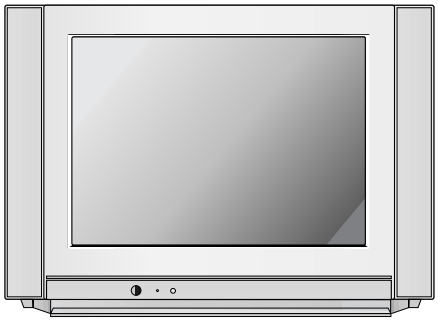
website:http://biz.LGservice.com
e-mail:http://www.LGEservice.com/techsup.html

COLOR TV
SERVICE MANUAL

CHASSIS : MC-019A

MODEL : RT-17FB70V
RT-21FB70RN/RQ/RX/V/VX
RT-21FB700VX

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



CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Replacement Parts List.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **Isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitary that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Due to high vacuum and large surface area of picture tube, extreme care should be used in **handling the Picture Tube**. Do not lift the Picture tube by it's Neck.

X-RAY Radiation

Warning:

The source of X-RAY RADIATION in this TV receiver is the High Voltage Section and the Picture Tube.
For continued X-RAY RADIATION protection, the replacement tube must be the same type tube as specified in the Replacement Parts List.

To determine the presence of high voltage, use an accurate high impedance HV meter.

Adjust brightness, color, contrast controls to minimum.
Measure the high voltage.
The meter reading should indicate
23.5 ¡ 1.5KV: 14-19 inch, 26 ¡ 1.5KV: 19-21 inch,
29.0 ¡ 1.5KV: 25-29 inch, 30.0 ¡ 1.5KV: 32 inch
If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.

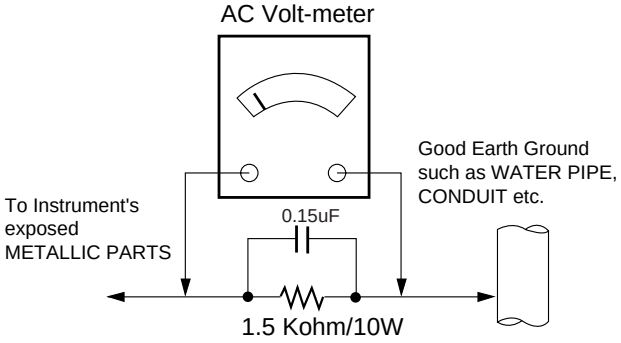
Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on positioin, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.
Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each esposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits sepcified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

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 nonabrasive 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 heatsink 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 fieldeffect transistors and semicounductor "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 electostatic 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 sufficent to demage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a repalcement 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 ieads 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 bruching 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 maintan tip temperature within the range or 500 ¡ÆF to 600 ¡ÆF.
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. Thorohly clean the surfaces to be soldered. Use a mall wirebristle (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 ¡ÆF to 600 ¡ÆF)
   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 circuiboard printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 ¡ÆF to 600 ¡ÆF)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.

c. Qulckly 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 parapraphs 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 boare.
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 heatsink 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 heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicula 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 involoves 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.

SPECIFICATIONS

Note : Specification and others are subject to change without notice for improvement.

- **Video input system:**
  PAL-B/G, D/K, I/I
  SECAM-B/G, D/K,L/L'
  NTSC M
  NTSC 4.43

- **Intermediate Frequency (Unit : MHz)**
  VISION IF : 38.9MHz
  COLOR IF : 34.47MHz(4.43)
  35.32MHz(3.58) : NTSC-M
  (VIF-4.25000MHz
  VIF-4.40625MHz): SECAM

  SOUND IF : 33.4MHz (B/G)
  32.9MHz (I/I)
  32.4MHz (D/K)
  34.4MHz (M)

- **Power requirement :** 110~240V, 50/60Hz
- **Power consumption :** 95
- **STAND-BY :** 3W

- **Tuning range**

Band	For TV				For CATV
	B/G	D/K	I/I	NTSC	
VHF-Low	Ch2-4	Ch1-5		Ch2-13	S1'-S3', S1
VHF-High	Ch5-12	Ch6-12	Ch4-13		S2-S10, S11-S20
Hyper					S21-S41
UHF	Ch21-69			Ch14-69	

- **Tuning system :**
  FVS
  100 Programme memory
  200 Programme memory(W/O TXT)

- **Antenna input impedance :** VHF/UHF 75 ohm, unbalanced

- **OSD (On Screen Display) :** EASY-MENU

- **Voice coil impedance :** 8 ohm

- **Sound output :** 7W ¡ ¿2(MAX)
  Dual/Stereo : A2/NICAM(Option)

- **External connection :** Head Phone Jack
  A/V in : 2
  PERI Connector(Full Scart) : 1
  DVD in

- **External In/Output**
  Audio-In:0.5Vrms±3dB,over 10Kohm
  Audio-Out:0.5Vrms±3dBb,below 1Kohm
  Video-In/Out:1Vp-p±3dB,75ohm
  DVD In Y: 1Vp-p±3dB
  Pb,Pr : 0.7Vp-p±3dB

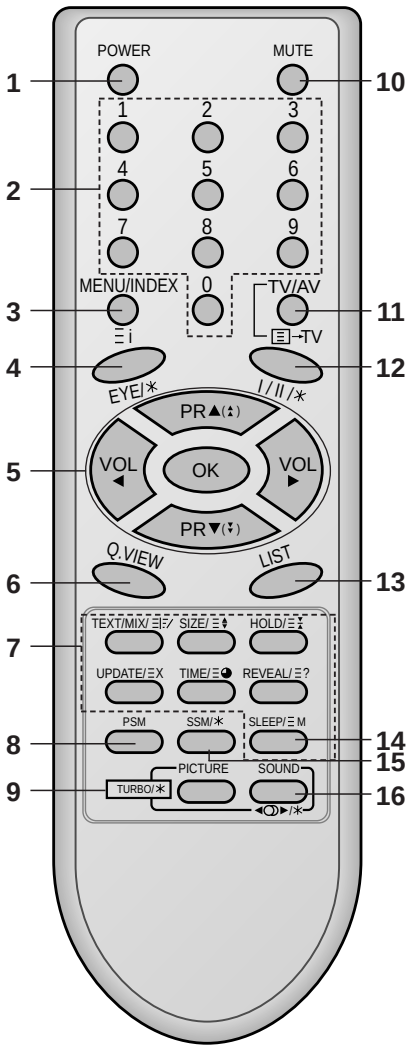
- **Feature :** Auto programme/Manual programme
  CSM (Color Status Memory)
  Auto Sleep
  Turbo Picture & Sound
  Programme Editing
  PSM (Picture Status Memory)
  Teletext (TOP/FLOF/LIST)
  ACMS
  Auto Volume Level
  Game
  SSM(Sound Status Memory)
  Favorite Program

DECRIPTION OF CONTROLS

All the functions can be controlled with the remote control handset. Some functions can also be adjusted with the buttons on the front panel of the set.

Remote control handset

Before you use the remote control handset, please install the batteries. See the next page.



(With TELETEXT)

1. **POWER**
   switches the set on from standby or off to standby.

2. **NUMBER BUTTONS**
   switches the set on from standby or directly select a number.

3. **MENU (or INDEX)**
   selects a menu.
   selects an index page in the teletext mode (only TELETEXT models).

4. **EYE/✱ (option)**
   switches the eye function on or off.

5. **▲ / ▼ (Programme Up/Down)**
   selects a programme or a menu item.
   switches the set on from standby.
   scans programmes automatically.
   ◄ / ► (Volume Up/Down)
   adjusts the volume.
   adjusts menu settings.
   OK
   accepts your selection or displays the current mode.

6. **Q.VIEW**
   returns to the previously viewed programme.
   selects a favorite programme.

7. **TELETEXT BUTTONS (option)**
   These buttons are used for teletext.
   For further details, see the ‘Teletext’ section.

8. **PSM (Picture Status Memory)**
   recalls your preferred picture setting.

9. **TURBO PICTURE / SOUND BUTTON (option)**
   selects Turbo picture and sound.

10. MUTE
switches the sound on or off.

11. TV/AV
selects TV or AV mode.
clears the menu from the screen.
switches the set on from standby.

12. I/II/✱ (option)
selects the language during dual language broadcast. (option)
selects the sound output.

13. LIST
displays the programme table.

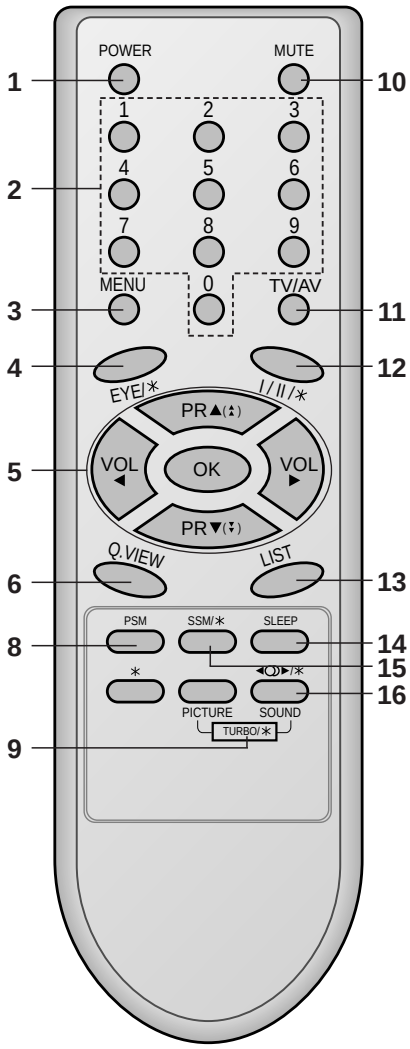
14. SLEEP
sets the sleep timer.

15. SSM/✱ (option) (Sound Status Memory)
recalls your preferred sound setting.

16. SURROUND (◀◯▶/✱) (option)
selects surround sound.

✱ : No function

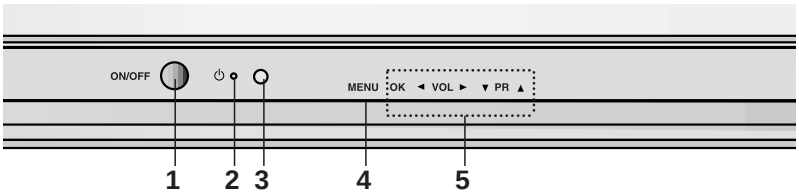
COLOURED BUTTONS : These buttons are used for teletext (only TELETEXT models) or programme edit.

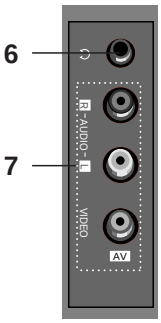


(Without TELETEXT)

Front panel

RF/RT-21FB70 series





Side panel

1. **MAIN POWER (ON/OFF)**
   switches the set on or off.

2. **POWER/STANDBY INDICATOR**
   illuminates brightly when the set is in standby mode.
   dims when the set is switched on.
   blinks when signal is input from the remote control.

3. **REMOTE CONTROL SENSOR**

4. **MENU**
   selects a menu.

5. **OK**
   accepts your selection or displays the current mode.
   ◄ / ► (Volume Up/Down)
   adjusts the volume.
   adjusts menu settings.
   ▲ / ▼ (Programme Up/Down)
   selects a programme or a menu item.
   switches the set on from standby.

6. **AUDIO - L/R (or AUDIO) / VIDEO IN SOCKETS (AV) (option)**
   Connect the audio/video out sockets of external equipment to these sockets.
   Note :*If both the input jacks on the front/side panel and back panel have been connected to external equipments simultaneously, only the input jacks on the front/side panel can be received.*

7 **HEADPHONE SOCKET**
   Connect the headphone plug to this socket.

Note : *Shown is a simplified representation of front or side panel. Here shown may be somewhat different from your set.*

ADJUSTMENT

● Safety Precautions

1. It is safe to adjust after using insulating transformer between the power supply line and chassis input to prevent the risk of electric shock and protect the instrument.
2. Never disconnect leads while the TV receiver is on.
3. Don't short any portion of circuits while power is on.
4. The adjustment must be done by the correct appliances. But this is changeable in view of productivity.
5. Unless otherwise noted, set the line voltage to 110~240Vac ±10%, 50/60Hz.
6. The adjustment of TV should be performed afther warming up for 20 minutes.

● Test Equipment required

1. Multimeter (volt meter)
2. Oscilloscope
3. 10:1 PROBE
4. Color Analyzer

● CDL Data Adjustment(LINE SVC-0)

1) Press the SVC button to get into the SVC-0 Mode.
2) Press the Channel UP/DOWN button to select CDL12.
3) Press the Volume UP/DOWN button until the CDL data is the same as the Table below.

	21" FCD	14,16" CPT	15" CPT	20,21" CPT
CDL Data	**12**	**8**	**10**	**12**
Remark	**FLAT**		**FLAT**	

4) Press the OK(■) button to memorize the data.

● OPTION Data Adjustment(OPTION-1,OPTION-2)

1) Press OK buttons on both TV set and Remote Controller at the same time to get into SVC mode.
2) Press the Yellow button several times to find OPTION-1 or OPTION-2.
3) Input the correspond OPTION data referring to Table below with the numeric buttons.
4) Press the OK(■) button to memorize the data.

Table 1. OPTION 1 Function

Option	Code	Function	Remark
C MUTE	0	ACTIVE	
	1	NOT ACTIVE	
DVD	0	W/O DVD	
	1	DVD(REAR JACK)	
2 IN 1	0	W/O 2 IN 1TUNER	
	1	WITH 2 IN 1TUNER	
TOP	0	FLOF TXT	
	1	TOP TXT	
SCART	0	PHONO JACK	
	1	SCART JACK	
TBS	0	W/O TBS	
	1	WITH TBS	
EYE	0	W/O EYE	
	1	WITH EYE	
4 KEY	0	W/O 4 KEY	
	1	WITH 4 KEY	
MONO	0		
	1	FORCED MONO	

Table 2. OPTION 2 Function

Option	Code	Function	Remark
BCF	0	Auto Abnormal ON	
	1	Not Used	
GAME	0	W/O GAME PACK	
	1	WITH GAME PACK	
200 PRO	0	100 PRO	
	1	200 PRO	
CHA + AU	0	Except China,Austrailia	
	1	China,Austrailia	
DUAL	0	W/O DUAL	
	1	WITH DUAL	
ACMS	0	Austrailia	
	1	Except Austrailia	
T-SCH	0	W/O TURBO SEARCH	
	1	WITH TURBO SEARCH	
T-P/S	0	W/O TURBO P/S	
	1	WITH TURBO P/S	
CURVE	0	NORMAL VOLUME CURVE	
	1	M-A,India VOLUME CURVE	

Table 3. OPTION 3 Function

Option	Code	Function	Remark
RESERVED	0	* * *	
	1	* * *	
HOTEL	0	W/O HOTEL	
	1	W/HOTEL	
SYSTEM	0	BG/L	
	1	BG/I/DK	
	2	BG/I/DK/M	
	3	BG/I/DK DUAL	
	4	BG/I/DK/M DUAL	
	5	2nd IF BG	
	6	2nd IF I	
	7	2nd IF DK	

Option	Code	Function	Remark
OSD-L (EU)	0	ENG. ONLY	English
	1	EU-7EA	English,Deutsch,Francais,Italiano,Espanol
	2	EU ALL	English,Nederlands,Svenska,Dansk,Suomi,Por
			tugues,Romaneste,Polski,Cesky,Pyccknn
	3	EU EAST	English,Romaneste,Polski,Cesky,Pyccknn,Magyar
OSD-L (M-ASIA)	0	ENG. ONLY	English
	1	ARABIC	English,Arab,,Urdu,French
	2	PARSI	English,Parsi,Urdu,French
	3	ARAB,FARSI,URDE	English,French,Arab,Urdu,Parsi
OSD-L (E-ASIA)	0	ENG.ONLY	English
	1	ASIA-ALL	English,Malay,Vietnam,Indonesian,Thai
OSD-L (CH+HI)	0	ENG.ONLY	English
	1	E+CHINA	English,Chinese
	2	E+HINDI	English,Hindi
TXT-L (EU)	0	W-EU	
	1	E-EU	
	2	CYRILLIC	
	3	UKRAINIAN	
TXT-L (E-ASIA)	0	WEST-EU	
TXT-L (ARAB)	0	WEST-EU	
	1	ARABIC	
TXT-L (FARSI)	0	WEST-EU	
	1	FARSI	

● AGC Adjustment (SERVICE 1)

Test Point	**: AGC TP (C101)**
Adjust	**: Remote Controller**

1) Connect RF signal (70dB±0.2dB) and turn on the TV.
¡ Standard adjustment Channel
- EU 05 Ch. (f_{rf} = 175.25MHz)
2) Press the OK buttons on TV set and Remote Controller at the same time to get into SVC-0 mode.
3) Press the Channel UP/DOWN button on the Remote Controller several times to find AGC??.
4) Press the Volume UP/DOWN button until the AGC Voltage is the same as the Table below.
5) Press the OK(■) button to memorize the data.

Tuner P/N	6700VPF009G	6700VPF016A
Marker	LG Innotek(W/S TUNER)	DAEWOO(W/S TUNER)
AGC Voltage	2.7± 0.05V	2.7± 0.05V

Tuner P/N	6700VPF009S	
Marker	LG Innotek(TBS TUNER)	
AGC Voltage	2.5± 0.05V	

● FOCUS Adjustment

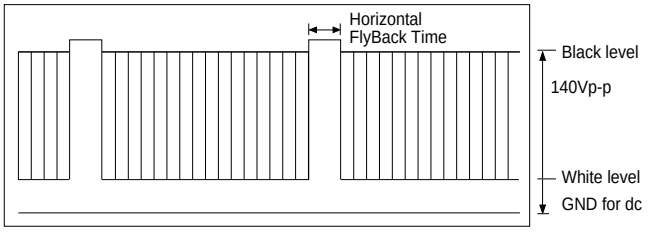
Test Point	**: RK (Red Cathode of CPT Board)**
Adjust	**: Screen Volume of FBT**

1) Tune the TV set to receive a PAL 05CH.
2) Adjust the Focus Volume of FBT for best focus.

● Screen Voltage Adjustment

Test Point	**: Observing Display**
Adjust	**: Focus Volume of FBT**

1) Connect the probe of oscilloscope to the RK (Red Cathode) of CPT Board.
2) Set the oscilloscope to 50V/div and 20Us/div and after putting GND line upon the lowest grid line of the scope by pressing GND button,enter into DC mode.
3) Tune the TV set to receive a PAL-B/G 05CH.
4) Adjust Screen Volume of FBT so that the waveform is the same as below figure (DC 140±3V).



14”	OTHERS
DC 130V±3 V	DC 140V±3 V

● White Balance Adjustment.(LINE SVC-0)

NOTE : This adjustment should be performed after screen voltage adjustment.

1) Tune the TV set to receive an 100% white pattern.
2) Press OK(■) buttons on TV set and remote controller at the same time to get into SVC mode.
3) Press Yellow button on remote controller. (Standard mode)
4) Press Channel UP/DOWN button for desirous function adjustment.
5) Adjust VOL+ or VOL-button in each status of "RG--"/"BG--" for X=272±8, Y=288±8 with color analyzer.(Europe Model**:** X=288±8, Y=295±X=272±8, 11,000K)

Status	Initial Data	Remark
RG	31	
GG	31	
BG	31	
BLO-R	31	
BLO-G	31	

7) Press the OK(■) button to memorize the data.

● Deflection Data Adjustment (Line SVC-1)

NOTE: To enter SVC mode, press "OK" buttons on both TV set and the Remote control at the same time.

1. Preparation for Deflection Adjustment

1) At SVC mode, press the Yellow colored button.
   And then, deflection data adjustment OSD (SVC1 mode) will be displayed.
2) Tune the TV set to receive a PAL 05 CH and set the ARC mode is standard.

2. Deflection Initial Setup Data

Status	Default	21" FLAT S/S	21" FLAT LG
VL	31	31	31
VA	31	31	31
VS	31	31	31
HS	31	31	31
SC	25	25	25

3. Deflection Adjustment Procedure

VL (Vertical Linearity)
Adjust so that the boundary line between upper and lower half is in accord with geometric horizontal center of the CPT.

VA (Vertical Amplitude)
Adjust so that the circle of a digital circle pattern may be located within the effective screen of the CPT.

SC (Vertical "S" Correction)
Adjust so that all distance between each horizontal lines are to be the same.

VS (Vertical Shift)
Adjust so that the horizontal center line of a digital circle pattern is in accord with geometric horizontal center of the CPT.

HS (Horizontal Shift)
Adjust so that the vertical center line of a digital circle pattern is in accord with geometric vertical center of the CPT.

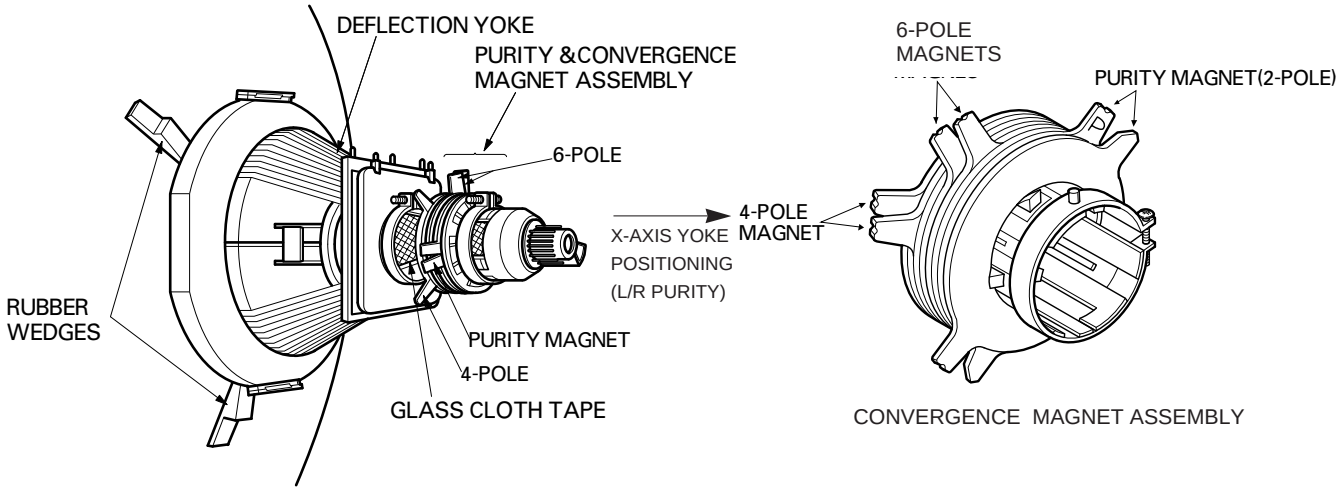
Press the OK(■) button to memorize the data.

PURITY & CONVERGENCE ADJUSTMENT

Caution:
Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments.
However, the effects of adjacent receiver components, or replacement of picture tube or deflection yoke may require the need to readjust purity any convergence.

5. Reconnect the internal degaussing coil.

6. Position the beam bender locking rings at the 9 o'clock position and the other three pairs of tabs (2,4 and 6 pole magnets) at the 12 o'clock position.



¡ Purity Adjustment

This procedure DOES NOT apply to bonded yoke and picture tube assemblies.
The instrument should be at room temperature (60 degrees F or above) for six (6) hours and be operating at low beam current (dark background) for approximately 20 to 30 minutes before performing purity adjustments.

CAUTION: Do not remove any trim magnets that may be attached to the bell of the picture tube.

1. Remove the AC power and disconnect the internal degaussing coil.

2. Remove the yoke from the neck of the picture tube.

3. If the yoke has the tape version beam bender, remove it and replace it with a adjustable type beam bender (follow the instructions provided with the new beam bender)

4. Replace the yoke on the picture tube neck, temporarily remove the three (3) rubber wedges from the bell of the picture tube and then slide the yoke completely forward.

7. Perform the following steps, in the order given, to prepare the receiver for the purity adjustment procedure.

   a. Face the receiver in the "magnetic north" direction.

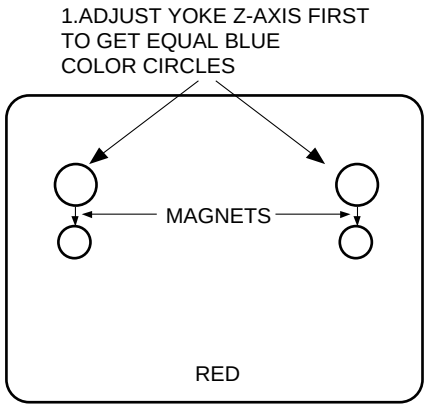
   b. Externally degauss the receiver screen with the television power turned off.

   c. Turn the television on for approximately 10 seconds to perform internal degaussing and then turn the TV off.

   d. Unplug the internal degaussing coil. This allows the thermistor to cool down while you are performing the purity adjustment. DO NOT MOVE THE RECEIVER FROM ITS "MAGNETIC NORTH" POSITION.

   e. Turn the receiver on and obtain a red raster by increasing the red bias control (CW) and decreasing the bias controls for the remaining two colors (CCW).

   f. Attach two round magnets on the picture tube screen at 3 o'clock and 9 o'clock positions, approximately one (1) inch from the edge of the mask (use double-sided tape).



8. Referring to above, perform the following two steps:
   a. Adjust the yoke Z-axis to obtain equal blue circles.
   b. Adjust the appropriate beam bender tabs to obtain correct purity (four equal circles).

9. After correct purity is set, tighten the yoke clamp screw and remove the two screen magnets.

10. Remove the AC power and rotate the receiver 180 degrees (facing "magnetic south").

11. Reconnect the internal degaussing coil.

12. Turn the receiver on for 10 seconds (make sure the receiver came on) to perform internal degaussing, and then turn the receiver off.

13. Unplug the internal degaussing coil.

14. Turn on the receiver and check the purity by holding one (1) round magnet at the 3 o'clock and a second round magnet at 9 o'clock position. If purity is not satisfactory, repeat steps 8 through 14.

15. Turn off the receiver and reconnect the internal degaussing coil.

¡ Convergence Adjustment

Caution: This procedure DOES NOT apply to bonded yoke and picture tube assemblies.
Do not use screen magnets during this adjustment procedure. Use of screen magnets will cause an incorrect display.

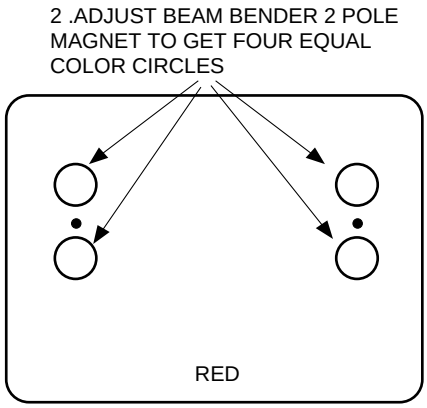
1. Remove AC power and disconnect the internal degaussing coil.

2. Apply AC Power and set the brightness to the Picture Reset condition. Set the Color control to minimum.

3. Make a horizontal line.

4. Adjust the Red, Green and Blue Bias controls to get a dim white line.

5. Restore the screen by removing the horizontal line.



6. Reconnect the internal degaussing coil and apply AC power.

7. Turn the receiver on for 10 seconds to perform internal degaussing and then turn the receiver off again.

8. Unplug the internal degaussing-coil.

9. Turn on the receiver, connect a signal generator to the VHF antenna terminal and apply a crosshatch signal.

Caution: During the convergence adjustment procedure, be very careful not to disturb the purity adjustment tabs are accidentally move, purity should be confirmed before proceeding with the convergence adjustments.

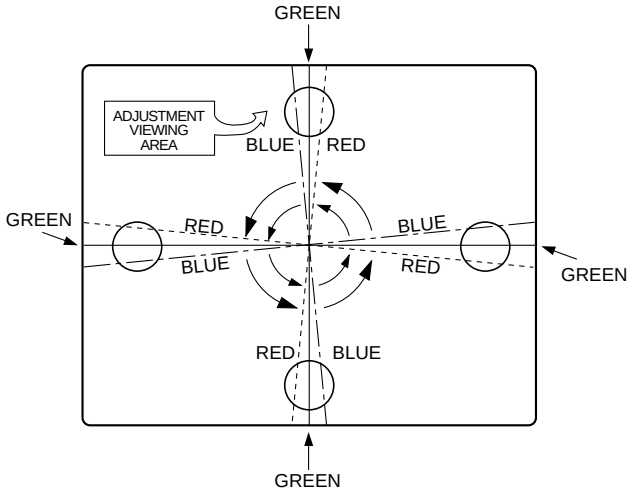
Note: Make sure the focus is set correctly on this instrument before proceeding with the following adjustment.

10. Converge the red and blue vertical lines to the green vertical line at the center of the screen by performing the following steps (below TABLE).
    a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in opposite directions from the 12 o'clock position to converge the red and blue vertical lines.
    b. Carefully rotate both tabs of the 6-pole ring magnet simultaneously in opposite directions form the 12 o'clock position to converge the red and blue (now purple) vertical lines with the green vertical line.

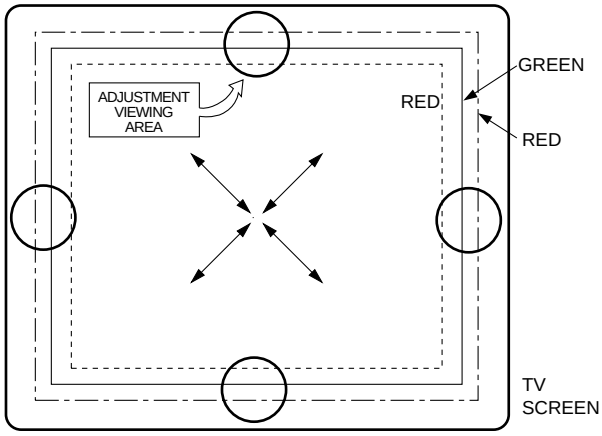
11. Converge the red and blue horizontal with the green line at the center of the screen by performing the following steps. (below TABLE)
    a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in the same direction (keep the spacing between the two tabs the same) to converge the red and blue horizontal lines.
    b. Carefully rotate both tabs of the 6-pole ring magnet simultaneously in same direction (keep the spacing between the two tabs the same) to converge the red and blue (now purple) horizontal lines with the green horizontal line.
    c. Secure the tabs previsouly adjusted by locking them in place with the locking tabs on the beam bender.

RING PAIRS	ROTATION DIRECTION OF BOTH TABS	MOVEMENT OF RED AND BLUE BEAMS
4 POLE	OPPOSITE	B R OR B R
	SAME	B R OR B R
6 POLE	OPPOSITE	B R OR B R
	SAME	B R OR B R

UP/DOWN ROCKING OF THE YOKE CAUSES OPPOSITE ROTATION OF RED AND BLUE RASTERS

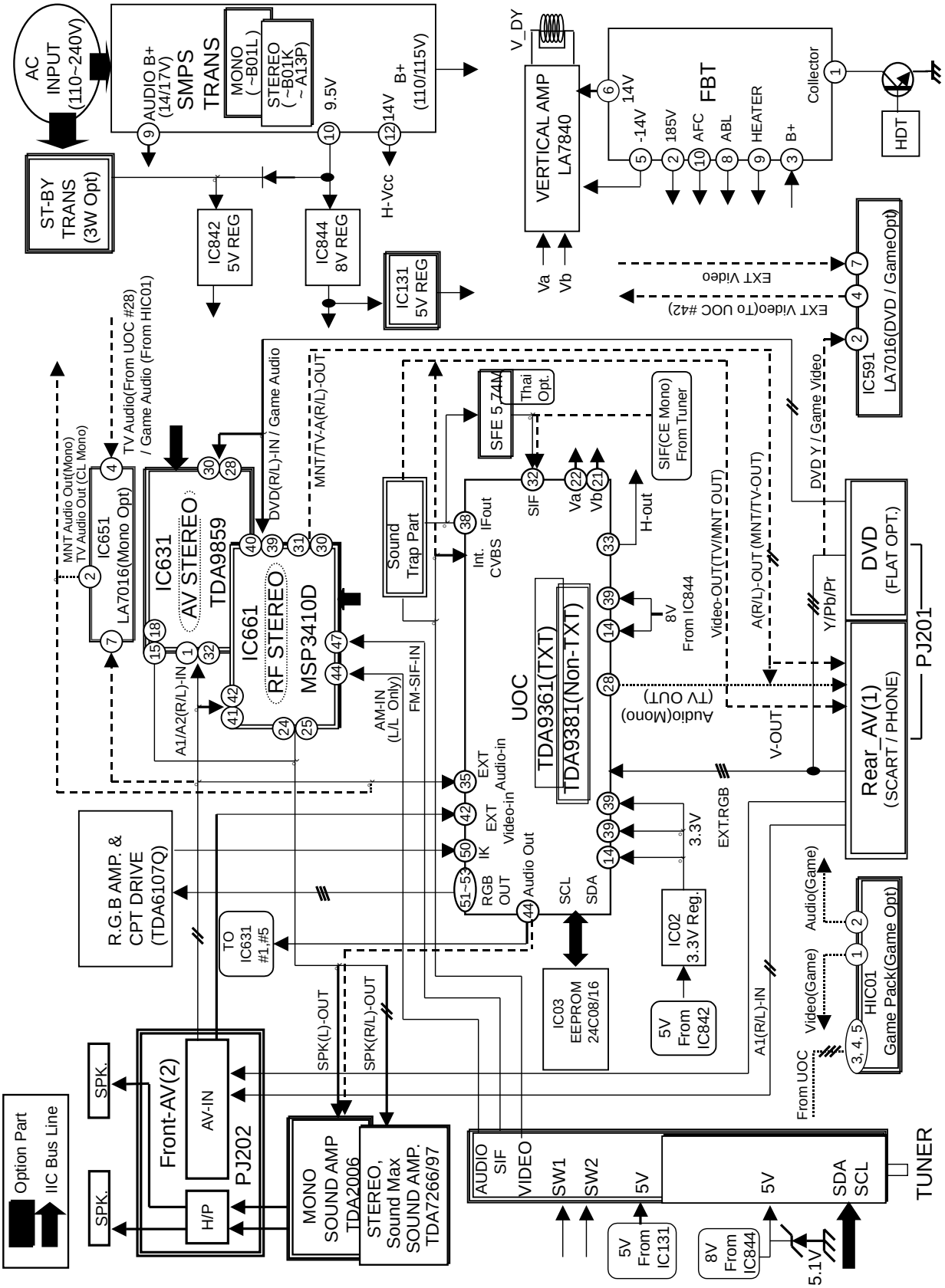


LEFT/RIGHT ROCKING OF THE YOKE CAUSES OPPOSITE SIZE CHANGE OF THE RED AND BLUE RASTERS



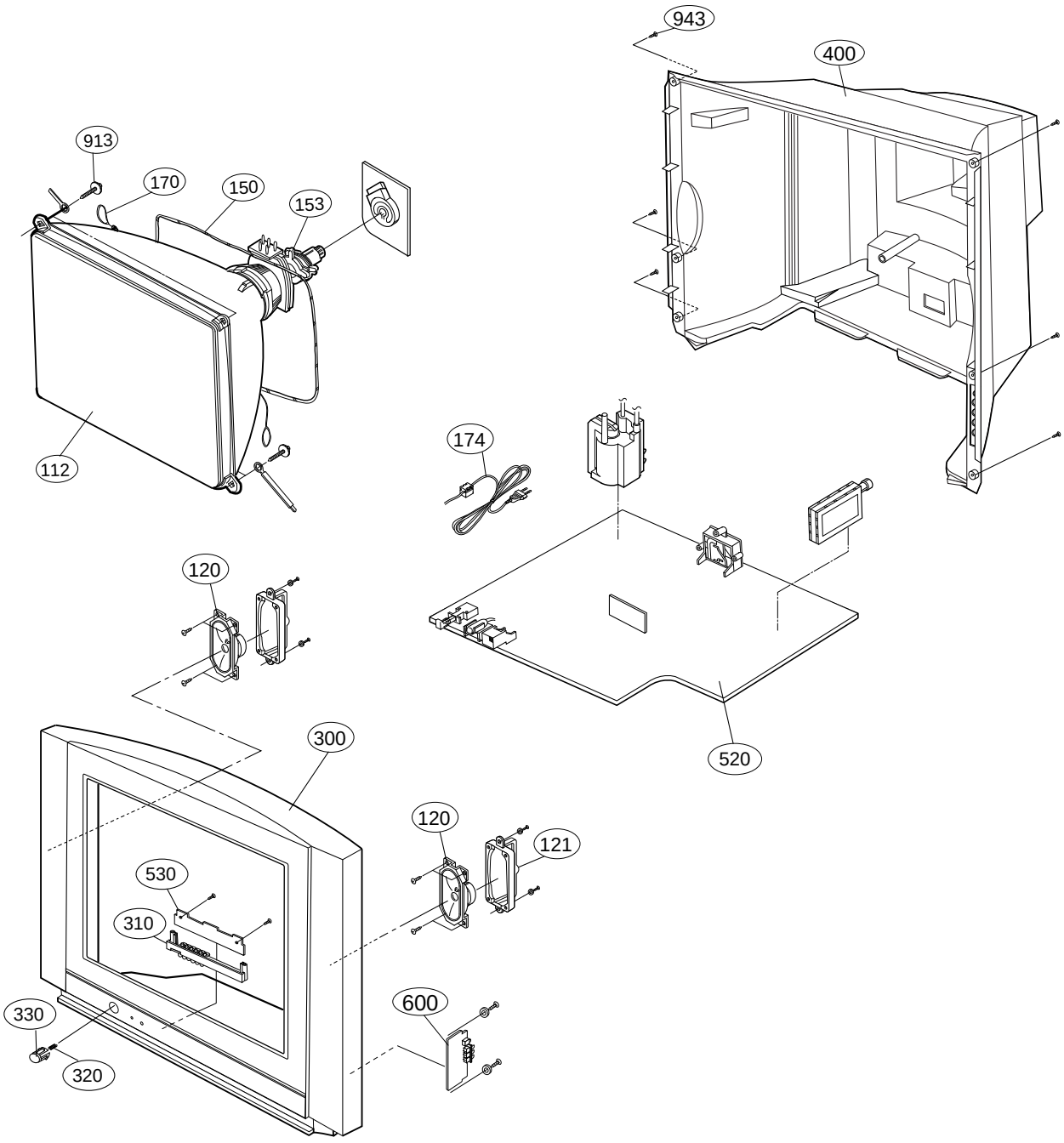
12. While watching the 6 o'clock positions on the screen, rock the front of the yoke in a vertical (up/down) direction to converge the red and blue vertical lines. (Fig upper left)
13. Temporarily place a rubber wedge at the 12 o'clock position to hold the vertical position or the yoke.
14. Check the 3 o'clock and 9 o'clock areas to confirm that the red and blue horizontal lines are converged.
    If the lines are not converged, slightly offset the vertical tilt of the yoke (move the rubber wedge if necessary) to equally balance the convergence error of the horizontal lines at 3 o'clock and 9 o'clock and the vertical lines at 6 o'clock and 12 o'clock.
15. Place a 1.5 inch piece of glass tape over the rubber foot at the rear of the 12 o'clock wedge.
16. While watching the 6 o'clock and 12 o'clock areas of the screen, rock the front of the yoke in the horizontal (left to right) motion to converge the red and blue horizontal lines. (Fig. upper right)
17. Temporarily place a rubber wedge at the 5 o'clock and 7 o'clock positions to hold the horizontal position of the yoke.
18. Check the 3 o'clock and 9 o'clock areas to confirm that the red and blue vertical lines are converged. If the lines are not converged, slightly offset the horizontal tilt of the yoke (move the temporary rubber wedges if necessary) to equally balance the convergence error of the horizontal lines at 6 o'clock and 12 o'clock and the vertical lines at 3 o'clock and 9 o'clock.
19. Using a round magnet confirm purity at the center, right and left sides and corners. See Purity Adjustment Procedure.
20. Reconfirm convergence and apply a 1.5 inch piece of glass tape over the rubber foot at the rear of the 5 o'clock and the 7 o'clock wedges.

BLOCK DIAGRAM



MEMO

EXPLODED VIEW



EXPLODED VIEW PARTS LIST

The components identified by mark ⚠ is critical for safety.
Replace only with part number specified.

LOCA. NO	PARTS No.		DESCRIPTIONS
	17"	21"	
⚠ 112	6334V17001A	6334V21004B	CPT
	-	2426GDB30CA	CPT SET, A51QDJ279X(PB) 00Q7NP FREE,BARE
120	120-C77M	120-C77M	SPEAKER,FULLRANGE ESTEC 8 OHM 10/15W 130DB 57*117MM
121	-	4810V00088B	BRACKET,SPEAKER CE-29K30 NON PP NONE
	4810V00906A	4810V00906A	BRACKET,SPEAKER RT-21FB7 LGEVN EXPORT MC019A ABS, HF-380 NON
⚠ 150	150-D02Q	150-D02X	COIL,DEGAUSSING
	-	150-D02N	COIL,DEGAUSSING CU 21" 60T 12 OHM
⚠ 153	6150V-1014K	6150V-1014H	DY(DEFLECTION YOKE)
	-	6150Z-1223A	DY(DEFLECTION YOKE),DC21SPFL3 21"FCD PIN FREE
⚠ 170	170-A01B	170-A01N	CPT EARTH
⚠ 174	174-009E	6410VEH001B	POWER CORD
	-	6410VEH001J	POWER CORD,EL-207 VDE/SEMKO 2100MM HOUSING L1=200 BLACK
300	3091V00601C	3091V00555B	CABINET ASSEMBLY
	-	3091V00557C	CABINET ASSEMBLY,RT-21FB70V(SY-SET) NON MC019A MIDDLE EAST
	-	3091V00622E	CABINET ASSEMBLY,RT-21FB70VX VN-MT STEREO MC019A VN-LOCAL
310	-	5020V00838A	BUTTON,CONTROL RT-21FB70 ABS, HF-380 6KEY
	5020V00849A	5020V00849A	BUTTON,CONTROL RT-21FB70 ABS, HF-380 6KEY LGEVN EXPORT
	-	5020V00896A	BUTTON,CONTROL RT-21FB70 ABS, HF-380 6KEY LGESY-LOCAL
320	320-062H	320-062E	SPRING,
	-	320-070H	SPRING,COIL
330	-	5020V00839A	BUTTON,POWER RT-21FB70 ABS, HF-380 1KEY
	5020V00848A	5020V00848A	BUTTON,POWER RT-21FB70 ABS, HF-380 1KEY LGEVN EXPORT
	-	5020V00897A	BUTTON,POWER RT-21FB70 ABS, HF-380 1KEY LGESY-LOCAL
400	3809V00416C	3809V00388B	BACK COVER ASSEMBLY
	-	3809V00389C	BACK COVER ASSEMBLY,RT-21FB70V(SY-SET) DVD(1PHONE)
	-	3809V00426E	BACK COVER ASSEMBLY,RT-21FB70VX VN-MT DVD(1PHONE) VN-LOCAL
520	6871VMMQ64X	6871VMMQ65Y	PWB(PCB) ASSEMBLY,MAIN MC019A
	-	6871VMM860N	PWB(PCB) ASSEMBLY,MAIN MC019A RT-21FB70VX.LTSLTM7
	-	6871VMMS87U	PWB(PCB) ASSEMBLY,MAIN MC019A RT-21FB70VX.LMLLSD8
530	6871VSM986Z	6871VSM986V	PWB(PCB) ASSEMBLY,SUB CONT MC019A
	-	6871VSM988D	PWB(PCB) ASSEMBLY,SUB CONT MC019A 21FB70,LGEMT7
	-	6871VSME76E	PWB(PCB) ASSEMBLY,SUB CTL MC019A 21FB70(SY-SKD MID EST)
600	6871VSM997M	6871VSM986U	PWB(PCB) ASSEMBLY,SUB A/V MC019A SIDE
	-	6871VSM988C	PWB(PCB) ASSEMBLY,SUB A/V MC019A SIDE,21FB70,LGEMT7
913	332-057A	332-057B	SCREW,DRAWING ASSY,HEXAGON
943	1PTF0403116	1PTF0403116	SCREW,TAP TITE(P)[TRUSS HEAD]

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

REPLACEMENT PARTS LIST

LOCA. NO	PART NO	DESCRIPTION
		IC
HIC01	0IZZVC0049A	IC, GEONAS 15 - GAME MODULE .
IC01	0ICTMPH006C	IC, 64P ST MC019A EURO/CIS TXT
IC02	0IMCRAU001A	IC, 3P ST 3.3V VOLTAGE REGULATOR
IC03	0IAL241610B	IC, AT24C16A-10PI-2.7 8PIN DIP ST EEPROM
IC130	0IMCRSG004A	IC, L7805CV SGS-THOMSON 3PIN TO220 ST
IC301	0ISA784070A	IC, LA7840 7S VERTICAL - - - -
IC591	0ISA701600A	IC, LA7016 8S ANALOG S/W - - - -
IC602	0ISG729700A	IC, TDA7297 15P,SIP BK 2CH 15W DUAL AMP
IC603	0IMCRAU002A	IC, S7142M AUK KOREA 3P TO-92M TP 4.2V
IC661	0IMCRMN011C	IC, MSP3410G PO B8 V3 MICRONAS 52P DIP
IC662	0IFA753307A	IC, KA75330ZTA(KA7533ZTA) 3P,TO-92 TP 3.3V
⚠ IC801	0ILI817000G	IC, LTV817M-VB 4P,DIP BK PHOTO COUPLER
⚠ IC802	0ILI817000G	IC, LTV817M-VB 4P,DIP BK PHOTO COUPLER
⚠ IC803	0ISK665413C	IC, STR-F6654R(LF1352) 5 SIP BK STR MC00AA
⚠ IC804	0ISK110000A	IC, SE110N(LF12) 3P 110V ERROR AMP - - - -
IC842	0IKE780500Q	IC, KIA7805API 3P TO-220 ST REGULATOR 5V
IC844	0IMCRKE001A	IC, KIA78R08PI KEC 4PIN,TO220IS-4 ST 1A
IC901	0IPH610700B	IC, TDA6107JF/N3 9P ST RGB AMP
		TRANSISTOR
Q301	0TR198009BA	TR, 2SA1980Y TP AUK - -
Q402	0TRSA10002A	TR, TT2140 SANYO ST TO220F 1500V 6A
Q442	0TR233109AA	TR, KSC2331-Y TP SAMSUNG TO-92L
Q551	0TR198009BA	TR, 2SA1980Y TP AUK - -
Q552	0TR198009BA	TR, 2SA1980Y TP AUK - -
Q571	0TR198009BA	TR, 2SA1980Y TP AUK - -
Q621	0TR534309AA	TR, 2SC5343Y TP AUK - -
Q671	0TR198009BA	TR, 2SA1980Y TP AUK - -
Q672	0TR198009BA	TR, 2SA1980Y TP AUK - -
Q801	0TR102009AB	TR, KRC102M(KRC1202) KEC TP NA NA NA
Q802	0TR102009AB	TR, KRC102M(KRC1202) KEC TP NA NA NA
Q806	0TR102009AB	TR, KRC102M(KRC1202) KEC TP NA NA NA
		DIODE
D301	0DR140059AC	DIODE, 1N4005GP TP DO41 600V 1.0A - - -
D401	0DR150009EA	DIODE, DO15 600V 1.5A 50A 250NSEC 5UA
D441	0DR060009AA	DIODE, TVR06J TP DO41 600V 0.6A - - -
D442	0DR060009AA	DIODE, TVR06J TP DO41 600V 0.6A - - -
D443	0DR060009AA	DIODE, TVR06J TP DO41 600V 0.6A - - -
D501	0DS141489AB	DIODE, 1N4148 TP GRANDE - 20V - - - -
D571	0DS141489AB	DIODE, 1N4148 TP GRANDE - 20V - - - -
D802	0DR100009FA	DIODE, DO41 200V 1.0A 30A 50NSEC 10UA
D803	0DS141489AB	DIODE, 1N4148 TP GRANDE - 20V - - - -
D806	0DR100009FA	DIODE, DO41 200V 1.0A 30A 50NSEC 10UA
D807	0DD300009AC	DIODE, RU3AMV(1) TP SANKEN
D808	0DR060009AA	DIODE, TVR06J TP DO41 600V 0.6A - - -
D813	0DD060009AC	DIODE, TVR06J TP - 600V - - 250NSEC -
D815	0DD420000BB	DIODE, D4L20U SHINDENGEN
D824	0DD420000BB	DIODE, D4L20U SHINDENGEN
D901	0DR210009AC	DIODE, TP DO35 200V 0.2A 1A 50SEC 100A
D902	0DR210009AC	DIODE, TP DO35 200V 0.2A 1A 50SEC 100A
D903	0DR210009AC	DIODE, TP DO35 200V 0.2A 1A 50SEC 100A
D904	0DR140049AC	DIODE, 1N4004A DO41 500V 1.0A 30A - 10UA
DB801	0DD260000BB	DIODE, BRIDGE D2SBA60(STK) SHINDENKEN
ZD101	0DZ510009AK	DIODE, GDZJ5.1B TP GRANDE DO34 0.5W 5.1V
ZD441	0DZ620009AK	DIODE, GDZJ6.2B TP GRANDE DO34 0.5W 6.2V
ZD442	0DZ820009BF	DIODE, GDZJ8.2B TP GRANDE DO34 0.5W 8.2V
ZD443	0DZ330009DG	DIODE, GDZJ33B TP GRANDE DO34 0.5W 33.0V
ZD501	0DZ820009BF	DIODE, GDZJ8.2B TP GRANDE DO34 0.5W 8.2V
ZD601	0DZ910009BD	DIODE, GDZJ9.1B TP GRANDE DO34 0.5W 9.1V
ZD901	0DZ750009BE	DIODE, GDZJ7.5B TP GRANDE DO34 0.5W 7.5V
		CAPACITOR
C01	0CN1020K519	1000P 50V K B TA52
C02	0CN1030F679	10000P 16V M Y TA52
C03	0CE107DD618	100UF STD 10V M FL TP5
C04	0CC2400K415	24P 50V J NP0 TP
C05	0CC2400K415	24P 50V J NP0 TP
C07	0CE107DD618	100UF STD 10V M FL TP5
C102	0CE105DK618	1UF STD 50V M FL TP5
C107	0CE107DD618	100UF STD 10V M FL TP5
C109	0CE476DK618	47UF STD 50V M FL TP5
C1121	0CE107DD618	100UF STD 10V M FL TP5
C113	0CN1020K519	1000P 50V K B TA52
C121	0CN1010K519	100P 50V K B TA52
C1260	0CE226DF618	22UF STD 16V M FL TP5
C131	0CE107DD618	100UF STD 10V M FL TP5
C201	0CE227DD618	220UF STD 10V M FL TP5
C208	0CE226DF618	22UF STD 16V M FL TP5
C209	0CE226DF618	22UF STD 16V M FL TP5
C210	0CN1030F679	10000P 16V M Y TA52
C258	0CN1030F679	10000P 16V M Y TA52
C259	0CN1030F679	10000P 16V M Y TA52
C301	0CQ1041N509	0.1U 100V K POLY TP
C302	0CQ3931N509	0.0390UF 100V K PE TP
C303	0CK1810W515	180P 500V K B TS
C304	0CE107DJ618	100UF STD 35V M FL TP5
C307	0CQ6821N509	0.0068U 100V K POLY TP
C401	181-013V	M/PP 0.39UF 400V 5% FM .
C402	0CE475DP618	4.7UF STD 160V 20% FL TP 5
C403	181-015E	MPP 1600V 0.0068UF H
C404	0CK8210W515	820P 500V K B TS
C405	181-091U	R 220PF 2KV 10%,-10% R/TP TP7.5
C441	0CQ1531N509	0.015U 100V K POLY TP
C443	0CE477DH618	470UF STD 25V M FL TP5
C444	0CE475DR618	4.7UF STD 250V 20% FL TP 5
C446	0CE477DH618	470UF STD 25V M FL TP5
C447	0CQ3321N509	0.0033U 100V K POLY TP
C449	181-009V	PP 200V 0.047UF K
C452	0CE106DK618	10UF STD 50V M FL TP5
C501	181-007F	MPE ECQ-V1H224JL3(TR), 50V 0.22UF J
C502	0CN1030F679	10000P 16V M Y TA52
C503	0CE107DD618	100UF STD 10V M FL TP5
C504	0CE225DK618	2.2UF STD 50V 20% FL TP 5

For Capacitor & Resistors, the charactors at 2nd and 3rd digit in the P/No. means as follows;

CC, CX, CK, CN : Ceramic
CQ : Polyestor
CE : Electrolytic

RD : Carbon Film
RS : Metal Oxide Film
RN : Metal Film
RF : Fusible

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

LOCA. NO	PART NO	DESCRIPTION
C505	0CQ2221N509	0.0022U 100V K POLY TP
C506	0CE105DK618	1UF STD 50V M FL TP5
C507	0CQ2221N509	0.0022U 100V K POLY TP
C508	0CE476DF618	47UF STD 16V M FL TP5
C509	0CE106DF618	10UF STD 16V M FL TP5
C51	0CN1030F679	10000P 16V M Y TA52
C511	0CE105DK618	1UF STD 50V M FL TP5
C512	0CN1020K519	1000P 50V K B TA52
C513	0CN1020K519	1000P 50V K B TA52
C514	0CQ1041N455	0.1000UF 100V J PP NI FM7.5
C524	0CN1030F679	10000P 16V M Y TA52
C534	0CN1030F679	10000P 16V M Y TA52
C538	181-007H	MPE ECQ-V1H474JL3(TR), 50V 0.47UF J
C561	0CE107DD618	100UF STD 10V M FL TP5
C573	0CE107DF618	100UF STD 16V M FL TP5
C574	0CQ1021N509	0.001U 100V K POLY TP
C593	0CE475DK618	4.7UF STD 50V 20% FL TP 5
C594	0CQ1041N509	0.1U 100V K POLY TP
C595	0CE475DK618	4.7UF STD 50V 20% FL TP 5
C601	0CE226DF618	22UF STD 16V M FL TP5
C602	181-007F	MPE ECQ-V1H224JL3(TR), 50V 0.22UF J
C603	0CQ4721N509	0.0047U 100V K POLY TP
C605	0CQ4721N509	0.0047U 100V K POLY TP
C606	181-007F	MPE ECQ-V1H224JL3(TR), 50V 0.22UF J
C607	0CN1030F679	10000P 16V M Y TA52
C612	0CE477DH618	470UF STD 25V M FL TP5
C633	0CE107DD618	100UF STD 10V M FL TP5
C634	0CN1030F679	10000P 16V M Y TA52
C635	0CE106DF618	10UF STD 16V M FL TP5
C661	0CX4700K409	47P 50V J SL TA52
C662	0CX4700K409	47P 50V J SL TA52
C663	0CE227DD618	220UF STD 10V M FL TP5
C664	0CN1030F679	10000P 16V M Y TA52
C665	0CN1030F679	10000P 16V M Y TA52
C666	0CE335DK618	3.3UF STD 50V 20% FL TP 5
C667	0CN3320F569	3300P 16V K X TA52
C668	0CN3320F569	3300P 16V K X TA52
C669	0CE226DF618	22UF STD 16V M FL TP5
C670	0CE106DF618	10UF STD 16V M FL TP5
C671	0CE107DD618	100UF STD 10V M FL TP5
C672	0CE106DF618	10UF STD 16V M FL TP5
C673	0CN1030F679	10000P 16V M Y TA52
C674	0CN1030F679	10000P 16V M Y TA52
C675	0CE106DF618	10UF STD 16V M FL TP5
C676	181-007G	50V 0.33UF J MATSUSHITA
C677	181-007G	50V 0.33UF J MATSUSHITA
C678	181-007G	50V 0.33UF J MATSUSHITA
C679	181-007G	50V 0.33UF J MATSUSHITA
C680	0CN1030F679	10000P 16V M Y TA52
C681	0CE106DF618	10UF STD 16V M FL TP5
C684	0CN1030F679	10000P 16V M Y TA52
C685	0CE106DF618	10UF STD 16V M FL TP5

LOCA. NO	PART NO	DESCRIPTION
C686	0CX5600K409	56P 50V J SL TA52
C687	0CX5600K409	56P 50V J SL TA52
C688	0CX5600K409	56P 50V J SL TA52
C689	0CC0200K115	2PF D 50V 0.5 PF NP0 TR
C690	0CC0200K115	2PF D 50V 0.5 PF NP0 TR
C801	0CE107BJ618	100UF KME 35V M FL TP5
C802	181-091U	R 220PF 2KV 10%,-10% R/TP TP7.5
C803	0CK4710W515	470PF 500V K B TR
C804	0CQ1041N509	0.1U 100V K POLY TP
⚠ C806	0CE337KV6A0	330UF SLT 450V M VNSN BULK
C807	0CK10201515	1000P 1KV K B TS
C808	0CK10201515	1000P 1KV K B TS
⚠ C809	181-506J	ECQ-U 2A224KVA 0.22UF 250V 10%,-10% M AC
⚠ C811	181-120K	2200PF 4KV M E FMTW LEAD 4.5
⚠ C812	0CE108DH618	1000UF STD 25V M FL TP5
C813	0CK4710W515	470PF 500V K B TR
C815	0CK4710W515	470PF 500V K B TR
C816	0CN1030F679	10000P 16V M Y TA52
C817	0CK4710W515	470PF 500V K B TR
C818	0CE107BH618	100UF KME 25V M FL TP5
C819	181-091Y	R 680PF 2KV 10%,-10% R/TP TP7.5
C820	0CE227DP650	220UF STD 160V M FM7.5 BULK
C821	181-120N	1000PF 4KV M E FMTW LEAD4.5
C823	0CK4710K515	470PF 50V K B TR
C825	181-091P	SL 270PF 1KV 10%,-10% R/TP TP5
C828	0CE107DF618	100UF STD 16V M FL TP5
C829	0CF1021047A	1000PF D 800V 5% TP 7.5 M/PP NI
C830	0CE475DK618	4.7UF STD 50V 20% FL TP 5
C831	0CE108BF618	1000UF KME 16V M FL TP5
C834	0CE476CP618	47UF SHL,SD 160V 20% FL TP 5
C841	0CE477DD618	470UF STD 10V M FL TP5
C901	0CE475DR618	4.7UF STD 250V 20% FL TP 5
C902	0CQ1044R539	0.1UF TE 250V K M/PE NI TP5
C903	0CK12202510	1200P 2KV K B S
C904	0CE475DR618	4.7UF STD 250V 20% FL TP 5
C905	0CN5610K519	560P 50V K B TA52
R655	0CN1030F679	10000P 16V M Y TA52

COIL & TRANSFORMER

J57	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L04	0LA1000K119	INDUCTOR,AXIAL LEAD100UH K 2.3*3.4 TP
L05	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L210	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L401	6140VE0001V	COIL,LINEARITY 60UH 0.6PHY 69.5TURN
L402	6140VB0001F	COIL,CHOKE 130UH 0.45PHY 55.5TURN
L501	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L502	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L503	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L506	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L611	0LA0102K049	INDUCTOR,AXIAL LEAD10UH 10% TP 5.0X14
L661	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L662	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

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CC, CX, CK, CN : Ceramic
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CE : Electrolytic
RD : Carbon Film
RS : Metal Oxide Film
RN : Metal Film
RF : Fusible

LOCA. NO	PART NO	DESCRIPTION
L663	0LA0102K119	INDUCTOR,AXIAL LEAD10UH K 2.3*3.4 TP
L801	150-C02F	COIL,CHOKE 82UH PHY TURN
R443	0LA0101K119	INDUCTOR,AXIAL LEAD1.0UH K 2.3*3.4 TP
R545	0LA0681K119	INDUCTOR,AXIAL LEAD6.8UH K 2.3*3.4 TP
R546	0LA0681K119	INDUCTOR,AXIAL LEAD6.8UH K 2.3*3.4 TP
R547	0LA0681K119	INDUCTOR,AXIAL LEAD6.8UH K 2.3*3.4 TP
T402	6170VC0003A	TRANSFORMER,10*12 JSUH BASE 10MM
T802	6170VMCB01K	TRANSFORMER,SMPS[COIL]EER4215 340UH
CONNECTOR		
P02A	366-932B	CONNECTOR, 2.5MM 3P GIL-G LG CABLE S
P05A	366-921J	CONNECTOR, 2.5MM 10P GIL-G LG CABLE .
P06A	366-921D	CONNECTOR, 2.5MM 5P GIL-G LG CABLE .
P07A	366-932C	CONNECTOR, 2.5MM 4P GIL-G LG CABLE S
P1205	387-A10H	CONNECTOR, 10P 2.5MM 450MM H-B
P1206	387-A05H	CONNECTOR, 5P 2.5MM 450MM H-B
P301	366-043K	CONNECTOR, PLUG(4P)
P601	366-921B	CONNECTOR, 2.5MM 3P GIL-G LG CABLE .
P602	366-921C	CONNECTOR, 2.5MM 4P GIL-G LG CABLE .
P801A	366-009D	CONNECTOR, 2.36PAI 1P . K/M AUTO
P801B	366-009D	CONNECTOR, 2.36PAI 1P . K/M AUTO
P802	366-043B	CONNECTOR, ASSY,PLUG(2P)
P902	387-603E	CONNECTOR, 9P 2.5MM 430MM B-B
P903	366-009D	CONNECTOR, 2.36PAI 1P . K/M AUTO
RESISTOR		
C546	0RD1103F609	110K OHM 1/6 W 5.00% TA52
F811	0RP0020J809	0.02 OHM 1 W 20% TA52
F812	0RP0050H709	0.05 OHM 1/2 W 10% TA52
⚠ FR441	0RF0470J607	0.47 OHM 1 W 5.00% TA62
⚠ FR442	0RF0151J607	1.5 OHM 1 W 5.00% TA62
⚠ FR443	0RF0470J607	0.47 OHM 1 W 5.00% TA62
⚠ FR802	0RF0470H609	0.47 OHM 1/2 W 5.00% TA52
⚠ FR901	0RF0151J607	1.5 OHM 1 W 5.00% TA62
J149	0RD1001F609	1K OHM 1/6 W 5% TA52
J154	0RD6800F609	680 OHM 1/6 W 5% TA52
J30	0RD2200F609	220 OHM 1/6 W 5.00% TA52
J33	0RD2200F609	220 OHM 1/6 W 5.00% TA52
J39	0RD2200F609	220 OHM 1/6 W 5.00% TA52
J69	0RD1500F609	150 OHM 1/6 W 5.00% TA52
L10	0RD0102F609	10 OHM 1/6 W 5% TA52
L1101	0RD1500F609	150 OHM 1/6 W 5.00% TA52
R01	0RD1002F609	10K OHM 1/6 W 5% TA52
R02	0RD1001F609	1K OHM 1/6 W 5% TA52
R03	0RD1000F609	100 OHM 1/6 W 5% TA52
R04	0RD3301F609	3.3K OHM 1/6 W 5.00% TA52
R05	0RD3301F609	3.3K OHM 1/6 W 5.00% TA52
R07	0RD4701F609	4.7K OHM 1/6 W 5% TA52
R09	0RD1000F609	100 OHM 1/6 W 5% TA52
R10	0RD1000F609	100 OHM 1/6 W 5% TA52
R105	0RD1000F609	100 OHM 1/6 W 5% TA52
R106	0RD1000F609	100 OHM 1/6 W 5% TA52

LOCA. NO	PART NO	DESCRIPTION
R107	0RS0272J607	27 OHM 1 W 5.00% TA62
R11	0RD1001F609	1K OHM 1/6 W 5% TA52
R1101	0RD3001F609	3K OHM 1/6 W 5.00% TA52
R1102	0RD3601F609	3.6K OHM 1/6 W 5.00% TA52
R1104	0RD1601F609	1.6K OHM 1/6 W 5.00% TA52
R1105	0RD1201F609	1.2K OHM 1/6 W 5% TA52
R1121	0RD2201F609	2.2K OHM 1/6 W 5.00% TA52
R1122	0RD3902F609	39K OHM 1/6 W 5.00% TA52
R1123	0RD2200F609	220 OHM 1/6 W 5.00% TA52
R121	0RD1001F609	1K OHM 1/6 W 5% TA52
R122	0RD1001F609	1K OHM 1/6 W 5% TA52
R1254	0RD2200H609	220 OHM 1/2 W 5.00% TA52
R1255	0RD2200H609	220 OHM 1/2 W 5.00% TA52
R13	0RD1000F609	100 OHM 1/6 W 5% TA52
R14	0RD1000F609	100 OHM 1/6 W 5% TA52
R15	0RD1000F609	100 OHM 1/6 W 5% TA52
R16	0RD4701F609	4.7K OHM 1/6 W 5% TA52
R201	0RD0512F609	51 OHM 1/6 W 5.00% TA52
R208	0RD1001F609	1K OHM 1/6 W 5% TA52
R251	0RD0752F609	75 OHM 1/6 W 5.00% TA52
R301	0RD0101F609	1 OHM 1/6 W 5.00% TA52
R302	0RN1501F409	1.5K OHM 1/6 W 1.00% TA52
R304	0RD0221H609	2.2 OHM 1/2 W 5.00% TA52
R305	0RD0221H609	2.2 OHM 1/2 W 5.00% TA52
R306	0RS2700K607	270 OHM 2 W 5.00% TA62
R307	0RD1501F609	1.5K OHM 1/6 W 5% TA52
R310	0RD1801F609	1.8K OHM 1/6 W 5.00% TA52
R311	0RD4701H609	4.7K OHM 1/2 W 5.00% TA52
R312	0RD2201F609	2.2K OHM 1/6 W 5.00% TA52
R313	0RD1002F609	10K OHM 1/6 W 5% TA52
R401	0RD1501H609	1.5K OHM 1/2 W 5.00% TA52
R402	0RS2702K607	27K OHM 2 W 5.00% TA62
R442	0RD5100H609	510 OHM 1/2 W 5.00% TA52
R444	0RD0392H609	39 OHM 1/2 W 5.00% TA52
R446	0RD1001F609	1K OHM 1/6 W 5% TA52
R447	0RD2401F609	2.4K OHM 1/6 W 5.00% TA52
R450	0RD4701H609	4.7K OHM 1/2 W 5.00% TA52
R451	0RD0392H609	39 OHM 1/2 W 5.00% TA52
R453	0RS5602H609	56K OHM 1/2 W 5.00% TA52
R455	0RS2702K607	27K OHM 2 W 5.00% TA62
R456	0RS2202H609	22K OHM 1/2 W 5.00% TA52
R501	0RD2202F609	22K OHM 1/6 W 5% TA52
R503	0RD1000F609	100 OHM 1/6 W 5% TA52
R504	0RN3902F409	39K OHM 1/6 W 1.00% TA52
R51	0RD1000F609	100 OHM 1/6 W 5% TA52
R518	0RD3302F609	33K OHM 1/6 W 5% TA52
R52	0RD1000F609	100 OHM 1/6 W 5% TA52
R521	0RD1000F609	100 OHM 1/6 W 5% TA52
R522	0RD2702F609	27K OHM 1/6 W 5.00% TA52
R523	0RD1003F609	100K OHM 1/6 W 5% TA52
R524	0RD3001F609	3K OHM 1/6 W 5.00% TA52
R526	0RD2001F609	2K OHM 1/6 W 5% TA52

For Capacitor & Resistors, the charactors at 2nd and 3rd digit in the P/No. means as follows;

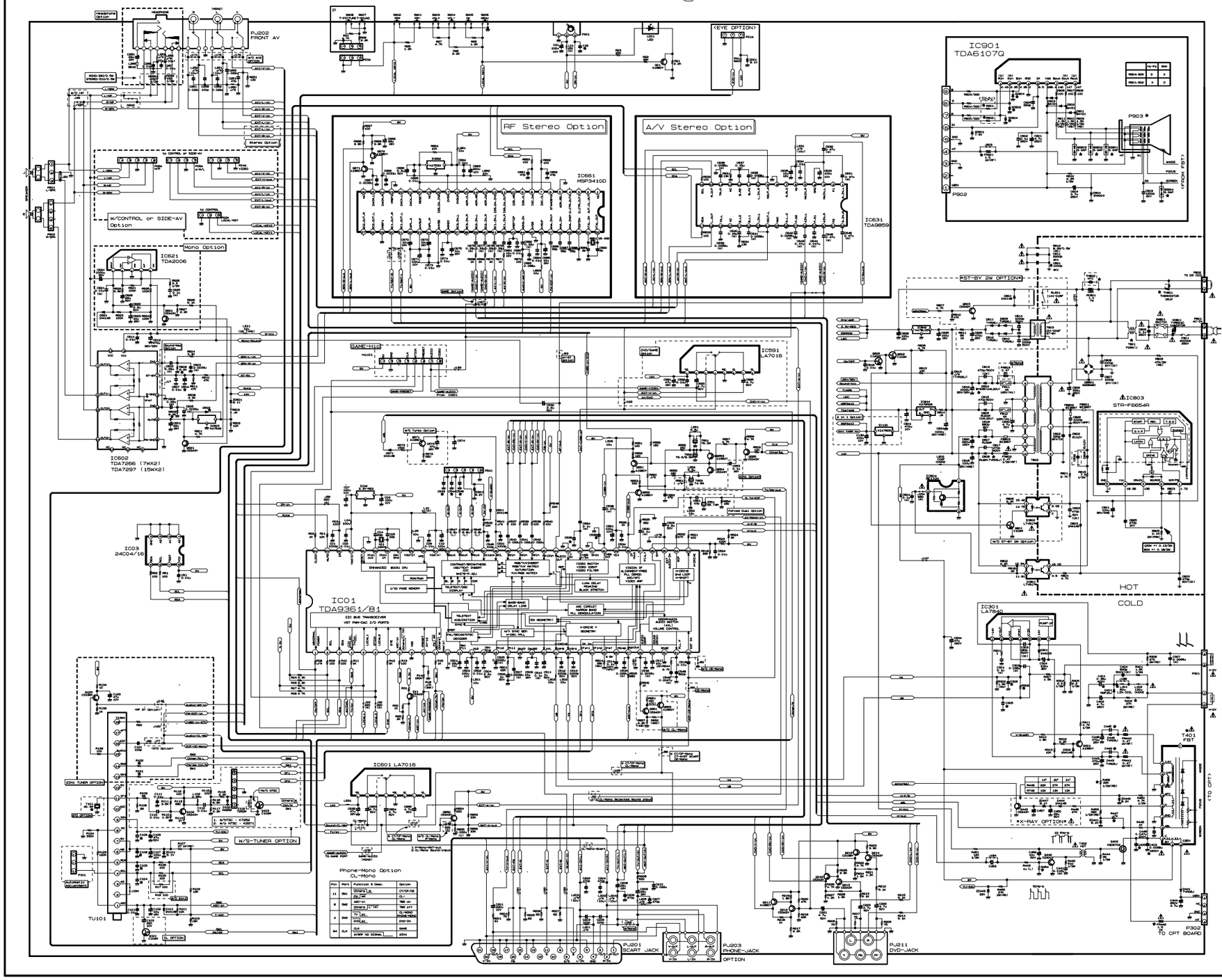
CC, CX, CK, CN : Ceramic
CQ : Polyestor
CE : Electrolytic

RD : Carbon Film
RS : Metal Oxide Film
RN : Metal Film
RF : Fusible

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

LOCA. NO	PART NO	DESCRIPTION
R542	0RD1002F609	10K OHM 1/6 W 5% TA52
R551	0RD2200F609	220 OHM 1/6 W 5.00% TA52
R552	0RD2200F609	220 OHM 1/6 W 5.00% TA52
R553	0RD3300F609	330 OHM 1/6 W 5.00% TA52
R559	0RD1800F609	180 OHM 1/6 W 5.00% TA52
R572	0RD5600F609	560 OHM 1/6 W 5% TA52
R573	0RD2403F609	240K OHM 1/6 W 5.00% TA52
R601	0RD4701F609	4.7K OHM 1/6 W 5% TA52
R602	0RD1002F609	10K OHM 1/6 W 5% TA52
R604	0RD1301F609	1.3K OHM 1/6 W 5.00% TA52
R606	0RD1501F609	1.5K OHM 1/6 W 5% TA52
R608	0RD1301F609	1.3K OHM 1/6 W 5.00% TA52
R609	0RD1501F609	1.5K OHM 1/6 W 5% TA52
R610	0RD4702F609	47K OHM 1/6 W 5% TA52
R611	0RD4702F609	47K OHM 1/6 W 5% TA52
R632	0RD1000F609	100 OHM 1/6 W 5% TA52
R633	0RD1000F609	100 OHM 1/6 W 5% TA52
R662	0RD1000F609	100 OHM 1/6 W 5% TA52
R663	0RD1000F609	100 OHM 1/6 W 5% TA52
R665	0RD3901F609	3.9K OHM 1/6 W 5% TA52
R666	0RD3901F609	3.9K OHM 1/6 W 5% TA52
R667	0RD0102F609	10 OHM 1/6 W 5% TA52
R670	0RD1001F609	1K OHM 1/6 W 5% TA52
R671	0RD1001F609	1K OHM 1/6 W 5% TA52
R801	0RD2701F609	2.7K OHM 1/6 W 5% TA52
R802	0RD2201F609	2.2K OHM 1/6 W 5.00% TA52
R803	0RD1001F609	1K OHM 1/6 W 5% TA52
R804	0RD4701F609	4.7K OHM 1/6 W 5% TA52
R805	180-A01P	0.13 OHM 2 W 5% TA62 RWR
R806	0RD2401F609	2.4K OHM 1/6 W 5.00% TA52
R808	0RD4701F609	4.7K OHM 1/6 W 5% TA52
R809	0RS4702K607	47K OHM 2 W 5.00% TA62
⚠ R812	0RK8204H609	8.2M OHM 1/2 W 5.00% TA52
R813	0RD1002F609	10K OHM 1/6 W 5% TA52
R815	0RD0751H609	7.5 OHM 1/2 W 5.00% TA52
R816	0RD2001F609	2K OHM 1/6 W 5% TA52
R903	0RD2200F609	220 OHM 1/6 W 5.00% TA52
R904	0RD2200F609	220 OHM 1/6 W 5.00% TA52
R905	0RD2200F609	220 OHM 1/6 W 5.00% TA52
R906	0RD1000F609	100 OHM 1/6 W 5% TA52
R907	0RD1000F609	100 OHM 1/6 W 5% TA52
R908	0RD1000F609	100 OHM 1/6 W 5% TA52
R909	0RS1501H609	1.5K OHM 1/2 W 5.00% TA52
R910	0RS1501H609	1.5K OHM 1/2 W 5.00% TA52
R911	0RS1501H609	1.5K OHM 1/2 W 5.00% TA52
R912	0RD2204H609	2.2M OHM 1/2 W 5.00% TA52
RC801	180-822N	RWR 7W 1.0 OHM J PD
SWITCH		
SW01	140-315A	SWITCH, TACT SKHV17910B LG C&D NON 12V
SW02	140-315A	SWITCH, TACT SKHV17910B LG C&D NON 12V
SW03	140-315A	SWITCH, TACT SKHV17910B LG C&D NON 12V
SW04	140-315A	SWITCH, TACT SKHV17910B LG C&D NON 12V
SW05	140-315A	SWITCH, TACT SKHV17910B LG C&D NON 12V
SW06	140-315A	SWITCH, TACT SKHV17910B LG C&D NON 12V
⚠ SW801	6600VM2002A	SWITCH,PUSH 250V 8A HORIZONTAL 480G
FILTER & CRYSTAL		
FB801	125-022R	FILTER, BI3857 5.7X3.6MM AXIAL 26MM
FB802	125-022R	FILTER, BI3857 5.7X3.6MM AXIAL 26MM
FB803	125-022R	FILTER, BI3857 5.7X3.6MM AXIAL 26MM
T801	150-F06W	FILTER, SQE2930 36MH 0.5PHY 105TURN .
X01	156-A02B	RESONATOR,CRYSTAL 12.000MHZ 30PPM 16PF BK
X661	156-A02M	RESONATOR,CRYSTAL 18.432MHZ 30PPM 10PF BK
ACCESSORIES		
A1	3828VA0375S	MANUAL,OWNERS MC019A S&W/ME20 LG
A2	6710V00090A	REMOTE CONTROLLER,MC019A TXT LG NON
A3	132-210J	ANTENNA,2 POLE 3 SECTION 700MM 750MM
MISCELLANEOUS		
⚠ F801	0FS4001B53C	FUSE,SLOW BLOW,4000MA 250 V 5.2X20 CY/CE
LD01	0DL100000AE	LED,SA5711(DL-1LO) BK AMBER -
PA1101	6726VV0006D	REMOTE CONTROLLER RECEIVER,TEMIC 38.0KHZ
PJ1202	6613V00004F	JACK ASSY,PPJ107F PARK ELECTRONIC A/V 3P
PJ1203	380-068D	JACK,PHONE,UEJ-CV-003 UGCOM E/P WITH S/W
PJ201	6612VJH004H	JACK,RCA,6P STEREO MC-019A (21P SCART PIN TO PIN)
⚠ SK901	6620VBC003A	SOCKET ,CPT PCS030A PARK ELEC 8PIN 14/360
T401	6174V-6006E	FBT,BSC23-N0107 20"/21" YINYANG 6174V-6006C
⚠ TH801	163-051F	THERMISTOR,PTC +/- 20% 220V 85 80 STRAIGHT
TU101	6700MF0001E	TUNER,TAFD-Z242D LG MULTI FS 4SYS,DIN
VD801	164-003G	VARISTOR,TVR621D14A THINKING 620V 10%

Schematic Diagram of MC-019A



NOTICE

Since this is basic circuit diagram, the value of components and some partial connection are subject to be changed for improvement without notice.

The components marked ⚠ conform to VDE or IEC guidelines and are essential for safe operation of the TV receiver.
While those marked ⚠ are required for correct operation.
Use specified parts only when replacing.

Value of resistor, capacitor and inductor

1. Resistances are shown in ohm. m=1,000. M=1,000,000.
2. Unless otherwise noted in schematic: all capacitor values less than 1 are expressed in mfd and the values more than 1 in pF.
3. Unless otherwise noted in schematic: all inductor values more than 1 are expressed in uH and the values less than 1 in nanyrld.

Observation of voltages and waveforms

1. Voltages read with VTVM from point to chassis ground.
   Sink voltage is 200V/DC volts.
   signal pattern is colourbar.
2. The schematic shown is representative only.
3. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
4. Check FINE TUNING, AGC, CONTRAST, BRIGHTNESS and COLOUR controls for best picture. make sure that COLOUR and BRIGHTNESS are in mid-point and CONTRAST is in MAX.
5. Waveforms are taken using a standard colour signal.

<SYSTEM OPTION>

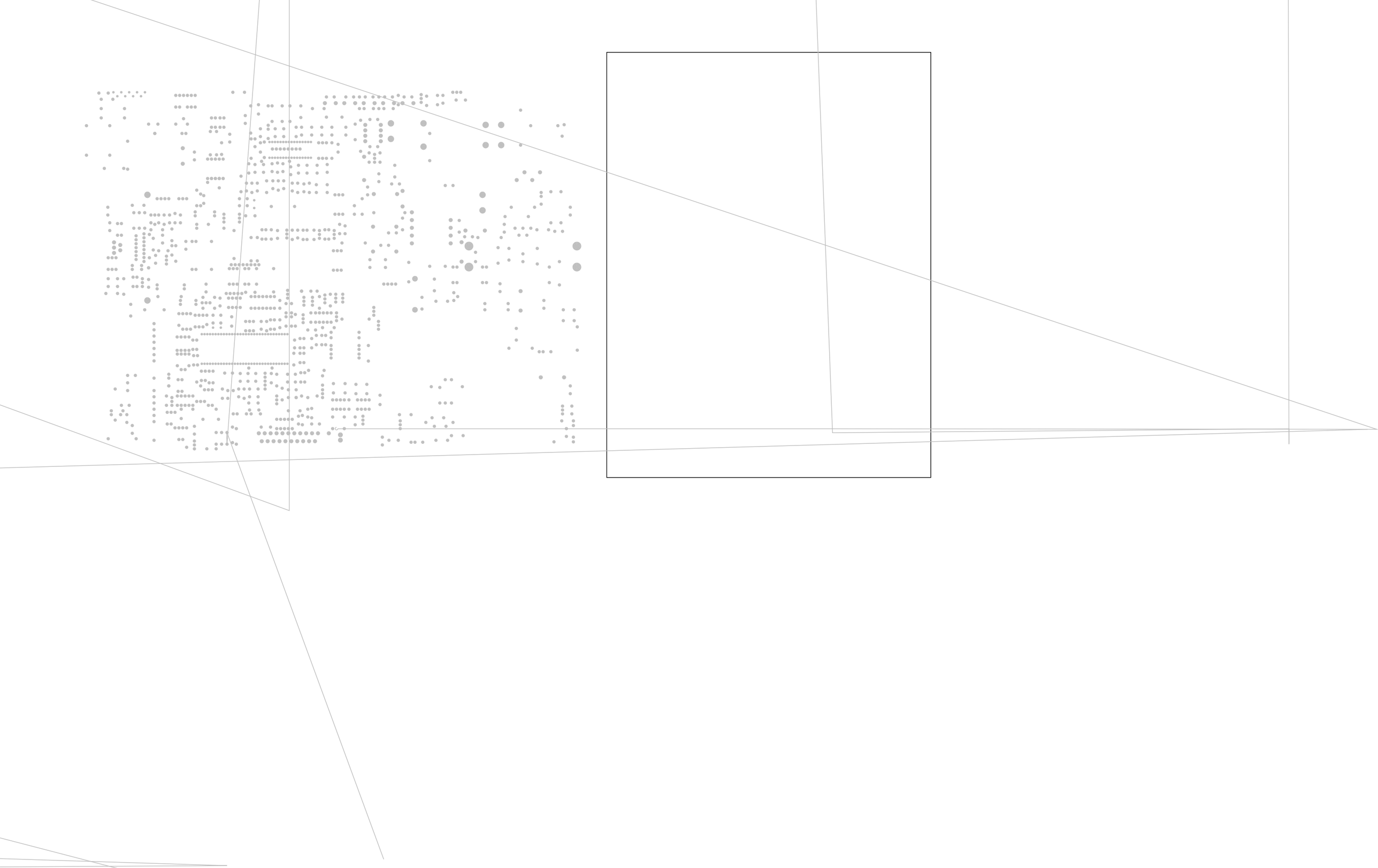
1 RF STEREO

2 AV STEREO

COMPONENT	CL	CE	CT	CF	REMARKS

3 MONO

COMPONENT	CL	CE	CT	CF	REMARKS



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