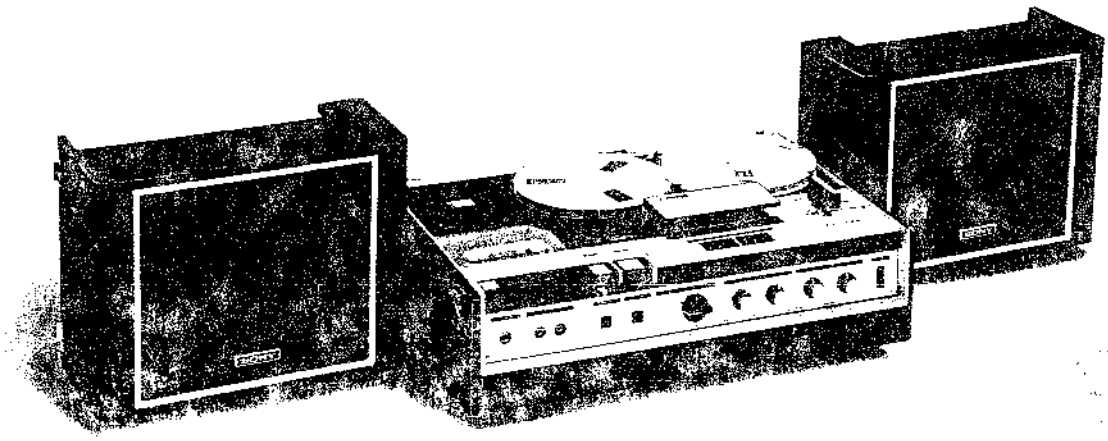


SPECIFICATIONS

Power Requirements:	[illegible] 110, 120, 127, 220 and 240 V AC Voltage Selector, [illegible] 45 W
Track System:	Four track 2-channel stereo reel-to-reel and cassette
Reel Size:	[illegible] cm) maximum (optional)
Cassette:	SONY tape cassette C-60, C-90, C-120 or equivalent
Tape Speed:	Reel [illegible] ips, 3¾ ips and 1⅞ ips (19 cm/s, 9.5 cm/s [illegible] cm/s) Cassette [illegible] ips (4.8 cm/s)
Recording Time:	Reel (with 1,200 ft tape) [illegible] speed [illegible] 7½ ips (19 cm/s) [illegible] 3¾ ips (9.5 cm/s) 3 hrs 1⅞ ips (4.8 cm/s) 6 hrs Cassette (with C-60) 1.0 hr (with C-90) 1.5 hrs (with C-120) 2.0 hrs
Frequency Response:	Reel 30 ~ 18,000 Hz at 7½ ips (19 cm/s) 30 ~ 13,000 Hz at 3¾ ips (9.5 cm/s) 30 ~ 7,000 Hz at 1⅞ ips (4.8 cm/s) Cassette 50 ~ 10,000 Hz
Signal-to-Noise Ratio:	Reel 50 dB or better Cassette 45 dB or better
Flutter and Wow:	Reel less than 0.12% at 7½ ips (19 cm/s) Cassette less than 0.2%
Recording Bias Frequency:	85 kHz
Power Output:	[illegible] maximum music power)
Inputs:	Two MIC inputs Impedance: 600Ω Maximum sensitivity: 0.19 mV (-72 dB) [illegible] inputs Impedance: 100 kΩ Maximum sensitivity: 80.0 mV (-22 dB) Two AUX/DIN inputs Impedance: 85 kΩ [illegible] Two CdPs connector Impedance: 4 kΩ Maximum sensitivity: 4.0 mV (-44 dB)
Outputs:	Two LINE OUTputs Impedance: 100 kΩ Output level: 0.44 V (-5 dB) Two SPEAKER outputs Impedance: 8Ω Output level: 2.83 V (+11.2 dB) HEADPHONE output Impedance: 8Ω Output level: 0.11 V (-18.5 dB)
Speaker:	Two 5" (130 mm) dynamic speakers Impedance: 8Ω
Semiconductors:	25 transistors and 5 diodes
Dimensions:	21-[illegible] (W) x 11-[illegible] (H) x 13-[illegible] (D) 528 x 300 x 352 mm
Weight:	43 lb (19.5 kg)

SERVICE MANUAL

TABLE OF CONTENTS

Note: *"REEL"* and *"CASSETTE"* described in this Service Manual mean the following:

REEL : open reel tape recorder section
CASSETTE: cassette recorder section

1. GENERAL DESCRIPTION

The SONY Model TC-330 is a new type stereo tape recorder which is a combination of an open reel and a cassette recorders.

The recorder provides the following outstanding features:

a. SOURCE selector, MIC, AUX, PHONO, CASSETTE and REEL.
b. Dubbing from REEL to CASSETTE or vice versa can be made easily.
c. The all-silicon transistor power amplifier of ITL and OTL for low distortion and high power output (five watts each of L and R channels).
d. NOISE SUPPRESS switch for low noise recording and playback.
e. Separate TREBLE and BASS control
f. The recorder can be also used as a public-address system.

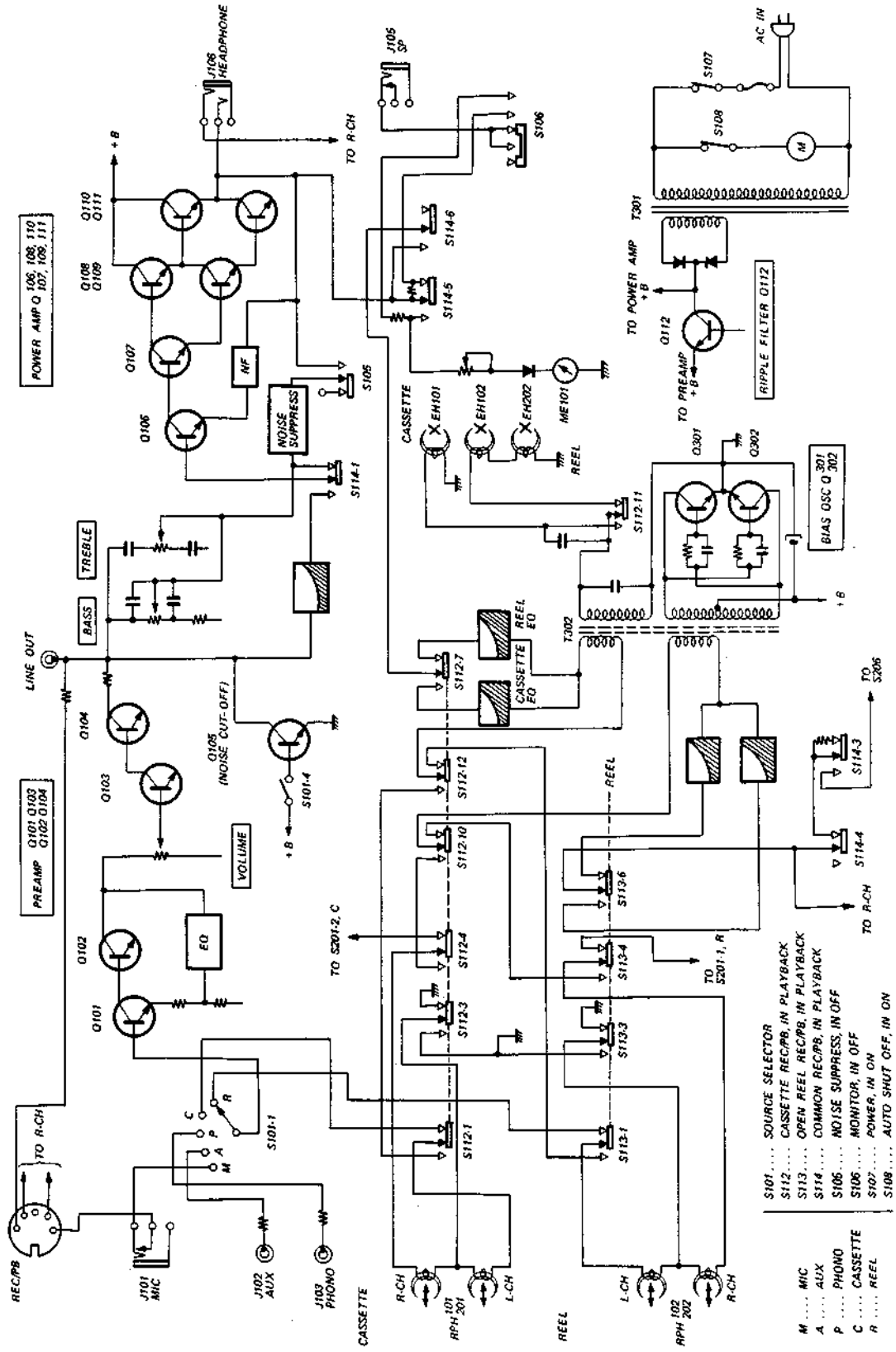
for REEL

- Retractable pinch roller makes easy tape threading.
- Four digit tape index counter
- Scrape flutter filter roller is located between the erase and record/playback heads. It prevents the tape from developing longitudinal vibrations which can result in tape squeal or frequency modulated distortion of the tape movement across the heads.

for CASSETTE

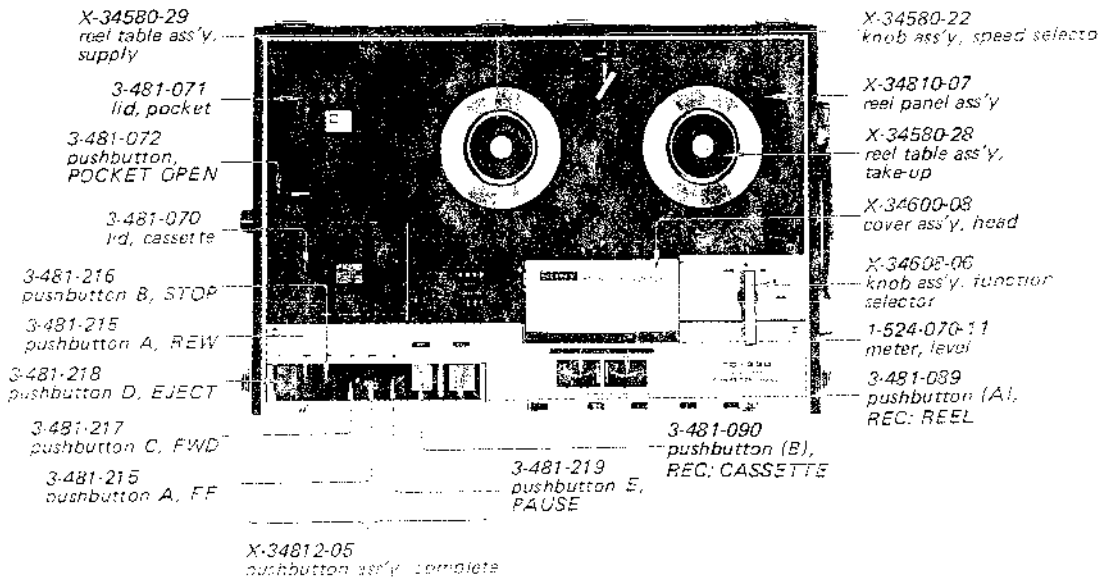
- Easy operation with piano-key type function selector.
- Tape-end lamp indicates the tape end with a sensing foil.
- Pocket for a tape cassette is very convenience to continue a recording or a playback replacing with other tape cassette.

2. BLOCK DIAGRAM

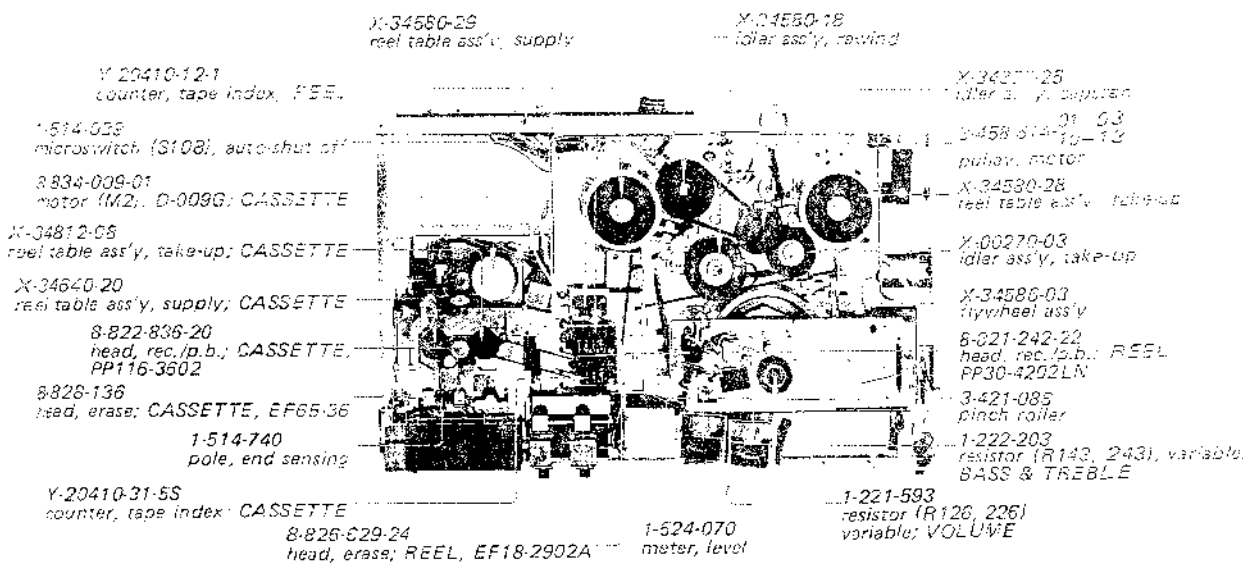


3. MAJOR PARTS LOCATION

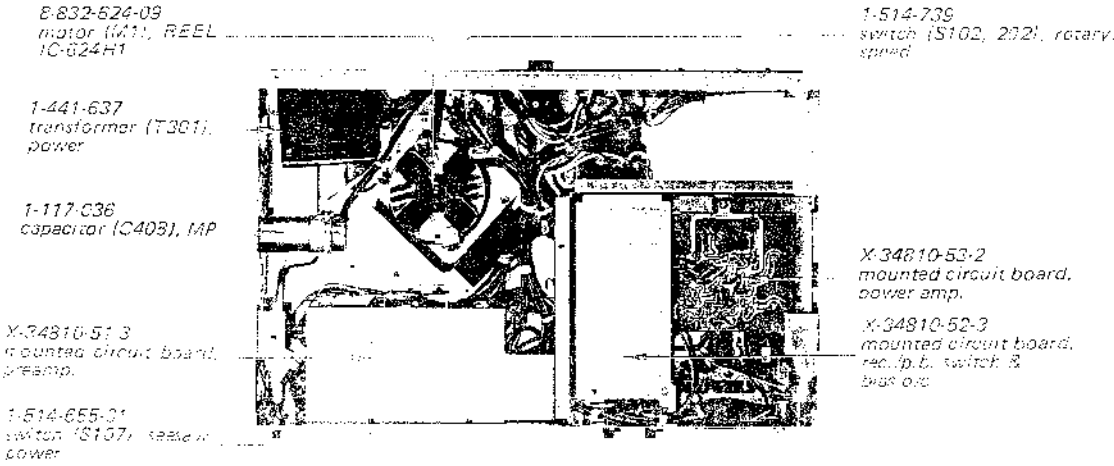
3-1. Cabinet Top View



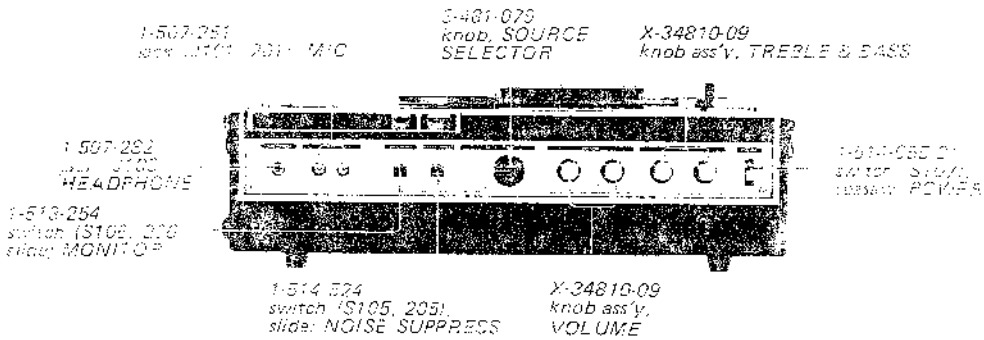
3-2. Chassis Top View



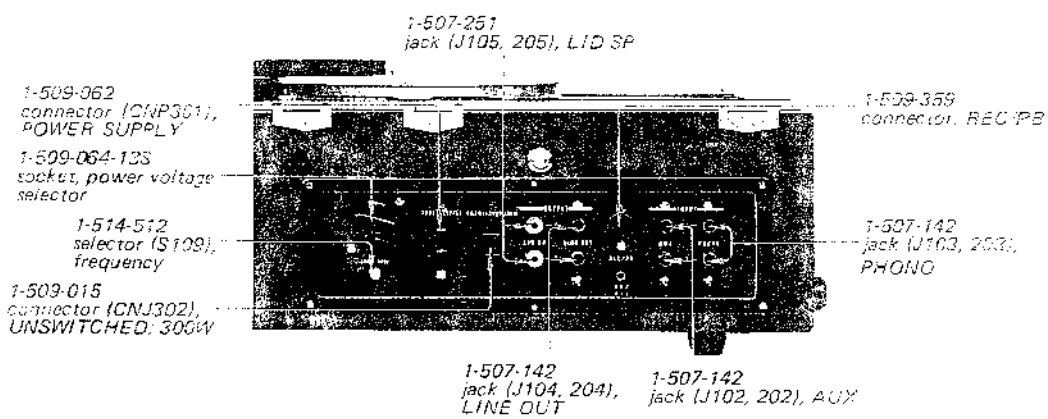
3-3. Chassis Bottom View



3-4. Control Panel Front View



3-5. Jack Plate Front View



4. DISASSEMBLY

1. Main Cabinet Ass'y Removal

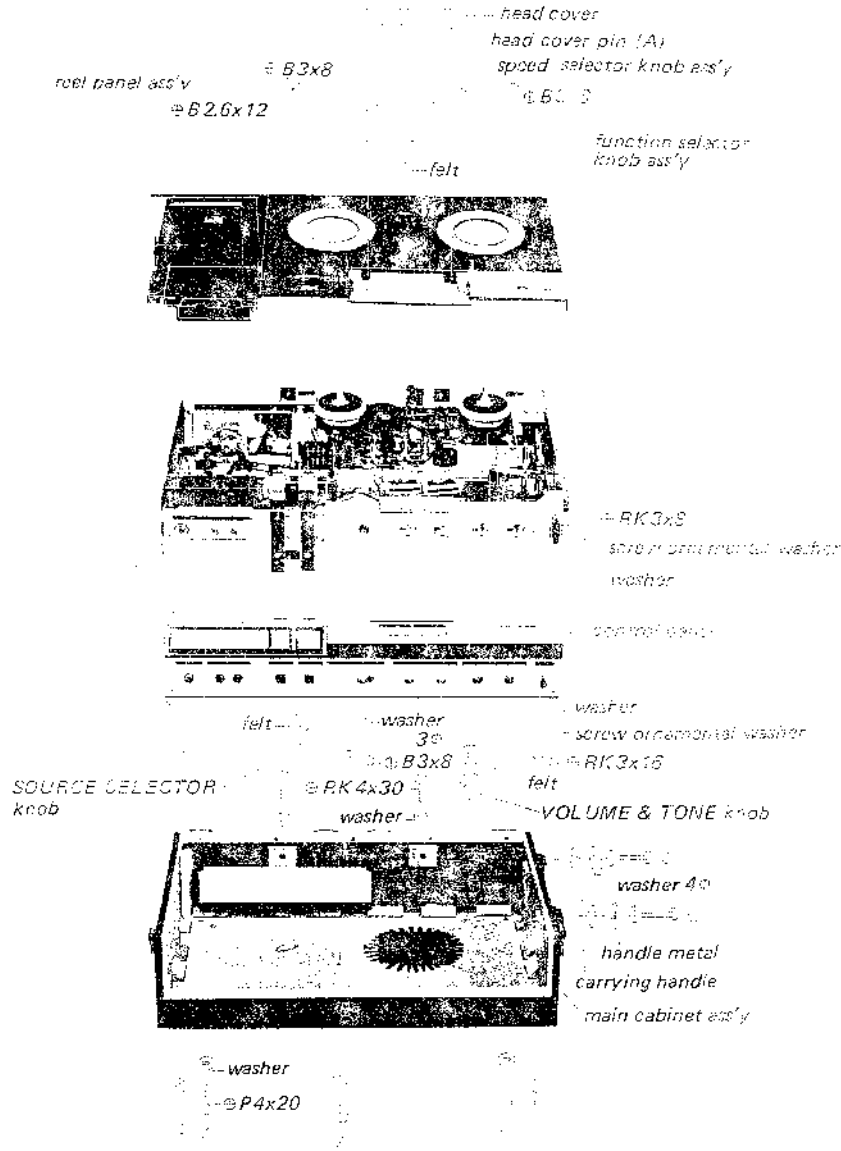
1. Remove the two screws marked with ◦ and remove the carrying handle.
2. Remove the two screws marked with ◦.
3. Remove the five screws marked with ◦.
4. By removing the main cabinet ass'y, the circuit boards can be checked.

2. Reel Panel Ass'y Removal

1. Remove the three screws marked with ◦, head cover by pulling it and the two head cover pins (A).
2. Remove the speed selector knob ass'y by pulling it and function selector knob ass'y by loosening its set screw.
3. By removing the reel panel ass'y, head replacement and some of mechanical adjustment can be made.

3. Control Panel Removal

Remove the three screws marked with ◦.



5. ADJUSTMENTS

5-1. Mechanical Adjustment

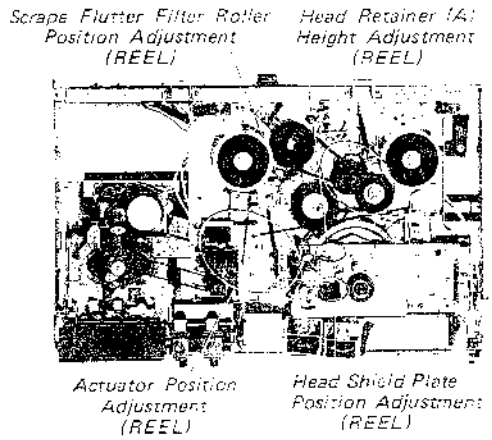
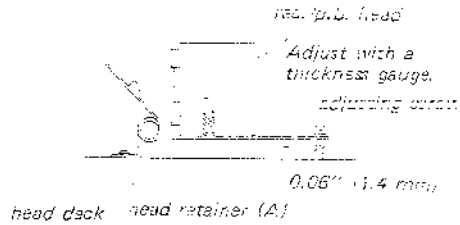


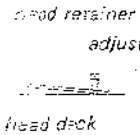
Fig. 5-1-1 Adjusting parts location

Head Retainer (A) Height Adjustment (REEL)
– in STOP mode –

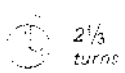


Apply lock paint to the adjusting screw.

Other Adjusting Method



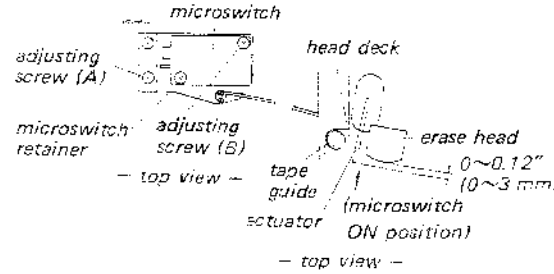
1. Turn the adjusting screws until the head retainer (A) is in contact with the head deck.

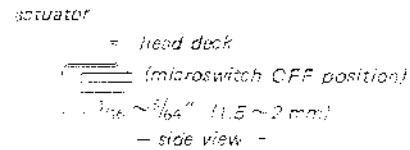


2. Turn the adjusting screw clockwise 2⅓ turns from the head retainer (A) position shown above.

3. Apply lock paint to the adjusting screw.

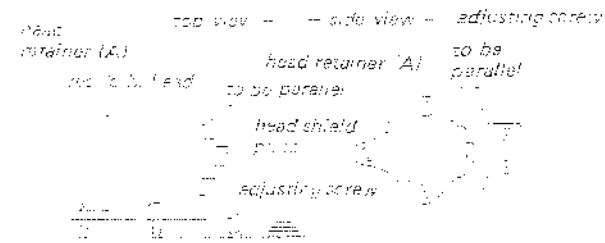
Actuator Position Adjustment (REEL)
– in STOP mode –





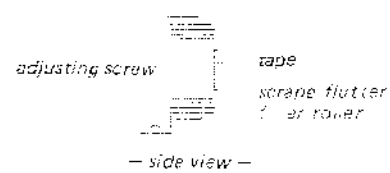
1. Loosen the adjusting screws (A) and adjust the microswitch retainer position so that the actuator comes in the mid position between the erase head and the tape guide.
2. Loosen the adjusting screws (B) and adjust the microswitch position to obtain the actuator position as shown when the actuator is pushed in the direction shown.
3. Apply lock paint to the adjusting screws.

Head Shield Plate Position Adjustment (REEL)
– in FWD mode –



Loosen the adjusting screws and adjust so that the head shield plate is in parallel with the rec. p.b. head.

Scrape Flutter Filter Roller Position Adjustment (REEL)
– in FWD mode –



Thread a tape, place the set in FWD mode with 1⅞ ips (4.8 cm/s) speed, loosen the adjusting screw and adjust the scrape flutter filter roller position so that the tape comes completely contact with it.

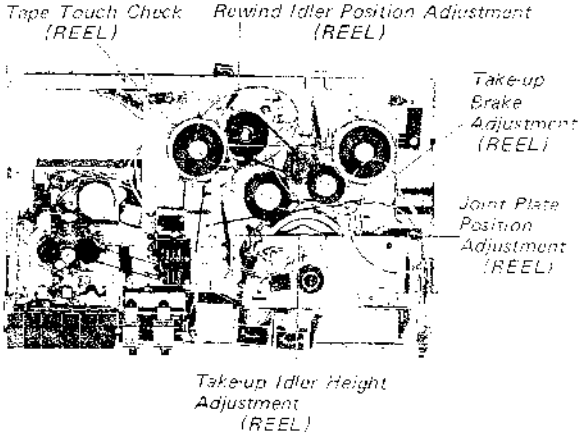
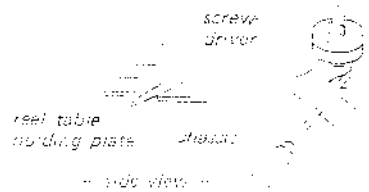


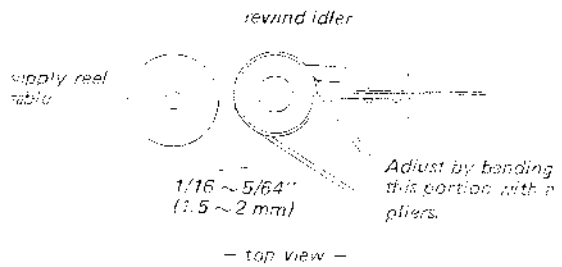
Fig. 5-1-2 Adjusting parts location

Tape Touch Check (REEL) – FF, FWD & REW modes –

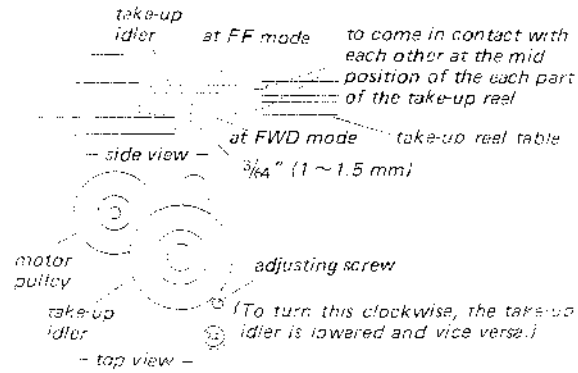
Thread a tape with correctly shaped reel and check that if the tape edge is in contact with the reel at the beginning and end in FF, FWD and REW modes.
If the tape edge comes in contact with the reel, adjust the reel table position with a screwdriver as shown.



Rewind Idler Position Adjustment (REEL) – in STOP mode –

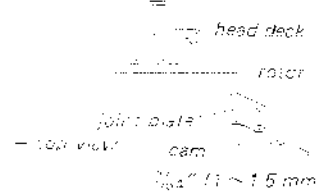


Take-up Idler Height Adjustment (REEL) – in FF and FWD modes –



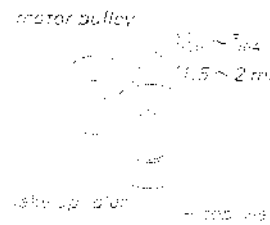
Joint Plate Position Adjustment (REEL) in FWD and STOP modes

– in FWD mode –



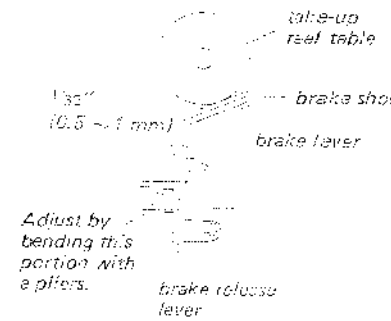
Bend the portion ⁻ in the direction shown by the arrow with a pliers so that the clearance between the rotor and the cam is within the range shown.

– in STOP mode



After the joint rod position adjustment, make sure that the take-up idler position is as shown in the figure.

Take-up Brake Adjustment (REEL) – in STOP mode –



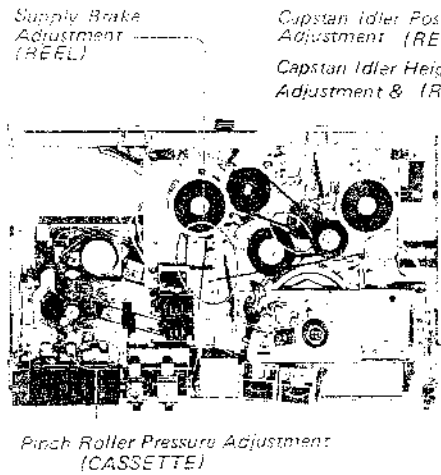
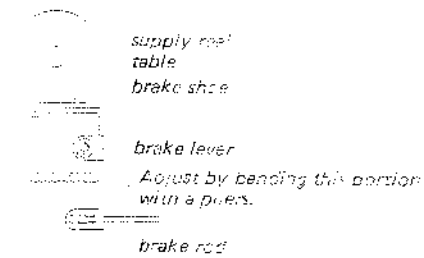
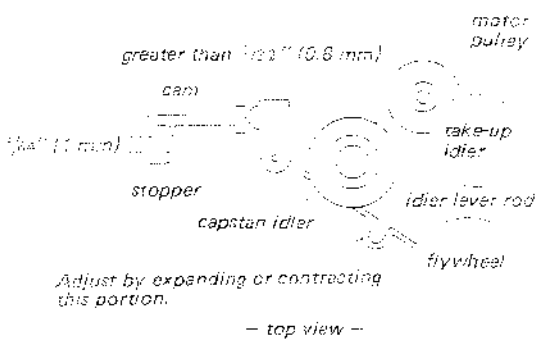


Fig. 5-1-3 Adjusting parts location

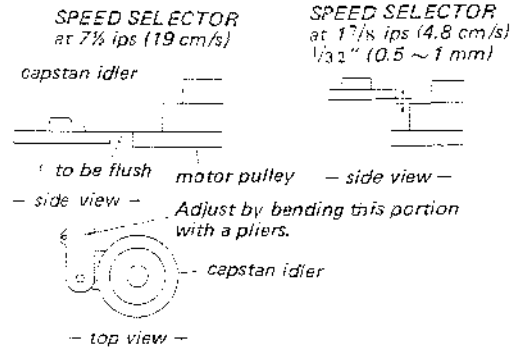
Supply Brake Adjustment (REEL)
– in STOP mode –



Capstan Idler Position Adjustment (REEL)
– in STOP mode –
(Speed Selector at 7½ ips, 19 cm/s)

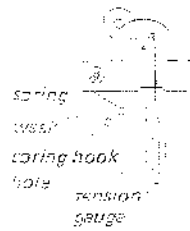


Capstan Idler Height Adjustment (REEL)
– in STOP mode –



Pinch Roller Pressure Adjustment (CASSETTE)
– in FWD mode –

STANDARD: 8.8 ~ 11.3 oz (250 ~ 320 g)



Place the set in FWD mode, pull the tension gauge and read it just when the pinch roller departs from the capstan. Adjust the pinch roller pressure by changing the spring hook hole.

Torque Measurement (CASSETTE)

Torque should be as follows.

FWD torque: More than 1.31 oz-inch (95 ~ 65 g-cm)

REW torque: 0.65 ~ 2.11 oz-inch (60 ~ 150 g-cm)

– Continued to next page –

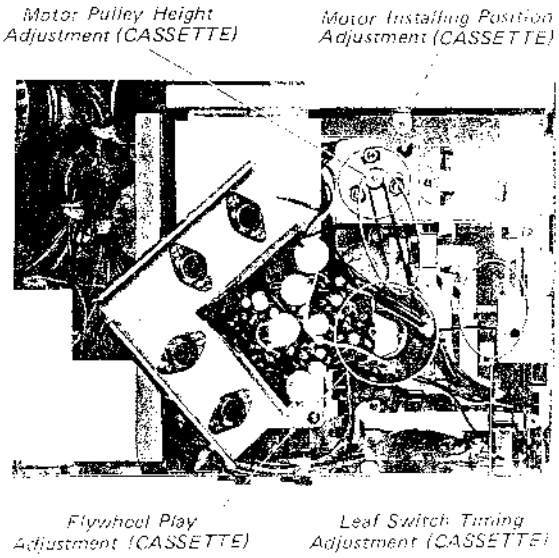
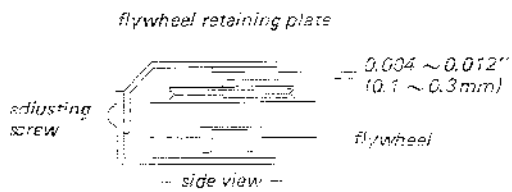


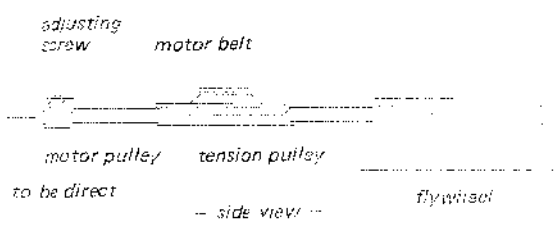
Fig. 5-1-4 Adjusting parts location

Flywheel Play Adjustment (CASSETTE) in STOP mode



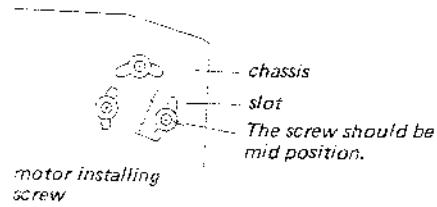
Loosen the adjusting screw and adjust the flywheel retaining plate position.

Motor Pulley Height Adjustment (CASSETTE) — in FWD mode —



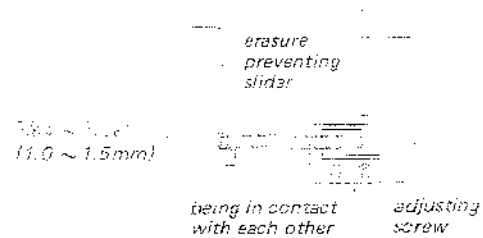
Loosen the adjusting screws and adjust the motor pulley height so that the motor belt operates in a straight line. Note: Put on the motor belt making the smooth side inside.

Motor Installing Position Adjustment (CASSETTE) — in FWD mode —



(To avoid for the belt coming in contact with the motor installing screws.)

Leaf Switch Timing Adjustment (CASSETTE) — in STOP mode



1. Loosen the adjusting screws and adjust the leaf switch position.
2. After the adjustment apply lock paint to the adjusting screws.

Pinch Roller, Take-up Idler and Brake Timing Check (CASSETTE)

The following operations must be made at the same time when pushing the FWD button.

a. The brake levers depart from the supply reel and take-up reel tables.
b. The take-up idler comes in contact with the take-up reel table.
c. The pinch roller presses the capstan.

5-2. Electrical Adjustment

Preface for the Adjustment

1. Standard input level is as follows unless otherwise specified.

Input	MIC	AUX	PHONO	REC/PB Connector
Signal Source Impedance	600 Ω	10 kΩ	300 Ω	80 kΩ
Input Level	0.775mV (-60 dB)	0.243 V (-10 dB)	4.3mV (-45 dB)	17.2mV (-33 dB)

Where 0 dB = 0.775 V

2. Input Connection

With a balanced attenuator

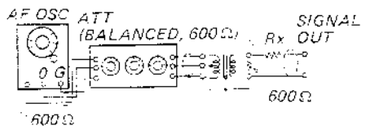


Fig. 5-2-1 Input connection

With an unbalanced attenuator

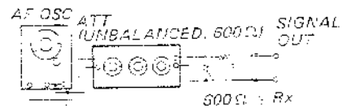


Fig. 5-2-2 Input connection

	MIC	AUX	PHONO	REC/PB Connector
Signal Source Impedance	600 Ω	10 kΩ	300 Ω	80 kΩ
Rx	500 Ω	10 kΩ	∞	80 kΩ

3. Standard output level in the playback mode is as follows unless otherwise specified.

Output	LINE OUT	SP
Load	100 kΩ	8 Ω
Output Level	0.435 V (-5 dB)	2.8 V (+11.2dB)

Where 0 dB = 0.775 V

Note: When measuring the output level, use a VTVM. If the LINE OUTput level is measured with an ac voltmeter of low input impedance (lower than 1 MΩ), the reading is almost the same with 100 kΩ load resistor or with no 100 kΩ load resistor.

4. The variable resistor and switch positions should be set as follows unless otherwise specified.

a. VOL control
Play back the 2nd tone (400 Hz) of SONY alignment tape (or the 1st tone, 400 Hz, of SONY alignment tape) with the BASS and TREBLE controls set at mechanically mid position and with 7½ ips (19 cm/s) tape speed, and set the VOL control to obtain the LINE OUT level of 0.435 V (-5 dB).

b. BASS & TREBLE controls
Mechanically mid position

c. SP MONITOR switch
"2" position

d. NOISE SUPRESS switch
"OFF" position

e. SOURCE SELECTOR switch
Set in accordance with the each adjustment.

5. The each SONY alignment tape is recorded as follows.

Tape \ Tone	1st	2nd	3rd	4th	Remarks
J-19-K1	1kHz 0.243V (-10dB)	400Hz 0.775V (0dB)			7½ ips (19cm/s) REEL
J-19-F1	1kHz 0.243V (-10dB)	400Hz 0.775V (0dB)	400Hz 0.243V (-10dB)	10kHz 0.243V (-10dB)	7½ ips (19cm/s) REEL

Tape \ Tone	5th	6th	7th	Remarks
J-19-F1	7kHz 0.243V (-10dB)	80Hz 0.243V (-10dB)	40Hz 0.243V (-10dB)	7½ ips (19cm/s) REEL

Tape	Tone	Remarks
P-4-A8T	6,300Hz 0.243V (-10dB)	1⅞ ips (4.8 cm/s) CASSETTE
P-4-F8T	333 Hz 0.775V (0dB)	1⅞ ips (4.8cm/s) CASSETTE

6. a. Before making the adjustment or measurement, be sure to clean the heads with cloth or swap dampened with denatured alcohol and to demagnetize the record/playback head with a head demagnetizer (SONY HE-2).

b. The blank tapes used in this adjustment are as follows.
SONY super 150 (REEL)
SONY C-60 (CASSETTE)

7. This adjustment or measurement should be made in numerical order as follows.

Adjustment & Measurement	Order REEL	Order CASSETTE
1. Tape Path Adjustment	1	—
2. Rec./PB Head Azimuth Adjustment	2	1
3. Phase Check	3	2
4. PB Frequency Response Measurement	4	3
5. PB Signal-to-Noise Ratio Measurement	5	4
6. Meter Calibration	6	—
7. Recording Bias Adjustment	7	5
8. Recording Level Check	8	6
9. Overall Frequency Response Measurement	9	7
10. Overall Signal-to-Noise Ratio Measurement	10	8
11. Overall Distortion Measurement	11	9
12. Power Amp. Output Level Measurement	12	—
13. Overall Maximum Output Measurement	13	10
14. Noise Suppress Response Check	14	—
15. Bass & Treble Response Check	15	—
16. Dubbing Level Check	16	11
17. Dubbing Signal-to-Noise Ratio Measurement	17	12
18. Crosstalk Check (between tracks)	18	13
19. Crosstalk Check (between channels)	19	14
20. Wow & Ruttle Measurement	20	15
21. Minimum Input Level Measurement	21	—
22. Tape Lamp Check	—	16

Adjustment and Measurement

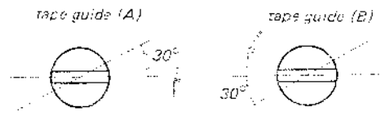
1. Tape Path Adjustment

1) Thread a tape and set the machine in mechanically FWD mode.

2) Turn the tape guide (A) so that the upper edge of the tape and the upper edge of the upper core or erase head are in the same height.

3) Turn the tape guide (B) so that the upper edge of the tape and the upper edge of the core of rec./p.b. head are in the same height.

4) Turn the tape guide (A) clockwise by 30 degrees. Turn the tape guide (B) counterclockwise by 30 degrees.



5) Adjusted tape path is as shown in Fig. 5-2-3.

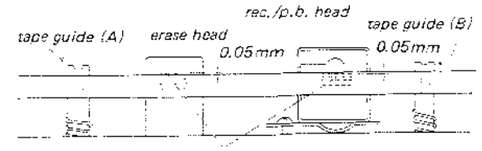


Fig. 5-2-3 Adjusted tape path

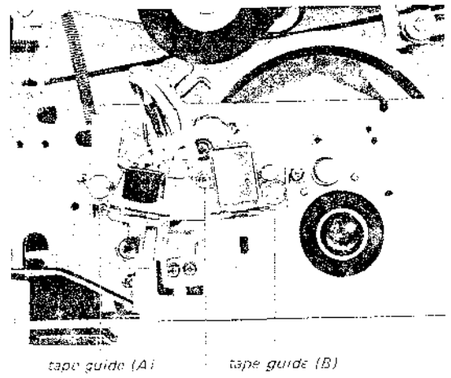


Fig. 5-2-4 Adjusting parts location

2. Rec./P.B. Head Azimuth Adjustment

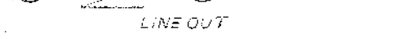


Fig. 5-2-5 Test setup

REEL

(See Fig. 5-2-4).

1) Play back the first tone (1 kHz) of the tape J-19-K1, or the first tone (10 kHz) of the tape J-19-F1. Adjust the azimuth adjusting screw for maximum output level.

2) When the same maximum level cannot be obtained at both channels, take the mid angle of the azimuth adjusting screw.

3) Press the supply reel slightly. Make sure that the output level does not increase more than 1 dB when the tape comes in close contact with the head.

Notes:
1) Clean the head with denatured alcohol before making adjustment.
2) Lock the azimuth adjusting screw with a locking paint after adjustment.
3) Check for the tape pass after adjustment.

1) Play back the tape (P-4-A81), and adjust the azimuth adjusting screw for maximum output level. See Fig. 5-2-5.
2) When the same maximum level cannot be obtained at both channels, take the mid angle of the azimuth adjusting screw.

Notes:
1) Choose the maximum peak of several ones. See Fig. 5-2-6.
2) Check for the tape pass after adjustment.

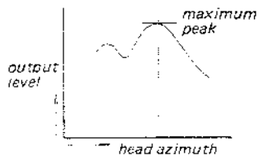


Fig. 5-2-6 Head azimuth adjustment (CASSETTE)

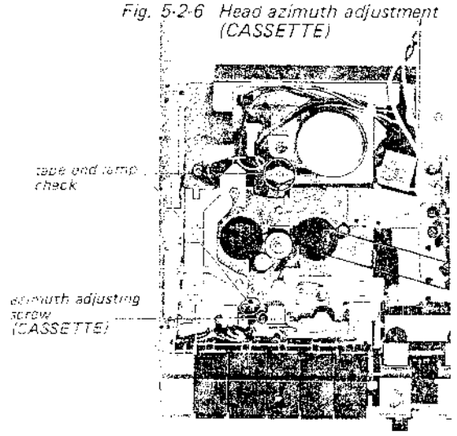


Fig. 5-2-7 Adjusting parts location

3. Phase Check

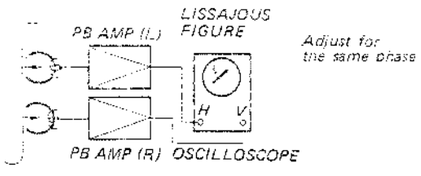


Fig. 5-2-8 Test setup

REEL

1) Play back the second tone (400Hz) of the tape (J-19-K1), or the second of the J-19-F1. Connect the scope to the speaker output, the horizontal input to channel L and the vertical input to channel R. Observe the Lissajous figure. If the Lissajous figure shows different phases of L and R output signals, adjust the azimuth adjusting screw.

2) Perform the same check at the LINE OUT and the HEADPHONE.

CASSETTE

Play back 333Hz signal of the tape (P-4-L81). Perform the check as in the procedure of the REEL.

4. Playback Frequency Response Measurement
(See Fig. 5-2-5 on page 12.)

Specification

(REEL) J-19-F1

Tone	3	4	5	6	7
Freq.	400Hz	10kHz	7kHz	80Hz	40Hz
Value	0dB	+1dB~ -3dB	+0.5dB~ -2.5dB	+6dB~ 0dB	+0.5dB~ -6.5dB

J-19-K1

Tone	2	1
Freq.	400Hz	10kHz
Value	0dB	-9dB~ -13dB

(CASSETTE)

Tape	Freq.	Value
P-4-L81	333Hz	0dB
P-4-A81	6,300Hz	-10dB~ -15dB

REEL

1) Play back the tape (J-19-F1). Make sure that the deviation of the playback output level at each frequency shown in the table can be obtained.
2) The deviation only at the 10kHz can be obtained in use of the tape, J-19-K1.

CASSETTE

Play back the tapes (P-4-L81 and P-4-A81). Make sure that the deviation of the playback output level shown in the table can be obtained.

5. Playback Signal-to-Noise Ratio Measurement
(See Fig. 5-2-5 on page 12.)

Specification

REEL greater than 46 dB
CASSETTE greater than 46 dB

REEL

Play back the second tone (400 Hz) of the tape (J-19-K1), or the second of the J-19-F1. Read the output level. Set the unit to the playback mode without the tape threaded, and read the level. Make sure the specified difference of the output level between the two can be obtained.

CASSETTE

Play back 333Hz signal of the tape (P-4-L81). Perform the check as in the procedure of the REEL.

6. Meter Calibration

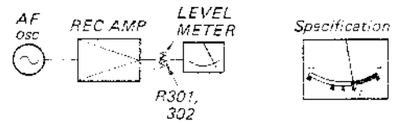


Fig. 5-2-9 Test setup

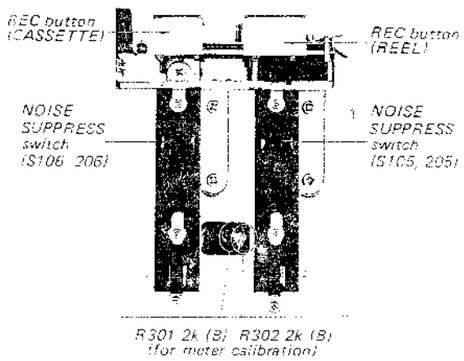


Fig. 5-2-10 Adjusting parts location

1) Deliver a 1kHz signal 0.775 mV (-60 dB) to the MIC jack in the Record mode.
2) Adjust R301 and R302 so that the pointer of the level meter reads "0".

7. Recording Bias Adjustment

Specification

		bias voltage
REEL	rec./p.b. head:	greater than 20V
	erase head:	greater than 40V
CASSETTE	rec./p.b. head:	greater than 15V
	erase head:	greater than 40V

REEL

Select the tap of the bias oscillator coil for the specified overall frequency response curve. See Overall Frequency Response Measurement on page 14.

CASSETTE

Perform the same adjustment as in the procedure of the REEL.

8. Recording Level Check

REEL

1) Deliver a 1 kHz signal 0.775 mV (-60 dB) to the MIC jack.
2) Record the signal on a blank tape.

3) Play back the tape. Make sure that the specified LINE OUT level can be obtained.

Specification

between 0.305 V (-8 dB) and 0.610 V (-2 dB)

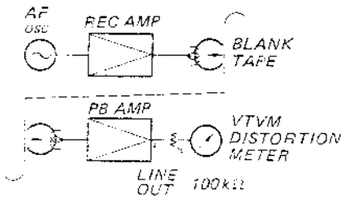


Fig. 5-2-11 Test setup for the Procedure 8, 9, 10, 11 & 13

CASSETTE

Perform the same adjustment as in the procedure of the REEL.

9. Overall Frequency Response Measurement
(See Fig. 5-2-11.)

Specification

Speed \ Freq.	1kHz	10kHz	7kHz	100Hz	80Hz
17/8 ips (4.76 cm/s)	0dB	0dB~ -13.5dB	-9.5dB	-13dB	+2dB~ -4dB

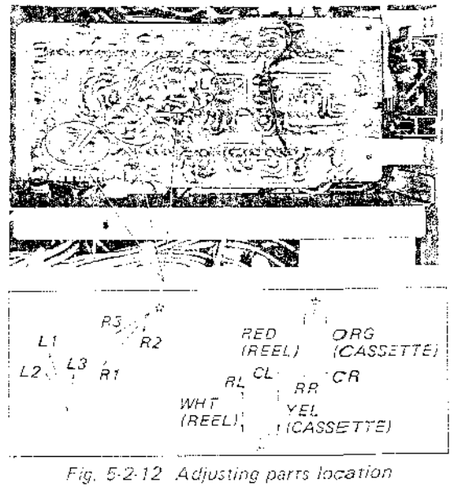


Fig. 5-2-12 Adjusting parts location

REEL

1) Deliver a 1 kHz signal 0.775 mV (-60 dB) to the MIC jack.
2) Record 1 kHz, 18 kHz, 13 kHz, 10 kHz, 7 kHz, 5 kHz, 100 Hz and 30 Hz signals of 77 μV (-80 dB) on the blank tape in order.
3) Play back the tape. Make sure that the specified deviation of the output level at each frequency can be obtained.
4) Select the tap of the bias oscillator for the specified deviation, if necessary.

Note:
When the specified deviation cannot be obtained after performing step 4, check the Playback Frequency Response.

CASSETTE

Perform the same adjustment as in the procedure of the REEL.

10. Overall Signal-to-Noise Ratio Measurement
(See Fig. 5-2-11 on page 14.)

Specification

REEL

greater than 43 dB at $7^1/_2$ ips (19 cm/s)
greater than 40 dB at $3^3/_4$ ips (9.5 cm/s)
greater than 39 dB at $1^7/_8$ ips (4.8 cm/s)

CASSETTE

greater than 40 dB

REEL

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack.
2) Record the signal on a blank tape. Cut off the input signal, and terminate the MIC jack with a 600 Ω resistor. Continue the recording with no signal input.
3) Play back the tape. Make sure that the specified difference of the output level between the two parts of the tape can be obtained.

CASSETTE

Perform the same adjustment as in the procedure of the REEL.

11. Overall Distortion Measurement
(See Fig. 5-2-11 on page 14.)

Specification

REEL less than 3%
CASSETTE less than 4%

REEL

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack.
2) Record the signal on a blank tape.
3) Play back the tape and measure the distortion.

CASSETTE

Perform the same adjustment as in the procedure of the REEL.

12. Power Amplifier Output Level Measurement

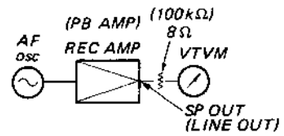


Fig. 5-2-13 Test setup for the Procedure 12, 14 & 21

Specification
in PB mode
+11.2 dB (2.8 V) ±1.5 dB
in REC MONITOR
Switch Position: "1" -17 dB (0.109 V) ±1.5 dB
"2" -1 dB (0.685 V) ±1.5 dB
OFF no output

REEL

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack in the Playback mode.
2) Make sure that the specified speaker output level can be obtained.
3) Set the unit to the Record mode. Make sure that the specified speaker output level can be obtained at each monitor switch position, 2, 1 and OFF.

13. Overall Maximum Output Level Measurement
(See Fig. 5-2-11 on page 14.)

Specification greater than 6.1 V (18.4 dB) (5 W)

REEL

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack.
2) Record the signal on a blank tape.
3) Play back the tape with the VOL and tone controls set to fully clockwise position. Check the speaker output level.

CASSETTE

Perform the same adjustment as in the procedure of the REEL.

14. Noise Suppressor Response Check
(See Fig. 5-2-13.)

Specification
between -4.5 dB and -8.5 dB from 1 kHz output level

REEL

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack in the Playback mode.
2) Set the Noise Suppressor switch to ON, and check the speaker output level.
3) Change the signal frequency to 10 kHz. Check the output level.

15. Bass & Treble Response Check
(See Fig. 5-2-13 on page 15.)

Specification difference from 1 kHz output level

BASS	100 Hz	MAX	greater than +6 dB
		MIN	less than -6 dB
TREBLE	10 kHz	MAX	greater than +6 dB
		MIN	less than -6 dB

REEL

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack.
2) Check the speaker output level.
3) Change the frequency to 100 Hz. Check the output levels with the BASS Control set to MAX and MIN.
4) Change the frequency to 10 kHz. Check the output levels with the TREBLE Control set to MAX and MIN.
5) Make sure that the specified differences can be obtained.

16. Dubbing Level Check

Specification

LINE OUT between 0.243 V (-10 dB) and 0.775 V (0 dB) (difference within 3 dB between channels)

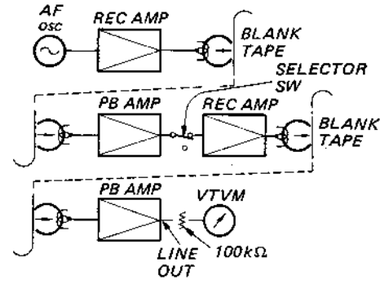


Fig. 5-2-14 Test setup for the Procedure 16 & 17

REEL to CASSETTE

1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack.
2) Record the signal on a blank tape.
3) Thread a blank tape cassette, play back the tape with the Source Selector set to REEL, and start dubbing.
4) Play back the tape cassette with the Source Selector set to CASSETTE. Check the line output level. Make sure the specified value can be obtained.

CASSETTE to REEL

Perform the adjustment in the same way as in the REEL to CASSETTE.

17. Dubbing Signal-to-Noise Ratio Measurement
(See Fig. 5-2-14.)

VALUE greater than 40 dB

REEL to CASSETTE

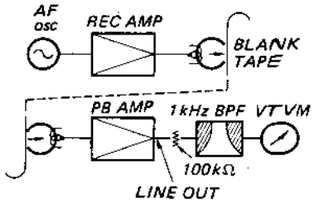
1) Deliver a 1 kHz signal of 0.775 mV (-60 dB) to the MIC jack.
2) Record the signal on a blank tape. Cut off the input signal, and terminate the MIC jack with a 600 Ω resistor. Continue the recording with no signal input.
3) Thread a blank tape cassette, play back the tape with the Source Selector set to REEL, and start dubbing.
4) Play back the tape cassette with the Source Selector set to CASSETTE. Check the output levels at both parts of the tape.
Make sure that the signal-to-noise ratio is greater than 40 dB.

Note:
The recorded part without signal should be made perfect dubbing.

CASSETTE to REEL

Perform the measurement in the same way as in the REEL to CASSETTE.

18. Crosstalk Check between Tracks



VALUE
REEL
greater than 50 dB
CASSETTE
greater than 55 dB

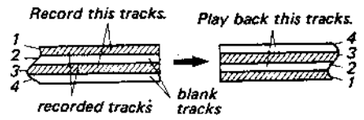
Fig. 5-2-15 Test setup for the Procedure 18, 19 & 20

REEL

1) Deliver 1 kHz signal of 2.45 mV (-50 dB) to the MIC jack, and record it on the blank tape.
2) Play back the tape. Check the LINE OUT level

through the 1 kHz bandpass filter.

3) Reverse the reels. Play back the unrecorded tracks. Check the line output level through the bandpass filter. Make sure that the correct difference can be obtained.

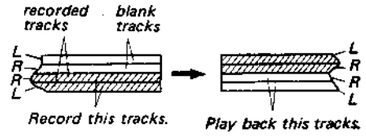


Notes:

1. The tape should be perfectly erased before making crosstalk check. A bulk eraser is recommendable.
2. The pointer of the Level Meter oscillates to the full when the input of 2.45 mV (-50 dB) is supplied.

CASSETTE

Perform the same measurement as in the procedure of the REEL.



Note:

Same as in the REEL.

19. Crosstalk Check between Channels

(See Fig. 5-2-15 on page 16.)

Specification

REEL

greater than 45 dB

CASSETTE

greater than 25 dB

REEL

1) Deliver a 1 kHz signal of 2.45 mV (-50 dB) to the MIC jack of Channel L, and terminate the jack of Channel R with a 600Ω resistor. Thread a blank tape, and set the both channels to the Record mode.
2) Play back the tape. Check the line output levels through the 1 kHz bandpass filter.
3) Make sure that the specified difference of the output level between the two channels can be obtained.
4) Perform the same measurement with the signal delivered to Channel R, and a resistor to Channel L.

Note:

See the Note in the Crosstalk Check between Tracks.

CASSETTE

Perform the same measurement as in the REEL.

20. Erase Ratio Measurement

(See Fig. 5-2-15 on page 16.)

Specification

REEL

greater than 60 dB

CASSETTE

greater than 60 dB

REEL

1) Deliver a 1 kHz signal of 2.45 mV (-50 dB) to the MIC jack, and record it onto a blank tape.
2) Rewind the tape by half. Cut off the input from the jack. Erase the tape by setting the unit to the Record mode without input signal.
3) Play back the tape. Make sure that the specified difference of the output level between the two parts of the tape through a 1 kHz bandpass filter.

CASSETTE

Perform the same measurement as in the REEL.

21. Minimum Input Level Measurement

(See Fig. 5-2-13 on page 15.)

Specification

MIC jack	less than 0.195 mV (-72 dB)
AUX jack	less than 61 mV (-22 dB)
PHONO jack	less than 1.09 mV (-57 dB)

1) Set the BASS and TREBLE Controls to the mechanical mid position, and the VOL Control to maximum.
2) Deliver a 1 kHz signal to the input jacks, MIC, AUX and PHONO. Check the input levels with the line output levels adjusted for 0.433 V (-5 dB).

22. End Lamp Check

(See Fig. 5-2-7 on page 13.)

CASSETTE

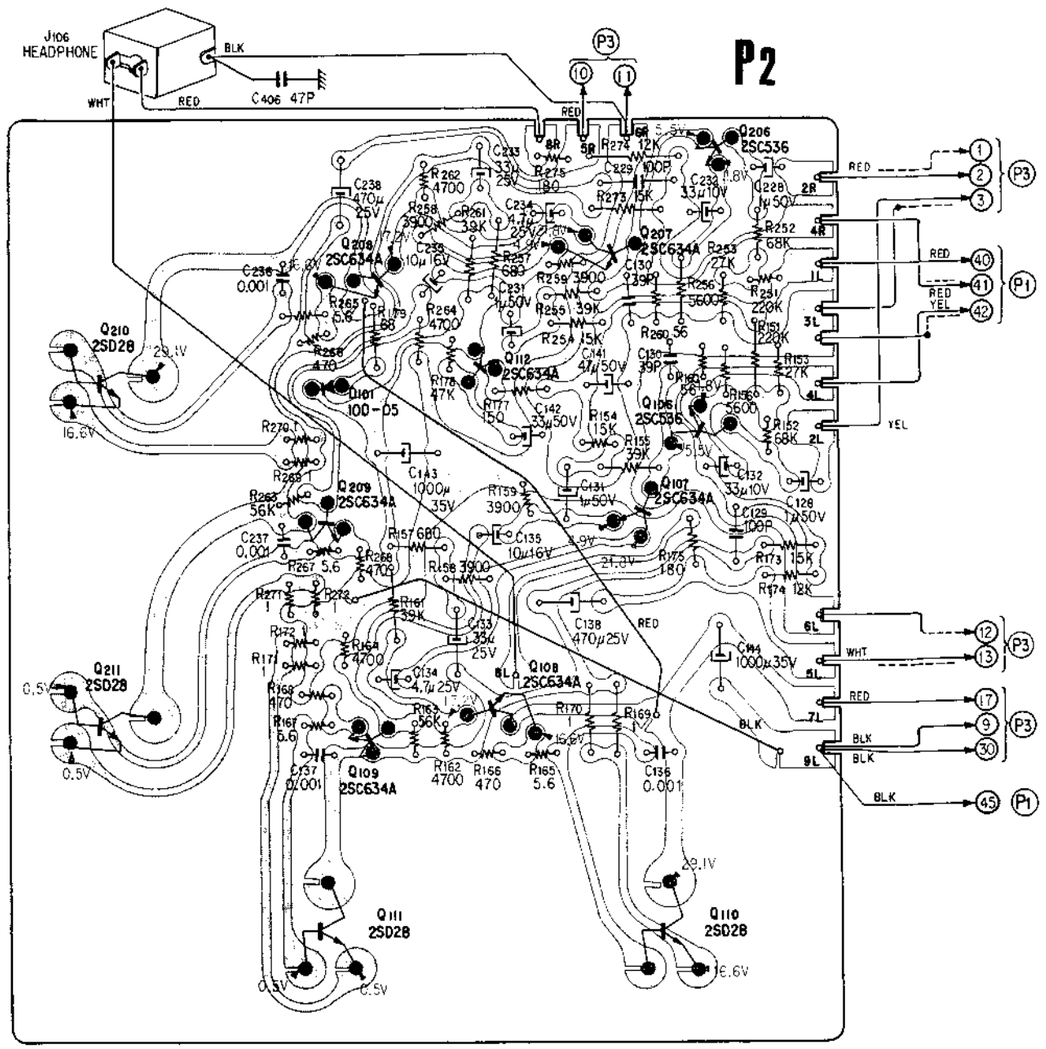
End Lamp Check

Make sure that the lamp lights at the end of the tape cassette in the Forward mode, when the tape cassette with sensing foil is used.

6. MOUNTING DIAGRAM

Power Amp. Circuit Board

– Conductor Side –



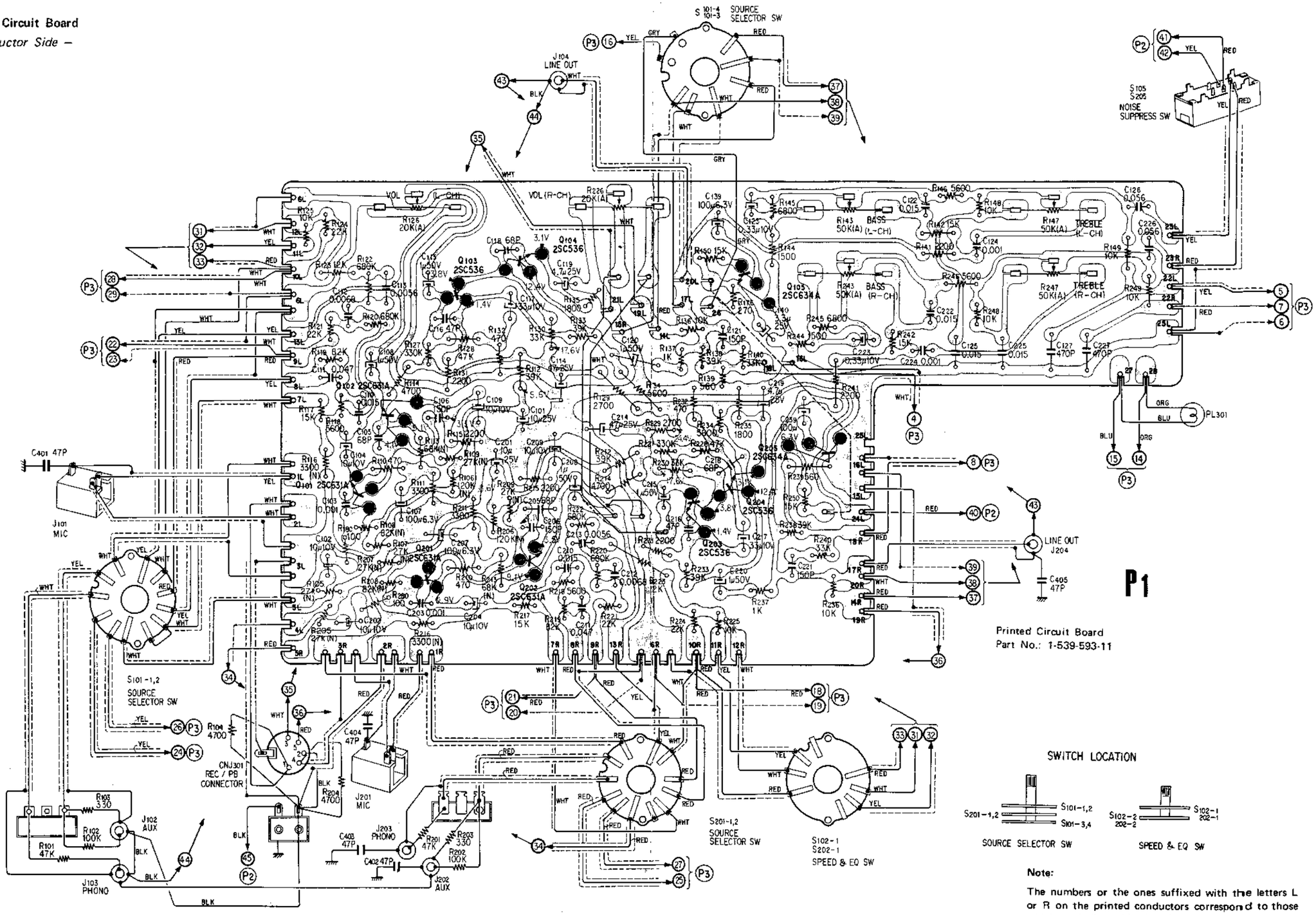
Printed Circuit Board
Part No.: 1-539-591-11

Note:

The numbers suffixed with the letters L or R on the printed conductors correspond to those which are indicated in the schematic diagram on pages 23 and 24.

Preamp. Circuit Board

– Conductor Side –



Printed Circuit Board
Part No.: 1-539-593-11

SWITCH LOCATION

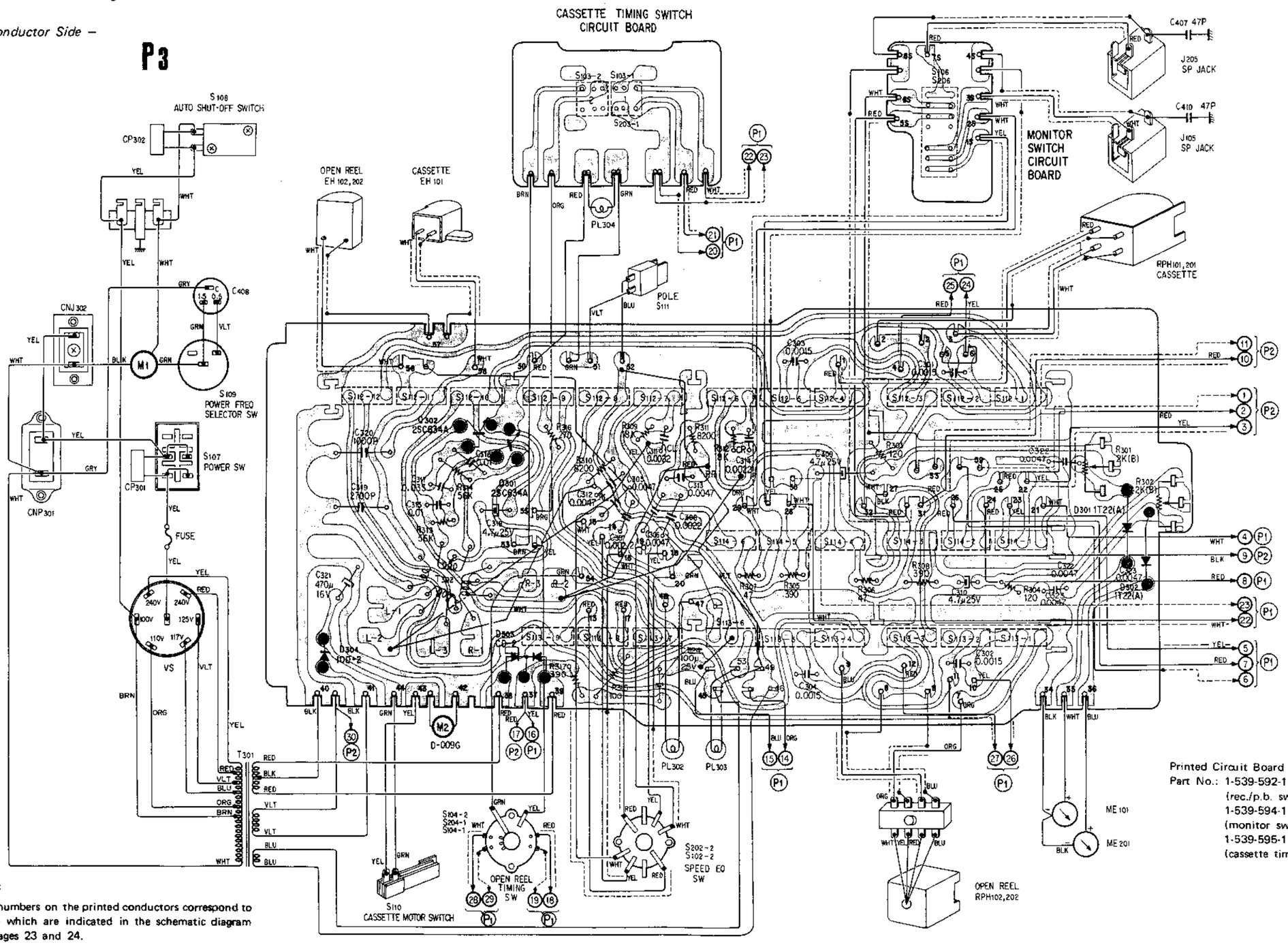
Note:

The numbers or the ones suffixed with the letters L or R on the printed conductors correspond to those which are indicated in the schematic diagram on pages 23 and 24.

Rec./PB Switch & Bias Osc. Circuit Board

Monitor Switch & Cassette Timing Switch Circuit Boards

– Conductor Side –

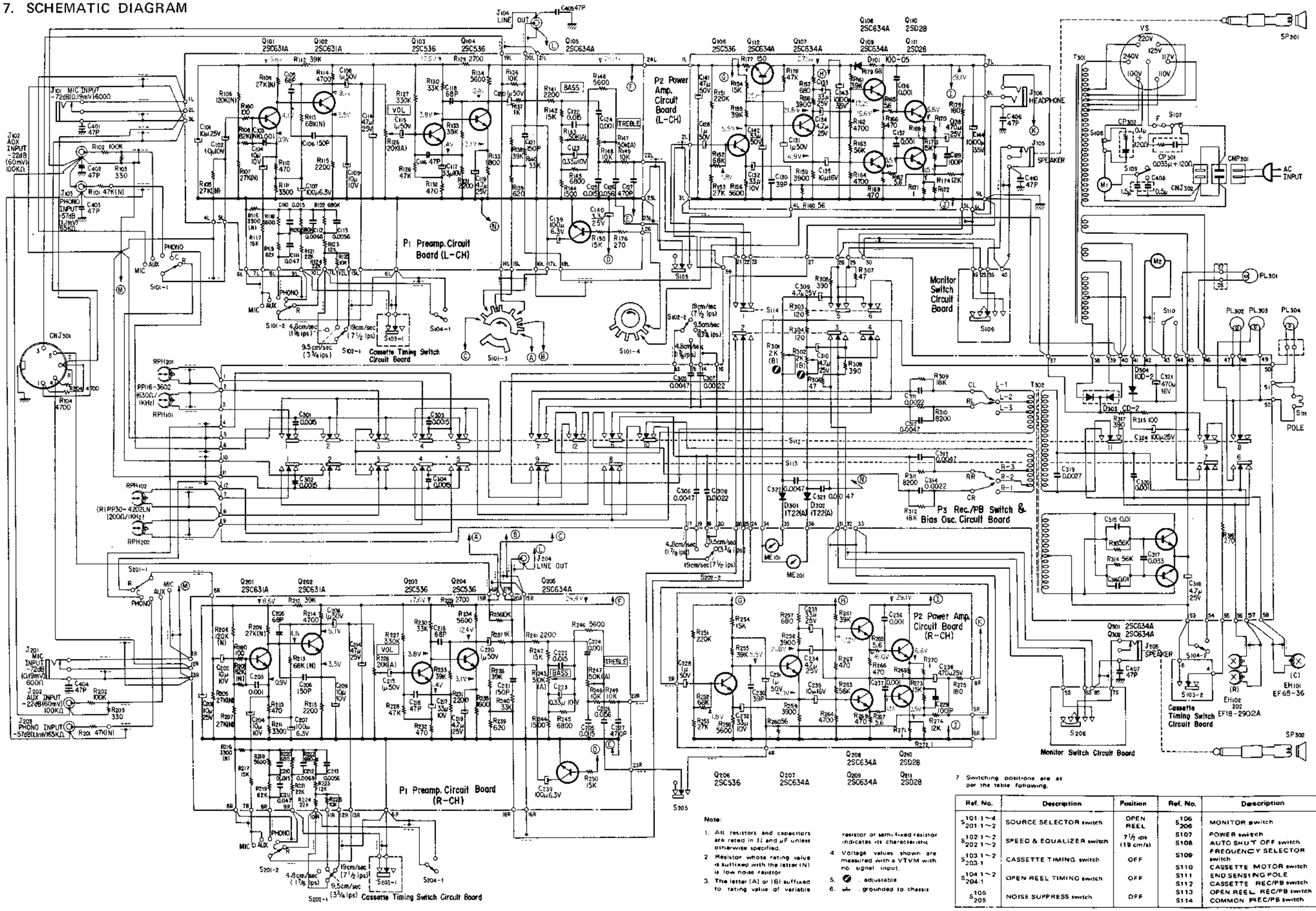


Note:

The numbers on the printed conductors correspond to those which are indicated in the schematic diagram on pages 23 and 24.

Printed Circuit Board
Part No.: 1-539-592-11
(rec./p.b. switch & bias osc.)
1-539-594-11
(monitor switch)
1-539-595-11
(cassette timing switch)

7. SCHEMATIC DIAGRAM



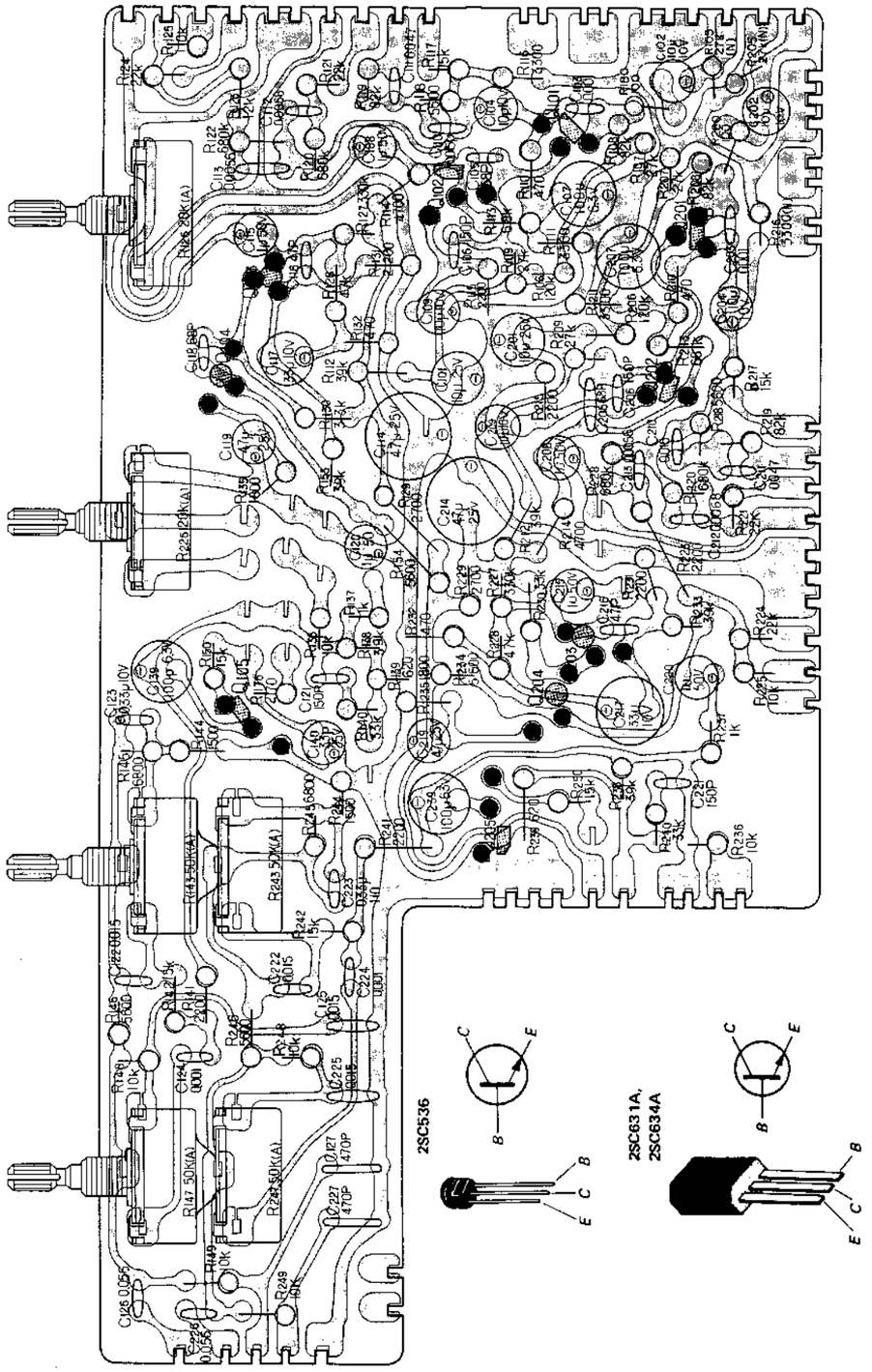
Note:

1. All resistors and capacitors are rated in Ω and μF unless otherwise specified.
2. Resistor whose rating value is suffixed with the letter (N) is low noise resistor.
3. The letter (A) or (B) suffixed to rating value of variable resistor or semi-fixed resistor indicates its characteristic.
4. Voltage values shown are measured with a VTVM with no signal input.
5. ◐ : adjustable
6. ⏚ : grounded to chassis
7. Switching positions are as per the table following.

Ref. No.	Description	Position	Ref. No.	Description	Position
S101-1~4 S201-1~2	SOURCE SELECTOR switch	OPEN REEL	S106 S206	MONITOR switch	OFF
S102-1~2 S202-1~2	SPEED & EQUALIZER switch	7½ ips (19 cm/s)	S107	POWER switch	ON
S103-1~2 S203-1	CASSETTE TIMING switch	OFF	S108	AUTO SHUT OFF switch	ON
			S109	FREQUENCY SELECTOR switch	60 Hz
S104-1~2 S204-1	OPEN REEL TIMING switch	OFF	S110	CASSETTE MOTOR switch	OFF
			S111	END SENSING POLE	OFF
S105 S205	NOISE SUPPRESS switch	OFF	S112	CASSETTE REC/PB switch	PB
			S113	OPEN REEL REC/PB switch	PB
			S114	COMMON REC/PB switch	PB

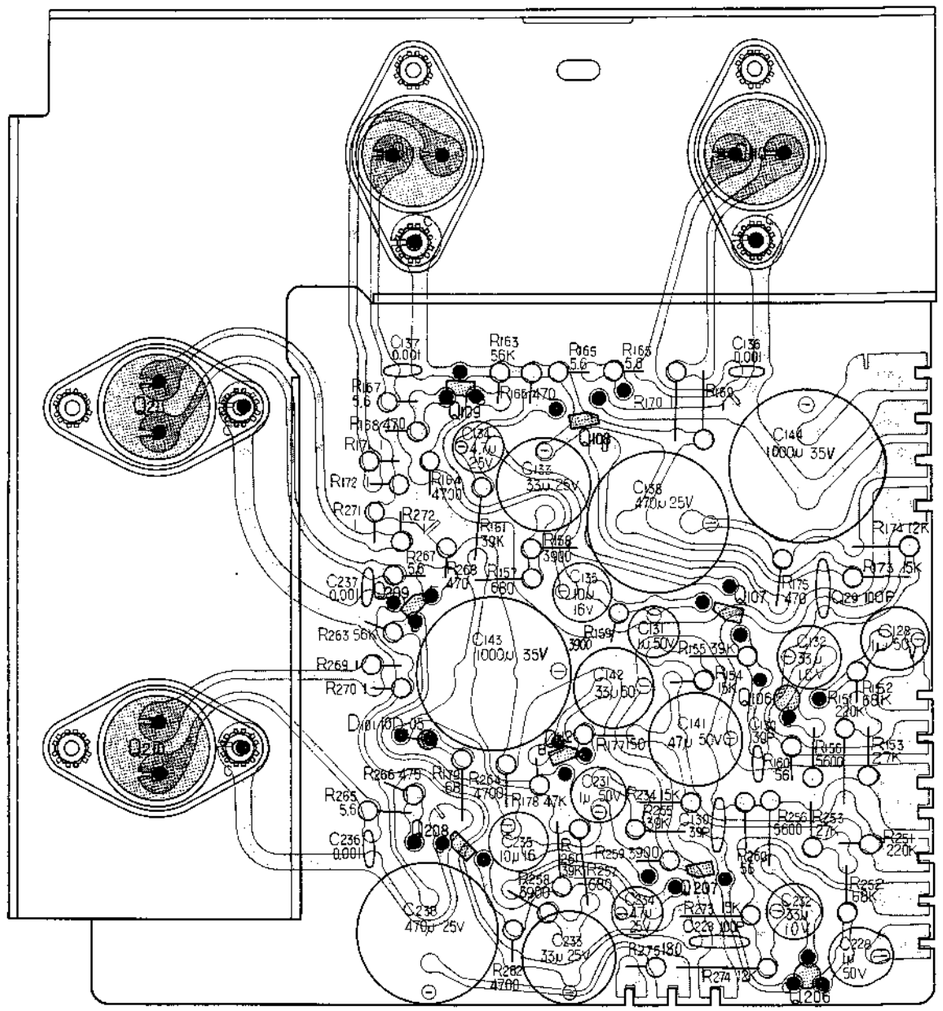
Preamp. Circuit Board

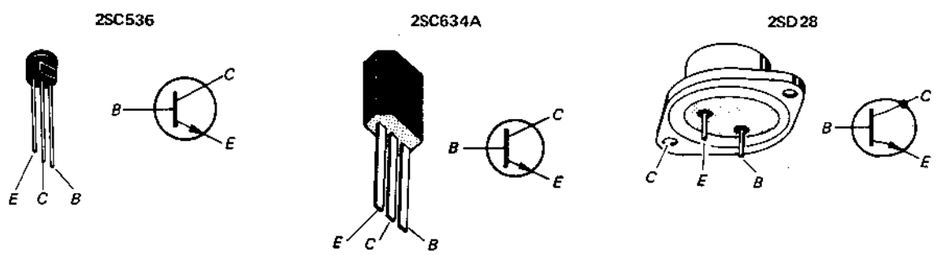
– Component Side –



Power Amp. Circuit Board

– Component Side –

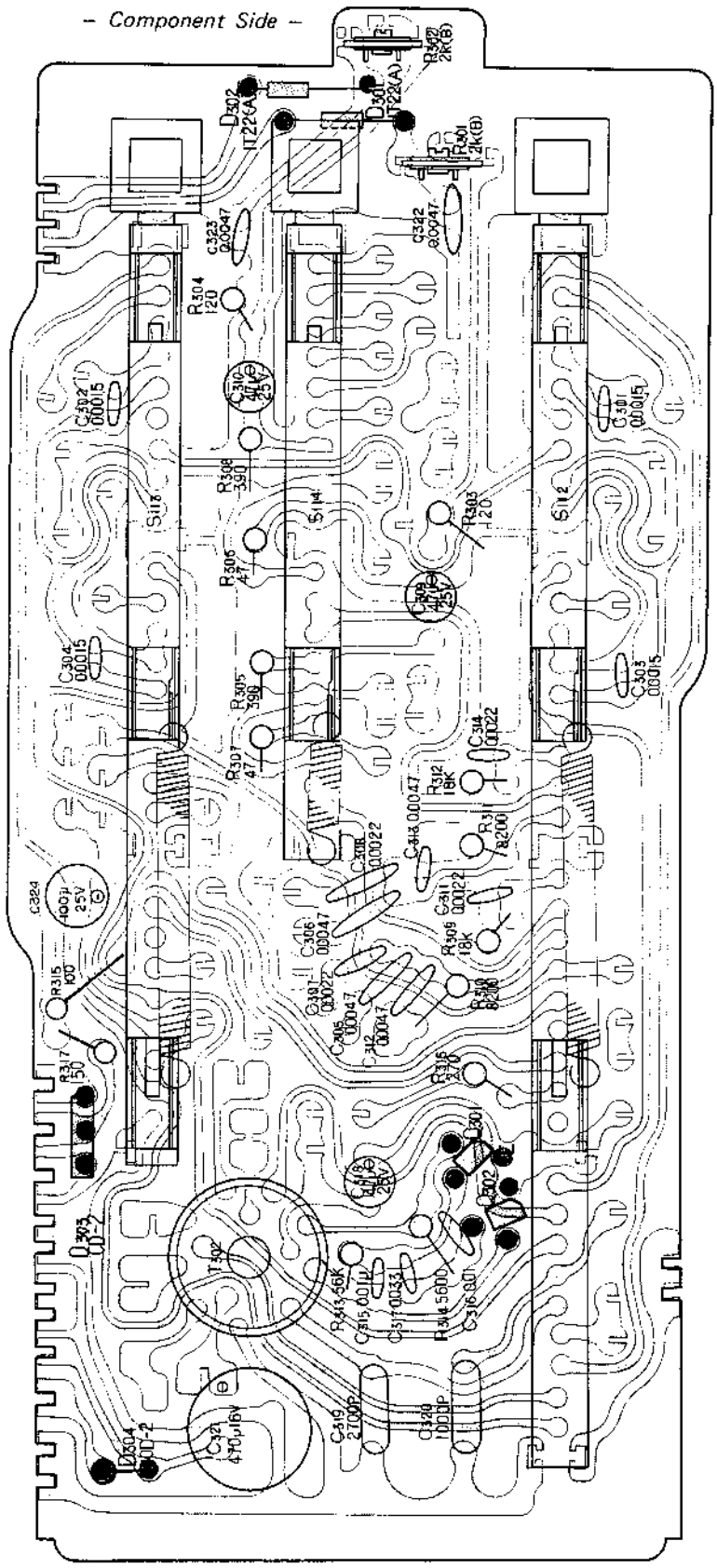


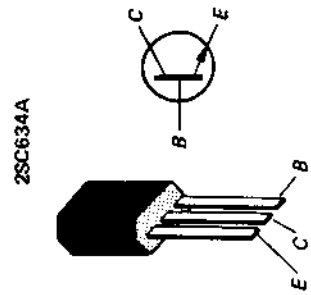


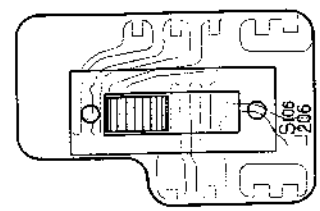
Rec./PB Switch & Bias Osc. Circuit Board

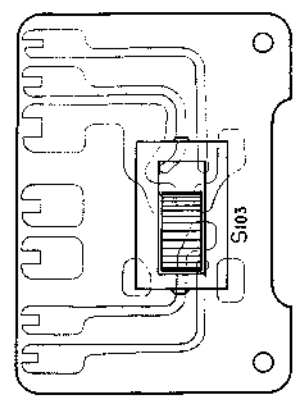
Monitor Switch & Cassette Timing Switch Circuit Boards

– Component Side –



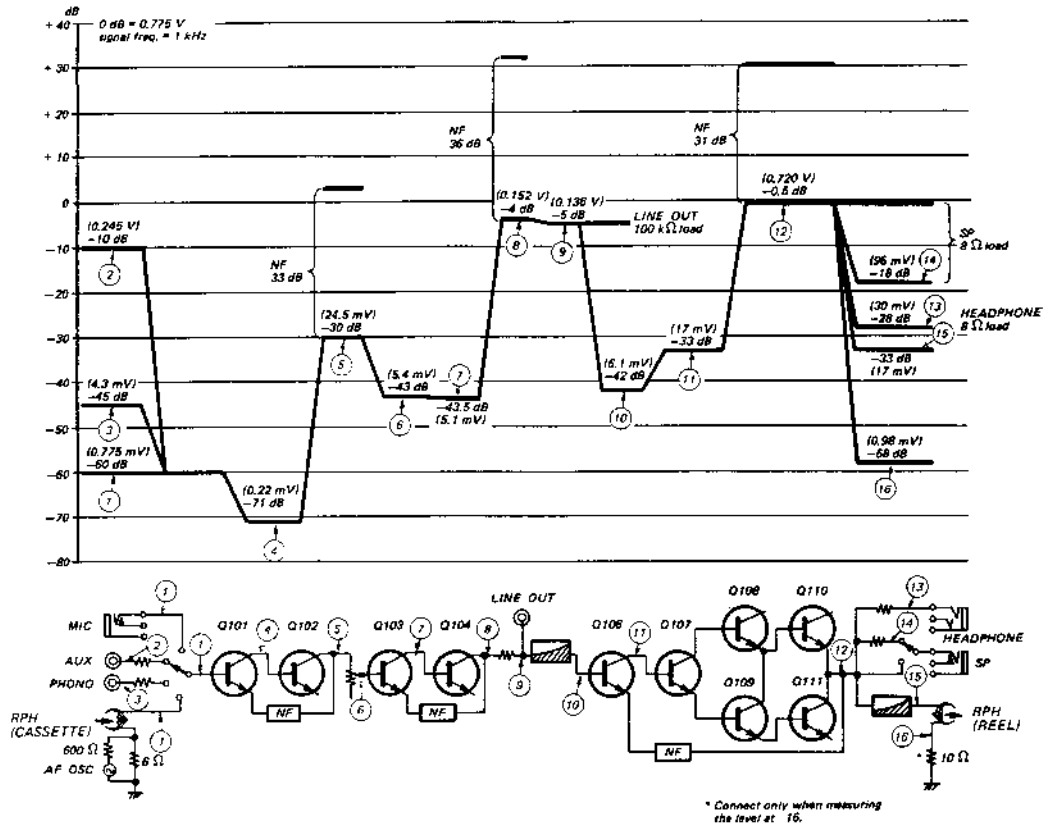




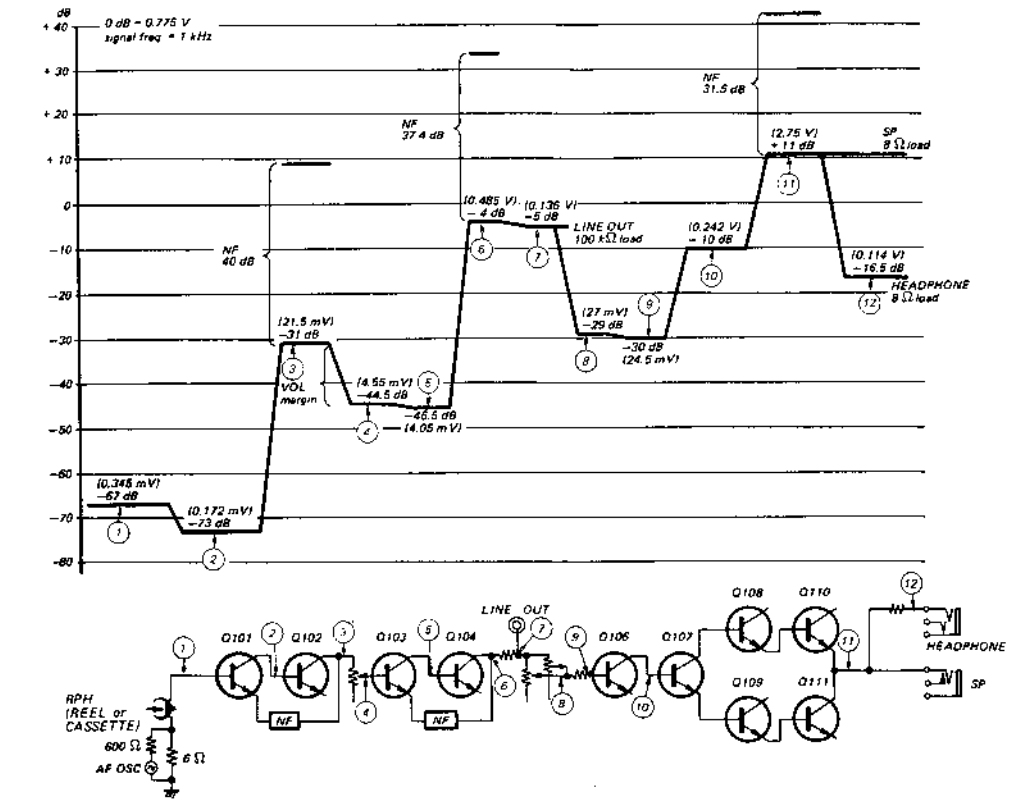


8. LEVEL DIAGRAM

Record



Playback



9. MODIFICATION FOR DIFFERENT POWER LINE FREQUENCY

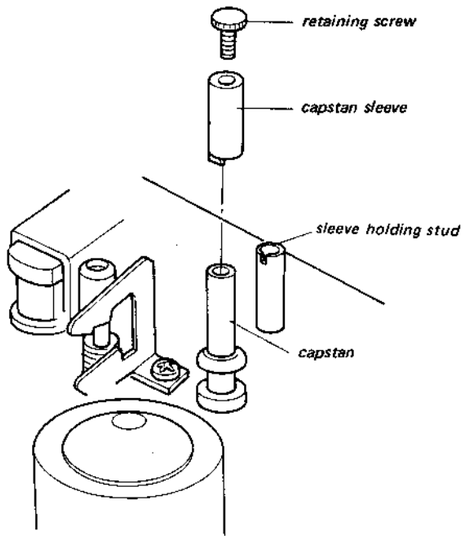
Note: This modification is for the REEL section only. No modification is needed for the CASSETTE section.

for 50 Hz

Set the frequency selector to "50" position. Remove the capstan sleeve from the sleeve holding stud, put the capstan sleeve on the capstan and secure it with the retaining screw.

for 60 Hz

Set the frequency selector to "60" position. Remove the capstan sleeve, put it on the sleeve holding stud and fix it with the retaining screw.



10. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	MOUNTED CIRCUIT BOARDS	
	X-34810-53-2	power amp.
	X-34810-52-3	rec./p.b. switch & bias osc.
	X-34810-51-3	preamp.
	X-34810-55-1	monitor switch
	X-34810-54-1	cassette timing switch
	PRINTED CIRCUIT BOARDS	
	1-539-591-11	power amp.
	1-539-592-11	rec./p.b. switch & bias osc.
	1-539-593-11	preamp.
	1-539-594-11	monitor switch
	1-539-595-11	cassette timing switch
	SEMICONDUCTORS	
Q101, 201		transistor, 2SC631A
Q102, 202		transistor, 2SC631A
Q103, 203		transistor, 2SC536
Q104, 204		transistor, 2SC536
Q105, 205		transistor, 2SC634A
Q106, 206		transistor, 2SC536
Q107, 207		transistor, 2SC634A
Q108, 208		transistor, 2SC634A
Q109, 209		transistor, 2SC634A
Q110, 210		transistor, 2SD28
Q111, 211		transistor, 2SD28
Q112		transistor, 2SC634A
Q301		transistor, 2SC634
Q302		transistor, 2SC634
D101		diode, 10D-05
D301		diode, 1T-22 (A)
D302		diode, 1T-22 (A)
D303		diode, CD-2
D304		diode, 10D-2
	TRANSFORMERS	
T301	1-441-637	power
T302	1-433-147	bias osc.
	CAPACITORS	
C101, 201	1-121-398	10 μF 25V, electrolytic
C102, 202	1-121-469	10 μF 10V, electrolytic
C103, 203	1-105-661-12	0.001 μF 50V, mylar
C104, 204	1-121-469	10 μF 10V, electrolytic
C105, 205	1-107-127	68 pF 50V, silvered mica
C106, 206	1-107-135	150 pF 50V, silvered mica
C107, 207	1-121-413	100 μF 6.3V, electrolytic
C108, 208	1-121-391	1 μF 50V, electrolytic
C109, 209	1-121-469	10 μF 10V, electrolytic
C110, 210	1-105-675-12	0.015 μF 50V, mylar
C111, 211	1-105-681-12	0.047 μF 50V, mylar

Ref. No.	Part No.	Description
C112, 212	1-105-671-12	0.0068 μF 50V, mylar
C113, 213	1-105-070-12	0.0056 μF 50V, mylar
C114, 214	1-121-410	47 μF 25V, electrolytic
C115, 215	1-121-391	1 μF 50V, electrolytic
C116, 216	1-107-123	47 pF 50V, silvered mica
C117, 217	1-121-402	33 μF 10V, electrolytic
C118, 218	1-107-127	68 pF 50V, silvered mica
C119, 219	1-121-395	47 μF 25V, electrolytic
C120, 220	1-121-391	1 μF 50V, electrolytic
C121, 221	1-107-135	150 pF 50V, silvered mica
C122, 222	1-105-675-12	0.015 μF 50V, mylar
C123, 223	1-127-021	0.33 μF 10V, electrolytic
C124, 224	1-105-661-12	0.001 μF 50V, mylar
C125, 225	1-105-675-12	0.015 μF 50V, mylar
C126, 226	1-105-682-12	0.056 μF 50V, mylar
C127, 227	1-107-244	470 pF 50V, silvered mica
C128, 228	1-121-391	1 μF 50V, electrolytic
C129, 229	1-107-131	100 pF 50V, silvered mica
C130, 230	1-107-121	39 pF 50V, silvered mica
C131, 231	1-121-391	1 μF 50V, electrolytic
C132, 232	1-121-402	33 μF 10V, electrolytic
C133, 233	1-121-404	33 μF 25V, electrolytic
C134, 234	1-121-395	4.7 μF 25V, electrolytic
C135, 235	1-121-469	10 μF 10V, electrolytic
C136, 236	1-105-661-12	0.001 μF 50V, mylar
C137, 237	1-105-661-12	0.001 μF 50V, mylar
C138, 238	1-121-733	470 μF 25V, electrolytic
C139, 239	1-121-413	100 μF 6.3V, electrolytic
C140	1-121-392	3.3 μF 25V, electrolytic
C141	1-121-411	47 μF 50V, electrolytic
C142	1-121-405	33 μF 50V, electrolytic
C143	1-121-388	1000 μF 35V, electrolytic
C144	1-121-388	1000 μF 35V, electrolytic
C301	1-105-663-12	0.0015 μF 50V, mylar
C302	1-105-663-12	0.0015 μF 50V, mylar
C303	1-105-663-12	0.0015 μF 50V, mylar
C304	1-105-663-12	0.0015 μF 50V, mylar
C305	1-105-669-12	0.0047 μF 50V, mylar
C306	1-105-669-12	0.0047 μF 50V, mylar
C307	1-105-665-12	0.0022 μF 50V, mylar
C308	1-105-665-12	0.0022 μF 50V, mylar
C309	1-121-395	4.7 μF 25V, electrolytic
C310	1-121-395	4.7 μF 25V, electrolytic
C311	1-105-665-12	0.0022 μF 50V, mylar
C312	1-105-669-12	0.0047 μF 50V, mylar
C313	1-105-669-12	0.0047 μF 50V, mylar
C314	1-105-665-12	0.0022 μF 50V, mylar
C315	1-105-673-12	0.01 μF 50V, mylar
C316	1-105-673-12	0.01 μF 50V, mylar
C317	1-105-679-12	0.033 μF 50V, mylar
C318	1-121-398	10 μF 25V, electrolytic

Ref. No.	Part No.	Description	
C319	1-129-707	2700 pF	630V, polyethylene
C320	1-129-702	1000 pF	630V, polyethylene
C321	1-121-426	470 μF	16V, electrolytic
C322	1-106-074-12	0.0047 μF	50V, mylar
C323	1-106-074-12	0.0047 μF	50V, mylar
C324	1-121-416	100 μF	25V, electrolytic
C401	1-107-123	47 pF	50V, silvered mica
C402	1-107-123	47 pF	50V, silvered mica
C403	1-107-123	47 pF	50V, silvered mica
C404	1-107-123	47 pF	50V, silvered mica
C405	1-107-123	47 pF	50V, silvered mica
C406	1-107-123	47 pF	50V, silvered mica
C407	1-107-123	47 pF	50V, silvered mica
C408	1-117-036	(1.5+0.5)μF	250V, MP
C409	1-105-681-12	0.047 μF	50V, mylar
C410	1-107-123	47 pF	50V, silvered mica

RESISTORS

R101, 201	1-242-713	47 kΩ	¼W,	carbon
R102, 202	1-242-721	100 kΩ	¼W,	carbon
R103, 203	1-242-661	330 Ω	¼W,	carbon
R104, 204	1-242-689	4700 Ω	¼W,	carbon
R105, 205	1-242-707	27 kΩ	¼W,	carbon
R106, 206	1-242-723	120 kΩ	¼W,	carbon
R107, 207	1-242-707	27 kΩ	¼W,	carbon
R108, 208	1-242-719	82 kΩ	¼W,	carbon
R109, 209	1-242-707	27 kΩ	¼W,	carbon
R110, 210	1-242-665	470 Ω	¼W,	carbon
R111, 211	1-242-685	3300 Ω	¼W,	carbon
R112, 212	1-242-711	39 kΩ	¼W,	carbon
R113, 213	1-242-717	68 kΩ	¼W,	carbon
R114, 214	1-242-689	4700 Ω	¼W,	carbon
R115, 215	1-242-681	2200 Ω	¼W,	carbon
R116, 216	1-242-685	3300 Ω	¼W,	carbon
R117, 217	1-242-701	15 kΩ	¼W,	carbon
R118, 218	1-242-691	5600 Ω	¼W,	carbon
R119, 219	1-242-719	82 kΩ	¼W,	carbon
R120, 220	1-242-741	680 kΩ	¼W,	carbon
R121, 221	1-242-705	22 kΩ	¼W,	carbon
R122, 222	1-242-741	680 kΩ	¼W,	carbon
R123, 223	1-242-699	12 kΩ	¼W,	carbon
R124, 224	1-242-705	22 kΩ	¼W,	carbon
R125, 225	1-242-697	10 kΩ	¼W,	carbon
R126, 226	1-221-593	20 kΩ (A)		variable
R127, 227	1-242-733	330 kΩ	¼W,	carbon
R128, 228	1-242-713	47 kΩ	¼W,	carbon
R129, 229	1-242-683	2700 Ω	¼W,	carbon
R130, 230	1-242-709	33 kΩ	¼W,	carbon
R131, 231	1-242-681	2200 Ω	¼W,	carbon
R132, 232	1-242-665	470 Ω	¼W,	carbon
R133, 233	1-242-711	39 kΩ	¼W,	carbon

Ref. No.	Part No.	Description	
R134, 234	1-242-691	5600 Ω	¼W, carbon
R135, 235	1-242-679	1800 Ω	¼W, carbon
R136, 236	1-242-697	10 kΩ	¼W, carbon
R137, 237	1-242-673	1 kΩ	¼W, carbon
R138, 238	1-242-711	39 kΩ	¼W, carbon
R139, 239	1-242-668	620 Ω	¼W, carbon
R140, 240	1-242-709	33 kΩ	¼W, carbon
R141, 241	1-242-681	2200 Ω	¼W, carbon
R142, 242	1-242-701	15 kΩ	¼W, carbon
R143, 243	1-222-203	50 kΩ (A)	variable
R144, 244	1-242-677	1500 Ω	½W, carbon
R145, 245	1-242-693	6800 Ω	½W, carbon
R146, 246	1-242-691	5600 Ω	¼W, carbon
R147, 247	1-222-203	50 kΩ (A)	variable
R148, 248	1-242-697	10 kΩ	½W, carbon
R149, 249	1-242-697	10 kΩ	¼W, carbon
R150, 250	1-242-701	15 kΩ	½W, carbon
R151, 251	1-242-729	220 kΩ	¼W, carbon
R152, 252	1-242-717	68 kΩ	¼W, carbon
R153, 253	1-242-707	27 kΩ	½W, carbon
R154, 254	1-242-701	15 kΩ	¼W, carbon
R155, 255	1-242-711	39 kΩ	¼W, carbon
R156, 256	1-242-691	5600 Ω	½W, carbon
R157, 257	1-242-669	680 Ω	½W, carbon
R158, 258	1-242-687	3900 Ω	½W, carbon
R159, 259	1-242-687	3900 Ω	½W, carbon
R160, 260	1-242-643	56 Ω	½W, carbon
R161, 261	1-242-711	39 kΩ	½W, carbon
R162, 262	1-242-689	4700 Ω	½W, carbon
R163, 263	1-242-715	56 kΩ	½W, carbon
R164, 264	1-242-689	4700 Ω	½W, carbon
R165, 265	1-242-619	5.6 Ω	½W, carbon
R166, 266	1-242-665	470 Ω	½W, carbon
R167, 267	1-242-619	5.6 Ω	½W, carbon
R168, 268	1-242-665	470 Ω	½W, carbon
R169, 269	1-242-601	1 Ω	½W, carbon
R170, 270	1-242-601	1 Ω	½W, carbon
R171, 271	1-242-601	1 Ω	½W, carbon
R172, 272	1-242-601	1 Ω	½W, carbon
R173, 273	1-242-701	15 kΩ	½W, carbon
R174, 274	1-242-699	12 kΩ	½W, carbon
R175, 275	1-242-655	180 kΩ	½W, carbon
R176	1-242-659	270 Ω	½W, carbon
R177	1-242-653	150 Ω	½W, carbon
R178	1-242-713	47 kΩ	½W, carbon
R179	1-242-645	68 Ω	½W, carbon
R180, 280	1-242-649	100 Ω	½W, carbon
R301	1-221-663	2 kΩ (B)	semi-fixed
R302	1-221-663	2 kΩ (B)	semi-fixed
R303	1-242-651	120 Ω	½W, carbon
R304	1-242-651	120 Ω	½W, carbon
R305	1-242-663	390 Ω	½W, carbon

Ref. No.	Part No.	Description	
R306	1-244-841	47 Ω	½W, carbon
R307	1-244-841	47 Ω	½W, carbon
R308	1-242-663	390 Ω	¼W, carbon
R309	1-242-703	18 kΩ	¼W, carbon
R310	1-242-695	8200 Ω	¼W, carbon
R311	1-242-695	8200 Ω	¼W, carbon
R312	1-242-703	18 kΩ	¼W, carbon
R313	1-242-715	56 kΩ	¼W, carbon
R314	1-242-715	56 kΩ	¼W, carbon
R315	1-244-849	100 Ω	½W, carbon
R316	1-242-647	270 Ω	¼W, carbon
R317	1-244-863	390 Ω	½W, carbon

SWITCHES

S101-1~4 S201-1~2	1-514-747	rotary, source selector
S102-1~2 S202-1~2	1-514-739	rotary, speed & equalizer
S103-1~2 S203	1-513-273	slide, cassette timing
S104-1~2 S204-1	1-514-548	rotary, reel timing
S105, 205	1-514-524	slide, noise suppress
S106, 206	1-513-254	slide, monitor
S107	1-514-655-31	seesaw, power
S108	1-514-039	micro, auto-shut-off
S109	1-514-512	selector, frequency
S110	1-514-584	leaf, cassette motor
S111	1-514-740	pole, end sensing
S112	1-514-738	slide, rec./p.b.; CASSETTE
S113	1-514-737	slide, rec./p.b.; REEL
S114	1-513-231-17	slide, common rec./p.b.

JACKS

J101, 201	1-507-251	MIC
J102, 202	1-507-142	AUX
J103, 203	1-507-142	PHONO
J104, 204	1-507-142	LINE OUTput
J105, 205	1-507-251	LID SP
J106	1-507-282	HEADPHONE

HEADS

RPH101, 201	8-822-836-20	rec./p.b.; CASSETTE (PP116-3602)
RPH102, 202	8-821-242-22	rec./p.b.; REEL (PP30-4202LN)
EH101, 201	8-828-136-00	erase; CASSETTE (EF65-36)
EH102, 202	8-826-629-24	erase; REEL (EF18-2902A)

LAMPS

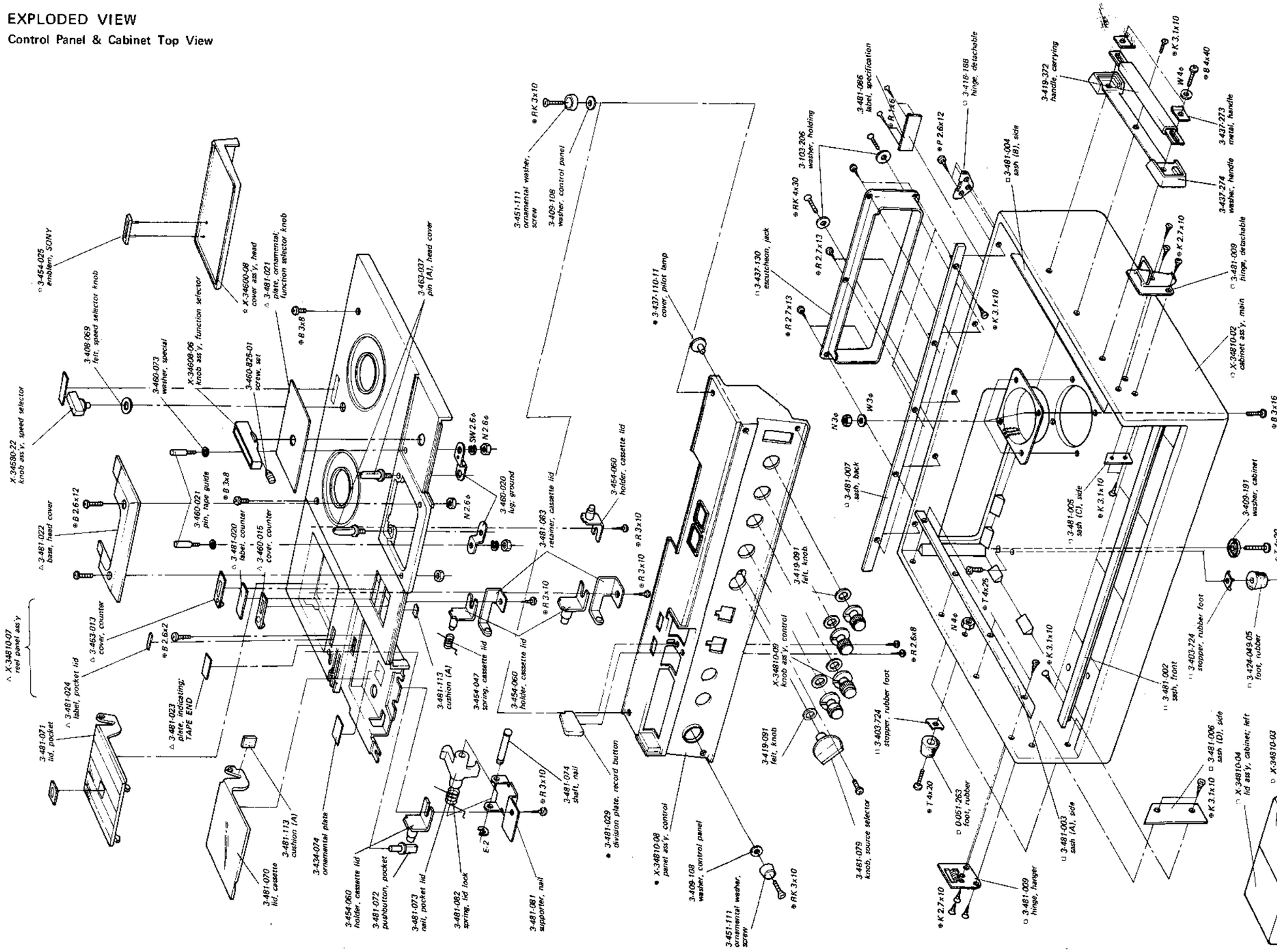
PL301	1-518-093-11	pilot, power
PL302	1-518-093-21	pilot, record; CASSETTE
PL303	1-518-093-21	pilot, record; REEL
PL304	1-518-093-11	pilot, tape end

MISCELLANEOUS

CNJ301	1-509-359	connector, rec./p.b.
CNJ302	1-509-015	connector, power supply, UNSWITCHED
CNP301	1-509-062	connector, power supply
VS	1-509-064-13S	socket, power voltage selector
F	1-532-096	fuse, 0.8A
ME101, 201	1-524-070-11	meter, level
M1	8-832-624-09	motor, ac; OPEN REEL (IC-624HT)
M2	8-834-009-01	motor, dc; CASSETTE (D-009G)
SP301	1-502-175	speaker
SP302	1-502-175	speaker
CP301	1-231-057-12	encapsulated component, (0.033μF + 120Ω) 400V
CP302	1-101-534-12	encapsulated component, (0.1μF + 120Ω) 400V
	1-536-146	terminal strip, 1-L-1; A type
	1-536-178	terminal strip, 1-L; C type
	1-536-179	terminal strip, 1-L-1; C type
	1-533-006	holder, fuse w/cover
	1-534-413	cord, speaker

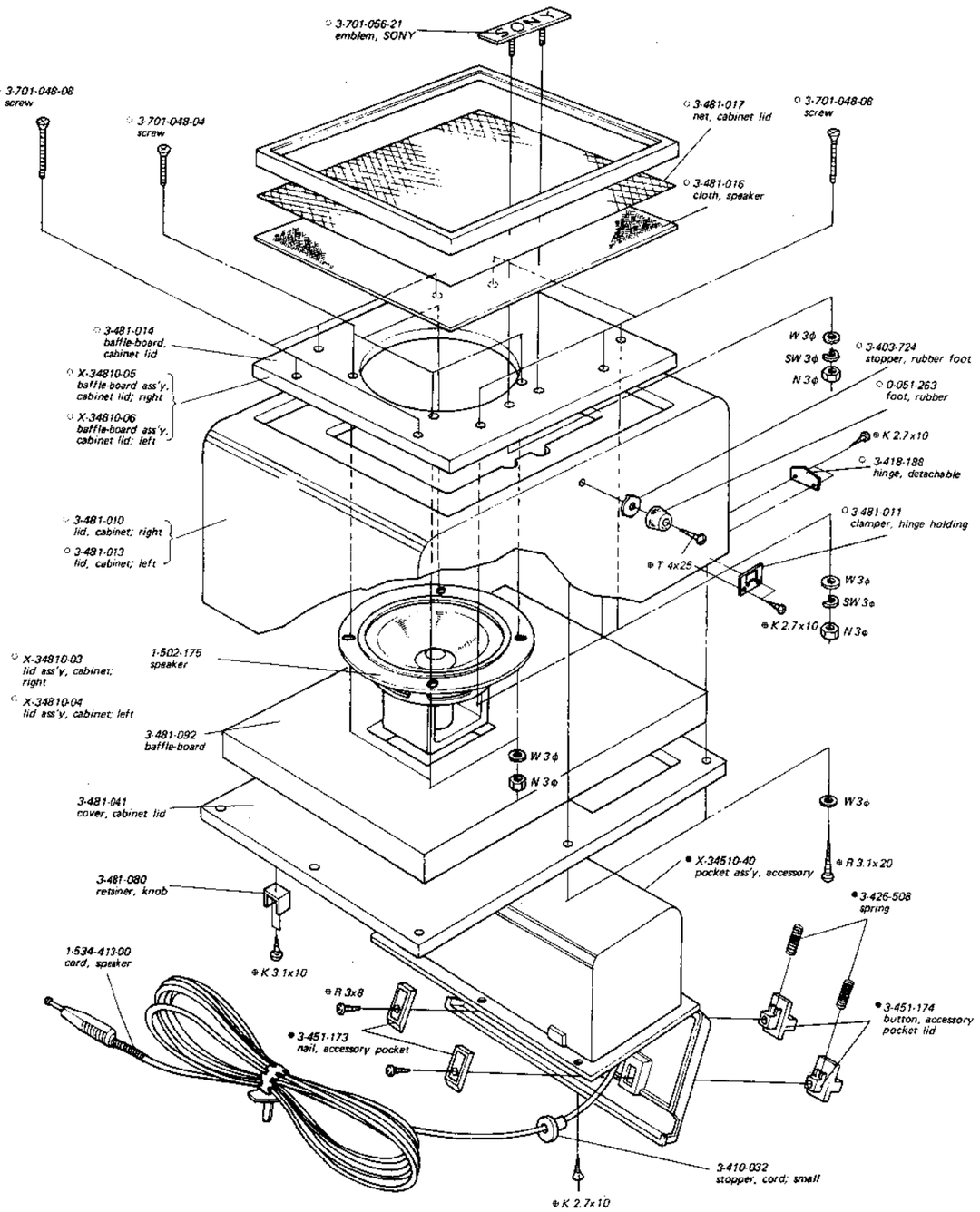
11. EXPLODED VIEW

Control Panel & Cabinet Top View



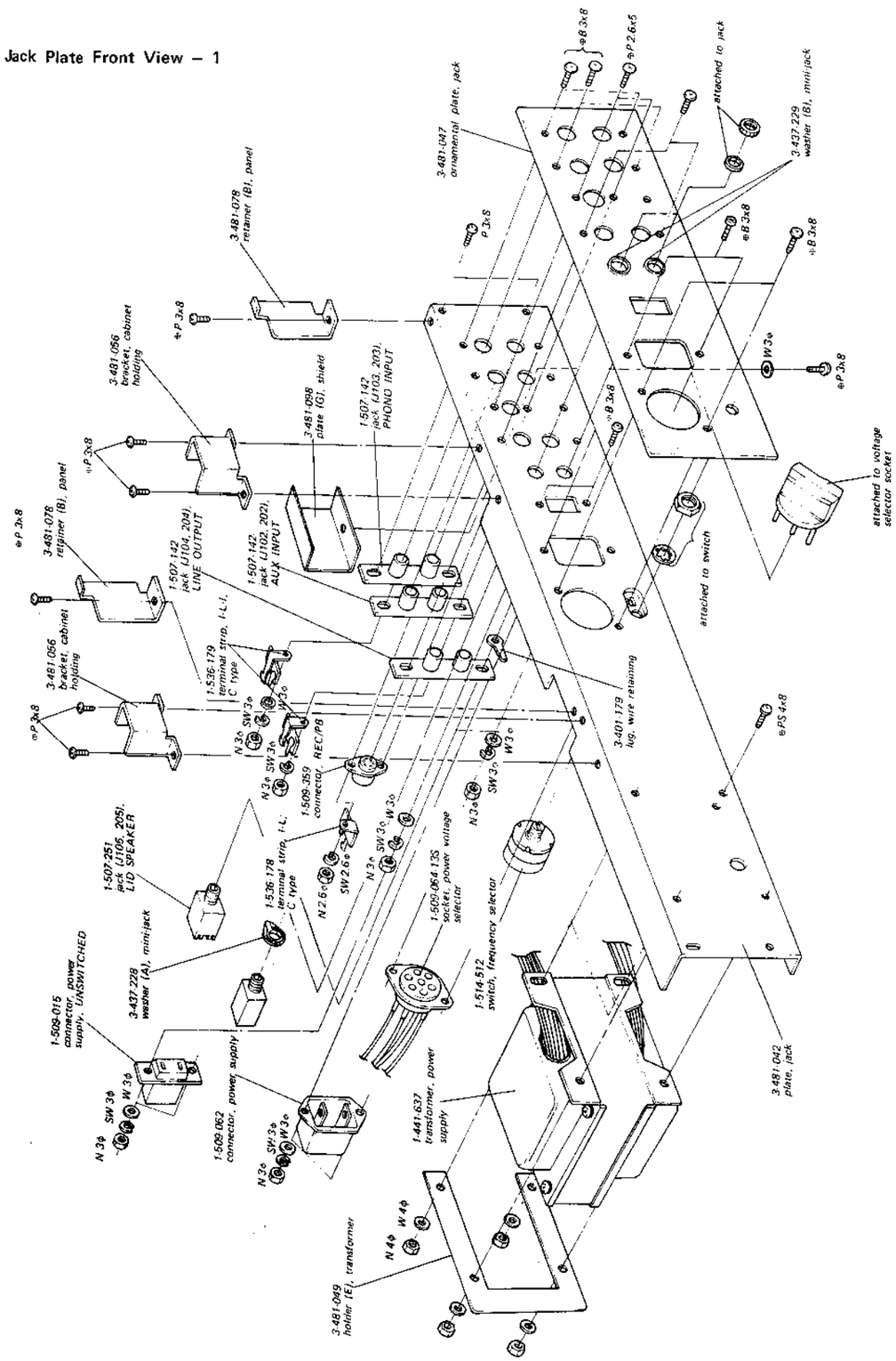
Parts marked with ☆ are included in the head cover ass'y (X-34600-08).
Parts marked with △ are included in the reel panel ass'y (X-34810-07).
Parts marked with ● are included in the control panel ass'y (X-34810-08).
Parts marked with □ are included in the complete cabinet ass'y (X-34810-01).

Cabinet Lid Top View

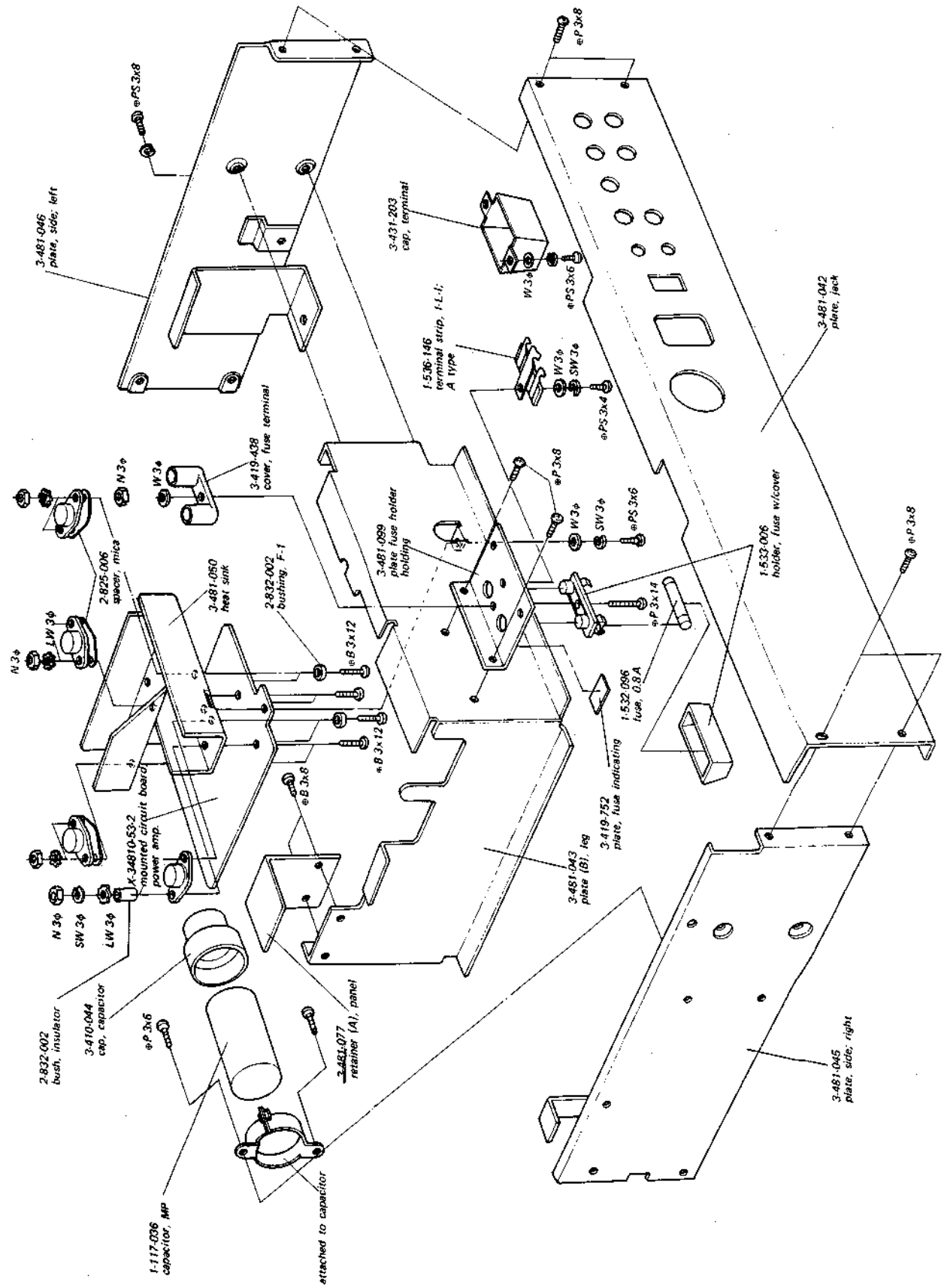


Parts marked with ○ are included in the complete cabinet ass'y (X-34810-01).
Parts marked with ● are included in the accessory pocket ass'y (X-34510-40).

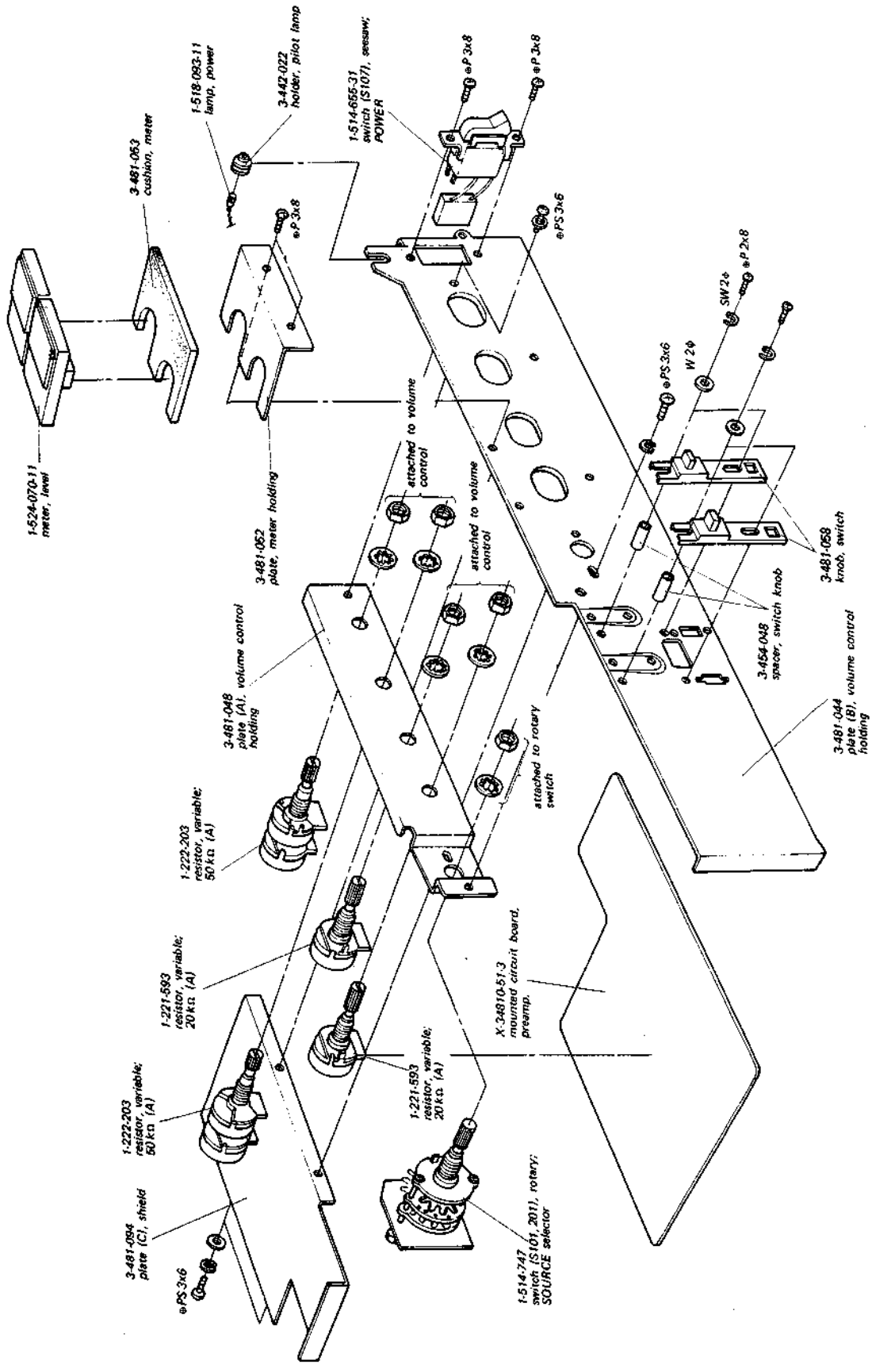
Jack Plate Front View – 1



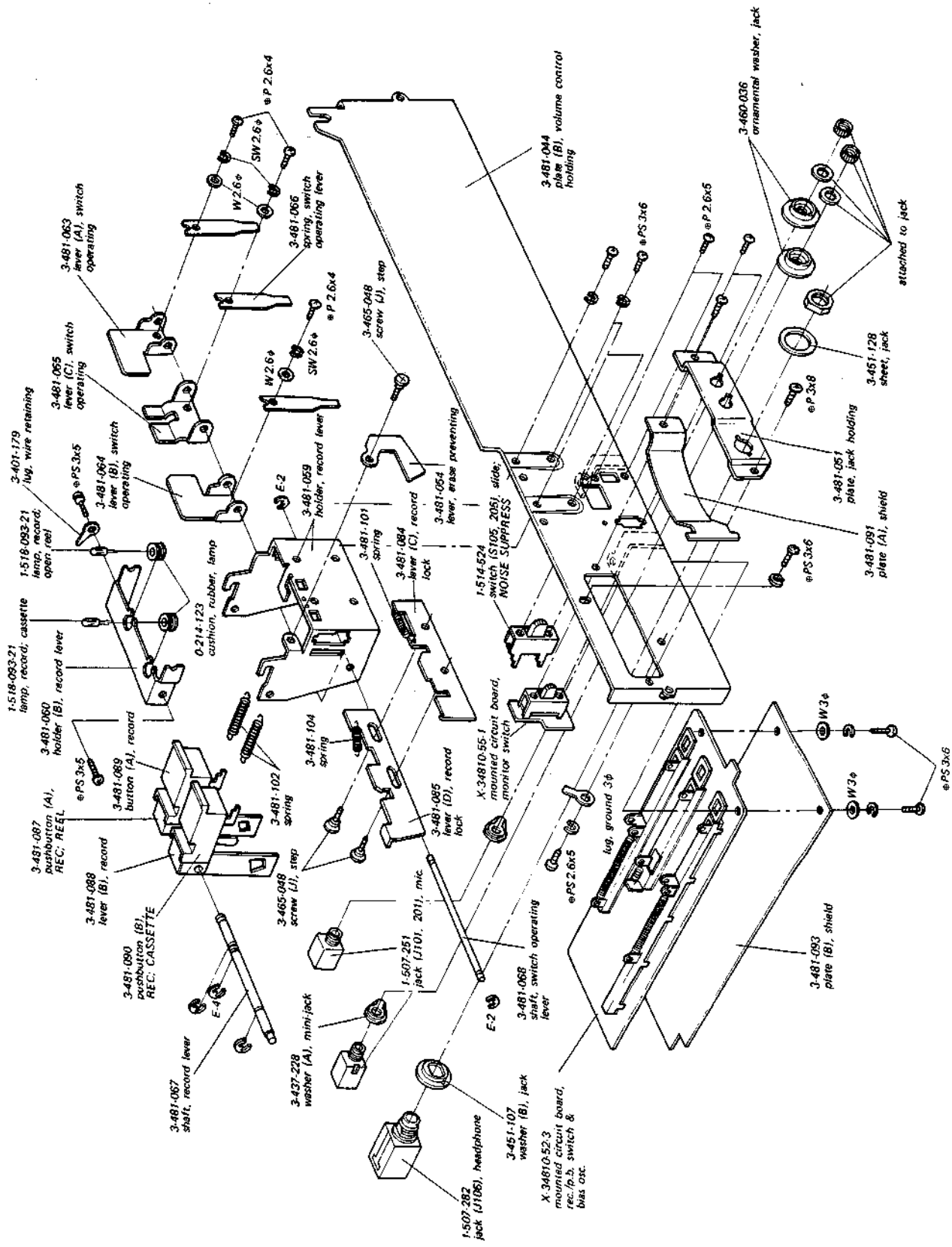
Jack Plate Front View – 2



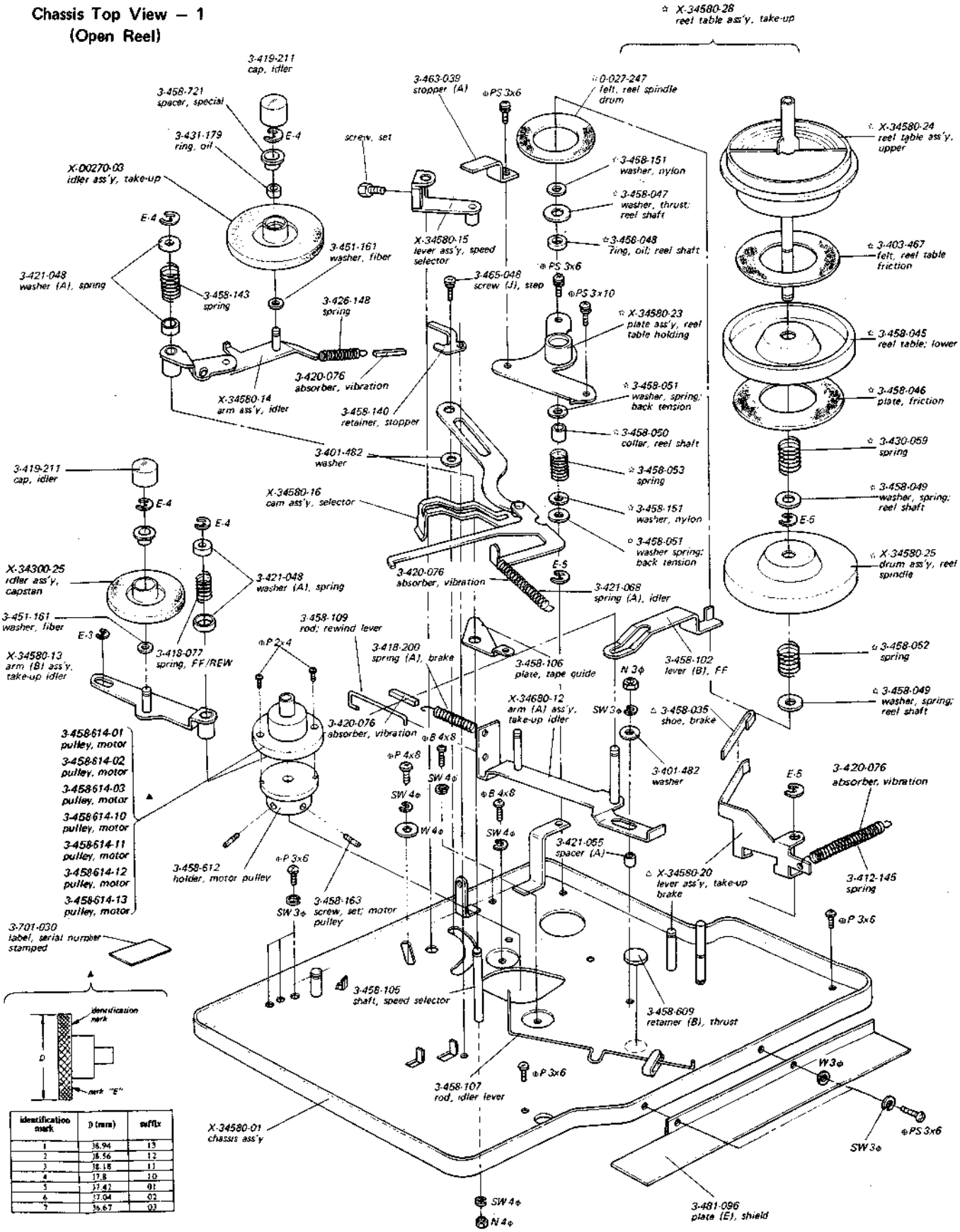
Volume Control Front View



Operating Mechanism Top View



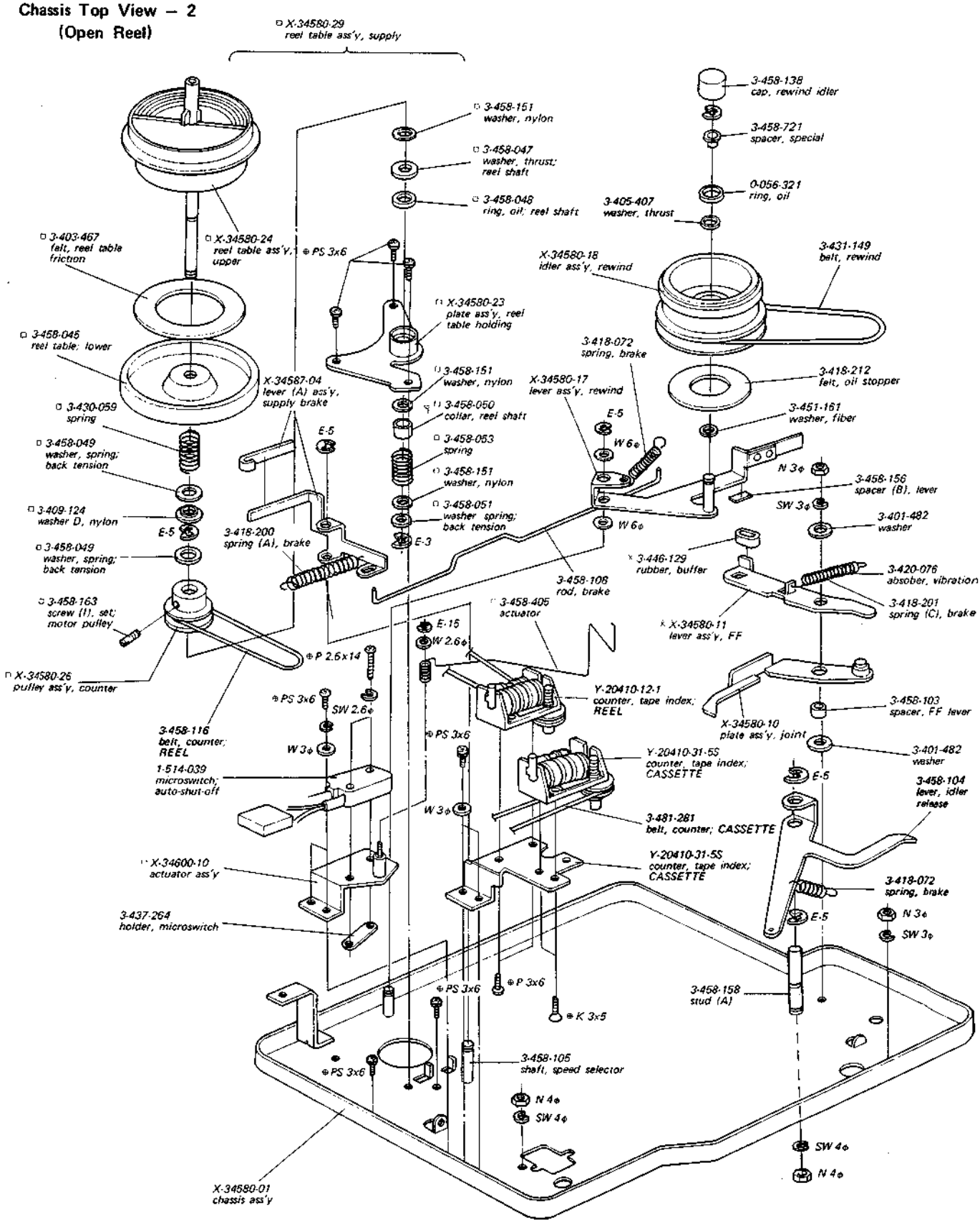
Chassis Top View – 1
(Open Reel)



identification mark	D (mm)	suffix
1	38.94	13
2	38.56	12
3	38.18	11
4	37.8	10
5	37.42	01
6	37.04	02
7	36.67	03

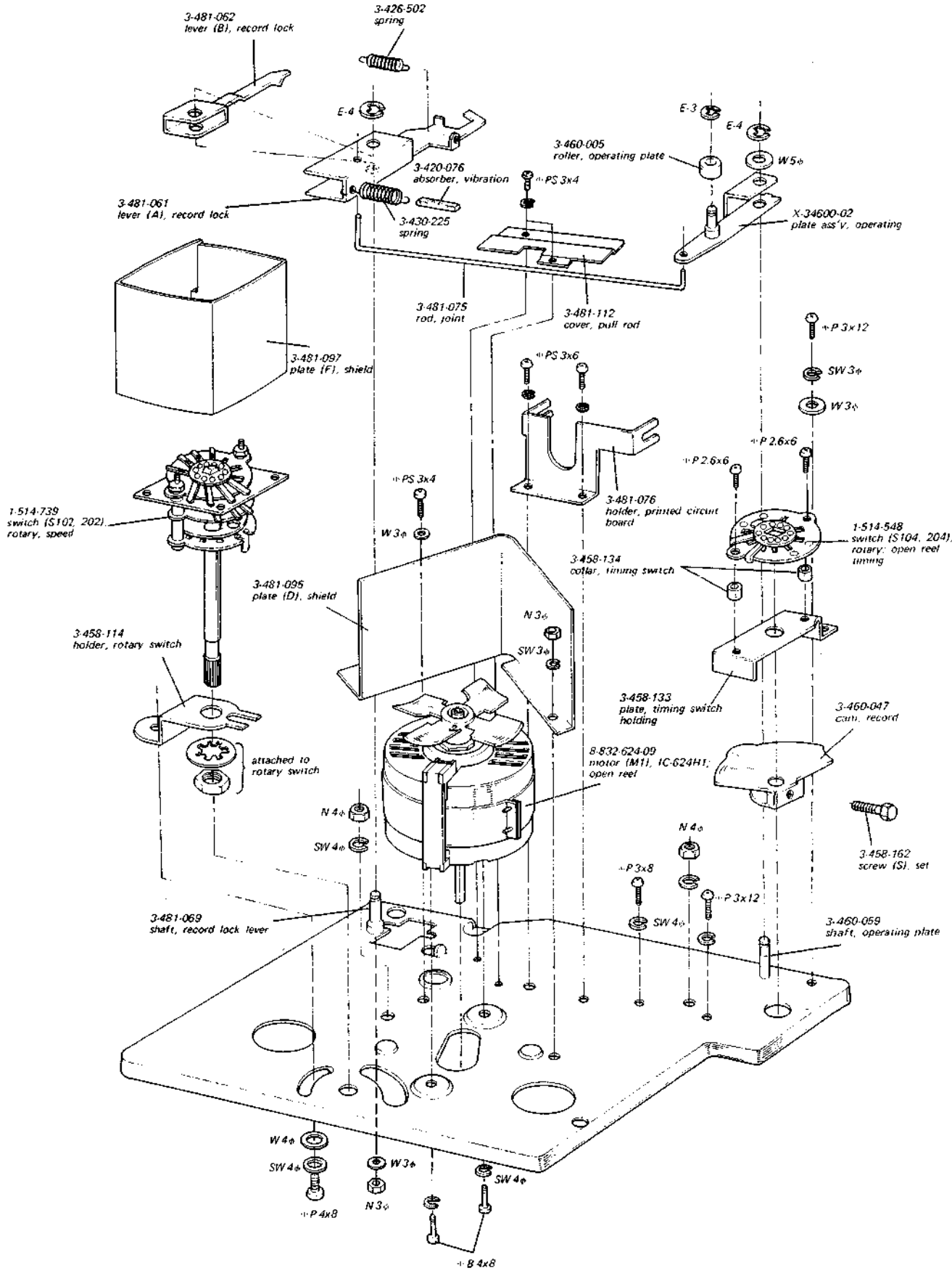
Parts marked with ☆ are included in the take-up reel table ass'y (X-34580-28)
Parts marked with △ are included in the take-up brake lever ass'y (X-34580-20).

Chassis Top View – 2 (Open Reel)

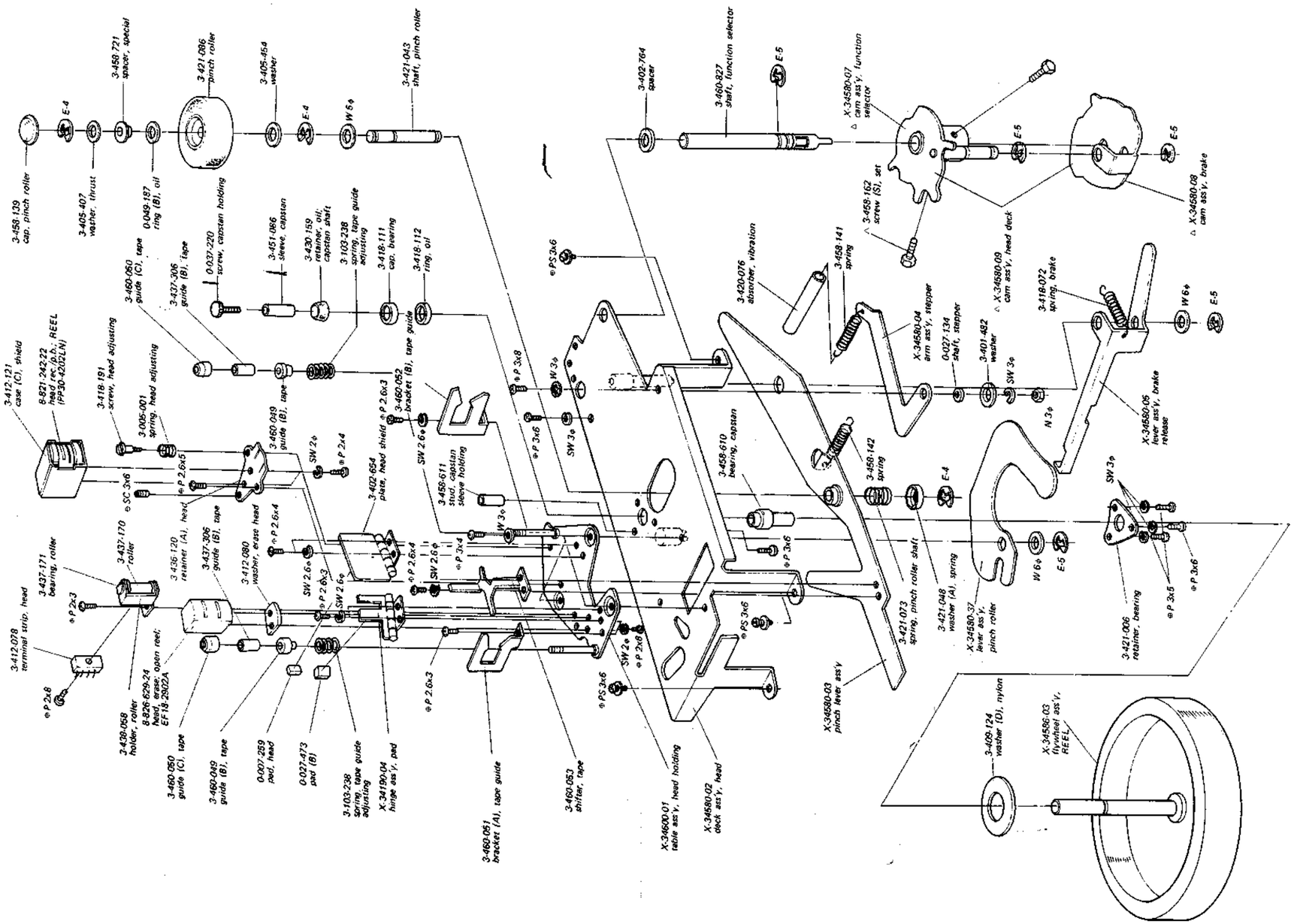


Parts marked with □ are included in the supply reel table ass'y (X-34580-29).
Parts marked with ○ are included in the actuator ass'y (X-34600-10).
Parts marked with * are included in the FF lever ass'y (X-34580-11).

Chassis Bottom View (Open Reel)

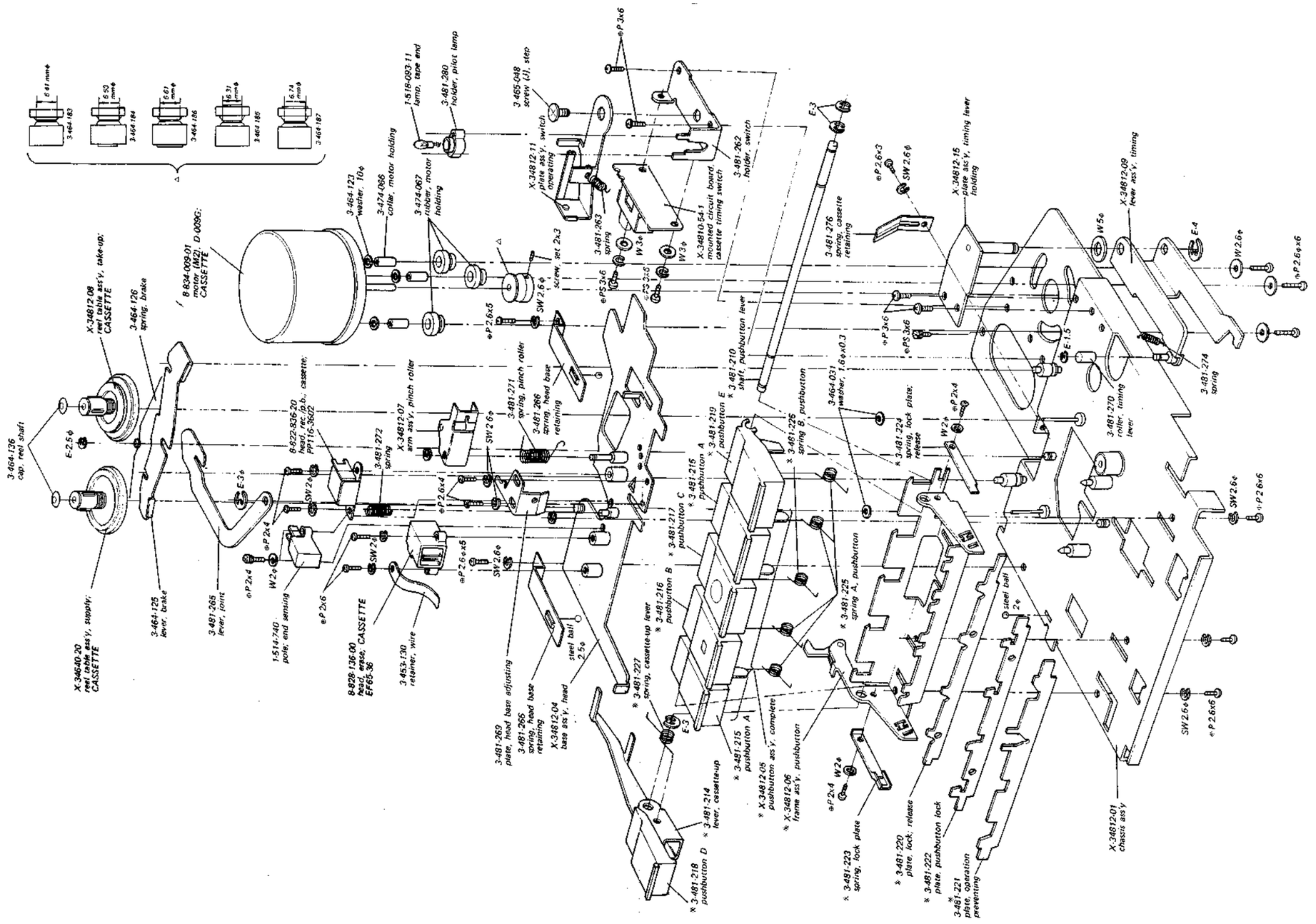


Head Deck Top View
(Open Reel)



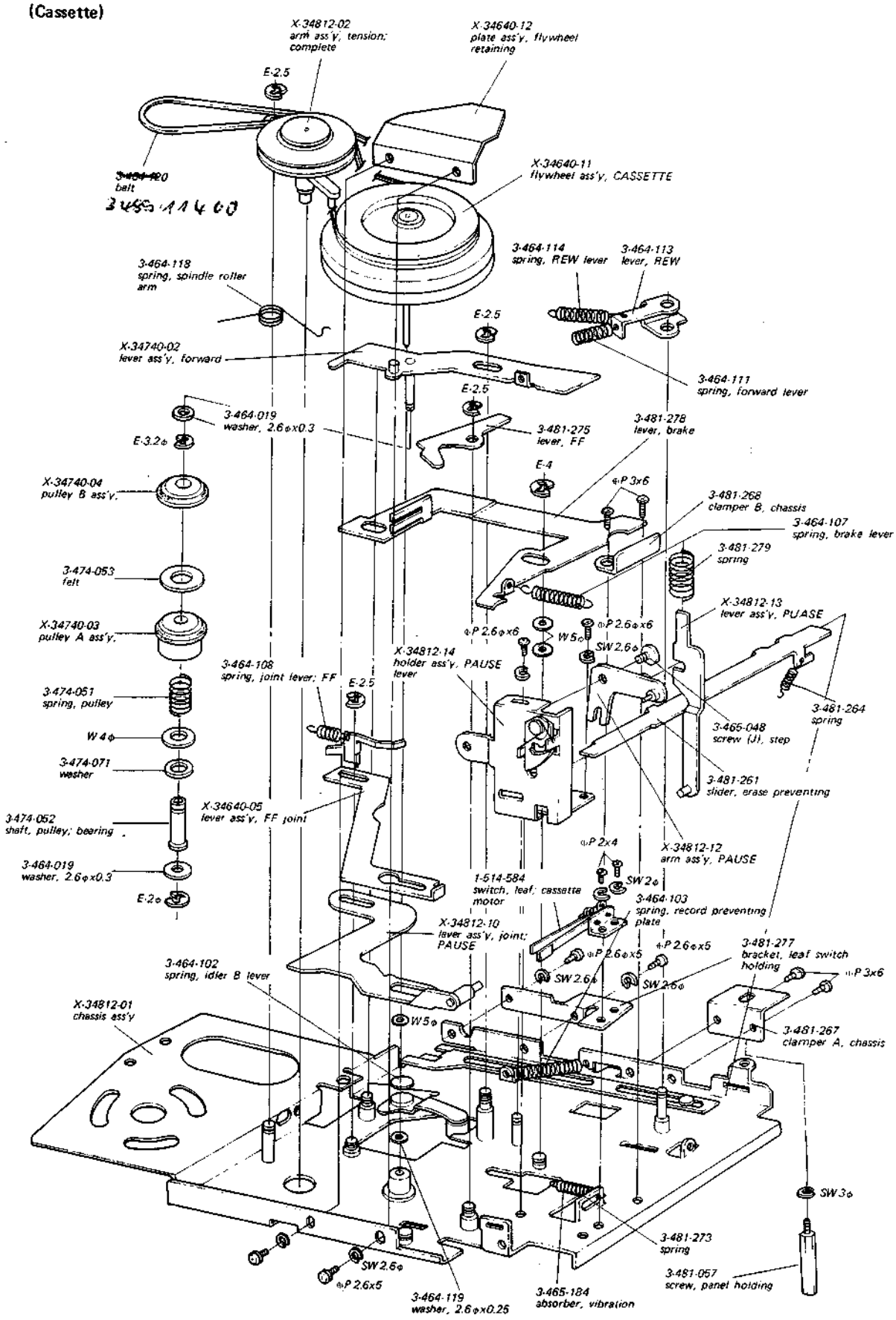
Parts marked with △ are included in the head deck cam ass'y (X-34580-09).

Chassis Top View (Cassette)

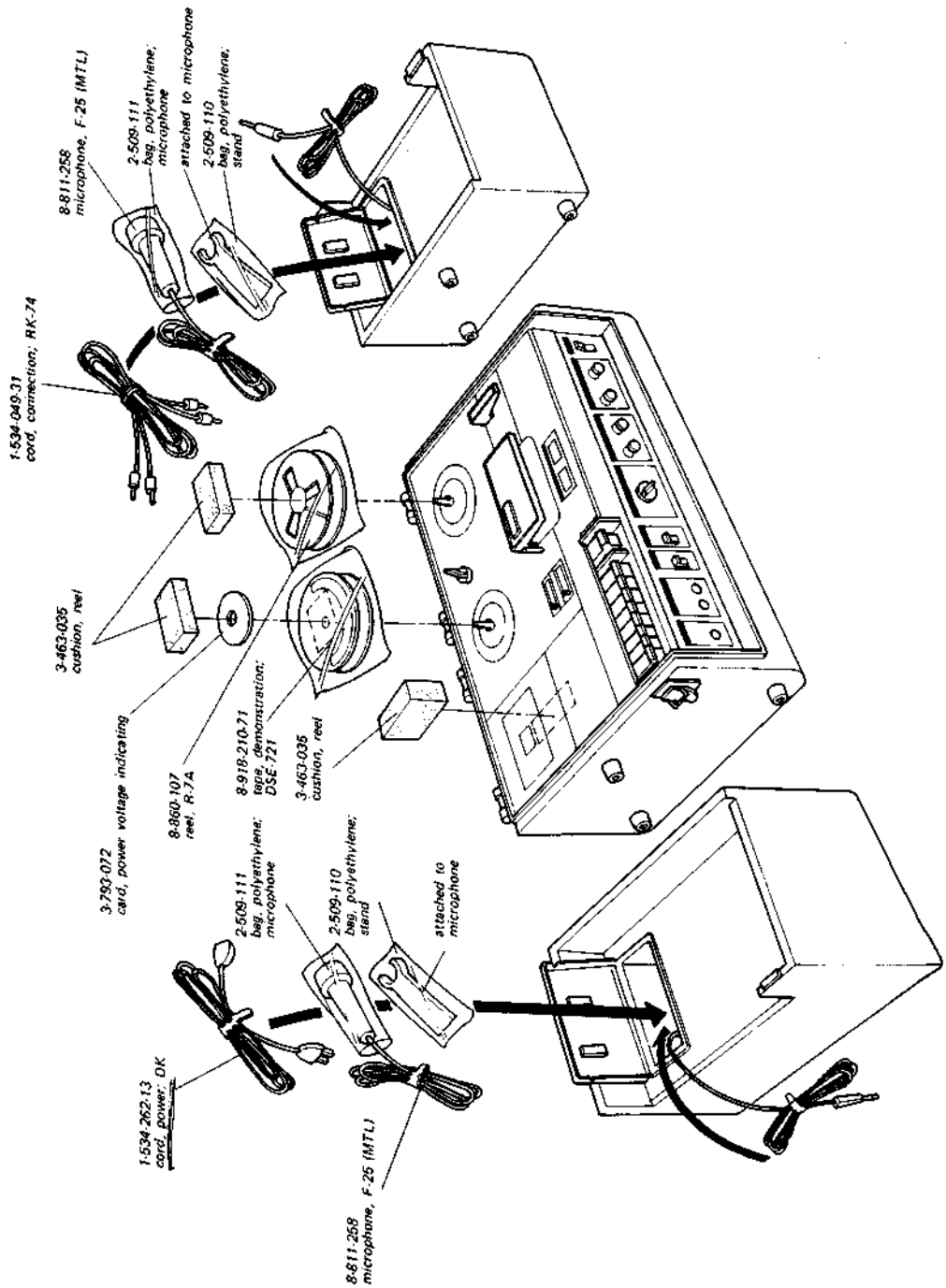


Parts marked with * are included in the pushbutton ass'y (X-34812-05).

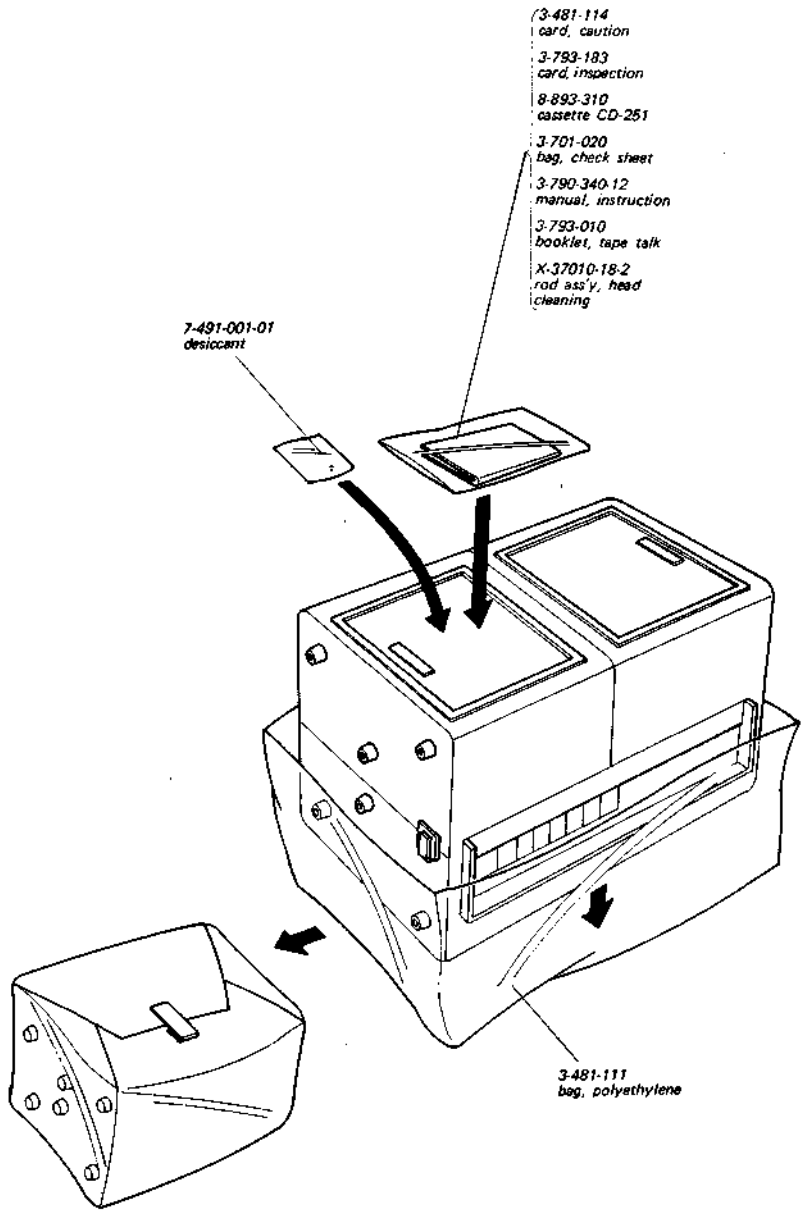
Chassis Bottom View (Cassette)



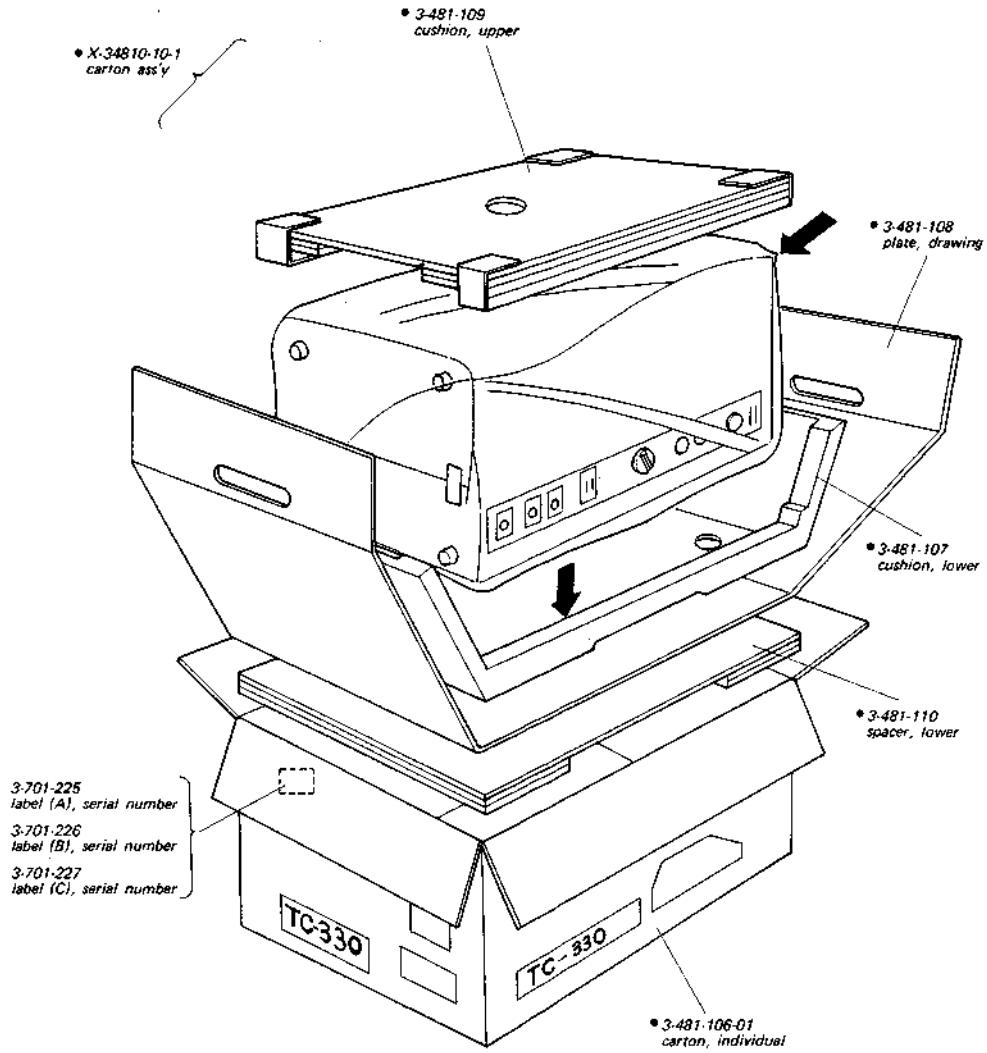
Packing — 1


8-811-258
microphone, F-25 (MTL)
2-509-111
bag, polyethylene;
microphone
attached to microphone
2-509-110
bag, polyethylene;
stand
1-534-049-31
cord, connection; RK-74
3-463-035
cushion, reel
3-792-072
card, power voltage indicating
8-860-107
reel, R-7A
8-918-210-71
tape, demonstration;
DSE-721
3-463-035
cushion, reel
2-509-111
bag, polyethylene;
microphone
2-509-110
bag, polyethylene;
stand
attached to
microphone
1-534-262-13
cord, power; OK
8-811-258
microphone, F-25 (MTL)

Packing — 2


3-481-114
card, caution
3-793-183
card, inspection
8-893-310
cassette CD-251
3-701-020
bag, check sheet
3-790-340-12
manual, instruction
3-793-010
booklet, tape talk
X-37010-18-2
rod ass'y, head cleaning
7-491-001-01
desiccant
3-481-111
bag, polyethylene

Packing – 3



Parts marked with • are included in carton ass'y (X-34810-10-1).

12. HARDWARES

Part No.	Description
(for REEL)	
	Screws
7-621-255-25	⊕ P2 x 4
7-621-255-55	⊕ P2 x 8
7-621-259-12	⊕ P2.6 x 3
7-621-259-22	⊕ P2.6 x 4
7-621-259-35	⊕ P2.6 x 5
7-621-259-45	⊕ P2.6 x 6
7-621-266-05	⊕ P2.6 x 16
7-621-722-65	⊕ R3 x 10, tapping
7-621-770-48	⊕ B2.6 x 12
7-621-770-62	⊕ B2.6 x 5
7-621-843-59	⊕ R3.1 x 20, wood
7-621-852-38	⊕ K2.7 x 10, wood
7-682-145-01	⊕ P3 x 4
7-682-148-01	⊕ P3 x 8
7-682-149-01	⊕ P3 x 10
7-682-150-01	⊕ P3 x 12
7-682-166-04	⊕ P4 x 20
7-682-246-01	⊕ K3 x 5
7-682-247-01	⊕ K3 x 6
7-682-349-04	⊕ RK3 x 10
7-682-352-04	⊕ RK3 x 16
7-682-368-04	⊕ RK4 x 30
7-682-548-05	⊕ B3 x 8
7-682-548-14	⊕ B3 x 8
7-682-570-05	⊕ B4 x 40
7-682-645-01	⊕ PS3 x 4
7-682-646-01	⊕ PS3 x 5
7-682-647-01	⊕ PS3 x 6
7-682-648-01	⊕ PS3 x 8
7-682-649-01	⊕ PS3 x 10
7-682-650-01	⊕ PS3 x 12
7-682-661-01	⊕ PS4 x 8
7-683-139-01	⊖ SC3 x 5
7-683-143-01	⊖ SC3 x 12
7-683-242-31	3 x 10, holding w/hexagonal hole
7-685-146-31	⊕ P3 x 8, tapping
	Nuts
7-622-408-05	3φ, speed
7-684-013-01	3φ
7-684-014-01	4φ
7-684-033-01	3φ, lock
	Washers
7-623-105-12	2φ
7-623-107-02	2.6φ
7-623-107-12	2.6φ
7-623-108-12	3φ
7-623-108-20	3φ
7-623-110-02	4φ
7-623-110-12	4φ
7-623-112-18	5φ
7-623-112-19	5φ
7-623-113-12	6φ
7-623-113-18	6φ
7-623-113-22	6φ
	Spring Washers
7-623-205-22	2φ
7-623-207-22	2.6φ
7-623-208-22	3φ
7-623-210-22	4φ
	Lock Washers
7-623-308-04	3φ
7-623-408-04	3φ
	Retaining Rings
7-624-104-01	E-2
7-624-106-01	E-3
7-624-108-01	E-4
7-624-109-01	E-5
(for CASSETTE)	
	Screws
7-621-255-25	⊕ P2 x 4
7-621-255-45	⊕ P2 x 6
7-621-259-15	⊕ P2.6 x 3
7-621-259-25	⊕ P2.6 x 4
7-621-259-35	⊕ P2.6 x 5
7-621-259-55	⊕ P2.6 x 8
7-621-710-27	⊖ SC2 x 3
7-682-647-01	⊕ PS3 x 6
7-685-145-31	⊕ P3 x 6, tapping
	Washers
7-623-105-02	2φ
7-623-107-12	2.6φ
7-623-108-12	3φ
7-623-110-12	4φ
7-623-112-12	5φ
7-623-112-18	5φ
	Spring Washers
7-623-205-22	2φ
7-623-207-22	2.6φ
	Retaining Rings
7-624-102-01	E-1.5
7-624-104-01	E-2
7-624-106-01	E-3
7-624-107-01	E-3.2
7-624-108-01	E-4
7-624-118-01	E-2.5
	Steel Balls
7-671-112-01	2φ
7-671-112-11	2.5φ

—— Hardware Nomenclature ——

P – Pan Head Screw .....

PS – Pan Head Screw with Spring Washer .....

K – Flat Countersunk Head Screw ...

B – Binding Head Screw .....

RK – Oval Countersunk Head Screw ..

T – Truss Head Screw .....

R – Round Head Screw .....

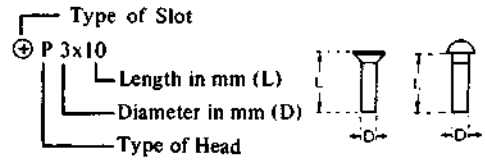
F – Flat Fillister Head Screw .....

SC – Set Screw .....

E – Retaining Ring (E Washer) .....

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –



13. NECESSARY ADJUSTMENT OR CHECKING AFTER PARTS REPLACEMENT OR REASSEMBLY

Replaced or Reassembled Parts	Necessary Adjustment or Checking
rec./p.b. head (REEL or CASSETTE)	tape path adjustment (page 12) closstalk check (page 16 & 17) head shield plate position adjustment (page 7) head azimuth adjustment (page 12 & 13) playback frequency response measurement (page 13) overall frequency response measurement (page 14) Demagnetize the head.
erase head (REEL or CASSETTE)	tape path adjustment (page 12) erase ratio measurement (page 17)
motor (REEL or CASSETTE)	motor pulley height adjustment (page 10) motor installing position adjustment (page 10)
idler (REEL)	take-up idler height adjustment (page 8) rewind idler position check (page 8)
pinch roller (CASSETTE)	pinch roller pressure adjustment (page 9)
flywheel (CASSETTE)	flywheel play adjustment (page 10) There should be no oil on the belt.
microswitch	actuator position adjustment (page 7)
reel table (REEL)	tape touch check (page 8)
rotating parts	Clean them with cloth or swab dampened with denatured alcohol.
tension pulley (CASSETTE)	torque measurement (page 9)

MEMO

Date	P.I. N°	Model
13 Mar 80	TC-00880	See list below Voir list ci-dessous Siehe beiliegende Liste

Subject: Standardization of fast forward/rewind idlers
Standardisation du galét FF/REW
Standardisierung der FF/REW Zwischenräder

Model Modèle Modell	Former P/N N° de pièce ancien Alte Teilnummer	New P/N N° de pièce nouveau Neue Teilnummer	Price Prix Preis
TCM-757	X-3558-607-0 ✓		
TCM-767	"		
TCM-787	"		
CFM-31/31S/31L	"		
CFM-313S/313L	"	X-3563-902-0 ✓	© ✓
CFM-323S	"		
CFM-333/333S	"		
CFS-55/55S/55L	"		
CFS-65/65S/65L	"		
CFS-71/71S/71L	X-3563-902-0 X		
CFS 35S	"		
TC-K1A	X-3558-607-0		
TC-K2	"	X-3563-902-0	©
TC-K15	"		
HMK-44/44B	X-3558-607-0		
HMK-119	"	X-3563-902-0	©
HSK-11	"		
HMK-33	"		

The Fast Forward/Rewind torque of the new idler (X-3563-902-0) is higher than the former one's (X-3558-607-03) by 10g.cm, because the new one is usable with AMS-models.

Le couple FF/REW du nouveau galet (X-3563-902-0) dépasse celui de l'ancien galet (X-3558-607-03) par 10g.cm, étant donné que le nouveau type sert pour les modèles AMS.

Das FF/REW Drehmoment des neuen Zwischenrades (X-3563-902-0) muss um 10g.cm höher sein als das des alten Rades (X-3558-607-03), weil der neue Typ für AMS-Modelle geeignet ist

Nachfolgende Ersatzteil-Nummern sind neu angelegt bzw. geändert worden. Bitte tragen Sie diese in das dazugehörige Service-Manual ein.

Gerät	Seite	ET-Nr. (alt)	ET-Nr. (neu)	Bezeichnung	Pr.-Gr.
TC-K45	23/B3	-	3-565-534-00	bracket, B, cass.	C
TC-K777	31		8-890-592-00	Messcass. CS-15	L
TC-U30	24	-	1-518-351-00	lamp (PL-301)	B
-	-	-	L-10000-50-0	System XL-33L	Z
CFS-F5L	-	-	S-31051-89-9	Fernbed. RM-23	Z
CFS-71S	30/B2	-	3-561-836-00	lever, FF-button	B
"	30/B3	-	3-563-919-00	lever, rew-butt.	B
KV-2204E	44/G3	-	4-317-720-00	bracket, F-board	E
M-201	18/A3	-	3-554-093-00	lock arm, A	B
M-201	18/B3	-	3-554-094-00	lock arm, B	B
PS-X55	22/C2	-	7-671-156-01	steelball, 4 mm	A
PS-4750	11	-	X-48141-06-0	support, hinge	B
ST-515	27/L-105	-	1-401-623-00	coil, FM-osc.	B
TA-5650	25	-	4-839-512-00	cover	C
T-555	32/IC606	9-941-008-87	9-943-010-28	IC TC-9129P	P
TC-K5	32/B2	-	X-35550-03-0	lever, A, rec.	B
TC-K60	36/B3	-	3-555-115-00	frame, cass. hold	C
TC-K96R	43/B3	-	X-35583-06-0	slider, rec.	B
TCM-600/B	17/B4	-	7-627-451-78	screw, K1,4x5, bl	I
TFM-C850W	18	1-224-617-00	1-224-616-11	res. 5K	C
TFM-C850W	18	1-224-616-00	1-224-617-00	res. 10K	C
TPS-L2	17/B4	3-499-042-00	3-480-136-00	belt, counter	B
TPS-L2	17/B4	3-480-136-00	3-499-042-00	belt, B	B
V-135	16/Q310	1-806-278-21	1-806-277-21	Tr. 2SD-895-E	B
V-135	16/Q311	1-806-274-21	1-806-273-21	Tr. 2SB-775-E	E