

Service Manual

Colour Television



TX-21RX25R

GP41Z Chassis

Specifications

Power Source :	AC SINGLE 220-240 V, 50/60 Hz
Power Consumption :	86 W
Aerial Impedance :	75 Ω 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. ZEALAND) 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) 14-69 NTSC M (U.S.A.)
CATV	S1-S20 (OSCAR) 1-125 (U.S.A. CATV) C13-C49 (JAPAN) S21-S41 (HYPER) Z1-Z37 (CHINA) 5A, 9A (AUST)

Video / Audio Terminal :

DVD	
Y	1.0 Vp-p 75 Ω
P _B	0.7 Vp-p 75 Ω
P _R	0.7 Vp-p 75 Ω
AV 1, 2, 3	
Video In	1 Vp-p 75 Ω
Audio In	Approx. 0.5 V, 47 k Ω
Monitor Out	
Video Out	1 Vp-p 75 Ω
Audio Out	Approx. 0.5 V, 1 k Ω

High Voltage :	24.0 kV $\pm$ 1.5 at zero beam current
Picture Tube :	A51QGA993X01 51.0 cm (21 inches) Measured diagonally, 90° deflection

Audio Output :	20.0 W
Dimensions :	Height : 431 mm Width : 596 mm Depth : 340 mm
Mass :	20.5 kg (Net)

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

Panasonic®

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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

	Page		Page
1 Safety Precautions	3	4 Conductor Views	22
1.1. General Guidelines	3	5 Schematic Diagram	23
1.2. Leakage Current Cold Check	3	5.1. A Board	25
1.3. Leakage Current Hot Check (Fig. 1)	3	5.2. L Board	30
1.4. X-Radiation	4	5.3. V Board	33
1.5. SW-Board Fix to Cabinet	4	5.4. PP Board	35
1.6. GP41Z Chassis Block Diagram	5	5.5. G Board	37
2 Service Hints	6	5.6. K Board	39
2.1. Service Position for E-Board	6	5.7. P Board	40
2.2. Service Mode Explanation	6	5.8. SW Board	41
2.3. Adjustment for White Balance	7	6 Parts Locations	43
2.4. Adjustment for CRT CUT OFF	7	6.1. Packing Exploded View - A	43
2.5. Adjustment Procedure	7	6.2. Packing Exploded View - B	44
2.6. Adjustment of Purity	8	6.3. Parts Locations	45
3 Location of Lead Wiring	20	7 Replacement Parts List	46
3.1. Wire Dressing	20	7.1. Replacement Parts List	47
3.2. Wire Dressing and Connections	21		

1 Safety Precautions

1.1. General Guidelines

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 power socket.
5. Potential, as high as **25.0 kV** 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 check to prevent the customer from being exposed to shock hazards.

1.2. Leakage Current Cold Check

1. Unplug the power 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 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 M Ω and 20 M Ω . 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 power cord directly into the power socket. Do not use an isolation transformer for this check.
2. Check that a 2 k Ω non-inductive resistor and an AC/DC current meter are 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.

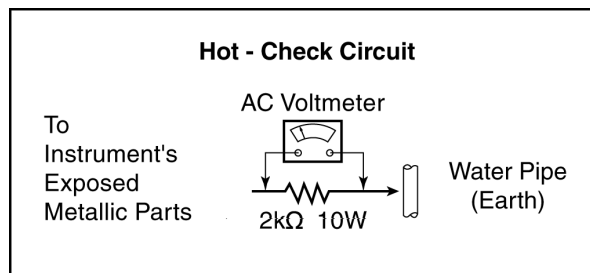


Fig. 1

1.4. X-Radiation

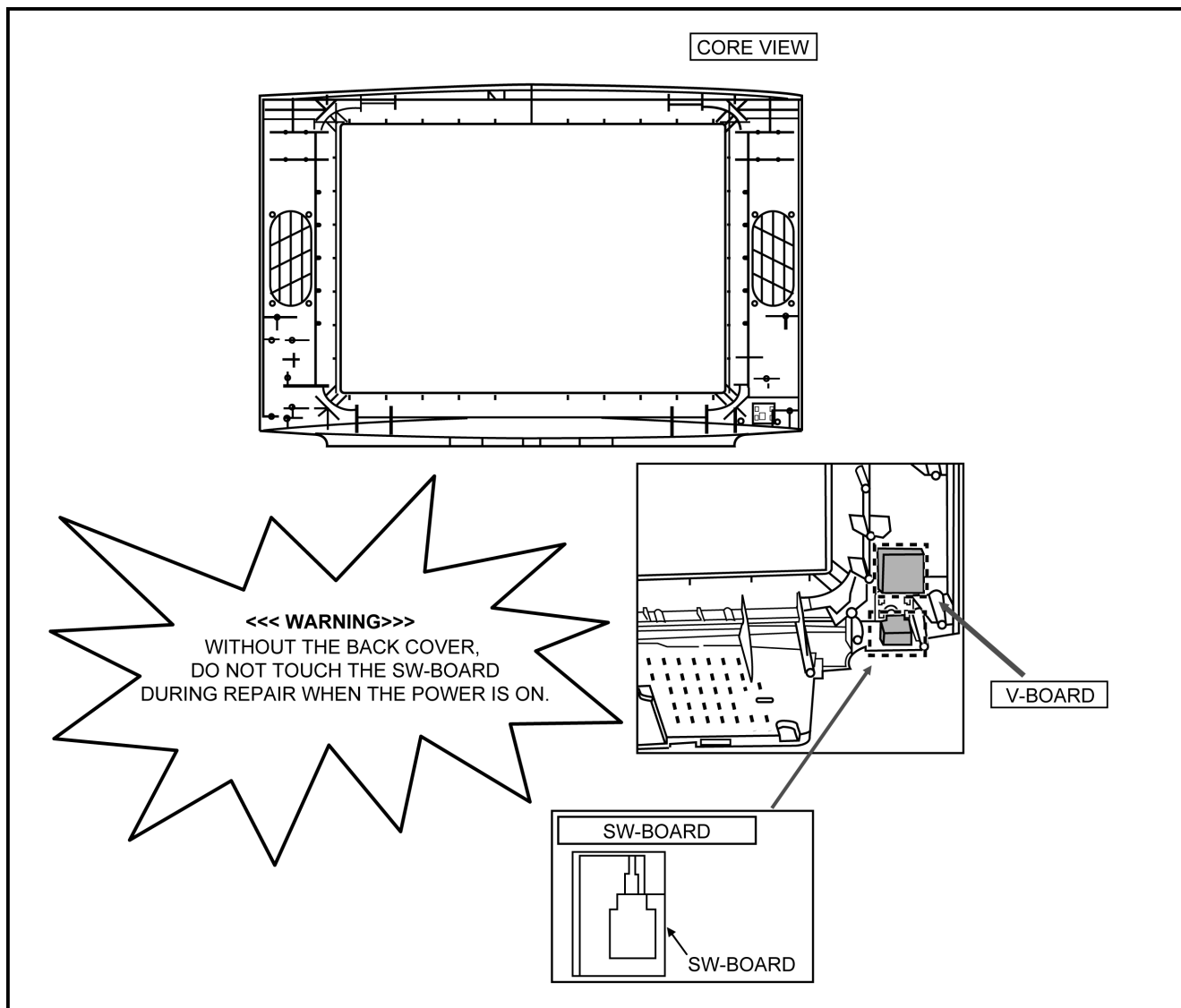
Warning:

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 the jig is capable of handling **25.5 kV** without causing X-Radiation.

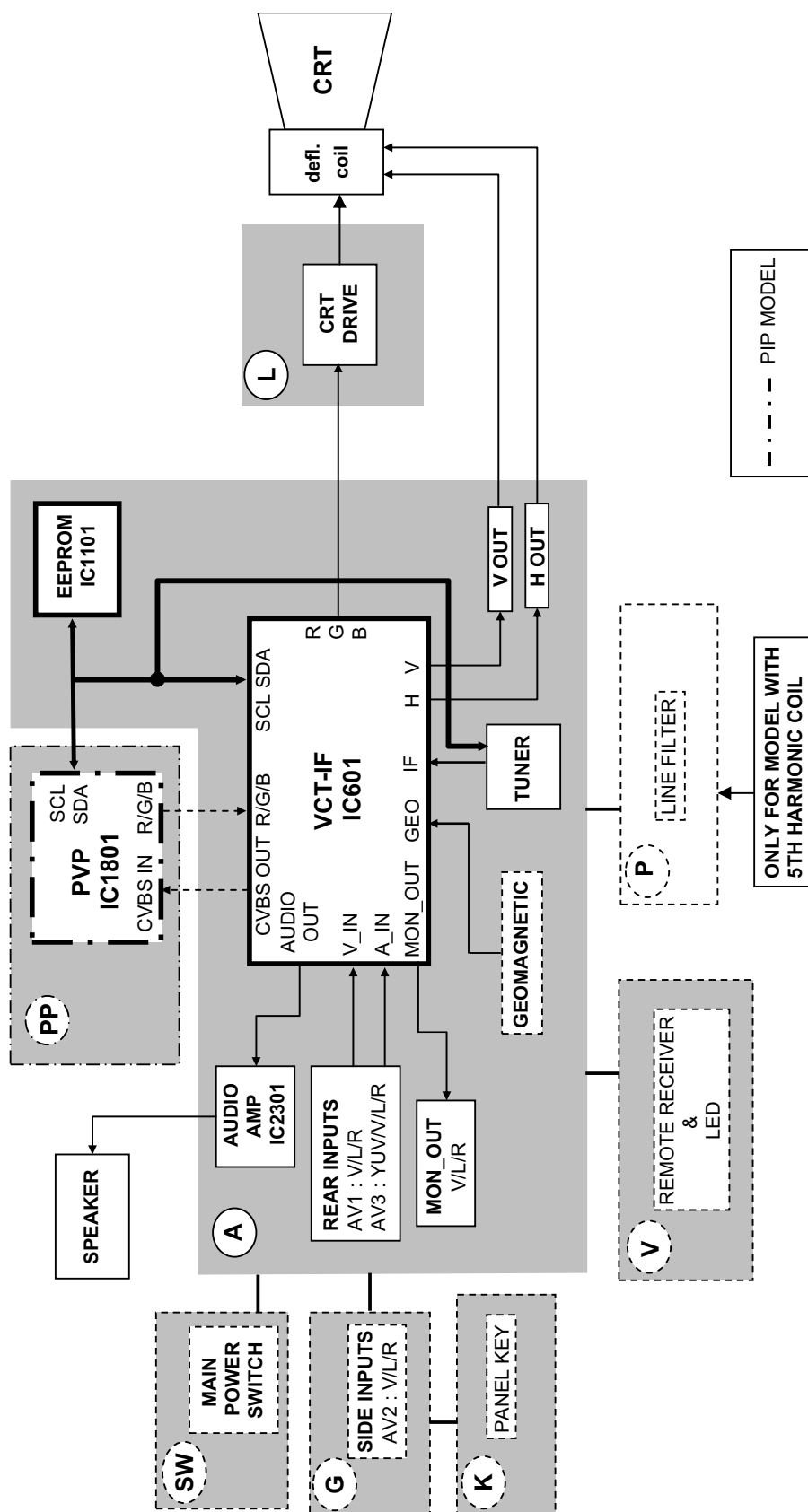
Note: It is important to use an accurate periodically calibrated high voltage meter.

1. Set the brightness to minimum.
2. Use the remote to get into Service Mode.
3. Measure the EHT. The meter reading should indicate **24.0 ± 1.5 kV**. If the meter indication is out of tolerance, immediate service and correction are required to prevent the possibility of premature component failure.
4. To prevent the possibility of X-Radiation, it is essential to use the specified picture tube, if service replacement becomes necessary.

1.5. SW-Board Fix to Cabinet



1.6. GP41Z 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 Fig. 2.

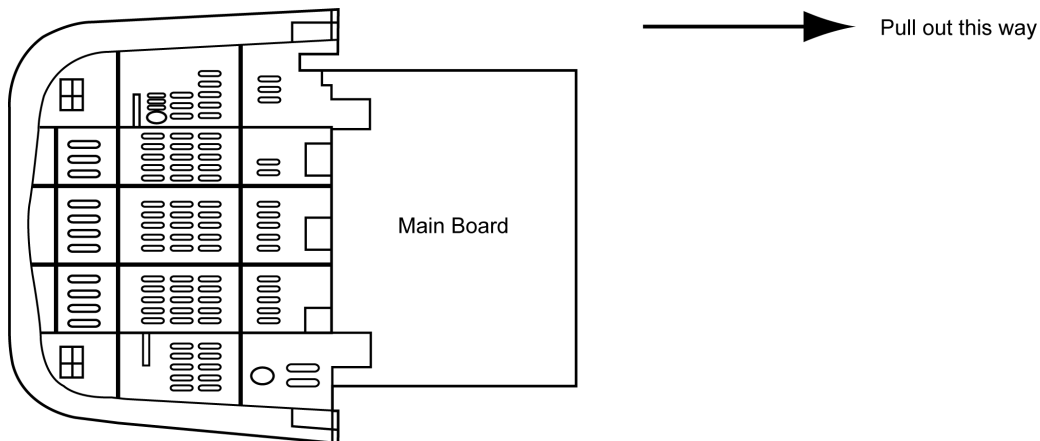


Fig. 2

2.2. Service Mode Explanation

1. Service Mode Access
 - a) Set the timer ON.
 - b) Press remote's RECALL ($\oplus$) and panel's volume down key simultaneously to enter SERVICE 1.
2. Service Mode 1 Controls

Key 3/4	Previous/Next Service 1 Item
Key 8/9	Adjust user Brightness (-/+)
Program up/down	Program position up/down
Volume +	Increment of selected item
Volume -	Decrement of selected item
OK	Store/Save selected item
Normalize	Exit service mode

3. Service Mode 2 Controls

To enter SERVICE 2; press channel key '1' in SERVICE 1 entry screen.

Key 3/4	Previous/Next Service 2 Item
Key 8/9	Toggle for option bit 0-7
Program up/down	Program position up/down
Volume +	Increment of selected item
Volume -	Decrement of selected item
OK	Store/Save selected item
Normalize	Exit service mode

NOTE:- Service Mode 2 options bit refer to each model front cover spec.

4. Service Mode 3 Controls

To enter SERVICE 3; press channel key '1' in SERVICE 2 entry screen.

Key 3/4	Previous/Next Service 1 Item
Program up/down	Program position up/down
Volume +	Increment of selected item
Volume -	Decrement of selected item
OK	Store/Save selected item
Normalize	Exit service mode

2.3. Adjustment for White Balance

Preparation:

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

Adjustment of Low Light

1. Adjustment Sub Bright, so that $Y = 6.5 \pm 1.0$ nit.
2. Adjustment R-CUT OFF, so that $X = 0.241 \pm 0.005$ nit.
3. Adjustment G-CUT OFF, so that $Y = 0.242 \pm 0.005$ nit.

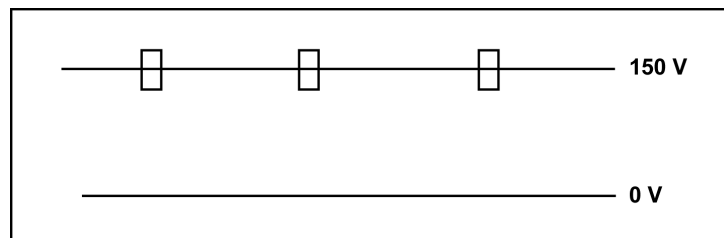
Adjustment of High Light

1. Adjustment Sub Bright, so that $Y = 150$ nit.
2. Adjustment R-Drive, so that $X = 0.263 \pm 0.003$ nit.
3. Adjustment B-Drive, so that $Y = 0.261 \pm 0.003$ 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 [5] in factory mode to enter vertical line and adjust by presing the 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 15 : 3.35 ± 0.2 V
 TPA 16 : 130 ± 2 V
 TPA 17 : 8.25 ± 0.35 V
 TPA 18 : 1.85 ± 0.15 V
 TPA 19 : 5.30 ± 0.2 V
 TPA 20 : 188 ± 15 V

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 16 and confirm the +B voltage is $130.0 \text{ V} \pm 2$.
2. Connect a high frequency voltmeter to heater and confirm that voltage reads $6.3 \text{ V (RMS)} \pm 0.24$.
3. Normalize the brightness and contrast.

2.6. Adjustment of Purity

1. INSTRUMENTS

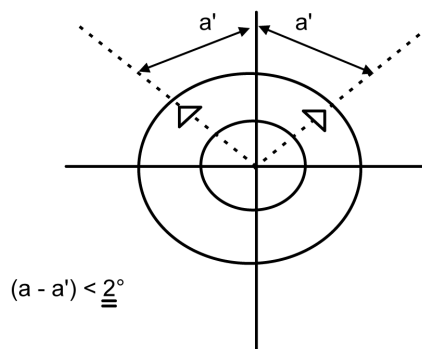
- a. Purity Jig
- b. Helmholtz device

2. PREPARATION

- a. Set the Helmholtz device to local magnetic field.
Horizontal : $0 \pm 0.03 \times 10^{-4} \text{ T}$
- b. Aging should be performed over 60 minutes.
- c. Receive the purity pattern (White pattern).
- d. Picture menu : CONTRAST ... Max. BRIGHT ... Max.
- e. Set V-CENTER to [4].
- f. Static convergence should have been roughly adjusted.
- g. Connect DC current meter through FBT (pin 3) and adjust to $[1200 \pm 10\%] \mu\text{A}$.

3. ADJUSTMENT

- a. Set both purity magnet's knobs to top.
- b. Adjust the purity so that the markers on monitor scope of purity jig become symmetrical in horizontal direction.
- c. Only for stripe CRT, correct vertical centre by purity magnet too.
- d. Set up deflection yoke so that the position of deflection yoke becomes $[10 \mu\text{m} \pm 5]$ forward on monitor scope at this time by attention note to tile deflection yoke.
- e. Repeat procedures (a) ~ (d).
- f. Tighten deflection yoke band.
- g. Adjust beam landing by microscope. (Only for model change or check instruments)



ADJUSTMENT OF CONVERGENCE

1. INSTRUMENT

- a. Helmholtz device

2. PREPARATION

- a. Set the Helmholtz device to local magnetic field.
Horizontal : $0 \pm 0.03 \times 10^{-4} \text{T}$
- b. Receive the crosshatch pattern.
- c. Picture menu : DYNAMIC Normal and adjust BRIGHT DAC until gray portion of crosshatch.
- d. Set DY to CRT not to tilt (up and down and left right).

3. ADJUSTMENT

a. Static Convergence Adjustment

- a. Make sure that the magnets are positioned as shown as in Fig. 1.
- b. Adjust the 4-pole magnets (Fig. 1) to align centre dots of R and B adjust 6-pole magnets to align centre dots to G.
- c. After adjustment, secure magnets with magnet lock of white lacquer.
 - Beams move with rotating when static magnet is turned. Rotational reduce of beams differs by angle of two magnets. Therefore, repeat magnet adjustment several times so that all aligned completely.

b. YHC, YV, XV Adjustment (Fig. 2)

- a. Adjust that static and Dynamic convergence is best with YHC VR, YV VR and XV coil. In case of static convergence is tilted, repeat (1) Static Convergence Adjustment.

c. Dynamic Convergence Adjustment

- a. When dynamic convergence is bad, fixing permalloy between neck and DY so that dynamic convergence best.

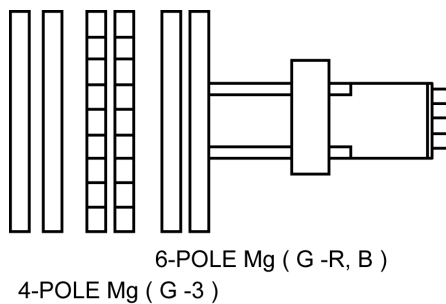


Fig. 1

4. CONFIRM THAT LEFT UPPER SIDE LINE IS STRAIGHT.

When left upper side line is not straight, put magnet on DY and adjust the left upper side line to straight.

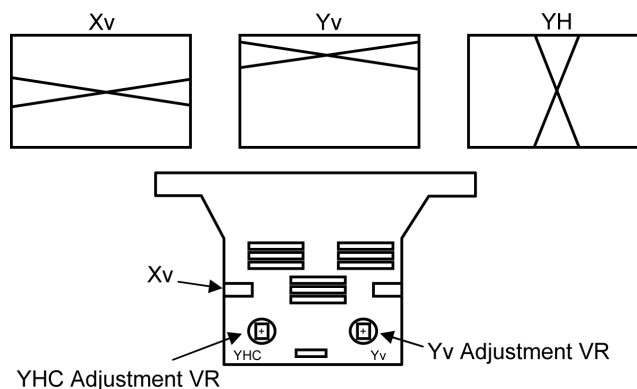


Fig. 2

ADJUSTMENT OF CRT VRS

1. PREPARATION

- Set DY to CRT not to tilt up and down left and right deflection. (Fig. 1)
- Set CY to CRT and set CY magnet primarily.
 Pur Mg : Set Pur Mg that 2 magnets are horizontal position.
 VRS Mag : Set VRS Mg that 2 magnets are top position.
- Set geomagnetic correction DAC. As in TABLE 1.

2. ADJUSTMENT

- Receive the white balance pattern.
- Adjust V-CENTER.
- Set R,B CUT OFF to minimum, and set G CUT OFF to centre.
- Receive the aging pattern.
- Set 2 magnets of vertical position to up and down equally so that centre part of CRT. (Fig. 2)

	MANUAL
DAC	0

TABLE 1

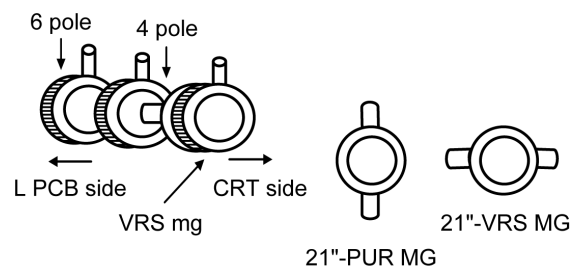


Fig. 1

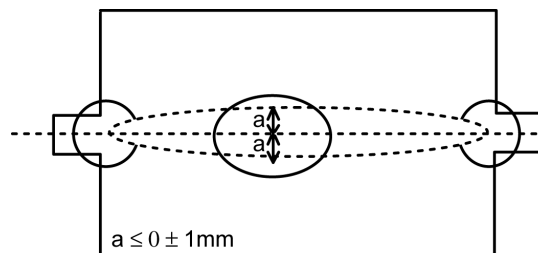


Fig. 2

TERRESTRIAL MAGNETISM CIRCUIT CONFIRMATION

1. CONFIRMATION OF GEOMAGNETIC CIRCUIT

- Select GEOMAGNETIC mode in PRESET MENU.
- Confirm that it leans right side as shown (Fig. 1), when change the DAC (*).
- Confirm that it leans left side as shown (Fig. 1), when change the DAC (**).
- Confirm that purity is changed, when change the DAC.
- Set Geomagnetic DAC as in TABLE 1.

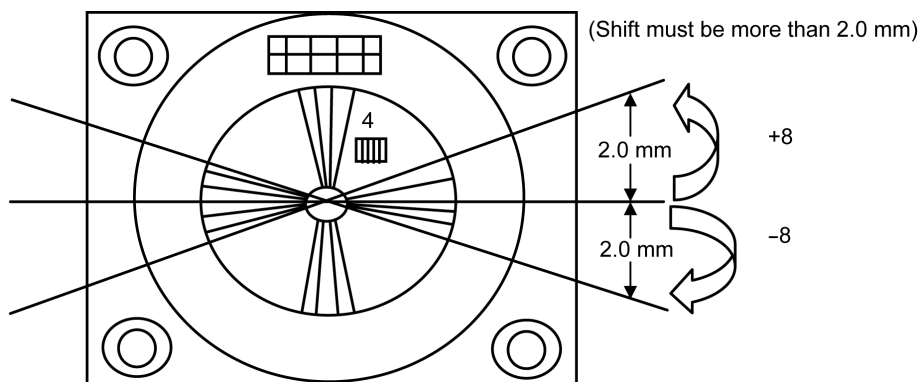


Fig. 1

	MANUAL
DAC	0

TABLE 1

	MANUAL
*DAC	-1 ~ -8
**DAC	+1 ~ +8

TABLE 2

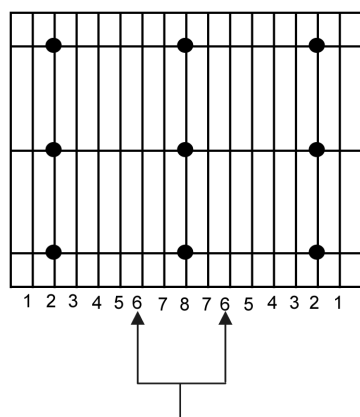
FOCUS ADJUSTMENT

1. PREPARATION

- Receive crosshatch pattern E-4
- Picture menu : DYNAMIC NORMAL

2. ADJUSTMENT

- Adjust focus VR for best position.



Adjust focus base on no. 6 line

Fig. 1. Crosshatch Pattern

DEFLECTION

Note:- For Philippines model, all 50 Hz adjustment is made in AV mode.

A . DEFLECTION ADJUSTMENT / CONFIRMATION (50 Hz, 4:3 Mode ONLY)

(Service 1)

1. INSTRUMENT

- a. Helmholtz device

2. PREPARATION

- a. Set the Helmholtz device to local magnetic field.
- b. Picture menu : DYNAMIC Normal

3. CONFIRMATION AND ADJUSTMENT

- a. Adjustment of 50 Hz V-CENTER
 - a. Receive the monoscope pattern (E11).
 - b. Adjust V-POS so that centre of monoscope pattern is at CRT centre.
- b. Adjustment of 50 Hz V-AMP
 - a. Receive the monoscope pattern (E11).
 - b. Adjust V-AMP so that
 - C, D (Fig. 3) is 2.0 ± 0.1
 - A, B (Fig. 3) is 2.0 ± 0.1
- c. Adjustment of 50 Hz H-CENTER
 - a. Receive the monoscope pattern (E11).
 - b. Adjust H-POS so that horizontal position is at centre of CRT.

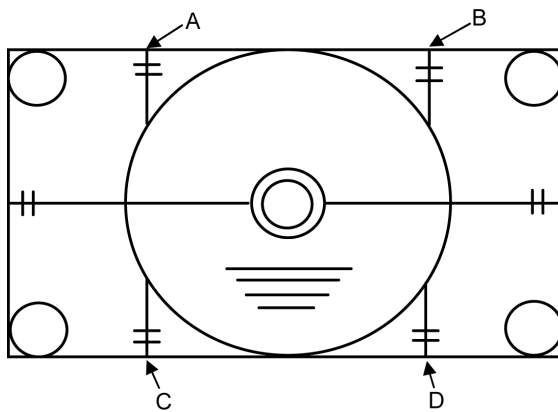


Fig. 3

B . DEFLECTION ADJUSTMENT / CONFIRMATION (50 Hz, 4:3 Mode ONLY)

(Service 1)

1. INSTRUMENT

- a. Helmholtz device

2. PREPARATION

- a. Set the Helmholtz device to local magnetic field.
- b. Picture menu : DYNAMIC Normal

3. CONFIRMATION AND ADJUSTMENT

- a. Adjustment of 50 Hz V-CENTER

- a. Receive the Philips pattern (US11).
- b. Adjust V-POS so that centre of Philips pattern is at 2/3 of Top and Bottom.
A, B (Fig. 3c) is 2/3 of viewable size

- b. Adjustment of 50 Hz V-AMP

- a. Receive the Philips pattern (US11).
- b. Adjust V-AMP so that
A (Fig. 3b) is 2/3 of viewable size

- c. Adjustment of 50 Hz H-CENTER

- a. Receive the Philips pattern (US11).
- b. Adjust H-POS so that horizontal position is at centre of CRT.
C, D (Fig. 3c) is 2/3 of viewable size

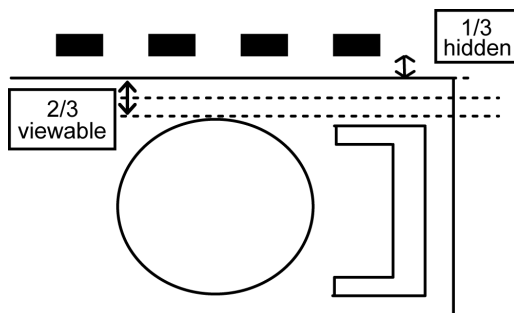


Fig. 3b

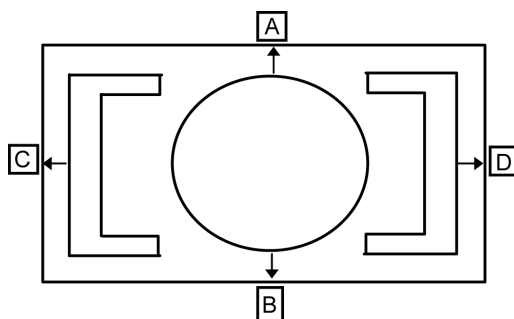


Fig. 3c

4. ADJUSTMENT OF 50 Hz H-AMP

- a. Receive the monoscope pattern (E11).
- b. Adjust H-AMP so that both edges are within 2.5 ± 0.2 . Refer to Fig. 1.

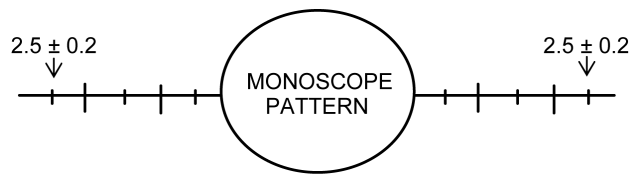


Fig. 1

5. EW ADJUSTMENT / CONFIRMATION

a. PREPARATION

- a. Receive crosshatch pattern (E4).

b. EW ADJUSTMENT

- a. Adjust the vertical line no. 2 to straight line (parabola) by EW-AMP 1. (Refer to Fig. 1c)

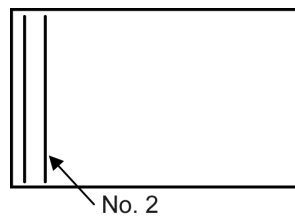


Fig. 1c

(16:9 MODE) ADJUSTMENT / CONFIRMATION**1. V-ZOOM (16:9) ADJUSTMENT**

(Service 3)

- *a. Receive PAL monoscope pattern E11. (If no burst signal : Set to force PAL)
- b. Set the aspect to 16:9.
- c. Confirm that A, B in Fig. 1 is $4.0\text{ cm} \pm 1.5$, if not, adjust V-ZOOM.
- d. Receive NTSC monoscope pattern US13. (If no burst signal : Set to force NTSC)
- c. Confirm that A, B in Fig. 1 is *a, if not, adjust V- ZOOM.

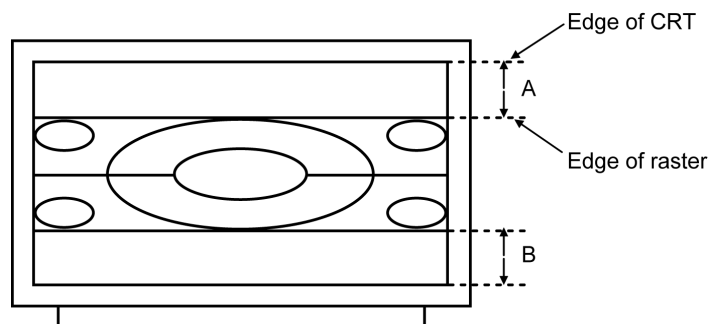


Fig. 1

1. Confirmation of deflection setting, if not in spec, touch up as below :-
(Service 3)

A) For 60 Hz (4:3 only) :

a. Adjustment of 60 Hz V-CENTER

a. Receive the monoscope pattern (US13).

b. Adjust V-POS 60 Hz offset so that centre of monoscope pattern is at CRT centre.

b. Adjustment 60 Hz V-AMP

a. Receive the monoscope pattern (US13).

b. Adjust V-AMP 60 Hz offset so that

C, D (Fig. 3) is 2.0 ± 0.1

A, B (Fig. 3) is 2.0 ± 0.1

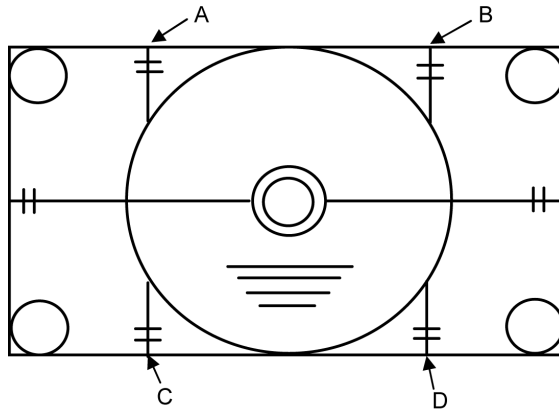


Fig. 3

c. Adjustment of 60 Hz H-CENTER

a. Receive the monoscope pattern (US13).

b. Adjust H-POS 60 Hz offset so that horizontal position is at centre of CRT.

d. Adjustment of 60 Hz H-AMP

a. Receive the monoscope pattern (US13).

b. Adjust H-AMP 60 Hz offset so that both edges are within 2.5 ± 0.2 . Refer to Fig. 1.

c. Touch up if necessary.

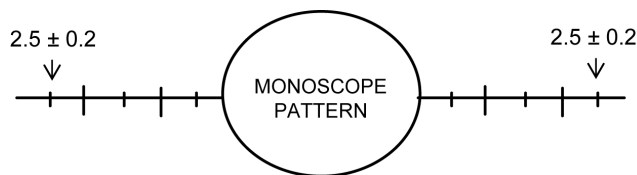


Fig. 1

e. EW ADJUSTMENT

a. Receive crosshatch pattern. (JA7)

b. Adjust the vertical line no. 2 to straight line (parabola) by EW-AMP1 60 Hz offset. (Fig. 3)

c. Touch up if necessary.

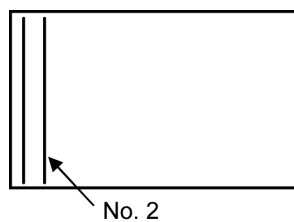


Fig. 3

B) For other Deflection touch up 50 & 60 Hz ; 4:3 & 16:9

1. Adjustment of V-Sym

- a. Adjust V-SYM so that $a=b$ in Fig. 1

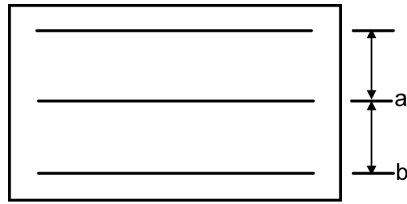


Fig. 1

2. Adjustment of V-LIN

- a. Adjust V-LIN $a=b=c=d$ in Fig. 2.

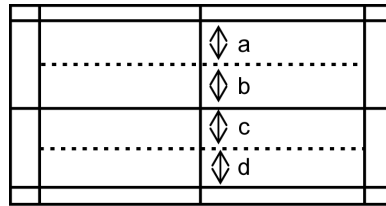


Fig. 2

3. Adjustment of TRAPEZOID

- a. Adjust the vertical line to straight line of both sides of vertical lines (trapezoid) in Fig. 3 by TRAPEZ 1.

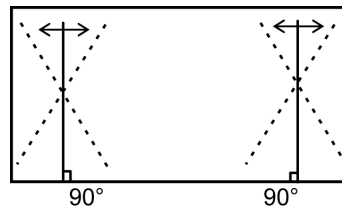


Fig. 3

4. Adjustment of UPPER CORNER AND LOWER CORNER

- a. Adjust the EW at corner in Fig. 4 by UPPER-CORNER and LOW-CORNER.



Fig. 4

5. Adjustment of ANGLE

- a. Adjust ANGLE so that the vertical line is orthogonal to the horizontal line (Fig. 5).

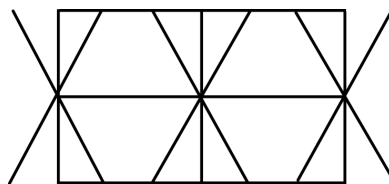


Fig. 5

6. Adjustment of BOW

- a. Adjust BOW so that the vertical lines are straight. (Fig. 6)

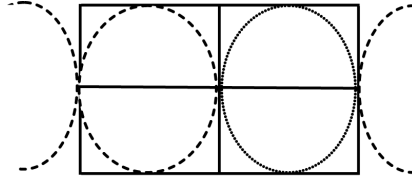
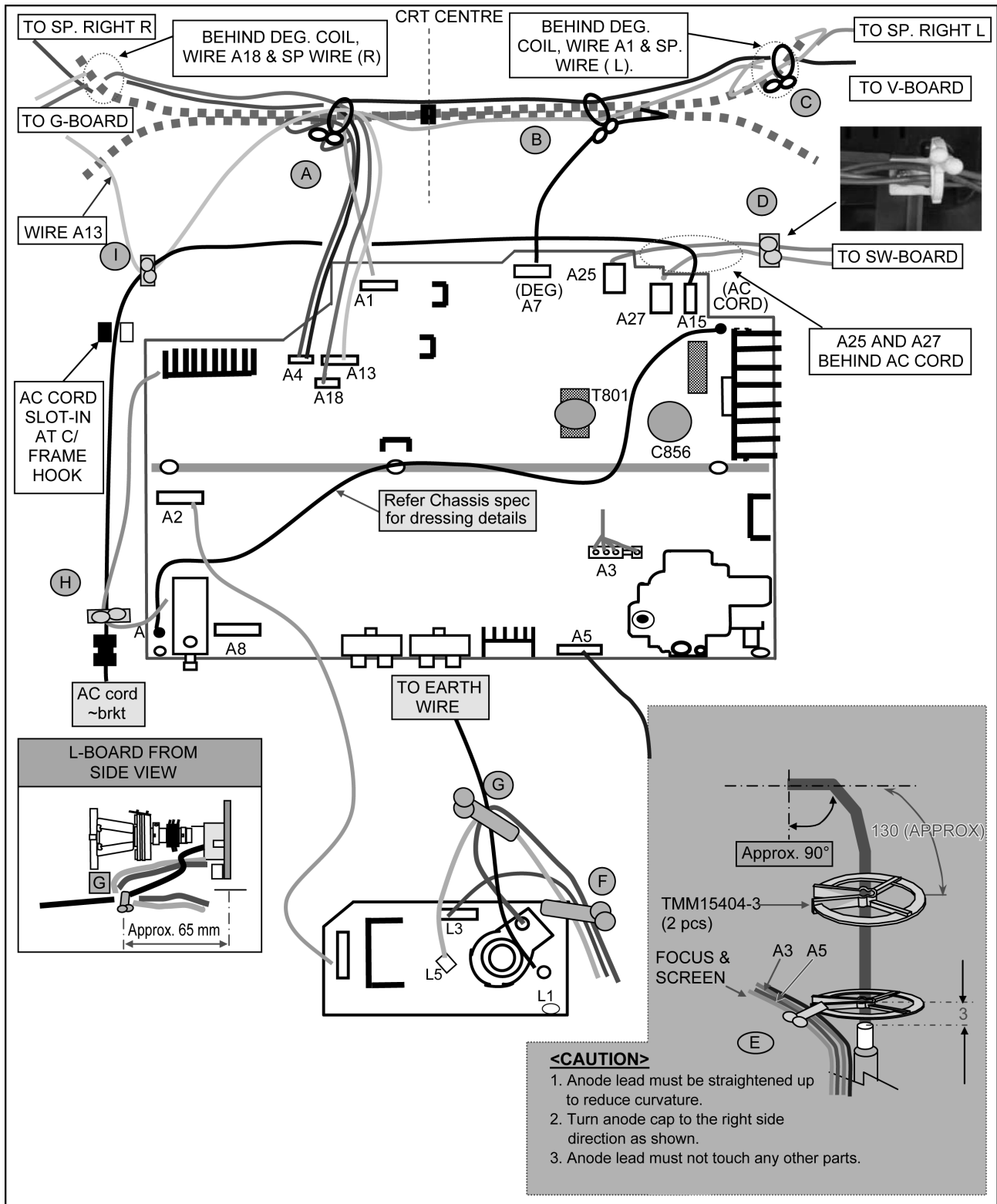


Fig. 6

3 Location of Lead Wiring

3.1. Wire Dressing



3.2. Wire Dressing and Connections

< CONNECTIONS >

LEAD \ CLAMPER	A	B	C	D	E	F	G	H	I						
A18 ~ G18	●														
DEG COIL	●	●	●												
SPEAKER (R)	⊕														
SPEAKER (L)	●	●	⊕												
A13 ~ G13)	●								●						
A1 ~ V1	●	●	●												
AC CORD								●	●						
A5 ~ L3					●	●									
A3					●	●									
FOCUS & SCREEN					●	●	●								
A27 ~ SW5				●											
A25 ~ SW15				●											
A7		●													
L1							●								
C ~ C								●							
G20 ~ K20	WIRE MUST BE INSERTED AT G-BOARD AND K-BOARD CONNECTERS.														

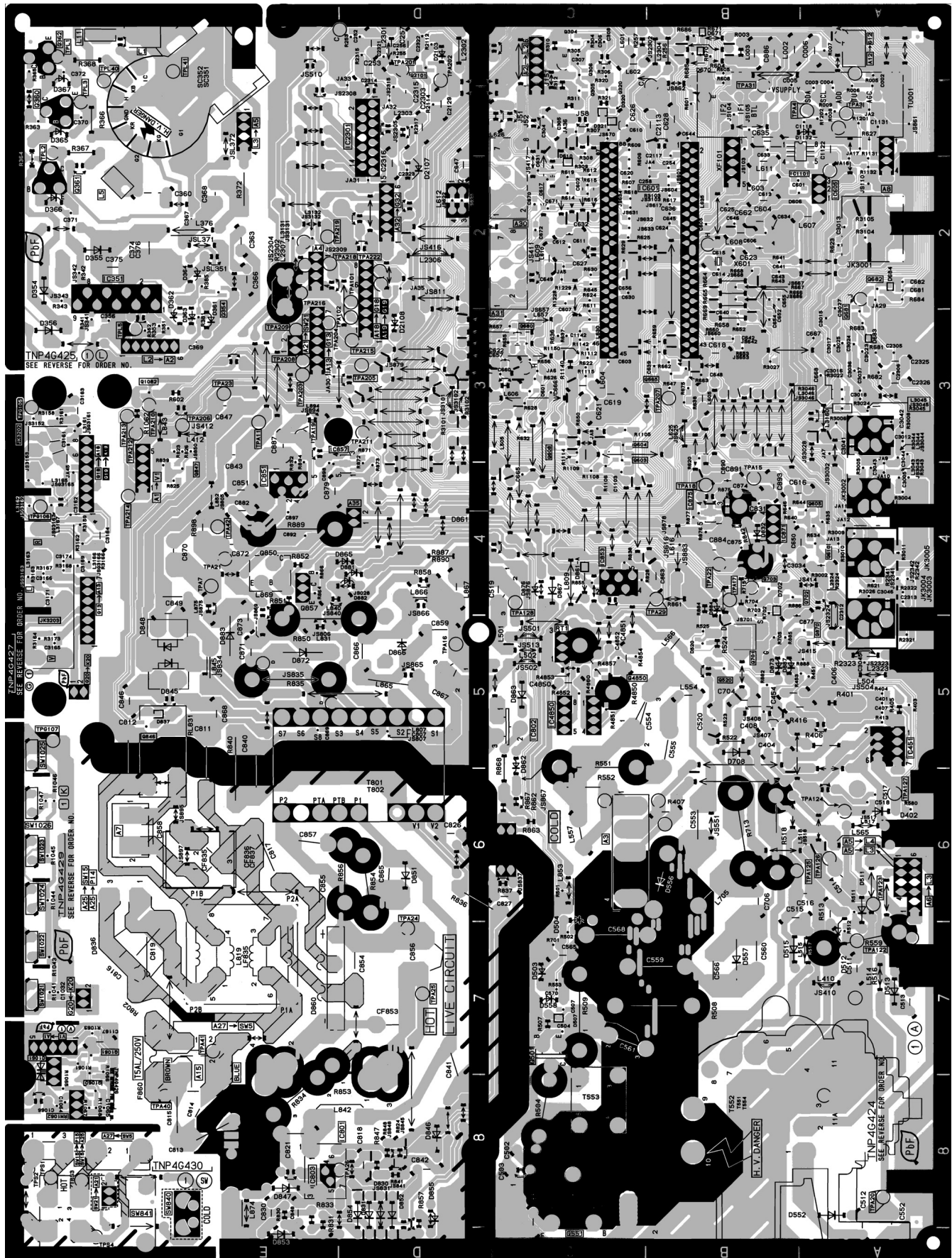
● = SINGLE CLAMP

⊕ = DOUBLE CLAMP

< SAFETY CAUTION POINTS >

1. ALL LEAD MUST NOT TOUCH THE HIGH TEMPERATURE PARTS.
(HEAT SINK / FBT / POWER CIRCUIT)
2. DY LEAD MUST BE KEPT A DISTANCE (MINIMUM 10 mm) FROM FBT BODY.
3. ANODE LEAD MUST BE KEPT A DISTANCE (MINIMUM 10 mm) FROM OTHER PARTS.
4. AC CORD MUST BE INSERTED ACCORDING TO POLARITY AND COLOUR.

4 Conductor Views



5 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 1/4 W 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 50 V capacitors unless marked as follows :

Unit of capacitance is μF unless otherwise noted.

	Temperature Compensation		Electrolytic
	Polyester		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 SINGLE 220-240 V, 50/60 Hz

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 an arrow mark () is found, connection is easily found from the direction of the 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 separate power supply to isolate the earth connection.

The circuit is defined by HOT and COLD indications in the schematic diagram.

Take the following precautions:

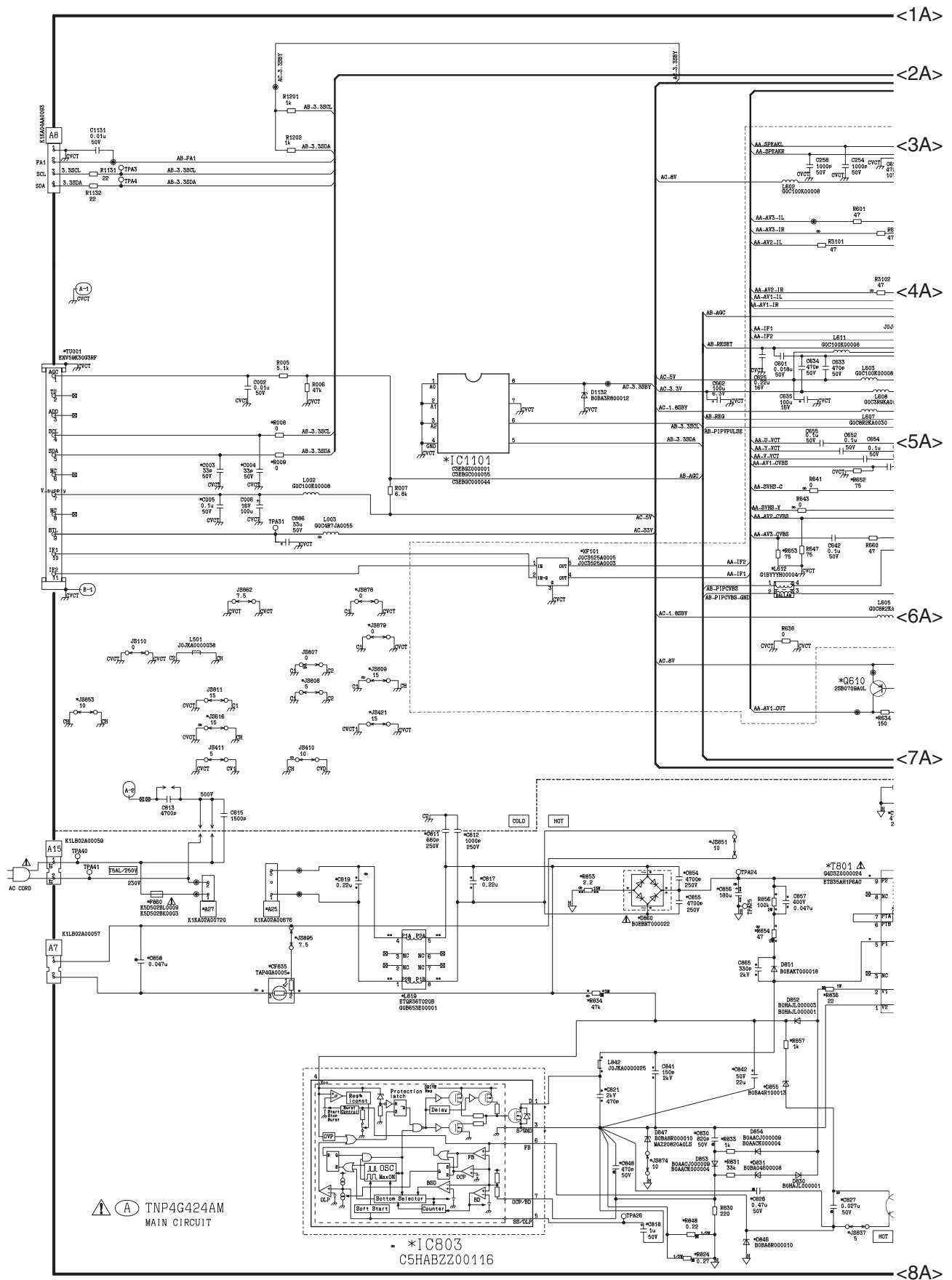
All circuits, except the Power Circuit are cold.

Precautions:

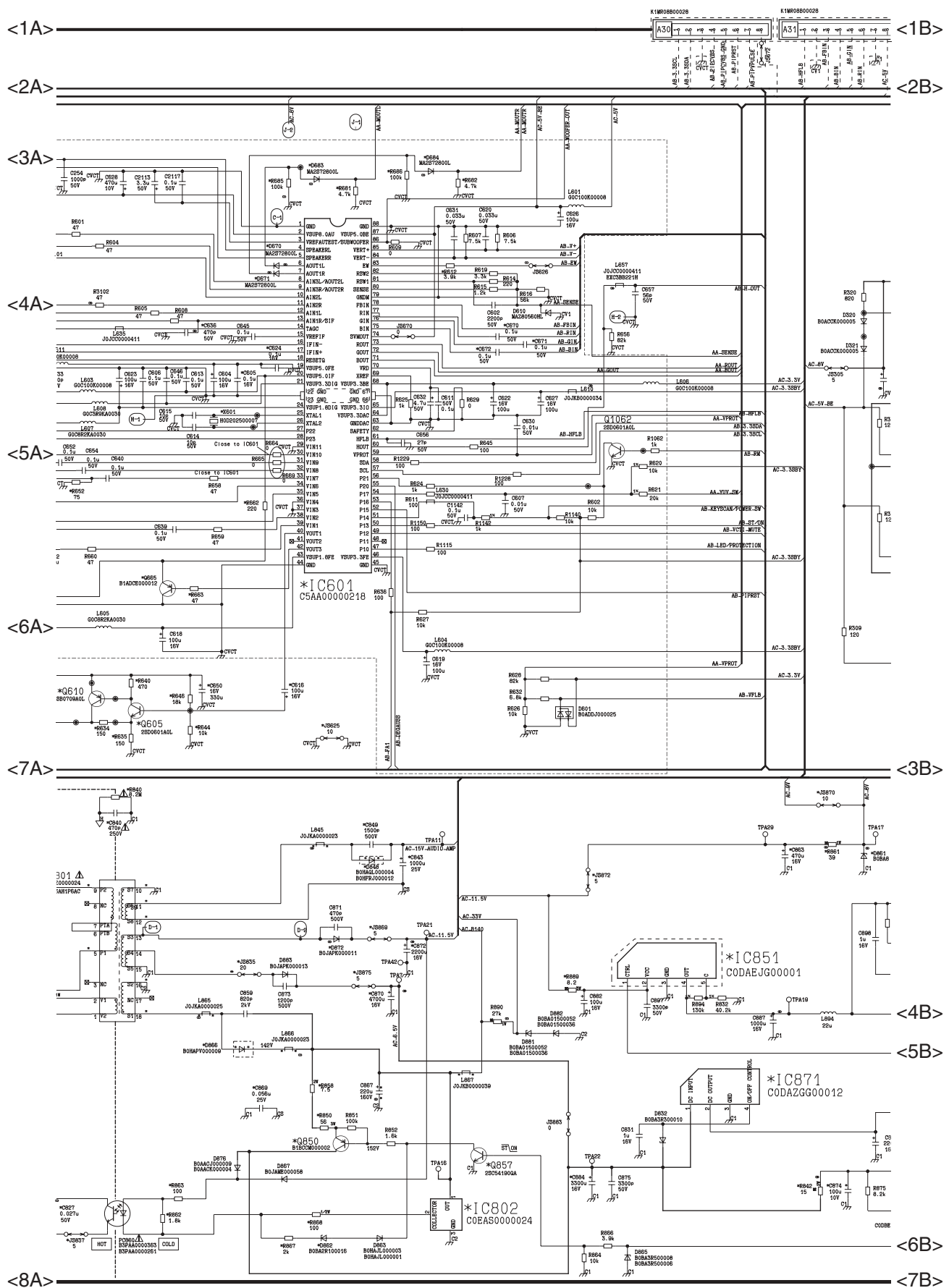
- a. Do not touch the hot part or the hot and cold parts at the same time or you may be shocked.
- b. Do not short-circuit the hot and cold circuits or a fuse may blow and parts may break.
- c. Do not connect an instrument such as an oscilloscope to the hot and cold circuits simultaneously or a fuse may blow.
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.

5.1. A Board

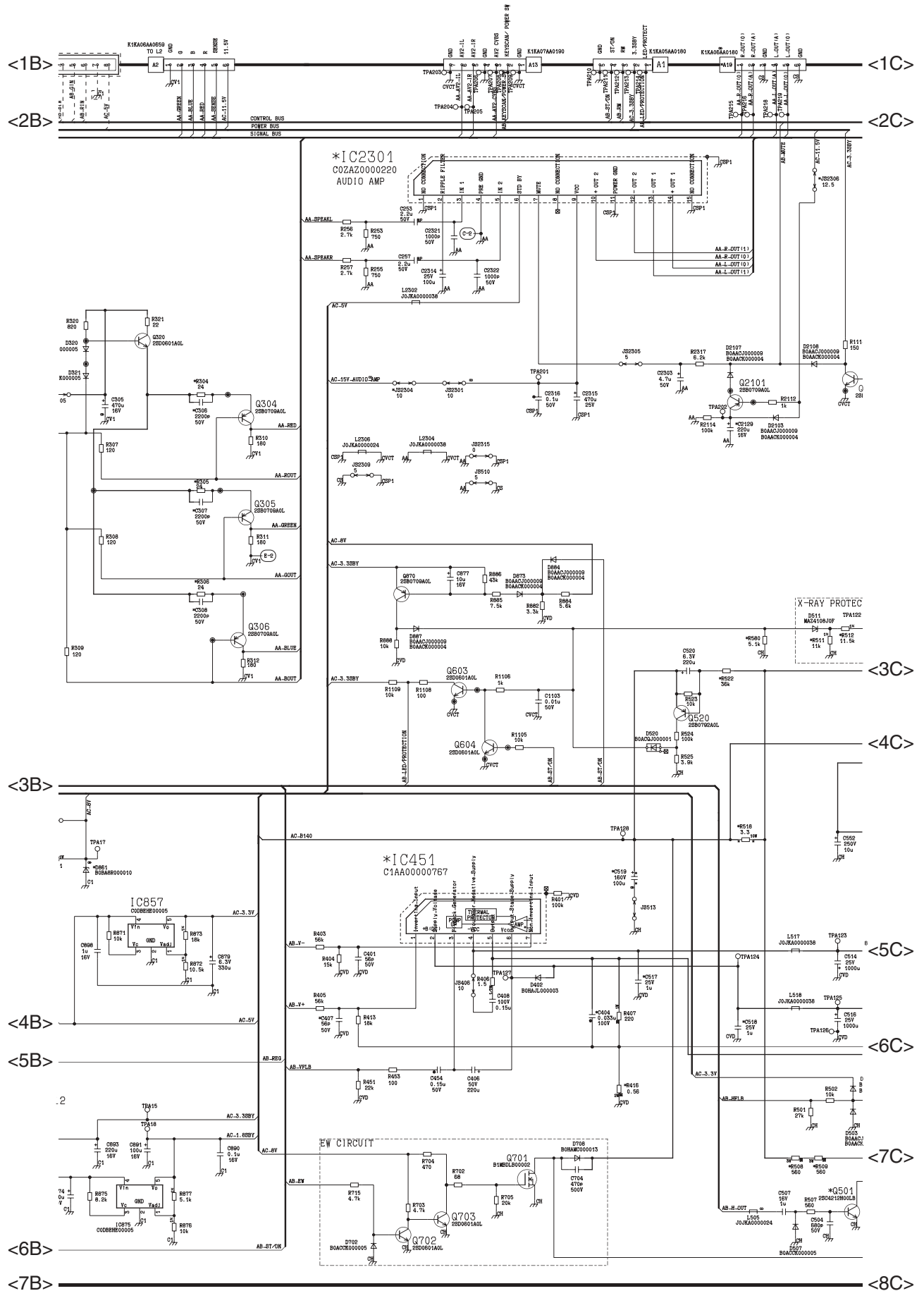
5.1.1. A Board (1/5)



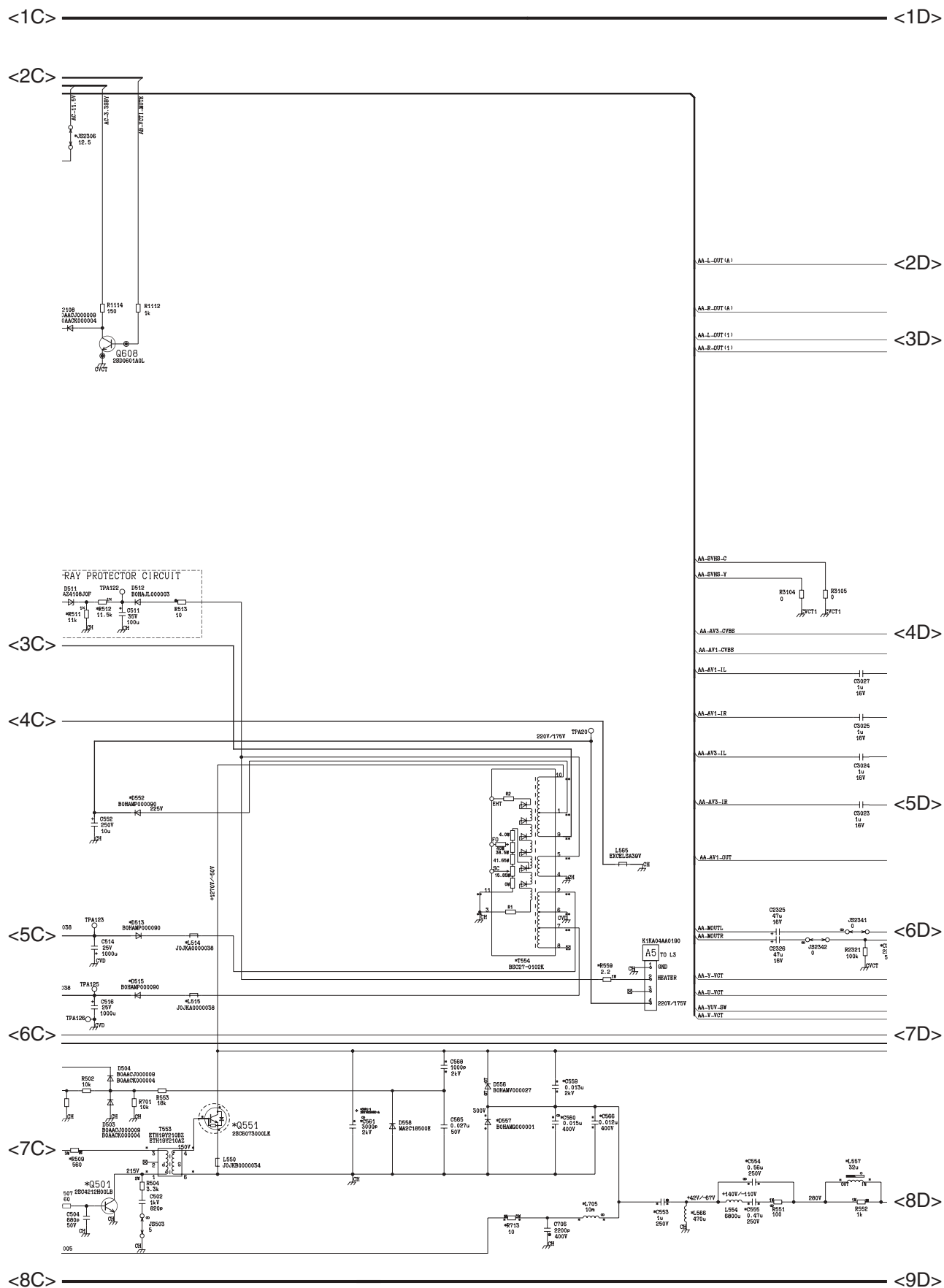
5.1.2. A Board (2/5)



5.1.3. A Board (3/5)

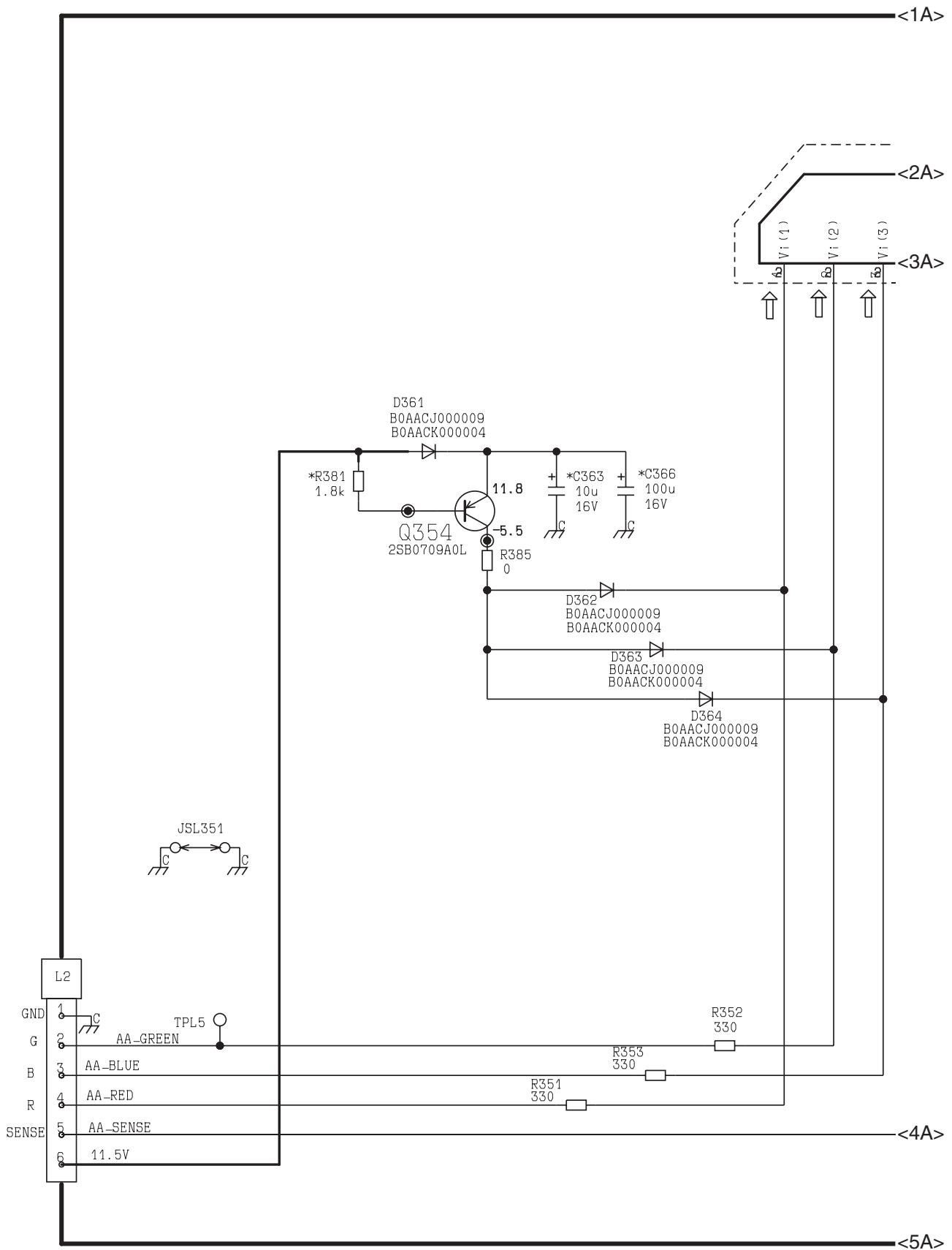


5.1.4. A Board (4/5)

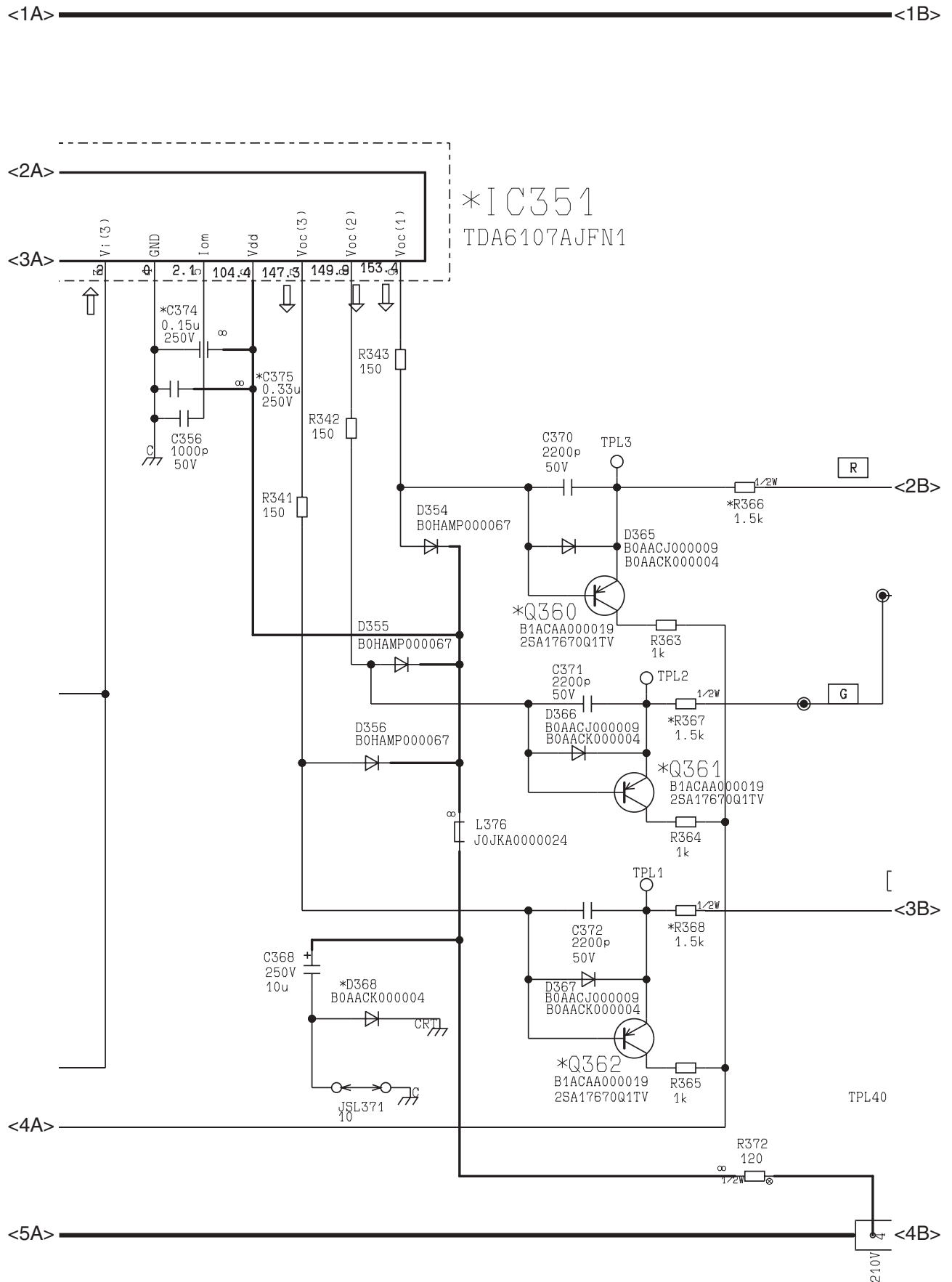


5.2. L Board

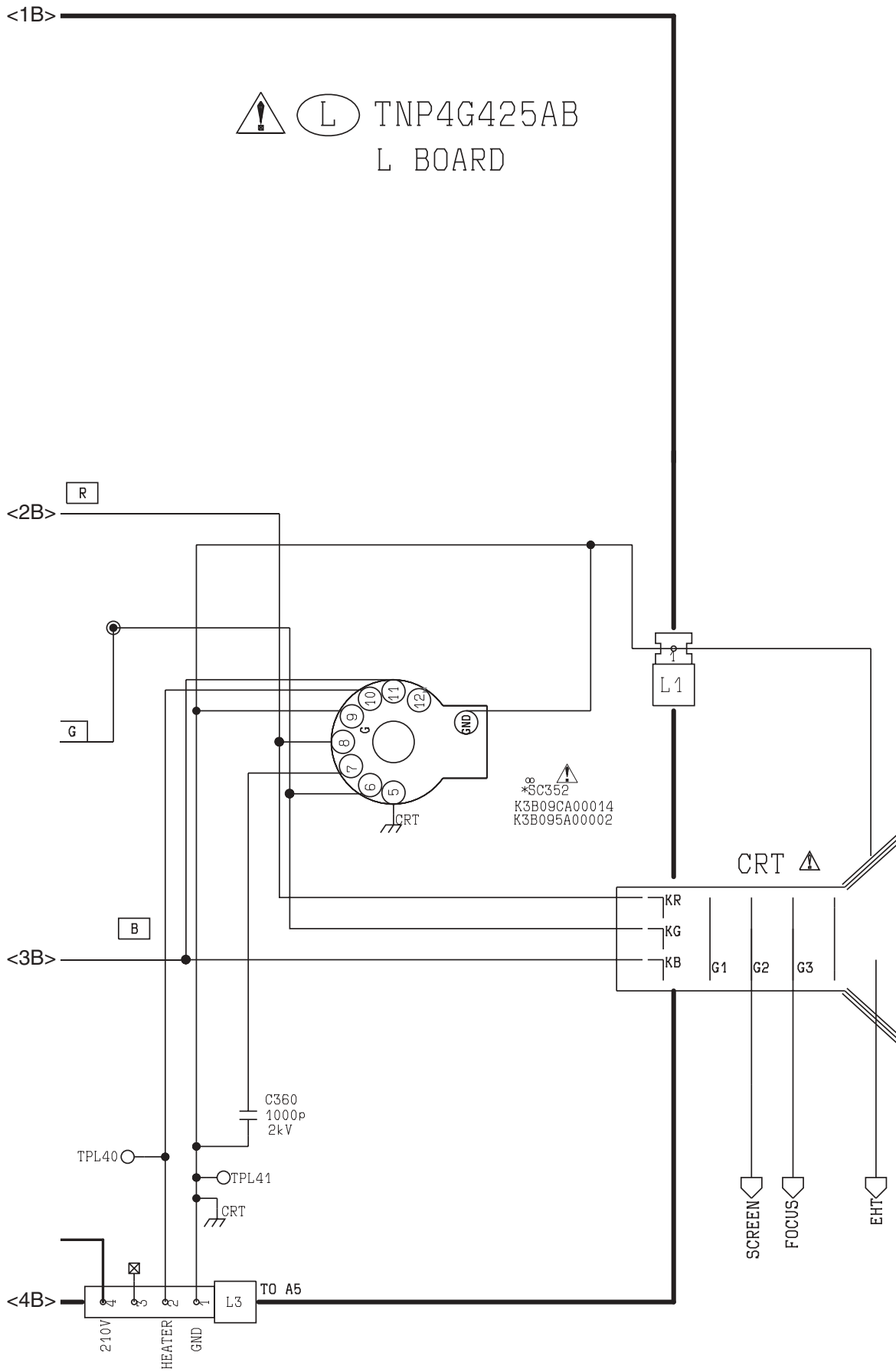
5.2.1. L Board (1/3)



5.2.2. L Board (2/3)

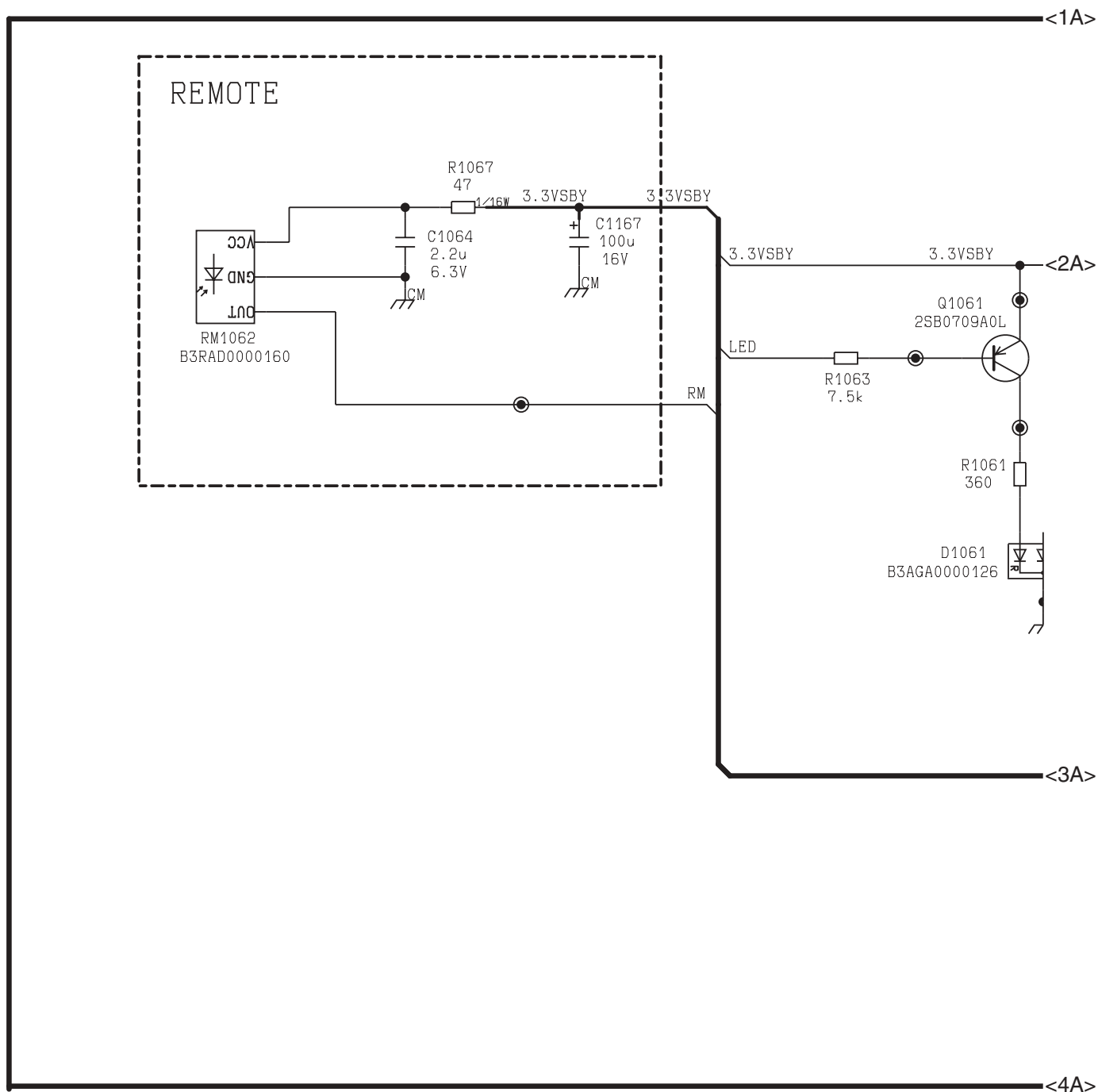


5.2.3. L Board (3/3)

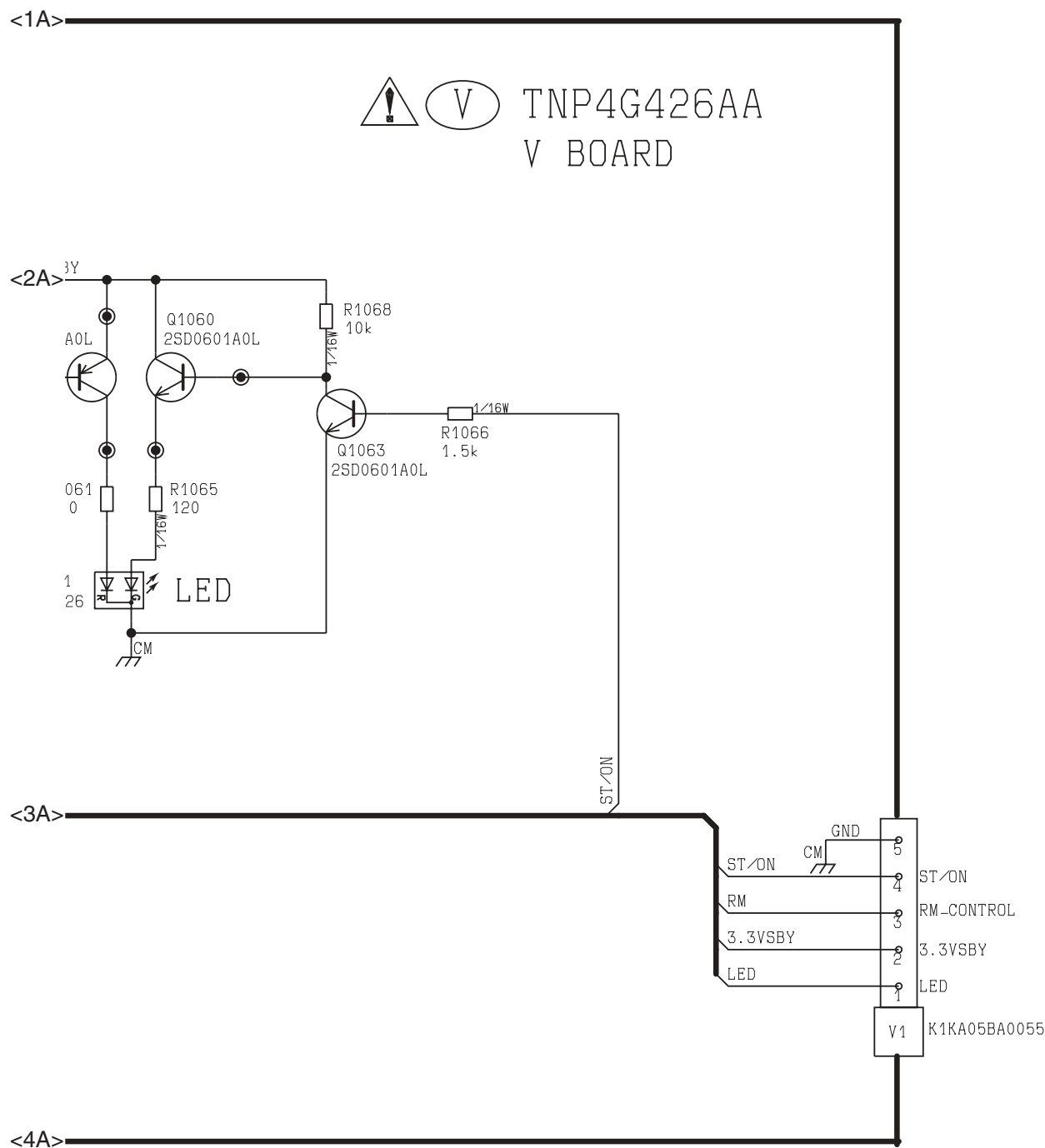


5.3. V Board

5.3.1. V Board (1/2)

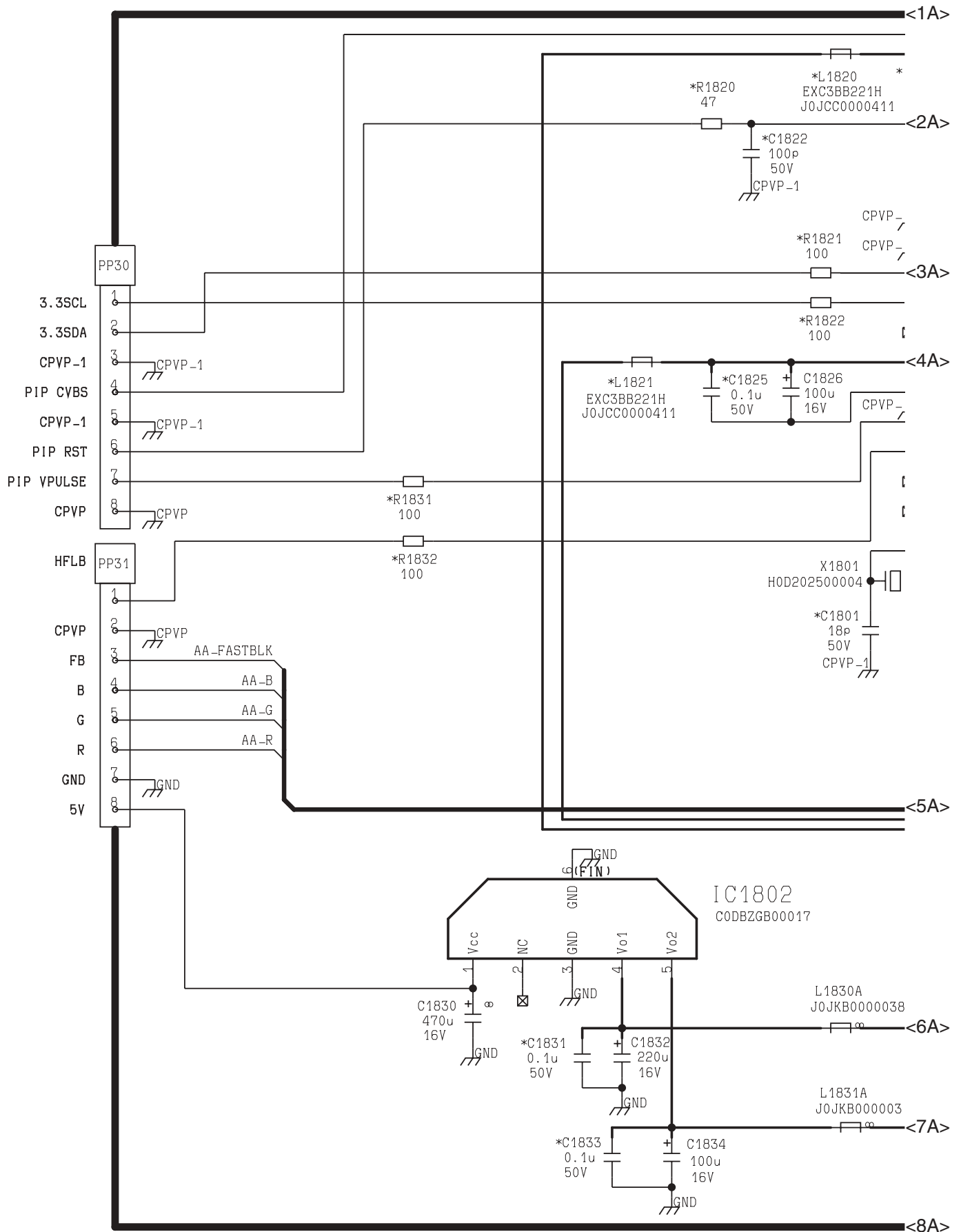


5.3.2. V Board (2/2)

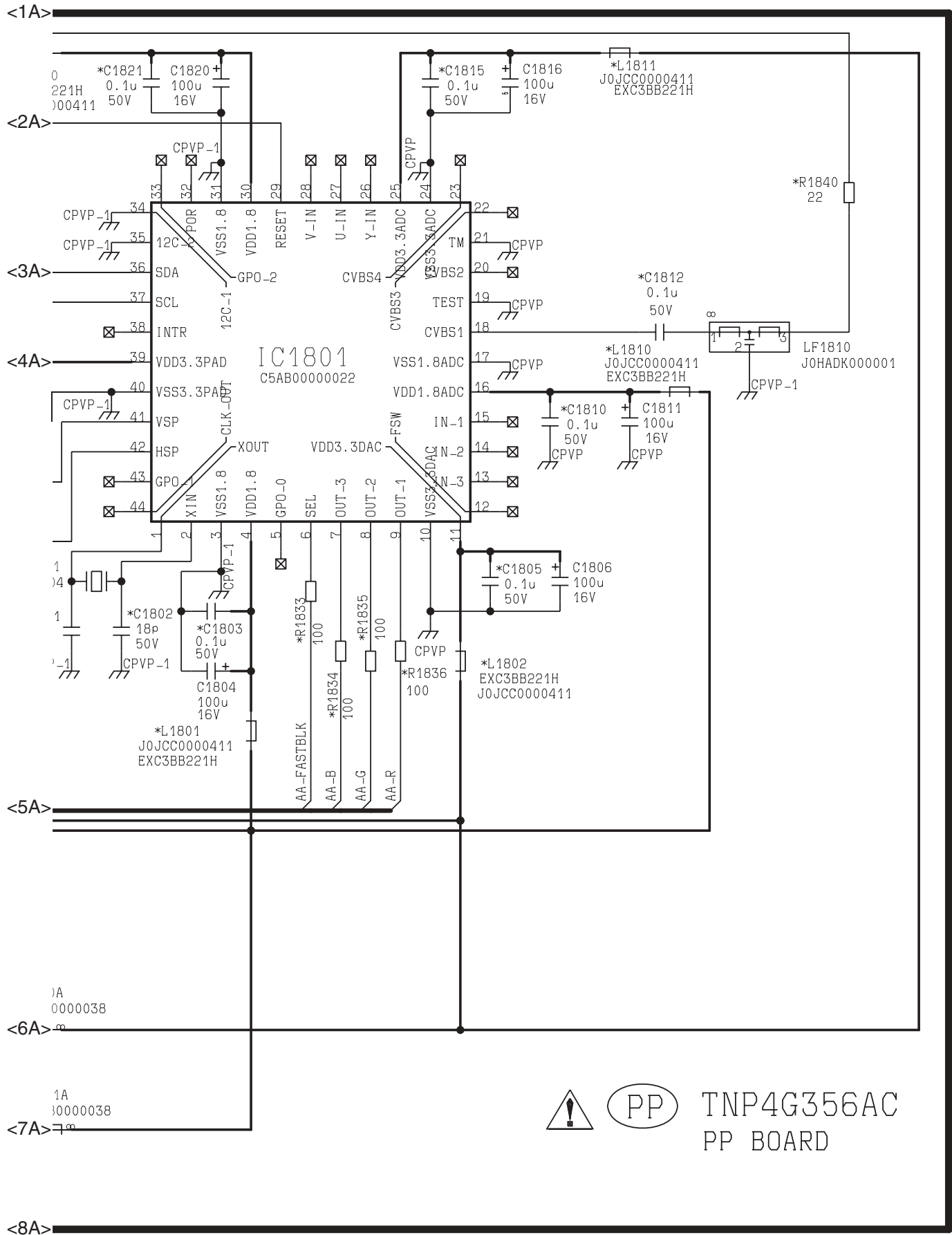


5.4. PP Board

5.4.1. PP Board (1/2)

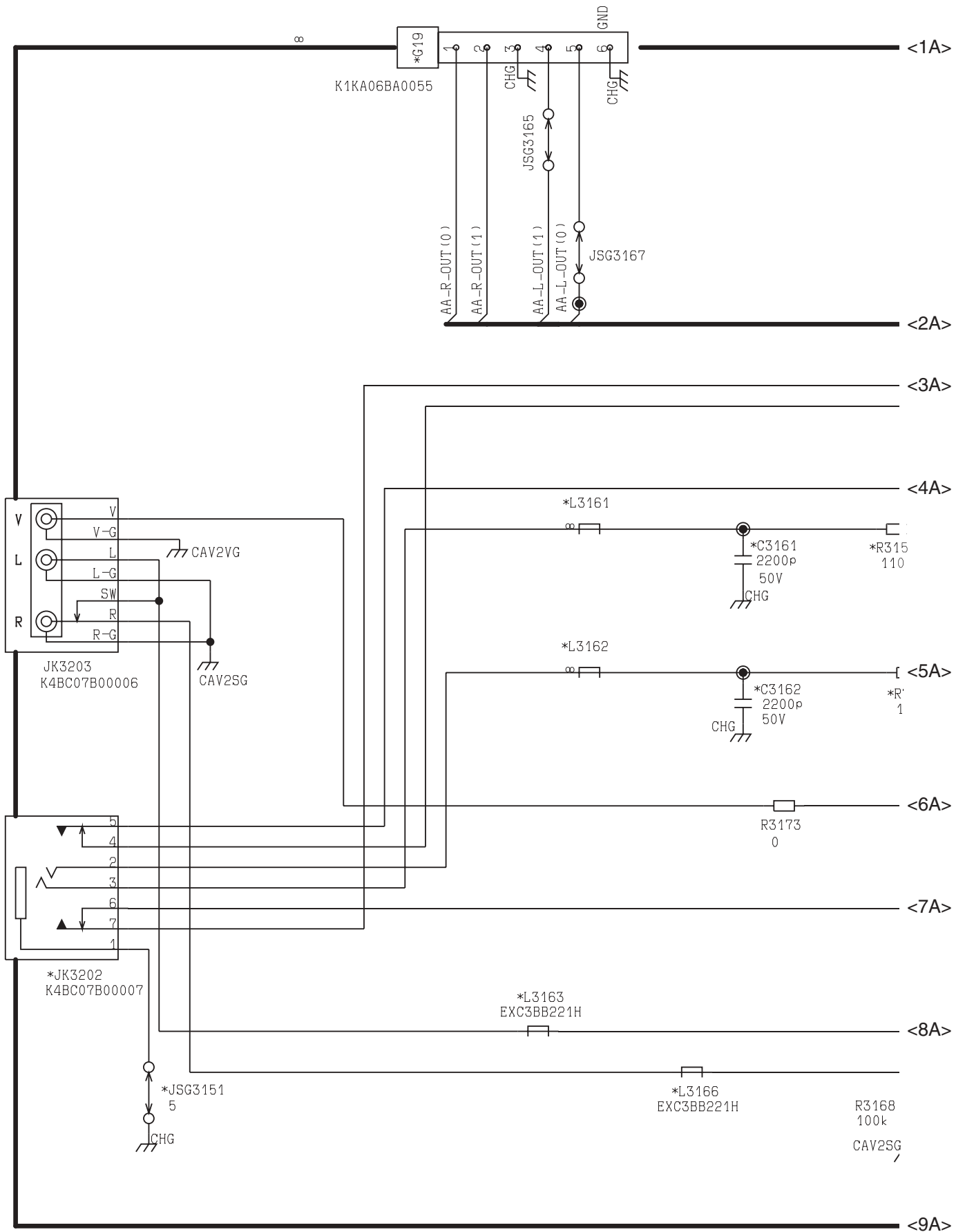


5.4.2. PP Board (2/2)

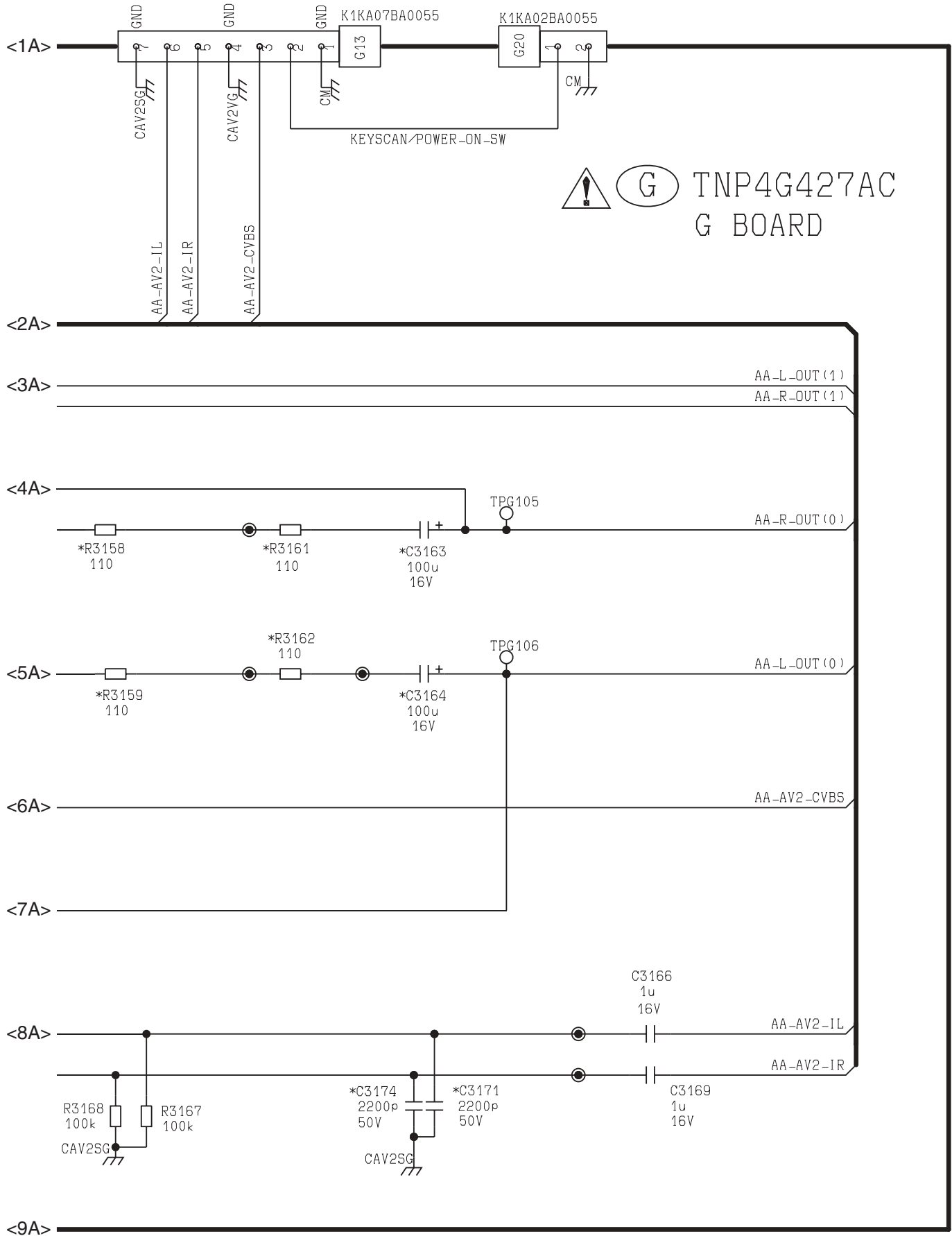


5.5. G Board

5.5.1. G Board (1/2)

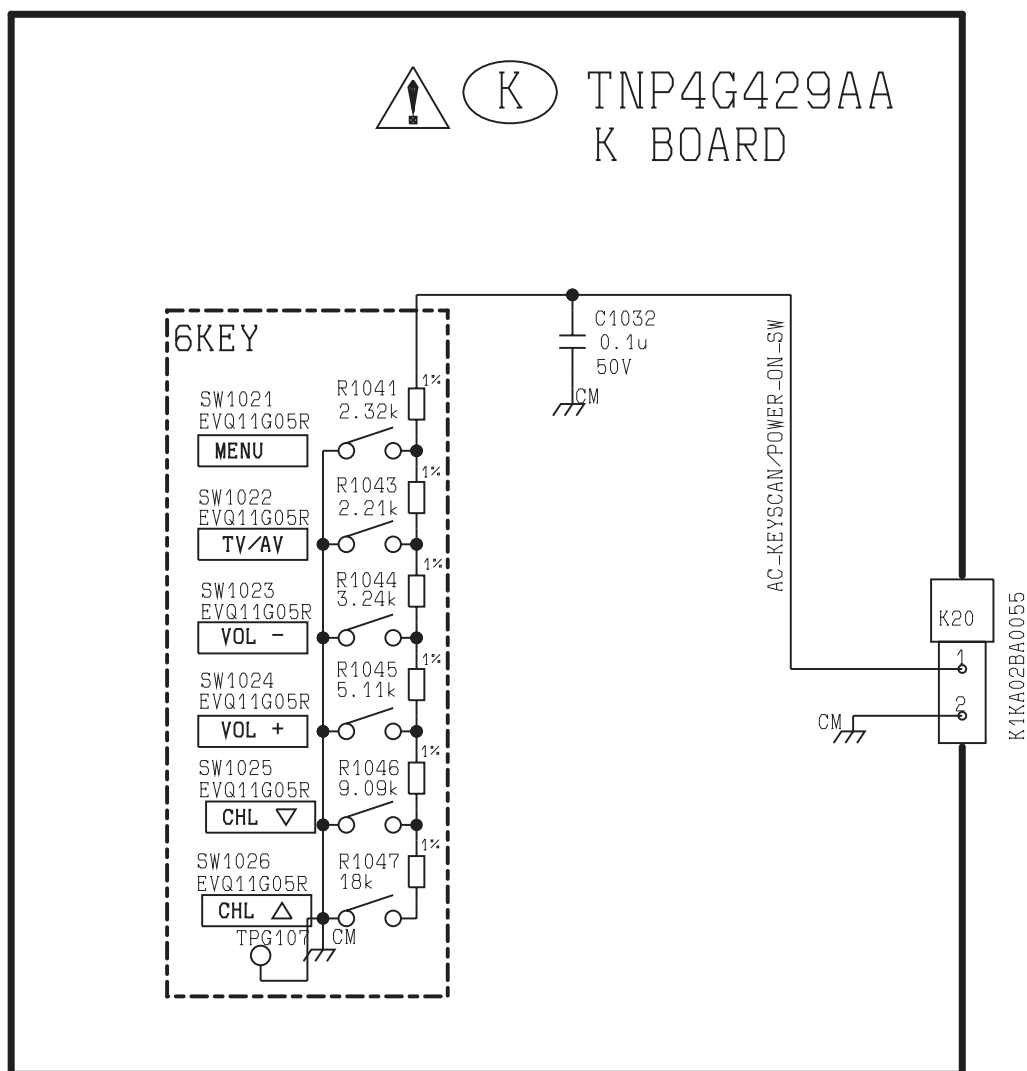


5.5.2. G Board (2/2)



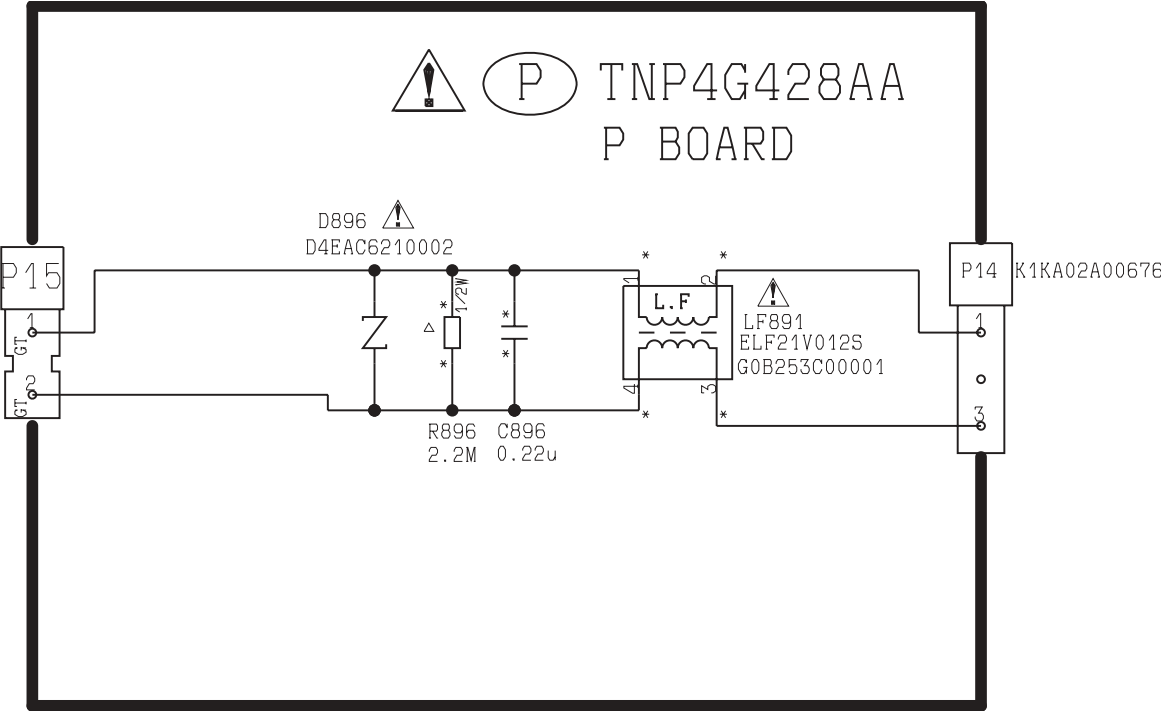
5.6. K Board

5.6.1. K Board



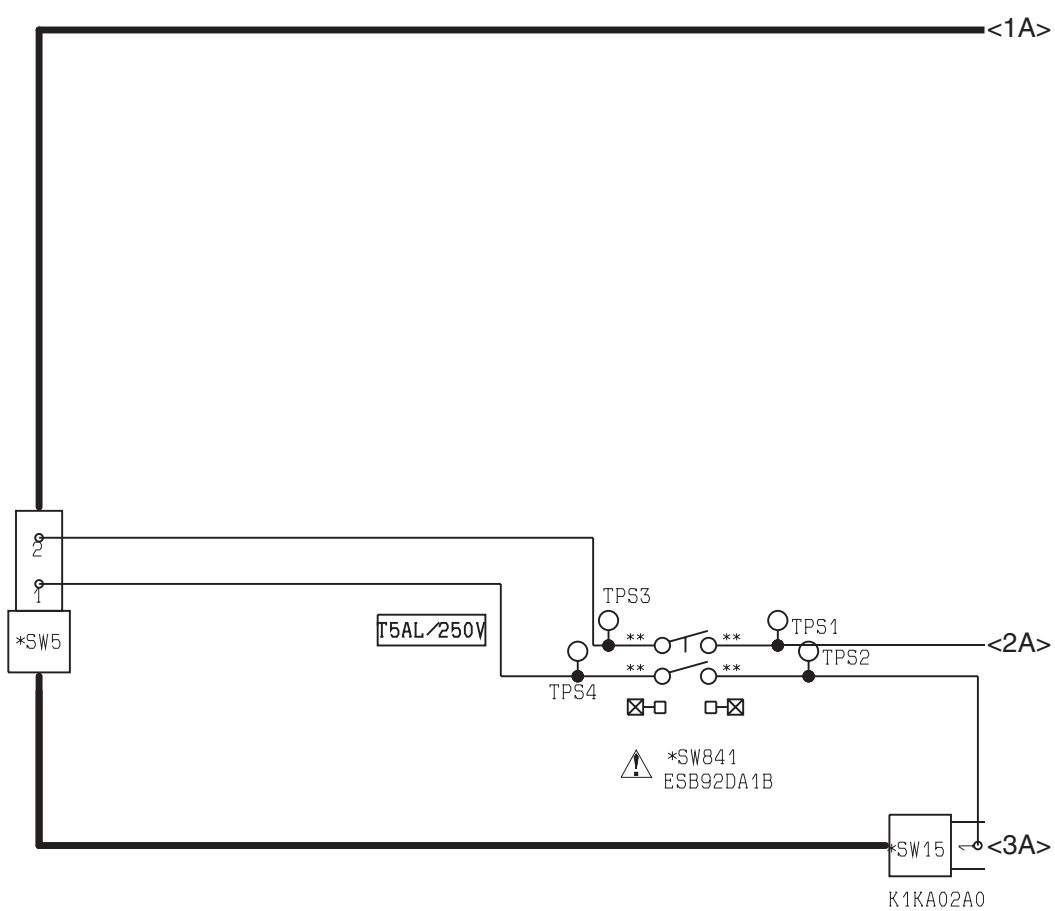
5.7. P Board

5.7.1. P Board

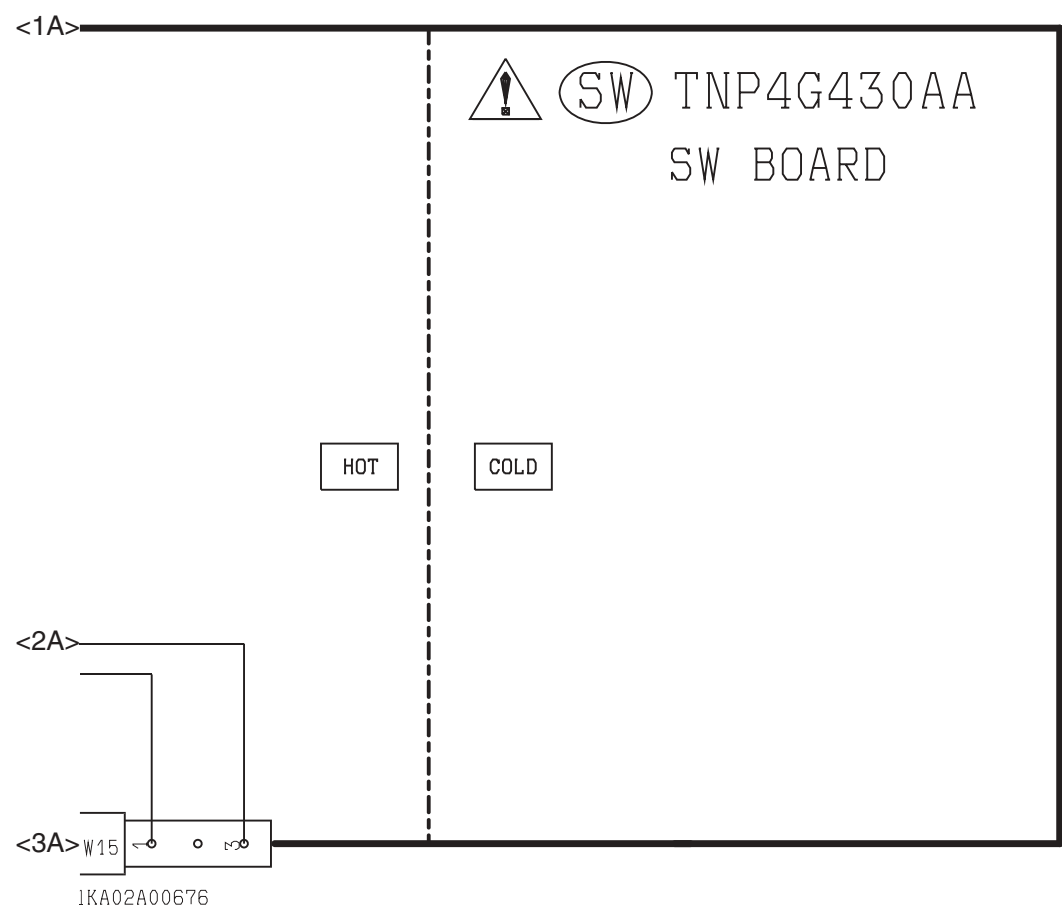


5.8. SW Board

5.8.1. SW Board (1/2)

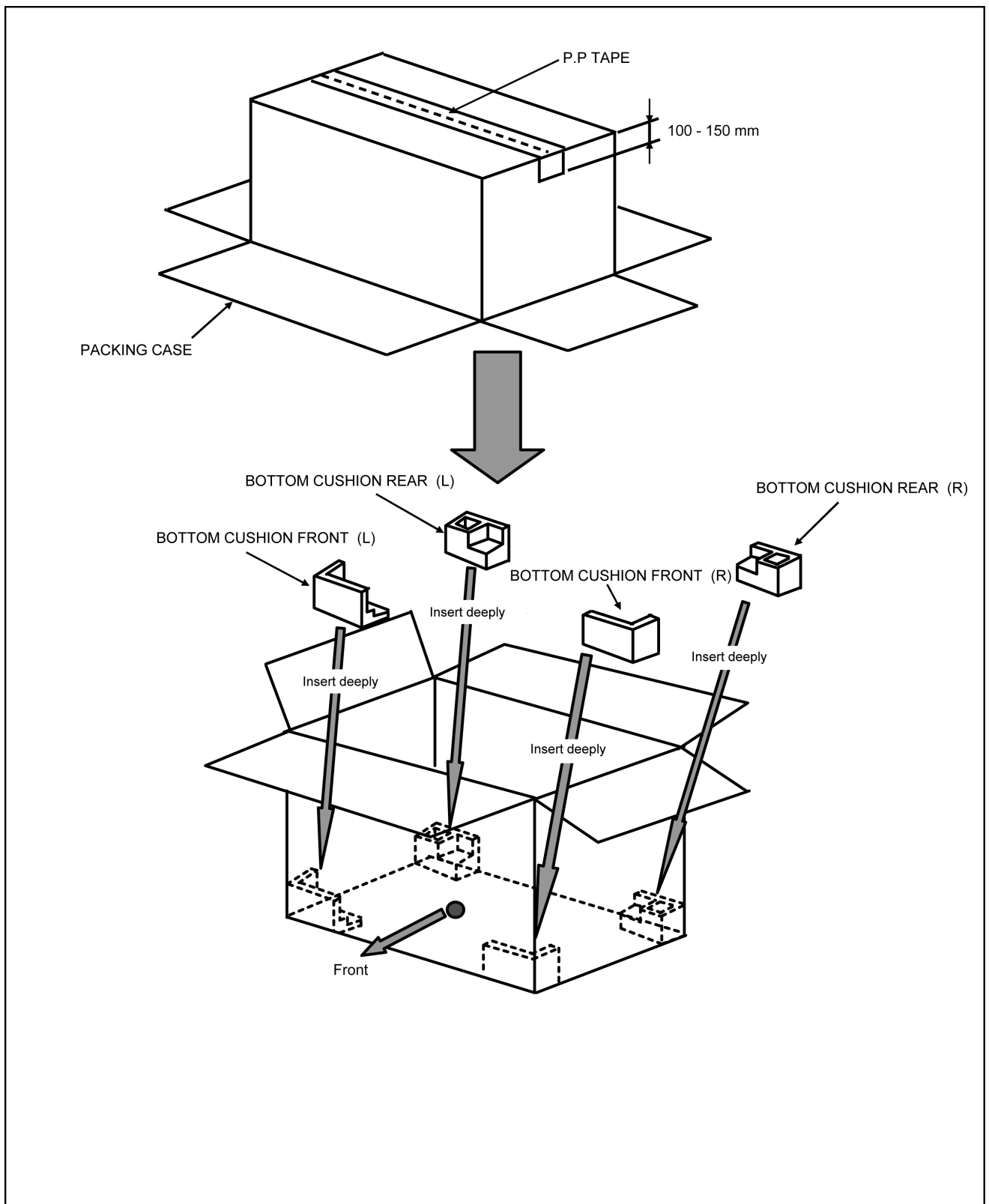


5.8.2. SW Board (2/2)

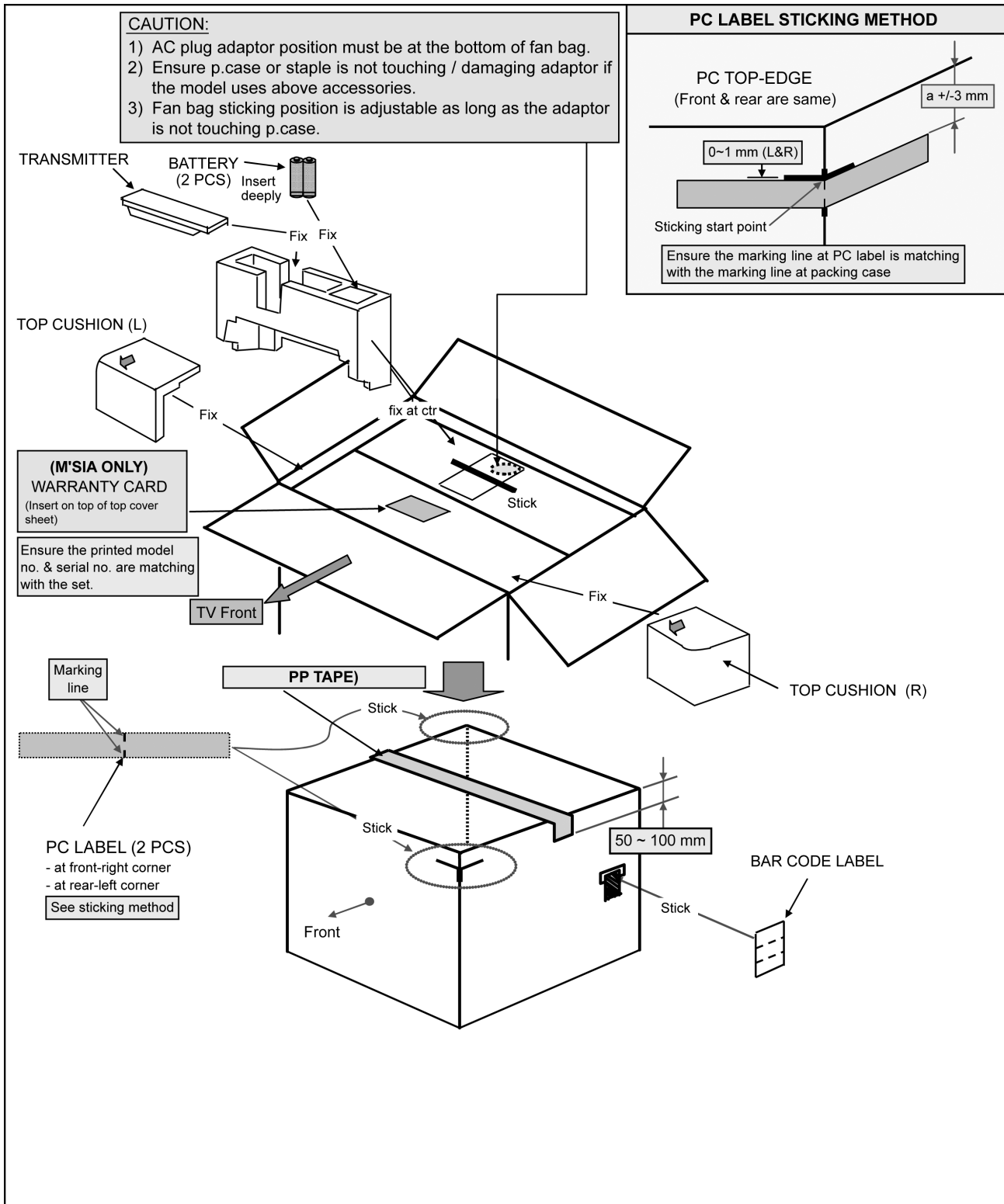


6 Parts Locations

6.1. Packing Exploded View - A

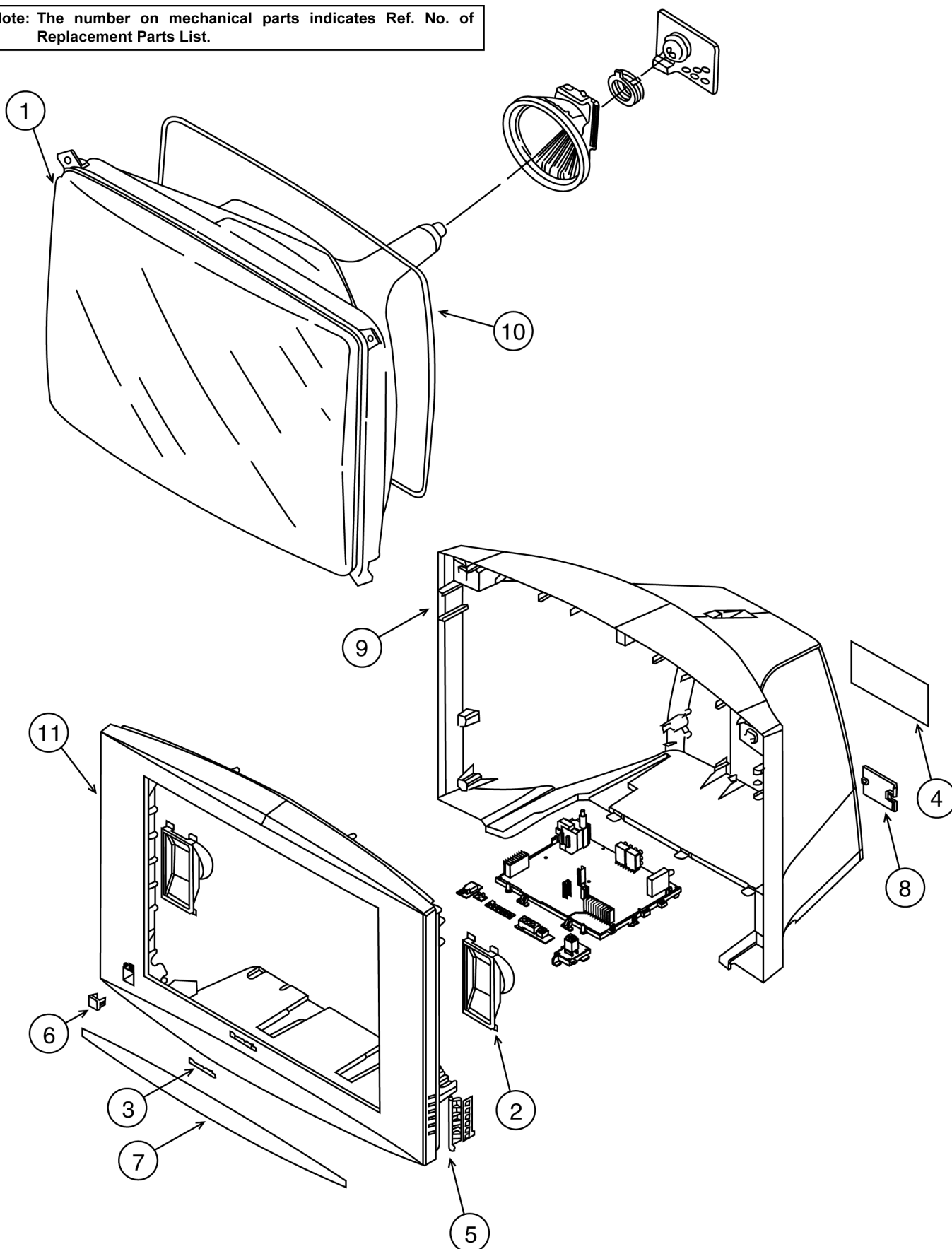


6.2. Packing Exploded View - B



6.3. Parts Locations

Note: The number on mechanical parts indicates Ref. No. of Replacement Parts List.



7 Replacement Parts List

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.

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** 100 k Ω , **J**, 1/4 W

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

2. Capacitor

Example :

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

Type	Allowance
C: Carbon	C: $\pm 0.25 \text{ pF}$
F: Electrolytic	D: $\pm 0.5 \text{ pF}$
P: Polyester Polypropylene	F: $\pm 1 \text{ pF}$ G: $\pm 3\%$
S: Tantalum	J: $\pm 5\%$ K: $\pm 10\%$ L: $\pm 15\%$ M: $\pm 20\%$ P: $\pm 100\%$, -0% Z: $\pm 80\%$, -20%

7.1. Replacement Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
1	A51QGV991X31	ITC CRT	△
	K2CQ2YY00023	AC CORD	△
2	L0AA11C00011	SPEAKER	
	N2QAHB000074	REMOTE CONTROL	
3	TBM4G3021	PANASONIC BADGE	
4	TBM4GC106	MODEL NAME PLATE	△
5	TBX4GA00401	6 KEY BUTTON	
6	TBX4GA00502	POWER SWITCH BUTTON	
	TES4G214	SPRING (POWER BUTTON)	
	TKK4GC5003	SMOKED PANEL	
7	TKR4GA00701A	ORNAMENT PANEL (BOTTOM)	
8	TKP4G11745	AC CORD BRACKET	
9	TKU4GC00301	BACK COVER	
10	TLK4G9102J-S	DEGAUSSING COIL	△
NLA	TNP4G356AC	PP BOARD	△
NLA	TNP4G424AM	A BOARD	△
NLA	TNP4G425AB	L BOARD	△
NLA	TNP4G426AA	V BOARD	△
NLA	TNP4G427AC	G BOARD	△
NLA	TNP4G428AA	P BOARD (HARMONIC BOARD)	△
NLA	TNP4G429AA	K BOARD	△
NLA	TNP4G430AA	SW BOARD	△
	TPE4G14036	SET COVER	
	TQZ4GB026	FAN BAG	
11	TTY4GA0027	CABINET	
	TXFPC03FG23	CARTON	
	TXFPD01FM05	TOP CUSHION	
	TXFPD02FM05	BOTTOM CUSHION	
	CAPACITORS		
C002	F1H1H103A975	C 0.01UF, Z, 50V	
C003	ECJ1VC1H330J	C 33PF, J, 50V	
C004	ECJ1VC1H330J	C 33PF, J, 50V	
C005	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C006	F2A1C101A310	E 100UF, 16V	
C1032	ECJ2VF1H104Z	C 0.1UF, Z, 50V	
C1064	ECJ2FB0J225K	C 2.2UF, J, 6.3V	
C1103	F1J1H103A590	C 0.01UF, J, 50V	
C1131	F1J1H103A590	C 0.01UF, J, 50V	
C1142	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1167	F2A1C101A310	E 100UF, 16V	
C1801	ECJ1VC1H180J	C 18PF, J, 50V	
C1802	ECJ1VC1H180J	C 18PF, J, 50V	
C1803	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1804	ECA1CM101B	E 100UF, 16V	
C1805	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1806	ECA1CM101B	E 100UF, 16V	
C1810	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1811	ECA1CM101B	E 100UF, 16V	
C1812	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1815	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1816	ECA1CM101B	E 100UF, 16V	
C1820	ECA1CM101B	E 100UF, 16V	
C1821	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1822	ECUX1H101JCX	C 100PF, J, 50V	
C1825	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1826	ECA1CM101B	E 100UF, 16V	
C1830	F2A1C4710045	ELECTROLYTIC CAPACITOR	
C1831	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1832	ECA1CM221B	E 220UF, 16V	
C1833	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C1834	ECA1CM101B	E 100UF, 16V	
C2113	F2A1H3R3A317	E 3.3UF, 50V	
C2117	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C2129	F2A1C221A338	E 220UF, 16V	
C2303	F2A1H4R7A317	E 4.7UF, 50V	
C2312	ECJ2VC1H222J	C 2200PF, J, 50V	
C2313	ECJ2VC1H222J	C 2200PF, J, 50V	
C2314	F2A1E101A273	E 100UF, 25V	
C2315	F2A1E471A299	E 470UF, 25V	
C2316	ECQV1H104JL	P 0.1UF, J, 50V	
C2321	F1J1H102A018	E 1000UF, 50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C2322	F1J1H102A018	E 1000UF, 50V	
C2325	F2A1C470A310	E 47UF, 16V	
C2326	F2A1C470A310	E 47UF, 16V	
C253	ECA1HEN2R2B	E 1000UF, 50V	
C254	F1J1H102A018	E 1000UF, 50V	
C257	ECA1HEN2R2B	E 2.2UF, 50V	
C258	F1J1H102A018	E 1000UF, 50V	
C3005	ECJ2VC1H222J	C 2200PF, J, 50V	
C3012	ECJ2VC1H222J	C 2200PF, J, 50V	
C3016	ECJ2VC1H222J	C 2200PF, J, 50V	
C3018	ECJ2VC1H222J	C 2200PF, J, 50V	
C3023	ECJ1VF1C105Z	C 1UF, Z, 16V	
C3024	ECJ1VF1C105Z	C 1UF, Z, 16V	
C3025	ECJ1VF1C105Z	C 1UF, Z, 16V	
C3027	ECJ1VF1C105Z	C 1UF, Z, 16V	
C3034	F2A1A471A274	E 470UF, 10V	
C3041	ECJ2VC1H152J	C 1500PF, J, 50V	
C3042	ECJ2VC1H152J	C 1500PF, J, 50V	
C3043	ECJ2VC1H222J	C 2200PF, J, 50V	
C3044	ECJ2VC1H222J	C 2200PF, J, 50V	
C3045	ECJ2VC1H222J	C 2200PF, J, 50V	
C3046	ECJ2VC1H222J	C 2200PF, J, 50V	
C305	F2A1C471A339	E 470UF, 16V	
C306	F1J1H222A590	C 2200PF, 50V	
C307	F1J1H222A590	C 2200PF, 50V	
C308	F1J1H222A590	C 2200PF, 50V	
C3161	ECJ2VC1H222J	C 2200PF, J, 50V	
C3162	ECJ2VC1H222J	C 2200PF, J, 50V	
C3163	F2A1C101A310	E 100UF, 16V	
C3164	F2A1C101A263	E 100UF, 16V	
C3166	ECJ1VF1C105Z	C 1UF, Z, 16V	
C3169	ECJ1VF1C105Z	C 1UF, Z, 16V	
C3171	ECJ2VC1H222J	C 2200PF, J, 50V	
C3174	ECJ2VC1H222J	C 2200PF, J, 50V	
C356	F1H1H102A971	C 1000PF, J, 50V	
C360	ECKW3D102KBP	C 1000PF, K, 2KV	
C363	ECA1CM100B	E 10UF, 16V	
C366	F2A1C101A310	E 100UF, 16V	
C368	ECA2EM100B	E 10UF, 250V	
C370	F1J1H222A590	C 2200PF, 50V	
C371	F1J1H222A590	C 2200PF, 50V	
C372	F1J1H222A590	C 2200PF, 50V	
C374	F0C2E154A087	P 0.15UF, 250V	
C375	F0C2E334A092	P 0.33UF, 250V	
C401	ECJ1VC1H560J	C 56PF, J, 50V	
C404	ECQB1333JF	P 0.033UF, J, 100V	
C406	F2A1H221A247	E 220UF, 50V	
C407	ECJ1VC1H560J	C 56PF, J, 50V	
C408	ECQB1154JF	P 0.15UF, J, 100V	
C454	ECQV1H154JM	P 0.15UF, J, 50V	
C502	ECKR3A821KBP	C 820PF, K, 1KV	
C504	F1J1H681A590	C 680PF, J, 50V	
C507	ECJ1VF1C105Z	C 1UF, Z, 16V	
C511	F2A1V101A246	E 100UF, 35V	
C514	F2A1E102A199	E 1000UF, 25V	
C516	F2A1E102A199	E 1000UF, 25V	
C517	ECJ2FB1E105K	E 1UF, K, 25V	
C518	ECJ2FB1E105K	E 1UF, K, 25V	
C519	F2A2C1010015	E 100UF, 160V	
C520	F2A0J221A317	E 220UF, 6.3V	
C552	F2A2E1000023	E 10UF, 250V	
C553	ECQE2105KF	P 1UF, K, 100V	
C554	F0C2E564A059	P 0.56UF, 250V	
C555	F0C2E474A088	P 0.47UFF, 250V	
C559	ECWH20133JVB	P 0.47UFF, 250V	
C560	ECQF4273JZH	P 0.015UF, J, 400V	
C561	F0C3D272A003	P 0.013 UF, 2kv	
C565	F0A1H273A039	P 0.027F, 50V	
C566	ECQF6332JZ	P 3300PF, J, 630V	
C568	F0C3D102A003	P 1000PF, 2kv	
C601	F1J1H183A021	C 0.018UF, 50V	
C602	F1J1H222A590	C 2200PF, 50V	
C604	F2A1C101A310	E 330UF, 6.3V	

Ref. No.	Part No.	Part Name & Description	Remarks
C605	ECJ2VB1C104K	C 0.1UF, K, 16V	
C606	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C607	F1H1H103A975	C 0.01UF,Z, 50V	
C611	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C613	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C614	ECJ1VC1H100C	C 10PF, C, 50V	
C615	ECJ1VC1H100C	C 10PF, C, 50V	
C616	F2A1C101A310	E 330UF, 6.3V	
C618	F2A1C101A310	E 330UF, 6.3V	
C619	F2A1C101A310	E 330UF, 6.3V	
C620	F1H1H333A970	C 0.033UF,K, 50V	
C622	F2A1C101A310	E 330UF, 6.3V	
C623	F2A1C101A310	E 330UF, 6.3V	
C624	ECJ2VB1C104K	C 0.1UF, K, 16V	
C625	F1H1C224A065	C 0.22UF, K, 16V	
C626	F2A1C101A310	E 330UF, 6.3V	
C627	F2A1C101A310	E 330UF, 6.3V	
C628	F2A1A471A274	E 470UF, 10V	
C630	F1H1H103A975	C 0.01UF,Z, 50V	
C631	F1H1H333A970	C 0.033UF,K, 50V	
C632	F2A1H4R7A317	E 4.7UF, 50V	
C633	ECJ1VC1H471J	C 470PF, J, 50V	
C634	ECJ1VC1H471J	C 470PF, J, 50V	
C635	F2A1C101A310	E 330UF, 6.3V	
C636	ECJ1VC1H471J	C 470PF, J, 50V	
C639	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C640	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C642	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C645	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C646	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C650	F2A1C331A339	E 330UF, 16V	
C652	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C654	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C655	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C656	ECJ1VC1H270J	C 27PF, J, 50V	
C657	ECJ1VC1H560J	C 56PF, J, 50V	
C662	F2A0J101A317	E 100UF, 6.3V	
C670	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C671	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C672	ECJ1VF1H104Z	C 0.1UF, Z, 50V	
C704	F1B2H471A058	C 470PF, 500V	△
C706	ECQM4222JZ	P 2200PF, 400V	△
C811	F1A2E681A002	C 680PF, 250V	△
C812	F1A2E102A001	C 1000PF, 100V	△
C813	F1AAF472A009	C 4700PF, M	△
C815	F1AAF152A005	C 1500PF, M	△
C818	F2A1H1R0A317	C 1UF, 25V	
C819	F0CAF224A066	P 0.22PF	
C821	ECKW3D471KBP	C 470PF, K, 2KV	
C826	ECQV1H474JM	P 0.47UF, J, 50V	
C827	ECQB1H273JF	P 0.027UF, J, 50V	
C830	ECQB1H821KF	P 820PF, J, 50V	
C831	ECJ1VF1C105Z	C 1UF, 16V	
C840	F1A2E471A002	C 470PF, 250V	△
C841	ECKW3D151KBR	C 150PF, K, 2KV	
C842	F2A1H220A536	E 22UF, 50V	
C843	F2A1E102A223	E 1000UF, 25V	
C848	ECQB1H471JF	P 470PF, J, 50V	
C849	F1B2H152A072	C 1500F, 500V	
C854	ECKWAE472ZED	C 4700PF, Z,500V	
C855	ECKWAE472ZED	C 4700PF, Z,500V	
C856	F2B2G221A086	CAPACITOR	
C857	F0C2G473A099	P 0.047UF,J, 400V	
C859	ECKW3D821KBP	C 820PF, K, 2KV	
C863	F2A1C471A339	E 470UF, 16V	
C865	ECKW3D331JBP	C 330PF, J, 2KV	
C867	F2A2C2210013	E 220UF, 160V	
C869	F1J1E563A003	C 0.056UF, 25V	
C870	F2A1C472A260	E 4700UF, 16V	
C871	F1B2H471A058	C 470PF, 500V	
C872	F2A1C222A232	E 2200UF, 16V	
C873	F1B2H122A073	C 1200PF, 500V	
C874	ECA1CM101B	E 100UF, 16V	

Ref. No.	Part No.	Part Name & Description	Remarks
C875	F1J1H332A021	C 3300PF, 50V	
C877	F2A1C1000079	C 3300PF, 50V	
C879	F2A0J331A260	E 10UF, 16V	
C882	F2A1C101A310	E 330UF, 6.3V	
C884	F2A1C332A232	E 330UF, 6.3V	
C886	F2A1H330A342	E 33UF, 50V	
C887	F2A1C102A317	E 1000UF, 16V	
C890	F1H1C104A143	C 0.1UF,K, 16V	
C891	F2A1C101A310	E 330UF, 6.3V	
C893	F2A1C221A338	E 22UF, 160V	
C896	F0CAF224A066	P 0.22UF,J, 240V	
C897	F1J1H103A590	C 3300PF, 50V	
C898	ECJ1VF1C105Z	C 1UF, 16V	
	DIODES		
D1061	B3AGA0000126	DIODE (LED LIGHT)	
D1132	B0BA3R800012	DIODE	
D2103	B0AACJ000009	DIODE	
D2107	B0AACJ000009	DIODE	
D2108	B0AACJ000009	DIODE	
D320	B0ACCK000005	DIODE	
D321	B0ACCK000005	DIODE	
D354	B0HAMP000067	DIODE	
D355	B0HAMP000067	DIODE	
D356	B0HAMP000067	DIODE	
D361	B0AACJ000009	DIODE	
D362	B0AACJ000009	DIODE	
D363	B0AACJ000009	DIODE	
D364	B0AACJ000009	DIODE	
D365	B0AACJ000009	DIODE	
D366	B0AACJ000009	DIODE	
D367	B0AACJ000009	DIODE	
D368	B0AAK000004	DIODE	
D402	B0HAJL000003	DIODE	
D503	B0AACJ000009	DIODE	
D504	B0AACJ000009	DIODE	
D507	B0ACCK000005	DIODE	
D511	MA4108J	DIODE	
D512	B0HAJL000003	DIODE	
D513	B0HAMP000090	DIODE	
D515	B0HAMP000090	DIODE	
D520	B0ACQJ000001	DIODE	
D552	B0HAMP000090	DIODE	
D556	B0HAMV000027	DIODE	
D557	B0HAMQ000001	DIODE	
D558	MA185	DIODE	
D601	B0ADDJ000025	DIODE	
D610	MAZ80560HL	DIODE	
D670	MA2S72800L	DIODE	
D671	MA2S72800L	DIODE	
D683	MA2S72800L	DIODE	
D684	MA2S72800L	DIODE	
D702	B0ACCK000005	DIODE	
D708	EU02	DIODE	
D830	B0HAJL000001	DIODE	
D831	B0BA03500016	DIODE	
D832	B0BA3R300010	ZENER DIODE	
D837	B0ACCK000012	DIODE	
D846	B0BA8R000010	DIODE	
D847	B0BA8R000010	DIODE	
D848	B0HAQL000004	DIODE	
D851	B0EAKT000018	DIODE	
D852	B0HAJL000003	DIODE	
D853	B0AACJ000009	DIODE	
D854	B0AACJ000009	DIODE	
D855	B0BA4R100013	DIODE	
D860	B0EBNT000022	DIODE	△
D861	B0BA8R000010	DIODE	
D862	MTZJ2.0B	ZENER DIODE	
D863	B0HAJL000003	DIODE	
D865	B0BA3R500008	DIODE	
D866	B0HAPV000009	DIODE	
D867	B0JAME000058	DIODE	
D872	B0JAPK000011	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D873	B0AACJ000009	DIODE	
D876	B0AACJ000009	DIODE	
D881	B0BA01500052	DIODE	
D882	B0BA01500052	DIODE	
D883	B0JAPK000013	DIODE	
D884	B0AACJ000009	DIODE	
D887	B0AACJ000009	DIODE	
D896	D4EAC6210002	VARISTOR	△
	INTEGRATED CIRCUITS		
IC1101	TVR4GAS741	EEPROM IC	
IC1801	C5AB00000022	IC	
IC1802	C0DBZGB00017	IC, POWER SUPPLY	
IC2301	C0ZAZ0000220	IC	
IC351	TDA6107AJFN1	IC	
IC451	C1AA00000767	IC	
IC601	TVR4G46-5	ROM IC	△
IC802	C0EAS0000024	IC	
IC803	C5HABZZ00116	IC, HYBRID	
IC851	C0DAEJG00001	IC, POWER SUPPLY	
IC857	C0DBEHE00005	IC, POWER SUPPLY	
IC871	C0DAZGG00012	IC, POWER SUPPLY	
IC875	C0DBEHE00005	IC, POWER SUPPLY	
	COILS		
L002	G0C100K00008	COIL	
L003	G0C4R7JA0055	PEAKING COIL	
L1801	J0JCC0000411	BEAD CORE	
L1802	J0JCC0000411	BEAD CORE	
L1810	J0JCC0000411	BEAD CORE	
L1811	J0JCC0000411	BEAD CORE	
L1820	J0JCC0000411	BEAD CORE	
L1821	J0JCC0000411	BEAD CORE	
L1830	J0JKB0000038	COIL	
L1831	J0JKB0000038	COIL	
L2302	J0JKA0000038	BEAD CORE	
L2304	J0JKA0000038	BEAD CORE	
L2306	J0JKA0000024	EMI FILTER	
L2323	J0JKA0000038	BEAD CORE	
L2324	J0JKA0000038	BEAD CORE	
L3045	J0JCC0000411	BEAD CORE	
L3046	J0JCC0000411	BEAD CORE	
L3161	EXC3BB221H	CHIP BEAD CORE	
L3162	EXC3BB221H	CHIP BEAD CORE	
L3163	EXC3BB221H	CHIP BEAD CORE	
L3166	EXC3BB221H	CHIP BEAD CORE	
L376	J0JKA0000024	EMI FILTER	
L501	J0JKA0000038	BEAD CORE	
L505	J0JKA0000024	EMI FILTER	
L514	J0JKA0000038	BEAD CORE	
L515	J0JKA0000038	BEAD CORE	
L517	J0JKA0000038	BEAD CORE	
L518	J0JKA0000038	BEAD CORE	
L550	J0JKB0000034	EMI FILTER	
L554	ELC08D682E	CHOKE COIL	
L557	ELH5L7159	LINEARITY COIL	
L565	EXCELSA39V	BEAD CORE	
L566	ELC18B471L	CHOKE COIL	
L601	G0C100K00008	COIL	
L602	G0C100K00008	COIL	
L603	G0C100K00008	COIL	
L604	G0C100K00008	COIL	
L605	TALV35VB8R2K	PEAKING COIL	
L606	G0C100K00008	COIL	
L607	TALV35VB8R2K	PEAKING COIL	
L608	G0C3R9KA0030	PEAKING COIL	
L610	J0JKB0000034	EMI FILTER	
L611	G0C100K00008	COIL	
L612	TSK1040	BEAD CORE	
L630	J0JCC0000411	BEAD CORE	
L635	J0JCC0000411	BEAD CORE	
L657	J0JCC0000411	BEAD CORE	
L705	ELC18B103L	CHOKE COIL	
L819	ETQR36T020B	CHOKE COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L842	J0JKA0000025	BEAD CORE	
L845	J0JKA0000023	BEAD CORE	
L865	J0JKA0000025	BEAD CORE	
L866	J0JKA0000023	BEAD CORE	
L867	J0JKB0000039	EMI FILTER	
L894	G0A220GA0002	CHOKE COIL	
	TRANSISTORS		
Q1060	2SD0601A0L	TRANSISTOR	
Q1061	2SB709ATX	TRANSISTOR	
Q1062	2SD0601A0L	TRANSISTOR	
Q1063	2SD0601A0L	TRANSISTOR	
Q2101	2SB709ATX	TRANSISTOR	
Q304	2SB709ATX	TRANSISTOR	
Q305	2SB709ATX	TRANSISTOR	
Q306	2SB709ATX	TRANSISTOR	
Q320	2SD0601A0L	TRANSISTOR	
Q354	2SB709ATX	TRANSISTOR	
Q360	B1ACAA000019	TRANSISTOR	
Q361	B1ACAA000019	TRANSISTOR	
Q362	B1ACAA000019	TRANSISTOR	
Q501	2SC4212H	TRANSISTOR	
Q520	2SB0792A0L	TRANSISTOR	
Q551	2SC6073000LK	TRANSISTOR	
Q603	2SD0601A0L	TRANSISTOR	
Q604	2SD0601A0L	TRANSISTOR	
Q605	2SD0601A0L	TRANSISTOR	
Q608	2SD0601A0L	TRANSISTOR	
Q610	2SB709ATX	TRANSISTOR	
Q665	B1ADCE000012	TRANSISTOR	
Q701	B1DFDM000012	TRANSISTOR	
Q702	2SD0601A0L	TRANSISTOR	
Q703	2SD0601A0L	TRANSISTOR	
Q846	2SD0601A0L	TRANSISTOR	
Q850	B1BCCM000002	TRANSISTOR	
Q857	2SC54190QA	TRANSISTOR	
Q870	2SB709ATX	TRANSISTOR	
	RESISTORS		
R005	D0GB512JA008	F 5.1KOHM, J, 1W	
R006	ERJ3GEYJ473	M 47KOHM, J, 1/16W	
R007	ERJ3GEYJ682	M 6.8KOHM, J, 1/16W	
R008	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R009	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R1041	ERJ3EKF2321	M2.32KOHM, F, 1/16W	
R1043	ERJ3EKF2211	M2.21KOHM, F, 1/16W	
R1044	ERJ3EKF3241	M3.24KOHM, F, 1/16W	
R1045	ERJ3EKF5111	M5.11KOHM, F, 1/16W	
R1046	ERJ3EKF9091	M9.09KOHM, F, 1/16W	
R1047	ERJ3EKF1802	M 18KOHM, F, 1/16W	
R1061	ERJ3GEYJ361	F 360OHM, J, 1/2W	
R1062	ERDS2TJ102	C 1KOHM, J, 1/4W	
R1063	ERJ3GEYJ752	M 7.5KOHM, J, 1/16W	
R1065	ERJ3GEYJ121	M 120OHM, J, 1/16W	
R1066	ERJ3GEYJ152	M 1.5KOHM, J, 1/16W	
R1067	ERJ3GEYJ470	M 47OHM, J, 1/16W	
R1068	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R1105	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R1106	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R1108	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1109	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R1112	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R1114	ERJ3GEYJ151	M 150OHM, J, 1/16W	
R1115	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1131	ERJ3GEYJ220	M 22OHM, J, 1/16W	
R1132	ERJ3GEYJ220	M 22OHM, J, 1/16W	
R1140	DIAC1002A094	M 10KOHM, F, 1/16W	
R1142	ERJ3EKF1001	M 1KOHM, F, 1/16W	
R1150	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1201	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R1202	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R1228	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1229	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1820	ERJ3GEYJ470	M 47OHM, J, 1/16W	
R1821	ERJ3GEYJ101	M 100OHM, J, 1/16W	

Ref. No.	Part No.	Part Name & Description	Remarks
R1822	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1831	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1832	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1833	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1834	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1835	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1836	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R1840	ERJ3GEYJ220	M 220OHM, J, 1/16W	
R2112	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R2114	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R2317	D0GB622JA008	F 6.2KOHM, J, 1/2W	
R2321	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R2322	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R253	D0GB751JA008	F 750OHM, J, 1/2W	
R255	D0GB751JA008	F 750OHM, J, 1/2W	
R256	ERDS2TJ272	C 2.7KOHM, J, 1/4W	
R257	ERDS2TJ272	C 2.7KOHM, J, 1/4W	
R3002	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R3004	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R3008	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R3009	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R3010	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R3011	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R3022	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R3024	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R3026	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R304	ERJ6GEYJ240	F 240OHM, J, 1/4W	
R305	ERJ6GEYJ240	F 240OHM, J, 1/4W	
R306	ERJ6GEYJ240	F 240OHM, J, 1/4W	
R307	ERJ3GEYJ121	M 120OHM, J, 1/16W	
R308	ERJ3GEYJ121	M 120OHM, J, 1/16W	
R309	ERJ3GEYJ121	M 120OHM, J, 1/16W	
R310	D0AE181JA046	C 180OHM, J, 1/4W	
R3101	ERDS2TJ470	C 470OHM, J, 1/4W	
R3102	ERDS2TJ470	C 470OHM, J, 1/4W	
R3104	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R3105	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R311	D0AE181JA046	C 180OHM, J, 1/4W	
R312	D0AE181JA046	C 180OHM, J, 1/4W	
R3158	D0GB111JA008	F 110OHM, J, 1/16W	
R3159	D0GB111JA008	F 110OHM, J, 1/16W	
R3161	D0GB111JA008	F 110OHM, J, 1/16W	
R3162	D0GB111JA008	F 110OHM, J, 1/16W	
R3167	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R3168	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R3173	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R320	ERJ3GEYJ821	M 820OHM, J, 1/16W	
R321	D0AE220JA046	C 220OHM, J, 1/4W	
R341	ERJ3GEYJ151	M 150OHM, J, 1/16W	
R342	ERJ3GEYJ151	M 150OHM, J, 1/16W	
R343	ERJ3GEYJ151	M 150OHM, J, 1/16W	
R351	ERJ3GEYJ331	M 330OHM, J, 1/16W	
R352	ERJ3GEYJ331	M 330OHM, J, 1/16W	
R353	ERJ3GEYJ331	M 330OHM, J, 1/16W	
R363	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R364	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R365	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R366	ERDS1TJ152	C 1.5KOHM, J, 1/2W	
R367	ERDS1TJ152	C 1.5KOHM, J, 1/2W	
R368	ERDS1TJ152	C 1.5KOHM, J, 1/2W	
R372	ERQ12AJ121P	F 120OHM, J, 1/2W	
R381	ERJ3GEYJ182	M 1.8KOHM, J, 1/16W	
R385	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R401	ERDS2TJ104	C 100KOHM, J, 1/4W	
R403	ERJ3GEYJ563	M 56KOHM, J, 1/16W	
R404	ERJ3GEYJ153	M 15KOHM, J, 1/16W	
R405	ERDS2TJ563	C 56KOHM, J, 1/4W	
R406	ERDS1TJ1R5	C 1.5OHM, J, 1/2W	
R407	ERG1SJ221E	M 220OHM, J, 1W	
R413	ERJ3GEYJ183	M 18KOHM, J, 1/16W	
R416	ERX2SJR56E	M 0.56OHM, J, 2W	
R451	ERJ3GEYJ223	M 22KOHM, J, 1/16W	
R453	ERJ3GEYJ101	M 100OHM, J, 1/16W	

Ref. No.	Part No.	Part Name & Description	Remarks
R501	ERJ3GEYJ273	M 27KOHM, J, 1/16W	
R502	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R504	ERG2SJS332H	M 10KOHM, J, 1/10W	
R507	ERDS2TJ561	C 560OHM, J, 1/4W	
R508	ERG3FJ561H	M 560OHM, J, 3W	
R509	ERG3FJ561H	M 560OHM, J, 3W	
R511	ERJ3EKF1102	M 11KOHM, F, 1/16W	
R512	ERJ3EKF1152	M11.5KOHM, 1/10W	
R513	ERQ14AJ100E	F 10OHM, J, 1/4W	
R518	D0DK3R3J0002	W 3.3OHM, J, 1/10W	
R522	ERDS2TJ363	C 36KOHM, J, 1/4W	
R523	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R524	ERDS2TJ104	C 100KOHM, J, 1/4W	
R525	ERJ3GEYJ392	M 3.9KOHM, J, 1/16W	
R551	ERG1FJ101P	M 100OHM, J, 1W	
R552	ERG1SJ102P	M 1KOHM, J, 1W	
R553	ERJ3GEYJ183	M 18KOHM, J, 1/16W	
R559	D0C12R2JA042	M 2.2OHM, J, 1W	
R580	D0GB512JA008	F 5.1KOHM, J, 1W	
R601	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R602	ERDS2TJ103	C 10KOHM, J, 1/4W	
R604	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R605	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R606	ERJ3GEYJ752	M 7.5KOHM, J, 1/16W	
R607	ERJ3GEYJ752	M 7.5KOHM, J, 1/16W	
R608	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R609	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R611	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R612	ERJ3GEYJ392	M 3.9KOHM, J, 1/16W	
R614	ERJ3GEYJ221	M 220OHM, J, 1/16W	
R615	ERJ3GEYJ122	M 1.2KOHM, J, 1/16W	
R616	ERJ3GEYJ563	M 56KOHM, J, 1/16W	
R619	ERJ3GEYJ332	M 3.3KOHM, J, 1/16W	
R620	ERJ3EKF1002	M 10KOHM, F, 1/16W	
R621	ERJ3EKF2002	M 20KOHM, F, 1/16W	
R624	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R625	ERJ3GEYJ102	M 1KOHM, J, 1/16W	
R626	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R627	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R628	ERJ3GEYJ823	M 82KOHM, J, 1/16W	
R629	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R632	ERJ3GEYJ682	M 6.8KOHM, J, 1/16W	
R634	ERJ3GEYJ151	M 150OHM, J, 1/16W	
R635	ERJ3GEYJ151	M 150OHM, J, 1/16W	
R636	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R638	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R640	ERJ3GEYJ471	M 470OHM, J, 1/16W	
R641	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R643	ERJ3GEY0R00	M 0OHM, J, 1/16W	
R644	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R645	ERJ3GEYJ101	M 100OHM, J, 1/16W	
R646	ERJ3GEYJ183	M 18KOHM, J, 1/16W	
R647	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R652	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R653	ERJ3GEYJ750	M 750OHM, J, 1/16W	
R656	ERJ3GEYJ823	M 82KOHM, J, 1/16W	
R658	ERDS2TJ470	C 470OHM, J, 1/4W	
R659	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R660	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R662	ERJ3GEYJ221	M 220OHM, J, 1/16W	
R663	ERJ3GEYJ470	M 470OHM, J, 1/16W	
R664	ERDS2T0T	C 0OHM, 1/4W	
R665	ERDS2T0T	C 0OHM, 1/4W	
R669	ERDS2T0T	C 0OHM, 1/4W	
R681	ERJ3GEYJ472	M 4.7KOHM, J, 1/16W	
R682	ERJ3GEYJ472	M 4.7KOHM, J, 1/16W	
R685	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R686	ERJ3GEYJ104	M 100KOHM, J, 1/16W	
R701	ERJ3GEYJ103	M 10KOHM, J, 1/16W	
R702	ERJ3GEYJ680	M 68OHM, J, 1/16W	
R703	ERJ3GEYJ472	M 4.7KOHM, J, 1/16W	
R704	ERJ3GEYJ471	M 470OHM, J, 1/16W	
R705	D0GB203JA008	F 20KOHM, J, 1W	

Ref. No.	Part No.	Part Name & Description	Remarks
R713	ERG3FJ100H	M 10OHM,J, 3W	
R715	ERDS2TJ472	C 4.7KOHM,J, 1/4W	
R824	ERX12SJR27E	M 0.27OHM,J, 1/2W	
R825	ERJ3GEYJ471	M 470OHM,J,1/16W	
R830	ERDS2TJ221	C 220OHM,J, 1/4W	
R831	ERDS2TJ333	C 33KOHM,J, 1/4W	
R832	ERJ3EKF4022	M 40.2KOHM,J,1/16W	
R833	ERDS2TJ102	C 1KOHM,J, 1/4W	
R834	ERG3FJ473H	M 47KOHM,J, 3W	
R836	ERG1SJ220P	M 220OHM,J, 1W	
R839	ERJ3GEYJ472	M 4.7KOHM,J,1/16W	
R840	DOAW825JA001	C 8.2MOHM,J, 1W	△
R842	ERG2FJ150H	M 150OHM,J, 2W	
R847	ERDS2TJ473	C 47KOHM,J, 1/4W	
R848	ERX12SJR22E	M 0.22OHM,J, 1/2W	
R850	ERG3SJS560H	M 560OHM,J, 3W	
R851	ERDS2TJ104	C 100KOHM,J, 1/4W	
R852	DOAE162JA046	C 1.6KOHM,J, 1W	
R854	ERG2FJ470H	M 470OHM,J, 2W	
R856	ERG2SJS104H	M 100KOHM,J, 2W	
R857	ERDS2TJ102	C 1KOHM,J, 1/4W	
R858	ERX2SJ7R5E	M 7.5OHM,J, 2W	
R861	ERG1SJ390P	M 390OHM,J, 1W	
R862	ERDS2TJ182	C 1.8KOHM,J, 1/4W	
R863	ERDS2TJ101	C 100OHM,J, 1/4W	
R864	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R866	ERJ3GEYJ392	M 3.9KOHM,J,1/16W	
R867	DOAE202JA046	C 2KOHM,J, 1/4W	
R868	ERDS1TJ101	C 100OHM,J, 1/2W	
R871	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R872	ERJ3EKF1052	F 10.5KOHM,J, 1/10W	
R873	ERJ3EKF1802	M 18KOHM,F,1/16W	
R875	ERJ3GEYJ822	M 8.2KOHM,J,1/16W	
R876	ERJ3EKF1002	M 10KOHM,F,1/16W	
R877	ERJ3EKF5101	F 27KOHM,J, 1W	
R882	ERJ3GEYJ332	M 3.3KOHM,J,1/16W	
R884	ERDS2TJ562	C 5.6KOHM,J, 1/4W	
R885	ERJ3GEYJ752	M 7.5KOHM,J,1/16W	
R886	D0GB433JA008	F 43KOHM,J, 1W	
R888	ERJ3GEYJ103	M 10KOHM,J,1/16W	
R889	ERX3FJ8R2H	M 8.2OHM,J, 3W	
R890	ERG1SJ273P	M 27KOHM,J, 1W	
R894	ERJ3EKF1303	M 130KOHM,J,1/10W	
R896	ERC12ZGK225D	M 130KOHM, 1/10W	
	TRANSFORMERS		
T553	ETH19Y210BZ	H DRIVE TRANS	△
T554	BSC27-0102K	FLYBACK TRANS	△
T801	ETS35AH1P6AC	SWITCHING TRANS	△
	OTHERS		
A13	K1KA07AA0190	CONNECTOR	
A19	K1KA06AA0180	CONNECTOR	
A2	K1KA06AA0659	CONNECTOR	
A25	K1KA02A00676	CONNECTOR	
A27	K1KA02A00720	CONNECTOR	
A4	K1KA04AA0190	CONNECTOR	
A5	K1KA04AA0190	CONNECTOR	
A8	K1KA04AA0093	CONNECTOR	
CF835	TAP4GA0005	POSISTOR	△
F860	K5D502BL0009	FUSE	△
G13	K1KA07BA0055	CONNECTOR	
G19	K1KA06BA0055	CONNECTOR	
G20	K1KA02BA0055	CONNECTOR	
JA10	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA11	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA12	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA13	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA16	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA17	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA2	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA29	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA30	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA31	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA32	ERJ6GEY0R00	M 0OHM,J,1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
JA33	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA35	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA36	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA4	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA45	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA5	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA6	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA7	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA8	ERJ6GEY0R00	M 0OHM,J,1/10W	
JA9	ERJ6GEY0R00	M 0OHM,J,1/10W	
JK3002	K4BK10B00005	AV TERMINAL	
JK3003	K4BK10B00006	AV TERMINAL	
JK3202	K4BC07B00007	AV TERMINAL	
JK3203	K4BC07B00006	AV TERMINAL	
JS110	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS2315	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS2341	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS2342	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS3043	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS3044	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS3131	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS3132	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS670	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS807	ERJ6GEY0R00	M 0OHM,J,1/10W	
JS850	ERJ3GEY0R00	M 0OHM,J,1/16W	
JS883	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSG3165	ERJ3GEY0R00	M 0OHM,J,1/16W	
JSG3167	ERJ3GEY0R00	M 0OHM,J,1/16W	
K20	K1KA02BA0055	CONNECTOR	
L2	K1KA06AA0659	CONNECTOR	
L3	K1KA04AA0190	CONNECTOR	
LF1810	J0HADK000001	EMI FILTER	
LF891	ELF21V012S	LINE FILTER	△
P14	K1KA02A00676	CONNECTOR	
PC860	B3PAA0000363	PHOTO COUPLER	△
PP30	K1MR08BA0008	CONNECTOR	
PP31	K1MR08BA0008	CONNECTOR	
RL831	K6B1CDA00028	RELAY	△
RM1062	B3RAD0000160	REMOCON RECEIVER	
SC352	K3B09CA00014	CRT SOCKET	△
SW1021	EVQ11G05R	SWITCH	
SW1022	EVQ11G05R	SWITCH	
SW1023	EVQ11G05R	SWITCH	
SW1024	EVQ11G05R	SWITCH	
SW1025	EVQ11G05R	SWITCH	
SW1026	EVQ11G05R	SWITCH	
SW15	K1KA02A00676	CONNECTOR	
SW5	K1KA02A00720	CONNECTOR	
SW841	ESB92DA1B	SWITCH	△
TU001	ENV59K30G3RF	TUNER	△
V1	K1KA05BA0055	CONNECTOR	
X1801	H0D202500004	CRYSTAL OSC	
X601	H0D202500007	CRYSTAL OSC	△
XF101	J0C3525A0005	SAW FILTER	△