

Service Manual

Color Television



CT-24SL14J
CT-24SL14UJ
CT-27SL14J
CT-27SL14UJ
 GN3 (NA10)




This simplified service manual is issued to add listed models to the NA10 family service manuals order No. MTNC030733A1(CT-27SL13G), MTNC030834A1(CT-24SL13G) & MTNC030623C1(CT-25L8G). A complete parts list and schematics are included in this simplified service manual. Please file and use this simplified service manual together with simplified service manuals MTNC030733A1(CT-27SL13G), MTNC030834A1(CT-24SL13G) and main service manual order No. MTNC030623C1 (CT-25L8G).

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.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

CONTENTS

	Page		Page
1 Safety precautions	3	5 Receiver feature table	7
2 Service notes	4	6 Board description table	7
2.1. X-Ray Protection Circuit Check & Adjustments	5	7 TV Location of controls	8
3 EEPROM replacement	5	8 Location of controls (remote)	9
4 About lead free solder (PbF)	6	8.1. EUR7613ZB0	9

9 Disassembly for service	10	15.2. A-Board printed circuit (2 of 2)	23
9.1. Disassembly for CRT replacement	10	15.3. C-Board printed circuit	24
9.2. Back cover removal	11	16 Block diagrams	25
9.3. Inside View	11	16.1. Video Signal Block Diagram	26
10 Chassis service adjustment procedures	12	16.2. Audio Signal Block diagram	27
11 Service mode (electronic adjustments)	13	17 Schematics	28
11.1. Service adjustment default values for items	14	17.1. English schematic notes	29
12 Service adjustments (electronic controls)	15	17.2. Notas de esquemáticos en español	30
12.1. Sub-Brightness and ContrastService DAC adjustment (BRIGH, CONT)	15	17.3. A-Board schematic TNP2AH060DB (1 of 4)	31
12.2. Color output adjustmentService DAC adjustment (COLOR, TINT)	15	17.4. A-Board schematic TNP2AH060DB (2 of 4)	32
12.3. Color output adjustmentService DAC adjustment(COLOR, TINT, B-Y_G)	15	17.5. A-Board schematic TNP2AH060DB (3 of 4)	33
12.4. Color temperature adjustment(B/W Tracking)Service DAC Adjust.(CUT R) (CUT G) (CUT B) (R DR) (B DR)	16	17.6. A-Board schematic TNP2AH060DB (4 of 4)	34
12.5. Deflection adjustments	16	17.7. A-Board schematic TNP2AH060MA (1 of 4)	35
12.6. MTS circuit adjustments	18	17.8. A-Board schematic TNP2AH060MA (2 of 4)	36
12.7. Clock adjustment (CLOCK)	18	17.9. A-Board schematic TNP2AH060MA (3 of 4)	37
13 Identification of main components	19	17.10. A-Board schematic TNP2AH060MA (4 of 4)	38
13.1. A-Board main components	19	17.11. C-Board schematic TNP2AA157AN/AR (1 of 2)	39
13.2. C-Board main components	19	17.12. C-Board schematic TNP2AA157AN/AR (2 of 2)	40
14 Reference for PDF colors	20	17.13. Voltages	41
15 Conductor views	21	17.14. Waveforms	43
15.1. A-Board printed circuit (1 of 2)	22	18 Parts location	44
		19 Parts list	45
		19.1. Parts list notes	45
		19.2. Parts list	46

1 Safety precautions

General guidelines

An isolation transformer should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always replace protective devices, such as fish paper, isolation resistors and capacitors, and shields after servicing the receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this receiver is operating. Operation of the receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high voltage equipment.

Extreme care should be practiced when handling the picture tube. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. Discharge the picture tube by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a well insulated wire or use a grounding probe. Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to x ray radiation.

The test picture tube used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against x ray radiation as well as implosion. The magnetic shield limits the x ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling 50kV without causing x-ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. Do not use a line isolation transformer when testing.

Leakage current cold check

Unplug the A.C. cord and connect a jumper between the two plug prongs. Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240k Ω and 5.2M Ω . If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage current hot check

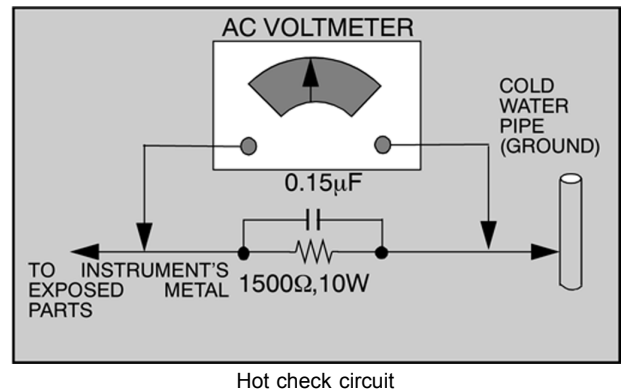
Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5k Ω 10 watt resistor in parallel with a 0.15 μ F capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson model 229, Sencore model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the receiver must be repaired and rechecked before it is returned to the customer.



Insulation test

Connect an insulation tester between an exposed metallic part and A.C. line. Apply 1080VAC/60Hz for 1 second. Confirm that the current measurement is 0.5mA ~ 2.0mA. Repeat test with other metallic exposed parts.

X-ray radiation

WARNING

The potential source of x-ray radiation in the TV set is in the high voltage section and the picture tube.

NOTE

It is important to use an accurate, calibrated high voltage meter.

Set the brightness, picture, sharpness and color controls to minimum.

Measure the high voltage. The high voltage should be 30.55 \pm 1.25kV for 24" CRT and 29.25 \pm 1.25kV for 27" CRT. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

Horizontal oscillator disable circuit test

This test must be performed as a final check before the receiver is returned to the customer. See horizontal oscillator disable circuit procedure check in this manual.

2 Service notes

NOTE

These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.

Leadless chip component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board, however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code, 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

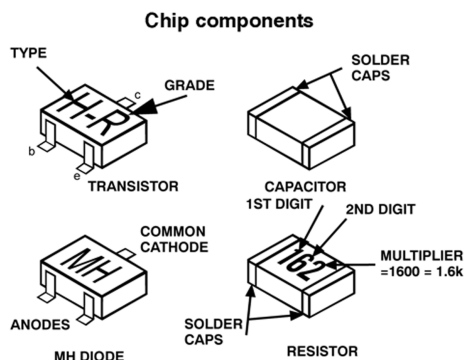
Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

Component removal

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

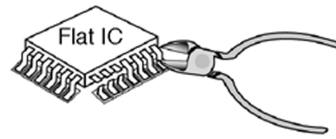
Chip component installation

1. Put a small amount of solder on the board soldering pads.
2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.

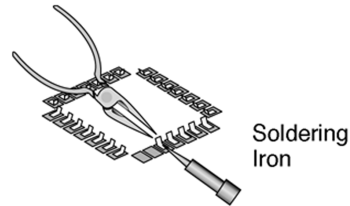


How to replace flat IC (required tools)

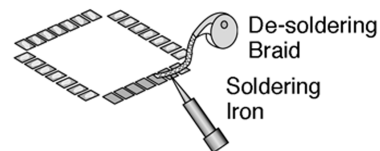
1. Remove the solder from all of the pins of a Flat IC by using a desolder braid



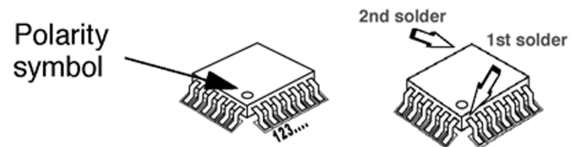
2. Put the iron wire under the pins of the Flat IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.



3. Remove the solder from all the pads of the Flat IC by using a de solder braid



4. Position the new Flat IC in place (apply the pins of the Flat IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol



5. Solder all pins to the soldering pads using a fine tipped soldering iron



6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de solder braid as shown in the figure below



IMPORTANT

To protect against possible damage to the solid state devices due to arcing or static discharge, make certain that all ground wires and CRT DAG wire are securely connected.

CAUTION

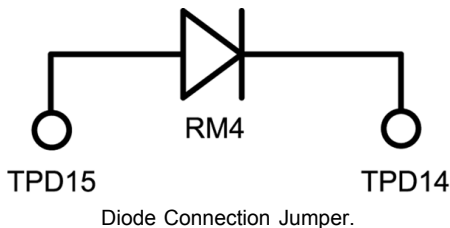
The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground (hot) or (cold) when servicing, or incorrect voltages will be measured.

2.1. X-Ray Protection Circuit Check & Adjustments

This test must be performed as final check before the receiver is returned to the customer. If voltages are out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

Equipment:

1. Isolation transformer.
2. High voltage meter.
3. D.C. Ammeter
4. Short jumper.
5. HHS jig (See figure below).



Preparation:

1. Make sure the receiver is turned off.
2. Connect the receiver to an isolation transformer.
3. Connect the ammeter serial from the flyback anode lead to the picture tube anode socket.
4. Prepare short jumper and HHS jig.

Procedure:

1. Connect the short jumper between TPD16 & TPD17.
2. Connect the jumper diode between TPD14 and TPD15 (anode connected to TPD15 and cathode to TPD14).
3. Apply 75VAC to AC input of isolation transformer.
4. Turn the receiver on.
5. Apply a monoscope pattern.
6. Set customer picture and brightness controls to the minimum.
7. Set current within 50 μ A to 100 μ A by changing the picture and bright controls.
8. Slowly increase AC voltage at the input of the isolation transformer and confirm HHS voltage measure **34.5kV**.
9. Turn power off and remove jigs.

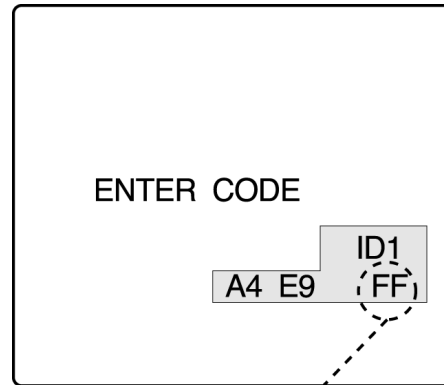
3 EEPROM replacement

If a new EEPROM integrated circuit is replaced for servicing, follow the next procedure once that the memory is properly assembled:

1. Enter to service mode.
2. Turn the TV set ON.
3. Once inside service mode the first image that appears on-screen is the ID1 register with the respective address value (FF) like the image below.

Note:

All 3 registers (ID1, ID2, ID3) should appear with FF values if a new EEPROM is assembled.



VALUE TO MODIFY

4. With "VOL" keys adjust the correct value according with the service adjustment table (see "Service Mode" section).
5. Change to the next ID switch register with "CH" keys and repeat the same procedure as step 4.
6. When replacing a new EEPROM be sure to set the correct ID switch values for each model.
7. Once that all 3 registers are set with the correct address value, perform all of the remaining adjustments and servicing.

IMPORTANT:

Correct ID switch configuration should be input when replacing EEPROM for each television model, otherwise if wrong values are configured, the television software will not function accordingly and properly.

4 About lead free solder (PbF)

NOTE

Lead is listed as (Pb) in the periodic table of elements.

In the information below, Pb will refer to lead solder, and PbF will refer to Lead Free Solder.

The lead free solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).

That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

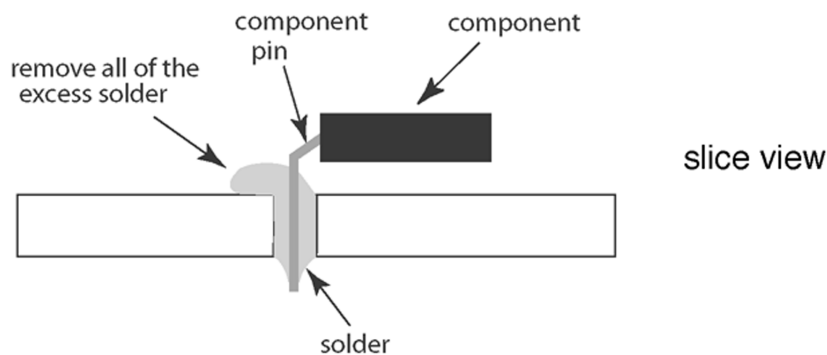
This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.

PCBs manufactured using lead free solder will have the "PbF" or a leaf symbol stamped on the back of PCB.



CAUTION

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30 ~ 40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side.



Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g

5 Receiver feature table

FEATURE/MODEL	CT-24SL14J/UJ	CT-27SL14J/UJ
CHASSIS	AP422	AP430
MICRO	128K	
MENU LANGUAGE	ENG/SPAN/FR	
CLOSED CAPTION	X	
V-CHIP (USA/CANADA)	X	
CHANNEL COUNT	181	
CHANNEL INFO BANNER	X	
VIDEO INPUT SKIP	SKIP	
75 OHM INPUT	X	
REMOTE CONTROL	EUR7613ZB0	
CRT SUPPLIER	MTPDT	MDDA (FLAT)
FAMILY	GN3	
COMB FILTER	3 DIG	
HEC/VEC (X=BOTH)	X	
VM	X (SELECTABLE)	
V/A NORM (X=BOTH)	V	
COLOR TEMP	X	
PRESET/INPUT LABELING	X	
VIDEO PICTURE MEMORY	X	
MTS/SAP/DBX	X	
BUILT-IN AUDIO POWER	5Wx2	
No. OF SPEAKERS	2	
BASS/BAL/TREBLE CONTROL	X	
AI SOUND	X	
SURROUND	X	
A/V IN (REAR/FRONT)	3(2/1)	
AUDIO OUT (FAO: F, VAO: V)	F, V	
COMPONENT INPUT (Y, Pb, Pr)	1	
S-VIDEO INPUT (REAR/FRONT)	1/0	
EPJ/HPJ/MISC	HPJ	
DIMENSIONS (WxDxH)	695.16x464x538.46mm 27.36x18.26x21.19in	754.3x534.3x601.6mm 29.69x21.03x23.68in
WEIGHT (Kg/Lbs)	34 / 74.95	35.4 / 78.04

Note:

Specifications are subject to change without notice or obligation. Dimensions and weights are approximate.

6 Board description table

CT-24SL14J / CT-24SL14UJ

BOARD	PART NUMBER	DESCRIPTION
A	TNP2AH060DB	MAIN BOARD
C	TNP2AA157AN	CRT BOARD

CT-27SL14J / CT-27SL14UJ

BOARD	PART NUMBER	DESCRIPTION
A	TNP2AH060MA	MAIN BOARD
C	TNP2AA157AR	CRT BOARD

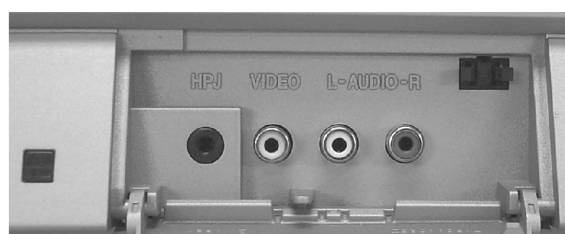
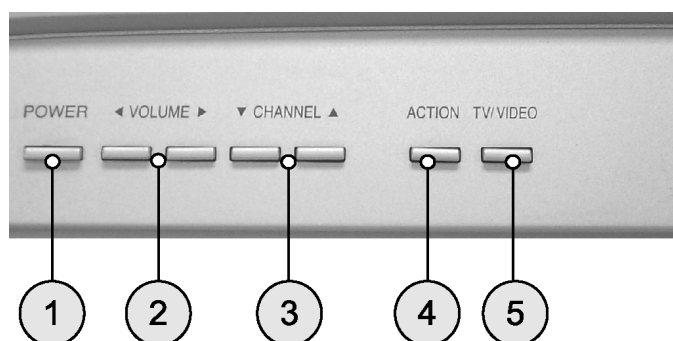
NOTE

When ordering a replacement board assembly, append an "S" to the board number

EXAMPLE

To order the A Board, for CT-27SL14J the replacement board is TNP2AH060MAS.

7 TV Location of controls



IR Sensor
& Front AV jacks

Quick reference control operation

- 1 **Power** - Press to turn ON or OFF.
- 2 **Volume** - Press to adjust sound level, or to adjust audio menus, video menus, and select operating features when menus are displayed
- 3 **Channel** - Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select cable converter box channels after programming remote control infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position).
- 4 **Action** - Press to display main menu and access on screen feature and adjustment menus.
- 5 **TV/Video** - Press to select TV or one of the video inputs.

8 Location of controls (remote)

8.1. EUR7613ZB0

POWER

Press to turn ON and OFF.

TV - VCR - DBS/CBL - DVD

Press to select a component

MUTE

Press to mute sound.

TV/VIDEO

Press to select TV, Video mode.

MENU

Press to select TV, Video mode.

KEYBOARD

Press to select any channel.

R-TUNE

Press to switch to previously viewed channel or video mode.



SAP

Press to access the secondary audio program broadcast.

CH

Press to select next or previous channel and navigate in menus.

VOL

Press to adjust TV sound and navigate in menus.

RECALL

Press to display time, channel sleep timer and other options.

GUIDE

DBS and DVD functions button.

EXIT

DBS menu function button.

PROG

Press for delimiter between major and minor channel number.

DVD & VCR KEYPAD

Press to control DVD and VCR basic functions.

Note:

For additional information about this remote please refer to the owner's manual section remote operation, listed on the parts list section.

9 Dissassembly for service

Back cover

Remove all the screws marked with an arrow (←) from the back of the receiver

NOTE

Screw configuration, type, and number of screws vary depending on the model of the receiver serviced and the application; various models are covered in this manual. Use same hardware when reassembling the receiver.

- 3 screws at the top edge of the receiver.
- 2 screw by the A/V jacks.
- 1 screw at each lower corner of the receiver.
- 1 screw by the Flyback.
- 1 screw by the A/C cord.

A-Board - Main chassis

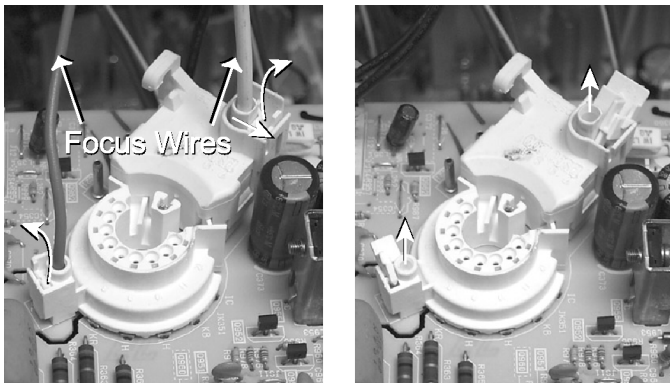
1. Slide the chassis completely out of the guide rails.
2. Stand the receiver on its edge. The underside of the board is completely accessible for component replacement.

Note:

Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal.

C-Board - CRT output

The board plugs onto the socket on the CRT neck. To release the Focus wire, use a dull object to release the tab on the socket (near the wire opening) and carefully pull on the wire. To connect the focus wire, press on the tab to lock it then insert the wire in the opening and press on it until it is fully inserted and locked in place.



Focus cable release

Speakers

Each speaker is secured to the cabinet with 4 screws.

NOTE

When reassembling speakers be sure to connect the speaker wires to the correct speaker lead (+) (-)

9.1. Disassembly for CRT replacement

1. Discharge the CRT as instructed in the "safety precautions".
2. Disconnect the yoke (DY) plug, degaussing coil (DEG) plug from the main board.
3. Unplug the CRT 2nd anode button from the main board.

4. Remove the C-Board from the CRT base and unplug the black wires (CRT dag ground) C11 & C21.
5. Disconnect the speakers plug from the A-Board.
6. Lift the main chassis (A-Board) and all mounted boards completely out with the CRT board attached.
7. Perform complete removal of chassis, as instructed in "disassembly for service" section.

CRT replacement

1. Perform "disassembly for CRT replacement" procedure.
2. Insure that the CRT H.V. Anode button is discharged before handling the CRT. Read the "safety precautions" section on handling the picture tube.
3. Remove the components from the CRT neck and place the cabinet face down on a soft pad.
4. Note the original order for the CRT mounting hardware as they are remove from the CRT mounting brackets at each corner of the CRT.
5. Remove the CRT with the degaussing coil and the dag ground braid attached.
6. Note the original locations and mounting of the degaussing coil and the dag ground assembly to insure proper reinstallation on the replacement CRT.

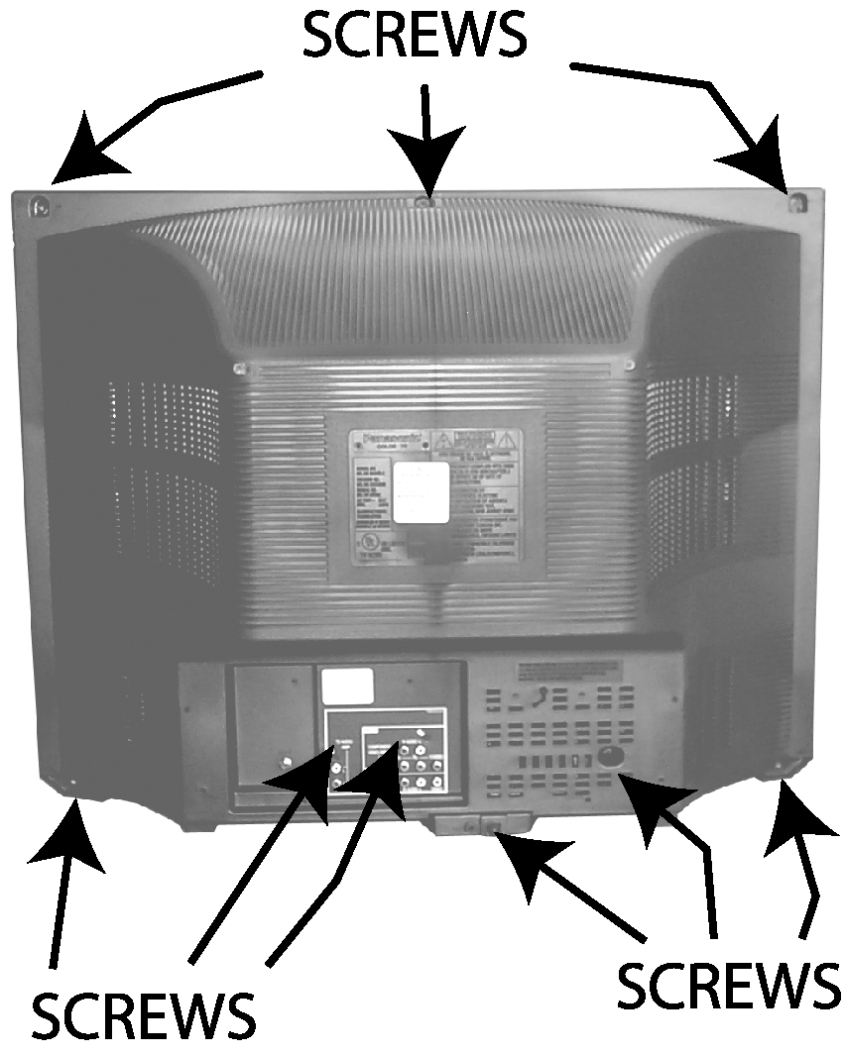
To remove and remount the degaussing coil:

- Unhook the coil spring from the bottom corners of the CRT ears.
 - Release the braid loop from the upper corners of the CRT ears.
7. Mount the dag ground braid on the replacement CRT. Position the degaussing coil with new ties. Dress coil as was on the original CRT.
 8. Replace the components on CRT neck and reinstall into cabinet. Verify that all ground wires and circuit board plugs get connected.

IMPORTANT NOTICE

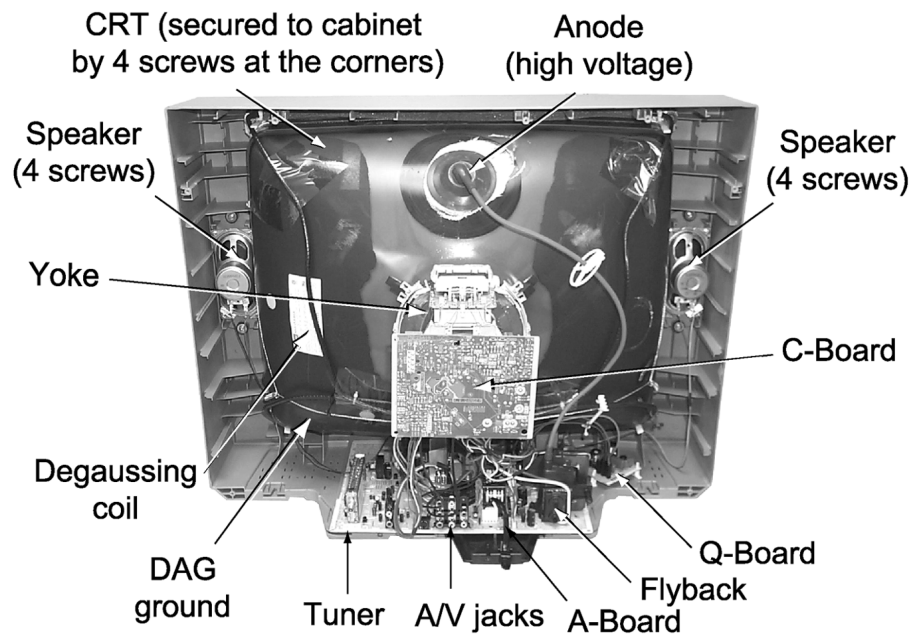
When ordering the CRT, please order CRT and CRT kit also. Please see parts list section for part numbers.

9.2. Back cover removal



Back Cover

9.3. Inside View

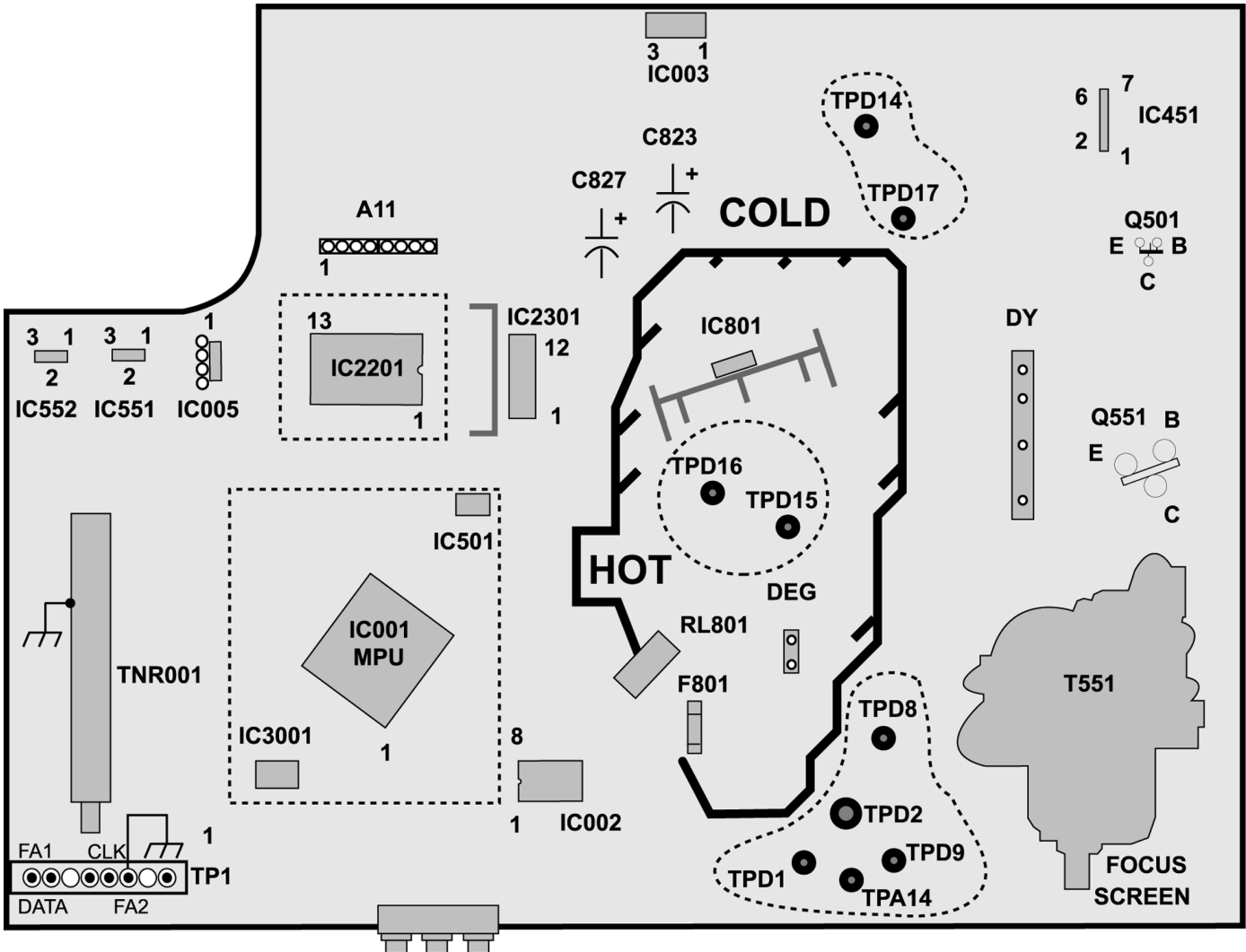


10 Chassis service adjustment procedures

All service adjustments are factory preset and should not require adjustment unless controls and/or associated components are replaced.

Note:

Connect the (-) lead of the voltmeter to the appropriate ground. Use IC801's heat sink when the HOT ground symbol is used. Otherwise, use COLD ground (tuner shield, IC451's heat sink or FA2).



Component and voltage test points

Note:

Components and test points within dotted areas are located on trace side.

B+ voltage check

1. Set the BRIGHT and PICTURE to minimum by using the PICTURE menu.
2. Connect the DVM between C825 (+ side) or TPD14 and cold ground.
3. Confirm that B+ voltage is 131.0V ± 2.0V. This voltage supplies B+ to the horizontal output and flyback circuits.

Source voltage chart

120V AC line input. Set the BRIGHT and the PICTURE to minimum by using the PICTURE menu. Use cold or hot ground for the (-) lead of the DVM as needed.

A-BOARD	TEST POINT	VOLTAGE	
		24" CRT	27" CRT
+B2	TPD14	131.0 ± 2.0V	131.0 ± 2.0V

A-BOARD	TEST POINT	VOLTAGE	
		24" CRT	27" CRT
SOUND	C823 (+)	22.7 ± 1.0V	22.7 ± 1.0V
STB12V	C827 (+)	12.8 ± 1.0 V	12.8 ± 1.0 V
220V	TPA14	205 ± 10 V	217 ± 10 V
VERTICAL	TPD8	27.4 ± 1.5V	27.4 ± 1.5V
9V	IC551 pin 3	9.0 ± 0.5V	9.0 ± 0.5V
5V	IC552 pin 3	5.0 ± 0.5V	5.0 ± 0.5V
3.3V	IC005 pin 2	3.3 ± 0.3V	3.3 ± 0.3V
EHT	CRT anode	30.55 ± 1.25kV	29.25 ± 1.25kV
HEATER	JK351 H-HGND	6.3 ± 0.24V	6.0 ± 0.24V

High voltage check

1. Select an active TV channel and confirm that horizontal is in sync.
2. Adjust BRIGHTNESS and CONTRAST using PICTURE icon menu so video just disappears.
3. Using a high voltage meter confirm that the high voltage is 30.55 ± 1.25kV for 24" and 29.25 ± 1.25kV for 27".

11 Service mode (electronic adjustments)

This receiver has electronic technology using the IC bus concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed by using "on screen display menu". (The service adjustment mode).

NOTE

It is suggested that the technician reads all the way through and understand the following procedure for entering/exiting the service adjustment mode; then proceed with the instructions working with the receiver. When becoming familiar with the procedure, the flow chart for service mode may be used as a quick guide.

Quick entry to service mode

When minor adjustments need to be done to the electronic controls, the method of entering the service mode without removal of the cabinet back is as follows using the remote control:

1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Press "ACTION" twice to exit menus.
4. Tune to the channel 124.
5. Adjust VOLUME to minimum (0).
6. Press VOL → (decrease) on receiver. Red "CHK" appears in upper corner.

To toggle between aging and service modes:

While the "CHK" is displayed on the left top corner of the CRT, pressing "ACTION" and "VOL" UP on the TV simultaneously will toggle between the modes. Red "CHK" for service and yellow "CHK" for aging.

7. Press POWER on the remote control to display the service adjustment modes menu, select adjustment by pressing the volume right/left buttons and channel up/down buttons on the remote and ACTION to enter the adjustment.

MTS	MTSIN	SEPAL	SEPAH	
CLOCK	CLOCK			HHSTH
VIDEO	COLOR	TINT	BRIGH	CONT
	B-Y_G	CUT_G	CUT_R	CUT_B
	BRT	R-DR	B-DR	
HDEF	H-POS	H-WID	PCC	
	TOPG	BTMG	TRAP	
FINE	PCCHG	PCCLG	PCCHS	PCCLS
	TOPSL	BTMSL		
VDEF	VEAMP	V-C	V-S	VPOS
SETID	ID1	ID2	ID3	

Exiting the service mode:

This TV goes out from service mode when it is unplugged or turned OFF. To exit the service mode, turn the TV OFF or unplug the TV from A.C.

Other method

Press ACTION and POWER on the receiver simultaneously for at least 2 seconds.

The receiver momentarily shuts off; then comes back on

tuned to channel 3 with a preset level of sound.

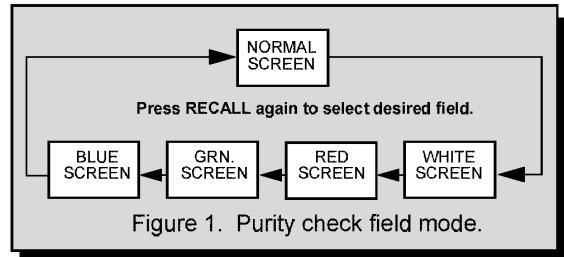
Any programmed channels, channels caption data and some others user defined settings will be erased when exited by pressing ACTION and POWER on receiver.

IMPORTANT NOTE

Always check that the TV exits the service mode.

To confirm colors

When in service mode (red "CHK" is displayed) press RECALL on the remote control to enter the purity field check mode



Entering service mode (open-back method)

While the receiver is connected and operating in normal mode, momentarily short test point FA1 (TP1 pin 2) to cold ground (TP1 pin 3).

The receiver enters the aging mode.

Yellow letters "CHK" appear in the upper left corner of the screen.

(The volume right/left and channel up/down will adjust rapidly).

Note:

If service mode is accessed by this method be sure to reset the set after service is performed.

11.1. Service adjustment default values for items

NAME	DESCRIPTION	REGISTER VALUE	
		CT-24SL14J/UJ	CT-27SL14J/UJ
MTSIN	MTS INPUT LEVEL	29	
SEPAL	MTS LOW LEVEL SEPARATION	0D	
SEPAH	MTS HIGH LEVEL SEPARATION	27	
CLOCK	CLOCK	128	
HHSTH	HHS VOLTAGE LEVEL REFERENCE	94	
COLOR	COLOR	00 F0	
TINT	TINT	56	
BRIGH	SUB-BRIGHTNESS	29	
CONT	SUB-CONTRAST	70	
B-Y_G	MAGENTA TINT ADJ	80	
CUT_G	GREEN CUT-OFF	03 D6	
CUT_R	RED CUT-OFF	04 50	
CUT_B	BLUE CUT-OFF	03 D1	
BRT	BRIGHT	29	
R-DR	RED DRIVE	09 5A	
B-DR	BLUE DRIVE	07 FD	
H-POS	HORIZONTAL POSITION	7C	
H-WID	HORIZONTAL WIDTH	23	
PCC	PINCUSHION	17	
TOPG	TOP CORNER PINCUSHION	B2	
BTMG	BOTTOM CORNER PINCUSHION	A8	
TRAP	TRAPEZOID	7F	
PCCHG	PINCUSHION HIGH	0F	
PCCLG	PINCUSHION LOW	1D	
PCCHS	PINCUSHION HIGH	00	
PCCLS	PINCUSHION LOW	00	
TOPSL	TOP CORNER PINCUSHION SLICE LEVEL	33	
BTMSL	BOTTOM CORNER PINCUSHION SLICE LEVEL	33	
VEAMP	VERTICAL SIZE	5D	
V-C	VERTICAL LINEARITY	58	
V-S	VERTICAL SIZE CORRECTION	0A	
VPOS	VERTICAL POSITION	7F	
ID1*	ID SWITCH 1	FC	
ID2*	ID SWITCH 2	5F	7F
ID3*	ID SWITCH 3	7B	

IMPORTANT:

These table values are approximated and could change due to variation of electrical characteristics in each set, except for the ID switch values.

*Note:

The correspondent ID switch (ID1, ID2, ID3) data configuration should not be modified in any way. If EEPROM circuit needs to be replaced, these ID values should be configured according with this table.

12 Service adjustments (electronic controls)

NOTE

Please correlate with available pattern on all adjustments

12.1. Sub-Brightness and Contrast Service DAC adjustment (BRIGH, CONT)

Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.

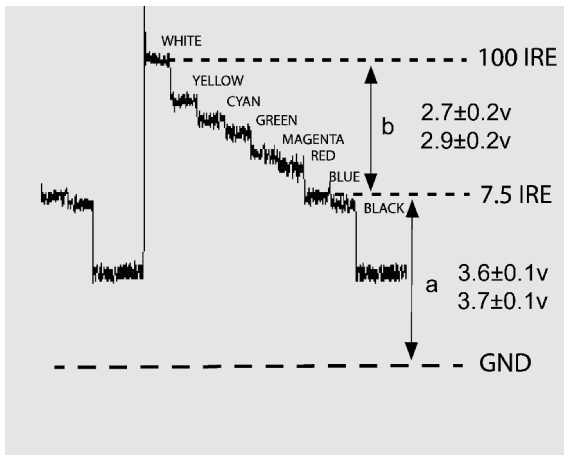
This adjustment is factory set. Do not adjust unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

Preparation

1. Apply a colorbar pattern.
2. Set the PICTURE control to the maximum.
3. Set COLOR control to minimum (no color on picture).
4. Set the BRIGHTNESS control to the center.
5. Set the SHARPNESS control to the center.
6. Connect the oscilloscope to TP35.

Procedure

1. In the service mode, select DAC for brightness adjustment "BRIGH", and adjust data to obtain "a" ($3.7 \pm 0.1V$ for 24" CRT & $3.6 \pm 0.1V$ for 27" CRT) between 7.5IRE and GND level at TP35. (See waveform detail).
2. In service mode, select DAC for contrast adjustment "CONT", and adjust data to obtain "b" ($2.9 \pm 0.1V$ for 24" CRT & $2.7 \pm 0.1V$ for 27" CRT) between 7.5IRE and 100IRE level at TP35. (See waveform detail)



12.2. Color output adjustment Service DAC adjustment (COLOR, TINT)

NOTE

if a rainbow pattern generator is available perform the following procedure; the next section describes the procedure with no rainbow pattern.

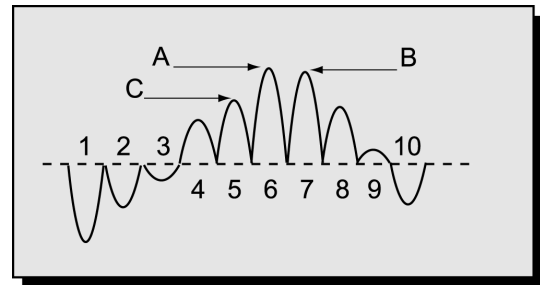
Make sure that sub-contrast adjustment was finished prior to perform this adjustment.

PREPARATION

1. Normalize the picture settings.
2. Set the BRIGHTNESS control to minimum.
3. Set the COLOR control to the center.
4. Set the TINT control to the center.
5. Set the PICTURE control to the maximum.
6. Set the SHARPNESS control to the minimum.

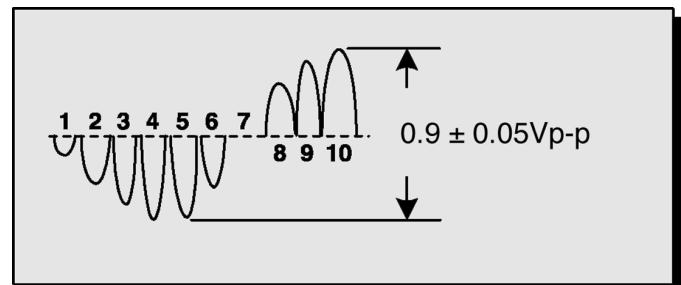
PROCEDURE

1. Apply a rainbow color bar pattern.
2. Connect the oscilloscope to TP37.
3. In service mode adjust "TINT" register until the waveform measured is as the one shown. Tint level from C and B peaks must be almost in the same level and from A to C $0.35 V_{pp}$.



TP37 Waveform.

4. Connect the oscilloscope to TP35 and GND.
5. Adjust "COLOR" register so that the amplitude is $0.9 \pm 0.05 V_{p-p}$.



TP35 Waveform.

12.3. Color output adjustment Service DAC adjustment (COLOR, TINT, B-Y_G)

NOTE

Color and tint adjustment sets the reference settings for the user controls; It is important to read the procedures.

(NO RAINBOW PATTERN)

Make sure that sub-contrast adjustment was finished prior to perform this adjustment

PREPARATION

Normalize the picture settings.

PROCEDURE

1. Apply a color bar pattern.
2. In service mode adjust "R DR" and "B DR" data to "80".

- In service mode adjust "TINT" data so that the color does not become greenish or redish.
- In service mode adjust "COLOR" data so that the color level is not too high (saturated) or too low (tending to black and white).
- In service mode adjust "B-Y G" data so that blue and green seem natural.
- Confirm that saturation and picture are normal (normal image).
- If image is not satisfactory, repeat adjustment until the image is normal and natural.

NOTE

The image can be compared against other set to see the image quality.

- Turn screen clockwise slowly until color is slightly appeared.
- Then adjust "CUT R" and "CUT B" until line becomes white.
- Press RECALL button on the remote to restore the raster.
- Adjust "R DR" and "B DR" so the white seems like white and black like black.
- Apply a normal signal and confirm that the image is normal and a good gray scale
- If correction is needed perform minor touch-up method.

12.4. Color temperature adjustment (B/W Tracking) Service DAC Adjust. (CUT R) (CUT G) (CUT B) (R DR) (B DR)

Minor Touch-Up Method

OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for "good gray scale and warm highlights".

- LOW LIGHT areas - In service mode for making electronic adjustments, select CUT R, CUT G, CUT B and adjust the picture for gray.
- HIGH LIGHT areas - In service mode for making electronic adjustments, select drive R DR, B DR and adjust the picture for warm whites.

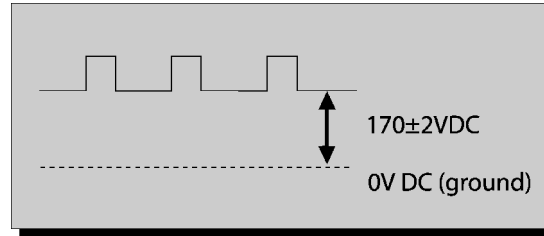
Complete adjustment

PREPARATION

- Turn the receiver "ON" and allow 30 minutes warm up at WHITE PATTERN.
- Apply a color bar pattern (with no color).
- Turn the SCREEN control (part of FBT T551) fully counterclockwise.
- Preset the following service DACs for best results:
 - BRIGH _____ 1 D0
 - CUT R _____ 02 00
 - CUT G _____ 02 00
 - CUT B _____ 02 00
 - R DR _____ 07 FF
 - B DR _____ 07 FF

PROCEDURE

- Connect the oscilloscope to KG (CRT-Board).
- In service mode for making electronic adjustment, select "BRIGH" DAC.
- Press RECALL button on the remote control to collapse the raster. (service SW).
- Connect oscilloscope to KG on C-Board and adjust service mode "CUT-G" DAC until 170±2V above DC ground is measured
- Remove the probe from KG.



12.5. Deflection adjustments

To reset deflection adjustments

To reset deflection adjustments to factory adjusted default, enter to service mode (with red CHK displayed), press POWER button on remote to display the service menu, then press and hold RECALL button for at least three seconds, a reset message will appear in the image.

Use this feature when deflection adjustment gets off adjustment to the point that it cannot be adjusted back easily.

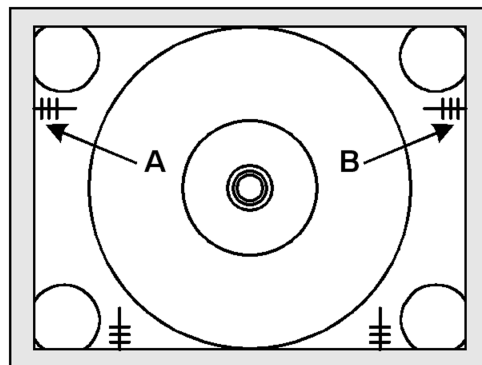
12.5.1. H-Center adjustment

PREPARATION

- Apply a crosshatch pattern.
- Normalize the picture settings.

PROCEDURE

- Apply a pattern that permits to center the picture.



Horizontal Center Adjustment

- If the horizontal center is not aligned, in service mode adjust "H POS" DATA to adjust the horizontal center of the monoscope pattern to the CRT center.
- Verify that horizontal width (A & B mark) is within 4.5 ± 0.7.

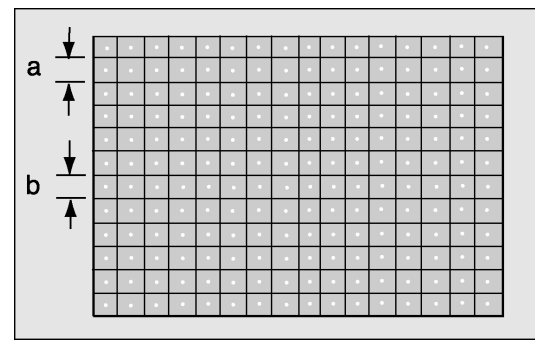
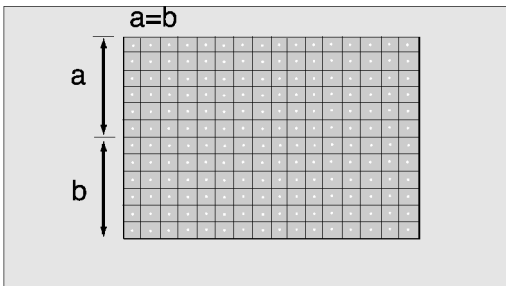
12.5.2. Vertical linearity(V-C), V-Size and V-Position adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.

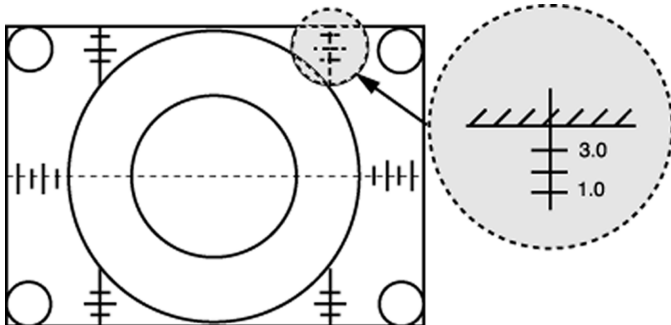
PROCEDURE

1. Enter service mode, select DAC adjustment "V-POS" and adjust monoscope pattern to the center vertical position of the CRT center mark.
2. Adjust linearity data "V-C" so that interval of "a" is same as "b" (a=b).



V-Adjustment

3. If the v-position is not at the CRT center, adjust V position "V POS" DATA again.
4. Apply a monoscope pattern.
5. Confirm that center horizontal line is in center mark on CRT.
6. Adjust "VEAMP" register for correct vertical size by making monoscope round circle leaving 4 marks off the CRT edge.



Vertical centering adjustment.

12.5.3. V-S Correction adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.

PROCEDURE

1. Enter to service mode
2. Check a and b sizes, If $b-a < -1.5\text{mm}$ (in top & bottom extending case)
 - Increase "V-S" DATA by one step

NOTE

Repeat "a" and "b" until $b-a \pm 1.5\text{mm}$

3. Confirm to make outermost circle of monoscope pattern a correct circle

12.6. MTS circuit adjustments

The MTS circuit adjustments require two steps:

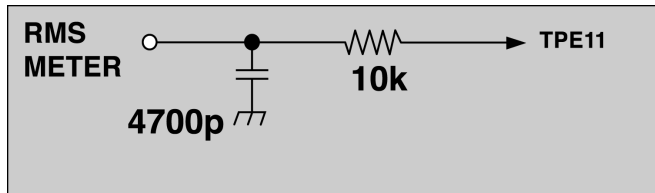
1. Input level adjustment.
2. Stereo separation adjustment.

Input level adjustment

Service DAC adjustment (MTSIN)

PREPARATION

1. Connect an RMS meter with filter jig as shown in figure to TPE11.



Filter Jig

2. Connect an RF signal generator to the RF antenna input.

PROCEDURE

1. Apply the following signal from the RF signal generator:
 - Video: 100 IRE flat field, 30% modulation.
 - Audio: 300Hz, 100% modulation, monaural (70 ±5dB, 75Ω OPEN, P/S 10dB). Make sure that the 75μs pre-emphasis is OFF.
2. Adjust the MTS input level adjustment "MTSIN" data until the RMS voltage measured is 120 ± 4.0mVrms.

Stereo separation adjustment (SEPAH)

PREPARATION

1. Connect an R.F. signal generator to the RF antenna input.
2. Connect a scope to TPE10.

PROCEDURE

1. Select stereo mode in audio menu
2. Apply the following signal from the RF signal generator:
 - Video: 100 IRE flat field, 30% modulation.
 - Audio: 300Hz, 30% modulation, stereo (left only) (70±5dB, 75Ω OPEN, P/S 10dB).

NOTE

After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.

3. In service mode, adjust the MTS Low-Level separation adjustment "SEPAL" data until the amplitude displayed on the scope is minimum.
4. Apply the following signal from the RF signal generator:
 - Video: 100 IRE flat field, 30% modulation
 - Audio: 3KHz, 30% modulation, stereo (left only) (70 ±5dB, 75Ω OPEN, P/S 10dB).

NOTE

After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R.

SW ON.

5. Adjust the MTS High-level separation adjustment "SEPAH" until the amplitude displayed on the scope is minimum.
6. Repeat above steps 2 through 5 until the amplitude is at minimum for both signals.

12.7. Clock adjustment (CLOCK)

PREPARATION

Connect the frequency counter from TP017 (IC001 pin 79) to cold ground

PROCEDURE

1. Turn the receiver "OFF" with the A.C. power applied.
2. Measure TP017 (IC001 pin 79) for the frequency of the waveform and record the reading.

NOTE

3. TP017 (IC001 pin 79) measurement must have at least four digits of resolution following the decimal point. Example: 000.0000
4. Place the receiver into service mode for making electronic adjustment, select the clock adjustment DAC "CLOCK".
5. Calculate and set "CLOCK" based on the following formula:

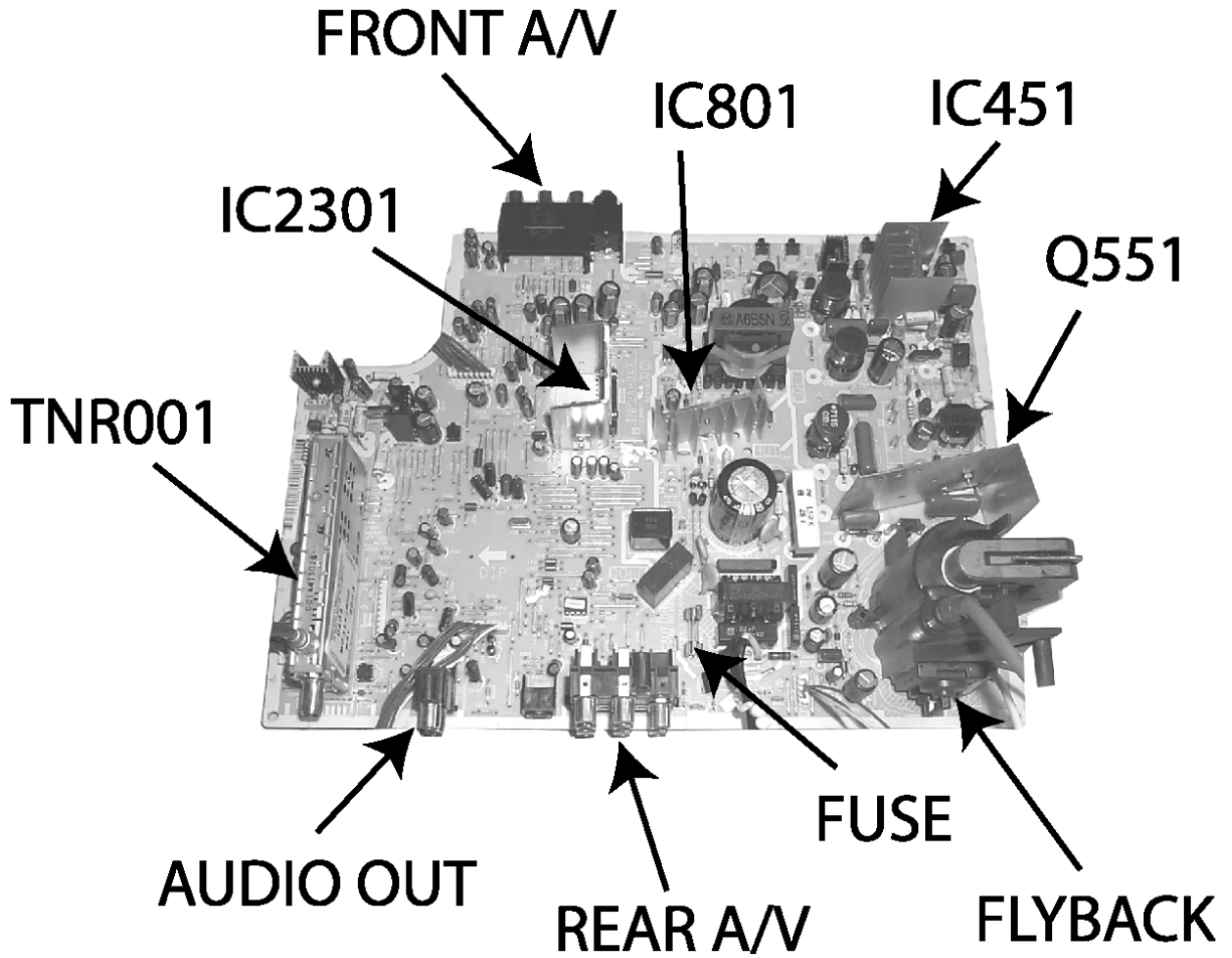
$$\text{CLOCK} = 128 - \left[\frac{(\text{TP017}_{\text{freq}} - 610.35)}{610.35} \times 450000 \right]$$

NOTE

TP017 (IC001 pin 79) measurement will not change regardless of the value stored in CLOCK.

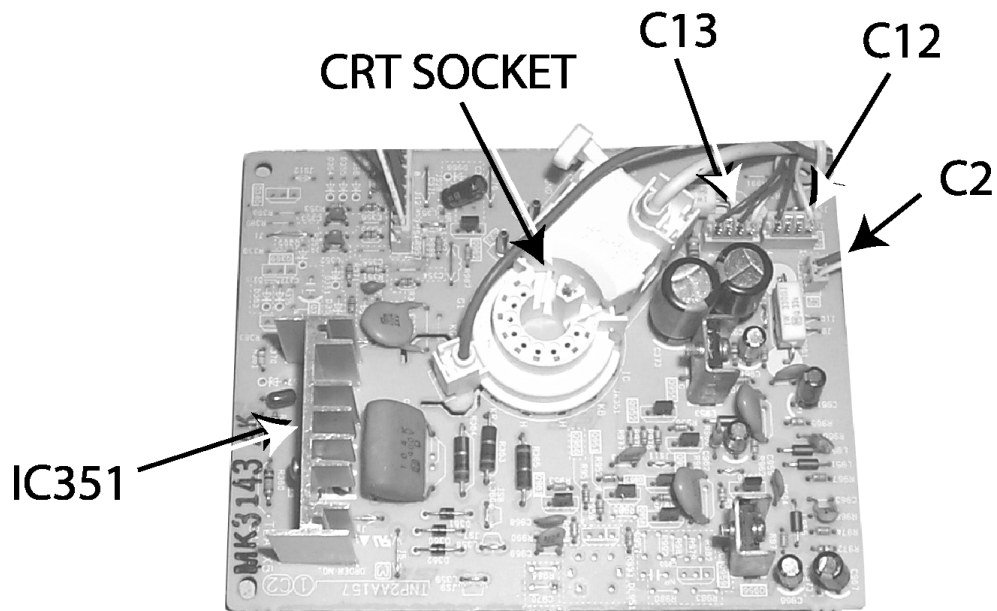
13 Identification of main components

13.1. A-Board main components



A-Board main components

13.2. C-Board main components



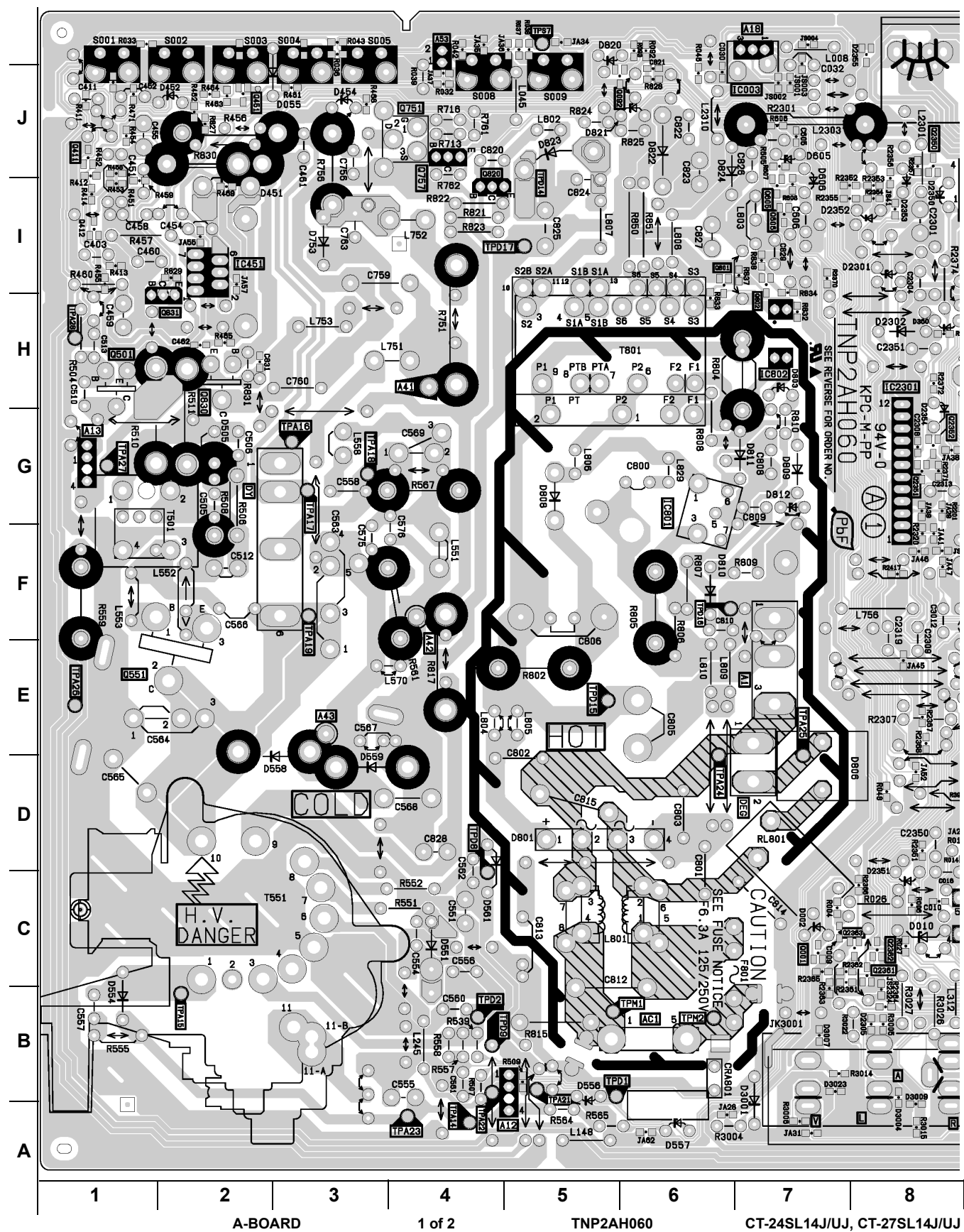
C-Board main components

14 Reference for PDF colors

DESCRIPTION OF PDF LINK COLORS	
TYPE	DESTINATION
SCHEMATIC	
YELLOW ON IC	IC ON PCB
YELLOW ON CONNECTOR	CONNECTOR ON PCB
YELLOW ON SCHEMATIC	PCB
CYAN	WAVEFORM
GREEN ON SIDE	SCHEMATIC CONTINUED
GREEN ON CONNECTOR	CONNECTOR CONNECTION
BLUE ON IC	VOLTAGE
PCB	
BLUE ON IC	IC ON SCHEMATIC
BLUE ON CONNECTOR	CONNECTOR ON SCHEMATIC
BLUE ON PCB	SCHEMATIC
GREEN ON SIDE	PCB CONTINUED
BLOCK DIAGRAMS	
GREEN ON IC	IC ON SCHEMATIC
GREEN ON SIDE	BLOCK DIAGRAM CONTINUED

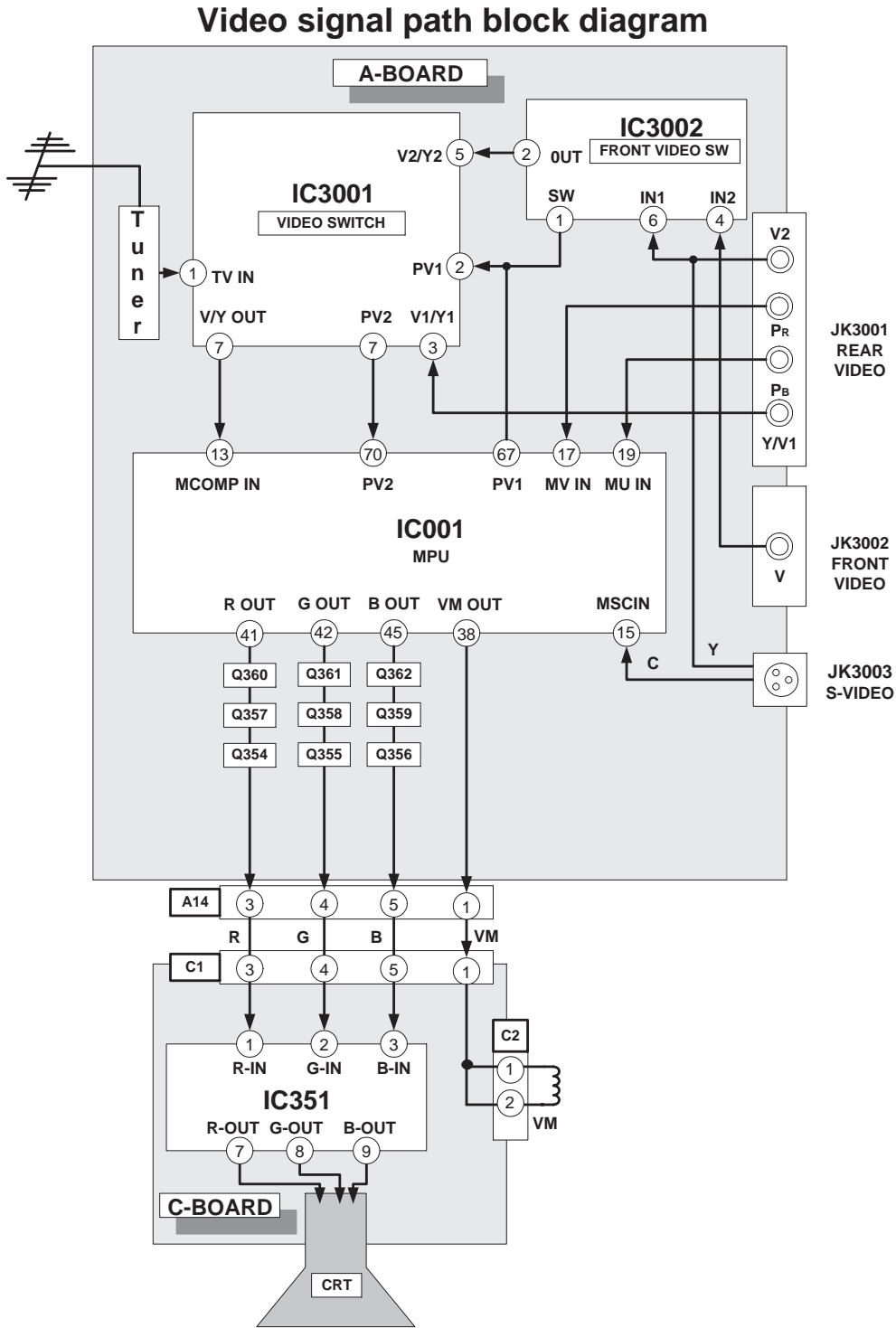
15 Conductor views

15.1. A-Board printed circuit (1 of 2)

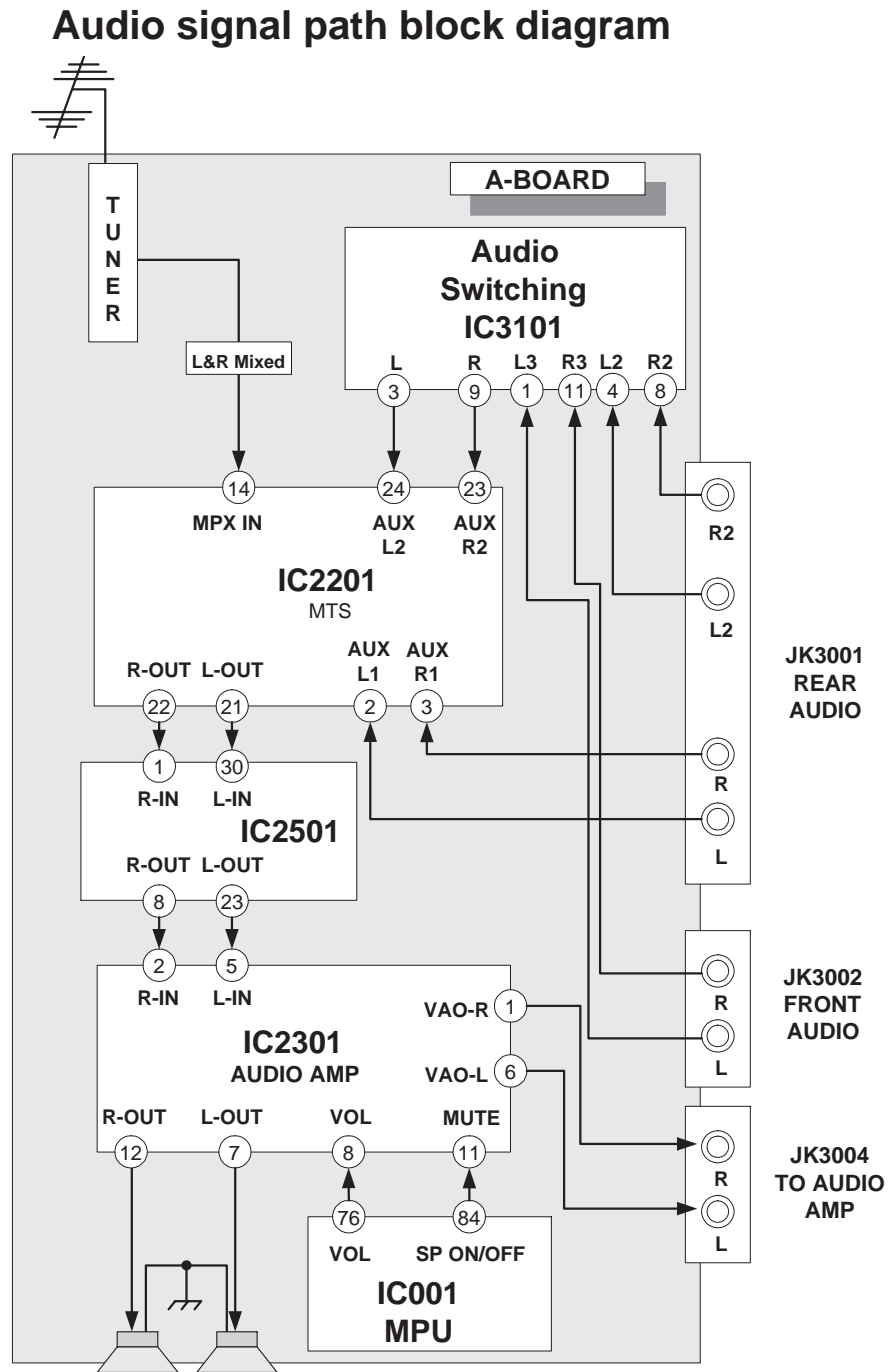


16 Block diagrams

16.1. Video Signal Block Diagram



16.2. Audio Signal Block diagram



CT-24SL14J/UJ, CT-27SL14J/UJ MODELS

17 Schematics

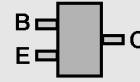
17.1. English schematic notes

Notes:

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A \triangle IN THE SCHEMATIC.

CHIP TRANSISTOR LEAD DESIGNATION



SCHEMATIC NOTES

1. Resistors are carbon 1/4W unless noted otherwise.
 2. Capacitors are ceramic 50V unless noted otherwise.
 3. Coil value notes is inductance in μH .
 4. Test point indicated by \uparrow ; Test point but no pin \uparrow .
 5. Components indicated with \triangle are critical parts and replacement should be made with manufacture specified replacement parts only.
 6. **—** (BOLD LINE) indicates the route of B+ supply.
 7. The schematic diagrams are current at the time of printing and are subject to change without notice.
 8. Ground symbol \downarrow indicates **HOT GROUND CONNECTION**; \uparrow indicates COLD GROUND.
- NOTE: All other component symbols are used for engineering design purposes.*

VOLTAGE MEASUREMENTS

1. Voltage measurement:
 - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
 - All Picture and Audio adjustments are set to Normalize.
TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
Volume - Min.
TV/Video SW - TV position
Audio Mode - Stereo
 - Voltage readings are nominal and may vary $\pm 10\%$ on active devices. Some voltage reading will vary with signal strength and picture content.
 - Supply voltages are nominal.
 2. Ground symbol \downarrow indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.
- CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.*

WAVEFORM MEASUREMENTS

1. $\textcircled{3}$ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
 2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
 3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
 4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
 5. Ground symbol \downarrow shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.
- CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.*

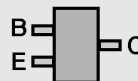
17.2. Notas de esquemáticos en español

Notas

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRÍTICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRÍTICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO \triangle .

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN CHIP



NOTAS DE LOS DIAGRAMAS

- Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
 - Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
 - El valor indicado de las Bobinas es la inductancia expresada en μH .
 - Los puntos de prueba en la terminal de algún componente son indicados por \uparrow . Los puntos de prueba fuera de los componentes se indican con \uparrow .
 - Los componentes señalados con el símbolo \triangle son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
 - (LINEA GRUESA)** indica las líneas de alimentación de los Voltajes B+.
 - Los diagramas eléctricos están sujetos a cambio sin previo aviso.
 - El símbolo \downarrow indica que es una conexión a **Tierra Caliente** y el símbolo \rightarrow indica conexión a **Tierra Fría**.
- NOTA:** Los demás símbolos de componentes incluidos son usados con fines de diseño.

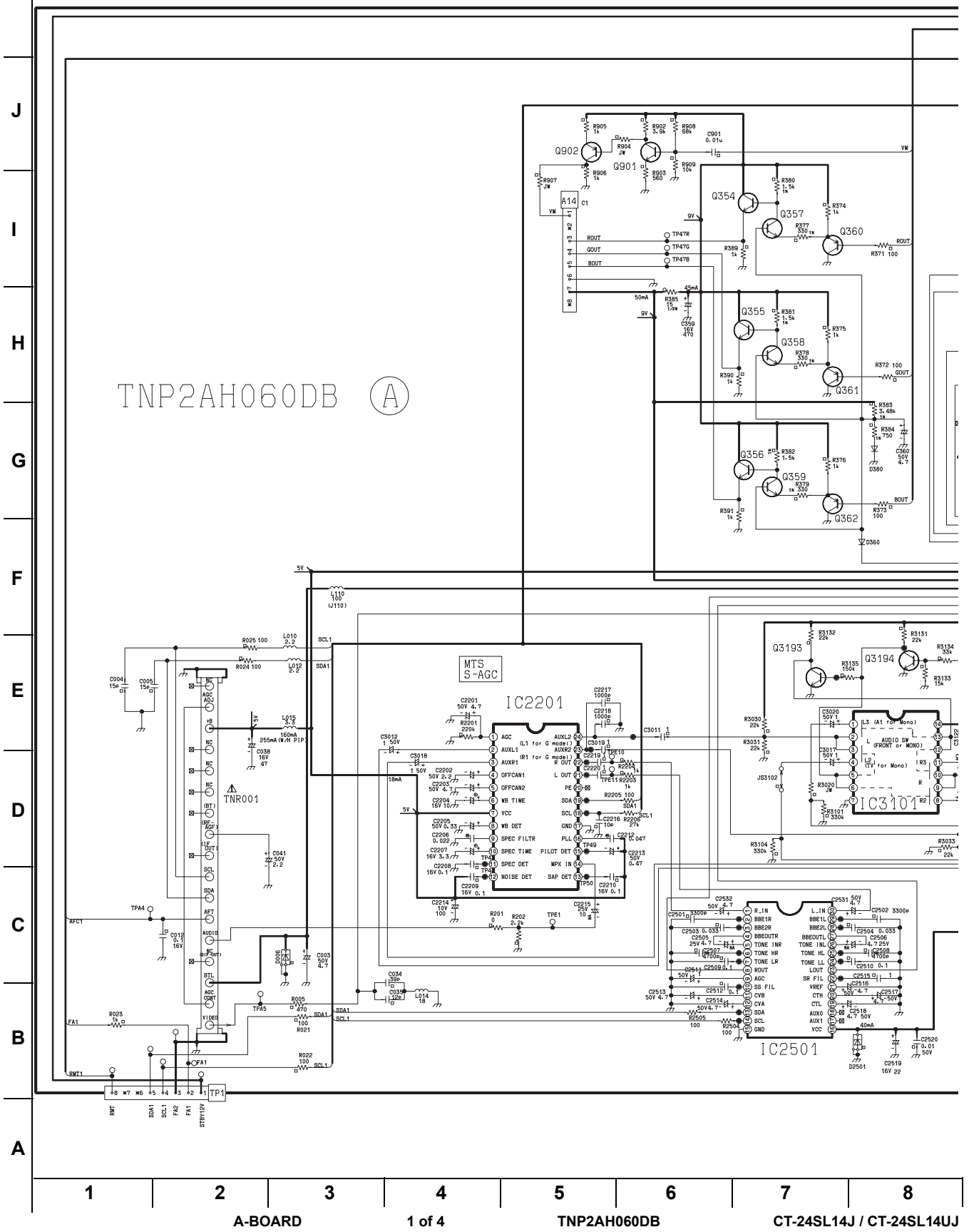
MEDICIÓN DE VOLTAJES

- Medición de voltaje:
 - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
 - Los ajustes de los Menus Picture y Audio se normalizan. En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE. El nivel de Volumen se minimiza. De los modos TV y Video, seleccionar el modo TV. Seleccionar modo Estereo del Audio.
 - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
 - Las fuentes de voltajes son nominales.
- El símbolo \downarrow indica el tipo de tierra que se utiliza en la conexión del medidor.
- PRECAUCION:** Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

MEDICIÓN DE FORMAS DE ONDA

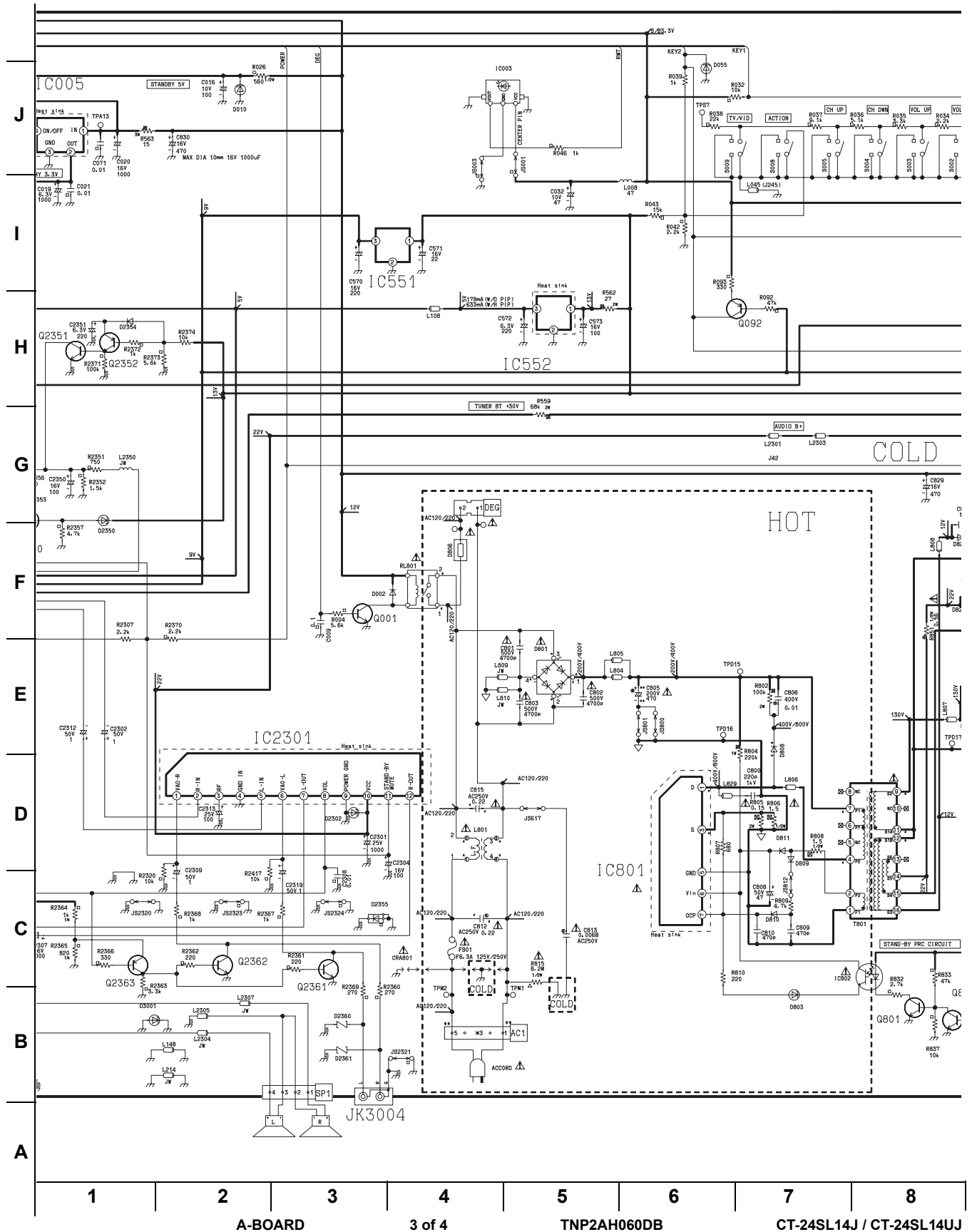
- Un símbolo como $\textcircled{3}$ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
 - Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
 - Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
 - Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
 - El símbolo de tierra \downarrow que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.
- PRECAUCION:** Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

17.3. A-Board schematic TNP2AH060DB (1 of 4)

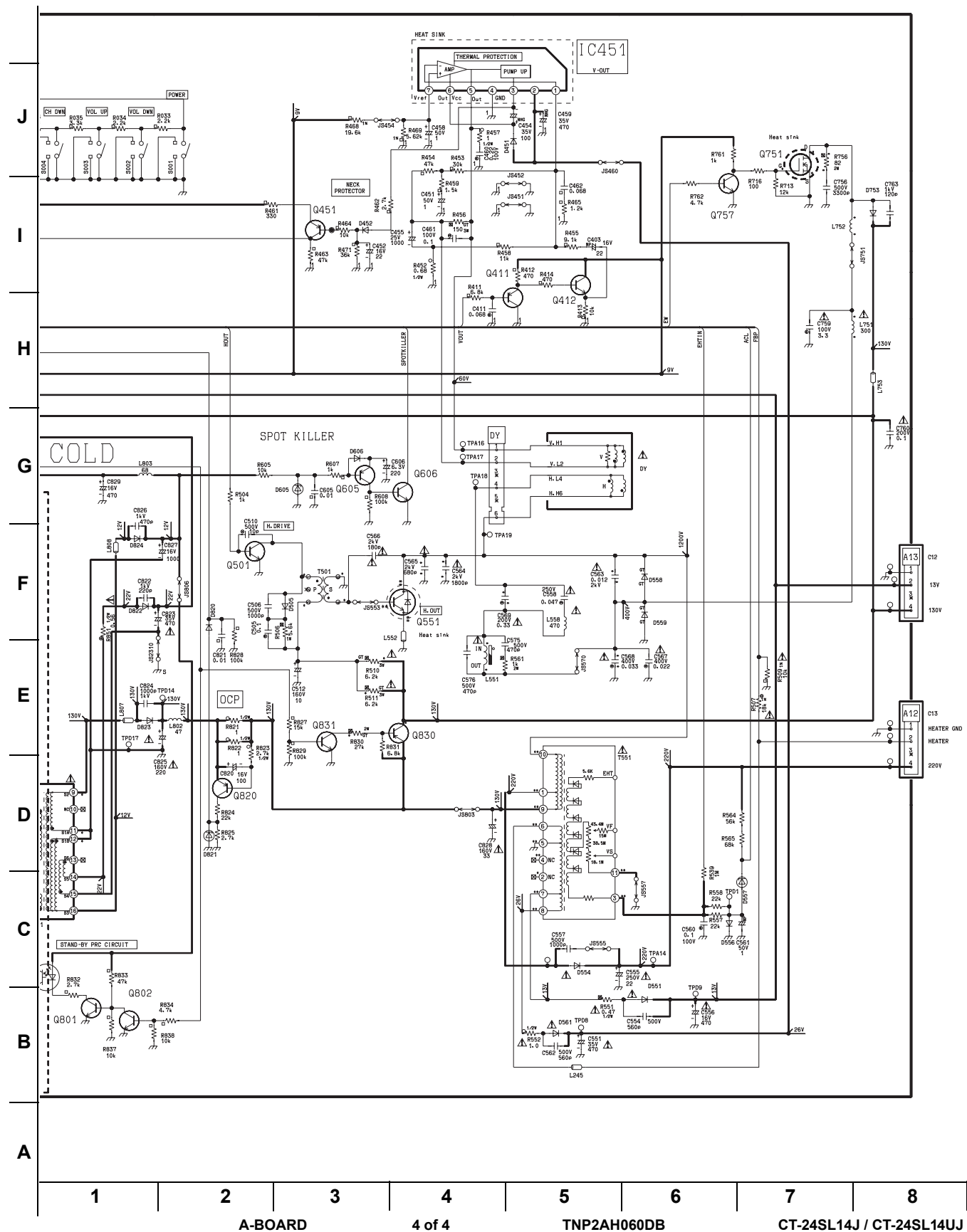


TNP2AH060DB (A)

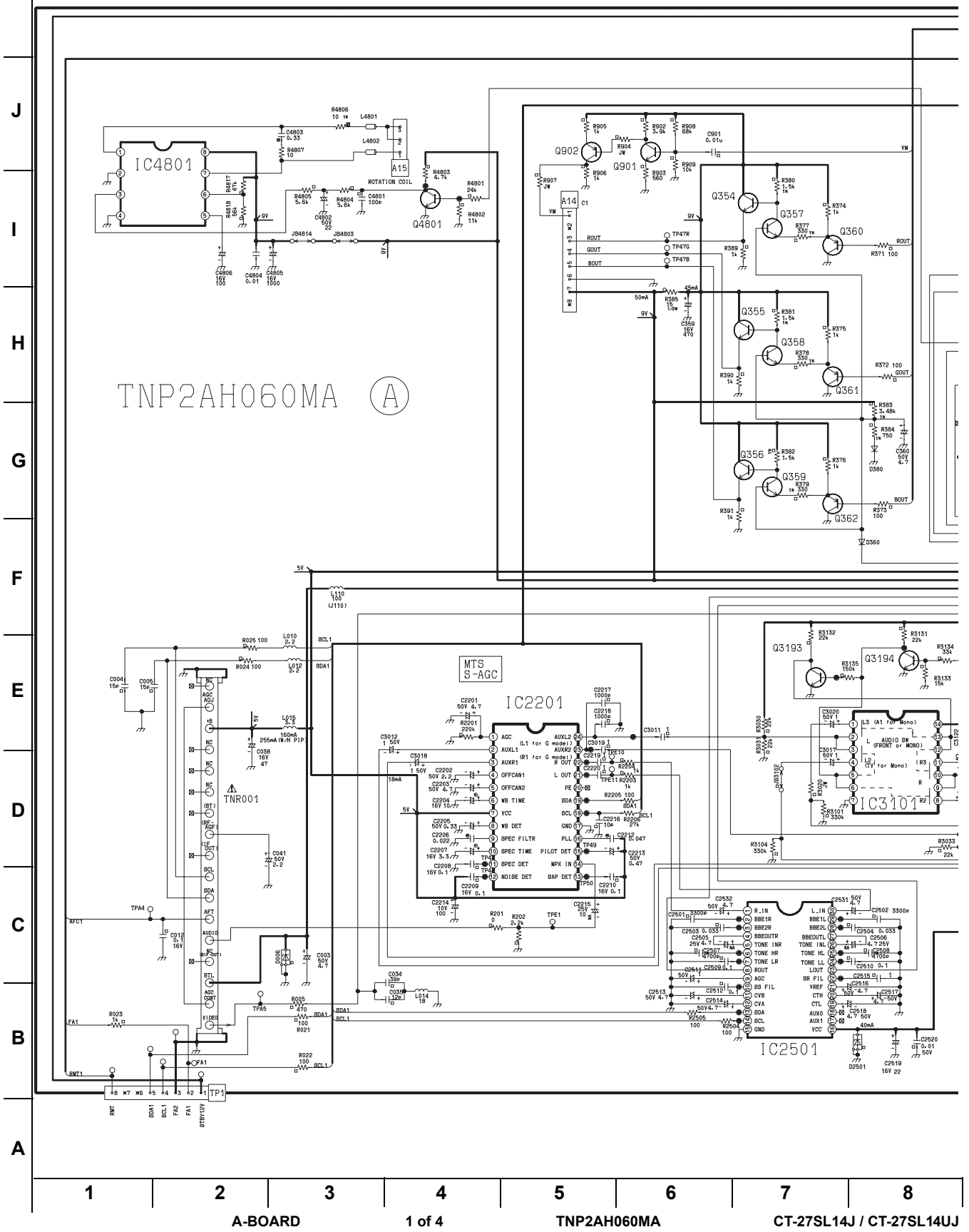
17.5. A-Board schematic TNP2AH060DB (3 of 4)



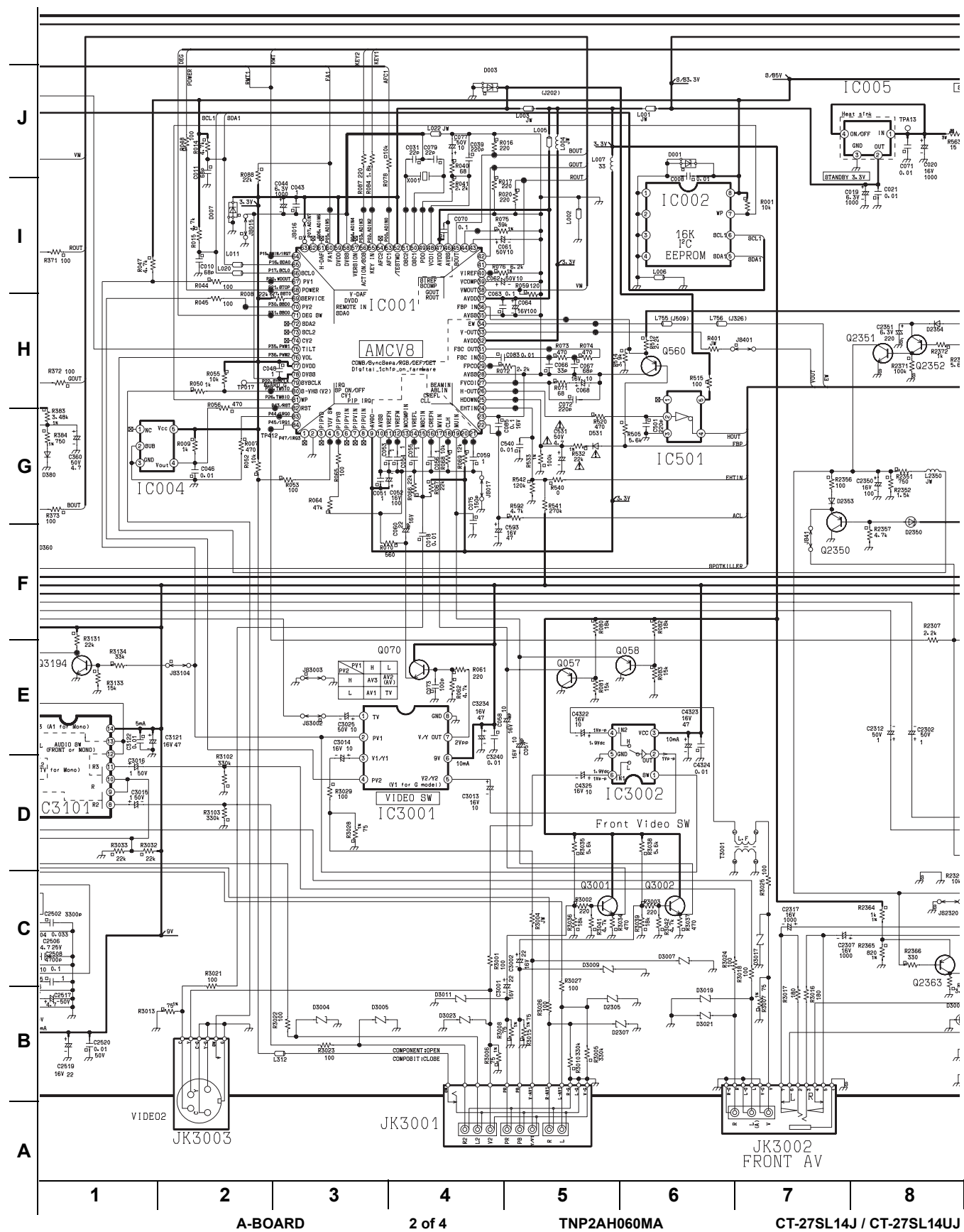
17.6. A-Board schematic TNP2AH060DB (4 of 4)



17.7. A-Board schematic TNP2AH060MA (1 of 4)



17.8. A-Board schematic TNP2AH060MA (2 of 4)



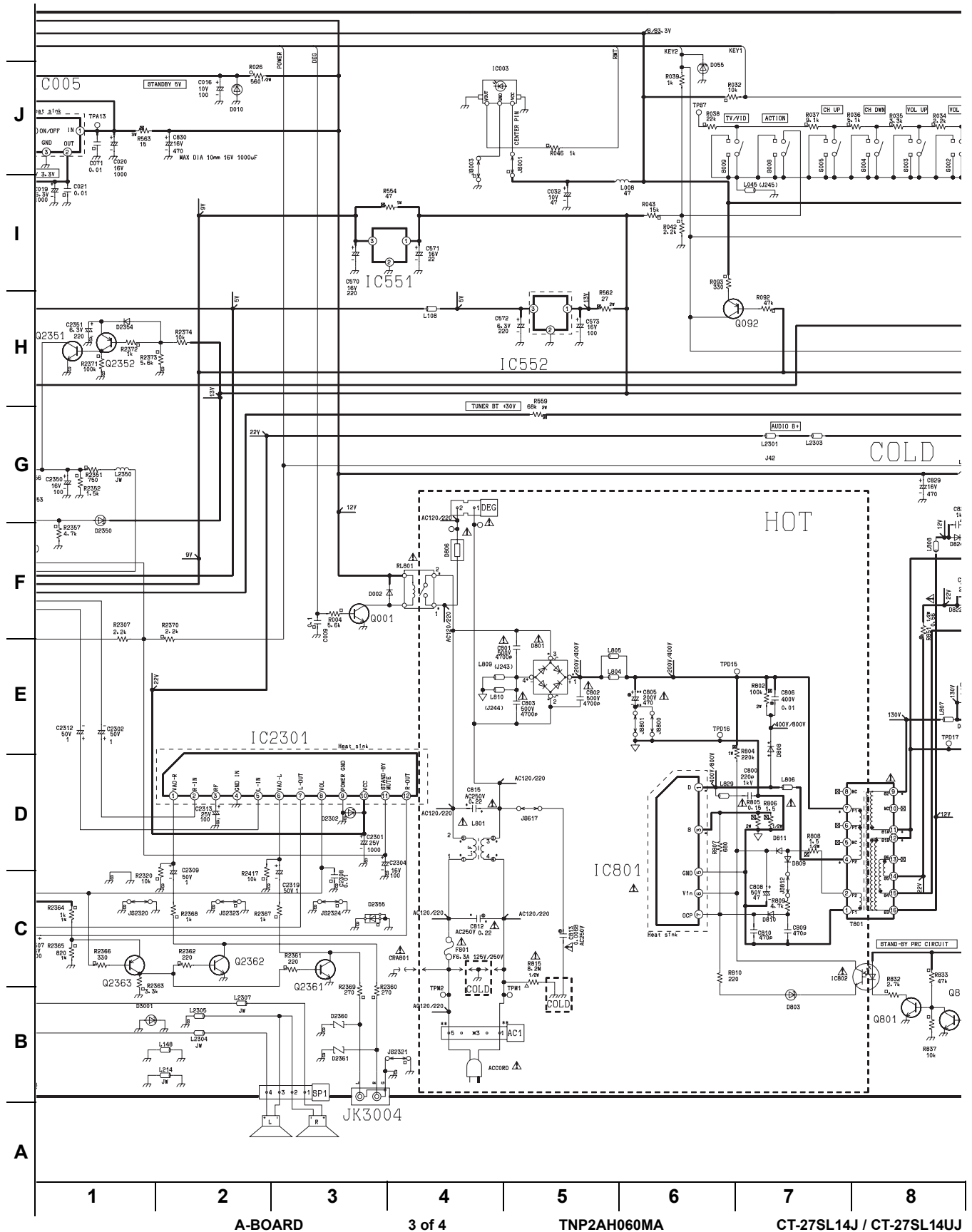
A-BOARD

2 of 4

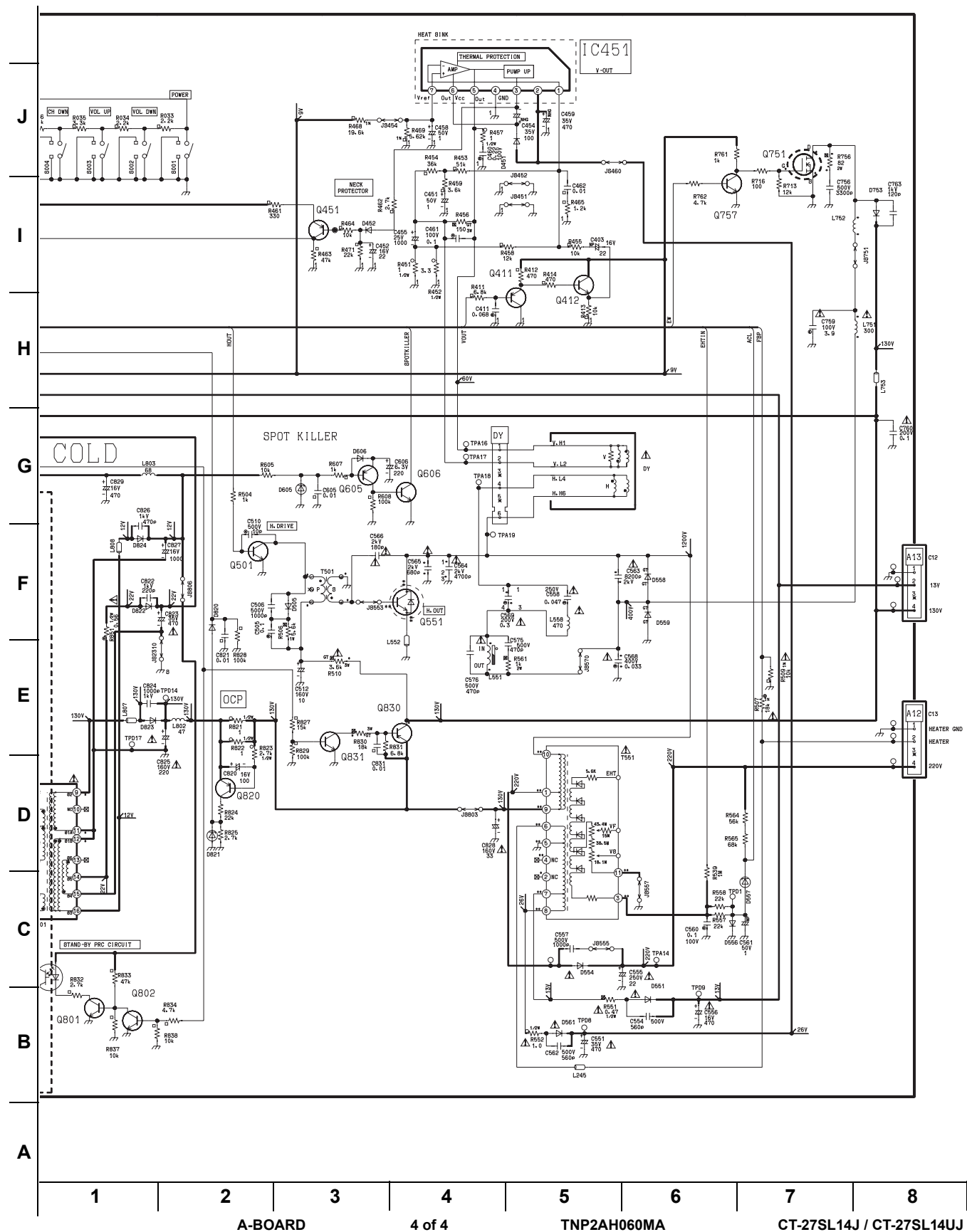
TNP2AH060MA

CT-27SL14J / CT-27SL14UJ

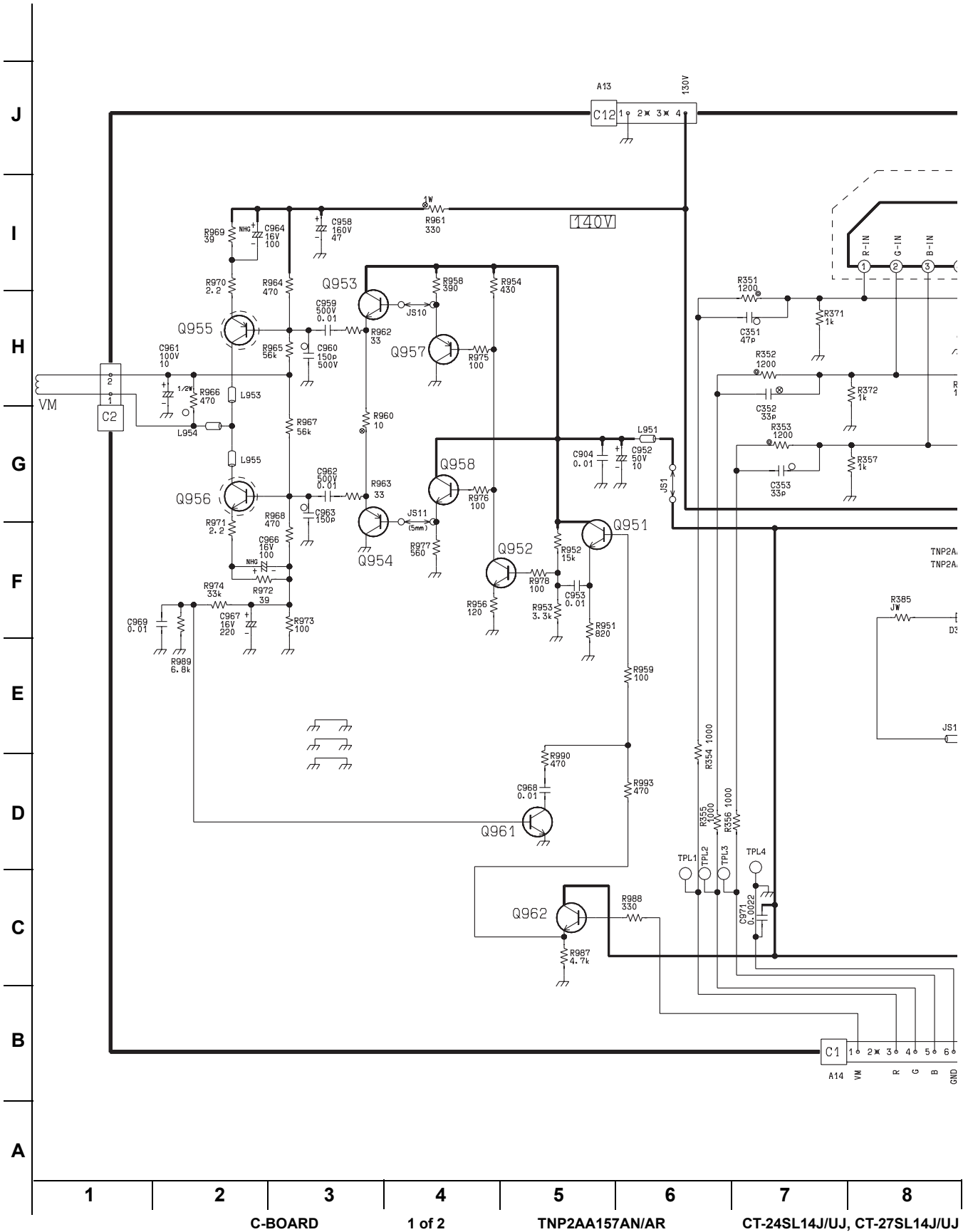
17.9. A-Board schematic TNP2AH060MA (3 of 4)



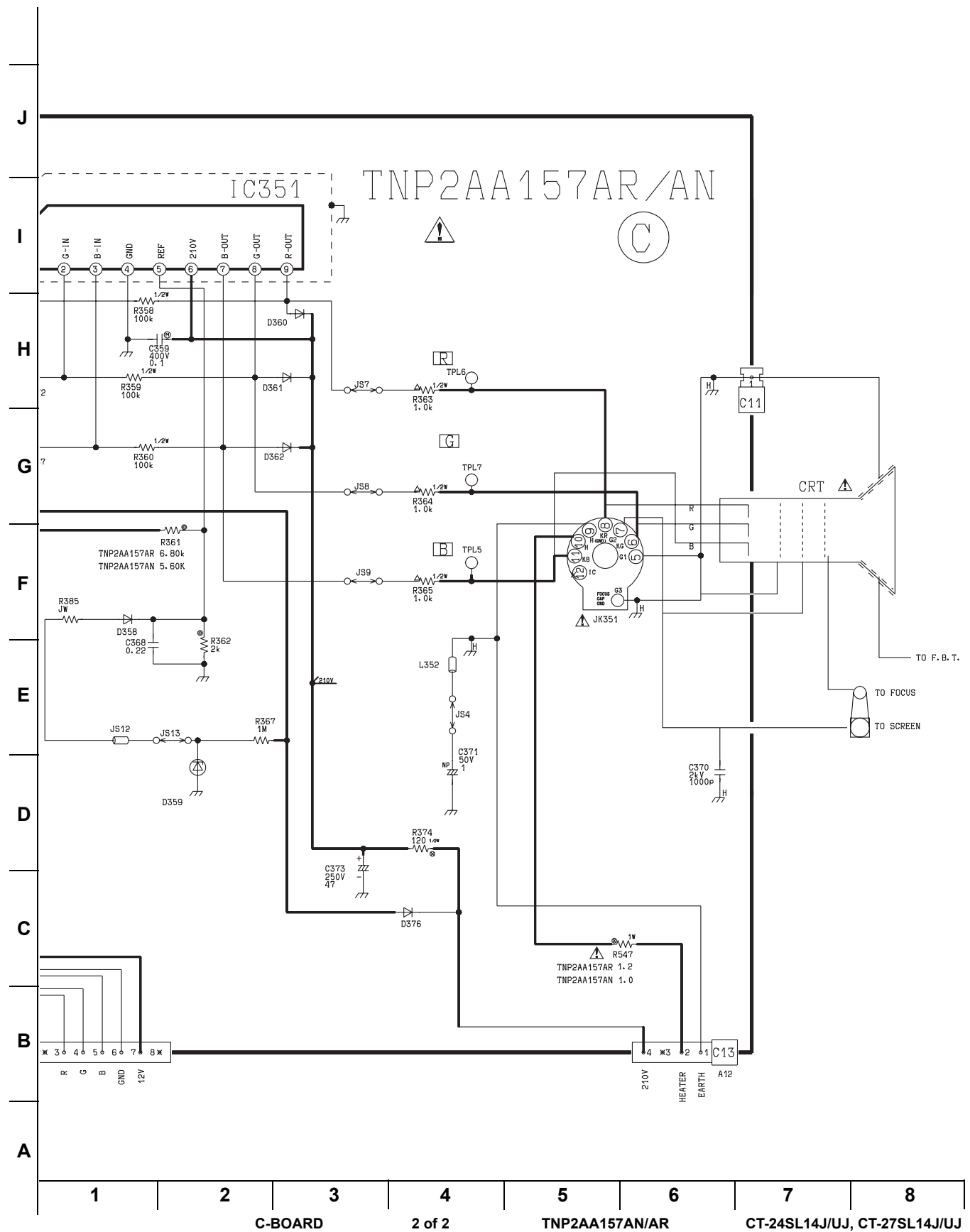
17.10. A-Board schematic TNP2AH060MA (4 of 4)



17.11. C-Board schematic TNP2AA157AN/AR (1 of 2)



17.12. C-Board schematic TNP2AA157AN/AR (2 of 2)



17.13. Voltages

A - BOARD - TNP2AH060

IC001				IC002				IC501				IC2201				IC2301									
1	0.00	43	.....	2.50	1	.....	0.00	1	.....	0.00	1	.....	1.60	13	.....	2.80	1	.....	7.50			
2	0.00	44	.....	1.70	2	.....	0.00	2	.....	1.35	2	.....	2.20	14	.....	2.20	2	.....	5.60			
3	0.00	45	.....	0.00	3	.....	0.00	3	.....	0.00	3	.....	2.20	15	.....	2.50	3	.....	21.00			
4	0.00	46	.....	0.00	4	.....	0.00	4	.....	1.05	4	.....	2.30	16	.....	3.50	4	.....	0.00			
5	0.00	47	.....	3.30	5	.....	3.40	5	.....	3.30	5	.....	2.40	17	.....	0.00	5	.....	5.60			
6	1.20	48	.....	1.90	6	.....	3.40	6	.....		6	.....	0.07	18	.....	3.20	6	.....	7.50			
7	1.20	49	.....	1.90	7	.....	5.20	7	.....		7	.....	5.00	19	.....	3.40	7	.....	10.60			
8	1.30	50	.....	1.60	8	.....	5.20	8	.....		8	.....	2.50	20	.....	0.00	8	.....	1.30			
9	3.30	51	.....	1.70					IC551				9	.....	2.60	21	.....	2.20	9	.....	0.00	
10	0.00	52	.....	3.30					IC552				10	.....	0.80	22	.....	2.20	10	.....	22.70	
11	2.70	53	.....	1.70					IC801↓				11	.....	2.30	23	.....	2.20	11	.....	3.20	
12	1.50	54	.....	1.40					IC802↓				12	.....	2.50	24	.....	2.20	12	.....	10.20	
13	1.40	55	.....	3.30									IC2501				IC3101						
14	0.40	56	.....	1.40									1	.....	4.40	16	.....	8.90	1	.....	0.10	
15	1.60	57	.....	0.00									2	.....	0.00	17	.....	0.00	2	.....	4.40	
16	2.20	58	.....	0.00									3	.....	0.00	18	.....	0.00	3	.....	4.40	
17	1.70	59	.....	3.30									4	.....	4.50	19	.....	3.80	4	.....	4.40	
18	1.70	60	.....	3.30									5	.....	4.50	20	.....	3.80	5	.....	7.80	
19	1.40	61	.....	3.30									6	.....	4.50	21	.....	4.40	6	.....	7.80	
20	1.40	62	.....	0.70									7	.....	4.50	22	.....	4.80	7	.....	0.00	
21	1.00	63	.....	3.30									8	.....	4.50	23	.....	4.40	8	.....	4.40	
22	2.60	64	.....	3.30									9	.....	1.00	24	.....	4.50	9	.....	4.40	
23	0.00	65	.....	3.40									10	.....	4.50	25	.....	4.60	10	.....	4.40	
24	1.90	66	.....	3.50									11	.....	3.60	26	.....	4.50	11	.....	0.00	
25	1.90	67	.....	0.10									12	.....	3.60	27	.....	4.50	12	.....	0.00	
26	1.40	68	.....	3.20									13	.....	2.90	28	.....	0.00	13	.....	0.00	
27	1.28	69	.....	0.00									14	.....	3.20	29	.....	0.00	14	.....	8.90	
28	0.00	70	0.00									15	0.00	30	4.40	IC4801					
29	1.30	71	0.00									IC3001				IC3002				1	5.10	
30	1.80	72	.....	5.20									1	.....	4.10	1	.....	0.20	2	.....	5.10	
31	1.00	73	.....	5.20									2	.....	0.20	2	.....	4.40	3	.....	3.30	
32	3.30	74	.....	0.00									3	.....	4.10	3	.....	8.90	4	.....	3.30	
33	1.70	75	.....	0.00									4	.....	0.00	4	.....	5.10	5	.....	0.00	
34	0.80	76	.....	0.00									5	.....	4.10	5	.....	0.00	6	.....	2.50	
35	0.00	77	.....	3.30									6	.....	9.00	6	.....	5.10	7	.....	2.50	
36	0.60	78	.....	0.00									7	.....	4.30	7	.....	0.00	8	.....	4.90	
37	3.30	79	.....	0.00									8	.....	0.00	8	.....	4.90	9	.....	4.90	
38	3.30	80	3.30																	10	9.00	
39	2.30	81	5.20																				
40	1.70	82	3.30																				
41	0.40	83	0.00																				
42	0.40	84	3.30																				

A - BOARD - TNP2AH060

	Q001	Q057	Q058	Q070	Q092	Q2350	Q2361	Q2362	Q2363
B	0.00	1.50	1.50	4.12	8.90	5.35	0.30	0.00	1.34
C	13.00	0.00	0.00	8.90	1.40	0.00	0.00	0.10	0.00
E	0.00	0.07	0.07	3.50	3.30	3.14	0.00	0.00	1.50

	Q3001	Q3002	Q3193	Q3194	Q354	Q355	Q356	Q357	Q358
B	1.30	1.30	0.60	0.05	4.50	4.30	4.40	2.60	2.60
C	3.30	3.30	0.03	7.80	8.50	8.40	8.40	4.50	4.30
E	0.70	0.70	0.00	0.00	3.80	3.60	3.70	2.00	2.00

	Q359	Q360	Q361	Q362	Q411	Q412	Q451	Q4801	Q501
B	2.60	0.50	0.40	0.40	2.25	2.90	5.10	0.40	0.40
C	4.40	0.00	0.00	0.00	0.00	9.00	1.40	2.10	56.80
E	2.00	1.10	1.10	1.10	2.90	2.40	3.30	0.00	0.00

	Q551	Q560	Q605	Q606	Q801	Q802	Q820	Q830	Q831
B	0.00	0.30	4.80	0.00	0.00	0.70	130.40	129.80	0.60
C	14.70	0.00	0.00	3.30	12.52	0.00	0.00	130.40	0.20
E	0.00	0.60	4.70	0.00	0.00	0.00	130.80	130.50	0.00

	Q751	Q757	Q901	Q902
G	7.50	0.00	1.00	5.20
D	8.90	7.60	5.20	2.40
S	0.00	0.00	0.40	5.80

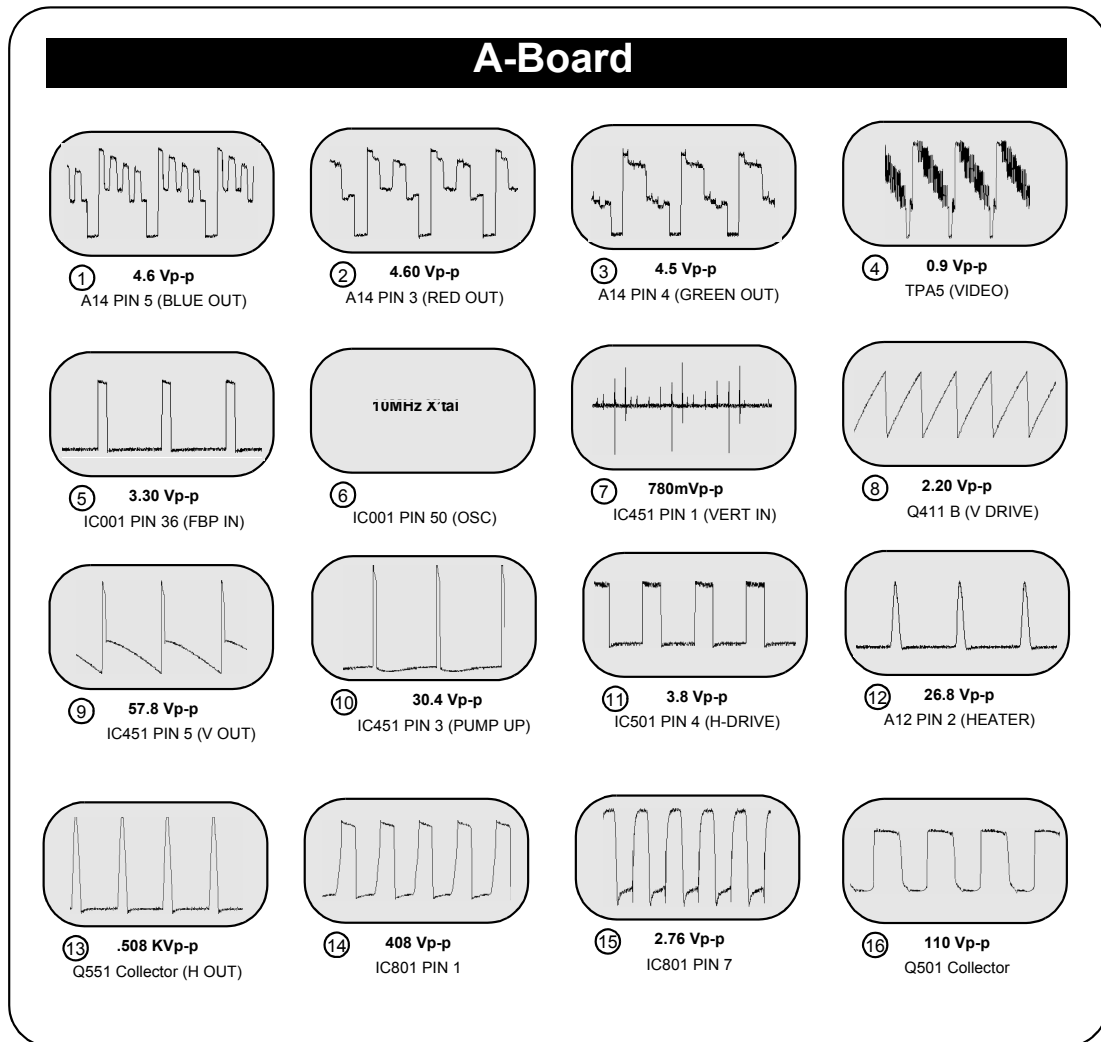
C - BOARD - TNP2AA157

IC351			Q951	Q952	Q953	Q954	Q955
1	.....	2.40					
2	.....	2.40	B	1.90	1.50	6.30	5.10
3	.....	2.40	C	8.90	5.70	8.90	0.00
4	.....	0.00	E	1.50	1.50	5.70	5.60
5	.....	2.50					
6	...	216.80					
7	...	145.30					
8	...	152.70					
9	...	151.00					

	Q956	Q957	Q958	Q961	Q962
B	0.80	5.80	5.70	0.30	2.40
C	65.20	0.00	8.90	1.80	8.90
E	0.30	6.30	5.10	0.00	1.90

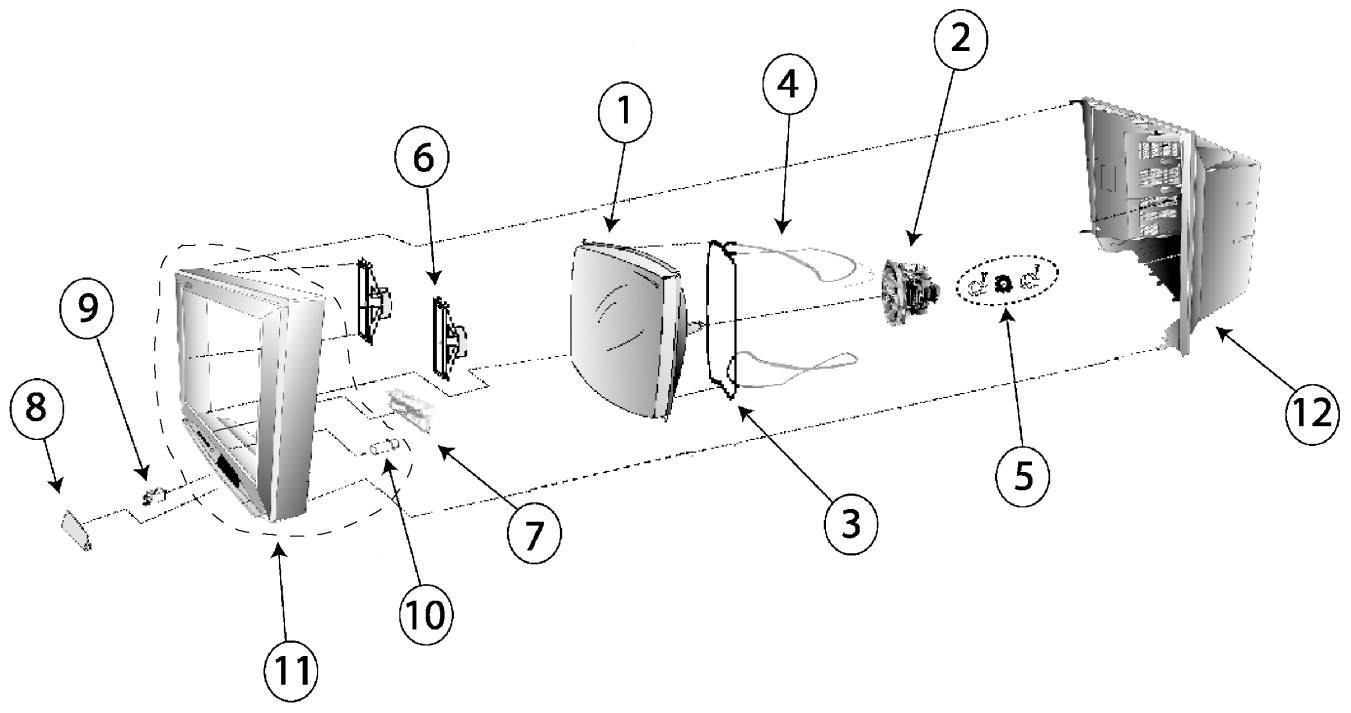
CT-24SL14J/UJ, CT-27SL14J/UJ

17.14. Waveforms



CT-24SL14J/UJ, CT-27SL14J/UJ


18 Parts location



19 Parts list

19.1. Parts list notes

Important Safety Notice

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

Abbreviation of part name and description

1. Resistor

Example :

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

2. Capacitor

Example :

ECKF1H103ZF **C** 0.01 μ F, **Z**, 50V
Type Allowance

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	

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

19.2. Parts list

Ref. No.	Part No.	Part Name & Description	Remarks
CAPRISTORS			
CRA801	TP00842-51	CAPRISTOR	△
CAPACITORS			
C003	ECA1HM4R7B	CAP E 4.7UF-50V	
C004	TCJ2VC1H150J	CAP C 15PF-J-50V	
C005	TCJ2VC1H150J	CAP C 15PF-J-50V	
C008	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C009	ECJ2VB1C104K	CAP C .1UF-K-16V CT-24SL14J CT-24SL14UJ	
C009	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C010	TCJ2VC1H680J	CAP C 68PF-J-50V	
C011	TCJ2VC1H680J	CAP C 68PF-J-50V	
C012	ECJ2VB1C104K	CAP C .1UF-K-16V	
C013	TCJ2VC1H680J	CAP C 68PF-J-50V	
C016	ECA1AM101B	CAP E 100UF-10V	
C017	TCJ2VC1H680J	CAP C 68PF-J-50V	
C018	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C019	ECA0JM102B	CAP E 1000UF-6.3V	
C020	ECA1CM102B	CAP E 1000UF-16V	
C021	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C031	TCJ2VC1H220J	CAP C 22PF-J-50V	
C032	ECA1AM470B	CAP E 47UF-10V	
C034	TCJ2VC1H390J	CAP C 39PF-J-50V	
C035	TCJ2VC1H120J	CAP C 12PF-J-50V	
C038	ECA1CM470B	CAP E 47UF-16V	
C039	TCJ2VB1H221K	CAP C 220PF-K-50V	
C041	ECA1HM2R2B	CAP E 2.2UF-50V	
C043	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C044	ECA0JM102B	CAP E 1000UF-6.3V	
C046	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C048	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C051	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C052	ECA1CM101B	CAP E 100UF-16V	
C053	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C054	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C055	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C056	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C057	ECEA1CN100UB	CAP E 10UF-16V	
C058	ECEA1CN100UB	CAP E 10UF-16V	
C059	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C060	ECEA1CN220UB	CAP E 22UF-16V	
C061	ECA1HM100B	CAP E 10UF-50V	
C062	ECA1HM100B	CAP E 10UF-50V	
C063	ECJ2VF1C104Z	CAP C .1UF-Z-16V	
C064	ECA1CM101B	CAP E 100UF-16V	
C066	TCJ2VC1H330J	CAP C 33PF-J-50V	
C067	TCJ2VC1H680J	CAP C 68PF-J-50V	
C068	ECA1CM100B	CAP E 10UF-16V	
C070	ECJ2VF1C104Z	CAP C .1UF-Z-16V	
C071	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C072	TCJ2VB1H221K	CAP C 220PF-K-50V	
C073	TCJ2VC1H101J	CAP C 100PF-J-50V	
C075	ECJ2VC1H151J	CAP C 150PF-J-50V	
C077	ECA1HM100B	CAP E 10UF-50V	
C079	TCJ2VC1H220J	CAP C 22PF-J-50V	
C083	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C085	ECJ2VB1C104K	CAP C .1UF-K-16V	
C351	TACCV470T50V	CAP C 47PF-J-50V	
C352	TACCV330T50V	CAP C 33PF-K-50V	
C353	TACCV330T50V	CAP C 33PF-K-50V	
C359	ECA1CM471B	CAP E 470UF-16V	
C359	ECQM4104KZB	CAP P .10UF-K-400V	
C360	ECA1HM4R7B	CAP E 4.7UF-50V	
C368	ECQV1H224JL3	CAP P .22UF-J-50V	
C370	ECKW3D102KBR	CAP C 1000PF-K-2KV	
C371	ECEA1HN010UB	CAP E 1UF-50V	
C373	ECA2EM470E	CAP E 47UF-250V	
C403	ECEA1CN220UB	CAP E 22UF-16V	
C411	ECQB1H683JF3	CAP P .068UF-J-50V	
C451	ECA1HM010B	CAP E 1UF-50V	
C452	ECA1CM220B	CAP E 22UF-16V	

Ref. No.	Part No.	Part Name & Description	Remarks
C454	ECA1VHG101B	CAP E 100UF-35V	
C455	ECA1EM102E	CAP E 1000UF-25V	
C458	ECA1HM010B	CAP E 1UF-50V	
C459	ECA1VHG471B	CAP E 470UF-35V	
C460	ECQB1224KF3	CAP P .22UF-K-100V	
C461	ECQB1104JF3	CAP P .10UF-J-100V	
C462	TCJ2VF1H103Z	CAP C .01UF-Z-50V CT-27SL14J CT-27SL14UJ	
C462	TCJ2VF1H683Z	CAP C 68UF-Z-50V CT-24SL14J CT-24SL14UJ	
C501	ECJ2VB1H221K	CAP C 220PF-K-50V	
C505	ECQB1H104JF3	CAP P .10UF-J-50V	
C506	ECKR2H102KB5	CAP C 1000PF-K-500V	
C510	ECCR2H100D5	CAP C 10PF-D-500V	
C512	ECA2CM100B	CAP E 10UF-160V	
C531	ECA1HM4R7B	CAP E 4.7UF-50V	△
C540	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V CT-24SL14J CT-24SL14UJ	
C540	ECJ2VF1H103Z	CAP C .01UF-Z-50V CT-24SL14J CT-24SL14UJ	
C540	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C551	ECA1VM471B	CAP E 470UF-35V	△
C554	ECKR2H561KB5	CAP C 560PF-K-500V	
C555	ECA2EM220E	CAP E 22UF-250V	△
C556	ECA1CM471B	CAP E 470UF-16V	△
C557	ECKR2H102KB5	CAP C 1000PF-K-500V	
C558	ECQE2473JFB	CAP P .47UF-J-400V	△
C560	ECQB1104JF3	CAP P .10UF-J-100V	
C561	ECEA1HN010UB	CAP E 1UF-50V	
C562	ECKR2H561KB5	CAP C 560PF-K-500V	
C563	ECWH20123JVB	CAP P .012UF-J-2000V CT-24SL14J CT-24SL14UJ	△
C563	ECWH20822JVB	CAP P 8.2K-J-2000V CT-27SL14J CT-27SL14UJ	△
C564	ECWH20182JVB	CAP P .1800PF-J-2000V CT-24SL14J CT-24SL14UJ	△
C564	ECWH20472JVB	CAP P 8200PF-J-2000V CT-27SL14J CT-27SL14UJ	△
C565	ECKW3D681JBR	CAP C 680PF-J-2KV	△
C566	ECKW3D181JBP	CAP C 180PF-J-2KV	△
C567	ECQM4223JZW	CAP P .022UF-J-400V CT-24SL14J CT-24SL14UJ	△
C568	ECQM4333JZW	CAP P .033UF-J-400V CT-27SL14J CT-27SL14UJ	△
C568	ECQM4333KZW	CAP P .022UF-K-400V CT-24SL14J CT-24SL14UJ	△
C569	ECWF2304JSR	CAP P .30UF-J-200V CT-27SL14J CT-27SL14UJ	△
C569	ECWF2334JSR	CAP M .33UF-J-200V CT-24SL14J CT-24SL14UJ	△
C570	ECA1CM221B	CAP E 10UF-16V	
C571	ECA1CM220B	CAP E 22UF-16V	
C572	ECA0JM221B	CAP E 220UF-6.3V	
C573	ECA1CM101B	CAP E 100UF-16V	
C575	ECKR2H471KB5	CAP C 470PF-K-500V	
C576	ECKR2H471KB5	CAP C 470PF-K-500V	
C593	ECA1CM470B	CAP E 47UF-16V	
C605	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C606	ECA0JM221B	CAP E 220UF-6.3V	
C756	ECKD2H332KB5	CAP C 3300PF-K-500V CT-27SL14J CT-27SL14UJ	
C756	ECKR2H332KB5	CAP C 3300PF-K-550V CT-24SL14J CT-24SL14UJ	
C759	ECQE1335KFB	CAP P 3.3UF-K-100V CT-24SL14J CT-24SL14UJ	△
C759	ECQE1395KNB	CAP P 3.95UF-K-100V CT-27SL14J CT-27SL14UJ	△
C760	ECQM2104KZW	CAP P .1UF-K-200V	△
C763	ECKR3A121KBP	CAP C 120PF-K-1KV	
C800	ECKR3A221KBP	CAP C 220PF-K-1KV	
C801	ECKWAE472ZED	CAP C .0047UF-Z-250V	△
C802	ECKWAE472ZED	CAP C .0047UF-Z-250V	△
C803	ECKWAE472ZED	CAP C .0047UF-Z-250V	△
C805	ECOS2DA471BB	CAP E 470UF-200V	△

Ref. No.	Part No.	Part Name & Description	Remarks
C806	ECQM4103KZW	CAP P .01UF-K-400V	
C808	ECA1HM470B	CAP E 47UF-50V	
C809	TACCW471T50V	CAP C 470PF-K-50V	
C810	TACCW471T50V	CAP C 470PF-K-50V	
C812	ECQU2A224MLA	CAP P .22UF-M-250V	△
C812	ECQU2A682MLA	CAP P .0068UF-M-250V	△
C815	ECQU2A224MLA	CAP P .22UF-M-250V	△
C820	ECA1CM101B	CAP E 100UF-16V	
C821	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C822	ECKR3A221KBP	CAP C 220PF-K-1KV	
C823	ECA1VM471B	CAP E 470UF-35V	△
C824	ECKR3A102KBP	CAP C 1000PF-K-1KV	
C825	EEUMG2C221SC	CAP E 220UF-160V	△
C826	ECKR3A471KBP	CAP C 470PF-K-1KV	
C827	ECA1CM102B	CAP E 1000UF-16V	
C828	ECA160V33UE	CAP E 33UF-160V	△
C829	ECA1CM471B	CAP E 470UF-16V	
C830	ECA1CM471B	CAP E 470UF-16V	
C831	ECJ2VF1H103Z	CAP C .01UF-Z-50V CT-27SL14J CT-27SL14UJ	
C901	TCJ2VB1H103K	CAP C .01UF-K-50V	
C904	TACCW103T50V	CAP C .010UF-50V	
C952	ECA1HM100B	CAP E 10UF-50V	
C953	TACCW103T50V	CAP C .010UF-50V	
C958	ECA2CM470E	CAP E 47UF-160V	
C959	ECKW2H103ZF7	CAP C .01F-Z-500V	
C960	ECCR2H151J5	CAP C 150-500V	
C961	ECA2AM100B	CAP E 10UF-100V	
C962	ECKW2H103ZF7	CAP C .01F-Z-500V	
C963	ECCR1H151J5	CAP DISC 150-5-50V	
C964	ECA1CHG101B	CAP E 100UF-16V	
C966	ECA1CHG101B	CAP E 100UF-16V	
C967	ECA1CM221B	CAP E 10UF-16V	
C968	TACCW103T50V	CAP C .010UF-50V	
C969	TACCW103T50V	CAP C .010UF-50V	
C971	ECKR1H222KB5	CAP C 2200PF-K-50V	
C2201	ECA1HM4R7B	CAP E 4.7UF-50V	
C2202	ECA1HM2R2B	CAP E 2.2UF-50V	
C2203	ECA1HM4R7B	CAP E 4.7UF-50V	
C2204	AP106K016CAE	CAP T 10UF-16V	
C2205	ECA1HMR33B	CAP E .33UF-50V	
C2206	ECQB1H223JF3	CAP P .022UF-J-50V	
C2207	AP335K016CAE	CAP T 3.3UF-16V	
C2208	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2209	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2210	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2212	ECQB1H473JF3	CAP P .047UF-J-50V	
C2213	ECA1HMR47B	CAP E .47UF-50V	
C2214	ECA1AM101B	CAP E 100UF-10V	
C2215	EEANA1E100B	CAP E 10UF-25V	
C2216	TCJ2VC1H100D	CAP C 10PF-J-50V	
C2217	ECJ2VB1H102K	CAP C .001UF-K-50V	
C2218	ECJ2VB1H102K	CAP C .001UF-K-50V	
C2219	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2220	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2301	ECA1EM102E	CAP E 1000UF-25V	
C2302	ECA1HM010B	CAP E 1UF-50V	
C2304	ECA1CM101B	CAP E 100UF-16V	
C2307	ECA1CM102B	CAP E 1000UF-16V	
C2308	ECJ2VF1H103Z	CAP C .01UF-Z-50V	
C2309	ECA1HM010B	CAP E 1UF-50V	
C2312	ECA1HM010B	CAP E 1UF-50V	
C2313	ECA1EM101B	CAP E 100UF-25V	
C2317	ECA1CM102B	CAP E 1000UF-16V	
C2319	ECA1HM010B	CAP E 1UF-50V	
C2350	ECA1CM101B	CAP E 100UF-16V	
C2351	ECA0JM221B	CAP E 220UF-6.3V	
C2501	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2502	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2503	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2504	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2505	EEANA1E4R7B	CAP E 4.7UF-25V	
C2506	EEANA1E4R7B	CAP E 4.7UF-25V	

Ref. No.	Part No.	Part Name & Description	Remarks
C2507	TCJ2VB1H472K	CAP C 4700PF-K-50V	
C2508	TCJ2VB1H472K	CAP C 4700PF-K-50V	
C2509	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2510	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2511	ECA1HM010B	CAP E 1UF-50V	
C2512	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2513	ECA1HM4R7B	CAP E 4.7UF-50V	
C2514	ECA1HM4R7B	CAP E 4.7UF-50V	
C2515	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2516	ECA1HM4R7B	CAP E 4.7UF-50V	
C2517	ECA1HM4R7B	CAP E 4.7UF-50V	
C2518	ECA1HM4R7B	CAP E 4.7UF-50V	
C2519	ECA1CM220B	CAP E 22UF-16V	
C2520	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C2531	ECA1HM4R7B	CAP E 4.7UF-50V	
C2532	ECA1HM4R7B	CAP E 4.7UF-50V	
C3001	ECA1CM220B	CAP E 22UF-16V	
C3002	ECA1CM220B	CAP E 22UF-16V	
C3011	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3012	ECA1HM010B	CAP E 1UF-50V	
C3013	ECA1CM100B	CAP E 10UF-16V	
C3014	ECA1CM100B	CAP E 10UF-16V	
C3015	ECA1HM010B	CAP E 1UF-50V	
C3016	ECA1HM010B	CAP E 1UF-50V	
C3017	ECA1HM010B	CAP E 1UF-50V	
C3018	ECA1HM010B	CAP E 1UF-50V	
C3019	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3020	ECA1HM010B	CAP E 1UF-50V	
C3025	ECA1HM100B	CAP E 10UF-50V	
C3121	ECA1CM470B	CAP E 47UF-16V	
C3122	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3234	ECA1CM470B	CAP E 47UF-16V	
C3240	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C4322	ECA1CM100B	CAP E 10UF-16V	
C4323	ECA1CM470B	CAP E 47UF-16V	
C4324	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C4325	ECA1CM100B	CAP E 10UF-16V	
C4801	TCJ2VC1H101J	CAP C 100PF-J-50V CT-27SL14J CT-27SL14UJ	
C4802	ECA1HM220B	CAP E 22UF-50V CT-27SL14J CT-27SL14UJ	
C4803	ECQV1H334JL3	CAP P .33UF-J-50V CT-27SL14J CT-27SL14UJ	
C4804	TACCW103T50V	CAP C .010UF-50V CT-27SL14J CT-27SL14UJ	
C4805	ECA1CM102B	CAP E 1000UF-16V CT-27SL14J CT-27SL14UJ	
C4806	ECA1CM101B	CAP E 100UF-16V CT-27SL14J CT-27SL14UJ	
C4806	ECA1CM102B	CAP E 1000UF-16V CT-27SL14J CT-27SL14UJ	
DIODES			
D001	MAZ30680ML	DIODE ZENER	
D002	MA2C165001VT	DIODE	
D003	MAZ30510HL	DIODE	
D006	MAZ33000HL	DIODE	
D007	MAZ30510HL	DIODE	
D010	MAZ40510MF	DIODE ZENER	
D055	MAZ40330MF	DIODE ZENER	
D358	MA2C165001VT	DIODE	
D359	MAZ40270LF	DIODE ZENER	
D360	BOHAGP000003	DIODE	
D360	MA2C165001VT	DIODE	
D361	BOHAGP000003	DIODE	
D362	BOHAGP000003	DIODE	
D376	BOHAJP000015	DIODE	
D380	MA2C029WBF	DIODE	
D451	BOEAKL000008	DIODE RECTIFIER	
D452	MA2C165001VT	DIODE	
D505	D1NL40V70	DIODE	
D531	MA2C165001VT	DIODE	△
D551	BOHAMM000072	DIODE FAST RECOVERY	△
D554	AU02V0	DIODE RECTIFIER	△
D556	MA2C165001VT	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D557	MAZ40270LF	DIODE ZENER	
D558	BOHANV000008	DIODE	
D559	EU2V1	DIODE	
D561	AU02V0	DIODE RECTIFIER	△
D605	MAZ40470HF	DIODE ZENER	
D606	MA2C165001VT	DIODE	
D753	AU01ZV0	DIODE	
D801	D3SBA60-4103	DIODE	△
D803	MAZ41200MF	DIODE ZENER	
D806	TAP2AA0003	PTC 3-OHM	△
D808	SARS01V1	DIODE	
D809	BOHAJP000015	DIODE	
D810	BOHAJP000015	DIODE	
D811	BOHAJP000015	DIODE	
D820	MA2C165001VT	DIODE	
D821	MAZ40470HF	DIODE ZENER	
D822	BOHAMM000103	DIODE	
D823	S3L60P154004	DIODE	△
D824	BOHAMM000072	DIODE FAST RECOVERY	
D2302	MAZ43000MF	DIODE ZENER	
D2305	CVS20B120MTA	DIODE ZENER	
D2307	CVS20B120MTA	DIODE ZENER	
D2350	MAZ41000LF	DIODE ZENER	
D2353	MA2C165001VT	DIODE	
D2354	MA2C165001VT	DIODE	
D2355	MAZ30510HL	DIODE	
D2360	CVS20B120MTA	DIODE ZENER	
D2361	CVS20B120MTA	DIODE ZENER	
D2501	MAZ31100ML	DIODE ZENER	
D3001	MAZ40510MF	DIODE ZENER	
D3004	CVS20B120MTA	DIODE ZENER	
D3005	CVS20B120MTA	DIODE ZENER	
D3007	CVS20B120MTA	DIODE ZENER	
D3007	MAZ31100ML	DIODE ZENER	
D3008	MAZ31100ML	DIODE ZENER	
D3009	CVS20B120MTA	DIODE ZENER	
D3009	MAZ31100ML	DIODE ZENER	
D3010	MAZ31100ML	DIODE ZENER	
D3011	CVS20B120MTA	DIODE ZENER	
D3011	MAZ31100ML	DIODE ZENER	
D3012	MAZ31100ML	DIODE ZENER	
D3017	CVS20B120MTA	DIODE ZENER	
D3017	MAZ31100ML	DIODE ZENER	
D3018	MAZ31100ML	DIODE ZENER	
D3019	CVS20B120MTA	DIODE ZENER	
D3021	CVS20B120MTA	DIODE ZENER	
D3023	CVS20B120MTA	DIODE ZENER	
D3023	MAZ31100ML	DIODE ZENER	
D3024	MAZ31100ML	DIODE ZENER	
FUSES			
F801	XBA2A00101	FUSE 6.3A 125V	△
INTEGRATED CIRCUITS			
IC001	MN101E11GTD1	MPU	
IC002	TVR2AJ179S	EEPROM	
IC003	GP1UE282GK	IR SENSOR	
IC004	PST9128NR	RESET	
IC005	PQ3RD13	3.3V STBY REGULATOR	
IC351	C1AA00000622	RGB AMPLIFIER	
IC451	AN15525A	VERTICAL OUTPUT AMPLIFIER	
IC501	NC7SZU04M5X	H-DRIVE INVERTER	
IC551	AN78M09LB	9V VOLTAGE REGULATOR	
IC552	AN78M05LB	5V VOLTAGE REGULATOR	
IC801	STRW5634	MAIN POWER SUPPLY	△
IC802	PC123X2YFZ	OPTO-COUPLER	△
IC2201	AN5829S-E1V	AUDIO MTS	
IC2301	AN17807A	AUDIO AMPLIFIER	
IC2501	NJW1164MTE1	AUDIO PROCESSOR	
IC3001	MM1114XFBE	VIDEO SWITCH	
IC3002	MM1501XNRE	FRONT VIDEO SWITCH	
IC3101	74HC4066D653	AUDIO SWITCH	
IC4801	AN15530B	TILT CORRECTION OP-AMP CT-27SL14J CT-27SL14UJ	
COILS			

Ref. No.	Part No.	Part Name & Description	Remarks
L002	EXCELSA39V	EMI BEAD CORE	
L005	EXCELSA35T	FERRITE BEAD	
L006	EXCELSA35T	FERRITE BEAD	
L007	ELESN330JA	COIL 33UH CT-27SL14J CT-27SL14UJ	
L008	G0C470KA0029	COIL PEAKING 47UH	
L010	G0C2R2KA0029	COIL PEAKING 2.2UH	
L011	EXCELSA26T	FERRITE BEAD	
L012	G0C2R2KA0029	COIL PEAKING 2.2UH	
L013	EXCELSA26T	FERRITE BEAD	
L014	ELESN180KA	COIL PEAKING 18UH	
L015	ELESN3R3JA	COIL PEAKING 3.3UH	
L020	EXCELSA26T	FERRITE BEAD	
L032	EXCELSA26T	FERRITE BEAD	
L045	EXCELSA35T	FERRITE BEAD	
L108	EXCELSA35T	FERRITE BEAD	
L110	G0C101KA0021	COIL PEAKING 100UH	
L148	EXCELSA24T	FERRITE BEAD	
L245	EXCELSA35T	FERRITE BEAD	
L312	EXCELSA24T	FERRITE BEAD	
L551	ELH5L7138	HORIZONTAL LINEARITY COIL CT-27SL14J CT-27SL14UJ	△
L551	ELH5L7139	HORIZONTAL LINEARITY COIL CT-24SL14J CT-24SL14UJ	△
L552	EXCELSA39V	EMI BEAD CORE	
L558	ELC10D471E	CHOKO COIL	△
L751	ELC18B301E	COIL CHOKE	△
L752	ELC18B103E	COIL CT-24SL14J CT-24SL14UJ	
L752	ELC18B103L	COIL CT-27SL14J CT-27SL14UJ	
L753	EXCELSA35T	FERRITE BEAD	
L755	EXCELSA39V	EMI BEAD CORE	
L756	EXCELSA39V	EMI BEAD CORE	
L801	ELF21V020A	COIL	△
L802	TALL08T470KA	COIL	
L803	TALL08T680KA	COIL	
L804	EXCELDR35V	FERRITE BEAD	
L805	EXCELDR35V	FERRITE BEAD	
L806	EXCELDR35V	FERRITE BEAD	
L807	EXCELSA35T	FERRITE BEAD	
L808	EXCELSA35T	FERRITE BEAD	
L809	EXCELDR35V	FERRITE BEAD CT-27SL14J CT-27SL14UJ	
L810	EXCELDR35V	FERRITE BEAD CT-27SL14J CT-27SL14UJ	
L829	EXCELDR27V	FERRITE BEAD	
L951	EXCELSA24T	FERRITE BEAD	
L953	EXCELSA24T	FERRITE BEAD	
L954	EXCELSA24T	FERRITE BEAD	
L955	EXCELSA24T	FERRITE BEAD	
L2301	EXCELSA35T	FERRITE BEAD	
L2303	EXCELSA39V	EMI BEAD CORE	
L2305	EXCELSA35T	FERRITE BEAD	
TRANSISTORS			
Q001	2PD601AR-115	TRANSISTOR	
Q057	2PB709AR-115	TRANSISTOR	
Q058	2PB709AR-115	TRANSISTOR	
Q070	2PD601AR-115	TRANSISTOR	
Q092	2PB709AR-115	TRANSISTOR	
Q354	2PD601AR-115	TRANSISTOR	
Q355	2PD601AR-115	TRANSISTOR	
Q356	2PD601AR-115	TRANSISTOR	
Q357	2PD601AR-115	TRANSISTOR	
Q358	2PD601AR-115	TRANSISTOR	
Q359	2PD601AR-115	TRANSISTOR	
Q360	2PB709AR-115	TRANSISTOR	
Q361	2PB709AR-115	TRANSISTOR	
Q362	2PB709AR-115	TRANSISTOR	
Q411	2SB0710AQL	TRANSISTOR	
Q412	2SD0602AQL	TRANSISTOR	
Q451	2PB709AR-115	TRANSISTOR	
Q501	2SC4212HLB	TRANSISTOR	
Q551	2SC5902000LK	TRANSISTOR	△

Ref. No.	Part No.	Part Name & Description	Remarks
Q560	2PB709AR-115	TRANSISTOR	
Q605	2PB709AR-115	TRANSISTOR	
Q606	2PD601AR-115	TRANSISTOR	
Q751	B1DACM000001	TRANSISTOR	
Q757	2SC1685QRSTA	TRANSISTOR	
Q801	2PD601AR-115	TRANSISTOR	
Q802	2PD601AR-115	TRANSISTOR	
Q820	2SA1767QTA	TRANSISTOR	
Q830	2SB1011QRL	TRANSISTOR	
Q831	2SC1473ATA	TRANSISTOR	
Q901	2PD601AR-115	TRANSISTOR	
Q902	2PB709AR-115	TRANSISTOR	
Q951	2SC3311ATA	TRANSISTOR	
Q952	2SC3311ATA	TRANSISTOR	
Q953	2SC1741ASTP	TRANSISTOR	
Q954	2SB1030ATA	TRANSISTOR	
Q955	2SA214000SLB	TRANSISTOR	
Q956	2SC599300SLB	TRANSISTOR	
Q957	2SA1309ATA	TRANSISTOR	
Q958	2SC3311ATA	TRANSISTOR	
Q961	2SC3311ATA	TRANSISTOR	
Q962	2SC3311ATA	TRANSISTOR	
Q2350	2PB709AR-115	TRANSISTOR	
Q2351	2PD601AR-115	TRANSISTOR	
Q2352	2PB709AR-115	TRANSISTOR	
Q2361	2PD601AR-115	TRANSISTOR	
Q2362	2PD601AR-115	TRANSISTOR	
Q2363	2PB709AR-115	TRANSISTOR	
Q3001	2PD601AR-115	TRANSISTOR	
Q3002	2PD601AR-115	TRANSISTOR	
Q3193	2PD601AR-115	TRANSISTOR	
Q3194	2PD601AR-115	TRANSISTOR	
Q4801	2PD601AR-115	TRANSISTOR CT-27SL14J CT-27SL14UJ	
RELAYS			
RL801	K6B1AGA00042	RELAY	⚠
RESISTORS			
R001	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R004	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R005	ERJ6GEYJ471V	RES M 470-J-1/10W	
R007	ERJ6GEYJ471V	RES M 470-J-1/10W	
R008	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R009	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R014	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R015	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R016	ERJ6GEYJ221V	RES M 220-J-1/10W	
R017	ERJ6GEYJ221V	RES M 220-J-1/10W	
R018	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R019	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R020	ERJ6GEYJ221V	RES M 220-J-1/10W	
R021	ERJ6GEYJ101V	RES M 100-J-1/10W	
R022	ERJ6GEYJ101V	RES M 100-J-1/10W	
R023	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R024	ERJ6GEYJ101V	RES M 100-J-1/10W	
R025	ERJ6GEYJ101V	RES M 100-J-1/10W	
R026	ERDS1FJ561P	RES C 560-J-1/2W	
R027	ERJ6GEYJ472V	RES M 4.7K-J-1/10W CT-27SL14J CT-27SL14UJ	
R032	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R033	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R034	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R035	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R036	ERJ6GEYJ512V	RES M 5.1K-J-1/10W	
R037	ERJ6GEYJ912V	RES M 9.1K-J-1/10W	
R038	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R039	ERDS2TJ102T	RES C 1K-J-1/4W	
R040	ERJ6GEYJ680V	RES M 68-J-1/10W	
R041	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R042	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R043	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R044	ERJ6GEYJ101V	RES M 100-J-1/10W	
R045	ERDS2TJ101T	RES C 100-J-1/4W	
R046	ERJ6GEYJ102V	RES M 1K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R047	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R048	ERJ6GEYJ101V	RES M 100-J-1/10W	
R050	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R052	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R053	ERJ6GEYJ101V	RES M 100-J-1/10W	
R055	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R056	ERJ6GEYJ471V	RES M 470-J-1/10W	
R057	ERJ6GEYJ101V	RES M 100-J-1/10W	
R059	ERJ6GEYJ121V	RES M 120-J-1/10W	
R060	ERJ6GEYJ101V	RES M 100-J-1/10W	
R061	ERJ6GEYJ221V	RES M 22K-J-1/10W	
R062	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R063	ERDS2TJ101T	RES C 100-J-1/4W CT-27SL14J CT-27SL14UJ	
R064	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R065	ERDS2TJ101T	RES C 100-J-1/4W	
R066	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R067	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R068	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R069	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R070	ERJ6GEYJ561V	RES M 560-J-1/10W	
R071	ERJ6GEYJ680V	RES M 68-J-1/10W	
R072	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R073	ERJ6GEYJ471V	RES M 470-J-1/10W	
R074	ERJ6GEYJ471V	RES M 470-J-1/10W	
R075	ERJ6ENF3902V	RES M 39K-F-1/10W	
R076	ERJ6ENF6201V	RES M 6.2K-F-1/10W	
R077	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R078	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R080	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R081	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R082	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R083	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R084	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R087	ERDS2TJ221T	RES C 220-J-1/4W	
R088	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R092	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R093	ERJ6GEYJ331V	RES M 330-J-1/10W	
R202	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R351	ER0S2THF1201	RES M 1.2K-F-1/4W	
R352	ER0S2THF1201	RES M 1.2K-F-1/4W	
R353	ER0S2THF1201	RES M 1.2K-F-1/4W	
R354	ERDS2TJ102T	RES C 1K-J-1/4W	
R355	ERDS2TJ102T	RES C 1K-J-1/4W	
R356	ERDS2TJ102T	RES C 1K-J-1/4W	
R357	ERDS2TJ102T	RES C 1K-J-1/4W	
R358	ERDS1TJ104T	RES C 100K-J-1/2W	
R359	ERDS1TJ104T	RES C 100K-J-1/2W	
R360	ERDS1TJ104T	RES C 100K-J-1/2W	
R361	EROS2THF5601	RES M 5.6K-F-1/4W CT-24SL14J CT-24SL14UJ	
R361	EROS2THF6801	RES M 6.8K-F-1/4W CT-27SL14J CT-27SL14UJ	
R362	EROS2THF2001	RES M 2K-F-1/4W	
R363	ERC12GK102D	RES C 1K-K-1/2W	
R364	ERC12GK102D	RES C 1K-K-1/2W	
R365	ERC12GK102D	RES C 1K-K-1/2W	
R367	ERDS2TJ105T	RES C 1M-J-1/4W	
R371	ERDS2TJ102T	RES C 1K-J-1/4W	
R371	ERJ6GEYJ101V	RES M 100-J-1/10W	
R372	ERDS2TJ102T	RES C 1K-J-1/4W	
R372	ERJ6GEYJ101V	RES M 100-J-1/10W	
R373	ERJ6GEYJ101V	RES M 100-J-1/10W	
R374	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R374	ERQ12AJ121P	RES F 120-J-1/2W	
R375	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R376	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R377	ERJ6ENF3300V	RES M 330-F-1/10W	
R378	ERJ6ENF3300V	RES M 330-F-1/10W	
R379	ERJ6ENF3300V	RES M 330-F-1/10W	
R380	ERJ6ENF1501V	RES M 1.5K-F-1/10W	
R381	ERJ6ENF1501V	RES M 1.5K-F-1/10W	
R382	ERJ6ENF1501V	RES M 1.5K-F-1/10W	
R383	ERJ6ENF3481V	RES M 3.48K-F-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R384	ERJ6ENF7500V	RES M 750-F-1/10W	
R385	ERDS1FJ150P	RES C 15-J-1/2W	
R389	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R390	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R391	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R411	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R412	ERJ6GEYJ471V	RES M 470-J-1/10W	
R413	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R414	ERJ6GEYJ471V	RES M 470-J-1/10W	
R451	ERDS1FJR0P	RES C 1.0-J-1/2W CT-27SL14J CT-27SL14UJ	
R452	ERDS1FJ3R3P	RES C 3.3-J-1/2W CT-27SL14J CT-27SL14UJ	
R452	ERDS1FJR68P	RES C .68-J-1/2W CT-24SL14J CT-24SL14UJ	
R453	ERJ6GEYJ303V	RES M 30K-J-1/10W CT-24SL14J CT-24SL14UJ	
R453	ERJ6GEYJ513V	RES M 51K-J-1/10W CT-27SL14J CT-27SL14UJ	
R454	ERJ6GEYJ363V	RES M 36K-J-1/10W CT-27SL14J CT-27SL14UJ	
R454	ERJ6GEYJ473V	RES M 47K-J-1/10W CT-24SL14J CT-24SL14UJ	
R455	ERJ6GEYJ103V	RES M 10K-J-1/10W CT-27SL14J CT-27SL14UJ	
R455	ERJ6GEYJ912V	RES M 9.1K-J-1/10W CT-24SL14J CT-24SL14UJ	
R456	ERG3FJ151	RES M 150-J-3W	
R457	ERDS1FJR0P	RES C 1.0-J-1/2W	△
R458	ERJ6GEYJ113V	RES M 11K-J-1/10W CT-24SL14J CT-24SL14UJ	
R458	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R459	ERJ6GEYJ152V	RES M 1.5K-J-1/10W CT-24SL14J CT-24SL14UJ	
R459	ERJ6GEYJ362V	RES M 3.6K-J-1/10W CT-27SL14J CT-27SL14UJ	
R461	ERJ6GEYJ331V	RES M 330-J-1/10W	
R462	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R463	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R464	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R465	ERJ6GEYJ122V	RES M 1.2K-J-1/10W	
R468	ERJ6ENF1962V	RES M 19.6K-F-1/10W	
R469	ERJ6ENF5621V	RES M 5.62K-F-1/10W	
R471	ERJ6GEYJ223V	RES M 22K-J-1/10W CT-27SL14J CT-27SL14UJ	
R471	ERJ6GEYJ363V	RES M 36K-J-1/10W CT-24SL14J CT-24SL14UJ	
R504	ERDS2TJ102T	RES C 1K-J-1/4W	
R505	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R506	ERG1SJ562P	RES M 5.6K-J-1W	
R507	EROS2THF1802	RES M 18K-F-1/4W	△
R509	ERJ6ENF1002V	RES M 10K-F-1/10W	△
R510	ERG3FJ362	RES M 3.6K-F-3W CT-27SL14J CT-27SL14UJ	△
R510	ERG3FJ622	RES M 6.2K-J-3W CT-24SL14J CT-24SL14UJ	△
R511	ERG3FJ622	RES M 6.2K-J-3W CT-24SL14J CT-24SL14UJ	△
R512	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R514	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R515	ERJ6GEYJ101V	RES M 100-J-1/10W	
R520	ERJ6GEYJ471V	RES M 470-J-1/10W	
R532	ERJ6ENF2202V	RES M 22K-F-1/10W	△
R533	ERJ6ENF1003V	RES M 100K-F-1/10W	△
R539	ERDS2TJ105T	RES C 1M-J-1/4W	
R541	ERDS2TJ274T	RES C 27K-J-1/4W	
R542	ERJ6GEYJ124V	RES M 120K-J-1/10W	
R547	ERQ1CJP1R0S	RES F 1.0-J-1W CT-24SL14J CT-24SL14UJ	
R547	ERQ1CJP1R2S	RES F 1.2-J-1W CT-27SL14J CT-27SL14UJ	
R551	ERX12SJR47P	RES M .47-J-1/2W	△
R552	ERDS1FJR0T	RES C 1.0-J-1/2W	△
R554	ERG1SJ470P	RES M 47-J-1W CT-27SL14J CT-27SL14UJ	
R557	ERDS2TJ223T	RES C 22K-J-1/4W	
R558	ERDS2TJ223T	RES C 22K-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R559	ERG2FJ683H	RES M 68K-J-2W	
R561	ERG2FJ102H	RES M 1K-J-2W	
R562	ERG2FJ270H	RES M 27-J-2W	
R563	ERG3FJ150H	RES M 15-J-3W	
R564	ERDS2TJ563T	RES C 56K-J-1/4W	
R565	ERDS2TJ683T	RES C 68K-J-1/4W	
R592	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R605	ERDS2TJ103T	RES C 10K-J-1/4W	
R606	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R607	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R608	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R713	ERDS2TJ123T	RES C 12K-J-1/4W	
R716	ERDS2TJ101T	RES C 100-J-1/4W	
R756	ERG2FJ820H	RES M 82-J-2W	
R761	ERDS2TJ102T	RES C 1K-J-1/4W	
R762	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R802	ERG2FJ104H	RES M 100K-J-2W	
R804	ERG1DJ224P	RES M .22UF-P-1W	
R805	ERX2FZJR15H	RES M .18-J-2W	△
R806	ERX12SJ1R5P	RES M 1.5-J-1/2W	△
R807	ERDS2TJ681T	RES C 680-J-1/4W	
R808	ERX12SJ1R5P	RES M 1.5-J-1/2W	
R809	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R810	ERDS2TJ221T	RES C 220-J-1/4W	
R815	ERC12ZGK825D	RES C 8.2MEG-K-1/2W	△
R821	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R822	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R823	ERDS1FJ272T	RES C 2.7K-J-1/2W	
R824	ERDS2TJ223T	RES C 22K-J-1/4W	
R825	ERDS2TJ272T	RES C 2.7K-J-1/4W	
R827	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R828	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R829	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R830	ERG2FJ273H	RES M 27K-J-2W CT-24SL14J CT-24SL14UJ	
R830	ERG3FJ183	RES M 18K-J-3W CT-27SL14J CT-27SL14UJ	
R831	ERDS2TJ682T	RES C 6.8K-J-1/4W	
R832	ERJ6GEYJ122V	RES M 1.2K-J-1/10W CT-24SL14J CT-24SL14UJ	
R832	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R833	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R834	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R837	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R838	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R851	ERQ12HJR56P	RES F .56-J-1/2W	△
R902	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R903	ERJ6GEYJ561V	RES M 560-J-1/10W	
R905	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R906	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R908	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R909	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R951	ERDS2TJ821T	RES C 820-J-1/4W	
R952	ERDS2TJ153T	RES C 15K-J-1/4W	
R953	ERDS2TJ332T	RES C 3.3K-J-1/4W	
R954	ERDS2TJ431T	RES C 430-J-1/4W	
R956	ERDS2TJ121T	RES C 120-J-1/4W	
R958	ERDS2TJ391T	RES C 390-J-1/4W	
R959	ERDS2TJ101T	RES C 100-J-1/4W	
R960	ERQ14AJ100E	RES F 10-J-1/4W	
R961	ERQ1CJP331S	RES F 330-J-1W	
R962	ERDS2TJ330T	RES C 33-J-1/4W	
R963	ERDS2TJ330T	RES C 33-J-1/4W	
R964	ERDS2TJ471T	RES C 470-J-1/4W	
R965	ERDS2TJ563T	RES C 56K-J-1/4W	
R966	ERDS1FVJ471T	RES C 470-J-1/4W	
R967	ERDS2TJ563T	RES C 56K-J-1/4W	
R968	ERDS2TJ471T	RES C 470-J-1/4W	
R969	ERDS2TJ390T	RES C 39-J-1/2W	
R970	ERDS2TJ2R2T	RES C 2.2-J-1/4W	
R971	ERDS2TJ2R2T	RES C 2.2-J-1/4W	
R972	ERDS2TJ390T	RES C 39-J-1/2W	
R973	ERDS2TJ101T	RES C 100-J-1/4W	
R974	ERDS2TJ333T	RES C 33K-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R975	ERDS2TJ101T	RES C 100-J-1/4W	
R976	ERDS2TJ101T	RES C 100-J-1/4W	
R977	ERDS2TJ561T	RES C 560-J-1/4W	
R978	ERDS2TJ101T	RES C 100-J-1/4W	
R987	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R988	ERDS2TJ331T	RES C 330-J-1/4W	
R989	ERDS2TJ682T	RES C 6.8K-J-1/4W	
R990	ERDS2TJ471T	RES C 470-J-1/4W	
R993	ERDS2TJ471T	RES C 470-J-1/4W	
R2201	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R2203	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2204	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2205	ERDS2TJ101T	RES C 100-J-1/4W	
R2206	ERDS2TJ273T	RES C 27K-J-1/4W	
R2307	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R2320	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2351	ERJ6GEYJ751V	RES M 750-J-1/10W	
R2352	ERJ6GEYJ152V	RES M 1.5K-J-1/10W	
R2356	ERJ6GEYJ101V	RES M 100-J-1/10W	
R2357	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R2360	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2361	ERJ6GEYJ221V	RES M 220-J-1/10W	
R2362	ERJ6GEYJ221V	RES M 220-J-1/10W	
R2363	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2364	ERJ6ENF1001V	RES M 1K-F-1/10W	
R2365	ERJ6ENF8200V	RES M 820-F-1/10W	
R2366	ERJ6GEYJ331V	RES M 330-J-1/10W	
R2367	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2368	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2369	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2370	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2371	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R2372	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2373	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R2374	ERDS2TJ103T	RES C 10K-J-1/4W	
R2417	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2504	ERDS2TJ101T	RES C 100-J-1/4W	
R2505	ERDS2TJ101T	RES C 100-J-1/4W	
R3001	ERDS2TJ101T	RES C 100-J-1/4W	
R3002	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3003	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3005	ERJ6GEYJ334V	RES M 330K-J-1/10W	
R3006	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3007	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3008	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3010	ERJ6GEYJ334V	RES M 330K-J-1/10W	
R3013	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3014	ERJ6ENF75R0V	RES M 75.0-F-1/10W CT-24SL14J CT-24SL14UJ	
R3015	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3016	ERDS2TJ181T	RES C 180-J-1/4W	
R3017	ERDS2TJ181T	RES C 180-J-1/4W	
R3018	ERDS2TJ101T	RES C 100-J-1/4W	
R3020	ERJ6GEYJ682V	RES M 6.8K-J-1/10W CT-24SL14J CT-24SL14UJ	
R3021	ERDS2TJ101T	RES C 100-J-1/4W	
R3022	ERDS2TJ101T	RES C 100-J-1/4W	
R3023	ERDS2TJ101T	RES C 100-J-1/4W	
R3024	ERDS2TJ101T	RES C 100-J-1/4W	
R3025	ERDS2TJ101T	RES C 100-J-1/4W	
R3026	ERDS2TJ101T	RES C 100-J-1/4W	
R3027	ERDS2TJ101T	RES C 100-J-1/4W	
R3028	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3029	ERJ6GEYJ101V	RES M 100-J-1/10W	
R3030	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R3031	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R3032	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R3033	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R3034	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3035	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R3036	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R3037	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3038	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R3039	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R3041	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R3042	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R3101	ERJ6GEYJ334V	RES M 330K-J-1/10W	
R3102	ERJ6GEYJ334V	RES M 330K-J-1/10W	
R3103	ERJ6GEYJ334V	RES M 330K-J-1/10W	
R3104	ERJ6GEYJ334V	RES M 330K-J-1/10W	
R3131	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R3132	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R3133	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R3134	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R3135	ERJ6GEYJ154V	RES M 150K-J-1/10W	
R4801	ERJ6GEYJ103V	RES M 10K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4802	ERJ6GEYJ103V	RES M 10K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4803	ERJ6GEYJ472V	RES M 4.7K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4804	ERJ6GEYJ562V	RES M 5.6K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4805	ERJ6GEYJ562V	RES M 5.6K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4806	ERJ6GEYJ562V	RES M 5.6K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4806	ERG1S100P	RES M 10-J-1W CT-27SL14J CT-27SL14UJ	
R4807	ERDS2TJ100T	RES C 10-J-1/4W CT-27SL14J CT-27SL14UJ	
R4817	ERJ6GEYJ473V	RES M 47K-J-1/10W CT-27SL14J CT-27SL14UJ	
R4818	ERJ6GEYJ563V	RES M 56K-J-1/10W CT-27SL14J CT-27SL14UJ	
SWITCHES			
S001	EVQPC105K	SWITCH	
S002	EVQPC105K	SWITCH	
S003	EVQPC105K	SWITCH	
S004	EVQPC105K	SWITCH	
S005	EVQPC105K	SWITCH	
S008	EVQPC105K	SWITCH	
S009	EVQPC105K	SWITCH	
TRANSFORMERS			
T501	ETH19Y211AZ	TRANSFORMER	
T551	TLF2AA005	FLYBACK TRANSFORMER	△
T801	ETS35AA6B5NC	TRANSFORMER	△
T3001	TF0402B04P03	TRANSFORMER	
CRYSTALS / FILTERS			
X001	A1100005BD	CRYSTAL	
OTHERS			
TNR001	ENG36A10GF	TUNER	△
1	A60LVY196X-D	CRT 24" WITH DEFLECTION YOKE CT-24SL14J CT-24SL14UJ	△
	M68LZP195X	CRT 27" CT-27SL14J CT-27SL14UJ	△
M001	TJS2AC00401	CRT SOCKET	△
2	TLY2AA033	DEFLECTION YOKE	△
3	TSP2AA023	DEGAUSSING COIL CT-24SL14J CT-24SL14UJ	△
	TSP2AA026-1	DEGAUSSING COIL CT-27SL14J CT-27SL14UJ	△
4	TXF3A01DB3	DAG GND CT-24SL14J CT-24SL14UJ	
	TXF3A01EX4	DAG GND CT-27SL14J CT-27SL14UJ	
5	TP-13000PX5	CONVERGENCE & PURITY RINGS	
M002	TSP2AF005	GEOMAGNETIC COIL CT-27SL14J CT-27SL14UJ	
M003	0FMK014ZZ	PERMALLOY MAGNET	
M004	TMM2A30702	YOKE WEDGE	
6	EASG12D552C2	SPEAKER	
M005	TXFKP13GSR	SPEAKER BRACKET	
7	TBX2AA0211	7-KEY BUTTON	
8	TKP2AA0832S	FRONT DOOR	
9	TEK6935	LATCH	
10	TKX2AA0135	IR GUIDE	
M006	TSN63115-4	PURITY MAGNET	
M007	TSX2AA0361	A/C LINE CORD	△

Ref. No.	Part No.	Part Name & Description	Remarks
11	TXFKY08JSER	FRONT CABINET CT-27SL14J CT-27SL14UJ	
	TXFKY09JSER	FRONT CABINET CT-24SL14J CT-24SL14UJ	
12	TXFKU14GSER	BACK CABINET CT-27SL14J CT-27SL14UJ	
	TXFKU02JSER	BACK CABINET CT-24SL14J CT-24SL14UJ	
JK3001	TJB2AA0221	A/V 8 PIN TERMINAL	
JK3002	TJB2AA0045	FRONT A/V TERMINAL	
JK3003	TJB2AA0421	S-VIDEO TERMINAL	
JK3004	TJB2AA0211-1	AUDIO OUT 2 PIN TERMINAL	
OTHER ACCESSORIES			
M008	TQB2AA0499	OWNER'S MANUAL	
M009	EUR7613ZB0	REMOTE CONTROL	
M010	UR76EC0303E	BATTERY COVER (EUR7613ZB0)	
M011	EUR7613Z6A	REMOTE CONTROL	
M012	UR76EC0303D	BATTERY COVER (EUR7613Z6A)	