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**TOSHIBA**

SERVICE MANUAL

COLOUR TELEVISION

**21N21E**

## 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/SECAM
		Speaker	1 Speaker	
			Position	Front
			Size	1.5 x2.5 Inch
			Impedance	4 ohm
		Sound Output	MAX	5.0 W
			10%(Typical)	4.0 W
		DDR SECAM		Yes
G-2	Tuning System	Broadcasting System		CCIR, FRENCH System BG, DK, L
		Tuner and Receive CH	System	1Tuner
			Destination	CCIR Hyper+France CATV
			Tuning System	F-Synth
			Input Impedance	VHF/UHF 75 ohm
			CH Coverage	E2~E4, X~Z+2, S1~S10, E5~E12,S11~S41,E21~E69
		Intermediate Frequency	PAL/SECAM(U&VH)/SECAM(VL)	
			Picture(FP)	38.9/38.9/34.4MHz
			Sound(FS)	33.4/32.4/40.9MHz
			FP-FS	5.5/6.5/6.5MHz
			Picture(FP)	PAL DK,SECAM DK
			Sound(FS)	38.9 , 38.9 MHz
			FP-FS	32.4 , 32.4 MHz
			FP-FS	6.5 , 6.5MHz
G-3	Power	Auto Tuning Method		ALL Band (Not C.C.I.R. CH Plan)
		Preset CH		100
		Stereo/Dual TV Sound		No
		Tuner Sound Muting		Yes
		Power Source	AC	230V AC 50Hz
			DC	
G-4	Regulation	Power Consumption		at AC
		Stand by (at AC)		60 W at AC 230 V 50 Hz
		Per Year		3 W at AC 230 V 50 Hz
		Protector		-- kWh/Year
G-5	Temperature	Power Fuse		Yes
		Safety		CE(EN60065:98,IEC60065)
		Radiation		CE (EN55013, EN55020)
G-6	Operating Humidity	X-Radiation		-
		Operation		+5oC ~ +40oC
		Storage		-20oC ~ +60oC
				Less than 80% RH

## GENERAL SPECIFICATIONS

G-7	On Screen Display	Menu		Yes
		Menu Type		Character
		Picture		Yes
		Contrast		Yes
		Brightness		Yes
		Color		Yes
		Tint (NTSC Only)		Yes
		Sharpness		Yes
		Audio		No
		Bass		No
		Treble		No
		Balance		No
		BBE On/Off		No
		Stable Sound On/Off		No
		CH Tuning		Yes
		Manual		Yes
		Auto		Yes
		CH Allocation		Yes
		Language		Yes
		Clock Set		No
		On Timer Set		Yes
		Off Timer Set		Yes
		Pin Code Registration		No
		Panel Lock		Yes
		Nicam Auto Off		No
		AV Color System		Yes
		Sound System		No
		Auto 4:3 Default		No
		AV2 Output		No
		Output Source		No
		Source		No
		Control Level		Yes
		Volume		Yes
		Brightness		Yes
		Contrast		Yes
		Color		Yes
		Tint (NTSC Only)		Yes
		Sharpness		Yes
		Tuning		Yes
		Bass		No
		Treble		No
		Balance		No
		Back Light		No
		Nicam ST		No
		Tone 1/2 (A/B)		No
		Surround On/Off		No
		Pin Code		No
		AV		Yes
		Skip		Yes
		Channel		Yes
		Hotel Lock		No
		Sleep Timer		No
		Selectable Picture		Yes
		Wide Mode		No
		Sound Mute		Yes
G-8	OSD Language		English French Spanish Germany Italian Polski Sweden Netherlands Portugal Denmark Russian Czech Slovak Hungarian	
G-9	Clock and Timer	Sleep Timer	Max Time	- Min
			Step	- 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-EY
		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	32 Keys
		Keys	
		Power	Yes
		1	Yes
		2	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	No
		Audio Select	No
		Sleep Timer	No
		Mute	Yes
		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
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	Yes
		Just Clock Function	No
		Game Position	No
		CH Label	No
		VM Circuit	No
		Full OSD	No
		Unitext	No
		Fastext	Yes
		Top Text	Yes
		TEXT Language	East Europe
		Premiere	No
		Comb Filter	No
			Lines
		Auto CH Memory	No
		Fine Tuning	Yes
		Stable Sound	No
		Auto Set Up	No
		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

## GENERAL SPECIFICATIONS

G-12	Accessories	Owner's Manual		Language	Hungarian,Czech,Slovak,Polish,Bulgarian Romanian,Slovenian,Croatian,Russian
				w/Guarantee Card	No
		Remote Control Unit			Yes
		Rod Antenna			No
				Poles Terminal	Pole 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
		G-13	Interface	Switch	Front
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)
Terminals	Front			On Timer	Yes(Green)
				Video Input	RCA
				Audio Input	RCA
				Other Terminal	Head Phone (MONO)
	Rear			Video Input(Rear1)	No
				Video Input(Rear2)	No
				Audio Input(Rear1)	No
				Audio Input(Rear2)	No
				Video Output	No
				Audio Output	No
				Euro Scart(21Pin)	No
				S-INPUT	
				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)		506.6 x 484 x 464.5	
G-15	Weight	Net (Approx.)		21.0 kg ( --- lbs)	
		Gross (Approx.)		23.8kg ( ---lbs)	



# GENERAL SPECIFICATIONS

G-16	Carton	Master Carton		No				
			Content	----	Sets			
			Material	--	/--			
			Dimensions W x D x H(mm)	--	x	--	x	--
			Description of Origin	---				
		Gift Box			Yes			
			Material	Double/Brown				
			Dimensions W x D x H(mm)	580 x 575 x 555				
			Design	As per Buyer's				
			Description of Origin	Yes				
		Drop Test			Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces			
			Height (cm)	46				
	Container Stuffing	320		Sets/40' container				
G-17	Material	Cabinet	Cabinet Front	PS 94 HB				
			Cabinet Rear	PS 94 HB				
		PCB	Holder	PS 94V0 NON-DECABROM				
			Non-Halogen Demand	Yes				
			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.

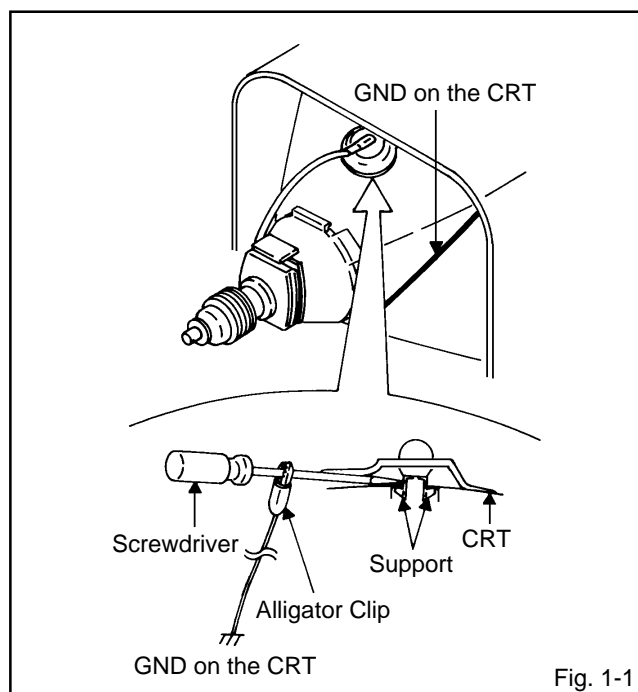


Fig. 1-1

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.)

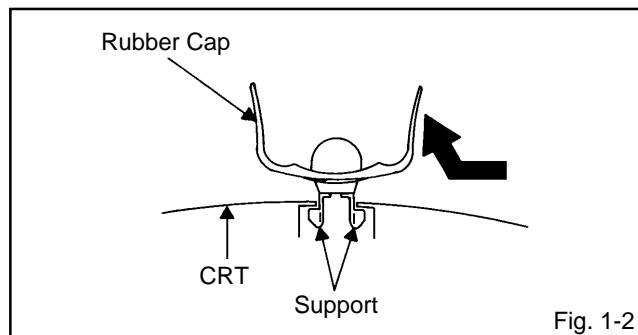


Fig. 1-2

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.)

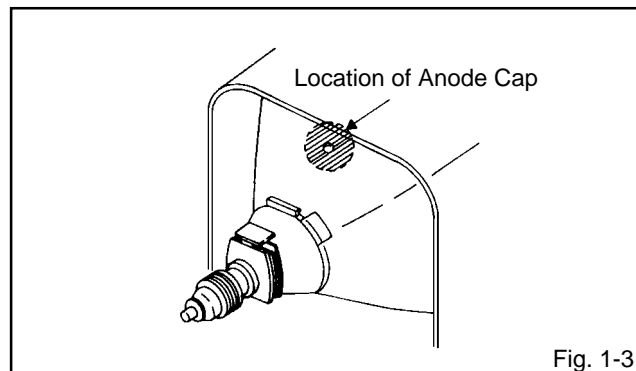


Fig. 1-3

### 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.)

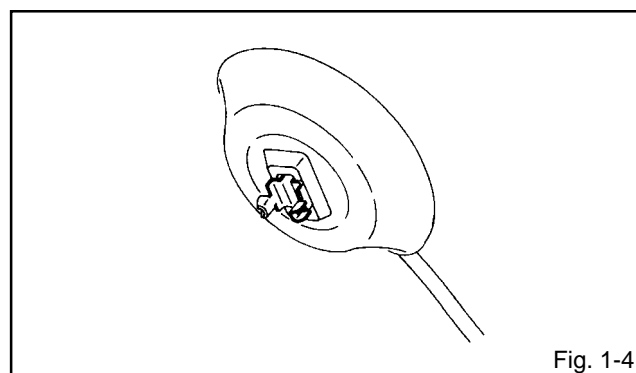


Fig. 1-4

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

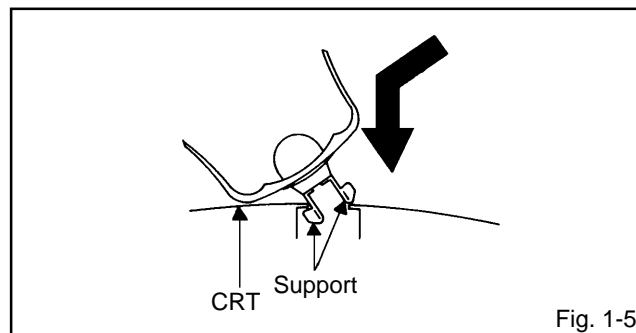


Fig. 1-5

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

## DISASSEMBLY INSTRUCTIONS

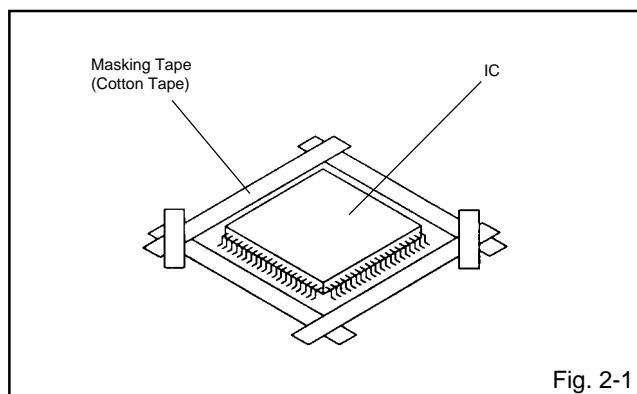
### 2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

#### 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

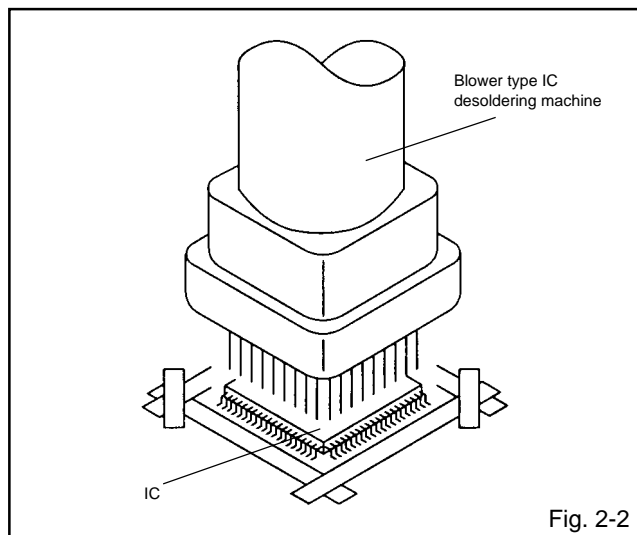
Masking is carried out on all the parts located within 10 mm distance from IC leads.



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

#### NOTE

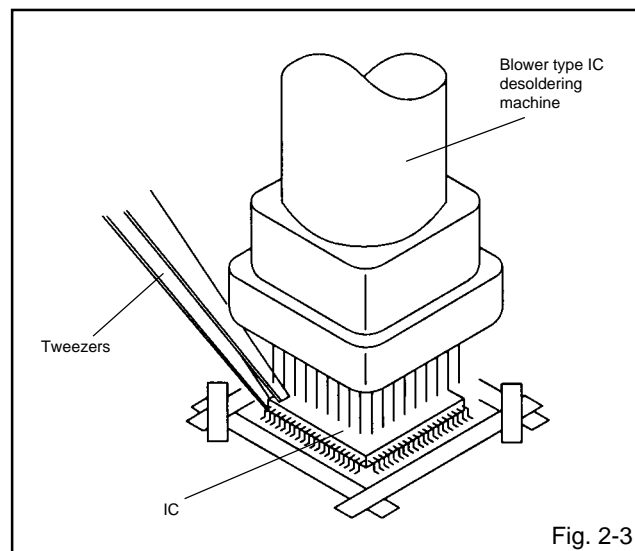
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

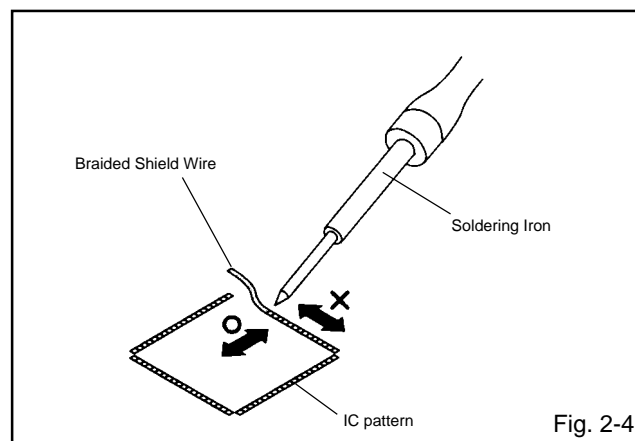
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



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

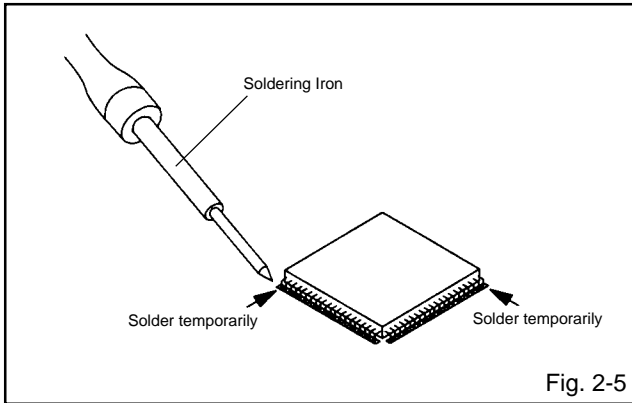
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



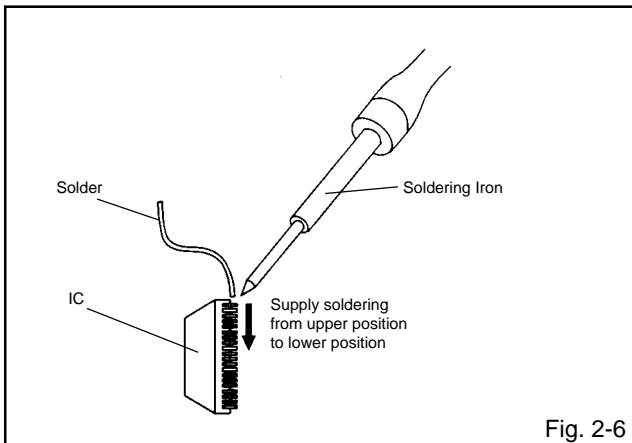
# DISASSEMBLY INSTRUCTIONS

## 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.)



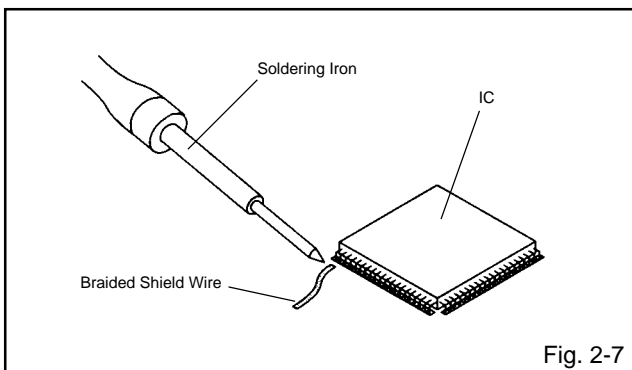
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 2-6.)



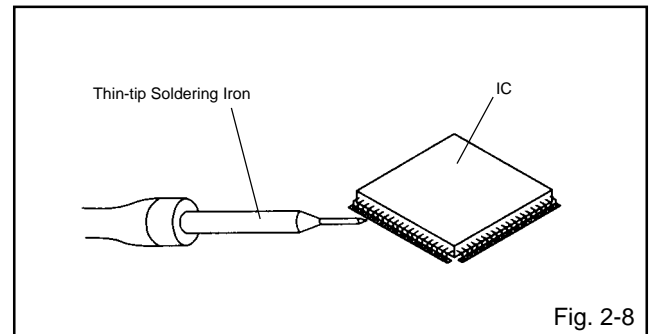
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 2-7.)

### 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	7	Releasig of PROTECTION PASSWORD.
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 2 second.
3. After the confirmation of using hours, turn off the power.

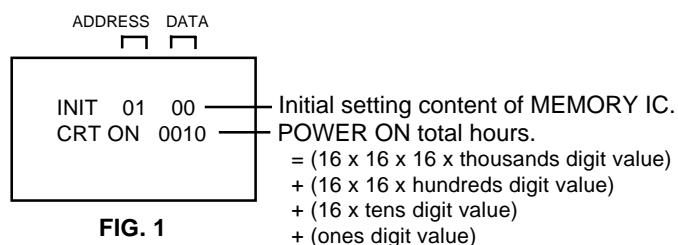


FIG. 1

## WHEN REPLACING EEPROM (MEMORY) IC

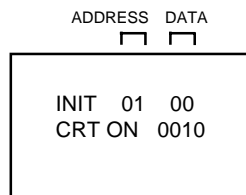
If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

**Note:** No need setting due to the adjustment value except the list below.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	---	00	38	23	17	61	81	48	00	03	73	0D	03	00	06	74
10	10	00	80	80	80	---	---	---	---	---	---	---	---	---	---	---

**Table 1**

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control for more than 2 seconds.



**Fig. 1**

3. ADDRESS is now selected and should "blink". Using the VOL. +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press OK to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using VOL. +/- button until required DATA value has been selected.
6. Pressing OK will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

**After the data input, set to the initializing of shipping.**

9. Turn POWER on.
10. While holding down VOLUME button on front cabinet, press key 1 on remote control for more than 2 seconds.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

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

# ELECTRICAL ADJUSTMENTS

## 1. 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.

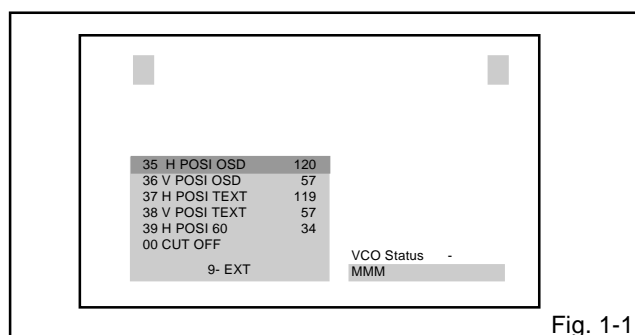


Fig. 1-1

2. Use the Channel button (0-9) 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 5 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  $117 \pm 0.5V$ .

### 2-2: VCO COARSE, VCO FINE

1. Place the set with Aging Test for more than 10 minutes.
2. Connect the oscillator (38.9MHz) 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 5 step down point from the upper limit on the "OK".  
(Example: In case of the "OK" point 30~41, select 36.)

### 2-3: VCO COARSE L1, VCO FINE L1

1. Place the set with Aging Test for more than 10 minutes.
2. Connect the oscillator (33.95MHz) to TP001.
3. Activate the adjustment mode display of Fig. 1-1 and press the channel button (15) on the remote control to select "VCO COARSE L1".
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 L1" mode.
6. Press the VOL. +/- button on the remote control to select the 5 step down point from the upper limit on the "OK".  
(Example: In case of the "OK" point 30~41, select 36.)

### 2-4: AGC VOLTAGE

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the UHF ( $63 \pm 1dB$ ).
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  $2.80 \pm 0.05V$ .

### 2-5: 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.

# ELECTRICAL ADJUSTMENTS

## 2-6: 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.

## 2-7: FOCUS

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

## 2-8: 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.
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.

## 2-9: 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: VERTICAL SIZE

**NOTE:** Adjust after performing adjustments in section 2-8.

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. Press the the VOL. +/- button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes  $8 \pm 2\%$ .
5. Receive the monoscope pattern of NTSC.
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 **(12)** on the remote control to select "V SIZE (60)".
8. Press the the VOL. +/- button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes  $10 \pm 2\%$ .

## 2-11: 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.

## 2-12: CONTRAST CENT

1. Receive the PAL color bar pattern.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "CONTRAST CENT".
3. Press the VOL. +/- button on the remote control until the contrast step No. becomes "35".  
Receive a broadcast and check if the picture is normal.
4. Set to the AV mode. Then perform the above adjustments 1~3.



## ELECTRICAL ADJUSTMENTS

### 2-13: 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 **TP801**.
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  $90 \pm 10\%$  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.

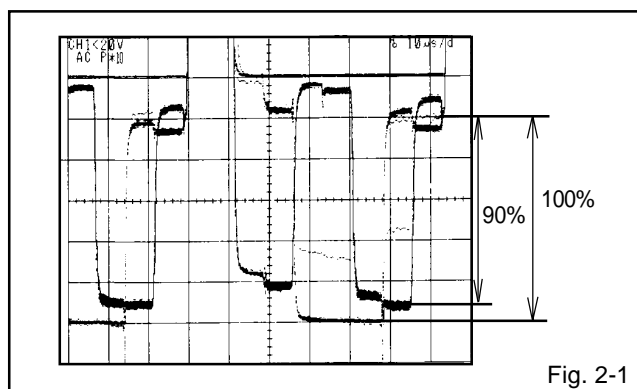


Fig. 2-1

### 2-14: 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 **TP803**.
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)**

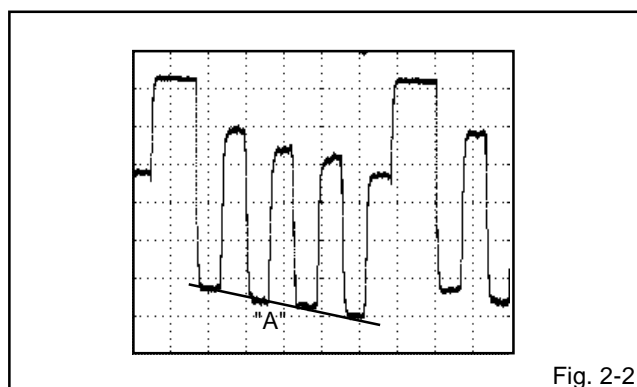


Fig. 2-2

### 2-15: 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)	05	---
10	V POSI (60)	00	---
18	BRIGHT MAX	25	25
19	BRIGHT MIN	16	16
20	TINT	30	ADJ.
21	SHARP	04	04
23	CONTRAST MAX	50	50
24	CONTRAST MIN	10	10
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	10	---
34	BANDPASS	00	---
35	H POSI OSD	120	---
36	V POSI OSD	57	---
37	H POSI TEXT	119	---
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.

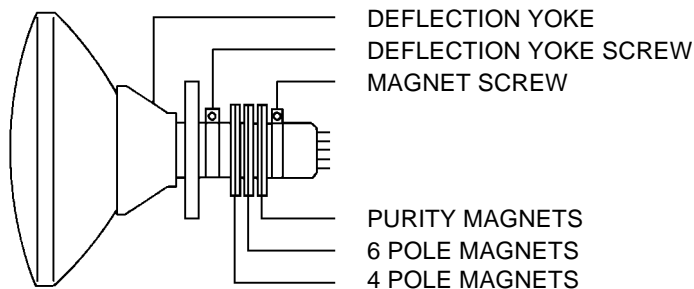


Fig. 3-1

### 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)**

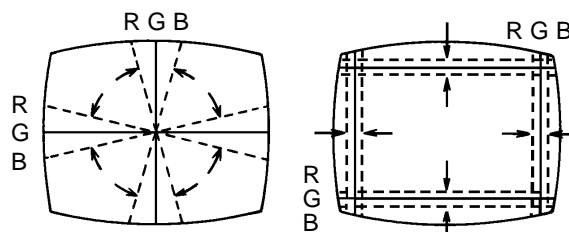
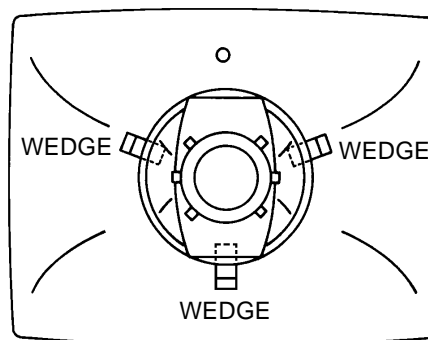


Fig. 3-2-a

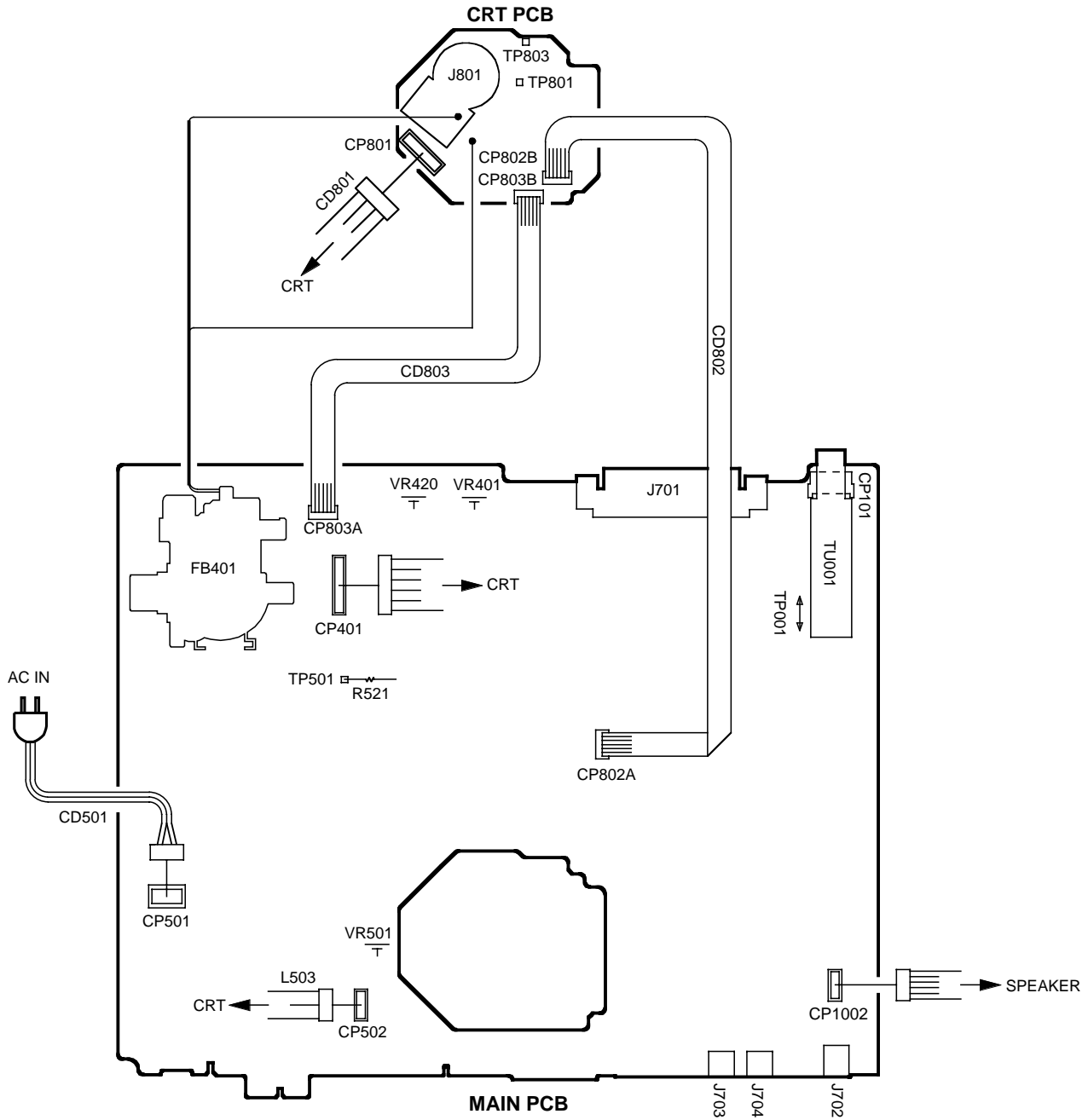


WEDGE POSITION

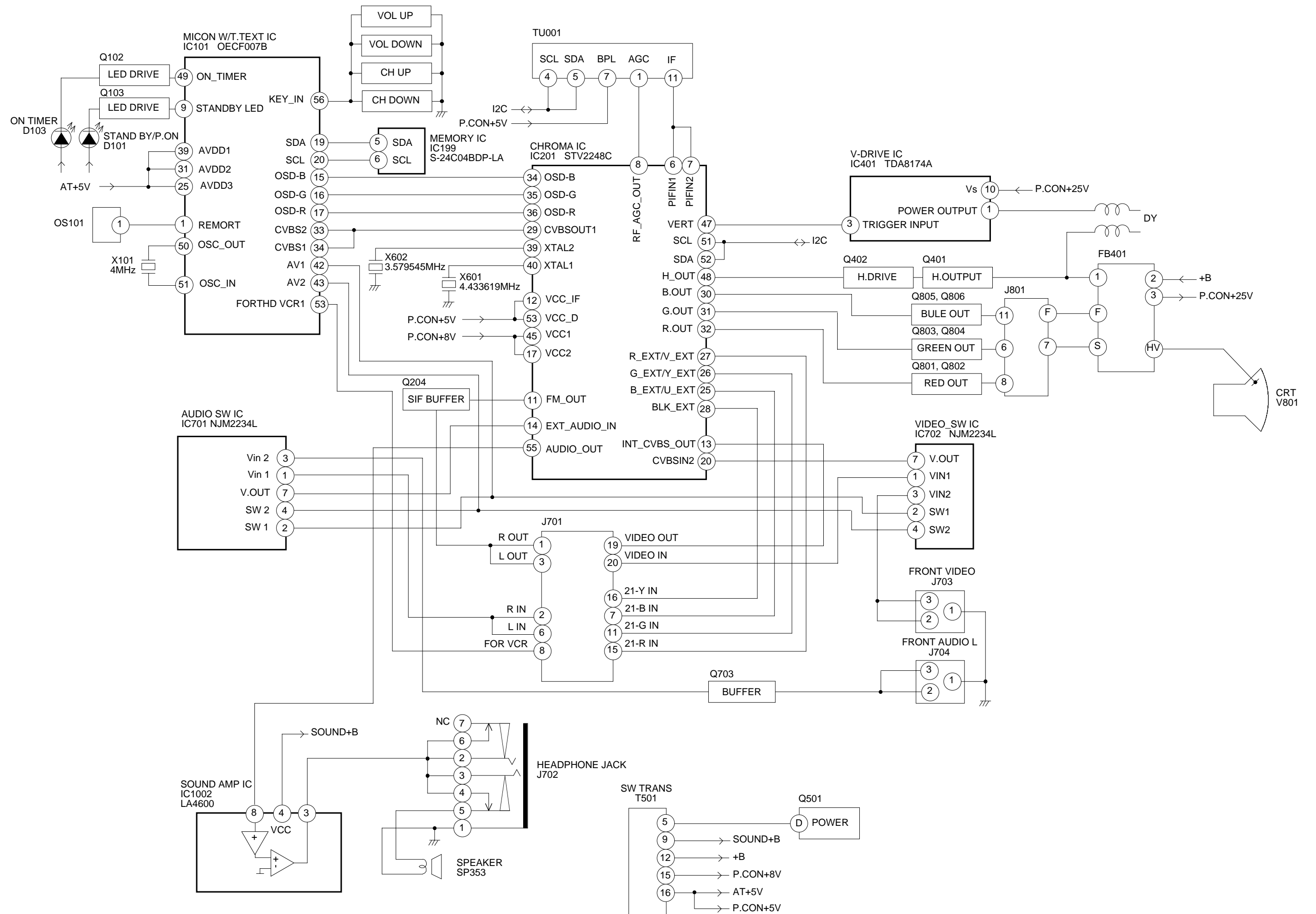
Fig. 3-2-b

## ELECTRICAL ADJUSTMENTS

### 4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



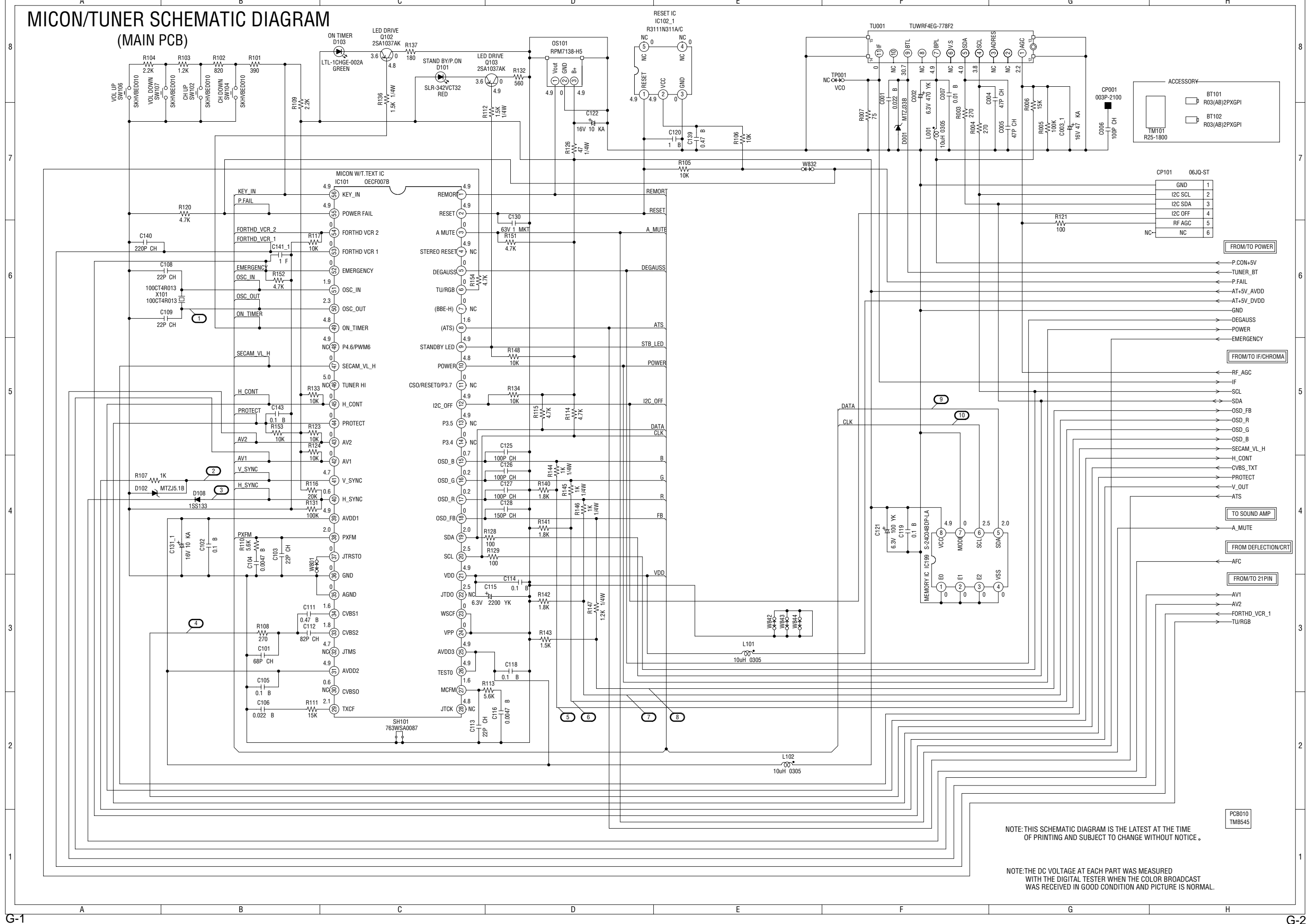
# BLOCK DIAGRAM







# MICON/TUNER SCHEMATIC DIAGRAM (MAIN PCB)

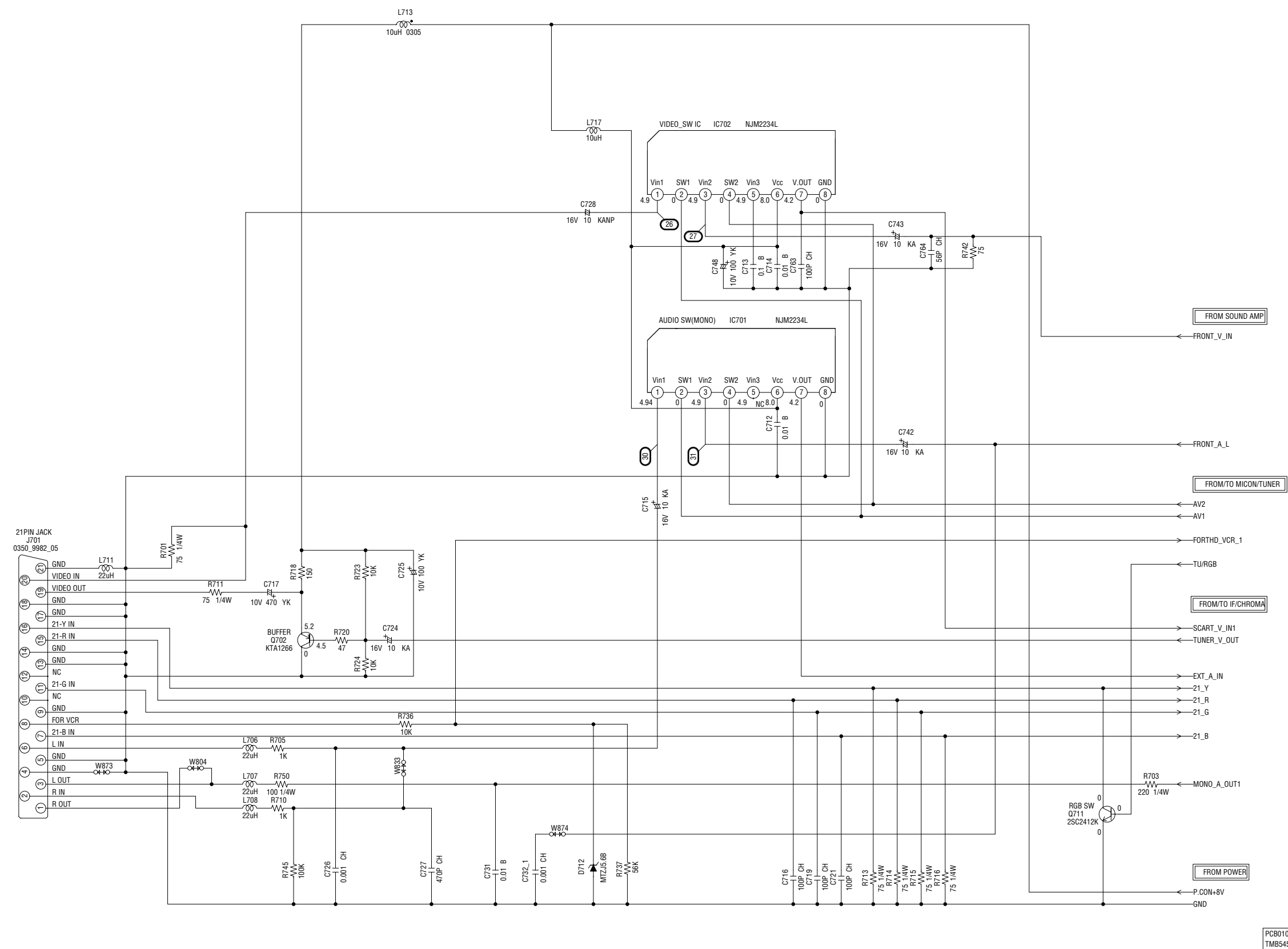


## (MAIN PCB)





21PIN/AV SW SCHEMATIC DIAGRAM  
(MAIN PCB)

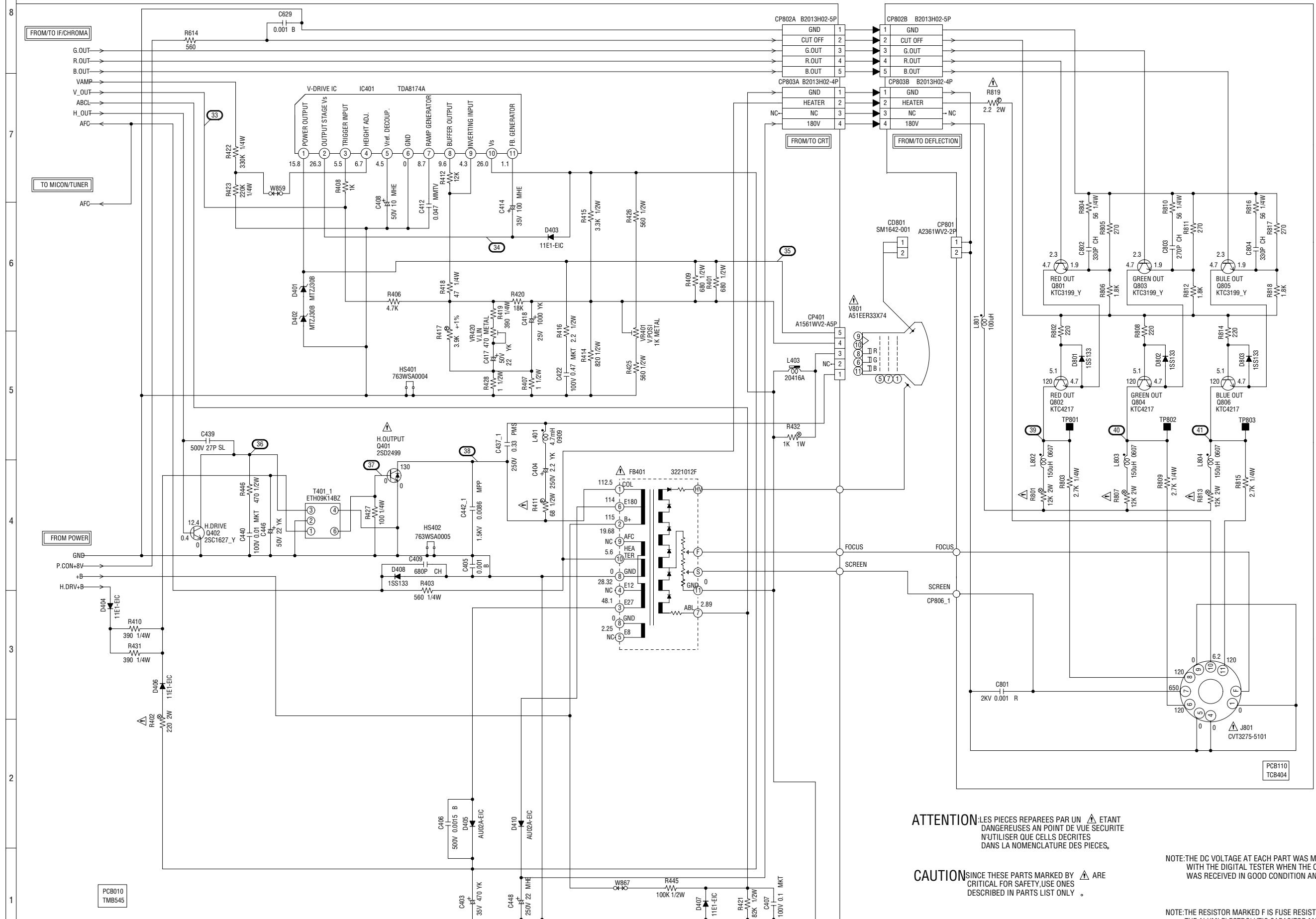


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME  
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

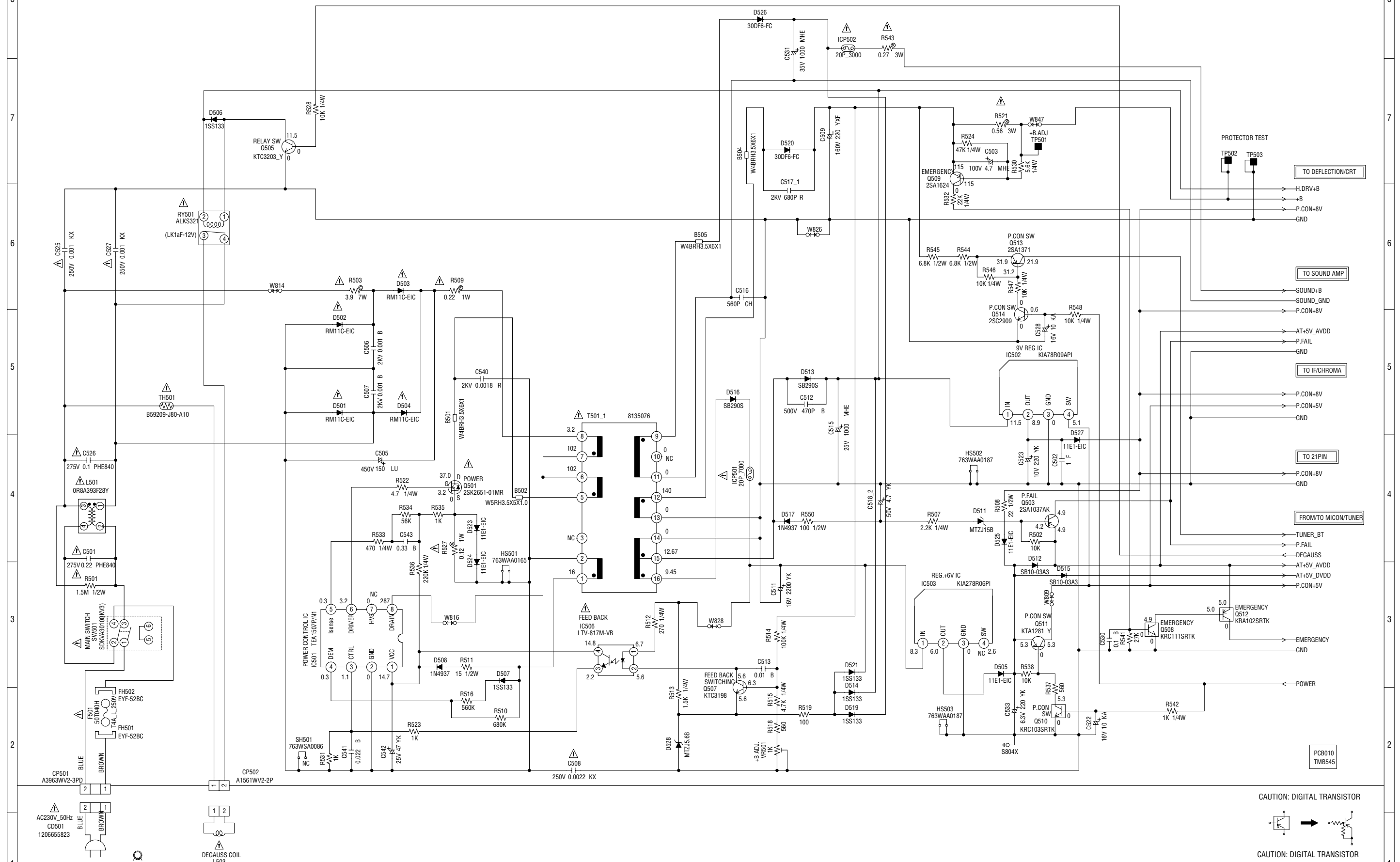
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED  
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST  
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

PCB010  
TM8545

# DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)



# POWER SCHEMATIC DIAGRAM (MAIN PCB)



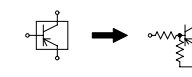
**CAUTION:** SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

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

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

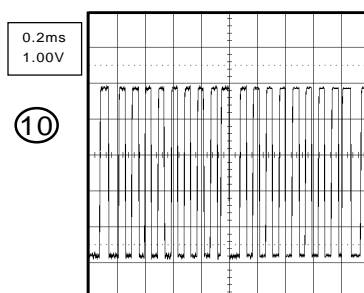
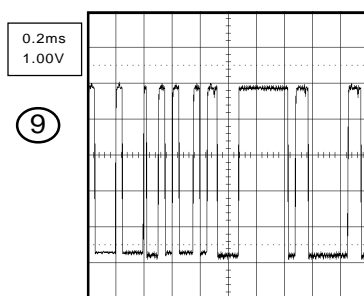
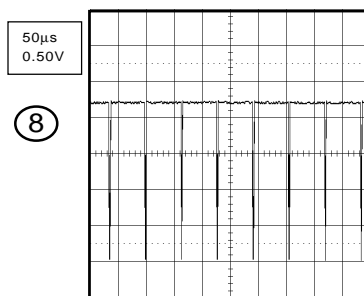
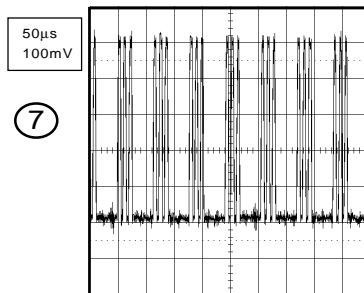
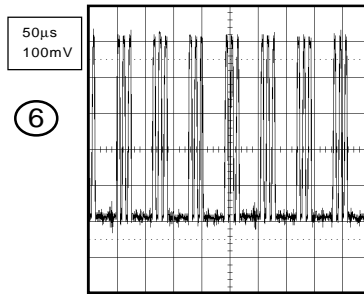
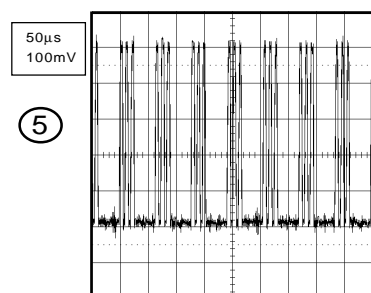
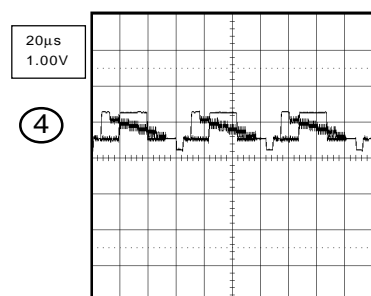
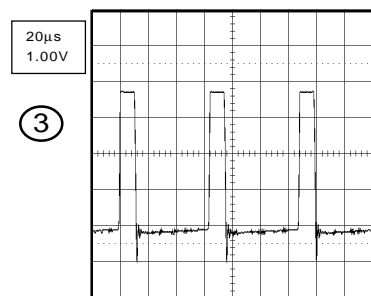
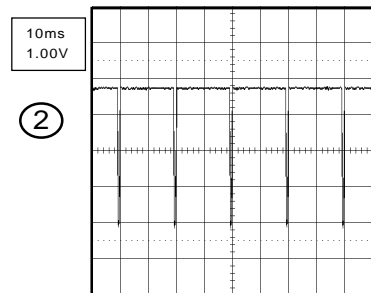
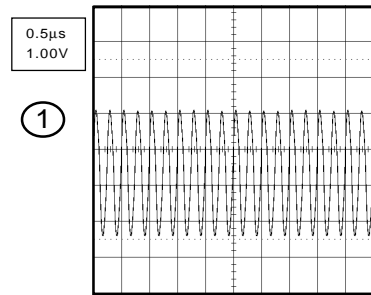
**NOTE:** THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CAUTION: DIGITAL TRANSISTOR

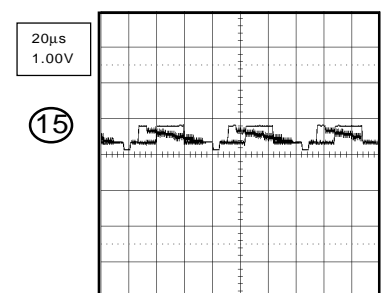
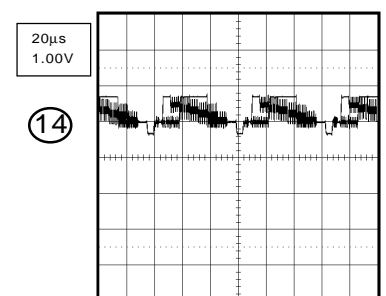
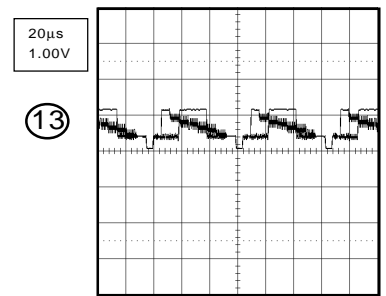
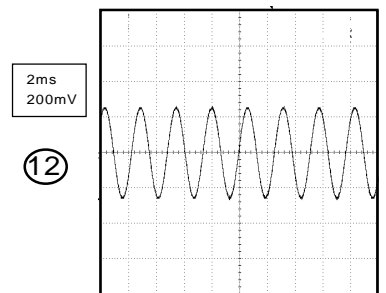
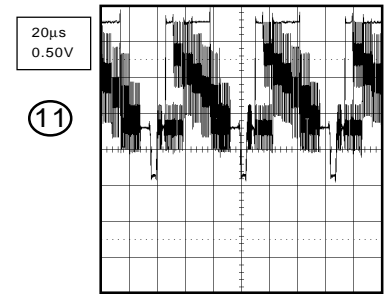


# WAVEFORMS

## MICON/TUNER

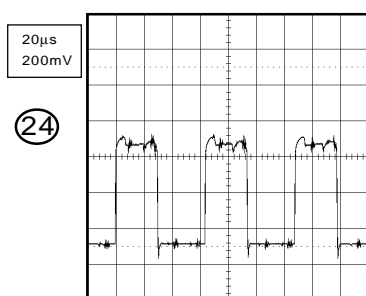
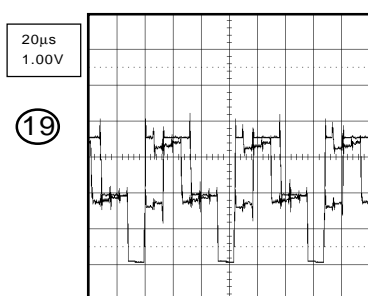
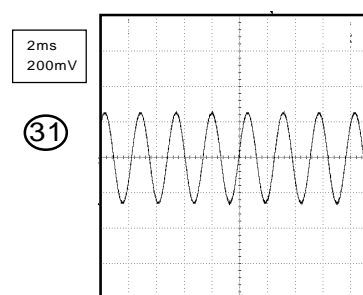
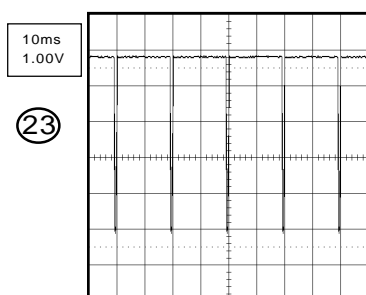
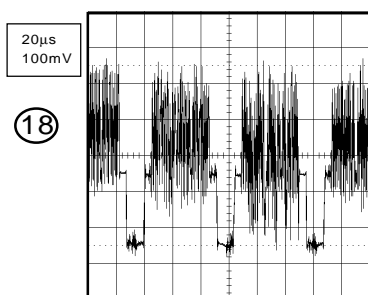
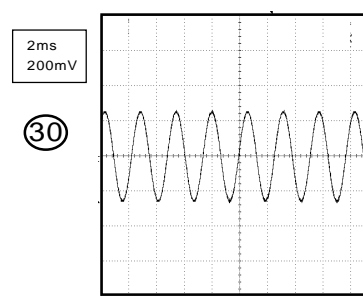
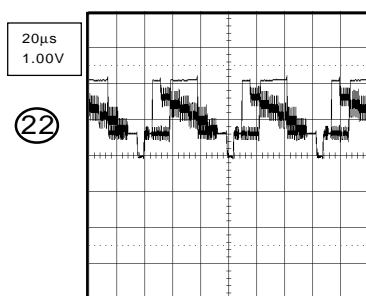
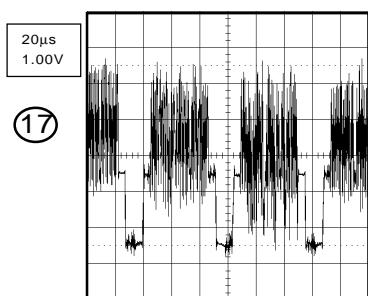
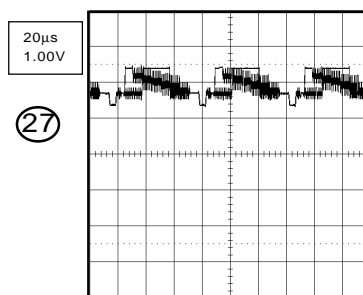
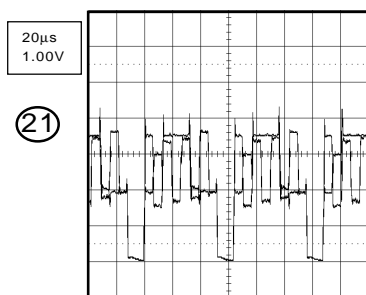
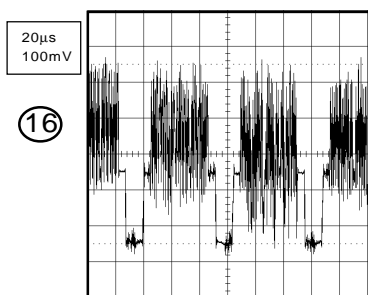


## IF/CHROMA

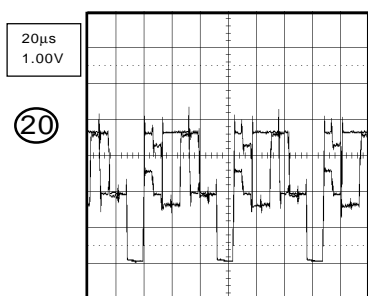
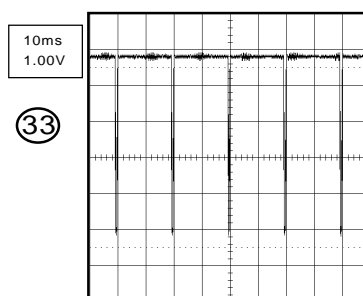


**NOTE:** The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

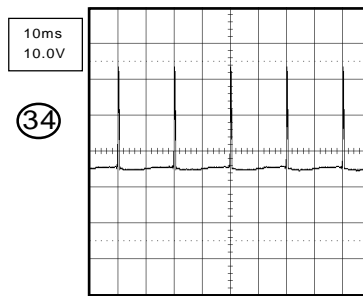
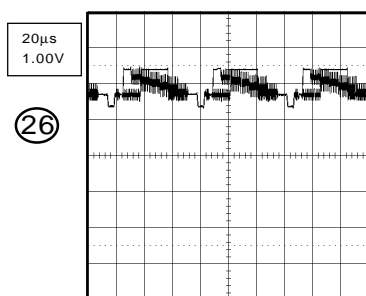
## WAVEFORMS



## DEFLECTION/CRT

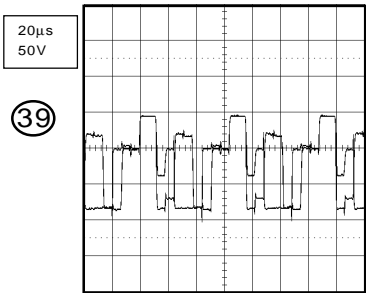
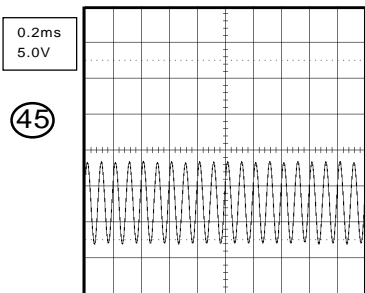
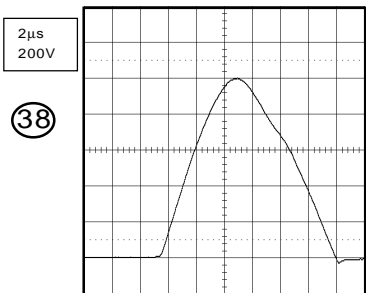
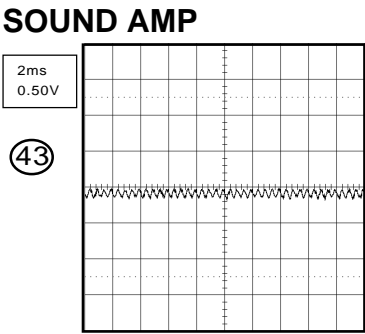
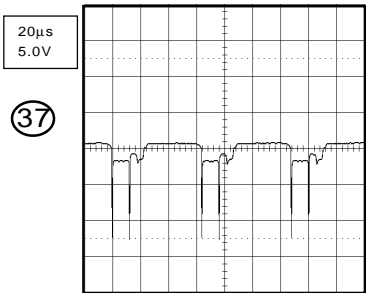
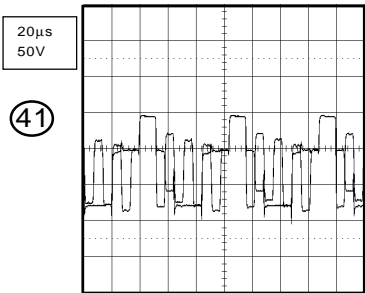
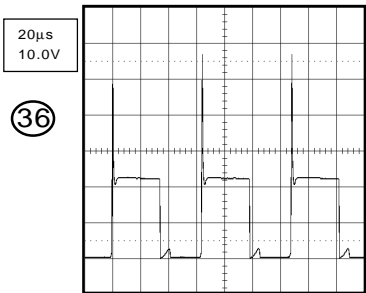
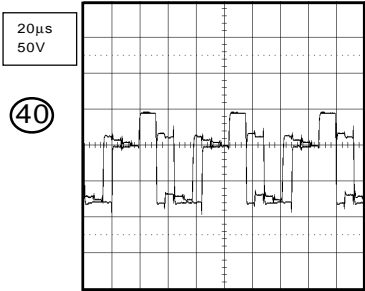
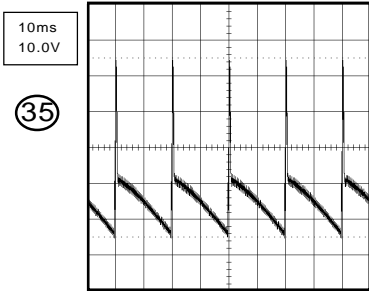


## 21PIN/AV SW



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

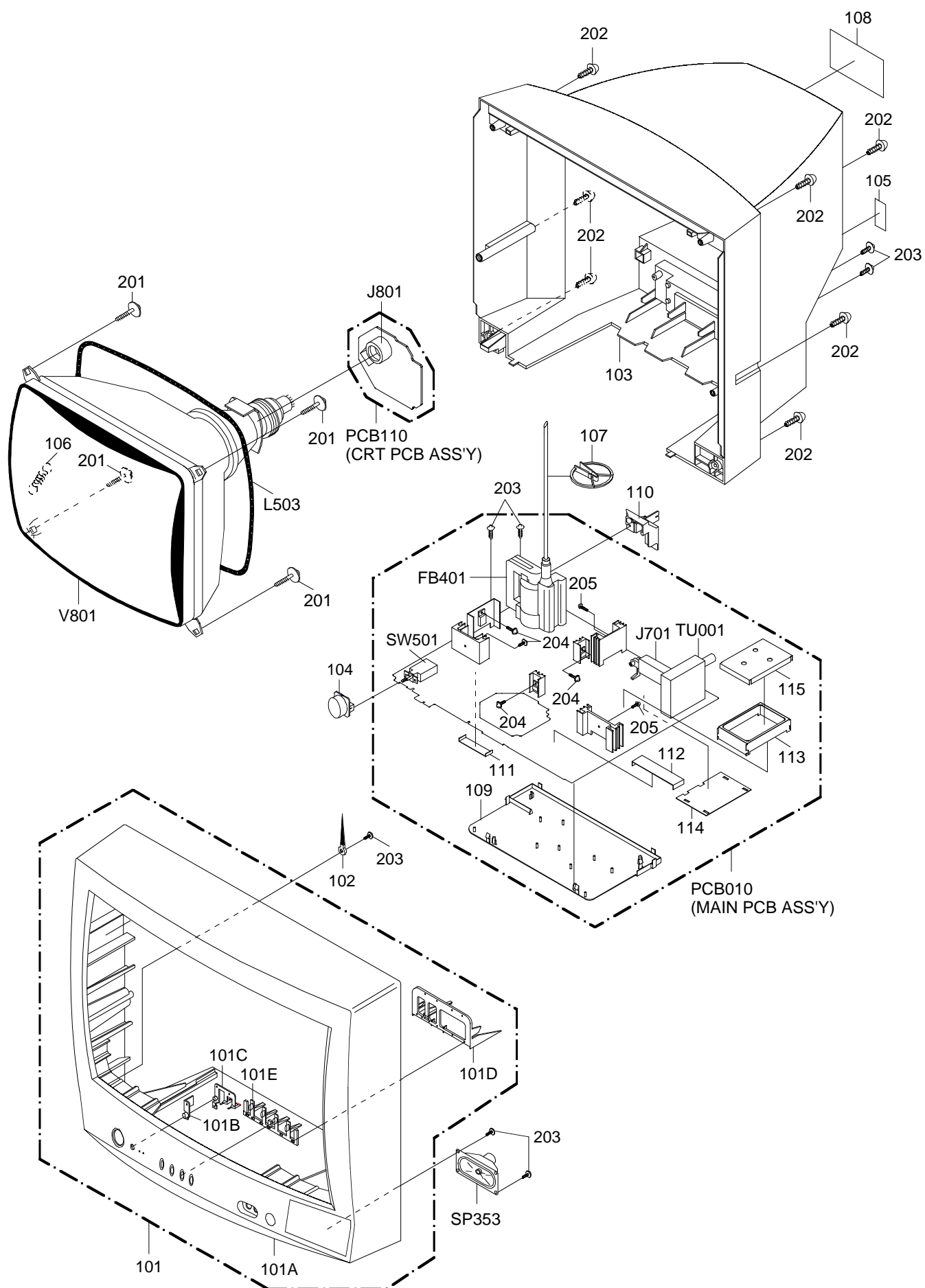
WAVEFORMS



SOUND AMP

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

REF. NO.	PART NO.	DESCRIPTION		
101	A3L922G720	CABINET,FRONT ASSY		
101A	701WPJ1142	CABINET,FRONT		
101B	711WPA0171	PLATE,FRONT		
101C	713WPA0214	GUIDE,REMOCON		
101D	735WPA0667	BUTTON,BASE		
101E	735WPB0233	BUTTON,FRAME		
102	8995034000	CORD CLIP UL CO.		
103	702UPA0253	CABINET,BACK(1/4)		
104	735WPB0234	BUTTON,POWER		
105	7230007540	SHEET,JACK		
106	741WUA0001	SPRING,EARTH		
107	899HV3T001	HOLDER,ANODE WIRE		
108	722549A146	SHEET,RATING		
109	755WPA0032	COVER,PCB		
110	761WPA0258	HOLDER,FBT		
111	752WSA0086	SHIELD,IC(30P,40P)		
112	752WSA0087	SHIELD,IC		
113	752WSAA008	SHIELD , CASE		
114	752WSAA006	PLATE , SHIELD		
115	752WSAA013	SHIELD,LID		
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	8107630804	SCREW,TAP TITE(S)	BRAZIER	3x8
---	791WHA0085	LAMIFILM,BAG		
---	792UHA0171	PACKAGE, TOP		
---	792UHA0172	PACKAGE,BOTTOM		
---	793UCDB083	GIFT BOX		
---	A3L922G975	INSTRUCTION BOOK KIT		
---	JB5EDI00	POLYBAG,INSTRUCTION(RED CAUTION)		
---	J3L92201A	INSTRUCTION BOOK(SVK)		
---	J3L92210A	INSTRUCTION BOOK(B)		
---	J3L92211A	INSTRUCTION BOOK(PL)		
---	J3L92251A	INSTRUCTION BOOK(HU)		
---	J3L92280A	INSTRUCTION BOOK(RO)		
---	J3L92281A	INSTRUCTION BOOK(SVN)		
---	J3L92291A	INSTRUCTION BOOK(CR)		
---	J3L92261A	INSTRUCTION BOOK(CZ)		
---	J3L922A1A	INSTRUCTION BOOK(RU)		
---	J3L92207A	QUICK SET-UP SHEET(SVK)		
---	J3L92270A	QUICK SET-UP SHEET(B)		
---	J3L92271A	QUICK SET-UP SHEET(PL)		
---	J3L92273A	QUICK SET-UP SHEET(HU)		
---	J3L92275A	QUICK SET-UP SHEET(RO)		
---	J3L92276A	QUICK SET-UP SHEET(SVN)		
---	J3L92277A	QUICK SET-UP SHEET(CR)		
---	J3L92274A	QUICK SET-UP SHEET(CZ)		
---	J3L92278A	QUICK SET-UP SHEET(RU)		

# ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
RESISTORS				RESISTORS			
R003	R801R7271J	RC	270 OHM 1/10W	R409	R002T2681J	RC	680 OHM 1/2W
R004	R801R7271J	RC	270 OHM 1/10W	R410	R002T4391J	RC	390 OHM 1/4W
R005	R801R7104J	RC	100K OHM 1/10W	△ R411	R655U2680J	R,FUSE	68 OHM 1/2W
R006	R801R7153J	RC	15K OHM 1/10W	R412	R801R7123J	RC	12K OHM 1/10W
R007	R801R7750J	RC	75 OHM 1/10W	R414	R002T2821J	RC	820 OHM 1/2W
R101	R801R7391J	RC	390 OHM 1/10W	R415	R002T2332J	RC	3.3K OHM 1/2W
R102	R801R7821J	RC	820 OHM 1/10W	R416	R002T22R2J	RC	2.2 OHM 1/2W
R103	R801R7122J	RC	1.2K OHM 1/10W	R417	R4X5T6392F	R,METAL	3.9K OHM 1/6W
R104	R801R7222J	RC	2.2K OHM 1/10W	R418	R002T4470J	RC	47 OHM 1/4W
R105	R801R7103J	RC	10K OHM 1/10W	R419	R002T4391J	RC	390 OHM 1/4W
R106	R801R7103J	RC	10K OHM 1/10W	R420	R801R7183J	RC	18K OHM 1/10W
R107	R801R7102J	RC	1K OHM 1/10W	R421	R002T2823J	RC	82K OHM 1/2W
R108	R801R7271J	RC	270 OHM 1/10W	R422	R002T4334J	RC	330K OHM 1/4W
R109	R801R7222J	RC	2.2K OHM 1/10W	R423	R002T4224J	RC	220K OHM 1/4W
R110	R801R7562J	RC	5.6K OHM 1/10W	R425	R002T2561J	RC	560 OHM 1/2W
R111	R801R7153J	RC	15K OHM 1/10W	R426	R002T2561J	RC	560 OHM 1/2W
R112	R002T4152J	RC	1.5K OHM 1/4W	R427	R002T4101J	RC	100 OHM 1/4W
R113	R801R7562J	RC	5.6K OHM 1/10W	R428	R002T2010J	RC	1 OHM 1/2W
R114	R801R7472J	RC	4.7K OHM 1/10W	R431	R002T4391J	RC	390 OHM 1/4W
R115	R801R7472J	RC	4.7K OHM 1/10W	R432	R3K181102J	R'METAL	1K OHM 1W
R116	R801R7203J	RC	20K OHM 1/10W	R445	R002T2104J	RC	100K OHM 1/2W
R117	R801R7103J	RC	10K OHM 1/10W	R446	R002T2471J	RC	470 OHM 1/2W
R120	R801R7472J	RC	4.7K OHM 1/10W	△ R501	R002T2155J	RC	1.5M OHM 1/2W
R121	R801R7101J	RC	100 OHM 1/10W	△ R502	R801R7103J	RC	10K OHM 1/10W
R123	R801R7103J	RC	10K OHM 1/10W	△ R503	R5X2AE3R9J	R,CEMENT	3.9 OHM 7W
R124	R801R7103J	RC	10K OHM 1/10W	R507	R002T4222J	RC	2.2K OHM 1/4W
R126	R002T4470J	RC	47 OHM 1/4W	R508	R002T2220J	RC	22 OHM 1/2W
R128	R801R7101J	RC	100 OHM 1/10W	△ R509	R63581R22J	R,FUSE	0.22 OHM 1W
R129	R801R7101J	RC	100 OHM 1/10W	R510	R801R7684J	RC	680K OHM 1/10W
R131	R801R7104J	RC	100K OHM 1/10W	R511	R002T2150J	RC	15 OHM 1/2W
R132	R801R7561J	RC	560 OHM 1/10W	R512	R002T4271J	RC	270 OHM 1/4W
R133	R801R7103J	RC	10K OHM 1/10W	R513	R002T4152J	RC	1.5K OHM 1/4W
R134	R801R7103J	RC	10K OHM 1/10W	R514	R002T4104J	RC	100K OHM 1/4W
R136	R002T4152J	RC	1.5K OHM 1/4W	R515	R002T4472J	RC	4.7K OHM 1/4W
R137	R801R7181J	RC	180 OHM 1/10W	R516	R801R7564J	RC	560K OHM 1/10W
R140	R801R7182J	RC	1.8K OHM 1/10W	R518	R801R7561J	RC	560 OHM 1/10W
R141	R801R7182J	RC	1.8K OHM 1/10W	R519	R801R7101J	RC	100 OHM 1/10W
R142	R801R7182J	RC	1.8K OHM 1/10W	△ R521	R3X28BR56J	R,METAL OXIDE	0.56 OHM 3W
R143	R801R7152J	RC	1.5K OHM 1/10W	R522	R002T44R7J	RC	4.7 OHM 1/4W
R144	R002T4102J	RC	1K OHM 1/4W	R523	R801R7102J	RC	1K OHM 1/10W
R145	R002T4102J	RC	1K OHM 1/4W	R524	R002T4473J	RC	47K OHM 1/4W
R146	R002T4102J	RC	1K OHM 1/4W	△ R527	R3X181R12J	R,METAL OXIDE	0.12 OHM 1W
R147	R002T4122J	RC	1.2K OHM 1/4W	R528	R002T4103J	RC	10K OHM 1/4W
R148	R801R7103J	RC	10K OHM 1/10W	R530	R002T4562J	RC	5.6K OHM 1/4W
R151	R801R7472J	RC	4.7K OHM 1/10W	R531	R801R7102J	RC	1K OHM 1/10W
R152	R801R7472J	RC	4.7K OHM 1/10W	R532	R002T4223J	RC	22K OHM 1/4W
R153	R801R7103J	RC	10K OHM 1/10W	R533	R002T4471J	RC	470 OHM 1/4W
R154	R801R7472J	RC	4.7K OHM 1/10W	R534	R801R7563J	RC	56K OHM 1/10W
R201	R801R7470J	RC	47 OHM 1/10W	R535	R801R7102J	RC	1K OHM 1/10W
R202	R801R7151J	RC	150 OHM 1/10W	R536	R002T4224J	RC	220K OHM 1/4W
R203	R801R7102J	RC	1K OHM 1/10W	R537	R801R7561J	RC	560 OHM 1/10W
R204	R801R7221J	RC	220 OHM 1/10W	R538	R801R7103J	RC	10K OHM 1/10W
R205	R801R7561J	RC	560 OHM 1/10W	R541	R801R7273J	RC	27K OHM 1/10W
R206	R801R7102J	RC	1K OHM 1/10W	R542	R002T4102J	RC	1K OHM 1/4W
R213	R002T2101J	RC	100 OHM 1/2W	△ R543	R3X28BR27J	R,METAL OXIDE	0.27 OHM 3W
R214	R801R7222J	RC	2.2K OHM 1/10W	R544	R002T2682J	RC	6.8K OHM 1/2W
R215	R801R7682J	RC	6.8K OHM 1/10W	R545	R002T2682J	RC	6.8K OHM 1/2W
R217	R801R7102J	RC	1K OHM 1/10W	R546	R002T4103J	RC	10K OHM 1/4W
R218	R801R7151J	RC	150 OHM 1/10W	R547	R002T4103J	RC	10K OHM 1/4W
R219	R801R7102J	RC	1K OHM 1/10W	R548	R002T4103J	RC	10K OHM 1/4W
R301	R801R7102J	RC	1K OHM 1/10W	R550	R002T2101J	RC	100 OHM 1/2W
R302	R801R7152J	RC	1.5K OHM 1/10W	R604	R801R7101J	RC	100 OHM 1/10W
R303	R801R7101J	RC	100 OHM 1/10W	R606	R801R7101J	RC	100 OHM 1/10W
R304	R801R7102J	RC	1K OHM 1/10W	R607	R801R7223J	RC	22K OHM 1/10W
R305	R002T2221J	RC	220 OHM 1/2W	R608	R801R7473J	RC	47K OHM 1/10W
R306	R801R7682J	RC	6.8K OHM 1/10W	R609	R002T4221J	RC	220 OHM 1/4W
R307	R002T4104J	RC	100K OHM 1/4W	R610	R801R7101J	RC	100 OHM 1/10W
R309	R801R7222J	RC	2.2K OHM 1/10W	R614	R801R7561J	RC	560 OHM 1/10W
R310	R801R7222J	RC	2.2K OHM 1/10W	R618	R801R7103J	RC	10K OHM 1/10W
R311	R801R7222J	RC	2.2K OHM 1/10W	R620	R002T2271J	RC	270 OHM 1/2W
R312	R801R7562J	RC	5.6K OHM 1/10W	R622	R801R7334J	RC	330K OHM 1/10W
R401	R002T2681J	RC	680 OHM 1/2W	R626	R002T4103J	RC	10K OHM 1/4W
△ R402	R3X18A221J	R,METAL OXIDE	220 OHM 2W	R628	R801R7271J	RC	270 OHM 1/10W
R403	R002T4561J	RC	560 OHM 1/4W	R629	R801R7271J	RC	270 OHM 1/10W
R406	R801R7472J	RC	4.7K OHM 1/10W	R630	R801R7271J	RC	270 OHM 1/10W
R407	R002T2010J	RC	1 OHM 1/2W	R632	R801R7101J	RC	100 OHM 1/10W
R408	R801R7102J	RC	1K OHM 1/10W	R633	R002T4822J	RC	8.2K OHM 1/4W

# ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
RESISTORS				CAPACITORS			
R634	R801R7472J	RC	4.7K OHM 1/10W	C113	CS0RCH4H1J	CC	22 PF 50V CH
R636	R801R7473J	RC	47K OHM 1/10W	C114	CS0RB0315K	CC	0.1 UF 25V B
R638	R801R7222J	RC	2.2K OHM 1/10W	C115	E02LT0222M	CE	2200 UF 6.3V
R639	R801R7823J	RC	82K OHM 1/10W	C116	CS0RB04Q3K	CC	0.0047UF 50V B
R641	R801R7102J	RC	1K OHM 1/10W	C118	CS0RB0315K	CC	0.1 UF 25V B
R643	R801R7471J	RC	470 OHM 1/10W	C119	CS0RB0315K	CC	0.1 UF 25V B
R645	R801R7222J	RC	2.2K OHM 1/10W	C120	CS0RB0216K	CC	1 UF 16V B
R646	R801R7822J	RC	8.2K OHM 1/10W	C121	E02LU0101M	CE	100 UF 6.3V
R701	R002T4750J	RC	75 OHM 1/4W	C122	E50HU2100M	CE	10 UF 16V
R703	R002T4221J	RC	220 OHM 1/4W	C125	CS0RCH412J	CC	100 PF 50V CH
R705	R801R7102J	RC	1K OHM 1/10W	C126	CS0RCH412J	CC	100 PF 50V CH
R706	R002T2271J	RC	270 OHM 1/2W	C127	CS0RCH412J	CC	100 PF 50V CH
R707	R002T2101J	RC	100 OHM 1/2W	C128	CS0RCH4E2J	CC	150 PF 50V CH
R710	R801R7102J	RC	1K OHM 1/10W	C130	P235WE105J	CMP	1 UF 63V MKT
R711	R002T4750J	RC	75 OHM 1/4W	C131	E50HU2100M	CE	10 UF 16V
R713	R002T4750J	RC	75 OHM 1/4W	C139	CS0RB02Q5K	CC	0.47 UF 16V B
R714	R002T4750J	RC	75 OHM 1/4W	C140	CS0RCH4H2J	CC	220 PF 50V CH
R715	R002T4750J	RC	75 OHM 1/4W	C141	CS0RF0316Z	CC	1 UF 25V F
R716	R002T4750J	RC	75 OHM 1/4W	C143	CS0RB0215K	CC	0.1 UF 16V B
R718	R801R7151J	RC	150 OHM 1/10W	C201	CS0RCH430C	CC	3 PF 50V CH
R720	R801R7470J	RC	47 OHM 1/10W	C202	CS0RB0413K	CC	0.001 UF 50V B
R723	R801R7103J	RC	10K OHM 1/10W	C203	CS0RB04H4K	CC	0.022 UF 50V B
R724	R801R7103J	RC	10K OHM 1/10W	C204	CS0RB04H4K	CC	0.022 UF 50V B
R725	R002T2271J	RC	270 OHM 1/2W	C205	CS0RB0413K	CC	0.001 UF 50V B
R726	R801R7102J	RC	1K OHM 1/10W	C206	CS0RB0216K	CC	1 UF 16V B
R727	R801R7104J	RC	100K OHM 1/10W	C207	CS0RB02L5K	CC	0.33 UF 16V B
R728	R801R7104J	RC	100K OHM 1/10W	C209	E50HU2100M	CE	10 UF 16V
R736	R801R7103J	RC	10K OHM 1/10W	C210	E50HU5010M	CE	1 UF 50V
R737	R801R7563J	RC	56K OHM 1/10W	C211	CS0RCH412J	CC	100 PF 50V CH
R738	R801R7472J	RC	4.7K OHM 1/10W	C212	CS0RB0414K	CC	0.01 UF 50V B
R742	R801R7750J	RC	75 OHM 1/10W	C213	E50HU5010M	CE	1 UF 50V
R745	R801R7104J	RC	100K OHM 1/10W	C214	CS0RCH4B2J	CC	120 PF 50V CH
R750	R002T4101J	RC	100 OHM 1/4W	C215	CS0RB0315K	CC	0.1 UF 25V B
△ R801	R3X18A123J	R,METAL OXIDE	12K OHM 2W	C217	E02LU2470M	CE	47 UF 16V
R802	R801R7221J	RC	220 OHM 1/10W	C218	CS0RB04H4K	CC	0.022 UF 50V B
R803	R002T4272J	RC	2.7K OHM 1/4W	C220	E02LU1471M	CE	470 UF 10V
R804	R002T4560J	RC	56 OHM 1/4W	C221	CS0RB0315K	CC	0.1 UF 25V B
R805	R801R7271J	RC	270 OHM 1/10W	C301	CS0RB0413K	CC	0.001 UF 50V B
R806	R801R7182J	RC	1.8K OHM 1/10W	C302	CS0RCH4E2J	CC	150 PF 50V CH
△ R807	R3X18A123J	R,METAL OXIDE	12K OHM 2W	C303	CS0RB0413K	CC	0.001 UF 50V B
R808	R801R7221J	RC	220 OHM 1/10W	C304	CS0RB0413K	CC	0.001 UF 50V B
R809	R002T4272J	RC	2.7K OHM 1/4W	C305	CS0RB0315K	CC	0.1 UF 25V B
R810	R002T4560J	RC	56 OHM 1/4W	C306	CS0RB0315K	CC	0.1 UF 25V B
R811	R801R7271J	RC	270 OHM 1/10W	C403	E02LT4471M	CE	470 UF 35V
R812	R801R7182J	RC	1.8K OHM 1/10W	C404	E02LTD2R2M	CE	2.2 UF 250V
△ R813	R3X18A123J	R,METAL OXIDE	12K OHM 2W	C405	CHGTB0413K	CC	0.001 UF 50V B
R814	R801R7221J	RC	220 OHM 1/10W	C406	C0JTB05E3K	CC	0.0015UF 500V B
R815	R002T4272J	RC	2.7K OHM 1/4W	C407	P235W1104J	CMP	0.1 UF 100V MKT
R816	R002T4560J	RC	56 OHM 1/4W	C408	E5EZU5100M	CE	10 UF 50V
R817	R801R7271J	RC	270 OHM 1/10W	C409	CS0RCH4U2J	CC	680 PF 50V CH
R818	R801R7182J	RC	1.8K OHM 1/10W	C412	P232T0473J	CMPL	0.047 UF 50V MMTV
△ R819	R6558A2R2J	R,FUSE	2.2 OHM 2W	C414	E5EZU4101M	CE	100 UF 35V
R1001	R002T4472J	RC	4.7K OHM 1/4W	C417	E02LU5220M	CE	22 UF 50V
R1003	R801R7102J	RC	1K OHM 1/10W	C418	E02LF3102M	CE	1000 UF 25V
R1008	R002T4473J	RC	47K OHM 1/4W	C422	P235W1474J	CMP	0.47 UF 100V MKT
R1014	R002T4122J	RC	1.2K OHM 1/4W	C437	P4J7F3334J	CMPP	0.33 UF 250V PMS
R1015	R801R7472J	RC	4.7K OHM 1/10W	C439	C0JTLSK1J	CC	27 PF 500V SL
R1016	R801R7472J	RC	4.7K OHM 1/10W	C440	P235W1103J	CMP	0.01 UF 100V MKT
R1017	R801R7221J	RC	220 OHM 1/10W	C442	P4N8FK862H	CMPP	0.0086UF 1.5KV
CAPACITORS				C446	E02LU5220M	CE	22 UF 50V
C001	CS0RB04H4K	CC	0.022 UF 50V B	C448	E5EZF220M	CE	22 UF 250V
C002	E02LU0471M	CE	470 UF 6.3V	△ C501	P2472B224M	CMP	0.22UF 275V PHE840
C003	E50HU2470M	CE	47 UF 16V	C502	CS0RF0316Z	CC	1 UF 25V F
C004	CS0RCH4Q1J	CC	47 PF 50V CH	C503	E5EZT84R7M	CE	4.7 UF 100V
C005	CS0RCH4Q1J	CC	47 PF 50V CH	C505	E63J0J151M	CE	150 UF 450V
C006	CS0RCH412J	CC	100 PF 50V CH	C506	C0JBB0713K	CC	0.001 UF 2KV B
C007	CS0RB0414K	CC	0.01 UF 50V B	C507	C0JBB0713K	CC	0.001 UF 2KV B
C101	CS0RCH4U1J	CC	68 PF 50V CH	△ C508	CD39E0MH3M	CC	0.0022UF 250V
C102	CS0RB0315K	CC	0.1 UF 25V B	C509	E62NFB221M	CE	220 UF 160V
C103	CS0RCH4H1J	CC	22 PF 50V CH	C511	E02LF2222M	CE	2200 UF 16V
C104	CS0RB04Q3K	CC	0.0047UF 50V B	C512	C0JTB05Q2K	CC	470 PF 500V B
C105	CS0RB0315K	CC	0.1 UF 25V B	C513	CS0RB0414K	CC	0.01 UF 50V B
C106	CS0RB04H4K	CC	0.022 UF 50V B	C515	E5EZF3102M	CE	1000 UF 25V
C108	CS0RCH4H1J	CC	22 PF 50V CH	C516	CS0RCH4S2J	CC	560 PF 50V CH
C109	CS0RCH4H1J	CC	22 PF 50V CH	C517	C03L0R7U2K	CC	680 PF 2KV R
C111	CS0RB02Q5K	CC	0.47 UF 16V B	C518	E02LU54R7M	CE	4.7 UF 50V
C112	CS0RCH4W1J	CC	82 PF 50V CH	C522	E50HU2100M	CE	10 UF 16V

# ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
CAPACITORS				CAPACITORS			
C523	E02LU1221M	CE	220 UF 10V	C1012	E5EZT4471M	CE	470 UF 35V
△ C525	CD39E0M13M	CC	0.001 UF 250V	C1013	E02LT2102M	CE	1000 UF 16V
△ C526	P2472B104M	CMP	0.1 UF 275V PHE840	C1015	E62KT5470M	CE	47 UF 50V
△ C527	CD39E0M13M	CC	0.001 UF 250V	C1016	CS0RF0316Z	CC	1 UF 25V F
C528	E50HU2100M	CE	10 UF 16V	C1018	E02LU0101M	CE	100 UF 6.3V
C530	CS0RB0315K	CC	0.1 UF 25V B	C1019	E02LU0221M	CE	220 UF 6.3V
C531	E5EZF4102M	CE	1000 UF 35V	C1020	CS0RB0413K	CC	0.001 UF 50V B
C533	E02LU0221M	CE	220 UF 6.3V	DIODES			
C540	C03L0R7G3K	CC	0.0018UF 2KV R	D001	D97U03301B	DIODE,ZENER	MTZJ33B T-77
C541	CS0RB04H4K	CC	0.022 UF 50V B	D101	0021721150	LED	SLR-342VCT32
C542	E02LU3470M	CE	47 UF 25V	D102	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
C543	CS0RB02L5K	CC	0.33 UF 16V B	D103	0021E5Q210	LED	LTL-1CHGE-002A
C601	CS0RCH4Q1J	CC	47 PF 50V CH	D108	D1VT001330	DIODE,SILICON	1SS133T-77
C602	E00NU5010M	CE	1 UF 50 V	D301	DD1R0MA770	DIODE,SILICON	MA77
C603	CS0RF0316Z	CC	1 UF 25V F	D401	D97U03001B	DIODE,ZENER	MTZJ30B T-77
C605	CS0RB0216K	CC	1 UF 16V B	D402	D97U03001B	DIODE,ZENER	MTZJ30B T-77
C607	CS0RF0316Z	CC	1 UF 25V F	D403	D2WT011E10	DIODE SILICON	11E1-EIC
C608	CS0RB0315K	CC	0.1 UF 25V B	D404	D2WT011E10	DIODE SILICON	11E1-EIC
C609	CS0RB0315K	CC	0.1 UF 25V B	D405	D2WTAU02A0	DIODE SILICON	AU02A-EIC
C611	E50HU53R3M	CE	3.3 UF 50V	D406	D2WT011E10	DIODE SILICON	11E1-EIC
C612	CS0RB04E3K	CC	0.0015UF 50V B	D407	D2WT011E10	DIODE SILICON	11E1-EIC
C613	E02LU1471M	CE	470 UF 10V	D408	D1VT001330	DIODE,SILICON	1SS133T-77
C614	CS0RB0216K	CC	1 UF 16V B	D410	D2WTAU02A0	DIODE SILICON	AU02A-EIC
C615	CS0RB0216K	CC	1 UF 16V B	△ D501	D2WTRM11C0	DIODE SILICON	RM11C-EIC
C616	CS0RB04Q3K	CC	0.0047UF 50V B	△ D502	D2WTRM11C0	DIODE SILICON	RM11C-EIC
C618	CS0RB0315K	CC	0.1 UF 25V B	△ D503	D2WTRM11C0	DIODE SILICON	RM11C-EIC
C619	CS0RB0315K	CC	0.1 UF 25V B	△ D504	D2WTRM11C0	DIODE SILICON	RM11C-EIC
C620	CS0RB0315K	CC	0.1 UF 25V B	D505	D2WT011E10	DIODE SILICON	11E1-EIC
C621	E50HU2100M	CE	10 UF 16V	D506	D1VT001330	DIODE,SILICON	1SS133T-77
C622	CS0RB0315K	CC	0.1 UF 25V B	D507	D1VT001330	DIODE,SILICON	1SS133T-77
C623	CS0RB0315K	CC	0.1 UF 25V B	D508	D2WXN49370	DIODE SILICON	1N4937
C624	E50HU2100M	CE	10 UF 16V	D511	D97U01501B	DIODE,ZENER	MTZJ15B T-77
C625	CS0RCH4Q1J	CC	47 PF 50V CH	D512	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
C626	CS0RB0315K	CC	0.1 UF 25V B	D513	D2WXB290S0	DIODE SILICON	SB290S
C628	E02LU1221M	CE	220 UF 10V	D514	D1VT001330	DIODE,SILICON	1SS133T-77
C629	CS0RB0413K	CC	0.001 UF 50V B	D515	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
C630	CS0RCH4S1J	CC	56 PF 50V CH	D516	D2WXB290S0	DIODE SILICON	SB290S
C633	CS0RB0414K	CC	0.01 UF 50V B	D517	D2WXN49370	DIODE SILICON	1N4937
C634	E02NT2220M	CE	22 UF 16V	D519	D1VT001330	DIODE,SILICON	1SS133T-77
C637	CS0RCH4S1J	CC	56 PF 50V CH	D520	D28F30DF60	DIODE RECTIFIER	30DF6-FC
C638	CS0RB0414K	CC	0.01 UF 50V B	D521	D1VT001330	DIODE,SILICON	1SS133T-77
C640	CS0RB0414K	CC	0.01 UF 50V B	D523	D2WT011E10	DIODE SILICON	11E1-EIC
C641	E02N05R47M	CE	0.47 UF 50V	D524	D2WT011E10	DIODE SILICON	11E1-EIC
C712	CS0RB0414K	CC	0.01 UF 50V B	D525	D2WT011E10	DIODE SILICON	11E1-EIC
C713	CS0RB0315K	CC	0.1 UF 25V B	D526	D28F30DF60	DIODE RECTIFIER	30DF6-FC
C714	CS0RB0414K	CC	0.01 UF 50V B	D527	D2WT011E10	DIODE SILICON	11E1-EIC
C715	E50HU2100M	CE	10 UF 16V	D528	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
C716	CS0RCH412J	CC	100 PF 50V CH	D603	D1VT001330	DIODE,SILICON	1SS133T-77
C717	E02LU1471M	CE	470 UF 10V	D604	D2WT011E10	DIODE SILICON	11E1-EIC
C719	CS0RCH412J	CC	100 PF 50V CH	D606	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
C721	CS0RCH412J	CC	100 PF 50V CH	D607	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
C724	E50HU2100M	CE	10 UF 16V	D608	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
C725	E02LU1101M	CE	100 UF 10V	D609	D1VT001330	DIODE,SILICON	1SS133T-77
C726	CS0RCH413J	CC	0.001 UF 50V CH	D610	D1VT001330	DIODE,SILICON	1SS133T-77
C727	CS0RCH4Q2J	CC	470 PF 50V CH	D611	D1VT001330	DIODE,SILICON	1SS133T-77
C728	E00NU2100M	CE	10 UF 16 V	D612	D1VT001330	DIODE,SILICON	1SS133T-77
C731	CS0RB0414K	CC	0.01 UF 50V B	D614	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
C732	CS0RCH413J	CC	0.001 UF 50V CH	D615	D2W0B290S0	DIODE SILICON	SB290S-B-EIC
C736	E50HU5010M	CE	1 UF 50V	D712	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
C742	E50HU2100M	CE	10 UF 16V	D801	D1VT001330	DIODE,SILICON	1SS133T-77
C743	E50HU2100M	CE	10 UF 16V	D802	D1VT001330	DIODE,SILICON	1SS133T-77
C748	E02LU1101M	CE	100 UF 10V	D803	D1VT001330	DIODE,SILICON	1SS133T-77
C753	CS0RCH413J	CC	0.001 UF 50V CH	D1001	D1VT001330	DIODE,SILICON	1SS133T-77
C754	CHGTB0413K	CC	0.001 UF 50V B	D1002	D1VT001330	DIODE,SILICON	1SS133T-77
C757	E02LU1101M	CE	100 UF 10V	D1003	D1VT001330	DIODE,SILICON	1SS133T-77
C759	CS0RB0413K	CC	0.001 UF 50V B	ICS			
C763	CS0RCH412J	CC	100 PF 50V CH	IC101	I5PD0F007B	IC	OECF007B
C764	CS0RCH4S1J	CC	56 PF 50V CH	IC102	IC7J0311A0	IC	R3111N311A/C-TR
C801	C03L0R713K	CC	0.001 UF 2KV R	IC199	A3L922G015	IC	S-24C04BDP-LA
C802	CS0RCH4L2J	CC	330 PF 50V CH	IC201	I0WDE2248C	IC	STV2248C
C803	CS0RCH4K2J	CC	270 PF 50V CH	IC401	I0WTD81740	IC	TDA8174A
C804	CS0RCH4L2J	CC	330 PF 50V CH	△ IC501	I0WD015070	IC	TEA1507P/N1
C1002	E02LU0101M	CE	100 UF 6.3V	IC502	I1KA98R09A	IC	KIA78R09API
C1003	E50HU50R1M	CE	0.1 UF 50 V	IC503	I1KA98R060	IC	KIA278R06PI
C1009	CS0RB04N3K	CC	0.0039UF 50V B	△ IC506	0002E00610	PHOTO COUPLER	LTV-817M-VB
C1010	E50HU52R2M	CE	2.2 UF 50V	IC701	I0QS02234L	IC	NJM2234L
C1011	E02LU2101M	CE	100 UF 16V	IC702	I0QS02234L	IC	NJM2234L

# ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
ICS				SWITCHES			
IC1002	I03SP46000	IC	LA4600	SW106	0504201T31	SWITCH,TACT	SKHVBED010
TRANSISTORS				SW107	0504201T31	SWITCH,TACT	SKHVBED010
Q102	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	SW501	0530205016	SWITCH	SDKVA30100
Q103	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	VARIABLE RESISTORS			
Q201	T8AA03881S	TRANSISTOR SILICON	KTC3881S-RTK	VR401	V1K6213BT8	VOLUME,SEMI FIXED	NVG6THTB102
Q202	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	VR420	V1K62Q2BT8	VOLUME,SEMI FIXED	NVG6THTB471
Q204	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	VR501	V116313BTC	VOLUME,SEMI FIXED	EVNCYAA03B13
Q301	T8AA03881S	TRANSISTOR SILICON	KTC3881S-RTK	P.C.BOARD ASSEMBLIES			
Q302	T8AA03881S	TRANSISTOR SILICON	KTC3881S-RTK	PCB010	A3L922G010K	PCB ASS'Y	TMB545A
Q303	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	PCB110	A3L922G110K	PCB ASS'Y	TCB404A
Q304	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	MISCELLANEOUS			
Q401	TDFUF024990	TRANSISTOR SILICON	2SD2499	B501	024HT03564	CORE,BEADS	W4BRH3.5X6X1
Q402	TC5T01627Y	TRANSISTOR SILICON	2SC1627_Y(TPE2)	B502	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
Q501	T41F026510	TRANSISTOR FIELD EFF	ECT 2SK2651-01MR	B504	024HT03564	CORE,BEADS	W4BRH3.5X6X1
Q503	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	B505	024HT03564	CORE,BEADS	W4BRH3.5X6X1
Q505	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT	B701	024HT03564	CORE,BEADS	W4BRH3.5X6X1
Q507	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	B702	024HT03564	CORE,BEADS	W4BRH3.5X6X1
Q508	TNAAJ05003	COMPOUND TRANSISTOR	KRC111SRTK	BT101	1412004013	BATTERY,MANGAN	R03(AB)2PXP GPI
Q509	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA	BT102	1412004013	BATTERY,MANGAN	R03(AB)2PXP GPI
Q510	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	CD501	1206655823	CORD AC BUSH	1206655823
Q511	TAAT01281Y	TRANSISTOR SILICON	KTA1281_Y	CD801	1278210014	BRAIDED WIRE	SM1642-001
Q512	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK	CD802	WCL6840038	FLAT CABLE	AWG26 5C GRAY 400MM
Q513	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE	CD803	WBL6034038	FLAT CABLE	AWG26 4C BLACK 340MM
Q514	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA	CF201	1012T5R507	FILTER CERAMIC TRAP	TPWA02B-TF21
Q601	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	CF202	1029238R93	FILTER,SAW	TSF5330U
Q602	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK	CF301	1029138R93	FILTER,SAW	TSB6308U
Q603	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	CF303	1012T03101	FILTER CERAMIC TRAP	MKT31.9MA110P-TF
Q609	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	CF304	1012T04001	FILTER,CERAMIC TRAP	MKT40.4MA110P-TF
Q702	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)	CP001	069D01001A	CONNECTOR PCB SIDE	003P-2100
Q703	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	CP101	069X160379	CONNECTOR PCB SIDE	06JQ-ST
Q711	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	CP401	069S450089	CONNECTOR PCB SIDE	A1561VV2-A5P
Q801	TCATC3199Y	TRANSISTOR SILICON	KTC3199_Y-AT	CP501	069S320419	CONNECTOR PCB SIDE	A3963WV2-3PD
Q802	TCA0042170	TRANSISTOR SILICON	KTC4217(O,Y)	CP502	069S420110	CONNECTOR PCB SIDE	A1561VV2-2P
Q803	TCATC3199Y	TRANSISTOR SILICON	KTC3199_Y-AT	CP801	069S320010	CONNECTOR PCB SIDE	A2361VV2-2P
Q804	TCA0042170	TRANSISTOR SILICON	KTC4217(O,Y)	CP1002	069S120419	CONNECTOR PCB SIDE	A2502WV2-2P
Q805	TCATC3199Y	TRANSISTOR SILICON	KTC3199_Y-AT	CP802A	067U005049	WIRE HOLDER	B2013H02-5P
Q806	TCA0042170	TRANSISTOR SILICON	KTC4217(O,Y)	CP802B	067U005049	WIRE HOLDER	B2013H02-5P
Q1001	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK	CP803A	067U004029	WIRE HOLDER	B2013H02-4P
Q1003	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S	CP803B	067U004029	WIRE HOLDER	B2013H02-4P
COILS & TRANSFORMERS				EL001	124116281A	EYE LET	XRY16X28BD
L001	02167F100J	COIL	10 UH	EL002	124120301A	EYE LET	XRY20X30BD
L101	02167F100J	COIL	10 UH	F501	080NT04004	FUSE	50T040H
L102	02167F100J	COIL	10 UH	FB401	043221012F	TRANSFORMER,FLYBACK	3221012F
L202	033700005R	COIL,VIDEO IFT	3700005	FH501	06710T0006	HOLDER,FUSE	EYF-52BC
L203	021LA61R0M	COIL	1 UH	FH502	06710T0006	HOLDER,FUSE	EYF-52BC
L204	021LA6100J	COIL	10 UH	ICP501	0845T07003	IC PROTECTOR	20P_7000
L206	021LA6R22M	COIL	0.22 UH	ICP502	0845T03003	IC PROTECTOR	20P_3000
L207	021LA6100J	COIL	10 UH	OS101	0773071001	REMOTE RECEIVER	RPM7138-H5
L302	021LA6R22M	COIL	0.22 UH	RY501	0560V20115	RELAY	ALKS321
L401	021679472K	COIL	4.7 MH	SP353	070C535004	SPEAKER	SA04A10AWA
L403	022800033A	COIL,LINEARITY	20416A	TH501	D8E080A100	DEGAUSS ELEMENT	B59209-J80-A10
L501	029T000091	COIL,LINE FILTER	0R8A393F28Y	TM101	076R0EY020	TRANSMITTER	R25-1800
L502	02AHB9A972	CORE,FERRITE	W5T29X7.5X19	TU001	0145517006	TUNER,VHF-UHF	TUWRF4EG-778F2
L503	028R200015	COIL,DEGAUSS	8R200015	V801	098A210440	CRT W/DY	A51EER33X74
L601	02167F100J	COIL	10 UH	X101	100CT4R013	CRYSTAL	HC-49/U-S
L706	021LA6220J	COIL	22 UH	X601	100CT4R408	CRYSTAL	HC-49/U
L707	021LA6220J	COIL	22 UH	X602	100CT3R509	CRYSTAL	HC-49/U
L708	021LA6220J	COIL	22 UH	RESISTOR			
L711	021LA6220J	COIL	22 UH	RC.....	CARBON RESISTOR		
L713	02167F100J	COIL	10 UH	CAPACITORS			
L715	021LA6220J	COIL	22 UH	CC.....	CERAMIC CAPACITOR		
L717	021LA6100J	COIL	10 UH	CE.....	ALUMI ELECTROLYTIC CAPACITOR		
L801	021673101J	COIL	100 UH	CP.....	POLYESTER CAPACITOR		
L802	02167D151K	COIL	150 UH	CPP.....	POLYPROPYLENE CAPACITOR		
L803	02167D151K	COIL	150 UH	CPL.....	PLASTIC CAPACITOR		
L804	02167D151K	COIL	150 UH	CMP.....	METAL POLYESTER CAPACITOR		
T401	045009003J	TRANS,HORIZONTAL DRIVE	ETH09K14BZ	CMPL.....	METAL PLASTIC CAPACITOR		
T501	0481350764	TRANSFORMER,SWITCHING	8135076	CMPP.....	METAL POLYPROPYLENE CAPACITOR		
JACKS							
J701	063G100042	SOCKET,21PIN	0350_9982_05				
J702	060J131015	HEADPHONE JACK	MSJ-2000				
J703	060G401047	RCA JACK	HTJ-032-03AY				
J704	060G401046	RCA JACK	HTJ-032-03AW				
J801	066C130017	SOCKET,CATHODE RAY TUBE	CVT3275-5101				
SWITCHES							
SW102	0504201T31	SWITCH,TACT	SKHVBED010				
SW104	0504201T31	SWITCH,TACT	SKHVBED010				

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