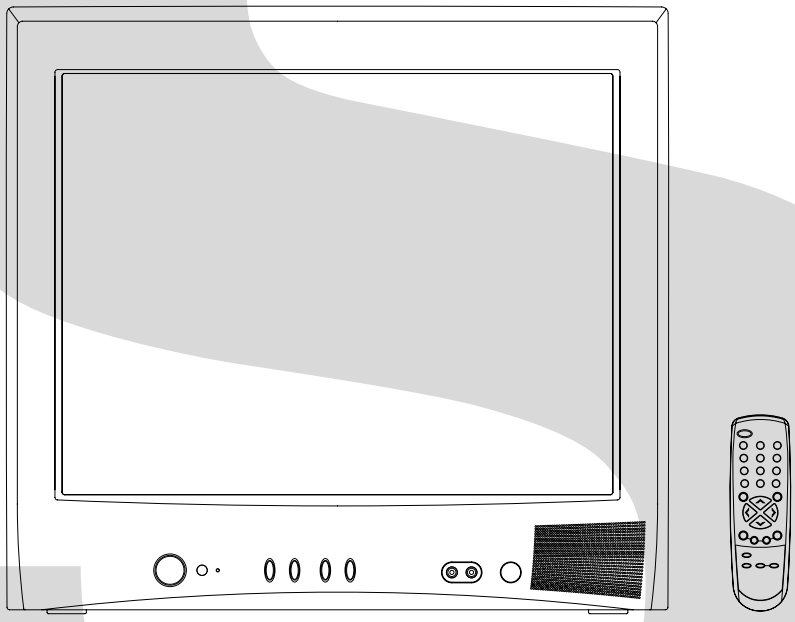
TOSHIBA

FILE NO. 050-200211

# SERVICE MANUAL

# COLOR TELEVISION

# 20A22



DOCUMENT CREATED IN JAPAN, Jul., 2002

## SERVICING NOTICES ON CHECKING

### 1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

### 2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

### 3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

### 4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

### 5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

### 6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

### 7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

**(INSULATION CHECK PROCEDURE)**

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

**[Note 1]**

If you have not the 500V insulation resistance meter, use a Tester.

**[Note 2]**

External exposure metal: Antenna terminal
Earphone jack

## HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

## IMPORTANT

Inferior silicon grease can damage IC's and transistors.
When replacing an IC's or transistors, use only specified silicon grease (YG6260M).
Remove all old silicon before applying new silicon.

# GENERAL SPECIFICATIONS

| | | | | |
|---|---|---|---|---|
| **G-1** | **TV System** | CRT | CRT Size / Visual Size | 20 inch / 508.0mmV |
| | | | CRT Type | Normal |
| | | | Deflection | 90 degree |
| | | | Magnetic Field BV/BH | +0.45G/0.18G |
| | | Color System | | NTSC |
| | | Speaker | | 1Speaker |
| | | | Position | Front |
| | | | Size | 1.6 x 2.8 Inch |
| | | | Impedance | 8 ohm |
| | | Sound Output | MAX | 1.5 W |
| | | | 10%(Typical) | 1.0 W |
| | | NTSC3.58+4.43 /PAL60Hz | | No |
| **G-2** | **Tuning System** | Broadcasting System | | US System M |
| | | Tuner and Receive CH | System | 1Tuner |
| | | | Destination | Others |
| | | | Tuning System | F-Synth |
| | | | Input Impedance | VHF/UHF 75 ohm |
| | | | CH Coverage | 2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84 |
| | | Intermediate Frequency | Picture(FP) | 45.75MHz |
| | | | Sound(FS) | 41.25MHz |
| | | | FP-FS | 4.50MHz |
| | | Preset CH | | No |
| | | Stereo/Dual TV Sound | | No |
| | | Tuner Sound Muting | | Yes |
| **G-3** | **Power** | Power Source | AC | 120V AC 60Hz |
| | | | DC | |
| | | Power Consumption | at AC | |
| | | | | 80 W at AC 120 V 60 Hz |
| | | | Stand by (at AC) | 5 W at AC 120 V 60 Hz |
| | | | Per Year | -- kWh/Year |
| | | Protector | Power Fuse | Yes |
| **G-4** | **Regulation** | | Safety | UL/CSA[From '02 JUL O/R] |
| | | | Radiation | FCC/IC [From '02 JUL O/R] |
| | | | X-Radiation | DHHS/HWC[From '02 JUL O/R] |
| **G-5** | **Temperature** | | Operation | +5oC ~ +40oC |
| | | | Storage | -20oC ~ +60oC |
| **G-6** | **Operating Humidity** | | | Less than 80% RH |

# GENERAL SPECIFICATIONS

| | | | | | |
|---|---|---|---|---|---|
| **G-7** | **On Screen Display** | Menu | | | Yes |
| | | | Menu Type | | Character |
| | | | Picture | | Yes |
| | | | | Contrast | Yes |
| | | | | Brightness | Yes |
| | | | | Color | Yes |
| | | | | Tint | Yes |
| | | | | Sharpness | Yes |
| | | | Audio | | No |
| | | | | Bass | No |
| | | | | Treble | No |
| | | | | Balance | No |
| | | | | BBE On/Off | No |
| | | | | Stable Sound On/Off | No |
| | | | CH Set Up | | Yes |
| | | | | TV/CABLE(CATV) | Yes |
| | | | | Auto CH Memory | Yes |
| | | | | Add/ Delete | Yes |
| | | | Lock | | Yes |
| | | | | CH Lock | Yes |
| | | | | Video Lock | Yes |
| | | | | Game Timer | Yes |
| | | | | Change Password | Yes |
| | | | Language | | Yes |
| | | | V-chip | | Yes |
| | | | | CH Label | No |
| | | | | Favorite CH | No |
| | | | | Color Stream DVD/DTV | No |
| | | | Control Level | | Yes |
| | | | | Volume | Yes |
| | | | | Brightness | Yes |
| | | | | Contrast | Yes |
| | | | | Color | Yes |
| | | | | Tint (NTSC Only) | Yes |
| | | | | Sharpness | Yes |
| | | | | Tuning | No |
| | | | | Bass | No |
| | | | | Treble | No |
| | | | | Balance | No |
| | | | | Back Light | No |
| | | | Stereo,Audio Output,SAP | | No |
| | | | Video | | Yes |
| | | | Color Stream | | No |
| | | | Channel(TV/Cable) | | Yes |
| | | | CH Label | | No |
| | | | Game Timer | | Yes |
| | | | Sleep Timer | | Yes |
| | | | Sound Mute | | Yes |
| | | | V-chip Rating | | Yes |
| **G-8** | **OSD Language** | | | | English French Spanish |
| **G-9** | **Clock and Timer** | Sleep Timer | | Max Time | 120 Min |
| | | | | Step | 10 Min |
| | | On/Off Timer | | Program(On Timer / Off Timer) | No |
| | | Wake Up Timer | | | No |
| | | Timer Back-up (at Power Off Mode) | | more than | -- Min Sec |

# GENERAL SPECIFICATIONS

| | | | | |
|---|---|---|---|---|
| **G-10** | **Remote Control** | Unit | | RC-EH |
| | | Glow in Dark Remocon | | Yes |
| | | Format | | Toshiba |
| | | Custom Code | | 40-BF h |
| | | Power Source | Voltage(D.C) | 3V |
| | | | UM size x pcs | UM-4 x 2 pcs |
| | | Total Keys | | 27 Keys |
| | | Keys | Power | Yes |
| | | | 1 | Yes |
| | | | 2 | Yes |
| | | | 3 | Yes |
| | | | 4 | Yes |
| | | | 5 | Yes |
| | | | 6 | Yes |
| | | | 7 | Yes |
| | | | 8 | Yes |
| | | | 9 | Yes |
| | | | 0 | Yes |
| | | | 100 | No |
| | | | CH Up | Yes |
| | | | CH Down | Yes |
| | | | Volume Up | Yes |
| | | | Volume Down | Yes |
| | | | TV/Caption/Text | Yes |
| | | | CH1/CH2 | Yes |
| | | | TV/Video(TV/AV) | Yes |
| | | | CH RTN/CH ENT(Quick View) | Yes |
| | | | Sleep | Yes |
| | | | RE Call(Call) | Yes |
| | | | Reset | Yes |
| | | | Menu | Yes |
| | | | Enter | Yes |
| | | | Mute | Yes |
| | | | Exit | No |
| | | | MTS(Audio Select) | No |
| | | | Set + | Yes |
| | | | Set - | Yes |
| | | Multi Brand Keys | CH Up(VCR) | No |
| | | | CH Down(VCR) | No |
| | | | Pause/Still | No |
| | | | TV/VCR(VCR) | No |
| | | | Code | No |
| | | | FF | No |
| | | | Rew | No |
| | | | Rec | No |
| | | | Play | No |
| | | | Stop | No |
| | | | TV | No |
| | | | VCR | No |
| | | | Cable | No |

# GENERAL SPECIFICATIONS

| | | | | |
|---|---|---|---|---|
| **G-11** | **Features** | Auto Degauss | | Yes |
| | | Auto Shut Off | | Yes |
| | | Canal+ | | No |
| | | CATV | | Yes |
| | | Anti-theft | | No |
| | | Rental | | No |
| | | Memory(Last CH) | | Yes |
| | | Memory(Last Volume) | | Yes |
| | | V-Chip | | Yes |
| | | | Type | USA,ORION Type |
| | | BBE | | No |
| | | Auto Search | | No |
| | | CH Allocation | | No |
| | | SAP | | No |
| | | Just Clock Function | | No |
| | | CH Label | | No |
| | | VM Circuit | | No |
| | | Full OSD | | No |
| | | Premiere | | No |
| | | Comb Filter | | No |
| | | | Lines | |
| | | Auto CH Memory | | Yes |
| | | Hotel Lock | | No |
| | | Closed Caption | | Yes |
| | | Stable Sound | | No |
| | | FBT Leak Test Protect | | Yes |
| | | CH Lock | | Yes |
| | | Video Lock | | Yes |
| | | Game Timer | | Yes |
| | | Energy Star | | No |
| | | Favorite CH | | No |
| **G-12** | **Accessories** | Owner's Manual | Language | English / French |
| | | | W/ Warranty | Yes |
| | | Remote Control Unit | | Yes |
| | | Rod Antenna | | No |
| | | | Poles | |
| | | | Terminal | |
| | | Loop Antenna | | No |
| | | | Terminal | |
| | | U/V Mixer | | No |
| | | DC Car Cord (Center+) | | No |
| | | Guarantee Card | | No |
| | | Warning Sheet | | No |
| | | Circuit Diagram | | No |
| | | Antenna Change Plug | | No |
| | | Service Facility List | | No |
| | | Important Safety Instruction | | Yes |
| | | Dew/AHC Caution Sheet | | No |
| | | AC Plug Adapter | | No |
| | | Quick Set-up Sheet | | No |
| | | Battery | | Yes |
| | | | UM size x pcs | UM4 x 2 |
| | | | OEM Brand | No |
| | | AC Cord | | No |
| | | AV Cord (2Pin-1Pin) | | No |
| | | Registration Card (NDL Card) | | Yes |
| | | ESP Card | | Yes |
| | | PTB Sheet | | No |
| | | 300 ohm to 75 ohm Antenna Adapter | | No |

# GENERAL SPECIFICATIONS

| | | | | | |
|---|---|---|---|---|---|
| **G-13** | **Interface** | Switch | Front | Power | Yes |
| | | | | System Select | No |
| | | | | Main Power SW | No |
| | | | | Sub Power | No |
| | | | | Channel Up/Reset | Yes |
| | | | | Channel Down/Enter | Yes |
| | | | | Volume Up/Set Up | Yes |
| | | | | Volume Down/Set Down | Yes |
| | | | | MENU=Volume Up+Volume Down | Yes |
| | | | Rear | AC/DC | No |
| | | | | TV/CATV Selector | No |
| | | | | Degauss | No |
| | | | | Main Power SW | No |
| | | Indicator | | Power | Yes |
| | | | | Stand-by | No |
| | | | | On Timer | No |
| | | Terminals | Front | Video Input | RCA |
| | | | | Audio Input | RCA x 1 |
| | | | | Other Terminal | No |
| | | | Rear | Video Input(Rear1) | No |
| | | | | Video Input(Rear2) | No |
| | | | | Audio Input(Rear1) | No |
| | | | | Audio Input(Rear2) | No |
| | | | | Video Output | No |
| | | | | Audio Output | No |
| | | | | S-Input | No |
| | | | | Color Stream | No |
| | | | | Diversity | No |
| | | | | Ext Speaker | No |
| | | | | DC Jack 12V(Center +) | No |
| | | | | VHF/UHF Antenna Input | F Type |
| | | | | AC Outlet | No |
| **G-14** | **Set Size** | | | Approx. W x D x H (mm) | 506.5 x 484 x 464.5 |
| **G-15** | **Weight** | | | Net (Approx.) | 21.0kg ( 46.3 lbs) |
| | | | | Gross (Approx.) | 23.8kg ( 52.5 lbs) |
| **G-16** | **Carton** | | Master Carton | | No |
| | | | | Content | ---- Sets |
| | | | | Material | -- /-- |
| | | | | Dimensions W x D x H(mm) | -- x -- x -- |
| | | | | Description of Origin | No |
| | | | Gift Box | | Yes |
| | | | | Material | Double/Brown |
| | | | | Dimensions W x D x H(mm) | 575 x 575 x 555 |
| | | | | Design | As per Buyer's |
| | | | | Description of Origin | Yes |
| | | | Drop Test | | Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces |
| | | | | Height (cm) | 46 |
| | | | Container Stuffing | | 320 Sets/40' container |
| **G-17** | **Cabinet Material** | | | Cabinet Front | PS 94V0 DECABROM |
| | | | | Cabinet Rear | PS 94V0 |

# DISASSEMBLY INSTRUCTIONS

## 1. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

**REMOVAL**

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 1-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

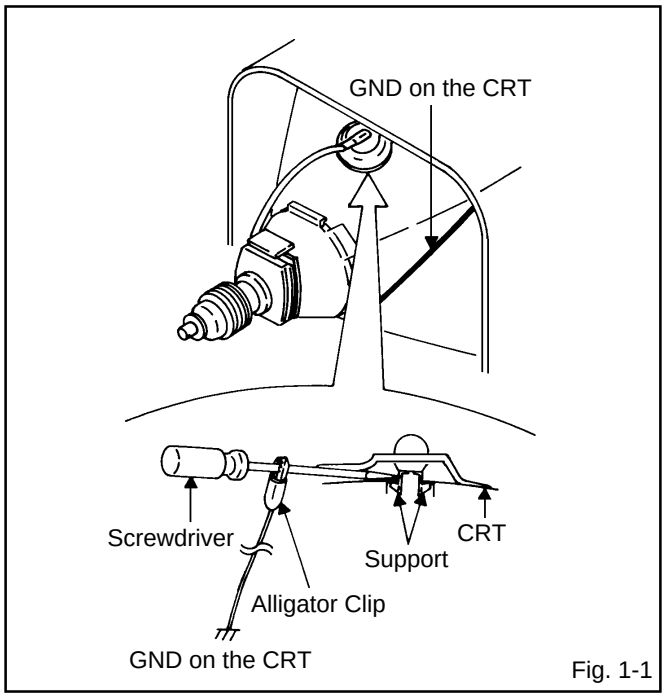


Fig. 1-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 1-2.)**

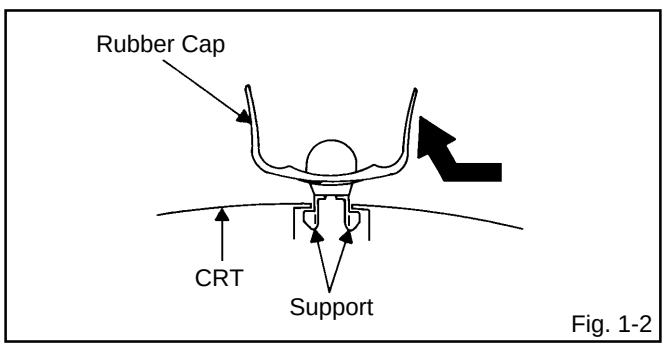


Fig. 1-2

3. After one side is removed, pull in the opposite direction to remove the other.

**NOTE**

Take care not to damage the Rubber Cap.

**INSTALLATION**

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 1-3.)**

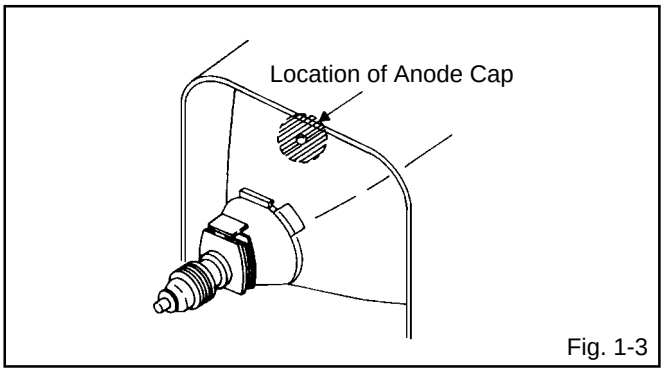


Fig. 1-3

**NOTE**

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 1-4.)**

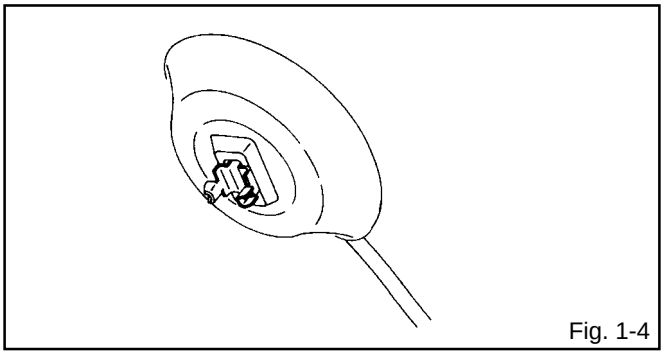


Fig. 1-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 1-5**.

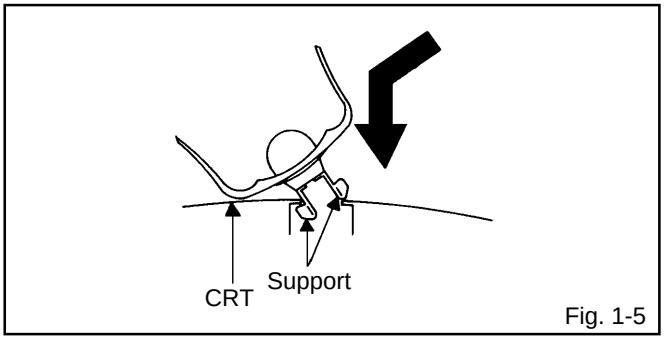


Fig. 1-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

# DISASSEMBLY INSTRUCTIONS

## 2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

**REMOVAL**

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 2-1.)**

   **NOTE**

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

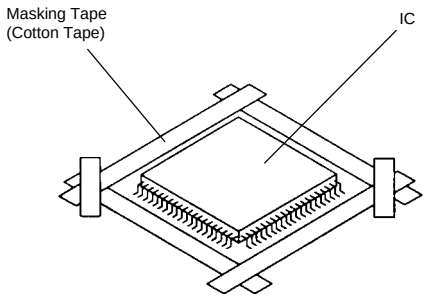



Fig. 2-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 2-2.)**

   **NOTE**

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

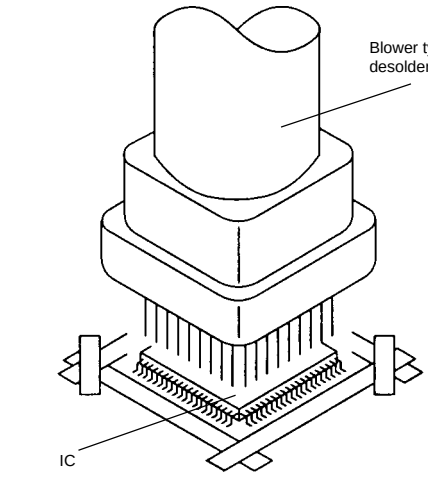



Fig. 2-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 2-3.)**

   **NOTE**

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

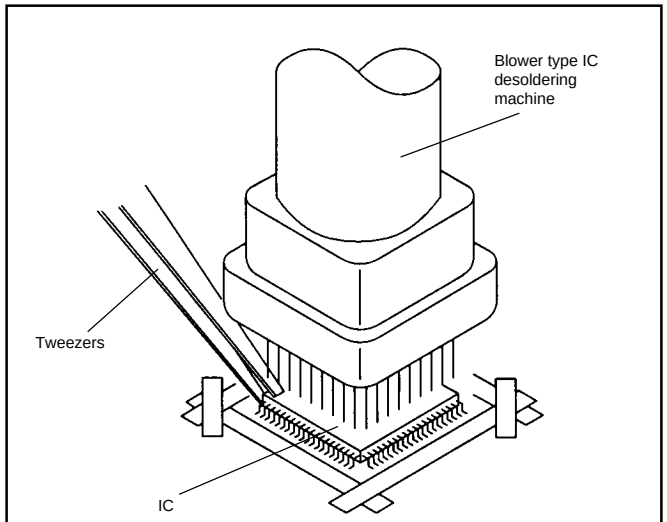



Fig. 2-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 2-4.)**

   **NOTE**

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

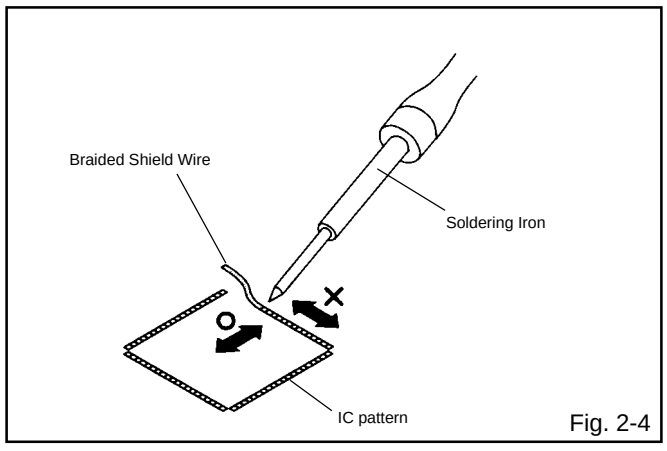



Fig. 2-4

# DISASSEMBLY INSTRUCTIONS

**INSTALLATION**

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 2-5.)**

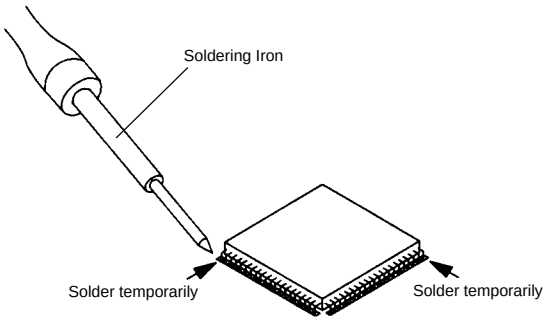



Fig. 2-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 2-6.)**

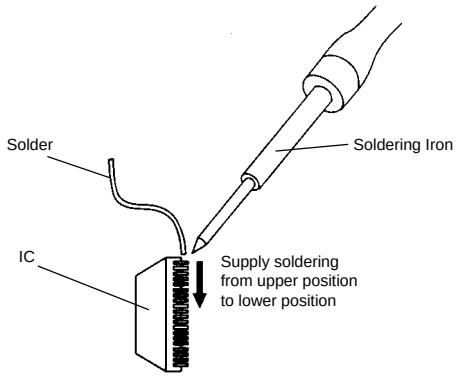



Fig. 2-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 2-7.)**

   **NOTE**

   Do not absorb the solder to excess.

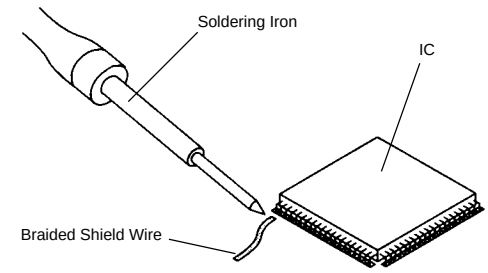



Fig. 2-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 2-8.)**

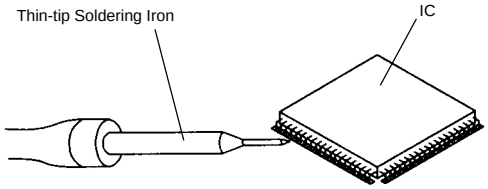



Fig. 2-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

   **NOTE**

   When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

# SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter the Service Mode, press both set key and remote control key for more than 1 second.

| Set Key | Remocon Key | Operations |
|---|---|---|
| VOL. (-) MIN | 0 | Releasing of V-CHIP PASSWORD and LOCK PASSWORD. |
| VOL. (-) MIN | 1 | Initialization of the factory.<br>NOTE: Do not use this for the normal servicing.<br>If you set a factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours. |
| VOL. (-) MIN | 6 | POWER ON total hours is displayed on the screen.<br>Refer to the "CONFIRMATION OF HOURS USED".<br><br>Can be checked of the INITIAL DATA of MEMORY IC.<br>Refer to the "WHEN REPLACING EEPROM (MEMORY) IC". |
| VOL. (-) MIN | 8 | Writing of EEPROM initial data.<br>NOTE: Do not use this for the normal servicing. |
| VOL. (-) MIN | 9 | Display of the Adjustment MENU on the screen.<br>Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment). |

# CONFIRMATION OF HOURS USED

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

**NOTE: If you set a factory initialization, the total hours is reset to "0".**

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second.
3. After the confirmation of using hours, turn off the power.

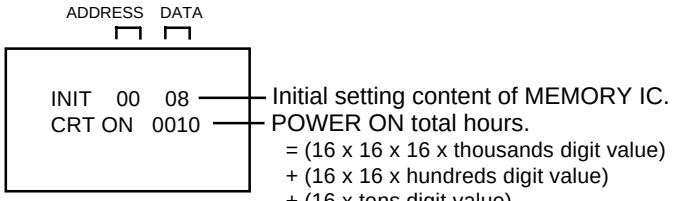



**FIG. 1**

# WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

| INI | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 | +A | +B | +C | +D | +E | +F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 08 | 60 | C9 | 02 | 09 | B3 | 24 | 29 | 09 | 00 | 44 | 20 | 00 | 49 | 4B | 9B |

**Table 1**

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second. ADDRESS and DATA should appear as FIG 1.
3. ADDRESS is now selected and should "blink". Using the SET +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET +/- button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

# ELECTRICAL ADJUSTMENTS

## 1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

**CAUTION**

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

**Prepare the following measurement tools for electrical adjustments.**

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

**On-Screen Display Adjustment**

1. In the condition of NO indication on the screen. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 1 second to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

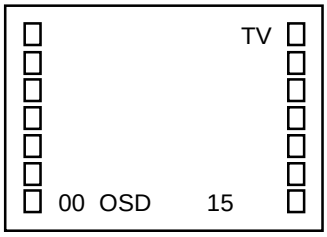



Fig. 1-1

2. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
3. Press the MENU button on the remote control to end the adjustments.

| NO. | FUNCTION | NO. | FUNCTION |
|---|---|---|---|
| 00 | OSD H | 16 | CONTRAST CENT |
| 01 | CUT OFF | 17 | CONTRAST MAX |
| 02 | RF AGC | 18 | CONTRAST MIN |
| 03 | VIF VCO | 19 | COLOR CENT |
| 04 | H.VCO | 20 | COLOR MAX |
| 05 | H.PHASE | 21 | COLOR MIN |
| 06 | V.SIZE | 22 | TINT |
| 07 | V.SHIFT | 23 | SHARPNESS |
| 08 | R.DRIVE | 24 | FM LEVEL |
| 09 | B.DRIVE | 25 | LEVEL |
| 10 | R.BIAS | 26 | SEPARATION 1 |
| 11 | G.BIAS | 27 | SEPARATION 2 |
| 12 | B.BIAS | 28 | TEST MONO |
| 13 | BRIGHT CENT | 29 | TEST STEREO |
| 14 | BRIGHT MAX | 30 | X-RAY TEST |
| 15 | BRIGHT MIN | | |

Fig. 1-2

## 2. BASIC ADJUSTMENTS

### 2-1: CONSTANT VOLTAGE

1. Place the set with Aging Test for more than 15 minutes.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Connect the digital voltmeter to the **TP402**.
5. Adjust the **VR502** until the digital voltmeter is 130 ± 0.05V.

### 2-2: RF AGC

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the VHF HIGH (63dB).
3. Connect the digital voltmeter to the **TP001**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF.AGC".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5 ± 0.05V.

### 2-3: CUT OFF

1. Adjust the unit to the following settings. R.DRIVE=10, B.DRIVE=10, R.BIAS=64, G.BIAS=64, B.BIAS=64, BRI CENT=120, CONT MAX=60.
2. Place the set with Aging Test for more than 15 minutes.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
4. Adjust the **Screen Volume** until a dim raster is obtained.

### 2-4: WHITE BALANCE

**NOTE:** Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(10)** on the remote control to select “R. BIAS”.
5. Press the CH. UP/DOWN button on the remote control to select the “R. BIAS”, “G. BIAS”, “B. BIAS”, “R. DRIVE” or “B. DRIVE”.
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R. BIAS, G. BIAS, B. BIAS, R. DRIVE, and B. DRIVE at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

### 2-5: FOCUS

1. Receive a broadcast.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

# ELECTRICAL ADJUSTMENTS

### 2-6: VIF VCO

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the monoscope pattern.
3. Connect the digital voltmeter between the **pin 5 of CP601** and the **GND**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "V.VCO".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5V.

### 2-7: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H.PHAS".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

### 2-8: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Check if the step No. V. SHIFT is "00".
4. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask.

### 2-9: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V.SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes 10 ± 2%.
5. Receive a broadcast and check if the picture is normal.

### 2-10: VERTICAL LINEARITY

**NOTE:** Adjust after performing adjustments in section 2-9. After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR402** until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

### 2-11: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-1)**

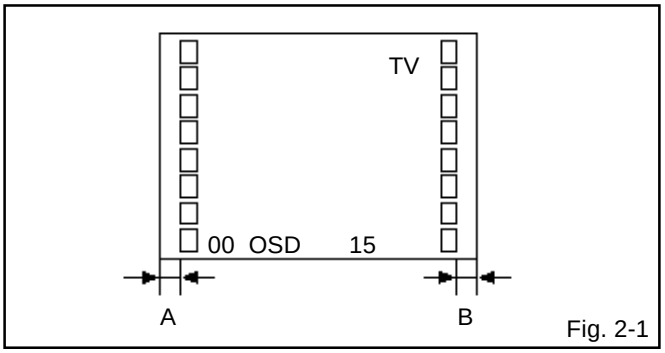


Fig. 2-1

### 2-12: BRIGHT CENT

1. Receive the black pattern*. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRI.CENT".
4. Press the VOL. UP/DOWN button on the remote control until the screen begin to shine.
5. Receive the black pattern*. (Audio Video Input)
6. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

*The Black Pattern means the whole black raster signal. Select the "RASTER" of the pattern generator, set to the OFF position for each R, G and B.

### 2-13: SUB TINT/SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
3. Connect the oscilloscope to **TP024**.
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line. **(Refer to Fig. 2-2)**
5. Press the channel button **(19)** on the remote control to select "COL. CENT".
6. Connect the oscilloscope to **TP022**.
7. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
8. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 120 ± 10% of the white level. **(Refer to Fig. 2-3)**
9. Receive the color bar pattern. (Audio Video Input)
10. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~8.

# ELECTRICAL ADJUSTMENTS

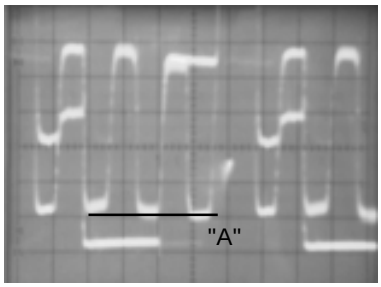



Fig. 2-2

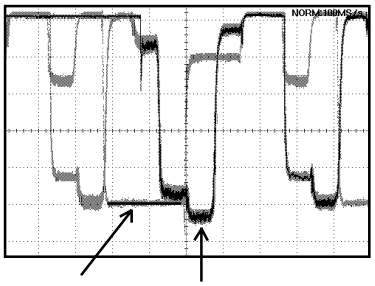



Fig. 2-3

**2-14: SUB CONTRAST**

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "CONT.MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "55".
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote to set to the AV mode. Then perform the above adjustment 1~3.

**2-15: Confirmation of Fixed Value (step No.)**

Please check if the fixed values of the each adjustment items are set correctly referring below.

| NO. | FUNCTION | RF |
|---|---|---|
| 04 | H VCO | 04 |
| 07 | V SHIFT | 00 |
| 14 | BRIGHT MAX | 170 |
| 15 | BRIGHT MIN | 60 |
| 16 | CONT CENT | 30 |
| 18 | CONT MIN | 12 |
| 20 | COLOR MAX | 65 |
| 21 | COLOR MIN | 01 |
| 23 | SHARPNESS | 40 |
| 24 | FM LEVEL | 00 |
| 25 | LEVEL | 00 |
| 26 | SEPARATION 1 | 00 |
| 27 | SEPARATION 2 | 00 |
| 28 | TEST MONO | 00 |
| 29 | TEST STEREO | 00 |

# ELECTRICAL ADJUSTMENTS

## 3. PURITY AND CONVERGENCE ADJUSTMENTS

**NOTE**

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

### 3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

### 3-2: PURITY

**NOTE**

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

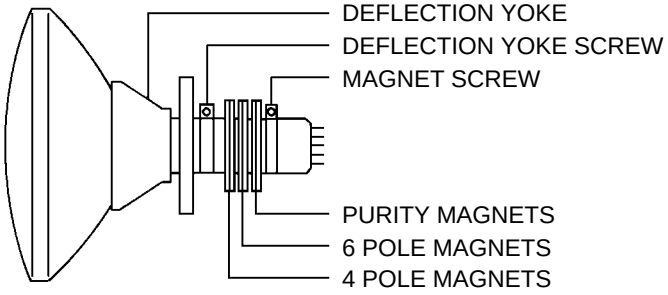



**Fig. 3-1**

### 3-3: STATIC CONVERGENCE

**NOTE**

Adjust after performing adjustments in section 3-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

### 3-4: DYNAMIC CONVERGENCE

**NOTE**

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**

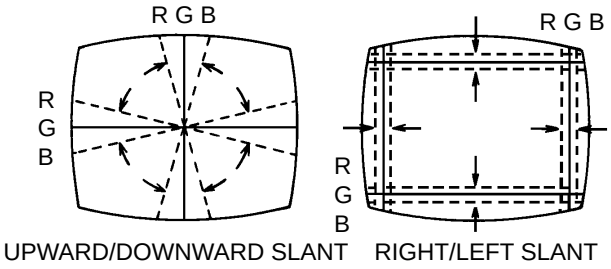
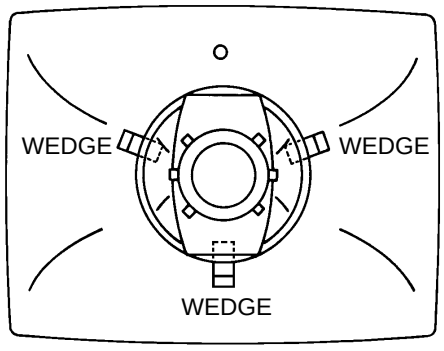



**Fig. 3-2-a**

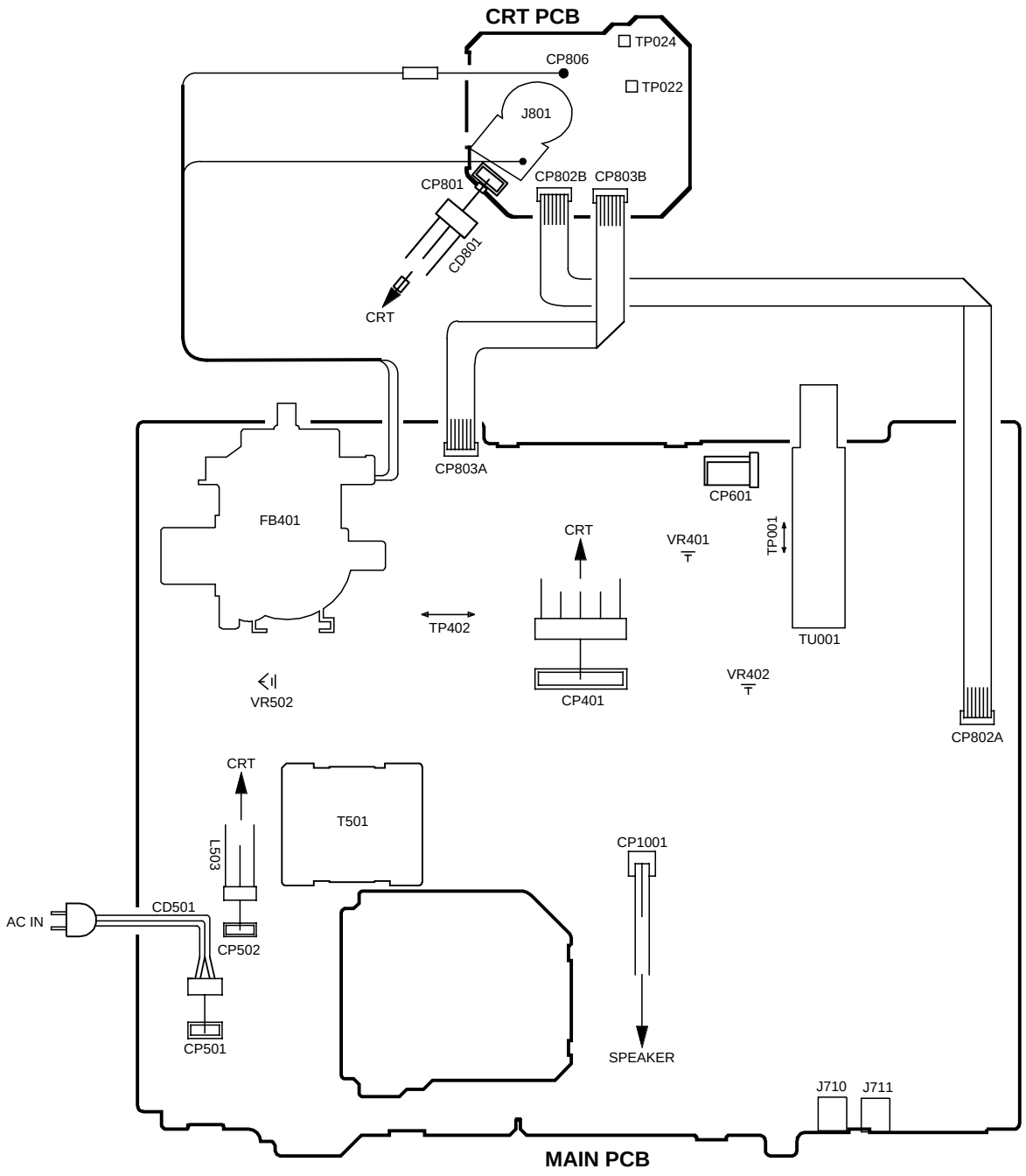



WEDGE POSITION

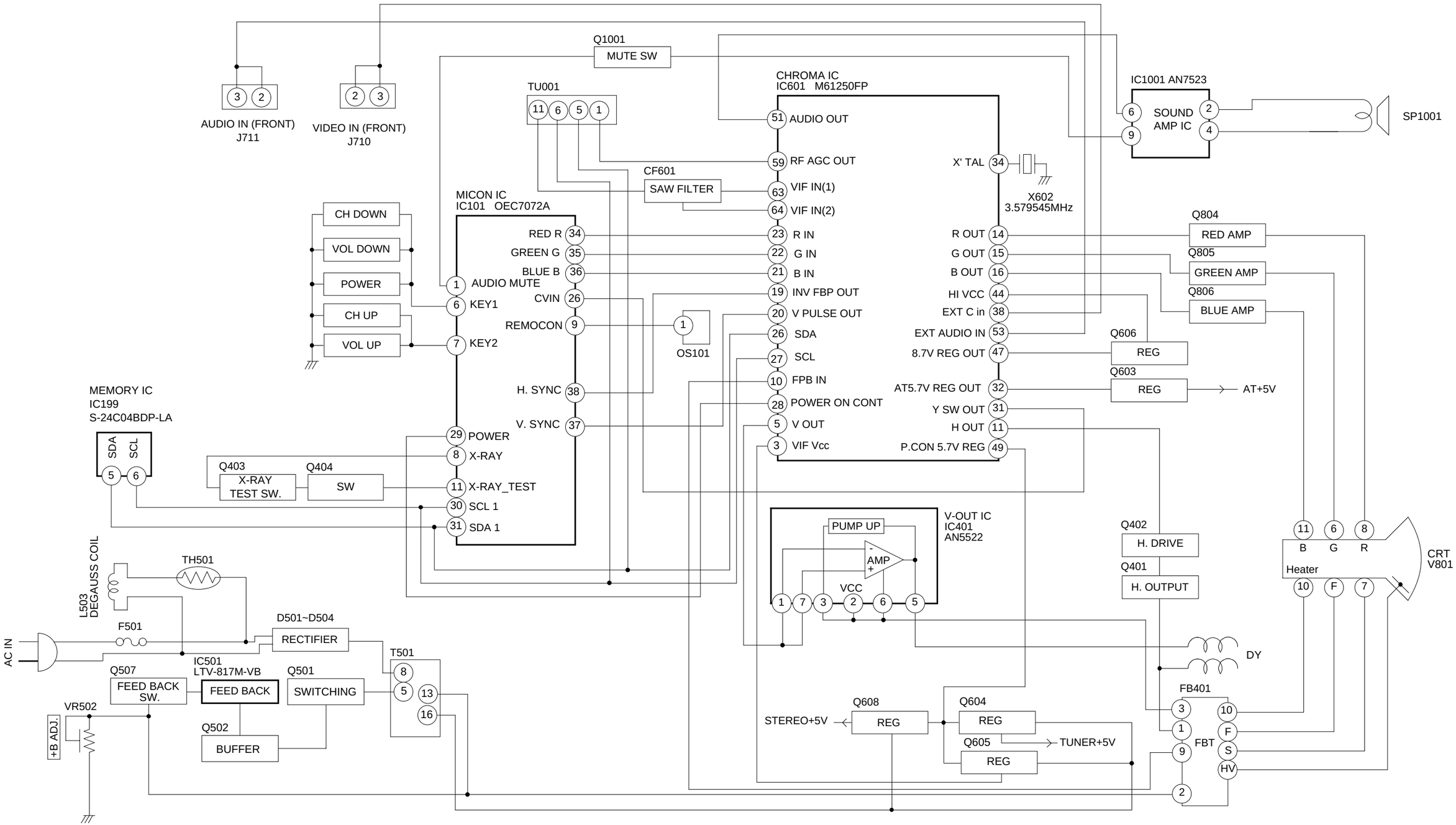
**Fig. 3-2-b**

# ELECTRICAL ADJUSTMENTS

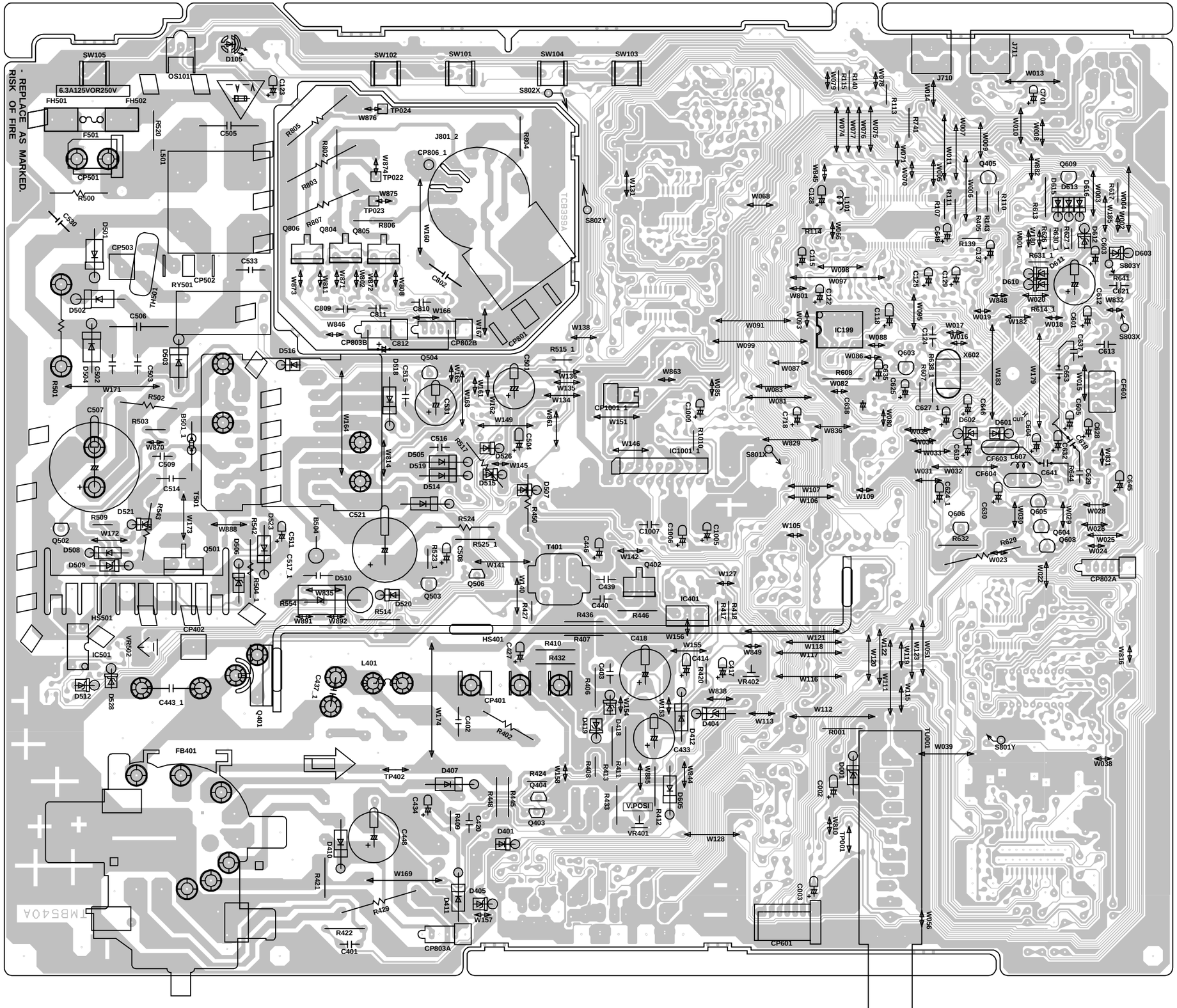
## 4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



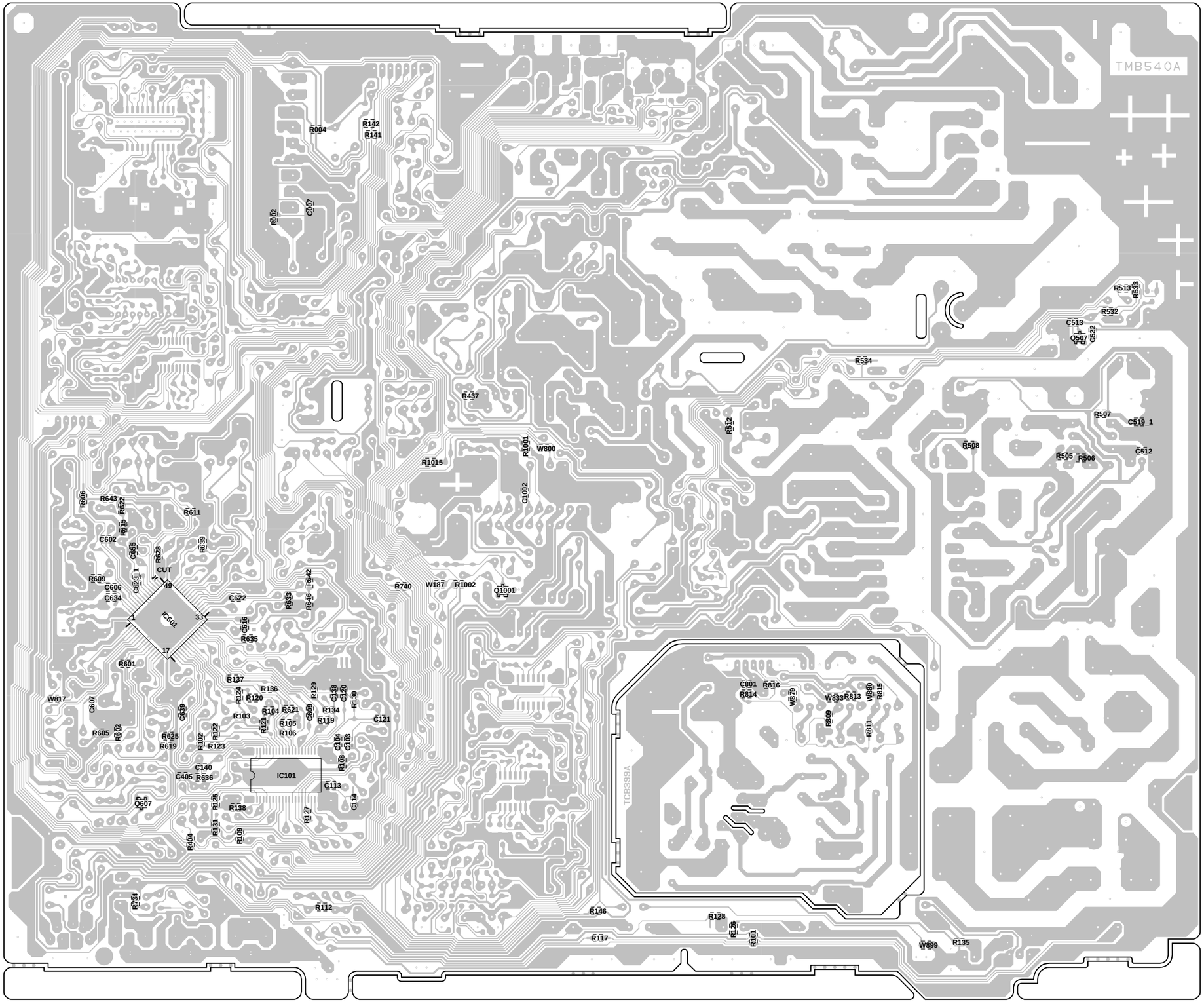
# BLOCK DIAGRAM



# PRINTED CIRCUIT BOARDS
# MAIN/CRT (INSERTED PARTS)
## SOLDER SIDE



# PRINTED CIRCUIT BOARDS
# MAIN/CRT (CHIP MOUNTED PARTS)
## SOLDER SIDE



# MICON/TUNER SCHEMATIC DIAGRAM

## (MAIN PCB)

TU001 ENV56DB6G3

ACCESSORY

TM101 RC-EH020

BT001 R03(AB)E_20_T

BT002 R03(AB)E_20_T

RED LED

POWER ON

D105 SLR-342VCT32

OS101 RPM7138-H5

R135 270

R101 560

R126 2.7K

R128 560

R002 100

C003 50V 4.7 YK

R004 390K

C007 0.022 B

C002 6.3V 470 YK

D001 MTZJ33B

TP001 NC

20/25/27 POWER SW105 SKHVBED010

25/27 VOL DOWN SW104 SKHVBED010

25/27 VOL UP SW103 SKHVBED010

25/27 CH DOWN SW102 SKHVBED010

20 CH DOWN 25/27 CH UP SW101 SKHVBED010

W810

R001 1K 1/2W

R110 1K 1/4W

R140 10 1/4W

R107 47K 1/4W

R142 270

R141 270

R111 47K 1/4W

R143 10K 1/4W

C123 50V 10 YK

TO SOUND

AUDIO_MUTE

GND

X-RAY

X-RAY_TEST

FROM/TO DEFLECTION/CRT

R125 2.2K

R138 2.2K

R112 2.2K

R113 2.2K 1/4W

R109 47K

R117 560

R115 47K 1/4W

R131 100

R146 10K

R114 10K 1/4W

W899 S802X

MICON IC IC101 OEC7072A

| | | | | | |
|---|---|---|---|---|---|
| 1 | AUDIO MUTE | 5.02 | H_CTL | 42 | 0.03 |
| 2 | EXT_MUTE | 0.04 | PROTECT | 41 | 0.010 |
| 3 | STANDBY_H | 0.04 | I2C_OFF | 40 | 5.00 |
| 4 | VOLUME | 0.04 | SYNC | 39 | 0.78 |
| 5 | AFT | 2.2 | H.SYNC | 38 | 4.17 |
| 6 | KEY1 | 5.02 | V.SYNC | 37 | 4.89 |
| 7 | KEY2 | 5.02 | BLUE B | 36 | 0 |
| 8 | X-RAY | 0 | GREEN G | 35 | 0 |
| 9 | REMOCON | 5 | RED R | 34 | 0 |
| 10 | TRAP_OFF(ON_TIMER) | 5.06 | BLANK | 33 | 0 |
| 11 | X-RAY_TEST | 0 | CLOCK CONT | 32 | 5.02 |
| 12 | AV2 | 0 | SDA1 | 31 | 4.92 |
| 13 | AV1 | 0 | SCL1 | 30 | 0.66 |
| 14 | DEGAUSS_H | 0 | POWER | 29 | 5.02 |
| 15 | P.FAIL | 5.01 | FSC IN | 28 | 5.02 |
| 16 | OSC2 | 0 | RESET | 27 | 0.069 |
| 17 | OSC1 | 0 | CVIN | 26 | 0 |
| 18 | CNVSS | 0 | V.HOLD | 25 | 0.15 |
| 19 | Xin | 2.24 | HLF | 24 | 0.18 |
| 20 | Xout | 2.3 | FILT | 23 | 0.928 |
| 21 | VSS | 0.08 | VCC | 22 | 5.03 |

C113 15P CH

C114 15P CH

R127 2.7K

L101 2.2uH

W845

C140 0.001 CH

R139 100 1/4W

R134 470

C124 0.1 B

C138 560P CH

R129 1M

C120 0.001 B

C121 220P CH

C115 50V 0.47 KA

R119 1K

R130 1K

C122 50V 1 KA

C103 470P CH

R108 1K

C104 0.01 B

C128 6.3V 100 YK

W801

C118 6.3V 470 YK

R123 4.7K

R122 4.7K

R121 4.7K

R120 4.7K

R136 100

R137 100

R106 4.7K

R105 4.7K

C137 50V 0.1 KA

C129 50V 0.1 KA

C125 50V 0.1 KA

R102 4.7K

R103 680

R104 680

R124 4.7K

MEMORY IC IC108 S-24C04BDP-LA

| | | | |
|---|---|---|---|
| 5 | SDA | 4.8 | |
| 6 | SCL | 4.8 | |
| 7 | MOD | 0 | |
| 8 | VCC | 4.9 | |
| 4 | VSS | 0 | |
| 3 | E2 | 0 | |
| 2 | E1 | 0 | |
| 1 | E0 | 0 | |

FROM/TO POWER

- AT+40V
- POWER_FAIL
- GND

DEGAUSS_H

FROM/TO CHROMA

- STEREO+5V
- AGC
- GND
- IF
- TUNER+5V

- PROTECT
- AFT
- SYNC
- HD
- VD
- I2C_OFF
- OSD_B
- OSD_G
- OSD_R
- OSD_BLK
- SDA
- SCL
- CLOCK_CONT
- POWER
- FSC
- RESET
- AT+5V
- Y_VIDEO

FROM/TO DEFLECTION/CRT

- AT+5V
- H_CTL
- GND

PCB010 TMB540

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

- R.SIGNAL
- G.SIGNAL
- B.SIGNAL
- DEFLECTION SIGNAL
- TUNER VIDEO SIGNAL

# CHROMA SCHEMATIC DIAGRAM

## (MAIN PCB)

FROM POWER

TO SOUND

FORM AV

FROM/TO MICON/TUNER

TO AV

FROM/TO DEFLECTION/CRT

TEST POINT

CP601
173979-7

| | |
|---|---|
| NC | 7 |
| NC | 6 |
| INT.MONI | 5 |
| IIC_OFF | 4 |
| SDA | 3 |
| SCL | 2 |
| GND | 1 |

PCB010
TMB540

CHROMA IC
IC601
M61250FP

CF603
SFSRA4M50CF00-A0

CF604
TPSRA4M50C00-A0

SAW FILTER
CF601
TSF5229P3

SWITCHING
Q607
KRA102SRTK

SWITCHING
Q609
KTC3198

REG
Q603
KTC3203_Y

REG
Q604
KTC3203_Y

REG
Q605
KTC3203_Y

REG
Q606
KTC3203_Y

REG
Q608
KTC3203_Y

47 8.7V REG OUT
48 LIMITER IN
49 P.Con5.7V REG

34 X'TAL
33 ACL/ABCL
32 AT5.7V REG OUT

64 VIF IN (2)
1 V RAMP CAP
2 AFT OUT

17 H VCO F/B
16 B OUT

CAUTION: DIGITAL TRANSISTOR

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

◀ R.SIGNAL
◀ G.SIGNAL
≪ B.SIGNAL
◀ DEFLECTION SIGNAL
◁◁ TUNER VIDEO SIGNAL

# DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)

FROM/TO CHROMA
CLAMP
G.OUT
R.OUT
B.OUT
V_FEEDBACK
V_OUT
ABCL
H_SYNC
H_OUT
GND

V-OUT IC IC401 AN5522
THERMAL PROTECTION
PUMP UP
AMP
VCC GND
3.9 26.1 2.2 0 13 26 3.9
R437 1.2K
D412 1T1E
C414 35V 100 YK

CP802A B2013H02-5P
CLAMP GND G.OUT R.OUT B.OUT
CP803A B2013H02-4P
HEATER GND 180V
NC

CP802B B2013H02-5P
CLAMP GND G.OUT R.OUT B.OUT
CP803B B2013H02-4P
HEATER GND NC 180V

CD801 SM1098-009-1A
CP801 A2361WV2-2P
V801 A51LMV10X20N45

C812 250V 2.2 YK
W871

R809 3.9K W872
R814 3.9K W873
R811 3.9K

W802 W833 R813 330
C811 560P CH
W808 W879 R816 330
C810 470P CH
W811 W880 R815 330
C809 560P CH

5.92 130.6 6.34
5.95 130.6 6.34
5.95 130.6 6.34

RED AMP Q804 KTC4217
GREEN AMP Q805 KTC4217
BLUE AMP Q806 KTC4217

TP022 TP023 TP024
W846
W874 R803 12K 2W R802 2.7K 1/4W
W875 R807 12K 2W R806 2.7K 1/4W
W876 R805 12K 2W R804 2.7K 1/4W

R418 39K+-1%
R420 15K +-1%
R432 680 1/2W
R410 680 1/2W
R411 1K 1/2W
D418 MTZJ30B
C418 25V 2200 YK
R406 1 1/2W
C427 50V 10 YK
W885 R412 470 1/2W
R417 22K +-1%
V.LIN
W849 VR402 47K METAL
C417 50V YK
R407 2.2 1/2W
R436 2.2 1/2W
C403 100V 0.22 MKT
R413 1.8K 1/2W
V.PROS W881 VR403 1K METAL
R433 470 1/2W
D419 MTZJ30B

HS401 763WAA0232
D404 MTZJ5.1B
R408 4.7K +-1%
SWITCHING Q404 KRC102MAT
X-RAY TEST SW. Q403 KRA104MAT
C434 50V 22 YK
R424 18K +-1%
R409 15K +-1%
R429 1.8 2W
D411 1N4937

FROM/TO MICON/TUNER
X-RAY
X-RAY_TEST
GND
H_CTL
AT+5V

C439 500V 22P SL
C440 500V 0.0022 B
H.DRIVE Q402 KTC4217
R404 220
R446 4.7K 1/2W
T401 ETH14Y46AY
L401 ELH5L4113
R402 1K 1W
C437_1 250V 0.47 PMS
C402 2KV 0.001 R
H.OUTPUT Q401 2SD2499(LBOEC1)
C443_1 1.5KV 0.0075 MPP
CP402 003P-2100
R427 100 1/4W
C446 50V 1 YK
C405 0.1 F
R405 10K 1/4W
H-CTL SW Q405 KTC3198
D401 1SS133
D405 MTZJ6.2B
C401 500V 390P B
R422 6.8K 1/2W
+B TP402
D407 1N4937
FB401 FQI-20B001R
289 COL
118.1 E180
115.0 B+
46.1 AFC
7.34 HEATER
0 GND
40.1 NC E12
63.9 E27
0 GND
22.8 NC E8
HV F S GND ABL 3.65
D410 1N4937
C448 250V 22 YK
R448 1.5M 1/4W
R445 180K 1/2W
W838 W844 R450 820 1W
C433 35V 470 YK
CP401 A1561WV2-A5P
C420 100V 0.1 MKT
R421 68K 1/4W

FROM/TO SOUND
GND

FROM POWER
+B
GND
H_DV_+B

FOCUS
SCREEN
CP806_1
C802 2KV 0.001 B
C801 330P CH
J801_2 CVT3275-5101

PCB110 TCB399
PCB010 TMB540

NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

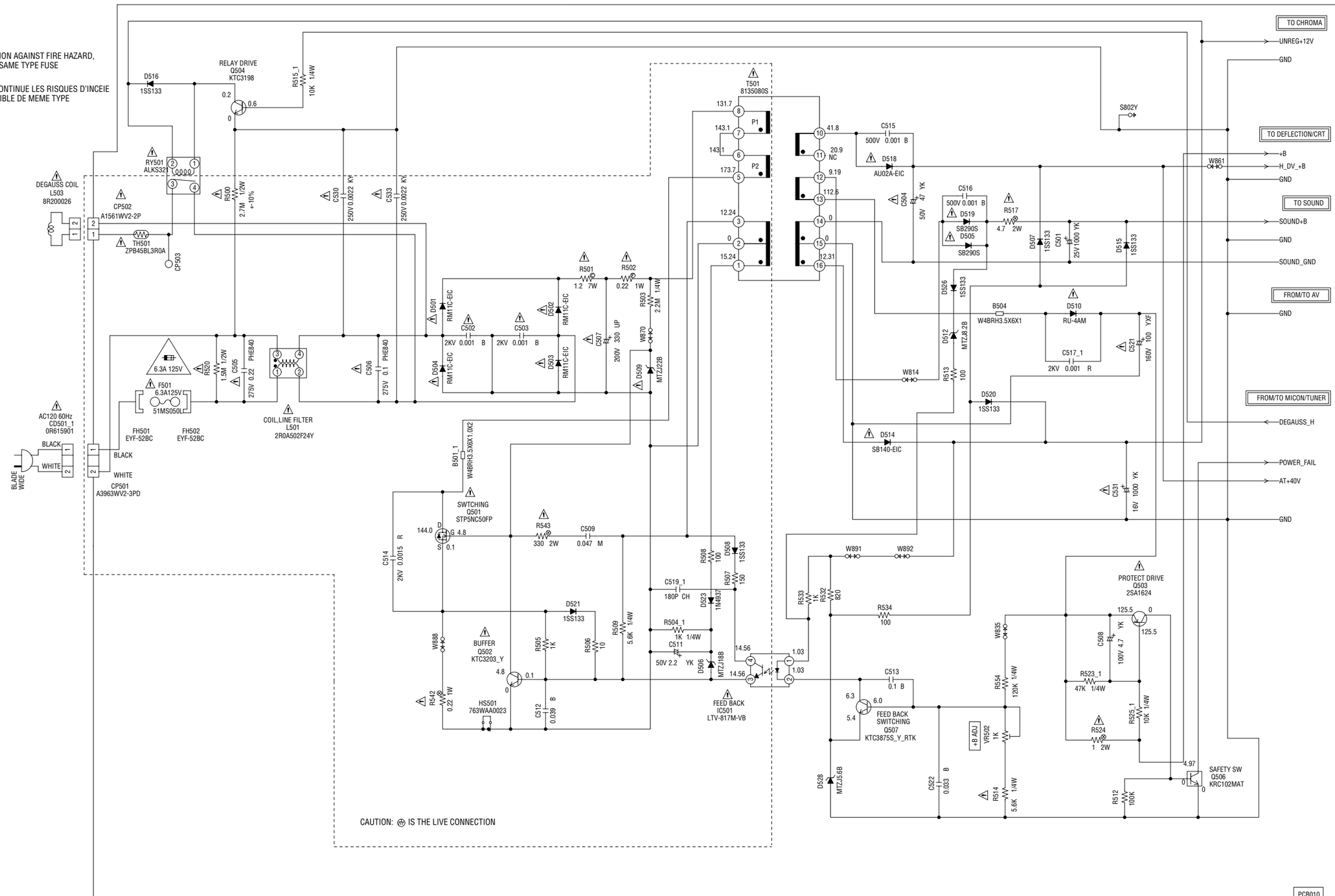
R.SIGNAL
G.SIGNAL
B.SIGNAL
DEFLECTION SIGNAL

# POWER SCHEMATIC DIAGRAM
## (MAIN PCB)

6.3A 125V

CAUTION:FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE 6.3A 125V(F501).

ATTENTION:POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTOLISER QUE DES FUSIBLE DE MEME TYPE 6.3A 125V(F501).




CAUTION: ⏚ IS THE LIVE CONNECTION

CAUTION: DIGITAL TRANSISTOR

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

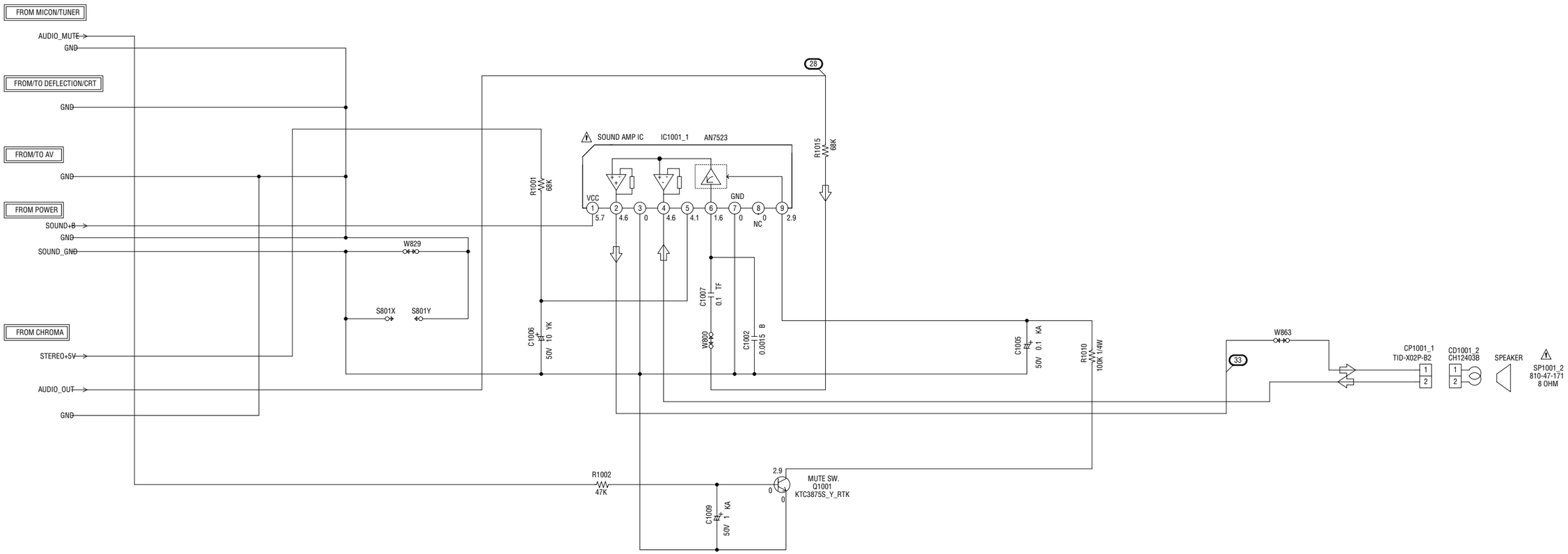
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

# SOUND SCHEMATIC DIAGRAM
(MAIN PCB)




NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

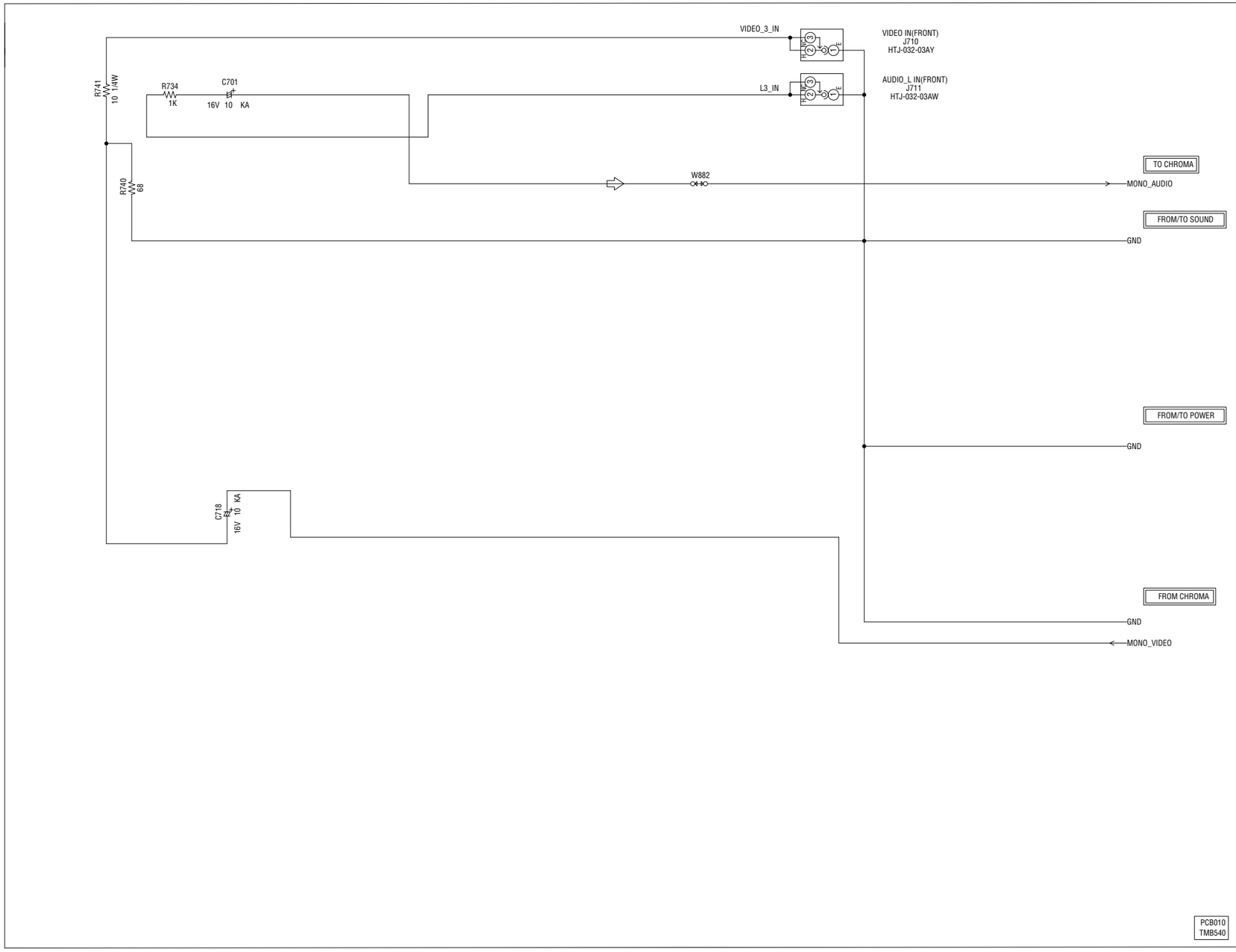
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

⇦ AUDIO SIGNAL

# AV SCHEMATIC DIAGRAM
(MAIN PCB)



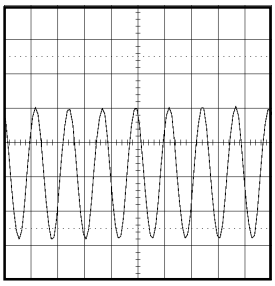

NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE:THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

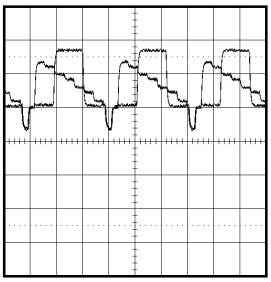
⇦ AUDIO SIGNAL

# WAVEFORMS

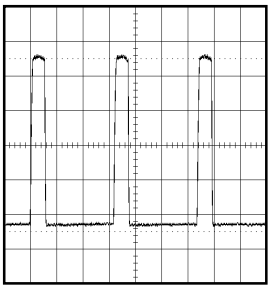
## MICON/TUNER



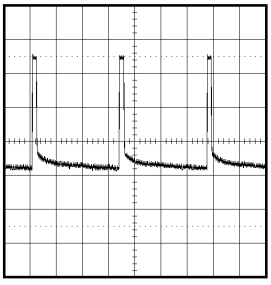
① 1V 0.1µs/div



② 0.5V 20µs/div

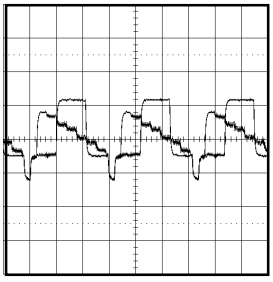


③ 200mV 20µs/div

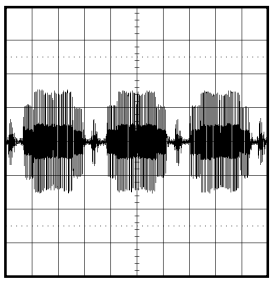


④ 200mV 5ms/div

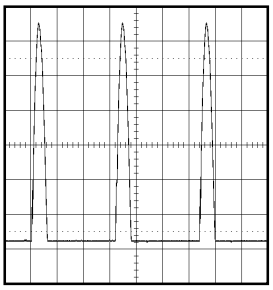
## CHROMA



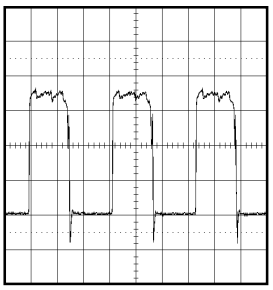
⑥ 0.5V 20µs/div



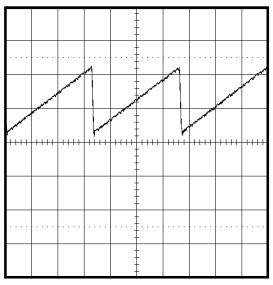
⑦ 200mV 20µs/div



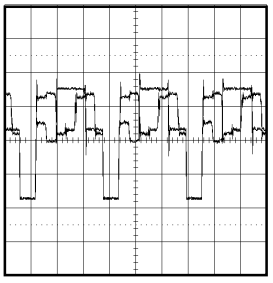
⑧ 20V 20µs/div



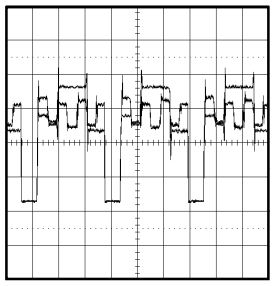
⑨ 200mV 20µs/div



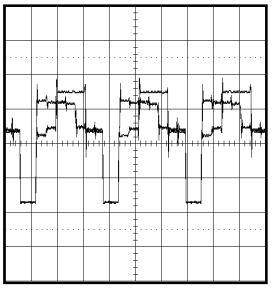
⑩ 0.5V 5ms/div



⑪ 1V 20µs/div

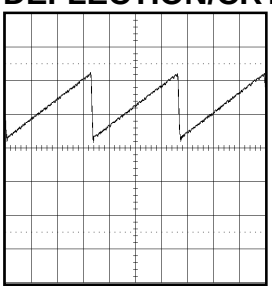


⑫ 1V 20µs/div

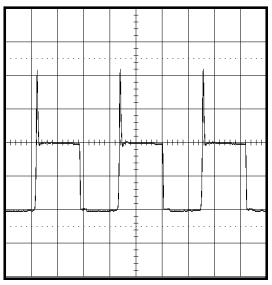


⑬ 1V 20µs/div

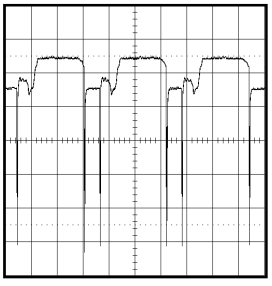
## DEFLECTION/CRT



⑭ 0.5V 5ms/div



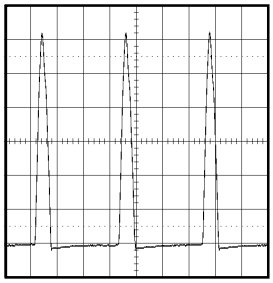
⑮ 20V 20µs/div



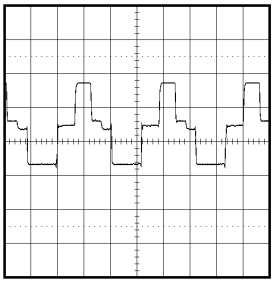
⑯ 2V 20µs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

# WAVEFORMS

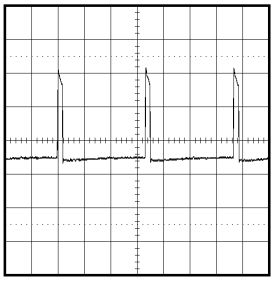


(17) 200V 20µs/div

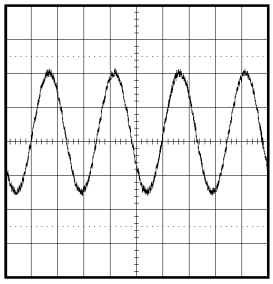


(22) 50V 20µs/div

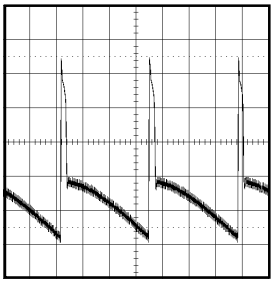
**SOUND**



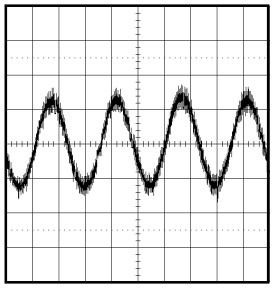
(18) 10V 5ms/div



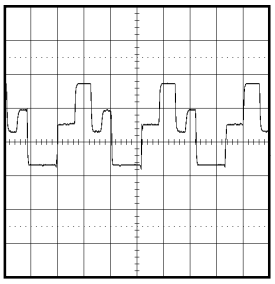
(28) 200mV 1ms/div



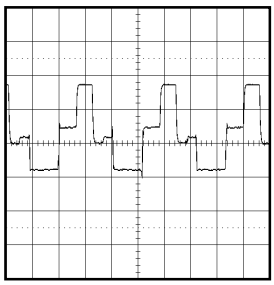
(19) 10V 5ms/div



(33) 0.5V 1ms/div



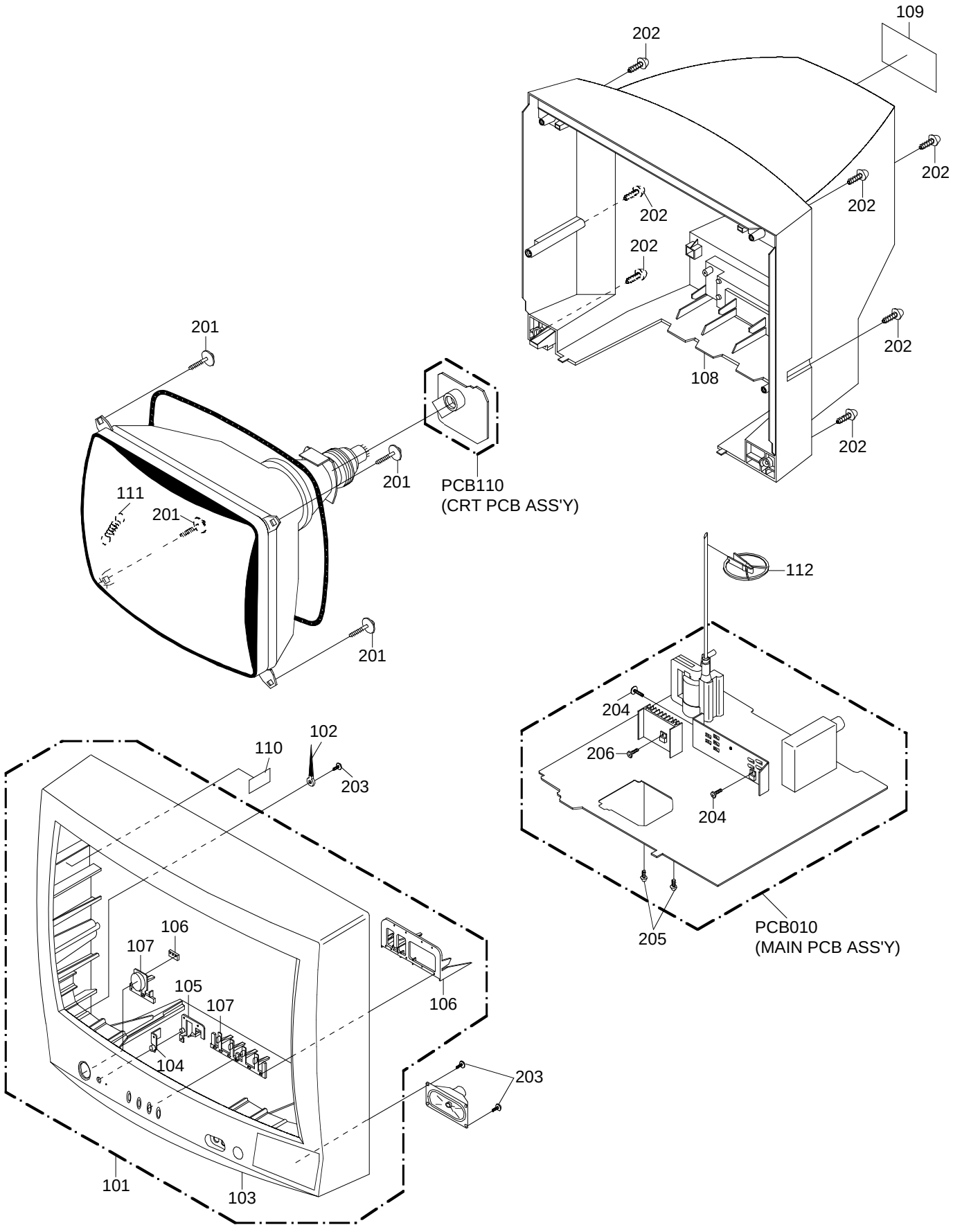
(20) 50V 20µs/div



(21) 50V 20µs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

# MECHANICAL EXPLODED VIEW



# MECHANICAL REPLACEMENT PARTS LIST

| Location No. | TSB P/N | Reference No. | Description | |
|---|---|---|---|---|
| 101 | AD301496 | A3L706X720 | CABINET,FRONT ASSY | |
| 102 | BZ710039 | 8995034000 | CORD CLIP UL CO. | |
| 103 | AD301497 | 701WPJB758 | CABINET,FRONT | |
| 104 | AD301498 | 711WPA0173 | PLATE,FRONT | |
| 105 | AD301499 | 713WPA0214 | GUIDE,REMOCON | |
| 106 | AD301500 | 735WPA0670 | BUTTON,BASE | |
| 107 | AD301501 | 735WPBA435 | BUTTON,FRAME | |
| 108 | AD301502 | 702WPAA279 | CABINET,BACK | |
| 109 | AD301503 | 722549A096 | SHEET,RATING | |
| 110 | AD300007 | 7230006755 | SHEET,CAUTION | |
| 111 | BZ710258 | 741WUA0001 | SPRING,EARTH | |
| 112 | BZ710260 | 899HV3T000 | HOLDER,ANODE WIRE | |
| 201 | BZ710275 | 8121J50B54 | SCREW,TAPPING(B0) GW20 | 5x28 |
| 202 | BZ710035 | 8117540A64 | SCREW,TAPPING(B0) TRUSS | 4x16 |
| 203 | BZ710031 | 8110630A04 | SCREW,TAP TITE(P) BRAZIER | 3x10 |
| 204 | BZ710239 | 8109I30A04 | SCREW,TAP TITE(B) WH7 | 3x10 |
| 205 | BZ710019 | 8109630802 | SCREW,TAP TITE(B) BRAZIER | 3x8 |
| 206 | BZ710018 | 8107630804 | SCREW,TAP TITE(S) BRAZIER | 3x8 |
| --- | AD301504 | 792WHA0379 | PACKAGE,TOP | |
| --- | AD301505 | 792WHA0380 | PACKAGE,BOTTOM | |
| --- | AD301506 | 793WCDB315 | GIFT BOX | |
| --- | AD301507 | A3L706X975 | INSTRUCTION BOOK KIT | |
| --- | AD300022 | J3I70417 | REGISTRATION CARD | |
| --- | AD300023 | J3I70436 | ESP CARD | |
| --- | AD301343 | J3L11416 | IMPORTANT SAFETY INSTRUCTION | |
| --- | AD301508 | J3L70601 | INSTRUCTION BOOK | |
| --- | AD300812 | JB5UD400 | POLYBAG,INSTRUCTION(RED CAUTION) | |

# ELECTRICAL REPLACEMENT PARTS LIST

| Location No. | TSB P/N | Reference No. | | Description | |
|---|---|---|---|---|---|
| | | **RESISTORS** | | | |
| R402 | AD300043 | R3X181102J | R,METAL OXIDE | 1K OHM 1W | |
| ⚠R408 | AD301014 | R4X5T6472F | R,METAL | 4.7K OHM 1/6W | |
| ⚠R409 | AD300037 | R4X5T6153F | R,METAL | 15K OHM 1/6W | |
| ⚠R424 | BZ210105 | R4X5T6183F | R,METAL | 18K OHM 1/6W | |
| ⚠R429 | BZ210046 | R6558A1R8J | R,FUSE | 1.8 OHM 2W | |
| ⚠R450 | AD301429 | R3X181821J | R,METAL OXIDE | 820 OHM 1W | |
| ⚠R500 | BZ210080 | R0G3K2275K | RC | 2.7M OHM 1/2W | |
| ⚠R501 | AD300720 | R5X2AE1R2J | R,CEMENT | 1.2 OHM 7W | |
| R502 | BZ210190 | R63581R22J | R,FUSE | 0.22 OHM 1W | |
| ⚠R503 | AD301430 | R002T4225J | RC | 2.2M OHM 1/4W | |
| ⚠R506 | AD301431 | R903N8100J | RC | 10 OHM 1/8W | |
| ⚠R514 | BZ210166 | R002T4562J | RC | 5.6K OHM 1/4W | |
| ⚠R515 | BZ210182 | R002T4103J | RC | 10K OHM 1/4W | |
| ⚠R517 | AD300885 | R3K28A4R7J | R,METAL | 4.7 OHM 2W | |
| ⚠R520 | BZ210206 | R002T2155J | RC | 1.5M OHM 1/2W | |
| ⚠R524 | BZ210083 | R3X28A010J | R,METAL OXIDE | 1 OHM 2W | |
| ⚠R542 | BZ210063 | R3X181R22J | R,METAL OXIDE | 0.22 OHM 1W | |
| ⚠R543 | AD301016 | R3X28A331J | R,METAL OXIDE | 330 OHM 2W | |
| R629 | AD301433 | R3X18A120J | R,METAL OXIDE | 12 OHM 2W | |
| ⚠R803 | BZ210050 | R3X18A123J | R,METAL OXIDE | 12K OHM 2W | |
| ⚠R805 | BZ210050 | R3X18A123J | R,METAL OXIDE | 12K OHM 2W | |
| ⚠R807 | BZ210050 | R3X18A123J | R,METAL OXIDE | 12K OHM 2W | |
| | | **CAPACITORS** | | | |
| C402 | BZ110182 | C03L0R713K | CC | 0.001 UF 2KV R | |
| ⚠C414 | AD301434 | E02LU4101M | CE | 100 UF 35V | |
| C418 | BZ210176 | E02LF3222M | CE | 2200 UF 25V | |
| ⚠C433 | BZ110149 | E02LT4471M | CE | 470 UF 35V | |
| ⚠C437 | BZ210173 | P4J7F3474J | CMPP | 0.47 UF 250V PMS | |
| C443 | AD301435 | P4N8FK752H | CMPP | 0.0075UF 1.5KV | |
| ⚠C448 | BZ110204 | E0ELFD220M | CE | 22 UF 250V | |
| ⚠C501 | BZ110078 | E02L03102M | CE | 1000 UF 25V | |
| ⚠C502 | AD301438 | C0PWB0713K | CC | 0.001 UF 2KV B | |
| ⚠C503 | AD301438 | C0PWB0713K | CC | 0.001 UF 2KV B | |
| ⚠C504 | BZ110197 | E02LU5470M | CE | 47 UF 50V | |
| ⚠C505 | BZ110138 | P2472B224M | CMP | 0.22UF 275V PHE840 | |
| ⚠C506 | BZ110145 | P2472B104M | CMP | 0.1 UF 275V PHE840 | |
| ⚠C507 | AD300607 | E51CGC331M | CE | 330 UF 200V | |
| C514 | BZ110191 | C03L0R7E3K | CC | 0.0015UF 2KV R | |
| C517 | BZ110182 | C03L0R713K | CC | 0.001 UF 2KV R | |
| ⚠C521 | AD300060 | E62NFB101M | CE | 100 UF 160V | |
| ⚠C530 | AD301352 | CC3LE0MH3M | CC | 0.0022UF 250V | |
| ⚠C531 | AD300925 | E02LT2102M | CE | 1000 UF 16V | |
| ⚠C533 | AD301352 | CC3LE0MH3M | CC | 0.0022UF 250V | |
| C618 | AD301321 | CQG0CH412J | CC | 100 PF 50V CH | or |
| | BZ110166 | CQGTCH412J | CC | 100 PF 50V CH | |
| C641 | AD301321 | CQG0CH412J | CC | 100 PF 50V CH | or |
| | BZ110166 | CQGTCH412J | CC | 100 PF 50V CH | |
| C653 | BZ110254 | CQG0B0415K | CC | 0.1 UF 50V B | or |
| | BZ110255 | CQGTB0415K | CC | 0.1 UF 50V B | |
| C802 | AD300078 | C0JBB0713K | CC | 0.001 UF 2KV B | |
| C812 | AD301439 | E0EL0D2R2M | CE | 2.2 UF 250V | or |
| | AD301440 | E0ELTD2R2M | CE | 2.2 UF 250V | |
| | | **DIODES** | | | |
| D001 | BZ410037 | D97U03301B | DIODE,ZENER | MTZJ33B T-77 | |
| D105 | BZ410054 | 0021721150 | LED | SLR-342VCT32 | |
| D401 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D404 | BZ410020 | D97U05R11B | DIODE,ZENER | MTZJ5.1B T-77 | |
| ⚠D405 | BZ410066 | D97U06R21B | DIODE,ZENER | MTZJ6.2B T-77 | |
| ⚠D407 | AD300731 | D2WXN49370 | DIODE,SILICON | 1N4937 | |
| ⚠D410 | AD300731 | D2WXN49370 | DIODE,SILICON | 1N4937 | |
| ⚠D411 | AD300731 | D2WXN49370 | DIODE,SILICON | 1N4937 | |
| D412 | BZ410043 | D2WT011E10 | DIODE,SILICON | 11E1-EIC | |
| D418 | BZ410019 | D97U03001B | DIODE,ZENER | MTZJ30B T-77 | |
| D419 | BZ410019 | D97U03001B | DIODE,ZENER | MTZJ30B T-77 | |
| ⚠D501 | BZ410062 | D2WTRM11C0 | DIODE,SILICON | RM11C-EIC | |
| ⚠D502 | BZ410062 | D2WTRM11C0 | DIODE,SILICON | RM11C-EIC | |
| ⚠D503 | BZ410062 | D2WTRM11C0 | DIODE,SILICON | RM11C-EIC | |
| ⚠D504 | BZ410062 | D2WTRM11C0 | DIODE,SILICON | RM11C-EIC | |
| D505 | BZ410076 | D2WXB290S0 | DIODE,SILICON | SB290S | |
| ⚠D506 | AD300671 | D97U01801B | DIODE,ZENER | MTZJ18B T-77 | |
| D507 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D508 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| ⚠D509 | BZ410113 | D97U02201B | DIODE,ZENER | MTZJ22B T-77 | |
| ⚠D510 | AD300073 | D2BFRU4AM0 | DIODE,SILICON | RU-4AM | |
| D512 | BZ410058 | D97U08R21B | DIODE,ZENER | MTZJ8.2B T-77 | |
| ⚠D514 | BZ410077 | D2WXSB1400 | DIODE,SCHOTTKY | SB140-EIC | |

# ELECTRICAL REPLACEMENT PARTS LIST

| Location No. | USA-TOSHIBA | Reference No. | Description | | |
|---|---|---|---|---|---|
| | | **DIODES** | | | |
| D515 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D516 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| ⚠D518 | BZ410063 | D2WTAU02A0 | DIODE,SILICON | AU02A-EIC | |
| D519 | BZ410076 | D2WXB290S0 | DIODE,SILICON | SB290S | |
| D520 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D521 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D523 | AD300731 | D2WXN49370 | DIODE,SILICON | 1N4937 | |
| D526 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D528 | BZ410021 | D97U05R61B | DIODE,ZENER | MTZJ5.6B T-77 | |
| D601 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D602 | BZ410058 | D97U08R21B | DIODE,ZENER | MTZJ8.2B T-77 | |
| D603 | BZ410022 | D97U06R81B | DIODE,ZENER | MTZJ6.8B T-77 | |
| D605 | BZ410043 | D2WT011E10 | DIODE,SILICON | 11E1-EIC | |
| D610 | AD300070 | D97U01201B | DIODE,ZENER | MTZJ12B T-77 | |
| D611 | AD300070 | D97U01201B | DIODE,ZENER | MTZJ12B T-77 | |
| D612 | AD300070 | D97U01201B | DIODE,ZENER | MTZJ12B T-77 | |
| D613 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D615 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| D616 | BZ410006 | D1VT001330 | DIODE,SILICON | 1SS133T-77 | |
| | | **ICS** | | | |
| IC101 | AD301322 | I56F07072A | IC | OEC7072A | |
| IC199 | AD301490 | A3L706X015 | IC | S-24C04BDP-LA | |
| ⚠IC401 | BZ611053 | I01TD55220 | IC | AN5522 | |
| ⚠IC501 | BZ410088 | 0002E00610 | PHOTO COUPLER | LTV-817M-VB | |
| IC601 | AD301324 | I06FC61250 | IC | M61250FP | |
| IC1001 | BZ611013 | I0FSP75230 | IC | AN7523 | |
| | | **TRANSISTORS** | | | |
| ⚠Q401 | BZ510040 | TDUU024990 | TRANSISTOR,SILICON | 2SD2499(LB0EC1) | |
| ⚠Q402 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON | KTC4217(O,Y) | |
| Q403 | AD301443 | TPATD03003 | COMPOUND | KRA104MAT | |
| Q404 | BZ510096 | TNATB03005 | COMPOUND TRANSISTOR | KRC102MAT | |
| Q405 | BZ510069 | TCATC31980 | TRANSISTOR,SILICON | KTC3198-AT(Y,GR) | |
| ⚠Q501 | BZ510093 | TJXG5NC500 | FET | STP5NC50FP | |
| ⚠Q502 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON | KTC3203_Y-AT | |
| ⚠Q503 | BZ510004 | TA3T016240 | TRANSISTOR,SILICON | 2SA1624-AA | |
| Q504 | BZ510069 | TCATC31980 | TRANSISTOR,SILICON | KTC3198-AT(Y,GR) | |
| Q506 | BZ510096 | TNATB03005 | COMPOUND TRANSISTOR | KRC102MAT | |
| Q507 | BZ510109 | TCAA3875SY | TRANSISTOR,SILICON | KTC3875S_Y_RTK | |
| Q603 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON | KTC3203_Y-AT | |
| Q604 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON | KTC3203_Y-AT | |
| Q605 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON | KTC3203_Y-AT | |
| Q606 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON | KTC3203_Y-AT | |
| Q607 | BZ510090 | TPAAB05001 | COMPOUND TRANSISTOR | KRA102SRTK | |
| Q608 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON | KTC3203_Y-AT | |
| Q609 | BZ510069 | TCATC31980 | TRANSISTOR,SILICON | KTC3198-AT(Y,GR) | |
| ⚠Q804 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON | KTC4217(O,Y) | |
| ⚠Q805 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON | KTC4217(O,Y) | |
| ⚠Q806 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON | KTC4217(O,Y) | |
| Q1001 | BZ510109 | TCAA3875SY | TRANSISTOR,SILICON | KTC3875S_Y_RTK | |
| | | **COILS &TRANSFORMERS** | | | |
| L101 | AD300121 | 021LA62R7K | COIL | 2.7 UH | |
| L401 | BZ310063 | 022100027A | COIL,LINEARITY | ELH5L4113 | |
| ⚠L501 | AD301444 | 029T000100 | COIL,LINE FILTER | 2R0A502F24Y | |
| ⚠L503 | BZ310033 | 028R200026 | COIL,DEGAUSS | 8R200026 | |
| L607 | BZ310043 | 021LA6150K | COIL | 15 UH | |
| T401 | AD300736 | 045013002J | TRANS,HORIZONTAL DRIVE | ETH14Y46AY | |
| ⚠T501 | AD301446 | 048135080S | TRANSFORMER,SWITCHING | 8135080S | |
| | | **JACKS** | | | |
| J710 | AD300110 | 060G401047 | RCA JACK | HTJ-032-03AY | |
| J711 | AD300111 | 060G401046 | RCA JACK | HTJ-032-03AW | |
| J801 | BZ614115 | 066C130017 | SOCKET,CATHODE RAY TUBE | CVT3275-5101 | |
| | | **SWITCHES** | | | |
| SW101 | BZ612001 | 0504201T31 | SWITCH,TACT | SKHVBED010 | |
| SW102 | BZ612001 | 0504201T31 | SWITCH,TACT | SKHVBED010 | |
| SW103 | BZ612001 | 0504201T31 | SWITCH,TACT | SKHVBED010 | |
| SW104 | BZ612001 | 0504201T31 | SWITCH,TACT | SKHVBED010 | |
| SW105 | BZ612001 | 0504201T31 | SWITCH,TACT | SKHVBED010 | |
| | | **VARIABLE RESISTORS** | | | |
| VR401 | BZ210238 | V1K6313BTE | VOLUME,SEMI FIXED | NVG6TLTAB102 | |
| VR402 | BZ210237 | V1K63Q4BTE | VOLUME,SEMI FIXED | NVG6TLTAB473 | |
| VR502 | BZ210108 | V116313BTC | VOLUME,SEMI FIXED | EVNCYAA03B13 | or |
| | AD301491 | V116213BT1 | VOLUME,SEMI FIXED | EVN-DCAA03B13 | |
| | | **P.C.BOARD ASSEMBLIES** | | | |
| PCB010 | AD301492 | A3L706X010 | PCB ASS'Y | TMB540A | |
| PCB110 | AD301493 | A3L706X110 | PCB ASS'Y | TCB399A | |

# ELECTRICAL REPLACEMENT PARTS LIST

| Location No. | USA-TOSHIBA | Reference No. | Description | |
|---|---|---|---|---|
| | | **MISCELLANEOUS** | | |
| B501 | BZ310122 | 024HT03563 | CORE,BEADS | W4BRH3.5X6X1.0X2 |
| B504 | BZ310129 | 024HT03564 | CORE,BEADS | W4BRH3.5X6X1 |
| ⚠CD501 | AD300746 | 120R615901 | CORD,AC BUSH | 0R615901 |
| CD801 | BZ614175 | 06CU82039A | CORD,CONNECTOR | SM1098-009-1A |
| CF601 | BZ613031 | 1029045R7G | FILTER,SAW | TSF5229P3 |
| CF603 | AD301328 | 1012T4R520 | FILTER,CERAMIC | SFSRA4M50CF00-A0 |
| CF604 | AD300686 | 1012T4R519 | FILTER,CERAMIC TRAP | TPSRA4M50C00-A0 |
| ⚠CP401 | BZ614303 | 069S450089 | CONNECTOR PCB SIDE | A1561WV2-A5P |
| CP402 | BZ614444 | 069D01001A | CONNECTOR PCB SIDE | 003P-2100 |
| CP501 | BZ614176 | 069S320419 | CONNECTOR PCB SIDE | A3963WV2-3PD |
| ⚠CP502 | AD300687 | 069S420110 | CONNECTOR PCB SIDE | A1561WV2-2P |
| CP503 | BZ614444 | 069D01001A | CONNECTOR PCB SIDE | 003P-2100 |
| CP601 | BZ614102 | 0694270139 | CONNECTOR PCB SIDE | 173979-7 |
| CP801 | BZ614269 | 069S320010 | CONNECTOR PCB SIDE | A2361WV2-2P |
| CD1001 | AD301494 | 06CH12403B | CORD,CONNECTOR | CH12403B |
| CP1001 | AD301495 | 069W120019 | CONNECTOR PCB SIDE | TID-X02P-B2 |
| CP802A | BZ614276 | 067U005049 | WIRE HOLDER | B2013H02-5P |
| CP802B | BZ614276 | 067U005049 | WIRE HOLDER | B2013H02-5P |
| CP803A | BZ614334 | 067U004029 | WIRE HOLDER | B2013H02-4P |
| CP803B | BZ614334 | 067U004029 | WIRE HOLDER | B2013H02-4P |
| EL001 | BZ614043 | 124116281A | EYE LET | XRY16X28BD |
| EL002 | BZ614044 | 124120301A | EYE LET | XRY20X30BD |
| ⚠F501 | BZ614125 | 081PC6R304 | FUSE | 51MS063LCC |
| ⚠FB401 | BZ310164 | 043219014F | TRANSFORMER,FLYBACK | FQI-20B001R |
| FH501 | BZ614005 | 06710T0006 | HOLDER,FUSE | EYF-52BC |
| FH502 | BZ614005 | 06710T0006 | HOLDER,FUSE | EYF-52BC |
| OS101 | AD301048 | 0773071001 | REMOTE RECEIVER | RPM7138-H5 |
| ⚠RY501 | AD300114 | 0560V20115 | RELAY | ALKS321 |
| S101 | BZ614403 | WCL6842038 | FLAT CABLE AWM2468 A | WG26 5C GRAY 420MM |
| S102 | AD301450 | WBL6032038 | FLAT CABEL AWM2468 A | WG26 4C BLACK 320MM |
| ⚠SP1001 | BZ614029 | 070C533008 | SPEAKER | 810-47-171 |
| ⚠TH501 | BZ410079 | DF5EL3R0A0 | DEGAUSS ELEMENT | ZPB45BL3R0A |
| TM101 | AD301335 | 076N0EH020 | TRANSMITTER | RC-EH020 |
| ⚠TU001 | AD301052 | 0145100059 | TUNER,VHF-UHF | ENV56DB6G3 |
| V801 | AD301452 | 098Y210435 | CRT W/DY | A51LMV10X20N45 |
| X602 | BZ613004 | 100CT3R505 | CRYSTAL | HC-49/C |

RESISTOR

| | |
|---|---|
| RC..... | CARBON RESISTOR |

CAPACITORS

| | |
|---|---|
| CC..... | CERAMIC CAPACITOR |
| CE..... | ALUMI ELECTROLYTIC CAPACITOR |
| CP..... | POLYESTER CAPACITOR |
| CPP..... | POLYPROPYLENE CAPACITOR |
| CPL..... | PLASTIC CAPACITOR |
| CMP..... | METAL POLYESTER CAPACITOR |
| CMPL..... | METAL PLASTIC CAPACITOR |
| CMPP..... | METAL POLYPROPYLENE CAPACITOR |

**TOSHIBA CORPORATION**
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