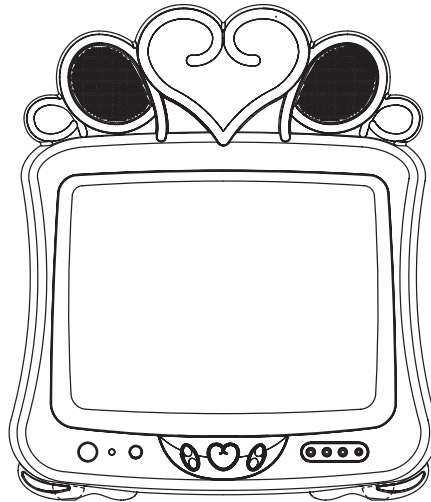




DT1350-P

SERVICE MANUAL

COLOR TELEVISION RECEIVER



**ORIGINAL
MFR'S VERSION A**

Design and specifications are subject to change without notice.

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 $\triangle$ mark, the designated parts must be used.

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

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

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

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

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

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

(INSULATION CHECK PROCEDURE)

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

[Note 1]

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

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

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

1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.

When replacing an IC's or transistors, use only specified silicon grease (YG6260M).

Remove all old silicon before applying new silicon.

CONTENTS

SERVICING NOTICES ON CHECKING	A1-1
HOW TO ORDER PARTS	A1-1
IMPORTANT	A1-1
CONTENTS	A2-1
GENERAL SPECIFICATIONS	A3-1~A3-4
DISASSEMBLY INSTRUCTIONS	
1. REMOVAL OF ANODE CAP	B1-1
2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC	B2-1, B2-2
SERVICE MODE LIST	C-1
CONFIRMATION OF HOURS USED	C-1
WHEN REPLACING EEPROM (MEMORY) IC	C-1
ELECTRICAL ADJUSTMENTS	D-1~D-5
BLOCK DIAGRAM	E-1, E-2
PRINTED CIRCUIT BOARDS	
MAIN/CRT/OPERATION/JACK1/JACK2	F-1~F-4
SCHEMATIC DIAGRAMS	
MICON/TUNER	G-1, G-2
CHROMA	G-3, G-4
TV POWER	G-5, G-6
DEFLECTION/CRT	G-7, G-8
SOUND/AV	G-9, G-10
WAVEFORMS	H-1, H-2
MECHANICAL EXPLODED VIEW	I-1
MECHANICAL REPLACEMENT PARTS LIST	J1-1
ELECTRICAL REPLACEMENT PARTS LIST	J2-1, J2-2

GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size		13 inch / 335.4mmV		
		System	CRT Type		Normal		
			Deflection		90 degree		
			Magnetic Field	BV/BH	+0.45G/0.18G		
			Color System		NTSC		
			Speaker	2Speaker			
				Position		Ext	
				Size	3 Inch		
			Impedance	8 ohm			
		Sound Output	MAX	0.5+0.5 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/ 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			
		Preset CH			No		
StereoTV Sound (Ext Audio Input Only)			Yes				
Tuner Sound Muting			Yes				
G-3	Power	Power Source	AC	120V AC 60Hz			
			DC				
		Power Consumption	at AC		<u>54 W at AC 120 V 60 Hz</u>		
			Stand by (at AC)	Per Year	<u>5 W at AC 120 V 60 Hz</u>		
				<u>-- kWh/Year</u>			
		Protector	Power Fuse	Yes			
Safety Circuit	Yes						
IC Protector(Micro Fuse)			No				
G-4	Regulation	Safety	UL / CSA				
		Radiation	FCC / IC				
		X-Radiation	DHHS / HWC				
G-5	Temperature	Operation	+5°C ~ +40°C				
		Storage	-20°C ~ +60°C				
G-6	Operating Humidity						
G-7	On Screen Display	Menu	Yes				
		Menu Type	Disney Charecter				
			Picture	Yes			
		Contrast	Yes				
			Brightness	Yes			
				Color	Yes		
					Tint	Yes	
					Sharpness	Yes	
					Reset	Yes	
					Audio	No	
		Bass	No				
		Treble	No				
		Balance	No				
		BBE On/Off	No				
		Stable Sound On/Off	No				
		CH Set Up	Yes				
			TV/CATV	Yes			
			Auto CH Memory	Yes			
		Add/ Delete	Yes				
		Language	Yes				
		V-chip	Yes				
		CH Label	No				
			Favorite CH	No			
			Color Stream DVD/DTV	No			
		CAPTION	Yes				
		Control Level	Yes				
			Sound	Yes			
			Brightness	Yes			
			Contrast	Yes			
			Color	Yes			
Tint	Yes						
Sharpness	Yes						
Tuning	No						
Bass	No						
Treble	No						
Balance	No						
Back Light	No						

GENERAL SPECIFICATIONS

		Stereo,Audio Output,SAP		No
		Video		Yes
		Color Stream		No
		Channel(TV/Cable)		Yes
		CH Label		No
		Sleep Timer		Yes
		Sound Mute		Yes
		V-chip Rating		Yes
G-8	OSD Language			English French Spanish
G-9	Clock and Timer	Sleep Timer	Max Time	120 Min
			Step	10 Min
		On/Off Timer	Program(On Timer / Off Timer)	No
		Wake Up Timer		No
		Timer Back-up (at Power Off Mode)	more than	-- Min Sec
G-10	Remote Control	Unit		RC-3K
		Glow in Dark Remocon		No
		Format		NEC
		Custom Code		86-05 h
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		23 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	No
			Menu	Yes
			Enter	No
			Mute	Yes
			Exit	No
			MTS(Audio Select)	No
			Set +	No
			Set -	No
		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
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

GENERAL SPECIFICATIONS

		CH Allocation		No		
		StereoTV Sound (Ext Audio Input Only)		Yes		
		Channel Lock		No		
		Just Clock Function		No		
		Game Position		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		
		Energy Star		No		
		Power On Memory		Yes		
		Favorite CH		No		
G-12	Accessories	Owner's Manual	Language	English	Spanish	French
			w/Guarantee Card	No		
			Buyer Model No.	DT1350-P		
		Remote Control Unit		Yes		
		Rod Antenna	Poles	No		
			Terminal			
		Loop Antenna	Terminal	No		
		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 Safeguard		No		
		Dew/AHC Caution Sheet		No		
		AC Plug Adapter		No		
		Quick Set-up Sheet		No		
		Battery	UM size x pcs	No		
			OEM Brand			
		AC Cord		No		
		AV Cord (2Pin-1Pin)		No		
		Registration Card		No		
		PTB Sheet		No		
		300 ohm to 75 ohm Antenna Adapter		No		
		Safety Strap		Yes		
		Printed Matter for Disney		Yes		
G-13	Interface	Switch	Front	Power	Yes	
				System Select	No	
				Main Power SW	No	
				Sub Power	No	
				Channel Up	Yes	
				Channel Down	Yes	
				Volume Up	Yes	
				Volume Down	Yes	
				MENU	Yes	
				TV/Video	Yes	
			Rear	AC/DC	No	
				TV/CATV Selector	No	
				Degauss	No	
				Main Power SW	No	
		Indicator		Power	No	
				Stand-by	No	
				On Timer	No	
		Terminals	Front	Video Input	RCA x 1	
				Audio Input	RCA x 2	
			Rear	Other Terminal	Head Phone	
				Video Input(Rear1)	RCA x 1	
				Video Input(Rear2)	No	
				Audio Input(Rear1)	RCA x 2	
				Audio Input(Rear2)	No	
				Video Output	No	
				Audio Output	No	
				Euro Scart	No	
		Color Stream	No			
		Diversity	No			

GENERAL SPECIFICATIONS

			Ext Speaker	Yes
			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)	401.5 x 371 x 465.5
			w/o Speaker, Legs Approx. W x D x H (mm)	401.5 x 371 x 350
G-15	Weight		Net (Approx.)	11.0kg (24.3lbs)
			Net w/o Speaker, Legs Approx.	9.5 kg (20.9lbs)
			Gross (Approx.)	13.5kg (29.8lbs)
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 / Full Color
			Dimensions W x D x H(mm)	493 x 423 x 465
			Design	As per Buyer's
			Description of Origin	Yes
		Drop Test		Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces
			Height (cm)	62
		Container Stuffing		640 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	No
G-18	Environment	Pb Free	Lead-free Solder	No
			Other	No
				No
		Cd Free		No

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

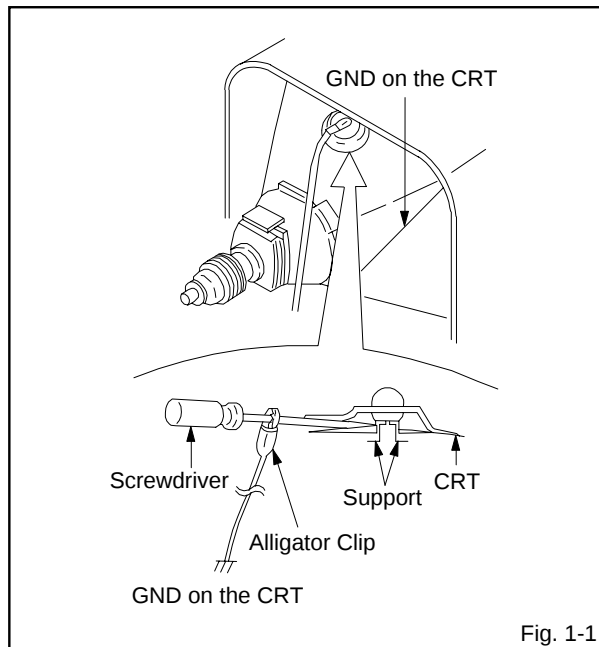
Read the following **NOTED** items before starting work.

- ★ 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.

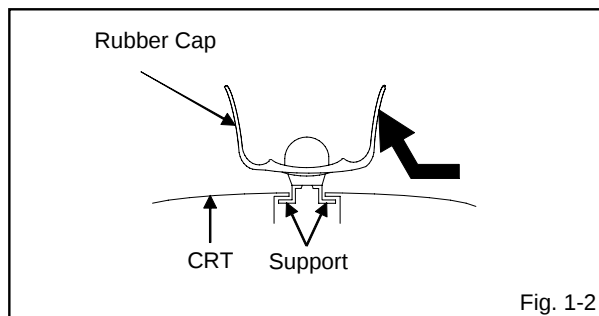
REMOVAL

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.)



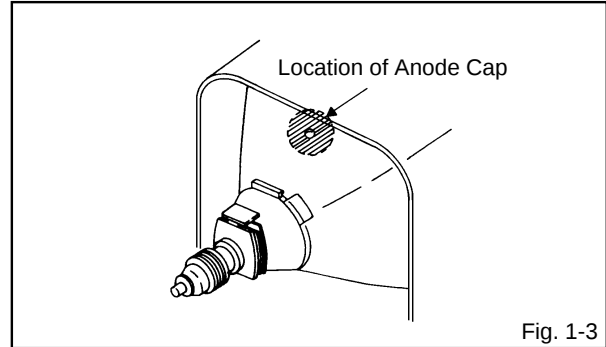
3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

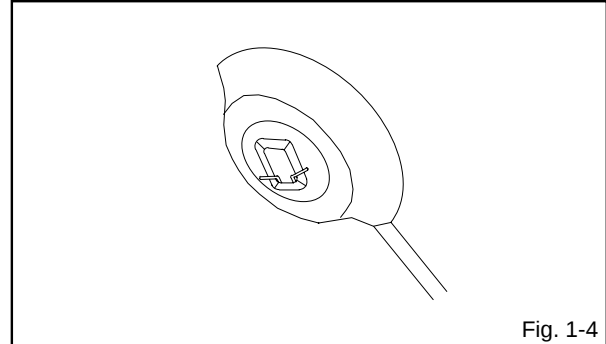
1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 1-3.)



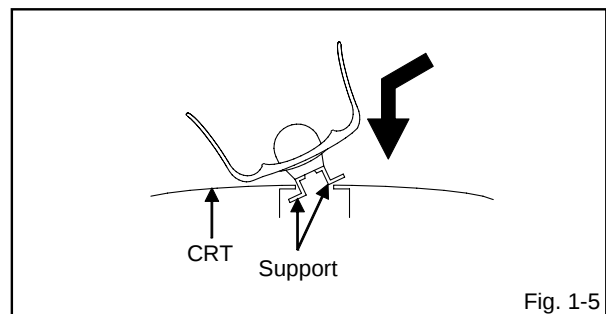
NOTE

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

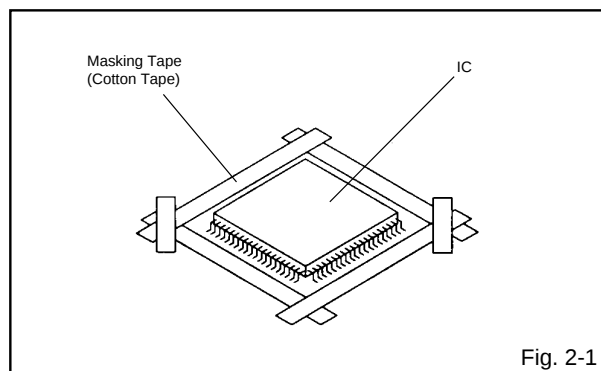
2.REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

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

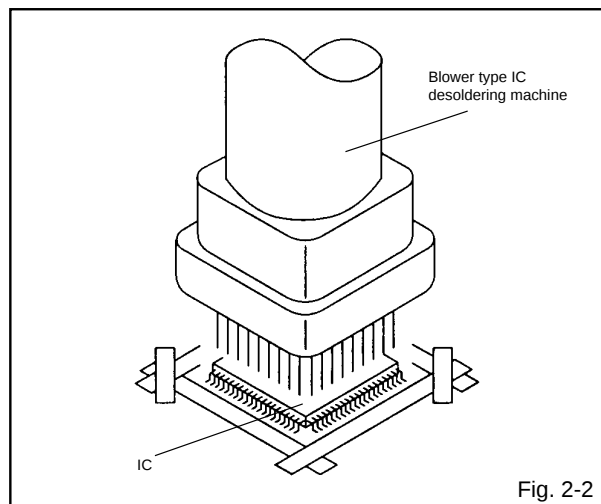
Masking is carried out on all the parts located within 10 mm distance from IC leads.



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

NOTE

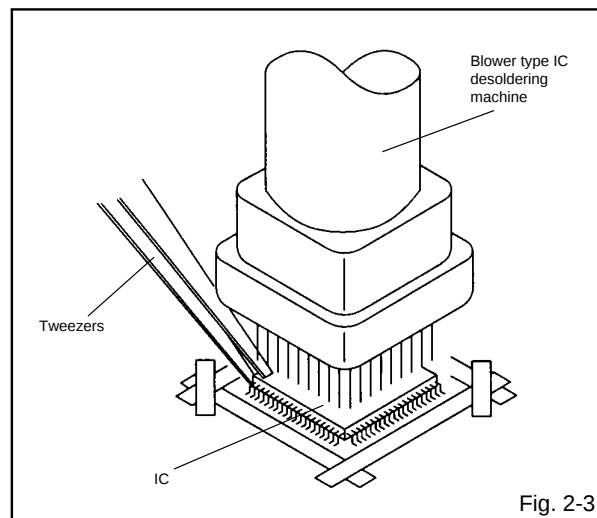
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

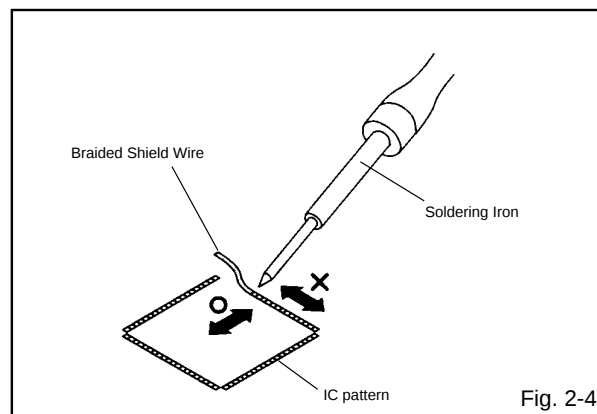
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



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

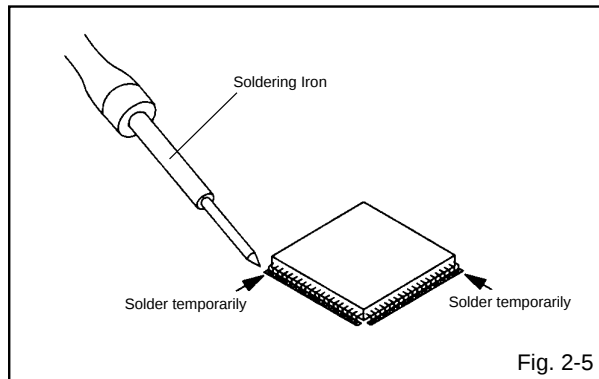
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



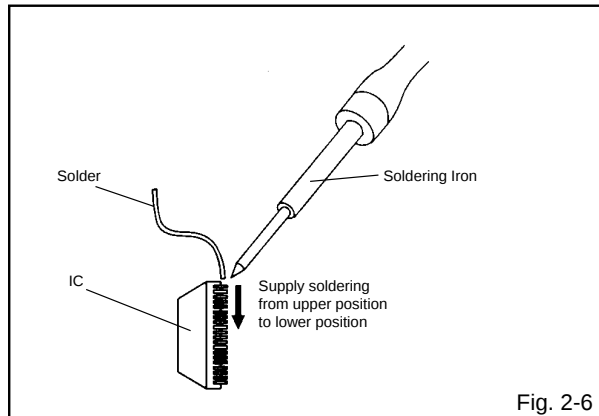
DISASSEMBLY INSTRUCTIONS

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.)



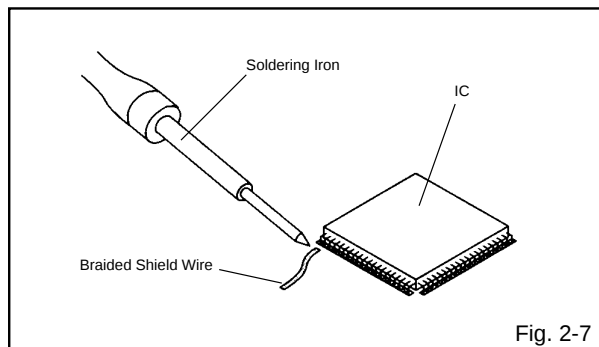
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 2-6.)



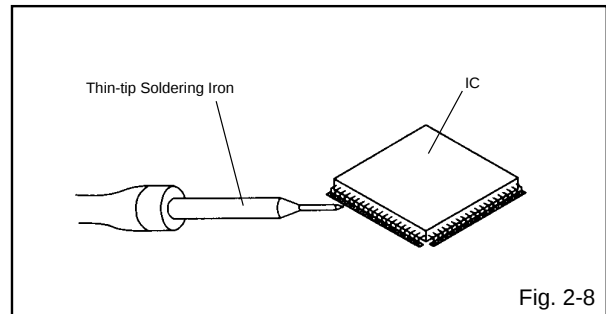
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 2-7.)

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

SERVICE MODE LIST

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

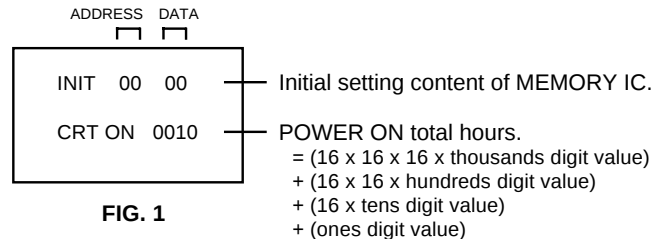
Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD and LOCK PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC 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 1 second.
3. After the confirmation of using hours, turn off the power.



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	00	60	99	93	1B	B3	24	3B	09	0F	07	05	00	AB	00	08
10	02															

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 1 second.
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 1 second.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

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

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease (**YG6260M**) on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

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

On-Screen Display Adjustment

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

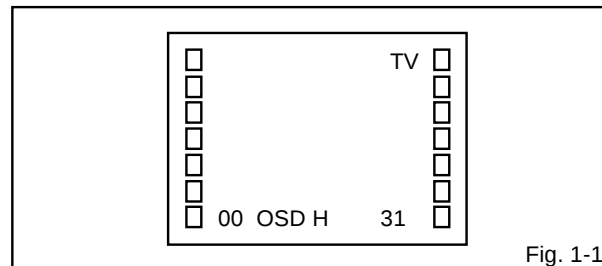


Fig. 1-1

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

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	16	CONTRAST CENT
02	RF.AGC	17	CONTRAST MAX
03	V.VCO	18	CONTRAST MIN
04	H.VCO	19	COLOR CENT
05	H.PHAS	20	COLOR MAX
06	V.SIZE	21	COLOR MIN
07	V.SHIFT	22	TINT
08	R.DRIVE	23	SHARPNESS
09	B.DRIVE	24	FM LEVEL
10	R.BIAS	28	TEST MONO
11	G.BIAS		
12	B.BIAS		
13	BRIGHT CENT		
14	BRIGHT MAX		
15	BRIGHT MIN		

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: VIF VCO

1. Place the set with Aging Test for more than 10 minutes.
2. Receive an 80dB monoscope pattern.
3. Connect the digital voltmeter between the **pin 5 of CP601** and the **GND**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**03**) on the remote control to select "V. VCO".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5V.

2-2: RF AGC DELAY

1. Place the set with Aging Test for more than 15 minutes.
2. Receive an 63dB monoscope pattern.
3. Connect the digital voltmeter to **TP001**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**02**) on the remote control to select "RF AGC".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.50V±0.05V.

2-3: CUT OFF

1. Adjust the unit to the following settings.
R.DRIVE=10, B.DRIVE=10, R.BIAS=64, G.BIAS=64, B.BIAS=64, BRI CENT=115, CONT MAX=45.
2. Place the set with Aging Test for more than 15 minutes.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**01**) on the remote control to select "CUT OFF".
4. Adjust the **Screen Volume** until a dim raster is obtained.

2-4: FOCUS

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

2-5: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the white 100% signal from the Pattern Generator.
3. Using the adjustment 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 6 and 7 until the white color is looked like a white.

ELECTRICAL ADJUSTMENTS

2-6: SUB TINT/SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Connect the oscilloscope to **pin 6 of CP601**.
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 **pin 7 of CP601**.
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. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales
8. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $100\% \pm 10\%$ of the white level. (Refer to Fig. 2-2)
9. Receive the color bar pattern. (Audio Video Input)
10. Connect the oscilloscope to **pin 6 of CP601**.
11. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
12. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line.
(Refer to Fig. 2-3)
13. Connect the oscilloscope to **pin 7 of CP601**.
14. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(19)** on the remote control to select "COL.CENT".
15. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales
16. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $100\% \pm 10\%$ of the white level. (Refer to Fig. 2-4)

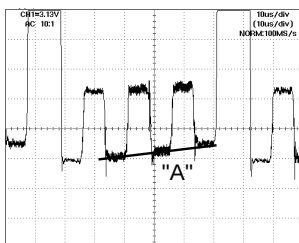


Fig. 2-1

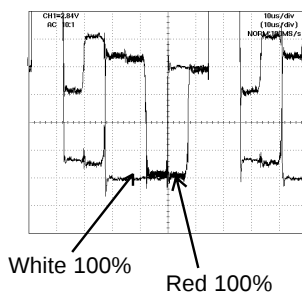


Fig. 2-2

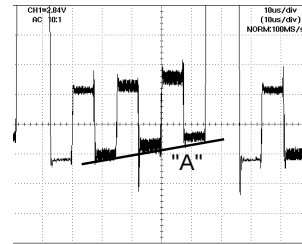


Fig. 2-3

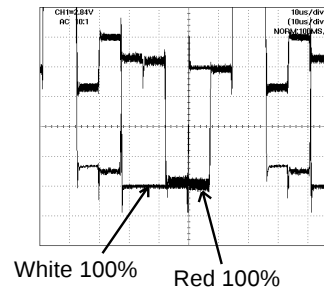


Fig. 2-4

2-7: HORIZONTAL PHASE

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

2-8: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. 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.

2-9: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the adjustment 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 $10 \pm 2\%$.
5. Receive a broadcast and check if the picture is normal.

ELECTRICAL ADJUSTMENTS

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 and up 2 steps. (**Refer to Fig. 2-5**)

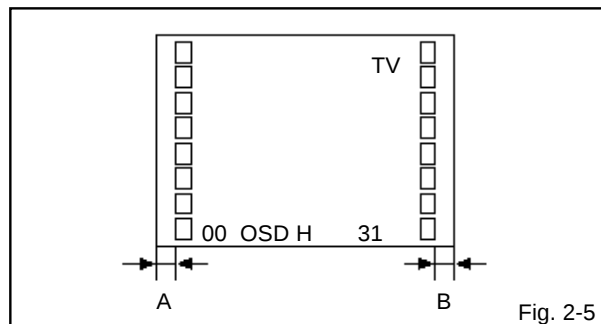


Fig. 2-5

2-11: SUB BRIGHTNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**13**) on the remote control to select "BRI.CENT".
2. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible.
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/AV button on the remote to set to the AV mode. Then perform the above adjustment 1~3.

2-12: 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 "45".
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.

2-13: Confirmation of Fixed Value (step No.)

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

NO.	FUNCTION	RF	AV
04	H VCO	03	03
14	BRIGHT MAX	140	140
15	BRIGHT MIN	50	50
16	CONT CENT	30	30
18	CONT MIN	10	10
20	COLOR MAX	70	70
21	COLOR MIN	00	00
23	SHARPNESS	48	48
24	FM LEVEL	107	107
28	TEST MONO	00	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.

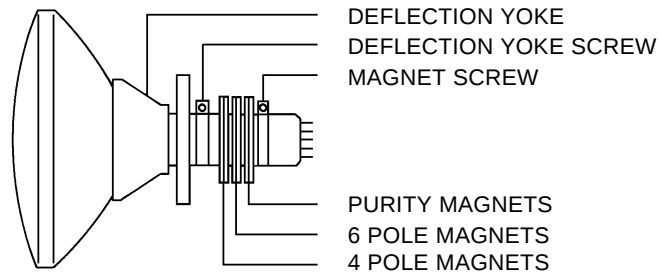


Fig. 3-1

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)**

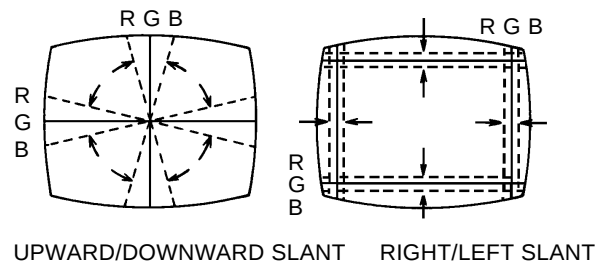


Fig. 3-2-a

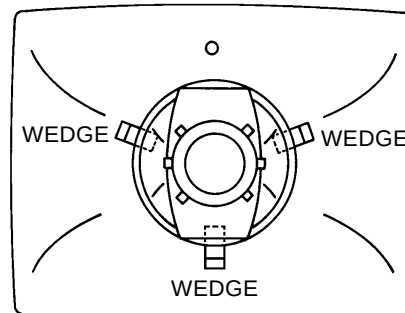
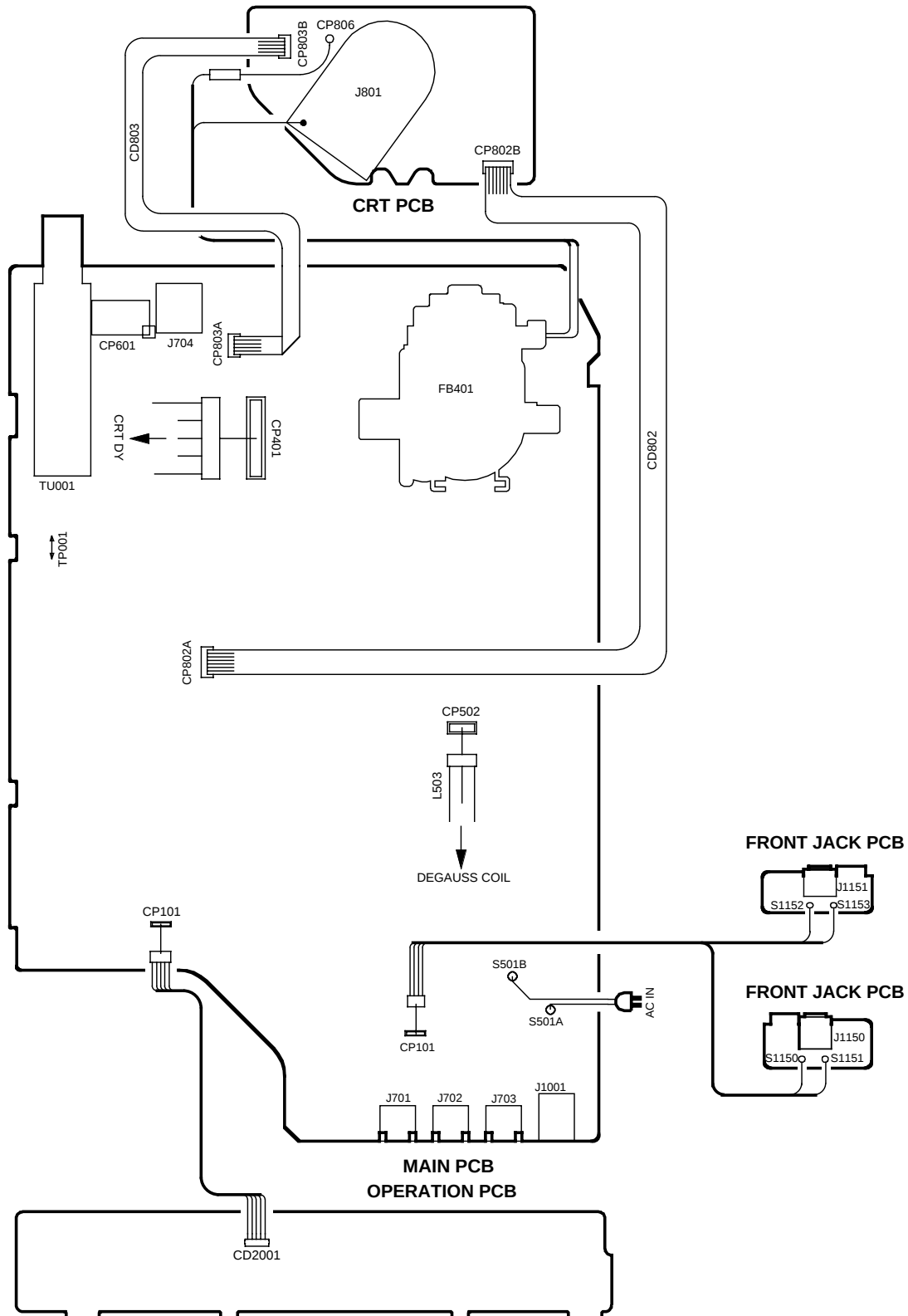


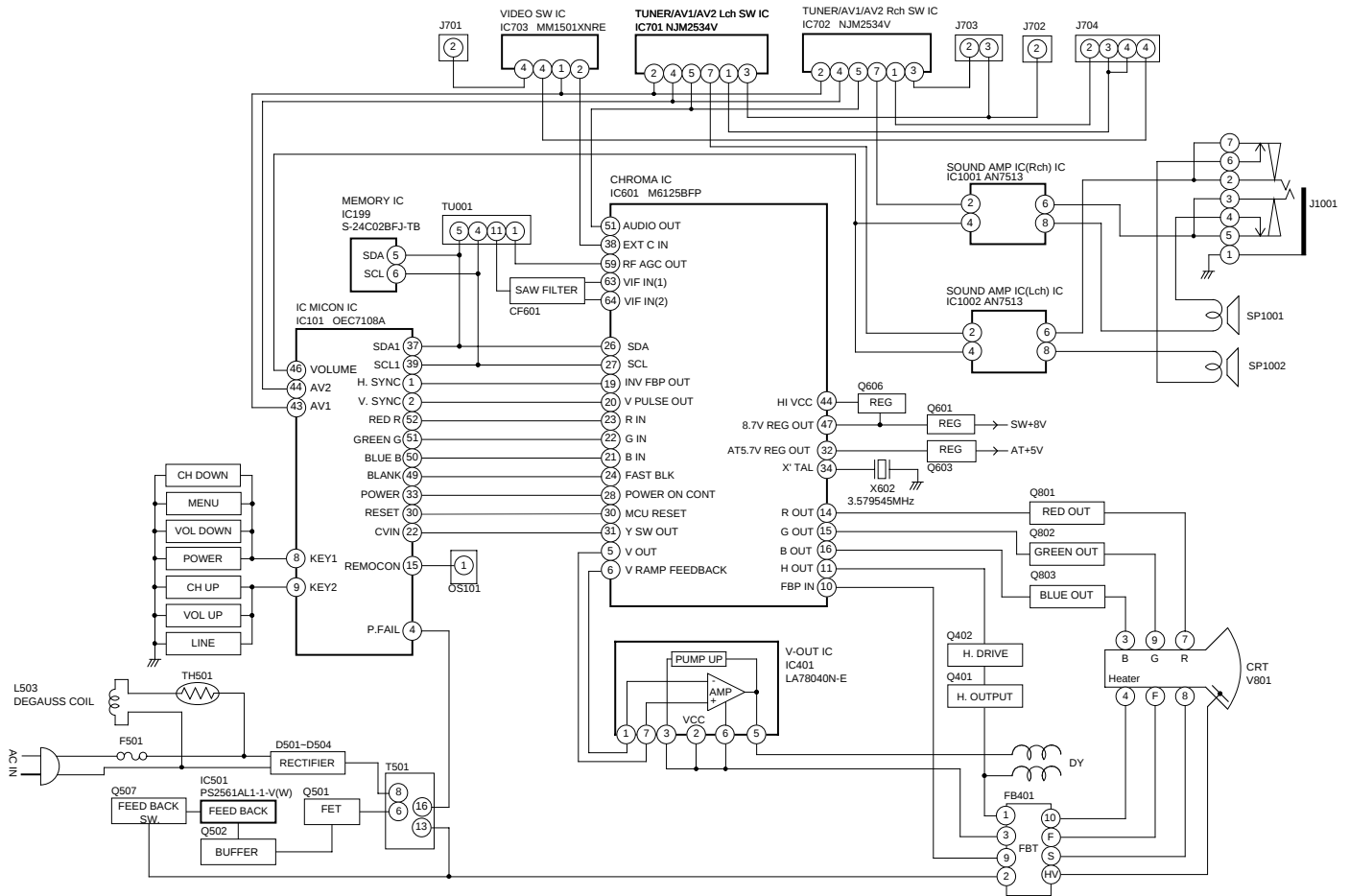
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

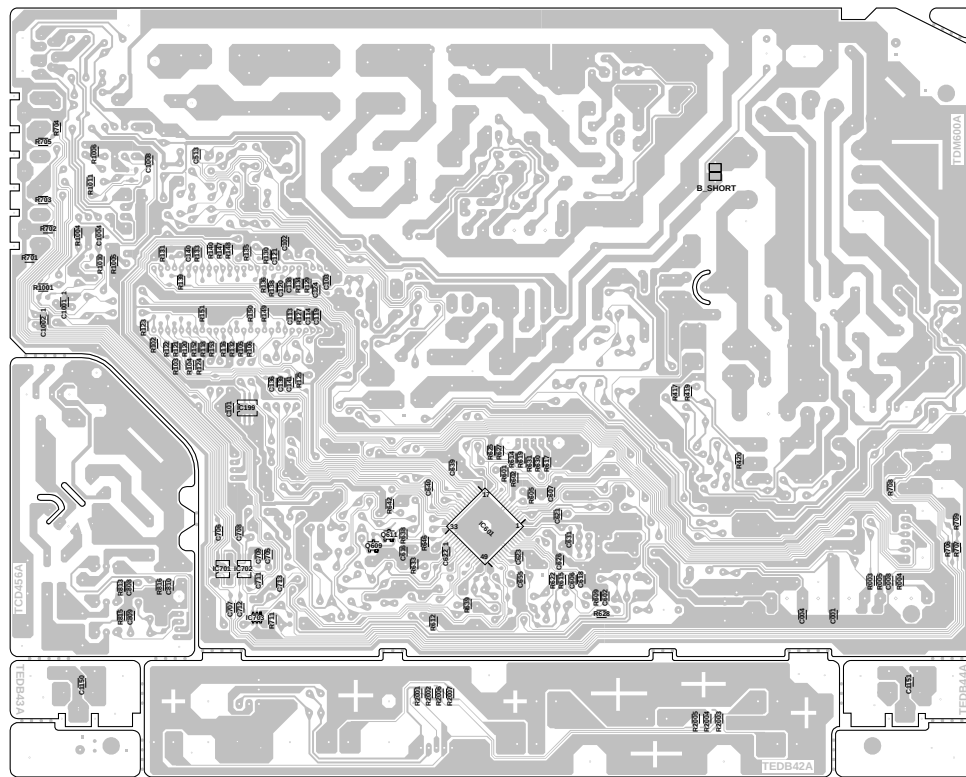
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



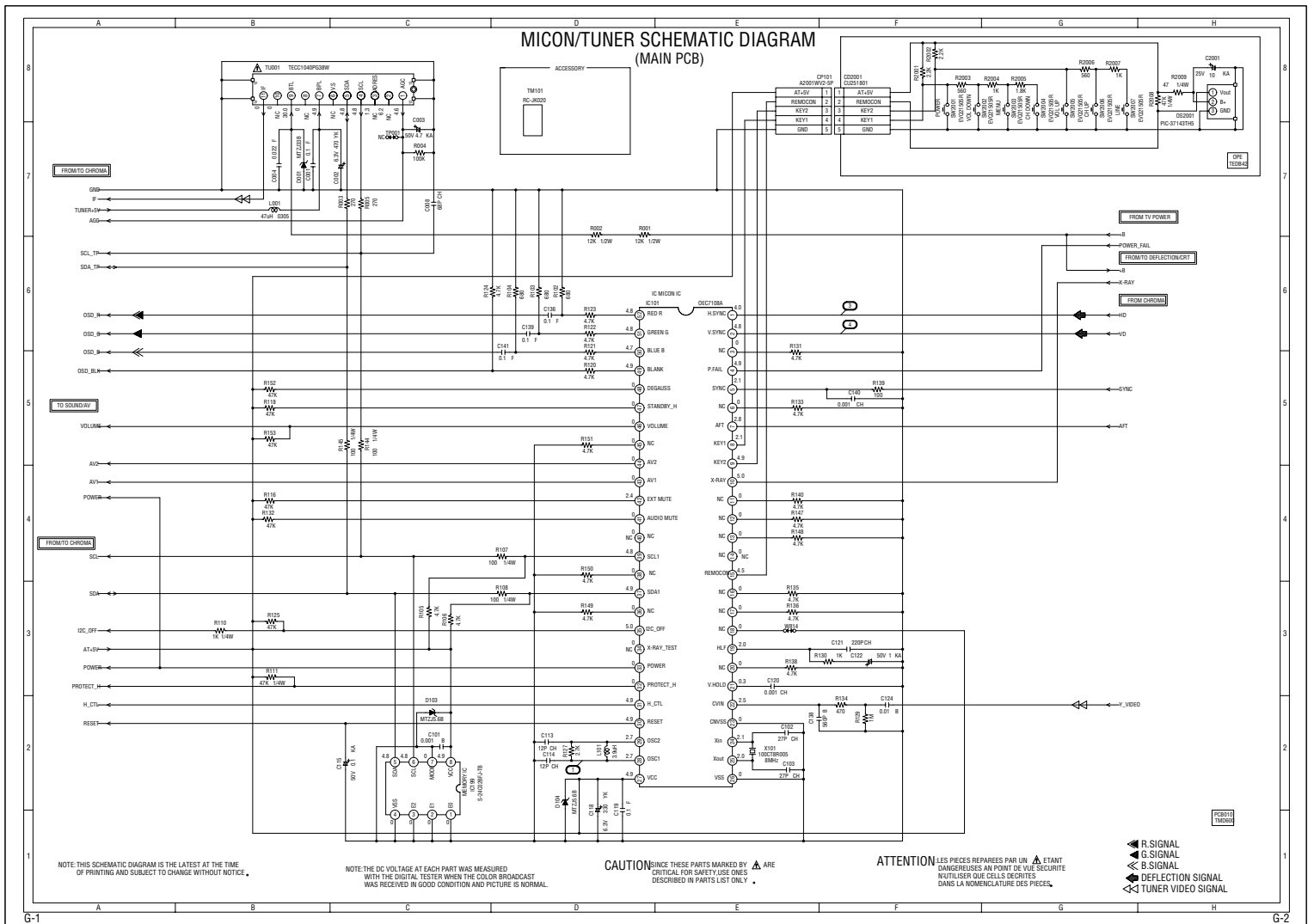
BLOCK DIAGRAM

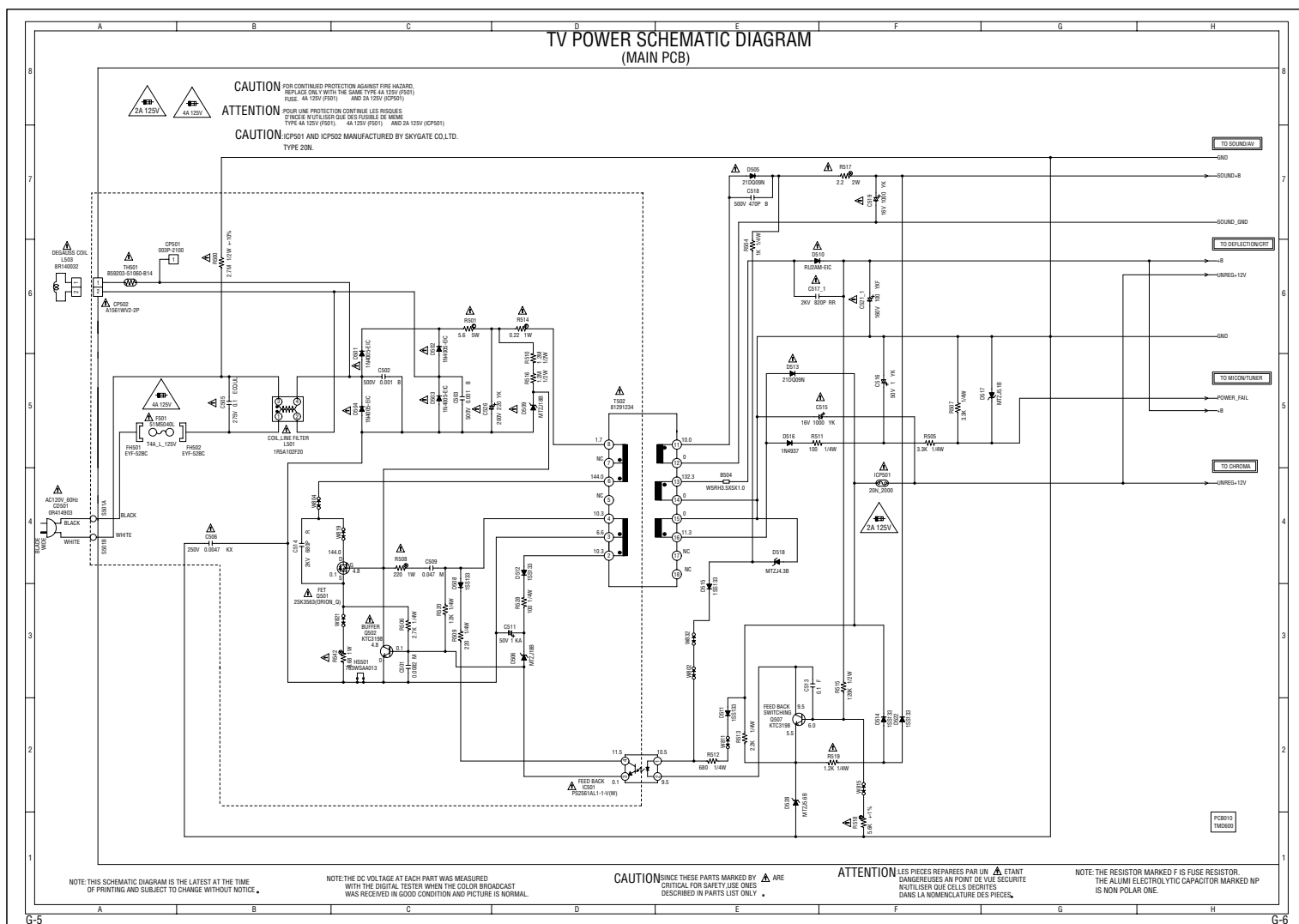


**PRINTED CIRCUIT BOARDS
MAIN/CRT/OPERATION/JACK1/JACK2 (CHIP MOUNTED PARTS)
SOLDER SIDE**

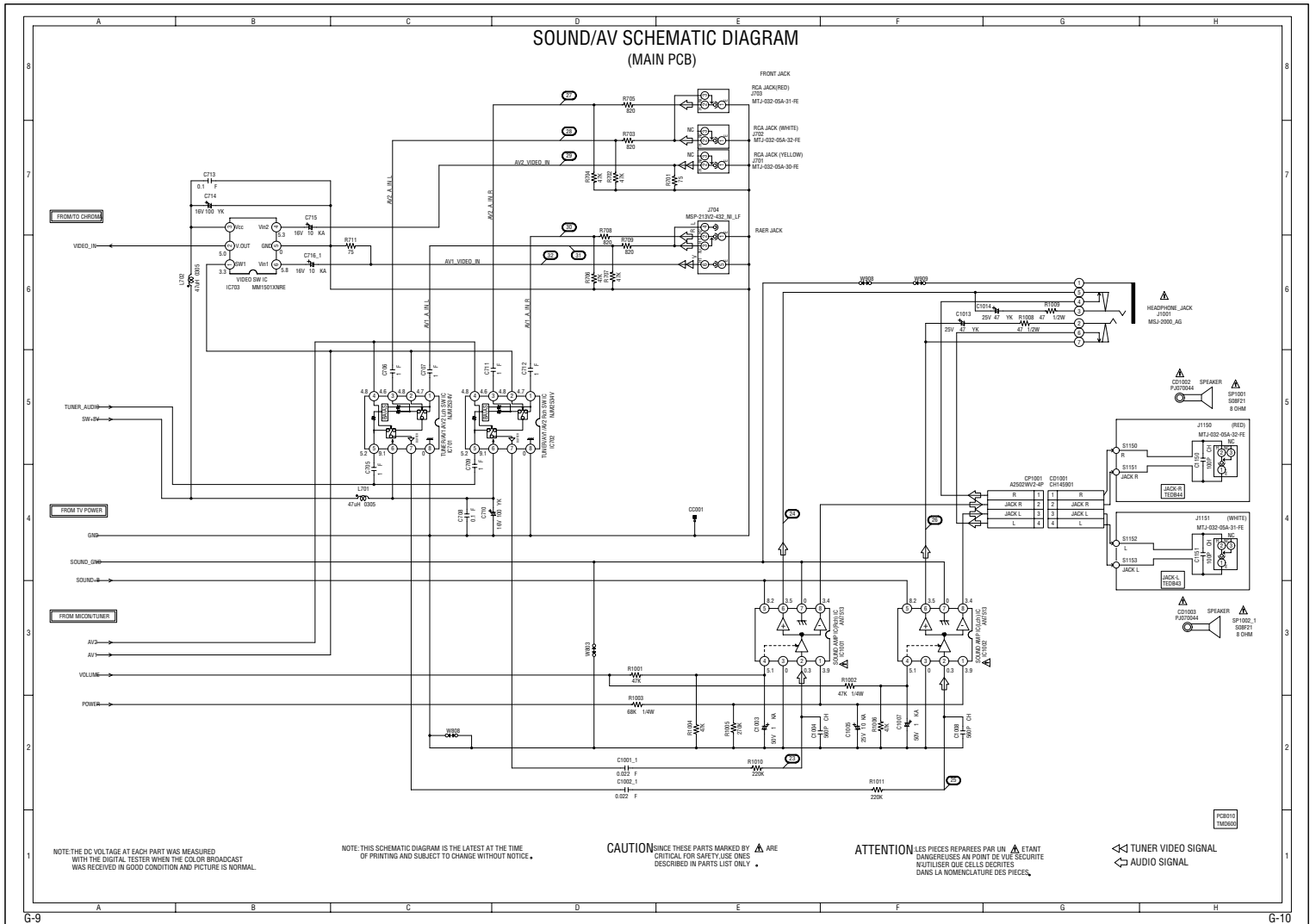


MICON/TUNER SCHEMATIC DIAGRAM (MAIN PCB)



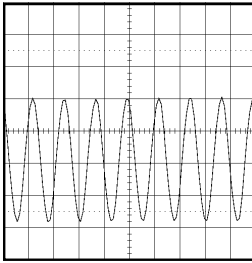




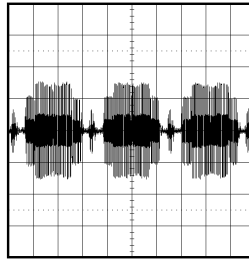


WAVEFORMS

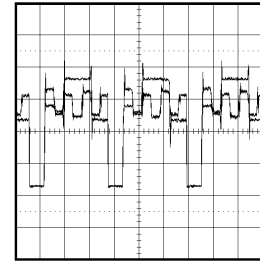
MICON/TUNER



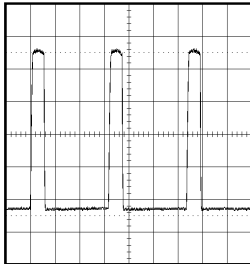
① 1V 0.1μs/div



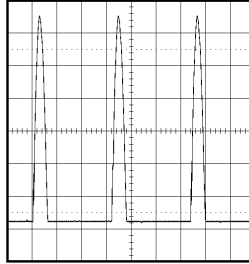
⑦ 200mV 20μs/div



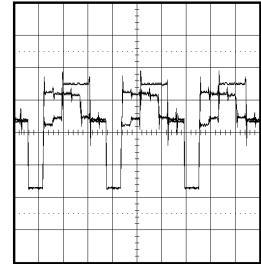
⑫ 1V 20μs/div



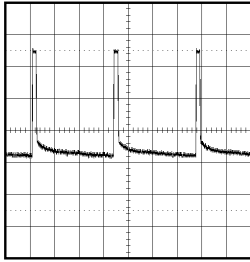
③ 200mV 20μs/div



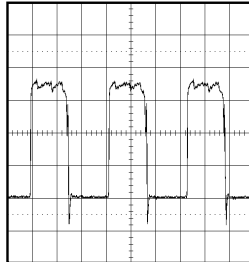
⑧ 20V 20μs/div



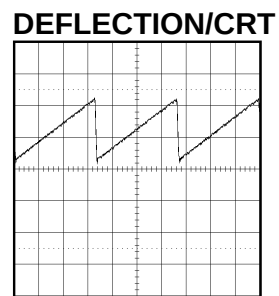
⑬ 1V 20μs/div



④ 200mV 5ms/div

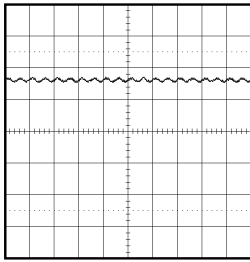


⑨ 200mV 20μs/div

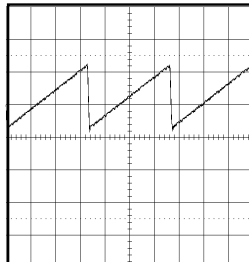


⑭ 0.5V 5ms/div

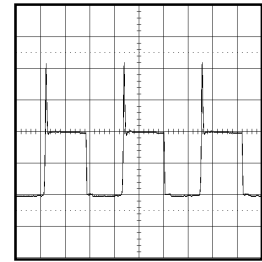
CHROMA



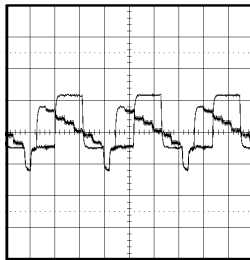
⑤ 0.5V 2ms/div



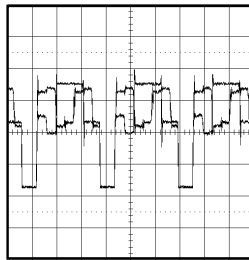
⑩ 0.5V 5ms/div



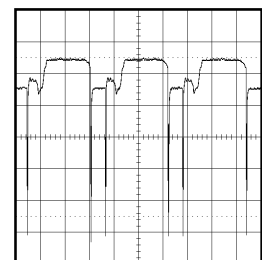
⑮ 20V 20μs/div



⑥ 0.5V 20μs/div



⑪ 1V 20μs/div

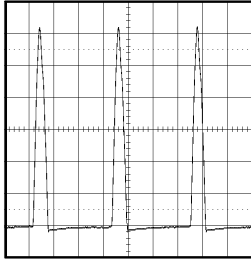


⑯ 2V 20μs/div

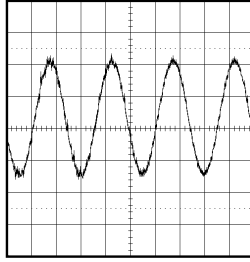
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

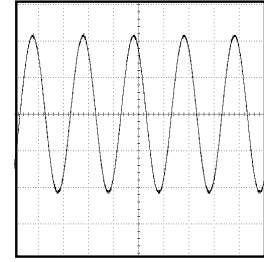
SOUND/AV



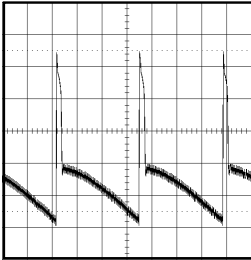
①⑦ 200V 20 μ s/div



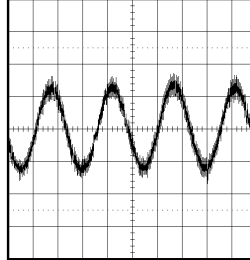
②③ 200mV 1ms/div



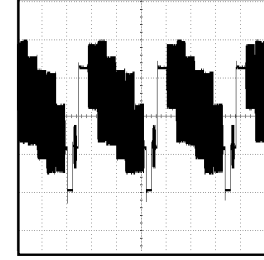
②⑧ 200mV 500 μ s/div



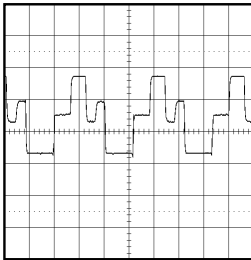
①⑨ 10V 5ms/div



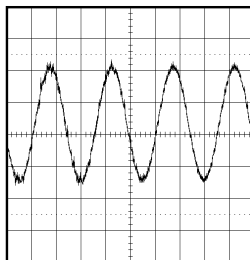
②④ 0.5V 1ms/div



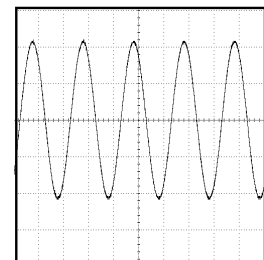
②⑨ 500mV 20 μ s/div



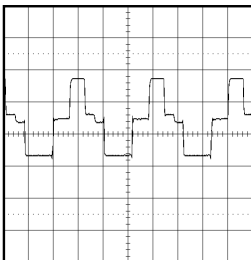
②⑩ 50V 20 μ s/div



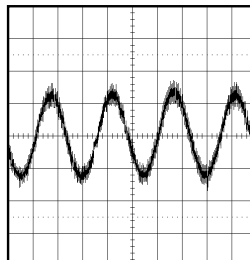
②⑤ 200mV 1ms/div



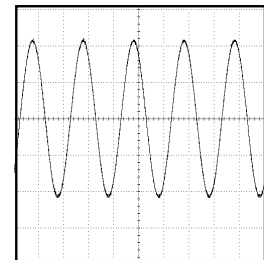
③⑩ 200mV 500 μ s/div



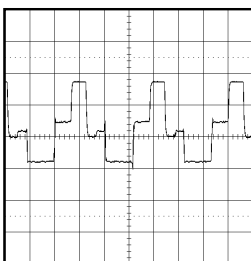
②① 50V 20 μ s/div



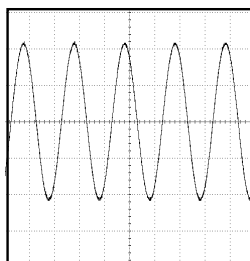
②⑥ 0.5V 1ms/div



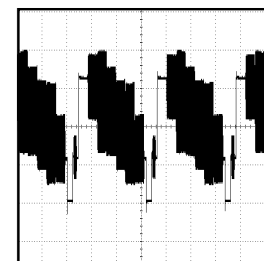
③① 200mV 500 μ s/div



②② 50V 20 μ s/div



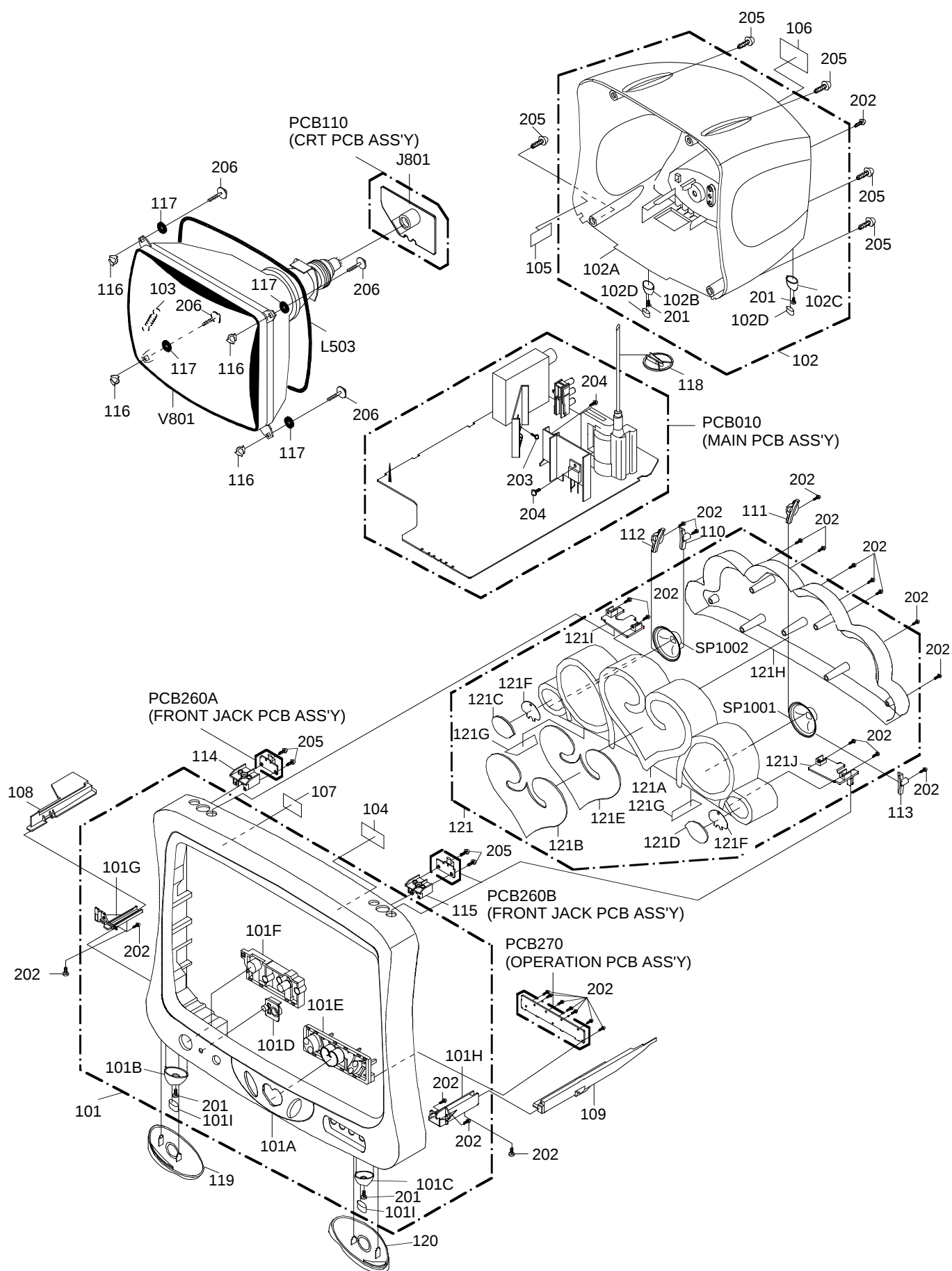
②⑦ 200mV 500 μ s/div



③② 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



ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.		PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION			
RESISTORS					ICS					
△	R401	R4X5T6273F	R,METAL	27K OHM 1/6W	△	IC101	I56D07108A	IC	OEC7108A	
△	R408	R4X5T6103F	R,METAL	10K OHM 1/6W		IC199	A3P902G015	INIT DATA		
△	R409	R4X5T6273F	R,METAL	27K OHM 1/6W	△	IC401	I03TD804N0	IC	LA78040N-E	
△	R429	R3X28B4R7J	R,METAL OXIDE	4.7 OHM 3W	△	IC501	000220002W	PHOTO COUPLER	PS2561AL1-1-V(W)	
△	R447	R3X28A151J	R,METAL OXIDE	150 OHM 2W		IC601	I06FC1250B	IC	M61250BFP	
△	R500	R0G3K2275K	RC	2.7M OHM 1/2W		IC701	I0QF02534V	IC	NJM2534V(Te2)	
△	R501	R5Y2CD5R6J	R,CEMENT	5.6 OHM 5W		IC702	I0QF02534V	IC	NJM2534V(Te2)	
△	R508	R3X181221J	R,METAL OXIDE	220 OHM 1W		IC703	I0UF015010	IC	MM1501XNRE	
△	R509	R002T4221J	RC	220 OHM 1/4W	△	IC1001	I01DP75130	IC	AN7513	
△	R514	R63581R22J	R,FUSE	0.22 OHM 1W		IC1002	I01DP75130	IC	AN7513	
△	R515	R002T2124J	RC	120K OHM 1/2W	TRANSISTORS					
△	R517	R3X28A2R2J	R,METAL OXIDE	2.2 OHM 2W	△	Q401	TD3U021400	TRANSISTOR SILICON	TT2140LS-CBC	
△	R518	R4X5T6562F	R,METAL	5.6K OHM 1/6W	△	Q402	TC5T01627Y	TRANSISTOR SILICON	2SC1627_Y(TPe2)	
△	R519	R002T4122J	RC	1.2K OHM 1/4W	△	Q501	T25F035630	FET	2SK3563(ORION_Q)	
△	R542	R3X181R68J	R,METAL OXIDE	0.68 OHM 1W	△	Q502	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
△	R629	R3X28B270J	R,METAL OXIDE	27 OHM 3W		Q507	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
△	R803	R3X181153J	R,METAL OXIDE	15K OHM 1W		Q601	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
△	R805	R3X181153J	R,METAL OXIDE	15K OHM 1W		Q603	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
△	R807	R3X181153J	R,METAL OXIDE	15K OHM 1W		Q604	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
CAPACITORS						Q605	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
△	C403	E02LT4471M	CE	470 UF 35V		Q606	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	
△	C414	E02LU4101M	CE	100 UF 35V		Q609	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK	
△	C418	E02LT3471M	CE	470 UF 25V		Q610	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	
△	C434	E02LU8220M	CE	22 UF 100V		Q611	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146	
	C437	P4J7F3474J	CMPP	0.47 UF 250V PMS	△	Q801	TCKT1473A0	TRANSISTOR SILICON	2SC1473A-TA-(RQ)	
△	C443	P4N8FJ862H	CMPP	0.0086UF 1.25KV	△	Q802	TCKT1473A0	TRANSISTOR SILICON	2SC1473A-TA-(RQ)	
△	C446	E02LU5220M	CE	22 UF 50V	△	Q803	TCKT1473A0	TRANSISTOR SILICON	2SC1473A-TA-(RQ)	
△	C448	E0ELFD220M	CE	22 UF 250V	COILS & TRANSFORMERS					
△	C503	C0JTB0513K	CC	0.001 UF 500V B		L001	02167F470J	COIL	47 UH	
△	C505	P2122B104M	CMP	0.1 UF 275V ECQUL		L101	021LA63R9K	COIL	3.9 UH	
△	C506	CD39E0MQ3M	CC	0.0047UF 250V	△	L501	029T00A7M1	COIL,LINE FILTER	1R5A102F20	
	C514	C0PLRR7U2K	CC	680 PF 2KV R	△	L503	028R140032	COIL,DEGAUSS	8R140032	
△	C515	E02LT2102M	CE	1000 UF 16V		L601	021LA6R39M	COIL	0.39 UH	
	C517	C0PLRR7W2K	CC	820 PF 2KV RR		L607	021LA6150J	COIL	15 UH	
△	C519	E02LT2102M	CE	1000 UF 16V		L701	02167F470J	COIL	47 UH	
△	C521	E62NFB101M	CE	100 UF 160V		L702	02167F470J	COIL	47 UH	
△	C526	E02LFC221M	CE	220 UF 200V		L801	021673221K	COIL	220 UH	
	C715	E52H02100M	CE	10 UF 16V or		T401	045009003J	TRANS,HORIZONTAL DRIVE	ETH09K14BZ	
		E50HU2100M	CE	10 UF 16V		△	T502	0481291234	TRANSFORMER,SWITCHING	81291234
	C716	E52H02100M	CE	10 UF 16V or	JACKS					
		E50HU2100M	CE	10 UF 16V		J701	060J421036	RCA JACK	MTJ-032-05A-30-FE	
	C819	C0JBB0713K	CC	0.001 UF 2KV B		J702	060J421037	RCA JACK	MTJ-032-05A-32-FE	
DIODES						J703	060J421030	RCA JACK	MTJ-032-05A-31-FE	
	D001	D97U03301B	DIODE,ZENER	MTZJ33B T-77		J704	060J431020	RCA JACK	MSP-213V2-432_NI_LF	
	D103	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	△	J801	066F120018	SOCKET,CATHODE RAY T	UBEISMS01S	
	D104	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77		J1001	060J131016	HEADPHONE JACK	MSJ-2000_AG	
	D403	D2WT011E10	DIODE SILICON	11E1-EIC		J1150	060J421037	RCA JACK	MTJ-032-05A-32-FE	
	D404	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77		J1151	060J421030	RCA JACK	MTJ-032-05A-31-FE	
△	D405	D2WTAU02A0	DIODE SILICON	AU02A-EIC	SWITCHES					
	D406	D2WT011E10	DIODE SILICON	11E1-EIC		SW2001	0504101T34	SWITCH,TACT	EVQ21505R	
	D408	D2WT011E10	DIODE SILICON	11E1-EIC		SW2002	0504101T34	SWITCH,TACT	EVQ21505R	
	D409	D2WT011E10	DIODE SILICON	11E1-EIC		SW2003	0504101T34	SWITCH,TACT	EVQ21505R	
△	D410	D2WTAU02A0	DIODE SILICON	AU02A-EIC		SW2004	0504101T34	SWITCH,TACT	EVQ21505R	
△	D411	D2WTAU02A0	DIODE SILICON	AU02A-EIC		SW2005	0504101T34	SWITCH,TACT	EVQ21505R	
△	D412	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77		SW2006	0504101T34	SWITCH,TACT	EVQ21505R	
△	D501	D2WXN40050	DIODE SILICON	1N4005-EIC		SW2007	0504101T34	SWITCH,TACT	EVQ21505R	
△	D502	D2WXN40050	DIODE SILICON	1N4005-EIC	P.C.BOARD ASSEMBLIES					
△	D503	D2WXN40050	DIODE SILICON	1N4005-EIC		PCB010	A3P902G010	PCB ASS'Y	TMD600A	
△	D504	D2WXN40050	DIODE SILICON	1N4005-EIC		PCB110	A3P902G110	PCB ASS'Y	TCD456A	
△	D505	D28T21DQ9N	DIODE SCHOTTKY	21DQ09N-TA2B1		PCB270	A3P902G270	PCB ASS'Y	TEDB42A	
	D506	D97U01801B	DIODE,ZENER	MTZJ18B T-77		PCB260A	A3P902G260	PCB ASS'Y	TEDB43A	
	D508	D1VT001330	DIODE,SILICON	1SS133T-77		PCB260B	A3P902G260	PCB ASS'Y	TEDB44A	
△	D509	D97U01801B	DIODE,ZENER	MTZJ18B T-77	MISCELLANEOUS					
△	D510	D2WXRU2AM0	DIODE SILICON	RU2AM-EIC		B504	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
	D511	D1VT001330	DIODE,SILICON	1SS133T-77	△	CD501	120R414903	CORD AC BUSH	0R414903 or	
	D512	D1VT001330	DIODE,SILICON	1SS133T-77			1209414909	CORD AC BUSH	9414909	
△	D513	D28T21DQ9N	DIODE SCHOTTKY	21DQ09N-TA2B1		CD802	WCL6842038	FLAT CABLE AWM2468	AWG26 5C GRAY 420MM	
	D514	D1VT001330	DIODE,SILICON	1SS133T-77		CD803	WBL6028038	FLAT CABLE AWM2468	AWG26 4C BLACK 280MM	
	D515	D1VT001330	DIODE,SILICON	1SS133T-77		CF601	1029045R7G	FILTER,SAW	TSF5229P3	
△	D516	D2WXN49370	DIODE SILICON	1N4937		CF602	1012T04702	FILTER,CERAMIC TRAP	MKT47.3MC110P-TF	
	D517	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77		CF603	1012T4R520	FILTER,CERAMIC	SFSRA4M50CF00-A0	
	D518	D97U04R31B	DIODE,ZENER	MTZJ4.3B T-77		CF604	1012T4R519	FILTER,CERAMIC TRAP	TPSRA4M50C00-A0	
	D522	D1VT001330	DIODE,SILICON	1SS133T-77		CP101	069S250629	CONNECTOR PCB SIDE	A2001WV2-5P	
	D528	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	△	CP401	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P	
	D601	D1VT001330	DIODE,SILICON	1SS133T-77		CP501	069D01001A	CONNECTOR PCB SIDE	003P-2100	
	D602	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77	△	CP502	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P	
	D605	D2WT011E10	DIODE SILICON	11E1-EIC	△	CP601	0697270650	CONNECTOR PCB SIDE	TKC-M07X-A1	

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
MISCELLANEOUS			
	CP801	069W010030	CONNECTOR PCB SIDE TBS-X01X-A1
	CD1001	06CH145901	CORD CONNECTOR CH145901
	CD1002	06CXB07001	CORD,RCA PIN P3070044
	CD1003	06CXB07001	CORD,RCA PIN P3070044
	CD2001	06CU251801	CORD CONNECTOR CU251801
	CP1001	069S140419	CONNECTOR PCB SIDE A2502WV2-4P
	CP802A	067U005049	WIRE HOLDER B2013H02-5P
	CP802B	067U005049	WIRE HOLDER B2013H02-5P
	CP803A	067U004029	WIRE HOLDER B2013H02-4P
	CP803B	067U004029	WIRE HOLDER B2013H02-4P
△	F501	081PC04005	FUSE 51MS040L
△	FB401	043214050F	TRANSFORMER,FLYBACK FNI14B002_M
	FH501	06710T0006	HOLDER,FUSE EYF-52BC
	FH502	06710T0006	HOLDER,FUSE EYF-52BC
△	ICP501	0845C02003	IC PROTECTOR 20N_2000
	OS2001	077Q037002	REMOTE RECEIVER PIC-37143TH5
	SP1001	070Y132018	SPEAKER S08F21
	SP1002	070Y132018	SPEAKER S08F21
△	TH501	D8EE0B1400	DEGAUSS ELEMENT B59203-S1060-B14
	TM101	076N0JK020	TRANSMITTER RC-JK020
△	TU001	0145K00062	TUNER,VHF-UHF TECC1040PG38W
△	V801	098Q1404B2	CRT W/DY A34AGT13X98(L)
	X101	100CT8R005	CRYSTAL HC-49/U-S
	X602	100DT3R531	CRYSTAL HC-49/U

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

SPEC.NO.	M3P9-02G
O/R NO.	K423007