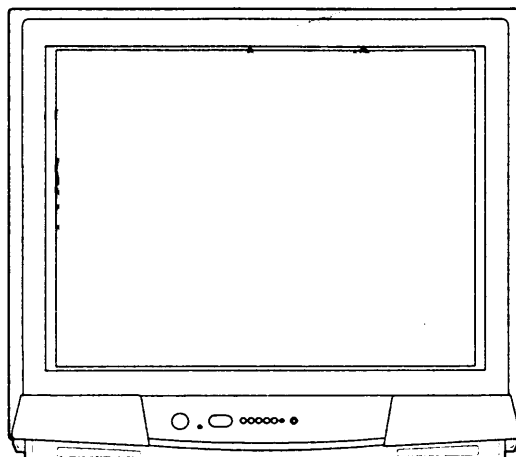




Service Manual

COLOUR TV



MODEL

CT-21AM4(AZ)**CAUTION**

Before servicing this chassis, it is important that the service person reads the "SAFETY PRECAUTIONS" in this service manual.

SPECIFICATIONS

- | | | | |
|-----------------|---|---------------------|-------------------------------|
| • Power Input | : AC 200~240V ; 50/60Hz | • Chassis | : A7 |
| • Power | : 93W | • Picture tube | : A51LEC098X |
| • Consumption | | • Cabinet | : 507(W) × 455(H) × 476(D) mm |
| • Reception | : CCIR-B/G | • Dimensions | |
| • System | | • Weight (Approx.): | : 18.7kg |
| • Colour System | : PAL 3.58 & 4.43 NTSC
(only video input signal) | | |
| • Reception | : VHF 44~470MHz | | |
| • Frequency | : UHF 470~862MHz | | |
| • Aerial Input | : 75Ω | | |
| • Speaker | : 80mm Round type, 1 pc. | | |

- Weight and dimensions shown are approximate.
- Design and specifications are subject to change without notice.


MITSUBISHI ELECTRIC

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SAFETY PRECAUTIONS

NOTICE: Observe all cautions and safety related notes located inside the cabinet and on the chassis.

WARNING

1. An isolation transformer should be used between the television receiver and the AC supply point before any test/service is performed on a LIVE chassis television receiver.
2. Operation of these receivers outside the cabinet or with the cover removed, involves a shock hazard from the receiver power supplies. Work on the receiver should not be attempted by anyone who is not thoroughly familiar with precautions necessary when working on high voltage equipment.
3. Do not install, remove or handle the picture tube in any manner unless shatter-proof goggles are worn. People not so equipped should be kept away while the picture tube is being handled. Keep the picture tube away from the body while handling.
4. When service is required, observe the original lead dressing. Extra precaution should be given to assure correct lead dressing in the high voltage area. Where a short-circuit has occurred, replace those components that indicate evidence of overheating.

X-RADIATION WARNING

The surface of the cathode ray tube may generate X-Radiation. Take precautions when servicing and, if possible, the use of a lead apron is recommended for shielding while handling.

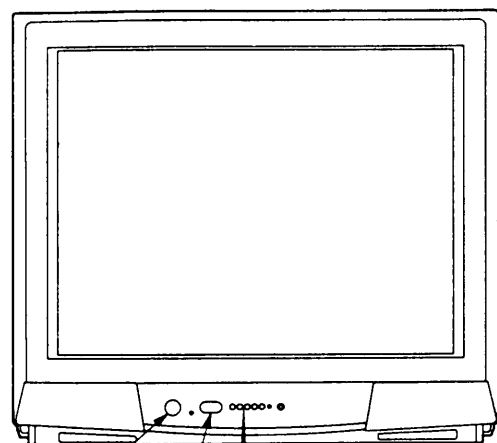
When replacing the cathode ray tube use only the designated replacement part since it is a critical component with regard to X-Radiation as noted above. No high-voltage adjustments are provided.

LEAKAGE CURRENT COLD CHECK

Before returning the receiver to the customer, it is recommended that leakage current be measured according to the following methods.

With the AC plug removed from the AC source, place a jumper across the two AC plug prongs. Turn the receiver AC switch on. Using an 500V D.C. Insulation Tester, connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (antennas, screwheads, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistance reading of 4 megohm. Any resistance below this value indicates an abnormality which requires corrective action.

CONTROLS AND CABINET PARTS



Mains Switch

Remote Contorol
sensor

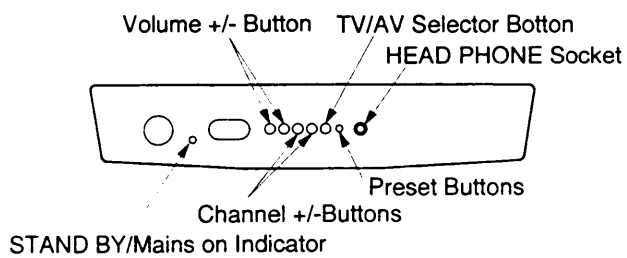
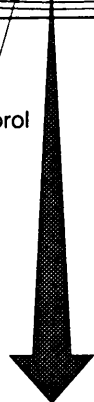


Fig. 1-1

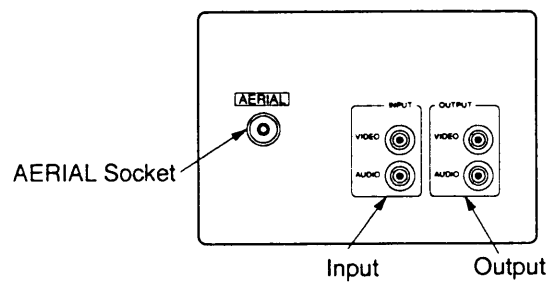
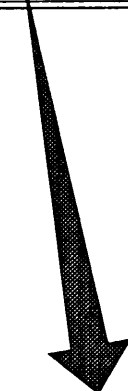
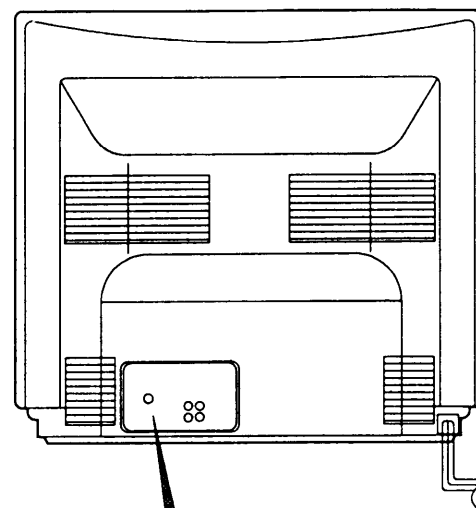


Fig. 1-2

LEAD DRESS

The Lead Wires to be clamped are listed in the table below.

Note: The inner wires are clamped so that they do not come close to heat generating or high voltage parts. After servicing route all wires in their original position.

* The Anode Lead Wire is routed so that no tensile strength is applied to the Anode cap. If the route of the Anode Lead Wire is changed, return it to the initial route shown below.

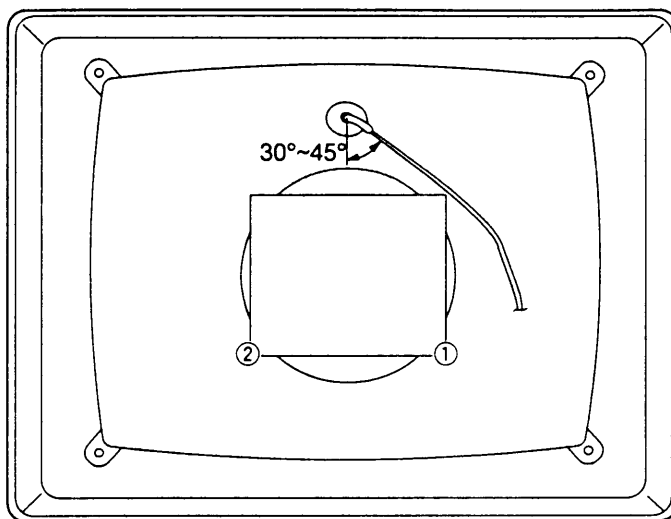


Fig. 2

LEAD WIRE	CLAMP
Focus Lead Wire	①
Screen Lead Wire	①
GA	②
GP	②

Table 1

REMOVING THE SPEAKER

To remove the Speaker, follow the steps below.

1. Remove the Speaker Holder shown in Fig. 3 in the direction shown by arrow.
2. Remove the Speaker shown in Fig. 3.

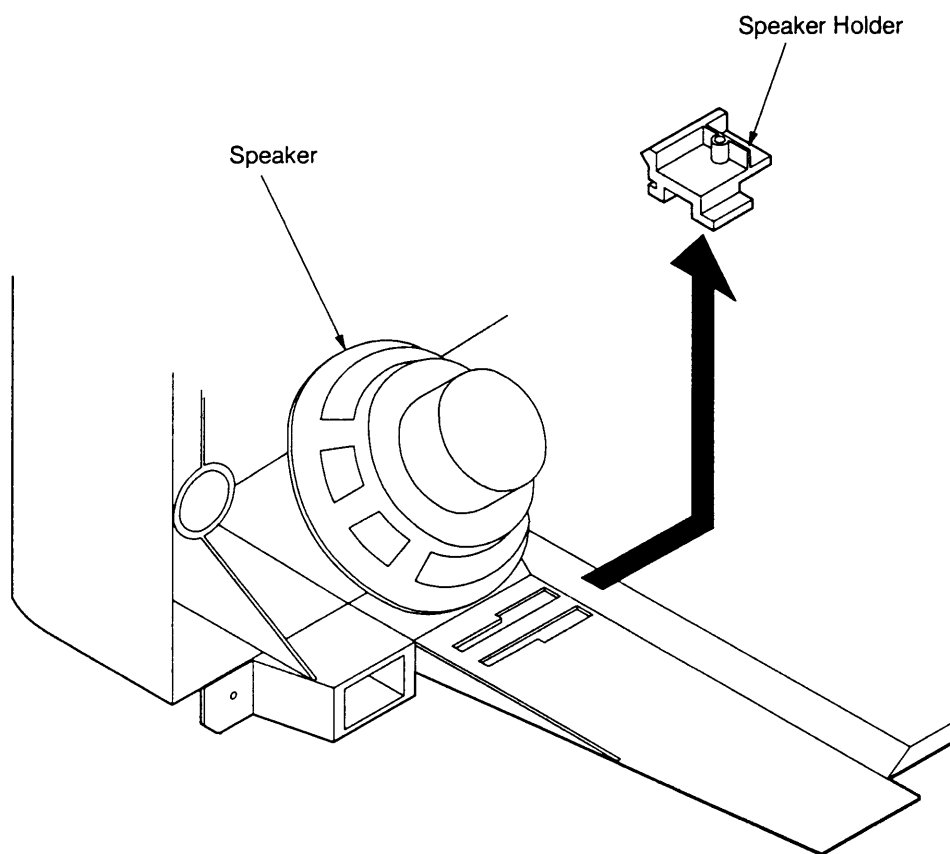


Fig. 3

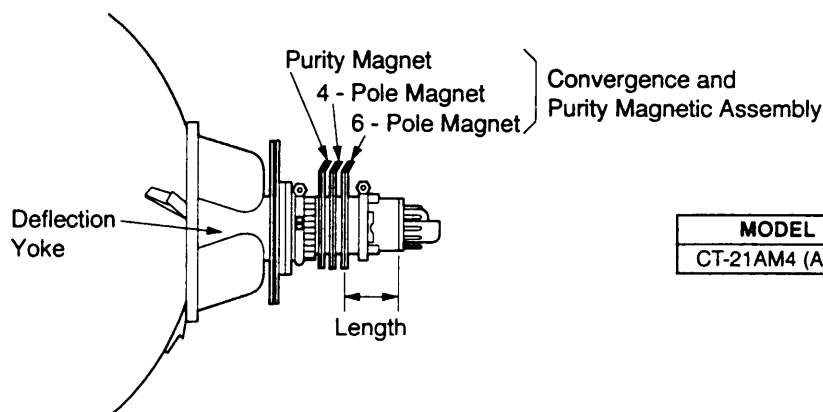
ITC ADJUSTMENTS

- ITC adjustments should be performed in the following sequence after replacing either the CRT, Deflection Yoke or Convergence and Purity Magnetic Assembly.

When not replacing parts, perform the necessary adjustment only.

- Installation

- Put the Deflection Yoke on the neck of the CRT, fully forward against the cone.
- Put the Convergence and Purity Magnetic Assembly on the neck of the CRT so that the distance between the 6-Pole Magnet and the base of the tube is as indicated in Table, and tighten the screw lightly.



MODEL	LENGTH
CT-21AM4 (AZ)	40.0 ± 1.0 mm

- Preliminary Adjustment

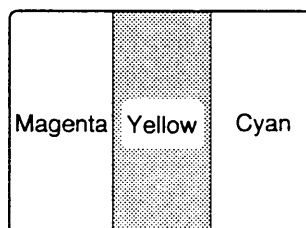
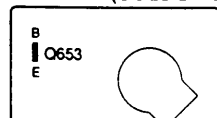
- Position the receiver with the CRT facing East or West.
- Degauss not only front and rear of the CRT but also the CRT holder, the chassis and front and sides of the cabinet.
Don't allow the degaussing coil near the Deflection Yoke.
(Insufficient degaussing causes magnetisation, giving an unfavorable effect on colour purity adjustment.)
- Run the picture tube for more than thirty minutes with a white raster signal applied giving normal beam current flow.
- Make sure that all electrical adjustments have been performed.

1. Purity	Adjustment purpose Insure the R, G and B beams land on their respective phosphorus.
	Symptom when incorrectly adjusted Colour patches appears, poor white uniformity.

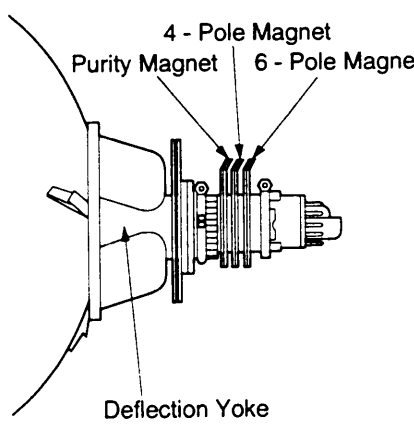
Input signal	VIDEO signal (yellow raster)
Input terminal	VIDEO IN terminal

- Supply a VIDEO signal (yellow raster).
To produce a yellow raster from white raster, short circuit the Base/Emitter junction of the BLUE output transistor Q653 on PCB-CRT.
- Press the "PICTURE" button on a remote hand unit to select "NATURAL".
- With the Deflection Yoke positioned fully forward, adjust the Purity Magnet so that the yellow bar is at the centre of the screen with normal vertical centring.
- Slide the Deflection Yoke slowly backwards to produce a uniform yellow raster.
- Tighten the Deflection Yoke in position.
- Supply a VIDEO signal for red raster, green raster and blue raster respectively to confirm no contamination is observed in each colour.
Adjust again the steps 1 through 5, if observed.

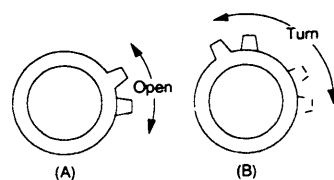
PCB-CRT (SOLDER SIDE)



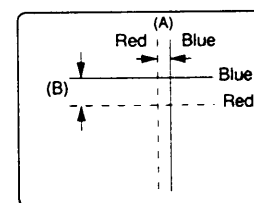
2. Static Convergence		Adjustment purpose Correct any colour misconvergence that occurs in the centre of the screen. Symptom when incorrectly adjusted Colour edging of objects in the main picture area.
Input signal	VIDEO signal (crosshatch)	<ol style="list-style-type: none"> 1. Supply a VIDEO signal (crosshatch). 2. Press the "PICTURE" button on a remote hand unit to select "NATURAL". 3. Adjust the angle between the tabs of the 4-Pole Magnet and the angular position to converge the "B" and "R" beams on the screen. 4. Adjust the angle between the tabs of the 6-Pole Magnet and the "B" and "R" beams to the "G" beam at the centre of the screen. 5. Make sure that purity in each colour "R", "G" and "B" is maintained. If necessary, repeat item 1 (Purity) and item 2 (Static Convergence).
Input terminal	VIDEO IN terminal	



4 - Pole Magnet
Purity Magnet
6 - Pole Magnet
Deflection Yoke

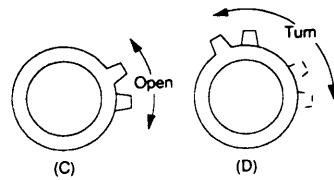


(A) (B)

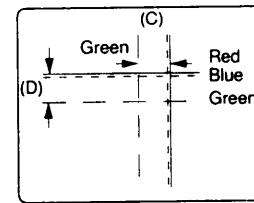


Red Blue
Blue Red

Adjustment by 4-Pole Magnet



(C) (D)

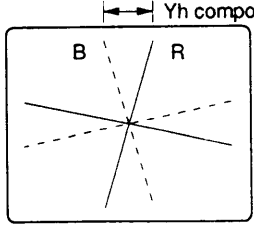


Green Red
Red Blue
Blue Green

Adjustment by 6-Pole Magnet

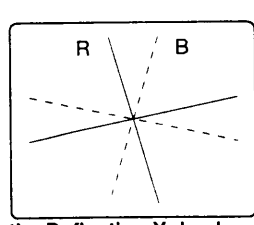
Note: With both 4-Pole and 6-Pole Magnets, converge the vertical line opening the tabs and the horizontal line by turning the tabs.

3. Dynamic Convergence		Adjustment purpose Correct any colour misconvergence that occurs in the centre of the screen. Symptom when incorrectly adjusted Colour edging of objects in the main picture area.
Input signal	VIDEO signal (crosshatch)	<p>* Dynamic convergence is adjusted by swinging the Deflection Yoke. Before this adjustment, make sure the screws fastening the Deflection Yoke is tightened sufficiently.</p> <ol style="list-style-type: none"> 1. Supply a VIDEO signal (crosshatch). 2. Observe both the ends of Y axis and X axis. If the Blue beam and Red beam do not converge horizontally and vertically, turn the Deflection Yoke vertically till the beams converge.
Input terminal	VIDEO IN terminal	



Yh component

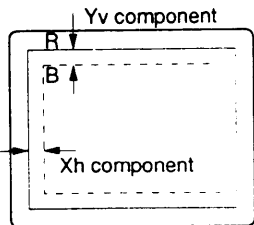
Turn the Deflection Yoke upward



Xv component

Turn the Deflection Yoke downward

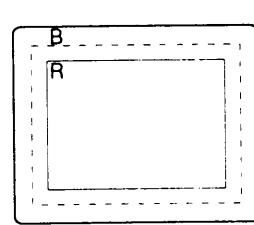
3. Observe both the ends of Y axis and X axis. If the Blue beam or Red beam do not converge on the Green beam horizontally and vertically, turn the Deflection Yoke horizontally till the beams converge.



Yv component

Xh component

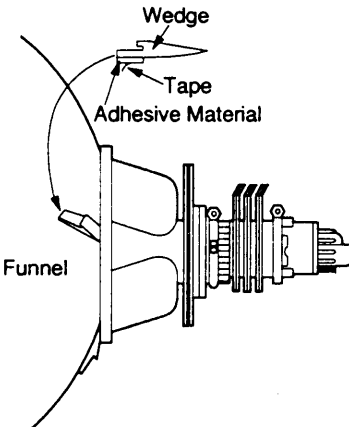
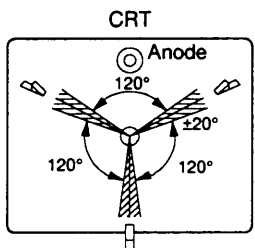
Turn the Deflection Yoke to the left



Xh component

Turn the Deflection Yoke to the right

4. Wedges Position		Adjustment purpose Fix the Deflection Yoke to the funnel of the CRT. Symptom when incorrectly adjusted Poor peripheral convergence and beam landing.
Input signal	—	<ol style="list-style-type: none"> 1. Insert 3 Wedges at approx. Right angles vertically and horizontally allowing no movement, of the Yoke. 2. After the position of the Wedges has been determined, gently turn up the end of the Wedge and strip the tape from the rear of the end to expose the Adhesive Material, then adhere to the funnel of the CRT. 3. Apply, Silicone Adhesive (Part No. 859D106O20) between the Wedges and the funnel of the CRT. 4. Bond the Yoke to the Wedges using contact cement.
Input terminal	—	

Note: Do not reuse Wedges.

ELECTRICAL ADJUSTMENTS

Perform only the alignments required.

If proper equipment is not available, do not attempt an alignment.

☐ Measuring equipment and Jigs

- Oscilloscope (Unless otherwise specified in particular, use 10 : 1 probes)
- Signal generator
- DC milliammeter
- DC voltmeter
- Electrical tools

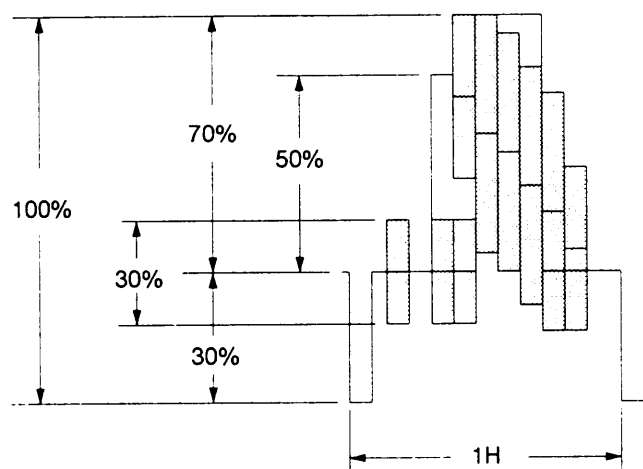
☐ Test signal

1) Monoscope signal

When you have no monoscope signal source for adjustment, connect the unit to a VCR and play an alignment tape (Monoscope).

2) Colour bar signal

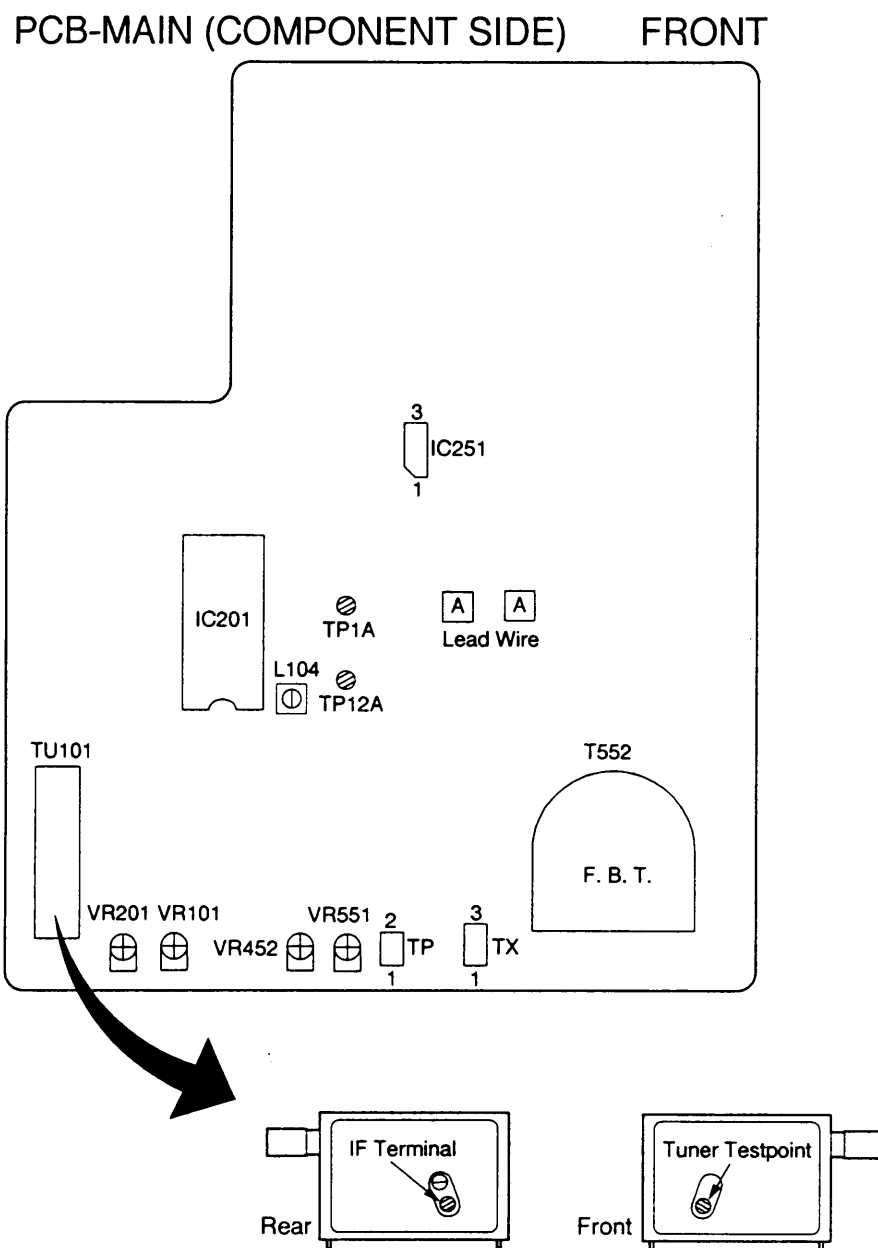
In this manual, unless otherwise specified in particular, use the colour bar signal specified below.



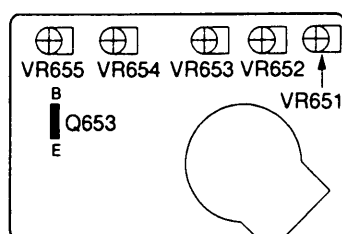
PAL

Split-Field Colour Bars (with 100% window)

Location of Test Points and Adjustments



PCB-CRT (SOLDER SIDE)



Non-User Menu Mode

1. Change to the non-user menu mode

1. Press the "MENU" button on a remote hand unit.
(The "MENU" display will appear.)
2. Press buttons "2", "3", "5" and "7" in order within four seconds.
The screen will change to the non-user menu mode.
If not repeat steps 1 and 2 again.

2. Selection of setting items

Press the "SELECTOR UP/DOWN" buttons to select a specific setting item.

- The selector "UP" button moves the Hi-lighted item up the screen.
- The selector "DOWN" button moves the Hi-lighted item down the screen.

3. Change of data

After selecting a setting item, use the "SELECTOR LEFT/RIGHT" buttons to change setting data.

- The "RIGHT" button changes/increases the setting data.
- The "LEFT" button changes/decreases the setting data.

[Non-user Menu Functions]

INITIAL : OFF/ON
This function reset's all the user adjustments to the factory default settings.

HOTEL LOCK : The HOTEL LOCK has two functions VOLUME and PRESET.

Note : These functions is mostly used in a situation where the customer want's to limit the Sound Output Level and does not want the Preset Channels Tuning to be changed by other users. Before making changes to these two functions please check the customers requirements.

VOLUME : The Volume range can be preset (20 ~ MAX) to the obtainable sound output level as desired.

PRESET : First tune all the desired channels. Then select the Preset to the ON position, this will disable the operation of the Preset button on the receiver.

Once the selection is made and you have exited the non-user mode, the only way to change the data again is to re-enter the non-user menu.

4. Saving of setting data

The newly entered data is automatically stored.

5. To exit the non-user menu mode

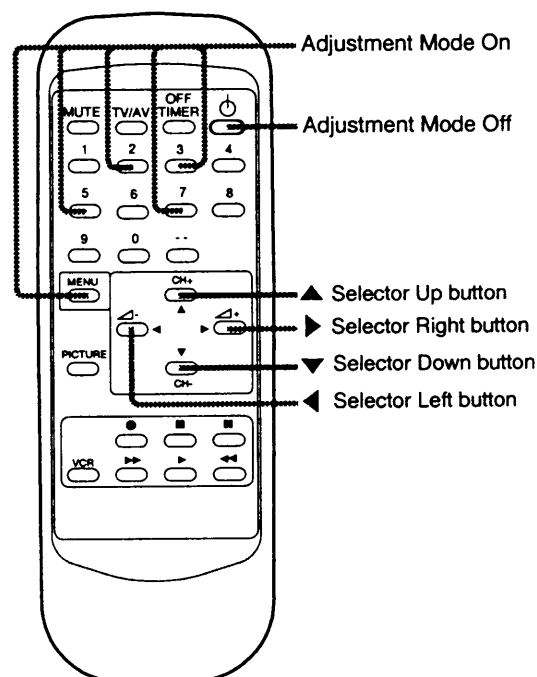
After completing Data Adjustments, exit the non-user menu mode by selecting the initial to the ON position or by pressing the power button on the remote hand unit.

Note : When initial is set to the ON position in order to exit the non-user mode it reset's all the user settings to the factory default position.

INITIAL	: OFF
C-SYSTEM	: PAL+NTSC
S-SYSTEM	: OFF
TEXT	: OFF
AUTO OFF	: ON
HOTEL LOCK	
VOLUME	: MAX
PRESET	: OFF

Non-user Menu Display

Remote Hand Unit



When Replacing EEPROM (IC702)

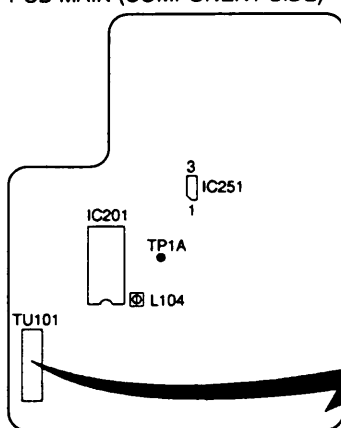
The EEPROM (IC702) stores the setting data. specified in the table below. When the EEPROM is replaced, the initial setting data must be loaded into the new EEPROM. After replacement, set the side condition.

C-SYSTEM	S-SYSTEM	TEXT
PAL+NTSC	OFF	OFF
AUTO OFF	HOTEL LOCK	
	VOLUME	PRESET
ON	MAX	OFF

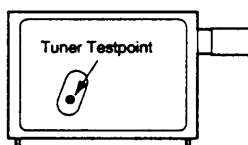
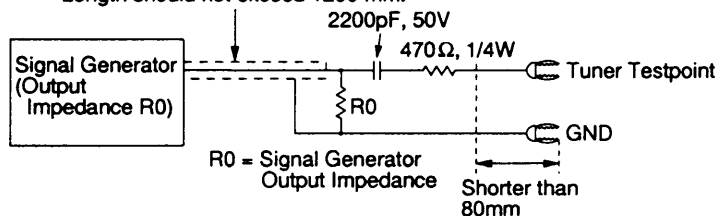
Adjustment Procedures

[VIF/SIF Circuit] 1. VCO		Adjustment purpose Setting VCO free frequency to the picture IF frequency. Symptom when incorrectly adjusted Impossible to tune channels properly.
Measuring instrument	DC Voltmeter	<ul style="list-style-type: none"> • Preheat the set for fifteen minutes or more. • Perform this adjustment with the PCB-MAIN removed. <ol style="list-style-type: none"> 1. Supply 12V_{ac} to pin ① of IC251. 2. Supply a sinewave signal (38.9MHz, 90dBμ/load) to the tuner testpoint using the circuit, as shown below. 3. Observe the DC voltage at TP1A. 4. Adjust L104 so that the DC voltage is $2.5 \pm 0.1V$. <p>Note : Turn L104 clockwise and confirm that voltage increases over the 4.5V. Turn L104 counter-clockwise and confirm that voltage decreases less the 0.5V.</p>
Test point	TP1A	
EXT trigger	—	
Measurement range	—	
Input signal	sinewave signal (38.9MHz, 90dBμ/load)	
Input terminal	Tuner testpoint	

PCB-MAIN (COMPONENT SIDE)

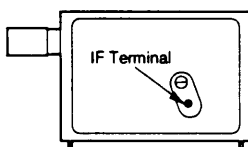
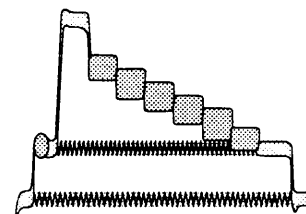
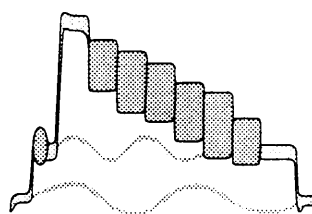
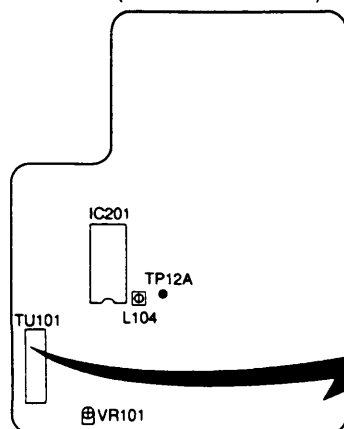


Use a 75Ω coaxial cable.
Length should not exceed 1200 mm.



[VIF/SIF Circuit] 2. RF AGC		Adjustment purpose The best receiving condition of RF signal. Symptom when incorrectly adjusted Poor S/N ratio or cross modulation.
Measuring instrument	Oscilloscope	<ul style="list-style-type: none"> • Preheat the set for fifteen minutes or more. <ol style="list-style-type: none"> 1. Supply an RF signal (colour bar 83±3dBμ/load). 2. Turn on AFT. 3. Adjust VR101 so that the picture and sound have no beat, noise and intermodulation distortion. 4. Supply a sinewave signal (38.9MHz, 90dBμ/load) to Tuner IF terminal via a capacitor (1pF). 5. Observe the waveform at TP12A. 6. Adjust L104 so that best component disappears.
Test point	TP12A	
EXT trigger	—	
Measurement range	—	
Input signal	RF signal (colour bar 83±3dBμ/load)	
Input terminal	RF IN terminal	

PCB-MAIN (COMPONENT SIDE)



[Deflection Circuit] 3. Horizontal Centring		Adjustment purpose Horizontal position of picture.
		Symptom when incorrectly adjusted Picture too shifted to the left, or the right.
Measuring instrument	—	<ol style="list-style-type: none">1. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.)2. Select "PICTURE" menu.3. Press the "PICTURE" button on a remote hand unit to select "HI BRIGHT".4. Select "RESET" to ON.5. Supply a VIDEO signal (monoscope).6. Adjust VR551 so that the readings of the left and right markers are the same.
Test point	—	
EXT trigger	—	
Measurement range	—	
Input signal	VIDEO signal (monoscope)	
Input terminal	VIDEO IN terminal	

PCB-MAIN (COMPONENT SIDE)

The diagram shows the component side of the PCB-MAIN. It features a large, irregularly shaped cutout on the left side. In the bottom right corner, there is a semi-circular component labeled T552 with 'F. B. T.' written below it. To the left of T552, there is a small rectangular component labeled VR551 with a small square symbol below it.

The diagram shows a monoscope signal pattern. It consists of a central circular area with a grid of lines. There are four circular markers at the corners of the grid, each containing a crosshair. Two horizontal markers are indicated by arrows: 'Horizontal marker (left)' pointing to a marker on the left side, and 'Horizontal marker (right)' pointing to a marker on the right side. The central area contains a series of horizontal lines of varying lengths, resembling a staircase or a series of steps.

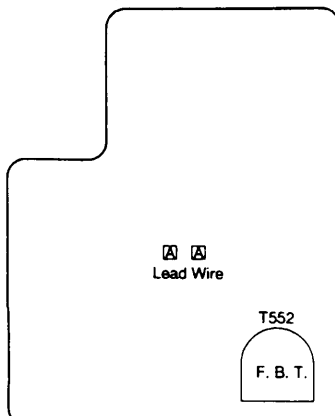
Horizontal marker (left)

Horizontal marker (right)

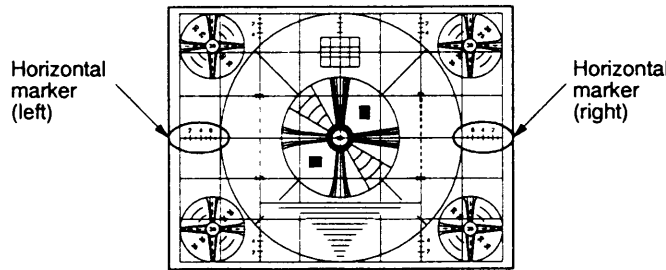
Monoscope signal

[Deflection Circuit] 4. Horizontal Width		Adjustment purpose To set the horizontal width of picture.
		Symptom when incorrectly adjusted The horizontal width of picture will be too small.
Measuring instrument	—	<ol style="list-style-type: none">1. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.)2. Select "PICTURE" menu.3. Press the "PICTURE" button on a remote hand unit to select "HI BRIGHT".4. Select "RESET" to ON.5. Supply a VIDEO signal (monoscope).6. Make sure that the sum of left and right markers is 4.5~7.0 (equivalent to 7~11% overscan). If the sum is less than 4.5 (7%), cut the Lead Wire A-A.
Test point	—	
EXT trigger	—	
Measurement range	—	
Input signal	VIDEO signal (monoscope)	
Input terminal	VIDEO IN terminal	

PCB-MAIN (COMPONENT SIDE)

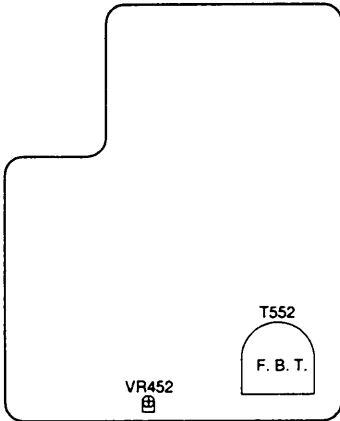
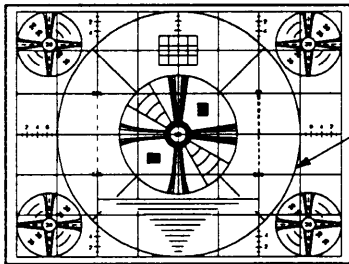


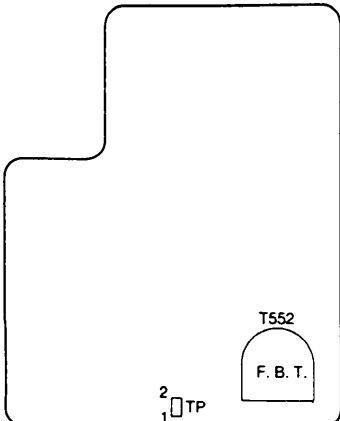
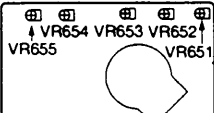
The diagram shows the component side of the PCB-MAIN. It features a large, irregularly shaped cutout on the left side. In the center, there are two small square components labeled 'A' and 'A', with the text 'Lead Wire' below them. At the bottom right, there is a semi-circular component labeled 'T552' and 'F. B. T.'.

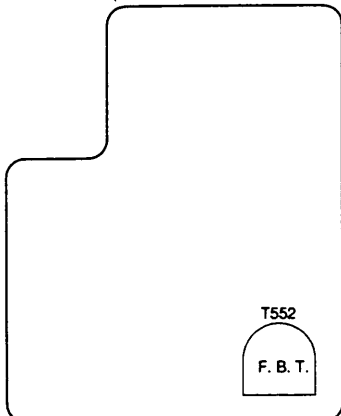


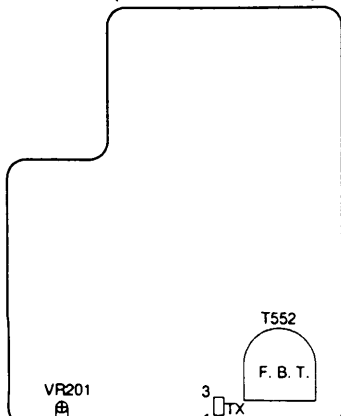
The diagram shows a monoscope signal pattern. It consists of a central circular area with a grid of lines. There are four circular markers at the corners of the grid, each containing a crosshair. Two horizontal markers are indicated by arrows: 'Horizontal marker (left)' and 'Horizontal marker (right)'. The text 'Monoscope signal' is centered below the diagram.

Monoscope signal

[Deflection Circuit]		Adjustment purpose	To set the vertical height of the picture.
5. Vertical Height		Symptom when incorrectly adjusted	The vertical size of the picture will be too large or too small and incorrect vertical linearity of the picture.
Measuring instrument	—	<ol style="list-style-type: none"> 1. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.) 2. Select "PICTURE" menu. 3. Press the "PICTURE" button on a remote hand unit to select "HI BRIGHT". 4. Select "RESET" to ON. 5. Supply a VIDEO signal (monoscope). 6. Adjust VR452 so that the largest circle is completely round. 	
Test point	—		
EXT trigger	—		
Measurement range	—		
Input signal	VIDEO signal (monoscope)		
Input terminal	VIDEO IN terminal		
PCB-MAIN (COMPONENT SIDE)			
		 <p style="text-align: center;">Monoscope signal</p>	

[CRT Circuit]		Adjustment purpose	Setting the cut off points of the three electron beams.
6. CRT Bias, Cut Off and White Balance		Symptom when incorrectly adjusted	Monochrome has colour tint, too dark or too bright picture.
Measuring instrument	—	<p>* Preheat the set for twenty minutes or more.</p> <p>[Presetting]</p> <ul style="list-style-type: none"> • Turn the CUT OFF VRs (VR651, VR652 and VR653) to fully counter-clockwise position that view from solder side on PCB. • Turn the DRIVE VRs (VR654 and VR655) in clockwise direction and set at approx. 90 degree from centre position that view from solder side on PCB. <ol style="list-style-type: none"> 1. Select the AV mode (with no input signal). 2. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.) 3. Select "EX. FUNC" menu and set the "BLUEBACK" to OFF. 4. Short-circuit the pins ① and ② of connector TP to obtain one horizontal line of the raster. 5. Set the SCREEN control on Flyback Transformer (T552) to the point where the first colour of R, G and B just appear. 6. Adjust the other two colours by the CUT OFF VRs to obtain the white line. 7. Open the pins ① and ② of connector TP. 8. Supply a VIDEO signal (monoscope). 9. Adjust the DRIVE VRs so that the entire screen is pure white. 10. Repeat steps 1 to 9 again, if the Pure White Picture is still not obtained. 	
Test point	—		
EXT trigger	—		
Measurement range	—		
Input signal	—		
Input terminal	—		
PCB-MAIN (COMPONENT SIDE)			
		<p>PCB-CRT (SOLDER SIDE)</p> 	

[Video Circuit] 7. Brightness		Adjustment purpose Black level of video signal.
		Symptom when incorrectly adjusted Too bright or too dark picture.
Measuring instrument	—	* Preheat the set for twenty minutes or more. 1. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.) 2. Select "PICTURE" menu. 3. Press the "PICTURE" button on a remote hand unit to select "HI BRIGHT". 4. Select "RESET" to ON. 5. Supply a VIDEO signal (colour bar). 6. Turn the "COLOUR" to minimum. 7. Adjust the SCREEN control on the Flyback Transformer (T552) so that the difference in tone is just visible between the blue area and the black area.
Test point	—	
EXT trigger	—	
Measurement range	—	
Input signal	VIDEO signal (colour bar)	
Input terminal	VIDEO IN terminal	
PCB-MAIN (COMPONENT SIDE)		
		

[Video Circuit] 8. Sub Cont		Adjustment purpose The best value for beam current.				
		Symptom when incorrectly adjusted The picture will be too bright or too dark.				
Measuring instrument	DC milliammeter	<ul style="list-style-type: none">* Preheat the set for twenty minutes or more.1. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.)2. Select "PICTURE" menu.3. Press the "PICTURE" button on a remote hand unit to select "HI BRIGHT".4. Select "RESET" to ON.5. Supply an RF signal (colour bar without window).6. Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.)7. Select "PICTURE" menu and set "COLOUR" to minimum.8. Observe the current value between pins ③ and ① of connector TX. (Positive lead to pin ③ of connector TX.)9. Adjust VR201 so that DC milliammeter indicates the value in table.				
Test point	+lead: pin ③ of connector TX - lead: pin ① of connector TX					
EXT trigger	—					
Measurement range	—					
Input signal	RF signal (colour bar without window)					
Input terminal	RF IN terminal					
PCB-MAIN (COMPONENT SIDE)						
						
		<table><tr><th>Model</th><th>DC Current</th></tr><tr><td>CT-21AM4 (AZ)</td><td>750 ± 20 μA</td></tr></table>	Model	DC Current	CT-21AM4 (AZ)	750 ± 20 μA
Model	DC Current					
CT-21AM4 (AZ)	750 ± 20 μA					

[CRT Circuit] 9. Focus		Adjustment purpose Sharpness of picture.
		Symptom when incorrectly adjusted Poor sharpness of picture.
Measuring instrument	—	1. Supply an RF signal (programme). 2. Press the "PICTURE" button on a remote hand unit to select "NATURAL". 3. Adjust the FOCUS control on the Flyback Transformer (T552) to the best overall focus.
Test point	—	
EXT trigger	—	
Measurement range	—	
Input signal	RF signal (programme)	
Input terminal	RF IN terminal	
PCB-MAIN (COMPONENT SIDE) <div style="border: 1px solid black; height: 150px; width: 150px; margin: 10px auto; position: relative;"> <div style="position: absolute; top: 10px; left: 10px; width: 80px; height: 80px; border: 1px solid black;"></div> <div style="position: absolute; bottom: 10px; left: 40px; text-align: center;"> T552 F. B. T. </div> </div>		

PARTS LIST

MODEL : CT-21AM4(AZ)

In order to expedite delivery of replacement part orders.

Specify : 1.Model number/Serial number

2.Part number and Description

3.Quantity

Unless full information is supplied, delay in execution of orders will result.

⚠ : Critical components

MARK	B	C	D	F	G	J	K
TOLERANCE (%)	±0.1	±0.25	±0.5	±1	±2	±5	±10

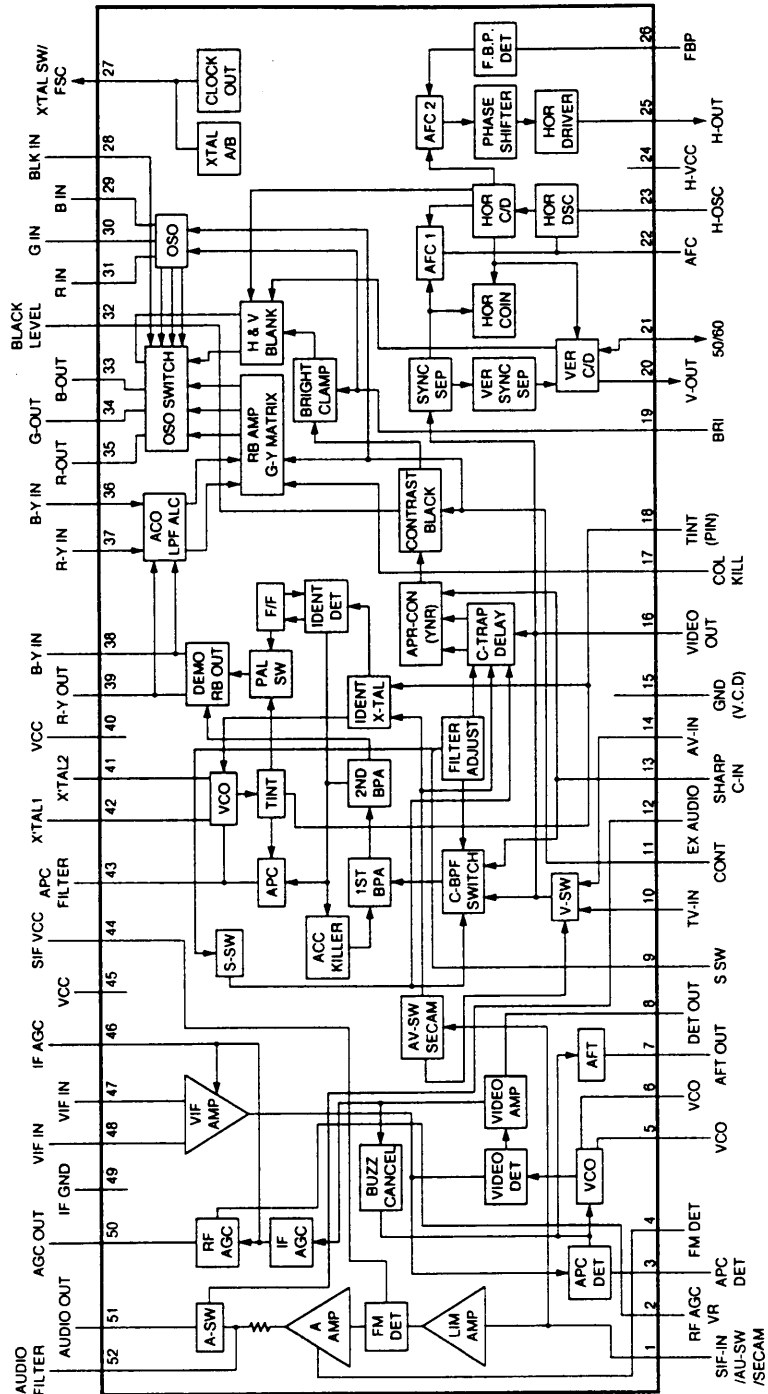
MARK	M	N	V	X	Z	P	Q
TOLERANCE (%)	±20	±30	+10 -10	+40 -20	+80 -20	+100 -0	+30 -10

MARK	B	C	D	F	G
TOLERANCE (pF)	±0.1	±0.25	±0.5	±1	±2

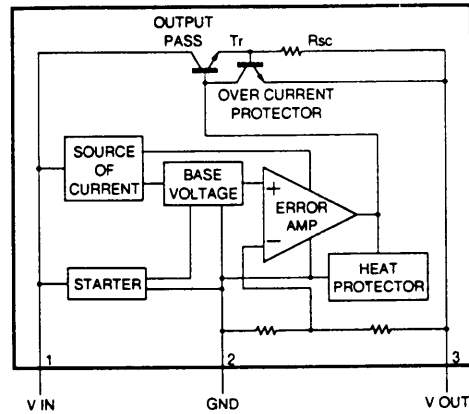
IC BLOCK DIAGRAMS

PCB-MAIN

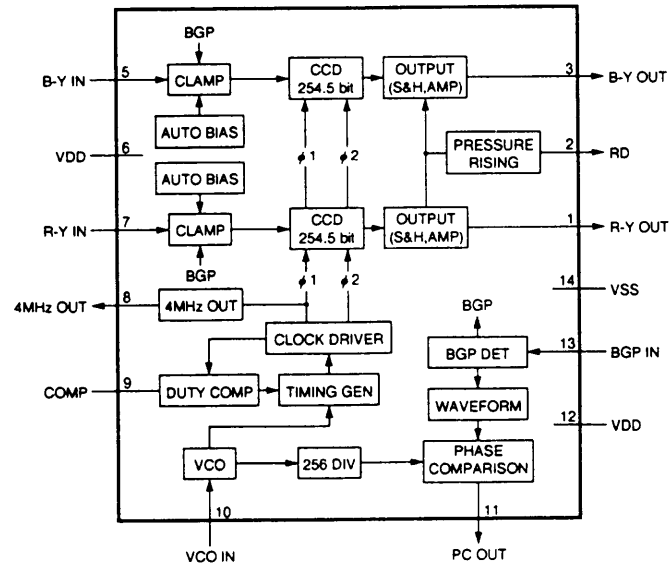
IC201 LA7688-N



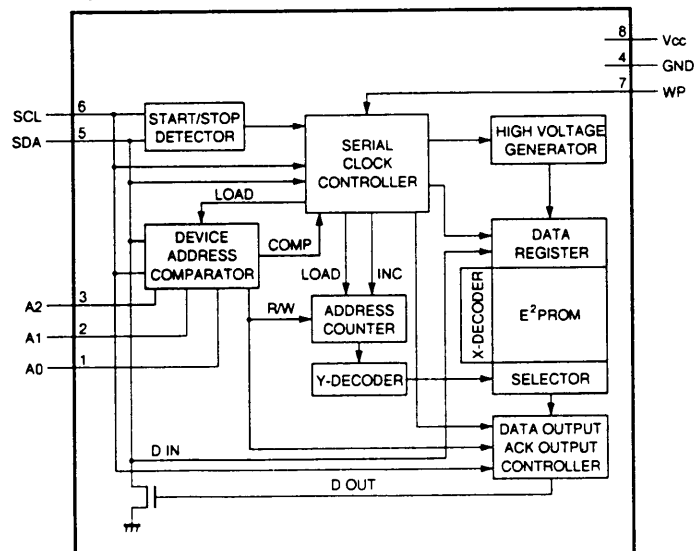
IC251 NJM7809FA/AN7809F



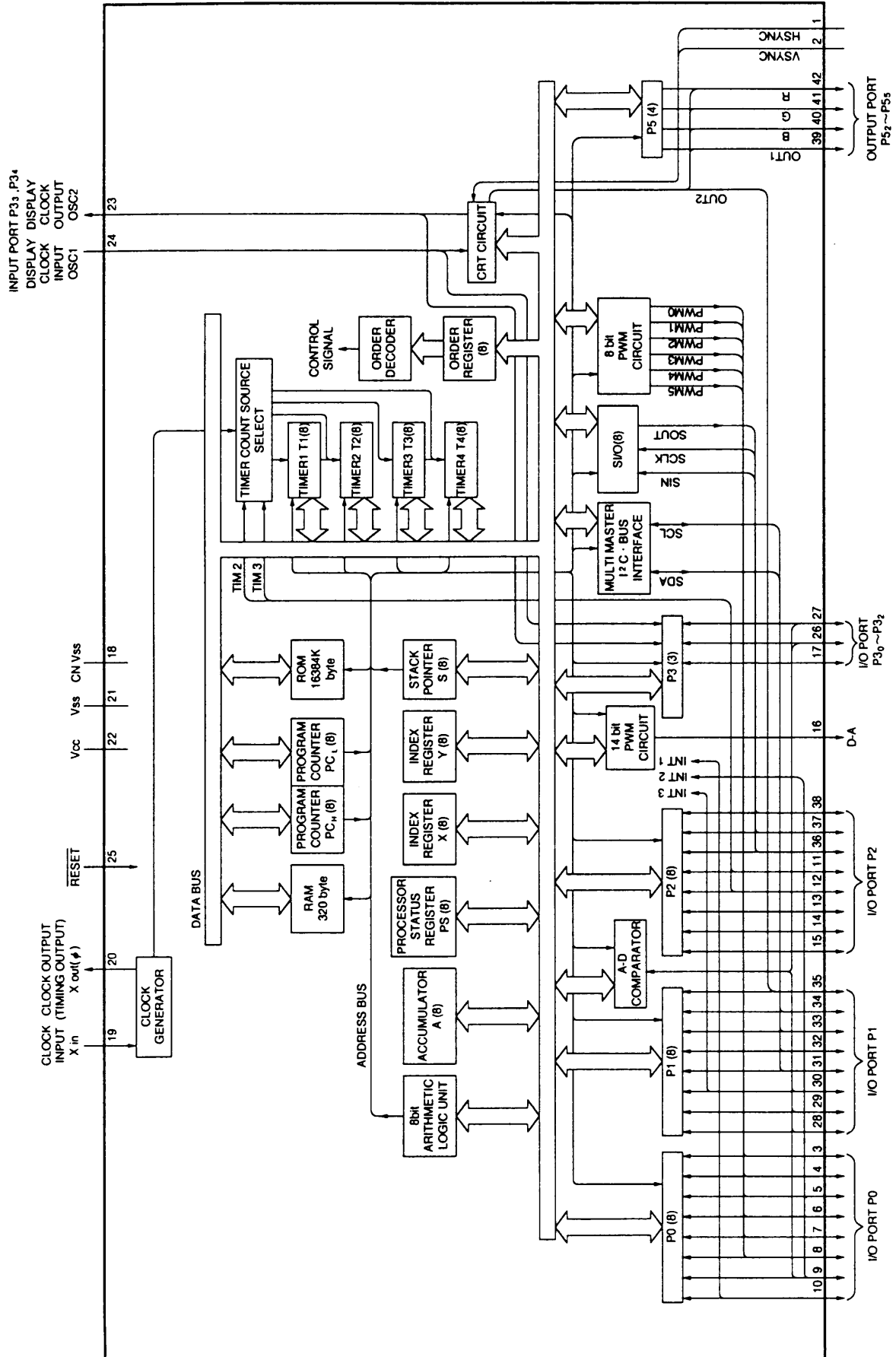
IC631 LC89950



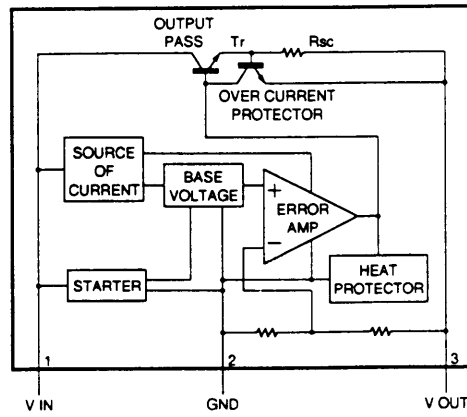
IC702 S-24C02A



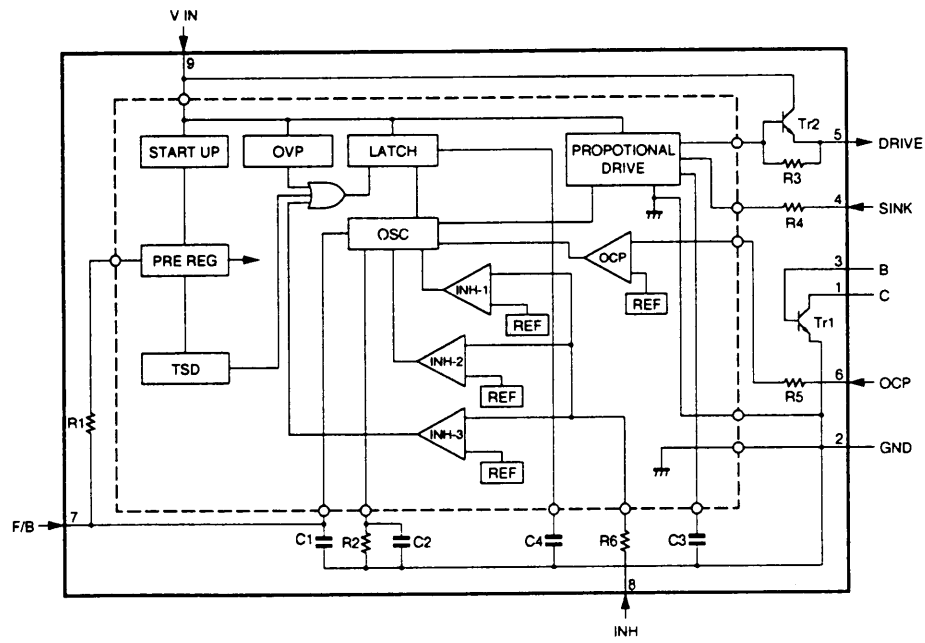
IC701 M37221M4-XXXSP



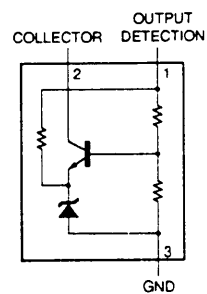
IC703 NJM7805FA



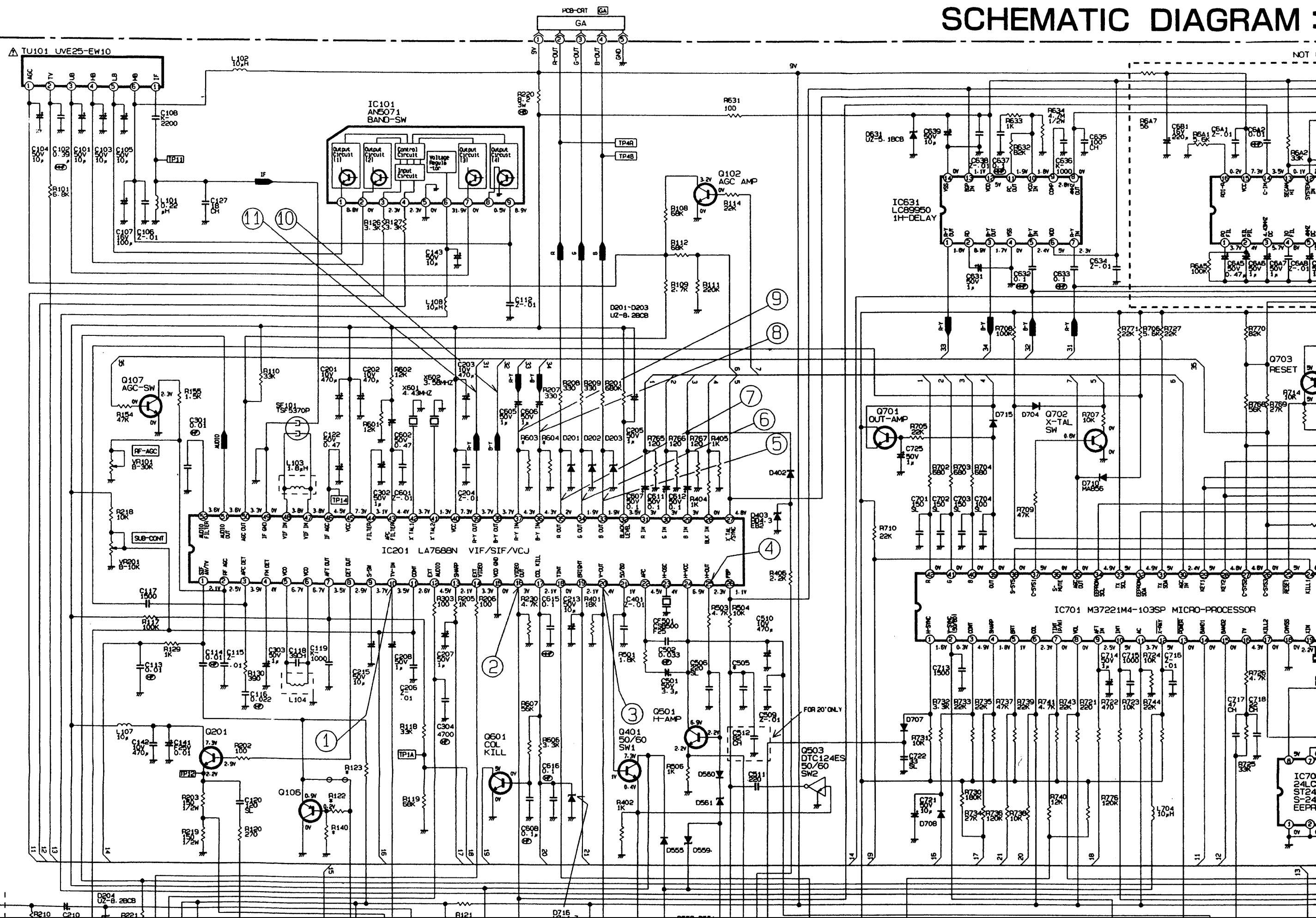
IC901 STR-S6707

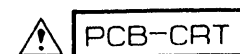


IC951 SE115N



SCHEMATIC DIAGRAM

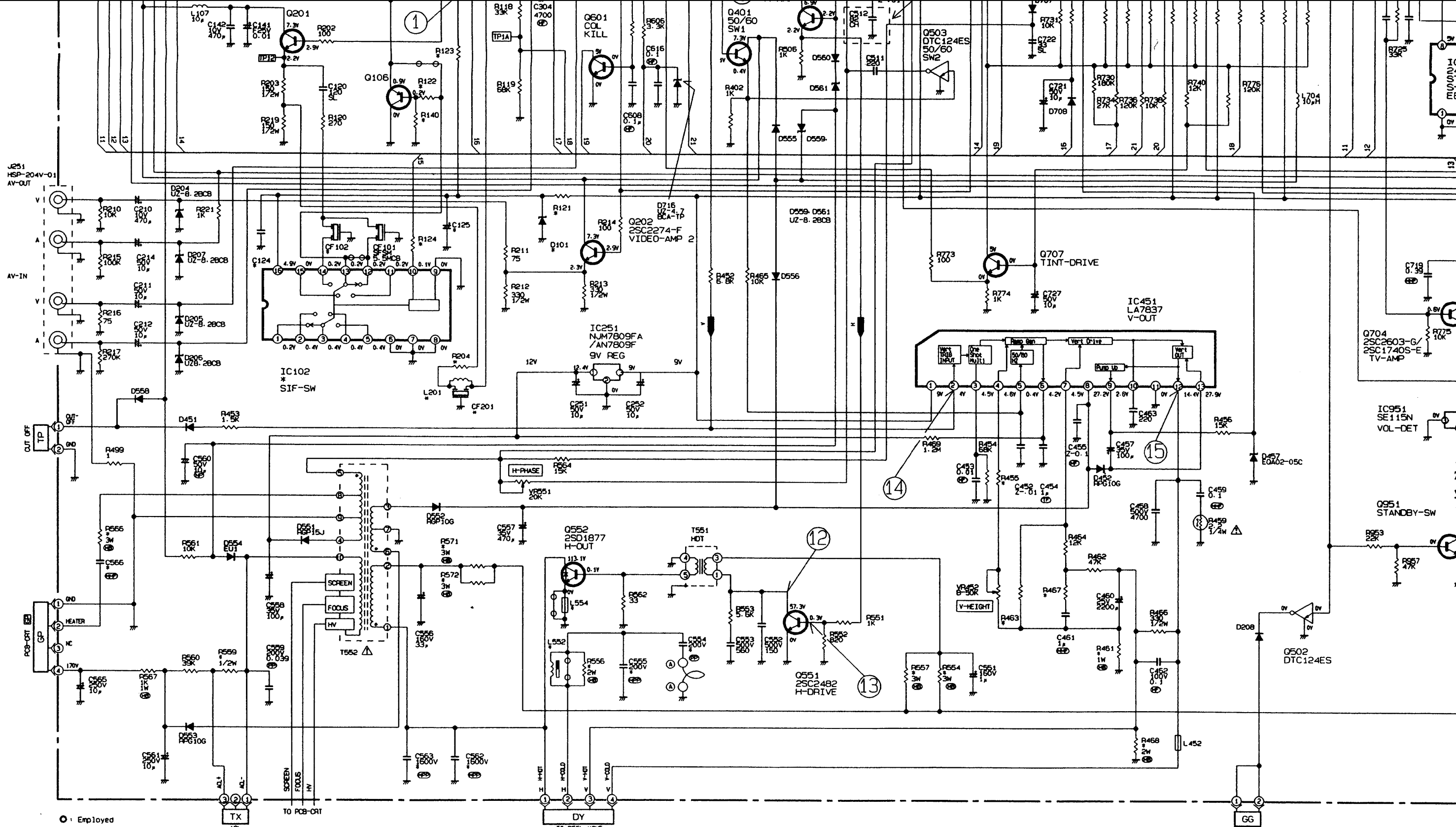




5. Resistors

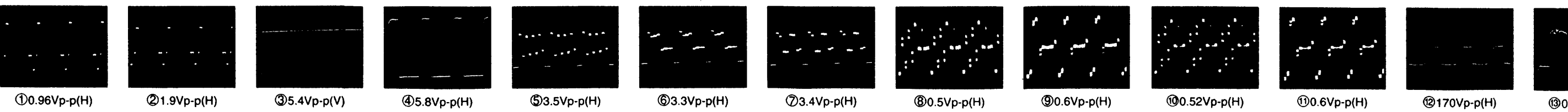
Value	Not indicated	PF, for numbers more than 1 μF, for numbers less than 1
Dielectric Strength	Not indicated :50V	
Tolerance	Not indicated $\pm 10\%$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> No Tolerance is indicated for electrolytic capacitors and $\pm 20\%$ </div>	
	G $\pm 2\%$ J $\pm 5\%$ K $\pm 10\%$ M $\pm 20\%$	P $\pm 100\%$ -0% Z $\pm 80\%$ -20% Q $\pm 30\%$ -10% T $\pm 200\%$ -0% C $\pm 0.25\text{PF}$ D $\pm 0.5\text{PF}$ F $\pm 1\text{PF}$ G $\pm 2\text{PF}$
Sort	I Parts except for chips II Chips	Not indicated : Ceramic capacitor (MF) : Polyester capacitor (PP) : Polypropylene film capacitor (ALM) : Aluminum electrolytic capacitor (TF) : Twin film capacitor (SC) : Semiconductor ceramic capacitor (MP) : Metalized paper (MPP) : Metalized plastic film capacitor (MMF) : Metalized polyester capacitor (MF.PP) : Polyester polypropylene film capacitor (PS) : Styrol capacitor (TAN) or (TANT) : Tantalum capacitor ———— (BP) or (NP) : Electrolytic capacitor ———— Not indicated : Ceramic capacitor chip ———— (BP) or (NP) : Non polarized electrolytic capacitor chip
Characteristic (only ceramic capacitor)	Not indicated : F or B (high dielectric percentage) CH, SL, etc. : Temperature compensating types	

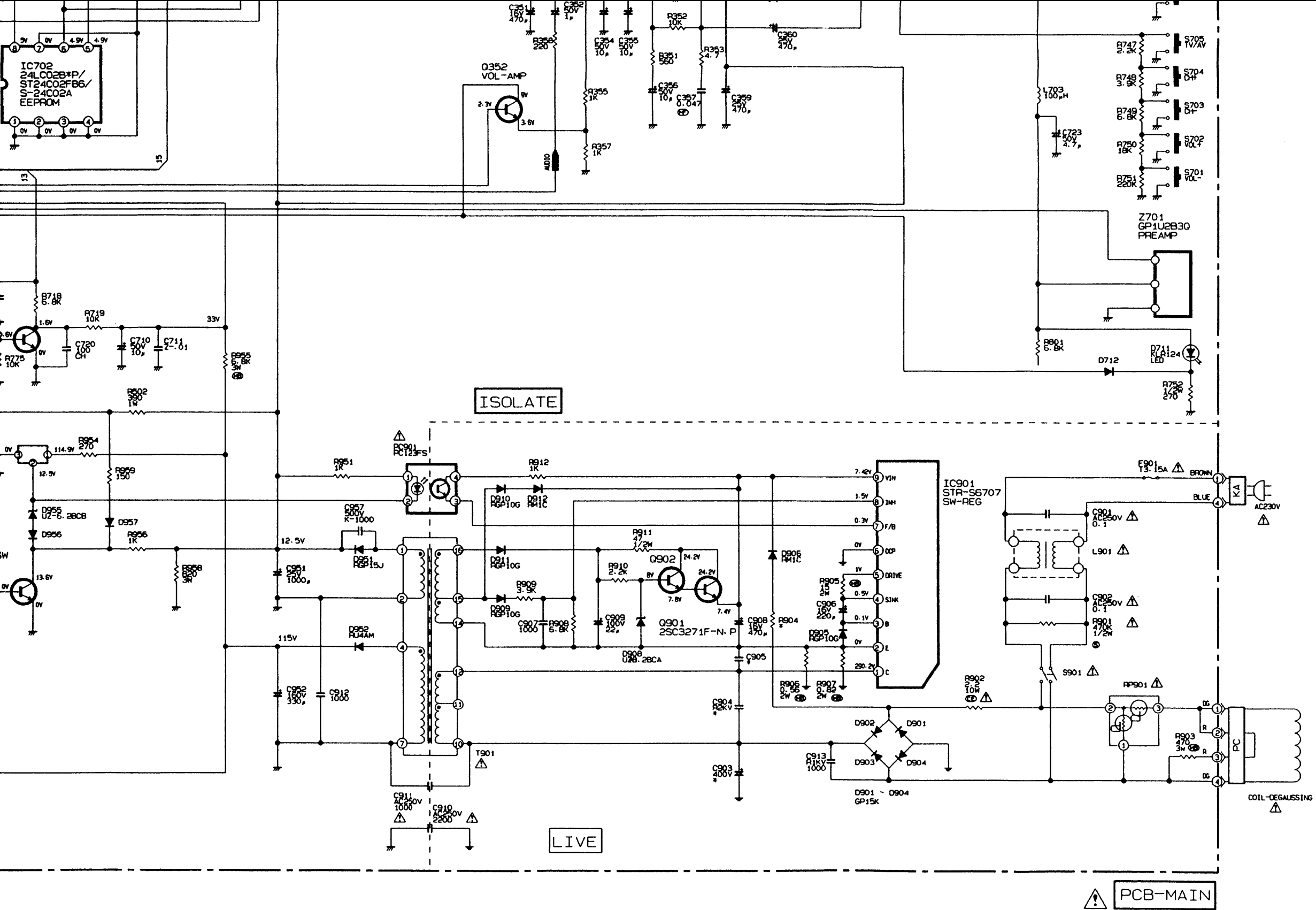
E
F
G
H
I
J



● : Employed
x : NOT Employed

MODEL	LOCATION	C124	C125	R140	L201	R204	R461	R463	R467	R468	C505	C554	C555	C562	C563	C566	L552	R554	R556	R557	R559	R566	R571	R572	C903	EJ351	EJ352	CF102	CF201	D101	IC102	D106	R121	R122
CT-14AM4(AZ)		-	-	-	8.2μH	47	2.2	33K	10K	1K	390	.056μ	.43μ	9100	-	1μ	JUMPER	8.2K	-	-	180K	.33	1.8	-	150μ	○	x	-	TPSS-5	-	-	-	-	-
CT-20AM4(AZ)		-	-	-	8.2μH	47	1.8	27K	6.8K	2.2K	270	.039μ	.39μ	5600	3600	2.2μ	333P012	5.6K	820	5.6K	150K	.56	8.2	8.2	220μ	x	○	-	TPSS-5	-	-	-	-	-
CT-21AM4(AZ)		-	-	-	8.2μH	47	1.5	27K	5.6K	2.2K	390	.039μ	.39μ	5600	3600	2.2μ	333P044	5.6K	820	5.6K	150K	1.2	8.2	8.2	220μ	○	x	-	TPSS-5	-	-	-	-	-





Sort	I except for chips	(MPP) : Metalized plastic film capacitor (MMF) : Metalized polyester capacitor (MF,PP) : Polyester polypropylene film capacitor (PS) : Styrol capacitor (TAN or TANT) : Tantalum capacitor (BP or NP) : Non polarized electrolytic capacitor
	II Chips	Not indicated : Ceramic capacitor chip (BP or NP) : Electrolytic capacitor (BP or NP) : Non polarized electrolytic capacitor chip
Characteristic (only ceramic capacitor)		Not indicated : F or B (high dielectric percentage) CH, SL, etc. : Temperature compensating types

5. Resistors

Value	Not indicated = Ω K = k Ω (1000 Ω) M = M Ω (1000k Ω)	
Wattage	Parts except for chips	Not indicated = 1/4W or 1/6W
	Chips	Not indicated = 1/10W
Tolerance	Not indicated : $\pm 5\%$ D = $\pm 0.5\%$ J = $\pm 5\%$ F = $\pm 1\%$ K = $\pm 10\%$	
Sort	I Parts except for chips	Not indicated : Carbon resistor (S) : Fixed composition resistor (MO) : Metal oxide film resistor (type B) (CF) : Cemented resistor (W) : Wire wound resistor (M) : Metal film resistor (MPC) : Metal plate cement resistor (ML) : Metal liner resistor
	II Chip	Not indicated : Chip resistor

6. This is a basic schematic diagram. Some sets may be subject to modification according to engineering improvement.

SPECIFIC SYMBOL	
	Zener Diode
	Varicap
	Posistor
	Thermistor
	Fusible Resistor
	Crystal unit
	Air Gap
	Part(resistor) attached on the copper-foil side of PCB
	Ceramic filter

22	R123	R124	C904	C905	R904	R603	R604
-	-	-	2200	1000	2W 47K	2.2M	2.2M
-	-	-	4700	2200	1W 27K	2.2M	2.2M
-	-	-	4700	2200	1W 27K	2.2M	2.2M

DIODES WITHOUT NAME ARE 1N4148

TRANSISTOR WITHOUT NAME ARE AS FOLLOWS *

NPN TYPE 2SC1740S-R.S/2SC2603-E.F

PNP TYPE 2SCA933S-R.S/2SA1115-E.F

