

TOSHIBA

NTDPJTV06
REV 1297

QUICK REFERENCE GUIDE N5SS CHASSIS

PROJECTION TELEVISION

TW40F80

©1997 TOSHIBA AMERICA CONSUMER PRODUCTS, INC.
NATIONAL SERVICE DIVISION
TRAINING DEPARTMENT
1420-B TOSHIBA DRIVE
LEBANON, TENNESSEE 37087
PHONE: (615) 449-2360
FAX: (615) 444-7520
www.toshiba.com/tacp

Contents

DISASSEMBLY 3

- 1. Front..... 3
- 2. Rear 5

CRT ADJUSTMENTS 6

- 1. Template Instructions 6
- 2. Optical and Electrical Focus..... 6
- 3. Mechanical Tilt 7
- 4. User Convergence 8
- 5. Magnetic Centering 8
- 6. Electrical Centering..... 8
- 7. Green Geometry 9
- 8. Red Convergence 10
- 9. Blue Convergence 11
- 10. White Balance 11
- 11. WID, HIT, & VLIN..... 12

BLOCK DIAGRAMS 13

- 1. System 13
- 2. Power Supply 14
- 3. Video 15
- 4. Audio 16
- 5. Deflection 17

TROUBLESHOOTING FLOW CHARTS 18

- 1. Shut down 18

DISASSEMBLY

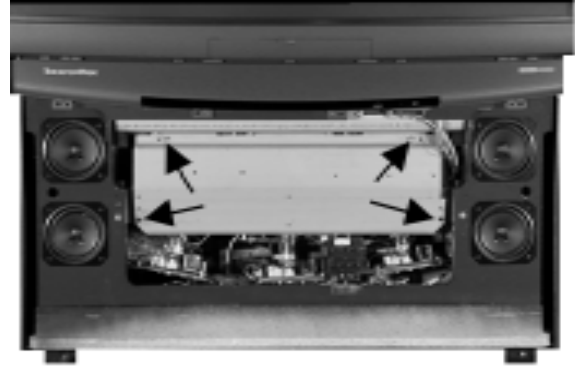
1. Front



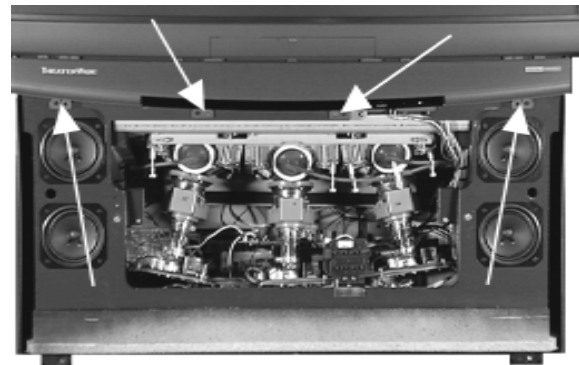
1. Retract the two screws located at the bottom of the speaker grill. Then, remove the speaker grill from the cabinet.



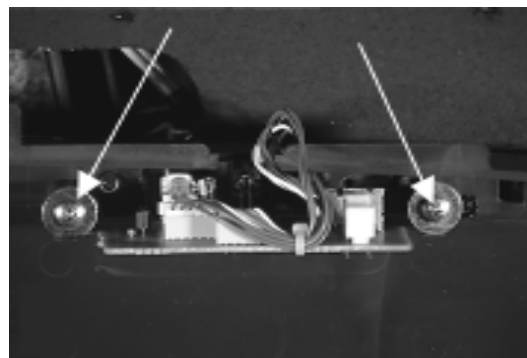
2. Retract the two screws located on the front service panel. Remove the panel by lifting up and pulling the bottom out and away from the cabinet.



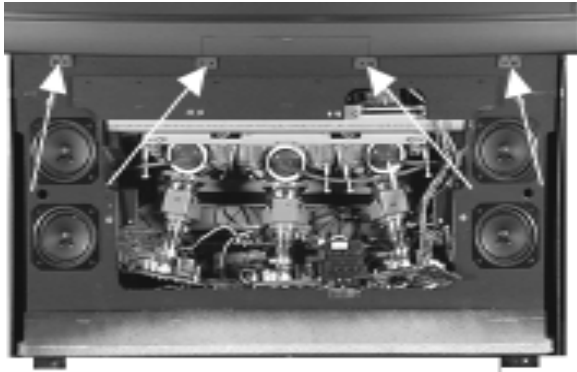
3. Retract the two screws located near the bottom of the x-ray shield. Loosen the top two screws. Slide the shield to the right and downward, then pull it away from the cabinet.



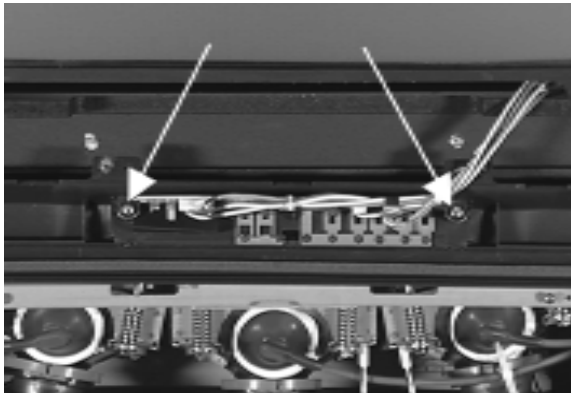
4. Retract the four screws located at the bottom of the Front-LED panel. This panel will still be attached to the cabinet via the Front-LED board's wiring harness.



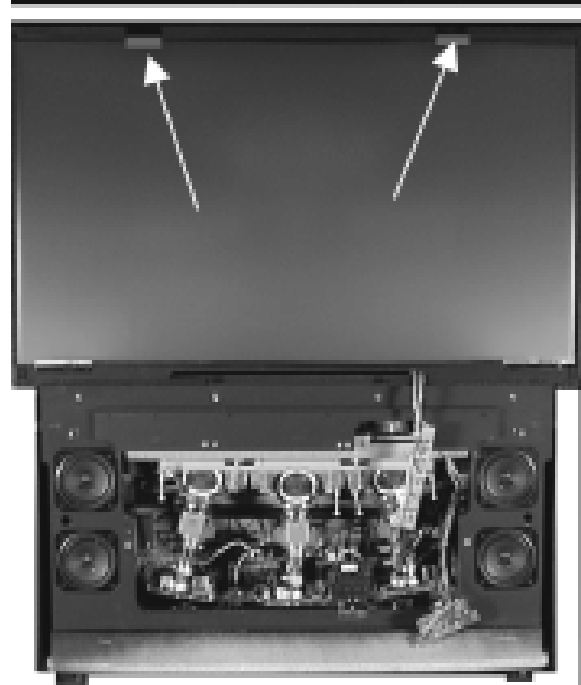
5. Retract the two screws located near the Front-LED P.C. board. Remove the Front-LED P.C. board from the panel and pull the panel away from the cabinet.



6. Retract the four screws located at the bottom of the bezel. Pull the bezel away from the cabinet while lowering the top of the bezel to the floor. The bezel will still be attached to the cabinet via the Front-control board's wire harness.



7. Retract the two screws located near the Front control PC board. Remove the PC board from the bezel. Pull the bezel away from the cabinet.

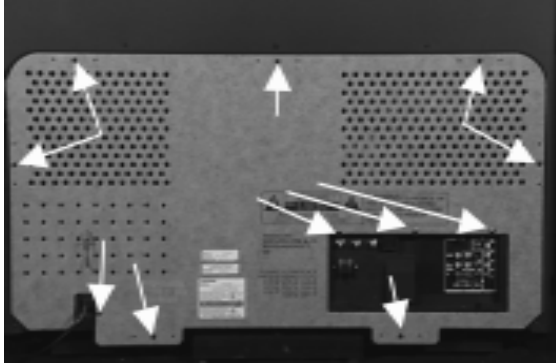


8. Pull the two brass clips up and away from the screen. Then, remove the lenticular and fresnel screens by lifting them up and away from the cabinet.

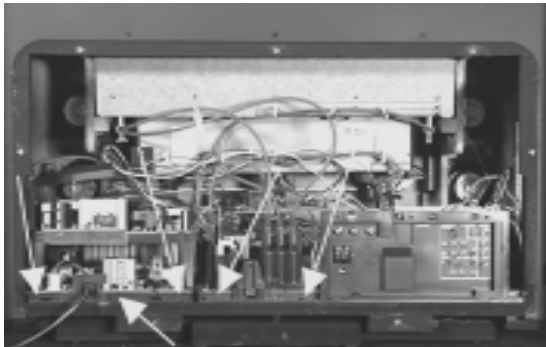


This completes the front disassembly procedure.

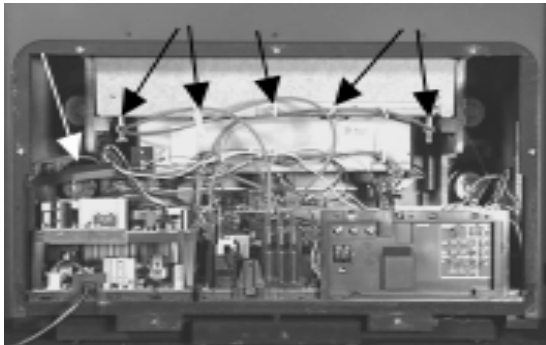
2. Rear



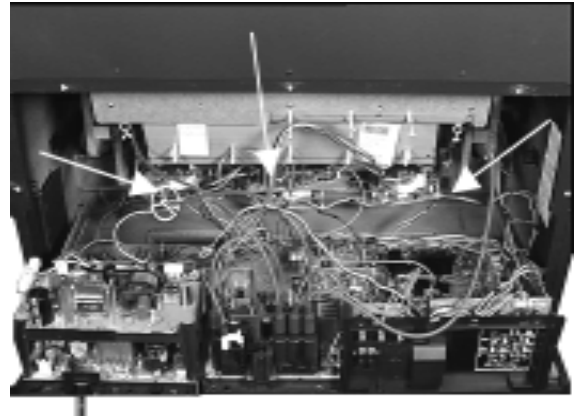
1. Remove seven (7) wood screws and four (4) brass screws on the back panel and remove the back panel.



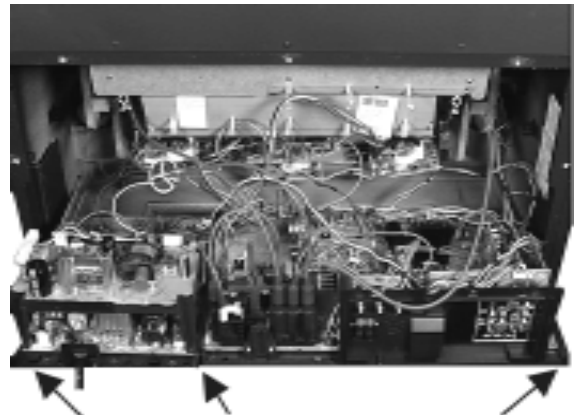
2. Remove the five (5) screws that secure the PC board chassis to the cabinet.



3. Release the wires from their harness clips. Remove the brass screw securing the grey plastic tray to the inside of the cabinet and remove the tray.



4. Partially slide both PC board chassis out from the cabinet. Release the wires from their harness clips located at the bottom front of the cabinet. Slide both chassis to approximately 50% of the way out from the cabinet.



5. Lift the corner of each chassis frame while sliding both chassis completely out of the cabinet.



6. Stand both chassis frames up on end with the solder sides of the PC boards facing outward. The TW40F80 is now in the proper service position.

CRT ADJUSTMENTS

1. Template Instructions

CAUTION: Use only water and a damp cloth to clean an overlay. Any other cleaning substance may cause damage.

Both the TW40F80 and TW56F80 are converged at four separate screens. In order to reduce the number of times a template must be installed and centered, two screens have been printed on each template.

On PSOL4001, the SOLID lines are for the FULL crosshatch and the DASHED lines are for the WIDE#1 crosshatch.

On PSOL4002, the SOLID lines are for the WIDE#2 crosshatch and the DASHED lines are for the WIDE#3 crosshatch.

The 56" templates are manufactured the same way. PSOL5601 contains the FULL and WIDE#1 crosshatch patterns. PSOL5602 contains the WIDE#2 and WIDE#3 crosshatch patterns.

The templates for the TW40F80 are centered by aligning the four corner brackets (located on each template) with the inner border that outlines the screen's viewing area.

For the TW56F80, temporarily install the template on the screen. Locate the center of the screen by stretching two pieces of string diagonally across it, corner to corner. Align the template's center crosshairs with the center point of the screen.

Secure each template to the bezel with low tack tape. To reduce parallax error, place the template as flat against the screen as possible.

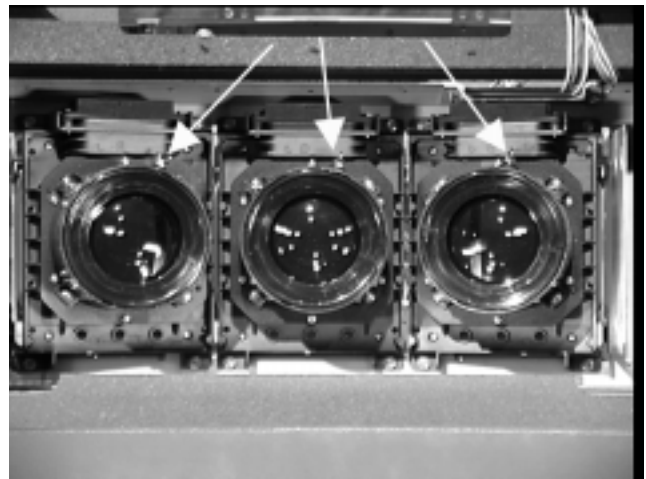
2. Optical and Electrical Focus

Always allow the set to warm up for at least 15 minutes before making CRT adjustments.

The TW40F80 and TW56F80 should be in the WIDE 1 picture size for these adjustments.

1. Follow the appropriate disassembly instructions to gain access to the CRTs.

2. If the wing nuts on the lenses are pointed toward the screen, reverse the lenses on each tube so the wing nuts are facing the back of the set. Leave the lenses in this position after servicing. Put the screen assembly back on.



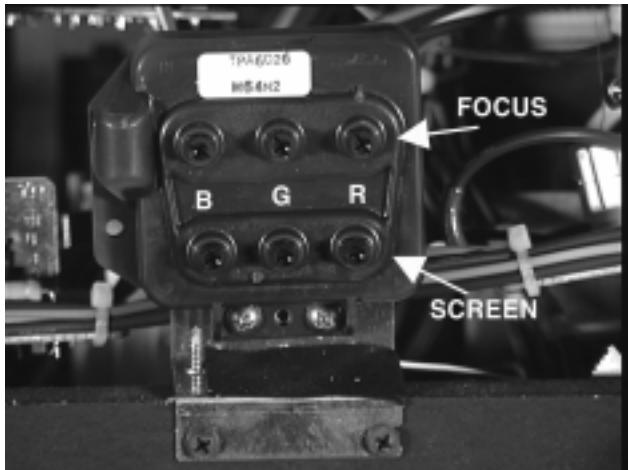
3. Enter the service mode by pressing MUTE on the remote control. Press and hold the MUTE key a second time, while pressing the MENU key on the set's front control panel. An "S" appears in the upper right corner of the screen, indicating the set is in the Service Mode. Press the MENU key again to enter the service adjustment mode, and "RCUT" appears in the upper left corner of the screen. Press the 7 key to display the convergence cross hatch pattern.

4. Select the WIDE 1 picture size with the PIC SIZE key on the TW40F80 and TW56F80.

5. Push the 100 key to turn off the red tube, and the RTN key to turn off the blue tube.

6. Move around to the rear of the set. Loosen the wing nut on the green lens. Rotate the lens while looking up at the back of the screen at the reflected image. Adjust the lens for the best focus in the center area of the screen. It helps to have the room dark. If the room is not dark enough, place the speaker grill, or a similar dark object, in front of the screen.

7. Move around to the front of the set and adjust the electrical focus for best focus in the center of the screen.



8. Repeat the optical focus, then tighten the wing nut.

9. Repeat the electrical focus.

10. Push the 100 key to turn on the red tube, and the 0 key to turn off the green tube.

11. Adjust the red optical and electrical focus.

12. Push the RTN key to turn on the blue tube, and the 100 key to turn off the red tube.

13. Adjust the blue optical and electrical focus. However, defocus the blue slightly with the electrical focus control to maintain uniform brightness.

14. Select the FULL picture size with the PIC SIZE key on the TW40F80 and TW56F80.

15. Push the 7 key two times to exit the convergence mode and call up the built in test patterns. There should be no connection to the Video 1 Input.

3. Mechanical Tilt

Make sure there is no connection to the VIDEO 1 input.

1. With the set still in service adjustment mode, push the TV / VIDEO key until the white cross bar on black background test pattern is displayed. Check each CRT's tilt. If a CRT's cross bar pattern is tilted, loosen the appropriate yoke with a non magnetic screw driver and rotate the yoke until the cross bar pattern is aligned vertically and horizontally.

On the TP50F50/51, the notches in the screen bezel can be used as a guide.

For the TW40F80 and TW56F80, place the FULL / WIDE 1 template on the screen and use the FULL (solid lines) center cross hairs as a guide.

2. Turn the power off to exit the service mode.

4. User Convergence

1. Turn the power on.
2. Put the TW40F80 and TW56F80 in the FULL picture size.
3. Enter the customer convergence screen:
 - a) **TW40F80 and TW56F80:** Press the menu key. Using the left or right arrow keys, select the PICTURE icon. Use the down arrow key to select CONVERGENCE. Use the right arrow key to start the customer convergence screen. The ENTER key selects RED or BLUE. The arrow keys move the selected color up, down, left, and right.
 - b) **TP50F50/51:** Press the setup key until CONVERGENCE is highlighted. Press the + or - key to start the customer convergence screen. The + and - keys then select RED or BLUE to converge. The 2 and 8 keys move the selected color up and down, the 4 and 6 keys move the selected color left and right.
4. Move the red vertical cross bar as far as it will go to the right. Note the location. Move the red vertical cross bar as far as it will go to the left. Note the location. Set the red vertical cross bar to the center of the two extremes.
5. Move the red horizontal cross bar as far as it will go towards the top of the screen. Note the location. Move the red horizontal cross bar as far as it will go toward the bottom of the screen. Note the location. Set the red horizontal cross bar to the center of the two extremes.
6. Switch to the blue cross bars and repeat the entire process.
7. Exit the customer convergence screen.

5. Magnetic Centering

1. Enter the service adjustment mode. Use the TV/VIDEO key to select the white cross bar on black background test pattern.
2. Rotate the centering rings on the green CRT to center the green cross bar. If the rings won't turn, remove the locking glue with a small knife. On the TP50F50/51, use the center cross hairs of the convergence template or the center notches in sides of the screen bezel.

There are no center notches on the screen bezels of the TW40F80 or TW56F80. Use the FULL center cross hairs of the FULL / WIDE 1 convergence template. The red and blue CRT centering rings may be misadjusted to make it easier to center the green cross bars.
3. Center the red and blue cross bars using the green cross bars as a guide.
4. Lock the centering rings with a pliable adhesive.
5. Exit the service adjustment mode.
6. Re-install the CRT x-ray shield.

6. Electrical Centering

1. Disconnect any input at the Video 1 input.
2. Select the FULL picture size on the TW40F80 and TW56F80. Put the set in the service adjustment mode.
3. Push the TV/VIDEO key on the remote until the white cross bar pattern on a black background is displayed.

4. Check the centering of the cross bar pattern with the centering notches in the bezel on the TP50F50/51. For the TW40F80 and TW56F80, use two pieces of string stretched diagonally, corner to corner, to find the center of the screen, or use the FULL center cross hairs of the FULL / WIDE 1 convergence template.

5. If the horizontal position is off, push the channel up or down key until the "HPOS" register appears. Use the volume key to center the pattern.

6. If the vertical position is off, push the channel up or down key until the "VPOS" register appears. Use the volume key to center the pattern.

7. Push the TV/VIDEO key until no test pattern is displayed. Turn the power off.

7. Green Geometry

1. Put the set in the service adjustment mode and bring up the convergence cross hatch pattern. Select the FULL picture size for the TW40F80 and TW56F80.

2. Push the 100 key to turn off the red tube, and RTN to turn off the blue tube.

3. Place the convergence template on the screen and align the center cross hairs with the center of the screen. Start with the FULL / WIDE 1 template on the TW40F80 and TW56F80. The solid line crosshatch is for FULL. The dashed line crosshatch is for WIDE 1.

4. Use low tack masking tape to attach the template to the bezel. Get the template as

flat as possible against the screen to reduce parallax errors.

NOTE: If the microcomputer memory IC (QA02) has been reset or replaced, or the crosshatch pattern is not reasonably close to the template pattern, make the adjustments in section 11 (WID, HIT, & VLIN Adjustments). Then proceed with step 5.

5. Push the 3 key on the remote until the blinking cursor in the upper left corner of the screen turns green.

6. Move the blinking cursor to the right with the 6 key, then down with the 8 key until it's one line to the right of center. The 4 key moves the cursor to the left, and the 2 key moves it up.

7. Push the 5 key to lock the cursor in place.

8. Use the 2, 6, 8, and 4 keys to align the lines of the cross hatch with those on the template.

9. Push the 5 key to unlock the cursor.

10. Move the cursor to another location and repeat steps 7 and 8.

There are two common methods for accomplishing digital convergence:

A. The first method begins in the center of the screen and moves in a counter-clockwise spiral outward to the various adjustment locations on the crosshatch pattern.

At each adjustment location the cross-hatch line is pulled vertically and horizontally to align with the template.

B. The second method starts at the center of the screen and adjusts all vertical lines working outward to the right side.

Then, starting back at the center of the screen, adjusts all vertical lines working outward to the left side.

The process is then repeated for the horizontal lines.

From the center of the screen, adjust all horizontal lines working upward to the top.

Go back to the center and adjust all horizontal lines working downward to the bottom.

Usually, either process will need to be repeated in order to fine tune the adjustments. Choose the method that is most comfortable for you.

After completing the Green Geometry for the FULL picture size, press the PIC SIZE key to change the picture size to WIDE 1. The crosshatch pattern does a one second distortion, indicating the FULL convergence settings have been saved.

NOTE: This completes the green geometry for the TP50F50/51, **however, the TW40F80 and TW56F80 require green geometry adjustments for 3 additional picture sizes:**

11. Press the PIC SIZE key to change the picture size to WIDE 1. The cross hatch pattern does a 1 second distortion, indicating the FULL convergence settings have been saved.

NOTE: If the WIDE 1 cross hatch pattern is not reasonably close to the WIDE 1 template, you may need to make the adjustments in section 11 for WIDE 1 only. WIDE 1 has its own WID, HIT, and VLIN registers.

12. Repeat steps 5 through 10 for the WIDE 1 picture size.

13. Press the PIC SIZE key to save the WIDE 1 settings and change to the WIDE 2 picture size.

14. Remove the FULL / WIDE 1 overlay. Put the WIDE 2 / WIDE 3 overlay in place and center it on the screen. The solid line crosshatch is for WIDE 2. The dashed line crosshatch is for WIDE 3.

15. Repeat steps 5 through 10 for the WIDE 2 picture size.

16. Press the PIC SIZE key to save the WIDE 2 settings and change to the WIDE 3 picture size.

17. Repeat steps 5 through 10 for the WIDE 3 picture size.

NOTE: The Red and Blue must be converged to the green. The Red and Blue convergence steps must be repeated for all picture sizes on the TW40F80 and the TW56F80.

8. Red Convergence

1. On the TW40F80 and TW56F80, change the Picture Size to FULL.

2. Remove the template and press the 100 key to turn on the red tube.

3. Press the 3 key until the red cursor appears.

4. Align the red cross hatch pattern to the green cross hatch pattern, using the same procedure used to align the green cross hatch pattern to the template.

5. On the TW40F80 and TW56F80, repeat these steps for the WIDE 1, WIDE 2, and WIDE 3 picture sizes.

9. Blue Convergence

1. On the TW40F80 and TW56F80, change the Picture Size to FULL.

2. Push the 100 key to turn off the red tube, and RTN to turn on the blue tube.

3. Push the 3 key until the blue cursor appears.

4. Align the blue cross hatch pattern to the green cross hatch, using the same procedure used to align the green cross hatch pattern to the template.

5. On the TW40F80 and TW56F80, repeat these steps for the WIDE 1, WIDE 2, and WIDE 3 picture sizes.

6. Push the 100 key to turn on the red tube and check the convergence with all three tubes on. The cross hatch pattern should be white with no red, green, or blue present. However, depending on how much you defocused the blue tube, a slight blue halo may show. Check all four picture sizes on the TW40F80 and TW56F80.

7. Push the 7 key to exit the convergence mode, push the 7 key again to exit the adjustment mode, then turn the power off to save all settings and exit the service mode.

8. Turn the set back on and check the overall picture quality with a live video signal. Check all the picture sizes on the TW40F80 and TW56F80. If all the picture sizes look good, put the set back together. If any picture sizes are not acceptable, recheck the convergence for that picture size.

9. Check the White balance and adjust, if needed.

10. White Balance

Perform the white balance procedure in a darkened room.

1. Install the screen assembly and select the FULL picture size.

2. Press the RESET key on the remote control to set the customer controls to their default values.

3. Enter the Service Adjustment mode and adjust registers RCUT, BCUT, GCUT, RDRV, and BDRV to a value of 40H.

4. Turn the power off to exit the Service Adjustment mode, then turn the TV back on.

5. Select Video 3. Remove any inputs to the Video 3 input jacks.

6. Remove the screen assembly.

7. Turn the RED, GREEN, and BLUE screen controls completely counter-clockwise.

8. Look down into the lens of each CRT and rotate the screen control clockwise until the raster is just visible.

9. Install the screen assembly.

10. Input an NTSC color bar signal or staircase from a color bar generator.

11. From the on screen menu, turn the customer color control to minimum.

12. Adjust the following registers for proper gray scale tracking from white to black:

a) RDRV and BDRV for light gray and white areas of the screen.

b) RCUT and BCUT for dark gray and black areas of the screen. Leave GCUT set at 40H.

13. Set the customer contrast to zero and the customer brightness to 40%.

14. Adjust the sub-brightness register, BRTC, until there is a slight difference in brightness level between the two darkest bars on the right side of the screen. Then, increase this value by six.

15. Generally, the subcolor register, SCOL, and the subtint register, TNTC, do not need to be adjusted. However, if adjustment is necessary, first reset the customer brightness and contrast to normal. Connect an oscilloscope to test point TP501 on the main board. Connect the ground lead of the scope to signal ground. From the Service Adjustment mode, select the SCOL register.

16. With the NTSC color bar pattern input, adjust the SCOL register for an amplitude of 1.0 vp-p.

17. Decalibrate the oscilloscope so the 1.0 vp-p- is 3 divisions high.

18. Select the TNTC register. Adjust the register until the amplitude of the 2nd bar is 2 divisions high (2/3 the amplitude of the SCOL setting.)

19. Recalibrate the oscilloscope and set the SCOL register to 1.8 vp-p.

Check the overall picture quality with a live video signal.

11. WID, HIT, & VLIN

NOTE: See the NOTES in Section 7, before performing the following procedure.

1. Push the 7 key to exit the convergence mode and display the RCUT register. If the WIDE 1 picture size is to be adjusted, select WIDE 1 picture size.

2. Push the channel up or down key until the WID register appears.

3. Adjust the WID register with the volume key until the vertical lines are close to those on the appropriate template.

4. Push the channel up or down key until the HIT register appears.

5. Adjust the HIT register with the volume key until the horizontal lines are close to those on the appropriate template.

6. Push the channel up or down key until the VLIN register appears.

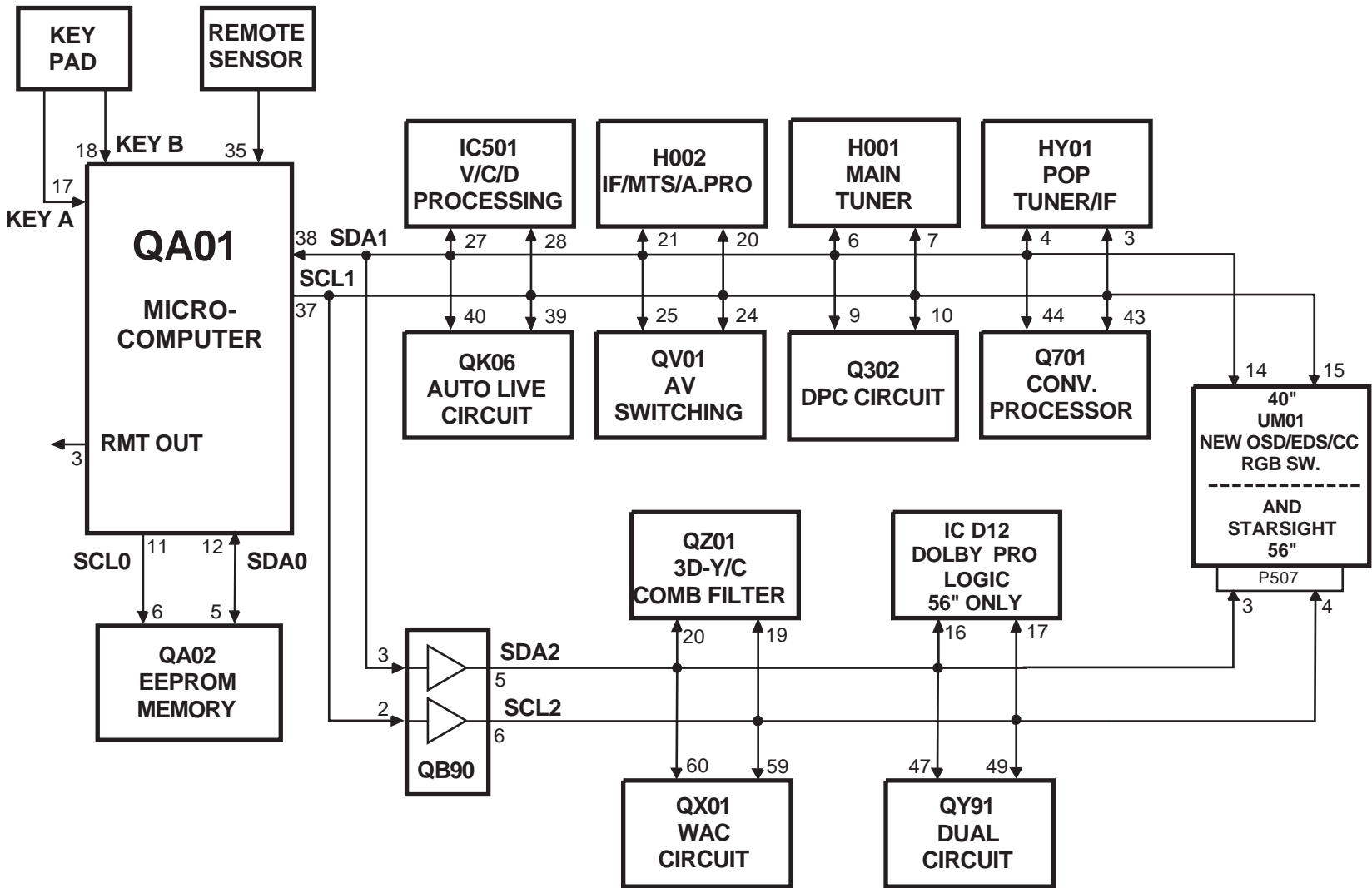
7. Adjust the VLIN register with the volume key until the horizontal lines are close to those on the appropriate template.

8. If needed, repeat both the HIT and VLIN adjustments for the best results.

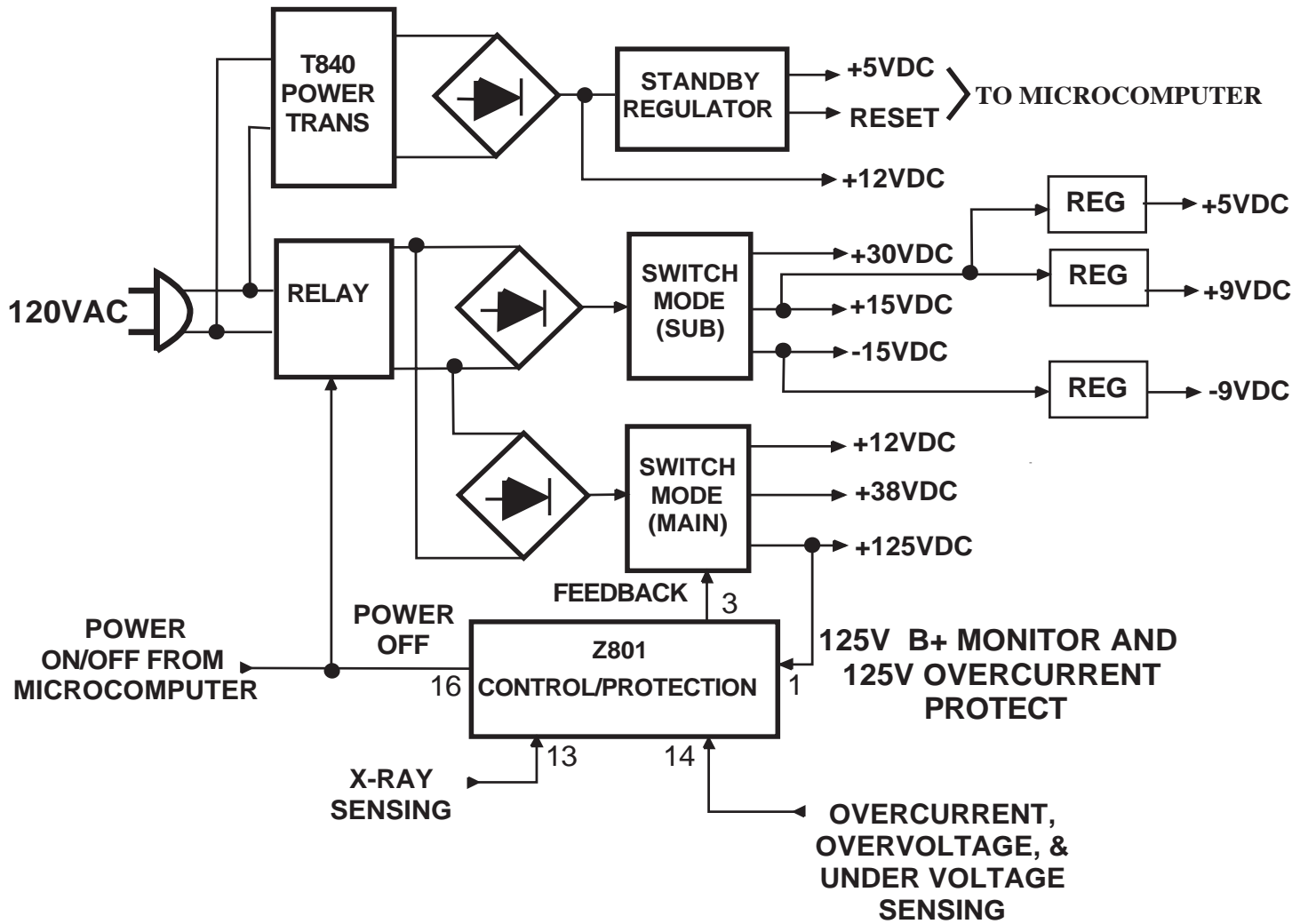
9. Push the seven key twice to return to the convergence mode. Continue with step 5 (or step 12, if in WIDE 1) of Section 7, Green Geometry.

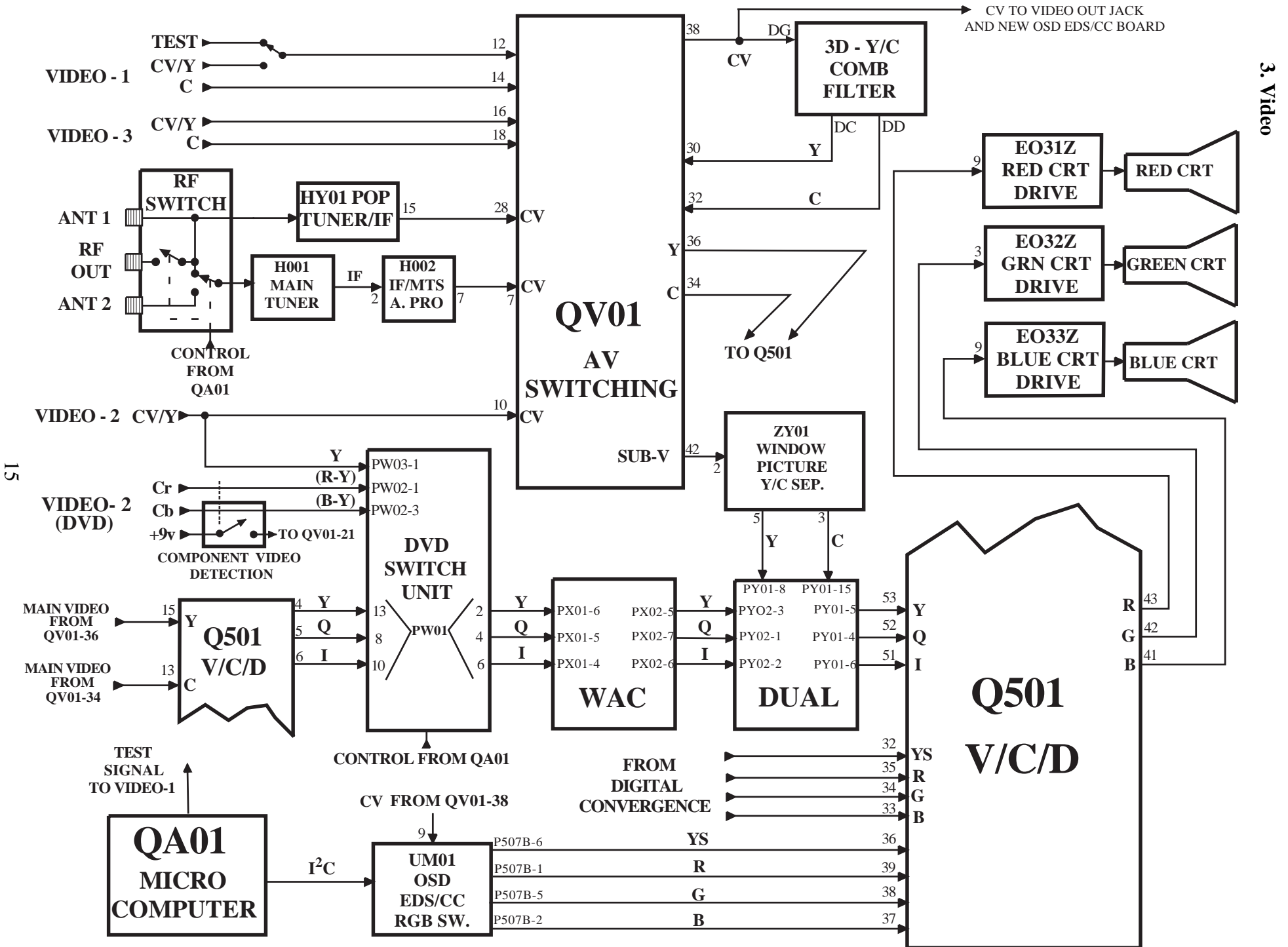
BLOCK DIAGRAMS

1. System

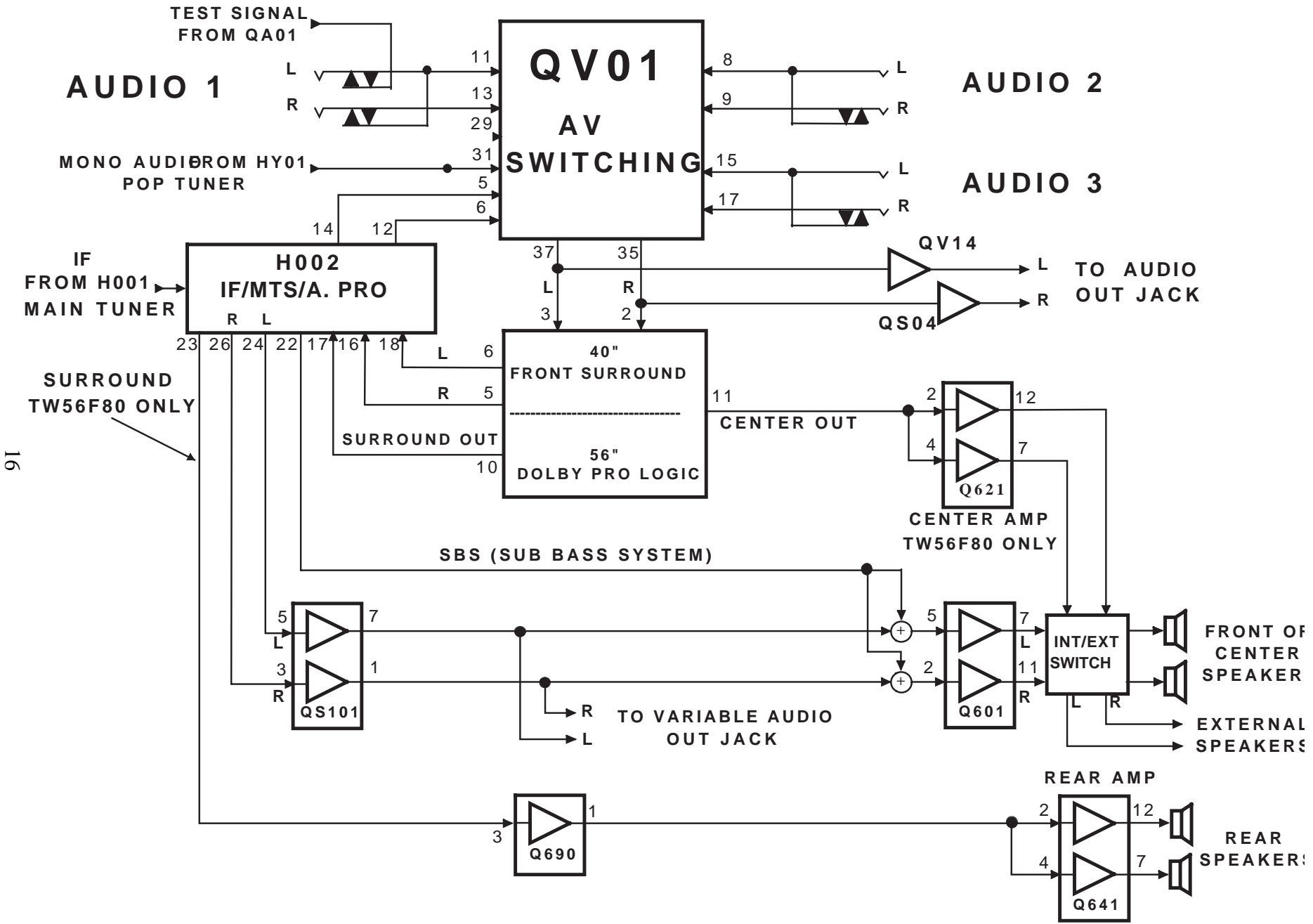


2. Power Supply



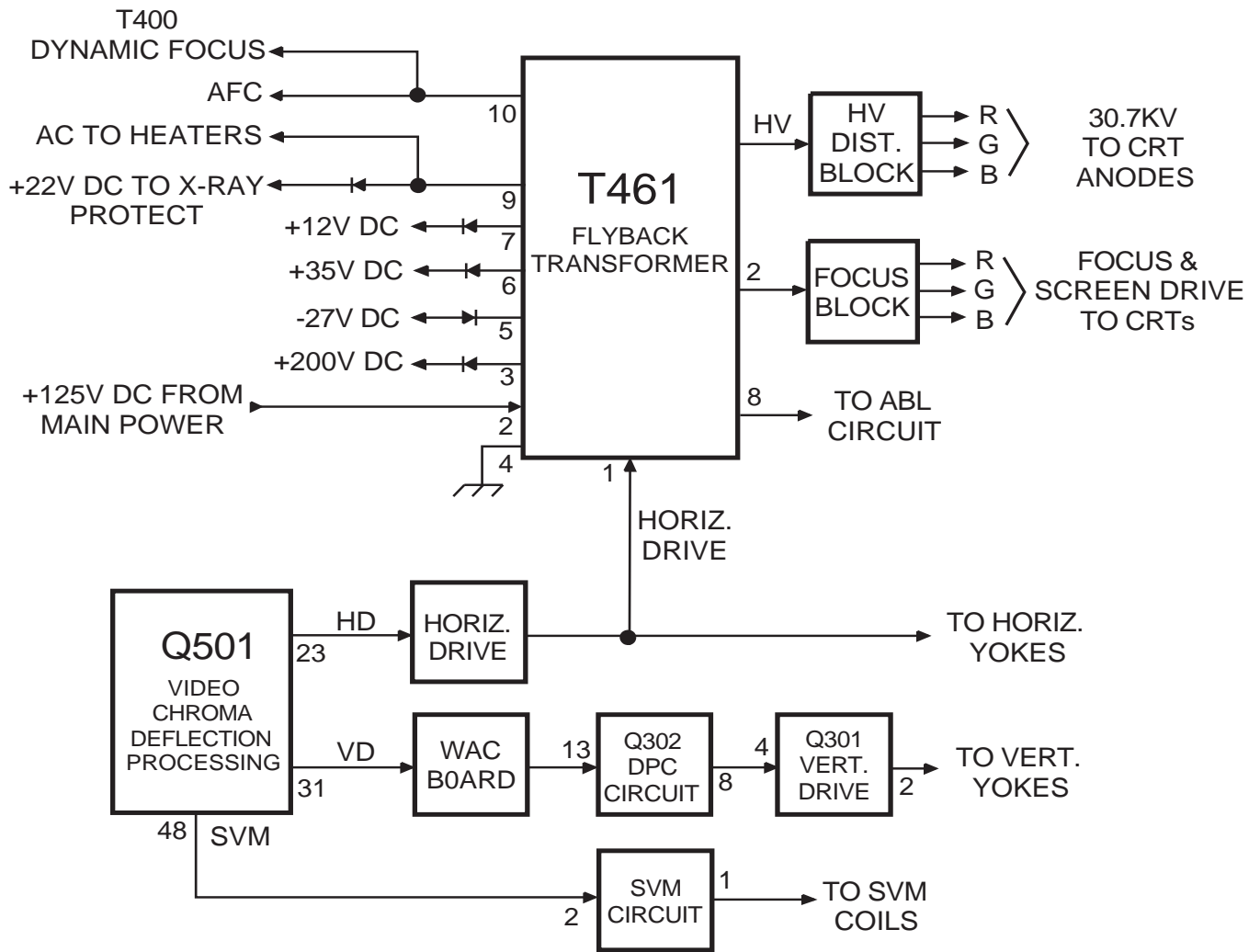


3. Video



16

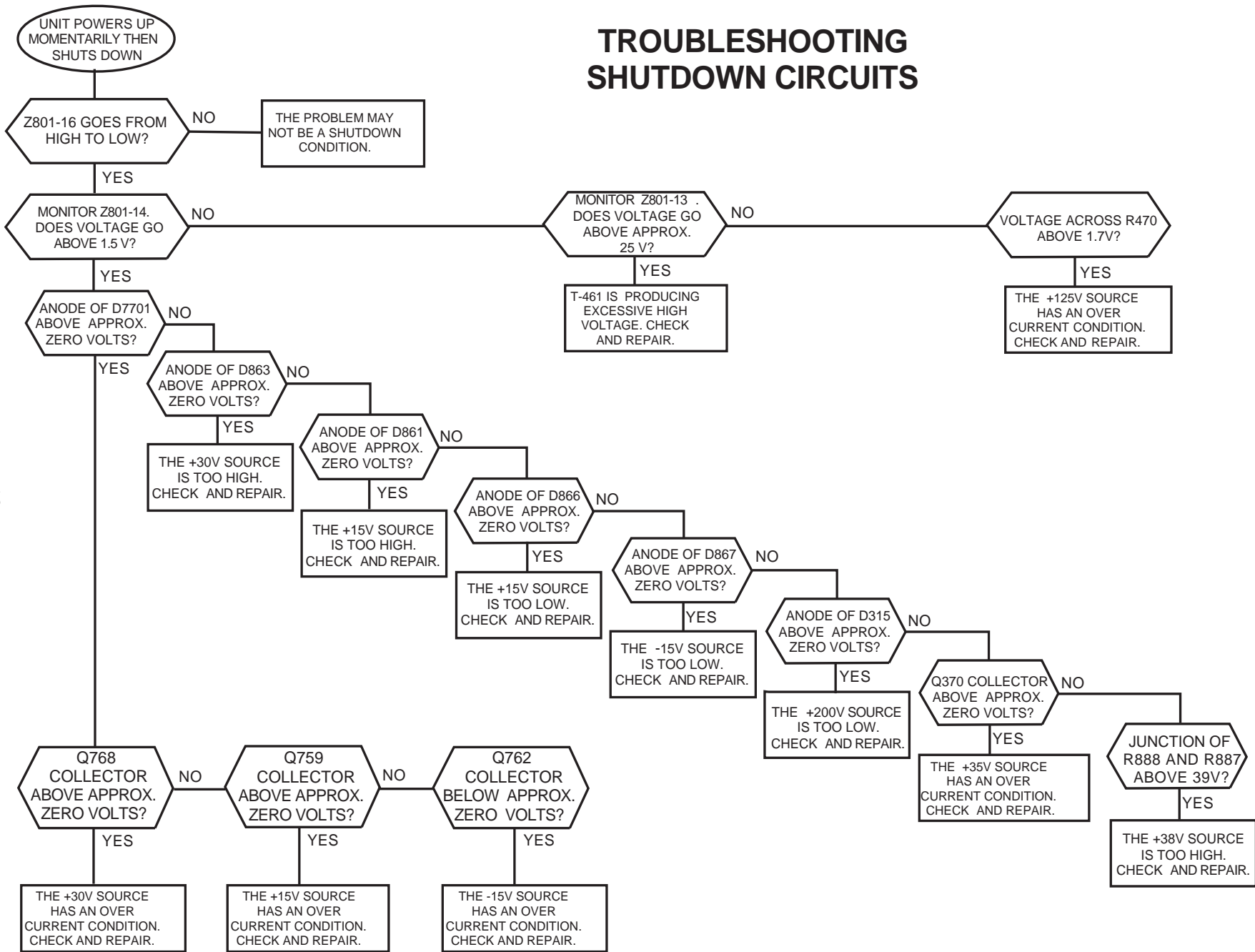
5. Deflection



TROUBLESHOOTING FLOW CHARTS

1. Shut down

TROUBLESHOOTING SHUTDOWN CIRCUITS



***ALL VOLTAGES MUST BE MEASURED WITH A PEAK RESPONSE METER.**