

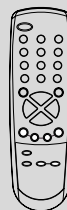
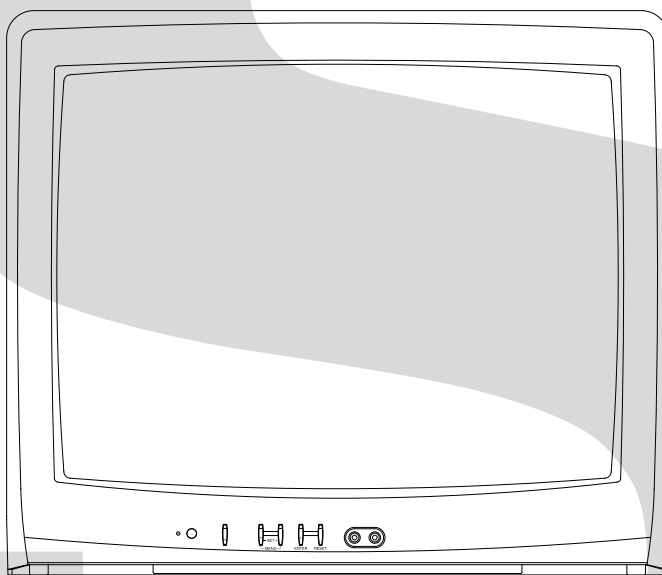
TOSHIBA

FILE NO. 050-200501

SERVICE MANUAL

COLOR TELEVISION

20AS25



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 external 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.

ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a PbF printing on the PCB.
(Please refer to figures.)



Caution:

- Pb free solder has a higher melting point than standard solder;
Typically the melting point is 50°F~70°F(30°C~40°C) higher.
Please use a soldering iron with temperature control and adjust it to 650°F ± 20°F (350°C ± 10°C).
In case of using high temperature soldering iron, please be carefull not to heat too long.
- Pb free solder will tend to splash when heated too high (about 1100°F/ 600°C).
- All products with the printed circuit board with PbF printing must be serviced with lead free solder.
When soldering or unsoldering, completely remove all of the solder from the pins or solder area,
and be sure to heat the soldering points with the lead free solder until it melts sufficiently.

Recommendations

Recommended lead free solder composition is Sn-3.0Ag-0.5Cu.

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GENERAL SPECIFICATIONS

| | | | | |
|-----|--------------------|------------------------|------------------------|---|
| G-1 | TV System | CRT | CRT Size / Visual Size | 19 inch / 480.0mmV |
| | | | CRT Type | Normal |
| | | | Deflection | 90 degree |
| | | | Magnetic Field BV/BH | +0.35G/0.30G |
| | | Color System | | NTSC |
| | | Speaker | | 1Speaker |
| | | | Position | Bottom |
| | | | Size | 3 Inch |
| | | | Impedance | 8 ohm |
| | | Sound Output | MAX | 1.5 W |
| G-2 | Tuning System | | 10%(Typical) | 1.0 W |
| | | NTSC3.58+4.43 /PAL60Hz | | No |
| | | Broadcasting System | | US System M |
| | | Tuner and Receive CH | System | 1Tuner |
| | | | Destination | USA(W/ CATV) |
| | | | 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 |
| G-3 | Power | Power Source | AC | 120V AC 60Hz |
| | | | DC | |
| | | Power Consumption | | at AC |
| | | | Stand by (at AC) | 73 W at AC 120 V 60 Hz |
| | | | Per Year | 5 W at AC 120 V 60 Hz |
| G-4 | Regulation | | | -- kWh/Year |
| | | Protector | Power Fuse | Yes |
| | | | Safety | UL |
| | | | Radiation | FCC |
| G-5 | Temperature | | X-Radiation | DHHS |
| | | Operation | | +5oC ~ +40oC |
| G-6 | Operating Humidity | Storage | | -20oC ~ +60oC |
| | | | | Less than 80% RH |

GENERAL SPECIFICATIONS

| | | | | | | | |
|-----|-------------------|-----------------------------------|--------------------|-------------------------|------------------------------|-----------|--|
| G-7 | On Screen Display | Menu | | Menu Type | | Yes | |
| | | | | Picture | | Character | |
| | | | | | | 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 | |
| | | | | Language | | Yes | |
| | | | | V-chip | | Yes | |
| | | | | Lock | | Yes | |
| | | | | On Timer | | Yes | |
| | | | | CH Label | | No | |
| | | | | Favorite CH | | No | |
| | | | | Color Stream DVD/DTV | | No | |
| | | | | Control Level | | Yes | |
| | | | | Volume | | Yes | |
| | | | | Brightness | | Yes | |
| | | | | Contrast | | Yes | |
| | | | | Color | | Yes | |
| | | | | Tint | | 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 | | | |
| | | On Timer | Step | 10 Min | | | |
| | | Wake Up Timer | Program(On Timer) | Yes | | | |
| | | Timer Back-up (at Power Off Mode) | more than | No | | | |
| | | | | -- | Min Sec | | |

GENERAL SPECIFICATIONS

| | | | |
|------|----------------|---------------------------|-----------------------|
| G-10 | Remote Control | Unit | RC-EH |
| | | Glow in Dark Remocon | Yes[From '04 DEC O/R] |
| | | Format | Toshiba |
| | | Custom Code | 40-BF h |
| | | Power Source | 3V |
| | | Voltage(D.C) | UM-4 x 2 pcs |
| | | UM size x pcs | 27 Keys |
| | | Total 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 (Max Time:120 Min) | Yes | |
| | | Stable Sound | No | |
| | | Energy Star | No | |
| | | Power On Memory | Yes | |
| | | Favorite CH | No | |
| G-12 | Accessories | Owner's Manual | Language | English / Spanish |
| | | | W/ Warranty | No |
| | | Remote Control Unit | | Yes |
| | | Rod Antenna | | No |
| | | | Poles | |
| | | | Terminal | |
| | | Loop Antenna | | No |
| | | | Terminal | |
| | | U/V Mixer | | No |
| | | DC Car Cord (Center+) | | No |
| | | Guarantee Card | | Yes |
| | | Warning Sheet | | No |
| | | Circuit Diagram | | No |
| | | Antenna Change Plug | | No |
| | | Service Facility List | | No |
| | | Important Safety Instruction | | No |
| | | 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) | | No |
| | | ESP Card | | No |
| | | 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 RCA x 1 |
| | | | | Audio Input | |
| | | | | Other Terminal | |
| | | | Rear | Video Input(Rear1) | No |
| | | | | Video Input(Rear2) | No |
| | | | | Audio Input(Rear1) | No |
| | | | | Audio Input(Rear2) | No |
| | | | | Video Output | No |
| | | | | Audio Output | No |
| | | | | Euro Scart | 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) | | 488 x 465 x 416 | |
| G-15 | Weight | Net (Approx.) | | 17.5kg (38.6 lbs) | |
| | | Gross (Approx.) | | 20.0kg (44.1lbs) | |
| 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) | 546 x 526 x 472 | |
| | | | Design | As per Buyer's | |
| | | | Description of Origin | Yes | |
| | | Drop Test | | Natural Dropping At 1 Corner / 2 Edges / 4 Surfaces | |
| | | | Height (cm) | 60 (ORION SPEC:46) | |
| | | | Container Stuffing | 436 Sets/40' container | |
| G-17 | Cabinet Material | Cabinet | Cabinet Front | PS 94V0 DECABROM | |
| | | | Cabinet Rear | PS 94V0 DECABROM | |
| | | PCB | Non-Halogen Demand | No | |
| | | | Eyelet Demand | Yes | |
| G-18 | Environment | Pb Free | | Phase3 | |

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

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

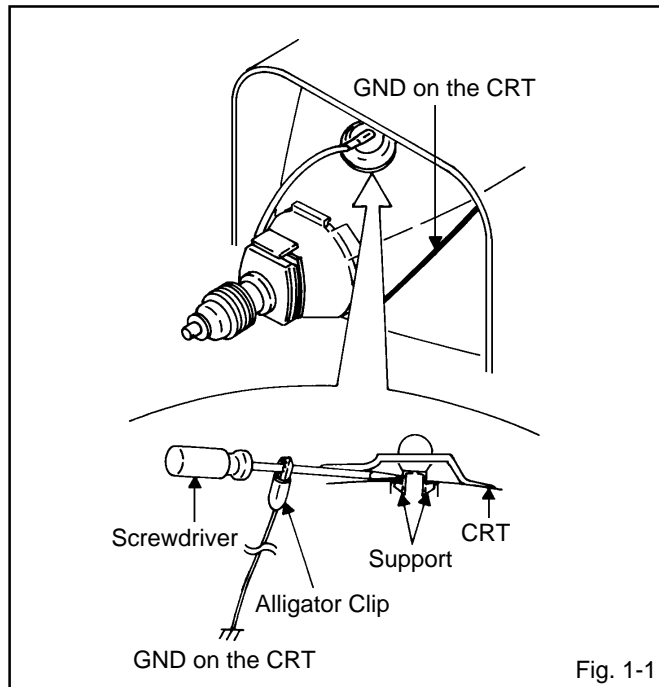
- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

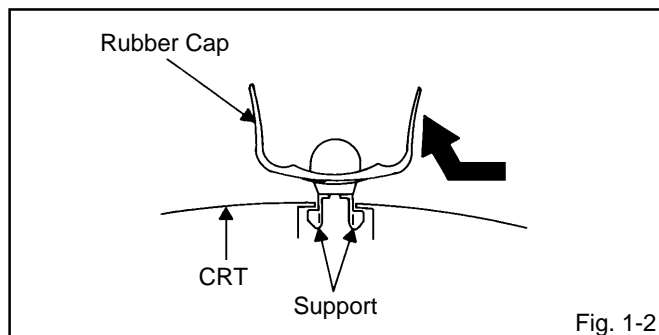
1. Follow the steps as follows to discharge the Anode Cap.
(Refer to Fig. 1-1.)

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.



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.)



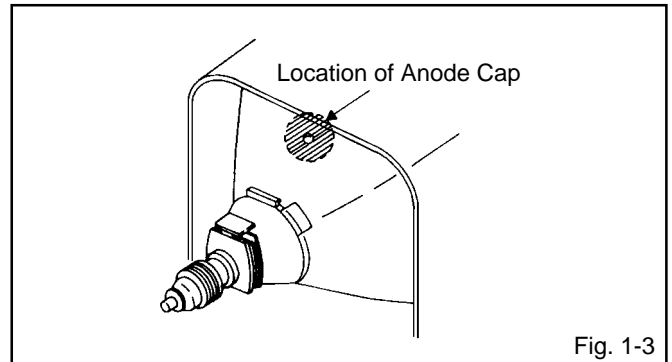
3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

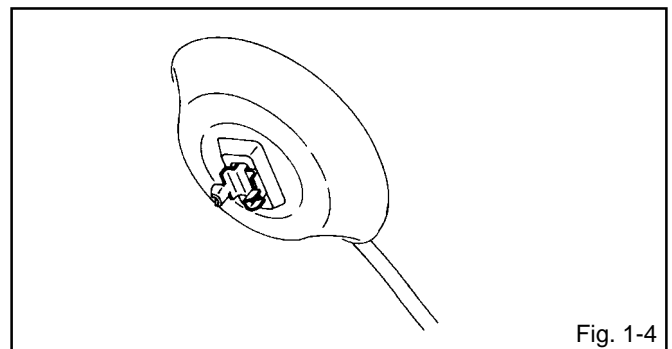
1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 1-3.)



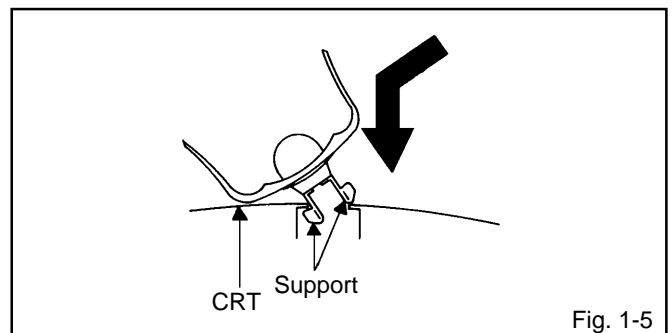
NOTE

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.)



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



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

DISASSEMBLY INSTRUCTIONS

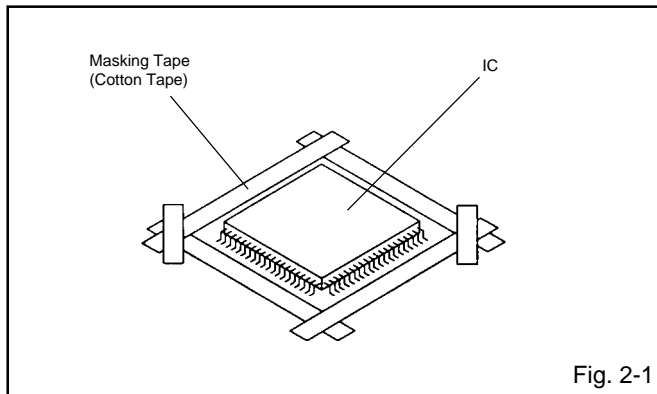
2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

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

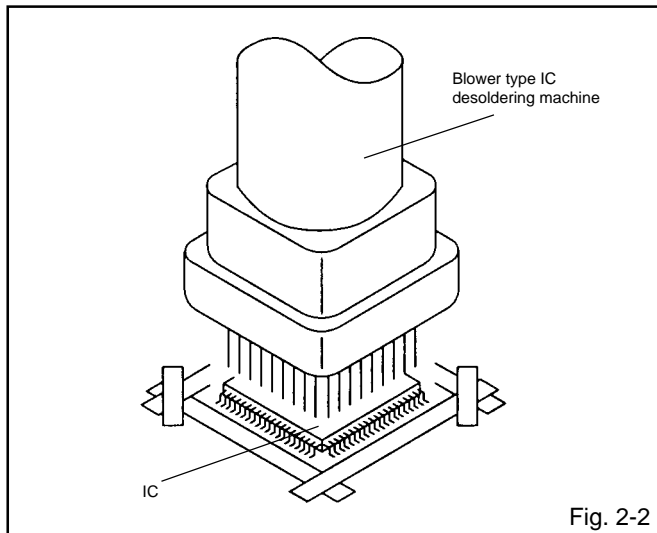
Masking is carried out on all the parts located within 10 mm distance from IC leads.



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

NOTE

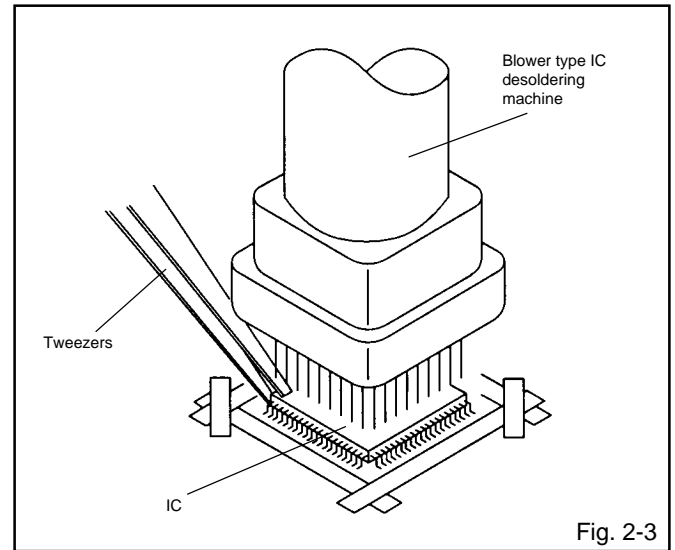
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

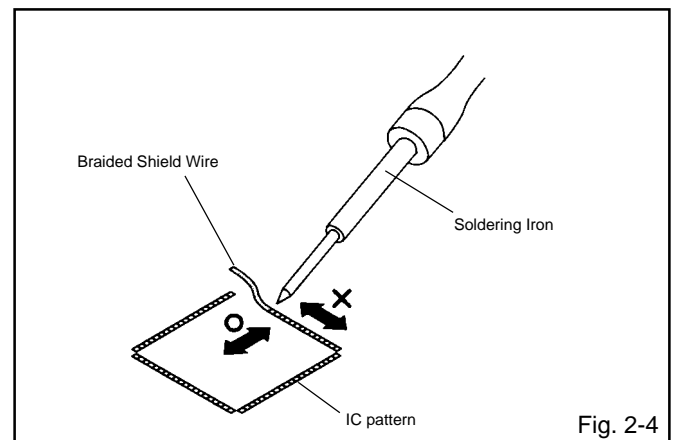
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



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

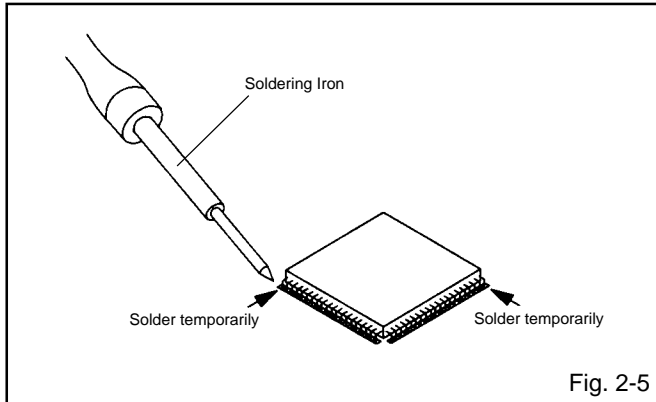
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



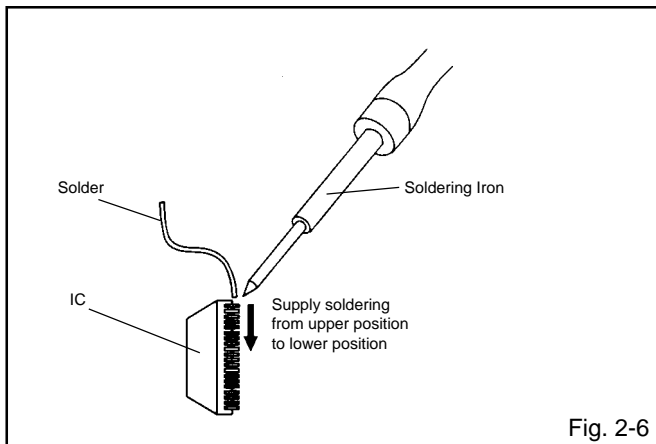
DISASSEMBLY INSTRUCTIONS

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.)



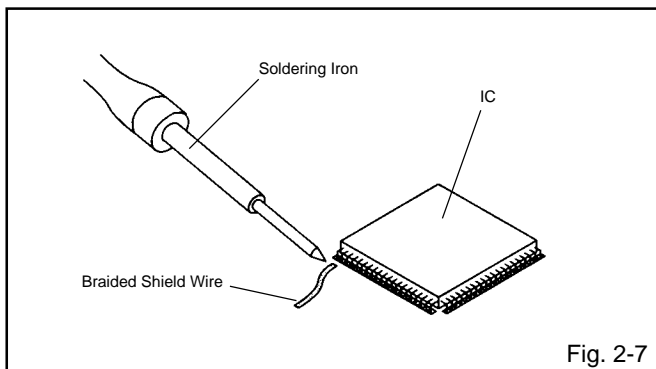
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 2-6.)



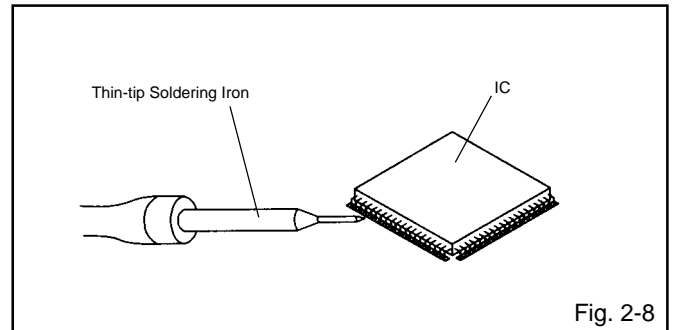
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 2-7.)

NOTE

Do not absorb the solder to excess.



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.)



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, always be 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 2 seconds.

| Set Key | Remocon Key | Operations |
|--------------|-------------|---|
| VOL. (-) MIN | 0 | Releasing of V-CHIP PASSWORD. |
| VOL. (-) MIN | 1 | Initialization of the factory. NOTE: Do not use this for the normal servicing. 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. Refer to the "CONFIRMATION OF HOURS USED". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC". |
| VOL. (-) MIN | 9 | Display of the Adjustment MENU on the screen. 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 2 seconds.
3. After the confirmation of using hours, turn off the power.

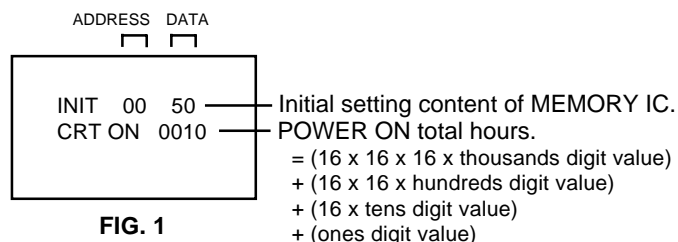


FIG. 1

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.

NOTE: No need setting for after INI 0F due to the adjustment value.

| INI | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 | +A | +B | +C | +D | +E | +F |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 50 | 04 | EB | 4E | 57 | B3 | 24 | 69 | 39 | 00 | 0C | 05 | 90 | AE | 00 | 07 |

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 2 seconds.
ADDRESS and DATA should appear as FIG 1.
 3. ADDRESS is now selected and should "blink". Using the VOL. +/- 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 VOL. +/- 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.
After the data input, set to the initializing of shipping.
 9. Turn POWER on.
 10. Press both VOL. DOWN button on the set and Channel button (1) on the remote control for more than 2 seconds.
 11. After the finishing of the initializing of shipping, the unit will turn off automatically.
- The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

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. 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 2 seconds to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

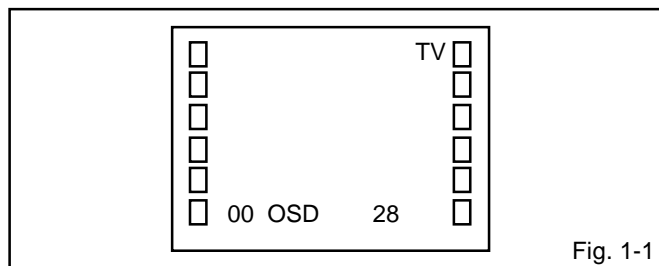


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. 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 |
| 04 | H. VCO | 18 | CONTRAST MIN |
| 05 | H. PHASE | 19 | COLOR CENTER |
| 06 | V. SIZE | 20 | COLOR MAX |
| 07 | V. SHIFT | 21 | COLOR MIN |
| 08 | R DRIVE | 22 | TINT |
| 09 | B DRIVE | 23 | SHARPNESS |
| 10 | R BIAS | 24 | FM LEVEL |
| 11 | G BIAS | 25 | LEVEL |
| 12 | B BIAS | 26 | SEPARATION1 |
| 13 | BRIGHT CENT | 27 | SEPARATION2 |
| 14 | BRIGHT MAX | 28 | TEST MONO |
| 15 | BRIGHT MIN | 29 | TEST STEREO |

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: 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=100, 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.

2-2: 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.

2-3: FOCUS

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

2-4: 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.

2-5: VERTICAL SHIFT

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 **(07)** on the remote control to select "V. SFT".
4. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

ELECTRICAL ADJUSTMENTS

2-6: 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 $10 \pm 2\%$.

2-7: SUB BRIGHTNESS

1. Receive the monoscope 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 white 10% is starting to be visible
5. Receive the monoscope 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.

2-8: SUB TINT/SUB COLOR

1. Receive the color bar pattern.
2. Connect the oscilloscope to **TP023**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line **(Refer to Fig. 2-1)**
5. Connect the oscilloscope to **TP022**.
6. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(19)** on the remote control to select "COL.CENT".
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $120 \pm 5\%$ of the white level. **(Refer to Fig. 2-2)**
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~7

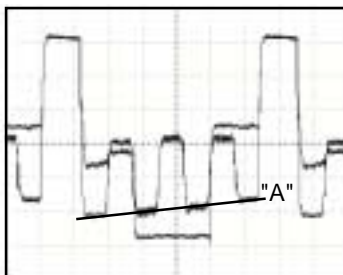


Fig. 2-1

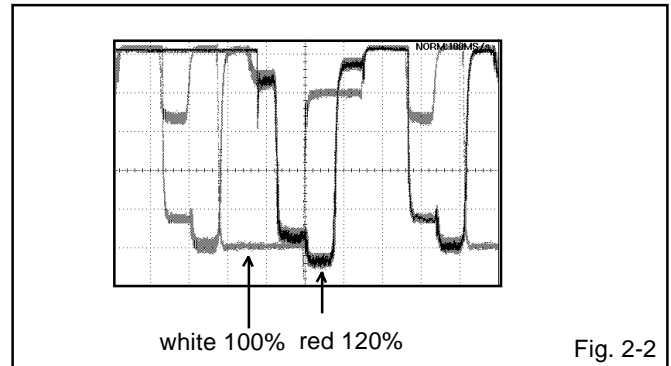


Fig. 2-2

2-9: 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 "60".
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-10: 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. 2-3)**

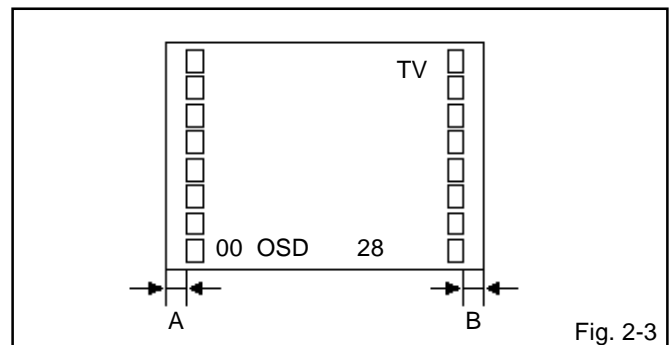


Fig. 2-3

2-11: Confirmation of Fixed Value (Step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below. (RF/AV)

| NO. | FUNCTION | STEP NO. |
|-----|---------------|----------|
| 04 | H. VCO | 04 |
| 14 | BRIGHT MAX | 183 |
| 15 | BRIGHT MIN | 60 |
| 16 | CONTRAST CENT | 30 |
| 18 | CONTRAST MIN | 17 |
| 20 | COLOR MAX | 74 |
| 21 | COLOR MIN | 00 |
| 23 | SHARPNESS | 45 |
| 24 | FM LEVEL | 00 |
| 25 | LEVEL | 00 |
| 26 | SEPARATION1 | 00 |
| 27 | SEPARATION2 | 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.

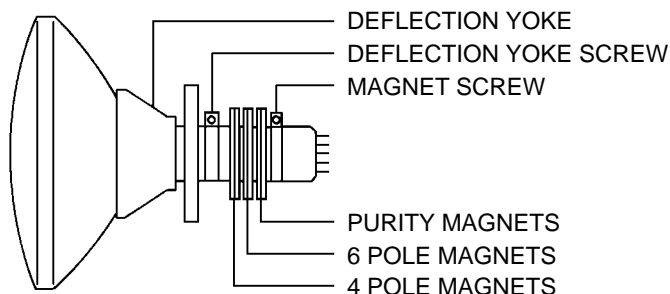


Fig. 3-1

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)**

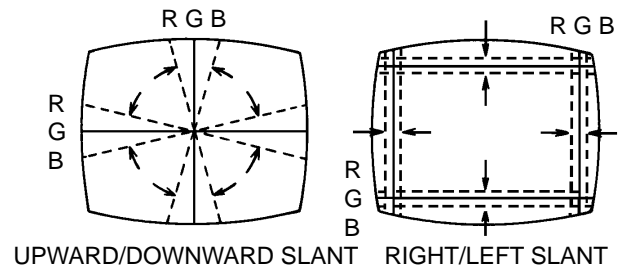
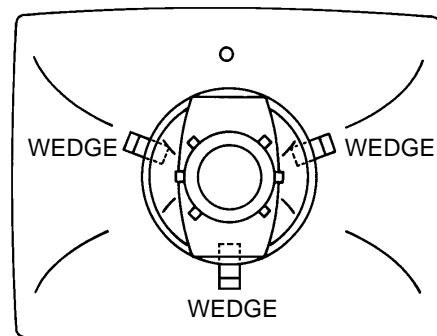


Fig. 3-2-a

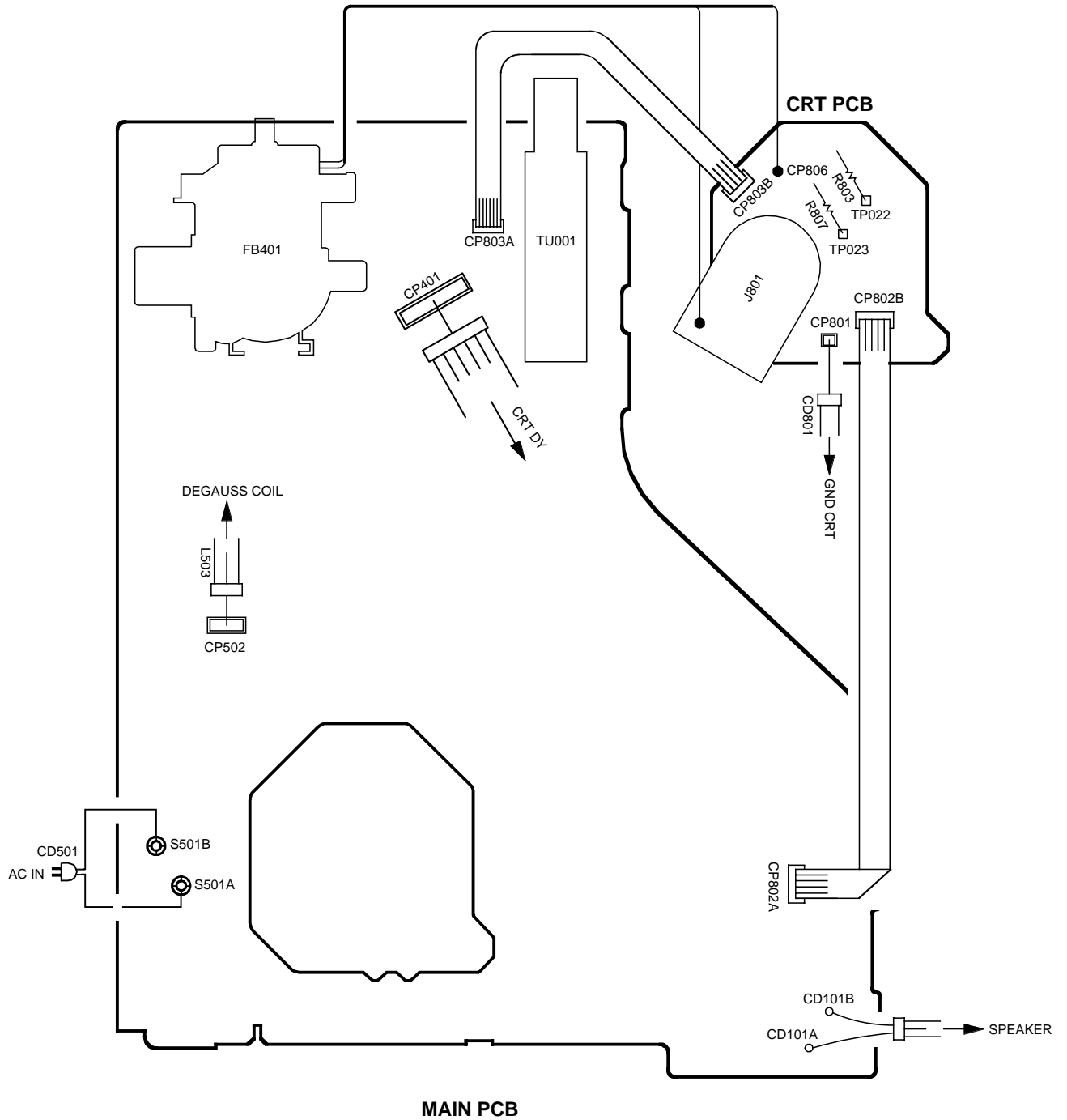


WEDGE POSITION

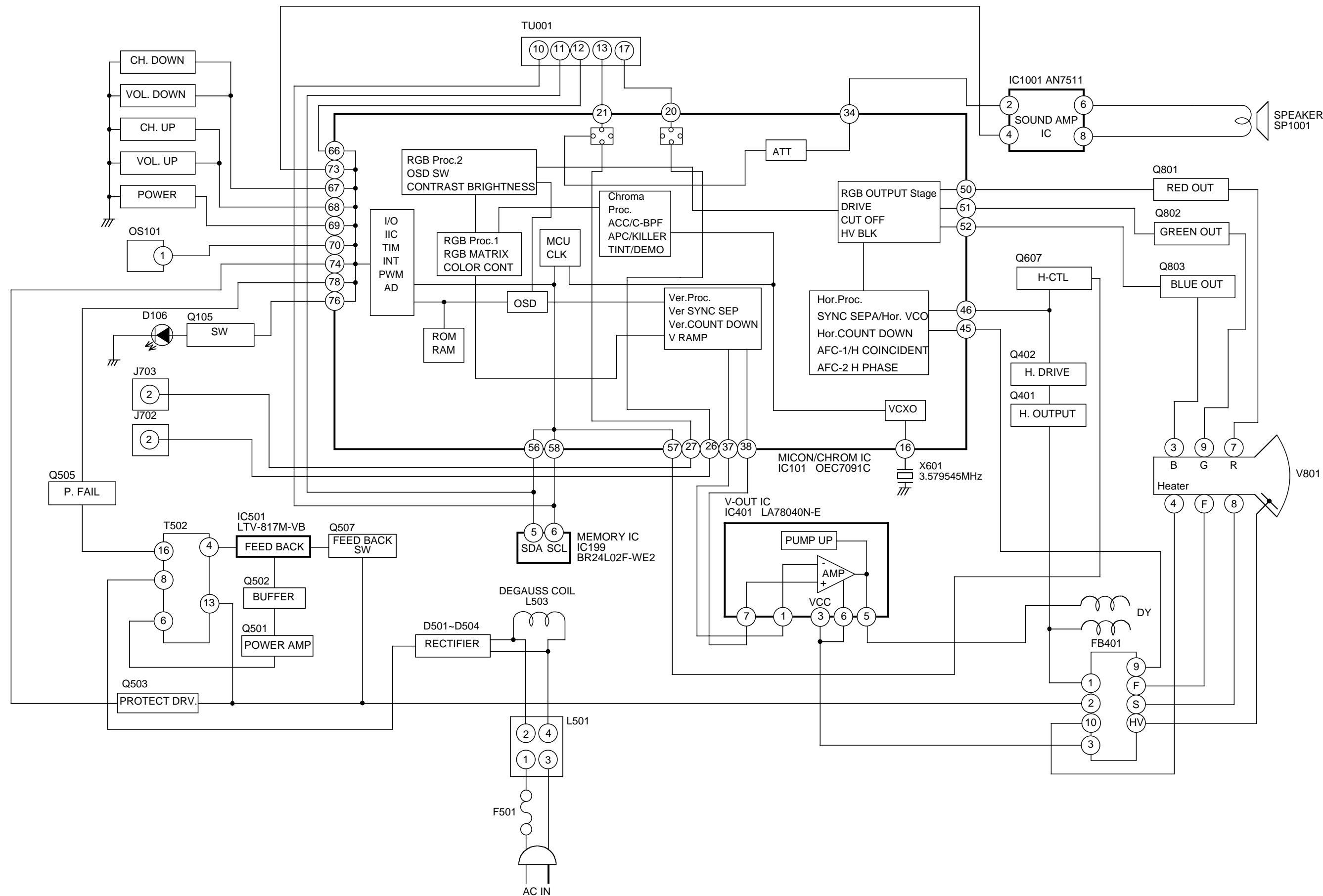
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

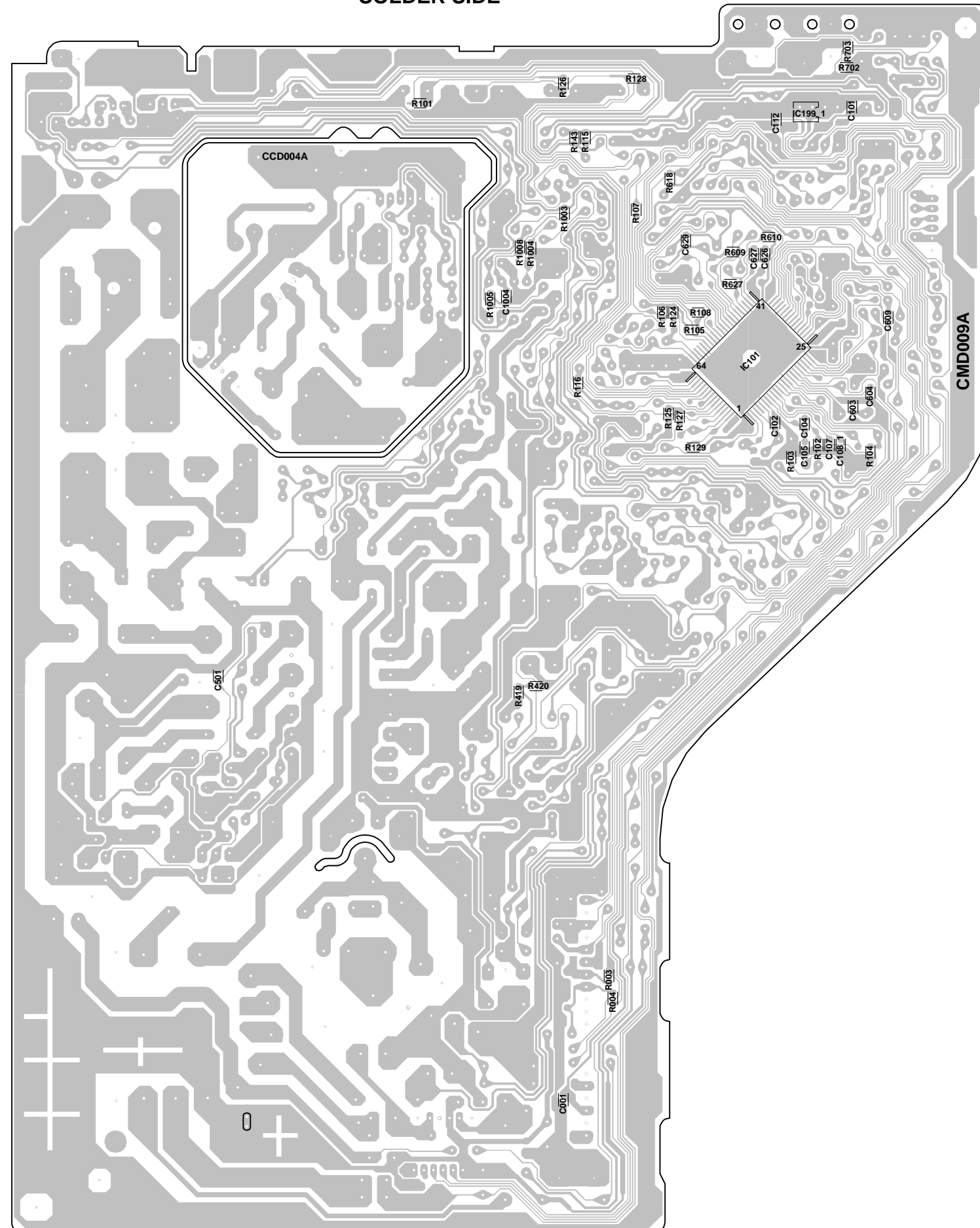
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



BLOCK DIAGRAM

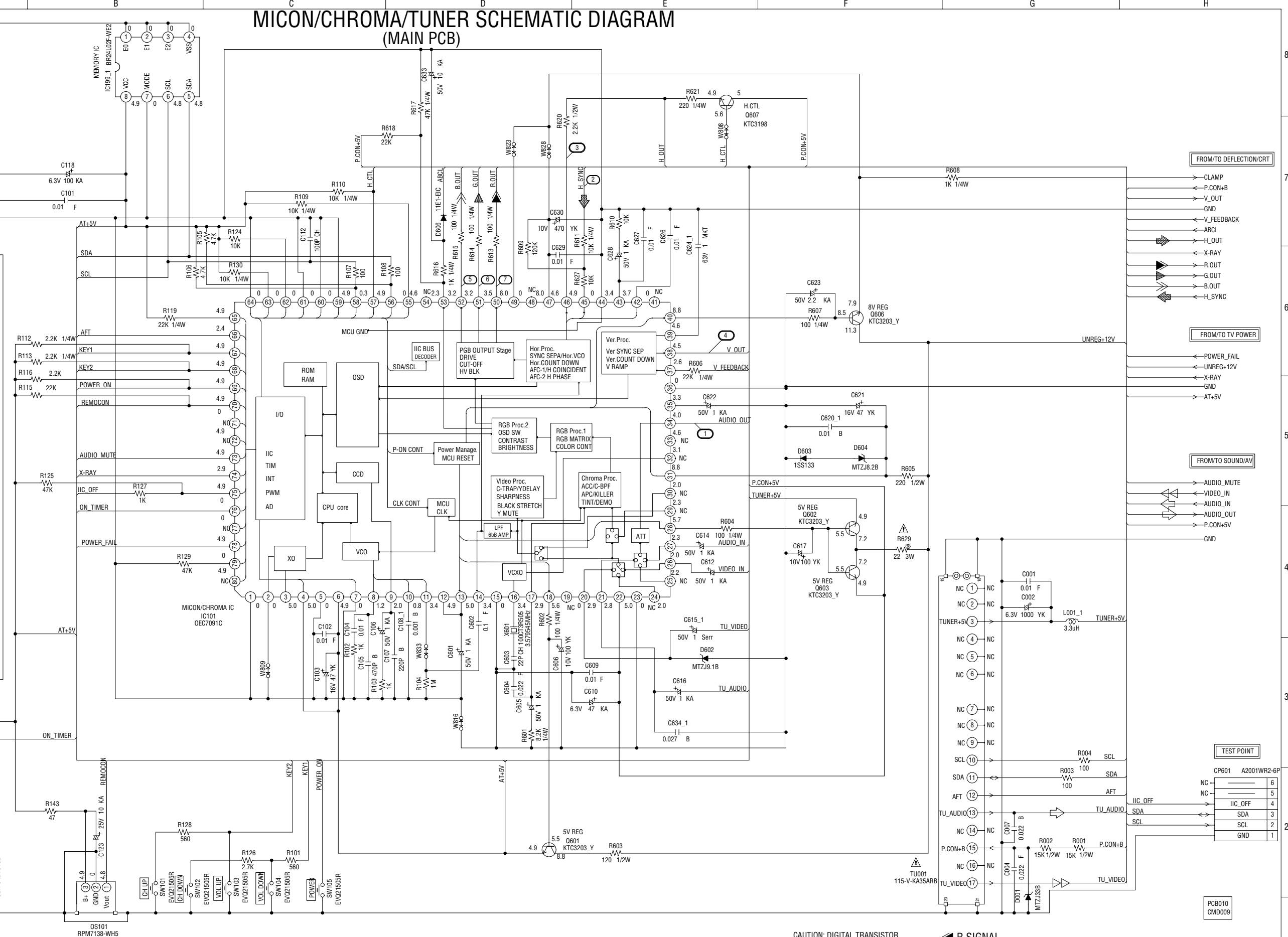


PRINTED CIRCUIT BOARDS
MAIN (CHIP MOUNTED PARTS)
SOLDER SIDE



MICON/CHROMA/TUNER SCHEMATIC DIAGRAM (MAIN PCB)

| | | | |
|----|------------------|----|------------|
| 1 | CNVSS | 41 | NC |
| 2 | XIN | 42 | HVCO F/B |
| 3 | XOUT | 43 | AFC FILTER |
| 4 | TEST1 | 44 | DEF GND |
| 5 | VSS | 45 | FBP IN |
| 6 | MCU VCC | 46 | H OUT |
| 7 | TEST0 | 47 | DEF VCC |
| 8 | FILT | 48 | NC |
| 9 | HILT | 49 | HI VCC |
| 10 | VHOLD | 50 | R OUT |
| 11 | CVIN | 51 | G OUT |
| 12 | RESET IN | 52 | B OUT |
| 13 | MCU RESET OUT | 53 | ACL |
| 14 | Y SW OUT | 54 | NC |
| 15 | V/C GND | 55 | PROTECT |
| 16 | 3.58 XTAL | 56 | SDA |
| 17 | C-APC | 57 | H_CTL |
| 18 | MCU5.7V REG OUT | 58 | SCL |
| 19 | NC | 59 | NC |
| 20 | CVBS IN3 | 60 | NC |
| 21 | AUDIO IN3 | 61 | NC |
| 22 | V/C VCC | 62 | DEGAUSS_H |
| 23 | MCU TEST | 63 | STANDBY_H |
| 24 | CVBS IN2 | 64 | VOLUME |
| 25 | AUDIO IN2 | 65 | NC |
| 26 | CVBS IN1 | 66 | AFT |
| 27 | AUDIO IN1 | 67 | KEY1 |
| 28 | 5.7V REG OUT | 68 | KEY2 |
| 29 | C(Y/C) IN | 69 | POWER_ON |
| 30 | Y(Y/C) IN | 70 | REMOCON |
| 31 | VREG VCC | 71 | AV2 |
| 32 | FSC OUT | 72 | AV1 |
| 33 | MONITOR OUT | 73 | AUDIO_MUTE |
| 34 | AUDIO ATT OUT | 74 | X-RAY |
| 35 | AUDIO ATT FILTER | 75 | IIC_OFF |
| 36 | TEST 3 | 76 | ON_TIMER |
| 37 | V RAMP F/B | 77 | SYNC |
| 38 | V RAMP OUT | 78 | POWER_FAIL |
| 39 | V RAMP CAP | 79 | NC |
| 40 | 8.7V REG OUT | 80 | EXT_MUTE |



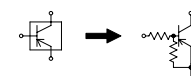
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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 REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: DIGITAL TRANSISTOR



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

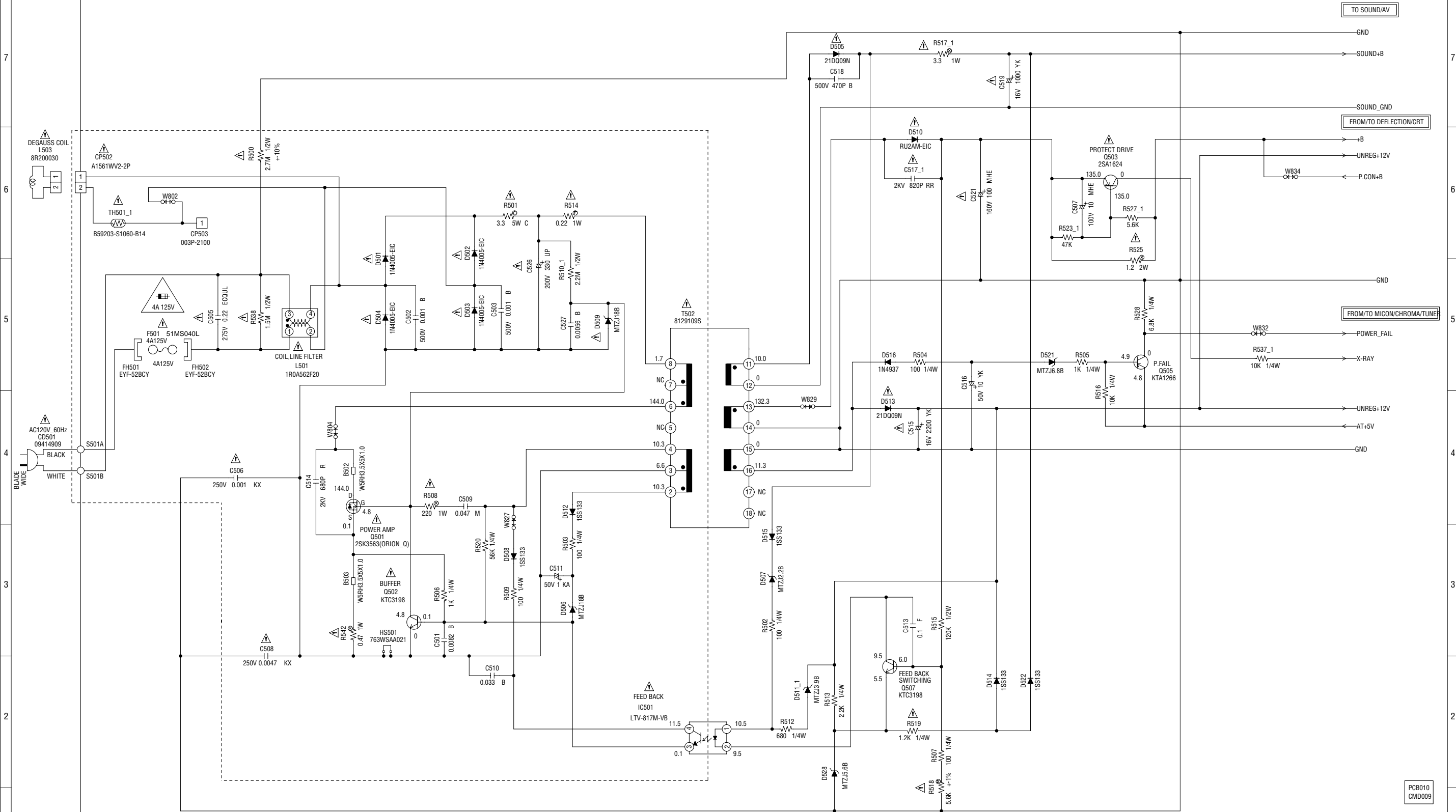
| TEST POINT | |
|------------|-------------|
| CP601 | A2001WR2-6P |
| NC | 6 |
| NC | 5 |
| IIC_OFF | 4 |
| SDA | 3 |
| SCL | 2 |
| GND | 1 |

PCB010
CMD009

TV POWER SCHEMATIC DIAGRAM (MAIN PCB)

CAUTION FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 4A 125V (F501)
FUSE.

ATTENTION POUR UNE PROTECTION CONTINUE LES RISQUES
D'INCENDIE N'UTILISER QUE DES FUSIBLE DE MEME
TYPE 4A 125V (F501).



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.

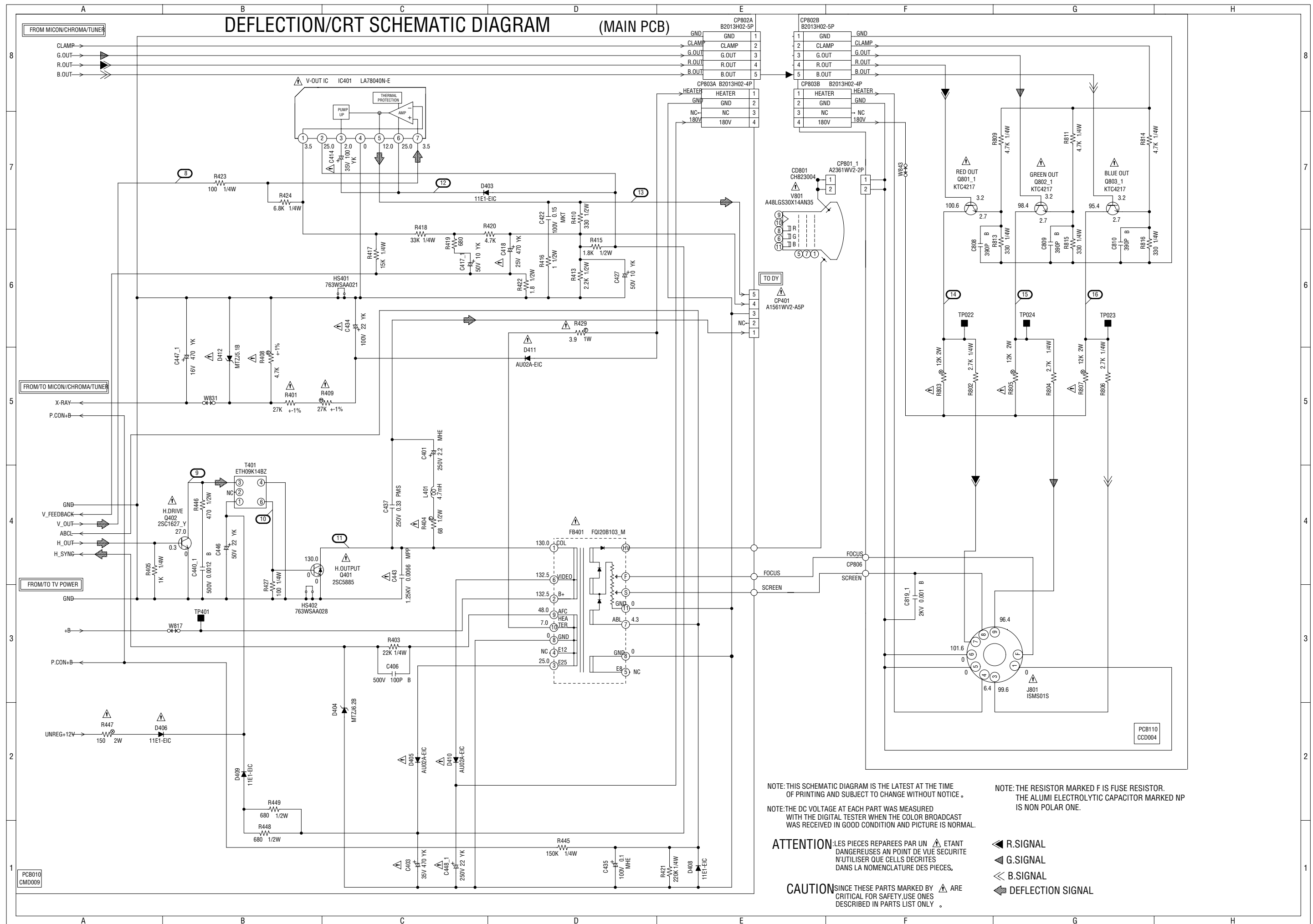
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

ATTENTION LES PIECES REPARÉES PAR UN ÉTANT
DANGEREUSES AU POINT DE VUE SÉCURITÉ
N'UTILISER QUE CELLES DÉCRITES
DANS LA NOMENCLATURE DES PIÈCES.

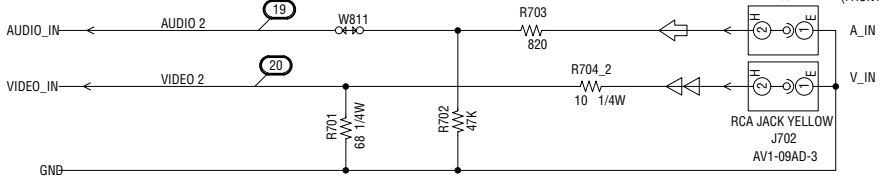
PCB010
CMD009

DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)



SOUND/AV SCHEMATIC DIAGRAM
(MAIN PCB)

TO MICON/CHROMA/TUNER



ACCESSORY

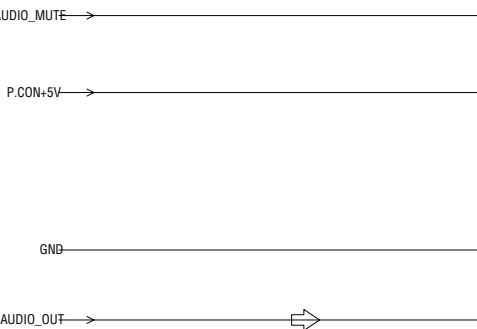
TM101
RC-EH050(CT-859)

UM-4
BT001
GR03X-SP2
UM-4
BT002
GR03X-SP2

FROM TV POWER



FROM MICON/CHROMA/TUNER



R1001
47K 1/4W

R1003
68K

R1004
100K

R1005
270K

C1003
50V 1 KA

C1004
0.0015 B

C1005
25V 10 KA

C1001
50V 0.1 KA

R1008
39K

W812

W807


CD101A
C3013207


CD101B
C3013206



SPEAKER
SP1001
S08F21A
8 OHM

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.

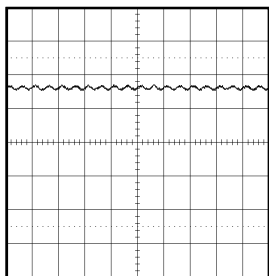
ATTENTION: LES PIECES REPARÉES PAR UN  ETANT
DANGEREUSES AN POINT DE VUE SECURITE
N'UTILISER QUE CELLS DECRITES
DANS LA NOMENCLATURE DES PIECES.

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

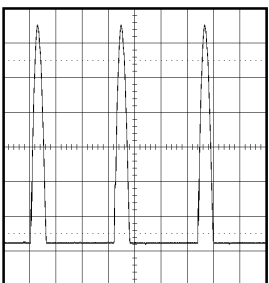
 TUNER VIDEO SIGNAL
 AUDIO SIGNAL

PCB010
CMD009

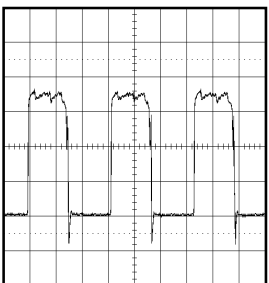
MICON/CHROMA/TUNER



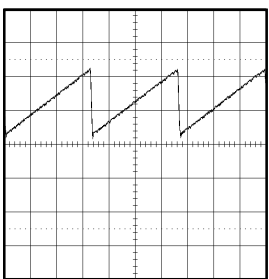
① 0.5V 2ms/div



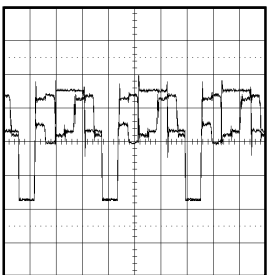
② 20V 20μs/div



③ 200mV 20μs/div

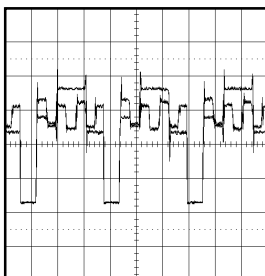


④ 0.5V 5ms/div

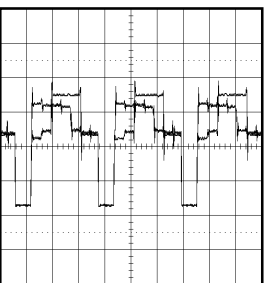


⑤ 1V 20μs/div

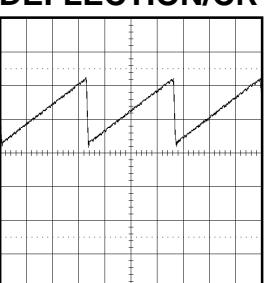
WAVEFORMS



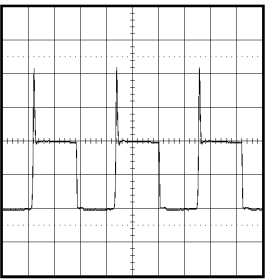
⑥ 1V 20μs/div



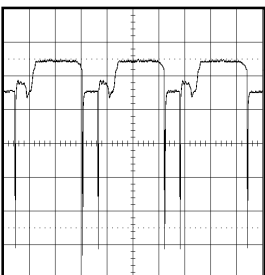
⑦ 1V 20μs/div



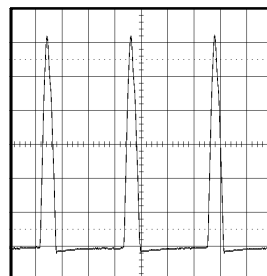
⑧ 0.5V 5ms/div



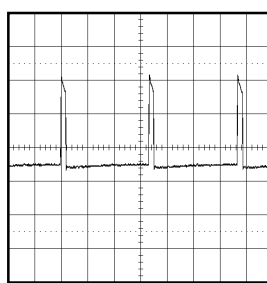
⑨ 20V 20μs/div



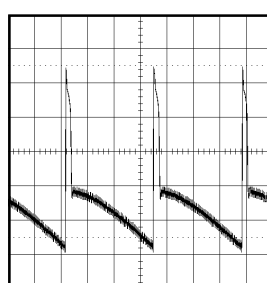
⑩ 2V 20μs/div



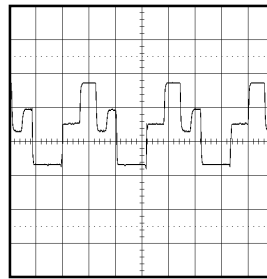
⑪ 200V 20μs/div



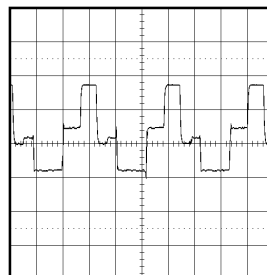
⑫ 10V 5ms/div



⑬ 10V 5ms/div



⑭ 50V 20μs/div

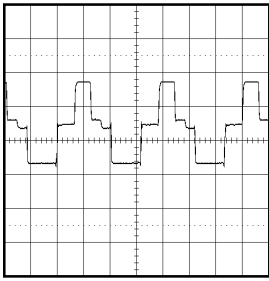


⑮ 50V 20μs/div

DEFLECTION/CRT

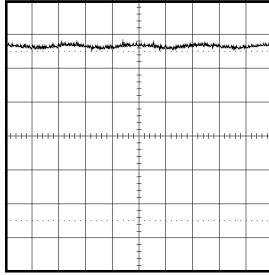
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

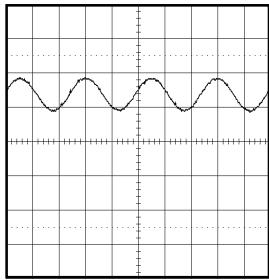


⑩ 50V 20 μ s/div

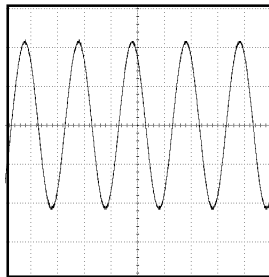
SOUND/AV



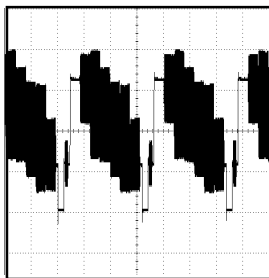
⑪ 0.5V 1ms/div



⑫ 1V 1ms/div



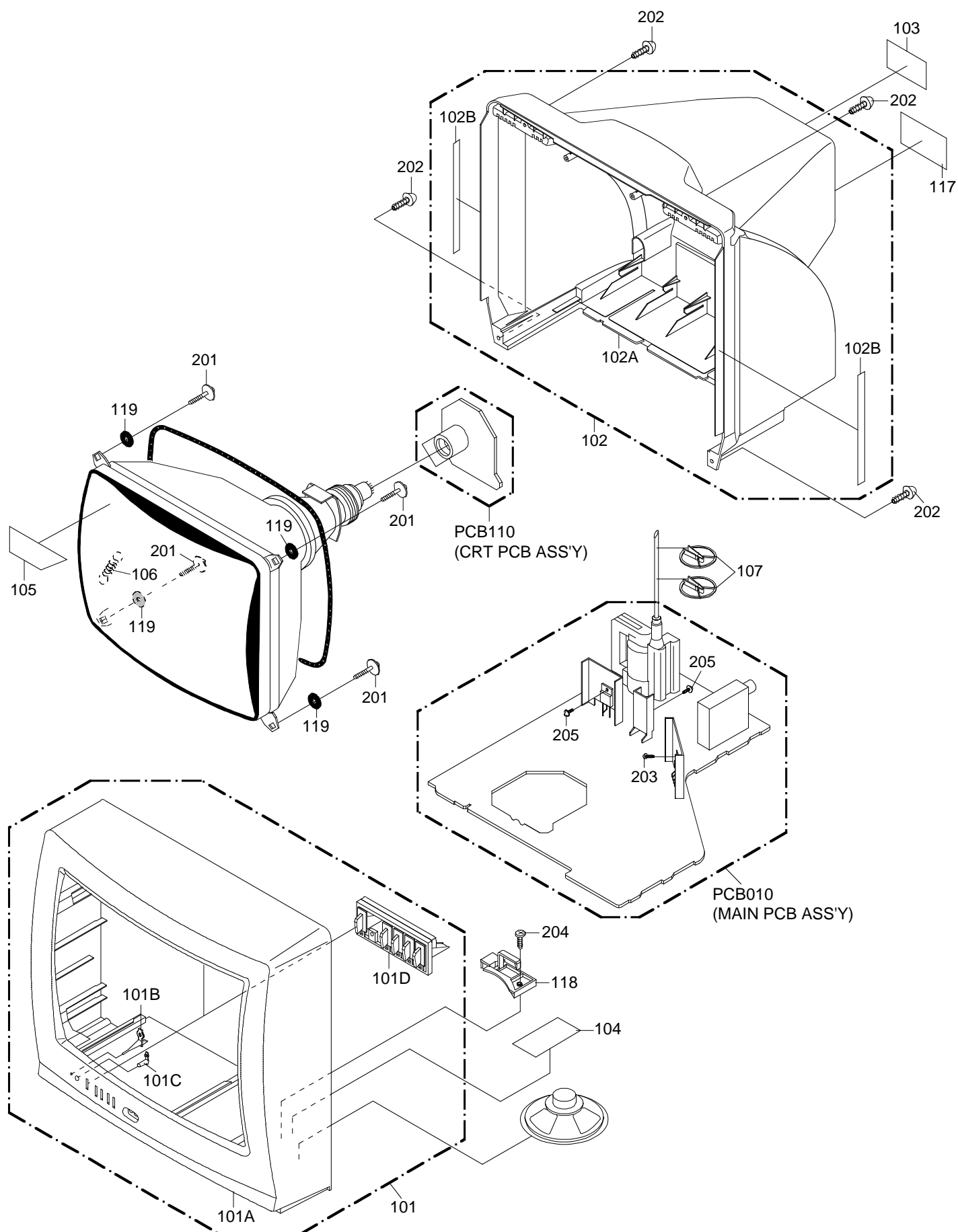
⑬ 200mV 500 μ s/div



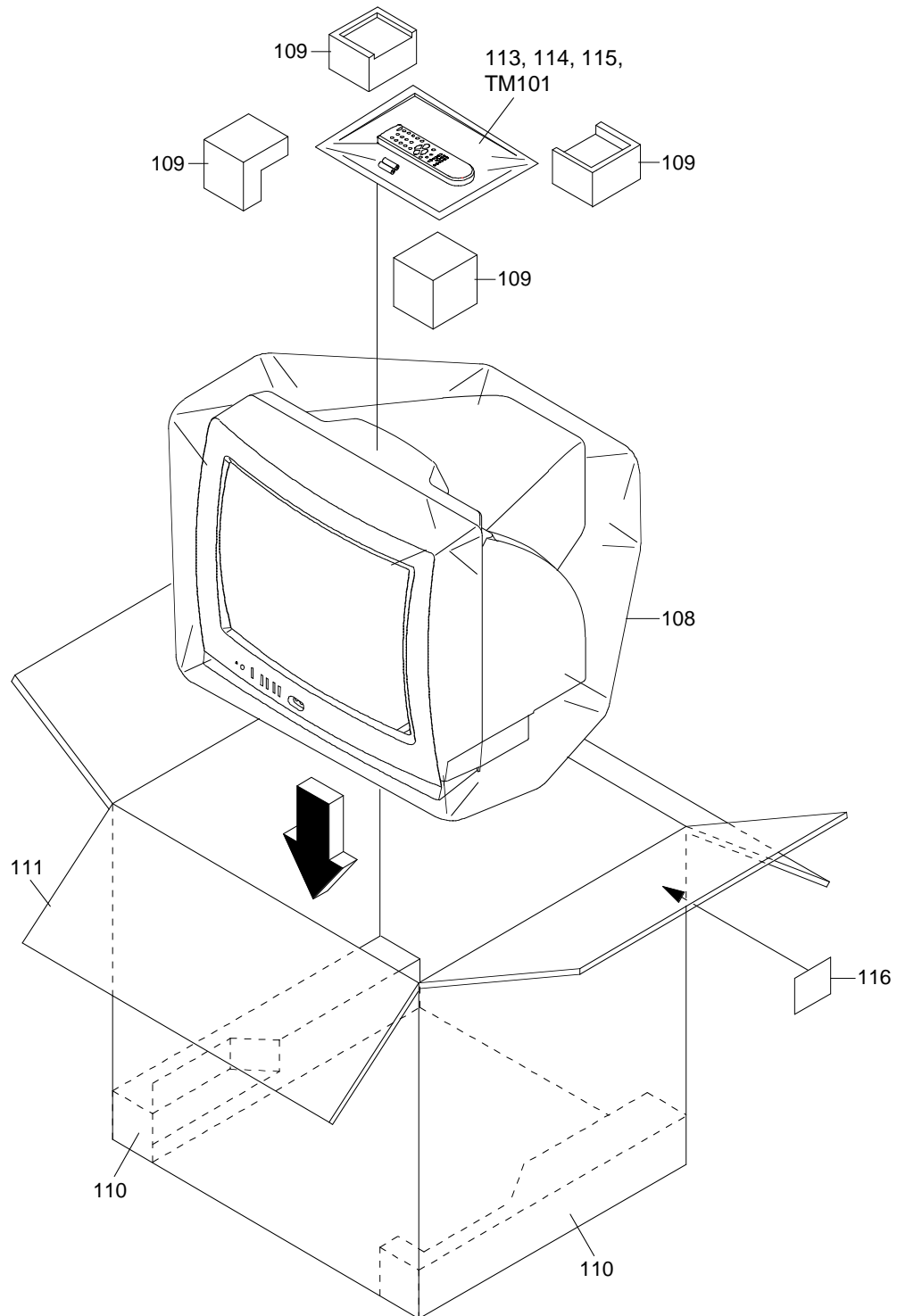
⑭ 500mV 20 μ s/div

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

MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW (PACKING DIAGRAM)



MECHANICAL REPLACEMENT PARTS LIST

| Location No. | TSB P/N | Reference No. | Description | |
|--------------|----------|---------------|----------------------------------|-------|
| 101 | AE006004 | 7A701A356A | FRONT CABI ASS'Y | |
| 101A | AE006173 | 701WPJC966 | CABINET,FRONT | |
| 101B | AE001500 | 713WPAA046 | GLASS,LED | |
| 101C | AD300694 | 713WPAA050 | GUIDE,REMOCON | |
| 101D | AE006174 | 735WPBB357 | BUTTON,FRAME | |
| 102 | AE005646 | 7A702A088A | BACK CABI ASS'Y | |
| 102A | AE006175 | 702WPAA844 | CABINET,BACK | |
| 102B | AE005648 | 800WQ0A091 | FELT SHEET | |
| 103 | AE005649 | 722549A413 | SHEET,RATING | |
| 104 | AE005650 | 723000C727 | SHEET,CAUTION | |
| 105 | AE005651 | 723000C778 | FILM,DECORATION | |
| 106 | BZ710660 | 741WUA0021 | SPRING,EARTH | |
| 107 | BZ710260 | 899HV3T000 | HOLDER,ANODE WIRE | |
| 108 | AE005652 | 791WHAA126 | FILM BAG | |
| 109 | AD300700 | 792WHAA054 | PACKAGE, TOP | |
| 110 | AD300701 | 792WHAA055 | PACKAGE,BOTTOM | |
| 111 | AE005653 | 793WCDC582 | GIFT BOX | |
| 112 | AE005654 | A3M218S975 | INSTRUCTION BOOK KIT | |
| 113 | AE005715 | JB5KD200 | POLYBAG,INSTRUCTION(RED CAUTION) | |
| 114 | AE006176 | J3M21802A | GUARANTEE CARD | |
| 115 | AE006177 | J3M21821B | INSTRUCTION BOOK(E/S) | |
| 116 | AE005656 | 723000C776 | SHEET,BAR CODE | |
| 117 | AE005657 | 726000A085 | SHEET,CRT SERVICEMAN | |
| 118 | AE006178 | 735WPAA938 | HOLDER,SPEAKER | |
| 119 | AD302158 | 800WR0A002 | SHEET,CRT SUPPORT | |
| 201 | AE005928 | 8160H50B8U | SCREW,TAP TITE(P) | W5x28 |
| 202 | AE004847 | 8117540A6U | SCREW,TAP TITE(B0) TRUSS | 4x16 |
| 203 | AE003531 | 810763080U | SCREW,TAP TITE(S) BRAZIER | 3x8 |
| 204 | AE003528 | 8110630A0U | SCREW,TAP TITE(P) BRAZIER | 3x10 |
| 205 | AE005659 | 810913080U | SCREW,TAP TITE(B) WH7 | 3x8 |

ELECTRICAL REPLACEMENT PARTS LIST

| Location No. | TSB P/N | Reference No. | Description |
|-------------------|----------|---------------|------------------------------|
| RESISTORS | | | |
| △R401 | BZ210089 | R4X5T6273F | R,METAL 27K OHM 1/6W |
| △R404 | AE001556 | R615U2680J | R,FUSE 68 OHM 1/2W |
| △R408 | BZ210258 | R4X5T6472F | R,METAL 4.7K OHM 1/6W |
| △R409 | BZ210089 | R4X5T6273F | R,METAL 27K OHM 1/6W |
| △R429 | AE005886 | R638813R9J | R,FUSE 3.9 OHM 1W |
| △R447 | BZ210229 | R3X28A151J | R,METAL OXIDE 150 OHM 2W |
| △R500 | BZ210080 | R0G3K2275K | RC 2.7M OHM 1/2W |
| △R501 | AD300652 | R5X2CD3R3J | R,CEMENT 3.3 OHM 5W |
| △R508 | BZ210240 | R3X181221J | R,METAL OXIDE 220 OHM 1W |
| R509 | AD301203 | R002T4101J | RC 100 OHM 1/4W |
| R510 | AE003279 | R00202225J | RC 2.2M OHM 1/2W |
| △R514 | AE005735 | R63881R22J | R,FUSE 0.22 OHM 1W |
| R515 | BZ210081 | R002T2124J | RC 120K OHM 1/2W |
| △R517 | AE001696 | R3X1813R3J | R,METAL OXIDE 3.3 OHM 1W |
| △R518 | BZ210244 | R4X5T6562F | R,METAL 5.6K OHM 1/6W |
| △R519 | BZ210124 | R002T4122J | RC 1.2K OHM 1/4W |
| △R525 | AD301315 | R3X18A1R2J | R,METAL OXIDE 1.2 OHM 2W |
| △R538 | BZ210206 | R002T2155J | RC 1.5M OHM 1/2W |
| △R542 | BZ210251 | R3X181R47J | R,METAL OXIDE 0.47 OHM 1W |
| △R629 | AE000081 | R3X28B220J | R,METAL OXIDE 22 OHM 3W |
| △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 | | | |
| △C403 | BZ110149 | E02LT4471M | CE 470 UF 35V |
| C414 | AD301434 | E02LU4101M | CE 100 UF 35V |
| △C418 | BZ110041 | E02LT3471M | CE 470 UF 25V |
| △C434 | BZ110195 | E02LU8220M | CE 22 UF 100V |
| C437 | BZ110174 | P4J7F3334J | CMPP 0.33 UF 250V PMS |
| △C443 | AE001548 | P4N8FJ662H | CMPP 0.0066UF 1.25KV |
| C446 | BZ110205 | E02LU5220M | CE 22 UF 50V |
| △C448 | BZ110204 | E0ELFD220M | CE 22 UF 250V |
| C503 | BZ110061 | C0JTB0513K | CC 0.001 UF 500V B |
| △C505 | BZ110025 | P2122B224M | CMP 0.22 UF 275V ECQUL |
| △C506 | AD301026 | CD39E0M13M | CC 0.001 UF 250V |
| △C508 | AE002878 | CD39E0MQ3M | CC 0.0047UF 250V |
| C514 | BZ110172 | C03L0R7U2K | CC 680 PF 2KV R |
| △C515 | BZ110135 | E02L02222M | CE 2200 UF 16V |
| △C517 | BZ110203 | C0PLRR7W2K | CC 820 PF 2KV RR |
| △C519 | BZ110207 | E02LT2102M | CE 1000 UF 16V |
| △C521 | BZ110092 | E5EZFB101M | CE 100 UF 160V |
| △C526 | AD301635 | E51CGC331M | CE 330 UF 200V |
| C527 | 79091377 | CQGTB04S3K | CC 0.0056UF 50V B |
| C615 | AE003280 | E52H05010M | CE 1 UF 50V |
| C819 | BZ110247 | C0JBB0713K | CC 0.001 UF 2KV B |
| DIODES | | | |
| D001 | BZ410037 | D97U03301B | DIODE,ZENER MTZJ33B T-77 |
| D106 | BZ410054 | 0021721150 | LED SLR-342VCT32 |
| D403 | BZ410043 | D2WT011E10 | DIODE,SILICON 11E1-EIC |
| D404 | BZ410066 | D97U06R21B | DIODE,ZENER MTZJ6.2B T-77 |
| △D405 | BZ410063 | D2WTAU02A0 | DIODE,SILICON AU02A-EIC |
| △D406 | BZ410043 | D2WT011E10 | DIODE,SILICON 11E1-EIC |
| D408 | BZ410043 | D2WT011E10 | DIODE,SILICON 11E1-EIC |
| D409 | BZ410043 | D2WT011E10 | DIODE,SILICON 11E1-EIC |
| △D410 | BZ410063 | D2WTAU02A0 | DIODE,SILICON AU02A-EIC |
| △D411 | BZ410063 | D2WTAU02A0 | DIODE,SILICON AU02A-EIC |
| △D412 | BZ410020 | D97U05R11B | DIODE,ZENER MTZJ5.1B T-77 |
| △D501 | BZ410085 | D2WXN40050 | DIODE,SILICON 1N4005-EIC |
| △D502 | BZ410085 | D2WXN40050 | DIODE,SILICON 1N4005-EIC |
| △D503 | BZ410085 | D2WXN40050 | DIODE,SILICON 1N4005-EIC |
| △D504 | BZ410085 | D2WXN40050 | DIODE,SILICON 1N4005-EIC |
| △D505 | BZ410010 | D28T21DQN9 | DIODE,SCHOTTKY 21DQ09N-TA2B1 |
| D506 | AD300671 | D97U01801B | DIODE,ZENER MTZJ18B T-77 |
| D507 | BZ410067 | D97U02R21B | DIODE,ZENER MTZJ2.2B T-77 |
| D508 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |
| △D509 | AD300671 | D97U01801B | DIODE,ZENER MTZJ18B T-77 |
| △D510 | BZ410080 | D2WXRU2AM0 | DIODE,SILICON RU2AM-EIC |
| D511 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |
| △D512 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |
| △D513 | BZ410010 | D28T21DQN9 | DIODE,SCHOTTKY 21DQ09N-TA2B1 |
| D514 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |

ELECTRICAL REPLACEMENT PARTS LIST

| Location No. | TSB P/N | Reference No. | Description |
|---------------------------------|----------|---------------|--|
| DIODES | | | |
| D515 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |
| D516 | AD300731 | D2WXN49370 | DIODE,SILICON 1N4937 |
| D521 | BZ410022 | D97U06R81B | DIODE,ZENER MTZJ6.8B T-77 |
| D522 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |
| D528 | BZ410021 | D97U05R61B | DIODE,ZENER MTZJ5.6B T-77 |
| D602 | BZ410023 | D97U09R11B | DIODE,ZENER MTZJ9.1B T-77 |
| D603 | BZ410006 | D1VT001330 | DIODE,SILICON 1SS133T-77 |
| D604 | BZ410058 | D97U08R21B | DIODE,ZENER MTZJ8.2B T-77 |
| D606 | BZ410043 | D2WT011E10 | DIODE,SILICON 11E1-EIC |
| ICS | | | |
| IC101 | AE005644 | I56F07091C | IC OEC7091C |
| IC199 | AE005642 | A3M218S015 | INIT DATA BR24L02F-WE2 |
| △IC401 | AE002783 | I03TD804N0 | IC LA78040N-E |
| △IC501 | BZ410088 | 0002E00610 | PHOTO COUPLER LTV-817M-VB |
| △IC1001 | BZ611001 | I01DP75110 | IC |
| TRANSISTORS | | | |
| Q105 | BZ510086 | TPATB03003 | COMPOUND TRANSISTOR KRA102MAT |
| △Q401 | AE000656 | TC1G058850 | TRANSISTOR,SILICON 2SC5885 |
| △Q402 | BZ510089 | TC5T01627Y | TRANSISTOR,SILICON 2SC1627_Y(TPE2) |
| △Q501 | AE002251 | T25F035630 | FET 2SK3563(ORION_Q) |
| △Q502 | BZ510069 | TCATC31980 | TRANSISTOR,SILICON KTC3198-AT(Y,GR) |
| △Q503 | BZ510004 | TA3T016240 | TRANSISTOR,SILICON 2SA1624-AA |
| Q505 | BZ510073 | TAATA12660 | TRANSISTOR,SILICON KTA1266-AT(Y,GR) |
| Q507 | BZ510069 | TCATC31980 | TRANSISTOR,SILICON KTC3198-AT(Y,GR) |
| Q601 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON KTC3203_Y-AT |
| Q602 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON KTC3203_Y-AT |
| Q603 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON KTC3203_Y-AT |
| Q606 | BZ510070 | TCAT032034 | TRANSISTOR,SILICON KTC3203_Y-AT |
| Q607 | BZ510069 | TCATC31980 | TRANSISTOR,SILICON KTC3198-AT(Y,GR) |
| △Q801 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON KTC4217(O,Y) |
| ! Q802 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON KTC4217(O,Y) |
| △Q803 | BZ510091 | TCA0042170 | TRANSISTOR,SILICON KTC4217(O,Y) |
| COILS & TRANSFORMERS | | | |
| L001 | BZ310136 | 021LA63R3K | COIL 3.3 UH |
| L401 | AD301644 | 021L75472J | COIL 4.7 MH |
| △L501 | AD301395 | 029T000104 | COIL,LINE FILTER 1R0A562F20 |
| △L503 | AE001529 | 028R200030 | COIL,DEGAUSS 8R200030 |
| T401 | BZ310157 | 045009003J | TRANS,HORIZONTAL DRIVE ETH09K14BZ |
| △T502 | AE001531 | 048129109S | TRANSFORMER,SWITCHING 8129109S |
| JACKS | | | |
| J702 | AE005633 | 060Q401112 | RCA JACK AV1-09AD-3 |
| J703 | AE005632 | 060Q401111 | RCA JACK AV1-09AD-4 |
| △J801 | BZ614434 | 066F120018 | SOCKET,CATHODE RAY TUBE ISMS01S |
| SWITCHES | | | |
| SW101 | BZ612010 | 0504101T34 | SWITCH,TACT EVQ21505R |
| SW102 | BZ612010 | 0504101T34 | SWITCH,TACT EVQ21505R |
| SW103 | BZ612010 | 0504101T34 | SWITCH,TACT EVQ21505R |
| SW104 | BZ612010 | 0504101T34 | SWITCH,TACT EVQ21505R |
| SW105 | BZ612010 | 0504101T34 | SWITCH,TACT EVQ21505R |
| P.C.BOARD ASSEMBLIES | | | |
| PCB010 | AE005641 | A3M218S010 | PCB ASS'Y CMD009A |
| PCB110 | AE005643 | A3M218S110 | PCB ASS'Y CCD004A |
| MISCELLANEOUS | | | |
| B502 | BZ310121 | 024HT03553 | CORE,BEADS W5RH3.5X5X1.0 |
| B503 | BZ310121 | 024HT03553 | CORE,BEADS W5RH3.5X5X1.0 |
| BT001 | AE005640 | 141R004016 | BATTERY,MANGAN GR03X-SP2 |
| BT002 | AE005640 | 141R004016 | BATTERY,MANGAN GR03X-SP2 |
| △CD501 | AE005639 | 1209414909 | CORD,AC BUSH 9414909 |
| CD801 | AE005637 | 06CH823004 | CORD,CONNECTOR CH823004 |
| CD802 | BZ614310 | WCL6844038 | FLAT CABLE AWM2468 A WG26 5C GRAY 440MM |
| CD803 | BZ614493 | WBL6032038 | FLAT CABLE AWM2468 A WG26 4C BLACK 320MM |
| △CP401 | BZ614303 | 069S450089 | CONNECTOR PCB SIDE A1561WV2-A5P |
| △CP502 | BZ614283 | 069S420110 | CONNECTOR PCB SIDE A1561WV2-2P |
| CP503 | BZ614016 | 069W01001A | CONNECTOR PCB SIDE 003P-2100 |
| CP601 | AE005634 | 069S260639 | CONNECTOR PCB SIDE A2001WR2-6P |
| CP801 | BZ614269 | 069S320010 | CONNECTOR PCB SIDE A2361WV2-2P |
| CD101A | AE005636 | 06C3013207 | CORD,CONNECTOR C3013207 |
| CD101B | AE005635 | 06C3013206 | CORD,CONNECTOR C3013206 |
| CP802A | BZ614276 | 067U005049 | WIRE HOLDER B2013H02-5P |
| CP802B | BZ614276 | 067U005049 | WIRE HOLDER B2013H02-5P |
| CP803A | BZ614334 | 067U004029 | WIRE HOLDER B2013H02-4P |

ELECTRICAL REPLACEMENT PARTS LIST

| Location No. | TSB P/N | Reference No. | Description |
|----------------------|----------|---------------|---------------------|
| MISCELLANEOUS | | | |
| CP803B | BZ614334 | 067U004029 | WIRE HOLDER |
| EL001 | BZ614043 | 124116281A | EYE LET |
| EL002 | BZ614044 | 124120301A | EYE LET |
| △F501 | AD302166 | 081PC04005 | FUSE |
| △FB401 | AE003283 | 043220061F | TRANSFORMER,FLYBACK |
| FH501 | AE002634 | 06710T0009 | HOLDER,FUSE |
| FH502 | AE002634 | 06710T0009 | HOLDER,FUSE |
| OS101 | AD301048 | 0773071001 | REMOTE RECEIVER |
| △SP1001 | AE005722 | 070Y132027 | SPEAKER |
| △TH501 | AD302000 | D8EE0B1400 | DEGAUSS ELEMENT |
| TM101 | AD301335 | 076N0EH020 | TRANSMITTER |
| △TU001 | AE006069 | 0163300018 | RF UNIT |
| △V801 | AE005638 | 098Y200495 | CRT W/DY |
| X601 | BZ613004 | 100CT3R505 | CRYSTAL |

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

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN