

2-5. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete adjustment procedures required for electric circuits of VHS Video Cassette Recorders.

2-5-1. TEST EQUIPMENT

To perform electrical adjustments following equipment is required.

1. Dual-Trace Oscilloscope. (More than 35MHz)
Voltage Range: 0.005-5V/div
Frequency Range: DC-35MHz
Probes: 10:1 OR 1:1
2. Frequency Counter.
Frequency Range: 0-10MHz
Probes: 1:1
3. Universal Counter.
4. Digital Volt Meter. (D.V.M.)
5. Video Sweep Generator.
6. Sine Wave Generator.
7. Video Pattern Generator.
8. VHS Alignment Tape. (VFJ8125H3F)
9. VHS Blank Tape.
10. Monitor.
11. Plastic Tip Driver.
12. DC Power Supply.

2-5-2. PREPARATION

During adjustment, set each selector as follows: when no indication in the procedure.

AI SW.....OFF
 PICTURE VR.....CENTRE FIX
 HIFI REC LEVEL VR.....CENTRE FIX
 16:9 SW.....AUTO
 S-VHS SW.....ON
 AV OUT SW.....NORMAL
 CVC SW.....OFF
 PHONES LEVEL VR.....MIN

2-5-3. HOW TO READ ADJUSTMENT PROCEDURES

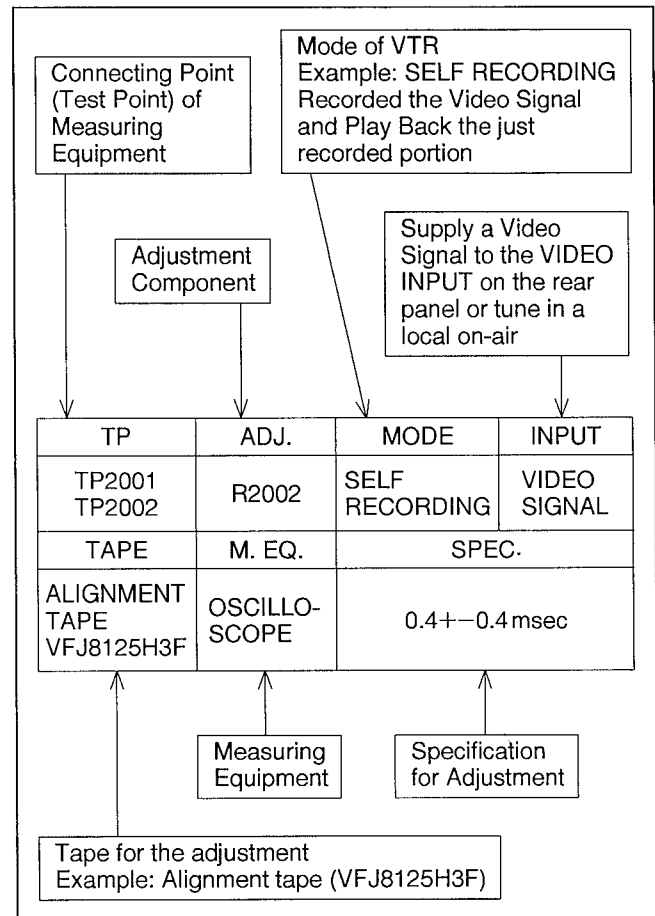


Fig. E1

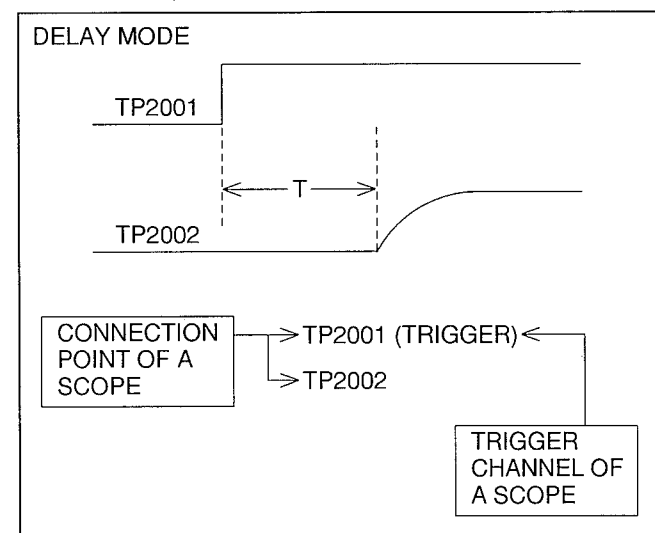


Fig. E2

SERVO SECTION

2-5-4. PG SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP3002	VR2001	PLAYBACK	
TAPE	M. EQ.	SPEC.	
ALIGNMENT TAPE VFJ8125H3F	OSCILLO- SCOPE	7.0+ \pm 0.5 (H)	

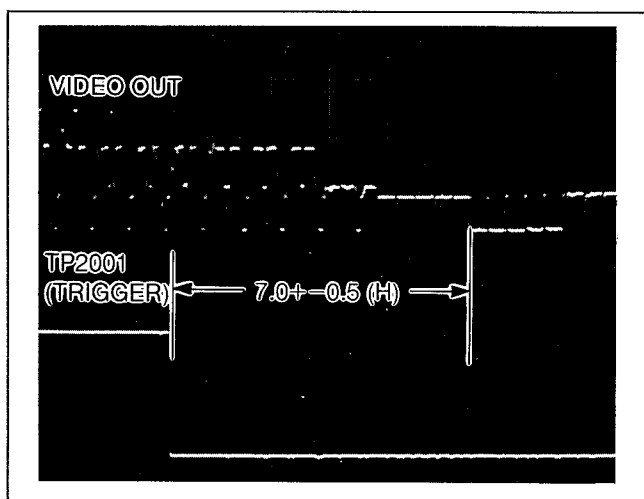


Fig. E3

LUMINANCE & CHROMINANCE SECTION

2-5-5. RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP507 (HOT) TP508 (GND)	VR305 (S VHS-Y) VR306 (VHS-Y) VR805 (PAL-C) VR807 (SECAM-C)	SP RECORDING	PAL/SECAM COLOUR BAR
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLO- SCOPE	S VHS-Y : 140+ \pm 5 (mVp-p) VHS-Y : 140+ \pm 5 (mVp-p) PAL-C : 32+ \pm 2 (mVp-p) SECAM-C : 32+ \pm 2 (mVp-p)	

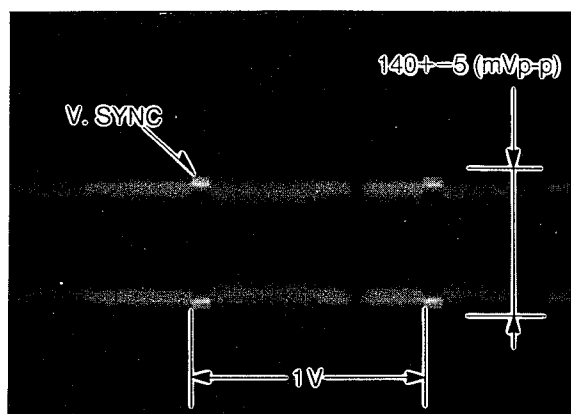
- Note: 1. Set the AI SW to OFF position.
 2. Connect a jumper wire between the pin 96 of IC6001 and GND (TEST MODE).
 3. LUMINANCE RECORDING CURRENT ADJUSTMENT
 1) Set the S VHS SW to OFF position. (VHS MODE)
 2) Adjust VR306 so that the amplitude of sync tip portion for VHS REC Y output level is 140 ± 5 (mVp-p).
 3) Set the S VHS SW to ON position. (S VHS MODE)

- 4) Adjust VR305 so that the amplitude of sync tip portion for S VHS REC Y output level is 140 ± 5 (mVp-p).

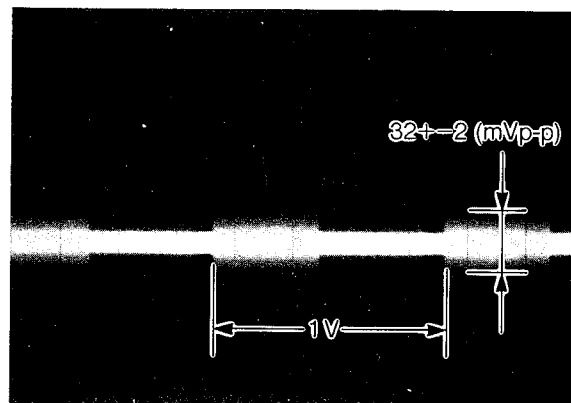
4. CHROMINANCE RECORDING CURRENT ADJUSTMENT

- 1) Supply +5V DC to TP3 (TRANSCODER C.B.A.) to eliminate Luminance component.
 2) Adjust VR805 so that the amplitude of Cyan for PAL REC CHROMINANCE is 32 ± 2 (mVp-p) in PAL COLOUR BAR.
 3) Adjust VR807 so that the amplitude of Cyan for SECAM REC CHROMINANCE is 32 ± 2 (mVp-p) in SECAM COLOUR BAR.

Y (VHS, S-VHS)



C (PAL)



C (SECAM)

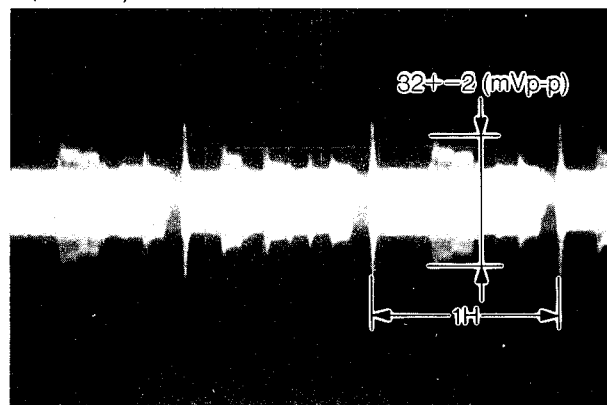


Fig. E4

2-5-6. VHS PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3002	VR302	SP (SELF RECORDED) PLAYBACK	PAL COLOUR BAR
TAPE	M EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	2.0 ± 0.2 (Vp-p)	

Note: 1. Set the S-VHS SW to OFF position.

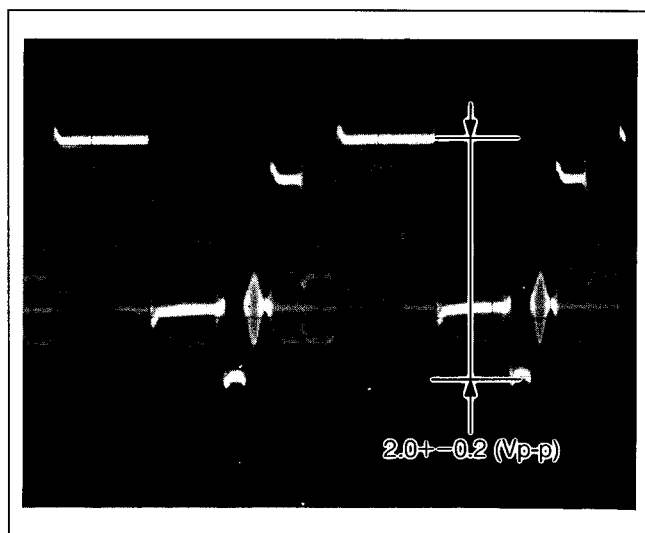


Fig. E5

2-5-7. S-VHS PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3022 (Y1) TP3021 (Y2)	VR301 (Y1) VR304 (Y2)	SP (SELF RECORDED) PLAYBACK	PAL COLOUR BAR
TAPE	M. EQ.	SPEC.	
S-VHS BLANK TAPE	OSCILLOSCOPE	Y1: 0.4 ± 0.01 (Vp-p) Y2: 2.0 ± 0.01 (Vp-p)	

Note: 1. Set the S-VHS SW to ON position.
2. Before this adjustment, VHS PLAYBACK LEVEL ADJUSTMENT must be done.

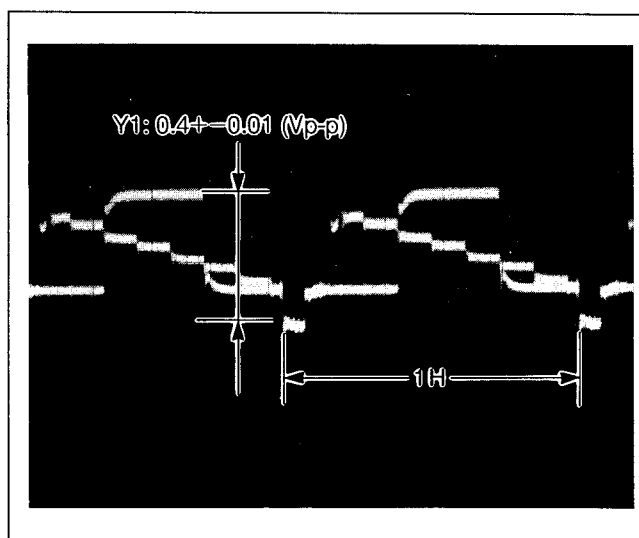


Fig. E6

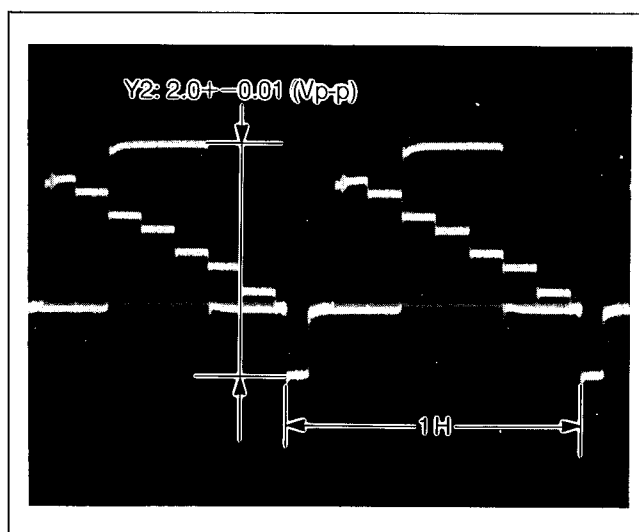


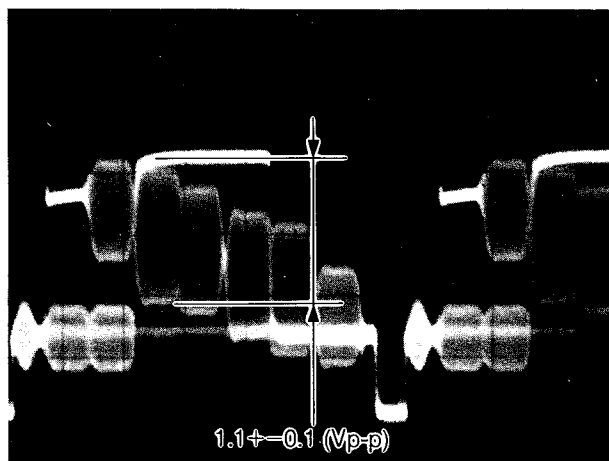
Fig. E7

2-5-8. CHROMINANCE PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3002 (I/O PACK)	VR804 (PAL) VR806 (SECAM)	SP (SELF RECORDED) PLAYBACK	PAL/SECAM COLOUR BAR
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	CYAN : 1.1 ± 0.1 (Vp-p) MAGENTA : 420 ± 25 (mVp-p)	

Note: 1. Set the S VHS SW of OFF position. (VHS MODE)
2. AV1 VIDEO OUT must be 75 ohm terminated.
3. Record PAL COLOUR BAR signal and playback the recorded portion.
4. Adjust VR804 so that the amplitude of Cyan is 1.1 ± 0.1 (Vp-p).
5. Record SECAM COLOUR BAR signal and playback the recorded portion.
6. Adjust VR806 so that the amplitude of Magenta is 420 ± 25 (mVp-p).

PAL (CYAN)



SECAM (MAGENTA)

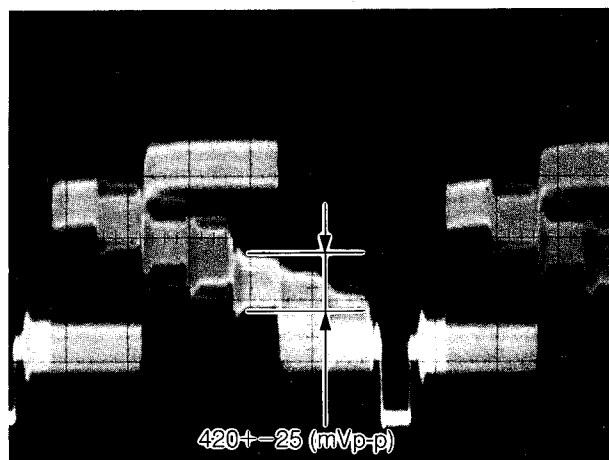
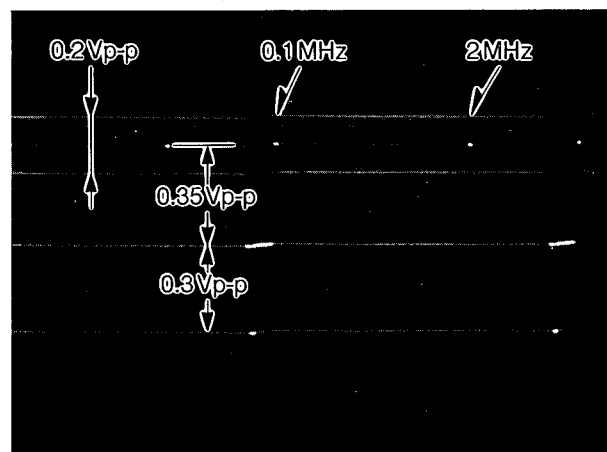


Fig. E8



CONDITION: BURST SIGNAL OFF
75 ohm TERMINATED

Fig. E9

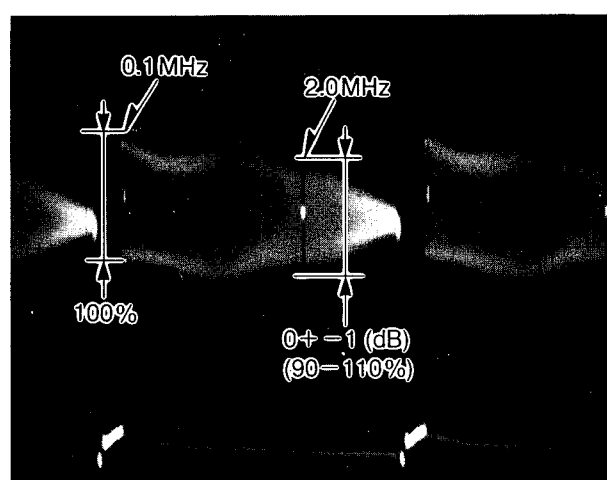


Fig. E10

2-5-9. VHS FREQUENCY RESPONSE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3002	VR3002 (SP) VR3001 (LP)	SP/LP (SELF RECORDED) PLAYBACK	VIDEO SWEEP SIGNAL (Shown in Fig. E9)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE/ VIDEO SWEEP GENERATOR	SP: 0 ± 1 (dB) (90-110%) LP: 0 ± 1 (dB) (90-110%)	

Note: 1. Set the Video Sweep Signal as shown in Fig. E9.
2. Set the AI and S-VHS SW to OFF position.
3. Set the VIDEO MODE SW to B/W position.

2-5-10. S-VHS FREQUENCY RESPONSE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3021	VR3003	SP (SELF RECORDED) PLAYBACK	VIDEO SWEEP SIGNAL TP1 (I/O PACK)
TAPE	M. EQ.	SPEC.	
S-VHS BLANK TAPE	OSCILLOSCOPE/ VIDEO SWEEP GENERATOR	SP: -4.5 ± 1 (dB) (55-70%)	

Note: 1. Before this adjustment, RF PEAK ADJUSTMENT must be done.
2. Set the Video Sweep Signal as shown in Fig. E11.
3. Set the AI SW to OFF position.

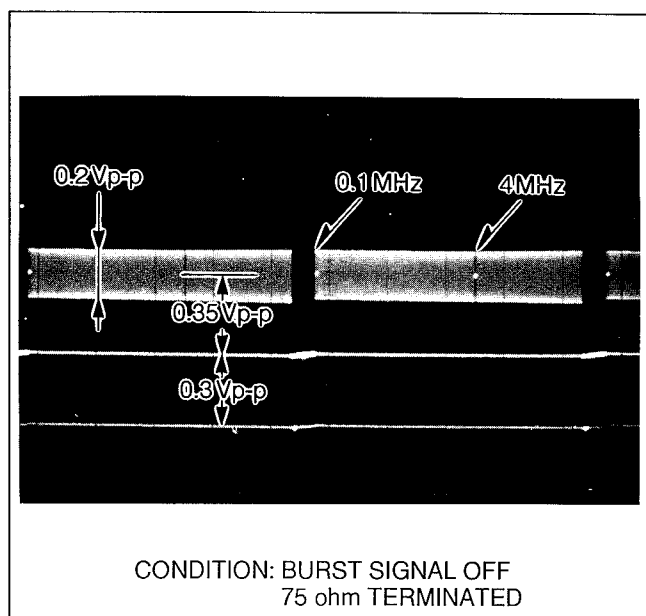


Fig. E11

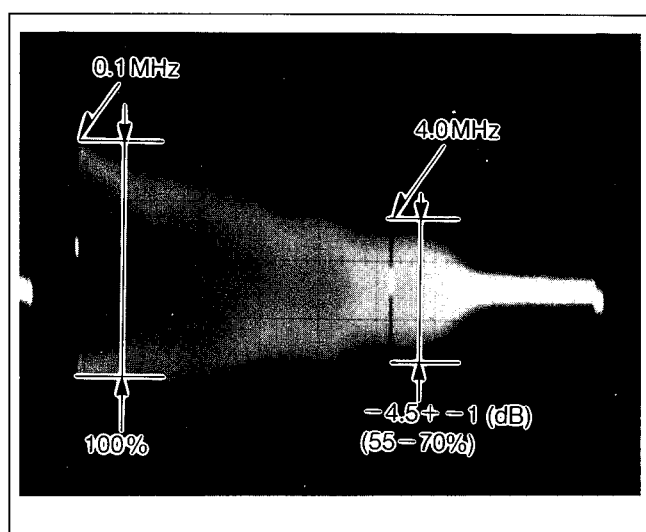


Fig. E12

2-5-11. VIDEO EE LEVEL (AGC) ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3002	VR3005	STOP	PAL COLOUR BAR
TAPE	M. EQ.	SPEC.	
		OSCILLOSCOPE	2.0+/-0.1 (Vp-p)

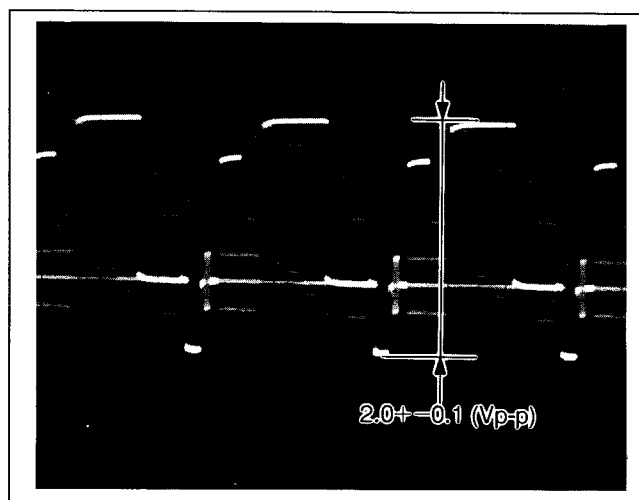


Fig. E13

2-5-12. ARTIFICIAL NTSC FREE RUN ADJUSTMENT

TP	ADJ.	MODE	INPUT
TL803	VR803	STOP	
TAPE	M. EQ.	SPEC.	
	FREQUENCY COUNTER/ SINEWAVE GENERATOR	15735+−100 (Hz)	

Note: 1. Supply +5V DC to TL802.
2. Turn VR803 to maximum frequency, then adjust VR803 until the specification.

2-5-13. YNR ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC301-34 (TL301)	VR303	STOP	PAL COLOUR BAR
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	WAVEFORM IS MINIMUM	

Note: 1. Connect a capacitor (1500pF) between IC301-34 and GND.

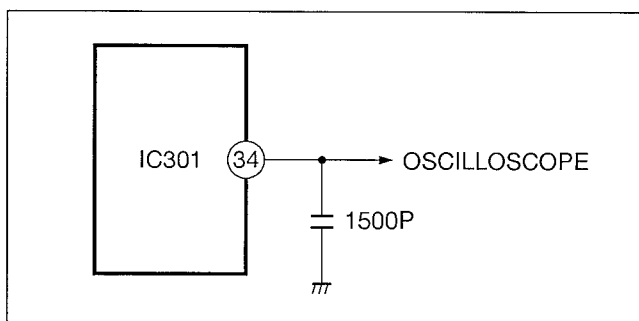


Fig. E14

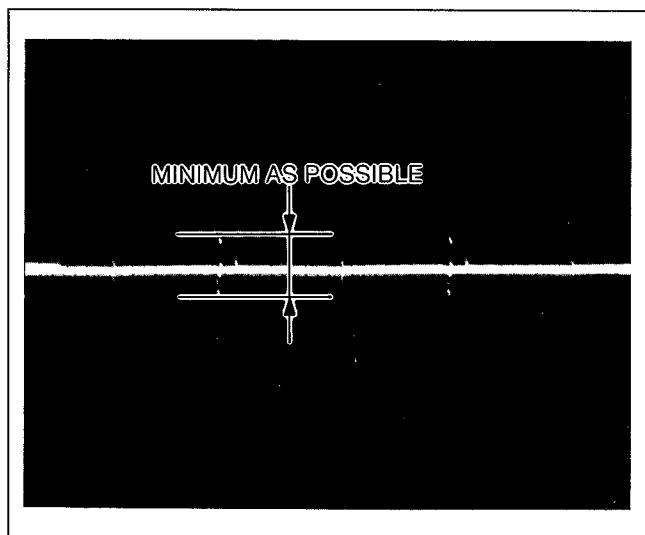


Fig. E15

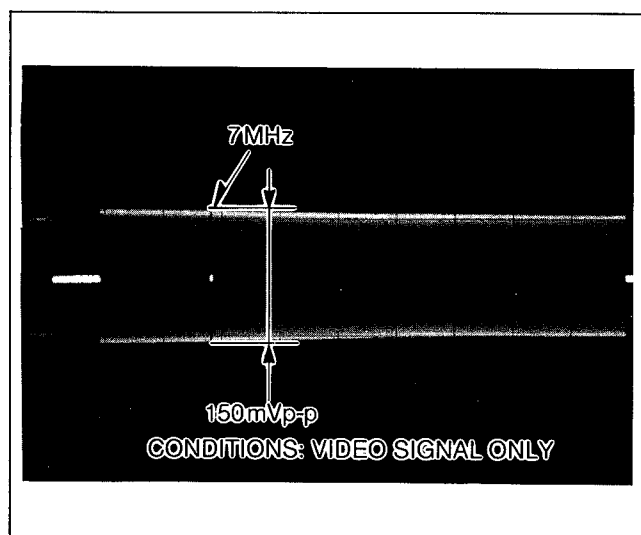


Fig. E17

2-5-14. RF PEAK FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP4	VR3004	STOP	VIDEO SWEEP SIGNAL TW5 (RF Y IN)
TAPE	M. EQ.	SPEC.	
OSCILLOSCOPE/VIDEO SWEEP GENERATOR		SIGNAL LEVEL AT 7MHz PORTION IS MAXIMUM	

- Note: 1. Connect the Service Circuit as shown in Fig. E16.
 2. Set VR3003 to centre position.
 3. Set the Video Sweep Signal Generator (video signal only) as shown in Fig. E17.
 4. Supply set up video sweep signal to TW5 via Service Circuit.
 5. Adjust VR3004 until the signal level at 7 MHz portion is maximum as shown in Fig. E18.

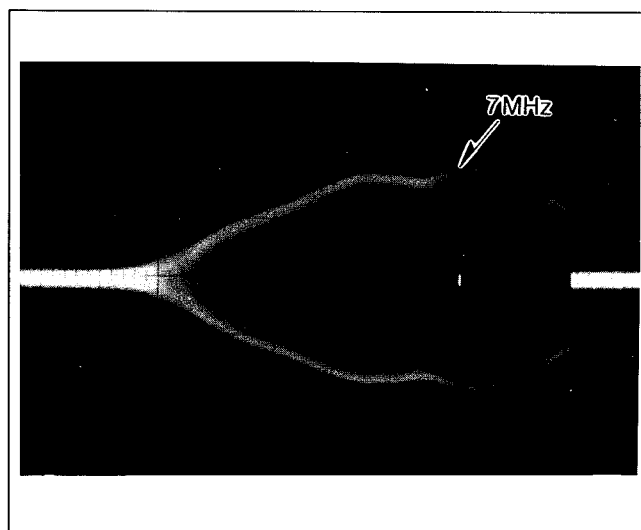


Fig. E18

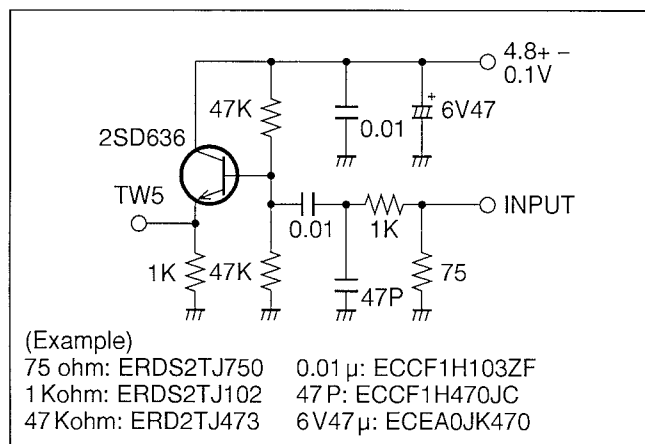


Fig. E16

2-5-15. AI REF. VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TW1	VR3014	SP (SELF RECORDED) PLAYBACK	PAL COLOUR BAR (TP3003)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	D.V.M	2.5+/-0.23 (V)	

- Note: 1. Set the S-VHS SW to OFF position.
 2. Set the CVC SW to ON position.

2-5-16. SECAM KILLER ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC8013-11 IC805-11	T8001 T882	STOP AND SP PLAYBACK	SECAM COLOUR BAR
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLO- SCOPE	T882/T8001 WAVEFORM IS MAXIMIZED	

Note: 1. T882 ADJUSTMENT

- 1) Set the SYSTEM SELECT SW to AUTO position.
- 2) Connect the oscilloscope to pin 11 of IC805 and adjust T882 until the amplitude of the $f_h/2$ waveform is maximized in STOP mode.

2. T8001 ADJUSTMENT

- 1) Set the SYSTEM SELECT SW to MESECAM position.
- 2) Record SECAM COLOUR BAR signal and playback the recorded portion.
- 3) Connect the oscilloscope to pin 11 of IC8013 and adjust T8001 until the amplitude of the $f_h/2$ waveform is maximized in playback mode.

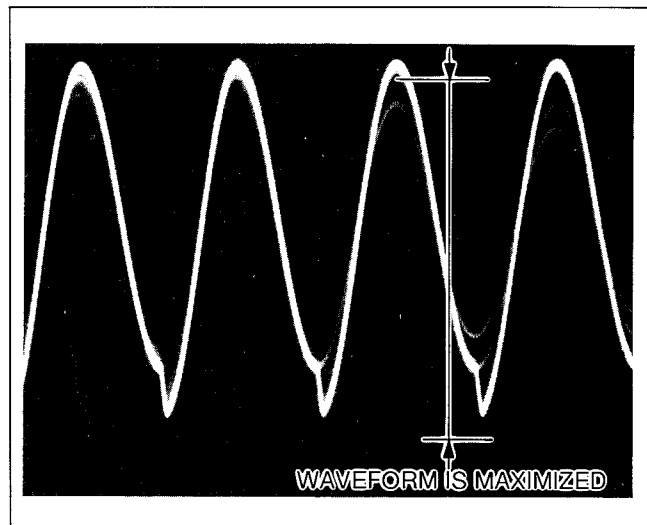


Fig. E19

2-5-17. SECAM BELL FILTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TL804	VR802	SP RECORDING	SINEWAVE 4.286MHz
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLO- SCOPE SINEWAVE GENERATOR	WAVEFORM IS MAXIMIZED at 4.286MHz+/-0.02MHz	

- Note: 1. Set the S VHS SW to OFF position. (VHS MODE)
2. Set the SYSTEM SELECT SW to SECAM position.
 3. Before recording the sinewave, set the sinewave generator until the signal level at pin 8 of PS802 is 170mVp-p.

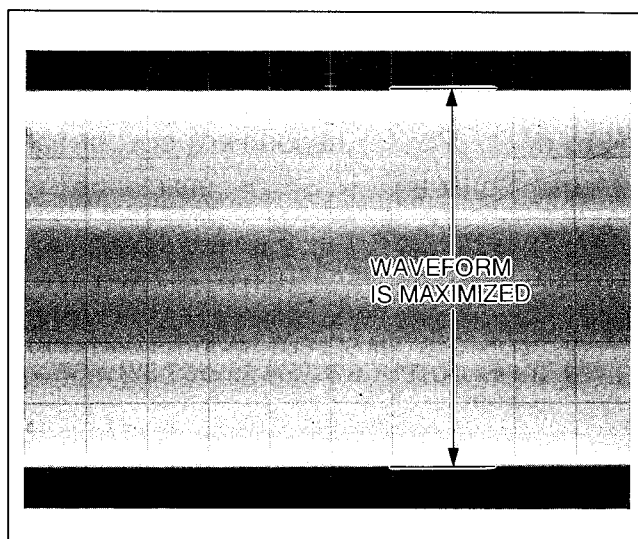


Fig. E20

2-5-18. REC PB EQUALIZER ADJUSTMENT

TP	ADJ.	MODE	INPUT
PS303-10	VR801	SP PLAYBACK	SINEWAVE 1.0715MHz (PS802-1)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLO- SCOPE SINEWAVE GENERATOR	WAVEFORM IS MAXIMIZED at 1.0715MHz+/-0.005MHz	

- Note: 1. Set the S VHS SW to OFF position. (VHS MODE)
2. Set the SYSTEM SELECT SW to SECAM position.
 3. Disconnect (open) the pin 8 of PS303.
 4. Before the adjustment, connect the sinewave generator to pin 1 of PS802 and set the sinewave generator until the signal level at TL805 is 25mVp-p.
 5. After adjustment, connect the pin 8 of PS303.

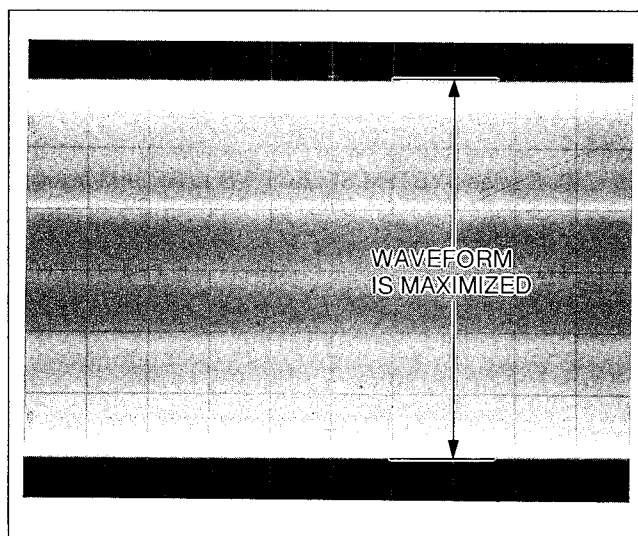


Fig. E21