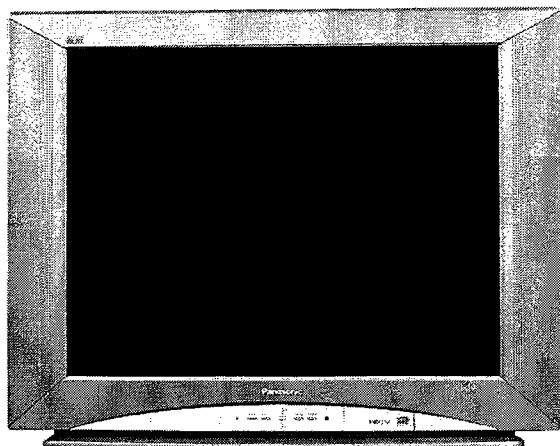


Service Manual

Color Television



CT-36HL43G
CT-36HL43UG
CT-32HL43G
CT-32HL43UG
CT-32HXC43G
CT-32HXC43UG
DX4

⚠ 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.

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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 it 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

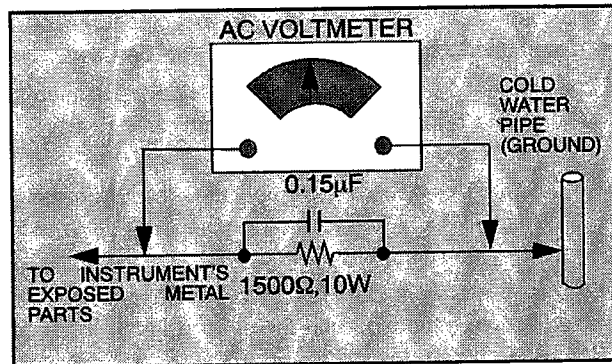
Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

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.



Hot check circuit

Insulation test

Connect an insulation tester between an exposed metallic part and A.C. line. Apply 1500VAC/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. With a 480i signal the high voltage should be 33.0 \pm 1.0kV and with a 1080i signal the high voltage should be 33.0 (+ 1.0kV, - 2.0kV). 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 1.6k Ω resistor, 0 = 0 Ω (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.

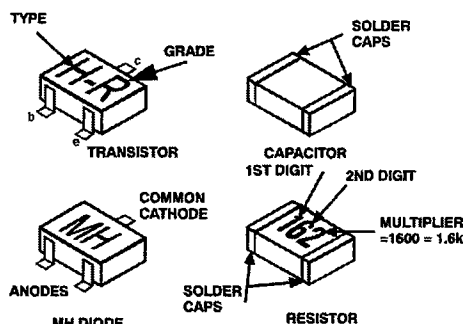
Component removal

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.

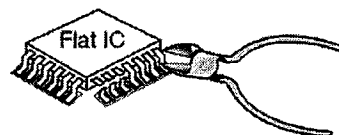
Chip components



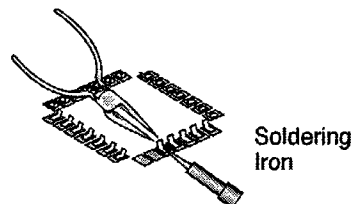
How to replace flat ic (required tools)

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

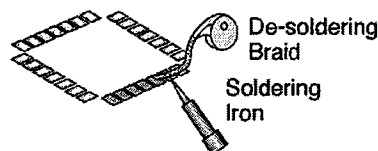
using a desolder braid



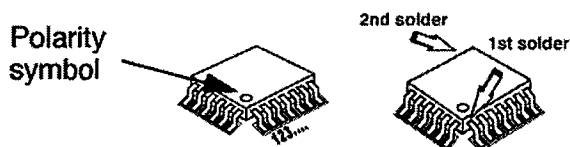
2. Put the iron wire under the pins of the Flat IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.



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.

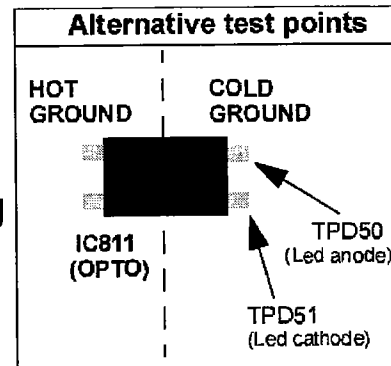
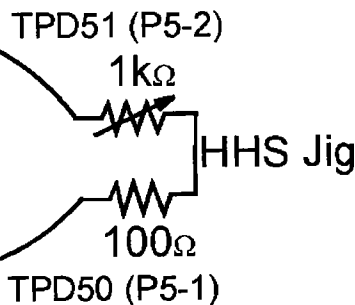
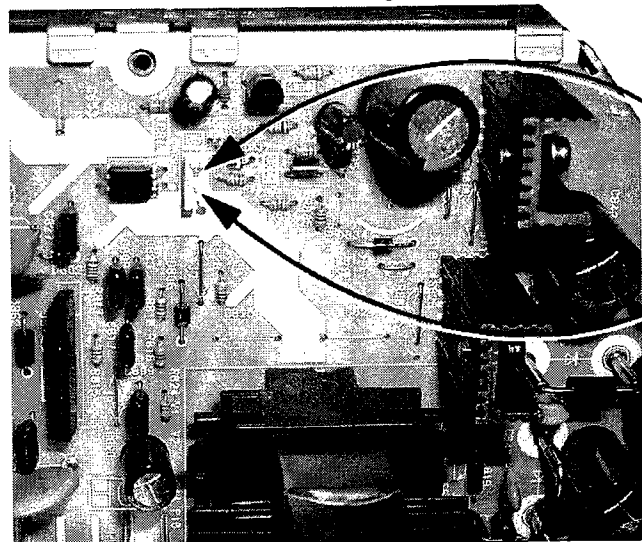
WARNING

This receiver has been designed to meet or exceed

applicable safety and x-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to x-ray radiation and shock and fire hazard, parts indicated with the symbol on the schematic must be replaced with identical parts. Order parts from the manufacturer's parts center using the parts numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specification.



TP labels are located on bottom of board

HORIZONTAL OSCILLATOR DISABLE CIRCUIT

This chassis employs a special circuit to protect against excessive high voltage and beam current. If, for any reason, the high voltage and beam current exceed a predetermined level this protective circuit activates and detunes the horizontal oscillator that limits the high voltage. The over-voltage protection circuit is not adjustable. However, if components indicated by the symbol on the schematic in either the horizontal sweep system or the over-voltage protection circuit itself are changed, the operation of the circuit should be checked using the following procedure:

Equipment needed to check the disabled circuit:

1. High voltage meter (0 ~ 50kV)
2. Variac or isolation transformer
3. 1k ohm VR
4. D.C. ammeter

PREPARATION

1. Connect receiver to A.C. 120 Volts. Do not turn ON.
2. Connect HIGH VOLTAGE meter to 2nd anode (H.V. button).

NOTE

Use cold ground for negative lead.

3. Connect the ammeter serial from the flyback anode lead to the picture tube anode socket.
4. Prepare HHS jig to be connected between TPD50 and TPD51 on P-Board as shown above.

PROCEDURE

1. Open connector A17.
2. Turn power ON and apply a white pattern.
3. Set current within 50-100 μ A by changing the picture and bright controls.
4. Turn power OFF.
5. Connect HHS jig between TPD50 and TPD51 on P-Board as shown above (VR should be turn fully clockwise).
6. Turn power on.
7. Using the variable resistor slowly increase the current until the horizontal sync frequency abruptly increases indicating that the horizontal frequency is just beginning to pull out of sync. Maintain the current within 50-100 μ A by changing the picture and bright controls
8. Observe the high voltage meter. High voltage should read less than 38.4kV.
9. Turn power OFF, remove HHS jig, HV meter, ammeter and connect A17 connector.
10. Turn power ON. Reset PICTURE and BRIGHTNESS controls. Confirm B+ 144V \pm 1.5V with 120V AC applied.

NOTE

If high voltage is not within the specified limit the cause must be determined before the receiver is returned to the owner.

3 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.

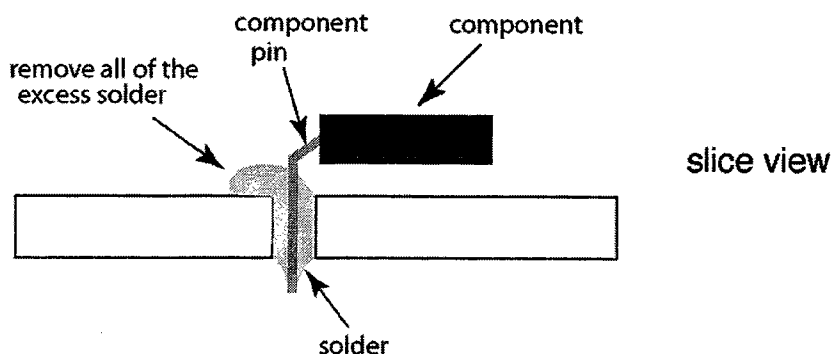
This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.

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

4 Receiver feature table

FEATURE/MODEL	CT-36HL43G/UG	CT-32HL43G/UG
CHASSIS	AP410	AP409
MICRO	256K	
MENU LANGUAGE	ENG/SPAN/FR	
CLOSE CAPTION	X	
V-CHIP (USA/CANADA)	X	
CHANNEL INFO BANNER	X	
VIDEO INPUT SKIP	SKIP	
CHANNEL COUNT	181	
PIP (1T), 2T PIP (2T), 2T SPLIT	2T SPLIT	
2RF	X	
REMOTE CONTROL (W/LIGHT)	EUR7603Z90	
CRT SUPPLIER	FLAT 4:3, MDDA	
FAMILY	DX4	
COMB FILTER	MOTION ADP, 3D Y/C	
HEC/VEC (X=BOTH)	X	
VM	X (DIGITAL)	
V/A NORM (X=BOTH)	X	
COLOR TEMP	X	
AIP	X	
PRESET/INPUT LABELING	X	
VIDEO PICTURE MEMORY	X	
DIGITAL SCAN RATE	1080i, 480p	
NTSC LINE DOUBLER	480p PROGRESSIVE	
MTS/SAP/DBX	X	
BUILT-IN AUDIO POWER	30W	
No. OF SPEAKERS	2 + SUBWOOFER	
BASS/BALANCE/TREBLE CONTROL	X	
AI SOUND	X	
SURROUND	X	
SPATIALIZER/BBE	BBE/VIVA	
A/V IN (REAR/FRONT)	4(3/1)	
A/V PROGRAM OUT	X	
AUDIO OUT (FAO: F, VAO:V)	F, V	
COMPONENT INPUT (Y, Pb, Pr)	2	
S-VHS INPUT (REAR/FRONT)	3(2/1)	
DVI/HDCP INPUT	1	
WEIGHT (KG/LB)	98KG/216LB	85.2KG/187.8LB
DIMENSIONS (W/D/H) mm	1049.5/742/895	894/685/809

Note:

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

FEATURE/MODEL	CT-32HXC43G/UG
CHASSIS	BP409
MICRO	256K
MENU LANGUAGE	ENG/SPAN/FR
CLOSE CAPTION	X
V-CHIP (USA/CANADA)	X
CHANNEL INFO BANNER	X
VIDEO INPUT SKIP	SKIP
CHANNEL COUNT	181
PIP (1T), 2T PIP (2T), 2T SPLIT	2T
2RF	X
REMOTE CONTROL (W/LIGHT)	EUR7603Z40 (GREY)
CRT SUPPLIER	FLAT 4:3, MDDA
FAMILY	DX4
COMB FILTER	3 LINE
HEC/VEC (X=BOTH)	X
VM	X (DIGITAL)
V/A NORM (X=BOTH)	X
COLOR TEMP	X
AIP	X
PRESET/INPUT LABELING	X
VIDEO PICTURE MEMORY	X
DIGITAL SCAN RATE	1080i, 480p

FEATURE/MODEL	CT-32HXC43G/UG
NTSC LINE DOUBLER	480p PROGRESSIVE
MTS/SAP/DBX	X
BUILT-IN AUDIO POWER	10Wx2
No. OF SPEAKERS	2
BASS/BALANCE/TREBLE CONTROL	X
AI SOUND	X
SURROUND	X
SPATIALIZER/BBE	BBE
A/V IN (REAR/FRONT)	4(3/1)
A/V PROGRAM OUT	X
AUDIO OUT (FAO: F, VAO:V)	F, V
COMPONENT INPUT (Y, Pb, Pr)	2
S-VHS INPUT (REAR/FRONT)	3(2/1)
DVI/HDCP INPUT	---
EPJ/HPJ/MISC	HPJ
WEIGHT (KG/LB)	85.2KG/187.8LB
DIMENSIONS (W/D/H) mm	894/685/809

Note:

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

5 Board description table

BOARD	CT-36HL43/UG CT-32HL43G/UG	CT-32HXC43G/UG	DESCRIPTION
A-BOARD	TNP2AH050	TNP2AH050AB	MAIN CHASSIS
D-BOARD	TNPH0466AE	TNPH0466AE	DEFLECTION
DV-BOARD	TNP2AA114	N/A	DVI BOARD
DG-BOARD	TNP2AA126AB	TNP2AA126AB	PIP PROCESSING, SPLIT, SEARCH, FORMATS
P-BOARD	TNP2AA148	TNP2AA148	POWER SUPPLY
H-BOARD	TNP2AA127	TNP2AA127	REAR A/V JACKS
L-BOARD	TNP2AA139	TNP2AA139	CRT BOARD
K-BOARD	TNP2AA143	N/A	FRONT KEY BOARD
G-BOARD	TNP2AA142	TNP2AA141AA	FRONT A/V BOARD

NOTE

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

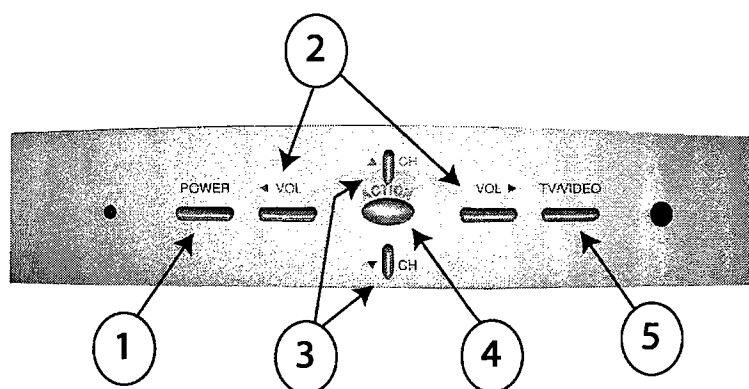
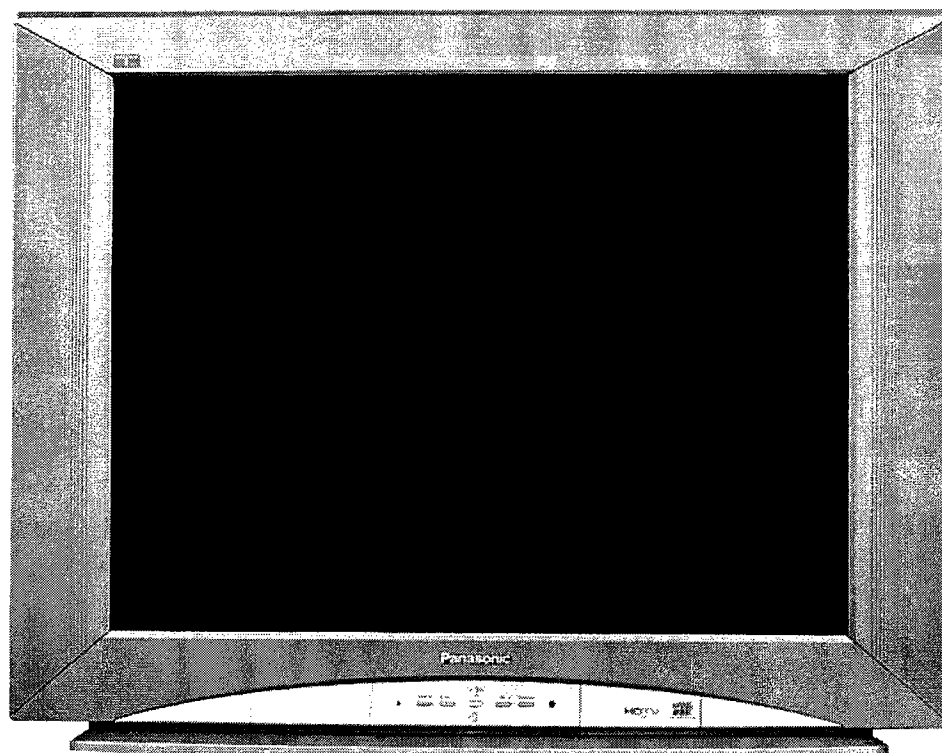
EXAMPLE

To order the A Board, the replacement board is TNP2AH050S

NOTE:

The DG-Board and DV-Board are non-serviceable boards, except for DV-Board audio connector and DVI conector. If any of these boards or DV-Board components are defective, replace it with a new one and take back the defectiver board to the service center.

6 TV Location of controls



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, for the main picture or the PIP frame (when PIP frame is displayed).

7 Location of controls (EUR7603Z90 remote)

POWER

Press to turn ON and OFF

MUTE

Press to mute sound

TV - VCR - DBS/CBL - DVD

Press to select remote operation.

VOLUME

Press to adjust TV sound and navigate in menus.

MENU

Press to access DTV, DBS, or DVD menus.

EXIT

DBS functions button.

NUMERIC PAD

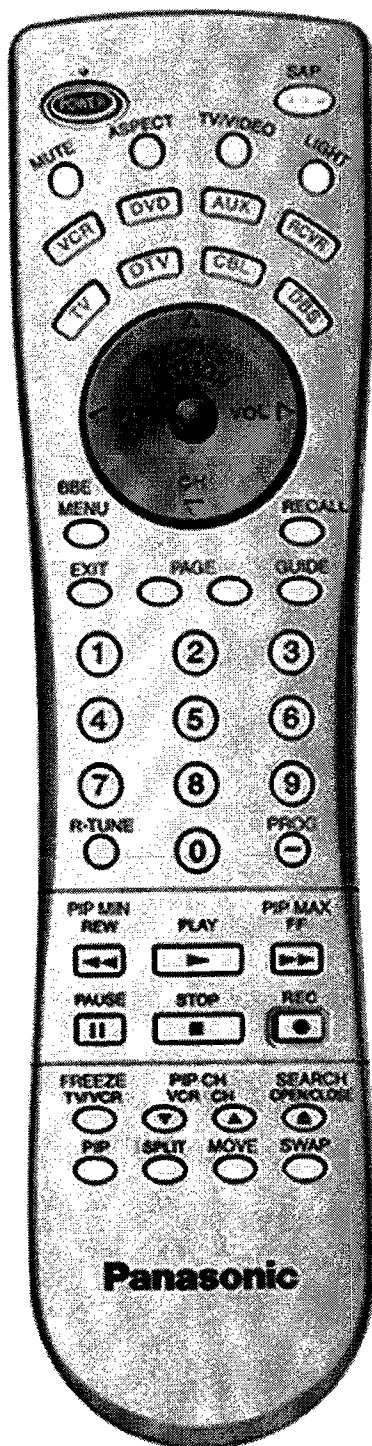
Press to select any channel

R-TUNE

Press to switch to previously viewed channel or video mode.

COMPONENT

Component function buttons.



SAP

Access second audio program.

TV/VIDEO

Press to select TV, Video mode

LIGHT

Press to illuminate buttons

CHANNEL

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

RECALL

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

GUIDE

DBS and DVD functions button.

PROG

Press for delimiter between major and minor channel number.

PIP SPLIT MOVE SWAP
FREEZE PIPCH SEARCH

PIP FUNCTION BUTTONS

Note:

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

8 Location of controls (EUR7613Z40 remote)

POWER

Press to turn ON and OFF

MUTE

Press to mute sound

TV - VCR - DBS/CBL - DVD

Press to select remote operation.

VOLUME

Press to adjust TV sound and navigate in menus.

MENU

Press to access DTV, DBS, or DVD menus.

EXIT

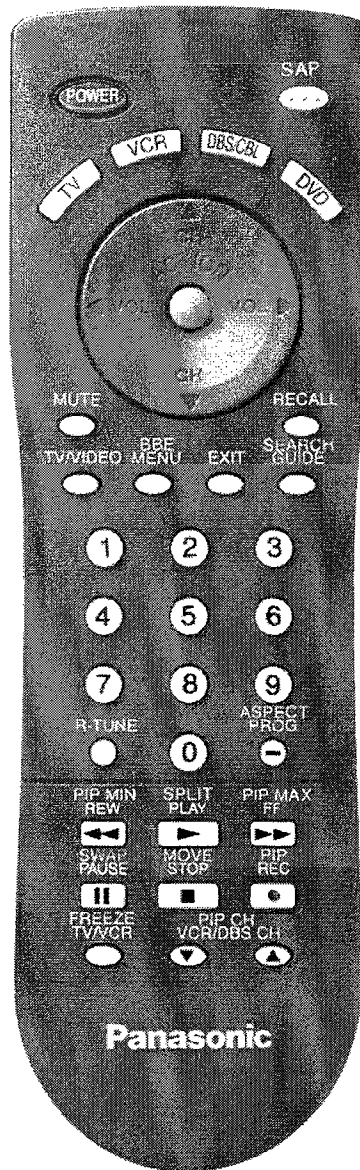
DBS functions button.

NUMERIC PAD

Press to select any channel

R-TUNE

Press to switch to previously viewed channel or video mode.



SAP

Access second audio program.

TV/VIDEO

Press to select TV, Video mode

CHANNEL

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

RECALL

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

GUIDE

DBS and DVD functions button.

PROG

Press for delimiter between major and minor channel number.

Note:

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

9 Auto diagnosis feature

This receiver incorporates a new self diagnosis feature. With this new feature will be easier for the technician to detect the failures. There is a LED located by the keyboard on the front panel, this LED will start flashing when a failure is detected by the circuits located in specific areas, depending on how many times the LED is flashing, this will tell you what circuit should be checked. Make a count of flashing and see the table shown below. Please use this feature effectively especially for intermittent problems.

SOS of front LED	
NUMBER OF FLASHES	POSSIBLE CIRCUIT
1	+140
2	LOW D.C.
4	HHS
5	IC4511
6	IC4518

AFTER THE COUNT

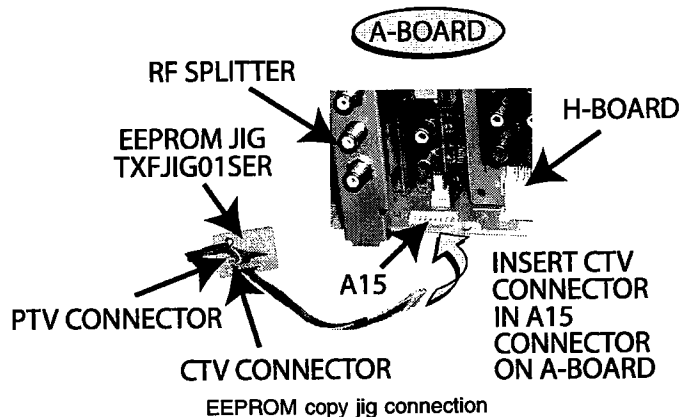
Proceed to check that area, verify what board is the problem located, this way the area to check will be reduced until the failure is found.

10 EEPROM copy jig

This CTV has a feature that allows to clone or back-up main EEPROM data adjustments from a CTV to other by connecting a jig to the CTV set. A jig part number TXFJIG01SER, is available through Matsushita/Panasonic Services.

Preparation:

To connect this jig, remove the lower back cover as instructed on disassembly for service section on this service manual and insert the jig into A15 connector located on the A-Board by the RF splitter. (See figure)



Procedure to copy data:

1. Enter to service mode and display service menu.
2. Select "AREA" DAC and then press ACTION button on remote to enter. Press VOL right/left to select one of the following options then press ACTION:
 - Select ALL to copy all main EEPROM data
 - Select ADJ to copy only adjustment data.
 - Select FIX to copy only fix data
3. To copy data from main EEPROM to jig, select "IN→EX" DAC and press ACTION button on remote.
4. To copy data from jig to main EEPROM, select "EX→IN" DAC and press ACTION button on remote.

11 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.

- 4 screws at the top edge of the receiver.
- 4 screw by the A/V jacks.
- 1 screw by the antenna jacks.
- 1 screw at the lower part of TV.
- 1 screw at each lower corner of the receiver.
- 1 screw by the retainer plate of the AC power cord.
- 1 screw by the A.C. cord assembly.

NOTE

Extensions for board connectors may be needed to take voltages on some boards, please see parts list section for part numbers in this service manual.

A-Board - Main chassis

The A-Board assembly rest on a chassis tray along with the D-Board.

Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. A-Board is secured to the chassis tray with screws.
2. The A-Board is mated to the D-Board by four flexible connectors: A4, A5, A6 & A7 (D4, D5, D6 & D7 on the D-Board, respectively). To remove either boards, unplug the connectors on the A-Board.

NOTE

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

D-Board - Deflection

The D-Board assembly rest on a chassis tray along with the A-Board.

Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. D-Board is secured to the chassis tray with screws.
2. The D-Board is mated to the A-Board by four flexible connectors: D4, D5, D6 and D7 (A4, A5, A6 & A7 on the A-Board, respectively). To remove either boards, unplug the connectors on the A-Board.

NOTE

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

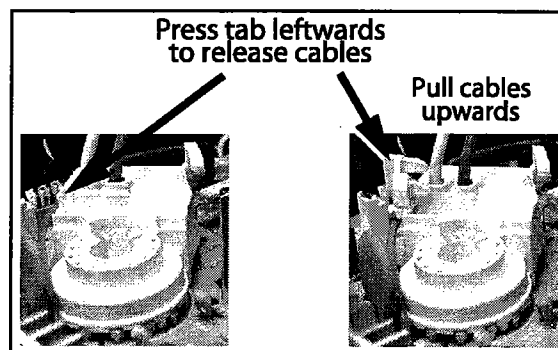
L-Board - CRT output

Plugs into the socket on the CRT neck.

To remove this board, first unplug the board from the CRT neck, then disconnect L1, L2 and L3 connectors, to disconnect the focus F1(red cable) & F2 (white cable) cables from the CRT socker, pull the tab and release the

cables (see figure), finally disconnect the screen cable from the D-Board D16 (screen and heater).

To reinsert back the cables, remember the original position of cables, F1 (red cable) goes to A on the CRT socket and F2 (white cable) goes to B on the CRT socket.



F1 and F2 cables release

To release screen GND cables from L-Board L10, L11 & L12 connectors, insert a wire in both sides of connector and pull upwards the cable, then remove the wire.

DG-Board

The DG-Board is assembled on the main chassis (A-Board) plugged at the A21, A22 and A23 (DG1, DG2 and DG3 respectively) connectors.

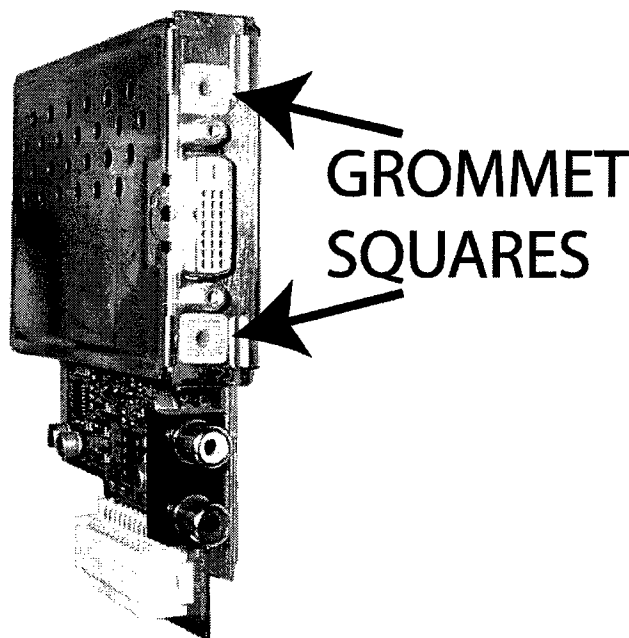
NOTE

This board is not-serviceable.

When removing this board pull carefully.

DV-Board (ONLY FOR HL MODELS)

1. Plugs onto the A-Board at the A5 (DV1) connectors.
2. This board has two Grommet squares, be careful to do not screw too tight, otherwise this grommet screw hole will get stripped.



Grommet squares on DV-Board

NOTE:

This board is non-serviceable. Except for JK002

(DVI AUDIO CONNECTOR) and JK002 (DVI CONNECTOR)

When removing this board pull carefully.

P-Board

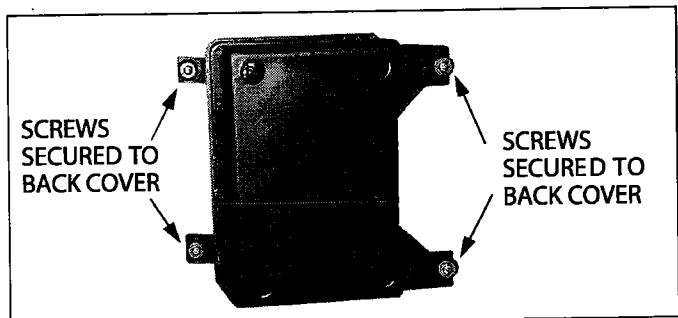
Plugs onto the right side of the D-Board at D2, D11, D12 and D3 connectors (P2, P11, P12 and P3 on P-Board, respectively); First remove the screws that holds the metal board, from the flyback and from the chassis tray and then use a flat head screwdriver to release the connector locking tabs and pull upwards the board.

G-Board

Mated to A-Board by three flexible connectors A1, A2, A3 and D40 from D-Board. To remove this board, first unplug the four flexible connectors, then RT1, G4 and G14 connectors, then pull upwards the board while unlock the tabs from the chassis tray.

Speakers

Each speaker is secured to a plastic base with 4 screws, and each plastic base is secured to the front cabinet with two screws. For models including subwoofer speaker is assembled within the backcover of the television set by 4 screws



Subwoofer

NOTE

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

11.1. Disassembly for CRT replacement

1. Discharge the CRT as instructed in the "safety precautions" section and remove 2nd anode button from the CRT.
2. Remove speaker modules (R and L)
3. Perform complete removal of chassis, as instructed in "disassembly for service" section.

NOTE

When remounting the CRT, reuse the metal sheet located in the lower part of the cabinet holding the CRT, hold with screws to the cabinet. This metal sheet is not supplied with the CRT replacement.

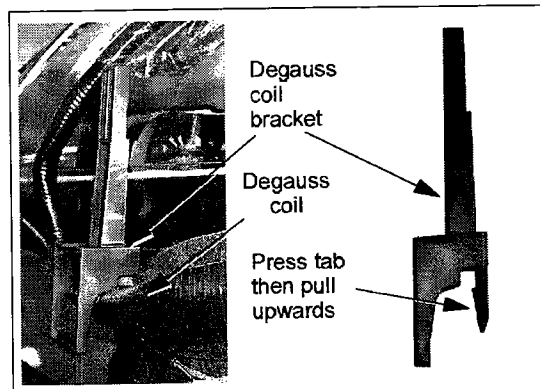
CRT replacement

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 removed 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.

NOTE

To remove the four brackets holding the degauss coil from the corners of the CRT, first remove the CRT from the cabinet, then remove the brackets by pressing the tab on the bracket and pull upwards. These brackets are included in the degauss coil kit, for part number, please see parts list section



Brackets removal

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.

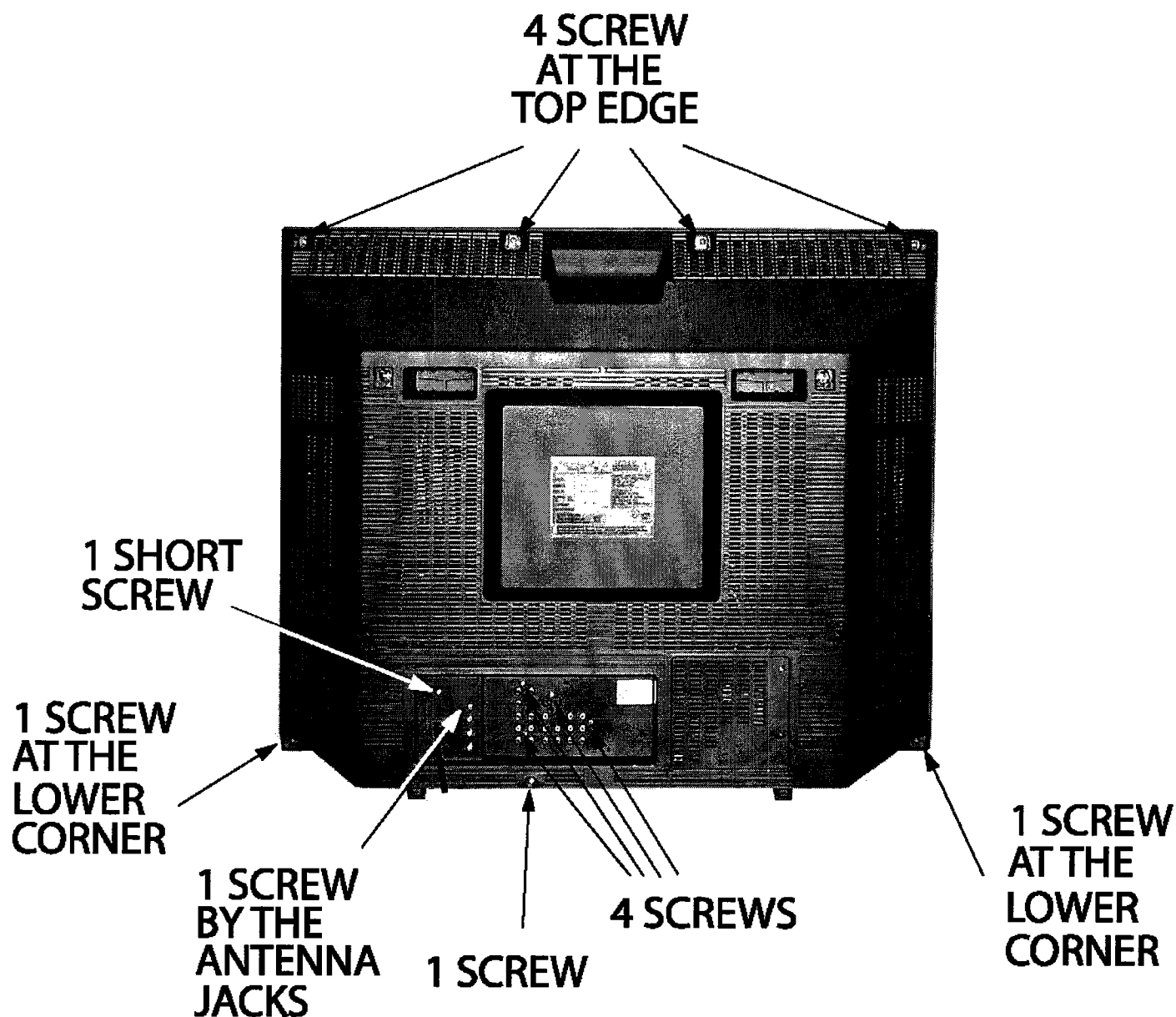
NOTE

Reuse all the clampers and mounting brackets from the degauss coil and screen, and when remounting the degauss coil assure that is not touching the speakers, this can be done by placing some tape, this may cause mask vibration. The mounting brackets and clampers are not supplied with the replacements.

IMPORTANT NOTICE

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

12 Back cover removal

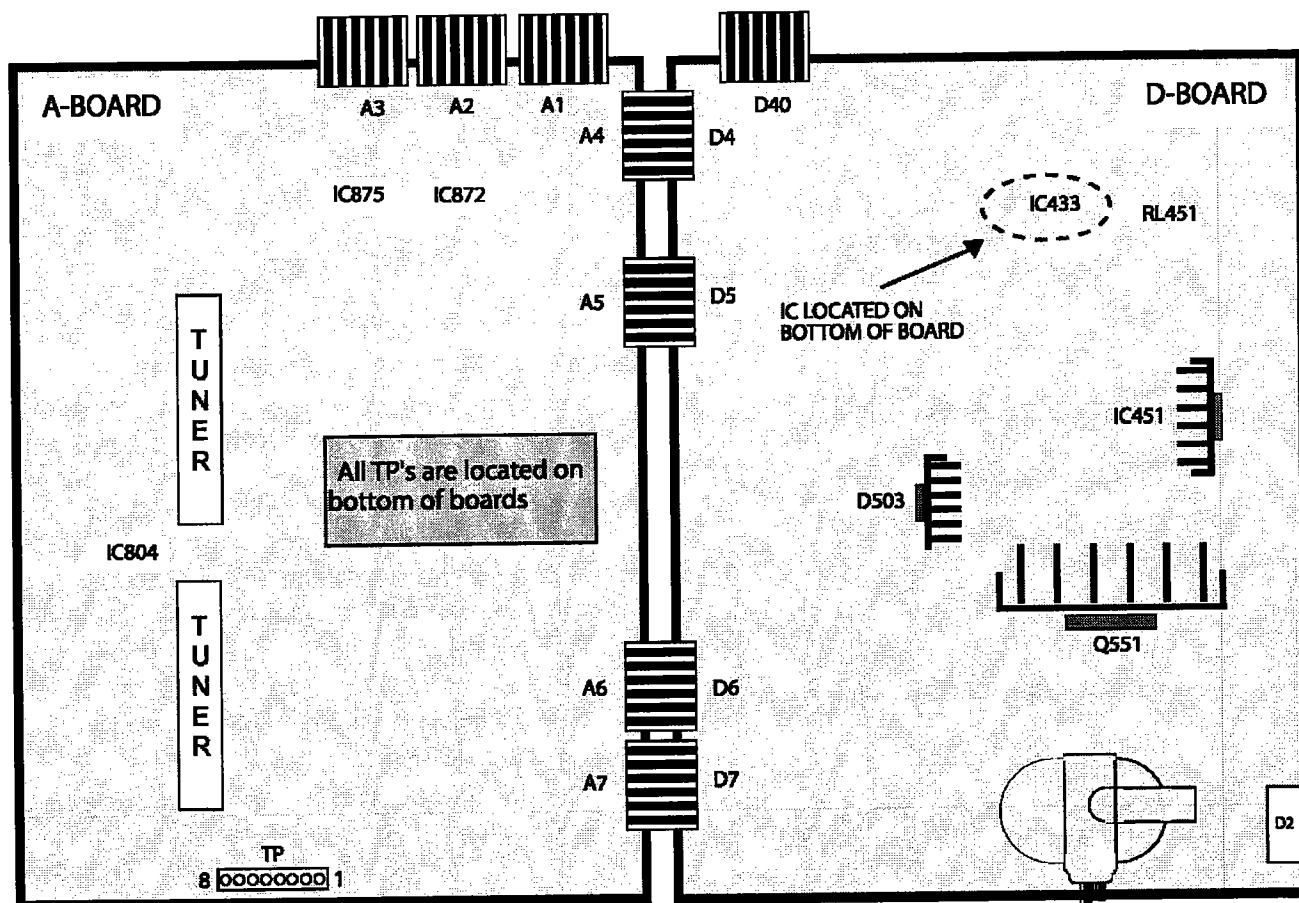


NOTE:

Cabinet appearance and location of the screws may vary depending on the model.

13 Chassis service adjustment procedures

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



140.0_V B+ voltage check

1. Set the BRIGHT and PICTURE to minimum by using the PICTURE menu.
2. Connect the DVM on TPD144 (D-Board by D2 connector) and cold ground
3. Confirm that B+ voltage is $144.0V \pm 1.5V$. 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	VOLTAGE
STBY 7V (BY IC804) A-Board TPP9	$7.5 \pm 0.6V$
MAIN 9V (BY IC875) A-Board TPA7	$9.0V \pm 0.5V$
MAIN 5V (BY IC871) A-Board TPA8	$5.0V \pm 0.3V$
GC 2.5V (BY IC872) A-Board TPA9	$2.5V \pm 0.2$
STBY 3.3V (BY A1 CONNECTOR) A-Board TPA16	$3.3V \pm 0.2V$
D-BOARD	VOLTAGE
+B2 (BY D2 CONNECTOR) D-Board TPD144	$144.0 \pm 1.5V$
25V (BY D40 CONNECTOR) D-Board TPD250	$27.5 \pm 2.0V$
15V (BY D4 CONNECTOR) D-Board TPD150	$15.7 \pm 1.5V$
-15V (BY RL451) D-Board TPD151	$-16.0V \pm 1.5V$
SOUND+ (BY D4 CONNECTOR) D-Board TPD160	$16.5V \pm 1.0V$
SOUND- (BY D4) D-Board TPD161	$-16.5V \pm 1.0V$
220V (BY D2 CONNECTOR) D-Board TPD7	$215V \pm 5.0V$
12V (BY IC433) D-Board TPA6	$12V \pm 0.5V$

High voltage check

1. Select an active TV channel and confirm that horizontal is in sync.
2. Adjust BRIGHTNESS and PICTURE using PICTURE icon menu so video just disappears.
3. Confirm B+ $144 \pm 1.5V$ is within limit.
4. Using a high voltage meter confirm that the high voltage is $33.0 \pm 1.0kV$

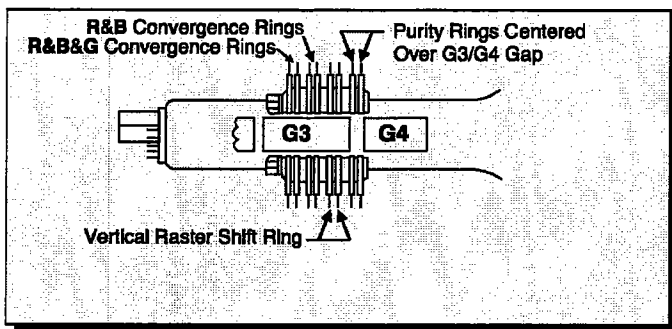
14 Purity and convergence procedure

Adjustment is necessary only if the CRT or the deflection yoke is replaced or if the setting was disturbed. The complete procedure consists of:

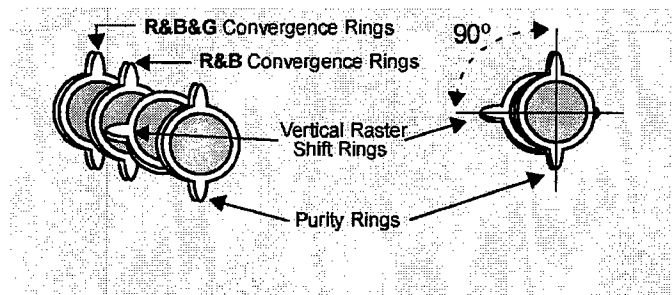
1. Vertical raster shift adjustment.
2. Initial static convergence.
3. Setting the purity.
4. Final static convergence.

WHEN THE CRT OR THE YOKE IS REPLACED

Place the yoke on the CRT neck (do not tighten the clamp). Place the vertical raster shift tabs at 3 o'clock (90° from the purity and convergence tabs



Description of rings



Initial position of rings

Turn the receiver ON. Operate the receiver for 60 minutes using the first purity check field (white screen) to stabilize the CRT.

Fully degauss the receiver by using an external degaussing coil.

Slide the deflection yoke back and forth on the neck of the CRT until it produces a near white, uniform raster.

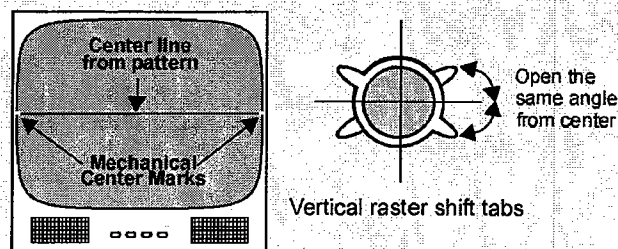
VERTICAL RASTER SHIFT ADJUSTMENT

Apply a green pattern with a horizontal line, adjust the Deflection Yoke so that has no tilt, then secure it.

Adjust center line of the pattern with the mechanical center of the CRT, this center is determined by two marks at the side edges of the screen. To adjust the line, once the vertical raster shift tabs are place at 3 o'clock to reduce its magnetic field effect open the tabs the same angle from the center, until the center line of the pattern becomes a straight line, centered with the marks of the CRT.

IMPORTANT NOTICE

Rings come along with deflection yoke in one piece.



Vertical raster shift adjustment

INITIAL CENTER STATIC CONVERGENCE

Connect a dot/cross hatch generator to the receiver and tune in a signal. Observe misconvergence at center of the screen only.

Adjust the R&B pole magnets; by separating tabs and rotating to converge blue with red.

Adjust the R&B and R&B&G pole magnets: by separating tabs and rotating to converge blue and red (magenta) with green.

NOTE

Precise convergence at this point is not important.

PURITY ADJUSTMENT

When the receiver is in the serviceman mode for making electronic adjustments, press the RECALL button on the remote control to enter purity check. (See the service adjustments electronic controls procedure).

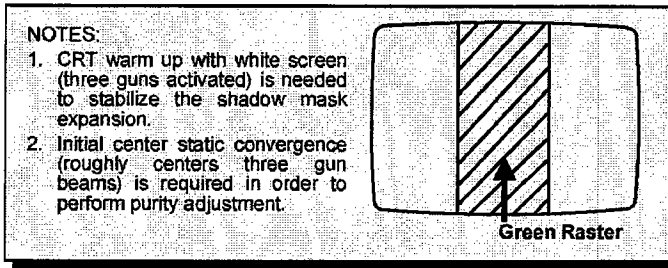
Operate the receiver for 60 minutes using the first purity check field (white screen) to stabilize the CRT.

Fully degauss the receiver by using an external degaussing coil

Press the RECALL button on the remote control again until the purity check (green screen) appears.

Loosen the deflection yoke clamp screw and move the deflection yoke back as close to the purity magnet as possible.

Adjust the purity rings to set the vertical green raster precisely at the center of the screen



Green raster adjustment

Slowly move the deflection yoke forward until the best overall green screen is displayed.

Tighten the deflection yoke clamp screw.

Press the RECALL button on the remote control again until the purity check blue and red screens appear and observe that good purity is obtained on each respective field.

Press the RECALL button on the remote control again until purity check (white screen) appears. Observe the screen for uniform white. If purity has not been achieved, repeat the above procedure.

FINAL CONVERGENCE PROCEDURE

NOTE

Vertical size and focus adjustments must be completed prior to performing the convergence adjustment. Connect a dot pattern generator to the receiver. The brightness level should not be higher than necessary to obtain a clear pattern.

Converge the red and the blue dots at the center of the screen by rotating the R&B pole static convergence magnets.

Align the converged red/blue dots with the green dots at the center of the screen by rotating the R&B&G pole static convergence magnets. Melt wax with soldering iron to reseal the magnets.

Slightly tilt vertically and horizontally (do not rotate) the deflection yoke to obtain a good overall convergence.

If convergence is not reached at the edges, insert permalloy in the DY corners to achieve proper convergence. Recheck for purity and readjust if necessary.

After vertical adjustment of the yoke, insert wedge at 11 o'clock position, then make the horizontal tilt adjustment.

Secure the deflection yoke by inserting four side wedges.

Apply adhesive between tab (thin portion) of wedge and CRT and place tape over the tab to secure to the CRT.

14.1. DYNAMIC CONVERGENCE ADJUSTMENT

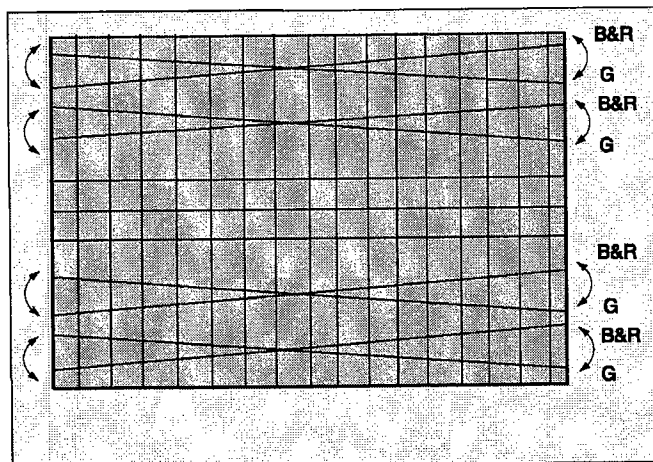
Use this for a precisely overall convergence adjust at the edges.

DY(YHC, YV, XV) ADJUSTMENT

YV ADJUSTMENT

(VR1 FOR HORIZONTAL DYNAMIC CONVERGENCE)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust VR1 (located in deflection yoke board to obtain a proper convergence at top and bottom of the screen

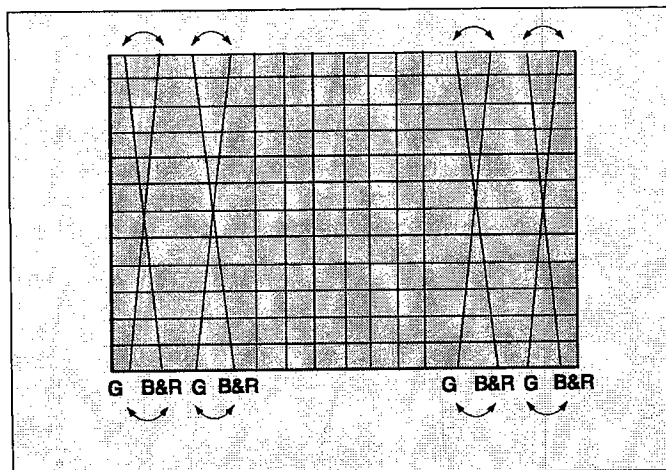


VR1 adjustment (YV)

YH Adjustment

(VR2 for vertical dynamic convergence)

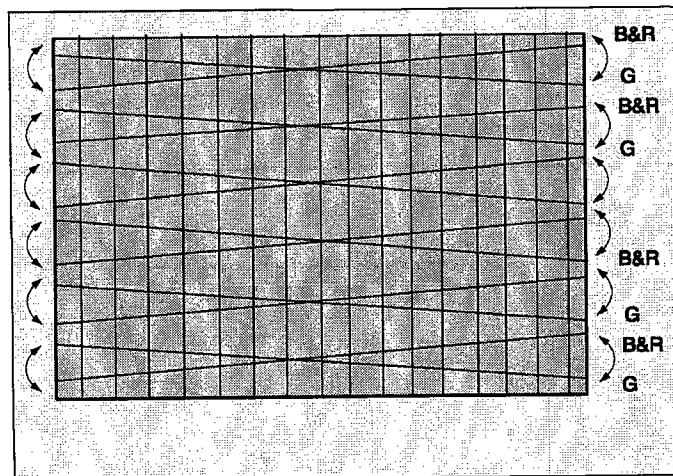
1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver Adjust VR2 (located in deflection yoke board to obtain a proper convergence at left and right side of the screen.



VR2 adjustment (YH)

XV Adjustment (precise adjustment)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust the coil located in deflection yoke board to obtain a proper convergence horizontally.



Xv adjustment

NOTE

Apply a red pattern and confirm purity, if purity is poor, repeat purity adjustments.

14.2. Permalloy convergence corrector strip (Part No. 0FMK014ZZ)

This strip is used in some sets to match the yoke and CRT for optimum convergence. If the yoke or CRT is replaced, the strip may not be required.

First converge the set without the strip and observe the corners.

First converge the set without the strip and observe the corners.

If correction is needed:

1. Place strip between CRT and yoke, in quadrant needing correction. Slowly move it around for desired results.
2. Press adhesive tightly to the CRT and secure with tape.

14.3. DAF adjustment (Dynamic focus adjustment)

The purpose of this adjustment is to move the focus in the picture, so the focus is in balance in the whole picture (same level). Perform this adjustment as a visual adjustment, centering both waveforms, repeat adjustment until best adjustment is obtained.

PREPARATION

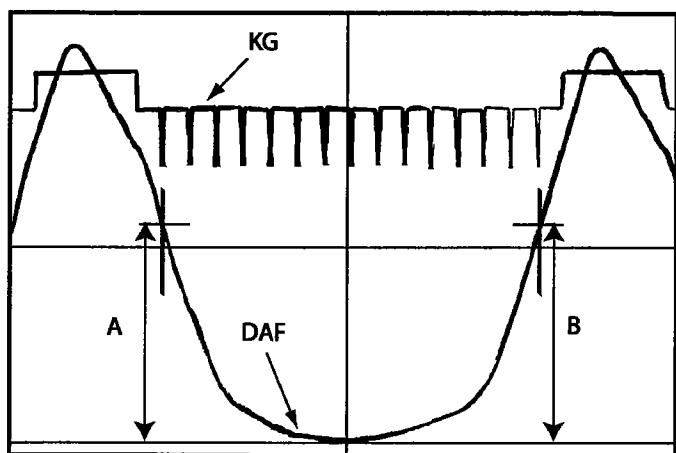
1. Picture settings normalized.
2. Picture mode set to VIVID.

PREPARATION

1. Apply a crosshatch pattern.
2. Connect channel one of the oscilloscope with 100x1 probe to DAF OUT on J172 (D-Board).
3. Connect channel two of the oscilloscope with 10x1 probe to KG (L-Board).
4. If the the points A and B are different adjust, in service mode, adjust (HDAFS) DATA so that become the same position.
5. Apply a 1080i crosshatch pattern and repeat from step 1 to step 4.

NOTE

Both waveforms should be centered. Upper waveform could be different depending on the pattern applied



DAF adjustment

Other method (DAF adjustment)

PREPARATION

1. Picture settings normalized.
2. Picture mode set to VIVID.

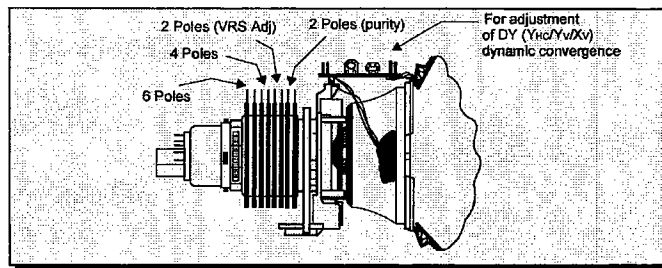
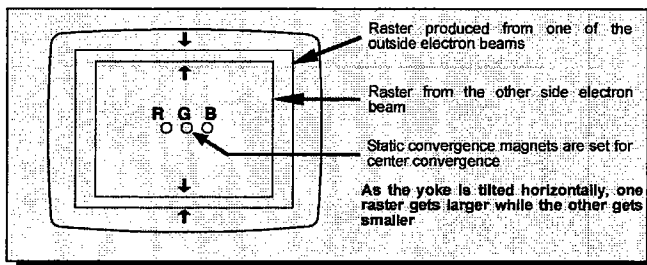
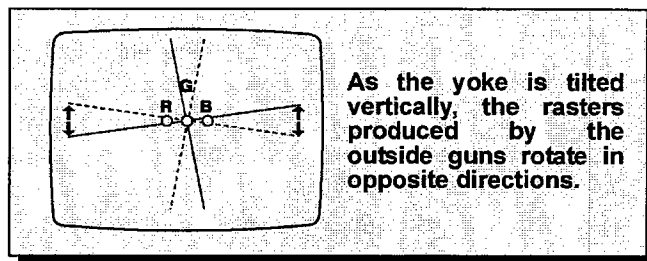
PROCEDURE

1. Apply a crosshatch pattern.

2. Put a mark in the focus control (on fly-back), so the control can be put back in the original position.
3. Turn the focus control (fly-back) fully, so the image is out focus.
4. Then in service mode adjust (HDAFS) DATA, so the focus is moving from side to side in the picture.
5. Adjust (HDAFS) DATA so the picture looks in balance in left and right.
6. Turn focus (fly-back) control back to its original position.
7. Apply a 1080i crosshatch pattern and repeat from step 1 to step 6.

NOTE

Repeat adjustment until best adjustment is obtained. For best adjustment, use oscilloscope as described in previous adjustment method.



15 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. 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.

NOTE

After receiver is set into service mode, set TIMER back to NO.

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.

MODE	480i	480p	1080i	D-IN
MTS	MTSIN	SEPAL	SEPAH	
CLOCK	CLOCK			
VIDEO	COLOR	TINT	BRIGHT	CONT
	B-Y_G	CUT_G	CUT_R	CUT_B
	BRT	R DR	B DR	
HDEF	H LIN	H POS	H WID	PCC
	PCCHG	PCCLG	PCCHS	PCCLS
	TOPG	BTMG	TOPSL	BTMSL
	TRAP	PARA	SIDE	HTRAP
VDEF	V RAS	VEAMP	V-C	V-S
DAF	HDAFS	VDAFG		
OTHER	VMM_G	VMM_P	HHS	EW_SW
	VTOP	SOSSW		
EFP	AREA	IN>EX	EX>IN	

NOTE

Some adjustments are available only in some modes (480i, 480p, 1080i); it is needed to apply the format. A 1080i, 480p, 480i pattern can be obtained from Panasonic's TU-DST51 set-top box DTV decoder.

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.

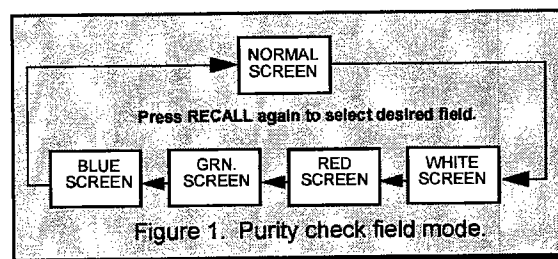
Any programmed channels, channels caption data and some others user defined settings will be erased when exited by pressing ACTION and POWER on receiver.

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 (A15 pin 2) to cold ground (A-Board).

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).

15.1. Service adjustment default values for items for 32"

REGISTER	DESCRIPTION	FORMAT			
		NTSC	480p (16:9)	1080i (16:9)	1080i (4:3)
MTSIN	INPUT LEVEL	1A			
SEPAL	LOW LEVEL SEPARATION	6			
SEPAH	HIGH LEVEL SEPARATION	20			
CLOCK	CLOCK	128			
COLOR	COLOR	2F		17	
TINT	TINT	76		81	
BRIGH	SUB-BRIGHTNESS	3B		42	
CONT	SUB-CONTRAST	23		65	
B-Y_G	MAGENTA TINT ADJ	2E		3E	
CUT G	GREEN CUT-OFF	01 65			
CUT R	RED CUT-OFF	01 85			
CUT B	BLUE CUT-OFF	01 A6			
BRT	BRIGHT				
R DR	RED DRIVE	A0			
B DR	BLUE DRIVE	A0			
HLIN	HORIZONTAL LINEARITY	79		7F	
HPOS	HORIZONTAL POSITIONING	01 7A		01 82	
HWID	HORIZONTAL WIDTH	54		2F	
PCC	PINCUSHION CORRECTION	50	2A	31	3E
PCCHG	PINCUSHION HIGH	6	0A	9	7
PCCLG	PINCUSHION LOW	2	7	5	9
PCCHS	PINCUSHION HIGH	4	3	3	3
PCCLS	PINCUSHION LOW	3	3	3	3
TOPG	TOP CORNER PINCUSHION	5B	55	4C	5B
BTMG	BOTTOM CORNER PINCUSHION	45	32	49	4A
TOPSL	TOP CORNER PINCUSHION SLICE LEVEL	2	8	6	7
BTMSL	BOTTOM CORNER PINCUSHION SLICE LEVEL	2	8	5	7
TRAP	TRAPEZOID	83	7E	7F	7D
PARA	PARALLELOGRAM	3	4	4	8
SIDE	E-W PINCUSHION ADJUSTMENT	4	6	7	8
HTRAP	HORIZONTAL TRAPEZOID	1A	1A	1A	14
VRAS	VERTICAL POSITION	8C	71	7B	79
VEAMP	VERTICAL SIZE	A8	E2	99	9A
V-C	VERTICAL LINEARITY	21	26	25	24
V-S	VERTICAL S CORRECTION	30	25	17	33
HDAFS	HORIZONTAL DAF PHASE	59		01 C5	A0
VDAFG	VERTICAL DAF GAIN	A0	63	60	0
VMM_G	-----	F0		F0	
VMM_P	-----	F3		F3	
HHS	-----	CB			
EW_SW	-----	0	0	0	
VTOP	-----	9C	7E	79	9B
SOSSW	-----	1		1	

NOTE:

The above table shows the default values for the service items, this values can change depending on the serviced TV.

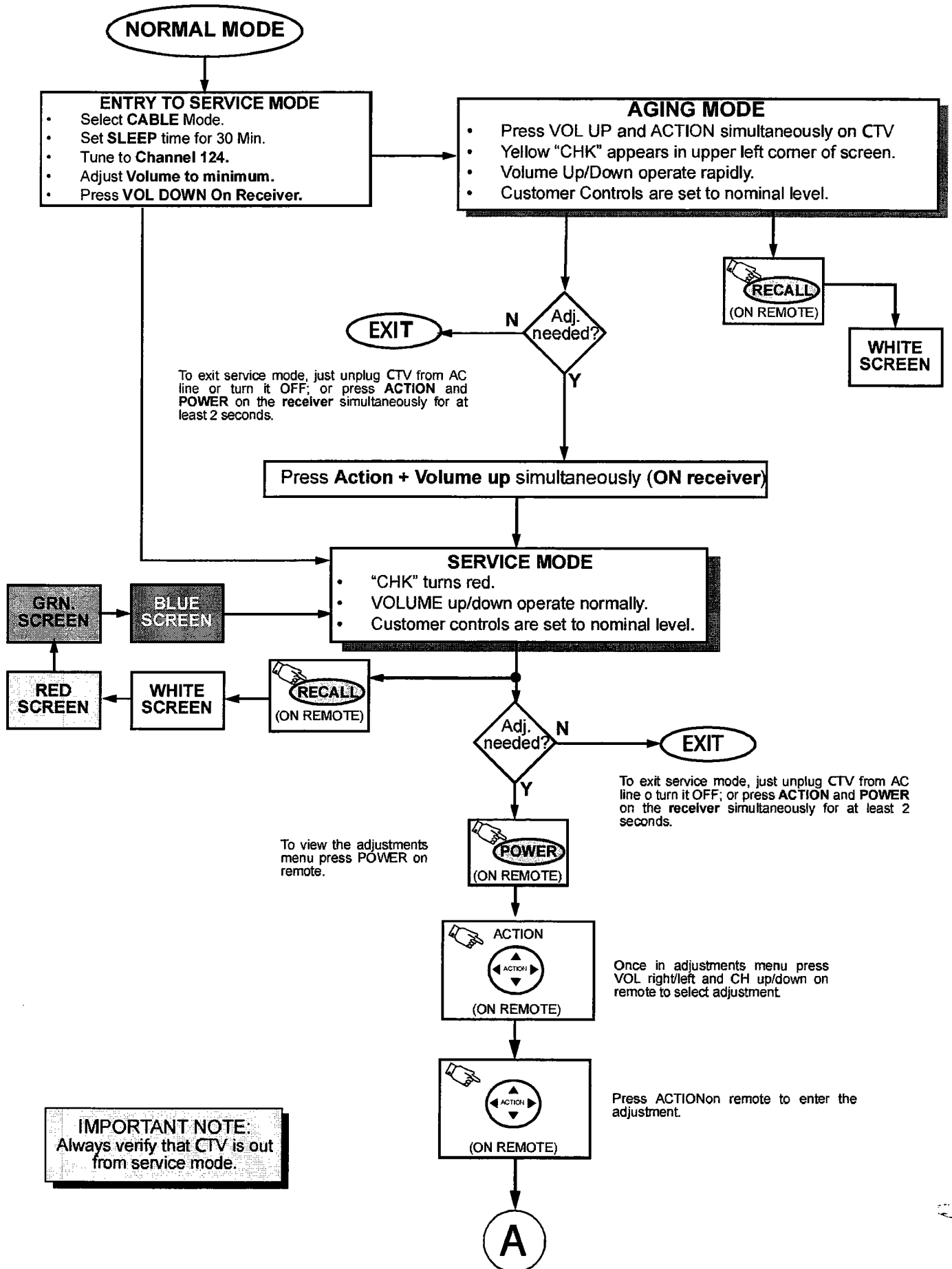
15.2. Service adjustment default values for items for 36"

REGISTER	DESCRIPTION	FORMAT			
		NTSC	480p (16:9)	1080i (16:9)	1080i (4:3)
MTSIN	INPUT LEVEL	1A			
SEPAL	LOW LEVEL SEPARATION	6			
SEPAH	HIGH LEVEL SEPARATION	20			
CLOCK	CLOCK	128			
COLOR	COLOR	2F		17	
TINT	TINT	7E		81	
BRIGH	SUB-BRIGHTNESS	3B		42	
CONT	SUB-CONTRAST	23		2E	
B-Y_G	MAGENTA TINT ADJ	2E		3E	
CUT G	GREEN CUT-OFF	01 65			
CUT R	RED CUT-OFF	01 85			
CUT B	BLUE CUT-OFF	01 A6			
BRT	BRIGHT				
R DR	RED DRIVE	A0			
B DR	BLUE DRIVE	A0			
HLIN	HORIZONTAL LINEARITY	7F		7F	
HPOS	HORIZONTAL POSITIONING	01 7B		01 82	
HWID	HORIZONTAL WIDTH	5D		3E	
PCC	PINCUSHION CORRECTION	2C	19	31	3E
PCCHG	PINCUSHION HIGH	1F	1F	9	7
PCCLG	PINCUSHION LOW	2	16	5	9
PCCHS	PINCUSHION HIGH	3	3	3	3
PCCLS	PINCUSHION LOW	3	2	3	3
TOPG	TOP CORNER PINCUSHION	5B	49	4C	5B
BTMG	BOTTOM CORNER PINCUSHION	42	2D	49	4A
TOPSL	TOP CORNER PINCUSHION SLICE LEVEL	3	5	6	7
BTMSL	BOTTOM CORNER PINCUSHION SLICE LEVEL	1	6	5	7
TRAP	TRAPEZOID	81	7D	7F	7D
PARA	PARALLELOGRAM	7	9	4	8
SIDE	E-W PINCUSHION ADJUSTMENT	8	8	7	8
HTRAP	HORIZONTAL TRAPEZOID	16	16	1A	14
VRAS	VERTICAL POSITION	87	72	8A	79
VEAMP	VERTICAL SIZE	BD	A6	99	9A
V-C	VERTICAL LINEARITY	1F	26	25	24
V-S	VERTICAL S CORRECTION	32	25	17	33
HDAFS	HORIZONTAL DAF PHASE	59		01 C5	
VDAFG	VERTICAL DAF GAIN	60	63	60	A0
VMM_G	-----	F0		F0	
VMM_P	-----	F3		F3	
HHS	-----	CB			
EW_SW	-----	0	0	0	0
VTOP	-----	9C	7E	79	9B
SOSSW	-----	1		1	1

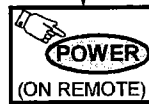
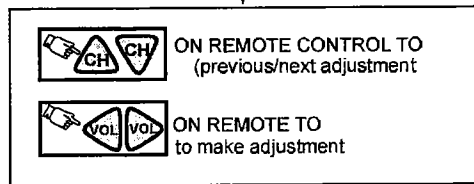
NOTE:

The above table shows the default values for the service items, this values can change depending on the serviced TV.

15.3. Instructional flow chart for service mode



A



Press POWER or ACTION on remote to exit the adjustment.



IMPORTANT NOTE:
Always verify that CTV is out
from service mode.

To exit service mode, just unplug CTV from AC line or turn it OFF; or press **ACTION** and **POWER** on the receiver simultaneously for at least 2 seconds.

16 Service adjustments (electronic controls)

NOTE

Please correlate with available pattern on all adjustments

16.1. (NTSC) Sub-Brightness Service DAC adjustment (BRIGHT)

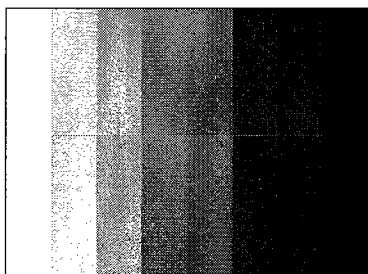
Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.

Preparation

1. Normalize picture settings.
2. Picture mode set to VIVID.
3. Switch NATURAL COLOR to OFF.
4. Switch COLOR TEMPERATURE to COOL.

Procedure

1. Apply a colorbar with no color pattern.
2. In the service mode for making electronic adjustments, select the DAC adjustment "BRIGHT" and adjust data so that 7.5IRE part is the same light output as the 3IRE part



Bars pattern

16.2. (1080i) Sub-Brightness Service DAC adjustment (BRIGHT)

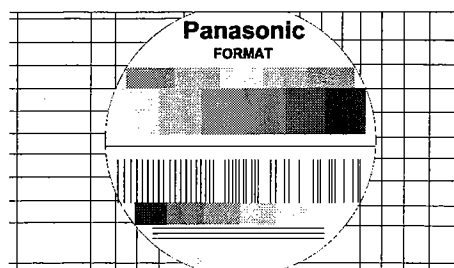
Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.

Preparation

1. Normalize picture settings.
2. Picture mode set to VIVID.
3. Switch NATURAL COLOR to OFF.
4. Switch COLOR TEMPERATURE to COOL.

Procedure

1. Apply a colorbar with no color pattern.
2. In the service mode for making electronic adjustments, select the DAC adjustment "BRIGHT" and adjust data so that 7.5IRE part is the same light output as the 3IRE part



16.3. (NTSC) Sub-Contrast Service DAC adjustment (CUT- G, CONT)

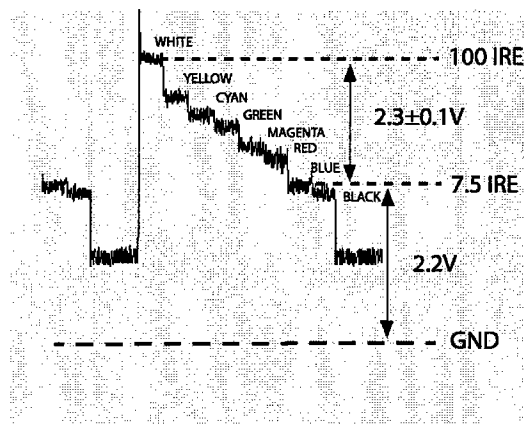
This adjustment is factory set. Do not adjust unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

Preparation

1. Apply a colorbar pattern.
2. Set the PICTURE settings to normal.
3. Set color to minimum (no color on picture).
4. Set PICTURE mode to VIVID
5. Connect the oscilloscope to TP47G.

Procedure

1. In the service mode, select DAC for brightness adjustment "BRIGH" and set data to "1 D0".
2. In service mode, select DAC for green cutoff adjustment "CUT-G", and adjust data to obtain 2.2 V between 7.5IRE and GND level at TP47G. (See waveform detail)
3. In service mode, select DAC for contrast adjustment "CONT", and adjust data to obtain $2.3 \pm 0.1V$ between 7.5IRE and 100IRE level at TP47G. (See waveform detail)



16.4. (1080i) Sub-Contrast Service DAC adjustment (CUT- G, CONT)

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 1080i pattern (colorbar no color).

2. Set the PICTURE settings to normal.
3. Set PICTURE mode to VIVID
4. Connect the oscilloscope to TP47G.

PROCEDURE

1. In the service mode, select DAC for brightness adjustment "BRIGH" to obtain 2.0V between 0 IRE and GND level at TP47G
2. In service mode, select DAC "CONT", and adjust data to obtain $2.5 \pm 0.1V$ between 0 IRE and 100 IRE level at TP47G

16.5. (NTSC) 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.

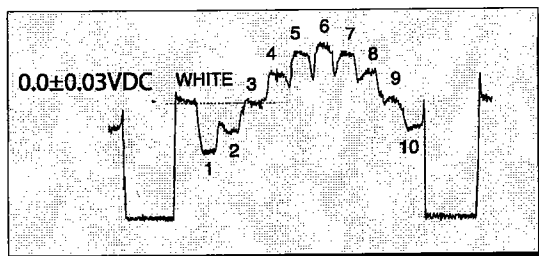
Make sure that sub-contrast adjustment was finished prior to perform this adjustment

PREPARATION

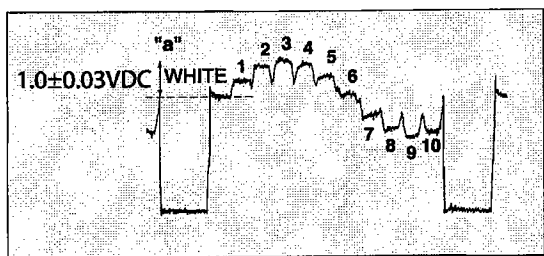
1. Normalize the picture settings.
2. Set picture mode to VIVID
3. Switch NATURAL COLOR to OFF.

PROCEDURE

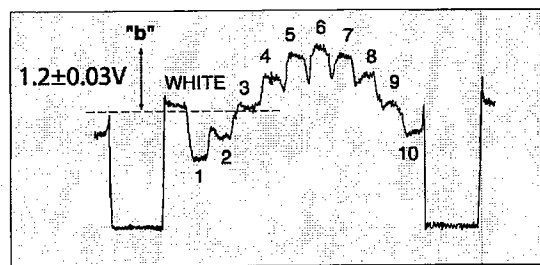
1. Apply a rainbow color bar pattern.
2. In service mode adjust "R DR" and "B DR" data to "80".
3. Connect the oscilloscope to TP47B.
4. In service mode adjust "TINT" data so that the peak white is located at same level as peak "3", within $0 \pm 0.03V$. (See waveform detail)



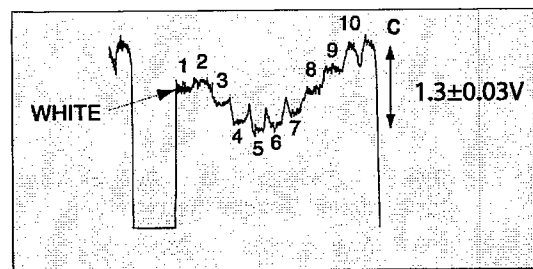
5. Connect the oscilloscope to TP47R.
6. In service mode adjust "COLOR" data so that the amplitude "a" is $1.0 \pm 0.03V$.



7. Connect the oscilloscope to TP47B.
8. In service mode adjust "B-Y G" data so that the amplitude "b" is $1.2 \pm 0.03V$ (between 3rd and 6th peaks).



9. With oscilloscope still connected to TP47B, adjust "TINT" data so that the peak "9" is located at same level as peak "3", within $0 \pm 0.03V$, then increase "TINT" data by 9 steps.
10. Connect oscilloscope to TP47G.
11. In service mode adjust "COLOR" data so that the amplitude "C" is $0.92 \pm 0.02V$.



12. Apply a studio color bar pattern and confirm that saturation and phase are normal (normal image).

16.6. (NTSC) 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

1. Normalize the picture settings.
2. Set picture mode to VIVID
3. Switch NATURAL COLOR to OFF.

PROCEDURE

1. Apply a color bar pattern.
2. In service mode adjust "R DR" and "B DR" data to "80".
3. In service mode adjust "TINT" data so that the color does not become greenish or redish.
4. In service mode adjust "COLOR" data so that the color level is not too high (saturated) or too low (tending to black and white).
5. In service mode adjust "B-Y G" data so that blue and green seem natural.
6. confirm that saturation and picture are normal (normal image).
7. If image is not satisfactory, repeat adjustment until the images is normal and natural

NOTE

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

16.7. (1080i) Color output adjustment Service DAC adjustment (COLOR, TINT)

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

PREPARATION

1. Normalize the picture settings.
2. Set picture mode to VIVID
3. Switch NATURAL COLOR to OFF.

PROCEDURE

1. Apply a 1080i pattern or signal
2. In service mode adjust "R DR" and "B DR" data to "80".
3. In service mode adjust "TINT" data so that the color does not become greenish or redish.
4. In service mode adjust "COLOR" data so that the color level is not too high (saturated) or too low (tending to black and white).
5. In service mode adjust "B-Y G" data so that blue and green seem natural.
6. confirm that saturation and picture are normal (normal image).
7. If image is not satisfactory, repeat adjustment until the images is normal and natural.

NOTE

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

16.8. 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".

1. LOW LIGHT areas - In service mode for making electronic adjustments, select CUT R, CUT G, CUT B and adjust the picture for gray.
2. 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

1. Turn the receiver "ON" and allow 30 minutes warm up at WHITE PATTERN.
2. Apply a color bar pattern (with no color).

3. Turn the SCREEN control (part of FBT T551) fully counterclockwise.

4. Preset the following service DACs for best results:

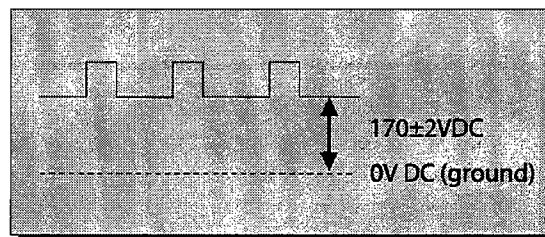
- BRIGH _____ 1 D0
- CUT R _____ 0 00
- CUT G _____ 1 80
- CUT B _____ 0 00
- R DR _____ 80
- B DR _____ 80
- PICTURE SETTINGS _____ NORMALIZED
- PICTURE MODE _____ VIVID

PROCEDURE

1. Connect the oscilloscope to KG (CRT-Board).
2. In service mode for making electronic adjustment, select "BRIGH" DAC.
3. Press RECALL button on the remote control to collapse the raster. (service SW).
4. Connect oscilloscope to KG on L-Board and adjust service mode "CUT-G" DAC until $170 \pm 2V$ above DC ground is measured
5. Remove the probe from KG.
6. Turn screen clockwise slowly until color is slightly appeared.
7. Then adjust "CUT R" and "CUT B" until line becomes white.
8. Press RECALL button on the remote to restore the raster.
9. Adjust "R DR" and "B DR" so the white seems like white and black like black
10. Apply a normal signal and confirm that the image is normal and a good gray scale
11. If correction is needed perform minor touch-up method.

NOTE

This adjustment (NTSC) will adjust automatically 480p and 1080i formats, no need to adjust for these formats



16.9. 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.

NOTE

Deflection adjustment for 480i/480p, 480i/480p 16:9 and 480i/480p split, 1080i letter and split mode are provided differently.

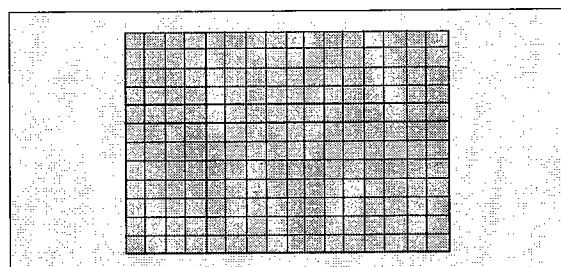
16.9.1. (480i/480p) H-Center adjustment

PREPARATION

1. Apply a crosshatch pattern.
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. If horizontal linearity is poor, in service mode, adjust data "H LIN"



H-Adjustment

2. Apply a pattern to center the picture.
3. 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.

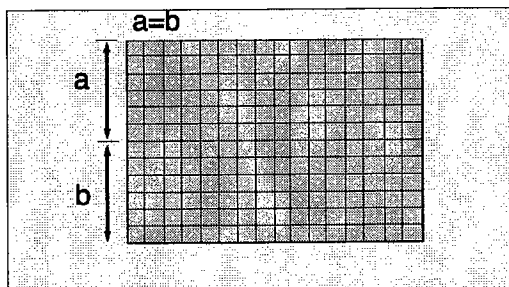
16.9.2. (480i/480p) Vertical linearity(V-C), V-Size and V-Position adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

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



3. If the v-position is not at the CRT center, adjust V position "V RAS" DATA again.
4. Adjust H-TRAPEZOID data "HTRAP" so that the upper and lower lines becomes horizontal.

16.9.3. (480i/480p) V-S, V-Size adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

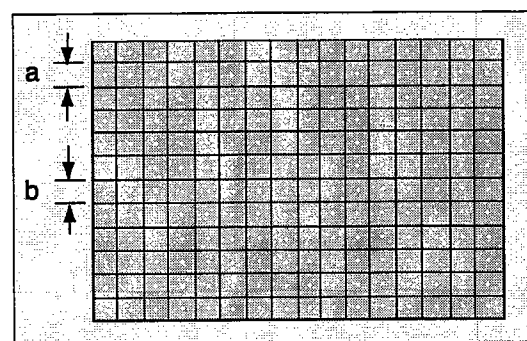
PROCEDURE

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
 - Adjust "VEAMP" so that V-SIZE is regular size again.

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



V-Adjustment

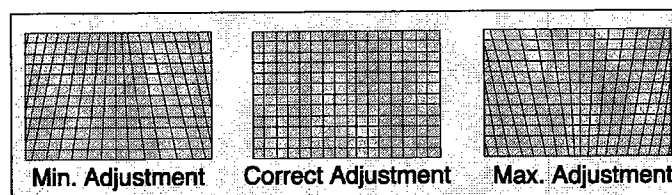
16.9.4. (480i/480p) Trapezoid adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "TRAP" and adjust DATA so that lines at right and left are vertical like a solid line



16.9.5. (480i/480p) Parallelogram adjustment

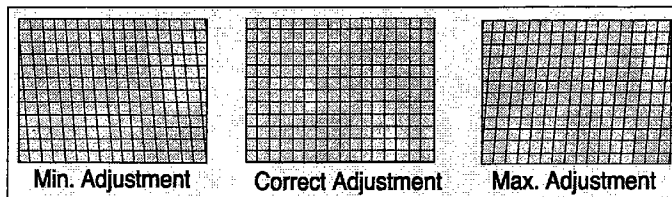
PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "PARA" and adjust so that

the lines at right and left are vertical like solid line.



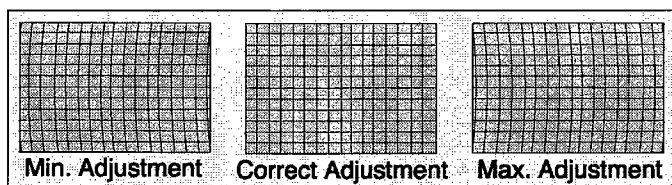
16.9.6. (480i/480p) E-W PCC balance adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "SIDE" and adjust so that lines at right and left are vertical like solid line.



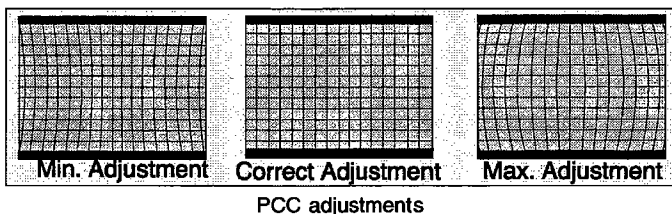
16.9.7. (480i/480p) PCC adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust "PCC" DATA so that the 1st line and 3rd line make a good balance



NOTE

If side and lower side is imbalanced, adjust "PCCHG" and "PCCLG" so that "PCC" make good balance.

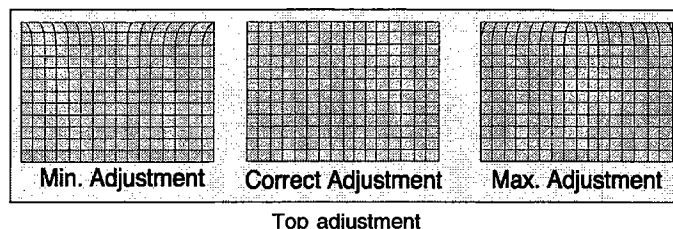
16.9.8. (480i/480p) Corner PCC adjustment

PREPARATION

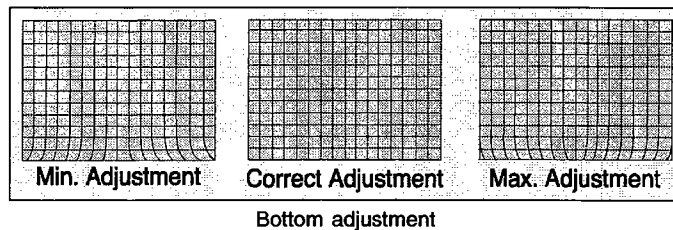
1. Apply a crosshatch pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. To adjust upper and lower linearity.
2. Adjust "TOPG" to straighten upper lines



3. Adjust "BTMG" to straighten lower lines



NOTE

If TOP-BOTTOM bending point is not so good, adjust "TOPSL" and "BTMSL" of slice level.

16.9.9. (480i/480p) H-Size adjustment

PREPARATION

1. Use a pattern that permits centering the image
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Adjust "H WID" DATA so that left width and right become in good balance (not too wide or narrow).

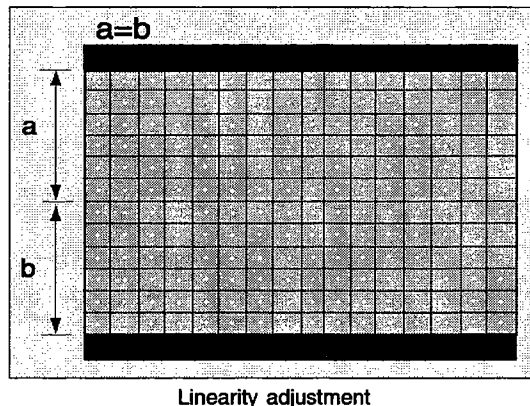
16.9.10. (480i/480p 16:9 and 480i/480p split) Vertical linearity(V-C) and V- Position adjustment

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

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



16.9.11. (480i/480p 16:9 and 480i/480p split) V-S, V-Size adjustment

PREPARATION

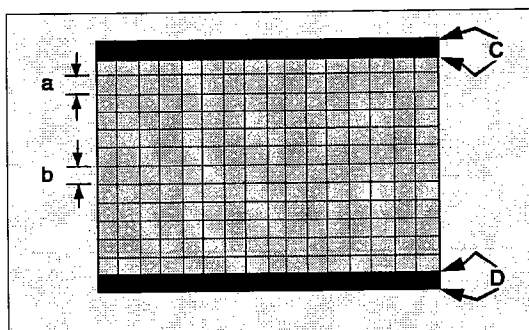
1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter to service mode
2. Adjust "VAMP" so that width C and D becomes 60mm for 32" and 70mm for 36"
3. Check a and b sizes, If $b-a < -1.5\text{mm}$ (in top and bottom extending case)
 - Increase "V-S" DATA by one step
 - Adjust "VEAMP" so that width C and D becomes 60mm for 32" and 70mm for 36".

NOTE

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



V-Adjustment

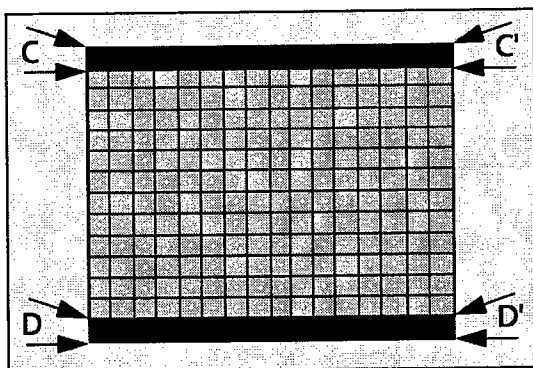
16.9.12. (480i/480p 16:9 and 480i/480p split) H-Trapezoid adjustment

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "HTRAP" and adjust DATA so that upper and lower edges become horizontal ($c=c'$ and $d=d'$)



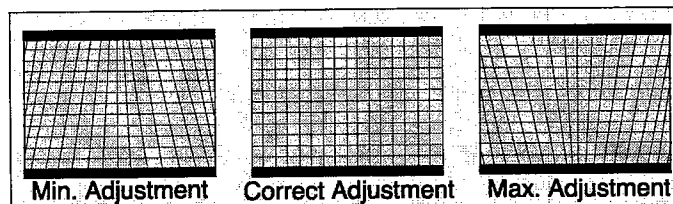
16.9.13. (480i/480p 16:9 and 480i/480p split) Trapezoid adjustment

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "TRAP" and adjust DATA so that lines at right and left are vertical like a solid line



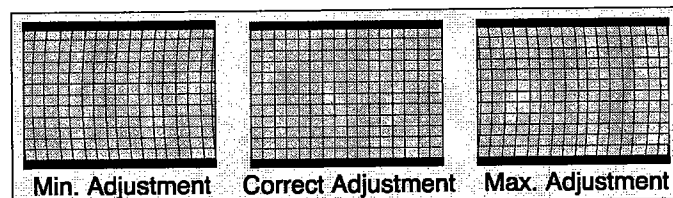
16.9.14. (480i/480p 16:9 and 480i/480p split) E-W PCC adjustment

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "SIDE" and adjust so that lines at right and left are vertical like solid line.



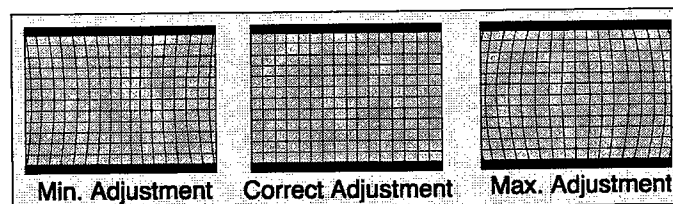
16.9.15. (480i/480p 16:9 and 480i/480p split) PCC adjustment

PREPARATION

1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust "PCC" DATA so that the 1st line and 3rd line make a good balance



NOTE

If side and lower side is imbalanced, adjust "PCCHG" and "PCCLG" so that "PCC" make good balance.

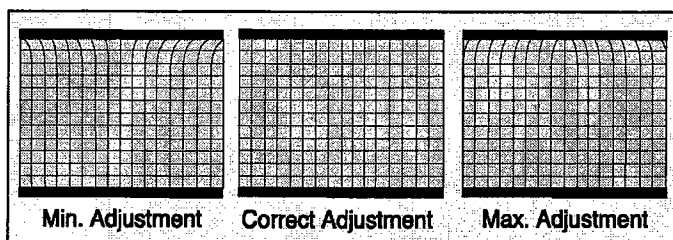
16.9.16. (480i/480p 16:9 and 480i/480p split) Corner PCC adjustment

PREPARATION

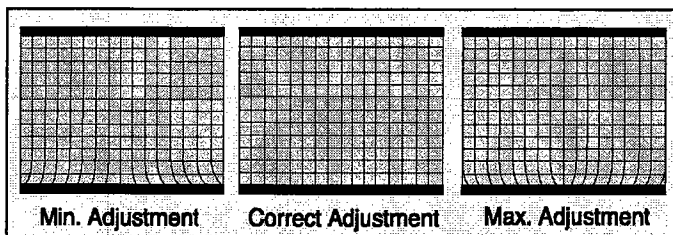
1. Apply a 480p pattern
2. Set mode to 16x9 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. To adjust upper and lower linearity.
2. Adjust "TOPG" to straighten upper lines



3. Adjust "BTMG" to straighten lower lines



NOTE

If TOP-BOTTOM bending point is not so good, adjust "TOPSL" and "BTMSL" of slice level.

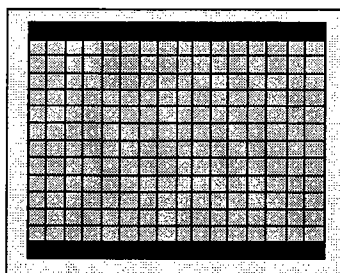
16.9.17. 1080i letter and split) H-Center adjustment

PREPARATION

1. Apply a 1080i pattern.
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. If horizontal linearity is poor, in service mode, adjust data "H LIN"



2. Apply a pattern to center the picture.
3. 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.

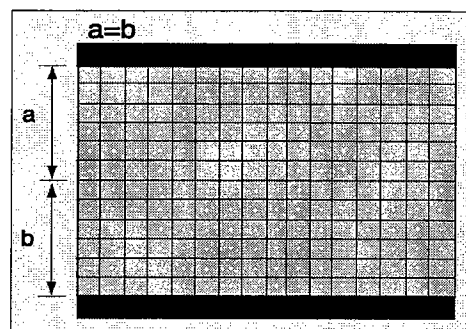
16.9.18. (1080i letter and split) Vertical linearity(V-C) and V-Position adjustment

PREPARATION

1. Apply a 1080i pattern.
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

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



3. If the v-position is not at the CRT center, adjust again.

16.9.19. (1080i letter and split) V-S, V-Size adjustment

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter to service mode
2. Adjust "VAMP" so that width C and D becomes 60mm for 32" and 70mm for 36"
3. Check a and b sizes, If $b-a < -1.5\text{mm}$ (in top and bottom extending case)
 - Increase "V-S" DATA by one step
 - Adjust "VEAMP" so that width C and D becomes 60mm for 32" and 70mm for 36".

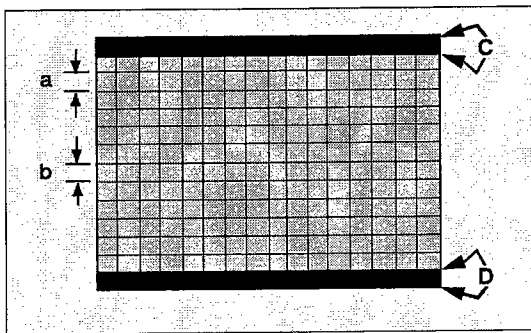
NOTE

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

4. Check a and b sizes, If $b-a > -1.5\text{mm}$ (in top and bottom extending case)
 - Decrease "V-S" DATA by one step
 - Adjust "VEAMP" so that width C and D becomes 60mm for 32" and 70mm for 36".

NOTE

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



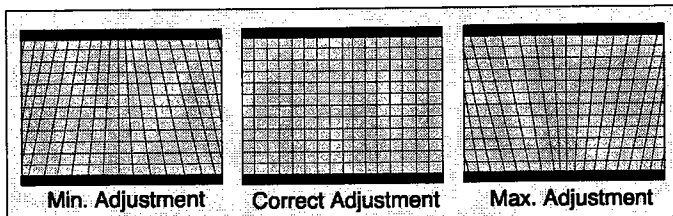
16.9.20. (1080i letter and split) Trapezoid adjustment

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "TRAP" and adjust DATA so that lines at right and left are vertical like a solid line



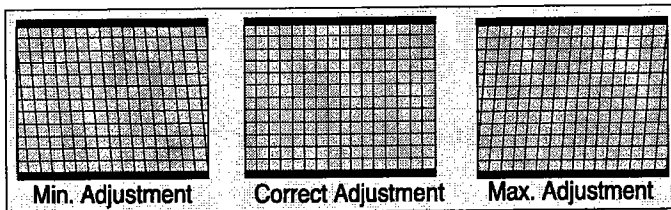
16.9.21. (1080i letter and split) Parallelogram adjustment

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "PARA" and adjust so that the lines at right and left are vertical like solid line.



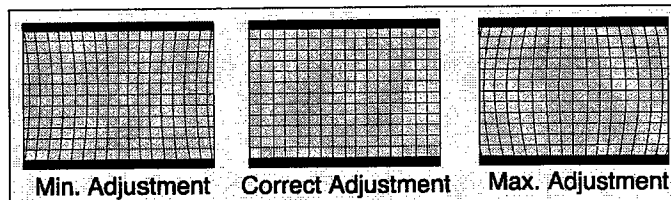
16.9.22. (1080i letter and split) PCC adjustment

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust "PCC" DATA so that the 1st line and 3rd line make a good balance



NOTE:

If upper and lower side is unbalanced, adjust "PCCHG" and "PCCLG" so that "PCC" make good balance.

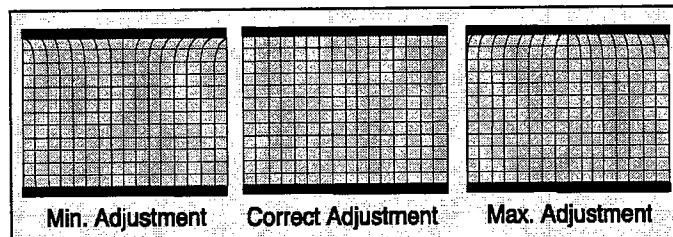
16.9.23. (1080i letter and split) Corner PCC adjustment

PREPARATION

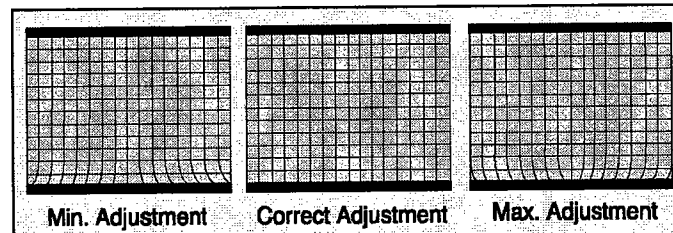
1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. To adjust upper and lower linearity.
2. Adjust "TOPG" to straighten upper lines



3. Adjust "BTMG" to straighten lower lines



NOTE

If TOP-BOTTOM bending point is not so good, adjust "TOPSL" and "BTMSL" of slice level.

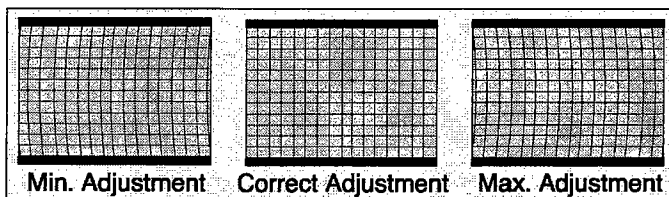
16.9.24. (1080i letter and split) E-W PCC adjustment

PREPARATION

1. Apply a 1080i pattern
2. Normalize the picture settings.
3. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust "SIDE" DATA so that the lines at left and right become vertical



16.9.25. (1080i letter and split) H-Width adjustment

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Adjust "H WID" DATA so that left width and right become in good balance (not too wide or narrow).

16.9.26. (1080i full) H-Size, V-SIZE adjustment

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Set mode to 4x3 in set-up menu
4. Normalize the picture settings.
5. Set picture mode to VIVID

PROCEDURE

1. Adjust "H WID" and "HPOS" DATA so that left width and right become in good balance (not too wide or narrow and centered).
2. Adjust "VEAMP" and "VRAS" DATA so that upper h and lower become in good balance (not too wide or narrow and centered)

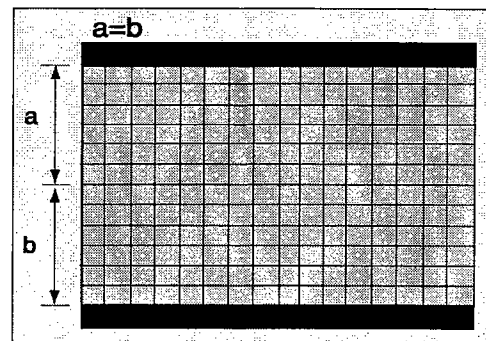
16.9.27. (1080i full) Vertical linearity(V-C) and V- Position adjustment

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Set mode to 4x3 in set-up menu
4. Normalize the picture settings.
5. Set picture mode to VIVID

PROCEDURE

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



3. If the v-position is not at the CRT center, adjust again.

16.9.28. (1080i full) V-S, V-Size adjustment

PREPARATION

1. Use a pattern that permits centering the image
2. Apply a 1080i pattern
3. Set mode to 4x3 in set-up menu
4. Normalize the picture settings.
5. Set picture mode to VIVID

PROCEDURE

1. Enter to service mode
2. Adjust "VAMP" to correct vertical size.
3. Check a and b sizes, If $b-a < -1.5\text{mm}$ (in top and bottom extending case)

- Increase "V-S" DATA by one step
- Adjust "VEAMP" to correct vertical size.

NOTE

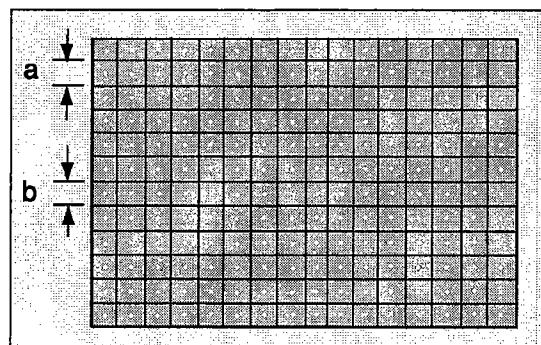
Repeat until $b-a \pm 1.5\text{mm}$

4. Check a and b sizes, If $b-a > -1.5\text{mm}$ (in top & bottom shortening case)

- Decrease "V-S" by one step.
- Adjust "VEAMP" to correct vertical size

NOTE

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



16.9.29. (1080i full) Trapezoid adjustment

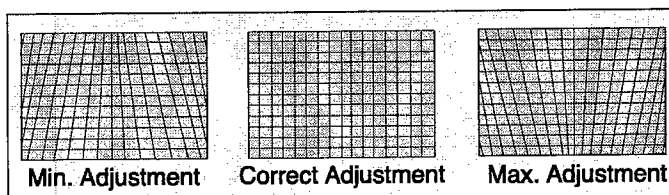
PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.

4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "TRAP" and adjust DATA so that lines at right and left are vertical like a solid line



16.9.30. (1080i full)

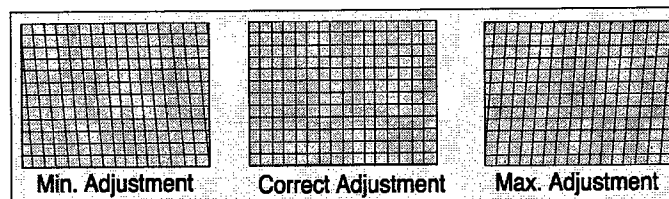
Parallelogram adjustment

PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Enter service mode, select "PARA" and adjust so that the lines at right and left are vertical like solid line.



16.9.31. (1080i full)

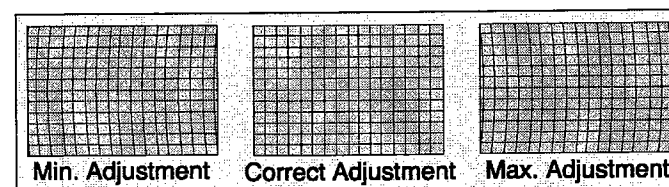
E-W PCC adjustment

PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.
4. Set picture mode to VIVID

PROCEDURE

1. Confirm that trapezoid adjustment is done.
2. Adjust "SIDE" DATA so that the lines at left and right become vertical



16.9.32. (1080i full)

Corner PCC adjustment

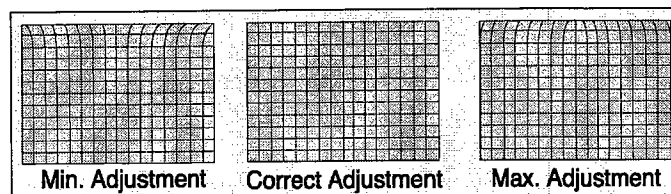
PREPARATION

1. Apply a 1080i pattern
2. Set mode to 4x3 in set-up menu
3. Normalize the picture settings.

4. Set picture mode to VIVID

PROCEDURE

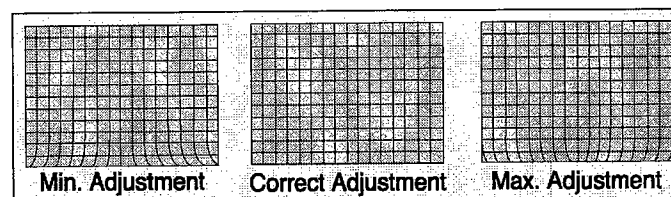
1. To adjust upper and lower linearity.
2. Adjust "TOPG" to straighten upper lines



3. Adjust "BTMG" to straighten lower lines

NOTE

If TOP-BOTTOM bending point is not so good, adjust "TOPSL" and "BTMSL" of slice level.



16.10. MTS circuit adjustments

The MTS circuit adjustments require two steps:

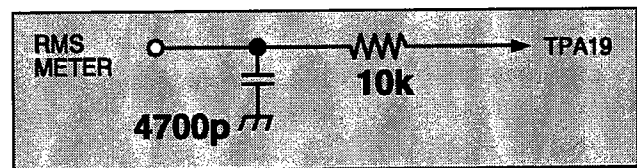
1. Input level adjustment.
2. Stereo separation adjustment.

Input level adjustment

Service DAC adjustment (MTSIN)

PREPARATION

1. Connect an RMS meter with filter jig as shown in figure to TPA19 (L_OUT)



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 \pm 5dB, 75 Ω OPEN, P/S 10dB). Make sure that the 75 μ s pre-emphasis is OFF.

2. Adjust the MTS input level adjustment "MTSIN" data until the RMS voltage measured is 106 \pm 6.0mVrms.

Stereo separation adjustment (SEPAH)

PREPARATION

1. Connect an R.F. signal generator to the RF antenna input.
2. Connect a scope to TPA20.

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.

16.11. Clock adjustment (CLOCK)

PREPARATION

Connect the frequency counter from TP96 (A23 pin 21) to cold ground

PROCEDURE

1. Turn the receiver "OFF" with the A.C. power applied.
2. Measure TP96 (A23 pin 21) for the frequency of the waveform and record the reading.

NOTE

3. TP96 (A23 pin 21) 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:

$$CLOCK = 128 + (0.450) \times 10^6 \frac{[(732.4220) - TP96[Hz]]}{(732.4220)}$$

NOTE

TP96 (A23 pin 21) measurement will not change regardless of the value stored in CLOCK.

16.12. Service Adjustments Mechanical Controls

WIDTH CORRECTION ADJUSTMENT

Note

Perform this adjustment only when FBT is changed.

Preparation

Connect the DVM (digital voltage meter) (+) lead to connector D10 pin-2 or TPQ27; and (-) lead to connector D10 pin-4.

Procedure

1. Apply a black pattern.
2. Adjust R524 on D-Board so that the voltage on connector D10 pin-2 or TPQ27 is $1.8 \pm 0.1V$ on D-Board.

FOCUS (PART OF T551)

Preparation

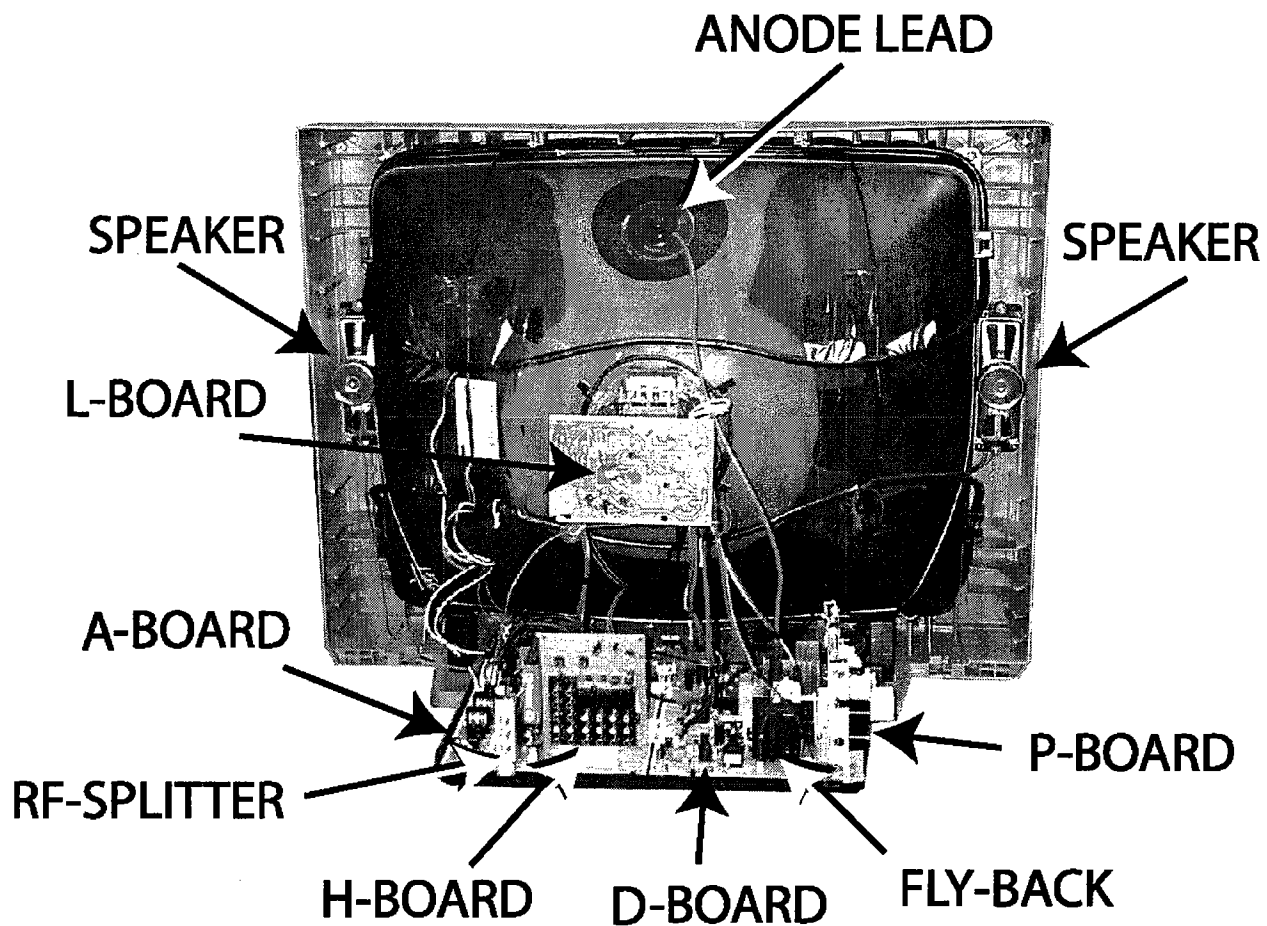
Apply a crosshatch pattern with dots.

Procedure

1. Adjust the FOCUS control to obtain the sharpest and clearest dot pattern.
 - F1 focus control adjusts vertically.
 - F2 focus control adjusts horizontally.
 - Use this two controls to adjust focus, until best overall picture is obtained.

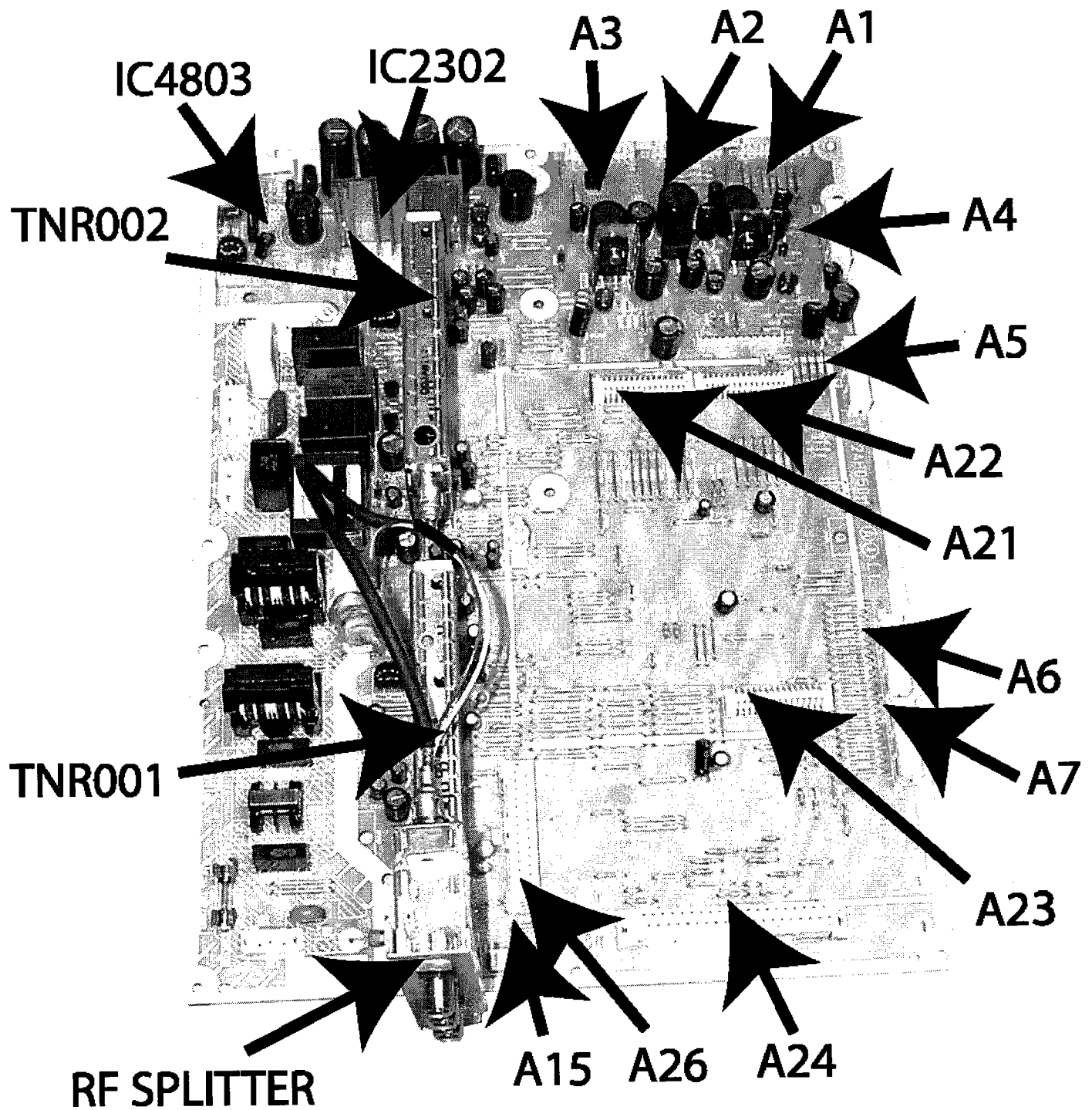
17 Identification of components

17.1. TV with back cover removed (may vary depending on model)



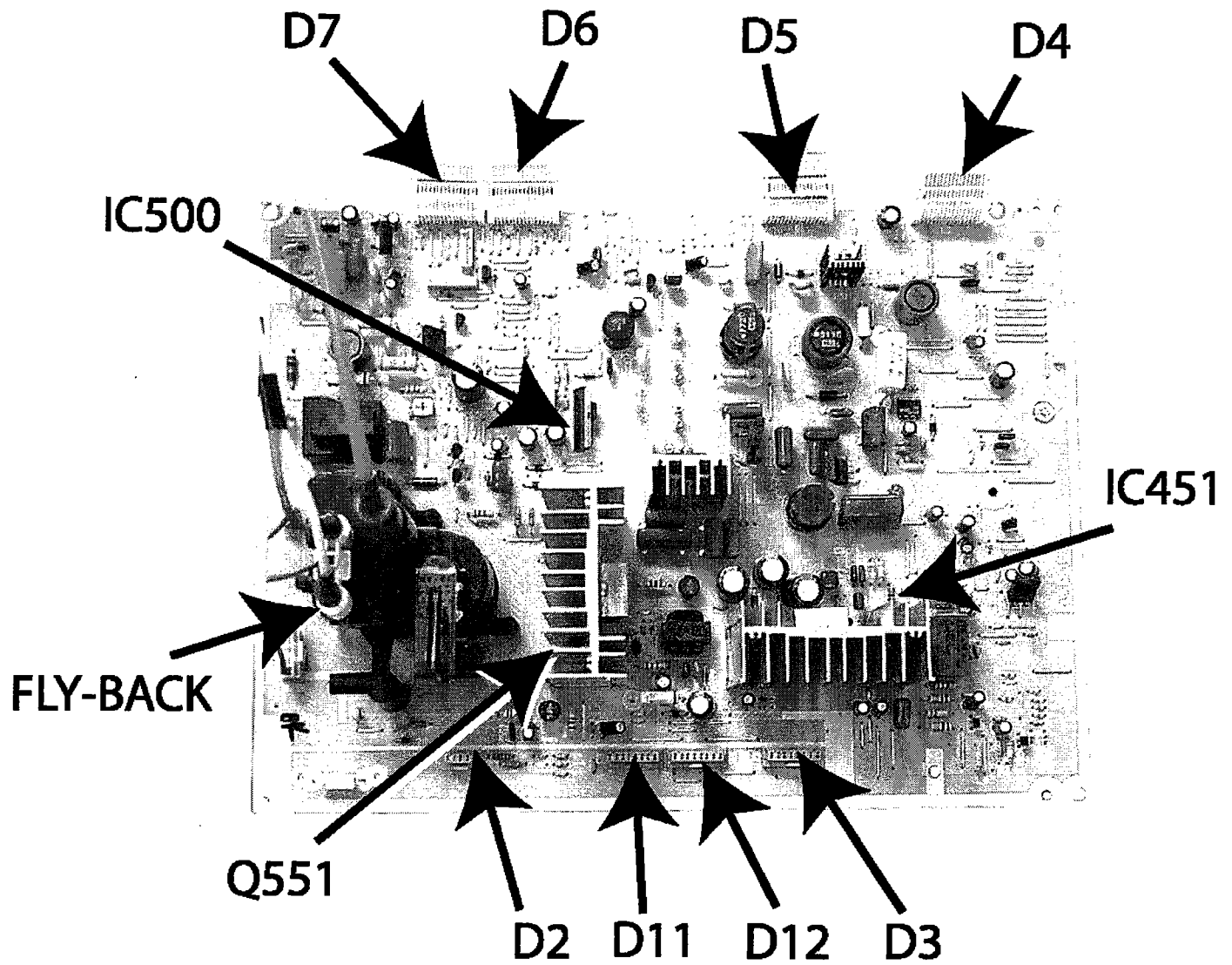
TV View with back cover removed

17.2. A-Board



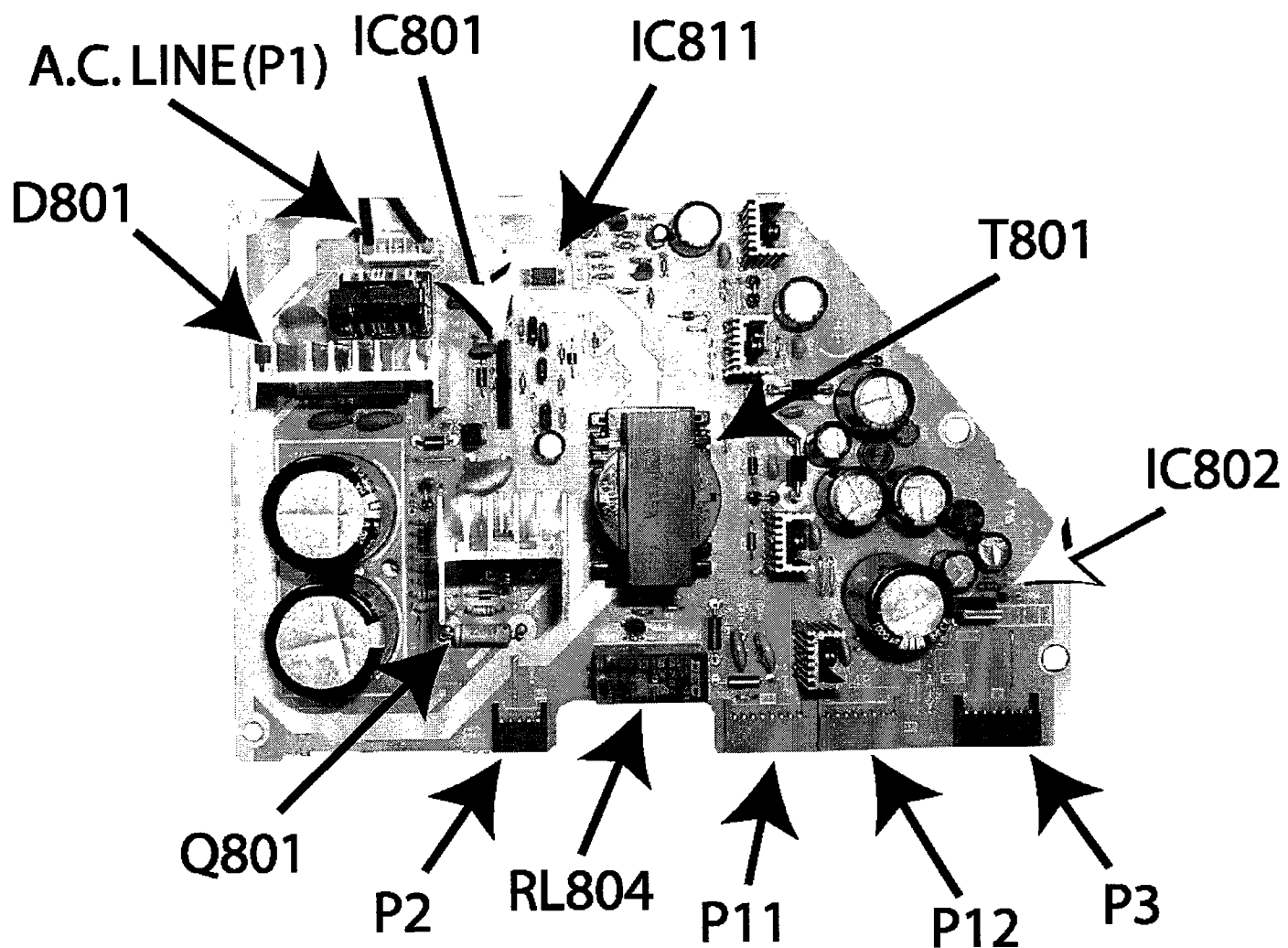
A-Board view

17.3. D-Board



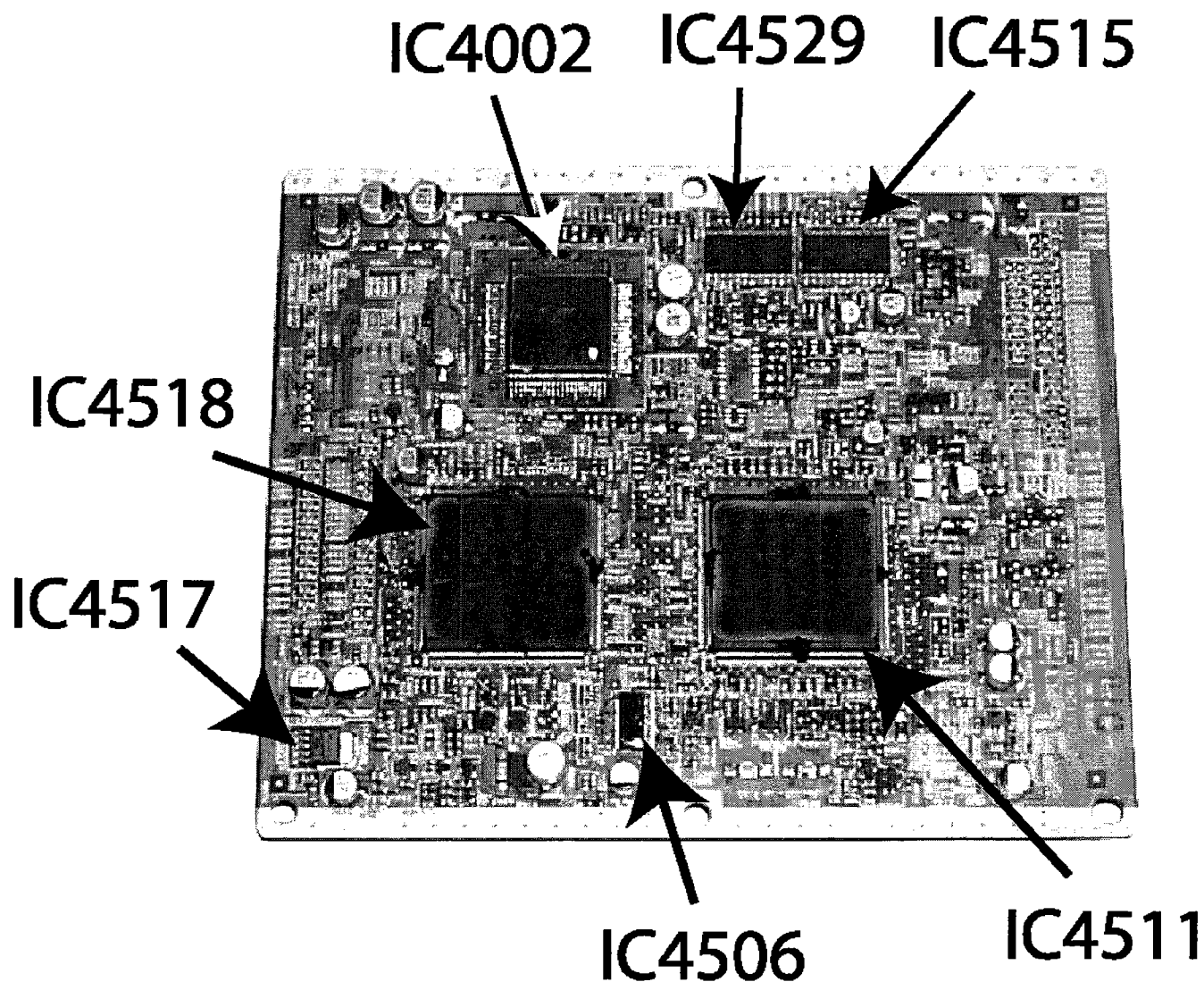
D-Board view

17.4. P-Board



P-Board view

17.5. DG-Board top

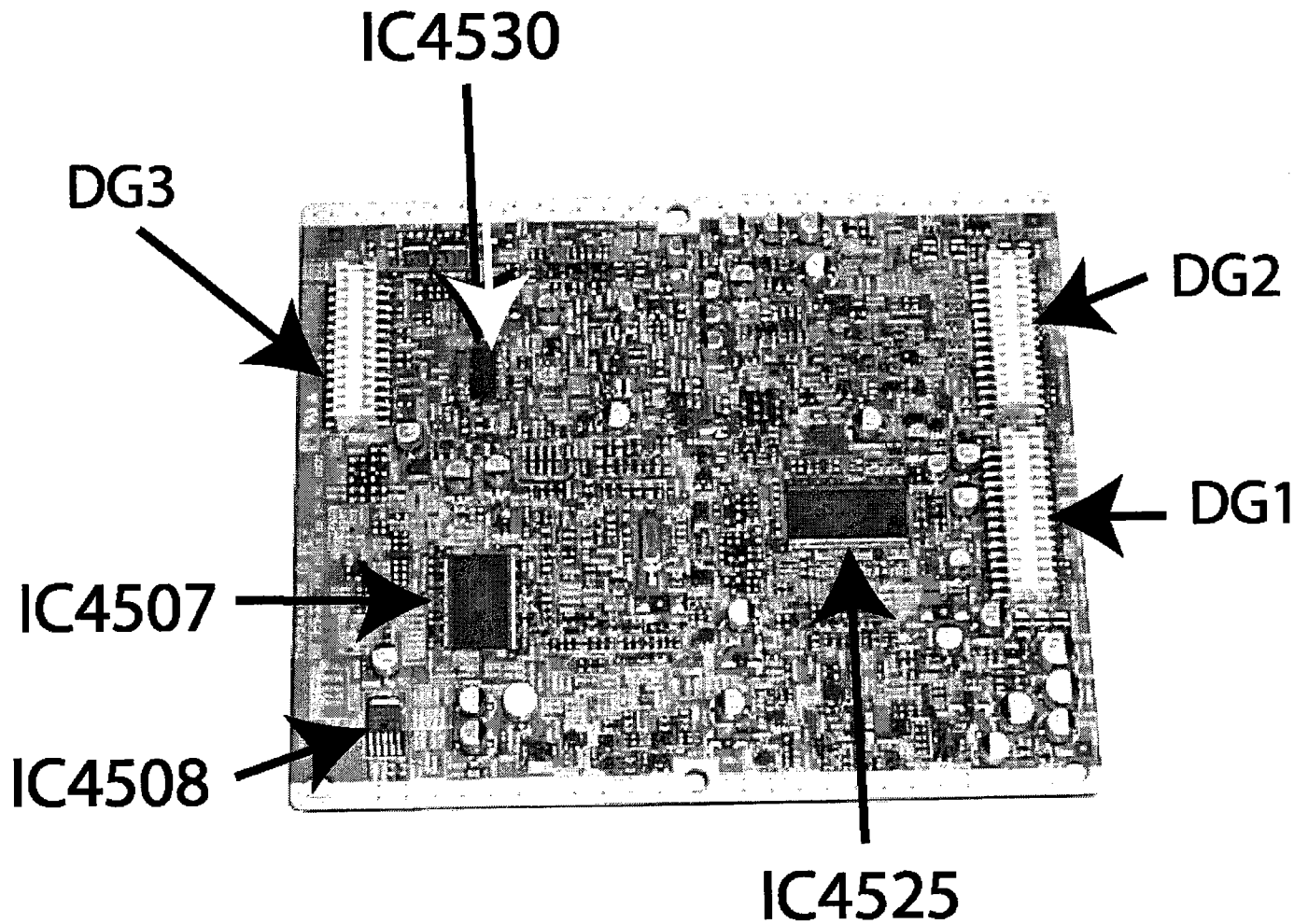


DG-Board top view

NOTE:

Please ADD "4" to all IC part numbers, EXAMPLE: On board is IC506, then by adding "4" is IC4506

17.6. DG-Board bottom

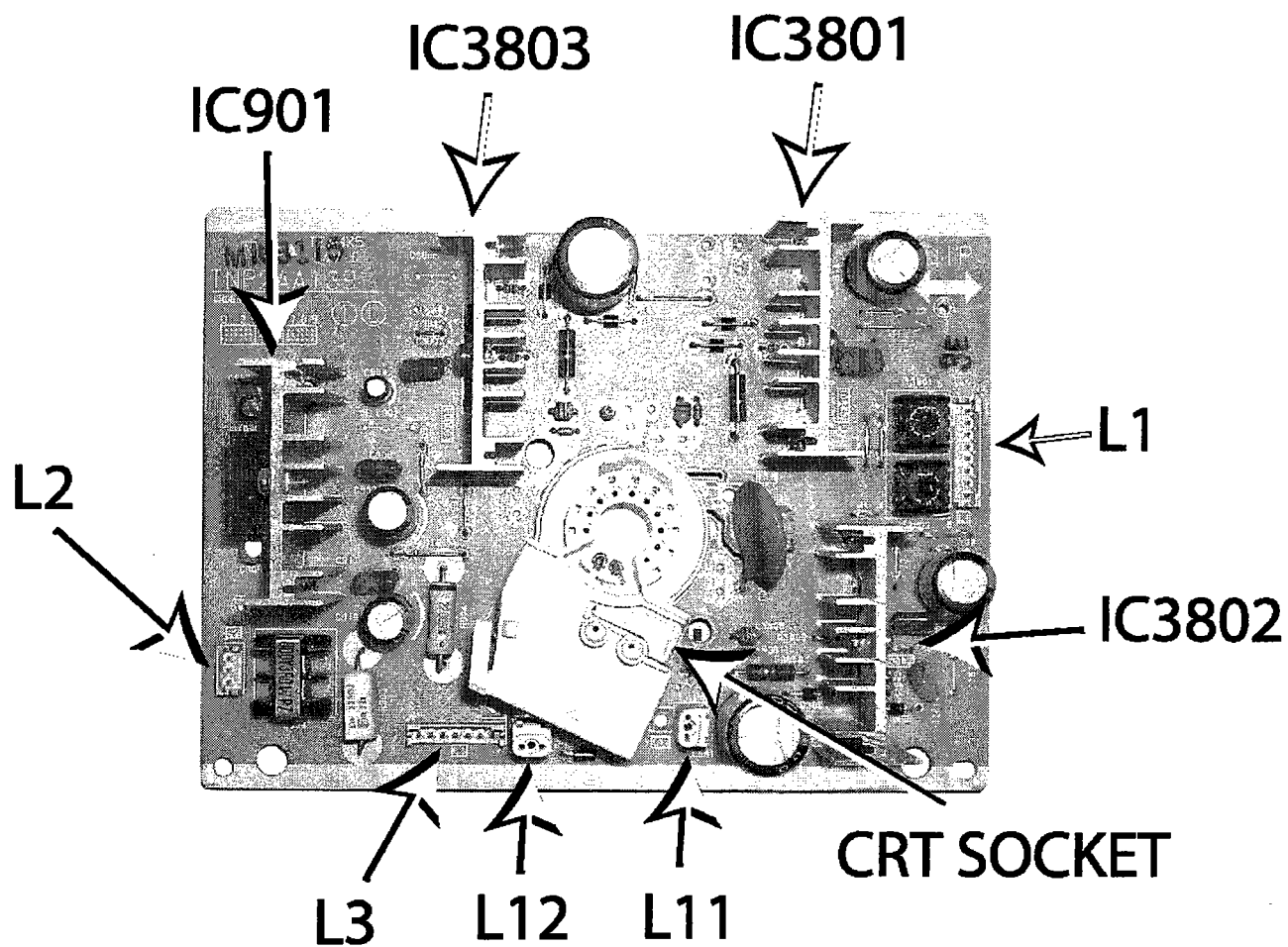


DG-Board bottom view

NOTE:

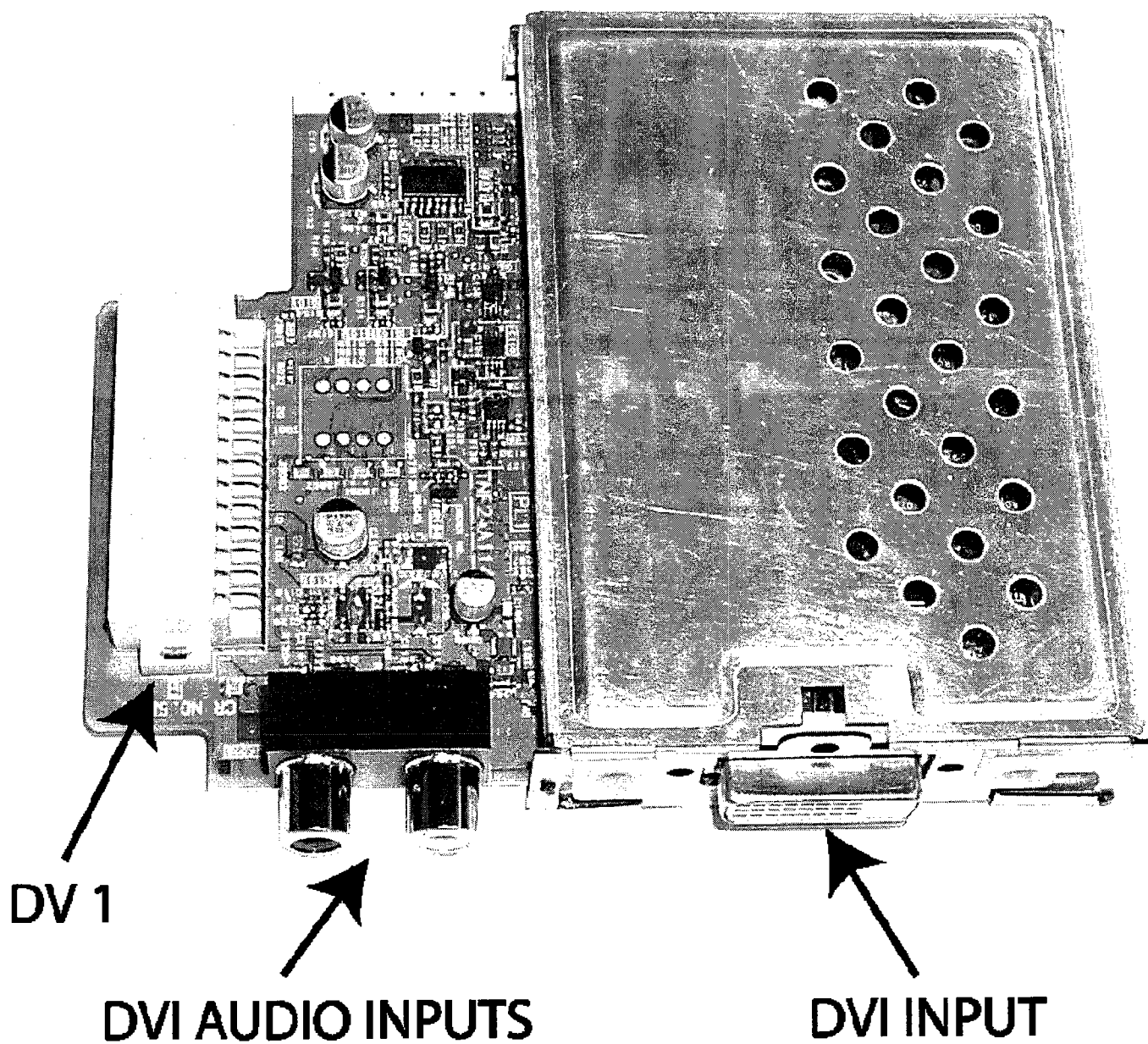
Please ADD "4" to all IC part numbers, EXAMPLE: On board is IC525, then by adding "4" is IC4525

17.7. L-Board



L-Board view

17.8. DV-Board (only for HL models)



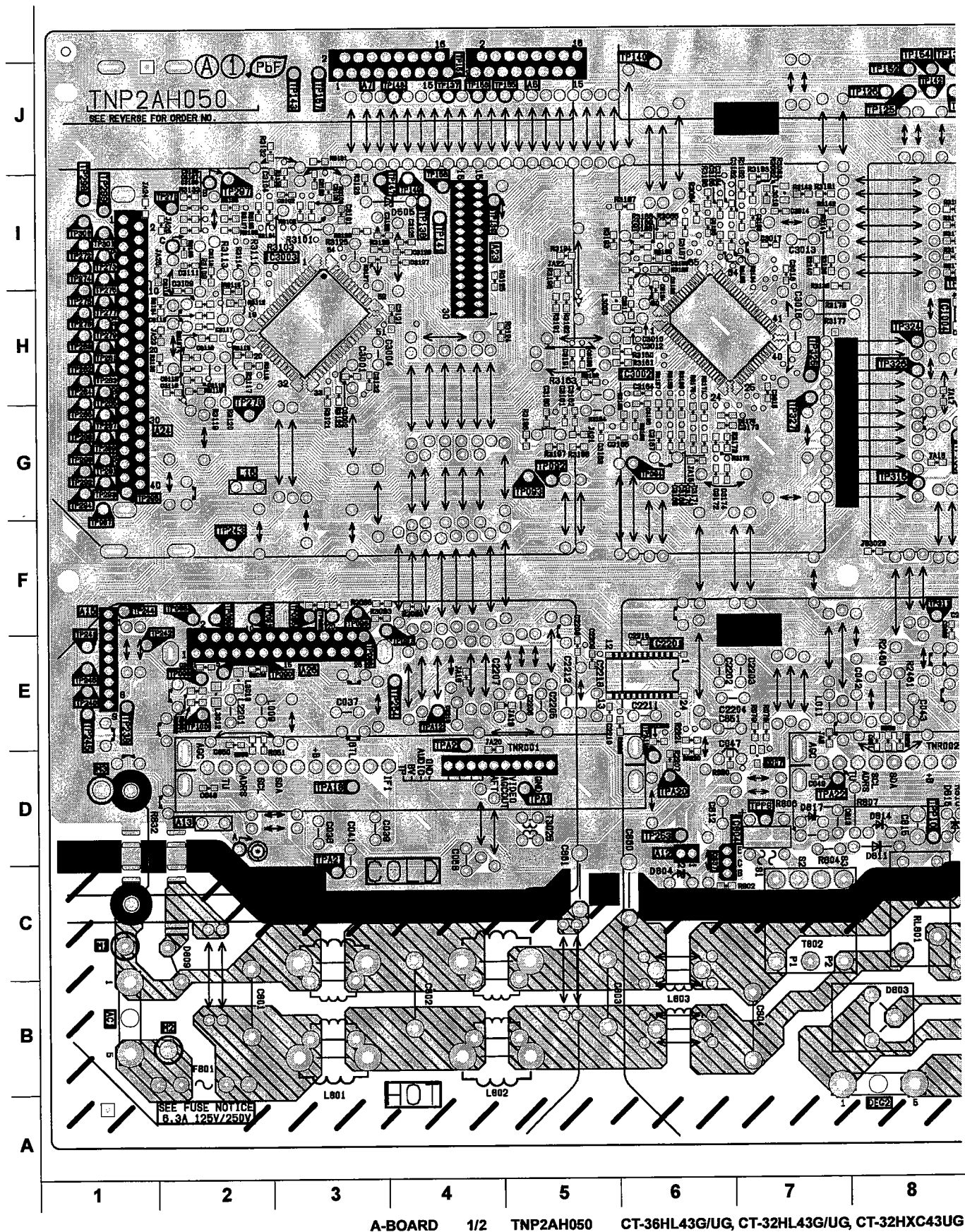
DV-Board view

18 Reference of PDF links color

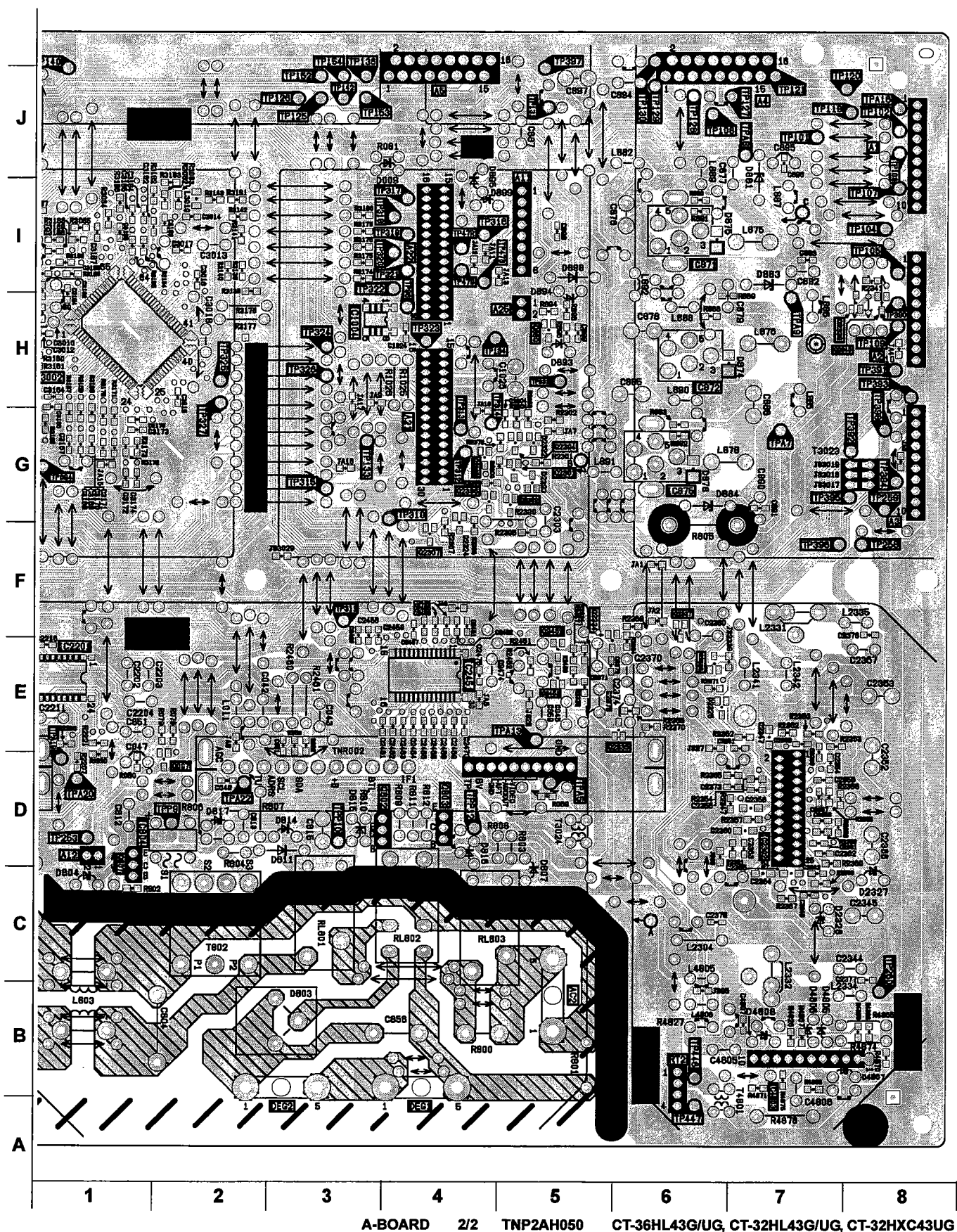
DESCRIPTION OF PDF LINK COLORS	
TYPE	DESTINATION
SCHEMATIC	
YELLOW ON IC	IC ON PCB
YELLOW ON CONNECTOR	CONNECTOR ON PCB
YELLOW ON SCHEMATIC	PCB
CYAN	WAVEFORM
GREEN ON SIDE	SCHEMATIC CONTINUED
GREEN ON CONNECTOR	CONNECTOR CONNECTION
BLUE ON IC	VOLTAGE
PCB	
BLUE ON IC	IC ON SCHEMATIC
BLUE ON CONNECTOR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

19 Conductor Views

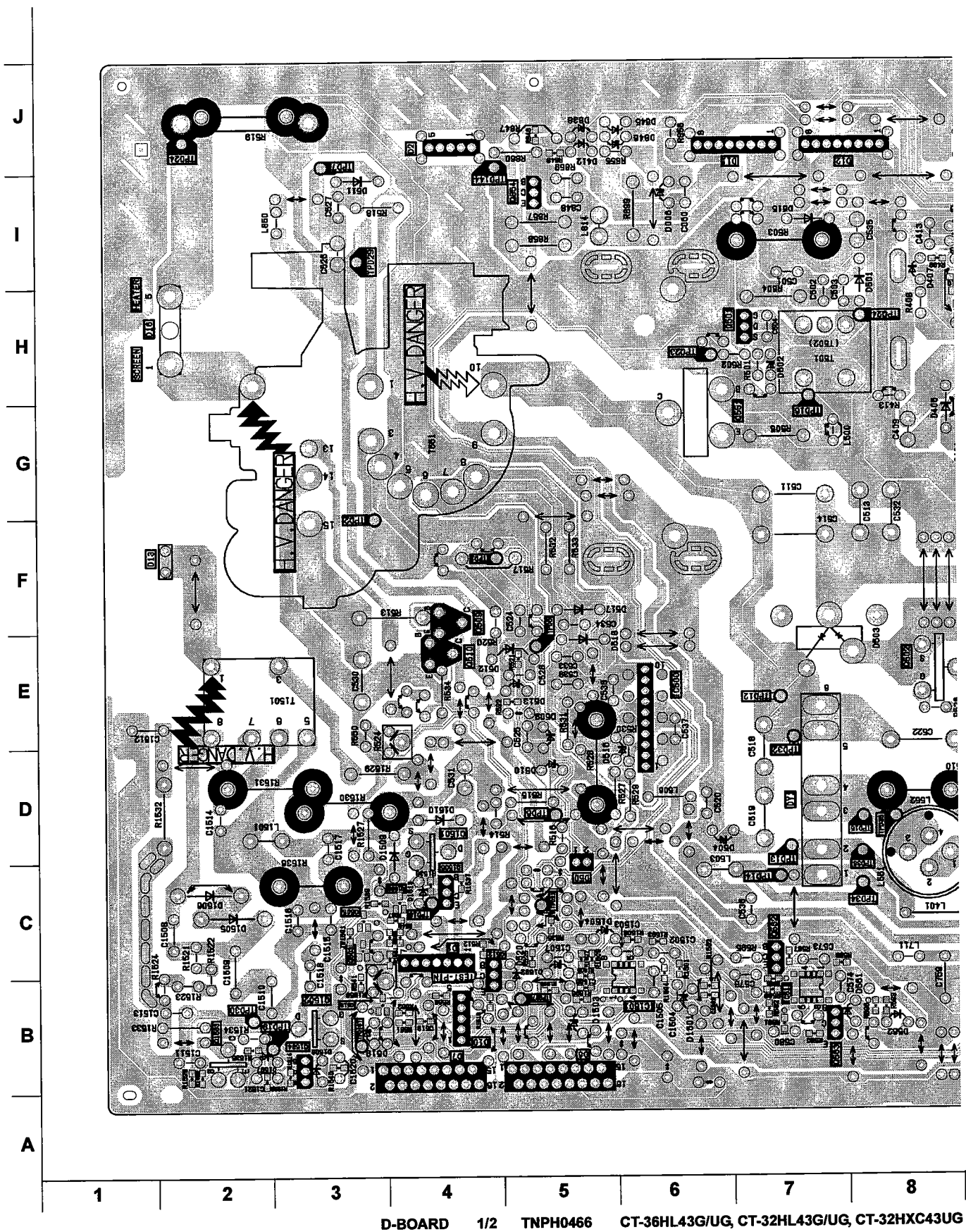
19.1. A-Board 1 of 2



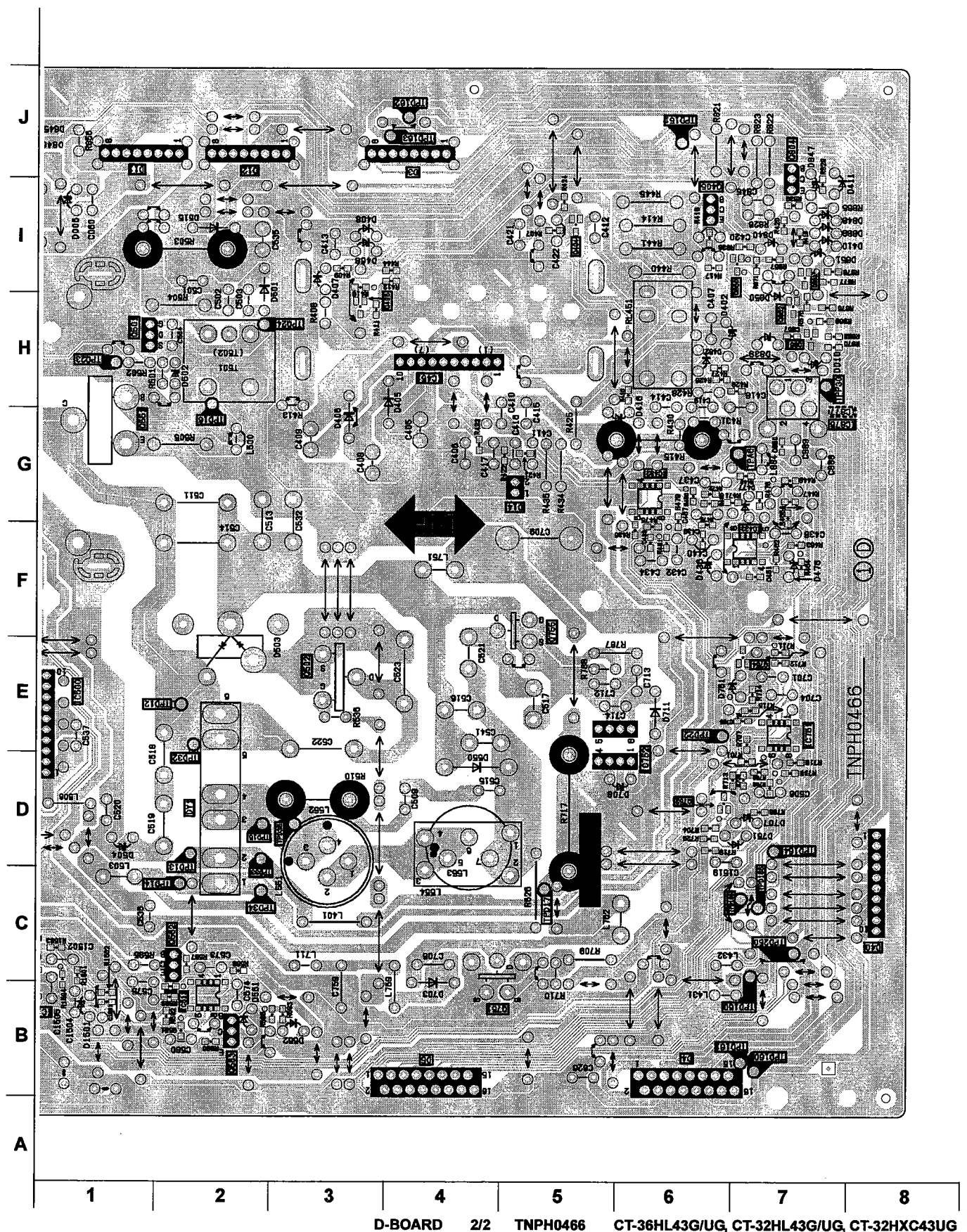
19.2. A-Board 2 of 2



19.3. D-Board 1 of 2



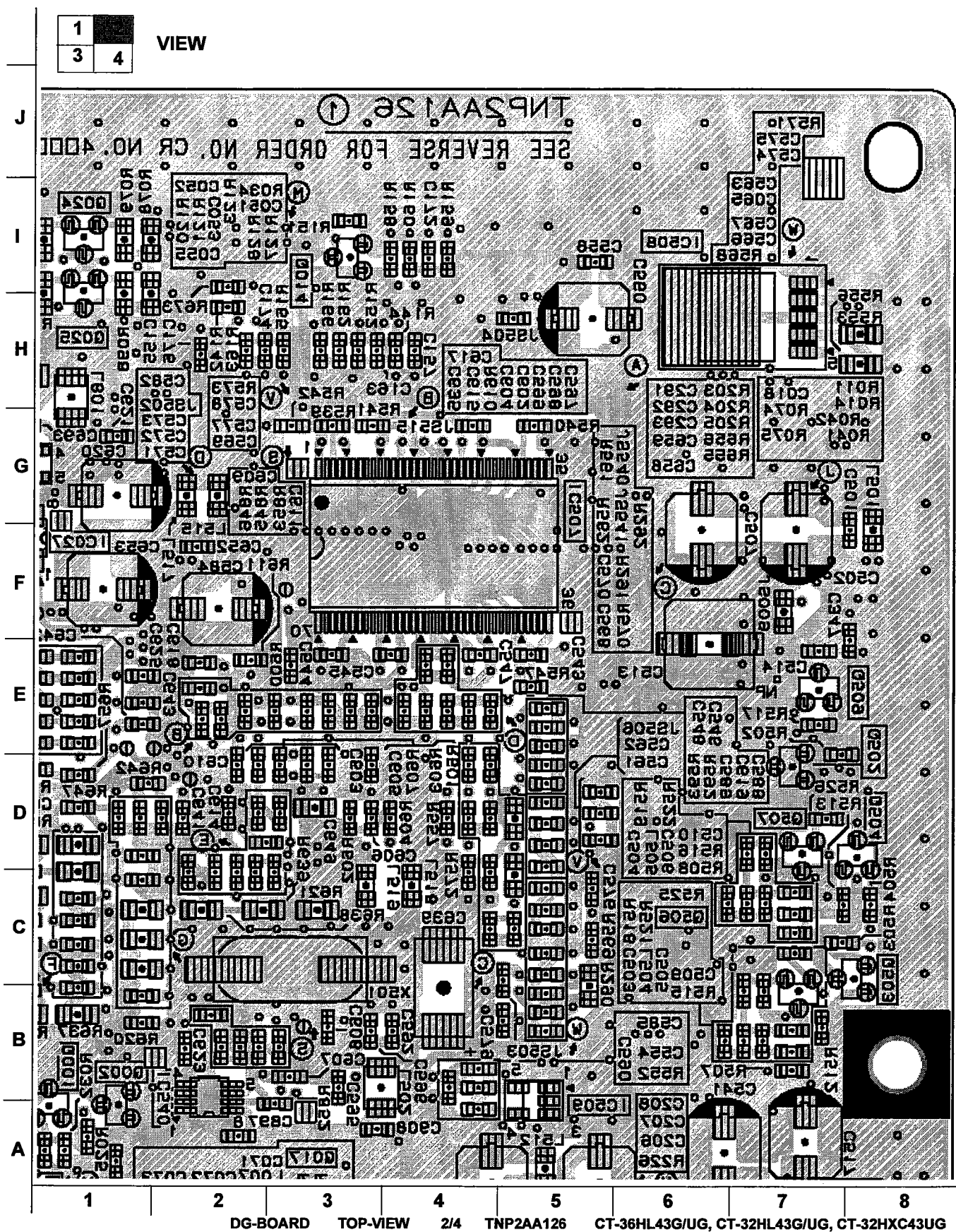
19.4. D-Board 2 of 2



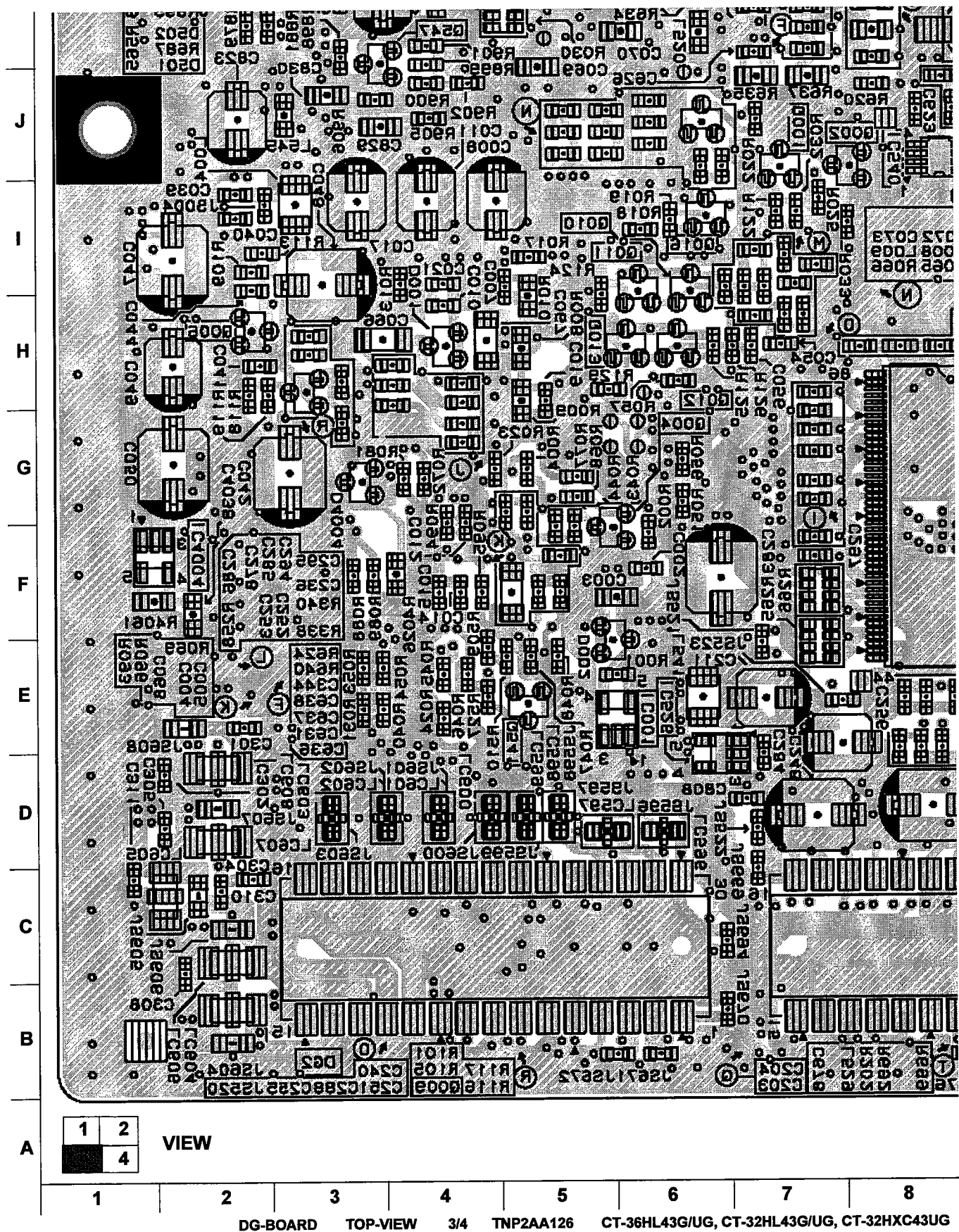
19.5. DG-Board top 1 of 4



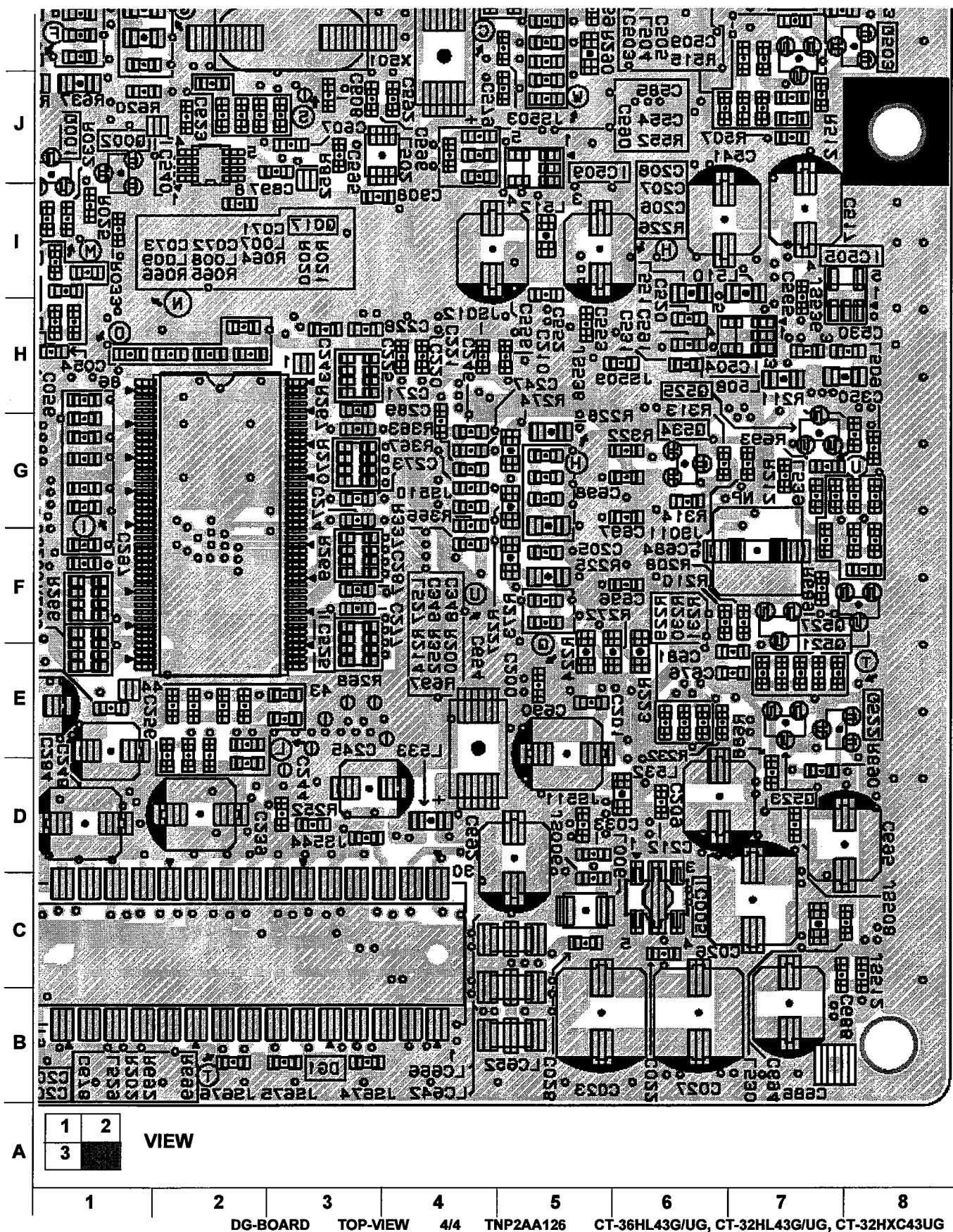
19.6. DG-Board top 2 of 4



19.7. DG-Board top 3 of 4



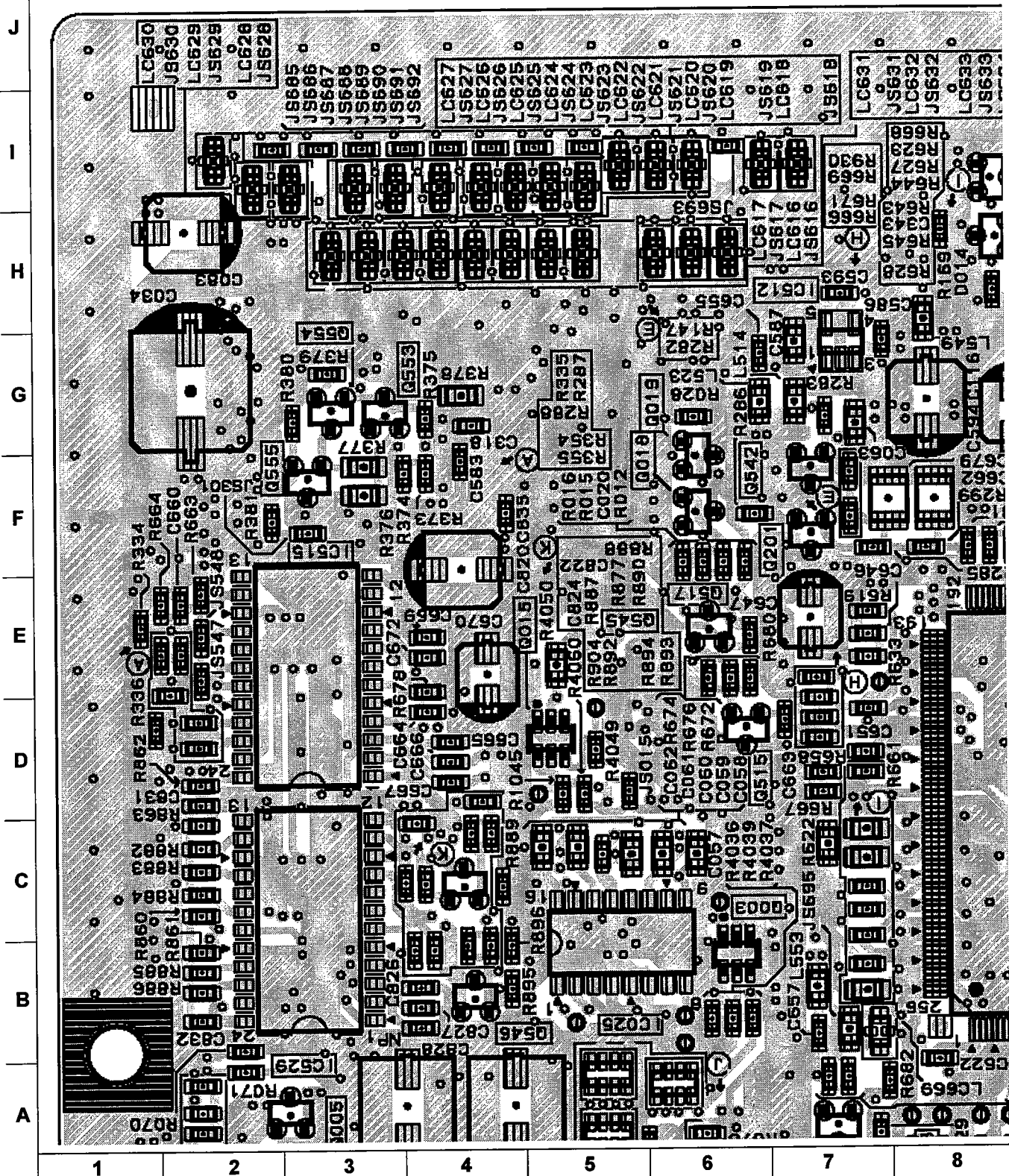
19.8. DG-Board top 4 of 4



19.9. DG-Board bottom 1 of 4

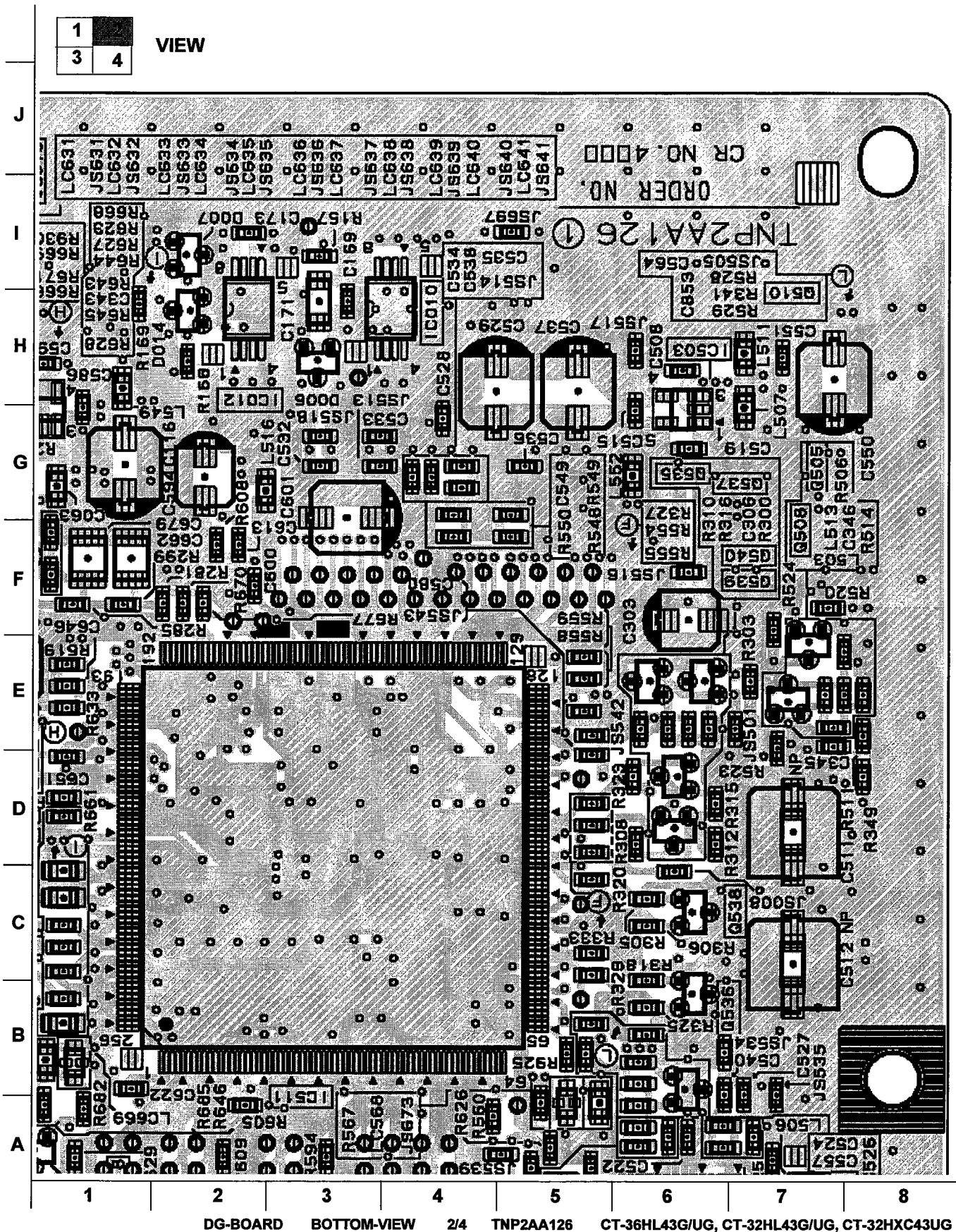
	2
3	4

VIEW

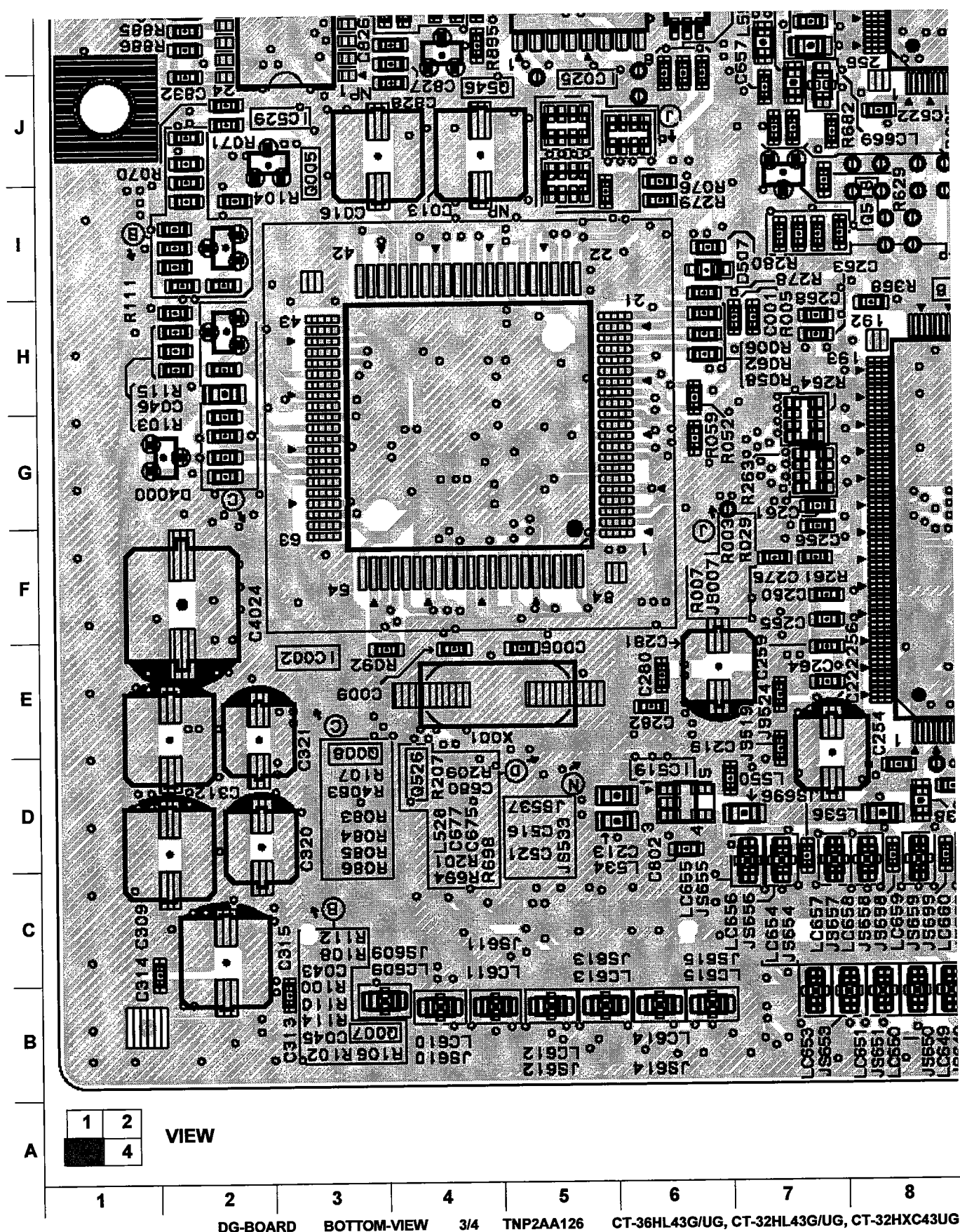


DG-BOARD BOTTOM-VIEW 1/4 TNP2AA126 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG

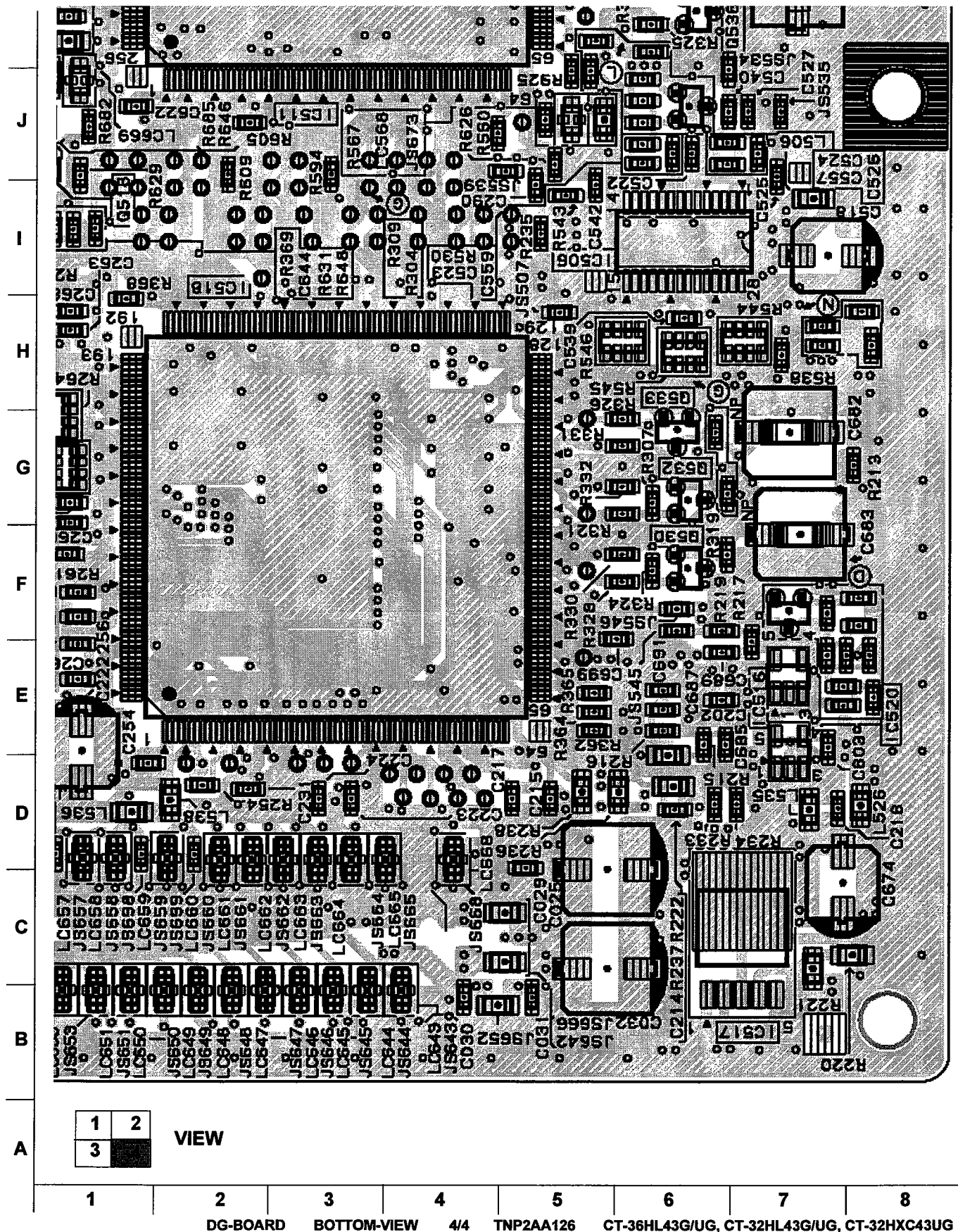
19.10. DG-Board bottom 2 of 4



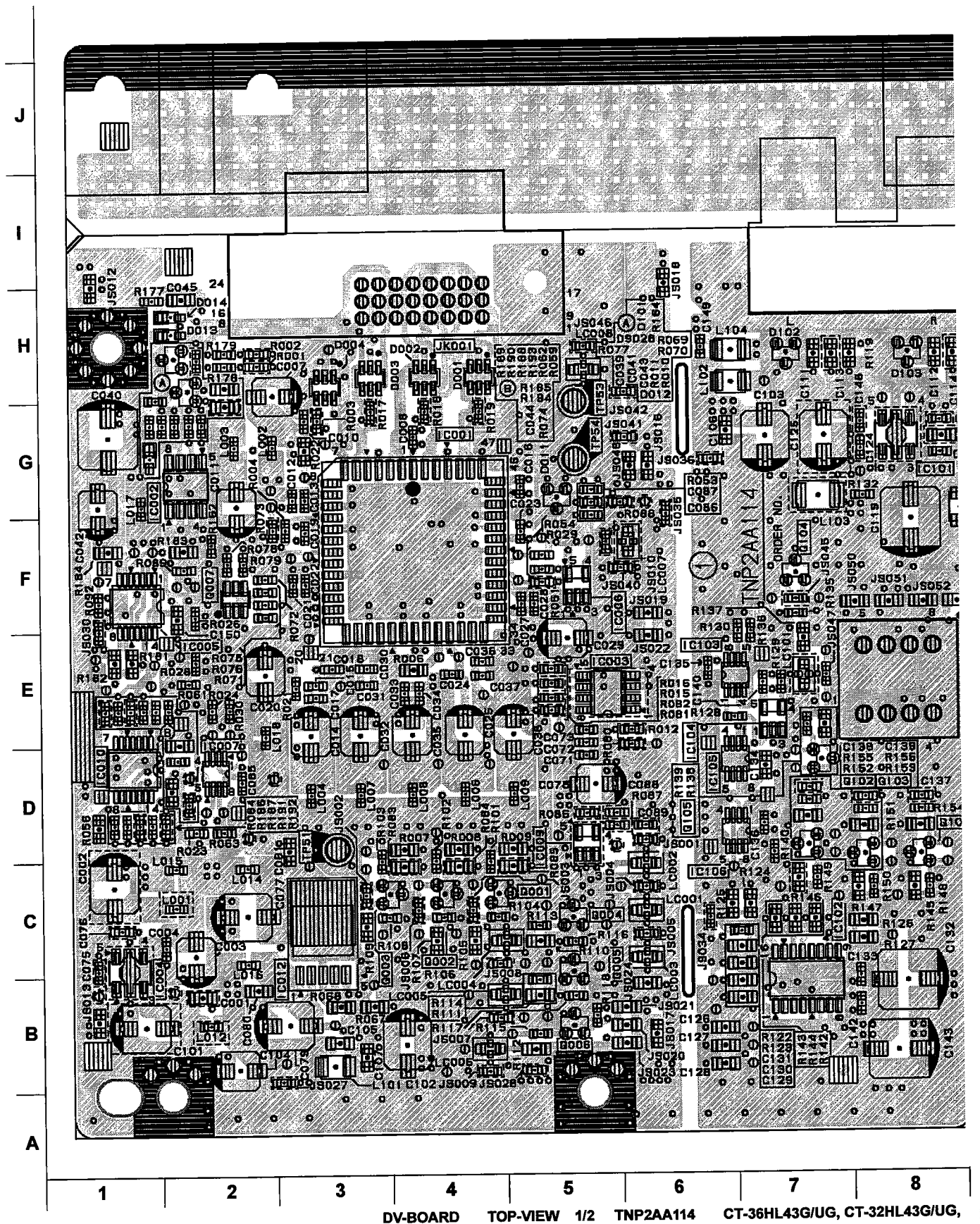
19.11. DG-Board bottom 3 of 4



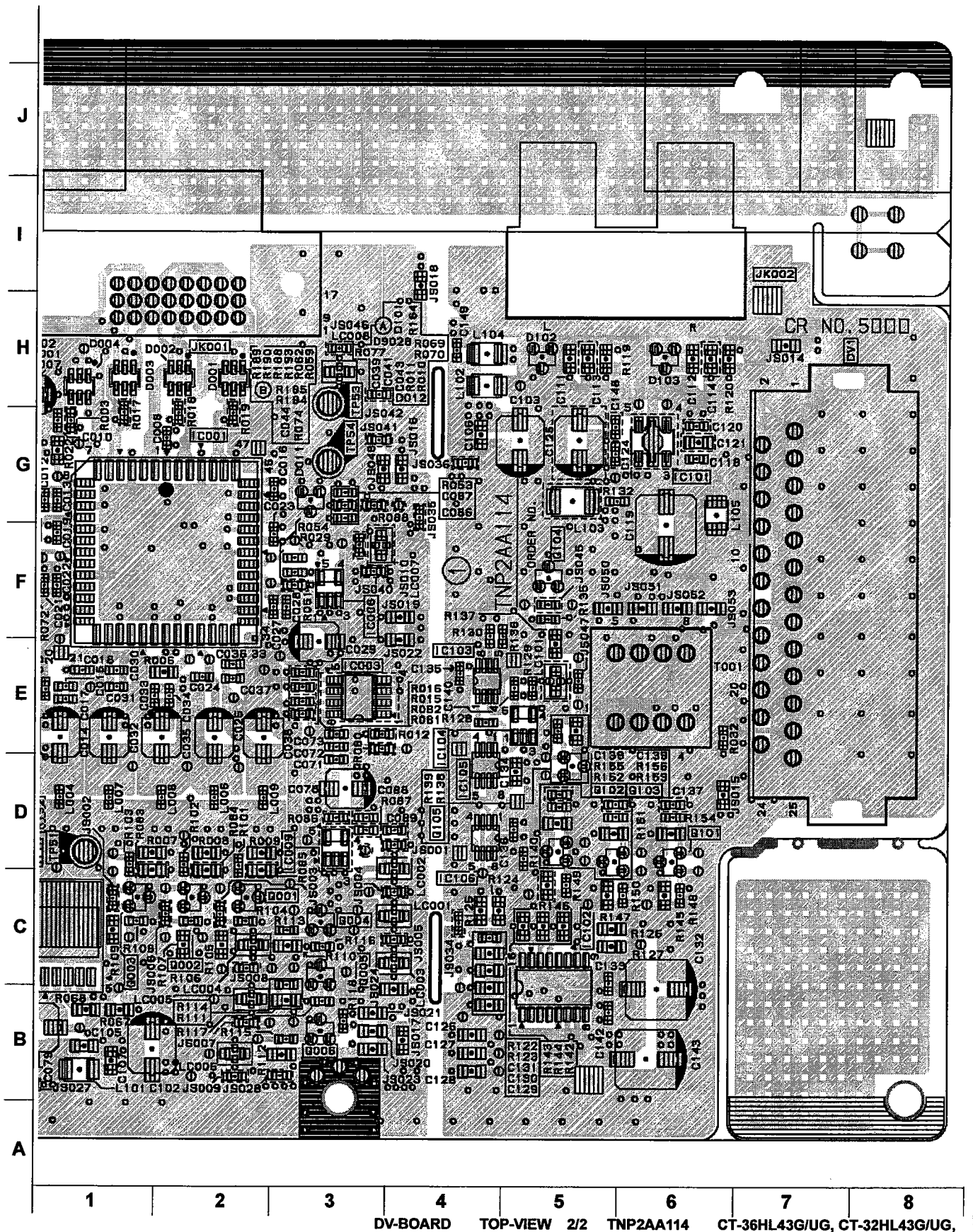
19.12. DG-Board bottom 4 of 4



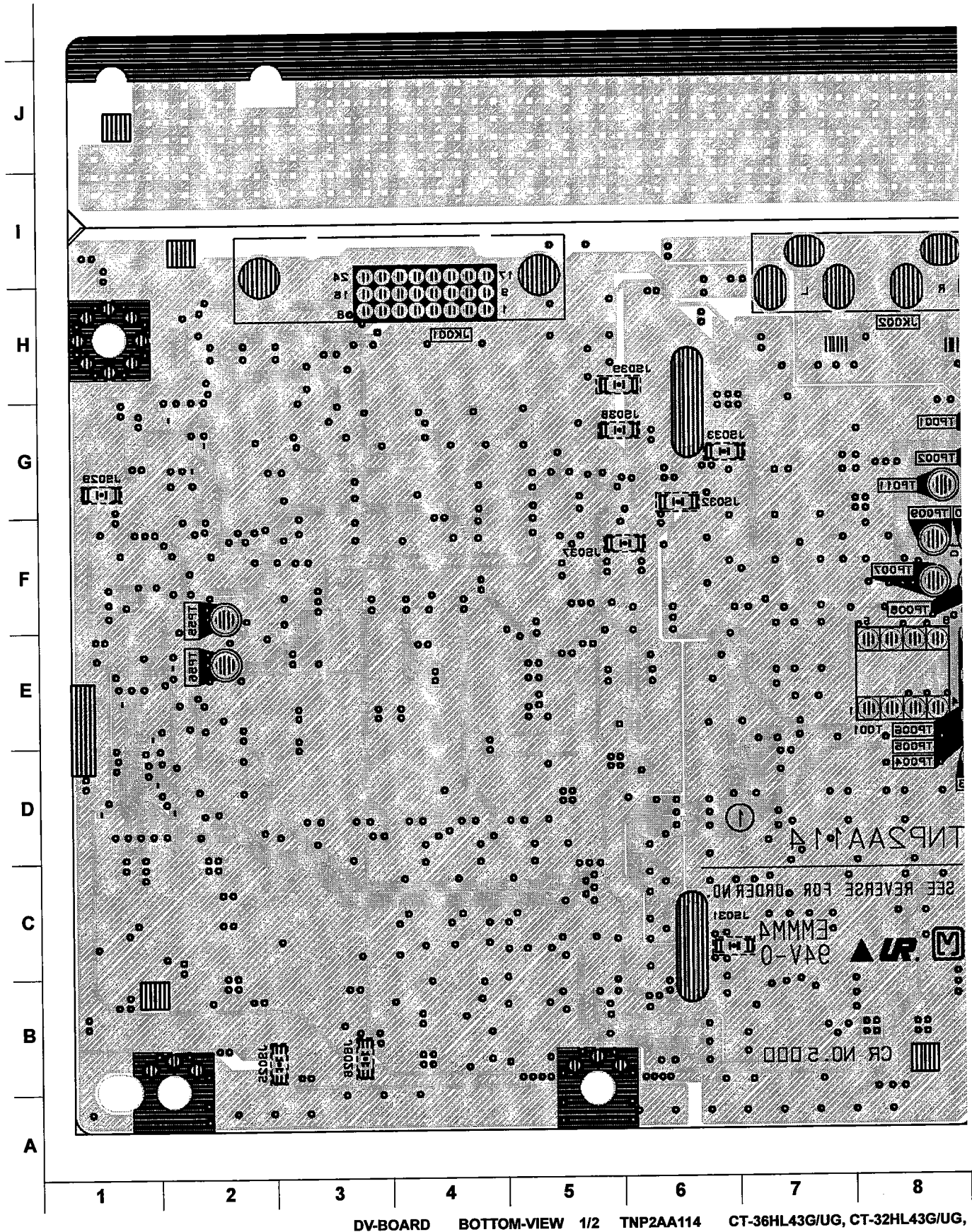
19.13. DV-Board top 1 of 2



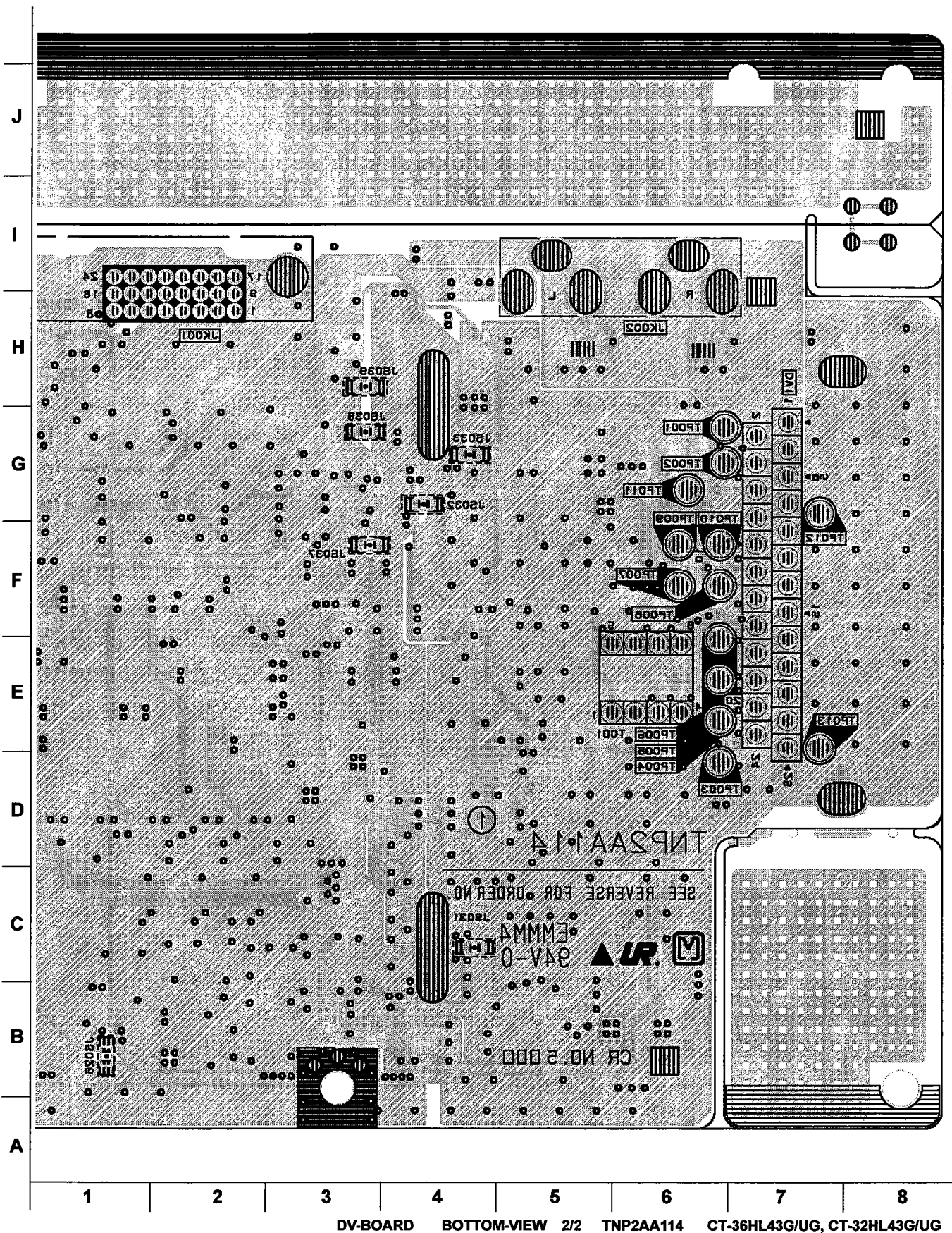
19.14. DV-Board top 2 of 2



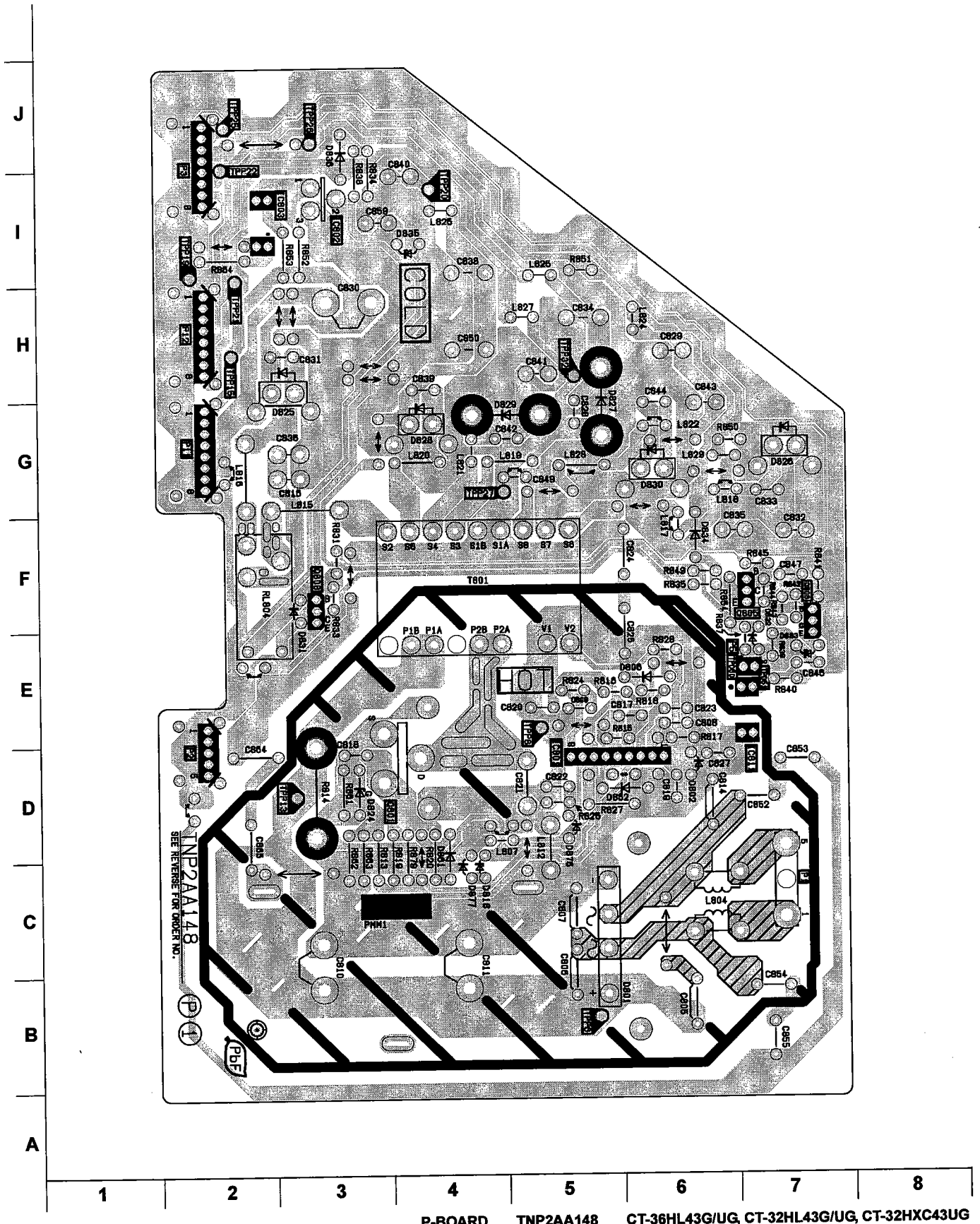
19.15. DV-Board bottom 1 of 2



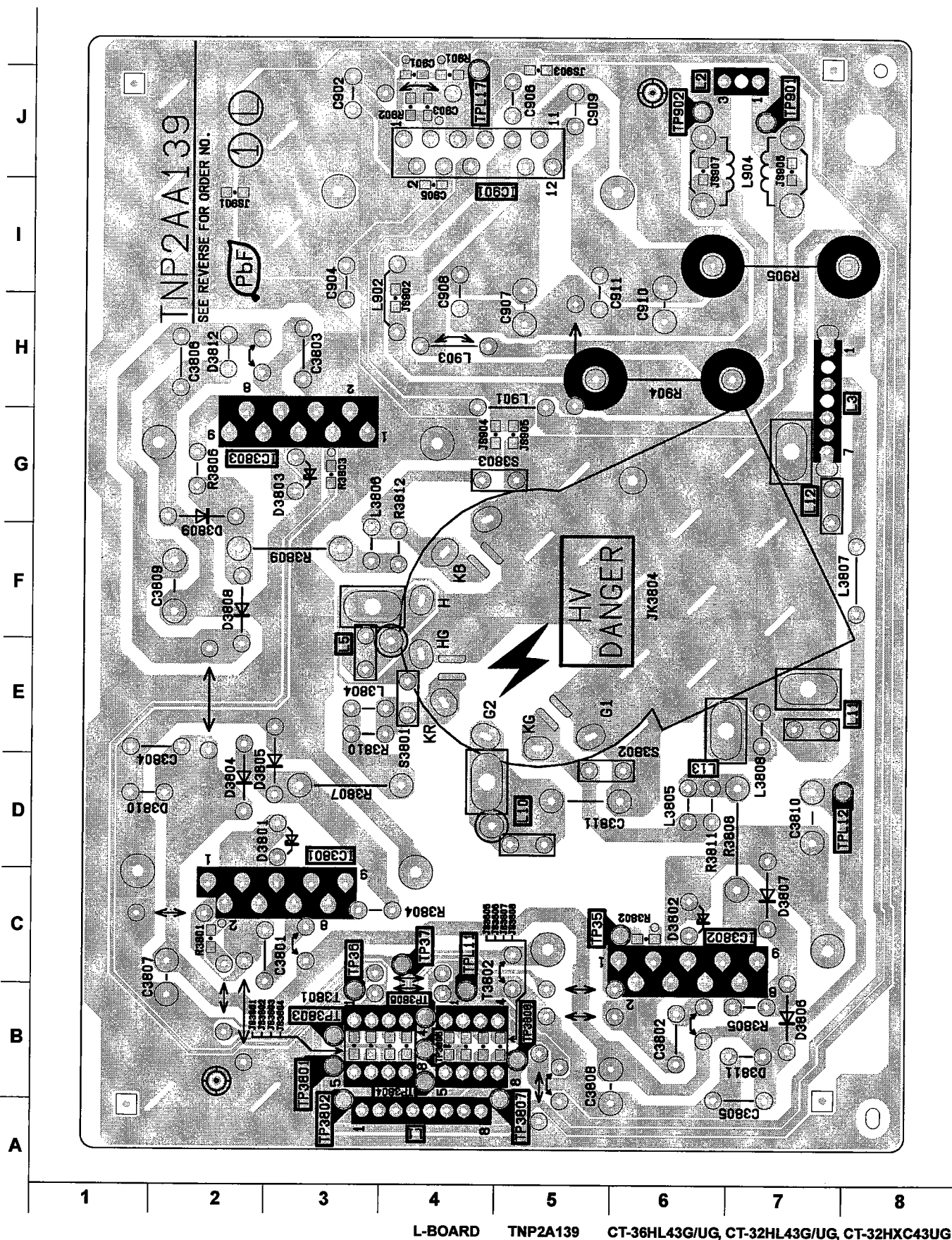
19.16. DV-Board bottom 2 of 2



19.17. P-Board



19.18. L-Board



19.19. H-Board

J

I

H

G

F

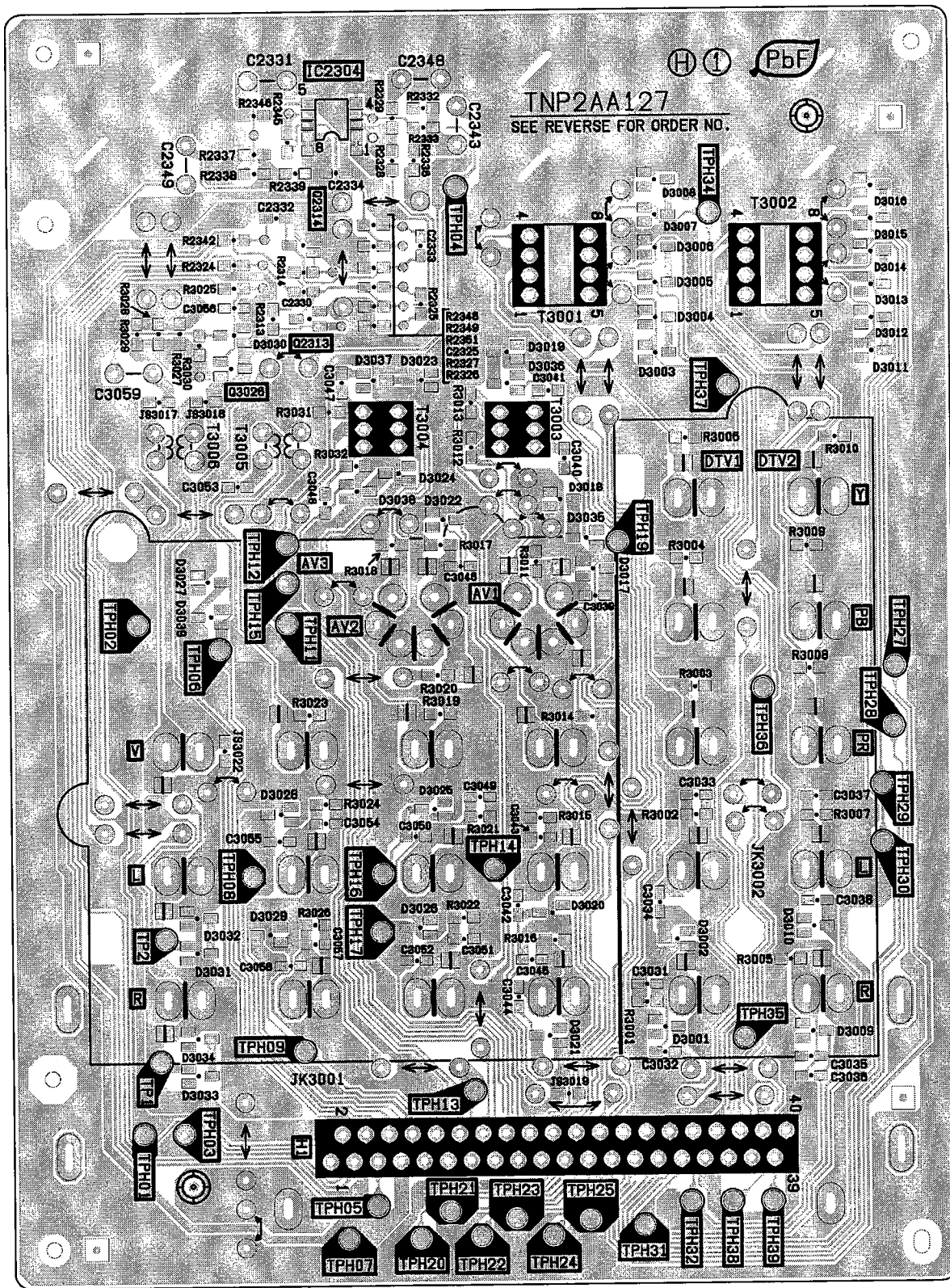
E

D

C

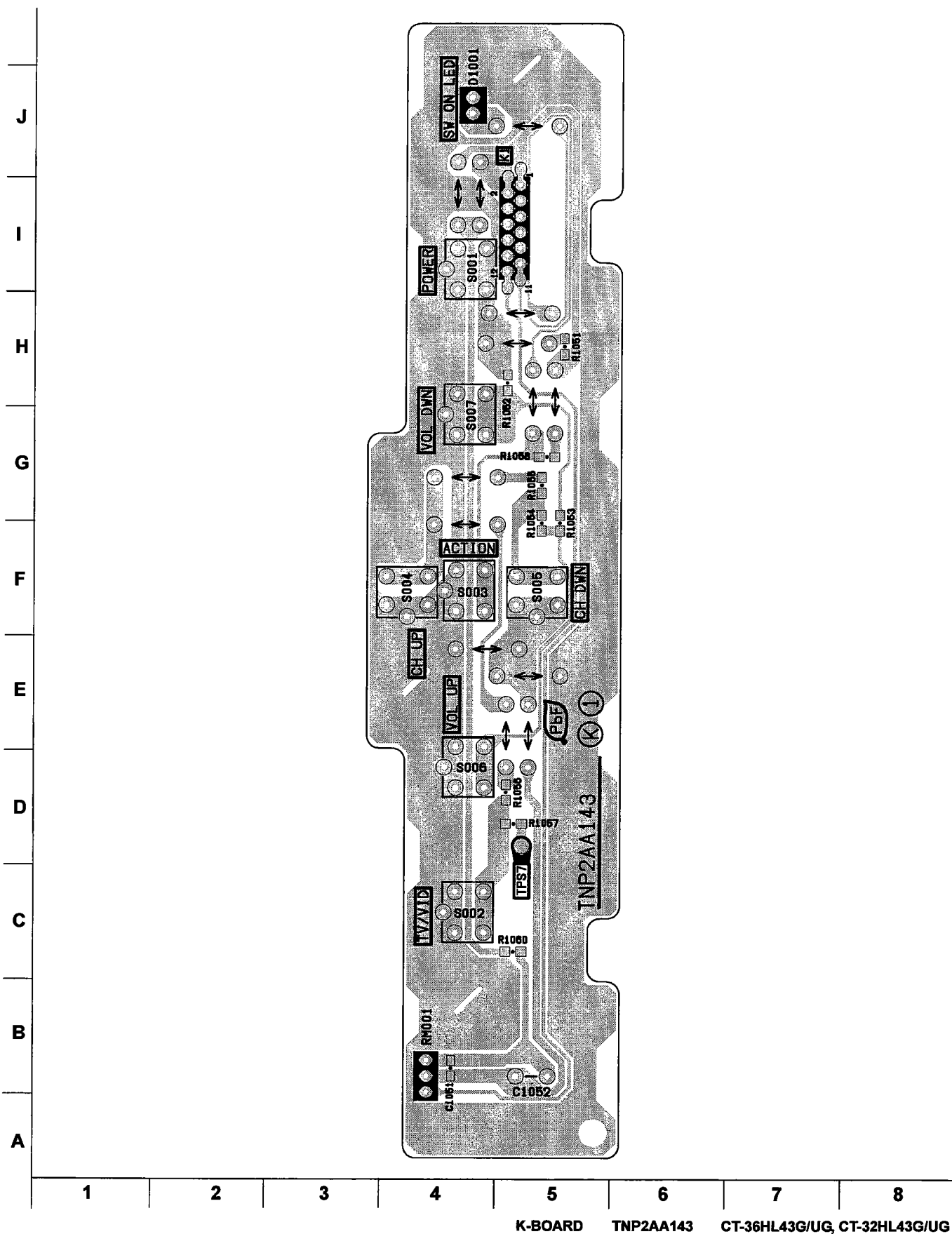
B

A

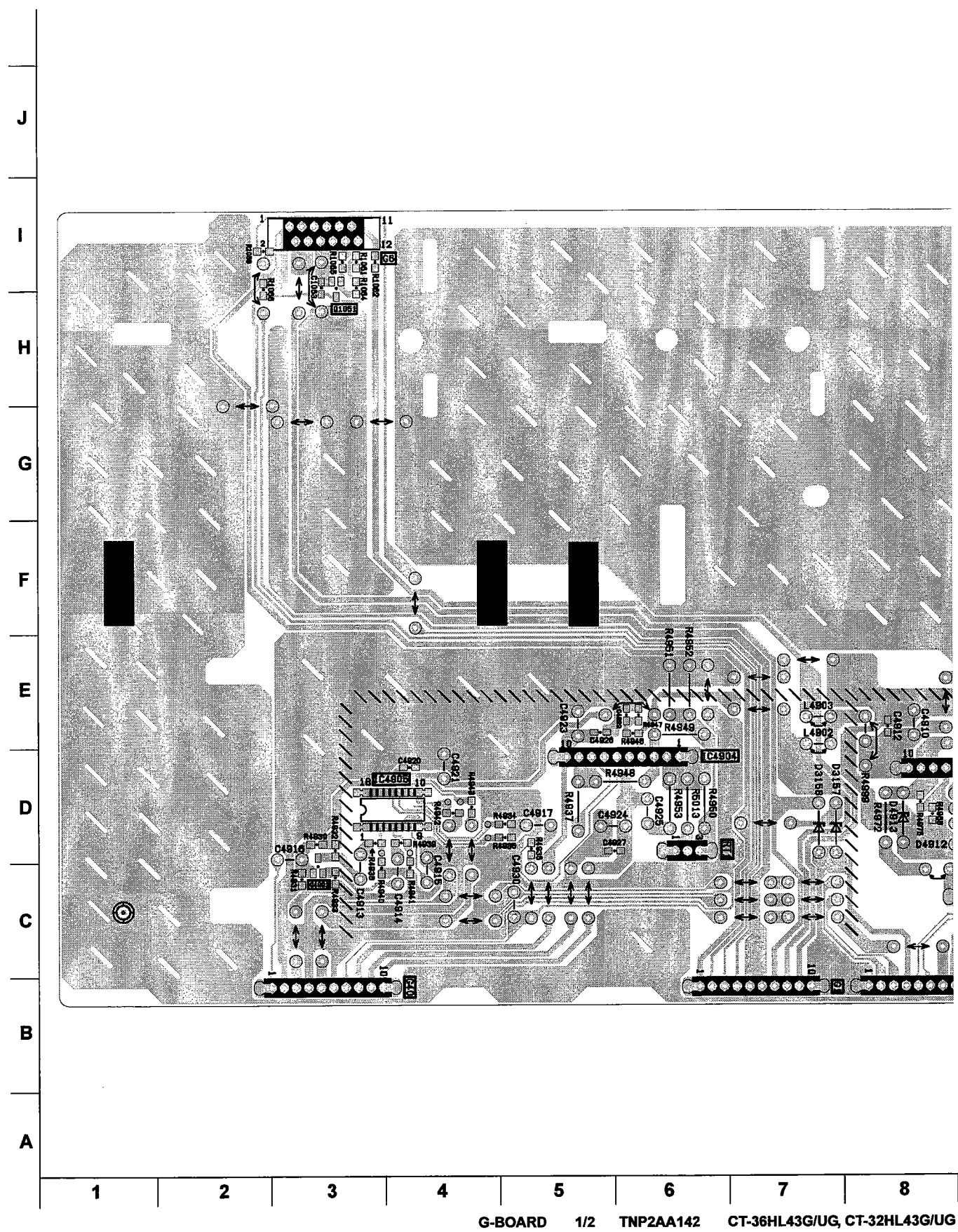


H-BOARD TNP2AA127 CT-36HL43G/UG, CT-32HL43G/UG

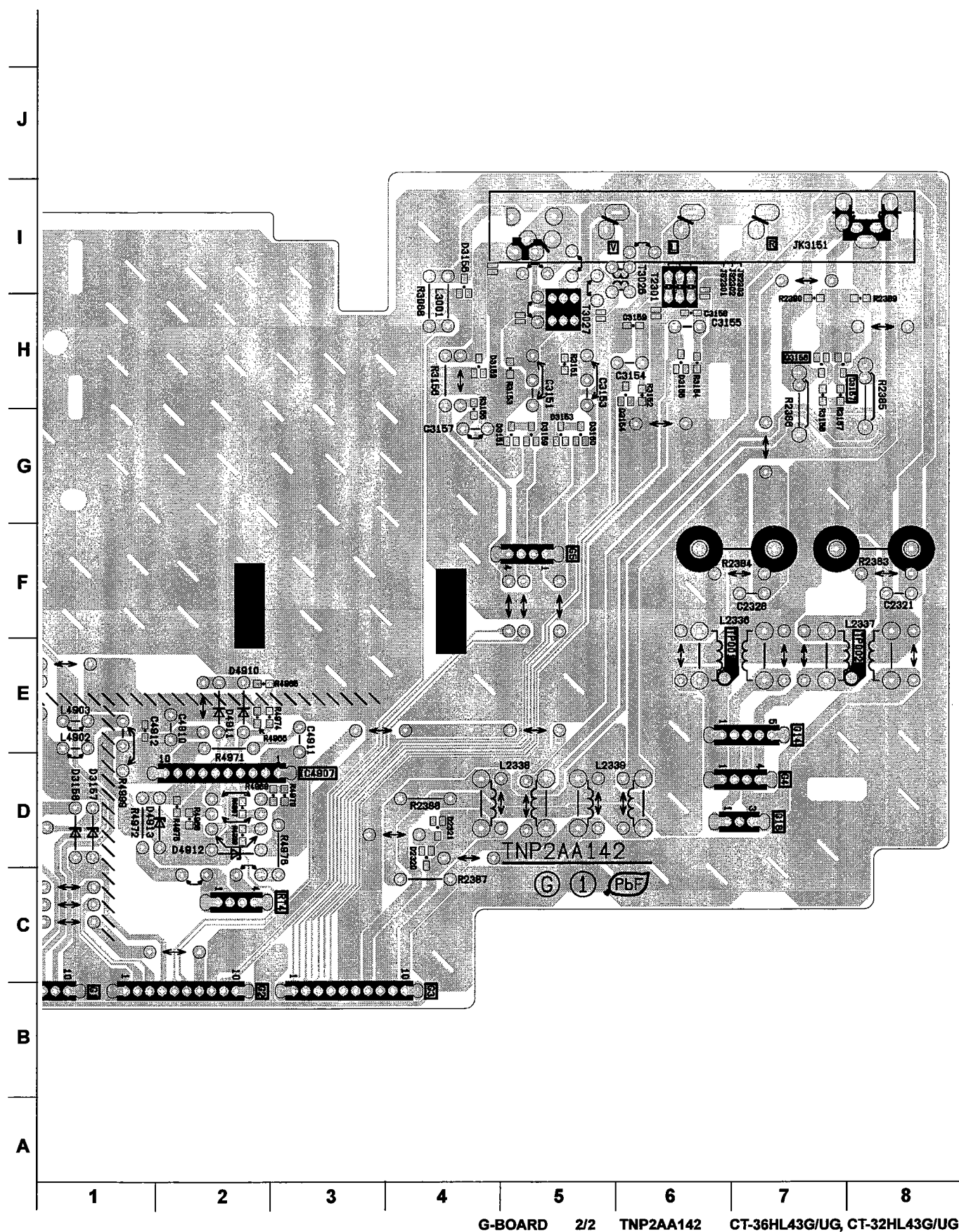
19.20. K-Board



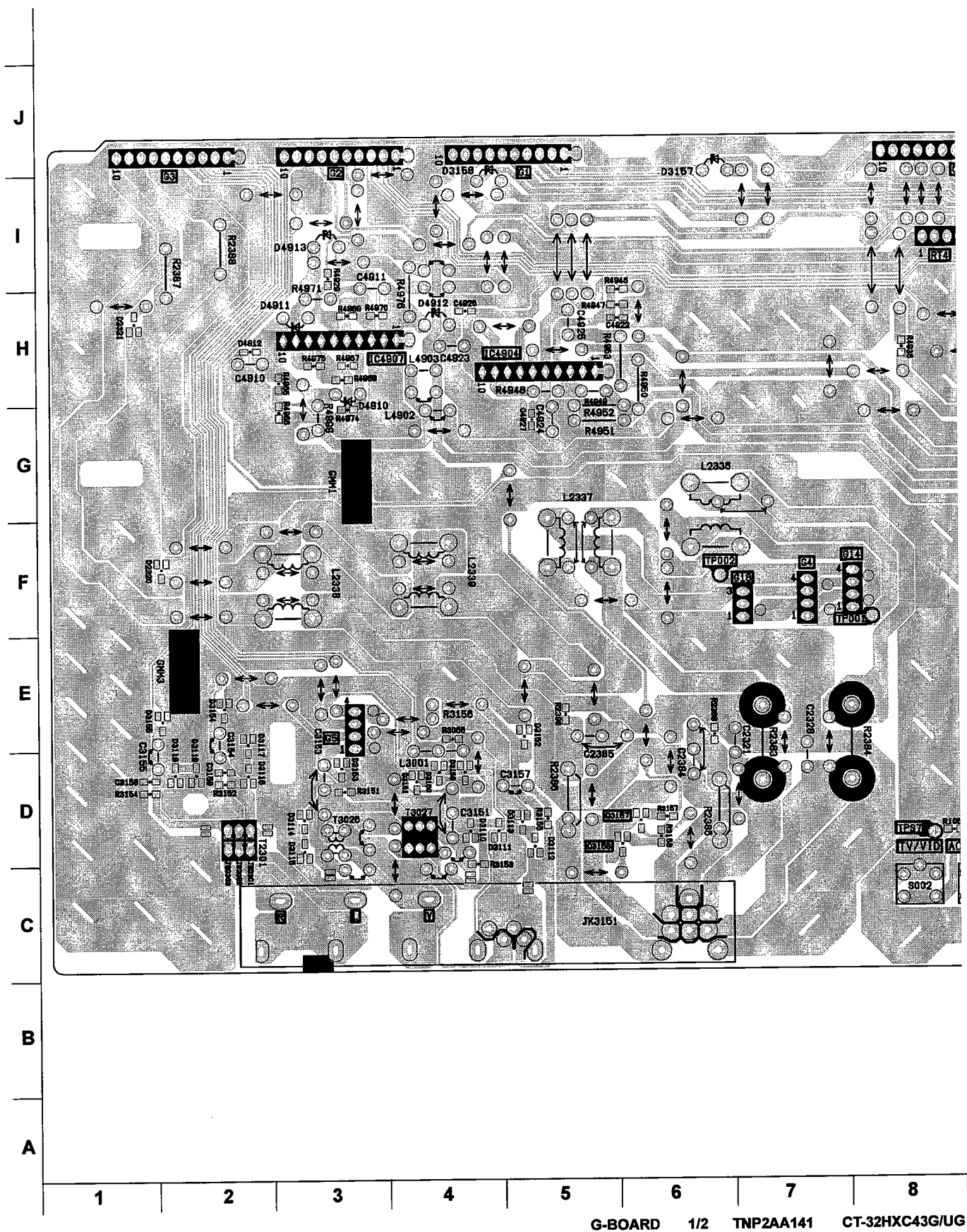
19.21. G-Board HL 1 of 2



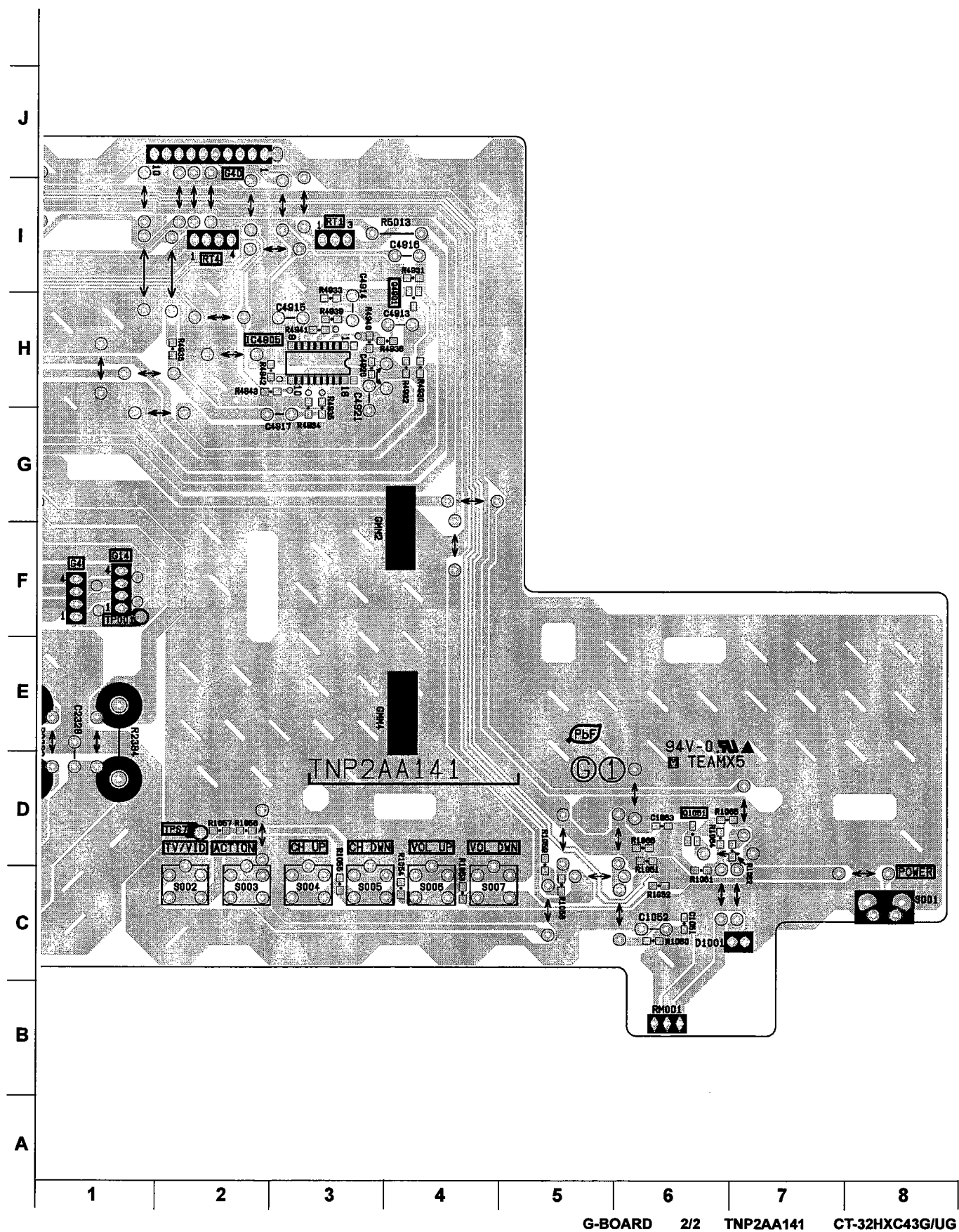
19.22. G-Board HL 2 of 2



19.23. G-Board HXC 1 of 2

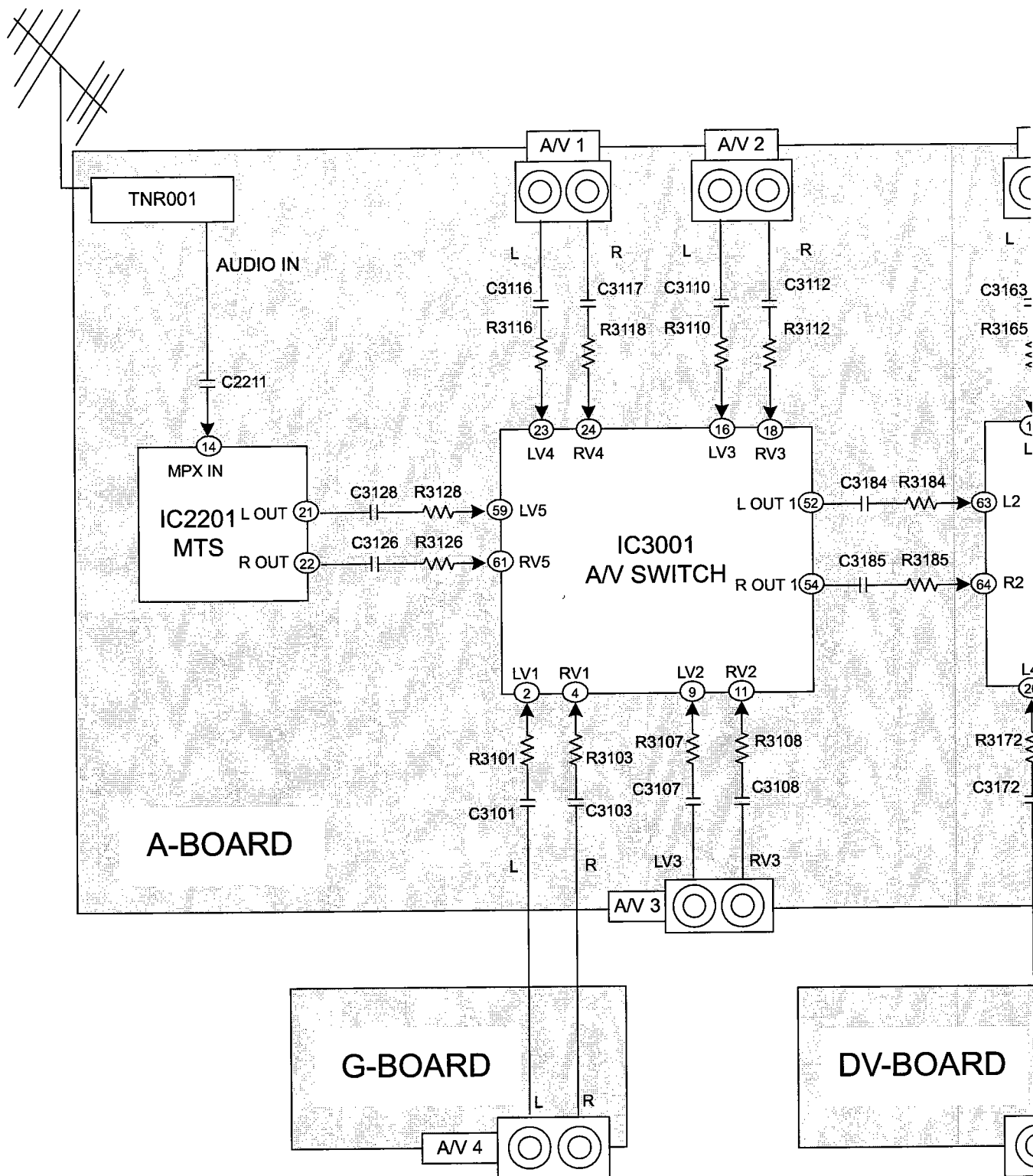


19.24. G-Board HXC 2 of 2

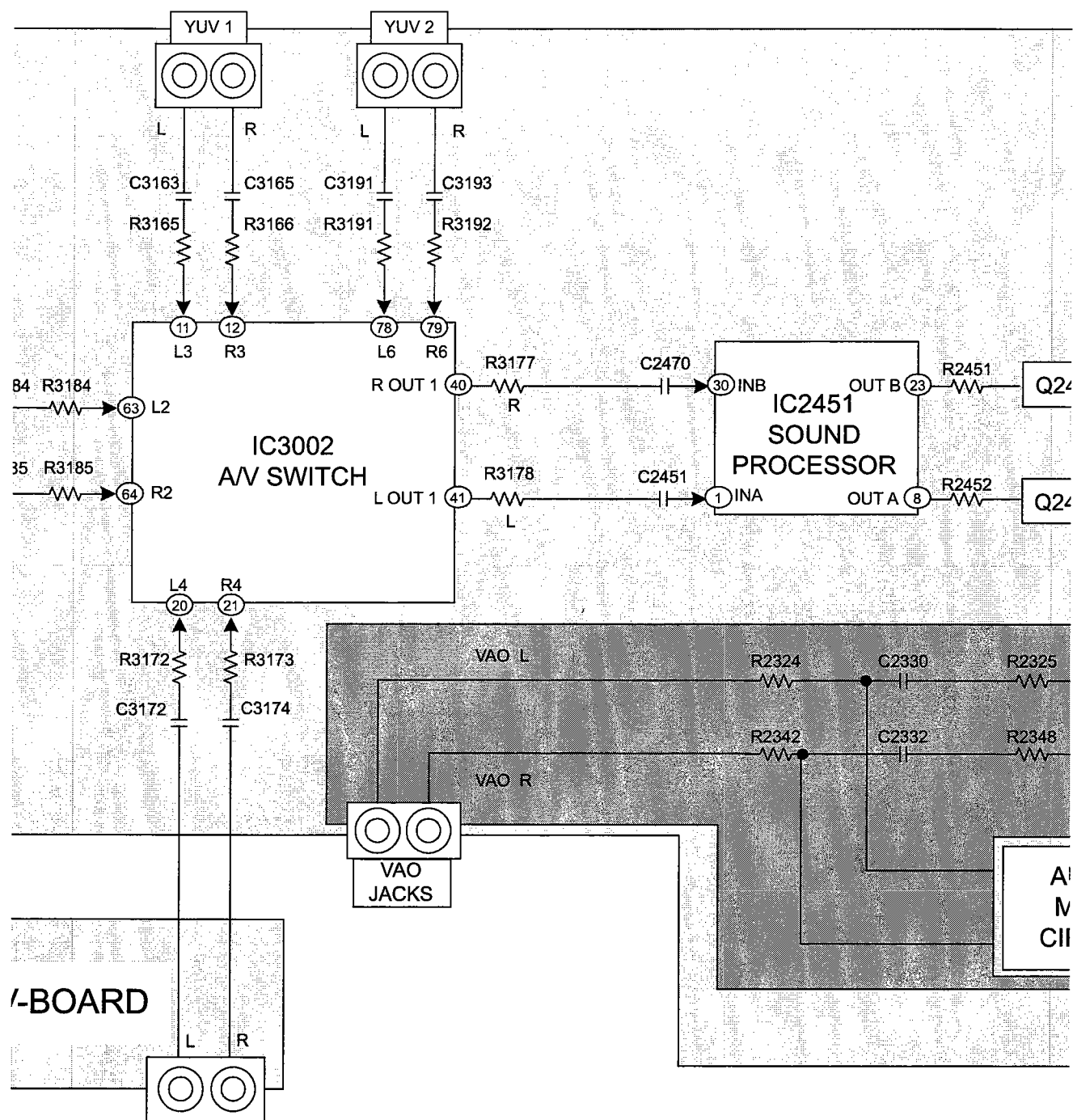


20 Block Diagrams

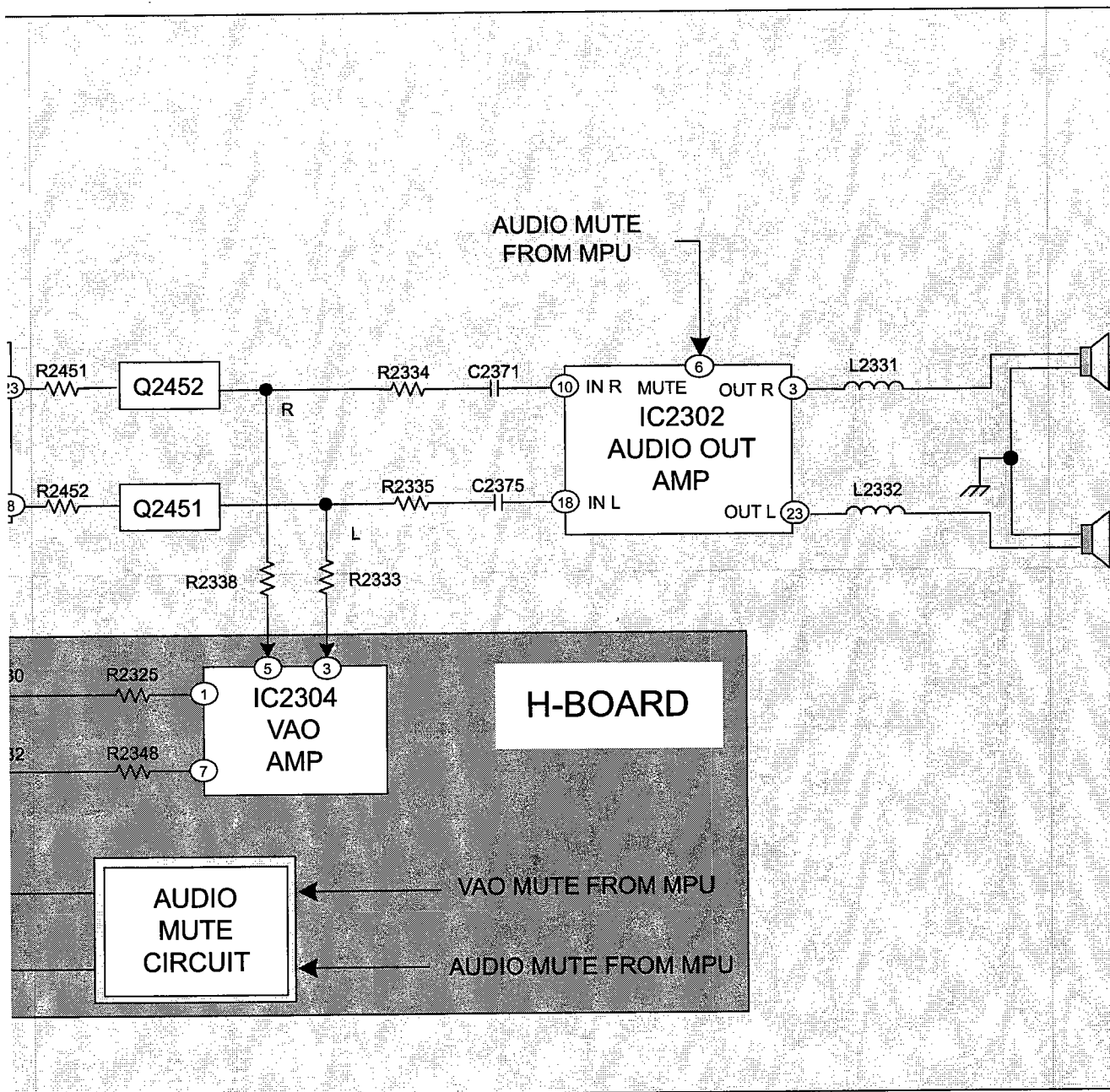
20.1. Audio Block Diagram



AUDIO BLOCK DIAGRAM 1/3 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG

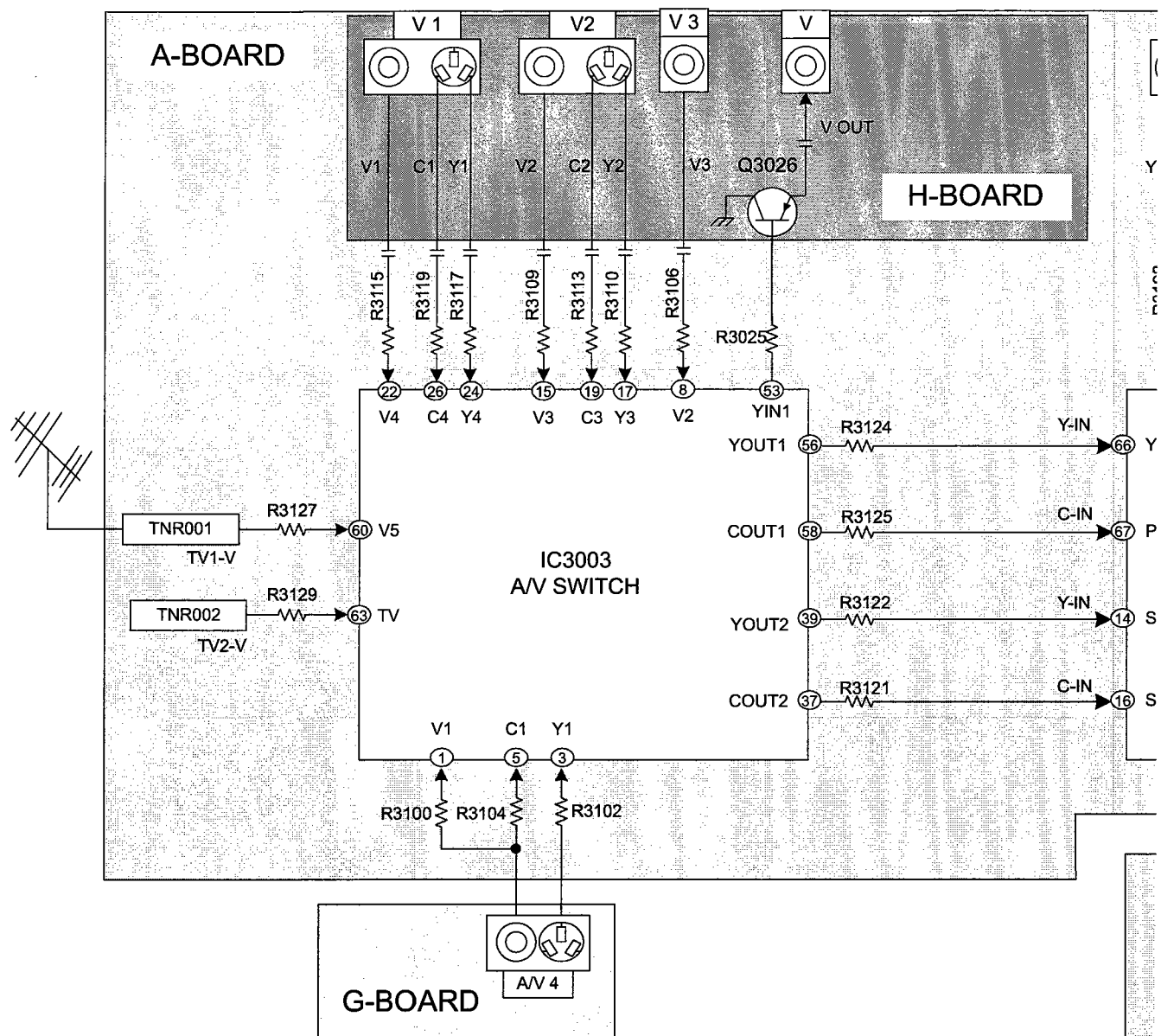


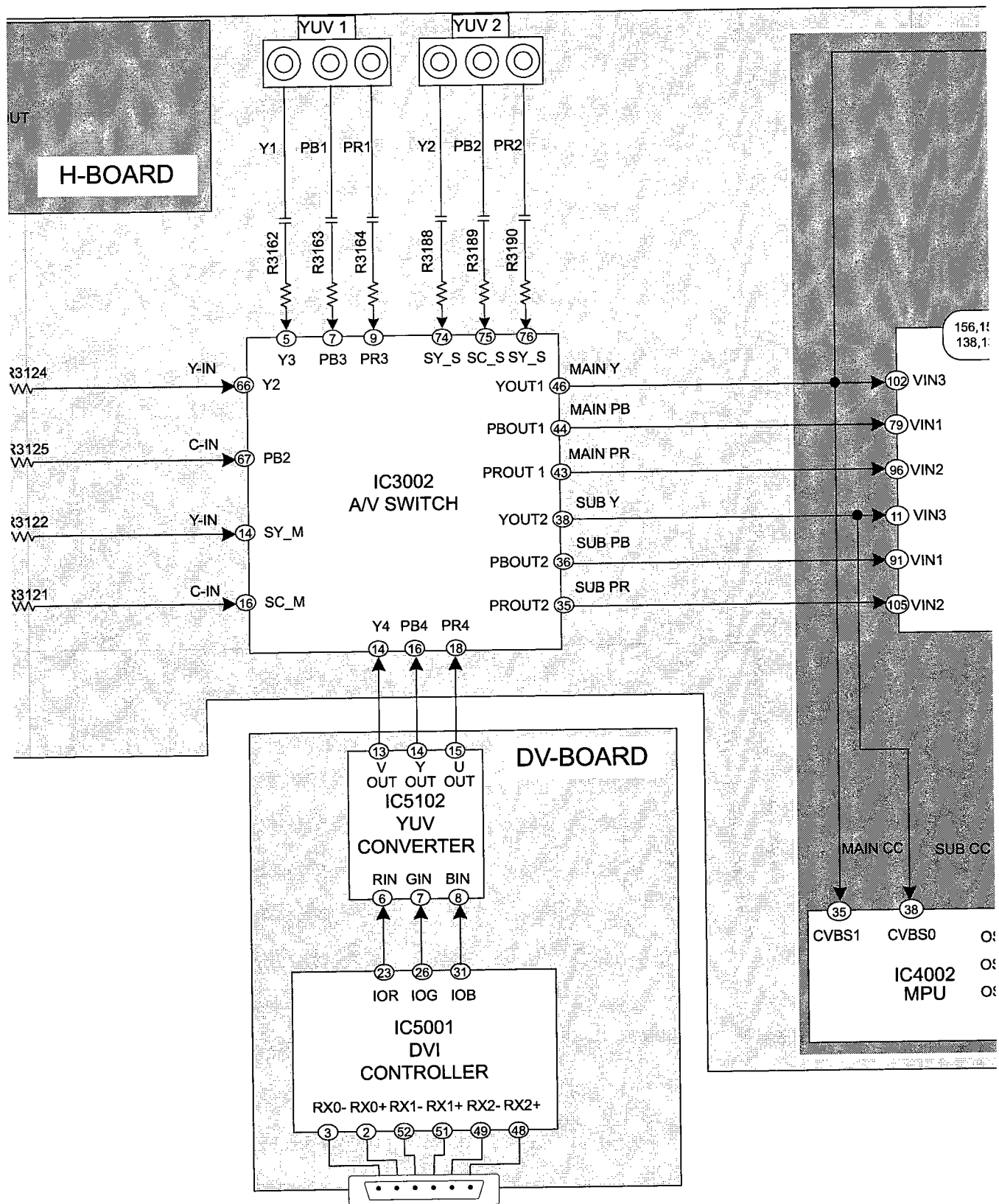
AUDIO BLOCK DIAGRAM 2/3 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG



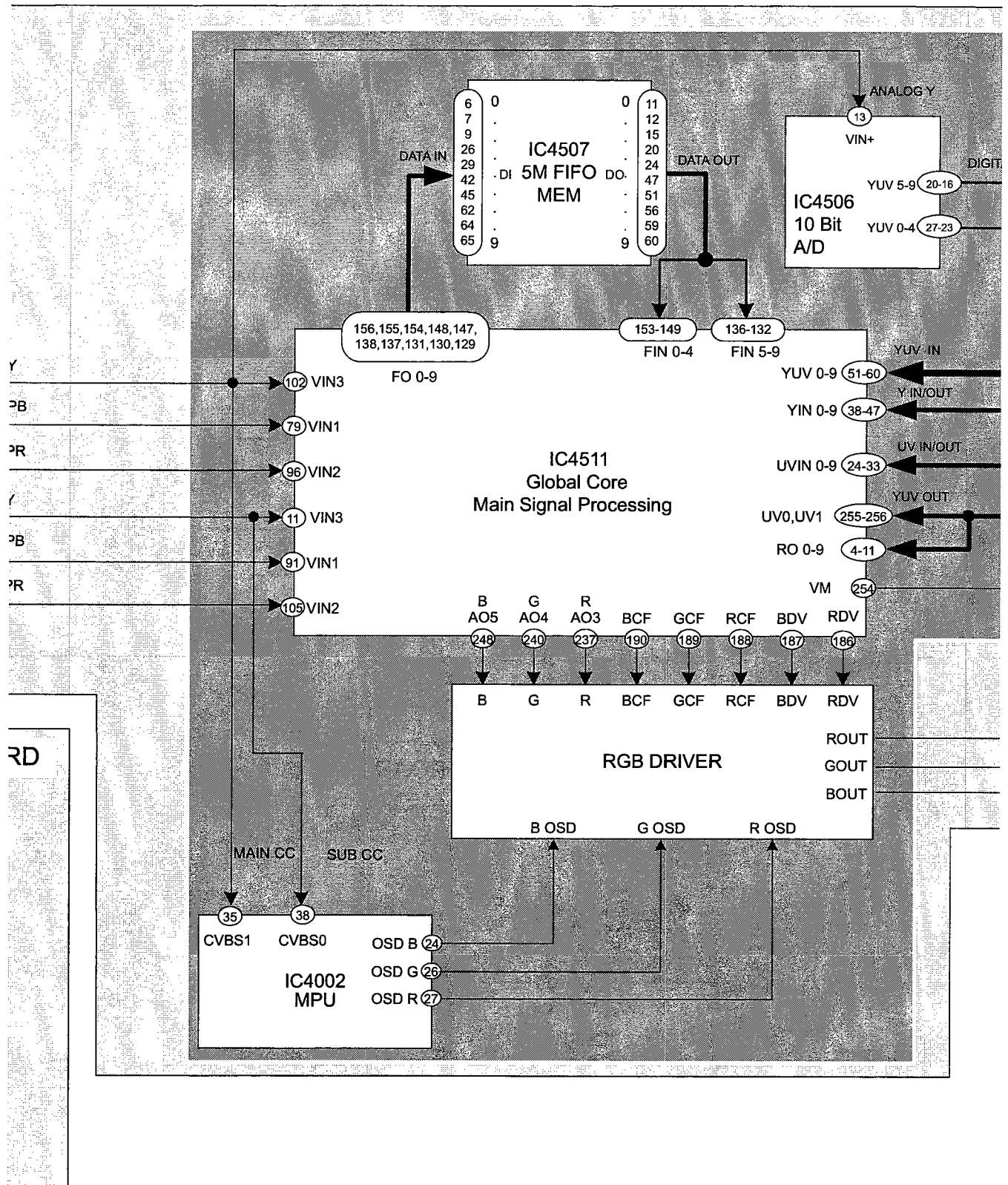
AUDIO BLOCK DIAGRAM 3/3 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG

20.2. Video Block Diagram

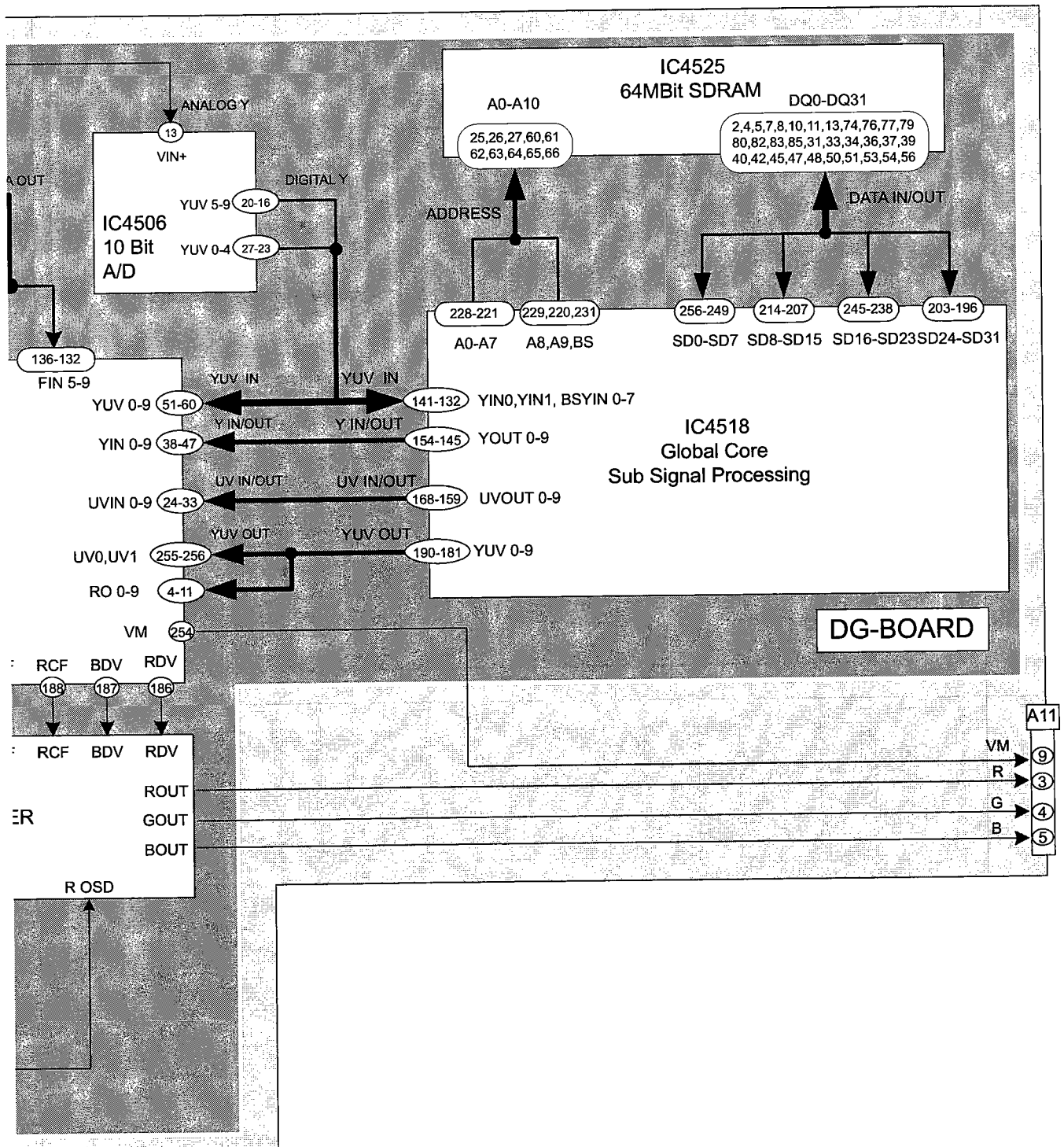




VIDEO BLOCK DIAGRAM 2/4 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG



VIDEO BLOCK DIAGRAM 3/4 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG



VIDEO BLOCK DIAGRAM 4/4 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG

21 Schematic Diagrams

21.1. Schematic notes in english

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 Δ 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 μ H.
 4. Test point indicated by \uparrow ; Test point but no pin \uparrow .
 5. Components indicated with Δ 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
 2. Voltage readings are nominal and may vary $\pm 10\%$ on active devices. Some voltage reading will vary with signal strength and picture content.
 3. Supply voltages are nominal.
 4. 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.**

21.2. Schematic notes in spanish

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 FABRICANTE. LOS COMPONENTES CRÍTICOS ESTÁN SEÑALADOS EN LOS DIAGRAMAS POR EL SÍMBOLO Δ .

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 Δ 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 \uparrow 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.

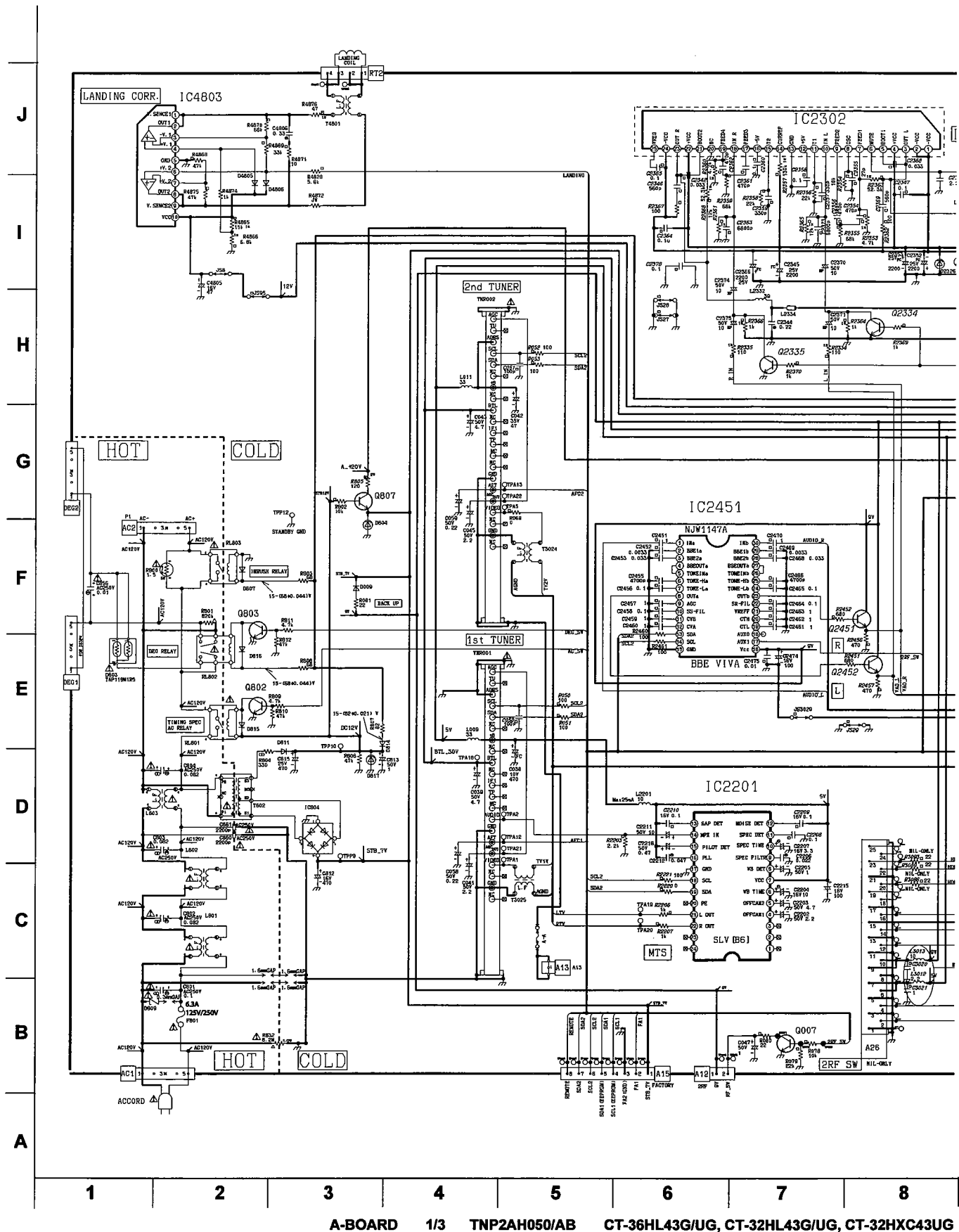
PRECAUCIÓN: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

MEDICIÓN DE FORMAS DE ONDA

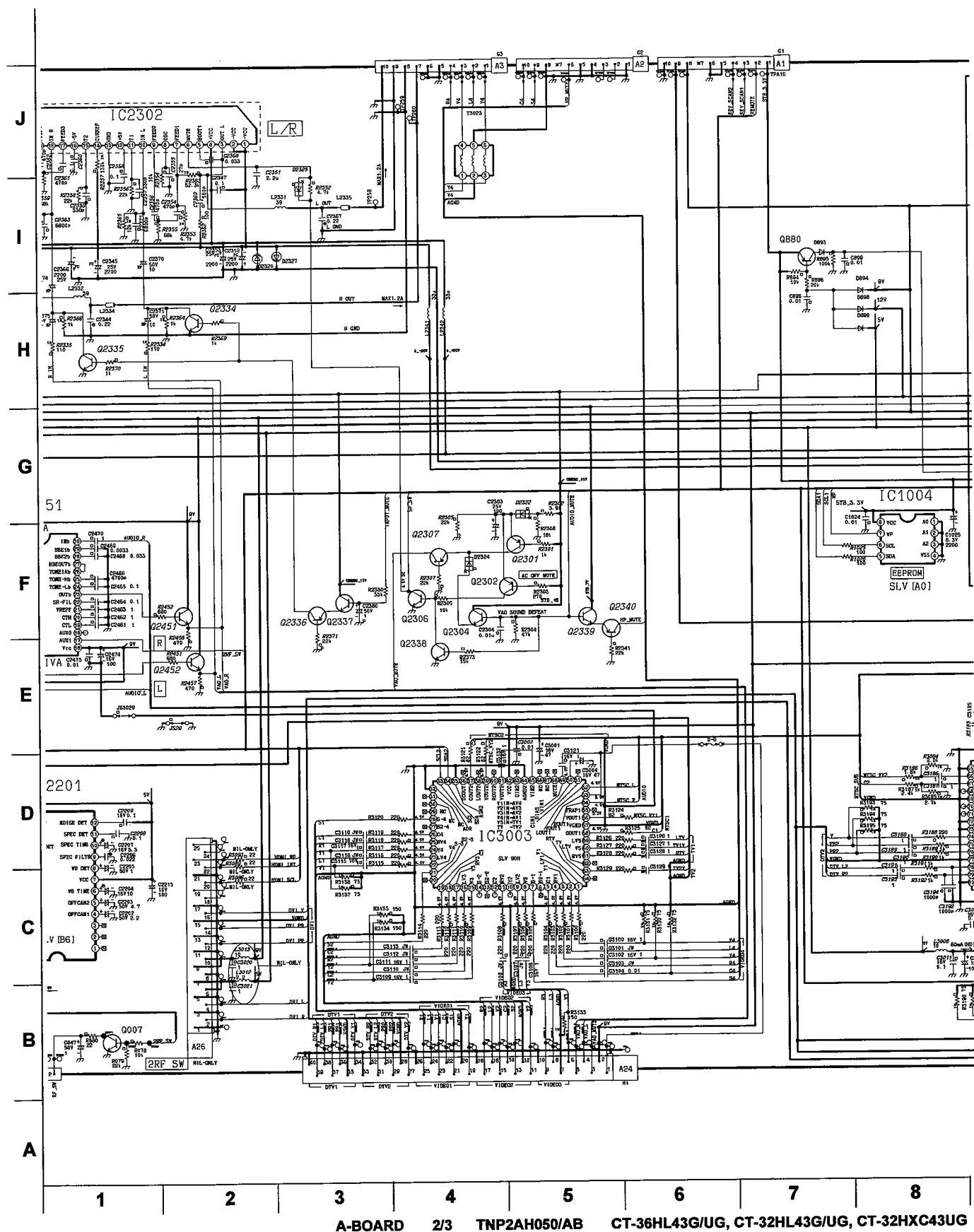
- Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
- Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 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.

PRECAUCIÓN: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

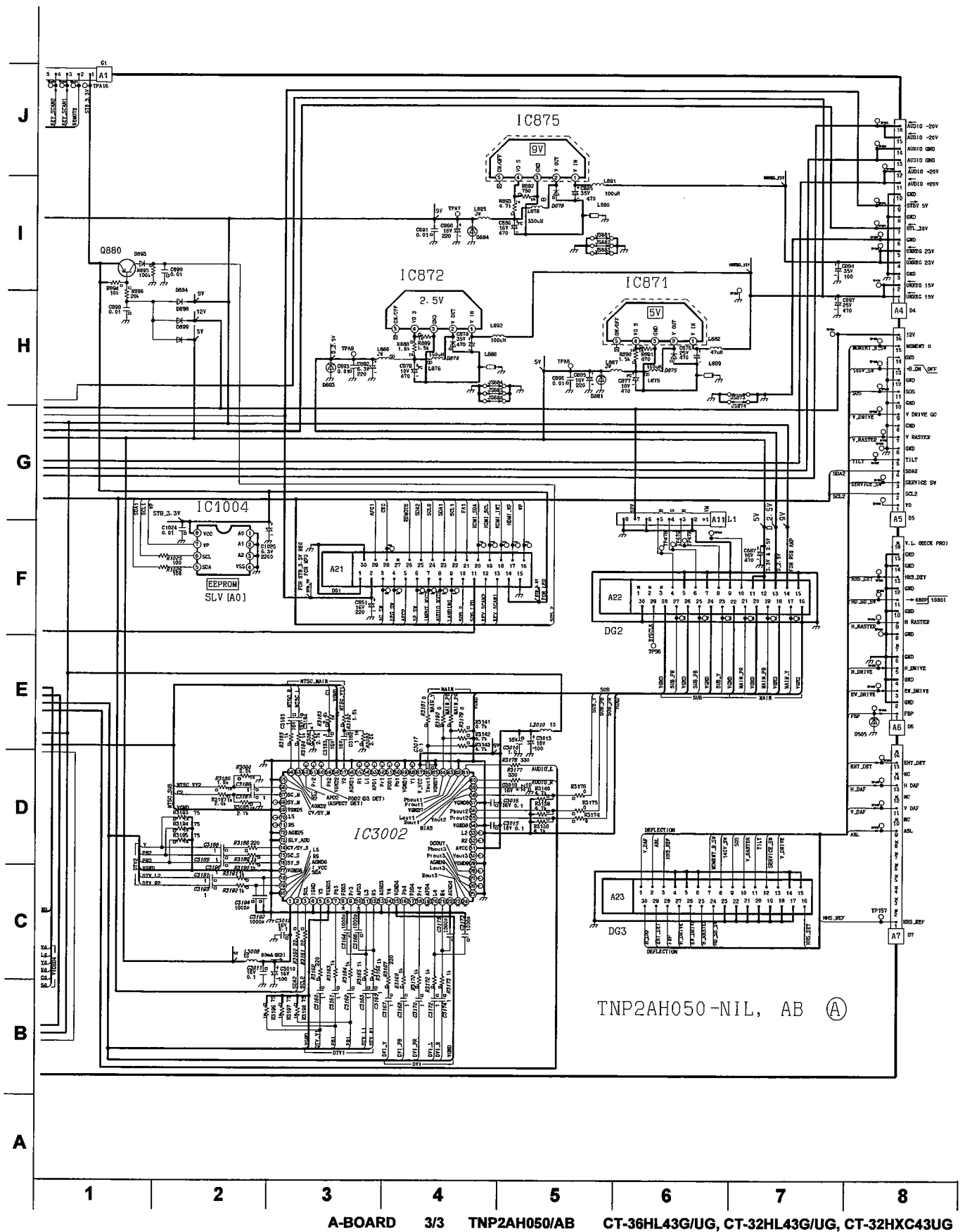
21.3. A-Board schematic 1 of 3



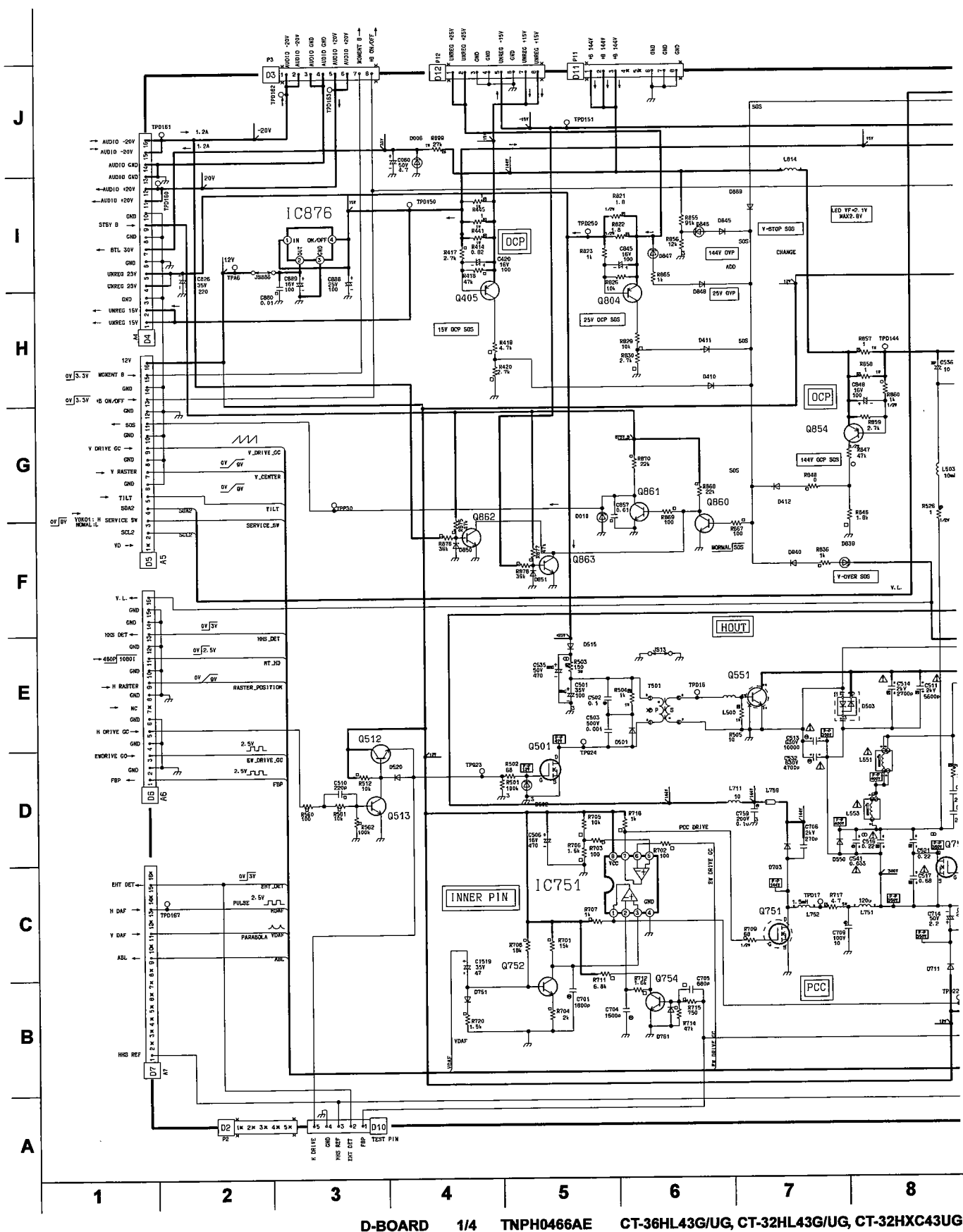
21.4. A-Board schematic 2 of 3



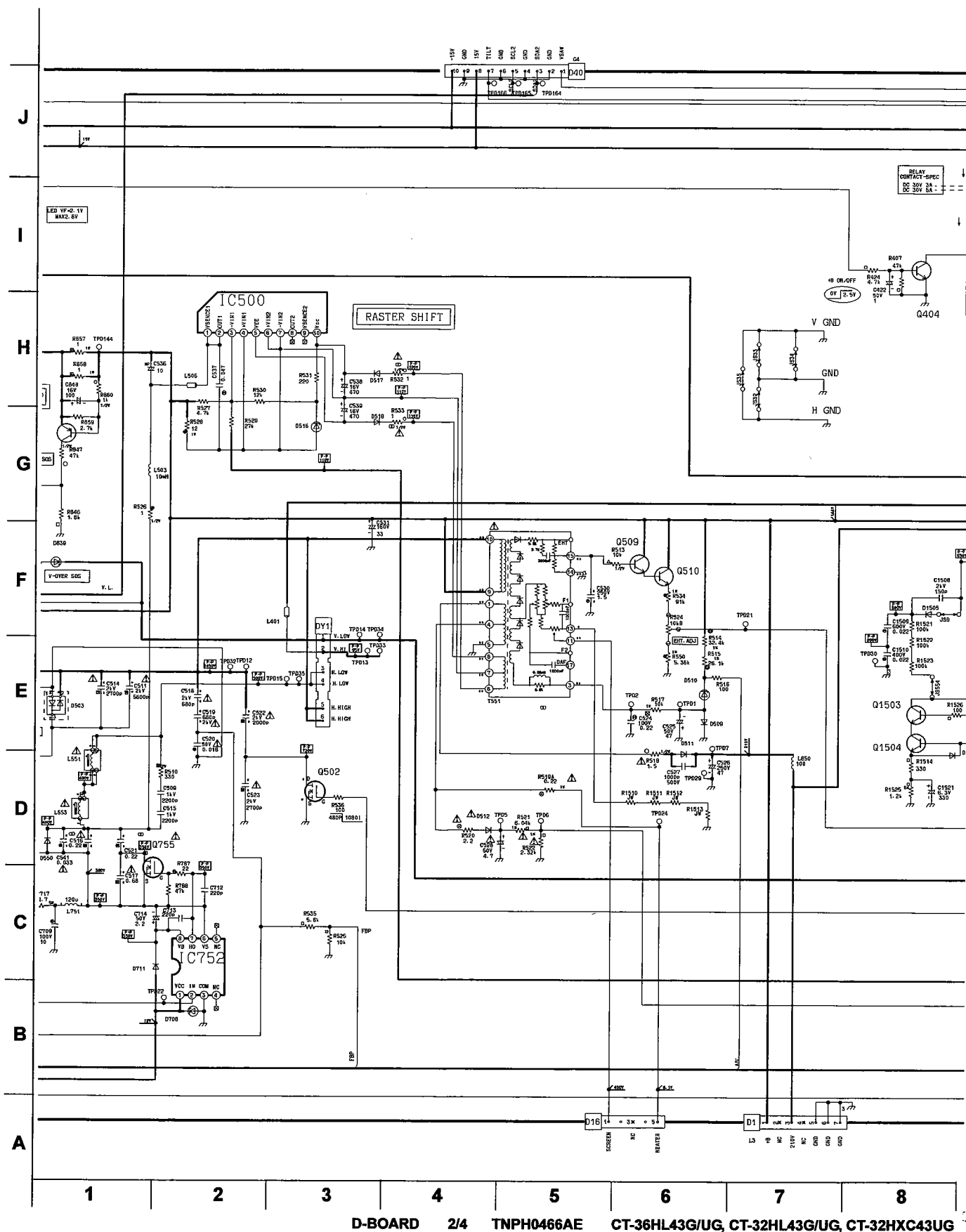
21.5. A-Board schematic 3 of 3



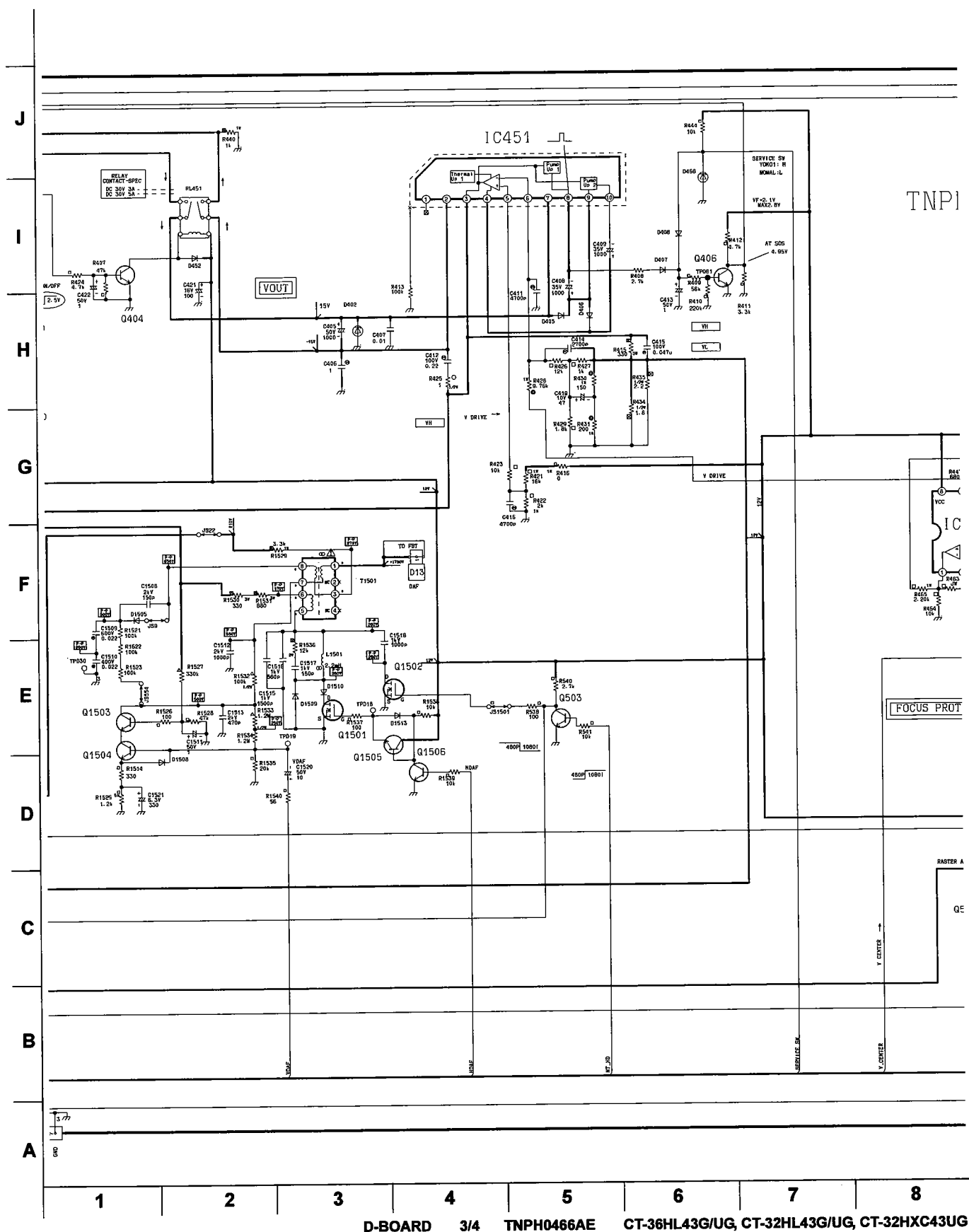
21.6. D-Board schematic 1 of 4



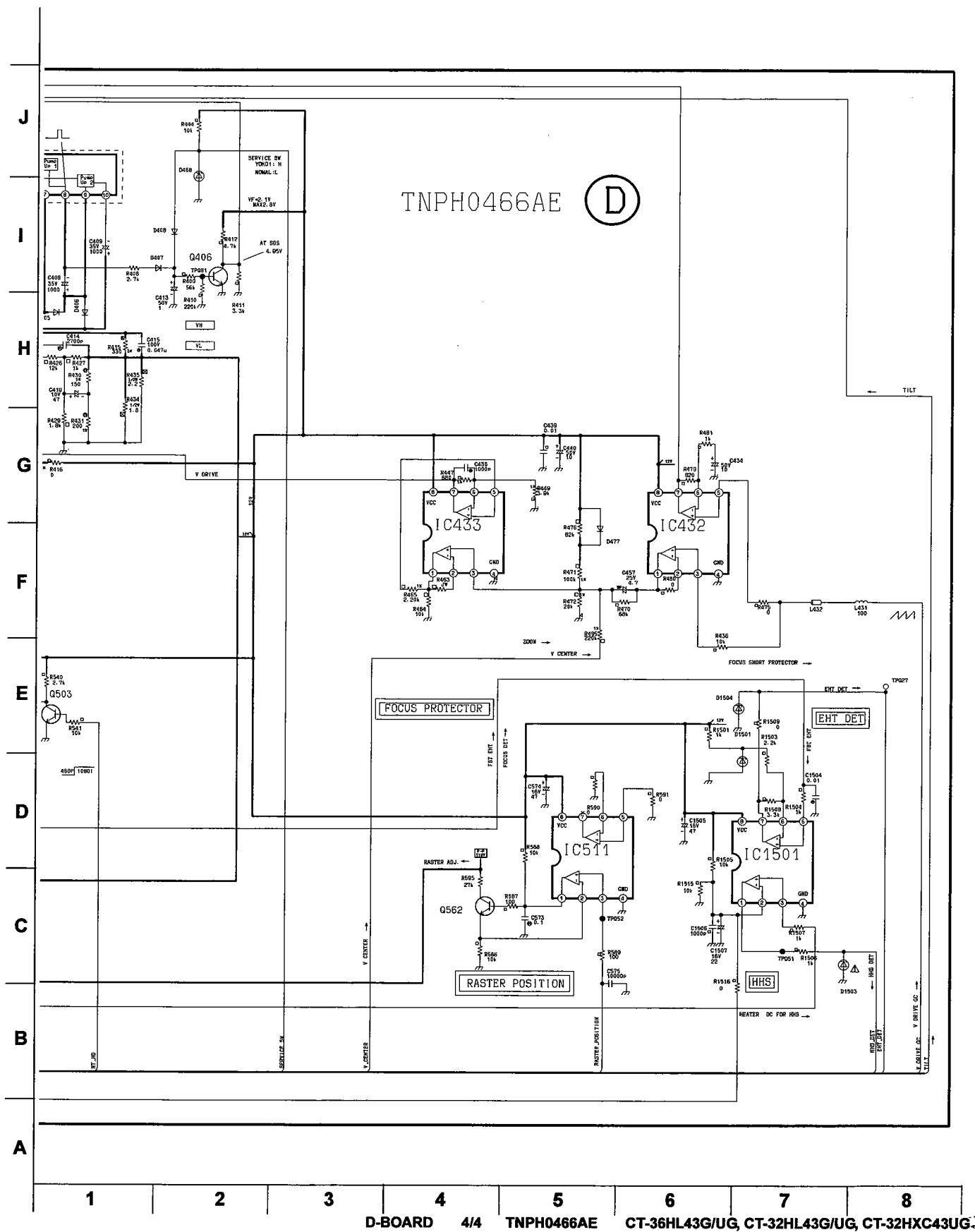
21.7. D-Board schematic 2 of 4



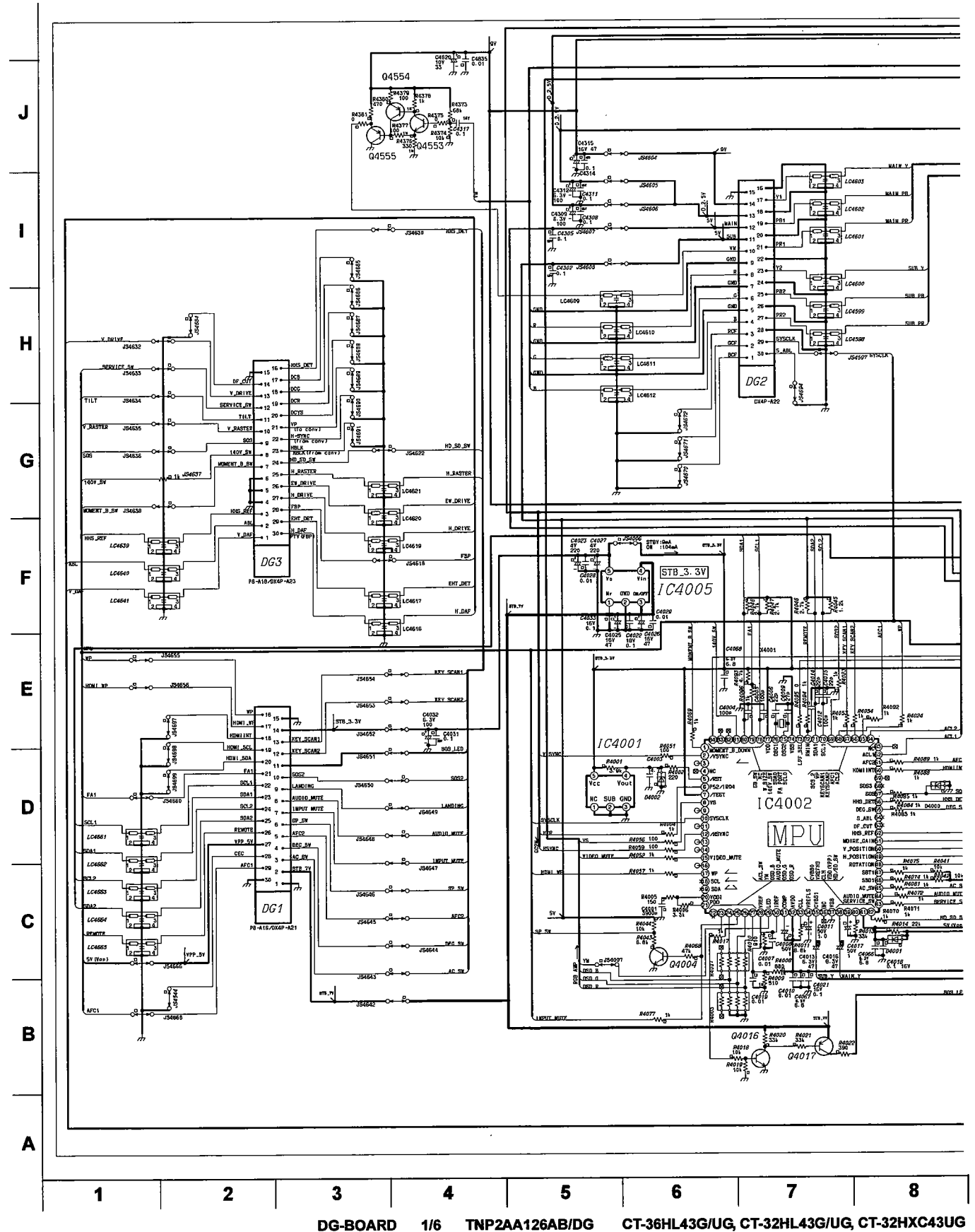
21.8. D-Board schematic 3 of 4



21.9. D-Board schematic 4 of 4

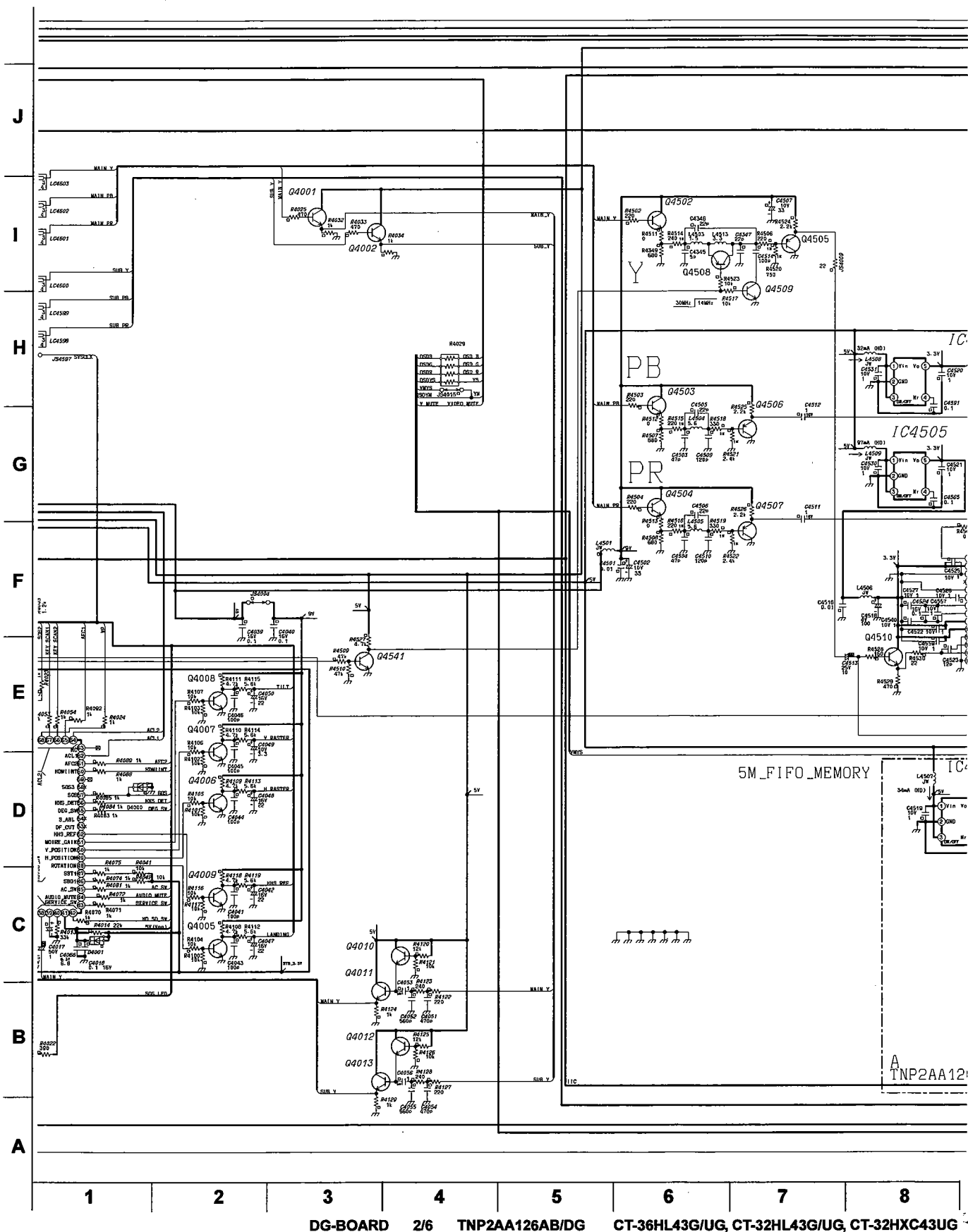


21.10. DG-Board schematic 1 of 6

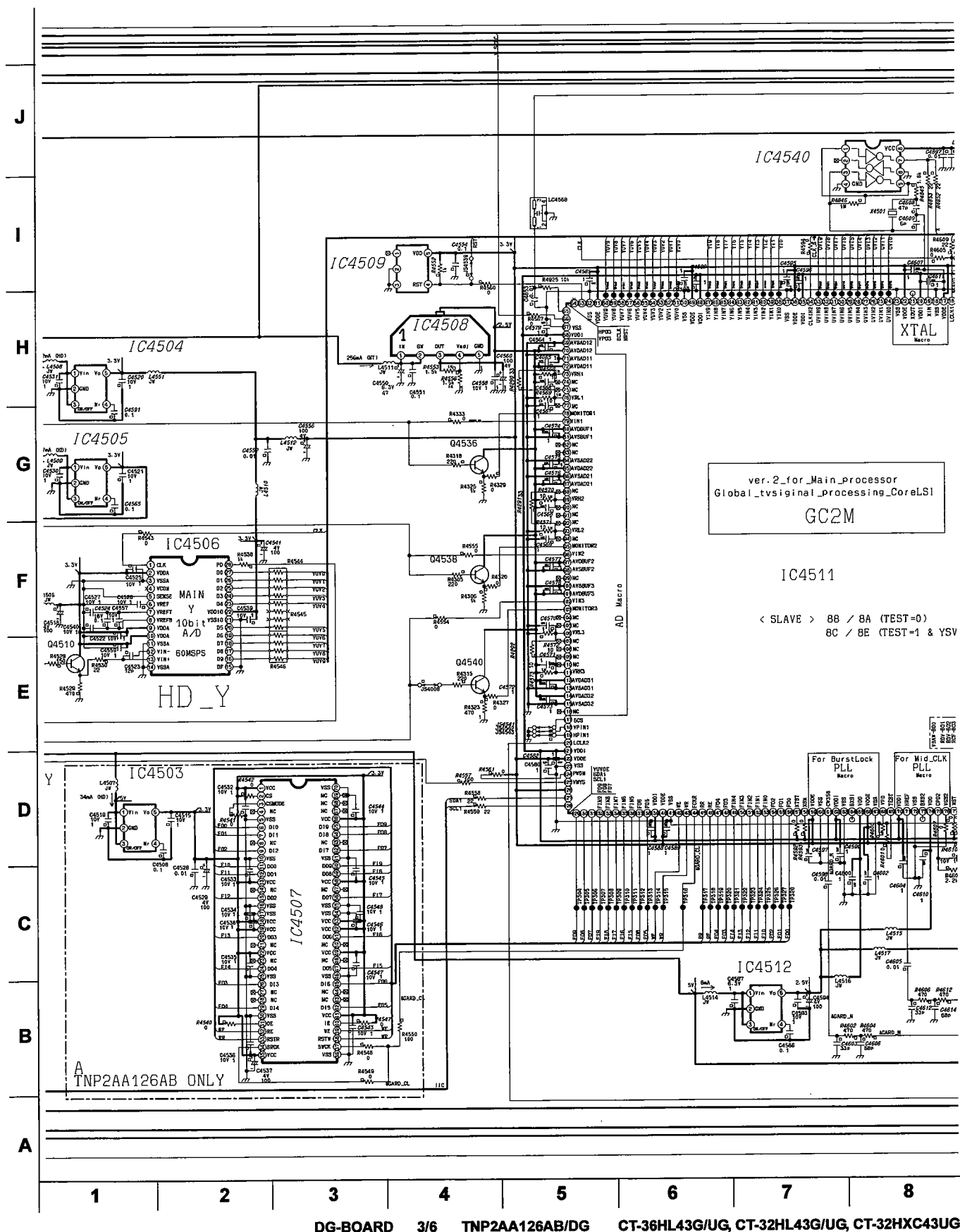


DG-BOARD 1/6 TNP2A126AB/DG CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG

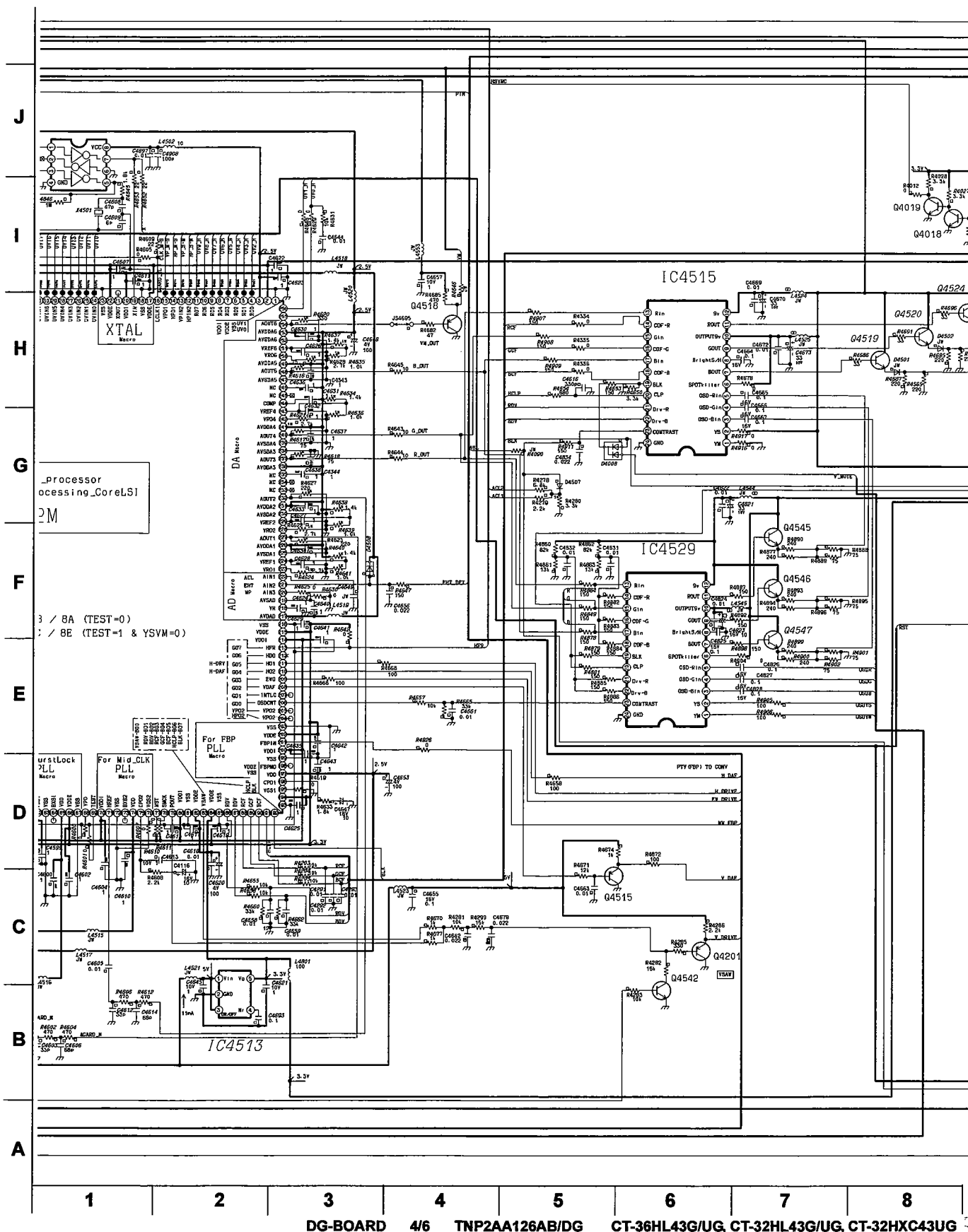
21.11. DG-Board schematic 2 of 6



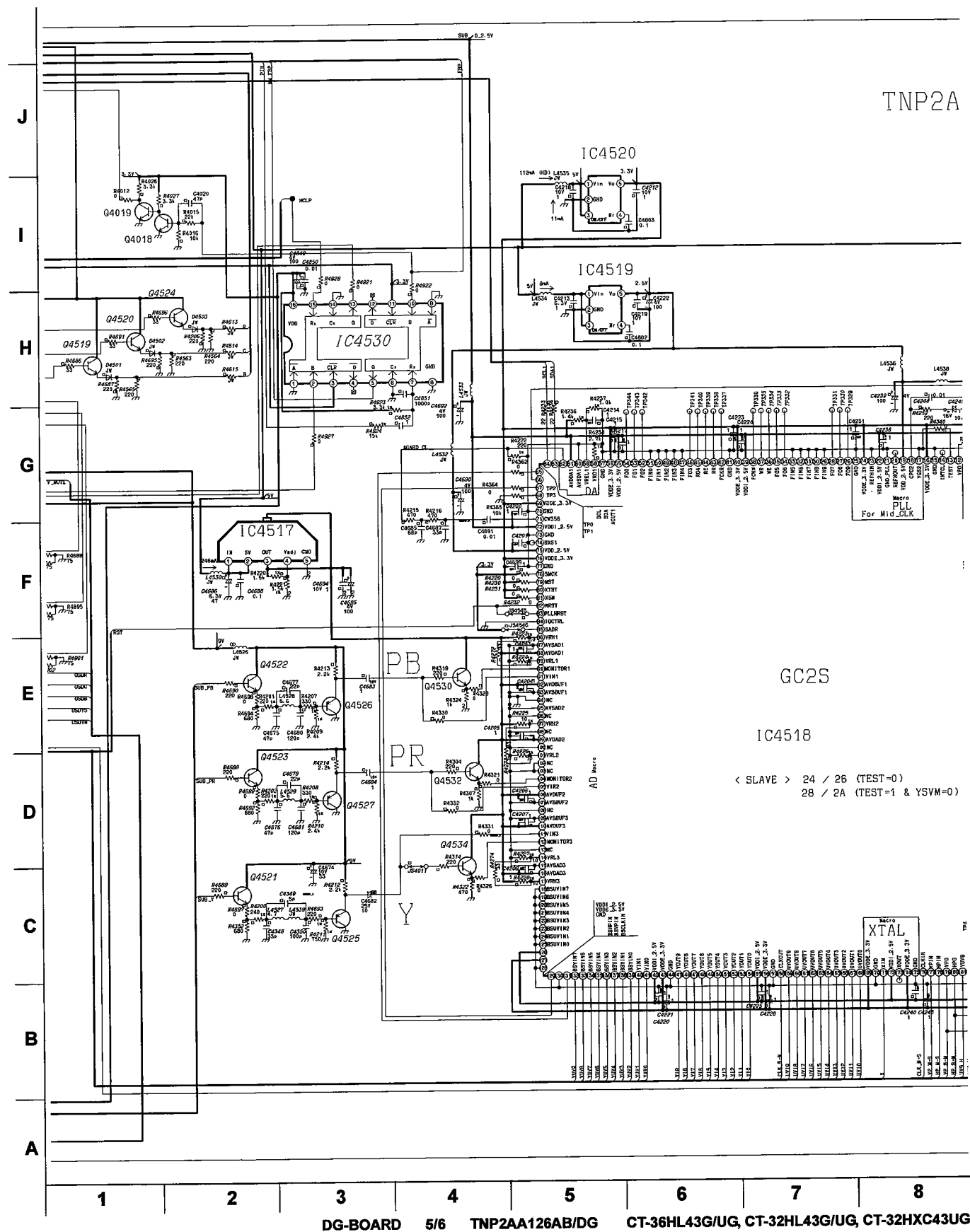
21.12. DG-Board schematic 3 of 6



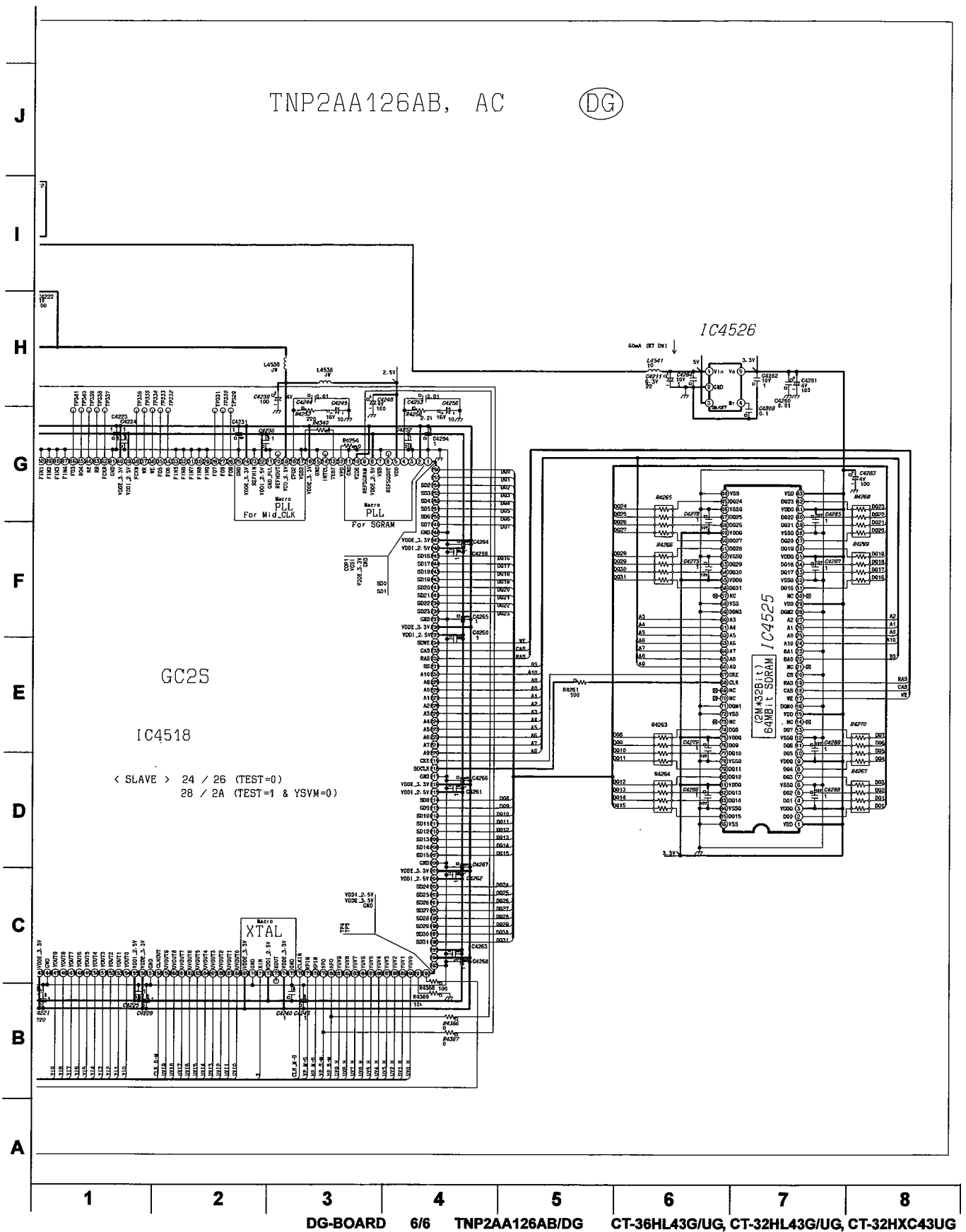
21.13. DG-Board schematic 4 of 6



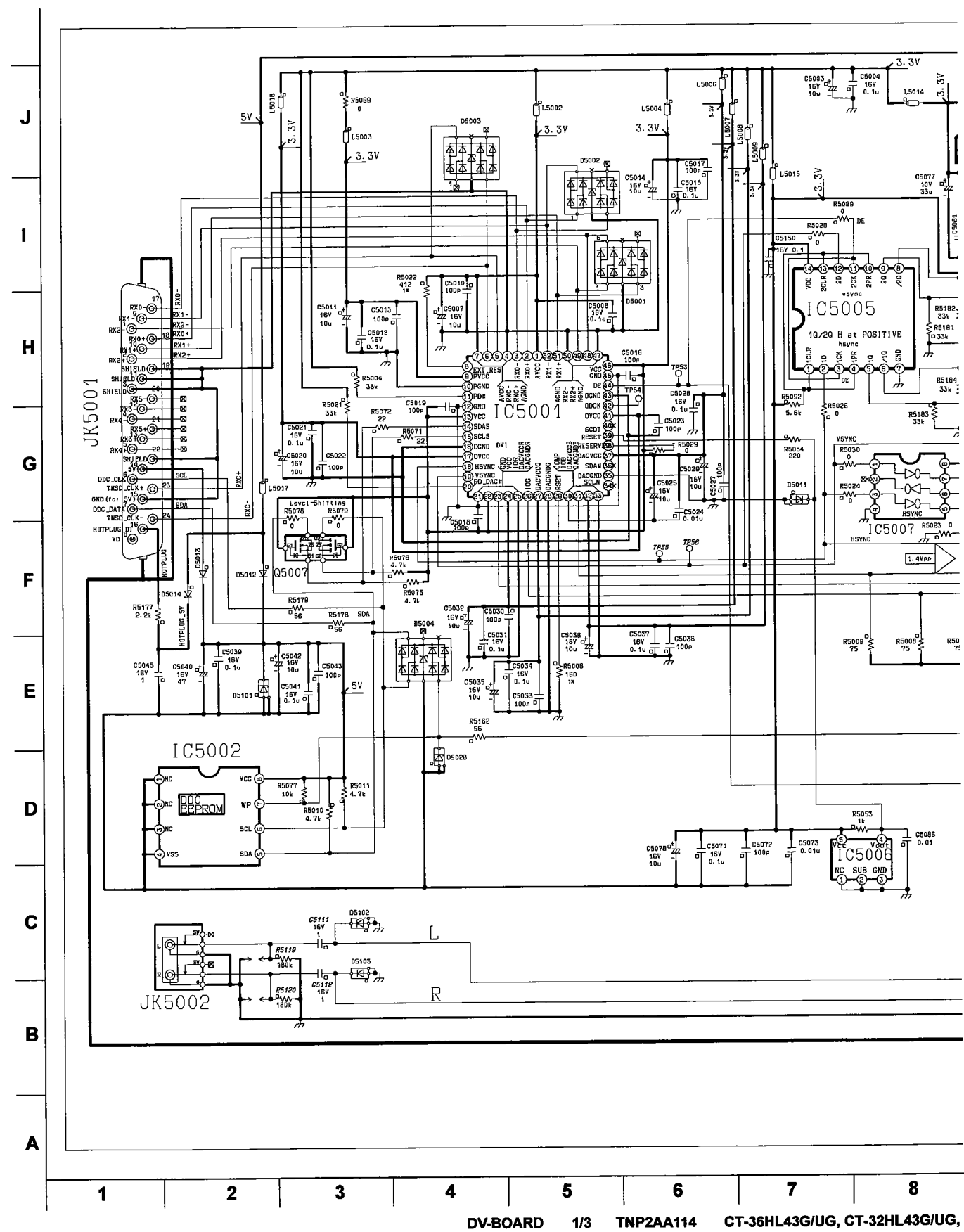
21.14. DG-Board schematic 5 of 6



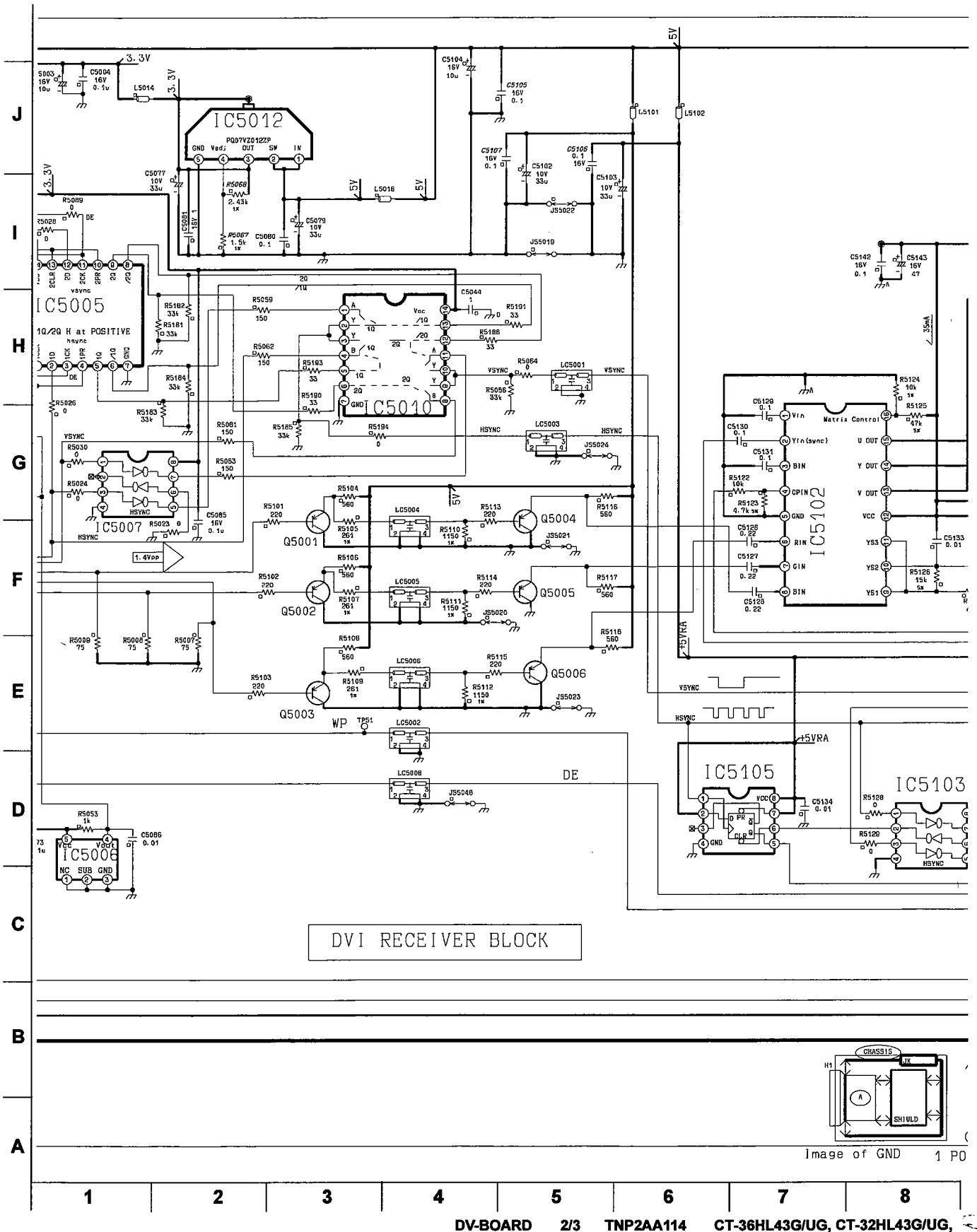
21.15. DG-Board schematic 6 of 6



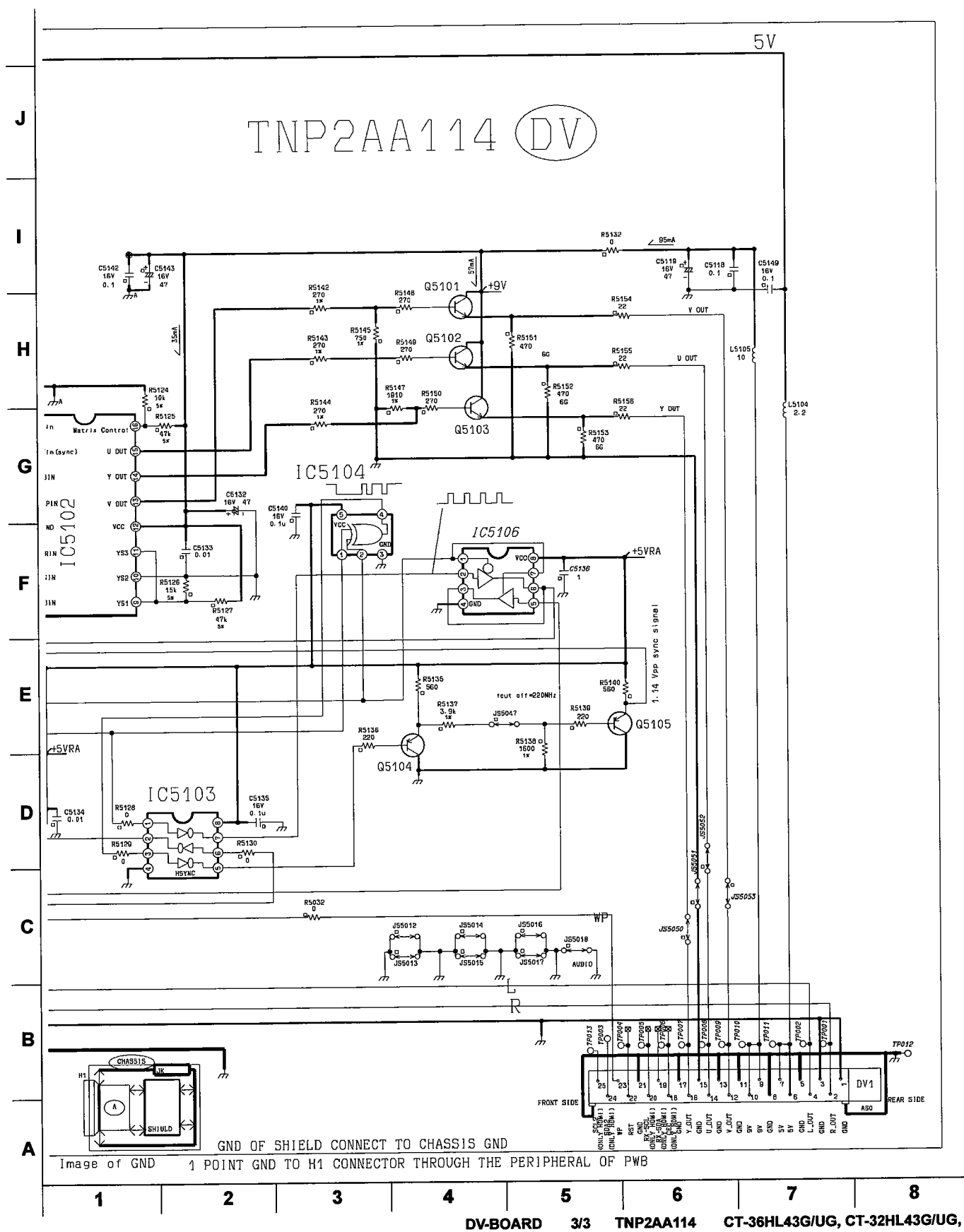
21.16. DV-Board schematic 1 of 3



21.17. DV-Board schematic 2 of 3



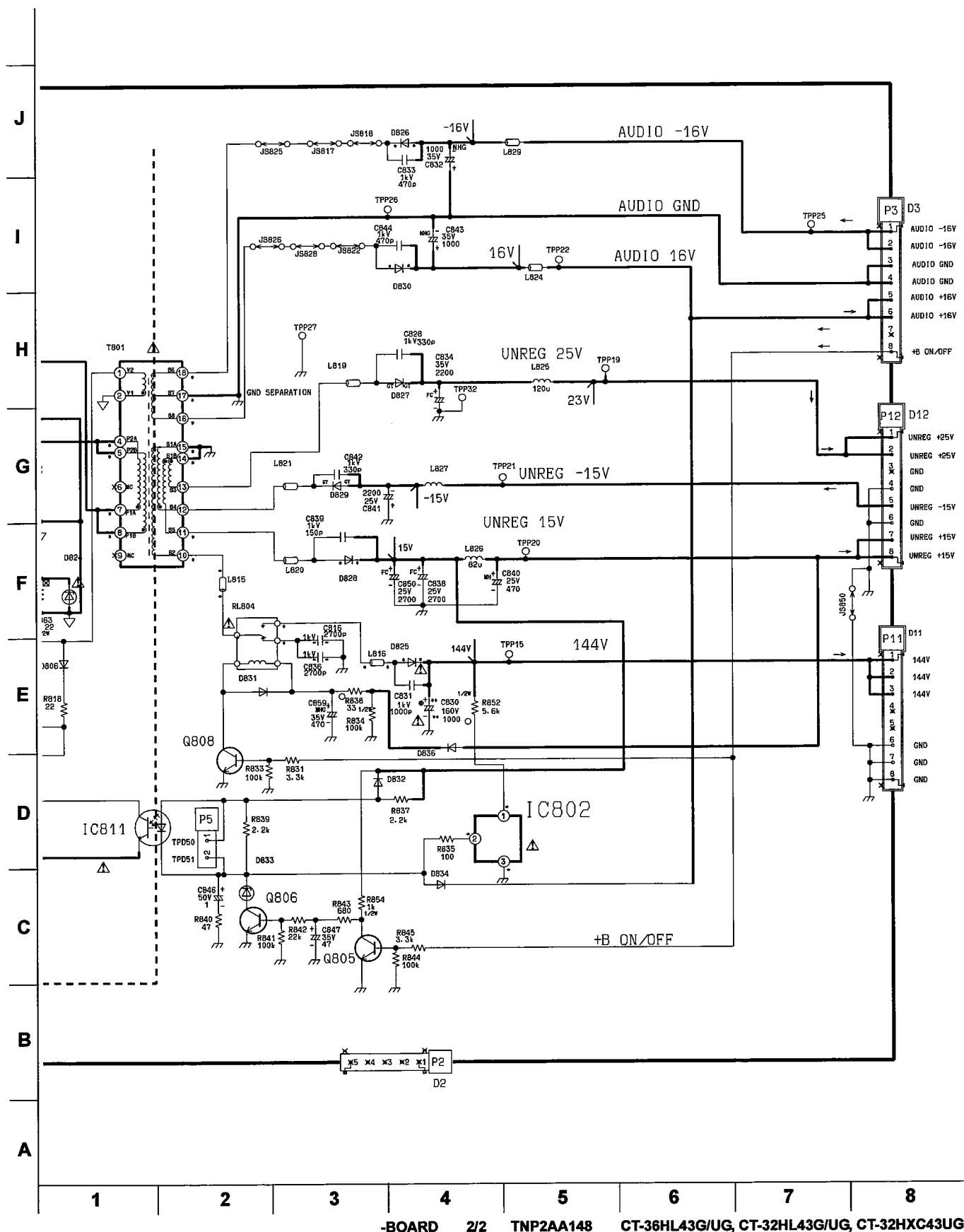
21.18. DV-Board schematic 3 of 3



A

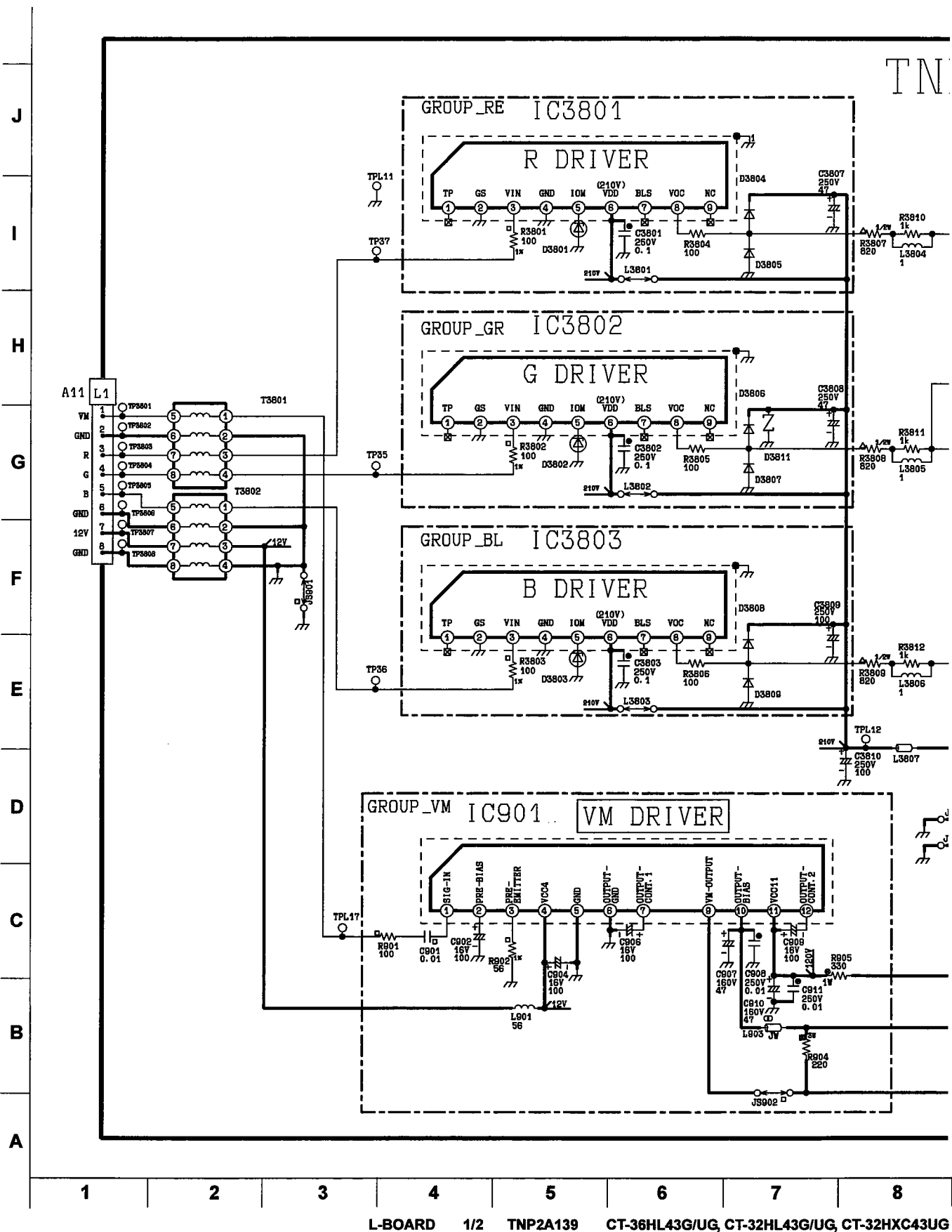


21.20. P-Board schematic 2 of 2

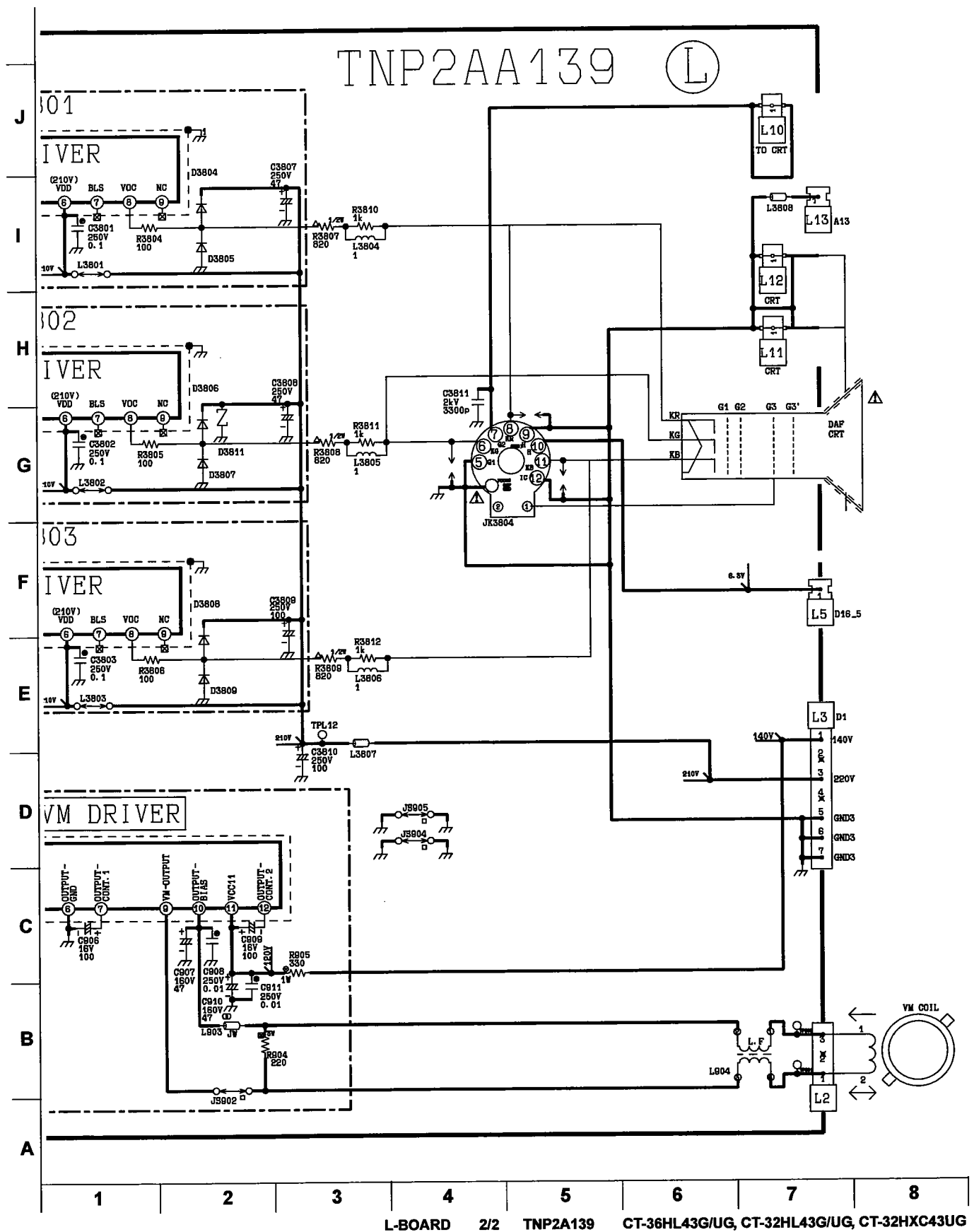


-BOARD 2/2 TNP2AA148 CT-36HL43G/UG, CT-32HL43G/UG, CT-32HXC43UG

21.21. L-Board schematic 1 of 2



21.22. L-Board schematic 2 of 2

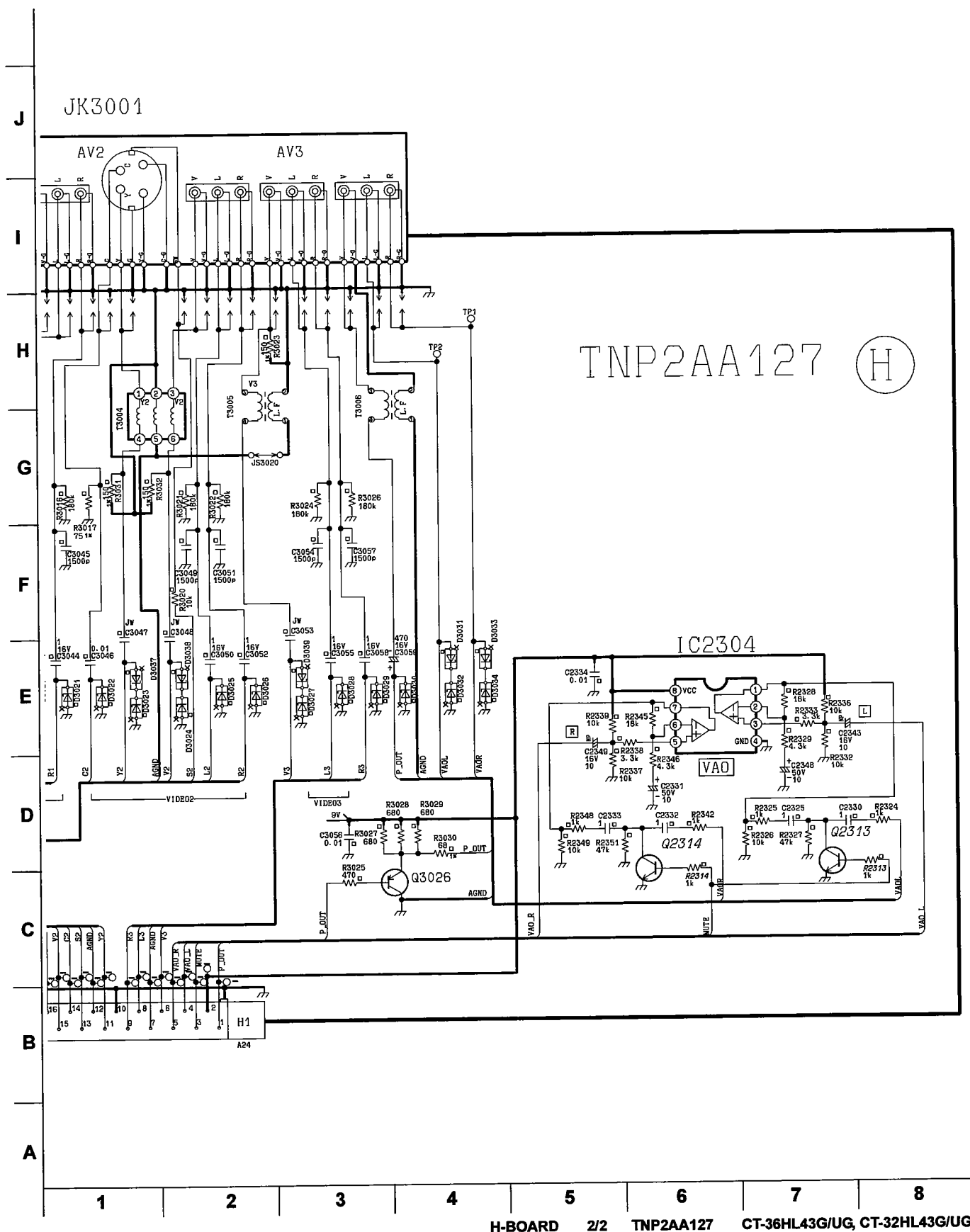


A



100

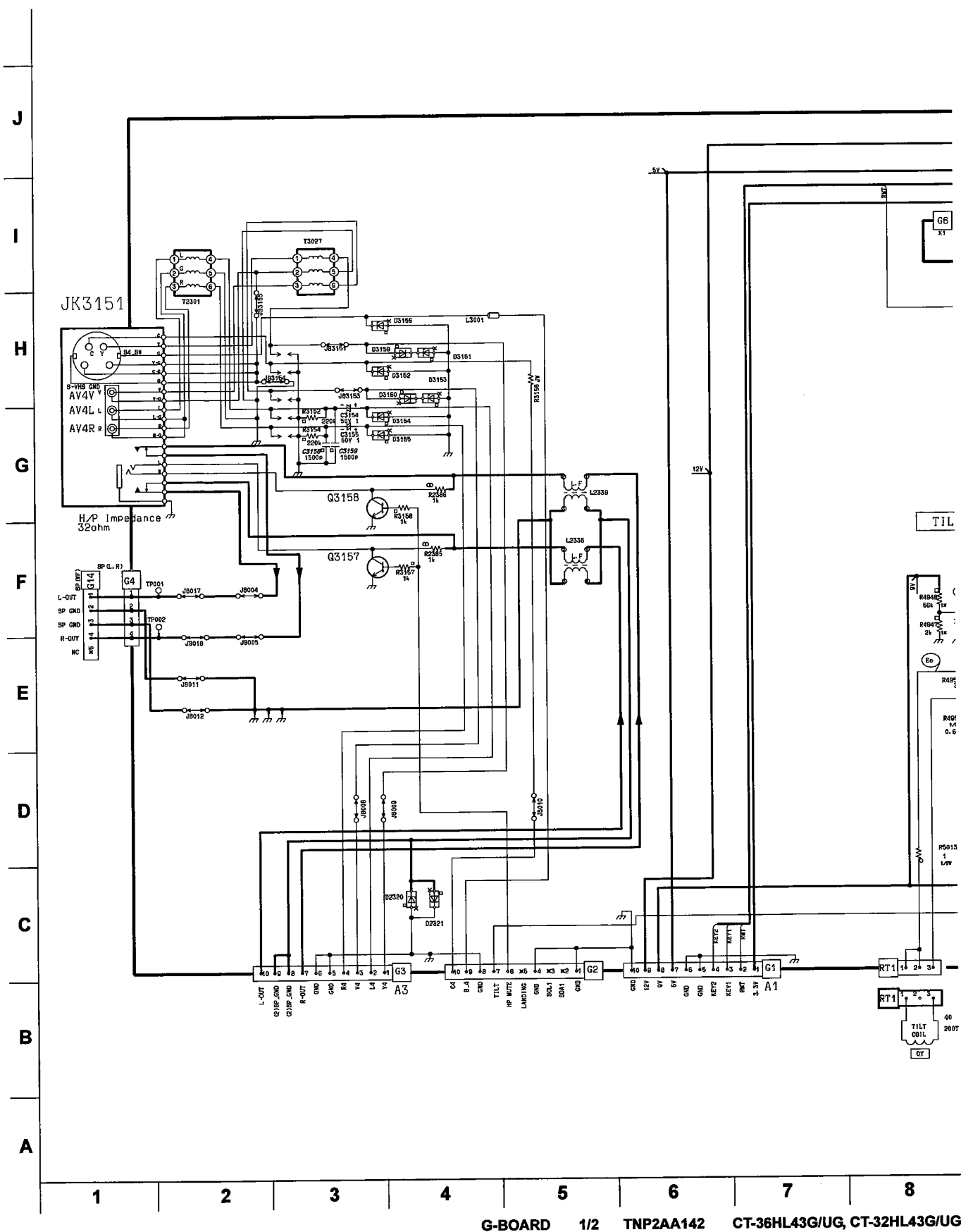
21.24. H-Board schematic 2 of 2



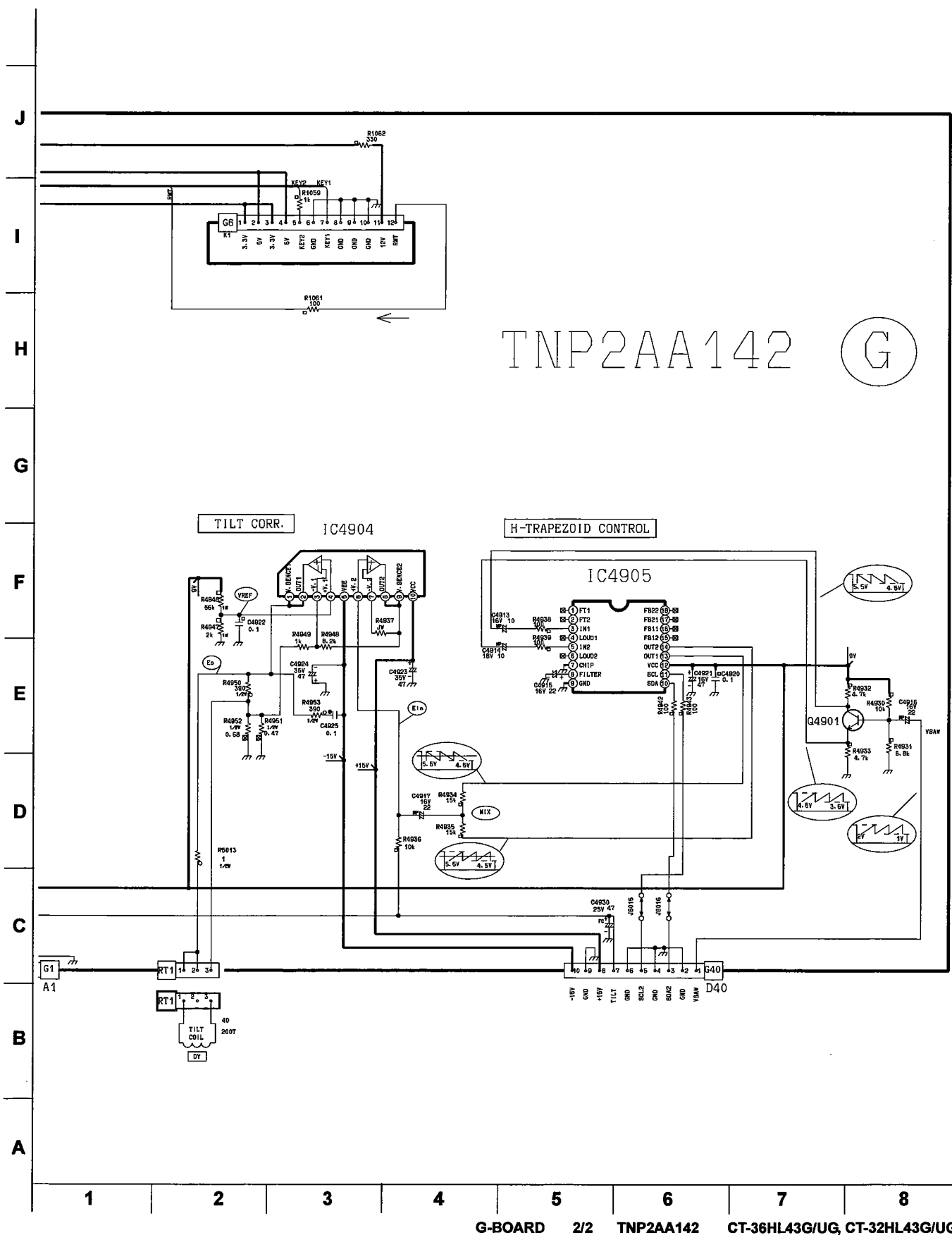
A



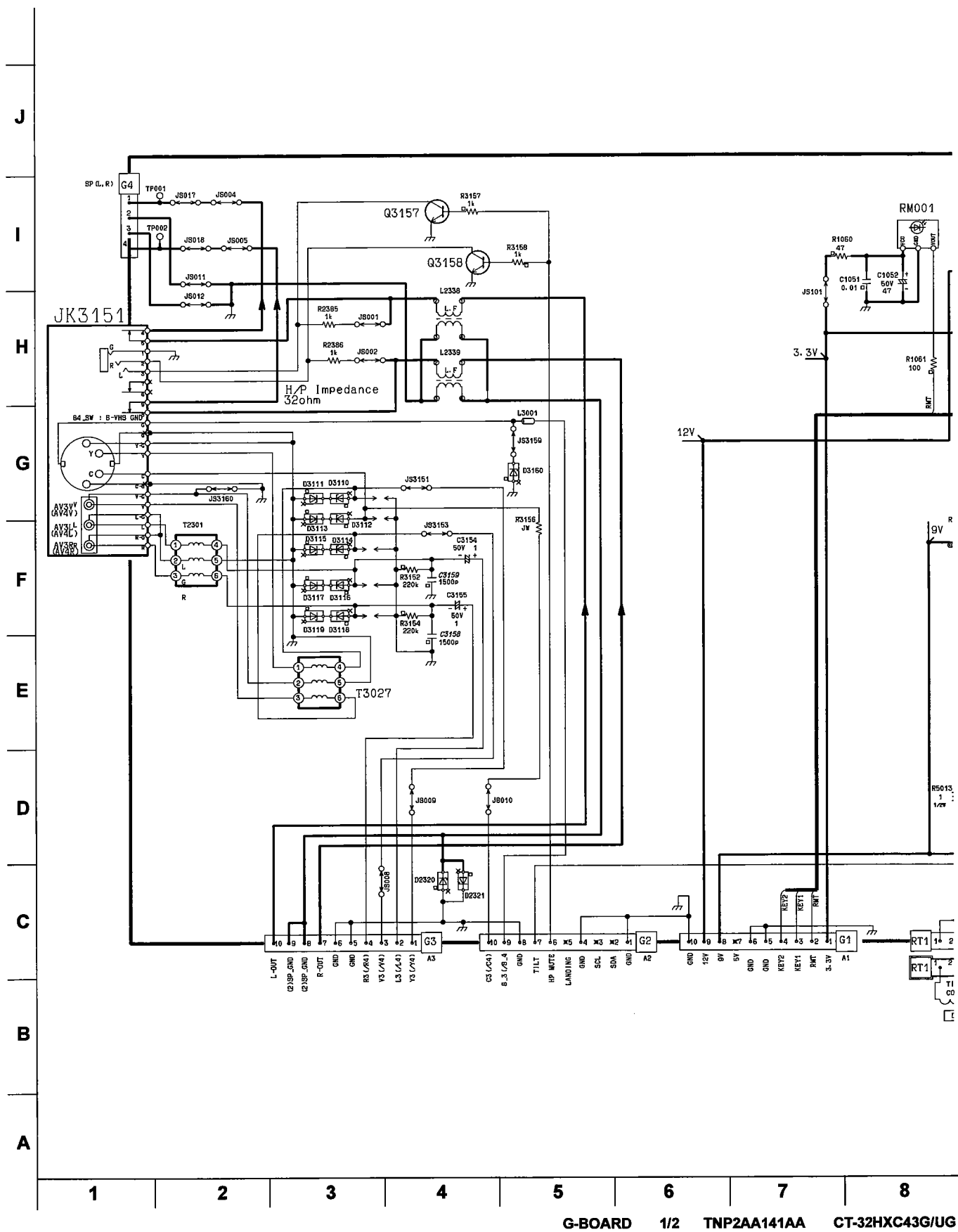
21.26. G-Board (HL) schematic 1 of 2



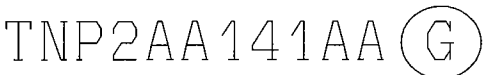
21.27. G-Board (HL) schematic 2 of 2



21.28. G-Board (HXC) schematic 1 of 2



A _____
B _____
C _____
D _____
E _____
F _____
G _____
H _____
I _____
J _____



21.30. Voltages

A - BOARD - TNP2AH050/AB

IC3002			
1	5.22	41	4.58
2	4.90	42	0.00
3	4.90	43	4.56
4	0.00	44	4.56
5	4.74	45	0.00
6	0.00	46	4.57
7	4.76	47	9.14
8	5.10	48	4.79
9	4.76	49	0.00
10	0.39	50	4.78
11	4.56	51	5.10
12	4.56	52	4.78
13	0.00	53	0.45
14	4.76	54	4.56
15	0.00	55	4.56
16	4.77	56	0.00
17	5.09	57	4.76
18	4.77	58	0.00
19	0.40	59	4.75
20	4.56	60	5.10
21	4.56	61	4.76
22	0.00	62	0.48
23	4.59	63	0.00
24	4.59	64	4.56
25	0.00	65	0.00
26	4.62	66	0.00
27	4.63	67	4.74
28	0.00	68	0.00
29	0.00	69	0.00
30	4.62	70	4.56
31	9.14	71	4.56
32	4.60	72	0.00
33	4.60	73	0.00
34	0.00	74	4.76
35	4.55	75	4.76
36	4.55	76	4.75
37	0.00	77	0.00
38	4.56	78	4.56
39	4.56	79	4.56
40	4.56	80	0.00

IC3003			
1	4.00	33	4.80
2	4.56	34	4.80
3	4.00	35	0.00
4	4.56	36	0.00
5	4.52	37	4.43
6	0.15	38	4.58
7	5.00	39	4.30
8	4.00	40	4.58
9	4.56	41	4.58
10	4.30	42	9.17
11	4.56	43	4.51
12	4.51	44	0.00
13	0.16	45	5.00
14	5.10	46	0.00
15	4.00	47	0.00
16	4.56	48	0.00
17	4.00	49	5.00
18	4.56	50	4.58
19	4.51	51	4.51
20	0.18	52	4.59
21	5.10	53	4.58
22	4.00	54	4.59
23	4.56	55	3.74
24	4.00	56	4.30
25	4.56	57	0.00
26	4.51	58	4.43
27	0.16	59	4.56
28	5.10	60	4.43
29	0.00	61	4.56
30	0.00	62	4.56
31	0.00	63	4.22
32	0.00	64	4.56

IC872	
1	15.87
2	2.83
3	0.00
4	1.24
5	6.75

IC875	
1	27.34
2	9.42
3	0.00
4	1.24
5	6.74

IC2451			
1	4.57	16	9.18
2	4.63	17	4.78
3	4.62	18	0.00
4	4.58	19	3.97
5	4.58	20	3.97
6	4.62	21	4.57
7	4.62	22	4.63
8	4.62	23	4.62
9	1.38	24	4.62
10	4.62	25	4.62
11	1.67	26	4.60
12	1.67	27	4.60
13	4.90	28	4.60
14	4.90	29	4.63
15	0.00	30	4.57

IC2201			
1	0.00	13	3.58
2	0.00	14	2.19
3	0.00	15	3.57
4	2.29	16	3.66
5	2.19	17	0.00
6	0.33	18	4.90
7	5.12	19	4.90
8	2.23	20	0.00
9	2.40	21	2.21
10	0.43	22	2.21
11	2.25	23	0.00
12	3.43	24	0.00

IC1004	
1	0.00
2	0.00
3	0.00
4	0.00
5	2.17
6	0.00
7	0.00
8	3.32

IC871	
1	15.87
2	5.41
3	0.00
4	1.24
5	6.77

IC2302	
1	-16.97
2	-16.97
3	-0.13
4	17.03
5	9.25
6	5.17
7	0.00
8	2.55
9	0.00
10	0.00
11	0.00
12	5.23
13	0.00
14	-15.74
15	0.00
16	-5.43
17	0.00
18	0.00
19	0.00
20	0.00
21	9.20
22	17.03
23	0.00
24	-16.97
25	-6.54

IC4803	
1	5.53
2	3.67
3	3.68
4	0.00
5	2.78
6	2.78
7	5.60
8	5.60
9	11.86

A - BOARD - TNP2AH050/AB

	Q007	Q802	Q803	Q880	Q2301	Q2302
B	0.71	0.71	0.00	3.32	15.92	15.92
E	0.00	0.00	0.00	3.32	10.90	10.90
C	0.00	0.00	15.91	-1.13	0.27	-0.12

	Q2304	Q2306	Q2307	Q2336	Q2337	Q2338
B	0.00	-0.11	0.00	0.00	0.00	0.00
E	0.00	0.00	-0.30	-0.13	-0.15	0.00
C	15.92	5.18	0.00	-0.14	15.91	-0.12

	Q2339	Q2340	Q2451	Q2452
B	0.00	0.00	4.60	4.60
E	-0.17	-0.18	3.97	3.96
C	5.94	-1.12	9.18	9.18

D - BOARD - TNPH0466AE

IC451	IC500	IC511	IC751
1 0.00	1 ... 142.6	1 3.76	1 3.97
2 -16.35	2 ... 142.6	2 3.22	2 7.10
3 0.00	3 ... 143.8	3 3.23	3 5.54
4 15.55	4 ... 143.9	4 0.00	4 0.00
5 1.30	5 ... 137.5	5 0.00	5 1.50
6 1.30	6 ... 143.9	6 0.00	6 0.64
7 16.00	7 ... 143.9	7 0.36	7 9.47
8 -14.68	8 ... 150.0	8 11.87	8 11.87
9 15.84	9 ... 149.7		
10 -14.67	10 ... 150.5		

IC752	IC876	IC1501
1 11.87	1 16.02	1 0.00
2 3.97	2 11.88	2 5.90
3 0.00	3 0.00	3 5.16
4 0.00	4 16.02	4 0.00
5 0.00		5 4.68
6 29.66		6 4.80
7 33.52		7 0.63
8 42.00		8 11.87

CT-36HL43G, CT-36HLUG, CT-32HL43G, CT-32HLUG, CT-32HXC43G, CT-32HXC43UG

D - BOARD - TNPH0466AE

	Q404	Q405	Q406	Q503	Q509	Q510	Q512	Q513
B	0.69	16.00	0.60	0.00	43.20	48.91	5.74	0.28
E	0.00	16.40	0.00	0.00	48.70	48.23	5.82	0.00
C	0.16	0.00	0.00	11.86	143.40	143.40	11.87	5.74

	Q551	Q562	Q752	Q754	Q804	Q854	Q860	Q861
B	0.00	3.76	1.41	-0.44	27.51	143.50	0.00	0.61
E	0.00	3.22	0.82	0.00	27.81	143.80	0.00	0.00
C	-102.20	126.30	5.55	7.05	0.00	0.00	0.63	0.00

	Q862	Q1503	Q1504	Q1505	Q1506
B	-0.56	18.97	2.22	4.55	0.38
E	0.00	18.47	1.64	4.61	0.00
C	0.63	266.2	18.47	11.87	4.56

	Q502	Q751	Q755	Q1501	Q1502
G	11.87	9.46	33.50	4.62	11.87
D	0.00	0.00	33.10	62.60	0.00
S	0.00	0.00	29.70	0.00	0.00

L - BOARD - TNP2AA139

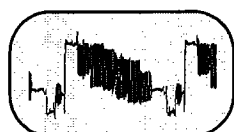
IC3801	IC3802	IC3803	IC901	IC4905
1 6.66	1 6.68	1 6.70	1 1.38	1 4.55
2 0.00	2 0.00	2 0.00	2 2.97	2 4.55
3 2.44	3 2.49	3 2.48	3 0.70	3 4.54
4 0.00	4 0.00	4 0.00	4 11.69	4 0.16
5 4.35	5 4.19	5 3.82	5 0.00	5 4.54
6 210.80	6 210.80	6 210.80	6 0.00	6 0.21
7 21.53	7 21.58	7 21.47	7 0.19	7 0.00
8 144.50	8 140.40	8 142.00	8 69.00	8 4.56
9 0.00	9 0.00	9 0.00	9 69.00	9 0.00

IC4904	IC4905
1 14.61	10 4.88
2 14.61	11 4.88
3 0.30	12 9.21
4 0.30	13 4.56
5 -16.37	14 4.56
6 2.82	15 4.53
7 2.83	16 4.56
8 2.83	17 4.53
9 2.83	18 4.56
10 15.96	

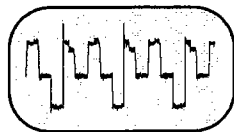
CT-36HL43G, CT-36HLUG, CT-32HL43G, CT-32HLUG, CT-32HXC43G, CT-32HXC43UG

21.31. Waveforms

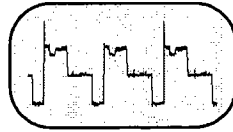
A-Board TNP2AH050/AB



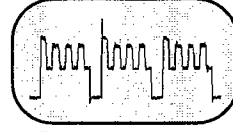
① 1.00 Vp-p
TNR001 (MAIN VIDEO)



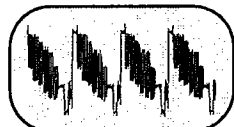
② 2.88 Vp-p
A11 PIN 3 (RED OUT)



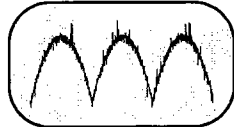
③ 2.88 Vp-p
A11 PIN 4 (GREEN OUT)



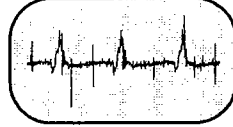
④ 2.88 Vp-p
A11 PIN 5 (BLUE OUT)



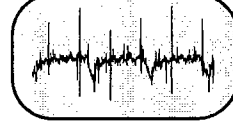
⑤ 2.06 Vp-p
A22 PIN 17 (MAIN Y)



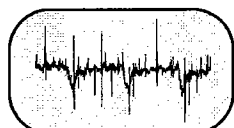
⑥ 0.80 Vp-p
A23 PIN 1 (V-DAF)



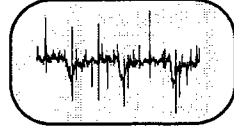
⑦ 0.37 Vp-p
A23 PIN 2 (ABL)



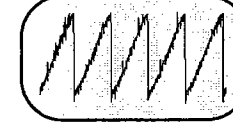
⑧ 0.16 Vp-p
A23 PIN 3 (HHS REF)



⑨ 0.12 Vp-p
A23 PIN 7 (MOMENT BSW)



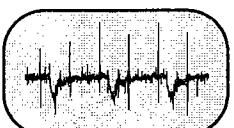
⑩ 0.13 Vp-p
A23 PIN 10 (V_RASTER)



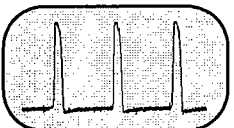
⑪ 0.86 Vp-p
A23 PIN 13 (V_DRIVE)



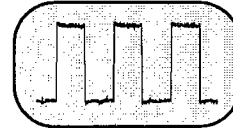
⑫ 3.36 Vp-p
A23 PIN 30 (H_DAF)



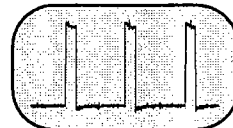
⑬ 0.11 Vp-p
A23 PIN 29 (EHT DET)



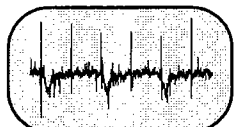
⑭ 3.8 Vp-p
A23 PIN 28 (FBP)



⑮ 3.4 Vp-p
A23 PIN 27 (H DRIVE)



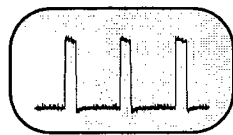
⑯ 3.4 Vp-p
A23 PIN 26 (EW DRIVE)



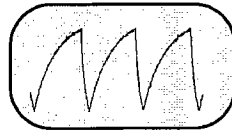
⑰ 0.11 Vp-p
A23 PIN 25 (H RASTER)

CT-36HL43G, CT-36HLUG, CT-32HL43G, CT-32HLUG, CT-32HXC43G, CT-32HXC43UG

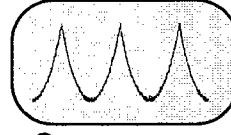
D-Board TNPH0466AE



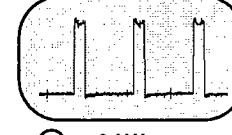
① 12.6 Vp-p
IC751 PIN 1



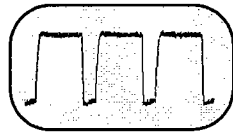
② 9.12 Vp-p
IC751 PIN 2



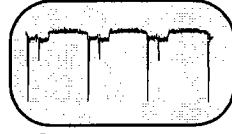
③ 5.92 Vp-p
IC751 PIN 3



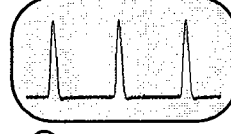
④ 3.44 Vp-p
IC751 PIN 6



⑤ 12.4 Vp-p
IC751 PIN 7



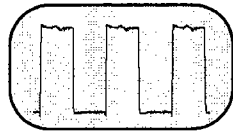
⑥ 14.0 Vp-p
Q551-B



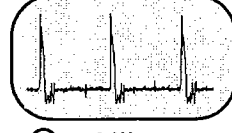
⑦ 1.66 KVp-p
Q551-C



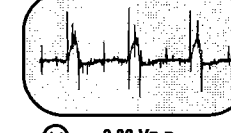
⑧ 20.4 Vp-p
Q501-D



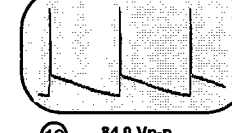
⑨ 11.5 Vp-p
Q501-G



⑩ 3.4 Vp-p
Q502-D



⑪ 0.82 Vp-p
Q502-G



⑫ 84.0 Vp-p
IC451 PIN 3



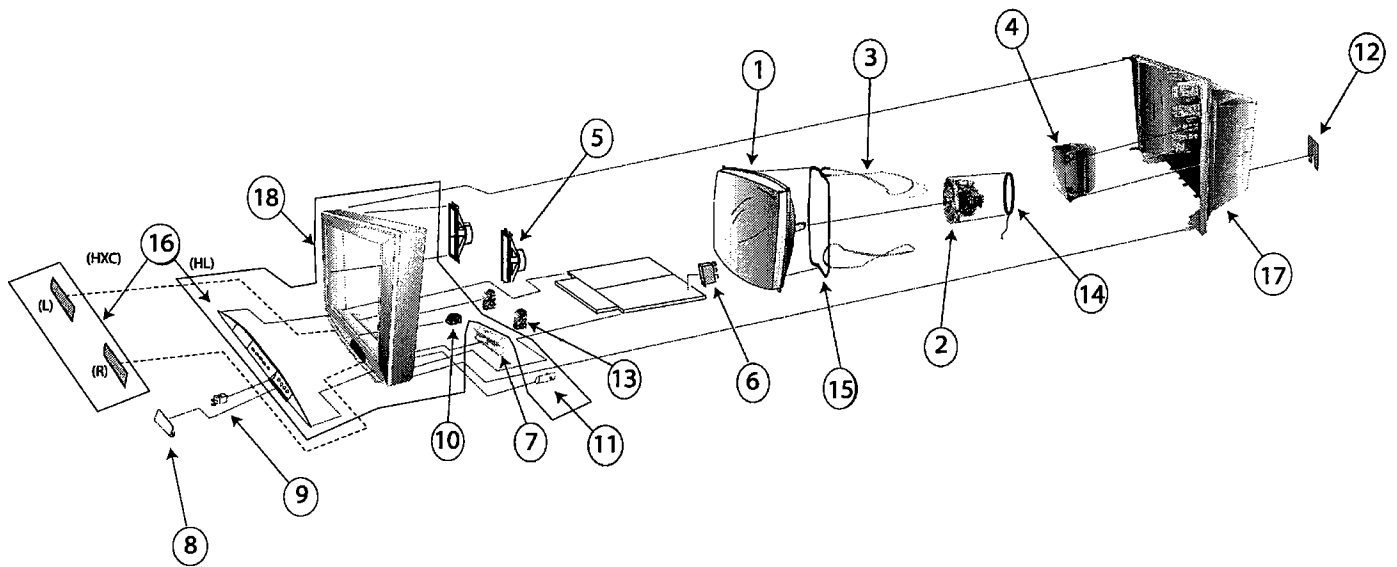
⑬ 64.8 Vp-p
IC451 PIN 4



⑭ 31.6 Vp-p
IC451 PIN 8

CT-36HL43G, CT-36HLUG, CT-32HL43G, CT-32HLUG, CT-32HXC43G, CT-32HXC43UG

22 Parts Location




NOTE:

Appearance may vary depending on the model

23 Parts list

23.1. Description of abbreviations guide

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

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 μ F, **Z**, 50V
Type Allowance

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%

23.2. Parts list

Ref. No.	Part No.	Part Name & Description	Remarks
CAPACITORS			
C038	EEUFCL471B	CAP E 470UF-10V	
C039	ECA1HM4R7B	CAP E 4.7UF-50V	
C041	ECA1HM2R2B	CAP E 2.2UF-50V	
C042	ECA1VM470B	CAP E 47UF/35V	
C043	ECA1HM4R7B	CAP E 4.7UF-50V	
C045	ECA1HM2R2B	CAP E 2.2UF-50V	
C047	ECA1HM010B	CAP E 1UF-50V	
C050	TCJ2VC1H101J	CAP C 100PF-J-50V	
C051	TCJ2VC1H101J	CAP C 100PF-J-50V	
C058	ECA1HMR22B	CAP E .22UF-50V	
C059	ECA1HMR22B	CAP E .22UF-50V	
C060	ECA1HM4R7B	CAP E 4.7UF-50V	
C405	ECA1HM102E	CAP E 1000UF-50V	
C406	ECQV1H105JL3	CAP P 1.0UF-J-50V	
C407	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C408	ECA1VM102E	CAP E 1000UF-35V	
C409	ECA1VM102E	CAP E 1000UF-35V	
C411	ECQB1H472JF3	CAP P 4700PF-J-50V	
C412	ECQB1224KF3	CAP P .22UF-K-100V	
C413	ECA1HM010B	CAP E 1UF-50V	
C414	ECQB1H272JF3	CAP P 2700PF-J-50V	
C415	ECQB1473KF3	CAP P .047UF-K-100V	
C416	ECQB1H472JF3	CAP P 4700PF-J-50V	
C419	EEUNA1A470B	CAP E 47UF-125V	
C420	ECA1CM101B	CAP E 100UF/16V	
C421	ECA1CM101B	CAP E 100UF/16V	
C422	ECA1HM010B	CAP E 1UF-50V	
C434	ECA1HM100B	CAP E 10UF/50V	
C438	ECQB1H102JF3	CAP P 1000PF-J-50V	
C439	TCJ2VB1H103K	CAP C .01UF-K-50V	
C440	ECA1HM100B	CAP E 10UF/50V	
C457	ECEAL1EN4R7UB	CAP E 4.7UF-25V	
C501	ECA1VHG101B	CAP E 100UF-35V	
C502	ECQV1H104JL3	CAP P .10UF-J-50V	
C503	ECKR2H102KB5	CAP C 1000PF-K-500V	
C506	ECA1CM471B	CAP E 470UF-16V	
C509	ECKR3A222KBP	CAP C .0022UF-K-1KV	
C510	TCJ2VC1H221J	CAP C 220PF-J-50V	
C511	ECWH20562JVB	CAP P 5600PF-J-2KV	△
C513	ECQF6103JZH	CAP P .010UF-J-630V	△
C514	ECWH20272JVV	CAP P 2700PF-J-2KV	△
C515	ECKR3A222KBP	CAP C .0022UF-K-1KV	
C516	ECWF2224JSR	CAP M .22UF-J-200V	△
C517	ECWF2684JSR	CAP M .26UF-J-200V	△
C518	ECKW3D681KBR	CAP C 680PF-K-2KV	△
C519	ECKW3D681KBR	CAP C 680PF-K-2KV	△
C520	ECQB1H183JF3	CAP P .018UF-J-50V	△
C521	ECWF2224JSR	CAP M .22UF-J-200V	
C522	ECWH20202JVV	CAP P 2000PF-J-2KV	△
C523	ECWH20562JVB	CAP C 5600PF-J-2KV	△
C524	ECQB1224JF3	CAP P .22UF-J-100V	
C525	ECA1HM470B	CAP E 47UF-50V	
C526	ECA2EM470E	CAP E 47UF-250V	
C527	ECKR2H102KB5	CAP C 1000PF-K-500V	
C528	ECA1HM4R7B	CAP E 4.7UF-50V	△
C530	ECQE2155JFB	CAP P 1.5UF-J-200V	
C531	ECA160V33UE	CAP E 33UF/160V	
C532	ECQF6472JZH	CAP P .0047UF-J-630V	△
C535	ECA1HHG471E	CAP E 470UF-50V	
C536	ECEAL1HN100UB	CAP E 10UF/50V	
C537	ECQB1H473JF3	CAP P .047UF-J-50V	
C538	ECA1CM471B	CAP E 470UF-16V	
C539	ECA1CM471B	CAP E 470UF-16V	
C541	ECQE2333JFB	CAP P .033UF-J-200V	△
C573	ECQB1H104JF3	CAP P .10UF-J-50V	
C574	ECA1CM470B	CAP E 47UF/16V	
C575	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C701	ECQB1H182JF3	CAP P 1800PF-J-50V	
C704	ECQB1H152JF3	CAP P 1500PF-J-50V	
C705	TCJ2VC1H681J	CAP C 680PF-J-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C706	ECKW3D271JBP	CAP C 270PF-J-2KV	
C709	ECQE1106KFB	CAP P 1000PF-K-1KV	
C712	ECKR1H221KB5	CAP C 220PF-K-50V	
C713	ECKR1H221KB5	CAP C 220PF-K-50V	
C714	ECA1HM2R2B	CAP E 2.2UF-50V	
C759	ECQM2104KZW	CAP P .1UF-K-200V	
C801	ECQU2A104BN9	CAP P .10UF-B-250V	△
C802	ECQU2A823BN9	CAP P .082UF-B-250V	△
C803	ECQU2A823BN9	CAP P .082UF-B-250V	△
C804	ECQU2A823BN9	CAP P .082UF-B-250V	△
C805	ECKW2H472PU7	CAP C 4700PF-P-500V	△
C806	ECKW2H472PU7	CAP C 4700PF-P-500V	△
C807	ECKW2H472PU7	CAP C 4700PF-P-500V	△
C808	ECQB1H102JF3	CAP P 1000PF-J-50V	
C809	ECQB1H333JF3	CAP P .033UF-J-50V	
C810	ECOS2DA821DB	CAP E 820UF-200V	△
C811	ECOS2DA821DB	CAP E 820UF-200V	△
C812	ECA1CM471B	CAP E 470UF-16V	
C813	ECA1HM010B	CAP E 1UF-50V	
C814	ECKW2H472PU7	CAP C 4700PF-P-500V	△
C815	ECA1EM471B	CAP E 470UF-25V	
C816	ECKW3A272KBP	CAP C 2700PF-K-1KV	
C817	ECQB1H332JF3	CAP P 3300PF-J-50V	
C819	TACCCQ221T50V	CAP C 220PF/50V	
C820	ECA1EHG221B	CAP E 220UF-25V	
C821	ECKW3D272KBP	CAP C 2700PF-K-2KV	
C822	ECQB1H393JF3	CAP P .039UF-J-50V	
C823	ECQB1H222JF3	CAP P 2200PF-J-50V	
C826	ECA1VM221B	CAP E 220UF-35V	
C827	ECQB1H333JF3	CAP P .033UF-J-50V	
C828	ECKR3A331KBP	CAP C 330PF-K-1KVDC	
C830	ETHC2C102H	CAP E 1000UF-160V	△
C831	ECKR3A102KBP	CAP C 1000PF-K-1KV	
C832	ECA1VHG102E	CAP E 1000UF/35V	
C833	ECKR3A471KBP	CAP C 470PF-K-1KV	
C834	EEUFCL1V222E	CAP E 2200UF-35V	
C838	EEUFCL1E272E	CAP E 2700UF-25V	
C839	ECKR3A151KBP	CAP C 150PF-K-1KV	
C840	ECA1EMH471B	CAP E 470UF-25V	
C841	ECA1EM222B	CAP E 2200UF-25V	
C842	ECKR3A331KBP	CAP C 330PF-K-1KVDC	
C843	ECA1VHG102E	CAP E 1000UF/35V	
C844	ECKR3A471KBP	CAP C 470PF-K-1KV	
C845	ECA1CM101B	CAP E 100UF/16V	
C846	ECA1HM010B	CAP E 1UF-50V	
C847	ECA1VM470B	CAP E 47UF/35V	
C848	ECA1CM101B	CAP E 100UF/16V	
C850	EEUFCL1E272E	CAP E 2700UF-25V	
C851	ECA1CM221B	CAP E 10UF-16V	
C856	ECQU2A103MNB	CAP P .010UF-M-250V	△
C857	TCJ2VB1H103K	CAP C .01UF-K-50V	
C859	ECA1VHG471B	CAP E 470UF-35V	
C860	ECKCNA222MEB	CAP C 2200PF-M-125V	△
C861	ECKCNA222MEB	CAP C 2200PF-M-125V	△
C876	ECA1EM471B	CAP E 470UF-25V	
C877	EEUFCL1A471B	CAP E 470UF-10V	
C878	ECA1EM471B	CAP E 470UF-25V	
C879	EEUFCL1A471B	CAP E 470UF-10V	
C880	TCJ2VB1H103K	CAP C .01UF-K-50V	
C885	ECA1VM471B	CAP E 470UF-35V	
C886	EEUFCL1C471B	CAP E 470UF-16V	
C887	ECA1CM471B	CAP E 470UF-16V	
C888	ECA1EM101B	CAP E 100UF-25V	
C889	ECA1CM101B	CAP E 100UF/16V	
C890	ECA1CM221B	CAP E 10UF-16V	
C891	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C892	ECA0JM221B	CAP E 220UF-6.3V	
C893	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C894	ECA1VM101B	CAP E 100UF-35V	
C895	ECA1CM221B	CAP E 10UF-16V	
C896	TCJ2VF1H103Z	CAP C .01UF-Z-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C897	ECA1EM471B	CAP E 470UF-25V	
C898	TCJ2VB1H103K	CAP C .01UF-K-50V	
C899	TCJ2VB1H103K	CAP C .01UF-K-50V	
C901	ECJ2VF1H103Z	CAP C .01UF-Z-50V	
C902	ECA1CM101B	CAP E 100UF/16V	
C904	ECA1CM101B	CAP E 100UF/16V	
C906	ECA1CM101B	CAP E 100UF/16V	
C907	ECA2EM220E	CAP E 22UF-250V	
C908	ECQE2103KF3	CAP P .010UF-K-200V	
C909	ECA1CM101B	CAP E 100UF/16V	
C910	ECA2CM100B	CAP E 10UF-160V	
C911	ECQE2103KF3	CAP P .010UF-K-200V	
C1024	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C1025	ECA0JM222B	CAP E 2200UF-6.3V	
C1051	ECJ2VF1H103Z	CAP C .01UF-Z-50V CT-32HL43G/UG, CT-36HL43G/UG	
C1051	TCJ2VB1H103K	CAP C .01UF-K-50V CT-32HXC43G/UG	
C1052	ECA1AM470B	CAP E 47UF-10V CT-32HL43G/UG CT-36HL43G/UG	
C1052	ECA1HM470B	CAP E 47UF-50V CT-32HXC43G/UG	
C1504	ECQB1H103JF3	CAP P .01UF-J-50V	
C1505	ECA1CM470B	CAP E 47UF/16V	
C1506	TCJ2VF1H102Z	CAP C 1000PF-Z-50V	
C1507	ECA1CM220B	CAP E 22UF-16V	
C1508	ECKW3D151KBP	CAP C 150PF-K-2KV	
C1509	ECQM6223KZW	CAP P .022UF-K-600V	
C1510	ECQM4223KZW	CAP P .022UF-K-400V	
C1511	ECA1HM010B	CAP E 1UF-50V	
C1512	ECKW3D102KBP	CAP C 1000PF-K-2KV	
C1513	ECKW3D471KBP	CAP C 470PF-K-2KVDC	
C1515	ECKR3A152KBP	CAP C 1500PF-K-1KVDC	
C1516	ECKR3A561KBP	CAP C 560PF-K-1KV	
C1517	ECKR3A151KBP	CAP C 150PF-K-1KV	
C1518	ECKR3A102KBP	CAP C 1000PF-K-1KV	
C1519	ECA1VM470B	CAP E 47UF/35V	
C1520	ECA1HM100B	CAP E 10UF/50V	
C1521	ECA0JM331B	CAP E 330UF-6.3V	
C2202	ECEA1HKA2R2B	CAP E 2.2UF-50V	
C2203	ECEA1HKA4R7B	CAP E 4.7UF-50V	
C2204	AP106K016CAE	CAP T 10UF/16V	
C2205	ECA1HM010B	CAP E 1UF-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	
C2211	ECA1HM100B	CAP E 10UF/50V	
C2212	ECQB1H473JF3	CAP P .047UF-J-50V	
C2215	ECA1CM101B	CAP E 100UF/16V	
C2218	ECA1HMR47B	CAP E .47UF-50V	
C2303	ECA1EM101B	CAP E 100UF-25V	
C2304	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C2325	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2330	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2331	ECA1HM100B	CAP E 10UF/50V	
C2332	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2333	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2334	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C2342	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2343	ECEA1CN100UB	CAP E 10UF-16V	
C2344	ECQB1H224JF3	CAP P .22UF-J-50V	
C2345	EEUFC1E222E	CAP E 2200UF-25V	
C2346	TCJ2VB1H561K	CAP C 560PF-K-50V	
C2347	ECJ3VB1H104K	CAP C .1UF-K-50V	
C2348	ECA1HM100B	CAP E 10UF/50V	
C2349	ECEA1CN100UB	CAP E 10UF-16V	
C2351	FLJ1C225A083	CAP C 2.2UF-Z-16V	
C2352	EEUFC1E222E	CAP E 2200UF-25V	
C2353	EEUFC1E222E	CAP E 2200UF-25V	
C2354	TCJ2VB1H471K	CAP C 470PF-K-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C2355	TCJ2VC1H270J	CAP C 27PF-J-50V	
C2356	TCJ2VB1H471K	CAP C 470PF-K-50V	
C2357	TCJ2VB1H331K	CAP C 330PF-K-50V	
C2358	ECJ3VB1H104K	CAP C .1UF-K-50V	
C2359	TCJ2VB1H331K	CAP C 330PF-K-50V	
C2360	ECJ3VB1H104K	CAP C .1UF-K-50V	
C2361	TCJ2VB1H471K	CAP C 470PF-K-50V	
C2362	TCJ2VB1H471K	CAP C 470PF-K-50V	
C2363	TCJ2VB1H682K	CAP C 6800PF-K-50V	
C2364	ECJ3VB1H104K	CAP C .1UF-K-50V	
C2365	ECJ3VB1H104K	CAP C .1UF-K-50V	
C2366	EEUFC1E222E	CAP E 2200UF-25V	
C2367	ECQB1H224JF3	CAP P .22UF-J-50V	
C2368	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2369	TCJ2VB1H561K	CAP C 560PF-K-50V	
C2370	ECEA1HN100UB	CAP E 10UF/50V	
C2371	ECEA1HN100UB	CAP E 10UF/50V	
C2373	TCJ2VB1H682K	CAP C 6800PF-K-50V	
C2374	ECEA1HN100UB	CAP E 10UF/50V	
C2375	ECEA1HN100UB	CAP E 10UF/50V	
C2378	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C2380	ECA1HM010B	CAP E 1UF-50V	
C2451	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2452	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2453	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2455	TCJ2VB1H472K	CAP C 4700PF-K-50V	
C2456	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2457	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2458	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2459	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2460	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2461	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2462	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2463	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2464	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2465	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2466	TCJ2VB1H472K	CAP C 4700PF-K-50V	
C2468	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2469	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2470	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2474	ECA1CM101B	CAP E 100UF/16V	
C2475	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3001	ECA1CM470B	CAP E 47UF/16V	
C3002	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3004	ECA1CM470B	CAP E 47UF/16V	
C3010	ECEA1CKA101B	CAP E 100UF-16V	
C3011	ECJ2VF1C104Z	CAP C .1UF-Z-16V	
C3012	ECJ2VB1C104K	CAP C .1UF-K-16V	
C3013	ECEA1CKA101B	CAP E 100UF-16V	
C3014	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3015	ECJ2VB1C104K	CAP C .1UF-K-16V	
C3016	ECJ2VB1C104K	CAP C .1UF-K-16V	
C3017	ECJ2VB1C104K	CAP C .1UF-K-16V	
C3018	ECEA1CKA100B	CAP E 10UF-16V	
C3020	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V CT-32HL43G/UG, CT-36HL43G/UG	
C3021	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V CT-32HL43G/UG, CT-32HL43G/UG	
C3031	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3032	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3033	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3034	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3035	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3036	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3037	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3038	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3039	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3042	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3043	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3044	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3045	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3046	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3049	TCJ2VB1H152K	CAP C 1500PF-K-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C3050	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3051	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3052	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3054	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3055	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3056	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3057	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3058	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3059	ECA1CM471B	CAP E 470UF-16V	
C3100	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3102	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3104	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3106	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3109	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3111	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3115	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3117	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3121	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V CT-32HL43G, CT-32HXC43G/UG CT-36HL43G/UG	
C3126	ECJ2YB1A105K	CAP C 1.0UF-K-125V	
C3127	ECJ2YB1A105K	CAP C 1.0UF-K-125V	
C3128	ECJ2YB1A105K	CAP C 1.0UF-K-125V	
C3129	ECJ2YB1A105K	CAP C 1.0UF-K-125V	
C3132	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3154	ECA1HM010B	CAP E 1UF-50V	
C3155	ECA1HM010B	CAP E 1UF-50V	
C3158	TCJ2VB1H152K	CAP C 1500PF-K-50V CT-32HXC43G/UG	
C3159	TCJ2VB1H152K	CAP C 1500PF-K-50V CT-32HXC43G/UG	
C3160	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3161	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3162	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3163	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3164	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C3165	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3166	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C3167	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3168	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3170	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3172	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3173	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C3174	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3175	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C3182	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3183	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3184	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3185	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3186	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3187	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3188	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3189	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3190	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3191	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3192	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C3193	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C3194	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C3801	ECQE2104KFW	CAP P .10UF-K-200V	
C3802	ECQE2104KFW	CAP P .10UF-K-200V	
C3803	ECQE2104KFW	CAP P .10UF-K-200V	
C3807	ECA2EM470E	CAP E 47UF-250V	
C3808	ECA2EM470E	CAP E 47UF-250V	
C3809	ECA2EM101E	CAP E 100UF-250V	
C3810	ECA2EM101E	CAP E 100UF-250V	
C3811	ECKC3D332KBN	CAP C 3300PF-K-2KV	
C4805	ECA1CM470B	CAP E 47UF/16V	
C4806	ECQV1H334JL3	CAP P .33UF-J-50V	
C4913	ECRA1CN100UB	CAP E 10UF-16V	
C4914	ECRA1CN100UB	CAP E 10UF-16V	
C4915	ECA1CM220B	CAP E 22UF-16V	
C4916	ECRA1CN220UB	CAP E 22UF-16V	
C4917	ECRA1CN220UB	CAP E 22UF-16V	
C4920	ECJ2VF1H104Z	CAP C .1UF-Z-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C4921	ECA1CM470B	CAP E 47UF/16V	
C4922	ECJ2VB1C104K	CAP C .1UF-K-16V CT-32HL43G/UG, CT-36HL43G/UG	
C4922	ECQB1H104JF3	CAP P .10UF-J-50V CT-32HXC43G/UG	
C4923	ECA1VM470B	CAP E 47UF/35V	
C4924	ECA1VM470B	CAP E 47UF/35V	
C4925	ECQB1H104JF3	CAP P .10UF-J-50V	
C4930	EBUFC1E470B	CAP E 47UF-25V CT-32HL43G/UG, CT-36HL43G/UG	
DIODES			
D006	MAZ43000HF	DIODE ZENER	
D009	MA2C165001VT	DIODE	
D010	MAZ40300MF	DIODE ZENER	
D13	K1ZZ00001205	DIODE	
D402	MAZ42700MF	DIODE ZENER	
D405	B0EAKM000018	DIODE RECTIFIER	
D406	B0EAKM000018	DIODE RECTIFIER	
D407	MA2C165001VT	DIODE	
D408	MA2C165001VT	DIODE	
D410	MA2C165001VT	DIODE	
D411	MA2C165001VT	DIODE	
D412	MA2C165001VT	DIODE	
D452	MA2C165001VT	DIODE	
D468	MAZ40620MF	DIODE ZENER	
D477	MA2C029WBF	DIODE	
D501	D1NL40V70	DIODE	
D502	MAZ41500MF	DIODE ZENER	
D503	B0KZ00000001	DIODE	
D505	MAZ40330MF	DIODE ZENER	
D509	MA2C165001VT	DIODE	
D510	MAZ40820MF	DIODE ZENER	
D511	D1NL40V70	DIODE	
D512	D1NL40V70	DIODE	△
D515	D1NL40V70	DIODE	
D516	MAZ40510LF	DIODE ZENER	
D517	D1NL40V70	DIODE	
D518	D1NL40V70	DIODE	
D520	MA167TA5VT	DIODE SWITCHING	
D550	B0HAMP000059	DIODE	
D703	D1NL40V70	DIODE	
D708	MAZ41500MF	DIODE ZENER	
D711	B0AAGR000002	DIODE SWITCHING	
D751	MA2C165001VT	DIODE	
D761	MA2C165001VT	DIODE	
D801	B0FDTA000001	DIODE	△
D802	MA2C700A0F	DIODE	
D803	D4DDF1R50001	DIODE	△
D804	MAZ41200MF	DIODE ZENER	
D806	AU012V0	DIODE	
D807	MA2C165001VT	DIODE	
D809	D4EAC3910001	DIODE	△
D811	B0EAKL000008	DIODE RECTIFIER	
D814	MA2C165001VT	DIODE	
D815	MA2C165001VT	DIODE	
D816	MA2C165001VT	DIODE	
D817	MAZ42200LF	DIODE ZENER	
D818	MAZ42000MF	DIODE ZENER	
D824	B0BA01000046	DIODE	△
D825	B0HAPV000011	DIODE	△
D826	MA3D690	DIODE	
D827	B0HANM000016	DIODE	
D828	MA3D690	DIODE	
D829	B0HANM000016	DIODE	
D830	MA3D690	DIODE	
D831	MA2C165001VT	DIODE	
D832	MA2C165001VT	DIODE	
D833	MAZ41100HF	DIODE ZENER	
D834	AU022V0	DIODE	
D836	AU022V0	DIODE	
D839	MAZ40390MF	DIODE ZENER	
D840	MA2C165001VT	DIODE	
D845	MA2C165001VT	DIODE	
D846	MAZ41800MF	DIODE ZENER	

Ref. No.	Part No.	Part Name & Description	Remarks
D847	MAZ43000MF	DIODE ZENER	
D848	MA2C165001VT	DIODE	
D850	MA2C165001VT	DIODE	
D851	MA2C165001VT	DIODE	
D861	B0JAME000052	DIODE	
D862	B0JAME000052	DIODE	
D874	B0JCME000025	DIODE	
D875	B0JCME000025	DIODE	
D876	MA2C165001VT	DIODE	
D877	MA2C165001VT	DIODE	
D878	B0JCME000025	DIODE	
D881	B0BA01000046	DIODE ZENER	
D883	B0BA01000046	DIODE ZENER	
D884	TMPG12G3	DIODE	
D889	MA2C165001VT	DIODE	
D893	MA2C165001VT	DIODE	
D894	MA2C165001VT	DIODE	
D898	MA2C165001VT	DIODE	
D899	MA2C165001VT	DIODE	
D1001	LN81RPH	DIODE CT-32HL43G/UG, CT-36HL43G/UG	
D1001	LN81RPHCF3	DIODE CT-32HXC43G/UG	
D1501	MAZ40750HF	DIODE ZENER	
D1503	MAZ40300HF	DIODE ZENER	△
D1504	MAZ40200HF	DIODE ZENER	
D1505	B0HACW000002	DIODE	
D1508	MA2C165001VT	DIODE	
D1509	AU02AV0	DIODE	
D1510	AU02AV0	DIODE	
D1513	MA2C165001VT	DIODE	
D2320	MAZ33000ML	DIODE	
D2321	MAZ33000ML	DIODE	
D2322	MA3X152K0L	DIODE	
D2324	MA3X152K0L	DIODE	
D2325	MA3X152K0L	DIODE	
D2326	MAZ42700MF	DIODE ZENER	
D2327	MAZ42700MF	DIODE ZENER	
D3001	MAZ31100ML	DIODE ZENER	
D3002	MAZ31100ML	DIODE ZENER	
D3003	MAZ31100ML	DIODE ZENER	
D3004	MAZ31100ML	DIODE ZENER	
D3005	MAZ31100ML	DIODE ZENER	
D3006	MAZ31100ML	DIODE ZENER	
D3007	MAZ31100ML	DIODE ZENER	
D3008	MAZ31100ML	DIODE ZENER	
D3009	MAZ31100ML	DIODE ZENER	
D3010	MAZ31100ML	DIODE ZENER	
D3011	MAZ31100ML	DIODE ZENER	
D3012	MAZ31100ML	DIODE ZENER	
D3013	MAZ31100ML	DIODE ZENER	
D3014	MAZ31100ML	DIODE ZENER	
D3015	MAZ31100ML	DIODE ZENER	
D3016	MAZ31100ML	DIODE ZENER	
D3017	MAZ31100ML	DIODE ZENER	
D3018	MAZ31100ML	DIODE ZENER	
D3019	MAZ31100ML	DIODE ZENER	
D3020	MAZ31100ML	DIODE ZENER	
D3021	MAZ31100ML	DIODE ZENER	
D3022	MAZ31100ML	DIODE ZENER	
D3023	MAZ31100ML	DIODE ZENER	
D3024	MAZ31100ML	DIODE ZENER	
D3025	MAZ31100ML	DIODE ZENER	
D3026	MAZ31100ML	DIODE ZENER	
D3027	MAZ31100ML	DIODE ZENER	
D3028	MAZ31100ML	DIODE ZENER	
D3029	MAZ31100ML	DIODE ZENER	
D3030	MAZ31100ML	DIODE ZENER	
D3031	MAZ31100ML	DIODE ZENER	
D3032	MAZ31100ML	DIODE ZENER	
D3033	MAZ31100ML	DIODE ZENER	
D3034	MAZ31100ML	DIODE ZENER	

Ref. No.	Part No.	Part Name & Description	Remarks
D3035	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-32HXC43UG, CT-36HL43G/UG	
D3036	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-32HXC43UG, CT-36HL43G/UG	
D3037	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-32HXC43UG, CT-36HL43G/UG	
D3038	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-32HXC43UG, CT-36HL43G/UG	
D3039	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-32HXC43UG, CT-36HL43G/UG	
D3110	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3111	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3112	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3113	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3114	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3115	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3116	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3117	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3118	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3119	MAZ31100ML	DIODE ZENER CT-32HXC43G/UG	
D3151	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-36HL43G/UG	
D3152	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-36HL43G/UG	
D3153	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-36HL43G/UG	
D3154	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-36HL43G/UG	
D3155	MAZ31100ML	DIODE ZENER CT-32HL43G/UG, CT-36HL43G/UG	
D3156	MAZ31100ML	DIODE ZENER	
D3159	MAZ31100ML	DIODE ZENER	
D3160	MAZ31100ML	DIODE ZENER	
D3801	MAZ41200MF	DIODE ZENER	
D3802	MAZ41200MF	DIODE ZENER	
D3803	MAZ41200MF	DIODE ZENER	
D3804	B0HALP000002	DIODE FAST RECOVERY	
D3805	B0HALP000002	DIODE FAST RECOVERY	
D3806	B0HALP000002	DIODE FAST RECOVERY	
D3807	B0HALP000002	DIODE FAST RECOVERY	
D3808	B0HALP000002	DIODE FAST RECOVERY	
D3809	B0HALP000002	DIODE FAST RECOVERY	
D3811	D4EAB3610002	DIODE	
D4805	MA2C165001VT	DIODE	
D4806	MA2C165001VT	DIODE	
FUSES			
F801	XBA2A00101	FUSE 6.3A 125V	△
INTEGRATED CIRCUITS			
IC432	C0ABBA000073	INT. CKT.	
IC433	C0ABBA000073	INT. CKT.	
IC451	LA7876N	INT CKT	
IC500	C0AABB000107	INT CKT	
IC511	AN6914S-E1	INT CKT	
IC751	AN6914S-E1	INT CKT	
IC752	C0EBZ0000373	INT. CKT.	
IC801	AN8029	INT CKT	△
IC802	C0EAS0000024	INT. CKT.	△
IC804	B0EBKM000016	DIODE RECTIFIER	
IC811	PC123FY2	INT CKT	△
IC871	C0DACMG00001	INT CKT	
IC872	C0DACMG00001	INT CKT	
IC875	C0DACMG00001	INT CKT	
IC876	C0DAZJG00004	INT. CKT.	

Ref. No.	Part No.	Part Name & Description	Remarks
IC901	C5AA00000195	INT CKT	
IC1004	TVR2AJ160S	INT CKT CT-32HL43G/UG, CT-36HL43G/UG	
IC1004	TVR2AJ161S	INT CKT CT-32HXC43G/UG	
IC1501	C0ABBA000073	INT. CKT.	
IC2201	AN5849S-E1V	INT CKT	
IC2302	CLAA00000645	INT CKT	
IC2304	C0ABBA000073	INT. CKT.	
IC2451	C1BB00000772	INT CKT CT-32HL43G/UG, CT-36HL43G/UG	
IC2451	NJW1137MPTE1	INT CKT CT-32HXC43G/UG	
IC3002	AN15852A-VT	INT CKT	
IC3003	CLAB00000460	INT. CKT.	
IC3801	CLAA00000648	INT CKT (VIDEO OUTPUT AMP	
IC3802	CLAA00000648	INT CKT (VIDEO OUTPUT AMP	
IC3803	CLAA00000648	INT CKT (VIDEO OUTPUT AMP	
IC4803	C0AABB000107	INT. CKT.	
IC4904	C0AABB000107	INT. CKT.	
IC4905	BD3869AF-E2	INT CKT	
RM001	PNA4701M04TV	INT CKT CT-32HXC43G/UG	
RM001	PNA4701M05TV	INT CKT CT-32HL43G/UG, CT-36HL43G/UG	
COILS			
J330	EXCELSA39V	FERRITE BEAD	
L009	ELELN330KA	COIL PEAKING 33UH	
L011	ELELN330KA	COIL PEAKING 33UH	
L401	EXCELSA39V	FERRITE BEAD	
L431	ELESN101KA	COIL PEAKING 100UH	
L432	EXCELD25V	FERRITE BEAD	
L500	TALL08TR56MA	COIL	
L503	TALL13N103JB	COIL	
L506	EXCELSA24T	FERRITE BEAD	
L551	ELH5L7720	COIL	△
L553	ELH5L8110	COIL	△
L711	ELESN100KA	COIL PEAKING 10UH	
L751	ELC18B151G	FILTER	
L752	TALFP15B152K	COIL	
L759	EXCELSA35T	FERRITE BEAD	
L801	G0B650H00002	COIL	△
L802	G0B332H00002	COIL	△
L803	G0B332H00002	COIL	△
L804	G0B102H00009	COIL	△
L807	EXCELD35V	FERRITE BEAD	
L812	EXCELSA35B	FERRITE BEAD	
L813	EXCELSA39E	FERRITE BEAD	
L814	TALL08T101KA	LINE FILTER	
L815	EXCELSA39E	FERRITE BEAD	
L816	EXCELSA39E	FERRITE BEAD	
L819	EXCELSA24T	FERRITE BEAD	
L820	EXCELSA24T	FERRITE BEAD	
L821	EXCELD35V	FERRITE BEAD	
L824	EXCELD35V	FERRITE BEAD	
L825	G0A151D00002	COIL	
L826	TLUADTB820K	COIL	
L827	TALL08T470KA	COIL	
L829	EXCELD35V	FERRITE BEAD	
L850	ELESN101JA	COIL PEAKING 100UH	
L875	G0A151ZA0004	COIL	
L876	G0A151ZA0004	COIL	
L878	G0A331ZA0004	COIL	
L890	EXCELD35V	FERRITE BEAD	
L891	G0A101E00003	COIL	
L904	G0B800H00001	COIL	
L1501	TALFP15B222K	COIL	
L2201	ELESN100JA	COIL PEAKING 10UH	
L2331	ELC12E390	COIL	
L2332	ELC12E390	COIL	
L2334	EXCELD35V	FERRITE BEAD	
L2335	EXCELD35V	FERRITE BEAD	
L2338	G0B800H00001	COIL	
L2339	G0B800H00001	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L2341	G0A330G00010	COIL	
L2342	G0A330G00010	COIL	
L3001	EXCELSA35T	FERRITE BEAD	
L3008	TALC325T100K	COIL	
L3010	TALC325T100K	COIL	
L3012	ELJPA2R2MF	CHIP INDUCTOR 2.2UH CT-32HL43G/UG, CT-36HL43G/UG	
L3013	ELJPA100KF	CHIP INDUCTOR 10UH CT-32HL43G/UG, CT-36HL43G/UG	
L3804	TALV35VB1R0J	COIL	
L3805	TALV35VB1R0J	COIL	
L3806	TALV35VB1R0J	COIL	
L3807	EXCELSA24T	FERRITE BEAD	
TRANSISTORS			
Q007	2SD601ARTX	TRANSISTOR	
Q404	2SD601ASTX	TRANSISTOR	
Q405	2SA1309ATA	TRANSISTOR	
Q406	2SD601ARTX	TRANSISTOR	
Q501	B1CKML000001	TRANSISTOR	
Q502	2SK2847LEMAT	TRANSISTOR	
Q503	2SD601ARTX	TRANSISTOR	
Q509	2SC1473QR	TRANSISTOR	
Q510	2SC1473QR	TRANSISTOR	
Q512	2SC1685QRSTA	TRANSISTOR	
Q513	2SD601ARTX	TRANSISTOR	
Q551	B1BAJW000001	TRANSISTOR	
Q562	2SC1473QRTA	TRANSISTOR	
Q751	2SK2538000LB	TRANSISTOR	
Q752	2SD601ARTX	TRANSISTOR	
Q754	2SD601ARTX	TRANSISTOR	
Q755	B1DEGG000010	TRANSISTOR	
Q801	2SK2917LB	TRANSISTOR	△
Q802	2SC1685QRSTA	TRANSISTOR	
Q803	2SC1685QRSTA	TRANSISTOR	
Q804	2SA1309ATA	TRANSISTOR	
Q805	2SC1685QRSTA	TRANSISTOR	
Q806	2SC1685QRSTA	TRANSISTOR	
Q807	2SC1318STA	TRANSISTOR	
Q808	2SC1685QRSTA	TRANSISTOR	
Q854	2SA19610QAHW	TRANSISTOR	
Q860	2SD601ARTX	TRANSISTOR	
Q861	2SD601ARTX	TRANSISTOR	
Q862	2SD601ARTX	TRANSISTOR	
Q863	2SD601ARTX	TRANSISTOR	
Q880	2SB709ARTX	TRANSISTOR	
Q1501	B1DEDR000005	TRANSISTOR	
Q1502	B1DEDR000005	TRANSISTOR	
Q1503	B1BAAT000001	TRANSISTOR	
Q1504	2SC1685QRSTA	TRANSISTOR	
Q1505	2SC1685QRSTA	TRANSISTOR	
Q1506	2SD601ARTX	TRANSISTOR	
Q2301	2SB709ARTX	TRANSISTOR	
Q2302	2SB709ARTX	TRANSISTOR	
Q2304	2SD601ARTX	TRANSISTOR	
Q2306	2SD601ARTX	TRANSISTOR	
Q2307	2SB709ARTX	TRANSISTOR	
Q2313	2SD601ARTX	TRANSISTOR	
Q2314	2SD601ARTX	TRANSISTOR	
Q2334	2SD601ARTX	TRANSISTOR	
Q2335	2SD601ARTX	TRANSISTOR	
Q2336	2SB709ARTX	TRANSISTOR	
Q2337	2SD601ARTX	TRANSISTOR	
Q2338	2SD601ARTX	TRANSISTOR	
Q2339	2SD601ARTX	TRANSISTOR	
Q2340	2SB709ARTX	TRANSISTOR	
Q2451	2SD601ARTX	TRANSISTOR	
Q2452	2SD601ARTX	TRANSISTOR	
Q3026	2SB709ARTX	TRANSISTOR	
Q3157	2SD601ARTX	TRANSISTOR	
Q3158	2SD601ARTX	TRANSISTOR	
Q4901	2SD601ARTX	TRANSISTOR	
RELAYS			
RL451	TSE10814	RELAY	

Ref. No.	Part No.	Part Name & Description	Remarks
RL801	K6B1AGA00043	RELAY	△
RL802	TSE10814	RELAY	△
RL803	K6B1AGA00042	RELAY	△
RL804	K6B1CGA00075	RELAY	△
RESISTORS			
R050	ERJ6GEYJ101V	RES M 100-J-1/10W	
R051	ERJ6GEYJ101V	RES M 100-J-1/10W	
R052	ERJ6GEYJ101V	RES M 100-J-1/10W	
R053	ERJ6GEYJ101V	RES M 100-J-1/10W	
R078	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R079	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R080	ERJ6GEYJ220V	RES M 22-J-1/10W	
R081	ERDS2TJ220T	RES C 22-J-1/4W	
R407	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R408	ERDS2TJ272T	RES C 2.7K-J-1/4W	
R409	ERJ6GEYJ563V	RES M 56K-J-1/10W	
R410	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R411	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R412	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R413	ERDS2TJ104T	RES C 100K-J-1/4W	
R414	ERX1SJR82P	RES M .82-J-1/2W	
R415	ERG3FJ331H	RES M 330-J-3W	
R417	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R418	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R419	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R420	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R421	ERJ6ENF1602V	RES M 16K-F-1/4W	
R422	ERJ6ENF2001V	RES M 2K-F-1/10W	
R423	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R424	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R425	ERDS1FJ1R0P	RES C 1.0-J-1/2W	
R426	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R427	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R428	ER0S2THF9761	RES M 9.76K-F-1/4W	
R429	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R430	ER0S2THF1500	RES M 150-F-1/4W	
R431	ER0S2THF2000	RES M 200-F-1/4W	
R434	ERX12SJ1R8P	RES M 1.8-J-1/2W	
R435	ERX12SJ2R2P	RES M 2.2-J-1/2W	
R436	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R440	ERGLSJ102P	RES M 1K-J-1W	
R441	ERX1SJ1R0P	RES M 1.0-J-1W	
R444	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R445	ERX1SJ1R0P	RES M 1.0-J-1W	
R447	ERJ6ENF6800V	RES M 680-F-1/10W	
R449	ERJ6ENF3901V	RES M 3.9K-F-1/10W	
R464	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R465	ERJ6ENF2201V	RES M 2.2K-F-1/10W	
R470	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R471	ERJ6ENF1003V	RES M 100K-F-1/10W	
R472	ERJ6ENF2002V	RES M 20K-F-1/10W	
R476	ERJ6GEYJ823V	RES M 82K-J-1/10W	
R479	ERJ6GEYJ821V	RES M 820-J-1/10W	
R481	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R495	ERJ6ENF2203V	RES M 220K-F-1/10W	
R501	ERDS2TJ104T	RES C 100K-J-1/4W	
R502	ERDS2TJ680T	RES C 68-J-1/4W	
R503	ERG3FJ181H	RES M 180-J-3W	
R504	ERGLSJ102P	RES M 1K-J-1W	
R505	ERGLSJ100P	RES M 10-J-1W	
R510	ERG2FJ331H	RES M 330-J-2W	
R512	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R513	ERC12GK103D	RES C 10K-K-1/2W	
R514	ER0S2THF3242	RES M 32.4K-F-1/4W	
R515	ER0S2THF2612	RES M 26.1K-F-1/4W	
R516	ERDS2TJ101T	RES C 100-J-1/4W	
R517	ERGLSJ103P	RES M 10K-J-1W	
R518	ERDS1FJ1R5T	RES C 1.5-J-1/2W	△
R520	ERQ14AJ2R2E	RES F 2.2-J-1/4W	△
R521	ERJ6ENF6041V	RES M 6.04K-F-1/10W	△
R522	ERJ6ENF2321V	RES M 2.32K-F-1/10W	△
R524	EVMEAGA00B14	CONTROL 10K	
R525	ERJ6GEYJ103V	RES M 10K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R526	ERQ12HJ1R0P	RES F 1.0-J-1/2W	
R527	ERDS2TJ472T	RES C 4.7K-J-1/4	
R528	ERQ1CJ1P120S	RES F 12-J-1W	
R529	ERDS2TJ273T	RES C 27K-J-1/4W	
R530	ERDS2TJ123T	RES C 12K-J-1/4W	
R531	ERDS2TJ221T	RES C 220-J-1/4W	
R532	ERDS1FJ1R0P	RES C 1.0-J-1/2W	△
R533	ERDS1FJ1R0P	RES C 1.0-J-1/2W	△
R534	ER0S2THF9102	RES M 91K-F-1/4W	
R535	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R536	ERDS2TJ101T	RES C 100-J-1/4W	
R538	ERJ6GEYJ101V	RES M 100-J-1/10W	
R540	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R541	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R550	ER0S2THF5361	RES M 5.36K-F-1/4W	
R560	ERJ6GEYJ101V	RES M 100-J-1/10W	
R561	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R562	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R586	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R587	ERJ6GEYJ101V	RES M 100-J-1/10W	
R588	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R589	ERJ6GEYJ101V	RES M 100-J-1/10W	
R595	ERDS2TJ273T	RES C 27K-J-1/4W	
R701	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R702	ERJ6GEYJ101V	RES M 100-J-1/10W	
R703	ERJ6GEYJ101V	RES M 100-J-1/10W	
R704	ERJ6GEYJ202V	RES M 2K-J-1/10W	
R705	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R706	ERJ6GEYJ152V	RES M 1.5K-J-1/10W	
R707	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R708	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R709	ERDS1FJ680T	RES C 68-J-1/2W	
R711	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R712	ERJ6GEYJ162V	RES M 1.6K-J-1/10W	
R714	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R715	ERJ6GEYJ751V	RES M 750-J-1/10W	
R717	ERF5AK4R7H	RES W 4.7-K-5W	
R718	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R720	ERJ6GEYJ152V	RES M 1.5K-J-1/10W	
R787	ERQ14AJ220P	RES F 22-J-1/4W	
R788	ERDS2TJ473T	RES C 47K-J-1/4W	
R800	ERU5TCK1R5T	RES F 1.5-K-5W	△
R801	ERC14GK824D	RES C 820K-K-1/4W	
R802	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R803	ERDS2TJ680T	RES C 68-J-1/4W	
R804	ERDS2TJ331T	RES C 330-J-1/4W	
R805	ERG2FJ121H	RES M 120-J-2W	
R806	ERDS2TJ473T	RES C 47K-J-1/4W	
R807	ERDS2TJ820T	RES C 82-J-1/4W	
R808	ERDS2TJ680T	RES C 68-J-1/4W	
R809	ERDS2TJ472T	RES C 4.7K-J-1/4	
R810	ERDS2TJ473T	RES C 47K-J-1/4W	
R811	ERDS2TJ472T	RES C 4.7K-J-1/4	
R812	ERDS2TJ473T	RES C 47K-J-1/4W	
R813	ERDS1FJ152T	RES C 1.5K-J-1/2W	
R814	ERG3FJ223	RES M 22K-J-3W	
R815	ERDS2TJ331T	RES C 330-J-1/4W	
R816	ERDS2TJ471T	RES C 470-J-1/4W	
R817	ER0S2THF1371	RES M 1.37K-F-1/4W	
R818	ERDS2TJ220T	RES C 22-J-1/4W	
R819	ERDS1FJ820T	RES C 82-J-1/2W	
R820	ERDS1FJ120T	RES C 12-J-1/2W	
R821	ERX12SJ1R8P	RES M 1.8-J-1/2W	
R822	ERX12SJ1R8P	RES M 1.8-J-1/2W	
R823	ERDS2TJ102T	RES C 1K-J-1/4W	
R824	ERDS2TJ153T	RES C 15K-J-1/4W	
R825	ERDS2TJ104T	RES C 100K-J-1/4W	
R826	ERDS2TJ103T	RES C 10K-J-1/4W	
R828	ERDS2TJ103T	RES C 10K-J-1/4W	
R829	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R830	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R831	ERDS2TJ332T	RES C 3.3K-J-1/4W	
R832	ERD75TAJ825	RES C 8.2MEG-J-3/4W	△

Ref. No.	Part No.	Part Name & Description	Remarks
R833	ERDS2TJ104T	RES C 100K-J-1/4W	
R834	ERDS2TJ104T	RES C 100K-J-1/4W	
R835	ERDS2TJ101T	RES C 100-J-1/4W	
R836	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R837	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R838	ERDS1FJ330T	RES C 30-J-1/2W	
R839	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R840	ERDS2TJ470T	RES C 47-J-1/4W	
R841	ERDS2TJ104T	RES C 100K-J-1/4W	
R842	ERDS2TJ223T	RES C 22K-J-1/4W	
R843	ERDS2TJ681T	RES C 680-J-1/4W	
R844	ERDS2TJ104T	RES C 100K-J-1/4W	
R845	ERDS2TJ332T	RES C 3.3K-J-1/4W	
R846	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R847	ERDS1FJ473T	RES C 47K-J-1/2W	
R852	ERDS1FJ562T	RES C 56K-J-1/2W	
R854	ERDS1TJ102T	RES C 1K-J-1/2W	
R855	ERDS2TJ913T	RES C 91K-J-1/4W	
R856	ERDS2TJ123T	RES C 12K-J-1/4W	
R857	ERX1SJ1R0P	RES M 1.0-J-1W	
R858	ERX1SJ1R0P	RES M 1.0-J-1W	
R859	ERDS2TJ272T	RES C 2.7K-J-1/4W	
R860	ERDS1FJ102T	RES C 1K-J-1/2W	
R861	ERX12SJR22P	RES M .22-J-1/2W	
R862	ERX12SJR22P	RES M .22-J-1/2W	
R863	ERX12SJR22P	RES M .22-J-1/2W	
R865	ERDS2TJ102T	RES C 1K-J-1/4W	
R867	ERJ6GEYJ101V	RES M 100-J-1/10W	
R868	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R869	ERJ6GEYJ101V	RES M 100-J-1/10W	
R870	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R875	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R876	ERJ6GEYJ393V	RES M 39K-J-1/10W	
R877	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R878	ERJ6GEYJ393V	RES M 39K-J-1/10W	
R879	ERDS1FJ750T	RES C 75-J-1/2W	
R888	ERJ6ENF1601V	RES M 1.6K-F-1/10W	
R889	ERJ6ENF1501V	RES M 1.5K-F-1/10W	
R890	ERJ6ENF1501V	RES M 1.5K-F-1/10W	
R891	ERJ6ENF4700V	RES M 470-F-1/10W	
R892	ERJ6ENF7500V	RES M 750-F-1/10W	
R893	ERJ6ENF4701V	RES M 4.7K-F-1/10W	
R894	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R895	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R896	ERJ6GEYJ203V	RES M 20K-J-1/10W	
R899	ERG1SJ273P	RES M 27K-J-1W	
R901	ERJ6GEYJ101V	RES M 100-J-1/10W	
R902	ERJ6ENF56R0V	RES M 56.0-F-1/10W	
R904	ERG3FJ221H	RES M 220-J-3W	
R905	ERQ1CJP331S	RES F 330-J-1W	
R1025	ERDS2TJ101T	RES C 100-J-1/4W	
R1026	ERDS2TJ101T	RES C 100-J-1/4W	
R1051	ERJ6ENF1002V	RES M 10K-F-1/10W	
R1052	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R1053	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R1054	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R1055	ERJ6GEYJ512V	RES M 5.1K-J-1/10W	
R1056	ERJ6GEYJ912V	RES M 9.1K-J-1/10W	
R1057	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R1058	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R1059	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R1060	ERJ6GEYJ470V	RES M 47-J-1/10W	
R1061	ERJ6GEYJ101V	RES M 100-J-1/10W	
R1062	ERJ6GEYJ182V	RES M 1.8K-J-1/10W CT-32HL43G/UG, CT-36HL43G/UG	
R1062	ERJ6GEYJ331V	RES M 330-J-1/10W CT-32HXC43G/UG	
R1501	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R1503	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R1504	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R1505	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R1506	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R1507	ERJ6GEYJ102V	RES M 1K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R1508	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R1514	ERJ6GEYJ331V	RES M 330-J-1/10W	
R1515	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R1521	ERDS2TJ104T	RES C 100K-J-1/4W	
R1522	ERDS2TJ104T	RES C 100K-J-1/4W	
R1523	ERDS2TJ104T	RES C 100K-J-1/4W	
R1525	ERJ6GEYJ122V	RES M 1.2K-J-1/10W	
R1526	ERJ6GEYJ101V	RES M 100-J-1/10W	
R1527	ERC14GK334D	RES C 330K-K-1/4W	
R1528	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R1529	ERG1SJ332P	RES M 3300-J-1W	
R1530	ERG3FJ331H	RES M 330-J-3W	
R1531	ERG3FJ681H	RES M 680-J-3W	
R1532	ERC12GK104D	RES C 100K-K-1/2W	
R1533	ERC12GK125D	RES C 1.2M-K-1/2W	
R1534	ERDS2TJ125T	RES C 1.2M-J-1/WW	
R1535	ERJ6GEYJ203V	RES M 20K-J-1/10W	
R1536	ERG2FJ123H	RES M 12K-J-2W	
R1537	ERJ6GEYJ101V	RES M 100-J-1/10W	
R1538	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R1539	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R1540	ERJ6GEYJ560V	RES M 56-J-1/10W	
R2203	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2206	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2207	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2221	ERJ6GEYJ101V	RES M 100-J-1/10W	
R2301	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2302	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R2303	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2304	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R2305	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2307	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2308	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2309	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2313	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2314	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2324	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2325	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2326	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2327	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R2328	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2329	ERJ6GEYJ432V	RES M 4.3K-J-1/10W	
R2330	ERDS2TJ333T	RES C 33K-J-1/4W	
R2332	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2333	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2334	ERJ6ENF1100V	RES M 110-F-1/10W	
R2335	ERJ6ENF1100V	RES M 110-F-1/10W	
R2336	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2337	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2338	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2339	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2341	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2342	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2345	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2346	ERJ6GEYJ432V	RES M 4.3K-J-1/10W	
R2348	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2349	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2351	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R2352	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R2353	ERJ6ENF4701V	RES M 4.7K-F-1/10W	
R2354	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2355	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R2356	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2357	ERJ6ENF1303V	RES M 130K-F-1/10W	
R2358	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2359	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R2360	ERJ6ENF4701V	RES M 4.7K-F-1/10W	
R2361	ERJ6ENF1202V	RES M 12K-F-1/10	
R2362	ERJ6GEYJ101V	RES M 100-J-1/10W	
R2363	ERJ6ENF5232V	RES M 5.32K-F-1/10W	
R2364	ERJ6ENF1001V	RES M 1K-F-1/10W	
R2365	ERJ6ENF1202V	RES M 12K-F-1/10	
R2366	ERJ6ENF1001V	RES M 1K-F-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R2367	ERJ6GEYJ101V	RES M 100-J-1/10W	
R2368	ERJ6ENF5232V	RES M 5.32K-F-1/10W	
R2369	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2370	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2371	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2373	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R2385	ERDS2TJ102T	RES C 1K-J-1/4W	
R2386	ERDS2TJ102T	RES C 1K-J-1/4W	
R2451	ERDS2TJ681T	RES C 680-J-1/4W	
R2452	ERJ6GEYJ681V	RES M 680-J-1/10W	
R2456	ERJ6GEYJ471V	RES M 470-J-1/10W	
R2457	ERJ6GEYJ471V	RES M 470-J-1/10W	
R2460	ERDS2TJ101T	RES C 100-J-1/4W	
R2461	ERDS2TJ101T	RES C 100-J-1/4W	
R3001	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3002	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3005	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3007	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3011	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3014	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R3015	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3016	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3017	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3020	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R3021	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3022	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3023	ERJ6ENF1500V	RES M 150-F-1/10W	
R3024	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3025	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3026	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3027	ERJ6GEYJ681V	RES M 680-J-1/10W	
R3028	ERJ6GEYJ681V	RES M 680-J-1/10W	
R3029	ERJ6GEYJ681V	RES M 680-J-1/10W	
R3030	ERJ6ENF68R0V	RES M 68-F-1/10W	
R3031	ERJ6ENF1500V	RES M 150-F-1/10W CT-32HL43G/UG, CT-32HXC43G, CT-36HL43G/UG	
R3031	ERJ6ENF68R0V	RES M 150-F-1/10W CT-32HXC43UG	
R3032	ERJ6ENF1500V	RES M 150-F-1/10W CT-32HL43G/UG, CT-32HXC43G, CT-36HL43G/UG	
R3032	ERJ6ENF68R0V	RES M 150-F-1/10W CT-32HXC43UG	
R3082	ERJ6ENF2001V	RES M 2K-F-1/10W	
R3083	ERJ6ENF2701V	RES M 2.7K-F-1/10W	
R3084	ERJ6ENF2001V	RES M 2K-F-1/10W	
R3085	ERJ6ENF2701V	RES M 2.7K-F-1/10W	
R3086	ERJ6GEYJ220V	RES M 22-J-1/10W CT-32HL43G/UG, CT-36HL43G/UG	
R3089	ERJ6GEYJ220V	RES M 22-J-1/10W CT-32HL43G/UG, CT-36HL43G/UG	
R3093	ERJ6GEYJ220V	RES M 22-J-1/10W CT-32HL43G/UG, CT-36HL43G/UG	
R3100	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3101	ERDS2TJ221T	RES C 220-J-1/4W	
R3102	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3103	ERDS2TJ221T	RES C 220-J-1/4W	
R3104	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3105	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3106	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3107	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3108	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3109	ERDS2TJ221T	RES C 220-J-1/4W	
R3110	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3111	ERDS2TJ221T	RES C 220-J-1/4W	
R3112	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3113	ERDS2TJ221T	RES C 220-J-1/4W	
R3114	ERDS2TJ221T	RES C 220-J-1/4W	
R3115	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3116	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3117	ERDS2TJ221T	RES C 220-J-1/4W	
R3118	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3119	ERDS2TJ221T	RES C 220-J-1/4W	
R3120	ERDS2TJ221T	RES C 220-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R3121	ERJ6GEYJ820V	RES M 82-J-1/10W	
R3122	ERJ6GEYJ820V	RES M 82-J-1/10W	
R3123	ERJ6GEYJ820V	RES M 82-J-1/10W	
R3124	ERJ6GEYJ820V	RES M 82-J-1/10W	
R3125	ERJ6GEYJ820V	RES M 82-J-1/10W	
R3126	ERDS2TJ221T	RES C 220-J-1/4W	
R3127	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3128	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3129	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3130	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3131	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3133	ERJ6ENF1500V	RES M 150-F-1/10W	
R3134	ERJ6ENF1500V	RES M 150-F-1/10W	
R3135	ERJ6ENF1500V	RES M 150-F-1/10W	
R3136	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3137	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3140	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R3143	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R3152	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R3154	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R3157	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3158	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3160	ERJ6GEYJ220V	RES M 22-J-1/10W	
R3161	ERJ6GEYJ220V	RES M 22-J-1/10W	
R3162	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3163	ERDS2TJ102T	RES C 1K-J-1/4W	
R3164	ERDS2TJ102T	RES C 1K-J-1/4W	
R3165	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3166	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3167	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3168	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3170	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3172	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3173	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3177	ERDS2TJ331T	RES C 330-J-1/4W	
R3178	ERDS2TJ331T	RES C 330-J-1/4W	
R3182	ERJ6ENF1801V	RES M 1.8K-F-1/10W	
R3183	ERJ6ENF2401V	RES M 2.4K-F-1/10W	
R3184	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3185	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3186	ERJ6ENF1801V	RES M 1.8K-F-1/10W	
R3187	ERJ6ENF2401V	RES M 2.4K-F-1/10W	
R3188	ERJ6GEYJ221V	RES M 220-J-1/10W	
R3189	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3190	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3191	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3192	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3193	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3194	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3195	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3196	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3197	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3198	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3801	ERJ6ENF1000V	RES M 100-F-1/10W	
R3802	ERJ6ENF1000V	RES M 100-F-1/10W	
R3803	ERJ6ENF1000V	RES M 100-F-1/10W	
R3804	ERDS2TJ101T	RES C 100-J-1/4W	
R3805	ERDS2TJ101T	RES C 100-J-1/4W	
R3806	ERDS2TJ101T	RES C 100-J-1/4W	
R3807	ERC12GK821D	RES C 820-K-1/2W	
R3808	ERC12GK821D	RES C 820-K-1/2W	
R3809	ERC12GK821D	RES C 820-K-1/2W	
R3810	ERDS2TJ102T	RES C 1K-J-1/4W	
R3811	ERDS2TJ102T	RES C 1K-J-1/4W	
R3812	ERDS2TJ102T	RES C 1K-J-1/4W	
R4828	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R4865	ER0S2TKF1502	RES M 15.0K-F-1/4	
R4866	ERJ6ENF6801V	RES M 6.8K-F-1/10W	
R4868	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R4869	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R4870	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R4871	ERJ6GEYJ100V	RES M 10-J-1/10W	
R4874	ERDS2TJ102T	RES C 1K-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R4875	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R4876	ERG1SJA70P	RES M 47-J-1W	
R4930	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R4931	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R4932	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R4933	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R4934	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R4935	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R4936	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R4938	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4939	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4942	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4943	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4946	ERJ6ENF5602V	RES M 56K-F-1/10W	
R4947	ERJ6ENF2001V	RES M 2K-F-1/10W	
R4948	ERDS2TJ822T	RES C 8.2K-J-1/4W	
R4949	ERDS2TJ102T	RES C 1K-J-1/4W	
R4950	ERDS1FJ391T	RES C 390-J-1/2W	
R4951	ERX12SJR47P	RES M 47-J-1/2W	
R4952	ERX12SJR68P	RES M .68-J-2W	
R4953	ERDS1FJ391T	RES C 390-J-1/2W	
R5013	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R519A	ERQ1CZKPR22S	RES F .22-K-1W	
SWITCHES			
S001	EVQPB05R	SWITCH CT-32HL43G/UG, CT-36HL43G/UG	
S001	EVQPF106K	SWITCH CT-32HXC43G/UG	
S002	EVQPB05R	SWITCH	
S003	EVQPB05R	SWITCH	
S004	EVQPB05R	SWITCH	
S005	EVQPB05R	SWITCH	
S006	EVQPB05R	SWITCH	
S007	EVQPB05R	SWITCH	
TRANSFORMERS			
T501	ETH19K204AZ	TRANSFORMER	
T551	TXFFT03GSE	ASSY FLYBACK	△
T801	ETS42AD4A5AD	TRANSFORMER	△
T802	ETP30KB921GG	TRANSFORMER	△
T1501	ETF18L106A	TRANSFORMER	△
T2301	G0BYYYY00016	TRANSFORMER	
T3001	G0B250D00001	TRANSFORMER	
T3002	G0B250D00001	TRANSFORMER	
T3003	G0BYYYY00016	TRANSFORMER	
T3004	G0BYYYY00016	TRANSFORMER	
T3005	TF0402B04P03	TRANSFORMER	
T3006	TF0402B04P03	TRANSFORMER	
T3023	G0BYYYY00016	TRANSFORMER	
T3024	TF0402B04P03	TRANSFORMER	
T3025	TF0402B04P03	TRANSFORMER	
T3027	G0BYYYY00016	TRANSFORMER	
T3801	G0B250D00001	TRANSFORMER	
T3802	G0B250D00001	TRANSFORMER	
T4801	TF0402B04P03	TRANSFORMER	
T5001	G0B250D00001	TRANSFORMER CT-32HL43G/UG, CT-36HL43G/UG	
OTHERS			
TNR001	ENG36619G	MAIN TUNER	△
TNR002	ENG36620G	SUB TUNER	△
1	M80LSW095X	CRT 32 INCH PF CT-32HL43G/UG, CT-32HXC43G/UG	△
	A90LSW295X	CRT 36 INCH PF CT-36HL43G/UG	△
M001	K3B10CA00041	CRT SOCKET	△
2	KDY45HE59F	DEFLECTION YOKE CT-36HL43G/UG	△
	TLY2AA024	DEFLECTION YOKE CT-32HL43G/UG, CT-32HXC43G/UG	△
M002	TXFYA010EGW	DAG GROUND	
3	TSP2AA016-1	DEGAUSSING COIL CT-32HXC43G/UG	△
	TSP2AA025	DEGAUSSING COIL CT-36HL43G/UG	△
	TSP2AA027	DEGAUSSING COIL CT-32HL43G/UG	△

Ref. No.	Part No.	Part Name & Description	Remarks
4	EABG8509A2	SUB-WOOFER BOX CT-32HL43G/UG, CT-36HL43G/UG	
5	EASG12D555B2	SPEAKER CT-32HXC43G/UG	
	EASG18S501B2	SPEAKER CT-32HL43G/UG, CT-36HL43G/UG	
6	ENPE2A001	SPLITTER 2RF (U-LIM)	
7	TBX2AA0191	BUTTON FUNCTION KEY CT-32HL43G/UG, CT-36HL43G/UG	
8	TKP2AA0722S	DOOR CT-32HL43G/UG, CT-36HL43G/UG	
	TKP2AA0405S	DOOR CT-32HXC43G/UG	
9	TEK6935	DOOR CATCH CT-32HL43G/UG, CT-36HL43G/UG	
	TEK6940	DOOR CATCH CT-32HXC43G/UG	
10	TKP2AA0391	LED PANEL CT-32HXC43G/UG	
	TKP2AA0741	LED PANEL CT-32HL43G/UG, CT-36HL43G/UG	
11	TKX2AA0181	IR GUIDE CT-32HL43G/UG, CT-36HL43G/UG	
M003	TMMJ057	RUBBER WASHER CT-32HXC43G/UG	
M004	TMM2A30702	WEDGE YOKE CT-32HL43G/UG, CT-36HL43G/UG	
12	TMW2A97121	STRAIN RELIEF: AC LINE CORD	
13	TMZ2AC50011	BRACKET SUPPORT CRT CT-32HL43G/UG, CT-36HL43G/UG	
M005	TSM2AA001	MAGNET PERMALLOY	
M006	TSN63115-2	MAGNET PURITY CT-32HL43G/UG, CT-36HL43G/UG	
	TSN63115-4	MAGNET PURITY CT-32HXC43G/UG	
14	TSP2AF007	COIL ROTATION CT-32HL43G/UG, CT-36HL43G/UG	
15	TSP2AF008	COIL GEOMAGNETIC CT-36HL43G/UG	
	TSP2AF009	COIL GEOMAGNETIC CT-32HL43G/UG, CT-32HXC43G/UG	
M007	TSX2AA0351	LINE CORD AC	△
16	TTP2AA0733S	FRONT PANEL CT-32HL43G/UG, CT-36HL43G/UG	
	TXFKP08GSE	FRONT PANELS (LEFT AND RIGHT) CT-32HXC43G/UG	
17	TXFKU04GSE	ASSY CABINET BACK CT-36HL43G/UG	
	TXFKU06GSE	ASSY CABINET BACK CT-32HL43G/UG	
	TXFKU08GSE	ASSY CABINET BACK CT-32HXC43G/UG	
18	TXFKY06GSE	ASSY CABINET FRONT (INCLUDES PANASONIC BATCH, FRONT PANEL, LED PANEL AND IR GUIDE) CT-36HL43G/UG	
	TXFKY07GSE	ASSY CABINET FRONT (INCLUDES PANASONIC BATCH, FRONT PANEL, LED PANEL AND IR GUIDE) CT-32HL43G/UG	
	TXFKY08GSE	ASSY CABINET FRONT (INCLUDES PANASONIC BATCH, LED PANEL AND OVERLAY) CT- 32HXC43G/UG	
M008	TXFSPB01BSE	ASSY SPEAKER BRACKETS CT-32HXC43G/UG	
JK3001	TJB2AA0251	TERMINAL REAR A/V 12P	
JK3002	TJB2AA0241	TERMINAL REAR A/V 10P	
JK3151	TJBA187	JACK A/V OUTPUT CT-32HXC43G/UG	
JK3151	TJB2AA0371	TERMINAL FRONT A/V CT-32HL43G/UG, CT-36HL43G/UG	
JK5001	DV2R024NKB	EDI CONNECTOR CT-36HL43G/UG, CT-32HL43G/UG	
JK5002	TJB2AA0411	TERMINAL VIDEO CT-36HL43G/UG, CT-32HL43G/UG	
OTHERS			
M009	TQB2AA0467	OWNERS MANUAL	
M010	EUR7603Z90	REMOTE CONTROL CT-32HL43G/UG, CT-36HL43G/UG	

Ref. No.	Part No.	Part Name & Description	Remarks
M011	UR76EC0303D	BATTERY COVER, REMOTE CT-32HL43G/UG, CT-36HL43G/UG	
M012	EUR7613Z40	REMOTE CONTROL CT-32HXC43G/UG	
M013	UR76EC0303A	BATTERY COVER, REMOTE CT-32HXC43G/UG	

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