

HITACHI

SERVICE MANUAL

NTSC NA8 CHASSIS

PA

No. 0138

27GX01B-501
27GX01B-511

R/C:
CLU-351U

CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product Safety Notices" in this Service Manual.

This television will display television Closed Captioning (☒ CC or ☐) in accordance with paragraph 15.119 of the FCC rules.

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

SOLID STATE COLOR TELEVISION

JUNE 2000

HHEA-MANUFACTURING DIVISION

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety-related notes located on or inside the cabinet and on the chassis or picture tube.

WARNING: Since the chassis of this receiver is connected to one side of the AC power supply during operation, whenever the receiver is plugged in, service should not be attempted by anyone unfamiliar with the precautions necessary when working on this type of receiver.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away from the picture tube while handling.
2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on a "HOT" chassis receiver.
3. When replacing a chassis in the receiver, all protective devices must be put back in place, such as barriers, nonmetallic knobs, adjustment and compartment covershields, isolation resistors, capacitors, etc.
4. When service is required, observe the original lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Critical components as indicated on the circuit diagram should not be replaced by another manufacturer's. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the receiver has become defective, or inadvertently defeated during servicing.

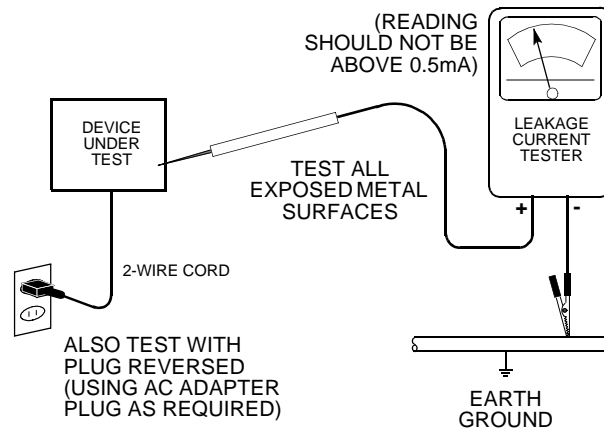
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the 120V AC 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch ON. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis should have a minimum resistor reading of $0.24M\Omega$ and a maximum resistor reading of $12M\Omega$. Any resistance value below or above this range indicates an abnormality which requires corrective action. An exposed metal part not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC cord directly into a 120V AC 60Hz outlet (do not use an isolated transformer for this check). Turn the AC power ON. Using a Leakage Current Tester (Simpson's Model 229 or equivalent), measure for current from all exposed metal parts of the cabinet (antennas, screwheads, overlays, control shafts, etc.). Any current measured must not exceed 0.5 milliamps.



AC LEAKAGE TEST

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE RECEIVER TO THE CUSTOMER.

High voltage

This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this service manual regarding this hold down circuit when servicing, so that this hold down circuit is operated correctly.

Serviceman Warning

With minimum BRIGHTNESS, CONTRAST, SHARPNESS, and COLOR, the operating high voltage in this receiver is lower than $28.30kV \pm 1.25kV$. In case any component having influence on the high voltage is replaced, confirm that high voltage with minimum BRIGHTNESS, CONTRAST, SHARPNESS, and COLOR is lower than $28.30kV \pm 1.25kV$. To measure high voltage use a High Impedance High Voltage meter. Connect (-) to chassis earth and (+) to the CRT ANODE button. (See the connection diagram on page 4.)

Note: Turn power switch OFF without fail before the connection to the Anode Button

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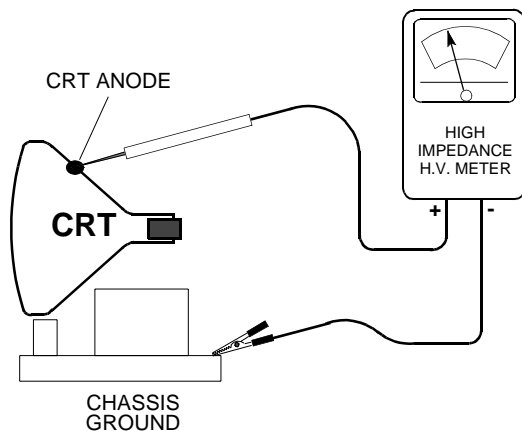
PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service manual.

Electrical components having such features are identified with a ⚠ mark in the schematics and parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement component, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Production safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. [A subscription to, or additional copies of HITACHI Service Manuals may be obtained at a nominal charge from HITACHI Sales Corporation.]



X-Radiation

TUBE: The primary source of X-Radiation in this receiver is the picture tube. The tube utilized in this chassis is specially constructed to limit X-Radiation emissions. For continued X-Radiation protection, the replacement tube must be the same type as the original HITACHI-approved type.

When troubleshooting and making test measurements in a receiver with excessive high voltage problem, avoid being unnecessarily close to the picture tube and high voltage components.

Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

This Service Manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void warranty. Consumers should not risk trying to do the necessary repairs and should refer to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with solder. Also, when soldering do not inhale any smoke or fumes produced.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics identified by ⚠ on the parts list in this service manual and its supplements and bulletins. Before servicing this product, it is important that the service technician read and follow the "Safety Precautions" and the "Product Safety Notices" in this Service Manual.

For continued X-Radiation protection, replace picture tube with original type or HITACHI equivalent type.

POWER SOURCE

This television receiver is designed to operate on 120Volt/60Hz, AC house current. Insert the power cord into a 120Volts/60Hz outlet.

NEVER CONNECT THE TV TO OTHER THAN THE SPECIFIED VOLTAGE OR TO DIRECT CURRENT.

Service Notes

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 (⚡) or (↗) 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.

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. Voltmeter (0 - 200V scale)
2. High Voltage Meter (0 - 50kV)
3. Variac or Isolation Transformer

Procedure:

1. Tune in a station to verify that the horizontal is in sync.
2. Obtain a Monoscope pattern or a signal generator crosshatch pattern
3. Set **Bright** and **Picture** level to zero (0).
4. Turn the Receiver OFF. Connect a jumper across IC803 pin 3 and pin 4. Apply +9V DC to cathode of D001.
5. Reduce the AC supply voltage to approximately 45V. Connect the high voltage meter to the CRT anode. (H.V. button).

Note: Use the Dag Ground (C10 on the CRT Board) to connect the (-) lead of the meter.

6. Turn the Receiver ON. Slowly increase the AC supply voltage and verify that the high voltages does not exceed **37.1kV**, when horizontal just begins to pull out of sync. If the high voltage is not within the specified limit, the cause must be determined and corrected before the Receiver is returned to the customer.

Receiver Feature Table

FEATURE/MODEL	27GX01B-501 27GX01B-511
Chassis	NA8
Tuning system	96K
# of channels	181
Menu language	Eng/Span/Fr
Closed Caption	X
V-Chip	X
75 Ω input	X
Remote Model #	HL00761
Picture tube	M68LGLO61X
V/A norm (X=both)	X
MTS/SAP/DBX	X
Volume Correction	X
Built-in audio power	5Wx2 (10%)
# of speakers	2
A/V in (rear/front)	3(2/1)
Dimensions mm (HxWxD) in	594.8x665.2x544.5 23.4x26.1x21.4
Weight (kg/lbs)	38/83.6
Power source (V/Hz)	120/60
Anode voltage	28.30kV \pm 1.25kV
Video input jack	1V _{p-p} 75 Ω , phono jack
Audio input jack	500mV RMS 47k Ω
A-Board TNP2AH017	AD
C-Board TNP2AA047	AP

Table 1. Receiver Features

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

Location of Controls (Receiver)



Figure 1. Location of Controls Receiver
Quick Reference Control Operation

Quick Reference Control Operation	
1	Power Button - Press to turn ON or OFF.
2	Volume Buttons - Press to adjust Sound Level, or to adjust Audio Menus, Video Menus, and select operating features when menus are displayed
3	Channel Buttons - Press to select programmed channels. Press to highlight desired features when menus are displayed.
4	Menu Button - Press to display Main Menu and access On Screen feature and Adjustment Menus.
5	Input Button - Press to select TV or one of two Video Inputs.
6	Front AV In Jacks - Front audio, video and earphone jacks.

Location of Controls (Remote)

Power Button

Press to turn On or Off.

Mute Button

Press to mute sound. A second press resumes sound. Press also to toggle Closed Captioning.

Input Button

Press to select TV or video input.

Menu Button

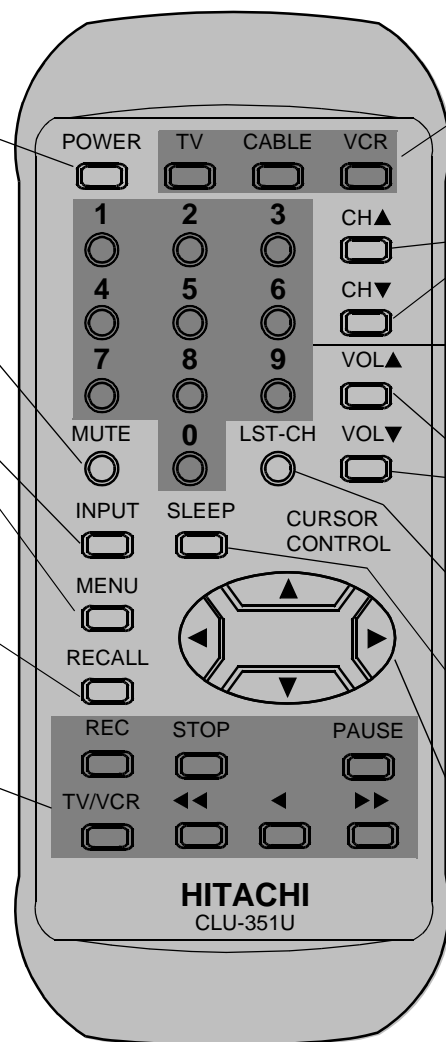
Press to display main menu and access or exit onscreen features or Adjustment menus.

Recall Button

Press to display Time status of sleep timer, channel, video mode, channel I.D. and audio mode.

Precoded VCR Buttons

These buttons transmit the chosen precoded VCR codes.



Mode Buttons

These buttons allow the remote to control your TV, VCR, or cable box depending on which mode button is selected.

Channel Buttons

Press to select channels.

Keypad Buttons

Press desired channel number to access channel.

Volume Buttons

Press to adjust TV sound level.

LST-CH (Last Channel) Button

Press to switch to the previously tuned channel.

Sleep Button















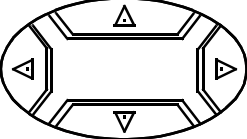




Press to turn TV Off in 30, 60, or 90 minutes.

















Cursor Button

Press to adjust Audio menus, Video menus, and select operating features when menus are displayed.

Figure 2. Location of Controls (Remote)

Remote Control Quick Reference Functional Key Chart

Key	Operates	
POWER 	TV CABLE VCR	Turns TV On and Off Turns Cable Box On and Off Turns VCR On and Off
INPUT 	TV	Selects the TV Input Mode
MENU 	TV	Activates and Exits TV Menus
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; justify-content: space-around; width: 100%;"> 123 </div> <div style="display: flex; justify-content: space-around; width: 100%;">    </div> <div style="display: flex; justify-content: space-around; width: 100%;"> 456 </div> <div style="display: flex; justify-content: space-around; width: 100%;">    </div> <div style="display: flex; justify-content: space-around; width: 100%;"> 789 </div> <div style="display: flex; justify-content: space-around; width: 100%;">    </div> <div style="display: flex; justify-content: center; width: 100%;"> 0 </div> <div style="display: flex; justify-content: center; width: 100%;">  </div> </div>	TV VCR CABLE	Selects Channel Selects code in Video Lock Menu Selects Channel in Channel I.D. Menu Selects Channel in Timer Menu Selects Precoded VCR codes when programming remote Selects Precoded CABLE codes when programming remote
RECALL 	TV	Display Channel, Time, Channel I.D. and Audio Mode
	TV	Menu Navigation
CH ▲  CH ▼ 	TV CABLE	Channel Up/Down Channel Up/Down
VOL ▲  VOL ▼ 	TV	Volume Up/Down

Key	Operates	
SLEEP 	TV	Selects 30, 60 or 90 minutes for Automatic Turn Off. Also use to turn Sleep Timer off by selecting NO
MUTE 	TV	Mutes TV Audio Access and exit Closed Captioning
LST-CH 	TV	Select previously tuned channel
Mode Selection Buttons TV  CABLE  VCR 	TV CABLE VCR	Selects TV Mode for the remote control Selects Cable Mode for the remote control Selects VCR Mode for the remote control
Standard VCR Control Buttons REC        STOP  PAUSE  TV/VCR 	VCR VCR VCR VCR VCR VCR VCR CABLE	Record Rewind Fast Forward Play Stop Pause Selects TV or VCR Mode Selects A/B Mode

Using the Remote to Control VCR and Cable box Functions

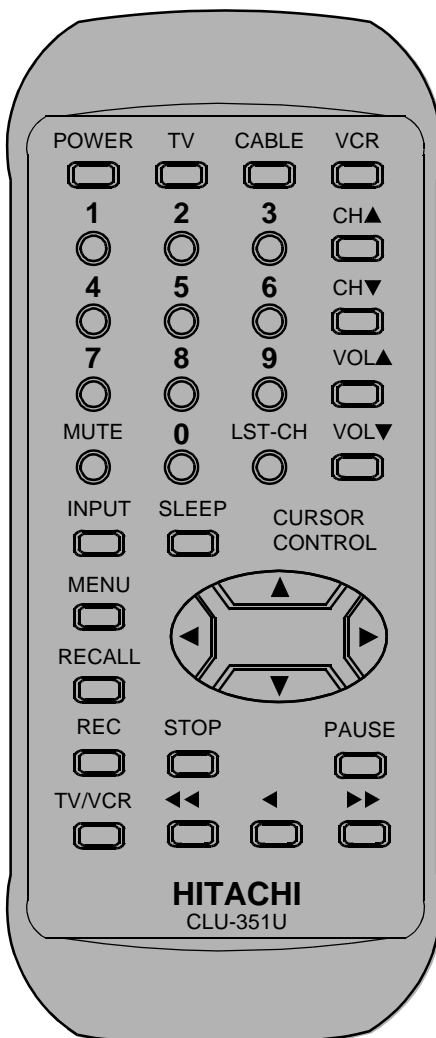
Operating the Precoded Function for Your VCR

This remote is designed to operate different types of VCRs. You must first program the remote to match the remote system in your VCR. (Refer to the VCR Code Index section.)

1. Turn on your VCR.
2. Aim the remote control at the front of your VCR.
3. Press the VCR button to switch to VCR precoded mode.
4. While holding down the VCR button, enter the 2-digit preset code that matches your VCR*. The remote will turn on your VCR when the correct 2-digit preset code is entered. When this occurs, the remote control is programmed for your VCR. If your VCR does not turn off after 5 seconds, try a different 2-digit preset code.
5. The remote will now control your VCR.

NOTES:

- If your VCR cannot be operated after performing the above procedures, this means that your VCR codes have not been precoded into the remote.
- In the unlikely event that your VCR cannot be operated after performing the above procedures, consult your VCR operating guide.
- The remote control will remember the codes you have programmed in until the batteries are removed. After replacing the batteries repeat the entire programming procedure stated above.
- If your VCR does not have a power function, the remote will issue the CHANNEL UP function.



* (Codes are listed on page 12)

Operating the Precoded Function for Your Cable Box

1. Turn on your cable box.
2. Aim the remote control at the front of your cable box.
3. Press the cable box button to switch to cable box precoded mode.
4. While holding down the CABLE button, enter the 2-digit preset code that matches your cable box*. The remote will turn on your cable box when the correct 2-digit preset code is entered. When this occurs, the remote control is programmed for your cable box. If your cable box does not turn off after 5 seconds, try a different 2-digit preset code.
5. The remote will now control your cable box.

NOTES:

- If your cable box cannot be operated after performing the above procedures, this means that your cable box codes have not been precoded into the remote.
- In the unlikely event that your cable box cannot be operated after performing the above procedures, consult your cable box operating guide.
- The remote control will remember the codes you have programmed in until the batteries are removed. After replacing the batteries repeat the entire programming procedure stated above.
- If your cable box does not have a power function, the remote will issue the CHANNEL UP function.
- For some models, the remote control's channel ▲ and ▼ will control the cable box channel. The number buttons will control your television channel although you are in cable mode.

VCR and Cable Box Codes Index

The remote is capable of operating many brands of VCRs and cable boxes. You must first program the remote control to match the remote system in your VCR or cable box.

NOTE: The remote control memory is limited. Some models of VCRs or cable boxes may not operate. The remote control is not designed to control all features that are available in all models.

Code Index For VCRs


VCR Brand	Code (s)
Emerson	00,01,10,16,23,33,37,40, 43
Funai	00
GE	09,22
Hitachi	00,14,15
JVC	14,26
Magnavox	09,12,28
Mitsubishi	16,23,26,45
Panasonic	09,35,46
RCA	15,22
Sony	06,07,08,09
Toshiba	16,17,42
Zenith	07,08,12

Code Index for Cable Boxes

Cable Box Brand	Code(s)
G.I.	09
Jerrold	03, 09, 10, 12, 13, 51
Magnavox	40
Philips	40
Pioneer	39
Samsung	39
Scientific Atlantic	04, 06, 14, 52, 56
Zenith	00

Disassembly for Service

Back Cover

Remove all the screws marked with an arrow() from the back of the Receiver.

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

- 3 screws at the top edge of the Receiver.
- 1 screw at each lower corner of the Receiver.
- 1 screw by the retainer plate of the AC power cord.
- 1 screw by the Flyback assembly.
- 1 screw by the A/V jacks.

A-Board - Main Chassis

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

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

C-Board - CRT Output

Plugs into the socket on the CRT neck.

Speakers

Each speaker is secured to the cabinet's front with 4 screws.

Keyboard Push Button Assembly

Fastened to the inside of the cabinet front with up to 3 screws.

Disassembly for CRT Replacement

1. Discharge the CRT as instructed in the **Safety Precautions** (see page 2).
2. Disconnect the yoke (DY) plug, degaussing coil (DEG) plug and the CRT 2nd anode button from the main board.
3. Remove the C-Board from the CRT base and unplug the black wire (CRT dag ground) C10.
4. Disconnect the A11, A12, and Speakers plugs from the A-Board.
5. Lift the Main Chassis (A-Board) and all mounted boards completely out with the CRT Board attached.

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** (see page 2) 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.
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 re-mount the degaussing coil:

The degaussing coil is held in place by clampers fastened to the CRT corner ears. These clampers must be installed onto the replacement CRT prior to mounting the degaussing coil.

To remove and re-mount the dag ground braid:

a. Unhook the coil spring from the bottom corners of the CRT ears.

b. 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 re-install into cabinet. Verify that all ground wires and circuit board plugs get connected.

Chassis Service Adjustment Procedures

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

Note: Connect the (-) lead of the voltmeter to the appropriate ground. Use IC803's heat sink when the HOT ground symbol (↘) is used. Otherwise, use COLD ground (↗) — Tuner shield, IC451's heat sink or FA2.

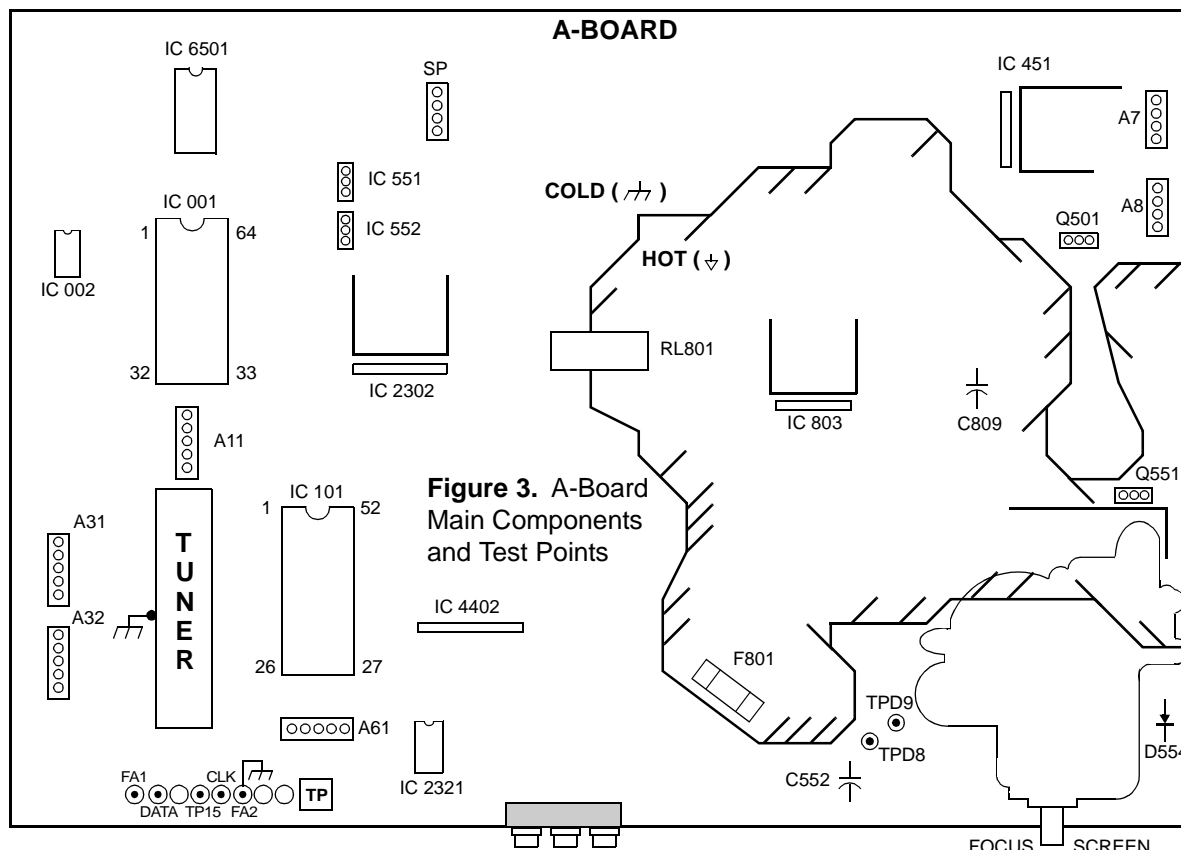


Figure 3. A-Board Main Components and Test Points

MOMENTARILY CONNECT A JUMPER FOR ENTERING SERVICE MODE (FA1 to FA2)

131.0V B+ Voltage Confirmation

1. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu.
2. Connect the DVM between C809(+ side) and cold ground (↗).
3. Confirm that B+ voltage is **131.0V ± 2.5V**. This voltage supplies B+ to the Horizontal Output & Flyback circuits.

Source Voltage Chart

120V AC line input. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu. Use cold ground (↗) for the (-) lead of the DVM.

C572 (+)	+5.0V ± 0.25V
TPD9	+13.0V ± 2V
C552(+)	+8.0V ± 1V
TPD8	+27.4V ± 2V
IC551 pin3	+9.0V ± 0.5V
CATHODE OF D554	+220.0V ± 15V

Adjust Picture Menu for normalized video adjustments.

B+ 5V Source Voltages

Volatile 5V:

C572, + side = IC552 pin 3, Tuner BP, IC101 (IF 5V).

MPU 5V:

Emitter Q002 = IC001 (V_{DD}, AV_{DD}).

Stand-by 5V:

IC001 (key in 1), I²C EEPROM (IC002), Remote Receiver.

B+ 9V Source Voltage

IC551 pin 3 = IC101 (IF 9V), Tuner (BM).

B+ 12V (Stand- by) Note: +16V when power is on
Cathode D001 = RL801 (on-off relay), Q002 (+5V Reg).

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+ 131V is within limit.
4. Using a high voltage meter confirm that the High Voltage is 28.30kV ±1.25kV.

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:

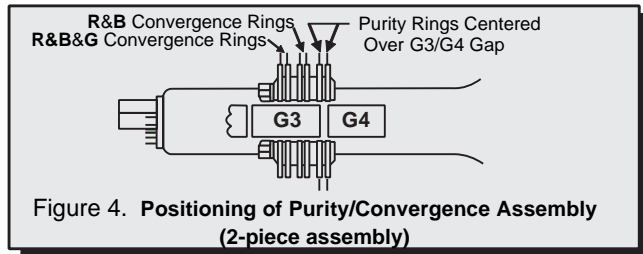
1. Vertical Raster Shift Adjustment. (**Only for Models with Purity/Convergence Assembly with 4 Pairs of Rings**).
2. Initial static convergence.
3. Setting the purity.
4. Final static convergence.

When the CRT or the Yoke is Replaced

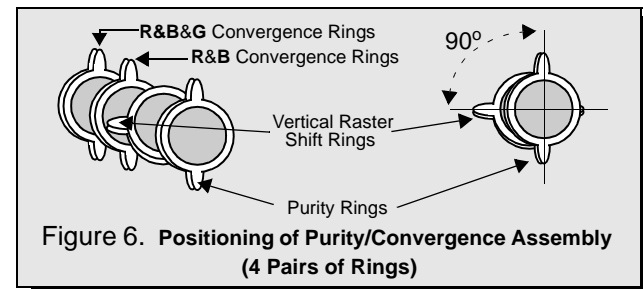
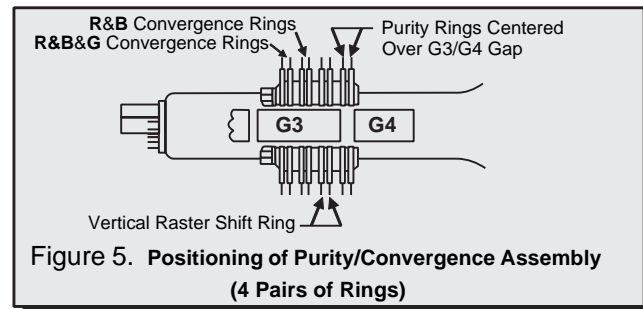
Place the yoke on the CRT neck (do not tighten the clamp).

For a 2-piece assembly (see Fig. 4):

Position purity/convergence assembly as shown and tighten clamp snugly. Remove the hot-melt glue seal on assembly and position like tabs of purity device together at 12 o'clock to reduce its magnetic field effect.

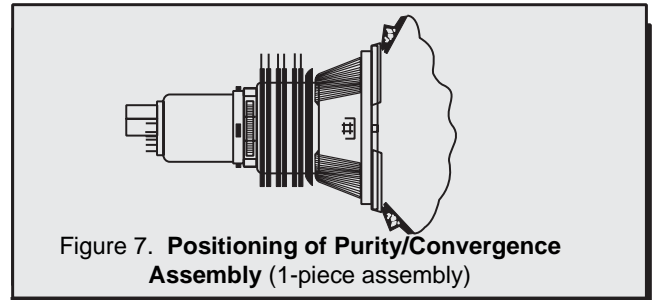


For models using 4 pairs of rings, place the vertical raster shift tabs at 3 o'clock (90° from the purity and convergence tabs, see Fig. 5 and Fig. 6)



For a 1-piece assembly (see Fig. 7):

Position like tabs of purity devices together at 12 o'clock to reduce any magnetic field effect. (For better results, note part number and look for specifications at Service Center)



For either assemblies:

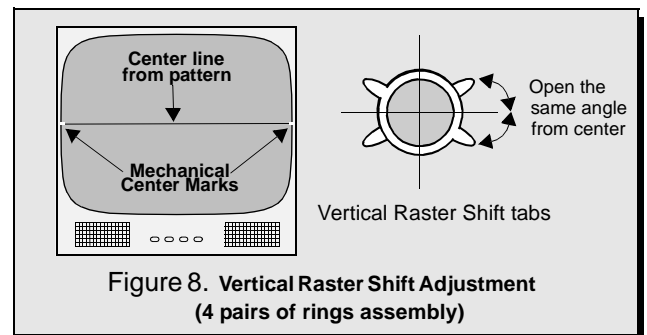
Turn the Receiver ON. Operate the Receiver for 60 minutes using the first Purity Check field (white screen) to stabilize the CRT.

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 (Only for Models with Purity/Convergence Assembly with 4 Pairs of Rings).

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 (see Fig. 5 and Fig. 6) 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. (see Fig. 8)



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.

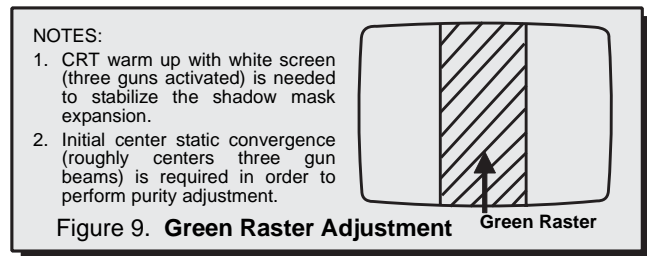
Fully degauss the Receiver by using an external degaussing coil.

Press the **Recall** button on the Remote Control again until the Purity Check (green screen) appears.

For a 2-piece assembly (see Fig. 4):

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 (see Fig. 9).



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

For a 1-piece assembly (see Fig. 7):

Slowly move the deflection yoke and purity rings assembly toward the CRT board and adjust the purity magnet rings to set vertical green raster at center of screen (see Fig. 9).

Gradually move the deflection yoke & purity rings forward and adjust for best overall green screen.

Continue from here for either assemblies:

Tighten the deflection yoke clamp screw.

Press the **Recall** button on the Remote Control again until the purity check (blue screen) and (red screen) 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 (see Fig. 10 through Fig. 12):

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 (see following section) from 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 two side wedges at 3 and 7 o'clock positions.

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

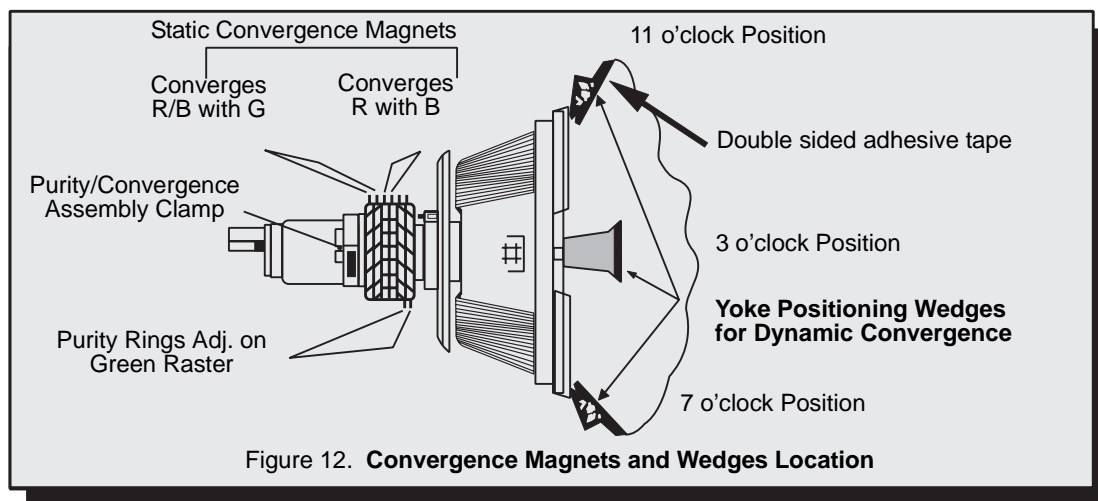
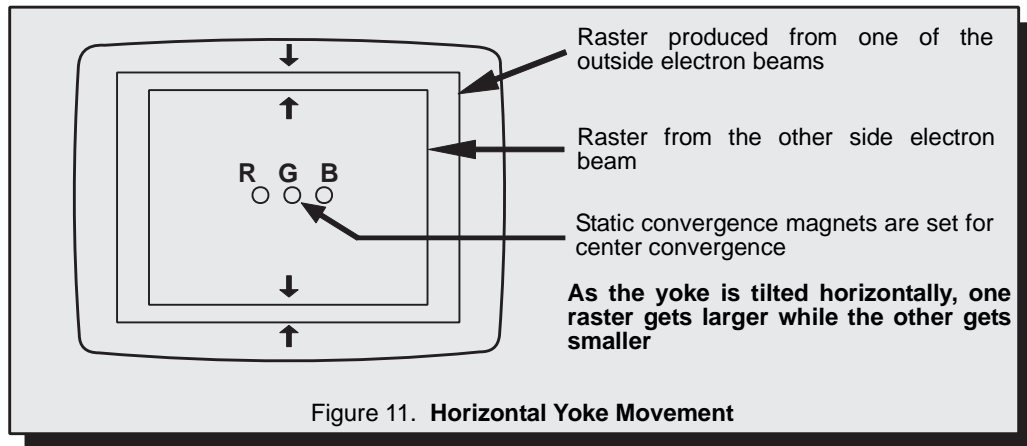
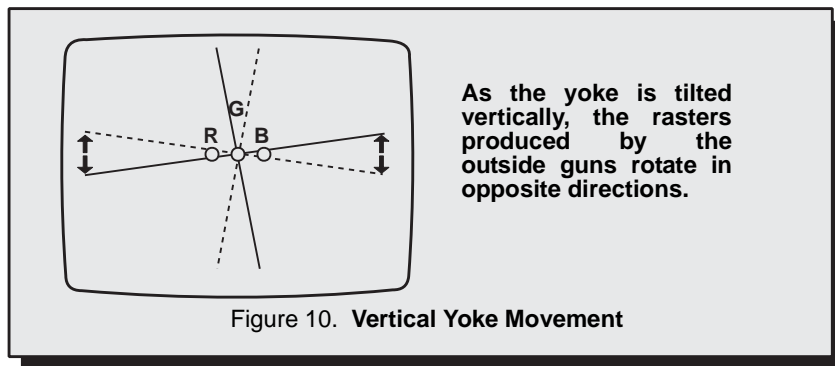
Permalloy Convergence Corrector Strip (Part No. 0FMK014ZZ)

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.

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.



Note: For models using 4 pairs of rings assemblies see Fig. 5 for details

Serviceman Mode (Electronic Controls)

This Receiver has electronic technology using the I²C 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 **Serviceman Adjustment Mode**.)

Note: *It is suggested that the technician reads all the way through and understand the following procedure for Entering/Exiting the **Serviceman Adjustment Mode**; then proceed with the instructions working with the Receiver. When becoming familiar with the procedure, the Flow Chart for Serviceman Mode may be used as a quick guide.*

Quick Entry to Serviceman Mode:

At times when minor adjustments need to be done to the electronic controls, the method of Entering the serviceman 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 CLOCK icon and set SLEEP time for 30 Min.
3. Press MENU button twice to exit menus.
4. Tune to the Channel 124.
5. Adjust VOLUME to minimum (0).
6. Press the VOL ◀ button (decrease) **on Receiver**. Red "CHK" appears in upper corner.

To toggle between Aging and Serviceman modes:

While the "CHK" is displayed on the left top corner of the CRT, pressing the Action and the Volume Up buttons on the Receiver simultaneously will toggle between the modes. Red "CHK" for Serviceman and yellow "CHK" for Aging.

7. **Press the Power Button on the Remote Control** to select one of seven Serviceman Adjustment Modes.
 - 1) **B**= Serviceman VCJ SUB-DATA ADJUSTMENT.
 - 2) **C**= Serviceman VCJ CUT-OFF ADJUSTMENT.
 - 3) **D**= Serviceman PIN CUSHION ADJUSTMENT.
 - 4) **M**= Serviceman MTS ADJUSTMENTS.
 - 5) **P**= Serviceman PIP ADJUSTMENT. (*Models with PIP only*)
 - 6) **S**= Serviceman OPTIONS ADJUSTMENTS.
 - 7) **X** = Serviceman COMB FILTER ADJUSTMENT.
 - 8) **"CHK"** = Normal operation of CHANNEL ▲▼ and VOLUME ◀▶.

Note: *Only the applicable settings for the Receiver serviced will be available (See **a** in Fig. 13).*

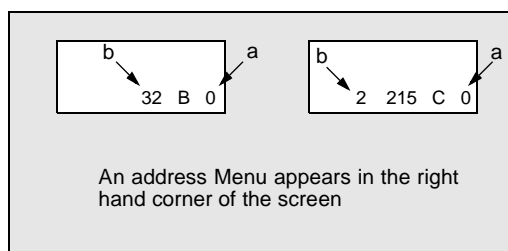


Figure 13. **Serviceman Mode Menu Adjustments.**

Exiting the Serviceman Mode:

Press the **Menu** and the **Power** buttons on the **Receiver** simultaneously for at least 2 seconds.

THE RECEIVER EXITS SERVICEMAN MODE.

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.

IMPORTANT NOTE:
Always Exit the Serviceman Mode
Following Adjustments.

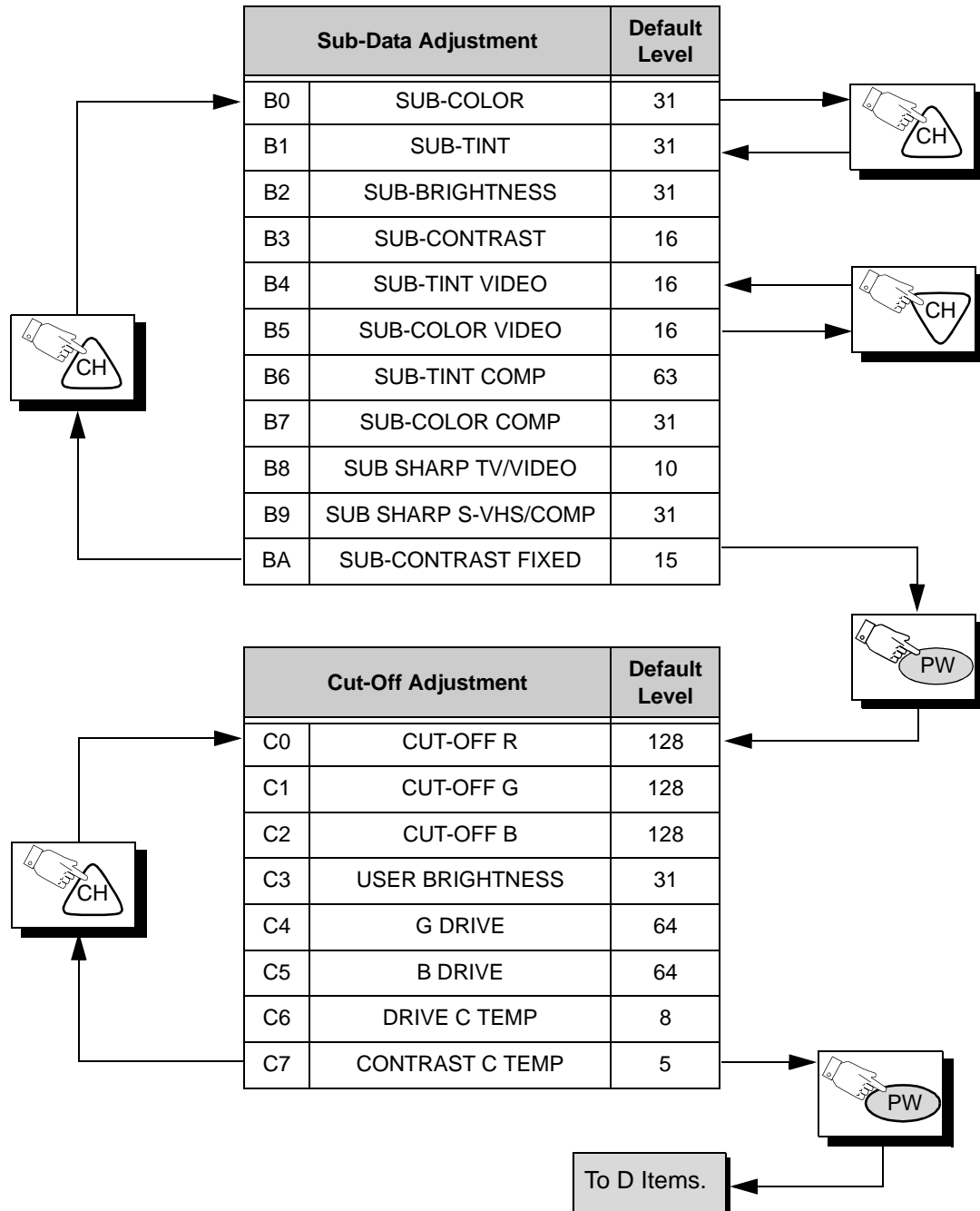
Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment .

For Adjustments:

1. Press **Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (a in Fig. 13).

Note: Write Down the original value set (b in Fig. 13) for each address before modifying anything. It is easy to erroneously adjust the wrong item.

2. Press **Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (b in Fig. 13).



IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Note: Some adjustments modes may not be available in some models depending on available options.

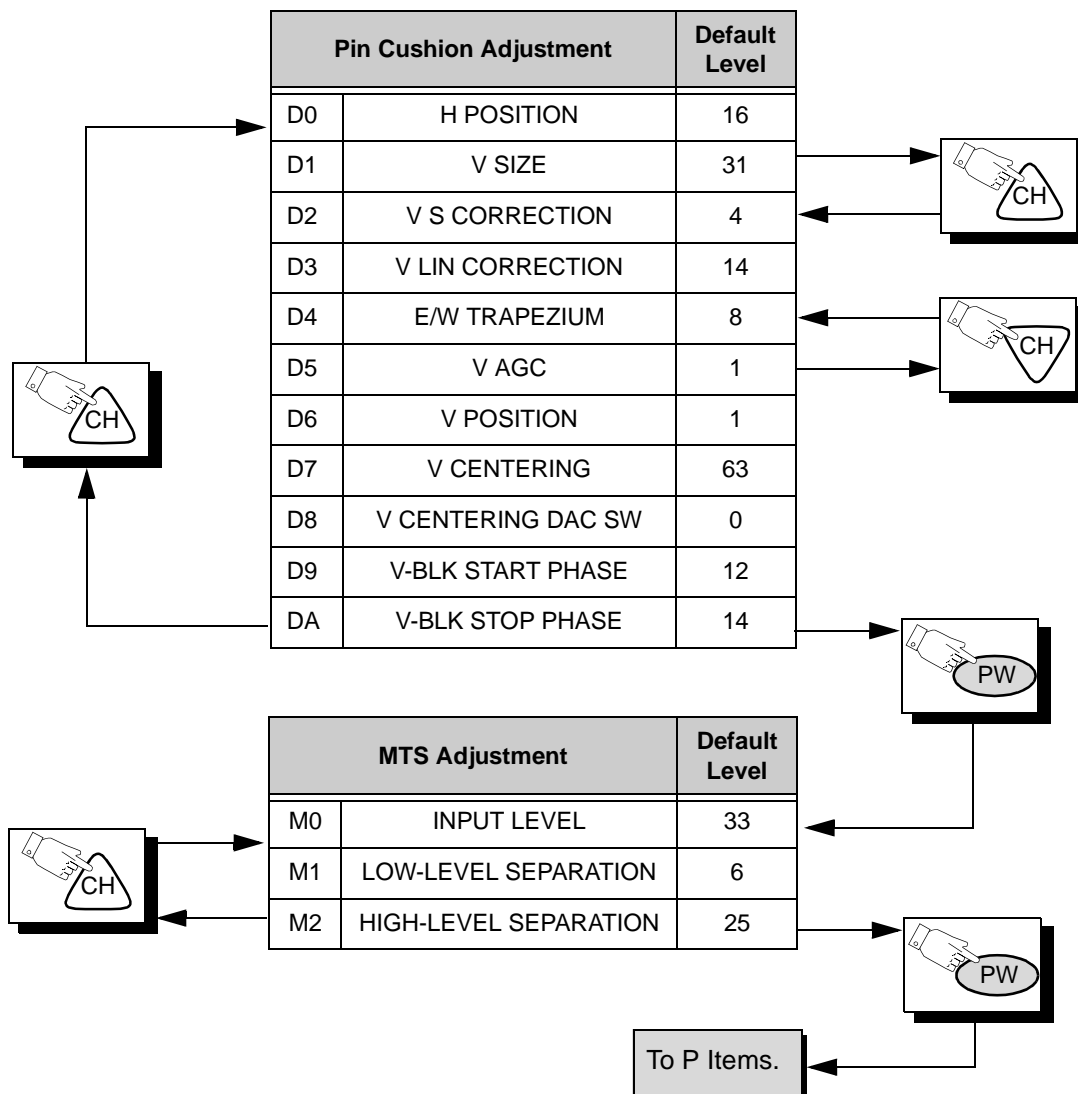
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. Press **Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 13).

Note: Write Down the original value set (**b** in Fig. 13) for each address before modifying anything. It is easy to erroneously adjust the wrong item.

2. Press **Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 13).



Note: Some adjustments modes may not be available in some models depending on available options.

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

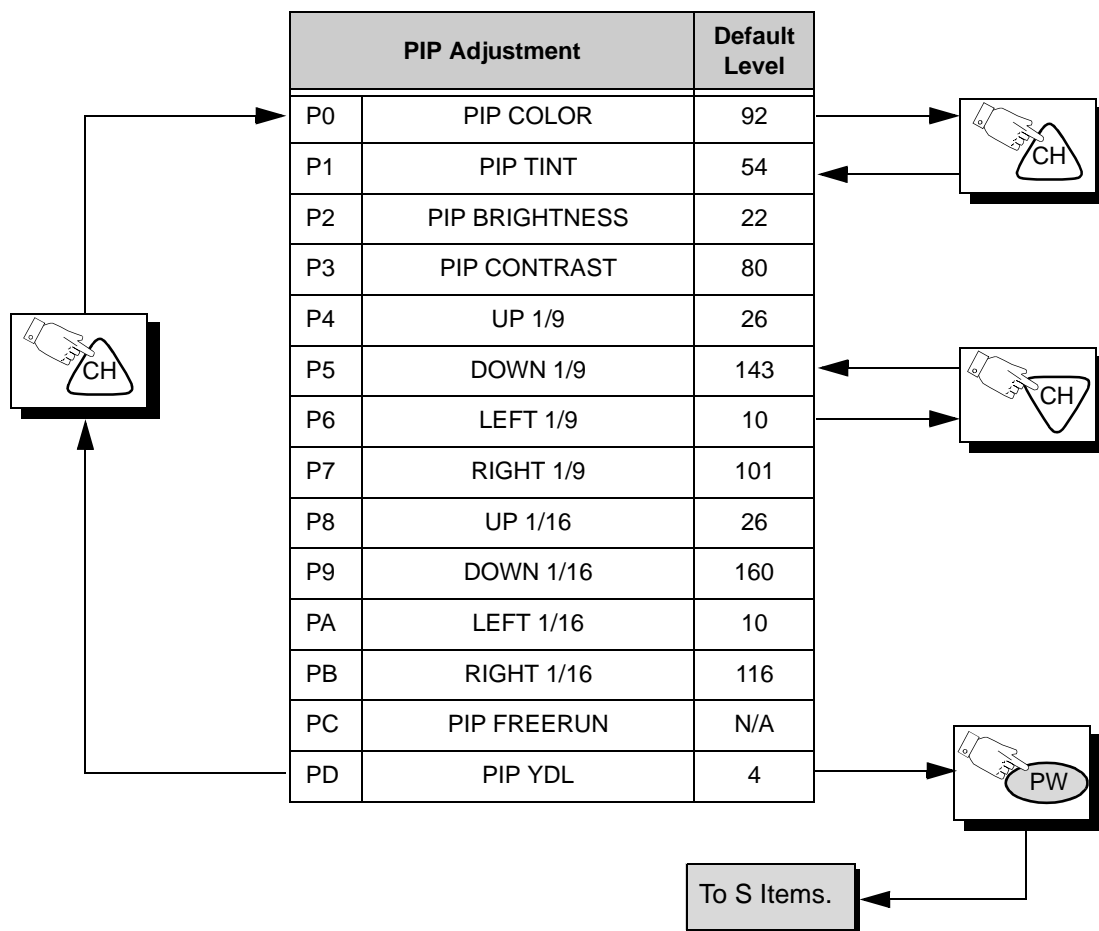
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. Press Channel Up/Down on the Remote Control to select one of the available Service Adjustments (a in Fig. 13).

Note: Write Down the original value set (b in Fig. 13) for each address before modifying anything. It is easy to erroneously adjust the wrong item.

2. Press Volume Up/Down on the Remote Control to adjust the level of the selected Service Adjustment (b in Fig. 13).



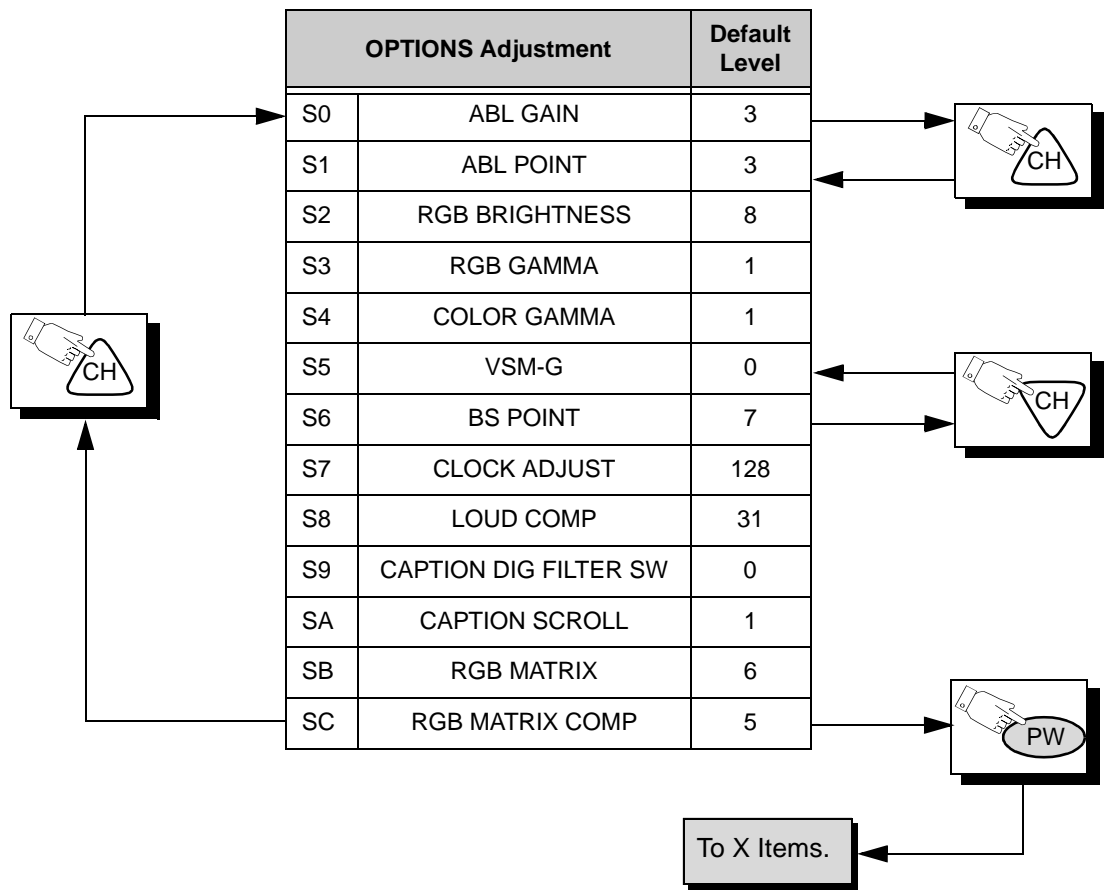
Note: Some adjustments modes may not be available in some models depending on available options.

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. Press Channel Up/Down on the Remote Control to select one of the available Service Adjustments (a in Fig. 13).
- Note:** Write Down the original value set (b in Fig. 13) for each address before modifying anything. It is easy to erroneously adjust the wrong item.
2. Press Volume Up/Down on the Remote Control to adjust the level of the selected Service Adjustment (b in Fig. 13).



Note: Some adjustments modes may not be available in some models depending on available options.

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

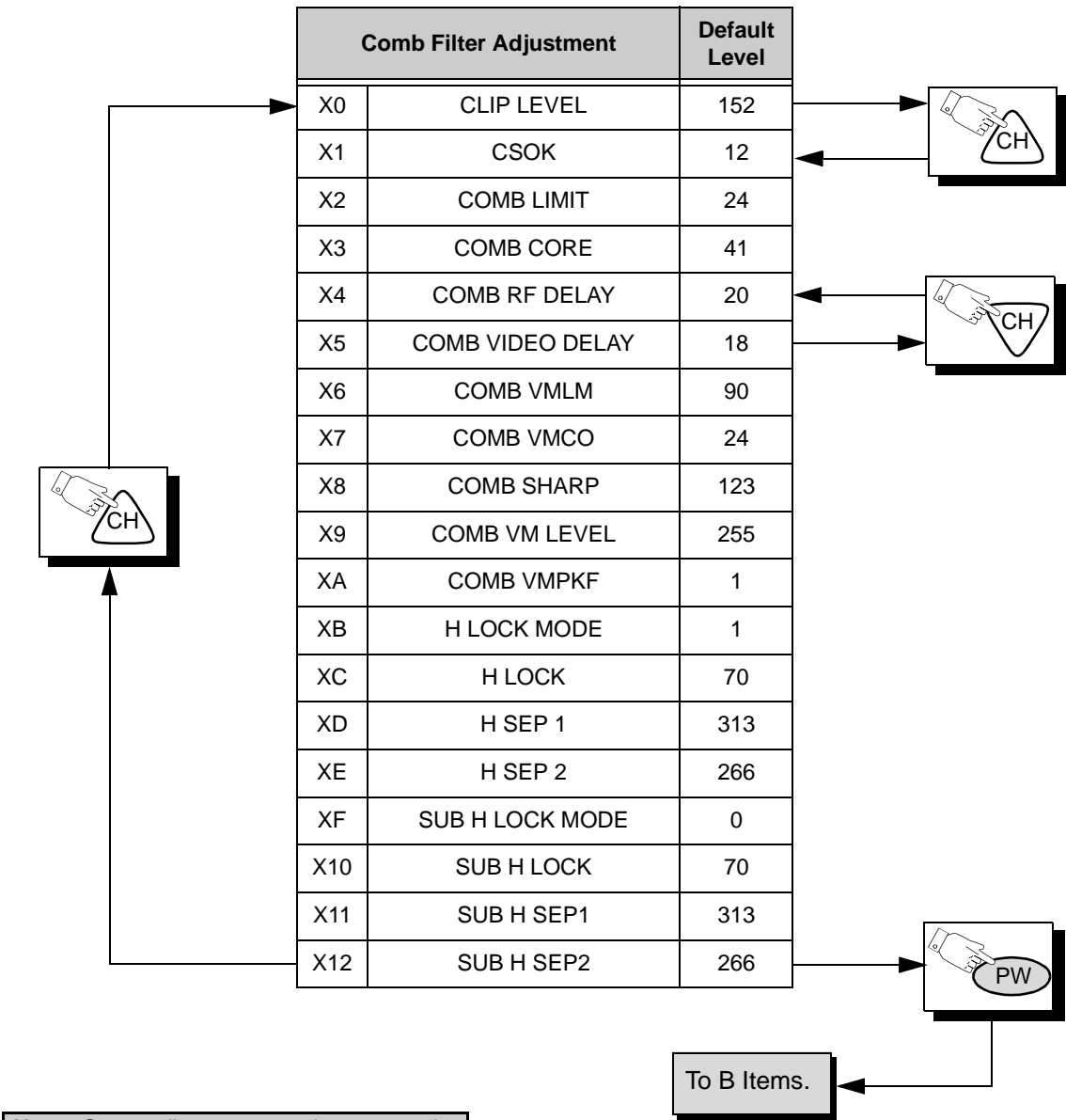
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. Press Channel Up/Down on the Remote Control to select one of the available Service Adjustments (a in Fig. 13).

Note: Write Down the original value set (b in Fig. 13) for each address before modifying anything. It is easy to erroneously adjust the wrong item.

2. Press Volume Up/Down on the Remote Control to adjust the level of the selected Service Adjustment (b in Fig. 13).

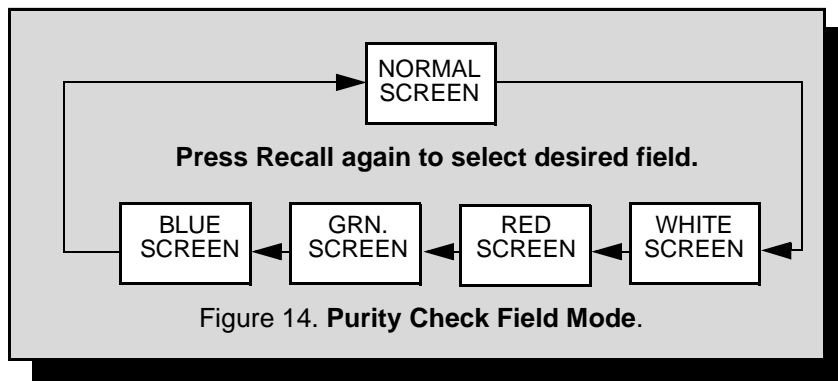


Note: Some adjustments modes may not be available in some models depending on available options.

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

To Check Purity:

Press the **Recall** Button on the **Remote Control** when in Serviceman Mode (red “CHK” is displayed) to enter the Purity Field Check Mode.



Helpful Hints

Entering Serviceman Mode (Back-Open Method)

1. While the Receiver is ON and operating in Normal Mode, momentarily short test point **FA1** (TP8) to Cold Ground (\nearrow) **FA2** (TP3) A-Board.
The Receiver enters the Aging Mode.
Yellow letters “CHK” appear in the upper left corner of the CRT.
(The Volume Up/Down will adjust rapidly).
2. Simultaneously press the **Menu** and the **Volume Up** buttons on the **Receiver** Control Panel.
The Receiver enters the Serviceman Mode.
The letter in “CHK” turn red.
(The Volume Up/Down will adjust normally).
(All customer controls are set to nominal level).

IMPORTANT NOTE:
Always Exit the Serviceman
Mode Following Adjustments.

Instructional Flow Chart for Serviceman Mode

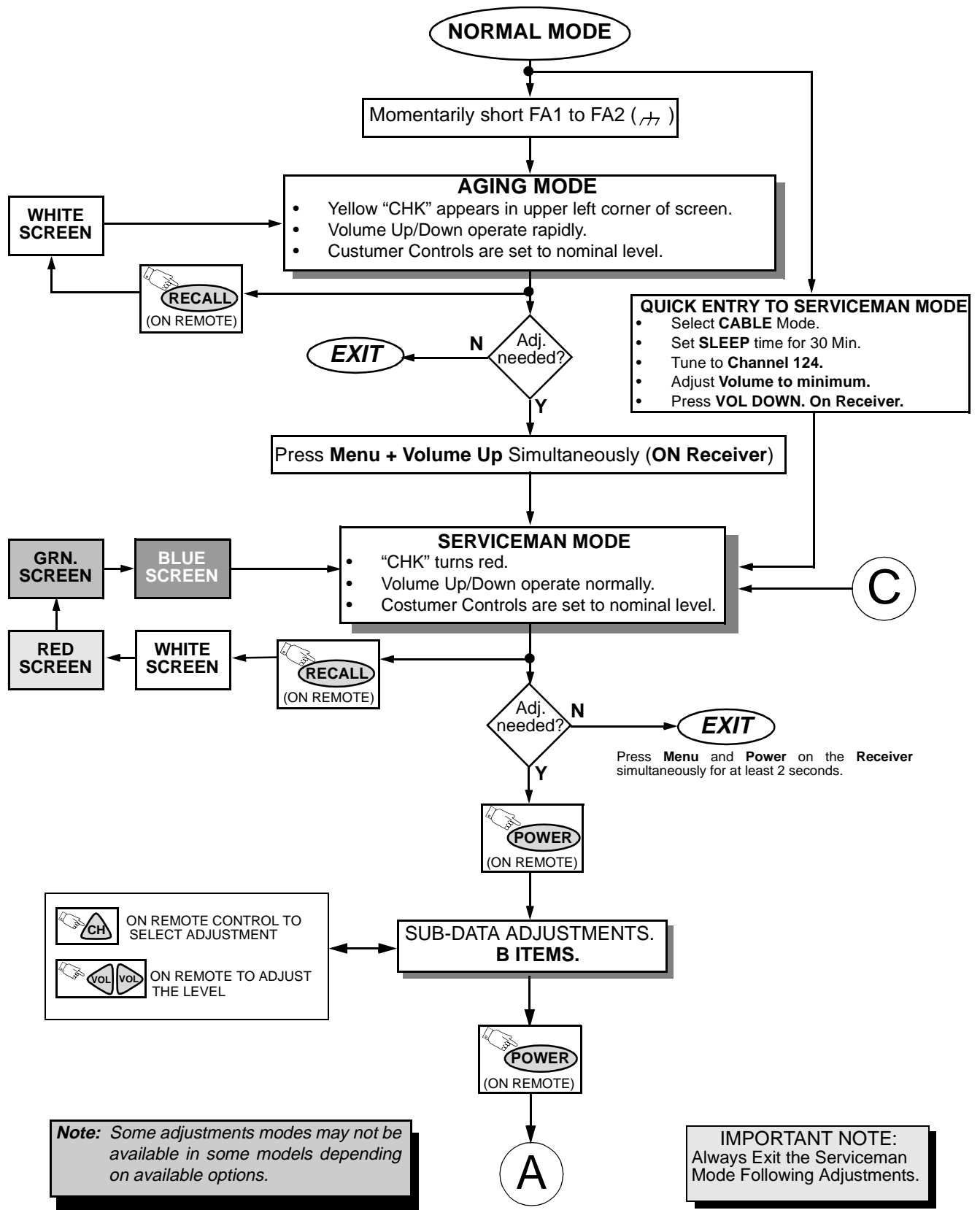


Figure 15. Flow Chart for Serviceman Mode.

Instructional Flow Chart for Serviceman Mode - Continued

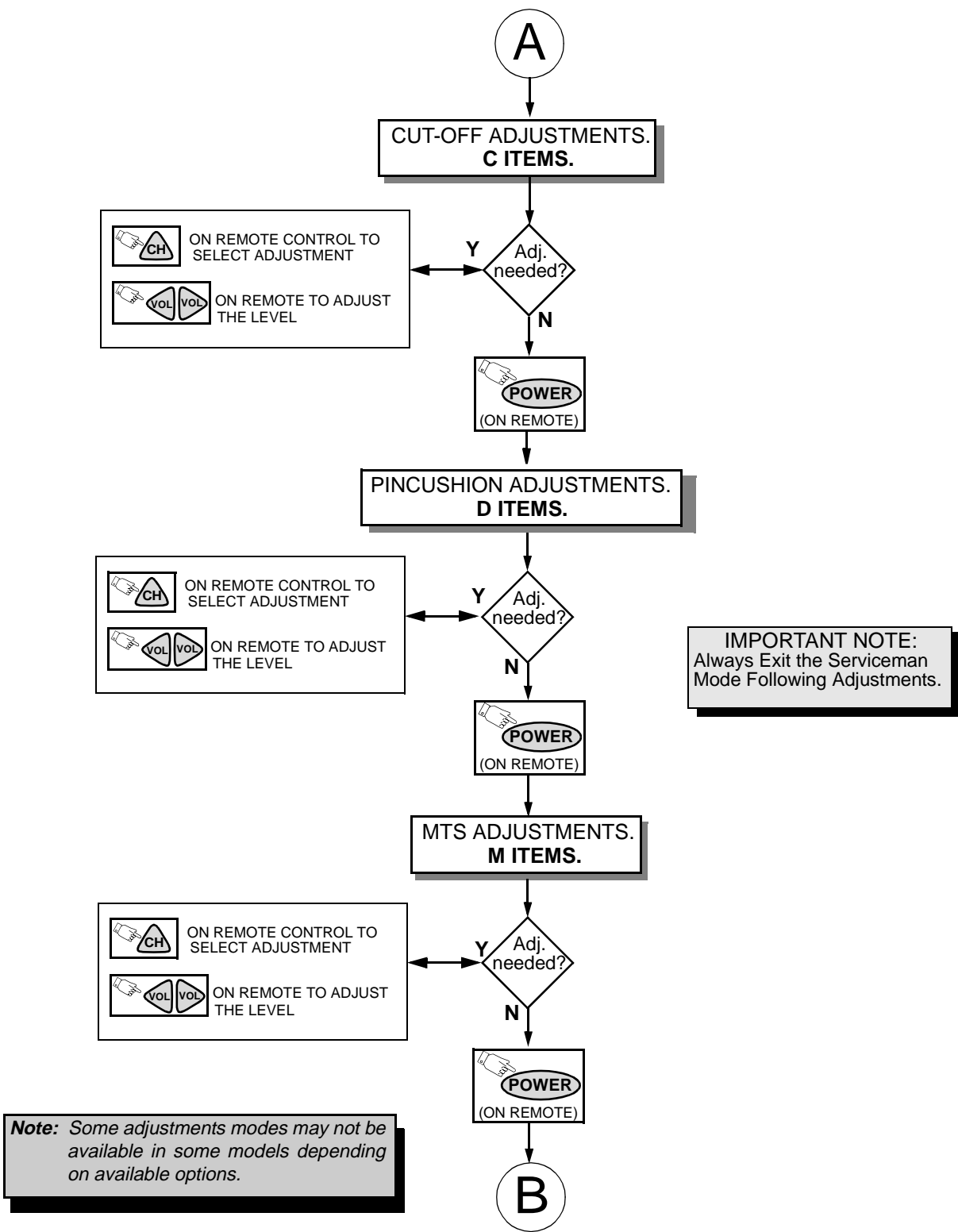
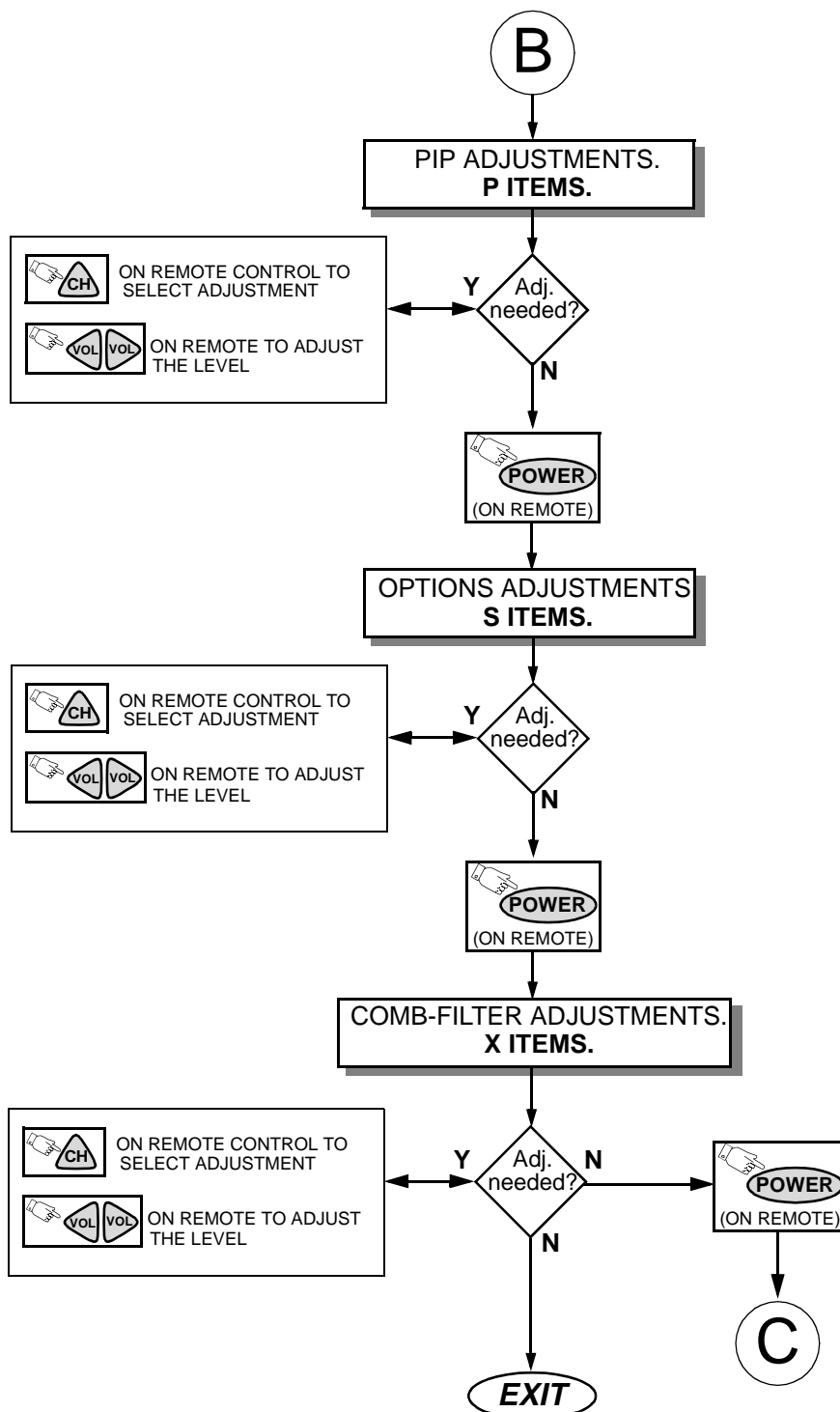


Figure 16. Flow Chart for Serviceman Mode (cont).

Instructional Flow Chart for Serviceman Mode - Continued



Press **Menu** and **Power** on the **Receiver** simultaneously for at least 2 seconds.

Figure 17. Flow Chart for Serviceman Mode (cont).

Note: Some adjustments modes may not be available in some models depending on available options.

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Service Adjustments (Electronic Controls)

Sub-Brightness

Serviceman DAC Adjustment (B2)

Adjustment of this control is important for setting proper operation of customer brightness and contrast controls. This adjustment must be made after Sub-Contrast or Color Temperature adjustments are made. **Do not adjust SCREEN** after the Sub-Brightness is set.

Preparation:

Apply a color bar signal with 100 IRE white and 7.5 IRE black. (Switch Color to "OFF" on the signal generator.) Operate the Receiver for a minimum of 10 minutes prior to performing this adjustment.

Procedure:

In the Serviceman Mode for making electronic adjustments, select the DAC adjustment (B2) and adjust until the black starts to look gray. Then decrease the level to the point where gray turns to black.

Note: You may set the accurate value following the Preparation steps and the Procedure step No. 2 of the Sub-Contrast adjustment described below.

Sub-Contrast

Serviceman DAC Adjustment (B3)

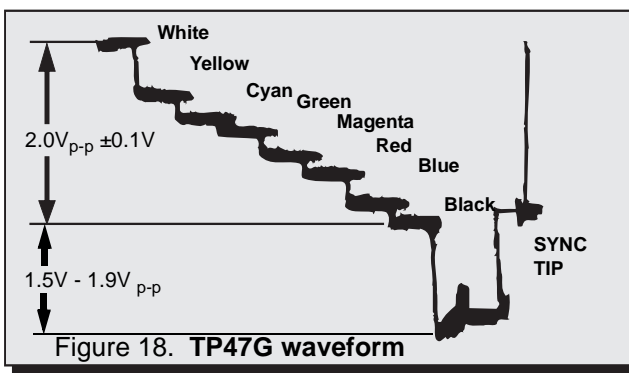
This adjustment is factory set. **Do not adjust** unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

Preparation:

1. Apply a color bar signal pattern with 87.5% modulation, 70% saturated color bar with a 100 IRE white and 7.5 black.

Note: The pattern used in this procedure is an EIA color bar pattern with 87.5% modulation with 100 IRE white and 7.5 black. Correlate the information in this procedure to the pattern used if another signal is used.

2. Preset the following controls:
 - BrightnessCenter.
 - ColorMin.
 - ContrastMax.
 - SharpnessCenter.
3. Connect the oscilloscope to TP47R. Set the scope time base to 20 μ s (horizontal).
4. Connect a jumper from TPD2 to ground (↯).



Procedure:

1. In the Serviceman Mode, select DAC Sub-Brightness Adjustment (B2) and adjust for **1.5-1.9Vp-p** between blanking and 7.5 IRE level. (See video waveforms detail, Fig. 18)
2. In the Serviceman Mode for electronic adjustments, select DAC Sub-Contrast Adjustment (B3) and adjust for **2.0Vp-p ±0.1V** white level to black level on video waveform (see video waveforms detail, Fig. 18).
3. Remove the jumper (Preparation step 4).

Tint/Color Adjustment

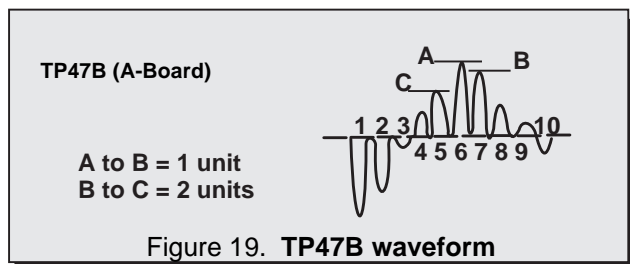
Serviceman DAC Adjustment (B1) (B0)

Preparation:

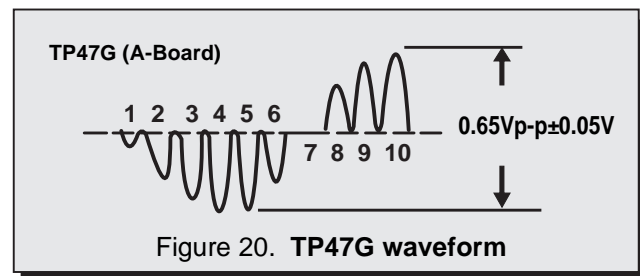
1. Apply a rainbow color bar signal.
2. Preset the following controls:
 - BrightnessMin.
 - ColorCenter.
 - TintCenter.
 - ContrastMax.
 - SharpnessMin.
3. Connect the oscilloscope to TP47B (A-Board).
4. Connect a jumper from TPD2 to GND (↯).
5. Connect a jumper from IC101 pin 28 to GND (↯).

Procedure:

1. In the Serviceman Mode for making electronic adjustments, select DAC Sub-Tint Adjustment (B1). Adjust until the waveform measured is as the one shown in Fig. 19.



2. Connect the oscilloscope to TP47G (A-Board).
3. Select DAC Sub-Color Adjustment (B0) and adjust for peak to peak amplitude to be **0.65Vp-p ±0.05V** for 27" models as shown in Fig. 20.



4. Remove the jumpers (Preparation steps 4 & 5).

Color Temperature Adjustment (B/W Tracking)

Serviceman DAC Adjust. (C0) (C1) (C2) (C4) (C5) 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 Serviceman Mode for making electronic adjustments, select Cutoff (C0) RED, (C1) GRN, (C2) BLU and adjust the picture for gray.
2. HIGH LIGHT areas – In Serviceman Mode for making electronic adjustments, select Drive (C4) GRN, (C5) BLU and adjust the picture for warm whites.

Complete Adjustment

Preparation:

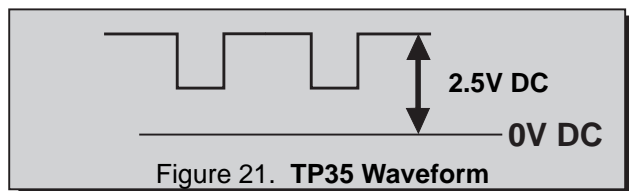
1. Turn the Receiver "ON" and allow 10 minutes warm up at high brightness.
2. Apply a color bar signal with color "OFF".
3. Turn the SCREEN control (part of FBT T551) fully counterclockwise.

Procedure:

Preset the following Serviceman DACs for best results:

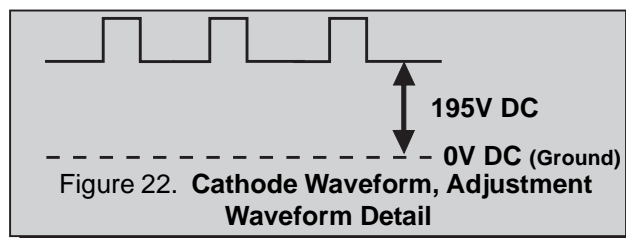
- C0 128
- C1 128
- C2 128
- C4 64
- C5 64

1. Connect the oscilloscope to C1-2 (CRT-Board).
2. In Serviceman Mode for making electronic adjustment, select the Sub-Bright DAC (B2).
3. Press the LST-CH key on the remote.
4. Observe the oscilloscope waveform at Horizontal rate and adjust the Serviceman Mode Sub-Bright DAC (B2) level until a scanning period of **2.5V** above DC ground is measured, as indicated in Fig. 21.



5. Connect the scope to RED Cathode (KR) on the CRT-Board.
6. In the Serviceman Mode for making electronic adjustments, select the RED CUTOFF DAC (C0).
7. Press the LST-CH key on the remote.

8. View scope trace at Horizontal rate and adjust the Serviceman Mode DAC (C0) level until a scanning period of **195V** above DC ground is measured, as indicated in Fig. 22.
9. Connect the scope to the GRN Cathode (KG).
10. In Serviceman Mode for making electronic adjustments, select the GRN CUTOFF DAC (C1).
11. Press the LST-CH key on the Remote



12. View the scope trace and adjust the Serviceman Mode DAC (C1) for the scanning period to be **195V** above DC ground. (See Fig. 22)
13. Connect the scope to the BLU Cathode (KB).
14. In Serviceman Mode for making electronic adjustments, select the BLU CUTOFF (C2).
15. Press the LST-CH key on the Remote.
16. View the scope trace and adjust the Serviceman Mode DAC (C2) for the scanning period to be **195V** above DC ground. (See Fig. 22)
17. Turn the Screen Control (part of FBT) slowly clockwise until a color horizontal line appears.
18. With the other two colors Serviceman Mode DAC CUTOFF adjustments (C0) RED, (C2) BLU; increase the colors to create a white horizontal line.
19. Confirm that a good gray scale is established by viewing B/W color bar pattern.
20. In the Serviceman Mode for making electronic adjustments select the DAC DRIVE adjustments (C4) GRN, (C5) BLUE and adjust for warm white in a white color bar pattern.
21. EXIT the Serviceman Mode.
22. Adjust the Picture Menu Video Adjustments **Brightness** and **Contrast** from low scale to high scale and check Black and White tracking.
23. If correction is needed: Re-Enter the Serviceman Mode and perform the **Minor Touch – Up Method**.
24. Perform **Sub-Brightness** Adjustment procedure if needed.

Service Adjustments (Electronic Controls, cont.)

Horizontal Centering

Serviceman DAC Adjustment (D0)

Preparation:

Connect a crosshatch generator.

Procedure:

1. In the Serviceman Mode for making electronic adjustments. Select the Horizontal Centering Adjustment DAC (D0) and adjust until the center of the crosshatch pattern is centered on CRT.
2. EXIT the Serviceman Adjustment Mode.

MTS Circuit Adjustments

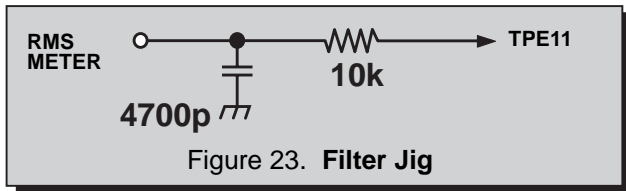
The MTS Circuit Adjustments require two steps:

1. Input Level Adjustment.
2. Stereo Separation Adjustment.

Input Level Adjustment (M0)

Preparation:

1. Connect an RMS meter with filter jig as shown in Fig. 23.



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).
2. Adjust the MTS Input Level Adjustment (M0) until the voltage measured is 106 \pm 6.0mV rms.

Stereo Separation Adjustment (M1 & M2)

Preparation:

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

Procedure:

1. Select Stereo Mode in Audio menu
2. Apply the following signal from the RF signal generator:
Video: 100 IRE flat field, 30% modulation.
Audio: 300Hz, 100% modulation, stereo (left only) (70 \pm 5dB, 75 Ω OPEN, P/S 10dB).
3. Adjust the MTS Low-Level Separation Adjustment (M1) 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, 100% modulation, stereo (left only) (70 \pm 5dB, 75 Ω OPEN, P/S 10dB).
5. Adjust the MTS High-Level Separation Adjustment (M2) 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.

Service Adjustments (Electronic Controls, cont.)

Clock Adjustment (S7)

Preparation:

Connect the frequency counter from TPS1 (IC001 Pin 13) to cold ground (\rightarrow).

Note: Frequency Counter probe capacitance should be 8pF or less.

Procedure:

1. Turn the Receiver "OFF" with the AC power applied.
2. Measure TPS1 (IC001 pin 13) for the frequency of the waveform and record the reading.

Note: Pin 13 measurement must have at least four digits of resolution following the decimal point. Example: 000.0000

3. Turn the Receiver back "ON".
4. Place the Receiver into Serviceman Mode for making electronic adjustment, select the Clock Adjustment DAC (S7).

5. Calculate and set S7 based on the following formula:

$$S7 = 128 + 0.901 \times 10^6 \frac{244.1406 - \text{pin13[Hz]}}{244.1406}$$

Note: Pin 13 measurement will not change regardless of the value stored in S7.

Vertical Size (D1)

1. Adjust the VERTICAL SIZE DAC control, D1, until the top and the bottom edges of the raster are visible.
2. Adjust the VERTICAL SIZE control, D1, until the top and the bottom of the raster touch the bezel edge. Then advance SIZE control to obtain an approximately 10% overscan. Linearity adjustment is done automatically when the size is being adjusted. (Best results can be obtained with a round test pattern.)

Service Adjustments (Mechanical Controls)

Focus (part of T551)

Preparation:

Connect a Signal generator and select a dot pattern.

Procedure:

Adjust the FOCUS control to obtain the sharpest and clearest dot pattern.

- a. Adjust for best center.
- b. Adjust for best area between the center and top right corner.

Audio Signal Path Block Diagram

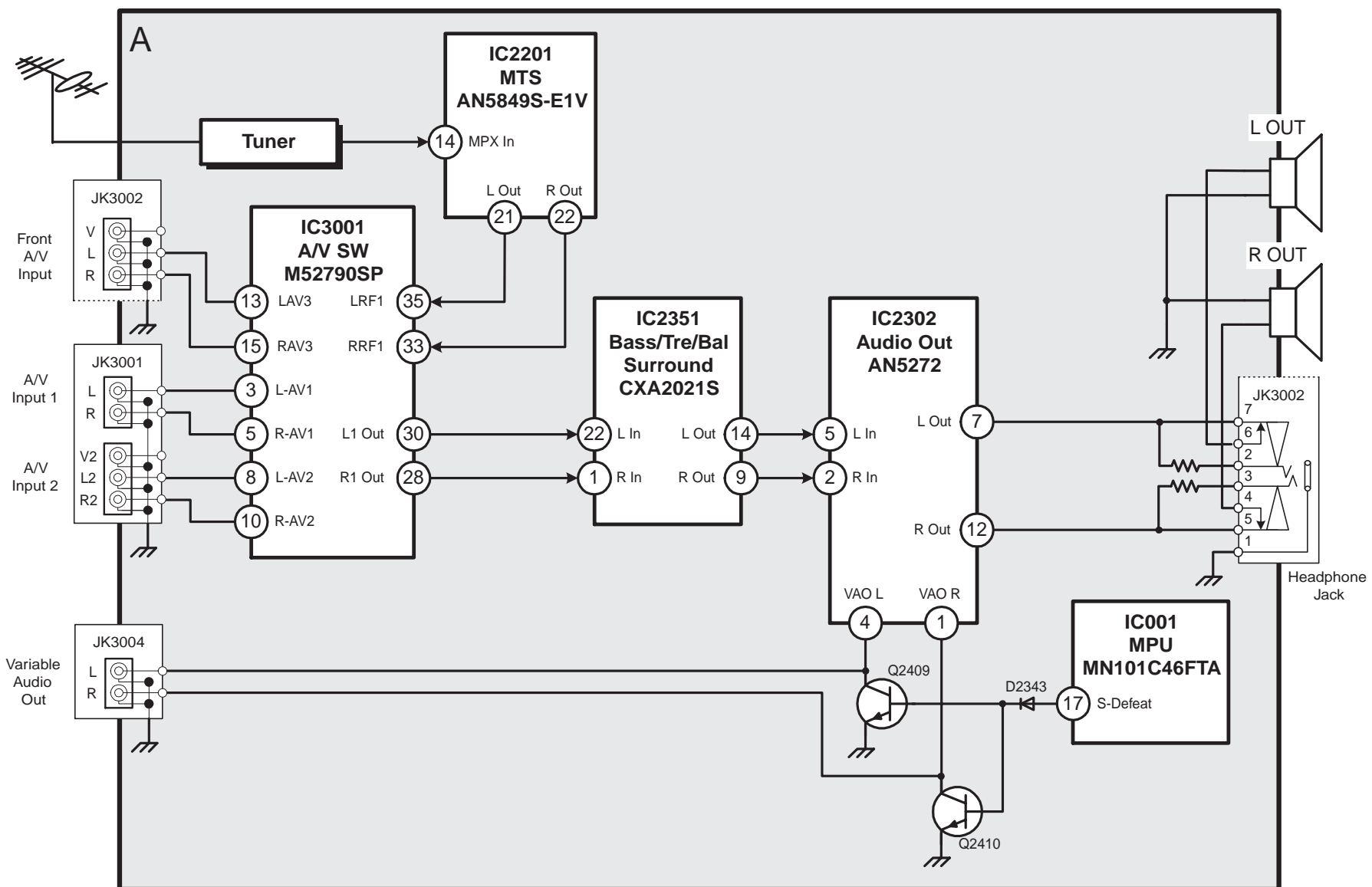


Figure 24. Audio Signal Path Block Diagram.

Video-Chroma Signal Path Block Diagram

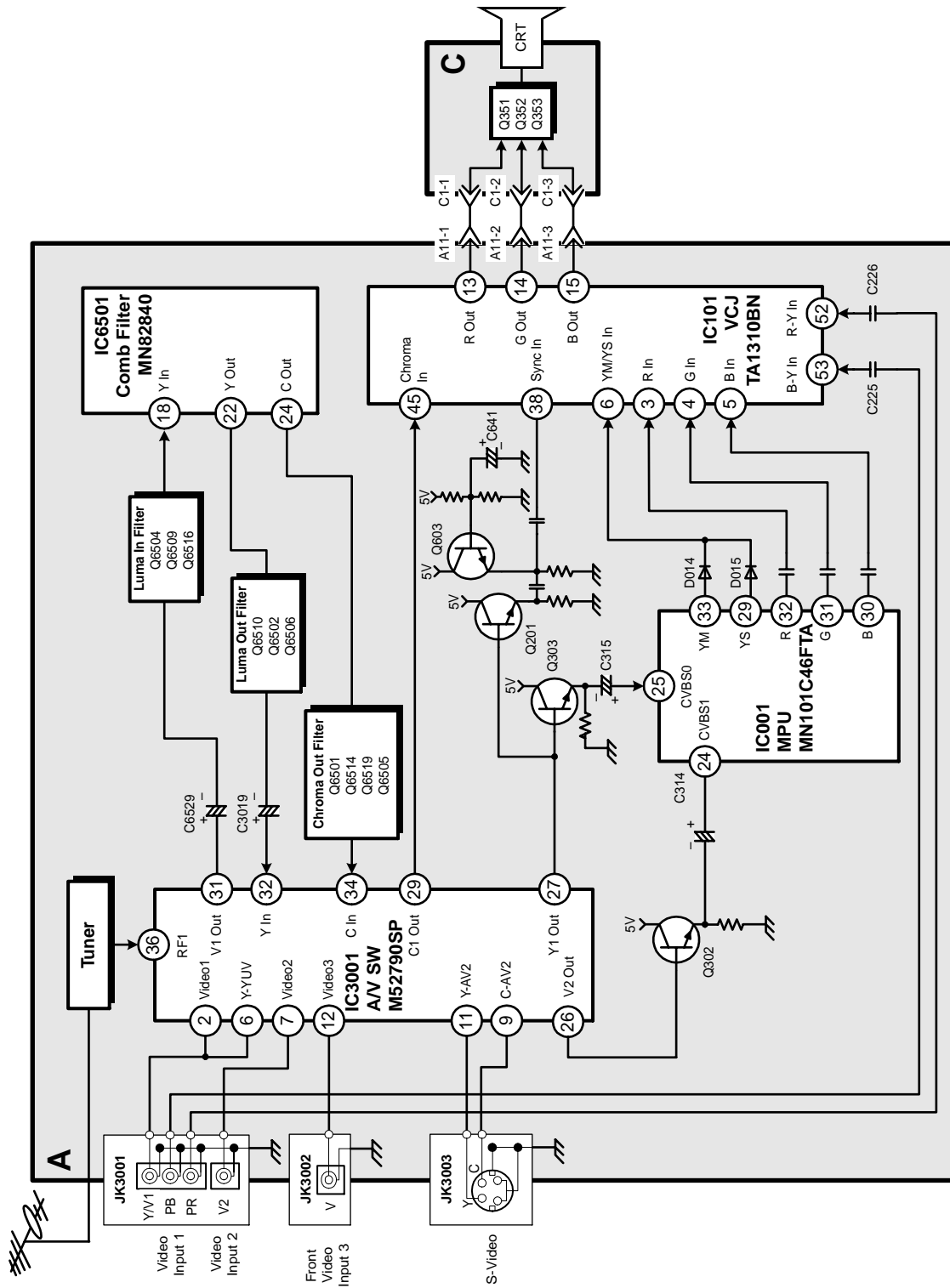


Figure 25. Video-Chroma Signal Path Block Diagram.

**IC101
TA1310BN**

Pin	Function	Pin	Function
1	VSM Out	56	DC RC
2	GND	55	BP DET
3	R In	54	Y In
4	G In	53	B-Y In
5	B In	52	R-Y In
6	YS / YM In	51	VCJ
7	Hold Down Reference	50	CW Out
8	Hold Down	49	X-tal
9	V Reg	48	R-Y Out
10	RGB Mute	47	B-Y Out
11	ABL In	46	APC
12	VK Out	45	Chroma In
13	R Out	44	GND
14	G Out	43	DL Out
15	B Out	42	Bend Correction
16	V _{cc} 9V	41	32 fh VCO
17	R Filter	40	AFC1
18	G Filter	39	V Sep
19	B Filter	38	Y/Sync In
20	Noise Filter	37	DEF V _{cc}
21	V Centering	36	Sync Out
22	EW FB	35	H Out
23	EW Out	34	FBP In
24	V Out	33	VD Out
25	V NFB	32	HD Out
26	V AGC	31	GND
27	V Ramp	30	SDA
28	EHT V	29	SCL

- 34 -

IC001 IN/OUT Pins and Functions (MPU)

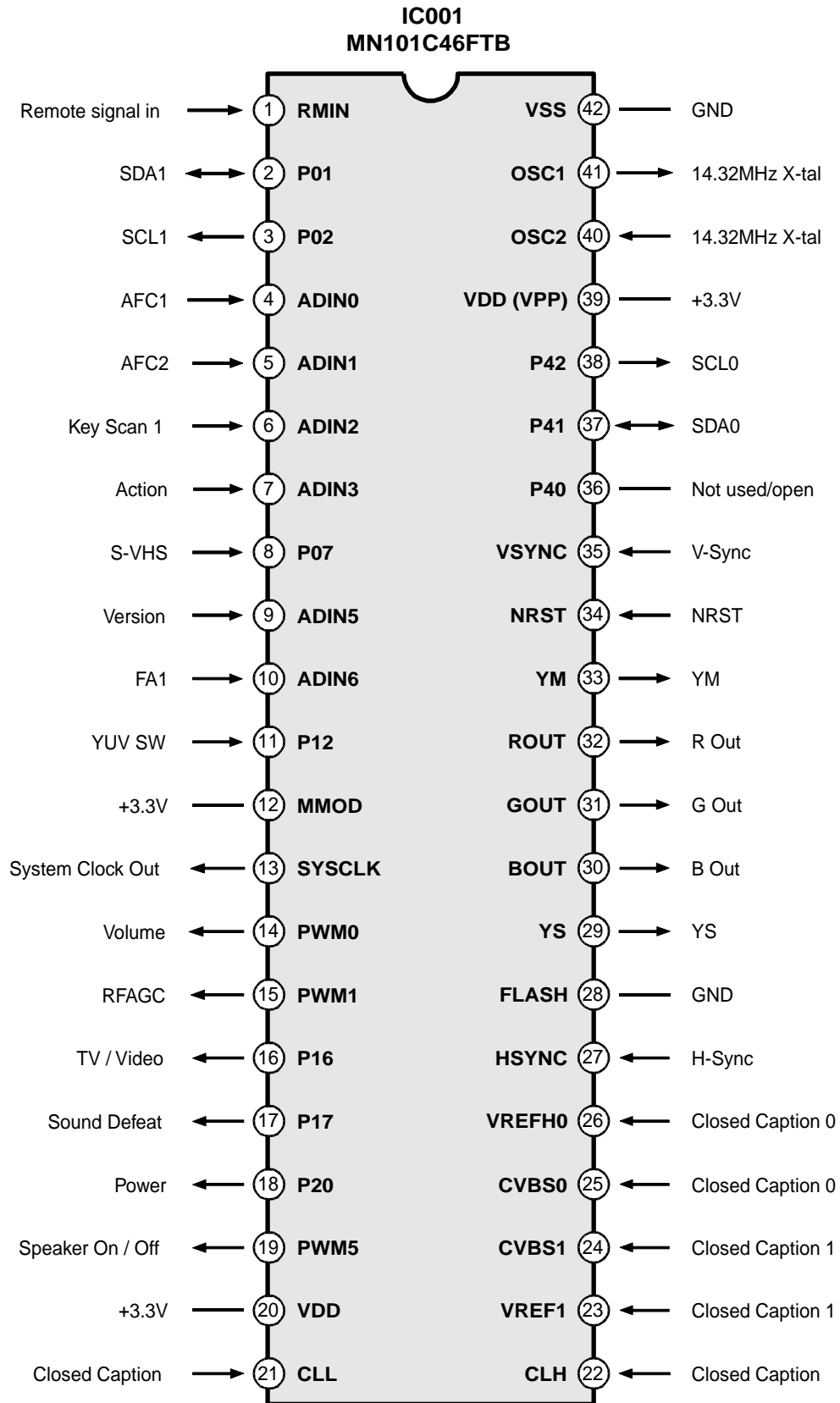


Figure 27. MPU IN/OUT Pins and Functions.

Component Identification

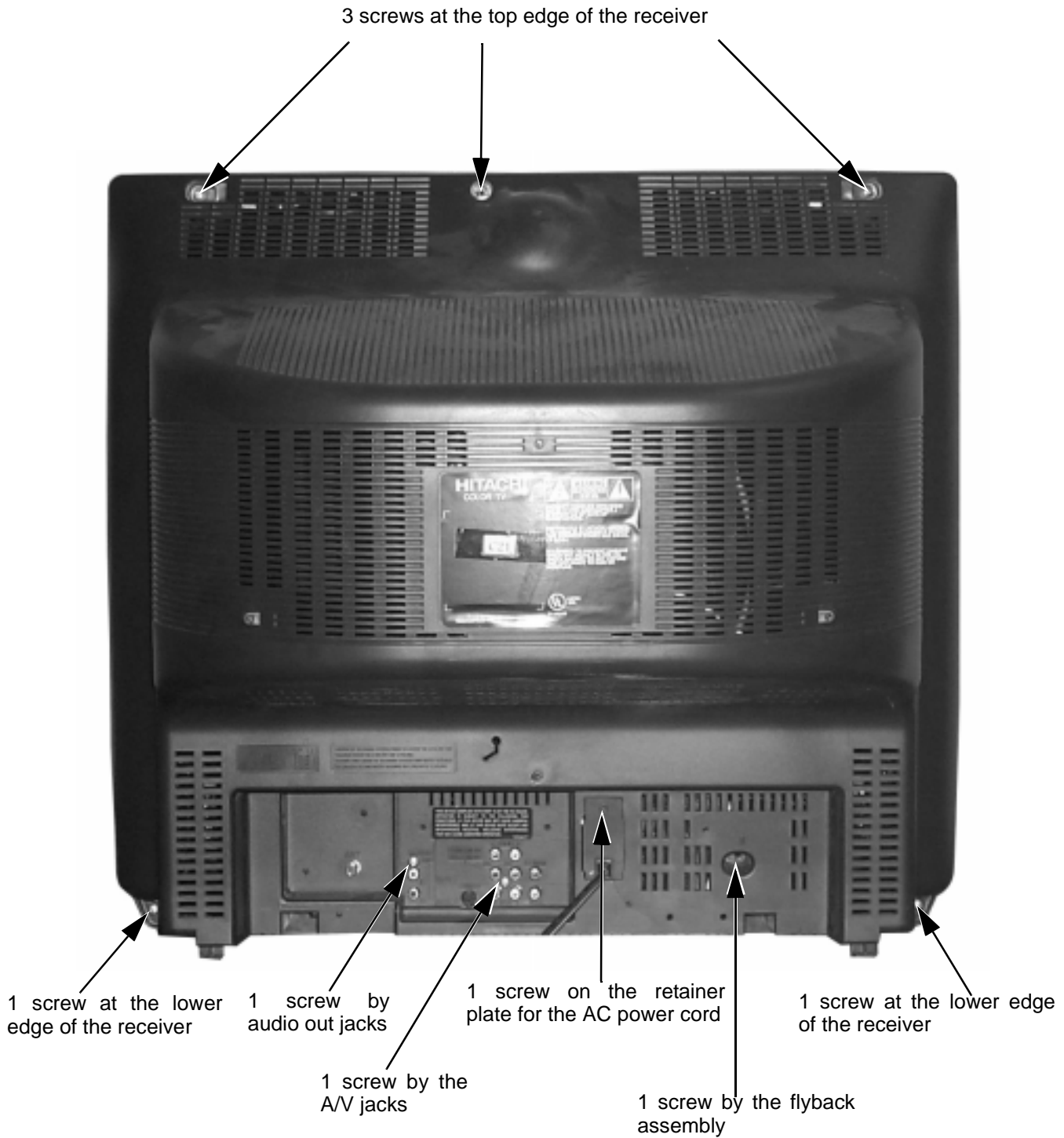
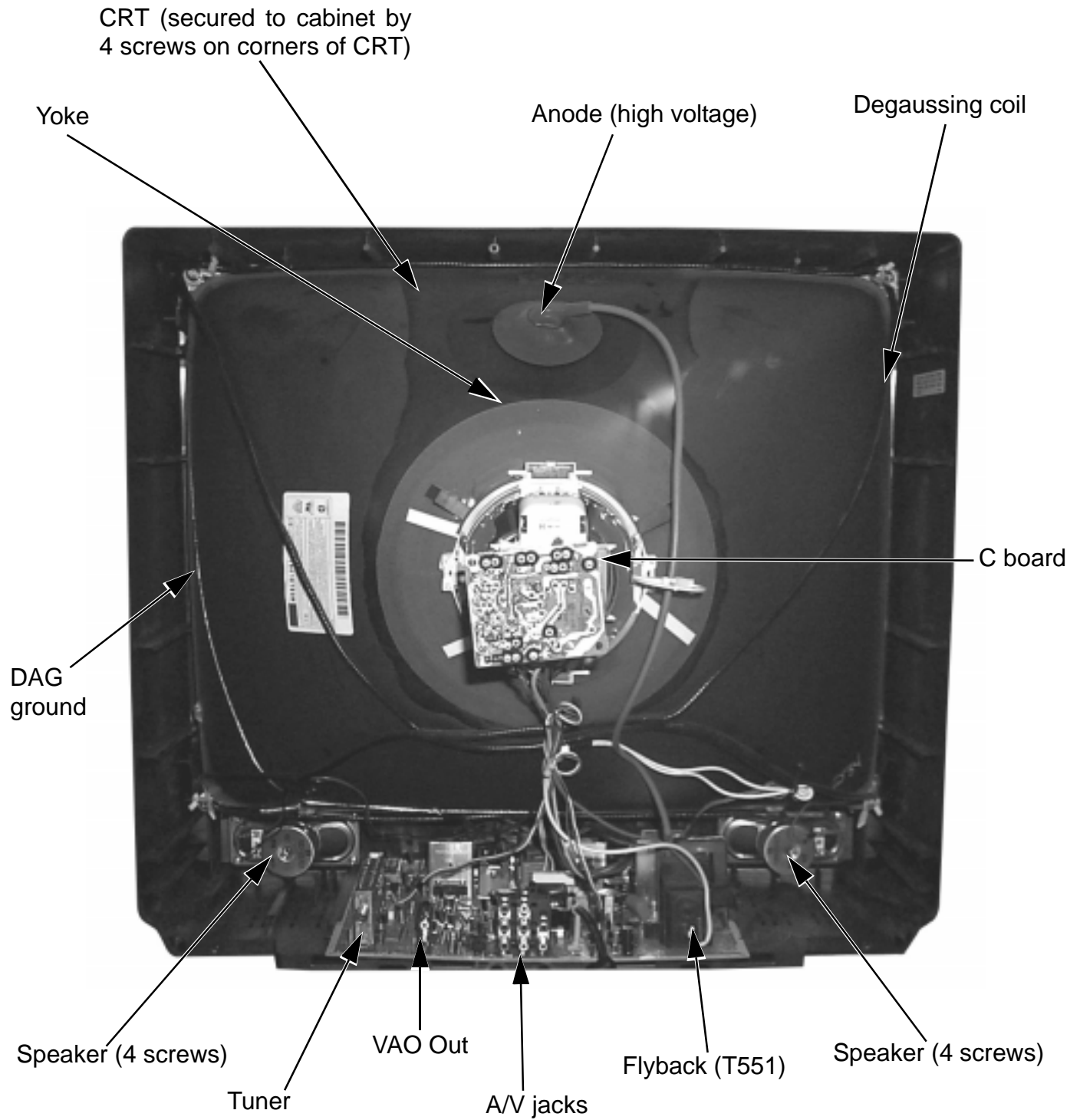


Figure 28. Back Cover Removal

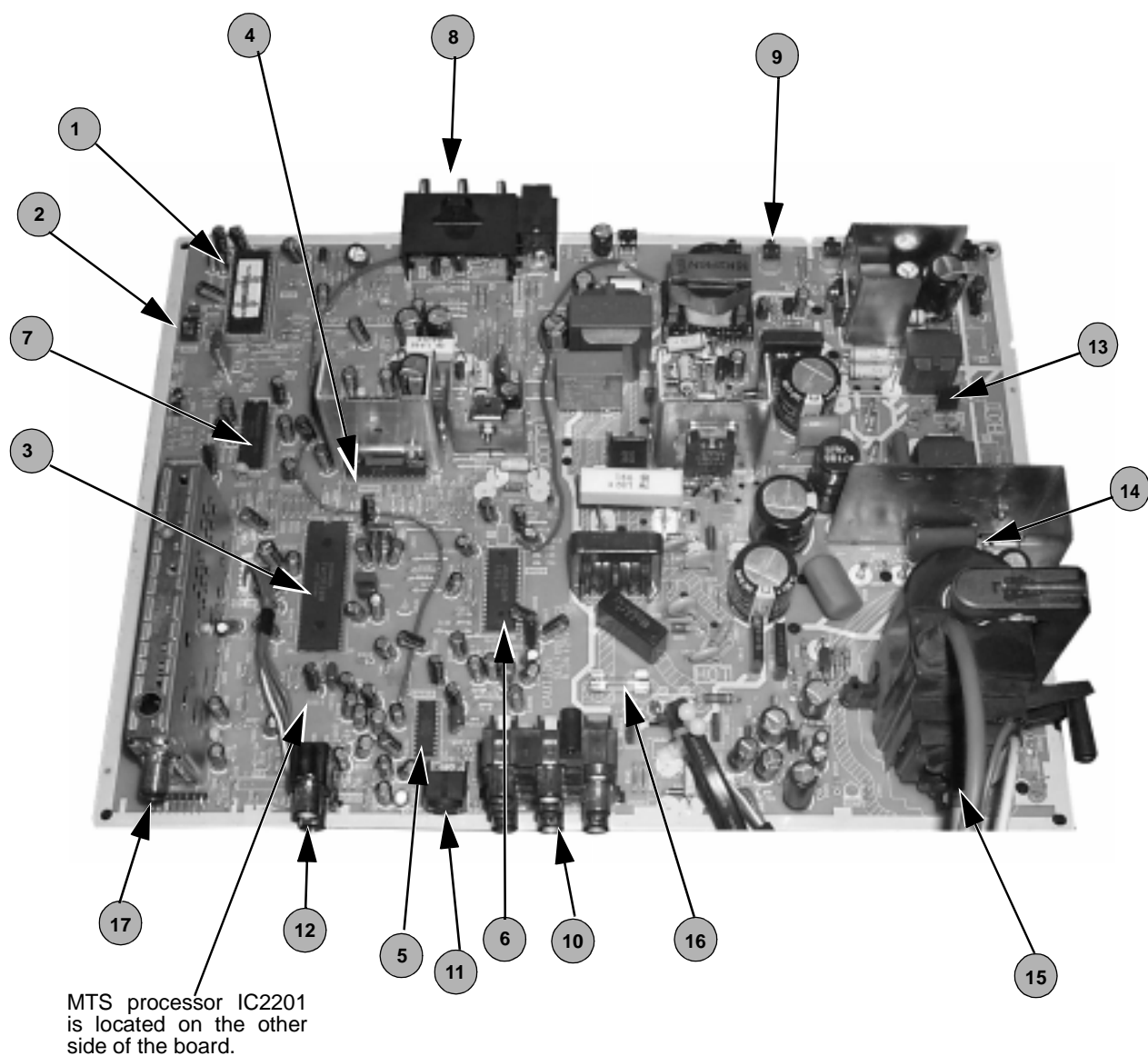
Component Identification



Note: After servicing the receiver, remember to dress the cables, as shown.

Figure 29. Rear View

Component Identification



NO.		LOCATION OF COMPONENTS									
INTEGRATED CIRCUITS		CONNECTORS		TRANSISTORS		VARIOUS					
1	IC 001 MPU	8	FRONT AV IN	13	Q501 H. DRIVE	15	T551 (FLYBACK)				
2	IC 002 EEPROM	9	FRONT KEYPAD	14	Q551 H. OUT	16	FUSE				
3	IC 101 VCJ	10	REAR AV IN			17	TUNER				
4	IC 2302 AUDIO	11	S-VIDEO IN								
5	IC 2351 BASS/TRE/BAL	12	VAO OUT								
6	IC 3001 A/V SWITCH										
7	IC 6501 COMB FILTER										

Figure 30. View of Main Board Assemblies

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
CAPRISTORS			C353	TACCW331T50V	CAP,C 330PF/50V
CRA801	TP00842-51	TAPING GAP TERMINAL	C354	ECKD3D102KB	CAP,C .001UF-K-2KV
CRA802	TP00842-51	TAPING GAP TERMINAL	C357	EEANA1E1R0B	CAP,E 1.0UF-25V
CAPACITORS			C401	ECJ2VB1C104K	CAP,C .1UF-I-16V
C001	ECA1CM470	CAP,E 47UF/16V	C403	ECA1HM010	CAP,E 1.0UF/50V
C002	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C404	ECA1HM010	CAP,E 1.0UF/50V
C003	ECA1HM4R7	CAP,E 4.7UF/50V	C405	ECSF1EE105	CAP,T 1.0UF/25V
C005	ECA1CM470	CAP,E 47UF/16V	C407	ECA1CM100	CAP,E 10UF/16V
C006	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C409	ECJ2VC1H101J	CAP,C 100PF-J-50V
C008	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C415	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C010	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C451	ECA1HM2R2	CAP,E 2.2UF/50V
C013	ECA0JM101	CAP,E 100UF/6.3V	C452	ECQB1H473JM	CAP,P .047UF-J-50V
C016	ECJ2VC1H101J	CAP,C 100PF-J-50V	C453	ECA1VM471	CAP,E 470UF/35V
C017	ECJ2VC1H270J	CAP,C 27PF-J-50V	C454	ECA1VM221	CAP,E 220UF/35V
C018	ECJ2VC1H270J	CAP,C 27PF-J-50V	C455	ECA1EM222	CAP,E 2200UF-25V
C020	ECA0JM331	CAP,E 330UF/6.3V	C456	ECCF1H020CC	CAP,C 2PF-C-50V
C021	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C457	ECJ2VB1C104K	CAP,C .1UF-I-16V
C022	ECA1EM471	CAP,E 470UF/25V	C458	ECA1CM101	CAP,E 100UF/16V
C024	ECA1HM4R7	CAP,E 4.7UF/50V	C459	ECQM1104JZ	CAP,P .1UF-J-100V
C025	ECA1HM010	CAP,E 1.0UF/50V	C502	ECA1CM221	CAP,E 220UF/16V
C026	ECA1HM010	CAP,E 1.0UF/50V	C503	ECJ2VC1H221J	CAP,C 220PF-J-50V
C032	ECA1CM331	CAP,E 330UF/16V	C504	ECQB1H222JM	CAP,P 2200PF-J-50V
C033	ECJ2VC1H680J	CAP,C 68PF-J-50V	C505	ECJ2VC1H180J	CAP,C 18PF-J-50V
C034	ECJ2VC1H680J	CAP,C 68PF-J-50V	C506	ECA1CM471	CAP,E 470UF/16V
C043	ECA1HM2R2	CAP,E 2.2UF/50V	C507	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C044	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C508	ECJ2VC1H102J	CAP,C .001UF-J-50V
C047	ECA0JM102	CAP,E 1000UF/6.3V	C510	ECCD2H100D	CAP,C 10PF-D-500V
C048	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C511	ECKD2H821KB	CAP,C 820PF-K-500V
C201	ECJ2VB1C104K	CAP,C .1UF-I-16V	C512	ECKD2H101KB	CAP,C 100PF-K-500V
C224	ECJ2VB1C104K	CAP,C .1UF-I-16V	C514	ECA1HMR22	CAP,E .22UF/50V
C225	ECJ2VB1C104K	CAP,C .1UF-I-16V	C515	ECJ2VC1H222J	CAP,C .0022UF-J-50V
C226	ECJ2VB1C104K	CAP,C .1UF-I-16V	C516	ECJ2VC1H391J	CAP,C 390PF-J-50V
C301	ECJ2VB1C104K	CAP,C .1UF-I-16V	C517	ECJ2VC1H221J	CAP,C 220PF-J-50V
C302	ECJ2VB1C104K	CAP,C .1UF-I-16V	C518	ECJ2VC1H151J	CAP,C 150PF-J-50V
C303	ECJ2VB1C104K	CAP,C .1UF-I-16V	C519	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C307	ECA1HM0R1	CAP,E 0.1UF/50V	C531	ECA1EM220	CAP,E 22UF/25V
C309	ECJ2VC1H390J	CAP,C 39PF-J-50V	C551	ECA1VM331	CAP,E 330UF/35V
C310	ECJ2VC1H390J	CAP,C 39PF-J-50V	C552	ECA1CM331	CAP,E 330UF/16V
C314	EEANA1E1R0B	CAP,E 1.0UF-25V	C553	ECA1CM331	CAP,E 330UF/16V
C315	EEANA1E1R0B	CAP,E 1.0UF-25V	C554	ECKD2H561KB	CAP,C 560PF-K-500V
C320	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	C555	ECA2EM220	CAP,E 22UF-250V
C321	ECJ2VB1H103K	CAP,C .01UF-K-50V	C556	ECA1CM102	CAP,E 1000UF/16V
C322	ECJ2VB1H103K	CAP,C .01UF-K-50V	C557	ECKD2H102KB	CAP,C .001UF-K-500V
C323	ECJ2VB1H103K	CAP,C .01UF-K-50V	C558	ECA1CM221	CAP,E 220UF/16V
C324	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	C560	ECEA1HN2R2U	CAP,E 2.2UF/50V
C330	ECA1AM101	CAP,E 100UF/10V	C561	ECKD2H561KB	CAP,C 560PF-K-500V
C331	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C562	ECKD2H561KB	CAP,C 560PF-K-500V
C337	ECA1HM2R2	CAP,E 2.2UF/50V	C563	ECWH12H822JS	CAP,P .0082UF-J-1.2KV
C342	ECA1HM010	CAP,E 1.0UF/50V	C564	ECWH12H272JS	CAP,P .0027UF-J-1.2KV
C351	TACCW331T50V	CAP,C 330PF/50V	C565	ECKD3D122JB	CAP,C .0012UF-J-2KV
C352	TACCW331T50V	CAP,C 330PF/50V	C566	ECKD3D181JB	CAP,C 180PF-J-2KV

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
C568	ECQM2274JZ	CAP,P .27UF-J-200V	C2314	ECQB1H473JM	CAP,P .047UF-J-50V
C569	TACFV2E474J	CAP,M .47UF-J-200V	C2315	ECA1EM100	CAP,E 10UF/25V
C571	ECA1CM471	CAP,E 470UF/16V	C2321	ECA1EM100	CAP,E 10UF/25V
C572	ECA1CM100	CAP,E 10UF/16V	C2324	ECA1EM100	CAP,E 10UF/25V
C573	ECA1CM101	CAP,E 100UF/16V	C2325	ECA1CM102	CAP,E 1000UF/16V
C601	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C2326	ECJ2VB1H223K	CAP,C .022UF-K-50V
C603	ECQB1H223JM	CAP,P .022UF-J-50V	C2327	ECJ2VB1H223K	CAP,C .022UF-K-50V
C616	ECJ2VB1C104K	CAP,C .1UF-I-16V	C2328	ECJ2VB1H223K	CAP,C .022UF-K-50V
C641	ECA1HM100	CAP,E 10UF/50V	C2329	ECJ2VB1H223K	CAP,C .022UF-K-50V
C801	ECKDAE472ZED	CAP,C .4700PF-Z-250VAC	C2331	ECA1HM010	CAP,E 1.0UF/50V
C802	ECKDAE472ZED	CAP,C .4700PF-Z-250VAC	C2333	ECA1HM010	CAP,E 1.0UF/50V
C803	ECKDAE472ZED	CAP,C .4700PF-Z-250VAC	C2339	ECA1HM010	CAP,E 1.0UF/50V
C804	ECKDAE472ZED	CAP,C .4700PF-Z-250VAC	C2340	ECA1HM010	CAP,E 1.0UF/50V
C805	EC0S2DA221BB	CAP,E 220UF/200V	C2342	ECA1AM470	CAP,E 47UF/10V
C806	EC0S2DA221BB	CAP,E 220UF/200V	C2350	EEANA1E100B	CAP,E 10UF-25V
C807	ECA1HM2R2	CAP,E 2.2UF/50V	C2351	ECJ2VB1C104K	CAP,C .1UF-I-16V
C808	ECA1CM101	CAP,E 100UF/16V	C2352	ECJ2VB1H472K	CAP,C .0047UF-K-50V
C809	EC0S2DG151DG	CAP,E 151UF/200V	C2353	ECA1HM4R7	CAP,E 4.7UF/50V
C810	ECQU2A153MV	CAP,P .015UF-M-250V	C2354	ECA1HM4R7	CAP,E 4.7UF/50V
C811	ECQU2A153MV	CAP,P .015UF-M-250V	C2355	ECA1HM4R7	CAP,E 4.7UF/50V
C812	ECQU2A224MV	CAP,P .22UF-M-250VAC	C2356	ECA1HMR47	CAP,E .47UF/50V
C814	ECQB1H823JM	CAP,P .082UF-J-50V	C2357	ECA1CM100	CAP,E 10UF/16V
C815	ECA1EHG101B	CAP,E 100UF-25V	C2358	EEANA1E100B	CAP,E 10UF-25V
C818	ECKD3A821KB	CAP,C 820PF-K-1KVDC	C2359	ECJ2VB1C104K	CAP,C .1UF-I-16V
C820	ECA1JHG100B	CAP,E 10UF-63V	C2360	ECJ2VB1H472K	CAP,C .0047UF-K-50V
C821	ECKD2H561KB	CAP,C 560PF-K-500V	C2361	ECA1AM470	CAP,E 47UF/10V
C822	ECA1EM221	CAP,E 220UF/25V	C2362	ECQB1H104JM	CAP,P .1UF-J-50V
C823	ECA160V33UE	CAP,E 33UF/160V	C2363	ECJ2VB1C104K	CAP,C .1UF-I-16V
C824	ECKD3A331KB	CAP,C 330PF-K-1KV	C2364	ECA1HM4R7	CAP,E 4.7UF/50V
C825	ECKD3A471KB	CAP,C 470PF-K-1KV	C2365	ECA1AM470	CAP,E 47UF/10V
C2202	ECA1HM2R2	CAP,E 2.2UF/50V	C2366	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2203	ECA1HM4R7	CAP,E 4.7UF/50V	C3001	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2204	AP106K016CAE	CAP,T 10UF/16V	C3002	ECA1AM101	CAP,E 100UF/10V
C2205	ECA1HM010	CAP,E 1.0UF/50V	C3003	ECA1CM100	CAP,E 10UF/16V
C2206	ECQB1H223JM	CAP,P .022UF-J-50V	C3004	ECA1HM010	CAP,E 1.0UF/50V
C2207	AP335K016CAE	CAP,T 3.3UF/16V	C3006	ECA1HM010	CAP,E 1.0UF/50V
C2208	ECJ2VB1C104K	CAP,C .1UF-I-16V	C3007	ECA1CM100	CAP,E 10UF/16V
C2209	ECJ2VB1C104K	CAP,C .1UF-I-16V	C3008	ECA1CM100	CAP,E 10UF/16V
C2210	ECJ2VB1C104K	CAP,C .1UF-I-16V	C3009	ECA1HM010	CAP,E 1.0UF/50V
C2211	ECA1CM100	CAP,E 10UF/16V	C3010	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2212	ECQB1H473JM	CAP,P .047UF-J-50V	C3011	ECA1HM010	CAP,E 1.0UF/50V
C2215	ECA0JM101	CAP,E 100UF/6.3V	C3012	ECA1CM100	CAP,E 10UF/16V
C2218	ECA1HMR47	CAP,E .47UF/50V	C3013	ECA1CM100	CAP,E 10UF/16V
C2301	ECA1VM102	CAP,E 1000UF/35V	C3014	ECA1HM010	CAP,E 1.0UF/50V
C2302	ECA1HM010	CAP,E 1.0UF/50V	C3016	ECA1HM010	CAP,E 1.0UF/50V
C2305	ECA1HM010	CAP,E 1.0UF/50V	C3018	ECA1CM100	CAP,E 10UF/16V
C2306	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C3019	ECA1CM100	CAP,E 10UF/16V
C2307	ECA1CM102	CAP,E 1000UF/16V	C3020	ECA1HM010	CAP,E 1.0UF/50V
C2309	ECQB1H473JM	CAP,P .047UF-J-50V	C3021	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C2311	ECA1HM3R3	CAP,E 3.3UF/50V	C3022	ECA1HM010	CAP,E 1.0UF/50V
C2313	ECA1EM101	CAP,E 100UF/25V	C3023	ECA1CM100	CAP,E 10UF/16V

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
C6501	ECA0JM101	CAP,E 100UF/6.3V	D805	TAP111M003	DIODE
C6502	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D806	MA4047M	DIODE, ZENER
C6504	ECJ2VC1H270J	CAP,C 27PF-J-50V	D807	MA165	DIODE
C6507	ECJ2VC1H120J	CAP,C 12PF-J-50V	D809	RU3YX-M	DIODE
C6510	ECJ2VC1H120J	CAP,C 12PF-J-50V	D820	EU02V1	DIODE
C6511	ECA1HM010	CAP,E 1.0UF/50V	D821	EU02V1	DIODE
C6512	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D822	EU02V1	DIODE
C6513	ECJ2VC1H270J	CAP,C 27PF-J-50V	D823	RL30A	DIODE
C6516	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D824	EU02V1	DIODE
C6517	ECEA1HN010U	CAP,E 1UF/50V	D825	TVSSR2KL	DIODE, PROTECTION
C6518	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D826	EU02V1	DIODE
C6520	ECA1CM100	CAP,E 10UF/16V	D829	MA165	DIODE
C6521	ECA1AM470	CAP,E 47UF/10V	D830	MA4270M	DIODE
C6522	ECJ2VC1H221J	CAP,C 220PF-J-50V	D2301	MA165	DIODE
C6523	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	D2305	MA4110M	DIODE, ZENER
C6524	ECA1HM010	CAP,E 1.0UF/50V	D2306	MA4110M	DIODE, ZENER
C6525	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D2307	MA4110M	DIODE, ZENER
C6526	ECA1CM100	CAP,E 10UF/16V	D2308	MA4110M	DIODE, ZENER
C6527	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	D2315	MA165	DIODE
C6528	ECA1AM470	CAP,E 47UF/10V	D2342	MA165	DIODE
C6529	ECA1CM100	CAP,E 10UF/16V	D2343	MA165	DIODE
C6531	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D3001	MA4110M	DIODE, ZENER
C6532	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	D3002	MA4110M	DIODE, ZENER
DIODES			D3003	MA4110M	DIODE, ZENER
D001	ERA15-01	DIODE	D3004	MA4110M	DIODE, ZENER
D002	MA165	DIODE	D3005	MA4110M	DIODE, ZENER
D003	MA4056M	DIODE	D3006	MA4110M	DIODE, ZENER
D006	MA4330H	DIODE	D3007	MA4110M	DIODE, ZENER
D007	ERA15-01	DIODE	D3008	MA4110M	DIODE, ZENER
D008	ERA15-01	DIODE	D3009	MA4110M	DIODE, ZENER
D009	ERA15-01	DIODE	D3010	MA4110M	DIODE, ZENER
D011	MA165	DIODE	D3015	MA4110M	DIODE, ZENER
D014	MA165	DIODE	D3016	MA4110M	DIODE, ZENER
D015	MA165	DIODE	D3017	MA4110M	DIODE, ZENER
D018	MA165	DIODE	D3018	MA4110M	DIODE, ZENER
D451	ERA15-01	DIODE	D3019	MA4110M	DIODE, ZENER
D502	MA4062L	DIODE	D3020	MA4110M	DIODE, ZENER
D530	MA4082L	DIODE	D3021	MA4110M	DIODE, ZENER
D531	AS01	DIODE	D3022	MA4110M	DIODE, ZENER
D532	MA4091M	DIODE, ZENER	FUSES		
D533	MA4091M	DIODE, ZENER	F801	XBA2A00101	FUSE 6.3A 125V
D551	TVSRU2N	DIODE	F801-1	TP00351-51	FUSE CLIP
D554	BYD33G-163	DIODE	F801-2	TP00351-51	FUSE CLIP
D555	MA165	DIODE	INTEGRATED CIRCUITS		
D556	MA4360H	DIODE, ZENER	IC001	MN101C46FTB	INT CKT
D557	TVSRU2N	DIODE	IC002	M24C08-WBN6	INT CKT
D558	RS3FS	DIODE	IC003	PIC-26042SR	INT CKT
D559	BYD33G-113	DIODE	IC005	PQ1R33	INT CKT
D561	BYD33G-163	DIODE	IC006	PST9229NR	INT CKT (RESET)
D801	GP15KL-042	DIODE	IC101	TA1310BN	INT CKT
D802	GP15KL-042	DIODE	IC451	LA7845N	INT CKT

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
IC551	AN78M09	PLUS 9V AVR	Q351	2SC3063	TRANSISTOR
IC552	AN7805	INT CKT	Q352	2SC3063	TRANSISTOR
IC801	PC817X2	INT CKT	Q353	2SC3063	TRANSISTOR
IC803	STR58041A	INT CKT	Q401	2SD601ARTX	TRANSISTOR
IC2201	AN5849S-E1V	INT CKT	Q402	2SD601ARTX	TRANSISTOR
IC2302	AN5272	INT CKT	Q501	2SC4212H	TRANSISTOR
IC2351	CXA2021S	INT CKT	Q509	2SD601ARTX	TRANSISTOR
IC3001	M52790SP	INT CKT A/V SWITCH	Q515	2SD601ARTX	TRANSISTOR
IC6501	MN82840	INT CKT	Q551	2SD2539MA1	TRANSISTOR
IC6502	PST9142NR	INT CKT	Q603	2SD601ARTX	TRANSISTOR
COILS			Q801	2SC1685RSTA	TRANSISTOR
L001	EXCELSA35	FERRITE BEAD	Q802	2SC1384RS	TRANSISTOR
L002	TLTABT2R2K	COIL, PEAKING 2.2UH	Q2302	2SB709ARTX	TRANSISTOR
L003	TLTABT2R2K	COIL, PEAKING 2.2UH	Q2303	2SD601ARTX	TRANSISTOR
L004	TLTABT2R2K	COIL, PEAKING 2.2UH	Q2342	2SB709ARTX	TRANSISTOR
L005	ELESN330KA	COIL, PEAKING 33UH	Q2343	2SD601ARTX	TRANSISTOR
L006	EXCELSA24T	FERRITE BEAD	Q2344	2SD601ARTX	TRANSISTOR
L008	TLTABT470K	COIL, PEAKING 47UH	Q2409	2SD601ARTX	TRANSISTOR
L010	TLTABT2R2K	COIL, PEAKING 2.2UH	Q2410	2SD601ARTX	TRANSISTOR
L011	TLTABT2R2K	COIL, PEAKING 2.2UH	Q6501	2SD601ARTX	TRANSISTOR
L012	TLTABT2R2K	COIL, PEAKING 2.2UH	Q6502	2SD601ARTX	TRANSISTOR
L013	TLTABT2R2K	COIL, PEAKING 2.2UH	Q6504	2SD601ARTX	TRANSISTOR
L106	EXCELSA35T	FERRITE BEAD	Q6505	2SD601ARTX	TRANSISTOR
L218	EXCELSA35T	FERRITE BEAD	Q6506	2SD601ARTX	TRANSISTOR
L319	TLTABT101K	COIL, PEAKING	Q6509	2SD601ARTX	TRANSISTOR
L351	TLTABT101K	COIL, PEAKING	Q6510	2SB709ARTX	TRANSISTOR
L501	ELESN3R3KA	COIL, PEAKING 3.3UH	Q6514	2SB709ARTX	TRANSISTOR
L515	TLTABT101K	COIL, PEAKING	Q6516	2SB709ARTX	TRANSISTOR
L518	TLTABT120K	COIL, PEAKING 12UH	Q6517	2SD601ARTX	TRANSISTOR
L541	EXCELDR35	FERRITE BEAD	Q6519	2SD601ARTX	TRANSISTOR
L551	ELH5L7103	COIL	RELAYS		
L554	EXCELSA24T	FERRITE BEAD	RL801	TSEH8007	RELAY
L555	EXCELSA24T	FERRITE BEAD	RESISTORS		
L556	EXCELSA24T	FERRITE BEAD	R002	ERJ6GEYJ182	RES,M 1.8K-J-1/10
L801	ELF20N020A	COIL, 2UH	R003	ERJ6GEYJ562	RES,M 5.6K-J-1/10
L803	ELF17N007A	LINE FILTER	R004	ERDS1TJ122	RES,C 1.2K-J-1/2
L804	EXCELSA39	FERRITE BEAD	R005	ERDS2TJ101	RES,C 100-J-1/4
L2310	TLTABT2R2K	COIL, PEAKING 2.2UH	R006	ERDS1TJ181	RES,C 180-J-1/2
L6502	ELESN330JA	COIL, PEAKING 33UH	R007	ERJ6GEYJ103	RES,M 10K-J-1/10
L6505	ELESN330JA	COIL, PEAKING 33UH	R008	ERJ6GEYJ103	RES,M 10K-J-1/10
L6507	ELESN150KA	COIL, PEAKING 15UH	R009	ERJ6GEYJ221	RES,M 220-J-1/10
L6508	EXCELSA35T	FERRITE BEAD	R010	ERJ6GEYJ103	RES,M 10K-J-1/10
TRANSISTORS			R012	ERJ6GEYJ102	RES,M 1K-J-1/10
Q001	2SD601ARTX	TRANSISTOR	R013	ERJ6GEYJ223	RES,M 22K-J-1/10
Q002	2SC1685QRS	TRANSISTOR	R014	ERJ6GEYJ472	RES,M 4.7K-J-1/10
Q003	2SD601ARTX	TRANSISTOR	R015	ERJ6GEYJ472	RES,M 4.7K-J-1/10
Q004	2SC1685QRS	TRANSISTOR	R016	ERJ6GEYJ472	RES,M 4.7K-J-1/10
Q005	2SD601ARTX	TRANSISTOR	R017	ERJ6GEYJ472	RES,M 4.7K-J-1/10
Q201	2SD601ARTX	TRANSISTOR	R020	ERJ6GEYJ682	RES,M 6.8K-J-1/10
Q302	2SD601ARTX	TRANSISTOR	R021	ERJ6GEYJ101	RES,M 100-J-1/10
Q303	2SD601ARTX	TRANSISTOR	R022	ERJ6GEYJ101	RES,M 100-J-1/10

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
R023	ERJ6GEYJ102	RES,M 1K-J-1/10	R352	ERG2FJ123H	RES,M 12K-J-2W
R024	ERJ6GEYJ221	RES,M 220-J-1/10	R353	ERG2FJ123H	RES,M 12K-J-2W
R025	ERJ6GEYJ223	RES,M 22K-J-1/10	R354	ERDS1TJ272	RES,C 2.7K-J-1/2
R027	ERJ6GEYJ103	RES,M 10K-J-1/10	R355	ERDS1TJ272	RES,C 2.7K-J-1/2
R028	ERJ6GEYJ223	RES,M 22K-J-1/10	R356	ERDS1TJ272	RES,C 2.7K-J-1/2
R030	ERJ6GEYJ102	RES,M 1K-J-1/10	R357	ERDS2TJ181	RES,C 180-J-1/4
R032	ERJ6ENF1002	RES,M 10K-F-1/10	R358	ERDS2TJ181	RES,C 180-J-1/4
R033	ERJ6GEYJ272	RES,M 2.7K-J-1/10	R359	ERDS2TJ181	RES,C 180-J-1/4
R034	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R360	ERDS2TJ821	RES,C 820-J-1/4
R035	ERJ6GEYJ362	RES,M 3.6K-J-1/10	R361	ERDS2TJ821	RES,C 820-J-1/4
R036	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R362	ERDS2TJ821	RES,C 820-J-1/4
R037	ERJ6GEYJ103	RES,M 10K-J-1/10	R363	ERDS2TJ101	RES,C 100-J-1/4
R038	ERJ6GEYJ223	RES,M 22K-J-1/10	R364	ERDS2TJ101	RES,C 100-J-1/4
R039	ERJ6GEYJ102	RES,M 1K-J-1/10	R365	ERDS2TJ101	RES,C 100-J-1/4
R040	ERJ6GEYJ472	RES,M 4.7K-J-1/10	R401	ERJ6GEYJ102	RES,M 1K-J-1/10
R041	ERJ6GEYJ472	RES,M 4.7K-J-1/10	R402	ERJ6GEYJ471	RES,M 470-J-1/10
R042	ERJ6GEYJ102	RES,M 1K-J-1/10	R403	ERJ6GEYJ622	RES,M 6.2K-J-1/10
R044	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R405	ERJ6GEYJ102	RES,M 1K-J-1/10
R045	ERJ6GEYJ223	RES,M 22K-J-1/10	R408	ERJ6GEYJ331	RES,M 330-J-1/10
R046	ERJ6GEYJ333	RES,M 33K-J-1/10	R409	ERJ6GEYJ271	RES,M 270-J-1/10
R047	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R410	ERJ6ENF1272	RES,M 12.7K-F-1/10W
R049	ERJ6GEYJ101	RES,M 100-J-1/10	R411	ERJ6ENF6801	RES,M 6.8K-F-1/10
R060	ERJ6GEYJ471	RES,M 470-J-1/10	R412	ERDS2TJ123	RES,C 12K-J-1/4
R065	ERJ6GEYJ101	RES,M 100-J-1/10	R452	ERDS1FJ1R8	RES,C 1.8-J-1/2
R066	ERJ6GEYJ103	RES,M 10K-J-1/10	R453	ERJ6GEYJ123	RES,M 12K-J-1/10
R067	ERJ6GEYJ103	RES,M 10K-J-1/10	R454	ERJ6GEYJ473	RES,M 47K-J-1/10
R068	ERJ6GEYJ103	RES,M 10K-J-1/10	R455	ERJ6GEYJ103	RES,M 10K-J-1/10
R072	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R456	ERG3FJ151H	RES,M 150-J-3W
R073	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R457	ERDS1FJ1R5	RES,C 1.5-J-1/2
R074	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R458	ERDS1FJ2R7	RES,C 2.7-J-1/2
R075	ERJ6GEYJ102	RES,M 1K-J-1/10	R460	ERJ6GEYJ103	RES,M 10K-J-1/10
R076	ERJ6GEYJ102	RES,M 1K-J-1/10	R461	ERJ6GEYJ223	RES,M 22K-J-1/10
R077	ERJ6GEYJ102	RES,M 1K-J-1/10	R465	ERJ6GEYJ104	RES,M 100K-J-1/10
R078	ERJ6GEYJ101	RES,M 100-J-1/10	R468	ER0S2CKF4321	RES,M 4.32K-F-1/4
R079	ERJ6GEYJ101	RES,M 100-J-1/10	R469	ER0S2CKF1471	RES,M 1.47K-F-1/4
R201	ERJ6GEYJ331	RES,M 330-J-1/10	R470	ERDS2TJ102	RES,C 1K-J-1/4
R223	ERJ6GEYJ561	RES,M 560-J-1/10	R501	ERJ6GEYJ301	RES,M 300-J-1/10
R225	ERJ6GEYJ331	RES,M 330-J-1/10	R502	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R226	ERJ6GEYJ331	RES,M 330-J-1/10	R504	ERJ6GEYJ333	RES,M 33K-J-1/10
R245	ERJ6GEYJ224	RES,M 220K-J-1/10	R505	ERDS1TJ181	RES,C 180-J-1/2
R301	ERJ6GEYJ331	RES,M 330-J-1/10	R506	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R302	ERJ6GEYJ331	RES,M 330-J-1/10	R507	ERJ6GEYJ561	RES,M 560-J-1/10
R303	ERJ6GEYJ331	RES,M 330-J-1/10	R508	ERJ6GEYJ471	RES,M 470-J-1/10
R305	ERJ6GEYJ682	RES,M 6.8K-J-1/10	R509	ERJ6GEYJ221	RES,M 220-J-1/10
R306	ERJ6GEYJ103	RES,M 10K-J-1/10	R510	ERG3FJ362H	RES,M 3.6K-J-3W
R309	ERJ6GEYJ332	RES,M 3.3K-J-1/10	R511	ERG3FJ362H	RES,M 3.6K-J-3W
R310	ERJ6GEYJ332	RES,M 3.3K-J-1/10	R512	ERG2FJ392H	RES,M 3.9K-J-2W
R312	ERJ6GEYJ393	RES,M 39K-J-1/10	R513	ERJ6GEYJ471	RES,M 470-J-1/10
R328	ERJ6GEYJ105	RES,M 1.0MEG-J-1/10	R514	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R341	ERJ6GEYJ474	RES,M 470K-J-1/10	R515	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R351	ERG2FJ123H	RES,M 12K-J-2W	R516	ERJ6GEYJ272	RES,M 2.7K-J-1/10

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
R517	ERJ6GEYJ181	RES,M 180-J-1/10	R2308	ERJ6GEYJ221	RES,M 220-J-1/10
R531	ERD25FJ470	RES,C 47-J-1/4	R2311	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R532	ERJ6ENF5602	RES,M 56K-F-1/10	R2312	ERJ6GEYJ752	RES,M 7.5K-J-1/10
R533	ERJ6ENF2102	RES,M 21K-F-1/10	R2313	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R550	ERDS1FJ1R0	RES,C 1.0-J-1/2	R2318	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R551	ERDS1FJ1R0	RES,C 1.0-J-1/2	R2319	ERJ6GEYJ223	RES,M 22K-J-1/10
R552	ERDS1FJ1R0	RES,C 1.0-J-1/2	R2321	ERDS2TJ181	RES,C 180-J-1/4
R553	ERG3FJ270H	RES,M 27-J-3W	R2322	ERDS2TJ181	RES,C 180-J-1/4
R556	ERJ6GEYJ272	RES,M 2.7K-J-1/10	R2323	ERJ6GEYJ822	RES,M 8.2K-J-1/10
R557	ERJ6GEYJ103	RES,M 10K-J-1/10	R2325	ERJ6GEYJ103	RES,M 10K-J-1/10
R558	ERQ1CKPR22	RES,F .22-K-1W	R2329	ERJ6GEYJ751	RES,M 750-J-1/10
R559	ERG2FJ683H	RES,M 12K-J-2W	R2330	ERJ6GEYJ183	RES,M 18K-J-1/10
R560	TLTABT101K	COIL, PEAKING	R2332	ERJ6GEYJ751	RES,M 750-J-1/10
R561	ERG2FJ102H	RES,M 1K-J-2W	R2333	ERJ6GEYJ183	RES,M 18K-J-1/10
R563	ERDS2TJ683	RES,C 68K-J-1/4	R2334	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R564	ERDS2TJ823	RES,C 82K-J-1/4	R2336	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R566	ERDS1FJ1R0	RES,C 1.0-J-1/2	R2337	ERJ6GEYJ221	RES,M 220-J-1/10
R574	ERG2FJ270H	RES,M 27-J-2W	R2338	ERJ6GEYJ103	RES,M 10K-J-1/10
R601	ERJ6GEYJ391	RES,M 390-J-1/10	R2339	ERJ6GEYJ221	RES,M 220-J-1/10
R618	ERJ6GEYJ474	RES,M 470K-J-1/10	R2340	ERJ6GEYJ223	RES,M 22K-J-1/10
R619	ERJ6GEYJ563	RES,M 56K-J-1/10	R2341	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R620	ERJ6GEYJ153	RES,M 15K-J-1/10	R2342	ERJ6GEYJ223	RES,M 22K-J-1/10
R801	ERF7ZK1R5	RES,W 1.5-K-7W	R2343	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R804	ERW12PK1R8	RES,W 1.8-K-1/2W	R2344	ERJ6GEYJ471	RES,M 470-J-1/10
R805	ERDS2TJ274	RES,C 270K-J-1/4	R2345	ERJ6GEYJ223	RES,M 22K-J-1/10
R806	ERDS2TJ274	RES,C 270K-J-1/4	R2346	ERJ6GEYJ471	RES,M 470-J-1/10
R808	ERDS1FJ1R0	RES,C 1.0-J-1/2	R2350	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R809	ERDS1FJ1R0	RES,C 1.0-J-1/2	R2351	ERJ6GEYJ105	RES,M 1.0MEG-J-1/10
R810	ERDS1FJ272	RES,C 2.7K-J-1/2	R2352	ERJ6GEYJ105	RES,M 1.0MEG-J-1/10
R812	ERDS1TJ183	RES,C 18K-J-1/2	R2353	ERJ6GEYJ101	RES,M 100-J-1/10
R813	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R2355	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R815	ERC12ZGM825	RES,S 8.2MEG-M-1/2	R2366	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R818	ERQ12HJR56	RES,F .56-J-1/2	R2367	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R820	ERJ6GEYJ273	RES,M 27K-J-1/10	R2418	ERJ6GEYJ471	RES,M 470-J-1/10
R821	ERJ6GEYJ392	RES,M 3.9K-J-1/10	R2419	ERJ6GEYJ471	RES,M 470-J-1/10
R822	ERD50FJ474	RES,C 470K-J-1/2W	R3001	ERJ6GEYJ101	RES,M 100-J-1/10
R823	ERDS2TJ222	RES,C 2.2K-J-1/4	R3003	ERJ6GEYJ102	RES,M 1K-J-1/10
R824	ERG3FJ390H	RES,M 39-J-3W	R3004	ERJ6GEYJ102	RES,M 1K-J-1/10
R825	ERDS2TJ102	RES,C 1K-J-1/4	R3005	ERJ6GEYJ330	RES,M 33-J-1/10
R826	ERF2AKR22	RES,W .22-K-2W	R3006	ERJ6GEYJ750	RES,M 75-J-1/10
R827	ERDS1FJ561	RES,C 560-J-1/2	R3007	ERJ6GEYJ750	RES,M 75-J-1/10
R828	ERG3FJ470	RES,M 47-J-3W	R3008	ERJ6GEYJ750	RES,M 75-J-1/10
R829	ERQ14AJ6R8	RES,F 6.8-J-1/4	R3009	ERJ6GEYJ750	RES,M 75-J-1/10
R2203	ERJ6GEYJ751	RES,M 750-J-1/10	R3010	ERJ6GEYJ750	RES,M 75-J-1/10
R2206	ERJ6GEYJ102	RES,M 1K-J-1/10	R3011	ERJ6GEYJ750	RES,M 75-J-1/10
R2207	ERJ6GEYJ102	RES,M 1K-J-1/10	R3012	ERJ6GEYJ750	RES,M 75-J-1/10
R2221	ERJ6GEYJ101	RES,M 100-J-1/10	R3013	ERDS2TJ331	RES,C 330-J-1/4
R2301	ERQ2CJP1R0	RES,F 1.0-J-2W	R3014	ERJ6GEYJ330	RES,M 33-J-1/10
R2305	ERD25FJ180	RES,C 18-J-1/4	R3015	ERDS2TJ102	RES,C 1K-J-1/4
R2306	ERD25FJ180	RES,C 18-J-1/4	R3016	ERJ6GEYJ102	RES,M 1K-J-1/10
R2307	ERJ6GEYJ221	RES,M 220-J-1/10	R3017	ERJ6GEYJ330	RES,M 33-J-1/10

REPLACEMENT PARTS LIST

Models: 27GX01B-501 & 27GX01B-511

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REF NO.	PART NO.	DESCRIPTION
R3018	ERJ6GEYJ102	RES,M 1K-J-1/10
R3019	ERDS2TJ102	RES,C 1K-J-1/4
R3020	ERJ6GEYJ330	RES,M 33-J-1/10
R6501	ERJ6GEYJ471	RES,M 470-J-1/10
R6502	ERJ6GEYJ471	RES,M 470-J-1/10
R6503	ERJ6GEYJ471	RES,M 470-J-1/10
R6505	ERJ6GEYJ471	RES,M 470-J-1/10
R6509	ERJ6GEYJ471	RES,M 470-J-1/10
R6510	ERJ6GEYJ102	RES,M 1K-J-1/10
R6511	ERJ6GEYJ123	RES,M 12K-J-1/10
R6512	ERJ6GEYJ102	RES,M 1K-J-1/10
R6513	ERJ6GEYJ152	RES,M 1.5K-J-1/10
R6515	ERJ6GEYJ102	RES,M 1K-J-1/10
R6516	ERJ6GEYJ103	RES,M 10K-J-1/10
R6518	ERJ6GEYJ333	RES,M 33K-J-1/10
R6519	ERJ6GEYJ333	RES,M 33K-J-1/10
R6520	ERJ6GEYJ102	RES,M 1K-J-1/10
R6522	ERJ6GEYJ102	RES,M 1K-J-1/10
R6523	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R6524	ERJ6GEYJ471	RES,M 470-J-1/10
R6526	ERJ6GEYJ102	RES,M 1K-J-1/10
R6535	ERJ6GEYJ181	RES,M 180-J-1/10
R6537	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R6538	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R6540	ERJ6GEYJ151	RES,M 150-J-1/10
R6542	ERJ6GEYJ680	RES,M 68-J-1/10
R6543	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R6544	ERJ6GEYJ102	RES,M 1K-J-1/10
R6545	ERJ6GEYJ221	RES,M 220-J-1/10
R6548	ERJ6GEYJ471	RES,M 470-J-1/10
R6549	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R6553	ERJ6GEYJ101	RES,M 100-J-1/10
R6554	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R6555	ERJ6GEYJ153	RES,M 15K-J-1/10
R6556	ERJ6GEYJ333	RES,M 33K-J-1/10
R6557	ERJ6GEYJ123	RES,M 12K-J-1/10
R6558	ERJ6GEYJ103	RES,M 10K-J-1/10
R6559	ERJ6GEYJ272	RES,M 2.7K-J-1/10
R6560	ERJ6GEYJ124	RES,M 120K-J-1/10
R6565	ERJ6GEYJ102	RES,M 1K-J-1/10
R6566	ERJ6GEYJ681	RES,M 680-J-1/10
R6567	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R6568	ERJ6GEYJ471	RES,M 470-J-1/10
SWITCHES		
S001	TSE2AD001	SWITCH
S002	TSE2AD001	SWITCH

REF NO.	PART NO.	DESCRIPTION
S003	TSE2AD001	SWITCH
S004	TSE2AD001	SWITCH
S005	TSE2AD001	SWITCH
S008	TSE2AD001	SWITCH
S009	TSE2AD001	SWITCH
TRANSFORMERS		
T001	TLP16297	TRANSFORMER, POWER SUPPLY
T501	TLH15452	TRANSFORMER, HORIZONTAL DRIVER
T502	ETE19Z30AY	TRANSFORMER, HORIZONTAL COUPLING
T551	TLF2AA002	TRANSFORMER, FLYBACK
T801	ETS29AK3L5NC	TRANSFORMER, SWITCHING
CRYSTALS/FILTERS		
X001	TSSA092	CRYSTAL OSCILLATOR
X501	TSS2AA001	CRYSTAL, 3.58MHZ
X601	TAFC5B503F30	CRYSTAL
OTHERS		
M001	ETC33X82NA	YOKE, CONVERGENCE
TNR001	ENG36604G	TUNER
M002	HL00761	TRANSMITTER, REMOTE CTRL
M003	H462271	WARRANTY CARD 27GX01B-501
M004	H462472	WARRANTY CARD 27GX01B-511
M005	M68LGL061X	CRT 27"
M006	TAS2AA0015	SPEAKER, 16 OHM/1.5W
M007	TBM2AA0031	BADGE, HITACHI
M008	TJS2AC00301	CRT SOCKET
M009	TKX2AA00401	GUIDE, IR
DY	TLY2AA006	DEFLECTION YOKE
M010	TMM2A30702	WEDGE, YOKE
M011	TQB2AA0334	MANUAL, OWNERS 27GX01B-501
M012	TQB2AA0335	MANUAL, OWNERS 27GX01B-511
M013	TQB2AA7077	V-CHIP HITACHI NA8
M014	TSX2AA0111	AC LINE CORD
M015	TXFBX05BSER	ASSY, 7-KEY BUTTON
M016	TXFKU43BSER	ASSY, CABINET BACK
M017	TXFKU44BSER	ASSY, CABINET BACK
M018	TXFKY21BSER	ASSY, CABINET FRONT
M019	TXF3A01ZER	ASSY. DAG GROUND
M020	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP
DEG	0LK19045A	COIL, DEGAUSSING 27"
M0021	2784243	BATTERY
JK3001	TJB2AA0221	TERMINAL, A/V 8P
JK3002	TJB2AA0045	TERMINAL, FRONT A/V
JK3003	TJB2AA0171	TERMINAL, A/V
JK3004	TJB2AA0211	TERMINAL, A/V 2P

DESCRIPTION OF ABBREVIATIONS GUIDE

RESISTOR			
TYPE		TOLERANCE	
C	Carbon	F	+/- 1%
F	Fuse	J	+/- 5%
M	Metal Oxide	K	+/- 10%
S	Solid	M	+/- 20%
W	Wire Wound	G	+/- 2%

RES, C 270-J-1/4

CAPACITOR			
TYPE		TOLERANCE	
C	Ceramic	C	+/- 0.25pF
E	Electrolytic	D	+/- 0.5pF
P	Polyester	F	+/- 1pF
S	Styrol	J	+/- 5%
T	Tantalum	K	+/- 10%
		L	+/- 15%
		M	+/- 20%
		P	+10% -0%
		Z	+80% -20%

CAP, P .068UF-K-50V

HITACHI

A

B

C

D

E

F

G

H

A-Board Schematic (Left Portion)

TNP2AH017AD A

JK3002
TJB2AA0045

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Sheet 1 of 2
Side AA-Board Schematic
(Left Portion)

CT-27GX01B-501 & CT-27GX01B-511

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Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive

Voltage Measurements

- 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/Video CABLE. (Set-Up Menu) in TV/Video Mode
 - Volume - Min
 - TV/Video SW - TV position
 - Audio Mode - Stereo

Voltage readings are nominal and may vary $\pm 10\%$ on active devices. Some voltage strength will vary with signal strength and picture content.

Supply voltages are nominal.

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.

Schematic Notes

- Resistors are carbon 1/4W unless noted otherwise.
- Capacitors are ceramic 50V unless noted otherwise.
- Coil value notes is inductance in μ H.
- Test point indicated by \uparrow . Test point but no pin \uparrow .
- Components indicated with Δ are critical parts and replacement should be made with manufacturer specified replacement parts only.
- BOLD LINE** indicates the route of B+ supply.
- The schematic diagrams are current at the time of printing and are subject to change without notice.
- Ground symbol \downarrow indicates **HOT GROUND CONNECTION**; \downarrow indicates **COLD GROUND**.

NOTE: All other component symbols are used for engineering design purposes.

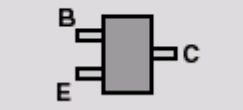
Waveform Measurements

- Indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
- 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).
- Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
- 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.

- 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.

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 DESIGNATIONOverlapping Section
See Sheet 2 Side A for Right Portion of Schematic

A

B

C

D

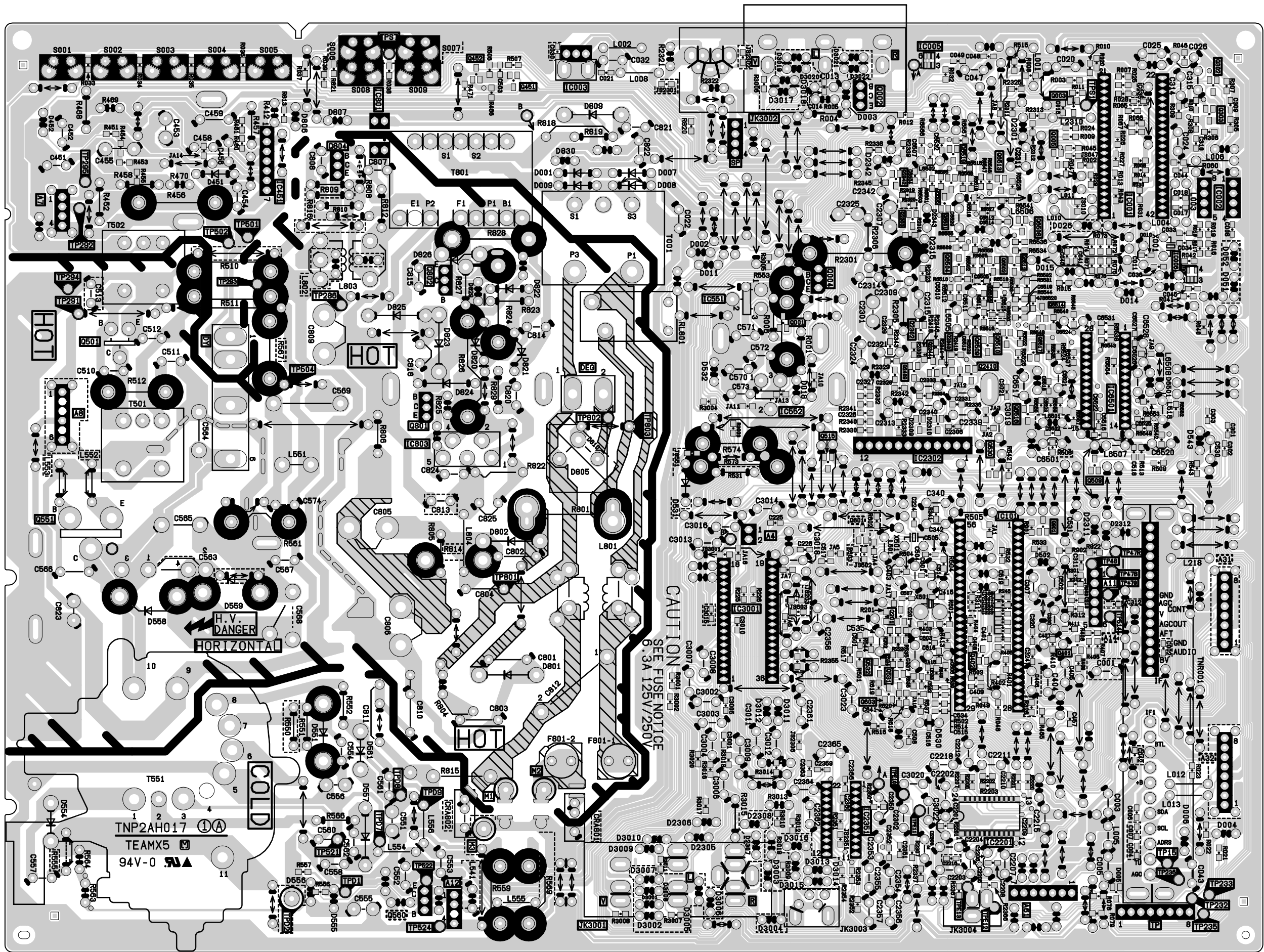
E

F

G

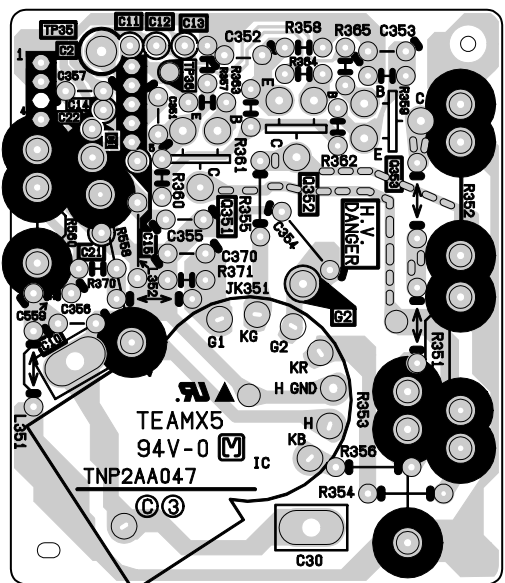
H

A-Board Layout - TNP2AH017

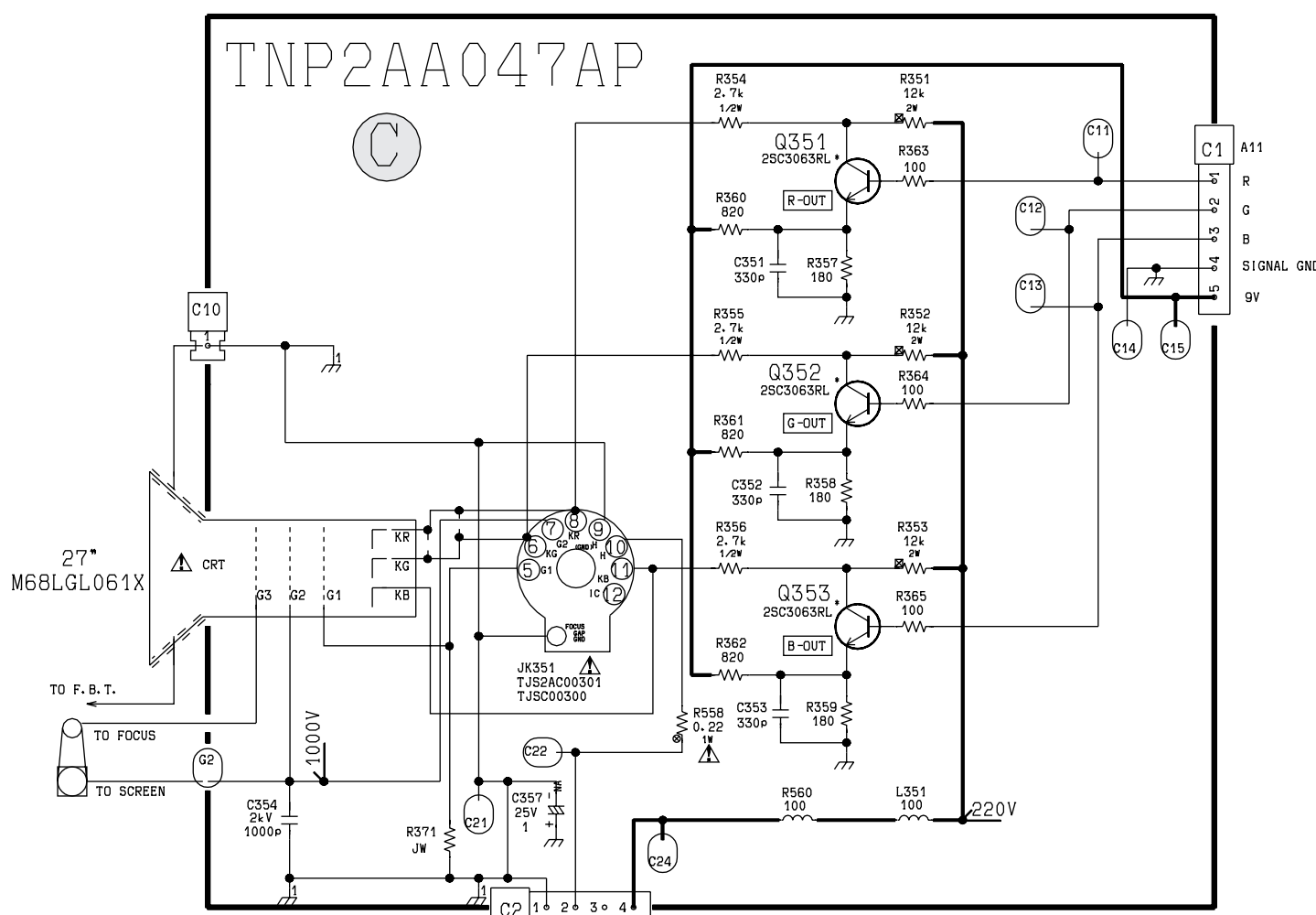


Note:
The board layouts have been modified to enhance and display traces otherwise hidden by a mask.

C-Board Layout - TNP2AA047

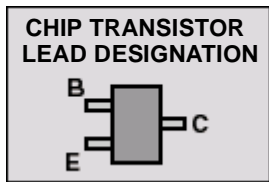


C-Board Schematic



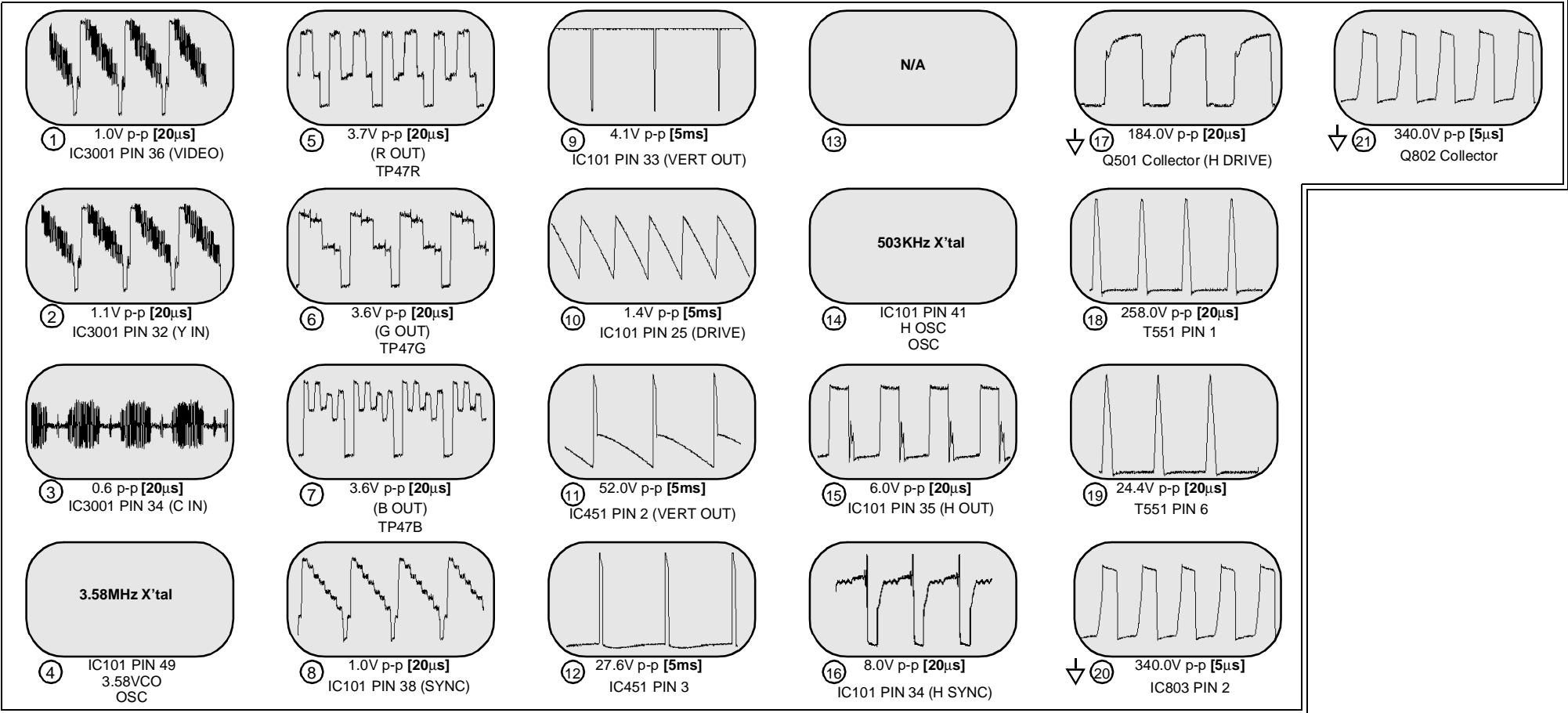
C-Board Voltage Measurements
(Transistors)

	Q351	Q352	Q353
IC B	2.41	2.37	2.41
IC C	164.50	169.50	164.50
IC D	2.25	2.19	2.24



Note:
Voltages were obtained
using a digital multimeter.

Waveforms - A-Board



Boards Designation

- A-Board - Main Chassis
- C-Board - CRT Drive

Waveform Measurements

- Indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
- 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.)
- Customer Controls (Picture/Audio Menu) are set to Normalize. Volume - Min
- 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.
- Ground symbol ∇ 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.

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Voltage Measurements

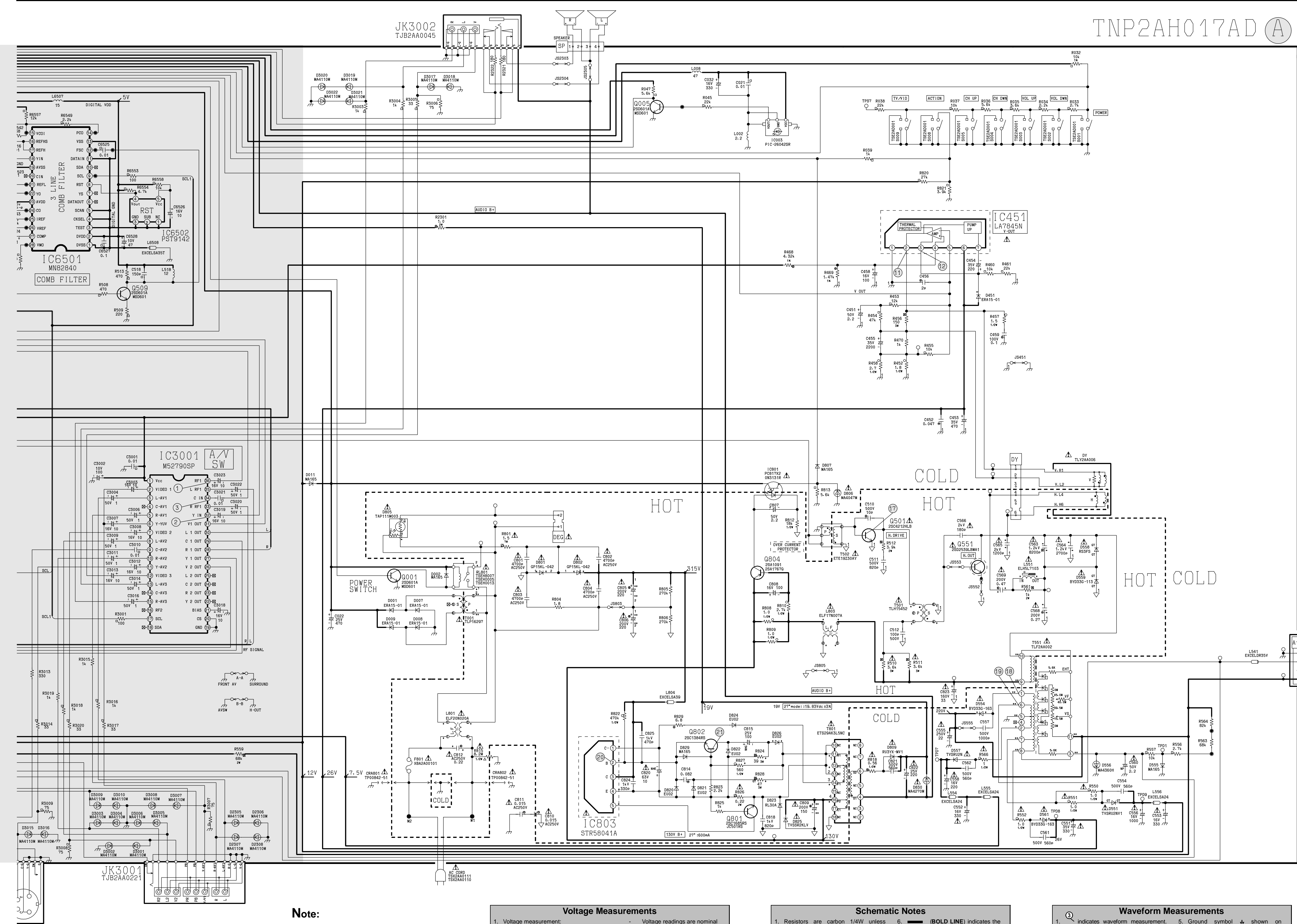
- Voltage measurement:
 - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
 - All Picture and Audio adjustments are set to Normalize. TV ANT/CABLE - (Set-Up Menu)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

Schematic Notes

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

A B C D E F G H

A-Board Schematic (Right Portion)



A-Board Voltage Measurements
(ICs and Transistors)

IC001					IC002				
1	0.00	22	2.06	1	GND	2	4.70	23	2.41
2	4.70	23	2.41	3	GND	3	4.62	24	1.36
4	1.80	25	1.34	4	GND	4	1.80	25	1.34
5	n.c	26	2.40	5	n.c	5	n.c	26	2.40
6	3.27	27	2.89	6	3.85	6	3.27	27	2.89
7	1.66	28	GND	7	GND	7	1.66	28	GND
8	3.27	29	0.07	8	3.27	8	3.27	29	0.07
9	0.00	30	0.10	9	0.00	9	0.00	30	0.10
10	3.27	31	0.10	10	3.27	10	3.27	31	0.10
11	0.00	32	0.11	11	0.00	11	0.00	32	0.11
12	3.27	33	0.06	12	3.27	12	3.27	33	0.06
13	1.00	34	3.27	13	1.00	13	1.00	34	3.27
14	0.10	35	3.68	14	0.10	14	0.10	35	3.68
15	0.10	36	n.c	15	0.10	15	0.10	36	n.c
16	n.c	37	3.90	16	n.c	16	n.c	37	3.90
17	0.07	38	3.90	17	0.07	17	0.07	38	3.90
18	3.18	39	3.27	18	3.18	18	3.18	39	3.27
19	0.08	40	1.67	19	0.08	19	0.08	40	1.67
20	3.27	41	1.68	20	3.27	20	3.27	41	1.68
21	1.54	42	GND	21	1.54	21	1.54	42	GND

IC101					IC451				
1	n.c	29	3.86	1	GND	2	10.33	3	22.34
2	GND	30	n.c	2	GND	3	22.34	4	2.27
3	3.38	31	GND	3	n.c	4	2.27	5	2.26
4	3.36	32	3.93	4	2.27	5	2.26	6	2.68
5	3.36	33	1.04	5	2.26	6	2.68	7	2.57
6	0.00	34	1.04	6	2.68	7	2.57	8	2.57
7	6.16	35	n.c	7	2.57	8	2.57	9	2.57
8	5.20	36	n.c	8	2.57	9	2.57	10	2.57
9	5.22	37	9.58	9	2.57	10	2.57	11	2.57
10	GND	38	3.10	10	2.57	11	2.57	12	2.57
11	5.79	39	6.84	11	2.57	12	2.57	13	2.57
12	n.c	40	8.13	12	2.57	13	2.57	14	2.57
13	2.42	41	6.86	13	2.57	14	2.57	15	2.57
14	2.40	42	4.85	14	2.57	15	2.57	16	2.57
15	2.39	43	1.15	15	2.57	16	2.57	17	2.57
16	8.92	44	GND	16	2.57	17	2.57	18	2.57
17	4.81	45	1.17	17	2.57	18	2.57	19	2.57
18	4.66	46	1.42	18	2.57	19	2.57	20	2.57
19	4.57	47	n.c	19	2.57	20	2.57	21	2.57
20	2.89	48	n.c	20	2.57	21	2.57	22	2.57
21	n.c	49	3.63	21	2.57	22	2.57	23	2.57
22	n.c	50	3.29	22	2.57	23	2.57	24	2.57
23	n.c	51	4.86	23	2.57	24	2.57	25	2.57
24	0.63	52	2.95	24	2.57	25	2.57	26	2.57
25	5.20	53	2.98	25	2.57	26	2.57	27	2.57
26	1.97	54	3.72	26	2.57	27	2.57	28	2.57
27	4.36	55	3.06	27	2.57	28	2.57	29	2.57
28	6.08	56	n.c	28	2.57	29	2.57	30	2.57

IC3001					IC2201				
1	8.92	19	GND	1	n.c	2	n.c	3	n.c
2	3.91	20	GND	2	n.c	3	n.c	4	2.32
3	4.63	21	4.15	3	n.c	4	2.32	5	2.18
4	n.c	22	n.c	4	2.32	5	2.18	6	0.28
5	4.63	23	n.c	5	2.18	6	0.28	7	4.85
6	3.58	24	n.c	6	0.28	7	4.85	8	2.40
7	3.59	25	n.c	7	4.85	8	2.40	9	0.39
8	4.64	26	3.38	8	2.40	9	0.39	10	2.25
9	4.64	27	3.36	9	0.39	10	2.25	11	3.22
10	4.63	28	4.01	10	2.25	11	3.22	12	3.24
11	3.58	29	4.02	11	3.22	12	3.24	13	2.18
12	3.58	30	4.01	12	3.24	13	2.18	14	3.28
13	4.64	31	3.77	13	2.18	14	3.28	15	3.41
14	n.c	32	4.00	14	3.28	15	3.41	16	3.98
15	4.63	33	4.63	15	3.41	16	3.98	17	4.00
16	n.c	34	4.64	16	3.98	17	4.00	18	n.c
17	4.73	35	4.63	17	4.00	18	n.c	19	4.00
18	n.c	36	3.98	18	n.c	19	4.00	20	n.c

IC2302					IC801				
1	6.03	2	6.73	3	0.10	1	0.62	2	0.00
4	6.05	5	6.74	6	18.31	3	0.00	4	0.00
7	10.99	8	11.24	9	154.76	5	12.27	6	12.27
10	21.28	11	11.35	12	150.14	7	154.76	8	150.14
13	11.35	14	11.11	15	152.77	9	150.14	10	152.77

IC003					IC2351				
1	4.40	2	GND	3	4.44	1	4.40	2	GND
4	4.44	5	4.40	6	4.41	3	4.44	4	4.43
7	4.50	8	5.50	9	4.41	5	4.43	6	4.43
10	1.46	11	4.73	12	4.77	7	4.43	8	4.43
13	4.77	14	5.47	15	4.45	9	4.43	10	4.43
16	4.45	17	4.41	18	4.41	11	4.43	12	4.43
19	4.44	20	4.44	21	4.44	13	4.43	14	4.43
22	4.44	23	4.44	24	4.44	15	4.43	16	4.43
25	4.44	26	4.44	27	4.44	17	4.43	18	4.43
28	4.44	29	4.44	30	4.44	19	4.43	20	4.43
31	4.44	32	4.44	33	4.44	21	4.43	22	4.43
34	4.44	35	4.44	36	4.44	23	4.43	24	4.43
37	4.44	38	4.44	39	4.44	25	4.43	26	4.43
40	4.44	41	4.44	42	4.44	27	4.43	28	4.43
43	4.44	44	4.44	45	4.44	29	4.43	30	4.43
46	4.44	47	4.44	48	4.44	31	4.43	32	4.43
49	4.44	50	4.44	51	4.44	33	4.43	34	4.43
52	4.44	53	4.44	54	4.44	35	4.43	36	4.43
55	4.44	56	4.44	57	4.44	37	4.43	38	4.43
58	4.44	59	4.44	59	4.44	39	4.43	40	4.43
60	4.44	60	4.44	60	4.44	41	4.43	42	4.43
61	4.44	61	4.44	61	4.44	43	4.43	44	4.43
62	4.44	62	4.44	62	4.44	45	4.43	46	4.43
63	4.44	63	4.44	63	4.44	47	4.43	48	4.43
64	4.44	64	4.44	64	4.44	49	4.43	50	4.43
65	4.44	65	4.44	65	4.44	51	4.43	52	4.43
66	4.44	66	4.44	66	4.44	53	4.43	54	4.43
67	4.44	67	4.44	67	4.44	55	4.43	56	4.43
68	4.44	68	4.44	68	4.44	57	4.43	58	4.43
69	4.44	69	4.44	69	4.44	59	4.43	60	4.43
70	4.44	70	4.44	70	4.44	61	4.43	62	4.43
71	4.44	71	4.44	71	4.44	63	4.43	64	4.43
72	4.44	72	4.44	72	4.44	65	4.43	66	4.43
73	4.44	73	4.44	73	4.44	67	4.43	68	4.43
74	4.44	74	4.44	74	4.44	69	4.43	70	4.43
75	4.44	75	4.44	75	4.44	71	4.43	72	4.43
76	4.44	76	4.44	76	4.44	73	4.43	74	4.43
77	4.44	77	4.44	77	4.44	75	4.43	76	4.43
78	4.44	78	4.44	78	4.44	77	4.43	78	4.43
79	4.44	79	4.44	79	4.44	79	4.43	80	4.43
80	4.44	80	4.44	80	4.44	81	4.43	82	4.43
81	4.44	81	4.44	81	4.44	83	4.43	84	4.43
82	4.44	82	4.44	82	4.44	85	4.43	86	4.43
83	4.44	83	4.44	83	4.44	87	4.43	88	4.43
84	4.44	84	4.44	84	4.44	89	4.43	90	4.43
85	4.44	85	4.44	85	4.44	91	4.43	92	4.43
86	4.44	86	4.44	86	4.44	93	4.43	94	4.43
87	4.44	87	4.44	87	4.44	95	4.43	96	4.43
88	4.44	88	4.44	88	4.44	97	4.43	98	4.43
89	4.44	89	4.44	89	4.44	99	4.43	100	4.43
90	4.44	90	4.44	90	4.44	101	4.43	102	4.43
91	4.44	91	4.44	91	4.44	103	4.43	104	4.43
92	4.44	92	4.44	92	4.44	105	4.43	106	4.43
93	4.44	93	4.44	93	4.44	107	4.43	108	4.43
94	4.44	94	4.44	94	4.44	109	4.43	110	4.43
95	4.44	95	4.44	95	4.44	111	4.43	112	4.43
96	4.44	96	4.44	96	4.44	113	4.43	114	4.43
97	4.44	97	4.44	97	4.44	115	4.43	116	4.43
98	4.44	98	4.44	98	4.44	117	4.43	118	4.43
99	4.44	99	4.44	99	4.44	119	4.43	120	4.43
100	4.44	100	4.44	100	4.44	121	4.43	122	4.43
101	4.44	101	4.44	101	4.44	123	4.43	124	4.43
102	4.44	102	4.44	102	4.44	125	4.43	126	4.43
103	4.44	103	4.44	103	4.44	127	4.43	128	4.43
104	4.44	104	4.44	104	4.44	129	4.43	130	4.43
105	4.44	105	4.44	105	4.44	131	4.43	132	4.43
106	4.44	106	4.44	106	4.44	133	4.43	134	4.43
107	4.44	107	4.44	107	4.44	135	4.43	136	4.43
108	4.44	108	4.44	108	4.44	137	4.43	138	4.43
109	4.44	109	4.44	109	4.44	139	4.43	140	4.43
110	4.44	110	4.44	110	4.44	141	4.43	142	4.43
111	4.44	111	4.44	111	4.44	143	4.43	144	4.43
112	4.44	112	4.44	112	4.44	145	4.43	146	4.43
113	4.44	113	4.44	113	4.44	147	4.43	148	4.43
114	4.44	114	4.44	114	4.44	149	4.43	150	4.43
115	4.44	115	4.44	115	4.44	151	4.43	152	4.43
116	4.44	116	4.44	116					