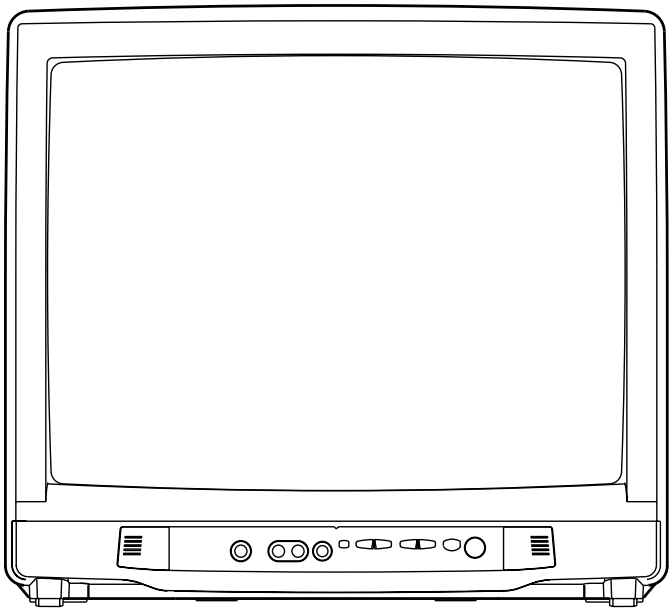
Symphonic

SERVICE MANUAL

19" COLOR TELEVISION

ST419B



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.

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SPECIFICATIONS

< TUNER>

ANT. Input ---------- 75ohm Unbal., F type
Reference Level ---------- 20Vp-p (CRT Green Cathode)
Test Input Signal ---------- 400Hz 30% modulation

Description	Condition	Unit	Nominal	Limit
1. Intermediate Freq.	Picture Sound	MHz MHz	45.75 41.25	— —
2. Peak Picture Sens	VHF CATV UHF	dBμV dBμV dBμV	15 15 15	30 30 40
3. AFT Pull In Range (10mV input)	—	MHz	± 2.0	± 0.7

< DEFLECTION>

Description	Condition	Unit	Nominal	Limit
1. Deflection Freq.	Horizontal Vertical	KHz Hz	15.734 60	— —
2. Linearity	Horizontal Vertical	% %	— —	± 15 ± 10
3. Over Scan	—	%	10	—
4. High Voltage	—	KV	26	—

< VIDEO & CHROMA>

Description	Condition	Unit	Nominal	Limit
1. Misconvergence	Center Side Corner	mm mm mm	— — —	0.4 1.5 2.1
2. Brightness	APL 100%	Ft-L	40	25
3. Color Temperature	—	°K	9200°K	—
4. Resolution	Horizontal Vertical	Line Line	250 300	— —

<AUDIO>

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

Description	Condition	Unit	Nominal	Limit
1. Audio Output Power	10% THD	W	1	0.8
2. Audio Distortion (w/LPF)	500mW	%	2	7
3. Audio Freq. Response	–3dB	Hz	70~11K	—

Note:

Nominal specifications represent the design specifications. All units should be able to approximate these. Some will exceed and some may drop slightly below these specifications. Limit specifications represent the absolute worst condition that still might be considered acceptable. In no case should a unit fail to meet limit specifications.

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

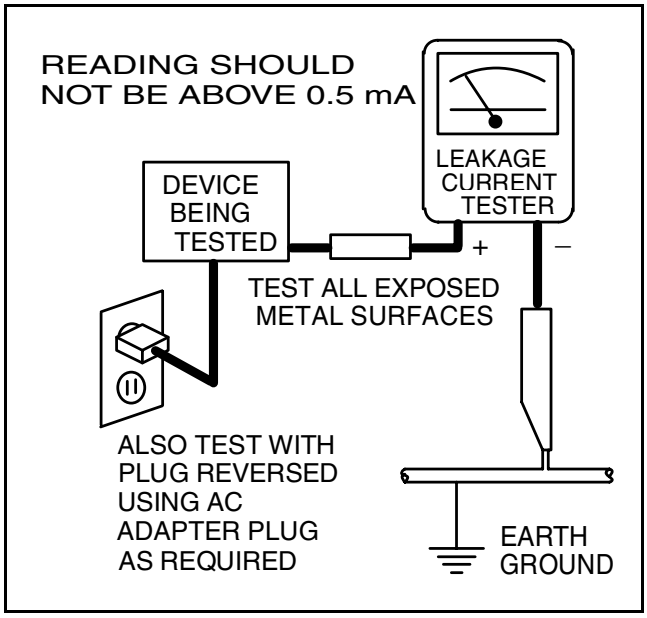
1. **Before returning an instrument to the customer,** always make a safety check of the entire instrument, including, but not limited to, the following items:

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 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). 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 milli-ampere. 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 normally have 85V AC(RMS) 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.

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 they comply 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 5~6 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

The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.

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 internal connectors, first, disconnect the AC plug from the AC supply outlet.

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')
110 to 130 V	USA or CANADA	≥ 3.2 mm (0.126 inches)

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

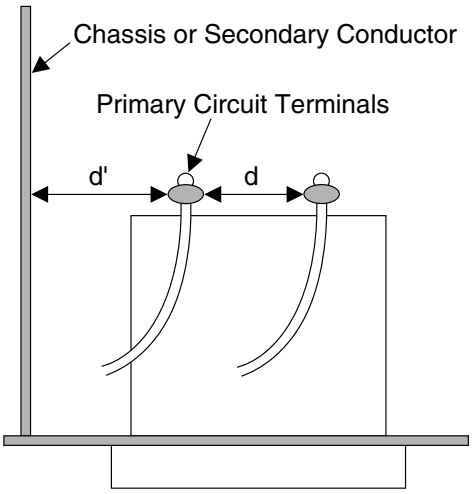


Fig. 1

2. Leakage Current Test

Confirm the 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.) is lower than or equal to the specified value in the table below.

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.

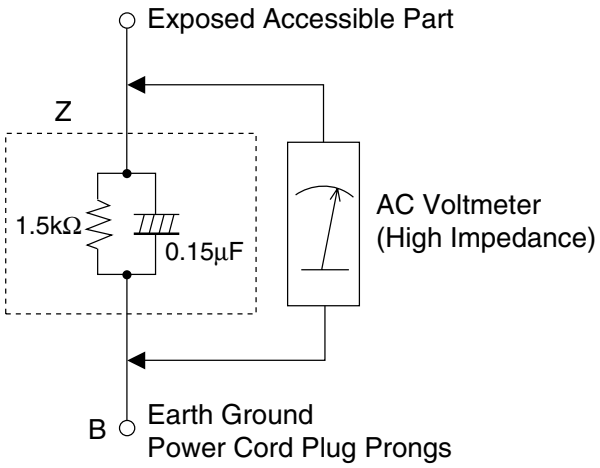


Fig. 2

Table 2 : Leakage current ratings for selected areas

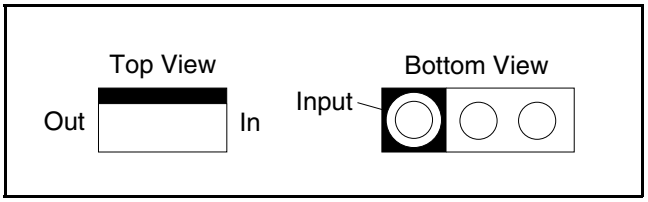
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
110 to 130 V	USA	0.15μF CAP. & 1.5kΩ RES. connected in parallel	i≤0.5mA rms	Exposed accessible parts

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

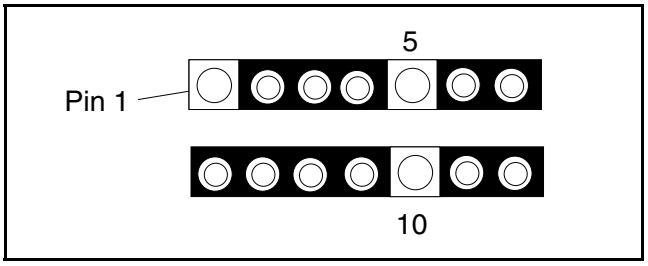
STANDARD NOTES FOR SERVICING

Circuit Board Indications

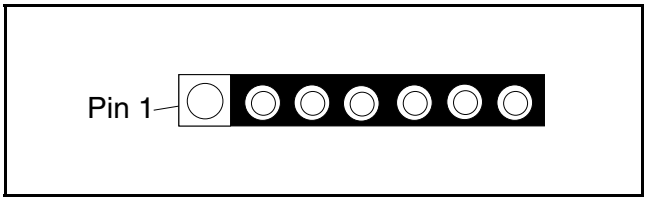
a. The output pin of the 3 pin Regulator ICs is indicated as shown.



b. For other ICs, pin 1 and every fifth pin are indicated as shown.



c. The 1st pin of every male connector is indicated as shown.



How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

(1) Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

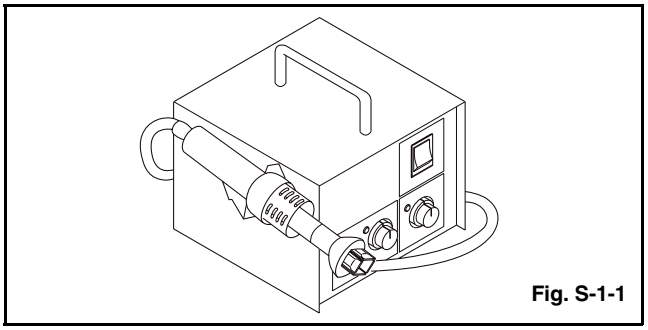


Fig. S-1-1

(2) Remove the flat pack-IC with tweezers while applying the hot air.

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Caution:

1. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)
2. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

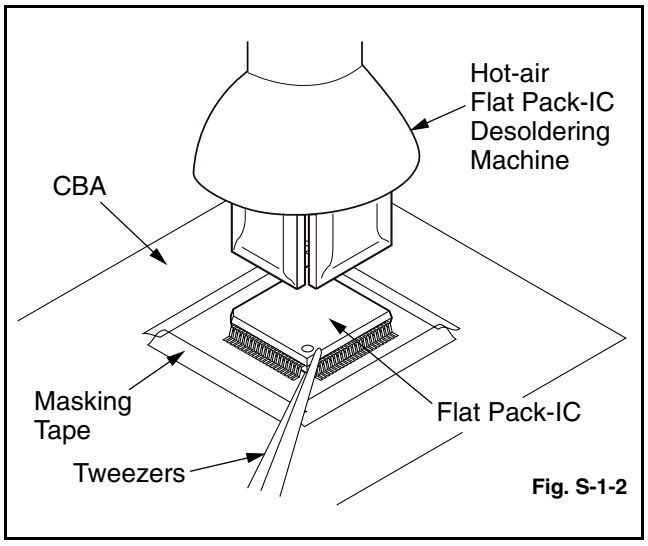


Fig. S-1-2

With Soldering Iron:

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

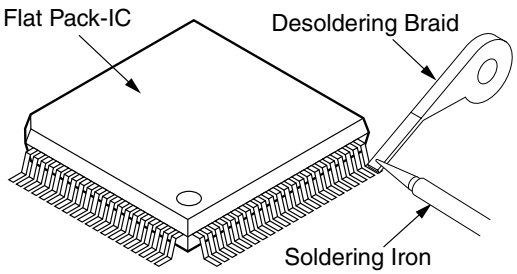


Fig. S-1-3

(2) Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

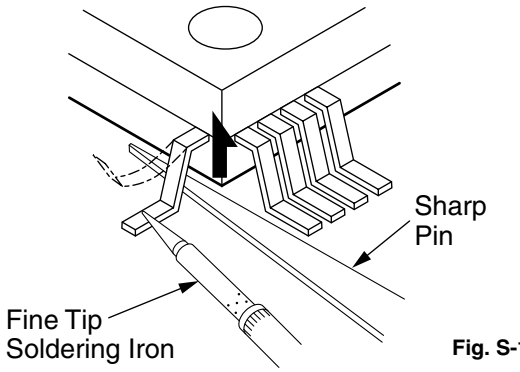


Fig. S-1-4

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

(2) Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.

(3) While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.

(4) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(5) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Note:

When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

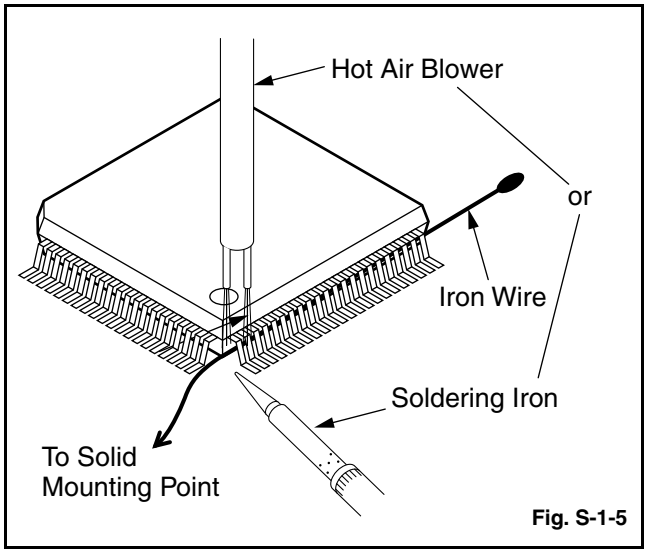


Fig. S-1-5

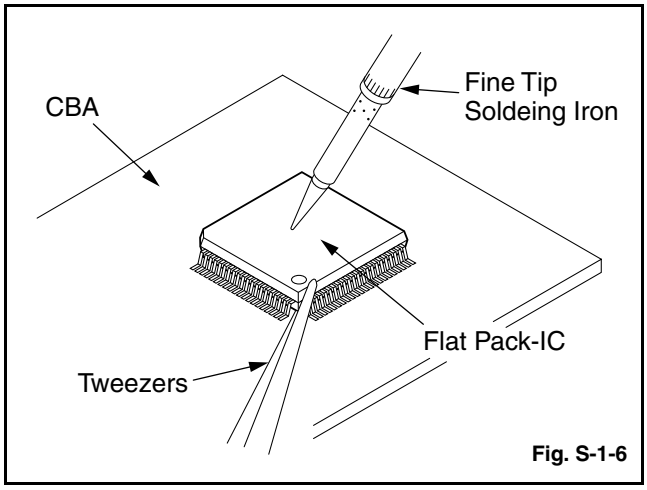


Fig. S-1-6

2. Installation

(1) Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.

(2) The " ● " mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then pre- solder the four corners of the flat pack-IC. (See Fig. S-1-8.)

(3) Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

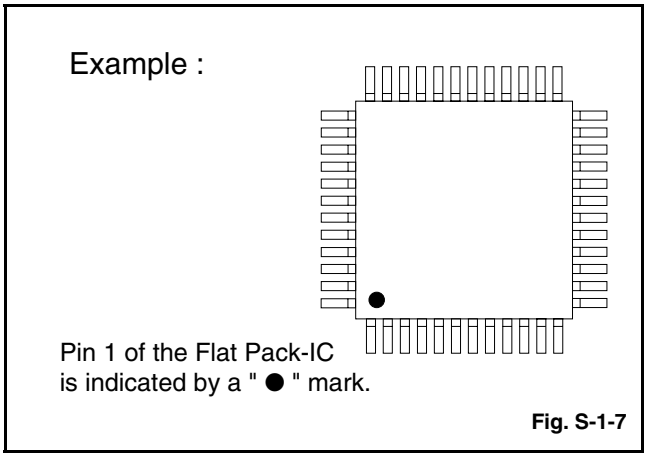


Fig. S-1-7

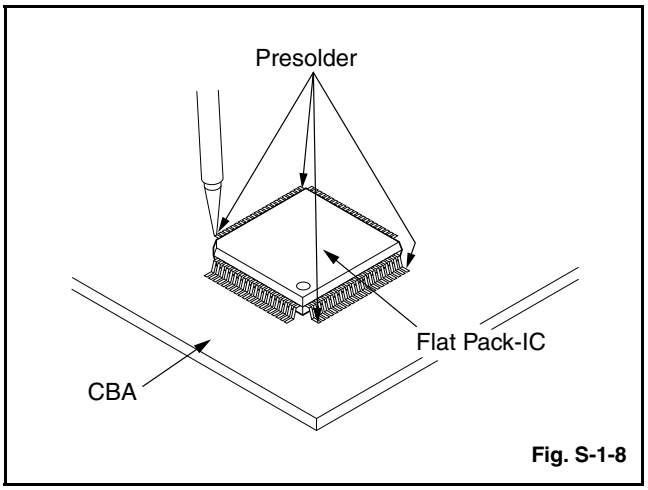


Fig. S-1-8

Instructions for Handling Semiconductors

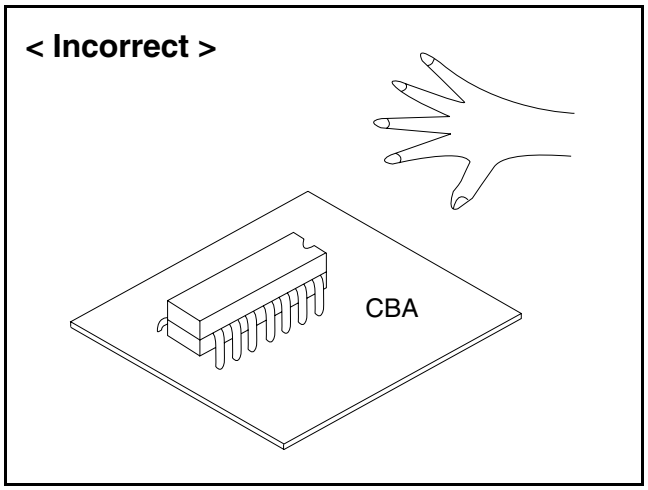
Electrostatic breakdown of the semiconductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

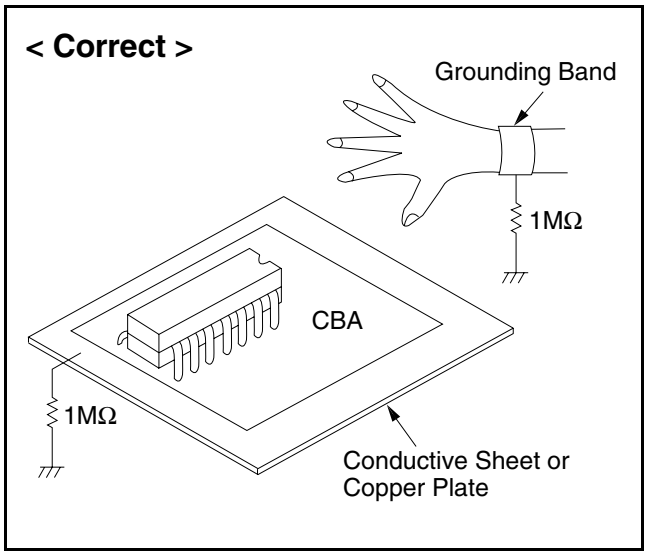
1. Ground for Human Body

Be sure to wear a grounding band (1MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1MΩ) on the workbench or other surface, where the semiconductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semiconductors with your clothing.





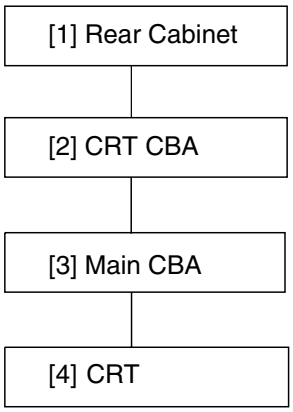
CABINET DISASSEMBLY INSTRUCTIONS

1. Disassembly Flowchart

This flowchart indicates the disassembly steps for the cabinet parts, and the CBA in order to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route and dress the cables as they were.

Caution !

When removing the CRT, be sure to discharge the Anode Lead of the CRT with the CRT Ground Wire 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	5(S-1), (S-3)	1
[2]	CRT CBA	4,5	CN501	2
[3]	Main CBA	3,5	CN571	3
[4]	CRT	4	4(S-2), Anode Cap	4
↓	↓	↓	↓	↓
①	②	③	④	⑤

Note :

①. Order of steps in procedure. When reassembling, follow the steps in reverse order.
These numbers are also used as the Identification (location) No. of parts in figures.

②. Parts to be removed or installed.

③. Fig. No. showing procedure of part location

④. Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.

S=Screw, P=Spring, L=Locking Tab, CN=Connector, *=Unhook, Unlock, Release, Unplug, or Desolder

2(S-2) = two Screws (S-2)

⑤. Refer to the following "Reference Notes in the Table."

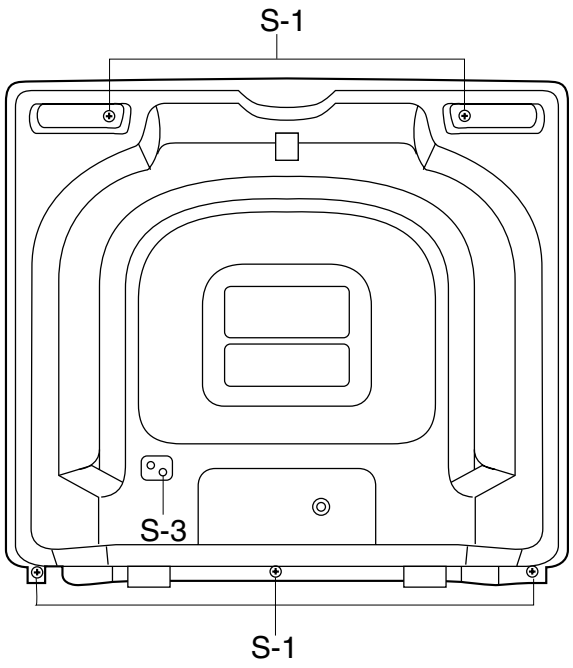
Reference Notes in the Table

1. Removal of the Rear Cabinet. Remove screws 5(S-1) and (S-3) then slide the Rear Cabinet backward.
2. Removal of the CRT CBA. Disconnect CN501 then pull the CRT CBA backward.
3. Removal of the Main CBA. Disconnect CN571 on the Main CBA then slide the Main CBA backward.

Caution !

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

4. Removal of the CRT. Remove screws 4(S-2) and Anode Cap. then slide the CRT backward.



[1] Rear Cabinet

Fig. 1

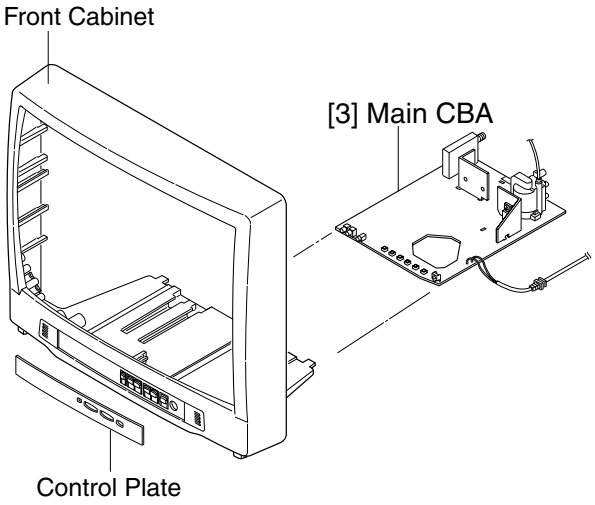


Fig. 3

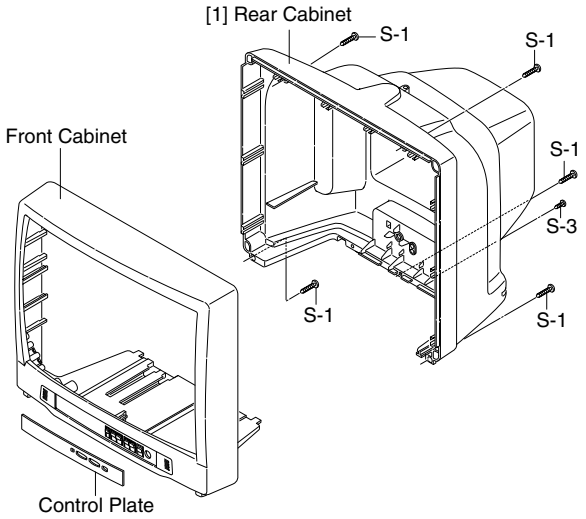


Fig. 2

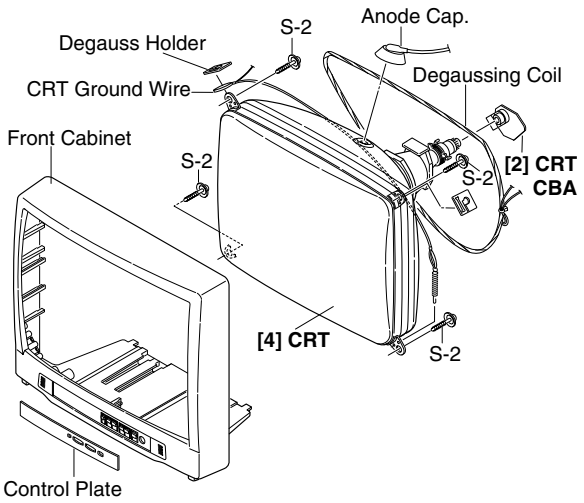


Fig. 4

TV Cable Wiring Diagram

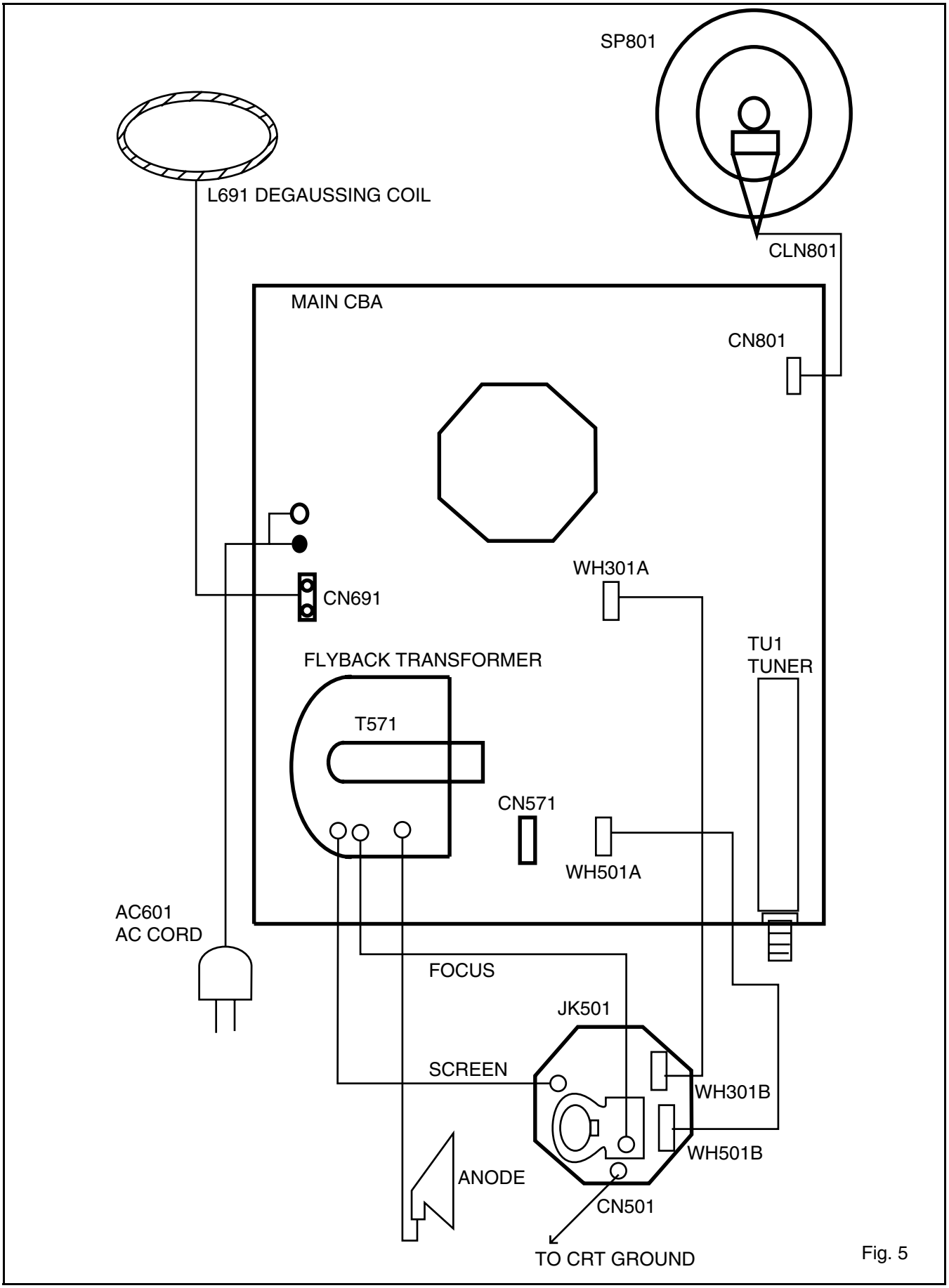


Fig. 5

ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note:
"CBA" is abbreviation for "Circuit Board Assembly".

NOTE:

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
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. NTSC Pattern Generator (Color Bar W/White Window, Red Color, Dot Pattern, Gray Scale, Monoscope, Multi-Burst)
2. DC Voltmeter
3. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50V/Div,
   F-Range: DC~AC-60MHz
4. Plastic Tip Driver
5. Remote control unit:Part No. N0121UD or N0134UD
6. DC power supply 13.2V/5A

How to make Service remote control unit:

1. Prepare normal remote control unit. (Part No. N0121UD or N0134UD) Remove 3 Screws from the back lid. (Fig. 1-1)
2. Added J1 (Jumper Wire) to the remote control CBA. (Fig. 1-2)

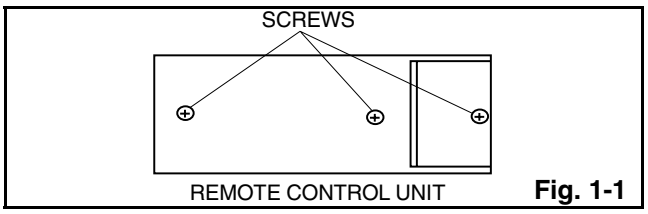


Fig. 1-1

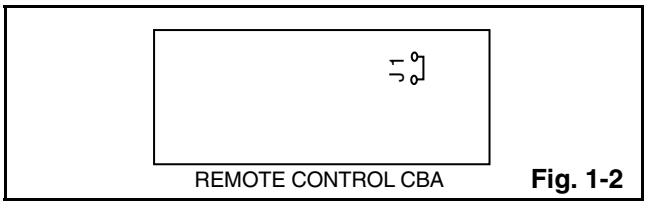


Fig. 1-2

How to set up the service mode:

Service mode:

1. Use the service remote control unit.
2. Turn the power on. (Use main power on the TV unit.)
3. Press " SLEEP " button on the service remote control unit. Version of micro computer will display on the CRT. (Ex: 200-0.07 or 054-0.13)
4. When CPU version is 054-0.13: Check the display on the lower left is "00" and if it is not "00", set it at "00" according to "3-1 FRENCH, ACCESS CODE, VIDEO TONE".

   When CPU version is 200-0.07: Confirm that the character of U (U.S.A. model) is indicated on the bottom left of the CRT. If the character of C (CANADA model) is indicated, perform "3-1 Setting for FRENCH data Values".

1. DC 114V Adjustment

Purpose: To obtain correct operation.

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

Test Point	Adj. Point	Mode	Input
TP601 TP300 (GND)	VR661	---	---
Tape	**M. EQ.**	**Spec.**	
---	DC Voltmeter	+114±0.5V DC.	

Note: TP601, TP300(GND), VR661 --- Main CBA

1. Connect DC Volt Meter to TP601 and TP300(GND).
2. Adjust VR661 so that the voltage of TP601 becomes +114±0.5V DC.

2. Black Strech Control Adjustment

Purpose: To show the fine black color.

Symptom of Misadjustment: Black color will not appear correctly.

Note: Use Service remote control unit.

1. Enter the Service mode. (See page 5-1)
2. Press " 6 " button on the Service remote control unit. " B-S " is indicated.
3. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that display will change " OFF ", " 0 ", " 1 ", " 2 " and " 3 ". Then choose " B-S OFF ".
4. Press " 6 " button on the Service remote control unit. " B-S*2 " is indicated.
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that display will change " 0", " 1 ". " 2 " and " 3 ". Then choose " B-S*2 0".
6. Turn the power off and on again.
   (Main power button on the TV unit.)

3-1. Setting for 7F and FRENCH data Values

General

1. Enter the Service mode. (See page 5-1)
2. Press " VOL ▼ " button on the Service remote control unit. Display changes " C/D ", " VCO ", " 7F " and " FRENCH " cyclically when " VOL ▼ " button is pressed.

7F

1. Press " VOL ▼ " button on the Service remote control unit. Then select 7F display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit. Then choose 7F=FF.

FRENCH

1. Press " VOL ▼ " button on the Service remote control unit. Then select FRENCH display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit. Then choose FRENCH=OFF.

When CPU version is 054-0.13, perform the following settings:

ACCESS CODE ---- set to OFF

VIDEO TONE ---- set to OFF

Note: **C/D** and **VCO** data values are no need to adjust at this moment.

3-2. Setting for CONTRAST, COLOR, TINT, V-TINT and SHARP data Values

General

1. Enter the Service mode. (See page 5-1)
2. Press " MENU " button on the Service remote control unit. Display changes " BRIGHT ", " CONTRAST ", " COLOR ", " TINT ", " V-TINT " and " SHARP " cyclically when " MENU " button is pressed.

CONTRAST (CNT)

1. Press " MENU " button on the Service remote control unit. Then select " CONTRAST " (CNT) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " CONTRAST " (CNT) becomes 92.

COLOR (CLR)

1. Press " MENU " button on the Service remote control unit. Then select " COLOR " (CLR) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " COLOR " (CLR) becomes 56.

TINT (TNT)

1. Press " MENU " button on the Service remote control unit. Then select " TINT " (TNT) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " TINT " (TNT) becomes 60.

V-TINT (V-TNT)

1. Press " MENU " button on the Service remote control unit. Then select " V-TINT " (V-TNT) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " V-TINT " (V-TNT) becomes 60.

SHARP (SHARP)

1. Press " MENU " button on the Service remote control unit. Then select " SHARP " (SHARP) display.
2. Press " CH ▲ / ▼ " buttons on the Service remote control unit and select " SHARP OFF ".

Note: **BRIGHT**data value is no need to adjust at this moment.

4. H f_O Adjustment

Purpose: To get correct horizontal frequency.

Symptom of Misadjustment: . If H f_0 adjustment is in correct, sqew distortion will appear on the screen.

Test Point	Adj. Point	Mode	Input
TP302	CH ▲ / ▼ button ["H-ADJ"] MODE		----
Tape	**M. EQ.**	**Spec.**	
----	Frequency Counter	15.734 kHz±300Hz	

Note: TP302 --- Main CBA

Use Service remote control unit.

1. Connect Frequency Counter to TP302 and ground.
2. Set the unit to the VIDEO mode which is located before CH2 and no input is necessary. Enter the Service mode. (See Page 5-1)
3. Operate the unit for at least 20 minutes.
4. Press " 2 " button on the Service remote control unit and select H-ADJ Mode. (By pressing " 2 " button the display will change from TV AGC to H-ADJ)
5. Press " CH ▲ / ▼ " button on the Service remote control unit so that the display will change " 0 " ~ " 7 ". At this moment, Choose display one of them from " 0 " ~ " 7 " when the Frequency Counter shows 15.734 kHz±300Hz or closer.
6. Turn the power off and on again. (Main Power button on the TV unit.)

5. VCO Adjustment

Purpose: To operate VCO correctly.

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

Test Point	Adj. Point	Mode	Input
---	---		No signal
Tape	**M. EQ.**	**Spec.**	
---	---	---	

Note: Use service remote control unit.

1. Disconnect the RF input and set the unit to Channel 4.
2. Enter the Service mode. (See Page 5-1)
3. Press " 3 " button on the Service remote control unit. The Auto VCO adjustment is started.
4. If the display color is changed from red to green, This adjustment is done.
5. Turn the Power off and on again. (Main power button on the TV unit.)

6. 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	Adj. Point	Mode	Input
TP301	CH ▲ / ▼ buttons	RF	Color Bar 67.25MHz 60dBμV
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator DC Volt Meter	+2.5±0.1VDC or +2.8±0.1VDC by Tuner Type.	

Notes: TP301 --- Main CBA

Use Service remote control unit.

1. Enter the Service mode. (See Page 5-1) Then press number " 2 " button on the Service remote control unit.
2. Receive the Color Bar signal for channel 4 (67.25MHz). (RF Input Level: 60dBμV)
3. Press " CH ▲ / ▼ " buttons so that the voltage of TP301 becomes +2.5±0.1V DC. If the tuner is used TEDH9-300A. (Tuner type number)
4. Press " CH ▲ / ▼ " buttons so that the voltage of TP301 becomes +2.8±0.1V DC. If the tuner is used B8095AD. (Tuner type number)
5. Turn the Power off and on again. (Main power button on the TV unit.)

7. Black Level Adjustment

Purpose: Set Sub-bright Level

Symptom of Misadjustment: If Sub-brightness is incorrect, Proper brightness can not be obtained by adjusting the Bright ness Control.

Note: TP502, TP501 (GND) --- CRT CBA

1. Enter the Service mode. (See page 5-1).
2. Press " MENU " button on the Service remote control unit and select " BRT "mode. (Display changes " BRT ", " CNT ", " CLR " and " TNT "cyclically when MENU button is pressed).
3. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the value of " BRT " becomes 128.
4. Turn the power off and on again. (Main power button on the TV unit.)

8. C-Trap Adjustment

Purpose: To get minimum leakage of the color signal carrier.

Symptom of Misadjustment: If C- Trap Adjustment is incorrect, stripes will appears on the screen.

Test Point	Adj. Point	Mode	Input
TP502 (Blue) TP501 (GND)	CH ▲ / ▼ buttons	RF	Color Bar
Tape	**M. EQ.**	**Spec.**	
----	Oscilloscope	----	

Note: TP502, TP501 --- CRT CBA

Use Service remote control unit.

1. Connect Oscilloscope to TP502 and TP501 (GND).
2. Enter the Service mode. (See Page 5-1) Receive color bar signal from RF Input.
3. Press " 0 " button on the Service remote control unit and select C-TRP Mode.
4. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the display will change " 0 ", " 1 ", " 2 " and " 3 ". Choose display " 0 ", " 1 ", " 2 " or " 3 " when B-Out (3.58MHz) value becomes minimun on the oscilloscope reading.
5. Turn the power off and on again. (Main power button on the TV unit.)

9. V. Size Adjustment

Purpose: To obtain correct vertical width of screen image.

Symptom of Misadjustment: If V. Size is incorrect, vertical size of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Screen Control CH ▲ / ▼ buttons [V-S] Mode	RF	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use service remote control unit.

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode. (See page 5-1)
3. Receive the Monoscope Pattern.
4. Press " 9 " button on the Service remote control unit and select " V-S "mode. (Display changes " V-S " and " V-P " cyclically when " 9 " button is pressed).
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the monoscope pattern will be 90±5% of display size and the circle is round.
6. Turn the power off and on again. (Main power button on the TV unit.)

10. V. Position Adjustment

Purpose: To obtain correct vertical width of screen image.

Symptom of misadjustment: If V. Position is incorrect, vertical height of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Screen Control CH ▲ / ▼ buttons [V-P] Mode	RF	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use Service remote control unit

1. Operate the unit for at least 20 minutes.
2. Enter the Service Mode. (See page 5-1)
3. Receive the Monoscope Pattern.
4. Press " 9 " button on the Service remote control unit and select " V-P "mode. (Display change " V-S " and " V-P " cyclically when " 9 " button is pressed).
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the top and bottom of the monoscope pattern will be equal of each other.
6. Turn the Power off and on again. (Main power button on the TV unit.)

11. H. Position Adjustment

Purpose: To obtain correct horizontal position of screen image.

Symptom of Misadjustment: If H. Position is incorrect, horizontal position of image on the screen may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Screen Control CH ▲ / ▼ buttons [H-P] Mode	RF	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Monoscope	90±5%	

Note: Use Service remote control unit

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode. (See page 5-1)
3. Receive the Monoscope Pattern.
4. Press " 8 " button on the remote control unit and select " H-P "mode.
5. Press " CH ▲ / ▼ " buttons on the Service remote control unit so that the monoscope pattern will be 90±5% of display size and the circle is round.
6. Turn the Power off and on again. (Main power button on the TV unit.)

12. Cut-off Adjustment

Purpose: To adjust the beam current of R, G, B, and screen voltage.

Symptom of Misadjustment: White color may be reddish, greenish or bluish.

Test Point	Adj. Point	Mode	Input
---	Screen-Control CH ▲ / ▼ buttons	RF	Black Raster
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See Reference Notes below.	

Figure

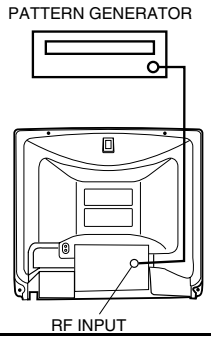


Fig. 2

Note: Screen Control FBT --- Main CBA

F.B.T= Fly Back Transformer

Use Service remote control unit

1. Degauss the CRT and allow CRT to operate for 20 minutes before starting the alignment.
2. Input the Black Raster Signal from RF Input.
3. Enter the Service mode. (See page 5-1)
4. Press " VOL ▼ " button on the Service remote control unit and select " C/D " mode. (Display changes " C/D ", "VCO ", " 7F " and " FRENCH " cyclically when " VOL ▼ " button is pressed.) then press " 1 ". The display will momentarily show " CUT OFF R " (R= Red). Now there should be a horizontal line across the center of the picture tube. If needed gradually turn the screen control on the flyback, clockwise until the horizontal line appears. Adjust the Red Cut off by pressing the " CH ▲ / ▼ " buttons. Proceed to Step 5 when the Red Cut off adjustment is done.
5. Press the " 2 "button. The display will momentarily show " CUT OFF G " (G=Green). Adjust the Green Cut off by pressing the " CH ▲ / ▼ " buttons. Proceed to step 6 when the Green Cut off adjustment is done.
6. Press the " 3 " button. The display will momentarily show " CUT OFF B " (B=Blue). Adjust the Blue cut off by pressing the " CH ▲ / ▼ " buttons. When done with steps 4, 5 and 6 the horizontal line should be pure white if not,then attempt the Cut off adjustment again.

13. 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	Adj. Point	Mode	Input
Screen	CH ▲ / ▼ buttons	RF	White Raster (APL 100%)
Tape	**M. EQ.**	**Spec.**	
	Pattern Generator, Color analyzer	See below	

Figure

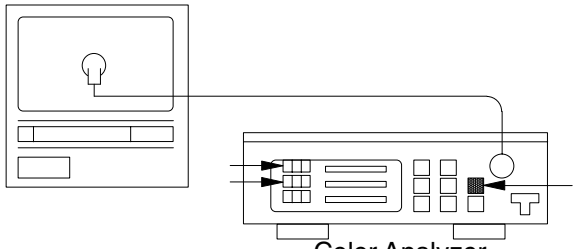


Fig. 3

Note: Use Service remote control unit

1. Operate the unit more than 20 minutes.
2. Face the unit to east. Degauss the CRT using Degaussing Coil.
3. Input the White Raster (APL 100%).
4. Set the color analyzer to the CHROMA mode and after zero point calibration, bring the optical receptor to the center on the tube surface (CRT).
5. Enter the Service mode . Press " VOL ▼ " button on the Service remote control unit and select " C/D " mode. (Display changes " C/D ", "VCO ", " 7F " and " FRENCH " cyclically when " VOL ▼ " button is pressed.) then Press No. 8 button on the Service remote control Unit.
6. Press No. 4 button on the service remote control unit for Red adjustment. Press N0. 5 button on the Service remote control unit for Blue adjustment.
7. In each color mode, Press " CH ▲ / ▼ " button to adjust the values of color.
8. Adjusting Red and Blue color so that the tempreture becomes 9200K (x : 286 / y : 294) ±3%.
9. At this time, Re-check that Horizontal line is white. If not, Re-adjust Cut-off Adjustment until the Horizontal Line becomes pure white.
10. Turn off and on again to return to normal mode. Receive APL 100% white signal and Check Chroma temperatures become 9200K (x : 286 / y : 294) ±3%.

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

14. Sub-Brightness Adjustment

Purpose: To get proper brightness.

Symptom of Misadjustment: If Sub-Brightness is incorrect, proper brightness cannot be obtained by adjusting the Brightness Control.

Test Point	Adj. Point	Mode	Input
---	CH ▲ / ▼ buttons	RF	IQW
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	
Figure			

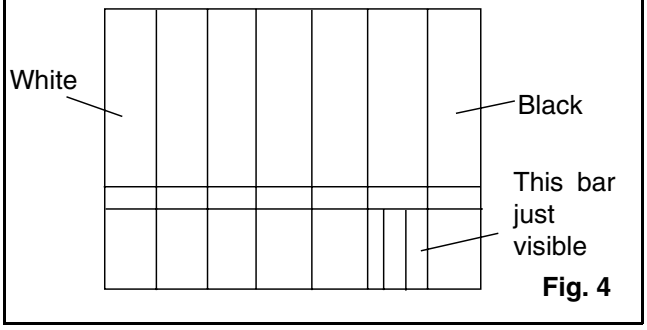


Fig. 4

Note: IQW Setup level --- 7.5 IRE
Use Service remote control unit

1. Enter the Service mode. (See page 5-1)
   Then input IQW signal from RF Input.
2. Press " MENU " button on the Service remote control unit and Select " BRT " mode. (Display changes " BRT ", " CNT ", " CLR ", and " TNT " cyclically when MENU button is pressed). Press " CH ▲ / ▼ " buttons so that the bar is just visible (See above figure).
3. Turn the power off and on again. (Main power button on the TV unit.)

15. Focus Adjustment

Purpose: Set the optimum Focus.

Symptom of Misadjustment: If Focus Adjustment is incorrect, blurred images are shown on the display.

Test Point	Adj. Point	Mode	Input
---	Focus Control	---	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Note: Focus VR (FBT) — Main CBA FBT = Fly Back Transformer

1. Operate the unit more than 30 minutes
2. Face the unit to the East and Degauss the CRT using Degaussing Coil.
3. Input the Monoscope Pattern.
4. Adjust the Focus Control on the FBT to obtain clear picture.

The following 2 adjustments normally are not attempted in the field. Only when replacing the CRT then adjust as a preparation.

16. Purity Adjustment

Purpose: To obtain pure color.

Symptom of Misadjustment: If Color Purity Adjustment is incorrect, large areas of color may not be properly displayed.

Test Point	Adj. Point	Mode	Input
---	Deflection Yoke Purity Magnet	---	Red Color
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	
Figure			

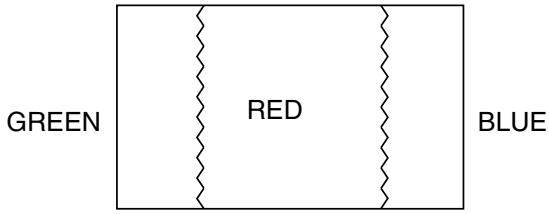


Fig. 5

1. Set the unit facing east.
2. Operate the unit for over 30 minutes before adjusting.
3. Fully degauss the unit using an external degaussing coil.
4. Loosen the screw on the Deflection Yoke Clamper and pull the Deflection Yoke back away from the screen. (See Fig. 6)
5. Loosen the Ring Lock and adjust the Purity Magnets so that a red field is obtained at the center of the screen. Tighten Ring Lock. (See Fig. 5,6)
6. Slowly push the Deflection Yoke toward bell of CRT and set it where a uniform red field is obtained.
7. Tighten the clamp screw on the Deflection Yoke.

17. Convergence Adjustment

Purpose: To obtain proper convergence of red, green and blue beams.

Symptom of Misadjustment: If Convergence Adjustment is incorrect, the edge of white letters may have color edges.

Test Point	Adj. Point	Mode	Input
---	C.P. Magnet (RB), C.P. Magnet (RB-G), Deflection Yoke	---	Dot Pattern or Crosshatch
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figures

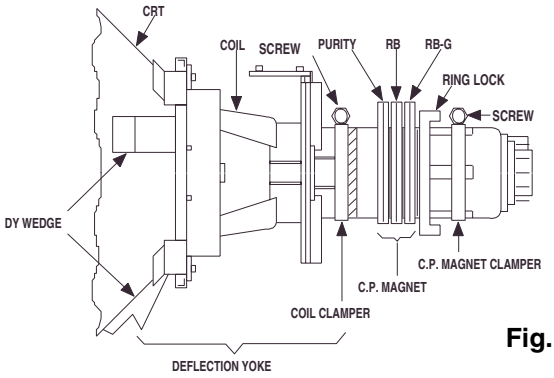


Fig. 6

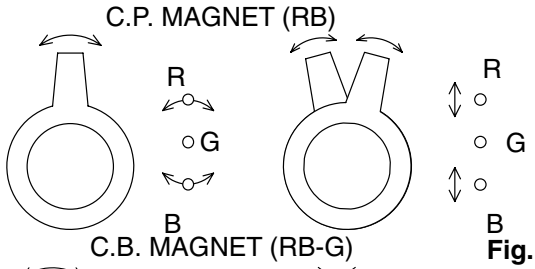


Fig. 7

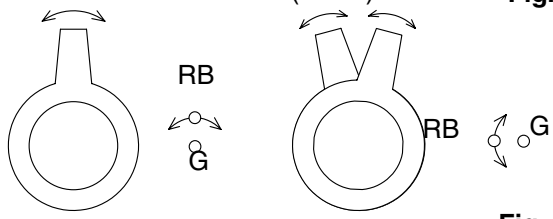
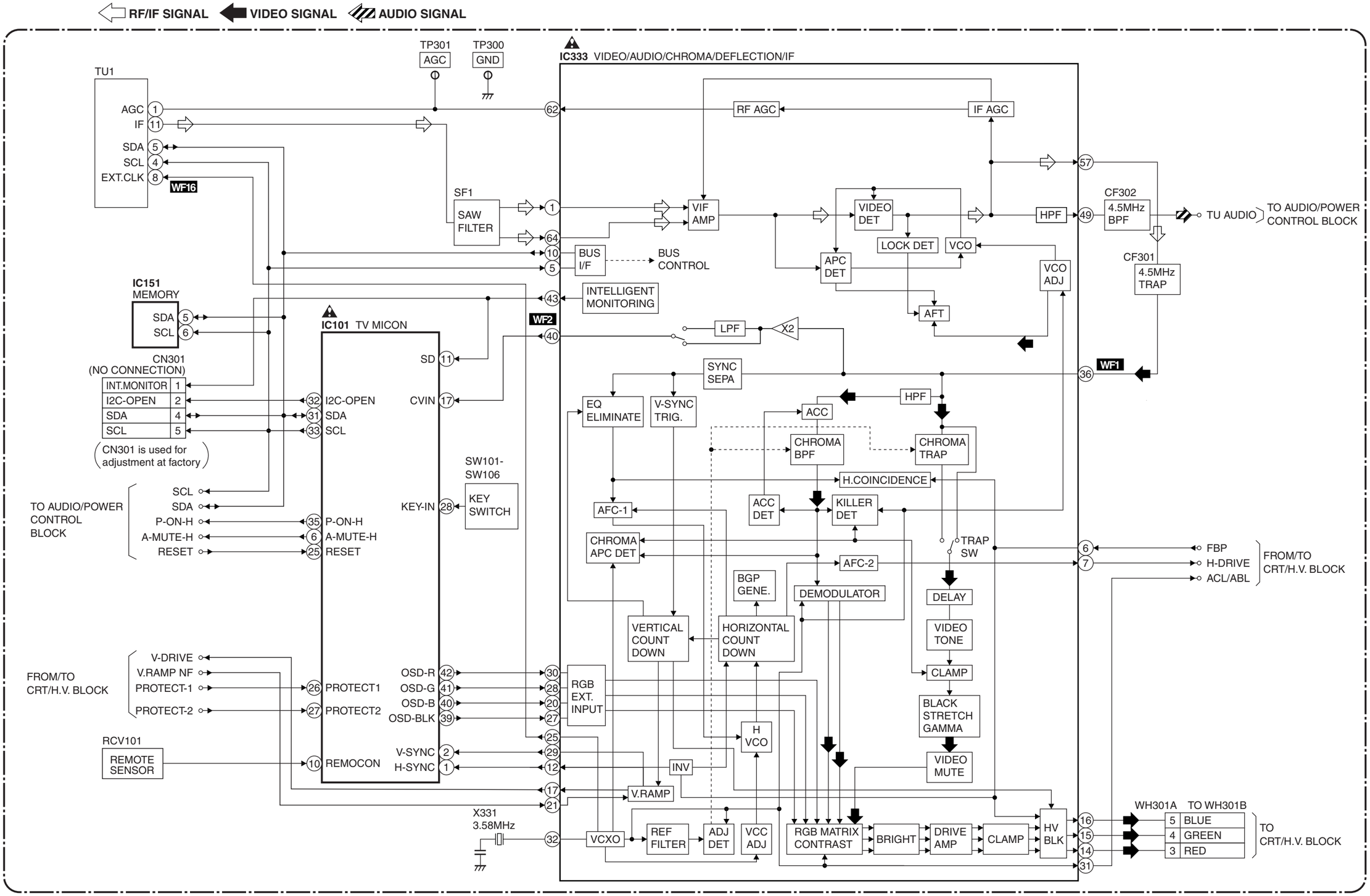


Fig. 8

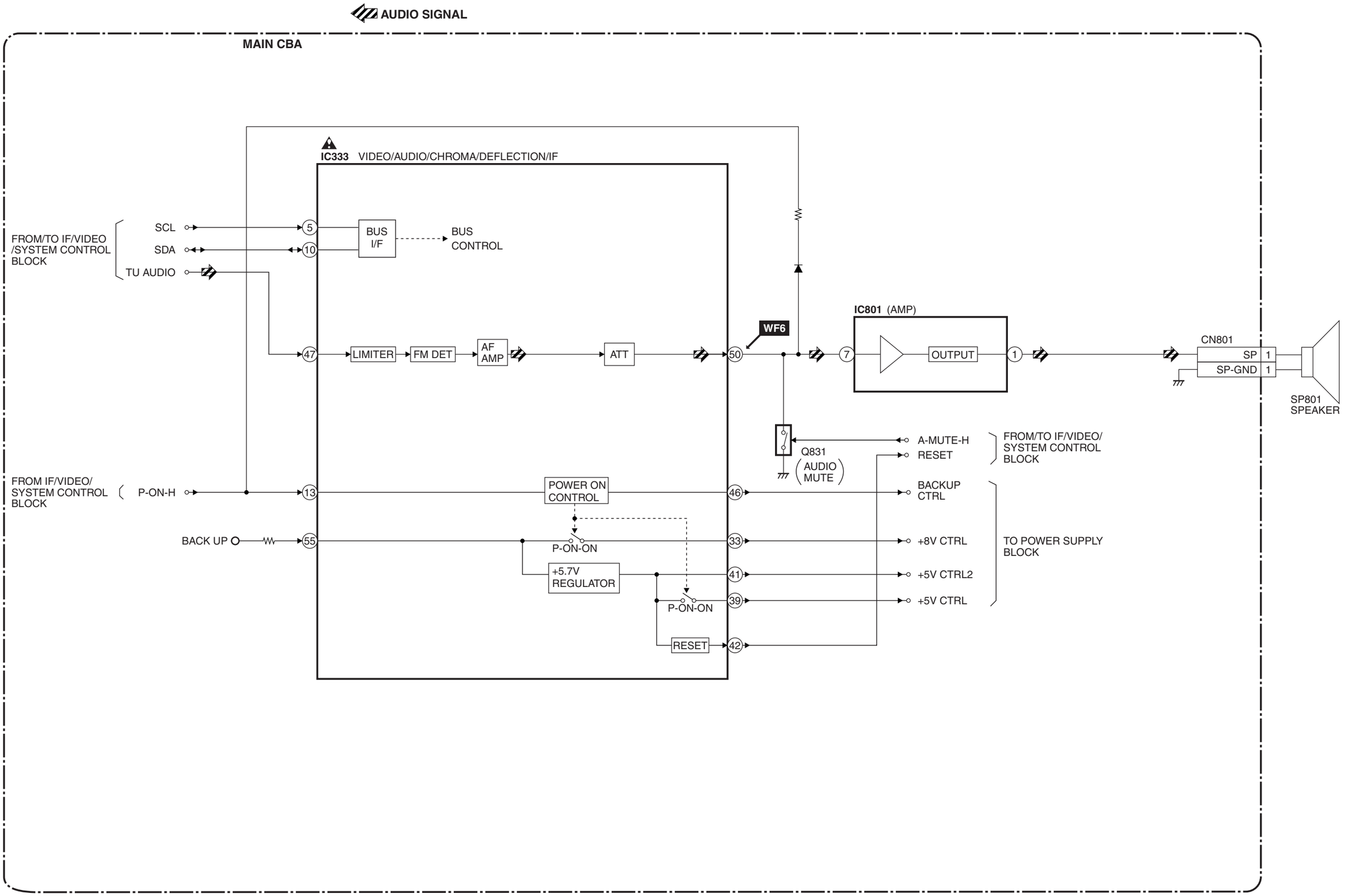
1. Loosen the Ring Lock and align red with blue dots or Crosshatch at the center of the screen by rotating (RB) C.P. Magnets. (See Fig. 7)
2. Align red / blue with green dots at the center of the screen by rotating (RB-G) C.P. Magnet. (See Fig. 8)
3. Fix the C.P. Magnets by tightening the Ring Lock.
4. Remove the DY Wedges and slightly tilt the Deflection Yoke horizontally and vertically to obtain the best overall convergence.
5. Fix the Deflection Yoke by carefully inserting the DY Wedges between CRT and Deflection Yoke.

BLOCK DIAGRAMS

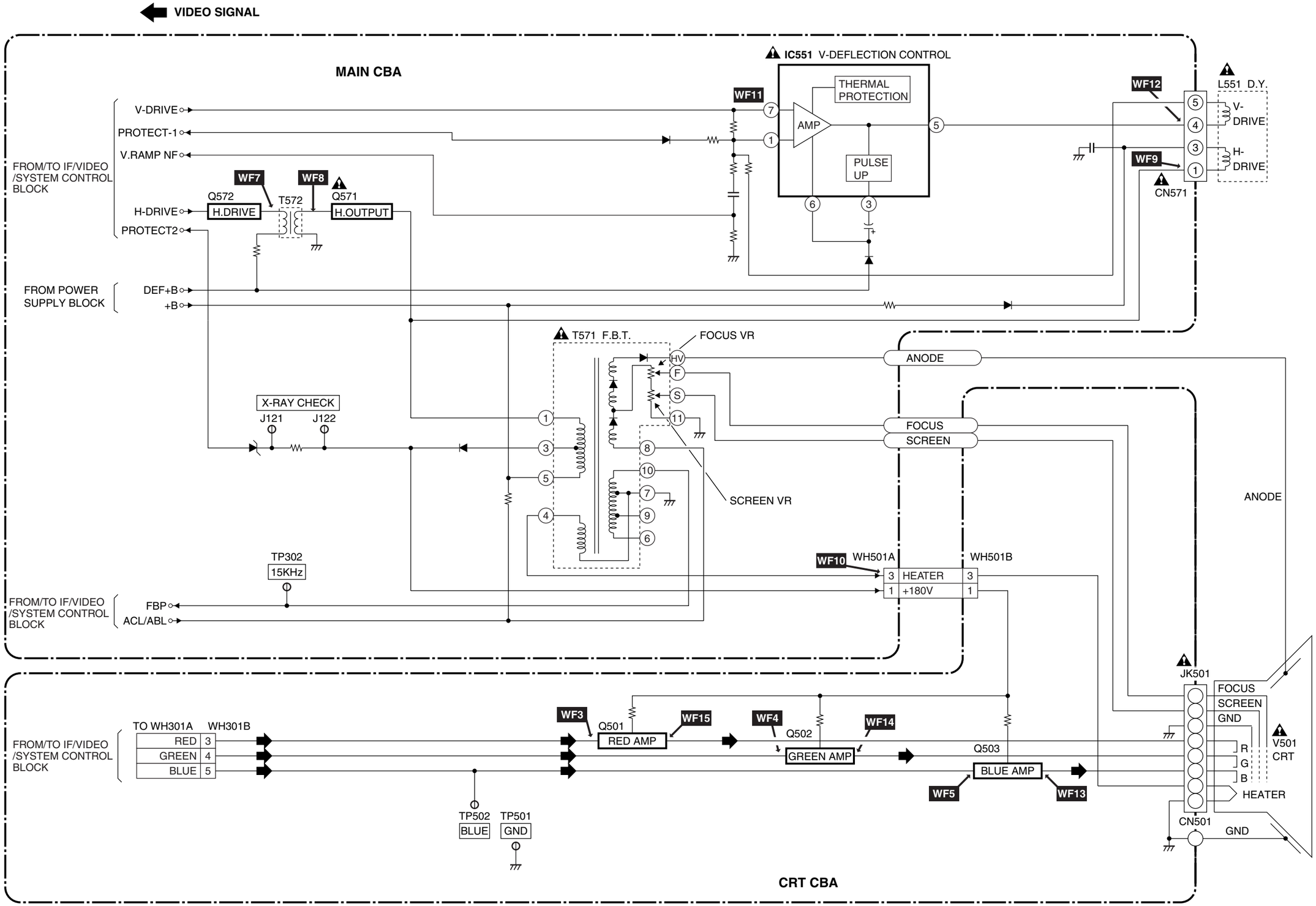
IF/Video/System Control Block Diagram



Audio/Power Control Block Diagram



CRT/H.V. Block Diagram



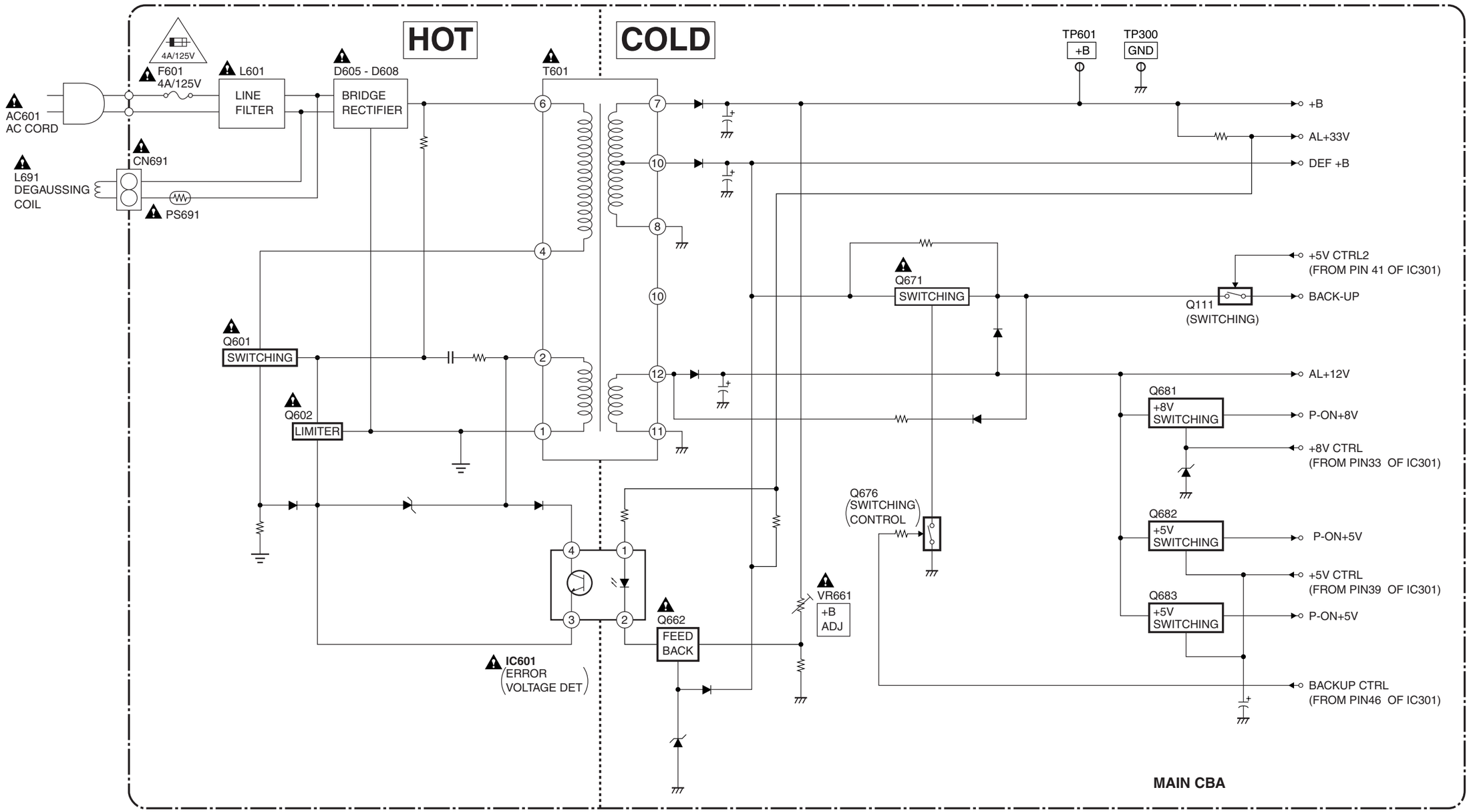
Power Supply Block Diagram

CAUTION !
Fixed voltage power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

4A/125V

CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.
"This symbol means fast operating fuse."
"Ce symbole reprèsente un fusible à fusion rapide."

NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

Standard Notes

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark " ⚠ " inthe schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Note:

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 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P=10^{-6}\mu F$).
5. All voltages are DC voltages unless otherwise specifi

Note of Capacitors:

ML --- Mylar Cap. PP --- Metalized Film Cap. SC --- Semiconductor Cap. L --- Low Leakage type

Temperature Characteristics of Capacitors are noted with the following:

B --- ±10% CH --- 0±60ppm/°C SL --- +350~-1000ppm/°C

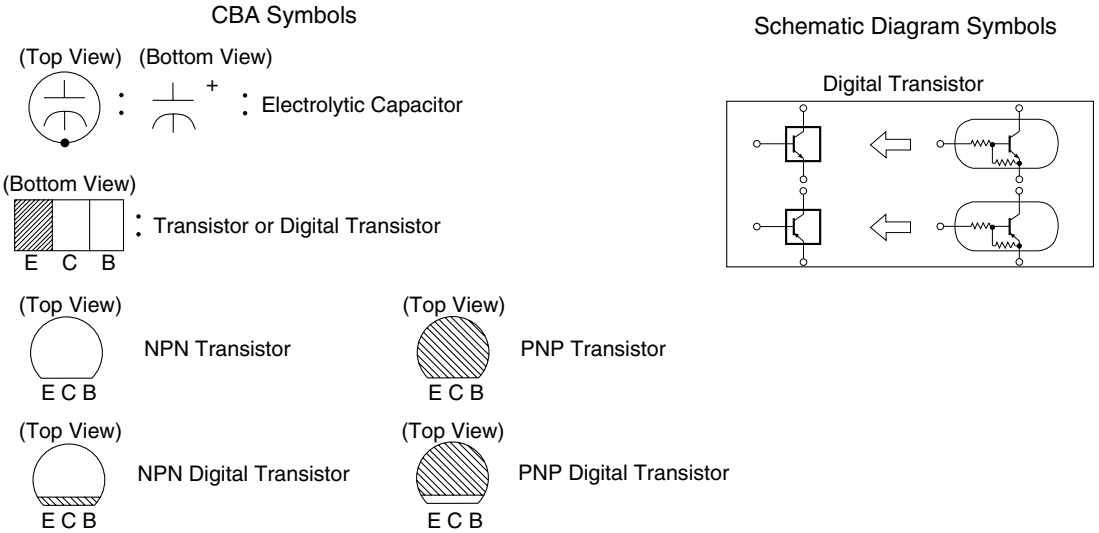
Tolerance of Capacitors are noted with the following:

Z --- +80~-20%

Note of Resistors:

CEM --- Cement Res. MTL --- Metal Res. F --- Fuse Res.

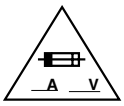
Capacitors and transistors are represented by thefollowing symbols.



LILIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE

SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. **CAUTION:** FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.



RISK OF FIRE-REPLACE FUSE AS MARKED.

2. **CAUTION:**

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. **Note:**

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

(2) To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

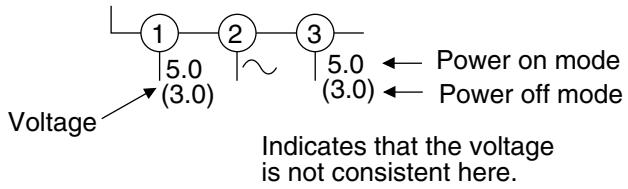
4. Wire Connectors

(1) Prefix symbol "CN" means "connector" (can disconnect and reconnect).

(2) Prefix symbol "CL" means "wire-solder holes of the PCB" (wire is soldered directly).

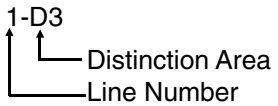
5. Note: Mark "•" is a leadless (chip) component.

6. Voltage indications on the schematics are as shown below:
Plug the TV power cord into a standard AC outlet.



Unit: Volts

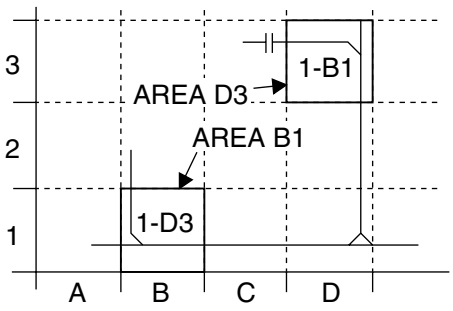
7. How to read converged lines



Examples:

1. "1-D3" means that line number "1" goes to area "D3".

2. "1-B1" means that line number "1" goes to area "B1".



8. Test Point Information

: Indicates a test point with a jumper wire across a hole in the PCB.

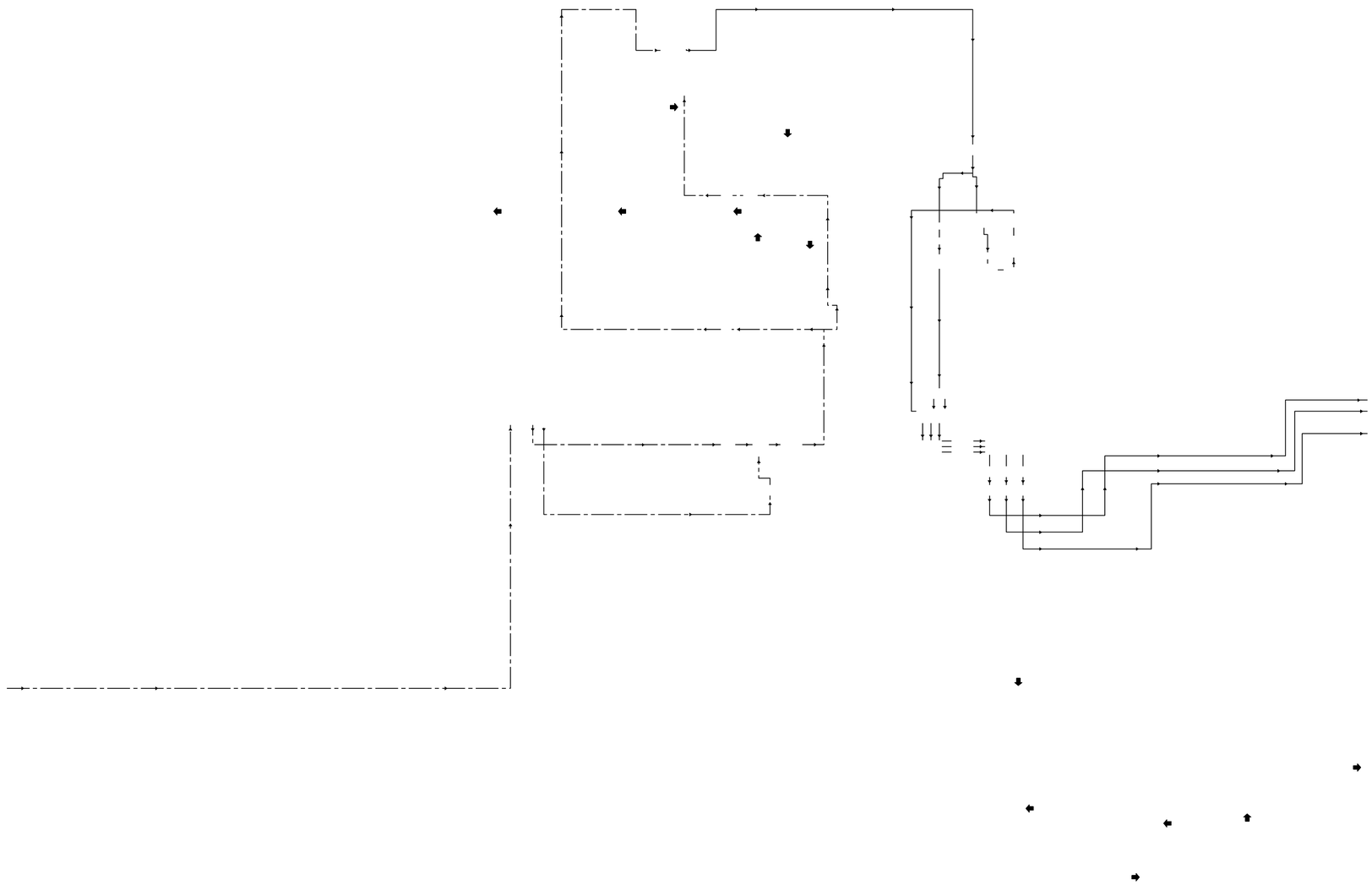
: Used to indicate a test point with a component lead on foil side.

: Used to indicate a test point with no test pin.

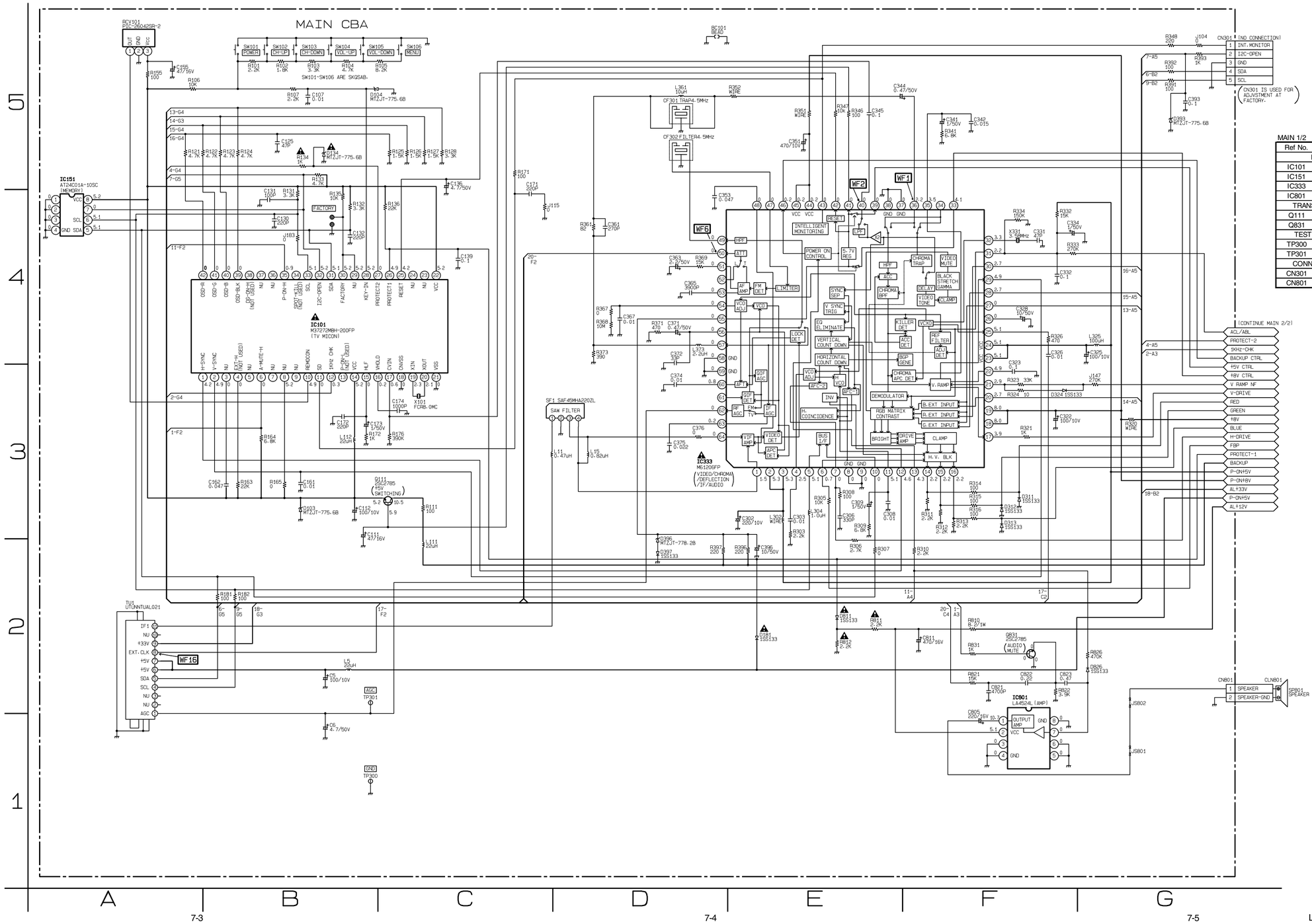
: Used to indicate a test point with a test pin.

A5	B5	C5	D5	E5	F5	G5
A4	B4	C4	D4	E4	F4	G4
A3	B3	C3	D3	E3	F3	G3
A2	B2	C2	D2	E2	F2	G2
A1	B1	C1	D1	E1	F1	G1

IF SIGNAL
VIDEO SIGNAL
AUDIO SIGNAL



Main 1/2 Schematic Diagram

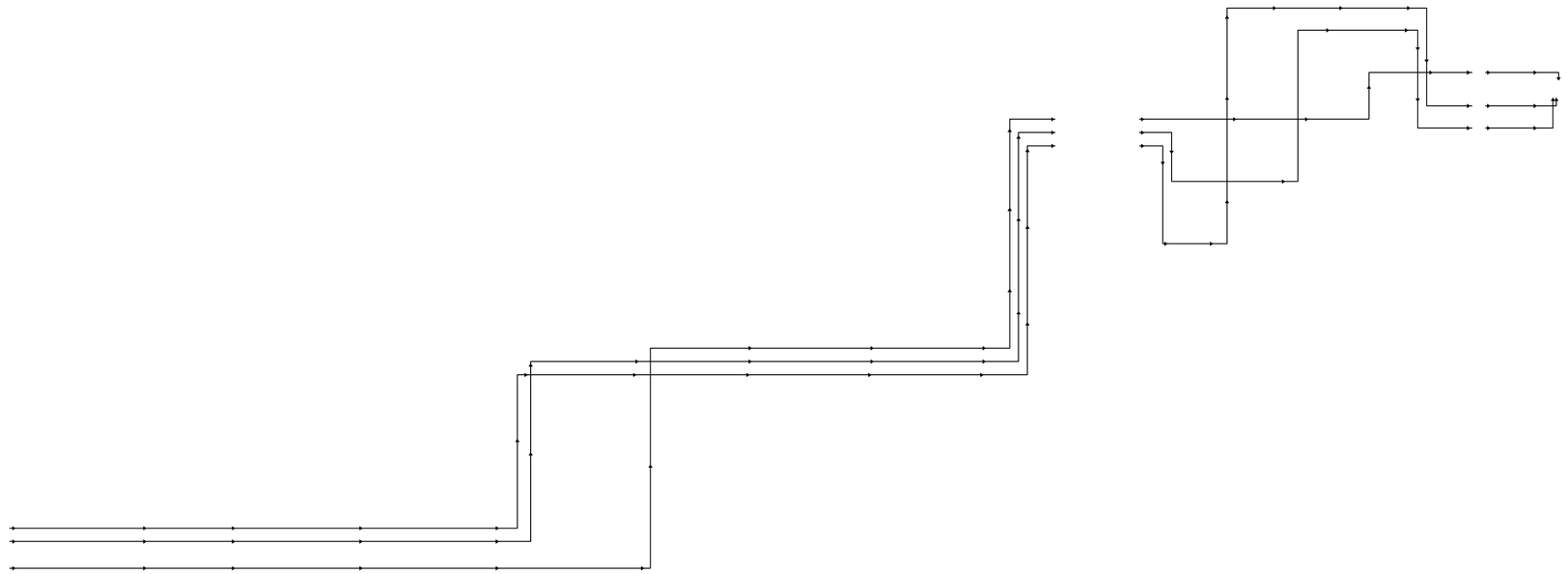


7-3 7-4 7-5

L1400SCM1

H5	I5	J5	K5	L5	M5	N5
H4	I4	J4	K4	L4	M4	N4
H3	I3	J3	K3	L3	M3	N3
H2	I2	J2	K2	L2	M2	N2
H1	I1	J1	K1	L1	M1	N1

VIDEO SIGNAL



Main 2/2 & CRT Schematic Diagram

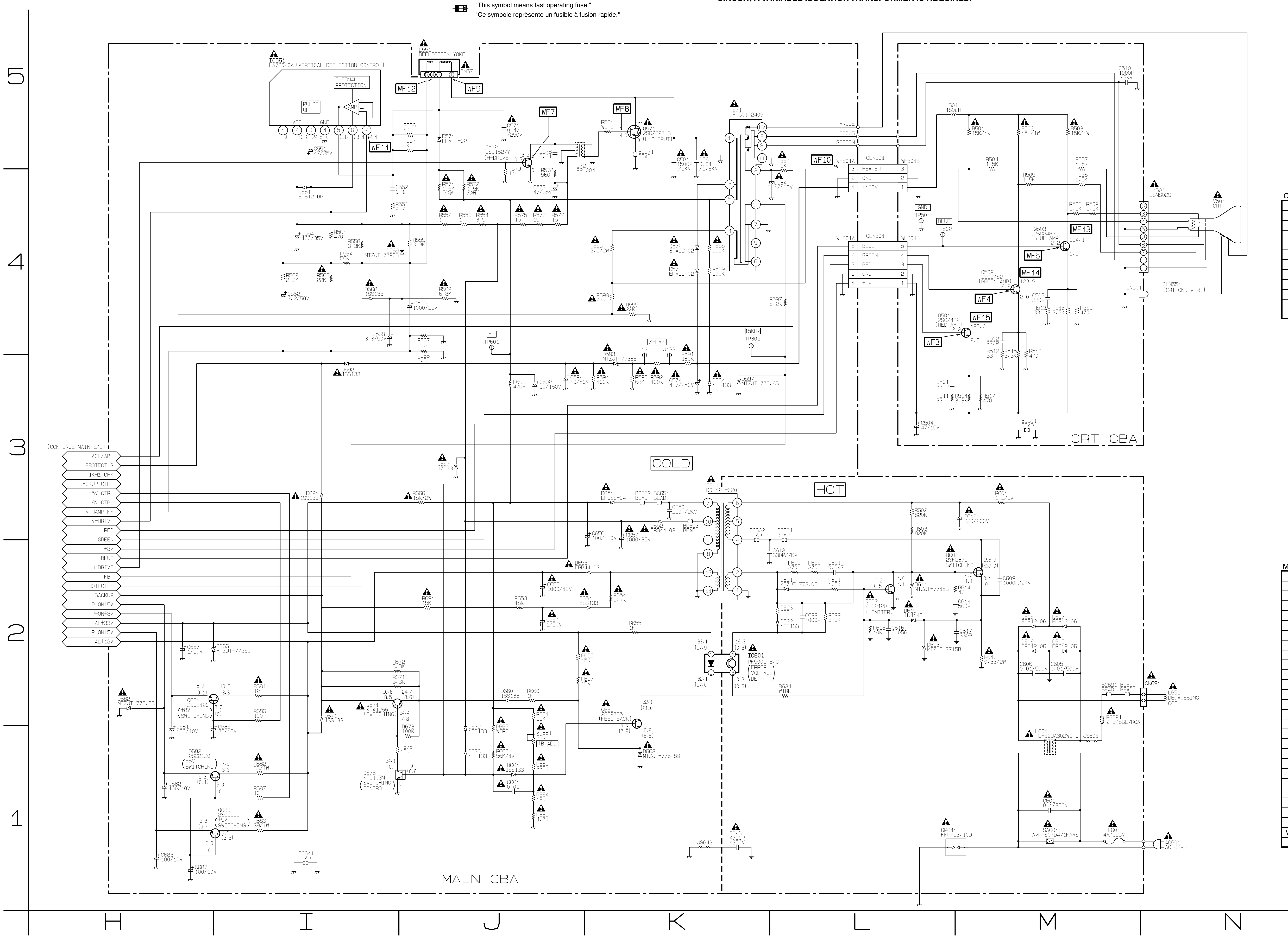
CAUTION !
Fixed voltage power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

4A/125V

CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.
"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT, AN ISOLATION TRANSFORMER MUST BE USED. ALSO, IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY, WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT, A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.

NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



CRT

Ref No.	Position
TRANSISTORS	
Q501	M-4
Q502	M-4
Q503	M-4
TEST POINTS	
TP501	L-4
TP502	L-4
CONNECTORS	
CN501	N-4
WH301B	L-4
WH501B	L-5

MAIN 2/2

Ref No.	Position
ICS	
IC551	I-5
IC601	K-2
TRANSISTORS	
Q571	K-5
Q572	J-5
Q601	M-2
Q602	L-2
Q662	K-1
Q671	I-2
Q676	I-1
Q681	H-2
Q682	H-1
Q683	H-1
Q696	K-1
TEST POINTS	
J121	K-4
J122	K-4
TP302	K-4
TP601	J-4
CONNECTORS	
CN571	J-5
CN691	N-2
WH301A	L-4
WH501A	L-5
VARIABLE RESISTORS	
VR661	J-1

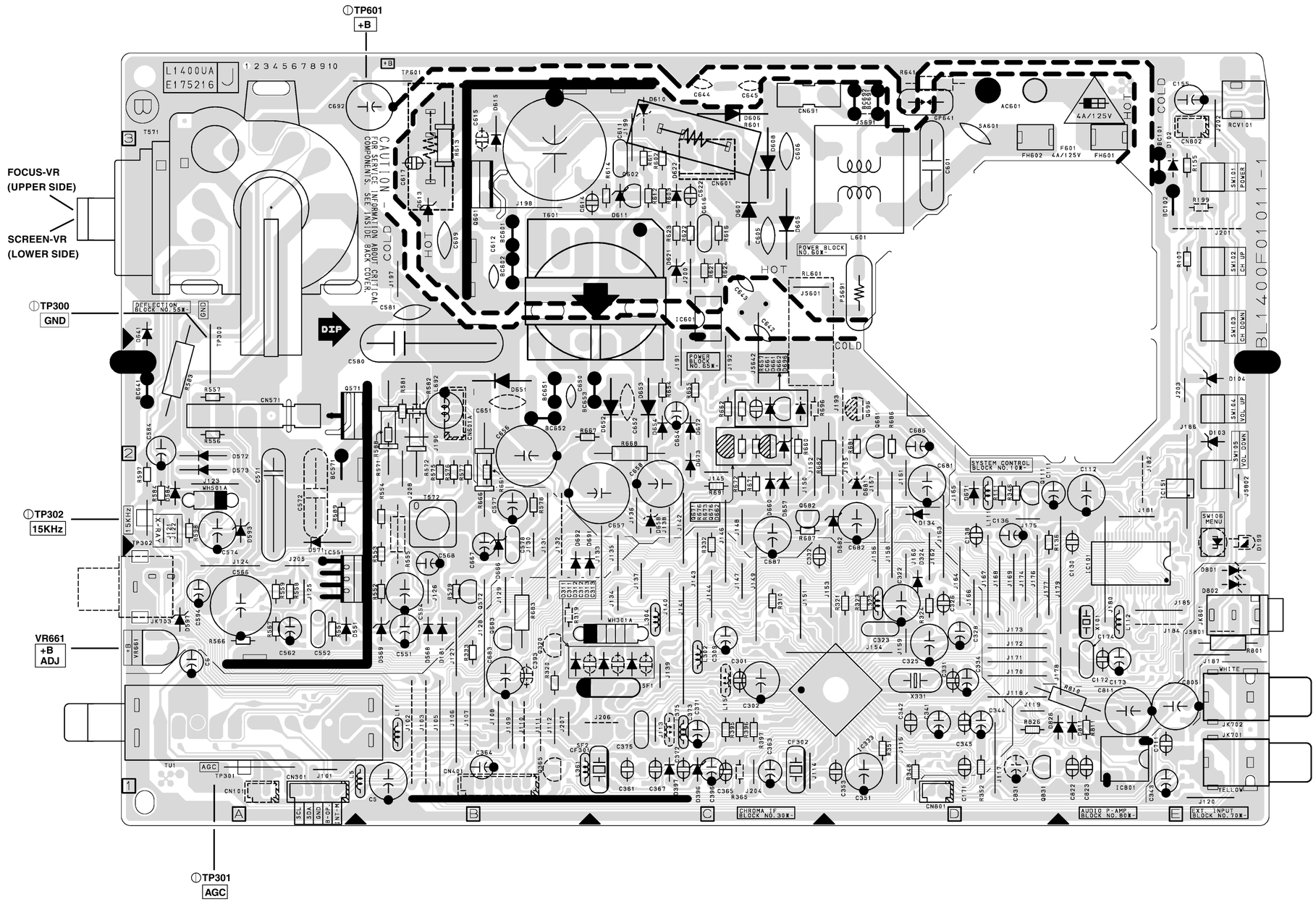
Main CBA Top View

CAUTION !
Fixed voltage power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

4A/125V

CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.
"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT, AN ISOLATION TRANSFORMER MUST BE USED. ALSO, IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY, WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT, A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.



Main CBA Bottom View

CAUTION !
Fixed voltage power supply circuit is used in this unit.
If Main Fuse (F601) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

4A/125V

CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES
D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.
"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT, AN ISOLATION TRANSFORMER MUST BE USED. ALSO, IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY, WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT, A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.

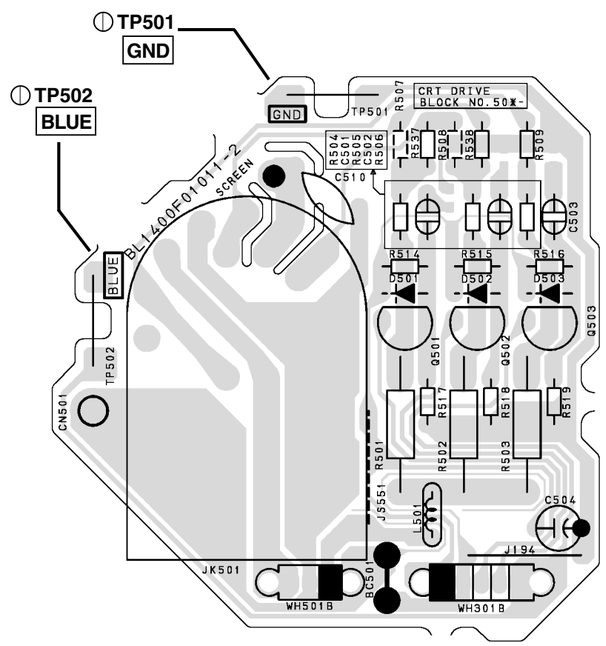
MAIN CBA

Ref No.	Position
ICS	
IC101	E-1
IC151	E-2
IC333	D-1
IC551	A-1
IC601	C-3
IC801	E-1
TRANSISTORS	
Q111	D-2
Q571	A-2
Q572	B-1
Q601	B-3
Q602	C-3
Q662	C-2
Q671	C-2
Q676	C-2
Q681	D-2
Q682	C-2
Q683	B-1
Q831	D-1
TEST POINTS	
J121	A-2
J122	A-2
TP300	A-3
TP301	A-1
TP302	A-2
TP601	B-3
CONNECTORS	
CN301	A-1
CN571	A-2
CN691	C-3
CN801	D-1
WH301A	C-1
WH501A	A-2
VARIABLE RESISTORS	
VR661	A-1

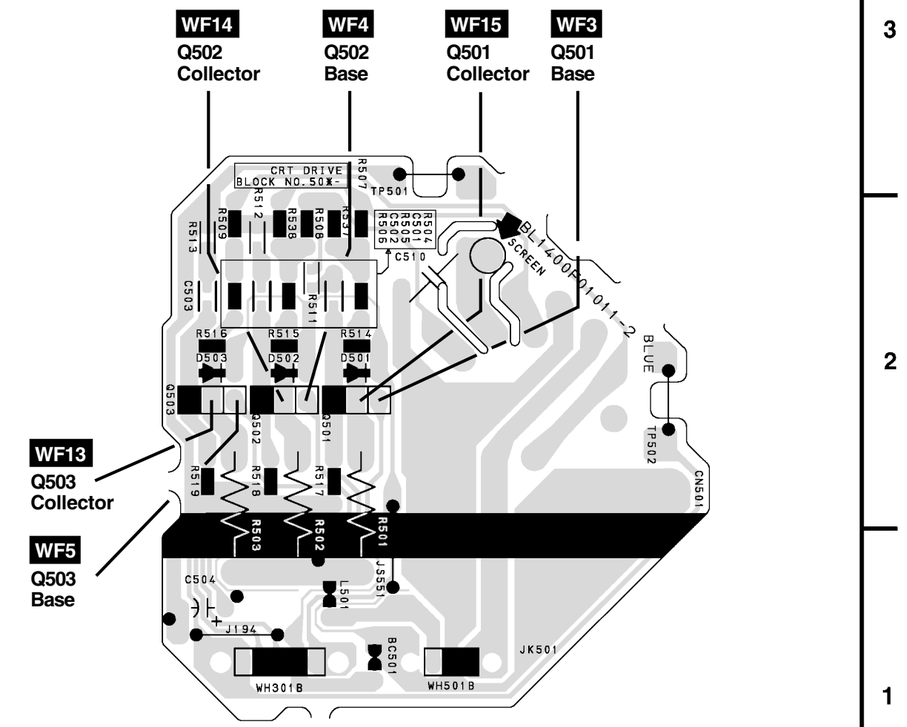
CRT CBA Top View

CRT CBA

Ref No.	Position
TRANSISTORS	
Q501	B-2
Q502	B-2
Q503	C-2
TEST POINTS	
TP501	B-3
TP502	A-2
CONNECTORS	
CN501	A-2
WH301B	B-1
WH501B	B-1



CRT CBA Bottom View



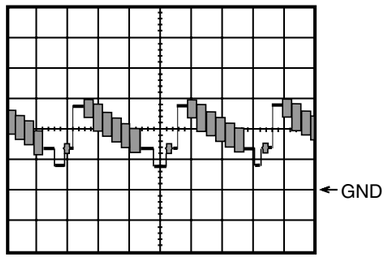
WAVEFORMS

WF1 ~ WF16 = Waveforms to be observed at Waveform check points. (Shown in Schematic Diagram.)

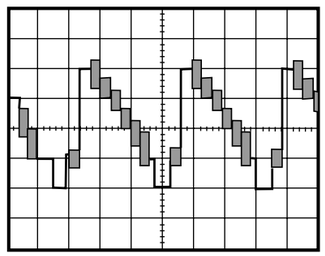
Input: NTSC Color Bar Signal (with 1kHz Audio Signal)

INITIAL POSITION: Unplug unit from AC outlet for at least 5 minutes. reconnect to AC outlet and then turn power on.

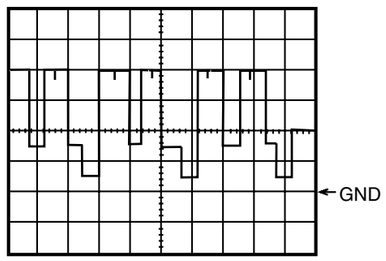
(Brightness---Center Color---Center Tint --- Center Contrast---Approx 70%)



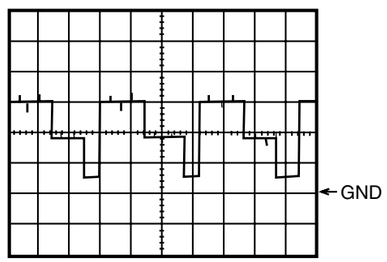
WF1 1DIV: 0.5V 20µsec
C 354 Minus Lead



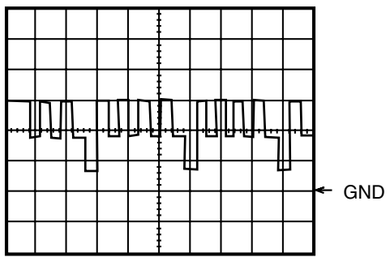
WF2 1DIV: 0.5V 20µsec
IC 301 Pin 40



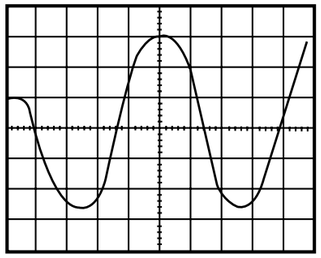
WF3 1DIV: 2V 20µsec
Q501 Base



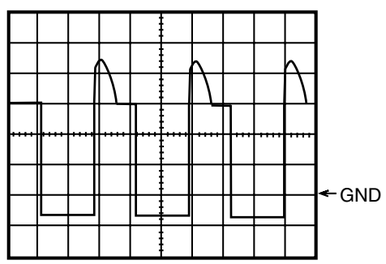
WF4 1DIV: 2V 20µsec
Q 502 Base



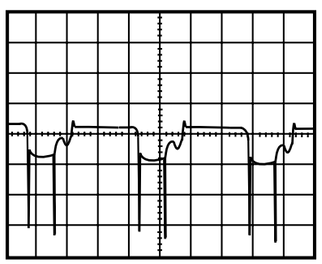
WF5 1DIV: 2V 20µsec
Q 503 Base



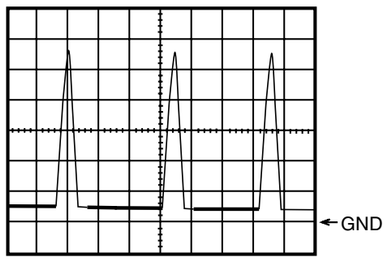
WF6 1DIV: 0.2V 20msec
IC 301 Pin 50



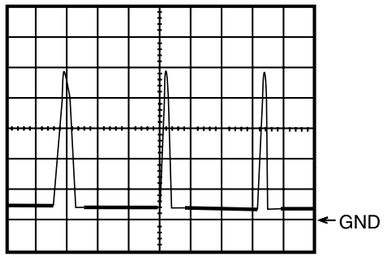
WF7 1DIV: 10V 20µsec
Q 572 Collector



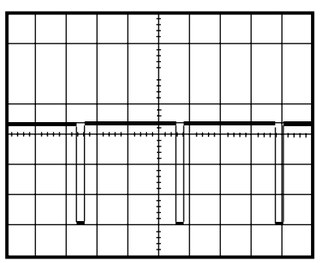
WF8 1DIV: 5V 20µsec
Q 571 Base



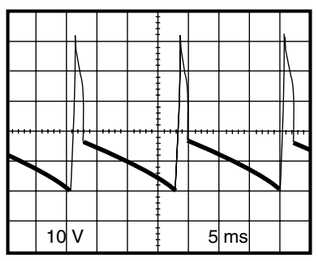
WF9 1DIV: 200V 20µsec
CN 571 Pin 1



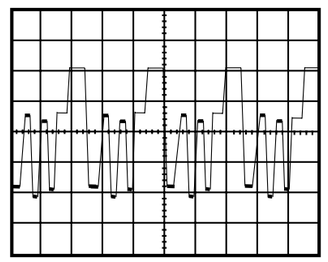
WF10 1DIV: 5V 20µsec
WH501A Pin 2



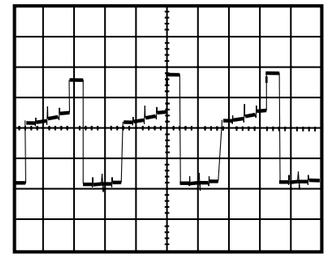
WF11 1DIV: 2V 5msec
IC 551 Pin 7



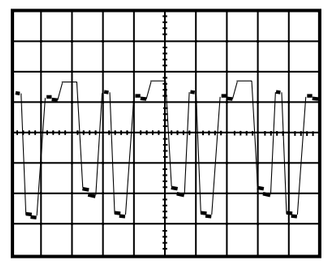
WF12 1DIV: 10V 5msec
CN 571 Pin 4



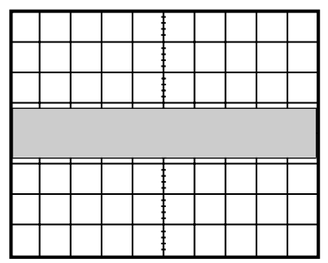
WF13 1DIV: 20V 20µsec
Q503 Collector



WF14 1DIV: 20V 20µsec
Q 502 Collector

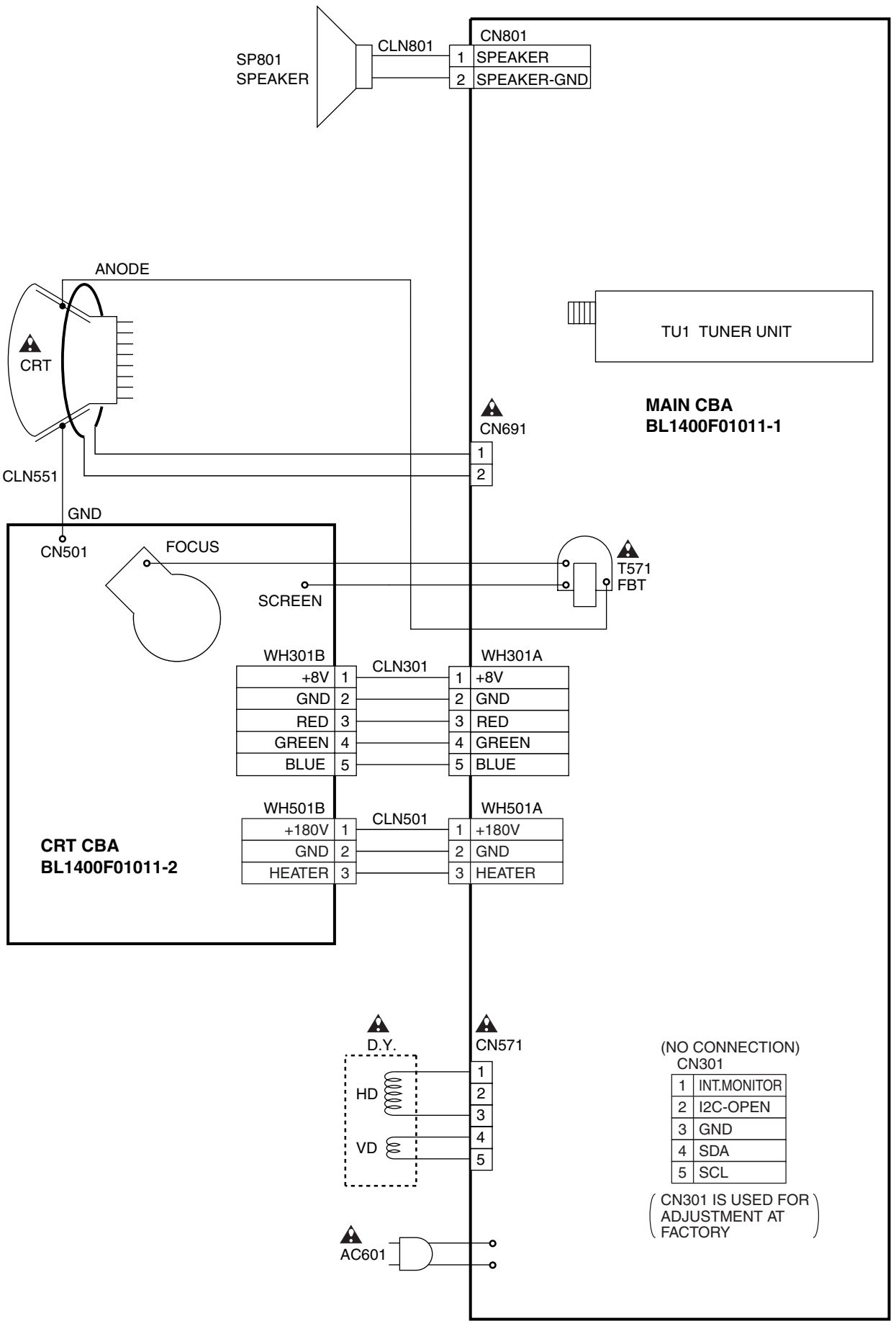


WF15 1DIV: 20V 20µsec
Q 501 Collector



WF16 1DIV: 0.2V 20µsec
TU 1 Pin 8

WIRING DIAGRAM



IC PIN FUNCTIONS

IC101 (TV Micro Computer)

Pin No.	Signal Name	Function
1	H-SYNC	Input For Horizontal Synchronize Signal
2	V-SYNC	Input For Vertical Synchronize Signal
3	N.U.	Not Used
4	EXT-H	Ext-H
5	N.U.	Not Used
6	A-MUTE-H	Audio Mute
7	N.U.	Not Used
8	N.U.	Not Used
9	N.U.	Not Used
10	REMOCON	Input For Remote Control
11	SD	Detection SD signal
12	1kHz-CHK	Power Supply Protection
13	P-ON-L	Output for P-ON-L (Not Used)
14	VCC	+5V
15	HLF	Filter for CCD
16	VHOLD	VHOLD
17	CVIN	Input for Video Signal
18	CV Vss	GND
19	XIN	Input for Oscillator
20	XOUT	Output for Oscillator
21	VSS	GND
22	VCC	+5V
23	N.U.	Not Used
24	N.U.	Not Used
25	RESET	RESET
26	PROTECT-1	Power Supply Protection
27	PROTECT-2	Power Supply Protection
28	KEY-IN	Key Input (Main)
29	N.U.	Not Used
30	FACTORY	Factort Key Input
31	SDA	I2C-BUS Controller Interface (Data)
32	I2C-OPEN	White Balance Adjustment Judgement
33	SCL	I2C-BUS Controller Interface (Clock)
34	SPOT-KILL	Spot Countermeasure (Not Used)
35	P-ON-H	Output for P-ON-H
36	N.U.	Not Used
37	N.U.	Not Used
38	N.U.	Not Used
39	OSD-BLK	Picture Shut Down Output
40	OSD-B	Blue Output
41	OSD-G	Green Output
42	OSD-R	Red Output

IC331 (IF/Video/Chrominance/Defletion)

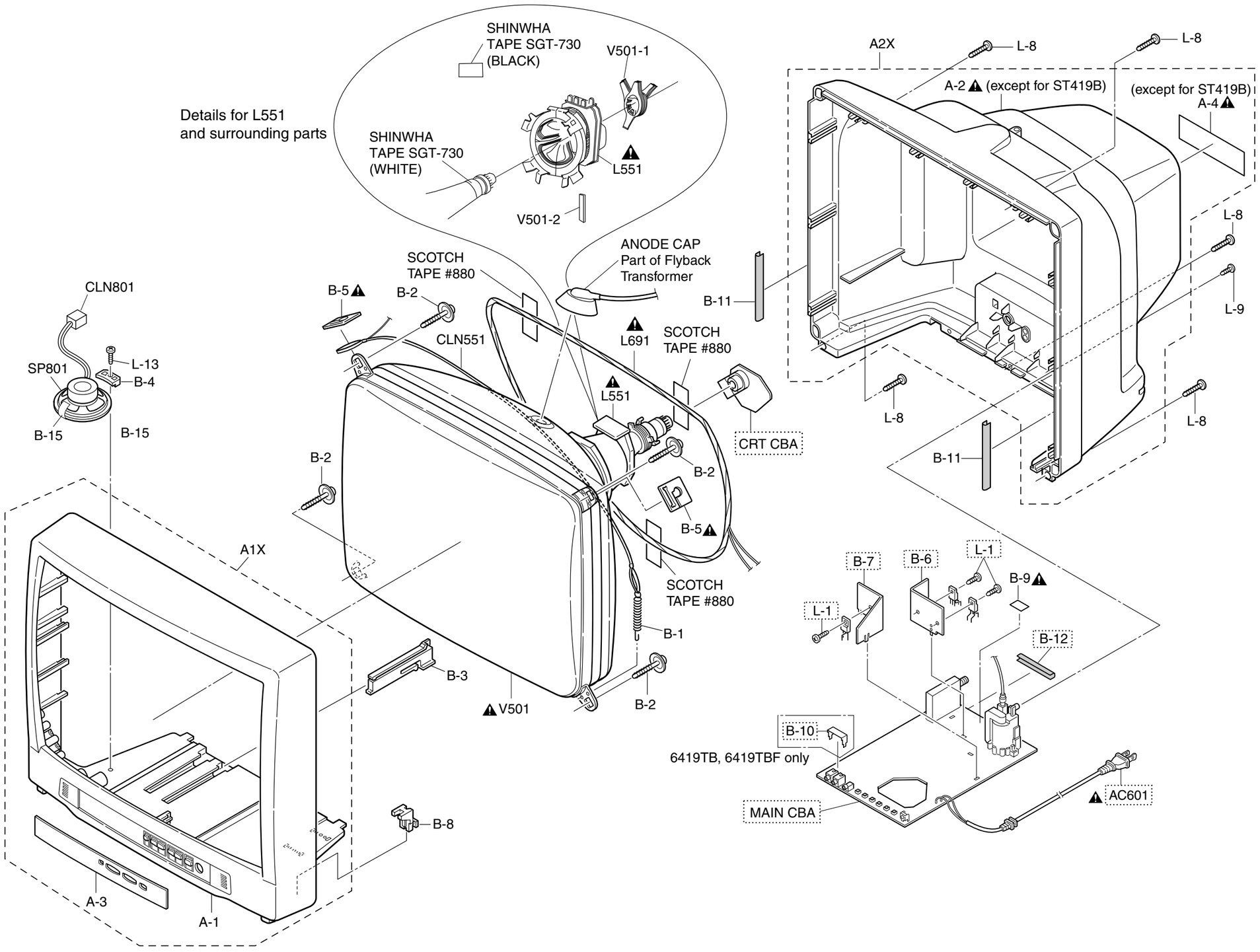
Pin No.	Signal Name	Function
1	IF IN 2	IF INput 2
2	IF-VCC1	IF-VCC 1
3	IF-VCC2	IF VCC 2
4	H. VCO-FB	H. VCO-FB
5	SCL	SCL
6	FBP- IN	FBP Input
7	H-OUT	H-Output
8	DEF GND 1	DEF GND 1
9	DEF GND 2	DEF GND 2
10	SDA	SDA
11	AFC FILTER 1	AFC Filter 1
12	INV. FBP-OUT	INV. FBP-OUT
13	P-ON-CTRL	Power on Control Output
14	R-OUT	R Output
15	G-OUT	G Output
16	B-OUT	B Output
17	V-OUT	Vertical Out
18	VCC 1	Start up VCC 1
19	VCC 2	Start up VCC 2
20	B-IN	OSD Blue Input
21	V-RAMP NF	V Ramp NF

Pin No.	Signal Name	Function
22	V RAMP	Filter for V Ramp
23	VC-VCC1	VC VCC 1
24	VC-VCC2	VC VCC 2
25	FSC-OUT	Freq. Sub carrier Output
26	SPOT-KILLER	Spot-Killer
27	FAST BLK	Fast Blanking Input
28	G-IN	OSD Green Input
29	V PULSE OUT	V-Pulse Output
30	R-IN	OSD Red Input
31	ACL/ABL	ACL/ABL
32	X-TAL 3.58	Chroma Osc
33	8.7V OUT	8.7V Output
34	EXT-IN	External Input
35	CHROMA APC FILTER	Filter for CHROMA APC
36	TV-IN	TV Input
37	VC GND 1	VC GND 1
38	VC GND 2	VC GND 2
39	VC GND 3	VC GND 3
40	Y-SW OUT	Y-SW Output
41	5.7V OUT	5.7V Output
42	Reset	MCU Reset Output
43	INTERI GENT MONITOR	Interigent Monitor Out
44	Hi Vcc 1	Hi Vcc 1
45	Hi Vcc 2	Hi Vcc 2
46	SW. REG. CONT.	Switching Reg. Control Output
47	SIF LIMITER-IN	SIF Limitter Input
48	IF AGC FILTER 2	Filter for IF AGC
49	QIF OUT	QIF Output
50	AUDIO OUT	Audio Output
51	AUDIO BYPASS	Filter for Audio Bypass

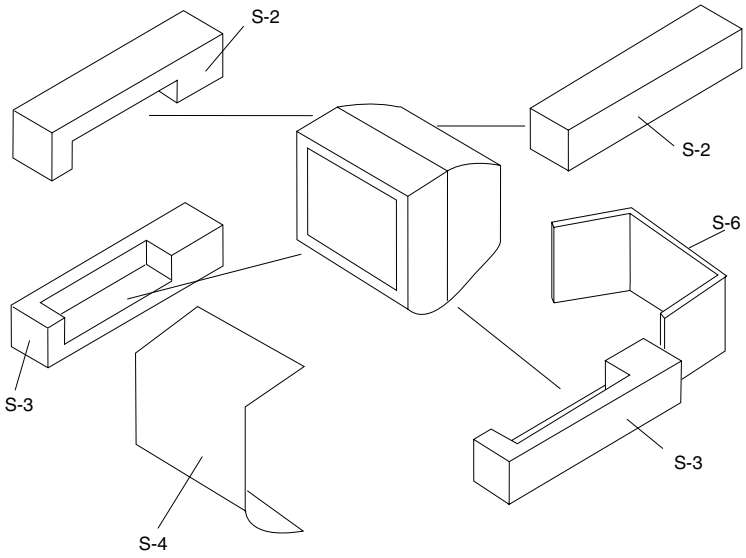
Pin No.	Signal Name	Function
52	EXT AUDIO IN	External Audio In
53	FM DETECT OUT	RF Output
54	VIF VCO-FB	VIF VCO-FB
55	REG. Vcc IN	REG. Vcc Input
56	VIDEO APC FILTER	Filter for Video APC
57	VIDEO OUT	Video Out
58	IF GND 1	GND 1
59	IF GND 2	GND 2
60	AFT OUT	AFT Out
61	QIF IN	QIF Input (Not Used)
62	RF AGC OUT	RF AGC Out
63	IF AGC FILTER 1	Filter for IF AGC
64	IF IN 1	IF Input 1

EXPLODED VIEWS

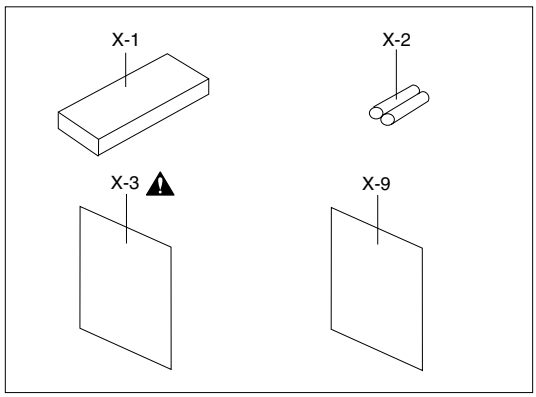
Cabinet

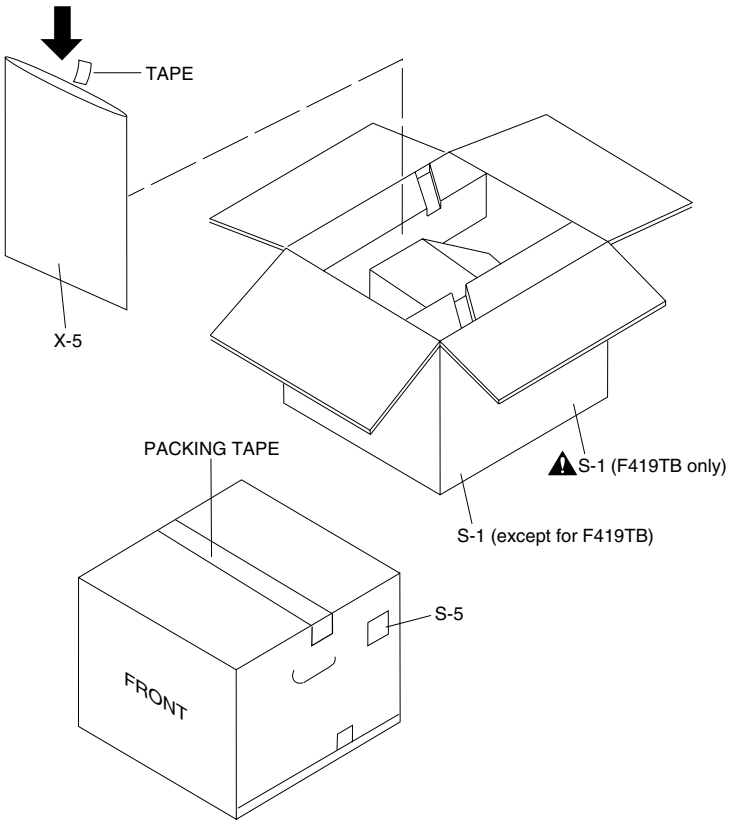


Packing



Some Ref. Numbers are not in sequence.





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.
A1X	FRONT CABINET ASSEMBLY	0EM201365
A-1	FRONT CABINET	0EM000479
A-3	CONTROL PLATE	0EM201336
A2X	REAR CABINET ASSEMBLY	0EM201366
A-2	REAR CABINET	0EM000482
A-4 ⚠	RATING LABEL	0EM406037
B-1	TENSION SPRING B0080B0:EM40808	26WH006
B-2	CRT MOUNTING SCREW B0030U1:K42419	8A00083
B-3	PCB HOLDER	0EM301429
B-4	SPEAKER HOLDER	0EM406026
B-5⚠	DEGAUSS HOLDER	0EM404845
B-8	AC CORD HOLDER	0EM406104
B-11	CLOTH:95X15XT:0.5	0EM405041
B-15	CLOTH(10X30XT1.0)	0EM405137
L-8	SCREW, P-TIGHT 4X18 BIND HEAD +	GBMP4180
L-9	SCREW TAPPING M4X14	DBU14140
L-13	SCREW, P-TIGHT 3X12 BIND HEAD+	GBMP3120
	PACKING	
S-1	CARTON	0EM406039
S-2	STYRFOAM BOTTOM	0EM000489
S-3	STYRFOAM TOP	0EM000488
S-4	SET SHEET 1000X1700	0EM402178
S-5	SERIAL NO. LABEL	0EM406038
S-6	HOLD PAD	0EM406207
	ACCESSORIES	
X-1	REMOCON UNIT 130/ERC001/N0105UD or	N0105UD
	REMOCON UNIT 130/ERC001/N0127UD	N0127UD
X-2	DRY BATTERY R6P UM3 or	XB0M451GH001
	DRY BATTERY R6P/2S or	XB0M451T0001
	DRY BATTERY(SUNRISE) R6SSE/2S or	XB0M451MS002
	DRY BATTERY R6P(AR)2PX or	XB0M451HU002
	DRY BATTERY R6P(AR)2P X ICI	XB0M451HU003
X-3⚠	OWNER'S MANUAL(E)/(S):ENGLISH/SPANISH	0EMN01748
X-5	POLYETHYLENE BAG F8626B5	Z325350
X-9	RETURN STOP SHEET	0VM408869A
	DE PARTS	
CLN551	CRT GND WIRE CRT GND	WX1L7820-003
CLN801	WIRE ASSEMBLY SPEAKER WIRE(220MM)	WX1L7950-001
L 691⚠	DEGAUSSING COIL AVDG014 or	LLBH00ZWR003
	DEGAUSSING COIL F-003	LLBH00ZTM003
SP 801	SPEAKER S08F02B or	DSD0808XQ010
	SPEAKER J-F097-C5	DSD0808DCP01
Note: 1. V501 (CRT) HAS COUPLE OF SUBSTITUTIONAL PARTS AND EACH PARTS ALSO HAS MATCHING COMBINATION WITH L551. PLEASE SEE TABLE 1 FOR DETAILS OF MATCHING CONBINATION. 2. L551 (DEFLECTION YOKE) HAS MATCHING COMBINATION WITH V501. PLEASE SEE TABLE 1 FOR DETAILS OF MATCHING COMBINATION.		
	CRT TYPE 1	
V 501⚠	CRT A48JLL90X	TCRT190QS009
V501-1	C.P.MAGNET JH225-014	XM04000BV009
V501-2	WEDGE FT-00110W or	XV10000T4001
	WEDGE DB25SR	XV10000D9001
L 551⚠	DEFLECTION YOKE KDY3MDA84X or	LLBY00ZMS013
	DEFLECTION YOKE LLBY00ZSY006 or	LLBY00ZSY006
	DEFLECTION YOKE CDY-M2019F	LLBY00ZQS004
	CRT TYPE 2	
V 501⚠	CRT A48LGS30X	TCRT190THA01
V501-1	C.P.MAGNET JH225-014	XM04000BV009
V501-2	WEDGE FT-00110W or	XV10000T4001
	WEDGE DB25SR	XV10000D9001
L 551⚠	DEFLECTION YOKE KDY3MCB20X or	LLBY00ZMS016
	DEFLECTION YOKE 330P510A37	LLBY00ZTHA01
	CRT TYPE 3	
V 501⚠	CRT A48LRH93X(W)	TCRT190P7002
V501-1	C.P.MAGNET JH225-014	XM04000BV009
V501-2	WEDGE FT-00110W or	XV10000T4001
	WEDGE DB25SR	XV10000D9001
L 551⚠	DEFLECTION YOKE CDY-M2023F or	LLBY00ZQS005
	DEFLECTION YOKE LLBY00ZSY007	LLBY00ZSY007

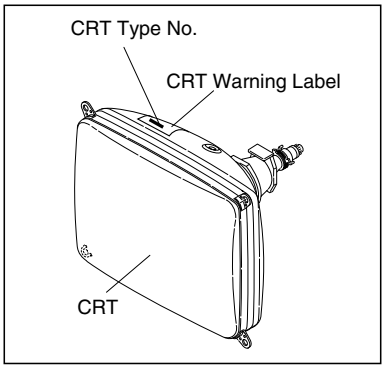
Table 1 (V501 and L551 Combination)

Note 1: Purity and Convergence Adjustments must be performed following CRT replacement. Refer to Electrical Adjustment Instructions.

Note2: Please confirm CRT Type No. on the CRT Warning Label which is located on the CRT. Then See the Table 1 for V501 and L551 combination chart.
Please refer this CRT, Deflection Yoke combination chart for parts order.

V 501: CRT Type No.	V 501: CRT Part No.	L551: Deflection Yoke Part No.
CRT A48JLL90X	TCRT190QS009	LLBY00ZMS013 LLBY00ZSY006 LLBY00ZQS004
CRT A48LGS30X	TCRT190THA01	LLBY00ZMS016 LLBY00ZTHA01
CRT A48LRH93X(W)	TCRT190P7002	LLBY00ZQS005 LLBY00ZSY007

CRT Warning Label Location



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.

NOTES:

1. Parts that not assigned part numbers (---------) are not available.
2. 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%

MMA-314 CBA

Ref No.	Description	Part No.
	MMA-314 CBA Consists of the following	0ESA03986
	MAIN CBA	----------
	CRT CBA	----------

Main CBA

Ref No.	Description	Part No.
	MAIN CBA Consist of the follwing	----------
	CAPACITORS	
C 5	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C 6	ELECTROLYTIC CAP. 4.7µF/50V M or	CE1JMASTL4R7
	ELECTROLYTIC CAP. 4.7µF/50V M	CE1JMASDL4R7
C 107	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C 111	ELECTROLYTIC CAP. 47µF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47µF/16V M	CE1CMASDL470
C 112	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C 125	CHIP CERAMIC CAP. CH J 47pF/50V	CHD1JJBCH470
C 130	CERAMIC CAP.(AX) B K 220pF/50V	CCA1JKT0B221
C 131	CHIP CERAMIC CAP. CH J 100pF/50V	CHD1JJBCH101
C 132	CHIP CERAMIC CAP. CH J 220pF/50V	CHD1JJBCH221
C 136	ELECTROLYTIC CAP. 4.7µF/50V M or	CE1JMASTL4R7
	ELECTROLYTIC CAP. 4.7µF/50V M	CE1JMASDL4R7
C 139	CHIP CERAMIC CAP. F Z 0.1µF/25V	CHD1EZB0F104
C 155	ELECTROLYTIC CAP. 47µF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47µF/16V M	CE1CMASDL470
C 161	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C 162	CHIP CERAMIC CAP. B K 0.047µF/50V or	CHD1JKB0B473
	CHIP CERAMIC CAP. B K 0.047µF/25V	CHD1EKB0B473
C 171	CHIP CERAMIC CAP. CH J 220pF/50V	CHD1JJBCH221
C 172	CHIP CERAMIC CAP. CH J 220pF/50V	CHD1JJBCH221
C 173	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL010
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C 174	FILM CAP.(P) 0.001µF/50V J or	CMA1JJS00102
	FILM CAP.(P) 0.001µF/50V J or	CA1J102MS029
	FILM CAP.(P) 0.001µF/50V J TV or	CMB1JJS00102
	* MYLAR CAP. 0.001µF/50V K	2250102S
C 302	ELECTROLYTIC CAP. 220µF/10V M or	CE1AMASTL221
	ELECTROLYTIC CAP. 220µF/10V M	CE1AMASDL221
C 303	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C 306	CHIP CERAMIC CAP. CH J 330pF/50V	CHD1JJBCH331
C 308	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C 309	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL010
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C 322	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C 323	FILM CAP.(P) 0.1µF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1µF/50V J or	CA1J104MS029
	FILM CAP.(P) 0.1µF/50V J TV or	CMB1JJS00104
	MYLAR CAP. 0.1µF/50V K	2250104S
C 325	ELECTROLYTIC CAP. 100µF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100µF/10V M	CE1AMASDL101
C 326	CERAMIC CAP.(AX) F Z 0.01µF/25V	CDA1EZT0F103
C 328	ELECTROLYTIC CAP. 10µF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10µF/50V M	CE1JMASDL100
C 331	CHIP CERAMIC CAP. CH J 47pF/50V	CHD1JJBCH470
C 332	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C 334	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL010
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C 341	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASTL010
	ELECTROLYTIC CAP. 1µF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1µF/50V M	CE1JMASDL010
C 342	CERAMIC CAP.(AX) B K 0.015µF/50V	CA1J153TU011
C 344	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C 345	CERAMIC CAP.(AX) F Z 0.1µF/50V or	CA1J104TU014
	CERAMIC CAP.(AX) F Z 0.1µF/50V	CCA1JZT0F104
C 351	ELECTROLYTIC CAP. 470µF/10V M or	CE1AMASTL471
	ELECTROLYTIC CAP. 470µF/10V M	CE1AMASDL471
C 353	CHIP CERAMIC CAP. B K 0.047µF/50V or	CHD1JKB0B473
	CHIP CERAMIC CAP. B K 0.047µF/25V	CHD1EKB0B473
C 361	CHIP CERAMIC CAP. CH J 270pF/50V	CHD1JJBCH271
C 363	ELECTROLYTIC CAP. 2.2µF/50V M LL	CE1JMASLL2R2
C 365	CERAMIC CAP.(AX) X K 3900pF/16V	CDA1CKT0X392
C 367	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C 371	ELECTROLYTIC CAP. 0.47µF/50V M or	CE1JMASTLR47
	ELECTROLYTIC CAP. 0.47µF/50V M	CE1JMASDLR47
C 372	CHIP CERAMIC CAP. CH J 33pF/50V	CHD1JJBCH330
C 374	CHIP CERAMIC CAP. B K 0.01µF/50V	CHD1JKB0B103
C 375	FILM CAP.(P) 0.022µF/50V J or	CMA1JJS00223
	FILM CAP.(P) 0.022µF/50V J or	CA1J223MS029
	FILM CAP.(P) 0.022µF/50V J TV or	CMB1JJS00223
	MYLAR CAP. 0.022µF/50V K	2250223S

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

Ref No.	Description	Part No.
C 376	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
C 393	CHIP CERAMIC CAP. F Z 0.1μF/25V	CHD1EZB0F104
C 396	ELECTROLYTIC CAP. 10μF/50V M or	CE1JMASTL100
	ELECTROLYTIC CAP. 10μF/50V M	CE1JMASDL100
C 551	ELECTROLYTIC CAP. 47μF/35V M or	CE1GMASTL470
	ELECTROLYTIC CAP. 47μF/35V M	CE1GMASDL470
C 552	FILM CAP.(P) 0.1μF/50V J or	CMA1JJS00104
	FILM CAP.(P) 0.1μF/50V J or	CA1J104MS029
	FILM CAP.(P) 0.1μF/50V J TV or	CMB1JJS00104
	MYLAR CAP. 0.1μF/50V K	2250104S
C 554	ELECTROLYTIC CAP. 100μF/35V M or	CE1GMASTL101
	ELECTROLYTIC CAP. 100μF/35V M	CE1GMASDL101
C 562	ELECTROLYTIC CAP. 2.2μF/50V M LL	CE1JMASLL2R2
C 566	ELECTROLYTIC CAP. 1000μF/25V M or	CE1EMZNTL102
	ELECTROLYTIC CAP. 1000μF/25V M or	CE1EMZPDL102
	ELECTROLYTIC CAP. 1000μF/25V M	CE1EMZADL102
C 568	ELECTROLYTIC CAP. 3.3μF/50V M or	CE1JMASTL3R3
	ELECTROLYTIC CAP. 3.3μF/50V M	CE1JMASDL3R3
C 571 ⚠	PP CAP. 0.47μF/250V J or	CT2E474MS041
⚠	P.P. CAP. 0.47μF/200V J or	CA2D474KF002
⚠	P.P.CAP 0.47μF/200 J	CA2D474VC012
C 574 ⚠	ELECTROLYTIC CAP. 4.7μF/250V M or	CE2EMASTL4R7
⚠	ELECTROLYTIC CAP. 4.7μF/250V M	CE2EMASDL4R7
C 577	ELECTROLYTIC CAP. 47μF/35V M or	CE1GMASTL470
	ELECTROLYTIC CAP. 47μF/35V M	CE1GMASDL470
C 578	FILM CAP.(P) 0.01μF/50V J or	CMA1JJS00103
	FILM CAP.(P) 0.01μF/50V J or	CA1J103MS029
	FILM CAP.(P) 0.01μF/50V J TV or	CMB1JJS00103
	MYLAR CAP. 0.01μF/50V K	2250103S
C 580 ⚠	PP CAP. 0.01μF/1.6kV J or	CT3C103MS039
⚠	PP CAP. 0.01μF/1.6kV J or	CBH3CJQ00103
⚠	P.P.CAP 0.01μF/1.6kV J	CA3C103VC011
C 581 ⚠	CERAMIC CAP. LB 1500pF/2kV or	CA3D152KG004
⚠	CERAMIC CAP. BN 1500pF/2kV	CCD3DKA0B152
C 584 ⚠	ELECTROLYTIC CAP. 1μF/160V M or	CE2CMASTL1R0
⚠	ELECTROLYTIC CAP. 1μF/160V M	CE2CMASDL010
C 594 ⚠	ELECTROLYTIC CAP. 10μF/50V M or	CE1JMASTL100
⚠	ELECTROLYTIC CAP. 10μF/50V M	CE1JMASDL100
C 601⚠	METALLIZED FILM CAP. 0.1μF/250V or	CT2E104MS037
⚠	FILM CAP.(MP) 0.1μF/250V M or	CT2E104DC009
⚠	FILM CAP.(MP) 0.1μF/250V K	CT2E104DC011
C 605	CERAMIC CAP. F Z 0.01μF/500V or	CCD2JZD0F103
	CERAMIC CAP. 0.01μF/AC250V	CCD2EZA0F103
C 606	CERAMIC CAP. F Z 0.01μF/500V or	CCD2JZD0F103
	CERAMIC CAP. 0.01μF/AC250V	CCD2EZA0F103
C 609	CERAMIC CAP. B K 1000pF/2kV or	CCD3DKD0B102
	CERAMIC CAP. B K 1000pF/2kV or	CCD3DKP0B102
	CERAMIC CAP. B K 1000pF/2kV	CA3D102MR030
C 610 ⚠	ELECTROLYTIC CAP. 220μF/200V or	CA2D221NC088
⚠	ELECTROLYTIC CAP. 220μF/200V SL X	CA2D221S6003
C 611	FILM CAP.(P) 0.047μF/50V J or	CMA1JJS00473
	FILM CAP.(P) 0.047μF/50V J or	CA1J473MS029
	FILM CAP.(P) 0.047μF/50V J TV or	CMB1JJS00473
	MYLAR CAP. 0.047μF/50V K	2250473S
C 612	CERAMIC CAP. LB 330pF/2kV or	CA3D331KG004
	CERAMIC CAP. BN 330pF/2kV	CCD3DKA0B331
C 614	CERAMIC CAP.(AX) B K 560pF/50V	CCA1JKT0B561
C 616	FILM CAP.(P) 0.056μF/50V J or	CMA1JJS00563
	FILM CAP.(P) 0.056μF/50V J or	CA1J563MS029
	FILM CAP.(P) 0.056μF/50V J TV or	CMB1JJS00563
	MYLAR CAP. 0.056μF/50V KT	2250563S

Ref No.	Description	Part No.
C 617	CERAMIC CAP.(AX) B K 330pF/50V	CCA1JKT0B331
C 622	CERAMIC CAP.(AX) B K 1000pF/50V	CCA1JKT0B102
C 643⚠	CERAMIC CAP. 0.0047UF F CS or	CCG2HMN0F472
⚠	SAFETY CAP. 4700pF/250V or	CCG2EMA0F472
⚠	SAFETY CAP. E M 4700pF/250V KH	CCG2EMP0E472
C 650	CERAMIC CAP. LB 220pF/2kV or	CA3D221KG004
	CERAMIC CAP. BN J 220pF/2kV	CCD3DKA0B221
C 654	ELECTROLYTIC CAP. 1μF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1μF/50V M or	CE1JMASTL010
	ELECTROLYTIC CAP. 1μF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL010
C 656	ELECTROLYTIC CAP. 100μF/160V M	CE2CMZPTL101
C 657	ELECTROLYTIC CAP. 1000μF/35V M or	CE1GMZNTL102
	ELECTROLYTIC CAP. 1000μF/35V M or	CE1GMZNDL102
	ELECTROLYTIC CAP. 1000μF/35V M	CE1GMZADL102
C 658	ELECTROLYTIC CAP. 1000μF/16V M(VR/HC) or	CE1CMZNTL102
	ELECTROLYTIC CAP. 1000μF/16V M or	CE1CMZPDL102
	ELECTROLYTIC CAP. 1000μF/16V M	CE1CMZADL102
C 661	CERAMIC CAP.(AX) F Z 0.01μF/25V	CDA1EZT0F103
C 667	ELECTROLYTIC CAP. 1μF/50V M or	CE1JMASTL1R0
	ELECTROLYTIC CAP. 1μF/50V M or	CE1JMASTL010
	ELECTROLYTIC CAP. 1μF/50V M or	CE1JMASDL1R0
	ELECTROLYTIC CAP. 1μF/50V M	CE1JMASDL010
C 681	ELECTROLYTIC CAP. 100μF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C 682	ELECTROLYTIC CAP. 100μF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C 683	ELECTROLYTIC CAP. 100μF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C 686	ELECTROLYTIC CAP. 33μF/16V M or	CE1CMASTL330
	ELECTROLYTIC CAP. 33μF/16V M	CE1CMASDL330
C 687	ELECTROLYTIC CAP. 100μF/10V M or	CE1AMASTL101
	ELECTROLYTIC CAP. 100μF/10V M	CE1AMASDL101
C 692	ELECTROLYTIC CAP. 10μF/160V M or	CE2CMASTL100
	ELECTROLYTIC CAP. 10μF/160V M	CE2CMASDL100
C 805	ELECTROLYTIC CAP. 220μF/16V M or	CE1CMASTL221
	ELECTROLYTIC CAP. 220μF/16V M	CE1CMASDL221
C 811	ELECTROLYTIC CAP. 470μF/16V M or	CE1CMASTL471
	ELECTROLYTIC CAP. 470μF/16V M	CE1CMASDL471
C 821	CHIP CERAMIC CAP. B K 4700pF/50V	CHD1JKB0B472
C 822	CERAMIC CAP.(AX) F Z 0.22μF/50V	CA1J224TU014
C 823	CERAMIC CAP.(AX) F Z 0.47μF/50V	CA1J474TU014
	CONNECTORS	
CN 301	CONNECTOR BASE, 5P TUC-P05P-B1	J3TUA05TG001
CN 571	CONNECTOR BASE, 5P TV-50P-05-V3 or	J3TVC05TG002
	CONNECTOR BASE, 5P RTB-1.5-5P or	J3RTC05JG001
	CONNECTOR BASE, 5P W-P3005-02	1730812
CN 691	CONNECTOR BASE, 2P TV-50P-02-V3 or	J3TVC02TG002
	CONNECTOR BASE, 2P RTB-1.5-2P	J3RTC02JG001
CN 801	STRAIGHT CONNECTOR BASE 00 8283 0212 00 000 or	J383C02UG002
	STRAIGHT PIN HEADER, 2P 173981-2	1770258
	DIODES	
D 103	ZENER DIODE MTZJT-775.6B	QDTB0MTZJ5R6
D 104	ZENER DIODE MTZJT-775.6B	QDTB0MTZJ5R6
D 134 ⚠	ZENER DIODE MTZJT-775.6B	QDTB0MTZJ5R6
D 181 ⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148 or	NDTZ001N4148
⚠	DIODE 1SS176TPA7	1SS176T
D 311	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133

Ref No.	Description	Part No.
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 312	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 313	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 324	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 393	ZENER DIODE MTZJT-775.6B or	QDTB0MTZJ5R6
	ZENER DIODE MTZJT-775.6A	QDTA0MTZJ5R6
D 396	ZENER DIODE MTZJT-778.2B	QDTB0MTZJ8R2
D 397	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 551	DIODE 1N5397-B or	NDLZ001N5397
	RECTIFIER DIODE ERB12-06	QDQZ0ERB1206
D 568 ⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148 or	NDTZ001N4148
⚠	DIODE 1SS176TPA7	1SS176T
D 569 ⚠	ZENER DIODE MTZJT-7720B	QDTB00MTZJ20
D 571	DIODE FR104-B or	NDLZ000FR104
	RECTIFIER DIODE ERA22-02 or	QDPZ0ERA2202
	RECTIFIER DIODE 10ELS2	QDQZ0010ELS2
D 572 ⚠	DIODE FR104-B or	NDLZ000FR104
⚠	RECTIFIER DIODE ERA22-02 or	QDPZ0ERA2202
⚠	RECTIFIER DIODE 10ELS2	QDQZ0010ELS2
D 573 ⚠	DIODE FR104-B or	NDLZ000FR104
⚠	RECTIFIER DIODE ERA22-02 or	QDPZ0ERA2202
⚠	RECTIFIER DIODE 10ELS2	QDQZ0010ELS2
D 584 ⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148 or	NDTZ001N4148
⚠	DIODE 1SS176TPA7	1SS176T
D 593 ⚠	ZENER DIODE MTZJT-7736B	QDTB00MTZJ36
D 597	ZENER DIODE MTZJT-776.8B	QDTB0MTZJ6R8
D 605 ⚠	DIODE 1N5397-B or	NDLZ001N5397
⚠	RECTIFIER DIODE ERB12-06	QDQZ0ERB1206
D 606 ⚠	DIODE 1N5397-B or	NDLZ001N5397
⚠	RECTIFIER DIODE ERB12-06	QDQZ0ERB1206
D 607 ⚠	DIODE 1N5397-B or	NDLZ001N5397
⚠	RECTIFIER DIODE ERB12-06	QDQZ0ERB1206
D 608 ⚠	DIODE 1N5397-B or	NDLZ001N5397
⚠	RECTIFIER DIODE ERB12-06	QDQZ0ERB1206
D 611 ⚠	ZENER DIODE MTZJT-7715B	QDTB00MTZJ15
D 613 ⚠	ZENER DIODE MTZJT-7715B	QDTB00MTZJ15
D 615 ⚠	SWITCHING DIODE 1N4148 T-77	QDTZ001N4148
D 621	ZENER DIODE MTZJT-773.0B	QDTB0MTZJ3R0
D 622	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 651 ⚠	RECTIFIER DIODE 15DF4 or	QDQZ00015DF4
⚠	RECOVERY DIODE ERC18-04 or	QDZZ0ERC1804
⚠	FAST RECOVERY DIODE ERC25-06	QDQZ0ERC2506
D 652 ⚠	DIODE FR154 or	NDLZ000FR154
⚠	FAST RECOVERY DIODE ERB44-02	QDPZ0ERB4402
D 653 ⚠	DIODE FR154 or	NDLZ000FR154
⚠	FAST RECOVERY DIODE ERB44-02	QDPZ0ERB4402
D 654	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148

Ref No.	Description	Part No.
	DIODE 1SS176TPA7	1SS176T
D 657 ⚠	DIODE 1ZC33 or	QDQZ0001ZC33
⚠	ZENER DIODE RD33FB	QDQZ000RD33F
D 660	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 661	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 662 ⚠	ZENER DIODE MTZJT-776.8B	QDTB0MTZJ6R8
D 666 ⚠	ZENER DIODE MTZJT-7736B	QDTB00MTZJ36
D 671	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 672	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 673	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 682 ⚠	ZENER DIODE MTZJT-775.6B	QDTB0MTZJ5R6
D 691 ⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148 or	NDTZ001N4148
⚠	DIODE 1SS176TPA7	1SS176T
D 692	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
D 811 ⚠	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
⚠	SWITCHING DIODE 1N4148 or	NDTZ001N4148
⚠	DIODE 1SS176TPA7	1SS176T
D 826	SWITCHING DIODE 1SS133(T-77) or	QDTZ001SS133
	SWITCHING DIODE 1N4148 or	NDTZ001N4148
	DIODE 1SS176TPA7	1SS176T
	ICS	
IC 101 ⚠	IC M37272M8H-200FP	QSZAA0SMB013
IC 151	IC:MEMORY AT24C01A-10SC or	NSMMA0SAZ011
	IC(EEPROM) M24C01-MN6 or	NSMMA0SSS027
	IC:MEMORY BR24C01AF-W or	QSMBA0SRM002
	IC:MEMORY BR24C01AF	QSMMA0SRM002
IC 333 ⚠ ⚠	IC:CHROMA/IF 1 CHIP M61203CFP	QSBBC0RMB001
IC 551 ⚠	VERTICAL OUTPUT IC LA78040A or	QSBBA0SSY003
⚠	VERTICAL OUTPUT IC AN5522	QSZBA0SMS002
IC 601 ⚠	PHOTO COUPLER PF5001-B,C or	QPE300PF5001
⚠	PHOTOCOUPLER LTV-817B-F or	NPEB0LTV817F
⚠	PHOTOCOUPLER LTV-817C-F	NPEC0LTV817F
IC 801	AUDIO AMP LA4524L	QSBLA0SSY087
	COILS	
L 5	INDUCTOR 22μH-K-5FT or	LLARKBSTU220
	INDUCTOR 22μH-K	LLARKDQKA220
L 11	INDUCTOR 0.47μH-J-26T or	LLAXJATTUR47
	INDUCTOR 0.47μH-K-26T	LLAXKATTUR47
L 15	INDUCTOR 0.82μH-J-26T	LLAXJATTUR82
L 111	INDUCTOR 22μH-K-5FT or	LLARKBSTU220
	INDUCTOR 22μH-K	LLARKDQKA220
L 112	INDUCTOR 22μH-J-26T or	LLAXJATTU220
	INDUCTOR 22μH-K-26T	LLAXKDTKA220
L 302	PCB JUMPER D0.6-P5.0	JW5.0T
L 304	INDUCTOR 1.0μH-K-26T or	LLAXKATTU1R0
	INDUCTOR 1.0μH-K-26T	LLAXKDTKA1R0
L 325	INDUCTOR 100μH-K-5FT or	LLARKBSTU101

Ref No.	Description	Part No.
	INDUCTOR 100µH-K	LLARKDQKA101
L 361	INDUCTOR 10µH-J-26T or	LLAXJATTU100
	INDUCTOR 10µH-K-26T	LLAXKDTKA100
L 373	INDUCTOR 2.2µH-J-26T or	LLAXJATTU2R2
	INDUCTOR 2.2µH-K-26T	LLAXKDTKA2R2
L 601⚠	LINE FILTER TLF12UA302W1R0 or	LLBG00ZTU025
⚠	LINE FILTER 5.0MH 6Y075 or	LLBG00ZKT004
⚠	LINE FILTER LF005 or	LLBG00ZLH001
⚠	LINE FILTER UU10.5-A or	LLBG00ZY2008
⚠	LINE FILTER SA-91213B	LLBG00ZSA002
L 692	CHOKE COIL 47µH-K or	LLBD00PkV004
	POT COIL 47µH K or	LLBD**DMM001
	POT COIL 47µH K	LLBD00DQE001
	TRANSISTORS	
Q 111	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198GR TO-92 or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q 571 ⚠	TRANSISTOR 2SD2627LS-FEC-YB11 or	QQZZ02SD2627
⚠	TRANSISTOR 2SD2629-YB	QQZZ02SD2629
Q 572	TRANSISTOR 2SC1627Y-TPE2	QQSY02SC1627
Q 601 ⚠	MOS FET 2SK2872-54MR or	QFZZ02SK2872
⚠	MOS FET 2SK2662	QF5Z02SK2662
Q 602 ⚠	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
⚠	TRANSISTOR 2SC2120-Y(TPE2)	QQSY02SC2120
Q 662 ⚠	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
⚠	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
⚠	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
⚠	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
⚠	TRANSISTOR KTC3198GR TO-92 or	NQS40KTC3198
⚠	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
⚠	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
⚠	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
Q 671 ⚠	TRANSISTOR 2SA1175(F) or	QQSF02SA1175
⚠	TRANSISTOR KTA1267(GR) or	NQS10KTA1267
⚠	TRANSISTOR KTA1266(GR) or	NQS40KTA1266
⚠	TRANSISTOR 2SA1318(T)-AANP or	2SA1318TZ
⚠	TRANSISTOR 2SA1318(U)-AANP or	2SA1318UZ
⚠	TRANSISTOR 2SA1015-GR(TPE2)	QQS102SA1015
Q 676	RES. BUILT-IN TRANSISTOR BA1F4M-T or	QQSZ00BA1F4M
	RES. BUILT-IN TRANSISTOR KRC103M	NQSZ0KRC103M
Q 681 ⚠	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
⚠	TRANSISTOR 2SC2120-Y(TPE2)	QQSY02SC2120
Q 682 ⚠	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
⚠	TRANSISTOR 2SC2120-Y(TPE2)	QQSY02SC2120
Q 683 ⚠	TRANSISTOR 2SC2120-O-TPE2 or	QQS002SC2120
⚠	TRANSISTOR 2SC2120-Y(TPE2)	QQSY02SC2120
Q 831	TRANSISTOR 2SC2785(F) or	QQSF02SC2785
	TRANSISTOR 2SC2785(H) or	QQSH02SC2785
	TRANSISTOR 2SC2785(J) or	QQSJ02SC2785
	TRANSISTOR KTC3199(GR) or	NQS10KTC3199
	TRANSISTOR KTC3198GR TO-92 or	NQS40KTC3198
	TRANSISTOR 2SC3331(T)-AANP or	2SC3331TZ
	TRANSISTOR 2SC3331(U)-AANP or	2SC3331UZ
	TRANSISTOR 2SC1815-GR(TPE2)	QQS102SC1815
	RESISTORS	

Ref No.	Description	Part No.
R 101	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 102	CHIP RES.(1608) 1/10W J 1.8k Ω	RRXAJB5Z0182
R 103	CHIP RES.(1608) 1/10W J 3.3k Ω	RRXAJB5Z0332
R 104	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 105	CHIP RES.(1608) 1/10W J 8.2k Ω	RRXAJB5Z0822
R 106	CHIP RES.(1608) 1/10W J 10k Ω	RRXAJB5Z0103
R 107	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 111	CARBON RES. 1/4W J 100 Ω or	RCX4JATZ0101
	CARBON RES. 1/6W J 100 Ω	RCX6JATZ0101
R 121	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 122	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 123	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 124	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 125	CHIP RES.(1608) 1/10W J 1.5k Ω	RRXAJB5Z0152
R 126	CHIP RES.(1608) 1/10W J 1.5k Ω	RRXAJB5Z0152
R 127	CHIP RES.(1608) 1/10W J 1.5k Ω	RRXAJB5Z0152
R 128	CHIP RES.(1608) 1/10W J 3.3k Ω	RRXAJB5Z0332
R 131	CHIP RES.(1608) 1/10W J 3.3k Ω	RRXAJB5Z0332
R 132	CHIP RES.(1608) 1/10W J 3.3k Ω	RRXAJB5Z0332
R 133	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 134 ⚠	CHIP RES.(1608) 1/10W J 1k Ω	RRXAJB5Z0102
R 135	CHIP RES.(1608) 1/10W J 10k Ω	RRXAJB5Z0103
R 136	CARBON RES. 1/4W J 22k Ω or	RCX4JATZ0223
	CARBON RES. 1/6W J 22k Ω	RCX6JATZ0223
R 155	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 163	CHIP RES.(1608) 1/10W J 22k Ω	RRXAJB5Z0223
R 164	CHIP RES.(1608) 1/10W J 6.8k Ω	RRXAJB5Z0682
R 165	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
R 171	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 172	CHIP RES.(1608) 1/10W J 1k Ω	RRXAJB5Z0102
R 176	CHIP RES.(1608) 1/10W J 390k Ω	RRXAJB5Z0394
R 181	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 182	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 303	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 305	CHIP RES.(1608) 1/10W J 10k Ω	RRXAJB5Z0103
R 306	CHIP RES.(1608) 1/10W J 2.7k Ω	RRXAJB5Z0272
R 307	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
R 308	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 309	CHIP RES.(1608) 1/10W J 6.8k Ω	RRXAJB5Z0682
R 310	CARBON RES. 1/4W J 2.2k Ω or	RCX4JATZ0222
	CARBON RES. 1/6W J 2.2k Ω	RCX6JATZ0222
R 311	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 312	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 313	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 314	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 315	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 316	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 320	PCB JUMPER D0.6-P5.0	JW5.0T
R 321	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 323	CARBON RES. 1/4W J 33k Ω or	RCX4JATZ0333
	CARBON RES. 1/6W J 33k Ω	RCX6JATZ0333
R 324	CARBON RES. 1/4W J 10 Ω or	RCX4JATZ0100
	CARBON RES. 1/6W J 10 Ω	RCX6JATZ0100
R 326	CHIP RES.(1608) 1/10W J 470 Ω	RRXAJB5Z0471
R 332	CARBON RES. 1/4W J 15k Ω or	RCX4JATZ0153
	CARBON RES. 1/6W J 15k Ω	RCX6JATZ0153
R 333	CARBON RES. 1/4W J 270k Ω or	RCX4JATZ0274
	CARBON RES. 1/6W J 270k Ω	RCX6JATZ0274
R 334	CHIP RES.(1608) 1/10W J 150k Ω	RRXAJB5Z0154
R 341	CHIP RES.(1608) 1/10W J 6.8k Ω	RRXAJB5Z0682

Ref No.	Description	Part No.
R 346	CARBON RES. 1/4W J 100 Ω or	RCX4JATZ0101
	CARBON RES. 1/6W J 100 Ω	RCX6JATZ0101
R 347	CHIP RES.(1608) 1/10W J 10k Ω	RRXAJB5Z0103
R 348	CARBON RES. 1/4W J 220 Ω or	RCX4JATZ0221
	CARBON RES. 1/6W J 220 Ω	RCX6JATZ0221
R 351	PCB JUMPER D0.6-P5.0	JW5.0T
R 352	PCB JUMPER D0.6-P5.0	JW5.0T
R 361	CHIP RES.(1608) 1/10W J 82 Ω	RRXAJB5Z0820
R 367	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
R 368	CHIP RES.(1608) 1/10W J 10M Ω	RRXAJB5Z0106
R 369	CHIP RES.(1608) 1/10W J 15k Ω	RRXAJB5Z0153
R 371	CHIP RES.(1608) 1/10W J 470 Ω	RRXAJB5Z0471
R 373	CHIP RES.(1608) 1/10W J 390 Ω	RRXAJB5Z0391
R 391	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 392	CHIP RES.(1608) 1/10W J 100 Ω	RRXAJB5Z0101
R 393	CHIP RES.(1608) 1/10W J 1k Ω	RRXAJB5Z0102
R 396	CARBON RES. 1/4W J 220 Ω or	RCX4JATZ0221
	CARBON RES. 1/6W J 220 Ω	RCX6JATZ0221
R 397	CARBON RES. 1/4W J 220 Ω or	RCX4JATZ0221
	CARBON RES. 1/6W J 220 Ω	RCX6JATZ0221
R 551	CARBON RES. 1/4W J 4.7 Ω or	RCX4JATZ04R7
	CARBON RES. 1/6W J 4.7 Ω	RCX6JATZ04R7
R 552 ⚠	CARBON RES. 1/4W J 1 Ω or	RCX4JATZ01R0
⚠	CARBON RES. 1/6W J 1 Ω	RCX6JATZ01R0
R 553 ⚠	CARBON RES. 1/4W J 1 Ω or	RCX4JATZ01R0
⚠	CARBON RES. 1/6W J 1 Ω	RCX6JATZ01R0
R 554 ⚠	CARBON RES. 1/4W J 3.9 Ω or	RCX4JATZ03R9
⚠	CARBON RES. 1/6W J 3.9 Ω	RCX6JATZ03R9
R 556	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 557	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 558	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 559	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 561	CHIP RES.(1608) 1/10W J 470 Ω	RRXAJB5Z0471
R 562	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 563	CHIP RES.(1608) 1/10W J 22k Ω	RRXAJB5Z0223
R 564	CHIP RES.(1608) 1/10W J 56k Ω	RRXAJB5Z0563
R 566	CARBON RES. 1/4W J 3.3 Ω or	RCX4JATZ03R3
	CARBON RES. 1/6W J 3.3 Ω	RCX6JATZ03R3
R 567	CARBON RES. 1/4W J 3.3 Ω or	RCX4JATZ03R3
	CARBON RES. 1/6W J 3.3 Ω	RCX6JATZ03R3
R 569 ⚠	CHIP RES.(1608) 1/10W J 6.8k Ω	RRXAJB5Z0682
R 571 ⚠	FIXED METAL OXIDE FILM RES. 2W J 1.5k Ω or	RN02152KE007
⚠	METAL OXIDE FILM RES. 2W J 1.5k Ω or	RN02152ZU001
⚠	METAL RESISTOR 2W J 1.5k Ω or	RN02152UB001
⚠	METAL OXIDE FILM RES. 2W J 1.5k Ω	RN02152DP004
R 572 ⚠	FIXED METAL OXIDE FILM RES. 2W J 1.5k Ω or	RN02152KE007
⚠	METAL OXIDE FILM RES. 2W J 1.5k Ω or	RN02152ZU001
⚠	METAL RESISTOR 2W J 1.5k Ω or	RN02152UB001
⚠	METAL OXIDE FILM RES. 2W J 1.5k Ω	RN02152DP004
R 575 ⚠	CARBON RES. 1/4W J 15 Ω or	RCX4JATZ0150
⚠	CARBON RES. 1/6W J 15 Ω	RCX6JATZ0150
R 576 ⚠	CARBON RES. 1/4W J 15 Ω or	RCX4JATZ0150
⚠	CARBON RES. 1/6W J 15 Ω	RCX6JATZ0150
R 577 ⚠	CARBON RES. 1/4W J 15 Ω or	RCX4JATZ0150
⚠	CARBON RES. 1/6W J 15 Ω	RCX6JATZ0150

Ref No.	Description	Part No.
R 578	CARBON RES. 1/4W J 560 Ω or	RCX4JATZ0561
	CARBON RES. 1/6W J 560 Ω	RCX6JATZ0561
R 579	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 581	PCB JUMPER D0.6-P5.0	JW5.0T
R 583 ⚠	FIXED METAL OXIDE FILM RES. 2W J 3.9 Ω or	RN02JZQZ03R9
⚠	FIXED METAL OXIDE FILM RES. 2W J 3.9 Ω or	RN02JZPZ03R9
⚠	METAL OXIDE FILM RES. 2W J 3.9 Ω	RN023R9ZU001
R 584 ⚠	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
⚠	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 588 ⚠	CARBON RES. 1/4W J 100k Ω or	RCX4JATZ0104
⚠	CARBON RES. 1/6W J 100k Ω	RCX6JATZ0104
R 589	CARBON RES. 1/4W J 100k Ω or	RCX4JATZ0104
	CARBON RES. 1/6W J 100k Ω	RCX6JATZ0104
R 591 ⚠	CHIP RES.(1608) 1/10W J 180k Ω	RRXAJB5Z0184
R 592 ⚠	CHIP RES.(1608) 1/10W J 100k Ω	RRXAJB5Z0104
R 593 ⚠	CHIP RES.(1608) 1/10W J 68k Ω	RRXAJB5Z0683
R 594 ⚠	CHIP RES.(1608) 1/10W J 100k Ω	RRXAJB5Z0104
R 597	CARBON RES. 1/4W J 8.2k Ω or	RCX4JATZ0822
	CARBON RES. 1/6W J 8.2k Ω	RCX6JATZ0822
R 598 ⚠	CARBON RES. 1/4W J 47k Ω or	RCX4JATZ0473
⚠	CARBON RES. 1/6W J 47k Ω	RCX6JATZ0473
R 599 ⚠	CHIP RES.(1608) 1/10W J 22k Ω	RRXAJB5Z0223
R 601 ⚠	CEMENT RES. 5W K 1.2 Ω or	RW051R2DP005
⚠	CEMENT RESISTOR 5W K 1.2 Ω or	RW051R2PG001
⚠	CEMENT RESISTOR SQZ05S1R2J or	RW051R2Y4001
⚠	CEMENT RES. 3W J 1.2 Ω	RW031R2PG007
R 602	CARBON RES. 1/4W J 820k Ω or	RCX4JATZ0824
	CARBON RES. 1/6W J 820k Ω	RCX6JATZ0824
R 603	CARBON RES. 1/4W J 820k Ω or	RCX4JATZ0824
	CARBON RES. 1/6W J 820k Ω	RCX6JATZ0824
R 611	CARBON RES. 1/4W J 270 Ω or	RCX4JATZ0271
	CARBON RES. 1/6W J 270 Ω	RCX6JATZ0271
R 612	CARBON RES. 1/4W J 270 Ω or	RCX4JATZ0271
	CARBON RES. 1/6W J 270 Ω	RCX6JATZ0271
R 613 ⚠	FIXED METAL OXIDE FILM RES. 2W J 0.33 Ω or	RN02JZQZ0R33
⚠	METAL OXIDE FILM RES. 2W J 0.33 Ω or	RN02R33ZU001
⚠	METAL RES 2W J 0.33 Ω	RN02JZPZ0R33
R 614	CARBON RES. 1/4W J 47 Ω or	RCX4JATZ0470
	CARBON RES. 1/6W J 47 Ω	RCX6JATZ0470
R 616	CARBON RES. 1/4W J 10k Ω or	RCX4JATZ0103
	CARBON RES. 1/6W J 10k Ω	RCX6JATZ0103
R 621	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
R 622	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 623	CARBON RES. 1/4W J 330 Ω or	RCX4JATZ0331
	CARBON RES. 1/6W J 330 Ω	RCX6JATZ0331
R 624	PCB JUMPER D0.6-P5.0	JW5.0T
R 653	CHIP RES.(1608) 1/10W J 15k Ω	RRXAJB5Z0153
R 654	CARBON RES. 1/4W J 2.7k Ω or	RCX4JATZ0272
	CARBON RES. 1/6W J 2.7k Ω	RCX6JATZ0272
R 655 ⚠	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
⚠	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 656	CHIP RES.(1608) 1/10W J 15k Ω	RRXAJB5Z0153
R 657	CARBON RES. 1/4W J 15k Ω or	RCX4JATZ0153
	CARBON RES. 1/6W J 15k Ω	RCX6JATZ0153
R 660	CARBON RES. 1/4W J 1k Ω or	RCX4JATZ0102
	CARBON RES. 1/6W J 1k Ω	RCX6JATZ0102
R 661 ⚠	CARBON RES. 1/4W J 15k Ω or	RCX4JATZ0153

Ref No.	Description	Part No.
⚠	CARBON RES. 1/6W J 15k Ω	RCX6JATZ0153
R 662 ⚠	CARBON RES. 1/4W J 220k Ω or	RCX4JATZ0224
⚠	CARBON RES. 1/6W J 220k Ω	RCX6JATZ0224
R 664 ⚠	CHIP RES.(1608) 1/10W J 12k Ω	RRXAJB5Z0123
R 665 ⚠	CHIP RES.(1608) 1/10W J 4.7k Ω	RRXAJB5Z0472
R 666 ⚠	METAL OXIDE FILM RES. 2W J 15k Ω or	RN02153KE007
⚠	METAL OXIDE FILM RES. 2W J 15k Ω or	RN02153ZU001
⚠	METAL RESISTOR 2W J 15k Ω or	RN02153UB001
⚠	METAL OXIDE FILM RES. 2W J 15k Ω	RN02153DP004
R 667 ⚠	PCB JUMPER D0.6-P5.0	JW5.0T
R 668 ⚠	METAL OXIDE FILM RES. 1W J 56k Ω or	RN01563KE009
⚠	METAL OXIDE FILM RES. 1W J 56k Ω or	RN01563ZU001
⚠	METAL OXIDE RESISTOR 1W J 56k Ω or	RN01563UB001
⚠	METAL OXIDE FILM RES. 1W J 56k Ω	RN01563DP003
R 671	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 672	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 673	CARBON RES. 1/4W J 100k Ω or	RCX4JATZ0104
	CARBON RES. 1/6W J 100k Ω	RCX6JATZ0104
R 676	CARBON RES. 1/4W J 10k Ω or	RCX4JATZ0103
	CARBON RES. 1/6W J 10k Ω	RCX6JATZ0103
R 681 ⚠	CARBON RES. 1/4W J 12 Ω or	RCX4JATZ0120
⚠	CARBON RES. 1/6W J 12 Ω	RCX6JATZ0120
R 682 ⚠	FIXED METAL OXIDE FILM RES. 1W J 33 Ω or	RN01330KE007
⚠	METAL OXIDE FILM RES. 1W J 33 Ω or	RN01330ZU001
⚠	METAL RES. 1W J 33 Ω or	RN01330UB001
⚠	METAL OXIDE FILM RES. 1W J 33 Ω	RN01330DP003
R 683 ⚠	FIXED METAL OXIDE FILM RES. 1W J 39 Ω or	RN01390KE007
⚠	METAL OXIDE FILM RES. 1W J 39 Ω or	RN01390ZU001
⚠	FIXED METAL OXIDE FILM RES. 1W J 39 Ω or	RN01390UB001
⚠	METAL OXIDE FILM RES. 1W J 39 Ω	RN01390DP003
R 686	CARBON RES. 1/4W J 100 Ω or	RCX4JATZ0101
	CARBON RES. 1/6W J 100 Ω	RCX6JATZ0101
R 687	CARBON RES. 1/4W J 10 Ω or	RCX4JATZ0100
	CARBON RES. 1/6W J 10 Ω	RCX6JATZ0100
R 691	CARBON RES. 1/4W J 15k Ω or	RCX4JATZ0153
	CARBON RES. 1/6W J 15k Ω	RCX6JATZ0153
R 810 ⚠	METAL OXIDE FILM RES. 1W J 8.2 Ω or	RN018R2ZU002
⚠	METAL OXIDE FILM RES. 1W J 8.2 Ω or	RN018R2KE009
⚠	METAL RESISTOR 1W J 8.2 Ω	RN018R2UB001
R 811 ⚠	CARBON RES. 1/4W J 2.2k Ω or	RCX4JATZ0222
⚠	CARBON RES. 1/6W J 2.2k Ω	RCX6JATZ0222
R 812 ⚠	CHIP RES.(1608) 1/10W J 2.2k Ω	RRXAJB5Z0222
R 821	CHIP RES.(1608) 1/10W J 15k Ω	RRXAJB5Z0153
R 822	CHIP RES.(1608) 1/10W J 3.9k Ω	RRXAJB5Z0392
R 826	CARBON RES. 1/4W J 470k Ω or	RCX4JATZ0474
	CARBON RES. 1/6W J 470k Ω	RCX6JATZ0474
R 831	CHIP RES.(1608) 1/10W J 1k Ω	RRXAJB5Z0102
J 104	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
J 115	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
J 147	CARBON RES. 1/4W J 270k Ω or	RCX4JATZ0274
	CARBON RES. 1/6W J 270k Ω	RCX6JATZ0274
J 183	CHIP RES. 1/10W J 0 Ω	RRXAJB5Z0000
	SWITCHES	
SW 101	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW 102	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW 103	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW 104	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW 105	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
SW 106	TACT SWITCH SKQSAB or	SST0101AL038
	TACT SWITCH KSM0612B or	SST0101HH003
	TACT SWITCH SKHHAM	SST0101AL029
	MISCELLANEOUS	
AC 601⚠	AC CORD LA-2366 or	WAC0172LW006
⚠	AC CORD WAC0172AS006 or	WAC0172AS006
⚠	AC CORD WAC0172LTE01	WAC0172LTE01
B- 6	HEAT SINK(PFB)ASSEMBLY	0EM406029
B- 7	HEAT SINK(PFA)	0EM406027
B- 12	CLOTH(65) L7735TR:65X10X0.5T	0EM402149
BC 101	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 571	BEAD INDUCTORS FBA04HA600VB-00	LLBF00STU026
BC 601	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 602	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 641	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 651	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 652	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 653	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 691	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
BC 692	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
CF 301	4.5M TRAP XT4.5MB2 or	FBE455PLN001
	CERAMIC TRAP 4.5MHz or	FBE455PMR003
	CERAMIC TRAP 4.5MHz	FBE455PMS001
CF 302	4.5M FILTER LTH4.5MCB or	FBB455PLN001
	CERAMIC FILTER SFSRA4M50CF00-B0 or	FBB455PMR004
	CERAMIC FILTER 4.5MHz	FBB455PMS001
CLN301	WIRE ASSY WX1L1100-102	WX1L1100-102
F 601⚠	FUSE 4A/125V 237 TYPE or	PAGJ20CAG402
⚠	FUSE TDS4A125VU/C	PAGD20CW3402
FH 601	FUSE HOLDER MSF-015 or	XH01Z00LY001
	FUSE HOLDER FH-V-03078 or	XH01Z00DK001
	HOLDER, FUSE CNT41-0014	1790424
FH 602	FUSE HOLDER MSF-015 or	XH01Z00LY001
	FUSE HOLDER FH-V-03078 or	XH01Z00DK001
	HOLDER, FUSE CNT41-0014	1790424
GP 641⚠	GAP. FNR-G3.10D	FAZ000LD6005
JS 601	PCB JUMPER D0.6-P7.5	JW7.5T
JS 642	PCB JUMPER D0.6-P15.0	JW15.0T
JS 801	PCB JUMPER D0.6-P5.0	JW5.0T
JS 802	PCB JUMPER D0.6-P5.0	JW5.0T
L- 1	B-TITE SCREW 3X8 BIND + CHROME or	GBMB3080
	B-TITE SCREW 3X8 BIND + CHROME	GBMB3080
PS 691⚠	THERMISTOR ZPB45BL7R0A	QNZZ45BL7R0A
RCV101	REMOCON RECEIVE UNIT PIC-26042SR-2 or	USESJRSKK032
	REMOCON RECEIVE UNIT PIC-37042SR	USESJRSKK034
SA 601⚠	SURGE ABSORBER AVR-S07D471KAAS or	QVQZ0AVRS07D
⚠	VARISTOR ENC471D-07A or	QVQZ0471D07A
⚠	SURGE ABSORBER JVR-07N471K	NVQZVR07N471
SF 1	SAW FILTER SAF45MHA220ZL	FBB456PMR002
T 571⚠	FLYBACK TRANS BSC21-2602S	LTF00CPS2027

Ref No.	Description	Part No.
T 572	H0RIZONTAL DRIVE TRANS LP2-004	LTH00CPA5004
T 601⚠	SWITCHING TRANS K0F12F-0201 or	LTT00CPKT064
⚠	SWITCHING TRANS SA-19L11	LTT00CPSA084
TP 300	PCB JUMPER D0.6-P12.5	JW12.5T
TP 301	PCB JUMPER D0.6-P15.0	JW15.0T
TP 601	PCB JUMPER D0.6-P12.5	JW12.5T
TU 1	TUNER UNIT TEDH9-203B	UTUNNTUAL021
VR 661 ⚠	CARBON P.O.T. 30k Ω B or	VRCB303KA011
⚠	CARBON P.O.T. 30k Ω B	VRCB303HH014
X 101	CERAMIC RESONATOR KBR-8.0MKC or	FY0805PKC002
	CERAMIC RESONATOR CSTS0800MG03 or	FYL805PMR001
	CERAMIC RESONATOR ZTT 8.00MHz or	FY0805PLN001
	CERAMIC RESONATOR FCR8.0MC	FY0805PTE001
X 331	X'TAL 3.579545 MHz	FXD355LLN003

CRT CBA

Ref No.	Description	Part No.
	CRT CBA Consist of the following	----------
	CAPACITORS	
C 501	CHIP CERAMIC CAP. CH J 330pF/50V	CHD1JJBCH331
C 502	CHIP CERAMIC CAP. CH J 270pF/50V	CHD1JJBCH271
C 503	CHIP CERAMIC CAP. CH J 330pF/50V	CHD1JJBCH331
C 504	ELECTROLYTIC CAP. 47μF/16V M or	CE1CMASTL470
	ELECTROLYTIC CAP. 47μF/16V M	CE1CMASDL470
C 510	CERAMIC CAP. B K 1000pF/2kV or	CCD3DKD0B102
	CERAMIC CAP. B K 1000pF/2kV or	CCD3DKP0B102
	CERAMIC CAP. B K 1000pF/2kV	CA3D102MR030
	CONNECTORS	
CN 501	PIN CONNECTOR 005P-5100	JTEA001TG001
	COILS	
L 501	INDUCTOR 180μH-J-5FT or	LLARJCSTU181
	INDUCTOR 180μH-K-5FT	LLARKDSKA181
	TRANSISTORS	
Q 501	TRANSISTOR 2SC2482 TPE6 or	QQSZ02SC2482
	TRANSISTOR 2SC3468(E)-AE or	QQSE02SC3468
	TRANSISTOR 2SC3468(D)-AE or	QQSD02SC3468
	TRANSISTOR 2SC2271(D)-AEMP or	2SC2271DZ
	TRANSISTOR 2SC2271(E)-AE	QQSE02SC2271
Q 502	TRANSISTOR 2SC2482 TPE6 or	QQSZ02SC2482
	TRANSISTOR 2SC3468(E)-AE or	QQSE02SC3468
	TRANSISTOR 2SC3468(D)-AE or	QQSD02SC3468
	TRANSISTOR 2SC2271(D)-AEMP or	2SC2271DZ
	TRANSISTOR 2SC2271(E)-AE	QQSE02SC2271
Q 503	TRANSISTOR 2SC2482 TPE6 or	QQSZ02SC2482
	TRANSISTOR 2SC3468(E)-AE or	QQSE02SC3468
	TRANSISTOR 2SC3468(D)-AE or	QQSD02SC3468
	TRANSISTOR 2SC2271(D)-AEMP or	2SC2271DZ
	TRANSISTOR 2SC2271(E)-AE	QQSE02SC2271
	RESISTORS	
R 501 ⚠	FIXED METAL OXIDE FILM RES. 1W J 15k Ω or	RN01153KE007
⚠	METAL OXIDE FILM RES. 1W J 15k Ω or	RN01153ZU001
⚠	METAL RESISTOR 1W J 15k Ω or	RN01153UB001
⚠	METAL OXIDE FILM RES. 1W J 15k Ω	RN01153DP003
R 502 ⚠	FIXED METAL OXIDE FILM RES. 1W J 15k Ω or	RN01153KE007
⚠	METAL OXIDE FILM RES. 1W J 15k Ω or	RN01153ZU001
⚠	METAL RESISTOR 1W J 15k Ω or	RN01153UB001
⚠	METAL OXIDE FILM RES. 1W J 15k Ω	RN01153DP003
R 503 ⚠	FIXED METAL OXIDE FILM RES. 1W J 15k Ω or	RN01153KE007
⚠	METAL OXIDE FILM RES. 1W J 15k Ω or	RN01153ZU001
⚠	METAL RESISTOR 1W J 15k Ω or	RN01153UB001
⚠	METAL OXIDE FILM RES. 1W J 15k Ω	RN01153DP003
R 504	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
R 505	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
R 506	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
R 509	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
R 511	CHIP RES.(1608) 1/10W J 33 Ω	RRXAJB5Z0330
R 512	CHIP RES.(1608) 1/10W J 33 Ω	RRXAJB5Z0330
R 513	CHIP RES.(1608) 1/10W J 33 Ω	RRXAJB5Z0330
R 514	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 515	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 516	CARBON RES. 1/4W J 3.3k Ω or	RCX4JATZ0332
	CARBON RES. 1/6W J 3.3k Ω	RCX6JATZ0332
R 517	CARBON RES. 1/4W J 470 Ω or	RCX4JATZ0471
	CARBON RES. 1/6W J 470 Ω	RCX6JATZ0471
R 518	CARBON RES. 1/4W J 470 Ω or	RCX4JATZ0471
	CARBON RES. 1/6W J 470 Ω	RCX6JATZ0471
R 519	CARBON RES. 1/4W J 470 Ω or	RCX4JATZ0471
	CARBON RES. 1/6W J 470 Ω	RCX6JATZ0471
R 537	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
R 538	CARBON RES. 1/4W J 1.5k Ω or	RCX4JATZ0152
	CARBON RES. 1/6W J 1.5k Ω	RCX6JATZ0152
	MISCELLANEOUS	
BC 501	BEAD INDUCTORS FBR07HA121TB-00	LLBF00ZTU021
CLN501	PARALLEL WIRE 3P	WX1L1114-101
JK 501⚠	CRT SOCKET ISMS02S	JSCC220PK003
TP 501	PCB JUMPER D0.6-P10.0	JW10.0T
TP 502	PCB JUMPER D0.6-P10.0	JW10.0T

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