

SERVICE MANUAL

AKAI TAPE RECORDER

MODEL

1700

AND

1710

TABLE OF CONTENTS

I	SPECIFICATIONS	1
I	HOW TO MEASURE DESIGNATED VALUES OF SPECIFICATIONS	2
II	LOCATION OF CONTROLS	3
IV	DISASSEMBLY OF TAPE TRANSPORT UNITS AND AMPLIFIERS.....	4
V	TRANSPORT MECHANISM	6
VI	ADJUSTMENT OF TAPE TRANSPORT UNIT	9
VI	ADJUSTMENT OF AMPLIFIER	10
VII	MAINTENANCE PROCEDURES	11
IX	LIST OF REPLACEMENT PARTS	12
X	EXPLODED VIEW OF COMPONENT PARTS	14
XI	TROUBLE SHOOTING CHART	21
XII	SCHEMATIC DIAGRAM	25
XII	CONNECTING DIAGRAM	26

I SPECIFICATIONS

MODEL

NUMBER: Akai Model 1700, portable 4-track stereo tape recorder.

WEIGHT (NET

IN CARTON): 33 lbs (15 kg) without accessories.

DIMENSIONS : 13-1/2" (H) × 13-1/2" (W) × 9" (D) case closed.

POWER RE-

QUIREMENTS: A. C. 100, 110, 120, 200, 220 or 240 volts interchangeable. 50-60 cycles.

POWER CON-

SUMPTION: 80 VA.

RECORDING

SYSTEM: Inline 4 track stereo and 4-track monaural recording.

PLAYBACK

SYSTEM: Inline 4-track stereo, monaural playback.

TAPE SPEED : Three speeds; 7-1/2" (19 cm), 3-3/4" (9.5 cm) and 1-7/8" (4.75 cm) per second. (15" per second with an optional accessory capstan and pinch wheel.)

TAPE SPEED

DEVIATION: Less than ± 3 per cent at all tape speeds.

WOW AND

FLUTTER: Less than 0.2 % at 7-1/2 ips. R.M.S.
Less than 0.3 % at 3-3/4 ips. R.M.S.
Less than 0.45 % at 1-7/8 ips. R.M.S.

FAST FORWARD AND REWIND

TIME: 150 seconds for 1,200 ft. tape at 50 cycles and 120 seconds at 60 cycles.

FREQUENCY

RESPONSE: 40 to 18,000 cps. at 7-1/2 ips;
± 3 db. 80 to 12,000 cps. at 7-1/2 ips;
± 3 db. 80 to 10,000 cps. at 3-3/4 ips;
± 4 db. 80 to 4,000 cps. at 1-7/8 ips.

DISTORTION : Within 4 % at 1,000 cps, 0 VU (total harmonic)

SIGNAL-TO-

NOISE RATIO: 40 db below recorded level signal at all speeds.

CROSS TALK : Within 55 db between each track.

CHANNEL

SEPARATION: Better than 80 db at 1,000 cps +3 VU.

POWER INPUT

LEVELS: Microphone input level
-55 db (VR. max.) at 1,000 cps.
Phono and radio input level
-40 db (VR. max.) at 1,000 cps.

POWER

OUTPUT: Pre-Amplifier output, 0.7 V at 1,000 cps, impedance more than 100 K ohms.
Main output, 34 dbm. up (in 600 ohms).

INSULATION

RESISTANCE: More than 50 MEG ohms.

INSULATION

YIELD

STRENGTH: More than one minute at A. C. 1,000 V.

MONITORING

SYSTEM: With headphone during recording.

MOTOR

: Condenser starting induction two-speed motor.
1/100 HP. Power factor, 70 per cent.
2,900 to 1,450 r.p.m. at 50 cps,
3,480 to 1,740 r.p.m. at 60 cps.

HEADS

: Inline 4-track stereo/monaural record-play head;
Impedance... 3,500 ohms ± 10 % at 1,000 cps.
4-track erase head;
Impedance... 4,000 ohms ± 15 % at 90 kc.

MICROPHONE

USED: Round dynamic microphone
Impedance... 50,000 ohms
Sensitivity... -55 db.
Frequency Response... 70 to 15,000 cps ± 10 db.

SPEAKER

INCLUDED: Two 5" × 7" dynamic speakers.
Impedance... 8 ohms
Allowable Input... 6 watts
Frequency Response... 80 to 12,000 cps, ± 10 db.

TUBES USED : 12AT7 × 2, 6BM8 × 2.

SILICON

DIODE USED: 150D × 2

REELS USED : Up to 7" reel

RECORDING

LEVEL

INDICATOR: Horizontal, A-model VU meter.

II HOW TO MEASURE DESIGNATED VALUES OF SPECIFICATIONS

TAPE SPEED

DEVIATION: Record the 1,000 cps. sine curve of the tape speed at rating speeds with a standard sound recorder (AMPEX 351A, for instance) which is little affected by the tape speed deviation throughout the whole length of the tape. Put this standard tape on the tape recorder under test for playing back, and measure its output by a counter, then convert the value into rating power frequency to evaluate the tape speed deviation.

For a rough measurement, the tape speed deviation can also be measured with a testing tape for speed by a stop watch.

WOW AND

FLUTTER: Playback the 3,000 cps. standard tape that guarantees wow and flutter within 0.07 per cent, and read the effective value on wow meter.

Since the sensibility of wow and flutter frequency below 2 cps. and above 5 cps. drops, the frequency over 5 cps. is put to 3 db/OCT circuit, and the frequency below 2 cps. is put to 6 db/OCT circuit for adjustment. This adjusted value is called auditory compensated value.

FREQUENCY

RESPONSE: Connect to the input terminal of the recorder, record a sine curve sweep (OVERALL FREQUENCY RESPONSE) frequency at 100 cps -10 db, from Audio Frequency Oscillator.

Adjust tone volume to flat, playback the tape by connecting VTVM to speaker output then read the frequency response to adjust a maximum deviation of 6 db.

TOTAL HARMONIC DISTORTION

FACTOR: Provide the input terminal of the recorder with 1,000 cps. sine curve signals and record these signals on a recording tape at the zero level on the recorder's VU meter.

Then playback the signals under the normal recording condition to measure the distortion factor by an oscillator. Remove the recording tape from the recorder, then read the noise level on the oscillator to get the required distortion factor by the following formula:

$$d_0 = d - d_1 - d_2$$

d_0 ...required

d ...overall distortion factor

d_1 ...noise level

d_2 ...distortion factor of the oscillator used

SIGNAL TO

NOISE: Playback the sine curve, 250 cps. tape recorded on a standard recorder on the recorder to measure the voltage. Remove the tape, then measure the noise level under the same condition. Calculate the ratio between the two in decibel.

OUTPUT:

Playback on the recorder the 1,000 cps. sine curve tape which was recorded at the zero VU level on a standard recorder. Terminate the test recorder with eight ohms.

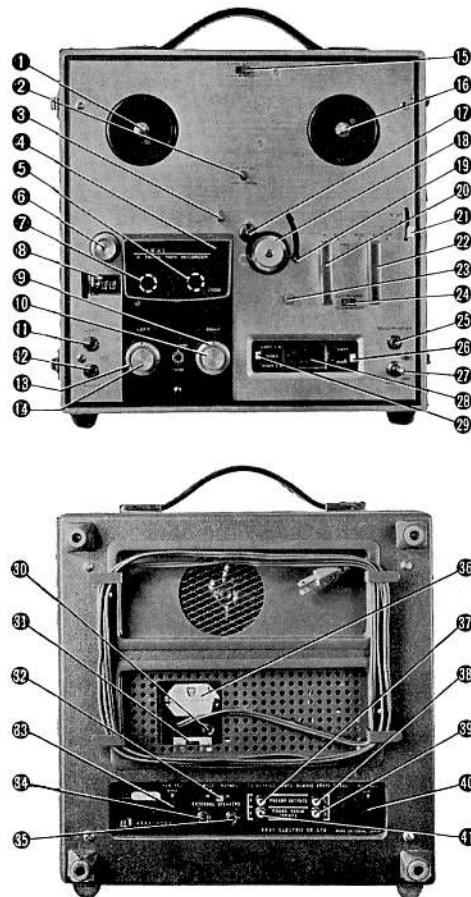
Square the voltage reading, then divide the figure by eight ohms to get the r.m.s. power output.

CROSS TALK:

Record 1,000 cps. signal at +3 VU on the third track, then playback this signal through a 1,000 cps. Band Pass Filter.

Compare the output of tracks 1 and 3 in decibels.

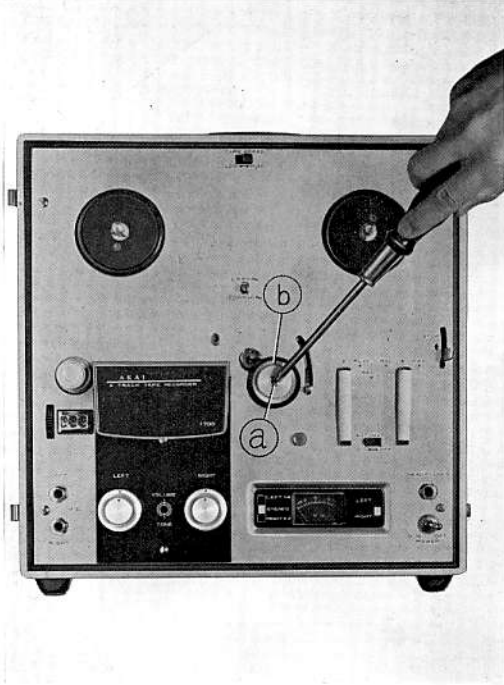
III LOCATION OF CONTROLS



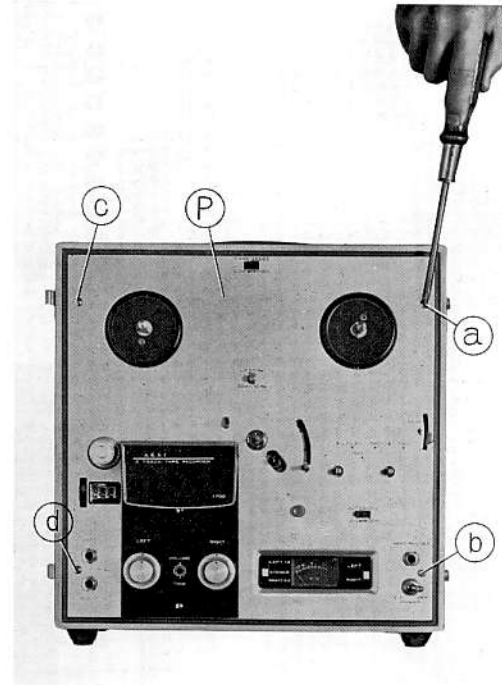
- | | |
|---------------------------------------|-----------------------------------|
| ① Supply reel shaft | ②② Rewind/Fast-forward switch |
| ② Cycle conversion switch | ②③ Record safety button |
| ③ Capstan storage post | ②④ Automatic stop switch |
| ④ Head cover | ②⑤ Stereo headphone jack |
| ⑤ Record/Play head | ②⑥ VU meter conversion switch |
| ⑥ Tape guide | ②⑦ Power switch |
| ⑦ Erase head | ②⑧ VU meter |
| ⑧ Index counter | ②⑨ Track selector switch |
| ⑨ Right channel volume control | ③⑩ Fuse post |
| ⑩ Right channel tone control | ③① Cycle conversion switch |
| ⑪ Left channel microphone input jack | ③② Speaker switch |
| ⑫ Right channel microphone input jack | ③③ Hum adjust (right) |
| ⑬ Left channel volume control | ③④ Speaker output jack (right) |
| ⑭ Left channel tone control | ③⑤ Speaker output jack (left) |
| ⑮ Speed change switch | ③⑥ Voltage selector switch |
| ⑯ Take-up reel shaft | ③⑦ Preamp output jack (right) |
| ⑰ Capstan shaft | ③⑧ Preamp output jack (left) |
| ⑱ Pinch wheel | ③⑨ Phono/Radio input jack (left) |
| ⑲ Automatic stop lever | ④⑩ Hum adjust (left) |
| ⑳ Record/Play switch | ④⑪ Phono/Radio input jack (right) |
| ㉑ Instant stop lever | |

IV DISASSEMBLY OF TAPE TRANSPORT UNITS & AMPLIFIERS

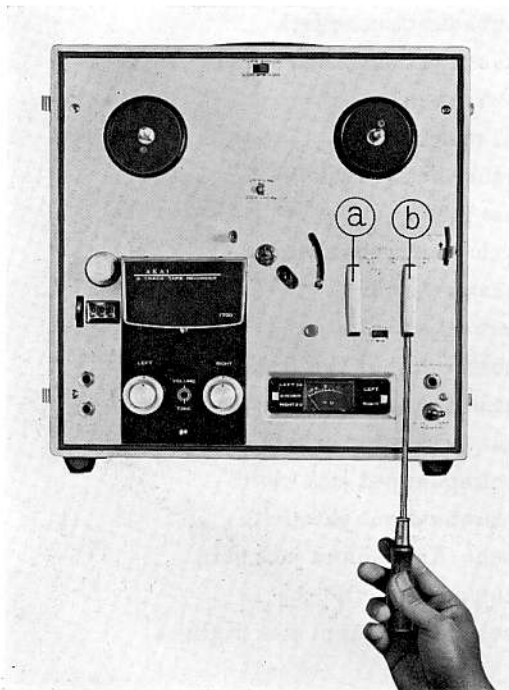
- (1) Loosen the RETAINING SCREW (a) of PINCH ROLLER (b) using a phillips-headed screw driver to remove the PINCH ROLLER (b).



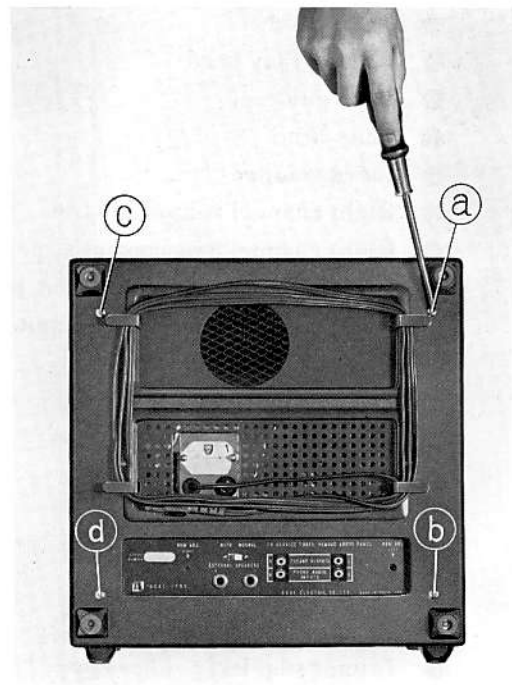
- (3) Loosen the SCREWS marked from (a) to (d) in order to remove DECK PANEL (P).



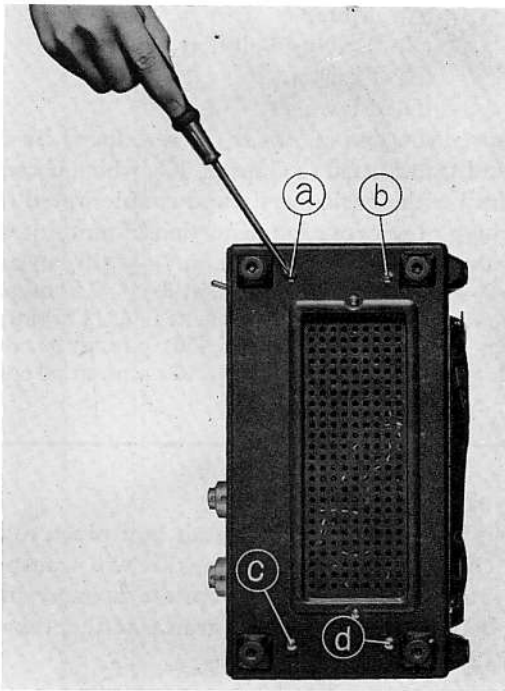
- (2) Remove the DECK CONTROL KNOBS (a) and (b) by loosening their retaining screws using a phillips-headed screw driver.



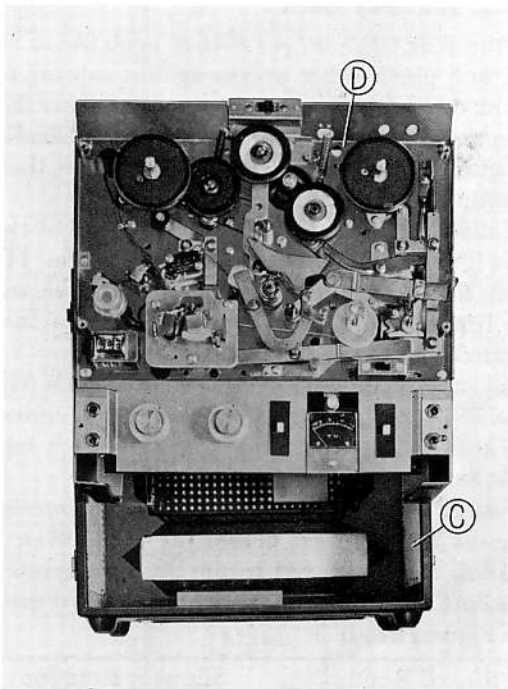
- (4) Loosen the SCREWS marked from (a) to (d).



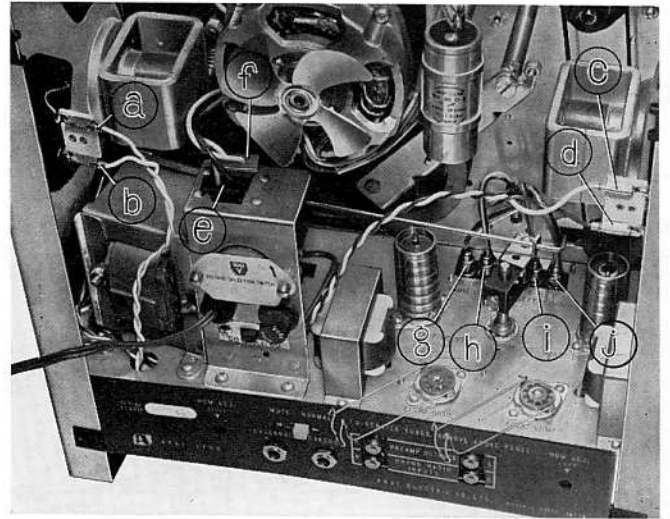
(5) Loosen the SCREWS marked from (a) to (d).



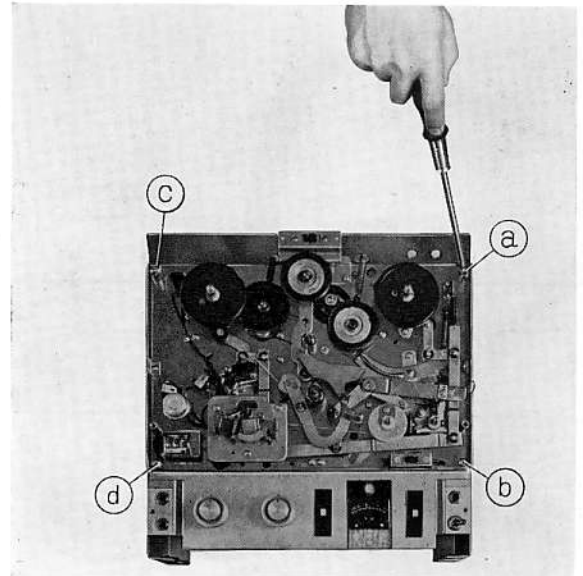
(6) Lift TAPE DECK and AMPLIFIER (D) from the cabinet (B).



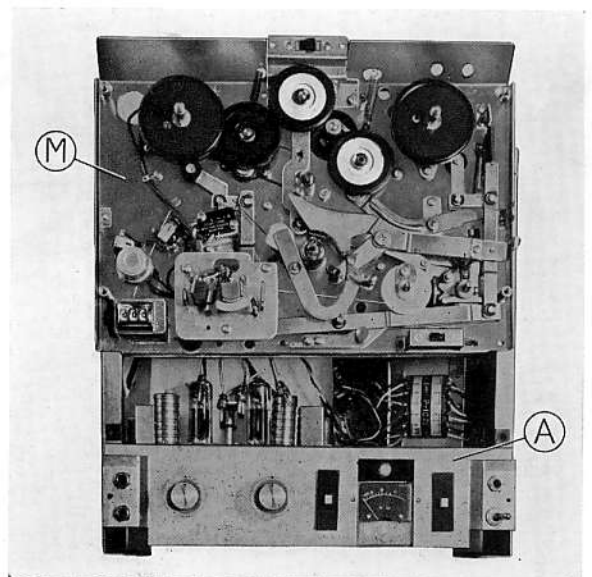
(7) Disconnect the PINS of speaker marked (a) and (d), the PLUGS of motor marked (e) and (f) and the PINS of head marked (g) and (j).



(8) Loosen the RETAINING SCREWS of deck frame marked from (a) to (d)



(9) Separate TAPE DECK (M) from AMPLIFIER (A).



V TRANSPORT MECHANISM

Driving of Capstan

Figure 1.

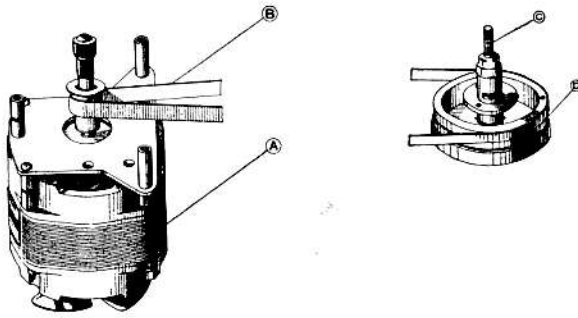


Fig. 1

- (A) Motor
- (B) Driving Belt (flat belt)
- (C) Capstan
- (D) Flywheel

High-speed rotation of *Motor* (A) is reduced by *Driving Belt* (B) and transmitted to *Capstan* (C), which is connected to *Flywheel* with ample inertia and enables rated rotation by absorbing minor rotation distortion of motor itself.

Capstan Rotation	606 r.p.m. at 7-1/2" (19 cm) per sec.
	303 r.p.m. at 3-3/4" (9.5 cm) per sec.
	151.5 r.p.m. at 1-7/8" (4.75 cm) per sec.
Motor Rotation	2,900 to 1,450 r.p.m. at 50 cps.
	3,480 to 1,740 r.p.m. at 60 cps.

Driving of Pinch Roller

Put tape between rotating capstan and pinch roller and push pinch roller against capstan, this will transport the tape at rated speed. The appropriate pressure of pinch roller is between 1,000 to 1,150 grams at the tape speed of 7-1/2" (19 cm) per second.

Recording and Play Back

Turn the *RECORD, PLAYBACK* knob (A) to "PLAY" position, and pinch roller presses against capstan to move tape at the rated speed. At the same time, *Idler* (B) moves between *Motor Bushing* (C) and the *Take-Up Reel Spindle* (D) to transmit the motor rotation to (D) so that the tape is moved and wound on the take-up reel.

The *Take-Up Reel Spindle Base* is made up of two plastic rollers (1 and 2) with a clutch felt in between. The *Idler* is rotating the plastic roller (2) under. Therefore, the tape-winding friction is adjusted by the slipping of the felt to enable rated winding of the tape.

On the other hand, the *Supply Reel Spindle* (H) has a *Brake roller* (E) hung on the *Plastic Roller* (4) under which provides appropriate back tension by the clutch felt slipping to the rotation of the *Pulley* (3) above.

To prevent accidental erasure, the *Record Interlock Button* (F) must be depressed before the *RECORD, PLAYBACK* knob can be moved to the "REC" position. The *Safety device* (G) is depressed to enter the record mode.

(See Figures 2 and 3)

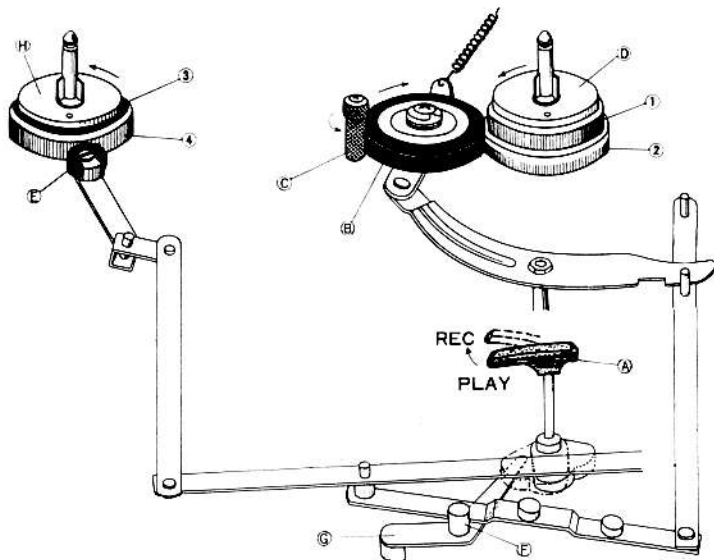


Fig. 2

Braked Rotation Slipping Rotation

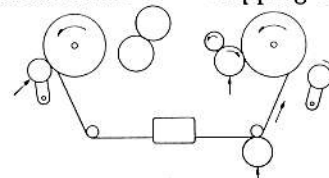


Fig. 3

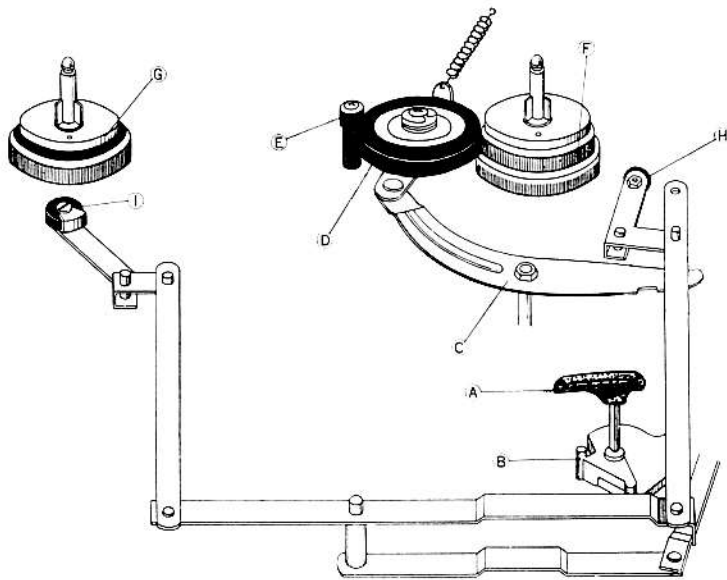


Fig. 4

FAST-FORWARD MECHANISM

Turn the *FAST FWD-REWIND knob (A)* to "FAST FWD" position, and the *cam (B)* under the knob pushes up the *Lever (C)*. The *Idler (D)* moves into the space between the *Plastic Roller (F)* above the *Take-Up Reel Spindle* and the upper part of the rotating motor drive bushing to transmit the motor rotation to the take-up reel spindle. At the same time, *Brake Rollers (H)* and *(I)* come off the reel spindle to free the *Supply Reel Spindle (G)*, thereby allowing fast winding of the tape onto the take-up reel.

(See Figures 4 and 5)

Free Rotation High-Speed Rotation

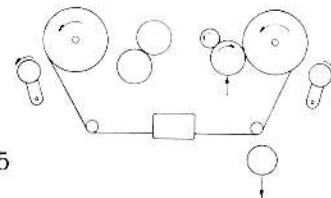


Fig. 5

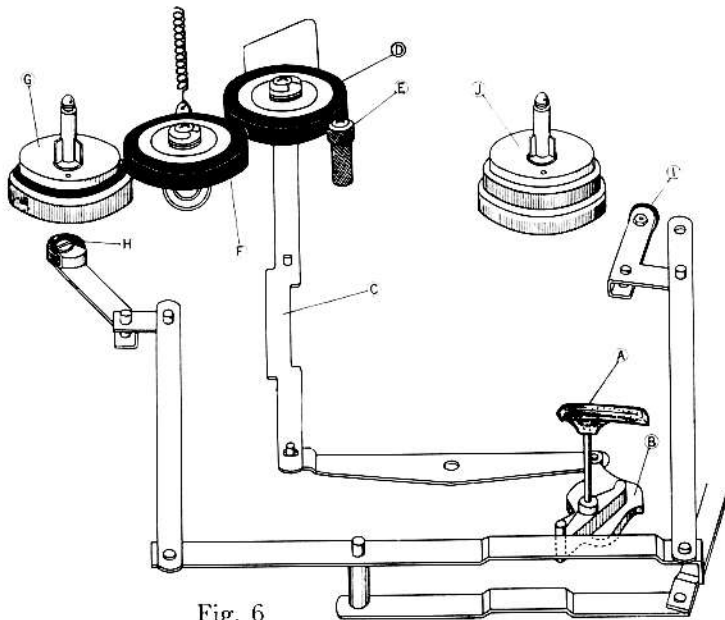


Fig. 6

REWIND MECHANISM

Turn the *FAST FWD-REWIND knob (A)* to "REWIND" position, and the *cam (B)* under the knob pushes the *Lever (C)* up. The *Idler (D)* moves into the space between the upper part of the rotating *Motor drive bushing (E)* and the *Intermediate Pulley (F)* to transmit the high-speed rotation of the motor through the intermediate pulley to the *Supply Reel Spindle (G)*. At the same time, *Brake Rollers (H)* and *(I)* come off the reel spindle to free the *take-up reel spindle (J)*, thereby rewinding the tape into the supply reel at a fast speed.

(See Figures 6 and 7)

High-Speed Rotation Free Rotation

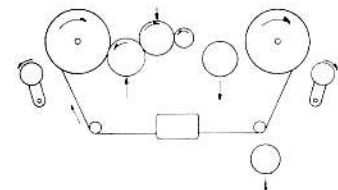


Fig. 7

Modes of Operation	Pinch Roller	Take-up Idler Wheel	Rewind Idler Wheel	Take-up-side Brake	Supply side Brake
(a) STOP	×	×	×	○	○
(b) FAST-FORWARD	×	○	×	×	×
(c) REWIND	×	×	○	×	○
(d) RECORDING PLAYBACK	○	○	×	×	×

NOTES: ×-marks indicates "open" and ○-marks "engaged"

STOP CONTROL

Push the stop lever to "STOP" position, *Brake Rollers (A)* and *(B)* depress reel spindles to stop rotation of the reel spindles.

As the brake rubber depresses the plastic rollers under the reel spindles, no friction works on the tape itself.

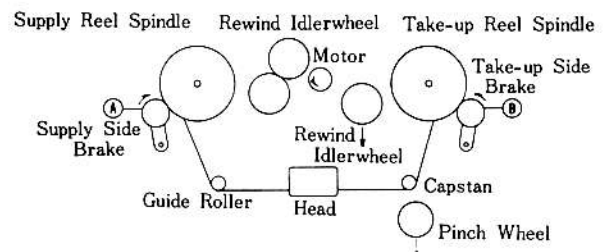


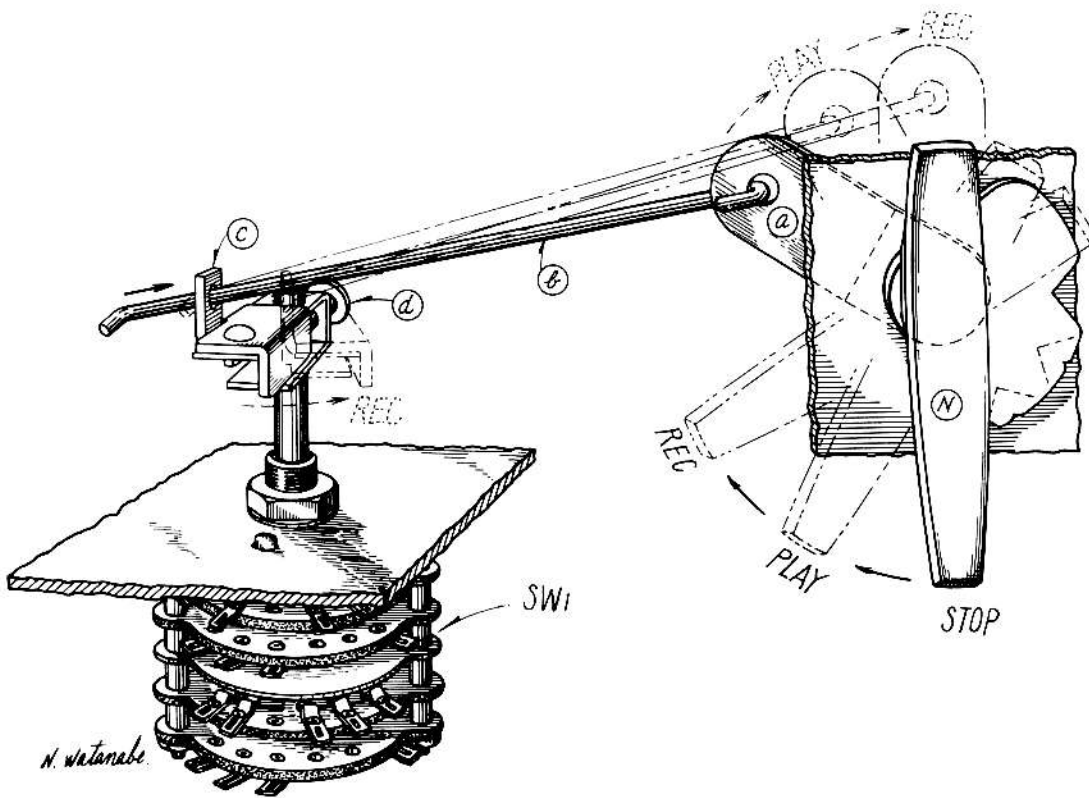
Fig. 8

RECORD/PLAYBACK CHANGING MECHANISM

By turning the RECORD/PLAYBACK KNOB (N) to the recording position, the LEVER (a) pulls the RECORDING LEVER (b) and (c), as illustrated in dotted line, then the RECORD/PLAYBACK CHANGE SWITCH (SW1) turns to recording position.

If the LEVER (c) does not turn properly, SW1 does not operate properly so may occur the abnormal oscillation and also can't record.

Then must adjust the LEVER (c) to proper position by loosening the SCREW (d).



VI ADJUSTMENT OF TAPE TRANSPORT UNIT

1. ADJUSTMENT OF PINCH WHEEL

It is important that the pinch wheel shaft is kept in complete alignment with the capstan shaft. A proper pinch wheel pressure is between 1,000 and 1,150 grams when the unit is operated at the tape speed of 7-1/2 ips. Any deviation from this specification will result in wow and flutter. Check pinch wheel pressure by a spring scale and, if necessary, adjust the pinch wheel load spring.

2. ADJUSTMENT OF TAKE-UP IDLER WHEEL

The take-up idler wheel must be kept in complete alignment with the take-up reel shaft. When the unit is set in fast forward condition, the idler wheel will contact to the upper knurled wheel of the take-up reel shaft assembly, and it will contact to the lower knurled wheel during record or play mode. Adjust idler wheel load spring so that the idler wheel pressure is kept between 50 and 80 grams. The idler wheel rapidly wears if the pressure is excessive. The slippage occurs if the pressure is smaller than the specification.

3. ADJUSTMENT OF REWIND IDLER WHEEL

The rewind idler wheel must be kept in complete alignment with the rewind reel shaft. The amount of pressure to the knurled motor bushing should be maintained about 50 grams during rewind operation. Adjust both the idler load spring and rewind roller.

4. ADJUSTMENT OF INTERMEDIATE WHEEL

The intermediate wheel is located between the rewind idler wheel and the rubber ring which is used on the upper part of the supply reel shaft assembly. When the unit is set in rewind mode, it will contact to these parts simultaneously delivering torque of motor. An adequate pressure is 50 grams. Adjust the load spring of the intermediate wheel if the pressure is not sufficient.

5. ADJUSTMENT OF TAKE-UP REEL SHAFT ASSEMBLY

A felt clutch material is attached to the bottom side of the reel table base plate so that recording tape will not be stretched during fast forwarding operation due to excessive tension. To check the amount of friction of this part, place a 5-inch reel with recording tape wound by 60 m/m in diameter, and gently pull the end of tape upward using a spring scale. Adjust the conical spring so that the amount of tension at this part will be kept between 400 to 500 grams. Another felt clutch material is attached to the take-up drive wheel. It is to provide proper slipping operation during record or play mode. The procedure for checking friction of this part is same as the foregoing, and between 120 and 200 grams of friction will provide the best result. Adjust the star-shaped spring just under the take-up drive wheel. When the unit is set in rewind mode, the amount of friction of this part will greatly be reduced and will become 10 to 20 grams. Check to see whether this is satisfactory if not, readjust the star-shaped spring for Brake, and spring retainer washed accordingly. (See figure 11 (a) at left)

6. ADJUSTMENT OF SUPPLY REEL SHAFT ASSEMBLY

A felt clutch material is used between the lower side of the reel table base plate and the rewind rubber ring to protect recording tape from an excessive tension while rewinding operation. To check the amount of friction of this part, place onto the supply reel table a 5-inch reel with recording tape wound by 60m/m in diameter and gently pull the end of tape upward by a spring scale. Adjust the conical spring so that the amount of tension is kept between 400 and 500grams. Another felt clutch is attached to the rewind drive wheel to provide proper slipping operation during record or play mode. The procedure for checking friction of this part is same as the foregoing, and between 80 and 120 grams of friction will give the best result. When the unit is set in fast forward mode, the amount of friction will greatly be reduced and will become 10 to 20 grams.

Check to see whether this is proper, if not, readjust coil spring and spring retainer washer.

(See figure 11 (b) at left)

7. ADJUSTMENT OF TAPE HEAD

A vertical azimuth alignment of tape head is the only adjustment that can be made at the field of service. To align tape head, play 8,000 cycles recorded on an Ampex standard alignment tape. Rotate the azimuth alignment screw until a maximum playback level through the small hole which is positioned on the shield cover of the tape head assembly.

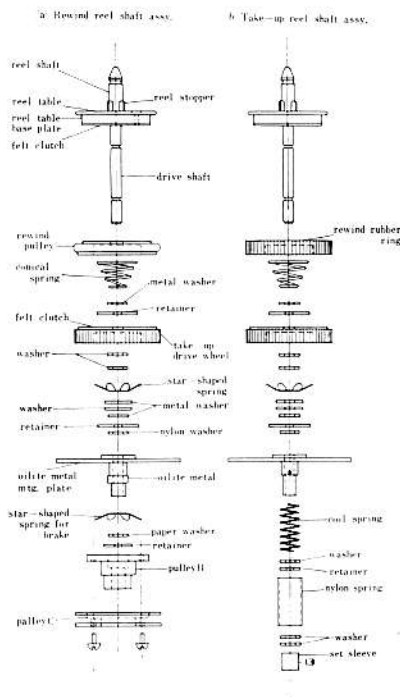


Fig. 11

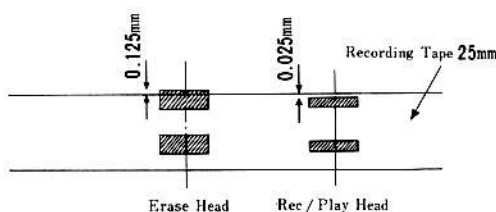


Fig. 12

VII ADJUSTMENT OF AMPLIFIER

1. ADJUSTMENT OF RECORDING BIAS FREQUENCY

Recording/erasing bias frequency was set at 90 KC plus or minus 5 KC before shipment. It is decided by inductance of the oscillator coil (part # 17-L₁) and its resonant capacitor (part # C-17). To measure recording bias frequency, insert a 10 or 100 ohm resistor in series to the record/play head and connect vertical input terminals of an oscilloscope as shown in the Fig. 13. Another testing instrument to be prepared is an audio frequency oscillator and its output should be connected to horizontal input terminals of the oscilloscope. Vary frequency generated by the audio frequency oscillator around 90 KC, and set the oscillator at the point where a desirous figure appears on the oscilloscope. The recording bias frequency now corresponds to the reading of the oscillator. Check oscillator coil, C-17 and bias head if the recording bias frequency measured is not within 90 KC \pm 5 KC.

2. ADJUSTMENT OF RECORDING BIAS VOLTAGE

A proper recording bias voltage is 45 volts \pm 3 volts A.C. and is adjusted by C16. To measure recording bias voltage, connect a V.T.V.M. (Vacuum Tube Volt Meter) to the record/play head as shown in the Fig. 14.

Check C16 (included AK 13) and record/play head if the recording bias voltage measured does not meet to the above-mentioned specification.

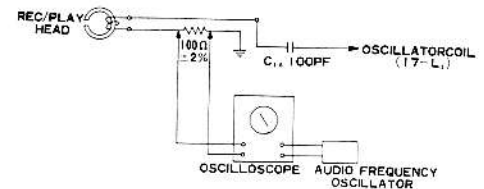
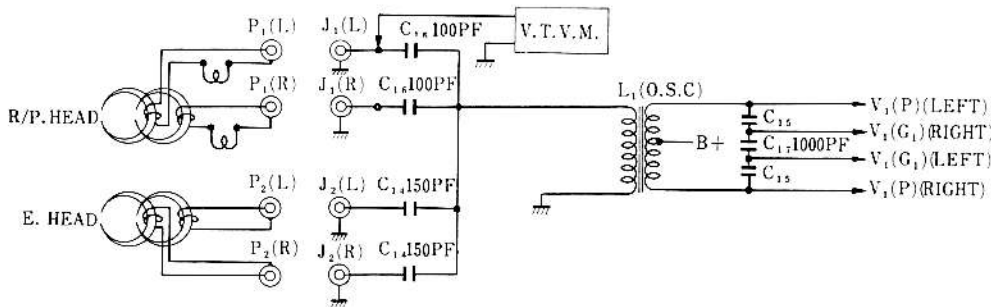


Fig. 13

3. ADJUSTMENT OF ERASING BIAS VOLTAGE

A proper erasing bias voltage is 65 volts \pm 5 volts A.C. and is adjusted by C14. To measure erasing bias voltage, connect a V.T.V.M. to the erase head as shown in the Fig. 15.

Check C14 and erase head if the erasing bias voltage measured does not meet to the above-mentioned specification.

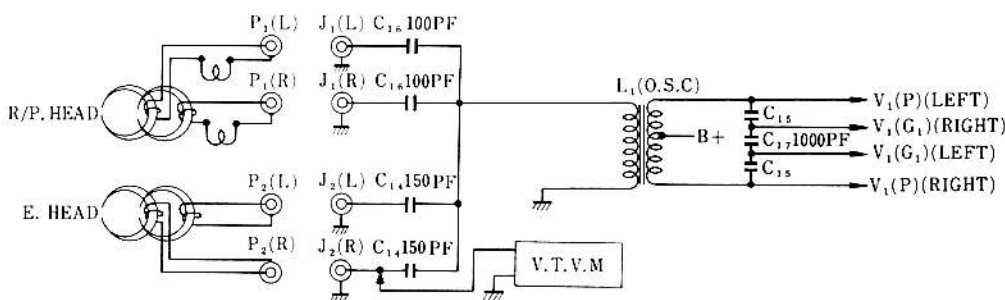


Fig. 15

4. ADJUSTMENT OF RECORDING LEVEL

A basic recording level, referred to as "0 VU", set at the point where current of 30 μ A \pm 10 % flows to the recording head at 1,000 cycles. The VU meter indicates 0 VU \pm 2 VU when a signal of -55 db \pm 5 db at the microphone jack or -40 db \pm 5 db at the line input jack when the volume control set at its maximum.

Adjustment of recording level can be accomplished by varying sensitivity of VU meter, however, it is not necessary to make in a field of service as all VU meters have correctly been calibrated at factory before shipment. (See Fig. 16 for details.)

NOTE: Make sure to stop oscillation by disconnecting the oscillator coil # 17-L₁ at the points marked "P" and "G" prior to measurement of recording level.

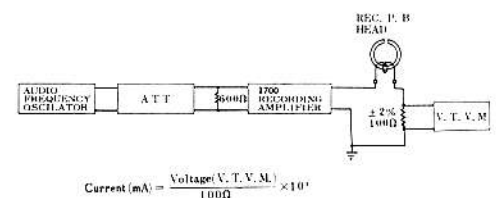


Fig. 16

VIII MAINTENANCE PROCEDURES

1. LUBRICATION INSTRUCTION

For maximum service life and optimum performance, lubricate the parts identified below after each 500 hours of operation. Use only light machine oil of good quality

Motor	3 drops
Drive Capstan Shaft	2 drops
Rewind Idler Wheel Bearing and Wind take-up Idler Bearing.	1 drop
Intermediate Idler Bearing	1 drop
Pinch Wheel Bearing	2 drops
Take-up and Supply Reel Shaft Bearing &	2 drops

Also apply a liberal film of light machine grease to each roller surface of all levers and cams.

CAUTION: DO NOT OVER-LUBRICATE. WIPE OFF EXCESS OIL BY A COTTON SWAB SOAKED IN ALCOHOL. OTHERWISE, THE OVER-FLOWED LUBRICANT MAY BE SCATTERED DURING OPERATION. THE RUBBER COMPONENT PARTS WILL BE DETERIORATED.

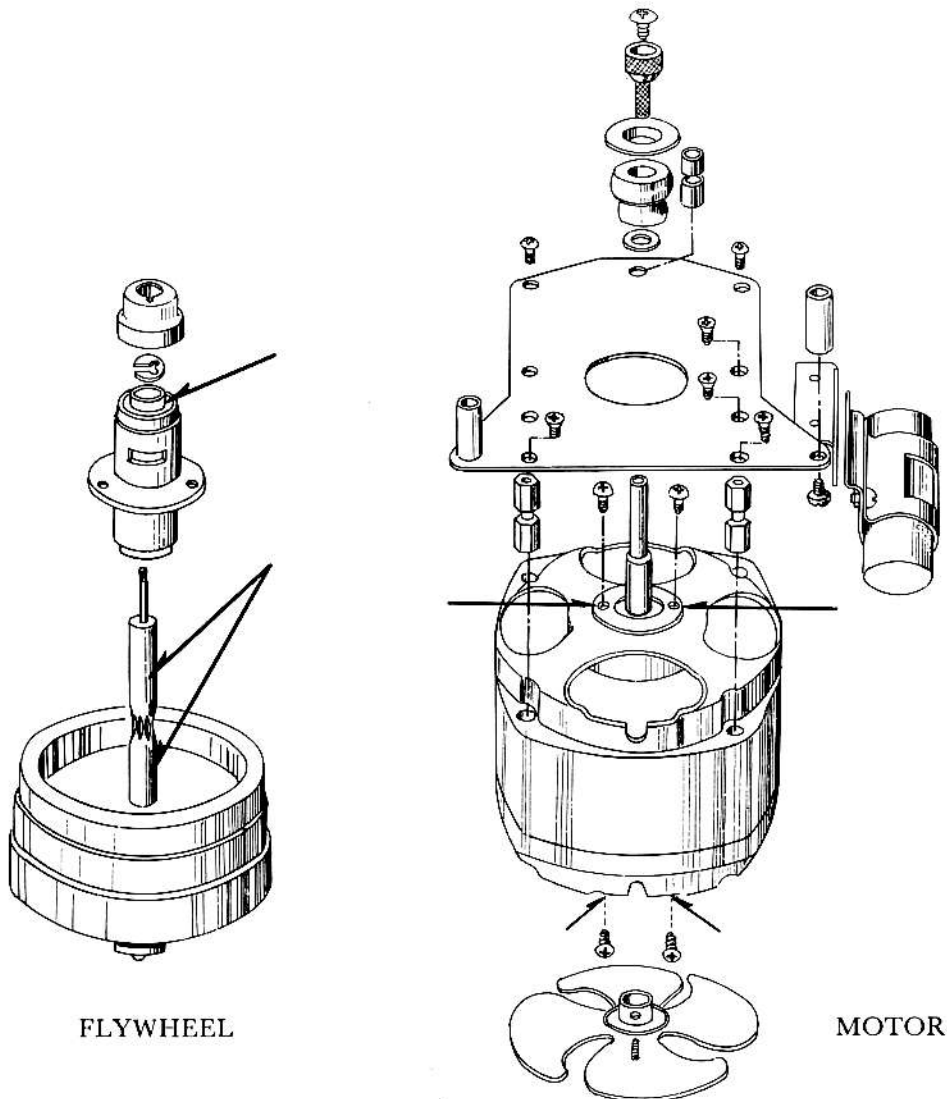


Fig. 17

2. CLEANING TAPE HEADS AND OTHER PARTS

Wipe surface of tape heads, guide roller bearing, capstan bushing and pinch wheel periodically with a soft cloth soaked in alcohol or carbon-tet.

IX LIST OF REPLACEMENT PARTS

Parts No. Nomenclature

TOP PANEL

171-001 Deck Panel

002 Head Cover

003 Frame, Head Cover

004 Capstan Rest

004a Capstan Holder

005a Table A, Tape Guide

005b Washer

005c Table, Washer

005d Washer

005e Bearing (635JZZ)

005f Washer

005g Table, Washer

005h Washer

005i Table B, Tape Guide

005j Prop, Tape Guide

006 Plate

DECK FRAME

172-001 Deck Frame

002 Head Assembly, Complete

002a Erase Head

002b Record/Playback Head

002c Screw Flat Mould 4×8

002d Prop A, Head

002e Prop C, Head

002f Screw Flat Mould 4×8

002g Screw Flat 4×8

003 Index Counter, Complete

003a Pulley, Counter

003b Belt, Counter

003c Screw, Without Head 4×7.5

004 Supply Reel Assembly

004a Screw Flat 3×6

004b Plate, Reel Table

004c Reel Shaft A, Supply Reel

004d Rubber Ring

004e Rewind Pulley

004f Spring G, Left

004g Washer

004h Washer Pin, Large

004i Felt Washer

004j Take-up Roller, C

004k Holder, Reel Shaft
(Star Type Spring)

004l Washer

004m Washer

004n Washer

004o Washer Pin, large

004p Washer

004q Metal Fitting A, Reel Table

004r Holder, Reel Shaft
(Star Type Spring)

004s Washer

Parts No. Nomenclature

172-004t Washer Pin

004u Pulley, Reel Shaft

004v Screw, without Head

005 Take-up Reel Assembly

005a Reel Shaft A, Take-up Reel

005b Felt Washer

005c Take-up Roller, A

005d Spring G, Right

005e Deer Skin

005f Take-up Roller, B

005g Holder, Reel Shaft
(Star Type Spring)

005h Metal Fitting B, Reel Table

005i Spring, F3

005j Washer

005k Washer

005l Washer Pin

005m Nylon Spring

006a AS Lever, Complete

006b Plate, AS Lever, with AS
Lever Prop

006c Screw Bind 3×5

006d Washer Pin

006e 3 mm Ground Lug

007a Instant Stop Lever, A

007b Spring, Instant Stop Lever

007c Stopper, Instant Stop Lever

007d Screw Bind 3×5

007e Holder B, Instant Stop Lever

007f Screw Flat Mould 4×8

008a Recording Safety Button

008b Cam Stopper

008c Fiber, Cam Stopper

008d Insulator Plate, Cam Stopper

008e Screw Flat Mould 4×8

009a Pinch Wheel

009b Metal Cap, Pinch Wheel

009c Screw

009d Lever, Pinch Wheel

009e Shaft C, Pinch Wheel

009f 4 mm Nut

009g Shaft A, Cam Roller

009h Cam Roller B

009i Shaft, Pinch Wheel Lever

010a Lever, Take-up Brake

010b Take-up Brake Roller

010c Screw, Brake Roller

010d 3 mm Nut

010e Shaft, Take-up Brake Lever

010f Washer Pin

011a Lever, Supply Brake

011b Supply Brake Roller

011c Screw, Brake Roller

011d 3 mm Nut

011e Shaft, Supply Brake Lever

011f Washer Pin

012a Switch, Automatic Shut-off
(6P Slide Switch)

Parts No. Nomenclature

172-012b Plate, Automatic Shut-off
Switch

012c Screw Semi-Cubic 3×5

013a Micro Switch M-8-3

013b Holder, Switch

013c Screw Semi-Cubic 3×5

013d Screw Flat Mould 3×15

013e Washer

014a Switch, Speed Change
(6P Slide Switch NC)

014b Plate, Speed Change Switch

014c Screw Flat Mould 4×10

014d Cord Support

015a Idler Wheel

015b Washer

015c Washer Pin

016a Internal Wheel

016b Washer

016c Washer Pin

017a Lever, A

017b Shaft, Lever A

018a Lever, B

018b Cam Roller, A

018c Cam Roller, B

018d Washer Pin

019a Lever, C3

019b Washer Pin

019c Washer

020 Lever, D

021 Lever, E-2

022a Lever, FA

022b Cam Roller, A

022c Washer Pin

023a Lever, G

023b Holder, Lever G Metal

023c Stopper, Lever G

023d Lever G Metal

024a Lever, H-C

024b Idler Shaft, B

025a Lever K

025b Screw A

026a Lever F, for Motor

026b Fiber Washer

026c Washer Pin

027 Prop, Panel

028 Spring Pin, B

029 Spring Holder

030a Hum Bucking Coil, for Left
Channel

Parts No.	Nomenclature
172-030b	Hum Bucking Coil, for Right Channel
030c	Holder, Hum Bucking Coil
030d	Screw Semi.Cubic 3×22
032a	Lever, Belt Change
032b	Metal Fitting, Belt Change Lever
032c	Spring, Belt Change Lever
033a	Table, Lifter Pin
033b	Lifter Pin
033c	Spork, for Lifter
033d	Cam A, Head Lifter
033e	Cam B, Head Lifter
034a	Spring A
034b	Spring, UN-D
034c	Spring, D
034d	Spring, E
034e	Spring, Idler
034f	New Spring D
034g	Torsion Spring
034h	Spring, B
034i	Spring, Belt Change
034j	Spring B, Belt Change
173-001	Motor, Complete
001a	Screw Flat Mould 3×15
001b	Stepped Pulley
001c	Belt Holder
001d	Motor Pulley
001e	Oil Retainer
001f	Motor Holder
001g	Motor
001h	Motor Fan, D
001i	MP Condenser 2uf (260VAC)
001j	Holder, Motor Condenser
001k	Prop, Motor 8×22.5
001l	Prop, Motor 8×21.5
001m	Screw
001n	Screw
001o	Screw Flat Mould 4×50
001p	Screw, without Head 4×5
001q	Screw Bind 3×5
001r	Hexagonal Nut
174-001	Flywheel, Complete
001a	Capstan
001b	Main Metal Case
001c	Flywheel
001d	4 mm Ball Bearing
001e	Plate C, Flywheel
001f	Washer
001g	Washer
001h	Wing Nut
001i	Screw, Flywheel adjust
001j	Prop B, Flywheel
001k	Prop C, Flywheel
001l	Drive Belt
175-001	Switch Block
001a	Knob, Record/Playback & Rewind Fast Forward
001b	Screw

Parts No.	Nomenclature
175-001c	Cam A
001d	Cam B
001e	8 mm Ball Bearing
001f	Switch Table, A
001g	Lever, I
001h	Fast/Forward Rewind Shaft
001i	RC/Playback Rewind Shaft
001j	Pin
001k	Plate, Cam
001l	Spring, K
001m	Cam, C
001n	Switch Table, B
001o	Record/Playback Conversion Pin
001p	Spork Cam
001q	Washer
001r	Prop
001s	Screw Bind 3×5
001t	Screw
001u	Screw
001v	Screw
001w	Nut
CASE	
176-001	Cabinet, Complete
002a	Table, Rubber Foot
002b	Rubber Foot
002c	Screw Semi-Cubic 3×18
003a	Ventilator (Panel Escucheon)
003b	Screw Truss 6×12
004a	Ventilator, A
004b	Screw Truss 6×12
005a	Ventilator, B
005b	Screw Truss 6×12
006	Prop C, Reel
007	Russ Plate, Speaker
008a	Chassis A, Speaker
008b	Chassis B, Speaker
009a	Speaker 5×7"
009b	Screw Flat Mould 4×12
010	Speed Nut
AMPLIFIER	
17-A1	Amp. Chassis
A2	1700 Name Plate
A3	Amplifier Knob, A (Tone)
A4	Amplifier Knob, B (Volume)
A5	Angle, changing Voltage
A6a	Screw, without Head 4×6.5
A6b	Screw, without Head 4×11.5
A6c	Screw, Semi.Cubic 4×8
17-AK13	C.R. Compound Body
AK14	C.R. Compound Body

Parts No.	Nomenclature
17-C2	Mica Condenser 101J 500 WV
C3	Ceramic Condenser 0.02 P 500 WV
C4	Ceramic Condenser 0.02 P 500 WV
C5	Oil Paper Condenser 0.05 M 400 WV
C6	Ceramic Condenser 0.02 P 500 WV
C7	Ceramic Condenser 0.01 P 500 WV
C8	Ceramic Condenser 0.02 P 500 WV
C9	Ceramic Condenser 0.02 P 500 WV
C10	Ceramic Condenser 0.002 P 1 KWV
C11	Ceramic Condenser 0.02 P 500 WV
C12	Tubular Type Electrolytic Condenser 50 µf 25 WV
C14	Mica Condenser 101J 500 WV
C16	Mica Condenser 151J 500 WV
C18	Mica Condenser 500J 500 WV
C20a-b	Lug Terminal Type Electrolytic Condenser 40+40 µf 350 WV
C21	Tubular Type Electrolytic Condenser 40 µf 350 WV
C22	Tubular Type Electrolytic Condenser 20 µf 300 WV
C23	Tubular Type Electrolytic Condenser 10 µf 15 WV
C24	Tubular Type Electrolytic Condenser 10 µf 10 WV
17-R1	Fixed Resistor 1/4 P 500 KΩ
R2	Fixed Resistor 1/4 P 3 KΩ
R3	Fixed Resistor 1/4 P 2.2 MΩ
R4	Fixed Resistor 1/2 P 250 KΩ
R5	Fixed Resistor 1/2 P 100 KΩ
R6	Fixed Resistor 1/4 P 2 KΩ
R7	Fixed Resistor 1/2 P 250 KΩ
R8	Fixed Resistor 1/4 P 500 KΩ
R9	Fixed Resistor 1/4 P 20 KΩ
R10	Fixed Resistor 1/4 P 1 MΩ
R11	Flexible Resistor 1 W 8 Ω
R12	Fixed Resistor 1/4 P 200 Ω
R13	Fixed Resistor 1/4 P 10 KΩ
R14	Fixed Resistor 1/4 P 500 KΩ
R15	Fixed Resistor 1/4 P 500 KΩ
R16	Fixed Resistor 1/4 P 1 KΩ
R18	Wired Resistor 10WL 470 Ω
R19	Wired Resistor 10WL 470 Ω
R20	Fixed Resistor 1L 10 KΩ
R21	Wired Resistor 3WL 180 Ω
R22	Flexible Wired Resistor 3W 8 Ω
R23	Fixed Resistor 1/4 P 10 KΩ
R24	Fixed Resistor 1/4 P 500 Ω
17-VR1-2	Variable Resistor 1 M(A) 50K(A) Double VR
VR3	Wired Variable Resistor 1/2 W 100 Ω
VR4	Wired Variable Resistor 1/2 W 100 Ω

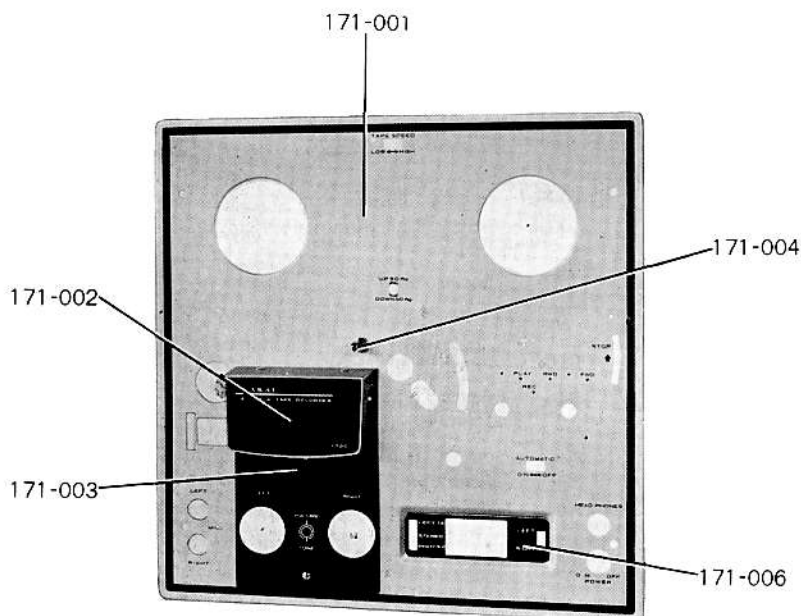
Parts No.	Nomenclature
17-SD1	Silicone Diode SM-150D
SD2	Silicone Diode SM-150D
17-F1	Fuse Post
F2	Fuse, 2 A
17-J1	2 Connective Pin Jack
J2	2 Connective Pin Jack
J3-5	2 Connective Pin Jack
J4	2 Pole E Jack
J6	2 Pole E Jack
J7	3 Pole E Jack
17-T1	Power Transformer
T2	Out-put Transformer
17-L1	Oscillator Coil
L2	Choke Transformer
17-M1	VU Meter
17-PL1	Pilot Lamp
PL2	Lamp Socket, Swan Type
17-SW1	Rotary Switch (Record/ Playback Conversion)

Parts No.	Nomenclature
17-SW2	6P Slide Switch, with White Knob (Meter Conversion)
SW3	6P Slide Switch, with White Knob (Speaker ON/OFF)
SW4	8P Slide Switch (Track Selector)
SW5	Toggle Switch (Power ON/OFF)
SW6	6P Slide Switch, with Black Knob (50/60 cycle change)
17-TB1	52L2 Lug Plate
TB2	42L1 Lug Plate
TB3	41L2 Lug Plate
TB4	31L1 Lug Plate
TB5	2L1 Lug Plate
17-V1a	Vacuum Tube 12AT7
V1b	Vacuum Tube 12AT7
V2a	Vacuum Tube 6BM8
V2b	Vacuum Tube 6BM8
17-VS1	Vacuum Tube Socket, 9P mould type
VS2	Vacuum Tube Socket, 9P mould type

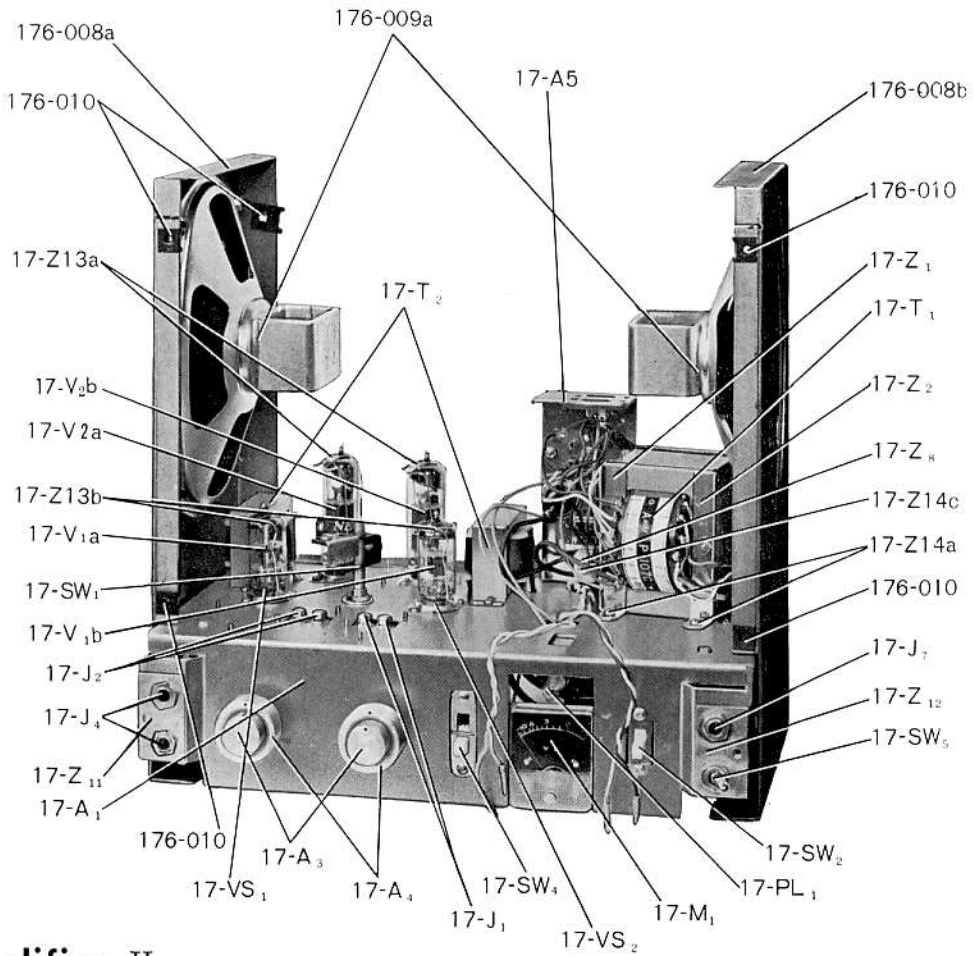
Parts No.	Nomenclature
17-VS3	Vacuum Tube Socket, 9P mould type
VS4	Vacuum Tube Socket, 9P mould type
17-Z1	Transformer Angle, Left
Z2	Transformer Angle, Right
Z3	Name Plate, Cycle Change
Z4	Socket, change Voltage
Z5	Hexagonal Prop, Selector
Z6	Name Plate, change AC
Z7	3 mm Nut, special
Z8	Cord Support
Z9	Rubber Bush, AC Cord
Z10	AC Cord
Z11	Plate A, Jack
Z12	Plate B, Jack
Z13a	Clamp Pin, for 6BQ5
Z13b	Clamp Pin, for 12AT7
Z14a	Screw Semi-Cubic 4×8
Z14b	Screw Semi-Cubic 3×6
Z14c	Screw Flat Mould 4×16
Z14d	Screw Semi-Cubic 3×6

X EXPLODED VIEW OF COMPONENT PARTS

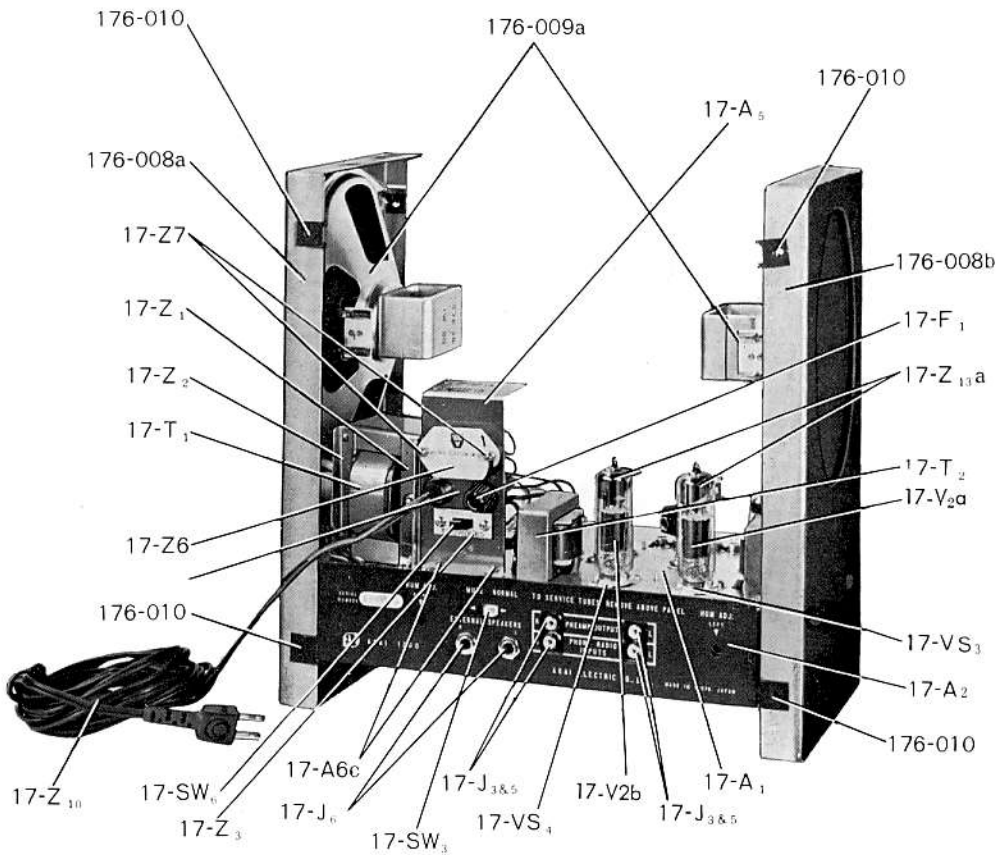
Front Panel



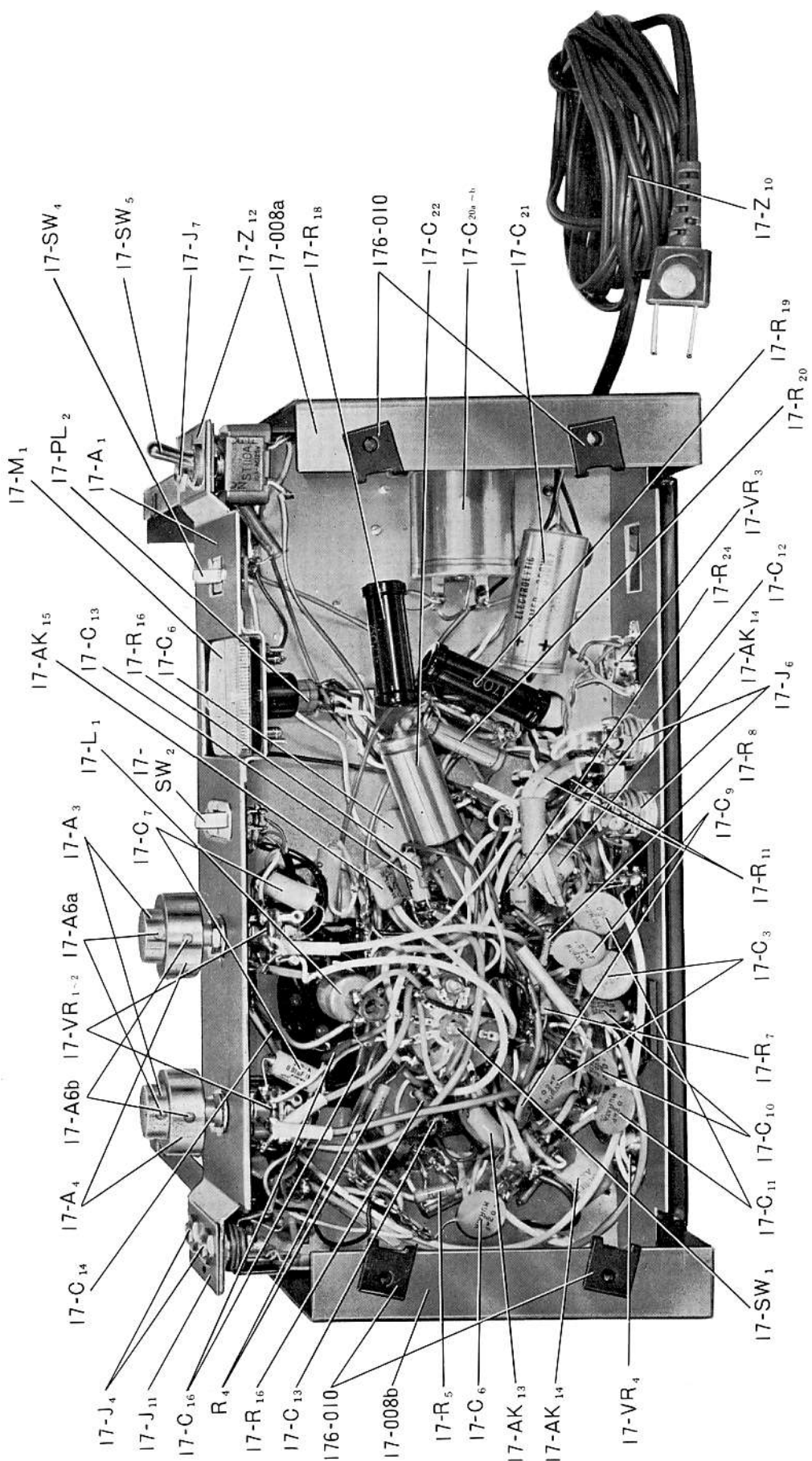
Amplifier I



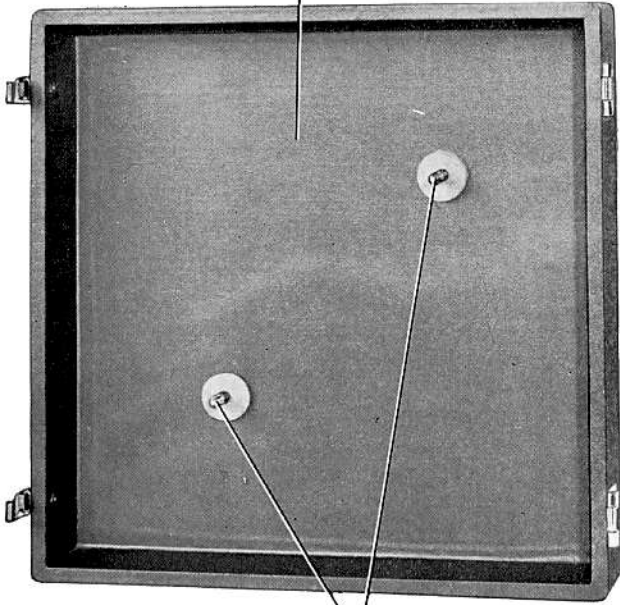
Amplifier II



Amplifier III

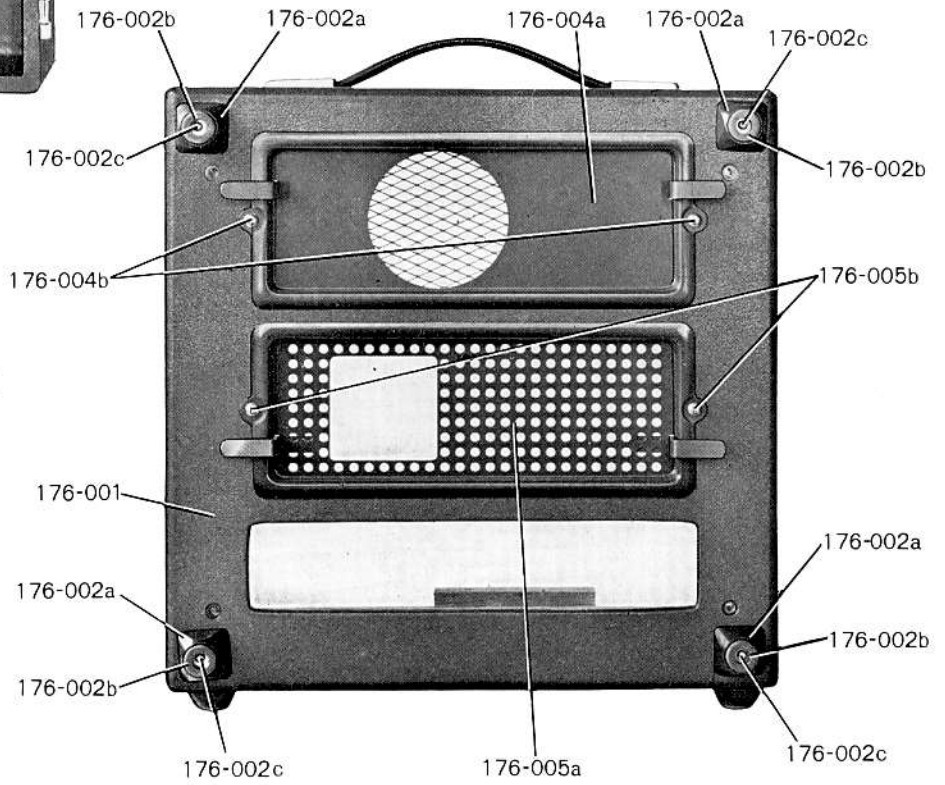


176-001

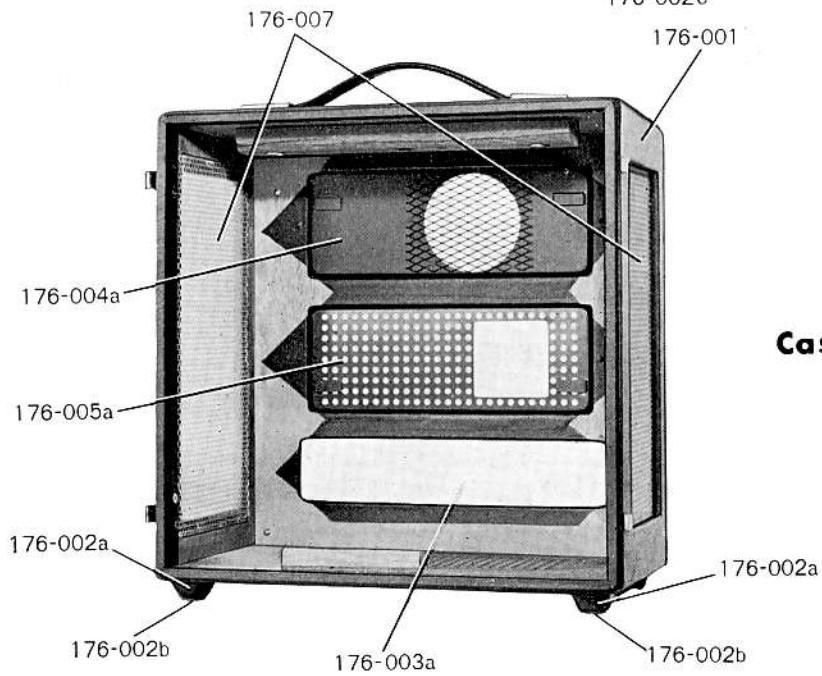


176-006

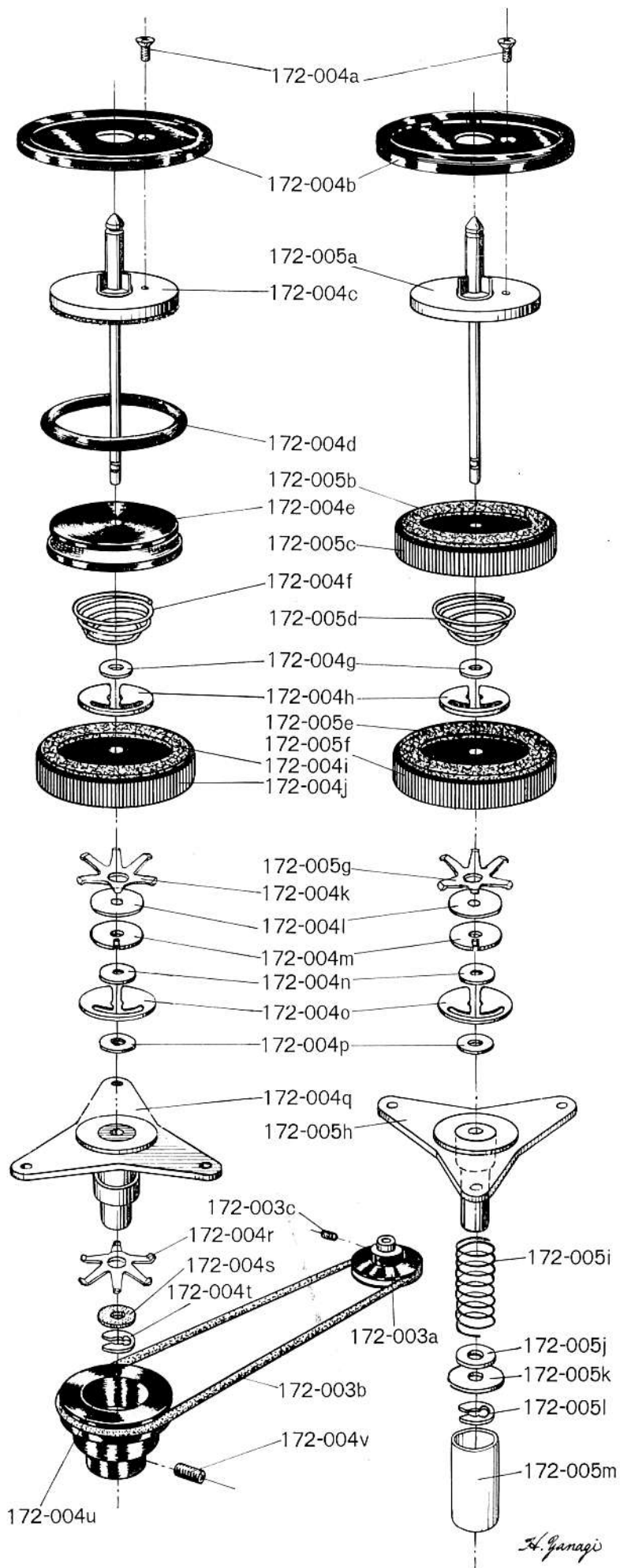
Case I

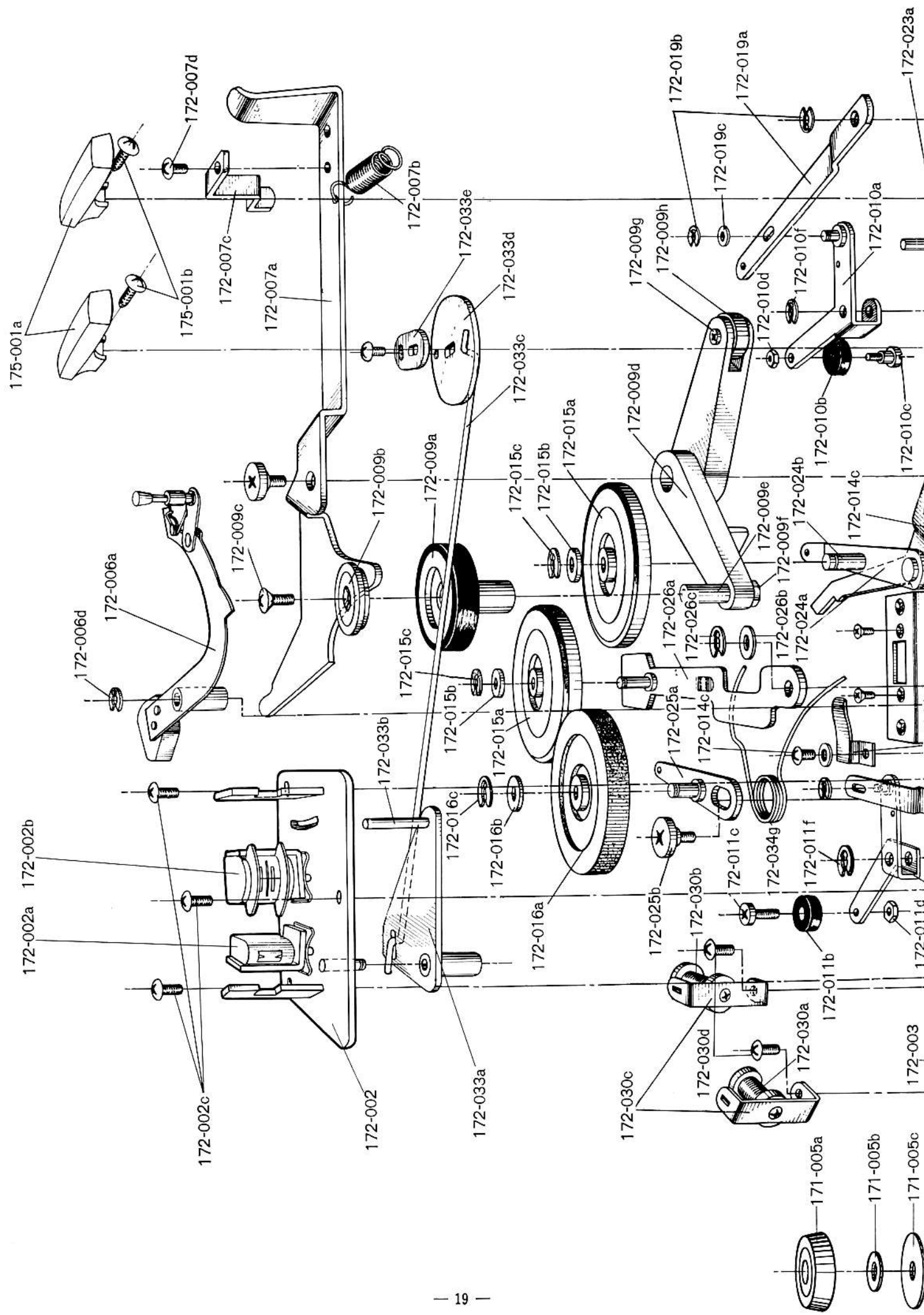


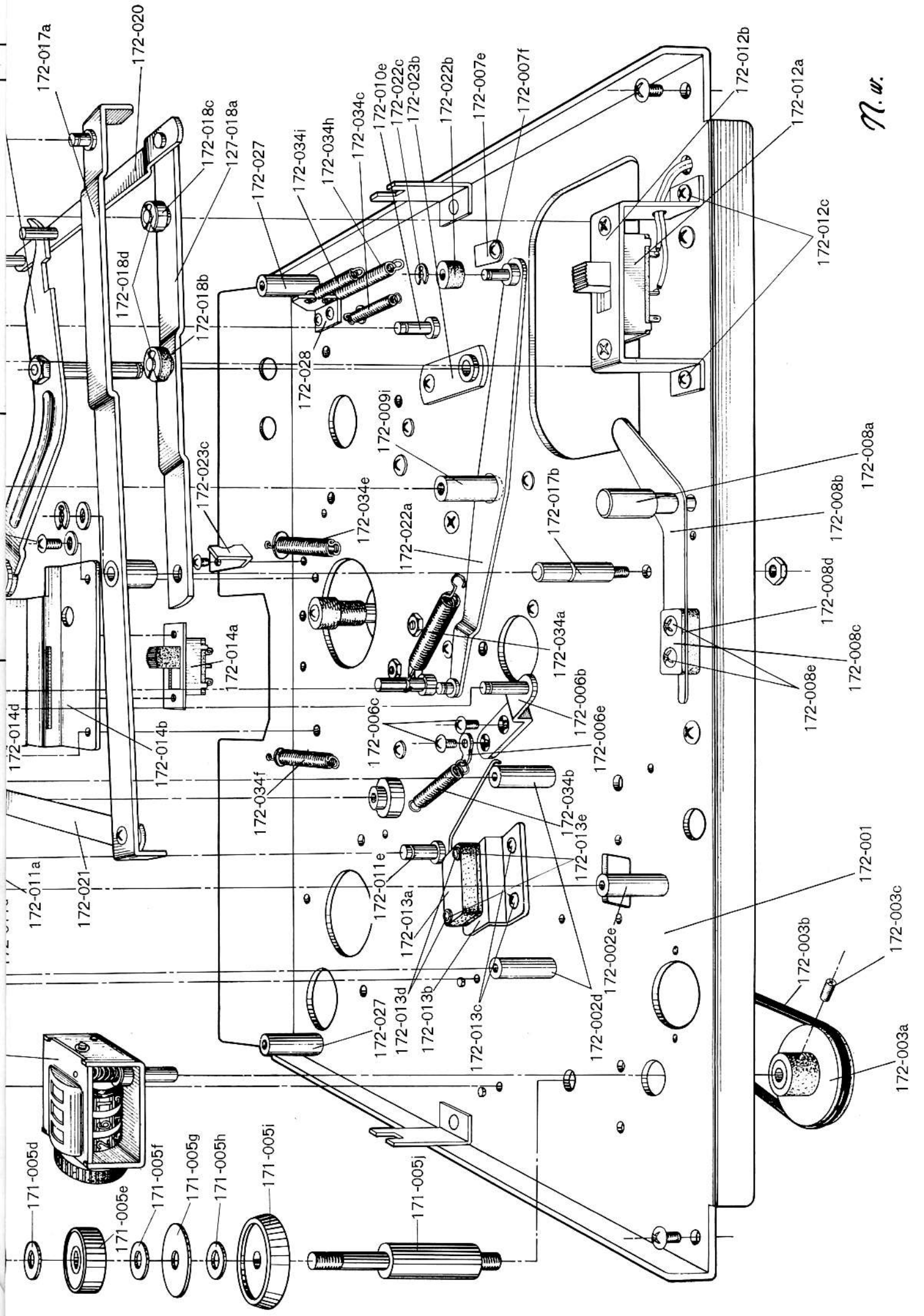
Case II



Case III

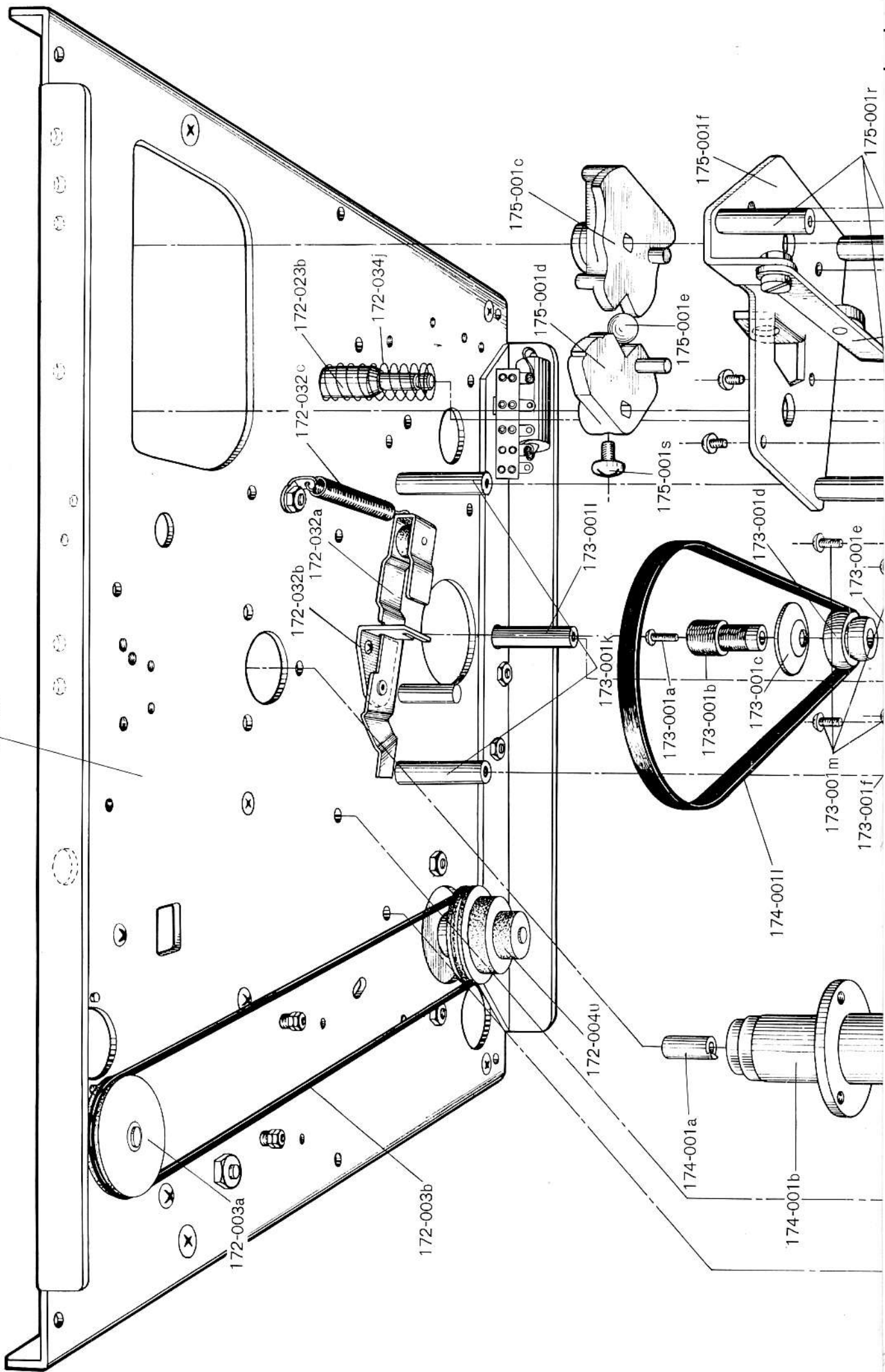






N. w.

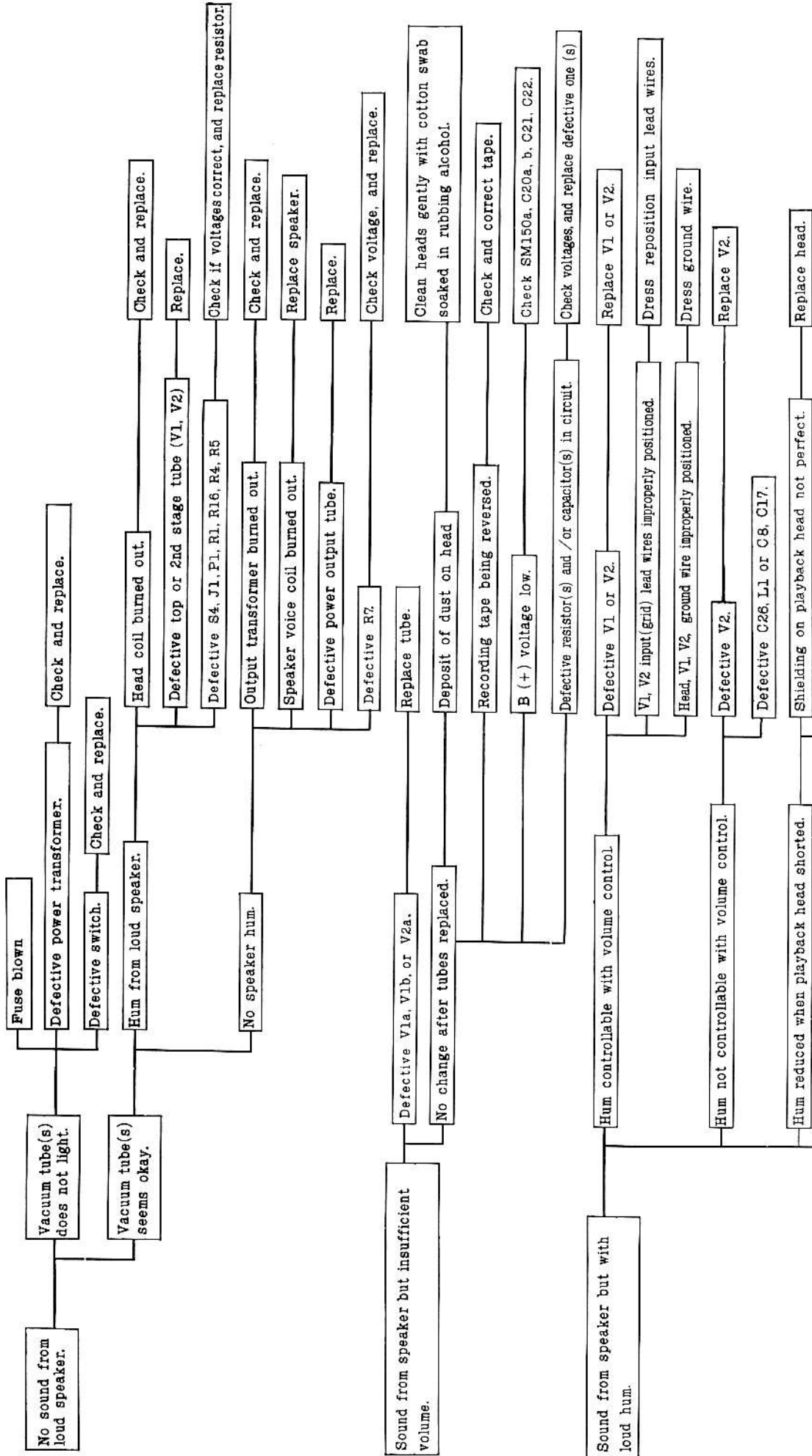
172-001



XI TROUBLE SHOOTING CHART FOR MODEL 1700

SECTION "A" TROUBLES WITH AMPLIFIER

I. Playback problems. (Unit set in play position.)



Defective C26, L1 or C8, C17.

Hum reduced when playback head shorted.

Replace head.

Shielding on playback head not perfect.

Check motor and power transformer, replace if necessary.

Leakage flux from motor or from power transformer.

Read just hum bucking coil.

Hum bucking coil out of adjustment.

Unit picks up external magnetic flux.

Ground recorder at capstan storage post.

Reposition recorder.

Hum recorded on tape.

Shield recorder.

Hum recorded on tape.

Renew recording.

Hum recorded on tape.

Replace V1.

Defective V1, C5, IN, Nf Circuit.

Check R1, R6, R8 or R11 and replace.

Defective R4, R5.

Replace V2.

Defective V2.

Check R7.

Defective R7.

Check and replace output transformer.

Output transformer being burned out.

Replace recording tape with new one.

Uneven coating on recording tape.

Demagnetize heads using head demagnetizer.

Tape heads being magnetized.

Replace V1, V2.

Defective V1, V2.

Check R1, R3 or R8.

Defective R1, R3 or R8.

Check C5, C7, C10, R2, VRL.

Defective C5, C7, C10, R2, VRL.

Lack of bass.

Defective recording tape.

Replace recording tape.

Defective recording tape.

Lack of treble.

Recording tape in close contact with tape heads.

Clean tape heads.

Dust on tape heads.

Record/play head mis-aligned. (Azimuth alignment of gap in recording head.)

Weak back tension.

Re-align head using standard alignment tape.

Check supply reel shaft assembly and readjust spring tension.

Worm-out tape heads.

Replace head assembly.

Defective V1 or V2.

Replace V1 or V2.

Incorrect circuit rating.

Check component parts in circuit by measuring voltage. See wiring diagram for regular voltage.

Defective loud speaker.

Replace loud speaker.

Sound distorted.

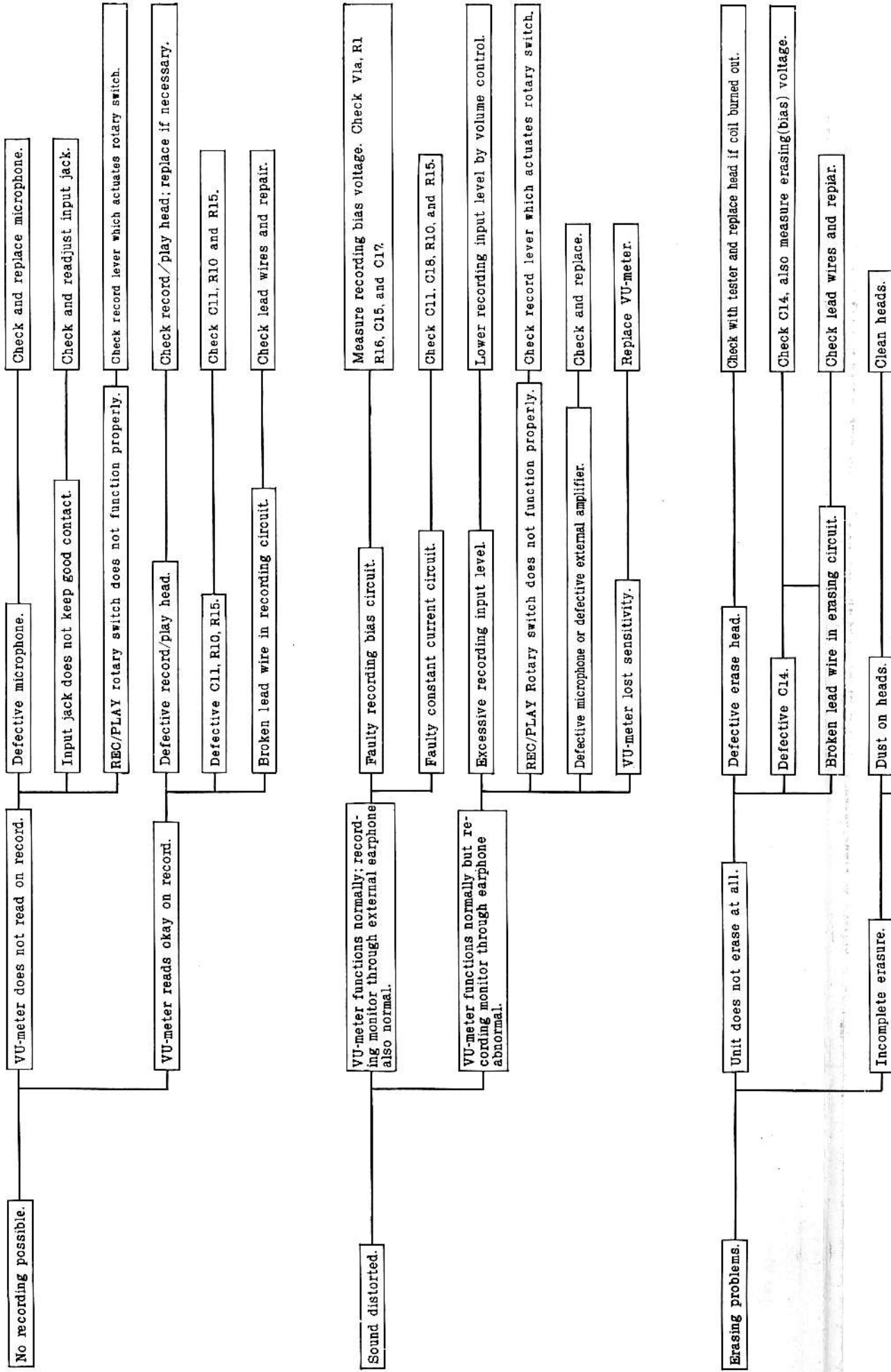
Replace V1 or V2.

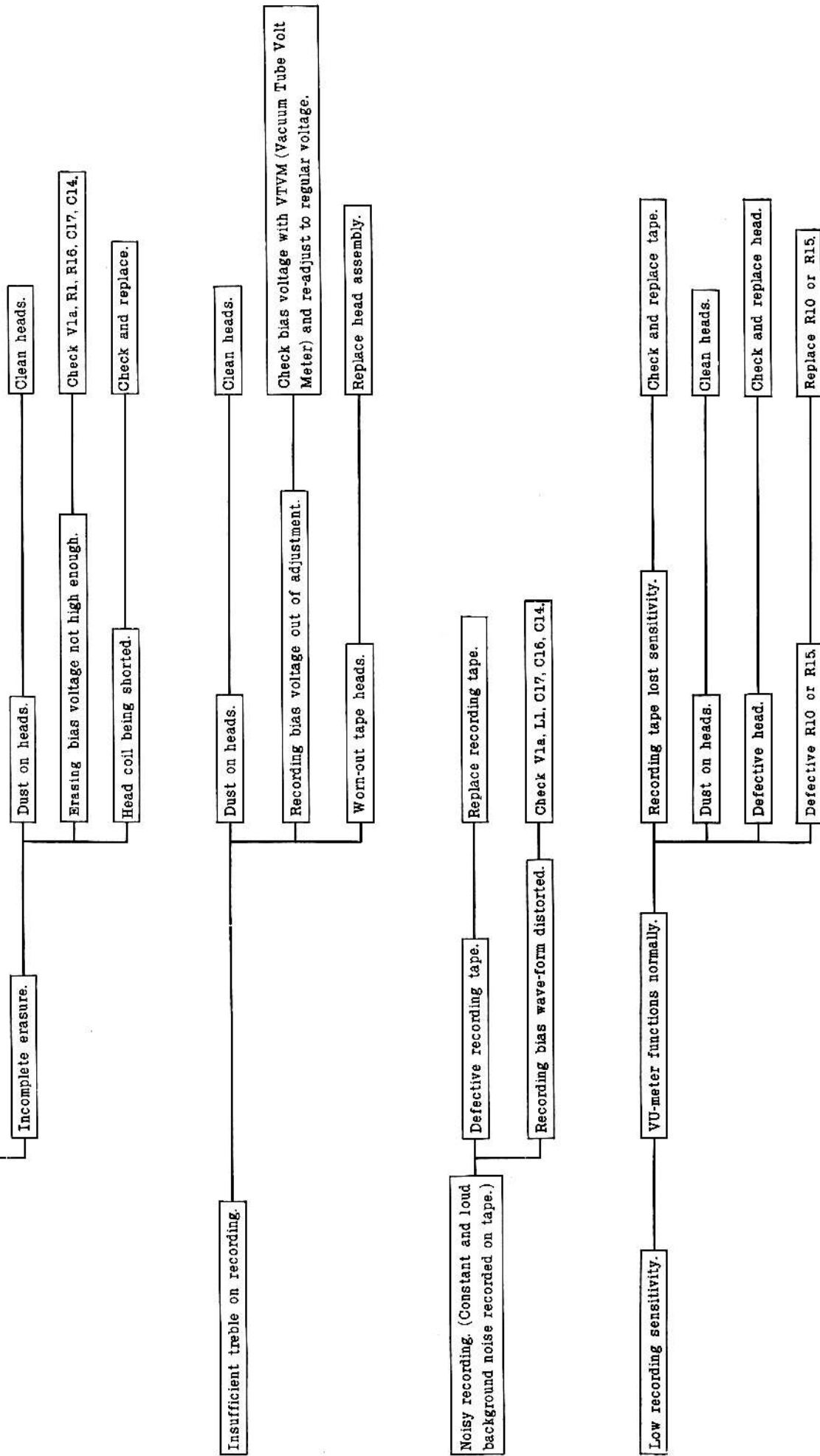
Check component parts in circuit by measuring voltage. See wiring diagram for regular voltage.

Replace loud speaker.

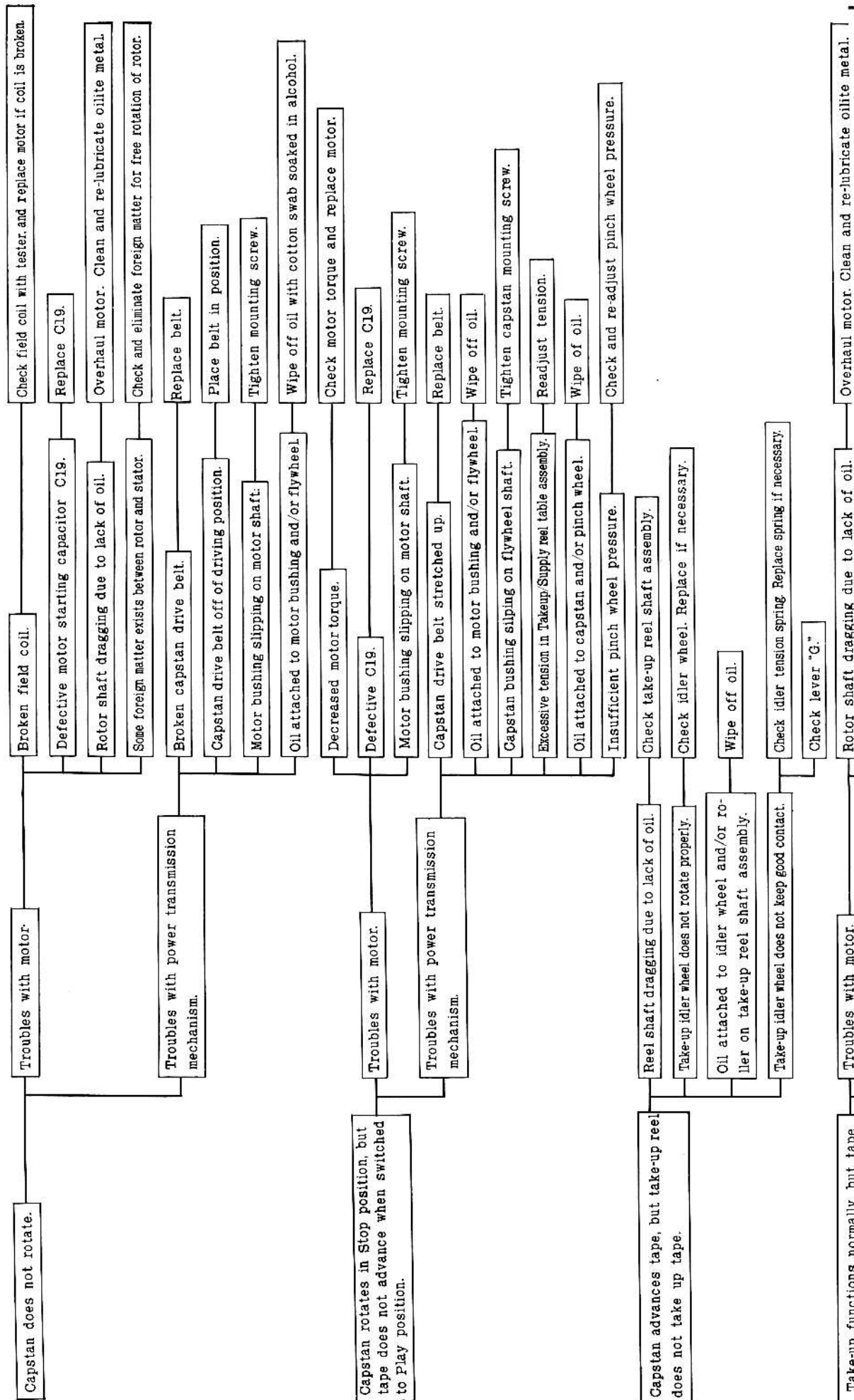
2. Recording Problems.

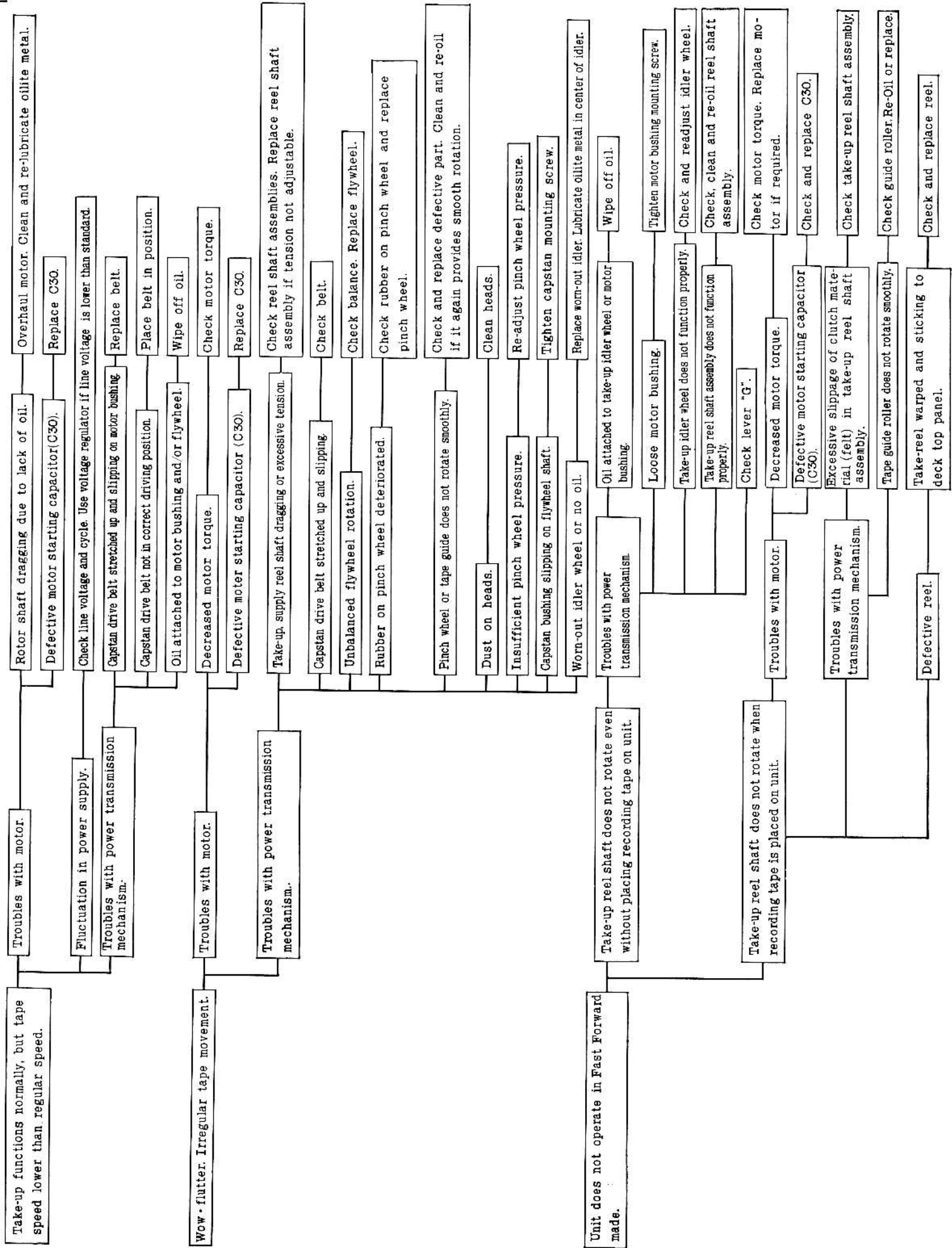
(Unit plays back pre-recorded tapes okay, but recording not satisfactory.)



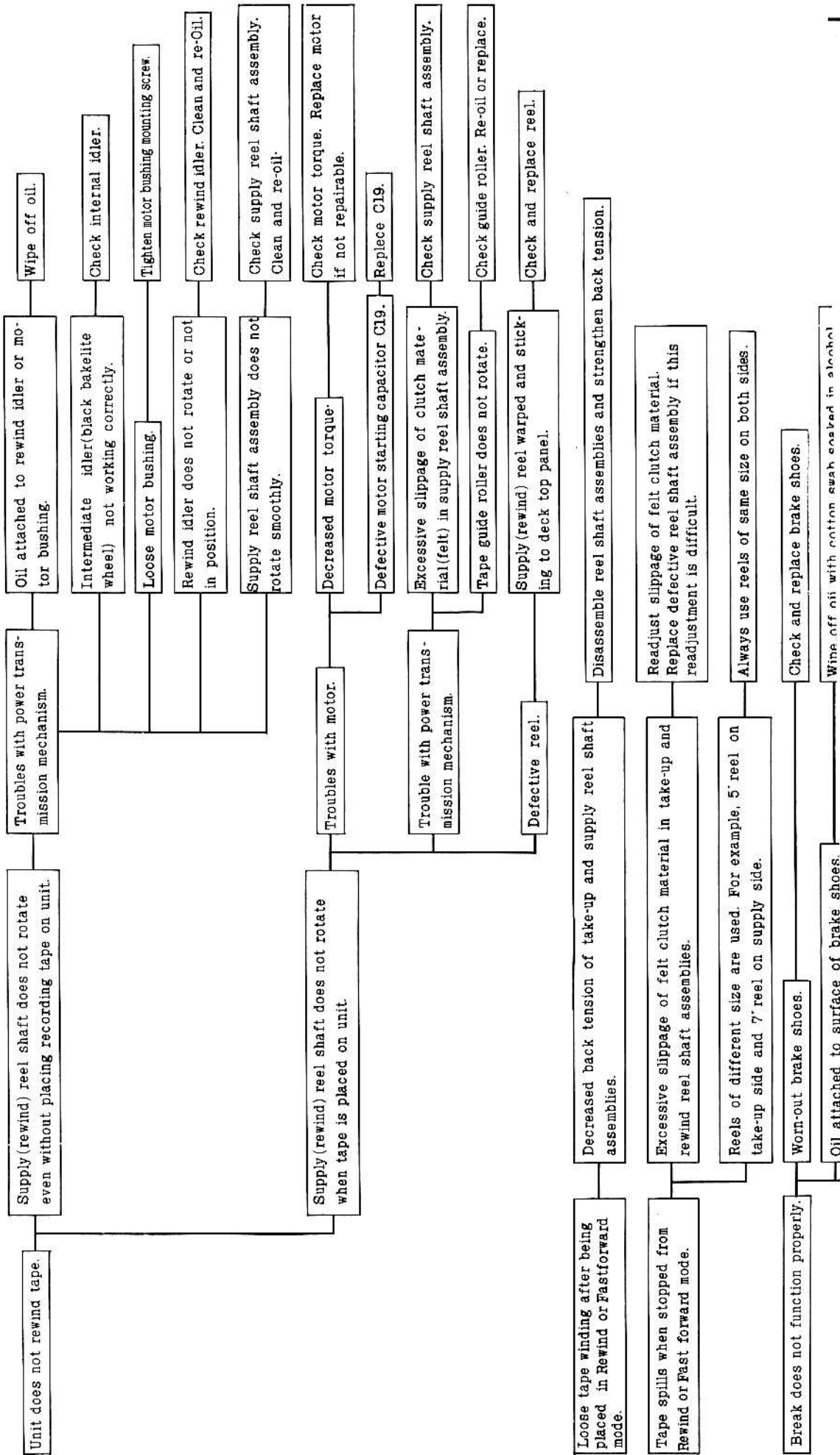


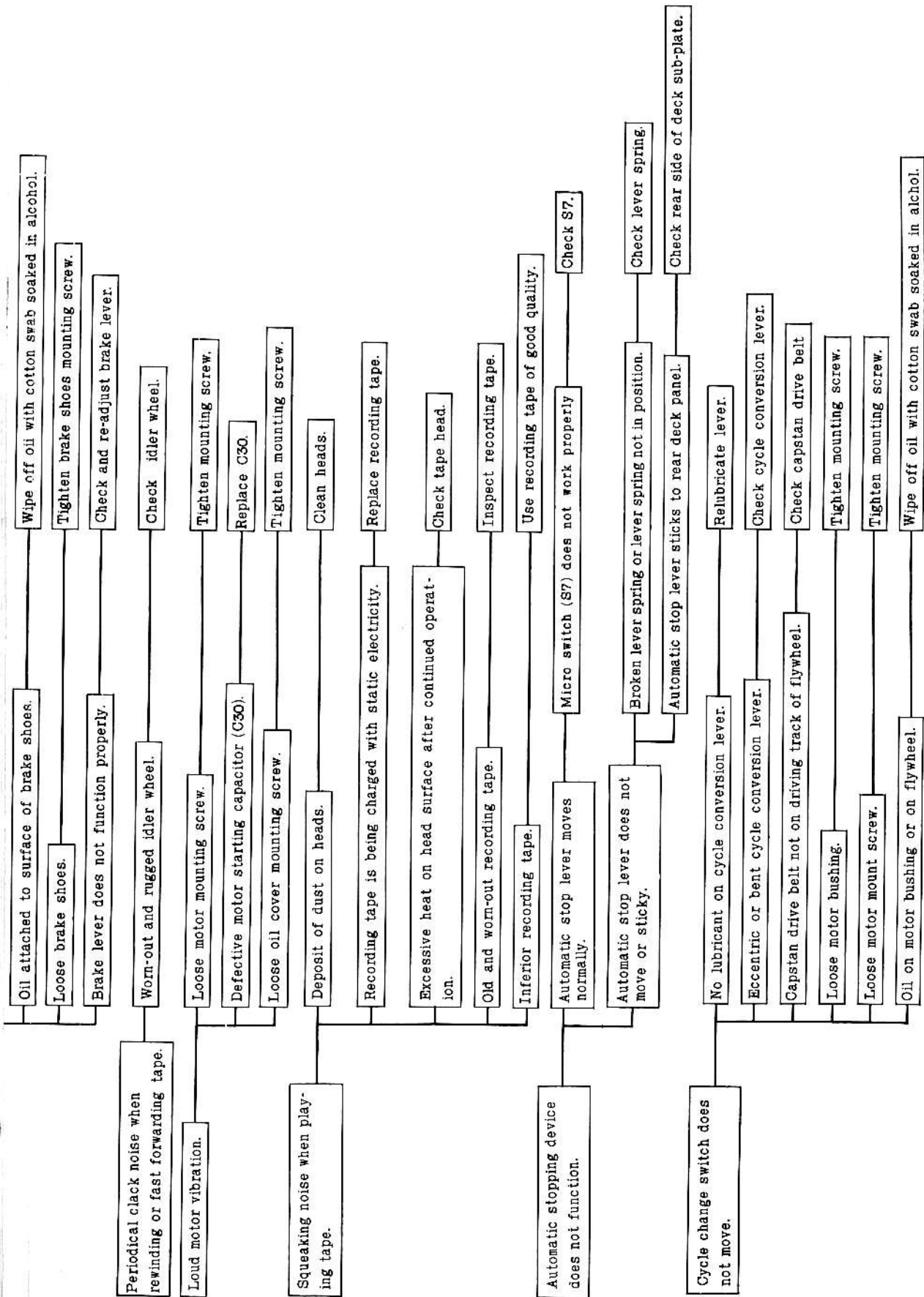
SECTION "B" TROUBLES WITH TAPE TRANSPORT MECHANISM.



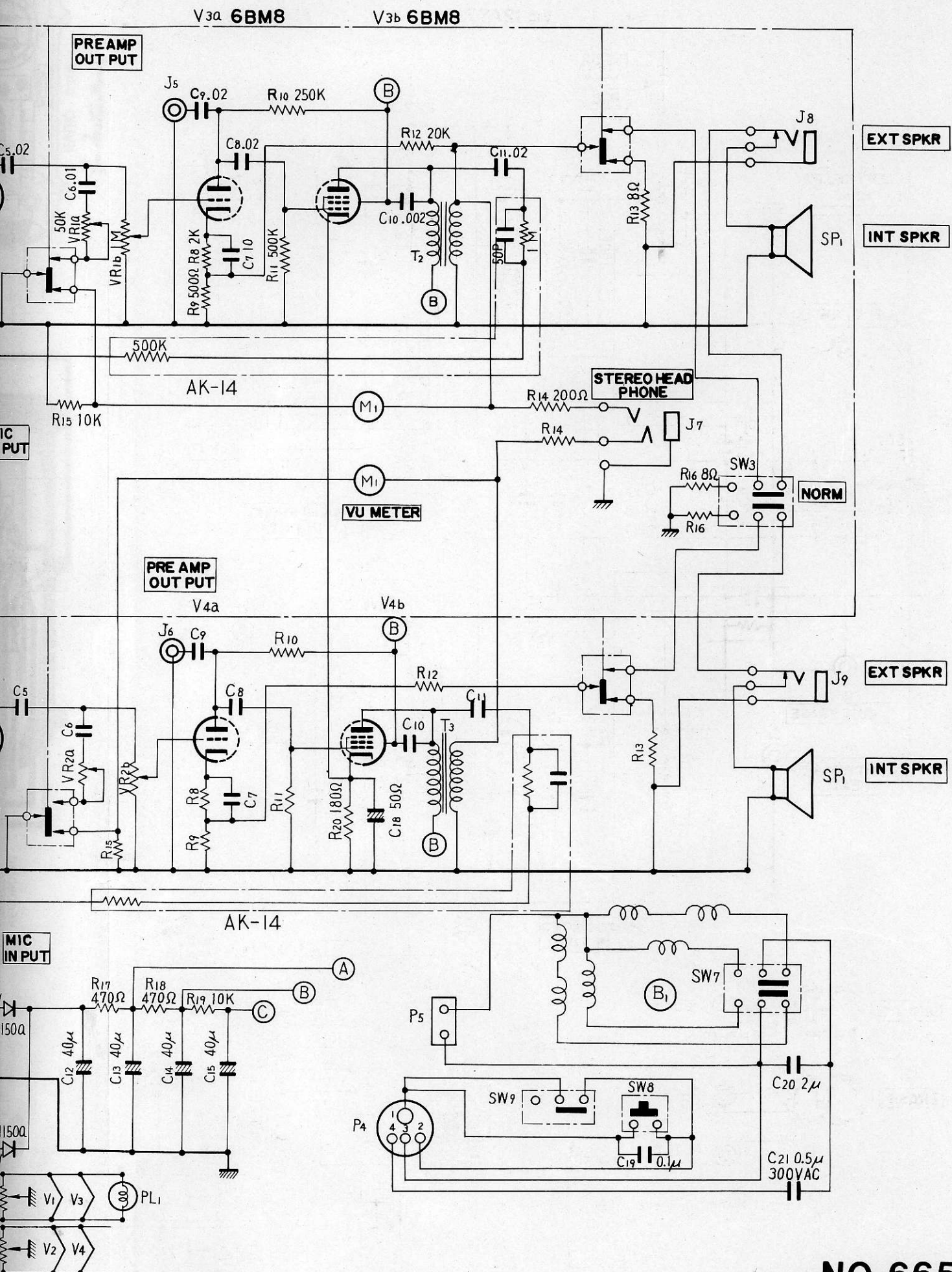


SECTION "B" TROUBLES WITH TAPE TRANSPORT MECHANISM.

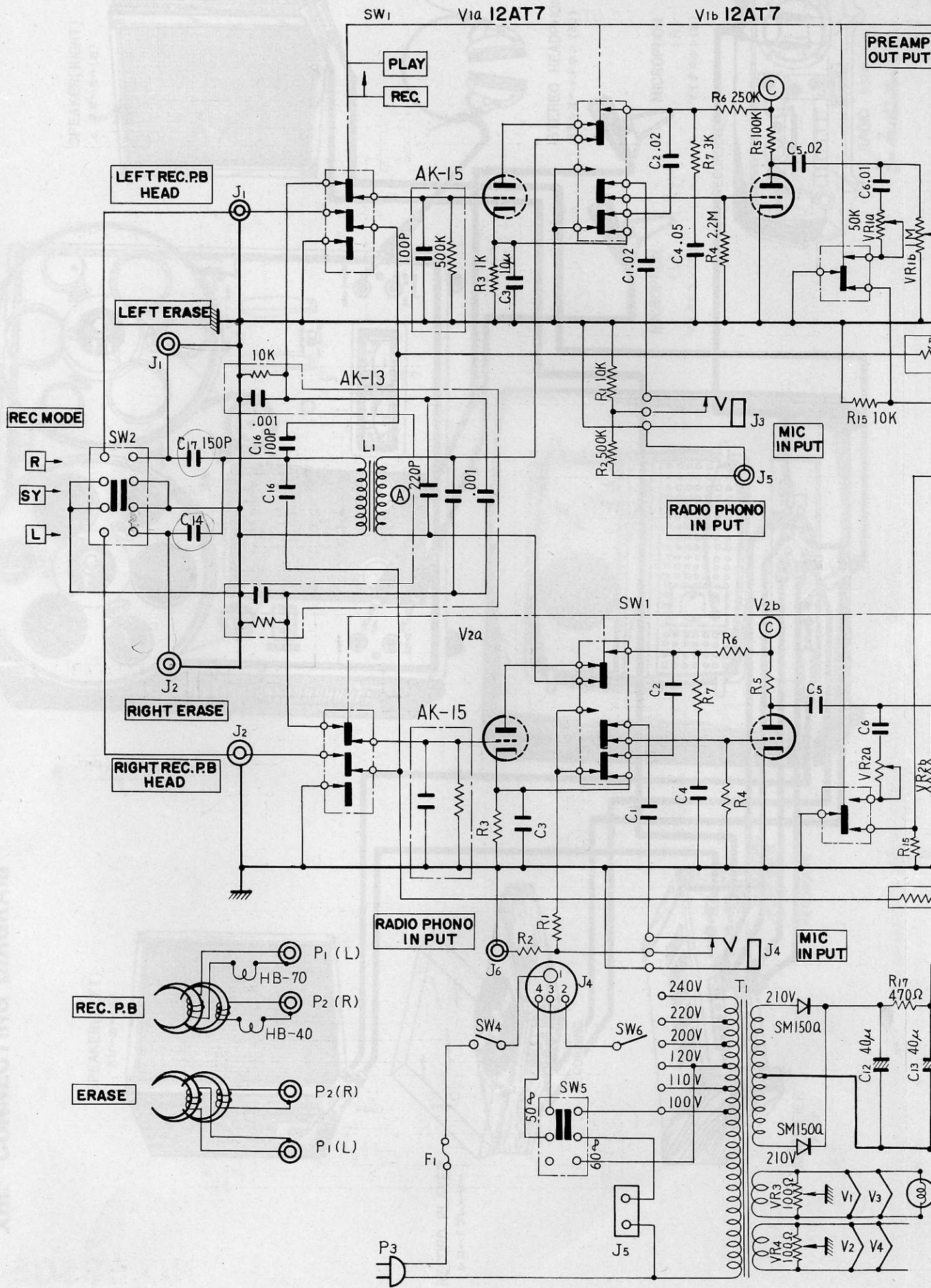




SCHEMATIC DIAGRAM

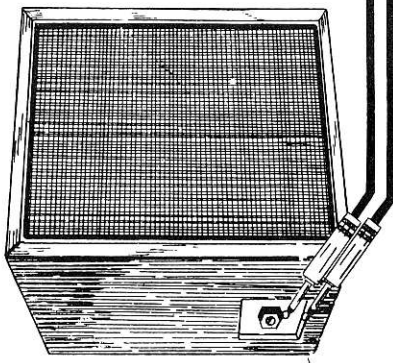


XII SCHEMATIC

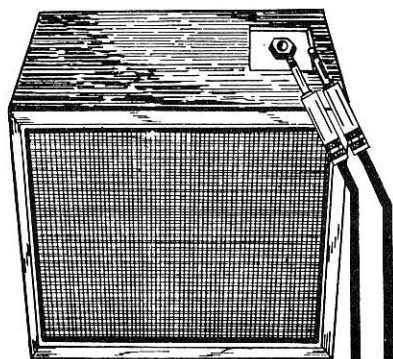


XIII. CONNECTING DIAGRAM

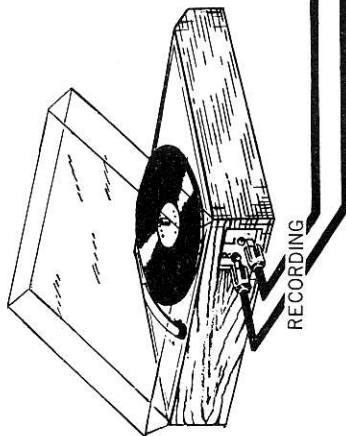
SPEAKER (LEFT)
スピーカー(左)



SPEAKER (RIGHT)
スピーカー(右)



RECORD PLAYER
レコードプレーヤー



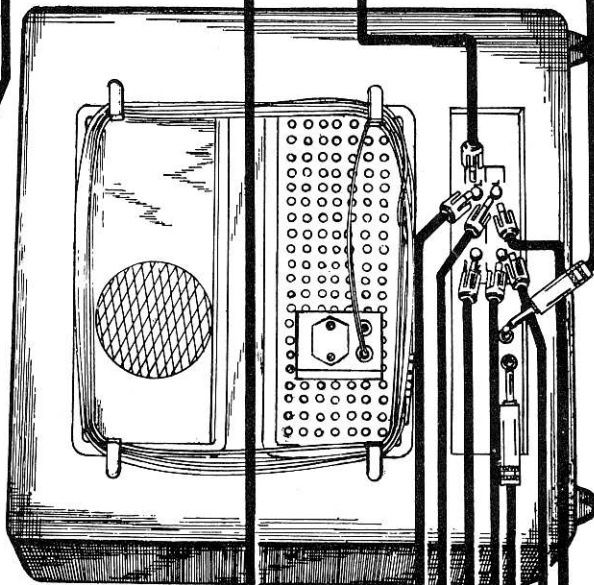
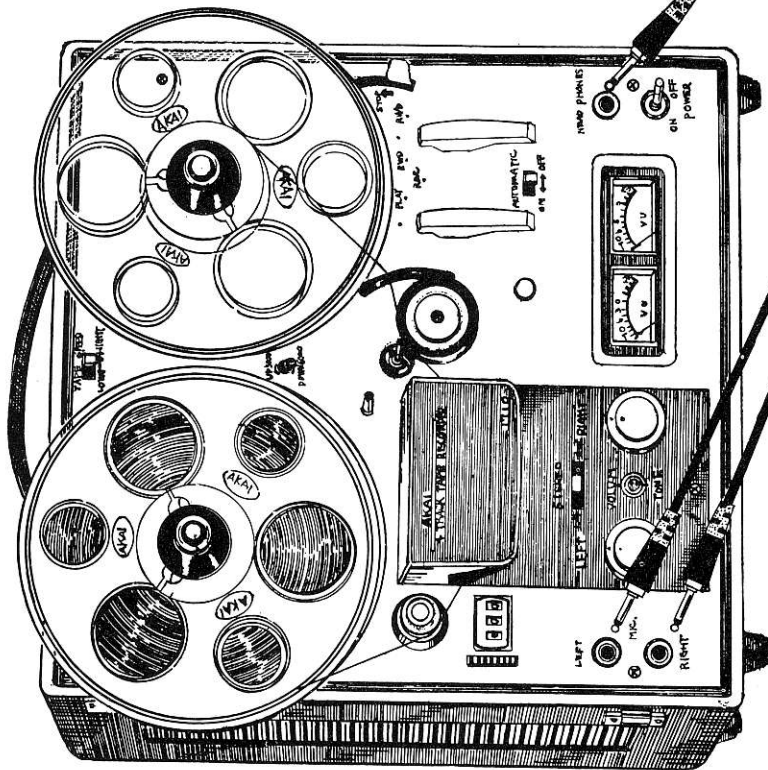
RECORDING

RECORDING

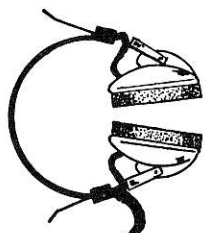
PLAY BACK

RECORDING

AMPLIFIER
アンプ



STEREO HEADPHONE
ステレオヘッドホン (8Ω)



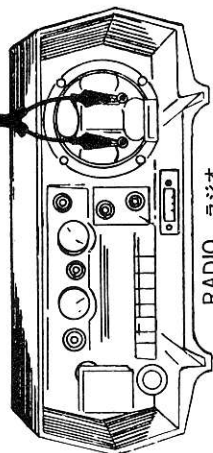
MICROPHON
(R)
マイクロホン(右)



MICROPHON
(L)
マイクロホン(左)



RECORDING



RADIO ラジオ

J. Matsubara



AKAI ELECTRIC CO., LTD.
AKAI TRADING CO., LTD.

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