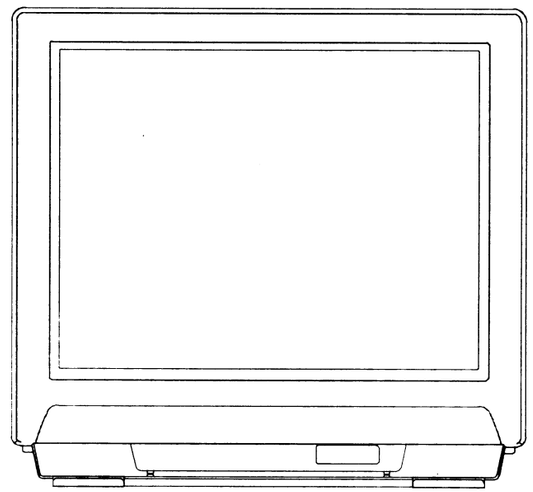
FUNAI

SERVICE MANUAL

21" COLOR TELEVISION

MS-21VN



IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Funai Equipment. The service procedures recommended by Funai and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Funai could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Funai has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Funai must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

TABLE OF CONTENTS

GENERAL SPECIFICATIONS *

Feature and Specifications

Color System:	PAL - B/G, SECAM - B/G, D/K NTSC 3.58/4.43MHz (Video Playback)
Tuning System:	Voltage Synthesized
Receivable Channels: (OIRT + CCIR ch)	VHF-L; R1~R5 / E2~E4 ch (X~S2) VHF-H; R6~R12 E5~E12 ch (S6~S10) UHF; 21~69 CATV~MID
Number of Preset:	Up to 57
Antenna Impedance:	UHF/VHF 75Ω, Unbalanced
Picture Tube:	14", Tinted
Picture Control:	Color, Brightness, Contrast Game(ON/OFF), Sharp/Soft
Picture Control Memory:	Standard Select
Speaker:	77mm Round Type, 8Ω
Output Power:	3W
Other Features:	Automatic Channel Preset Automatic Degaussing
Power Source:	100V~270V, 50/60Hz AC (Auto Voltage)
Power Consumption:	68W
Cabinet Size:	362(W) x 327(H) x 354(D)mm
Weight:	8.5kg
Regurations:	IEC-65

Control and Switches

Power:	Push (Front)
Channel Up/Down:	Push (Front)
Volume Up/Down:	Push (Front)
Tuning Up/Down:	Push (Front)
Program:	Push (Front)
Auto Memo / Band:	Push (Front)
Remote Control: (20 keys)	Standby, 0/AV, 1~9, Cannel Up, Channel Down, Mute, Display Previous Picture Select (Bright / Contrast / Color / Video Mode) Control / Volume Up/Down Sleep

Display

LED Indicator:	Standby (Power ON, LED OFF) ※ When turning on the power button stand-by LED is put off.
On Screen Display:	Channel Volume GAME ON-OFF Brightness Color Contrast Sharp-Soft Sleep Timer (10~90 Minute) Tuning Indicator Band Position

Jack and Terminals

UHF/VHF Antenna:	IEC (75Ω)
Video In:	RCA
Audio In:	RCA - 2P
Earphone:	3.5m/m CES

Accessories

Remote Control Unit

Battery: (R6, UM3 x 2)

Owner's Manual

Rod Antenna

*** Specifications are subject to change without notice.**

PERFORMANCE SPECIFICATIONS

<Tuner>

VHF/UHF Input: 75Ω Unbalanced, IEC connector
Reference Level: 20Vp-p (CRT Green Cathode)
Input Signal: 400Hz, 30%AM

Description	Condition	Unit	Nominal	Limit
1. Intermediate Frequency	Picture	MHz	38.0	—
	Sound	MHz	31.5(D/K)	—
	Sound	MHz	32.5(B/G)	—
2. Peak Picture Sens.	VHF	dBμV	20	30
	UHF	dBμV	20	40
3. AFT Pull In Range		MHz	+1.5	+1.0
(10mV Input)		MHz	-0.7	-0.5

<Deflection>

Description	Condition	Unit	Nominal	Limit
1. Deflection Frequency	Horizontal (PAL/SECAM)	KHz	15.625	—
	(NTSC)	KHz	15.750	—
	Vertical (PAL/SECAM)	Hz	50	—
	(NTSC)	Hz	60	—
2. Linearity	Horizontal	%	—	15
	Vertical	%	—	10
3. High Voltage		KV	23	—
4. Over Scan	Horizontal	%	10	—
	Vertical	%	10	—

<Video & Chroma)

Description	Condition	Unit	Nominal	Limit
1. Misconvergence	Center	mm	—	0.4
	Side	mm	—	2.0
	Corner	mm	—	1.5
2. Brightness	APL100%	Ft-L	45	35
3. Color Temperature		°K	8000-10MPCD	—
4. Resolution	Horizontal	Line	300	—
	Vertical	Line	300	—

<Audio>

All items are measured across 8Ω load at speaker output terminal.

Description	Condition	Unit	Nominal	Limit
1. Audio Output Power	10%THD	W	3.0	2.5
2. Audio Distortion	50mW	%	2	5
3. Audio Frequency Response	-6dB	Hz	55-8.0K	—

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Safety Precautions for TV Circuit

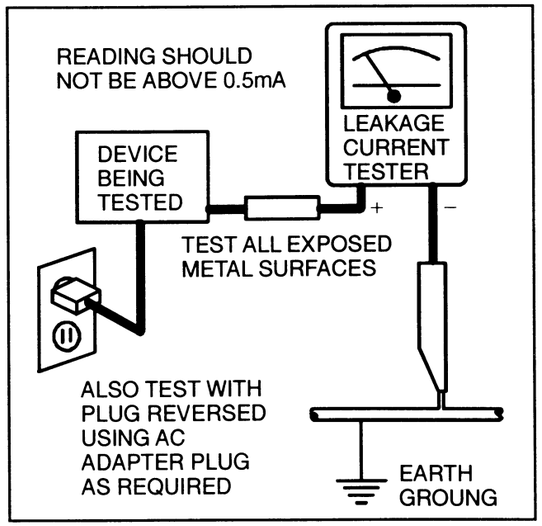
1. **Before returning an instrument to the customer,** always make a safety check of the entire instrument, including, but not limited to, the following items:

   a. Be sure that no built-in protective devices are defective and have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**

   b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.

   c. Antenna Cold Check - With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.

   d. Leakage Current Hot Check - With the instrument completely reassembled, plug the AC line cord directly into a AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester. With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliampere. Reverse the instrument power cord plug in the outlet and repeat the test.



ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

e. X-Radiation and High Voltage Limits - Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original. Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place. High voltage must be measured each time servicing is performed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called "horizontal disable" or "hold down.") Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the Product Safety & X-Radiation Warning note on the service data chassis schematic. High voltage is maintained within specified limits by close tolerance safety-related components/adjustments in the high-voltage circuit. If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning -** Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4. **Picture Tube Implosion Protection Warning -** The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do not try to remove such "permanently attached" yokes from the picture tube.

5. **Hot Chassis Warning -**
   a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safety-serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter, measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, *remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground.
   b. Some TV receiver chassis have a circuit which obtain voltage about 70% of AC voltage between chassis and earth ground regardless of the AC plug polarity. This chassis can be safety-serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection.
   c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulation material that must not be defeated or altered.
   Note: * In case unit has no polarity AC plug only.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: a. near sharp edges, b. near thermally hot parts-be sure that leads and components do not touch thermally hot parts, c. the AC supply, d. high voltage, and e. antenna wiring. Always inspect in all areas for pinched, out of place, or frayed wiring. Check AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. **Product Safety Notice -** Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual

inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc.. Parts that have special safety characteristics are identified by a (⚠) on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are strictly inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Precautions during Servicing

A. Parts identified by the (⚠) symbol are critical for safety.
Replace only with part number specified.

B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

C. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

D. Use specified insulating materials for hazardous live parts. Note especially:
1) Insulation Tape
2) PVC tubing
3) Spacers
4) Insulators for transistors.

E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

F. Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

G. Check that replaced wires do not contact sharp edged or pointed parts.

H. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

I. Also check areas surrounding repaired locations.

J. Use care that foreign objects (screws, solder droplets. etc.) do not remain inside the set.

K. Crimp type wire connector
When replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, in order to prevent shock hazards, perform carefully and precisely the following steps.
Replacement procedure
1) Remove the old connector by cutting the wires at a point close to the connector.
Important: Do not re-use a connector (discard it).
2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
4) Use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

L. When connecting or disconnecting the VCR connectors, first, disconnect the AC plug from AC supply socket.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1 : Ratings for selected area

AC Line Voltage	Region	Clearance Distance (d) (d')
200 to 240 V	Europe Australia	≥ 4mm (d) ≥ 6mm (d')

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

2. Leakage Current Test

Confirm specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig. 2 and following table.

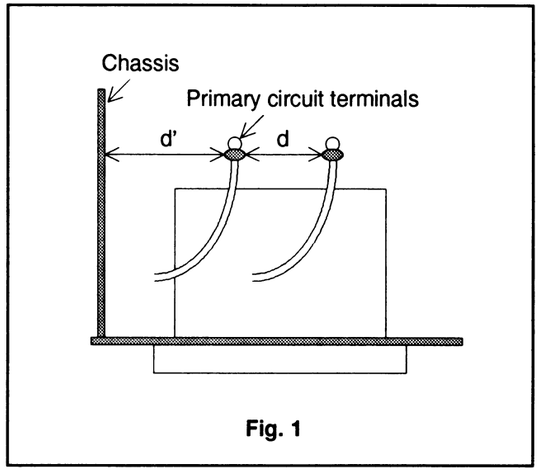


Fig. 1

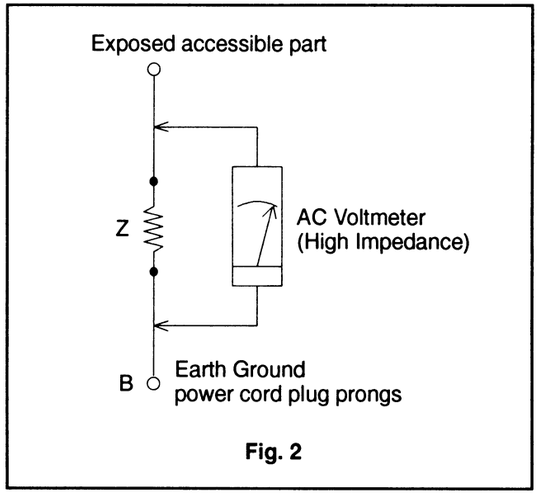


Fig. 2

Table 2 : Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
200 to 240 V	Europe Australia	2kΩ RES. in connected	i≤0.7mA rms i≤2mA dc	Antenna terminals
		50kΩ RES. in connected	i≤0.7mA rms i≤2mA dc	Other terminals

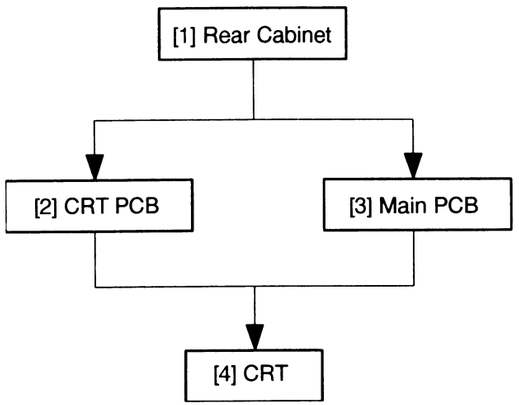
Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

DISASSEMBLY INSTRUCTIONS

1. Disassembly Flow Chart

This flow chart indicates the disassembly steps of the cabinet parts and PCB in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in the reverse order. Bend, route and dress the cables as they were originally.

CAUTION ! :
When removing the CRT, make sure to discharge Anode Lead of the CRT.
Use the CRT Ground Wire to discharge the CRT before removing the Anode Cap.



2. Disassembly Method

STEP/ LOC. NO.	PART	REMOVAL		
		FIG. NO.	REMOVE/*UNLOCK/ RELEASE/UNPLUG/ UNCLAMP/ DESOLDER	NOTE
[1]	Rear Cabinet	1, 2	L-5 (4pcs), L-6, L-7	1
[2]	CRT PCB	4, 5	CN451B, CN452B, CN453, FOCUS WIRE, SCREEN WIRE	2
[3]	Main PCB	3, 5	CN451A, CN452A, CN501, CN601, CN801, CN802, ANODE CAP, FOCUS WIRE, SCREEN WIRE	3
[4]	CRT	4, 5	B-2 (4pcs)	4

Reference <Notes> in Table

1. (1) Remove 6 screws (L-5, L-6, L-7) and slide the Rear Cabinet backward.
2. (1) If not already removed, first remove the Rear Cabinet.
   (2) Remove all relative wires, then pull the CRT PCB backward.
3. (1) If not already removed, first remove the Rear Cabinet.
   (2) Remove all relative wires on the Main PCB and remove the Anode Cap, then slide the Main PCB backward.

Caution !
Discharge Anode Lead of the CRT with the CRT Ground Wire before removing the Anode Cap.

4. (1) If not already removed, first remove the Rear Cabinet and Main PCB.
   (2) Remove 4 screws (B-2), then the CRT can be removed.

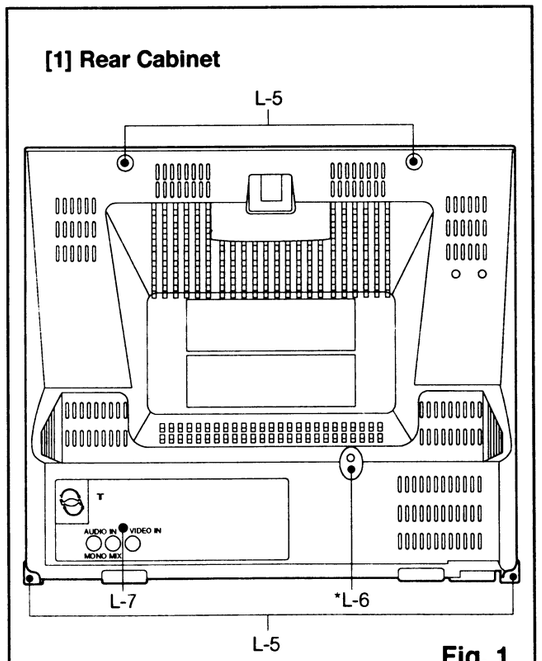


Fig. 1

*L-6
Lower: used FBT; LTF00EPSM006 (FCK-14B040)

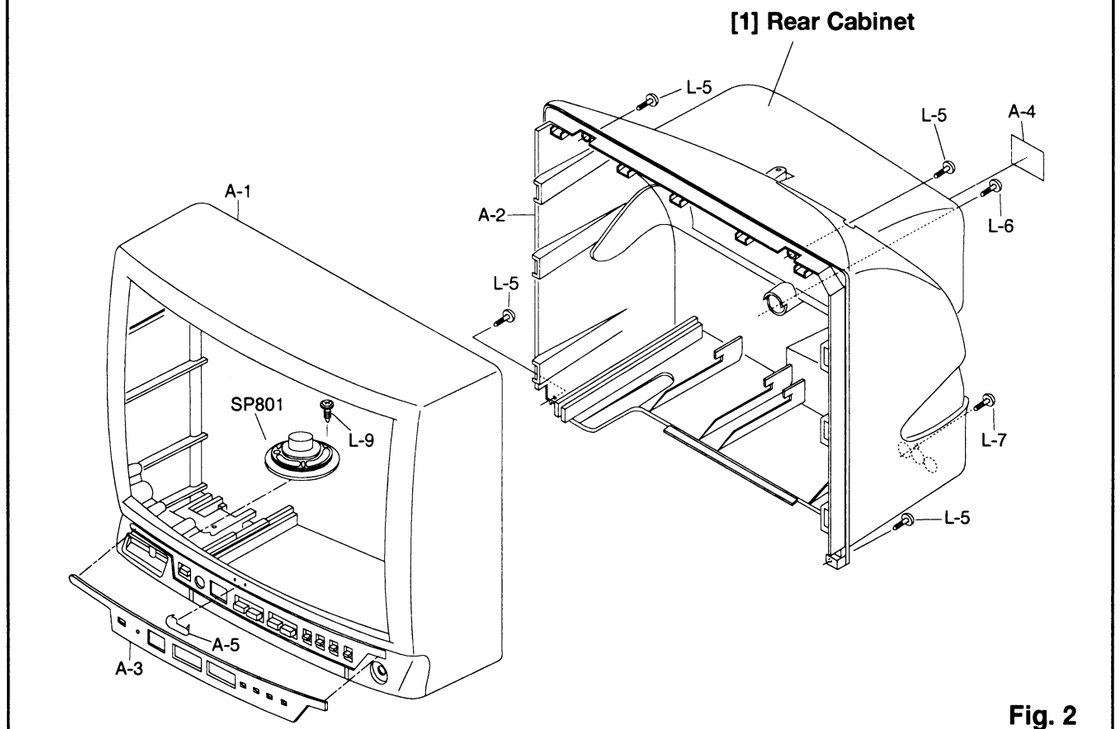


Fig. 2

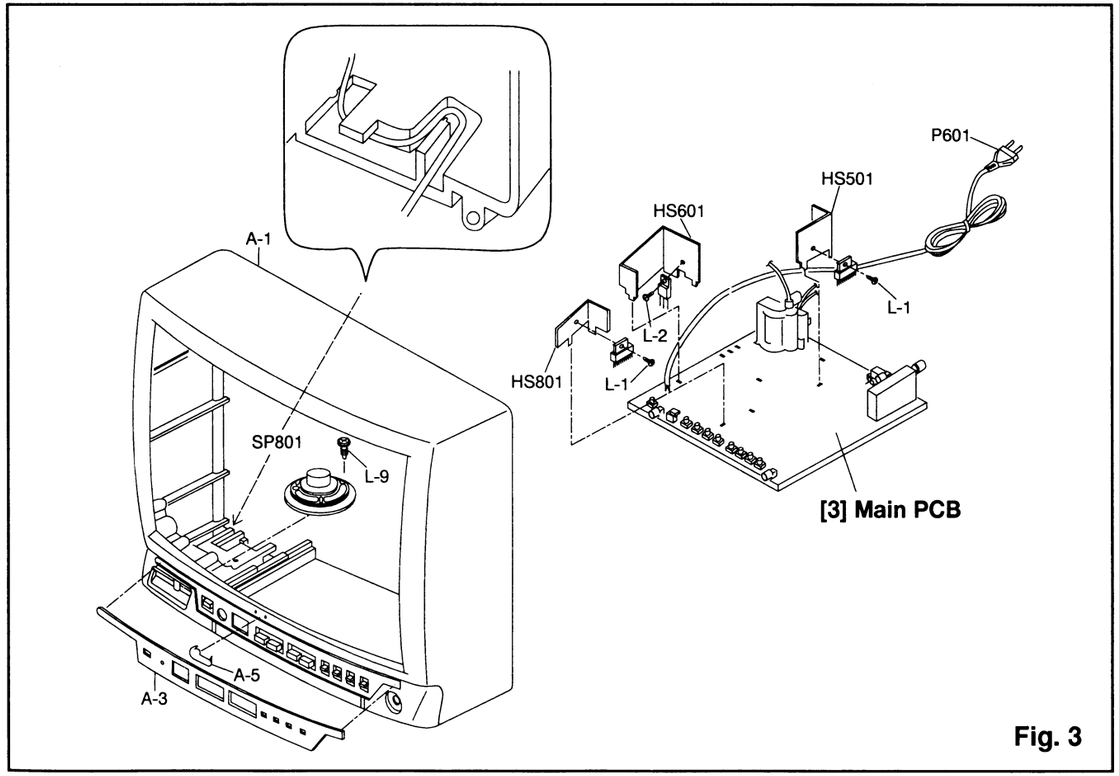


Fig. 3

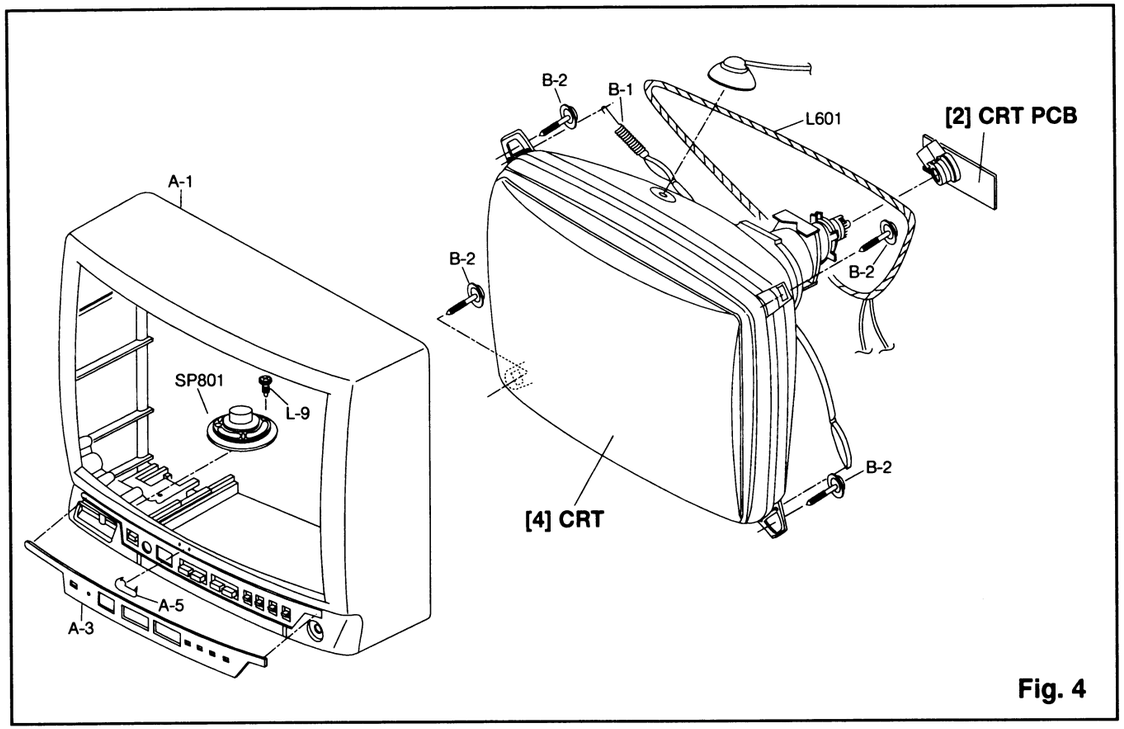


Fig. 4

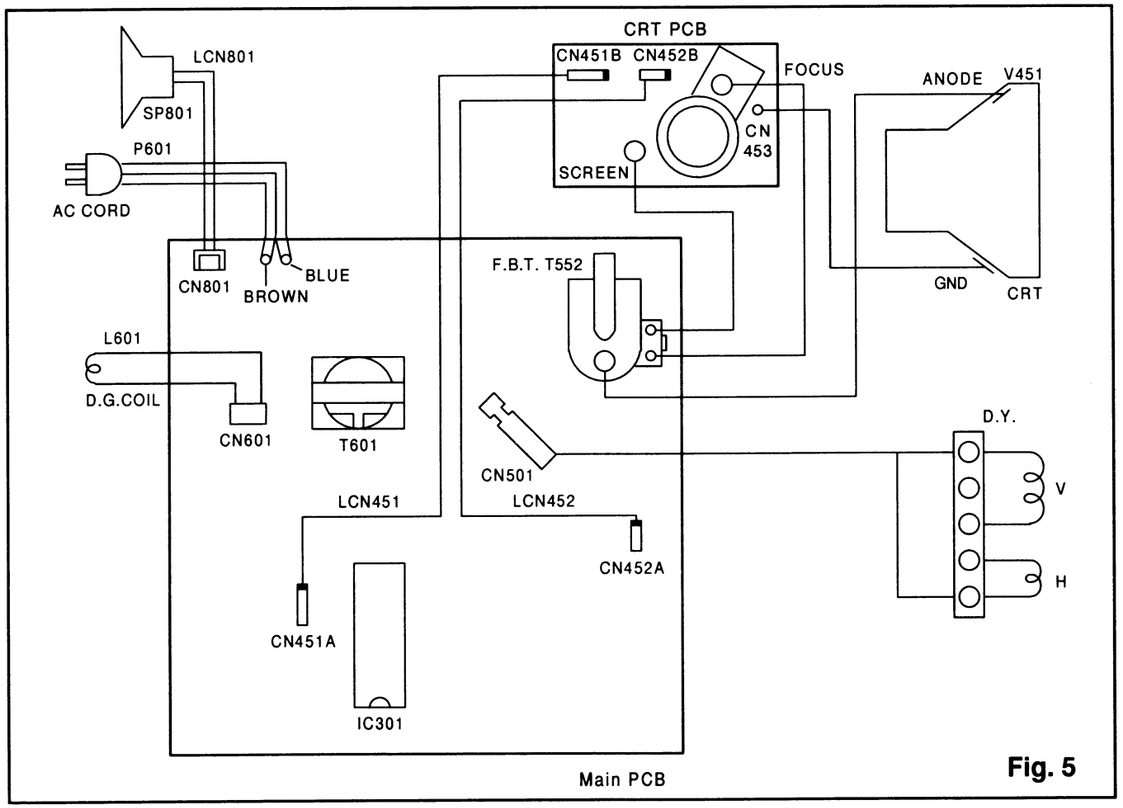


Fig. 5

ELECTRICAL ADJUSTMENT INSTRUCTIONS

Note:

Electrical adjustments are required after replacing circuit components. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

Test Equipment Required:

1. Monoscope
2. PAL and SECAM Pattern Generator
3. IF Sweeper and Scope
4. Spectrum Analyzer
5. DC Volt Meter
6. Oscilloscope: Dual Trace with 10:1 probe
7. Color Analyzer
8. AM S.S.G. (Standard Signal Generator)

How to Set Up the Service Mode:

Preset Mode: Press Picture Select button on the remote control unit, then press the number "1" button.

Brightness ——— Center
Color ——————— Center
Contrast ——— Approx 70%

All adjustment procedures must be performed in order of numbering.

Operate the unit more than 20 minutes.

1. Power Supply DC Voltage Adjustment

Purpose: To get correct voltage.

Symptom of Misadjustment: The picture is dark and unit does not operate correctly.

Test Point	Adjustment Point	Input
R621 TP1 (GND)	VR621	Monoscope Pattern
Equipment		**Spec.**
Monoscope DC Volt Meter		DC +112±0.5V

Reference Notes: R621, TP1, VR621 --- Main PCB

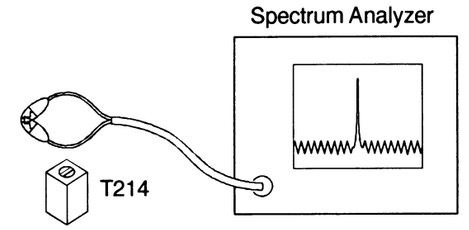
- Adjust VR621 so that the + of C623 becomes DC +112±0.5V.

2. VCO Adjustment

Purpose: To set the IF (Intermediate Frequency).

Symptom of Misadjustment: Proper picture cannot be obtained.

Test Point	Adjustment Point	Input
T214	T214	—
Equipment		**Spec.**
Spectrum Analyzer		38.0±0.05MHz
Connections of M. EQ.		



Reference Notes: T214 --- Main PCB

1. Short C214.
2. Set the Spectrum Analyzer as shown in the above table. (Make a loop by connecting both probes of the Spectrum Analyzer and bring the loop near T214 to pick up the leakage wave.)
3. Adjust T214 for reading 38.0±0.05MHz on the Spectrum Analyzer.

<without Spectrum Analyzer>

1. Turn T214 in both directions, right and left, far enough to find the point where Noise Bands or Beats appear on the TV Screen.
2. After finding those points in both directions, adjust T214 so that it is exactly half-way between those two points.
3. After the above adjustment, tune in another Local Broadcast. Then confirm that no Noise Bands or Beats appear on the TV Screen.

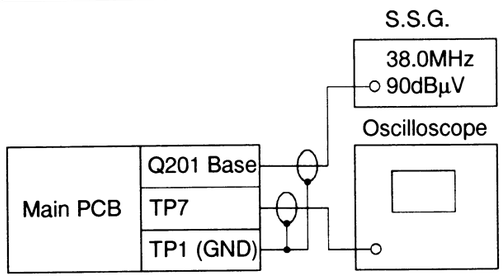
3. AFT Adjustment

Purpose: To operate AFT correctly.

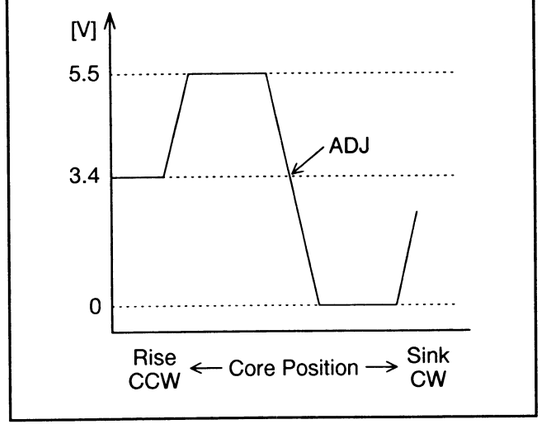
Symptom of Misadjustment: AFT does not work correctly and/or synchronization is faulty.

Test Point	Adjustment Point	Input
TP7 TP1 (GND)	T211	---
Equipment		**Spec.**
AM S.S.G. Oscilloscope		DC +3.4±0.2V

Connections of M. EQ.



Figure



Reference Notes: Q201, T211, TP1, TP7 --- Main PCB

1. Input the 38.0MHz (90dBμV) no modulating signal from Q201 base.
2. Turn the core inside of T211 counterclockwise until the top of core is the same height as metal case.
3. Turn the core of T211 clockwise and find the point where the voltage drops from approximately 5.5V to 0V immediately on the oscilloscope.
4. Turn the core of T211 little by little and find the point where DC +3.4±0.2V is obtained between the area mentioned in step 3.

Note: Before the adjustment, confirm that the tuner output does not have any noise except white noise.

4. AGC Adjustment

Purpose: Set AGC (Auto Gain Control) Level.

Symptom of Misadjustment: AGC does not synchronize correctly when RF Input Level is too weak and picture distortion may occur if it is too strong.

Test Point	Adjustment Point	Input
TP8 TP1 (GND)	VR211	PAL Color Bar
Equipment		**Spec.**
PAL Pattern Generator DC Volt Meter		DC +4.5±0.1V

Reference Notes: TP1, TP8, VR211 --- Main PCB

1. Receive the PAL Color Bar signal for channel 2 (48.25MHz). (RF Input Level: 80dBμV)
2. Adjust VR211 so that the voltage of TP8 becomes DC +4.5±0.1V. (ALPS TUNER)

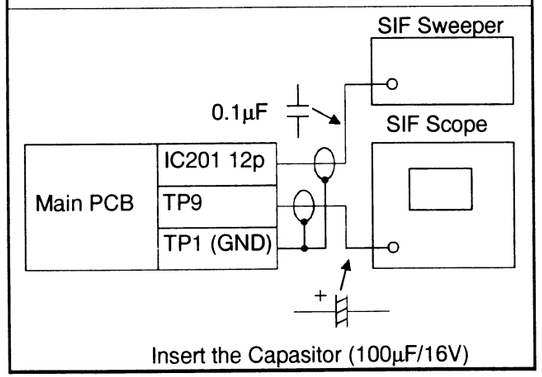
5. SIF Adjustment

Purpose: To set the SIF (Sound Intermediate Frequency).

Symptom of Misadjustment: Not sound.

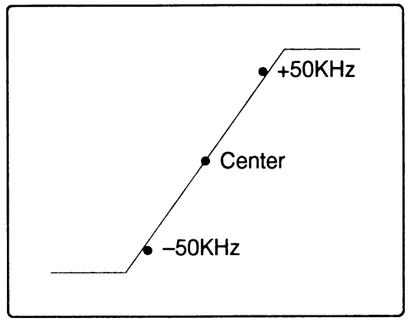
Test Point	Adjustment Point	Input
TP9 TP1 (GND)	T212, T213	---
Equipment		**Spec.**
SIF Sweeper & Scope		See below

Connections of M. EQ.



Insert the Capasitor (100μF/16V)

Figure



Note:
SIF waveform (–50~+50KHz) must be straight.

Reference Notes: TP1, TP9, T212, T213 --- Main PCB

1. Connect SIF Sweeper & Scope shown in the above table.
2. Adjust T212 (SIF=6.5MHz) so that the center mark will be center of SIF waveform and its waveform is straight.
3. Adjust T213 (SIF=5.5MHz) so that the center mark will be center of SIF waveform and its waveform is straight.
4. Repeat 2 & 3.

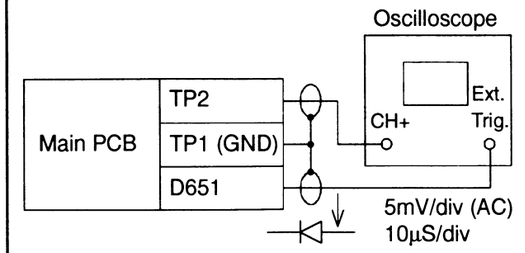
6. Bell Filter Adjustment

Purpose: To adjust the center frequency of SECAM bell filter.

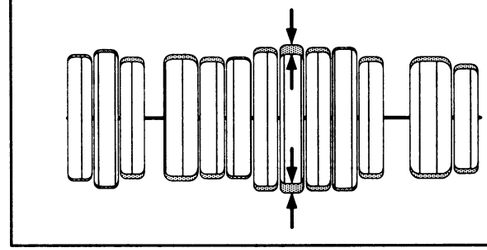
Symptom of Misadjustment: The color will be reversed when the SECAM signal is entered.

Test Point	Adjustment Point	Input
TP2 TP1 (GND)	T404	SECAM Color Bar
Equipment		**Spec.**
SECAM Pattern Generator Oscilloscope		See below

Connections of M. EQ.



Figure



Reference Notes: D651, TP1, TP2, T404 --- Main PCB

- Adjust T404 so that the waveform will be flat shown in the above figure.

7. SECAM Ident Coil Adjustment

Purpose: To adjust the peak value of SECAM Ident signal.

Symptom of Misadjustment: The display is not colored when the SECAM signal is entered.

Test Point	Adjustment Point	Input
TP5 TP1 (GND)	T403	SECAM Color Bar
Equipment		**Spec.**
SECAM Pattern Generator Oscilloscope		See below

Reference Notes: TP1, TP5, T403 --- Main PCB

1. Set oscilloscope to 10:1 probe, 0.2V/div (DC) and Range 5μS/div.
2. Adjust T403 so that the TP5 will be peak DC Voltage.

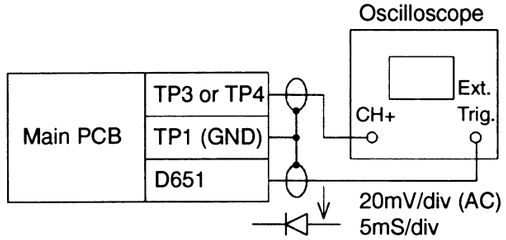
8. SECAM Demodulate Coil Adjustment

Purpose: To adjust the level of R-Y and (B-Y) color difference signal.

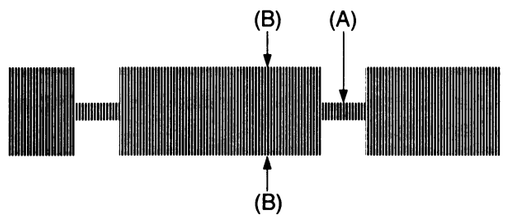
Symptom of Misadjustment: The Red, Green and Blue will be unbalanced.

Test Point	Adjustment Point	Input
TP3 (R-Y) TP4 (B-Y) TP1 (GND)	T402 (R-Y) T401 (B-Y)	SECAM Black Raster
Equipment		**Spec.**
SECAM Pattern Generator Oscilloscope		See below

Connections of M. EQ.



Figure



Reference Notes:
D651, TP1, TP3, TP4, T401, T402 — Main PCB

1. Adjust T402 with core driver so that (A) becomes center of (B) as shown in the above table. (TP3)
2. Adjust T401 with core driver so that (A) becomes center of (B) as shown in the above table. (TP4)

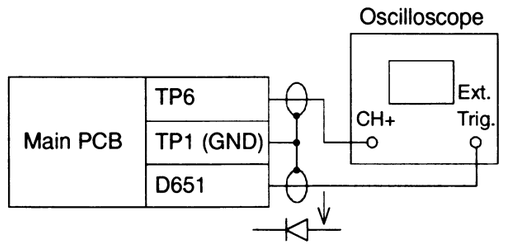
9. 1H Delay Line Adjustment

Purpose: To get correct 1H delay line when the PAL signal is entered.

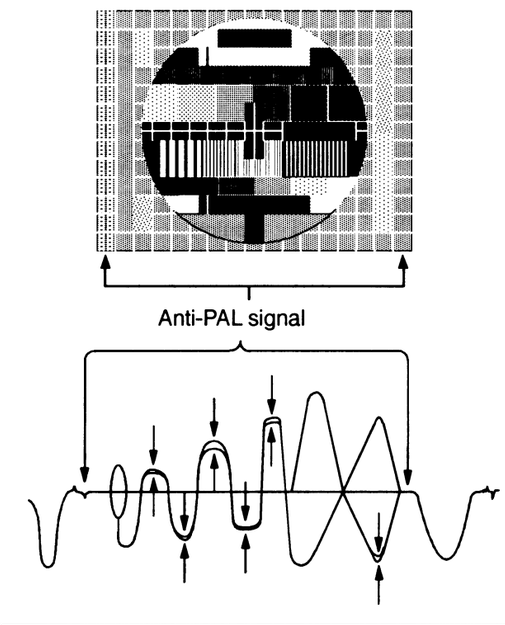
Symptom of Misadjustment: The Anti-PAL signal part is colored when the Philips Pattern is entered. Each scanning line is colored on the color bar.

Test Point	Adjustment Point	Input
TP6 TP1 (GND)	T301, VR301	Philips Pattern
Equipment		Spec.
PAL Pattern Generator Oscilloscope		See below

Connections of M. EQ.



Figure



Reference Notes:
D651, TP1, TP6, T301, VR301 — Main PCB

- Adjust VR301 and T301 so that the amplitude at Anti-PAL signal part becomes minimum (no color) and the waveform at the color bar part is not seen in double ("Venetian Blind" does not appear at the color bar signal part).

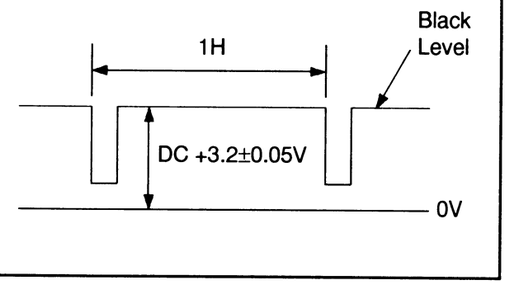
10. Black Level Adjustment

Purpose: To obtain optimum picture quality.

Symptom of Misadjustment: Black color may not be properly displayed (lighter or darker).

Test Point	Adjustment Point	Input
TP6 TP1 (GND)	VR351	Black Raster
Equipment		**Spec.**
Pattern Generator Oscilloscope		DC +3.2±0.05V

Figure



Reference Notes: TP1, TP6, VR351 — Main PCB

1. Preset the picture control to initial position.
2. Receive the Black Raster pattern.
3. Adjust VR351 so that the TP6 becomes DC +3.2±0.05V as shown in the above table. (TP6 waveform)

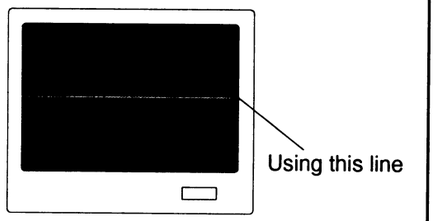
11. Cut Off Adjustment

Purpose: To adjust the beam current of Red, Green, Blue and screen voltage.

Symptom of Misadjustment: White color may be reddish, greenish or bluish. When the screen voltage is too high, the scanning line is appeared on the screen.

Test Point	Adjustment Point	Input
Screen	VR451 VR452 VR453 Screen-VR	Black Raster
Equipment		**Spec.**
Pattern Generator		See below

Figure



Reference Notes:
VR451, VR452, VR453, VR454, VR455 — CRT PCB
Screen-VR — Main PCB (FBT)

1. Degauss the CRT using Degaussing Coil..
2. Set the Screen-VR to minimum. (Counterclockwise)
3. Set the drive VRs (VR454, VR455) to mechanical center, and cut off VRs (VR451, VR452, VR453) to 10 o'clock position.
4. Short the Emitter and Collector of Q125. (Horizontal One Line)
5. Slowly turn the Screen-VR (FBT) to the point where horizontal line is just visible.
6. Adjust VR451 (R. Cut Off), VR452 (G. Cut Off) and VR453 (B. Cut Off) so that horizontal line becomes pure white.
7. Re-adjust the Screen-VR (FBT) to the point where horizontal line is just visible.
8. Open the Emitter and Collector of Q125.

Note: Confirm that White Balance Adj. is correct after this adjustment, and attempt White Balance Adj. if needed.

12. White Balance Adjustment

Purpose: To mix red, green and blue beams correctly for pure white.

Symptom of Misadjustment: White becomes bluish or reddish.

Test Point	Adjustment Point	Input
Screen	VR454 VR455	White Raster (APL 100%)
Equipment		**Spec.**
Pattern Generator Color Analyzer		See below

Reference Notes: VR454, VR455 — CRT PCB

1. Degauss the CRT using Degaussing Coil..
2. Set the color analyzer to the CHROMA mode and after zero point calibration, bring the optical sensor into close contact with center on the CRT surface.
3. Adjust VR454 (R. DRIVE) and VR455 (B. DRIVE) so that the respective chroma temperatures becomes 8000K-10MPCD (x : 0.300 / y : 0.290) ±3%.

Note: Confirm that Cut Off Adj. is correct after this adjustment, and attempt Cut Off Adj. if needed.

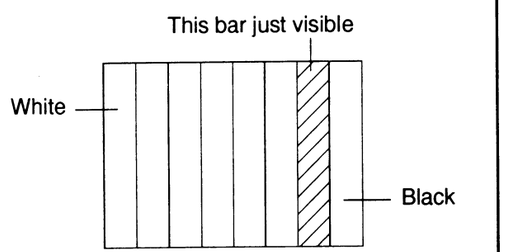
13. Sub Bright Adjustment

Purpose: To get proper brightness.

Symptom of Misadjustment: Proper brightness cannot be obtained by adjusting the Brightness Control.

Test Point	Adjustment Point	Input
Screen	Screen-VR	Gray Scale (8 step)
Equipment		**Spec.**
Pattern Generator		See Below

Figure



Reference Notes: Screen-VR — Main PCB (FBT)

- Adjust Screen-VR so that the level of dark gray bar (as shown above) is just visible.

  Note: Use the Gray Scale Signal without set up.

14. Focus Adjustment

Purpose: Set the optimum Focus.

Symptom of Misadjustment: Blurred images are shown on the display.

Test Point	Adjustment Point	Input
Screen	Focus VR	Monoscope Pattern
Equipment		**Spec.**
Monoscope		See below

Reference Note: Focus VR — Main PCB (FBT)

- Adjust Focus-VR (FBT) to be obtained clear picture.

15. V. Position & Size Adjustment

Purpose: To get correct vertical position and size of screen image.

Symptom of Misadjustment: Vertical position and size of screen image may not be properly displayed.

Test Point	Adjustment Point	Input
Screen	VR501, VR521	Monoscope Pattern
Equipment		**Spec.**
Monoscope		See below

Reference Note: VR501, VR521 — Main PCB

1. Adjust VR521 so that the top & bottom of Monoscope pattern will be equal.
2. Adjust VR501 so that the vertical size will be 90±5% of Monoscope Pattern and the circle is round.

16. H. Position & Size* Adjustment

Purpose: To get correct horizontal position and size of screen image.

Symptom of Misadjustment: Horizontal position and size of screen image may not be properly displayed.

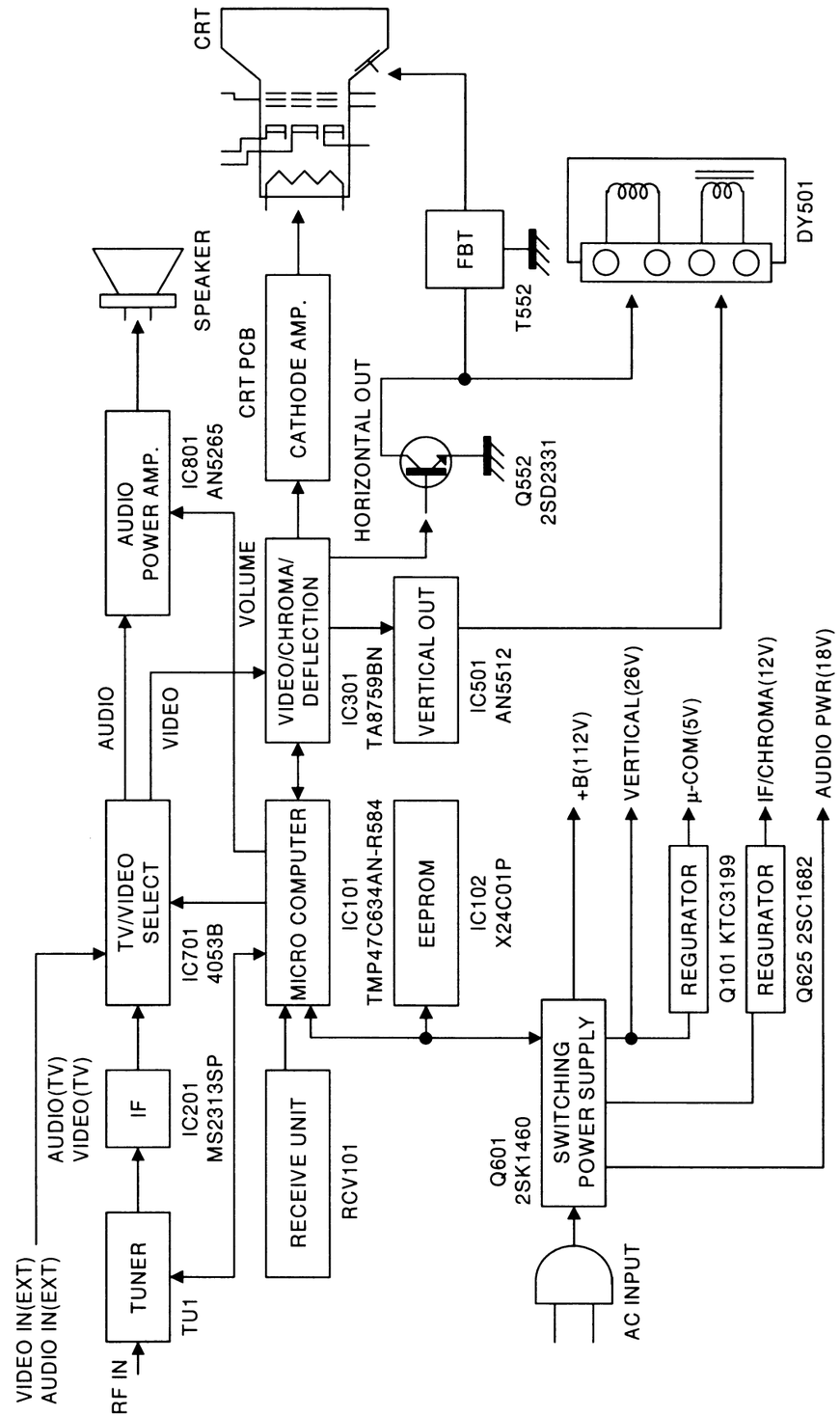
Test Point	Adjustment Point	Input
Screen	VR331 , L551	Monoscope Pattern
Equipment		**Spec.**
Monoscope		See below

Reference Note: VR331, L551 — Main PCB

1. Adjust VR331 so that the right & left of monoscope pattern will be equal.
2. Adjust L551 so that the horizontal size will be 90±5% of Monoscope Pattern and the circle is round.

* Only model with L551.

BLOCK DIAGRAM



SCHEMATIC DIAGRAMS / PCB'S AND TEST POINTS

Standard Notes

Warning

Critical components having special safety characteristics are identified witha ⚠ by the Ref. No. in the parts list and enclosed within a broken line * (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Funai Electric Company. Funai assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

Notes:

① Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.

② All resistance values are indicated in ohms ($K=10^3$, $M=10^6$).

③ Resistor wattages are 1/5W or 1/6W unless otherwise specified.

④ All capacitance values are indicated in μF ($P=10^{-6}$μF).

VOLTAGE CHART

(Unit: Volt)

Pin No.	IC101	IC102	IC201	IC501	IC601	IC701	IC801
1	2.4	0.0	2.1	0.0	44.0	5.9	0.0
2	4.5	0.0	5.9	14.2	42.9	6.1	5.0
3	4.4	0.0	5.0	0.0	0.0	2.5	0.0
4	3.8	0.0	2.7	27.6	0.6	2.5	7.3
5	1.3	4.9	1.9	15.3		0.7	9.0
6	0.0	4.9	1.5	0.7		0.0	9.0
7	0.0	0.0	0.0	-0.3		0.0	0.0
8	0.0	4.9	2.0	1.1		0.0	0.0
9	3.2		3.2	27.2		12.2	19.2
10	1.6		4.2			12.2	
11	1.6		3.6			12.2	
12	1.6		2.9			2.4	
13	0.0		5.3			2.4	
14	0.0		4.5			2.4	
15	0.0		4.4			5.9	
16	4.2		5.3			12.2	
17	0.2		2.6				
18	5.6		12.2				
19	6.0		2.6				
20	0.1		2.4				
21	0.0						
22	0.0						
23	0.0						
24	0.0						
25	0.0						
26	3.8						
27	4.7						
28	2.7						
29	2.8						
30	0.0						
31	2.1						
32	2.2						
33	4.9						
34	0.0						
35	4.0						
36	4.4						
37	0.0						
38	0.0						
39	4.9						
40	4.9						
41	4.9						
42	4.9						

Pin No.	IC301	Pin No.	IC301
1	8.8	33	7.0
2	8.2	34	3.2
3	8.8	35	0.8
4	6.6	36	7.9
5	6.6	37	
6	12.3	38	7.2
7	3.3	39	2.2
8	6.6	40	9.2
9	6.6	41	3.5
10	6.1	42	3.6
11	6.0	43	3.5
12	5.3	44	5.1
13	5.3	45	5.2
14	8.0	46	5.2
15	6.1	47	7.2
16	10.7	48	3.3
17	3.5	49	7.2
18	5.4	50	0.0
19	0.0	51	0.0
20	5.0	52	0.0
21	0.1	53	0.0
22	11.6	54	0.0
23	5.4	55	6.1
24	6.0	56	3.3
25	5.0	57	6.1
26	3.3	58	4.5
27	11.2	59	3.3
28	3.3	60	6.2
29	0.7	61	12.3
30	8.9	62	6.2
31	6.6	63	12.3
32	6.5	64	8.2

Input: PAL Color Bar Signal (with 1KHz Audio Signal)

Receiving Ch.: E2 ch (48.25MHz)

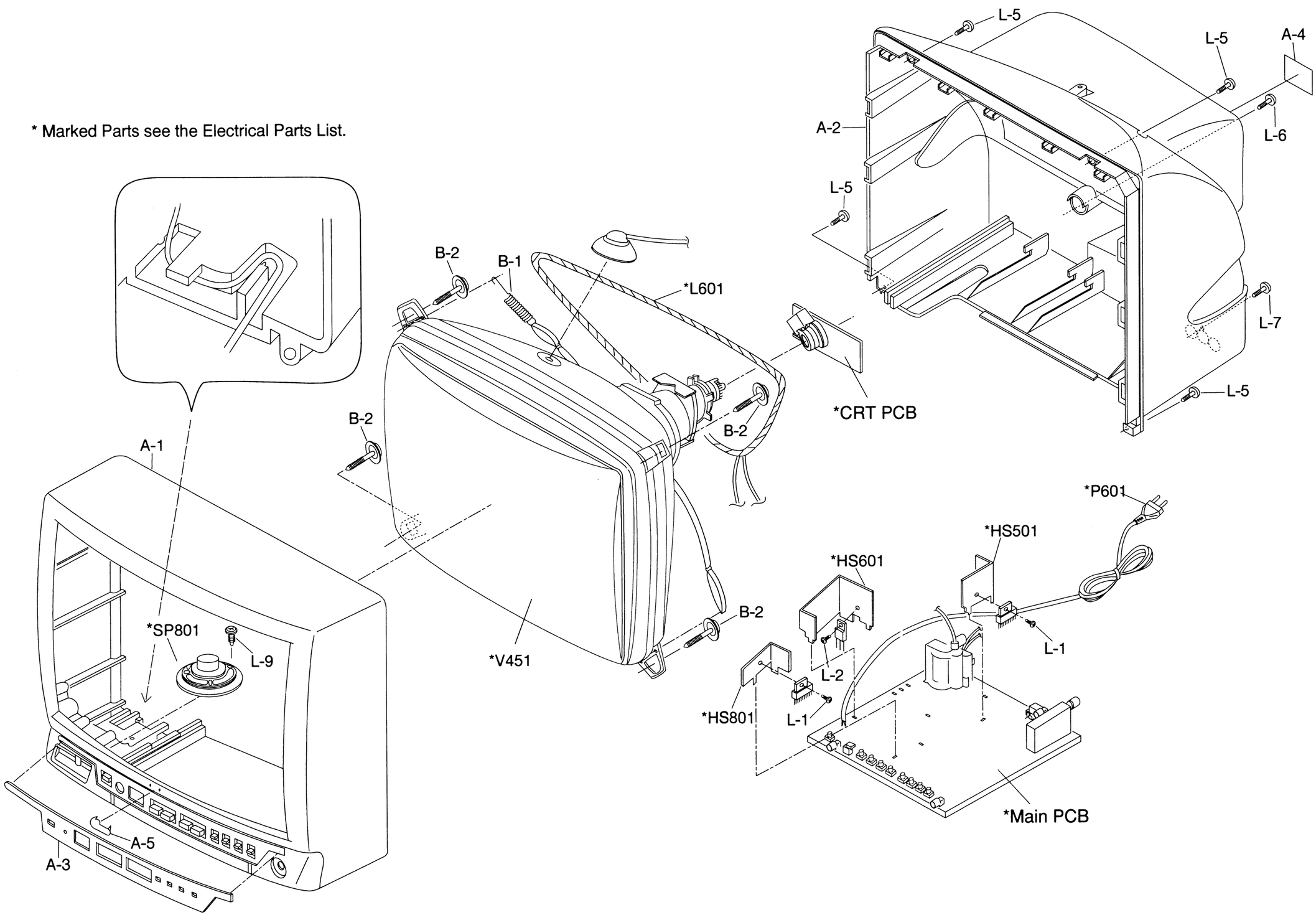
Preset Mode: Press Picture Select button on the remote control unit, then press the number "1" button.

Brightness--- Center
Color--- Center
Contrast--- Approx 70%

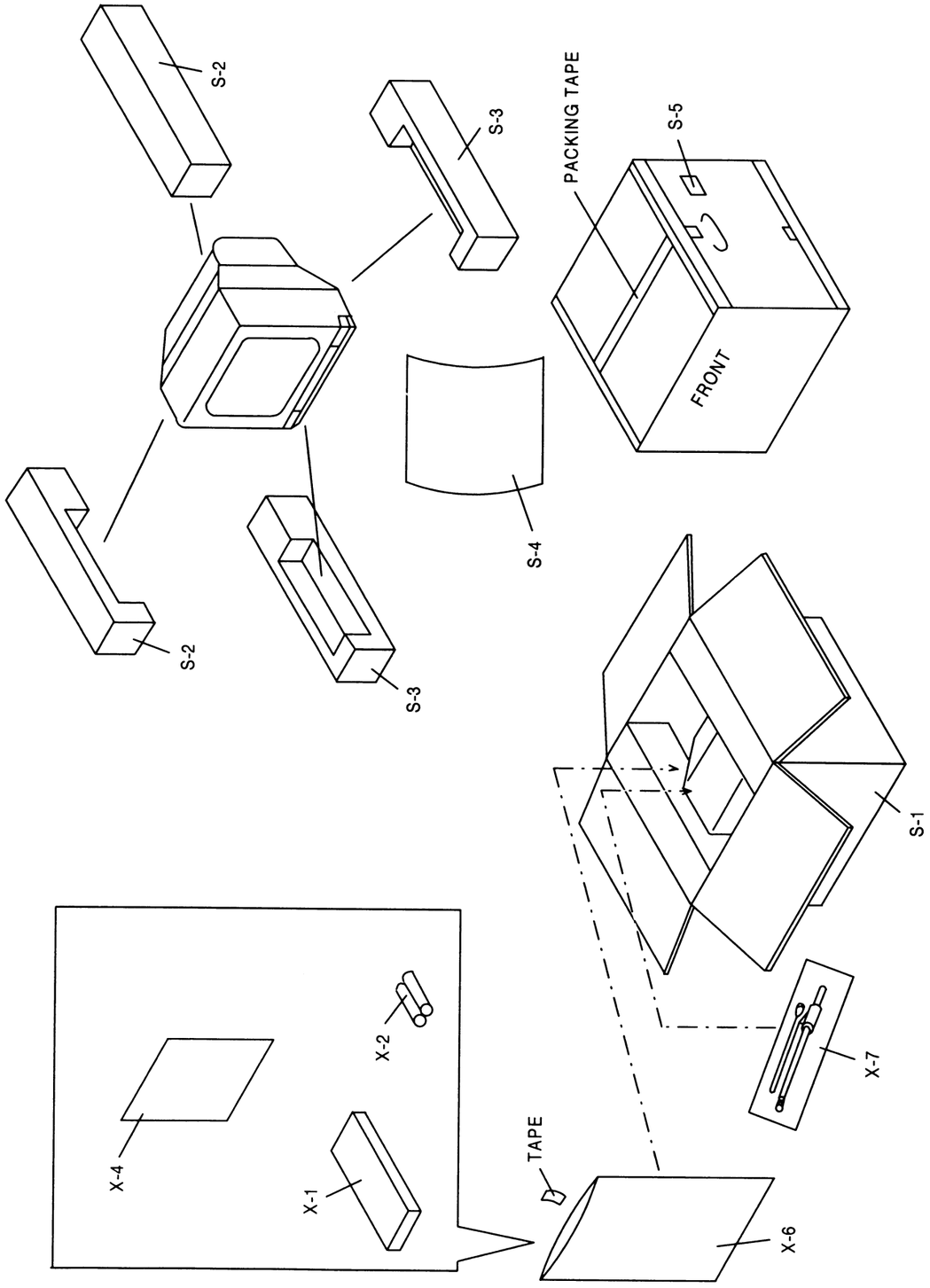
Pin No.	E	C	B
Q1	0.0	2.9	0.6
Q2	12.2	0.1	11.8
Q3	12.1	0.0	12.1
Q4	12.1	12.1	11.4
Q101	4.9	9.3	5.5
Q102	5.5	5.5	4.8
Q103	0.0	4.1	0.1
Q104	27.7	9.4	27.3
Q105	0.0	27.2	0.0
Q121	0.0	4.7	0.0
Q122	0.0	3.8	0.0
Q123	0.0	4.4	0.1
Q125	0.0	0.7	0.0
Q201	0.9	9.5	1.6
Q281	0.0	4.2	0.0
Q301	0.0	12.2	0.1
Q381	0.0	2.2	0.0
Q391	0.0	0.1	0.7
Q393	5.2	0.0	4.6
Q394	5.2	0.0	6.2
Q395	0.0	6.4	0.0
Q396	0.0	5.4	0.0
Q397	6.6	0.0	0.9
Q451	3.2	125.2	3.5
Q452	3.2	129	3.5
Q453	3.3	125.4	3.5
Q551	0.0	72.7	0.4
Q552	-0.2	122.7	0.0
Q601	0.7	–	0.1
Q602	0.0	0.7	-0.1
Q603	0.0	0.7	-8.0
Q604	0.6	0.0	0.7
Q621	6.7	43.0	7.3
Q622	3.2	112	0.1
Q623	0.0	0.0	0.5
Q625	12.8	14.0	12.3
Q702	2.4	12.3	3.0
Q703	1.8	12.3	2.4
Q704	0.0	12.2	0.0
Q705	0.0	12.2	0.0
Q801	0.0	4.1	0.4

EXPLODED VIEW

* Marked Parts see the Electrical Parts List.



PACKING EXPLODED VIEW



MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

Ref. No.	Description	Part No.
A-1	FRONT CABINET	0EM000162
A-2	REAR CABINET	0EM000163
A-3	CONTROL PLATE	0EM300797
A-4 ⚠	RATING LABEL	0EM402566
A-5	BRAND BADGE	0EM400975
B-1	TENTION SPRING	26WH006
B-2	CRT MOUNTING SCREW	8A00083
L-1	B-TIGHT SCREW 3X8 BIND HEAD+	GBMB3080
L-2	B-TIGHT SCREW 3X10 BIND HEAD+	GBMB3100
L-5	P-TIGHT SCREW 4X16 BIND HEAD+	GBMP4160
L-6	P-TIGHT SCREW 4X12 BIND HEAD+	GBKP4120
L-7	P-TIGHT SCREW 3X10 BIND HEAD+	GBKP3100
L-9	P-TIGHT SCREW 3X8 ø12-PAN HEAD+	GCMP3080
S-1	CARTON	0EM402567
S-2	STYROFORM TOP	0EM000165
S-3	STYROFORM BOTTOM	0EM000166
S-4	SET SHEET	0EM401153
S-5	SERIAL NO. LABEL	24LH033
X-1	REMOCON UNIT	UREMT20MM007
X-2	BATTERY UM-3X2 or	1790849
	BATTERY UM-3X2 or	1813020
	BATTERY UM-3X2	579W099
X-4 ⚠	OWNER'S MANUAL (E)	0EMN00938
X-6	POLYETHYLENE BAG	Z220300
X-7	ROD ANTENNA	0EMN00542

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTE: Parts that not assigned part numbers (----------) are not available.

Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%
G.....±2% J.....±5% K.....±10%
M.....±20% N.....±30% Z.....+80/-20%

PCB Assembly

Ref. No.	Description	Part No.
	PCB Assembly Consists of the following:	**MMA-132C**
	Main PCB Assembly CRT PCB Assembly	——— ———

Main PCB Assembly

Ref. No.	Description	Part No.
	Main PCB Assembly Consists of the following:	———
	CAPACITORS	
C 1	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 2	CHIP CERAMIC CAP. CH 100pF/50V or	12CH101C
	CHIP CERAMIC CAP. CH 100pF/50V	CHE1JJ8CH101
C 3	TF CAP. 0.1µF/50V or	125U104S
	TF CAP. 0.1µF/50V	122Z309S
C 4	TF CAP. 0.1µF/50V or	125U104S
	TF CAP. 0.1µF/50V	122Z309S
C 5	TF CAP. 0.1µF/50V or	125U104S
	TF CAP. 0.1µF/50V	122Z309S
C 6	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 7	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 8	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 9	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 10	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 11	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 101	ELECTROLYTIC CAP. 47µF/16V	126C476S
C 102	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 103	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 105	ELECTROLYTIC CAP. 220µF/6.3V	126A227S
C 110	ELECTROLYTIC CAP. 47µF/16V	126C476S
C 111	CHIP CERAMIC CAP. F 0.022µF/50V or	12F3223C
	CHIP CERAMIC CAP. F 0.022µF/50V	CHE1JZ80F223
C 155	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 156	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 171	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 172	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 173	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 174	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 175	CHIP CERAMIC CAP. CH 24pF/50V or	12CH240C
	CHIP CERAMIC CAP. CH 24pF/50V	CHE1JJ8CH240
C 176	CHIP CERAMIC CAP. CH 24pF/50V or	12CH240C
	CHIP CERAMIC CAP. CH 24pF/50V	CHE1JJ8CH240
C 185	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 186	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 187	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 188	CHIP CERAMIC CAP. SL 100pF/50V or	1270101C
	CHIP CERAMIC CAP. SL 100pF/50V	CHE1JJ8SL101
C 204	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 205	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 206	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 207	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 210	CERAMIC CAP. CH 27pF	32CH270
C 211	CHIP CERAMIC CAP. CH 10pF/50V or	12CH100C
	CHIP CERAMIC CAP. CH 10pF/50V	CHE1JD8CH100
C 212	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 213	TF CAP. 0.1µF/50V or	125U104S
	TF CAP. 0.1µF/50V	122Z309S
C 214	TF CAP. 0.47µF/50V or	125U474S
	TF CAP. 0.47µF/50V	122Z317S
C 215	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 216	ELECTROLYTIC CAP. 100µF/10V	126B107S
C 217	ELECTROLYTIC CAP. 0.47µF/50V	126F474S
C 219	CHIP CERAMIC CAP. SL 39pF/50V or	1270390C
	CHIP CERAMIC CAP. SL 39pF/50V	CHE1JJ8SL390
C 220	CHIP CERAMIC CAP. SL 47pF/50V or	1270470C
	CHIP CERAMIC CAP. SL 47pF/50V	CHE1JJ8SL470
C 221	CHIP CERAMIC CAP. SL 33pF/50V or	1270330C
	CHIP CERAMIC CAP. SL 33pF/50V	CHE1JJ8SL330
C 223	ELECTROLYTIC CAP. 100µF/16V	126C107S
C 224	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 226	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 227	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 230	CHIP CERAMIC CAP. UJ 39pF	CHE1JJ8UJ390
C 281	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 301	CERAMIC CAP. Z 0.022µF/50V	3F40223S
C 302	CHIP CERAMIC CAP. F 0.033µF/50V or	12F3333C
	CHIP CERAMIC CAP. F 0.033µF/50V	CHE1JZ80F333
C 303	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 304	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 305	ELECTROLYTIC CAP. 0.47µF/50V	126F474S
C 306	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 307	*MYLAR CAP. 0.056µF K or	1250563S
	MYLAR CAP. 0.056µF K	2250563S
C 308	CHIP CERAMIC CAP. B 0.01µF/50V or	12B3103C
	CHIP CERAMIC CAP. B 0.01µF/50V	CHE1JJ80B103
C 309	ELECTROLYTIC CAP. 2.2µF/50V	126X225S
C 310	CHIP CERAMIC CAP. SL 13pF/50V or	1270130C
	CHIP CERAMIC CAP. SL 13pF/50V	CHE1JJ8SL130
C 311	CHIP CERAMIC CAP. CH 39pF/50V or	12CH390C
	CHIP CERAMIC CAP. CH 39pF/50V	CHE1JJ8CH390
C 312	CHIP CERAMIC CAP. CH 27pF/50V or	12CH270C
	CHIP CERAMIC CAP. CH 27pF/50V	CHE1JJ8CH270
C 313	SEMICONDUCTOR CAP. 0.027µF/25V K	CDA1EKS0X273
C 314	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 317	CHIP CERAMIC CAP. SL 33pF/50V or	1270330C
	CHIP CERAMIC CAP. SL 33pF/50V	CHE1JJ8SL330
C 318	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 319	ELECTROLYTIC CAP. 100µF/16V	126C107S
C 331	SEMICONDUCTOR CAP. 0.015µF/25V K	CDA1EKS0X153
C 333	ELECTROLYTIC CAP. 0.47µF/50V (L.L) or	CE1JMAULLR47
	ELECTROLYTIC CAP. 0.47µF/50V (L.L)	CE1JMASLLR47
C 334	ELECTROLYTIC CAP. 100µF/16V	126C107S
C 335	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 336	SEMICONDUCTOR CAP. 0.022µF/25V K	CDA1EKS0X223
C 337	ELECTROLYIC CAP. 3.3µF/50V	126F335S
C 338	CHIP CERAMIC CAP. B 0.01µF/50V or	12B3103C
	CHIP CERAMIC CAP. B 0.01µF/50V	CHE1JJ80B103
C 339	CHIP CERAMIC CAP. B 330pF/50V or	12B3331C
	CHIP CERAMIC CAP. B 330pF/50V	CHE1JJ80B331
C 340	CHIP CERAMIC CAP. B 0.001µF/50V or	12B3102C
	CHIP CERAMIC CAP. B 0.001µF/50V	CHE1JJ80B102
C 341	CHIP CERAMIC CAP. SL 47pF or	1270470C
	CHIP CERAMIC CAP. SL 47pF	CHE1JJ8SL470
C 351	CHIP CERAMIC CAP. CH 180pF/50V or	12CH181C
	CHIP CERAMIC CAP. CH 180pF/50V	CHE1JJ8CH181
C 352	CHIP CERAMIC CAP. CH 180pF/50V or	12CH181C
	CHIP CERAMIC CAP. CH 180pF/50V	CHE1JJ8CH181
C 353	SEMICONDUCTOR CAP. 0.1µF/25V K	CDA1EKS0X104
C 354	ELECTROLYTIC CAP. 4.7µF/50V	126F475S
C 355	SEMICONDUCTOR CAP. 0.1µF/25V K	CDA1EKS0X104
C 356	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 357	CHIP CERAMIC CAP. CH 22pF/50V or	12CH220C
	CHIP CERAMIC CAP. CH 22pF/50V	CHE1JJ8CH220
C 358	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 359	CHIP CERAMIC CAP. SL 120pF/50V or	1270121C
	CHIP CERAMIC CAP. SL 120pF/50V	CHE1JJ8SL121
C 360	CHIP CERAMIC CAP. SL 56pF/50V or	1270560C
	CHIP CERAMIC CAP. SL 56pF/50V	CHE1JJ8SL560
C 361	ELECTROLYTIC CAP. 0.1µF/50V	126F104S
C 362	ELECTROLYTIC CAP. 0.1µF/50V	126F104S
C 363	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 364	ELECTROLYTIC CAP. 0.1µF/50V	126F104S
C 365	ELECTROLYTIC CAP. 0.47µF/50V	126F474S
C 366	ELECTROLYTIC CAP. 0.47µF/50V	126F474S
C 367	ELECTROLYTIC CAP. 0.47µF/50V	126F474S
C 381	CHIP CERAMIC CAP. SL 68pF/50V or	1270680C
	CHIP CERAMIC CAP. SL 68pF/50V	CHE1JJ8SL680
C 382	CHIP CERAMIC CAP. SL 33pF/50V or	1270330C
	CHIP CERAMIC CAP. SL 33pF/50V	CHE1JJ8SL330
C 383	CHIP CERAMIC CAP. SL 47pF/50V or	1270470C
	CHIP CERAMIC CAP. SL 47pF/50V	CHE1JJ8SL470
C 401	CHIP CERAMIC CAP. CH 180pF/50V or	12CH181C
	CHIP CERAMIC CAP. CH 180pF/50V	CHE1JJ8CH181
C 402	CHIP CERAMIC CAP. CH 180pF/50V or	12CH181C
	CHIP CERAMIC CAP. CH 180pF/50V	CHE1JJ8CH181
C 403	CHIP CERAMIC CAP. CH 7pF/50V	12CH709C
C 404	CHIP CERAMIC CAP. CH 20pF/50V or	12CH200C
	CHIP CERAMIC CAP. CH 20pF/50V	CHE1JJ8CH200
C 405	CHIP CERAMIC CAP. CH 6pF/50V	12CH609C
C 406	CHIP CERAMIC CAP. CH 20pF/50V or	12CH200C
	CHIP CERAMIC CAP. CH 20pF/50V	CHE1JJ8CH200
C 407	MYLAR CAP. 0.056µF K or	1250563S
	MYLAR CAP. 0.056µF K	2250563S
C 408	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 409	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 410	CHIP CERAMIC CAP. SL 27pF/50V or	1270270C
	CHIP CERAMIC CAP. SL 27pF/50V	CHE1JJ8SL270
C 412	CHIP CERAMIC CAP. F 0.01µF/50V or	12F3103C
	CHIP CERAMIC CAP. F 0.01µF/50V	CHE1JZ80F103
C 501	CHIP CERAMIC CAP. B 0.001µF/50V or	12B3102C
	CHIP CERAMIC CAP. B 0.001µF/50V	CHE1JJ80B102
C 502	ELECTROLYTIC CAP. 2.2µF/50V (L.L) or	CE1JMAULL2R2
	ELECTROLYTIC CAP. 2.2µF/50V (L.L)	CE1JMASLL2R2
C 503	TF CAP. 0.1µF/50V or	125U104S
	TF CAP. 0.1µF/50V	122Z309S
C 504	CHIP CERAMIC CAP. B 470pF/50V or	12B3471C
	CHIP CERAMIC CAP. B 470pF/50V	CHE1JJ80B471
C 505	MYLAR CAP. 0.033µF K or	1250333S
	MYLAR CAP. 0.033µF K	2250333S
C 506	ELECTROLYTIC CAP. 100µF/35V	126E107S
C 507	ELECTROLYTIC CAP. 100µF/35V	126E107S
C 508	ELECTROLYTIC CAP. 3.3µF/50V (L.L) or	CE1JMAULL3R3
	ELECTROLYTIC CAP. 3.3µF/50V (L.L)	CE1JMASLL3R3
C 509	ELECTROLYTIC CAP. 1000µF/25V	626D108
C 510	TF CAP. 0.1µF/50V or	125U104S
	TF CAP. 0.1µF/50V	122Z309S
C 511	ELECTROLYTIC CAP. 3.3µF/50V (L.L) or	CE1JMAULL3R3
	ELECTROLYTIC CAP. 3.3µF/50V (L.L)	CE1JMASLL3R3
C 551	CHIP CERAMIC CAP. B 330pF/50V or	12B3331C
	CHIP CERAMIC CAP. B 330pF/50V	CHE1JJ80B331
C 552	CERAMIC CAP. 330pF/500V	CCD2JKS0B331
C 553	CERAMIC CAP. 0.0022µF/500V	CCD2JKS0B222
C 554	P.P. CAP. 0.0082µF/1.6KV or	CA3C822DT007
	P.P. CAP. 0.0082µF/1.6KV or	122Z284
	P.P. CAP. 0.0082µF/1.6KV	1220499
	[used CRT: 370KRB22-TC09(SPYB)]	
	P.P. CAP. 0.0068µF/1.6KV or	CA3C682DT007
	P.P. CAP. 0.0068µF/1.6KV or	122Z283
	P.P. CAP. 0.0068µF/1.6KV	1220498
	[used CRT: A34KPU02XX48/ 37GDA85X-TC01]	
C 555	CERAMIC CAP. 470pF/2KV BN TYPE [used CRT: 37GDA85X-TC01]	CCD3DKA0B471
	CERAMIC CAP. 1000pF 2KV Bn [used CRT: A34KPU02XX48	CCD3DKA0B102
	[C555 Not used if the CRT:370KRB22-TC09 (SPYB) is used]	
C 556	P.P. CAP. 0.47µF/200V or	CT2E474DT003
	P.P. CAP. 0.47µF/200V [used CRT: 370KRB22-TC09(SPYB)/ A34KPU02XX48]	122Z256
	P.P. CAP. 0.56µF/200V or	CT2E564DT003
	P.P. CAP. 0.56µF/200V [used CRT: 37GDA85X-TC01]	122Z257
C 557	ELECTROLYTIC CAP. 1µF/250V or	CE2EMZNTL010

* Mylar is a registered trademark of E. I. DuPont de Nemours and Company.

Ref. No.	Description	Part No.
	ELECTROLYTIC CAP. 1µF/250V or	122Z340
	ELECTROLYTIC CAP. 1µF/250V or	6220690
	ELECTROLYTIC CAP. 1µF/250V	CE2EMZDDL010
C 601 ⚠	LINE ACROSS CAP. 0.1µF/250V or	CT2E104DT001
	LINE ACROSS CAP. 0.1µF/250V or	122Z181
	LINE ACROSS CAP. 0.1µF/250V	CA2E104MS005
C 603	CERAMIC CAP. 0.0022µF AC250V or	CCH2EZP0E222
	CERAMIC CAP. 0.0022µF AC250V	CCD2EZA0E222
C 604	CERAMIC CAP. 0.0022µF AC250V or	CCH2EZP0E222
	CERAMIC CAP. 0.0022µF AC250V	CCD2EZA0E222
C 605	CERAMIC CAP. 0.0022µF AC250V or	CCH2EZP0E222
	CERAMIC CAP. 0.0022µF AC250V	CCD2EZA0E222
C 606	CERAMIC CAP. 0.0022µF AC250V or	CCH2EZP0E222
	CERAMIC CAP. 0.0022µF AC250V	CCD2EZA0E222
C 607	ELECTROLYTIC CAP. 100µF/400V	CA2H101NC008
C 608	ELECTROLYTIC CAP. 33µF/25V	126D336S
C 609	MYLAR CAP. 0.0082µF K or	1250823S
	MYLAR CAP. 0.0082µF K	2250823S
C 610	MYLAR CAP. 0.01µF K or	1250103S
	MYLAR CAP. 0.01µF K	2250103S
C 611	MYLAR CAP. 0.033µF K or	1250333S
	MYLAR CAP. 0.033µF K	2250333S
C 613	MYLAR CAP. 0.0022µF K or	1250222S
	MYLAR CAP. 0.0022µF K	2250222S
C 614	MYLAR CAP. 0.0022µF K or	1250222S
	MYLAR CAP. 0.0022µF K	2250222S
C 615	CERAMIC CAP. 220pF/2KV or	CCD3DKP0B221
	CERAMIC CAP. 220pF/2KV	6220581
C 617 ⚠	CERAMIC CAP. 0.0047µF AC400V or	CCG2HZP0Z472
	CERAMIC CAP. 0.0047µF AC400V	1220353
C 618 ⚠	CERAMIC CAP. 0.0047µF AC400V or	CCG2HZP0Z472
	CERAMIC CAP. 0.0047µF AC400V	1220353
C 619 ⚠	CERAMIC CAP. 0.0047µF AC400V or	CCG2HZP0Z472
	CERAMIC CAP. 0.0047µF AC400V	1220353
C 622	ELECTROLYTIC CAP. 100µF/16V	126C107S
C 623	ELECTROLYTIC CAP. 100µF/160V (105°C) or	CA2C101NC009
	ELECTROLYTIC CAP. 100µF/160V (105°C)	CE2CMZDEH101
C 624	CERAMIC CAP. 470pF/500V	CCD2JKS0B471
C 625	ELECTROLYTIC CAP. 2200µF/16V or	CE1CMRDDL222
	ELECTROLYTIC CAP. 2200µF/16V	626C228
C 626	MYLAR CAP. 0.001µF K or	1250102S
	MYLAR CAP. 0.001µF K	2250102S
C 627	ELECTROLYTIC CAP. 470µF/35V or	CE1GMRDDL471
	ELECTROLYTIC CAP. 470µF/35V	626E477
C 628	CERAMIC CAP. 0.001µF/500V	CCD2JKS0B102
C 629	ELECTROLYTIC CAP. 470µF/25V or	CE1EMRDDL471
	ELECTROLYTIC CAP. 470µF/25V	626D477
C 631	ELECTROLYTIC CAP. 220µF/16V	126C227S
C 634	CERAMIC CAP. SL 15pF	3S41150S
C 635	ELECTROLYTIC CAP. 47µF/160V (105°C)or	CA2C470NC009
	ELECTROLYTIC CAP. 47µF/160V (105°C)	CE2CMZDEH470
C 651	CERAMIC CAP. 0.001µF/500V	CCD2JKS0B102
C 652	ELECTROLYTIC CAP. 4.7µF/100V	CE2AMASDL4R7
C 653	CERAMIC CAP. 0.0047µF/500V	CCD2JKD0B472
C 701	ELECTROLYTIC CAP. 47µF/16V	126C476S
C 702	ELECTROLYTIC CAP. 4.7µF/50V	126F475S
C 703	SEMICONDUCTOR CAP. 0.056µF/25V K	CDA1EKS0X563
C 704	ELECTROLYTIC CAP. 1µF/50V	126F105S
C 801	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 802	ELECTROLYTIC CAP. 2.2µF/50V	126F225S
C 803	CHIP CERAMIC CAP. B 0.018µF/50V or	12B3183C
	CHIP CERAMIC CAP. B 0.018µF/50V	CHE1JJ80B183
C 804	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 805	ELECTROLYTIC CAP. 10µF/50V	126F106S
C 806	ELECTROLYTIC CAP. 470µF/25V or	CE1EMRDDL471
	ELECTROLYTIC CAP. 470µF/25V	626D477

Ref. No.	Description	Part No.
C 807	ELECTROLYTIC CAP. 470µF/10V	126B477S
C 808	ELECTROLYTIC CAP. 470µF/10V	126B477S
C 809	SEMICONDUCTOR CAP. 0.1µF/25V K	CDA1EKS0X104
	CONNECTORS	
CN501	CONNECTOR BASE 5P or (for D.Y.)	J3RTC05JG001
	CONNECTOR BASE 5P or (for D.Y.)	J3RTC05MY002
	CONNECTOR BASE 5P (for D.Y.)	1730812
CN601	CONNECTOR BASE 2P or (for D.G.COIL)	J3RTC02JG001
	CONNECTOR BASE 2P or (for D.G.COIL)	J3RTC02MY002
	CONNECTOR BASE 2P (for D.G.COIL)	1780276
CN801	CONNECTOR BASE 2P or (for SPEAKER)	J383C02UG002
	CONNECTOR BASE 2P (for SPEAKER)	1770258
	DIODES	
D 1	ZENER DIODE L5631	L5631
D 2	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 3	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 4	ZENER DIODE UZ-7.5BS (B)	QDSB0UZ7R5BS
D 5	ZENER DIODE UZ-7.5BS (B)	QDSB0UZ7R5BS
D 101	ZENER DIODE UZ-5.6BS (B)	QDSB0UZ5R6BS
D 102	ZENER DIODE UZ-4.3BS (B)	QDSB0UZ4R3BS
D 111	LED 5132T or	NP4Z0005132T
	LED SLR-55VC 3F	1401273
D 171	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 173	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 174	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 201	ZENER DIODE UZ-5.1BS (B)	QDSB0UZ5R1BS
D 283	ZENER DIODE UZ-20BS (B)	QDSB00UZ20BS
D 284	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 285	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 286	ZENER DIODE UZ-12BS (B)	QDSB00UZ12BS
D 287	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 331	ZENER DIODE UZ-9.1BS (C)	QDSC0UZ9R1BS
D 501	ZENER DIODE UZ-7.5BS (B)	QDSB0UZ7R5BS
D 502	DIODE ERA15-02KFRB	QDNZ0ERA1502
D 503	DIODE 1N4148M	QDSZ01N4148M
D 555	DIODE ERB44-04L3	QDQZ0ERB4404
D 603	DIODE ERB12-10L3	QDQZ0ERB1210
D 604	DIODE ERB12-10L3	QDQZ0ERB1210
D 605	DIODE ERB12-10L3	QDQZ0ERB1210
D 606	DIODE ERB12-10L3	QDQZ0ERB1210
D 611	ZENER DIODE UZ-15BS (B)	QDSB00UZ15BS
D 612	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 613	ZENER DIODE UZ-7.5BS (B)	QDSB0UZ7R5BS
D 615	DIODE 1N4148M	QDSZ01N4148M
D 616	DIODE 1N4148M	QDSZ01N4148M
D 621	DIODE ERD38-06L	AERD3806L000
D 622	DIODE ERB44-04L3	QDQZ0ERB4404
D 623	DIODE ERB44-04L3	QDQZ0ERB4404
D 624	DIODE ERB44-04L3	QDQZ0ERB4404
D 625	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 626	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 627	DIODE 1Z150 (LC6) or	QD4Z0001Z150
	DIODE EQB01-150	AEQB01150000
D 628	ZENER DIODE MTZ-6.8B	QDUB00MTZ6R8
D 629	DIODE 1N4148M or	QDSZ01N4148M

Ref. No.	Description	Part No.
	DIODE 1SS176	1SS176S
D 631	ZENER DIODE UZ-12BS (B)	QDSB00UZ12BS
D 632	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 633	ZENER DIODE UZ-3.9BS (B)	QDSB0UZ3R9BS
D 634	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 635	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 651	DIODE ERB44-04L3	QDQZ0ERB4404
D 652	ZENER DIODE UZ-12BS (B)	QDSB00UZ12BS
D 701	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 702	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
D 801	DIODE 1N4148M or	QDSZ01N4148M
	DIODE 1SS176	1SS176S
	ICS	
IC101	IC TMP47C634AN-R584	QSMQA0ZTS045
IC102	IC 24LC01B/P or	NSMMA0SMH002
	IC X24C01AP or	NSMMA0ZXC003
	IC ST24C01CB1 or	NSMMA0ZSS002
	IC AT24C01A-10PC	NSMMA0ZAZ003
IC201	IC M52313SP	QSBLA0SMB011
IC301	IC TA8759BN	QSBLB0ZTS042
IC501	IC AN5512	QSBLA0SMS006
IC601 ⚠	PHOTO COUPLER PC120	QPEZ00PC120F
IC701	IC TC4053BP or	14DW168
	IC BU4053B or	14LF166
	IC MC14053BCP or	14D0168
	IC NJU4053BD	14D0436
IC801	IC AN5265	14LN160
	COILS	
L 171	MICRO INDUCTOR 39µH J	2164390S
L 201	MICRO INDUCTOR 1µH K	2165109S
L 202	MICRO INDUCTOR 2.2µH K	2165229S
L 212	MICRO INDUCTOR 10µH K	2165100S
L 213	MICRO INDUCTOR 8.2µH K	2165829S
L 301	MICRO INDUCTOR 8.2µH K	2165829S
L 351	MICRO INDUCTOR 68µH K	2165680S
L 352	MICRO INDUCTOR 33µH K	2165330S
L 353	MICRO INDUCTOR 68µH K	2165680S
L 381	MICRO INDUCTOR 18µH K	2165180S
T 211	CASING COIL or	LFA07V0MM041
	CASING COIL	LFA07V0SF097
T 212	CASING COIL or	LFA07V0MM040
	CASING COIL	LFA07V0SF099
T 213	CASING COIL or	LFA07V0MM039
	CASING COIL	LFA07V0SF098
T 214	CASING COIL or	LFA07V0MM042
	CASING COIL	LFA07V0SF096
L 621	POT TYPE COIL 47µH or	LLARZGZSF470
	POT TYPE COIL 47µH	LLBD**DMM001
T 301	CASING COIL or	LFA07V0MM029
	CASING COIL or	LFA07V0SF100
	CASING COIL	LFA07V0SF105
T 401	CASING COIL or	LFA07V0MM031
	CASING COIL or	LFA07V0SF103
	CASING COIL	LFA07V0SF108
T 402	CASING COIL or	LFA07V0MM031
	CASING COIL or	LFA07V0SF103
	CASING COIL	LFA07V0SF108
T 403	CASING COIL or	LFA07V0MM030
	CASING COIL or	LFA07V0SF102
	CASING COIL	LFA07V0SF107
T 404	CASING COIL or	LFA07V0MM032

Ref. No.	Description	Part No.
	CASING COIL or	LFA07V0SF101
	CASING COIL	LFA07V0SF106
	TRANSISTORS	
Q 1	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 2	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 3	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 4	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 101	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 102	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 103	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 104	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 105	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 121	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 122	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 123	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 125	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA

Ref. No.	Description	Part No.
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 201	TRANSISTOR 2SC3000 (D) or	2SC3000DZ
	TRANSISTOR 2SC3000 (E)	2SC3000EZ
Q 281	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 301	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 381	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 391	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 393	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 394	TRANSISTOR KTA1266 (GR) or	NQS40KTA1266
	TRANSISTOR KTA1267 (GR) or	NQS10KTA1267
	TRANSISTOR 2SA1318 (T) or	2SA1318TZ
	TRANSISTOR 2SA1318 (U) or	2SA1318UZ
	TRANSISTOR 2SA1015 (GR)	QQS102SA1015
Q 395	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 396	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 397	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 551	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E)	2SC2271EZ
Q 552	TRANSISTOR 2SD2331LS	QQPZ02SD2331
Q 601 ⚠	FET 2SK1460	QF9Z02SK1460
Q 602	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 603	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 604	TRANSISTOR 2SB698 (F) or	QQSF002SB698
	TRANSISTOR 2SB698 (G) or	QQSG002SB698
	TRANSISTOR 2SA950 (Y)	Q2SA950YTPE2

Ref. No.	Description	Part No.
Q 621	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E)	2SC2271EZ
Q 622	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E)	2SC2271EZ
Q 623	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E)	2SC2271EZ
Q 625	TRANSISTOR 2SD1682(S) or	QQ3S02SD1682
	TRANSISTOR 2SD1682(T)	QQ3T02SD1682
Q 702	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 703	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 704	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 705	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815
Q 801	TRANSISTOR KTC3198 (GR) or	NQS40KTC3198
	TRANSISTOR KTC3199 (GR) or	NQS10KTC3199
	TRANSISTOR 2SC3331 (T) or	QSC3331TNPAA
	TRANSISTOR 2SC3331 (U) or	QSC3331UNPAA
	TRANSISTOR 2SC1815 (GR)	QQS102SC1815

RESISTORS

R 1	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 2	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 3	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 4	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 5	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 6	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 7	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 8	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 9	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 10	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 11	CHIP RES. 1/10W 3.3KΩ or	134F332C
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 12	CHIP RES. 1/10W 3.3KΩ or	134F332C
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 13	CHIP RES. 1/10W 5.6KΩ or	134F562C
	CHIP RES. 1/10W 5.6KΩ	RRXAJR8Z0562
R 14	CHIP RES. 1/10W 5.6KΩ or	134F562C
	CHIP RES. 1/10W 5.6KΩ	RRXAJR8Z0562
R 15	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 16	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103

Ref. No.	Description	Part No.
R 17	CHIP RES. 1/10W 4.7Ω	134F479C
R 101	CARBON RES. 1/4W 10Ω	RCX4JASZ0100
R 102	CARBON RES. 1/4W 330Ω	RCX4JASZ0331
R 103	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 104	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 105	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 106	CHIP RES. 1/10W 8.2KΩ or	134F822C
	CHIP RES. 1/10W 8.2KΩ	RRXAJR8Z0822
R 107	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 108	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 109	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 110	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 111	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 112	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 113	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 118	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 119	CARBON RES. 1/4W 10KΩ	RCX4JASZ0103
R 121	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 122	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 123	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 124	CHIP RES. 1/10W 390Ω or	134F391C
	CHIP RES. 1/10W 390Ω	RRXAJR8Z0391
R 125	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 127	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 128	CHIP RES. 1/10W 100Ω or	134F101C
	CHIP RES. 1/10W 100Ω	RRXAJR8Z0101
R 130	CHIP RES. 1/10W 100KΩ or	134F104C
	CHIP RES. 1/10W 100KΩ	RRXAJR8Z0104
R 133	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 135	CHIP RES. 1/10W 2.2KΩ or	134F222C
	CHIP RES. 1/10W 2.2KΩ	RRXAJR8Z0222
R 136	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 139	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 145	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 146	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 152	CARBON RES. 1/4W 4.7KΩ	RCX4JASZ0472
R 153	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 154	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 155	CHIP RES. 1/10W 6.8KΩ or	134F682C
	CHIP RES. 1/10W 6.8KΩ	RRXAJR8Z0682
R 156	CHIP RES. 1/10W 6.8KΩ or	134F682C
	CHIP RES. 1/10W 6.8KΩ	RRXAJR8Z0682
R 158	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103

Ref. No.	Description	Part No.
R 159	CARBON RES. 1/4W 10KΩ	RCX4JASZ0103
R 161	CHIP RES. 1/10W 6.8KΩ or	134F682C
	CHIP RES. 1/10W 6.8KΩ	RRXAJR8Z0682
R 162	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 164	CHIP RES. 1/10W 68KΩ or	134F683C
	CHIP RES. 1/10W 68KΩ	RRXAJR8Z0683
R 165	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 166	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 167	CHIP RES. 1/10W 1.8KΩ or	134F182C
	CHIP RES. 1/10W 1.8KΩ	RRXAJR8Z0182
R 169	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 171	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 172	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 173	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 174	CARBON RES. 1/4W 680Ω	RCX4JASZ0681
R 175	CHIP RES. 1/10W 68KΩ or	134F683C
	CHIP RES. 1/10W 68KΩ	RRXAJR8Z0683
R 178	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 179	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 180	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 181	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 185	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 186	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 187	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 188	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 189	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 190	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 201	CHIP RES. 1/10W 82Ω or	134F820C
	CHIP RES. 1/10W 82Ω	RRXAJR8Z0820
R 202	CHIP RES. 1/10W 6.8KΩ or	134F682C
	CHIP RES. 1/10W 6.8KΩ	RRXAJR8Z0682
R 203	CHIP RES. 1/10W 1.5KΩ or	134F152C
	CHIP RES. 1/10W 1.5KΩ	RRXAJR8Z0152
R 204	CHIP RES. 1/10W 330Ω or	134F331C
	CHIP RES. 1/10W 330Ω	RRXAJR8Z0331
R 205	CHIP RES. 1/10W 33Ω or	134F330C
	CHIP RES. 1/10W 33Ω	RRXAJR8Z0330
R 206	CHIP RES. 1/10W 100Ω or	134F101C
	CHIP RES. 1/10W 100Ω	RRXAJR8Z0101
R 207	CHIP RES. 1/10W 2.2KΩ or	134F222C
	CHIP RES. 1/10W 2.2KΩ	RRXAJR8Z0222
R 211	CHIP RES. 1/10W 3.3KΩ or	134F332C
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 213	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 214	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 215	CHIP RES. 1/10W 47Ω or	134F470C
	CHIP RES. 1/10W 47Ω	RRXAJR8Z0470
R 216	CHIP RES. 1/10W 560Ω or	134F561C
	CHIP RES. 1/10W 560Ω	RRXAJR8Z0561
R 217	CHIP RES. 1/10W 1KΩ or	134F102C

Ref. No.	Description	Part No.
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 218	CHIP RES. 1/10W 180Ω or	134F181C
	CHIP RES. 1/10W 180Ω	RRXAJR8Z0181
R 219	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 220	CHIP RES. 1/10W 270KΩ or	134F274C
	CHIP RES. 1/10W 270KΩ	RRXAJR8Z0274
R 221	METAL RES. 1W 120Ω or	RN01JZDZ0121
	METAL RES. 1W 120Ω	RN01121KE004
R 222	CHIP RES. 1/10W 1.5KΩ or	134F152C
	CHIP RES. 1/10W 1.5KΩ	RRXAJR8Z0152
R 283	CARBON RES. 1/4W 10KΩ	RCX4JASZ0103
R 284	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 285	CARBON RES. 1/4W 220KΩ	RCX4JASZ0224
R 286	CARBON RES. 1/4W 27KΩ	RCX4JASZ0273
R 301	CHIP RES. 1/10W 560Ω or	134F561C
	CHIP RES. 1/10W 560Ω	RRXAJR8Z0561
R 302	CHIP RES. 1/10W 8.2KΩ or	134F822C
	CHIP RES. 1/10W 8.2KΩ	RRXAJR8Z0822
R 303	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 304	CHIP RES. 1/10W 6.8KΩ or	134F682C
	CHIP RES. 1/10W 6.8KΩ	RRXAJR8Z0682
R 305	CHIP RES. 1/10W 390Ω or	134F391C
	CHIP RES. 1/10W 390Ω	RRXAJR8Z0391
R 306	CHIP RES. 1/10W 2.2KΩ or	134F222C
	CHIP RES. 1/10W 2.2KΩ	RRXAJR8Z0222
R 307	CHIP RES. 1/10W 330KΩ or	134F334C
	CHIP RES. 1/10W 330KΩ	RRXAJR8Z0334
R 308	CHIP RES. 1/10W 3.3KΩ or	134F332C
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 309	CHIP RES. 1/10W 1.8MΩ or	134F185C
	CHIP RES. 1/10W 1.8MΩ	RRXAJR8Z0185
R 310	CHIP RES. 1/10W 1.2KΩ or	134F122C
	CHIP RES. 1/10W 1.2KΩ	RRXAJR8Z0122
R 311	CHIP RES. 1/10W 1.8KΩ or	134F182C
	CHIP RES. 1/10W 1.8KΩ	RRXAJR8Z0182
R 312	CHIP RES. 1/10W 5.6KΩ or	134F562C
	CHIP RES. 1/10W 5.6KΩ	RRXAJR8Z0562
R 313	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 314	CHIP RES. 1/10W 5.6KΩ or	134F562C
	CHIP RES. 1/10W 5.6KΩ	RRXAJR8Z0562
R 315	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 316	CHIP RES. 1/10W 33KΩ or	134F333C
	CHIP RES. 1/10W 33KΩ	RRXAJR8Z0333
R 321	CHIP RES. 1/10W 4.7MΩ or	134F475C
	CHIP RES. 1/10W 4.7MΩ	RRXAJR8Z0475
R 322	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 331	CHIP RES. 1/10W 2.7KΩ or	134F272C
	CHIP RES. 1/10W 2.7KΩ	RRXAJR8Z0272
R 332	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 333	CHIP RES. 1/10W 150Ω or	134F151C
	CHIP RES. 1/10W 150Ω	RRXAJR8Z0151
R 334	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 335	CHIP RES. 1/10W 270Ω or	134F271C
	CHIP RES. 1/10W 270Ω	RRXAJR8Z0271
R 336	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 337	CHIP RES. 1/10W 470Ω or	134F471C
	CHIP RES. 1/10W 470Ω	RRXAJR8Z0471
R 338	CHIP RES. 1/10W 3.3KΩ or	134F332C

Ref. No.	Description	Part No.
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 339	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 340	CHIP RES. 1/10W 150Ω or	134F151C
	CHIP RES. 1/10W 150Ω	RRXAJR8Z0151
R 341	CHIP RES. 1/10W 120Ω or	134F121C
	CHIP RES. 1/10W 120Ω	RRXAJR8Z0121
R 342	CHIP RES. 1/10W 330KΩ or	134F334C
	CHIP RES. 1/10W 330KΩ	RRXAJR8Z0334
R 343	CHIP RES. 1/10W 120KΩ or	134F124C
	CHIP RES. 1/10W 120KΩ	RRXAJR8Z0124
R 351	CHIP RES. 1/10W 560Ω or	134F561C
	CHIP RES. 1/10W 560Ω	RRXAJR8Z0561
R 352	CHIP RES. 1/10W 8.2KΩ or	134F822C
	CHIP RES. 1/10W 8.2KΩ	RRXAJR8Z0822
R 353	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 354	CHIP RES. 1/10W 33KΩ or	134F333C
	CHIP RES. 1/10W 33KΩ	RRXAJR8Z0333
R 355	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 357	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 360	CARBON RES. 1/4W 680Ω	RCX4JASZ0681
R 361	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 362	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 363	CHIP RES. 1/10W 220Ω or	134F221C
	CHIP RES. 1/10W 220Ω	RRXAJR8Z0221
R 365	CHIP RES. 1/10W 1.2KΩ or	134F122C
	CHIP RES. 1/10W 1.2KΩ	RRXAJR8Z0122
R 366	CHIP RES. 1/10W 1.5KΩ or	134F152C
	CHIP RES. 1/10W 1.5KΩ	RRXAJR8Z0152
R 367	CHIP RES. 1/10W 12KΩ or	134F123C
	CHIP RES. 1/10W 12KΩ	RRXAJR8Z0123
R 368	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 369	CHIP RES. 1/10W 15KΩ or	134F153C
	CHIP RES. 1/10W 15KΩ	RRXAJR8Z0153
R 370	CHIP RES. 1/10W 470Ω or	134F471C
	CHIP RES. 1/10W 470Ω	RRXAJR8Z0471
R 383	CHIP RES. 1/10W 470Ω or	134F471C
	CHIP RES. 1/10W 470Ω	RRXAJR8Z0471
R 385	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 386	CHIP RES. 1/10W 4.7KΩ or	134F472C
	CHIP RES. 1/10W 4.7KΩ	RRXAJR8Z0472
R 391	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 392	CHIP RES. 1/10W 8.2KΩ or	134F822C
	CHIP RES. 1/10W 8.2KΩ	RRXAJR8Z0822
R 393	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 394	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 395	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 396	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 397	CHIP RES. 1/10W 220KΩ or	134F224C
	CHIP RES. 1/10W 220KΩ	RRXAJR8Z0224
R 401	CHIP RES. 1/10W 3.3KΩ or	134F332C
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 402	CHIP RES. 1/10W 6.8KΩ or	134F682C
	CHIP RES. 1/10W 6.8KΩ	RRXAJR8Z0682

Ref. No.	Description	Part No.
R 403	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 404	CHIP RES. 1/10W 150Ω or	134F151C
	CHIP RES. 1/10W 150Ω	RRXAJR8Z0151
R 405	CHIP RES. 1/10W 4.7MΩ or	134F475C
	CHIP RES. 1/10W 4.7MΩ	RRXAJR8Z0475
R 501	CHIP RES. 1/10W 82KΩ or	134F823C
	CHIP RES. 1/10W 82KΩ	RRXAJR8Z0823
R 502	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 503	CARBON RES. 1/4W 15KΩ	RCX4JASZ0153
R 504	CHIP RES. 1/10W 1KΩ or	134F102C
	CHIP RES. 1/10W 1KΩ	RRXAJR8Z0102
R 505	CARBON RES. 1/4W 68KΩ	RCX4JASZ0683
R 506	CARBON RES. 1/4W 6.8KΩ	RCX4JASZ0682
R 507	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 508	CARBON RES. 1/4W 56KΩ	RCX4JASZ0563
R 509	CARBON RES. 1/4W 3.3Ω	1345339S
R 510	CARBON RES. 1/4W 3.3Ω	1345339S
R 511	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 512	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 513	FUSE RES. 1/4W 4.7Ω or	RFX44R7MS002
	FUSE RES. 1/4W 4.7Ω or	5366479
	FUSE RES. 1/4W 4.7Ω	RFX44R7QJ001
R 514	CARBON RES. 1/4W 68KΩ	RCX4JASZ0683
R 521	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 522	CARBON RES. 1/4W 560Ω	RCX4JASZ0561
R 551	METAL RES. 3W 220Ω or	RN03JZDZ0221
	METAL RES. 3W 220Ω	RN03221KE003
R 552	CARBON RES. 1/4W 10KΩ	RCX4JASZ0103
R 553	CEMENT RES. 5W 1.8KΩ or	RW05182PG004
	CEMENT RES. 5W 1.8KΩ or	RW05182UB004
	CEMENT RES. 5W 1.8KΩ	RW05182KA004
R 554	METAL RES. 1W 15KΩ or	RN01JZDZ0153
	METAL RES. 1W 15KΩ	RN01153KE004
R 555	CARBON RES. 1/4W 0.47Ω	1345478S
R 556	CARBON RES. 1/4W 10KΩ	RCX4JASZ0103
R 557	CHIP RES. 1/10W 330Ω or	134F331C
	CHIP RES. 1/10W 330Ω	RRXAJR8Z0331
R 558	CARBON RES. 1/4W 100KΩ	RCX4JASZ0104
R 559	CARBON RES. 1/4W 56KΩ	RCX4JASZ0563
R 560	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 561	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
R 601	CEMENT RES. 5W 1.2Ω or	RW051R2PG001
	CEMENT RES. 5W 1.2Ω or	RW051R2UB001
	CEMENT RES. 5W 1.2Ω	RW051R2KA006
R 607	CARBON RES. 1/4W 560KΩ	RCX4JASZ0564
R 610	CARBON RES. 1/4W 330Ω	RCX4JASZ0331
R 611	CARBON RES. 1/4W 820KΩ	RCX4JASZ0824
R 612	CARBON RES. 1/4W 68KΩ	RCX4JASZ0683
R 613	CARBON RES. 1/4W 330Ω	RCX4JASZ0331
R 614	CEMENT RES. 5W 0.47Ω or	RW05R47PG001
	CEMENT RES. 5W 0.47Ω or	RW05R47UB001
	CEMENT RES. 5W 0.47Ω	RW05R47KA006
R 615	CARBON RES. 1/4W 220Ω	RCX4JASZ0221
R 616	CARBON RES. 1/4W 1MΩ	RCX4JASZ0105
R 617	CARBON RES. 1/4W 330Ω	RCX4JASZ0331
R 618	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 619	CARBON RES. 1/4W 220Ω	RCX4JASZ0221
R 620	CARBON RES. 1/4W 4.7MΩ	1345475S
R 621	METAL RES. 2W 0.68Ω	RN02JZDZ0R68
R 622	CARBON RES. 1/4W 680Ω	RCX4JASZ0681
R 623	CARBON RES. 1/4W 270Ω	RCX4JASZ0271
R 624	CARBON RES. 1/4W 2.2KΩ	RCX4JASZ0222
R 626	CARBON RES. 1/4W 4.7MΩ	1345475S

Ref. No.	Description	Part No.
R 628	CHIP RES. 1/10W 2.2Ω	134F229C
R 629	CARBON RES. 1/4W 220Ω	RCX4JASZ0221
R 631	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 632	METAL RES. 2W 4.7Ω	RN02JZDZ04R7
R 633	CARBON RES. 1/4W 100Ω	RCX4JASZ0101
R 634	CARBON RES. 1/4W 560Ω	RCX4JASZ0561
R 635	CARBON RES. 1/4W 6.8KΩ	RCX4JASZ0682
R 636	CARBON RES. 1/4W 15KΩ	RCX4JASZ0153
R 637	CARBON RES. 1/4W 33KΩ	RCX4JASZ0333
R 638	CARBON RES. 1/4W 33KΩ	RCX4JASZ0333
R 639	CARBON RES. 1/4W 18KΩ	RCX4JASZ0183
R 640	CARBON RES. 1/4W 6.8KΩ	RCX4JASZ0682
R 641	CARBON RES. 1/4W 220KΩ	RCX4JASZ0224
R 642	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 643	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 644	CARBON RES. 1/4W 3.3KΩ	RCX4JASZ0332
R 645	CARBON RES. 1/4W 12KΩ	RCX4JASZ0123
R 647	CARBON RES. 1/4W 100Ω	RCX4JASZ0101
R 650	CARBON RES. 1/4W 1KΩ	RCX4JASZ0102
R 651	FUSE RES. 1/4W 2.2Ω or	RFX42R2MS002
	FUSE RES. 1/4W 2.2Ω or	5366229
	FUSE RES. 1/4W 2.2Ω	RFX42R2QJ001
R 652	CHIP RES. 1/10W 1MΩ or	134F105C
	CHIP RES. 1/10W 1MΩ	RRXAJR8Z0105
R 653	CARBON RES. 1/4W 4.7KΩ	RCX4JASZ0472
R 655	FUSE RES. 1W 3.3Ω or	RF013R3UB001
	FUSE RES. 1W 3.3Ω or	RF01339KA004
	FUSE RES. 1W 3.3Ω or	5363339
	FUSE RES. 1W 3.3Ω	RF013R3QJ001
R 701	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 702	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 703	CHIP RES. 1/10W 3.3KΩ or	134F332C
	CHIP RES. 1/10W 3.3KΩ	RRXAJR8Z0332
R 704	CHIP RES. 1/10W 2.2KΩ or	134F222C
	CHIP RES. 1/10W 2.2KΩ	RRXAJR8Z0222
R 705	CHIP RES. 1/10W 330Ω or	134F331C
	CHIP RES. 1/10W 330Ω	RRXAJR8Z0331
R 706	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 707	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 708	CHIP RES. 1/10W 27KΩ or	134F273C
	CHIP RES. 1/10W 27KΩ	RRXAJR8Z0273
R 709	CHIP RES. 1/10W 2.2KΩ or	134F222C
	CHIP RES. 1/10W 2.2KΩ	RRXAJR8Z0222
R 710	CHIP RES. 1/10W 150KΩ or	134F154C
	CHIP RES. 1/10W 150KΩ	RRXAJR8Z0154
R 711	CHIP RES. 1/10W 120KΩ or	134F124C
	CHIP RES. 1/10W 120KΩ	RRXAJR8Z0124
R 712	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 713	CHIP RES. 1/10W 47KΩ or	134F473C
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 714	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 715	CHIP RES. 1/10W 22KΩ or	134F223C
	CHIP RES. 1/10W 22KΩ	RRXAJR8Z0223
R 716	CHIP RES. 1/10W 1.5KΩ or	134F152C
	CHIP RES. 1/10W 1.5KΩ	RRXAJR8Z0152
R 718	CHIP RES. 1/10W 2.2KΩ or	134F222C
	CHIP RES. 1/10W 2.2KΩ	RRXAJR8Z0222
R 719	CHIP RES. 1/10W 47KΩ or	134F473C

Ref. No.	Description	Part No.
	CHIP RES. 1/10W 47KΩ	RRXAJR8Z0473
R 720	CHIP RES. 1/10W 1.5KΩ or	134F152C
	CHIP RES. 1/10W 1.5KΩ	RRXAJR8Z0152
R 724	CHIP RES. 1/10W 1.5KΩ or	134F152C
	CHIP RES. 1/10W 1.5KΩ	RRXAJR8Z0152
R 732	CHIP RES. 1/10W 10KΩ or	134F103C
	CHIP RES. 1/10W 10KΩ	RRXAJR8Z0103
R 801	CARBON RES. 1/4W 100Ω	RCX4JASZ0101
R 802	CHIP RES. 1/10W 5.6KΩ or	134F562C
	CHIP RES. 1/10W 5.6KΩ	RRXAJR8Z0562
R 804	CHIP RES. 1/10W 12KΩ or	134F123C
	CHIP RES. 1/10W 12KΩ	RRXAJR8Z0123
R 805	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
R 806	CHIP RES. 1/10W 560Ω or	134F561C
	CHIP RES. 1/10W 560Ω	RRXAJR8Z0561
R 807	CARBON RES. 1/4W 10KΩ	RCX4JASZ0103
R 808	CARBON RES. 1/4W 4.7Ω	1345479S
R 809	METAL RES. 2W 5.6Ω	RN02JZDZ05R6
R 810	CARBON RES. 1/4W 100Ω	RCX4JASZ0101
R 813	CHIP RES. 1/10W 47KΩ or	RRXAJR8Z0473
	CHIP RES. 1/10W 47KΩ	134F473C
C 315	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
C 316	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
C 413	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 11	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 12	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 13	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 14	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 15	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 16	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 17	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 18	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 19	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 20	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 21	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 22	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 23	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 24	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 25	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 26	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 27	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 29	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 30	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 31	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 33	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 34	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 35	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 36	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 38	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 40	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 41	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 42	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 43	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 47	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 48	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
JC 49	CHIP RES. 1/10W 0Ω or	134F000C
	CHIP RES. 1/10W 0Ω	RRXAJR8Z0000
	SWITCHES	
SW101	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW102	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW103	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW104	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW105	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW107	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW108	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW109	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
SW110	TACT SWITCH or	SST0101AL013
	TACT SWITCH or	SST0101MS013
	TACT SWITCH	SST0101HH016
	TRANSFORMERS	
T 551	H. DRIVE TRANS	1150325
T 552 ⚠	F.B.T. FCK-14B040	LTF00EPSM006
T 601 ⚠	POWER TRANS	LTT00EPMS015
T 602 ⚠	LINE FILTER or	LLBG00ZTZ001
	LINE FILTER	LLBG00ZMS008
	VARIABLE RESISTORS	
VR211	SEMIFIXED RES. 10KΩ B or	138J781
	SEMIFIXED RES. 10KΩ B	638A103
VR301	SEMIFIXED RES. 1KΩ B or	138J777
	SEMIFIXED RES. 1KΩ B	638A102
VR331	SEMIFIXED RES. 200 Ω B or	238J113
	SEMIFIXED RES. 200 Ω B	638A221
VR351	SEMIFIXED RES. 5KΩ B or	138J780
	SEMIFIXED RES. 5KΩ B	638A472
VR501	SEMIFIXED RES. 50KΩ B or	138J784
	SEMIFIXED RES. 50KΩ B	638A473
VR521	SEMIFIXED RES. 10KΩ B or	138J781
	SEMIFIXED RES. 10KΩ B	638A103
VR621	SEMIFIXED RES. 20KΩ B or	138J782
	SEMIFIXED RES. 20KΩ B	638A223
	CRYSTAL OSCILLATOR	
X 101	CERAMIC RESONATOR 4.19MHz or	FY0415LMS002
	CERAMIC RESONATOR 4.19MHz or	1813682
	CERAMIC RESONATOR 4.19MHz	1812885
X 301	CRYSTAL OSCILLATOR 4.43MHz	1811387
X 302	CRYSTAL OSCILLATOR 3.58MHz	1811291
X 331	CERAMIC RESONATOR CSB503F30	1813527
	MISCELLANEOUS	
	CABLE TIE or	1790256
	CABLE TIE	1790356
	LABEL 15mmX5mm	
	SUMI TUBE ø12X25mm F2 TYPE (for C618 used)	
	LED HOLDER (for D111)	0EM300761
	SENSOR HOLDER (for RCV101)	0EM402360
BC551	BEADS CORE	1190038
BC601	BEADS CORE	1190038
BC602	BEADS CORE	1190038
BC621	BEADS CORE	1190038
CF211	CERAMIC TRAP 5.5MHz+6.5MHz	FBE655PMR002
CF212	CERAMIC FILTER 5.5MHz or	1812018
	CERAMIC FILTER 5.5MHz	FBB555PMS001
CF213	CERAMIC FILTER 6.5MHz or	1813595
	CERAMIC FILTER 6.5MHz	FBB655PMS001
CN451A	CABLE HOLDER 5P or	XW01D05NF001
	CABLE HOLDER 5P	XW01B05NF001
CN452A	CABLE HOLDER 4P or	XW01D04NF001
	CABLE HOLDER 4P	XW01B04NF001
DL301	DELAY LINE	113N852
DL311	GLASS DELAY or	FD0445PXX001
	GLASS DELAY	1812056
F 601 ⚠	FUSE T4.0A 250V	1790998
FH601	FUSE HOLDER or	XH01Z00DK001
	FUSE HOLDER or	1790424
	FUSE HOLDER	1790848
FH602	FUSE HOLDER or	XH01Z00DK001
	FUSE HOLDER or	1790424
	FUSE HOLDER	1790848
HS501	HEAT SINK PH (for V OUT IC)	0EM400958
HS601	HEAT SINK OP ASSEMBLY (for POWER TR.)	0EM300771
HS801	HEAT SINK MP (for POWER AMP)	0EM402332
J 701	RCA JACK (2 PIN) or	JXRL020JC013
	RCA JACK (2 PIN)	JXRL020MY001
J 702	RCA JACK (1 PIN) or	JXRL010JC018
	RCA JACK (1 PIN)	JXRL010MY001
J 801	EARPHONE JACK or	JYSL030HD002
	EARPHONE JACK	JYSL030SR001
LCN451	RIBBON WIRE 5P (for CRT PCB)	WX1L8400-002
LCN452	RIBBON WIRE 4P (for CRT PCB)	WX1L8400-001
P 601 ⚠	AC CORD	5750112
PT601 ⚠	THERMISTER or	QN4ZPA2A5200
	THERMISTER	5790117
RCV101	REMOCON RECEIVING UNIT	USESJRSKK011
SF201	SAW FILTER KAF-38.0MR-MH	FBB386PKC001
TP 1	TEST PIN or	1700093
	TEST PIN	1740354
TP 2	TEST PIN or	1700093
	TEST PIN	1740354
TP 3	TEST PIN or	1700093
	TEST PIN	1740354
TP 4	TEST PIN or	1700093
	TEST PIN	1740354
TP 5	TEST PIN or	1700093
	TEST PIN	1740354
TP 6	TEST PIN or	1700093
	TEST PIN	1740354
TP 7	TEST PIN or	1700093
	TEST PIN	1740354
TP 8	TEST PIN or	1700093
	TEST PIN	1740354
TP 9	TEST PIN or	1700093
	TEST PIN	1740354
TU 1	TUNER TEKZ1-005A, 014A, 015A	UTUNPSDAL008

CRT PCB Assembly

Ref. No.	Description	Part No.
	CRT PCB Assembly Consists of the following:	———
	CAPACITORS	
C 451	CERAMIC CAP. 220pF B or	3B42221
	CERAMIC CAP. 220pF B	12B3221
C 452	CERAMIC CAP. 220pF B or	3B42221
	CERAMIC CAP. 220pF B	12B3221
C 453	CERAMIC CAP. 330pF B or	3B42331
	CERAMIC CAP. 330pF B	12B3331
C 454	CERAMIC CAP. 0.001µF 2KV or	CCD3DKP0B102
	CERAMIC CAP. 0.001µF 2KV	6220585
C 455	ELECTROLYTIC CAP. 10µF/50V	126F106S
	CONNECTOR	
CN453	CONNECTOR PIN 1P or (for CRT GND)	1700576
	CONNECTOR PIN 1P or (for CRT GND)	1730688
	CONNECTOR PIN 1P (for CRT GND)	JTEA000LC001
	COIL	
L 451	MICRO INDUCTOR 180µH K	2162181S
	TRANSISTORS	
Q 451	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E) or	2SC2271EZ
	TRANSISTOR 2SC2482	QQSZ02SC2482
Q 452	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E) or	2SC2271EZ
	TRANSISTOR 2SC2482	QQSZ02SC2482
Q 453	TRANSISTOR 2SC2271 (D) or	2SC2271DZ
	TRANSISTOR 2SC2271 (E) or	2SC2271EZ
	TRANSISTOR 2SC2482	QQSZ02SC2482
	RESISTORS	
R 451	METAL RES. 1W 15KΩ or	RN01JZDZ0153
	METAL RES. 1W 15KΩ	RN01153KE004
R 452	METAL RES. 1W 15KΩ or	RN01JZDZ0153
	METAL RES. 1W 15KΩ	RN01153KE004
R 453	METAL RES. 1W 15KΩ or	RN01JZDZ0153
	METAL RES. 1W 15KΩ	RN01153KE004
R 454	CARBON RES. 1/4W 2.7KΩ	RCX4JASZ0272
R 456	CARBON RES. 1/4W 2.7KΩ	RCX4JASZ0272
R 458	CARBON RES. 1/4W 2.7KΩ	RCX4JASZ0272
R 460	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 461	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 462	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 463	CARBON RES. 1/4W 820Ω	RCX4JASZ0821
R 464	CARBON RES. 1/4W 820Ω	RCX4JASZ0821
R 465	CARBON RES. 1/4W 820Ω	RCX4JASZ0821
R 466	CARBON RES. 1/4W 220Ω	RCX4JASZ0221
R 467	CARBON RES. 1/4W 220Ω	RCX4JASZ0221
R 468	CARBON RES. 1/4W 220Ω	RCX4JASZ0221

Ref. No.	Description	Part No.
R 469	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 470	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 471	CARBON RES. 1/4W 1.5KΩ	RCX4JASZ0152
R 472	CARBON RES. 1/4W 390Ω	RCX4JASZ0391
R 473	CARBON RES. 1/4W 390Ω	RCX4JASZ0391
R 474	CARBON RES. 1/4W 390Ω	RCX4JASZ0391
R 475	CARBON RES. 1/4W 560Ω	RCX4JASZ0561
	VARIABLE RESISTORS	
VR451	SEMIFIXED RES. 5KΩ B or	138J916
	SEMIFIXED RES. 5KΩ B	138A957
VR452	SEMIFIXED RES. 5KΩ B or	138J916
	SEMIFIXED RES. 5KΩ B	138A957
VR453	SEMIFIXED RES. 5KΩ B or	138J916
	SEMIFIXED RES. 5KΩ B	138A957
VR454	SEMIFIXED RES. 1KΩ B or	138J913
	SEMIFIXED RES. 1KΩ B	138A953
VR455	SEMIFIXED RES. 1KΩ B or	138J913
	SEMIFIXED RES. 1KΩ B	138A953
	MISCELLANEOUS	
CN451B	CABLE HOLDER 5P or	XW01D05NF001
	CABLE HOLDER 5P	XW01B05NF001
CN452B	CABLE HOLDER 4P or	XW01D04NF001
	CABLE HOLDER 4P	XW01B04NF001
SO451 ⚠	CRT SOCKET or	JSCC220PK001
	CRT SOCKET or	1780080
	CRT SOCKET	1780218

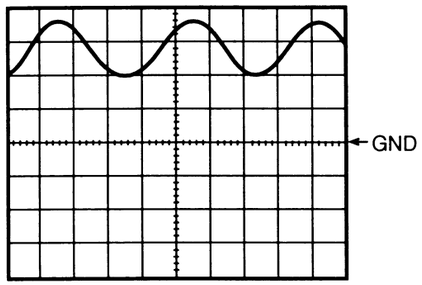
Chassis Electrical Parts

Ref. No.	Description	Part No.
V 451 ⚠	CRT 370KRB22-TC09(SPYB) or	1812341
	CRT 37GDA85X-TC01 or	1812724
	CRT A34KPU02XX48	TCRT190GS011
L 601 ⚠	DEGAUSING COIL	LLBH00ZTZ011
SP801	SPEAKER 8 Ω or	DSD0808SM002
	SPEAKER 8 Ω	DSD0808SY001
LCN453	WIRE ASSEMBLY (for CRT GND)	WX1L7401-001A
LCN801	WIRE ASSEMBLY (for SPEAKER)	WX1L5360-01

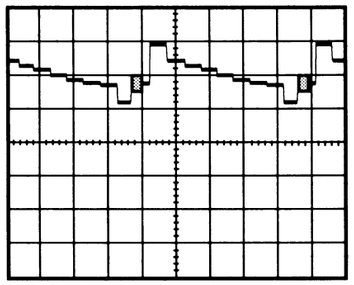
WAVEFORMS

Input: PAL Color Bar Signal (with 1KHz Audio Signal)
Receiving Ch.: E2 ch (48.25MHz)
Preset Mode: Press Picture Select button on the remote control unit, then press the number "1" button.
(Brightness---Center Color---Center Contrast---Approx 70%)

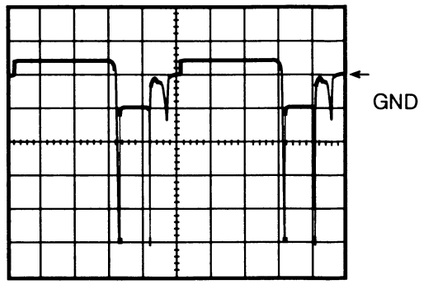
WFa ~ WFt = Waveforms to be observed at Waveform check points. (Shown in Schematic Diagram.)



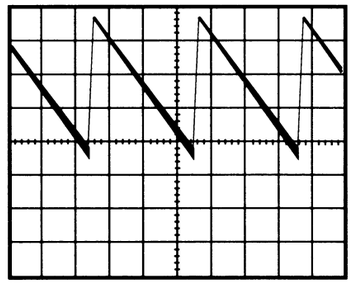
WFa 1DIV: 1V 0.2msec



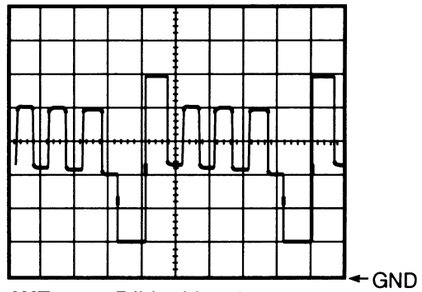
WFe 1DIV: 0.5V 10µsec



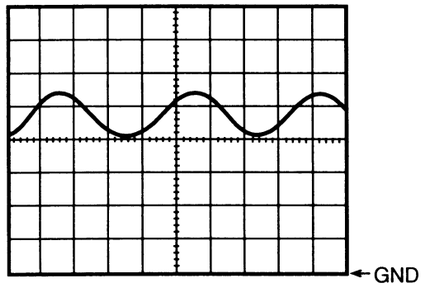
WFi 1DIV: 2V 10µsec



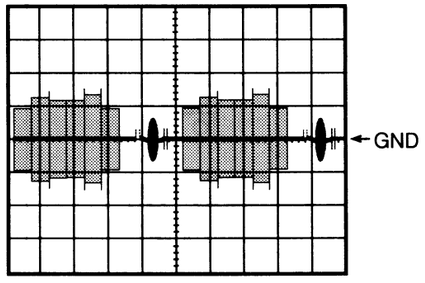
WFm 1DIV: 0.5V 5msec



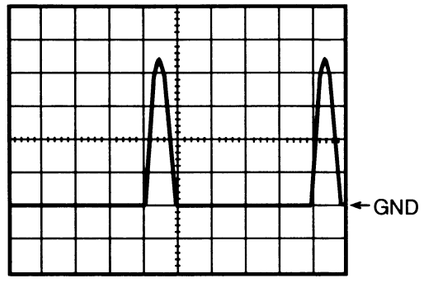
WFq 1DIV: 1V 10µsec



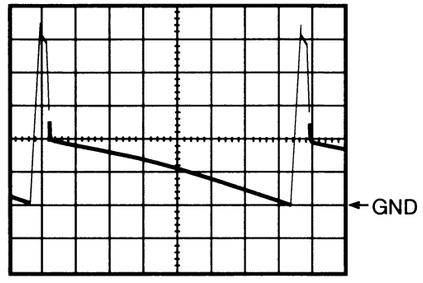
WFb 1DIV: 1V 0.2msec



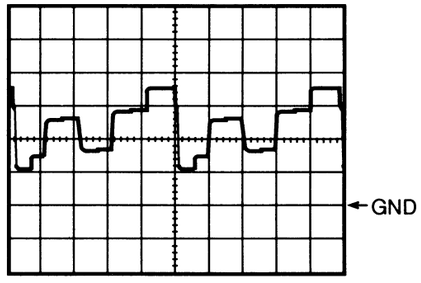
WFf 1DIV: 0.2V 10µsec



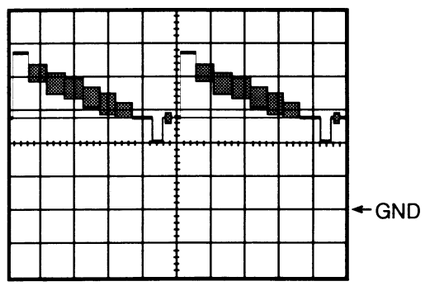
WFj 1DIV: 250V 10µsec



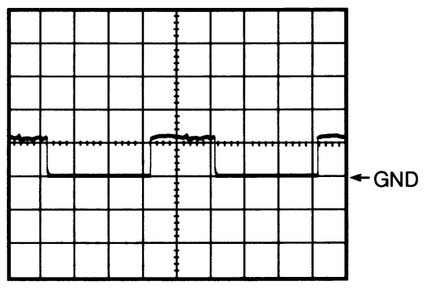
WFn 1DIV: 10V 2msec



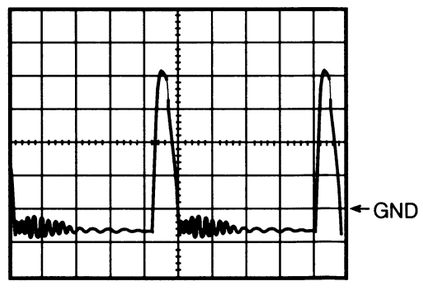
WFr 1DIV: 50V 10µsec



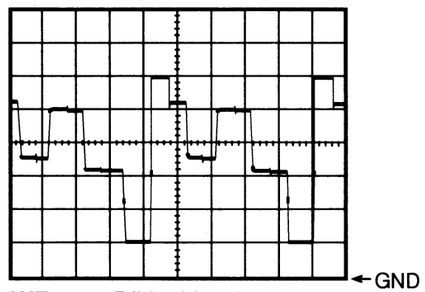
WFc 1DIV: 1V 10µsec



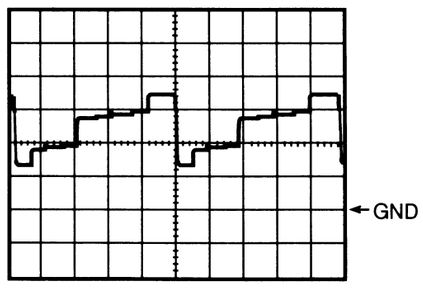
WFg 1DIV: 0.5V 10µsec



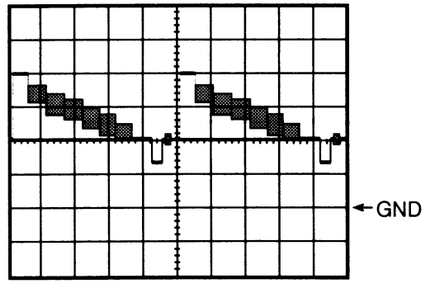
WFk 1DIV: 5V 10µsec



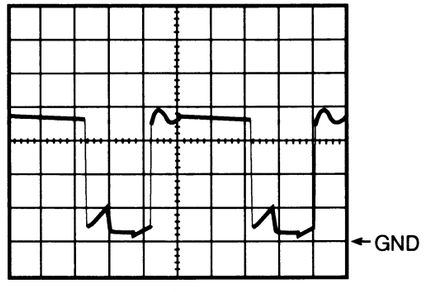
WFo 1DIV: 1V 10µsec



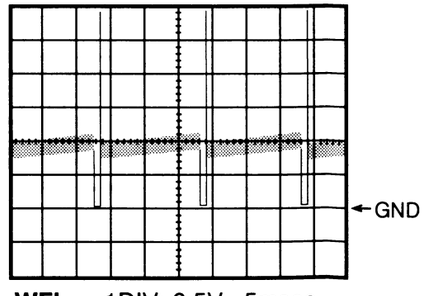
WFs 1DIV: 50V 10µsec



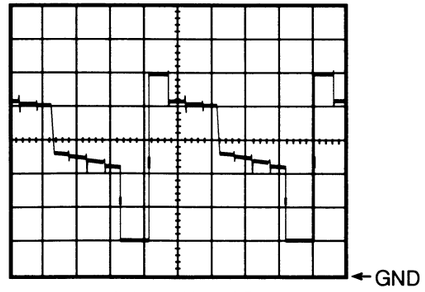
WFd 1DIV: 1V 10µsec



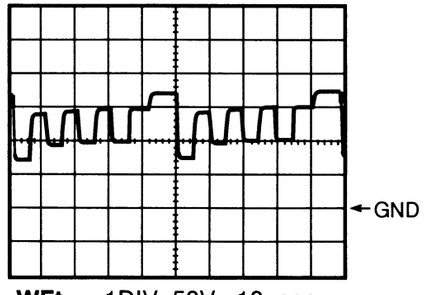
WFh 1DIV: 50V 10µsec



WFl 1DIV: 0.5V 5msec



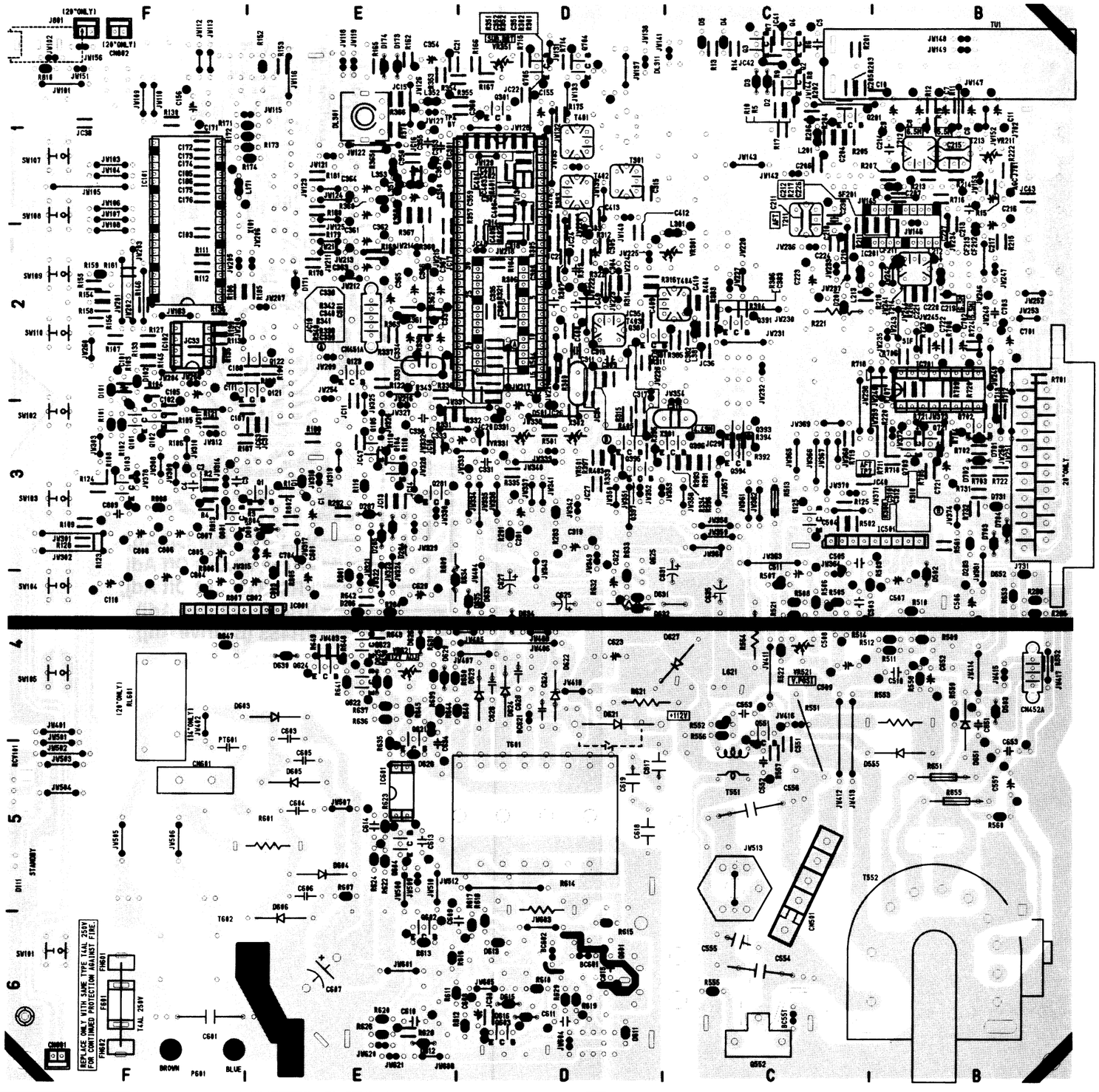
WFp 1DIV: 1V 10µsec



WFt 1DIV: 50V 10µsec

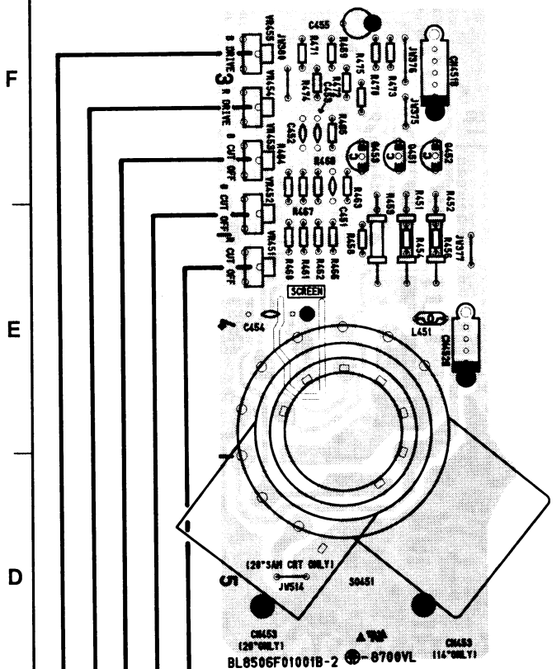
WIRING DIAGRAM

Main PCB (Bottom View)



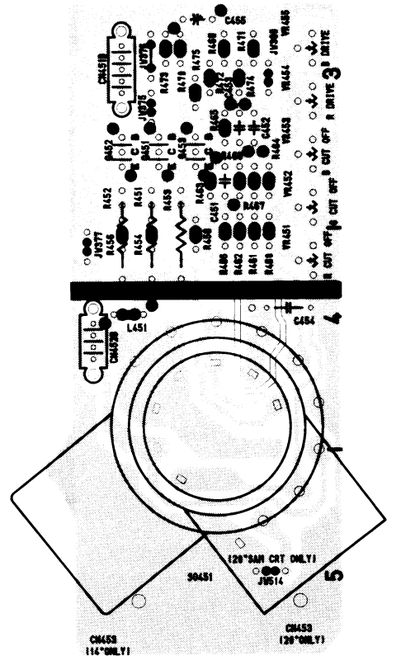
(BL8506F01001B-1)

CRT PCB (Top View)



VR451 (R.Cut Off Adj)
VR452 (G.Cut Off Adj)
VR453 (B.Cut Off Adj)
VR454 (R.Drive Adj)
VR455 (B.Drive Adj)

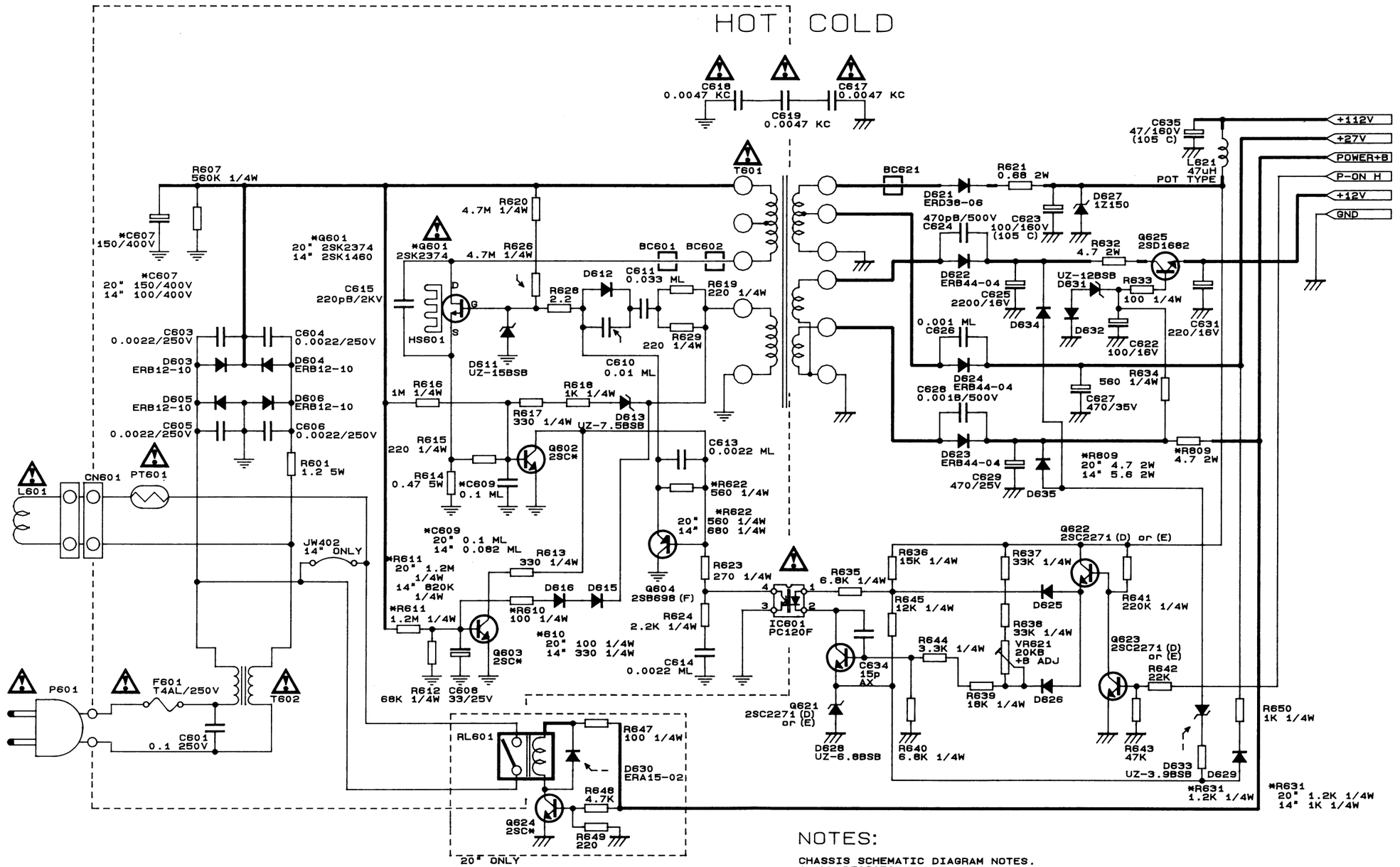
CRT PCB (Bottom View)



F
E
D
C
B
A
1
2
3
4

(BL8506F01001B-2)

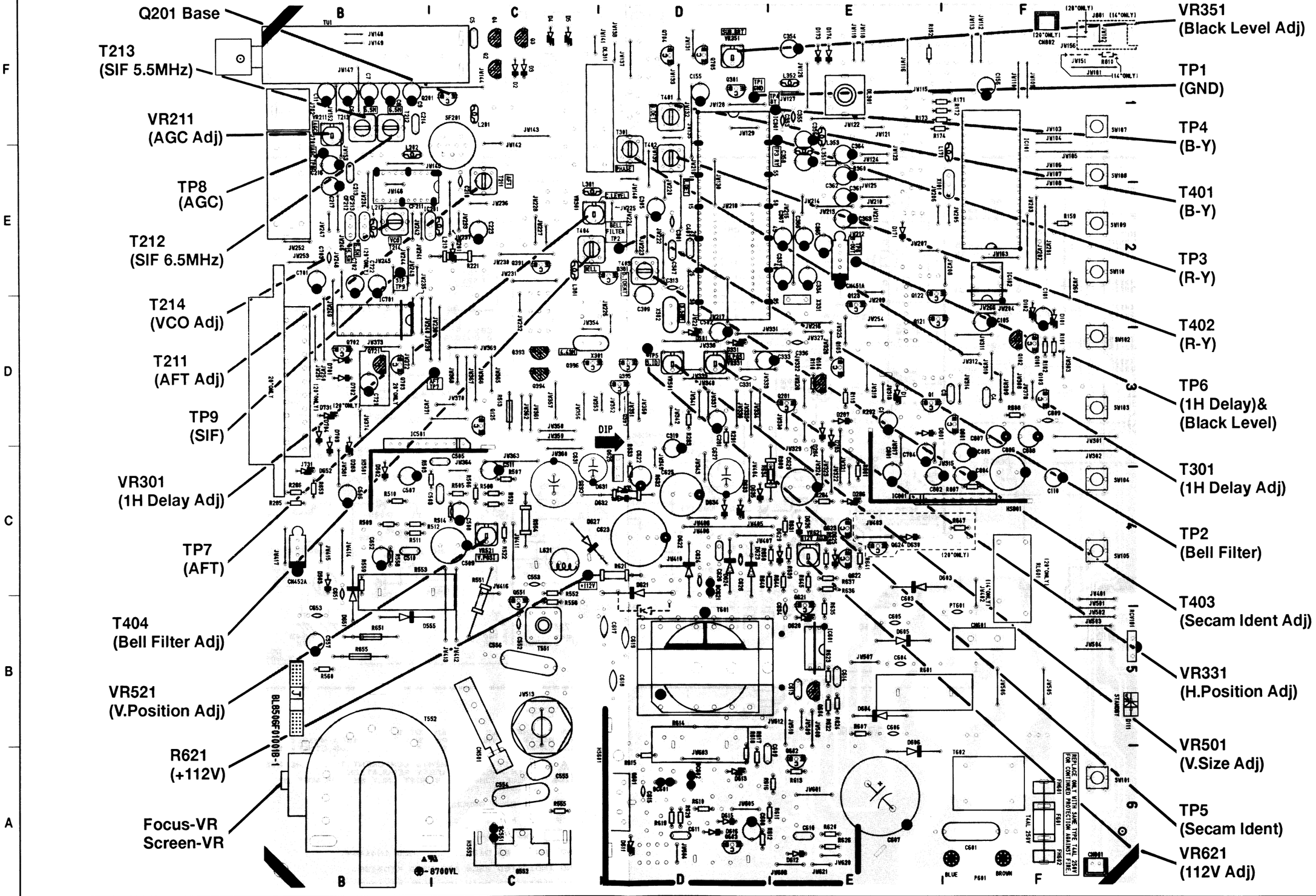
Power Supply Schematic Diagram



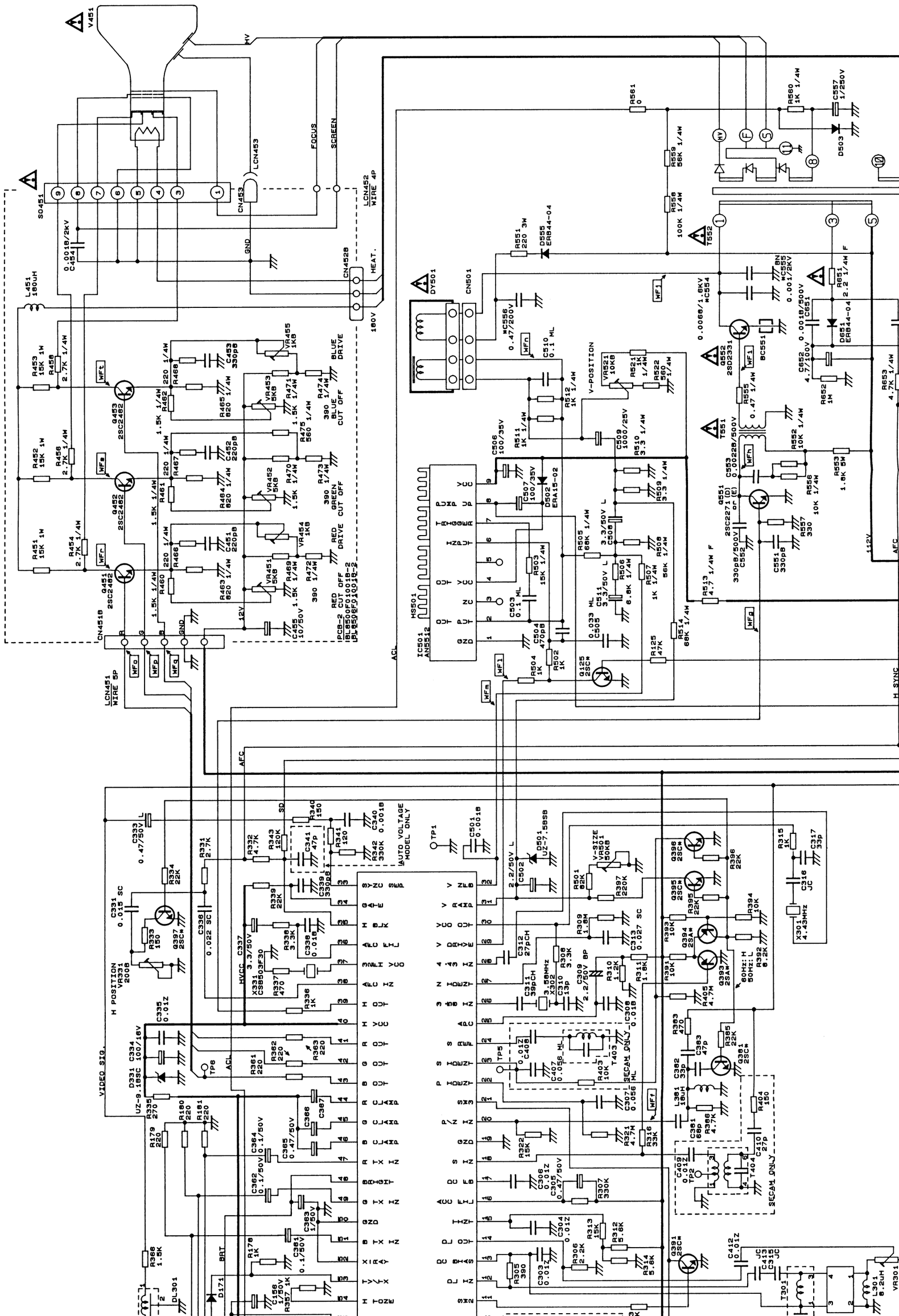
NOTES:

CHASSIS SCHEMATIC DIAGRAM NOTES.
1. ALL RESISTOR VALUES ARE IN OHMS. K=1000, M=1000K.
2. ALL CAPACITANCE VALUES ARE IN uF UNLESS OTHERWISE NOTED. pF=uuF.
3. ⚠ SAFETY REQUIREMENTS COMPONENT IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.
4. ⏚ IS COLD GROUND.
5. ⏚ IS HOT GROUND.
6. ▭ WAVEFORM READINGS.
7. NO INDICATED DIODES ARE USED 1N4148M.
8. NO INDICATED 2SC* ARE USED KTC3199.
9. NO INDICATED 2SA* ARE USED KTA1267.

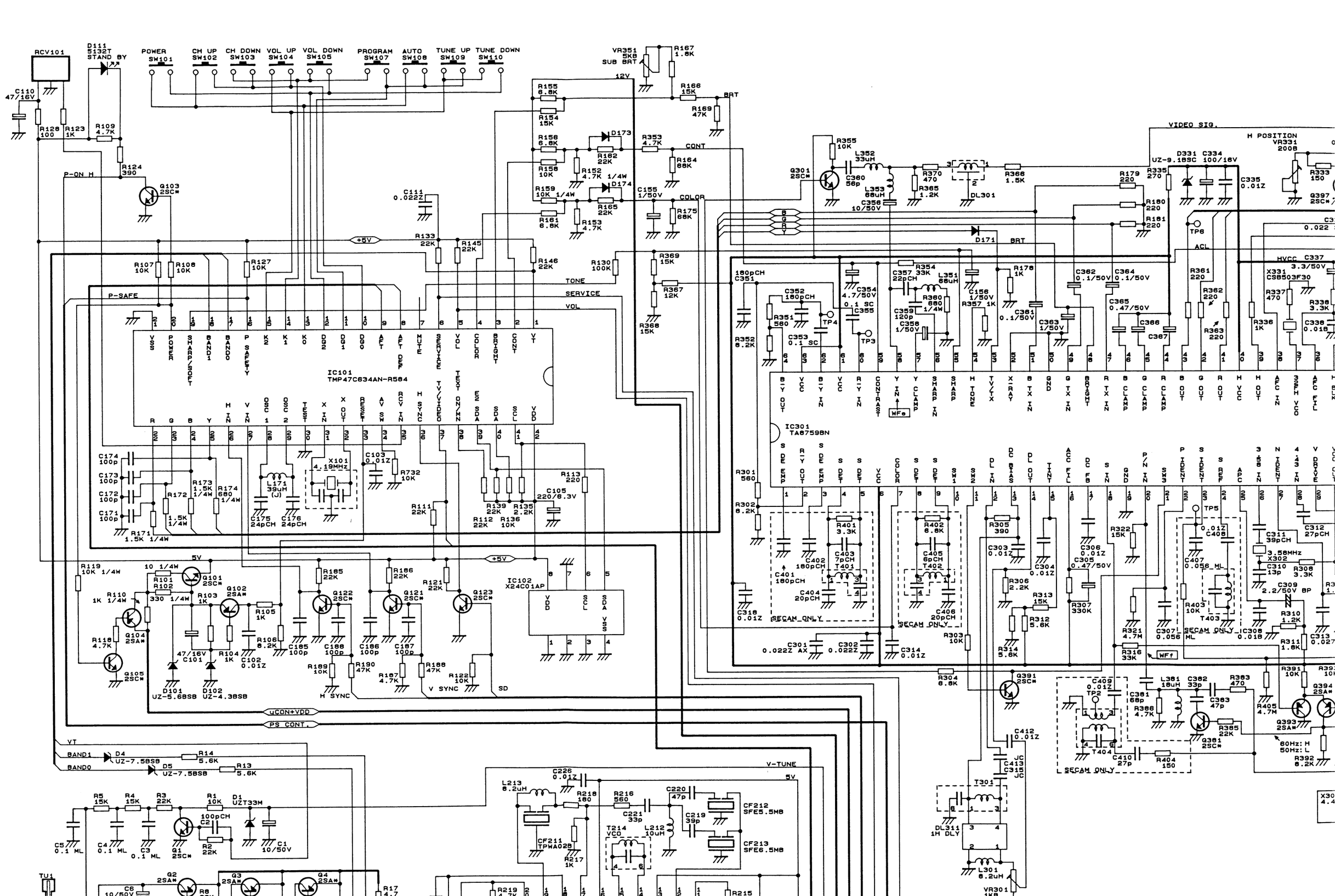
Main PCB (Top View)

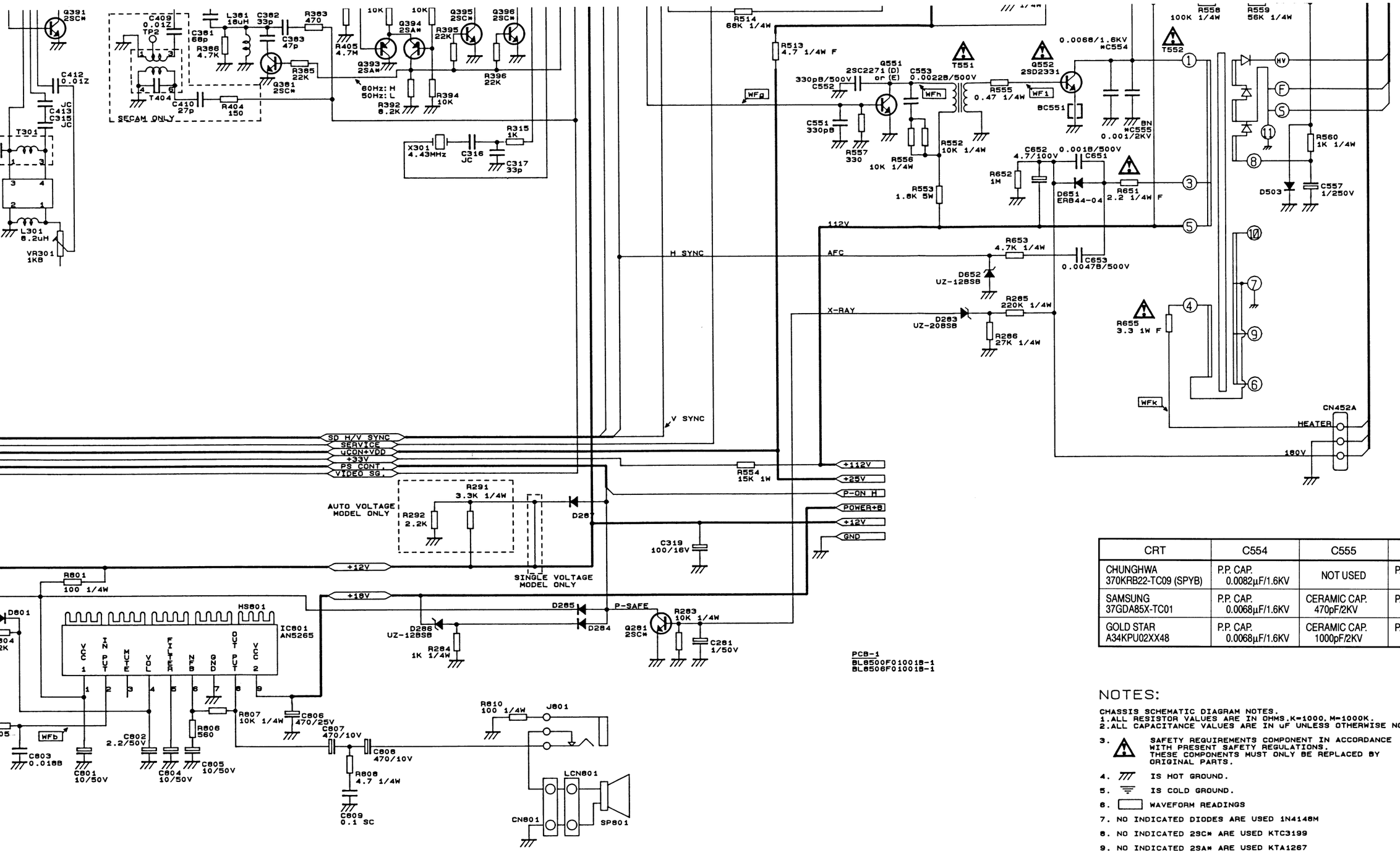


(BL8506F01001B-1)


V451
SO451
CN453
LCN453
FOCUS
SCREEN
HV
GND
LCN452 WIRE 4P
CN4528
HEAT.
180V
L451 180UH
0.0018/2kV C454
CN4518
LCN451 WIRE 5P
R
G
B
GND
12V
ACL
AFC
BLUE DRIVE
GREEN DRIVE
RED DRIVE
BLUE CUT OFF
GREEN CUT OFF
RED CUT OFF
Q453 2SC2482
Q452 2SC2482
Q451 2SC2482
VR455 1KB
VR453 5KB
VR452 5KB
VR451 5KB
VR454 1KB
R453 15K 1W
R452 15K 1W
R451 15K 1W
R456 2.7K 1/4W
R454 2.7K 1/4W
R458 2.7K 1/4W
R462 1.5K 1/4W
R461 1.5K 1/4W
R460 1.5K 1/4W
R466 220 1/4W
R467 220 1/4W
R468 220 1/4W
C453 330pB
C452 220pB
C451 220pB
R465 820 1/4W
R464 820 1/4W
R463 820 1/4W
R471 1.5K 1/4W
R470 1.5K 1/4W
R469 1.5K 1/4W
R475 560 1/4W
R474 390 1/4W
R473 390 1/4W
R472 390 1/4W
C455 10/50V
DY501
CN501
R551 220 3W
D555 ERB44-04
R556 100K 1/4W
R559 56K 1/4W
R561 0
R560 1K 1/4W
C557 1/250V
D503
T552
D651 ERB44-04
R651 2.2 1/4W F
C651 0.001B/500V
C652 4.7/100V
R652 1M
R653 4.7K 1/4W
C554 0.0068/1.6KV
*C555 0.001/2KV
Q552 2SD2331
BC551
R555 0.47 1/4W
T551
R552 10K 1/4W
R553 1.8K 5W
C553 0.0022B/500V
Q551 2SC2271 (D) or (E)
R556 10K 1/4W
C551 330pB
R557 330
C552 330pB/500V
R513 4.7 1/4W F
112V
AFC
H SYNC
*C556 0.47/200V
C510 0.1 ML
R512 1K 1/4W
V-POSITION
VR521 10KB
R521 1K 1/4W
R522 560
C506 100/35V
R511 1K 1/4W
C509 1000/25V
R510 3.3 1/4W
C507 100/35V
D502 ERA15-02
R505 68K 1/4W
C508 3.3/50V L
R509 3.3 1/4W
C503 0.1 ML
R503 15K 1/4W
C504 470pB
R502 1K
R504 1K
R507 1K 1/4W
R508 56K 1/4W
C511 3.3/50V L
R506 6.8K 1/4W
R514 68K 1/4W
R125 47K
Q125 2SC*
IC501 AN5512
HS501
VIDEO SIG.
H POSITION VR331 200B
Q397 2SC*
C331 0.015 SC
C333 0.47/50V L
R334 22K
R331 2.7K
C338 0.022 SC
R332 4.7K
R343 120K
R340 150
C341 47P
R341 120
C340 0.001B
R342 330K
AUTO VOLTAGE MODEL ONLY
C339 330pB
R339 22K
C337 3.3/50V
X331 C385 03F30
R337 470
C336 0.01B
R338 3.3K
R336 1K
C335 0.01Z
C334 100/16V
D331 UZ-9.1B3C
R335 270
R361 220
R362 220
R363 220
R179 220
R180 220
R181 220
C362 0.1/50V
C364 0.1/50V
C365 0.47/50V
C366
C367
C383 1/50V
C361 0.1/50V
R368 1.5K
R178 1K
C156 1/50V
R357 1K
D171
DL301
BAT
TP8
TP1
C501 0.001B
D501 UZ-7.5BSB
C502 2.2/50V L
R501 82K
VR501 50KB
R397 220K
Q396 2SC*
Q395 2SC*
Q394 2SA*
Q393 2SA*
R396 22K
R395 22K
R394 10K
R393 10K
R391 10K
R392 8.2K
60Hz: H
50Hz: L
R315 1K
C317 33p
C316 JC
X301 4.43MHz
R309 1.8M
C312 27pCH
C313 0.027 SC
C311 39pCH
X302 3.58MHz
C310 13p
R308 3.3K
C309 2.2/50V BP
R310 1.2K
R311 1.8K
R405 4.7M
C308 0.018
C307 0.056 ML
R321 4.7M
R316 33K
R322 15K
C306 0.01Z
C305 0.47/50V
R307 330K
C304 0.01Z
R313 15K
R312 5.8K
R306 2.2K
C303 0.01Z
R305 390
R314 5.8K
C407 0.056 ML
R403 10K
T403
SECAM ONLY
C408 0.01Z
C409 0.01Z
T402
C410 27p
T404
C381 68p
R386 4.7K
L381 10uH
C382 33p
Q381 2SC*
R383 470
C383 47p
R385 22K
R404 150
C412 0.01Z
C413 JC
C414 JC
T301
L301 8.2uH
VR301
C415 JC

Main / CRT Schematic Diagram





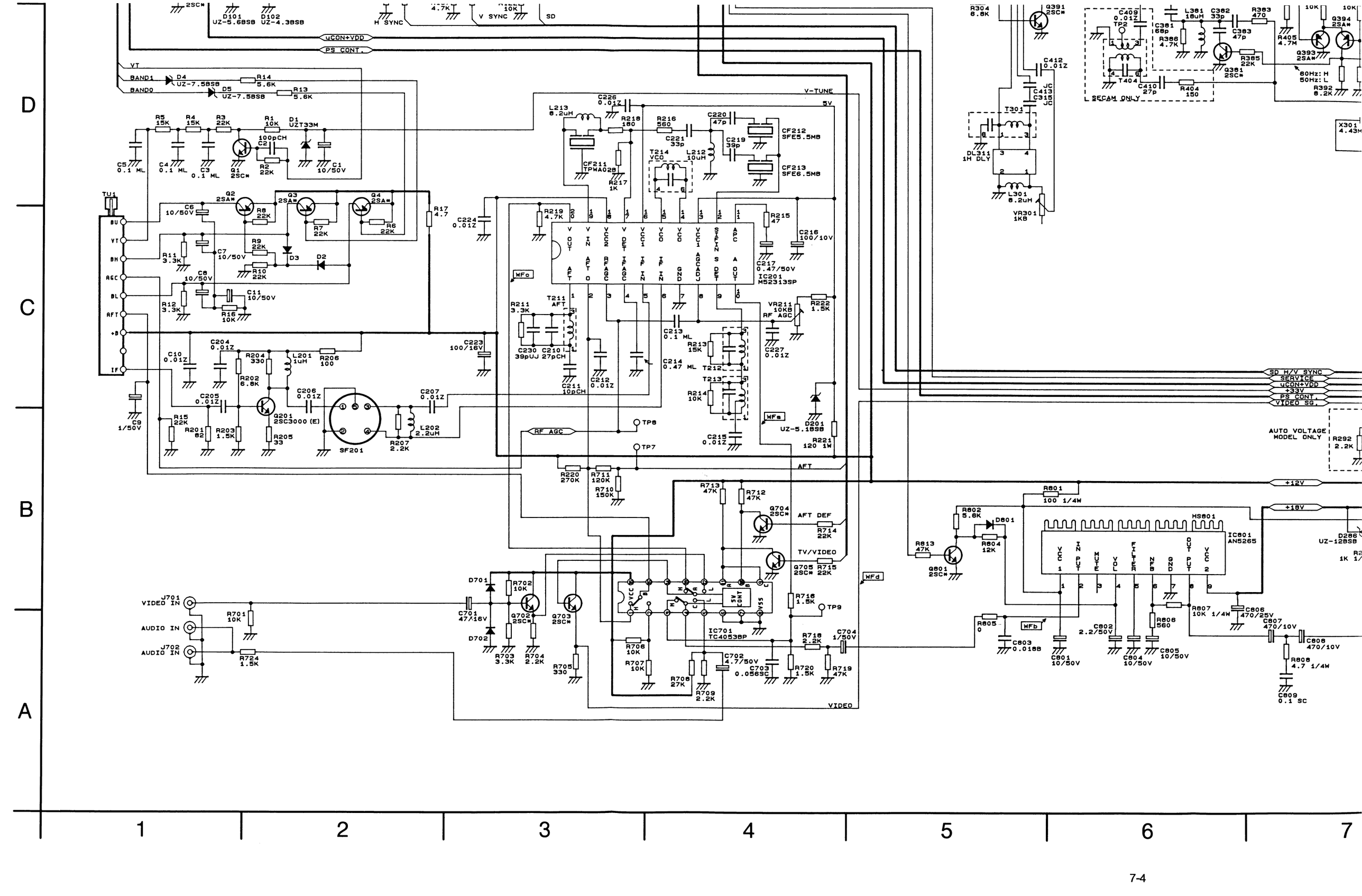
PCB-1
BL8500F01001B-1
BL8506F01001B-1

CRT	C554	C555	C556
CHUNGHWA 370KRB22-TC09 (SPYB)	P.P. CAP. 0.0082μF/1.6KV	NOT USED	P.P. CAP. 0.47μF/200V
SAMSUNG 37GDA85X-TC01	P.P. CAP. 0.0068μF/1.6KV	CERAMIC CAP. 470pF/2KV	P.P. CAP. 0.56μF/200V
GOLD STAR A34KPU02XX48	P.P. CAP. 0.0068μF/1.6KV	CERAMIC CAP. 1000pF/2KV	P.P. CAP. 0.47μF/200V

NOTES:

CHASSIS SCHEMATIC DIAGRAM NOTES.
1.ALL RESISTOR VALUES ARE IN OHMS.K=1000.M=1000K.
2.ALL CAPACITANCE VALUES ARE IN uF UNLESS OTHERWISE NOTED.pF=uuF.

3. ⚠ SAFETY REQUIREMENTS COMPONENT IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.
4. ⏚ IS HOT GROUND.
5. ⏚ IS COLD GROUND.
6. ▭ WAVEFORM READINGS
7. NO INDICATED DIODES ARE USED 1N4148M
8. NO INDICATED 2SC* ARE USED KTC3199
9. NO INDICATED 2SA* ARE USED KTA1267


D101 UZ-5.6BSB
D102 UZ-4.3BSB
H SYNC
V SYNC
SD
uCON+VDD
PS CONT.
VT
BAND1
BAND0
D4 UZ-7.5BSB
D5 UZ-7.5BSB
R14 5.6K
R13 5.6K
R5 15K
R4 15K
R3 22K
R1 10K
D1 UZT33M
100pCH C2
R2 22K
Q1 2SC*
C5 0.1 ML
C4 0.1 ML
C3 0.1 ML
C1 10/50V
TU1
BU
VT
BH
AGC
BL
AFT
+B
IF
Q2 2SA*
Q3 2SA*
Q4 2SA*
R8 22K
R7 22K
R6 22K
R17 4.7
C6 10/50V
R9 22K
D3
D2
R10 22K
C7 10/50V
R11 3.3K
C8 10/50V
R12 3.3K
C11 10/50V
R16 10K
C10 0.01Z
C204 0.01Z
R204 330
L201 1uH
R206 100
R202 6.8K
C205 0.01Z
C206 0.01Z
C207 0.01Z
C9 1/50V
R15 22K
R201 82
R203 1.5K
Q201 2SC3000 (E)
R205 33
SF201
R207 2.2K
L202 2.2uH
C223 100/16V
V-TUNE
5V
L213 8.2uH
C226 0.01Z
R218 180
R216 560
C220 47p
C221 33p
C219 39p
CF212 SFE5.5MB
CF213 SFE6.5MB
T214 VCO
L212 10uH
CF211 TPWA02B
R217 1K
C224 0.01Z
R219 4.7K
R215 47
C216 100/10V
C217 0.47/50V
IC201 M52313SP
VOUT AFTO AFTC VCCDET IFAGC VCC1 IFIN VCC GND VCC1 AGCADJ SHTIN SDET APCOUT
WFc
T211 AFT
R211 3.3K
C230 39pUJ
C210 27pCH
C211 10pCH
C212 0.01Z
C213 0.1 ML
C214 0.47 ML
T212
T213
R213 15K
R214 10K
C215 0.01Z
VR211 10KB RF AGC
R222 1.5K
C227 0.01Z
D201 UZ-5.1BSB
R221 120 1W
WFe
RF AGC
TP8
TP7
AFT
R220 270K
R711 120K
R710 150K
R713 47K
R712 47K
Q704 2SC*
AFT DEF
R714 22K
TV/VIDEO
Q705 2SC*
R715 22K
WFd
D701
D702
R702 10K
Q702 2SC*
Q703 2SC*
R703 3.3K
R704 2.2K
R705 330
C701 47/16V
R706 10K
R707 10K
R708 27K
R709 2.2K
C702 4.7/50V
C703 0.056SC
IC701 TC4053BP
R716 1.5K
TP9
R718 2.2K
C704 1/50V
R720 1.5K
R719 47K
VIDEO
J701 VIDEO IN
AUDIO IN
J702 AUDIO IN
R701 10K
R724 1.5K
R304 6.8K
Q391 2SC*
C412 0.01Z
JC
C413 C315
T301
DL311 1H DLY
L301 8.2uH
VR301 1KB
C409 0.01Z TP2
C381 68p
L381 18uH
C382 33p
R383 470
R386 4.7K
C383 47p
R385 22K
Q381 2SC*
T404
C410 27p
R404 150
SECAM ONLY
R405 4.7M
Q393 2SA*
Q394 2SA*
60Hz: H
50Hz: L
R392 8.2K
X301 4.43M
SD H/V SYNC
SERVICE
uCON+VDD
+33V
PS CONT.
VIDEO SG.
AUTO VOLTAGE MODEL ONLY
R292 2.2K
+12V
+18V
R801 100 1/4W
R802 5.6K
D601
R804 12K
R813 47K
Q801 2SC*
HS801
IC801 AN5265
VCC IN PUT MUTE VOL FILTER NFB GND OUT PUT VCC
R805 0
WFb
C803 0.018B
C801 10/50V
C802 2.2/50V
C804 10/50V
R806 560
C805 10/50V
R807 10K 1/4W
C806 470/25V
C807 470/10V
C808 470/10V
R808 4.7 1/4W
C809 0.1 SC
D286 UZ-12BSB
R2 1K 1/