

TX_TVD809
ALIGNMENT PROCEDURES

Operating Conditions

Unless otherwise noted, the following conditions must be observed when aligning the TV:

- 1. Chassis must be operated from a 120 VAC isolation transformer, with line voltage set to 120 VAC.
- 2. All voltages and waveforms referenced are with respect to Ground
- 3. Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:

→ “2. Picture Quality”
→ “2. Picture Resets”

→ “2. Normal Lighting”

- 4. A 10X probe must be used for oscilloscope and frequency measurements.
- 5. Minimum warm-up time is 10 minutes.

Required Test Equipment

Isolation Transformer:

Digital Voltmeter: Range .1V DC to 1000V DC, Accuracy: ± .5%/

DC Voltage Supply: Range: 0 to 50V, 2A—Well Filtered

Temperature Controlled Soldering Station: Grounded Tip Type—Tip Temperature 500F to 800F Adjustable

NTSC Video Signal Generator: Must provide 1V-P-P Negative Sync, Video into 75-OHM input. Produce, standard NTSC 75% Saturated Color Bars with 100% White Window. (B&K 1249, or equivalent)

RF Signal Generator: 100 kHz to 150 MHz .1V RMS, Int. Mod. 1KHz 30%

Cross Hatch Generator: Must have RF output.

Dual Trace, Delayed Sweep Oscilloscope: 25 MHz with Channel invert capability. Sensitivity’ 5m/V/cm Maximum Sweep Rate: .1us/cm.

POWER SUPPLY ALIGNMENT

- 1. Insure that input voltage is at 120 VAC, 60Hz.
- 2. Check that the values RP54, RP56, RP58 and RP59 are the proper values. Connect a voltmeter to “UB” and switch on the set. Voltmeter should indicate that “UB” below 135V. If the voltage at “UB” exceeds 135V, turn the set off immediately and check the values of the power supply circuit components. With “UB” less than 125V proceed to the next step.
- 3. Tune the set to a channel with a good picture.
- 4. Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:

→ “2. Picture Quality”
→ “2. Picture Resets”

→ “2. Normal Lighting”

- 5. Adjust PP01 (F7) so that the voltage at “UB” is **118.0V+/- 1V.**
- 6. Adjust controls VG2 and Focus on the IHVT (LL05) for

a normal picture.

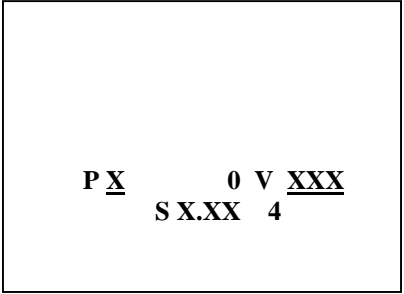
- 7. Allow the set to warm up for at least 3 minutes.
- 8. Set brightness, contrast and volume to minimum.
- 9. The “UB” voltage should be **118.0V+/-1.5V.** If not go back to step1 and re-align the power supply.

TV Service Mode

The service mode is provided to facilitate instrument alignment and service adjustments. The service mode is accessed by pressing a three-button combination on the front control panel of the instrument.

Using the Front Panel Controls to enter Service Mode

- 1. Turn on the TV and select the channel that will be used for the alignment procedure.
- 2. With the instrument “ON” press and hold the “VOL — ” button and then the “CH+” button, then press and release the “POWER” button.
- 3. The TV set should immediately display a line menu on the bottom of the screen (see below).



Service Mode Screen

The Parameter (P) number is on the left side of the display and represents the parameter that will be adjusted. The Value (V) is on the right side of the display and represents the decimal value stored for the function selected. Once the Service Mode Security Code has been entered the CH ^ and CH V buttons on the front panel (or the remote transmitter) are used to change the parameter (P) number. The VOL + and VOL - buttons are used to change the decimal value (V) of the function.

NOTE: When the service mode is accessed, the parameter will be “0”. Parameter “0” is used to input the security code. The security code is necessary to protect the factory alignments from inadvertent modification. Attempting to change the parameter (P) using CH ^ or CH V before the proper security code has been entered will cause the instrument to exit the service mode. A valid security code is entered (using VOL + or VOL -). The group of XX’s on the second line in the center of the service menu display the software version of the code.

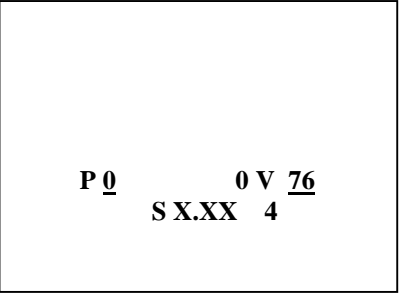
TX_TVD809
ALIGNMENT PROCEDURES

Security Codes

When the Service Mode is first entered, the parameter (P) will come up set at “0”, which corresponds to the security code function.

- 1. Turn on the TV and select the channel that will be used for the alignment procedure and access the service mode menu.
- 2. With the parameter (P) set to “0” adjust the value (V) (using VOL + or VOL -) to **76** for access to the Front Panel Service Mode.
- 3. Once the security code has been set, individual alignments can be accessed by pressing CH ^ or CH V changing the parameter (P) number.
- 4. Once a parameter (P) has been selected for a particular alignment the VOL + and VOL - buttons can be used to change the value (V) of the alignments selected. Parameters available through the front panel are shown in table

- 5. To exit the service menu, press “POWER” on the remote control or front panel.



Security Code Entry

Parameter #	Parameter name	Value range	Notes and comments
00	security number	Must be 076	Must not advance to other parameters until value set
04	VCO	127(Mono only)	
05	AGC	31 (Stereo) 63 (Mono)	
06	Red cut-off	255	
07	Green cut-off	255	
08	Blue cut-off	255	
09	Green Gain	255	
10	Blue Gain	255	
11	Peak white	52	
12	Horizontal phase	31	
13	Vertical phase	15	
14	Vertical amplitude	63	
15	Decoder Input Level	63	
16	Decoder_stereo VCO,	63	
17	Decoder Filter Setting,	63	
18	Decoder_Low_Band,	63	
19	Decoder_High_Band,	63	
20	Decoder_SAP_VCO,	63	
21	S-Video Feature	0 - Disable 1 - Enable	TX809 Stereo Model Only
22	Speaker On/Off Feature	0 - Disable 1 - Enable	TX809 Stereo Model Only
23	Sound Logic Feature	0 - Disable 1 - Enable	TX809 Stereo Model Only
24	Auto Tuning Feature	0 - Disable 1 - Enable	TX809 Stereo Model Only
25	Gemstar OSD Horizontal	185	
26	Gemstar OSD Vertical	160	

Table 1.

TX TVD809
ALIGNMENT PROCEDURES

Note: Before adjusting any parameters access all the parameters and write down the initial value for each. This will allow you to return to a “known” value if you encounter problems with the alignment.

RF AGC		
Test Point:	Observe Display	
Adjust:	AGC (P5)	Range 0 - 31

The RF AGC has been preset at the time of manufacture for optimum operation over a wide range of input signal conditions. Readjustment *should not* be required unless the tuner, IC IV01 or IC IR01 has been replaced. Adjustment of the RF AGC parameters may not have any visible effect except under unusual conditions. Adjusting the RF AGC to one extreme of it’s parameter limits will usually provide a relatively poor signal to noise ratio, while adjustment to the other extreme of it’s parameter limits will cause overload conditions such as channel 6 color beats or Cable TV adjacent channel interference. If the RF AGC parameter setting is adjusted, check all local channels for proper operation. Use the weakest local channel to adjust RF AGC parameter setting.

- Note:** The instrument’s channel can be changed by entering a channel number using the digit buttons on the remote control.
- Tune TV to weakest local station.
 - Access the service menu and select AGC alignment parameter (05).
 - Make a note of the value setting prior to making any adjustments. This so that you may reset the parameter to that value if no visible difference is detected when adjusting from one extreme of the parameter limits to the other.
 - Adjust the value of the AGC alignment parameter (05) to a value where the weakest viewable channel is no longer visible and a gray screen is displayed (Unusable Signal) or to the maximum parameter value setting where the picture quality is degraded the most (loss of color, snow or other visible defects).
 - Adjust the value of the AGC alignment parameter (05) to a value where the weakest viewable channel is now displayed and further adjustment of the parameter no longer improves the picture quality.
 - Check all local channels for proper operation with the new setting.

Picture Quality Alignment

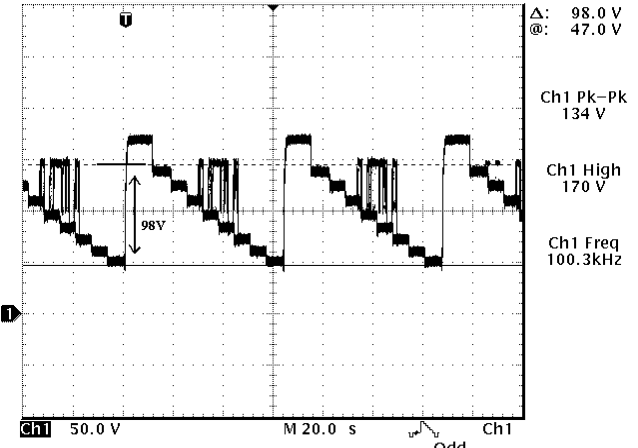
SCREEN ADJUSTMENT		
Test Point:	Observe Display	
Adjust:	SCREEN (VG2)	IHVT

- Tune the instrument to receive a gray scale staircase signal. **Note:** Some generators produce gray scale stairsteps by using the color bars signal with the color burst turned off. This produces bars that step from Black (7.5IRE) to

- White (77IRE).
- Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:
→ “2. Picture Quality”
→ “2. Picture Resets”
→ “2. Normal Lighting”
- Adjust the SCREEN (VG2) until the first gray scale bar (7.5 IRE) is just visible.

PEAK WHITE ADJUSTMENT		
Test Point:	TU51, 61, 71 Collector	Kine PCB
Adjust:	Peak White	Range: 0 - 52

- Tune the instrument to receive a gray scale staircase signal.
- Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:
→ “2. Picture Quality”
→ “2. Picture Resets”
→ “2. Normal Lighting”
- Measure the collector voltage of TU51, 61, and 71. Use the collector of the transistor with the highest peak-peak voltage for this adjustment.



- Place the instrument in the **TV SERVICE MODE**.
- Select the “PEAK” adjustment and adjust the value to obtain 98V +/- 2V between the blanking and White level.

Color Temperature Adjustment			
Test Point:	Observe Display		
Adjust:	Red cut-off (P06)	Range: 0 - 255	
	Green cut-off (P07)	Range: 0 - 255	
	Blue cut-off (P08)	Range: 0 - 255	
	Green Gain (P09)	Range: 0 - 255	
	Blue Gain (P10)	Range: 0 - 255	

NOTE: Allow the instrument to warm up for at least 15 minutes before doing the Color Temperature Adjustments. This compensates for color drift in the instrument as it warms to run temperature.

TX TVD809
ALIGNMENT PROCEDURES

- Tune the instrument to receive a gray scale staircase signal.
- Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:
→ “2. Picture Quality”
→ “2. Picture Resets”
→ “2. Normal Lighting”
- Put the instrument into **TV SERVICE MODE**.
- Adjust Green Gain (P09) to 128 and adjust Blue Gain (P10) to 128.
- Adjust Red cut-off (P06) value to mid -point (128).
- Adjust Green cut-off (P07) value to zero (0).
- Adjust Blue cut-off (P08) to produce magenta in the first few steps of the scale.
- Adjust Green cut-off (P07) to produce gray tone on the first few steps of the scale. Readjust Red cut-off and Blue cut-off if necessary to produce best gray tone.
- Adjust Green Gain (P09) and Blue Gain (P10) for best white level on the last steps of the gray scale.

FOCUS ADJUSTMENT		
Test Point:	Observe Display	
Adjust:	Focus Control	IHVT

- Tune the instrument to receive a crosshatch signal.
- Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:
→ “2. Picture Quality”
→ “2. Picture Resets”
→ “2. Normal Lighting”
- Adjust the *Focus* control (LL05) for best overall focus.

Picture Geometry Adjustment

Horizontal Phase Adjustment		
Test Point:	Observe Display	
Adjust:	PL140	Full CCW
	Horizontal Phase (P12)	Range: 0 - 31

- Using a signal generator tune the instrument to receive a crosshatch or other pattern that can be easily centered horizontally.
- Set Picture Quality controls at nominal (Brightness Saturation at 50% and Contrast at 70%) by using the remote control and pressing “Menu” and select:
→ “2. Picture Quality”
→ “2. Picture Resets”
→ “2. Normal Lighting”
- On the E/W Correction Board adjust PL140 full Counter-Clock-Wise (CCW).
- Access the service menu and select Horizontal Phase alignment parameter (P12).
- Adjust value range to center picture horizontally (side to side) use “VOL +” button to increase value range and use “VOL -” button to decrease value range.

Vertical Adjustments		
Test Point:	Observe Display	
Adjust:	Vertical Phase (P13)	Range: 0 - 15
	Vertical Amplitude (P14)	Range: 0 - 63

- Tune the instrument to receive a crosshatch pattern.
- Put the instrument into **TV SERVICE MODE**.
- Adjust Vertical Amplitude (P14) so that both the top and bottom of the crosshatch pattern can be viewed.
- Adjust Vertical Phase (P13) to center the display, using the top and bottom edges of the crosshatch as a reference.
- Adjust Vertical Amplitude (P14) so that the top and bottom lines of the crosshatch pattern are an equal distance from the edge of the screen. Adjust so that approximately 3.75% of the crosshatch pattern is hidden at both the top and bottom of the display (7.5% over scan +/- 2.5%)
EXAMPLE: If the crosshatch display has 12 blocks vertically, adjust so that ~ 1/2 block is hidden at both the top and bottom of the display (0.5/12 = 4.1%).
- If necessary repeat the vertical adjustments to get the proper overscan symmetry.

E/W Correction		
Test Point:	Observe Display	
Adjust:	E/W Horizontal	PL140
	E/W Pincushion	PL141
	E/W Trapezium	PL143
	Horizontal Phase (P12)	Range: 0 - 31

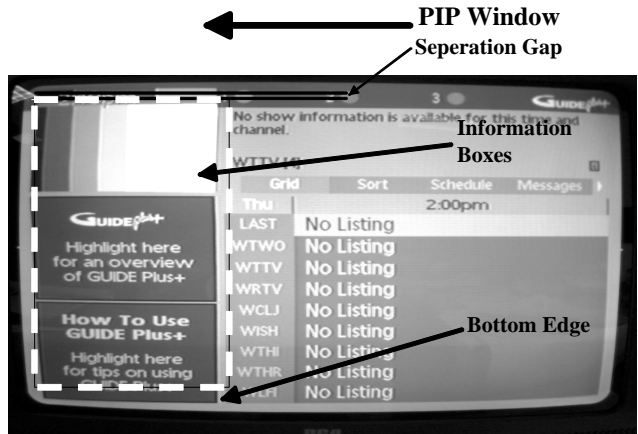
- Tune the instrument to receive a crosshatch pattern.
- On the E/W Correction Board adjust PL140 full Counter-Clock-Wise (CCW).
- Adjust PL140 (Horizontal Amplitude) so that the sides of the crosshatch pattern are an equal distance from the edge of the screen. Adjust so that approximately 4.5% of the crosshatch pattern is hidden at both sides of the display (9.0% over scan +/-3%)
EXAMPLE: If the crosshatch display has 15 blocks horizontally, adjust so that ~ 3/4 block is hidden at both sides of the display (0.75/15 = 5.0% X 2 + 10%).
- Adjust PL141 (Pincushion Correction) on the E/W Module so that the vertical lines on the sides of the crosshatch pattern are straight.
- Adjust PL143 (Trapezoid adjustment) on the E/W Module so that the vertical lines on either side of the crosshatch pattern are parallel to the sides of the screen.
- Put the instrument into **TV SERVICE MODE**.
- Adjust the Horizontal Phase (P12) range to center picture horizontally.

GEMSTAR

Gemstar Positioning

Test Point:	Observe Display		
Adjust:	OSD Horz.	(P25)	Range: 0 - 185
	OSD Vertical	(P26)	Range: 0 – 160

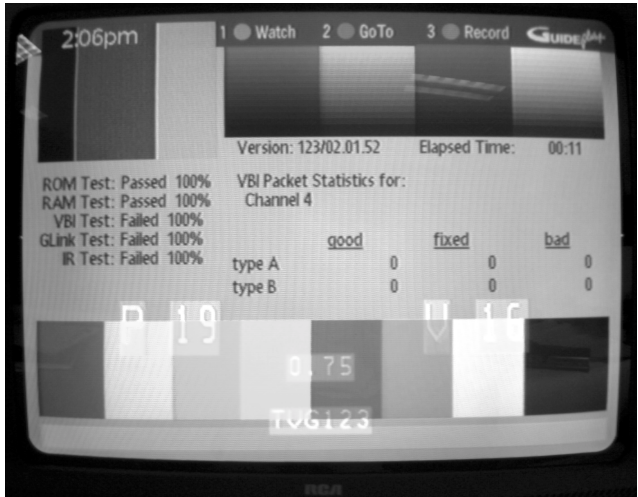
Note: The OSD for Gemstar is not intended to need any alignment. This alignment should only be performed if the Gemstar module is repaired or replaced.



Guide Plus+ Menu

1. Tune to a RF channel that carries Gemstar Plus+ information in the Vertical Blanking Interval (VBI).
2. Press “Guide” on the remote control to access the Guide Plus+ menu shown above. Familiarize yourself to the layout of the Menu screen. The Gemstar alignments con-

- trol the positioning of entire Guide Menu.
3. Access the Service Menu. This action will remove the Guide Menu.
 4. Go to parameter #25, Gemstar horizontal position. Adjust the value by one in either direction. This will bring up the Gemstar Diagnostic Screen. Adjust the horizontal centering of the Gemstar display so that the distance from the edge of the color bars to the edge of the tube is the same on both the left and right sides of the display.



Gemstar Diagnostic Screen

1. Go to parameter #26, Gemstar vertical position. Adjust the vertical centering of the Gemstar display so that the distance from the upper edge of the PIP window to the top edge of the tube is the same distance as the distance from the bottom of the blue bar to the bottom edge of the display.

Left Intentionally Blank