

ELECTRICAL & MECHANICAL ADJUSTMENT

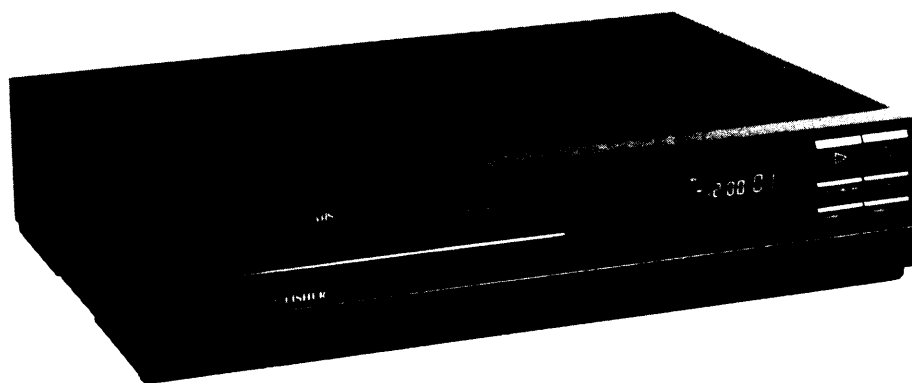


FISHER

VIDEO CASSETTE RECORDER

FVH-P5000/P5100

(U.K.)



(Photo: Model FVH-P5100)

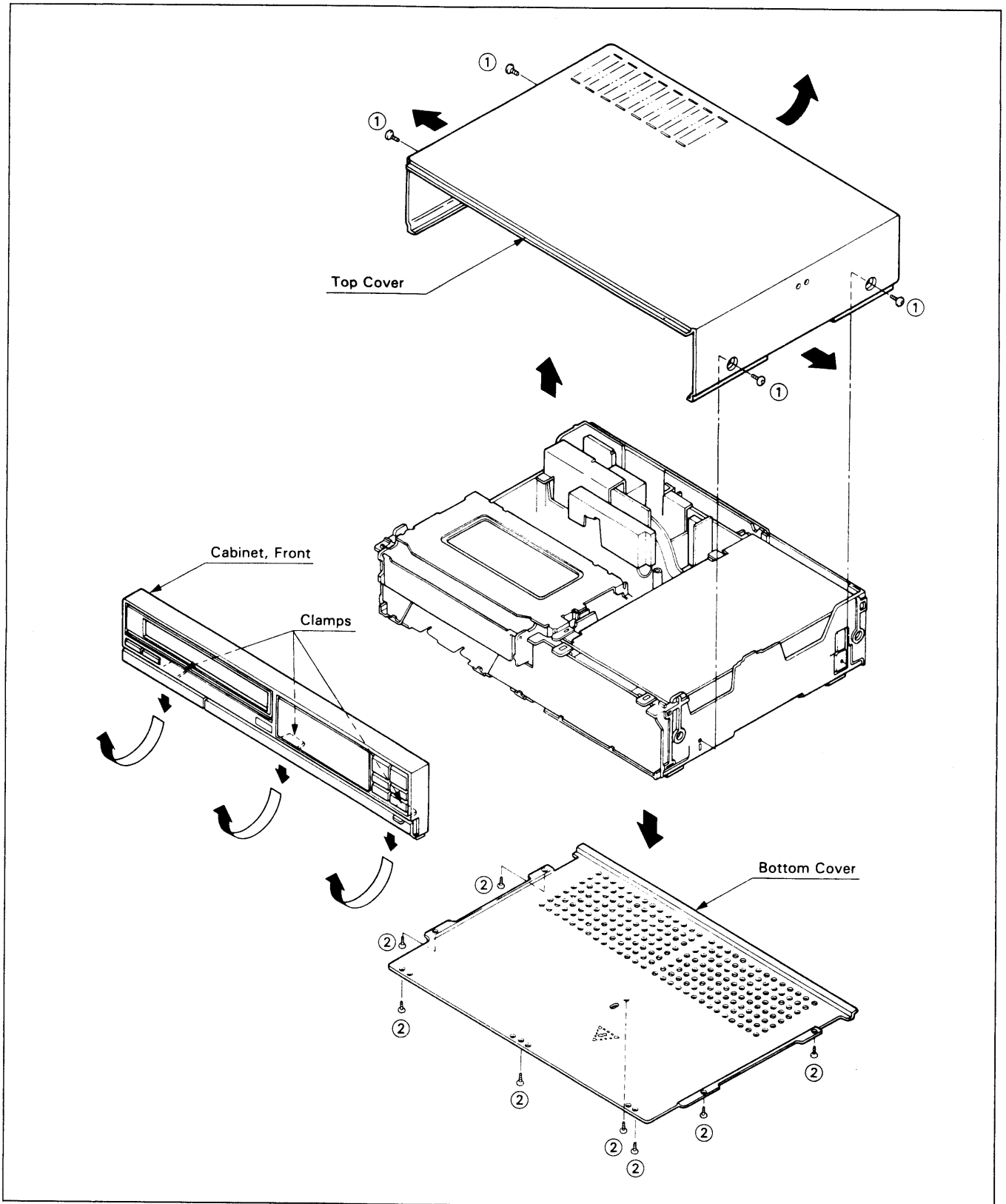
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1. CABINET DISASSEMBLY

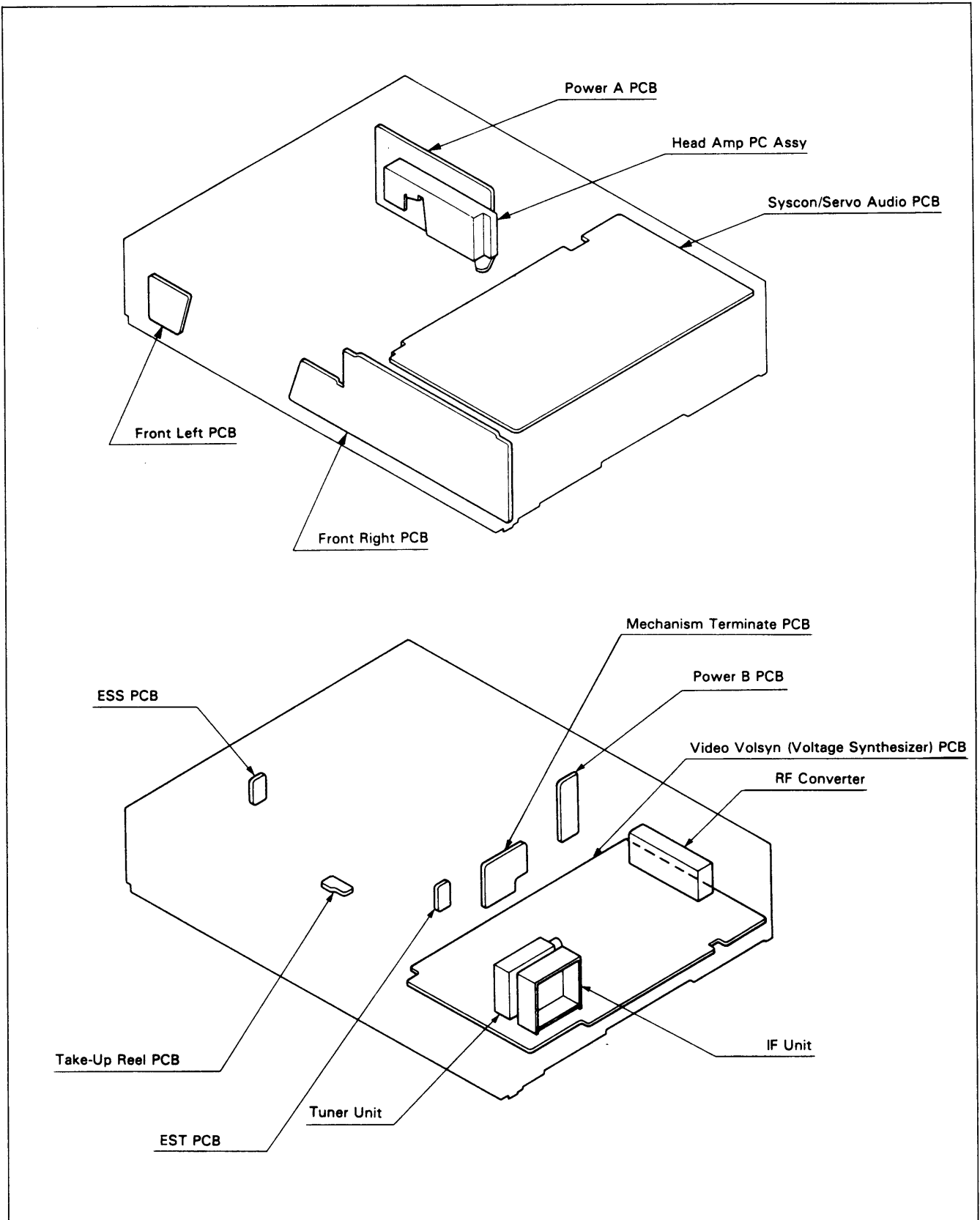
When disassembling the following parts, remove the screws shown in the figure in numerical order, and remove the parts in the direction of the arrows while pulling the clamps.

Note: Do not push or pull the clamps strongly, as damage may occur.



2. CIRCUIT BOARD DISASSEMBLY

2.1 CIRCUIT BOARD LOCATIONS

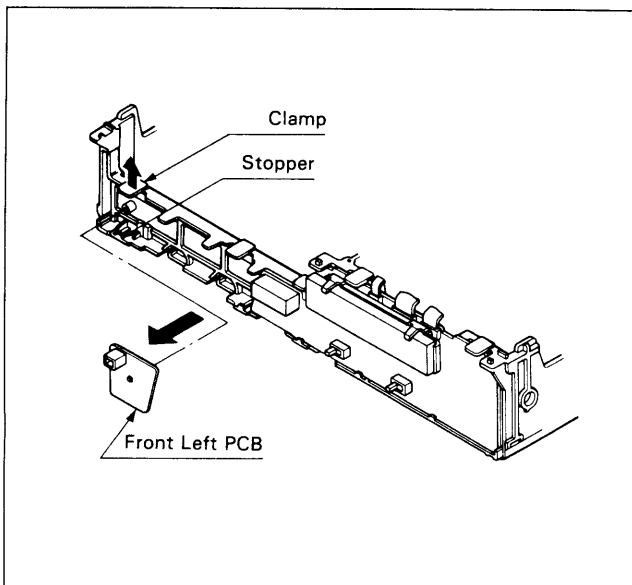


2.2 CIRCUIT BOARD DISASSEMBLY

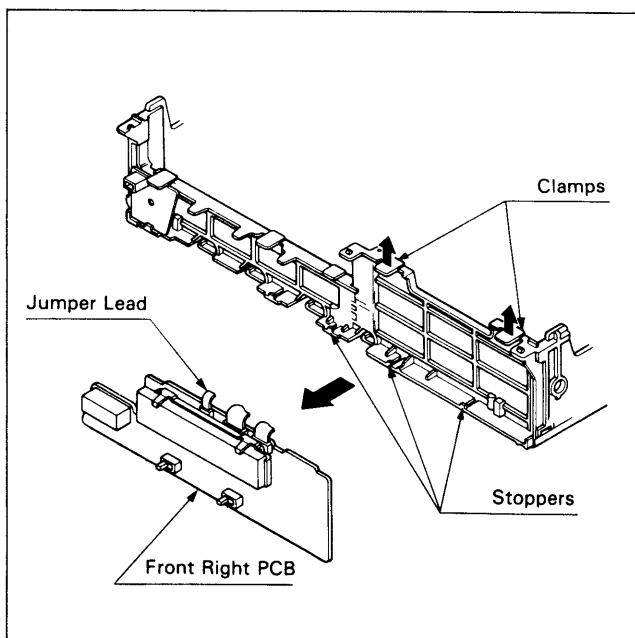
1. Be sure to disconnect the AC plug before doing the following procedures.
2. When disassembling the circuit board, remove the screws shown in the figure in numerical order, and remove the board in the direction of the large arrow while pulling the clamps in the direction of the small arrows. For complete removal, disconnect the connectors and, if necessary, remove the soldered connections on the connectors or the jumper lead.

Note: Do not push or pull the clamps strongly, as damage may occur.

2.2.1 FRONT LEFT PCB

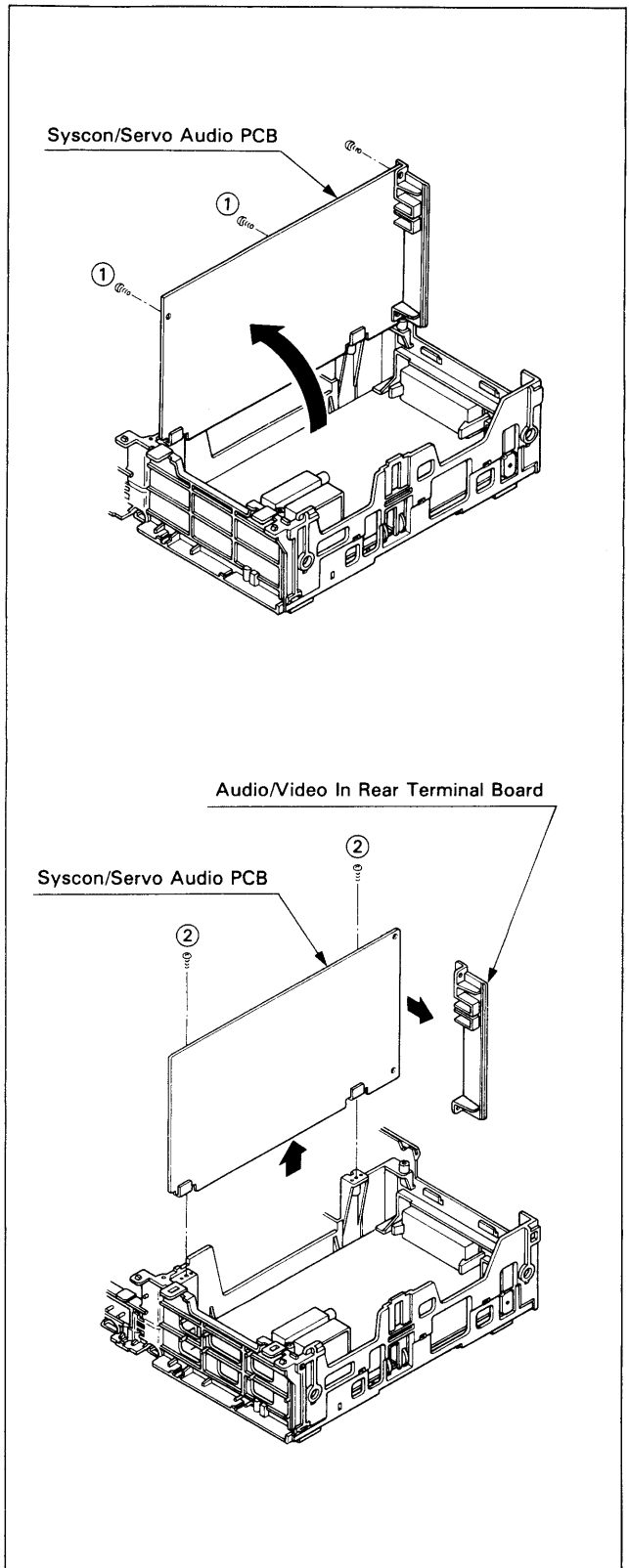


2.2.2 FRONT RIGHT PCB

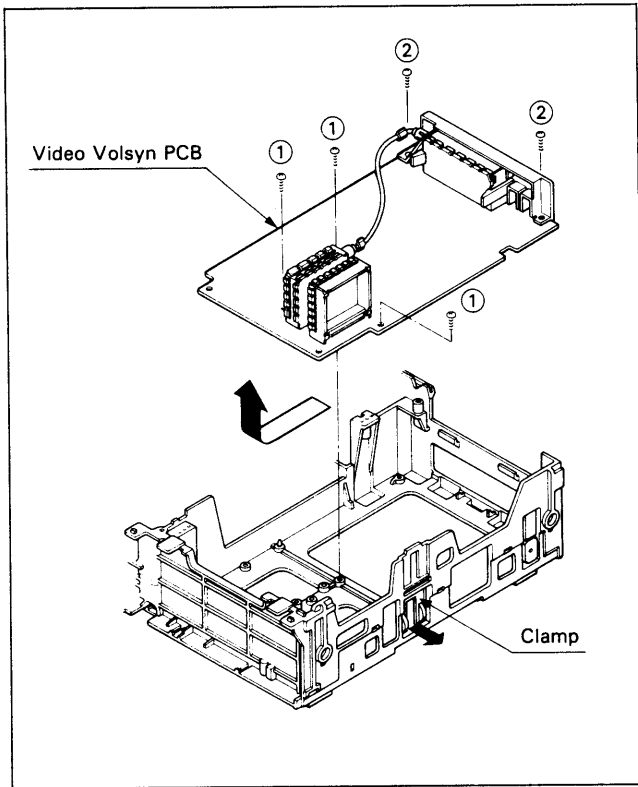


2.2.3 SYSCON/SERVO AUDIO PCB

When removing Audio/Video In Rear Terminal Board, unsolder RCA pin jacks of Audio/Video In Rear Terminal Board from Syscon/Servo Audio PCB.

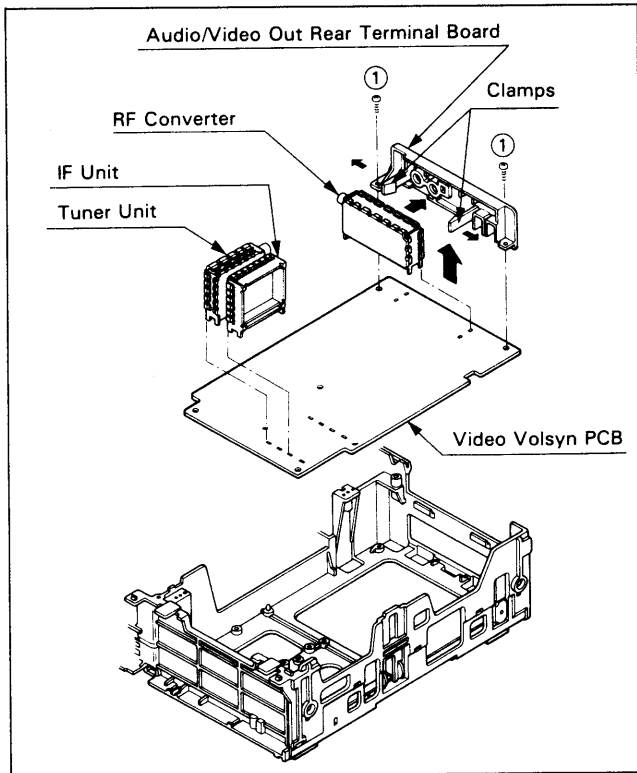


2.2.4 VIDEO VOLSYN (VOLTAGE SYNTHESIZER) PCB

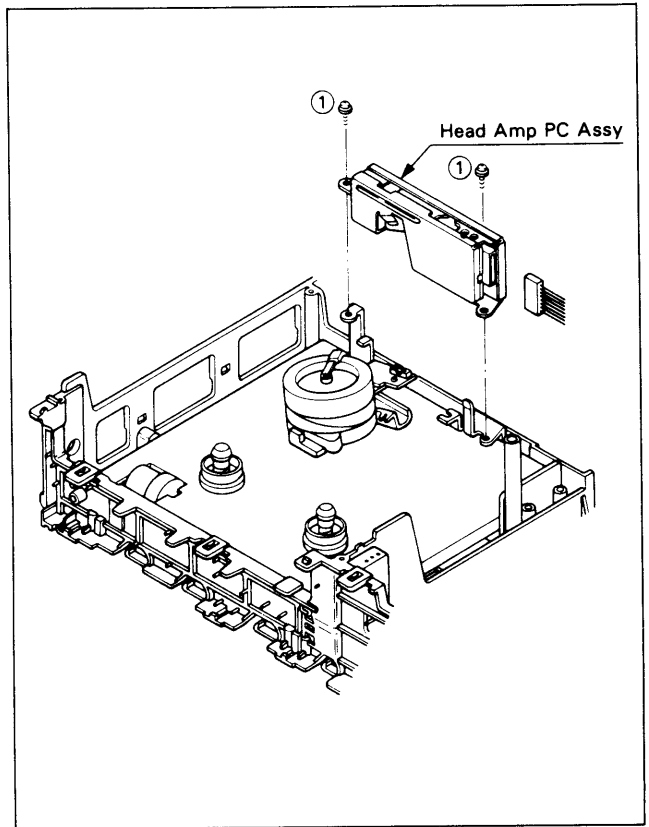


2.2.5 TUNER UNIT, IF UNIT AND RF CONVERTER

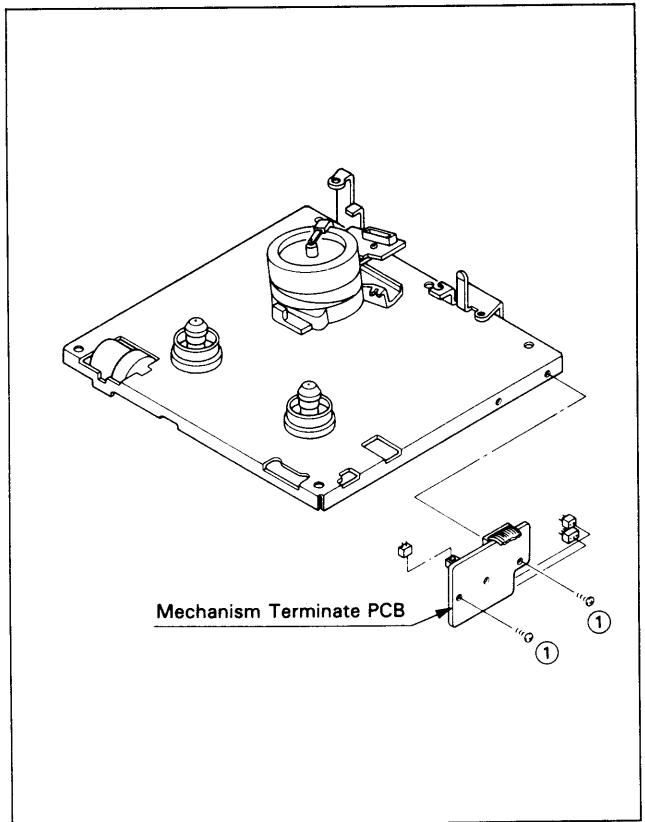
When removing Tuner Unit, IF Unit and RF Converter, unsolder from Video Volsyn PCB.



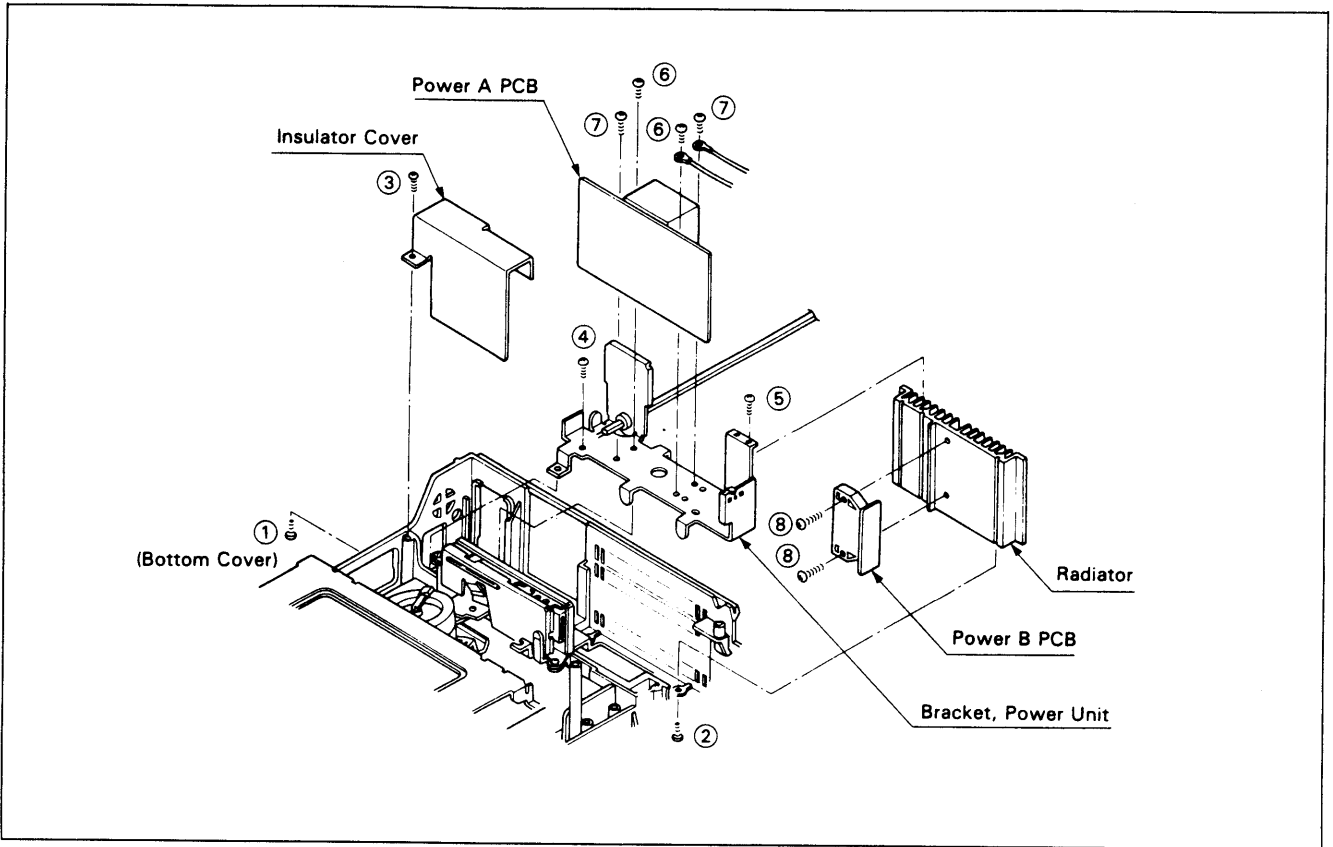
2.2.6 HEAD AMP PC ASSY



2.2.7 MECHANISM TERMINATE PCB



2.2.8 POWER PCB



MEMO

3. ELECTRICAL ADJUSTMENT

3.1 SYSTEM CONTROL SERVO CIRCUIT

- These adjustments should be carried out upon completion of the tape transport adjustments.
- If the tape transport adjustments (except the tilt adjustment) are carried out after these adjustments, follow the procedures again in Section 3.1.4 (1) CH1 PHASE/CH2 PHASE and (3) X VALUE.

3.1.1 EQUIPMENT AND JIGS REQUIRED

Oscilloscope	Dual trace with an external trigger terminal or more than triple trace.
Monitor TV	
Test Tape	VPM-6 (SVJ-00031): Monoscope, 6 kHz

3.1.2 LOCATION OF ADJUSTMENT POINTS

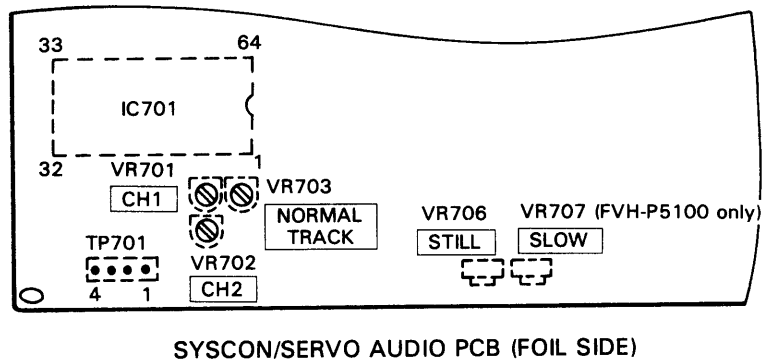


Fig. 3.1.1

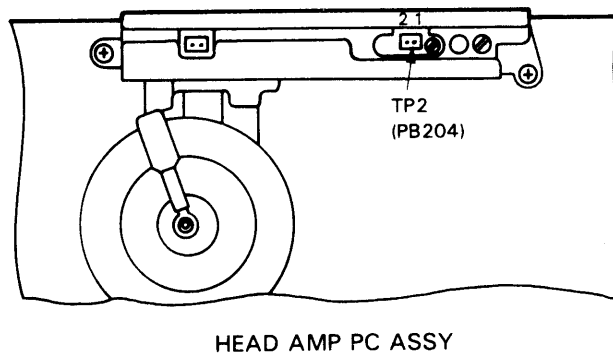
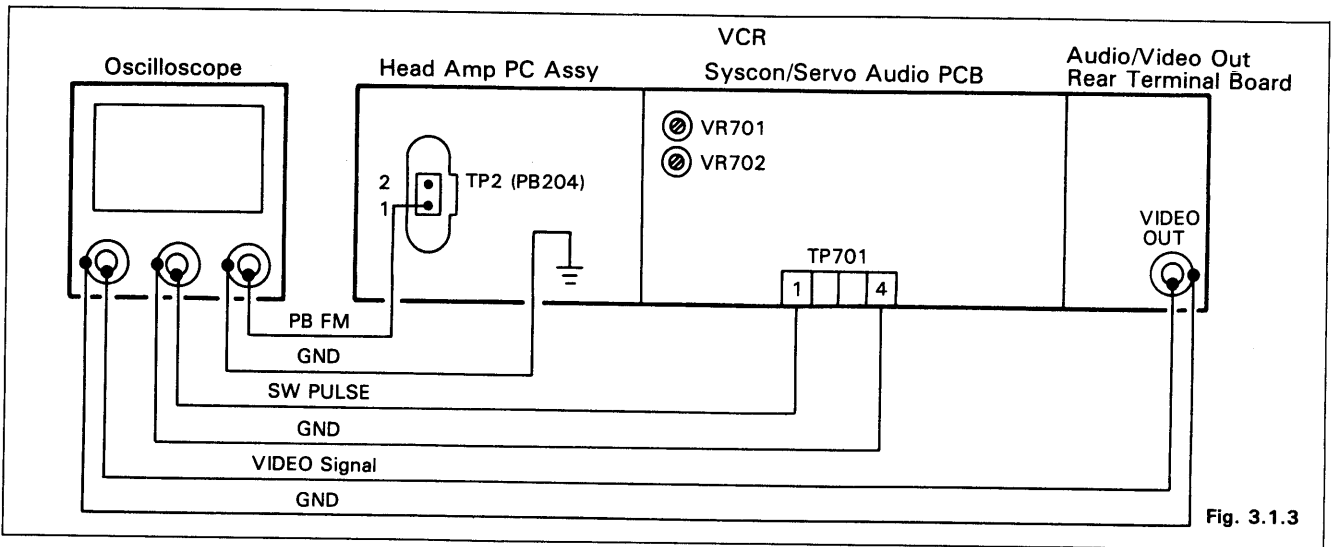


Fig. 3.1.2

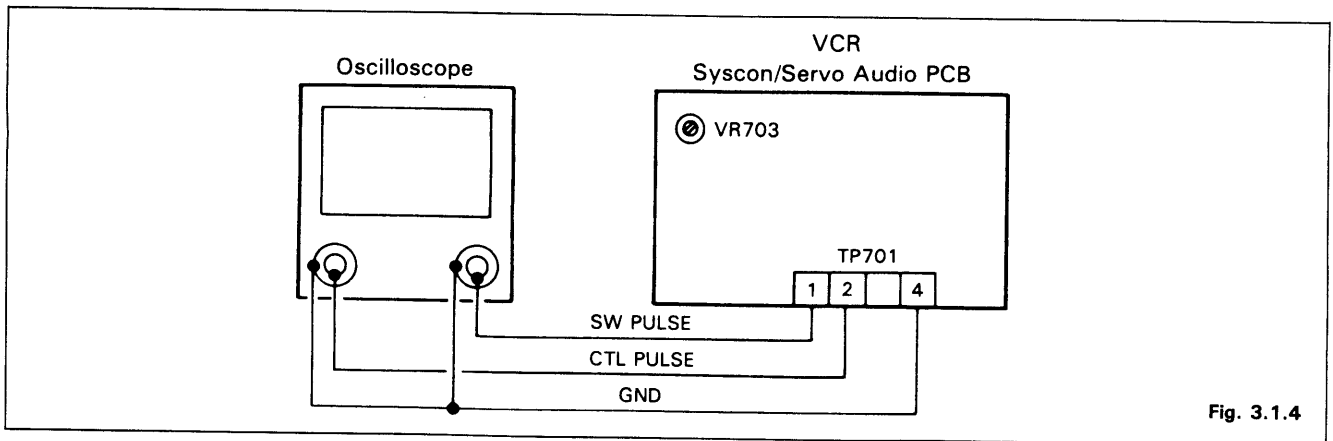
3.1.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (4) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.1.4.

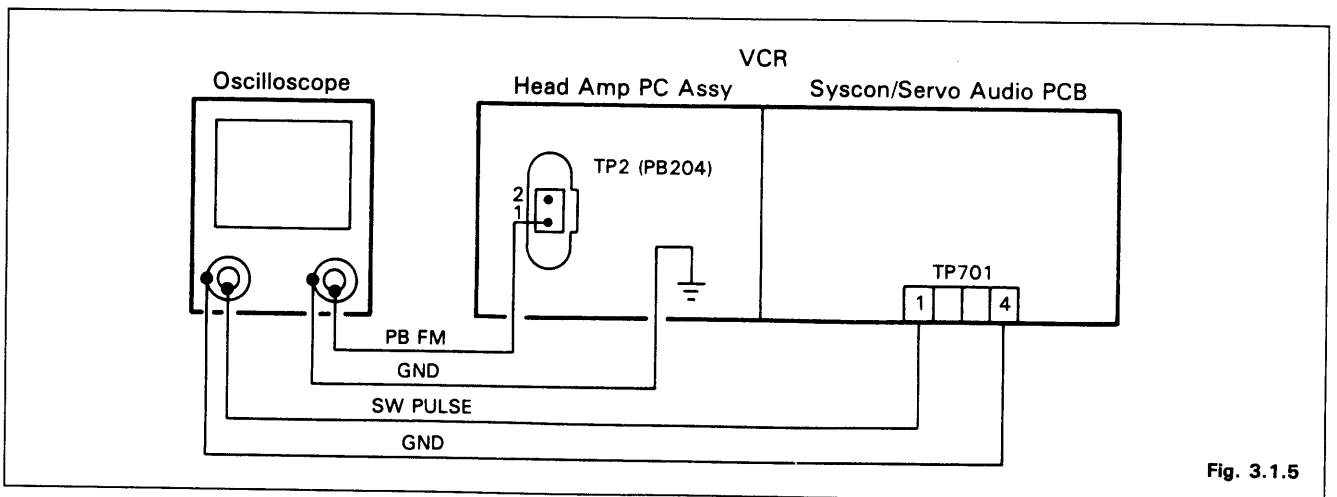
(1) CH1 PHASE/CH2 PHASE (PLAY MODE)



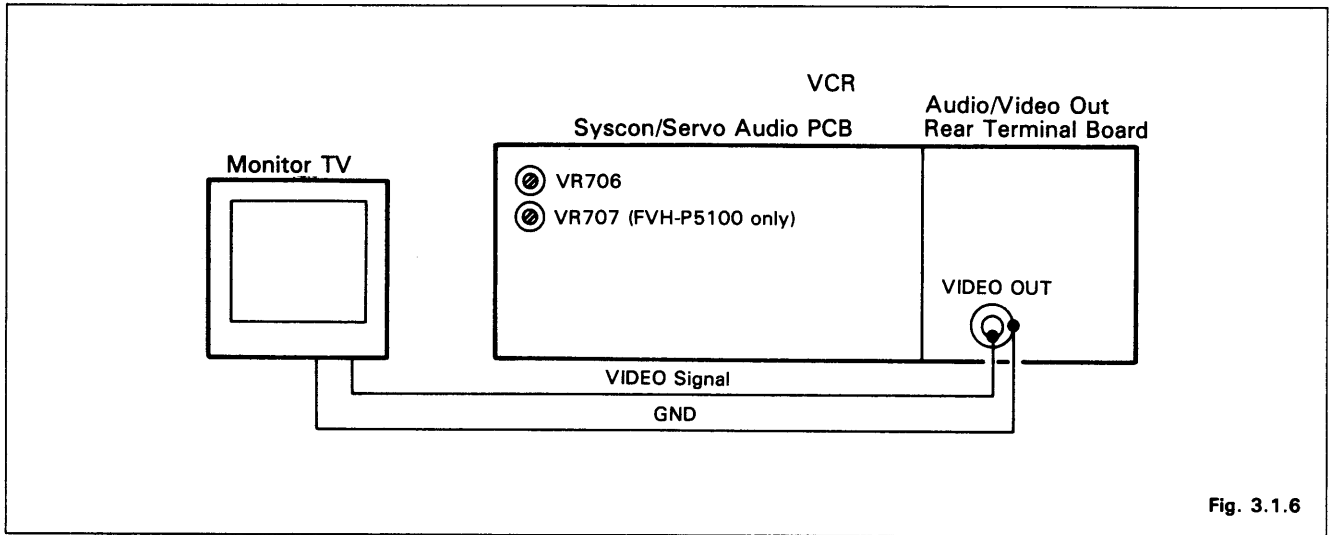
(2) PLAY MODE TRACKING



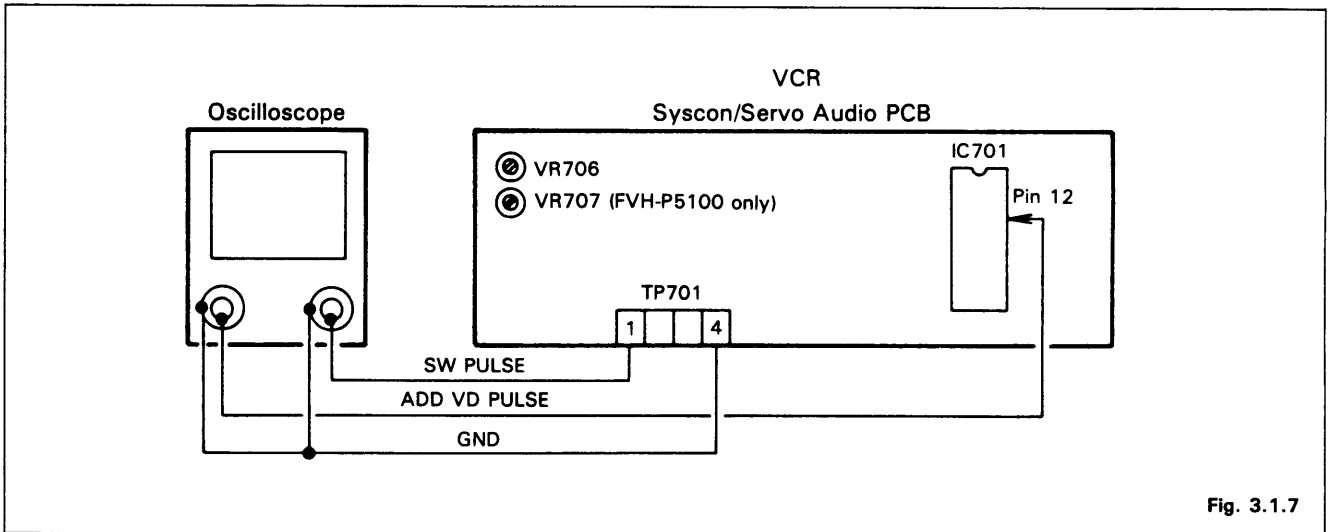
(3) X VALUE



(4) V-ADDITIONAL PULSE
 [A] ADJUSTMENT BY THE PICTURE OF MONITOR TV



[B] ADJUSTMENT BY ELECTRICAL WAVEFORM



3.1.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (4) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.1.3.

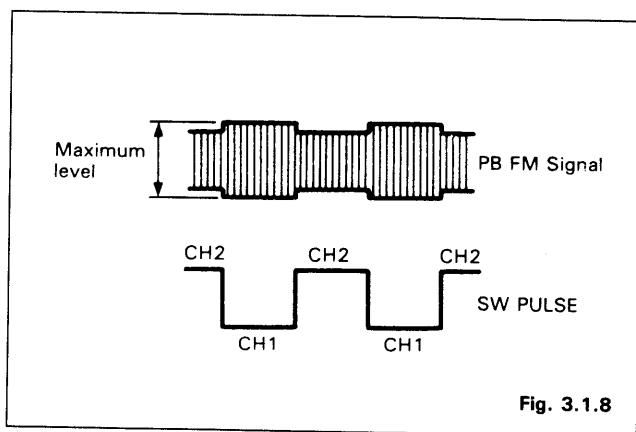
Note:

ADJ. is the abbreviation for adjustment in following section.

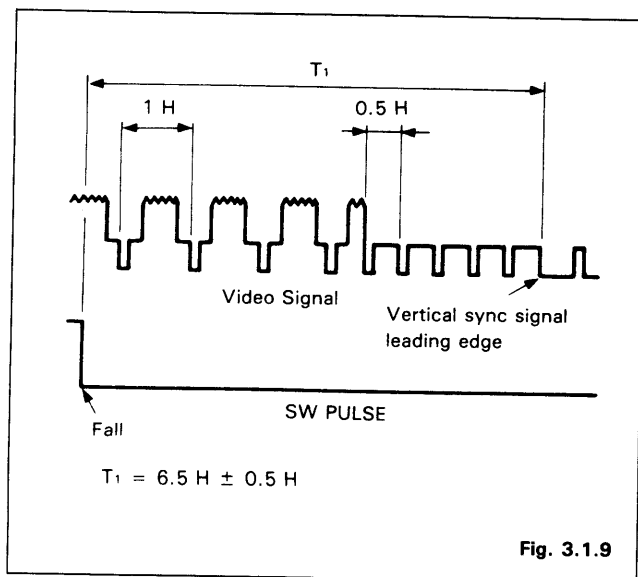
(1) CH1 PHASE/CH2 PHASE (PLAY MODE)

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP2 (PB204) (PB FM) (on Head Amp PC Assy) Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND) VIDEO OUTPUT terminal	Oscilloscope	PLAY mode Test Tape (VPM-6)
ADJ. Location	ADJ. Value	
VR151 (TRACKING control knob)	Maximum level (PB FM Signal)	
VR701 (CH1 PHASE)	$6.5 H \pm 0.5 H$	
VR702 (CH2 PHASE)	$6.5 H \pm 0.5 H$	

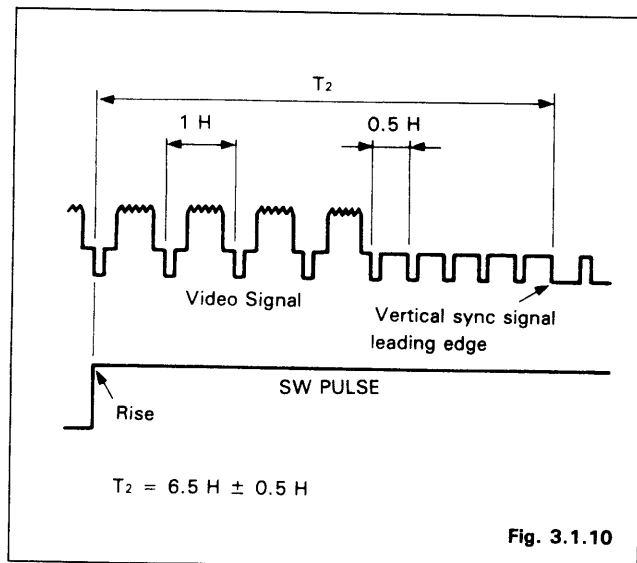
- Adjust VR151 (TRACKING control knob) behind the door on the front panel so that the PB FM Signals for both CH1 and CH2 are brought to their maximum levels. (Refer to Fig. 3.1.8)



- Adjust VR701 (CH1 PHASE) so that the width "T₁" becomes $6.5 H \pm 0.5 H$ as shown in Fig. 3.1.9



- Adjust VR702 (CH2 PHASE) so that the width "T₂" becomes $6.5 H \pm 0.5 H$ as shown in Fig. 3.1.10.

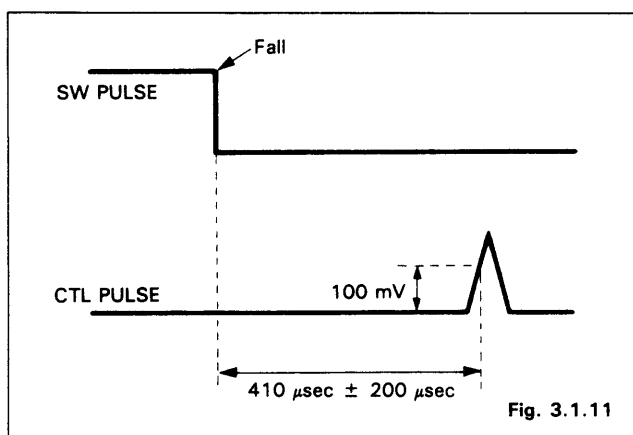


(2) PLAY MODE TRACKING

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP701 (SW PULSE) Pin 2 of TP701 (CTL PULSE) Pin 4 of TP701 (GND)	Oscilloscope	PLAY mode Test tape (VPM-6)
ADJ. Location	ADJ. Value	
VR703 (NORMAL TRACK)	$410 \mu\text{sec} \pm 200 \mu\text{sec}$	

1. Adjust VR151 (TRACKING control knob) behind the door on the front panel to its centre (detent) position.
2. Adjust VR703 (NORMAL TRACK) for $410 \mu\text{sec} \pm 200 \mu\text{sec}$ as shown in Fig. 3.1.11.

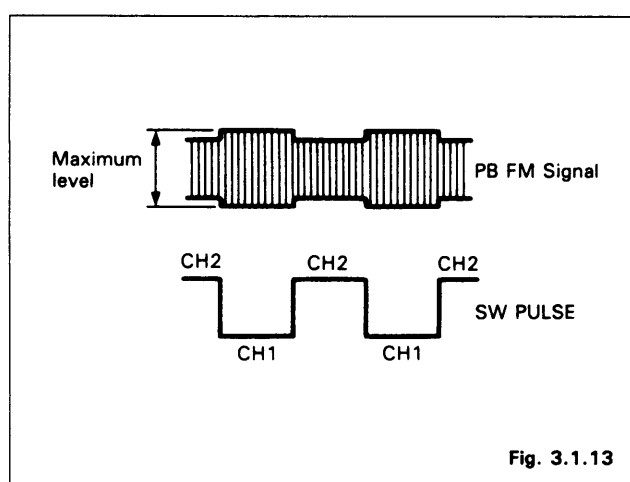
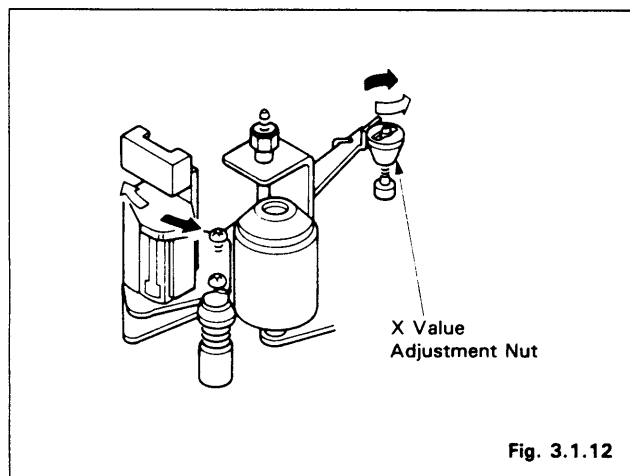


(3) X VALUE

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP2 (PB204) (PB FM) (on Head Amp PC Assy) Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND)	Oscilloscope	PLAY mode Test tape (VPM-6)
ADJ. Location	ADJ. Value	
X value adjustment nut	Maximum level (CH1 PB FM Signal)	

1. Adjust VR151 (TRACKING control knob) behind the door on the front panel to its centre (detent) position.
2. Adjust the X value adjustment nut for the maximum PB FM Signal for CH1. (Refer to Fig. 3.1.12 and Fig. 3.1.13)
3. After adjusting the X value, check that the output level of the PB FM Signal for CH1 changes symmetrically, by rotating VR151 (TRACKING control knob) behind the door on the front panel.



Note:

If the audio control erase head adjustments (except the tilt adjustment) are carried out after these adjustments, repeat the procedures in Section 3.1.4 (2) PLAY MODE TRACKING and (3) X VALUE.

(4) V-ADDITIONAL PULSE

The [A] ADJUSTMENT BY THE PICTURE OF THE MONITOR TV should be made finally.

When this adjustment is made, the preceding adjustments (Section 3.1.4 (1), (2), (3)) should have been made. If the electrical preadjustment is necessary, refer to [B] ADJUSTMENT BY THE ELECTRICAL WAVEFORM.

FVH-P5100 ONLY

Note: It is possible to use the STILL function and the SLOW function only with remote control operation.

[A] ADJUSTMENT BY THE PICTURE OF THE MONITOR TV

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	STILL mode Test tape (VPM-6)
		SLOW mode Test tape (VPM-6)
ADJ. Location		ADJ. Value
VR706 (STILL)		The minimum vertical shake
VR707 (SLOW)		

STILL MODE

1. Adjust VR706 (STILL) so that any vertical shake of the picture is brought to its minimum.

SLOW MODE

1. Adjust VR707 (SLOW) so that any vertical shake of the picture is brought to its minimum.

[B] ADJUSTMENT BY THE ELECTRICAL WAVEFORM

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND) Pin 12 of IC701 (ADD VD PULSE)	Oscilloscope	SLOW mode Test tape (VPM-6)
ADJ. Location		ADJ. Value
VR706 (STILL)		$176 \mu\text{sec} \pm 10 \mu\text{sec}$
VR707 (SLOW)		$176 \mu\text{sec} \pm 10 \mu\text{sec}$

1. Adjust VR706 (STILL) so that the width "B" becomes $176 \mu\text{sec} \pm 10 \mu\text{sec}$ as shown in Fig. 3.1.14.

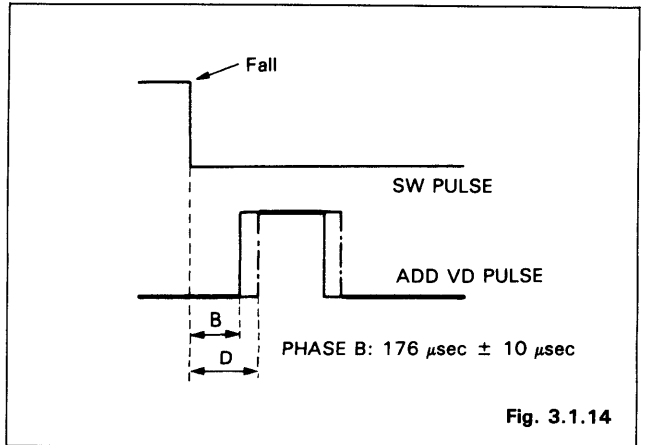


Fig. 3.1.14

2. Adjust VR707 (SLOW) so that the width "C" becomes $176 \mu\text{sec} \pm 10 \mu\text{sec}$ as shown in Fig. 3.1.15.

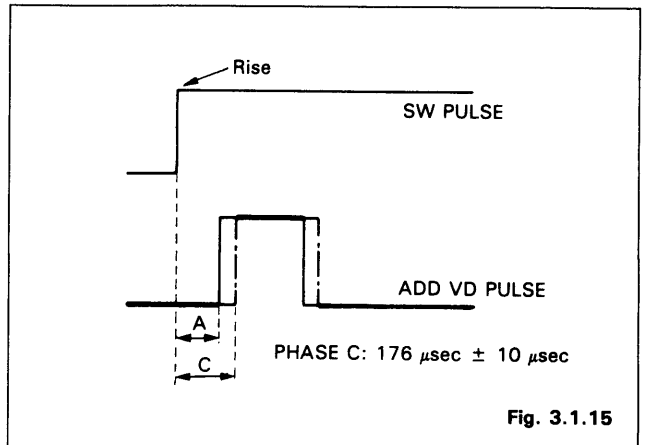


Fig. 3.1.15

- Notes:**
- PHASE A is fixed. (PHASE A: $128 \mu\text{sec}$)
 - PHASE D is adjusted automatically when PHASE C, B have been adjusted correctly. (PHASE D: $224 \mu\text{sec}$)

FVH-P5000 ONLY

Note: It is possible to use the STILL function only with remote control operation.

[A] ADJUSTMENT BY THE PICTURE OF THE MONITOR TV

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	STILL mode Test tape (VPM-6)
ADJ. Location		ADJ. Value
VR706 (STILL)		The minimum vertical shake

1. Adjust VR706 (STILL) so that any vertical shake of the picture is brought to its minimum.

[B] ADJUSTMENT BY THE ELECTRICAL WAVEFORM

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND) Pin 12 of IC701 (ADD VD PULSE)	Oscilloscope	STILL mode Test Tape (VPM-6)
ADJ. Location		ADJ. Value
VR706 (STILL)		224 μ sec \pm 10 μ sec

1. Adjust VR706 (STILL) for 224 μ sec \pm 10 μ sec as shown in Fig. 3.1.16.

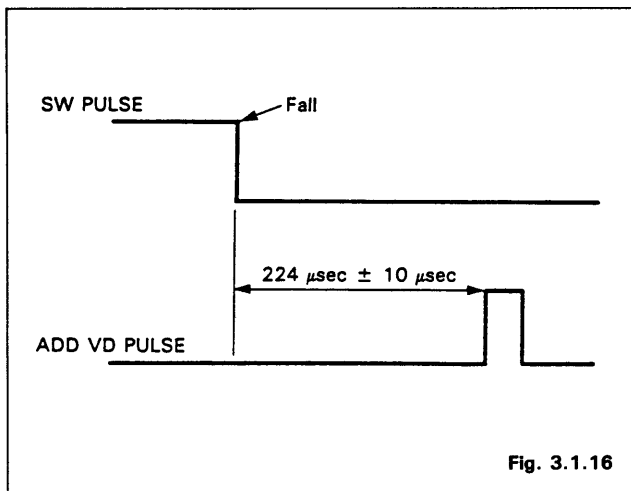


Fig. 3.1.16

3.2 VIDEO CIRCUIT

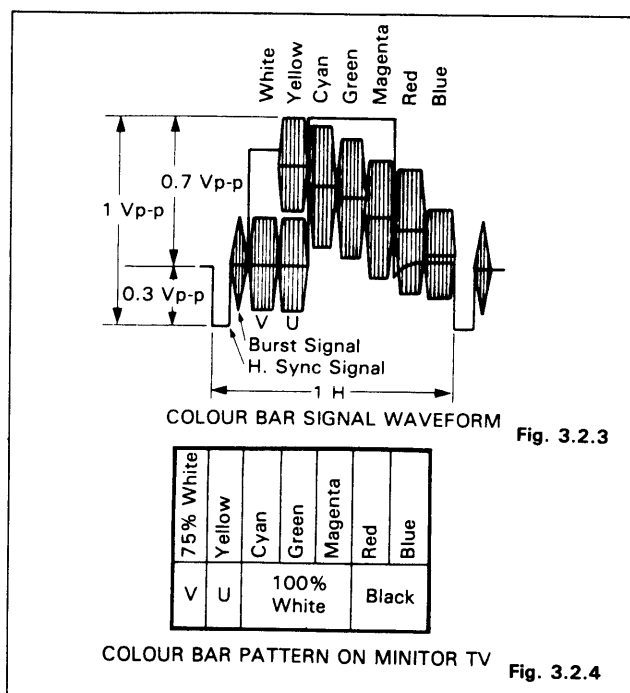
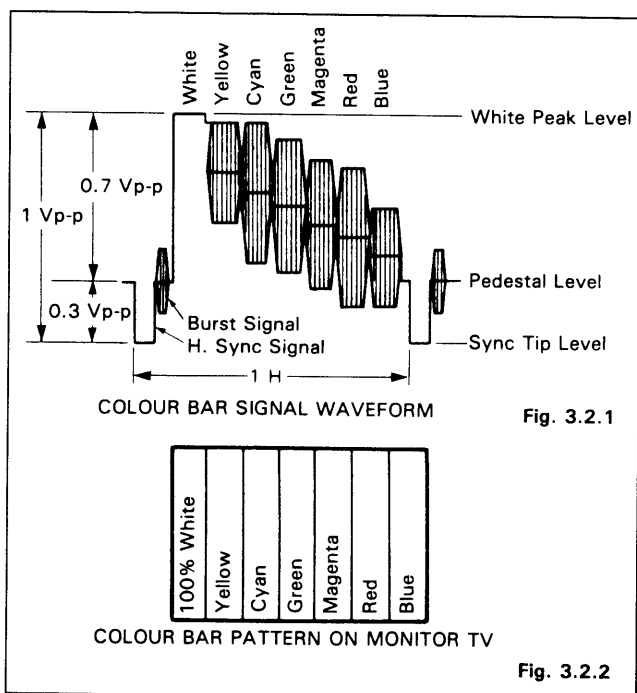
- Before making the following adjustments, Section 5 (MECHANICAL Adjustment) and Section 3.1 (SYSTEM CONTROL SERVO CIRCUIT) adjustments should be completed.

3.2.1 TEST EQUIPMENT AND STANDARDS REQUIRED

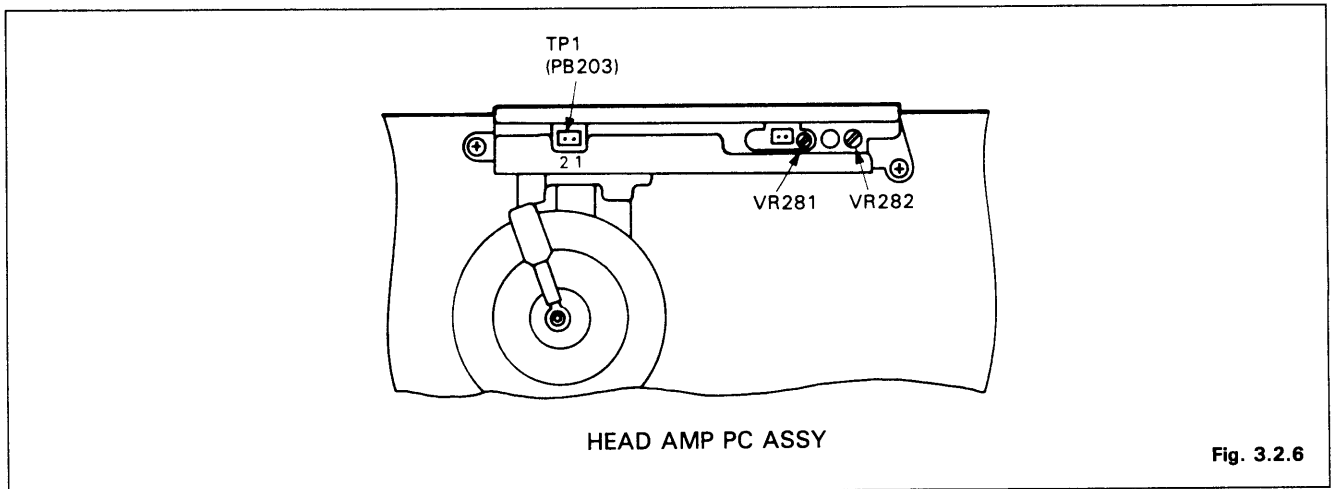
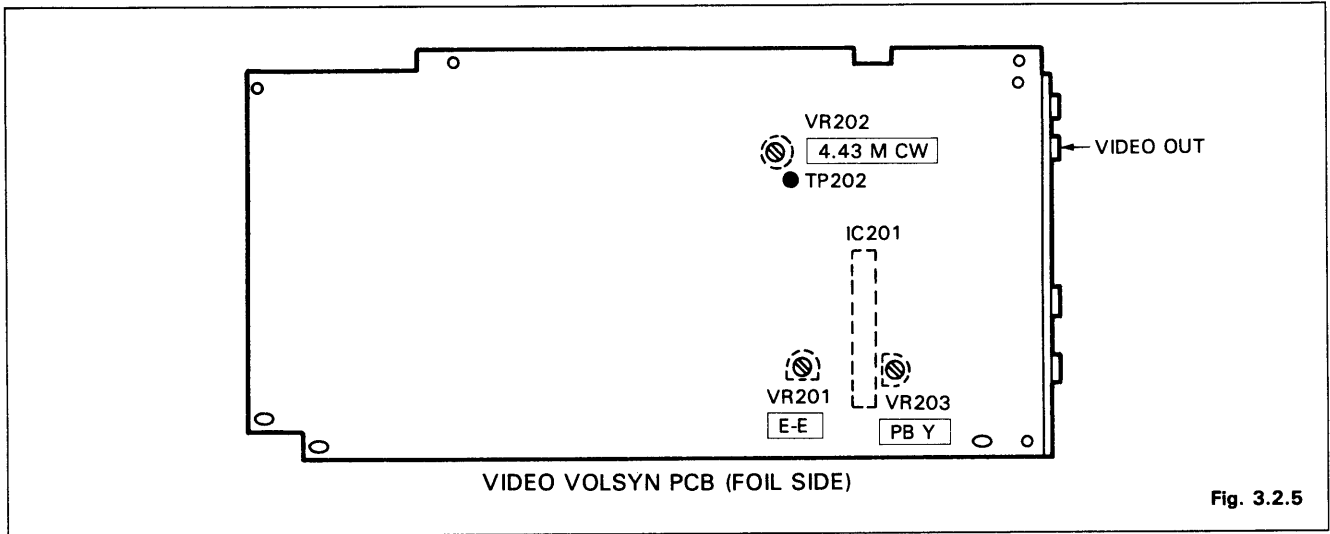
Colour Bar Signal Generator	Colour bar signal with 100% white level (EBU colour bar signal) (Signal waveform is described below. Refer to Fig. 3.2.1)
Oscilloscope	Vertical sensitivity: 5 mV/DIV, easy trigger Band width: more than 20 MHz
Frequency Counter	Input frequency: 20 Hz ~ 10 MHz
Test Tape	VPC-1 (SVJ-00032): colour bar, 1 kHz (Colour bar signal waveform is described below. Refer to Fig. 3.2.3.) VPM-6 (SVJ-00031): Monoscope, 1 kHz
Blank Tape	VHS-type cassette tape
Oscilloscope Probe	Input capacity: less than 25 pF (10:1) less than 40 pF (1:1) Covering frequency: DC ~ 40 MHz (10:1) DC ~ 30 MHz (1:1)

PAL TV TEST SIGNAL

- Colour bar signal used for adjustment is specified as follows. The specification of the colour bar signal should be measured with the oscilloscope at terminated with a 75 Ω resistor.
 - a) The amplitude of the sync signal should be approximately 0.3 Vp-p.
 - b) The amplitude of the video signal should be approximately 0.7 Vp-p (100% White).
 - c) The amplitude of the colour burst should be approximately 0.3 Vp-p.
- d) Confirm that there is no spike noise in the sync part of the horizontal sync signal.
(Refer to Fig 3.2.1 and Fig. 3.2.2)
- Confirm that the colour bar signal from the test tape (VPC-1) at the VIDEO OUTPUT terminal is terminated with a 75 Ω load resistor when the oscilloscope is attached. (Refer to Fig. 3.2.3 and Fig. 3.2.4.)



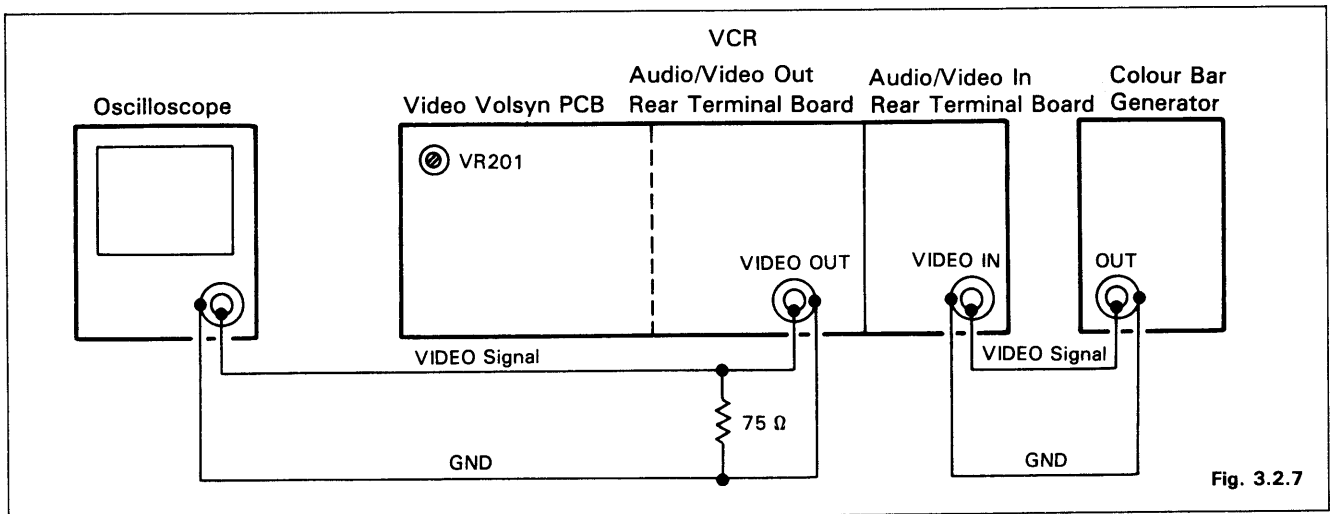
3.2.2 LOCATION OF ADJUSTMENT POINTS



3.2.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (4) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.2.4.

(1) E-E LEVEL



(2) 4.43 MHz VCO

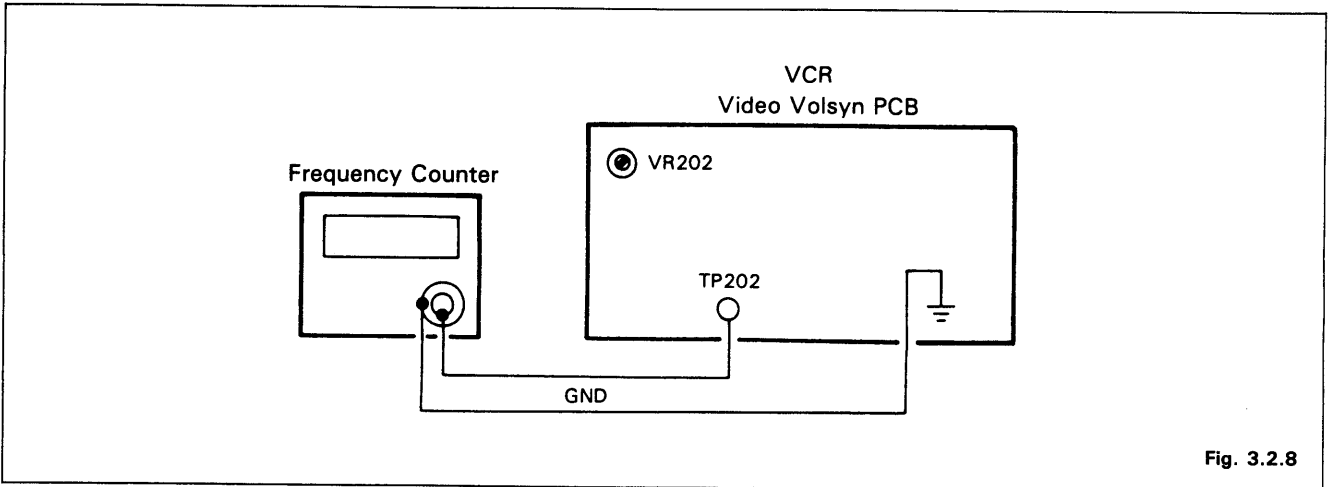


Fig. 3.2.8

(3) PB Y

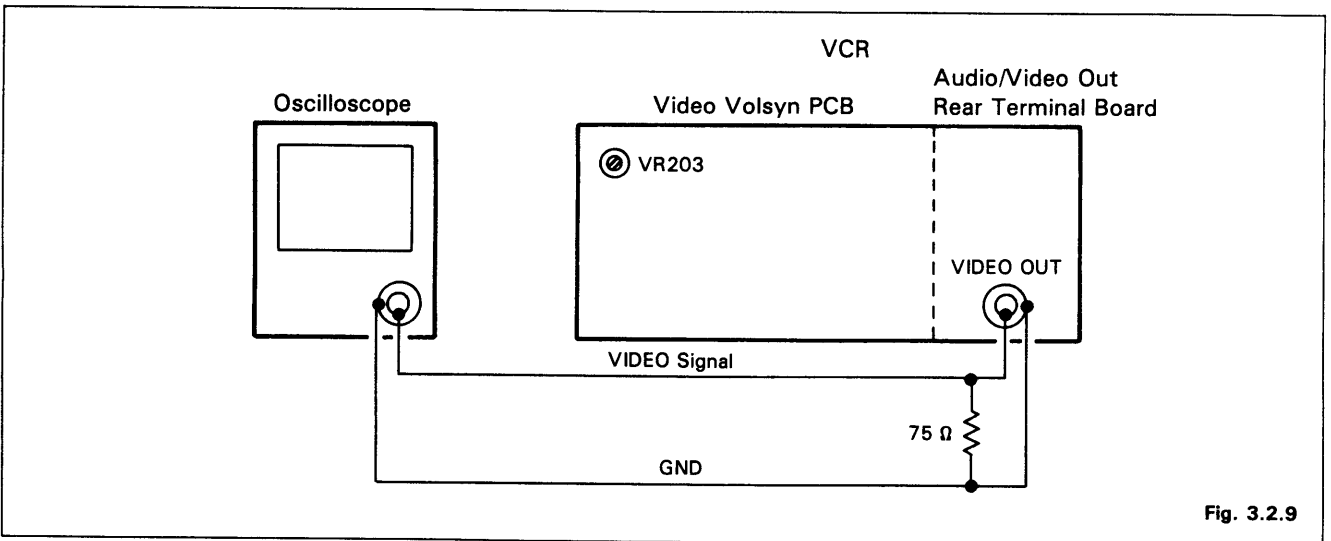


Fig. 3.2.9

(4) REC C/REC Y

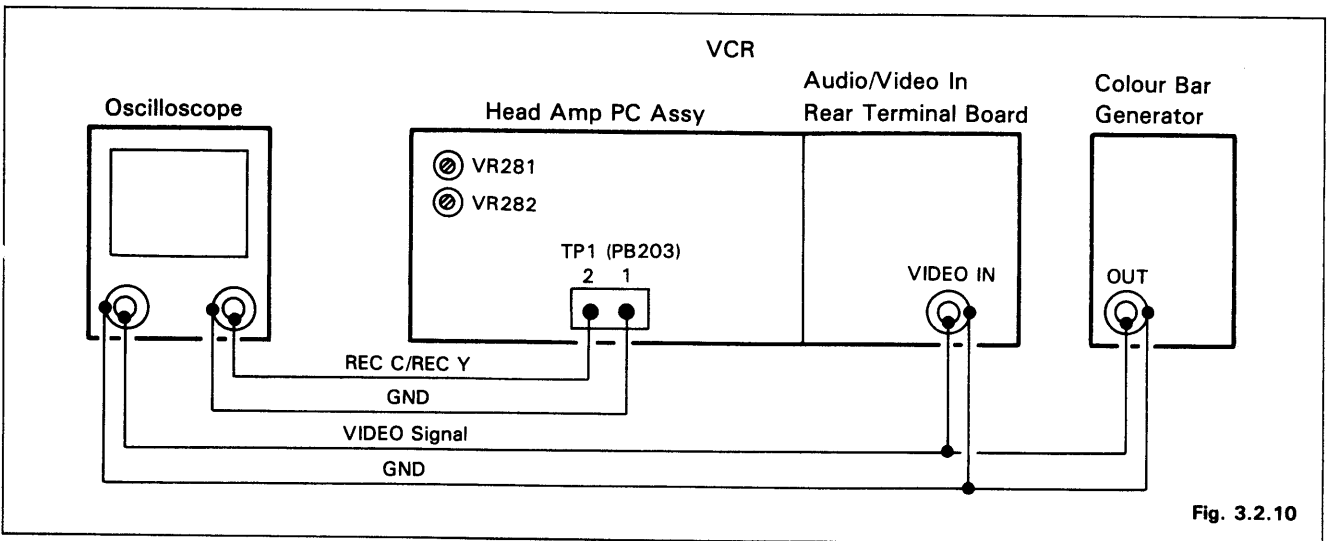


Fig. 3.2.10

3.2.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (4) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.2.3.

Note:

- ADJ. is the abbreviation for adjustment in following section.

(1) E-E LEVEL

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope Colour bar generator	E-E mode 75 Ω termination
ADJ. Location		ADJ. Value
VR201 (E-E LEVEL)		1.0 V _{p-p} ± 50 mV _{p-p}

- Notes:**
- Connect the colour bar generator to VIDEO INPUT terminal. (Refer to Fig. 3.2.7)
 - Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. (Refer to Fig. 3.2.7)

- Adjust VR201 (E-E LEVEL) for the video luminance signal level of 1.0 V_{p-p} ± 50 mV_{p-p}. (Refer to Fig. 3.2.11).

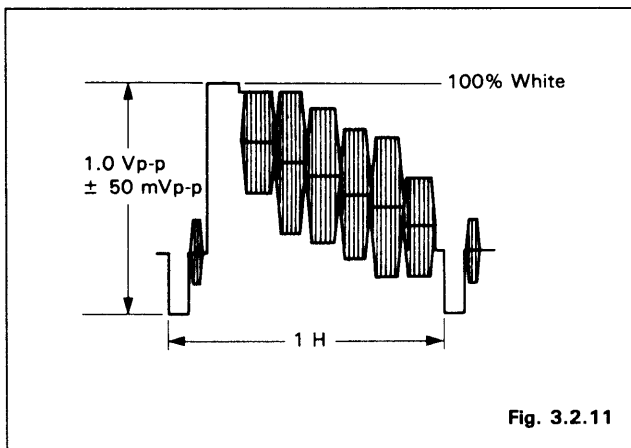


Fig. 3.2.11

(2) 4.43 MHz VCO

Measuring Point	Measuring Equipment	ADJ. Condition
TP202	Frequency Counter	PLAY mode Test Tape (VPM-6)
ADJ. Location		ADJ. Value
VR202 (4.43 M CW)		4.433619 MHz ± 5 Hz

- Adjust VR202 (4.43 M CW) so that the frequency is 4.433619 MHz ± 5 Hz.

(3) PB Y

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope	PLAY mode Test tape (VPC-1)
ADJ. Location		ADJ. Value
VR203 (PB Y)		1.0 V _{p-p} ± 50 mV _{p-p}

- Note:** Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. (Refer to Fig. 3.2.9)

- Adjust VR203 (PB Y) for the video luminance signal level of 1.0 V_{p-p} ± 50 mV_{p-p}. (Refer to Fig. 3.2.12)

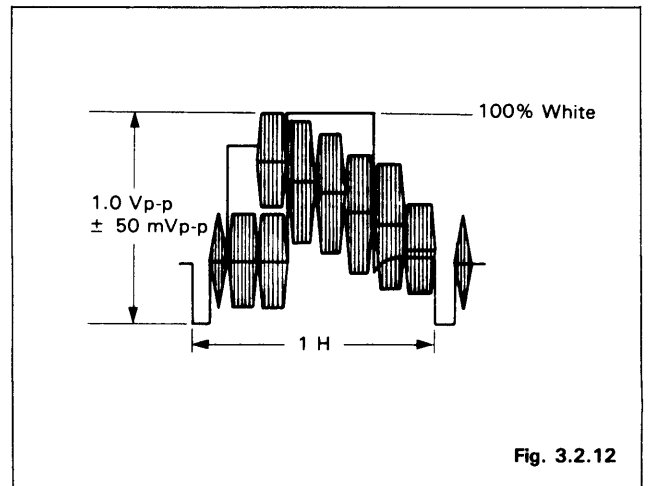


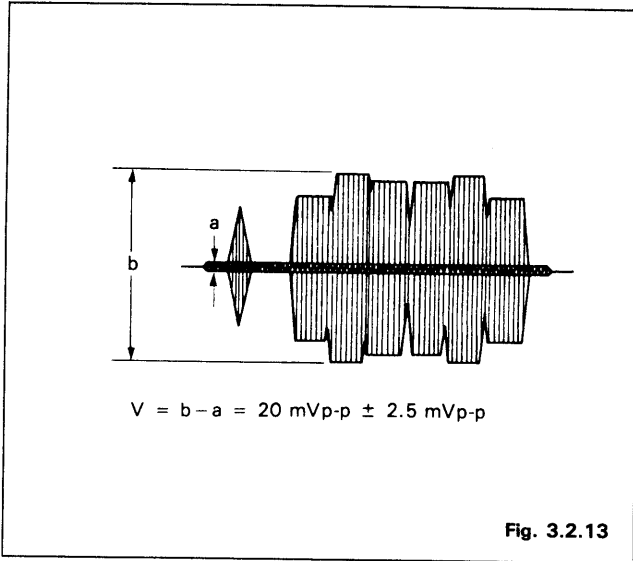
Fig. 3.2.12

(4) REC C/REC Y

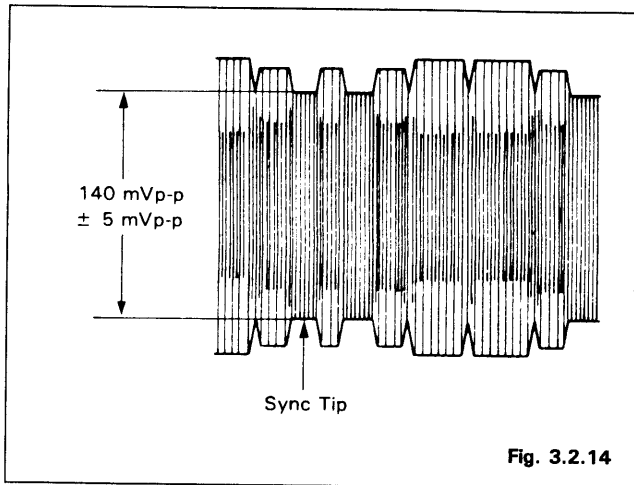
Measuring Point	Measuring Equipment	ADJ. Condition
Pin 2 of TP1 (PB203) Pin 1 of TP1 (PB203) (GND) (on Head Amp PC Assy)	Colour bar generator Oscilloscope (1:1 probe for REC C, 10:1 probe for REC Y)	REC mode Blank tape
ADJ. Location		ADJ. Value
VR282 (REC C)		20 mV _{p-p} ± 2.5 mV _{p-p}
VR281 (REC Y)		140 mV _{p-p} ± 5 mV _{p-p}

- Notes:**
- Connect the colour bar generator and the oscilloscope to VIDEO INPUT terminal.
 - Apply the trigger at H. sync of the input video signal.

- Adjust VR281 (REC Y) for the minimum video luminance signal level.
- Adjust VR282 (REC C) so that the width "V" becomes 20 mV_{p-p} ± 2.5 mV_{p-p} as shown in Fig. 3.2.13.



3. Adjust VR281 (REC Y) for the video luminance signal level at the sync tip of **140 mVp-p ± 5 mVp-p**. (Refer to Fig. 3.2.14)



3.3 AUDIO CIRCUIT

- Prior to making these adjustments, Section 5 MECHANICAL ADJUSTMENTS (especially, the tape guide roller height, tape guide height and audio control erase head height adjustments) should be carried out, so that the tape traveling between the loading guide pole and the audio control erase head runs without fluttering, twisting or curling.
- Prior to making these adjustments, (except the audio control erase head adjustments), Section 3.1 SYSTEM CONTROL SERVO and Section 3.2 VIDEO circuit adjustments should be carried out.

3.3.1 TEST EQUIPMENT AND STANDARDS REQUIRED

Standard Audio Signal Generator (SG)	Output frequency : 10 Hz ~ 20 kHz Output level : more than 1 V _{rms} Output impedance : 600 Ω Distortion ratio : less than 0.1% Output in use SG : Frequency 1 kHz, 10 kHz (switchable) Output level -28 dBV ± 0.5 dB
Colour Bar Signal Generator	Colour bar signal with 100% white level. (Signal waveform is described before. Refer to Fig. 3.2.1)
Oscilloscope	Vertical sensitivity : 10 mV/DIV Band width : more than 30 MHz
AC Voltmeter	Effective value indication Input frequency : 10 Hz ~ 20 kHz Input Impedance : more than 1 MΩ Measurement level : 1 mV (full scale)
Test Tape	VPC-1 (SVJ-00032) : Colour bar, 1 kHz VPM-6 (SVJ-00031) : Monoscope, 6 kHz
Blank Tape	VHS-type cassette tape
Dummy Plug	RCA plug, HOT and COLD short-circuited
Adjustment Screw Drivers	1. ACE Head height adjustment box driver 2. Azimuth adjustment screw driver 3. Variable resistor adjustment screw driver

3.3.2 LOCATION OF ADJUSTMENT POINTS

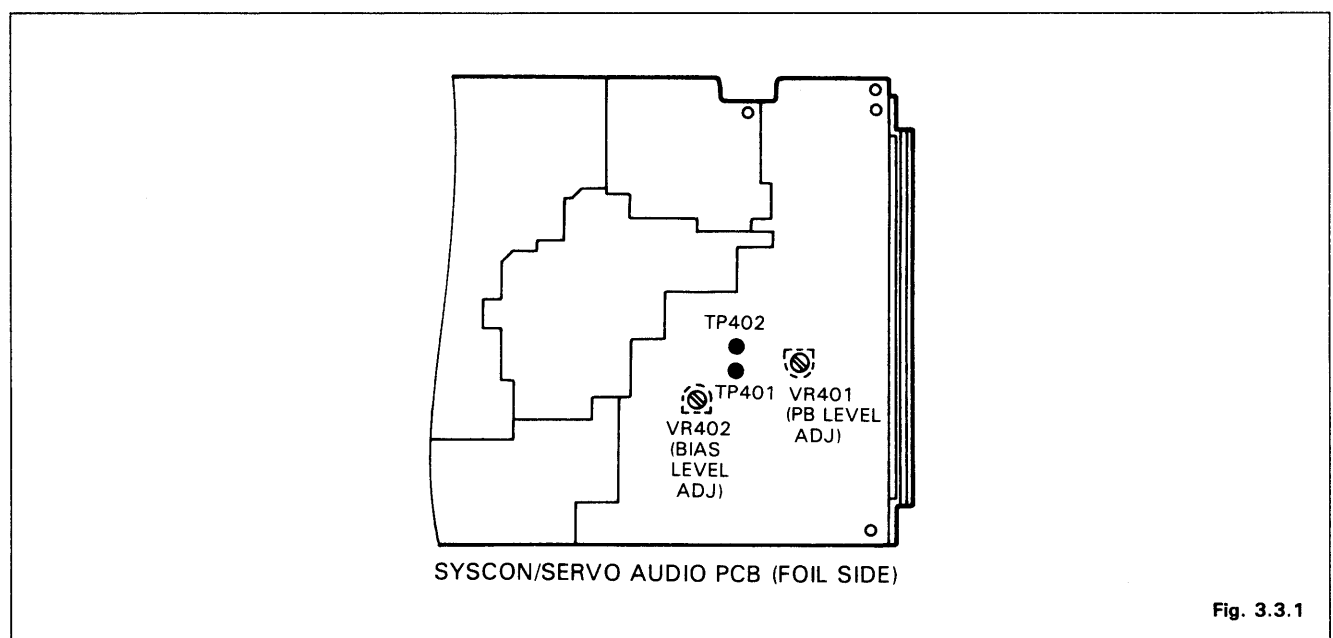
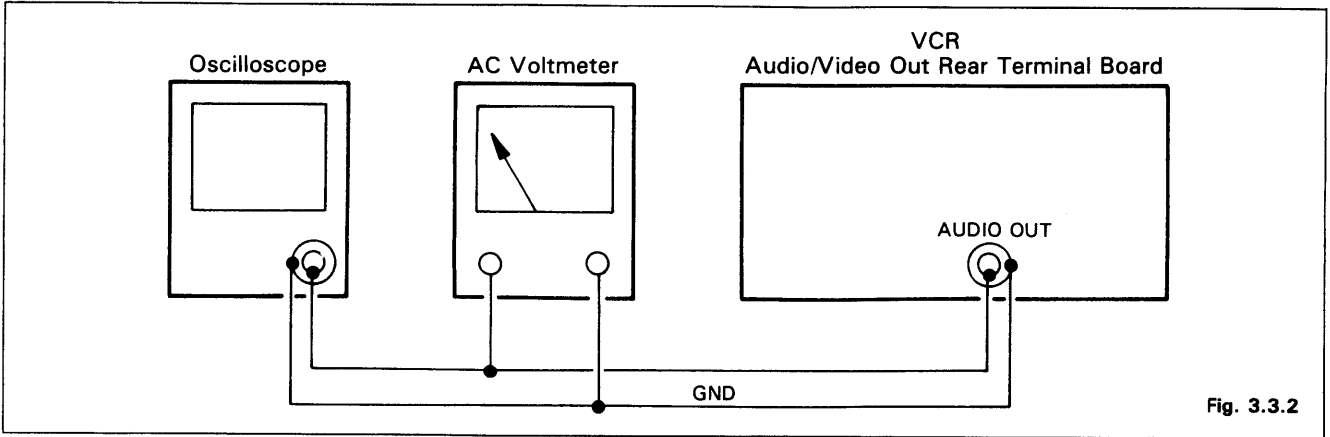


Fig. 3.3.1

3.3.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (4) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.3.4

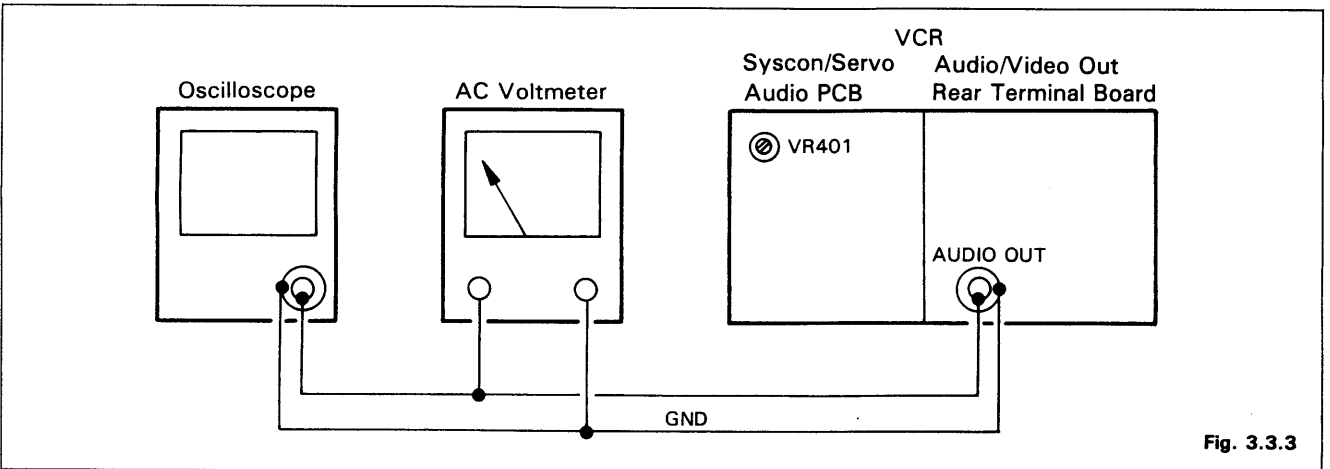
(1) ACE HEAD HEIGHT/ACE HEAD TILT



(2) ACE HEAD AZIMUTH

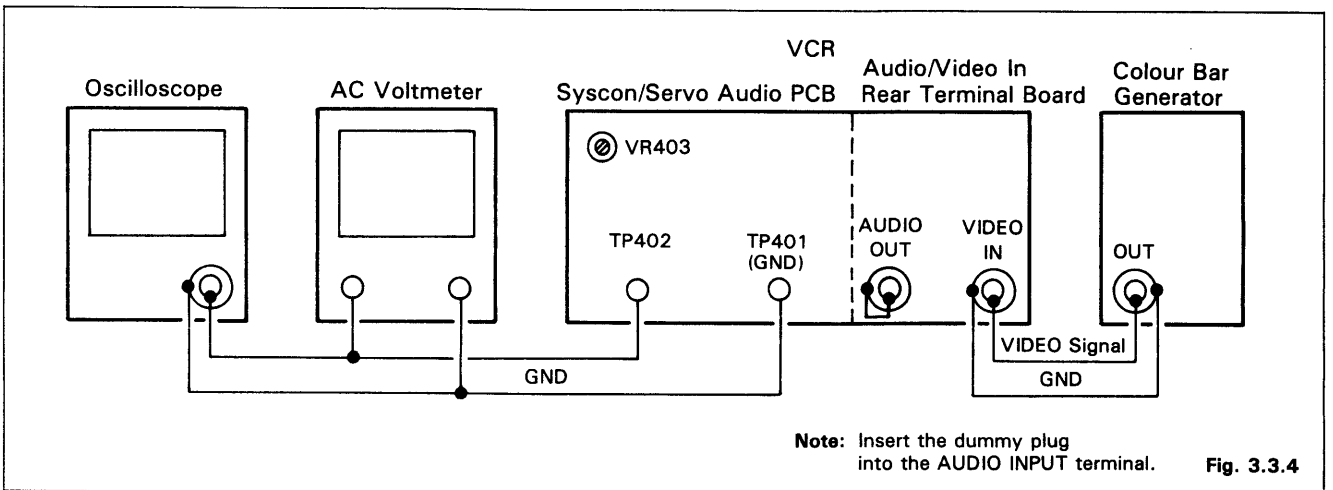
Refer to Fig. 3.3.2.

(3) PLAY MODE LEVEL



(4) BIAS LEVEL

[A]



[B]

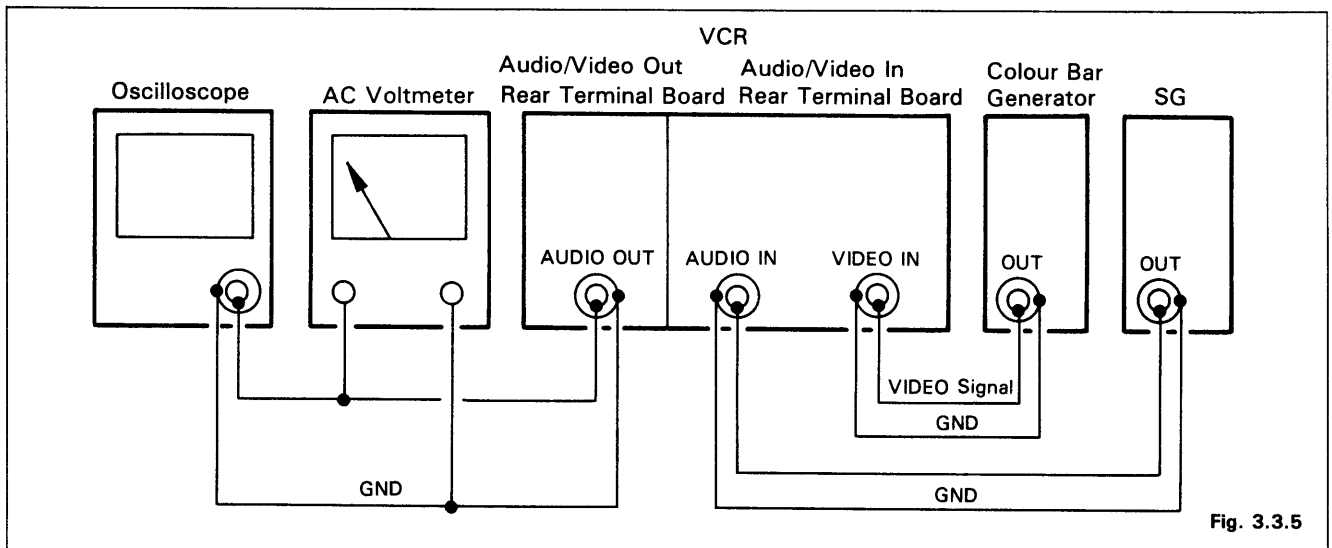


Fig. 3.3.5

3.3.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (4) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.3.3.

Notes:

- ADJ. is the abbreviation of adjustment in following section.
- Self-recording means "Record the AUDIO Signal and playback the just-recorded portion".

(1) ACE HEAD HEIGHT/ACE HEAD TILT

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
AUDIO OUTPUT terminal	Oscilloscope AC voltmeter	PLAY (SP) mode Test tape (VPC-1)
ADJ. Location		ADJ. Value
Tilt adjustment screw		—
Height adjustment nut Azimuth adjustment screw		Maximum level (AC voltmeter)

- Confirm that the tape running between the tape guide roller and ACE head has no slack. If the tape has slack, take it up by turning the tilt adjustment screw (Refer to Fig. 3.3.6). Then readjust GUIDE ROLLER HEIGHT (Refer to Section 5.2.3) and the X VALUE (Refer to Section 3.1.4 (3)).

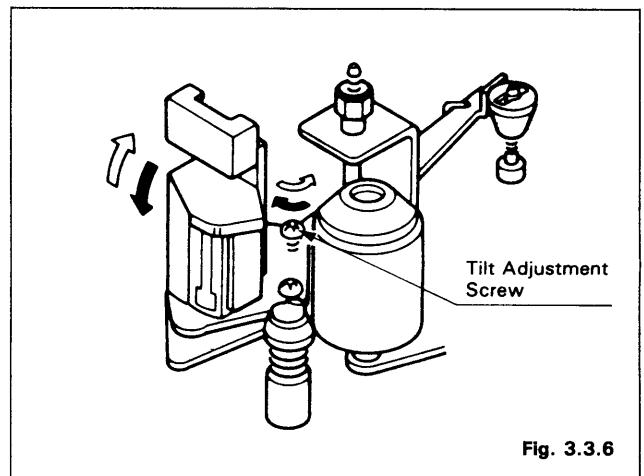


Fig. 3.3.6

- After confirming on the oscilloscope that a 1 kHz sine wave is being output, adjust the height adjustment nut so that the AC voltmeter's reading is brought to its maximum level. (Refer to Fig. 3.3.7)

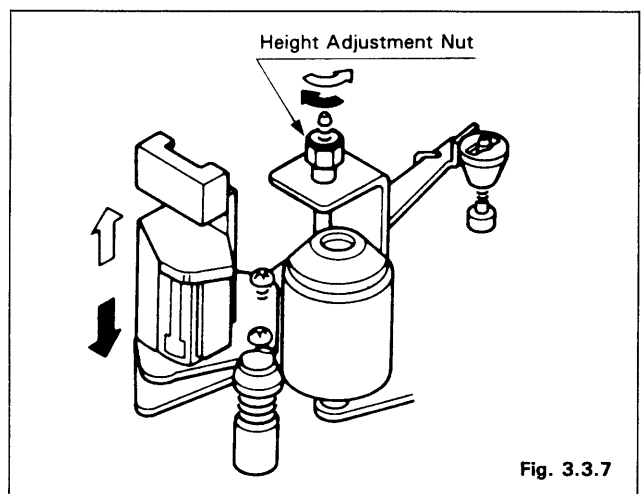


Fig. 3.3.7

- Adjust the azimuth adjustment screw so that the AC voltmeter's reading is brought to its maximum level. (Refer to Fig. 3.3.8)

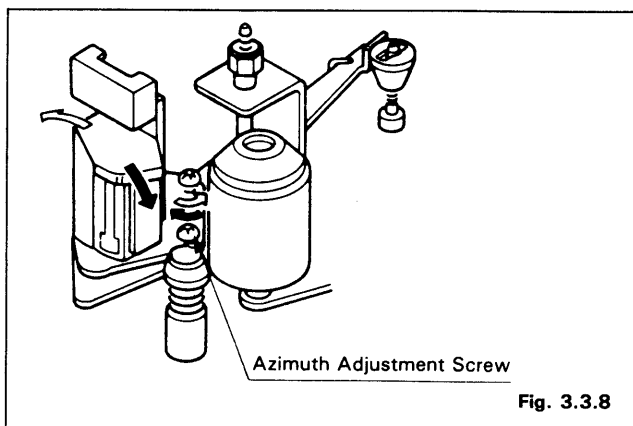


Fig. 3.3.8

- If the AC voltmeter's reading in step 2 increased more than 2 dB after step 3, perform step 2 again.

Note: The maximum reading on the AC voltmeter obtained in steps 2 and 3 is approximately -10 dBV.

(2) ACE HEAD AZIMUTH

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope AC voltmeter	PLAY mode Test tape (VPM-6)
ADJ. Location		ADJ. Value
Azimuth adjustment screw		Maximum level (AC voltmeter)

- After confirming on the oscilloscope that a 6 kHz sine wave is being output, adjust the azimuth adjustment screw so that the AC voltmeter's reading or oscilloscope waveform is brought to its maximum level. (Refer to Fig. 3.3.8)

Note: The maximum reading on the AC voltmeter obtained in step 1 should be be more than -5 dB below the value given in Section 3.3.4 (1).

(3) PLAY MODE LEVEL

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope AC voltmeter	PLAY mode Test tape (VPC-1)
ADJ. Location		ADJ. Value
VR401 (PB LEVEL ADJ.)		-10 dBV \pm 1 dB

- After confirming on the oscilloscope that a 1 kHz sine wave is being output, adjust VR401 (PB LEVEL ADJ.) so that the AC voltmeter's reading is -10 dBV \pm 1 dB.

(4) BIAS LEVEL [A]

Measuring Point	Measuring Equipment	ADJ. Condition
TP402 TP401 (GND)	Colour bar generator Oscilloscope AC voltmeter	REC mode Blank tape
ADJ. Location		ADJ. Value
VR402 (BIAS LEVEL ADJ.)		16 mVrms \pm 2 mVrms

- Notes:**
- Connect the colour bar generator to AUDIO INPUT terminal. (Refer to Fig. 3.3.4)
 - Insert the dummy plug in to the AUDIO INPUT terminal. (Refer to Fig. 3.3.4)

- After confirming on the oscilloscope that a 70 kHz sine wave is being output, adjust VR402 (BIAS LEVEL ADJ.) so that the AC voltmeter's reading is 16 mVrms \pm 2 mVrms.

[B]

Measuring Point	Measuring Equipment	ADJ. Condition
AUDIO OUTPUT terminal	Oscilloscope AC voltmeter Standard audio signal generator (SG) Colour bar generator	Self-recording Blank tape
ADJ. Location		ADJ. Value
VR402 (BIAS LEVEL ADJ.)		-2 dB \sim $+2$ dB between 1 kHz and 10 kHz

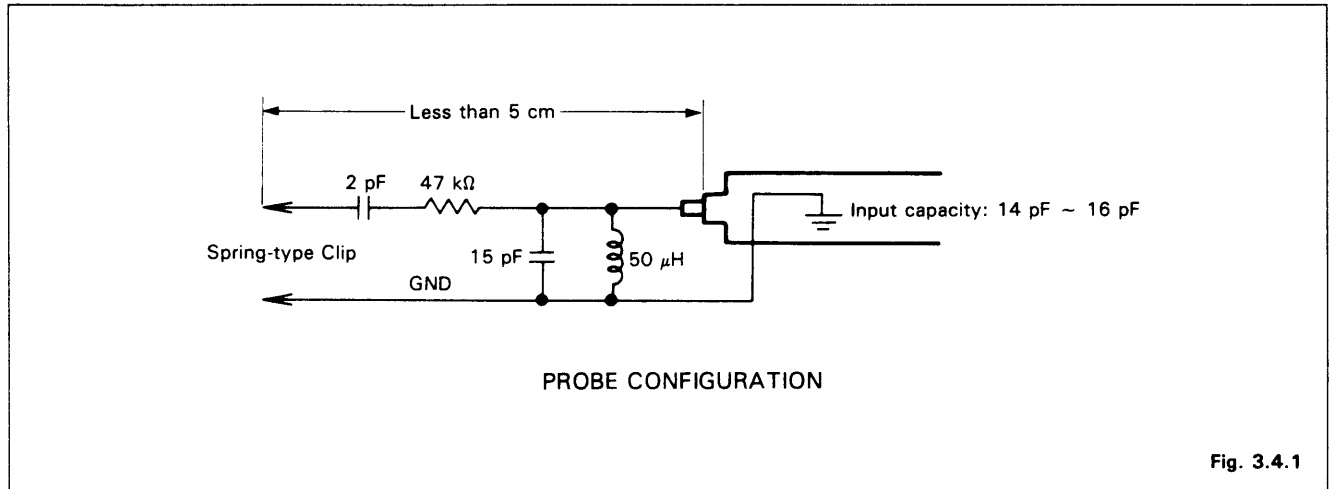
- Notes:**
- Connect the colour bar generator to AUDIO INPUT terminal.
 - Connect the standard audio signal generator to AUDIO INPUT terminal. (Refer to Fig. 3.3.5)

- Set the standard audio signal generator's frequency to 1 kHz and then 10 kHz. Record each frequency's signals.
- Playback the just-recorded portion.
- Confirm that the difference between AC voltmeter's readings for the 1 kHz and 10 kHz signals is **between -2 dB \sim $+2$ dB**.
- If the difference is under -2 dB, rotate VR402 (BIAS LEVEL ADJ.) slightly clockwise (seeing from the foil side) to adjust it.
- If the difference is over $+2$ dB, rotate VR402 (BIAS LEVEL ADJ.) slightly counterclockwise (seeing from the foil side) to adjust it.
- Repeat steps 1 through 5, if necessary.

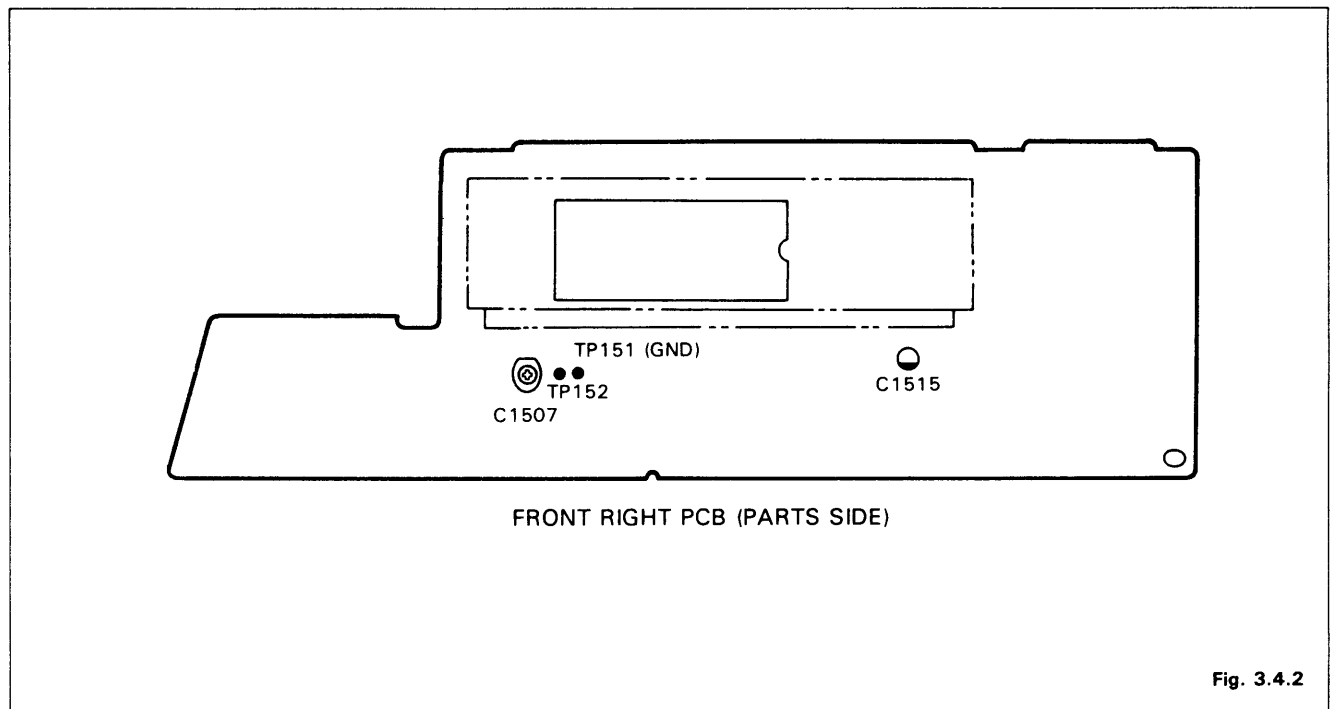
3.4 TIMER CIRCUIT

3.4.1 TEST EQUIPMENT AND STANDARDS REQUIRED

Universal Counter	8 significant digits
Oscilloscope	
DC voltmeter	
Probe	Modified Probe (Refer to Fig. 3.4.1)



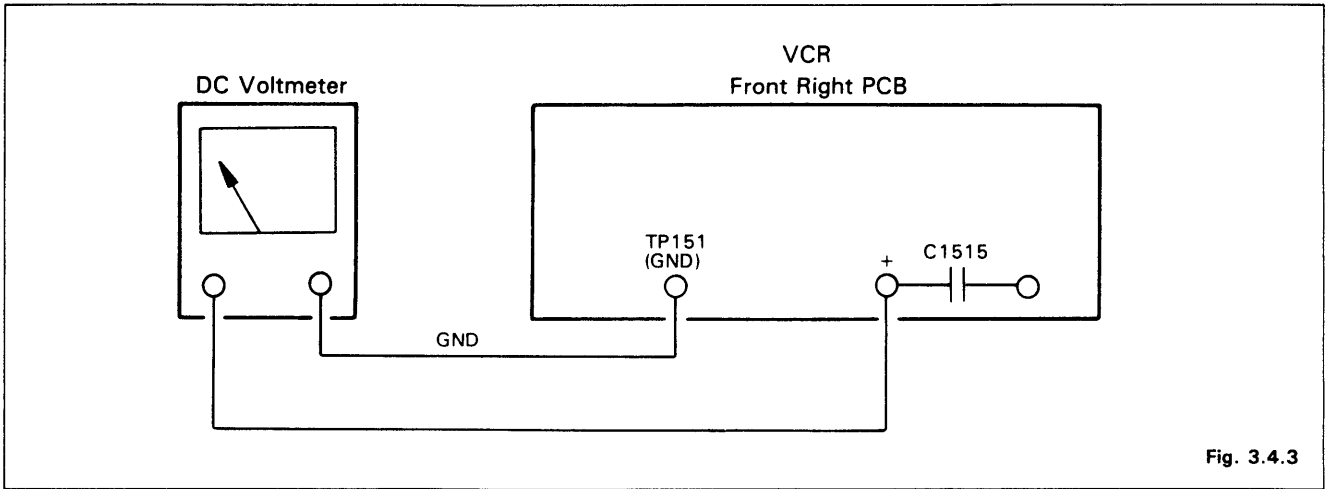
3.4.2 LOCATION OF ADJUSTMENT POINTS



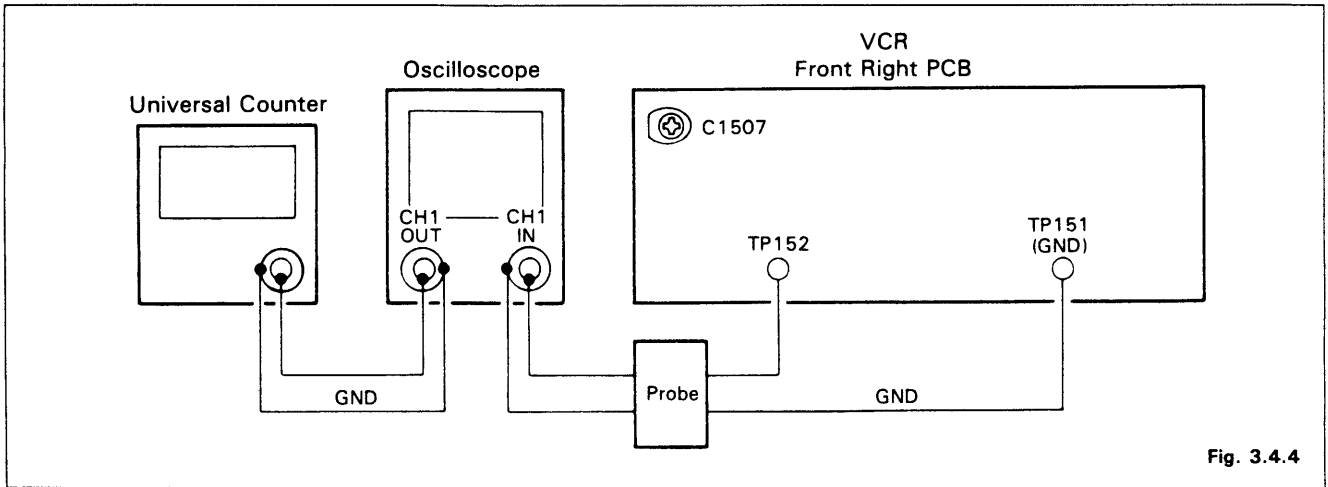
3.4.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (2) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.4.4.

(1) VOLTAGE TEST



(2) CRTS CLOCK FREQUENCY



3.4.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (2) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.4.3.

Note:

ADJ. is the abbreviation of adjustment in following section.

(1) VOLTAGE TEST

Measuring Point	Measuring Equipment	ADJ. Condition
Positive side of C1515 TP151 (GND)	DC voltmeter	E-E mode
ADJ. Location		ADJ. Value
		4.4 V ~ 4.6 V

VOLTAGE TEST OF POSITIVE SIDE OF C1515

- Check that the DC voltmeter's reading is **between 4.4 V and 4.6 V**.

(2) CRTS CLOCK FREQUENCY

Measuring Point	Measuring Equipment	ADJ. Condition
TP152 TP151 (GND)	Universal counter Oscilloscope Modified probe	E-E mode
ADJ. Location		ADJ. Value
C1507	4.194304 MHz \pm 20 Hz (Monthly allowance \pm 15 sec)	

- Set the universal counter to the frequency mode, accurate to 8 significant digits.
- Adjust C1507 until the counter indicates a frequency of **4.194304 MHz \pm 20 Hz**. (Monthly allowance \pm 15 sec).

3.5 TUNER IF CIRCUITS

- When any malfunction occurs in the TUNER circuit, the whole unit must be replaced.

Note: The TUNER unit does not need any adjustments, because precise adjustments have been performed before shipment.

- An adjustment of the IF circuit is shown as follows.

3.5.1 TEST EQUIPMENT AND STANDARD REQUIRED

Monitor TV	
------------	--

3.5.2 LOCATION OF ADJUSTMENT POINT

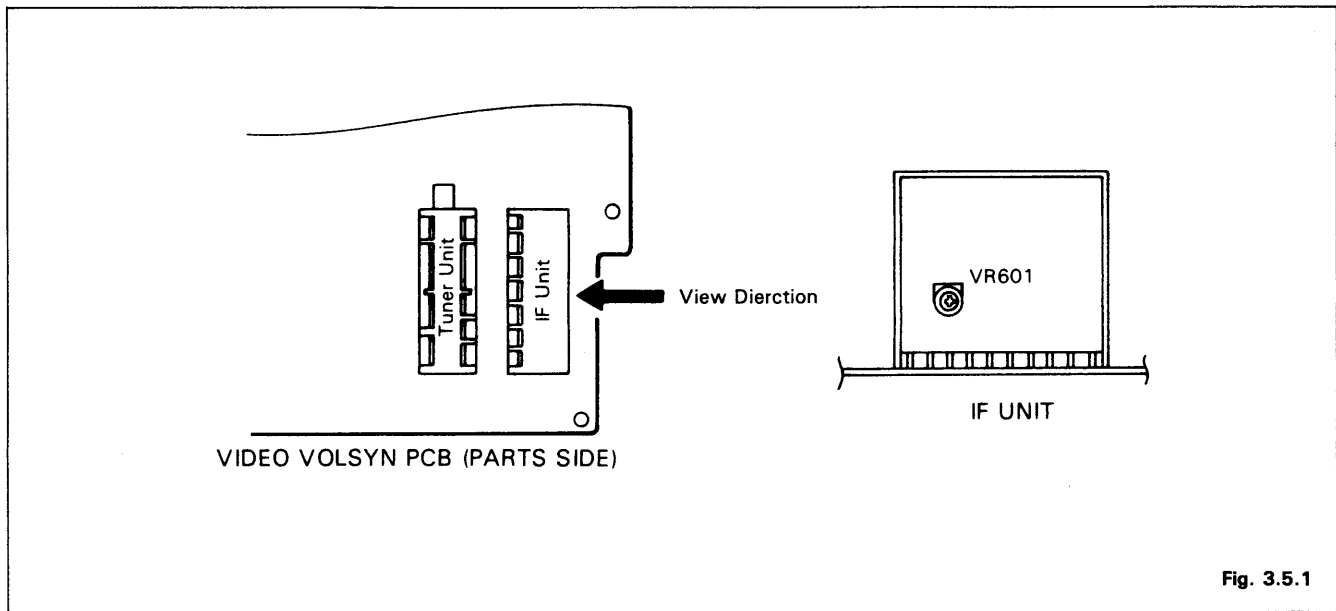


Fig. 3.5.1

3.5.3 TEST EQUIPMENT CONNECTING DIAGRAM

For adjustment (1) in this section, refer to the corresponding paragraph (number in parentheses) in Section 3.5.4.

(1) RF AGC

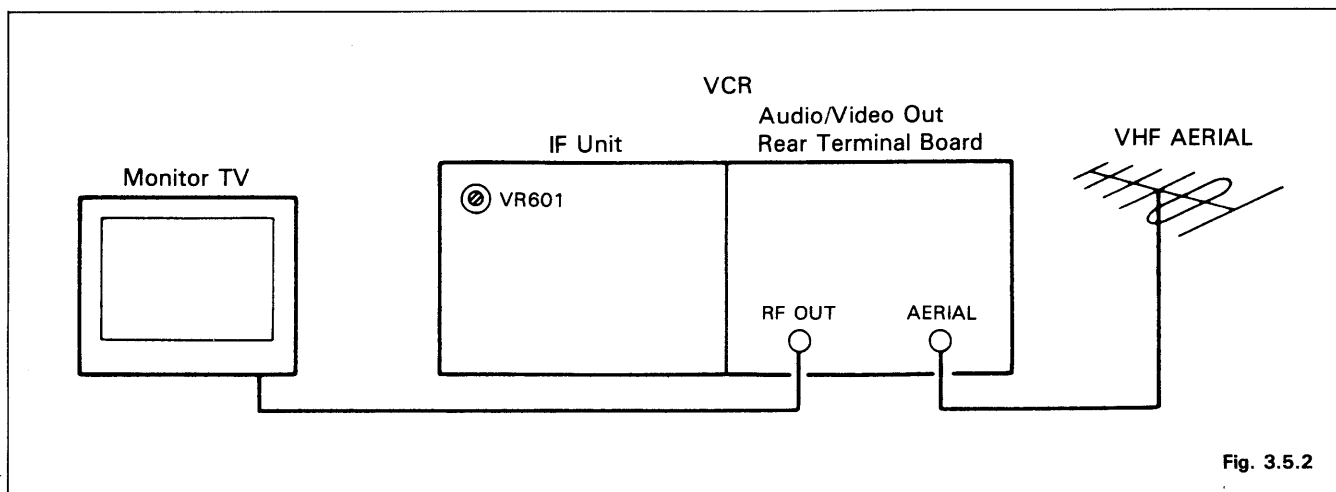


Fig. 3.5.2

3.5.4 ADJUSTMENT

- For test equipment connecting diagram for an adjustment (1) in this section, refer to the corresponding diagram (number in parentheses) in Section 3.5.3.

Note:

ADJ. is the abbreviation for adjustment in following section.

(1) RF AGC

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	E-E mode
ADJ. Location	ADJ. Value	
VR601 (on the IF circuit)	S/N is best point	

1. Receive the middle electrical field (60 dB ~ 80 dB) of the VHF high channel, and slowly turn VR601 from the point where snow-noise is present to the point where it just disappears from the monitor TV.
2. Confirm by monitor TV that there is no beat and saturation (S/N is best point) when receiving any TV channel.

3.6 ON-SCREEN CIRCUIT (SPECIAL ADJUSTMENT FOR THE MODEL FVH-P5100)

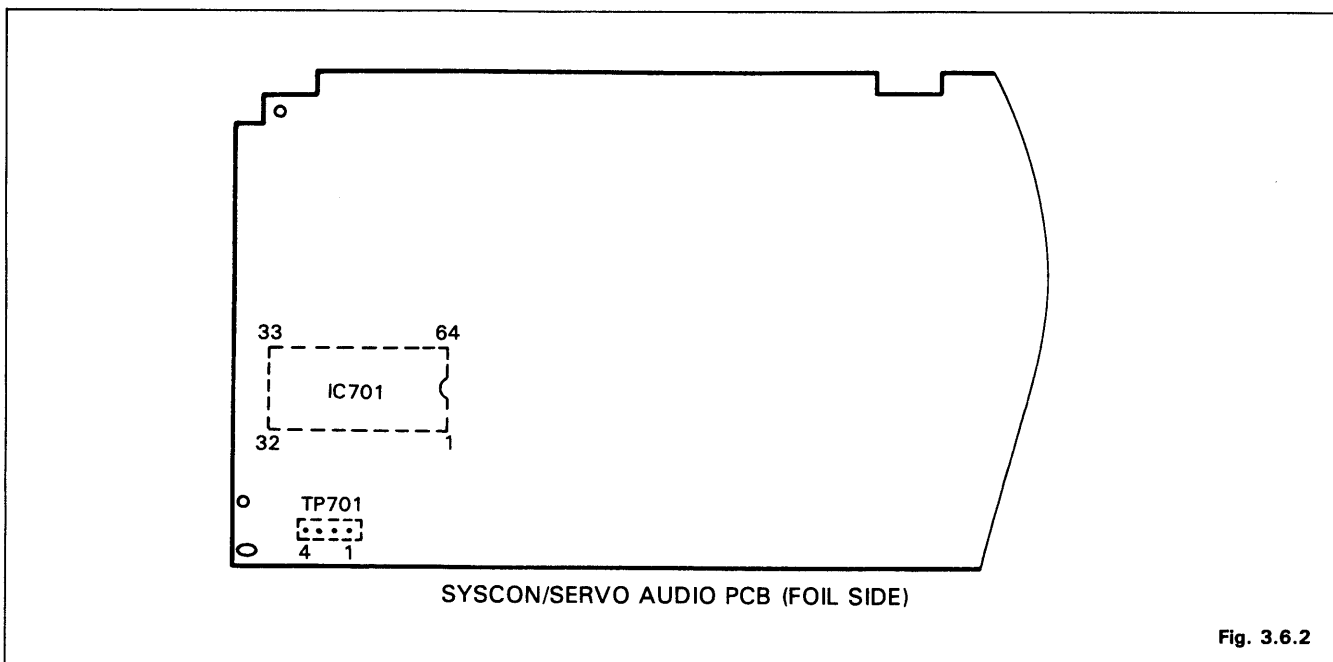
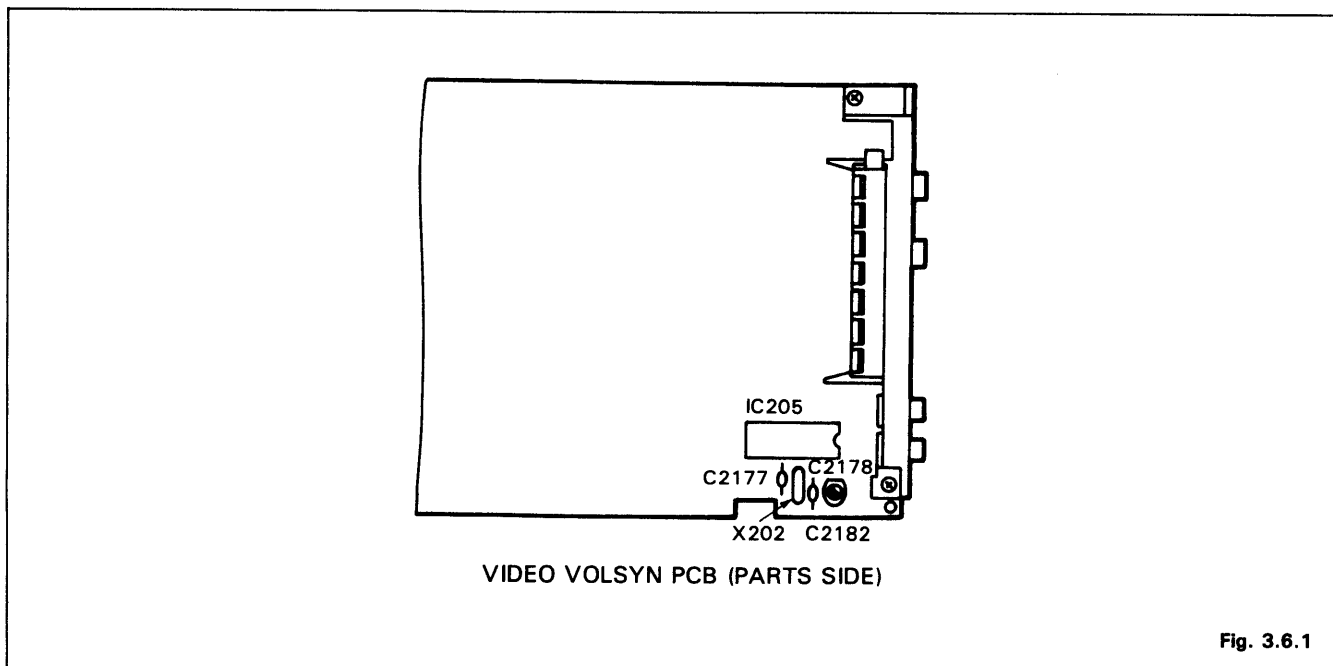
The model FVH-P5100 is basically the same as the model FVH-P5000, but adjustment of On-Screen is necessary.

Note: Adjust the On-Screen Circuit especially when IC205, X202, C2177, C2178 and C2182 are replacement.

3.6.1 TEST EQUIPMENT AND STANDARDS REQUIRED

Frequency Counter	
Remote Control Unit	RVR-550E
Probe	10:1 probe

3.6.2 LOCATION OF ADJUSTMENT POINT



3.6.3 TEST EQUIPMENT CONNECTING DIAGRAM

For adjustments (1) in this section, refer to the corresponding paragraph (number in parentheses) in Section 3.6.4.

(1) ON-SCREEN

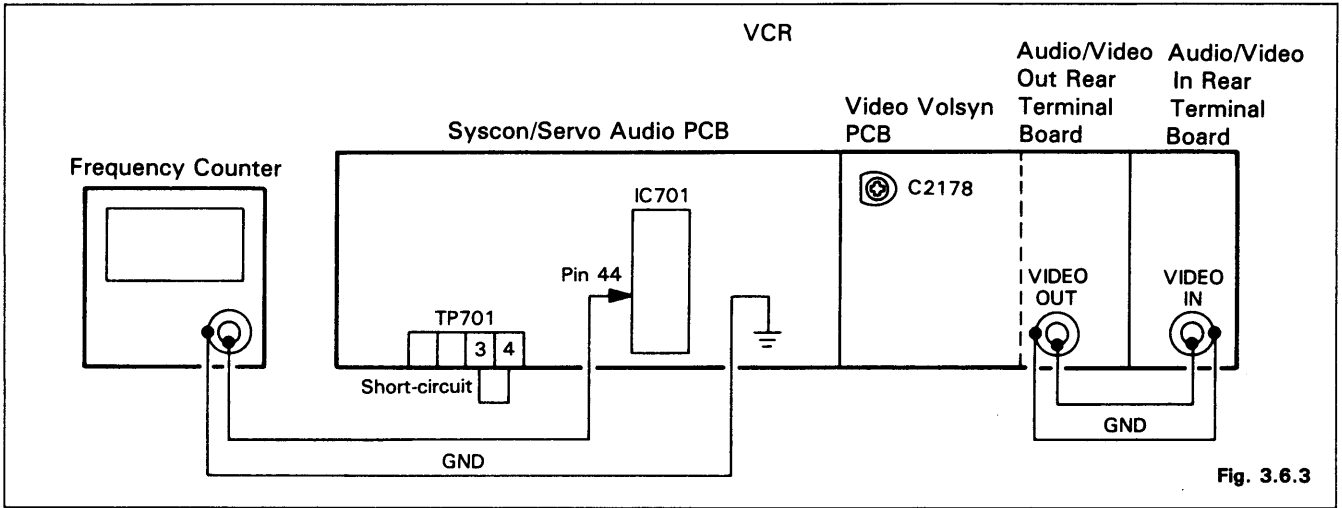


Fig. 3.6.3

3.6.4 ADJUSTMENT

- For test equipment connecting diagram for an adjustment (1) in this section, refer to the corresponding diagram (number in parentheses) in Section 3.6.3.

Note:

- ADJ. is the abbreviation for adjustment in following section.

(1) ON-SCREEN

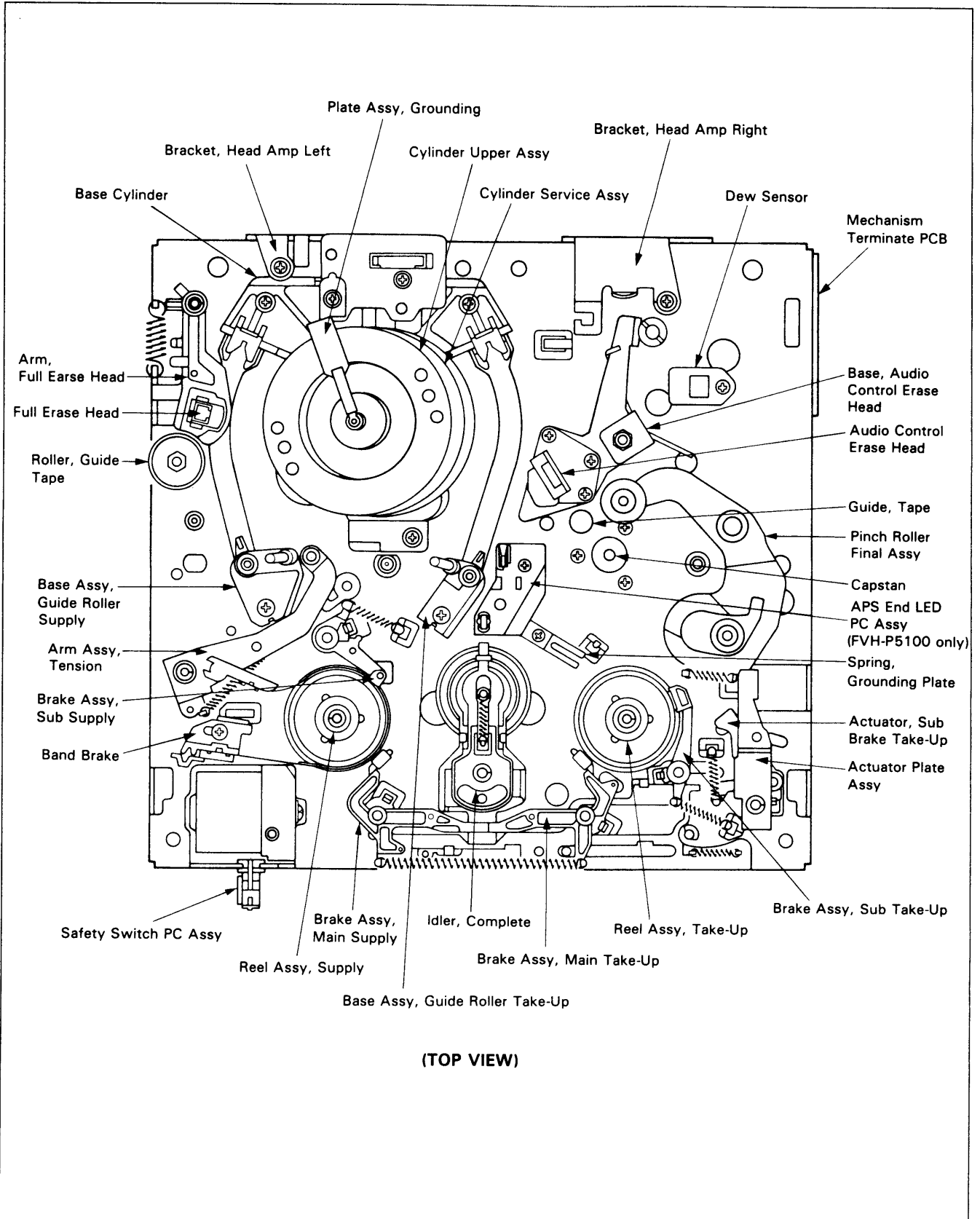
Measuring Point	Measuring Equipment	ADJ. Condition
Pin 44 of IC701 (on Syscon/Servo Audio PCB)	Frequency counter (10:1 probe)	Program mode (Remote control: RVR-550E)
ADJ. Location		ADJ. Value
C2178		4.433619 MHz \pm 5 Hz

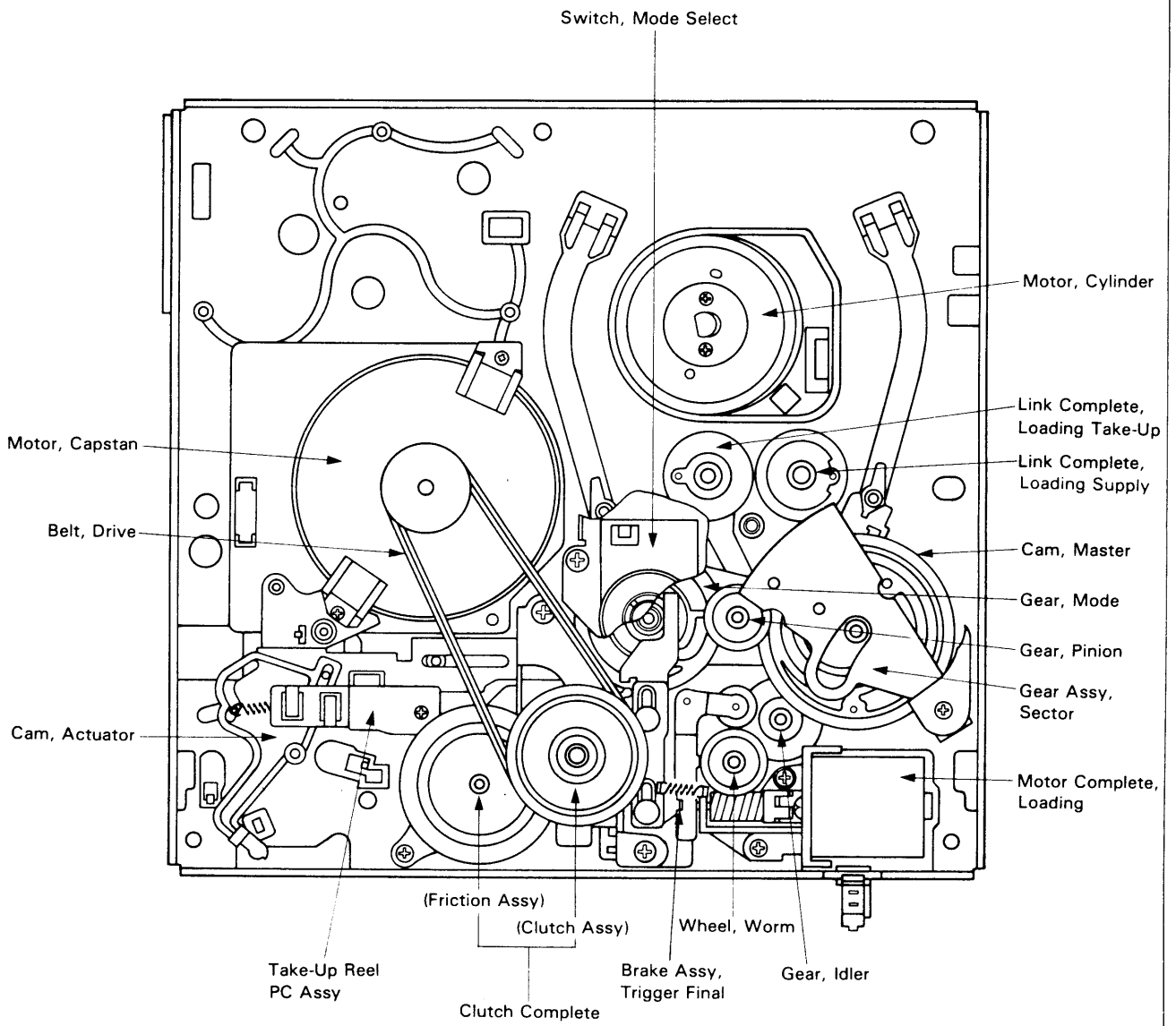
- Notes:
- Short-circuit pins 3 (F REC) and 4 (GND) of TP701.
 - Connect the VIDEO INPUT terminal to the VIDEO OUTPUT terminal. (Refer to Fig. 3.6.3)

- Adjust C2178 until the counter indicates a frequency of **4.433619 MHz \pm 5 Hz**.

4. MECHANICAL DISASSEMBLY

4.1 MECHANICAL PARTS LOCATIONS

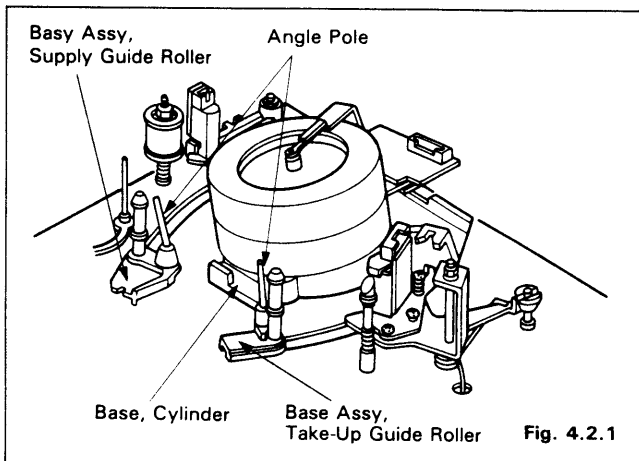




(BOTTOM VIEW)

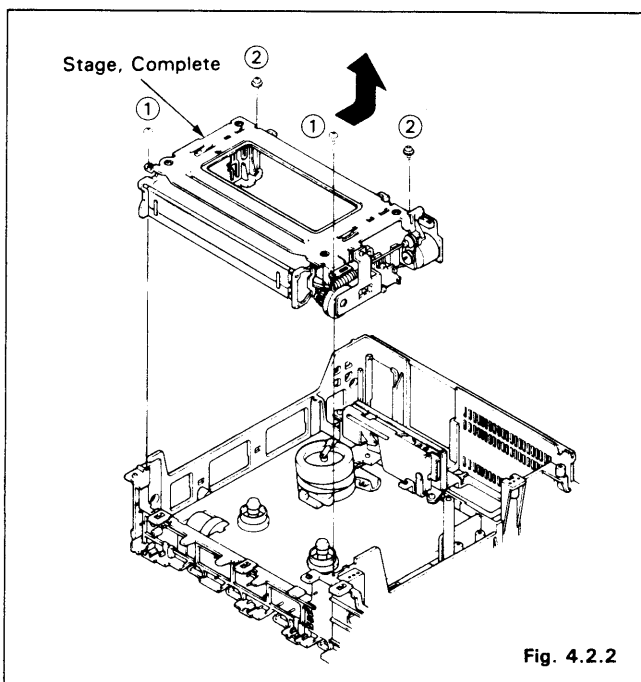
4.2 MAIN MECHANICAL PARTS DISASSEMBLY

1. When disassembling the unit, making replacements or adjustments, or cleaning parts, set the power switch to OFF before proceeding.
2. The parts shown in Fig. 4.2.1 were secured after having been adjusted at the manufacturing plant with precision jigs. These parts should not be removed or adjusted since this will make the tape running adjustments more difficult to perform.

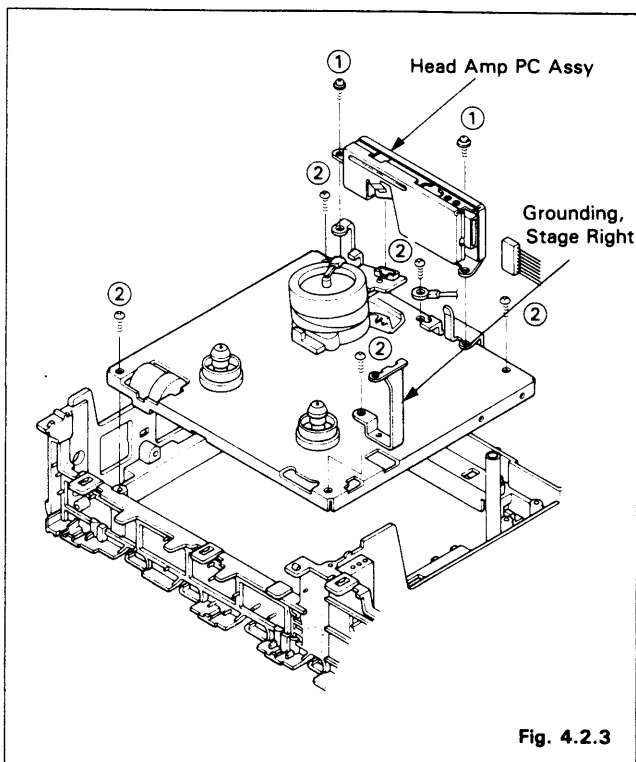


3. When removing the following parts, remove screws, nuts or washers in numerical order.
If necessary, disconnect the connectors.
When reassembling, reverse the order of disassembly.
4. Do not touch the tape transport area of the parts with bare hands.
If a tape transport area is touched with bare hands, clean it with cleaning fluid and chamois.

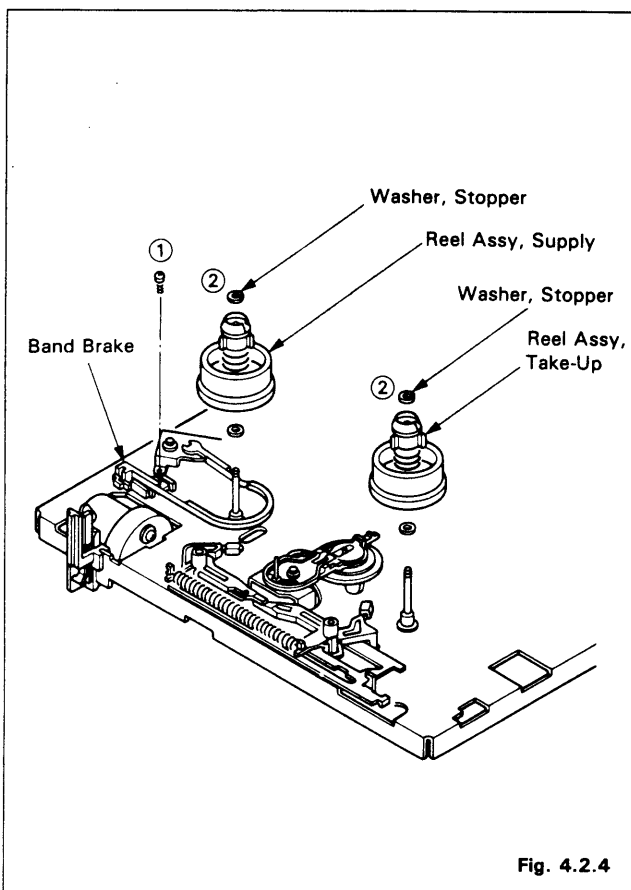
4.2.1 STAGE



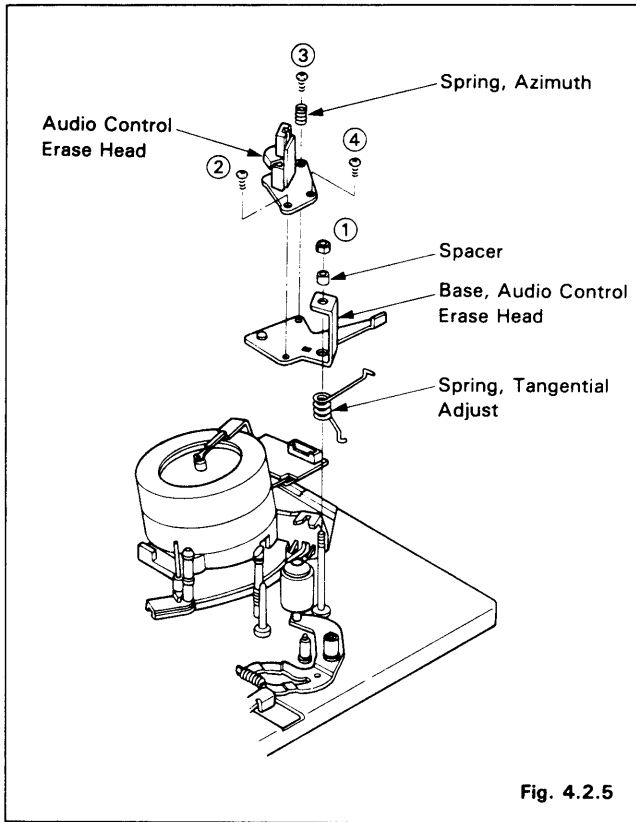
4.2.2 MAIN CHASSIS



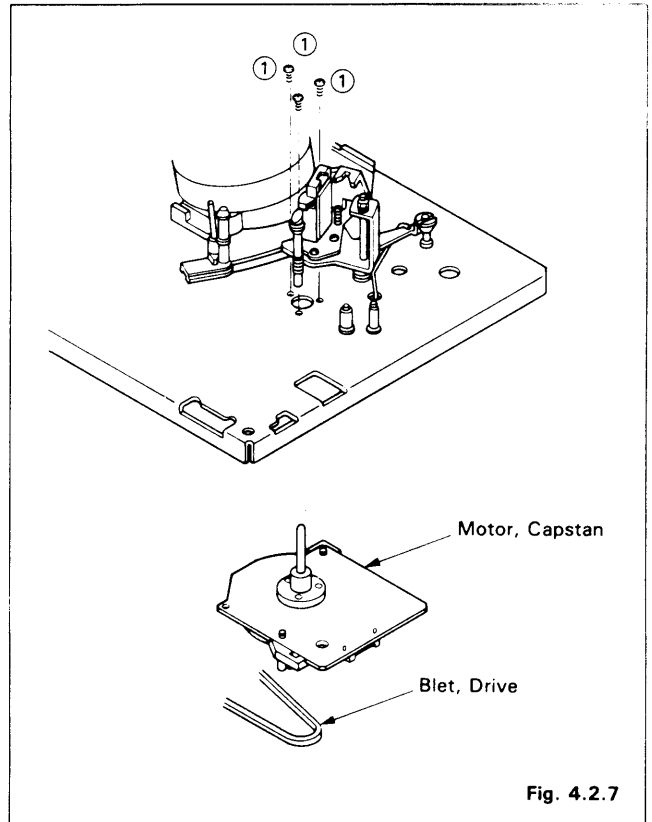
4.2.3 SUPPLY REEL/TAKE-UP REEL



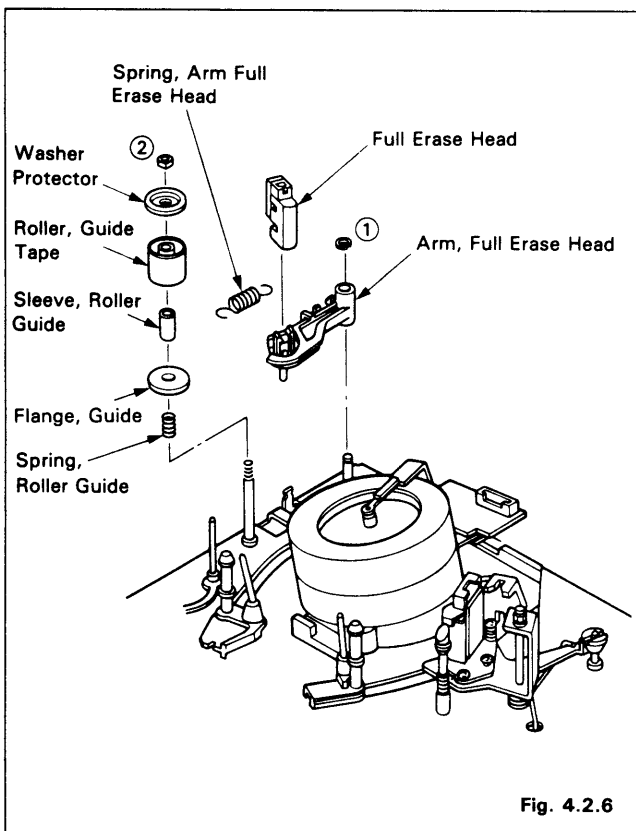
4.2.4 AUDIO CONTROL ERASE HEAD



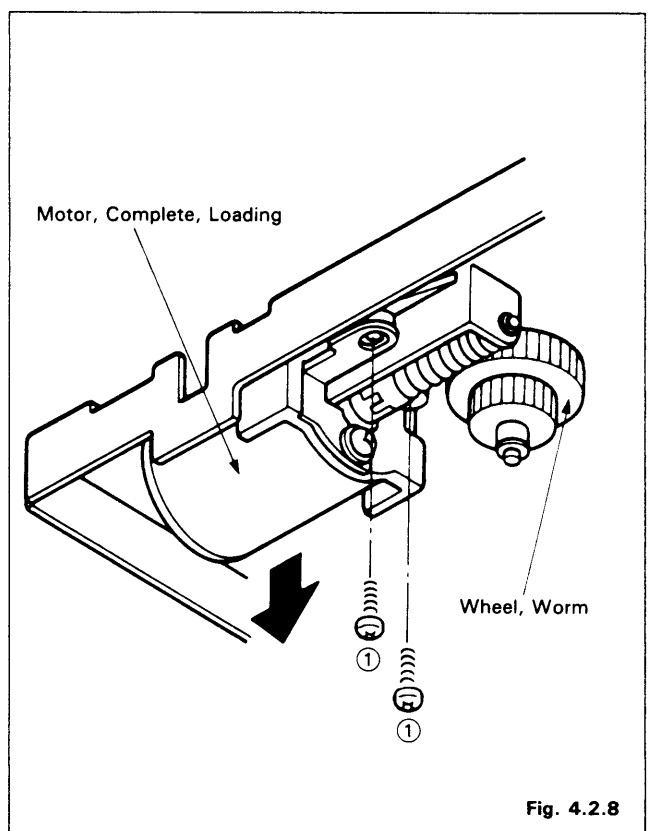
4.2.6 CAPSTAN MOTOR



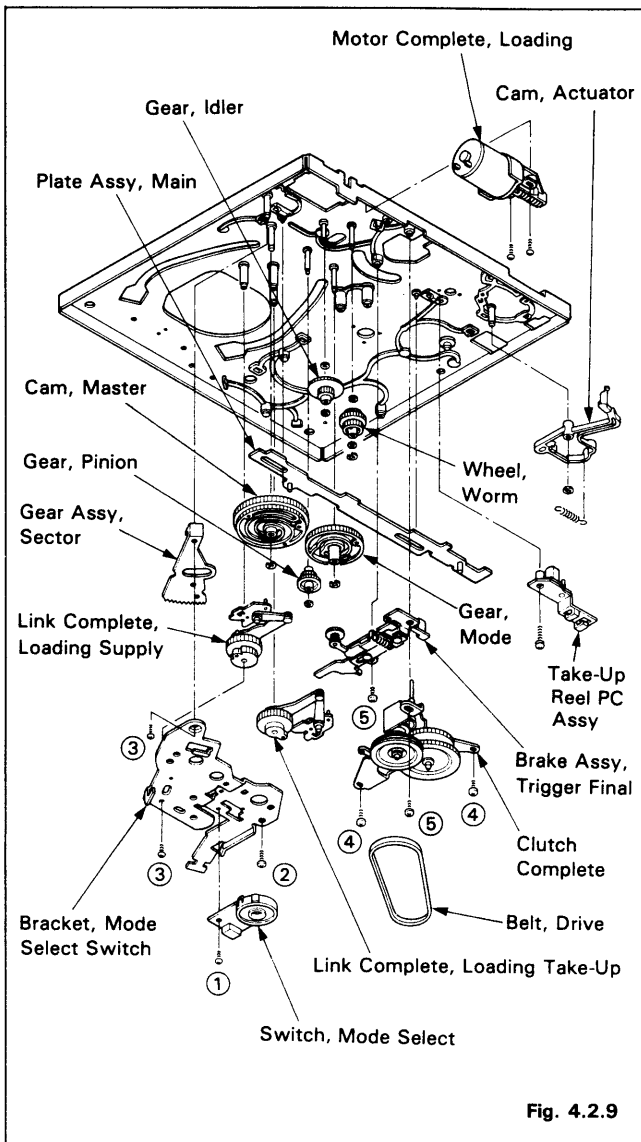
4.2.5 FULL ERASE HEAD AND TAPE GUIDE ROLLER



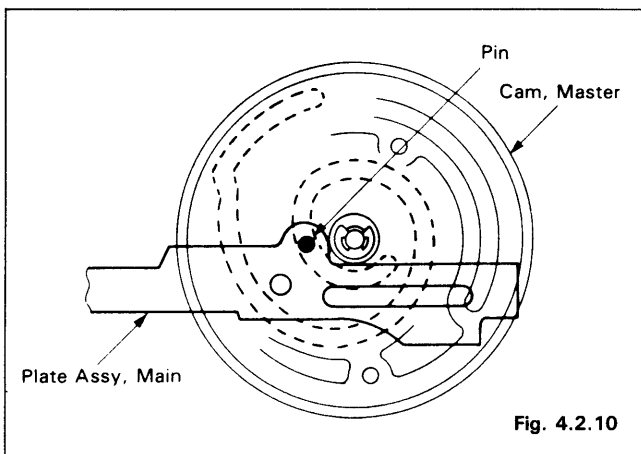
4.2.7 LOADING MOTOR



4.2.8 LOADING/UNLOADING MECHANISM

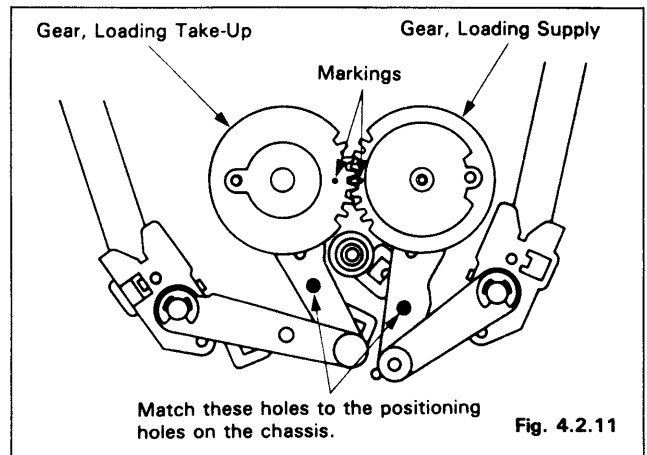


When installing the master cam, insert the pin of the main plate into the appropriate position in the master cam. (Refer to Fig. 4.2.10)

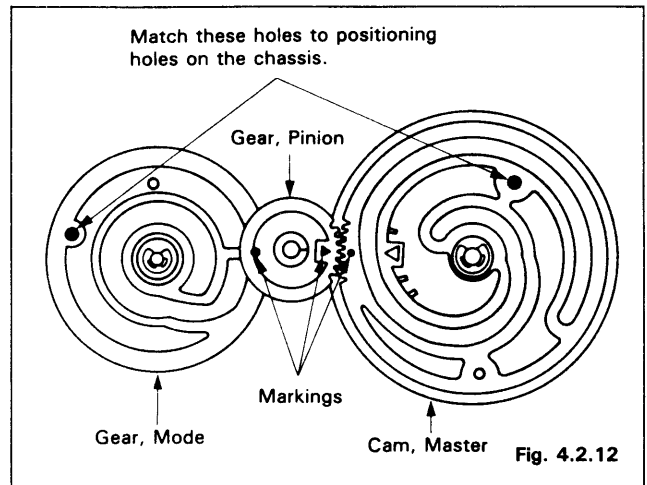


When reassembling, positioning the parts in following order.

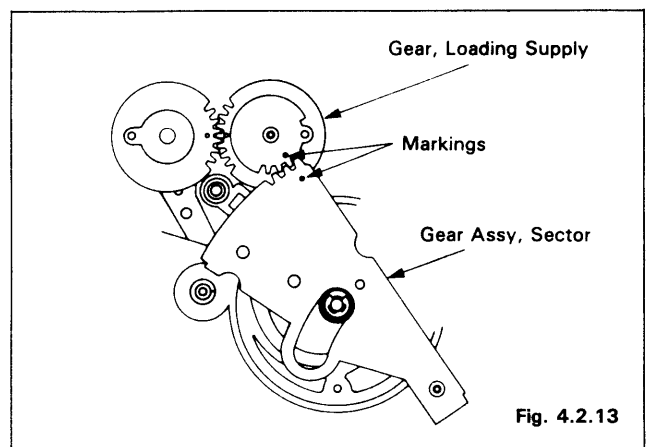
1. Match the mark on the supply loading gear and the take-up loading gear, as shown below.



2. Match the marks on the pinion gear to the mark on the master cam and the mode gear as shown below.



3. Match the mark on the sector gear to the mark on the supply loading gear as shown below.



4.2.9 LINK LOAD T COMPLETE/ LINK LOAD'S COMPLETE

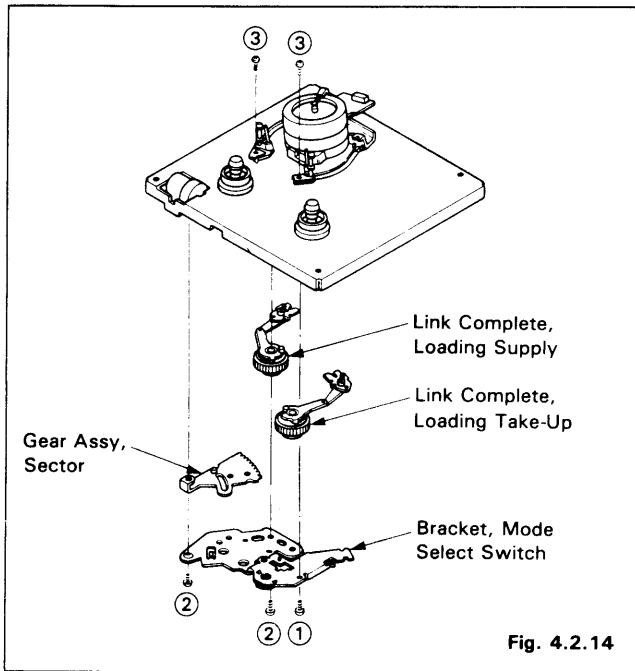


Fig. 4.2.14

4.2.11 UPPER CYLINDER

Prior to removing the upper cylinder, remove the soldered connection of the four lead wires inside the upper cylinder.

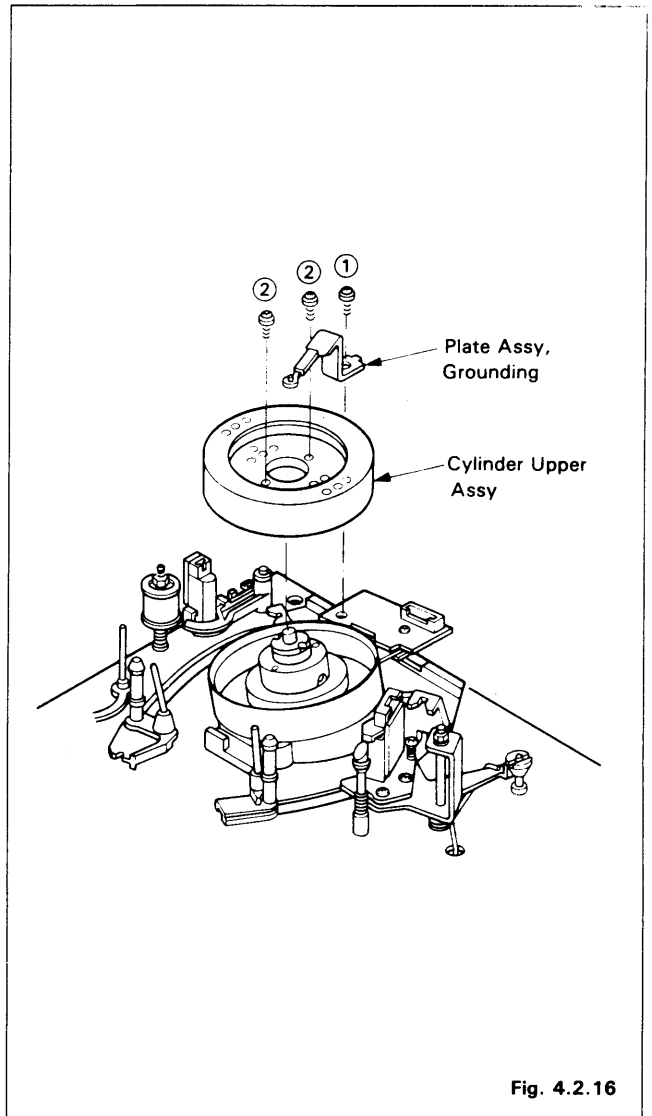


Fig. 4.2.16

Notes:

- As the cylinder is a precision part, take care not to damage the heads or the tape transport area.
- Hold the side of the upper cylinder (the tape transport area), and pull it upwards while turning it gradually to avoid excessive force. If the upper cylinder does not come off, it should be heated with a dryer to about 40°C before removal.
- When installing the cylinder, tighten two screws ② uniformly to obtain a 5 kg-cm to 6 kg-cm torque value.
- Prior to reassembling, clean up the contact surface on the upper cylinder with cleaning fluid. (Refer to Fig. 4.2.16)
- After reassembling the cylinder, clean up the tape transport area with cleaning fluid and chamois. (Refer to Fig. 4.2.16)

4.2.10 CYLINDER

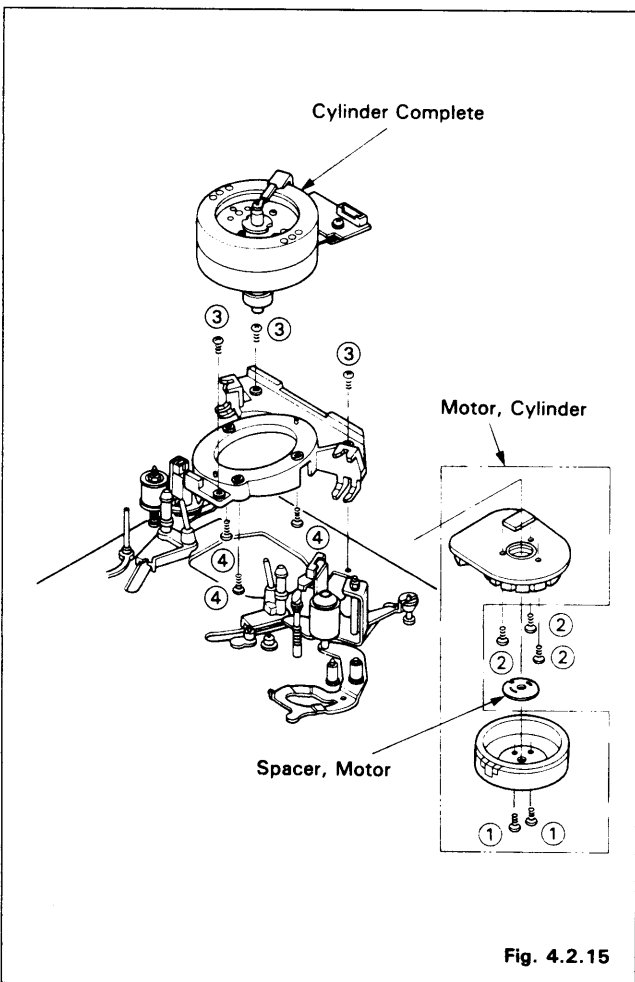
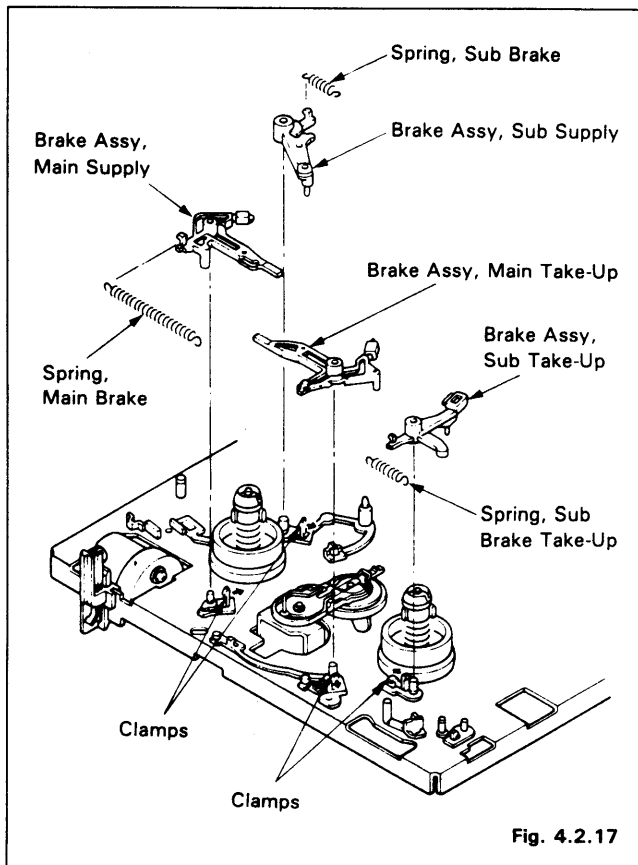
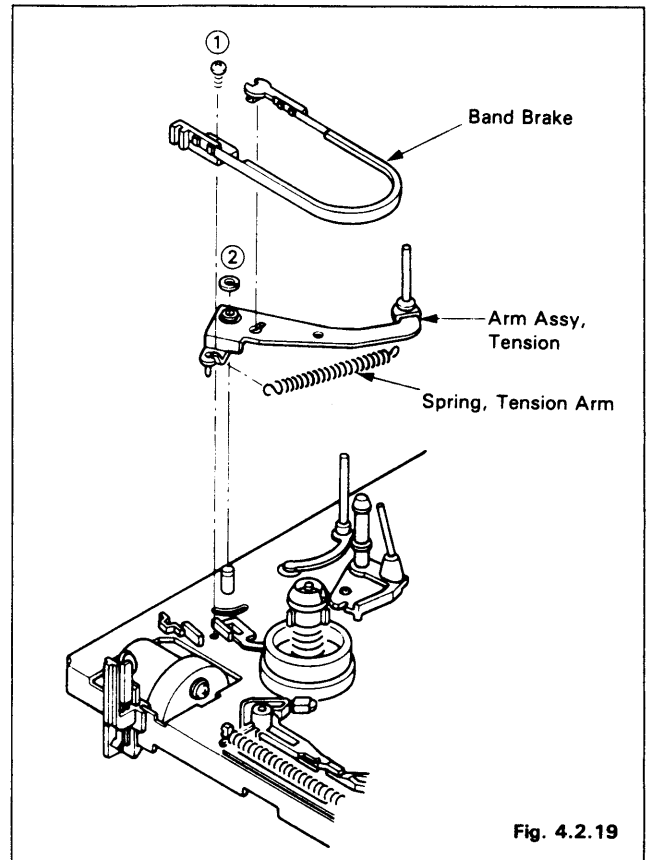


Fig. 4.2.15

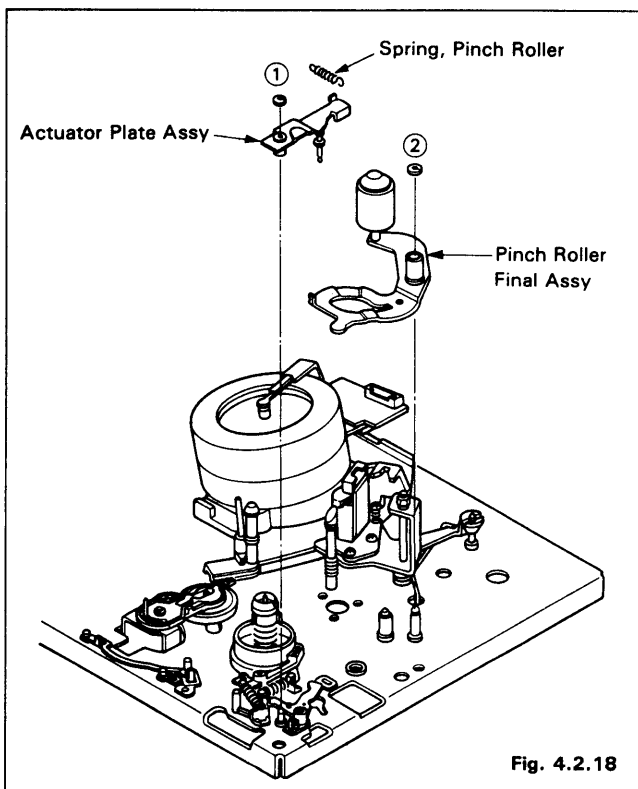
4.2.12 MAIN BRAKE/SUB BRAKE



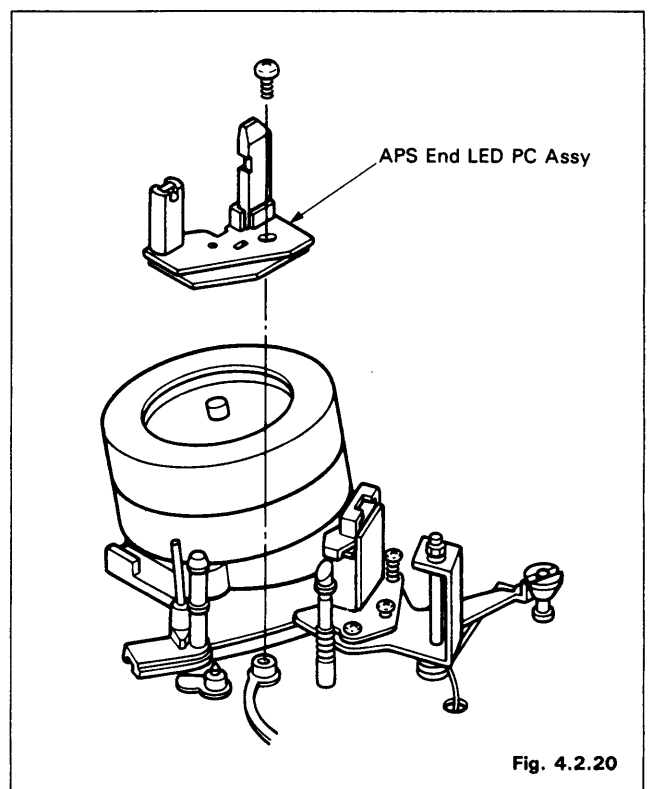
4.2.14 TENSION ARM/BAND BRAKE



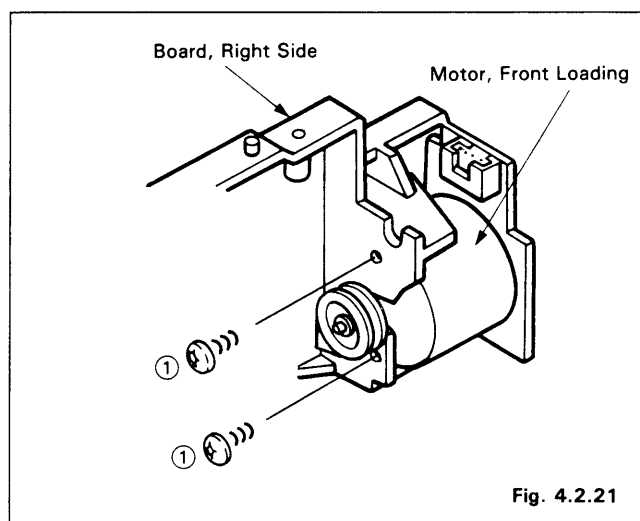
4.2.13 PINCH ROLLER



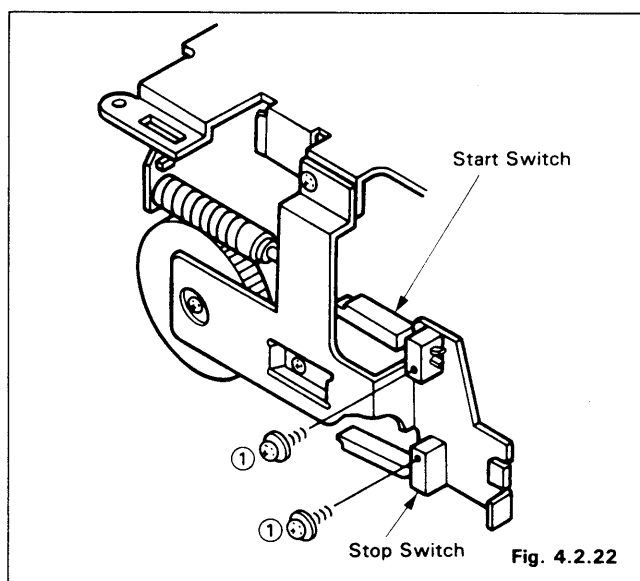
4.2.15 END LED PC ASSY (FVH-P5100 only)



4.2.16 FRONT LOADING MOTOR



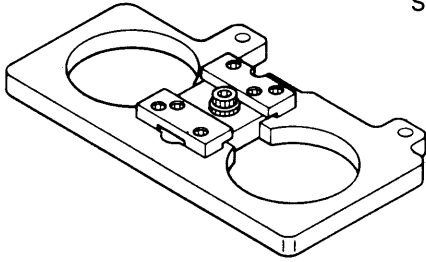
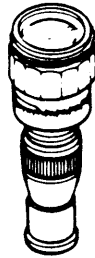
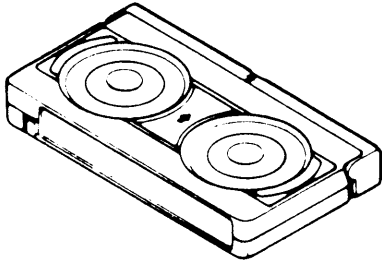
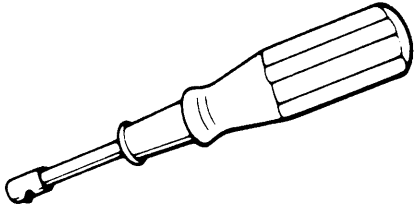
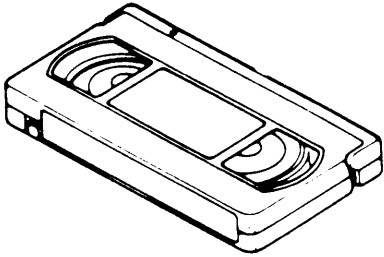
4.2.17 START SWITCH/STOP SWITCH



5. MECHANICAL ADJUSTMENT

5.1 JIGS AND TOOLS FOR ADJUSTMENTS

No.	Part Name	Part No.	Remarks
1	Cassette Housing Positioning Jig	SVJ-00010	Reel height adjustment
2	Torque Meter (KT-300FF)	SVJ-00011	Rewind torque (Supply reel) Fast forward torque (Take-up reel)
3	Torque Meter (KT-300NV)	SVJ-00012	Back tension adjustment (Supply reel) Take-up torque (Take-up reel)
4	Torque Meter (KT-300RV)	SVJ-00052	Review torque (Supply reel) Review back tension (Take-up reel)
5	Torque Gauge	SVJ-00020	Main brake torque (Supply reel, Take-up reel) Fast forward back tension (Supply reel) Rewind back tension (Take-up reel)
6	Test Tape (VPM-6)	SVJ-00031	Monoscope, 6 kHz
7	Adjustment Driver	SVJ-00040	Guide roller height adjustment

 <p>SVJ-00010</p>	 <p>SVJ-00020</p>
 <p>SVJ-00011 SVJ-00012 SVJ-00052</p>	 <p>SVJ-00040</p>
 <p>SVJ-00031</p>	

5.2 TAPE TRANSPORT ADJUSTMENT

5.2.1 REEL HEIGHT

1. Mount the cassette housing positioning jig and slide the gauge on the jig in the directions marked by the arrows.

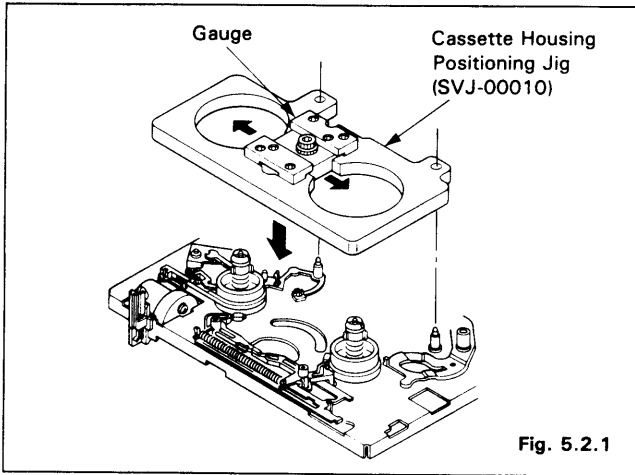


Fig. 5.2.1

2. The reel height is adjusted by changing the thickness of the POLYSLIDER washer.

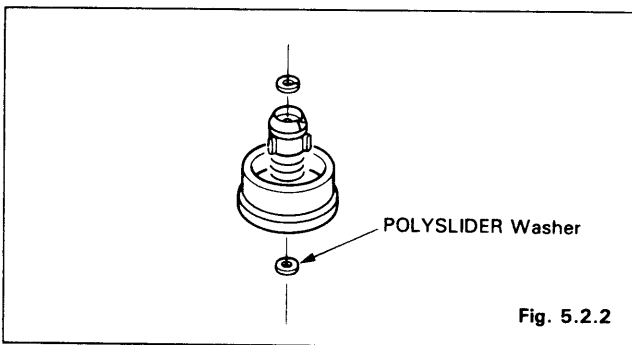


Fig. 5.2.2

3. Adjust the reel height so that the reel slides under surface A of the gauge but is stopped by surface B.
4. If the reel does not slide under surface A, change the washer thickness by using POLYSLIDER washer 0.5 mm or 0.3 mm. POLYSLIDER washer 0.4 mm is inserted at the factory.
5. Perform the same adjustment for the other reel.

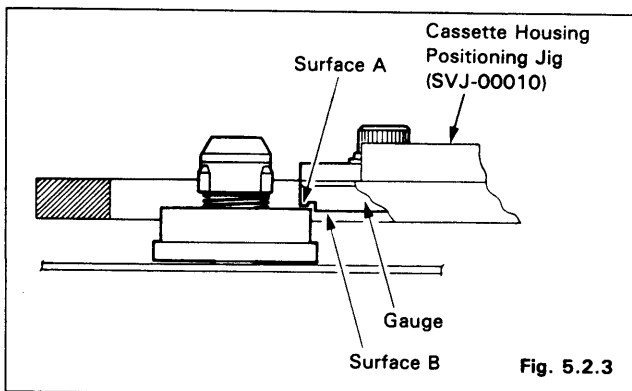


Fig. 5.2.3

5.2.2 BACK TENSION

1. Insert the torque meter (KT-300NV).
2. Set the VCR to the REC mode.
3. Measure the tension on the supply reel with a cassette-type torque meter (KT-300NV). The tension should be $50 \text{ gr-cm} \pm 5 \text{ gr-cm}$.

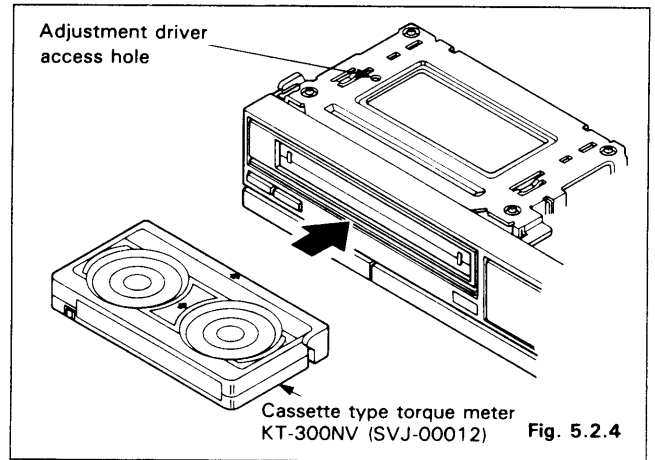


Fig. 5.2.4

4. If necessary, loosen the back tension adjustment screw, and adjust the position of the band brake to obtain the required tension value.
5. Retighten the screw when the required tension has been obtained.

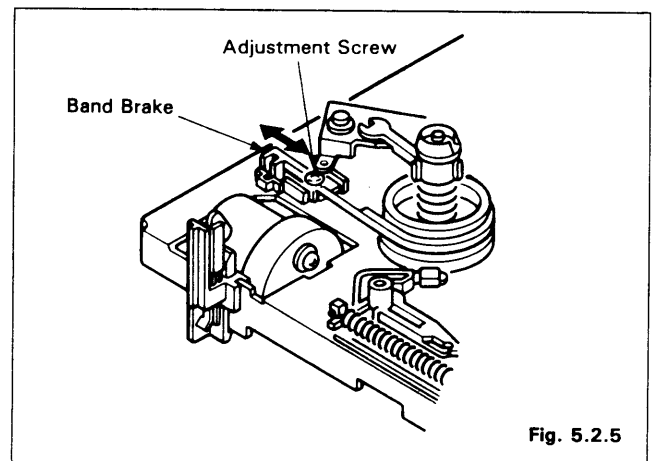


Fig. 5.2.5

Note:

The VCR should be placed horizontally for the back tension measuring procedure.

5.2.3 TAPE RUNNING POSITION ADJUSTMENT (GUIDE ROLLER/TAPE GUIDE)

1. Perform the height adjustment for the following items to obtain the proper tape running position.
 - ① Tape Guide Roller
 - ② Guide Roller (supply side)
 - ③ Guide Roller (take-up side)
 - ④ Tape Guide

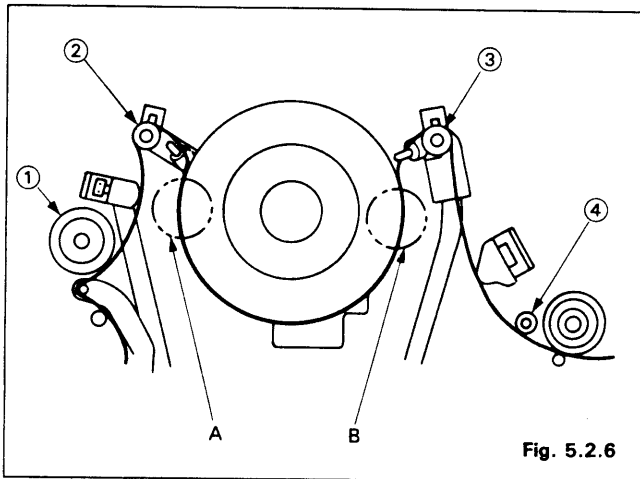


Fig. 5.2.6

2. Load a blank tape and set the VCR to the PLAY mode. Check the tape transport at points "A" and "B" as shown in Fig. 5.2.6.
3. Operate the VCR between the PLAY and STOP modes several times.
4. Observe the tape transport at the lead surface of the cylinder during the PLAY mode, and confirm that the tape runs smoothly along the lead surface of the cylinder without slipping downward and upward. (Refer to Fig. 5.2.7)

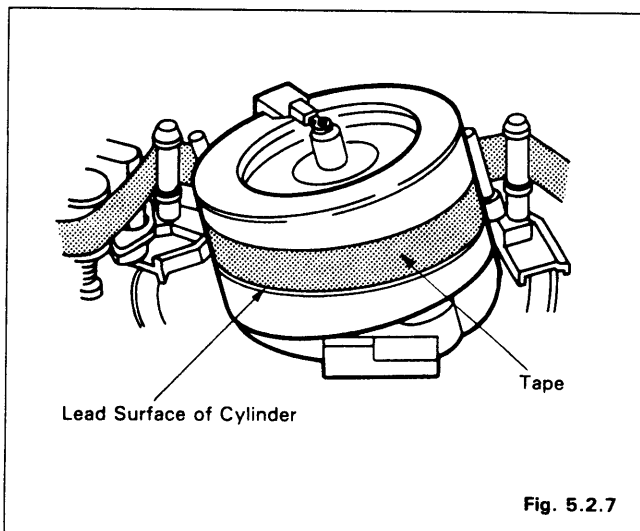


Fig. 5.2.7

5. During loading, play and unloading, observe the tape at the supply and take-up guide rollers, tape guide and tape guide roller. Confirm that there is no curling or creasing, etc., as shown in Fig. 5.2.8.

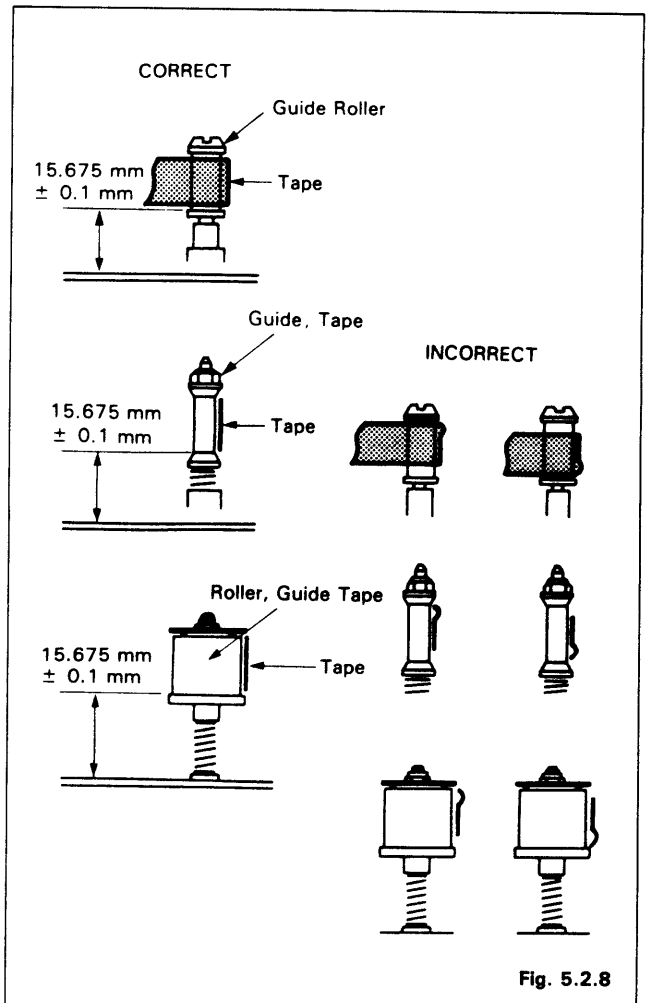


Fig. 5.2.8

6. If any curling or defects are noted, adjust tape guide roller and tape guide first. Adjust the height adjustment nut so that the tape runs as shown in Fig. 5.2.8. (Refer to Fig. 5.2.9)

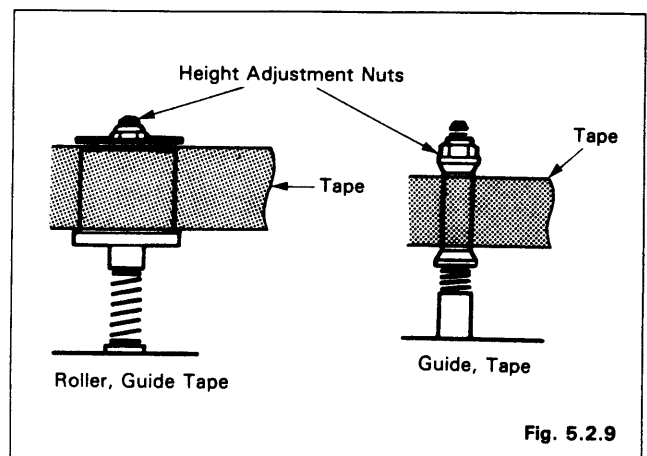


Fig. 5.2.9

- Next, adjust the guide roller height. Insert the adjustment driver (SVJ-00040) into the guide roller top. (Refer to Fig. 5.2.10)

Adjust the height by turning the driver slightly so that the tape runs on the guide roller as shown in Fig. 5.2.8, and the lower edge of the tape runs along the lead surface of the cylinder.

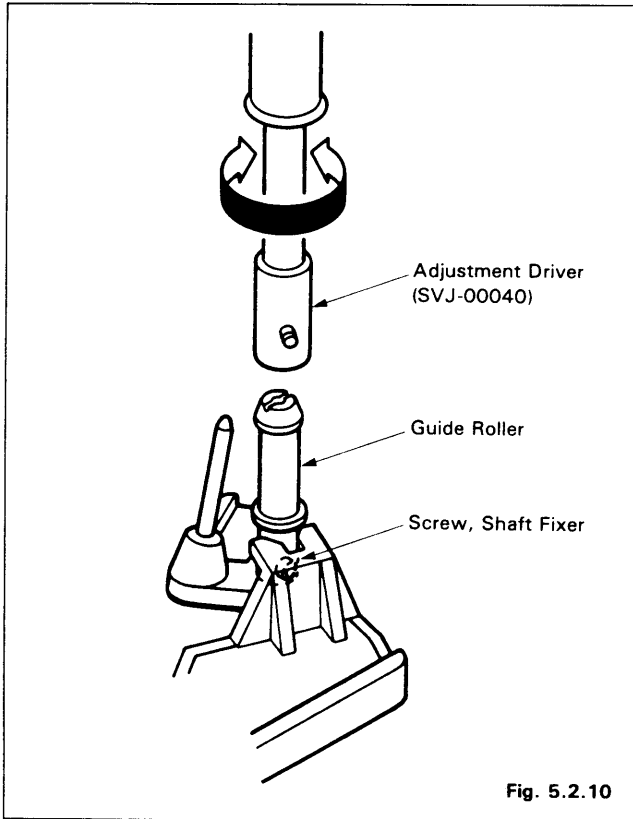


Fig. 5.2.10

- After completion of tape guide roller and the supply side guide roller adjustments, adjust tape guide and the take-up side guide roller by using the same procedures as for the supply side adjustments. In this case, adjust the guide roller height first.
- Finally, confirm that there is no curling or creasing at the take-up side guide roller and tape guide. If there is any curling or creasing between the take-up side guide roller and the audio control erase head, adjust the audio control erase head.

5.2.4 AUDIO CONTROL ERASE HEAD ADJUSTMENT

These adjustments should be carried out prior to the PLAY MODE TRACKING adjustment in Section 3.1.4 (2), and the X VALUE adjustment in Section 3.1.4 (3), the ACE HEAD HEIGHT/ACE HEAD TILT adjustment in Section 3.3.4 (1), and the ACE HEAD AZIMUTH adjustment in Section 3.3.4 (2).

- Load a recorded tape and set the VCR to the PLAY mode.
- Adjust the height of the edge of the audio track on the audio control erase head, using the height adjustment nut and the tilt adjustment screw, so that the tape transport is smooth at the tape guide. Align the audio control erase head height. (Refer to Fig. 5.2.11). Do not turn the tilt adjustment screw more than 90°.

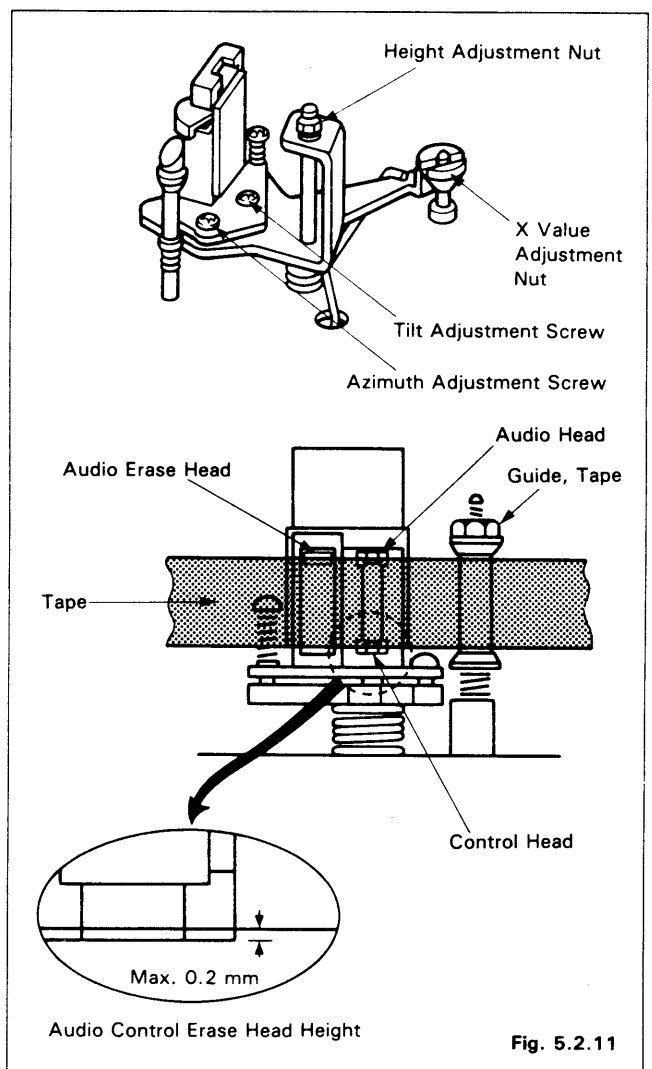
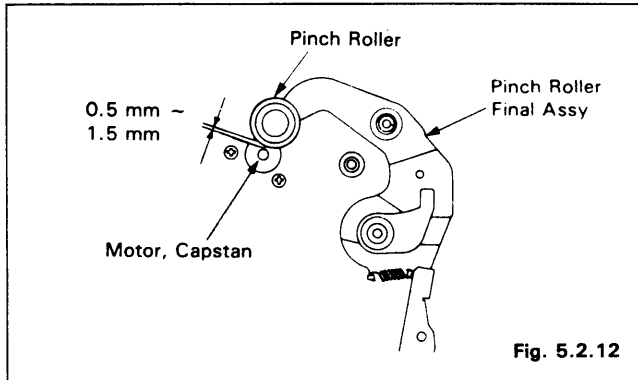


Fig. 5.2.11

- The fine adjustment is not required at this time. The following conditions are sufficient:
 - Proper tape transport between the audio control erase head and the tape guide.
 - Stable SERVO system operation (proper pickup of the tape's recorded control signal).

5.2.5 PINCH ROLLER POSITION CHECKING

1. Set the VCR to the REC PAUSE mode.
2. Measure the clearance between the capstan and the pinch roller. It should be from 0.5 mm to 1.5 mm.

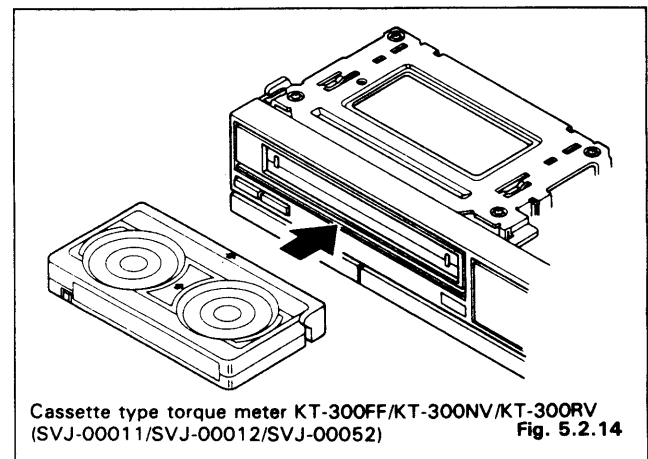
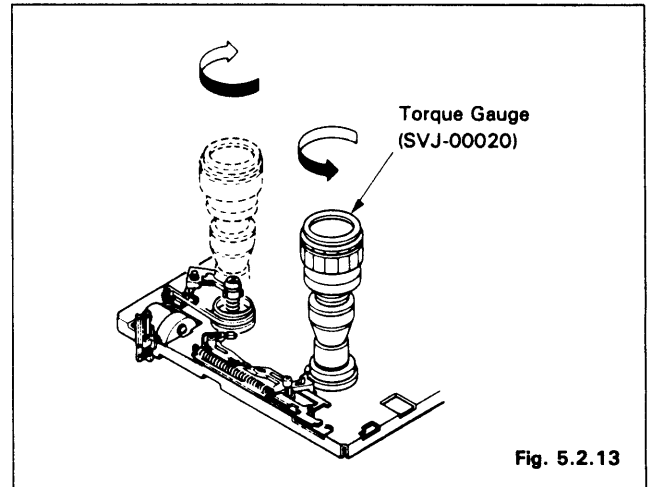


3. If the clearance is out of tolerance, replace the appropriate parts (Pinch Roller F Assy, Cam Actuator, etc.).

5.2.6 TORQUE VALUE CHECKING

Measuring Mode	Torque	Measuring reel	Torque Value	Measuring Equipment
PLAYBACK	Back Tension	Supply	45 gr-cm to 55 gr-cm *1	KT-300NV
	Take-up Torque	Take-up	100 gr-cm to 200 gr-cm	KT-300NV
REVIEW	Rewind Torque	Supply	140 gr-cm to 200 gr-cm	KT-300RV
	Back Tension	Take-up	40 gr-cm to 65 gr-cm	KT-300RV
FAST FORWARD *3	Back Tension	Supply	15 gr-cm to 30 gr-cm	Torque Gauge
	Take-up Torque	Take-up	800 gr-cm or more	KT-300FF
REWIND *3	Rewind Torque	Supply	800 gr-cm or more	KT-300FF
	Back Tension	Take-up	15 gr-cm to 30 gr-cm	Torque Gauge
STOP	Brake Torque	Supply	150 gr-cm or more *2	Torque Gauge
	Brake Torque	Take-up	150 gr-cm or more *2	Torque Gauge

- *1 The adjustment value at Section 5.2.2.
 *2 Check this value before the reel starts to rotate.
 *3 Cover the tape end sensor on the supply reel side with black insulating tape etc., so that the mechanism will operate without inserting a cassette.



If the torque value checked is out of tolerance, replace the appropriate parts as follows:

Check Items	Replace Parts
PLAY BACK Back Tension	Refer to Section 5.2.2
PLAY BACK Take-up Torque	Idler, Complete or Belt Drive or Clutch, Complete
REVIEW Rewind Torque	Idler, Complete or Belt Drive or Clutch, Complete
REVIEW Back Tension	Sub Brake Take-up
FAST FORWARD Back Tension	Band Brake
FAST FORWARD Take-up Torque	Idler, Complete or Belt Drive
REWIND Rewind Torque	Idler, Complete or Belt Drive
REWIND Back Tension	Sub Brake Take-up
Brake Torque Supply	Main Brake Supply
Brake Torque Take-up	Main Brake Take-up

5.3 ENVELOPE ADJUSTMENT

1. This adjustment should be made after making the tape transport adjustments.
2. When exchanging a circuit board, or parts on a circuit board, perform Section 3 (ELECTRICAL ADJUSTMENT).

5.3.1 ENVELOPE WAVEFORM SHAPING

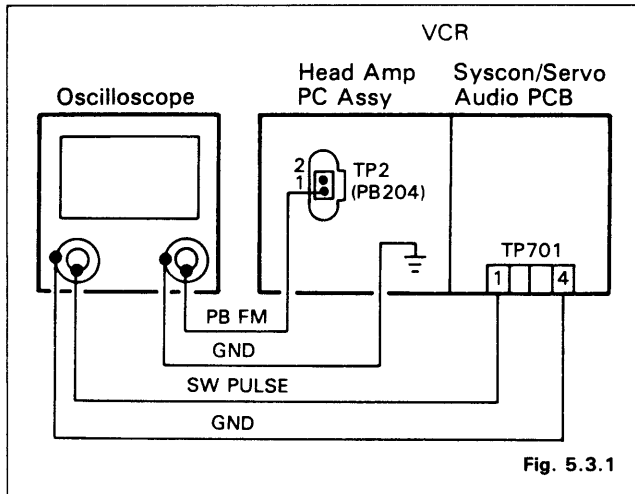


Fig. 5.3.1

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP2 (PB204) (on Head Amp PC Assy) Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND)	Oscilloscope	PLAY mode Test tape (VPM-6)
ADJ. Location	ADJ. Value	
Guide Rollers Tape Guide	Maximum level and correct waveform (PB FM Signal)	

1. Rotate VR151 (TRACKING control knob) behind the door on the front panel, and check with the oscilloscope that the PB FM Signal is brought to its maximum level. Then set VR151 (TRACKING control knob) behind the door on the front panel to its centre (detent) position and confirm that a nearly maximum level is obtained.

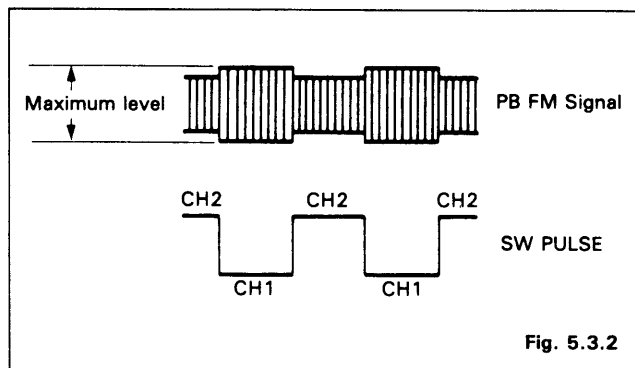


Fig. 5.3.2

2. The envelope adjustment can be performed by adjusting the height of both the supply side and the take-up side guide rollers.
3. The starting portion of the waveform can be adjusted by adjusting the supply side guide roller height. (Refer to Fig. 5.3.3)

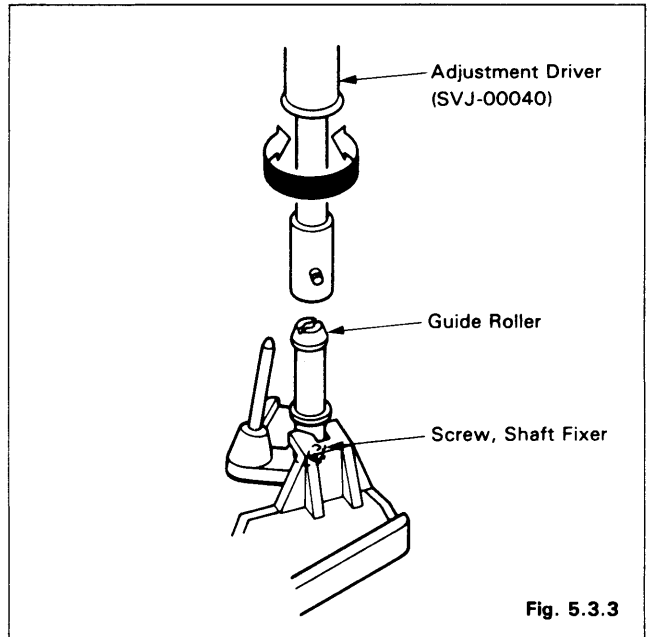


Fig. 5.3.3

4. Adjust the supply side guide roller height so that a flat continuous large waveform is obtained as shown in Fig. 5.3.4

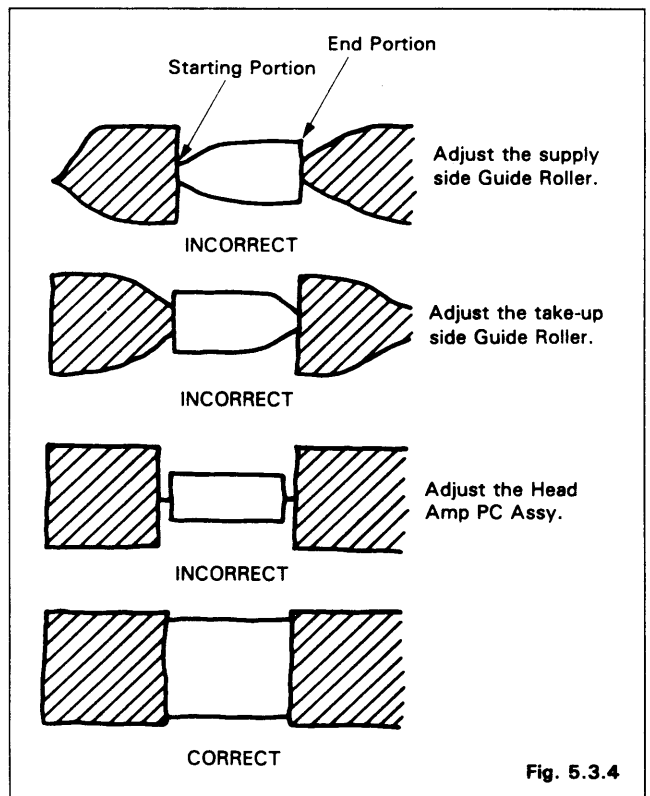


Fig. 5.3.4

5. Adjust the end portion of the waveform by adjusting the take-up side guide roller height, so that the waveform as shown in Fig. 5.3.3 is obtained.
6. After adjustment, rotate VR151 (TRACKING control knob) behind the door on the front panel to the left and right, and check that the waveform changes symmetrically.
7. Check the tape curl, referring to Section 5.2.3 (TAPE RUNNING POSITION ADJUSTMENT).

Note:

After the adjustment of Section 5.3.1 ENVELOPE WAVEFORM SHAPING, check the items described in the following table. If necessary, readjust them.

1	CH1 PHASE/CH2 PHASE	Refer to Section 3.1.4 (1)
2	ACE HEAD HEIGHT/ ACE HEAD TILT	Refer to Section 3.3.4 (1)
3	AZIMUTH	Refer to Section 3.3.4 (2)
4	X VALUE	Refer to Section 3.1.4 (3)

5.4 TAPE TRANSPORT ADJUSTMENT

It is very important for a VCR that the tape runs without creasing or curling, from the tape outlet of the video cassette to the tape inlet of the cassette.

The tape transport adjustment must be performed when the parts shown in Fig. 5.4 are removed and refitted. When adjustment is required, perform it in accordance with the sequence given in the chart below.

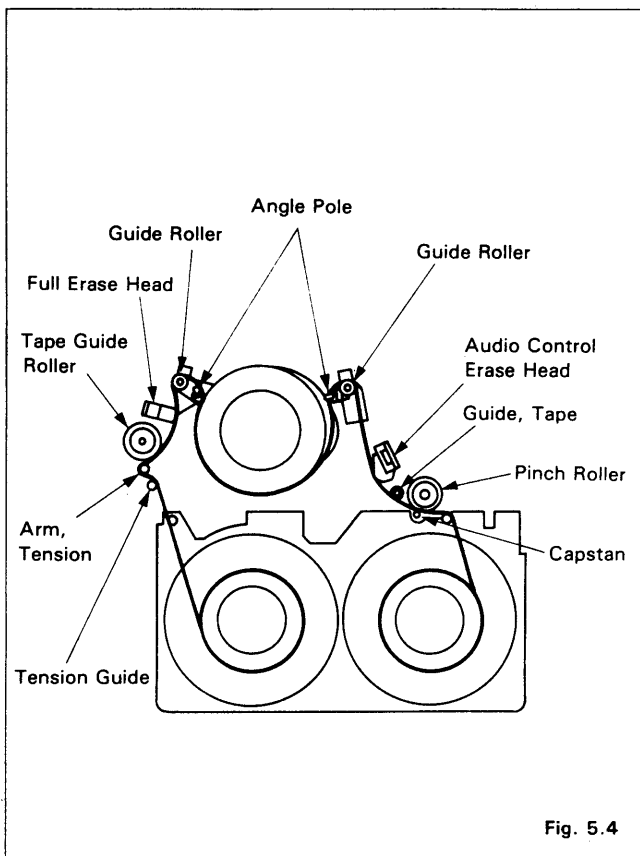
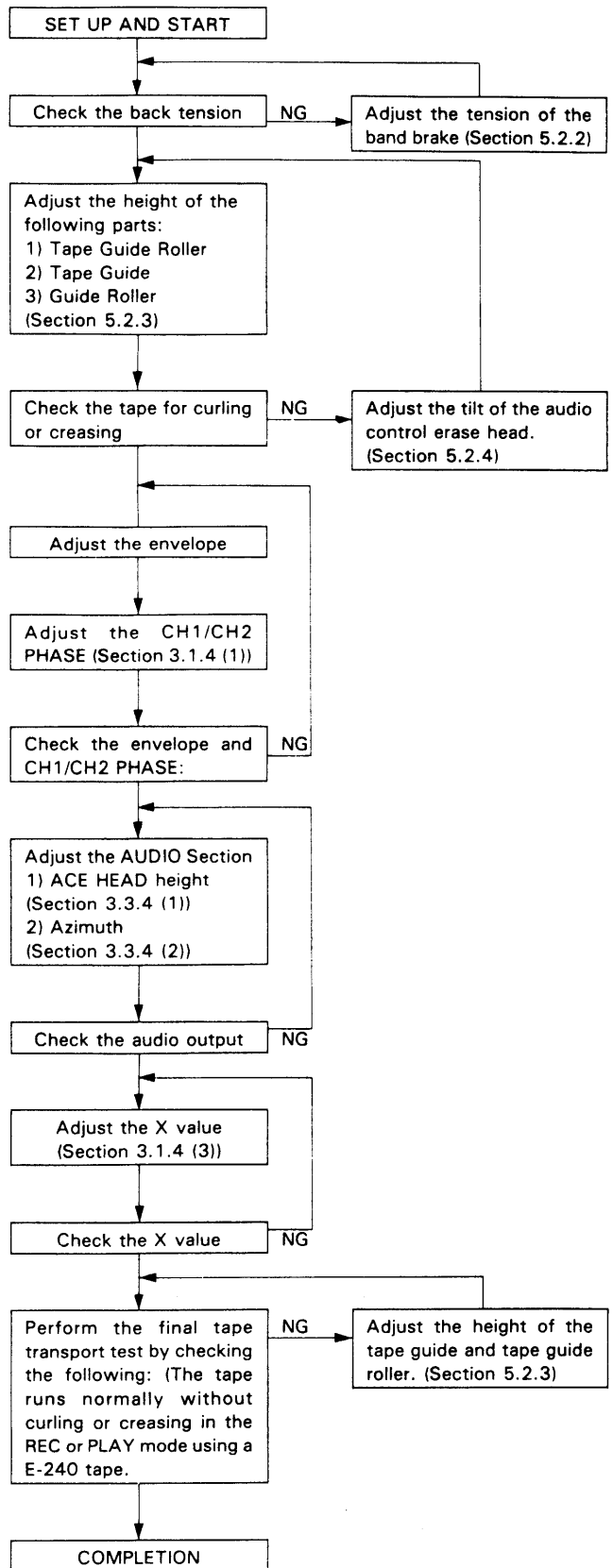


Fig. 5.4



6. MAINTENANCE

6.1 MAINTENANCE PARTS AND PERIODS

In order to keep the VCR in peak working order, maintain the parts indicated in Table 6.1 at the periods given.

Parts	Hours									
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
CYLINDER	○	○	○	○	○	○	○	○	○	○
AUDIO CONTROL ERASE HEAD	○	○	○	○	○	○	○	○	○	○
FULL ERASE HEAD	○	○	○	○	○	○	○	○	○	○
CAPSTAN	○	○	○	○	○	○	○	○	○	○
IDLER COMPLETE	○	○	○	●	○	○	○	●	○	○
PINCH ROLLER	○	○	○	○	○	●	○	○	○	○
BELT, DRIVE	○	○	○	●	○	○	○	●	○	○
PAD, MAIN BRAKE				●				●		
CLUTCH COMPLETE (FRICTION ASSY)				●				●		
REEL, TAKE-UP				○				○		
REEL, SUPPLY				○				○		

Table 6.1

○: Cleaning . . . Freon (fluorine-based organic solvent) Absolute methyl alcohol

●: Replacement

Above replacement times will vary greatly according to environmental and usage conditions. Routine inspection and maintenance are also important factors that influence the unit life. Note that rubber parts may become aged or deformed after long periods of storage, even if the unit is not used.

Note:

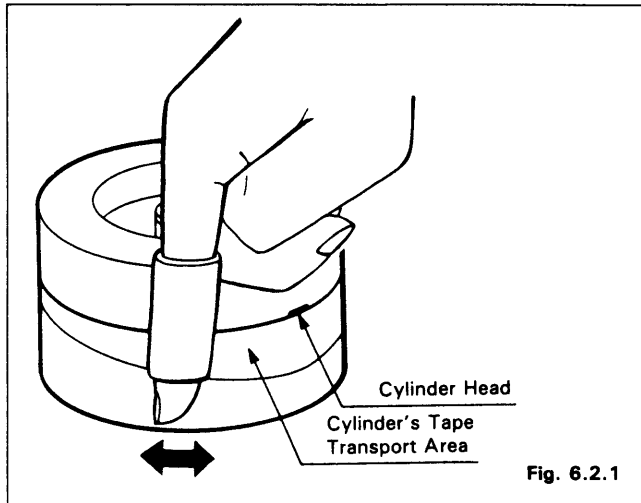
Even if the unit is not used frequently, cleaning and replacement of the rubber parts should be undertaken every 2 years.

6.2 CLEANING

6.2.1 CYLINDER

Wrap a piece of chamois around your finger. Dip it in head-cleaning fluid and clean the cylinder head. Move the chamois horizontally several times (in the direction of the arrow). Another cylinder head is located 180° away on the opposite side. Clean it the same way.

In the same manner clean the tape transport area of the cylinder. (Refer to Fig. 6.2.1)

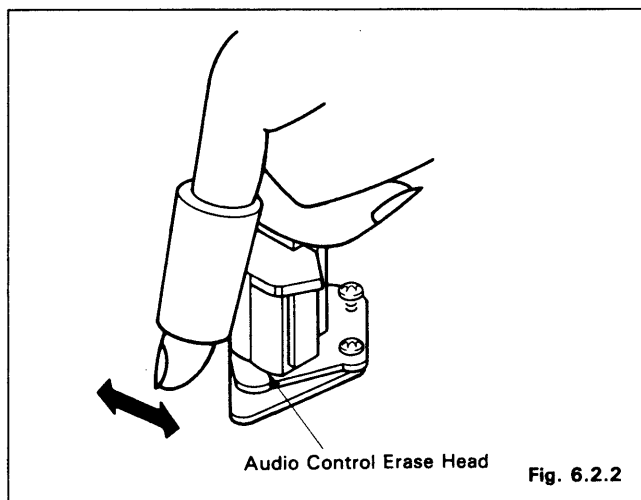


Note: Do not push forcefully against the cylinder head. Do not move the chamois up or down since this may damage the head. Always use a piece of chamois for cleaning.

6.2.2 AUDIO CONTROL ERASE HEAD

Wrap a piece of chamois around your finger. Dip it in head-cleaning fluid and clean the audio control erase head, wiping it horizontally.

Clean the FULL ERASE HEAD, the CAPSTAN MOTOR and the PINCH ROLLER in the same manner. (Refer to Fig. 6.2.2)



6.3 LUBRICATION

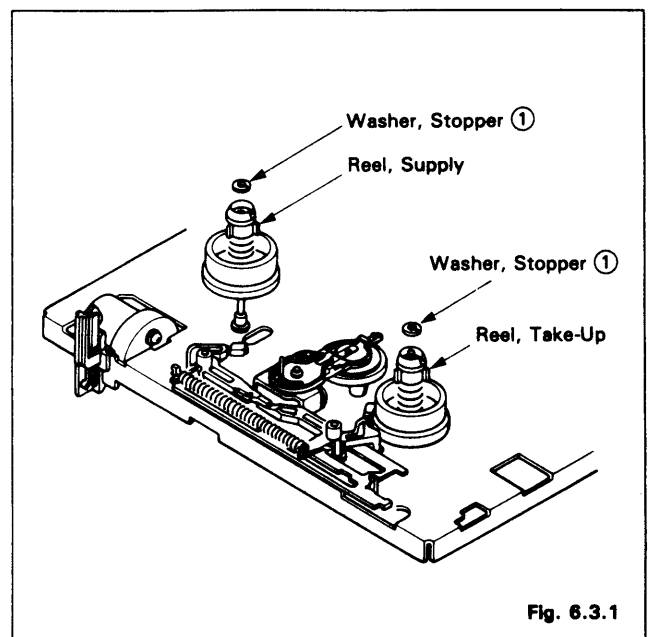
6.3.1 LUBRICATING PARTS

The following parts should be lubricated with oil (Turbionol No. 64 or equivalent) every 2000 hours.

- (1) Supply reel
- (2) Take-up reel

6.3.2 LUBRICATING PROCEDURE

1. Detach both of the reel stopper washers. (Refer to Fig. 6.3.1 ①)
2. Remove the supply and take-up reels.
3. Apply oil to the top at the axes.
4. Replace the supply reel and take-up reel, then replace the reel stopper washers.



PARTS LIST & SCHEMATIC DIAGRAMS

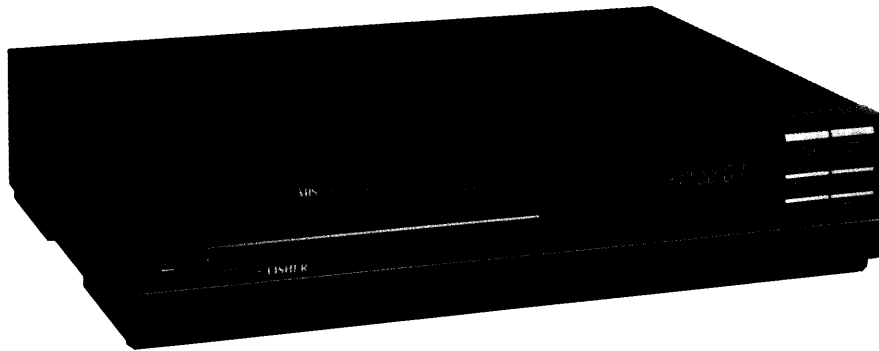


FISHER®

FVH-P5100

(U. K.)

VIDEO CASSETTE RECORDER



TECHNICAL SPECIFICATIONS

General Specifications

Television system	CCIR: 625 lines, 50 fields, PAL standard colour and monochrome signals
Recording system	Rotary helical scan system with two video heads one stationary head for normal track monaural sound
Format	VHS PAL standard
Tape width	12.7 mm
Tape speed	23.39 mm/sec
Recording time	240 minutes with E-240 cassette
Tape loading system	Automatic loading
Tuner	Voltage Synthesizer tuner with sequential channel selection Channel +/- selection with remote control 30 programs memories
Tuner channels	UHF: #21—#69 (470MHz—862MHz)
RF converter output	UHF channel 37 (30—39 adjustable)
Time indication	AM/PM 12-hour display system
Timer	14-day 4 programs
Tape counter	Separate 4-digit electronic display
Auto function	Power On/Playback/Rewind/Eject/Power Off/Cancel

Terminals

Aerial input	DIN (socket)
RF output	DIN (plug)
Video input/output	RCA connector
Audio input/output	RCA connector

Electrical Specifications

Video output	1 volt (pp) / 75Ω
Video input	0.5—2.0 volt (pp) / 75Ω
Audio output	400 mV (−8 dBV) 600Ω
Audio input	400 mV (−8 dBV) 50kΩ
Video S/N ratio	More than 40 dB (45 dB)
Audio frequency response	50—10,000 Hz (normal sound)
Audio S/N ratio	More than 40 dB (42 dB)

Other Specifications

Power requirement	240VAC, 50Hz
Power consumption	24 Watts
Dimensions (W×H×D)	440mm × 99mm × 335mm
Weight(approximate)	6.8Kg

Because its products are subject to continuous improvement, FISHER CORPORATION reserves the right to modify product designs and specifications without notice and without incurring any obligation.

REFERENCE NO. WM-20605

This is a Parts list & Schematic Diagrams for Model FVH-P5100 and only items changed from Model FVH-P5000 are indicated. For other items, refer to Parts List & Schematic Diagrams for Model FVH-P5000 (WM-20205) Issued Mar. '87.

ACCESSORIES

FVH-P5000			FVH-P5100		
Ref No	Part No	Description	Part No	Description	Remarks
	143-6-2704-58700 4-1924-01640	FAN BAG ASSY (Plastic Bag) WIRELESS REMOTE CONTROL RVR-510E	143-6-2704-58700 4-1924-01840	FAN BAG ASSY (Plastic Bag) WIRELESS REMOTE CONTROL RVR-530E	Change Change
	143-6-2704-62800 143-6-4114-39000	FAN BAG ASSY (Plastic Bag) INSTRUCTION MANUAL	143-6-2704-63000 143-6-4114-39100	FAN BAG ASSY (Plastic Bag) INSTRUCTION MANUAL	Change Change

WIRELESS REMOTE CONTROL UNIT

Ref No	Part No	Description	Part No	Description	Remarks
	4-1924-01640	Wireless Remote Control RVR-510E	4-1924-01840	Wireless Remote Control RVR-530E	Change
1	143-0-9964-12101	Case, Upper Assy-RC	143-0-9964-12801	Case, Upper Assy-RC	Change
3	143-0-9964-12101	4 Button-RC	143-0-9964-12802	6 Button-RC	Change

PACKING MATERIALS

Ref No	Part No	Description	Part No	Description	Remarks
	143-6-1424-02518	IND. CORR CARTON-UKP5000	143-6-1424-02519	IND. CORR CARTON-UKP5100	Change

CABINET PARTS (1)

Ref No	Part No	Description	Part No	Description	Remarks
1	143-0-1254-00806	Top Cover Assy-HBK-H	143-0-1254-00807	Top Cover Assy-HBK-J	Change
3	0-4014-06075	Front Right PC Assy	0-4014-06076	Front Right PC Assy	Change
5	143-0-1104-02609	Cabinet Front Assy-HBM-M	143-0-1104-02610	Cabinet Front Assy-HBM-P	Change

CABINET PARTS (2)

Ref No	Part No	Description	Part No	Description	Remarks
1	143-0-7304-10202	Stage, Complete-H	143-0-7304-10203	Stage, Complete-H	Change
18	0-4014-06610	Syscon Servo/Audio PC Assy	0-4014-06611	Syscon Servo/Audio PC Assy	Change
25	0-4014-06760	Video/Voltage Synthesizer PC Assy	0-4014-06761	Video/Voltage Synthesizer PC Assy	Change
31	143-0-1304-01415	Cabinet Bottom Assy-HBQ-W	143-0-1304-01416	Cabinet Bottom Assy-HBQ-Y	Change

CHASSIS PARTS (1)

Ref No	Part No.	Description	Part No	Description	Remarks
1	143-2-7304-23802	Flap-HBK-A2	143-2-7304-23803	Flap-HBK-A3	Change

CHASSIS PARTS (3)

Ref No	Part No.	Description	Part No.	Description	Remarks
9	143-0-5104-03900	Link, Loading Take-Up Complete	143-0-5104-03900	Link, Loading Take-Up Complete] or	Alternate
			143-0-5104-07000	Link, Loading Take-Up Complete]	
10	143-0-5104-03700	Link, Loading Supply Complete	143-0-5104-03700	Link, Loading Supply Complete] or	Alternate
			143-0-5104-06900	Link, Loading Supply Complete]	

VIDEO/VOLTAGE SYNTHESIZER P.C.B. PARTS

FVH-P5000			FVH-P5100		
Schematic Location	Part No.	Description	Part No.	Description	Remarks
	0-4014-06760	VIDEO/VOLTAGE SYNTHESIZER PC ASSY	0-4014-06761	VIDEO/VOLTAGE SYNTHESIZER PC ASSY	Change
	0-4010-00131	VIDEO ASSY	0-4010-00401	VIDEO ASSY	Change
		(CAPACITORS)			
C2153	403 038 6301	ELECT 220U M 6.3V			Delete
C2171			403 023 9607	CERAMIC 39P J 50V	Add
C2172			403 014 0200	CERAMIC 18P J 50V	Add
C2173			403 039 6508	ELECT 100U M 10V	Add
C2174			403 038 1603	ELECT 100U M 6.3V	Add
C2175			403 002 0502	CERAMIC 1000P K 25V	Add
C2176			403 002 0502	CERAMIC 1000P K 25V	Add
C2177			403 014 0200	CERAMIC 18P J 50V	Add
C2178			4-2224-00070	TRIMMER CON 30P	Add
C2179			403 072 2703	CERAMIC 0.022U Z 50V	Add
C2182			403 008 5105	CERAMIC 10P D 50V	Add
C2183			403 041 8804	ELECT 10U M 16V	Add
		(DIODES)			
D213	407 012 4406	DIODE 1SS133			Delete
or	407 008 0207	DIODE GMA01L			
or	407 008 6704	DIODE MA165. SAN			
D214	407 012 4406	DIODE 1SS133			Delete
or	407 008 0207	DIODE GMA01L			
or	407 008 6704	DIODE MA165. SAN			
D215			407 012 4406	DIODE 1SS133	Add
or			407 008 0207	DIODE GMA01L	
or			407 008 6704	DIODE MA165. SAN	
D219			407 012 4406	DIODE 1SS133	Add
or			407 008 0207	DIODE GMA01L	
or			407 008 6704	DIODE MA165. SAN	
		(IC)			
IC205			410 029 7001	IC M50455-001SP	Add
		(PLUGS)			
L2172			4-2724-U150K	INDUCTOR 15UH	Add
L2173			4-2724-U101K	INDUCTOR 100UH	Add
		(TRANSISTORS)			
Q271			405 004 4502	TR 2SA608-F-NP-AA	Add
or			405 004 5004	TR 2SA608-G-NP-AA	
		(RESISTORS)			
R2171			401 021 1807	CARBON 560 JA 1/4W	Add
R2173			401 023 1607	CARBON 820 JA 1/4W	Add
R2174			401 023 1607	CARBON 820 JA 1/4W	Add
R2175			401 012 5609	CARBON 1K JA 1/4W	Add
R2176			401 016 3700	CARBON 2.2K JA 1/4W	Add
R2177			401 018 3708	CARBON 3.3K JA 1/4W	Add
R2178			401 017 1705	CARBON 2.7K JA 1/4W	Add
R2179			401 021 2903	CARBON 5.6K JA 1/4W	Add
R2181			401 018 3708	CARBON 3.3K JA 1/4W	Add
R2182			401 019 0904	CARBON 390 JA 1/4W	Add
R2183			401 020 1907	CARBON 4.7K JA 1/4W	Add
R2184			401 014 4006	CARBON 1.5K JA 1/4W	Add
R2185			401 022 1806	CARBON 680 JA 1/4W	Add
R2186			401 012 5609	CARBON 1K JA 1/4W	Add
R2187			401 012 5609	CARBON 1K JA 1/4W	Add

FVH-P5000			FVH-P5100		
Schematic Location	Part No.	Description	Part No.	Description	Remarks
R2188 R2189 R2191 R2192 R2193			401 012 5609 401 012 5609 401 020 1907 401 020 1907 401 020 1907	CARBON 1K JA 1/4W CARBON 1K JA 1/4W CARBON 4.7K JA 1/4W CARBON 4.7K JA 1/4W CARBON 4.7K JA 1/4W	Add Add Add Add Add
X202 or	0-4010-00142	VOLTAGE SYNTHESIZER ASSY	4-2254-00220 4-2254-00221	CRYSTAL 17.734475MHZ CRYSTAL 17.734475MHZ	Add
		(DIODES)			
D1011 or	407 012 4208 407 007 9904	DIODE 1SS131 DIODE GMA01	0-4010-00145	VOLTAGE SYNTHESIZER ASSY	Change Delete

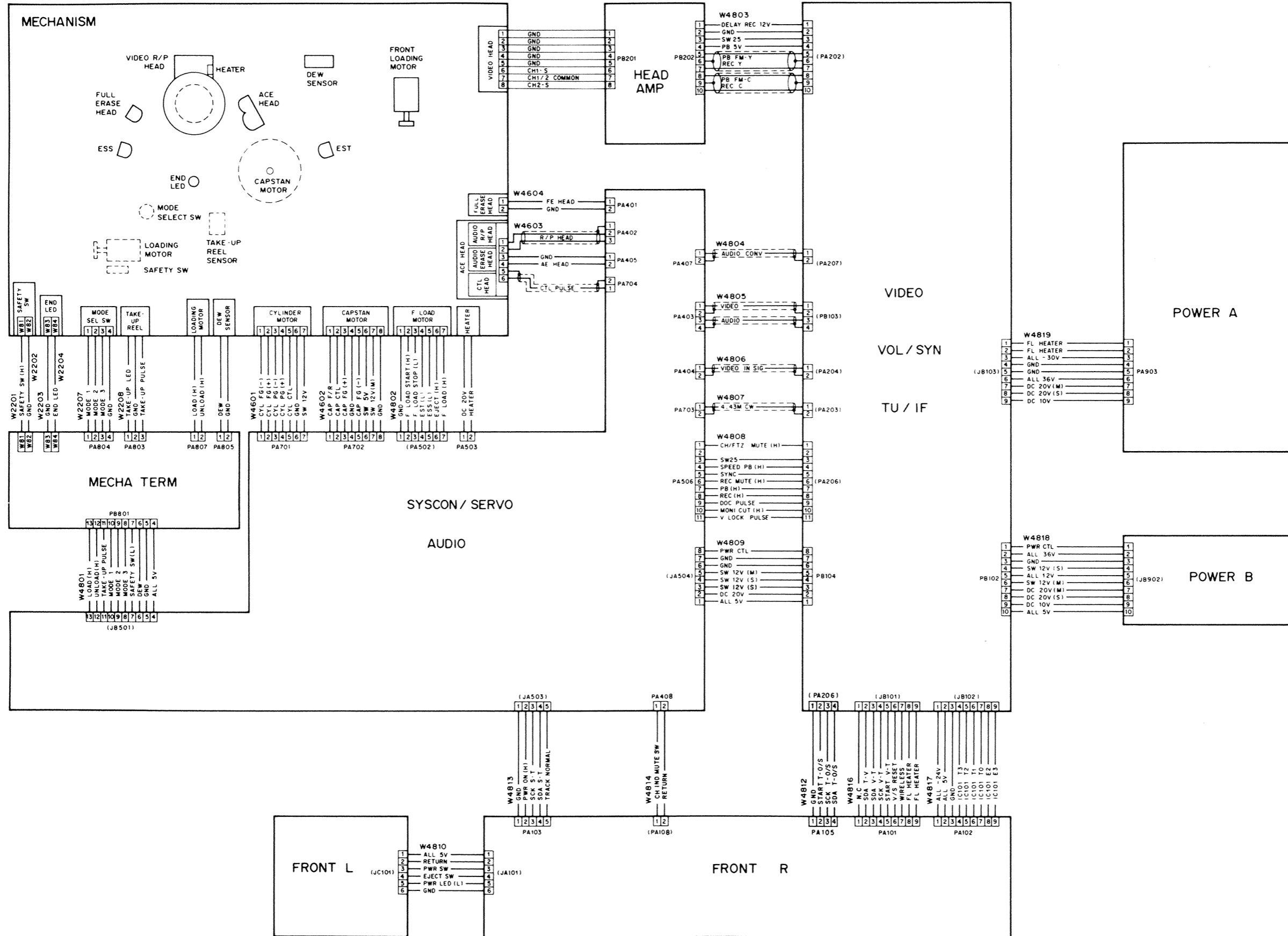
SYSTEM CONTROL SERVO/AUDIO P.C.B. PARTS

Schematic Location	Part No.	Description	Part No.	Description	Remarks
	0-4014-06610 0-4010-00380	SYSCON/AUDIO PC ASSY SYSCON SERVO ASSY	0-4014-06611 0-4010-00381	SYSCON/AUDIO PC ASSY SYSCON SERVO ASSY	Change Change
		(CAPACITOR)			
C7038			403 061 8204	POLYESTER 4700P K 50V	Add
		(RESISTORS)			
R5008 R7057			401 016 4707 401 020 1907	CARBON 22K JA 1/4W CARBON 4.7K JA 1/4W	Add Add
R7059 R7061	401 018 4804 401 018 4804	CARBON 33K JA 1/4W CARBON 33K JA 1/4W	401 020 2805 401 020 2805	CARBON 47K JA 1/4W CARBON 47K JA 1/4W	Change Change
		(VARIABLE RESISTOR)			
VR707			4-2224-01210	SEMI 68kB	Add

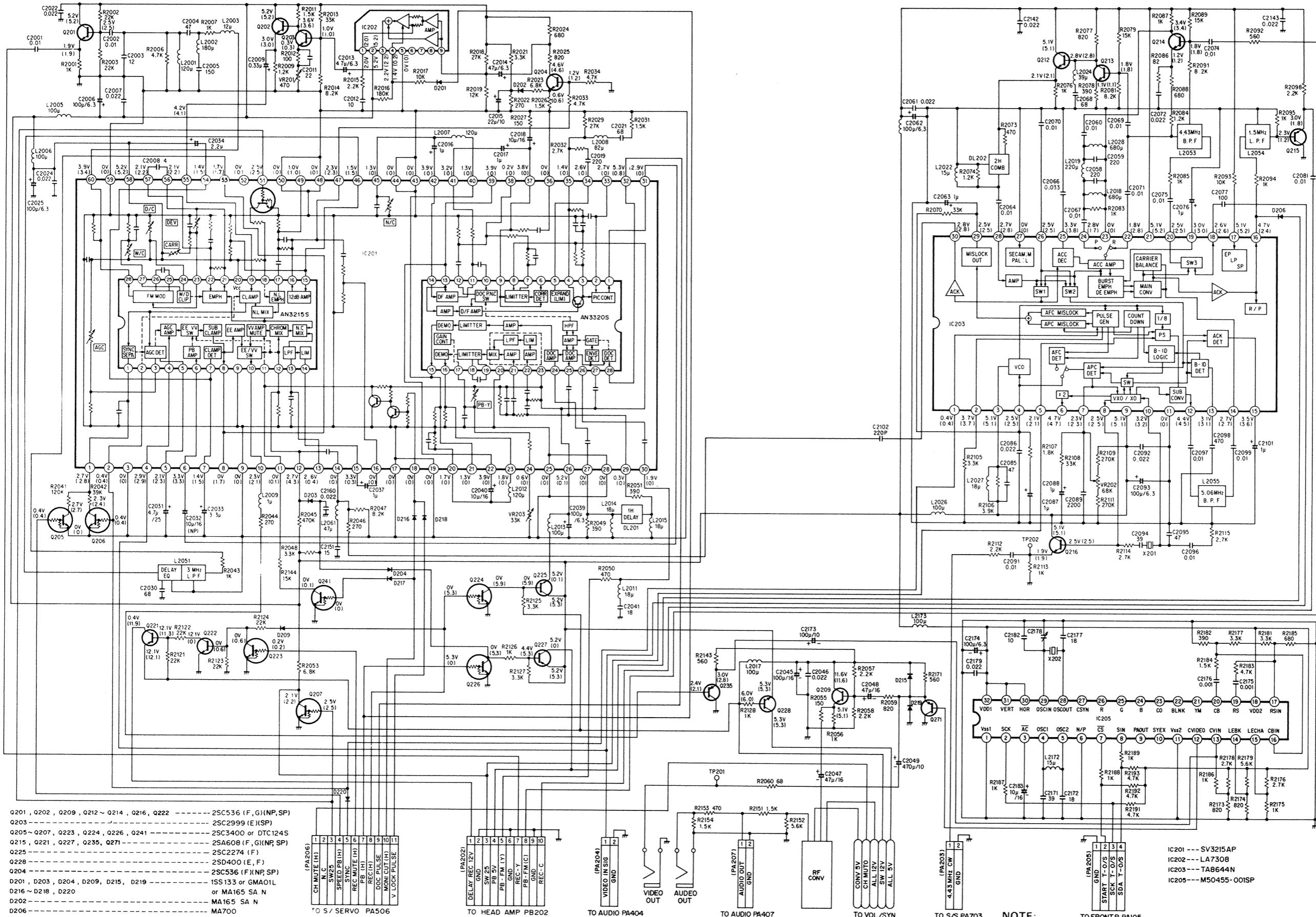
FRONT RIGHT P.C.B. PARTS

Schematic Location	Part No.	Description	Part No.	Description	Remarks
	0-4014-06075	FRONT RIGHT PC ASSY	0-4014-06076	FRONT RIGHT PC ASSY	Change
		(CAPACITOR)			
C1516	403 072 2703	CERAMIC 0.022U Z 50V	403 002 3602	CERAMIC 0.1U K 25V	Change
		(DIODES)			
D1512 or	407 012 4208 407 007 9904	DIODE 1SS131 DIODE GMA01			Delete
		(IC)			
IC151	409 108 2204	IC LC6558D-3289	409 117 4206	IC LC6558D-3343	Change
		(RESISTOR)			
R1541	401 012 6903	CARBON 10K JA 1/4W			Delete

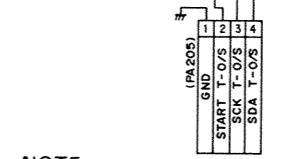
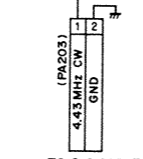
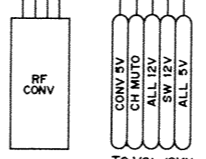
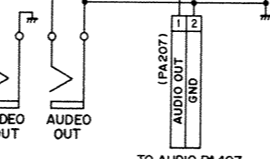
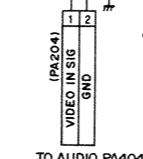
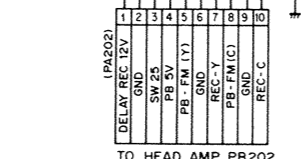
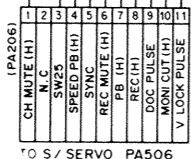
OVERALL WIRING DIAGRAM



VIDEO CIRCUIT DIAGRAM



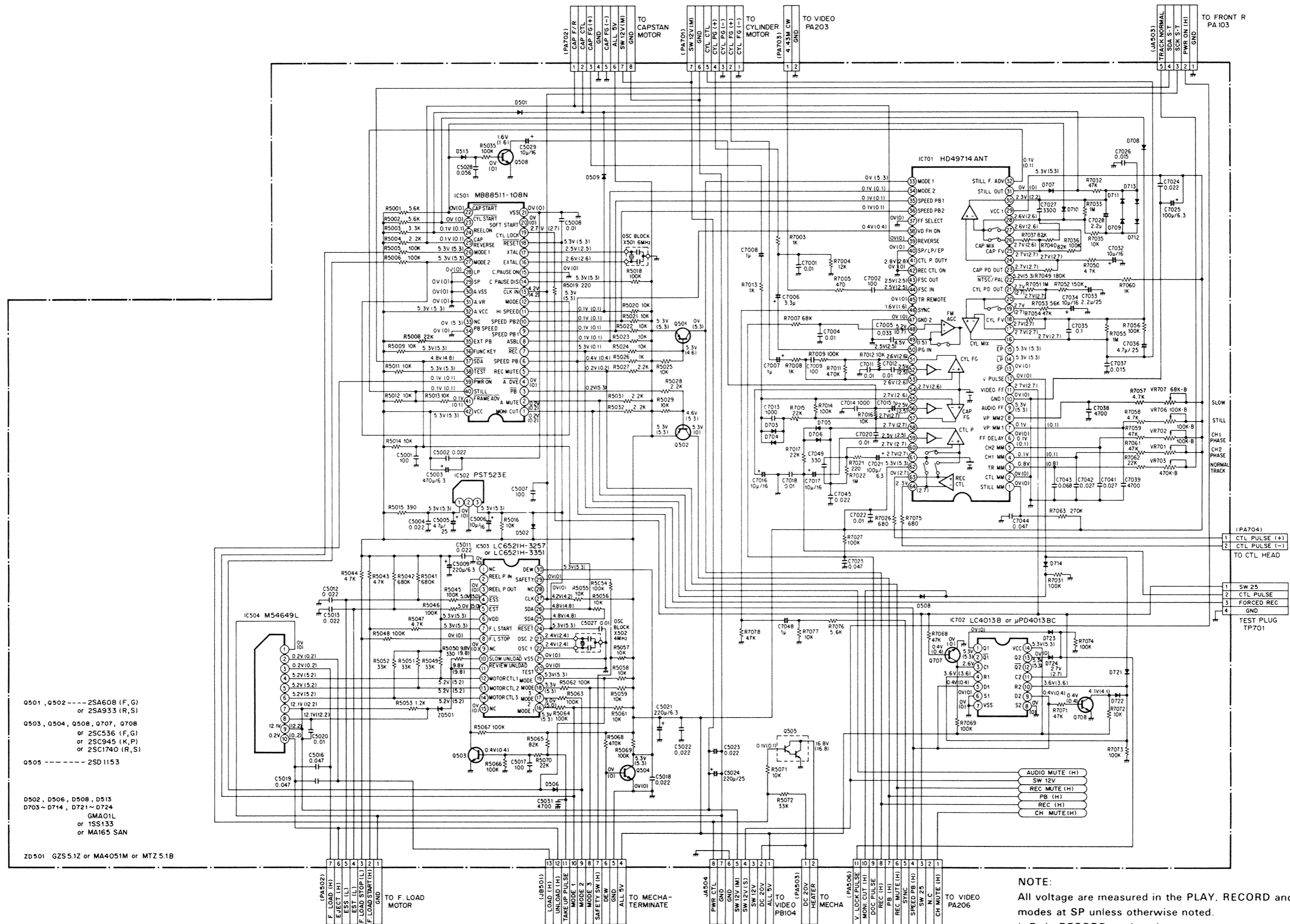
- Q201, Q202, Q209, Q212 ~ Q214, Q216, Q222 ----- 2SC536 (F, G)(NP, SP)
- Q203 ----- 2SC2999 (E)(SP)
- Q205 ~ Q207, Q223, Q224, Q226, Q241 ----- 2SC3400 or DTC124S
- Q215, Q221, Q227, Q235, Q271 ----- 2SA608 (F, G)(NP, SP)
- Q225 ----- 2SC2274 (F)
- Q228 ----- 2SD400 (E, F)
- Q204 ----- 2SC536 (F)(NP, SP)
- D201, D203, D204, D209, D215, D219 ----- ISS133 or GMA01L
- D216 ~ D218, D220 ----- or MA165 SA N
- D202 ----- MA165 SA N
- D206 ----- MA700



- IC201 --- SV3215AP
- IC202 --- LA7308
- IC203 --- TA8644N
- IC205 --- M50455-001SP

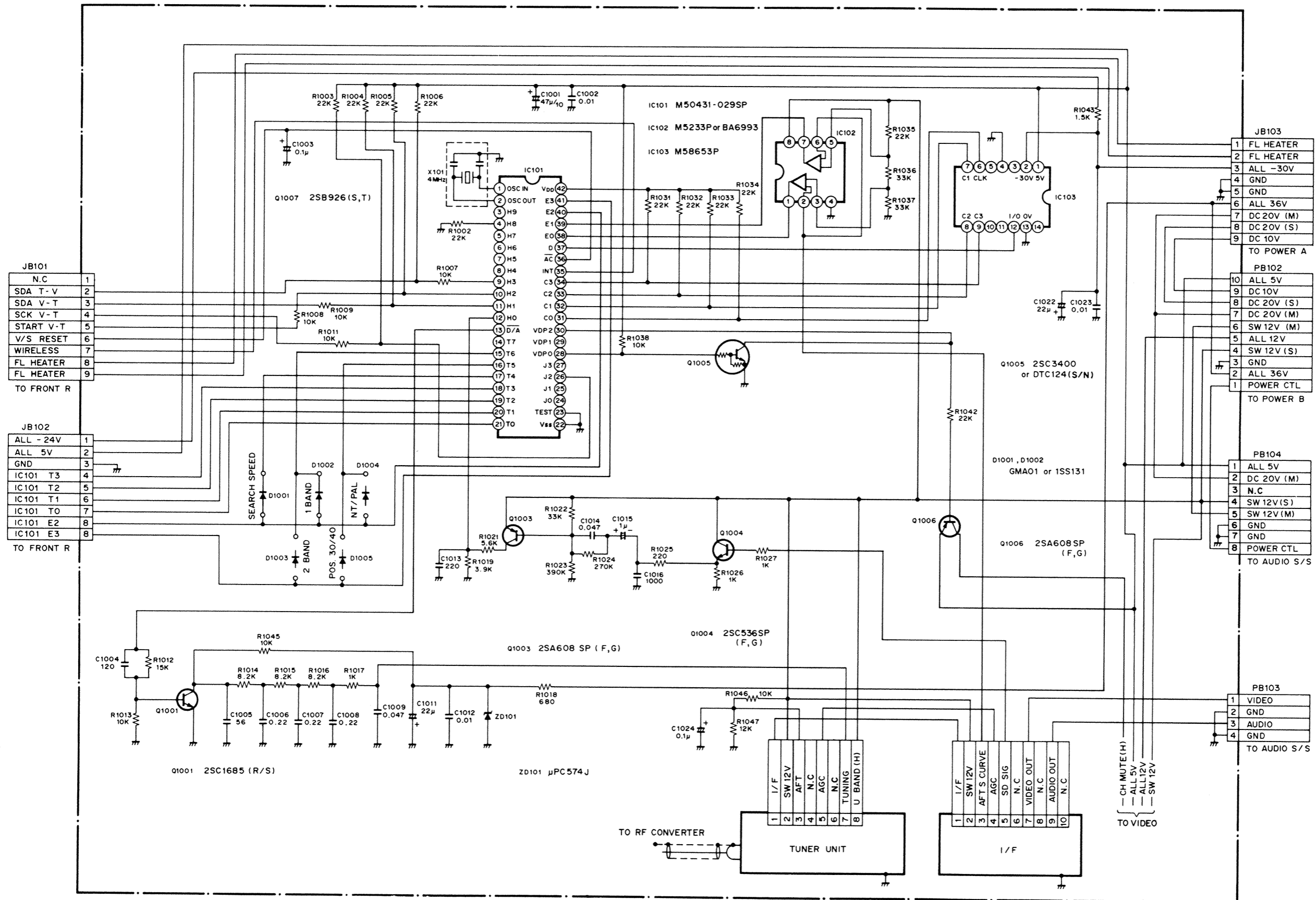
NOTE:
All voltage are measured in the PLAY and RECORD modes at SP unless otherwise noted.
()=RECORD mode only.

SYSTEM CONTROL SERVO CIRCUIT DIAGRAM

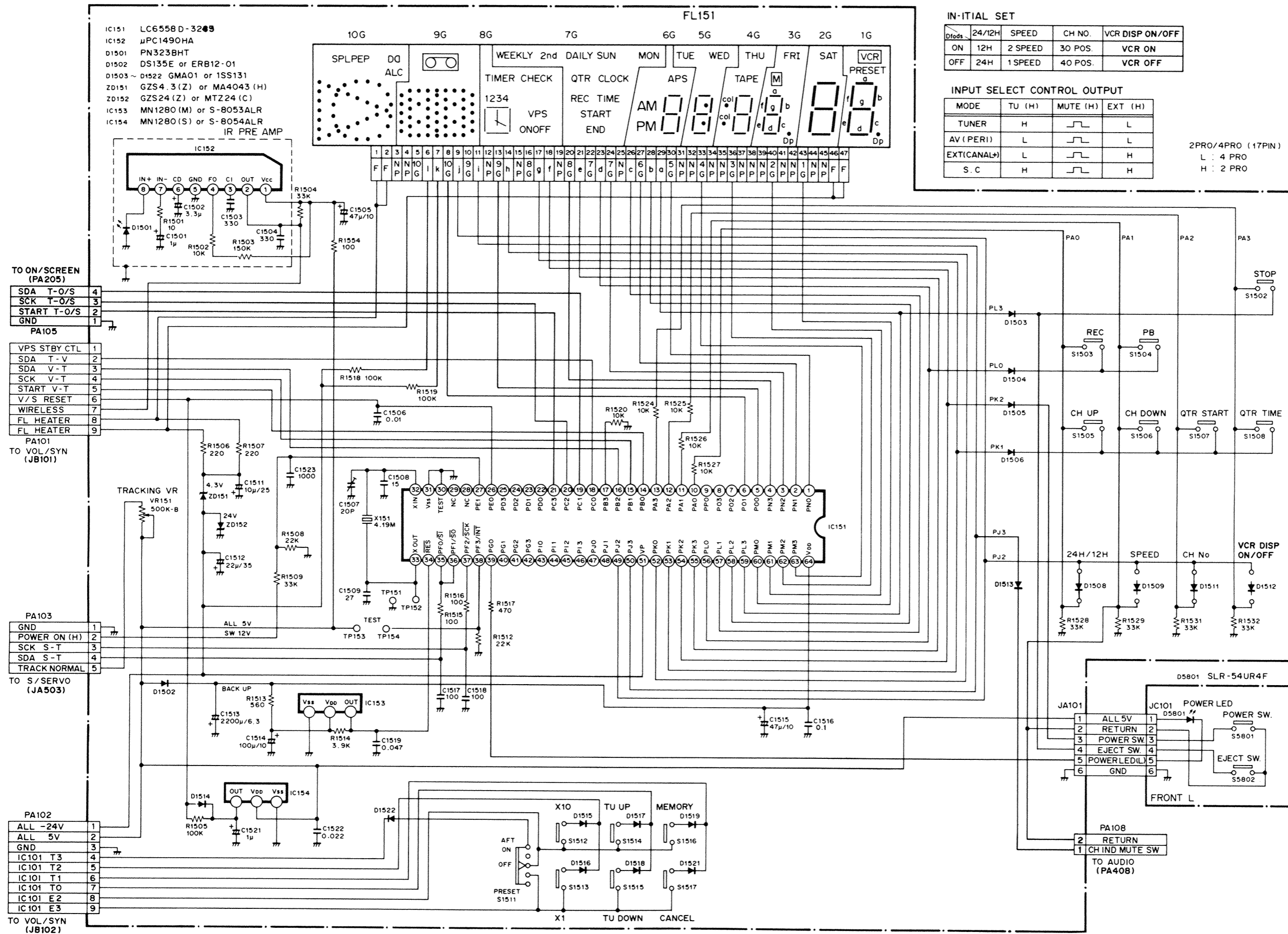


NOTE:
 All voltage are measured in the PLAY, RECORD and STOP modes at SP unless otherwise noted.
 (R)=RECORD mode only.
 (S)=STOP mode only.
 (P)=PLAY mode only.

TUNER IF/VOLTAGE SYNTHESIZER CIRCUIT DIAGRAM



FRONT RIGHT AND FRONT LEFT CIRCUIT DIAGRAM



IN-ITIAL SET

Dfods	24/12H	SPEED	CH NO.	VCR DISP ON/OFF
ON	12H	2 SPEED	30 POS.	VCR ON
OFF	24H	1 SPEED	40 POS.	VCR OFF

INPUT SELECT CONTROL OUTPUT

MODE	TU (H)	MUTE (H)	EXT (H)
TUNER	H	L	L
AV (PERI)	L	L	L
EXT(CANAL)	L	L	H
S.C	H	L	H

2PRO/4PRO (17PIN)
L : 4 PRO
H : 2 PRO