

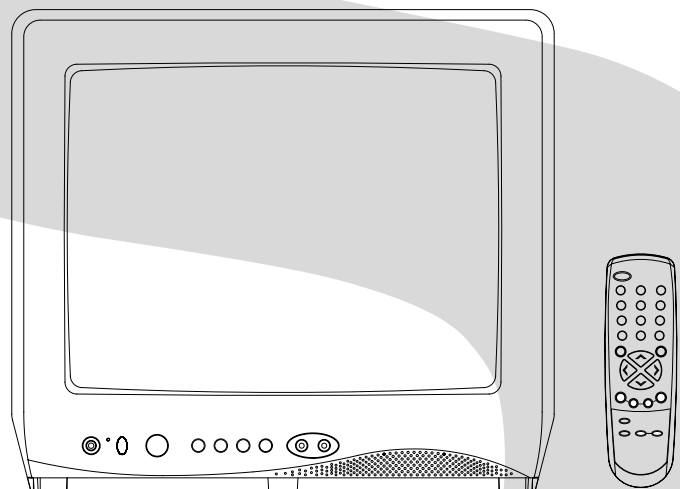
TOSHIBA

FILE NO. 050-200205

SERVICE MANUAL

COLOR TELEVISION

13A22



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

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

2. AVOID AN ELECTRIC SHOCK

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

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

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

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

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

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

6. AVOID AN X-RAY

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

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

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

7. PERFORM A SAFETY CHECK AFTER SERVICING

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

(INSULATION CHECK PROCEDURE)

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

[Note 1]

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

[Note 2]

External exposure metal: Antenna terminal

HOW TO ORDER PARTS

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

1. MODEL NUMBER and VERSION LETTER

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

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.

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

Remove all old silicon before applying new silicon.

GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size		13 inch / 335.4mmV	
			CRT Type		Normal	
			Deflection		90 degree	
			Magnetic Field	BV/BH	+0.45G/0.18G	
		Color System		NTSC		
		Speaker	1Speaker			
			Position			Bottom
			Size			3 Inch
			Impedance			8 ohm
		Sound Output	MAX		1.0 W	
10%(Typical)			0.8 W			
	NTSC3.58+4.43 /PAL60Hz				No	
G-2	Tuning System	Broadcasting System			US System M	
		Tuner and Receive CH	System	1Tuner		
			Destination	Others		
			Tuning System	F-Synth		
			Input Impedance	VHF/UHF 75 ohm		
			CH Coverage	2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84		
		Intermediate Frequency	Picture(FP)	45.75MHz		
			Sound(FS)	41.25MHz		
			FP-FS	4.50MHz		
		Preset CH	No			
Stereo/Dual TV Sound	No					
	Tuner Sound Muting				Yes	
G-3	Power	Power Source	AC	120V AC 60Hz		
			DC	-		
		Power Consumption	at AC		54 W at AC 120 V 60 Hz	
			Stand by (at AC)	5 W at AC 120 V 60 Hz		
		Per Year	-- kWh/Year			
		Protector	Power Fuse	Yes		
G-4	Regulation	Safety	UL			
		Radiation	FCC			
		X-Radiation	DHHS			
G-5	Temperature	Operation	+5oC ~ +40oC			
		Storage	-20oC ~ +60oC			
G-6	Operating Humidity				Less then 80% RH	

GENERAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

G-13	Interface	Switch	Front	Power	Yes	
				System Select	No	
				Main Power SW	No	
				Sub Power	No	
				Channel Up/Reset	Yes	
				Channel Down/Enter	Yes	
				Volume Up/Set Up	Yes	
				Volume Down/Set Down	Yes	
				MENU=Volume Up+Volume Down	Yes	
		Rear	AC/DC	No		
			TV/CATV Selector	No		
			Degauss	No		
			Main Power SW	No		
		Indicator	Power	Yes		
			Stand-by	No		
			On Timer	No		
		Terminals	Front	Video Input	RCA RCA x 1 Ear Phone	
				Audio Input		
				Other Terminal		
			Rear	Video Input(Rear1)	No	
				Video Input(Rear2)	No	
				Audio Input(Rear1)	No	
				Audio Input(Rear2)	No	
				Video Output	No	
				Audio Output	No	
				Euro Scart	No	
				Color Stream	No	
				Diversity	No	
				Ext Speaker	No	
				DC Jack 12V(Center +)	No	
				VHF/UHF Antenna Input	F Type	
				AC Outlet	No	
G-14	Set Size			Approx. W x D x H (mm)		<u>362 x 360 x 320.5</u>
G-15	Weight			Net (Approx.)		<u>9.5 kg</u> (20.9 lbs)
				Gross (Approx.)		<u>11.0kg</u> (24.4lbs)
G-16	Carton			Master Carton		No
			Content	---- Sets		
			Material	-- /--		
			Dimensions W x D x H(mm)	-- x -- x --		
			Description of Origin	No		
		Gift Box		Yes		
			Material	Double/Brown		
			Dimensions W x D x H(mm)	<u>440 x 408 x 380</u>		
			Design	As per Buyer's		
		Drop Test	Description of Origin	Yes		
				Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces		
			Height (cm)	62		
			Container Stuffing	866 Sets/40' container		
G-17	Cabinet Material	Cabinet Front		PS 94V0 DECABROM		
		Cabinet Rear		PS 94V0		

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

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

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

REMOVAL

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

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.

A cracking noise will be heard as the voltage is discharged.

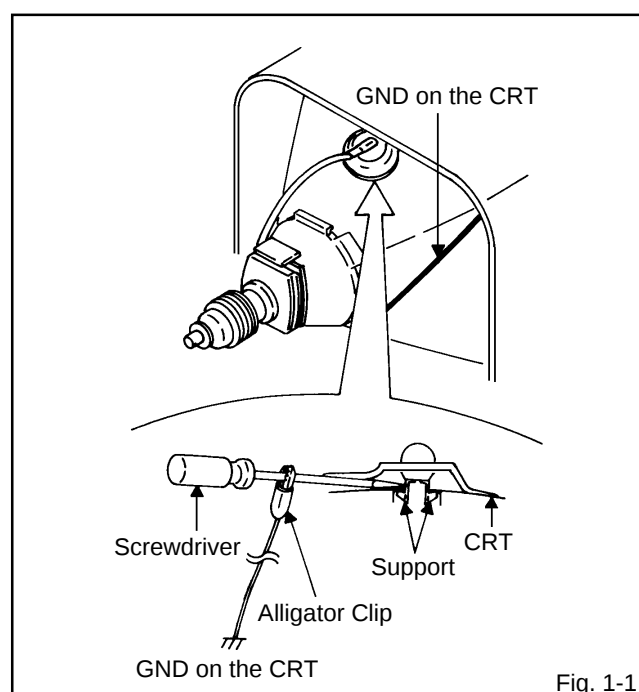


Fig. 1-1

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

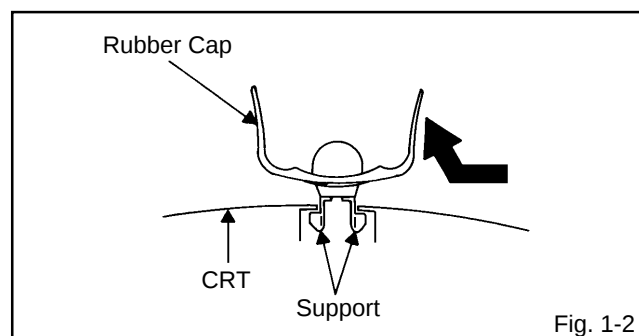


Fig. 1-2

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

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

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

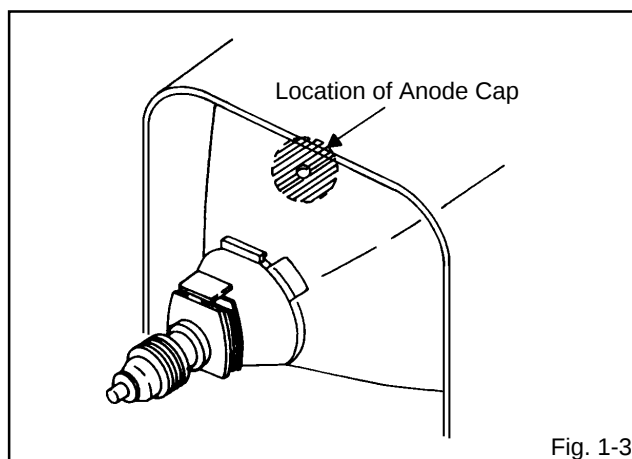


Fig. 1-3

NOTE

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

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

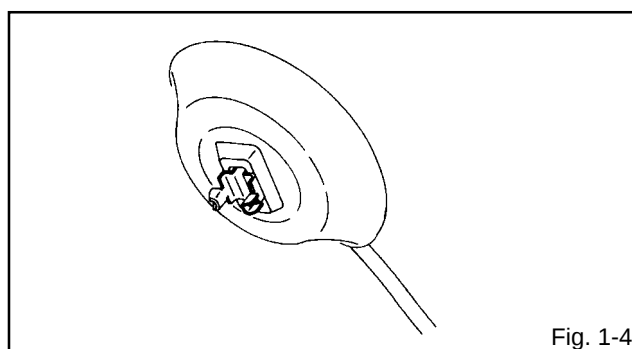


Fig. 1-4

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

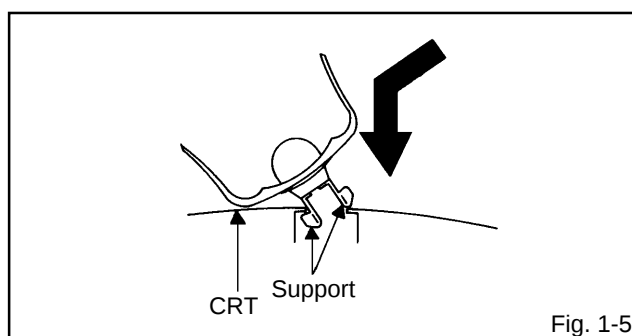


Fig. 1-5

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

DISASSEMBLY INSTRUCTIONS

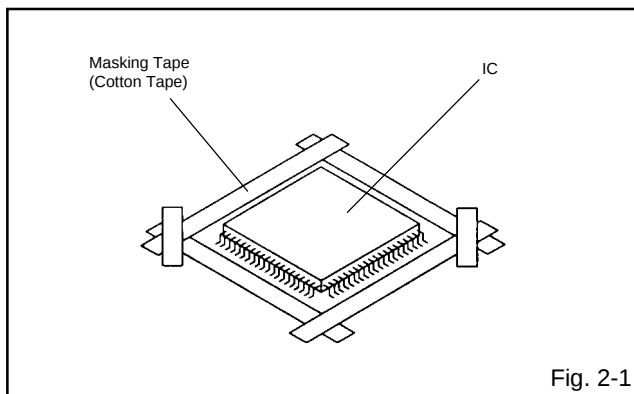
2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

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

NOTE

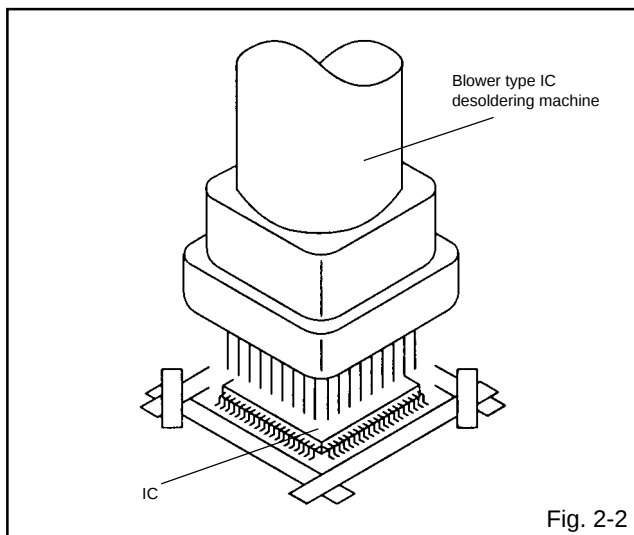
Masking is carried out on all the parts located within 10 mm distance from IC leads.



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

NOTE

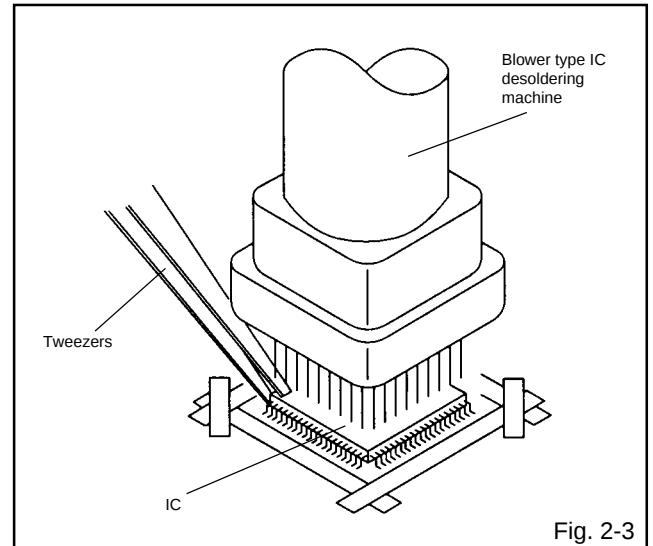
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

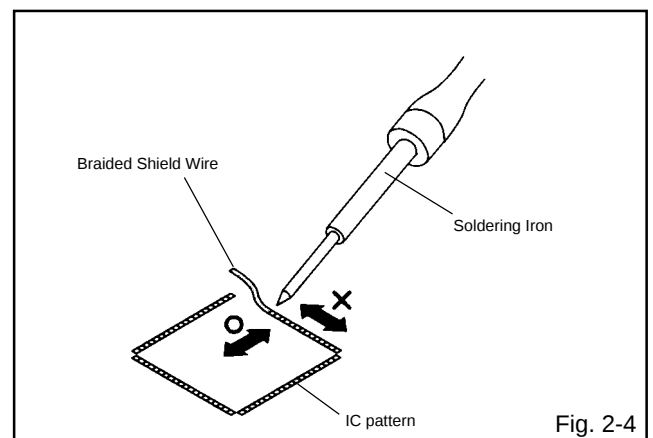
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



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

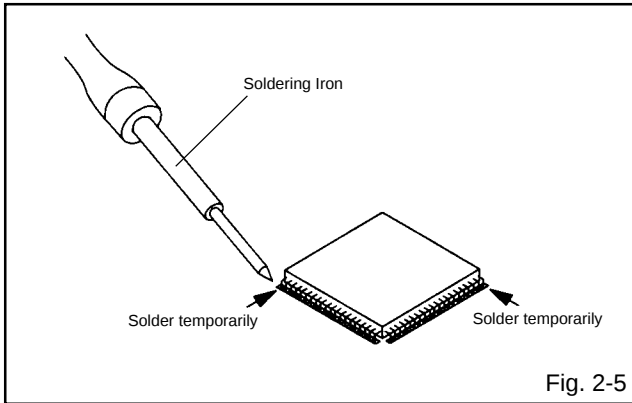
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



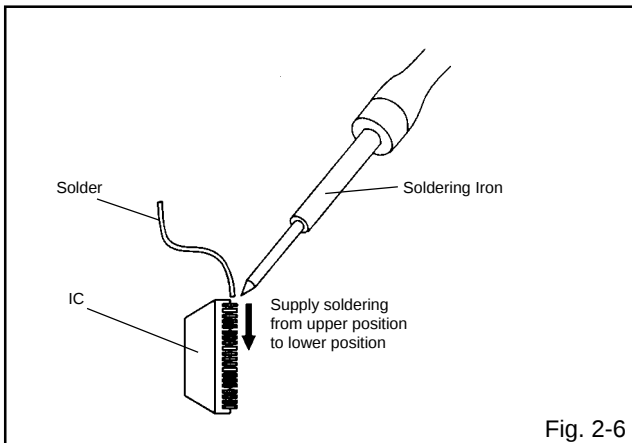
DISASSEMBLY INSTRUCTIONS

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.)**



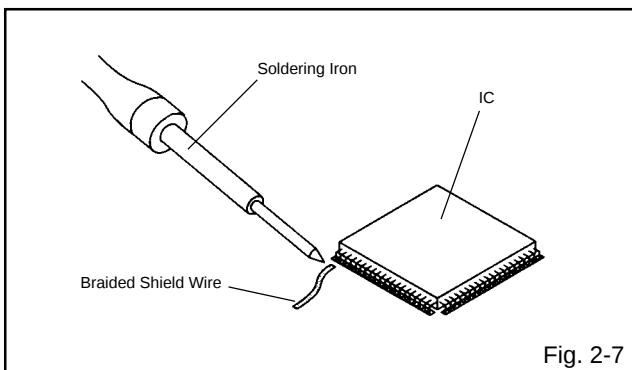
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 2-6.)**



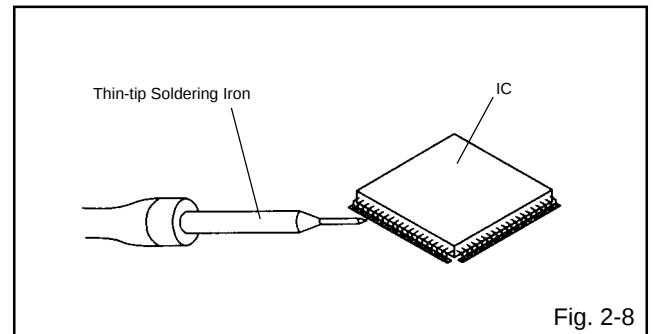
3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 2-7.)**

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.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF HOURS USED". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
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.

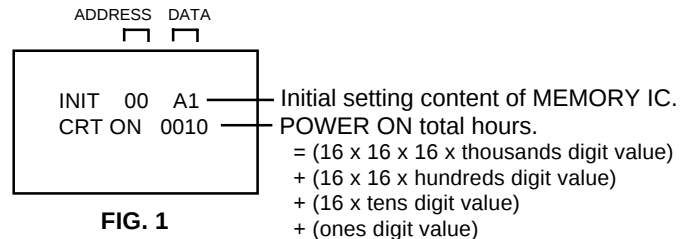


FIG. 1

WHEN REPLACING EEPROM (MEMORY) IC

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

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	08	60	99	02	09	B3	24	09	(*1)	00	44	25	00	D5	FF	A5

Table 1

(*1)

	Data
For USA	09
For CANADA	08

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

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

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

CAUTION

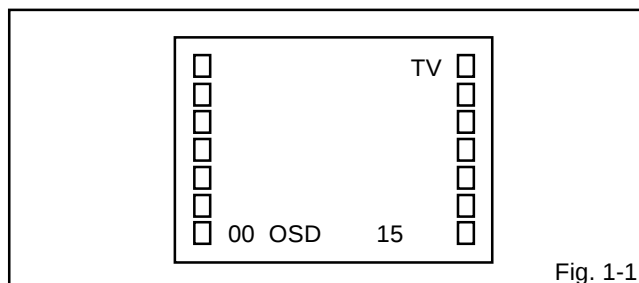
- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.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

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. 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**.



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 ACTION button on the remote control to end the adjustments.

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

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: RF AGC

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the VHF HIGH (63dB).
3. Connect the digital voltmeter to the **W043**.
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 $2.50 \pm 0.05V$.

2-2: 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, BRIGHTNESS=120, CONTRAST=40.
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.

2-3: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

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

2-4: FOCUS

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

2-5: VIF VCO

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

ELECTRICAL ADJUSTMENTS

2-6: HORIZONTAL PHASE

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

2-7: VERTICAL SHIFT

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

2-8: VERTICAL SIZE

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

2-9: OSD HORIZONTAL

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

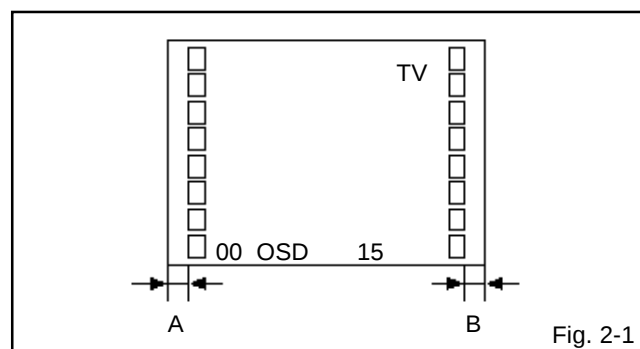


Fig. 2-1

2-10: BRIGHTNESS MANUAL

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 brightness step No. becomes "120".
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote to set to the AV mode. Then perform the above adjustment 2~3.

2-11: SUB TINT/SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
3. Connect the oscilloscope to **TP023**.
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line. **(Refer to Fig. 2-2)**
5. Press the channel button **(19)** on the remote control to select "COL. CENT".
6. Connect the oscilloscope to **TP022**.
7. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
8. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110% of the white level. **(Refer to Fig. 2-3)**
9. Receive the color bar pattern. (Audio Video Input)
10. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~8.

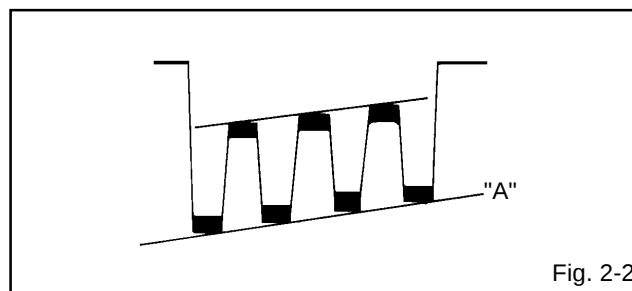


Fig. 2-2

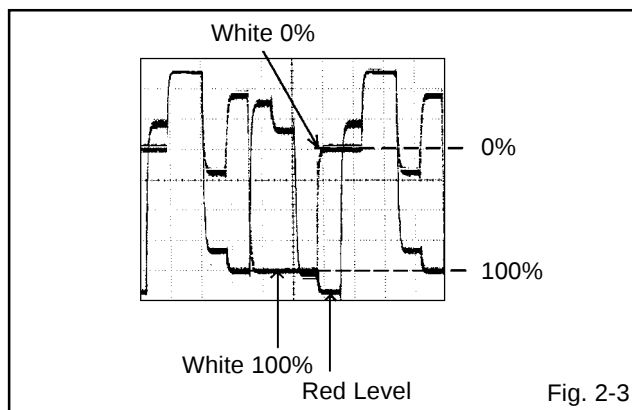


Fig. 2-3

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 "44".
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote to set to the AV mode. Then perform the above adjustment 2~3.

ELECTRICAL ADJUSTMENTS

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	04	04
14	BRIGHT MAX	140	140
15	BRIGHT MIN	60	60
16	CONT CENT	30	30
18	CONT MIN	12	12
20	COLOR MAX	74	75
21	COLOR MIN	01	01
23	SHARPNESS	40	40
24	FM LEVEL	00	00
25	LEVEL	00	00
26	SEPARATION 1	00	00
27	SEPARATION 2	00	00
28	TEST MONO	00	00
29	TEST STEREO	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 color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

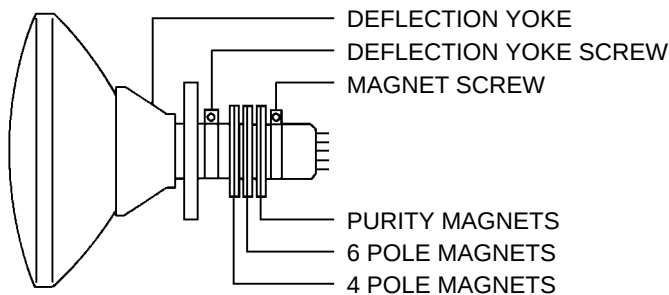


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

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

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

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

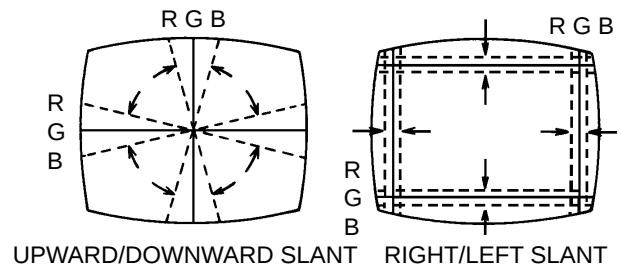
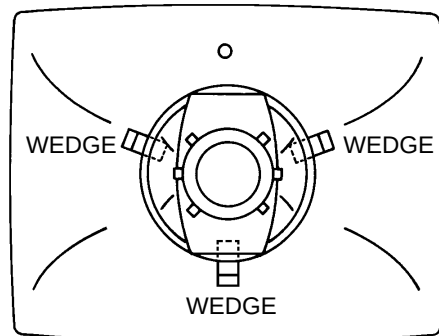


Fig. 3-2-a

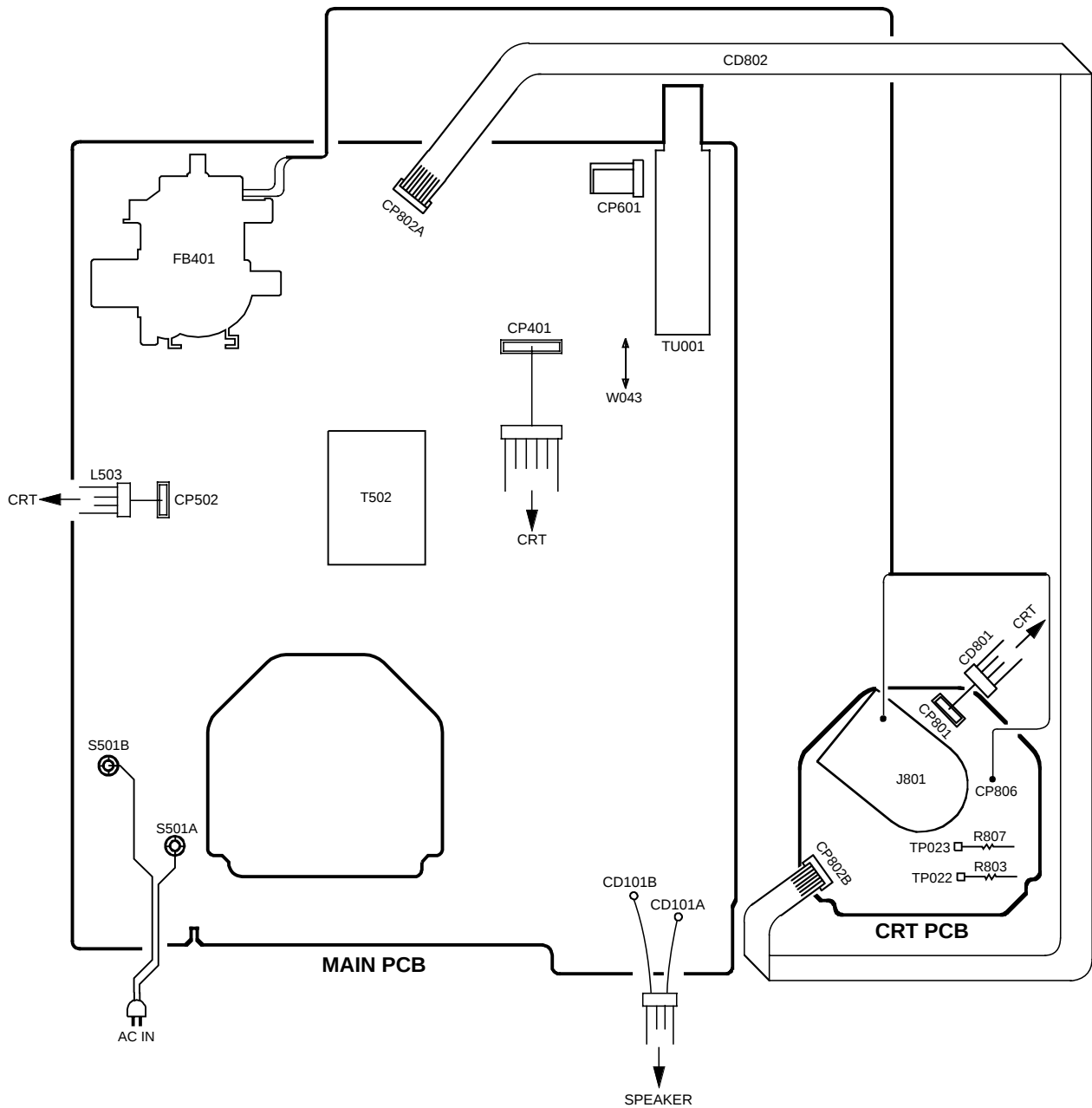


WEDGE POSITION

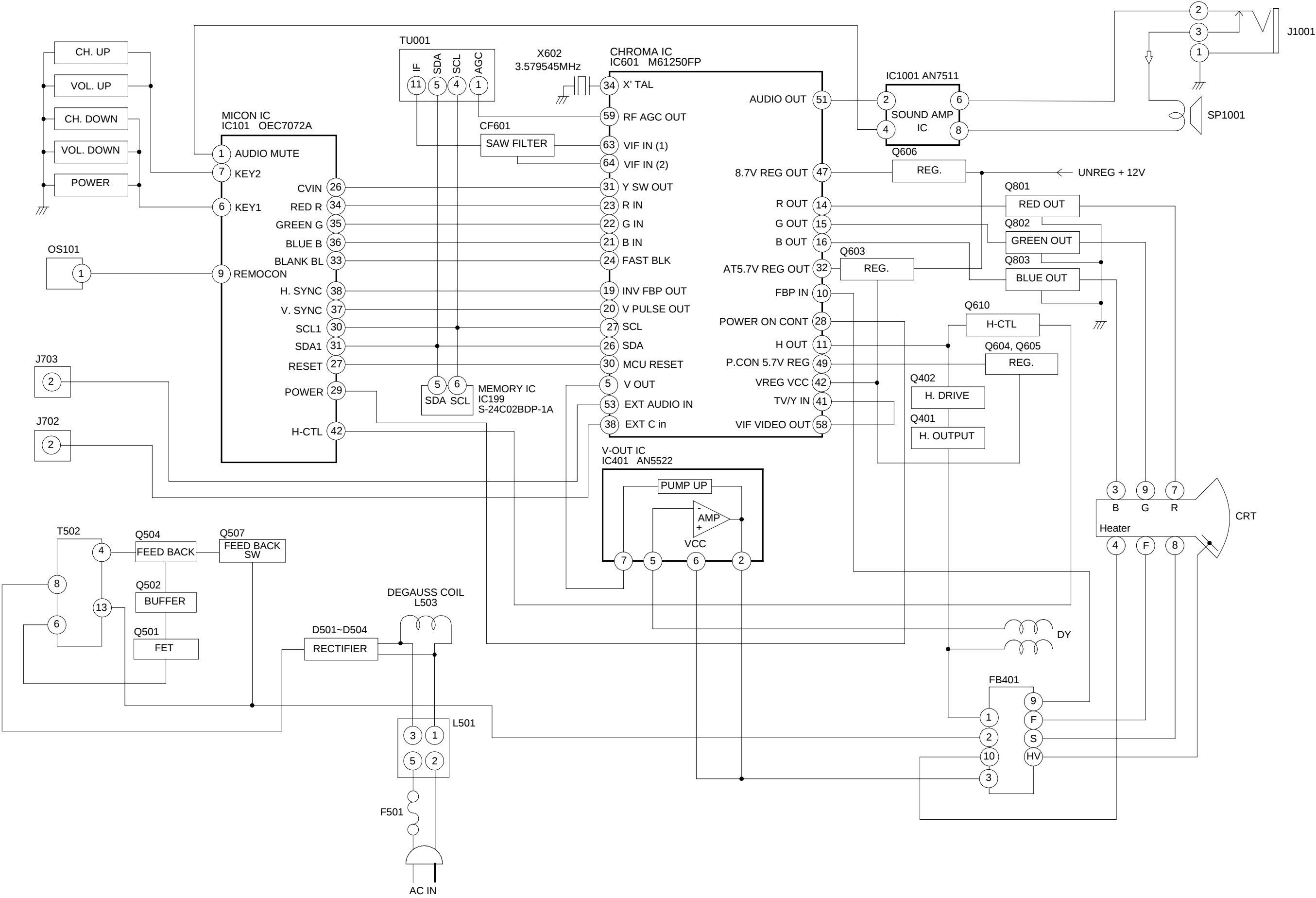
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

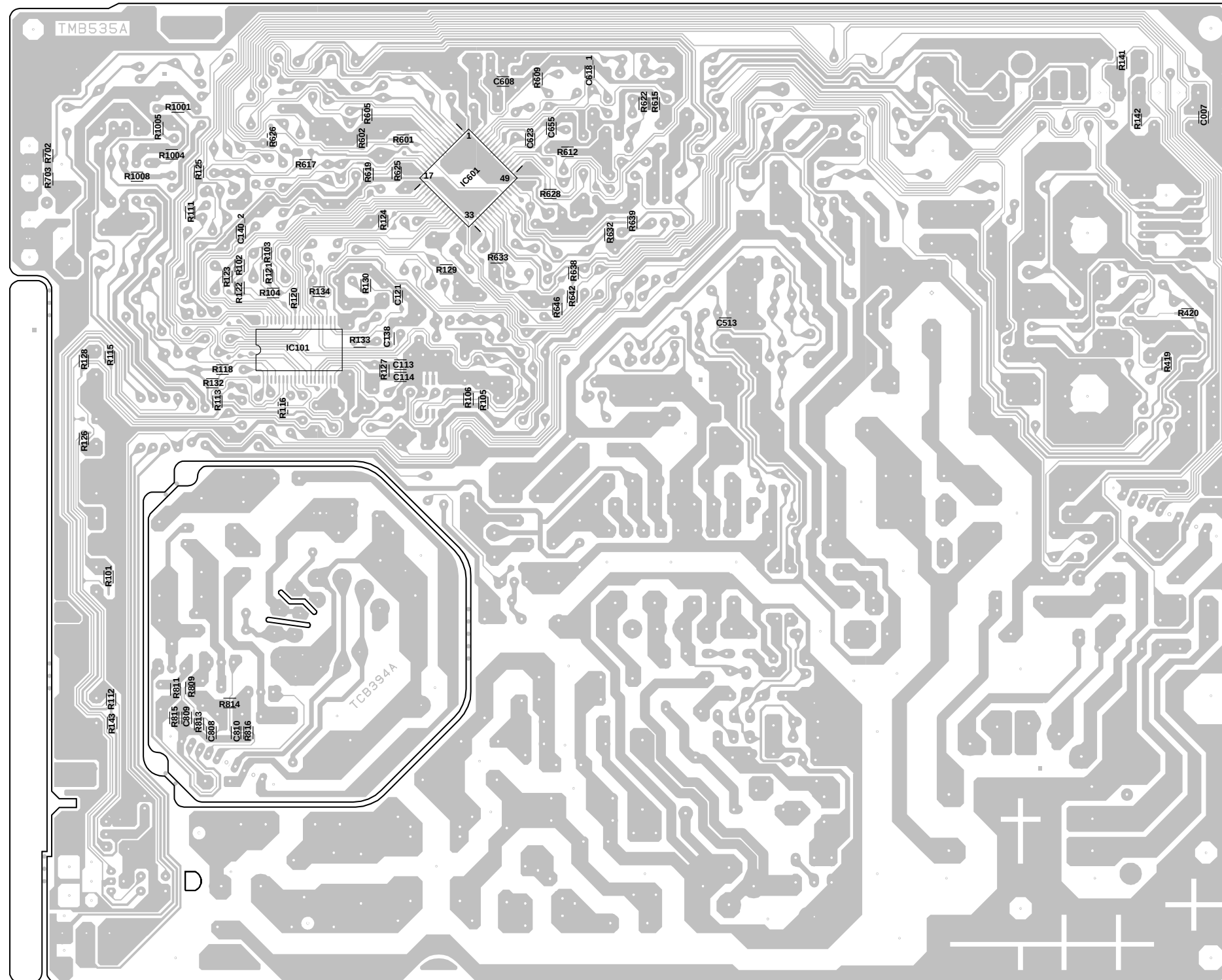
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



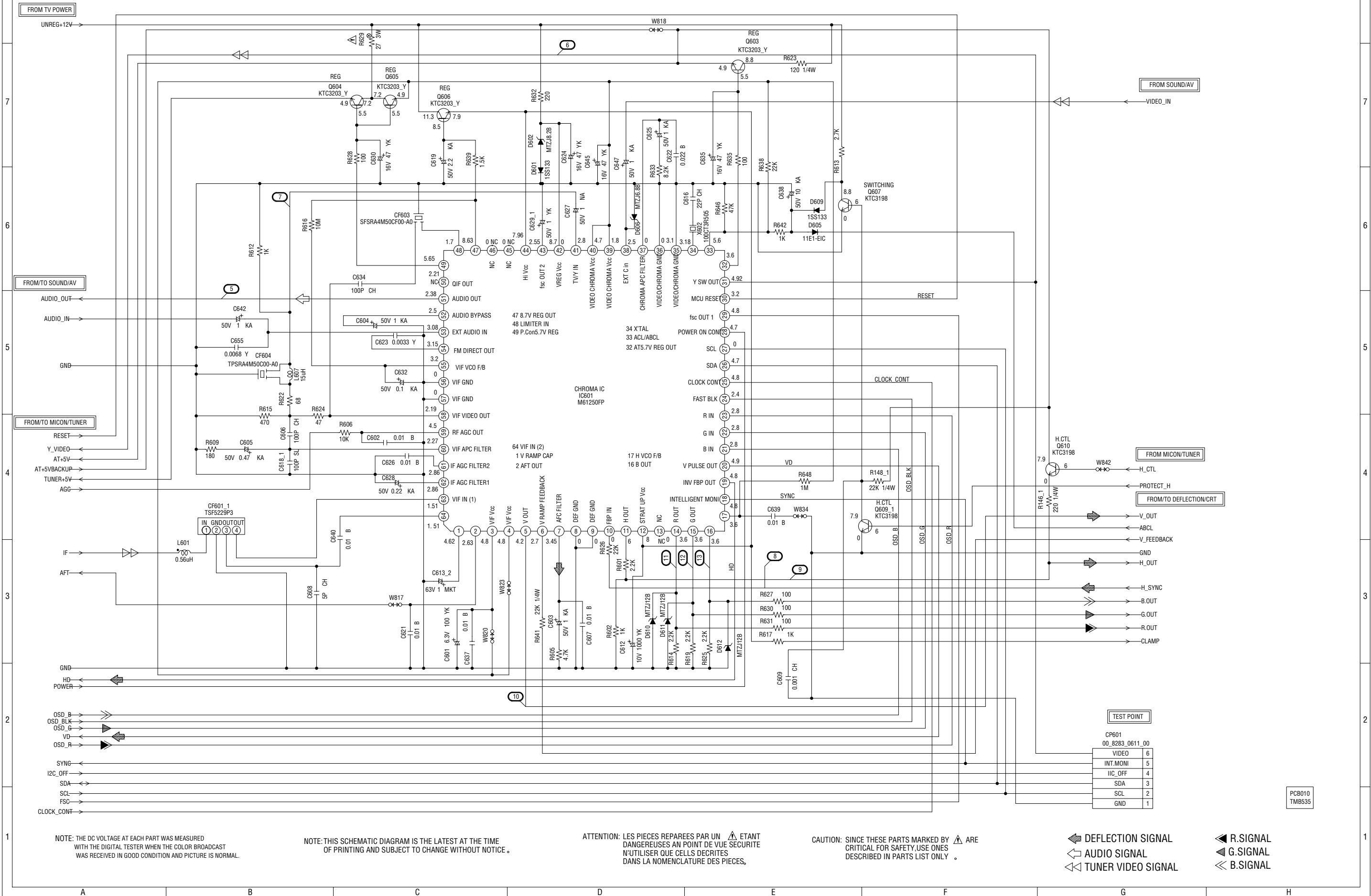
BLOCK DIAGRAM



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



CHROMA SCHEMATIC DIAGRAM
(MAIN PCB)



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

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

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT
DANGEREUSES À UN POINT DE VUE SÉCURITÉ
N'UTILISER QUE CELLLES DÉCRITES
DANS LA NOMENCLATURE DES PIÈCES.

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

DEFLECTION SIGNAL
 AUDIO SIGNAL
 TUNER VIDEO SIGNAL

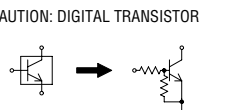
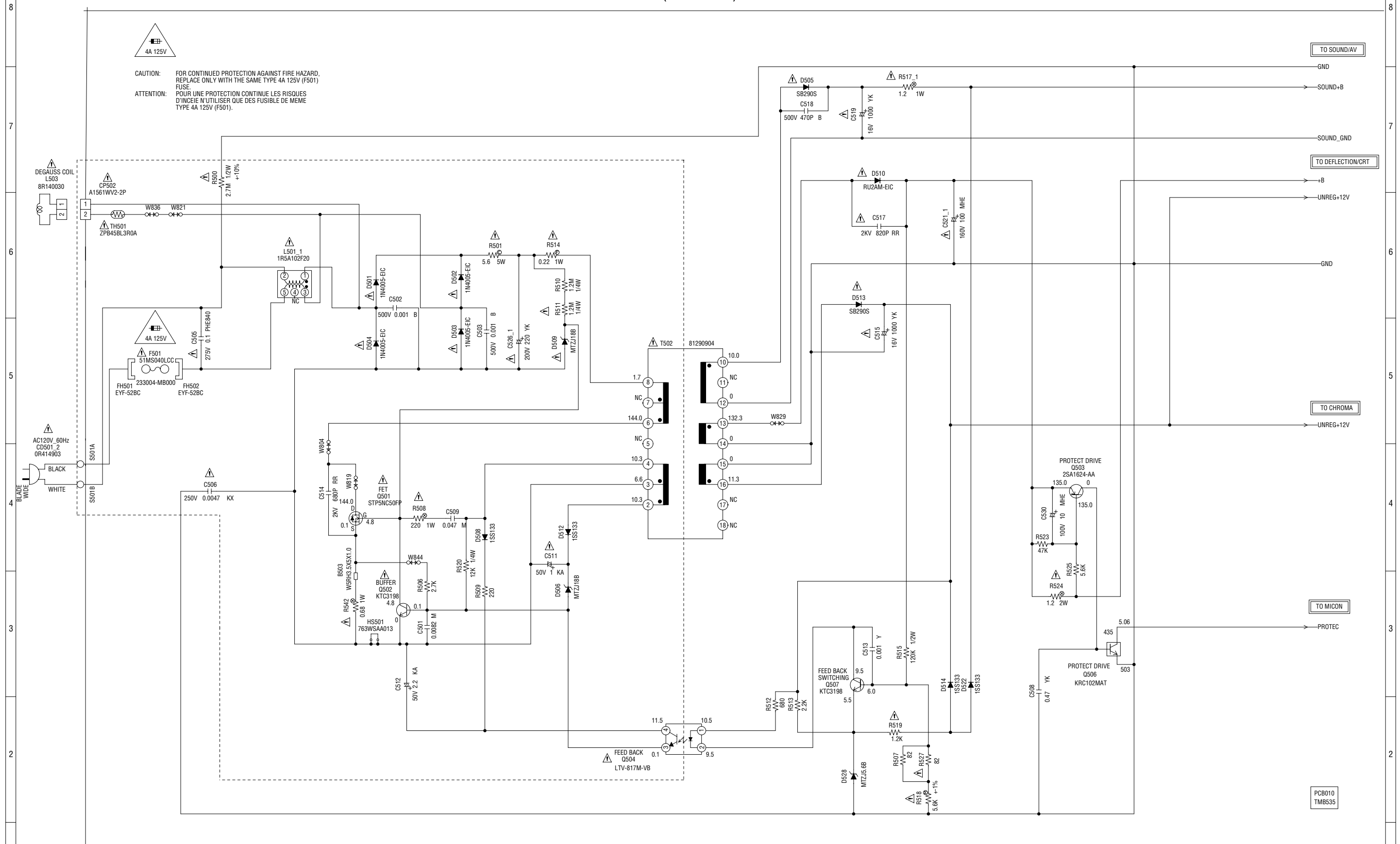
R SIGNAL
 G SIGNAL
 B SIGNAL

TEST POINT

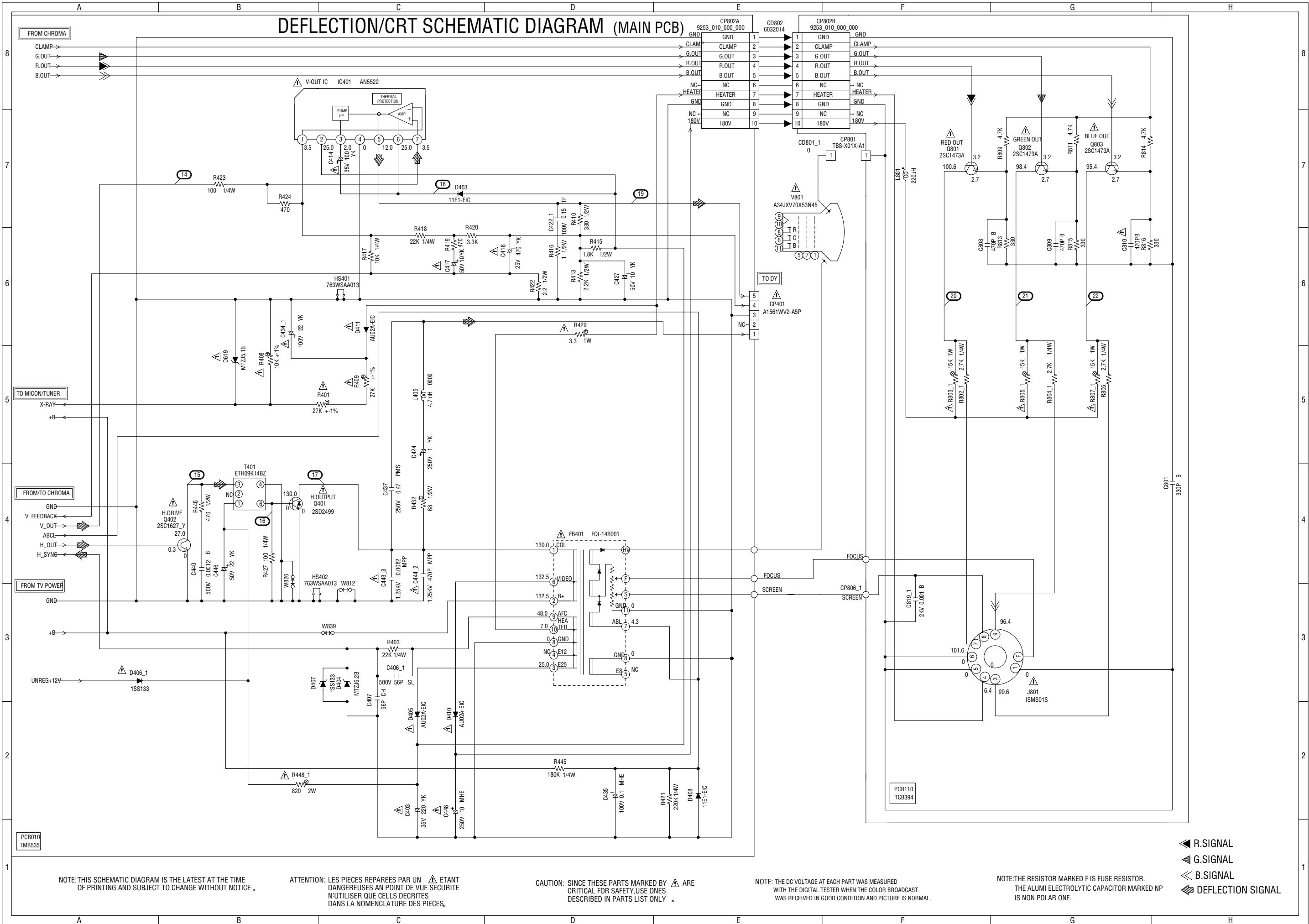
CP601	00_8283_0611_00
VIDEO	6
INT.MONI	5
IIC_OFF	4
SDA	3
SCL	2
GND	1

PCB010
TM8535

TV POWER SCHEMATIC DIAGRAM (MAIN PCB)



DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)



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

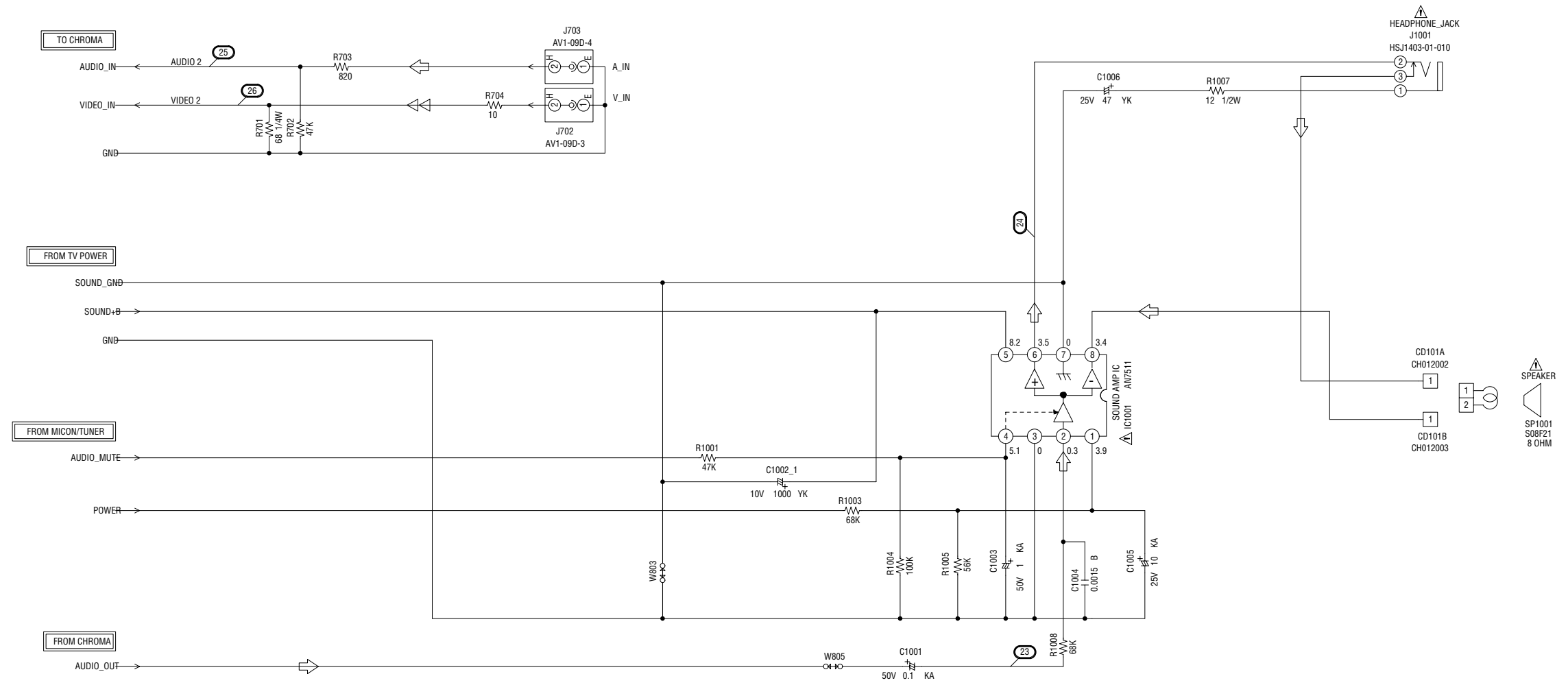
ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

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

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.

SOUND/AV SCHEMATIC DIAGRAM
(MAIN PCB)



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

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

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

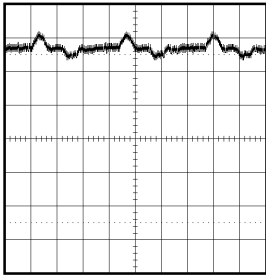
ATTENTION: LES PIECES REPARÉES PAR UN ETANT
DANGEREUSES AU POINT DE VUE SÉCURITÉ
N'UTILISER QUE CELLES DÉCRITES
DANS LA NOMENCLATURE DES PIÈCES.

TUNER VIDEO SIGNAL
 AUDIO SIGNAL

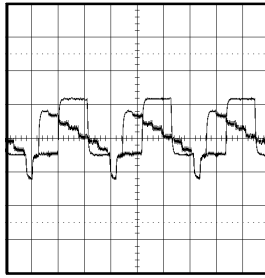
PCB010
TMB535

WAVEFORMS

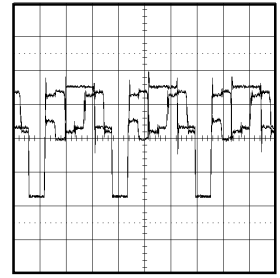
MICON/TUNER



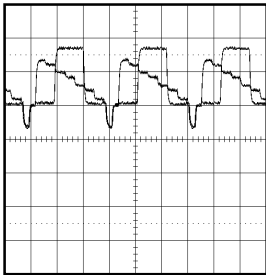
① 200mV 5ms/div



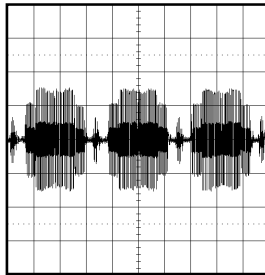
⑥ 0.5V 20μs/div



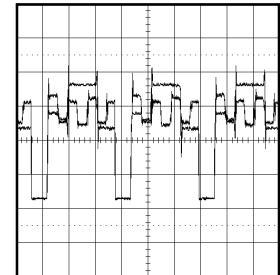
⑪ 1V 20μs/div



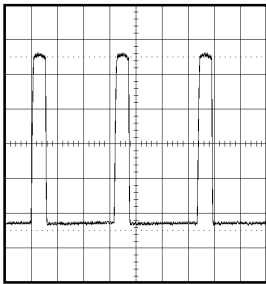
② 0.5V 20μs/div



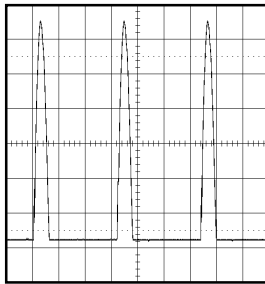
⑦ 200mV 20μs/div



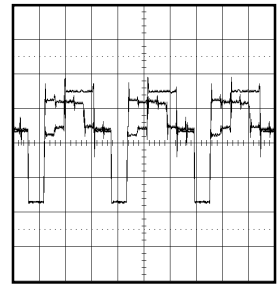
⑫ 1V 20μs/div



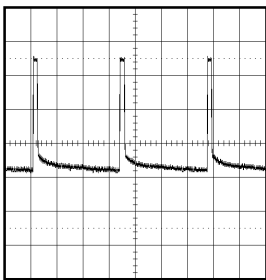
③ 200mV 20μs/div



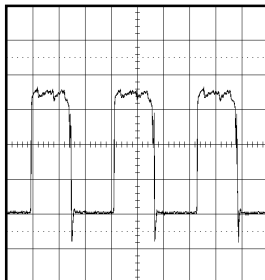
⑧ 20V 20μs/div



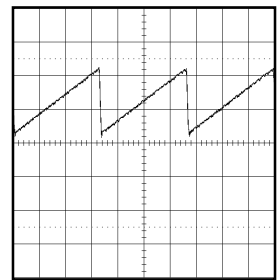
⑬ 1V 20μs/div



④ 200mV 5ms/div

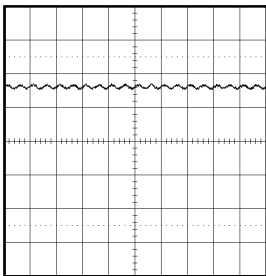


⑨ 200mV 20μs/div

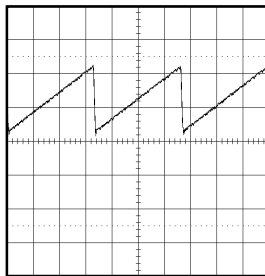


⑭ 0.5V 5ms/div

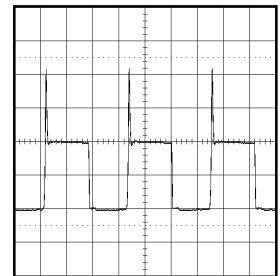
CHROMA



⑤ 0.5V 2ms/div



⑩ 0.5V 5ms/div

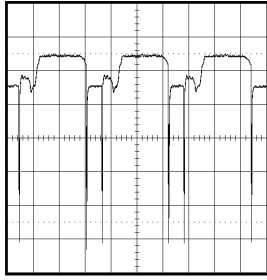


⑮ 20V 20μs/div

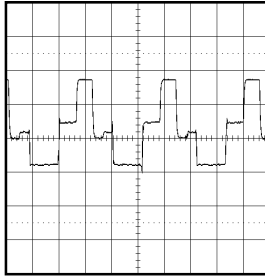
DEFLECTION/CRT

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

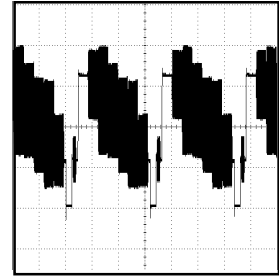
WAVEFORMS



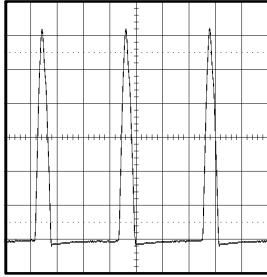
①⑥ 2V 20 μ s/div



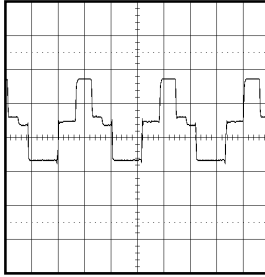
②① 50V 20 μ s/div



②⑥ 500mV 20 μ s/div

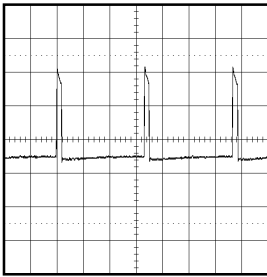


①⑦ 200V 20 μ s/div

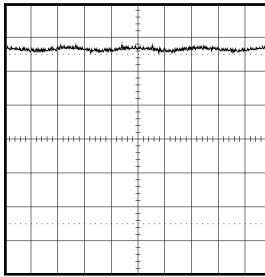


②② 50V 20 μ s/div

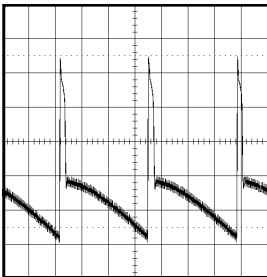
SOUND/AV



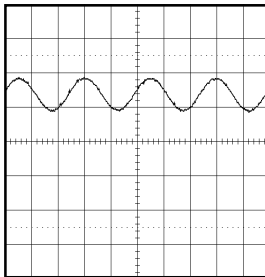
①⑧ 10V 5ms/div



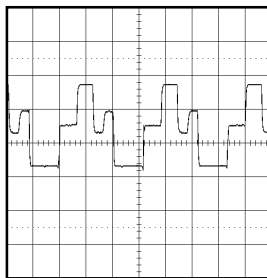
②③ 0.5V 1ms/div



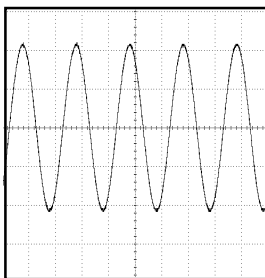
①⑨ 10V 5ms/div



②④ 1V 1ms/div



②⑦ 50V 20 μ s/div



②⑤ 200mV 500 μ s/div

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

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AD301336	A3L114C720	CABINET,FRONT ASSY	
102	AD300801	701WPJB228	CABINET,FRONT	
103	AD300802	713WPAA038	GLASS,LED	
104	AD300803	713WPAA039	GUIDE,REMOCON	
105	AD300804	735WPBA226	BUTTON,FRAME	
106	AD301337	702WPAA227	CABINET,BACK	
107	AD301338	722549A076	SHEET,RATING	
108	AD300007	7230006755	SHEET,CAUTION (FOR USA)	
	AD300132	7230006818	SHEET,CAUTION (FOR CANADA)	
109	AD300808	735WPA0396	SPEAKER HOLDER	
110	BZ710009	741WUA0019	SPRING,EARTH	
111	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
112	AD300843	800WQ00044	FELT SHEET	
201	BZ710275	8121J50B54	SCREW,TAPPING(B0) GW20	5x28
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	AD301339	8117540A44	SCREW,TAPPING(B0) TRUSS	4x14
204	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
205	BZ710352	8109I30604	SCREW,TAP TITE(B) WH7	3x6
206	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
207	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
208	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
---	AD300809	792WHAA052	PACKAGE, TOP	
---	AD300810	792WHAA053	PACKAGE, BOTTOM	
---	AD301340	793WCDB231	GIFT BOX (FOR USA)	
---	AD301410	793WCDB393	GIFT BOX (FOR CANADA)	
---	AD301341	A3L114C975	INSTRUCTION BOOK KIT	
---	AD300022	J3I70417	REGISTRATION CARD	
---	AD300023	J3I70436	ESP CARD	
---	AD301342	J3L11401	INSTRUCTION BOOK	
---	AD301343	J3L11416	IMPORTANT SAFETY INSTRUCTION	
---	AD300812	JB5UD400	POLYBAG,INSTRUCTION(RED CAUTION)	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
RESISTORS			
△ R401	BZ210089	R4X5T6273F	R,METAL 27K OHM 1/6W
△ R408	BZ210092	R4X5T6103F	R,METAL 10K OHM 1/6W
△ R409	BZ210089	R4X5T6273F	R,METAL 27K OHM 1/6W
△ R429	AD301311	R655813R3J	R,FUSE 3.3 OHM 1W
R448	AD301312	R3X18A821J	R,METAL OXIDE 820 OHM 2W
△ R500	BZ210080	R0G3K2275K	RC 2.7M OHM 1/2W
△ R501	AD300782	R5Y2CD5R6J	R,CEMENT 5.6 OHM 5W
R508	AD300783	R3X181221J	R,METAL OXIDE 220 OHM 1W
△ R509	AD301313	R001T6221J	RC 220 OHM 1/6W
R514	BZ210190	R63581R22J	R,FUSE 0.22 OHM 1W
△ R515	BZ210081	R002T2124J	RC 120K OHM 1/2W
△ R517	AD300784	R3X1811R2J	R,METAL OXIDE 1.2 OHM 1W
△ R518	AD300036	R4X5T6562F	R,METAL 5.6K OHM 1/6W
△ R519	AD301314	R001T6122J	RC 1.2K OHM 1/6W
R524	AD301315	R3X18A1R2J	R,METAL OXIDE 1.2 OHM 2W
△ R542	BZ210058	R3X181R68J	R,METAL OXIDE 0.68 OHM 1W
△ R629	AD301316	R3X28B270J	R,METAL OXIDE 27 OHM 3W
△ R803	BZ210099	R3X181153J	R,METAL OXIDE 15K OHM 1W
△ R805	BZ210099	R3X181153J	R,METAL OXIDE 15K OHM 1W
△ R807	BZ210099	R3X181153J	R,METAL OXIDE 15K OHM 1W
CAPACITORS			
△ C403	AD301317	E02LT4221M	CE 220 UF 35V
△ C414	AD300662	E02LT4101M	CE 100 UF 35V
△ C418	BZ110041	E02LT3471M	CE 470 UF 25V
△ C434	AD300064	E02LT8220M	CE 22 UF 100V
C437	BZ210173	P4J7F3474J	CMPP 0.47 UF 250V PMS
△ C443	BZ110137	P4N8FJ822H	CMPP 0.0082UF 1.25KV
△ C444	AD301318	P4N8FJ471J	CMPP 470 PF 1.25KV
△ C446	BZ110157	E02LT5220M	CE 22 UF 50V
△ C448	AD301319	E5EZ0D100M	CE 10 UF 250V
△ C503	BZ110061	C0JTB0513K	CC 0.001 UF 500V B
△ C505	BZ110145	P2472B104M	CMP 0.1 UF 275V PHE840
C506	BZ110196	CB3930MQ3M	CC 0.0047UF 250V
C514	AD301320	C0PLRR7U2K	CC 680 PF 2KV RR
△ C515	AD300925	E02LT2102M	CE 1000 UF 16V
C517	BZ110203	C0PLRR7W2K	CC 820 PF 2KV RR
△ C519	AD300925	E02LT2102M	CE 1000 UF 16V
C521	BZ110092	E5EZFB101M	CE 100 UF 160V
△ C526	BZ110089	E02LFC221M	CE 220 UF 200V
C634	AD301321	CQG0CH412J	CC 100 PF 50V CH
C819	AD300078	C0JBB0713K	CC 0.001 UF 2KV B
DIODES			
D001	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
D105	BZ410054	0021721150	LED SLR-342VCT32
D403	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D404	BZ410066	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77
△ D405	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D406	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D407	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D408	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△ D410	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
△ D411	BZ410063	D2WTAU02A0	DIODE,SILICON AU02A-EIC
D501	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△ D502	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△ D503	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
D504	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△ D505	BZ410076	D2WXB290S0	DIODE,SILICON SB290S
D506	AD300671	D97U01801B	DIODE,ZENER MTZJ18B T-77
D508	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△ D509	AD300671	D97U01801B	DIODE,ZENER MTZJ18B T-77
△ D510	BZ410080	D2WXRU2AM0	DIODE,SILICON RU2AM-EIC
D512	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△ D513	BZ410076	D2WXB290S0	DIODE,SILICON SB290S
D514	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D522	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
D601	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D602	BZ410058	D97U08R21B	DIODE,ZENER MTZJ8.2B T-77
D604	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
D605	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D606	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D607	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
D609	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D610	AD300070	D97U01201B	DIODE,ZENER MTZJ12B T-77
D611	AD300070	D97U01201B	DIODE,ZENER MTZJ12B T-77
D612	AD300070	D97U01201B	DIODE,ZENER MTZJ12B T-77
△ D619	BZ410020	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	USA-TOSHIBA	Reference No.	Description
ICS			
IC101	AD301322	I56F07072A	OEC7072A
IC199	AD301323	A3L114C015	S-24C02BDP-1A
IC199	AD301411	A3L115C015	S-24C02BDP-1A
△IC401	BZ611053	I01TD55220	AN5522
IC601	AD301324	I06FC61250	M61250FP
IC1001	BZ611001	I01DP75110	AN7511
TRANSISTORS			
△Q401	BZ510028	TDUF024990	2SD2499
△Q402	BZ510089	TC5T01627Y	2SC1627_Y(TPE2)
Q501	BZ510093	TJXG5NC500	STP5NC50FP
△Q502	BZ510069	TCATC31980	KTC3198-AT(Y,GR)
Q503	BZ510004	TA3T016240	2SA1624-AA
△Q504	BZ410088	0002E00610	LTV-817M-VB
Q506	BZ510096	TNATB03005	KRC102MAT
Q507	BZ510069	TCATC31980	KTC3198-AT(Y,GR)
Q603	BZ510070	TCAT032034	KTC3203_Y-AT
Q604	BZ510070	TCAT032034	KTC3203_Y-AT
Q605	BZ510070	TCAT032034	KTC3203_Y-AT
Q606	BZ510070	TCAT032034	KTC3203_Y-AT
Q607	BZ510069	TCATC31980	KTC3198-AT(Y,GR)
Q609	BZ510069	TCATC31980	KTC3198-AT(Y,GR)
Q610	BZ510069	TCATC31980	KTC3198-AT(Y,GR)
△Q801	AD300794	TCKT1473A0	2SC1473A-TA-(RQ)
△Q802	AD300794	TCKT1473A0	2SC1473A-TA-(RQ)
△Q803	AD300794	TCKT1473A0	2SC1473A-TA-(RQ)
COILS & TRANSFORMERS			
L101	AD300676	021LA63R3K	3.3 UH
L405	BZ310004	021679472K	4.7 MH
△L501	AD300677	029T00A7M1	1R5A102F20
△L503	AD300795	028R140030	8R140030
L601	BZ310012	021LA6R56M	0.56 UH
L607	BZ310043	021LA6150K	15 UH
L801	BZ310113	021673221K	220 UH
T401	BZ310157	045009003J	ETH09K14BZ
△T502	AD301325	0481290904	TRANSFORMER,SWITCHING
JACKS			
J702	AD300680	060Q401077	RCA JACK
J703	AD300681	060Q401076	RCA JACK
△J801	AD301147	066F120018	SOCKET,CATHODE RAY TUBE
J1001	AD300797	0602121012	JACK,RCA 3.5
SWITCHES			
SW101	BZ612001	0504201T31	SWITCH,TACT
SW102	BZ612001	0504201T31	SWITCH,TACT
SW103	BZ612001	0504201T31	SWITCH,TACT
SW104	BZ612001	0504201T31	SWITCH,TACT
SW105	BZ612001	0504201T31	SWITCH,TACT
P.C.BOARD ASSEMBLIES			
PCB010	AD301326	A3L114C010	PCB ASS'Y (FOR U.S.A.)
PCB010	AD301412	A3L115C010	PCB ASS'Y (FOR CANADA)
PCB110	AD301327	A3L114C110	PCB ASS'Y
MISCELLANEOUS			
B503	BZ310121	024HT03553	CORE,BEADS
△CD501	AD300685	120R414903	CORD AC BUSH
CF601	BZ613031	1029045R7G	FILTER,SAW
CF603	AD301328	1012T4R520	FILTER,CERAMIC
CF604	AD300686	1012T4R519	FILTER,CERAMIC TRAP
△CP401	BZ614303	069S450089	CONNECTOR PCB SIDE
△CP502	AD300687	069S420110	CONNECTOR PCB SIDE
CP601	AD301329	069E260659	CONNECTOR PCB SIDE
CP801	AD300800	069W010030	CONNECTOR PCB SIDE
CD101A	AD301330	06CH012002	CORD CONNECTOR
CD101B	AD301331	06CH012003	CORD CONNECTOR
CP802A	AD301333	067N010039	WIRE HOLDER
CP802B	AD301333	067N010039	WIRE HOLDER
EL001	BZ614043	124116281A	EYE LET
EL002	BZ614044	124120301A	EYE LET
△F501	AD300688	081PC04004	FUSE
△FB401	BZ310159	043214033F	TRANSFORMER,FLYBACK
FH501	BZ614005	06710T0006	HOLDER,FUSE
FH502	BZ614005	06710T0006	HOLDER,FUSE
OS101	BZ614290	077Q037003	REMOTE RECEIVER
S101	AD301334	WHL6032014	FLAT CABLE AWM2468 A
SP1001	AD300689	070Y132018	SPEAKER
△TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT
TM101	AD301335	076N0EH020	TRANSMITTER
△TU001	BZ310341	0145K00056	TUNER,VHF-UHF
△V801	BZ614342	098Y1404B9	CRT W/DY
X602	BZ613004	100CT3R505	CRYSTAL

ELECTRICAL REPLACEMENT PARTS LIST

RESISTOR

RC.....	CARBON RESISTOR
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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

TOSHIBA

FILE NO. 053-200226

SERVICE MANUAL

COLOR TELEVISION

13A22

MFR'S VERSION	CRT	PCB010	PCB110
A	A34JXV70X53N45	TMB535A	TCB394A
B	A34AGT13X98(L)		
D		TMB535B	TCB394B

Change of CRT

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	MFR'S VERSION A			MFR'S VERSION B		
	PART NO.	DESCRIPTION	TSB P/N	PART NO.	DESCRIPTION	TSB P/N
⚠ V801	098Y1404B9	CRT W/DY A34JXV70X53N45	BZ614342	098Q1404B2	CRT W/DY A34AGT13X98(L)	BZ614141

CRT are interchangeable.

Change of PCB

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	MFR'S VERSION B			MFR'S VERSION D		
	PART NO.	DESCRIPTION	TSB P/N	PART NO.	DESCRIPTION	TSB P/N
PCB010	A3L114C010	MAIN PCB ASS'Y (VERSION B) TMB535A	AD301326	A3L114C010	MAIN PCB ASS'Y (VERSION D) TMB535B	AD301326
PCB110	A3L114C110	CRT PCB ASS'Y (VERSION B) TCB394A	AD301327	A3L114C110	CRT PCB ASS'Y (VERSION D) TCB394B	AD301327

MAIN PCB's and CRT PCB's are interchangeable.

TOSHIBA CORPORATION

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