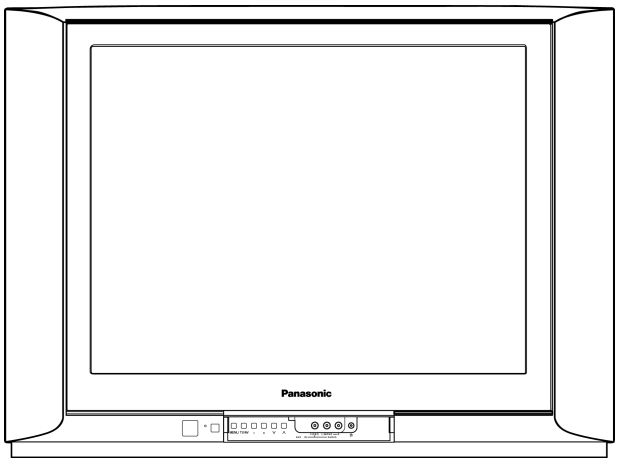
ORDER NO. MTV0701501CE

Service Manual

Colour Television



TC-21GX10TS

GL1 Chassis

Specifications

Power Source :	AC SINGLE 220-240V, 50/60 Hz
Power Consumption :	58W
Aerial Impedance :	75Ω unbalanced
	Coaxial type
Receiving System :	17 Systems
Receiving Channels :	
VHF	2-12 PAL / SECAM B,K1
	0-12 PAL B (AUST)
	1-9 PAL B (N.Z)
	1-12 PAL/SECAM D
	1-12 NTSC M (JAPAN)
	2-13 NTSC M (U.S.A)
UHF	21-69 PAL G,H,I / SECAM G,K,K1
	28-69 PAL B (AUST)
	13-57 PAL D,K
	13-62 NTSC M (JAPAN)
	13-62 NTSC M (JAPAN)
CATV	S1-S20 (OSCAR)
	1-125 (U.S.A CATV)
	C13-C49 (JAPAN)
	S21-S41 (HYPER)
	Z1-Z37 (CHINA)
	5A, 9A (AUST)

Audio Terminal :		
AV 1, 2		
	Video In	1 Vp-p, 75Ω
	Audio In	Approx. 0.5V, 47kΩ
Monitor Out		
	Video Out	1 Vp-p, 75Ω
	Audio Out	Approx. 0.5V, 1kΩ
High Voltage :		27.5kV ±1.5
		at zero beam current
Picture Tube :		A51QGA993X01
		50.5cm (21 inches)
		Measured diagonally,
		90° deflection
Audio Output :		3.5W + 3.5w = 7W
Dimensions :		Height : 472 mm
		Width : 598 mm
		Depth : 479 mm
Mass :		23 kg (Net Wt.)

Specifications are subject to change without notice.
Mass and dimensions shown are approximate.

Panasonic®

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

1 Safety Precautions

1.1. General Guide Lines

1. It is advisable to insert an isolation transformer in the AC supply before servicing this hot chassis.
2. When servicing, observe the original lead dress, especially the lead dress in the high voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations, are properly installed.
4. When the receiver is not to be used for a long period of time, unplug the power cord from the AC cord outlet.
5. Potential, as high as **29.0kV** is present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment. Always discharge the anode of the picture tube to the receiver chassis before handling the tube. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.2. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Turn on the receiver's power switch.
   Measure the resistance value, with an ohmmeter, between the jumper AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, aerials, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 4 MΩ and 20 MΩ. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

1.3. Leakage Current Hot Check (Fig. 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Check a 2 kΩ non-inductive resistor and an AC/DC current meter, in series with each exposed metallic part on the receiver in turn and an earth such as a water pipe.

   The current from any point should not exceed 0.7 mA peak AC or 2 mA DC. In the case of a measurement being outside of these limits specified, there is a possibility of a shock hazard and the receiver should be repaired and rechecked before it is returned to the customer.

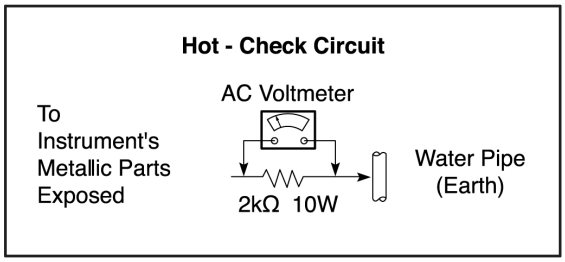


Fig. 1

1.4. X-Radiation

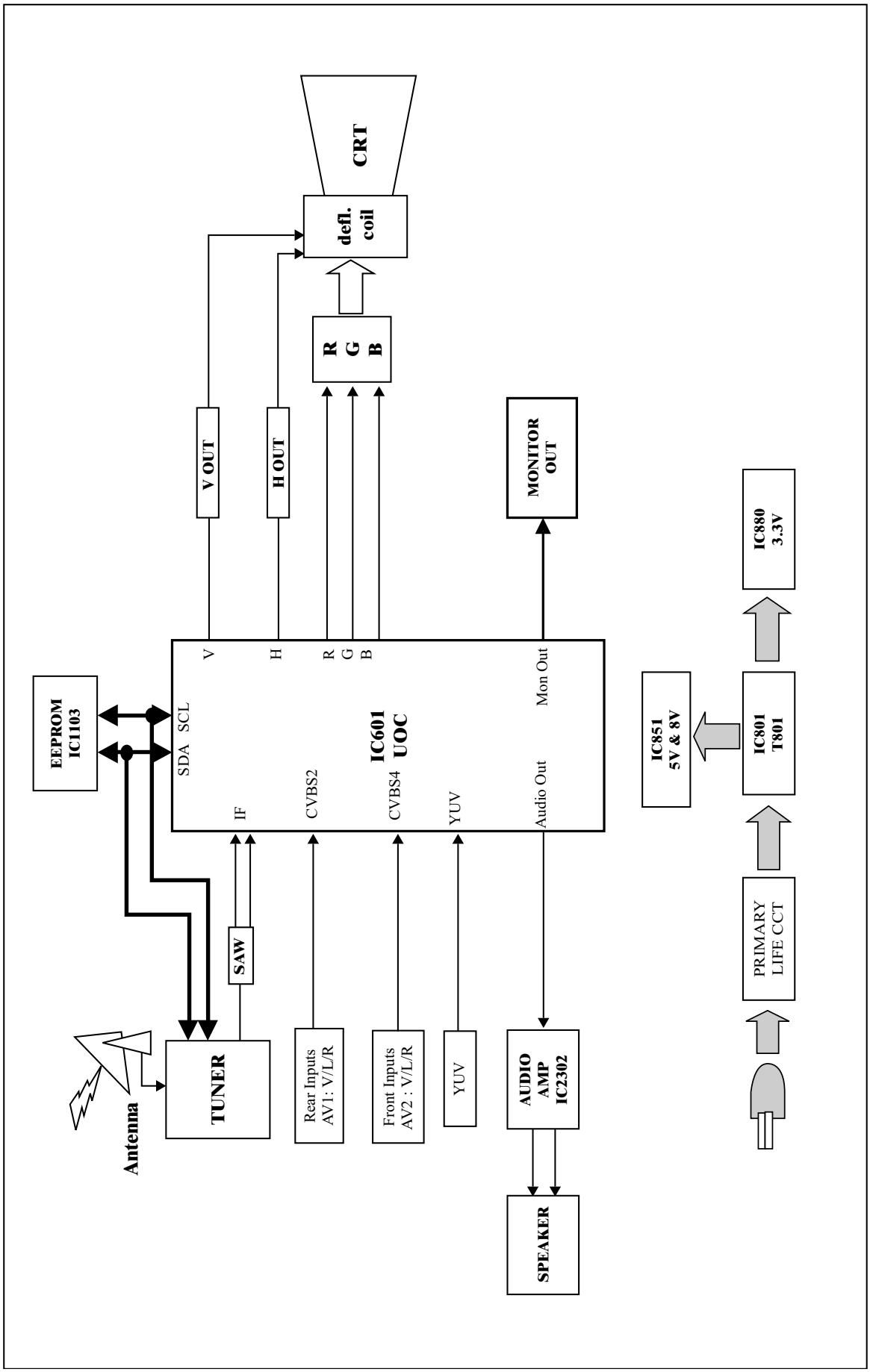
Warning:

The potential sources of X-Radiation in TV set are the EHT section and the picture tube. When using a picture tube test jig for service, ensure that jig is capable of handling **29.0kV** without causing X-Radiation.

Note: It is important to use an accurate periodically calibrated high voltage meter.

1. Set the brightness to minimum.
2. Use the remocon to get into Service Mode.
3. Measure the EHT. The meter reading should indicate **27.5±1.5kV**. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
4. To prevent the possibility X-Radiation, it is essential to use the specified picture tube, if service replacement becomes necessary.

1.5. GL1 Chassis Block Diagram



2 Service Hints

2.1. Service Position for E-Board

1. Remove the back cover.
2. Stand the TV set as shown in Fig. 2.
3. Remove the A-Board from the TV set by pulling the main board out as shown in Figure 2.

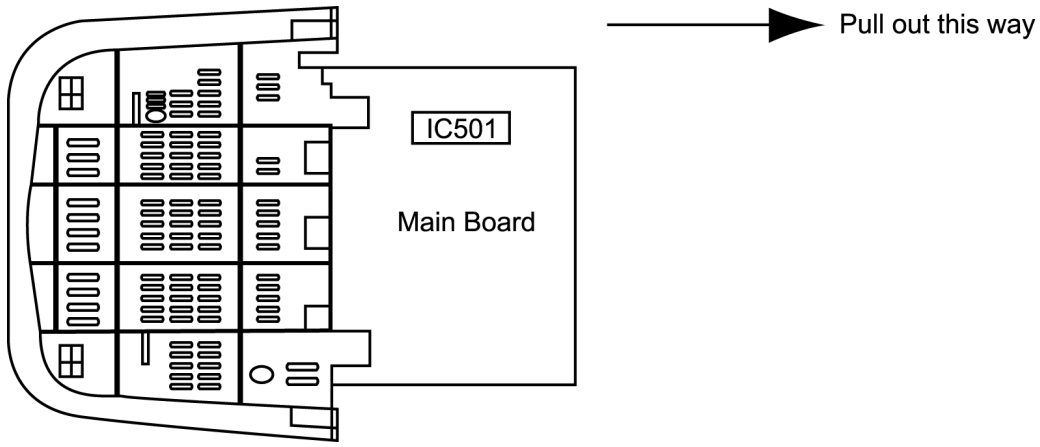
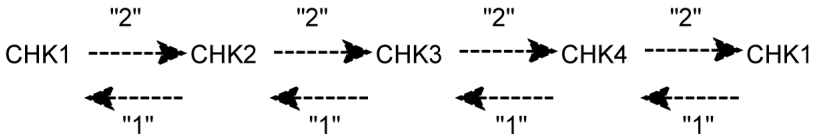


Fig. 2

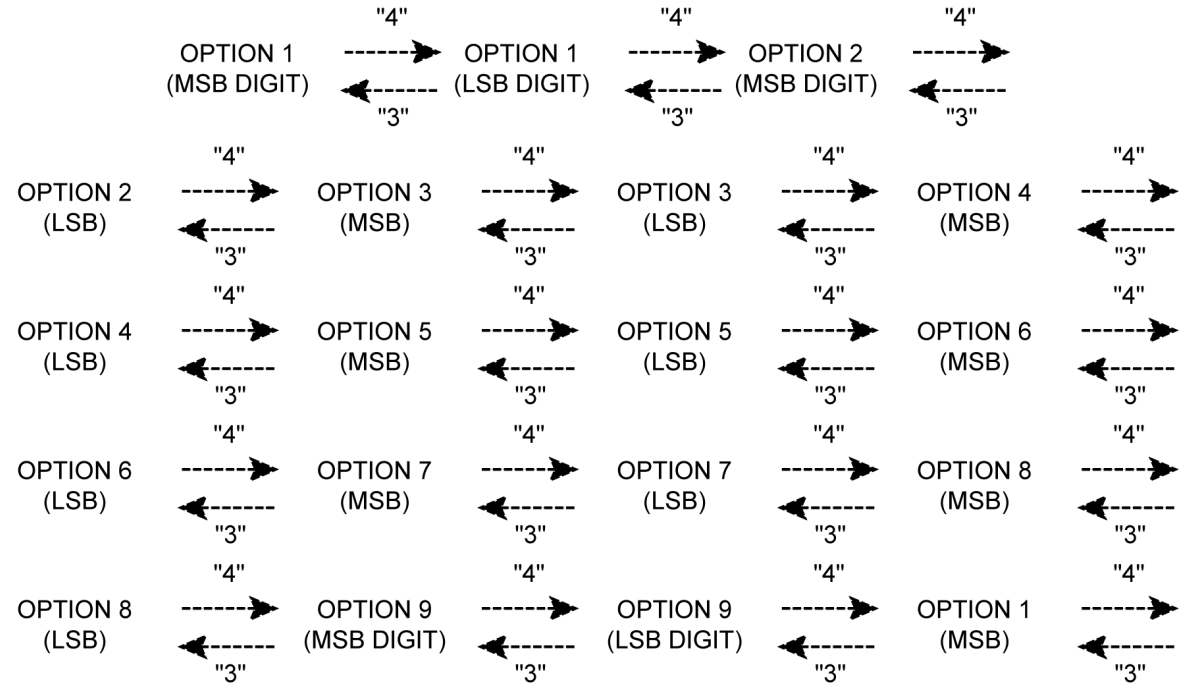
2.2. Factory Mode Adjustment

1. Adjustment.
   a. Set Timer ON (30 minutes)
      Press remote's RECALL & panel's vol down key simultaneously to select service mode.
   b. CHK should appear on right side of TV screen.
      After few seconds CHK 1 should appear on right side of TV screen.

      NOTE :
      To move from CHK 1 to CHK 2 mode, etc, please follow below rotation:-



   c. CHK 1
      Press digit key "4" to move option mode forward.
      Press digit key "3" to move option backward.
      The function rotation will be as follows :-

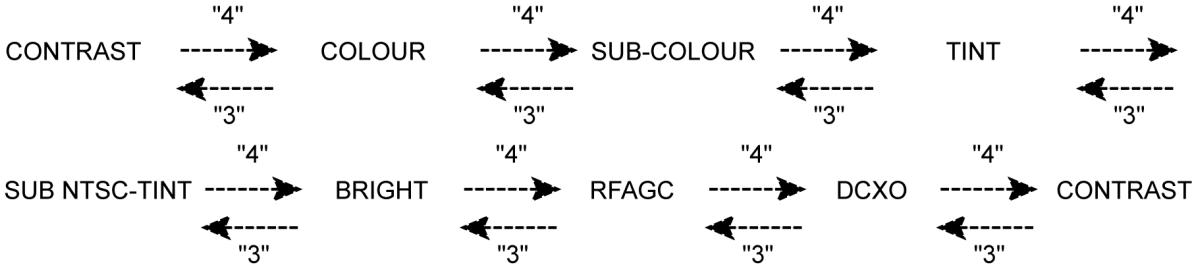


d. After selecting the required option mode press Vol up / Vol down to adjust correct option. OSD will change to RED colour. Press digit “0” to memorize data.

e. CHK2

Press digit key “2” to move forward to CHK2.

The function rotation will be as follows:-



f. Press digit key “4” to move forward from Colour ------> Sub-Colour, etc.

Press digit key “3” to move backward from Sub-Colour ------> Colour, etc.

g. Press volume up / volume down to adjust setting.

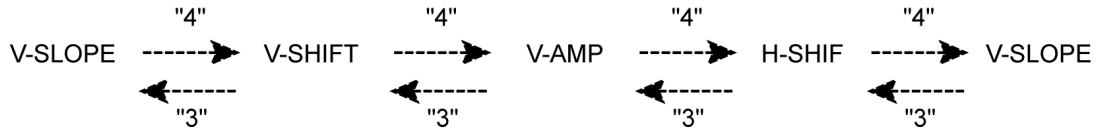
h. Press digit key “5” to make the AKB OFF (Blue OSD) - first time.

Press digit key “5” to make the AKB On (White OSD) - second time.

i. CHK3

Press digit key “2” to move forward to CHK 3.

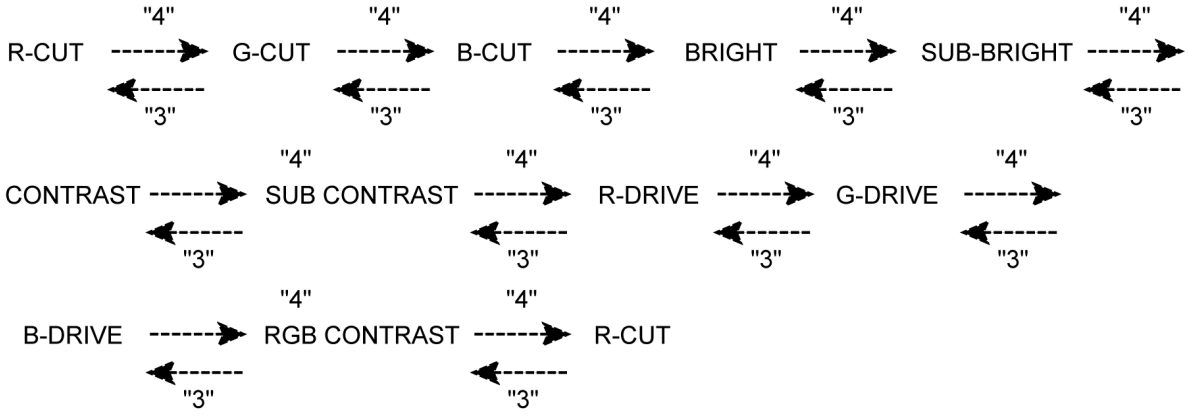
The function rotation will be as follows:-



j. Press digit key “4” to move forward from V-SLOPE ------> V-SHIFT
Press digit key “3” to move backward from V-SHIFT ------> V-SLOPE

k. Press volume up / volume down to adjust required setting.

l. CHK4
Press digit key “2” to move forward to CHK 4.
The function rotation will be as follows:-



m. Press digit key “4” to move forward from R-CUT ------> G-CUT
Press digit key “3” to move backward from G-CUT ------> R-CUT

n. After selecting the required mode, press volume up / volume down to adjust required setting.

o. Press digit key “5” to make the AKB OFF and H-Line mode - first time.
Press digit key “5” to make the AKB ON and Normal picture - second time.

p. After finish adjustment, press Power ON / OFF button on remote control to go to normal TV mode.

2. HOW TO CHANGE CHANNEL BY I2C BUS CONTROLLER
a. Short FA1 and FA2
b. Select Slave address ‘70H’, Sub-address ‘43H’ for RF AGC.
* Example :
Slave Address = 70H’, Sub-Address = 43H’
Data = 80H’ = Center

2.3. Adjustment for White Balance

Preparation:

1. Receive the white balance pattern and aging should have been performed over 30 minutes.
2. Set the picture menu to DYNAMIC NORMAL.
3. Degausse the CRT face.
4. Fix the CRT colour analyzer receiver unit to CRT face.

Adjustment of Low Light.

1. Adjustment Sub Bright, so that Y = 6.3 ± 1.0 nit.
2. Adjustment R-CUT OFF, so that X = 0.285 ± 0.015 nit.
3. Adjustment G-CUT OFF, so that Y = 0.300 ± 0.015 nit.

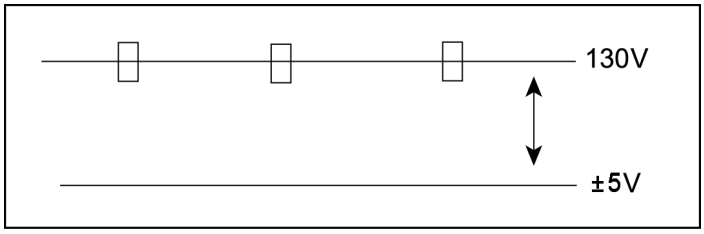
Adjustment of High Light

1. Adjustment Sub Bright, so that Y = 150 nit.
2. Adjustment R-Drive, so that X = 0.275 ± 0.010 nit.
3. Adjustment G-Drive, so that Y = 0.275 ± 0.010 nit.

2.4. Adjustment for CRT CUT OFF

Preparation:

1. Connect the oscilloscope probe to TPL5.
2. Screen VR min.
3. Set the data Sub Bright, Bright.
4. In service Mode at “Bright” dac press [6] in factory mode to enter vertical line and adjust by volume down or up button.
5. Adjust “Screen VR” until 1-H Line appears.



2.5. Adjustment Procedure

2.5.1. +B Voltage

Item / preparation

1. Operate the TV set.
2. Set control as follows :
   Brightness ..... minimum
   Contrast ..... minimum

Adjustment procedure

1. Confirm the DC voltage at the indicated test points, as follows :
   TPA 10 : 141 ± 1.5V
   TPA 12 : 3.3 ± 0.5V
   TPA 09 : 5 ± 1V

2.5.2. High Voltage

Item / preparation

1. Receive the crosshatch pattern.
2. Set to 0 Beam.
   Screen VR ..... minimum
   Contrast ..... minimum

Adjustment procedure

1. Connect a DC voltage meter to TPA 10 and confirm the +B voltage is 141.0 ± 1.5V.
2. Connect a high frequency voltmeter to heater and confirm that voltage reads 6.3 ± 0.24 (VRMS).
3. Normalize the brightness and contrast.

2.6. Adjustment

Before Colour Purity, Convergence and White Balance adjustment are attempted, V. Height, H. Centre and Focus adjustments must be completed.

Colour Purity

1. Set the Brightness and Contrast controls to their maximum positions.
2. Operate the TV set for 60 minutes.
3. Fully degausse the picture tube by using an external degaussing coil.
4. Apply a crosshatch pattern signal and adjust the static convergence magnets to the approximately correct position.
5. Receive a black and white signal.
6. Set the control as follows:
   Red.....minimum
   Green.....minimum
   Blue.....minimum
   Press the Shipping button on the remote control twice to select CRT Adjustment Mode to select low light.
7. Loosen the clamp screw for the Deflection Yoke A in Fig. 10 and move the Deflection Yoke as close to the purity magnet as possible.
8. Adjust the purity magnetic rings so that a vertical green field is obtained at the centre of the screen.

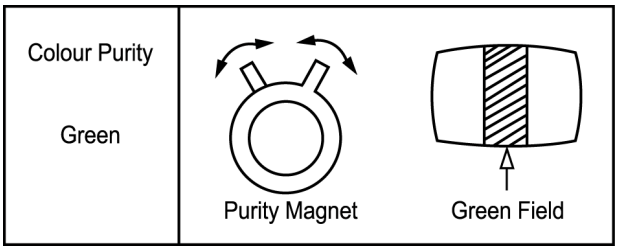


Fig. 6

9. Slowly push the Deflection Yoke and set it where a uniform green field is obtained.

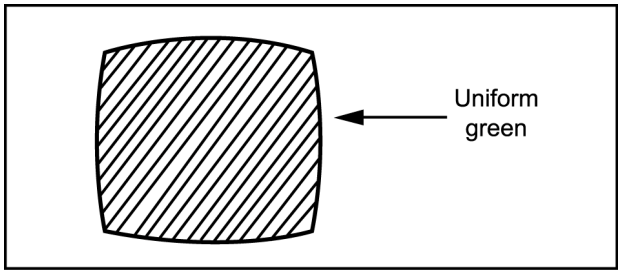


Fig. 21

10. Re-adjust the Low Light controls to their correct settings and make sure that a uniform white field is obtained.
11. Tighten the clamp screw A in Fig. 10.

Convergence

1. Apply a crosshatch pattern signal and Normalize Contrast control to the maximum positions.
2. Adjust Brightness until the grey position of the crosshatch pattern just becomes black.
3. Adjust the Red and Blue line at the centre of the screen by rotating the R-B static.

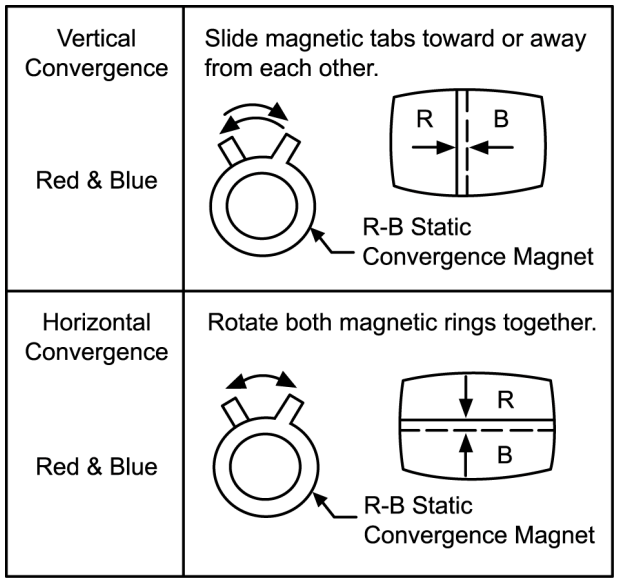


Fig. 8

4. Adjust Red and Blue with Green line at centre of the screen by rotating (RB)-G static convergence magnetic rings.
5. Lock convergence magnets with silicone sealer.
6. Remove the DY wedges and slightly tilt the Deflection Yoke vertically and horizontally to obtain the good overall convergence.

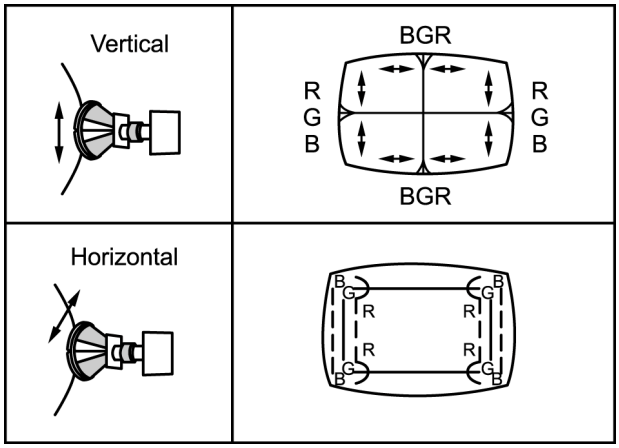


Fig. 9

7. Fix the Deflection Yoke by reinserting the DY wedges. Refer to Fig. 10.
8. If purity error is found, repeat “Colour Purity” adjustment.

Adjustment of CRT VRS

1. **Preparation**

a. Set DY to CRT not to tilt up and down left and right deflection.
b. Set CY to CRT and set CY magnet primarily (Fig. 1)
Purity magnet : Set purity magnet that 2 magnets are (TOP POSITION)
VRS magnet : Set purity magnet 2 magnets are (HORIZONTAL POSITION)

2. **Adjustment**

a. Receive that Cross Hatch pattern.
b. Adjust V-SHIFT -50Hz.
c. Set 2 magnets of horizontal position to up and down equally so that it will be the center part of CRT. (Fig. 2)

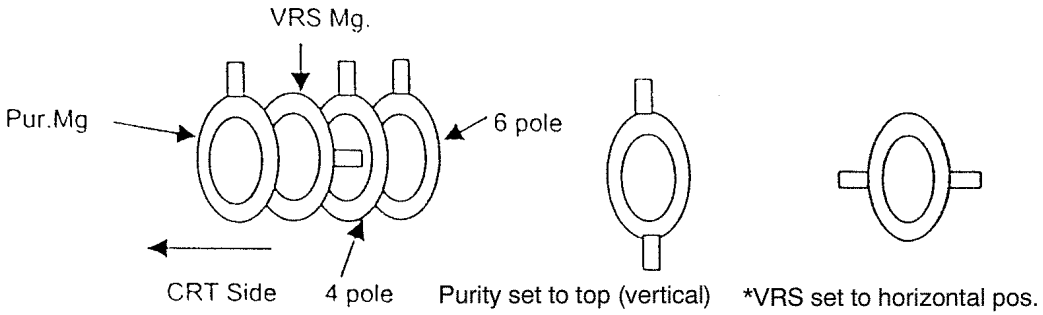
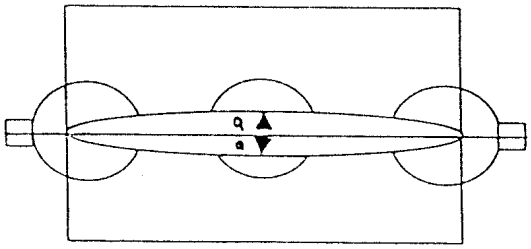


FIG 1.



a ≤ 0 ± 1mm

FIG 2.

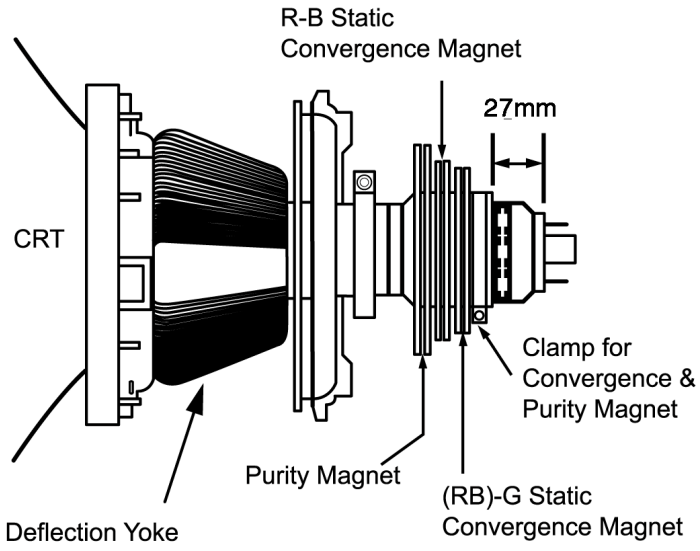


Fig. 10

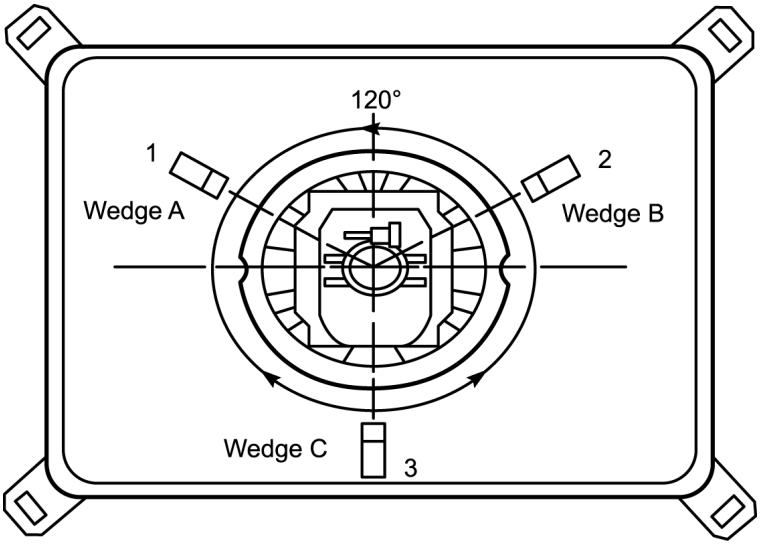
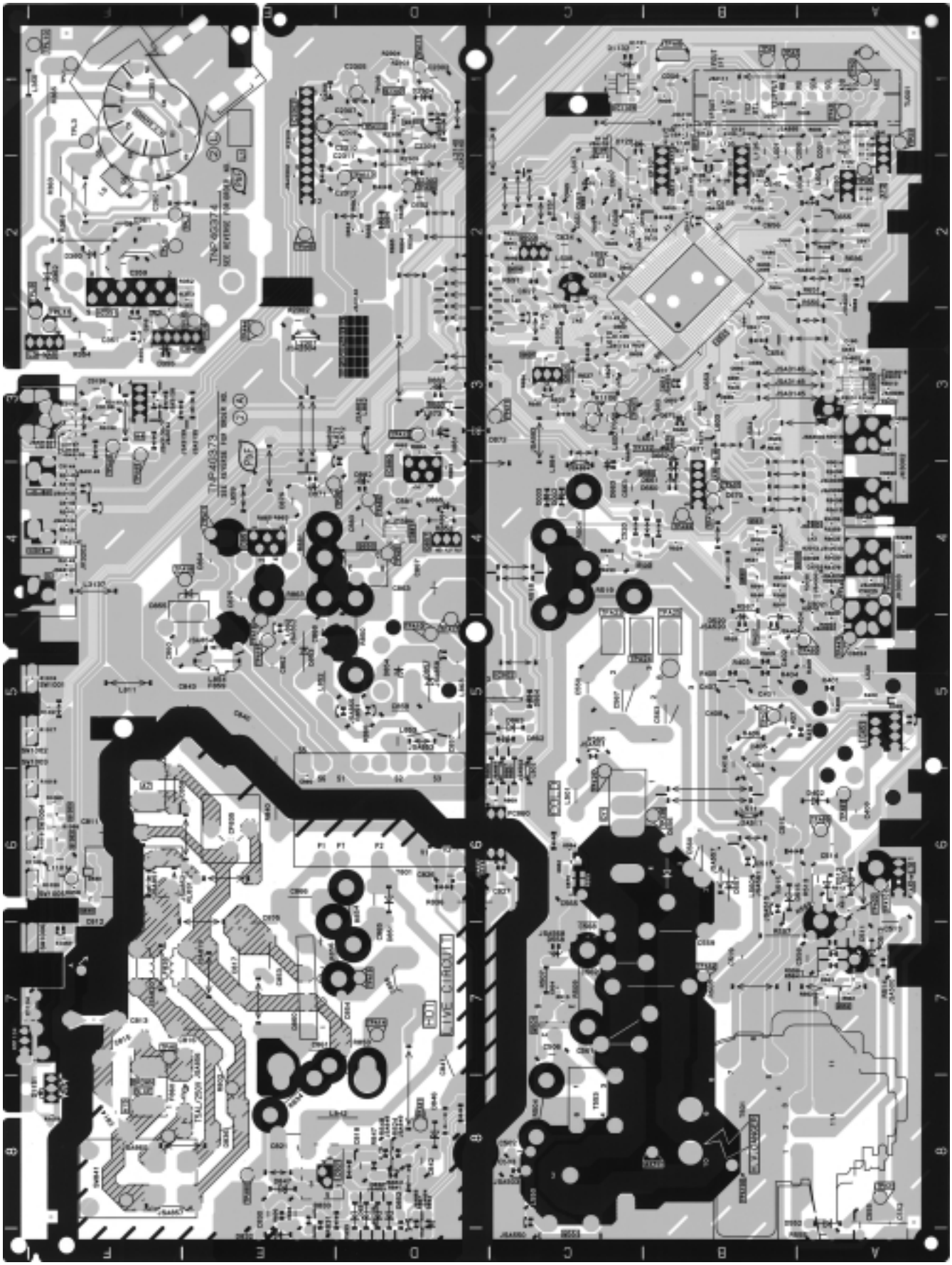


Fig. 11

Notes:

1. Wedge A, B and C should be inserted following the sequence of 1, 2 and 3 shown in Fig. 11.
2. The wedges should be set 120° apart from each other.
3. Be certain that three wedges are firmly fixed and the Deflection Yoke is tightly clamped in place. Otherwise the Deflection Yoke may shift its position and cause a loss of convergence and purity.

3 Conductor Views



4 Schematic Diagram

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Notes :

1. Resistor

   All resistors are carbon 1/4W resistors unless marked as follows :

   Unit of resistance is OHM (Ω) (K = 1 000 M = 1 000 000)

◯	Nonflammable	⊠	Metal Oxide
△	Solid	◎	Metal Film
⊘	Wire Wound	⊗	Fuse

2. Capacitor

   All capacitors are ceramic 50V capacitors unless marked as follows :

   Unit of capacitance is μF unless otherwise noted.

⊗	Temperature Compensation	+ -	Electrolytic
Ⓜ	Polyester	NP	Bipolar
ⓜ	Metalized Polyester	Ⓣ	Dipped Tantalum
⊠	Polypropylene	Ⓩ	Z-Type

3. Coil

   Unit of inductance is μH, unless otherwise noted.

4. Test Point

   ⏚ : Test Point position

5. Earth Symbol

   ⏚ : Chassis Earth (Cold) ⏚ : Line Earth (Hot)

6. Voltage Measurement
   Voltage is measured using DC voltmeter.
   Conditions of the measurement are the following :
   Power Source..... AC AUTO 110-240V, 50/60Hz
   Receiving Signal.....Colour Bar signal (RF)
   All customer's controls.....Maximum positions

7. Number in red circle indicates waveform number.
   (See waveform pattern table.)

8. When arrow mark (↗) is found, connection is easily found from the direction of arrow.

9. → : Indicates the major signal flow.

10. This schematic diagram is the latest at the time of printing and subject to change without notice.

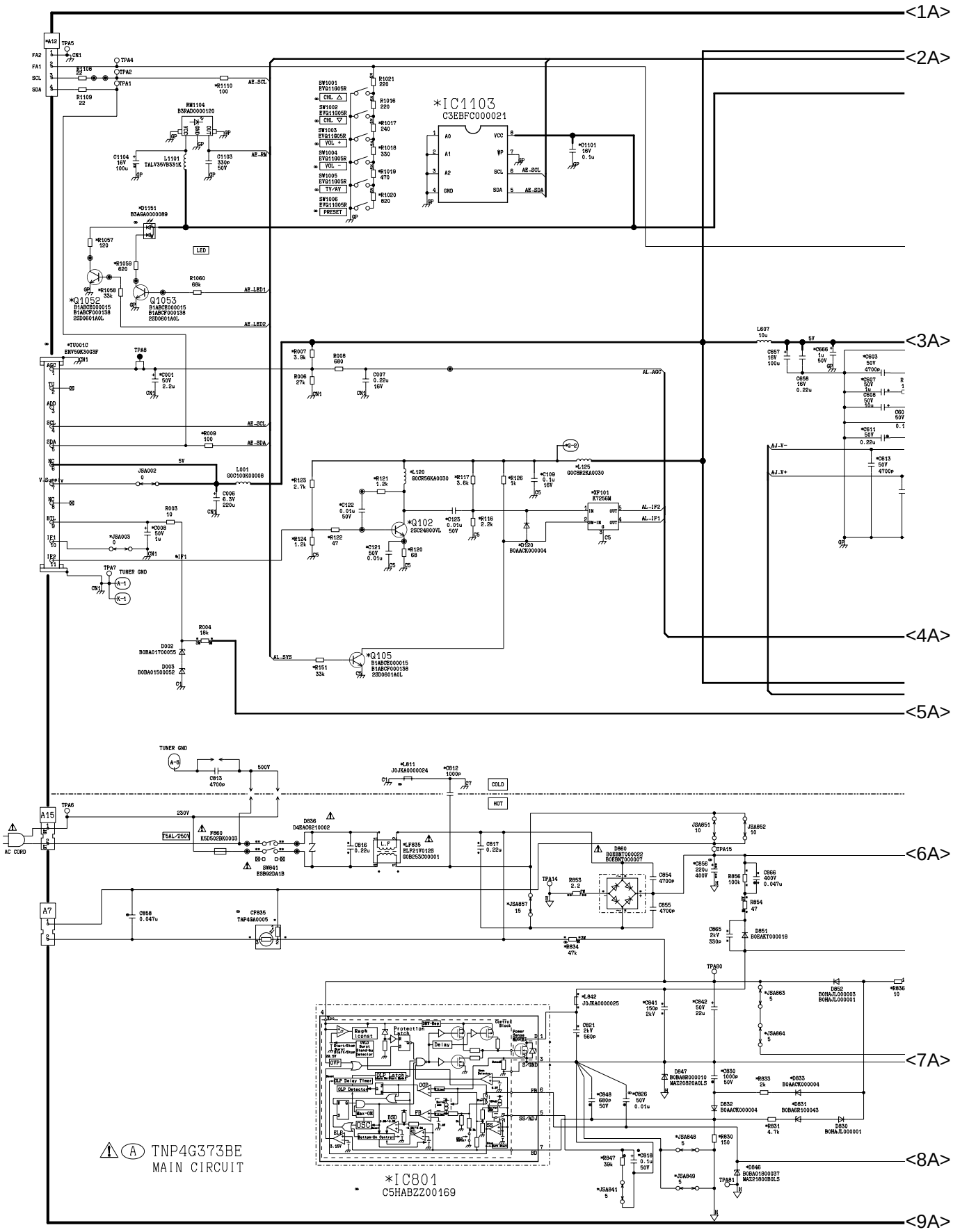
Remarks :

The Power Circuit contains a circuit area which uses a seperate power supply to isolate the earth connection.
The circuit is defined by HOT and COLD indications in the schematic diagram.
Take the following precautions :
All circuits, except the Power Circuit are cold.
Precautions :

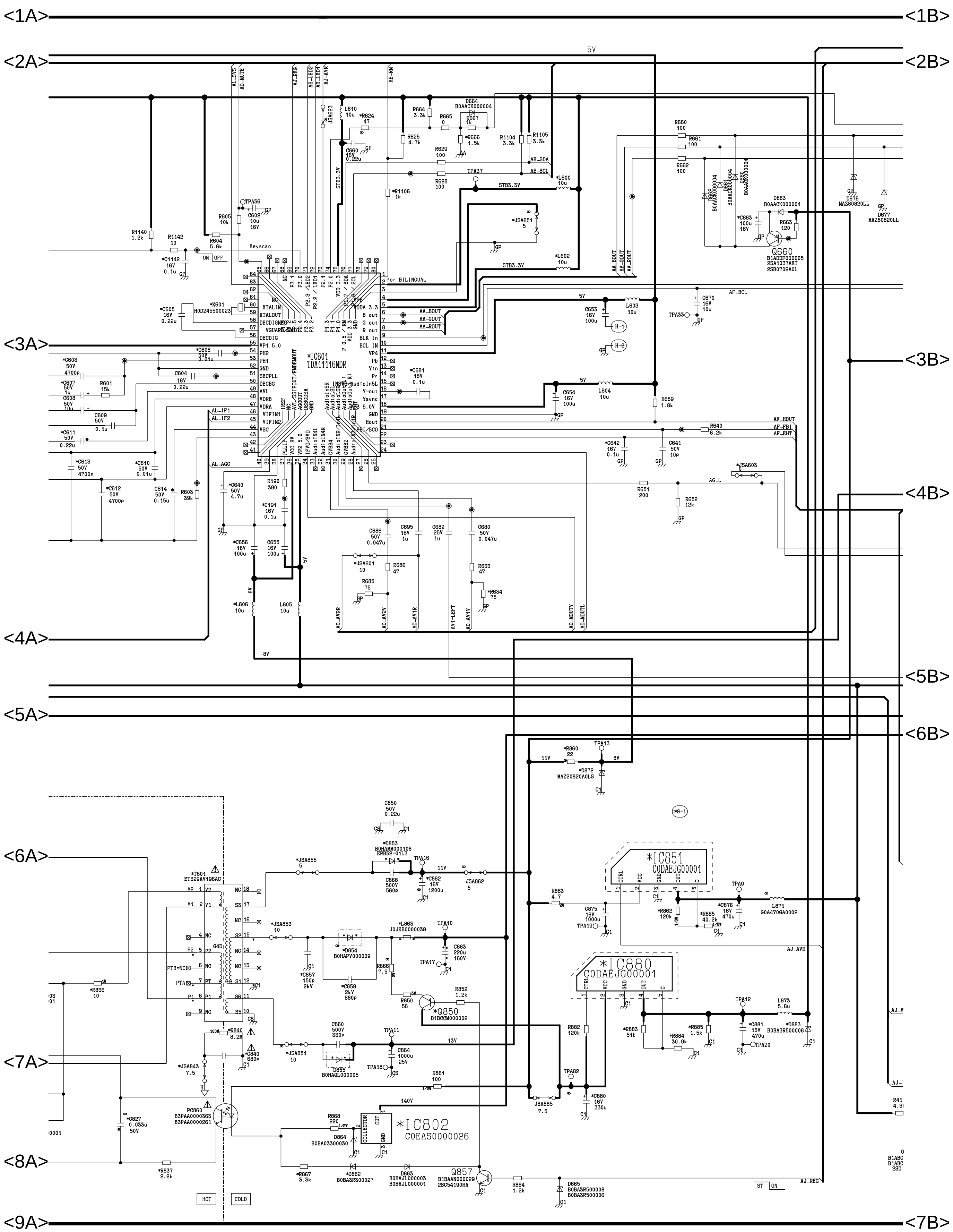
a. Do not touch the hot part or the hot and cold parts at the same time or you may be shocked.
b. Do not short-circuit the hot and cold circuits or a fuse may blow and parts may break.
c. Do not connect an instrument such as an oscilloscope to the hot and cold circuits simultaneously or a fuse may be blown.
   Connect the earth of instruments to the earth connection of the circuit being measured.
d. Make sure to disconnect the power plug before removing the chassis.

4.1. A Board

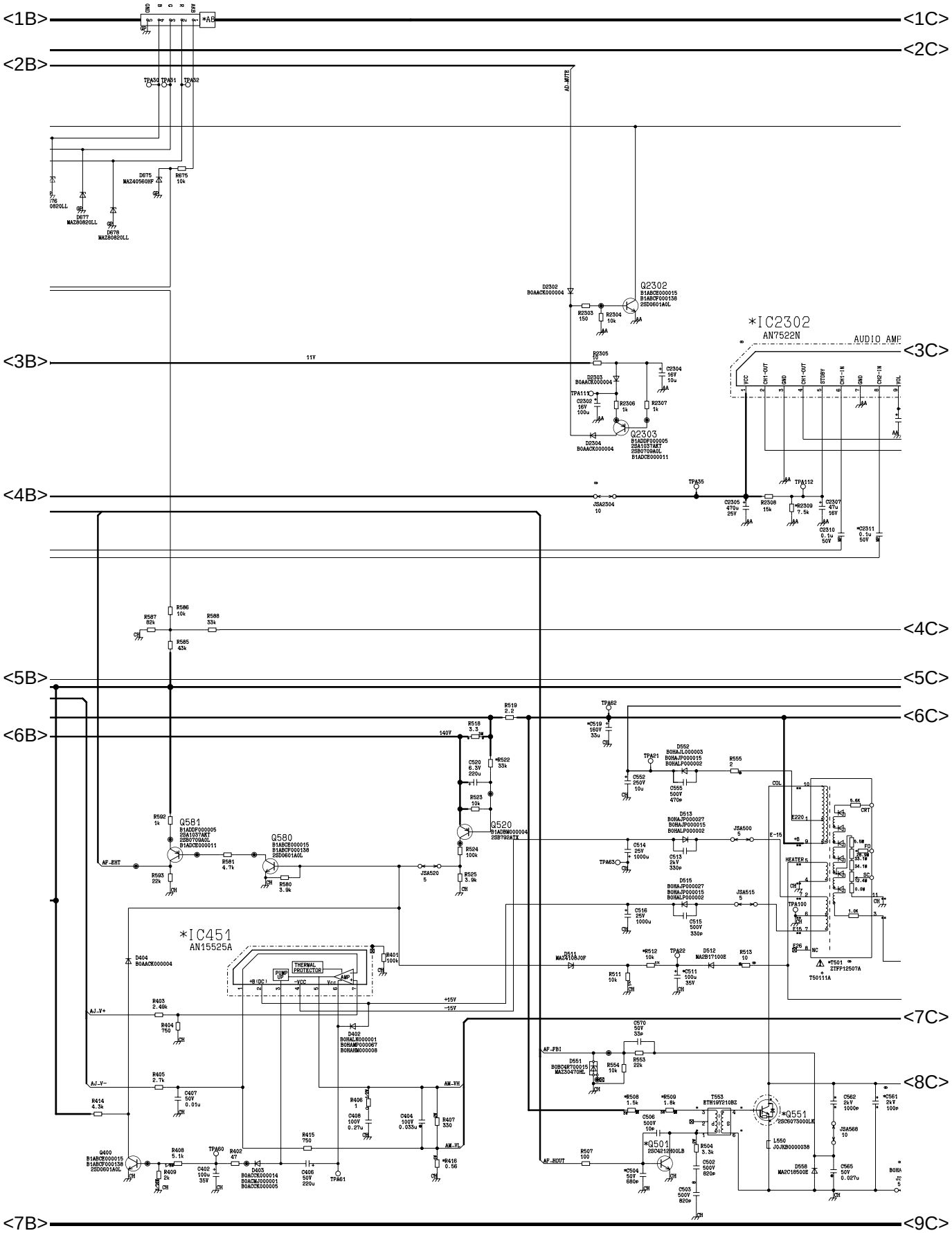
4.1.1. A Board (1/5)



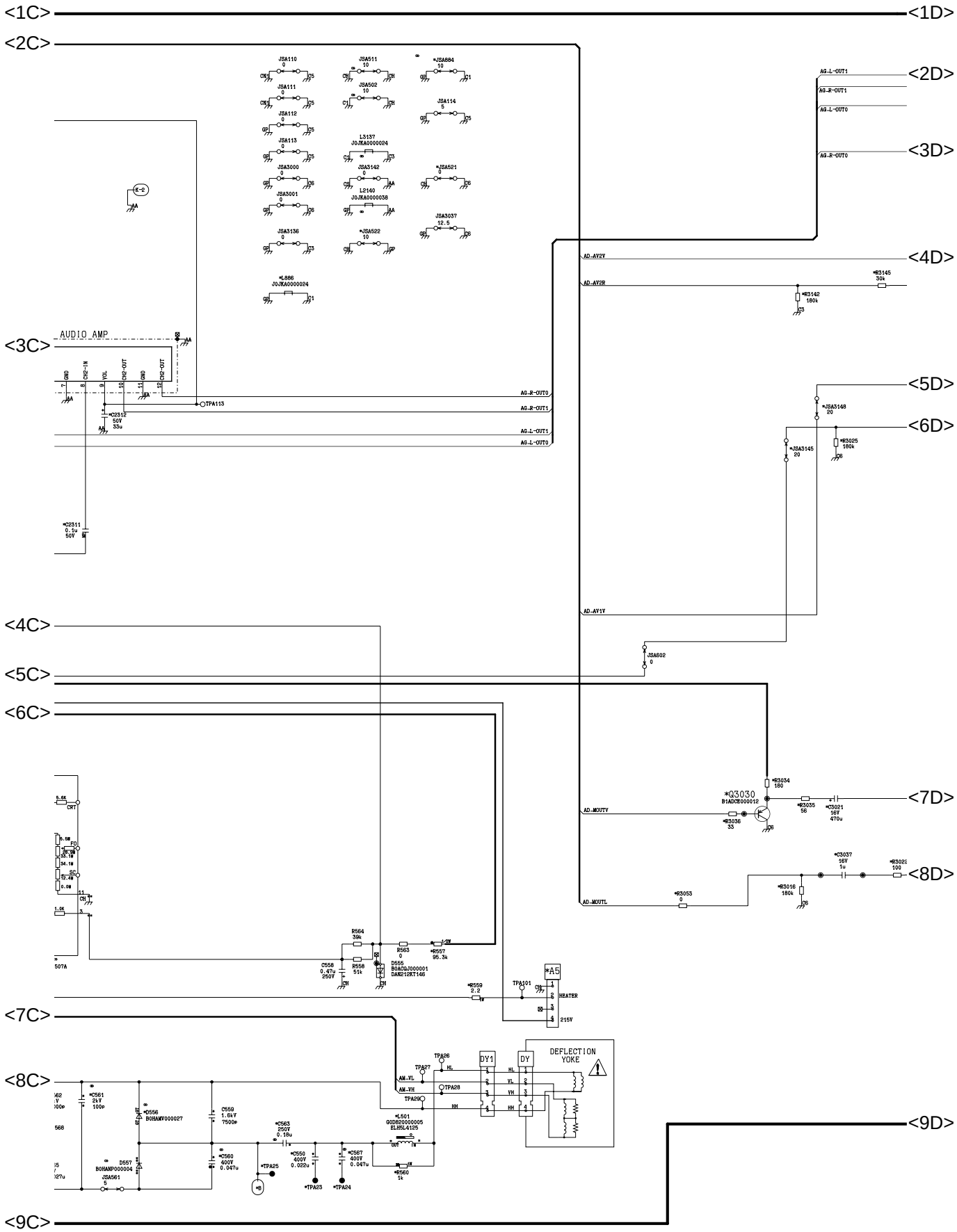
4.1.2. A Board (2/5)



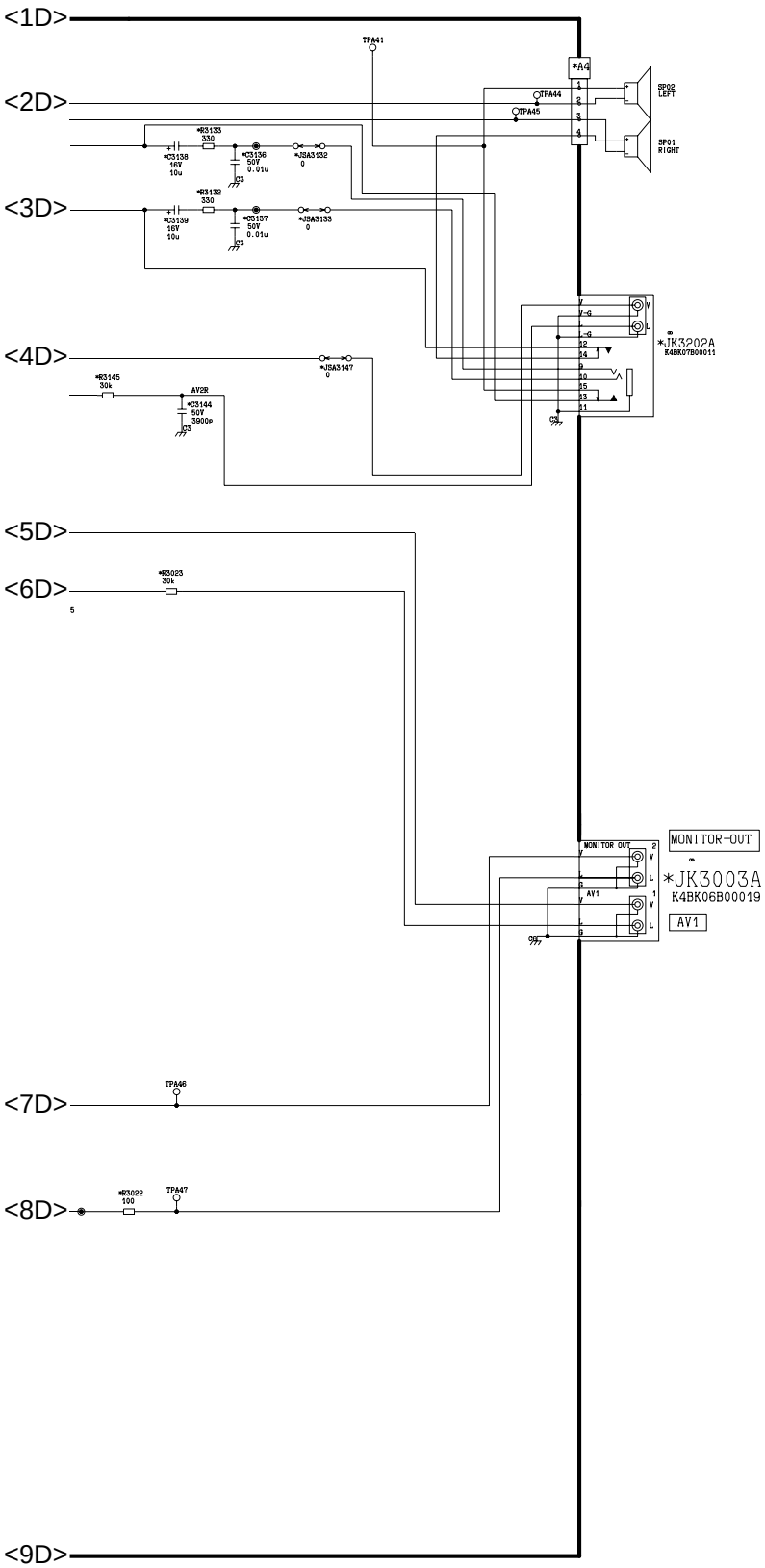
4.1.3. A Board (3/5)



4.1.4. A Board (4/5)

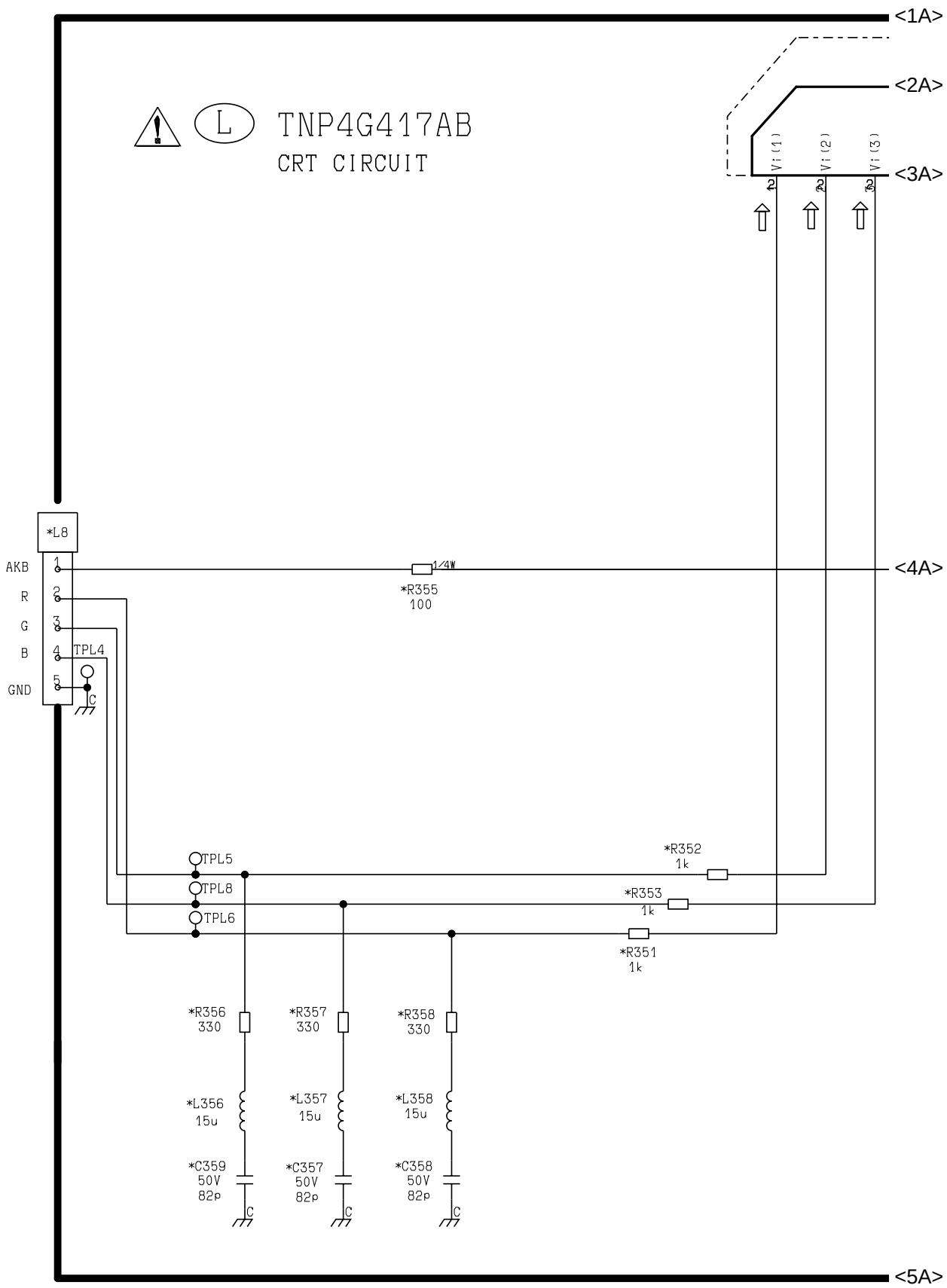


4.1.5. A Board (5/5)

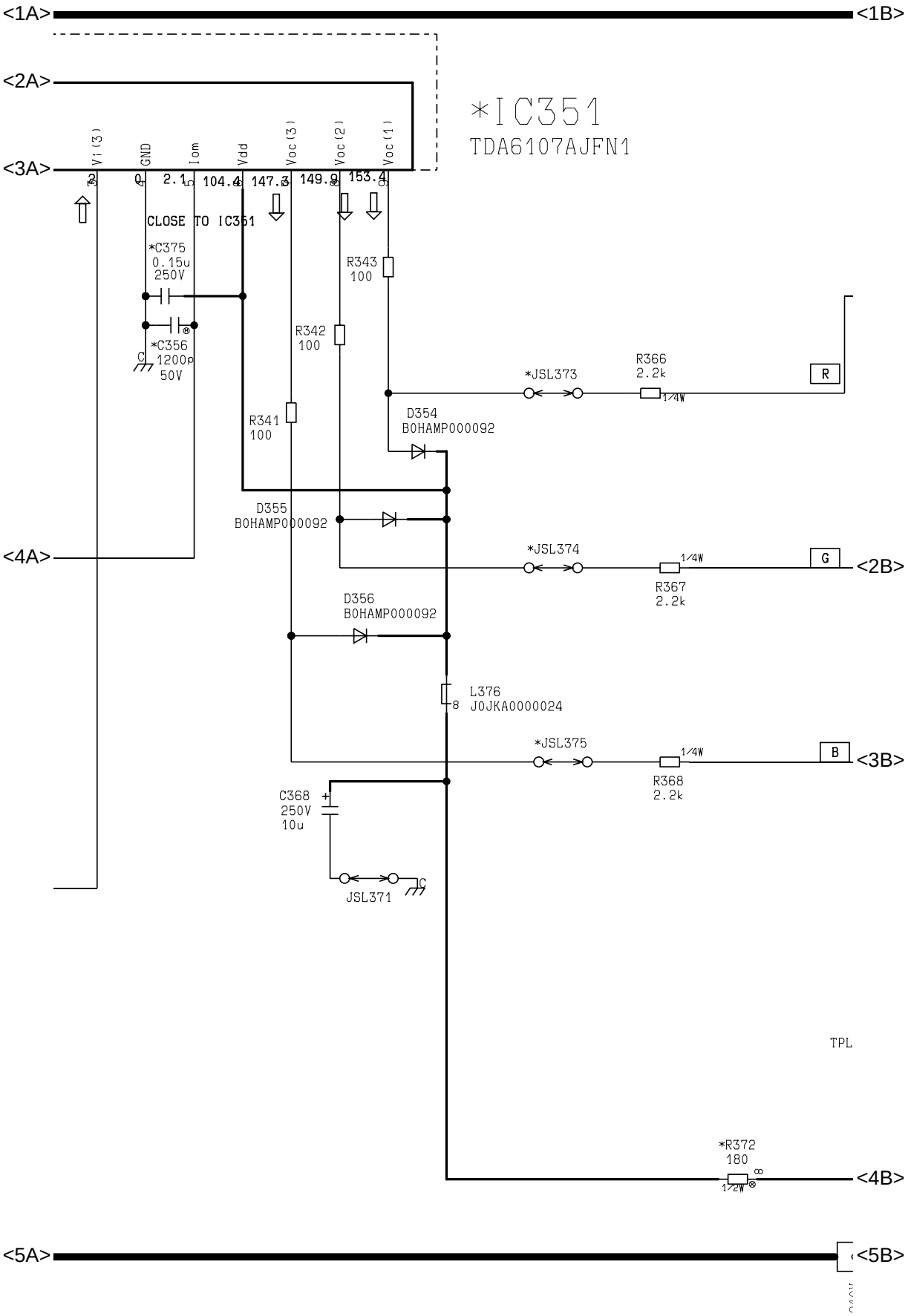


4.2. L Board

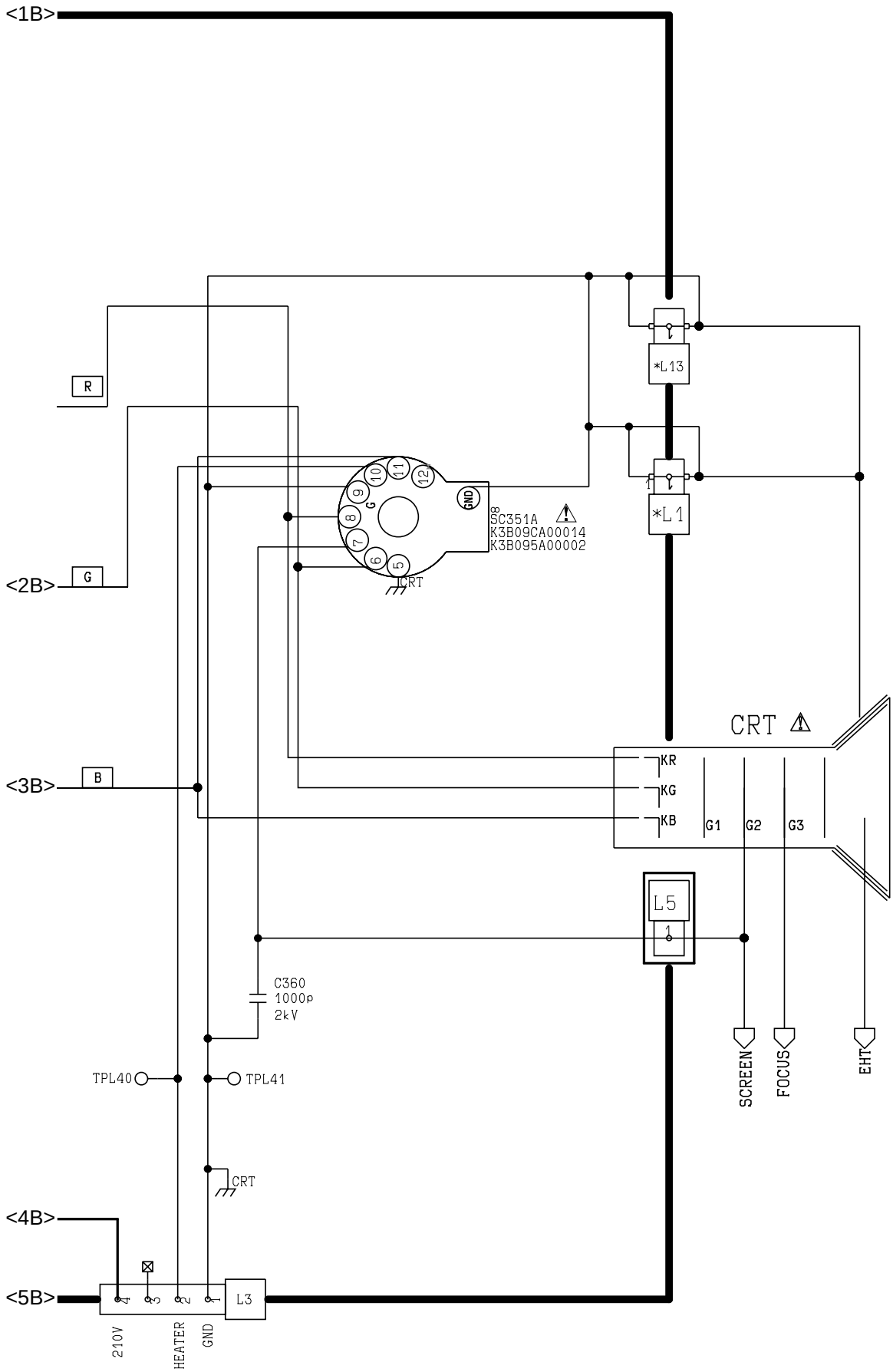
4.2.1. L Board (1/3)



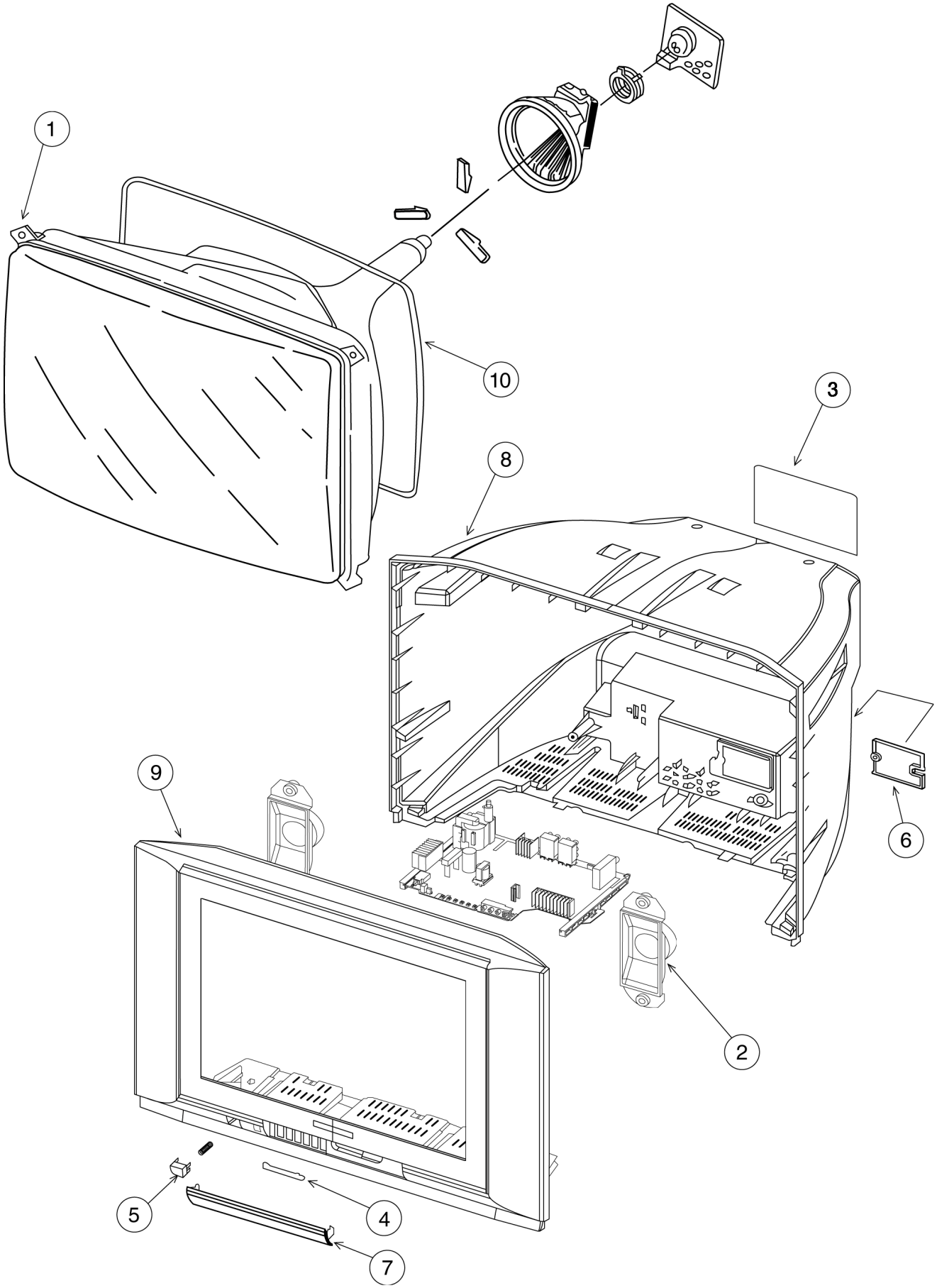
4.2.2. L Board (2/3)



4.2.3. L Board (3/3)



5 Parts Locations



6 Replacement Parts List

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use manufacturer's specified parts.

Note: Printed circuit board assembly with "NLA" is no longer available after production discontinuation of the complete set.

Abbreviation of part name and description

1. Resistor

Example :

ERD25TJ104 **C** 100KΩ, **J**, 1/4W
Type Allowance

Type	Allowance
C : Carbon	F : ± 1%
F : Fuse	G : ± 2%
M : Metal Oxide Metal Film	J : ± 5% K : ± 10%
S : Solid	M : ± 20%
W : Wire Wound	

2. Capacitor

Example :

ECKF1H103ZF **C** 0.01μF, **Z**, 50V
Type Allowance

Type	Allowance
C : Carbon	C : ± 0.25pF
E : Electrolytic	D : ± 0.5pF
P : Polyester Polypropylene	F : ± 1pF G : ± 3%
T : Tantalum	J : ± 5%
	K : ± 10%
	L : ± 15%
	M : ± 20%
	P : ± 100%, -0%
	Z : ± 80%, -20%

6.1. Replacement Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
1	A51QGA993X01	ITC	⚠
	EUR7717060	REMOTE CONTROL	
2	L0AA11C00005	SPEAKER	
3	TBM4G1531	MODEL NAME PLATE	⚠
4	TBM4G3021	PANASONIC BADGE	
5	TBX4G91211	POWER BUTTON	
6	TKP4G11744	AC CORD BRACKET	
7	TKP4G13551-1	DOOR	
8	TKU4GA2920	BACK COVER	
9	TKY4GA4411-2	CABINET ASSY	
10	TLK4G9097X	DEGAUSSING COIL	⚠
NLA	TNP4G373BE	A BOARD	⚠
NLA	TNP4G417AB	L BOARD (PRODUCED BY CIS)	⚠
	TQB4G5228	FAN BAG	
	TSX4G161L-1	AC POWER CORD	⚠
	CAPACITORS		
C001	ECA1HM2R2B	E 2.2UF, 50V	
C006	F2A0J221A317	E 220UF, 6.3V	
C007	ECJ1VB1C224K	E 0.22UF, 16V	
C008	F2A1H1R0A145	E 1UF, 50V	
C109	ECJ1VF1C104Z	C 0.1UF, Z, 16V	
C1101	ECJ1VF1C104Z	C 0.1UF, Z, 16V	
C1103	ECJ1VC1H331J	C 330PF, J, 50V	
C1104	ECEA1CKA101	E 100UF, 16V	
C1142	ECJ1VF1C104Z	C 0.1UF, Z, 16V	
C121	ECJ1VF1H103Z	C 0.01UF, Z, 50V	
C122	ECJ1VF1H103Z	C 0.01UF, Z, 50V	
C123	ECJ2VB1H103J	C 0.01UF, 50V	
C191	ECJ1VF1C104Z	C 0.1UF, Z, 16V	
C2302	F2A1C101A310	E 100UF, 16V	
C2304	F2A1C1000079	E 10UF, 16V	
C2305	F2A1E471A139	E 470UF, 25V	
C2307	F2A1C470A310	E 47UF, 16V	
C2310	ECEA1HKN0R1	E 0.1UF, 50V	
C2311	ECEA1HKN0R1	E 0.1UF, 50V	
C2312	F2A1H330A342	E 33UF, 50V	
C3021	F2A1C471A339	E 470UF, 16V	
C3037	ECJ1VF1C105Z	C 1UF, 16V	
C3136	ECJ1VF1H103Z	C 0.01UF, Z, 50V	
C3137	ECJ1VF1H103Z	C 0.01UF, Z, 50V	
C3138	F2A1C1000079	E 10UF, 16V	
C3139	F2A1C1000079	E 10UF, 16V	
C3144	ECJ2VB1H392K	C 3900PF, K, 50V	
C356	ECQB1H122JF	P 1200PF, J, 50V	
C357	F1A1H820A052	C 82PF, 50V	
C358	F1A1H820A052	C 82PF, 50V	
C359	F1A1H820A052	C 82PF, 50V	
C360	ECKW3D102KBP	C 1000PF, K, 2KV	
C368	ECA2EM100B	E 10UF, 250V	
C375	ECWF2154JSR	P 0.15UF, J,250V	
C402	F2A1V101A246	E 100UF, 35V	
C404	ECQB1333JF	P 0.033UF, J, 100V	
C406	F2A1H221A247	E 220UF, 50V	
C407	F0A1H103A039	C 0.01, 50V	
C408	ECQB1274JF	P 0.27UF, J,100V	
C502	F1B2H821A025	C 820PF, 500V	
C503	F1B2H821A025	C 820PF, 500V	
C504	ECJ1VB1H681K	C 680PF, K, 50V	
C506	F1A2H1000002	C 10PF, 500V	
C511	ECA1VM101B	E 100UF, 35V	
C513	ECKW3D331JBP	C 330PF, J, 2KV	
C514	F2A1E102A199	E 1000UF, 25V	
C515	F1B2H331A025	C 330PF, 500V	
C516	F2A1E102A199	E 1000UF, 25V	
C519	F2A2C330A096	E 33UF, 160V	
C520	F2A0J221A317	E 220UF, 6.3V	
C550	ECQM4223JZ	P 0.022UF, J,400V	
C552	F2A2E1000023	E 10UF, 250V	
C555	F1B2H471A022	C 470PF, 500V	
C558	F2A2ER47A186	E 0.47UF, 250V	
C559	F0C3C752A002	P 7500PF, 1.6KV	
C560	ECQM4473JZ	P 0.047UF, J,400V	
C561	ECKW3D101JBR	C 100PF, J, 2kV	
C562	ECKW3D102KBR	C 1000PF, K, 2KV	
C563	F0C2E184A088	P 0.18PF, 250V	
C565	ECQB1H273JF	P 0.027UF, J, 50V	
C567	ECQM4473JZ	P 0.047UF, J,400V	
C570	ECJ1VC1H330J	C 33PF, J, 50V	
C602	F2A1C1000079	E 10UF, 16V	
C603	ECJ1VB1H472K	C 4700PF, K, 50V	
C604	ECJ1VB1C224K	C 0.22UF, 16V	
C605	ECJ1VB1C224K	C 0.22UF, 16V	
C606	ECJ1VF1H103Z	C 0.01UF, Z, 50V	
C607	F2A1H1R0A145	E 1UF, 50V	
C608	F2A1H100A145	E 10UF, 50V	
C609	F1J1H104A717	C 0.1UF, 50V	
C610	ECJ1VF1H103Z	C 0.01UF, Z, 50V	
C611	ECQV1H224JL	P 0.22UF, J, 50V	
C612	ECJ1VB1H472K	C 4700PF, K, 50V	
C613	ECJ1VB1H472K	C 4700PF, K, 50V	
C614	ECQV1H154JM	P 0.15UF, J, 50V	
C640	F2A1H4R7A317	E 4.7UF, 50V	
C641	ECJ1VC1H100C	C 10PF, C, 50V	
C642	ECJ1VF1C104Z	C 0.1UF, Z, 16V	
C653	F2A1C101A310	E 100UF, 16V	
C654	F2A1C101A310	E 100UF, 16V	
C655	F2A1C101A310	E 100UF, 16V	
C656	F2A1C101A310	E 100UF, 16V	
C657	F2A1C101A310	E 100UF, 16V	
C658	ECJ1VB1C224K	C 0.22UF, K, 16V	
C660	ECJ1VB1C224K	C 0.22UF, K, 16V	
C663	F2A1C101A310	E 100UF, 16V	
C666	F2A1H1R0A317	C 1UF, 25V	
C670	F2A1C1000079	E 10UF, 16V	
C680	ECJ2YB1H473K	C 0.047UF, K, 50V	
C681	ECJ1VF1C104Z	C 0.1UF, Z, 16V	
C682	ECJ2FB1E105K	C 1UF, 25V	
C686	ECJ2YB1H473K	C 0.047UF, K, 50V	
C695	ECJ1VF1C105Z	C 1UF, 16V	
C812	F1A2E102A001	C 1000PF, 500V	
C813	ECKCNA472ME7	C 4700PF, M,	
C816	F0CAF224A066	P 0.22UF, 250V	⚠
C817	F0CAF224A066	P 0.22UF, 250V	⚠
C818	ECQB1H104JF	P 0.1UF, 50V	
C821	ECKW3D561KBP	C 560PF, K, 2KV	
C826	ECQB1H103JF	P 0.01UF, 50V	
C827	ECQB1H333JF	P 0.033UF, J, 50V	
C830	ECQB1H102JF	P 1000PF, 50V	
C840	F1A2E681A002	E 680PF, 240V	
C841	ECKW3D151KBR	C 150PF, K, 2KV	
C842	F2A1H220A536	E 22UF, 50V	
C848	ECQB1H681JF	P 680PF, J, 50V	
C850	ECJ2VF1H224Z	C 0.22UF, Z, 50V	
C854	ECKWAE472ZED	C 4700PF, Z,500V	⚠
C855	ECKWAE472ZED	C 4700PF, Z,500V	⚠
C856	F2B2G2210012	E 220UF, 400V	
C857	ECKW3D151KBR	C 150PF, K, 2KV	
C858	ECQE2A473JF	P 0.047UF, J,250V	
C859	ECKW3D681KBP	C 680PF, K, 2KV	
C860	F1B2H331A025	C 330PF, 500V	
C862	F2A1C122A256	E 1200UF, 16V	
C863	F2A2C2210013	E 220UF, 160V	
C864	F2A1E102A223	E 1000UF, 25V	
C865	ECKW3D331JBP	C 330PF, J, 2KV	
C866	ECQM4473JZ	P 0.047UF, J,400V	
C868	F1B2H561A025	C 560PF, 500V	⚠
C875	F2A1C1020060	E 1000UF, 16V	
C876	F2A1C471A245	E 470UF, 16V	
C880	F2A1C331A245	E 470UF, 16V	
C881	F2A1C471A339	E 470UF, 16V	
	DIODES		
D002	B0BA01700055	DIODE	
D003	B0BA01500052	DIODE	
D1151	B3AGA0000089	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D120	B0AACK000004	DIODE	
D2302	B0AACK000004	DIODE	
D2303	B0AACK000004	DIODE	
D2304	B0AACK000004	DIODE	
D354	B0HAMP000092	DIODE	
D355	B0HAMP000092	DIODE	
D356	B0HAMP000092	DIODE	
D402	B0HALN000001	DIODE	
D403	B0ACCK000014	DIODE	
D404	B0AACK000004	DIODE	
D511	MA4108J	DIODE	
D512	MA171	DIODE	
D513	B0HAJP000027	DIODE	
D515	B0HAJP000027	DIODE	
D551	B0BC4R700015	DIODE	
D552	B0HAJL000003	DIODE	
D555	B0ACQJ000001	DIODE	
D556	B0HAMV000027	DIODE	
D557	B0HANP000004	DIODE	
D558	MA185	DIODE	
D660	B0AACK000004	DIODE	
D661	B0AACK000004	DIODE	
D662	B0AACK000004	DIODE	
D663	B0AACK000004	DIODE	
D664	B0AACK000004	DIODE	
D675	MA4056H	DIODE	
D676	MAZ80820LL	ZENER DIODE	
D677	MAZ80820LL	ZENER DIODE	
D678	MAZ80820LL	ZENER DIODE	
D830	B0HAJL000001	DIODE	
D831	B0BA6R100003	DIODE	
D832	B0AACK000004	DIODE	
D833	B0AACK000004	DIODE	
D836	D4EAC6210002	VARISTOR	⚠
D846	B0BA01800037	ZENER DIODE	
D847	B0BA8R000010	DIODE	
D851	B0EAKT000018	DIODE	
D852	B0HAJL000003	DIODE	
D853	B0HAMM000108	DIODE	
D854	B0HAPV000009	DIODE	
D855	B0HAQL000005	DIODE	
D860	B0EBNT000022	DIODE	
D862	B0BA3R300027	ZENER DIODE	
D863	B0HAJL000003	DIODE	
D864	B0BA03300030	DIODE	
D865	B0BA3R500008	DIODE	
D872	MAZ20820A0LS	DIODE	
D883	MTZJ3.6A	ZENER DIODE	
	INTEDGRATED CIRCUITS		
IC1103	TVR4GAS625	EEPROM IC	
IC2302	AN7522N	IC	
IC351	TDA6107AJFN1	IC	
IC451	AN15525A	IC	
IC601	TDA11116NDR	IC	
IC801	C5HABZZ00169	IC, HYBRID	⚠
IC802	C0EAS0000026	IC	
IC851	C0DAEJG00001	IC, POWER SUPPLY	
IC880	C0DAEJG00001	IC, POWER SUPPLY	
	COILS		
L001	G0C100K00008	COIL	
L1101	TALV35VB331K	PEAKING COIL	
L120	TLTACTR56K	PEAKING COIL	
L125	TALV35VB8R2K	PEAKING COIL	
L2140	J0JKA0000038	BEAD CORE	
L3137	J0JKA0000024	EMI FILTER	
L356	G0C150JA0021	PEAKING COIL	
L357	G0C150JA0021	PEAKING COIL	
L358	G0C150JA0021	PEAKING COIL	
L376	J0JKA0000024	EMI FILTER	
L501	G0D820000005	LINEARITY COIL	
L550	J0JKB0000038	COIL	
L600	G0C100K00008	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L602	G0C100K00008	COIL	
L603	G0C100K00008	COIL	
L604	G0C100K00008	COIL	
L605	G0C100K00008	COIL	
L606	G0C100K00008	COIL	
L607	G0C100K00008	COIL	
L610	G0C100K00008	COIL	
L811	J0JKA0000024	EMI FILTER	
L842	J0JKA0000025	BEAD CORE	
L863	J0JKB0000039	EMI FILTER	
L871	TALL08T470KA	INDUCTION COIL	
L873	TALV35VB5R6K	PEAKING COIL	
L886	J0JKA0000024	EMI FILTER	
	TRANSISTORS		
Q102	2SC2480TX	TRANSISTOR	
Q105	B1ABCE000015	TRANSISTOR	
Q1052	B1ABCE000015	TRANSISTOR	
Q1053	B1ABCE000015	TRANSISTOR	
Q2302	B1ABCE000015	TRANSISTOR	
Q2303	B1ADDF000005	TRANSISTOR	
Q3030	B1ADCE000012	TRANSISTOR	
Q400	B1ABCE000015	TRANSISTOR	
Q501	2SC4212H	TRANSISTOR	
Q520	B1ADBM000004	TRANSISTOR	
Q551	2SC6073000LK	TRANSISTOR	
Q580	B1ABCE000015	TRANSISTOR	
Q581	B1ADDF000005	TRANSISTOR	
Q660	B1ADDF000005	TRANSISTOR	
Q850	B1BCCM000002	TRANSISTOR	
Q857	B1BAAN000029	TRANSISTOR	
	RESISTORS		
R003	ERJ3GEYJ100	M 10OHM,J,1/16W	
R004	ERG3FJ183H	M 18KOHM,J, 3W	
R006	ERJ3GEYJ273	M 27KOHM,J,1/16W	
R007	ERJ3GEYJ392	M 3.9KOHM,J,1/16W	
R008	ERJ3GEYJ681	M 680OHM,J,1/16W	
R009	ERJ3GEYJ101	M 100OHM,J,1/16W	
R1016	ERJ3GEYJ221	M 220OHM,J,1/16W	
R1017	ERJ3GEYJ241	M 240OHM,J,1/16W	
R1018	ERJ3GEYJ331	M 330OHM,J,1/16W	
R1019	ERJ3GEYJ471	M 470OHM,J,1/16W	
R1020	ERJ3GEYJ821	M 820OHM,J,1/16W	
R1021	ERJ3GEYJ221	M 220OHM,J,1/16W	
R1057	ERJ3GEYJ121	M 120OHM,J,1/16W	
R1058	ERJ3GEYJ333	M 33KOHM,J,1/16W	
R1059	ERJ3GEYJ621	M 620OHM,J,1/16W	
R1060	ERJ3GEYJ683	M 68KOHM,J,1/16W	
R1104	ERJ3GEYJ332	M 3.3KOHM,J,1/16W	
R1105	ERJ3GEYJ332	M 3.3KOHM,J,1/16W	
R1106	ERDS2TJ102	C 1KOHM,J, 1/4W	
R1108	ERJ3GEYJ220	M 22OHM,J,1/16W	
R1109	ERJ3GEYJ220	M 22OHM,J,1/16W	
R1110	ERJ3GEYJ101	M 100OHM,J,1/16W	
R1140	ERJ3GEYJ122	M 1.2KOHM,J,1/16W	
R1142	ERJ3GEYJ100	M 10OHM,J,1/16W	
R116	ERJ3GEYJ222	M 2.2KOHM,J,1/16W	
R117	D0GB362JA008	F 1KOHM,J,1/16W	
R120	ERJ3GEYJ680	M 68OHM,J,1/16W	
R121	ERJ3GEYJ122	M 1.2KOHM,J,1/16W	
R122	ERJ3GEYJ470	M 47OHM,J,1/16W	
R123	ERJ3GEYJ272	M 2.7KOHM,J,1/16W	
R124	ERJ3GEYJ122	M 1.2KOHM,J,1/16W	
R126	ERJ3GEYJ102	M 1KOHM,J,1/16W	
R151	ERDS2TJ333	C 33KOHM,J, 1/4W	
R190	ERJ3GEYJ391	M 390OHM,J,1/16W	
R2303	ERJ3GEYJ151	M 150OHM,J,1/16W	
R2304	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R2305	ERJ3GEYJ100	M 10OHM,J,1/16W	
R2306	ERJ3GEYJ102	M 1KOHM,J,1/16W	
R2307	ERJ3GEYJ102	M 1KOHM,J,1/16W	
R2308	ERJ3GEYJ153	M 15KOHM,J,1/16W	
R2309	ERJ3GEYJ752	M 7.5KOHM,J,1/16W	
R3016	ERJ3GEYJ184	M 180KOHM,J,1/16W	

Ref. No.	Part No.	Part Name & Description	Remarks
R3022	ERJ3GEYJ101	M 100OHM,J,1/16W	
R3023	ERJ3GEYJ303	M 30KOHM,J,1/16W	
R3025	ERJ3GEYJ184	M 180KOHM,J,1/16W	
R3034	ERJ3GEYJ181	M 180OHM,J,1/16W	
R3035	ERJ3GEYJ560	M 56OHM,J,1/16W	
R3036	ERJ3GEYJ330	M 33OHM,J,1/16W	
R3053	ERJ3GEY0R00	M 0OHM,J,1/16W	
R3132	ERJ3GEYJ331	M 330OHM,J,1/16W	
R3133	ERJ3GEYJ331	M 330OHM,J,1/16W	
R3142	ERJ3GEYJ184	M 180KOHM,J,1/16W	
R3145	ERJ3GEYJ303	M 30KOHM,J,1/16W	
R341	ERDS2TJ101	C 100OHM,J, 1/4W	
R342	ERDS2TJ101	C 100OHM,J, 1/4W	
R343	ERDS2TJ101	C 100OHM,J, 1/4W	
R351	ERDS2TJ102	C 1KOHM,J, 1/4W	
R352	ERDS2TJ102	C 1KOHM,J, 1/4W	
R353	ERDS2TJ102	C 1KOHM,J, 1/4W	
R355	ERDS2TJ101	C 100OHM,J, 1/4W	
R356	ERDS2TJ331	C 330OHM,J, 1/4W	
R357	ERDS2TJ331	C 330OHM,J, 1/4W	
R358	ERDS2TJ331	C 330OHM,J, 1/4W	
R366	ERC14GK222	C 2.2KOHM,K, 1/4W	
R367	ERC14GK222	C 2.2KOHM,K, 1/4W	
R368	ERC14GK222	C 2.2KOHM,K, 1/4W	
R372	ERQ12AJ181P	F 180OHM,J, 1/2W	
R401	ERDS2TJ104	C 100KOHM,J, 1/4W	
R402	ERJ3GEYJ470	M 47OHM,J,1/16W	
R403	D1AC2491A094	M 2.49KOHM, 1/10W	
R404	D0AE751JA046	C 750OHM,J, 1/10W	
R405	D1AC2701A094	M 2.7KOHM, 1/10W	
R406	ERDS1FJ1R0	C 1OHM,J, 1/2W	
R407	ERG2SJ331E	M 330OHM,J, 2W	
R408	ERJ6ENF5101	F 5.1KOHM,J,1/8W	
R409	ERJ3GEYJ202	M 2KOHM,J,1/16W	
R414	ERJ3GEYJ432	M 4.3KOHM,J,1/16W	
R415	D1AC7500A094	M 750OHM, 1/10W	
R416	ERX1SJR56E	M 0.56OHM, J, 1W	
R504	ERG2SJS332H	M 3.3KOHM, J, 2W	
R507	ERDS2TJ101	C 100OHM,J, 1/4W	
R508	ERG3FJ152H	M 1.5KOHM,J, 3W	
R509	ERG3FJ182H	M 1.8KOHM,J, 3W	
R511	ERJ6ENF1002	M 10KOHM, 1/10W	
R512	ERJ6ENF1002	M 10KOHM, 1/10W	
R513	ERQ14AJ100E	F 10OHM,J, 1/4W	
R518	ERX3FJ3R3H	M 3.3KOHM, J, 3W	
R519	ERQ1ABJP2R2S	F 2.2OHM,J, 1/4W	
R522	ERJ3GEYJ333	M 33KOHM,J,1/16W	
R523	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R524	ERJ3GEYJ104	M 100KOHM,J,1/16W	
R525	ERJ3GEYJ392	M 3.9KOHM,J,1/16W	
R553	ERJ3GEYJ223	M 22KOHM,J,1/16W	
R554	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R555	ERQ14AJ2R0E	F 2.0OHM,J, 1/4W	
R557	ER050CKF9532	M95.3KOHM,F, 1/2W	
R558	ERDS2TJ513	C 51KOHM,J, 1/4W	
R559	D0C12R2JA042	M 2.2OHM,J, 1W	
R560	ERG1SJ102E	M 1KOHM,J, 1W	
R563	ERJ3GEY0R00	M 0OHM,J,1/16W	
R564	ERDS2TJ393	C 39KOHM,J, 1/4W	
R580	ERJ3GEYJ392	M 3.9KOHM,J,1/16W	
R581	ERJ3GEYJ472	M 4.7KOHM,J,1/16W	
R585	D0GB433JA008	F 43KOHM,J, 1/4W	
R586	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R587	D0AE823JA046	C 82KOHM,J, 1/4W	
R588	ERJ3GEYJ333	M 33KOHM,J,1/16W	
R592	ERJ3GEYJ102	M 1KOHM,J,1/16W	
R593	ERJ3GEYJ223	M 22KOHM,J,1/16W	
R601	ERJ3GEYJ153	M 15KOHM,J,1/16W	
R603	ERJ3GEYJ393	M 39KOHM,J,1/16W	
R604	ERJ3GEYJ562	M 5.6KOHM,J,1/16W	
R605	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R624	ERDS2TJ470	C 47OHM,J, 1/4W	
R625	ERJ3GEYJ472	M 4.7KOHM,J,1/16W	

Ref. No.	Part No.	Part Name & Description	Remarks
R628	ERJ3GEYJ101	M 100OHM,J,1/16W	
R629	ERJ3GEYJ101	M 100OHM,J,1/16W	
R633	ERJ3GEYJ470	M 47OHM,J,1/16W	
R634	ERJ3GEYJ750	M 75OHM,J,1/16W	
R640	ERJ3GEYJ822	M 8.2KOHM,J,1/16W	
R651	D0AE201JA046	C 200OHM,J, 1/4W	
R652	ERJ3GEYJ123	M 12KOHM,J,1/16W	
R660	ERJ3GEYJ101	M 100OHM,J,1/16W	
R661	ERJ3GEYJ101	M 100OHM,J,1/16W	
R662	ERJ3GEYJ101	M 100OHM,J,1/16W	
R663	ERJ3GEYJ121	M 120OHM,J,1/16W	
R664	ERJ3GEYJ332	M 3.3KOHM,J,1/16W	
R665	ERJ3GEY0R00	M 0OHM,J,1/16W	
R666	ERJ3GEYJ152	M 1.5KOHM,J,1/16W	
R667	ERJ3GEYJ102	M 1KOHM,J,1/16W	
R675	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R685	ERJ3GEYJ750	M 75OHM,J,1/16W	
R686	ERDS2TJ470	C 47OHM,J, 1/4W	
R689	ERJ3GEYJ182	M 1.8KOHM,J,1/16W	
R830	ERDS2TJ151	C 150OHM,J, 1/4W	
R831	ERDS2TJ472	C 4.7KOHM,J, 1/4W	
R833	D0AE202JA046	C 2KOHM,J, 1/4W	
R834	ERG3FJ473H	M 47KOHM,J, 3W	
R836	D0C1100JA051	M 10OHM,J, 1W	
R837	ERDS2TJ222	C 2.2KOHM,J, 1/4W	
R840	D0AW825JA001	C 8.2,MOHM,J, 100W	
R847	ER0S2CHF3902	M 39KOHM,F, 1/4W	
R850	ERG3SJS560H	M 56OHM,J, 3W	
R852	ERDS2TJ122	C 1.2KOHM,J, 1/4W	
R853	D0D72R2KA002	M 2.2OHM,J, 7W	
R854	ERG2FJ470H	M 47OHM,J, 2W	
R856	ERG2SJS104H	M 100KOHM,J, 2W	
R860	ERQ14AJ220P	F 22OHM,J, 1/4W	
R861	ERDS1TJ101	C 100OHM,J, 1/2W	
R862	ERJ6ENF1203	F 120KOHM,J, 1/8W	
R863	ERX2FJ4R7H	M 4.7KOHM,J, 2W	
R864	ERJ3GEYJ122	M 1.2KOHM,J,1/16W	
R865	ERJ6ENF4022	F 40.2KOHM,J, 1/8W	
R866	ERX2SJ7R5E	M 7.5OHM,J, 2W	
R867	ERDS2TJ332	C 3.3KOHM,J, 1/4W	
R868	ERDS1TJ221	C 220OHM,J, 1/2W	
R882	ERJ6GEYJ124	M 120KOHM,J,1/10W	
R883	ERJ3EKF5102	F 51KOHM,J, 1/8W	
R884	ERJ3EKF3092	F 29.4KOHM,J, 1/10W	
R885	ERJ3GEYJ152	M 1.5KOHM,J,1/16W	
	TRANSFORMERS		
T501	ZTFP12507A	FLYBACK TRANS	⚠
T553	ETH19Y210BZ	H DRIVE TRANS	⚠
T801	ETS29AV196AC	SWITCHING TRANS	⚠
	OTHERS		
A12	K1KA04AA0093	CONNECTOR	
A4	K1KA04AA0190	CONNECTOR	
A5	K1KA04AA0659	CONNECTOR	
A8	K1KA05AA0659	CONNECTOR	
CF835	TAP4GA0005	POSISTOR	⚠
F860	K5D502BK0003	FUSE	⚠
JA1	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA10	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA2	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA4	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA5	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA6	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA7	ERJ3GEY0R00	M 0OHM,J,1/16W	
JA9	ERJ3GEY0R00	M 0OHM,J,1/16W	
JK3003	K4BK06B00019	AV TERMINAL	
JK3202	K4BK07B00011	AV TERMINAL	
JSA002	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA003	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA110	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA111	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA112	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA113	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA3000	ERJ3GEY0R00	M 0OHM,J,1/16W	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
JSA3001	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA3132	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA3133	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA3136	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA3142	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA3147	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA521	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA602	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA603	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSA623	ERJ3GEY0R00	M 0OHM,J,1/16W	
L1	K1ZZ00001300	CONNECTOR	
L3	K1KA04AA0190	CONNECTOR	
L5	K1ZZ00001312	CONNECTOR	
L8	K1KA05AA0659	CONNECTOR	
L13	K1ZZ00001300	CONNECTOR	
LF835	ELF21V012S	LINE FILTER	
PC860	B3PAA0000363	PHOTO COUPLER	⚠
RM1104	B3RAD0000120	REMOCON RECEIVER	
SC351	K3B09CA00014	CRT SOCKET	⚠
SW1001	EVQ11G05R	SWITCH	
SW1002	EVQ11G05R	SWITCH	
SW1003	EVQ11G05R	SWITCH	
SW1004	EVQ11G05R	SWITCH	
SW1005	EVQ11G05R	SWITCH	
SW1006	EVQ11G05R	SWITCH	
SW841	ESB92DA1B	SWITCH	⚠
TU001	ENV59K30G3F	TUNER	⚠
X601	H0D245500023	CRYSTAL OSC	⚠
XF101	K7256M	SAW FILTER	⚠