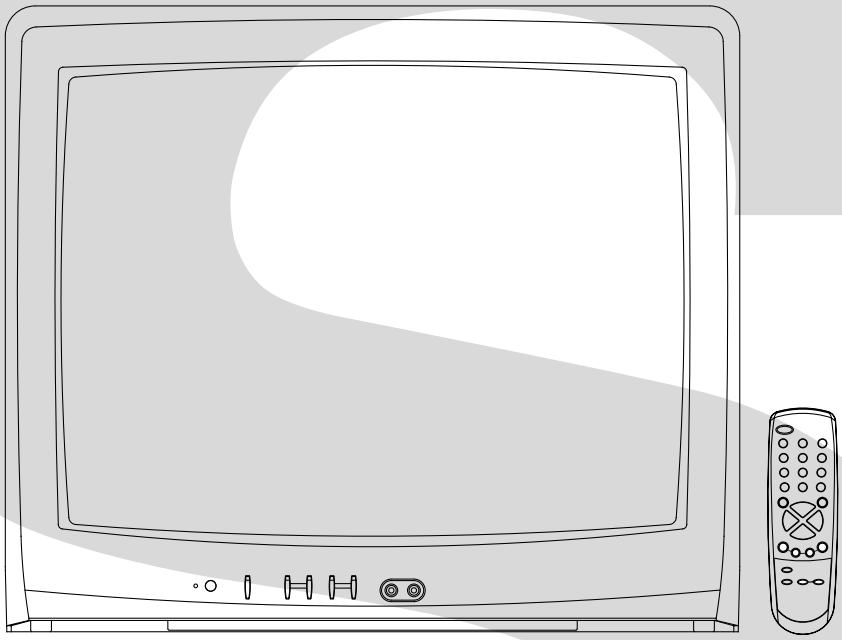
TOSHIBA

FILE NO. 050-200604GR
(MFR'S VERSION A)

SERVICE MANUAL

COLOR TELEVISION

20AS26



The above model is classified as a green product (*1), as indicated by the underlined serial number. This Service Manual describes replacement parts for the green product. When repairing this green product, use the part(s) described in this manual and lead-free solder (*2).

For (*1) and (*2), see the next page.

DOCUMENT CREATED IN JAPAN, January, 2006 GREEN

(*1) GREEN PRODUCT PROCUREMENT

The EC is actively promoting the WEEE & RoHS Directives that define standards for recycling and reuse of Waste Electrical and Electronic Equipment and for the Restriction of the use of certain Hazardous Substances. From July 1, 2006, the RoHS Directive will prohibit any marketing of new products containing the restricted substances.

Increasing attention is given to issues related to the global environmental. Toshiba Corporation recognizes environmental protection as a key management tasks, and is doing its utmost to enhance and improve the quality and scope of its environmental activities. In line with this, Toshiba proactively promotes Green Procurement, and seeks to purchase and use products, parts and materials that have low environmental impacts.

Green procurement of parts is not only confined to manufacture. The same green parts used in manufacture must also be used as replacement parts.

(*2) LEAD-FREE SOLDER

This product is manufactured using lead-free solder as a part of a movement within the consumer products industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

WARNING

This product is manufactured using lead free solder.

DO NOT USE LEAD BASED SOLDER TO REPAIR THIS PRODUCT !

The melting temperature of lead-free solder is higher than that of leaded solder by 86°F to 104°F (30°C to 40°C). Use of a soldering iron designed for lead-based solders to repair product made with lead-free solder may result in damage to the component and or PCB being soldered. Great care should be made to ensure high-quality soldering when servicing this product — especially when soldering large components, through-hole pins, and on PCBs — as the level of heat required to melt lead-free solder is high.

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
Headphone 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

When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Befor applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

TABLE OF CONTENTS

GENERAL SPECIFICATIONS

G-1	**TV System**	CRT	CRT Size / Visual Size	19 inch / 480.0mmV
			CRT Type	Normal
			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
			10%(Typical)	--- W
		NTSC3.58+4.43 /PAL60Hz		No
G-2	**Tuning System**	Broadcasting System		US System M
		Tuner and Receive CH	System	1Tuner
			Destination	USA(W/ CABLE)
			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	
				73 W at AC 120 V 60 Hz
			Stand by (at AC)	3 W at AC 120 V 60 Hz
			Per Year	-- kWh/Year
		Protector	Power Fuse	Yes
G-4	**Regulation**		Safety	UL
			Radiation	FCC
			X-Radiation	DHHS
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(CABLE)		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
			Step		10 Min
		On Timer	Program(On Timer)		Yes
		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
		CABLE		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/CABLE 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
				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	Material	Double/Brown
				Dimensions W x D x H(mm)	546 x 526 x 472
				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**		Environmental standard requirement (by buyer)		Green procurement of TOSHIBA
			Pb-free		Phase3(Phase3A)

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.

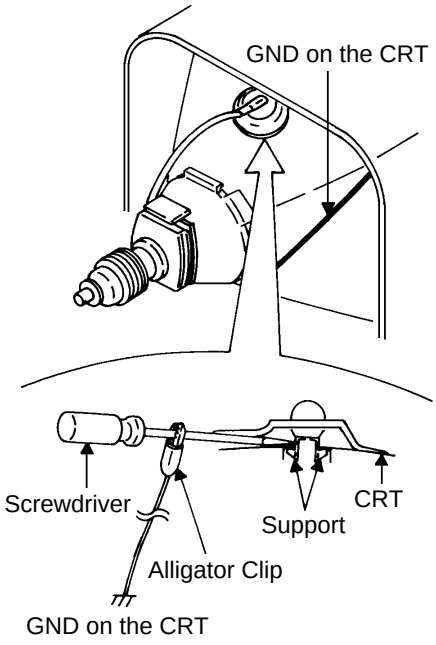


Fig. 1-1

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.)**

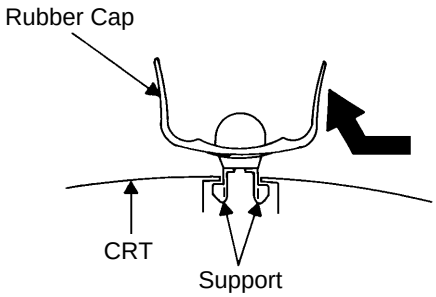


Fig. 1-2

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.)**

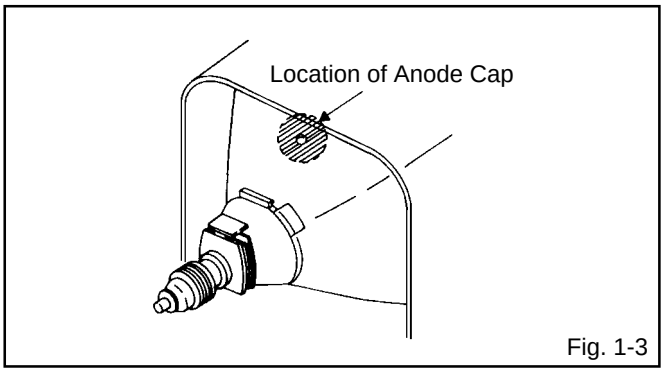


Fig. 1-3

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.)**

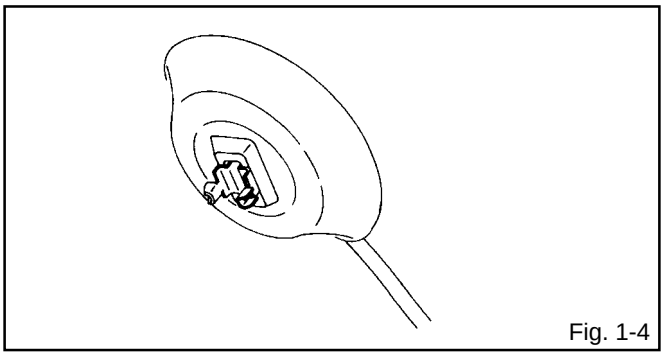


Fig. 1-4

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

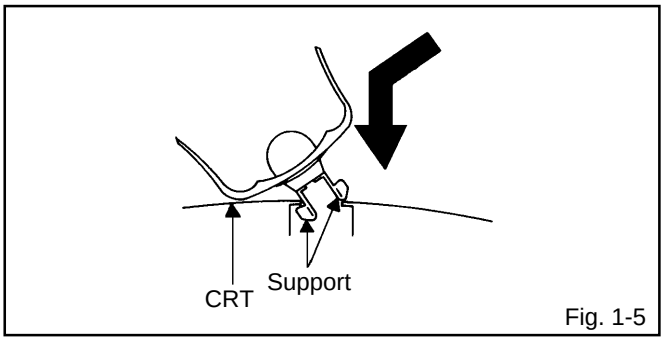


Fig. 1-5

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.

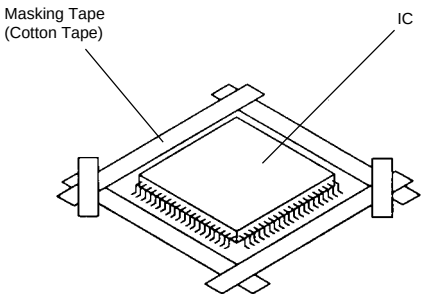


Fig. 2-1

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.

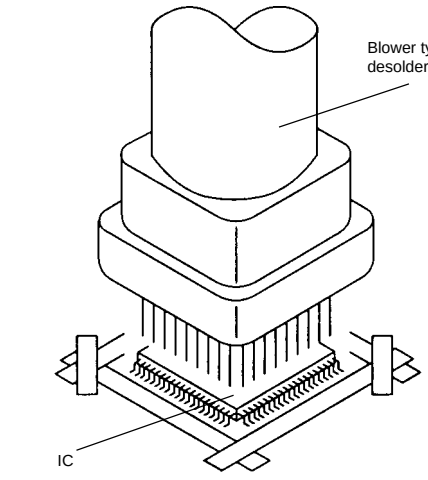


Fig. 2-2

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.

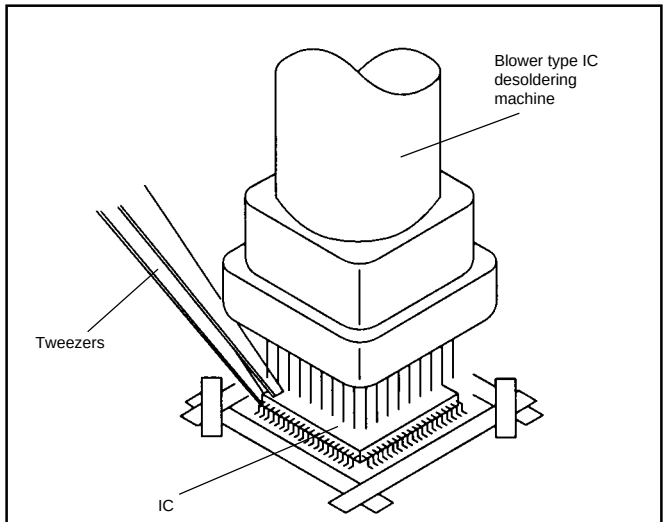


Fig. 2-3

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.

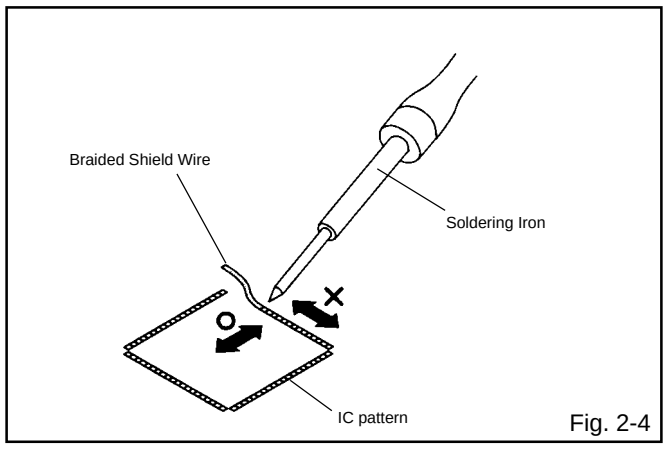


Fig. 2-4

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.)**

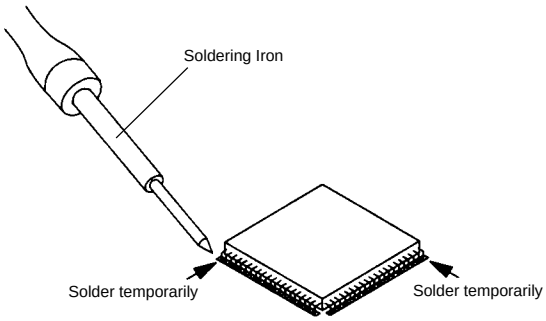


Fig. 2-5

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.)**

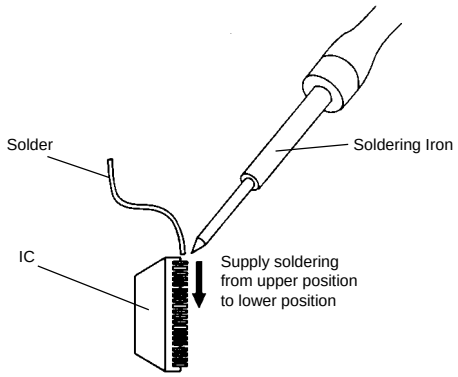


Fig. 2-6

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.

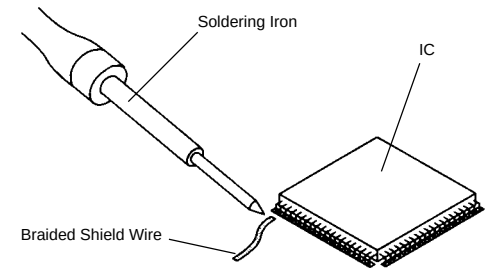


Fig. 2-7

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.)**

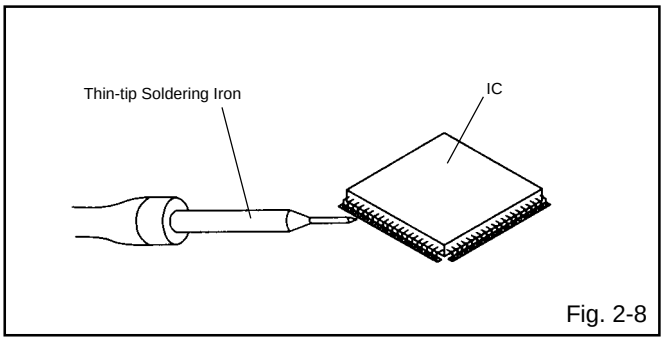


Fig. 2-8

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, always be sure to replace the IC in this case.

SERVICE MODE LIST

This unit is 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 factory data. NOTE: Do not use this for normal servicing. If you set 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 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.

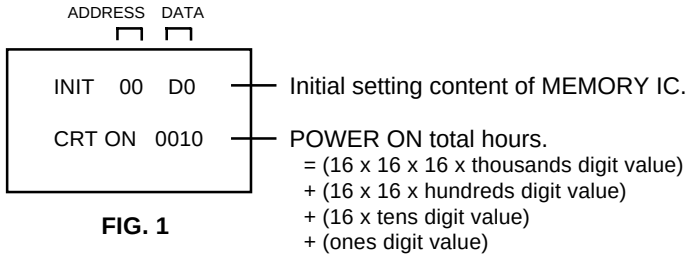


FIG. 1

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.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	D0	04	EB	4E	57	B3	24	69	39	00	00	05	90	D0	00	07

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key **(6)** on 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. While holding down VOLUME button on front cabinet, press key **(1)** on 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. 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 with a heat sink, apply the silicon grease on the contract 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**.

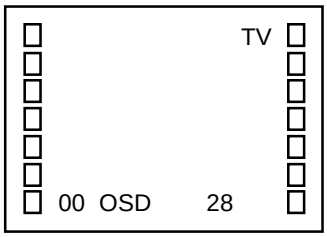


Fig. 1-1

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
04	H.VCO	18	CONTRAST MIN
05	H.PHASE	19	COLOR CENT
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	SEPARATION 1
13	BRIGHT CENT	27	SEPARATION 2
14	BRIGHT MAX	28	TEST MONO
15	BRIGHT MIN	29	TEST STEREO

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CUT OFF

1. Place the set in AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Place the set in Aging Test for more than 15 minutes.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
5. Adjust the **Screen Volume** until a dim raster is obtained.

2-2: FOCUS

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

2-3: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set in Aging Test for more than 15 minutes.
2. Receive the white 100% signal 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. Using the VOL. UP/DOWN button on the remote control, adjust the R.BIAS.
6. Press the CH. UP/DOWN button on the remote control to select the "R.DRIVE", "B.DRIVE", "G.BIAS" or "B.BIAS".
7. Using the VOL. UP/DOWN button on the remote control, adjust the R.DRIVE, B.DRIVE, G.BIAS or B.BIAS.
8. Perform the above adjustments 6 and 7 until the white color is achieved.

2-4: VERTICAL SIZE

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

ELECTRICAL ADJUSTMENTS

2-5: TINT

1. Receive the color bar pattern.(RF Input)
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. Receive the color bar pattern. (Audio Video Input)
6. Press the TV/AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

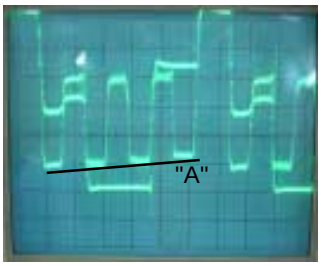


Fig. 2-1

2-6: COLOR CENT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color, and tint to normal position.
3. Connect the oscilloscope to **TP022**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(19)** on the remote control to select "COLOR CENT".
5. 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.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110 ± 10% of the white level. **(Refer to Fig. 2-2)**
7. Receive the color bar pattern. (Audio Video Input)
8. Press the TV/AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.
9. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 100 ± 10% of the white level. **(Refer to Fig. 2-2)**

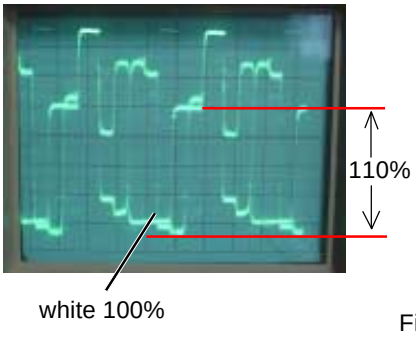


Fig. 2-2

2-7: HORIZONTAL PHASE

1. Receive the monoscope pattern from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H.PHASE".
3. 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: BRIGHT CENTER

1. Receive the monoscope pattern. (RF Input)
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRI.CENT".
3. Press the VOL. UP/DOWN button on the remote control until the white 7.5% is starting to be visible.
4. Receive the monoscope pattern. (Audio Video Input)
5. Press the TV/AV button on the remote to set to the AV mode. Then perform the above adjustment 2 and 3.

2-9: VERTICAL SHIFT

1. Receive the monoscope pattern from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V.SFT".
3. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

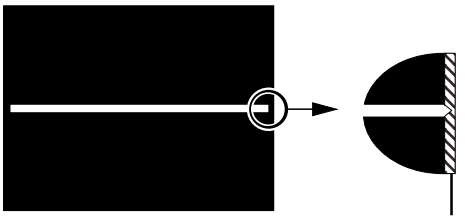


Fig. 2-3

2-10: OSD POSITION

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. 2-4)**

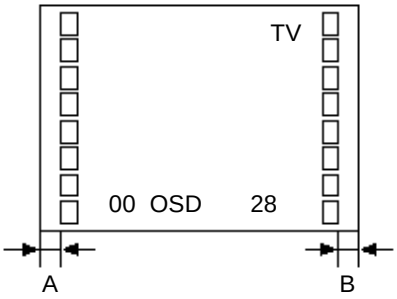


Fig. 2-4

ELECTRICAL ADJUSTMENTS

2-11: CONTRAST MAX

1. Receive the color bar pattern.(RF Input)
2. Activate the adjustment mode display of **Fig. 1-1** press the channel button **(17)** on the remote control to select "CONT.MAX".
3. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "70".
4. Receive the color bar pattern. (Audio Video Input)
5. Press the TV/AV button on the remote to set to the AV mode.
6. Activate the adjustment mode display of **Fig. 1-1** press the channel button **(17)** on the remote control to select "CONT.MAX".
7. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "77".

2-12: Confirmation of Fixed Value (Step No.)

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

NO.	FUNCTION	STEP NO.
04	H. VCO	04
14	BRIGHT MAX	183
15	BRIGHT MIN	60
16	CONT CENT	30
18	CONT MIN	17
20	COLOR MAX	74
21	COLOR MIN	00
23	SHARPNESS	45
24	FM LEVEL	00
25	LEVEL	00
26	SEPARTION1	00
27	SEPARTION2	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 colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

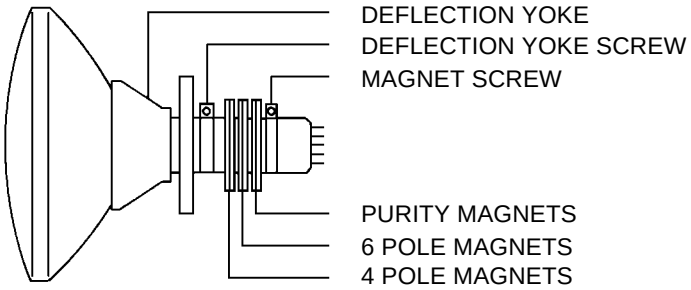


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

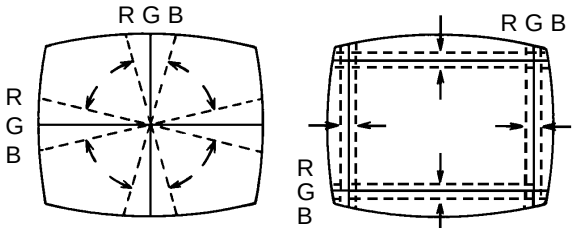
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

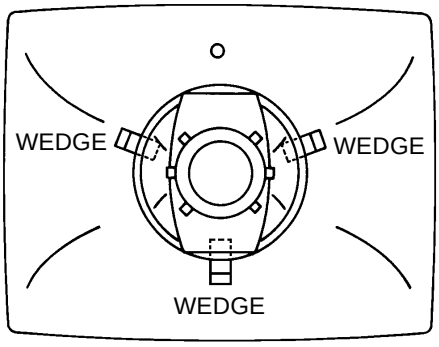
Adjust after performing adjustments in section 3-3.

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)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 3-2-a

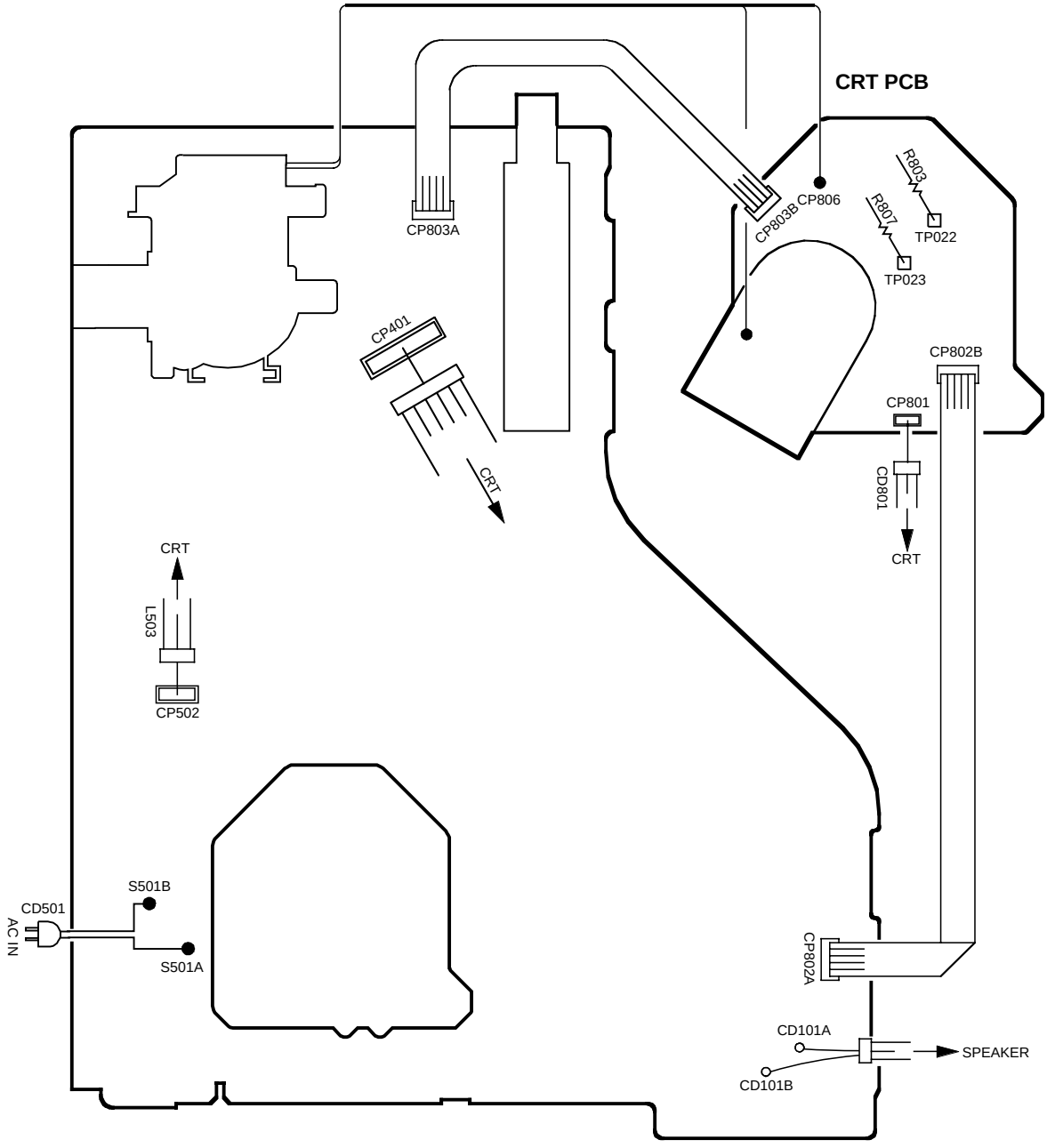


WEDGE POSITION

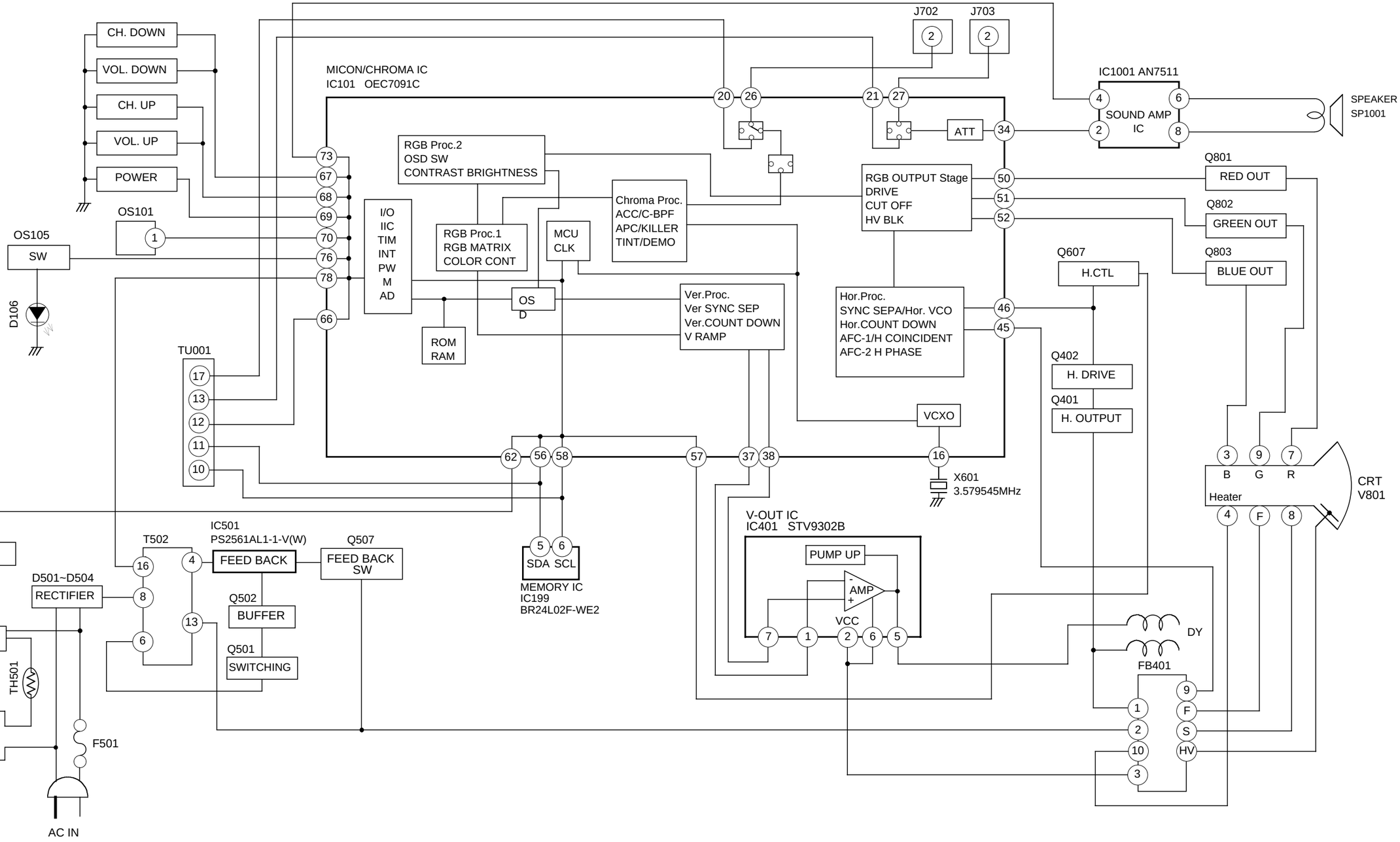
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

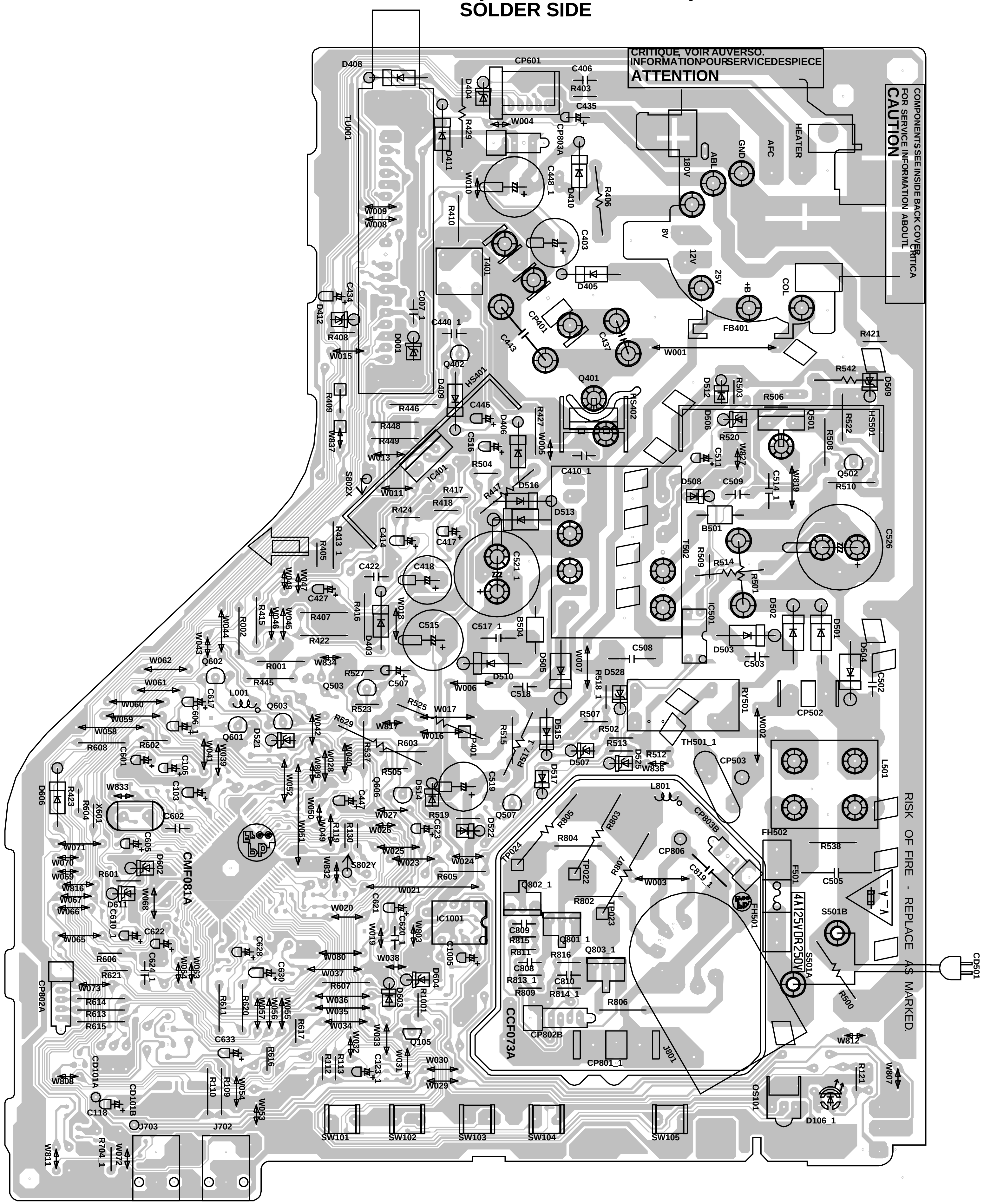
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



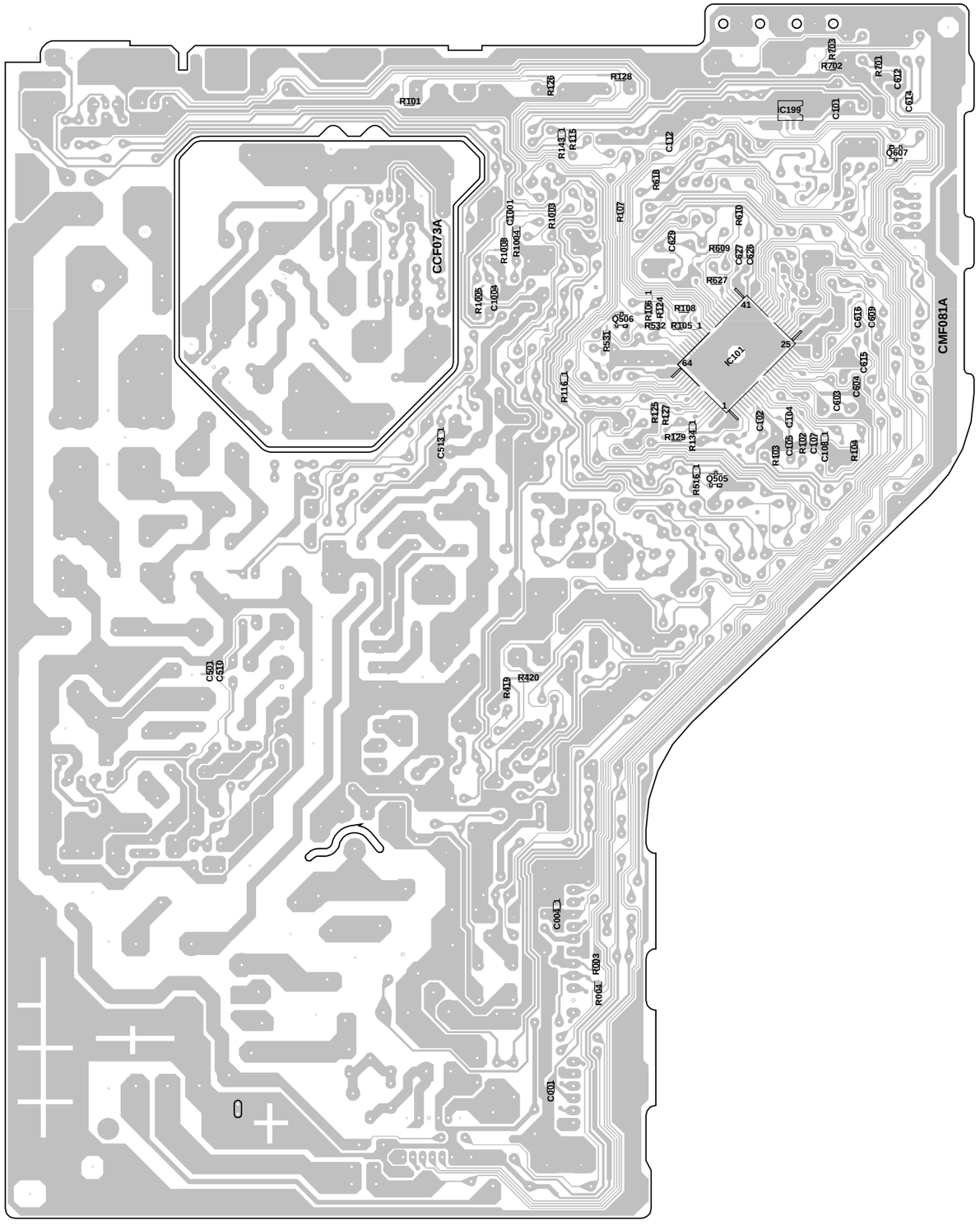
BLOCK DIAGRAM



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



PRINTED CIRCUIT BOARDS
MAIN (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	HLT	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

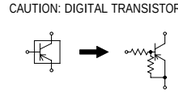
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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

CAUTION: DIGITAL TRANSISTOR



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'INCEIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE 4A 125V (F501).

4A 125V

SW Q506 2SC2412K 5.3 2.1 0

R532 10K

R532 2K

R531 10K

D517 1SS133

RY501 ALKS321

DEGAUSS COIL L503 8R200031

CP502 A1561WV2-2P

R600 2.7M 1/2W +-10%

TH501_1 B59203-S1060-B14

CP503 009P-2100

F501 4A125V

FH501 EYF-52BCY

FH502 EYF-52BCY

C505 0.33 ECQU(

R538 1.5M 1/2W

COIL,LINE FILTER L501 ELF15N010AP

D501 1N4005-EIC

D502 1N4005-EIC

D503 1N4005-EIC

D504 1N4005-EIC

C502 0.001 B

C503 0.001 B

R501 3.3 5W C

R514 0.22 1W

C526 220 200V YK

D509 MTZJ18B

R510 1.2M 1/2W

R522 1.2M 1/2W

T502 8129109S

AC120V_60Hz CD501 09414909 BLACK WHITE BLADE WIDE

SS01A

SS01B

B501 W5RH3.5X5X1.0

C514_1 2KV 820P RR

W819 0

POWER AMP Q501 2SK3563(ORION_Q)

R508 220 1/2W

C509 0.047 M

R520 12K 1/4W

W827 0

D508 1SS133

R509 220 1/4W

D512 1SS133

R503 100 1/4W

C511 50V 1 KA

D506 MTZJ18B

BUFFER Q502 KTC3198

R542 0.47 1W

R506 1K 1/4W

HS501 763WSAA029

C501 0.0082 B

C508 250V 0.0047 KX

C510 0.1 B

FEED BACK IC501 PS2561AL1-1-V(W)

R512 1K 1/4W

D528 MTZJ5.6B

R518_1 5.6K +-1%

D515 1SS133

D507 MTZJ2.2B

D525 MTZJ16B

R502 1K 1/4W

W838 0

R513 2.2K 1/4W

R515 120K 1/2W

C513_1 0.001 B

FEED BACK SWITCHING Q507 KTC3198

R519 1K 1/4W

R507 100 1/4W

D514 1SS133

D522 1SS133

D505 21DQ09N

C518 500V 470P B

R517_1 2.7 1W

C519 16V 1000 YK

D510 RU2AM-EIC

C517_1 2KV 820P RR

C521_1 200V 220 YXF

PROTECT DRIVE Q503 2SA1624

C507 100V 10 MHE

R523 47K 1/4W

R527 5.6K 1/4W

R525 1.5 2W

W834

P.FAIL Q505 2SA1037AK

D516 1N4937-PAN

R504 100 1/4W

D513 21DQ09N

C515 16V 1000 YK

C516 50V 10 YK

R505 1K 1/4W

D521 MTZJ10B-EIC

R516_1 10K

R537 100K 1/4W

B504 W5RH3.5X5X1.0

TO SOUND/AV

GND

SOUND+B

SOUND_GND

FROM/TO DEFLECTION/CRT

+B

UNREG+12V

P.CON+B

GND

FROM/TO MICON/CHROMA/TUNER

POWER_FAIL

DEGAUSS_H

X-RAY

UNREG+12V

AT+5V

GND

PCB070
CMF081

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

DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)

FROM MICON/CHROMA/TUNER

CLAMP
G.OUT
R.OUT
B.OUT

CP802A B2013H02-5P: GND 1, CLAMP 2, G.OUT 3, R.OUT 4, B.OUT 5

CP802B B2013H02-5P: 1 GND, 2 CLAMP, 3 G.OUT, 4 R.OUT, 5 B.OUT

CP803A B2013H02-4P: HEATER 1, GND 2, NC 3, 180V 4

CP803B B2013H02-4P: 1 HEATER, 2 GND, 3 NC, 4 180V

CP801_1 A2361WV2-2P: 1, 2

V-OUT IC IC401 STV9302B

THERMAL PROTECTION, PUMP UP, AMP

1 3.5 | 2 25.0 | 3 2.0 | 4 0 | 5 12.0 | 6 25.0 | 7 3.5

C414 35V 100 YK

R423 100 1/4W

R424 6.8K 1/4W

D403 1N4002-PAN

R418 22K 1/4W

R420 4.7K

R417 8.2K 1/4W

R419 680

C417 50V 22 YK

C418 25V 470 YK

C422 100V 0.15 MKT

R410 330 1/2W

R415 1.8K 1/2W

R416 1 1/2W

R407 3.9 1/2W

R422 3.9 1/2W

R413_1 2.2K 1/2W

C427 50V 10 YK

HS401 763WSAA029

TO DY

CP401 A1561WV2-A5P

R429 3.9 1W

D411 AU02A-EIC

C434 100V 22 YK

R408 10K +-1%

C447 50V 1 YK

D412 MTZJ5.1B

R409 56K +-1%

W837

FROM/TO MICON//CHROMA/TUNER

X-RAY
P.CON+B

T401 STP-03Q24

C437 250V 0.33 PMS

GND
V_FEEDBACK
V_OUT
ABCL
H_OUT
H_SYNC

H.DRIVE Q402 2SC1627_Y

R446 470 1/2W

C446 50V 22 YK

R405 1K 1/4W

C440_1 500V 0.0012 B

C410_1 0.001 CH

R427 100 1/4W

H.OUTPUT Q401 2SC5885

C443 1.25KV 0.0072 PHE

HS402 763WSA0043

FB401 FQI20B103_M

130.0 COL, 132.5 VIDEO, 132.5 B+, 48.0 AFC, 7.0 HEATER, 0 GND, NC E12, 25.0 E25

HV, F, S, GND 0, ABL 4.3, GND 0, E8 NC

FROM/TO TV POWER

GND

TP401

W817

+B

P.CON+B

R403 10K 1/4W

C406 500V 220P B

R406 1 1W

D404 MTZJ6.2B

R447 150 2W

UNREG+12V

D406 1N4002-PAN

D409 11E1-EIC

D405 1N4937-PAN

D410 AU02A-EIC

R449 680 1/2W

R448 680 1/2W

R445 150K 1/4W

C403 35V 470 YK

C448_1 250V 22 YK

C435 100V 0.1 MHE

R421 220K 1/4W

D408 1N4002-PAN

PCB070 CMF081

CD801 CH823004

V801 A48AKH13X04J

R, G, B

L801 100UH

R809 4.7K 1/4W

R811 4.7K 1/4W

R814_1 4.7K 1/4W

RED OUT Q801_1 KTC4217

GREEN OUT Q802_1 KTC4217

BLUE OUT Q803_1 KTC4217

3.2 / 2.7 / 128.0 | 126.0 | 120.5

C808 390P B

R813_1 330 1/4W

C809 390P B

R815 330 1/4W

C810 390P B

R816 330 1/4W

TP022 TP024 TP023

R803 12K 2W

R802 2.7K 1/4W

R805 12K 2W

R804 2.7K 1/4W

R807 12K 2W

R806 2.7K 1/4W

FOCUS
CP806
SCREEN

C819_1 2KV 0.001 B

J801 ISMP01S

96.4 / 101.6 / 0 / 6.4 / 99.6

PCB110 CCF073

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.

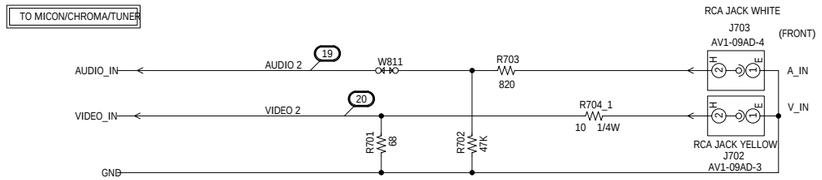
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

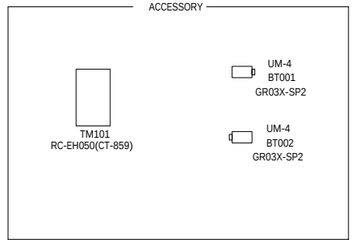
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

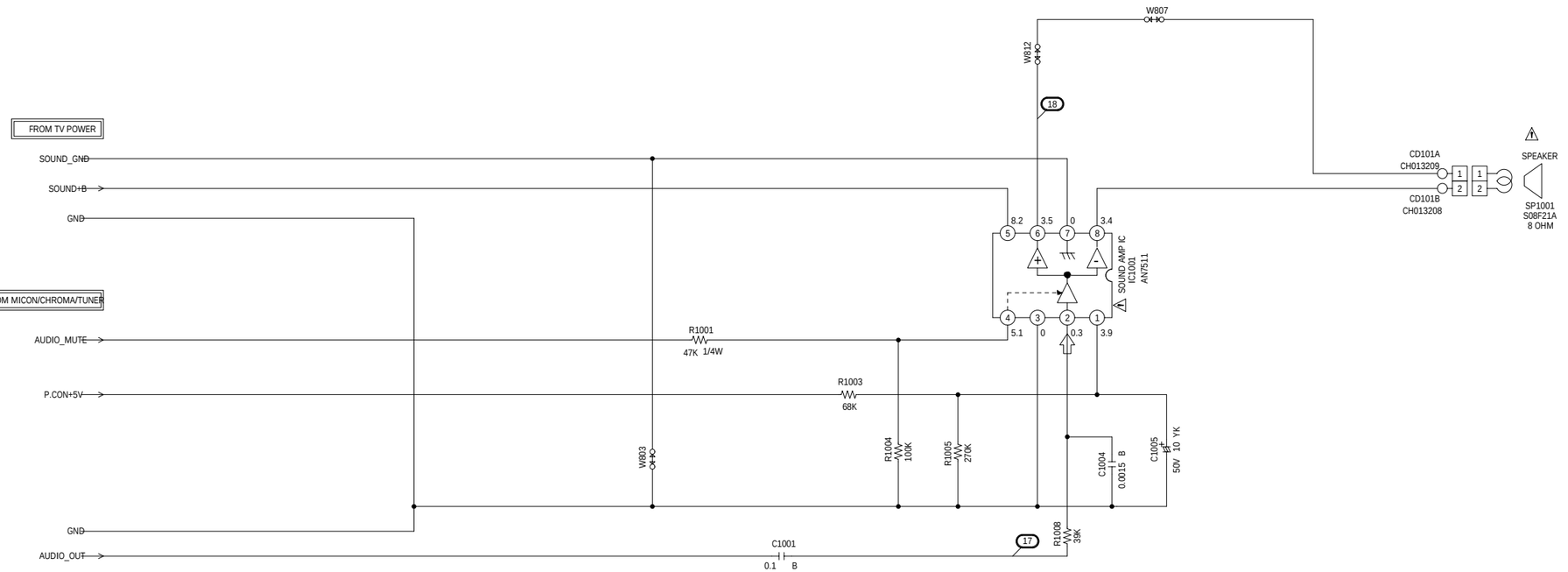
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

SOUND/AV SCHEMATIC DIAGRAM

(MAIN PCB)







PCB070
CMF081

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

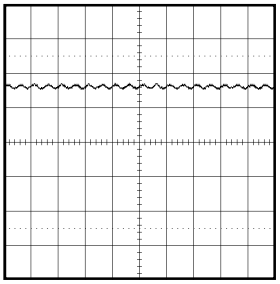
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

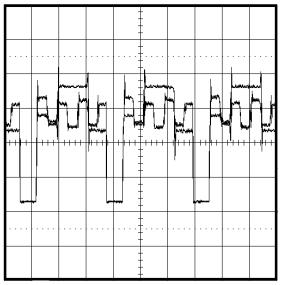
ATTENTION LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

WAVEFORMS

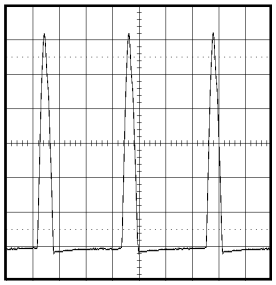
MICON/CHROMA/TUNER



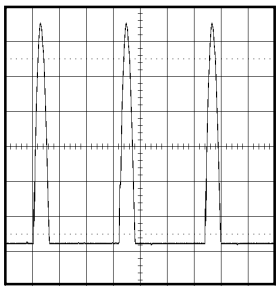
① 0.5V 2ms/div



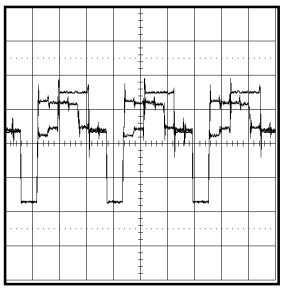
⑥ 1V 20µs/div



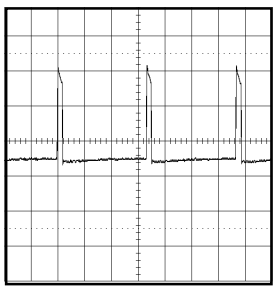
⑪ 200V 20µs/div



② 20V 20µs/div

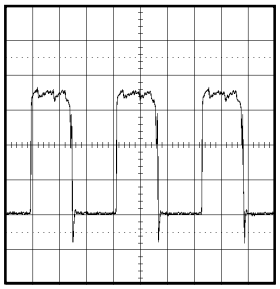


⑦ 1V 20µs/div

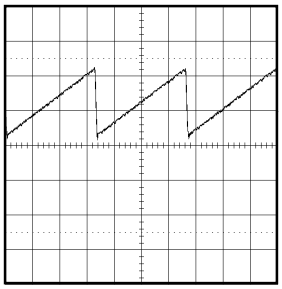


⑫ 10V 5ms/div

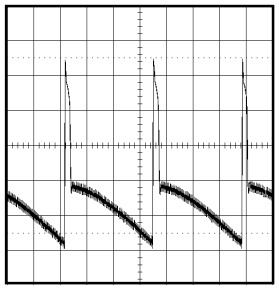
DEFLECTION/CRT



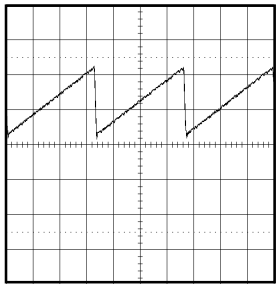
③ 200mV 20µs/div



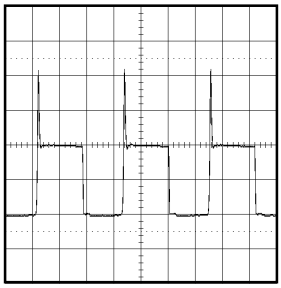
⑧ 0.5V 5ms/div



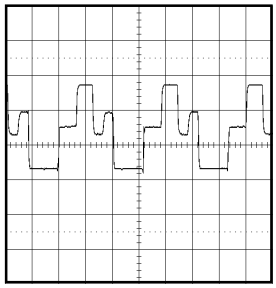
⑬ 10V 5ms/div



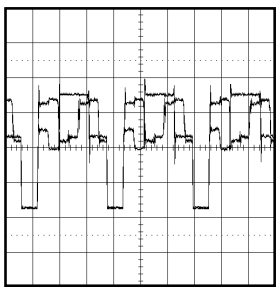
④ 0.5V 5ms/div



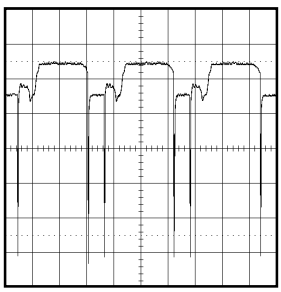
⑨ 20V 20µs/div



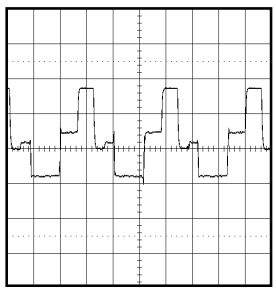
⑭ 50V 20µs/div



⑤ 1V 20µs/div



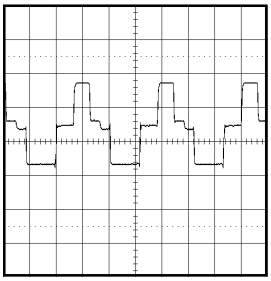
⑩ 2V 20µs/div



⑮ 50V 20µs/div

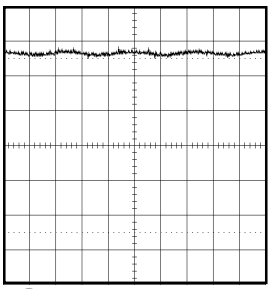
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

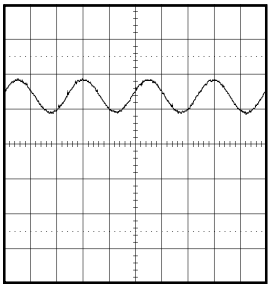


⑯ 50V 20µs/div

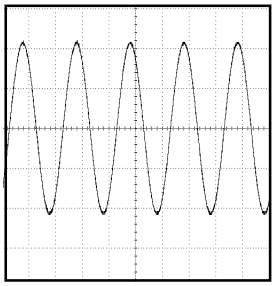
SOUND/AV



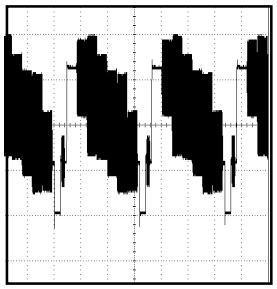
⑰ 0.5V 1ms/div



⑱ 1V 1ms/div



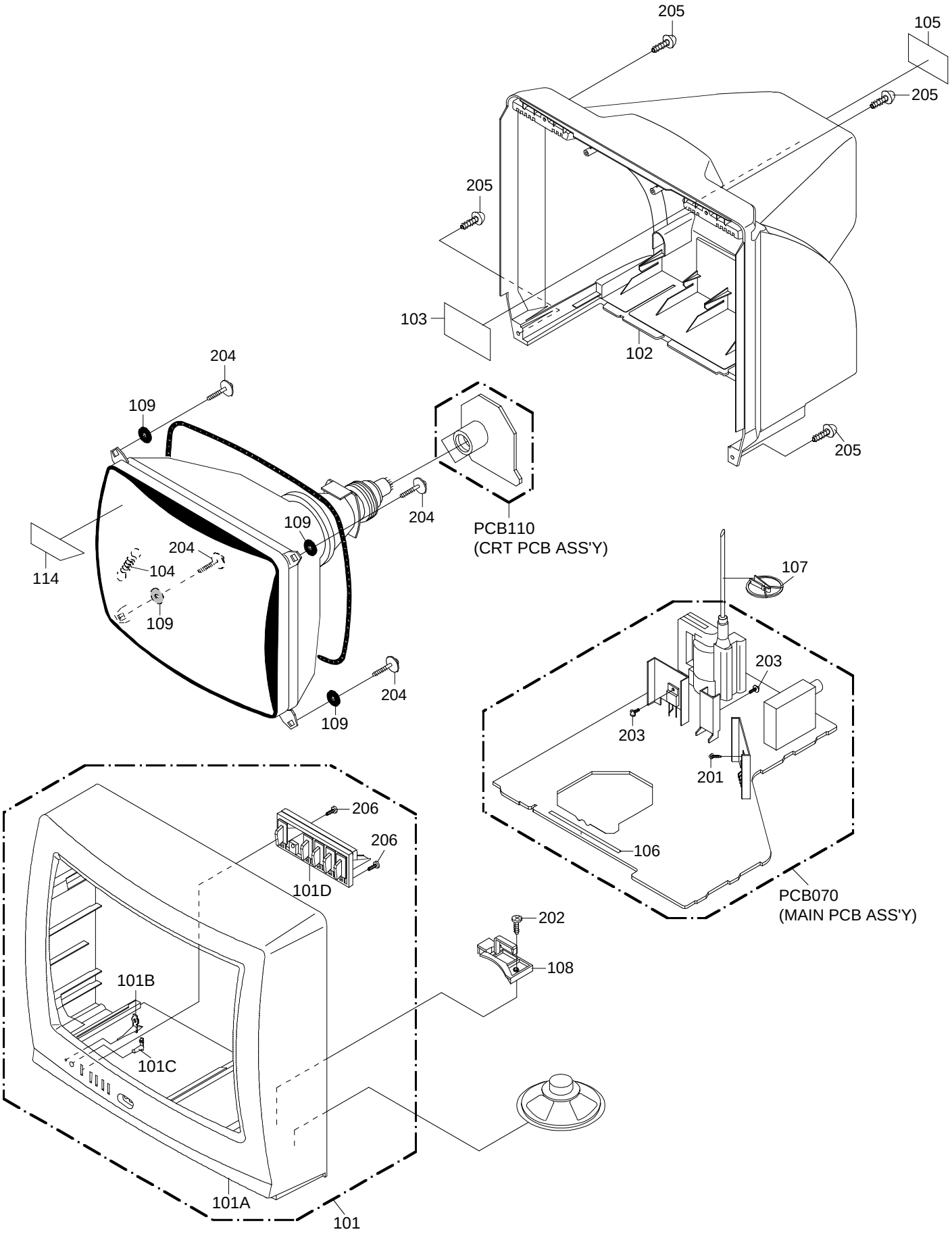
⑲ 200mV 500µs/div



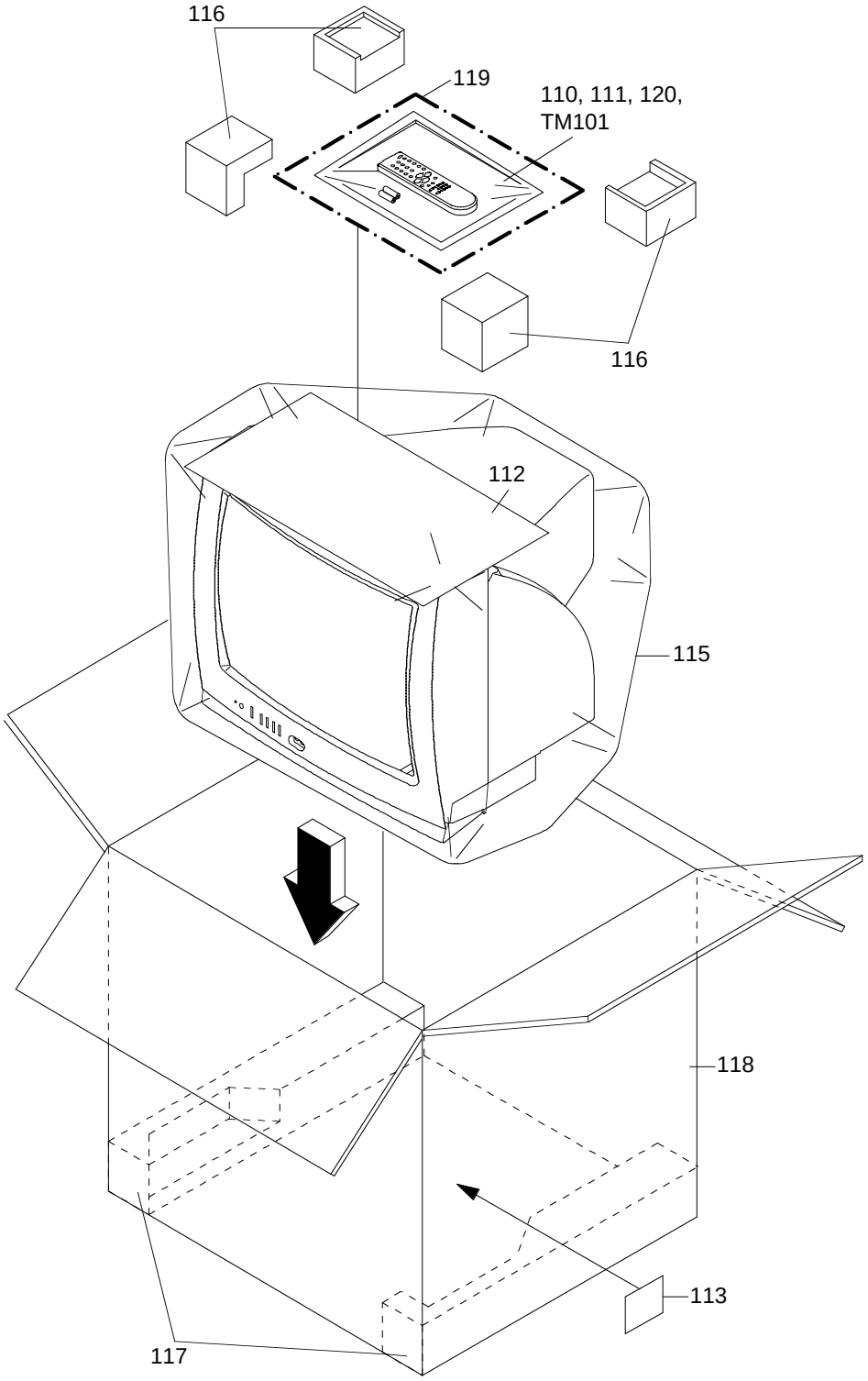
⑳ 500mV 20µs/div

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	72795617	7A701A420A	FRONT CABI ASS'Y
101A	72795585	701WPJD025	CABINET FRONT
101B	72795615	713WPAA046	GLASS LED
101C	72795613	713WPAA050	GUIDE REMOCON
101D	72795588	735WPBA980	BUTTON FRAME
102	72783496	A3X303Q740	CABINET,BACK ASSY
103	72783474	726000A032	SHEET CRT SERVICEMAN
104	72795687	741WUA0021	SPRING EARTH
105	72783497	722549A583	SHEET RATING
106	72795622	800WQ0A110	FELT SHEET
107	72794734	899HV3T000	HOLDER ANODE WIRE
108	72795611	735WPAA938	HOLDER SPEAKER
109	72783235	800WR0A010	SHEET CRT SUPPORT (D)
110	72783498	J3X30302A	GUARANTEE CARD
111	72783499	J3X30321A	INSTRUCTION BOOK(E/S)
112	72795703	791WHAA134	LIGHTRON SHEET
113	72783500	723000D286	SHEET BARCODE
114	72799617	723000C778	FILM DECORATION
115	72795621	791WHAA126	FILM BAG
116	72783479	792WHAA204	PACKAGE TOP
117	72798723	792WHAA055	PACKAGE BOTTOM
118	72783501	793WCDD104	GIFT BOX
119	72783502	A3X303Q975	INSTRUCTION BOOK KIT
120	72783478	JB5ND200	POLYBAG INSTRUCTION(RED CAUTION)
201	72798786	810763080U	SCREW TAP TITE(S) BRAZIER 3*8 CH
202	72798791	8110630A0U	SCREW TAP TITE(P) BRAZIER 3*10 CH
203	72781255	8109I3080U	SCREW TAP TITE(B) WH7 3*8 CH
204	72781294	8160H50B8U	SCREW TAP TITE(P) W5*28CH FLAT
205	72781279	8117540A6U	SCREW TAP TITE(B0) TRUSS 4*16 CH
206	72781272	8110630A2U	SCREW TAP TITE(P) BRAZIER 3*12 CH

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		RESISTORS		
R406	72781668	R3K181010J	R,METAL	1 OHM 1W
⚠R407	72797796	R002T23R9J	RC	3.9 OHM 1/2W
⚠R408	72796016	R4X5T6103F	R,METAL	10K OHM 1/6W
⚠R409	72797966	R4X5T6563F	R,METAL	56K OHM 1/6W
⚠R429	72795521	R638813R9J	R,FUSE	3.9 OHM 1W
⚠R447	72781689	R3K58A151J	R,METAL OXIDE	150 OHM 2W
⚠R500	72794631	R0G3K2275K	RC	2.7M OHM 1/2W
⚠R501	72795522	R5X2CD3R3J	R,CEMENT	3.3 OHM 5W
⚠R514	72794633	R63881R22J	R,FUSE	0.22 OHM 1W
⚠R517	72797849	R3X1812R7J	R,METAL OXIDE	2.7 OHM 1W
⚠R518	72795514	R4X5T6562F	R,METAL	5.6K OHM 1/6W
⚠R525	72797898	R3X28A010J	R,METAL OXIDE	1 OHM 2W
⚠R538	72795500	R002T2155J	RC	1.5M OHM 1/2W
⚠R542	72781684	R3K581R47J	R,METAL OXIDE	0.47 OHM 1W
⚠R629	72781701	R3K58B220J	R,METAL OXIDE	22 OHM 3W
⚠R803	72781688	R3K58A123J	R,METAL OXIDE	12K OHM 2W
⚠R805	72781688	R3K58A123J	R,METAL OXIDE	12K OHM 2W
⚠R807	72781688	R3K58A123J	R,METAL OXIDE	12K OHM 2W
		CAPACITORS		
⚠C418	72795628	E02LT3471M	CE	470 UF 25V
⚠C434	72794396	E02LU8220M	CE	22 UF 100V
C437	72795565	P4J7F3334J	CMPP	0.33 UF 250V PMS
⚠C443	72783482	P4G8FJ722H	CMPP	0.0072UF 1.25KV PHE
⚠C446	72794379	E02LU5220M	CE	22 UF 50V
⚠C447	72794416	E02LU5010M	CE	1 UF 50V
C448	72796351	E02LTD220M	CE	22 UF 250V
⚠C503	72795629	C0JTB0513K	CC	0.001 UF 500V B
⚠C505	72794401	P2122B334M	CMP	0.33 UF 275V ECQUL
⚠C508	72795579	CD39E0MQ3M	CC	0.0047UF 250V
⚠C514	72795580	C0PLRR7W2K	CC	820 PF 2KV RR
⚠C515	72794425	E02LT2102M	CE	1000 UF 16V
⚠C517	72795580	C0PLRR7W2K	CC	820 PF 2KV RR
⚠C518	72796329	C0JTB05Q2K	CC	470 PF 500V B
⚠C519	72794425	E02LT2102M	CE	1000 UF 16V
⚠C521	72794411	E62NFC221M	CE	220 UF 200V
⚠C526	72797379	E02LFC221M	CE	220 UF 200V
C819	72795578	C0JBB0713K	CC	0.001 UF 2KV B
		DIODES		
D001	72794465	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D106	72795529	0021721150	LED	SLR-342VCT32
D403	72783209	D2MXN40020	DIODE,FAST RECOVERY	1N4002-PAN
D404	72794490	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
⚠D405	72795543	D2MXN49370	DIODE,FAST RECOVERY	1N4937-PAN
D406	72783209	D2MXN40020	DIODE,FAST RECOVERY	1N4002-PAN
D408	72783209	D2MXN40020	DIODE,FAST RECOVERY	1N4002-PAN
D409	72794488	D2WT011E10	DIODE,SILICON	11E1-EIC
⚠D410	72794472	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠D411	72794472	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠D412	72794469	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
⚠D501	72795626	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D502	72795626	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D503	72795626	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D504	72795626	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D505	72794480	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D506	72795541	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D507	72794468	D97U02R21B	DIODE,ZENER	MTZJ2.2B T-77
D508	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D509	72795541	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠D510	72795545	D2WXRU2AM0	DIODE,SILICON	RU2AM-EIC
⚠D512	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D513	72794480	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D514	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D515	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D516	72795543	D2MXN49370	DIODE,FAST RECOVERY	1N4937-PAN
D517	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D521	72783210	D9WU01002B	DIODE,ZENER	MTZJ10B-EIC
D522	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D525	72797336	D97U03R61B	DIODE,ZENER	MTZJ3.6B T-77
D528	72794489	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D602	72794481	D97U09R11B	DIODE,ZENER	MTZJ9.1B T-77
D603	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D604	72794486	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D606	72794488	D2WT011E10	DIODE,SILICON	11E1-EIC
D611	72794487	D97U01201B	DIODE,ZENER	MTZJ12B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		ICS		
IC101	72795532	I56F07091C	IC	OEC7091C
IC199	72783483	A3X301Q075	INIT DATA	BR24L02F-WE2
⚠IC401	72783444	I0WTD9302B	IC	STV9302B
⚠IC501	72794512	000220002W	PHOTO COUPLER	PS2561AL1-1-V(W)
⚠IC1001	72795537	I01DP75110	IC	
		TRANSISTORS		
Q105	72795555	TPATB03003	COMPOUND TRANSISTOR	KRA102MAT
⚠Q401	72782813	TC1G058850	TRANSISTOR,SILICON	2SC5885
⚠Q402	72795480	TC5T01627Y	TRANSISTOR,SILICON	2SC1627_Y(TPE2)
⚠Q501	72795539	T25F035630	FET	2SK3563(ORION_Q)
⚠Q502	72794577	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠Q503	72794569	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
Q505	72795970	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q506	72794560	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q507	72794577	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q601	72795476	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q602	72795476	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q603	72795476	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q606	72795476	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q607	72794560	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
⚠Q801	72794574	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q802	72794574	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q803	72794574	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
		COILS &TRANSFORMERS		
L001	72796518	02167F3R3J	COIL	3.3 UH
⚠L501	72798941	0293000130	COIL,LINE FILTER	ELF15N010AP
⚠L503	72783484	028R200031	COIL,DEGAUSS	8R200031
L801	72795941	021673101K	COIL	100 UH
T401	72796466	045011001L	TRANS,HORIZONTAL DRIVE	STP-03Q24
⚠T502	72795483	048129109S	TRANSFORMER,SWITCHING	8129109S
		JACKS		
J702	72795495	060Q401112	RCA JACK	AV1-09AD-3
J703	72795494	060Q401111	RCA JACK	AV1-09AD-4
⚠J801	72783271	066F120020	SOCKET,CATHODE RAY TUBE	ISMP01S
		SWITCHES		
SW101	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW102	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW103	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW104	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW105	72794688	0504101T34	SWITCH,TACT	EVQ21505R
		P.C.BOARD ASSEMBLIES		
PCB070	72783485	A3X301Q070L	PCB ASS'Y	CMF081A
PCB110	72783486	A3X301Q110L	PCB ASS'Y	CCF073A
		MISCELLANEOUS		
B501	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B504	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
BT001	72799278	141R004016	BATTERY,MANGAN	GR03X-SP2
BT002	72799278	141R004016	BATTERY,MANGAN	GR03X-SP2
⚠CD501	72795554	1209414909	CORD,AC BUSH	9414909
CD801	72794460	06CH823004	CORD,CONNECTOR	CH823004
⚠CP401	72796822	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P
⚠CP502	72796821	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP503	72796825	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP601	72799047	069S260639	CONNECTOR PCB SIDE	A2001WR2-6P
CP801	72796816	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CD101A	72783487	06CH013209	CORD,CONNECTOR	CH013209
CD101B	72783488	06CH013208	CORD,CONNECTOR	CH013208
CP802A	72796751	067U005049	WIRE HOLDER	B2013H02-5P
CP802B	72796751	067U005049	WIRE HOLDER	B2013H02-5P
CP803A	72796750	067U004029	WIRE HOLDER	B2013H02-4P
CP803B	72796750	067U004029	WIRE HOLDER	B2013H02-4P
EL001	72797070	124120301A	EYE LET	XRY20X30BD
EL002	72797069	124116281A	EYE LET	XRY16X28BD
⚠F501	72795538	081PC04005	FUSE	51MS040L
⚠FB401	72795484	043220061F	TRANSFORMER,FLYBACK	FQI20B103_M
FH501	72794496	06710T0009	HOLDER,FUSE	EYF-52BCY
FH502	72794496	06710T0009	HOLDER,FUSE	EYF-52BCY
OS101	72783489	077A000027	REMOTE RECEIVER	ROM-V3138SY
⚠RY501	72796047	0560V20115	RELAY	ALKS321
S101	72798397	WBL6034038	FLAT CABLE AWM2468 A	WG26 4C BLACK 340MM
S102	72798402	WCL6848038	FLAT CABLE AWM2468 A	WG26 5C GRAY 480MM
⚠SP1001	72795488	070Y132027	SPEAKER	S08F21A
⚠TH501	72794693	D8EE0B1400	DEGAUSS ELEMENT	B59203-S1060-B14
TM101	72795473	076N0EH050	TRANSMITTER	RC-EH050(CT-859)
⚠TU001	72783421	0163300022	RF UNIT	115-V-KA35ARH

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		MISCELLANEOUS		
⚠V801	72796978	098Q200491	CRT W/DY	A48AKH13X04J
X601	72783450	100BT3R537	CRYSTAL	HC-49U

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