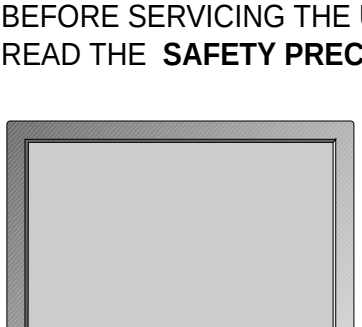
Website:http://biz.LGservice.com
E-mail:http://www.LGEservice.com/techsup.html

COLOR MONITOR
SERVICE MANUAL

CHASSIS NO. : LM57D

MODEL: FLATRON L1760TR (L1760TR-BFQ.AXQP, A**MQP)**
FLATRON L1960TR (L1960TR-BFQ.AXQP, A**MQP)**
( ) **Same model for Service

CAUTION
BEFORE SERVICING THE UNIT,
READ THE **SAFETY PRECAUTIONS** IN THIS MANUAL.



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SPECIFICATIONS

1. LCD CHARACTERISTICS

Type	: TFT Color LCD Module
Active Display Area	: 17 inch **- L1760TR**
	: 19 inch **- L1960TR**
Pixel Pitch	: 0.264 (H) x 0.264 (V) **- L1760TR**
	: 0.294 (H) x 0.294 (V) **- L1960TR**
Color Depth	: 16.2M colors
Size	: 358.5 (H) x 296.5 (V) x 17(D) **- L1760TR**
	: 396 (H) x 324 (V) x 16.5(D) **- L1960TR**
Electrical Interface	: LVDS
Surface Treatment	: Hard-coating(3H), Anti-Glare
Operating Mode	: Normally White, Transmissive mode
Backlight Unit	: 4-CCFL

2. OPTICAL CHARACTERISTICS

2-1. Viewing Angle by Contrast Ratio ≥ 10

L1760TR

Left : -70° min., -80°(Typ) Right : +70° min., +80°(Typ)
Top :+60° min., +75°(Typ) Bottom : -70° min., -85°(Typ)

L1960TR

Left : -75° min., -88°(Typ) Right : +75° min., +88°(Typ)
Top :+70° min., +85°(Typ) Bottom : -70° min., -85°(Typ)

2-2. Luminance : 180(Typ) ±30 -**sRGB**
: 200(min), 250(Typ)-**6500K**
: 150(min), 200(Typ)-**9300K**

2-3. Contrast Ratio : 500(min), 700(Typ)-**L1760TR**
450(min), 700(Typ)-**L1960TR**
2000 (DFCapplied)

3. SIGNAL (Refer to the Timing Chart)

3-1. Sync Signal
• Type : Separate Sync, Digital, SOG, Composite sync

3-2. Video Input Signal

1) Type	: R, G, B Analog
2) Voltage Level	: 0~0.71 V
a) Color 0, 0	: 0 Vp-p
b) Color 7, 0	: 0.467Vp-p
c) Color 15, 0	: 0.714Vp-p
3) Input Impedance	: 75Ω

3-3. Operating Frequency

Horizontal(Analog)	: 30 ~ 83kHz
Horizontal(Digital)	: 30 ~ 71kHz
Vertical	: 56 ~ 75Hz

4. Max. Resolution

D-sub Analog	: 1280 x 1024@75Hz
Digital	: 1280 x 1024@60Hz

5. POWER SUPPLY

5-1. Power : AC 100~240V, 50/60Hz , 0.6A

5-2. Power Consumption

MODE	H/V SYNC	VIDEO	POWER CONSUMPTION	LED COLOR
POWER ON (NORMAL)	ON/ON	ACTIVE	30 W(typ), 35W(max) -**L1760TR**	BLUE
			35 W(typ), 39W(max) -**L1960TR**	
STAND-BY	OFF/ON	OFF	less than 1 W	AMBER
SUSPEND	ON/OFF	OFF	less than 1 W	AMBER
DPMS OFF	OFF/OFF	OFF	less than 1 W	AMBER
POWER S/W Off	-	-	less than 1 W	OFF

6. ENVIRONMENT

6-1. Operating Temperature : 10°C~35°C (50°F~95°F) (Ambient)
6-2. Relative Humidity : 10%~80% (Non-condensing)
6-3. MTBF : 50,000 HRS with 90% Confidence
Lamp Life : 50,000 Hours(Min)

7. DIMENSIONS (with TILT/SWIVEL)

L1760TR

Width	: 393 mm (15.47")
Depth	: 84 mm (3.31")
Height	: 380 mm (11.02")

L1960TR

Width	: 430 mm (16.93")
Depth	: 87 mm (3.43")
Height	: 417 mm (16.42")

8. WEIGHT (with TILT/SWIVEL)

L1760TR

Net. Weight	: 3.7 kg (8.16 lbs)
Gross Weight	: 6.05 kg (13.34 lbs)

L1960TR

Net. Weight	: 4.6 kg (10.14 lbs)
Gross Weight	: 6.7 kg (14.77 lbs)

PRECAUTION

WARNING FOR THE SAFETY-RELATED COMPONENT.

- There are some special components used in LCD monitor that are important for safety. ***These parts are marked ⚠ on the schematic diagram and the replacement parts list.*** It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent electric shock, fire or other hazard.
- Do not modify original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

TAKE CARE DURING HANDLING THE LCD MODULE WITH BACKLIGHT UNIT.

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- The module not be exposed to the direct sunlight.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a softmaterial. (Cleaning with a dirty or rough cloth may damage the panel.)

⚠ CAUTION

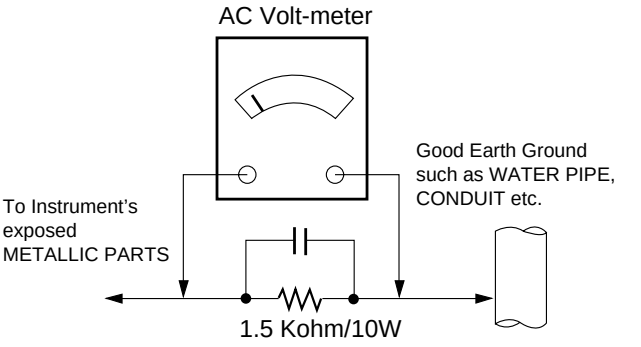
Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

⚠ WARNING

BE CAREFUL ELECTRIC SHOCK !

- If you want to replace with the new backlight (CCFL) or inverter circuit, must disconnect the AC adapter because high voltage appears at inverter circuit about 650Vrms.
- Handle with care wires or connectors of the inverter circuit. If the wires are pressed cause short and may burn or take fire.

Leakage Current Hot Check Circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the ***SAFETY PRECAUTIONS*** on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemicals on or near this receiver or any of its assemblies.
5. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
6. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
7. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
8. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
9. *Use with this receiver only the test fixtures specified in this service manual.*
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices.* Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500˚F to 600˚F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature.
      (500˚F to 600˚F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
      CAUTION: Work quickly to avoid overheating the circuitboard printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500˚F to 600˚F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
      CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

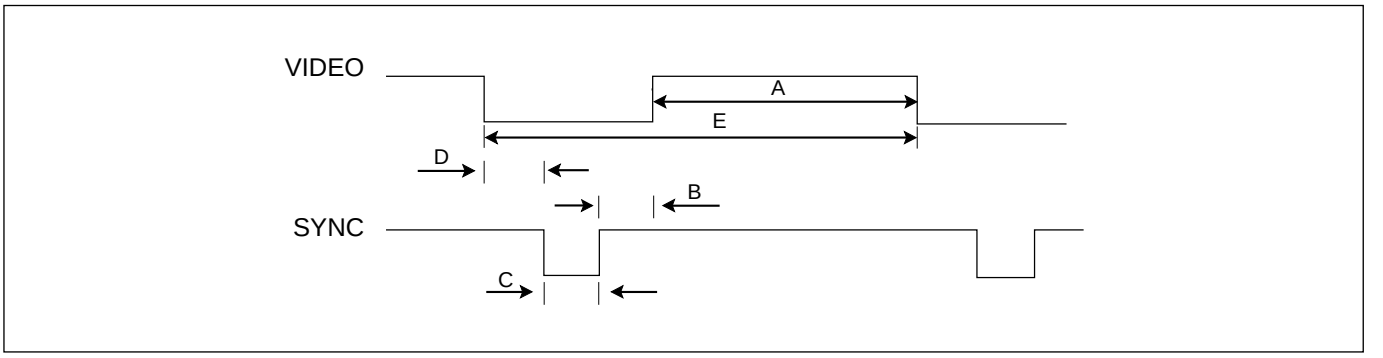
1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife.
   Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
   Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

TIMING CHART



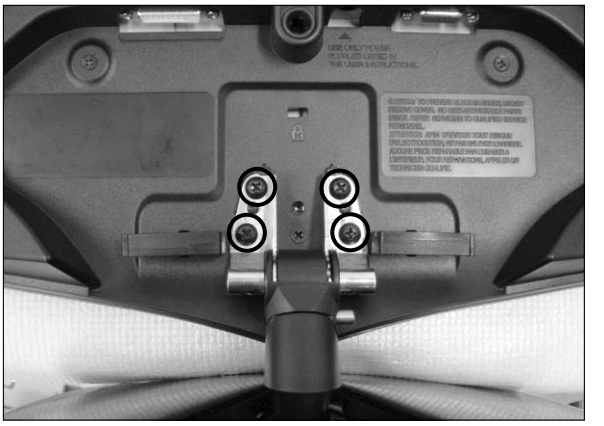
MODE	H / V	Sync Polarity	Dot Clock	Frequency	Total Period (E)	Video Active Time (A)	Sync Duration (D)	Front Porch (C)	Blanking Time (B)	Resolution
1	H(Pixels)	+	25.175	31.469	800	640	16	96	48	640 x 350
	V(Lines)	-		70.09	449	350	37	2	60	
2	H(Pixels)	-	28.321	31.468	900	720	18	108	54	720 X 400
	V(Lines)	+		70.08	449	400	12	2	35	
3	H(Pixels)	-	25.175	31.469	800	640	16	96	48	640 x 480
	V(Lines)	-		59.94	525	480	10	2	33	
4	H(Pixels)	-	31.5	37.5	840	640	16	64	120	640 x 480
	V(Lines)	-		75	500	480	1	3	16	
5	H(Pixels)	+	40.0	37.879	1056	800	40	128	88	800 x 600
	V(Lines)	+		60.317	628	600	1	4	23	
6	H(Pixels)	+	49.5	46.875	1056	800	16	80	160	800 x 600
	V(Lines)	+		75.0	625	600	1	3	21	
7	H(Pixels)	+/-	57.283	49.725	1152	832	32	64	224	832 x 624
	V(Lines)	+/-		74.55	667	624	1	3	39	
8	H(Pixels)	-	65.0	48.363	1344	1024	24	136	160	1024 x 768
	V(Lines)	-		60.0	806	768	3	6	29	
9	H(Pixels)	-	78.75	60.123	1312	1024	16	96	176	1024 x 768
	V(Lines)	-		75.029	800	768	1	3	28	
10	H(Pixels)	+/-	100.0	68.681	1456	1152	32	128	144	1152 x 870
	V(Lines)	+/-		75.062	915	870	3	3	39	
11	H(Pixels)	+/-	92.978	61.805	1504	1152	18	134	200	1152 x 900
	V(Lines)	+/-		65.96	937	900	2	4	31	
12	H(Pixels)	+	108.0	63.981	1688	1280	48	112	248	1280 x 1024
	V(Lines)	+		60.02	1066	1024	1	3	38	
13	H(Pixels)	+	135.0	79.976	1688	1280	16	144	248	1280 x 1024
	V(Lines)	+		75.035	1066	1024	1	3	38	

DISASSEMBLY

 # 1

Disassemble Rear Cover.

 # 2

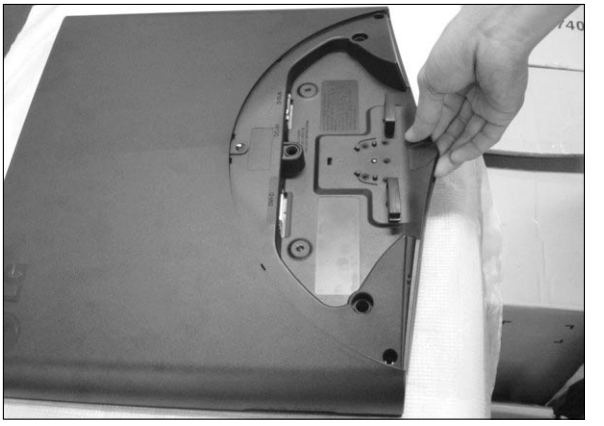


Remove the screws.

 # 3

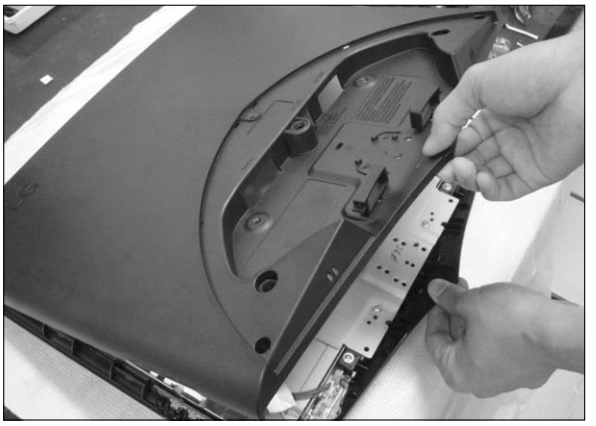
Remove the screws.

 # 4-1



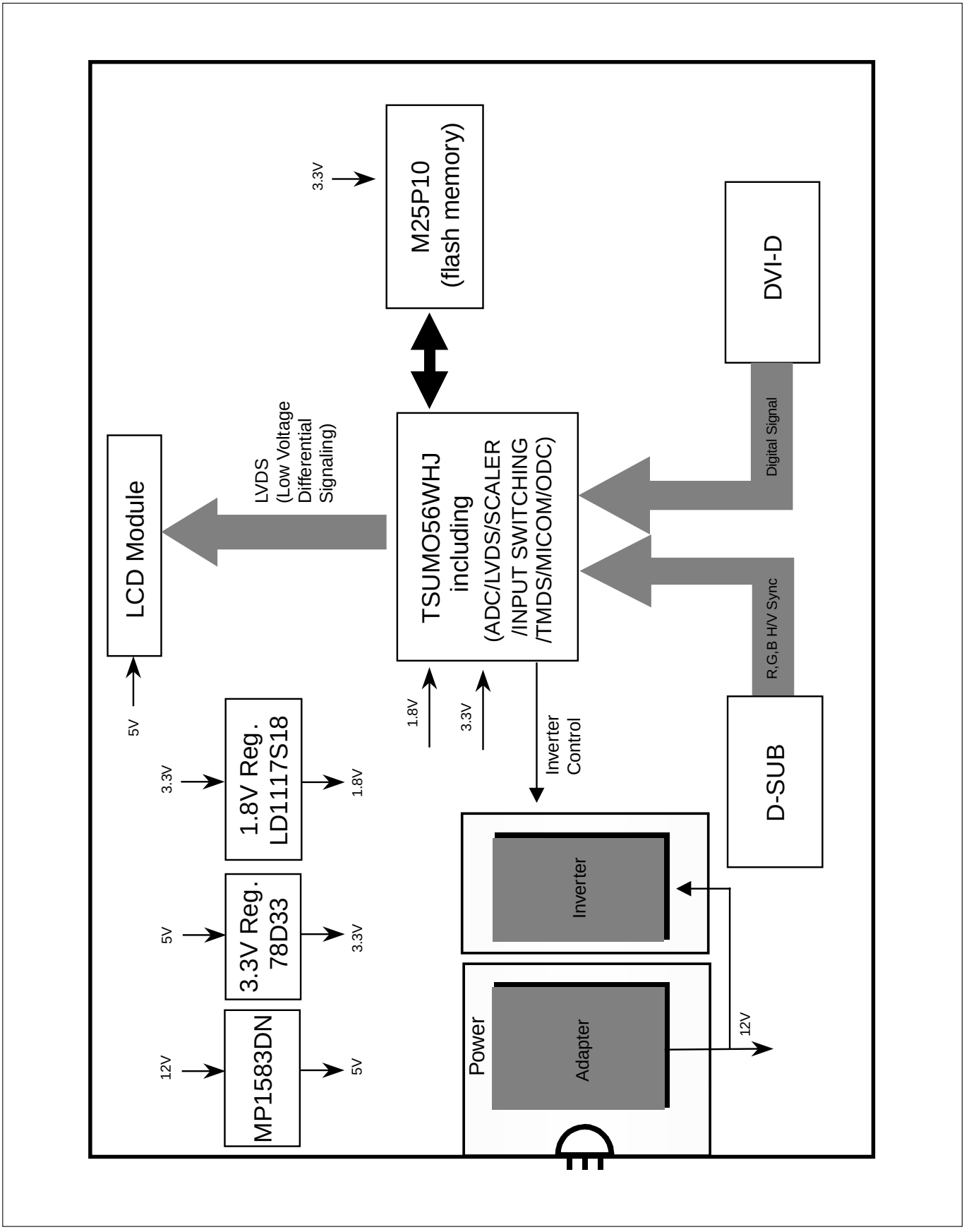
Disassembly the like a picture.

 # 4-2



Disassembly the like a picture.

BLOCK DIAGRAM



DESCRIPTION OF BLOCK DIAGRAM

1. Video Controller Part.

This part amplifies the level of video signal for the digital conversion and converts from the analog video signal to the digital video signal using a pixel clock.
The pixel clock for each mode is generated by the PLL.
The range of the pixel clock is from 25MHz to 135MHz.
This part consists of the Scaler, ADC and TMDS receiver .
The Scaler gets the video signal converted analog to digital, interpolates input to 1280 X 1024 resolution signal and outputs 8-bit R, G, B signal to transmitter.

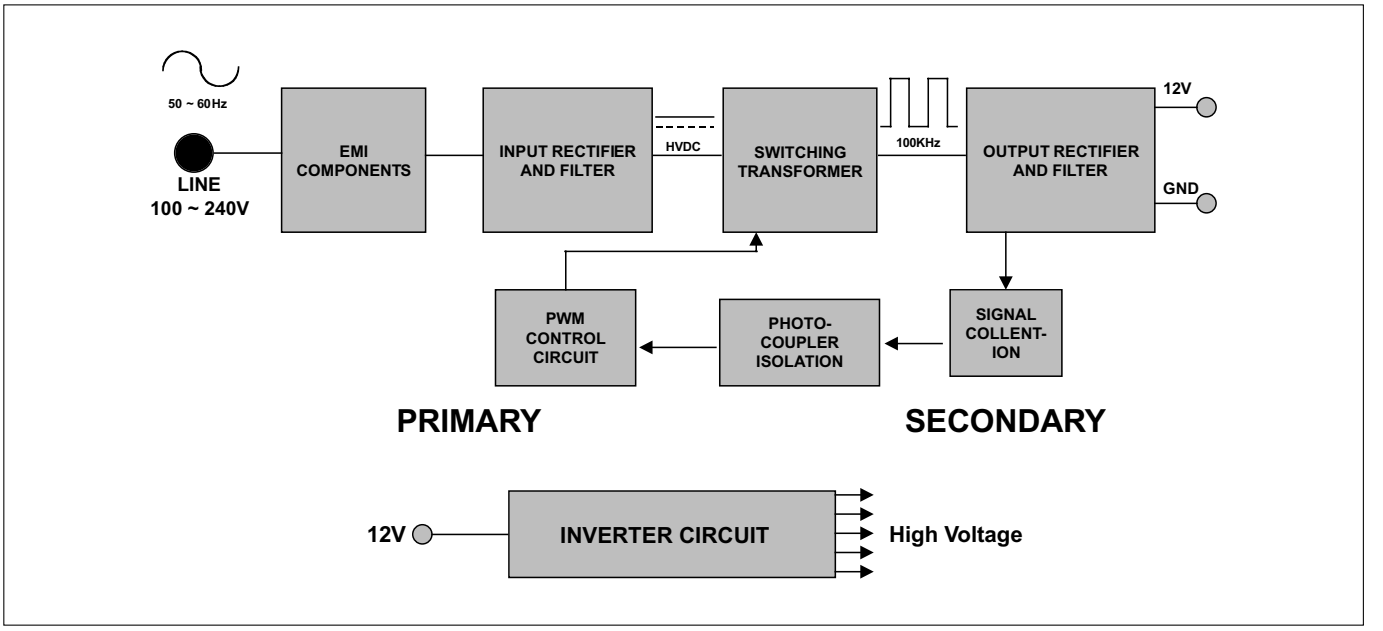
2. Power Part.

This part consists of the 3.3V regulator to convert power which is provided 12V,
5V in Power board and Micom
5V is provided for LCD panel.
Also, 5V is converted 3.3V by regulator and 3.3V is converted 1.8V by regulator.
Converted power is provided for IC in the main board.

3. MICOM Part.

This part consists of EEPROM IC which stores control data and the Micom.
The Micom distinguishes polarity and frequency of the H/V sync are supplied from signal cable.
The controlled data of each modes is stored in EEPROM.

LIPS Board Block Diagram



Operation description_LIPS

1. EMI components.

This part contains of EMI components to comply with global marketing EMI standards like FCC,VCCI CISPR, circuit included a line-filter, across line capacitor and of course the primary protection fuse.

2. Input rectifier and filter.

This part function is for transfer the input AC voltage to a DC voltage through a bridge rectifier and a bulk capacitor.

3. Energy Transfer.

This part function is for transfer the primary energy to secondary through a power transformer.

4. Output rectifier and filter.

This part function is to make a pulse width modulation control and to provide the driver signal to power switch, to adjust the duty cycle during different AC input and output loading condition to achieve the dc output stabilized, and also the over power protection is also monitor by this part.

5. Photo-Coupler isolation.

This part function is to feed back the DC output changing status through a photo transistor to primary controller to achieve the stabilized DC output voltage.

6. Signal collection.

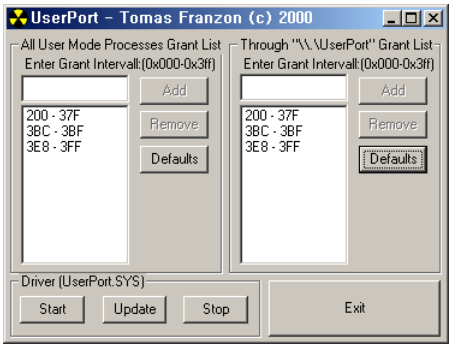
This part function is to collect the any change from the DC output and feed back to the primary through photo transistor.

ADJUSTMENT

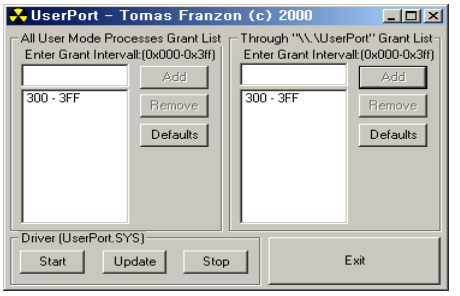
Windows EDID V1.0 User Manual

Operating System: MS Windows 98, 2000, XP
Port Setup: Windows 98 => Don't need setup
Windows 2000, XP => Need to Port Setup.
This program is available to LCD Monitor only.

1. Port Setup
   a) Copy "UserPort.sys" file to
   "c:\WINNT\system32\drivers" folder
   b) Run Userport.exe

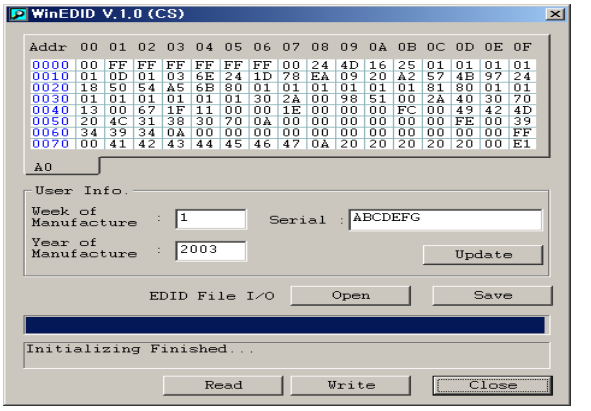


   c) Remove all default number
   d) Add 300-3FF

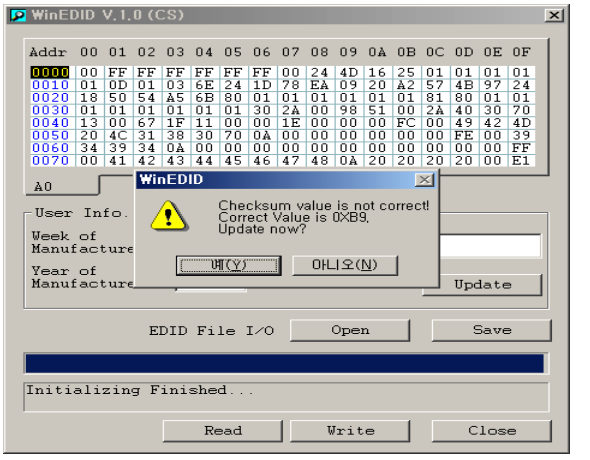


   e) Click Start button.
   f) Click Exit button.

2. EDID Read & Write
   1) Run WinEDID.exe



   2) Edit Week of Manufacture, Year of Manufacture, Serial Number
      a) Input User Info Data
      b) Click "Update" button
      c) Click " Write" button



SERVICE OSD

1) Turn off the power switch at the front side of the display.

2) Wait for about 5 seconds and press MENU, POWER switch with 1 second interval.

3) The SVC OSD menu contains additional menus that the User OSD menu as described below.

a) Auto Color : W/B balance and Automatically sets the gain and offset value.
b) NVRAM INIT : EEPROM initialize.(24C08)
c) CLEAR ETI : To initialize using time.
d) AGING : Select Aging mode(on/off).
e) R/G/B-9300K : Allows you to set the R/G/B-9300K value manually.
f) R/G/B-6500K : Allows you to set the R/G/B-6500K value manually.
g) R/G/B-Offset : Allows you to set the R/G/B-Offset value manually.(Analog Only)
h) R/G/B-Gain : Allows you to set the R/G/B-Gain value manually.(Analog Only)
i) MODULE : To select applied module.

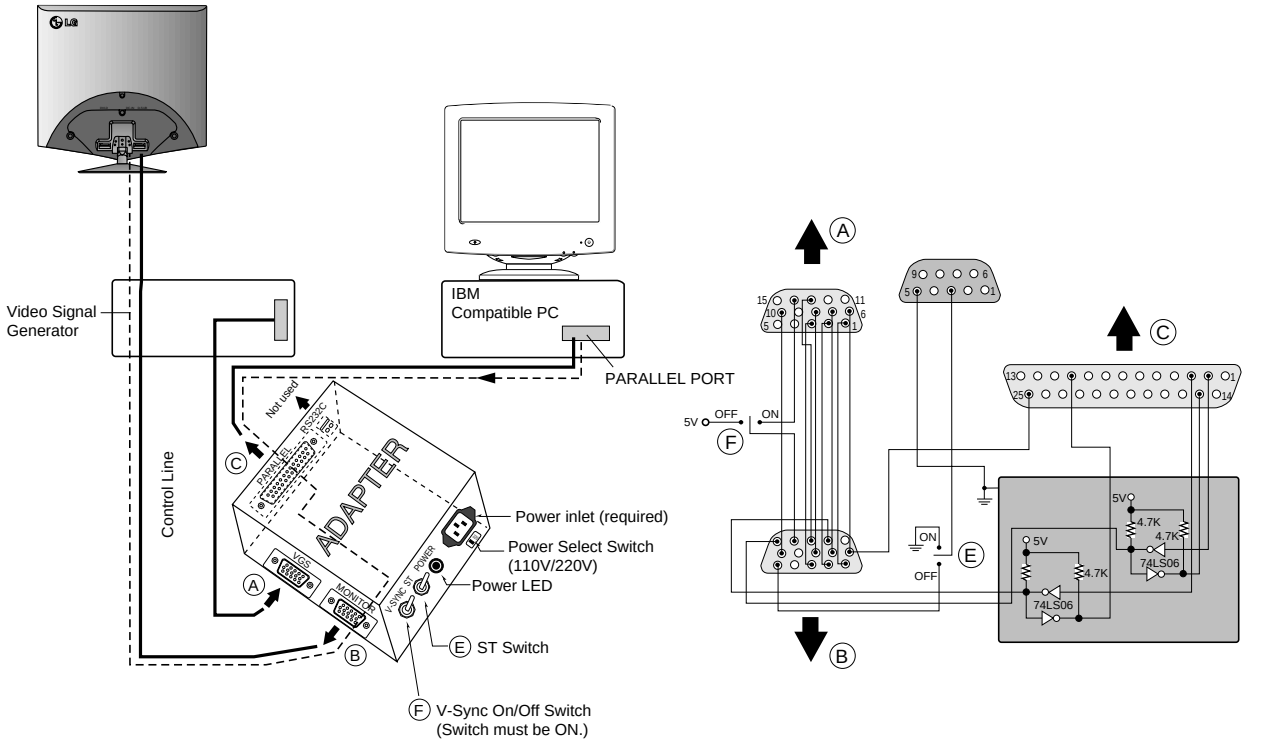
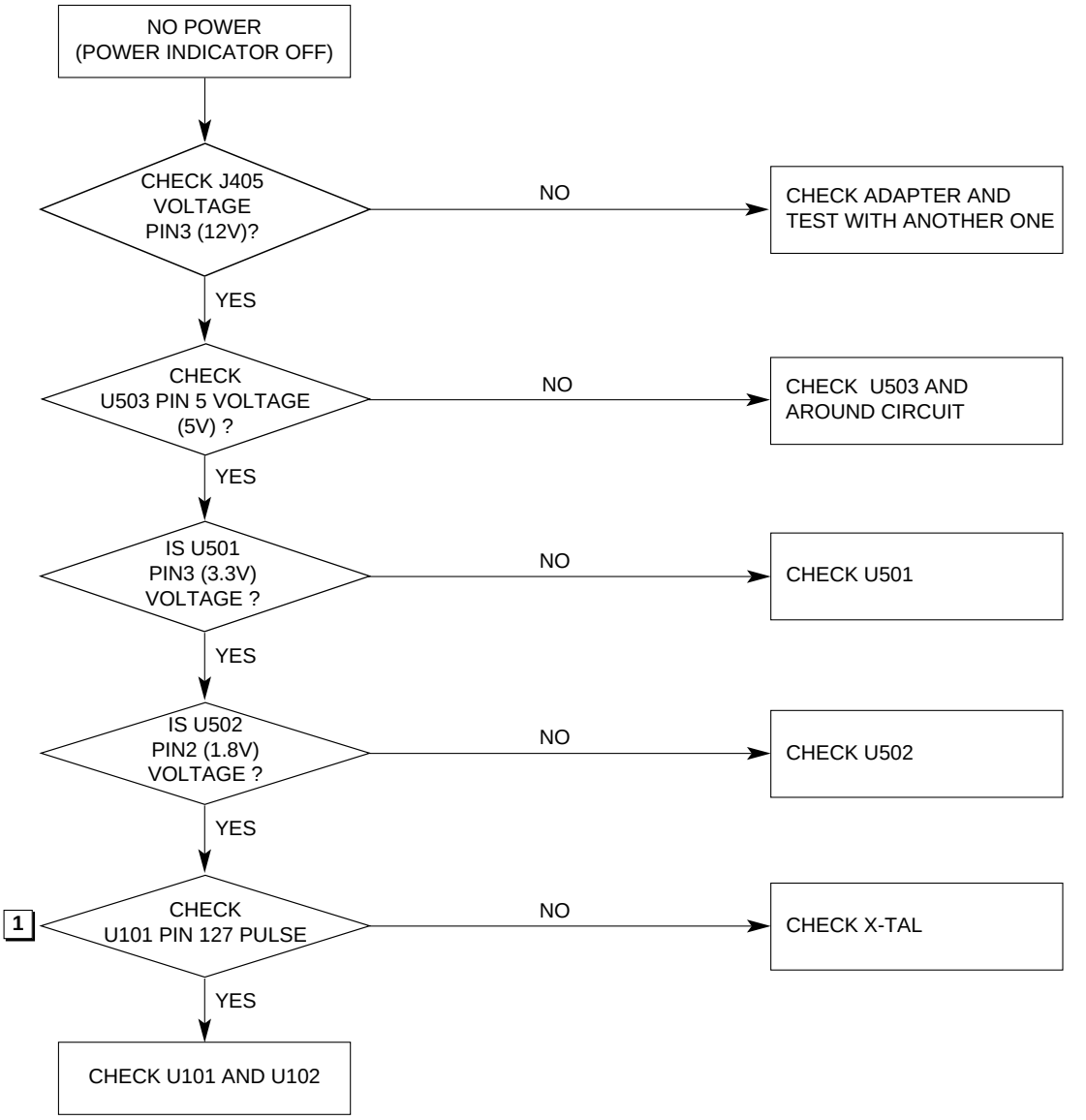


Figure 1. Cable Connection

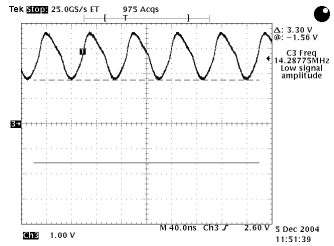
TROUBLESHOOTING GUIDE

1. NO POWER

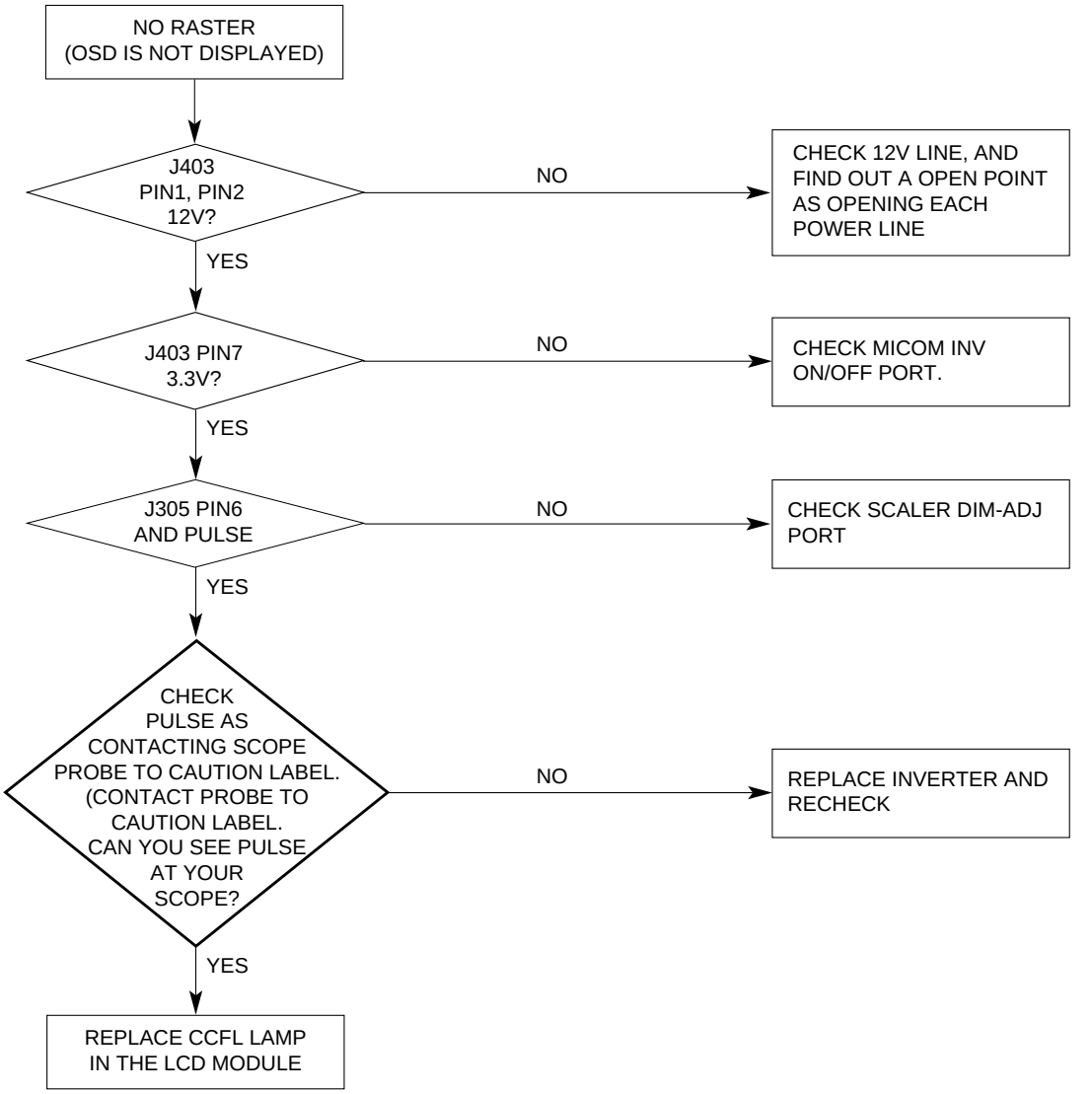


Waveforms

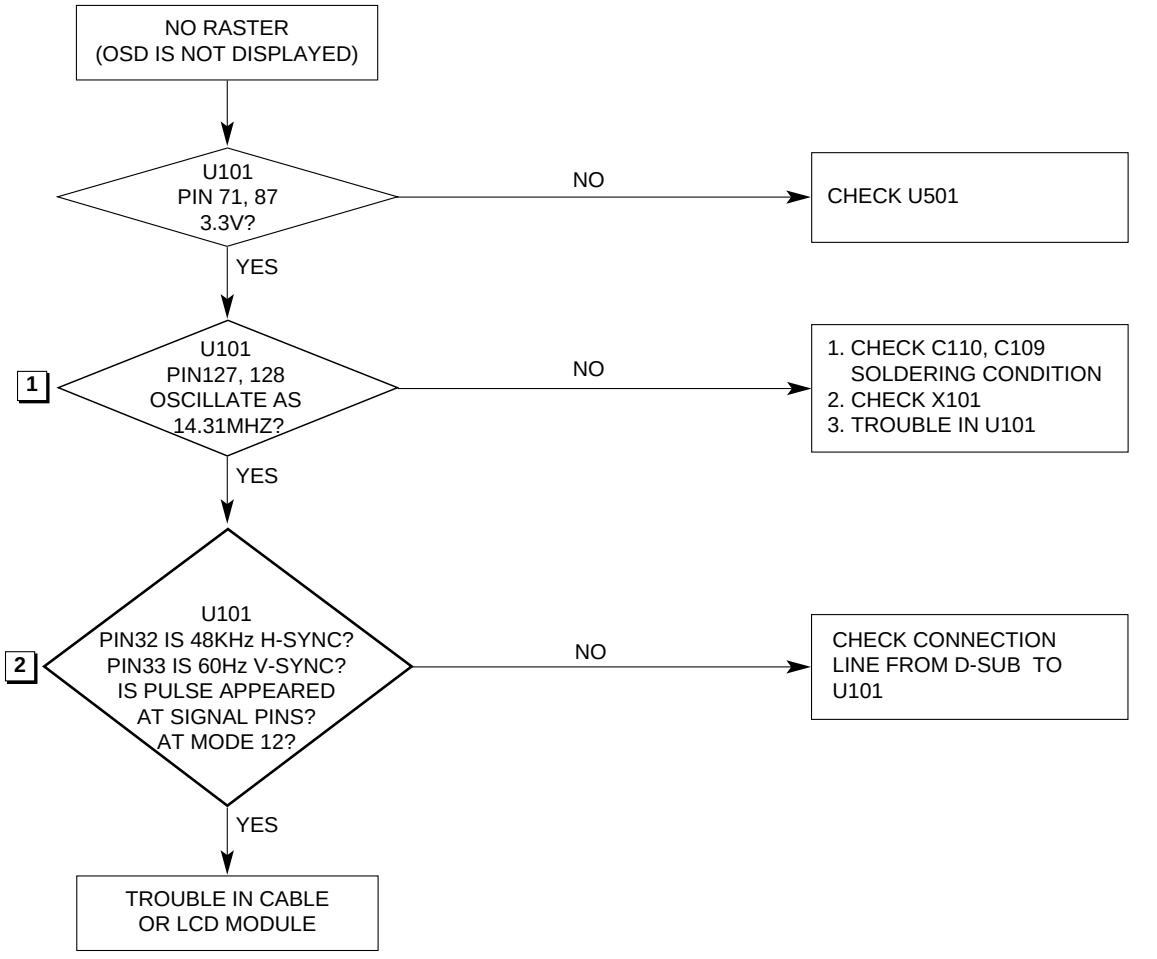
1 U101-#127



2. NO RASTER (OSD IS NOT DISPLAYED) – INVERTER

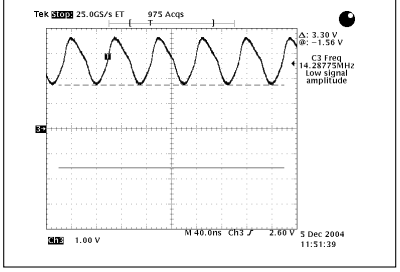


3. NO RASTER (OSD IS NOT DISPLAYED) – MSTAR

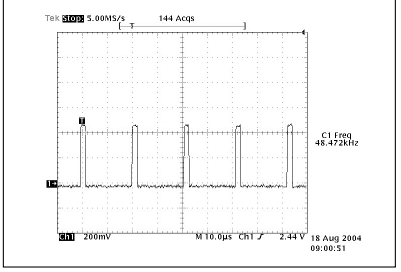


Waveforms

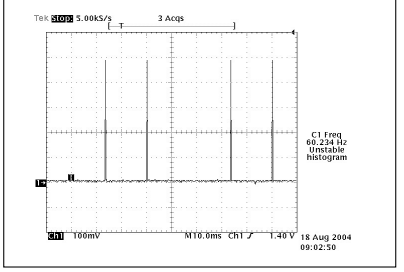
1 U101-#127, 128



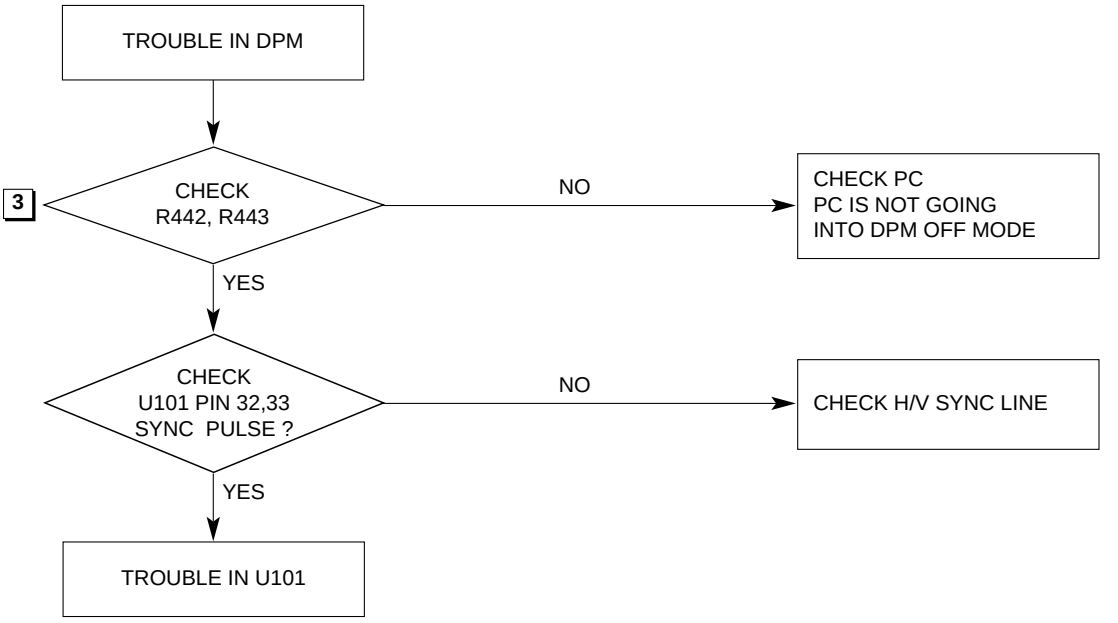
2 U101-#32 H-SYNC



2 U101-#33 V-SYNC

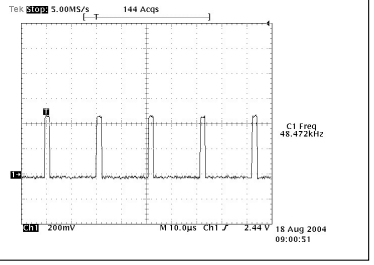


4. TROUBLE IN DPM

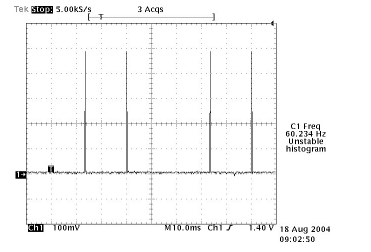


Waveforms

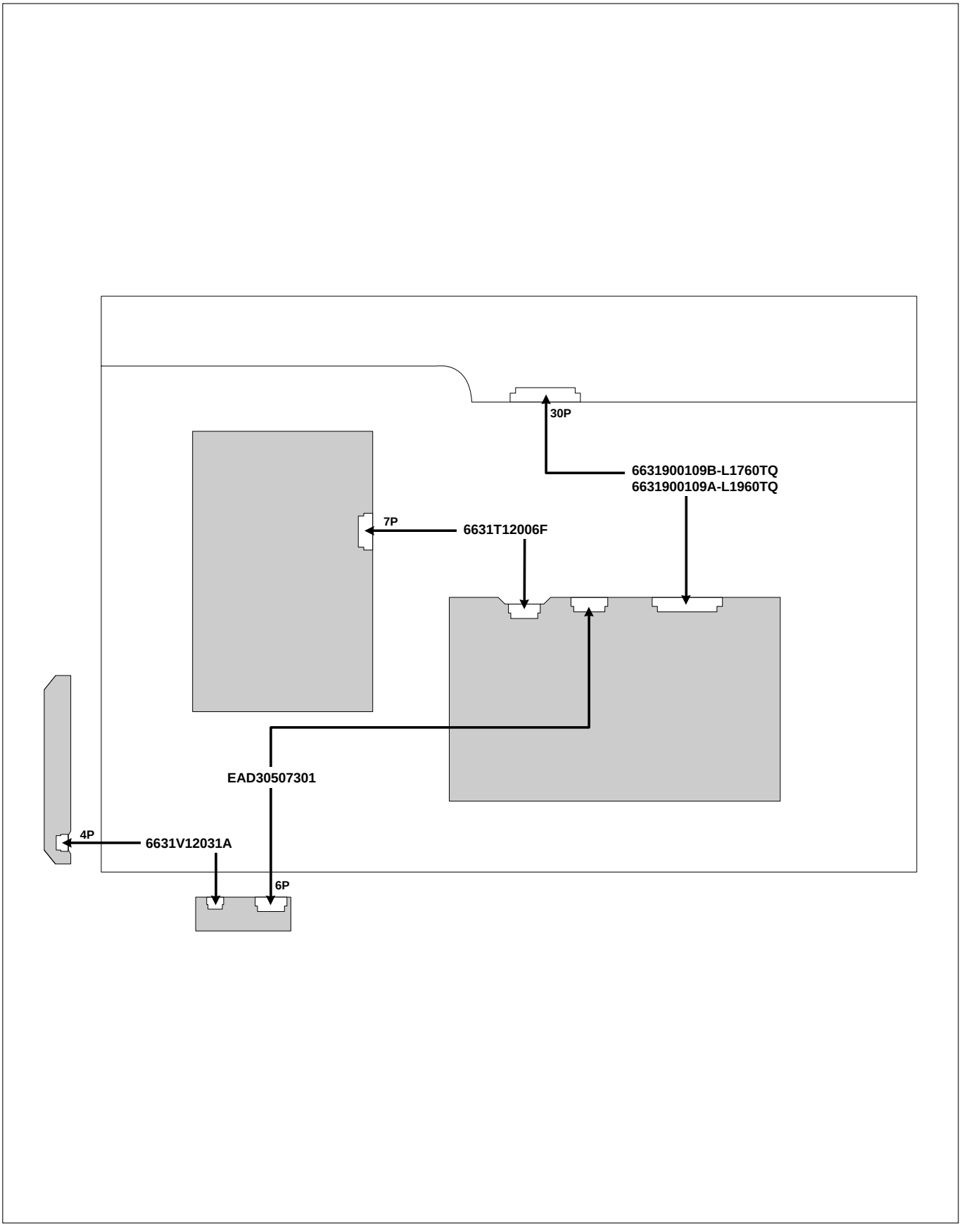
3 R442 H-Sync



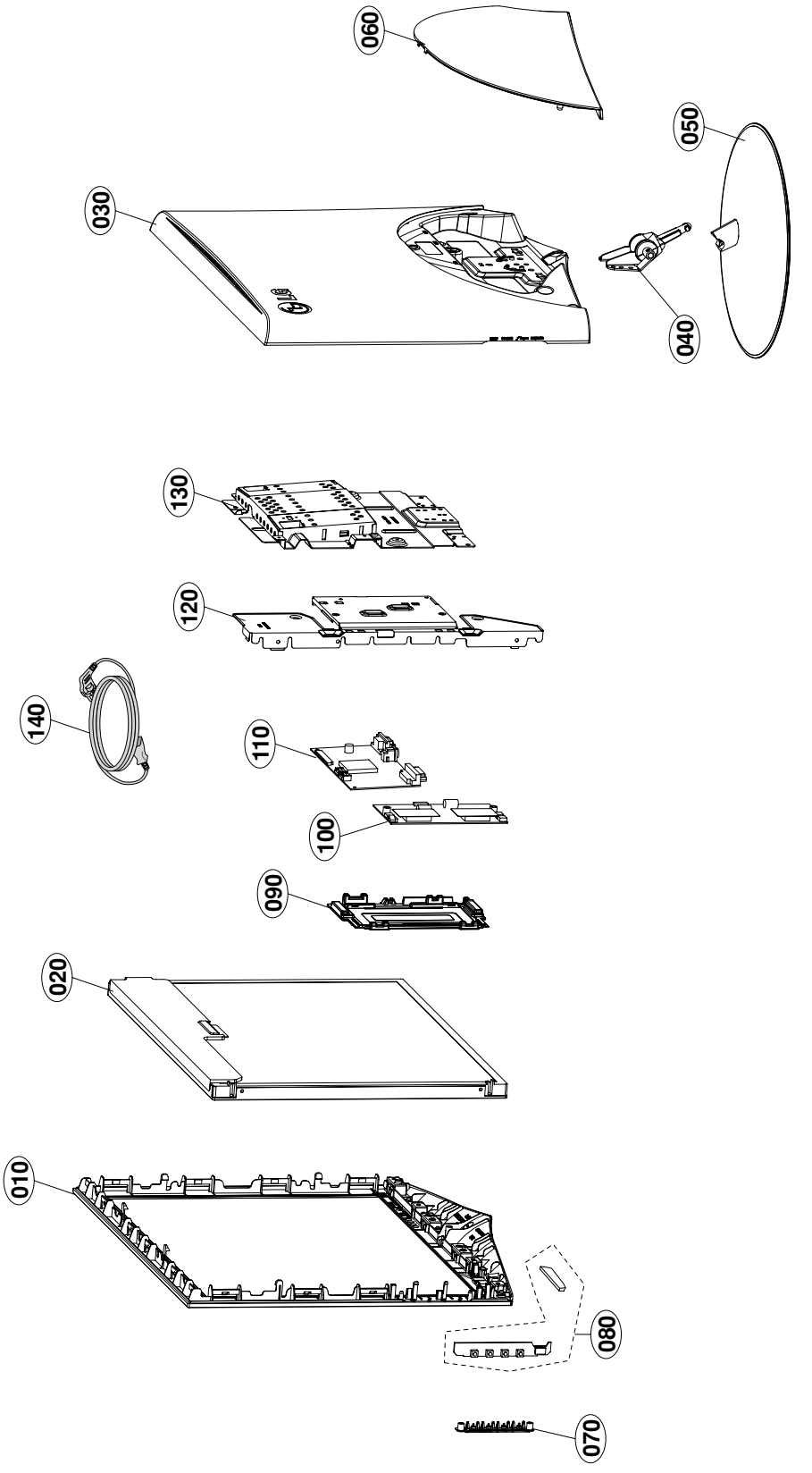
3 R443 V-Sync



WIRING DIAGRAM



EXPLODED VIEW



EXPLODED VIEW PARTS LIST

*** Note:** Safety mark ⚠

Ref. No.		Part No.	Description
010	⚠	30919L0031E	Cover Assembly, **L1760** . 17" L1760TR
		30919L0031F	Cover Assembly, **L1760** . 17" L1760 "E"-**CKD**
		30919L0032D	Cover Assembly, **L1960TR** LM57D 19" L1960TR CABINET
		30919L0032H	Cover Assembly, **L1960** LM57D 19" L1960TR D-**CKD**
020	⚠	EAJ32188801	LCD,Module-TFT, ***LM170E03-TLB3 DRIVER 17.0INCH 1280X1024 300CD COLOR*** 72% 5/4 800 VS 1 5MS, 160/160, 4LAMP, 2CH-LVDS
		EAJ32188901	LCD,Module-TFT, ***LM190E08-TLB5 DRIVER 19INCH 1280X1024 300CD COLOR*** 72% 5/4 800 : 1 P4 FACTORY 5MS, 2CH-LVDS, 160/160, 4LAMP
		or EAJ32189001	LCD,Module-TFT, ***LM190E08-TLB2 DRIVER 19.0INCH 1280X1024 300CD COLOR*** 72% 5/4 800:1 P7 FACTORY 5MS, 160/160, 2CH-LVDS, 4LAMP
030	⚠	3809900209A	Cover Assembly, **L1760** LM57C 17" BC ASSEMBLY
		3809900209B	Cover Assembly, **L1760** . 17" L1760 BACK COVER **CKD**
		3809900210G	Cover Assembly, **L1960TR** LM57D 19" L1960TR 2MS LPL
		3809900210L	Cover Assembly, **L1960TR** LM57D 19" L1960TR G-**CKD**
040	⚠	3043900054A	Base Assembly, L1760, L1960 . BASE TOP ASSY
		3043900054B	Base Assembly, ASSY L1760, L1960 LM57D L1760, L1960 STAND BASE TOP ASSY(**CKD**)
050	⚠	3043900055A	Base Assembly, L1760, L1960 . BASE BOTTOM ASSY
		3043900055B	Base Assembly, ASSY L1760, L1960 LM57D L1760, L1960 BASE BOTTOM ASSY(**CKD**)
060		35509K0301A	Cover, **L1760** TOP REAR DOOR
		35509K0301B	Cover, MOLD ABS HF-350 **L1760** ABS L1760 DOOR(**CKD**)
		35509K0302A	Cover, **L1960** TOP REAR DOOR
		35509K0302B	Cover, MOLD ABS HF-350 **L1960** ABS L1960 DOOR(**CKD**)
070		4940900029A	Knob, MAIN 4KEY L1760 .
		4940900029B	Knob, MOLD ABS HF-350 SUB 4KEY L1760, L1960 .-**CKD**
080		68719STA70A	PCB Assembly,Sub, SUB T.T LM57C L1X60T AXRDQP -
		68719STA70B	PCB Assembly,Sub, SUB T.T LM57D L1x60TQ KxxxQPN NT **CKD**
090		35509K0310A	Cover, L1760 PANEL INVERTER VACUUM
		35509K0310B	Cover, MOLD PS L1760,L1960 HIPS L1760, L1960 INVERTER VACUUM(**CKD**)
100	⚠	6633TZA019E	Inverter,DC/AC, FIF1742-50A 12.0TO12.0 800V 7MA 2 YES -**L1760TR**
		or 6633TZA019F	Inverter,DC/AC, FIF1742-50A_PWM 11.4VTO12.6V,11.4VTO12.6V,11.4VTO12.6V 800V 7MA 2 YES Bin3/4 FRONTEK-**L1760TR**
		66339A0020A	Inverter,DC/AC, FIF1742-50B 11.5VTO12.5V,11.5VTO12.5V,11.5VTO12.5V 800V 7.3A 4 YES PWM DIMMING 19INCH PB FREE-**L1960TR**
		or 66339A0020C	Inverter,DC/AC, FIF1742-50B_PWM 11.5VTO12.5V,11.5VTO12.5V,11.5VTO12.5V 800V 7.3A 4 YES PWM DIMMING 19INCH PB FREE Bin3/4 FRONTEK-**L1960TR**
110		EBU31069501	Main Total Assembly, **L1760TQ-BFQ** BRAND LM57D
		EBU31069502	Main Total Assembly, **L1760TQ-BFQ** BRAND LM57D NT **CKD**
		33139L7044A	Main Total Assembly, **L1960TQ** BRAND LM57D
		33139L7044B	Main Total Assembly, **L1960TQ** BRAND LM57D NT **CKD**
120		49509S0039A	Plate, SHIELD INVERTER LX60.-**L1760TR**
		49509S0039B	Plate, PRESS SPTE 0.5 SHIELD SPC **L1760** INVERTER SHIELD(**CKD**)
		49509S0041A	Plate, SHIELD INVERTER **L1960**
		49509S0041B	Plate, PRESS SPTE 0.3 SHIELD SPC **L1960** INVERTER SHIELD(**CKD**)
130		49519S0043A	Plate Assembly, FRAME METAL BRACKET
		49519S0043B	Plate Assembly, ASSY L1760, L1960 METAL BRACKET ASSY(**CKD**)
140		6410TEW010A	Power Cord, CEE,LP-34A&H05VV-FX3C,LS-60_1.87M_BLK LP-34A LS-60 1.87M - 250V 16A H05VV-F 3X0.75MM2 BLACK VDE SEMKO N LONGWELL COMPANY-**For Europe**
		EAD30470701	Power Cord, LP-42 LS-60 1.87M NONE 250V 10A H05VV-F 0.75MMX3C BLACK SII N LONGWELL-**For Israel**

REPLACEMENT PARTS LIST

CAUTION: BEFORE REPLACING ANY OF THESE COMPONENTS,
READ CAREFULLY THE **SAFETY PRECAUTIONS** IN THIS MANUAL.
* NOTE : **S** SAFETY Mark ⚠
AL ALTERNATIVE PARTS

DATE: 2006. 10. 16.

*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		MAIN BOARD		
		CAPACITORS		
		C101	0CK473CH56A	C1608X7R1E473KT 47nF 10% 25V
		C102	0CC102CK41A	C1608C0G1H102JT 1nF 5% 50V C
		C103	0CK473CH56A	C1608X7R1E473KT 47nF 10% 25V
		C104	0CK473CH56A	C1608X7R1E473KT 47nF 10% 25V
		C105	0CK473CH56A	C1608X7R1E473KT 47nF 10% 25V
		C106	0CK473CH56A	C1608X7R1E473KT 47nF 10% 25V
		C107	0CK473CH56A	C1608X7R1E473KT 47nF 10% 25V
		C108	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C109	0CC270CK41A	C1608C0G1H270JT 27pF 5% 50V
		C110	0CC270CK41A	C1608C0G1H270JT 27pF 5% 50V
		C111	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C112	0CE106WFKDC	MVK4.0TP16VC10M 10uF 20% 16V
		C113	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C114	0CK224CF56A	0603B224K160CT 220nF 10% 16V
		C115	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C116	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C118	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C119	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C120	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C121	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C122	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C123	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C124	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C125	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C126	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C127	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C128	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C129	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C130	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C131	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C132	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C133	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C134	0CK104CF56A	0603B104K160CT 100nF 10% 16V
		C135	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C137	0CK103CK51A	0603B103K500CT 10nF 10% 50V
		C138	0CK103CK51A	0603B103K500CT 10nF 10% 50V
		C401	0CE107WF6DC	MVK6.3TP16VC100M 100uF 20% 1
		C402	0CK103CK51A	0603B103K500CT 10nF 10% 50V
		C403	0CC102CK41A	C1608C0G1H102JT 1nF 5% 50V C
		C404	0CK105CD56A	C1608X7R1A105KT 1uF 10% 10V
		C405	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C406	0CC101CK41A	C1608C0G1H101JT 100pF 5% 50V
		C410	0CK103CK51A	0603B103K500CT 10nF 10% 50V
		C413	0CC101CK41A	C1608C0G1H101JT 100pF 5% 50V
		C414	0CC101CK41A	C1608C0G1H101JT 100pF 5% 50V
		C415	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C416	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C417	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C418	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C419	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C420	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C421	0CK104CK56A	0603B104K500CT 100nF 10% 50V

DATE: 2006. 10. 16.

*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		C422	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C423	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C424	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C425	0CC680CK41A	C1608C0G1H680JT 68pF 5% 50V
		C426	0CC680CK41A	C1608C0G1H680JT 68pF 5% 50V
		C427	0CC680CK41A	C1608C0G1H680JT 68pF 5% 50V
		C428	0CC680CK41A	C1608C0G1H680JT 68pF 5% 50V
		C429	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C430	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C431	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C501	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C502	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C503	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C504	0CE107WF6DC	MVK6.3TP16VC100M 100uF 20% 1
		C505	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C506	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C507	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C508	0CK103CK51A	0603B103K500CT 10nF 10% 50V
		C509	0CE107WF6DC	MVK6.3TP16VC100M 100uF 20% 1
		C510	0CE107WF6DC	MVK6.3TP16VC100M 100uF 20% 1
		C511	0CE107WF6DC	MVK6.3TP16VC100M 100uF 20% 1
		C512	0CK103CK51A	0603B103K500CT 10nF 10% 50V
		C513	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C514	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C515	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C516	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C517	0CC101CK41A	C1608C0G1H101JT 100pF 5% 50V
		C518	0CK102CK56A	0603B102K500CT 1nF 10% 50V X
		C519	0CK102CK56A	0603B102K500CT 1nF 10% 50V X
		C520	0CK102CK56A	0603B102K500CT 1nF 10% 50V X
		C521	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C522	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C523	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C524	0CE107EF610	KMG16VB100M 100uF 20% 16V 12
		C525	0CE107WF6DC	MVK6.3TP16VC100M 100uF 20% 1
		DIODEs		
		D404	0DD184009AA	KDS184 KDS184 TP KEC - 85V -
		D405	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D406	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D407	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D408	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D409	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D410	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D411	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D412	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D413	0DD184009AA	KDS184 KDS184 TP KEC - 85V -
		D416	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D417	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D418	0DSIH00018A	ENKMC2837-T112 1.2V 85V 300M
		D419	0DSON00138A	MMBD301LT1G 600MV 30V - - 1.
		D420	0DSON00138A	MMBD301LT1G 600MV 30V - - 1.
		D501	0DRON00268A	MBRS190T3G 750MV 90V 2A - -

DATE: 2006. 10. 16.

*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		ZD406	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD407	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD409	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD410	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD411	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD412	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD414	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
		ZD415	0DZ560009GB	BZT52C5V6S-(F) 5.6V 5.2TO6V
	ICs			
		U101	0IPRP00784A	FE251MOH-LF(TSUMO56WHJ-LF) 3
		U102	0IZZ9H9039A	AT25F2048 0IMMR00004B SST SO
		U103	0IMMRSG036B	M24C16-WMN6TP 16KBIT 2KX8BIT
		U402	0IMMRAL014D	AT24C02BN-10SU-1.8 2KBIT 256
		U403	0IMMRAL014D	AT24C02BN-10SU-1.8 2KBIT 256
		U501	0IPMGKE011A	KIA78D33F 4TO10V 3.3V 1.3W D
		U502	0IPMGSG019A	LD1117S18TR 3.3TO8V 1.8V 12W
		U503	0IMCRMZ001A	"MP1583DN-Z,LF 4.75TO23V 21V"
	FILTERs & INDUCTORs			
		L401	6210TCE001S	HU-1M2012-121 120OHM 2X1.25X
		L502	0LCML00003B	MLB-201209-0120P-N2 120OHM 2
		L503	0LCML00003B	MLB-201209-0120P-N2 120OHM 2
		L504	0LCML00003B	MLB-201209-0120P-N2 120OHM 2
		L501	6140TBZ048A	SLF10145T-150M2R2 15UH 20% -
	RESISTORs			
		R101	0RJ0562D677	MCR03EZPJ560 56OHM 5% 1/10W
		R102	0RJ4700D677	MCR03EZPJ471 470OHM 5% 1/10W
		R103	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R104	0RJ0562D677	MCR03EZPJ560 56OHM 5% 1/10W
		R105	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R106	0RJ0562D677	MCR03EZPJ560 56OHM 5% 1/10W
		R107	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R108	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R109	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R110	0RJ3900D677	MCR03EZPJ391 390OHM 5% 1/10W
		R111	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R112	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R113	0RJ1002D677	MCR03EZPJ103 10KOHM 5% 1/10W
		R116	0RJ1502D677	MCR03EZPJ153 15KOHM 5% 1/10W
		R117	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R118	0RJ0332D677	MCR03EZPJ330 33OHM 5% 1/10W
		R119	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R120	0RJ0332D677	MCR03EZPJ330 33OHM 5% 1/10W
		R121	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R122	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R124	0RJ1002D677	MCR03EZPJ103 10KOHM 5% 1/10W
		R125	0RJ1002D677	MCR03EZPJ103 10KOHM 5% 1/10W
		R128	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R129	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R401	0RJ5600D677	MCR03EZPJ561 560OHM 5% 1/10W
		R402	0RJ2202D677	MCR03EZPJ223 22KOHM 5% 1/10W
		R403	0RJ2702D677	MCR03EZPJ273 27KOHM 5% 1/10W
		R404	0RJ1002D677	MCR03EZPJ103 10KOHM 5% 1/10W
		R407	0RJ1001D677	MCR03EZPJ102 1KOHM 5% 1/10W
		R408	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R413	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R414	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		R415	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R416	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R417	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R418	0RJ1000D677	MCR03EZPJ101 100OHM 5% 1/10W
		R424	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R425	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R426	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R427	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R428	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R429	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R430	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R431	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R432	0RJ0102D677	MCR03EZPJ100 10OHM 5% 1/10W
		R433	0RJ1001D677	MCR03EZPJ102 1KOHM 5% 1/10W
		R434	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R435	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R436	0RJ0332D677	MCR03EZPJ330 33OHM 5% 1/10W
		R437	0RJ0332D677	MCR03EZPJ330 33OHM 5% 1/10W
		R438	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R439	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R440	0RJ0332D677	MCR03EZPJ330 33OHM 5% 1/10W
		R441	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R442	0RJ0682D677	MCR03EZPJ680 68OHM 5% 1/10W
		R443	0RJ0682D677	MCR03EZPJ680 68OHM 5% 1/10W
		R444	0RJ0332D677	MCR03EZPJ330 33OHM 5% 1/10W
		R445	0RJ0752D677	MCR03EZPJ750 75OHM 5% 1/10W
		R446	0RJ0752D677	MCR03EZPJ750 75OHM 5% 1/10W
		R447	0RJ0000D677	MCR03EZPJ000 0OHM 5% 1/10W 1
		R448	0RJ0752D677	MCR03EZPJ750 75OHM 5% 1/10W
		R449	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R450	0RJ4701D677	MCR03EZPJ472 4.7KOHM 5% 1/10
		R501	0RJ1502D477	MCR03EZPF153 15KOHM 1% 1/10W
		R502	0RJ1002D677	MCR03EZPJ103 10KOHM 5% 1/10W
		R503	0RJ4702D477	MCR03EZPF473 47KOHM 1% 1/10W
	OTHERs			
		U401	0TFVI80067A	SI3865BDV(E3) N-CHANNEL MOSF
		X101	6202VDT002B	SX-1 14.31818MHZ 30PPM 14.31
	CONTROL BOARD			
		C601	0CK105CD56A	C1608X7R1A105KT 1uF 10% 10V
		C602	0CC102CK41A	C1608C0G1H102JT 1nF 5% 50V C
		C605	0CC821CK41A	0603N821J500LT 820pF 5% 50V
		C606	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C607	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C608	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C701	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		C702	0CK104CK56A	0603B104K500CT 100nF 10% 50V
		LED601	0DLBE0248AA	BL-HB5KC39C-TRB BLUE-YELLOW
		Q601	0TRIH80001A	RT1C3904-T112 NPN 6V 60V 40V
		Q602	0TRIH80001A	RT1C3904-T112 NPN 6V 60V 40V
		R601	0RJ7501D677	MCR03EZPJ752 7.5KOHM 5% 1/10
		R602	0RJ1501D677	MCR03EZPJ152 1.5KOHM 5% 1/10
		R603	0RJ2203D677	MCR03EZPJ224 220KOHM 5% 1/10
		R604	0RJ1501D677	MCR03EZPJ152 1.5KOHM 5% 1/10
		R605	0RJ4700D677	MCR03EZPJ471 470OHM 5% 1/10W
		R606	0RJ4700D677	MCR03EZPJ471 470OHM 5% 1/10W
		R607	0RJ0562D677	MCR03EZPJ560 56OHM 5% 1/10W
		R701	0RJ7501D677	MCR03EZPJ752 7.5KOHM 5% 1/10
		R702	0RJ1201D677	MCR03EZPJ122 1.2KOHM 5% 1/10

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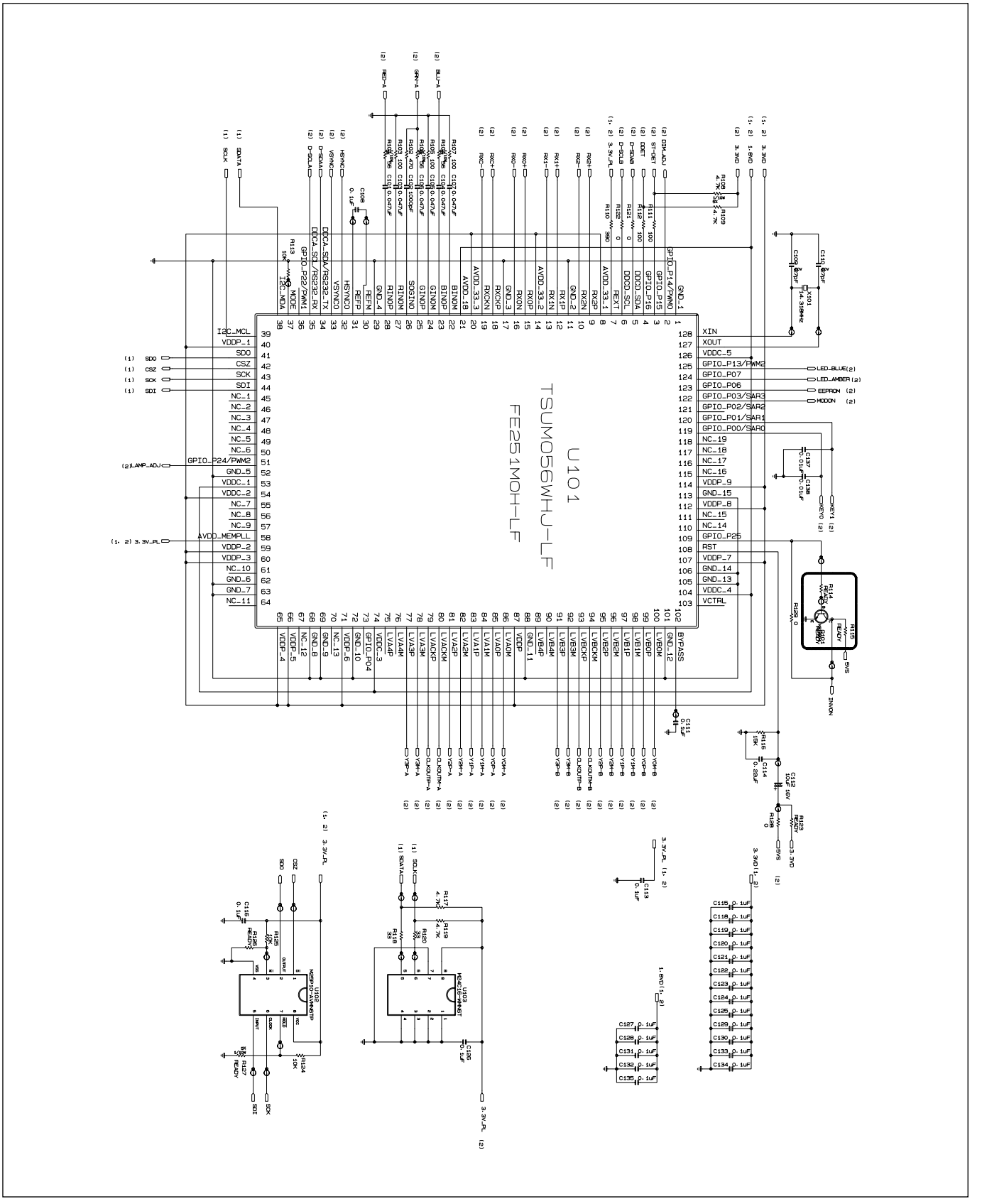
*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		R703	0RJ1201D677	MCR03EZPJ122 1.2KOHM 5% 1/10
		R704	0RJ1801D677	MCR03EZPJ182 1.8KOHM 5% 1/10
		SW701	6600R00004A	JTP1138A6EM 1C2P 12VDC 50MA
		SW702	6600R00004A	JTP1138A6EM 1C2P 12VDC 50MA
		SW703	6600R00004A	JTP1138A6EM 1C2P 12VDC 50MA
		SW704	6600R00004A	JTP1138A6EM 1C2P 12VDC 50MA
		U601	EAN30331001	ADA03 2.5TO5 100m - SOT26 R/

SCHEMATIC DIAGRAM

1. SCALER



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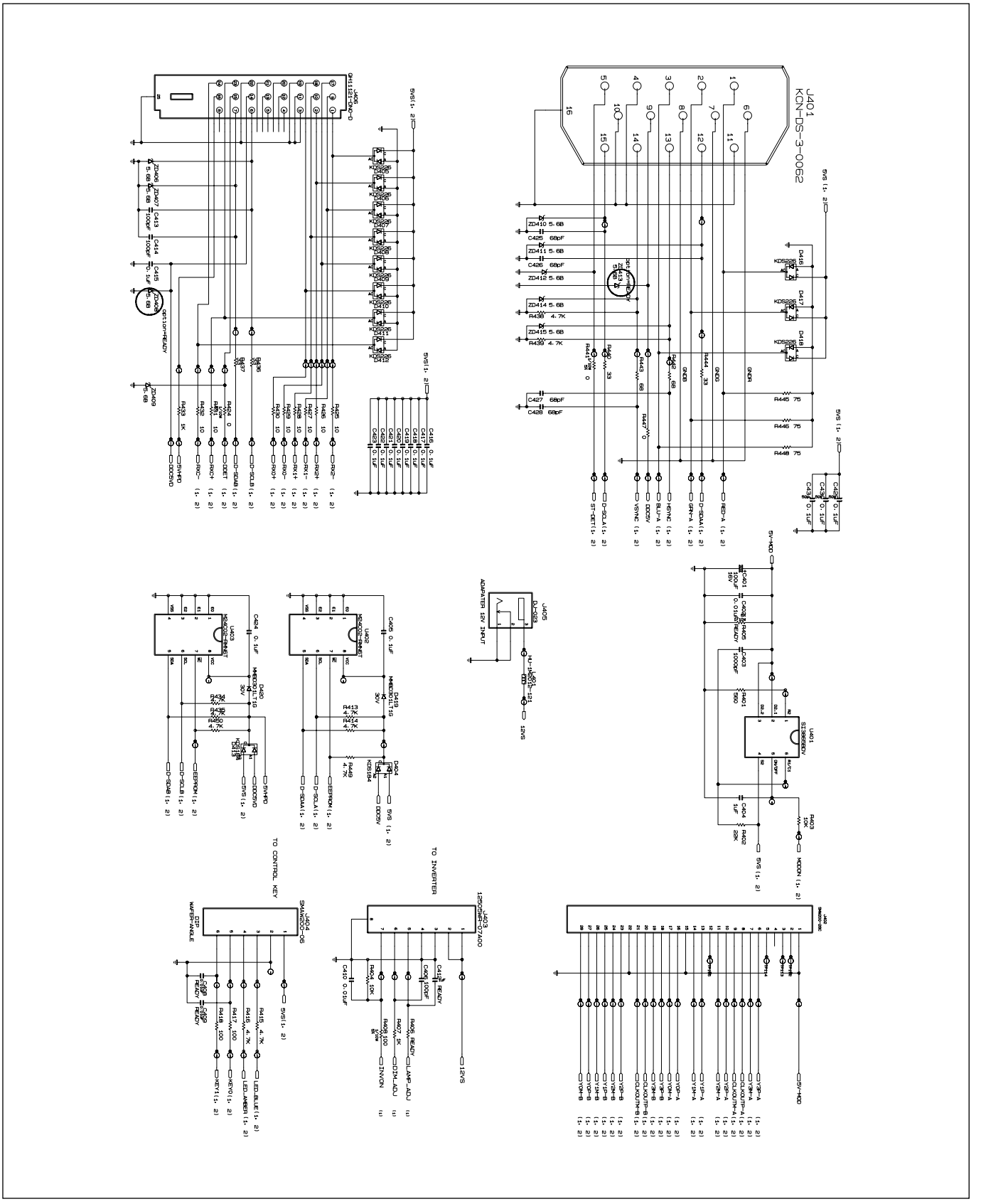
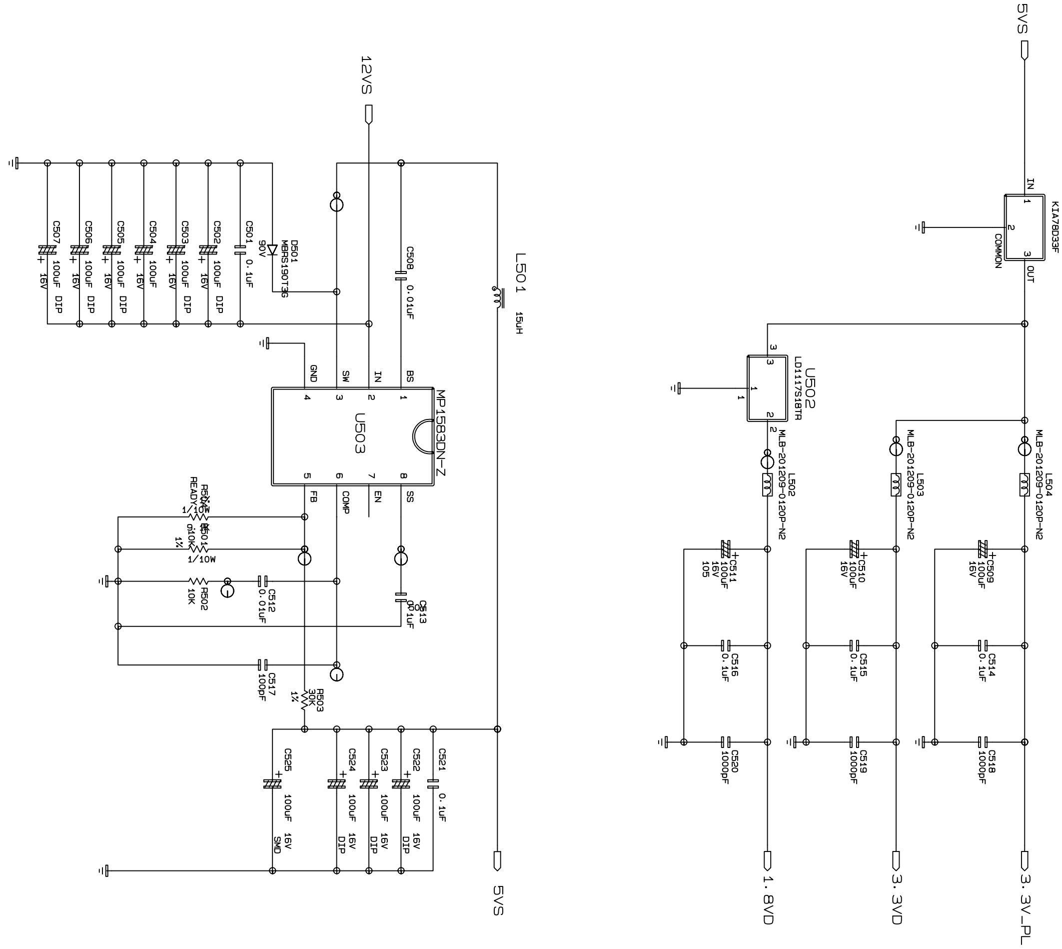


3. DC-DC BLOCK


12VS
5VS
L501
U503
MP1583DN-Z
U502
U501
KIA78D33F
1.8VD
3.3VD
3.3V_PL

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