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COLOR MONITOR SERVICE MANUAL

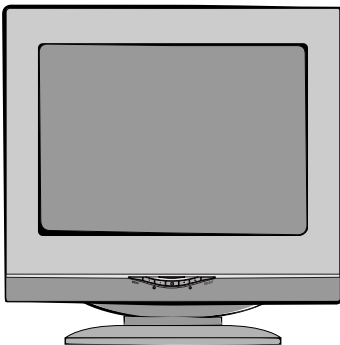
CHASSIS NO. : CA-130

MODEL: FLATRON F920B (F920BJ-AL **Q)

() **Same model for Service

CAUTION

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



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SPECIFICATIONS

1. PICTURE TUBE

- Size : 19 inch (Flat Slot Mask)
- Deflection Angle : 90°
- Neck Diameter : 29.1 mm
- Strip Pitch : 0.24 mm
- Diagonal Size : 457.5 mm
- View Size : 366.0 x 274.5 mm
- Face Treatment : AR-ASC (Anti-Reflective and Anti-Static Coating)

2. SIGNAL

- 2-1. Horizontal & Vertical Sync
 - 1) Input Voltage Level : Low= ≤0.8V, High= ≥2.1V
 - 2) Sync Polarity : Positive or Negative
- 2-2. Video Input Signal
 - 1) Voltage Level : 0~0.7 Vp-p
 - a) Color 0, 0 : 0 Vp-p
 - b) Color 7, 0 : 0.467 Vp-p
 - c) Color 15, 0 : 0.7 Vp-p
 - 2) Input Impedance : 75 Ω
 - 3) Video Color : R, G, B Analog
 - 4) Signal Format : Refer to the Timing Chart
- 2-3. Signal Connector
 - 15 Pin D-Sub Connector
- 2-4. Scanning Frequency
 - Horizontal : 30~98 kHz
 - Vertical : 50~160 Hz

3. POWER SUPPLY

- 3-1. Power Range
 - AC 100-240V~50/60HZ, 2.5A Max
 - AC 200-240V~50Hz, 1.5A Max.(PFC version)

3-2. Power Consumption

MODE	VIDEO	POWER CONSUMPTION	LED COLOR
MAX	Yes	less than 120W	GREEN
STAND-BY	No	less than 8W	AMBER
SUSPEND	No	less than 8W	AMBER
DPM OFF	No	less than 3W	AMBER
POWER SWITCH OFF	-	less than 1W	-

4. DISPLAY AREA

- 4-1. Active Video Area :
 - Max Image Size - 366.0 x 274.5mm (14.40" x 10.80")
 - Preset Image Size - 350 x 262 mm (13.78" x 10.31")
- 4-2. Display Color : Full Colors
- 4-3. Display Resolution : 1600 Dots x 1200Lines/75Hz
- 4-4. Video Bandwidth : 203MHz

5. ENVIRONMENT

- 5-1. Operating Temperature: 0°C~40°C (32°F~103°F)
(Ambient)
- 5-2. Relative Humidity : 10%~90%
(Non-condensing)
- 5-3. Altitude : 10,000 ft

6. DIMENSIONS (with TILT/SWIVEL)

- Width : 466.6 mm (18.37")
- Depth : 472.5 mm (18.60")
- Height : 474 mm (18.66")

7. WEIGHT (with TILT/SWIVEL)

- Net Weight : 23.2 kg (51.82 lbs)
- Gross Weight : 26.6 kg (59.52 lbs)

8. USB Specifications

- USB Standard : Rev. 1.0 complied self-powered hub
- Downstream power supply : 500mA for each (MAX)
- Communication speed : 12 Mbps (Full), 1.5 Mbps (Low)
- USB port : 1 Upstream port
2 Downstream ports

SAFETY PRECAUTIONS

SAFETY-RELATED COMPONENT WARNING!

There are special components used in this color monitor which 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 X-radiation, shock, fire, or other hazards. Do not modify the original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

CAUTION: No modification of any circuit should be attempted.

Service work should be performed only after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

SAFETY CHECK

Care should be taken while servicing this color monitor because of the high voltage used in the deflection circuits. These voltages are exposed in such areas as the associated flyback and yoke circuits.

FIRE & SHOCK HAZARD

An isolation transformer must be inserted between the color monitor and AC power line before servicing the chassis.

- In servicing, attention must be paid to the original lead dress specially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.
- All the protective devices must be reinstalled per the original design.
- Soldering must be inspected for the cold solder joints, frayed leads, damaged insulation, solder splashes, or the sharp points. Be sure to remove all foreign materials.

IMPLOSION PROTECTION

All used display tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only same type display tubes.

X-RADIATION

The only potential source of X-radiation is the picture tube. However, when the high voltage circuitry is operating properly there is no possibility of an X-radiation problem. The basic precaution which must be exercised is keep the high voltage at the factory recommended level; the normal high voltage is about 27kV. The following steps describe how to measure the high voltage and how to prevent X-radiation.

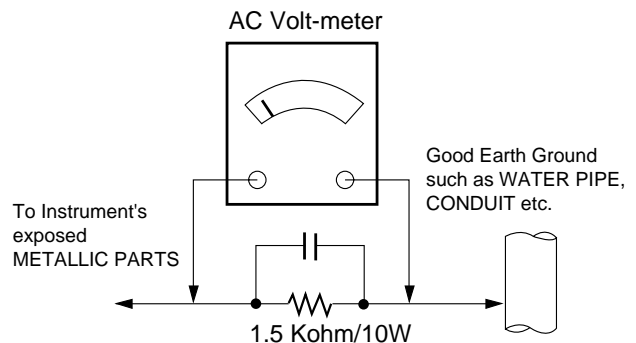
Note : It is important to use an accurate high voltage meter calibrated periodically.

- To measure the high voltage, use a high impedance high voltage meter, connect (-) to chassis and (+) to the CDT anode cap.
- Set the brightness control to maximum point at full white pattern.
- Measure the high voltage. The high voltage meter should be indicated at the factory recommended level.
- If the meter indication exceeds the maximum level, immediate service is required to prevent the possibility of premature component failure.
- To prevent X-radiation possibility, it is essential to use the specified picture tube.

CAUTION:

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

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 is 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 of 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 small 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).

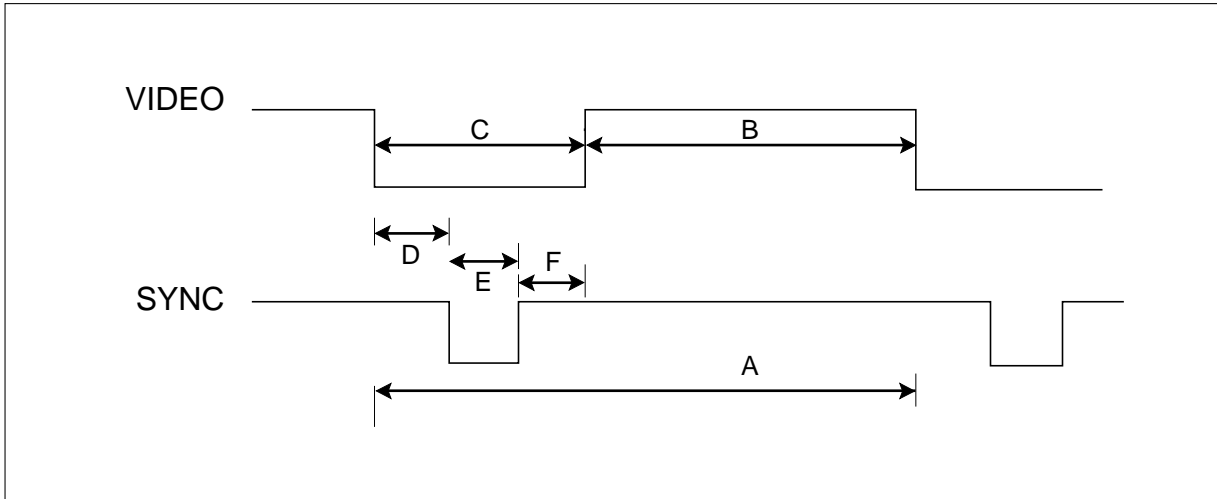
1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire 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.

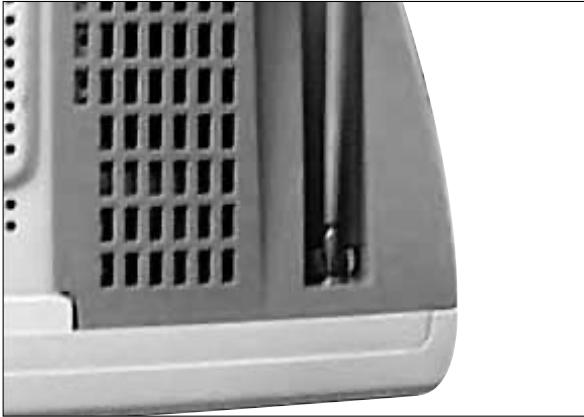
1. Remove the defective copper pattern with a sharp knife.
Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected 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

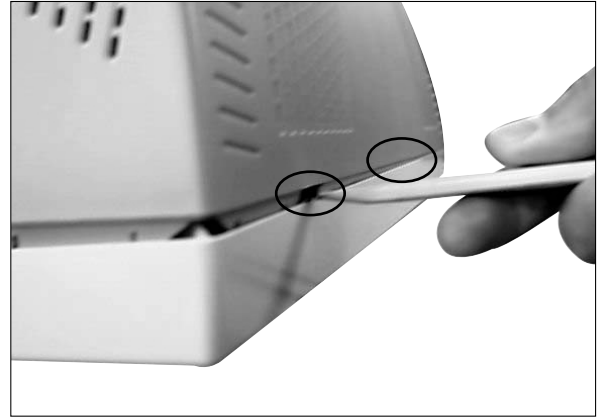


MODE		FACTORY PRESET MODE						
		MARK	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	
		VESA						
H O R I Z O N T A L	Sync Polarity		-	+	+	+	+	
	Frequency	kHz		43.269	53.674	68.677	91.146	93.750
	Total Period	μs	A	23.112	18.631	14.561	10.971	10.666
	Video Active Time	μs	B	17.778	14.222	10.836	8.127	7.901
	Blanking Time	μs	C	5.334	4.409	3.725	2.844	2.765
	Front Porch	μs	D	1.556	0.569	0.508	0.406	0.316
	Sync Duration	μs	E	1.556	1.138	1.016	1.016	0.948
Back Porch	μs	F	2.222	2.702	2.201	1.422	1.501	
V E R T I C A L	Sync Polarity		-	+	+	+	+	
	Frequency	Hz		85.008	85.061	84.997	85.024	75.000
	Total Period	ms	A	11.763	11.756	11.765	11.762	13.333
	Video Active Time	ms	B	11.093	11.178	11.183	11.235	12.800
	Blanking Time	ms	C	0.670	0.578	0.582	0.527	0.533
	Front Porch	ms	D	0.023	0.019	0.015	0.011	0.011
	Sync Duration	ms	E	0.069	0.056	0.044	0.033	0.032
Back Porch	ms	F	0.578	0.503	0.523	0.483	0.490	
Resolution			640 X 480 85Hz	800 X 600 85Hz	1024 X 768 85Hz	1280 X 1024 85Hz	1600 X 1200 75Hz	
Recall			Yes	Yes	Yes	Yes		

DISASSEMBLY



1. Carefully place the monitor on a soft cushion and stand it upright with the cabinet facing downward.
2. Remove the two screws from the back cover.



4. Separate the back cover from the latch at the bottom of the cabinet using the jig as shown in the figure.
(Insert the jig into the latch and lift slightly.)



3. Separate the back cover from the latch on top of the cabinet using a screwdriver as shown in the figure.
(Insert the screwdriver and gently press the latch.)



5. Lift up the back cover to separate from cabinet assembly.

ADJUSTMENT

1. Preparation for Service Adjustment

GENERAL INFORMATION

All adjustment are thoroughly checked and corrected when the monitor leaves the factory, but sometimes several adjustments may be required. Adjustment should be following procedure and after warming up for a minimum of 30 minutes.

- Alignment appliances and tools.
 - IBM compatible PC.
 - Programmable Signal Generator.
(eg. VG-819 made by Astrodesign Co.)
 - EPROM or EEPROM with saved each mode data.
 - Alignment Adaptor and Software.
 - Digital Voltmeter.
 - White Balance Meter.
 - Luminance Meter.
 - High-voltage Meter.

AUTOMATIC AND MANUAL DEGAUSSING

The degaussing coil is mounted around the CDT so that automatic degaussing when turn on the monitor. But a monitor is moved or faced in a different direction, become poor color purity cause of CDT magnetized, then press DEGAUSSING on the OSD menu.

ADJUSTMENT PROCEDURE & METHOD

- Install the cable for adjustment such as Figure 1 and run the alignment program on the DOS for IBM compatible PC.
- Set external Brightness and Contrast volume to max position.

1. Adjustment for B⁺ Voltage.

- 1) Display cross hatch pattern at Mode 4.
- 2) Adjust C905 (+) voltage to 190V ± 0.5V with **VR901**.

2. Adjustment for High-Voltage.

- 1) Display cross hatch pattern at Mode 4.
- 2) Adjust CDT Anode voltage to 27kV ± 0.2kV with **VR801**.

3. Adjustment for Horizontal Raster Center.

- 1) Display cross hatch pattern at Mode 4.
- 2) Adjust the Back Raster should be center of the screen with SW801.

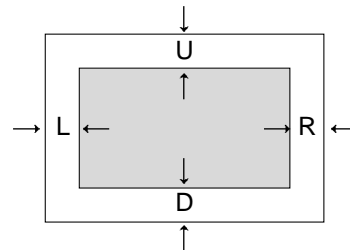
2. Adjustment by Service Hot key

How to enter SVC HOT KEY

1. Press Menu and OSD window will appear.
2. While OSD window is displayed, ★★ is seen on the left bottom of OSD window.
3. Press ◀+▼ simultaneously and the screen will immediately refresh.
4. Press Menu and make sure that ★★ is changed to 1 2.
5. Follow the menu on the left of OSD window to find 12 and OSD will change as shown in the figure.
6. Select Degauss in the above figure and then press Select and ▶ to change the screen as shown in the figure. (Back Raster for Pattern)

FOS SPEC

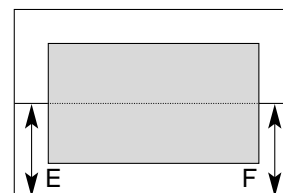
1. Size
H : 350 ± 4mm
V : 262 ± 4mm
Scanning frequency : All Mode (Mode 1~5)
Display image : Crosshatch pattern
2. Centering
Scanning frequency : All Mode (Mode 1~5)
Display image : Crosshatch pattern
Horizontal : 10 Row
Vertical : 8 Row



$$H : |L-R| \leq 4\text{mm}, V : |U-D| \leq 4\text{mm}$$

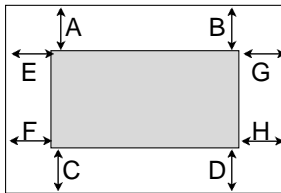
3. Tilt

- Scanning frequency : All Mode (Mode 1~5)
Display image : Crosshatch pattern
Horizontal : 10 Row
Vertical : 8 Row



$$\text{Tilt} : |E-F| \leq 2.0\text{mm}$$

4. Distortion
 Scanning frequency : All Mode (Mode 1~5)
 Display image : Crosshatch pattern
 Horizontal : 10 Row
 Vertical : 8 Row



$$\begin{aligned} |A-B| &\leq 2.5\text{mm}, & |C-D| &\leq 2.5\text{mm} \\ |E-F| &\leq 2.0\text{mm}, & |G-H| &\leq 2.0\text{mm} \end{aligned}$$

5. Displa Size drift
 • $\pm 4\text{mm}$: 25°C Standard, 10°C, 35°C
 • $\pm 0.5\text{mm}$: 180V ~ 264V

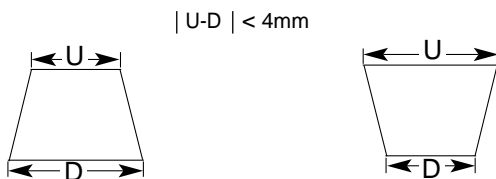
6. Linearity

				Y1
				Y2
				Y3
				Y4
X1	X2	X3	X4	

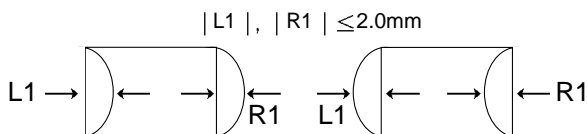
Formula : $\{(Max - Min) / Max\} \times 100(\%)$
 Criteria : H - 10% Max. (Upper 40kHz)
 12% Max. (Less 40kHz)
 V - 8% Max.

7. Regulation
 Luminance $\leq 1\text{mm}$
 Dynamic(Iode) $\leq 1\text{mm}$
 Scanning frequency : All Mode (Mode 1~5)

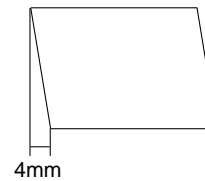
8. Trapezoid



9. Pin Balance



10. Parallelogram



11. Adjustment of white balance (Adjustment of chromaticity diagram)
 *(Adjustment of white balance must be made after entering Hot Key Mode and DEGAUSS.)

CONDITIONS

Signal: 91 kHz / 85 Hz
 Display image: Back raster (Color 0,0)
 Contrast: Maximum
 Brightness: Maximum
 Color temperature: 9300K

11-1. Adjustment of cut off (Adjustment of back raster)

11-1(a). Before adjustment, press Menu and Degauss to remove.
 => Enter hot key mode.
 Adjust Brightness and Contrast to Max in OSD window.

- Adjust cut off (back raster) first. Enter DEGAUSS in the Menu and modify the following data.
 Modify RCUT to Min (1) ,
 Modify GCUT To Min (1) ,
 Adjust to BCUT Data = 70 (46 (h)) ,
 Adjust to SBRT Data = 90 (5A (h)).
- Turn FBT screen volume on "CRT COLOR ANALYZER CA-100" equipment to adjust Brightness to $0.15 \pm 0.05\text{FL}$.
- Adjust RCUT, GCUT, and SBRT to set chromaticity diagram at :
 x: 0.283 ± 0.003
 y: 0.298 ± 0.003
 Y: $0.40 \pm 0.05\text{FL}$

* If color values would not be matched desirable values, repeat sequence 1 and 2 after readjusting "GREEN CUTOFF" control a little different.

11-2. Adjustment of White Balance

After finishing adjustment of cut off (back raster), approve "Color(15.0) Full white pattern".

Adjust to BDRV Data = 94.

Adjust RDRV and GDRV to set chromaticity diagram at :

x: 0.283 ± 0.003

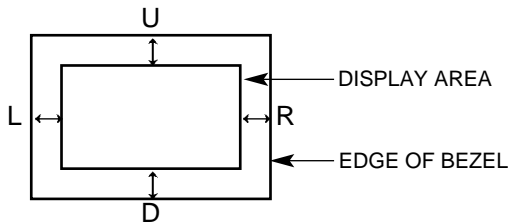
y: 0.298 ± 0.003

Approve "Window pattern (70x70mm)" to adjust S-CON to Y : $40 \pm 1FL$.

Approve "Color (15.0) Full white pattern" again and adjust ABL Data to Y : $30 \pm 1FL$

Adjust the horizontal position and vertical position to ≤ 4.0 mm of the center point of the screen.

$$|L-R| \leq 4.0 \text{ mm. } |U-D| \leq 4.0 \text{ mm.}$$



* SIZE adjustment should be made in ALL Mode.

12. Focus Adjustment

CONDITIONS

Scanning frequency : All Mode (Mode 1~5)

Display image: "H" character pattern

Brightness: Cut off point

Contrast: Maximum

PROCEDURE

1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

14. Color Purity Adjustment

Color purity is the absence of undesired color.

Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS

Orientation: Monitor facing east

Scanning Frequency: 1208 x 1024@85Hz(91kHz/85Hz)

Display image: White flat field

Luminance: Cut off point at the center of the display area

Note: Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE

For trained and experienced service technicians only.

Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields.
2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer.
3. Make sure the spacing between the PCM assembly and the CRT stem is $29 \text{ mm} \pm 1 \text{ mm}$.
4. Display a green pattern over the entire display area.
5. Adjust the purity magnet rings on the PCM assembly to display a pure green pattern.
(Optimum setting: $x = 0.295 \pm 0.015$,
 $y = 0.594 \pm 0.015$)
6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 4-6. Color Purity Tolerances

Red:	$x=0.620 \pm 0.015$	$y=0.334 \pm 0.015$
Green:	$x=0.620 \pm 0.015$	$y=0.334 \pm 0.015$
Blue:	$x=0.620 \pm 0.015$	$y=0.334 \pm 0.015$

(For 9300K color adjustment: $x = 0.283 \pm 0.02$,
 $y = 0.298 \pm 0.02$)

7. When you have the PCMs properly adjusted, carefully glue them together to prevent their movement during shipping.

3. Adjustment Using Service software Program (Adjustment Program)

1. Adjustment for Factory Mode (Preset Mode).

- 1) Display cross hatch pattern at Mode All.
- 2) Run alignment program for F900BJ on the IBM compatible PC.
- 3) EEPROM → ALL CLEAR → Y(Yes) command.
<Caution> Do not run this procedure unless the EEPROM is changed. All data in EEPROM (mode data and color data) will be erased.
- 4) COMMAND → PRESET START → Y(Yes) command.
- 5) DIST. ADJ. → FOS. ADJ command.
- 6) Adjust H-POSITION as arrow keys to center of the screen.
- 7) Adjust H-SIZE as arrow keys to $350 \pm 2\text{mm}$.
- 8) Adjust V-POSITION as arrow keys to center of the screen.
- 9) Adjust V-SIZE as arrow keys to $262 \pm 2\text{mm}$.
- 10) Adjust TRAPEZOID as arrow keys to be the best condition.
- 11) Adjust SIDE PINCUSHON as arrow keys to be the best condition.
- 12) Adjust TILT as arrow keys to be the best condition.
- 13) Display cross hatch pattern at Mode 4.
- 14) DIST. ADJ. → BALANCE DATA command.
- 15) Adjust balance of Pin-Balance as arrow keys to be the best condition.
- 16) Adjust parallelogram as arrow keys to be the best condition.
- 17) Save of the Mode.
- 18) Save of the System.
- 19) Display from Mode 4 and repeat above from number 6) to 16).
- 20) COMMAND → PRESET EXIT → Y (Yes) command.

2. Adjustment for White Balance and Luminance.

- 1) Set the White Balance Meter.
- 2) Press the DEGAUSSING on the OSD menu for demagnetization of the CDT.
- 3) Display color 0,0 pattern at Mode 4.
- 4) COMMAND → PRESET START → Y(Yes) command.
- 5) Set Brightness and Contrast to max position.
- 6) COLOR ADJ. → LUMINANCE command of the alignment program.
- 7) COLOR ADJ. → BIAS ADJ. command of the alignment program.
- 8) Check whether blue color or not at R-BIAS and G-BIAS to min position, Sub-Brightness to 90 (5A(h)) position, B-Bias to 70(46(h)) position. If it's not blue color, the monitor must repair.
- 9) Adjust Screen control on the FBT to $0.15 \pm 0.05\text{FL}$ of the raster luminance.
- 10) Adjust R-BIAS and G-BIAS command to $x=0.283 \pm 0.006$ and $y=0.298 \pm 0.006$ on the White Balance Meter with PC arrow keys.
- 11) Display color 15,0 Full White(70x70mm) at mode 4.
- 12) DRIVE ADJ command.
- 13) Set B-DRIVE to 94(5E(h)) at DRIVE of the alignment program.
- 14) Adjust R-DRIVE and G-DRIVE command to white balance $x=0.283 \pm 0.003$ and $y=0.298 \pm 0.003$ on the White Balance Meter with PC arrow keys.
- 15) Adjust SUB-CONTRAST command to $40 \pm 1\text{FL}$ of the raster luminance.
- 15) Display color 15,0 full white patten at Mode 4.
- 16) COLOR ADJ. → LUMINANCE → ABL command.
- 17) Adjust ABL to $30 \pm 1\text{FL}$ of the luminance.
- 18) Exit from the program.

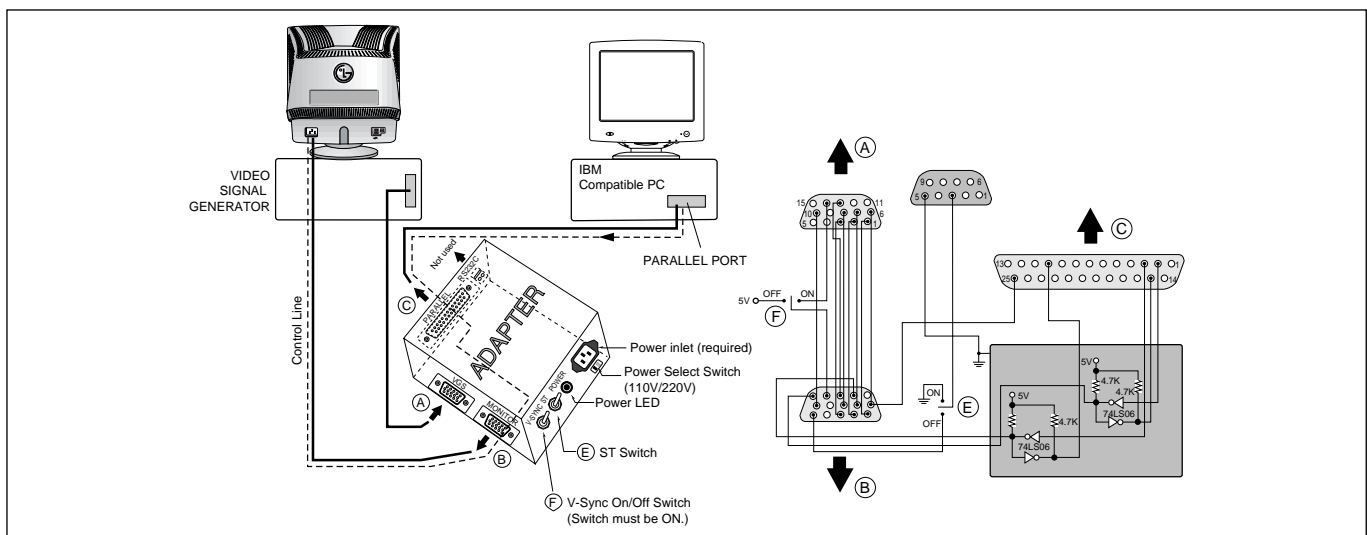
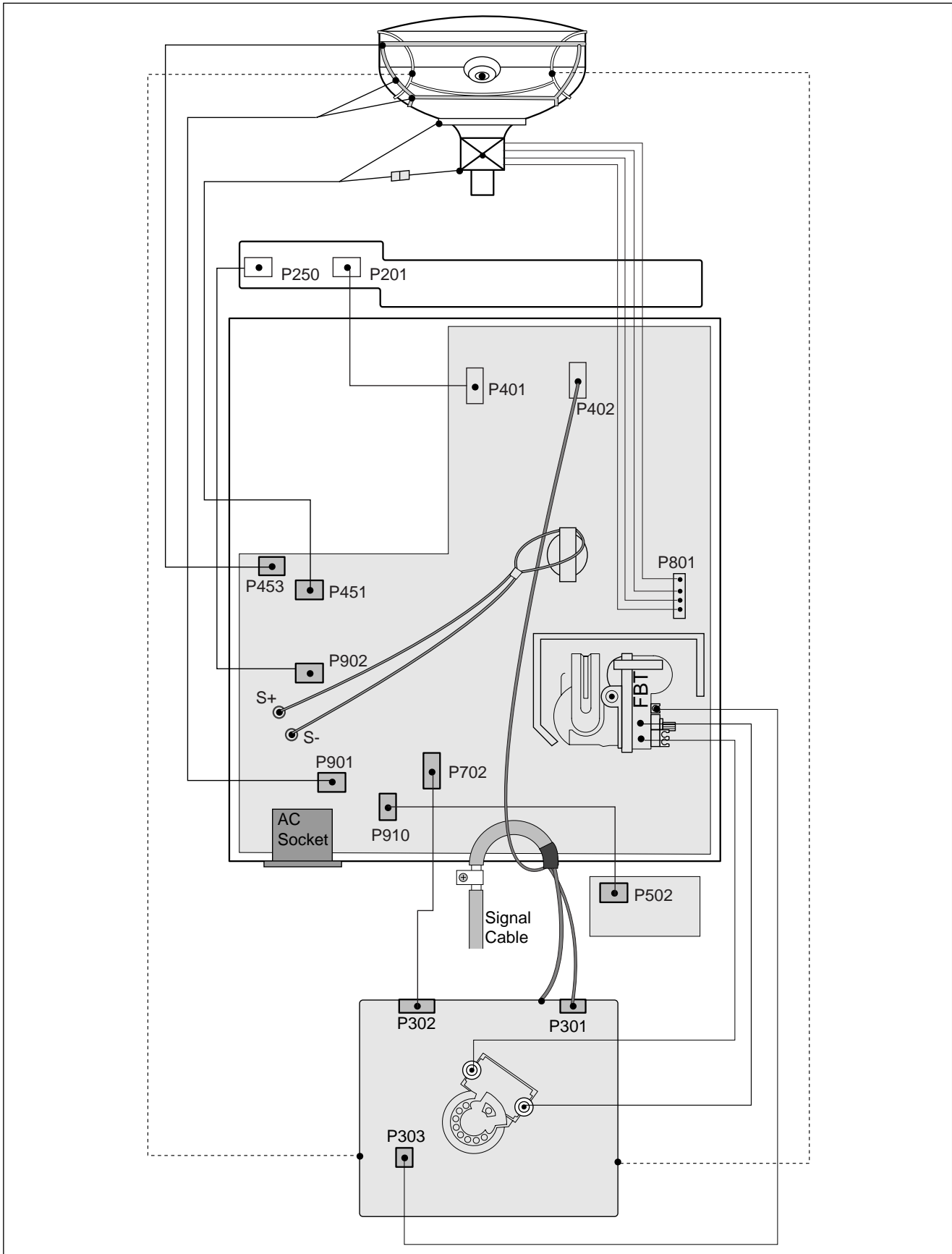


Figure 1. Cable Connection

WIRING DIAGRAM



DESCRIPTION OF BLOCK DIAGRAM

1. Line Filter & Associated Circuit.

This is used for suppressing noise of power input line flowing into the monitor and/or some noise generated in this monitor flowing out through the power input line.

That is to say, this circuit prevents interference between the monitor and other electric appliances.

2. Degauss Circuit & Coil.

The degauss circuit consists of the degaussing coil, the PTC (Positive Temperature Coefficient) thermistor (TH901), and the relay (RL901). This circuit eliminates abnormal color of the screen automatically by degaussing the slot mask in the CDT when turn on the power switch.

When you need to degauss while using the monitor, select DEGAUSS on the OSD menu.

3. SMPS (Switching Mode Power Supply).

This circuit works with power of 100~240V or 200~240V (50/60Hz) specially for PFC version.

The operation procedure is as follows:

- 1) AC input voltage is rectified and smoothed by the bridge diode (D901) and the capacitor (C905).
- 2) The rectified voltage (DC voltage) is applied to the primary coil of the transformer (T901).
- 3) The control IC (IC901) generates switching pulse to turn on and off the primary coil of the transformer (T901) repeatedly.
- 4) Depending on the turn ratio of the transformer, the secondary voltages appear at the secondary coil of the transformer (T901).
- 5) These secondary voltages are rectified by each diode (D924, D926, D923, D929, D922, D921, D920) and operate the other circuits. (Deflection, Video Amplifier, etc.)

4. Display Power Management Circuit.

This circuit control power consumption of the monitor by detecting H and V sync signal. There are stand-by and suspend mode. When no horizontal or vertical sync signal input, the circuit consists of Q913, Q915 and IC401 control signal becomes stand-by and suspend mode. It's power consumption is below 8W. When no horizontal and vertical sync signal input, it's power consumption is below 1W.

5. X-ray Protection.

This circuit detects the rectified DC voltage comes from the FBT pin 4. If the high voltage of the FBT reaches up to about 30kV (abnormal state), H.V control (IC802) detects. It stops B⁺ voltage supplied to the FBT (T701), and high voltage is not be generated, (In the normal state, the high voltage is about 26kV.)

6. Micom(Microprocessor) Circuit.

The operating procedure of Micom (Microprocessor) and its associated circuit is as follows:

- 1) H and V sync signal is supplied from Signal Cable to the Micom (IC401).
- 2) The Micom (IC401) distinguishes polarity and frequency of HandV sync.
- 3) The Micom controls each OSD function signals. (H-size, H-position, V-size, etc.)
- 4) The controlled data of each mode is stored in IC402. User can adjust screen condition by each OSD function. The data of the adjust screen condition is stored automatically.

7. Horizontal and Vertical Synchronous Processor.

This circuit generates the horizontal drive pulse and the vertical drive pulse by taking sync-signal from Signal Cable. This circuit consists of the TDA4841(IC801) and the associated circuit.

8. Oscillating Circuit for D/D Converter.

This circuit generates the pulse wave which has the horizontal period by taking the output of the TDA4841(IC801).

9. D/D (DC to DC) Converter.

This circuit supplies DC voltage to the horizontal deflection output circuit by decreasing DC 192V which is the secondary voltage of the SMPS in accordance with the input horizontal sync signal.

10. D/D Drive & Convert Circuit.

This circuit is used for supplying B⁺ voltage to horizontal deflection output transistor (Q801).

11. Horizontal Deflection Output Circuit.

This circuit makes the horizontal deflection by supplying the saw-tooth current to the horizontal deflection yoke.

12. High Voltage Output & FBT (Flyback Transformer).

The high voltage output circuit is used for generating pulse wave to the primary coil of the FBT (Flyback Transformer (T701)). A boosted voltage (about 27kV) appears at the secondary of the FBT and it is supplied to the anode of the CDT.

And there are another output voltages such as the dynamic focus voltage.

13. H-Linearity Correction Circuit.

This circuit corrects the horizontal linearity for each horizontal sync frequency.

14. Vertical Output Circuit.

This circuit takes the vertical wave from the TDA4841(IC801) and performs the vertical deflection by supplying the saw-tooth wave current from the TDA4867J (IC601) to the vertical deflection yoke.

15. Dynamic Focus Output Circuit.

This circuit takes H and V parabola wave from the TDA4841(IC801), and amplifies these waves to offer to the FBT (T701).

16. H & V Blanking and Brightness Control.

This circuit eliminates the retrace line by supplying a negative pulse to the G1 of the CDT.

17. Image Rotation (Tilt) Circuit.

This circuit corrects the tilt of the screen by supplying the image rotation signal to the tilt coil which is attached to the CDT near the deflection.

18. Static Convergence Control Circuit.

This circuit corrects the convergence of the screen by supplying the convergence signal to the 4H (STC) coil which is attached to the CDT near the deflection.

19. Moire Reduction Circuit

This circuit reduce interference between the periodical display pattern and the CDT's slot (or dot).

The positions of every other one dot video signal beams (red, green, and blue beam) are shifted finely, thus reducing interference.

20. OSD Circuit.

This circuit is used for performing the OSD (On-Screen- Display) function.

When a user selects the OSD Select/Adjustment control, the adjustment status displays on the screen.

21. Video Pre-Amp Circuit.

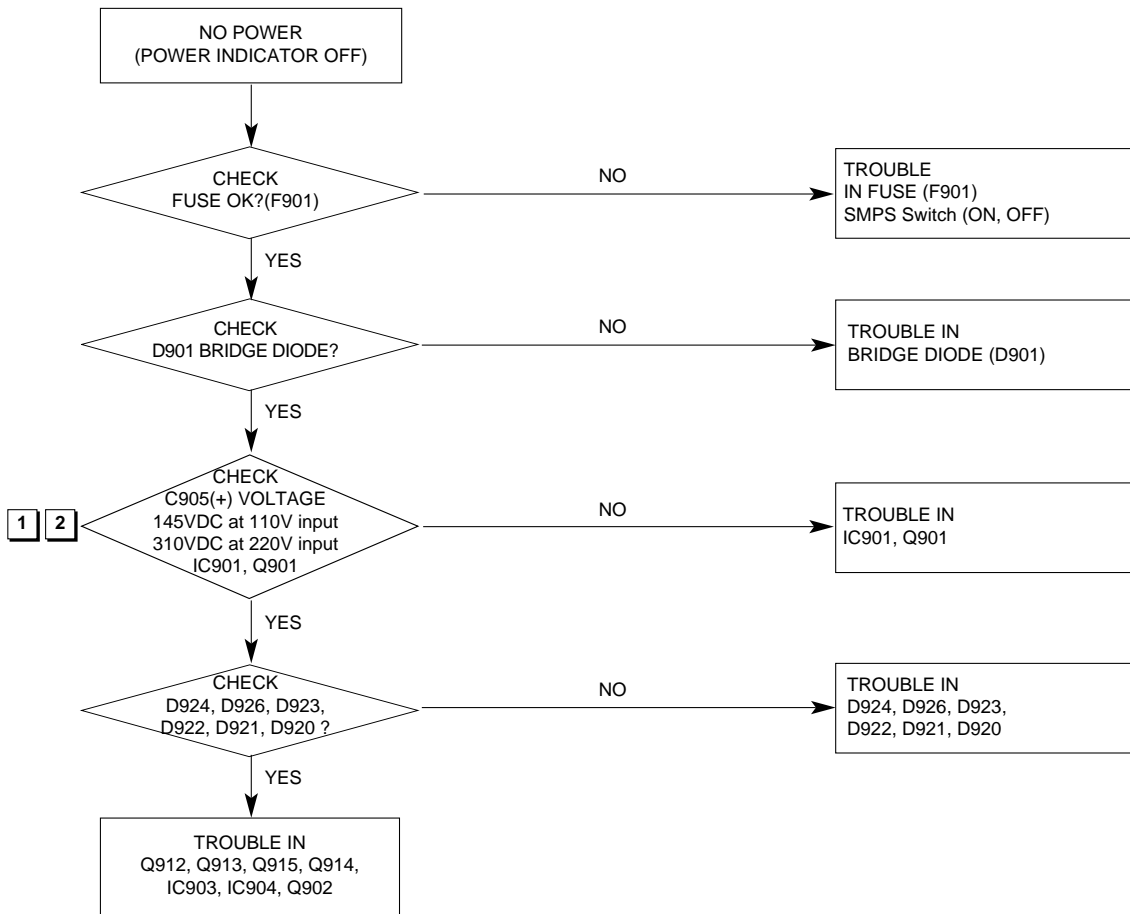
This circuit amplifies the analog video signal from 0-0.7V to 0-4V. This circuit is operated by taking the clamp, R, G, B drives, and contrast signals from the Micom (IC401).

22. Video Output Amp Circuit.

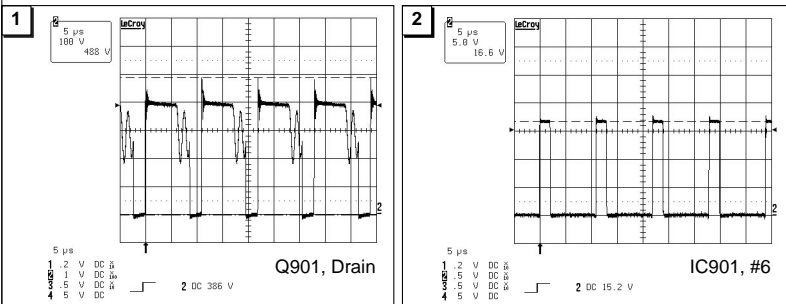
This circuit amplifies the video signal which comes from the video pre-amp circuit and amplified video signal is applied to the CDT cathode.

TROUBLESHOOTING GUIDE

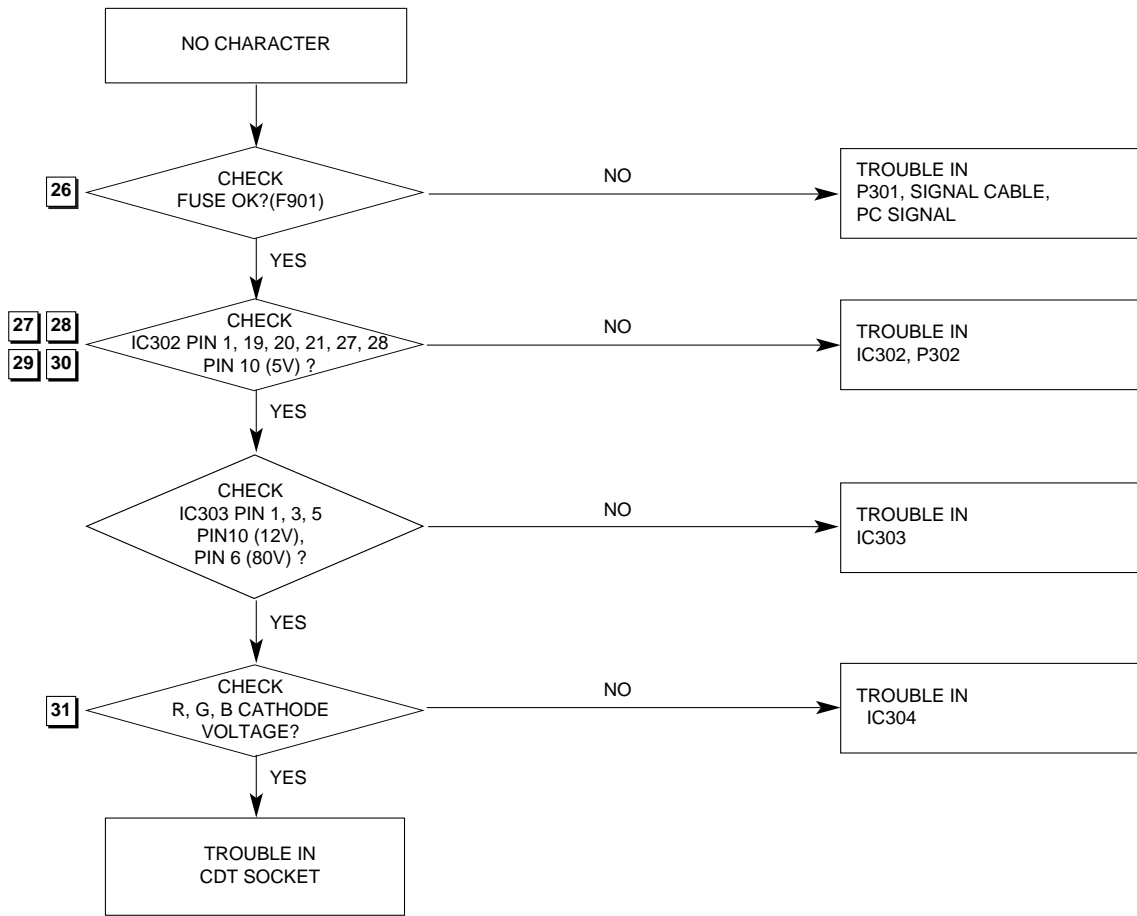
1. NO POWER



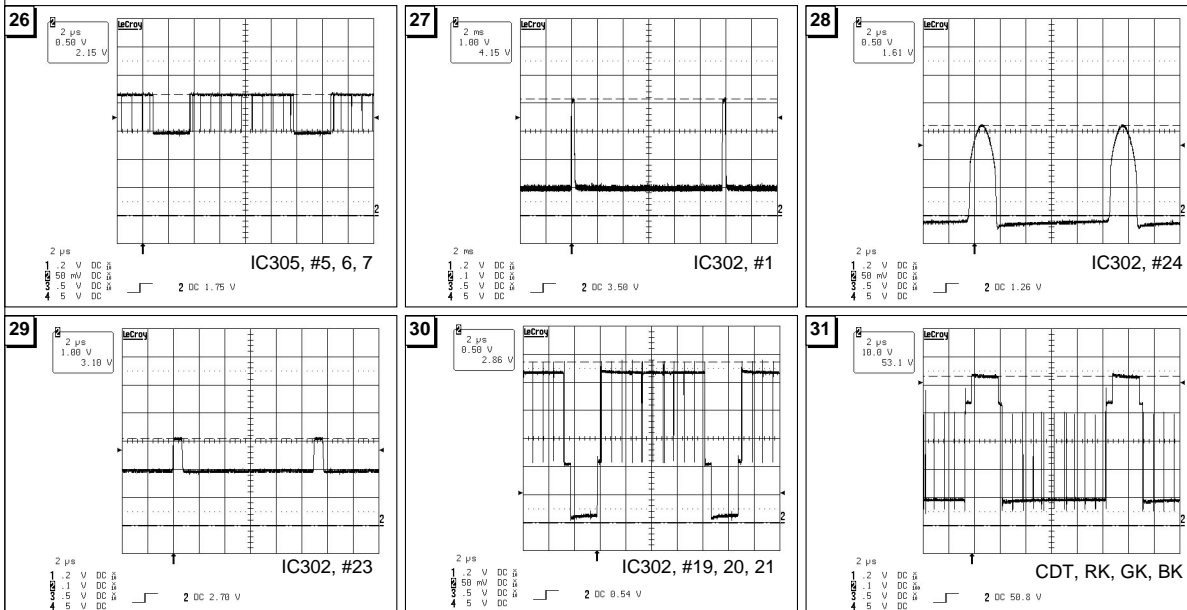
Waveforms



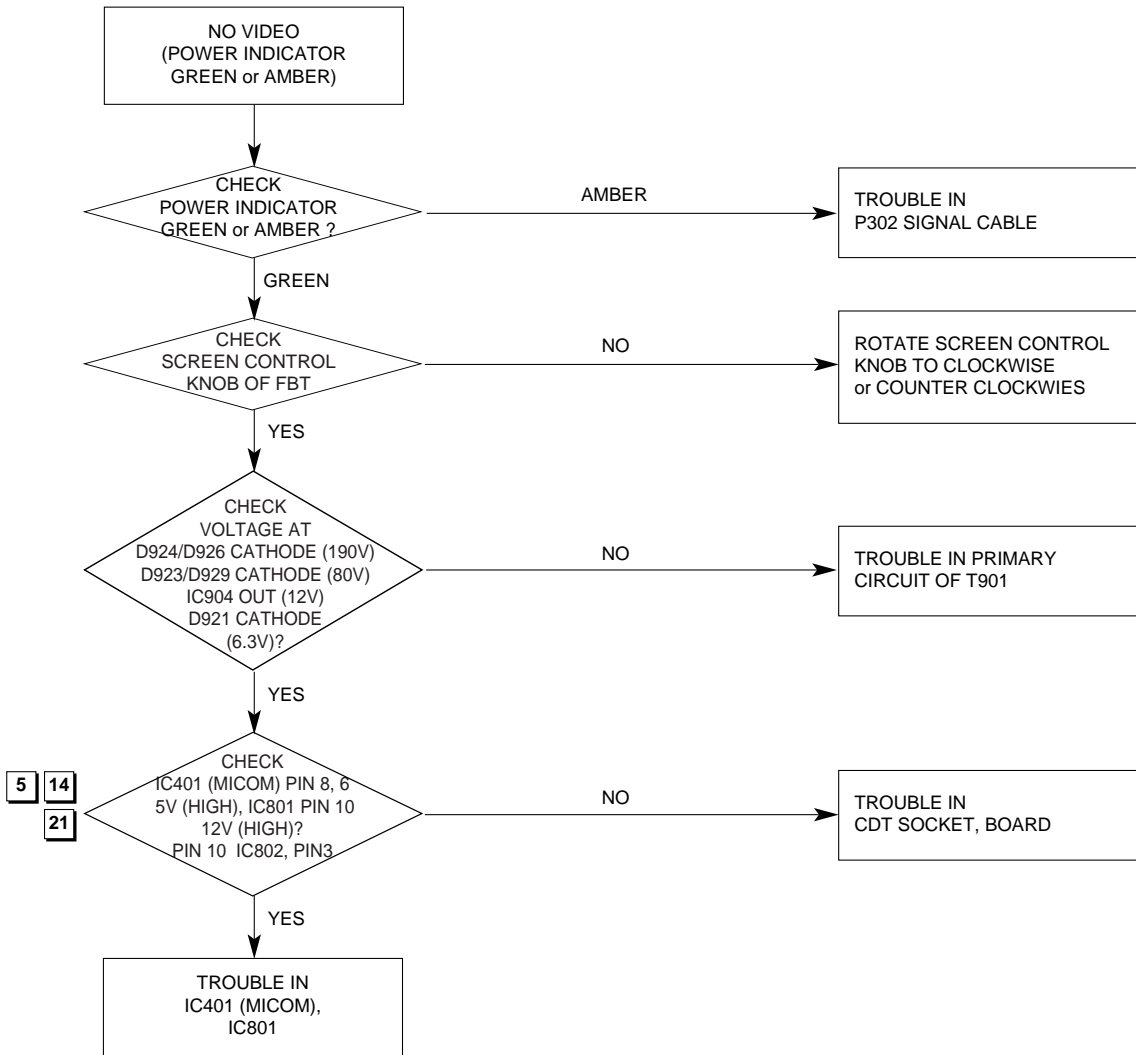
2. NO CHARACTER



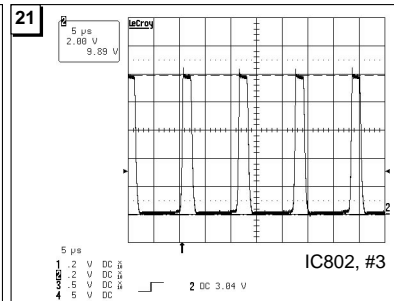
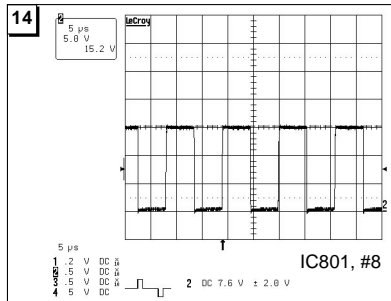
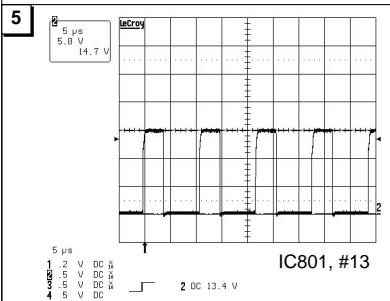
Waveforms



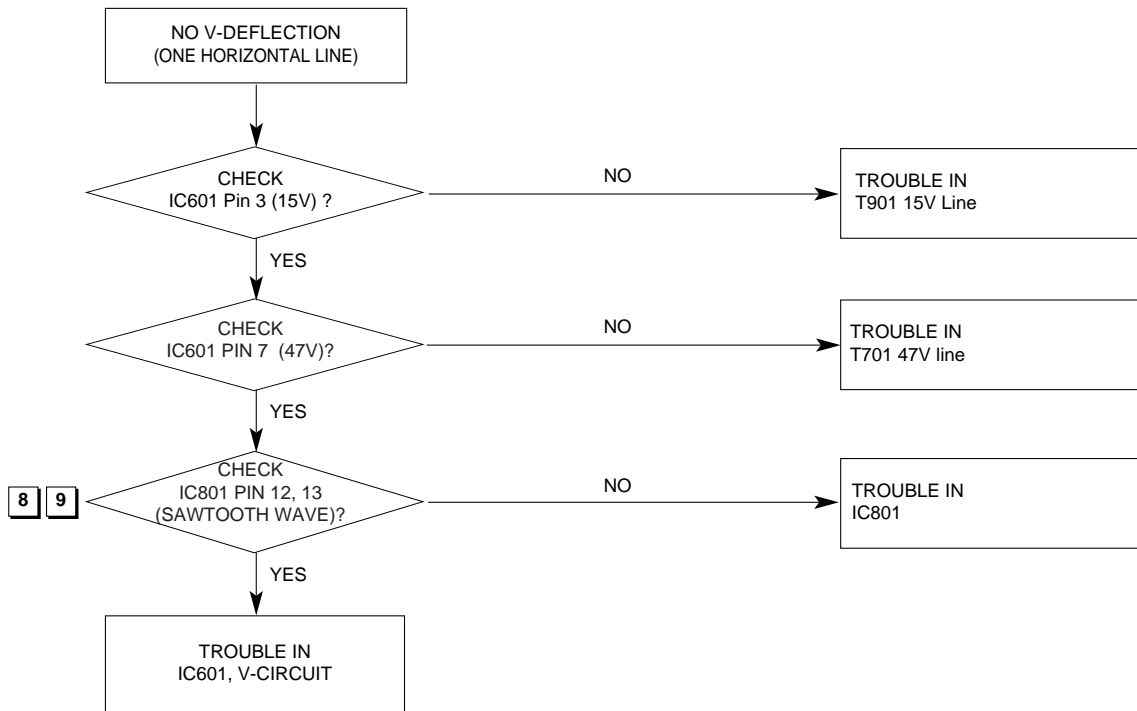
3. NO RASTER



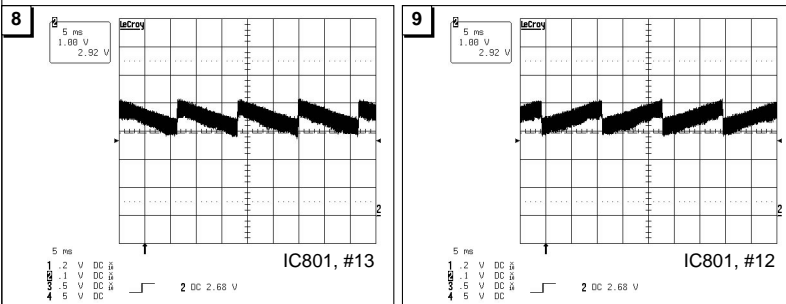
Waveforms



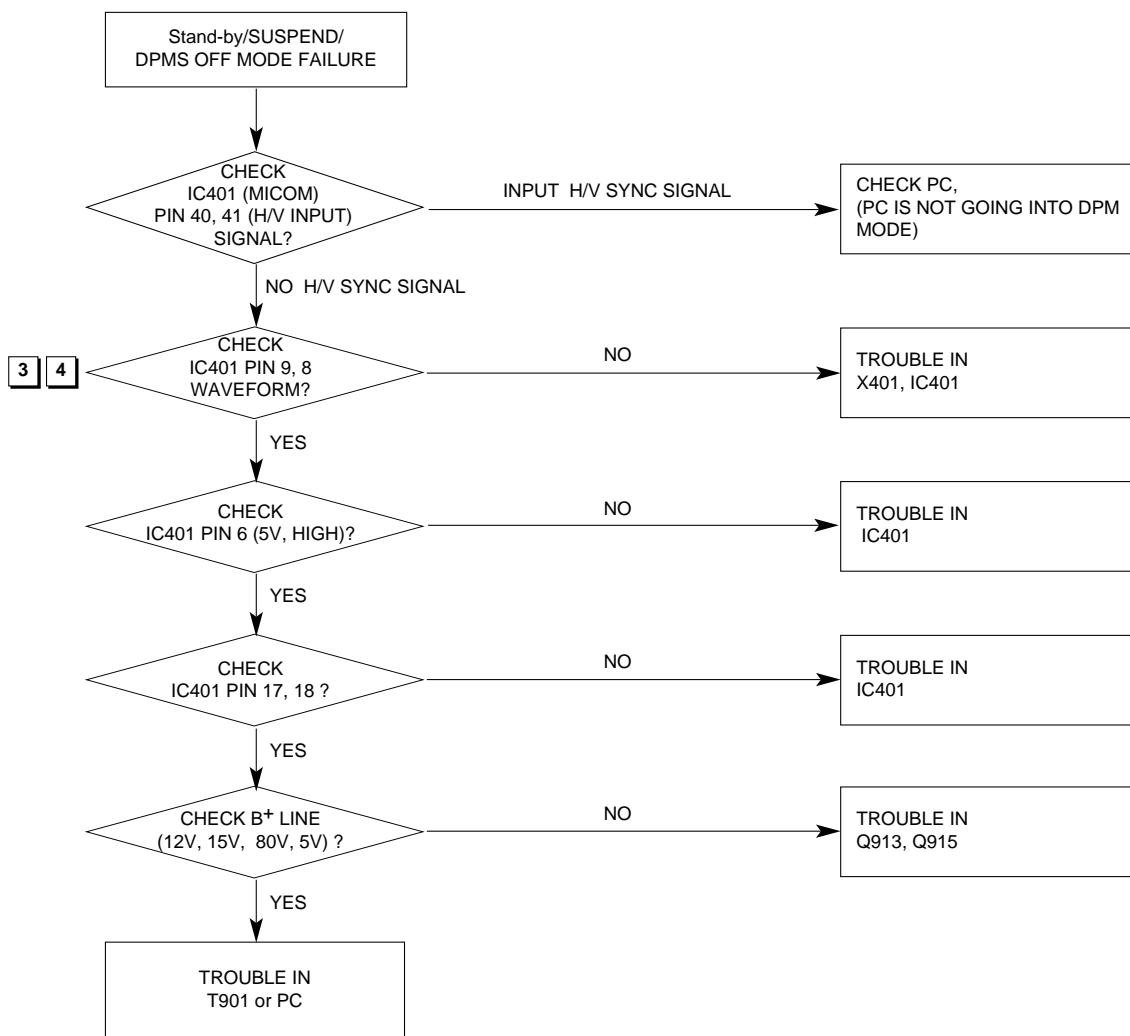
4. NO VERTICAL DEFLECTION



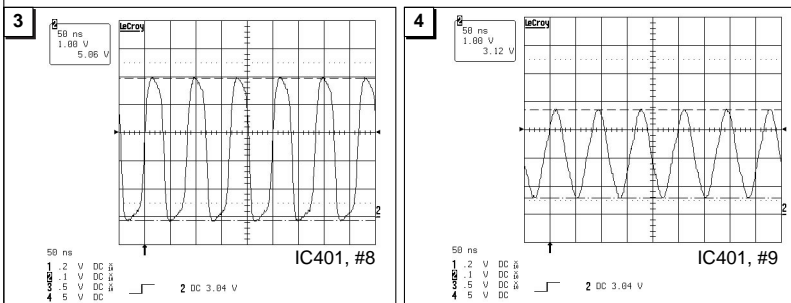
Waveforms



5. TROUBLE IN DPM



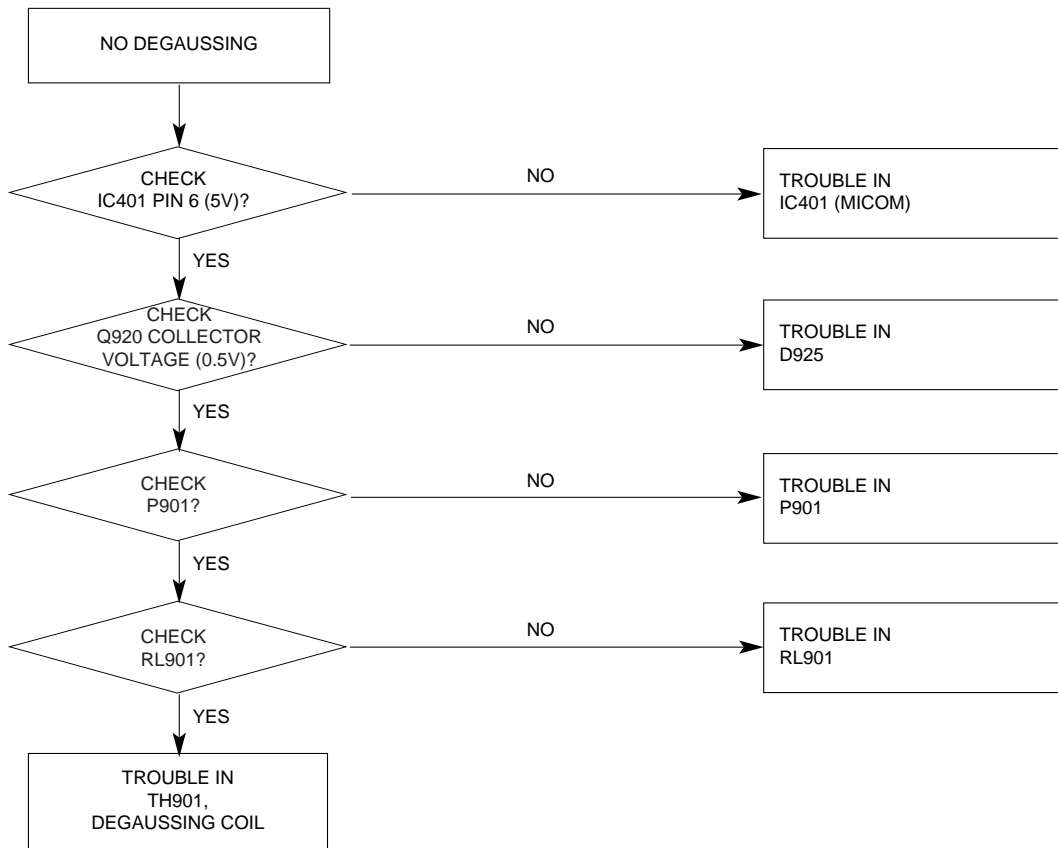
Waveforms



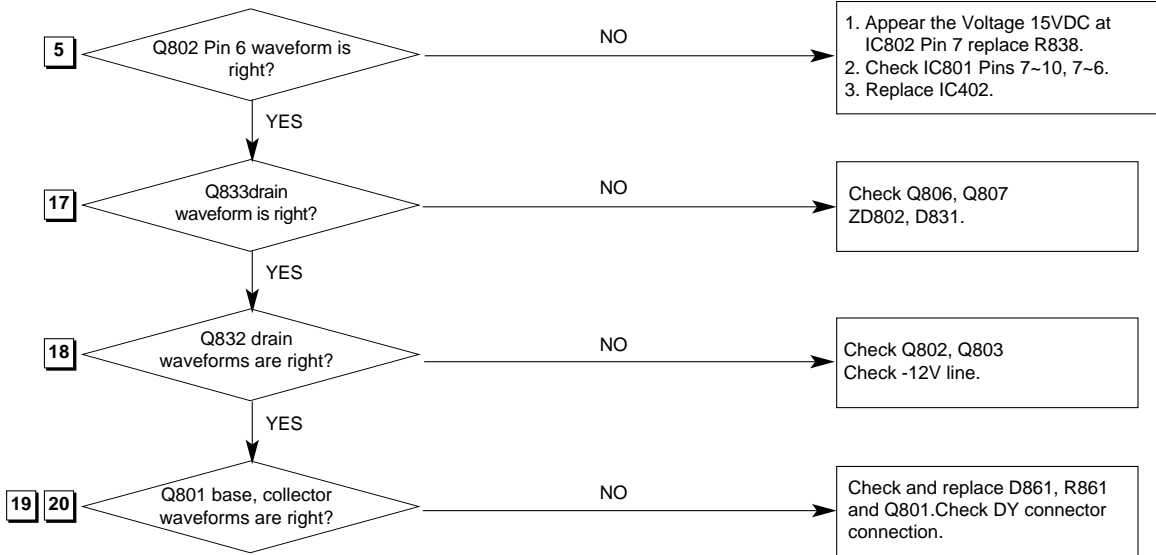
DPMS TABLE

MODE \ ITEM	H/V SYNC	VIDEO	LED
NORMAR	ON/ON	NORMAL	GREEN
STAND-BY	OFF/ON	OFF(0V)	AMBER
SUSPEND	ON/OFF	OFF(0V)	AMBER
OFF	OFF/OFF	OFF(0V)	AMBER

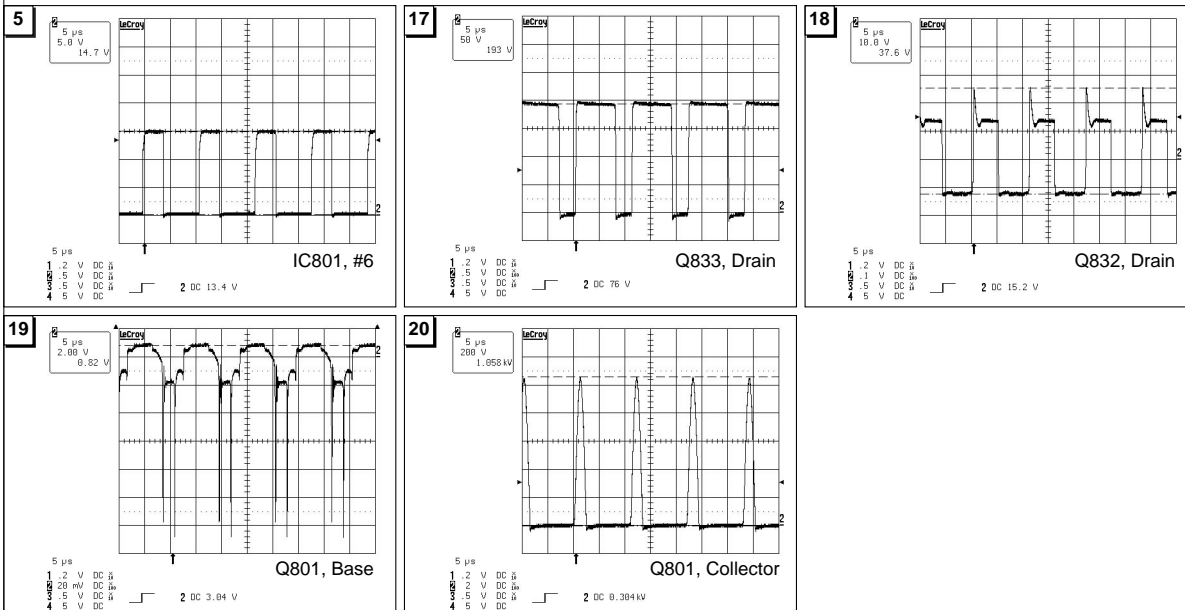
6. NO DEGAUSSING



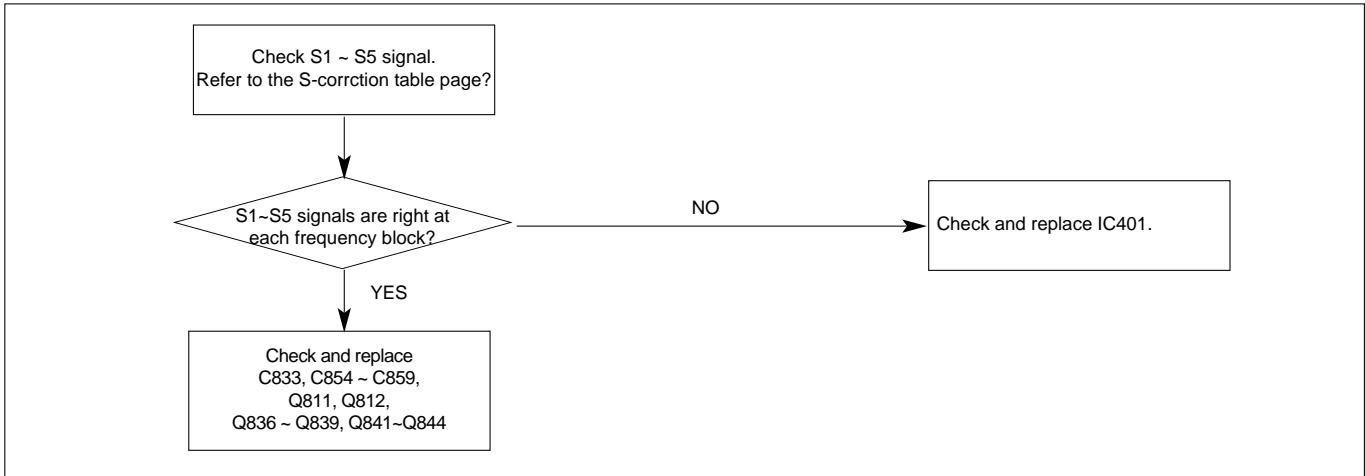
7. H_Deflection Failure



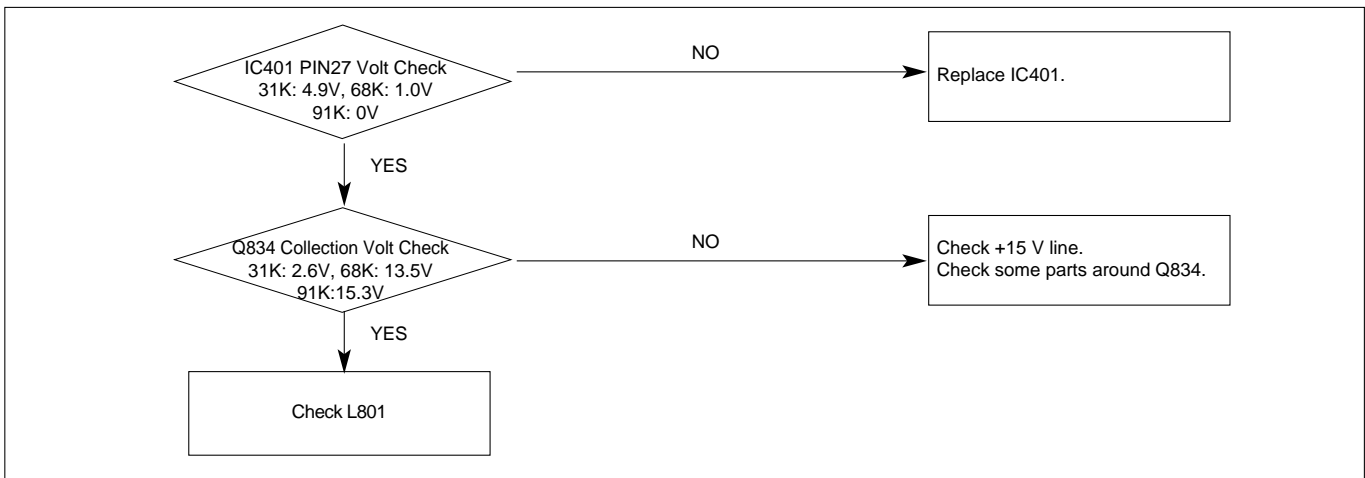
Waveforms



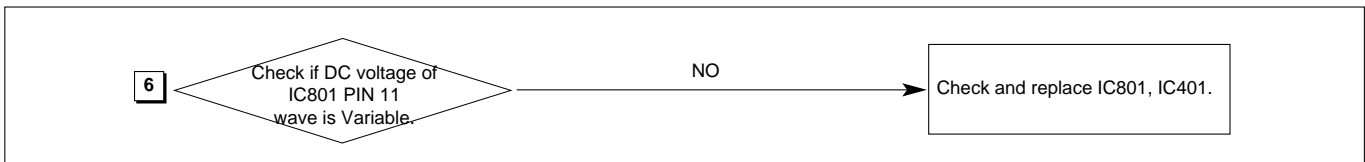
8. S Correction Failure



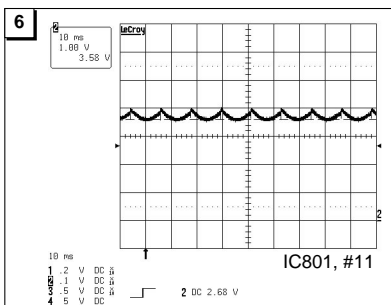
9. H_Lin. Failure



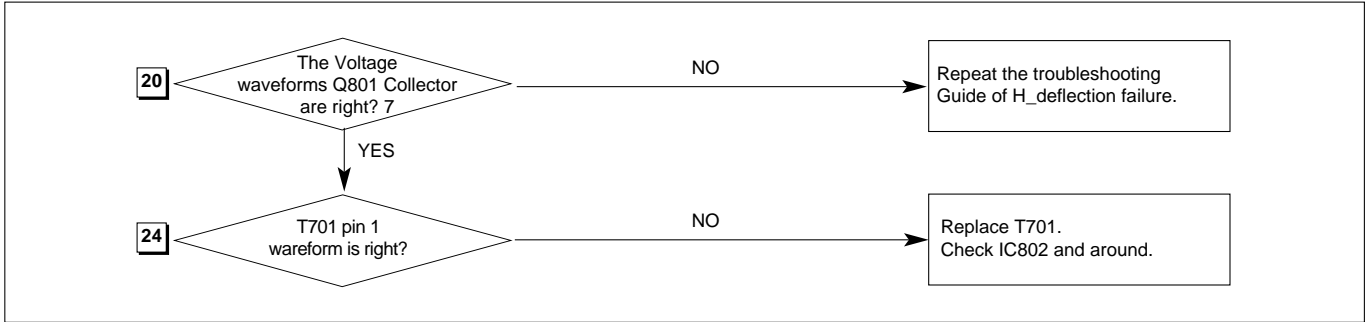
10. Invariable H_Size



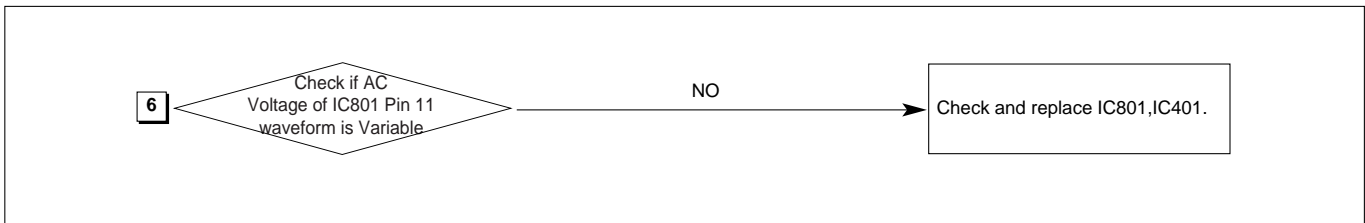
Waveforms



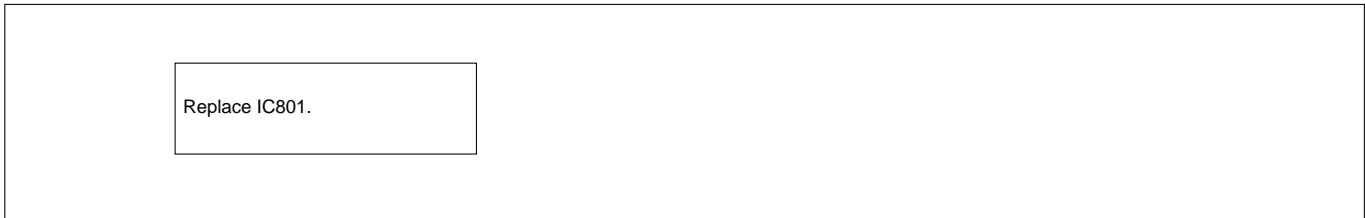
11. Abnormal H_Size



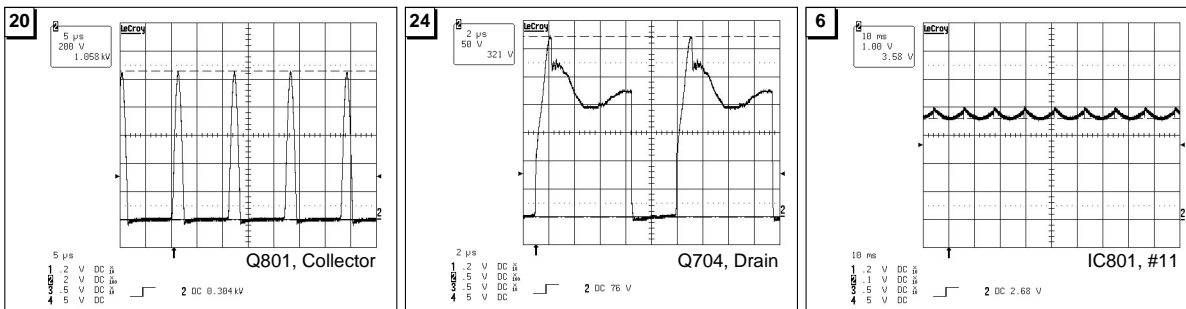
12. Side Pin or Trap Failure



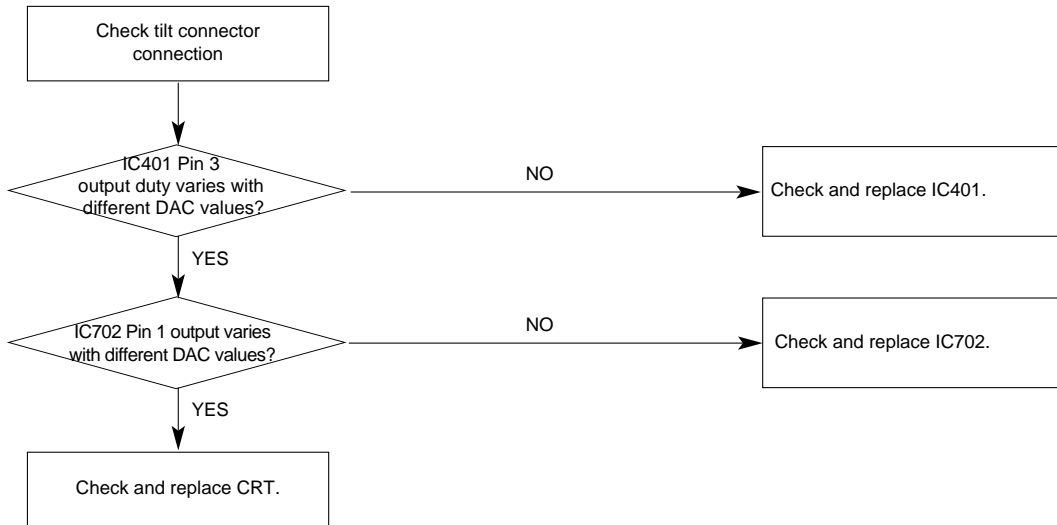
13. Para. or Pin Balance Failure



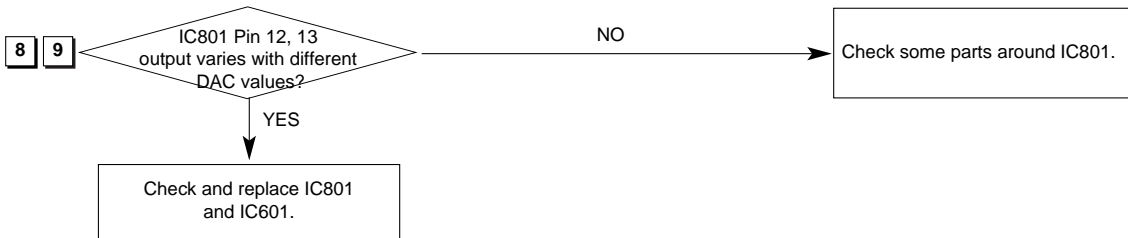
Waveforms



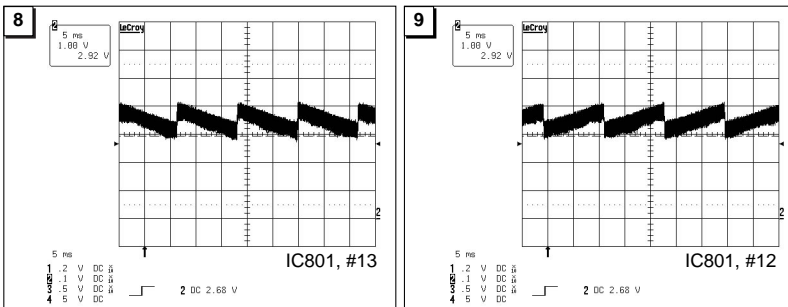
14. Tilt Failure



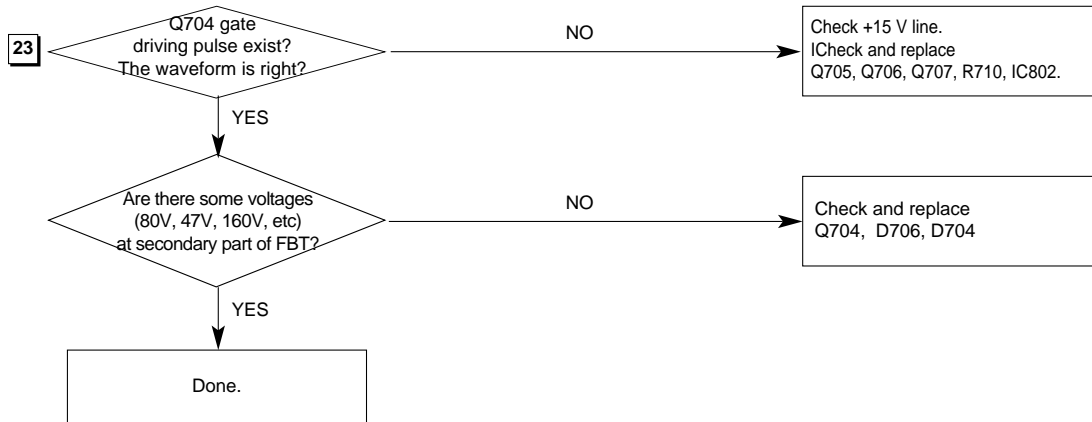
15. V Size or Pos. Variation Failure



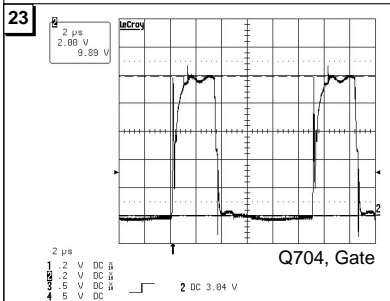
Waveforms



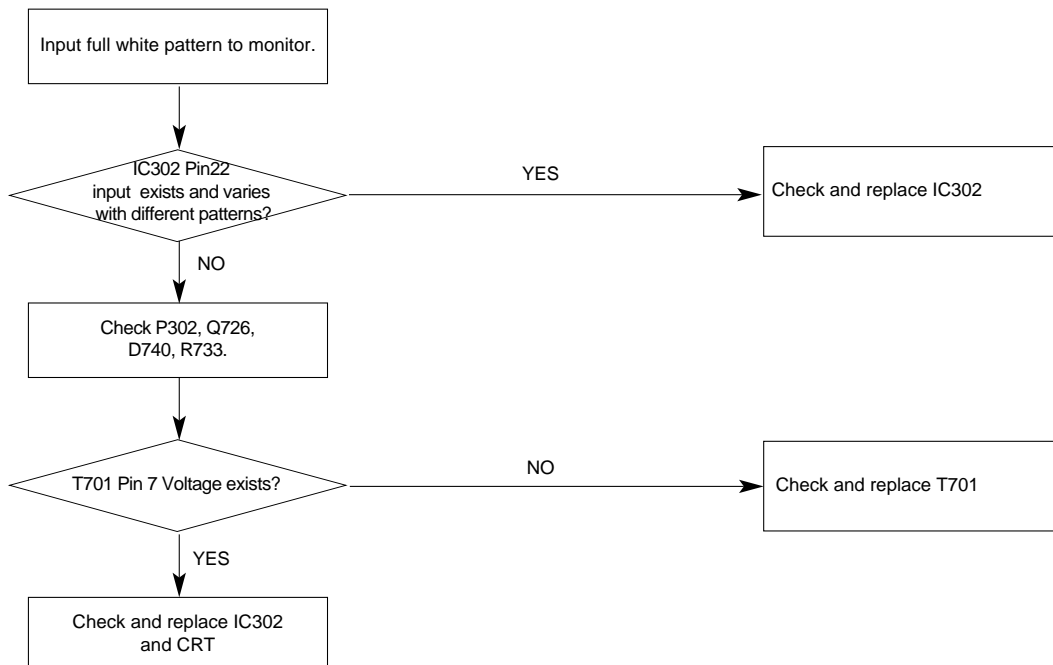
16. High Voltage Failure



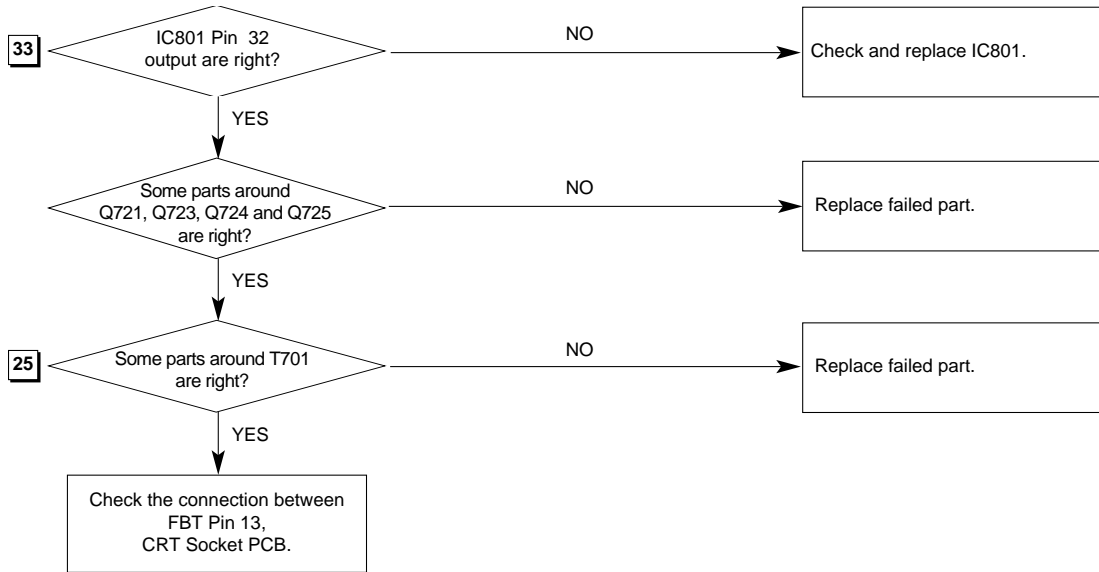
Waveforms



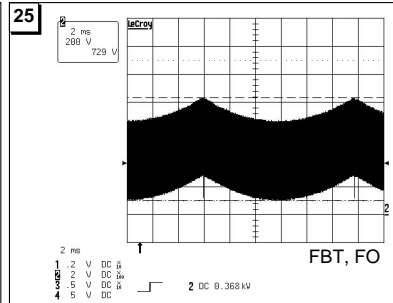
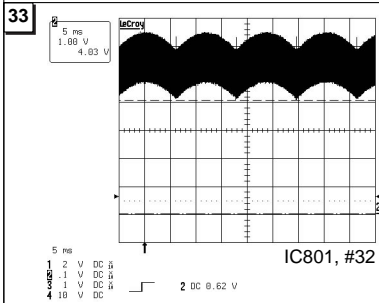
17. ABL Failure



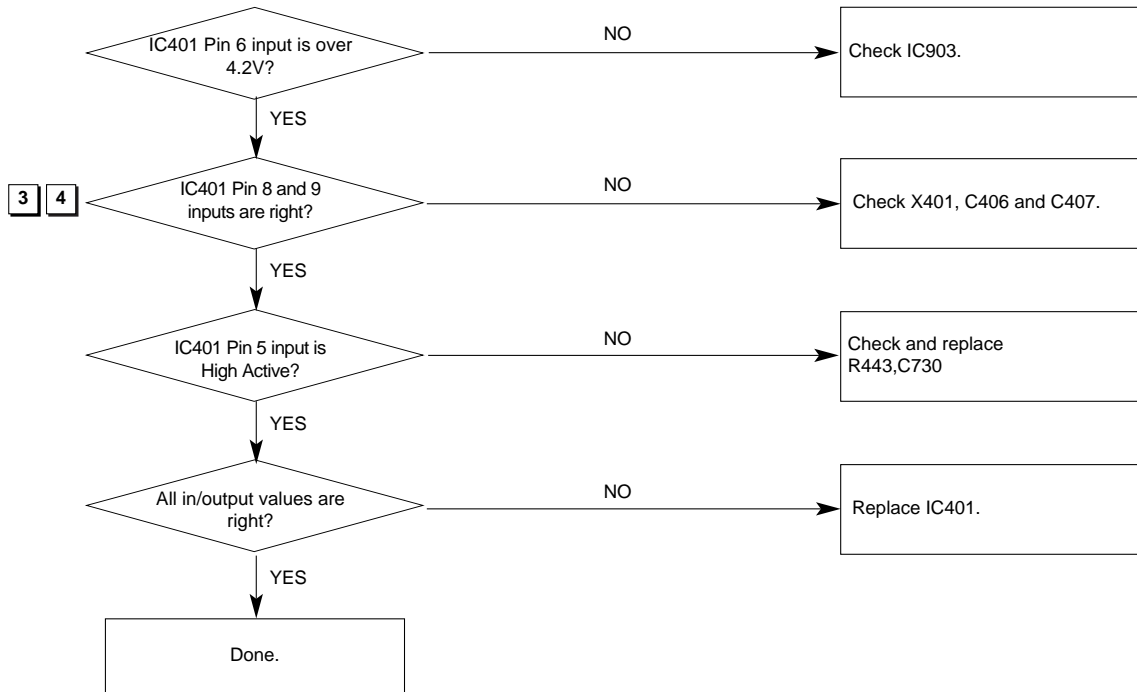
18. Focus Failure



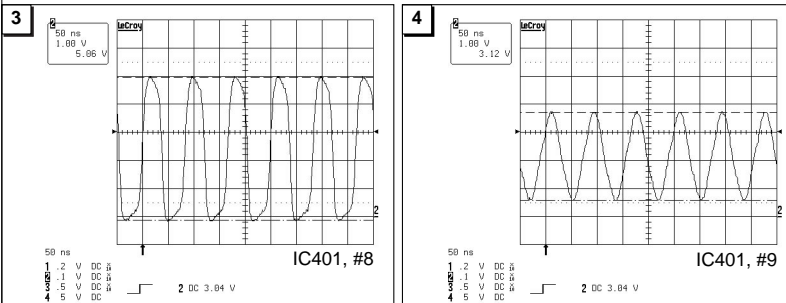
Waveforms



19. Micom Failure



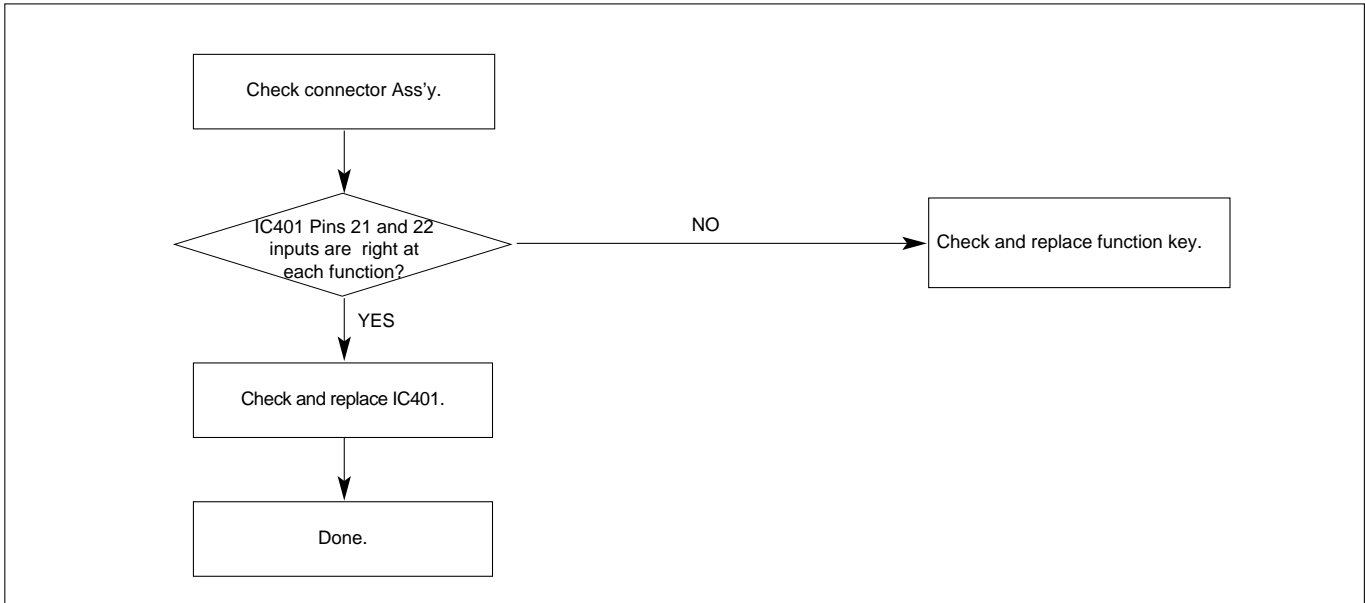
Waveforms



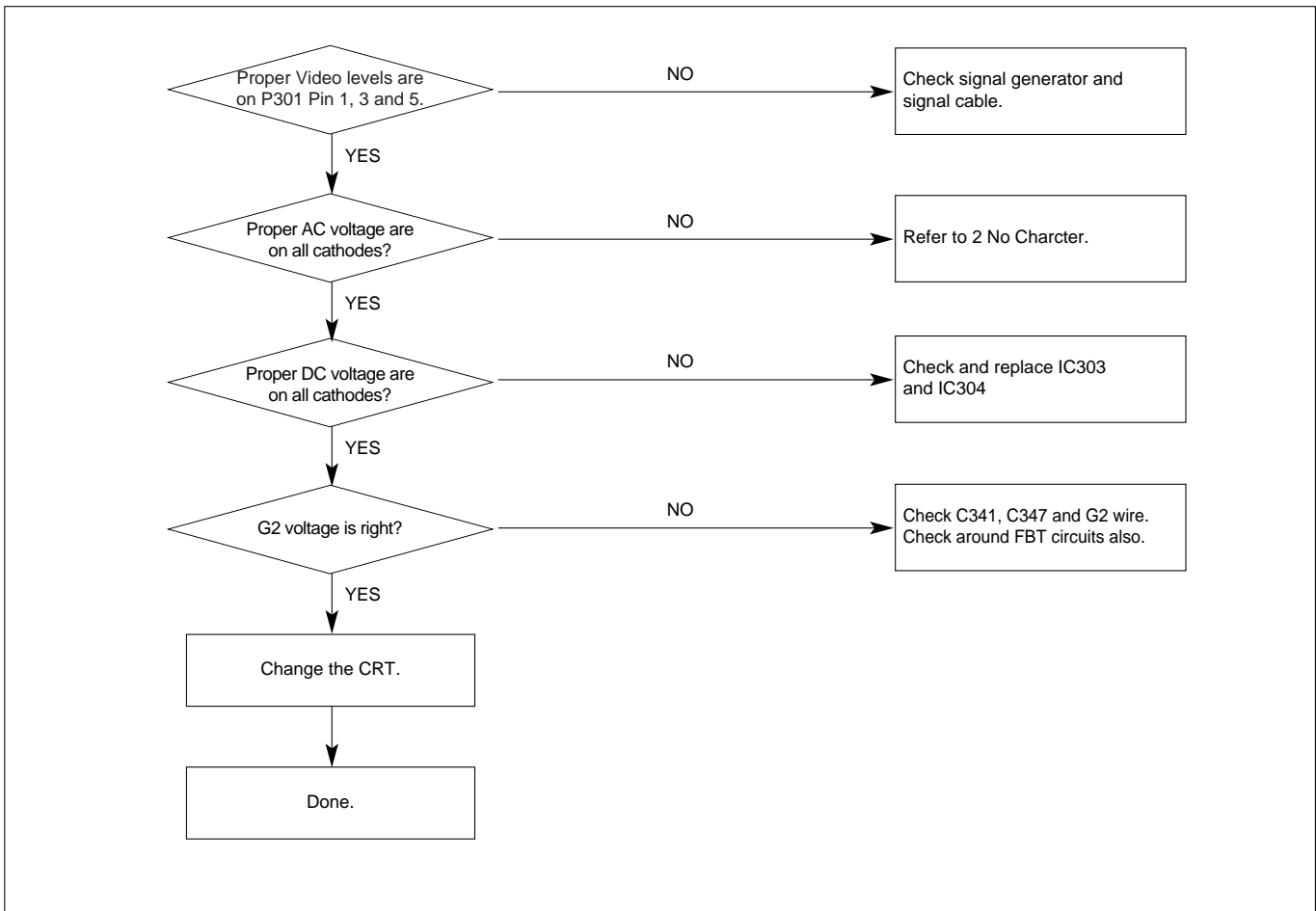
20. OSD Failure

Change IC302

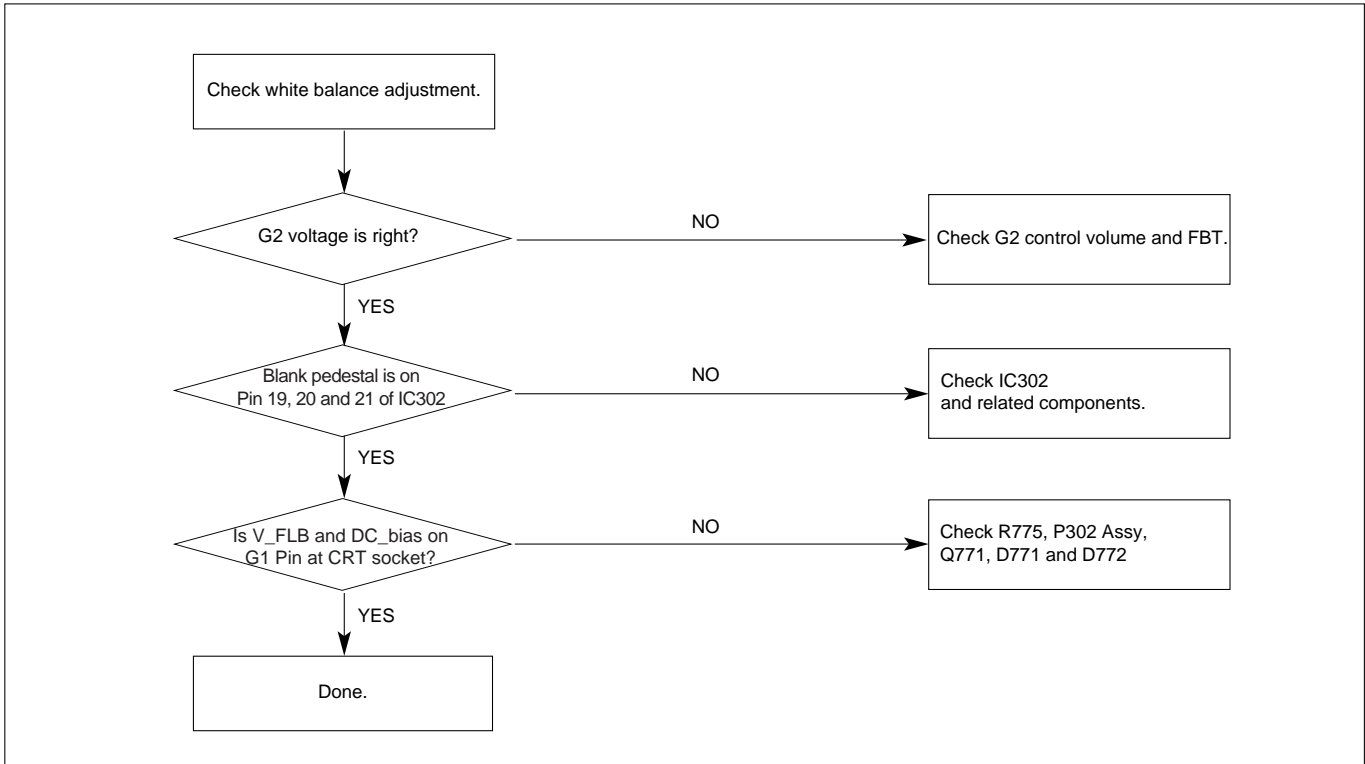
21. User Control Failure



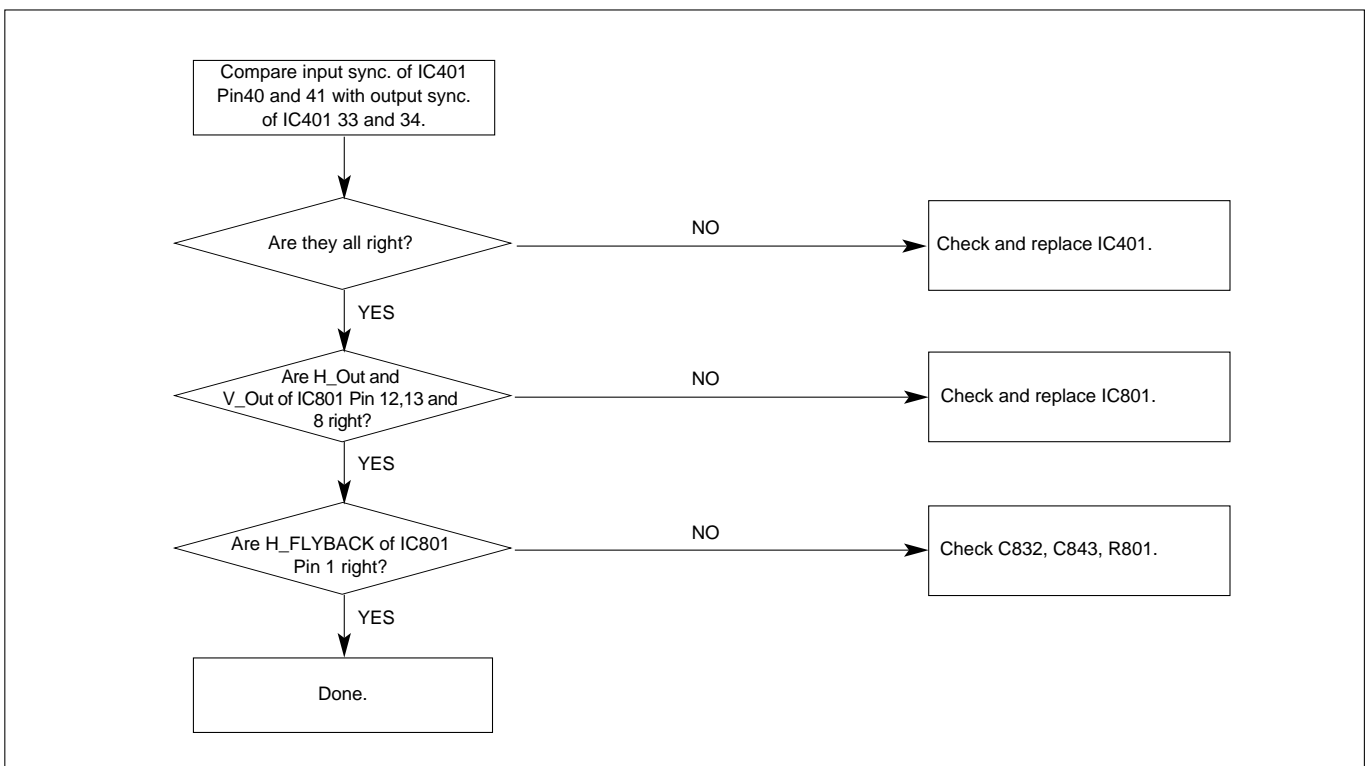
22. Missing Color



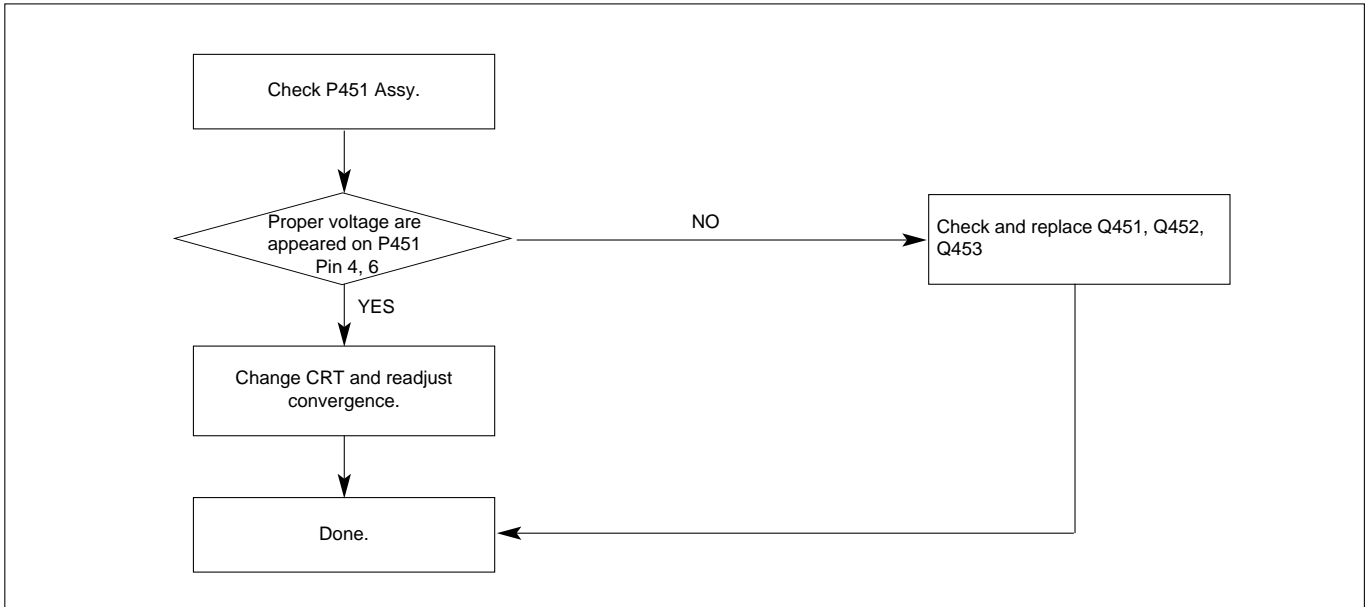
23. Visible Retrace



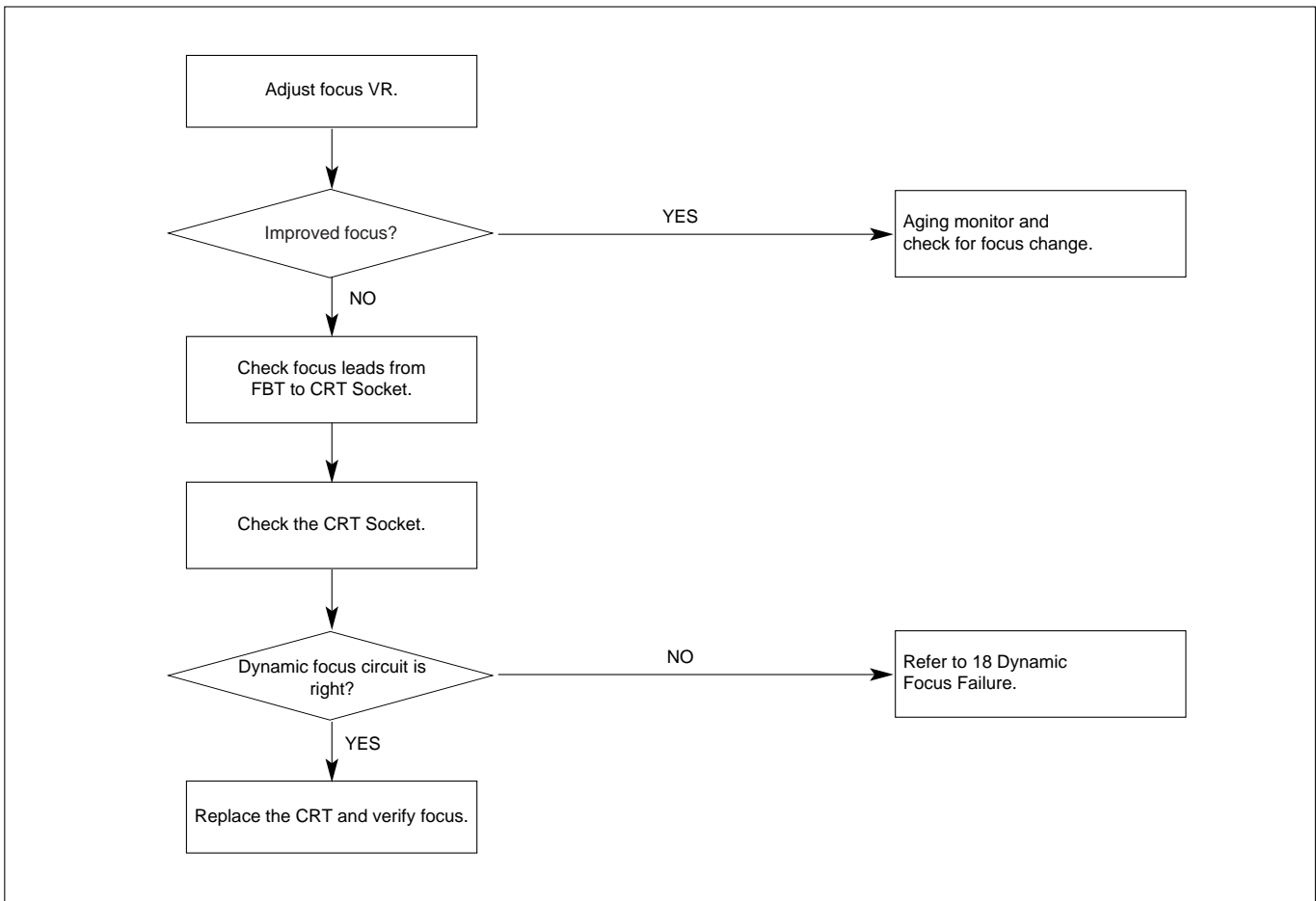
24. Unsynchronized Image



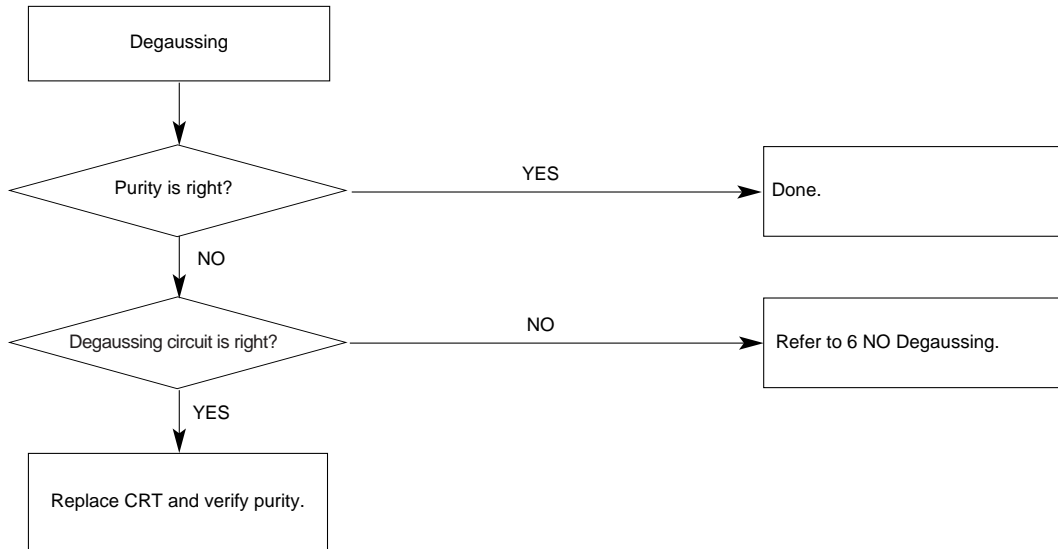
25. Misconvergence



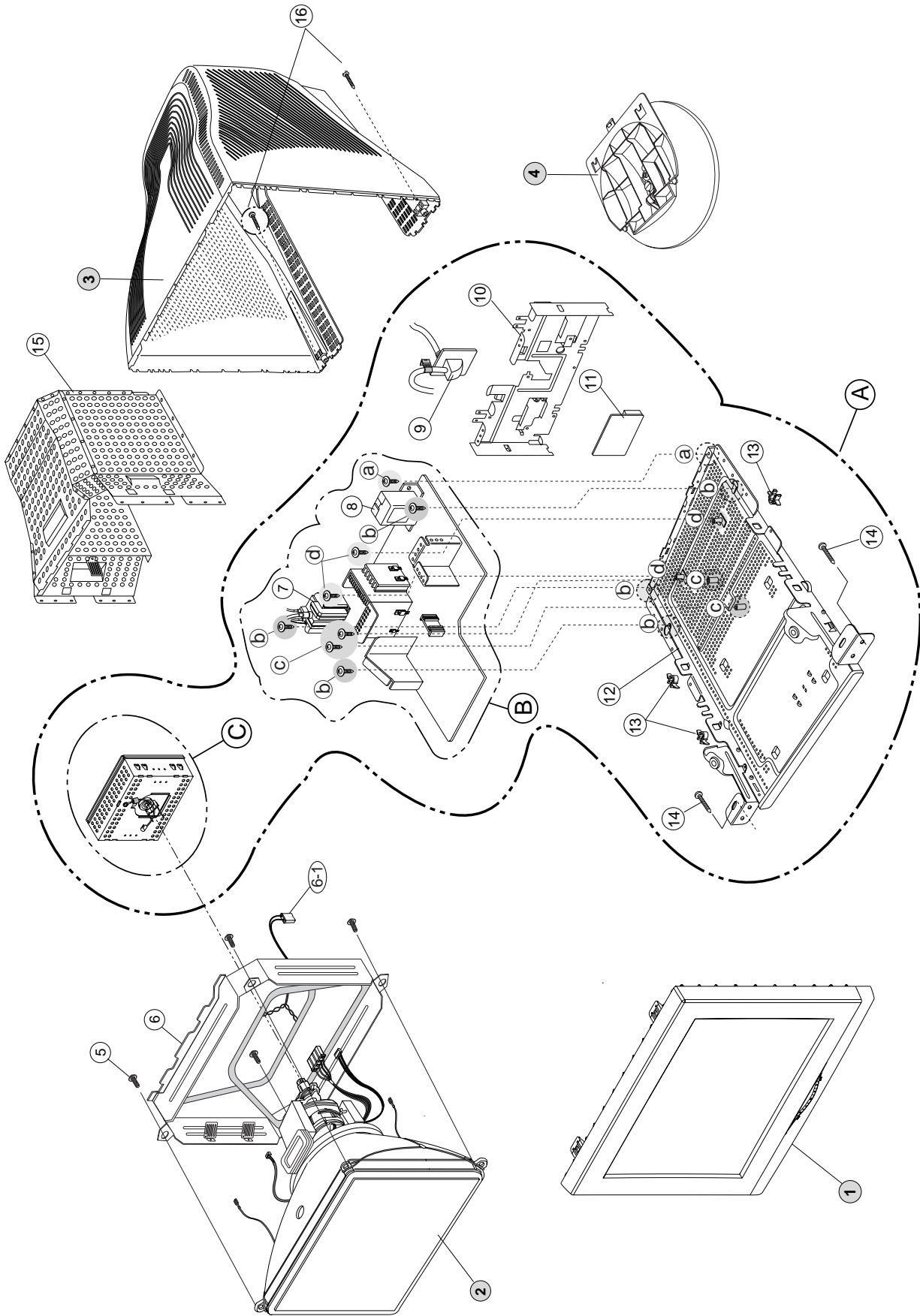
26. Poor Focus



27. Purity Failure



EXPLODED VIEW




EXPLODED VIEW PARTS LIST

Ref. No.	Part No.	Description
1	3091TKC118A	CABINET ASSEMBLY, F920 BRAND C091 3RD FLATRON TCO99
2	6318L19008A	CDT(CIRC), M46QDG423X11NDDD LG-PHILIPS 107KHZ 29.1MM FLATRON TCO V2
3	3809TKC045L	BACK COVER ASSEMBLY, F920BJ C044 PC+ABS 8D650 TCO03
4	3043TKK101G	TILT SWIVEL ASSEMBLY, F920BJ B059/T064 8D650 KUMI
5	339-002J	SCREW ASSY, PHP+5*25 (FZMW1)+GW18
6	4951TKS041H	METAL ASSEMBLY, FRAME FB990G,PEM NUT BOTTOM FRAME
6-1	6140TC2017A	COIL,DEGAUSSING, - GET 0.6*90T,14 OHM,WITH PURITY FB790G
7	6174T13010K	FBT (FLY BACK TRANSFORMER), FQM19A013,T910BJ(98K) SAMSUNG 19"
8	6200TJB001N	FILTER(CIRC),EMC, 02MD5 DELTA BK F900BJ
9	6866TDU002G	CABLE,D-SUB, UL20276 AWG30 DT 1870MM GRAY(85964) F900BJ DM
10	4950TKK450A	METAL, REAR BRACKET FB990G
11	6871TUT028A	PWB(PCB) ASSEMBLY,USB, F700PJ SUB TOTAL BRAND .
12	4951TKK090E	METAL ASSEMBLY, SHIELD BOTTOM-FB990J
13	4930TKK031C	HOLDER, PCB FIX , PC+ABS
14	332-102E	SCREW, PTP+4*16(MSWR/FZMY)
15	4815TKT009A	SHIELD ASSY, TOP(FB915B)
16	332-102E	SCREW, PTP+4*16(MSWR/FZMY)
A	3313T19054E	MAIN TOTAL ASSEMBLY, F920BJ BRAND CA-130
B	6871TMT408E	PWB(PCB) ASSEMBLY,MAIN, F920BJ ALEUQ BRAND CA-130 TOTAL
a	332-112F	SCREW,DRAWING, D3.5 L10.0 MSWR/FZMY +SW3.5+RW3.5
b	4001TKK004E	SCREW ASSEMBLY, TAPTITE P TYPE D3.0 L10.0 MSWR/FZMY SW3+RW10
c	339-008C	SCREW ASSY, MP+3*10(FZMY)+SW3+RW3
d	332-095B	SCREW,DRAWING, PZP+3*10(MSWR/FZMY)

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: 2004. 3. 30.				
*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
MAIN BOARD				
CAPACITORS				
			C301	OCK1020K515 1000PF 50V K B TR
			C303	OCK3320K515 3300P 50V K B TS
			C304	181-288B MKT 100V 104JTR PHS26104
			C306	181-288N MKT 100V 103JTR PHS86103
			C307	OCK1030K945 0.01UF 50V Z F TR
			C308	OCK1040K945 0.1UF 50V Z F TR
			C309	OCK1040K945 0.1UF 50V Z F TR
			C310	181-288E MKT 100V 474JTR PHS 26474
			C311	181-288B MKT 100V 104JTR PHS26104
			C312	181-288B MKT 100V 104JTR PHS26104
			C313	181-288B MKT 100V 104JTR PHS26104
			C315	OCE476CF638 "47UF SHL,SD 16V M FM5 TP 5"
			C317	OCK1040K945 0.1UF 50V Z F TR
			C318	OCN1040K949 0.1M 50V Z F TA52
			C319	OCK1040K945 0.1UF 50V Z F TR
			C320	OCE107CN630 100U SHL 100V M FM5
			C321	OCK1040K945 0.1UF 50V Z F TR
			C323	OCE107CH638 "100UF SHL,SD 25V M FM5 TP 5"
			C324	OCN1040K949 0.1M 50V Z F TA52
			C325	181-288E MKT 100V 474JTR PHS 26474
			C328	OCE476CN618 47UF SHL 100V M FL TP5
			C330	181-288B MKT 100V 104JTR PHS26104
			C331	181-288E MKT 100V 474JTR PHS 26474
			C332	181-288E MKT 100V 474JTR PHS 26474
			C333	181-288E MKT 100V 474JTR PHS 26474
			C334	181-288B MKT 100V 104JTR PHS26104
			C335	181-288B MKT 100V 104JTR PHS26104
			C339	OCK2710W515 270P 500V K B TS
			C340	181-288B MKT 100V 104JTR PHS26104
			C341	OCK10302945 0.01UF 2KV Z F TR
			C342	OCC2200W415 22PF 500V J NP0 TR
			C344	181-288C MKT 100V 224JTR PHS 26224
			C346	OCK10202515 1000PF D 2KV 10% TR B(Y5P)
			C347	OCK10302940 0.01M 2KV Z F S
			C355	OCE476CF638 "47UF SHL,SD 16V M FM5 TP 5"
			C372	OCN1040K949 0.1M 50V Z F TA52
			C401	OCC5600K415 56P 50V J NP0 TP
			C402	OCE476CH638 "47UF SHL,SD 25V M FM5 TP 5"
			C403	OCK2710K515 270P 50V K B TS
			C404	OCK2710K515 270P 50V K B TS
			C405	OCK2710K515 270P 50V K B TS
			C406	OCC0400K115 4P 50V D NP0 TS
			C407	OCC0400K115 4P 50V D NP0 TS
			C410	OCK1040K945 0.1UF 50V Z F TR
			C417	OCK1040K945 0.1UF 50V Z F TR
			C452	OCE106CK638 "10UF SHL,SD 50V M FM5 TP 5"
			C453	OCE106CK638 "10UF SHL,SD 50V M FM5 TP 5"
			C454	OCK1040K945 0.1UF 50V Z F TR
			C455	OCK1040K945 0.1UF 50V Z F TR
			C456	OCN1040K949 0.1M 50V Z F TA52
			C457	181-288E MKT 100V 474JTR PHS 26474
			C458	OCK1040K945 0.1UF 50V Z F TR

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
			C459	OCK1010K515 100PF 50V K B TR
			C460	OCE475CK638 "4.7UF SHL,SD 50V M FM5 TP 5"
			C601	OCQ6821N419 6800PF 100V J PE NI TP
			C602	181-288Q MKT 100V 154JTR PHS26154
			C603	OCK1020W515 1000P 500V K B TS
			C605	OCE476CN618 47UF SHL 100V M FL TP5
			C611	OCE108CH618 1000UF SHL 25V M FL TP5
			C701	OCE106CK638 "10UF SHL,SD 50V M FM5 TP 5"
			C702	OCE3376N650 330M SMS 100V M FM7.5
			C704	OCBZTBU003M 562J 20.0*14.0*8.5*10.0 800V
			C705	OCE336CN638 "33UF SHL,SD 100V M FM5 TP 5"
			C707	OCE106CK638 "10UF SHL,SD 50V M FM5 TP 5"
			C708	OCE476CQ618 47U SHL 200V M FL TP5
			C709	181-477A 102J 19.5*12.0*7.0*7.5 250V
			C710	OCC3300K405 33P 50V J SL TP
			C711	OCQ4721N419 0.0047U 100V J POLY NI TP5
			C712	OCK2220K515 2200P 50V K B TS
			C713	OCE107CH638 "100UF SHL,SD 25V M FM5 TP 5"
			C730	OCE476CH638 "47UF SHL,SD 25V M FM5 TP 5"
			C731	OCE105CK638 "1UF SHL,SD 50V 20% FM5 TP 5"
			C732	OCK1040K945 0.1UF 50V Z F TR
			C734	181-288T MKT 100V 223KTR PHS85223
			C735	OCK10302945 0.01UF 2KV Z F TR
			C736	OCK10302945 0.01UF 2KV Z F TR
			C738	OCE685CN638 "6.8UF SHL,SD 100V 20% TP 5"
			C739	OCK1040K945 0.1UF 50V Z F TR
			C740	OCE106EK638 10UF KMG 50V M FM5 TP 5
			C741	OCC1000W105 10PF 500V D SL TR
			C742	OCC1000W105 10PF 500V D SL TR
			C743	OCE106CN638 "10UF SHL,SD 100V M FM5 TP 5"
			C744	OCN1020K519 1000P 50V K B TA52
			C771	OCK6810K515 680P 50V K B TS
			C772	OCK4710W515 470P 500V K B TS
			C801	OCQ6821N419 6800PF 100V J PE NI TP
			C802	181-288B MKT 100V 104JTR PHS26104
			C803	OCE106CK638 "10UF SHL,SD 50V M FM5 TP 5"
			C804	181-288D MKT 100V 473JTR PHS26473
			C805	181-476R 2200 D 100V H PP NI TP5
			C806	OCE227CH638 "220UF SHL,SD 25V M FM5 TP 5"
			C807	181-288B MKT 100V 104JTR PHS26104
			C808	OCC1000K115 10P 50V D NP0 TS
			C809	OCK1020K515 1000PF 50V K B TR
			C810	OCE105CK638 "1UF SHL,SD 50V 20% FM5 TP 5"
			C811	OCE476CH638 "47UF SHL,SD 25V M FM5 TP 5"
			C812	OCE107CH638 "100UF SHL,SD 25V M FM5 TP 5"
			C813	OCE106CK638 "10UF SHL,SD 50V M FM5 TP 5"
			C814	OCK5610K515 560P 50V K B TS
			C815	OCE227CF638 "220UF SHL,SD 16V M FM5 TP 5"
			C817	OCE476CH638 "47UF SHL,SD 25V M FM5 TP 5"
			C818	181-288J MKT 100V 563JTR PHS26563
			C819	181-477U 333J 19.5*13.0*7.5*7.5 250V
			C821	OCN1040K949 0.1M 50V Z F TA52
			C823	OCK1010K515 100PF 50V K B TR
			C832	OCK10102515 100PF D 2KV 10% B(Y5P) TR

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			C833	181-482D 184J 18.0*15.0*8.5*7.5 250V
			C834	0CN1040K949 0.1M 50V Z F TA52
			C835	0CBZTTA001R 103J 20.0*17.0*10.0*7.5 800V
			C841	0CE476CR630 "47UF SHL,SD 250V M FM5 BULK"
			C842	181-309H 272J 23.0*17.0*10.0*15.0 1.6
			C843	0CQ3321N419 3300P 100V J POLY NI TP
			C844	181-309H 272J 23.0*17.0*10.0*15.0 1.6
			C845	181-288B MKT 100V 104JTR PHS26104
			C846	0CE108EF618 1000UF KMG 16V M FL TP 5
			C847	0CQ2221N419 2200PF 100V J PE NI TP
			C848	0CK47101515 470P 1KV K B TS
			C849	0CK6810W515 680P 500V K B TS
			C850	0CK1040K945 0.1UF 50V Z F TR
			C851	0CK1040K945 0.1UF 50V Z F TR
			C852	0CN1040K949 0.1M 50V Z F TA52
			C854	181-482W 304J 19.0*18.5*10.5*7.5 250V
			C855	181-477Z 823J 20.0*17.5*10.0*7.5 250V
			C856	181-482G 334J 18.0*18.0*11.0*7.5 250V
			C857	181-305M 824J 26.0*21.5*13.0*15.0 25
			C858	181-303A 104J 20.5*18.5*10.5*10.0 250
			C859	181-478B 124J 20.0*19.0*11.0*7.5 250V
			C860	0CN1040K949 0.1M 50V Z F TA52
			C861	0CN1040K949 0.1M 50V Z F TA52
			C863	0CN1040K949 0.1M 50V Z F TA52
			C864	0CN1040K949 0.1M 50V Z F TA52
			C865	0CE105CK638 "1UF SHL,SD 50V 20% FM5 TP 5"
			C891	0CZZTFT001J ECQB1H562JM3 562J 50V TP5.0
			C892	0CZZTFT001M ECQB1H103JF3 MATSUSHITA 50V
			C893	181-288B MKT 100V 104JTR PHS26104
			C894	0CZZTFT001L ECQB1H822JM3 822J 50V TP5.0
			C895	181-288B MKT 100V 104JTR PHS26104
			C896	181-288Q MKT 100V 154JTR PHS26154
			C902	0CKZTTA003C SC E 472M 14.0FF7 250V TP7.5
			C903	0CK10101515 100PF 1KV K B TR
			C904	181-304V 393J 19.5*15.5*9.5*10.0 400V
			C905	181-296F 330UF SMH(30*40) 400V M VNS
			C906	0CE475CN638 "4.7UF SHL,SD 100V M FM5 TP 5"
			C907	0CE336CK638 "33UF SHL,SD 50V M FM5 TP 5"
			C908	0CK1040K945 0.1UF 50V Z F TR
			C909	181-288T MKT 100V 223KTR PHS85223
			C910	0CZZTFT001N ECQB1H123JM3 123J 50V TP5.0
			C911	0CE108CD618 1000UF SHL 10V M FL TP5
			C912	0CE475CK638 "4.7UF SHL,SD 50V M FM5 TP 5"
			C915	0CE476CH638 "47UF SHL,SD 25V M FM5 TP 5"
			C916	0CK2220K515 2200P 50V K B TS
			C917	0CKZTTA003C SC E 472M 14.0FF7 250V TP7.5
			C918	0CKZTTA003C SC E 472M 14.0FF7 250V TP7.5
			C920	0CC47001505 47PF 1KV K SL TR
			C921	0CE227CR650 220UF SHL 250V M FM7.5 BULK
			C922	0CE3376N650 330M SMS 100V M FM7.5
			C923	0CK1010W515 100P 500V K B TS
			C925	0CE228CH618 2200U SHL 25V M FL TP5
			C926	0CE108EF618 1000UF KMG 16V M FL TP 5
			C927	0CE228CH618 2200U SHL 25V M FL TP5
			C928	0CE108EF618 1000UF KMG 16V M FL TP 5
			C929	0CK1020K515 1000PF 50V K B TR
			C930	0CQ2721N419 2700PF 100V J PE NI TP
			C931	0CK1010W515 100P 500V K B TS
			C932	0CC47001505 47PF 1KV K SL TR
			C953	0CE477CF638 470UF SHL TYPE 16V M FM5 TP
			C970	0CE476CH638 "47UF SHL,SD 25V M FM5 TP 5"

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
			DIODEs	
			D301	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D302	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D303	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D304	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D305	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D306	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D307	0DS124409AA 1SS244 TP ROHM KOREA
			D308	0DS124409AA 1SS244 TP ROHM KOREA
			D309	0DS124409AA 1SS244 TP ROHM KOREA
			D310	0DS124409AA 1SS244 TP ROHM KOREA
			D311	0DS124409AA 1SS244 TP ROHM KOREA
			D312	0DS124409AA 1SS244 TP ROHM KOREA
			D313	0DS124409AA 1SS244 TP ROHM KOREA
			D314	0DS124409AA 1SS244 TP ROHM KOREA
			D315	0DS124409AA 1SS244 TP ROHM KOREA
			D316	0DR140059DA 1N4005TB52 TP LITEON DO41 60
			D401	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D402	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D405	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D451	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D452	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D453	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D454	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D701	0DR400409AC UF4004 GULF TP DO41 400V 1A
			D702	0DR400409AC UF4004 GULF TP DO41 400V 1A
			D703	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D704	0DR100009CA RGP10G TP GULF SEMICONDUCTOR
			D706	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D707	0DR100009DA RGP10J TP GULF SEMICONDUCTOR
			D708	0DRFJ00011A YG339D6F208 FUJI ST TO220 -4
			D731	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D732	0DD400709CB UF4007 TP G.I DO204AL 1000V
			D733	0DD400709CB UF4007 TP G.I DO204AL 1000V
			D734	0DD400709CB UF4007 TP G.I DO204AL 1000V
			D735	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D736	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D737	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D738	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D740	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D771	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D772	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D773	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D801	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D802	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D803	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D804	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D805	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D808	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D811	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D812	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D831	0DR260400AA S2L60-4004P15 BK SHINDENGEN
			D833	0DD100009AH ES1FV(1) TP SANKEN E/EO-TMD
			D834	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D835	0DRGF00069A SB140 GULF TP DO41 40V 1A 40
			D836	0DRGF00069A SB140 GULF TP DO41 40V 1A 40
			D837	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D838	0DR200000EA FMQ-G2FMS BK SANKEN NON 1500
			D839	0DS141489AB 1N4148 TP GRANDE DO-34 500MW
			D840	0DR100009DA RGP10J TP GULF SEMICONDUCTOR
			D861	0DD140009AA EK14 V(1) TP SANKEN E/EO-TMD
			D901	0DRGF00090A GBL06 GULF BK GBL 600V 4A 12

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		D902	0DRGF00109A	GUF10M GULF TP DO41 1000V 1A
		D903	0DR100009CA	RGP10G TP GULF SEMICONDUCTOR
		D904	0DR100009DA	RGP10J TP GULF SEMICONDUCTOR
		D905	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D906	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D907	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D908	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D909	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D910	0DRGF00139A	GPP20J GULF TP DO15 600V 2.0
		D911	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D912	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D913	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D914	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D920	0DRSD00079A	D2L20U SHINDENGEN TP DO-204A
		D921	0DRSD00079A	D2L20U SHINDENGEN TP DO-204A
		D922	0DR540400AA	UF5404L BK G.I DO201AD 400V
		D923	0DRGS00400A	31GF4 GENERAL SEMICONDUCTOR
		D924	0DR260400AA	S2L60-4004P15 BK SHINDENGEN
		D925	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D926	0DR260400AA	S2L60-4004P15 BK SHINDENGEN
		D927	0DS141489AB	1N4148 TP GRANDE DO-34 500MW
		D928	971-0054	TIN 50MM TAPING
		D929	0DRGS00400A	31GF4 GENERAL SEMICONDUCTOR
		D951	0DR100009CA	RGP10G TP GULF SEMICONDUCTOR
		ZD402	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD403	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD404	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD405	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD407	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD408	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD409	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD410	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD601	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD703	0DZ510009BE	GDZ5.1B TP GRANDE DO34 500MW
		ZD711	0DZ180009BD	GDZJ18B TP GRANDE DO34 0.5W
		ZD712	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
		ZD801	0DZ110009AD	MTZJ11B TP ROHM-K DO34 500MW
		ZD802	0DZ180009BD	GDZJ18B TP GRANDE DO34 0.5W
		ZD804	0DZ180009BD	GDZJ18B TP GRANDE DO34 0.5W
		ZD901	0DZ240009BJ	GDZJ24B TP GRANDE DO34 500MW
		ZD902	0DZ560009AG	GDZJ5.6B TP GRANDE DO-34 500
ICs				
		IC302	0IPRPN025B	LM1246DDB/NA NATIONAL SEMICO
		IC303	0IPRPN007A	LM2463TA NATIONAL SEMICONDUCTOR
		IC304	0IPRPN005A	LM2480NA NATIONAL SEMICONDUCTOR
		IC401	0IMCRWL012D	"LGM31B-140/DJK WELTREND 42,S"
		IC402	0ISG240860A	M24C08-BN6 8DIP BK 8K SERIAL
		IC601	0IPRPPH018A	"TDA4867J PHILIPS 9PIN,ST DIP"
		IC702	0INS353000A	LF353N OP-AMP
		IC801	0IPRPPH005A	"TDA4841PS PHILIPS 32P,SDIP S"
		IC802	0IMI625010A	M62501P 16P4 BK INTERFACE PW
		IC901	0ISS384300A	KA3843B 8P SDIP BK PWM CONTR
		IC903	0ISS780500F	KA7805
		IC905	0ISS781200K	KA78R12-STU TO220(4L) BK L/D
COILS & CORES				
		L301	0LA0220K119	0.22UH K 2.3*3.4 TP
		L302	0LA0150K119	AXIAL TAE YANG 0.15UH 10% A
		L303	0LA0220K119	0.22UH K 2.3*3.4 TP

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		L311	0LA0390K119	0.39UH K 2.3*3.4 TP
		L312	0LA0390K119	0.39UH K 2.3*3.4 TP
		L313	0LA0390K119	0.39UH K 2.3*3.4 TP
		L701	6140TBZ009D	"- GET NO CORE,0.1*30 50TS,10"
		L801	6140TYZ011E	"- GET H-LIN,2.0UH,FB990G"
		L805	150-985P	DR12*15 6MH 0.25MM 365.5T
		L806	150-985N	DR10*10 4.7UH 0.16MM 322.5
		L901	6140TBZ031B	EE36SI PFC 49MH 0.5MM 228 +/
		FB301	125-022J	FERRITE KQ-1 JS 3.5*5.0MM AX
		FB302	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB303	125-022J	FERRITE KQ-1 JS 3.5*5.0MM AX
		FB304	125-022J	FERRITE KQ-1 JS 3.5*5.0MM AX
		FB305	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB306	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB309	125-155B	BFS3580R2FG SAMWHA 3.5*8.0MM
		FB310	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB311	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB401	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB402	125-155N	BFD3565R2FG SAMWHA 3.5*6.5MM
		FB403	125-155L	BFS3580A0FG SAMWHA 3.5*8.0MM
		FB404	6210TCE003F	BRD3580B BO SUNG 3580MM RADI
		FB405	6210TCE003F	BRD3580B BO SUNG 3580MM RADI
		FB406	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB407	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB701	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB801	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB841	125-155P	BFS2550R2FG SAMWHA 2.5*5.0MM
		FB901	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB902	125-155A	BFD3510R2FG SAMWHA 3.5*10MM
		FB903	125-155H	BFS3510A0FG SAMWHA 3.5*10MM
		FB904	125-155H	BFS3510A0FG SAMWHA 3.5*10MM
		FB905	125-155C	BFD3514R2FG SAMWHA 3.5*14MM
		FB906	125-155H	BFS3510A0FG SAMWHA 3.5*10MM
		FB907	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB908	125-155J	BFS2550A0FG SAMWHA 2.5*5.0MM
		FB909	125-155H	BFS3510A0FG SAMWHA 3.5*10MM
TRANSISTOR				
		Q301	0TR127509AC	KTA1275-Y(KTA1013) TP KEC TO
		Q302	0TR231609AA	KSC2316-Y TP SAMSUNG TO92L
		Q451	0TR488009AA	BF488 TP PHILIPS TO92 PNP
		Q452	0TR127009AA	KTA1270-Y(KTA562TM) TP KEC T
		Q453	0TR320209AA	KTC3202-Y(KTC1959) TP KEC TO
		Q454	0TR488009AA	BF488 TP PHILIPS TO92 PNP
		Q455	0TR127009AA	KTA1270-Y(KTA562TM) TP KEC T
		Q456	0TR320209AA	KTC3202-Y(KTC1959) TP KEC TO
		Q458	0TR320509AB	KTC3205-Y(KTC2236A) TP KEC T
		Q459	0TR127309AA	KTA1273-Y(KTA966A) TP KEC TO
		Q701	0TR320509AB	KTC3205-Y(KTC2236A) TP KEC T
		Q704	0TFFN10003C	INFINEON SPA07N60C3(E8153) S
		Q705	0TR320209AA	KTC3202-Y(KTC1959) TP KEC TO
		Q706	0TR127009AA	KTA1270-Y(KTA562TM) TP KEC T
		Q707	0TR390409CA	FAIRCHILD 2N3904(TA) TP TO-9
		Q708	0TR319809AA	KTC3198-Y(KTC1815) TP KEC TO
		Q721	0TR390409CA	FAIRCHILD 2N3904(TA) TP TO-9
		Q723	0TR390409CA	FAIRCHILD 2N3904(TA) TP TO-9
		Q724	0TR463300AB	2SC4633(LS-CB11) BK SANYO L
		Q725	0TR463300AB	2SC4633(LS-CB11) BK SANYO L
		Q726	0TR555109AB	2N5551 TP SAMSUNG TO92 AMP
		Q771	0TR920009AB	KSP92 TP SAMSUNG TO92 HIGH V
		Q801	0TR558900BA	"2SC5589(LG,W/M) BK TOSHIBA T"

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
			Q802	0TR471009AA KSD471AC-Y TP SAMSUNG TO92
			Q803	0TR564009AB KSB564AC-YTA TP SANSUNG TO92
			Q804	0TR319809AA KTC3198-Y(KTC1815) TP KEC TO
			Q806	0TR471009AA KSD471AC-Y TP SAMSUNG TO92
			Q807	0TR564009AB KSB564AC-YTA TP SANSUNG TO92
			Q808	0TR127009AA KTA1270-Y(KTA562TM) TP KEC T
			Q810	0TR114009AB DTC114ES TP ROHM-K SPT NPN
			Q811	0TF630000CA IRFS630A BK SAMSUNG 200V 6.5
			Q812	0TR114009AB DTC114ES TP ROHM-K SPT NPN
			Q832	0TF283509AA 2SK2835(TP) TP TOSHIBA 200V
			Q833	0TFFC10008A SFS9634 FAIRCHILD ST TO220F
			Q834	0TR231609AA KSC2316-Y TP SAMSUNG TO92L
			Q836	0TF630000CA IRFS630A BK SAMSUNG 200V 6.5
			Q837	0TF630000CA IRFS630A BK SAMSUNG 200V 6.5
			Q838	0TF630000CA IRFS630A BK SAMSUNG 200V 6.5
			Q839	0TF640000CA IRFS640A BK SAMSUNG 200V 9A
			Q841	0TR114009AB DTC114ES TP ROHM-K SPT NPN
			Q842	0TR114009AB DTC114ES TP ROHM-K SPT NPN
			Q843	0TR114009AB DTC114ES TP ROHM-K SPT NPN
			Q844	0TR114009AB DTC114ES TP ROHM-K SPT NPN
			Q901	0TFFN10003C INFINEON SPA07N60C3(E8153) S
			Q902	0DR100609BA MCR100-6RLRA TP MOTOROLA TO9
			Q903	0TR319809AA KTC3198-Y(KTC1815) TP KEC TO
			Q912	0TR127309AA KTA1273-Y(KTA966A) TP KEC TO
			Q913	0TR319809AA KTC3198-Y(KTC1815) TP KEC TO
			Q914	0TR928009AB KSA928A-Y TP SAMSUNG TO92L P
			Q915	0TR319809AA KTC3198-Y(KTC1815) TP KEC TO
			Q920	0TR319809AA KTC3198-Y(KTC1815) TP KEC TO
RESISTORS				
			R301	0RD0752Q609 75 1/4W(3 5% TA52
			R302	0RD0752Q609 75 1/4W(3 5% TA52
			R303	0RD0752Q609 75 1/4W(3 5% TA52
			R305	0RN6201F409 6.20K 1/6W 1% TA52
			R306	0RD1002Q609 10K 1/4W(3 5% TA52
			R307	0RD5102Q509 51K OHM 1/4 W (3.4) 2% TA52
			R308	0RD1002Q609 10K 1/4W(3 5% TA52
			R314	0RD1000Q609 100 1/4W(3 5% TA52
			R315	0RD1000Q609 100 1/4W(3 5% TA52
			R319	0RD8201Q609 8.20K 1/4W(3 5% TA52
			R320	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R326	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R327	0RD2001Q609 2K 1/4W(3 5% TA52
			R328	0RD2001Q609 2K 1/4W(3 5% TA52
			R329	0RD2001Q609 2K 1/4W(3 5% TA52
			R330	0RD1000Q609 100 1/4W(3 5% TA52
			R331	0RD1500Q609 150 1/4W(3 5% TA52
			R332	0RD1800Q609 180 1/4W(3 5% TA52
			R333	0RD1300Q609 130 1/4W(3 5% TA52
			R334	0RD3303Q609 330K 1/4W(3 5% TA52
			R335	0RD3303Q609 330K 1/4W(3 5% TA52
			R336	0RD3303Q609 330K 1/4W(3 5% TA52
			R337	0RD1500Q609 150 1/4W(3 5% TA52
			R340	0RN1002F409 10K 1/6W 1 TA52
			R341	0RD0332A609 33 OHM 1/2 W (7.0) 5% TA52
			R342	0RD0332A609 33 OHM 1/2 W (7.0) 5% TA52
			R343	0RD0332A609 33 OHM 1/2 W (7.0) 5% TA52
			R344	0RD0332Q609 33 1/4W(3 5% TA52
			R345	0RD0332Q609 33 1/4W(3 5% TA52
			R346	0RD0332Q609 33 1/4W(3 5% TA52
			R347	971-0054 TIN 50MM TAPING

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
			R401	0RD3300Q609 330 1/4W(3 5% TA52
			R402	0RD1000Q609 100 1/4W(3 5% TA52
			R403	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R405	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R406	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R407	0RD1000Q609 100 1/4W(3 5% TA52
			R412	0RD1000Q609 100 1/4W(3 5% TA52
			R413	0RD2202Q609 22K 1/4W(3 5% TA52
			R414	0RD2202Q609 22K 1/4W(3 5% TA52
			R415	0RD2202Q609 22K 1/4W(3 5% TA52
			R416	0RD2202Q609 22K 1/4W(3 5% TA52
			R418	0RD2000Q609 200 1/4W(3 5% TA52
			R419	0RN1002F409 10K 1/6W 1 TA52
			R420	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R421	0RD1001Q609 1K 1/4W(3 5% TA52
			R422	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R423	0RD1000Q609 100 1/4W(3 5% TA52
			R424	0RN2201F409 2.20K 1/6W 1% TA52
			R425	0RD2001Q609 2K 1/4W(3 5% TA52
			R426	0RD2001Q609 2K 1/4W(3 5% TA52
			R428	0RD1000Q609 100 1/4W(3 5% TA52
			R429	0RD1000Q609 100 1/4W(3 5% TA52
			R430	0RD1801Q609 1.80K 1/4W(3 5% TA52
			R431	0RD1801Q609 1.80K 1/4W(3 5% TA52
			R432	0RD1301Q609 1.30K 1/4W(3 5% TA52
			R434	0RN1002F409 10K 1/6W 1 TA52
			R440	0RD1000Q609 100 1/4W(3 5% TA52
			R443	0RD1001Q609 1K 1/4W(3 5% TA52
			R451	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R452	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R453	0RD1500Q609 150 1/4W(3 5% TA52
			R454	0RD6201Q609 6.20K 1/4W(3 5% TA52
			R455	0RN0270G609 0.27 1/4W 5 TA52
			R456	0RD0622A609 62 OHM 1/2 W (7.0) 5% TA52
			R457	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R458	0RD4701Q609 4.70K 1/4W(3 5% TA52
			R459	0RD1500Q609 150 1/4W(3 5% TA52
			R460	0RD8201Q609 8.20K 1/4W(3 5% TA52
			R461	0RX0472J609 47 OHM 1 W 5% TA52
			R462	0RD0102A609 10 OHM 1/2 W (7.0) 5% TA52
			R463	0RD6801Q609 6.80K 1/4W(3 5% TA52
			R464	0RN1000F409 100OHM 1/6 W 1% TA52
			R465	0RN6202F409 62KOHM 1/6 W 1% TA52
			R466	0RD4302Q609 43K 1/4W(3 5% TA52
			R467	0RN5601F409 5.60K 1/6W 1% TA52
			R473	0RD1004Q609 1M OHM 1/4 W (3.4) 5% TA52
			R493	0RD1000Q609 100 1/4W(3 5% TA52
			R494	0RD1000Q609 100 1/4W(3 5% TA52
			R601	0RD2001Q609 2K 1/4W(3 5% TA52
			R602	0RD2001Q609 2K 1/4W(3 5% TA52
			R603	0RD0111A509 1.1 OHM 1/2 W(7.0) 2% TA52
			R604	0RD0331A609 3.3 OHM 1/2 W (7.0) 5% TA52
			R605	0RN1502F409 15K 1/6W 1% TA52
			R606	0RN1502F409 15K 1/6W 1% TA52
			R607	0RD2000A609 200 OHM 1/2 W (7.0) 5% TA52
			R608	0RD1000Q609 100 1/4W(3 5% TA52
			R609	0RD1000A609 100 OHM 1/2 W (7.0) 5% TA52
			R610	0RN0390H609 0.39 1/2W 5 TA52
			R701	0RMZTWD001K RWR SMART 100OHM 7 W 5% PD T
			R702	0RD1002Q609 10K 1/4W(3 5% TA52
			R703	0RD3301Q609 3.30K 1/4W(3 5% TA52
			R704	0RD2201Q609 2.20K 1/4W(3 5% TA52

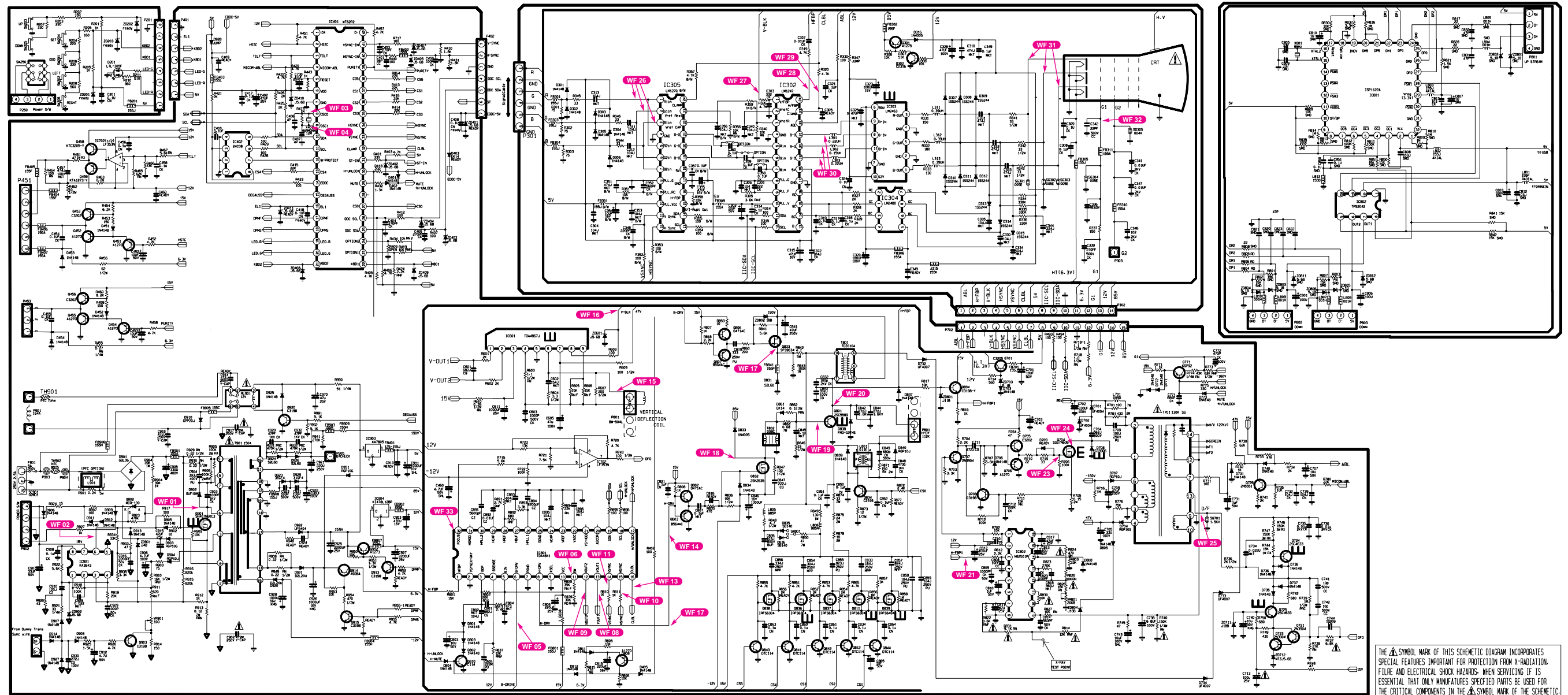
DATE: 2004. 3. 30.				
*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		R705	0RB0150K609	0.15 OHM 2 W 5% TA52
		R706	0RD1003Q609	100K 1/4W(3 5% TA52
		R707	0RD5601Q609	5.60K 1/4W(3 5% TA52
		R710	0RD0222Q609	22 1/4W(3 5% TA52
		R711	0RN1502F409	15K 1/6W 1% TA52
		R712	0RD1003Q609	100K 1/4W(3 5% TA52
		R714	0RD1001Q609	1K 1/4W(3 5% TA52
		R715	0RD5601Q609	5.60K 1/4W(3 5% TA52
		R716	0RD1004Q609	1M OHM 1/4 W (3.4) 5% TA52
		R717	0RD1000Q609	100 1/4W(3 5% TA52
		R718	0RN0101H609	1.0 1/2W 5 TA52
		R718-1	0RN0111H509	1.1 OHM 1/2 W 2.00% TA52
		R719	0RD0332Q609	33 1/4W(3 5% TA52
		R720	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R721	0RN7501F409	7.50K 1/6W 1% TA52
		R722	0RD1003Q609	100K 1/4W(3 5% TA52
		R723	0RN1302F409	13K 1/6W 1% TA52
		R730	0RD6202Q609	62K OHM 1/4 W (3.4) 5% TA52
		R731	0RD1000Q609	100 1/4W(3 5% TA52
		R732	0RD1001Q609	1K 1/4W(3 5% TA52
		R733	0RD4702Q609	47K 1/4W(3 5% TA52
		R734	0RD2001Q609	2K 1/4W(3 5% TA52
		R735	0RD1002Q609	10K 1/4W(3 5% TA52
		R736	0RD2001A609	2.0K OHM 1/2 W (7.0) 5% TA52
		R737	0RD6801Q609	6.80K 1/4W(3 5% TA52
		R738	0RN2702F409	27K 1/6W 1% TA52
		R739	0RC1004A609	1M OHM 1/2 W(7.0) 5% TA52
△		R740	0RN1503G409	150K 1/4W 1 TA52
		R741	0RD2001Q609	2K 1/4W(3 5% TA52
		R742	0RD6800Q609	680 1/4W(3 5% TA52
		R743	0RD1000A609	100 OHM 1/2 W (7.0) 5% TA52
		R744	0RX1502J609	15KOHM 1 W 5% TA52
		R745	0RD0472Q609	47 1/4W(3 5% TA52
		R746	0RX1503L607	150K OHM 3 W 5% TA62
		R747	0RX1503L607	150K OHM 3 W 5% TA62
		R748	0RD0472Q609	47 1/4W(3 5% TA52
		R749	0RD4300Q609	430 OHM 1/4 W(3.4) 5.00% TA5
		R750	0RD6800Q609	680 1/4W(3 5% TA52
		R764	0RD0472Q609	47 1/4W(3 5% TA52
		R771	0RD1101Q609	1.1K OHM 1/4 W (3.4) 5% TA52
		R773	0RN6202H409	62000 OHM 1/2 W 1% TA52
		R774	0RN4302G409	43K OHM 1/4 W 1% TA52
		R775	0RD3300Q609	330 1/4W(3 5% TA52
		R776	0RD7502Q609	75K 1/4W(3 5% TA52
		R780	0RD2202Q609	22K 1/4W(3 5% TA52
		R781	0RX4300K607	430 OHM 2 W 5% TA62
		R801	0RD1502Q609	15K 1/4W(3 5% TA52
		R802	0RD2002Q509	20K OHM 1/4 W (3.4) 2% TA52
		R803	0RD3302Q609	33K 1/4W(3 5% TA52
		R805	0RD1002Q609	10K 1/4W(3 5% TA52
		R806	0RD1002Q609	10K 1/4W(3 5% TA52
		R807	0RD1001Q609	1K 1/4W(3 5% TA52
		R808	0RD1001Q609	1K 1/4W(3 5% TA52
		R809	0RN3902F409	39K 1/6W 1% TA52
		R810	0RD1001Q609	1K 1/4W(3 5% TA52
		R811	0RD1001Q609	1K 1/4W(3 5% TA52
		R812	0RD2201Q609	2.20K 1/4W(3 5% TA52
		R813	0RD2401Q609	2.40K 1/4W(3 5% TA52
△		R814	0RN1202F409	12K 1/6W 1% TA52
		R815	0RN4700F409	470 1/6W 1 TA52
		R816	0RD1001Q609	1K 1/4W(3 5% TA52
		R817	0RD1002Q609	10K 1/4W(3 5% TA52

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*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		R818	0RD2701Q609	2.70K 1/4W(3 5% TA52
△		R822	0RN3601F409	3.6K 1/6W 1 TA52
		R823	0RD2703Q609	270K 1/4W(3 5% TA52
△		R824	0RN4700F409	470 1/6W 1 TA52
△		R825	0RN1002F409	10K 1/6W 1 TA52
△		R826	0RN1602F409	16K 1/6W 1% TA52
		R827	0RN1002F409	10K 1/6W 1 TA52
		R830	0RD1002Q609	10K 1/4W(3 5% TA52
△		R831	0RN9101F409	9.10K 1/6W 1% TA52
		R835	0RD4700Q609	470 OHM 1/4 W (3.4) 5% TA52
		R836	0RD1002A609	10K OHM 1/2 W (7.0) 5% TA52
		R837	0RN1202F409	12K 1/6W 1% TA52
		R838	0RD0101Q609	1 1/4W(3 5% TA52
		R841	0RD5601Q609	5.60K 1/4W(3 5% TA52
		R842	0RMZTWD001A	4.7 OHM 5 W 5% B RWR
		R843	0RX1003J609	100KOHM 1 W 5% TA52
		R846	0RD0332A609	33 OHM 1/2 W (7.0) 5% TA52
		R847	0RD1000A609	100 OHM 1/2 W (7.0) 5% TA52
		R848	0RD0471A609	4.7 OHM 1/2 W (7.0) 5% TA52
		R849	0RX1300J609	130 OHM 1 W 5% TA52
		R850	0RMZTWD001C	47 OHM 7 W 5% RWR PD-TYPE
		R851	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R853	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R855	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R857	0RD3001Q609	3K 1/4W(3 5% TA52
		R859	0RD0102Q609	10 1/4W(3 5% TA52
		R860	0RD2000Q609	200 1/4W(3 5% TA52
		R861	0RMZTWW001J	RWR SMART 0.62OHM 7 W 5% CEM
		R862	0RB0120K607	0.12 OHM 2 W 5% TA62
		R864	0RD2202Q609	22K 1/4W(3 5% TA52
		R865	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R871	0RX1500K607	150 OHM 2 W 5% TA62
		R872	0RD2401Q609	2.40K 1/4W(3 5% TA52
		R873	0RD0122A609	12 OHM 1/2 W (7.0) 5% TA52
		R874	0RX0332K607	33 OHM 2 W 5% TA62
		R875	0RX0242K607	24 OHM 2 W 5.00% TA62
		R876	0RD3002Q509	30000 OHM 1/4 W (3.4) 2% TA5
		R878	0RX0182K607	18 OHM 2 W 5% TA62
		R891	0RN2701F409	2.7K OHM 1/6 W 1.00% TA52
		R892	0RN6800F409	680 1/6W 1% TA52
		R893	0RD3301Q609	3.30K 1/4W(3 5% TA52
		R894	0RN2202F409	22K 1/6W 1% TA52
		R895	0RD1000Q609	100 1/4W(3 5% TA52
		R896	0RD1000Q609	100 1/4W(3 5% TA52
		R902	0RD0912Q609	91 OHM 1/4 W (3.4) 5% TA52
		R903	0RD0752Q609	75 1/4W(3 5% TA52
		R904	0RX3902J609	39K OHM 1 W 5% TA52
		R905	0RX1003K607	100KOHM 2 W 5% TA62
		R906	0RX1003K607	100KOHM 2 W 5% TA62
		R907	0RD1000Q609	100 1/4W(3 5% TA52
		R908	0RN0220H609	0.22 1/2W 5% TA52
		R909	0RD1002Q609	10K 1/4W(3 5% TA52
△		R910	0RN1602H409	16000 OHM 1/2 W 1% TA52
△		R911	0RN6200F409	620 1/6W 1% TA52
		R912	0RD1001Q609	1K 1/4W(3 5% TA52
		R913	0RB0120K607	0.12 OHM 2 W 5% TA62
		R914	0RD1500Q609	150 1/4W(3 5% TA52
		R915	0RD8203Q609	820KOHM 1/4 W (3.4) 5% TA52
		R916	0RD8203Q609	820KOHM 1/4 W (3.4) 5% TA52
		R917	0RD1000Q609	100 1/4W(3 5% TA52
		R918	0RD1003Q609	100K 1/4W(3 5% TA52
		R919	0RD2002Q609	20K 1/4W(3 5% TA52

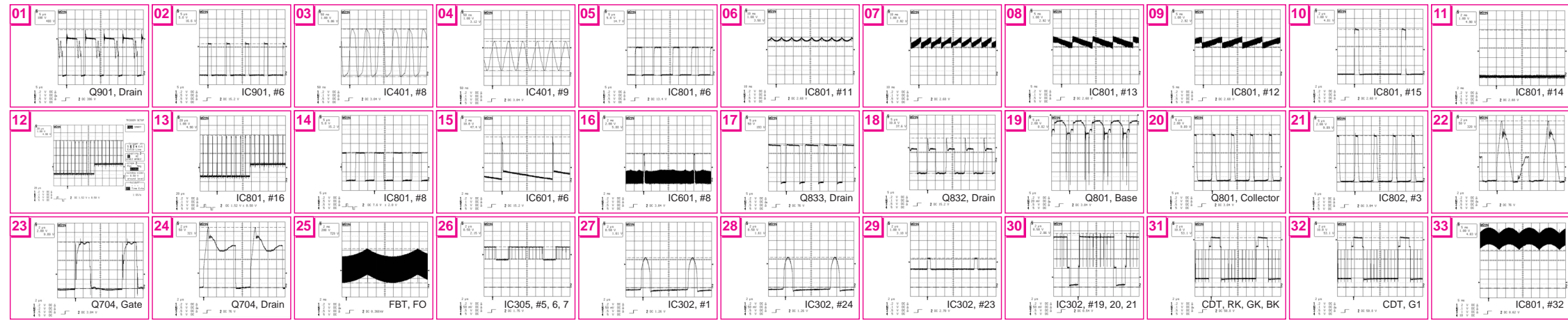
DATE: 2004. 3. 30.				
*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		R920	0RD0432Q609	43 OHM 1/4 W (3.4) 5% TA52
		R921	0RD0332Q609	33 1/4W(3 5% TA52
		R922	0RD5601Q609	5.60K 1/4W(3 5% TA52
		R923	0RD4703Q609	470K 1/4W(3 5% TA52
		R924	0RD0152Q609	15 1/4W(3 5% TA52
		R925	0RD1501Q609	1.50K 1/4W(3 5% TA52
		R926	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R927	0RD1001Q609	1K 1/4W(3 5% TA52
		R929	0RN0220H609	0.22 1/2W 5% TA52
		R930	0RN0220H609	0.22 1/2W 5% TA52
		R931	0RC4703A609	470K OHM 1/2 W(7.0) 5% TA52
		R932	0RC4703A609	470K OHM 1/2 W(7.0) 5% TA52
		R933	0RD0472Q609	47 1/4W(3 5% TA52
		R934	0RD3302Q609	33K 1/4W(3 5% TA52
		R935	0RD3301Q609	3.30K 1/4W(3 5% TA52
		R941	0RD2703Q609	270K 1/4W(3 5% TA52
		R949	0RN0220H609	0.22 1/2W 5% TA52
		R950	0RD1002Q609	10K 1/4W(3 5% TA52
		R951	0RD1101A609	1.1K OHM 1/2 W (7.0) 5% TA52
		R952	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R953	0RD1002Q609	10K 1/4W(3 5% TA52
		R954	0RD4700A609	470 OHM 1/2 W (7.0) 5% TA52
		R955	0RD4701Q609	4.70K 1/4W(3 5% TA52
		R984	0RX3902J609	39K OHM 1 W 5% TA52
		R990	0RD0512Q609	51 1/4W(3 5% TA52
		R991	0RD5101Q609	5.10K 1/4W(3 5% TA52
		R992	0RD5101Q609	5.10K 1/4W(3 5% TA52
OTHERS				
		F1	430-858C	AFC-520 BAE EUN TA
		F2	430-858C	AFC-520 BAE EUN TA
		F901	0FZZTTH001B	"TIME LAG HBC 5A/250V,215 005"
		RL901	6920TBB006A	DY3M-DC12V DONGYANG 250VAC 5
		SC301	6620TBD003A	PCS701E PARK ELEC. 10PIN 14/
		SC901	6200TJB001N	02MD5 DELTA BK F900BJ
		SG301	6918TAT005E	MTAS-201M GIGA AXIAL TAPING
		SG302	6918TAT005E	MTAS-201M GIGA AXIAL TAPING
		SG303	6918TAT005E	MTAS-201M GIGA AXIAL TAPING
		SG304	6918TAT005E	MTAS-201M GIGA AXIAL TAPING
		SG305	165-004A	AG20PT 152F-L3N/S-23 NON HAN
		SG701	165-004A	AG20PT 152F-L3N/S-23 NON HAN
		SW801	140-079C	SLS-1301 SW NON 30 0 HORIZEN
		T701	6174T13010K	"FQM19A013,T910BJ(98K) SAMSUN"
		T801	6140TDZ010A	"- - DUMMY,EER2834,F900BJ 80."
		T802	6170TCZ008C	EI2218 1.48MH FB990G
		T901	6170TMZ150A	EER4045 200UH V-18PIN F700PJ
		TH901	6322B00003A	J502P62D070Q290 JA HWA 7 OHM
		VR801	180-035Q	"EVN-DJAA03B24 (MEC),20KB"
		VR901	180-035A	"EVN-DJAA03B12 (MEC),100B"
		X401	6202TTB003B	HC-49/U HARMONY RADIAL 12MHZ
CONTROL BOARD				
		C201	0CN1040K949	0.1M 50V Z F TA52
		FB201	971-0016	TIN HDC 0.60H
		R201	0RD1001Q609	1K 1/4W(3 5% TA52
		R202	0RD1600Q609	160 1/4W(3 5% TA52
		R203	0RD2200Q609	220 1/4W(3 5% TA52
		R204	0RD2200Q609	220 1/4W(3 5% TA52
		R205	0RD1001Q609	1K 1/4W(3 5% TA52
		R206	0RD1600Q609	160 1/4W(3 5% TA52

DATE: 2004. 3. 30.				
*S	*AL	LOC. NO.	PART NO.	DESCRIPTION / SPECIFICATION
		R207	0RD3300Q609	330 1/4W(3 5% TA52
		R208	0RD3300Q609	330 1/4W(3 5% TA52
		R209	0RD5600Q609	560 1/4W(3 5% TA52
		R210	0RD3600Q609	360 1/4W(3 5% TA52
		R211	0RD5100Q609	510 1/4W(3 5% TA52
		SW201	6600R00001A	JTP1280F6 JEIL 12V DC 1MA VE
		SW202	6600R00001A	JTP1280F6 JEIL 12V DC 1MA VE
		SW203	6600R00001A	JTP1280F6 JEIL 12V DC 1MA VE
		SW204	6600R00001A	JTP1280F6 JEIL 12V DC 1MA VE
		SW205	6600R00001A	JTP1280F6 JEIL 12V DC 1MA VE
		SW206	6600R00001A	JTP1280F6 JEIL 12V DC 1MA VE
		SW250	6600M000020	2216F DAE JIN 30VDC 0.1A 250
USB BOARD				
		C801	0CE1074F638	"100UF SRA,SS 16V M FM5 TP 5"
		C803	0CE1074F638	"100UF SRA,SS 16V M FM5 TP 5"
		C805	0CH6330K416	33PF 50V J NPO 2012 R/TP
		C806	0CE1074F638	"100UF SRA,SS 16V M FM5 TP 5"
		C807	0CE1054K638	"1 UF SRA,SS 50V M FM5 TP 5"
		C808	0DZ510009EE	UDZ S 5.1B TP ROHM-K SOD323
		C809	0CH6330K416	33PF 50V J NPO 2012 R/TP
		C810	0CE1054K638	"1 UF SRA,SS 50V M FM5 TP 5"
		C812	0CH3103K516	10000PF 50V 10% B(Y5P) 2012
		C813	0CK1030K945	0.01UF 50V Z F TR
		C820	0CH6470K416	47PF 50V 5% NPO 2012 R/TP
		C821	0CH6470K416	47PF 50V 5% NPO 2012 R/TP
		C822	0CH6470K416	47PF 50V 5% NPO 2012 R/TP
		C823	0CH6470K416	47PF 50V 5% NPO 2012 R/TP
		C831	0CH6470K416	47PF 50V 5% NPO 2012 R/TP
		C832	0CH6470K416	47PF 50V 5% NPO 2012 R/TP
		C850	0CH3104K946	100000PF 50V Z F 2012 R/TP
		C851	0CH3104K946	100000PF 50V Z F 2012 R/TP
		IC801	0IPH112200C	"ISP1122ABD 32P,LQFP R/TP USB"
		IC802	0IT1204200B	TPS2042ADR TEXAS INSTRUMENT
		L801	125-155P	BFS2550R2FG SAMWHA 2.5*5.0MM
		L802	125-155H	BFS3510A0FG SAMWHA 3.5*10MM
		L803	971-0054	TIN 50MM TAPING
		L804	6210TCE001H	HB-1T2012-301JT CERATEC 2012
		L805	6210TCE001H	HB-1T2012-301JT CERATEC 2012
		L807	6210TCE001H	HB-1T2012-301JT CERATEC 2012
		L808	6210TCE001H	HB-1T2012-301JT CERATEC 2012
		L809	6210TCE001H	HB-1T2012-301JT CERATEC 2012
		L810	6210TCE001H	HB-1T2012-301JT CERATEC 2012
		L812	125-155D	BFS3514A0FG SAMHWA 3.5*14MM
		R801	0RH1502D622	15K 1/10W 5 D.R/TP
		R802	0RH1502D622	15K 1/10W 5 D.R/TP
		R803	0RH1502D622	15K 1/10W 5 D.R/TP
		R804	0RD0222Q609	22 1/4W(3 5% TA52
		R805	0RD0222Q609	22 1/4W(3 5% TA52
		R806	0RD0222Q609	22 1/4W(3 5% TA52
		R807	0RH1502D622	15K 1/10W 5 D.R/TP
		R808	0RH0222D622	22 OHM 1 / 10 W 2012 5.00% D
		R809	0RH1004D622	1.0M 1/10W 5 D.R/TP
		R810	0RH1004D622	1.0M 1/10W 5 D.R/TP
		R811	0RH1003D622	100K 1/10W 5 D.R/TP
		R812	0RH1003D622	100K 1/10W 5 D.R/TP
		R813	0RH1004D622	1.0M 1/10W 5 D.R/TP
		R814	0RH1004D622	1.0M 1/10W 5 D.R/TP
		R817	0RH0222D622	22 OHM 1 / 10 W 2012 5.00% D
		R821	0RH1501D622	1.5K OHM 1 / 10 W 2012 5.00%
		R828	0RH0222D622	22 OHM 1 / 10 W 2012 5.00% D

SCHEMATIC DIAGRAM



THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILTRATION AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.



NOTICE
 Since this is a basic schematic diagram,
 The value of components and some partial connection are
 subject to be changed for improvement without notice.



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