

SAFETY INSTRUCTIONS

SAFETY PRECAUTIONS

WARNING: The chassis of this receiver has a floating ground with the potential of one half the AC line voltage in respect to earth ground. Service should not be attempted by anyone not familiar with the precautions necessary when working on this type of equipment.

The following precautions must be observed:

1. An isolation transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. Comply with all cautions and safety-related notes provided on the side of the cabinet, inside the cabinet, on the chassis, and the picture tube.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as control knobs, adjustment covers, shields and barriers.

DO NOT OPERATE THIS TELEVISION RECEIVER IF THE PROTECTIVE SHIELD IS NOT IN POSITION AND PROPERLY SECURED.

4. Before replacing the back cover of the set, thoroughly inspect the inside of the cabinet to see that no stray parts or tools have been left inside.
Before returning any television to the customer, the service technician must perform the following safety checks to be sure that the unit is completely safe to operate without danger of electrical shock.

ANTENNA COLD CHECK

Remove AC plug from the 120VAC outlet and place a jumper across the two blades. Connect one lead of an ohmmeter to the jumpered AC plug, and touch the other lead to each exposed antenna terminal (UHF and VHF combination antenna terminal). The resistance must measure between 1M ohm and 5.2M ohm. Any resistance value below or above this range indicates an abnormality which requires corrective action.

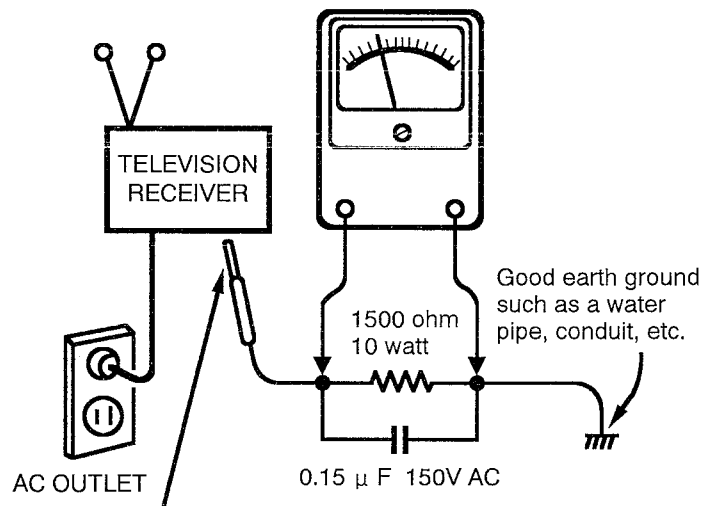
LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120 VAC outlet. (Do not use an isolation transformer for this check.) Use an AC voltmeter, that has 5000 ohms per volt or more sensitivity. Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 μ F 150 VAC capacitor, between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of the cabinet (antennas, handle bracket, metal cabinet, screw heads, metal overlays, control shafts, etc.). Measure the AC voltage across the 1500 ohm resistor.

The AC voltage should not exceed 750 mV. A reading exceeding 750 mV indicates that a dangerous potential exists. The fault must be located and corrected. Repeat the above test with the receiver power plug reversed.

NEVER RETURN A RECEIVER TO THE CUSTOMER WITHOUT TAKING THE NECESSARY CORRECTIVE ACTION.

READING SHOULD NOT EXCEED 750 mV
AC VOLT METER
(5000 ohms per volt or more sensitivity)



To be touched to all of exposed metal parts.
Voltmeter Hook-up for Leakage Current Check

X-RADIATION PRECAUTION

The primary source of X-RADIATION in solid-state receiver is the picture tube. The picture tube is specially constructed to limit X-Ray emission. For continued X-RADIATION protection, the replacement tube must be the same type as the original (including the suffix letter in the part numbers). Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specific limits. Refer to the X-RADIATION WARNING NOTE on the CHASSIS SCHEMATIC in this service manual for specific high voltage limits. If the high voltage exceeds specified limits, check the components specified on the chassis schematic diagram and take the necessary corrective action. Carefully follow the instructions for the +B Voltage Check and the High Voltage Check to maintain the high voltage within the specified limits.

HIGH VOLTAGE HOLD-DOWN TEST

To prevent X-RADIATION from the picture tube due to excessive high voltage, a HOLD-DOWN circuit is provided in the high voltage circuits. Every time the receiver is serviced, the high voltage HOLD-DOWN circuit must be tested for proper operation. Refer to the "HIGH VOLTAGE HOLD-DOWN TEST" in service adjustments.

PRODUCT SAFETY NOTICE

When replacing components in a receiver, always keep in mind the necessary product safety precautions. Pay special attention to the replacement of components marked with a star (★) in the parts list and in the schematic diagram. To ensure safe product operation, it is necessary to replace those components with the exact same PARTS.

SERVICE ADJUSTMENTS

GENERAL

This set is equipped with the On-screen Service Menu system included in the CPU which allows remote operation for the most of service adjustments.

IC802 (EEPROM) REPLACEMENT

When IC802 (EEPROM) is replaced, IC801 (CPU) will automatically write the initial reference data into IC802 for basic TV operation. However the bus data should be checked and some bus data should be set up before attempting the service adjustments. (See pages 4-5 for detailed information.)

INITIAL BUS DATA SETUP

Note: When IC802 (EEPROM) is replaced, the Service Menu "NO. 01 HP" (H Phase), "NO. 11 RD" (R Drive), "NO. 12 BD" (B Drive), "NO. 21 GD" (G Drive Reduction) and "NO. 27 STI" (Sub-Tint) should be set up for proper TV operation before attempting the service adjustments.

1. Disconnect the AC power cord (AC 120V line).
2. While pressing the "MENU" key, reconnect the AC power cord. The Service Menu display will now appear.
3. Select "NO. 01 HP" (H Phase) with "▲" or "▼" key. Adjust the data with "+" or "-" key for "11".
4. Select "NO. 11 RD" (Red Drive) with "▲" or "▼" key. Adjust the data with "+" or "-" key for "60".
5. Select "NO. 12 BD" (Blue Drive) with "▲" or "▼" key. Adjust the data with "+" or "-" key for "60".
6. Select "NO. 21 GD" (G Drive Reduction) with "▲" or "▼" key. Adjust the data with "+" or "-" key for "7".
7. Select "NO. 27 STI" (Sub-Tint) with "▲" or "▼" key. Adjust the data with "+" or "-" key for "13".
8. Press the "MENU" key to turn off the Service Menu display.

ON-SCREEN SERVICE MENU SYSTEM

1. Enter the Service Menu:

- While pressing the "MENU" key, connect the AC power cord. The Service Menu display will now appear. (See Figure 1 below.)

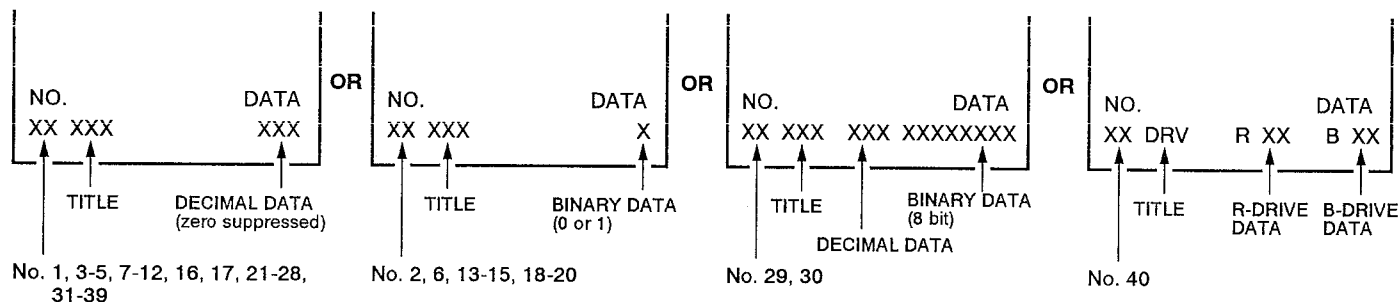


Figure 1. Service Menu Display

2. Service Adjustments:

- Press the "▲" or "▼" key to select the desired service menu you want to adjust. (See pages 4-5 for On-Screen Service Menu.)
- Use the "+" or "-" key to adjust the data.

3. Exit from the Service Menu:

- Press the "MENU" key to turn off the Service Menu display.

Table 1. ON-SCREEN SERVICE MENU

When IC802 (EEPROM) is replaced, check the bus data if they are same as below. The shaded menu should be checked and be set up or readjusted according to the procedure described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

NO.	TITLE	INITIAL REFERENCE DATA (decimal)	INITIAL SETUP DATA (decimal)	RANGE OF DATA (decimal)	FUNCTION
01	HP	15	* 11	0~31	H-Phase (H-Centering)
02	IAS	0	0	0, 1	IF AGC Switch 0: TV (Normal) 1: AV (IF Gain Minimum)
03	RAD	35	35	0~63	RF AGC Delay
04	PT	64	64	0~127	PLL Tuning
05	ADA	32	32	0~63	APC Detect. Adjust.
06	CD	0	0	0, 1	C-Diff
07	VS	32	32	0~63	Vertical Size
08	RB	0	0	0~255	Red Bias
09	GB	0	0	0~255	Green Bias
10	BB	0	0	0~255	Blue Bias
11	RD	55	* 60	0~127	Red Drive
12	BD	55	* 60	0~127	Blue Drive
13	TDS	1	1	0, 1	Trap & D (B.P.F.) Switch 0: OFF 1: ON
14	AF	0	0	0, 1	Auto Flesh 0: OFF 1: ON
15	BS	0	0	0, 1	Black Stretch 0: ON 1: OFF
16	VL	4	4	0~7	Video Level
17	FL	15	15	0~31	FM Level
18	NIS	1	1	0, 1	N/I Switch (Black Noise Inverter Switch) 0: ON 1: OFF
19	ABL	1	1	0, 1	ABL Defeat 0: OFF 1: ON
20	WP	1	1	0, 1	White Peak Limiter 0: ON 1: OFF
21	GD	8	* 7	0~15	G Drive Reduction
22	VC	0	0	0~7	V Size Compensation
23	VD	32	32	0~63	V DC (V-Position)
24	AG	3	3	0~3	AFC Gain 00: Auto 01: High Gain 10: Low Gain 11: Non-Gate
25	SB	32	32	0~63	Sub-Brightness
26	SCO	11	11	0~31	Sub-Color
27	STI	11	* 13	0~31	Sub-Tint
28	SSH	8	8	0~15	Sub-Sharpness
29	OPT	4	4	0~255	Option 1 (See Note 1 below.)
30	OP2	0	0	0~255	Option 2 (See Note 1 below.)
31	HR	0	0	0~63	H-Position (OSD H-Position)
32	INP	0	0	0~63	Input Level (Composite Input)
33	STE	0	0	0~63	Stereo VCO
34	FIL	0	0	0~63	fH Reject. Filter
35	LSP	0	0	0~63	Low Separation
36	HSP	0	0	0~63	High Separation
37	SPV	0	0	0~63	SAP VCO
38	PCO	0	0	0~63	PIP Color
39	PTI	0	0	0~63	PIP Tint
40	DRV	—	—	0~127	Red Drive Adjustment (See Note 2 below.)
		—	—	0~127	Blue Drive Adjustment (See Note 2 below.)
41	—	—	—	0~255	Red Bias Adjustment (See Note 3 below.)
	—	—	—	0~255	Green Bias Adjustment (See Note 3 below.)
	—	—	—	0~255	Blue Bias Adjustment (See Note 3 below.)

Note 1. Option Data should be "00000100" for Option 1 and "00000000" for Option 2. If they are wrong, the TV does not operate properly.

OPTION 1			
BIT	FUNCTION	DATA	
		0	1
0, 1	TV HOTEL MONITOR	00 : TV 01 : HOTEL 10 : MONITOR (*1) 11 : INHIBITED (=TV)	
2	VIDEO INPUT	NONE (*2)	YES
3, 4	CLOCK	00 : NONE 01 : YES (AC Freq.) 10 : YES (Internal OSC) 11 : INHIBITED (=NONE)	
5	STEREO/MONO	MONO (*3)	STEREO
6, 7	SURROUND	00 : NONE 01 : YES 10 : Q-SOUND 11 : INHIBITED (=NONE)	

OPTION 2			
BIT	FUNCTION	DATA	
		0	1
0	NOT USED	—	—
1	COLOR ENHANCER	NONE	YES
2	INITIAL CH	NONE	YES (*4)
3	BEAM DET. OPTION	NONE	YES
4	PIP	NONE	YES
5	NOT USED	—	—
6	NOT USED	—	—
7	NOT USED	—	—

- *1...When the Monitor option is used, the CPU regards that the TV with Video Input option and None PIP option.
 *2...When the None Video Input option is used, the CPU regards that the TV with None PIP option.
 *3...When the Mono option is used, the CPU regards that the TV with None Surround option.
 *4...When the Initial CH option is used, the Initial CH, the Favorite CH, the Parental Control and the XDS (Extended Data Service) features are available.

Note 2. Red/Blue Drive Adjustments in Service Menu "NO. 40 DRV": Adjust Red and Blue Drive Levels alternately with "1", "3", "7" or "9" key on the remote control. (See Figure 2.) The Drive Level adjustment data will be rewritten in the Service Menu No. 11 and 12 automatically.



Figure 2.

Note 3. Red/Green/Blue Bias Adjustments in Service Menu "NO. 41": Adjust each Bias Level with "1", "3", "4", "6", "7" or "9" key on the remote control. (See Figure 3.) The Bias Level adjustment data will be rewritten in the Service Menu No. 08~10 automatically.

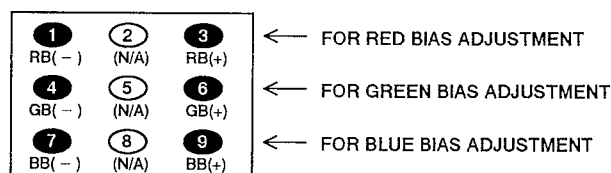


Figure 3.

ANTENNA CONNECTION

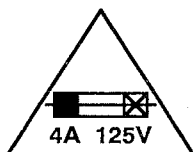
This receiver is designed for UHF/VHF reception. A 75 ohm terminal is provided for UHF and VHF receptions.

When connecting the CATV antenna system, connect the 75 ohm coaxial cable directly to 75 ohm terminal. For 300 ohm UHF/VHF antenna, use the adapter (not included with the TV set).

CIRCUIT PROTECTION

Fuse F601 (4A) is included in the AC line. This fuse must be replaced with the proper fuse. (See Parts List.)

CAUTION



FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D'INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

+B VOLTAGE CHECK

Connect voltmeter + lead to "TJ1 135V" and - lead to ground (TE7). Connect receiver to AC 120V line. Tune receiver to an active channel. Set the picture controls to the "Auto" levels. Voltage must measure between +133.0V and +136.1V. If the voltage is out of this range, the power circuit must be checked. No +B adjustment is provided on this chassis.

HORIZONTAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the horizontal center of TV screen. If picture center is too right or left, perform steps 3-6.
3. Turn off the receiver and disconnect the AC power cord (AC 120V line).
4. While pressing the "MENU" key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select "NO. 01 HP" (Horizontal Phase) with "▲" or "▼" key.
6. Adjust the data with "+" or "-" key for proper horizontal center. To turn off the Service Menu display, press the "MENU" key.

VERTICAL SIZE ADJUSTMENT

1. Tune receiver to an active channel.
2. Check the vertical size of the picture. If the vertical size is too large or small, perform steps 3-6.
3. Turn off the receiver and disconnect the AC power cord (AC 120V line).
4. While pressing the "MENU" key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select "NO. 07 VS" (Vertical Size) with "▲" or "▼" key.
6. Adjust the data with "+" or "-" key for full scan. To turn off the Service Menu display, press the "MENU" key.

VERTICAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the vertical center of TV screen. If picture center is too low, replace resistor R513 (2.2K ohm, 1/2W) with a 470 ohm, 1W resistor. If picture center is too high, connect resistor R512 (470 ohm, 1W).

GRAYSCALE ADJUSTMENT

1. Set the picture controls to the "Auto" levels.

2. Turn off the receiver and disconnect the AC power cord (AC 120V line).
3. While pressing the "MENU" key, reconnect the AC power cord. The Service Menu display will now appear.
4. Set "NO. 08 RB" (Red Bias), "NO. 09 GB" (Green Bias), and "NO. 10 BB" (Blue Bias) data to "0" each with "▲" or "▼", and "+" or "-" keys.
5. Set "NO. 11 RD" (Red Drive) and "NO. 12 BD" (Blue Drive) data to "60" each with "▲" or "▼", and "+" or "-" keys.
6. Set "NO. 21 GD" (G Drive Reduction) data to "7", "NO. 25 SB" (Sub-Brightness) data to "32", "NO. 26 SCO" (Sub-Color) data to "11", "NO. 27 STI" (Sub-Tint) data to "13" and "NO. 28 SSH" (Sub-Sharpness) data to "8" with "▲" or "▼", and "+" or "-" keys.
7. Turn Screen Control (T402) to minimum (fully counter-clockwise).
8. Select the Service Menu "NO. 41" (Bias Adjustments) with "▲" or "▼" key.
9. Advance Screen Control (T402) clockwise to obtain just visible one color line. If line does not appear, place this control to maximum (fully clockwise).
10. Raise each Bias Level with "3", "6" or "9" key to obtain just visible white line. (See Figure 4 below.)

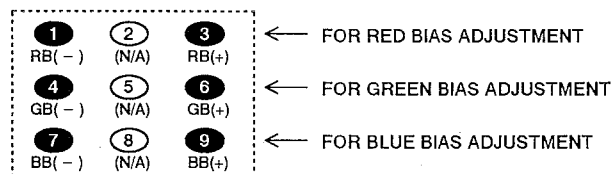


Figure 4. Remote Control Number keys function in Service Menu "NO. 41"

11. Select the Service Menu "NO. 40 DRV" (Drive Adjustments) with "▲" or "▼" key.
12. Adjust Red and Blue Drive Levels alternately with "1", "3", "7" or "9" key to produce normal black and white picture in highlight areas. (See Figure 5 below.)

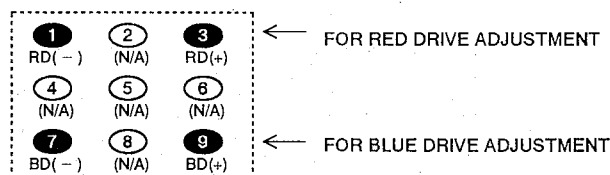


Figure 5. Remote Control Number keys function in Service Menu "NO. 40 DRV"

13. Check for proper grayscale at all brightness levels. To turn off the Service Menu display, press the "MENU" key.

Note: If Grayscale Adjustment is made after picture tube replacement, check Brightness Level Adjustment.

FOCUS ADJUSTMENT

Adjust Focus Control (T402) for well-defined scanning lines.

PLL TUNING ADJUSTMENT

Note: PLL Tuning must be adjusted after IC101 (Signal Processor), IC802 (EEPROM) or T151 (PLL VCO Coil) is replaced.

1. Disconnect the AC power cord (AC 120V line).
2. Press and hold the "MENU" key on the front control panel

while connecting the AC power cord. The Service Menu display will now appear.

3. Select "NO. 04 PT" (PLL Tuning) with "▲" or "▼" key.
4. Adjust the data to "64" with "+" or "-" key.
5. Disconnect the AC power cord (AC 120V line).
6. Connect voltmeter + lead to "TP113" on main board and - lead to main board ground.
7. Press and hold the "POWER" key on the front control panel while connecting the AC power cord. TV will turn on.
8. Disconnect the antenna terminal and select a good-quality active color channel in your area, using keys 0~9 on the remote control transmitter. Wait a few seconds, and then reconnect the antenna terminal.
9. Turn PLL VCO coil (T151) on main board fully clockwise, and then gradually turn the coil counterclockwise until voltage is at the maximum level (approximately 6.7VDC). Continue to turn the coil counterclockwise until the voltage is at the minimum level (approximately 0.7VDC), and then turn the coil clockwise until voltage indicates 3.8 ± 1.0 VDC. Voltage change in the coil adjustments is shown in Figure 6.
10. Disconnect voltmeter from chassis.

Select every active channel with keys 0~9 and the scanning keys, and check to be sure the AFT is operating properly.

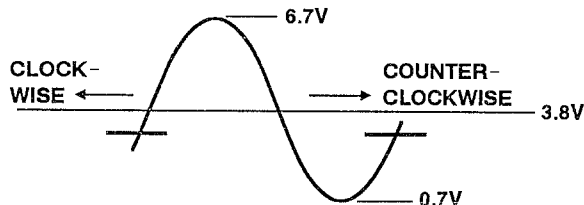


Figure 6. Voltage Change in Coil Adjustment

RF-AGC ADJUSTMENT

1. Tune receiver to strongest VHF station in your area.
2. Set contrast and brightness controls for maximum.
3. Turn off the receiver and disconnect the AC power cord (AC 120V line).
4. While pressing the "MENU" key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select "NO. 03 RAD" (RF-AGC Delay) with "▲" or "▼" key.
6. Adjust the data with "+" or "-" key in the direction which causes snow to appear, then in the opposite direction until the snow just disappears.
7. To turn off the Service Menu display, press the "MENU" key.

BRIGHTNESS LEVEL ADJUSTMENT

Note: Grayscale, RF-AGC, Video Level and High Voltage Check must be adjusted before attempting Brightness Level Adjustment.

1. Connect a color-bar generator to the antenna terminal.
2. Switch the generator to the crosshatch pattern.
3. Set the picture controls to the "Auto" levels.
4. Connect voltmeter (high impedance) + lead to terminal "TP51" and - lead to terminal "TP50" on main board. Set voltmeter for 1.5V ~ 3V range.
5. Turn off the receiver and disconnect the AC power cord (AC 120V line).
6. While pressing the "MENU" key, reconnect the AC power cord. The Service Menu will now appear.
7. Select "NO. 25 SB" (Sub Brightness) with "▲" or "▼" key.
8. Adjust the data with "+" or "-" key for 680 mVDC.

9. Press the "MENU" key to turn off the Service Menu display.
10. Check brightness level on every active channel, readjust (repeat steps 5~9) if necessary.

Note: Do not set to excessive brightness levels, otherwise the contrast level is suppressed.

HIGH VOLTAGE CHECK

Note: +B (+135V) Voltage Check and Grayscale Adjustment must be completed before attempting High Voltage Check.

1. Connect high voltage voltmeter + lead to anode of picture tube, and connect - lead to ground.
 2. Tune receiver to an active channel and confirm TV is operating properly.
 3. Eliminate the beam current by adjusting contrast and brightness controls to minimum.
 4. Confirm high voltage is within 27.0KV to 29.0KV. If reading is not within range, check horizontal circuit.
- No high-voltage adjustment is provided on this chassis.

HIGH VOLTAGE HOLD-DOWN TEST

Every time the receiver is serviced, the HIGH VOLTAGE HOLD-DOWN circuit must be tested for proper operation by following these steps:

1. Connect receiver to AC 120V line. Tune receiver to an active channel. Set the picture controls to the "Auto" levels.
2. Check that the voltage measured between "TP7" and "TE7" (ground side) is within 16.5VDC to 21VDC. If the voltage is out of this range, the Hold-Down circuit must be checked.
3. Connect DC Voltage supply to "TP7" through a 100 ohm 1/4W resistor and "TE7"(ground). Adjust the DC voltage to 23VDC. The receiver should shutdown, losing raster and sound. Then the receiver should turn off automatically. This reaction indicates that the Hold-Down circuit is functioning properly. If the receiver does not shutdown, a malfunction is indicated and its cause must be found and corrected.
4. To obtain picture again, remove the DC supply and wait a few minutes. Now turn on the receiver.

VIDEO INPUT LEVEL ADJUSTMENT

Note: Video Input Level adjustment affects brightness levels. When Video Input Level adjustment is made, brightness level must be checked.

1. Connect video signal generator output (1 Vp-p terminated at 75 ohms) to VIDEO INPUT JACK.
2. Set TV to VIDEO Mode.
3. Connect scope to "TP16A" and ground.
4. Adjust Video Input Level (VR1023) for 2.0 ± 0.2 Vp-p.
5. Set TV to TV Mode, Picture Controls to "Auto" levels.

Check brightness and contrast on several active channels. If brightness or contrast is incorrect reset bright level.

SOUND ADJUSTMENT

1. Connect Voltmeter - lead to ground and + lead to "TP20" (FM DET OUT).
2. Tune receiver to an active channel and fine tune to obtain the best picture.
3. Confirm D.V.M reading of 3.85 ± 0.2 VDC.
4. If the voltage is out of this range, adjust Sound I.F. Transformer (T131) for 3.85 ± 0.2 VDC.

PURITY AND CONVERGENCE ADJUSTMENTS

CAUTION: The Purity and Convergence adjustments have been made at the factory. Readjustments should be made only after the picture tube or deflection yoke is replaced. Follow the steps below for the necessary readjustments.

PURITY ADJUSTMENTS

1. When replacing picture tube or deflection yoke, mount deflection yoke and purity-convergence magnets assembly properly. See Figure 1. Position the picture tube facing east or west. Demagnetize the picture tube and receiver using an external degaussing coil. Set receiver to Service Menu "NO. 41" (no vertical sweep) position while degaussing.
2. Place the yoke on tube neck fully forward against glass.
3. Connect a color bar generator to the antenna terminal. Switch the generator to a white field. Move yoke backward on the neck until a uniform white field is obtained.
4. Allow 30 minutes warm up on a blank white field (high intensity grayscale).

Note: If white field cannot be obtained, check Grayscale Adjustments on page 6.

5. Reset the picture controls to the "Auto" levels. Select a green raster, either with the signal generator or by adjusting the bias controls. If a signal generator is used for this step, Skip to Step 10. If the bias controls will be used, go to step 6.
6. Adjust Service Menu "NO. 08 RB" (R-Bias), "NO. 09 GB" (G-Bias), and "NO. 10 BB" (B-Bias) data to "0" each.
7. Select Service Menu "NO. 41" (no vertical sweep).
8. Adjust the Screen Control counterclockwise until the horizontal scan line is no longer visible.
9. Select Service Menu "NO. 09 GB" (G-Bias) and raise the data to produce green raster. If retrace lines appear, reduce screen control slightly.
10. Pull yoke back on tube neck to obtain three-color raster (blue, green and red).
11. Adjust the angle between the two purity magnet tabs to center the vertical green belt in the picture tube. Do not rotate tabs. See Figure 3.
12. Slowly slide the deflection yoke forward until a uniform green screen is obtained.
13. Check the purity of the red and blue screens for uniformity. Turn off other colors to check (use bias controls) or use generator. If necessary, readjust the yoke position until all screens are pure.
14. If bias controls and screen control were used to set purity, reset Grayscale and Brightness Level. Refer to "Grayscale Adjustment" on page 6 and "Brightness Level Adjustment" on page 7.
15. Confirm that the yoke is not tilted. Tighten the yoke mounting screw. Adjust convergence next.

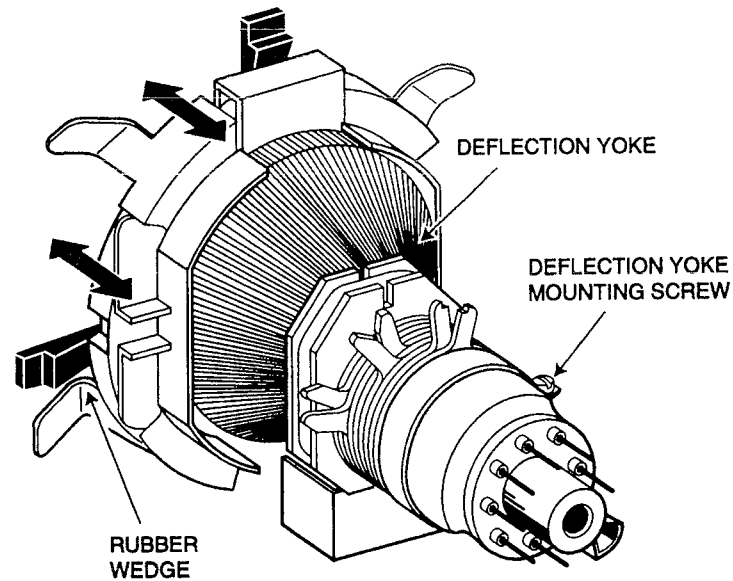


Figure 1. Deflection Yoke Movement

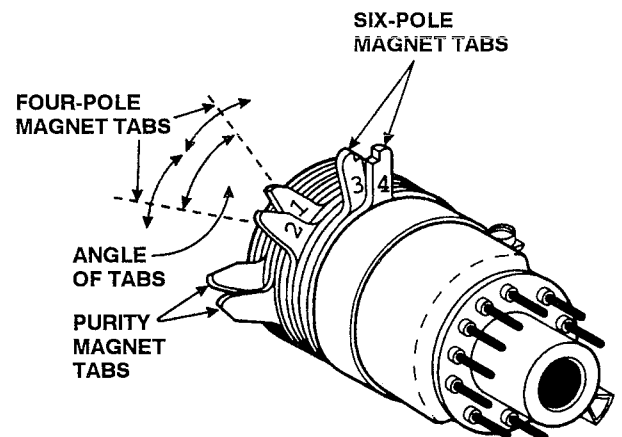


Figure 2. Purity and Convergence Magnets

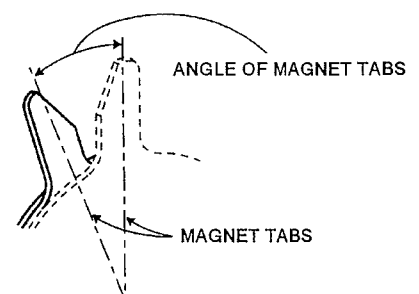
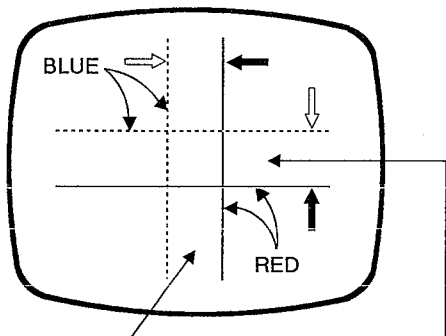


Figure 3. Adjusting Magnet

CONVERGENCE ADJUSTMENT

CENTER CONVERGENCE ADJUSTMENT

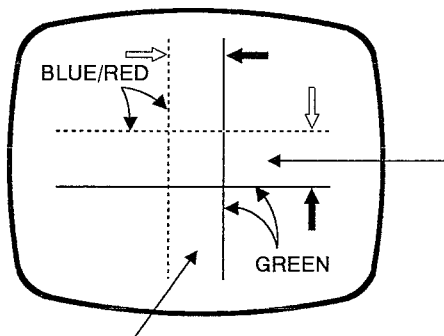
1. Connect a crosshatch generator to antenna terminals.
2. Set Contrast control to low level to eliminate "Blooming."
Reduce Brightness level to obtain black background if necessary.
3. Adjust the angle between the four-pole magnet tabs 1 and 2 (Figure 2), and superimpose the red and blue vertical lines in the center area of the picture screen. See Figure 4.
4. Keeping the tabs at the same angle, rotate them together to superimpose the blue and red horizontal lines in the center area of the picture screen. See Figure 4.
5. Adjust the six-pole magnet tabs 3 and 4 so the converged red/blue line is superimposed on the green line. This is the same procedure used in Steps 3 and 4. See Figure 5.



Adjust four-pole tabs angle to superimpose blue and red vertical line.

Adjust four-pole tabs together to superimpose red and blue horizontal line.

Figure 4. Blue and Red Line Movement



Adjust six-pole tabs angle to superimpose red/blue and green vertical line.

Adjust six-pole tabs together to superimpose red/blue and green horizontal line.

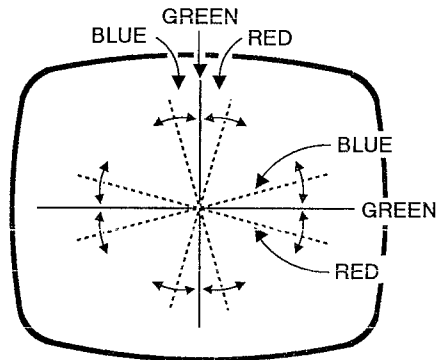
Figure 5. Blue/Red and Green Line Movement

OUTER AREA CONVERGENCE ADJUSTMENT

The outer area convergence is performed by positioning of the yoke as follows:

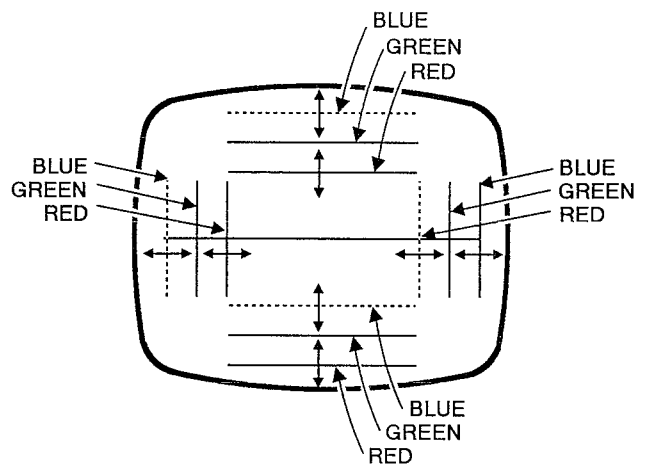
1. Move the top of the yoke towards or away from the picture tube. This movement will affect the vertical lines at the top and bottom and the horizontal lines at the sides. See Figure 6.
2. Check that splits at 12 O'Clock and 6 O'Clock positions are minimized, adjust yoke for best compromise. Secure with wedge at 12 O'Clock position. See Figure 1.
3. Move the side of the yoke towards or away from the picture tube to converge the horizontal lines at the top and bottom and the vertical lines at the sides. See Figure 7.
4. Check that splits at 12 O'Clock and 6 O'Clock are minimized, adjust yoke for best compromise. Secure yoke position with the side wedges. See Figure 1.

Note: When re-using the rubber wedges, apply a small amount of silicone rubber adhesive or hot melt to each of the wedges.



Line movement when adjusting top of yoke in and out.

Figure 6. Top of Yoke Movement



Line movement when adjusting side of yoke in and out.

Figure 7. Side of Yoke Movement

SERVICE HINTS

POWER FAILURE DETECTOR

This set is equipped with a Power Failure Detector function included in the CPU which checks for an abnormal condition in the chassis power supplies, including the power supply derived from the Horizontal Output Transformer.

If, while the power is on, a failure is caused by any of the following which results in a lower voltage supply, the CPU will turn the set off in 1.5 seconds to prevent unnecessary damage:

- Failure within the power supply circuits.
- A short circuit in the load side from the supply.
- Stoppage of the Horizontal Output Oscillator caused by the X-Radiation protection Hold-Down Circuit.

If, while the power is off, the power is switched on and any of these failures remains uncorrected, the CPU will shut off the power within 3 seconds.

Check the following if the set is turned off by the power failure detector.

1. Disconnect the AC power cord (AC 120V line) for at least 10 seconds.
2. Connect a DC Voltmeter to the following TEST POINT.

TJ5	9V
TJ6	7.6V
D429 Cathode	9V
D001 Cathode	14V

3. Press the power key and check for the proper voltage supplies.
4. If either of these voltages is low, the power failure detector should turn the set off within 3 seconds.
5. Check all circuits listed above.

Note: This set is equipped with a Power Surge Protection feature included in the CPU. If power failures occur three times within 15 minutes, the CPU will automatically stop the functioning to help prevent secondary damage. (TV will not turn on by pressing the power key.) To reset the operating programs within the CPU, disconnect the AC power cord for at least 10 seconds.

MECHANICAL DISASSEMBLIES

CABINET BACK REMOVAL

1. Refer to Figure 1, remove 7 screws.
2. Pull off cabinet back and remove.

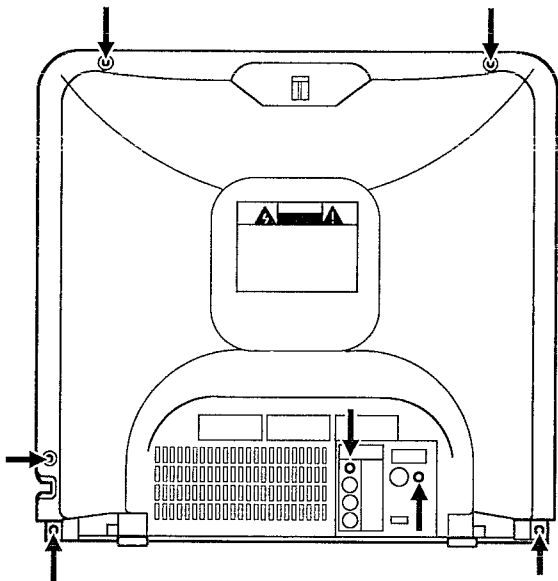


Figure 1. Cabinet Back Removal

CHASSIS REMOVAL

1. Remove cabinet back.
2. Discharge the picture tube anode (2nd anode lead) to the dag coating (picture tube grounding lead).
3. Disconnect Degaussing coil socket (K6D), Picture tube socket, Deflection yoke connector (K4X), Speaker connector (KSP), picture tube ground leads and 2nd anode lead.
4. Remove chassis completely by sliding it straight back.

PICTURE TUBE REMOVAL

CAUTION: Do not disturb the deflection yoke or magnet assembly on the picture tube neck. Care must be taken to keep these assemblies intact, unless picture tube is being replaced. Discharge the picture tube to the coating before handling the tube.

1. Remove chassis, referring to "Chassis Removal" instructions.
2. Place cabinet's front face down on a soft surface.
3. Remove the screw on each corner of the picture tube and GENTLY lift the picture tube out of the cabinet.
4. Install a replacement picture tube in reverse order. Properly install the degaussing coil and picture tube grounding lead on the picture tube. See to Figure 2.

Note: If Picture Tube is being replaced, mount the Degaussing Coil properly on the tube. See Figure 2.

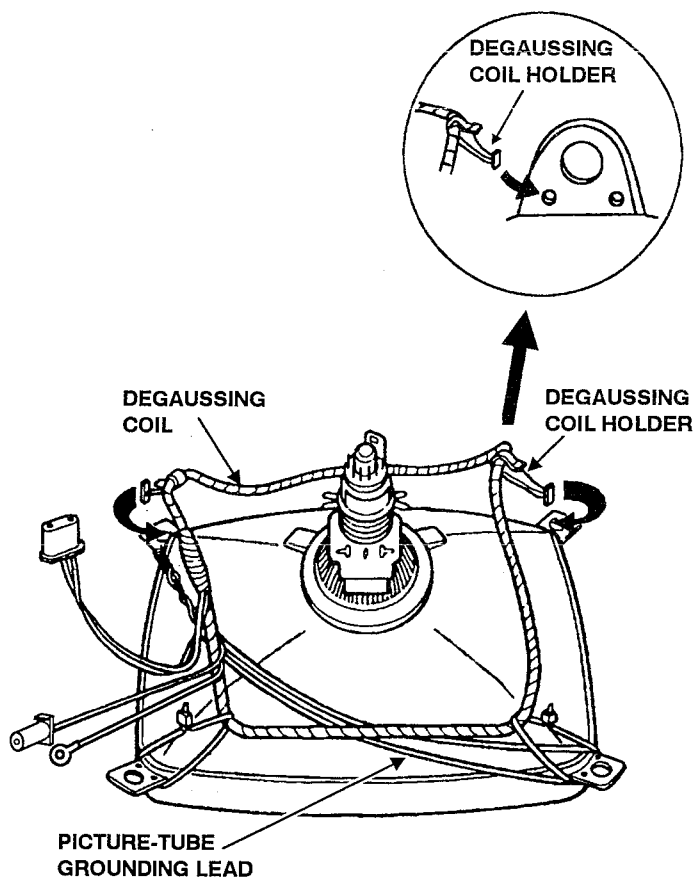


Figure 2. Picture Tube Replacement