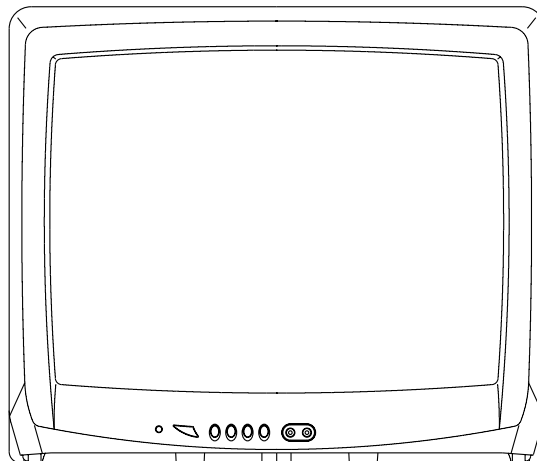




TCR2023

SERVICE MANUAL

COLOR TELEVISION RECEIVER



**ORIGINAL
MFR'S VERSION A**

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES


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

2. AVOID AN ELECTRIC SHOCK

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

3. USE THE DESIGNATED PARTS

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

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

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

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

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

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

6. AVOID AN X-RAY

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

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

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

7. PERFORM A SAFETY CHECK AFTER SERVICING

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

(INSULATION CHECK PROCEDURE)

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

[Note 1]

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

[Note 2]

External exposure metal: Antenna terminal

HOW TO ORDER PARTS

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

1. MODEL NUMBER and VERSION LETTER

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

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.

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

Remove all old silicon before applying new silicon.

CONTENTS

SERVICING NOTICES ON CHECKING	A1-1
HOW TO ORDER PARTS	A1-1
IMPORTANT	A1-1
CONTENTS	A2-1
GENERAL SPECIFICATIONS	A3-1~A3-4
DISASSEMBLY INSTRUCTIONS	B-1
SERVICE MODE LIST	C-1
CONFIRMATION OF USING HOURS	C-1
NOTE FOR THE REPLACING OF MEMORY IC	C-1
ELECTRICAL ADJUSTMENTS	D1-1~D2-1
MAJOR COMPONENTS LOCATION GUIDE	D3-1
BLOCK DIAGRAM	E-1, E-2
PRINTED CIRCUIT BOARDS	
MAIN/CRT	F-1~F-4
SCHEMATIC DIAGRAMS	
MICON/TUNER	G-1, G-2
CHROMA	G-3, G-4
POWER	G-5, G-6
DEFLECTION/CRT	G-7, G-8
SOUND/AV	G-9, G-10
WAVEFORMS	H-1, H-2
MECHANICAL EXPLODED VIEW	I-1
MECHANICAL REPLACEMENT PARTS LIST	J1-1
ELECTRICAL REPLACEMENT PARTS LIST	J2-1, J2-2

GENERAL SPECIFICATIONS

G-1.Outline of the Product

20 inch(480.0mmV):Measured diagonally
Color CRT 90 degree deflection

G-2.Broadcasting System

US System M

G-3.Color System ☒NTSC ☐PAL ☐SECAM or Monochrome signal

G-4.NTSC Playback(PAL 60Hz) ☐Yes ☒No

G-5.NTSC 3.58+4.43/PAL60Hz ☐Yes ☒No

G-6.Antenna Input Impedance

VHF/UHF 75 ohm unbalanced

G-7.Tuner and Receiving Channel

Tuner : Contactless Electric Tuner

☐Oscar(W/O HYPER) ☐Oscar(W/ HYPER) ☐France CATV ☒Others
channel coverage

2 ~ 69, 4A, A-5 ~ A-1, A ~ I, J ~ W, W+1 ~ W+84

Tuning System

☒Frequency syn. ☐Voltage syn. ☐Others

G-8.Preset Channel

-- channels

G-9.Intermediate Frequency

Picture(fP)	<u>45.75</u> MHz	<u> </u> MHz	<u> </u> MHz
Sound (fS)	<u>41.25</u> MHz	<u> </u> MHz	<u> </u> MHz
fP-fS	<u>4.50</u> MHz	<u> </u> MHz	<u> </u> MHz

G-10.Stereo/Dual TV Sound

☐ Yes(☐NICAM ☐GERMAN ☐USA ☐JAPAN) ☒No

G-11.Tuner Sound Muting ☒Yes ☐No

G-12.Power Source 220 V ☒AC 50Hz ☐AC 60Hz

G-13.Power Consumption: 66 W at AC 220 V 50 Hz

-- W at DC --- V

Stand by: 5 W at AC 220 V 50 Hz

Per Year: -- kWh / Year

G-14.Dimensions(Approx.)

488 mm(W) 465 mm(D) 415 mm(H)

G-15.Weight(Approx.)

Net: 17.5 kg (38.6 lbs)

Gross: 20.0 kg (44.1 lbs)

G-16.Cabinet Material

Cabinet Front: ☒PS ☒94HB ☒DECABROM
☐ABS ☐94V2 ☐NON-DECA
☐94V0

Back Panel: ☒PS ☒94HB ☒DECABROM
☐ABS ☐94V2 ☐NON-DECA
☐94V0

GENERAL SPECIFICATIONS

G-17.Protector: ☒Power Fuse

G-18.Regulation

Safety

<input type="checkbox"/> UL	<input type="checkbox"/> CSA	<input type="checkbox"/> SAA	<input type="checkbox"/> SI	<input type="checkbox"/> CE	<input type="checkbox"/> SEV
<input type="checkbox"/> BS	<input type="checkbox"/> NF	<input type="checkbox"/> NEMKO	<input type="checkbox"/> FEMKO	<input type="checkbox"/> DEMKO	<input type="checkbox"/> IEC65
<input type="checkbox"/> SEMKO	<input type="checkbox"/> NZ	<input type="checkbox"/> HOMOLO	<input type="checkbox"/> SABS	<input type="checkbox"/> CNS	<input type="checkbox"/> SISIR
<input type="checkbox"/> NOM	<input type="checkbox"/> AS3159	<input type="checkbox"/> DENTORI	<input type="checkbox"/> UNE	<input type="checkbox"/> GOST	<input checked="" type="checkbox"/> NONE

Radiation

<input type="checkbox"/> FCC	<input type="checkbox"/> DOC	<input type="checkbox"/> FTZ	<input type="checkbox"/> PTT	<input type="checkbox"/> CE	<input type="checkbox"/> SEV
<input type="checkbox"/> SABA	<input type="checkbox"/> SI	<input type="checkbox"/> NF	<input type="checkbox"/> NZ	<input type="checkbox"/> HOMOLO	<input type="checkbox"/> UNE
<input type="checkbox"/> CNS	<input type="checkbox"/> CISPR13	<input type="checkbox"/> DENTORI	<input type="checkbox"/> AS/NZS	<input checked="" type="checkbox"/> NONE	

X-Radiation

<input type="checkbox"/> PTB	<input type="checkbox"/> DHHS	<input type="checkbox"/> HWC	<input type="checkbox"/> DENTORI	<input checked="" type="checkbox"/> NONE
------------------------------	-------------------------------	------------------------------	----------------------------------	--

G-19.Temperature

Operation 5 °C ~ 40 °C

Storage -20 °C ~ 60 °C

G-20.Operating Humidity

Less than 80 %RH

G-21.Clock and Timer

Sleep Timer ☒Yes Max 120 Min.(10 Min. Step) ☐No

On/Off Timer ☐Yes Programs ☒No

Wake Up Timer ☐Yes Programs ☒No

G-22.Timer back up Time: More than -- Minutes (at Power Off Mode)

G-23.Terminals

<input checked="" type="checkbox"/> VHF/UHF Antenna Input	<input type="checkbox"/> Din Type	<input checked="" type="checkbox"/> F-Type	<input type="checkbox"/> France Type
<input checked="" type="checkbox"/> Front Video Input (RCA ø8.3)			
<input checked="" type="checkbox"/> Front Audio Input (RCA ø8.3)			
<input type="checkbox"/> Rear Video Input (RCA ø8.3)			
<input type="checkbox"/> Rear Audio Input (RCA ø8.3)			
<input type="checkbox"/> Rear Video Output (RCA ø8.3)			
<input type="checkbox"/> Rear Audio Output (RCA ø8.3)			
<input type="checkbox"/> 21 Pin	<input type="checkbox"/> S Input(Rear)		<input type="checkbox"/> Ear Phone Jack(ø3.5)

G-24.Indicator

<input type="checkbox"/> Power (<u> </u>)	<input type="checkbox"/> Stand By (<u> </u>)	<input type="checkbox"/> On Timer (<u> </u>)	<input checked="" type="checkbox"/> NONE
---	--	--	--

G-25.Display

On Screen Display

<input checked="" type="checkbox"/> Menu	<input type="checkbox"/> Clock Set(<input type="checkbox"/> 12H <input type="checkbox"/> 24H)	<input type="checkbox"/> System Selec	<input type="checkbox"/> On/Off Timer
	<input type="checkbox"/> Hotel Lock	<input type="checkbox"/> Area Code	<input checked="" type="checkbox"/> CH Tuning
	<input type="checkbox"/> Sound 1/2	<input type="checkbox"/> NICAM Auto Off	<input checked="" type="checkbox"/> Picture
	<input type="checkbox"/> Guide CH Set	<input type="checkbox"/> Audio	<input checked="" type="checkbox"/> Language
	<input type="checkbox"/> CATV	<input type="checkbox"/> Pin Code Registration	<input type="checkbox"/> V-Chip
<input checked="" type="checkbox"/> Control Level	<input checked="" type="checkbox"/> Sound	<input checked="" type="checkbox"/> Brightness	<input checked="" type="checkbox"/> Contrast
	<input checked="" type="checkbox"/> Color	<input checked="" type="checkbox"/> Tint(NTSC Only)	<input checked="" type="checkbox"/> Sharpness
	<input type="checkbox"/> Tuning	<input type="checkbox"/> Bass	<input type="checkbox"/> Treble
	<input type="checkbox"/> Balance	<input type="checkbox"/> Back Light	
<input type="checkbox"/> Stereo,Audio Output,Bilingual		<input type="checkbox"/> Picture Menu	
<input type="checkbox"/> Stereo,Audio Output,SAP		<input type="checkbox"/> Mid Night Theater	
<input type="checkbox"/> Stereo,Audio Output		<input type="checkbox"/> GAME	
<input checked="" type="checkbox"/> AV	<input checked="" type="checkbox"/> Channel	<input type="checkbox"/> Clock	<input type="checkbox"/> Hotel Lock
<input checked="" type="checkbox"/> Sleep Timer	<input checked="" type="checkbox"/> Sound Mute	<input type="checkbox"/> Pin Code	

GENERAL SPECIFICATIONS

G-26.OSD Language

☒Eng ☐Ger ☒Fre ☒Spa ☐Ita ☐Por ☐Jpn

OSD Language Setting

☐Eng ☐Ger ☐Fre ☒Spa ☐Ita ☐Por ☐Jpn
☐Not Applicable

G-27.Speaker : Position ☐Front ☐Side ☒Bottom

Size 3 inches
Imp 8 ohm x 1 pcs
Power Max 1.5 W
 10% 1.0 W (Typical)

G-28.EXT Speaker

☐Yes -- W Imp -- ohm

G-29.Carton

Master Carton: ☐Need ☒No Need

Content: ---- Set

Material: ---- / ---- Corrugated Carton

Dimensions: ---- mm(L) ---- mm(W) ---- mm(D)

Description of Origin ☐Yes ☐No

Gift Box

Material ☐ Double/Brown Corrugated Carton (☐with Photo Label)
 ☒ Double/White Corrugated Carton (☐with Photo Label)
 ☐ Double Full Color Carton W/Photo

Dimensions: 546 mm(L) 526 mm(W) 472 mm(D)

Design: As Per Buyer 's

Description of Origin: ☐Yes ☒No

Drop Test Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces

Height ☐25cm ☐31cm ☒46cm ☐62cm ☐80cm

Container Stuffing: 436 Sets / 40' container

G-30.Accessories

☒Owner's Manual (☐W/Guarantee Card) [Spanish]

☐AC Plug Adapter

☐Channel film

☒Battery (UM- 4 x 2)

☒Remote Control Unit

☐Safety Tip

☐Toll Free Insert Sheet

☒Guarantee Card ☐Audio-Video Cord (RCA)

☐Registration Card

☐Warning Sheet

☐Quick Set-Up Sheet

☐Schematic Diagram

☐Information Sheet

☐U/V Mixer

☐75 ohm Coaxial Cable (☐Single Shield

☐Double Shield)

☐21pin Cable

☐Car Cord

☐Service Station List

☒Rod Antenna (☒300 ohm to 75 ohm VHF Antenna Adaptor)

☐One Pole

☒Two Pole(☒F-Type

☐Din Type

☐France Type)

☐Loop Antenna

(☐F-Type

☐Din Type

☐France Type)

G-31.Other Features

☒Auto Degauss

☐Auto Search

☐Full OSD

☒Auto Shut Off

☐CH Allocation

☐Premiere

☐Canal+

☐SAP

☐Comb Filter

☒CATV(181CH)

☐Channel Lock

☒Auto CH Memory

☐Anti-Theft

☐Just Clock Function

☐Hotel Lock

☐Rental

☐Game Position

☐Fastext

☐Unitext

☐TopText

☒Closed Caption

☐Picture Menu

☐Mid Night Theater

☐V-Chip

GENERAL SPECIFICATIONS

G-32.Switch

Front

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Power(Tact) | <input checked="" type="checkbox"/> Channel Up/Reset | <input checked="" type="checkbox"/> Volume Up/Set Up |
| <input type="checkbox"/> System Select | <input checked="" type="checkbox"/> Channel Down/Enter | <input checked="" type="checkbox"/> Volume Down/Set Down |
| <input type="checkbox"/> Main Power SW | <input type="checkbox"/> Sub Power | <input checked="" type="checkbox"/> Menu:Vol Up + Vol Down |

Rear

- | | |
|----------------------------------|---|
| <input type="checkbox"/> AC/DC | <input type="checkbox"/> TV/CATV Selector |
| <input type="checkbox"/> Degauss | <input type="checkbox"/> Main Power SW |

G-33.Magnetic Field

- | | | |
|---|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> BV : +0.45G | <input type="checkbox"/> BV : +0.35G | <input type="checkbox"/> BV : +0.25G |
| BH : 0.18G | BH : 0.30G | BH : 0.30G |
| <input checked="" type="checkbox"/> BV : -0.15G | <input type="checkbox"/> BV : -0.25G | <input type="checkbox"/> BV : -0.50G |
| BH : 0.15G | BH : 0.15G | BH : 0.30G |

G-34.Remote Control Unit: RC-DW

Glow in Dark Remocon

☐Yes

☒No

Power Source:

D.C 3 V

Battery UM - 4 x 2

Total 27 Key

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> Power | <input checked="" type="checkbox"/> Quick View | <input checked="" type="checkbox"/> TV/AV |
| <input type="checkbox"/> Stand By | <input type="checkbox"/> Status | <input type="checkbox"/> Bar Select |
| <input checked="" type="checkbox"/> 0 | <input type="checkbox"/> Time Select | <input type="checkbox"/> PAL/SECAM |
| <input checked="" type="checkbox"/> 1 | <input type="checkbox"/> Time Set | <input checked="" type="checkbox"/> Volume Up |
| <input checked="" type="checkbox"/> 2 | <input checked="" type="checkbox"/> Mute | <input checked="" type="checkbox"/> Volume Down |
| <input checked="" type="checkbox"/> 3 | <input type="checkbox"/> CH Skip | <input type="checkbox"/> CH Call |
| <input checked="" type="checkbox"/> 4 | <input checked="" type="checkbox"/> CH1/CH2 | <input checked="" type="checkbox"/> CH Down |
| <input checked="" type="checkbox"/> 5 | <input type="checkbox"/> Channel | <input checked="" type="checkbox"/> CH Up |
| <input checked="" type="checkbox"/> 6 | <input type="checkbox"/> Text/Mix/TV | <input type="checkbox"/> CH Down/Page Down |
| <input checked="" type="checkbox"/> 7 | <input type="checkbox"/> Display Cancel | <input type="checkbox"/> CH Up/Page Up |
| <input checked="" type="checkbox"/> 8 | <input type="checkbox"/> Initial | <input type="checkbox"/> Page +/- |
| <input checked="" type="checkbox"/> 9 | <input type="checkbox"/> Store | <input type="checkbox"/> Program |
| <input type="checkbox"/> 10 | <input type="checkbox"/> Reveal | <input type="checkbox"/> F/T/B |
| <input type="checkbox"/> 11 | <input checked="" type="checkbox"/> Sleep | <input type="checkbox"/> Hold |
| <input type="checkbox"/> 12 | <input type="checkbox"/> Aft/Skip | <input type="checkbox"/> List |
| <input type="checkbox"/> 1 * | <input type="checkbox"/> Preset | <input type="checkbox"/> Rotate |
| <input type="checkbox"/> 2 * | <input type="checkbox"/> 5.5/6.5MHz | <input type="checkbox"/> Browse |
| <input type="checkbox"/> 0/10 | <input type="checkbox"/> Auto Memory | <input type="checkbox"/> Std/Auto |
| <input type="checkbox"/> Tone 1/2 | <input type="checkbox"/> Auto | <input type="checkbox"/> Memory |
| <input type="checkbox"/> Info | <input checked="" type="checkbox"/> Call | <input type="checkbox"/> Band Select |
| <input type="checkbox"/> Mono/Auto | <input checked="" type="checkbox"/> Reset | <input type="checkbox"/> Search |
| <input checked="" type="checkbox"/> TV/Caption/Text | <input checked="" type="checkbox"/> Menu | <input type="checkbox"/> Clock/Program |
| <input type="checkbox"/> Expand | <input checked="" type="checkbox"/> Enter | <input type="checkbox"/> Clock/Set |
| <input type="checkbox"/> Red | <input type="checkbox"/> Add | <input type="checkbox"/> Ch Set |
| <input type="checkbox"/> Cyan | <input type="checkbox"/> Delete | <input checked="" type="checkbox"/> Set + |
| <input type="checkbox"/> Normal | <input type="checkbox"/> Yellow | <input checked="" type="checkbox"/> Set - |
| <input type="checkbox"/> Color System | <input type="checkbox"/> Random | <input type="checkbox"/> Green |
| <input type="checkbox"/> Wide Seley | <input type="checkbox"/> Tuning Up/Time Text | <input type="checkbox"/> Nicam/Mono |
| <input type="checkbox"/> Auto Wide On/Off | <input type="checkbox"/> Tuning Down/Reset | <input type="checkbox"/> Tone A/B |
| <input type="checkbox"/> Picture Position | <input type="checkbox"/> Navi | <input type="checkbox"/> FM Transmitter |
| <input type="checkbox"/> Direct Change/Auto Search | <input type="checkbox"/> Back Light | |
| <input type="checkbox"/> Picture Menu | <input type="checkbox"/> Mid Night Theater | |

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.

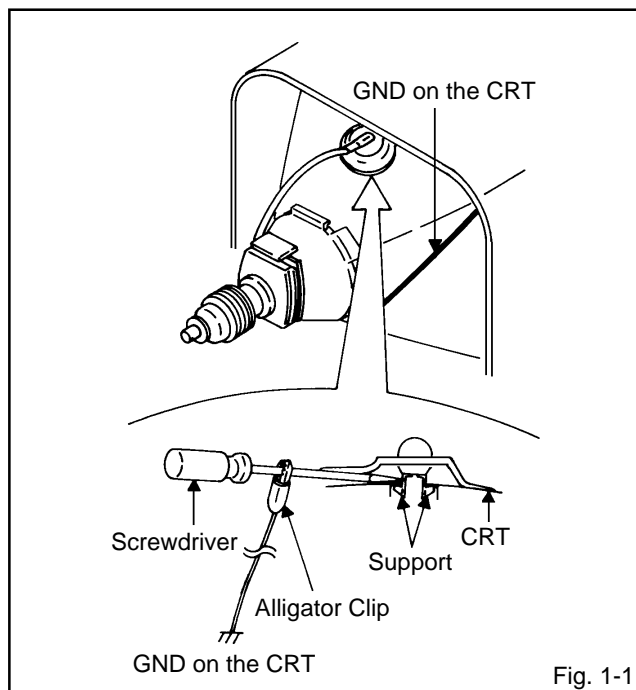


Fig. 1-1

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.)

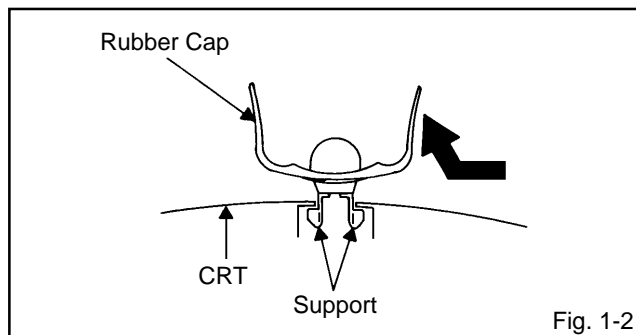


Fig. 1-2

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.)

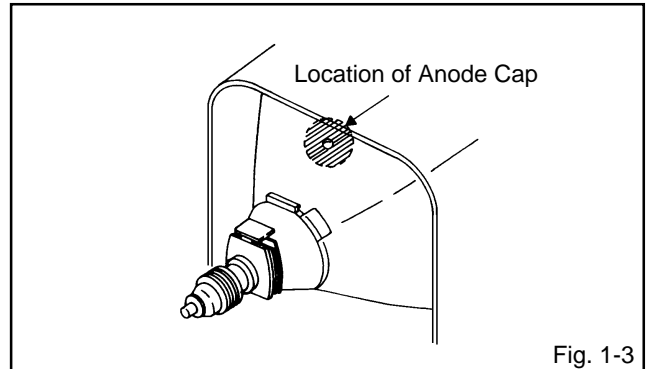


Fig. 1-3

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.)

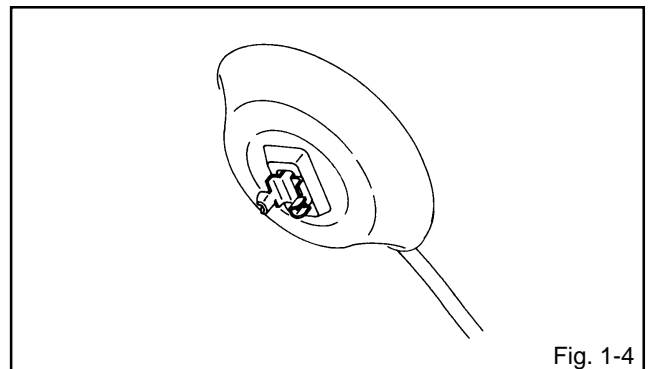


Fig. 1-4

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

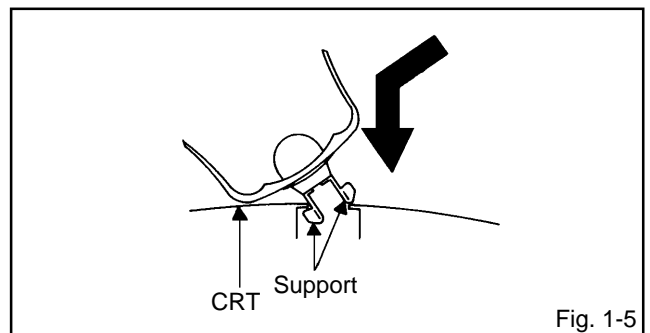


Fig. 1-5

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

SERVICE MODE LIST

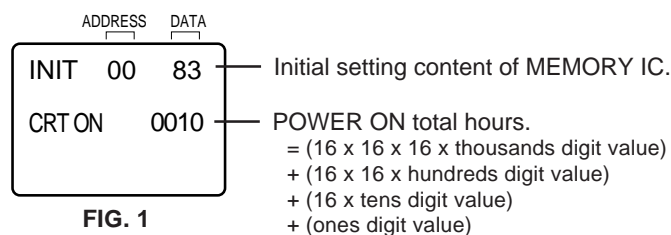
This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter the Service Mode, press both set key and remote control key for more than 1 second.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF USING HOURS". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "NOTE FOR THE REPLACING OF 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 USING HOURS

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second.
3. After the confirmation of using hours, turn off the power.



NOTE FOR THE REPLACING OF MEMORY IC

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

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A
70	A8	0A	A2	09	06	63	24	19	20	20	FF

Table 1

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

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

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

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
Inferior silicon grease can damage IC's and transistors.
- When replacing IC's and transistors, use only specified silicon grease (YG6260M).
Remove all old silicon before applying new silicon.

Prepare the following measurement tools for electrical adjustments.

1. Synchro Scope
2. Digital Voltmeter

On-Screen Display Adjustment

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

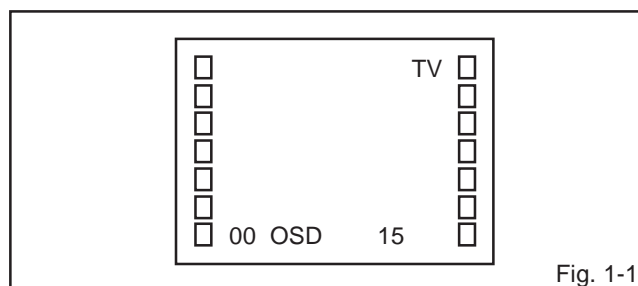


Fig. 1-1

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

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

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: RF DELAY

1. Place the set with Aging Test for more than 15 minutes.
2. Receive an 80dB monoscope pattern.
3. Connect the digital voltmeter between the TP001.
4. Activate the adjustment mode display of Fig. 1-1 and press the channel button (02) on the remote control to select "RF DELAY".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is $2.15V \pm 0.05V$.

2-2: CUT OFF

1. Adjust the unit to the following settings.
R.DRIVE=10, B.DRIVE=10, R.BIAS=64, G.BIAS=64, B.BIAS=64, BRIGHTNESS=130, CONTRAST=100.
2. Place the set with Aging Test for more than 15 minutes.
3. Activate the adjustment mode display of Fig. 1-1 and press the channel button (01) on the remote control to select "CUT OFF".
4. Adjust the **Screen Volume** until a dim raster is obtained.

2-3: FOCUS

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

2-4: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the white 100% signal from the Pattern Generator.
3. Using the adjustment control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of Fig. 1-1 and press the channel button (10) on the remote control to select "R.BIAS".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R.BIAS.
6. Press the CH. UP/DOWN button on the remote control to select the "R.DRIVE", "B.DRIVE", "G.BIAS" or "B.BIAS".
7. Using the VOL. UP/DOWN button on the remote control, adjust the R.DRIVE, B.DRIVE, G.BIAS or B.BIAS.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

2-5: SUB TINT/SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Connect the oscilloscope to TP023.
3. Activate the adjustment mode display of Fig. 1-1 and press the channel button (16) on the remote control to select "TINT".
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line.
(Refer to Fig. 2-1.)
5. Connect the oscilloscope to TP022.
6. Press the CH DOWN button once to set to "COLOR" mode.
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110% of the white level. (Refer to Fig. 2-2)
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~7.

ELECTRICAL ADJUSTMENTS

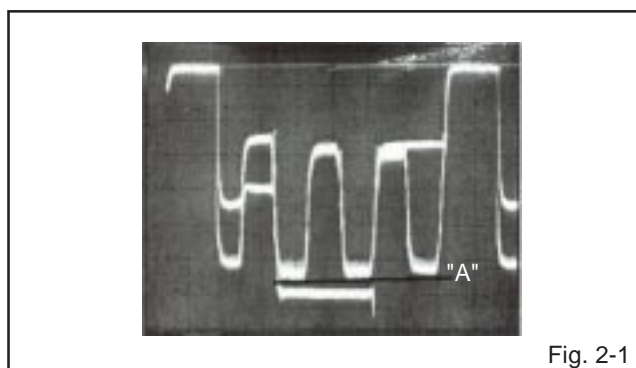


Fig. 2-1

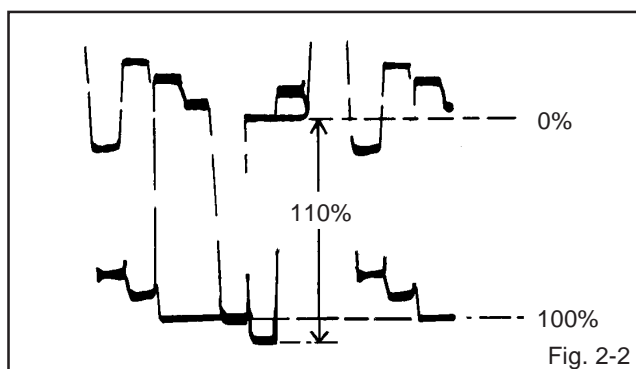


Fig. 2-2

2-6: HORIZONTAL PHASE

1. Receive the center cross signal from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H PHASE".
3. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-7: VERTICAL SIZE

NOTE: Adjust after performing adjustments in section 2-6

1. Receive the crosshatch signal from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V SIZE".
3. Press the VOL. UP/DOWN button on the remote control until the rectangle on the center of the screen becomes square.
4. Receive a broadcast and check if the picture is normal.

2-8: VERTICAL SHIFT

NOTE: Adjust after performing adjustments in section 2-7

1. Receive the crosshatch signal from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V SHIFT".
3. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

2-9: OSD HORIZONTAL

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

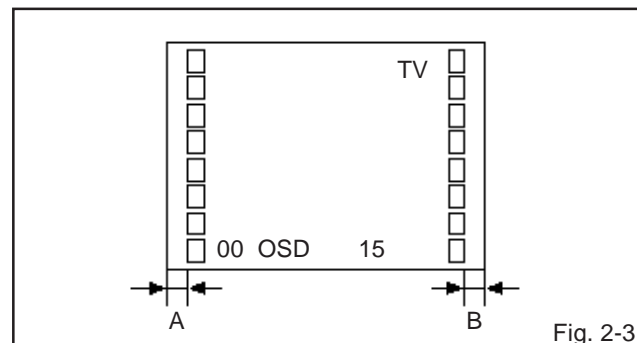


Fig. 2-3

2-10: VIF VCO

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

2-11: SUB BRIGHTNESS NORMAL

1. Place the set with Aging Test for more than 15 minutes.
2. Receive an 70~80dB monoscope pattern. (RF Input)
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRIGHTNESS".
4. Press the VOL. UP/DOWN button on the remote control until the GLAY SCALE begin to shine.
5. Place the set with Aging Test for more than 15 minutes.
6. Receive an 70~80dB monoscope pattern. (Audio Video Input)
7. Press the TV/AV button on the remote control to set to the AV mode. Then perform the above adjustments 3, 4.

2-12: CONTRANT VOLTAGE

1. Using the remote control, set the brightness and contrast to normal position.
2. Connect the digital voltmeter to **TP401**.
3. Set condition is AV MODE without signal.
4. Adjust the **VR501** until the digital voltmeter is $135 \pm 1V$.

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.

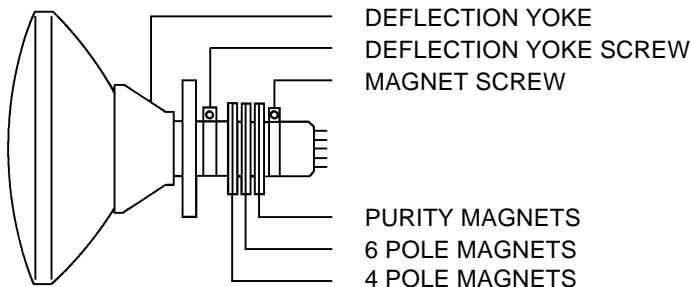


Fig. 3-1

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)**

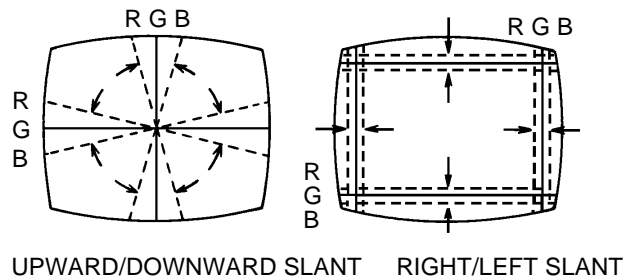


Fig. 3-2-a

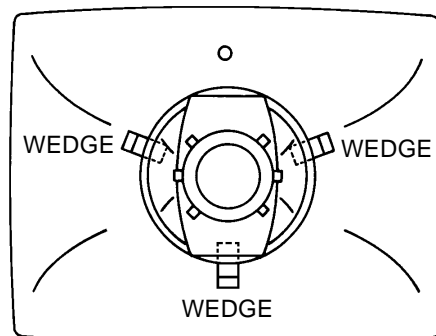
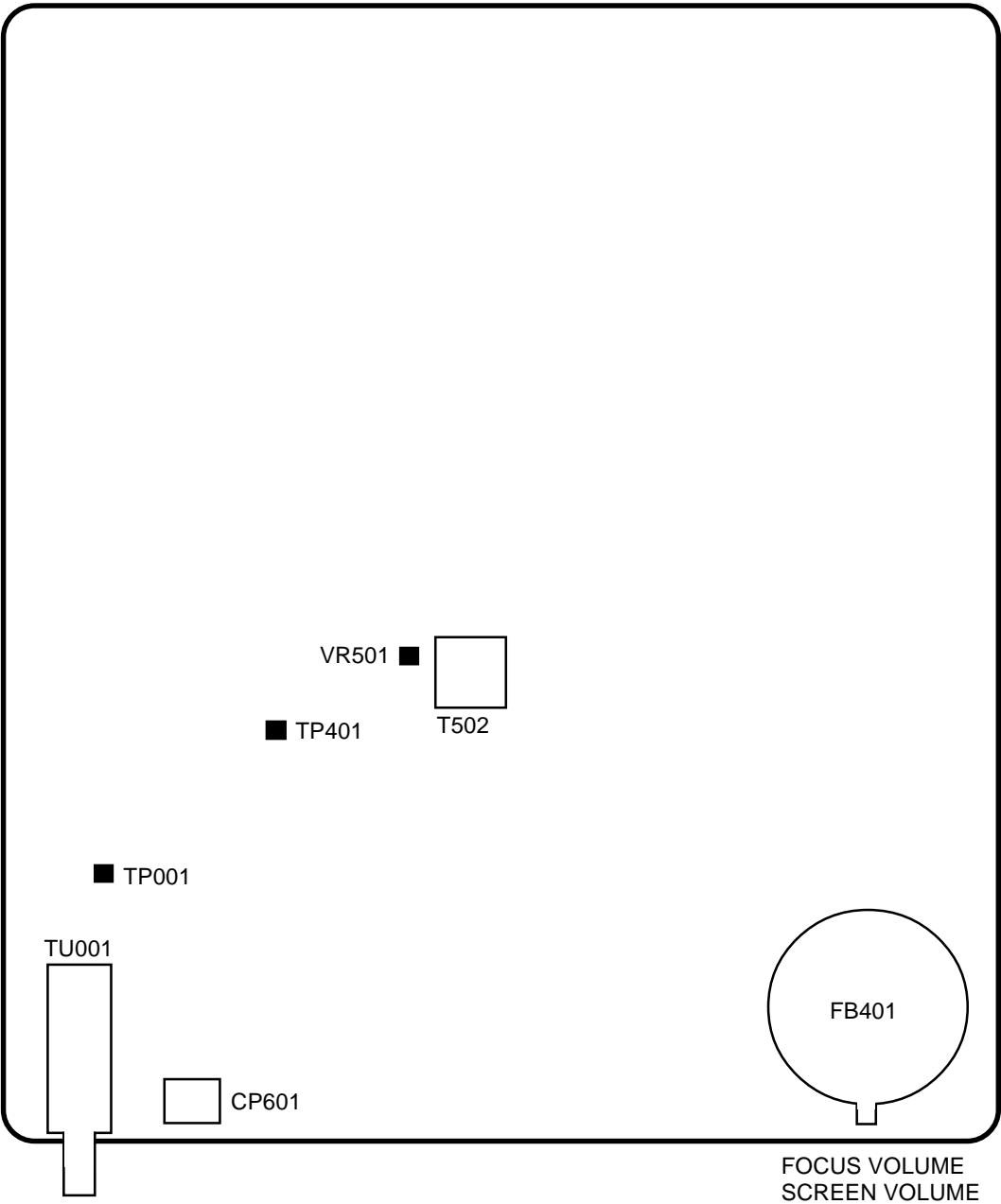
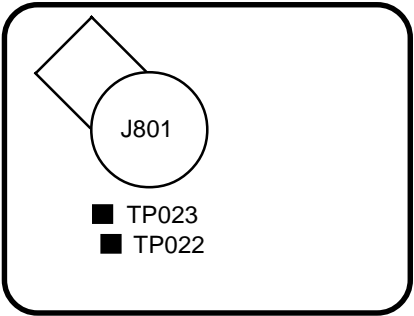


Fig. 3-2-b

MAJOR COMPONENTS LOCATION GUIDE

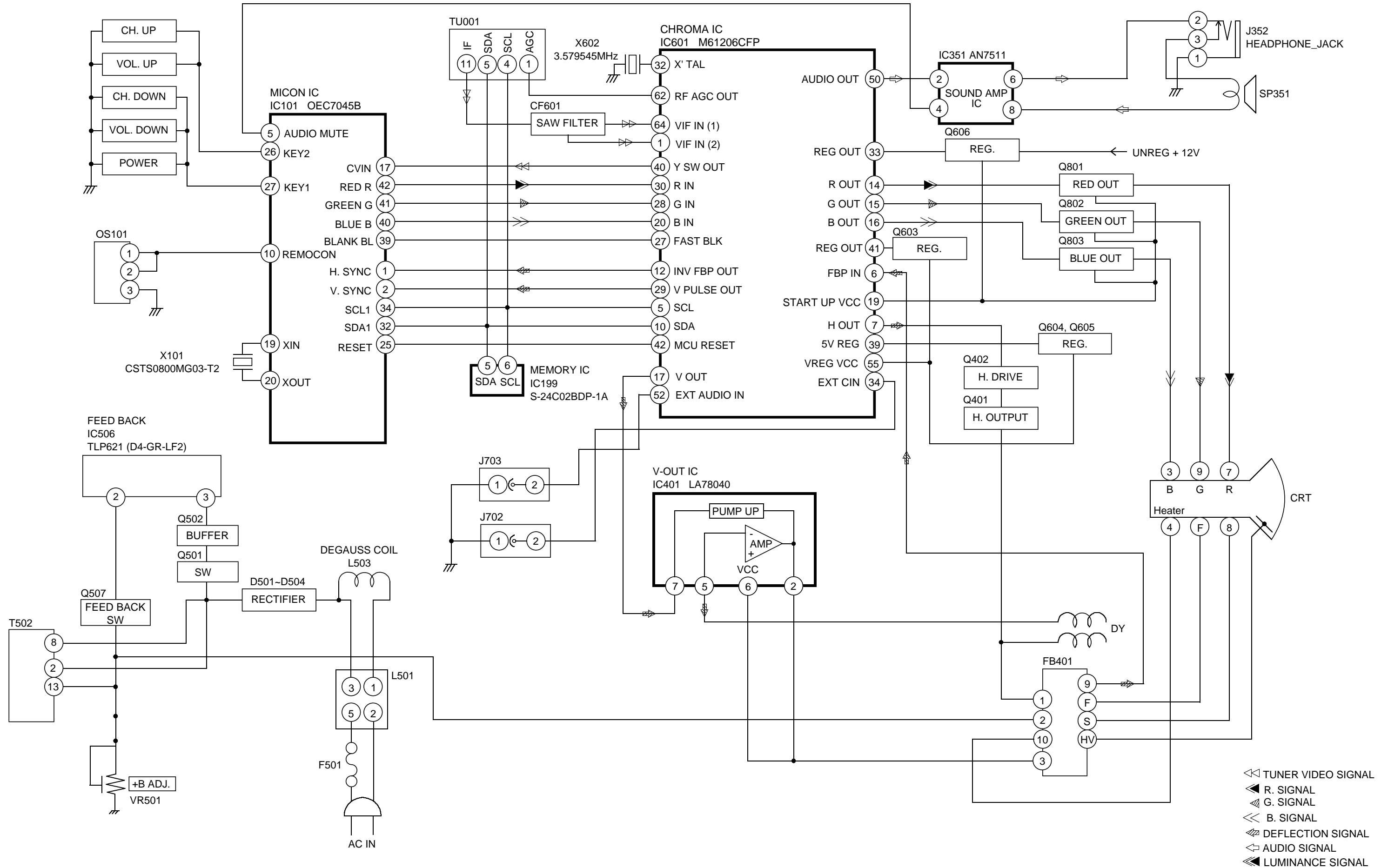


MAIN PCB

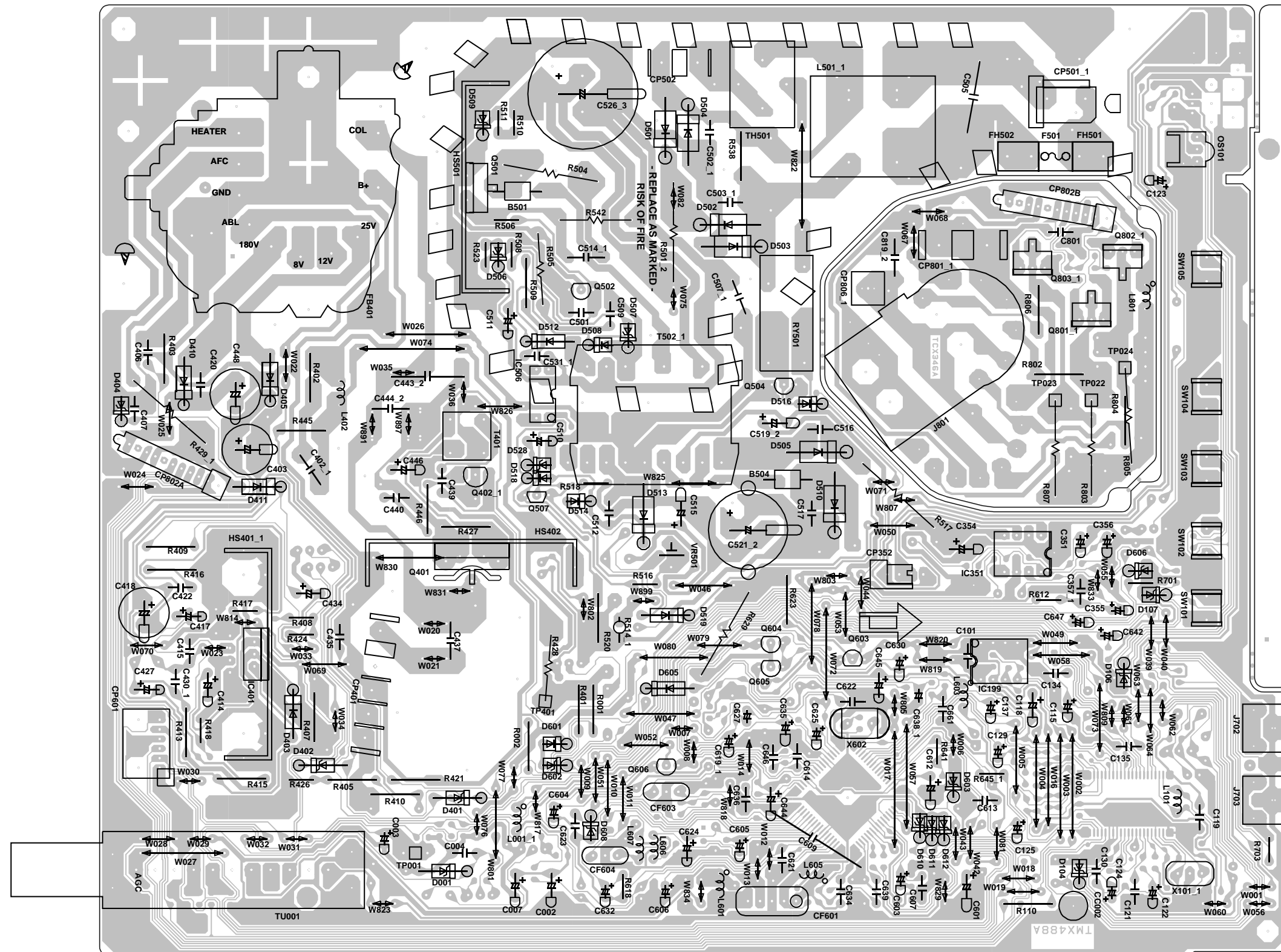


CRT PCB

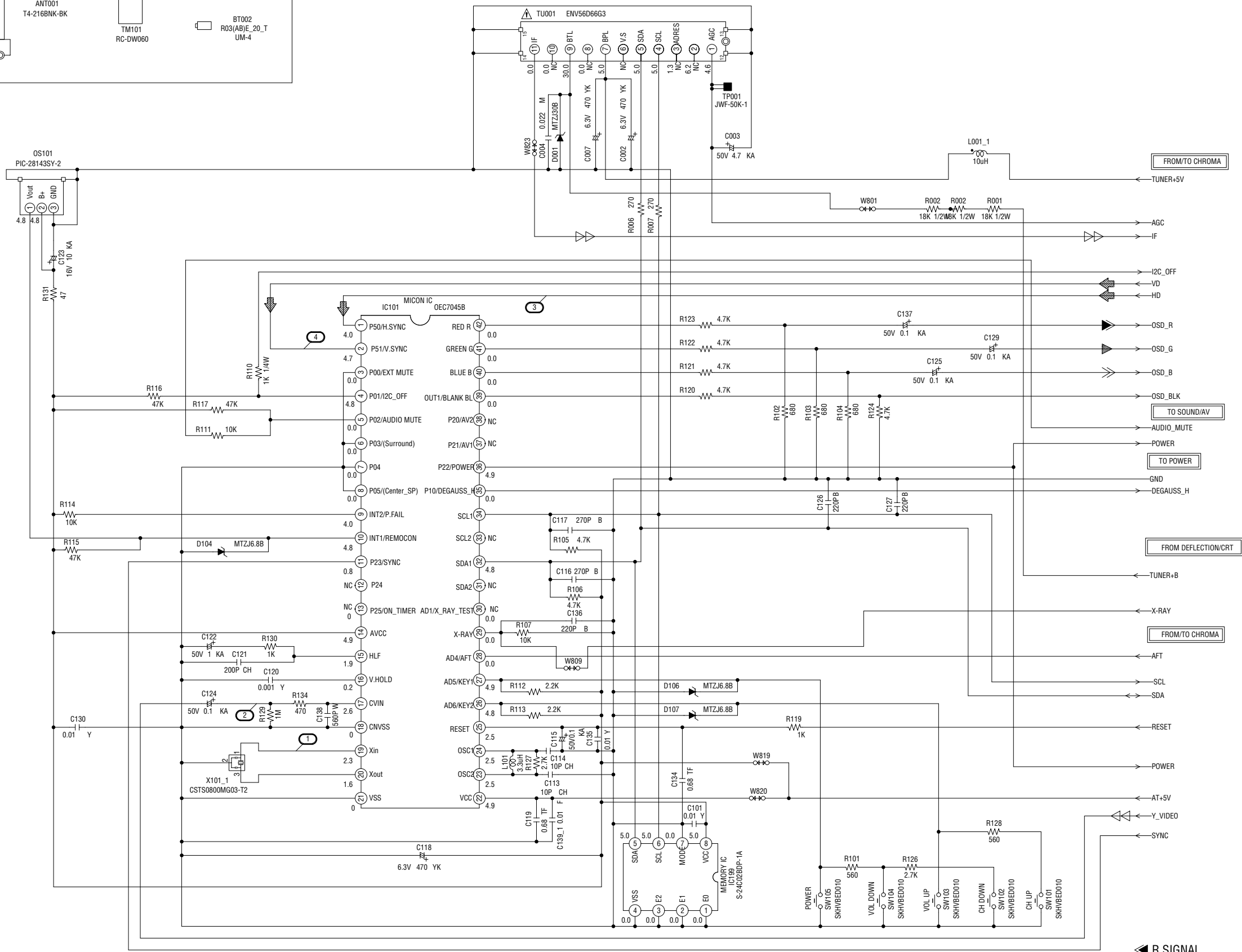
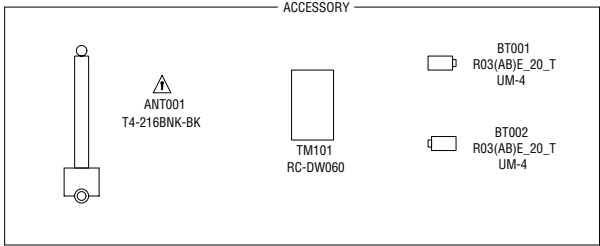
BLOCK DIAGRAM



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



MICON/TUNER 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.

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

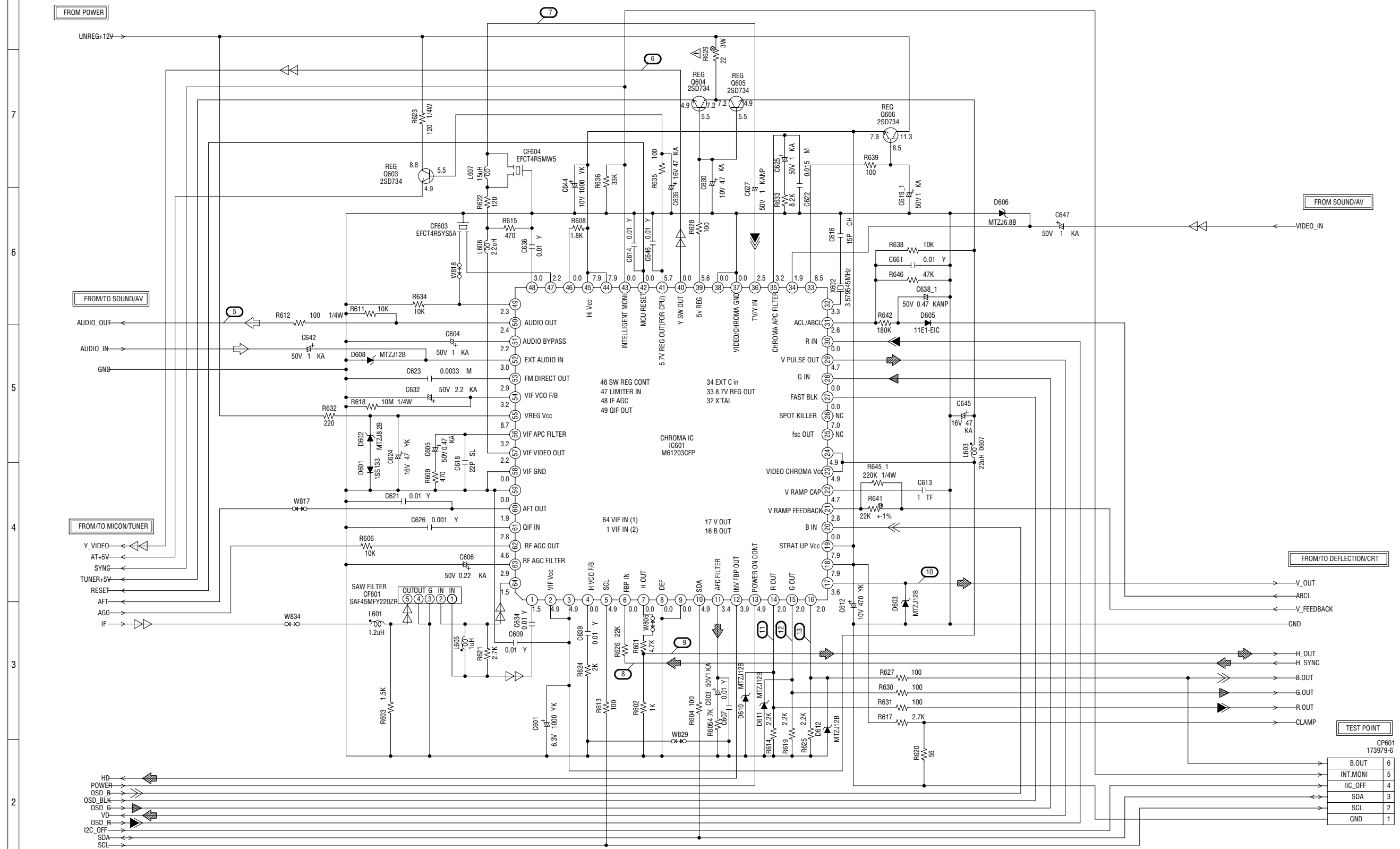
ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES À UN POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

- R.SIGNAL
- G.SIGNAL
- B.SIGNAL
- DEFLECTION SIGNAL
- TUNER VIDEO SIGNAL

PCB010
TMX488

CHROMA 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.

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.

-  DEFLECTION SIGNAL
-  AUDIO SIGNAL
-  LUMINANCE SIGNAL
-  TUNER VIDEO SIGNAL
-  R.SIGNAL
-  G.SIGNAL
-  B.SIGNAL

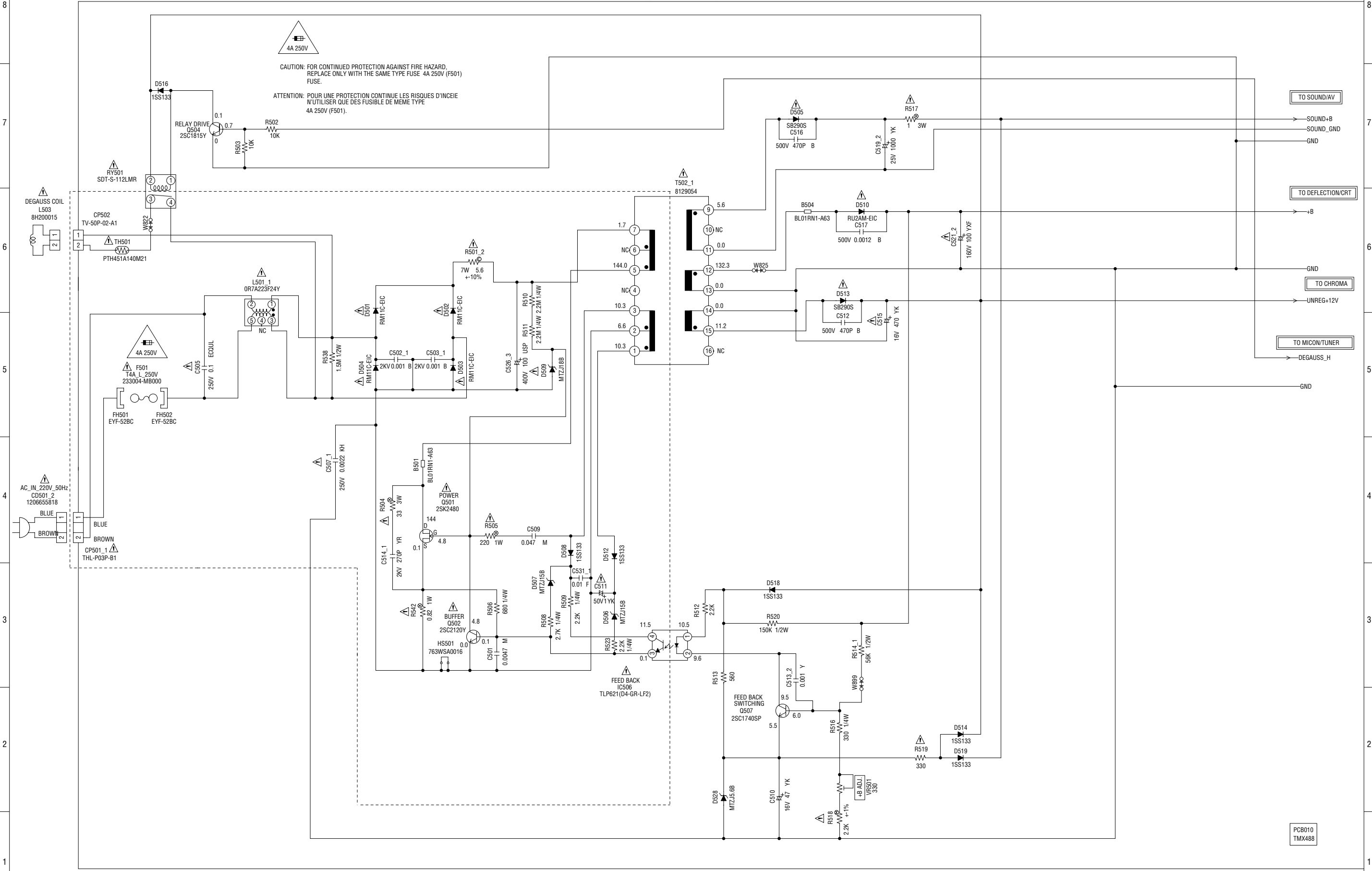
PCB010
TMX488

TEST POINT

CP601
173979-6

B.OUT	6
INT.MONI	5
IIC_OFF	4
SDA	3
SCL	2
GND	1

POWER SCHEMATIC DIAGRAM
(MAIN PCB)



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

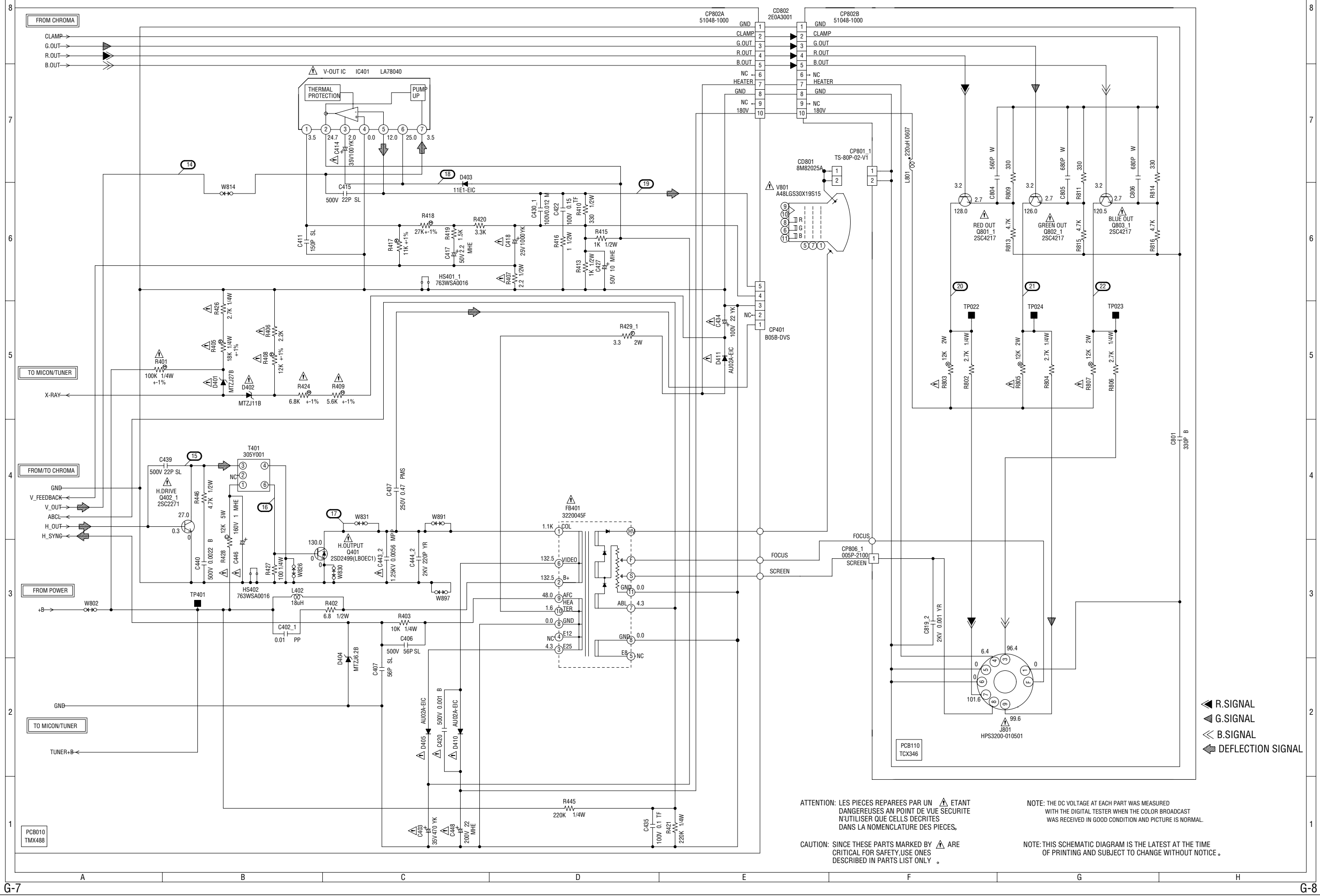
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

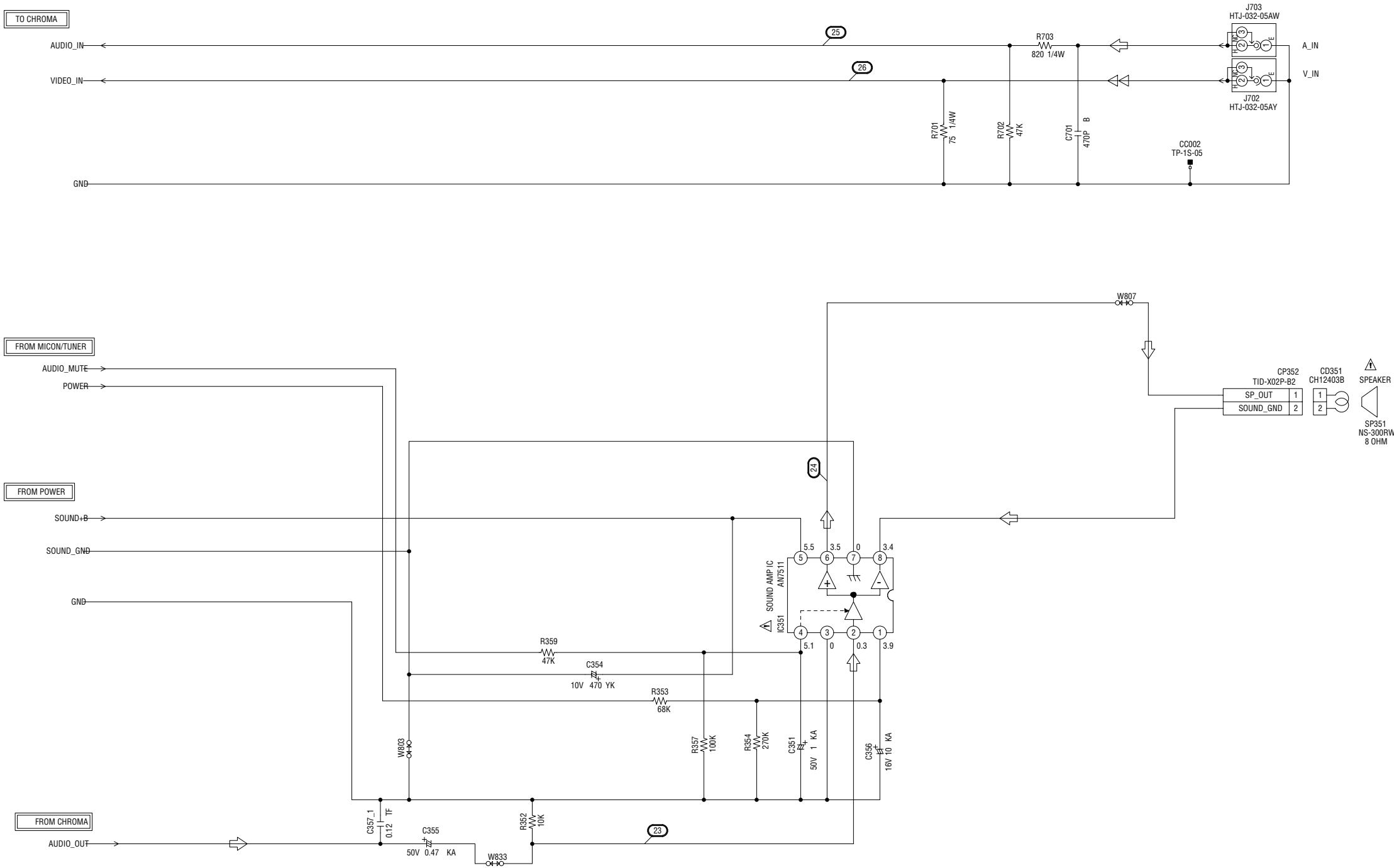
ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

PCB010
TMX488

DEFLECTION/CRT SCHEMATIC DIAGRAM (MAIN PCB)



SOUND/AV SCHEMATIC DIAGRAM
(MAIN PCB)



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

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

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

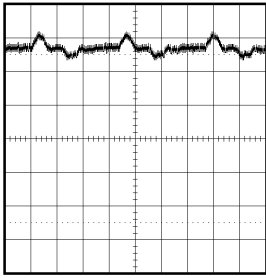
ATTENTION: LES PIECES REPARÉES PAR UN ETANT
DANGEREUSES AN POINT DE VUE SECURITE
N'UTILISER QUE CELLS DECRITES
DANS LA NOMENCLATURE DES PIECES.

AUDIO SIGNAL
 TUNER VIDEO SIGNAL

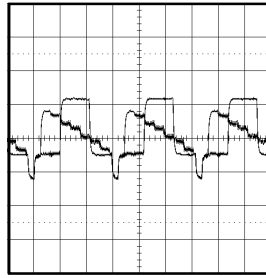
PCB010
TMX488

WAVEFORMS

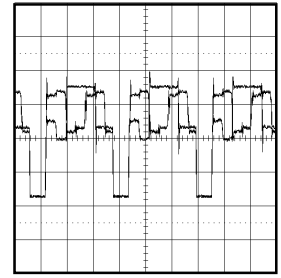
MICON/TUNER



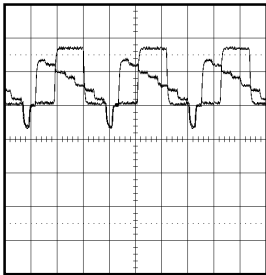
① 200mV 5ms/div



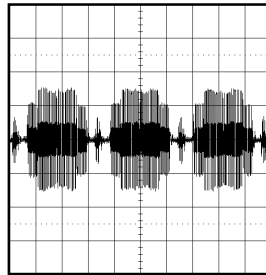
⑥ 0.5V 20μs/div



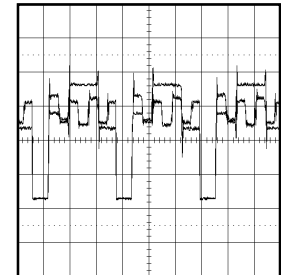
⑪ 1V 20μs/div



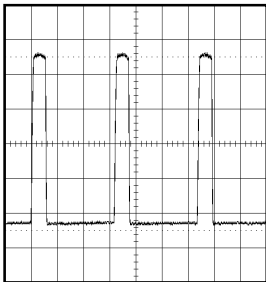
② 0.5V 20μs/div



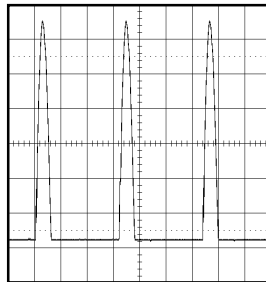
⑦ 200mV 20μs/div



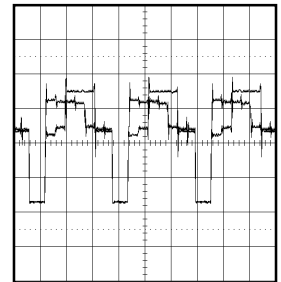
⑫ 1V 20μs/div



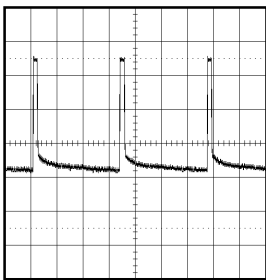
③ 200mV 20μs/div



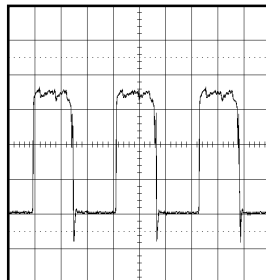
⑧ 20V 20μs/div



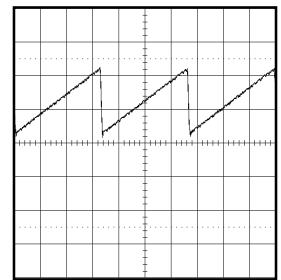
⑬ 1V 20μs/div



④ 200mV 5ms/div

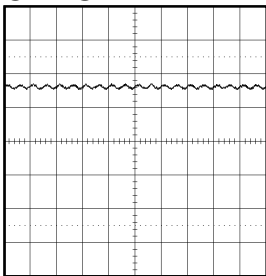


⑨ 200mV 20μs/div

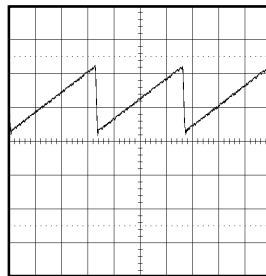


⑭ 0.5V 5ms/div

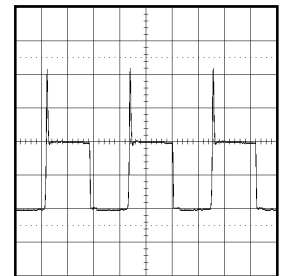
CHROMA



⑤ 0.5V 2ms/div



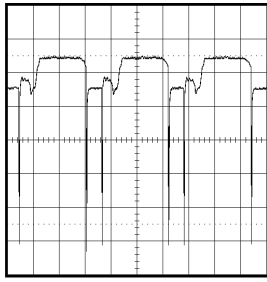
⑩ 0.5V 5ms/div



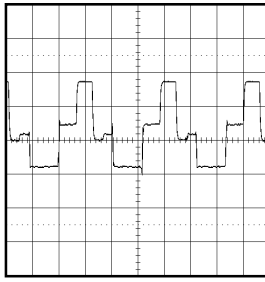
⑮ 20V 20μs/div

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

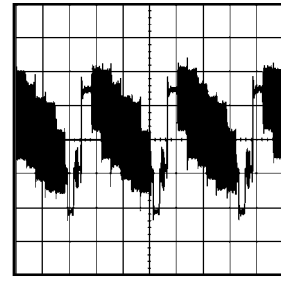
WAVEFORMS



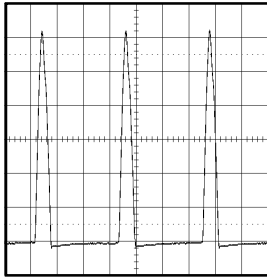
①⑥ 2V 20 μ s/div



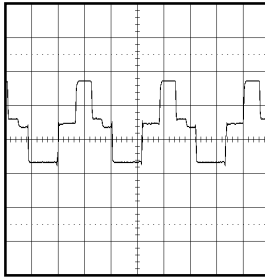
②① 50V 20 μ s/div



②⑥ 500mV 20 μ s/div

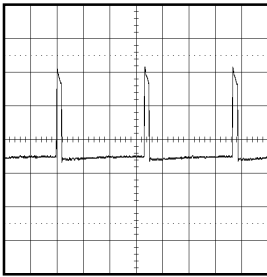


①⑦ 200V 20 μ s/div

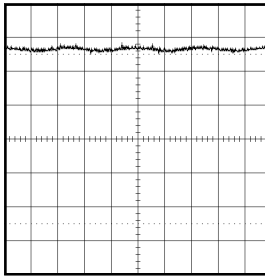


②② 50V 20 μ s/div

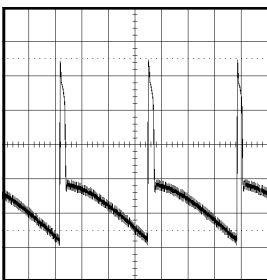
SOUND/AV



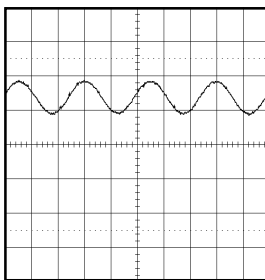
①⑧ 10V 5ms/div



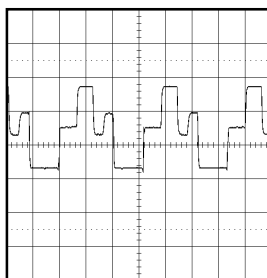
②③ 0.5V 1ms/div



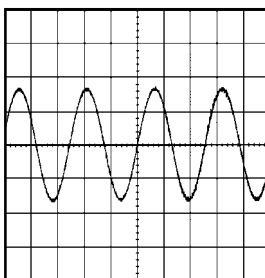
①⑨ 10V 5ms/div



②④ 1V 1ms/div



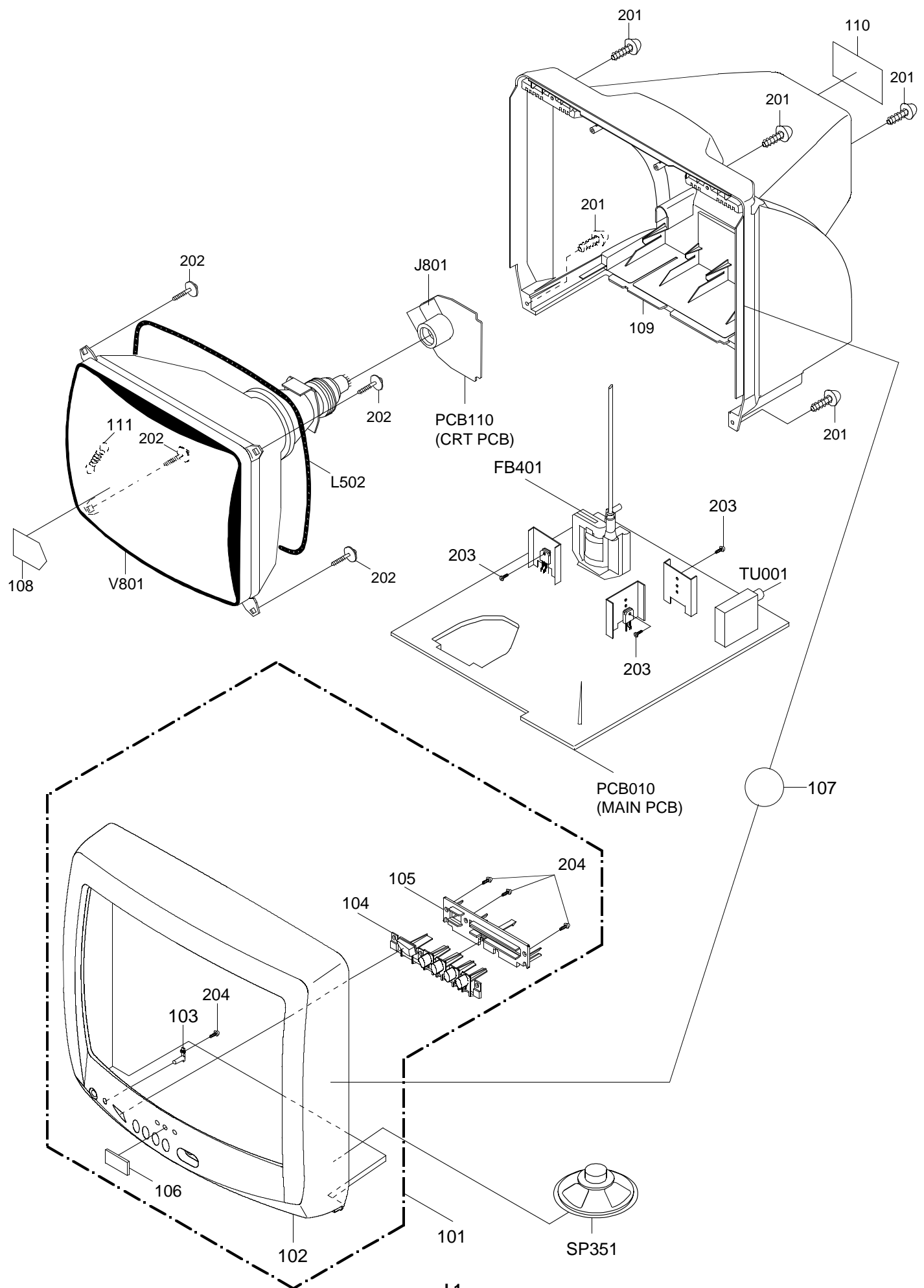
②⑤ 50V 20 μ s/div



②⑤ 500mV 1ms/div

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	A3J114C720	CABINET,FRONT ASSY
102	701WPJB273	CABINET,FRONT
103	713WPAA048	GUIDE,REMOCON
104	735WPBA230	BUTTON,FRAME
105	735WPAA211	BUTTON,BASE
106	711WPCA031	BADGE,BRAND
107	722000A065	GUARANTEE SEAL LABEL
108	723000B512	POP,LABEL
109	702WPAA156	CABINET,BACK
110	722A35A005	SHEET,RATING
111	741WUA0019	SPRING,EARTH
201	8117540A64	SCREW,TAPPING(B0) TRUSS 4x16
202	8121F50B84	SCREW,TAPPING(BO) GW20 FLAT 5x28
203	8109I30A04	SCREW,TAP TITE(B) WH7 3x10
204	8110630A04	SCREW,TAP TITE(P) BRAZIER 3x10
---	791WHAA017	LAMIFILM BAG
---	792WHAA050	PACKAGE, TOP
---	792WHAA051	PACKAGE,BOTTOM
---	793WCDA984	GIFT BOX
---	JB5K0200	POLYBAG
---	J3J02201	INSTRUCTION BOOK
---	J3J02202	WARRANTY CARD
---	A3J022C975	INSTRUCTION BOOK KIT

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
RESISTORS				DIODES			
△ R401	R4X5T4104F	R,METAL	100K OHM 1/4W	△ D513	D2WXB290S0	DIODE,SILICON	SB290S
△ R405	R4X5T4183F	R,METAL	18K OHM 1/4W	D514	D1VT001330	DIODE,SILICON	1SS133T-77
△ R406	R903N8222J	RC	2.2 OHM 1/8W	D516	D1VT001330	DIODE,SILICON	1SS133T-77
△ R407	R002T22R2J	RC	2.2 OHM 1/2W	D518	D1VT001330	DIODE,SILICON	1SS133T-77
△ R408	R4X5T6123F	R,METAL	12K OHM 1/6W	D519	D1VT001330	DIODE,SILICON	1SS133T-77
△ R409	R4X5T6562F	R,METAL	5.6K OHM 1/6W	D528	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
△ R424	R4X5T6682F	R,METAL	6.8K OHM 1/6W	D601	D1VT001330	DIODE,SILICON	1SS133T-77
△ R426	R002T4272J	RC	2.7K OHM 1/4W	D602	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
△ R428	R5W2CD123J	R,CEMENT	12K OHM 5W or	D603	D97U01201B	DIODE,ZENER	MTZJ12B T-77
	R5X2CD123J	R,CEMENT	12K OHM 5W	D605	D2WT011E10	DIODE,SILICON	11E1-EIC
R429	R6558A3R3J	R,FUSE	3.3 OHM 2W	D606	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
△ R501	R5W2CE5R6K	R,CEMENT	5.6 OHM 7W	D608	D97U01201B	DIODE,ZENER	MTZJ12B T-77
△ R504	R3X28B330J	R,METAL OXIDE	33 OHM 3W	D610	D97U01201B	DIODE,ZENER	MTZJ12B T-77
△ R505	R3X181221J	R,METAL OXIDE	220 OHM 1W	D611	D97U01201B	DIODE,ZENER	MTZJ12B T-77
R509	R002T4222J	RC	2.2K OHM 1/4W	D612	D97U01201B	DIODE,ZENER	MTZJ12B T-77
△ R517	R3X28B010J	R,METAL	1 OHM 3W	ICS			
△ R518	R4X5T6222F	R,METAL	2.2K OHM 1/6W	IC101	I56F07045B	IC	OEC7045B
△ R519	R903N8331J	RC	330 OHM 1/8W	IC199	A3J113C015	IC	S-24C02BDP-1A
R523	R002T4222J	RC	2.2K OHM 1/4W	△ IC351	I01DP75110	IC	AN7511
△ R542	R3X181R82J	R,METAL OXIDE	0.82 OHM 1W	△ IC401	I03TD80400	IC	LA78040
△ R629	R3X28B220J	R,METAL	22 OHM 3W	△ IC506	0002500560	PHOTO COUPLER	TLP621(D4-GR-LF2)
△ R803	R3X18A123J	R,METAL OXIDE	12K OHM 2W	IC601	I06FC1203C	IC	M61203CFP
△ R805	R3X18A123J	R,METAL OXIDE	12K OHM 2W	TRANSISTORS			
△ R807	R3X18A123J	R,METAL OXIDE	12K OHM 2W	△ Q401	TDUU024990	TRANSISTOR SILICON	2SD2499(LB0EC1)
CAPACITORS				△ Q402	TC3T022710	TRANSISTOR,SILICON	2SC2271(D,E)-AE
C402	P3N1F5103J	CPP	0.01 UF 630V	△ Q501	T22F024800	FET	2SK2480
△ C403	E02LT4471M	CE	470 UF 35V	△ Q502	TC5T021204	TRANSISTOR,SILICON	2SC2120Y(TPE2)
△ C414	E02LT4101M	CE	100 UF 35V	Q504	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
△ C418	E02LF3102M	CE	1000 UF 25V	Q507	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP(R,S) TP
△ C420	C0JTB0513K	CC	0.001 UF 500V B	Q603	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
△ C434	E02LT8220M	CE	22 UF 100V	Q604	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
C437	P4J7F3474J	CMPP	0.47 UF 250V PMS	Q605	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
△ C443	P4N8FJ562H	CMPP	0.0056UF 1.25KV	Q606	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
C444	C0JLYR7H2K	CC	220 PF 2KV YR	△ Q801	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
△ C446	E5EZTB010M	CE	1 UF 160V or	△ Q802	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
	E53ZTB010M	CE	1 UF 160V VZ or	△ Q803	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
	E53ZTD010M	CE	1 UF 250V VZ	COILS & TRANSFORMERS			
△ C448	E5EZTC220M	CE	22 UF 200V	L001	021673100K	COIL	10 UH
C502	C0JBB0713K	CC	0.001 UF 2KV B	L101	021LA63R3K	COIL LAP02TA3R3K	3.3 UH
C503	C0JBB0713K	CC	0.001 UF 2KV B	L402	02186G180M	COIL	18 UH
△ C505	P2122B104M	CMP	0.1 UF 250V EC or	△ L501	029T000094	COIL,LINE FILTER	0R7A223F24Y
	P2472B104M	CMP	0.1 UF 275V PH	△ L503	028H200015	COIL,DEGAUSS	8H200015
△ C507	CB3LE0MH3M	CC	0.0022UF 250V	L601	0216731R2K	COIL	1.2 UH
C510	E02LT2470M	CE	47 UF 16V	L603	02167D220K	COIL	22 UH
△ C511	E02LT5010M	CE	1 UF 50V or	L605	0216731R0K	COIL	1 UH
	E53ZT5010M	CE	1 UF 50V VZ	L606	021LA62R2K	COIL	2.2 UH
C514	C0JLYR7K2K	CC	270 PF 2KV YR	L607	021LA6150K	COIL	15 UH
△ C515	E02LT2471M	CE	470 UF 16V	L801	02167D221K	COIL	220 UH
C519	E02LT3102M	CE	1000 UF 25V	T401	03305Y0018	TRANS,HORIZONTAL DRIVE	305Y001
△ C521	E62NFB101M	CE	100 UF 160V	△ T502	0481290546	TRANSFORMER,SWITCHING	8129054
C526	E52C0H101M	CE	100 UF 400V	JACKS			
C609	CHG0Y0214M	CC	0.01 UF 16V Y	J702	060G421016	RCA JACK	HTJ-032-05AY
C644	E02L01102M	CE	1000 UF 10V	J703	060G421017	RCA JACK	HTJ-032-05AW
C819	C0JLYR713K	CC	0.001 UF 2KV YR	△ J801	066X120014	SOCKET,CATHODE RAY TUBE	HPS3200-010501
DIODES				SWITCHES			
D001	D97U03001B	DIODE,ZENER	MTZJ30B T-77	SW101	0504201T31	SWITCH,TACT	SKHVBED010
D104	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	SW102	0504201T31	SWITCH,TACT	SKHVBED010
D106	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	SW103	0504201T31	SWITCH,TACT	SKHVBED010
D107	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77	SW104	0504201T31	SWITCH,TACT	SKHVBED010
△ D401	D97U02701B	DIODE,ZENER	MTZJ27B T-77	SW105	0504201T31	SWITCH,TACT	SKHVBED010
△ D402	D97U01101B	DIODE,ZENER	MTZJ11B T-77	VARIABLE RESISTOR			
D403	D2WT011E10	DIODE,SILICON	11E1-EIC	VR501	V1163L2BTC	VOLUME,SEMI FIXED	EVNCYAA03BY2
D404	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77	P.C.BOARD ASSEMBLIES			
△ D405	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	PCB010	A3J113C01A	PCB ASS'Y	TMX488A
△ D410	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	PCB110	A3J113C11A	PCB ASS'Y	TCX346A
△ D411	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	MISCELLANEOUS			
△ D501	D2WTRM11C0	DIODE,SILICON	RM11C-EIC	△ ANT001	125C108027	ANTENNA ROD	T4-216BNK-BK
△ D502	D2WTRM11C0	DIODE,SILICON	RM11C-EIC	B501	024AT03655	CORE BEADS	BL01RN1-A63T6
△ D503	D2WTRM11C0	DIODE,SILICON	RM11C-EIC	B504	024AT03655	CORE BEADS	BL01RN1-A63T6
△ D504	D2WTRM11C0	DIODE,SILICON	RM11C-EIC	BT001	1412004008	BATTERY,MANGAN	R03(AB)E_20_T
△ D505	D2WXB290S0	DIODE,SILICON	SB290S	BT002	1412004008	BATTERY,MANGAN	R03(AB)E_20_T
D506	D97U01501B	DIODE,ZENER	MTZJ15B T-77	CD351	06CH12403B	CORD CONNECTOR	CH12403B or
D507	D97U01501B	DIODE,ZENER	MTZJ15B T-77		068112403A	CORD CONNECTOR	068112403A
D508	D1VT001330	DIODE,SILICON	1SS133T-77	△ CD501	1206655818	CORD AC	1206655818
△ D509	D97U01801B	DIODE,ZENER	MTZJ18B T-77	CD801	068M82025A	CORD CONNECTOR	8M82025A
△ D510	D2WXRU2AM0	DIODE,SILICON	RU2AM-EIC	CF601	1022T45R72	FILTER,SAW	SAF45MFY220ZR
D512	D1VT001330	DIODE,SILICON	1SS133T-77	CF603	1011T4R504	FILTER,CERAMIC	EFCT4R5YS5A

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
MISCELLANEOUS			
	CF604	FILTER,CERAMIC	EFCT4R5MW5
	CP352	CONNECTOR PCB SIDE	TID-X02P-B2
	CP401	CONNECTOR PCB SIDE	B05B-DVS
△	CP501	CORD UX CONNECTOR	THL-P03P-B1
	CP502	CONNECTOR PCB SIDE	TV-50P-02-A1
	CP601	CONNECTOR PCB SIDE	173979-6
	CP801	CONNECTOR PCB SIDE	TS-80P-02-V1
	CP806	CONNECTOR PCB SIDE	005P-2100
	CP802A	WIRE HOLDER	51048-1000
	CP802B	WIRE HOLDER	51048-1000
△	F501	FUSE	218004
△	FB401	TRANSFORMER FLYBACK	3220045F
	FH501	HOLDER,FUSE	EYF-52BC
	FH502	HOLDER,FUSE	EYF-52BC
	OS101	REMOTE RECEIVER	PIC-28143SY-2
△	RY501	RELAY	SDT-S-112LMR
△	SP351	SPEAKER	NS-300RW
△	TH501	DEGAUSS ELEMENT	PTH451A140M21
	TM101	TRANSMITTER	RC-DW060
△	TU001	TUNER,VHF-UHF	ENV56D66G3
△	V801	CRT W/DY	A48LGS30X19S15
	X101	CERAMIC OSCILLATOR	CSTS0800MG03-T2
	X602	CRYSTAL	HC-49/C

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

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

SPEC.NO.	M3J1-14C
O/R NO.	W143004