ALIGNMENT PROCEDURES

Note: AC line voltage should be approximately 120VAC. Customer controls should be set to nominal (PICTURE RESET in the *Video* menu) unless specified otherwise.

Regulated B + Standby Adjustment

Test Point:	TP4101 (Reg B+)	Main PCB
Adjust:	R4113 (Standby Adj)	Main PCB

1. Place the instrument in the standby mode (AC power applied, instrument OFF).
2. Connect a DC voltmeter to TP4101 (pin 9 of T4102); use pin 5 of T4102 as ground reference.
3. Adjust the *Regulated B+ Standby* control (R4113) for 140.0 ± 0.5 VDC.

Video Detector Alignment

Test Point:	TP2305 (IF AGC)	Main PCB
Adjust:	L2304 (Video Detector)	Main PCB

1. Connect an external marker generator to the chassis IF input (Tuner pin 3) through a 1000pF capacitor; use the tuner shield as ground reference. Set the marker generator for a 45.75 MHz (CW) marker.
2. Short TP2310 (+ lead of C2307) to ground (- lead of C2307).
3. Connect a DC voltmeter to TP2305 (+ lead of C2304); use the tuner shield as ground reference.
4. Adjust the *Video Detector* coil (L2304) for minimum voltage at TP2305.

4.5 MHz Detector Alignment

Test Point:	U1001-52 (Audio Out)	Main PCB
Adjust:	L1202 (4.5 MHz Det)	Main PCB

1. Tune the instrument to receive a signal with audio modulation.
2. Connect a scope probe (0.1V/0.5msec/div.) to U1001 pin 52; use the tuner shield as ground reference.
3. Adjust the *4.5 MHz Detector* coil (L1201) for maximum signal at U1001-52.

Note: L1201 tuning is very broad. For proper alignment, identify the range of the control in which the signal is maximum, then center the control within that range.

AFT Alignment

Test Point:	TP2309 (AFT)	Main PCB
Adjust:	L2303 (AFT)	Main PCB

1. Connect an external marker generator to the chassis IF input (Tuner pin 3) through a 1000pF capacitor; use the tuner shield as ground reference. Set the marker generator for a 45.75 MHz (CW) marker.
2. Connect a DC voltmeter to TP2309 (U1001 pin 50); use the tuner shield as ground reference.
3. Preset the *AFT* coil (L2303) fully clockwise; the DC voltmeter should read approximately 2.5 VDC.
4. Adjust L2303 counterclockwise until the voltage at TP2309 reaches a maximum, then decreases to 2.5 ± 0.1 VDC.

RF AGC Alignment

Test Point:	Observe Display	
Adjust:	R2311 (RF AGC)	Main PCB

The *RF AGC* control (R2311) has been aligned for optimum performance over a wide range of RF signal conditions. Readjustment of R2311 should not be necessary unless:

a. the tuner has been replaced,
b. the CTV IC (U1001) has been replaced,
c. R2311 has been replaced or misadjusted, or
d. unusual signal conditions exist, such as cable TV adjacent channel interference, picture bending, channel 6 color beats, broadcast noise or weak signal conditions.

Cable TV adjacent channel interference, picture bending and channel 6 color beats are usually a result of excessive signal level, and may be improved by adjusting R2311 to lower the gain of the tuner; however, this may result in a reduction in S/N ratio (noise due to weak signal).

Broadcast noise and weak signal may be improved adjusting R2311 to increase the gain of the tuner; however, this may result in a degradation of overload capabilities (interference or distortion due to excessive signal).

If the *RF AGC* control must be adjusted, use the weakest local broadcast channel as a signal source. After adjusting the control, check performance on all available channels.

Wide Band Audio Level Adjustment

Test Point:	TP1205 (WB Audio)	Main PCB
Adjust:	R1204 (WBA Level)	Main PCB

1. Tune the instrument to receive the signal from a MTS generator (B&K model 2009, or equivalent). Set the generator to provide an L + R modulating signal with 300 Hz audio.
2. Connect a scope probe (0.1V/5msec/div.) to TP1205 (JS1907 of the Digital Audio sip); use pin JS1906 as ground reference.
3. Adjust the *Wide Band Audio Level* control (R1204) for 75 ± 5 mVRMS at TP1205.

ALIGNMENT PROCEDURES (Continued)

Sub Brightness Adjustment

Test Point:	KS5001R-8 (Red Cathode)	Kine Drive PCB
Adjust:	R3346 (Sub Bright)	Main PCB

1. Tune the instrument to receive a super pulse signal (RCA model WR-515A, or equivalent).
2. Connect a scope probe (20V/20msec/div.) to pin 8 of the kine socket on the Red Kine Driver board; use J5002 as ground reference.
3. Adjust the *Sub Brightness* control (R3346) for 50.0 ± 1.0 Vp-p, with 0 IRE black level (refer to Figure 1).

Contrast Preset Adjustment

Test Point:	Q2906-E (Luma Out)	Main PCB
Adjust:	R2730 (Contrast Preset)	Main PCB

1. Tune the instrument to receive a super pulse signal (RCA model WR-515A, or equivalent).
2. Connect a scope probe (0.5V/20msec/div.) to the emitter of Q2906 (or JW454); use the tuner shield as ground reference.
3. Adjust the *Contrast Preset* control (R2730) for 2.0 ± 0.1 Vp-p at the emitter of Q2906.

Comb Filter Adjustment

Test Point:	U2601-7 (Luma Out)	Main PCB
Adjust:	L2601 (Notch Freq)	Main PCB
	R2603 (Notch Depth)	Main PCB

1. Tune the instrument to receive a color bar signal.
2. Connect a scope probe (500mV/20msec/div.) to pin 7 of U2601; use the tuner shield as ground reference.
3. Alternately adjust the *Notch Frequency* control (L2601) and the *Notch Depth* control (R2603) to minimize the level of the chroma burst portion of the signal.

Sync Level Adjust (Digital Comb)

This adjustment is sealed at time of manufacture and should require no further adjustment. If control (R6488) is replaced or adjustment is deemed necessary the following procedure is recommended.

Test Point:	JS6407	Comb SIP Ad-
just:	R6488	Comb SIP

1. Apply 75% split field NTSC color bar signal to instrument.
2. Connect oscilloscope probe (2.0V/20mS per Div.) to JS6407.
3. Adjust R6488 to product 2.0V p-p response.

Reference Voltage Adjust (Digital Comb White Stretch)

Test Point:	CR6401	Comb SIP Ad-
just:	R6421	Comb SIP

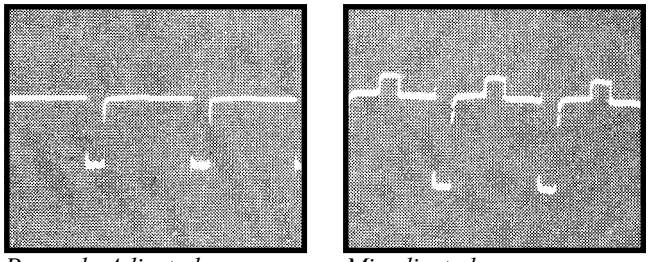
1. Apply 75% split field NTSC color bar signal to instrument.
2. Adjust: *Color control* to mid-range, *Contrast control* to 3/4 range, *Brightness control* to mid-range.
3. Allow OSK menu to time out (disappear).
4. Connect DVM across zener diode CR6401.
5. Adjust R6421 for 0 .005VDC.
6. Remove test equipment.

Chroma Filter Adjustment

Test Point:	Observe Display	
Adjust:	R2802 (Filter Adj)	Main PCB

1. Tune the instrument to receive a color bar signal.
2. Adjust the *Chroma Filter* control (R2802) for proper color display with clean transitions between bars.

Note: With R2802 set fully clockwise, colors in the display will be faded. With R2802 set fully counterclockwise, the display will be monochrome (no color). The correct setting should be near midrange. After completing the adjustment, check various broadcast channels to insure that there is no delay in color reproduction when a channel is tuned.



Properly Adjusted *Misadjusted*

Fig. 1 - Sub Brightness Adjustment

Sync Amplitude Adjust

1. Apply any convenient test signal.
2. Monitor luma output at JS6407.
3. Adjust R6448 to set blanking level (0 IRE) at 2.8 ± 0.1 V DC.

ALIGNMENT PROCEDURES (Continued)

Tint Preset Adjustment

Test Point:	Observe Display	
Adjust:	R2816 (Tint Preset)	Main PCB

1. Tune the instrument to receive a strong local broadcast.
2. Using the *Video* menu, set *Tint* to center.
3. Adjust the *Tint Preset* control (R2816) for proper flesh tone reproduction.

High Voltage Check

High voltage is NOT adjustable. Nominal high voltage is 25.5 kV. High voltage must not exceed 30.0 kV under any conditions.

High Voltage Measurement

1. Tune the instrument to receive a strong signal with bright picture content.
2. Using the *Video* menu, set *Brightness* and *Contrast* to maximum.
3. Connect a high impedance (>1000Megohm) DC voltmeter/high voltage probe to the high voltage anode; connect ground lead to the picture tube ground strap.

Shutdown Check

The following procedure must be performed prior to servicing, and after servicing deflection, high voltage or regulated B + circuits, to assure proper operation of the shutdown circuit.

1. Using the *Video* menu, set *Brightness* and *Contrast* to maximum.
2. Short stakes TP4902 (XRPI) and TP4901 (XRP2) together. The instrument must shut down, cycle on and off three times and then shut down and remain off, even if the short is removed. Once the short is removed, the instrument should not return to normal operation until the power button is pressed.

MPX (STEREO) ALIGNMENT

Test Equipment Required:

Audio Generator -- Capable of generating 99404 Hz and 15734 Hz.

Frequency Counter -- 20 Mhz

Oscilloscope -- Wideband

Digital Volt Meter -- Triplett 3550 or equivalent.

Stereo Generator -- B & K 2009 or equivalent.

Preparation:

Remove AC power from instrument. Clip jumper wire JW377.

Procedure:

Stereo LPF/SAP BPF Alignment

1. Apply 99404 Hz signal from Audio Generator to JW377 (sound input to pin 2 of U1600).
2. Connect oscilloscope or DVM to negative leg of C1602 (pin 3 of U1600).
3. Apply AC power to instrument and adjust R1604 for minimum indication.
4. Remove test equipment.

Stereo VCO Adjust

1. Connect 10 uFD capacitor from pin 2 of U1600 to ground.
2. Short pins 38 & 45 to pin 47 (U1600).
3. Connect frequency counter to pin 41 of U1600.
4. Adjust R1616 for 15734 Hz +/- 20 Hz.
5. Remove capacitor from pin 2 of U1600 and short from pins 38 & 45 to pin 47.

Baseband LPF Responses

1. Apply 15734 Hz signal from Audio Generator to JW377.
2. Short pin 39 to pin 40 (U1600) or positive leg to negative leg of C1616.
3. Connect oscilloscope or DVM to negative leg of C1615.
4. Adjust R1606 for minimum response.
5. Remove AC power from instrument and solder JW377 back together (previously clipped).

Low Frequency Separation

1. Apply AC power to instrument and make sure audio is present. Set audio menu for stereo operation with Expanded Stereo (SRS) OFF.
2. Connect MPX (Stereo) Generator to antenna input terminal.
3. Apply L only stereo signal 300 Hz (pilot ON).
4. Connect oscilloscope or DVM to JW207.
5. Adjust R1609 for minimum response.

High Frequency Separation

1. Use same connections as used for Low Frequency Separation except apply L only stereo signal 8 kHZ.
2. Adjust R1611 for minimum response.

Note: If minimum response is obtained only at one end of R1611 rotation, reset R1611 to center of rotation and adjust R1709 for minimum response.

3. Remove all test equipment.

PIX-IN-PIX (S-PIP) ALIGNMENT

Note: S-PIP alignment procedures must be performed in the following sequence, unless specified otherwise. AC line voltage should be approximately 120VAC. Customer controls should be set to nominal (PICTURE RESET in the *Video* menu) unless specified otherwise.

3.58 MHz Oscillator Alignment

Test Point:	Q8410-E (Osc Out)	S-PIP PCB
Adjust:	C8403 (3.58MHz Osc)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Short U8401 pin 1 to ground; this allows the 3.58 MHz oscillator to free-run.
4. Connect a frequency counter (use a 100X probe) to the emitter of Q8410; use the PIP shield as ground reference.
5. Adjust the *3.58 MHz Oscillator* control (C8403) for 3.579545 kHz ± 15 Hz at Q8410-E.
5. Remove the short added in step 3.

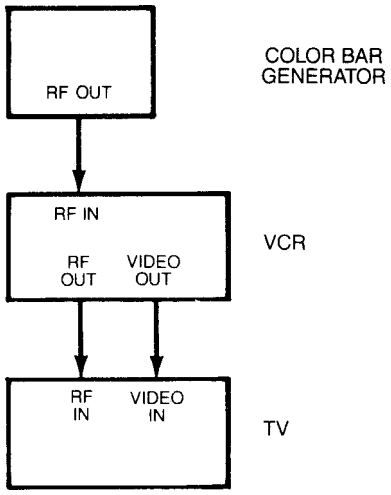


Fig. 2 - S-PIP Alignment Set-Up

14.318 MHz Oscillator Alignment

Test Point:	U8301-19 (3.58MHz)	S-PIP PCB
Adjust:	C8329 (14.318MHz Osc)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Short U8301 pin 6 to ground to allow the 14.318 MHz oscillator to free-run; the insert pix should lose color.
4. Connect a frequency counter (use a 100X probe) to U8301 pin 19; use the PIP shield as ground reference.
5. Adjust the *14.318 MHz Oscillator* control (C8329) for 3.579795 kHz ± 5 Hz at U8301-19.
6. Remove the short added in step 3.

125 kHz Oscillator Alignment

Test Point:	Observe Display	
Adjust:	L8501 (125kHz Osc)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main and insert pix.
3. Short U8503 pin 3 to ground; the insert picture should lose horizontal sync.
4. Adjust the *125 kHz Oscillator* control (L8501) to minimize the movement of the insert pix.
5. Remove the short added in step 3; the insert pix should be stable.

Burst Blanking Adjustment

For 30 pin Decoder IC (U8301) version.

Test Point:	U8301-3 (PIP Chroma)	S-PIP PCB
Adjust:	R8326 (Burst Blanking)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Connect a scope probe (50mV/10msec/div.) to U8301 pin 3 (JW301); use the PIP shield as ground reference.
4. Adjust the *Burst Blanking* control (R8326) to eliminate burst from the chroma signal.

Note: As the control is adjusted through its range, the level of burst *and* chroma signal will vary. Start with the control preset fully counterclockwise. As the control is adjusted clockwise, the signal should reach a peak, then a null, then a second peak. The correct setting for the control is at the null between the two peaks.

APC Adjust

For 28 pin Decoder IC (U8301) version.

Adjust:	R8326 (APC)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Rotate *APC* control (R8326) fully CW, then adjust control CCW to just produce in the small pix. Then adjust control an additional 1/16 CCW to lock in phase.
4. Check color on several channels to assure color phase lock in.

PIX-IN-PIX (S-PIP) ALIGNMENT (Continued)

Output Bias Adjust

Test Point:	Q8302-C	S-PIP PCB
Adjust:	R8320	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Check DC voltage at Q8302-C while rotating the *Output Bias* control (R8320) from full CCW to full CW.
4. Set R8320 to center of DC range.

Note: If minimum voltage at Q8302-C is 2.0 volts DC and maximum voltage is 6.0 volts DC, R8320 should be set to produce 4.0 volts DC at Q8302-C.

Luma Gain (Insert Pix) Adjustment

Test Point:	Q8306-C (Insert Luma)	S-PIP PCB
Adjust:	R8336 (Luma Gain)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Connect a scope probe (0.5V/20msec/div.) to the collector of Q8306; use the PIP shield as ground reference.
4. Adjust the *Luma Gain* control (R8336) for 1.30 ± 0.10 Vp-p (black-to-white) at Q8306-C.

Color Saturation Adjustment

Test Point:	Q8302-C (V IN)	S-PIP PCB
Adjust:	R8324 (Saturation)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Connect a scope probe (0.2V/20msec/div.) to the collector of Q8302; use the PIP shield as ground reference.
4. Adjust the *Saturation* control (R8324) for 1.3V ± 0.1Vp-p at Q8203-C.

Luma Reference Level Adjustment

Test Point:	Observe Display	
Adjust:	R8517 (Y Ref)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.
2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Using the *Video* menu, set the customer color control to minimum.
4. Adjust the *Y Reference* control (R8517) to match the luminance levels of the main pix and the insert pix.

Chroma Reference Level Adjustments

Test Point:	Q8210-E (PIP Chroma)	S-PIP PCB
Adjust:	R8422 (R-Y Null)	S-PIP PCB
	R8424 (B-Y Null)	S-PIP PCB
	R8307 (Tint)	S-PIP PCB
	R8518 (U/V Ref)	S-PIP PCB

1. Connect test equipment as shown in Figure 2.

R-Y/B-Y Null Adjustments

2. Tune the instrument to receive a color bar signal. Select PIP mode to display the color bar signal in both the main pix and insert pix.
3. Connect a scope probe (0.1V/20msec/div.) to the emitter of Q8210; use the PIP shield as ground reference.
4. Alternately adjust the *R-Y Null* control (R8422) and the *B-Y Null* control (R8424) to minimize the non-chroma portion of the signal at Q8210-E (see Fig. 3).

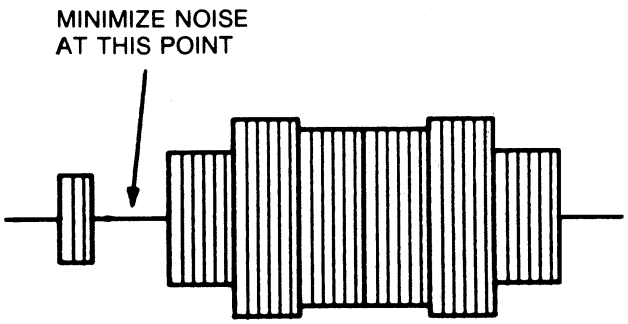


Fig. 3 - R-Y/B-Y Null Adjustment

Tint and U/V Reference Adjustments

5. Tune the instrument to receive a local broadcast color signal. Select PIP mode to display the signal in both the main pix and insert pix.
6. Adjust the *Tint* control (R8307) and the *U/V Reference* control (R8518) to match the flesh tones and chroma saturation of the insert pix to the flesh tones and chroma saturation of the big pix.
7. Repeat steps 2 through 6.

SERVICE ADJUSTMENTS

Purity Adjustment

Caution: This procedure DOES NOT apply to bonded yoke picture tube assemblies.

The instrument should be at room temperature (60 degrees F or above) for six (6) hours and be operating at low beam current (dark background) for approximately 20 to 30 minutes before performing purity adjustments.

Caution: Do not remove any trim magnets that may be attached to the bell of the picture tube.

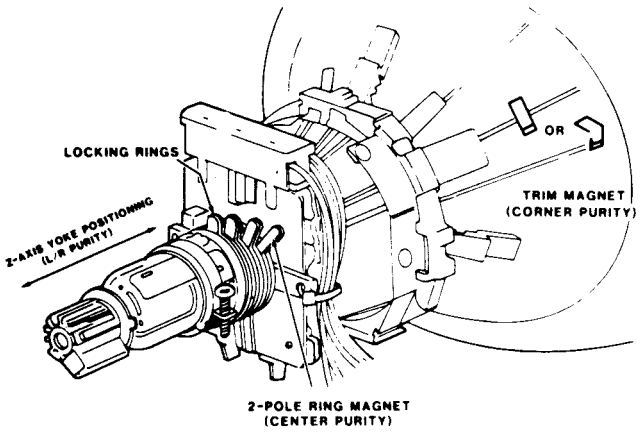


Fig. 1 - Purity Adjustment Locations

1. Remove the AC power.
2. Remove the yoke from the neck of the picture tube.
3. If the yoke has the tape version beam bender, remove it and replace it with an adjustable type beam bender (follow the instructions provided with the new bender).
4. Replace the yoke on the picture tube neck, temporarily remove the three (3) rubber wedges from the bell of the picture tube and then slide the yoke completely forward.
5. Reconnect the internal degaussing coil.
6. Position the beam bender locking rings at the 9 o'clock position and the other three pairs of tabs (2, 4 and 6 pole magnets) at the 12 o'clock position.
7. Perform the following steps, in the order given, to prepare the receiver for the purity adjustment procedure.
   a. Face the receiver in the "magnetic north" direction.
   b. Externally degauss the receiver screen with the television power turned off.
   c. Turn the television on for approximately 10 seconds to perform internal degaussing and then turn the TV off.
   d. Unplug the internal degaussing coil. This allows the thermistor to cool down while you are performing the purity adjustment. DO NOT MOVE THE RECEIVER FROM ITS "MAGNETIC NORTH" POSITION.
   e. Turn the receiver on and obtain a red raster by shorting JW418 to ground, increase the red bias control (CW) and decrease the bias controls for the remaining two colors (CCW).
   f. Attach two (2) round magnets on the picture tube screen at 3 o'clock and 9 o'clock positions, approximately one (1) inch from the edge of the mask (use double-sided tape).
8. Referring to Figure 3, perform the following two steps:
   a. Adjust the yoke Z-axis (See Fig. 1) to obtain equal blue circles.
   b. Adjust the appropriate beam bender tabs to obtain correct purity (four equal circles).
9. After correct purity is set, tighten the yoke clamp screw and remove the two (2) screen magnets.
10. Remove the AC power and rotate the receiver 180 degrees (facing "magnetic south").
11. Reconnect the internal degaussing coil.
12. Turn the receiver on for 10 seconds (make sure the receiver comes on) to perform internal degaussing, and then turn the receiver off.
13. Unplug the internal degaussing coil.
14. Turn on the receiver and check the purity by holding one (1) round magnet at the 3 o'clock and a second round magnet at 9 o'clock position. If purity is not satisfactory, repeat steps 8 through 14.
15. Turn off the receiver, remove short from JW418. Reconnect the internal degaussing coil.

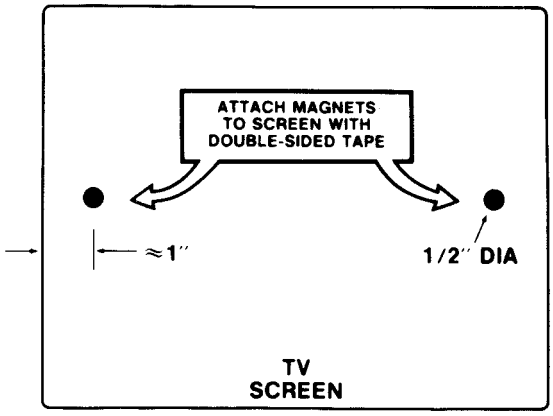


Fig. 2 - Magnets Attached at 3 O'clock and 9 O'clock

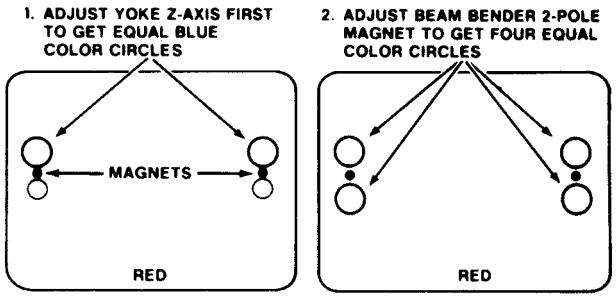


Fig. 3 - Purity Adjustment With Registration Offset Via Screen Magnets

SERVICE ADJUSTMENTS (Continued)

Convergence Adjustment

Caution: This procedure DOES NOT apply to bonded yoke picture tube assemblies.

Caution: Do not use screen magnets during this adjustment procedure. Use of screen magnets will cause an incorrect display.

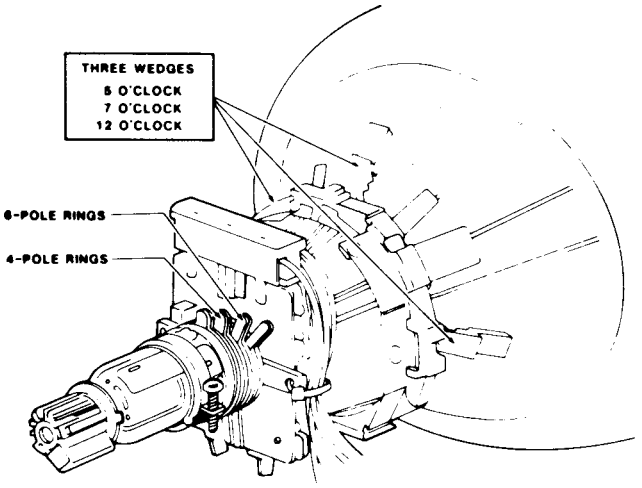


Fig. 4 - Convergence Adjustment Locations

Note: Replace tape type beam bender with an adjustable type beam bender. See parts list for stock number.

1. Remove AC power and disconnect the internal degaussing coil.
2. Obtain a service line by depressing Video Button while holding Setup Button depressed.
3. Turn the *Color* control to minimum.
4. Adjust the *Red, Green* and *Blue Bias* controls to get a dim white line.
5. Remove the AC power.
6. Reconnect the internal degaussing coil and apply AC power.
7. Turn the receiver on for 10 seconds to perform internal degaussing and then turn the receiver off again.
8. Unplug the internal degaussing coil.
9. Turn on the receiver, connect a signal generator to the VHF antenna terminal and apply a crosshatch signal.

Caution: During the convergence adjustment procedure, be very careful not to disturb the purity adjustment tabs that have been previously adjusted. If they are accidentally moved, purity should be confirmed before proceeding with the convergence adjustments.

10. Converge the red and blue vertical lines to the green vertical line at the center of the screen by performing the following steps (Fig. 5).
    a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in opposite directions from the 12 o'clock position to converge the red and blue vertical lines.
    b. Carefully rotate both tabs of the 6-pole ring magnet simultaneously in opposite directions from the 12 o'clock position to converge the red and blue (now purple) vertical lines with the green vertical line.
11. Converge the red and blue horizontal lines with the green line at the center of the screen by performing the following steps (Fig. 5).
    a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in same direction (keep the spacing between the two tabs the same) to converge the red and blue horizontal lines.
    b. Carefully rotate both tabs of the 6-pole ring magnet simultaneously in same direction (keep the spacing between the two tabs the same) to converge the red and blue (now purple) horizontal lines with the green horizontal line.
    c. Secure the tabs previously adjusted by locking them in place with the locking tabs on the beam bender.
12. While watching the 6 o'clock and 12 o'clock positions on the screen, rock the front of the yoke in a vertical (up/down) direction to converge the red and blue vertical lines (Fig. 6).

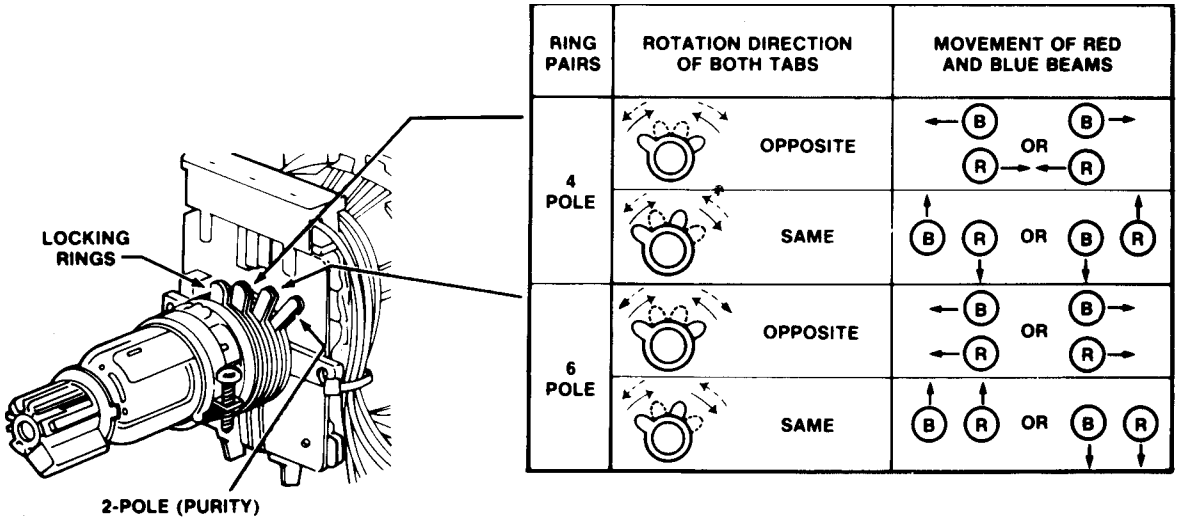


Fig. 5 - In-Line Kine Convergence Ring Adjustment

SERVICE ADJUSTMENTS (Continued)

Convergence Adjustment (Continued)

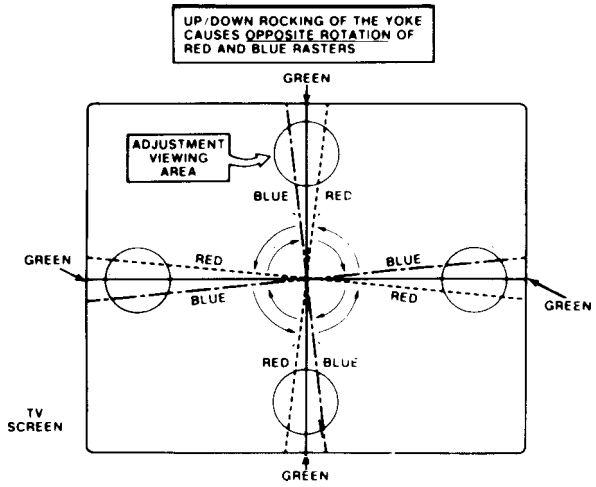


Fig. 6 - Yoke Tilt Convergence Adjustment

13. Temporarily place a rubber wedge at the 12 o'clock position to hold the vertical position of the yoke.
14. Check the 3 o'clock and 9 o'clock areas to confirm that the red and blue horizontal lines are converged. If the lines are not converged, slightly offset the vertical tilt of the yoke (move the rubber wedge if necessary) to equally balance the convergence error of the horizontal lines at 3 o'clock and 9 o'clock and the vertical lines at 6 o'clock and 12 o'clock.
15. Place a 1.5 inch piece of glass tape over the rubber foot at the rear of the 12 o'clock wedge.
16. While watching the 6 o'clock and 12 o'clock areas of the screen, rock the front of the yoke in the horizontal (left to right) motion to converge the red and blue horizontal lines (Fig. 7)
17. Temporarily place a rubber wedge at the 5 o'clock and 7 o'clock positions to hold the horizontal position of the yoke.

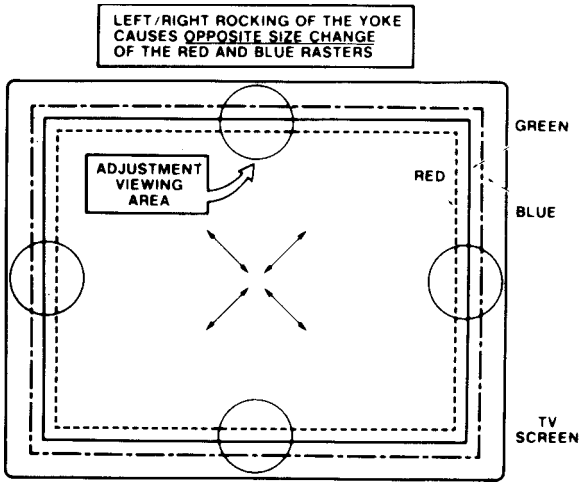


Fig. 7 - Yoke Horizontal Convergence Adjustment

18. Check the 3 o'clock and 9 o'clock areas to confirm that the red and blue vertical lines are converged. If the lines are not converged, slightly offset the horizontal tilt of the yoke (move the temporary rubber wedges if necessary) to equally balance the convergence error of the horizontal lines at 6 o'clock and 12 o'clock and the vertical lines at 3 o'clock and 9 o'clock.
19. Using a round magnet confirm purity at the center, right and left sides and corners. See Purity Adjustment Procedure.
20. Reconfirm convergence and apply a 1.5 inch piece of glass tape over the rubber foot at the rear of the 5 o'clock and the 7 o'clock wedges.

Color Temperature Adjustment

Test Point:	Observe Display	
Adjust:	R4704 (Screen)	Main PCB
	R2913 (Red Bias)	Main PCB
	R2921 (Green Bias)	Main PCB
	R2917 (Blue Bias)	Main PCB
	R2926 (R/B Drive)	Main PCB
	R2928 (G Drive)	Main PCB

1. Tune the instrument to receive a color bar signal.
2. Preset the *Drive* controls to midrange and the *Bias* controls to minimum. Preset the *Screen* control to minimum.
3. Defeat the chroma portion of the signal by either a) turning off the chroma at the signal generator, or b) shorting pin 42 of U1001 (located on the Main PCB) to ground.
4. Select channel 90 (S-VIDEO) for a blank display. Using the Video menu, set *Brightness* to three steps above the Reset value.
5. Defeat vertical scan by shorting the collector of Q4505 to ground.
6. Advance the *Screen* control (R4704) clockwise until a dim colored line just appears, and note which color (red, green or blue) is predominate. Adjust the remaining *Bias* controls (R2913, R2921 and/or R2917) to obtain a white line. Reduce the *Screen* setting, if necessary, to maintain a dim service line.
7. Remove the short from the collector of Q4505. Tune the instrument to receive the color bar signal (with no color).
8. Observe the brightest bar of the display and adjust the *Red/Blue Drive* control (R2926) and the *Green Drive* control (R2928) to obtain a white bar.
9. Repeat steps 4 through 8 as necessary to obtain good white tracking.

SERVICE ADJUSTMENTS (Continued)

Vertical Height Adjustment

Test Point:	Observe Display	
Adjust:	R4522 (V Height)	Main PCB

1. Tune the instrument to receive a local broadcast.
2. Adjust the *Vertical Height* control (R4522) for approximately 1/4" overscan at the top and bottom of the display.

Horizontal Centering Adjustment

Test Point:	Observe Display	
Adjust:	R4306 (H Phase)	Main PCB

1. Tune the instrument to receive a color bar signal.
2. Adjust the *Horizontal Phase* control (R4306) to center the video within the display area.

Focus Adjustment

Test Point:	Observe Display	
Adjust:	R4704 (Focus)	Main PCB

1. Tune the instrument to an unused channel ("snowy" display).
2. Set *Brightness* and *Contrast* to maximum for minimum beam current.
3. Adjust the *Focus* control (R4704) for best overall focus.

Dynamic Focus Adjust

The instruments equipped with dynamic focus are easily identified by the number of controls on the focus/screen block. The instruments with dynamic focus will have three controls versus two on those not equipped with dynamic focus. The top control is for adjusting the focus of the vertical lines and is labeled V. The center control is for adjusting the focus of the horizontal lines and is labeled H. The bottom control is for adjusting the screen voltage. The H and V control adjustments interact, therefore the controls should be adjusted to optimize the focus at the center of the screen.

Adjustment Procedure

1. Connect a crosshatch generator to the instrument and display a crosshatch pattern.
2. Adjust the H and V focus controls to optimize the focus of the horizontal and vertical lines at the center of the screen.

D-PIP Adjustment

1. Tune the instrument to an active channel with color programming.
2. Place instrument in pix-in-pix mode of operation.
3. Adjust R8031 (Y-Adjust) to match the small pix brightness level to the big pix brightness level.
4. Adjust R8037 (C-Adjust) to match the small pix color level to the big pix color level.

Field (Purity) Correction Compensation Adjustment

The 35-inch models have an extra large color picture tube. The effects of geomagnetism (Earth's magnetic field) may cause an uneven (partial colored) picture or splotches of unwanted diffused color (especially in the corners of the picture). The *POLARITY* and *STRENGTH* switches on the back of the TV provide compensation for this effect. These switches are on 35-inch models only.

If discoloration in small areas of the picture occurs, follow these steps to correct it.

1. Make sure the *STRENGTH* switch is in the *OFF* position as the diagram shows.

Note: If the *STRENGTH* switch was not in the *OFF* position, after moving it to the *OFF* position, turn the TV off for approximately 2 minutes. Then turn it back on again. If the discoloration is still there, continue to the next step.

2. Move the *STRENGTH* switch to the *LOW* position. If this improves the discoloration but does not get rid of it, move the *STRENGTH* switch to the *HIGH* position. This should correct the situation. If moving the *STRENGTH* switch makes the discoloration worse, go to the next step.
3. Change the position of the *POLARITY* switch. Make sure the *STRENGTH* switch is returned to the *OFF* position. If the discoloration is still there, move the *STRENGTH* switch to the *LOW* position. If this improves the discoloration but does not get rid of it, move the *STRENGTH* switch to the *HIGH* position. This should correct the situation.

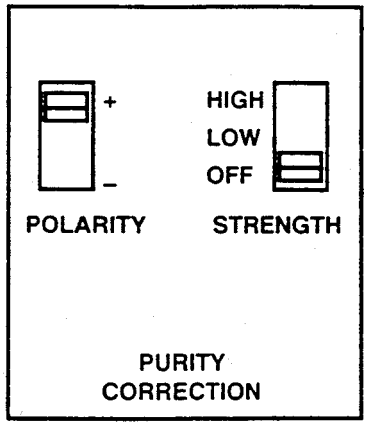


Fig. 1 - Field (Purity) Correction Compensation Adjustment

You may need to reset the *POLARITY* and *STRENGTH* switches if the TV is moved or repositioned in the room, especially if the TV will be facing a different direction.

SERVICE ADJUSTMENTS (Continued)

Field (Pix Tilt) Correction Compensation Adjustment

1. Make sure the *STRENGTH* switch is in the *OFF* position as the diagram shows.
2. Move the *STRENGTH* switch to the *LOW* position. If this improves the tilt but it is still not satisfactory, move the *STRENGTH* switch to the *HIGH* position. This should correct the situation. If moving the *STRENGTH* switch makes the tilt worse, go to the next step.
3. Change the position of the *POLARITY* switch. If this improves the tilt but it is still not satisfactory, move the *STRENGTH* switch to the *HIGH* position. This should correct the situation.

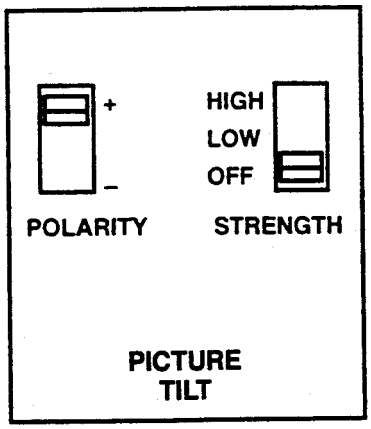


Fig. 2 - Field (Pix Tilt) Correction Compensation Adjustment

You may need to reset the *POLARITY* and *STRENGTH* switches if the TV is moved or repositioned in the room, especially if the TV will be facing a different direction.