

TOSHIBA

SERVICE MANUAL

COLOUR TELEVISION

21S23B2

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

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

2. AVOID AN ELECTRIC SHOCK

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

3. USE THE DESIGNATED PARTS

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

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

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

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

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

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

6. AVOID AN X-RAY

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

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

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

7. PERFORM A SAFETY CHECK AFTER SERVICING

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

(INSULATION CHECK PROCEDURE)

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

[Note 1]

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

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

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

1. MODEL NUMBER and VERSION LETTER

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

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.

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

Remove all old silicon before applying new silicon.

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GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size		21 inch / 544.5mmV
			CRT Type		NORMAL
			Deflection		90 degree
			Magnetic Field	BV/BH	+0.45G/0.18G
		Color System		PAL	
		Speaker			2 Speaker
			Position		Front
			Size		2.0 x4.7 Inch
			Impedance		8 ohm
		Sound Output	MAX		5.0+5.0 W
			10%(Typical)		4.0+4.0 W
		DDR SECAM		No	
		NTSC3.58(AV)+NTSC4.43		Yes	
		PAL60Hz		Yes	
G-2	Tuning System	Broadcasting System		U.K. System I	
		Tuner and Receive CH	System		1Tuner
			Destination		UK
			Tuning System		F-Synth
			Input Impedance		VHF/UHF 75 ohm
				21 - 69	
		Intermediate Frequency	CH Coverage		
			Picture(FP)		39.5MHz
			Sound(FS)		33.5MHz
		Preset CH	FP-FS		6.0MHz
					100
					Yes
G-3	Power	Power Source	AC		230V-240V AC 50Hz
			DC		
		Power Consumption	at AC		
					60 W at AC 230 V 50 Hz
			Stand by (at AC) Per Year		3 W at AC 230 V 50 Hz -- kWh/Year
G-4	Regulation	Protector		Power Fuse	
				Yes	
				CE(EN60065:98),BEAB	
G-5	Temperature	Safety		Radiation	
				CE	
				X-Radiation	
G-6	Operating Humidity	Operation		Storage	
				Less than 80% RH	

GENERAL SPECIFICATIONS

G-7	On Screen Display	Menu		Yes		
		Menu Type		Character		
		Picture		Yes		
		Contrast		Yes		
		Brightness		Yes		
		Colour		Yes		
		Tint (NTSC Only)		Yes		
		Sharpness		Yes		
		Audio		Yes		
		Bass		Yes		
		Treble		Yes		
		Balance		Yes		
		BBE On/Off		No		
		Stable Sound On/Off		No		
		CH Tuning		Yes		
		Manual		Yes		
		Auto		Yes		
		CH MAPPING		Yes		
		CH Allocation		No		
		Language		Yes		
		Clock Set		No		
		On/OffTimer Set		Yes		
		On Timer Set		No		
		Pin Code Registration		No		
		Panel Lock		Yes		
		Nicam Auto Off		Yes		
		AV Colour System		Yes		
		Sound System		No		
		Auto 4:3 Default		No		
		AV2 Output		Yes		
		Output Source		Yes		
		Source		Yes		
		Control Level		Yes		
		Volume		Yes		
		Brightness		Yes		
		Contrast		Yes		
		Colour		Yes		
		Tint (NTSC Only)		Yes		
		Sharpness		Yes		
		Tuning		Yes		
		Bass		Yes		
		Treble		Yes		
		Balance		Yes		
		Back Light		No		
		Nicam ST		Yes		
		Tone 1/2 (A/B)		Yes		
		Surround On/Off		No		
		Pin Code		No		
		AV		Yes		
		Skip		Yes		
		Channel		Yes		
		Broadcasting Station Name		Yes		
		Hotel Lock		No		
		Sleep Timer		No		
		Selectable Picture		Yes		
		Wide Mode		No		
		Sound Mute		Yes		
G-8	OSD Language			English	French	Spanish
G-9	Clock and Timer	Sleep Timer	Max Time Step	- Min		
				- Min		
		Clock	No			
		On Timer	Program(On Timer)	Yes		
		Off Timer	Program(Off Timer)	Yes		
		Wake Up Timer	No			
		Timer Back-up (at Power Off Mode)	more than	--	Min	Sec

GENERAL SPECIFICATIONS

G-10	Remote Control	Unit	RC-GX
		Glow in Dark Remocon	No
		Format	NEC
		Custom Code	40-BF h
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	34 Keys
		Keys	
		Power	Yes
		1/Rename	Yes
		2/Move	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0	Yes
		Volume Up / +	Yes
		Volume Down / -	Yes
		Previous	Yes
		Select Picture	Yes
		Menu	Yes
		OK(Enter)	Yes
		EXIT	Yes
		Audio Select	Yes
		On/OffTimer	No
		Mute	Yes
		DSP/surround/Virtual Dolby	No
		Woofers/Bass	No
		Picture Size	No
		T' TEXT Keys	
		TEXT / MIX / TV	Yes
		CH Up / Page Up	Yes
		CH Down / Page Down	Yes
		Red	Yes
		Green	Yes
		Yellow	Yes
		Cyan	Yes
		TEXT F/T/B	Yes
		Reveal	Yes
		TIMED PAGE(SUB PAGE)	Yes
		CALL / TEXT INDEX	Yes
		INPUT SELECT	Yes
		TEXT HOLD	Yes
		TIME / TXCL	Yes

GENERAL SPECIFICATIONS

G-11	Features	Auto Degauss		Yes	
		Auto Shut Off		Yes	
		Canal+		No	
		CATV		No	
		Anti-theft(Back Up 30 Min.)		No	
		Memory(Last CH)		Yes	
		Memory(Last Volume)		Yes	
		BBE		No	
		Auto Search		Yes	
		CH Allocation		No	
		CH MAPPING		Yes	
		Just Clock Function		No	
		Game Position		No	
		CH Label		No	
		VM Circuit		No	
		Full OSD		No	
		Noise Blue Back		Yes	
		T*Text		Yes	
				Text type	Fastext
				Text Language	English, French, Swedish, Hungarian Finnish, Turkish, German, Dutch Portuguese, Spanish, Italian, Greek
		Premiere		No	
		Comb Filter		No	
				Lines	
		Auto CH Memory		No	
		Stable Sound		No	
		Auto Set Up		Yes	
		FBT Leak Test Protect		Yes	
		Previous (Quick View)		Yes	
		Panel Lock		Yes	
		Power ON Memory		Yes	
		Double Focus & Dynamic Focus		No	
		Wss Signal Wide Change		No	
		Virtual Dolby Surround		No	
		Hotel Lock		No	
G-12	Accessories	Owner's Manual	Language	English	
			w/Guarantee Card	No	
		Remote Control Unit		Yes	
		Rod Antenna		No	
			Poles	Pole	
			Terminal	type	
		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 Safeguard		Yes (Owner's Manual In)	
		Dew/AHC Caution Sheet		No	
		AC Plug Adapter		No	
		Quick Set-up Sheet		Yes	
		Battery		Yes	
			UM size x pcs	UM-4 x 2 pcs	
			OEM Brand	No	
		AC Cord		No	
		AV Cord (2Pin-1Pin)		No	
		Registration Card		No	
		PTB Sheet		No	
		300 ohm to 75 ohm Antenna Adapter		No	

GENERAL SPECIFICATIONS

G-13	Interface	Switch	Front	Power (Tact Sw)		No
				System Select		No
				Main Power SW		Yes
				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		No	
			Stand-by		No	
			Stand-by/ON		Yes(Red)	
			On Timer		Yes(Green)	
		Terminals	Front	Video Input		RCA
				Audio Input		RCA x 2(Stereo)
				Other Terminal		HeadPhone (Stereo)
				Rear	Video Input(Rear1)	
			Video Input(Rear2)		No	
			Audio Input(Rear1)		No	
			Audio Input(Rear2)		No	
			Video Output		No	
			Audio Output		No	
			Euro Scart(21Pin)		Yes (x1)	
			S-INPUT		Yes (x1)	
			Euro Scart(21Pin)		Yes (x1)	
			RGB-INPUT		Yes (x1)	
			Component Input		No	
			Diversity		No	
			Ext Speaker		No	
			DC Jack 12V(Center +)		No	
			VHF/UHF Antenna Input		D Type	
			AC Outlet		No	
G-14	Set Size		Approx. W x D x H (mm)		590 x 492 x 446.5	
G-15	Weight	Net (Approx.)		21.0 kg (--- lbs)		
		Gross (Approx.)		23.8kg (---lbs)		
G-16	Carton	Master Carton	No			
			--- Sets			
			--- / ---			
			Dimensions W x D x H(mm)			
		Gift Box	Description of Origin			
			Yes			
			Material			
			Double/Brown			
		Drop Test	Dimensions W x D x H(mm)			
			658 x 575 x 529			
			Design			
		As per Buyer's				
		Description of Origin				
No (Assembled in U.K.)						
Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces						
Height (cm)						
46						
Container Stuffing						
288 Sets/40' container						
G-17	Material	Cabinet	Front	PS 94HB		
			Rear	PS 94HB		
			Holder	PS 94V0 NON-Decabrom		
		PCB	Non-Halogen Demand	Yes		
			Eyelet Demand	Yes		
G-18	Environment	Pb Free	Lead-free Solder	No		
			Other	No		
		Cd Free		No		

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

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

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

REMOVAL

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

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

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

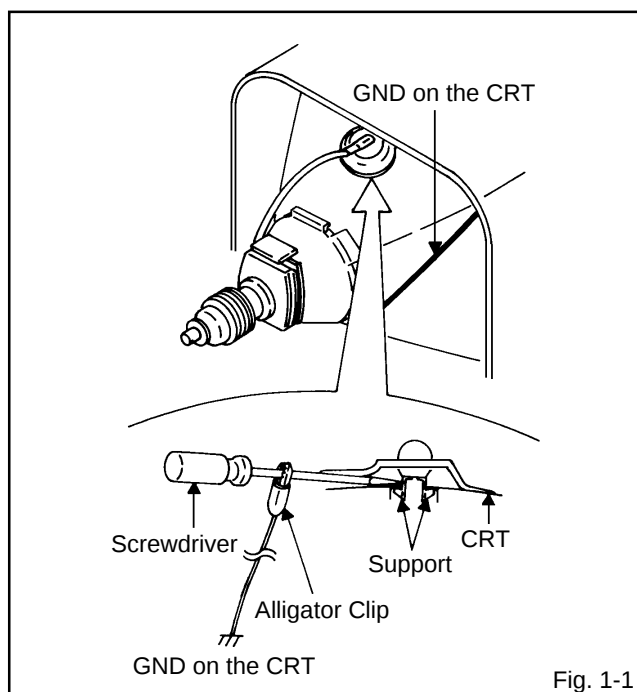


Fig. 1-1

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.)**

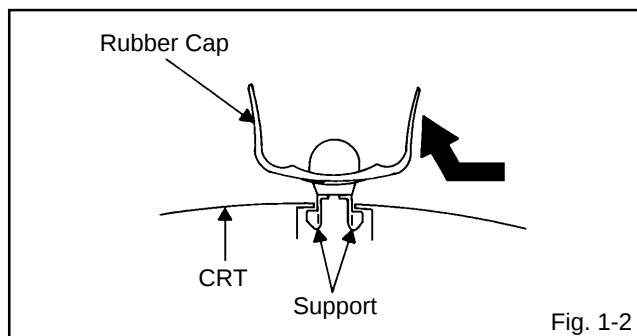


Fig. 1-2

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.)**

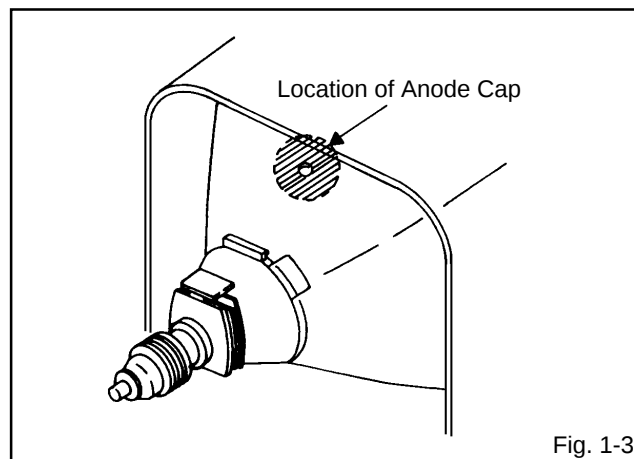


Fig. 1-3

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.)**

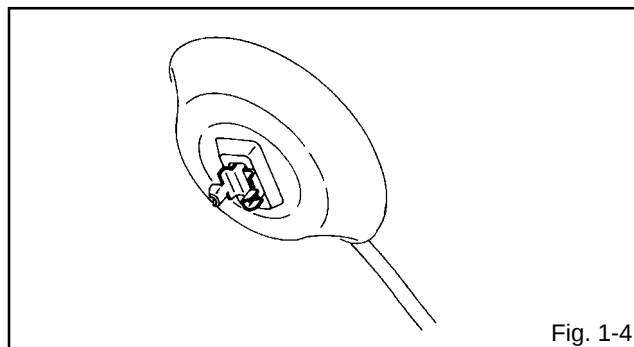


Fig. 1-4

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

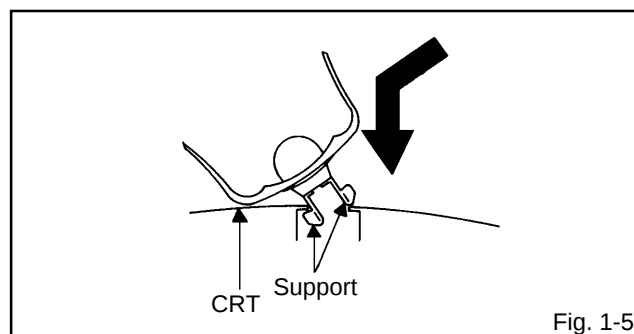


Fig. 1-5

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

DISASSEMBLY INSTRUCTIONS

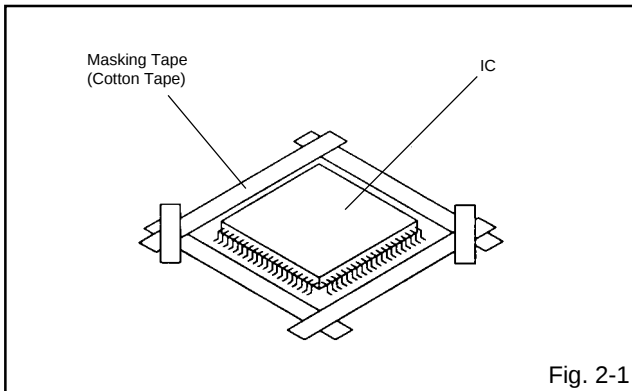
2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

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

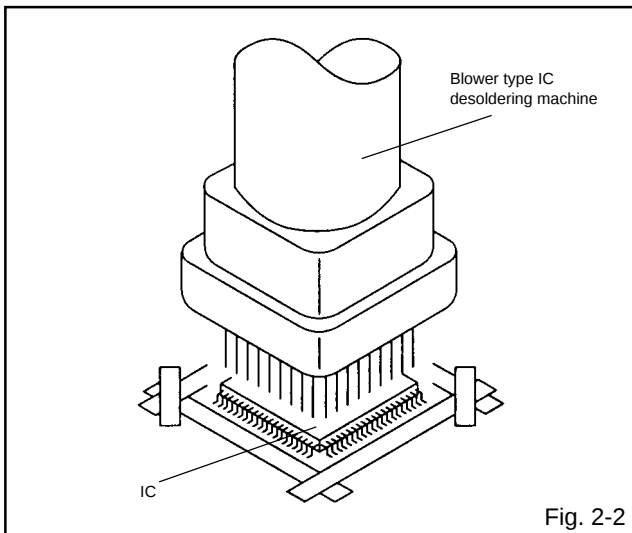
Masking is carried out on all the parts located within 10 mm distance from IC leads.



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

NOTE

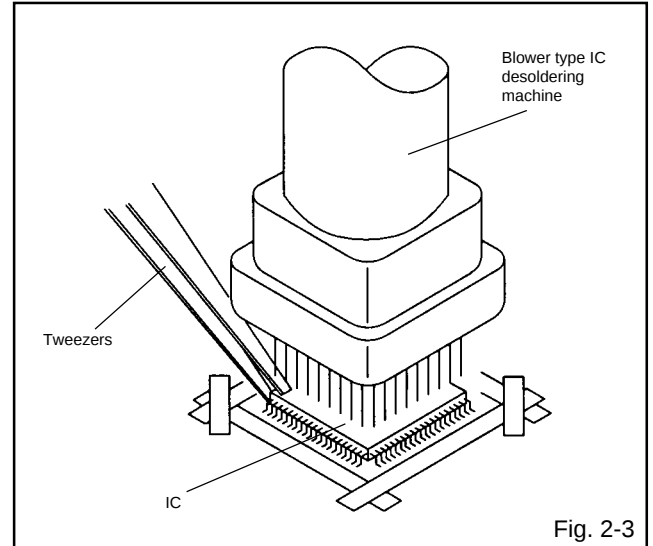
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

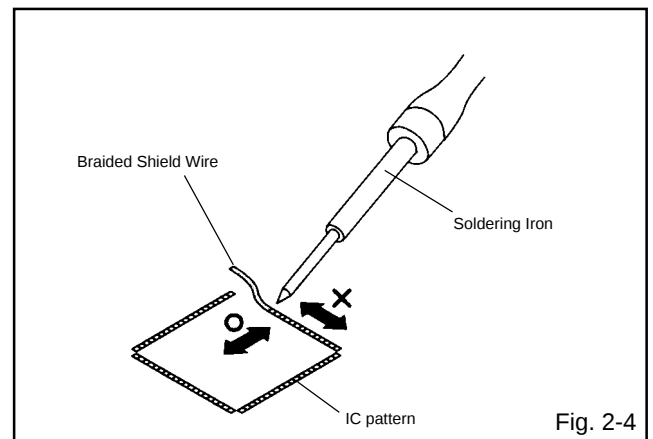
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



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

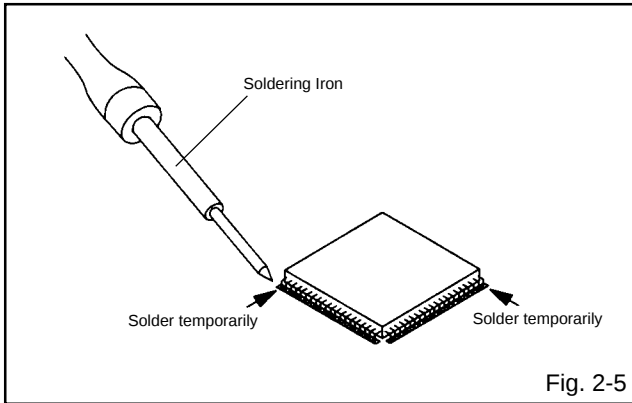
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



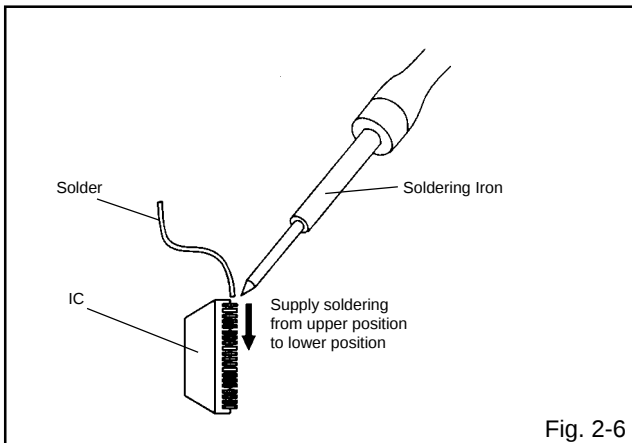
DISASSEMBLY INSTRUCTIONS

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.)**



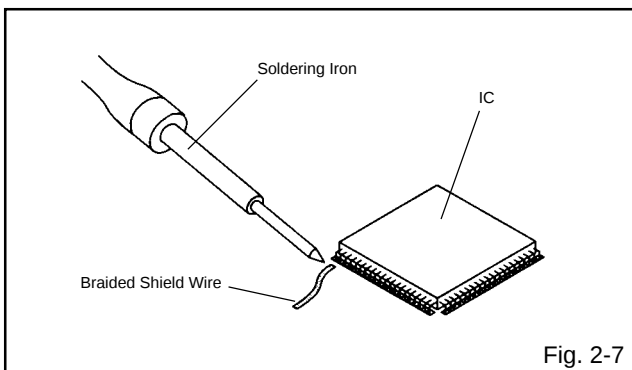
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 2-6.)**



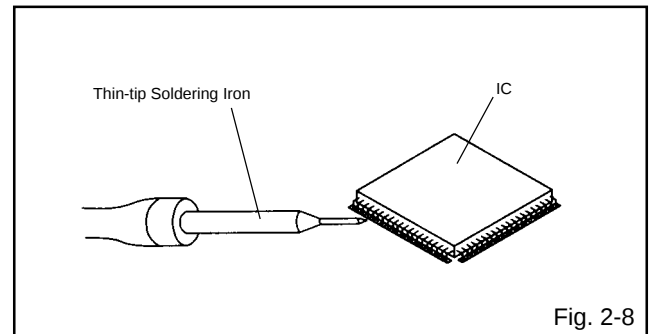
3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 2-7.)**

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 2 seconds.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Reset the user setting items (PICTURE, VOLUME and LANGUAGE) to the initial state for delivery.
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".

- Set the VOLUME to minimum.
- Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 2 seconds.
- After the confirmation of using hours, turn off the power.

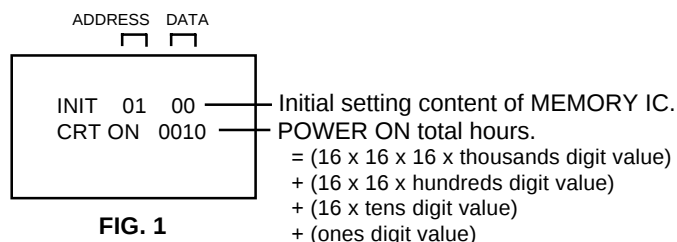


FIG. 1

WHEN REPLACING EEPROM (MEMORY) IC

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

NOTE: No need setting for after INI 16 due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	---	00	38	23	18	31	86	40	68	5A	27	07	83	00	06	73
10	10	00	90	90	90	3C	40	---	---	---	---	---	---	---	---	---

Table 1

- Enter DATA SET mode by setting VOLUME to minimum.
 - Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.
 - ADDRESS is now selected and should "blink". Using the VOL. +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
 - Press OK to select DATA. When DATA is selected, it will "blink".
 - Again, step through the DATA using VOL. +/- button until required DATA value has been selected.
 - Pressing OK will take you back to ADDRESS for further selection if necessary.
 - Repeat steps 3 to 6 until all data has been checked.
 - 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.
 - Turn POWER on.
 - Press both VOL. DOWN button on the set and Channel button **(1)** on the remote control for more than 2 seconds.
 - After the finishing of the initializing of shipping, the unit will turn off automatically.
- The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

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

CAUTION

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

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Pattern Generator

On-Screen Display Adjustment

1. In the condition of NO indication on the screen. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

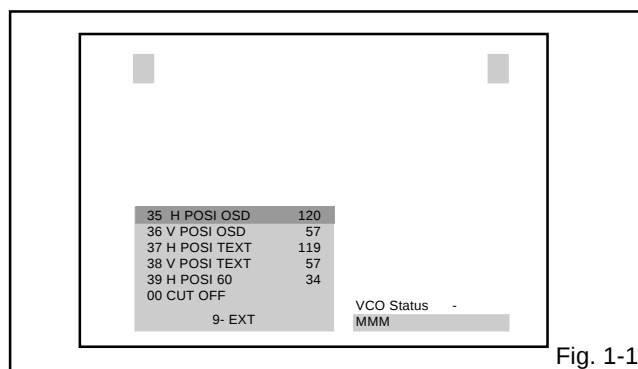


Fig. 1-1

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

NO.	FUNCTION	NO.	FUNCTION
00	CUT OFF	20	TINT
01	RF AGC	21	SHARP
02	AGC GAIN	22	CONTRAST CENT
03	R DRIVE	23	CONTRAST MAX
04	R CUTOFF	24	CONTRAST MIN
05	G DRIVE	25	COLOR CENT
06	G CUTOFF	26	COLOR MAX
07	B DRIVE	27	COLOR MIN
08	H POSI (50)	28	M R CUT OFF
09	V POSI (50)	29	M G CUT OFF
10	V POSI (60)	30	M B CUT OFF
11	V SIZE (50)	31	CVBS OUT
12	V SIZE (60)	32	APR THRESHOLD
13	VCO COARSE	33	BELL FILTER
14	VCO FINE	34	BANDPASS
15	VCO COARSE L1	35	H POSI OSD
16	VCO FINE L1	36	V POSI OSD
17	BRIGHT CENT	37	H POSI TEXT
18	BRIGHT MAX	38	V POSI TEXT
19	BRIGHT MIN	39	H POSI (60)

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CONSTANT VOLTAGE

1. Place the set with Aging Test for more than 15 minutes.
2. Connect the digital voltmeter to **TP501**.
3. Set condition is AV MODE without signal.
4. Adjust the **VR501** until the DC voltage is $117 \pm 1V$.

2-2: VCO

1. Place the set with Aging Test for more than 10 minutes.
2. Connect the oscillator (39.5MHz) to **TP001**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "VCO COARSE".
4. Press the VOL. +/- button on the remote control until the "OK" appear on the screen. If the "OK" is not displayed, select the "+" side on the changed from "+" to "-".
5. Press the Page UP button once to set to "VCO FINE" mode.
6. Press the VOL. +/- button on the remote control to select the 4 step down point from the upper limit on the "OK".
(Example: In case of the "OK" range 30~41, select 37.)

2-3: AGC VOLTAGE

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the UHF (63dB).
3. Connect the digital voltmeter to **pin 5 of CP101**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "RF AGC".
5. Press the VOL. +/- button on the remote control until the digital voltmeter is $2.4 \pm 0.05V$.

2-4: CUT OFF

1. Set condition is AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Place the set with Aging Test for more than 15 minutes.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(00)** on the remote control to select "CUT OFF".
5. Adjust the **Screen Volume** until a dim raster is obtained.

2-5: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the 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 **(03)** on the remote control to select "R DRIVE".
5. Press the Page UP/DOWN button on the remote control to select the "R DRIVE", "G DRIVE", "M R CUTOFF" or "M G CUTOFF".
6. Adjust the VOL. +/- button on the remote control to whiten the R DRIVE, G DRIVE, M R CUT OFF, and M G CUT OFF at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

ELECTRICAL ADJUSTMENTS

2-6: FOCUS

1. Receive a 70dB monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-7: HORIZONTAL POSITION

1. Receive the monoscope pattern 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 **(08)** on the remote control to select "H POSI (50)".
4. Press the VOL. +/- button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.
5. Receive the monoscope pattern of NTSC. (Audio Video Input)
6. Using the remote control, set the brightness and contrast to normal position.
7. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(39)** on the remote control to select "H POSI (60)".
8. Press the VOL. +/- button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-8: VERTICAL SIZE

1. Receive the monoscope pattern 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 **(11)** on the remote control to select "V SIZE (50)".
4. Adjust by using the VOL. +/- button on the remote control so that the Up/Down OVER SCAN Quantity becomes equal to the Right/Left OVER SCAN Quantity.
5. Receive a broadcast and check if the picture is normal.
6. Receive the monoscope pattern of NTSC. (Audio Video Input)
7. Using the remote control, set the brightness and contrast to normal position.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(12)** on the remote control to select "V SIZE (60)".
9. Adjust by using the VOL. +/- button on the remote control so that the Up/Down OVER SCAN Quantity becomes equal to the Right/Left OVER SCAN Quantity.

2-9: VERTICAL POSITION/VERTICAL LINEARITY

1. Receive the monoscope pattern from the Pattern Generator.
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.
4. Adjust the **VR420** until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-10: BRIGHT CENT

1. Receive the PAL black pattern*. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Place the set with Aging Test for more than 15 minutes.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "BRIGHT CENT".
5. Press the VOL. +/- button on the remote control until the screen begin to shine.
6. Receive the PAL black pattern*. (Audio Video Input)
7. Set to the AV mode. Then perform the above adjustments 2-5.

*The Black Pattern means the whole black raster signal. Select the "RASTER" of the pattern generator, set to the OFF position for each R, G and B.

2-11: CONTRAST CENT

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "CONTRAST CENT".
2. Press the VOL. +/- button on the remote control until the contrast step No. becomes "40".
3. Receive a broadcast and check if the picture is normal.
4. Set to the AV mode. Then perform the above adjustments 1-3.

2-12: COLOR CENT

1. Receive the PAL color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast and color to normal position.
3. Connect the oscilloscope to **TP022**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(25)** on the remote control to select "COLOR CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 5 scales on the screen of the oscilloscope.
6. Press the VOL. +/- button on the remote control until the red color level is adjusted to $85 \pm 10\%$ of the white level. (**Refer to Fig. 2-1**)
7. Receive the PAL color bar pattern. (Audio Video Input)
8. Set to the AV mode. Then perform the above adjustments 2-6.

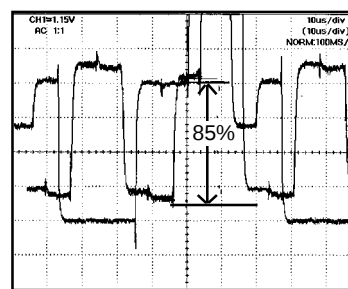


Fig. 2-1

ELECTRICAL ADJUSTMENTS

2-13: TINT

1. Receive the NTSC color bar pattern. (Audio Video Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Connect the oscilloscope to **TP024**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(20)** on the remote control to select "TINT".
5. Press the VOL. +/- button on the remote control until the section "A" becomes a straight line. **(Refer to Fig. 2-2)**

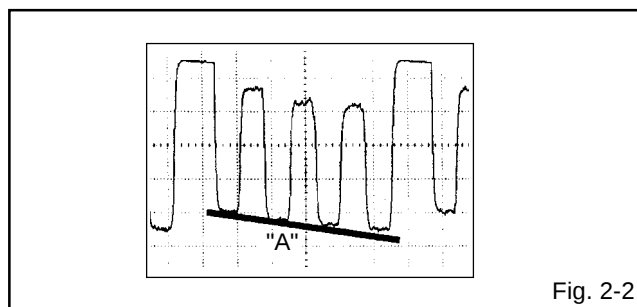


Fig. 2-2

2-14: 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
02	AGC GAIN	00	---
04	R CUTOFF	00	---
06	G CUTOFF	00	---
07	B DRIVE	45	---
09	V POSI (50)	08	---
10	V POSI (60)	00	---
18	BRIGHT MAX	30	30
19	BRIGHT MIN	16	16
20	TINT	30	ADJ.
21	SHARP	01	01
23	CONTRAST MAX	63	63
24	CONTRAST MIN	10	20
26	COLOR MAX	50	50
27	COLOR MIN	10	10
30	M B CUT OFF	127	---
31	CVBS OUT	31	---
32	APR THRESHOLD	00	---
33	BELL FILTER	00	---
34	BANDPASS	00	---
36	7V POSI OSD	57	---
37	H POSI TEXT	115	---
38	V POSI TEXT	57	---

*To check for the fixed values of the RF (60Hz), indicate the adjustment mode screen while input the 60Hz video signal.

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

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

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

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

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

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

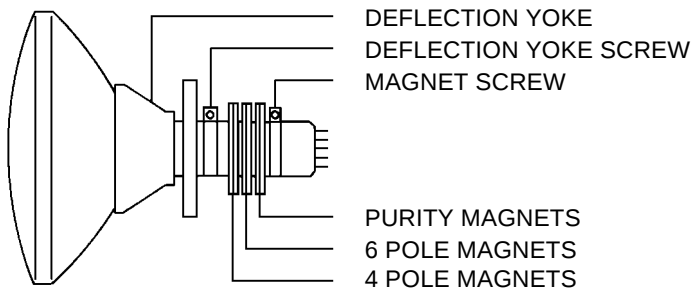


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

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

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

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

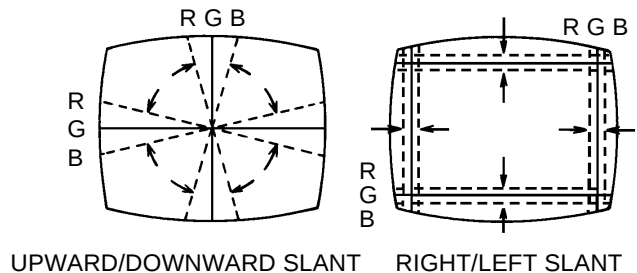


Fig. 3-2-a

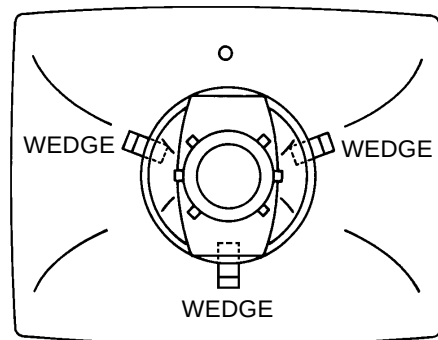
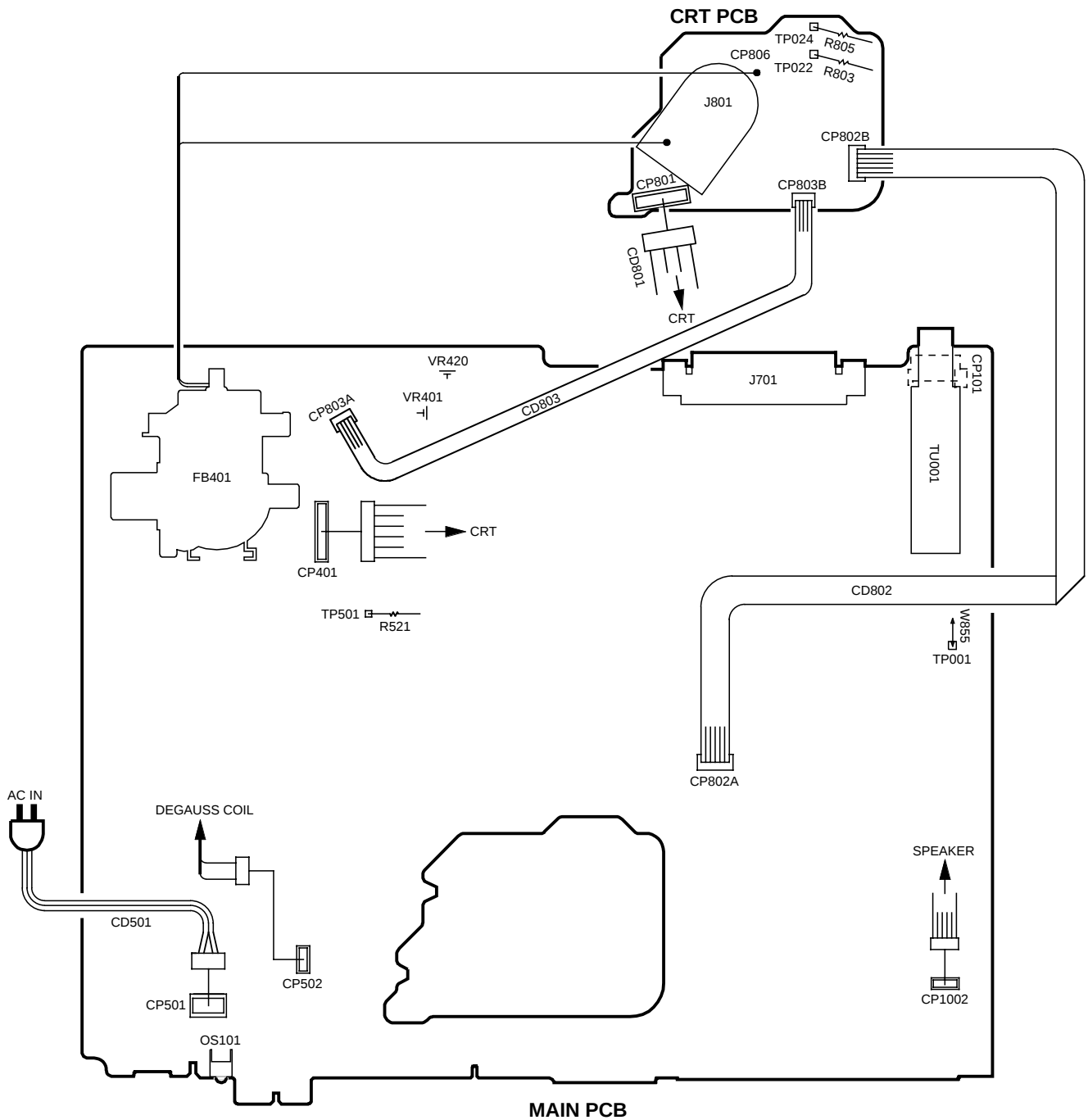


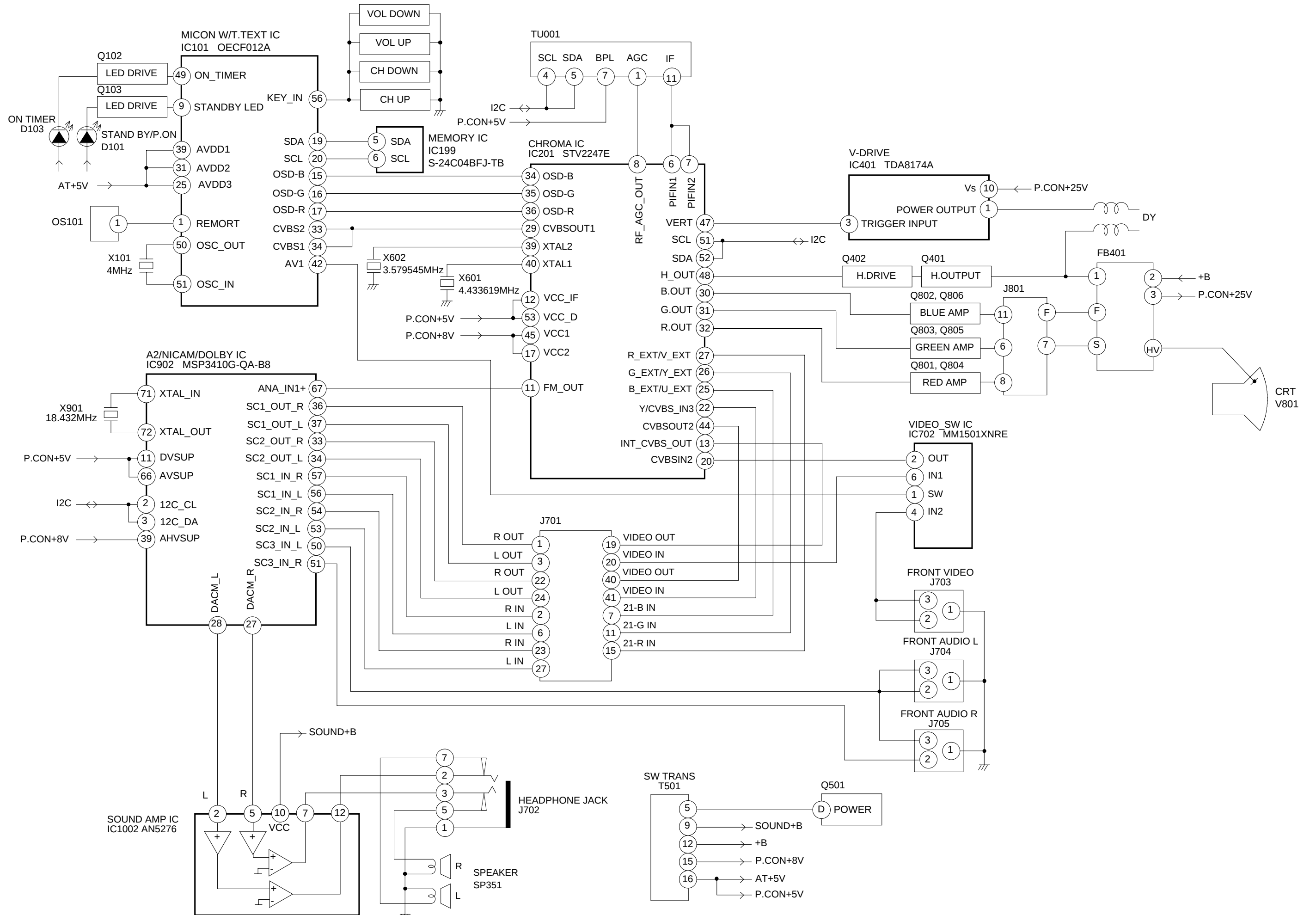
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

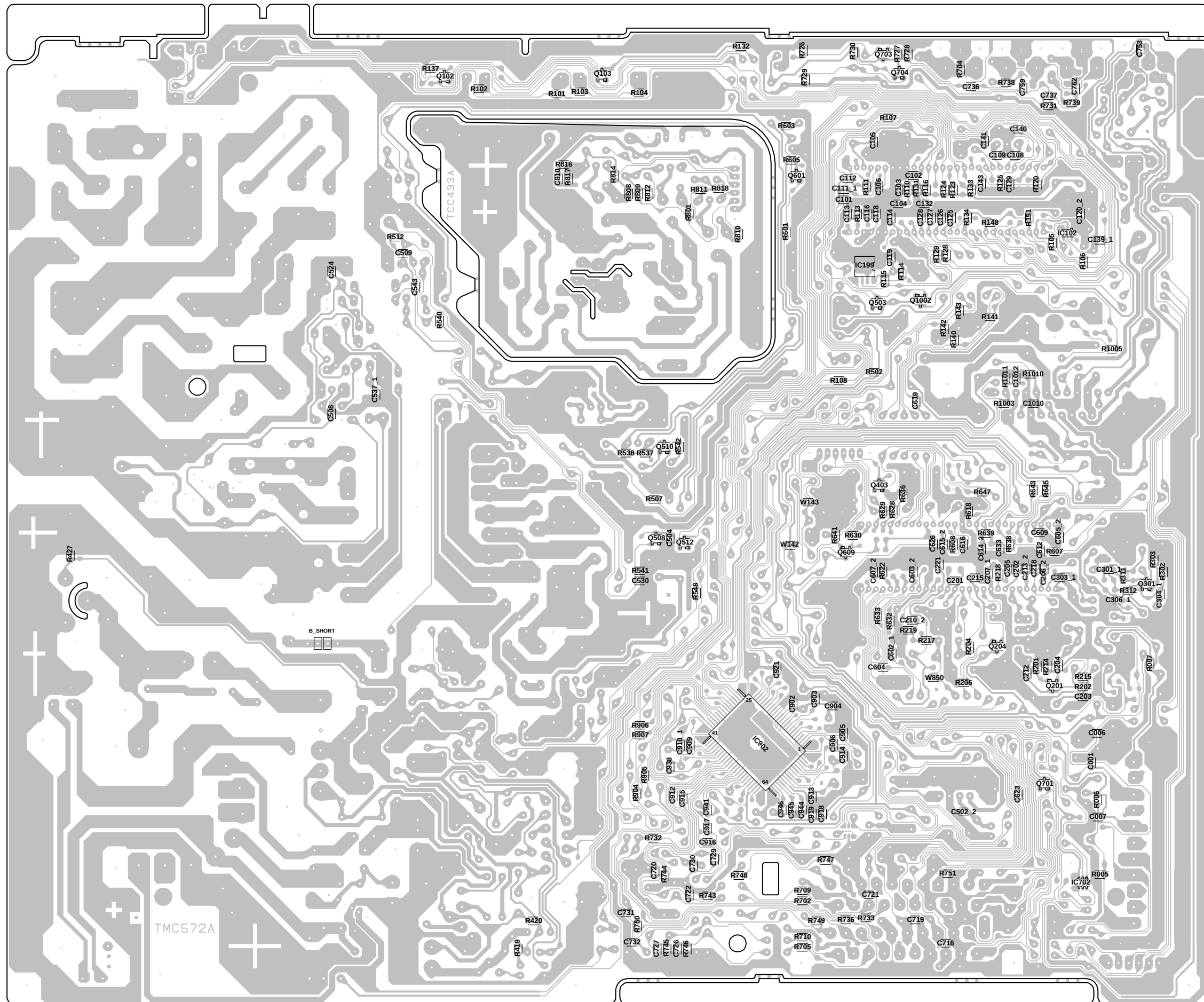
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



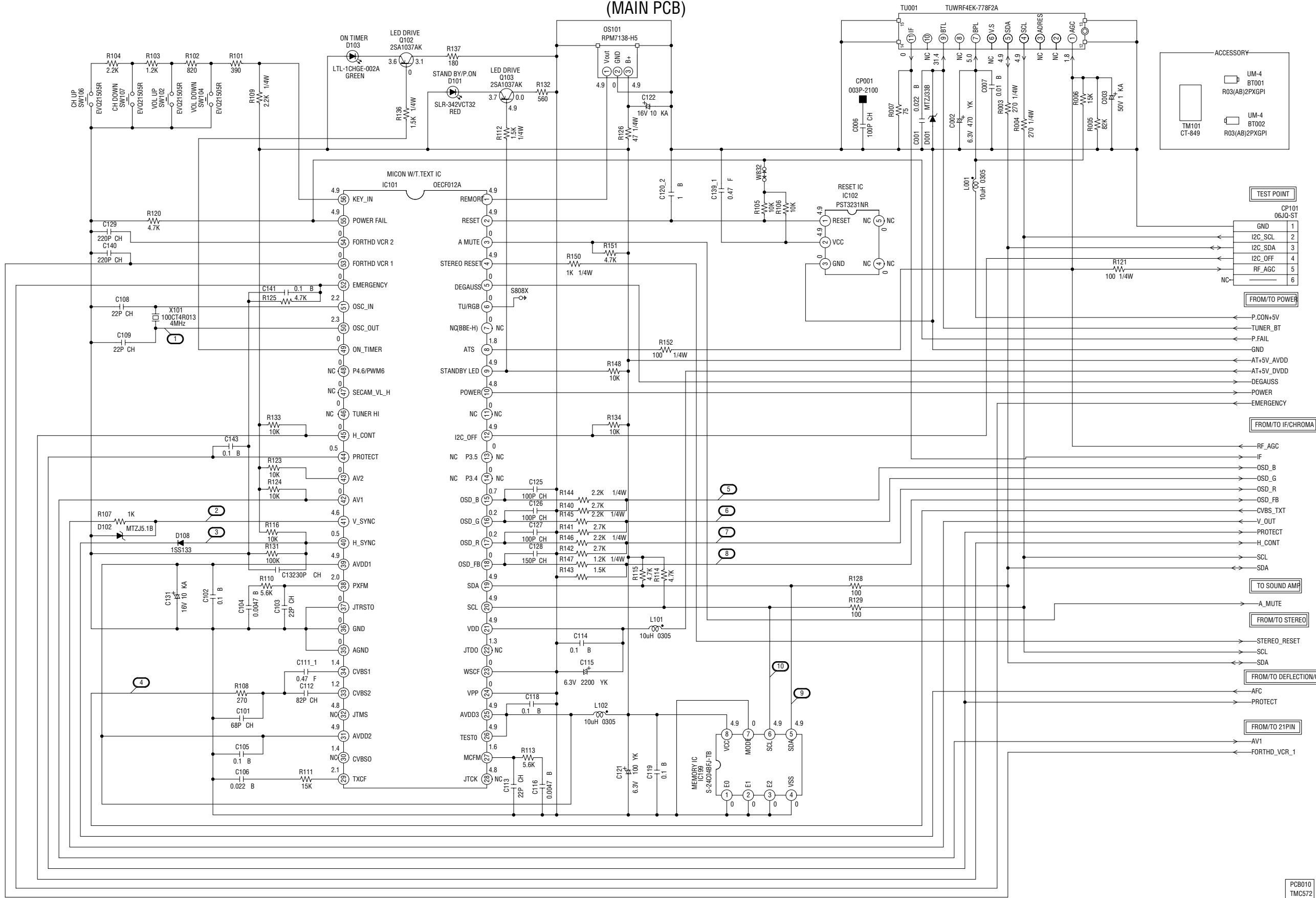
BLOCK DIAGRAM



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



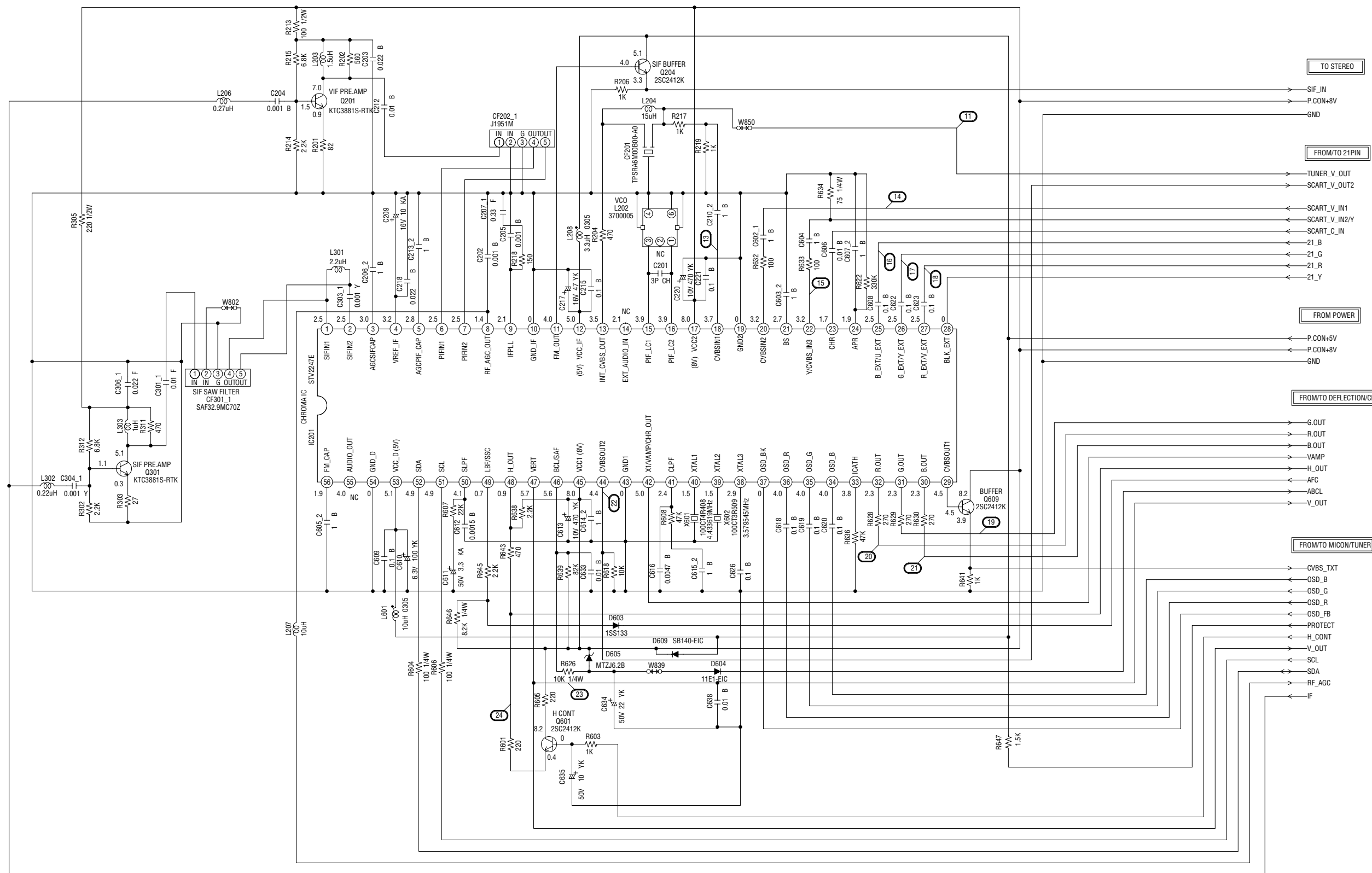
MICON/TUNER SCHEMATIC DIAGRAM (MAIN PCB)



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.

IF/CHROMA SCHEMATIC DIAGRAM
(MAIN PCB)

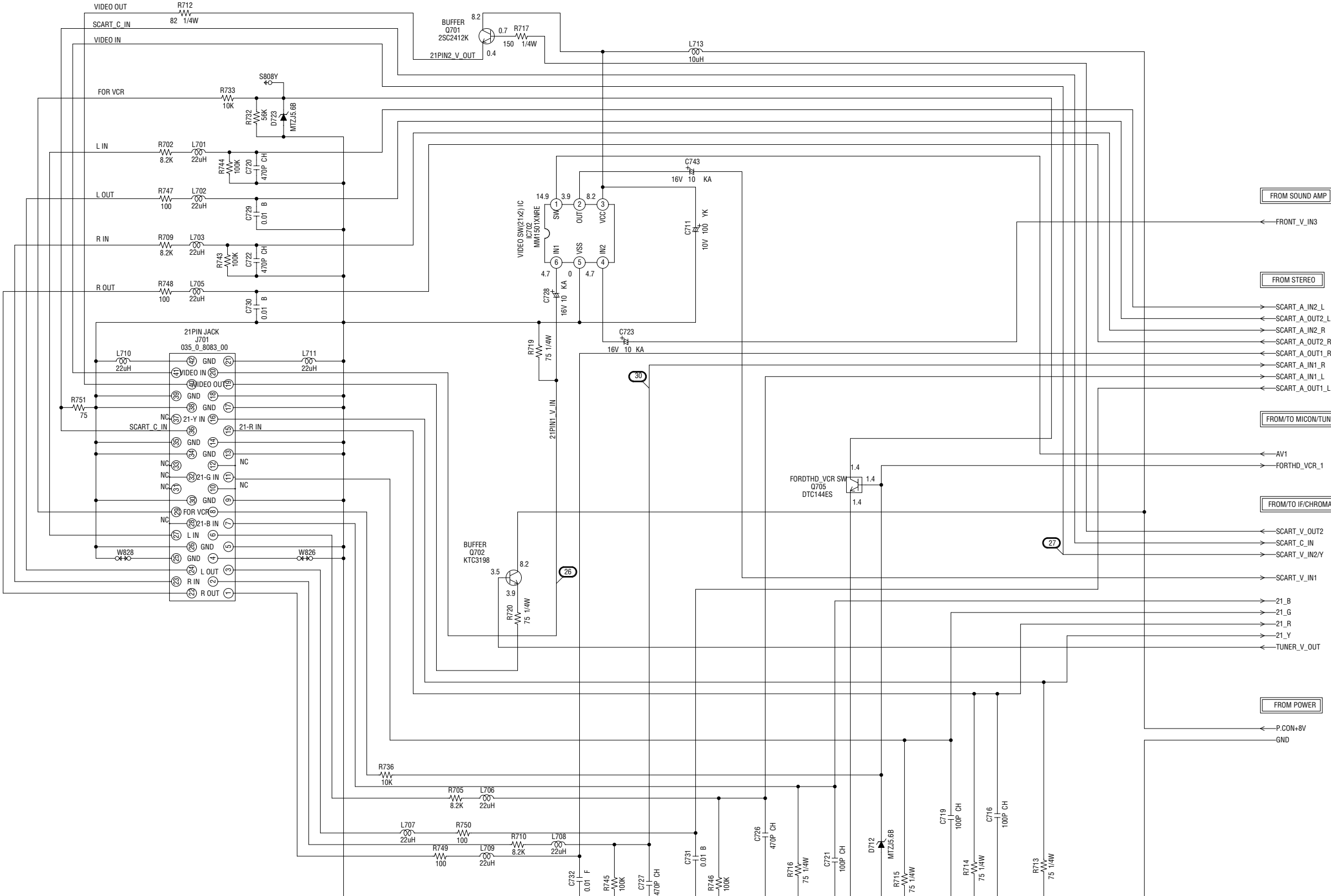


NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

PC8010
TMC572

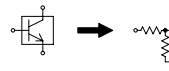
(MAIN PCB)



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

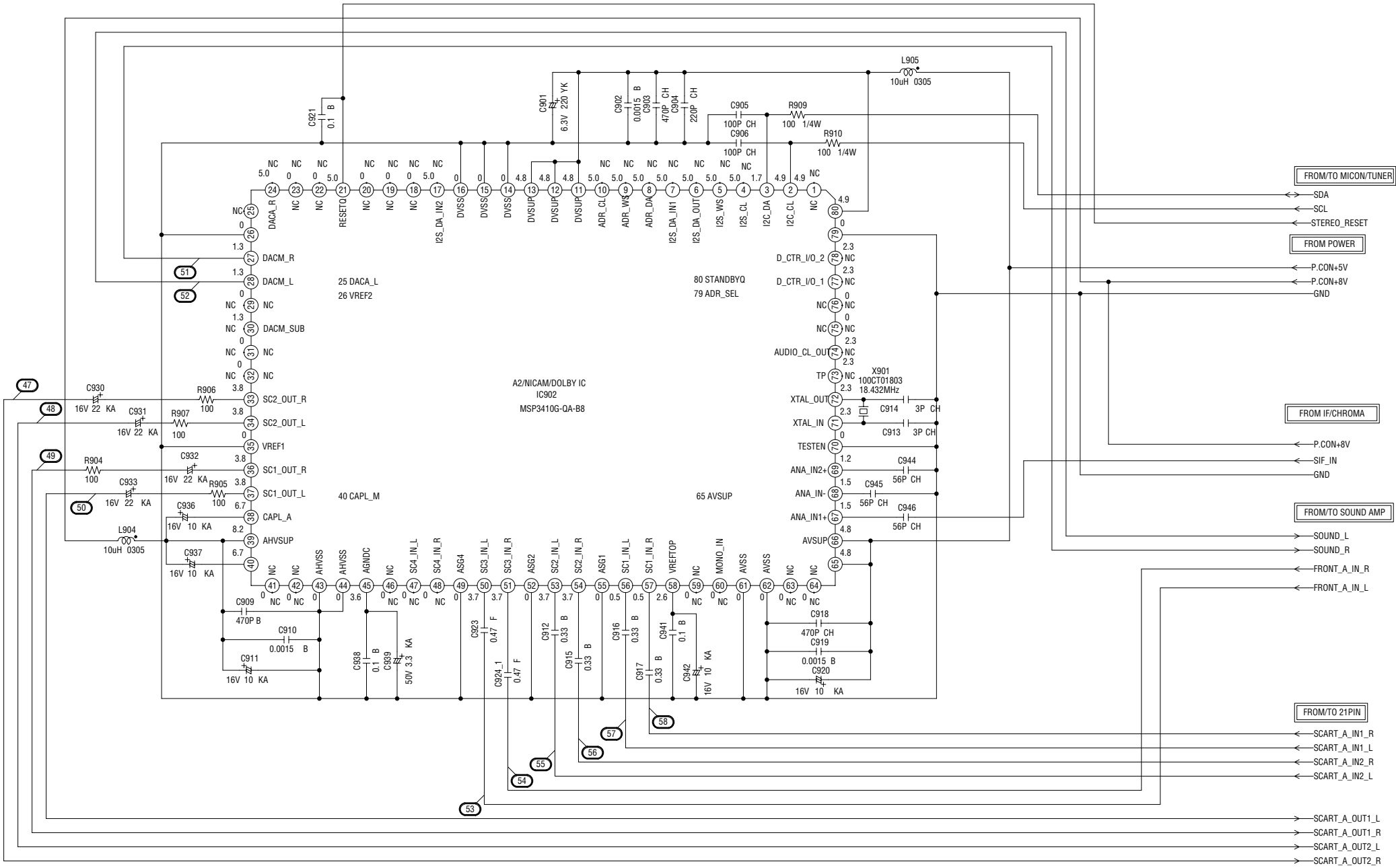
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: DIGITAL TRANSISTOR



PCB010
TMC572

STEREO SCHEMATIC DTAGRAM
(STEREO PCB)

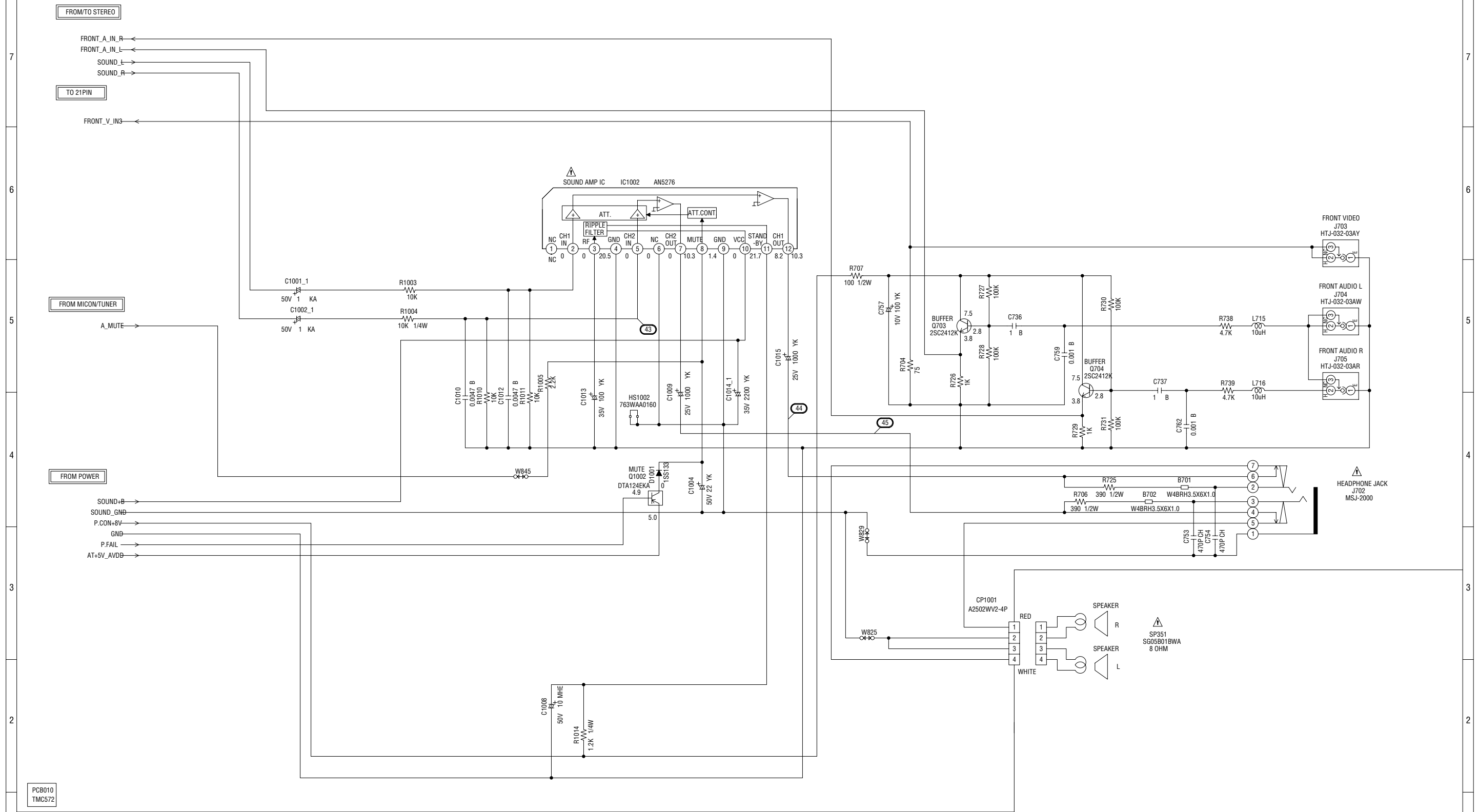


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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.

PCB010
TMC572

SOUND AMP SCHEMATIC DIAGRAM
(MAIN PCB)



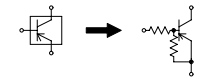
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NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

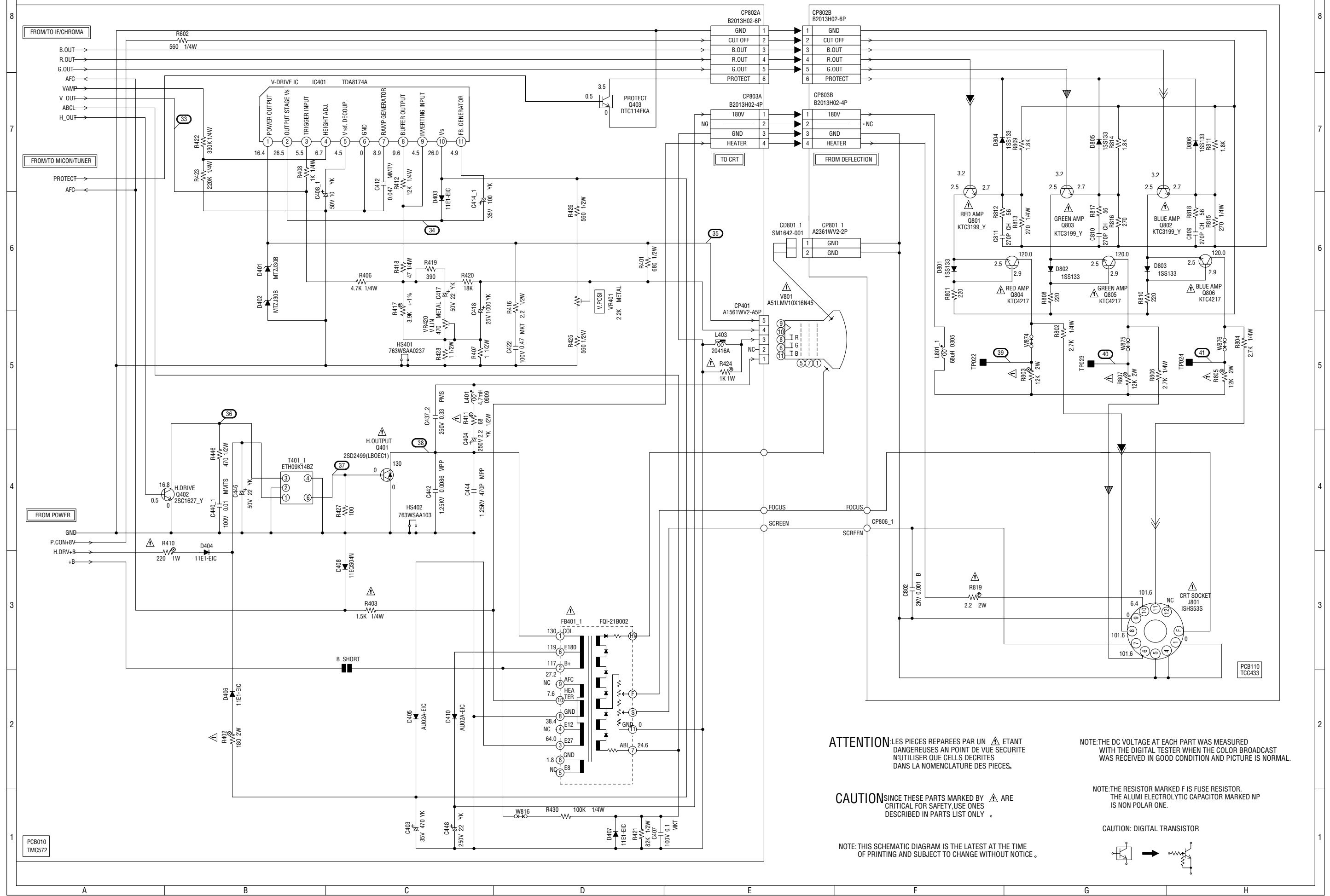
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CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

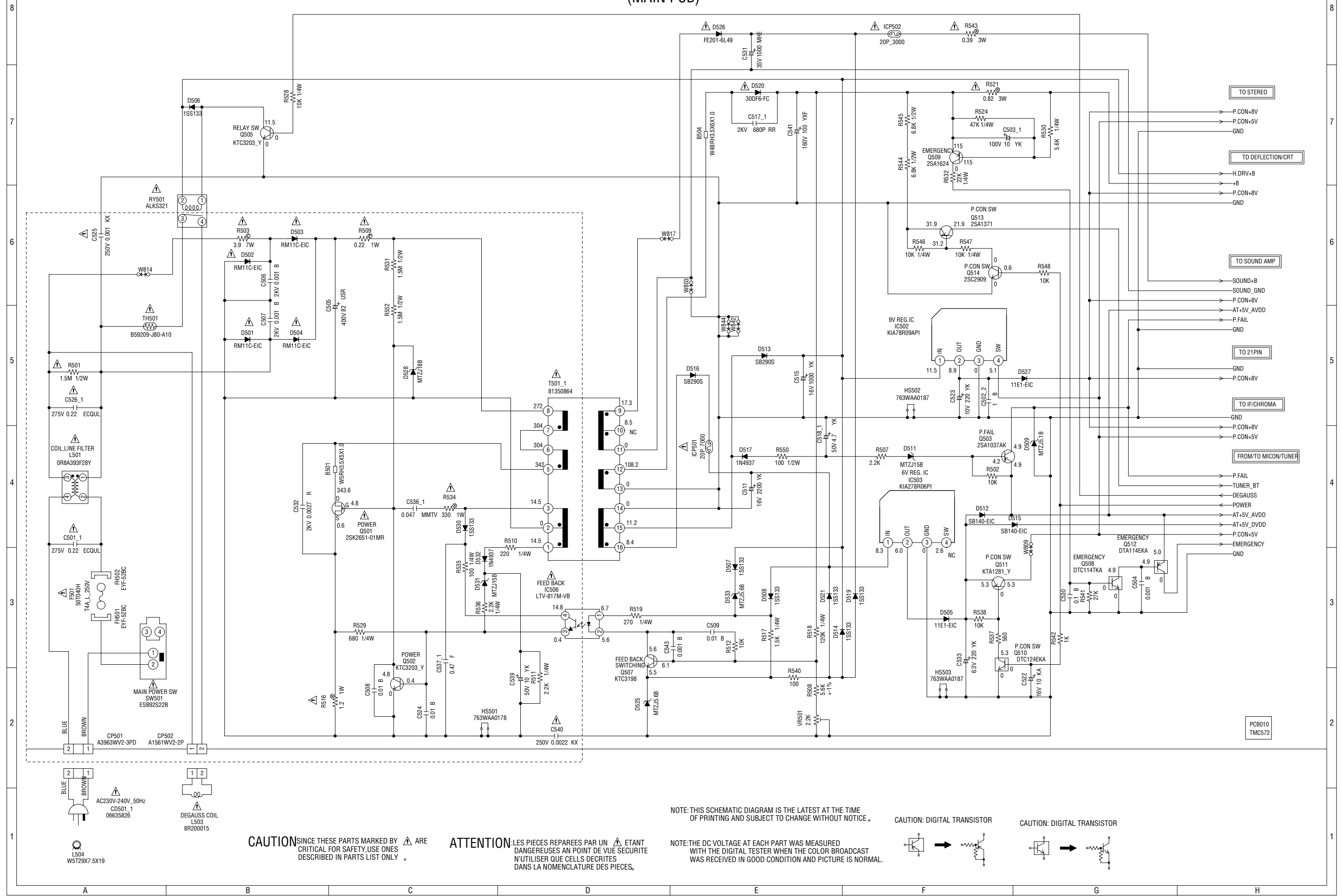
CAUTION: DIGITAL TRANSISTOR



DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)



POWER SCHEMATIC DIAGRAM (MAIN PCB)

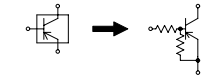


CAUTION SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

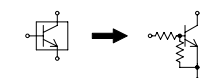
ATTENTION LES PIÉCES REPAREES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIÉCES.

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: DIGITAL TRANSISTOR

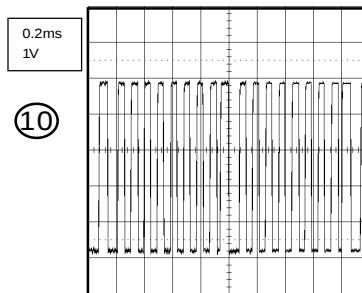
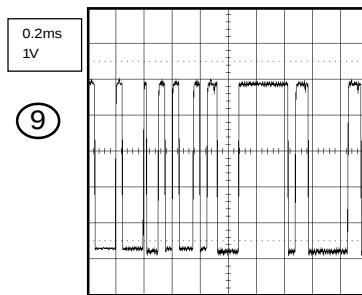
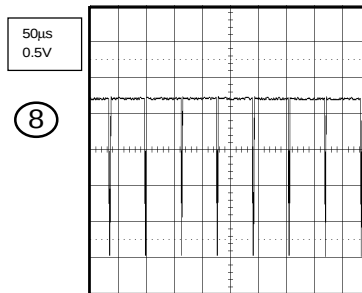
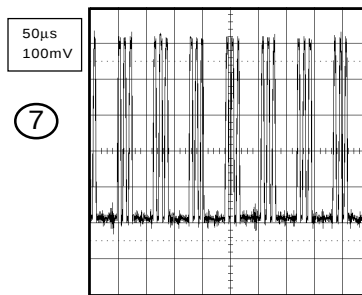
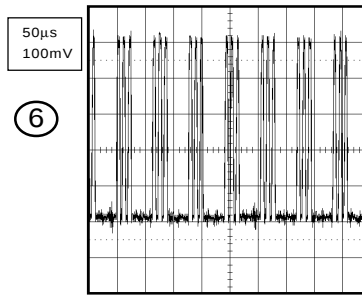
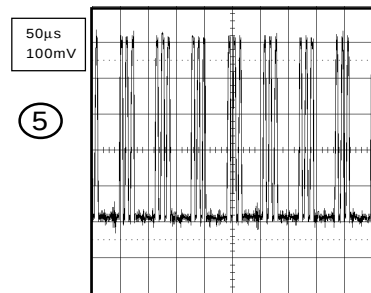
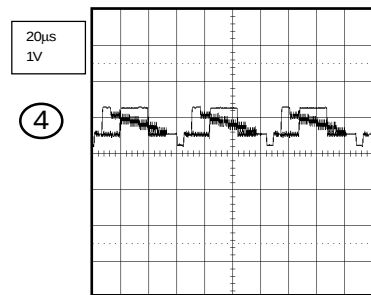
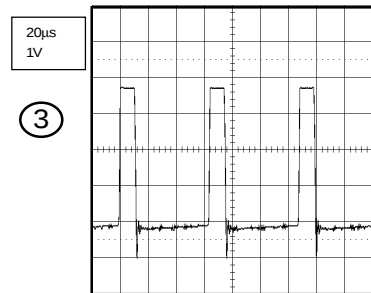
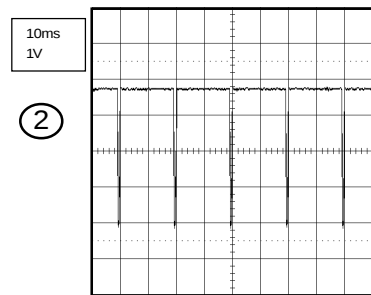
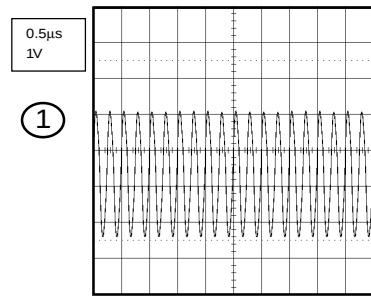


CAUTION: DIGITAL TRANSISTOR

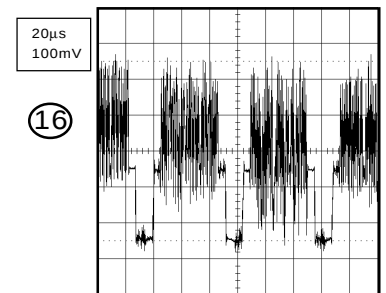
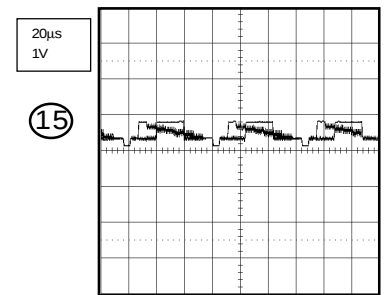
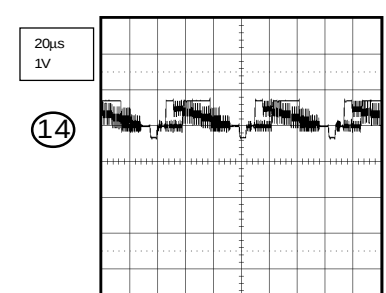
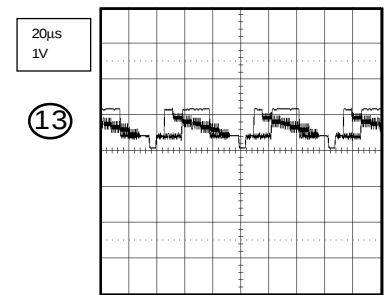
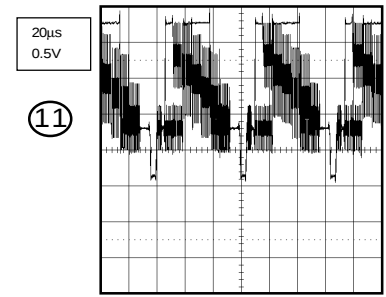


WAVEFORMS

MICON/TUNER

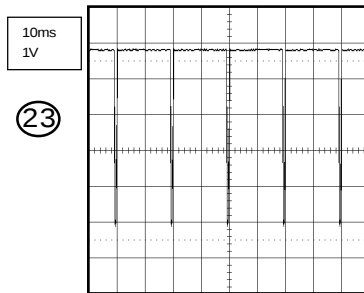
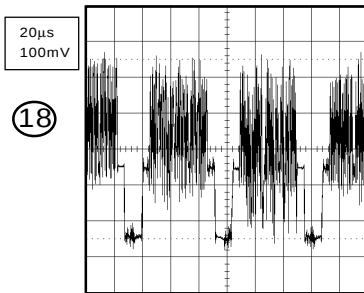
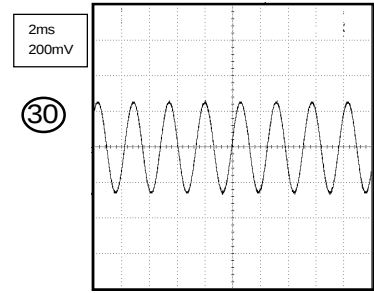
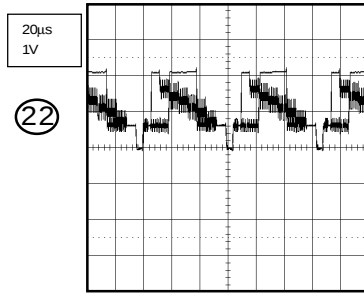
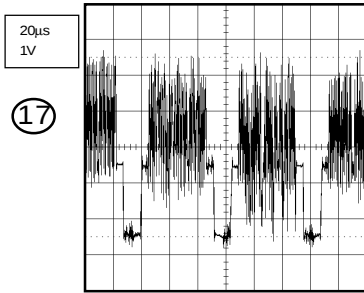


IF/CHROMA

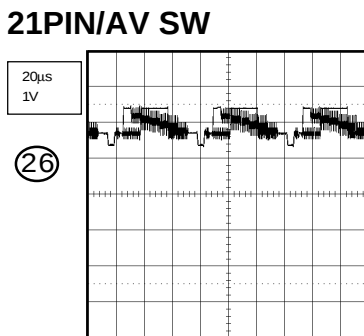
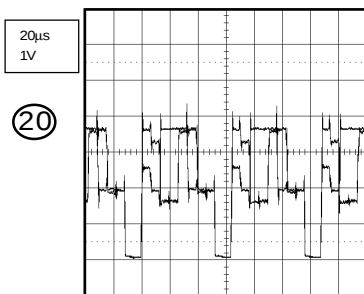
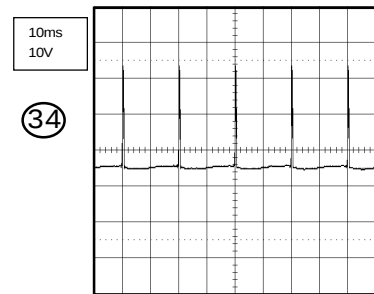
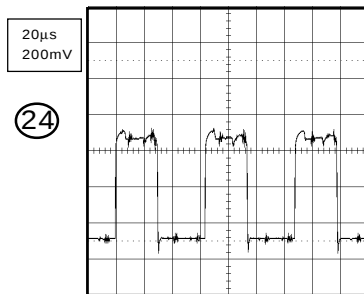
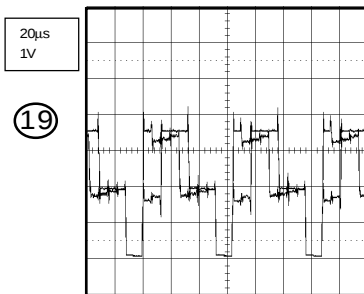
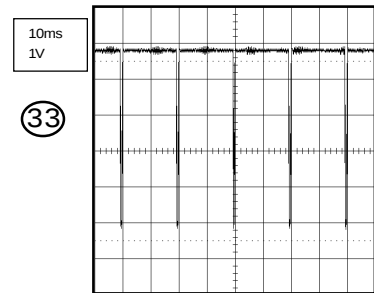


NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

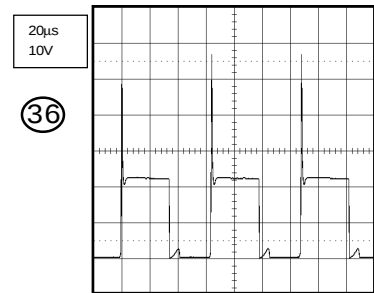
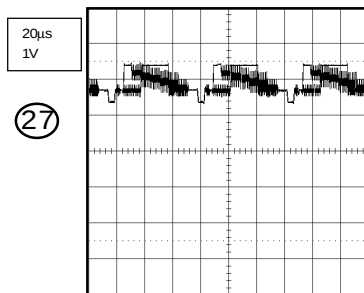
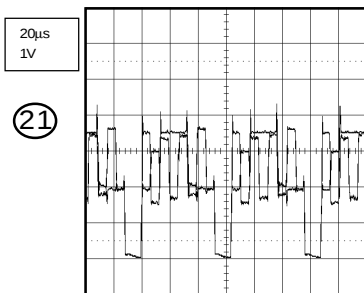
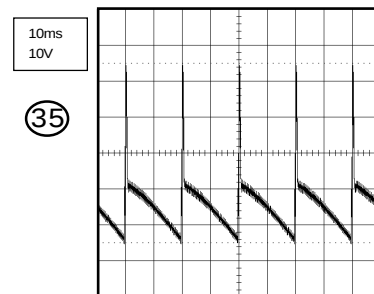
WAVEFORMS



DEFLECTION/CRT



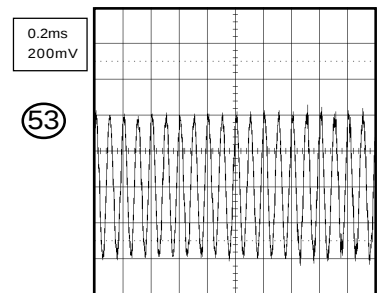
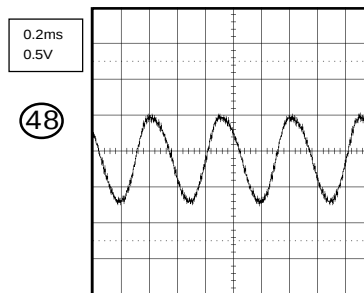
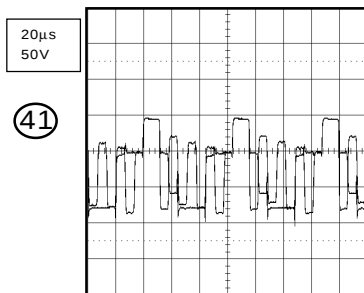
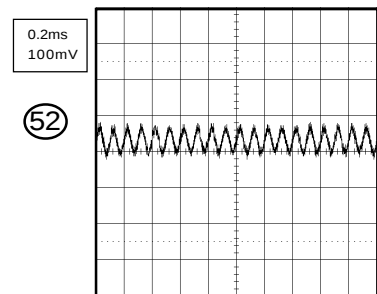
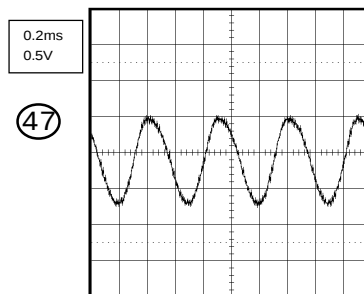
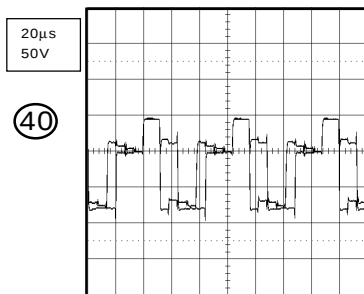
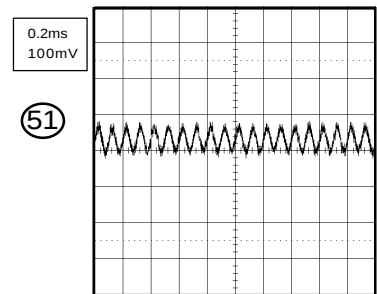
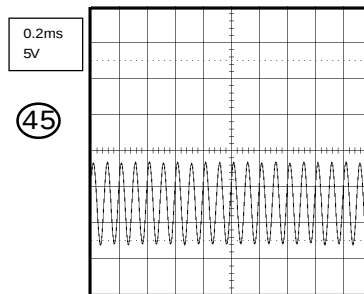
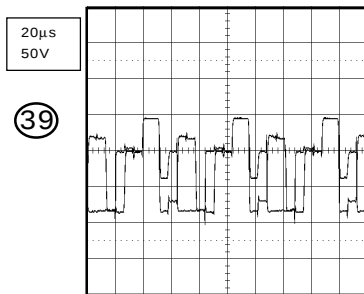
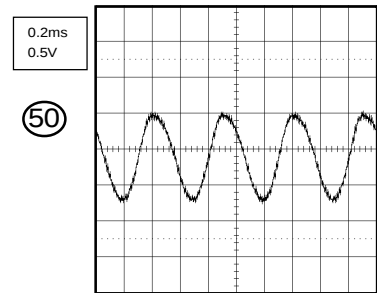
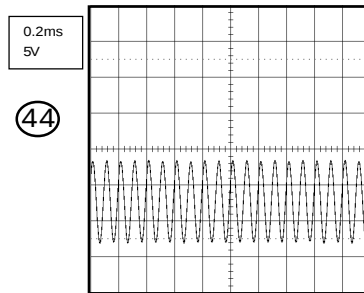
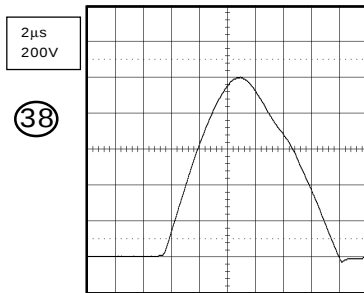
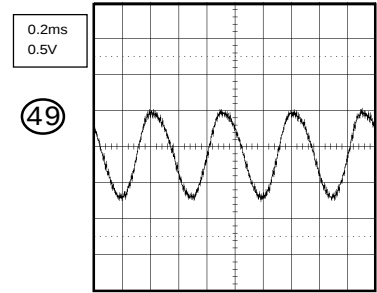
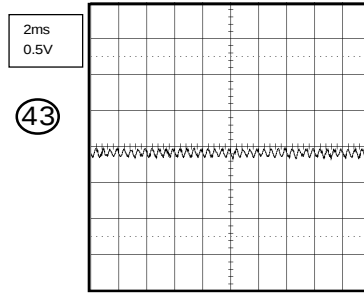
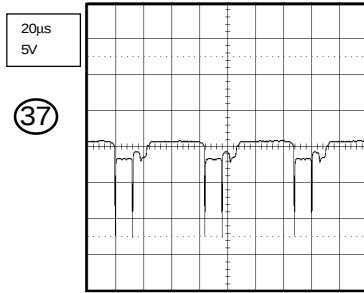
21PIN/AV SW



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

WAVEFORMS

SOUND AMP



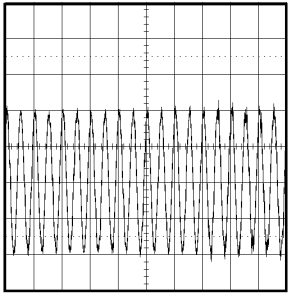
STEREO

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

WAVEFORMS

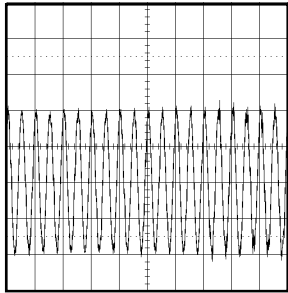
0.2ms
200mV

54



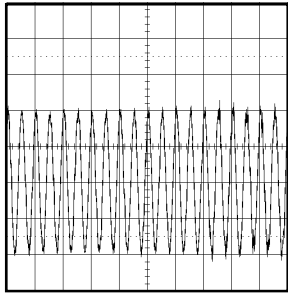
0.2ms
200mV

55



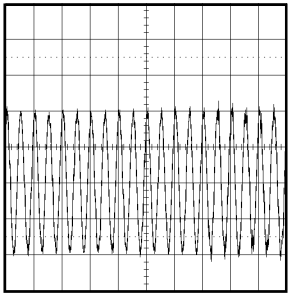
0.2ms
200mV

56



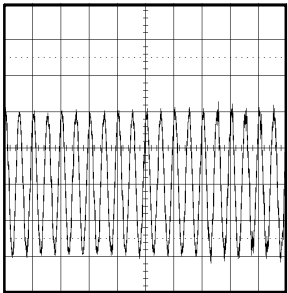
0.2ms
200mV

57



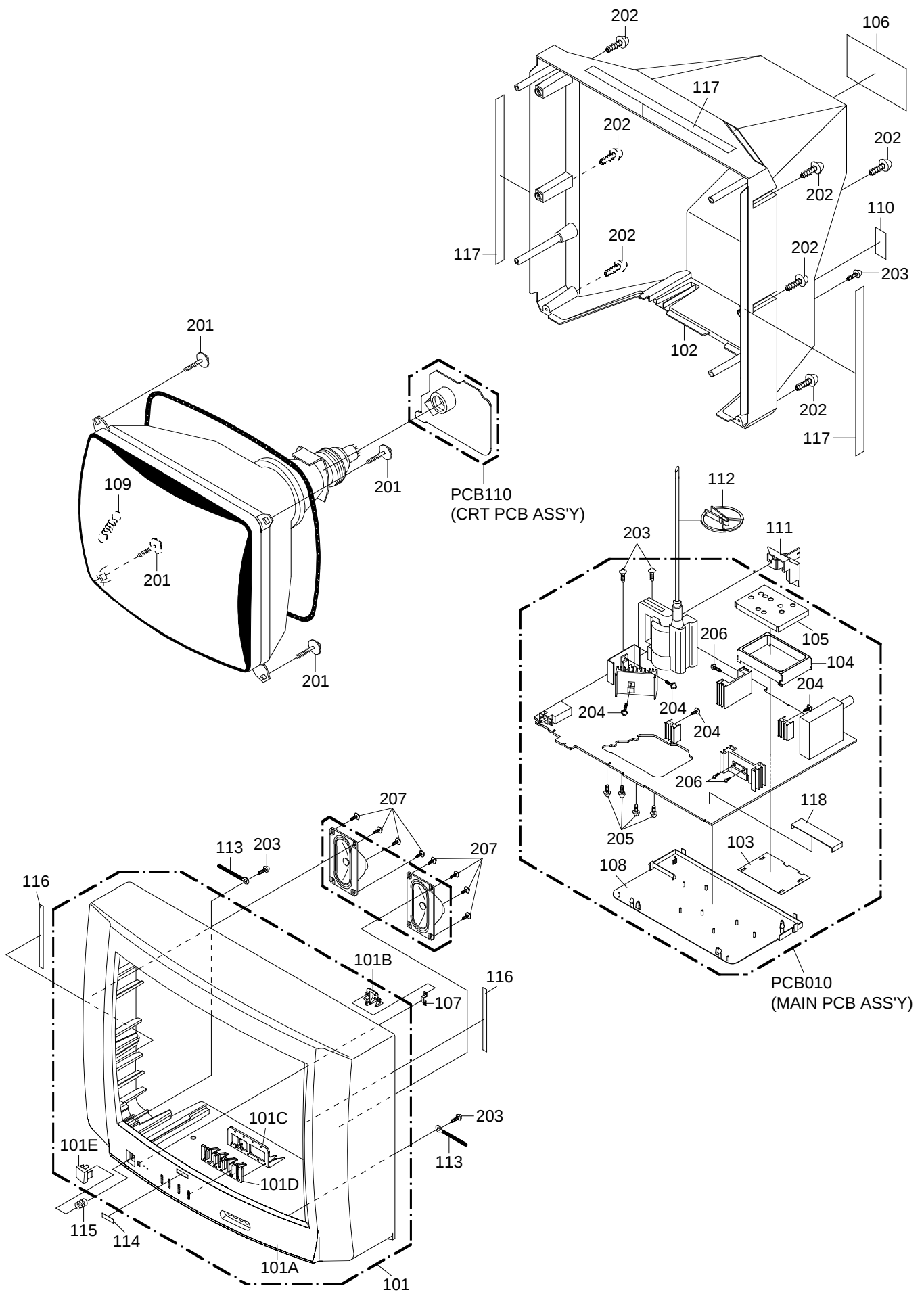
0.2ms
200mV

58



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

MECHANICAL EXPLODED VIEW



MECHANICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
101	A3M503Y720	CABINET,FRONT ASSY	
101A	701UPJA129	CABINET,FRONT	
101B	713UPAA001	GUIDE,REMOCON	
101C	735UPAA014	BUTTON,BASE	
101D	735UPBA028	BUTTON,FRAME	
101E	735UPBA029	BUTTON,POWER	
102	A3M503Y740	CABINET,BACK ASSY	
103	752WSAA006	PLATE,SHIELD	
104	752WSAA008	SHIELD,CASE	
105	752WSAA013	SHIELD,LID	
106	722549A224	SHEET,RATING	
107	711WPAA080	PLATE,FRONT	
108	755WPAA015	COVER PCB	
109	741WUA0001	SPRING,EARTH	
110	7230007471	SHEET,JACK	
111	761WPA0254	HOLDER,FBT	
112	899HV3T000	HOLDER,ANODE WIRE	
113	8995034000	CORD CLIP UL CO.	
114	723549A009	BADGE,BRAND	
115	743WKA0040	SPRING,BUTTON	
116	800WQ00045	FELT SHEET	
117	800UQ00009	FELT SHEET	
118	752WSA0087	SHIELD,IC	
201	8121J50B54	SCREW,TAP TITE(P) GW20	5x28
202	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
204	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
205	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
206	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
207	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
---	723000C293	SHEET,BAR CODE	
---	791WHA0085	LAMIFILM,BAG	
---	792UHAA027	PACKAGE,TOP	
---	792UHAA028	PACKAGE,BOTTOM	
---	793UCDB206	GIFT BOX	
---	A3M503N975	INSTRUCTION BOOK KIT	
---	J3M50301A	INSTRUCTION BOOK	
---	J3M50307A	QUICK SET-UP SHEET	
---	JB5XD200	POLYBAG,INSTRUCTION(RED CAUTION)	

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
RESISTORS			
R003	R002T4271J	RC	270 OHM 1/4W
R004	R002T4271J	RC	270 OHM 1/4W
R005	R903N8823J	RC	82K OHM 1/8W
R006	R903N8153J	RC	15K OHM 1/8W
R007	R903N8750J	RC	75 OHM 1/8W
R101	R903N8391J	RC	390 OHM 1/8W
R102	R903N8821J	RC	820 OHM 1/8W
R103	R903N8122J	RC	1.2K OHM 1/8W
R104	R903N8222J	RC	2.2K OHM 1/8W
R105	R903N8103J	RC	10K OHM 1/8W
R106	R903N8103J	RC	10K OHM 1/8W
R107	R903N8102J	RC	1K OHM 1/8W
R108	R903N8271J	RC	270 OHM 1/8W
R109	R002T4222J	RC	2.2K OHM 1/4W
R110	R903N8562J	RC	5.6K OHM 1/8W
R111	R903N8153J	RC	15K OHM 1/8W
R112	R002T4152J	RC	1.5K OHM 1/4W
R113	R903N8562J	RC	5.6K OHM 1/8W
R114	R903N8472J	RC	4.7K OHM 1/8W
R115	R903N8472J	RC	4.7K OHM 1/8W
R116	R903N8103J	RC	10K OHM 1/8W
R120	R903N8472J	RC	4.7K OHM 1/8W
R121	R002T4101J	RC	100 OHM 1/4W
R123	R903N8103J	RC	10K OHM 1/8W
R124	R903N8103J	RC	10K OHM 1/8W
R125	R903N8472J	RC	4.7K OHM 1/8W
R126	R002T4470J	RC	47 OHM 1/4W
R128	R903N8101J	RC	100 OHM 1/8W
R129	R903N8101J	RC	100 OHM 1/8W
R131	R903N8104J	RC	100K OHM 1/8W
R132	R903N8561J	RC	560 OHM 1/8W
R133	R903N8103J	RC	10K OHM 1/8W
R134	R903N8103J	RC	10K OHM 1/8W
R136	R002T4152J	RC	1.5K OHM 1/4W
R137	R903N8181J	RC	180 OHM 1/8W
R140	R903N8272J	RC	2.7K OHM 1/8W
R141	R903N8272J	RC	2.7K OHM 1/8W
R142	R903N8272J	RC	2.7K OHM 1/8W
R143	R903N8152J	RC	1.5K OHM 1/8W
R144	R002T4222J	RC	2.2K OHM 1/4W
R145	R002T4222J	RC	2.2K OHM 1/4W
R146	R002T4222J	RC	2.2K OHM 1/4W
R147	R002T4122J	RC	1.2K OHM 1/4W
R148	R903N8103J	RC	10K OHM 1/8W
R150	R002T4102J	RC	1K OHM 1/4W
R151	R903N8472J	RC	4.7K OHM 1/8W
R152	R002T4101J	RC	100 OHM 1/4W
R201	R903N8820J	RC	82 OHM 1/8W
R202	R903N8561J	RC	560 OHM 1/8W
R204	R801R7471J	RC	470 OHM 1/10W
R206	R903N8102J	RC	1K OHM 1/8W
R213	R002T2101J	RC	100 OHM 1/2W
R214	R903N8222J	RC	2.2K OHM 1/8W
R215	R903N8682J	RC	6.8K OHM 1/8W
R217	R903N8102J	RC	1K OHM 1/8W
R218	R903N8151J	RC	150 OHM 1/8W
R219	R903N8102J	RC	1K OHM 1/8W
R302	R903N8222J	RC	2.2K OHM 1/8W
R303	R903N8270J	RC	27 OHM 1/8W
R305	R002T2221J	RC	220 OHM 1/2W
R311	R903N8471J	RC	470 OHM 1/8W
R312	R903N8682J	RC	6.8K OHM 1/8W
R401	R002T2681J	RC	680 OHM 1/2W
△R402	R3X18A181J	R,METAL OXIDE	180 OHM 2W
R403	R002T4152J	RC	1.5K OHM 1/4W
R406	R002T4472J	RC	4.7K OHM 1/4W
R407	R002T2010J	RC	1 OHM 1/2W
R408	R002T4102J	RC	1K OHM 1/4W
△R410	R3X181221J	R,METAL OXIDE	220 OHM 1W
△R411	R635U2680J	R,FUSE	68 OHM 1/2W
R412	R002T4123J	RC	12K OHM 1/4W
R416	R002T22R2J	RC	2.2 OHM 1/2W
R417	R4X5T6392F	R,METAL	3.9K OHM 1/6W
R418	R002T4470J	RC	47 OHM 1/4W
R419	R903N8391J	RC	390 OHM 1/8W
R420	R903N8183J	RC	18K OHM 1/8W
R421	R002T2823J	RC	82K OHM 1/2W

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
RESISTORS			
R422	R002T4334J	RC	330K OHM 1/4W
R423	R002T4224J	RC	220K OHM 1/4W
△ R424	R3X181102J	R,METAL OXIDE	1K OHM 1W
R425	R002T2561J	RC	560 OHM 1/2W
R426	R002T2561J	RC	560 OHM 1/2W
R427	R801R7101J	RC	100 OHM 1/10W
R428	R002T2010J	RC	1 OHM 1/2W
R430	R002T4104J	RC	100K OHM 1/4W
R446	R002T2471J	RC	470 OHM 1/2W
△ R501	R002T2155J	RC	1.5M OHM 1/2W
R502	R903N8103J	RC	10K OHM 1/8W
△ R503	R5X2AE3R9J	R,CEMENT	3.9 OHM 7W
R507	R903N8222J	RC	2.2K OHM 1/8W
R508	R4X5T6562F	R,METAL	5.6K OHM 1/6W
△ R509	R63581R22J	R,FUSE	0.22 OHM 1W
R510	R002T4221J	RC	220 OHM 1/4W
R511	R002T4222J	RC	2.2K OHM 1/4W
R512	R903N8103J	RC	10K OHM 1/8W
△ R516	R3X1811R2J	R,METAL OXIDE	1.2 OHM 1W
R517	R002T4152J	RC	1.5K OHM 1/4W
R518	R002T4124J	RC	120K OHM 1/4W
R519	R002T4271J	RC	270 OHM 1/4W
△ R521	R3X28BR82J	R,METAL OXIDE	0.82 OHM 3W
R524	R002T4473J	RC	47K OHM 1/4W
R528	R002T4103J	RC	10K OHM 1/4W
R529	R002T4681J	RC	680 OHM 1/4W
R530	R002T4562J	RC	5.6K OHM 1/4W
R531	R002T2155J	RC	1.5M OHM 1/2W
R532	R002T4223J	RC	22K OHM 1/4W
△ R534	R3X181331J	R,METAL OXIDE	330 OHM 1W
R535	R002T4101J	RC	100 OHM 1/4W
R536	R002T4222J	RC	2.2K OHM 1/4W
R537	R903N8561J	RC	560 OHM 1/8W
R538	R903N8103J	RC	10K OHM 1/8W
R540	R903N8101J	RC	100 OHM 1/8W
R541	R903N8273J	RC	27K OHM 1/8W
R542	R903N8102J	RC	1K OHM 1/8W
△ R543	R3X28BR39J	R,METAL OXIDE	0.39 OHM 3W
R544	R002T2682J	RC	6.8K OHM 1/2W
R545	R002T2682J	RC	6.8K OHM 1/2W
R546	R002T4103J	RC	10K OHM 1/4W
R547	R002T4103J	RC	10K OHM 1/4W
R548	R903N8103J	RC	10K OHM 1/8W
R550	R002T2101J	RC	100 OHM 1/2W
R552	R002T2155J	RC	1.5M OHM 1/2W
R601	R903N8221J	RC	220 OHM 1/8W
R602	R002T4561J	RC	560 OHM 1/4W
R603	R903N8102J	RC	1K OHM 1/8W
R604	R002T4101J	RC	100 OHM 1/4W
R605	R903N8221J	RC	220 OHM 1/8W
R606	R002T4101J	RC	100 OHM 1/4W
R607	R903N8223J	RC	22K OHM 1/8W
R608	R903N8473J	RC	47K OHM 1/8W
R618	R903N8103J	RC	10K OHM 1/8W
R622	R903N8334J	RC	330K OHM 1/8W
R626	R002T4103J	RC	10K OHM 1/4W
R628	R903N8271J	RC	270 OHM 1/8W
R629	R903N8271J	RC	270 OHM 1/8W
R630	R903N8271J	RC	270 OHM 1/8W
R632	R903N8101J	RC	100 OHM 1/8W
R633	R903N8101J	RC	100 OHM 1/8W
R634	R00204750J	RC	75 OHM 1/4W
	R002T4750J	RC	75 OHM 1/4W
R636	R903N8473J	RC	47K OHM 1/8W
R638	R903N8222J	RC	2.2K OHM 1/8W
R639	R903N8823J	RC	82K OHM 1/8W
R641	R903N8102J	RC	1K OHM 1/8W
R643	R903N8471J	RC	470 OHM 1/8W
R645	R903N8222J	RC	2.2K OHM 1/8W
R646	R002T4822J	RC	8.2K OHM 1/4W
R647	R903N8152J	RC	1.5K OHM 1/8W
R702	R801R7822J	RC	8.2K OHM 1/10W
R704	R903N8750J	RC	75 OHM 1/8W
R705	R903N8822J	RC	8.2K OHM 1/8W
R706	R002T2391J	RC	390 OHM 1/2W
R707	R002T2101J	RC	100 OHM 1/2W
R709	R801R7822J	RC	8.2K OHM 1/10W

or

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
RESISTORS			
R710	R903N8822J	RC	8.2K OHM 1/8W
R712	R002T4820J	RC	82 OHM 1/4W
R713	R002T4750J	RC	75 OHM 1/4W
R714	R002T4750J	RC	75 OHM 1/4W
R715	R002T4750J	RC	75 OHM 1/4W
R716	R002T4750J	RC	75 OHM 1/4W
R717	R002T4151J	RC	150 OHM 1/4W
R719	R00204750J	RC	75 OHM 1/4W
R720	R00204750J	RC	75 OHM 1/4W
R725	R002T2391J	RC	390 OHM 1/2W
R726	R903N8102J	RC	1K OHM 1/8W
R727	R903N8104J	RC	100K OHM 1/8W
R728	R903N8104J	RC	100K OHM 1/8W
R729	R903N8102J	RC	1K OHM 1/8W
R730	R903N8104J	RC	100K OHM 1/8W
R731	R903N8104J	RC	100K OHM 1/8W
R732	R801R7563J	RC	56K OHM 1/10W
R733	R801R7103J	RC	10K OHM 1/10W
R736	R903N8103J	RC	10K OHM 1/8W
R738	R903N8472J	RC	4.7K OHM 1/8W
R739	R903N8472J	RC	4.7K OHM 1/8W
R743	R801R7104J	RC	100K OHM 1/10W
R744	R801R7104J	RC	100K OHM 1/10W
R745	R903N8104J	RC	100K OHM 1/8W
R746	R903N8104J	RC	100K OHM 1/8W
R747	R801R7101J	RC	100 OHM 1/10W
R748	R801R7101J	RC	100 OHM 1/10W
R749	R903N8101J	RC	100 OHM 1/8W
R750	R903N8101J	RC	100 OHM 1/8W
R751	R801R7750J	RC	75 OHM 1/10W
R801	R903N8221J	RC	220 OHM 1/8W
R802	R002T4272J	RC	2.7K OHM 1/4W
△ R803	R3X18A123J	R,METAL OXIDE	12K OHM 2W
R804	R002T4272J	RC	2.7K OHM 1/4W
△ R805	R3X18A123J	R,METAL OXIDE	12K OHM 2W
R806	R002T4272J	RC	2.7K OHM 1/4W
△ R807	R3X18A123J	R,METAL OXIDE	12K OHM 2W
R808	R903N8221J	RC	220 OHM 1/8W
R809	R903N8182J	RC	1.8K OHM 1/8W
R810	R903N8221J	RC	220 OHM 1/8W
R811	R903N8182J	RC	1.8K OHM 1/8W
R812	R903N8560J	RC	56 OHM 1/8W
R813	R002T4271J	RC	270 OHM 1/4W
R814	R903N8182J	RC	1.8K OHM 1/8W
R815	R002T4271J	RC	270 OHM 1/4W
R816	R903N8271J	RC	270 OHM 1/8W
R817	R903N8560J	RC	56 OHM 1/8W
R818	R903N8560J	RC	56 OHM 1/8W
△ R819	R6358A2R2J	R,FUSE	2.2 OHM 2W
R904	R903N8101J	RC	100 OHM 1/8W
R905	R903N8101J	RC	100 OHM 1/8W
R906	R801R7101J	RC	100 OHM 1/10W
R907	R801R7101J	RC	100 OHM 1/10W
R909	R002T4101J	RC	100 OHM 1/4W
R910	R002T4101J	RC	100 OHM 1/4W
R1003	R903N8103J	RC	10K OHM 1/8W
R1004	R002T4103J	RC	10K OHM 1/4W
R1005	R801R7222J	RC	2.2K OHM 1/10W
R1010	R903N8103J	RC	10K OHM 1/8W
R1011	R903N8103J	RC	10K OHM 1/8W
R1014	R002T4122J	RC	1.2K OHM 1/4W
CAPACITORS			
C001	CS0RB04H4K	CC	0.022 UF 50V B
C002	E02LU0471M	CE	470 UF 6.3V
C003	E50HU5010M	CE	1 UF 50V
C006	CS0RCH412J	CC	100 PF 50V CH
C007	CS0RB0414K	CC	0.01 UF 50V B
C101	CS0RCH4U1J	CC	68 PF 50V CH
C102	CS0RB0315K	CC	0.1 UF 25V B
C103	CS0KCH4H1J	CC	22 PF 50V CH
C104	CS0RB04Q3K	CC	0.0047UF 50V B
C105	CS0RB0315K	CC	0.1 UF 25V B
C106	CS0RB04H4K	CC	0.022 UF 50V B
C108	CS0KCH4H1J	CC	22 PF 50V CH
C109	CS0KCH4H1J	CC	22 PF 50V CH
C111	CS0RF02Q5Z	CC	0.47 UF 16V F
C112	CS0RCH4W1J	CC	82 PF 50V CH

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
CAPACITORS			
C113	CS0KCH4H1J	CC	22 PF 50V CH
C114	CS0RB0315K	CC	0.1 UF 25V B
C115	E02LT0222M	CE	2200 UF 6.3V
C116	CS0RB04Q3K	CC	0.0047UF 50V B
C118	CS0RB0315K	CC	0.1 UF 25V B
C119	CS0RB0315K	CC	0.1 UF 25V B
C120	CS0RB0216K	CC	1 UF 16V B
C121	E02LU0101M	CE	100 UF 6.3V
C122	E50HU2100M	CE	10 UF 16V
C125	CS0RCH412J	CC	100 PF 50V CH
C126	CS0RCH412J	CC	100 PF 50V CH
C127	CS0RCH412J	CC	100 PF 50V CH
C128	CS0RCH4E2J	CC	150 PF 50V CH
C129	CS0RCH4H2J	CC	220 PF 50V CH
C131	E50HU2100M	CE	10 UF 16V
C132	CS0RCH431J	CC	30 PF 50V CH
C139	CS0RF02Q5Z	CC	0.47 UF 16V F
C140	CS0RCH4H2J	CC	220 PF 50V CH
C141	CS0RB0315K	CC	0.1 UF 25V B
C143	CS0RB0315K	CC	0.1 UF 25V B
C201	CS0RCH430C	CC	3 PF 50V CH
C202	CS0RB0413K	CC	0.001 UF 50V B
C203	CS0RB04H4K	CC	0.022 UF 50V B
C204	CS0RB0413K	CC	0.001 UF 50V B
C205	CS0RB0413K	CC	0.001 UF 50V B
C206	CS0RB0216K	CC	1 UF 16V B
C207	CS0RF04L5Z	CC	0.33 UF 50V F
C209	E50HU2100M	CE	10 UF 16V
C210	CS0RB0216K	CC	1 UF 16V B
C212	CS0RB0414K	CC	0.01 UF 50V B
C213	CS0RB0216K	CC	1 UF 16V B
C215	CS0RB0315K	CC	0.1 UF 25V B
C217	E02LU2470M	CE	47 UF 16V
C218	CS0RB04H4K	CC	0.022 UF 50V B
C220	E02LU1471M	CE	470 UF 10V
C221	CS0RB0315K	CC	0.1 UF 25V B
C301	CS0KF0214Z	CC	0.01 UF 16V F
C303	CS0KY0313M	CC	0.001 UF 25V Y
C304	CS0KY0313M	CC	0.001 UF 25V Y
C306	CS0KF02H4Z	CC	0.022 UF 16V F
C403	E02LT4471M	CE	470 UF 35V
C404	E02LTD2R2M	CE	2.2 UF 250V
C407	P235W1104J	CMP	0.1 UF 100V MKT
C408	E02LU5100M	CE	10 UF 50V
C412	P232T0473J	CMPL	0.047 UF 50V MMTV
△C414	E02LU4101M	CE	100 UF 35V
C417	E02LU5220M	CE	22 UF 50V
C418	E02LF3102M	CE	1000 UF 25V
C422	P235W1474J	CMP	0.47 UF 100V MKT
C437	P4J7F3334J	CMPP	0.33 UF 250V PMS
C440	P232W1103J	CMP	0.01 UF 100V MMTS
C442	P4N8FJ862H	CMPP	0.0086UF 1.25KV
C444	P4N8FJ471J	CMPP	470 PF 1.25KV
△C446	E02LU5220M	CE	22 UF 50V
△C448	E0ELFD220M	CE	22 UF 250V
△C501	P2122B224M	CMP	0.22 UF 275V ECQUL
C502	CS0RB0216K	CC	1 UF 16V B
C503	E02LT8100M	CE	10 UF 100V
C504	CS0RB0413K	CC	0.001 UF 50V B
△C505	E52DHH820M	CE	82 UF 400V
C506	C0JBB0713K	CC	0.001 UF 2KV B
C507	C0JBB0713K	CC	0.001 UF 2KV B
C508	CS0RB0414K	CC	0.01 UF 50V B
C509	CS0RB0414K	CC	0.01 UF 50V B
C511	E02LF2222M	CE	2200 UF 16V
C515	E02LT2102M	CE	1000 UF 16V
C517	C0PLRR7U2K	CC	680 PF 2KV R
C518	E02LU54R7M	CE	4.7 UF 50V
C522	E50HU2100M	CE	10 UF 16V
C523	E02LU1221M	CE	220 UF 10V
C524	CS0RB0414K	CC	0.01 UF 50V B
△C525	CD39E0M13M	CC	0.001 UF 250V
△C526	P2122B224M	CMP	0.22 UF 275V ECQUL
C530	CS0RB0315K	CC	0.1 UF 25V B
△C531	E5EZF4102M	CE	1000 UF 35V
C532	C03LOR7K3K	CC	0.0027UF 2KV R
C533	E02LU0221M	CE	220 UF 6.3V

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
	CAPACITORS		
C536	P232T0473J	CMPL	0.047 UF 50V MMTV
C537	CS0RF04Q5Z	CC	0.47 UF 50V F
C539	E02LU5100M	CE	10 UF 50V
△C540	CD39E0MH3M	CC	0.0022UF 250V
C541	E62NFB101M	CE	100 UF 160V
C543	CS0RB0413K	CC	0.001 UF 50V B
C602	CS0RB0216K	CC	1 UF 16V B
C603	CS0RB0216K	CC	1 UF 16V B
C604	CS0RB0216K	CC	1 UF 16V B
C605	CS0RB0216K	CC	1 UF 16V B
C606	CQGTB0414K	CC	0.01 UF 50V B
C607	CS0RB0216K	CC	1 UF 16V B
C608	CQGTB0415K	CC	0.1 UF 50V B
C609	CS0RB0315K	CC	0.1 UF 25V B
C610	E02LU0101M	CE	100 UF 6.3V
C611	E50HU53R3M	CE	3.3 UF 50V
C612	CS0RB04E3K	CC	0.0015UF 50V B
C613	E02LU1471M	CE	470 UF 10V
C614	CS0RB0216K	CC	1 UF 16V B
C615	CS0RB0216K	CC	1 UF 16V B
C616	CS0RB04Q3K	CC	0.0047UF 50V B
C618	CQGTB0415K	CC	0.1 UF 50V B
C619	CS0RB0315K	CC	0.1 UF 25V B
C620	CQGTB0415K	CC	0.1 UF 50V B
C622	CQGTB0415K	CC	0.1 UF 50V B
C623	CS0RB0315K	CC	0.1 UF 25V B
C626	CS0RB0315K	CC	0.1 UF 25V B
C633	CS0RB0414K	CC	0.01 UF 50V B
C634	E02LU5220M	CE	22 UF 50V
C635	E02LU5100M	CE	10 UF 50V
C638	CQGTB0414K	CC	0.01 UF 50V B
C711	E02LU1101M	CE	100 UF 10V
C716	CS0RCH412J	CC	100 PF 50V CH
C719	CS0RCH412J	CC	100 PF 50V CH
C720	CS0RCH4Q2J	CC	470 PF 50V CH
C721	CS0RCH412J	CC	100 PF 50V CH
C722	CS0RCH4Q2J	CC	470 PF 50V CH
C723	E50HU2100M	CE	10 UF 16V
C726	CS0RCH4Q2J	CC	470 PF 50V CH
C727	CS0RCH4Q2J	CC	470 PF 50V CH
C728	E50HU2100M	CE	10 UF 16V
C729	CS0RB0414K	CC	0.01 UF 50V B
C730	CS0RB0414K	CC	0.01 UF 50V B
C731	CS0RB0414K	CC	0.01 UF 50V B
C732	CS0KF0214Z	CC	0.01 UF 16V F
C736	CS0RB0216K	CC	1 UF 16V B
C737	CS0RB0216K	CC	1 UF 16V B
C743	E50HU2100M	CE	10 UF 16V
C753	CS0RCH4Q2J	CC	470 PF 50V CH
C754	CQGTCH4Q2J	CC	470 PF 50V CH
C757	E02LU1101M	CE	100 UF 10V
C759	CS0RB0413K	CC	0.001 UF 50V B
C762	CS0RB0413K	CC	0.001 UF 50V B
C802	C0JBB0713K	CC	0.001 UF 2KV B
C809	CQGTCH4K2J	CC	270 PF 50V CH
C810	CS0RCH4K2J	CC	270 PF 50V CH
C811	CQGTCH4K2J	CC	270 PF 50V CH
C901	E02LU0221M	CE	220 UF 6.3V
C902	CS0RB04E3K	CC	0.0015UF 50V B
C903	CS0RCH4Q2J	CC	470 PF 50V CH
C904	CS0RCH4H2J	CC	220 PF 50V CH
C905	CS0RCH412J	CC	100 PF 50V CH
C906	CS0RCH412J	CC	100 PF 50V CH
C909	CS0RB04Q2K	CC	470 PF 50V B
C910	CS0RB04E3K	CC	0.0015UF 50V B
C911	E50HU2100M	CE	10 UF 16V
C912	CS0RB02L5K	CC	0.33 UF 16V B
C913	CS0RCH430C	CC	3 PF 50V CH
C914	CS0RCH430C	CC	3 PF 50V CH
C915	CS0RB02L5K	CC	0.33 UF 16V B
C916	CS0RB02L5K	CC	0.33 UF 16V B
C917	CS0RB02L5K	CC	0.33 UF 16V B
C918	CS0RCH4Q2J	CC	470 PF 50V CH
C919	CS0RB04E3K	CC	0.0015UF 50V B
C920	E50HU2100M	CE	10 UF 16V
C921	CS0RB0315K	CC	0.1 UF 25V B
C923	CQGTF04Q5Z	CC	0.47 UF 50V F

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
CAPACITORS			
C924	CQGTFO4Q5Z	CC	0.47 UF 50V F
C930	E50HU2220M	CE	22 UF 16 V
C931	E50HU2220M	CE	22 UF 16 V
C932	E50HU2220M	CE	22 UF 16 V
C933	E50HU2220M	CE	22 UF 16 V
C936	E50HU2100M	CE	10 UF 16V
C937	E50HU2100M	CE	10 UF 16V
C938	CS0RB0315K	CC	0.1 UF 25V B
C939	E50HU53R3M	CE	3.3 UF 50V
C941	CS0RB0315K	CC	0.1 UF 25V B
C942	E50HU2100M	CE	10 UF 16V
C944	CS0RCH4S1J	CC	56 PF 50V CH
C945	CS0RCH4S1J	CC	56 PF 50V CH
C946	CS0RCH4S1J	CC	56 PF 50V CH
C1001	E50HU5010M	CE	1 UF 50V
C1002	E50HU5010M	CE	1 UF 50V
C1004	E02LU5220M	CE	22 UF 50V
C1008	E5EZU5100M	CE	10 UF 50V
C1009	E02LF3102M	CE	1000 UF 25V
C1010	CS0RB04Q3K	CC	0.0047UF 50V B
C1012	CS0RB04Q3K	CC	0.0047UF 50V B
C1013	E02LU4101M	CE	100 UF 35V
C1014	E02LF4222M	CE	2200 UF 35V
C1015	E02LT3102M	CE	1000 UF 25V
DIODES			
D001	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D101	0021721150	LED	SLR-342VCT32
D102	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
D103	0021E5Q210	LED	LTL-1CHGE-002A
D108	D1VT001330	DIODE,SILICON	1SS133T-77
D401	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D402	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D403	D2WT011E10	DIODE,SILICON	11E1-EIC
D404	D2WT011E10	DIODE,SILICON	11E1-EIC
△D405	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D406	D2WT011E10	DIODE,SILICON	11E1-EIC
D407	D2WT011E10	DIODE,SILICON	11E1-EIC
D408	D28XQS04N0	DIODE,SCHOTTKY	11EQS04N-TA2B5
△D410	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
△D501	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
△D502	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
△D503	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
△D504	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D505	D2WT011E10	DIODE,SILICON	11E1-EIC
D506	D1VT001330	DIODE,SILICON	1SS133T-77
D507	D1VT001330	DIODE,SILICON	1SS133T-77
D508	D1VT001330	DIODE,SILICON	1SS133T-77
D509	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
D511	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D512	D2WXS1400	DIODE,SCHOTTKY	SB140-EIC
D513	D2WXB290S0	DIODE,SILICON	SB290S
D514	D1VT001330	DIODE,SILICON	1SS133T-77
D515	D2WXS1400	DIODE,SCHOTTKY	SB140-EIC
D516	D2WXB290S0	DIODE,SILICON	SB290S
D517	D2WXXN49370	DIODE,SILICON	1N4937
D519	D1VT001330	DIODE,SILICON	1SS133T-77
D520	D28F30DF60	DIODE,RECTIFIER	30DF6-FC
D521	D1VT001330	DIODE,SILICON	1SS133T-77
D525	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
△D526	D2CF2016L0	DIODE,SILICON	FE201-6L49
D527	D2WT011E10	DIODE,SILICON	11E1-EIC
D528	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D530	D1VT001330	DIODE,SILICON	1SS133T-77
D531	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D532	D2WXXN49370	DIODE,SILICON	1N4937
D533	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D603	D1VT001330	DIODE,SILICON	1SS133T-77
D604	D2WT011E10	DIODE,SILICON	11E1-EIC
D605	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D609	D2WXS1400	DIODE,SCHOTTKY	SB140-EIC
D712	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D723	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D801	D1VT001330	DIODE,SILICON	1SS133T-77
D802	D1VT001330	DIODE,SILICON	1SS133T-77
D803	D1VT001330	DIODE,SILICON	1SS133T-77
D804	D1VT001330	DIODE,SILICON	1SS133T-77
D805	D1VT001330	DIODE,SILICON	1SS133T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
DIODES			
D806	D1VT001330	DIODE,SILICON	1SS133T-77
D1001	D1VT001330	DIODE,SILICON	1SS133T-77
ICS			
IC101	I5PD0F012A	IC	OECF012A
IC102	I9UF032310	IC	PST3231NR
IC199	A3M503Y015	IC	S-24C04BFJ-TB
IC201	I0WDE2247E	IC	STV2247E
△IC401	I0WTD81740	IC	TDA8174A
IC502	I1KA98R09A	IC	KIA78R09API
IC503	I1KA98R060	IC	KIA278R06PI
△IC506	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC702	I0UF015010	IC	MM1501XNRE
IC902	I19FF34100	IC	MSP3410G-QA-B8
IC1002	I0FSP52760	IC	AN5276
TRANSISTORS			
Q102	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q103	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q201	T8AA03881S	TRANSISTOR,SILICON	KTC3881S-RTK
Q204	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q301	T8AA03881S	TRANSISTOR,SILICON	KTC3881S-RTK
Q401	TDUU024990	TRANSISTOR,SILICON	2SD2499(LB0EC1)
Q402	TC5T01627Y	TRANSISTOR,SILICON	2SC1627_Y(TPE2)
Q403	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
△Q501	T41F026510	TRANSISTOR,FIELD EFF	ECT 2SK2651-01MR
△Q502	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q503	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q505	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q507	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q508	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
Q509	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
Q510	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q511	TAAT01281Y	TRANSISTOR,SILICON	KTA1281_Y
Q512	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146
Q513	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE
Q514	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA
Q601	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q609	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q701	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q702	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q703	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q704	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q705	TNYTD03001	COMPOUND TRANSISTOR	DTC144ESTP
Q801	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
Q802	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
Q803	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
△Q804	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
△Q805	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
△Q806	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
Q1002	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146
COILS & TRANSFORMERS			
L001	02167F100J	COIL	10 UH
L101	02167F100J	COIL	10 UH
L102	02167F100J	COIL	10 UH
L202	033700005R	COIL,VIDEO IFT	3700005
L203	021LA61R5K	COIL	1.5 UH
L204	021LA6150K	COIL	15 UH
L206	021LA6R27M	COIL	0.27 UH
L207	021LA6100J	COIL	10 UH
L208	02167F3R3J	COIL	3.3 UH
L301	021LA62R2K	COIL	2.2 UH
L302	0216A6R22K	COIL	0.22 UH
L303	0216A61R0K	COIL	1 UH
L401	021679472K	COIL	4.7 MH
L403	022800033A	COIL,LINEARITY	20416A
△L501	029T000091	COIL,LINE FILTER	0R8A393F28Y
△L503	028R200015	COIL,DEGAUSS	8R200015
L504	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L601	02167F100J	COIL	10 UH
L701	0216A6220J	COIL	22 UH
L702	0216A6220J	COIL	22 UH
L703	0216A6220J	COIL	22 UH
L705	0216A6220J	COIL	22 UH
L706	021LA6220J	COIL	22 UH
L707	021LA6220J	COIL	22 UH
L708	021LA6220J	COIL	22 UH
L709	0216A6220J	COIL	22 UH
L710	0216A6220J	COIL	22 UH

ELECTRICAL REPLACEMENT PARTS LIST

Location	Part Number	Description	
COILS & TRANSFORMERS			
L711	021LA6220J	COIL	22 UH
L713	0216A6100K	COIL	10 UH
L715	0216A6100J	COIL	10 UH
L716	0216A6100J	COIL	10 UH
L801	02167F680J	COIL	68 UH
L904	02167F100J	COIL	10 UH
L905	02167F100J	COIL	10 UH
T401	045009003J	TRANS,HORIZONTAL DRIVE	ETH09K14BZ
△ T501	0481350864	TRANSFORMER,SWITCHING	81350864
JACKS			
J701	063G100041	SOCKET,21PIN	035_0_8083_00
J702	060J131015	HEADPHONE JACK	MSJ-2000
J703	060G401047	RCA JACK	HTJ-032-03AY
J704	060G401046	RCA JACK	HTJ-032-03AW
J705	060G401039	RCA JACK	HTJ-032-03AR
△ J801	066F130020	SOCKET,CATHODE RAY,TUBE	ISHS53S
SWITCHES			
SW102	0504101T34	SWITCH,TACT	EVQ21505R
SW104	0504101T34	SWITCH,TACT	EVQ21505R
SW106	0504101T34	SWITCH,TACT	EVQ21505R
SW107	0504101T34	SWITCH,TACT	EVQ21505R
△ SW501	0530105019	SWITCH	ESB92S22B
VARIABLE RESISTORS			
VR401	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
VR420	V1K62Q2BT8	VOLUME,SEMI FIXED	NVG6THTB471
VR501	V1163H3BTC	VOLUME,SEMI FIXED	EVNVCYAA03BE3
P.C.BOARD ASSEMBLIES			
PCB010	A3M503Y010K	PCB ASS'Y	TMC572A
PCB110	A3M503Y110K	PCB ASS'Y	TCC433A
MISCELLANEOUS			
B501	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B504	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B701	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B702	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
BT001	1412004013	BATTERY,MANGAN	R03(AB)2PXGPI
BT002	1412004013	BATTERY,MANGAN	R03(AB)2PXGPI
△ CD501	1206635826	CORD,AC BUSH	6635826
CD801	1278210014	BRAIDED WIRE	SM1642-001
CD802	WDL6042038	FLAT CABLE AWM2468 A	WG26 6C BLACK 420MM
CD803	WBL6034038	FLAT CABLE AWM2468 A	WG26 4C BLACK 340MM
CF201	1012T6R014	FILTER,CERAMIC TRAP	TPSRA6M00B00-A0
CF202	102E239R5B	FILTER,SAW	J1951M
CF301	1022132R91	FILTER,SAW	SAF32.9MC70Z
CP001	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP101	069X160379	CONNECTOR PCB SIDE	06JQ-ST
CP401	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P
CP501	069S320419	CONNECTOR PCB SIDE	A3963WV2-3PD
CP502	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP801	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP1001	069S140419	CONNECTOR PCB SIDE	A2502WV2-4P
CP802A	067U006049	WIRE HOLDER	B2013H02-6P
CP802B	067U006049	WIRE HOLDER	B2013H02-6P
CP803A	067U004029	WIRE HOLDER	B2013H02-4P
CP803B	067U004029	WIRE HOLDER	B2013H02-4P
CUS012	800WFAA008	CUSHION C	
EL001	124116281A	EYE LET	XRY16X28BD
EL002	124120301A	EYE LET	XRY20X30BD
△ F501	080NT04004	FUSE	50T040H
△ FB401	043221012F	TRANSFORMER,FLYBACK	FQI-21B002
FH501	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	06710T0006	HOLDER,FUSE	EYF-52BC
ICP501	0845T07003	IC PROTECTOR	20P_7000
ICP502	0845T03003	IC PROTECTOR	20P_3000
OS101	0773071001	REMOTE RECEIVER	RPM7138-H5
RY501	0560V20115	RELAY	ALKS321
SP351	070C555007	SPEAKER	SG05B01BWA
△ TH501	D8E080A100	DEGAUSS ELEMENT	B59209-J80-A10
TM101	076NOGX020	TRANSMITTER	CT-849
TU001	0144507035	TUNER,UHF	TUWRF4EK-778F2A
△ V801	098Y210434	CRT W/DY	A51LMV10X16N45
X101	100CT4R013	CRYSTAL	HC-49/U-S
X601	100CT4R408	CRYSTAL	HC-49/U
X602	100CT3R509	CRYSTAL	HC-49/U
X901	100CT01803	CRYSTAL	HC-49/U-S

ELECTRICAL REPLACEMENT PARTS LIST

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

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