

SERVICE MANUAL

AKAI
VIDEO TAPE RECORDER

MODEL VT-700



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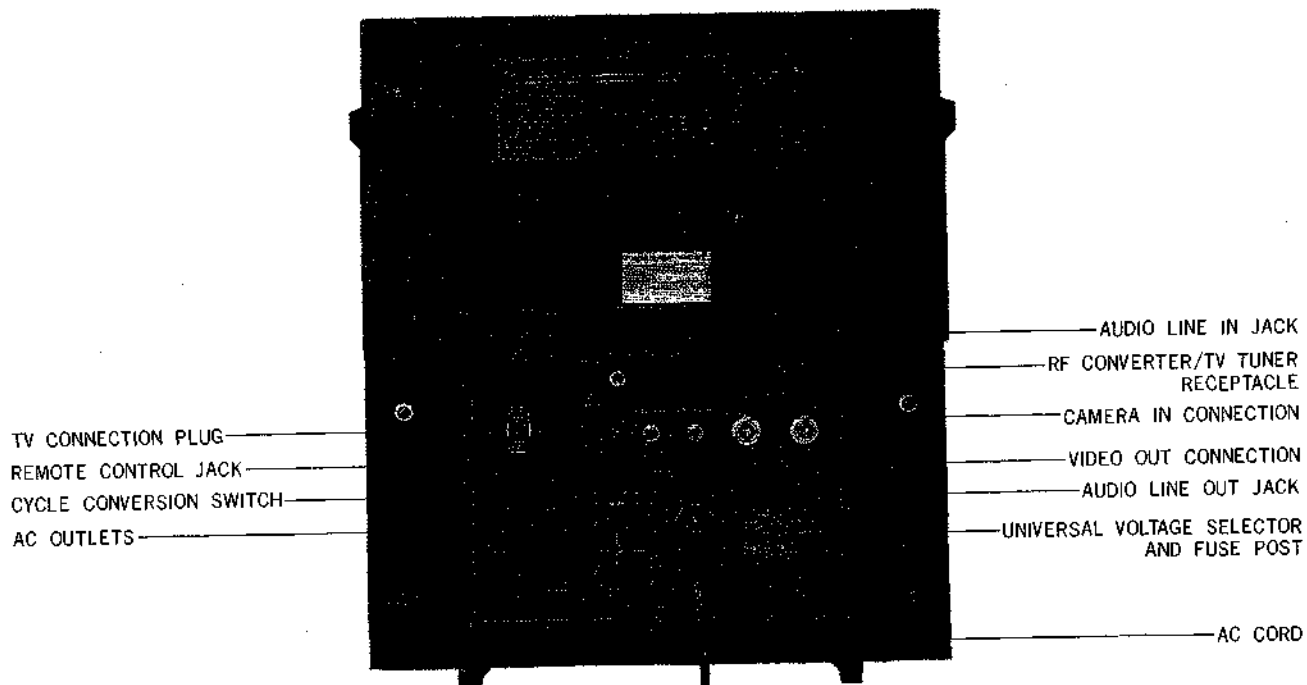
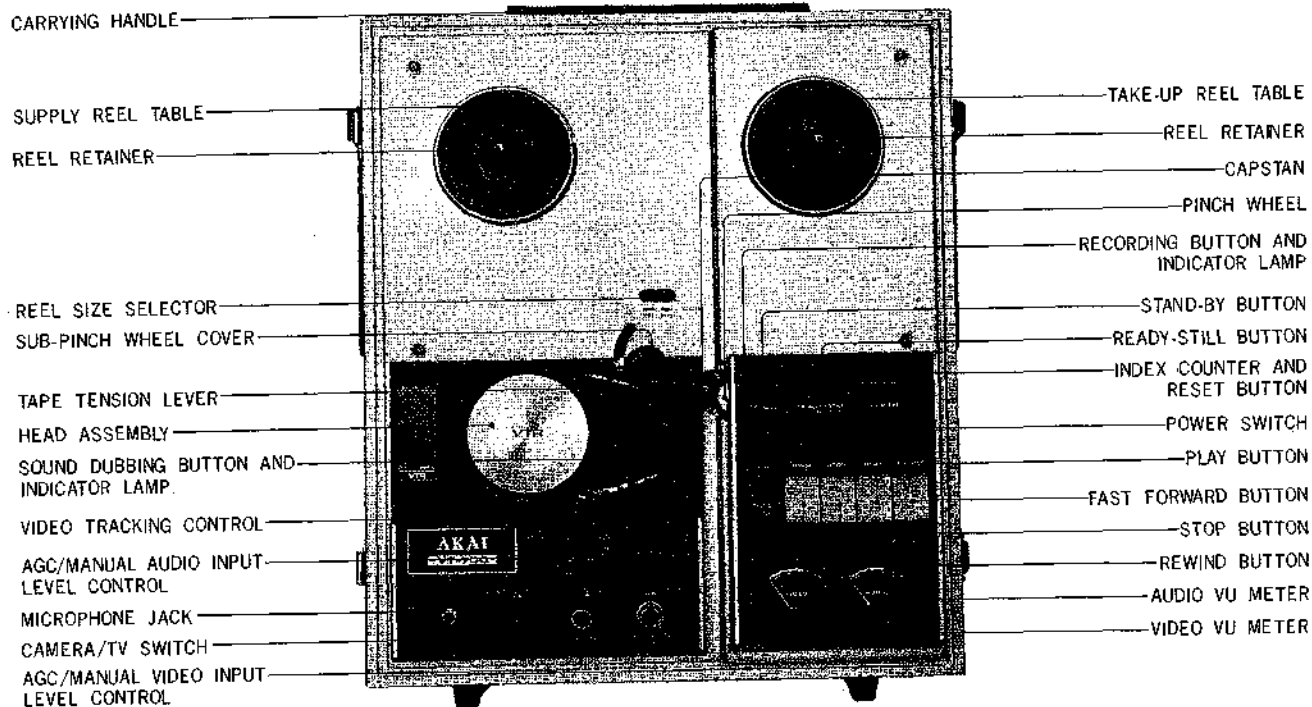
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When placing order for parts, please use Separate
PARTS LIST or PRICE LIST FOR PARTS.

I. SPECIFICATIONS

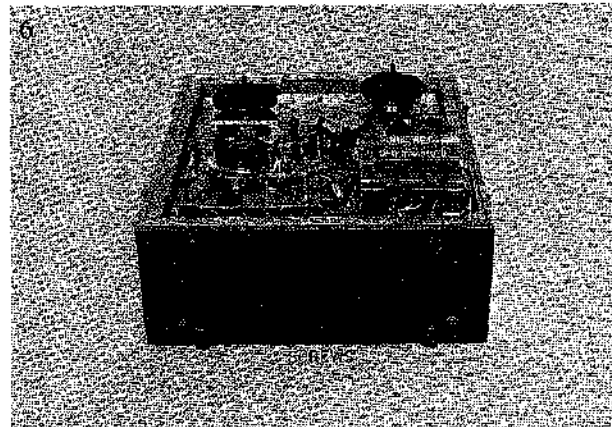
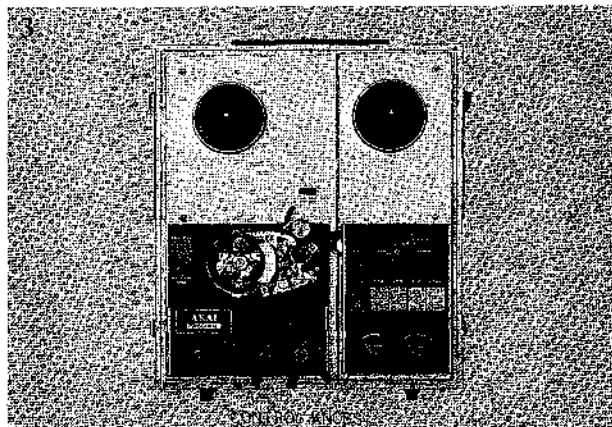
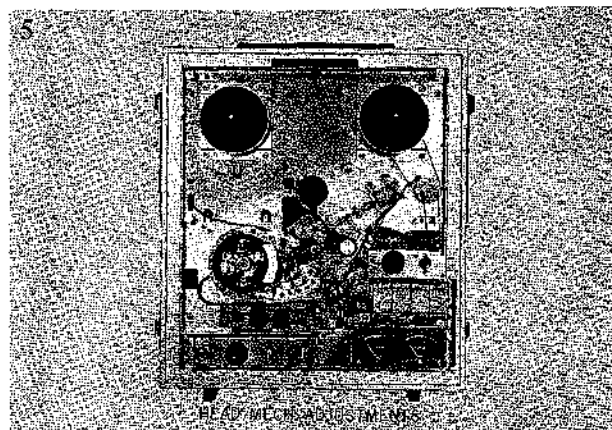
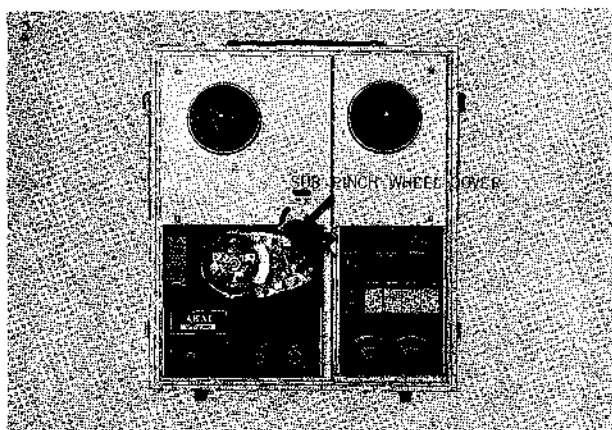
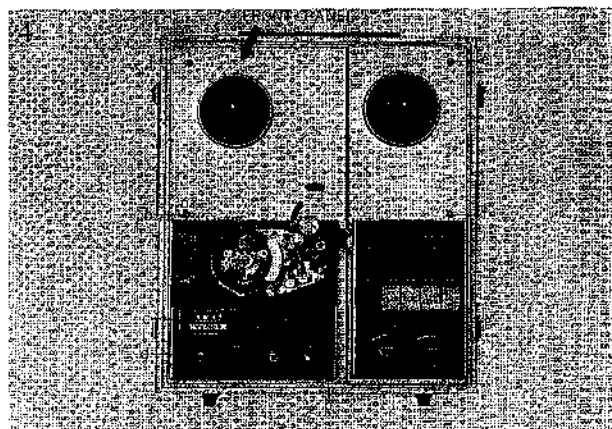
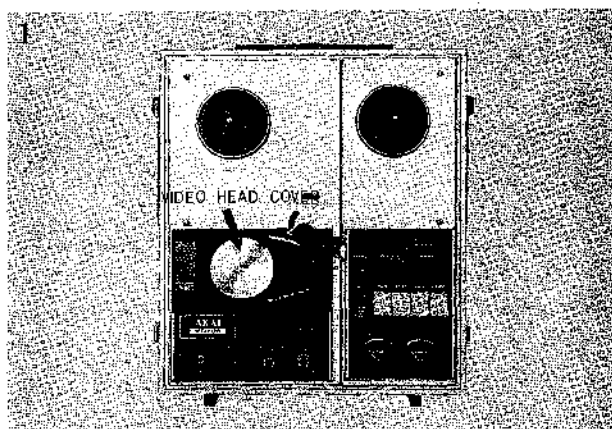
TV SIGNAL	: U.S Standard TV signal or CCIR Standard TV signal
RECORDING SYSTEM	: Twin rotating head (helical scan format)
RECORDING TIME	: 80 min (10" reel) 40 min (7" reel) 20 min (5" reel)
F.FWD. AND RWD. TIME	: 3 min. 30 sec. (10" reel); 2 min. 30 sec. (7" reel); 1 min. 30 sec. (5" reel)
TAPE SPEED	: US type 11-1/4 ips $\pm 0.7\%$ CCIR type 23.85 cm/sec. $\pm 0.7\%$
TAPE WIDTH	: 1/4 inch tape
HORIZONTAL RESOLUTION	: 200 lines
VIDEO SIGNAL TO NOISE RATIO	: Better than 40 dB
VIDEO INPUT LEVEL	: 1.4 Vp-p composite video signal (0.5-2 Vp-p acceptable, 75 ohm)
VIDEO OUTPUT LEVEL	: 1.4 Vp-p (75 ohm)
AUDIO BAND WIDTH	: U.S type 200 Hz (10 kHz ± 3 dB) CCIR type 100 Hz (10 kHz ± 3 dB)
AUDIO SIGNAL TO NOISE RATIO	: Better than 36 dB
LINE INPUT LEVEL	: More than 0.3 V r.m.s (more than 10 K Ohms)
MIC INPUT LEVEL	: More than -60 dB
LINE OUTPUT LEVEL	: 1 V r.m.s ± 3 dB
AUDIO DISTORTION LEVEL	: Less than 6%
WOW AND FLUTTER	: Less than 0.17% r.m.s
POWER SOURCE	: 100 V to 240 V AC 50 Hz. or 60 Hz.
POWER CONSUMPTION	: Less than 130 W
WEIGHT	: 25.5 Kg ± 0.5 Kg (with carton) (56 lbs.)
SIZE	: 478 (H) \times 417 (W) \times 264 (D) mm (19.1" \times 16.7" \times 10.6")

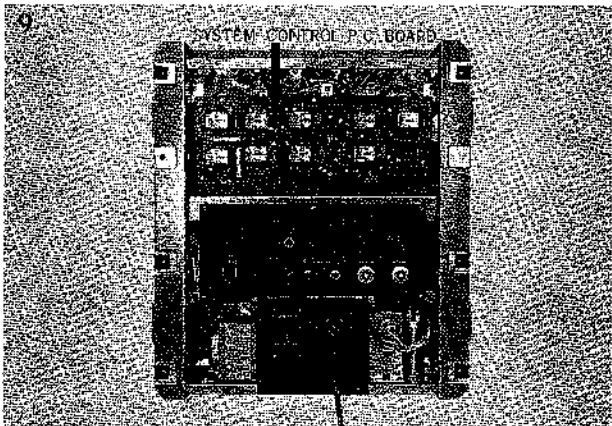
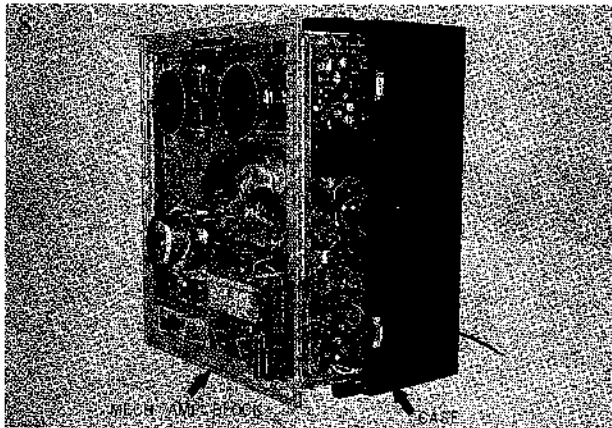
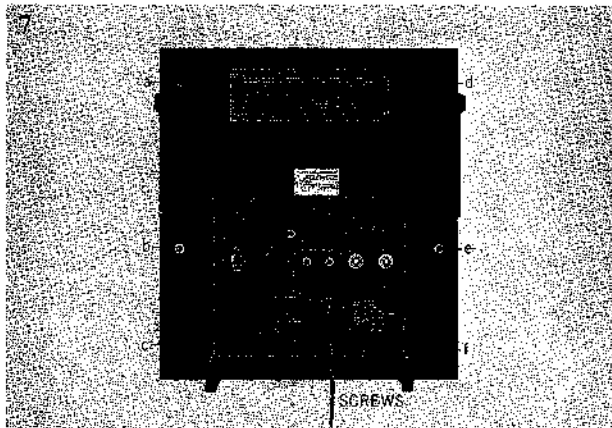
II. CONTROL LOCATIONS



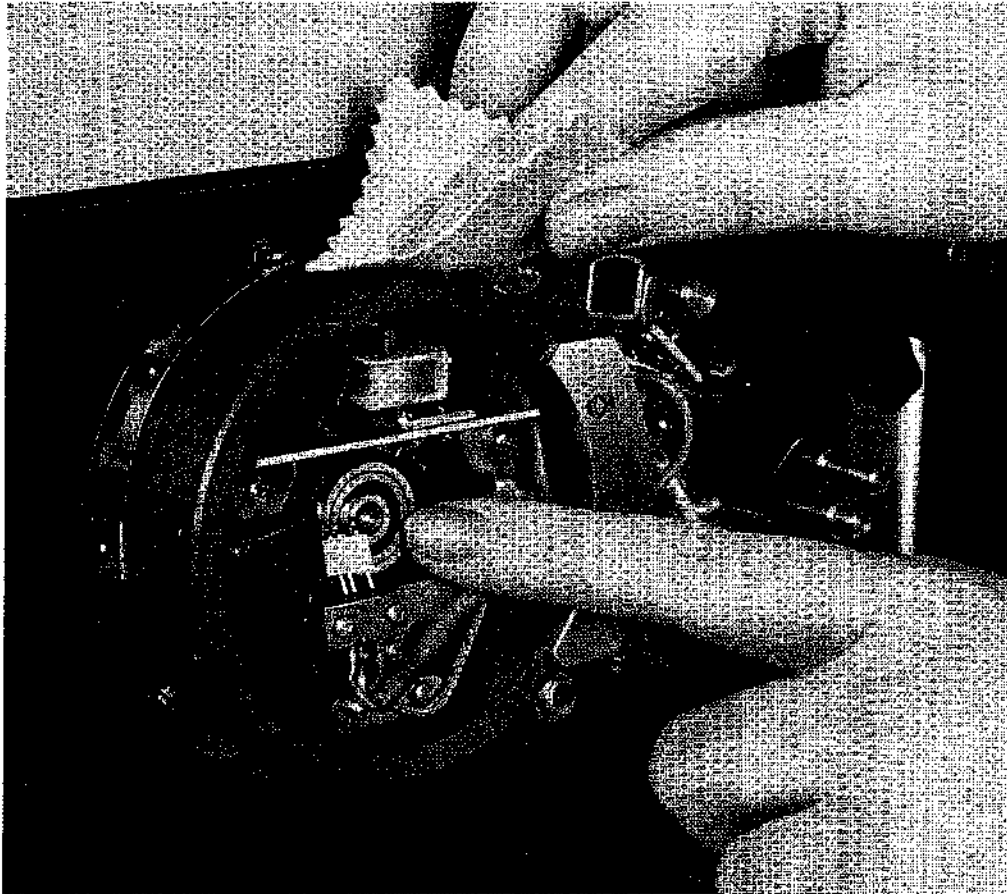
III. DISMANTLING OF TAPE TRANSPORT UNIT & AMPLIFIERS

In case of trouble, etc, necessitating disassembly, please disassemble in the order shown in photographs. Reassemble in reverse order.





IV. CLEANING THE HEADS



Sudden fading out of picture on monitor screen during playback or at the beginning of playback after the tape has been rewound due to a dirty video head is very common.

When cleaning video or other heads and tape guide, etc., please proceed as follows :

- (1) Remove Video Head Cover.
- (2) Soak a small piece of chamois with Freon Liquid or alcohol and clean the outer part of the video head drum by touching very lightly (ref. fig. 1)
- (3) With rotating motion, pass finger lightly over the slip ring part of the video head center, so that the surface of the chamois passes over the video head tip.
- (4) Clean the entire surface of the video head drum and the upper part of the drum guide band with chamois.
- (5) Clean surfaces of full track erase head, side track erase head, and control and audio heads.
- (6) If oxide deposits, etc. are adhering to tape guide, clean tape guide.

V. ADJUSTMENT OF VIDEO HEAD ASSEMBLY

1. CALIBRATION OF THE MICROSCOPES

- (a) As shown in Fig. 1, to adjust the position of the microscopes, with the prop positioned in the center of the microscopes, align the center line of the microscopes (microscopes attached to fixture plate) (A and A') with the mark on the fixture (ref. Fig. 2).

Confirm that when the fixture is rotated 180°, the mark is within 10 μ from the center line.

- (b) Adjust microscopes (B and B') so that the edge of the fixture overlaps the center lines by 50 μ .

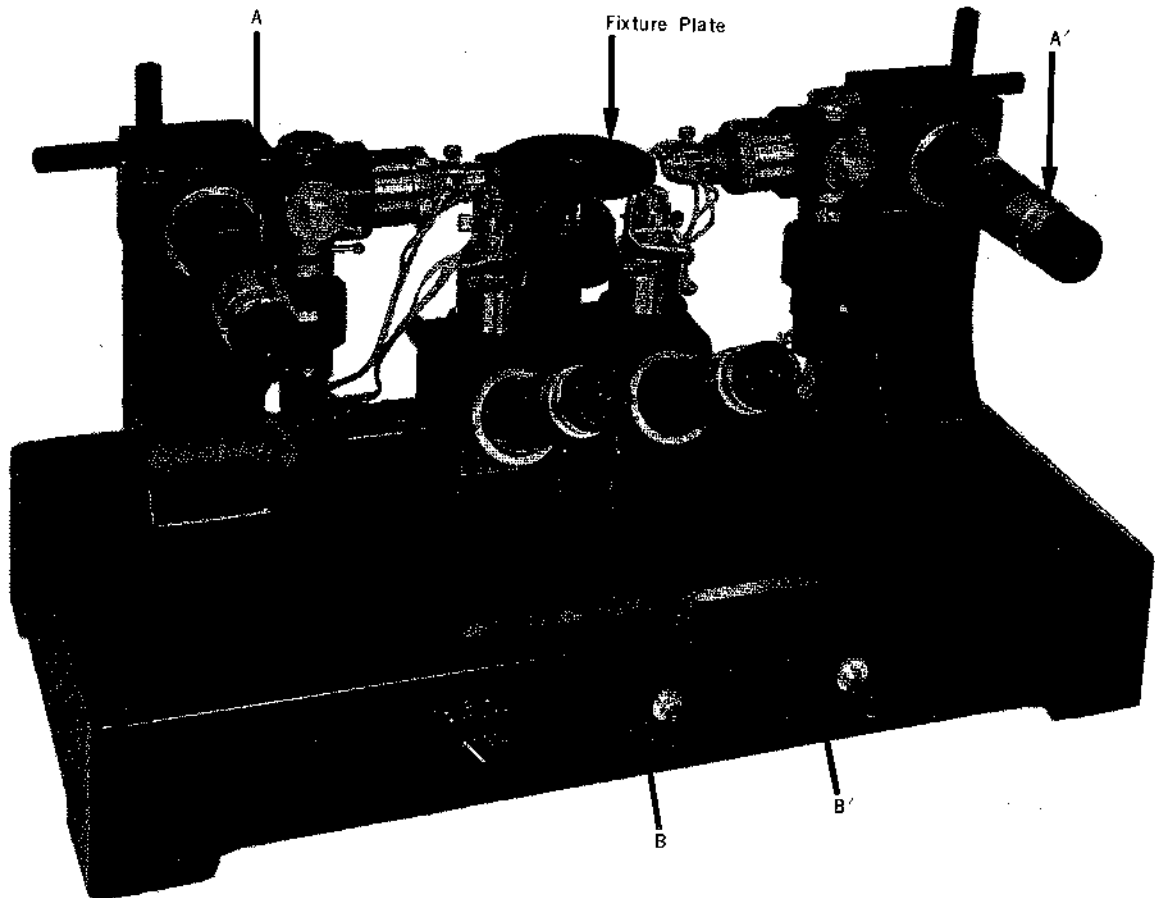


Fig. 1

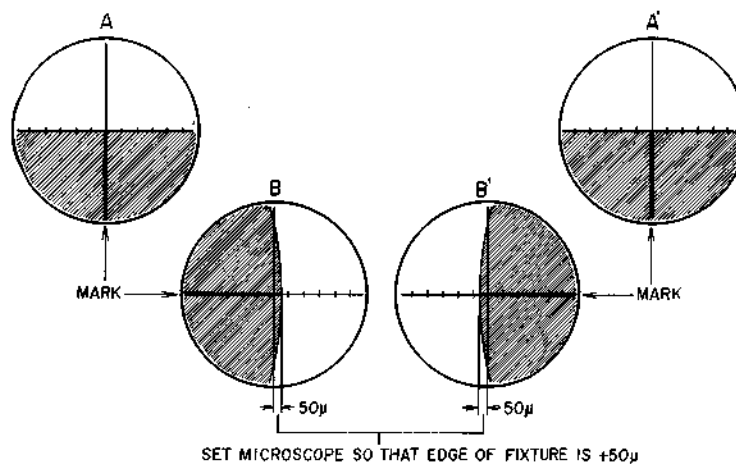


Fig. 2 Microscopic Views of Fixture

2. 180° SPACING AND PROTRUSION OF VIDEO HEAD TIPS

- (a) Screw down the head plate at the center part of the microscope, positioning the brass plate so that it is located on the forward side of the head plate as shown in Figs. 3, 4, and 5.
- (b) Adjust the protrusion of the head tips so that they are aligned with the center line of microscopes (B) and (B') as shown in Fig. 4.
- (c) In case the left hand head gap comes above the

center line of microscope (A), adjust by bringing the right hand head gap $236 \mu (\pm 10 \mu)$ to the left of the microscope's center line.

- (d) Rotate the head plate 180°. When the position of the left and right head tips are reversed, verify that the position of the right hand head gap is $236 \mu (\pm 10 \mu)$ away from the microscope's center line.

Note: In case the position of the head gap is further away from this position (236μ), this means there is a discrepancy in the calibration of the microscope.

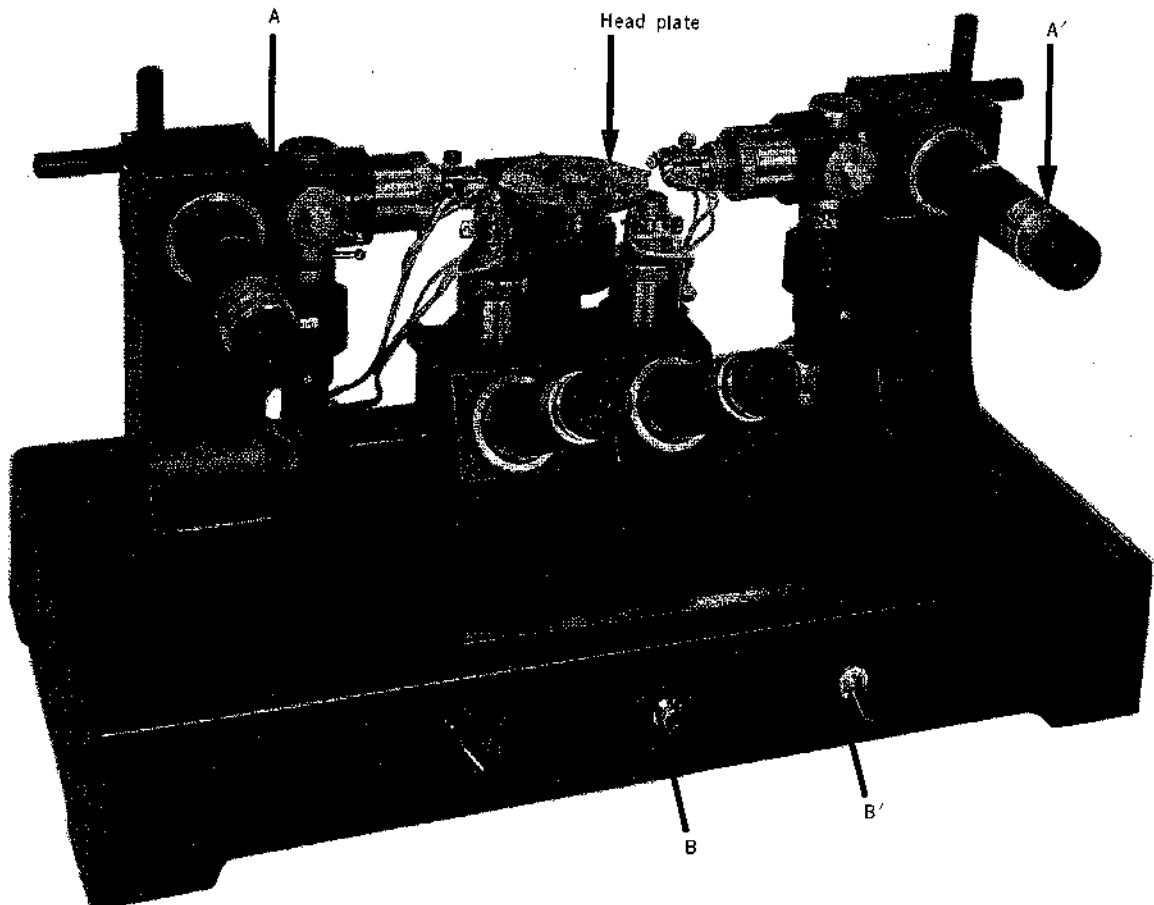


Fig. 3

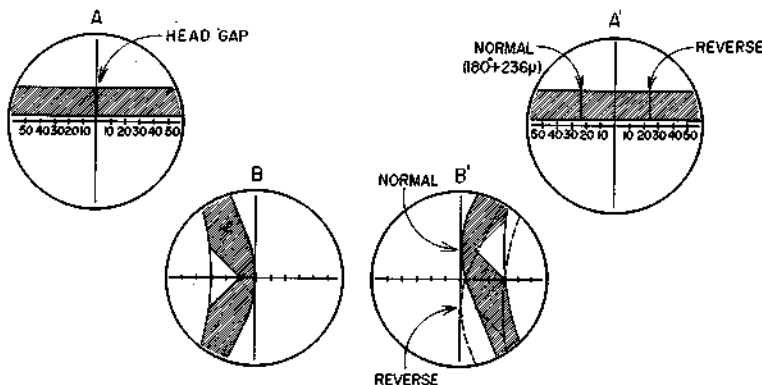


Fig. 4 Microscopic Views of Head Tip

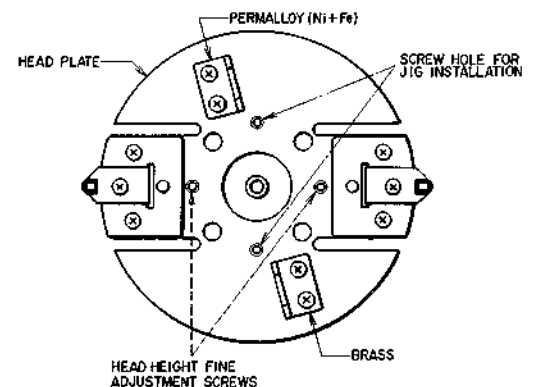


Fig. 5 Video Head Plate

3. DEGREE OF ROUNDNESS OF VIDEO HEAD'S LOWER DRUM (Ref. Fig. 6)

- (a) A 0.002 Dial Gauge is used to check the lower drum's degree of roundness.
- (b) The limited tolerance of roundness of the lower drum's outside circumference is within 5μ .
- (c) In case the variation of the outside circumference exceeds 5μ , loosen the 4 lower drum holding screws and correct the discrepancy.

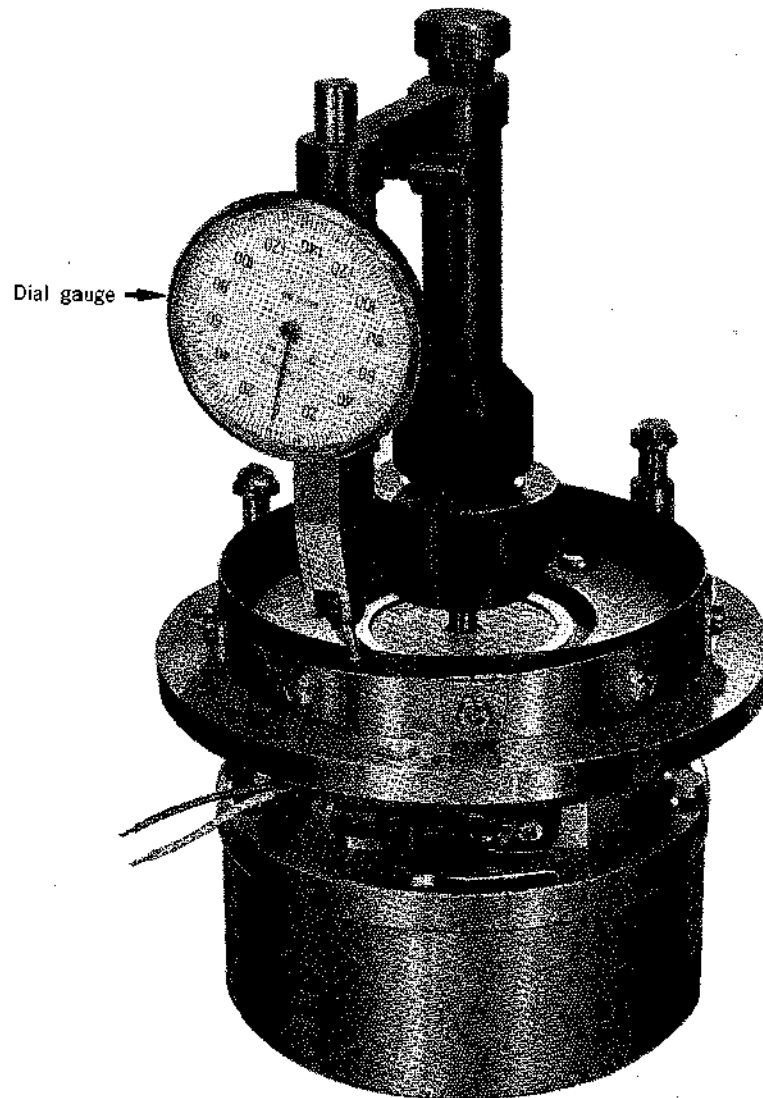


Fig. 6 Check the lower drum's degree of roundness

4. VIDEO HEAD HEIGHT ADJUSTMENT

Video Head Height Adjustment can be made using either a Single Microscope or Double Microscope.

A. Single Microscope Method

(a) Fit the head height adjustment jig to the head plate (made for angle and protrusion adjustments). As per Fig. 7 and 8, fit head plate to upper part of head motor (Screw (b) of height adjustment jig should be at lowest position).

(b) Loosen screw (b) of height adjustment jig slightly and lower position of head plate slightly. With height adjustment microscope, observe the spacing between the lower end of the head tip and the upper end of the lower drum.

Caution : If the position of the head plate is too low, the head tip will come in contact with the lower drum and become irreparably damaged.

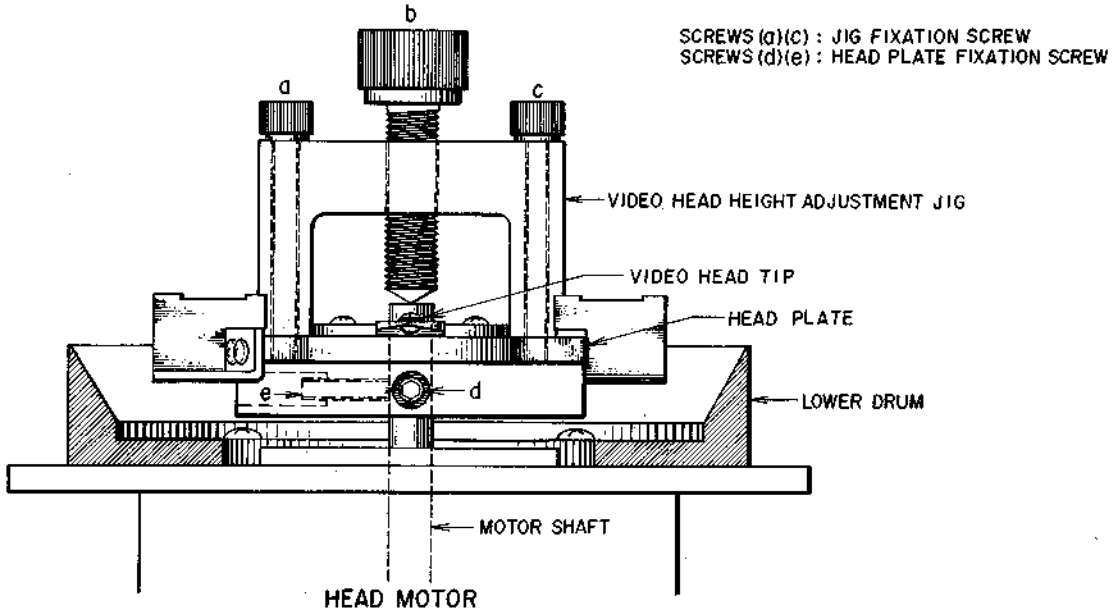


Fig. 7 Video Head Height Adjustment

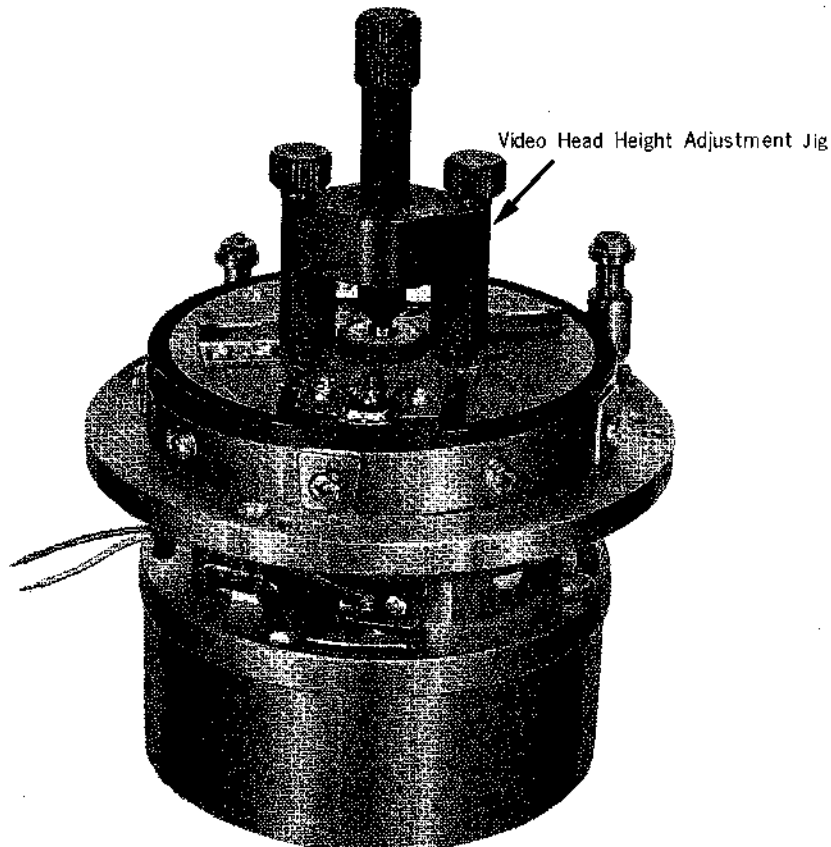


Fig. 8

(c) At the point where the lower end of the head tip is positioned at $430\ \mu$ from the top of the lower drum, tighten the two hexagonal screws on the lower part of the head plate (under brass pick-up plate and to right of this position). After the hexagonal screws have been tightened and the head plate secured to motor shaft, remove the height adjustment jig.

(d) Regulate each of the head tip height fine adjustment screws so that the head tip height is within a range of from $450\ \mu$ to $460\ \mu$ from the upper end of the lower drum. (Ref. Figs. 9 and 10).

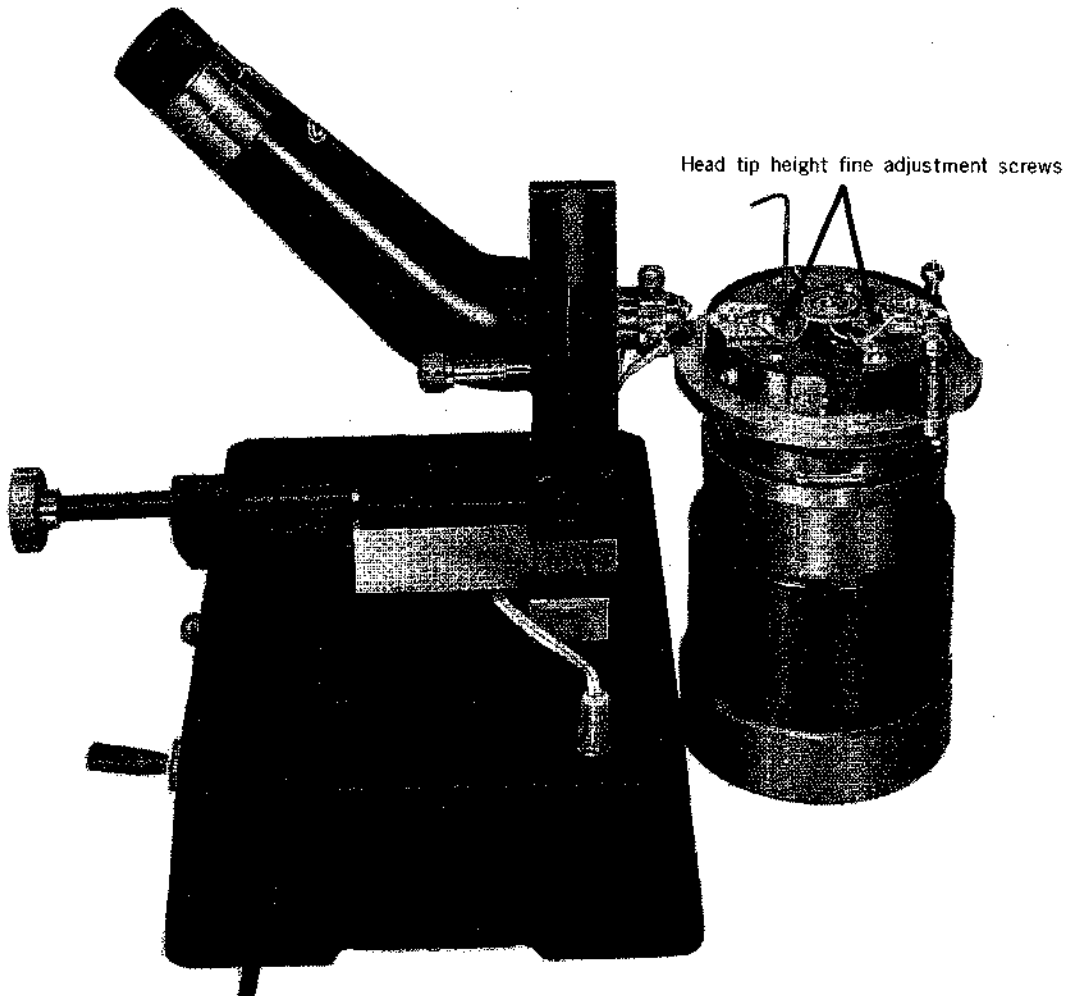


Fig. 9 Head Height Adjustment

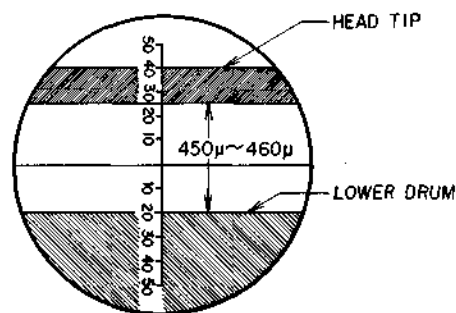


Fig. 10 Microscopic View of Head Height

B. Double Microscope Method

- (a) Use a Master Gauge as shown in Fig. 11 and adjust Knob "C" so that the edge of the Master Gauge can be seen above the center lines of both microscopes A and B.
- (b) Next, remove Master Gauge and set Video Head Assembly.
- (c) With Knob "C", adjust microscope height so that the motor flange edge can be seen above the center line of microscope A as shown in Fig. 12.
- (d) Fit the Head Height Adjustment Jig to the head

plate and fix the head plate to motor shaft at position at which the lower end of the head tip is $10\ \mu$ to $20\ \mu$ below the center line of microscope B (Refer to Fig. 7).

- (e) After head plate has been fixed at proper position, remove Head Height Adjustment Jig.
- (f) Adjust each of the various Head Tip Height Fine Adjustment Screws until the lower end of head tip can be seen above the center line of Microscope B as shown in Fig. 12.

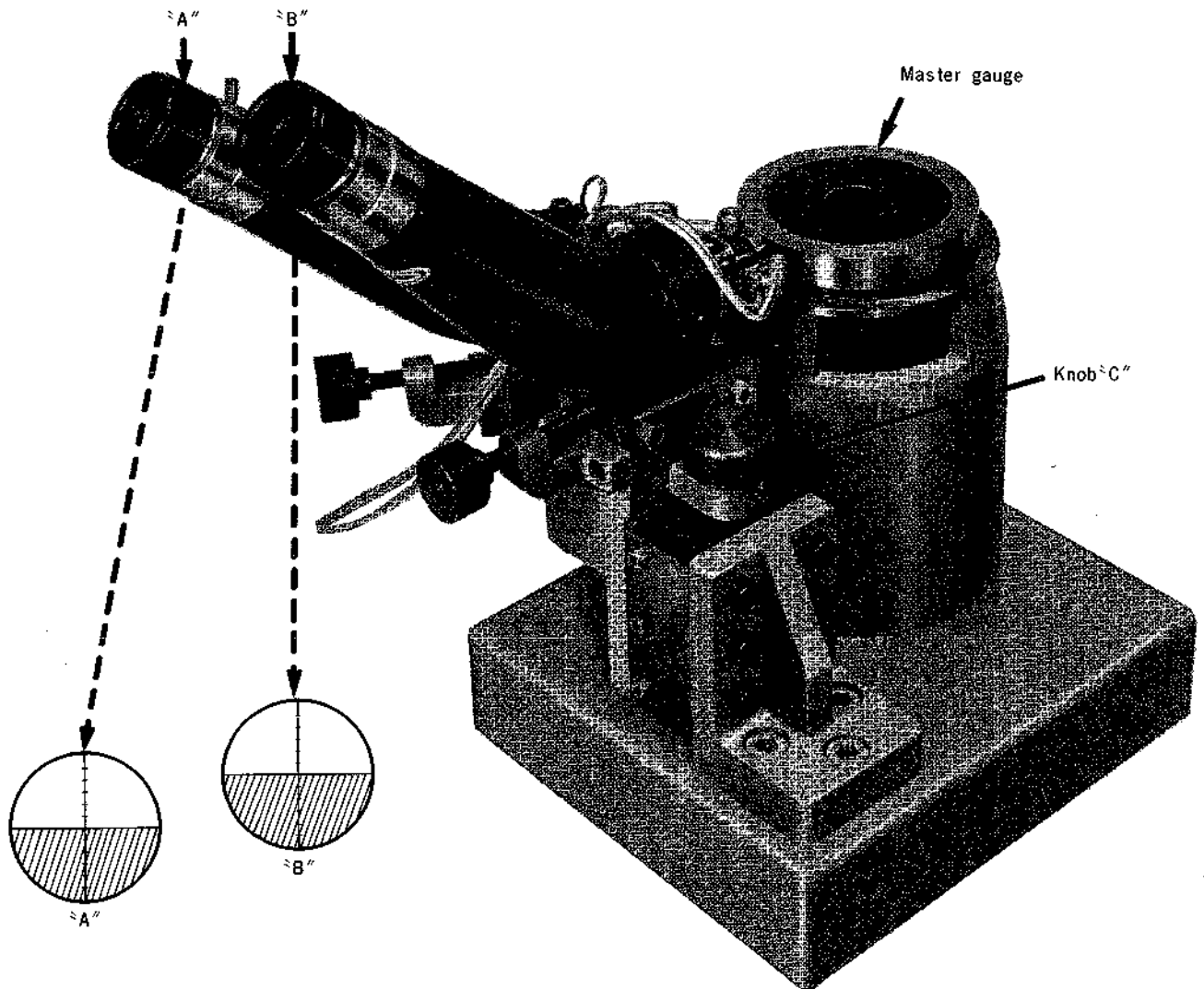


Fig. 11 Microscopic Views of Master Gauge

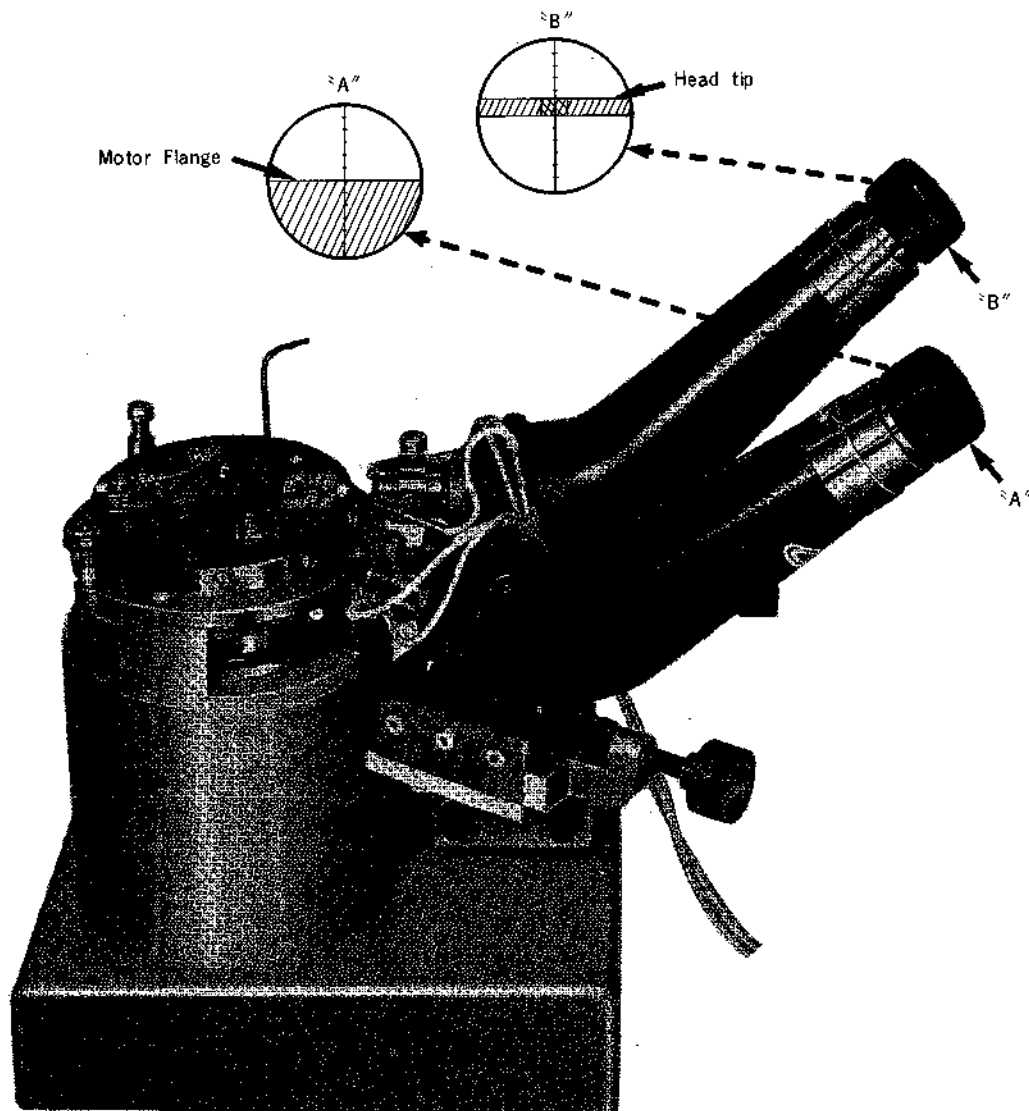


Fig. 12 Microscopic Views of Head Height

5. UPPER DRUM PROTRUSION

(a) After completion of head tip height adjustment, fit Dial Gauge (0.002 mm scale) to motor shaft in the upper drum and check the protrusion of the upper drum (Refer to Fig. 13).

(b) The necessary protrusion is from 0 to $10\ \mu$ at the center part of the upper drum.

(c) In case the protrusion is not within the necessary range, insert a spacer between the drum and drum support and adjust.

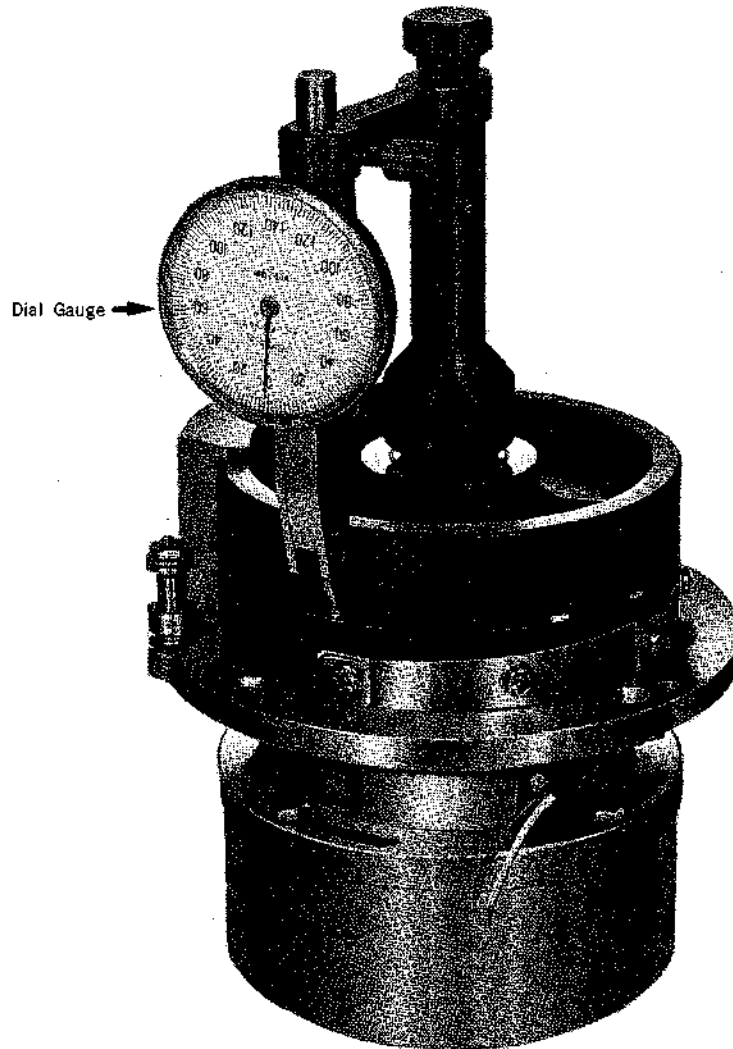


Fig. 13 Upper Drum Protrusion

6. WIRING ON SLIP RING

- (a) Be careful that the slip ring is positioned so that it does not slide around as the shaft rotates.
- (b) The color of the wire closest to the brass pick-up plate is yellow (wire on opposite side is red). (Refer to Fig. 14).

7. BRUSH TENSION ADJUSTMENT

- (a) Adjust brush tension by tightening tension adjustment screw (from place where brushes touch surface of slip ring) about 1/4 turn. (Refer to Fig. 15).

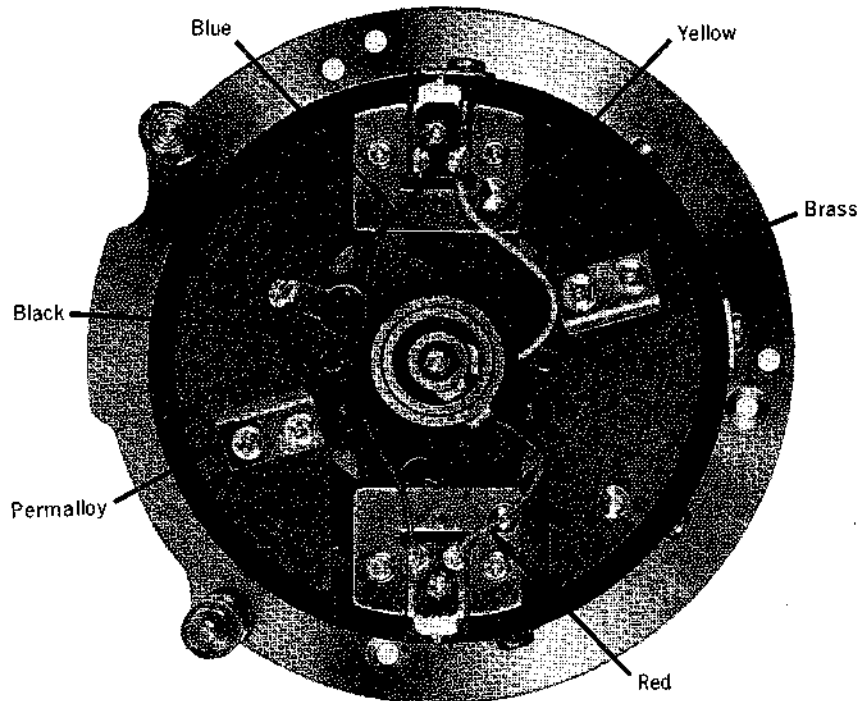


Fig. 14

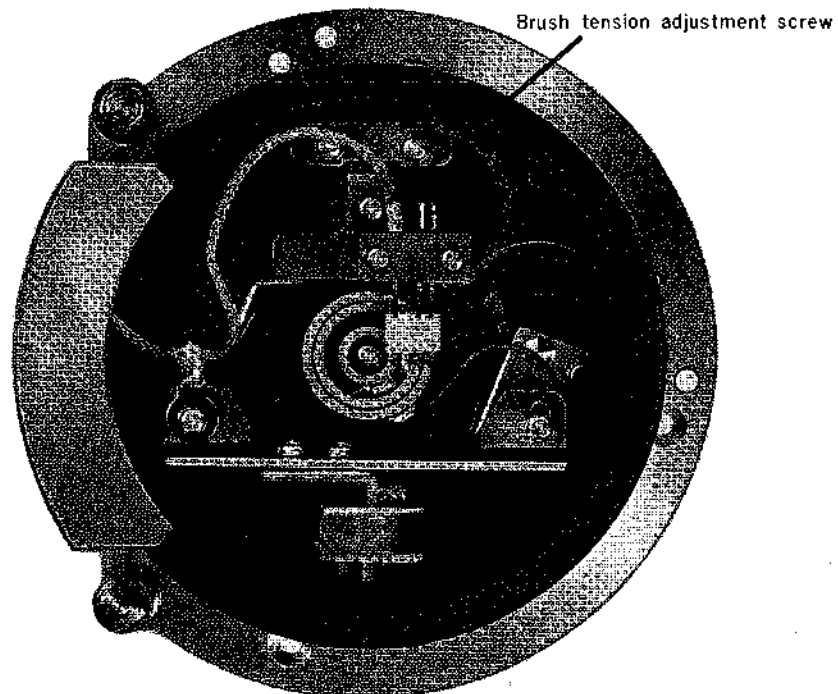


Fig. 15

VI. ADJUSTMENT OF TAPE TRANSPORT MECHANISM

1. PINCH ROLLER PRESSURE ADJUSTMENT

- (a) Loosen solenoid Holder bracket screw and position solenoid toward the arrow mark direction in Fig. 1 and fix at this position.
- (b) Adjust position of Plunger Stopper so that the gap between Pinch Roller and Capstan is 1.5 to 2.0 mm.
- (c) As shown in Fig. 2, connect a 0 to 2,000 gr. Spring Gauge to the Pinch Roller Shaft and measure the Pinch Roller Pressure. Standard pressure when Pinch Roller Revolutions are stopped (playback mode) is 1,700 gr (± 200 gr).

- (d) Loosen Pinch Roller Spring Lock Nut. With other nut (adjusting nut, fig. 1), adjust pinch roller pressure. After adjustment has been made, tighten Lock Nut.

Caution : After completing adjustment, load a 5" reel tape and confirm that the beginning of the tape winding (take-up) is smooth.

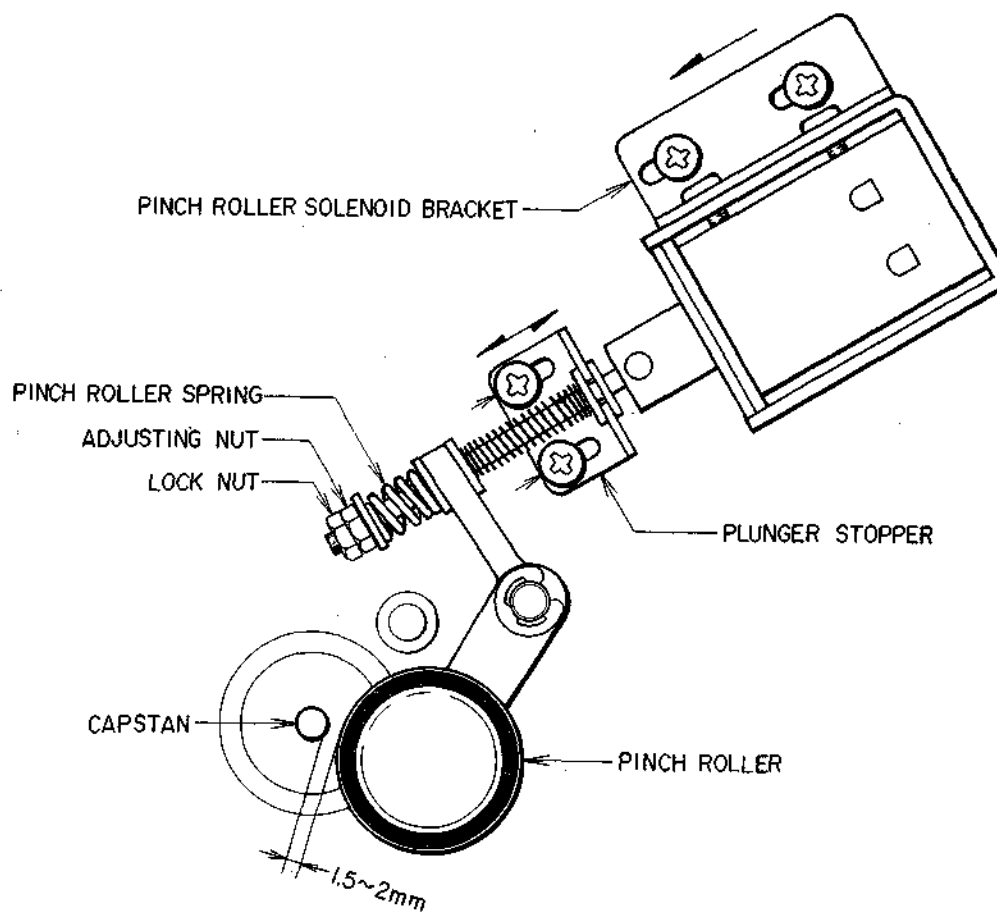


Fig. 1

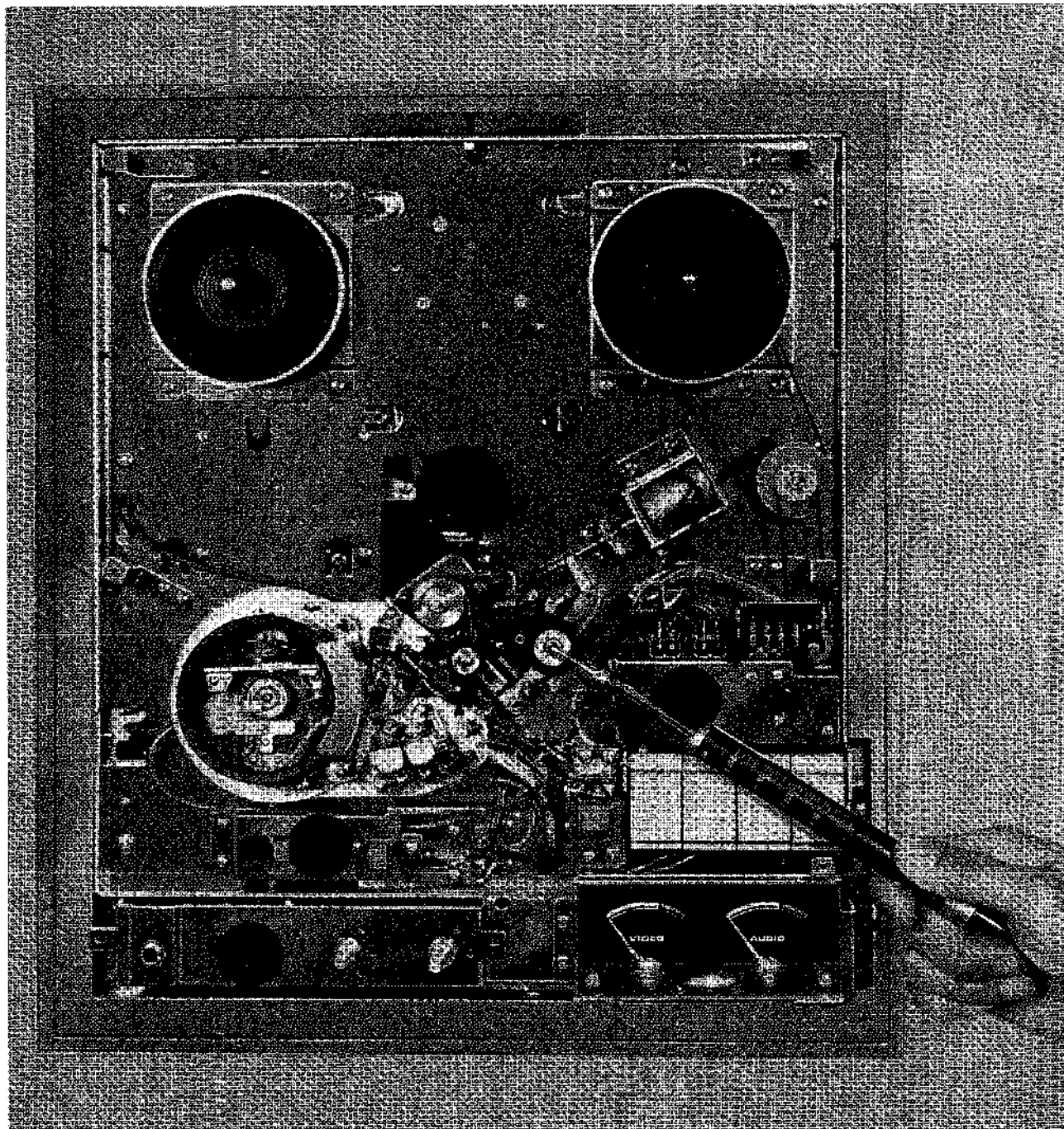


Fig. 2

2. BRAKE TENSION ADJUSTMENT

- (a) As shown in Fig. 3 a, b, connect a 0 to 500 gram Spring Gauge to a 60 mm diameter tape and measure Brake Tension (Stop Mode). Standard tension is 170 gr (± 30 gr).
- (b) Brake Tension Adjustment can be made by loosening the holding screws on Brake Brackets shown in Fig. 4 (re-positions brake bracket).

Caution: When the Brake Solenoid is energized, confirm that the felt side of the brake band separates perfectly from the outer circumference of the motor. If the brake band and motor makes contact, the Brake Bracket Adjustment is faulty.

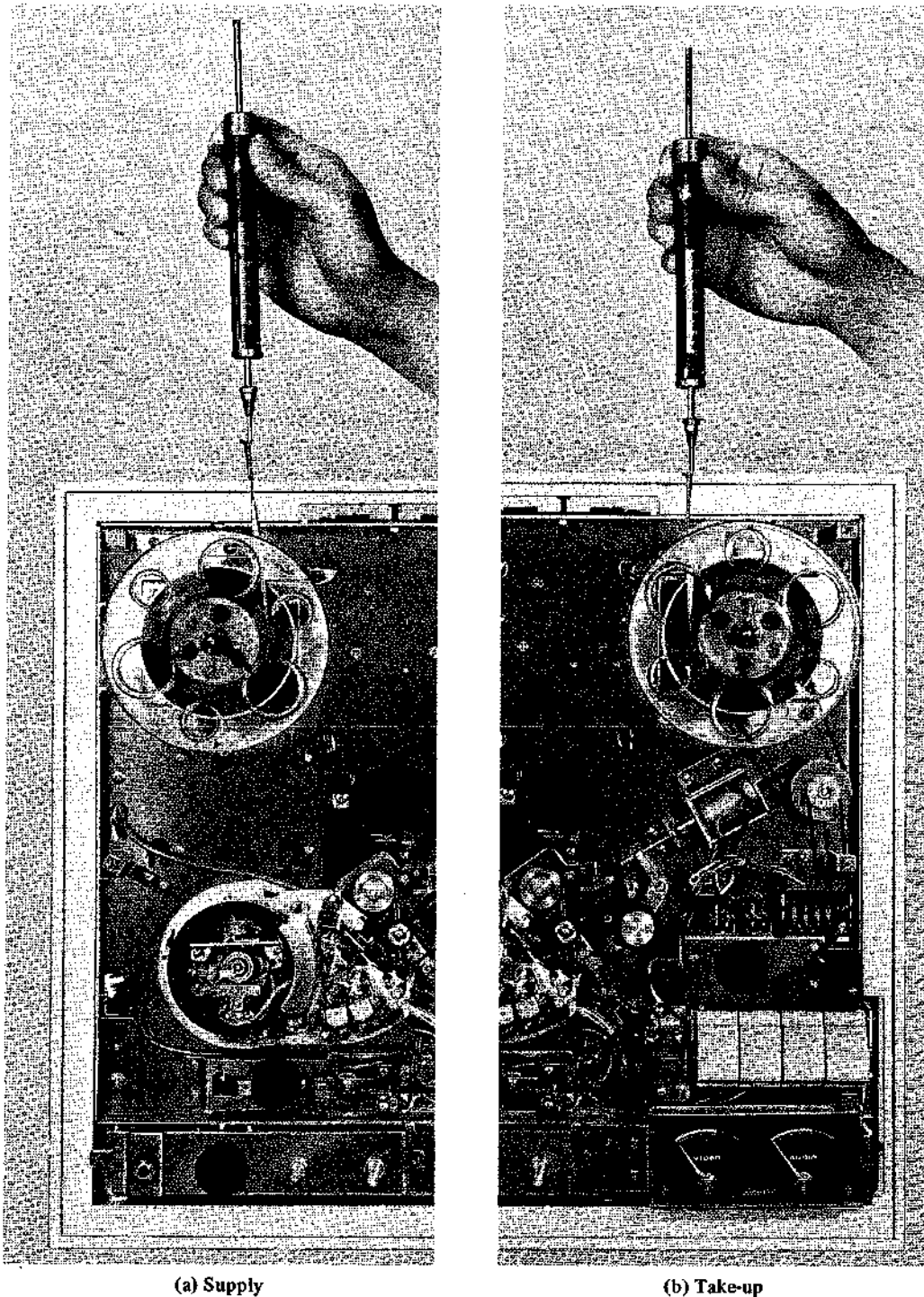


Fig. 3 Brake Tension Measurement

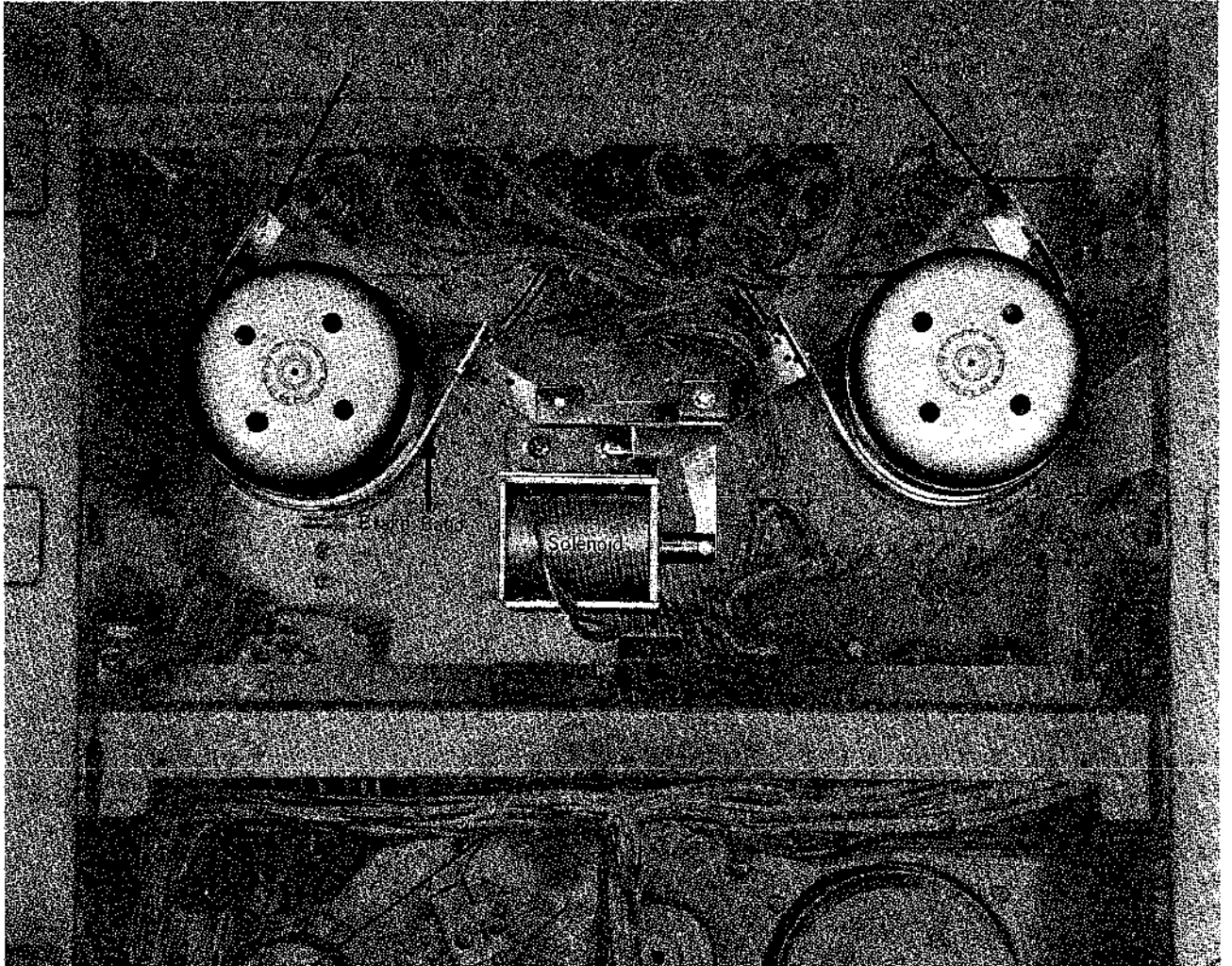


Fig. 4

3. TAKE-UP TORQUE AND TAPE HOLD BACK TENSION ADJUSTMENT

- (a) As shown in Fig. 5, connect a 0 to 300 gram Spring Gauge to a 60 mm (2.36") diameter tape and measure Take-Up Torque. (Playback Mode).
- (b) As shown in Fig. 6, connect a 0 to 50 gram Spring Gauge to a 60 mm (2.36") diameter tape and measure Tape Hold Back Tension. (Playback Mode).
- (c) When the Reel Selector is switched to and from 5,7 and 10-1/2" positions, specification of the Take-Up Torque and Hold Back Tension is shown on the following chart. Adjust each tension by re-positioning the Sliders of the two Resistors shown in Fig. 7.

Tape Hold Back Tension		Take-Up Torque
45gr. \pm 5gr. (25V \pm 1V)	Quick Tension	10" : 500gr. (Not Adjustable) 7" : 300gr. (Adjustable)
25gr. \pm 5gr. (18V \pm 1V)	10"	130gr. \pm 10gr. (42V)
12gr. \pm 2gr. (12V \pm 1V)	7"	85gr. \pm 5gr. (37V)

Caution : Tension and Voltage is indicated on chart. Adjust tension as per prescribed value.

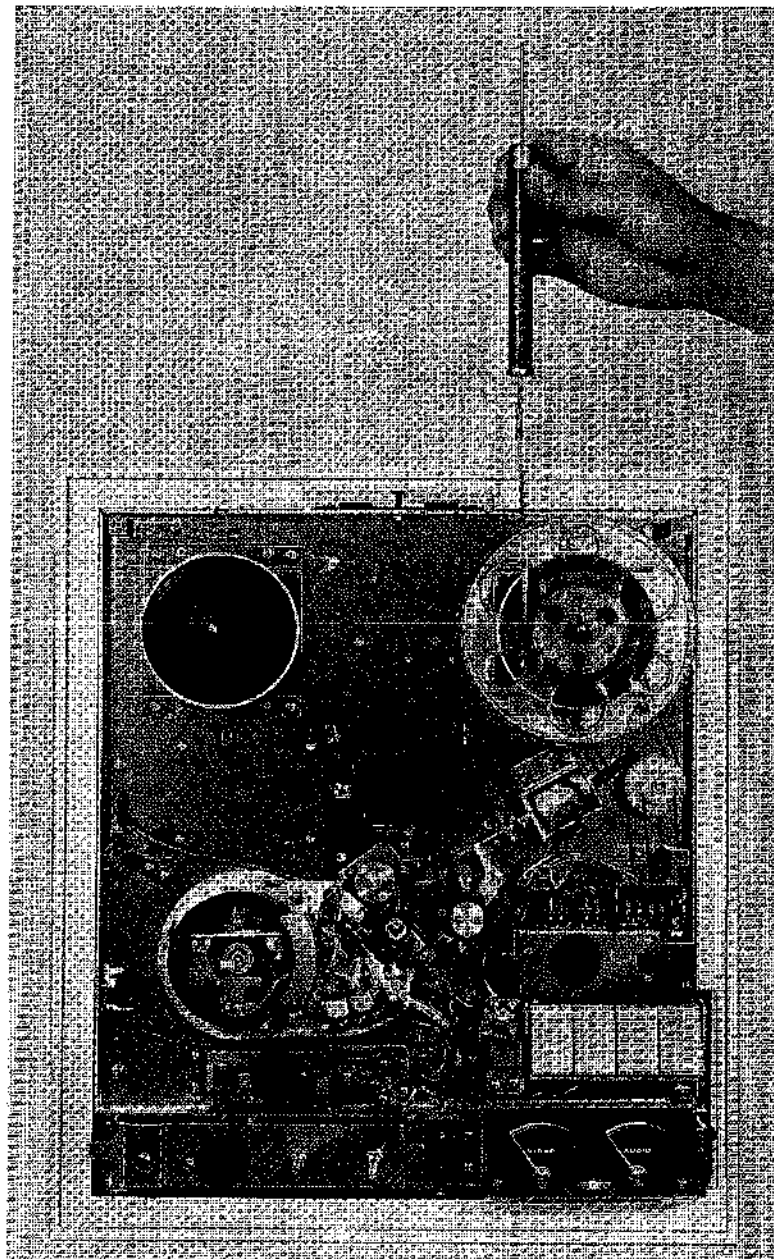


Fig. 5 Take-up Torque Measurement

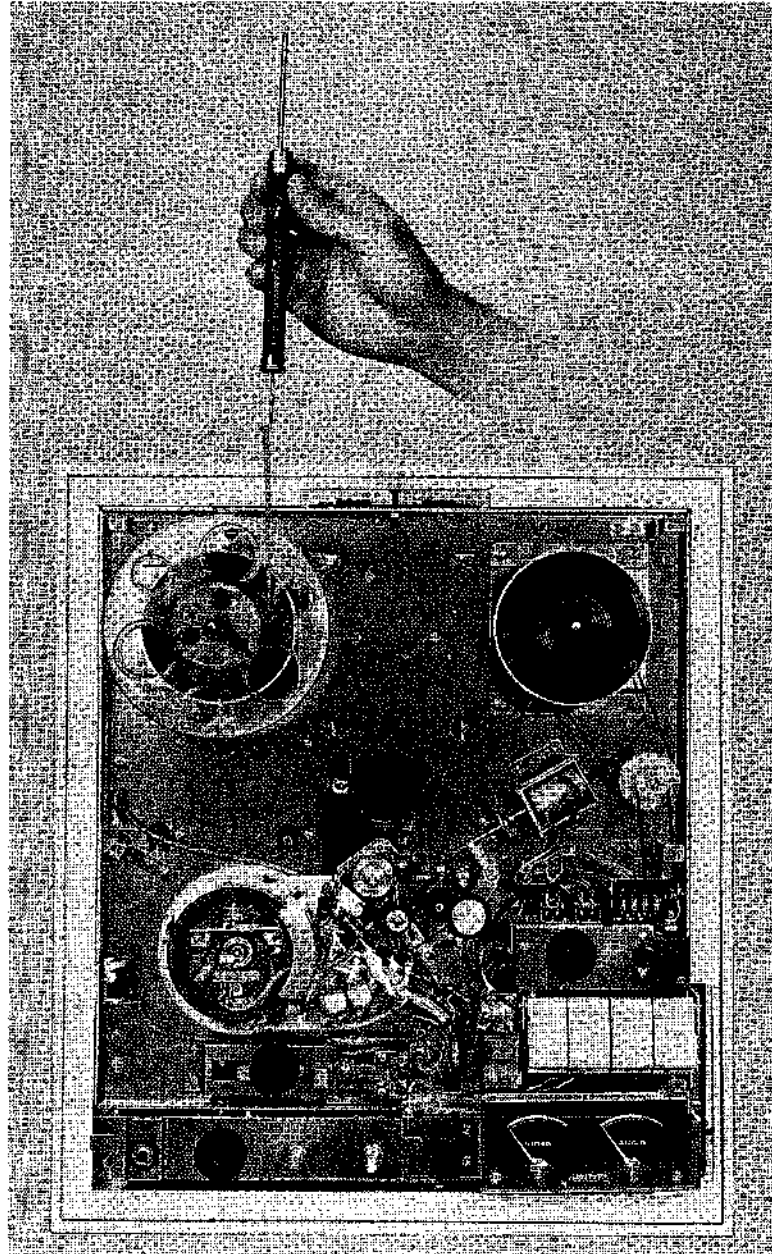


Fig. 6 Tape Hold Back Tension Measurement

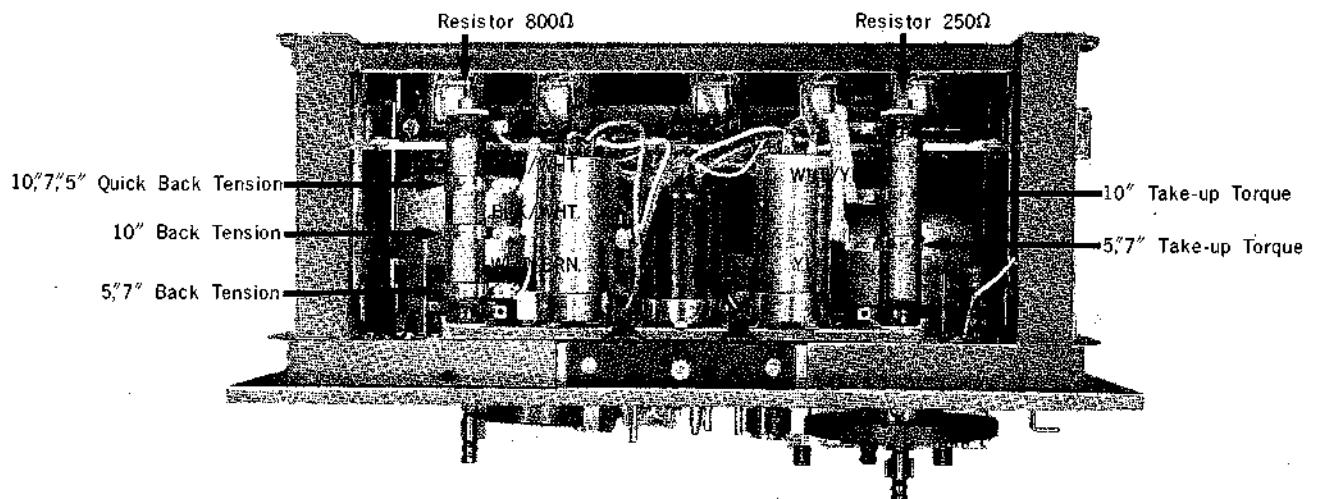


Fig. 7 Top View

4. REEL TABLE HEIGHT ADJUSTMENT

- (a) Adjust Reel Table Height so that tape is wound on center part of reel at Playback or Rewind Mode.
- (b) As shown in Fig. 8, loosen the 2 screws behind reel table and adjust height.

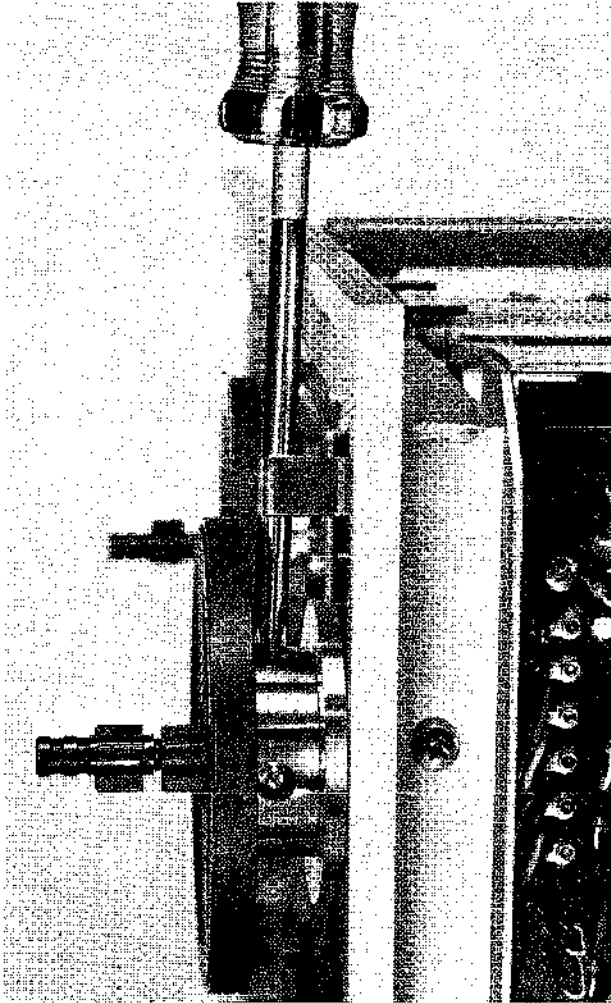


Fig. 8 Reel Table Height Adjustment

5. TENSION ARM ADJUSTMENT

- (a) As shown in Fig. 9, connect a 0 to 50 gr Spring Gauge to the Tension Arm. Measure Arm Tension at about a 45° upward position from stand-still position. Standard is 7 gr (± 2 gr).
- (b) If Tension Arm tension deviates from standard, adjust by turning (repositioning) Tension Arm Spring Hook (Fig. 9).

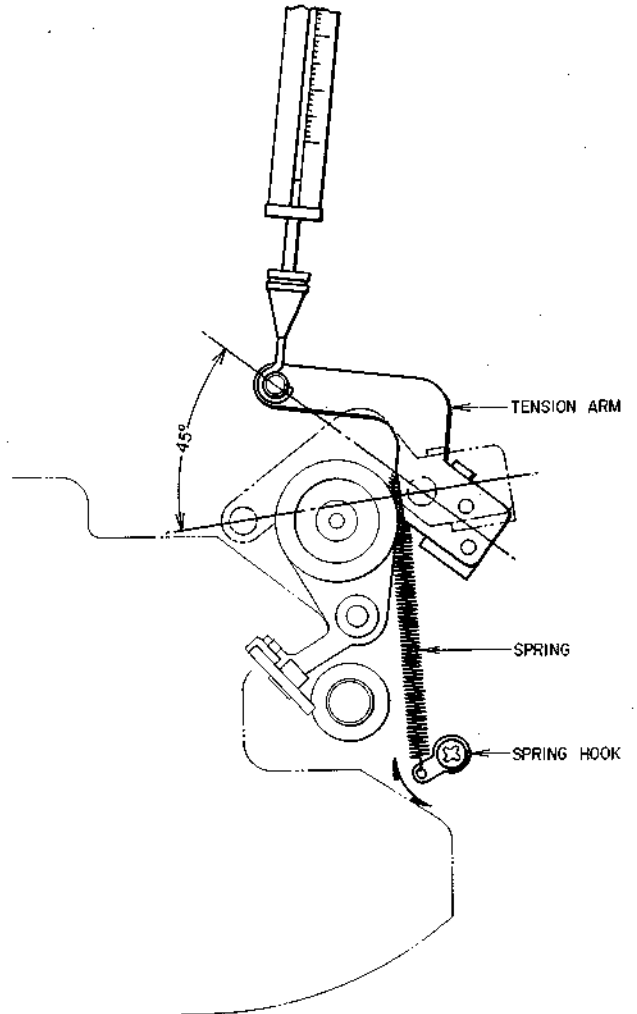


Fig. 9

6. SUB PINCH ROLLER ADJUSTMENT

- (a) At Stop Mode, set Sub Pinch Roller Plate Holding Screw so that the space between Sub Capstan and Sub Pinch Roller is 2 mm.
- (b) As shown in Fig. 10, connect a 0 to 50 gr Spring Gauge to the Sub Pinch Roller Shaft and measure the Sub Pinch Roller Pressure. Standard pressure is 30 gr (± 5 gr).
- (c) At Playback Mode, adjust pressure by changing angle of Spring Arm as shown in Fig. 10.
- (d) Sub Pinch Roller Shaft Angle Adjustment
Adjust angle of Sub Pinch Roller Shaft so that the

tape runs on the same part of Sub Pinch Roller at all operating modes (Fast Forward, Rewind, and Playback) and also, during playback mode, the tape enters the tape guide smoothly and runs in the center of the outer circumference of the Head Drum with no up and down movement.

Caution : As Sub Pinch Roller Shaft Angle Adjustment requires the services of a skilled engineer, this adjustment should not be attempted unless it is deemed absolutely necessary.

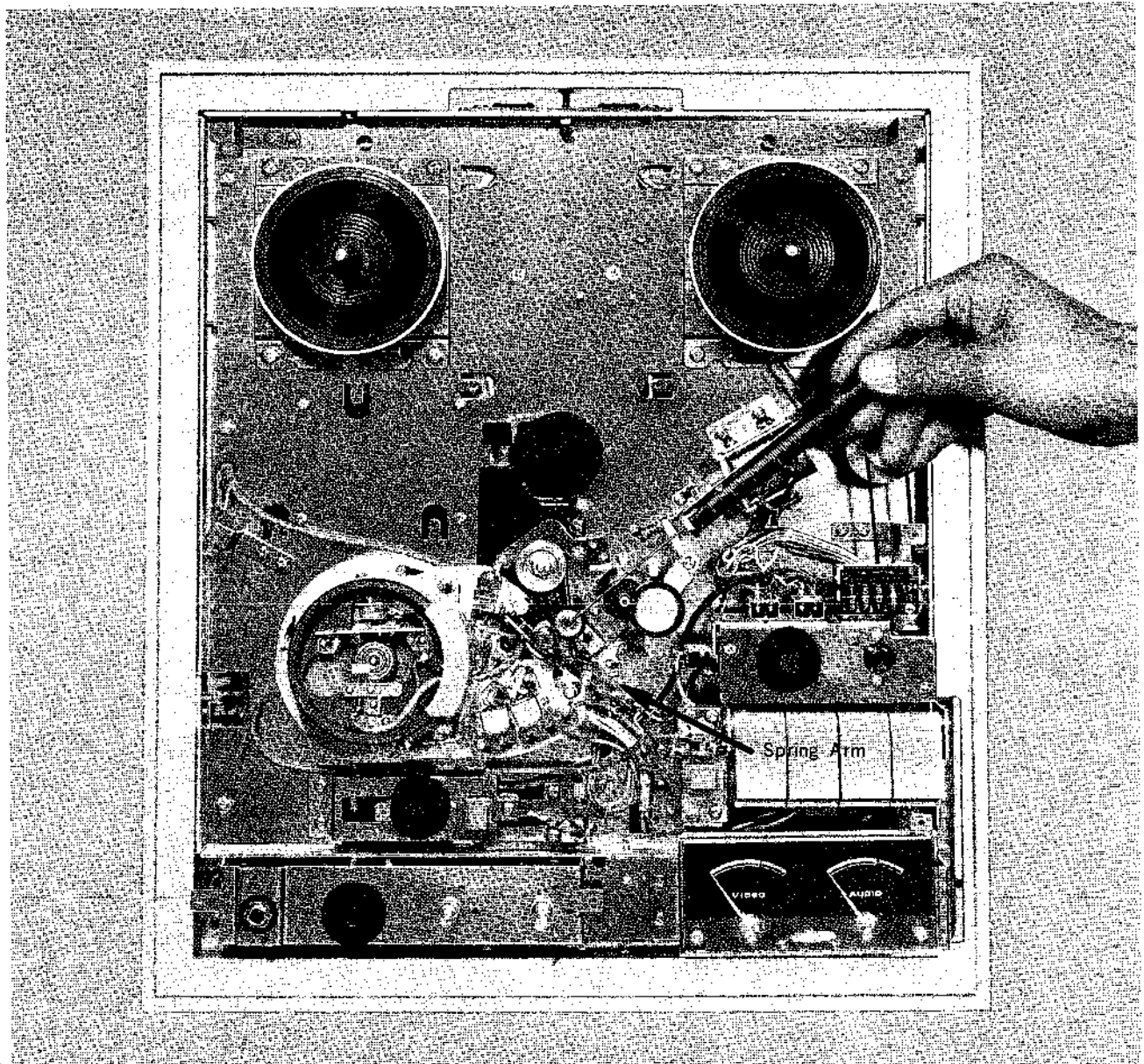


Fig. 10 Sub Pinch Roller Pressure Measurement

7. TAPE TRAVEL AND HEAD HEIGHT ADJUSTMENT

- (a) Connect an Oscilloscope to Video Amp P.C. Board TP-1.
- (b) Play back a Reference Tape and observe R.F. Envelope.
- (c) Try to maintain an almost square shaped R.F. Envelope as shown in Fig. 11 (Amplitude fluctuation should be very small).

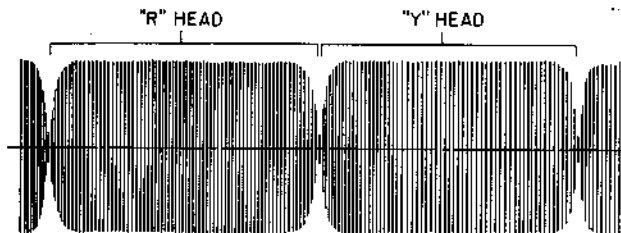


Fig. 11

- (d) If Tracking Crossover appears on RF Envelope as shown in Fig. 12, adjust height of Tape Guides 'A' and 'B' (Refer to Fig. 13).

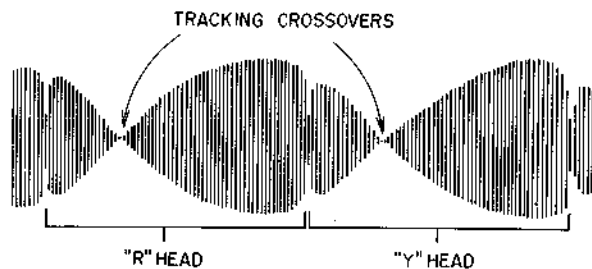


Fig. 12

- (e) Loosen Screws 'E' and 'F' and move position of CTL Head to right and left. Set at position at which

the RF Envelope Amplitude is maximum and almost square shaped.

- (f) If RF Envelope Amplitude fluctuates, the source is up and down movement of the tape from center of the outer circumference of the Head Drum during tape travel. In this case, carefully adjust the angle of Sub Pinch Roller Shaft as well as height of Tape Guides 'A' and 'B' so that the R.F. Envelope amplitude fluctuation is minimum. (R.F. Envelope amplitude fluctuation must be within 10% of peak to peak value).
- (g) If R.F. Envelope amplitude fluctuation still exists even after the above adjustments have been carefully completed, loosen Video Head Assembly Holding Screw and turn Screws 'G' and 'H' clockwise 1/2 or 1 turn (Fig. 13). At this condition, again carry out adjustment described in Item (f) above.
- (h) If leading edges of R.F. Envelope are not square, adjust height of Tape Guide 'B' as well as the slant of Side Track Erase Head and CTL Head.
- (i) For proper Head Height (Side Track Erase Head, as well as CTL and Audio Head), adjust to position as shown in Fig. 15.)

Caution: To properly judge each head height, the recorded tape must be dipped in developing solution, developed, and observed with a microscope. However, head height can also be judged by visually checking the position of each head while repeating recording/playback and observing R.F. Envelope.

- (j) Record and play back a Test Pattern Signal and observe R.F. Envelope. Confirm that amplitude is stable and does not fluctuate.

R.F. Envelope amplitude must exceed 0.6 Vp-p at recording/playback, and amplitude difference of the 2 heads should be less than 3 dB.

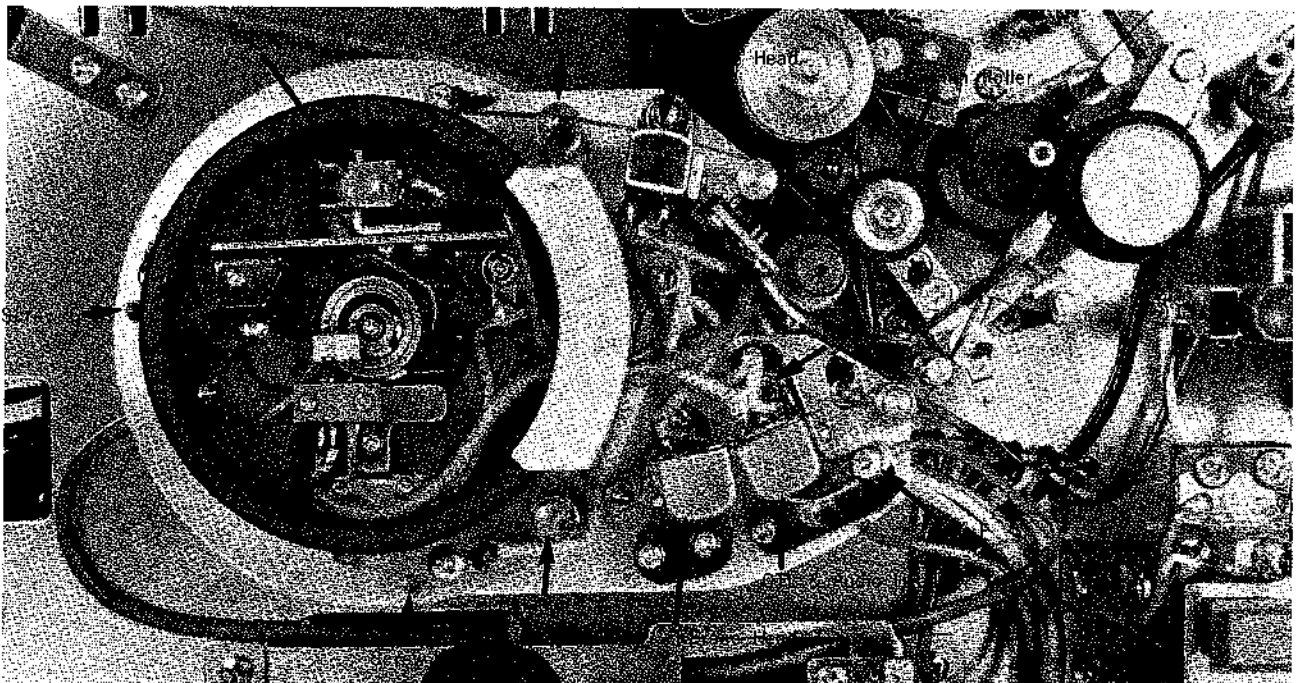


Fig. 13

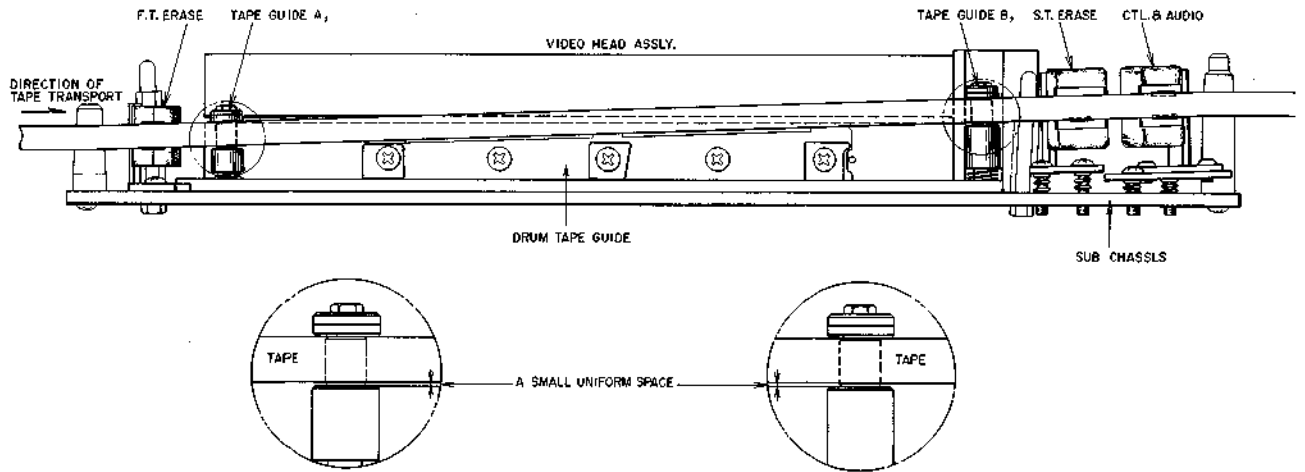


Fig. 14 Adjustment of Tape Guide

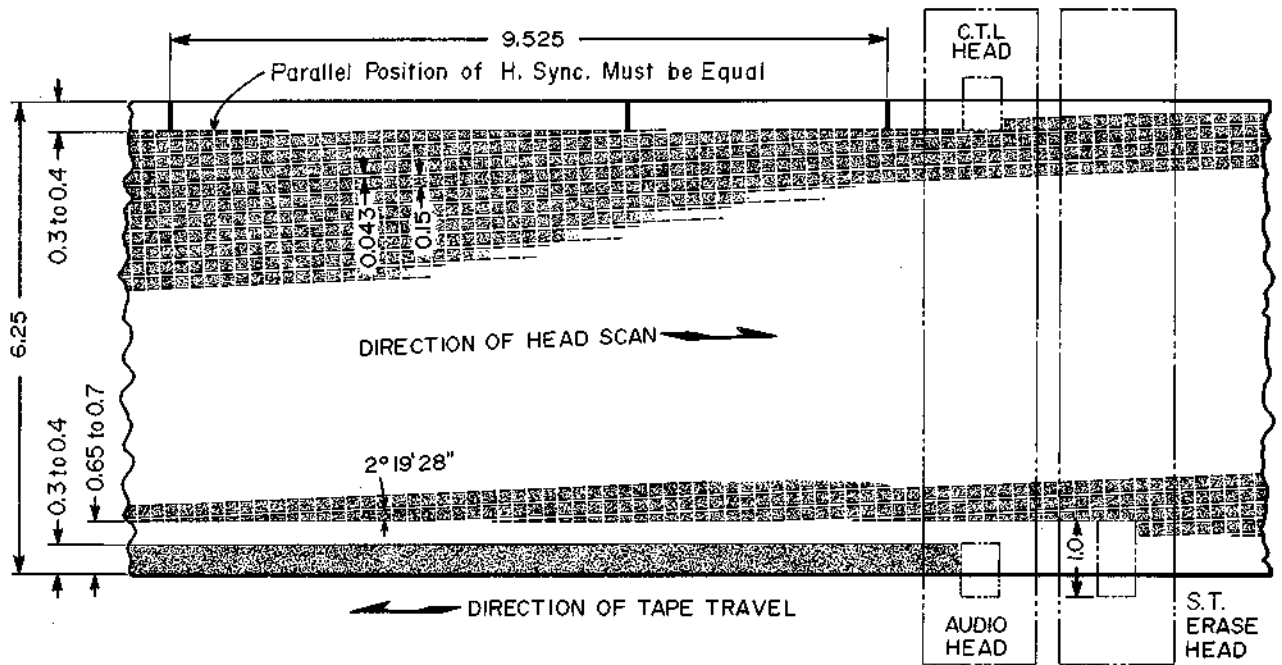


Fig. 15 Recorded Pattern of Video Tape (Viewed From Center of Head Drum)

VII. POWER SUPPLY AND CAPSTAN MOTOR DRIVE CIRCUIT

1. POWER SUPPLY P.C. BOARD VC-5002

- (a) As shown in Fig. 1, connect a D.C. Voltmeter between point "P" of Power Supply P.C. Board and Chassis.
- (b) Adjust VR-101 (1 k Ω) so that the Voltmeter indicates 12 V (± 0.2 V)

2. CAPSTAN DRIVE MOTOR P.C. BOARD VC-2045 TAPE SPEED ADJUSTMENT

- (a) Connect a Frequency Counter to the Audio Line Out Terminal.
- (b) Playback a 1,000 Hz Speed Test Tape.
- (c) Adjust VR-201 so that the Frequency Counter indication is within the range of 993 to 1,007 Hz at the beginning and the end of tape. (Refer to Fig. 1).

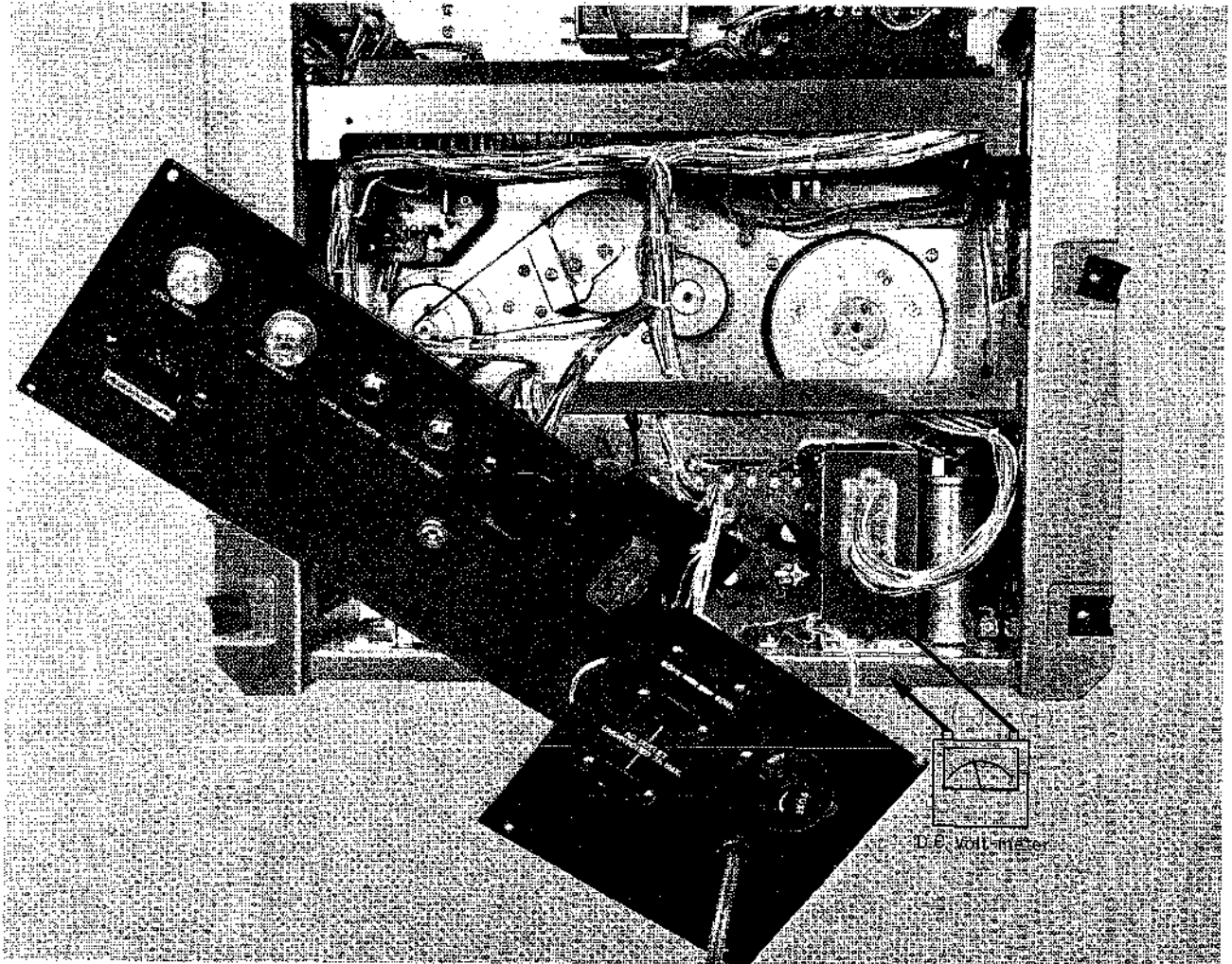


Fig. 1

VIII. SERVO (HEAD MOTOR SERVO CIRCUIT) VC-5013

The waveforms of various parts of the Head Motor Servo Circuit are shown in Fig. 2 and Fig. 3 and are also

indicated in the Schematic Diagram as mark (A) through (J), and (a) through (k).

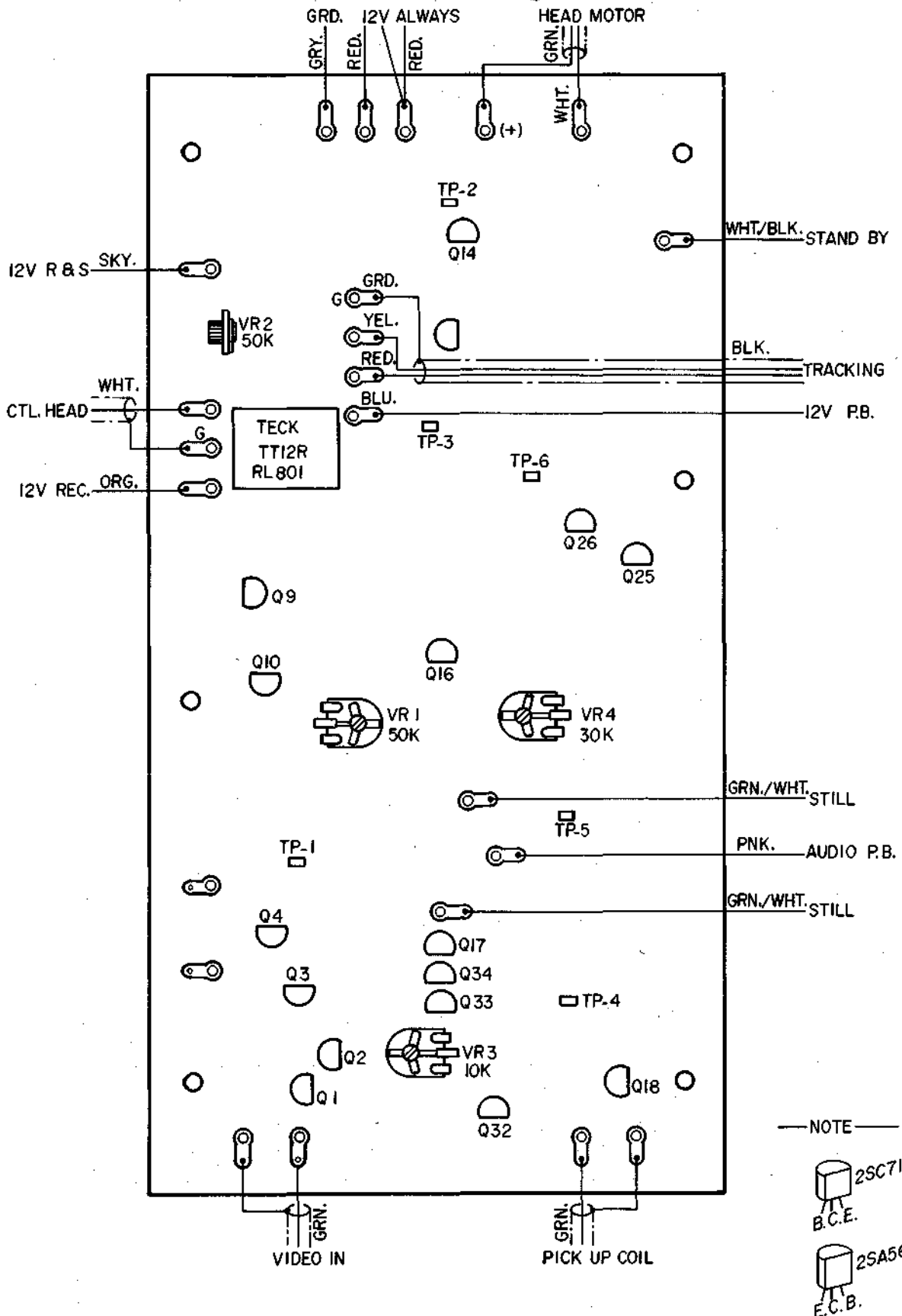


Fig. 1 Servo P.C. Board VC-5013

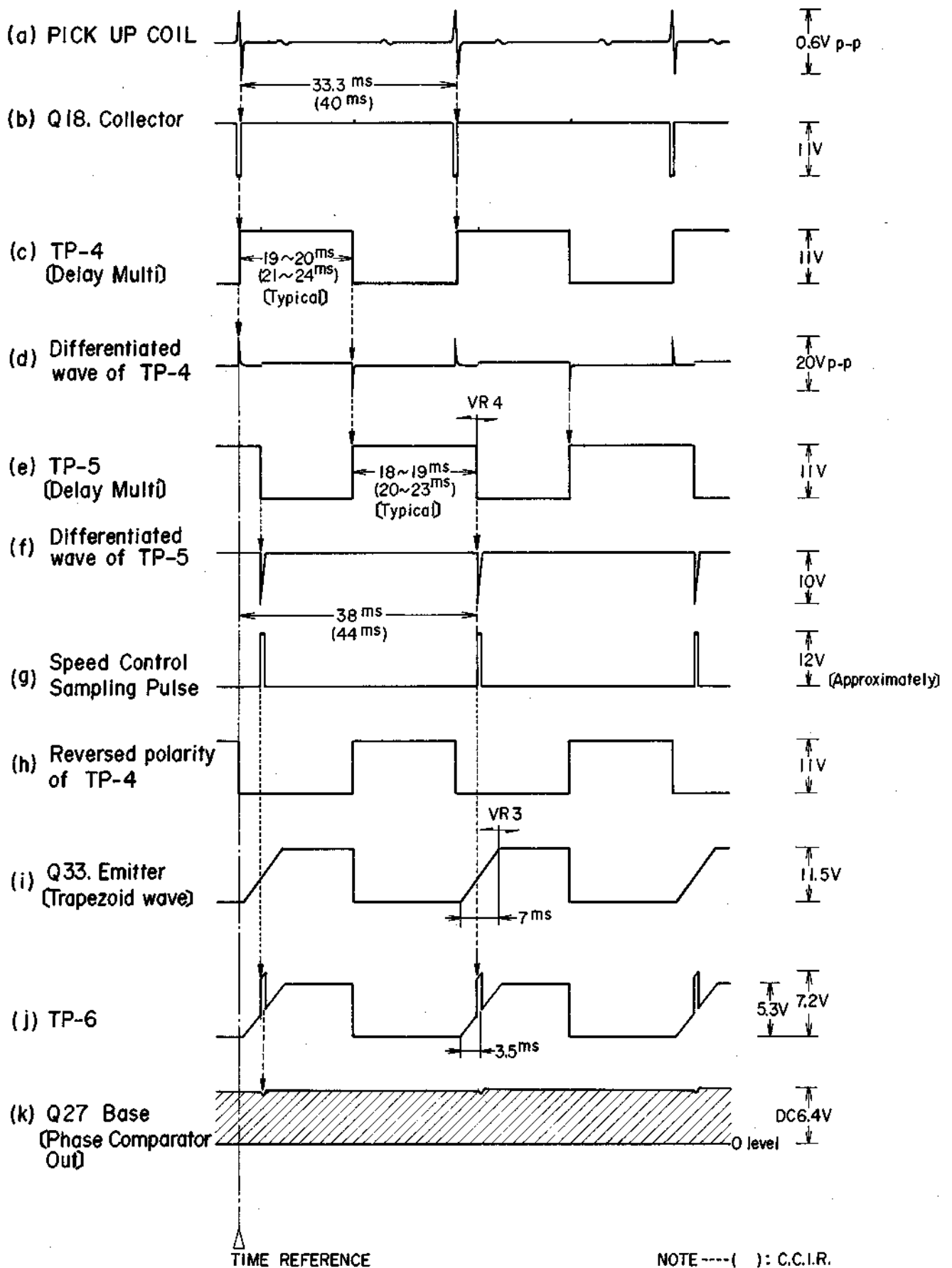


Fig. 2

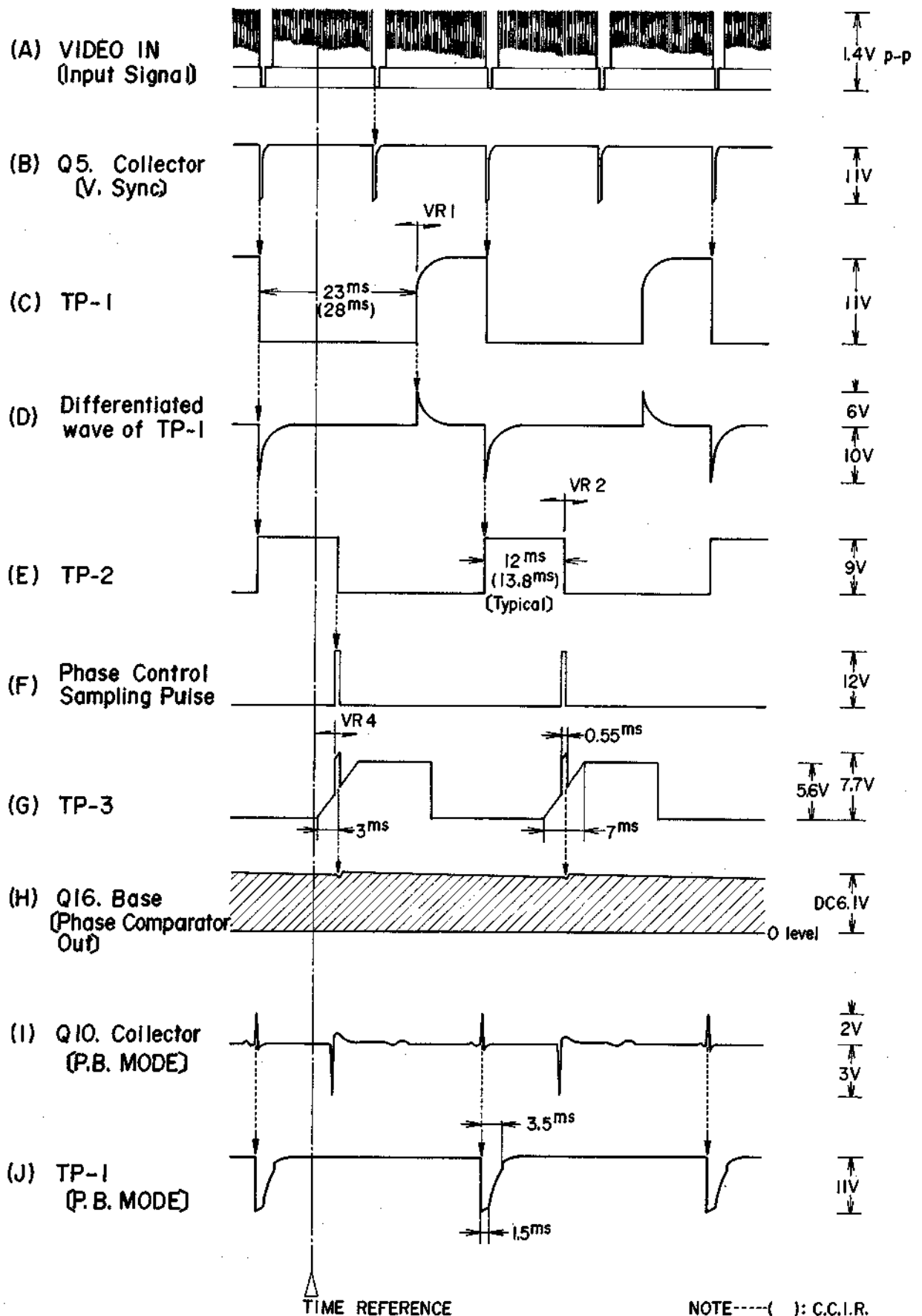


Fig. 3

Servo Circuit Adjustment

1. RECORDING MODE (STOP MODE)

Connect TV Monitor to TV Connector at rear of Model VT-700 (or connect Vidicon Camera VC-110 and Camera Adapter VCA-600 to CAMERA IN Jack).

- (1) Connect an Oscilloscope to Video In Terminal of Servo P.C. Board (VC-5013) and confirm that the Video Signal Amplitude is more than 1.2 Vp-p. (If amplitude is less than 1.2 Vp-p, check video input signal).
- (2) Connect Oscilloscope to Test Point TP-1. Adjust VR-1 (50 kΩB) to obtain waveform as shown in Fig. 4.

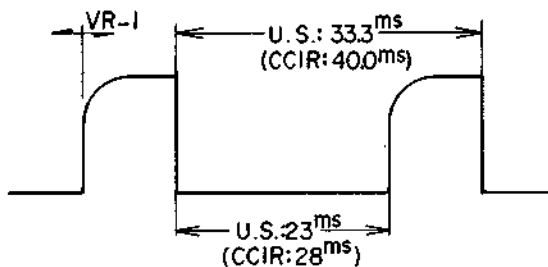


Fig. 4

- (3) Connect Oscilloscope to Test Point TP-2. Adjust VR-2 (50 kΩB) to obtain waveform as shown in Fig. 5.

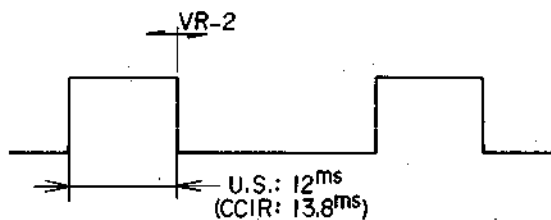


Fig. 5

- (4) Connect Oscilloscope to Collector of Transistor Q-18. Confirm that the Pick-Up Pulse Amplitude is more than 7 V as shown in Fig. 6. (If amplitude is less than 7 V, adjust angle of pick-up coil at upper part of Head Drum or Pick-Up Coil and Pick-Up Plate gap).

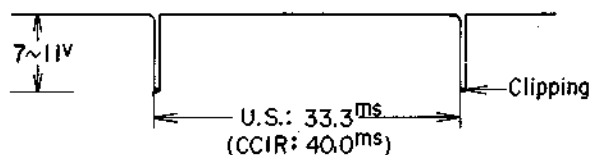


Fig. 6

- (5) Connect Oscilloscope to Test Point TP-3. Adjust VR-3 (10 kΩB) so that the Trapezoid Wave Ramp Slope is 7 ms as shown in Fig. 7. Further, adjust VR-4 (30 kΩB) so that the Phase Control Sampling Pulse is 3 ms away from the rise-up point of Trapezoid Wave (Fig. 7).

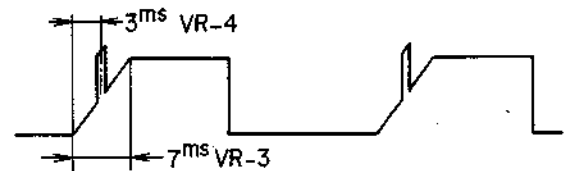


Fig. 7

- (6) Connect Oscilloscope to Test Point TP-6. Confirm that the Speed Control Sampling Pulse is about 3.5 ms away from the rise-up point of the Trapezoid Wave Ramp Slope. (See Fig. 8)

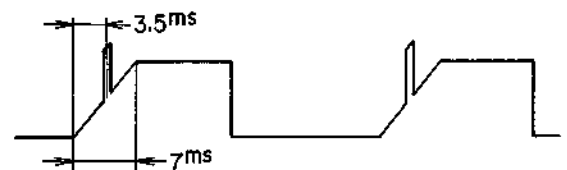


Fig. 8

2. PLAYBACK MODE

- (1) Connect Oscilloscope to Collector of Transistor Q-10. While playing back a Video Signal Recorded Tape, confirm that the Negative Pulse Amplitude is more than 3 Vp-p as shown in Fig. 9.

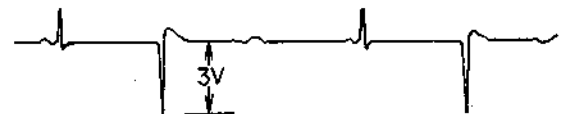


Fig. 9

- (2) Connect Oscilloscope to Test Point TP-1. At Playback Mode, confirm that the waveform at TP-1 is as shown in Fig. 10.

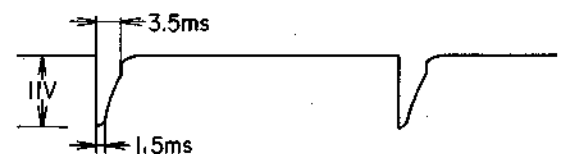


Fig. 10

-
- (3) Connect Oscilloscope to Test Point TP-2. When Tracking Control is changed from minimum to maximum, confirm that the Pulse Width change is from about 7 ms to 20 ms (Fig. 11).

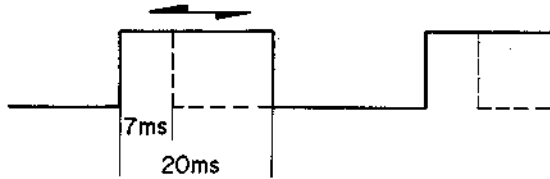


Fig. 11

3. VIDEO HEAD SWITCHING POINT ADJUSTMENT

Record and Play Back Video Signals supplied from TV or Camera, and adjust VR-2 so that Video Head Switching Point (over-lapping point) is about 10 horizontal scanning lines above the vertical blanking.

IX. VIDEO AMPLIFIER (VC-5011)

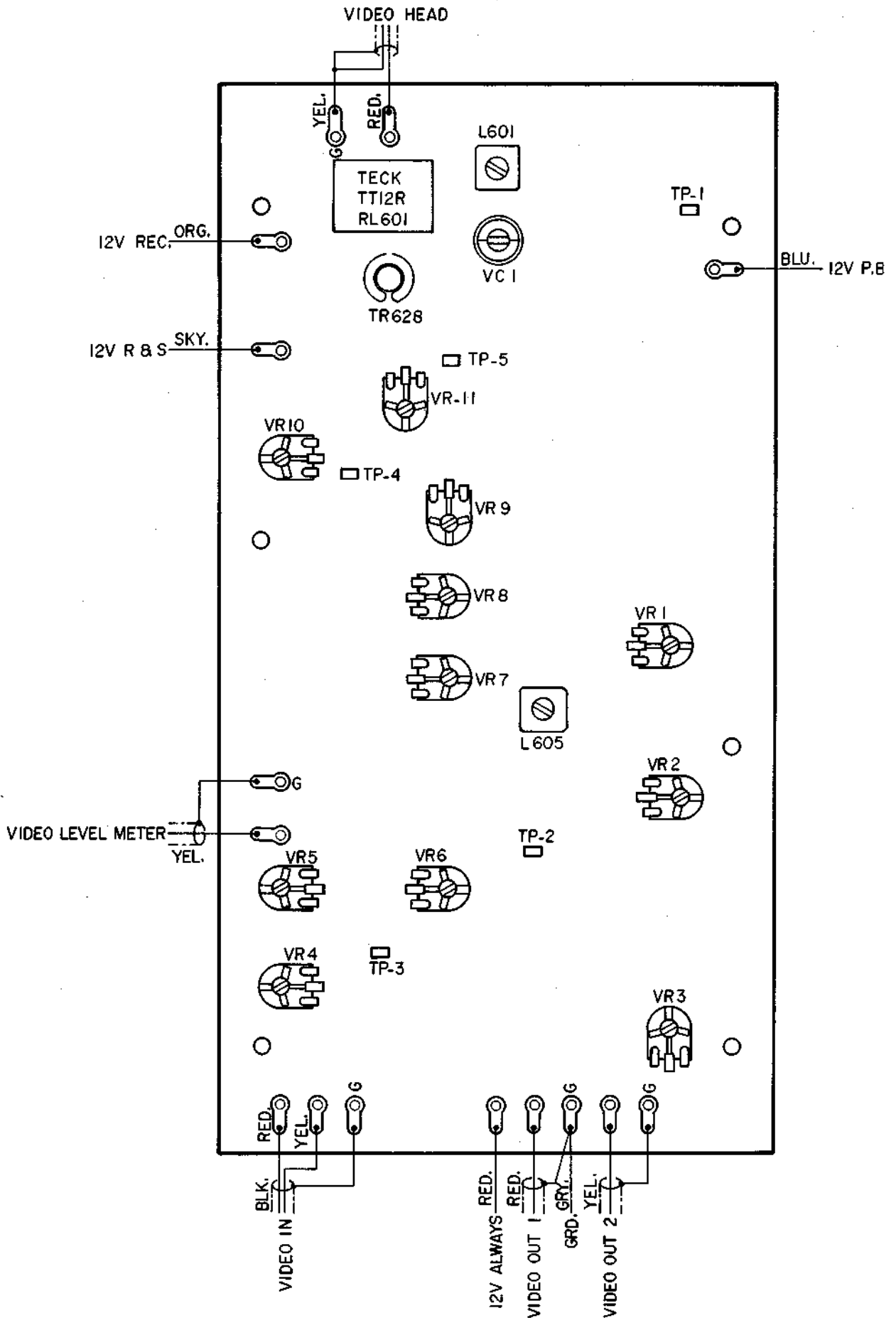


Fig. 1 Video P.C. Board VC-5011

1. AGC Output Level Adjustment

- Supply a Test Pattern Signal (1.4 Vp-p) to the "CAMERA IN" from a Monoscope or Vidicon Camera. Set CAMERA-TV Selector Switch to "CAMERA". Set Video Level Control to "AGC" position.
- Connect Oscilloscope to Test Point TP-3. Adjust VR-4 so that the waveform amplitude is 3 Vp-p as shown in Fig. 2.

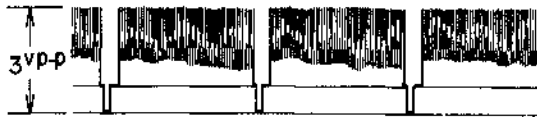


Fig. 2

2. VIDEO LEVEL METER CHECK

With a 3 Vp-p Video Signal Amplitude at TP-3, adjust VR-5 so that the Video Level Meter Indicator Needle registers between Silver and Black.

3. MODULATOR BALANCE ADJUSTMENT

- Connect Oscilloscope to Test Point TP-5.
- Set VR-6 fully counter-clockwise and set VR-8 fully clockwise.
- Adjust VR-9 and VR-10 so that the Positive and Negative parts of waveform are equal as shown in Fig. 3.

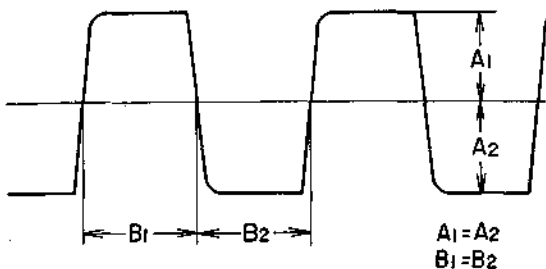


Fig. 3

4. FREQUENCY DEVIATION ADJUSTMENT

- Connect Oscilloscope to Test Point TP-5.
- Adjust VR-6 and VR-7 so that the frequency deviation is as shown in Fig. 4.

$$T_1 = 0.33 \mu\text{s} \text{ (3 MHz)}$$

$$T_2 = 0.5 \mu\text{s} \text{ (2 MHz)}$$

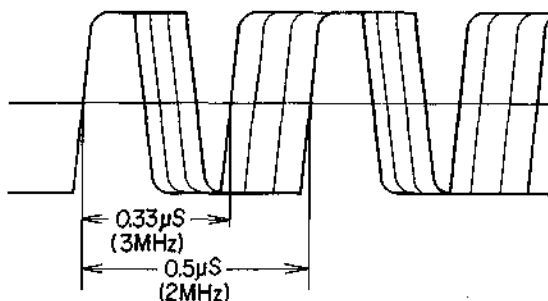


Fig. 4

5. WHITE CLIP LEVEL ADJUSTMENT

Connect Oscilloscope to Test Point TP-4. Adjust VR-8 so that the amplitude of the "over-shoot" part of upper part of video signal is 0.5 to 0.6 V as shown in Fig. 5.

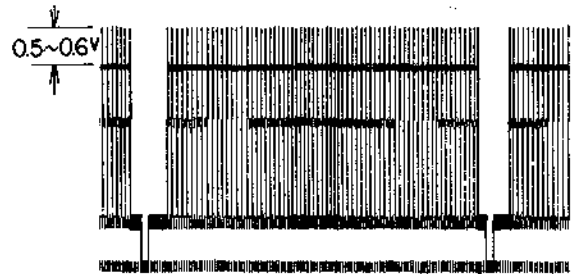


Fig. 5

6. CARRIER LEAK ADJUSTMENT (Modulator Balance, Limiter Balance, Demodulator Balance)

- Disconnect Video Input Signal.
- Connect Oscilloscope to Video Out Terminal of Video Amp P.C. Board. Set Vertical Gain Control of Oscilloscope to Maximum.
- Adjust VR-9, VR-1, and VR-2 so that the output signal amplitude at Video Out Terminal is Minimum.
- Carrier Leak Amplitude should be less than 15 mVp-p.

Caution: If Carrier Leak cannot be perfectly adjusted with VR-9, VR-1, and VR-2, also adjust VR-10.

7. VIDEO OUTPUT LEVEL ADJUSTMENT

- Connect Oscilloscope to Video Out Terminal.
- Adjust VR-3 so that the Video Output Signal Amplitude is 1.4 Vp-p ± 0.1 V.

Caution: At this time the Video Input Signal should be 1.4 Vp-p. In case the Video Input Signal is less than 1.4 Vp-p, adjust Video Output Signal Amplitude to equal the Input Signal Level.

8. PLAYBACK EQUALIZATION ADJUSTMENT

- Connect Oscilloscope to Test Point TP-1.
- Play back a Standard Reference Tape. Adjust VC-1 so that R.F. Envelope Amplitude is Maximum and also the error between A_1 (part at which brightness is intense) and A_2 (part at which brightness is not intense) is as small as possible. (See Fig. 6)
- It is ideal for R.F. Envelope to be more than 0.6 Vp-p, but this varies depending upon the quality of the Video Head Tip and CTL Head Adjustment.



RF. Envelope.

Fig. 6

9. RECORDING LEVEL ADJUSTMENT

- (a) Record and play back a Test Pattern Signal and adjust recording level so that the RF Envelope Amplitude is Maximum.
- (b) At recording mode, connect Oscilloscope to the Heat Sink of Transistor TR-628 (2 SC 968) and measure the recording level.
- (c) With recording waveform amplitude within the range of 2 to 3 V, adjust VR-11 to optimum value.
- (d) Rewind recorded tape and observe RF Playback Envelope Amplitude at TP-1.

10. CARRIER LEAK ADJUSTMENT AT PLAYBACK MODE

- (a) Connect Oscilloscope to Video Out Terminal.
- (b) Run a tape at recording mode with no input signal connected.
- (c) Rewind recorded tape and at Playback Mode, adjust VR-1 and VR-2 so that the Carrier Leak Voltage at Video Out Terminal is Minimum.
- (d) In case of having adjusted VR-1 or VR-2, make Item (6) Carrier Leak Adjustment again.
- (e) Finally, make an "Off Air" TV recording and check picture quality.

X. AUDIO AMPLIFIER VC-5012

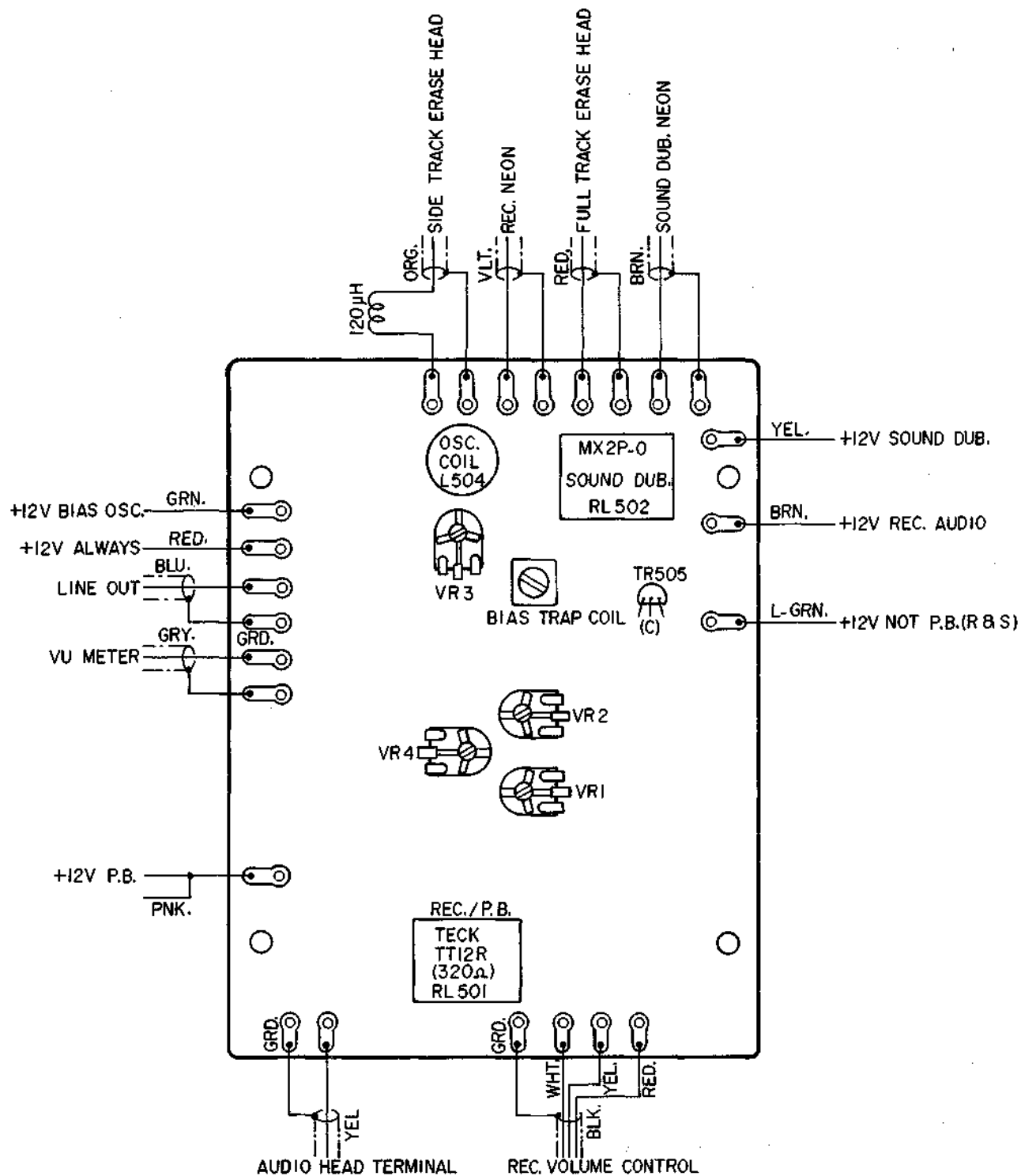


Fig. 1 Audio P.C. Board VC-5012

1. AGC SENSITIVITY ADJUSTMENT (Ref. Fig. 6-1)

- (a) Connect a 1 kHz, 350 mVrms (1 Vp-p) signal to the Audio Line In Terminal.
- (b) Set Audio Level Control to "AGC" position.
- (c) Adjust VR-2 so that the VU Meter Indicator Needle registers "0" VU (between silver and red).

Caution : Because of AGC time constant, the VU meter needle will be unstable for a short period of time after VR-2 is activated.

2. PLAYBACK LEVEL ADJUSTMENT

- (a) Play back a 700 Hz, "0" VU pre-recorded tape.
- (b) Adjust VR-4 so that the VU Meter Indicator Needle registers "0" VU.

Caution : In this case, check to make sure the Audio Head Height Adjustment has been properly carried out.

3. BIAS TRAP COIL ADJUSTMENT

- (a) At recording mode, connect Oscilloscope to Collector of Transistor TR-505 (2 SC 711).
- (b) Adjust core of Bias Trap Coil (L-503) so that Recording Bias Voltage is Minimum.

4. RECORDING BIAS VOLTAGE ADJUSTMENT

- (a) Connect a V.T.V.M. to Audio Head Terminal.
- (b) At recording mode, adjust VR-3 so that the Bias Voltage is 23 V RMS.

5. RECORDING LEVEL ADJUSTMENT

Record and play back a 1 kHz "0" VU signal, and adjust VR-1 so that the playback level is "0" VU.

6. FREQUENCY RESPONSE CHECK

- (a) Connect a High Sensitivity V.T.V.M. to the Audio Line Out Terminal.
- (b) Record and play back a 1 kHz and a 10 kHz signal at -10 VU. Compare the 10 kHz output level with the output level of the 1 kHz. If error is more than ± 3 dB, readjust Recording Bias Voltage by means of VR-3.
- (c) In case of having changed VR-3, make adjustment outlined in Item 5 above again.

Caution : If frequency response is especially poor, check Audio Head Azimuth.

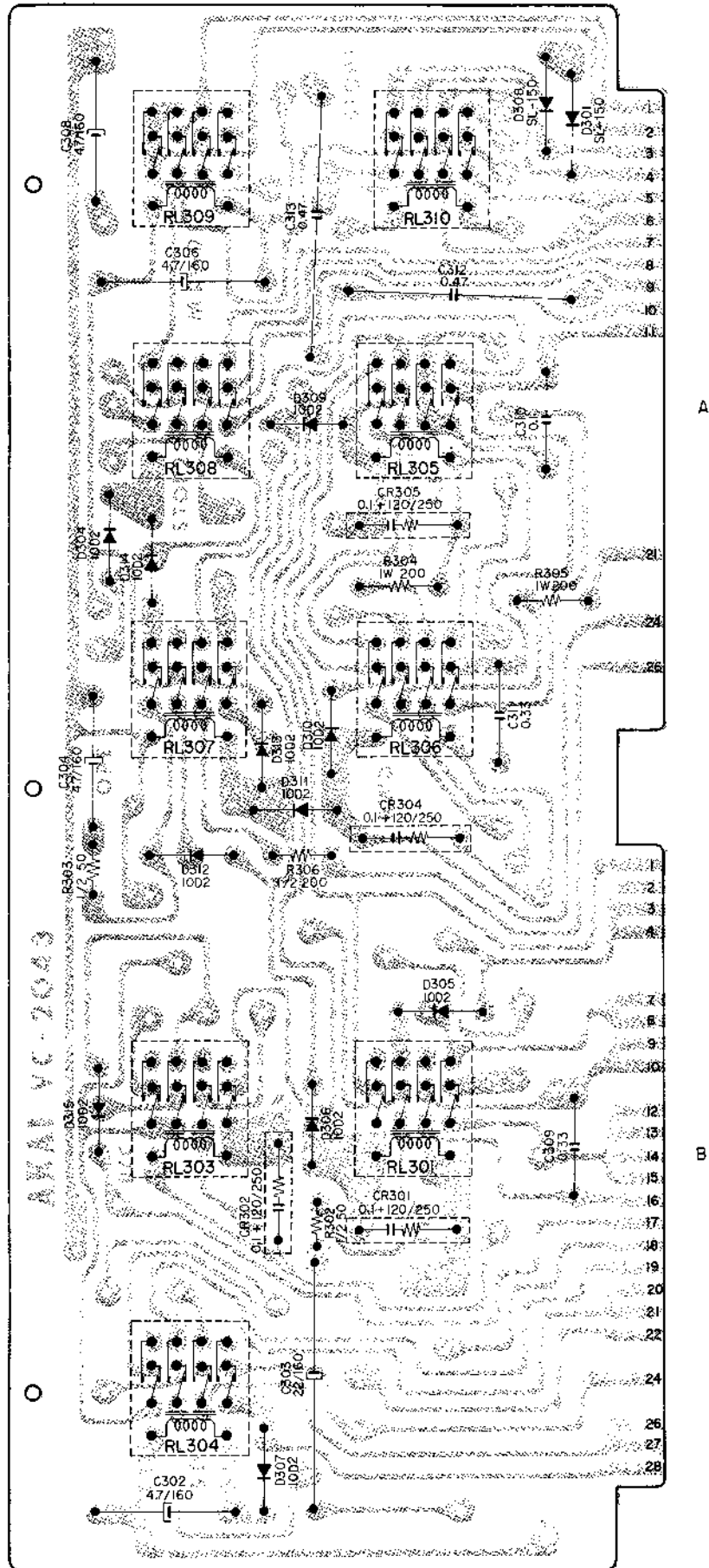
7. DISTORTION LEVEL CHECK

- (a) Connect a Distortion Meter to the Audio Line Out Terminal.
- (b) Record and play back a 1 kHz, "0" VU Signal and confirm that the Distortion Level is within 6%. If over 6%, recheck Bias Voltage.

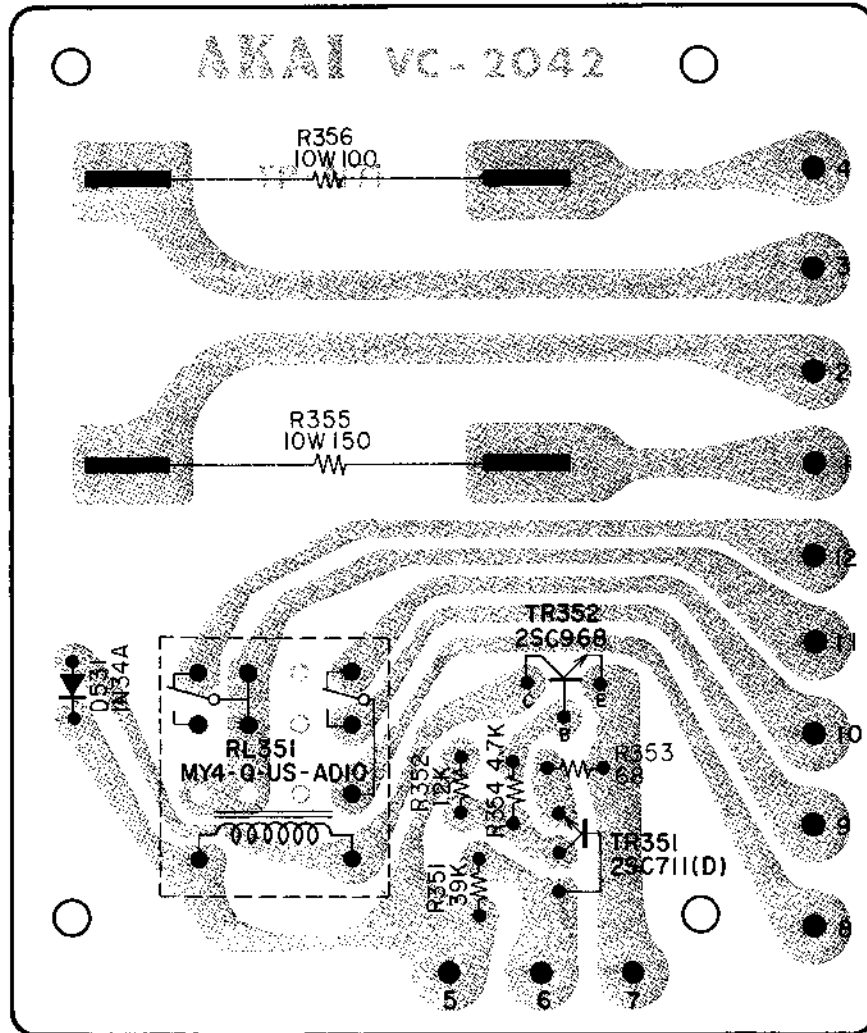


XI. COMPOSITE VIEWS OF COMPONENTS

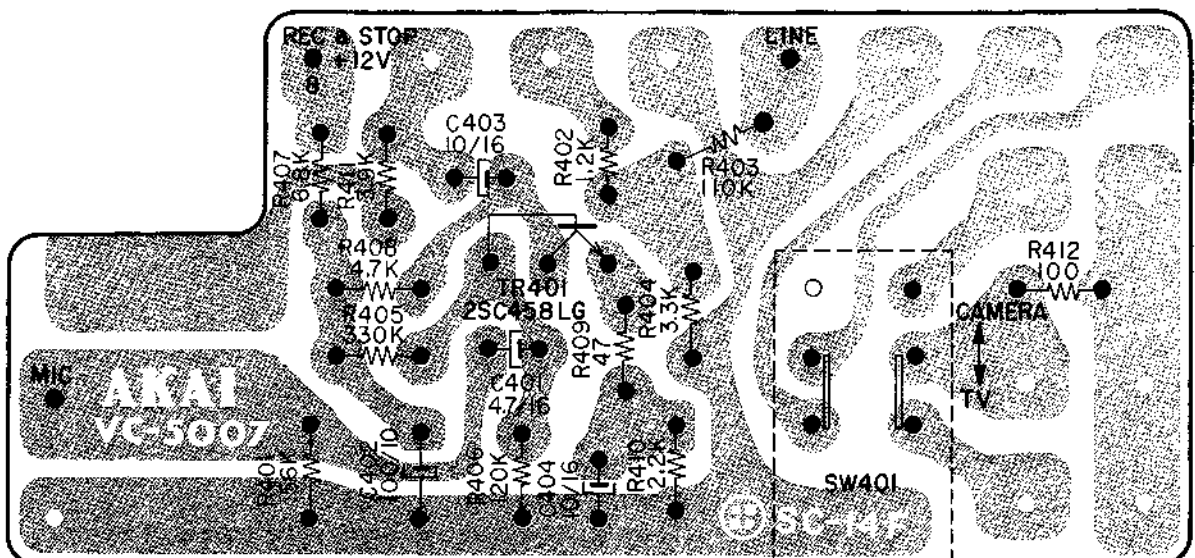
SYSTEM CONTROL P.C. BOARD I. (VC-2043A)



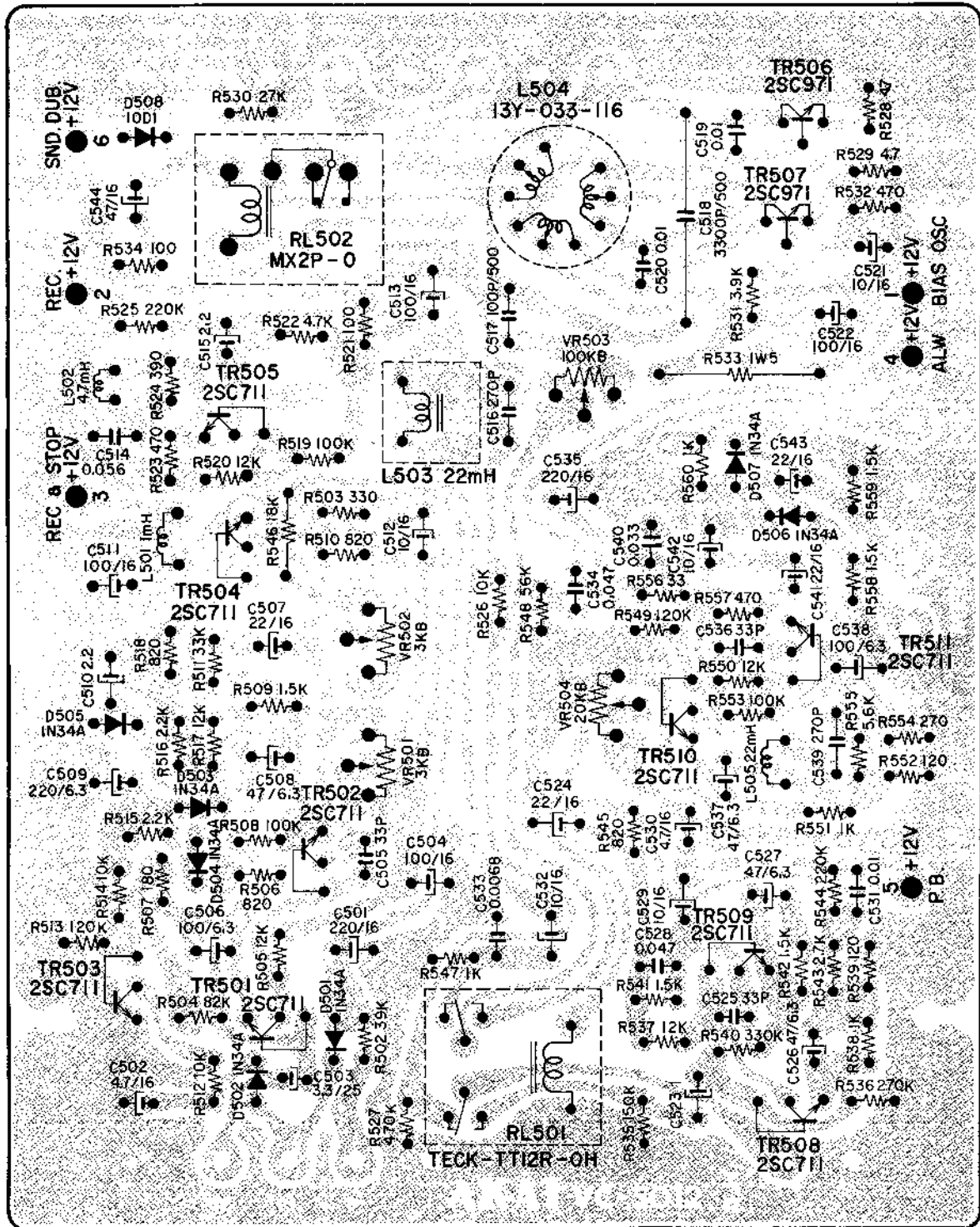
SYSTEM CONTROL P.C. BOARD II. (VC-2042)



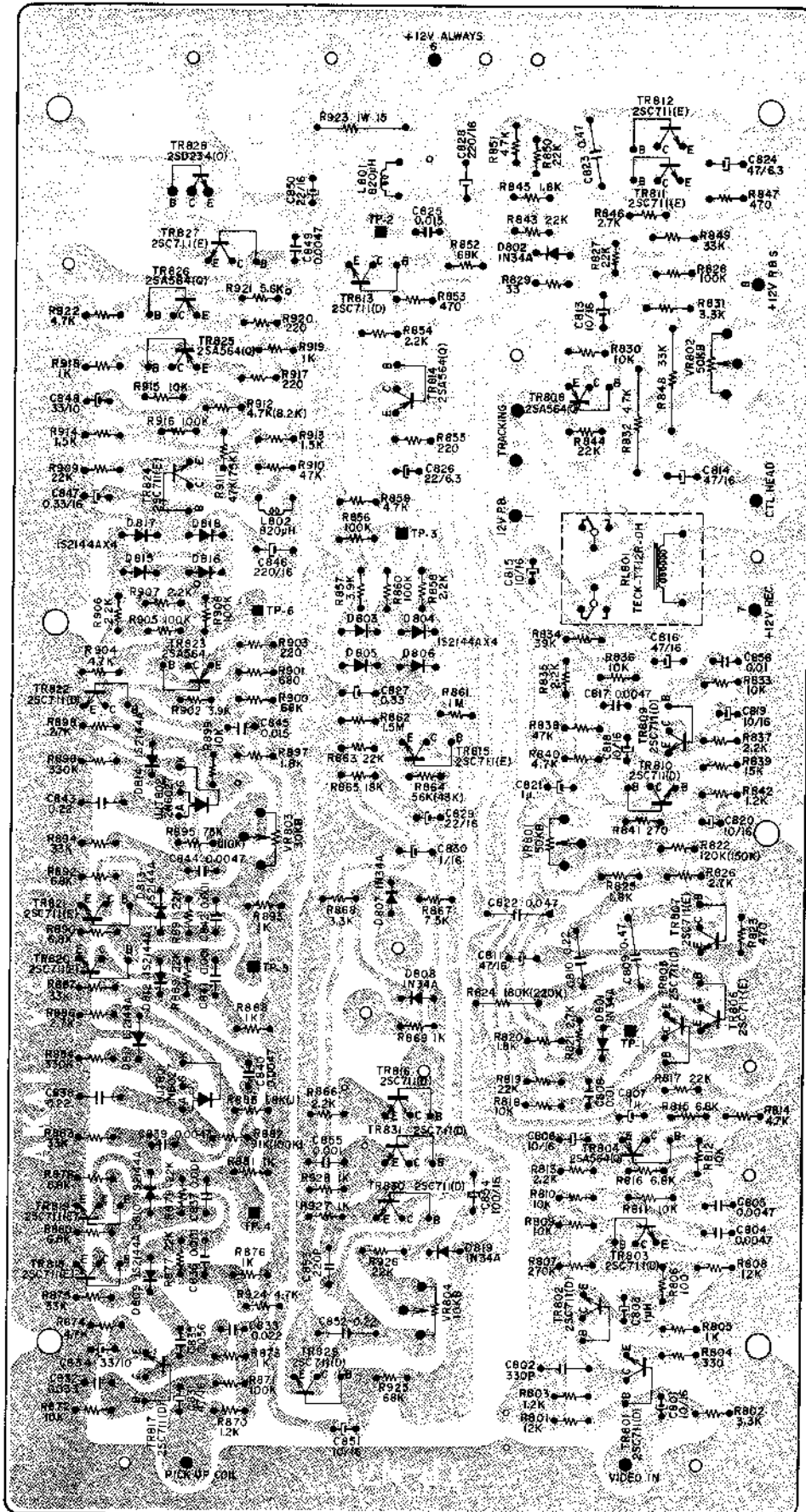
AUDIO AMP. P.C. BOARD II (VC-5007)



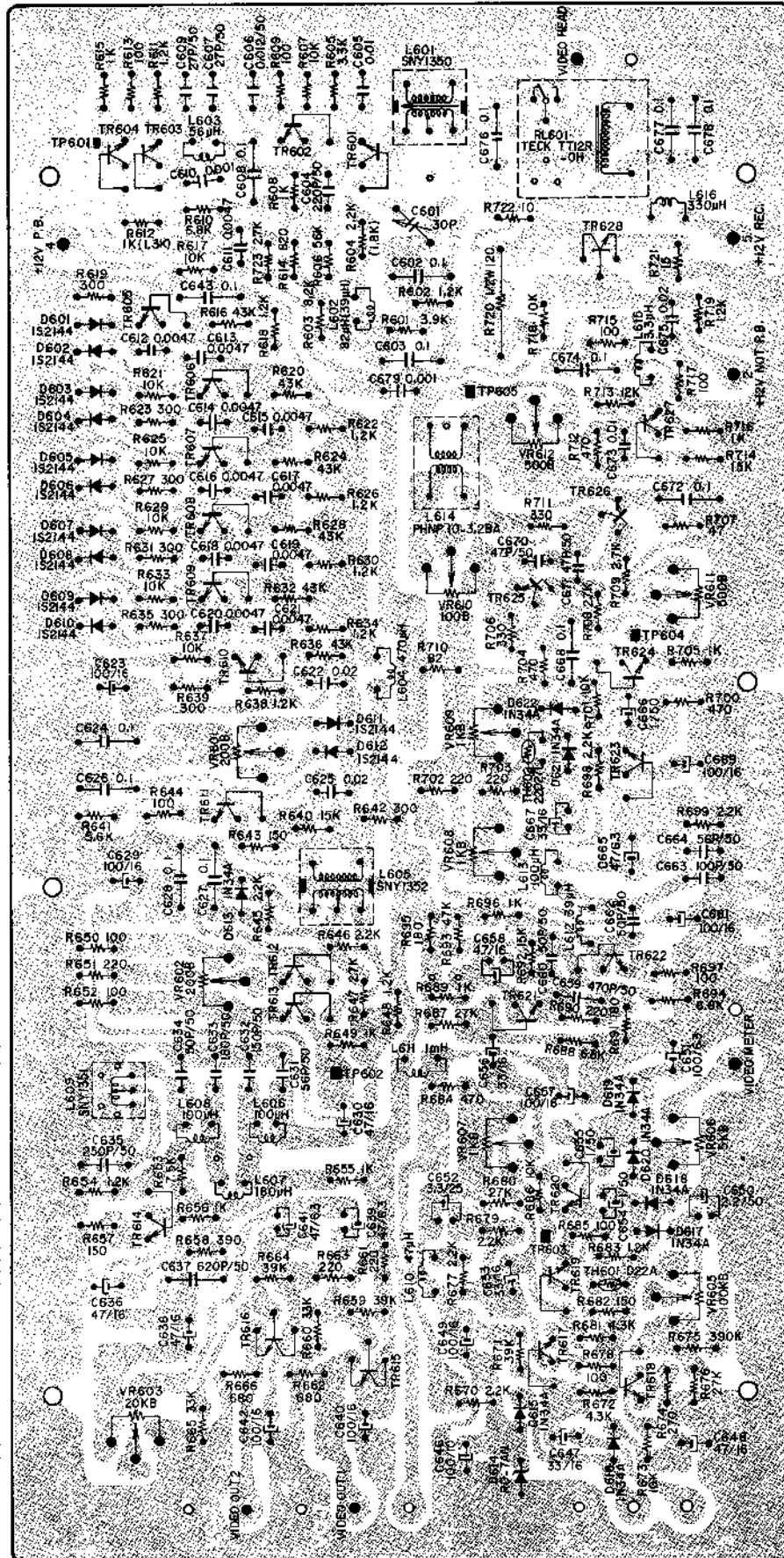
AUDIO AMP. P.C. BOARD I. (VC-5012)



SERVO (HEAD MOTOR SERVO) P.C. BOARD (VC-5013)



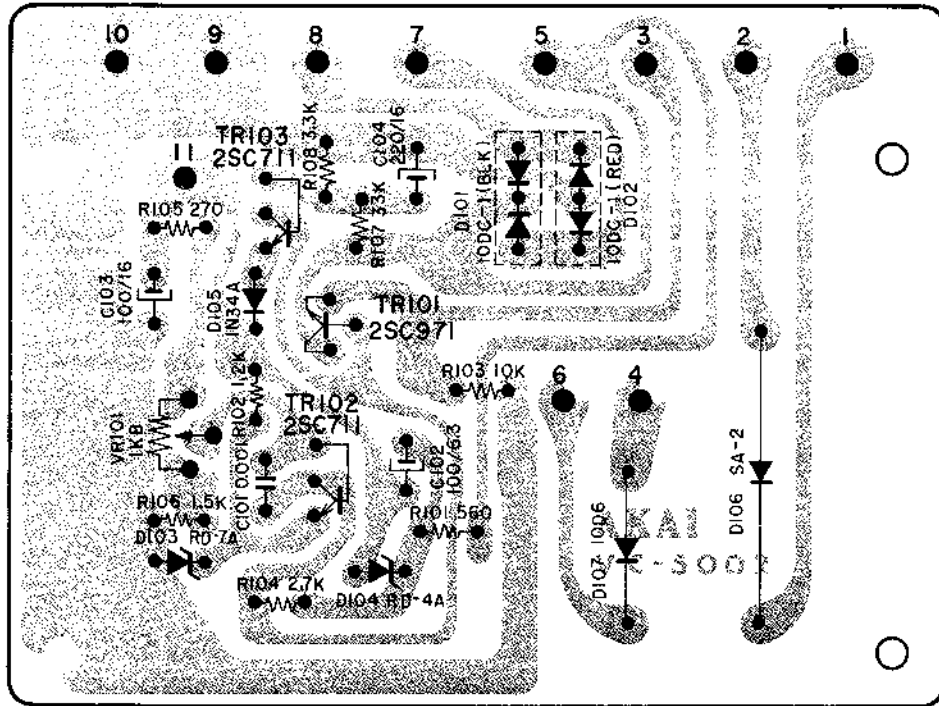
VIDEO AMP. P.C. BOARD (VC-5011)



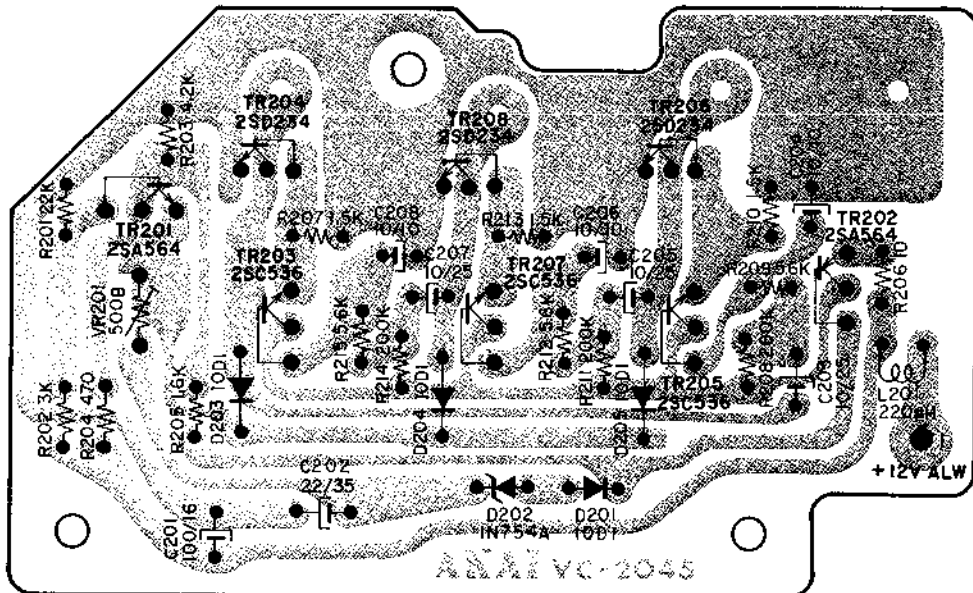
- TR601, 2, 3, ---25C645
- TR604, 5, 6, 7, 8, 9, 10, 11, ---25C711
- TR612, 13, ---25C458
- TR614, ---25C711
- TR615, 16, ---25C968
- TR617, 18, 19, 20, 21, 22, ---25C711
- TR623, ---25C498(B)
- TR625, 26, ---25C269
- TR628, ---25C968
- TR629, ---25C711
- TR631, ---25C711
- TR632, ---25C711
- TR633, ---25C711
- TR634, ---25C711
- TR635, ---25C711
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- TR696, ---25C711
- TR697, ---25C711
- TR698, ---25C711
- TR699, ---25C711
- TR700, ---25C711

NOTE
() --- C.C.I.R.

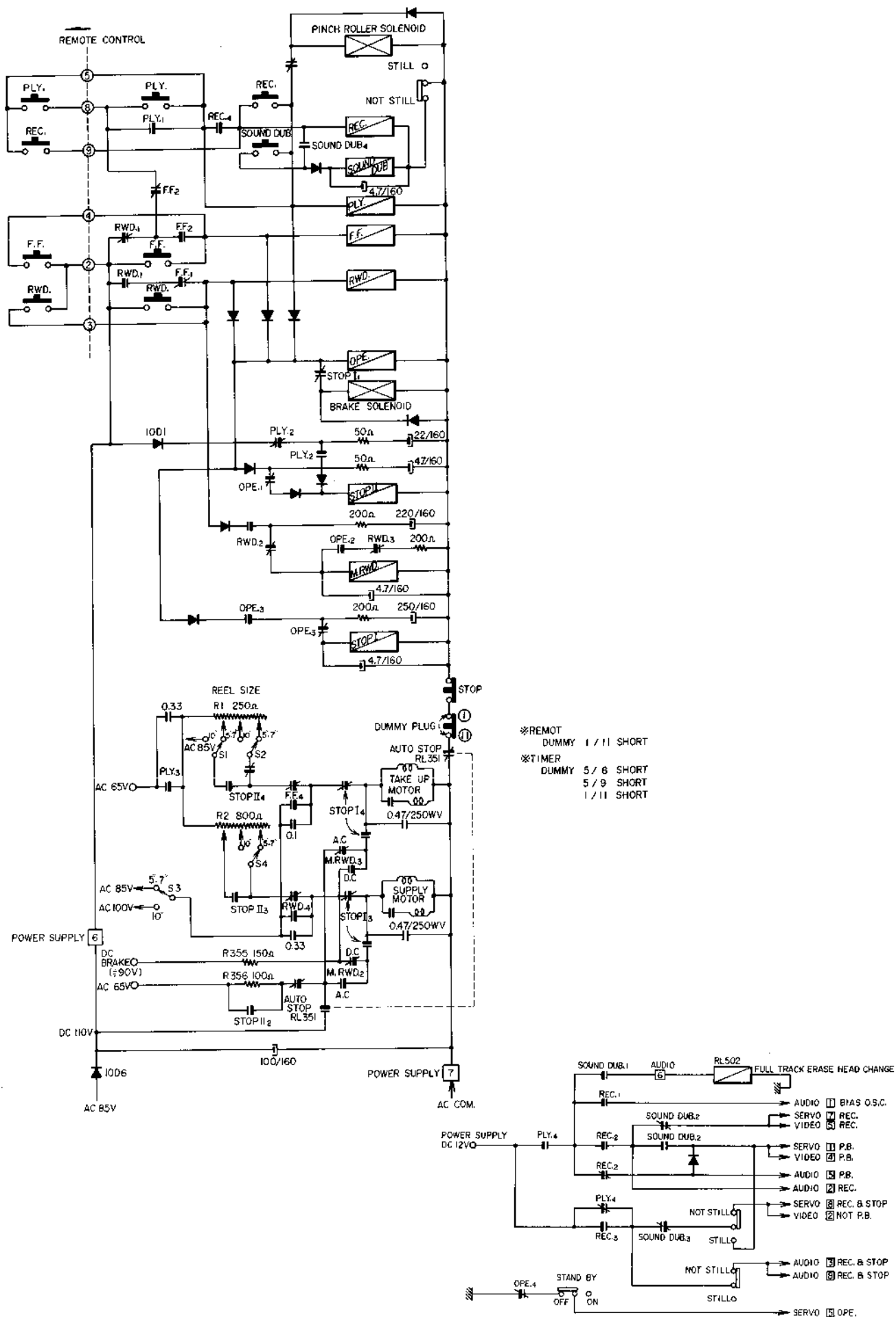
POWER SUPPLY P.C. BOARD (VC-5002)



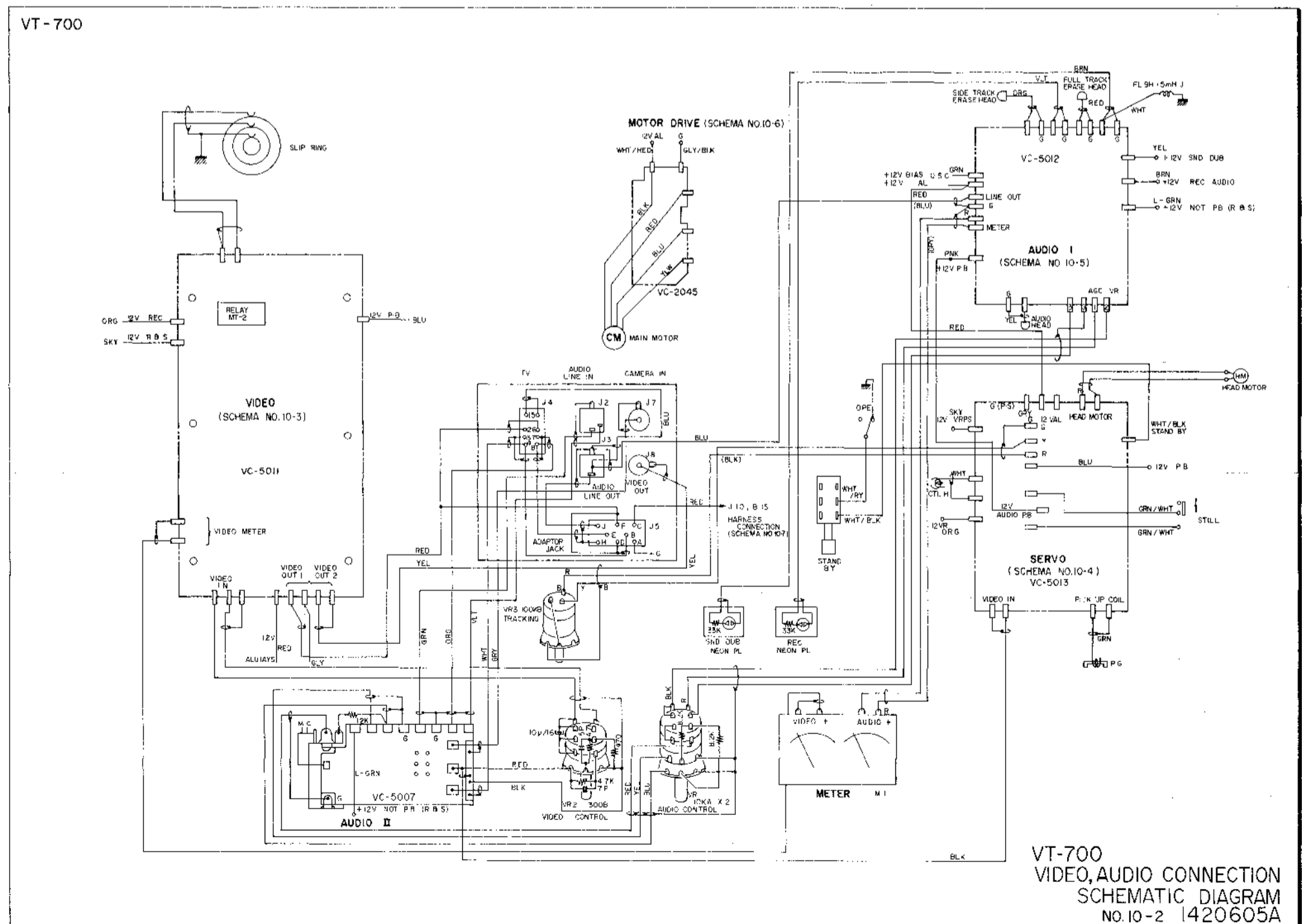
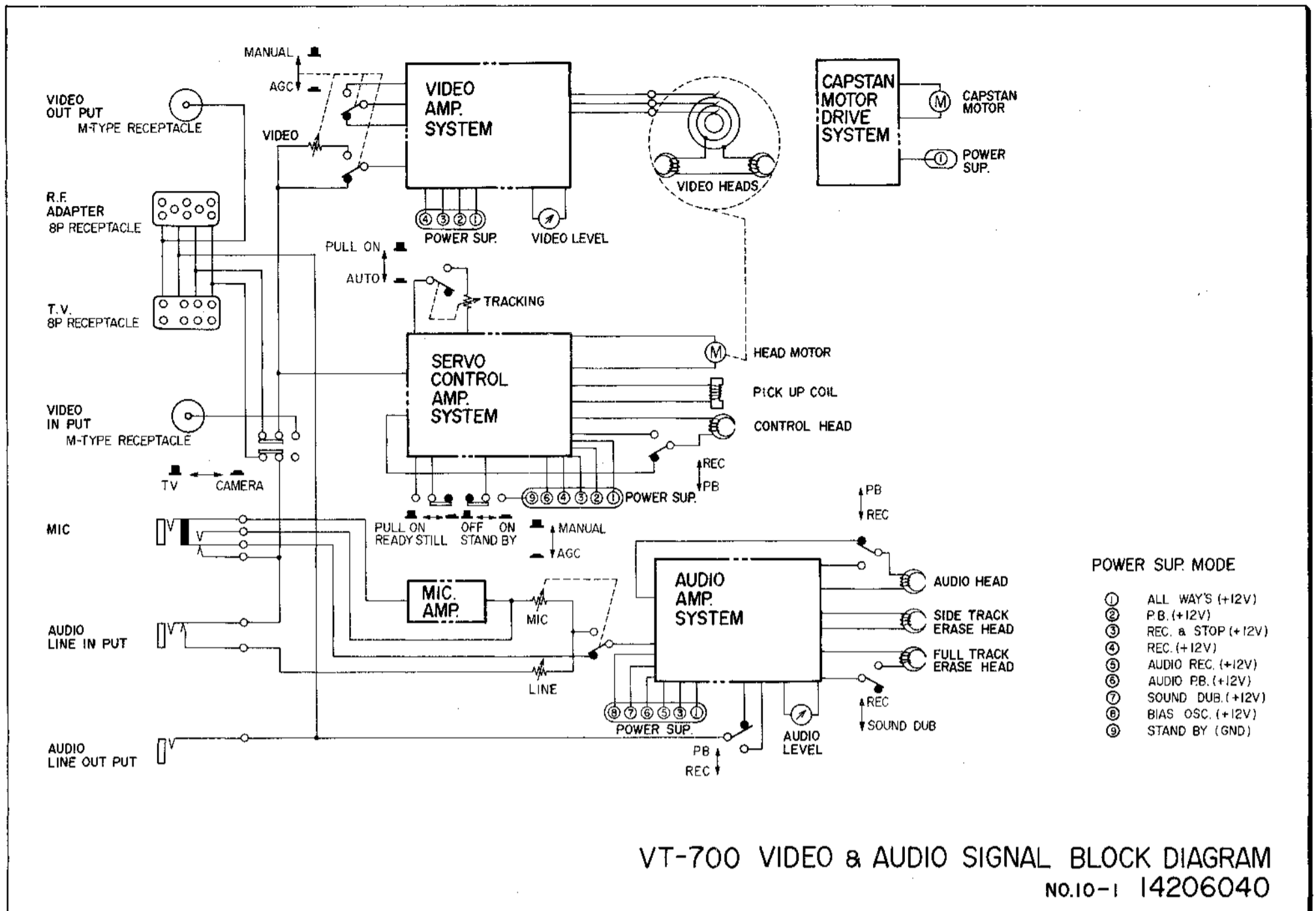
CAPSTAN DRIVE MOTOR P.C. BOARD (VC-2045)

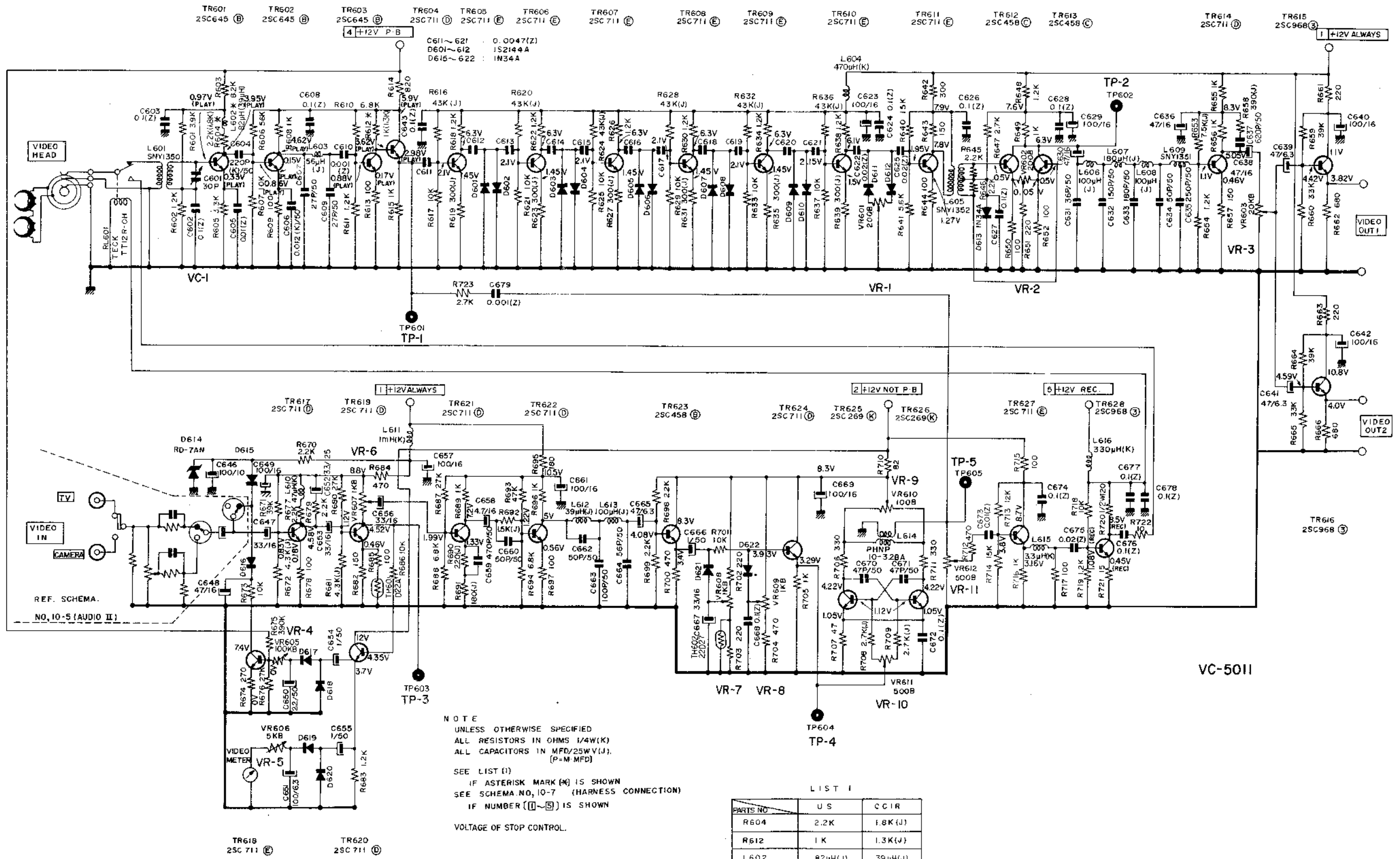


XII. SYSTEM CONTROL BLOCK DIAGRAM



MEMO





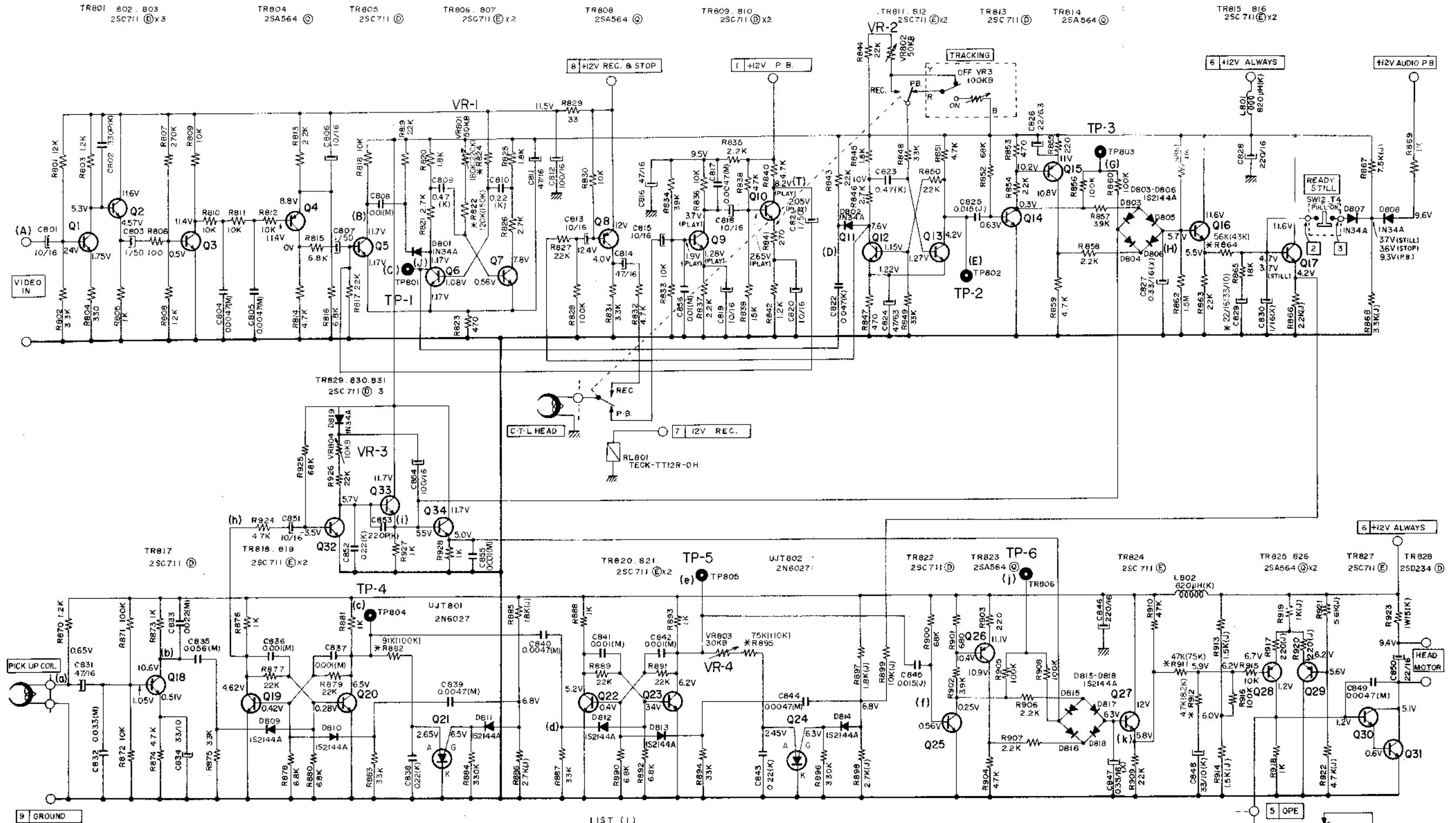
NOTE
 UNLESS OTHERWISE SPECIFIED
 ALL RESISTORS IN OHMS (1/4W(K)
 ALL CAPACITORS IN MFD/25WV(J).
 (P=M MFD)
 SEE LIST (1)
 IF ASTERISK MARK (*) IS SHOWN
 SEE SCHEMA NO. 10-7 (HARNESS CONNECTION)
 IF NUMBER (1-5) IS SHOWN
 VOLTAGE OF STOP CONTROL.

LIST 1

PARTS NO	US	CCIR
R604	2.2K	1.8K(J)
R612	1K	1.3K(J)
L602	82µH(J)	39µH(J)

VT-700 VIDEO SCHEMATIC DIAGRAM
 NO.10-3 1420606A

VT-700



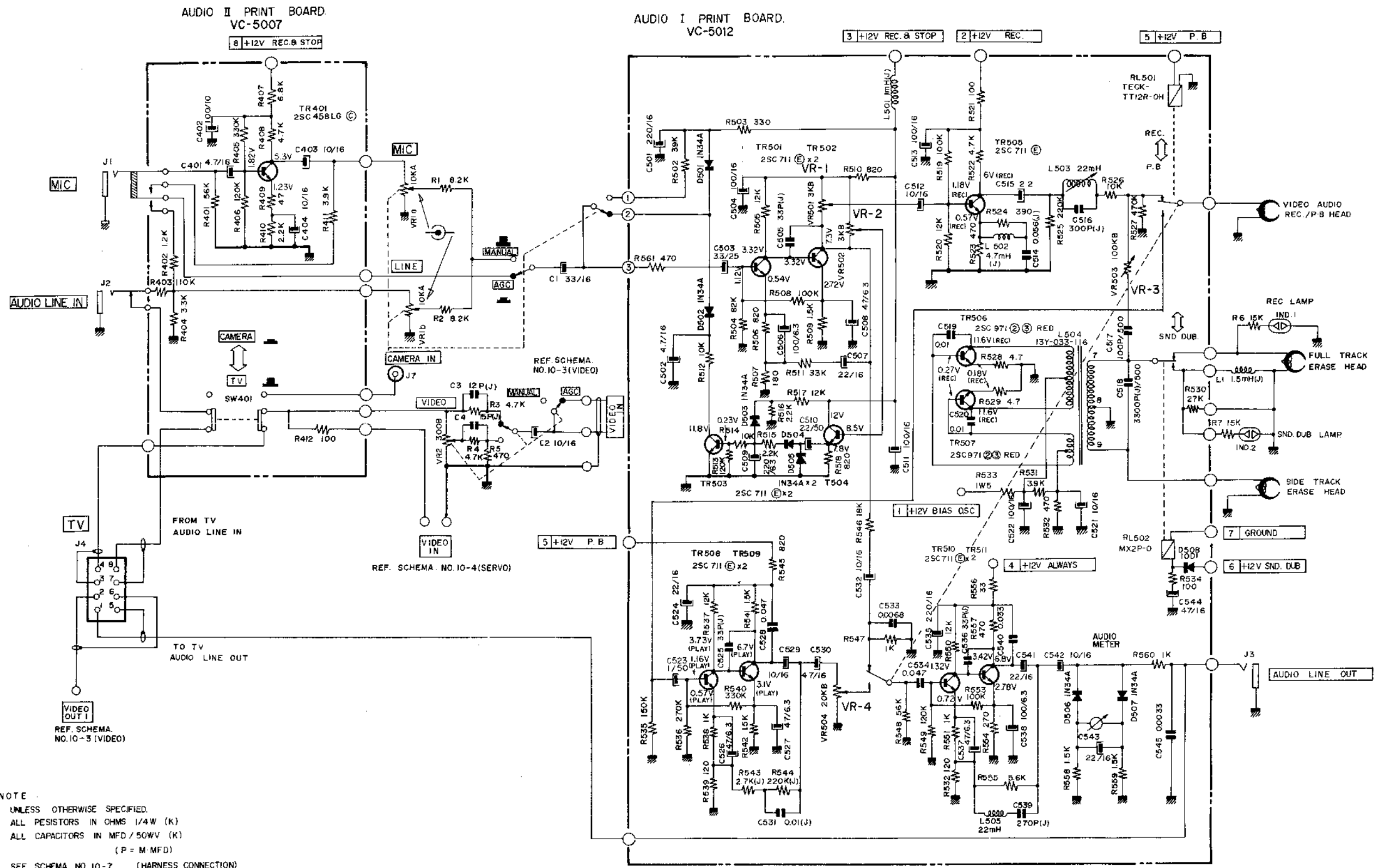
NOTE
UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS IN OHMS 1/4W (K).
ALL CAPACITORS IN MFD 50WV, MFD/2V.
(P = M · MFD)

SEE LIST (I)
IF ASTERISK MARK (*) IS SHOWN
SEE SCHEMA NO. 10-7 (HARNESS CONNECTION)
IF NUMBER (□~□) IS SHOWN.

LIST (I)

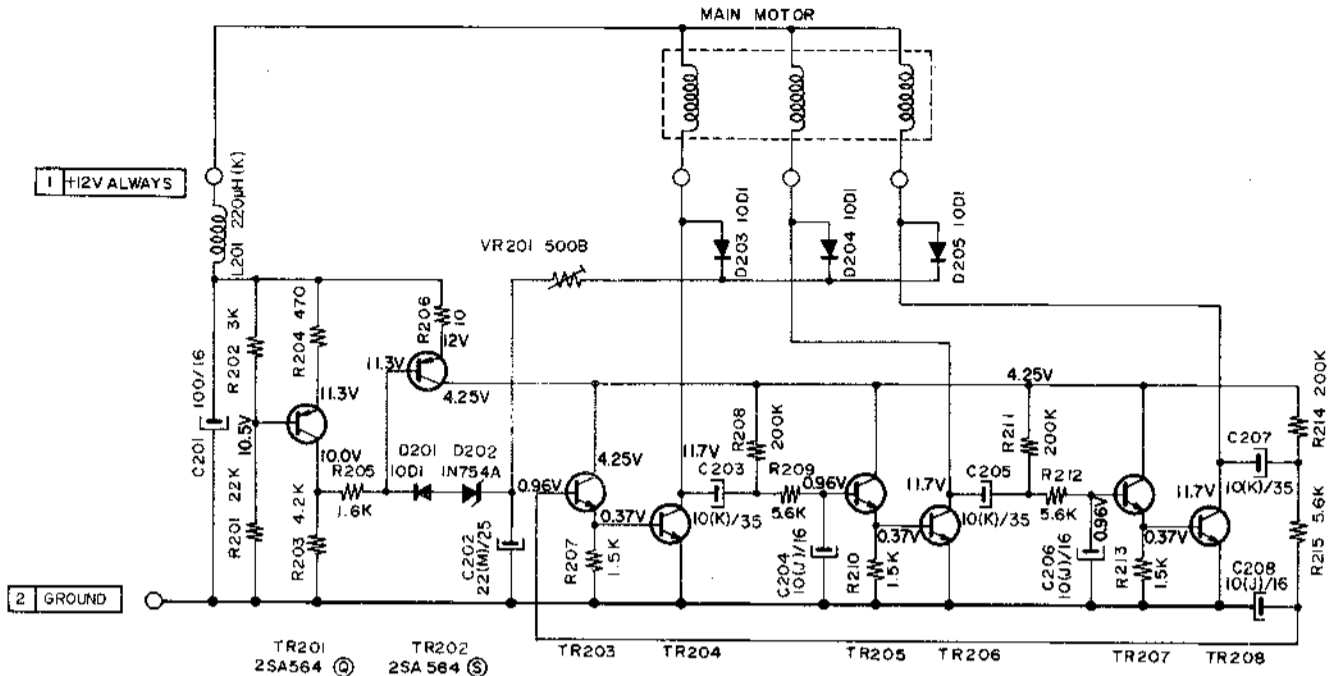
PARTS NO.	U S	C.C.I.R
R 822	1.20 K	150 K
R 824	18.0 K (J)	22.0 K (J)
R 864	5.6 K	4.3 K (J)
R 882	91 K (J)	10.0 K (J)
R 895	75 K (J)	11.0 K (J)
R 911	4.7 K (J)	7.5 K (J)
R 912	4.7 K	8.2 K (J)
C 829	22/16(K)	33/10(K)

VT-700 SERVO SCHEMATIC DIAGRAM
NO.10-4 1420607A



NOTE .
 UNLESS OTHERWISE SPECIFIED,
 ALL RESISTORS IN OHMS 1/4W (K)
 ALL CAPACITORS IN MFD / 50WV (K)
 (P = M.MFD)
 SEE SCHEMA NO.10-7 (HARNES CONNECTION)
 IF NUMBER (□~□) IS SHOWN.
 VOLTAGE OF STOP CONTROL.

VT-700 AUDIO I,II SCHEMATIC DIAGRAM
 No.10-5 1420608A

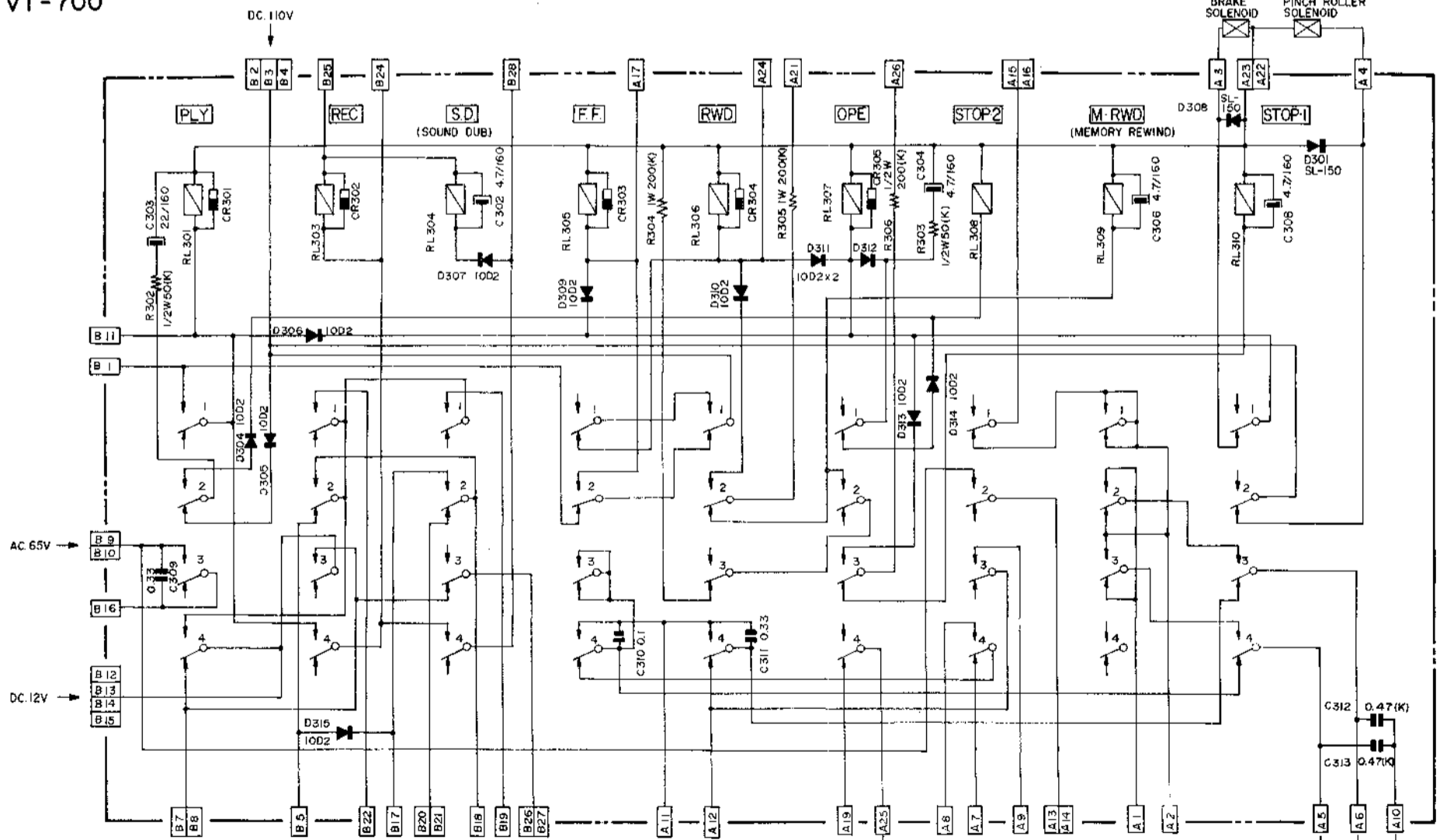


TR203, 205, 207 25C 536 (F)
 TR204, 206, 208 25D 234 (C)

VC-2045

NOTE
 ALL RESISTORS IN OHMS (1/4W)(J)
 ALL CAPACITORS IN MFD./WV.
 SEE SCHEMA NO. 10-2 (VIDEO, AUDIO CONNECTION)
 IF NUMBER [1], [2] IS SHOWN.

VT-700 CAPSTAN MOTOR DRIVE SCHEMATIC DIAGRAM
 NO.10-6 1420609A



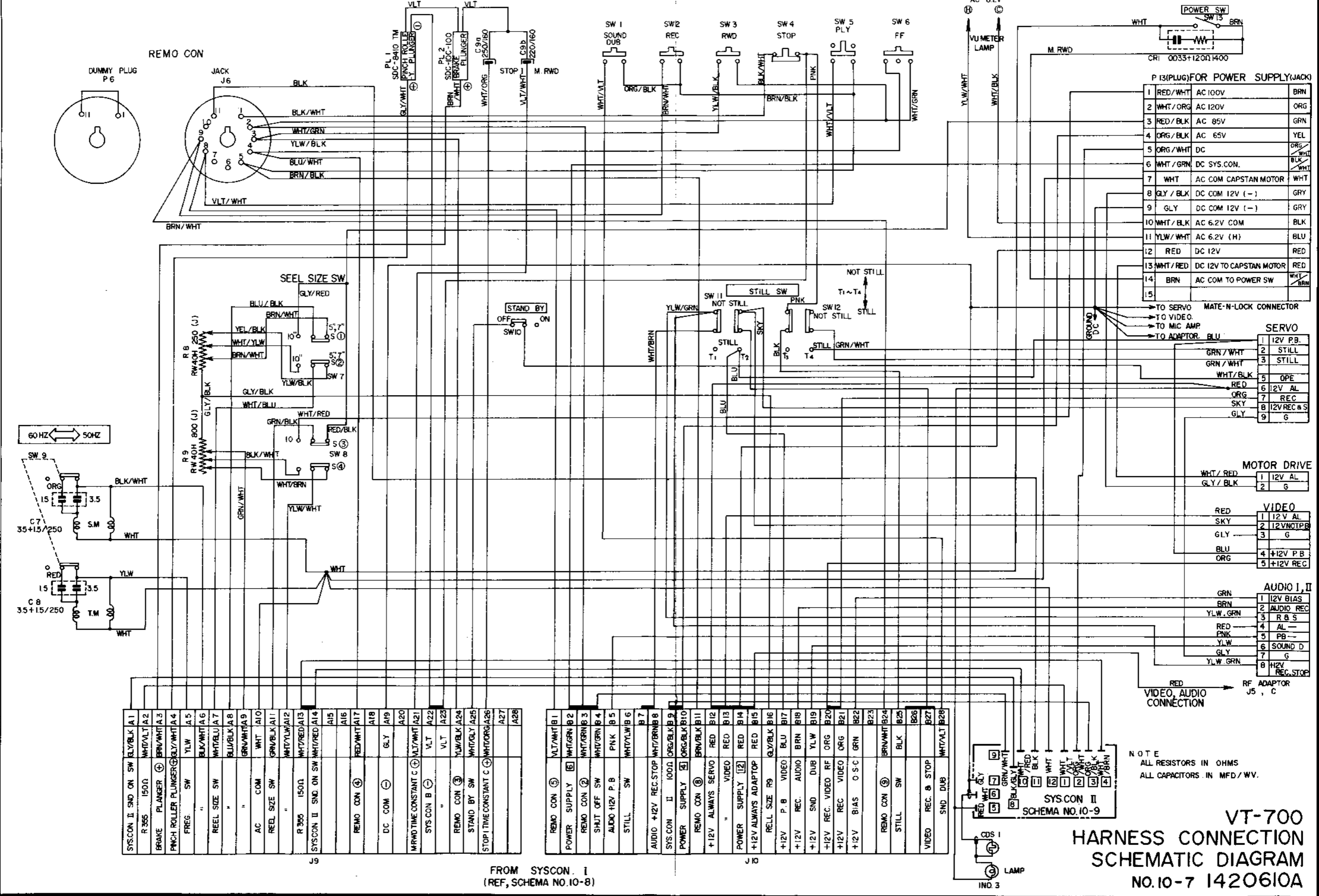
NOTE
 UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS IN OHMS
 ALL CAPACITORS IN MFD. (M)/250WV.
 SEE SCHEMA NO 10-7 (HARNES CONNECTION)
 IF NUMBER [A1], [A2B] IS SHOWN.
 [B1], [B2B]

CR301 305
 0.1μ +120Ω/250WV.
 RL301, 303~310
 MY4 - 0 - US - AD11

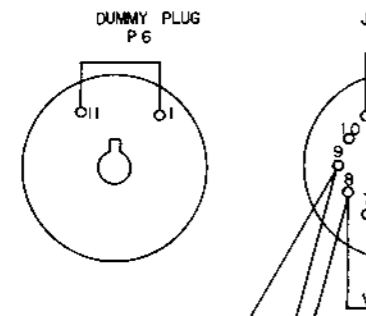
VC-2043

VT-700 SYS. CON. I SCHEMATIC DIAGRAM
 NO.10-8 1420611A

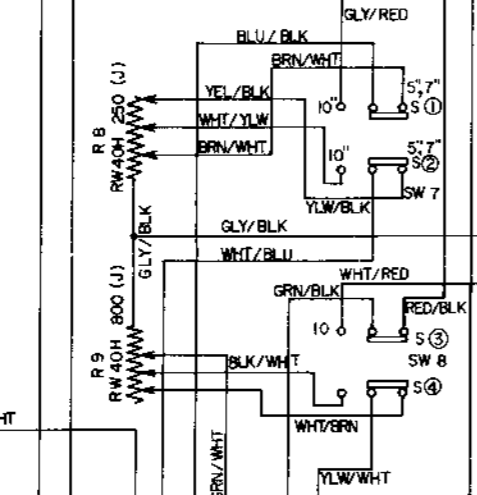
VT-700



REMO CON



SEEL SIZE SW



SW 9



1	SW	BLK/BLK	A1
2	150Ω	WHT/VLT	A2
3	PLUNGER	BRN/WHT	A3
4	PLUNGER	BLU/WHT	A4
5	SW	YLW	A5
6	REEL SIZE SW	BLK/WHT	A6
7	"	WHT/BLU	A7
8	"	BLU/BLK	A8
9	"	GRN/WHT	A9
10	COM	WHT	A10
11	REEL SIZE SW	GRN/BLK	A11
12	"	WHT/BLU	A12
13	150Ω	WHT/RED	A13
14	SW	WHT/RED	A14
15	"	WHT	A15
16	"	WHT	A16
17	REMO CON	RED/WHT	A17
18	"	RED/WHT	A18
19	DC COM	GLY	A19
20	"	GLY	A20
21	CONSTANT C	VLT/WHT	A21
22	"	VLT	A22
23	REMO CON	YLW/BLK	A24
24	STAND BY SW	WHT/GRN	A25
25	CONSTANT C	WHT/ORG	A26
26	"	WHT/ORG	A26
27	"	WHT/ORG	A26
28	"	WHT/ORG	A26

1	REMO CON	VLT/WHT	B1	
2	POWER SUPPLY	WHT/GRN	B2	
3	REMO CON	WHT/GRN	B3	
4	SHUT OFF SW	WHT/GRN	B4	
5	AUDIO 12V P.B	PNK	B5	
6	STILL SW	WHT/BLK	B6	
7	"	WHT/BLK	B6	
8	AUDIO 12V REC STOP	WHT/BRN	B8	
9	SYS CON II	ORG/BLK	B9	
10	POWER SUPPLY	ORG/BLK	B10	
11	REMO CON	BRN/BLK	B11	
12	+12V ALWAYS SERVO	RED	B12	
13	"	VIDEO	B13	
14	POWER SUPPLY	RED	B14	
15	+12V ALWAYS ADAPTOR	RED	B15	
16	REEL SIZE R9	GLY/BLK	B16	
17	+12V P.B	BLU	B17	
18	+12V REC	AUDIO	BRN	B18
19	+12V SND	DUB	YLW	B19
20	+12V REC	VIDEO	ORG	B20
21	+12V REC	VIDEO	ORG	B21
22	+12V BIAS	O.S.C	GRN	B22
23	"	O.S.C	GRN	B22
24	REMO CON	BRN/WHT	B24	
25	STILL SW	BLK	B25	
26	"	BLK	B25	
27	REC. & STOP	BLK	B27	
28	SND DUB	WHT/VLT	B28	

FROM SYSCON. I
(REF, SCHEMA NO. 10-8)

P 13 (PLUG) FOR POWER SUPPLY (JACK)

1	RED/WHT	AC 100V	BRN
2	WHT/ORG	AC 120V	ORG
3	RED/BLK	AC 85V	GRN
4	ORG/BLK	AC 65V	YEL
5	ORG/WHT	DC	ORG/WHT
6	WHT/GRN	DC SYS. CON.	BLK/WHT
7	WHT	AC COM CAPSTAN MOTOR	WHT
8	GLY/BLK	DC COM 12V (-)	GRY
9	GLY	DC COM 12V (-)	GRY
10	WHT/BLK	AC 6.2V COM	BLK
11	YLW/WHT	AC 6.2V (H)	BLU
12	RED	DC 12V	RED
13	WHT/RED	DC 12V TO CAPSTAN MOTOR	RED
14	BRN	AC COM TO POWER SW	WHT/BRN
15	"	"	WHT/BRN

SERVO

1	12V P.B.	GRN/WHT
2	STILL	GRN/WHT
3	STILL	WHT/BLK
4	OPE	RED
5	12V AL	ORG
6	REC	SKY
7	12V REC & S	GLY
8	"	GLY
9	"	GLY

MOTOR DRIVE

1	12V AL	WHT/RED
2	G	GLY/BLK

VIDEO

1	12V AL	RED
2	12V MOTOR P.B	SKY
3	G	GLY
4	+12V P.B	BLU
5	+12V REC	ORG

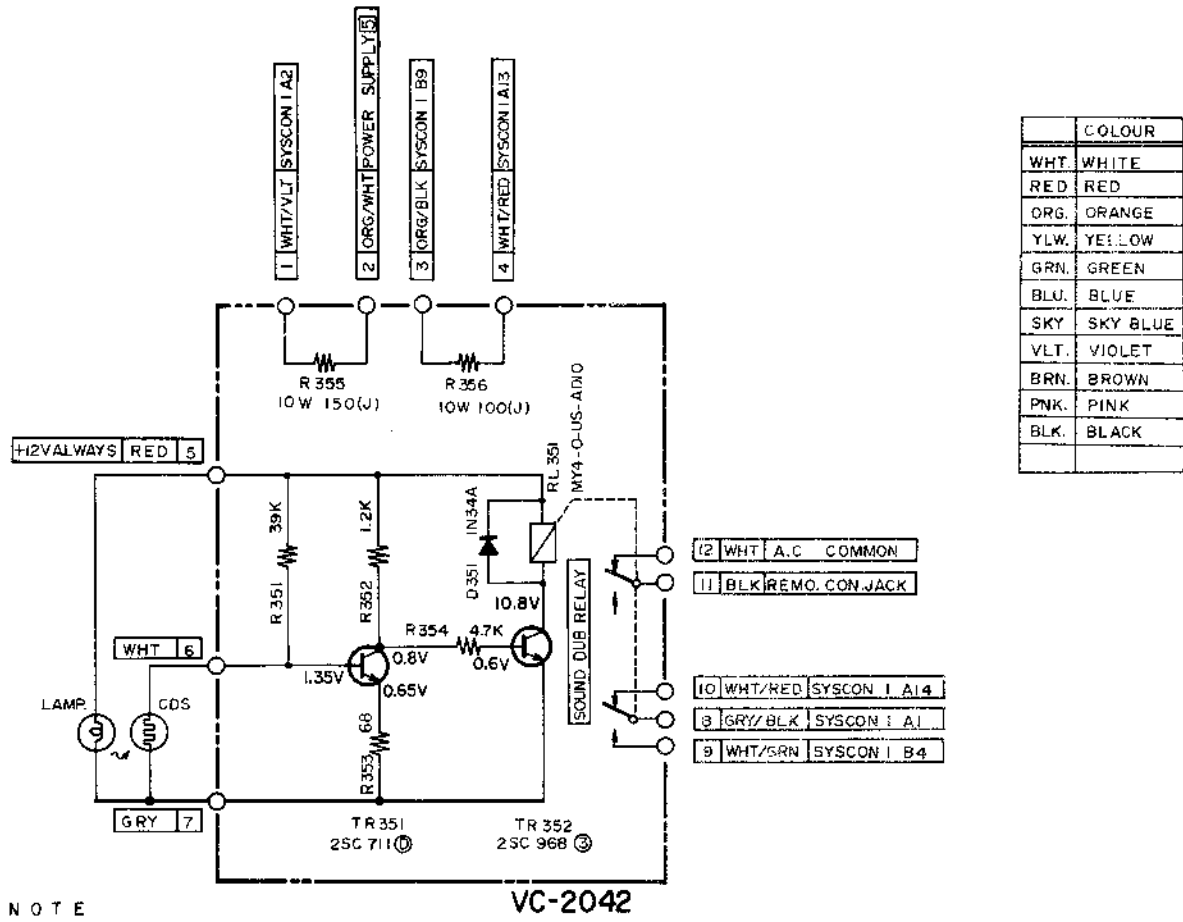
AUDIO I, II

1	12V BIAS	GRN
2	AUDIO REC	BRN
3	R B S	YLW/GRN
4	AL	RED
5	PB	PNK
6	SOUND D	YLW
7	G	GLY
8	12V REC STOP	YLW/GRN

VIDEO, AUDIO CONNECTION
RF ADAPTOR J5, C

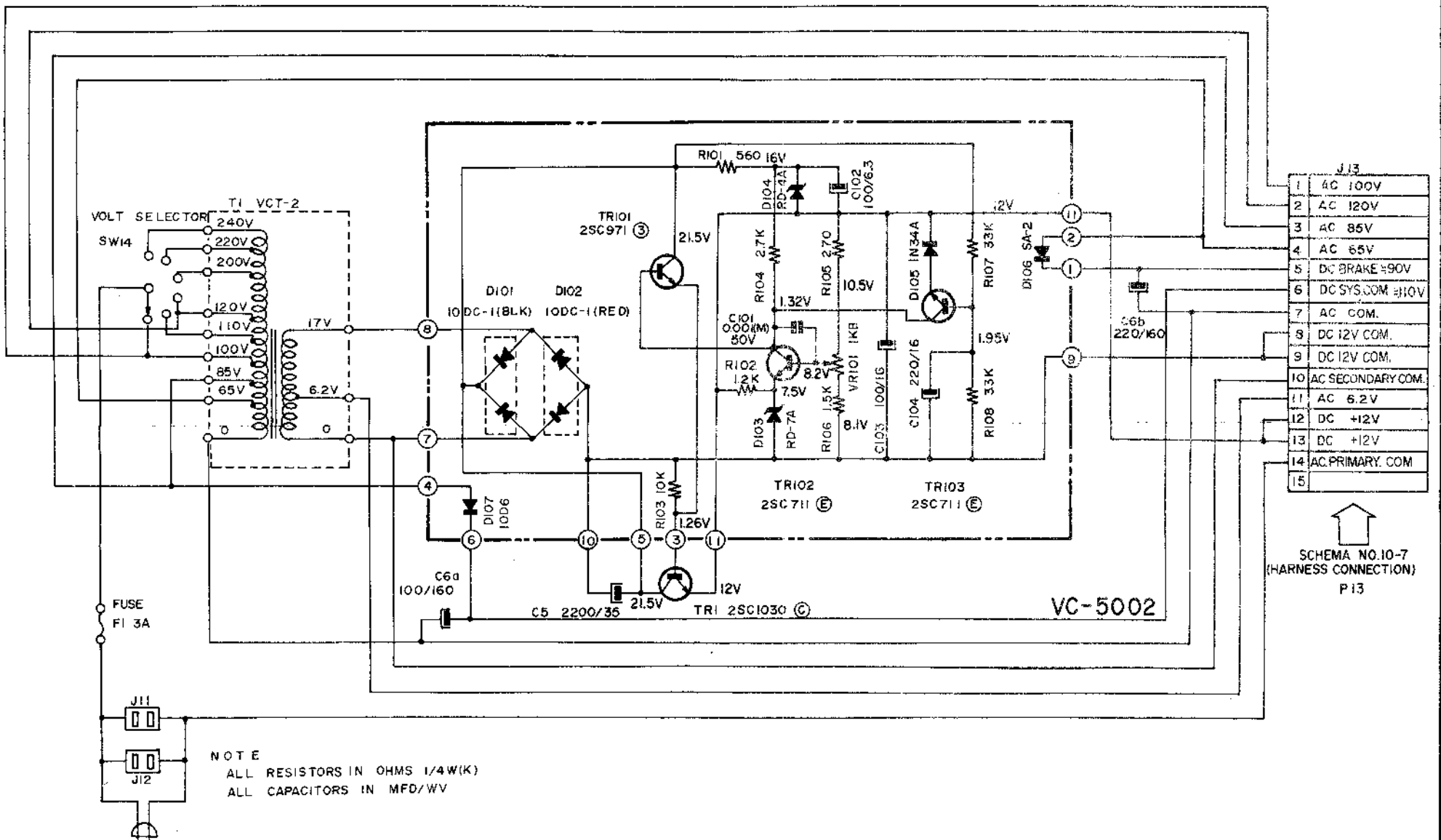
NOTE
ALL RESISTORS IN OHMS
ALL CAPACITORS IN MFD/WV.

VT-700
HARNESS CONNECTION
SCHEMATIC DIAGRAM
NO. 10-7 1420610A



NOTE
 UNLESS OTHERWISE SPECIFIED,
 ALL RESISTORS IN OHMS 1/4W (K).
 SEE SCHEMA NO. 10-7 (HARNESS CONNECTION)
 IF NUMBER (1) ~ (2) IS SHOWN.

VT-700 SYS. CON. II SCHEMATIC DIAGRAM
 AUTOMATIC STOP CIRCUIT. No.10-9 1420612A



NOTE
 ALL RESISTORS IN OHMS 1/4W(K)
 ALL CAPACITORS IN MFD/WV

VT-700 POWER SUPPLY SCHEMATIC DIAGRAM
 No.10-10 1420613A