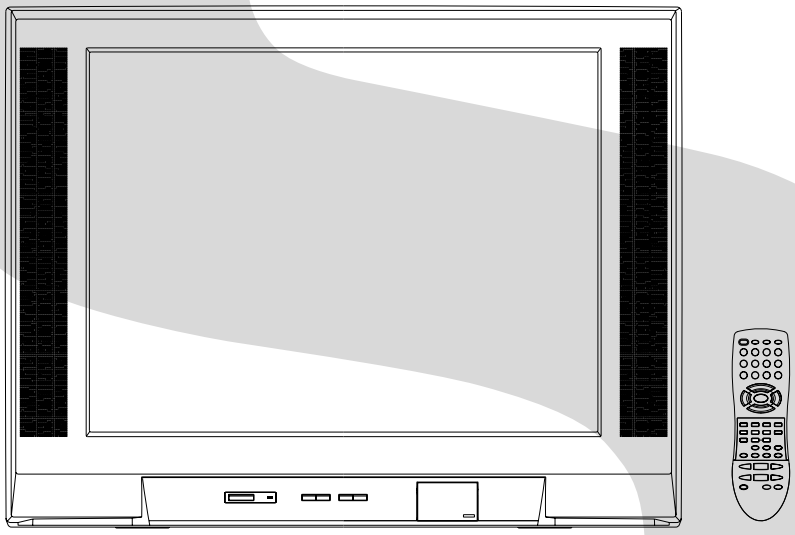
TOSHIBA

FILE NO. 050-200311

SERVICE MANUAL

COLOR TELEVISION

27A43



DOCUMENT CREATED IN JAPAN, Mar., 2003

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

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

2. AVOID AN ELECTRIC SHOCK

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

3. USE THE DESIGNATED PARTS

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

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

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

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

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

6. AVOID AN X-RAY

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

7. PERFORM A SAFETY CHECK AFTER SERVICING

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

(INSULATION CHECK PROCEDURE)

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

[Note 1]

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

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

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

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

IMPORTANT

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

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GENERAL SPECIFICATIONS

G-1	**TV System**	CRT	CRT Size / Visual Size	27 inch / 676mmV
			CRT Type	Normal
			Deflection	108 degree
			Magnetic Field BV/BH	+0.45G/0.18G
		Color System		NTSC
		Speaker		2Speaker
			Position	Front
			Size	2.0 x 3.5 Inch
			Impedance	8 ohm
		Sound Output	MAX	2.5 + 2.5 W
			10%(Typical)	2.0 + 2.0 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
		Stereo/Dual TV Sound		Yes
		Tuner Sound Muting		Yes
G-3	**Power**	Power Source	AC	120V AC 60Hz
			DC	-
		Power Consumption	at AC	
				125 W at AC 120 V 60 Hz
			Stand by (at AC)	3 W at AC 120 V 60 Hz
			Per Year	-- kWh/Year
		Protector	Power Fuse	Yes
G-4	**Regulation**		Safety	UL/CSA
			Radiation	FCC/IC
			X-Radiation	DHHS/HWC
G-5	**Temperature**		Operation	+5oC ~ +40oC
			Storage	-20oC ~ +60oC
G-6	**Operating Humidity**			Less than 80% RH

GENERAL SPECIFICATIONS

G-7	**On Screen Display**	Menu			Yes
			Menu Type		Icon
			Picture		Yes
				Contrast	Yes
				Brightness	Yes
				Color	Yes
				Tint	Yes
				Sharpness	Yes
			Audio		Yes
				Bass	Yes
				Treble	Yes
				Balance	Yes
				BBE On/Off	No
				Stable Sound On/Off	Yes
				Surround On/Off	Yes
			Set Up		Yes
				TV/CABLE(CATV)	Yes
				CH Program	Yes
				Add/Erase	Yes
			Option		Yes
				Language	Yes
				V-chip	Yes
				CH Label	Yes
				Favorite CH	Yes
				Lock	Yes
				On/Off Timer	Yes
				Color Stream DVD/DTV	Yes
			Control Level		Yes
				Volume	Yes
				Brightness	Yes
				Contrast	Yes
				Color	Yes
				Tint (NTSC Only)	Yes
				Sharpness	Yes
				Tuning	No
				Bass	Yes
				Treble	Yes
				Balance	Yes
				Back Light	No
			Stereo,Audio Output,SAP		Yes
			Video		Yes
			Color Stream		Yes
			Channel(TV/Cable)		Yes
			CH Label		Yes
			Game Timer		Yes
			Sleep Timer		Yes
			Sound Mute		Yes
			V-chip Rating		Yes
			16: 9		No
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 / Clock)	Yes
		Wake Up Timer			No
		Timer Back-up (at Power Off Mode)		more than	-- Min Sec

GENERAL SPECIFICATIONS

G-10	**Remote Control**	Unit		RC-GF
		Glow in Dark Remocon		Yes
		Format		Toshiba
		Custom Code		TV:40-BF h
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		48 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	Yes
			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/Enter	Yes
			Mute	Yes
			Exit	Yes
			MTS(Audio Select)	Yes
			Fav.Up	Yes
			Fav.Down	Yes
			16: 9	No
		Multi Brand Keys	CH Up(VCR)	Yes
			CH Down(VCR)	Yes
			Pause/Still	Yes
			TV/VCR(VCR)	Yes
			FF	Yes
			Rew	Yes
			Rec	Yes
			Play	Yes
			Stop	Yes
			TV	Yes
			VCR	Yes
			Cable	Yes
			DVD	Yes
			CODE	Yes
			DVD MENU <	Yes
			DVD MENU >	Yes
			DVD CLEAR	Yes
			TOP MENU	Yes
			DVD MENU	Yes

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,Toshiba Type
		BBE		No
		Auto Search		No
		CH Allocation		No
		SAP		Yes
		Just Clock Function		No
		CH Label		Yes
		VM Circuit		No
		Full OSD		No
		Premiere		No
		Comb Filter		Yes
				3 Lines
		Auto CH Memory		Yes
		Hotel Lock		No
		Closed Caption		Yes
		Stable Sound		Yes
		FBT Leak Test Protect		Yes
		CH Lock		Yes
		Video Lock		Yes
		Game Timer (Max Time:120 Min)		Yes
		Energy Star		Yes
		Favorite CH		Yes
		Surround		Yes
		16:9 Mode		No
		2 Tuner P-in-P		No
G-12	**Accessories**	Owner's Manual	Language	English /French
			W/ Warranty	Yes
		Remote Control Unit		Yes
		Rod Antenna		No
			Poles	
			Terminal	
		Loop Antenna		No
			Terminal	
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No
		Important Safety Instruction		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		Quick Set-up Sheet		No
		Battery		Yes
			UM size x pcs	UM4 size x 2
			OEM Brand	No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Registration Card (NDL Card)		Yes
		ESP Card		Yes
		PTB Sheet		No
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS

G-13	**Interface**	Switch	Front	Power	Yes
				System Select	No
				Main Power SW	No
				Sub Power	No
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
			Rear	AC/DC	No
				TV/CATV Selector	No
				Degauss	No
				Main Power SW	No
		Indicator		Power	Yes(RED)
				Stand-by	No
				On Timer	No
		Terminals	Front	Video Input	RCA
				Audio Input	RCA x 2
				Other Terminal	No
			Rear	Video Input(Rear1)	RCA
				Video Input(Rear2)	RCA
				Audio Input(Rear1)	RCA x 2
				Audio Input(Rear2)	RCA x 2
				Video Output	RCA
				Audio Output	RCA x 2
				S- Input	Yes
				Euro Scart	No
				Color Stream	RCA x 3
				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)	740 x 491.5 x 571.5
G-15	**Weight**			Net (Approx.)	37.0kg (81.6 lbs)
				Gross (Approx.)	41.0Kg (90.4 lbs)
G-16	**Carton**		Master Carton		No
				Content	---- Sets
				Material	-- /--
				Dimensions W x D x H(mm)	-- x -- x --
				Description of Origin	No
			Gift Box		Yes
				Material	Double/Brown
				Dimensions W x D x H(mm)	850 x 575 x 665
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test		Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	31
			Container Stuffing		168 Sets/40' container
G-17	**Cabinet Material**		Cabinet	Cabinet Front	PS 94V0 DECABROM
				Cabinet Rear	PS 94V0 DECABROM
			PCB	Non-Halogen Demand	No
				Eyelet Demand	Yes

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

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

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

REMOVAL

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

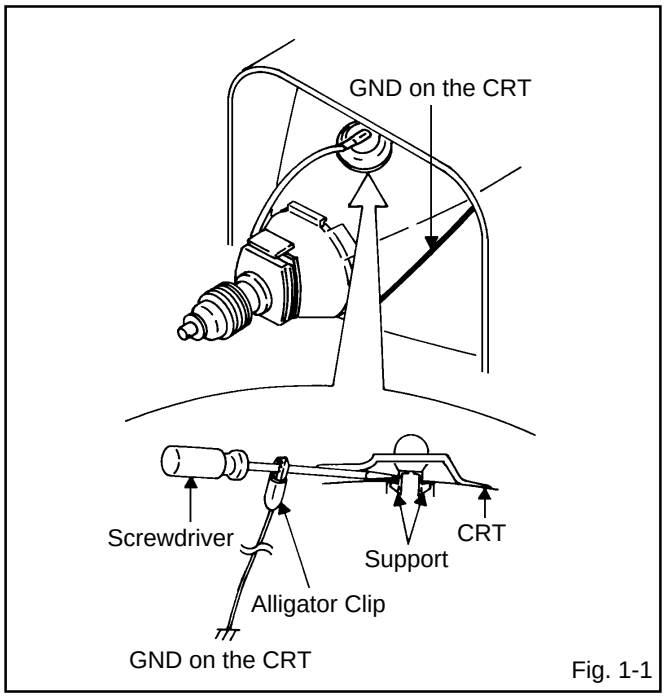


Fig. 1-1

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

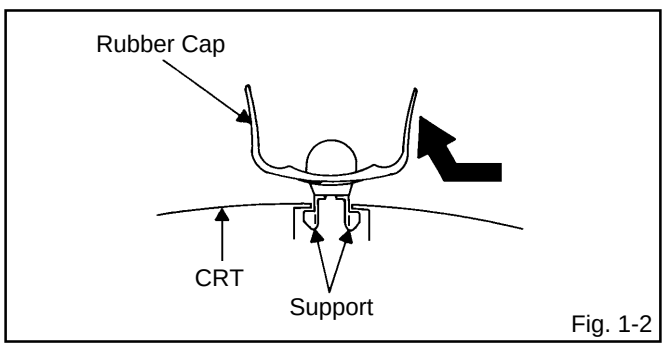


Fig. 1-2

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

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

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

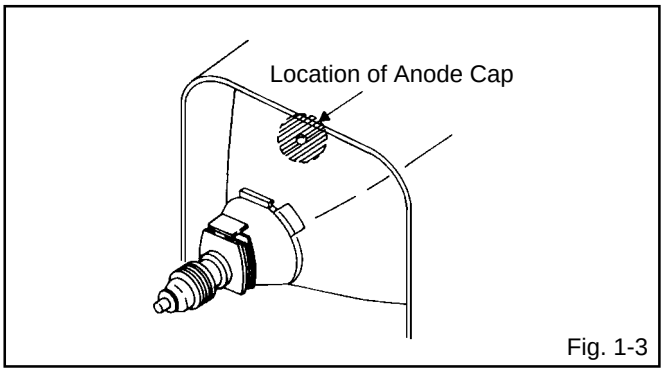
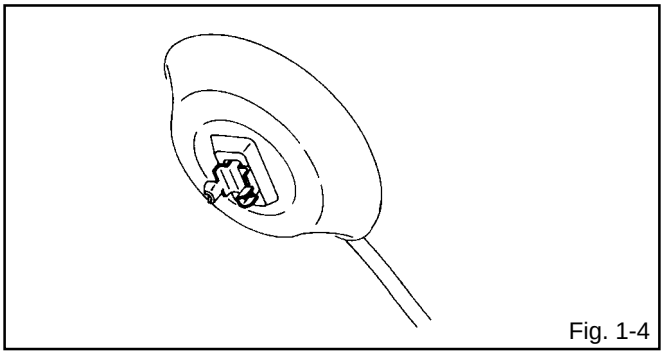


Fig. 1-3

NOTE

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

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


Fig. 1-4

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

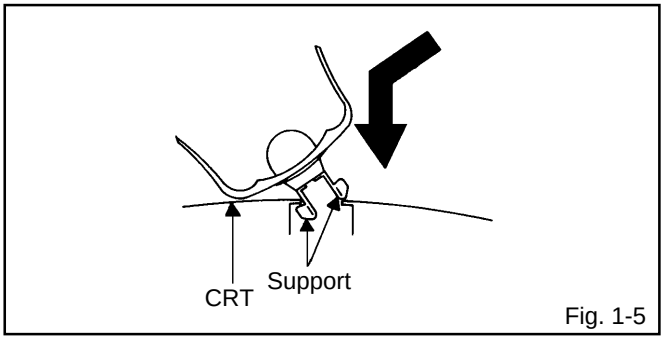


Fig. 1-5

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

DISASSEMBLY INSTRUCTIONS

2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

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

   NOTE

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

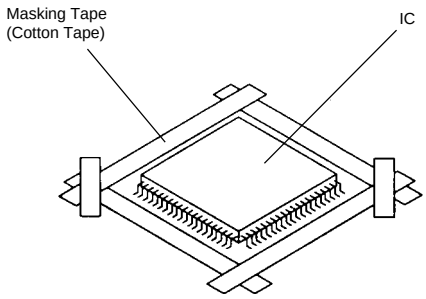


Fig. 2-1

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

   NOTE

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

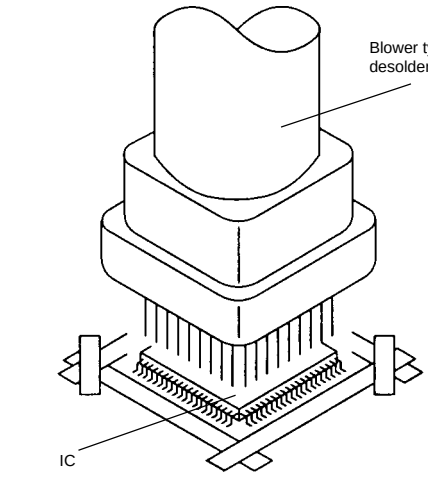


Fig. 2-2

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

   NOTE

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

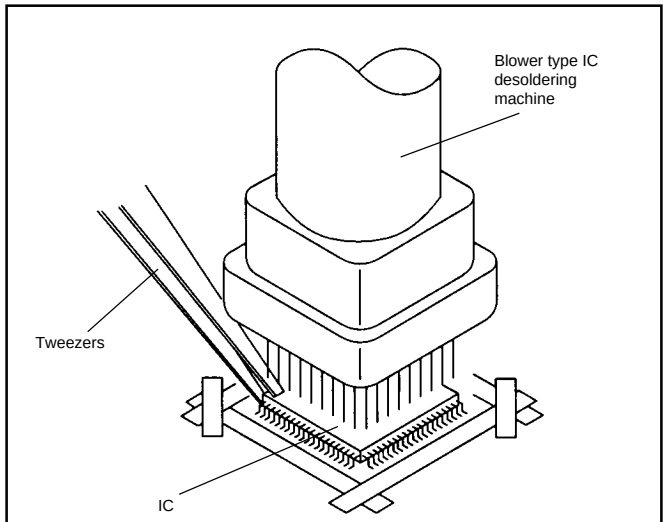


Fig. 2-3

4. Peel off the Masking Tape.

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

   NOTE

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

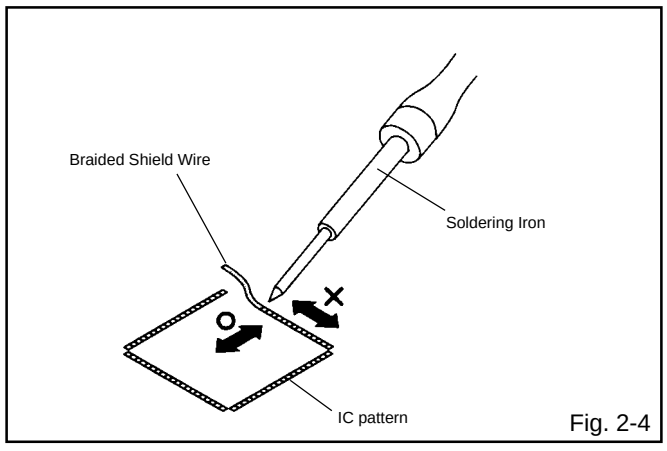


Fig. 2-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

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

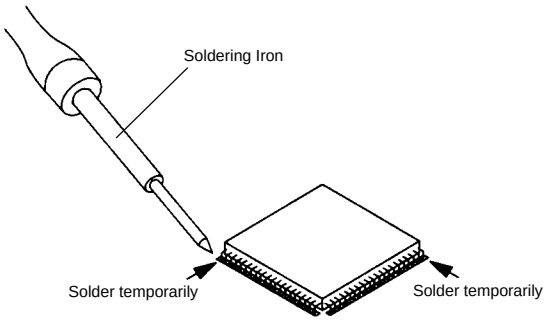


Fig. 2-5

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

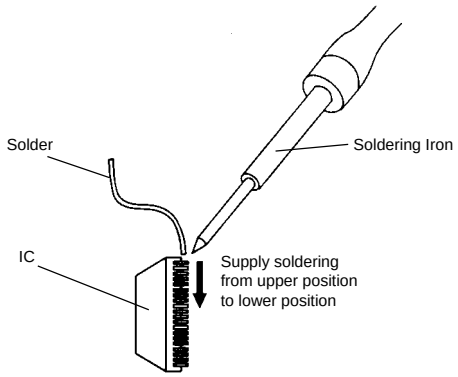


Fig. 2-6

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

   NOTE

   Do not absorb the solder to excess.

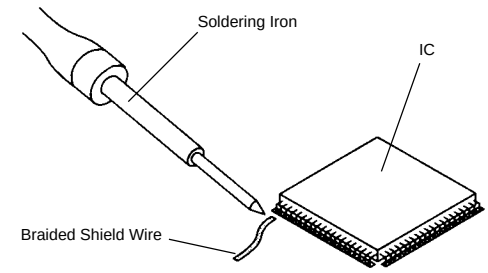


Fig. 2-7

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

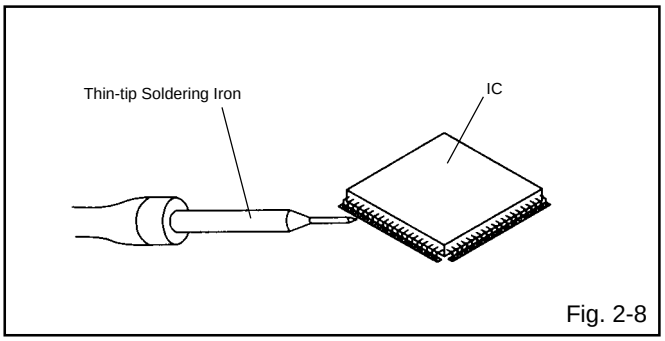


Fig. 2-8

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

   NOTE

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

SERVICE MODE LIST

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

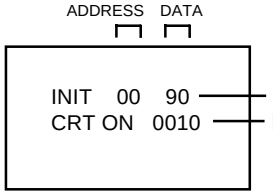
Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD and LOCK PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours.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



Initial setting content of MEMORY IC.
POWER ON total hours.
= (16 x 16 x 16 x thousands digit value)
+ (16 x 16 x hundreds digit value)
+ (16 x tens digit value)
+ (ones digit value)

FIG. 1

WHEN REPLACING EEPROM (MEMORY) IC

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

NOTE: No need setting for after INI 1F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	90	E8	02	65	5E	B3	24	37	39	AC	AA	04	40	40	40	7F
10	50	00	00	00	00	00	00	99	3F	0F	0D	C6	A8	21	43	00

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second. ADDRESS and DATA should appear as FIG 1.
3. ADDRESS is now selected and should "blink". Using the VOL. UP/DOWN 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. UP/DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input. **After the data input, set to the initializing of shipping.**
9. Turn POWER on.
10. Press both VOL. DOWN button on the set and Channel button **(1)** on the remote control for more than 1 second.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

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

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

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

CAUTION

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

Prepare the following measurement tools for electrical adjustments.

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

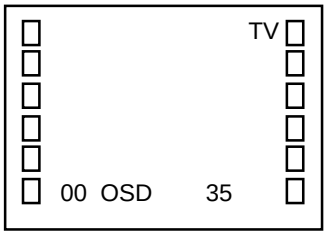


Fig. 1-1

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

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	19	CONTRAST CENT
01	CUT OFF	20	CONTRAST MIN
02	H. VCO	21	COLOR MAX
03	H. PHASE	22	COLOR CENTER
04	AFC GAIN	23	COLOR MIN
05	V. SHIFT	24	TINT
06	H. SIZE	25	SHARPNESS
07	V. SIZE	26	Cb DELAY FINE
08	V. LINEARITY	27	Cr DELAY FINE
09	VS CORRECTION	28	Cb PEDESTAL ADJ
10	DRIVE R	29	Cr PEDESTAL ADJ
11	DRIVE B	30	E/W PARABOLA
12	R CUT OFF	31	E/W CORNER
13	G CUT OFF	32	E/W TRAPEZIUM
14	B CUT OFF	33	LEVEL
15	BRIGHT MAX	34	SEPARATION1
16	BRIGHT CENT	35	SEPARATION2
17	BRIGHT MIN	88	READ DATA
18	CONTRAST MAX		

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CONSTANT VOLTAGE

1. Place the set with Aging Test for more than 5 minutes.
2. Set condition is AV MODE without signal.
3. Connect the digital voltmeter to the **TP003**.
4. Adjust the **VR502** until the digital voltmeter is 123 ± 0.5V.

2-2: CUT OFF

1. Place the set with Aging Test for more than 15 minutes.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
3. 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 **(12)** 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”, “B. DRIVE” or “G. DRIVE”.
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R. BIAS, G. BIAS, B. BIAS, B. DRIVE, and G. 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 the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-5: 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 **(03)** 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.

ELECTRICAL ADJUSTMENTS

2-6: HORIZONTAL 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 “H. SIZE”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes 11 ± 1%.

2-7: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR401** 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 **(07)** 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 9 ± 2%.

2-9: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-8. After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select “V. LIN”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-10: LEVEL

1. Receive the monoscope pattern (70dB).
2. Connect the AC voltmeter to **pin 6 of CP101**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(33)** on the remote control to select "LEVEL".
4. Press the VOL. UP/DOWN button on the remote control until the AC voltmeter is 75 ± 2mV.

2-11: PARABOLA

1. Receive the crosshatch signal from the Pattern Generator.
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 **(30)** on the remote control to select “PARABOLA”.
4. Press the VOL. UP/DOWN button on the remote control until the right and left vertical lines are straight.

2-12: TRAPEZIUM

1. Receive the crosshatch signal from the Pattern Generator.
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 **(32)** on the remote control to select “TRAPEZIUM”.
4. Press the VOL. UP/DOWN button on the remote control until the both vertical lines of the screen become parallel.

2-13: SEPARATION 1, 2

Please do the method (1) or method (2) adjustment.

Method (1)

1. Set the multi-sound signal generator for each different L-ch and R-ch frequency (Ex. L-ch=2KHz, R-ch=400Hz) and receive the RF.
2. Connect the oscilloscope to the **Audio Out Jack**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select “SEP 1”.
4. Press the VOL. UP/DOWN button on the remote control to adjust it until the audio output wave becomes a fine sine wave.
5. Press the CH UP button once the set to "SEP 2" mode. Then perform the above adjustment 4.

Method (2)

1. Set the multi-sound signal generator L-ch=1KHz, R-ch =Non input and receive the RF.
2. Connect the oscilloscope to the **Audio Out Jack (R-ch)**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select “SEP 1”.
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the R-ch output becomes minimum.
6. Set the multi-sound signal generator L-ch=Non input, R-ch=1KHz and receive the RF.
7. Connect the oscilloscope to the **Audio Out Jack (L-ch)**.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select “SEP 2”.
9. Press the VOL. UP/DOWN button on the remote control to adjust it until the L-ch output becomes minimum.

ELECTRICAL ADJUSTMENTS

2-14: BRIGHT CENT

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 0% is starting to be visible
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the TV/VIDEO button on the remote control to set to the CS mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
9. Press the VOL. UP/DOWN button on the remote control until the brightness step No. becomes “90

2-15: TINT/COLOR CENT

1. Receive the color bar pattern.
2. Connect the oscilloscope to **TP024**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(24)** on the remote control to select "TINT".
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line **(Refer to Fig. 2-1)**
5. Connect the oscilloscope to **TP022**.
6. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "COL.CENT".
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 120 ± 10% of the white level. **(Refer to Fig. 2-2)**
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~7.
10. Press the TV/VIDEO button on the remote control to set to the CS mode.
11. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

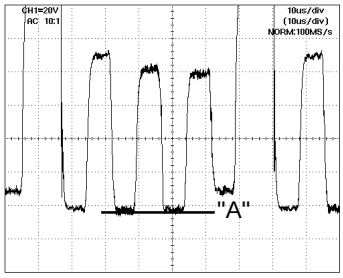


Fig. 2-1

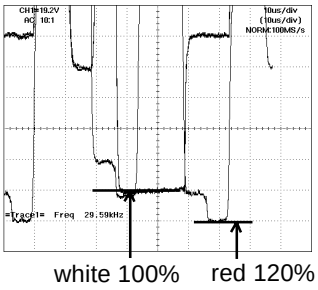


Fig. 2-2

2-16: CONTRAST MAX MANUAL

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** 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 “110”.
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.
5. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 1~3.

2-17: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-3)**

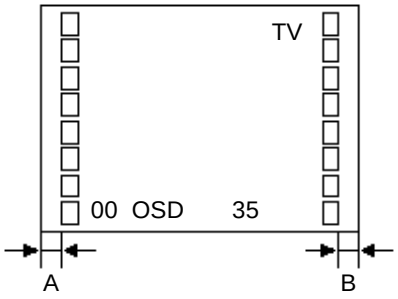


Fig. 2-3

2-18: Confirmation of Fixed Value (Step No.)

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

NO.	FUNCTION	STEP NO.	NO.	FUNCTION	STEP NO.
02	H.VCO	03	21	COL.MAX	80
04	AFC GAIN	04	23	COL.MIN	00
05	V.SHIFT	02	25	SHARPNESS	40
09	VS.CORRECTION	38	26	CB DL	00
15	BRI.MAX	140	27	CR DL	00
17	BRI.MIN	70	28	CB PED	08
19	CONT.CENT	64	29	CR PED	08
20	CONT.MIN	20	31	CORNER	35

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

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

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

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

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

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

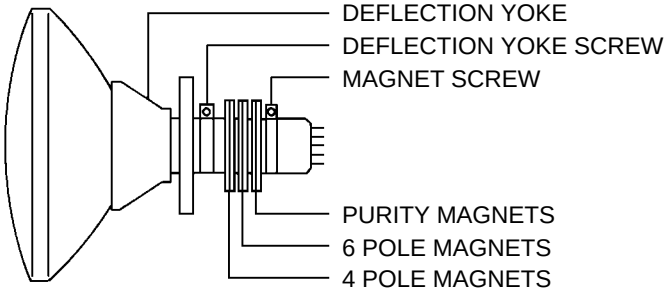


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

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

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

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

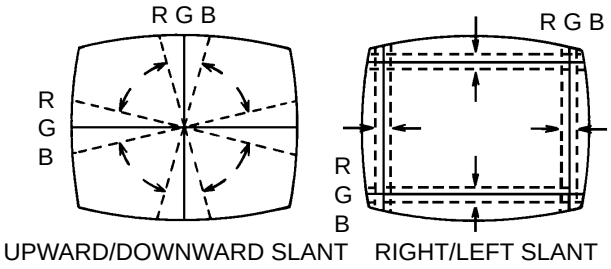
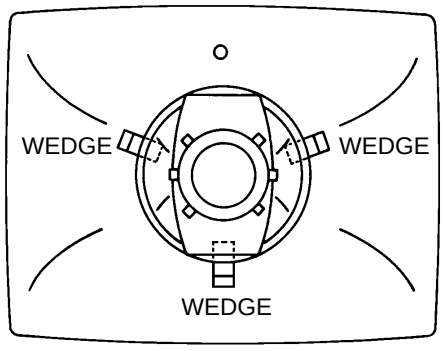


Fig. 3-2-a

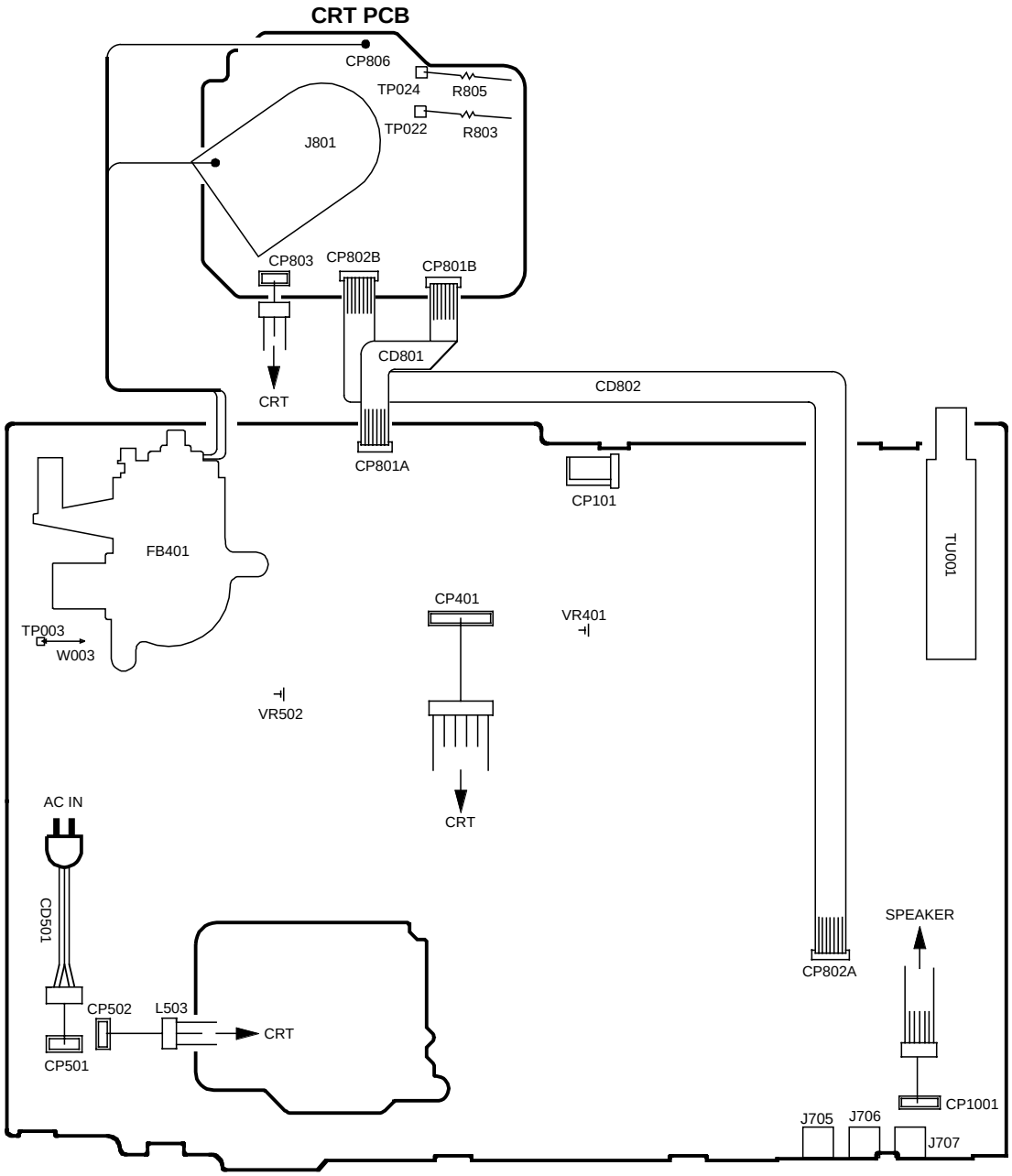


WEDGE POSITION

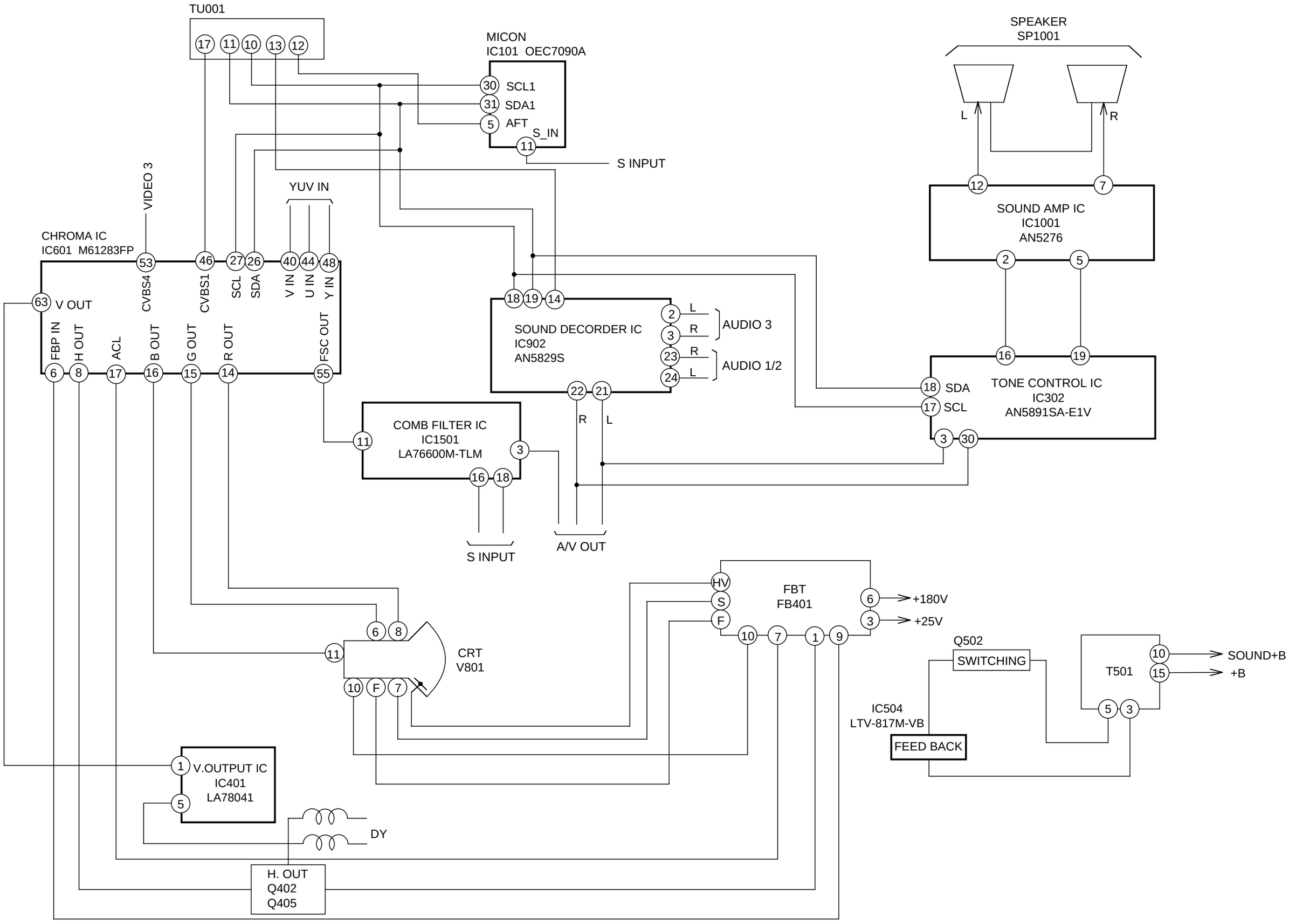
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

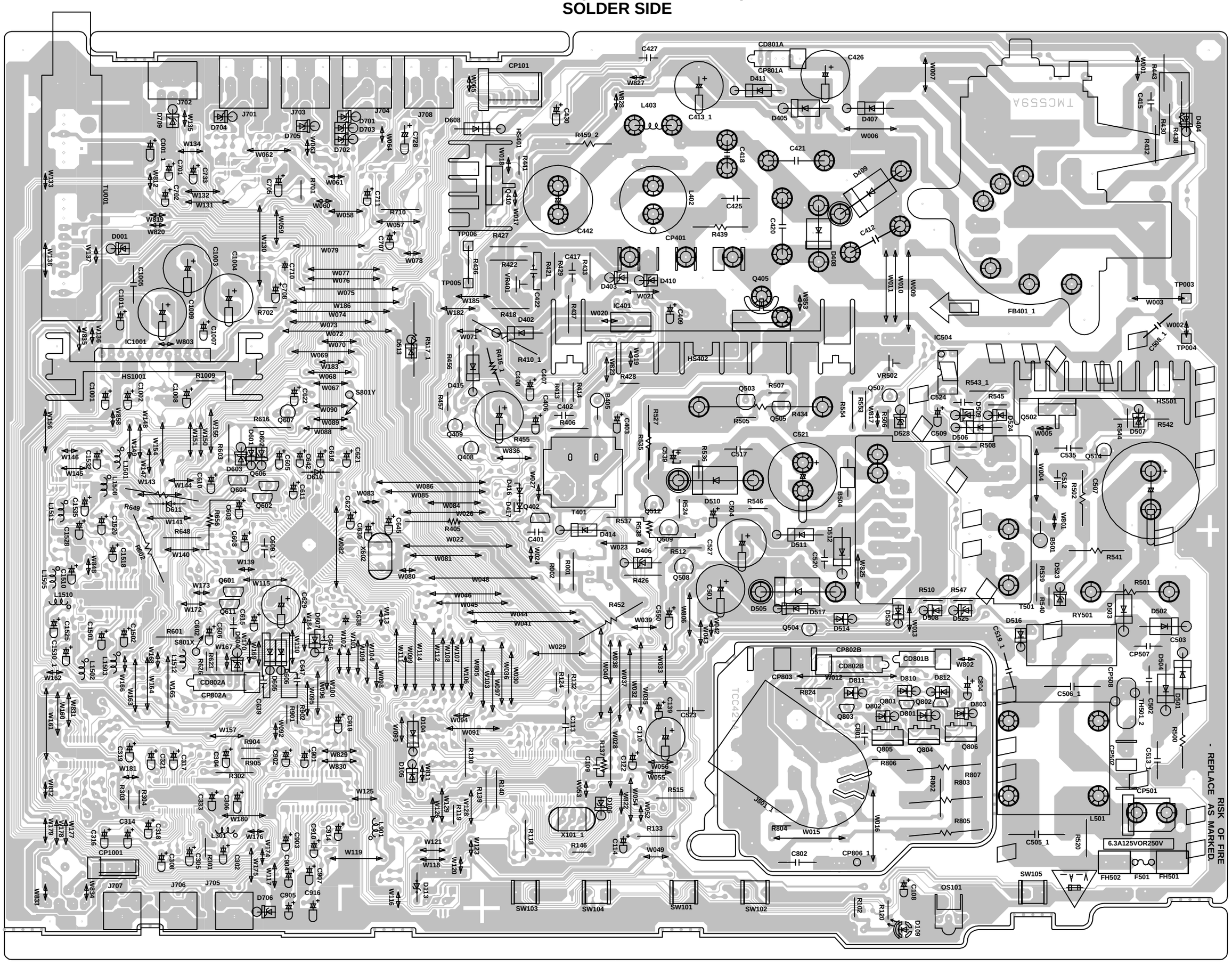
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



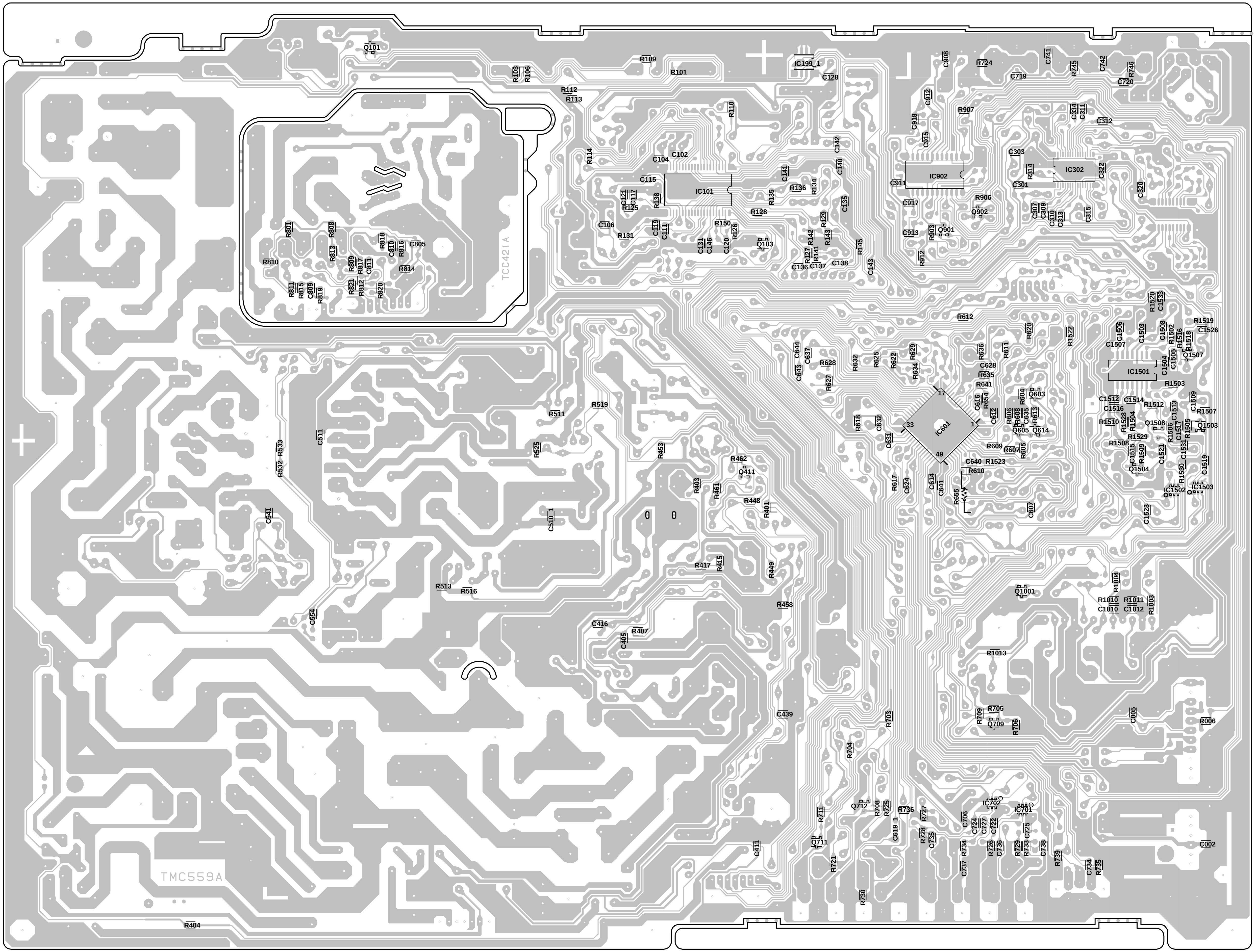
BLOCK DIAGRAM



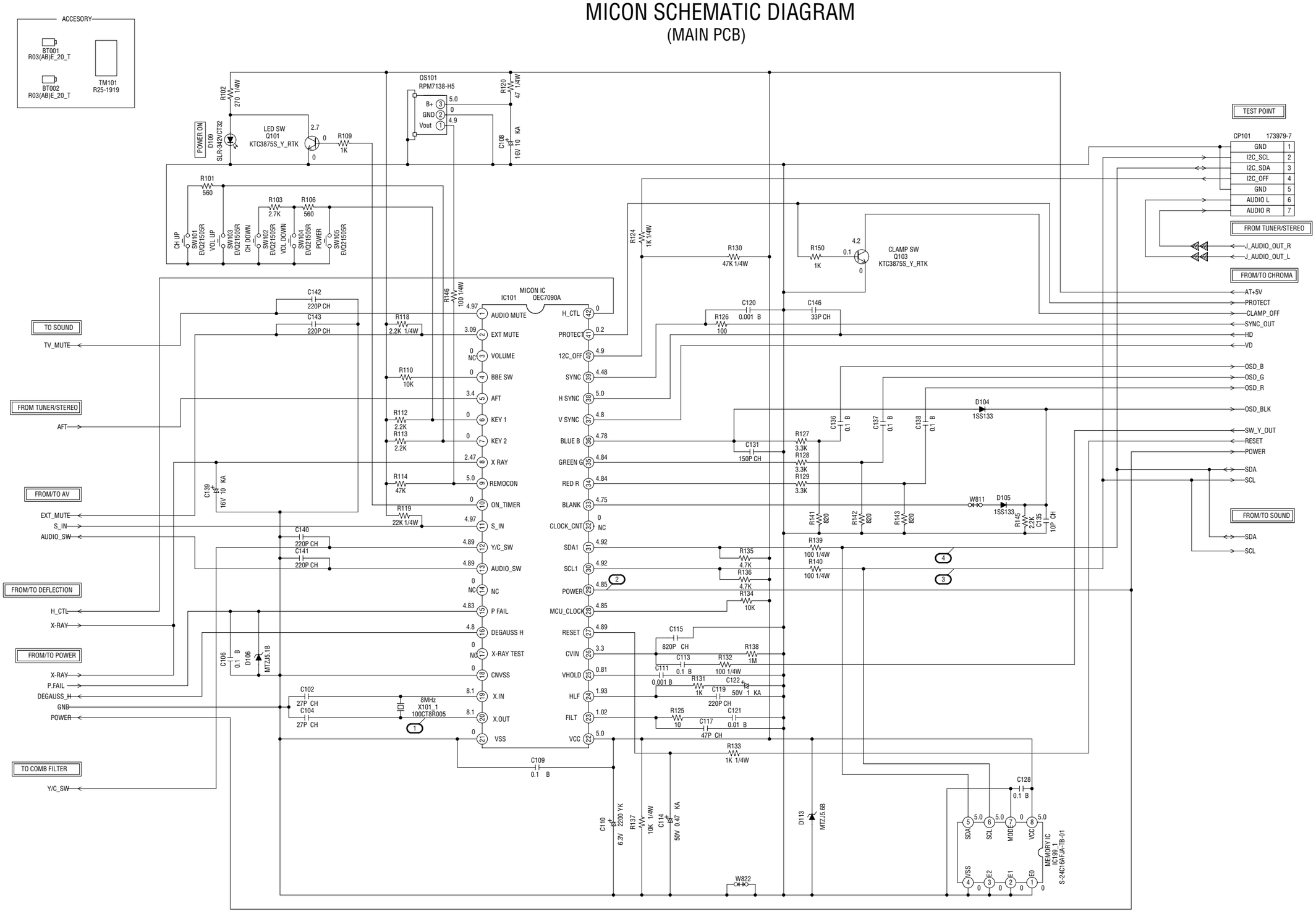
PRINTED CIRCUIT BOARDS
MAIN/CRT (INSERTED PARTS)
SOLDER SIDE



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



MICON 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.

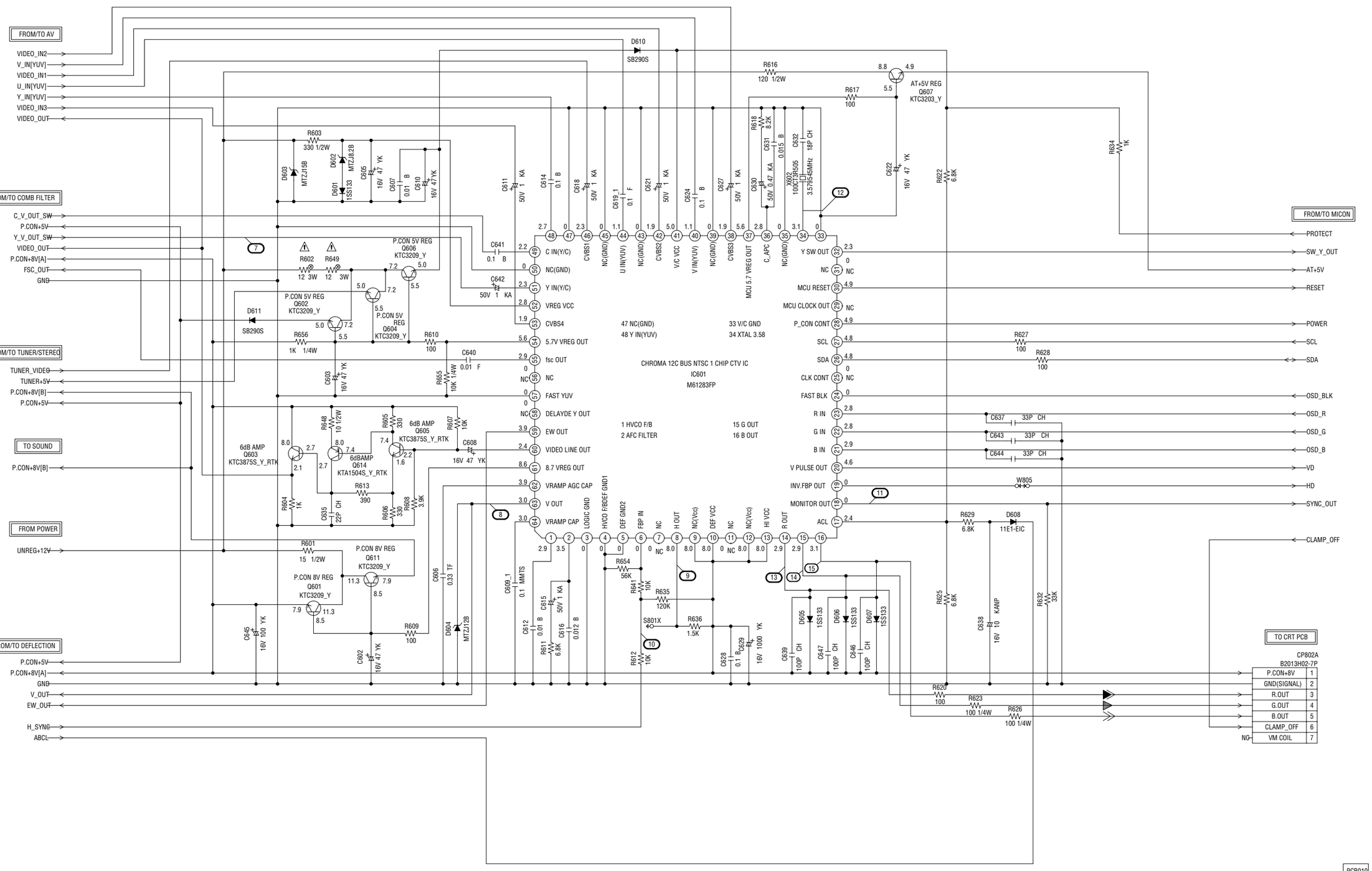
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

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

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

TUNER AUDIO SIGNAL

CHROMA SCHEMATIC DIAGRAM
(MAIN PCB)



R.SIGNAL
G.SIGNAL
B.SIGNAL

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.

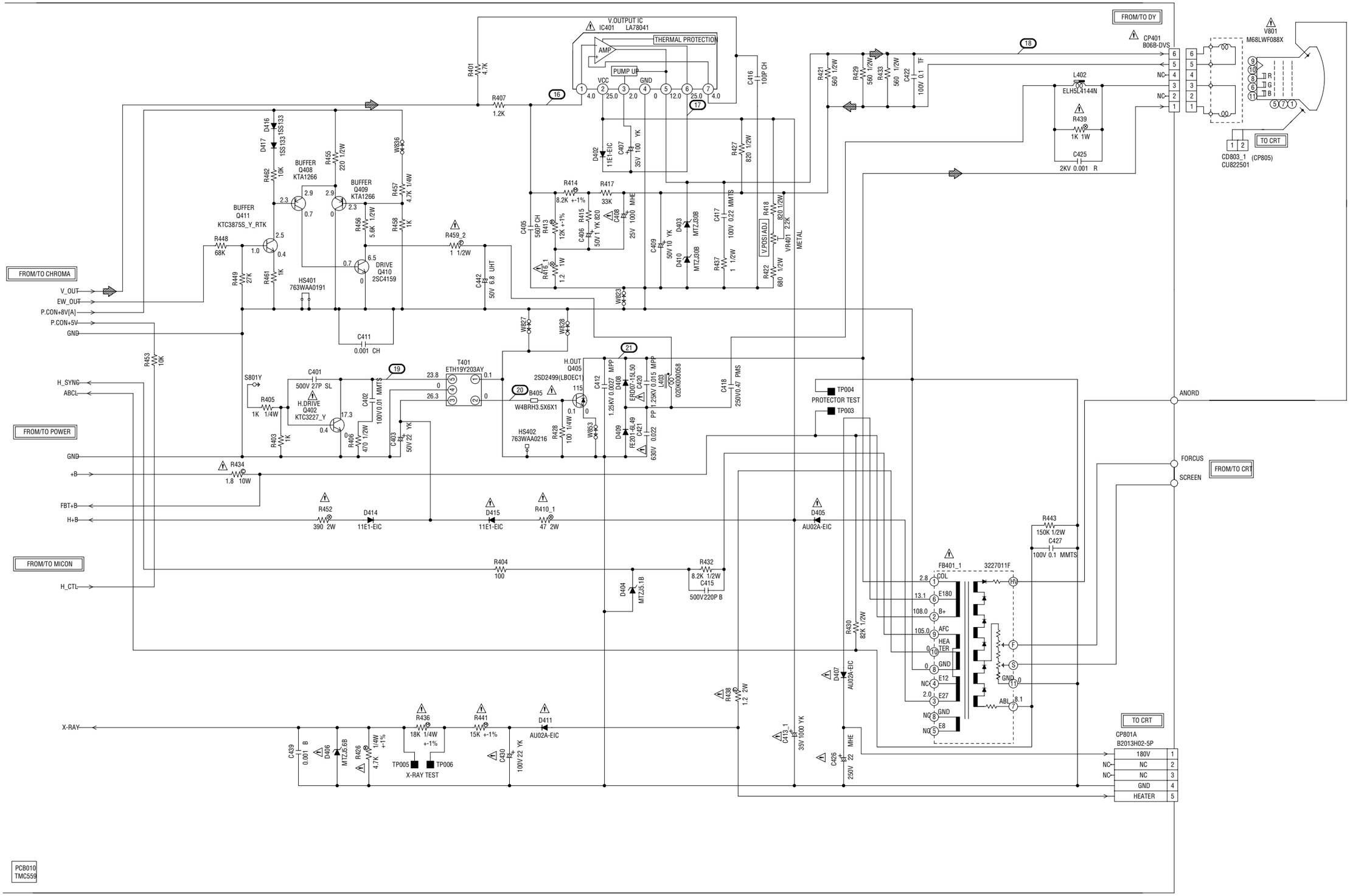
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CAUTION SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY 。

PCB010
TMC559

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

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

DEFLECTION SIGNAL

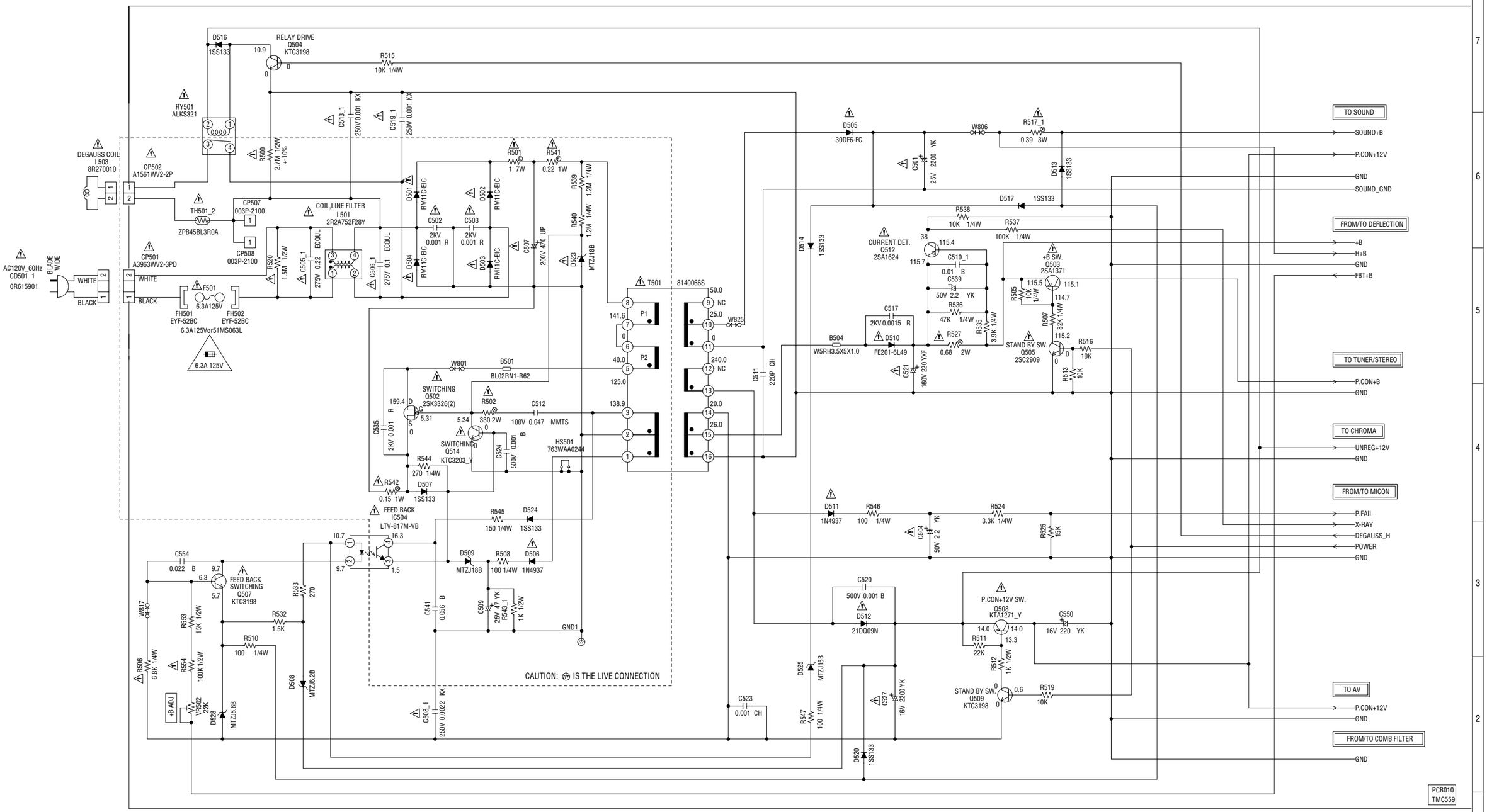
POWER SCHEMATIC DIAGRAM

(MAIN PCB)

6.3A 125V

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

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



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

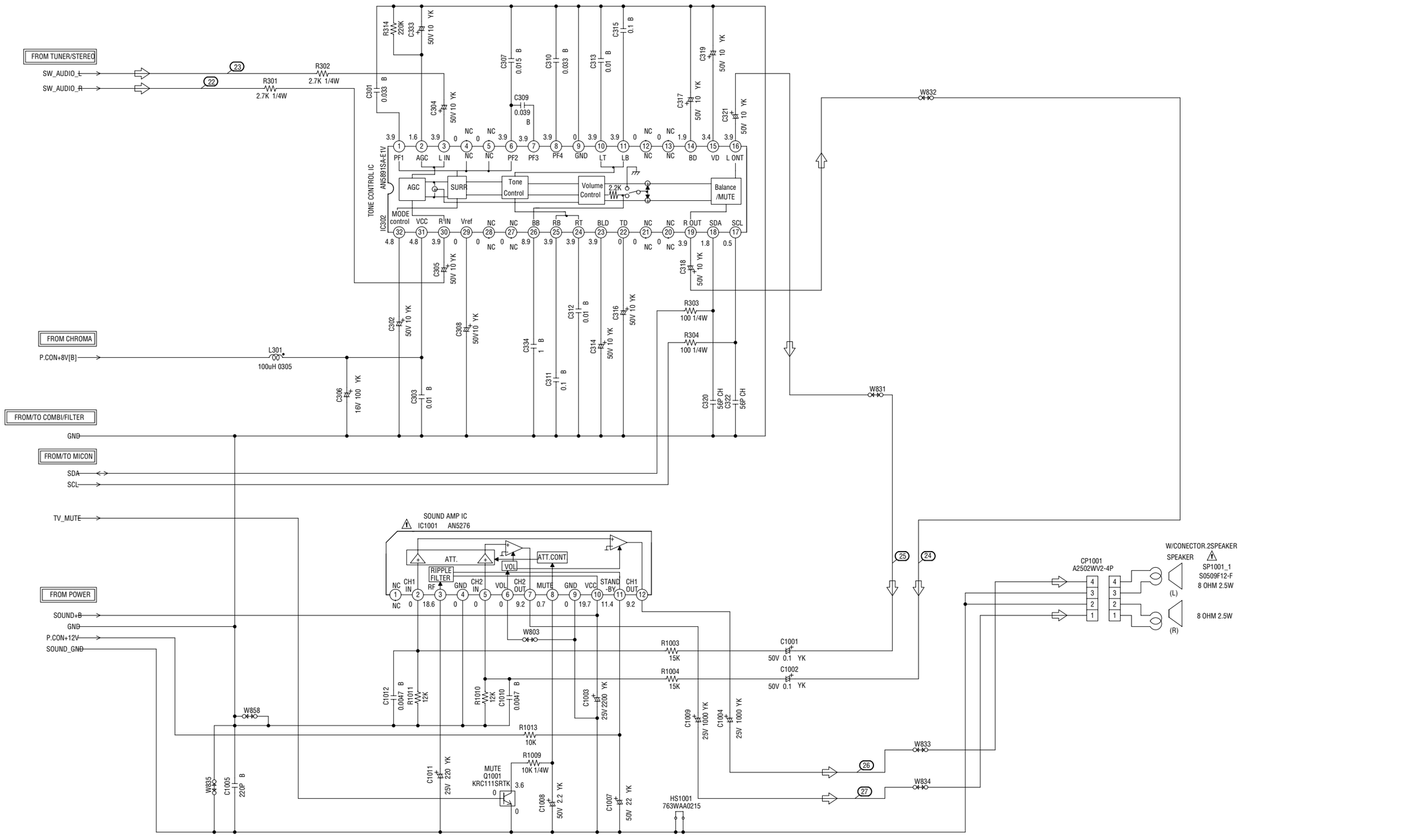
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

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

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

SOUND 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。

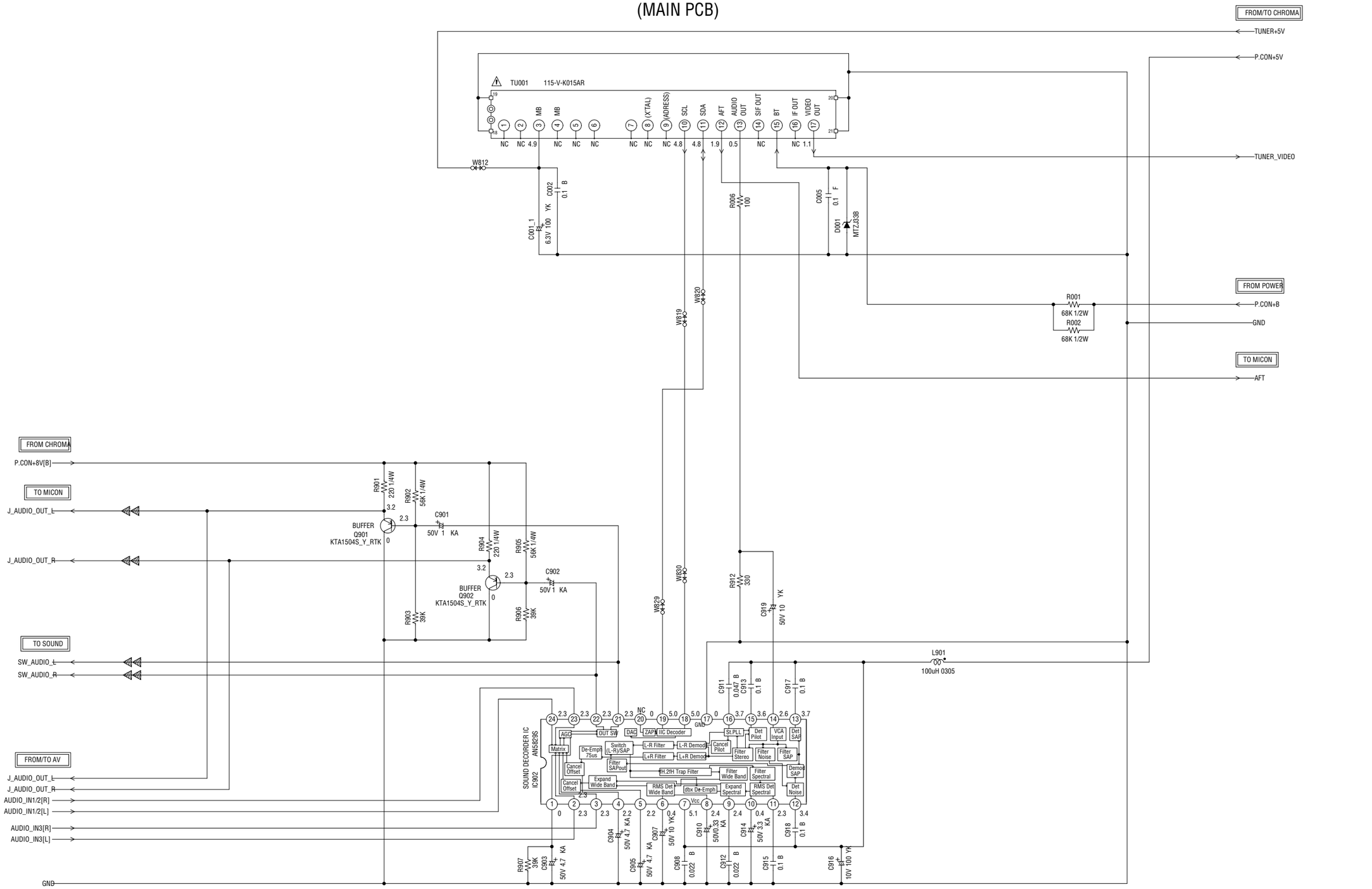
CAUTION SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

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

CAUTION: DIGITAL TRANSISTOR

⇦ AUDIO SIGNAL

TUNER/STEREO SCHEMATIC DIAGRAM
(MAIN PCB)



PCB010
TMC559

TUNER AUDIO SIGNAL

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.

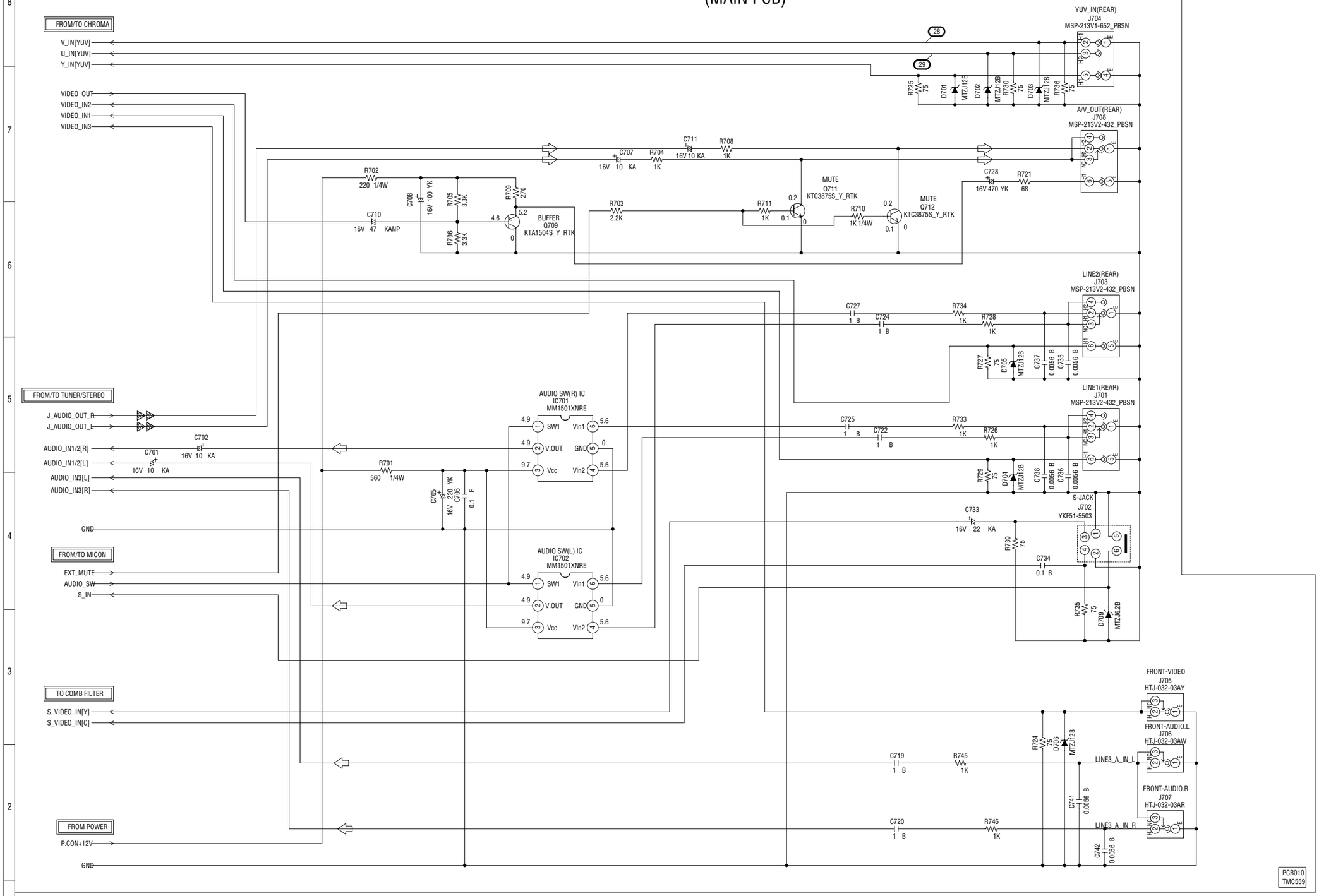
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

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

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

AV SCHEMATIC DIAGRAM

(MAIN PCB)



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

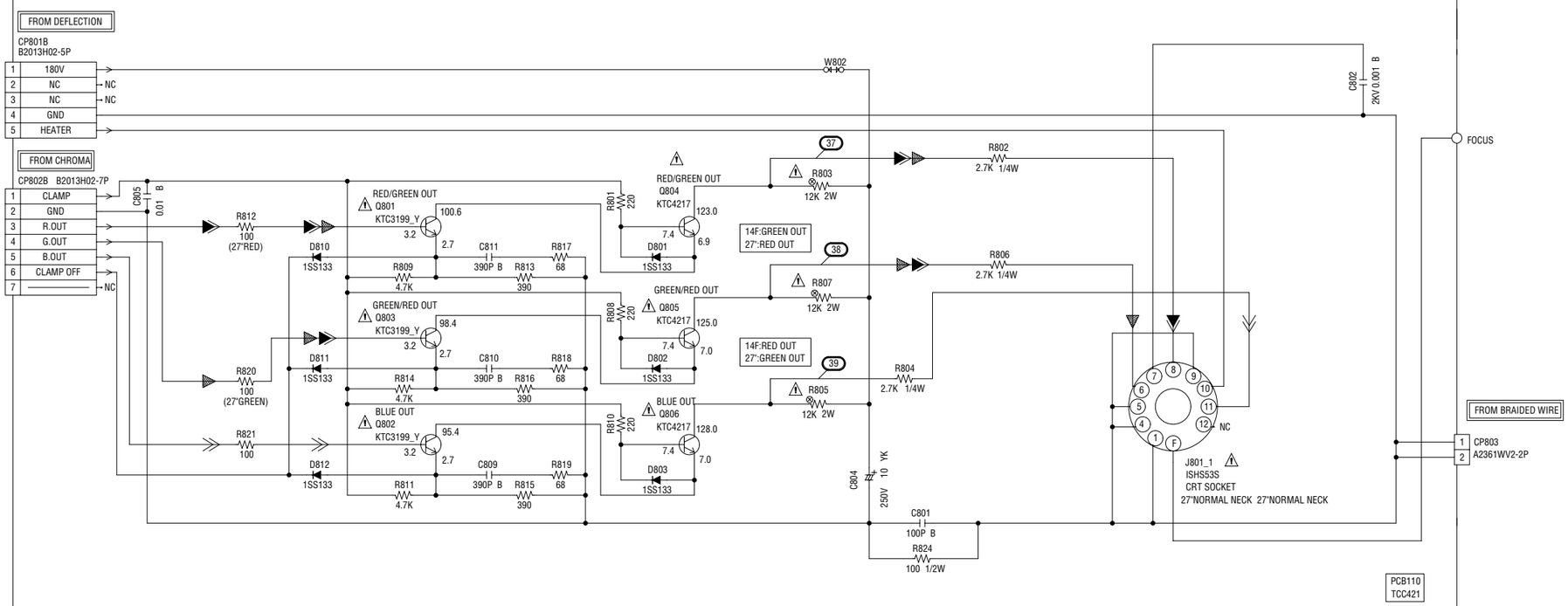
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

AUDIO SIGNAL

TUNER AUDIO SIGNAL

CRT SCHEMATIC DIAGRAM
(CRT PCB)

CRT BLOCK (W/O SVM)



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.

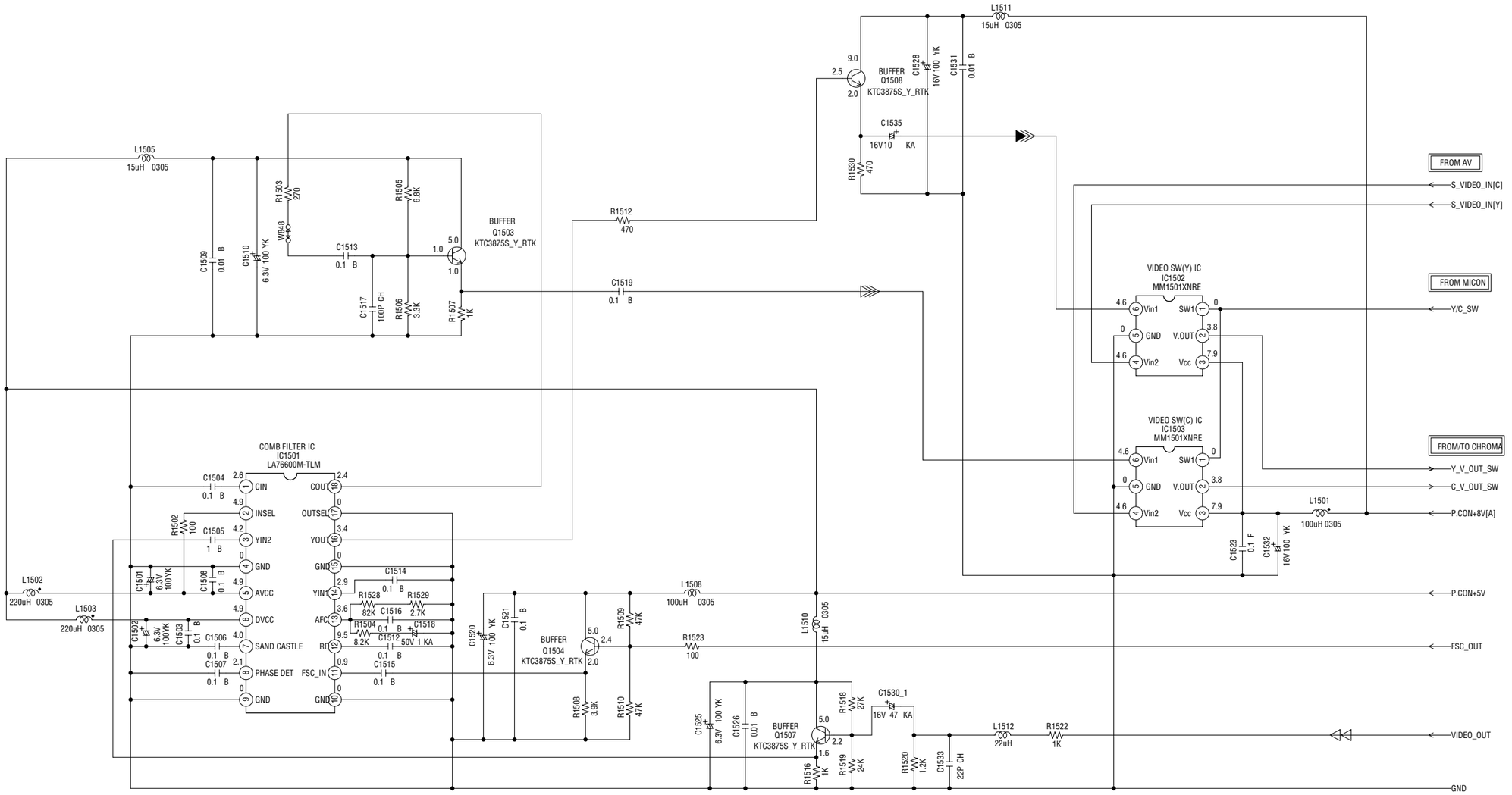
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

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

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

◀◀ R.SIGNAL
◀ G.SIGNAL
≪ B.SIGNAL

COMB/FILTER SCHEMATIC DIAGRAM
(MAIN PCB)



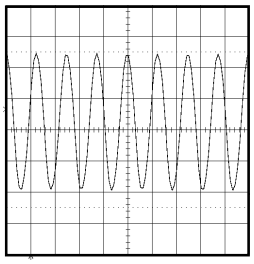
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

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

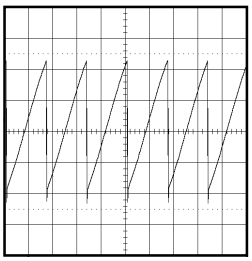
COLOR SIGNAL
LUMINANCE SIGNAL
TUNER VIDEO SIGNAL

WAVEFORMS

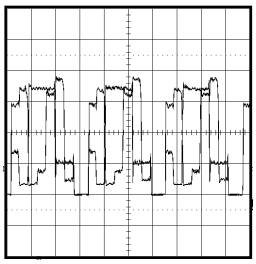
MICON



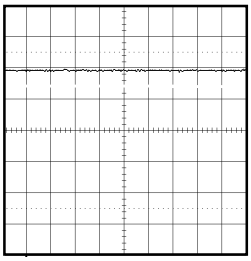
① 1V 0.1μs/div



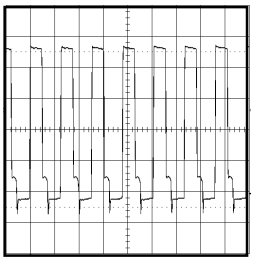
⑧ 0.5V 10ms/div



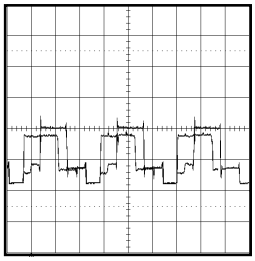
⑬ 1V 20μs/div



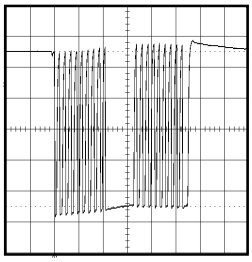
② 1V 1μs/div



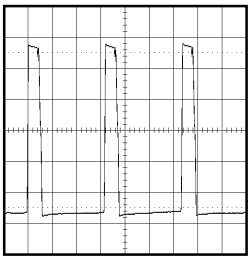
⑨ 1V 50μs/div



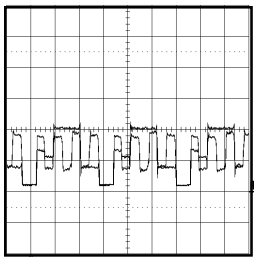
⑭ 2V 20μs/div



③ 1V 50μs/div

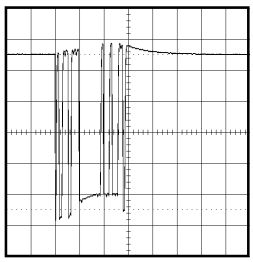


⑩ 2V 20μs/div

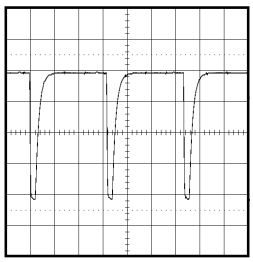


⑮ 2V 20μs/div

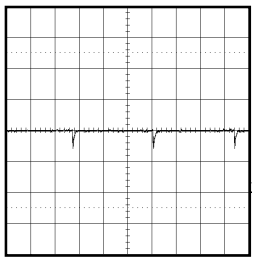
DEFLECTION



④ 1V 0.1ms/div

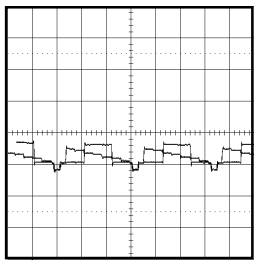


⑪ 0.5V 20μs/div

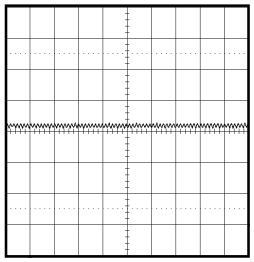


⑯ 2V 5ms/div

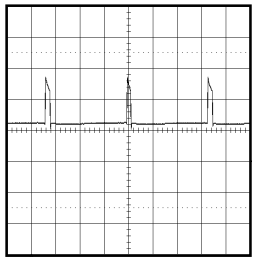
CHROMA



⑦ 1V 20μs/div



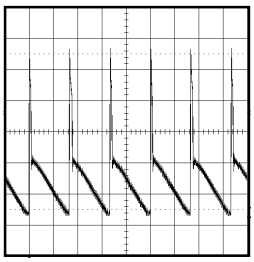
⑫ 1V 2μs/div



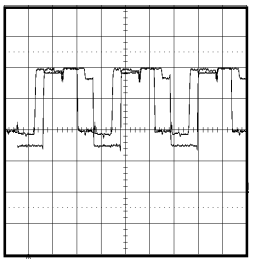
⑰ 20V 5ms/div

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

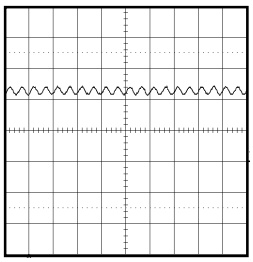
WAVEFORMS



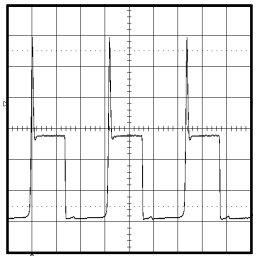
(18) 10V 10ms/div



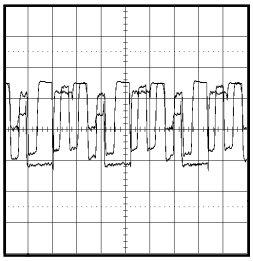
(38) 50V 20µs/div



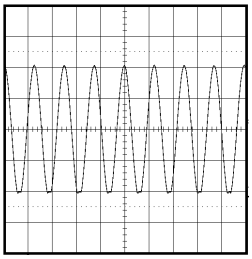
(25) 2V 5ms/div



(19) 20V 20µs/div

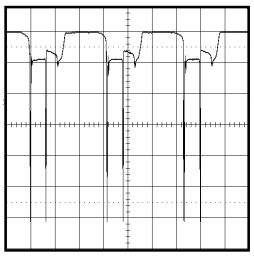


(39) 50V 20µs/div

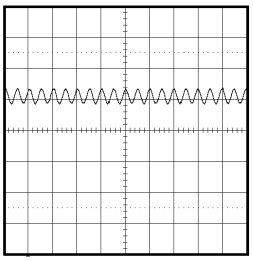


(26) 5V 2ms/div

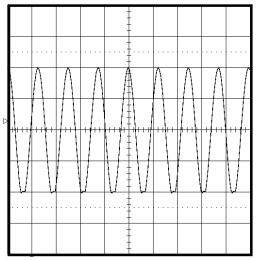
SOUND



(20) 2V 20µs/div

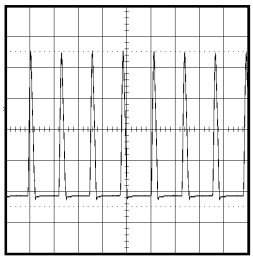


(22) 2V 5ms/div

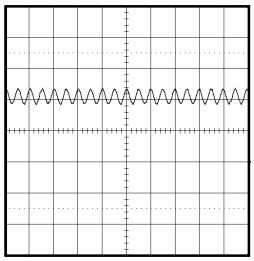


(27) 5V 2ms/div

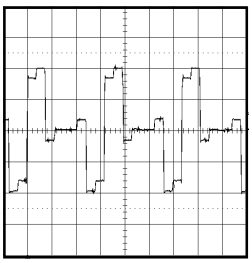
AV



(21) 200V 50µs/div

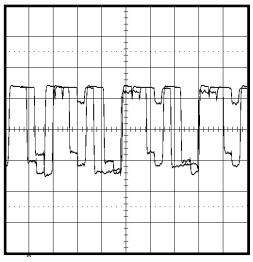


(23) 2V 5ms/div

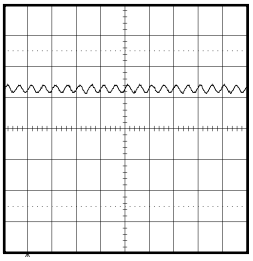


(28) 200mV 20µs/div

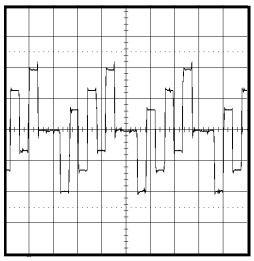
CRT



(37) 50V 20µs/div



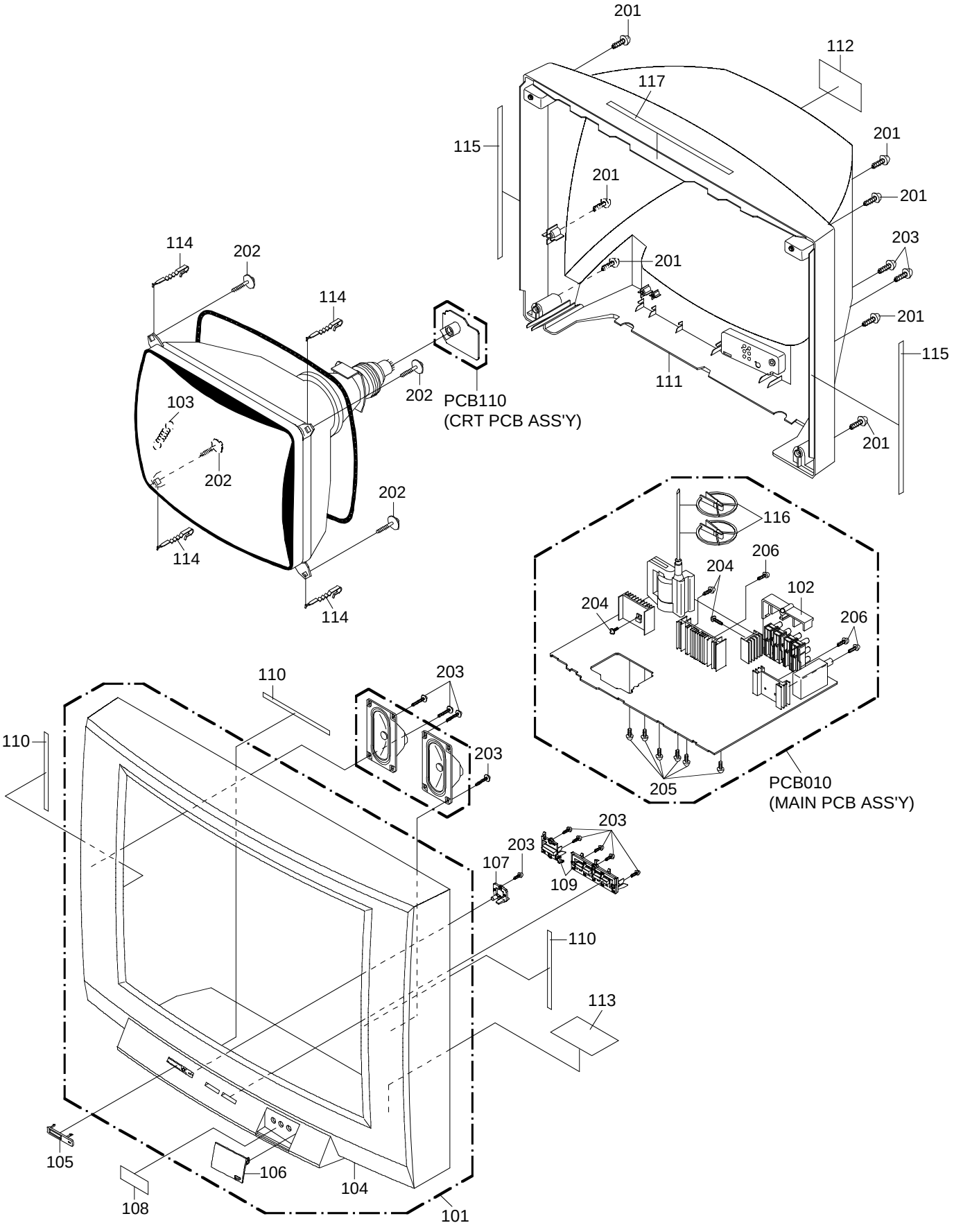
(24) 2V 5ms/div



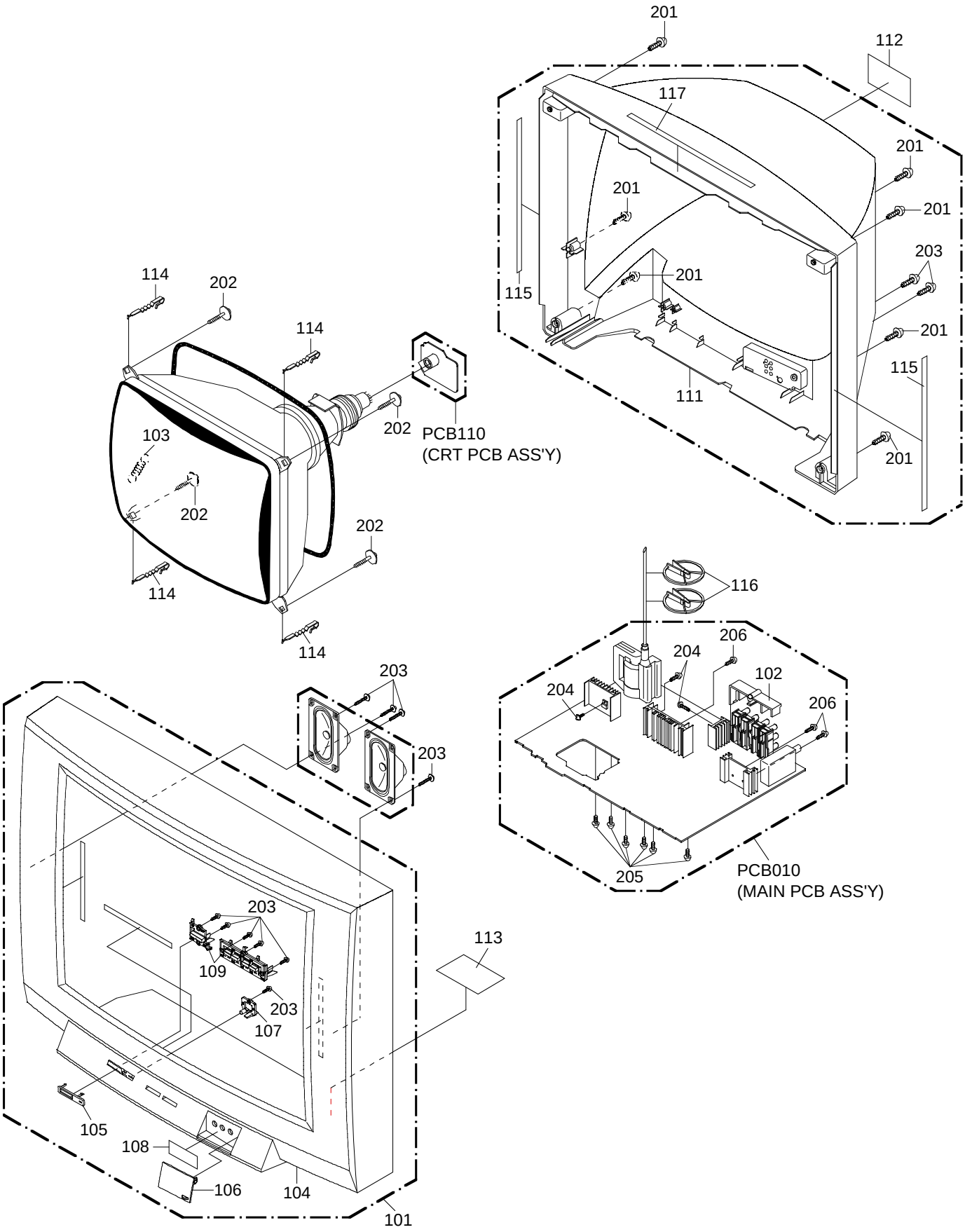
(29) 200mV 20µs/div

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

MECHANICAL EXPLODED VIEW (FOR USA)



MECHANICAL EXPLODED VIEW (FOR CANADA)



MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AD302118	A3N402M720	CABINET,FRONT ASSY (FOR USA)	
	AD302181	A3N403M720	CABINET,FRONT ASSY (FOR CANADA)	
102	AD301616	761WPA0263	HOLDER,JACK	
103	AD300759	741WUA0021	SPRING,EARTH	
104	AD302119	701APJ0089	CABINET,FRONT (FOR USA)	
	AD301617	701WPJB975	CABINET,FRONT (FOR CANADA)	
105	AD301618	711WPAA088	PLATE,FRONT	
106	AD302120	712APB0003	DOOR (FOR USA)	
	AD301619	712WPBA036	DOOR (FOR CANADA)	
107	AD301620	713WPAA090	GLASS,LED	
108	AD301409	7235490029	AV LABEL	
109	AD301621	735WPB0239	BUTTON ASS'Y	
110	AE000003	800WQ00045	FELT SHEET	
111	AD302121	702APA0155	CABINET,BACK (FOR USA)	
	AD301622	702WPA0961	CABINET,BACK (FOR CANADA)	
112	AD302122	722549A161	SHEET,RATING (FOR USA)	
	AD302123	722549A167	SHEET,RATING (FOR CANADA)	
113	AD301425	7240001120	SHEET,CSA (FOR USA)	
	AD301624	724000A002	SHEET,CSA (FOR CANADA)	
114	AD300768	762WPA0009	HOLDER,CRT WIRE	
115	AD301894	800WQ0A020	FELT SHEET	
116	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
117	AD301895	800WQ00055	FELT SHEET	
118	AE000063	A3N403M740	CABINET,BACK ASSY (FOR CANADA ONLY)	
201	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
202	AD301625	8141J50D54	SCREW,TAP TITE(P) GW20	5x45
203	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
204	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
205	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
206	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
---	AD300770	791AHA0024	FILM,BAG (FOR USA ONLY)	
---	AD300432	791WHA0092	LAMIFILM,BAG (FOR CANADA ONLY)	
---	AD302124	792AHA0094	PACKAGE,TOP (FOR USA)	
	AD301626	792WHA0416	PACKAGE,TOP (FOR CANADA)	
---	AD302125	792AHA0095	PACKAGE,BOTTOM (FOR USA)	
	AD301627	792WHA0417	PACKAGE,BOTTOM (FOR CANADA)	
---	AD302126	793ACDA166	GIFT BOX (FOR USA)	
	AD302127	793WCDB643	GIFT BOX (FOR CANADA)	
---	AD302128	A3N402M975	INSTRUCTION BOOK KIT (FOR USA)	
	AD302129	A3N403M975	INSTRUCTION BOOK KIT (FOR CANADA)	
---	AD300776	J3K10517	REGISTRATION CARD (FOR USA)	
	AD300022	J3I70417	REGISTRATION CARD (FOR CANADA)	
---	AD300777	J3K10536	ESP CARD (FOR USA)	
	AD300023	J3I70436	ESP CARD (FOR CANADA)	
---	AD302130	J3N40201A	INSTRUCTION BOOK (FOR USA)	
	AD302131	J3N40301A	INSTRUCTION BOOK (FOR CANADA)	
---	AD301384	JA4LD300	POLYBAG,INSTRUCTION(RED CAUTION)	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description	
		RESISTORS			
R137	BZ210235	R00204103J	RC	10K OHM 1/4W	
R405	AD301200	R00204102J	RC	1K OHM 1/4W	
R410	AD302107	R3X18A470J	R,METAL OXIDE	47 OHM 2W	
R416	AD300784	R3X1811R2J	R,METAL OXIDE	1.2 OHM 1W	
R434	BZ210259	R5Y2CF1R8J	R,CEMENT	1.8 OHM 10W	
R438	BZ210022	R6558A1R2J	R,FUSE	1.2 OHM 2W	
R439	BZ210003	R3K181102J	R,METAL	1K OHM 1W	
R452	AD301385	R3X18A391J	R,METAL OXIDE	390 OHM 2W	
R459	AD301595	R65582010J	R,FUSE	1 OHM 1/2W	
R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W	
R501	AD301596	R5X2AE010J	R,CEMENT	1 OHM 7W	
R502	AD301016	R3X28A331J	R,METAL OXIDE	330 OHM 2W	
⚠R506	BZ210162	R002T4682J	RC	6.8K OHM 1/4W	
R517	AD302108	R3X28BR39J	R,METAL OXIDE	0.39 OHM 3W	
R527	BZ210149	R3X18AR68J	R,METAL OXIDE	0.68 OHM 2W	
R541	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W	
R542	AD301017	R3X181R15J	R,METAL OXIDE	0.15 OHM 1W	
R602	AD301975	R3X28B120J	R,METAL OXIDE	12 OHM 3W	
⚠R649	AD301975	R3X28B120J	R,METAL OXIDE	12 OHM 3W	
R655	BZ210235	R00204103J	RC	10K OHM 1/4W	
R656	AD301200	R00204102J	RC	1K OHM 1/4W	
R803	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W	
R805	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W	
R807	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W	
		CAPACITORS			
C408	BZ110032	E5EZF3102M	CE	1000 UF 25V	
⚠C412	AD301599	P4N8FJ272H	CMPP	0.0027UF 1.25KV	
C413	AD301977	E0ELF4102M	CE	1000 UF 35V	
C418	BZ210173	P4J7F3474J	CMPP	0.47 UF 250V PMS	
C420	AD300723	P4N8FJ153H	CMPP	0.015 UF 1.25KV	
C421	AD301600	P3N1F5223J	CPP	0.022 UF 630V	
C422	AE000061	P61101104J	CMPL	0.1 UF 100V TF	or
	AE000062	P611T1104J	CMPL	0.1 UF 100V TF	or
	BZ110069	P613T1104J	CMPL	0.1 UF 100V TF	
C425	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
C426	AD300061	E5EZFD220M	CE	22 UF 250V	
C442	AD301601	E53FF56R8M	CE	6.8 UF 50V NP	
C501	BZ210176	E02LF3222M	CE	2200 UF 25V	
C502	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
C503	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
C505	BZ110025	P2122B224M	CMP	0.22 UF 275V ECQUL	
C506	BZ110035	P2122B104M	CMP	0.1 UF 275V ECQUL	
C507	BZ110012	E51CGC471M	CE	470 UF 200V	
C508	AD301108	CD39E0MH3M	CC	0.0022UF 250V	
C513	AD301026	CD39E0M13M	CC	0.001 UF 250V	
C517	BZ110191	C03L0R7E3K	CC	0.0015UF 2KV R	
C519	AD301026	CD39E0M13M	CC	0.001 UF 250V	
C521	AD301025	E62NFB221M	CE	220 UF 160V	
C527	BZ110119	E02LF2222M	CE	2200 UF 16V	
C535	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
C603	BZ210177	E02LU2470M	CE	47 UF 16V	
C639	AD301321	CQG0CH412J	CC	100 PF 50V CH	
C646	AD301321	CQG0CH412J	CC	100 PF 50V CH	
C647	AD301321	CQG0CH412J	CC	100 PF 50V CH	
C802	AD300078	C0JBB0713K	CC	0.001 UF 2KV B	
C804	BZ110126	E0EL0D100M	CE	10 UF 250V	
C1003	BZ210176	E02LF3222M	CE	2200 UF 25V	
C1004	BZ110053	E02LF3102M	CE	1000 UF 25V	
C1009	BZ110053	E02LF3102M	CE	1000 UF 25V	
		DIODES			
D001	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77	
D104	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D105	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D106	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77	
D109	BZ410054	0021721150	LED	SLR-342VCT32	
D113	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	
D402	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC	
D403	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77	
D404	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77	
D405	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	
D406	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	
D407	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		DIODES		
D408	AD302110	D2CF0715L0	DIODE,SILICON	ERD07-15L50
D409	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
D410	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D411	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D414	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D415	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D416	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D417	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D501	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D502	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D503	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D504	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D505	AD300076	D28F30DF60	DIODE,RECTIFIER	30DF6-FC
D506	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D507	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D508	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D509	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D510	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
D511	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D513	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D514	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D516	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D517	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D520	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D523	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D524	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D525	AD300670	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D601	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D602	BZ410058	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D603	AD300670	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D604	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D605	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D606	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D607	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D608	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D610	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
D611	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
D701	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D702	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D703	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D704	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D705	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D706	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D709	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D810	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D811	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D812	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
		ICS		
IC101	AD301981	I56F07090A	IC	OEC7090A
IC199	AD302111	A3N402M015	IC	S-24C16AFJA-TB-01
IC302	AD301983	I01FF58910	IC	AN5891SA-E1V
IC401	AD300414	I03TD80410	IC	LA78041
IC504	BZ410088	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC601	AD301984	I06FC12830	IC	M61283FP
IC701	AD301988	I0UF015010	IC	MM1501XNRE
IC702	AD301988	I0UF015010	IC	MM1501XNRE
IC902	AD300059	I01FF58290	IC	AN5829S
IC1001	AD300056	I0FSP52760	IC	AN5276
IC1501	AD301029	I03FE76600	IC	LA76600M-TLM
IC1502	AD301988	I0UF015010	IC	MM1501XNRE
IC1503	AD301988	I0UF015010	IC	MM1501XNRE
		TRANSISTORS		
Q101	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q103	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q402	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT
Q405	BZ510040	TDUU024990	TRANSISTOR,SILICON	2SD2499(LB0EC1)
Q408	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		TRANSISTORS		
Q409	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q410	AD300027	TC30041590	TRANSISTOR,SILICON	2SC4159(D,E)
Q411	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q502	BZ510098	T220033260	FET	2SK3326(2)
Q503	BZ510005	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE
Q504	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q505	BZ510011	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA
Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q508	BZ510077	TAAT012714	TRANSISTOR,SILICON	KTA1271_Y-AT
Q509	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q512	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
Q514	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q601	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q602	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q603	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q604	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q605	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q606	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q607	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q611	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q614	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q709	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q711	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q712	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠Q801	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q802	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q803	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q804	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q805	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q806	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
Q901	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q902	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1001	BZ510068	TNAAJ05003	COMPOUND TRANSISTOR	KRC111SRTK
Q1503	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1504	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1507	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1508	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
		COILS & TRANSFORMERS		
L301	BZ310041	02167F101J	COIL	100 UH
L402	AD301605	022100037A	COIL,LINEARITY	ELH5L4144N
L403	AD301606	02DK000058	COIL	02DK000058
L501	AD301124	029T000101	COIL,LINE FILTER	2R2A752F28Y
L503	AD301607	028R270010	COIL,DEGAUSS	8R270010
L901	BZ310041	02167F101J	COIL	100 UH
L1501	BZ310041	02167F101J	COIL	100 UH
L1502	AD301417	02167F221J	COIL	220 UH
L1503	AD301417	02167F221J	COIL	220 UH
L1505	AD300613	02167F150J	COIL	15 UH
L1508	BZ310041	02167F101J	COIL	100 UH
L1510	AD300613	02167F150J	COIL	15 UH
L1511	AD300613	02167F150J	COIL	15 UH
L1512	AD301608	0216A6220J	COIL	22 UH
T401	AD301125	0450190161	TRANS,HORIZONTAL DRIVE	ETH19Y203AY
T501	AD301034	048140066S	TRANSFORMER,SWITCHING	8140066S
		JACKS		
J701	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN
J702	AD300108	063Q700002	JACK	YKF51-5503
J703	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN
J704	AD301037	060J411024	RCA JACK	MSP-213V1-652 PBSN
J705	AD300110	060G401047	RCA JACK	HTJ-032-03AY
J706	AD300111	060G401046	RCA JACK	HTJ-032-03AW
J707	AD300112	060G401039	RCA JACK	HTJ-032-03AR
J708	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN
⚠J801	AD301356	066F130020	SOCKET,CATHODE RAY,TUBE	ISHS53S
		SWITCHES		
SW101	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW102	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW103	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW104	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW105	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		VARIABLE RESISTORS		
VR401	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
VR502	BZ210101	V1163H4BTC	VOLUME,SEMI FIXED	EVNCYAA03BE4
		P.C.BOARD ASSEMBLIES		
PCB010	AD302112	A3N402M010K	PCB ASS'Y	TMC559A (FOR USA)
PCB010	AD302113	A3N403M010	PCB ASS'Y	TMC559A(FOR CANADA)
PCB110	AD302091	A3N402M110K	PCB ASS'Y	TCC421A (FOR USA)
PCB110	AD302114	A3N403M110	PCB ASS'Y	TCC421A(FOR CANADA)
		MISCELLANEOUS		
B405	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B501	BZ310045	024AT03481	CORE,BEADS	BL02RN1-R62T2
B504	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
BT001	AE000012	1412004008	BATTERY,MANGAN	R03(AB)E_2P_G
BT002	AE000012	1412004008	BATTERY,MANGAN	R03(AB)E_2P_G
⚠CD501	AD300746	120R615901	CORD,AC BUSH	0R615901
CD801	BZ614385	WCL6838038	FLAT CABLE AWM2468 A	WG26 5C GRAY 380MM
CD802	AD302116	WEL6852038	FLAT CABLE AWM2468 A	WG26 7C GRAY 520MM
CD803	AD301363	06CU822501	CORD,CONNECTOR	CU822501
CP101	AD301364	0697270650	CONNECTOR PCB SIDE	TKC-M07X-A1
CP401	AD300095	069X460029	CONNECTOR PCB SIDE	B06B-DVS
CP501	BZ614176	069S320419	CONNECTOR PCB SIDE	A3963WV2-3PD
CP502	AD300687	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP507	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP508	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP803	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP1001	AD301045	069S140419	CONNECTOR PCB SIDE	A2502WV2-4P
CP801A	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P
CP801B	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P
CP802A	AD301997	067U007029	WIRE HOLDER	B2013H02-7P
CP802B	AD301997	067U007029	WIRE HOLDER	B2013H02-7P
EL001	BZ614044	124120301A	EYE LET	XRY20X30BD
EL002	BZ614043	124116281A	EYE LET	XRY16X28BD
F501	AD301046	081PC6R305	FUSE	51MS063L
FB401	AD301612	043227011F	TRANSFORMER,FLYBACK	3227011F
FH501	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
OS101	AD301048	0773071001	REMOTE RECEIVER	RPM7138-H5
RY501	AD300114	0560V20115	RELAY	ALKS321
SP1001	AD301613	070Y435007	SPEAKER	S0509F12-F
TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
TM101	AD302117	076R0GF020	TRANSMITTER	R25-1919
TU001	AD301800	0163300001	RF UNIT	115-V-K015AR
⚠V801	AD301614	0981270B01	CRT W/DY	M68LWF088X
X101	AD302002	100CT8R005	CRYSTAL	HC-49/U-S
X602	AD302003	100CT3R505	CRYSTAL	HC-49/C

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

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

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