
4. Alignment and Adjustments (Electrical)

4-1 Preadjustment

4-1-1 Factory Mode

1. Do not attempt these adjustments in the Video Mode.
2. The Factory Mode adjustments are necessary when either the EEPROM (IC902) or the CRT is replaced.
3. Do not tamper with the "Adjustment" screen of the Factory Mode menu. This screen is intended only for factory use.

4-1-3 When CRT Is Replaced

Make the following adjustments after setting up purity and convergence:

White Balance
Sub-Brightness
Vertical Center
Vertical Size
Horizontal Size

4-1-2 When EEPROM (IC902S) Is Replaced

1. When IC902 is replaced all adjustment data revert to initial values. It is necessary to re-program this data.
2. After IC902 is replaced, warm up the TV for 10 seconds.

4-2 Factory ("Service") Mode

4-2-1 Procedure for the "Adjustment" Mode

1. This mode uses the standard remote control. The Service Mode is activated by: (1) pressing the "FACTORY" service key on the local-keyboard, or (2) by entering the following remote-control sequence (within 2 seconds):

STAND-BY → DISPLAY → MENU → MUTE → POWER ON
2. The "SERVICE (FACTORY)" message will be displayed. The Service Mode has three components: Adjustment, Option and Reset.
3. Access the Adjustment Mode by pressing the "VOLUME" keys (Up or Down). The adjustment parameters are listed in the accompanying table, and selected by pressing the CHANNEL keys (▲, ▼).
4. Selection sequences for the PAL/SECAM B/G, L/systems:

down or up key:
AGC>TXP>AFW>SBT>SCT>SCR>STT>RG>GG>BG>TCT>SC>SL>PVS>PHS>NVS>NHS>CDL>BKS
5. The VOLUME keys increase or decrease the adjustment values, (stored in the non-volatile memory) when Adjustment Mode is cancelled.

4-2-2 Main Adjustment Parameters

OSD ABBREVIATION	RANGE	INITIAL DATA
AGC	63	28
XP	7	5
QSS	1	1
SBT	23	6
SCT	23	10
SCR	13	6
STT	13	9
RG	63	38
GG	63	32
BG	63	32
TCT	1	0
SC	63	11
SL	63	30
VA	63	38
PVS	63	27
PHS	63	40
NVS	63	38
NHS	63	22
CDL	15	4
SCL	3	1
PWL	15	12
OMD	63	26
BLR	63	31
BLB	63	27
AGC2T	31	15
PF	3	2
RP	3	2
YD	15	5

NOTE : PVS, PVA, PHS, NVS, NVA,NHS parameters must be aligned using both the 50 Hz and 60 Hz vertical-field rates.

4-2-3 AGING Mode (Reference Only)

This pattern is used for pre-heating the CRT during manufacturing--it is accessed in the factory by twice pressing the "FACTORY" key .

**Even if the TV power is cut off, the Aging Mode is not cancelled.
The "AGING" marking is displayed on the screen.
The AGINGmode is cancelled by repressing the "FACTORY" key.**

4-2-4 Option

BYTE	ITEM	0
1	LANGUAGE	EUROPE/URSSIA
2	SYSTEM	CF/CI/CW/CX/CB/CII
3	TUNER	1/2
4	HELP MESSAGE	ON/OFF
5	VCR HEAD	2HD/2HDLP/4HD/HIFI
6	G-CODE	SHOWVIEW/VIDEO PLUS/NONE
7	ATS OPTION	ON/OFF
8	VPS/PDC	PDC/VPS/NONE
9	TTX	ON/OFF

4-3 Reset

BYTE	ITEM	0
1	Contrast	
2	Bright	
3	Sharpness	
4	Color	
5	Tint	
6	Volume	
7	Program Number	
8	Color System	
9	Sound System	
	3DB LNA	
	Panel Lock	
	Language	
	Clock	
	Timer	
	On Time	
	Sleep	
	PICTURE MODE	

4-4 Other Adjustments

4-4-1 General

1. Usually, a color TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.
2. The picture should have good black and white details. There should be no objectionable color shading; if color shading is present, perform the purity and convergence adjustments described below.
3. Use the specified test equipment or its equivalent.
4. Correct impedance matching is essential.
5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.
6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.
7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.
8. To protect against shock hazard, use an isolation transformer.

4-4-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set has been moved or turned in a different direction, disconnect its AC power for at least 10 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before removing power.

4-4-3 High Voltage Check

CAUTION: There is no high voltage adjustment on this chassis. The B+ power supply must be set to +125 volts (Full color bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.
2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).
3. The high voltage should not exceed 27.5KV.
4. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 27.5KV under any conditions.

4-4-4 FOCUS Adjustment

1. Input a black and white signal.
2. Adjust the tuning control for the clearest picture.
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-4-5 Screen Adjustment

1. Turn to the ACTIVE channel.
2. Adjust the VR screen for a normal picture is (no blooming or flyback line).
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-4-6 Purity Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Plug in the CRT deflection yoke and tighten the clamp screw.
3. Plug the convergence yoke into the CRT and set in as shown in Fig. 4-1.
4. Input a black and white signal.
5. Fully demagnetize the receive by applying an external degaussing coil.
6. Turn the CONTRAST and BRIGHTNESS controls to maximum.
7. Loosen the clamp screw holding the yoke. Slide the yoke backward or forward to provide vertical green belt. (Fig. 4-2).
8. Tighten the convergence yoke.
9. Slowly move the deflection yoke forward, and adjust for the best overall green screen.
10. Temporarily tighten the deflection yoke.
11. Produce blue and red rasters by adjusting the low-light controls. Check for good purity in each field.
12. Tighten the deflection yoke.

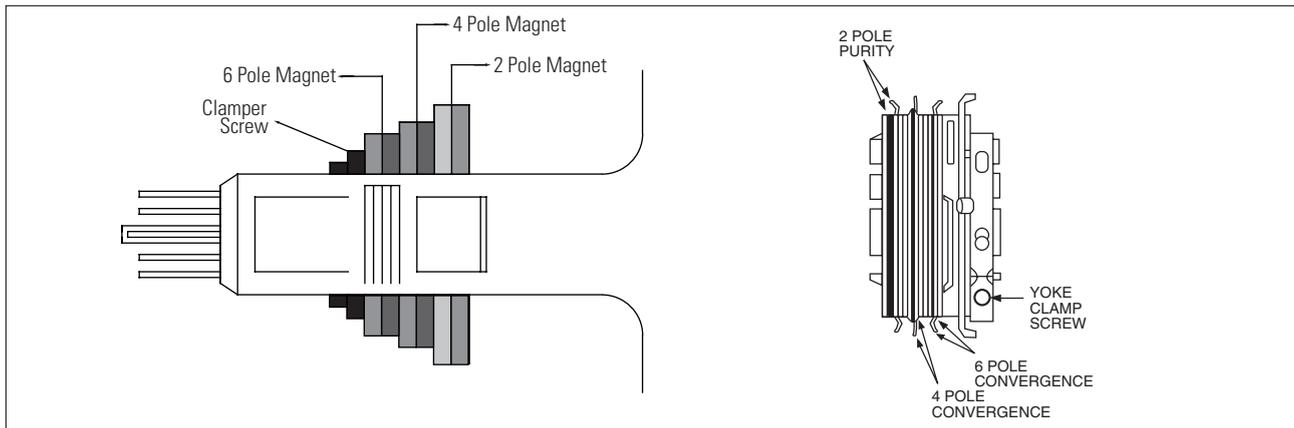


Fig. 4 -1 Convergence Magnet Assembly

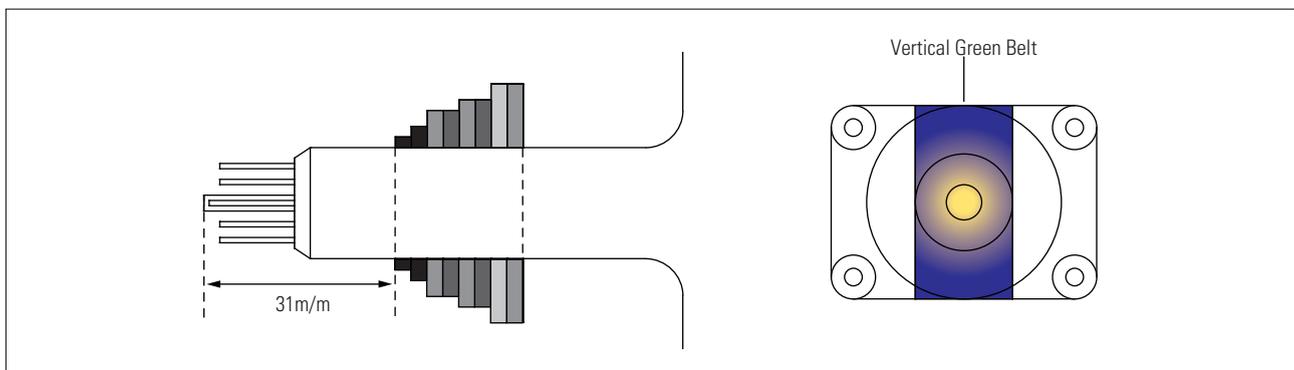


Fig.4-2 Center Convergence Adjustment

4-4-7 White Balance Adjustment

4-4-7 (A) HIGH-LIGHT ADJUSTMENT

1. Input either a Lion Head or a "pure white" pattern.
2. Warm up the TV for 30 minutes.
3. Check the data in the Service Mode
4. Adjust RG, BG in the Factory Mode.

4-4-7 (B) LOW-LIGHT ADJUSTMENT

1. Automatically accomplished during the high-light adjustment.

4-4-8 Center Convergence Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Adjust the two tabs of the 4 pole magnets to change the angle between them. Superimpose the red and blue vertical lines in the center area of the screen.
3. Adjust the Brightness and Contrast controls for a well defined picture.
4. Adjust the two-tab pairs of the 4 pole magnets, and change the angle between them. Superimpose the red and the blue vertical lines in the center area of the screen.
5. Turn the both tabs at the same time, keeping the angle constant, and superimpose the red and blue horizontal line in the center of the screen.
6. Adjust the two-tab pairs of the 6-pole magnets to superimpose the red and blue line onto the green. (Changing the angle affects the vertical lines, and rotating both magnets affects the horizontal lines.)
7. Repeat adjustments 2~6, if necessary.
8. Since the 4-pole magnets and 6-pole magnets interact, the dot movement is complex (Fig. 4-3).

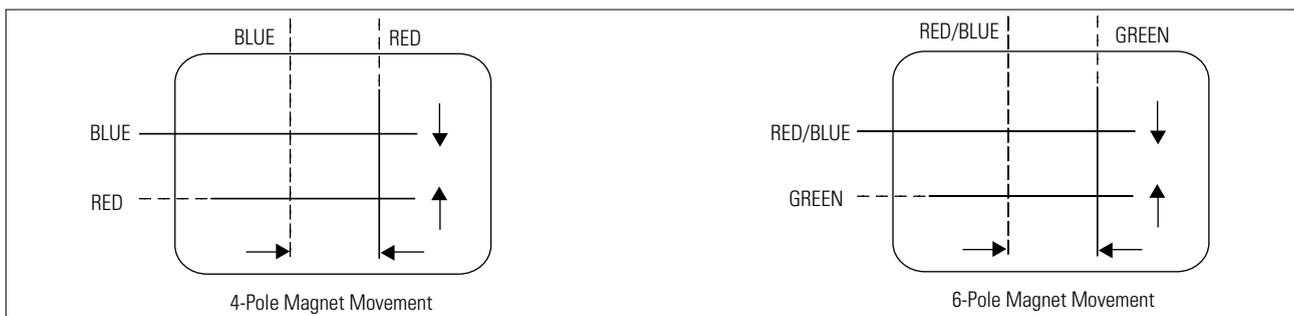


Fig 4-3 Center Convergence Adjustment

4-4-9 Dual Tuner AFT Adjustment

Test Equipment

1. TV Generator(PM5518, PM5418, ETC)
2. DC VOLTMETER

1. Connect DC Voltmeter to AFT terminal of TUNER IF-MODULE.
2. After selecting P00, input to IF1 terminal of TU002(38.9 MHz Using PM5518)
3. After selecting P00, set to $2.5V \pm 0.2V$ (Using FRANCE : T101, PAL/SCAM B/G,I,D/K : L102)

4-5 Electrical Adjustment (VCR Section)

4-5-1 Preparation

Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustment only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

4-5-2 Required Test Equipment

1. Color Television or Monitor
2. Oscilloscope : Wide-band, dual-trace, triggered delayed sweep.
3. DC Voltmeter
4. TV CH Generator
5. Attenuator
6. Recording tape. (Blank tape)
7. Pattern Generator : PAL color bar. 100% White.

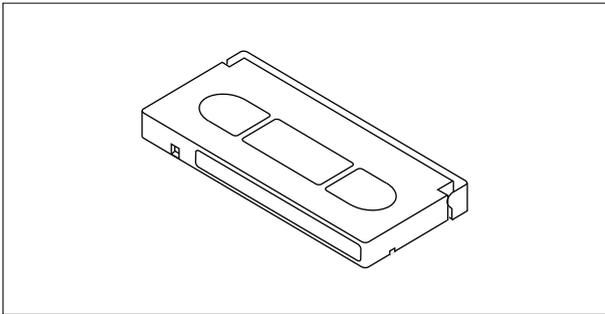


Fig. 4-4 Alignment Tape

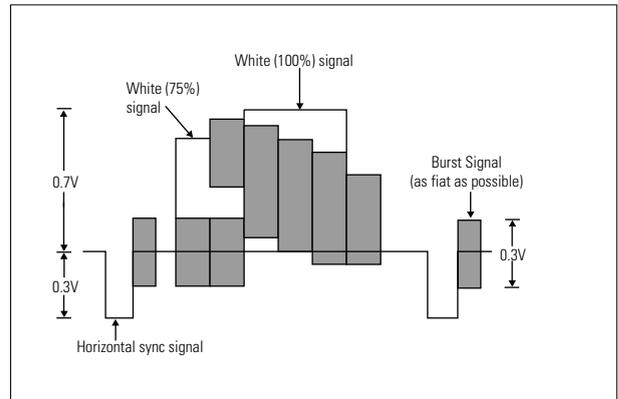


Fig. 4-5 Color bar signal of pattern generator

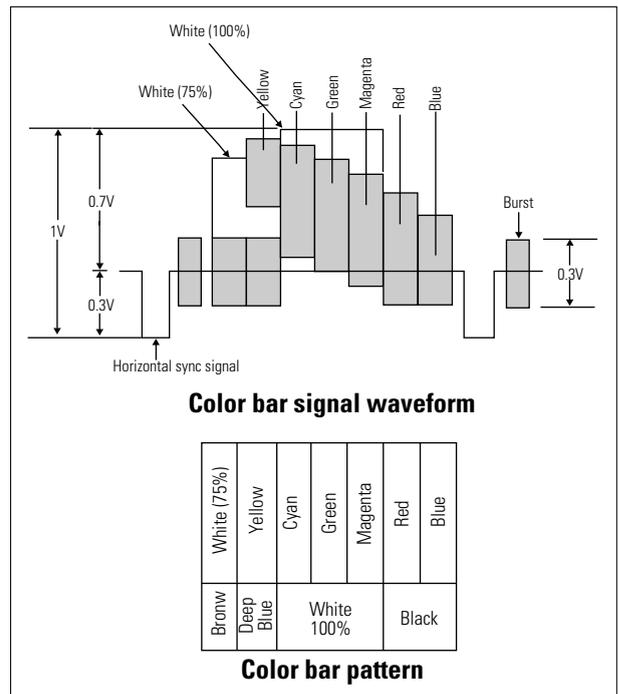
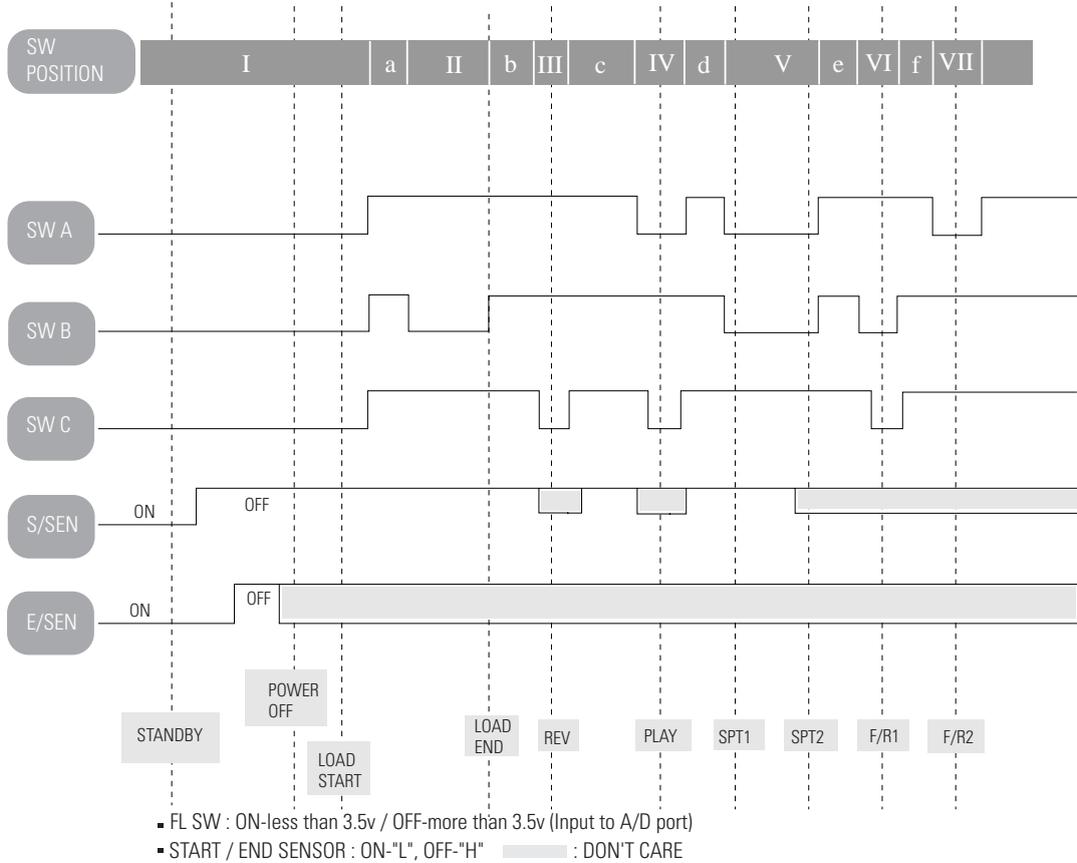


Fig. 4-6 Color bar signal of alignment tape (75% Color Bars)

4-5-3 PROGRAM SW



POSITION	PROGRAM S/W			TAPE SEN		OPERATION MODE
	A	B	C	S	F	
STANBY	0	0	0	0	0	Eject
POWER OFF	0	0	0	1	X	Unload POWER OFF
LOADING START	0	0	0	1	X	(Tape loading start point)
LOADING END	1	0 ->1	1	1	X	(Tape loading end point)
REV	1	1	0	X	X	Reverse Picture Search, Reverse SLOW
PLAY	0	1	0	X	X	Play, Rec,F-PS,Still,SLOW,F-ADV
STOP1	0	0	1	1	X	Stop (Play position 5 Min. over)
STOP 2	0	0	1	X	X	(MAIN Break ON MODE)
FF / REW 1	1	0	0	X	X	High speed Rew, Low speed FF
FF / REW 2	0	1	1	X	X	High speed FF, Low speed Rew

X : DON'T CARE

MEMO