

## ADJUSTMENT INSTRUCTIONS

### \*Alignment procedures

1. It is safe to adjust after using insulating transformer between the power supply line and chassis input to prevent the risk of electric shock and protect the instrument.
2. Never disconnect leads while the TV receiver is on.
3. Don't short any portion of circuits while power is on.
4. The adjustment must be done by the correct appliances. But this is changeable in view of productivity.
5. Unless other-wise noted, set the line voltage to 230V; 10%, 50hz.

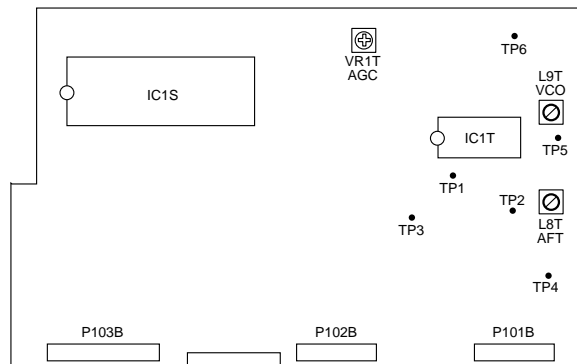
### \*Test Equipment required

1. VIF sweep generator
2. Color bar/cross-hatch pattern generator
3. DC power supply
4. Digital multi-meter
5. Color analyzer

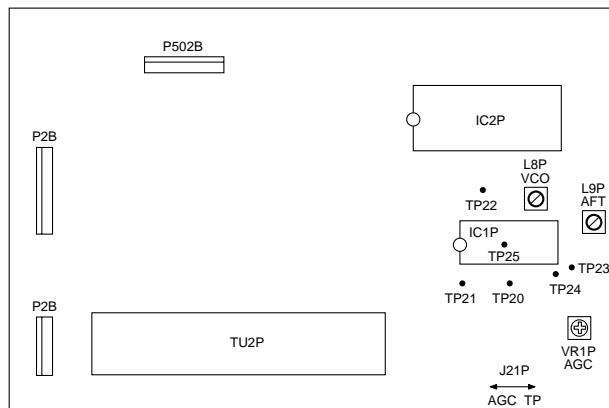
#### Preparation for VCO & AFT Adjustment

1. Connect the measuring equipment to the TV as shown in Fig.1
2. Set RF output level of Sweep S.G (Signal Generator) to 80dBuV.
3. Set Alignment Scope, Volts/Div to 100mV (VCO) or 1V(AFT), AC/DC switch to AC, Line/Ext switch to Ext.

IF Board (Component side view)



PIP Board (Component side view)



**NOTE:** TP point is on the copper side of PCB.

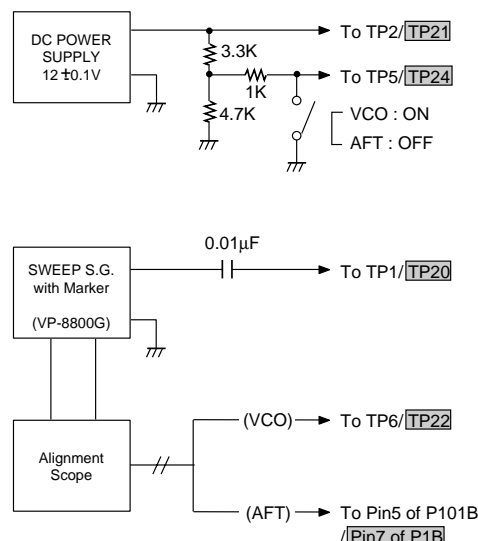



Fig.1: Connection Diagram of Equipment for VCO & AFT Adjustment.


#### NOTE:

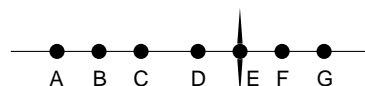
 : PIP Board (Only 2 TUNER PIP Model)

### \* VCO (Voltage Controlled Oscillator) Adjustment

**Test Point:** TP6 /  TP22

**Adjust:** L9T /  L8P

- 1) Turn on DC power supply.
- 2) Adjust Video Detector Coil (L9T /  L8P ) so that a waveform on Alignment Scope is the same as below Fig.2.





- A : 30.0MHZ
- B : 31.5MHZ
- C : 32.84MHZ
- D : 36.8MHZ
-  E : 38.0MHZ
- F : 39.5MHZ
- G : 40.25MHZ

Fig.2: VCO waveform on Alignment Scope

### \* AFT(Auto Fine Tuning) Adjustment

**Test Point:** PIN5 of P101B /  PIN7 of P1B

**Adjust:** L8T /  L9P

- 1) Turn on DC power supply.
- 2) Adjust IF AFT coil (L8T /  L9P ) so that 38.0 MHz (Vc) point will be center as Fig.3.

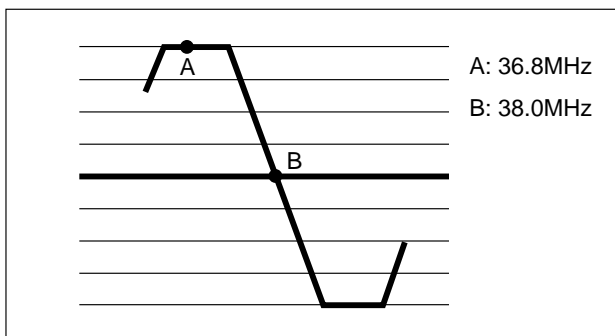


Fig.3: AFT waveform on Alignment Scope

### \* RF AGC (Auto Gain Control)Adjustment

**Test Point:** J1(on Main Board) / J22P

**Adjust:** VR1T / VR1P

The RF AGC control (VR1T/ VR1P ) was aligned at the time of manufacture for optimum performance over a wide range conditions. Readjust of VR1T/ VR1P should not be necessary unless unusual local conditions exist, such as:

- 1) Channel interference in a CATV system.
- 2) Picture bending and/or color beats, which are unusually due to excessive RF signal input when the receiver is too close to a transmitting tower or when the receiver is connected to an antenna distribution system where the RF signal has been amplified.  
In this case, the input signal should be attenuated (with pad or filter) to a satisfactory level.
- 3) Picture noise caused by "broadcast noise" or weak signal. If the broadcast is "clean" and the RF signal is at least 1mV (60dBuV), the picture will be noise free in any area.

Adjusting the VR1T/ VR1P (RF AGC) control to one end of rotation will usually cause a relatively poor signal to noise ratio;

Adjusting to the other end of rotation will usually cause a degradation of over load capabilities resulting in color beats or adjacent channel reference.

For best results, adjust the VR1T/ VR1P control while performing on all over local channels, or the voltage at J50(MAIN 1 Board) / J22P (PIP Board : OPTION) will be 5.5 +\_0.1Vdc in RF level 60+\_1dBuV.

### \* Vertical center/Horizontal center/ SECAM Adjustment

**NOTE:** These adjustments are already aligned at the time of manufacture for optimum performance. Readjust of them should not be necessary unless IC2(EEPROM) is defective. Because all the information of these adjustment are memorized in that IC.

### Adjustment procedures

- 1) Tune the TV set to receive a digital pattern unless otherwise noted.
- 2) Press OK button on Control Board continuously and yellow button on remote controller then you can find On Screen Display. (Refer to the following Fig.4).
- 3) Press PR+ or PR- button for desirous function adjustment.
- 4) Press VOL+ or VOL- button for correct picture.
- 5) Press OK button to memorize all the adjusted data.

[LINE SVC1]	PR1
H-CENT	11
V-CENT	02
SUB BRIGHT	10
SUB TINT	10
SECAM BELL	04
SECAM R-Y	08
SECAM B-Y	14
SECAM AMP	02

Fig.4

### Horizontal center adjustment

Adjust so that the horizontal center line of digital pattern is in accord with geometric horizontal center of the CPT.

### Vertical center adjustment

Adjust so that the vertical center line of digital pattern is in accord with geometric center of the CPT.

### SECAM BELL filter adjustment

- 1) Tune the TV set to receive a SECAM digital pattern.
- 2) Adjust so that the color on the 3.8MHz pattern is minimized.

### SECAM B-Y/R-Y adjustment

- 1) Tune the TV set to receive a SECAM digital pattern.
- 2) Adjust so that the background color is equal to the PAL background color.

### SECAM AMP adjustment

- 1) Tune the TV set to receive a SECAM digital pattern.
- 2) Adjust so that the level of SECAM color is equal to the level of PAL color.

SUB BRIGHT/TINT adjustment

**NOTE:** This adjustment should be performed after White Balance adjustment.

- 1) Tune the TV set to receive a broadcasting signal.
- 2) Adjust so that the brightness/TINT is optimum condition on the screen.

**NOTE:** If press OK button on Control Board continuously and press continually two times yellow button on remote controller then you can find On Screen Display as follow Fig.5.

\* Never change these data, these are important reference data for TV.

[LINE SVC2]		PR1
PEAK	LIMITER	OFF
P/N	GP	INITIAL
SECAM	GP	INITIAL
P/N	AMP	0
AV-IN	VOL	044
FM	PRESCALE	031
NICAM	VOL	108
SCART	VOL	040

Fig.5

\*Vertical Height (VH)/Horizontal Width (HW)/Pin Cushion (PC) Adjustment

- 1) Tune the TV set to receive a digital pattern.
- 2) Set contrast to 100%, brightness and color to 50% individually.
- 3) Adjust VR301(VH) so that the circle of the digital pattern may be located within the effective screen of the CPT.
- 4) Adjust VR404(HW) so that the circle of the digital pattern looks like exact circle.
- 5) Adjust VR403(PC) so that the outermost left and right vertical line looks like parallel with vertical lines of the CPT.

\* Screen & White Balance (color temperature) Adjustment

**NOTE:** This adjustment should be performed after warming up for 15 minutes at least.

<b>Test Point:</b>	Observing Display
<b>Adjust:</b>	Screen Control of FBT VR901, 902, 903 (Low Light) VR904, 905 (High Light)

- 1) Set VR901, 902, 903, 904, 905 on CPT Board to the mechanical center position.

- 2) Tune the TV set to receive white pattern of PAL standard signal.
- 3) Press OK button on Control Board continuously and blue button on remote controller for obtaining a horizontal line on the middle of CPT.
- 4) Turn the screen control of FBT counter-clockwise and set it to the minimum position.
- 5) Turn the screen control of FBT clockwise slowly to appear a horizontal line.
- 6) Adjust Cut-off volume(VR901, 902, 903) so that the horizontal line may become white.  
First, except the appeared color on the horizontal line with one volume and then make to be white line with the other two volume.
- 7) Turn the Screen control counter-clockwise for the horizontal line to be complet cut-off.
- 8) Press OK button.
- 9) With a color analyzer (white balance checker), adjust VR904 and VR905 on the CPT Board to set X position to 279+\_8 and Y position to 294+\_8 (color temperature is 12000+\_800) at the high light (45ft.L).
- 10) Control contast and brightness to be 4.5ft.L color temparature, and adjust VR901 and VR903 so that the screen may become white.
- 11) By varing contrast and brightness, whether you have good adjustment in high and low light areas on the screen.  
If not, re-adjust above setp 3)~ 10).

\* Focus Adjustment

**NOTE:** This adjustment should be performed after warming up for 10 minutes.

<b>Test Point:</b>	Observing Display
<b>Adjust:</b>	Focus control of FBT

- 1) Set color to minimum, brightness and contrast to maximum individually.
- 2) Tune the TV set to an inactive channel station (snow condition).
- 3) Adjust the Focus control for best overall focus.

## PURITY & CONVERGENCE ADJUSTMENT

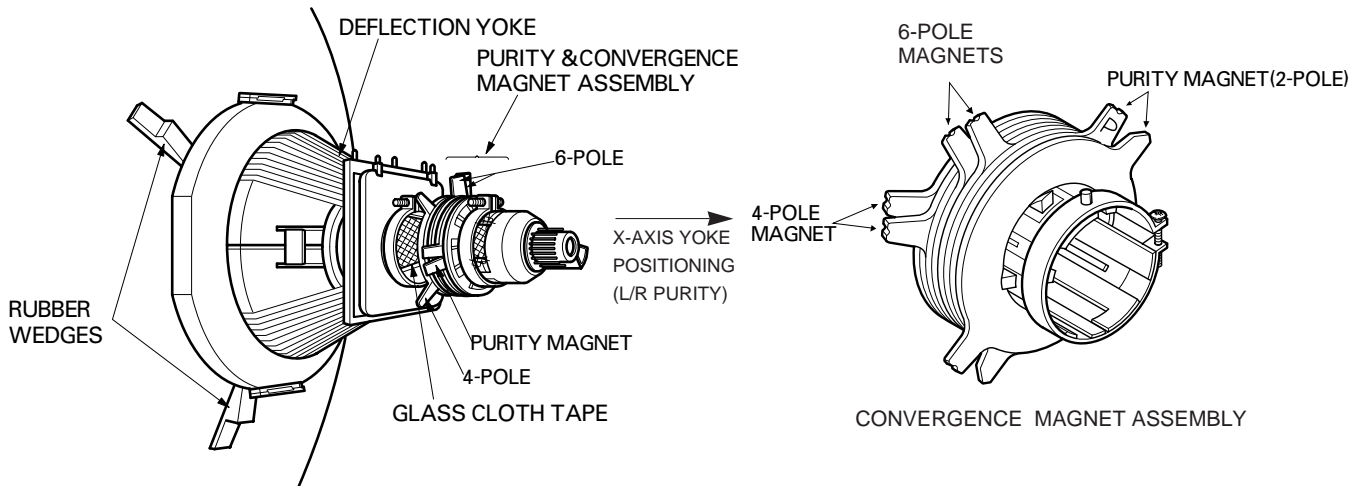
### Caution:

Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments.

However, the effects of adjacent receiver components, or replacement of picture tube or deflection yoke may require the need to readjust purity any convergence.

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.



### \* Purity Adjustment

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

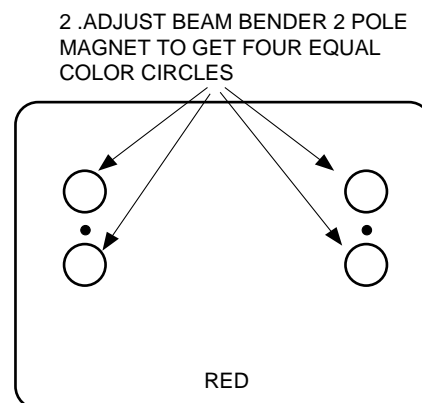
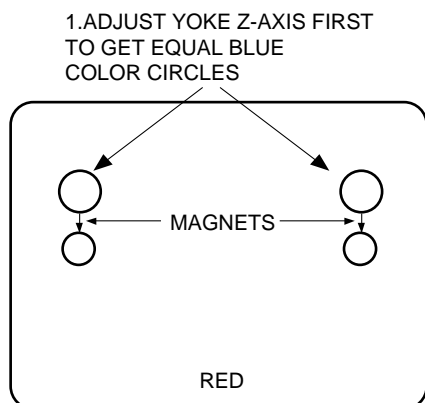
The instrument should be at room temperature (60 degrees F or above) for six (6) hours and be operating at low beam current (dark background) for approximately 20 to 30 minutes before performing purity adjustments.

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

1. Remove the AC power and disconnect the internal degaussing coil.
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 a adjustable type beam bender (follow the instructions provided with the new beam 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.

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 increasing the red bias control (CW) and decreasing the bias controls for the remaining two colors (CCW).
- f. Attach two 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 above, perform the following two steps:
  - a. Adjust the yoke Z-axis 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 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 came 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 and reconnect the internal degaussing coil.

### \* Convergence Adjustment

**Caution:** This procedure DOES NOT apply to bonded yoke and picture tube assemblies. Do not use screen magnets during this adjustment procedure. Use of screen magnets will cause an incorrect display.

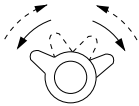
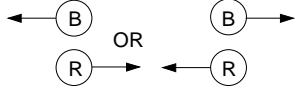



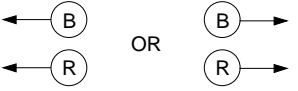

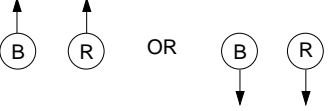
1. Remove AC power and disconnect the internal degaussing coil.
2. Apply AC Power and set the brightness to the Picture Reset condition. Set the Color control to minimum.
3. Apply 8V to the pin.
4. Adjust the Red, Green and Blue Bias controls to get a dim white line.
5. Remove the AC power and 8V from the pin.

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 are accidentally move, purity should be confirmed before proceeding with the convergence adjustments.

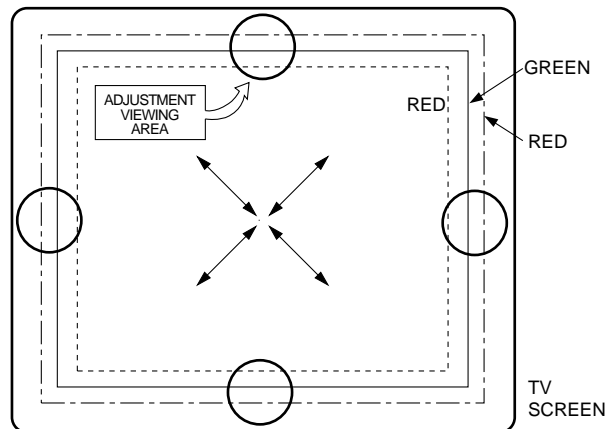
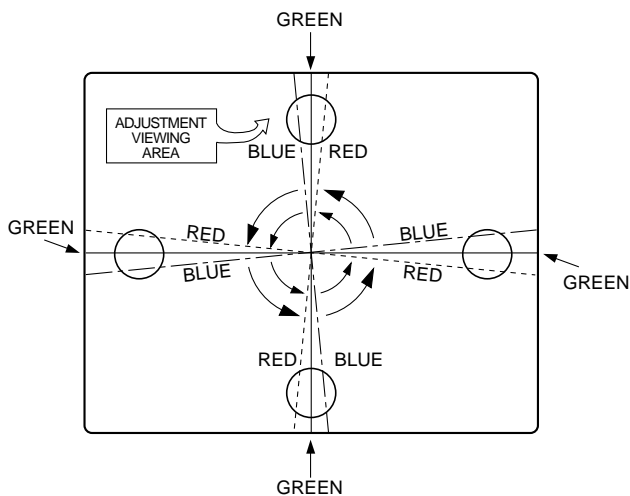
**Note:** Make sure the focus is set correctly on this instrument before proceeding with the following adjustment.

10. Converge the red and blue vertical lines to the green vertical line at the center of the screen by performing the following steps (below TABLE).
  - 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 with the green line at the center of the screen by performing the following steps. (below TABLE)
  - a. Carefully rotate both tabs of the 4-pole ring magnet simultaneously in the 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.

RING PAIRS	ROTATION DIRECTION OF BOTH TABS	MOVEMENT OF RED AND BLUE BEAMS
4 POLE	 OPPOSITE	
	 SAME	
6 POLE	 OPPOSITE	
	 SAME	

UP/DOWN ROCKING OF THE YOKE  
CAUSES OPPOSITE ROTATION OF RED  
AND BLUE RASTERS

LEFT/RIGHT ROCKING OF THE YOKE  
CAUSES OPPOSITE SIZE CHANGE OF THE  
RED AND BLUE RASTERS



- While watching the 6 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 upper left)
- Temporarily place a rubber wedge at the 12 o'clock position to hold the vertical position of the yoke.
- 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.
- Place a 1.5 inch piece of glass tape over the rubber foot at the rear of the 12 o'clock wedge.
- 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. upper right)
- Temporarily place a rubber wedge at the 5 o'clock and 7 o'clock positions to hold the horizontal position of the yoke.
- 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.
- Using a round magnet confirm purity at the center, right and left sides and corners. See Purity Adjustment Procedure.
- 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.