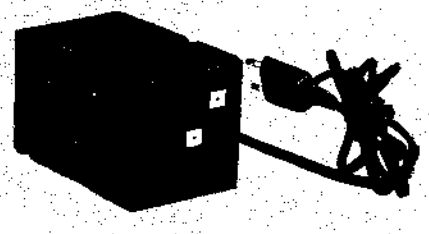
TC-164SD

AEP Model



AC-20
(supplied accessory)

TC-164SD

* 'Dolby' and the double-D symbol are the trade marks of Dolby Laboratory Inc. Noise reduction system manufactured under license from Dolby Laboratory Inc. *0 dB = 0.775 V

STEREO CASSETTE-CORDER

SPECIFICATIONS

TC-164SD

Power Requirements: AC 220 V, 50/60 Hz with the Sony AC Power Adaptor AC-20 (supplied)
DC 12 V
8 batteries size D (IEC designation R20)
12 V car battery with the Sony Car Battery Cord DCC-129 (optional)

Fast Forward and Rewind Time: Approx. 70 sec. (C-60)

Speaker: 100 x 50 mm (4 x 2 inches)

Power Output: 500 mW

Battery Life: Approx. 20 hours of continuous recording with Sony Long-life Batteries

Bias Frequency: 105 kHz

Signal/Noise Ratio: DOLBY NR OFF
- With Ferri-Chrome Cassette
  61 dB at peak level (NAB)
  59 dB (DIN, 1975 rev.)
  51 dB (DIN, old)
- With chromium dioxide cassette
  57 dB at peak level (NAB)

DOLBY NR ON
Improved by 5 dB at 1 kHz, 10 dB above 5 kHz

Total Harmonic Distortion: 1.2 %

Frequency Response: DOLBY NR OFF
- With Ferri-Chrome Cassette and chromium dioxide cassette
  20 – 20,000 Hz (NAB)
  30 – 17,000 Hz ±3 dB (NAB)
  30 – 17,000 Hz (DIN)
- With regular cassette
  20 – 16,000 Hz (NAB)
  30 – 13,000 Hz (DIN)

Wow and Flutter: 0.065 % WRMS (NAB)
±0.16 % (DIN)

Inputs:
MIC (phone jacks) 2
sensitivity 0.2 mV (–72 dB)
for a low-impedance microphone
LINE IN (phono jacks) 2
sensitivity 0.06 V (–22 dB)
input impedance 100 k ohms
LINE OUT (phono jacks) 2
output level 0.435 V (–5 dB) at load impedance 100 k ohms
suitable load impedance more than 100 k ohms
HEADPHONES 1
suitable load impedance 8 – 32 ohms

Dimensions: Approx. 370 (w) x 110 (h) x 240 (d) mm
14⅝ (w) x 4⅜ (h) x 9½ (d) inches
Including projecting parts and controls

Weight: Approx. 5.2 kg, 11 lb 8 oz (with batteries)

– Continued on page 2 –

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®

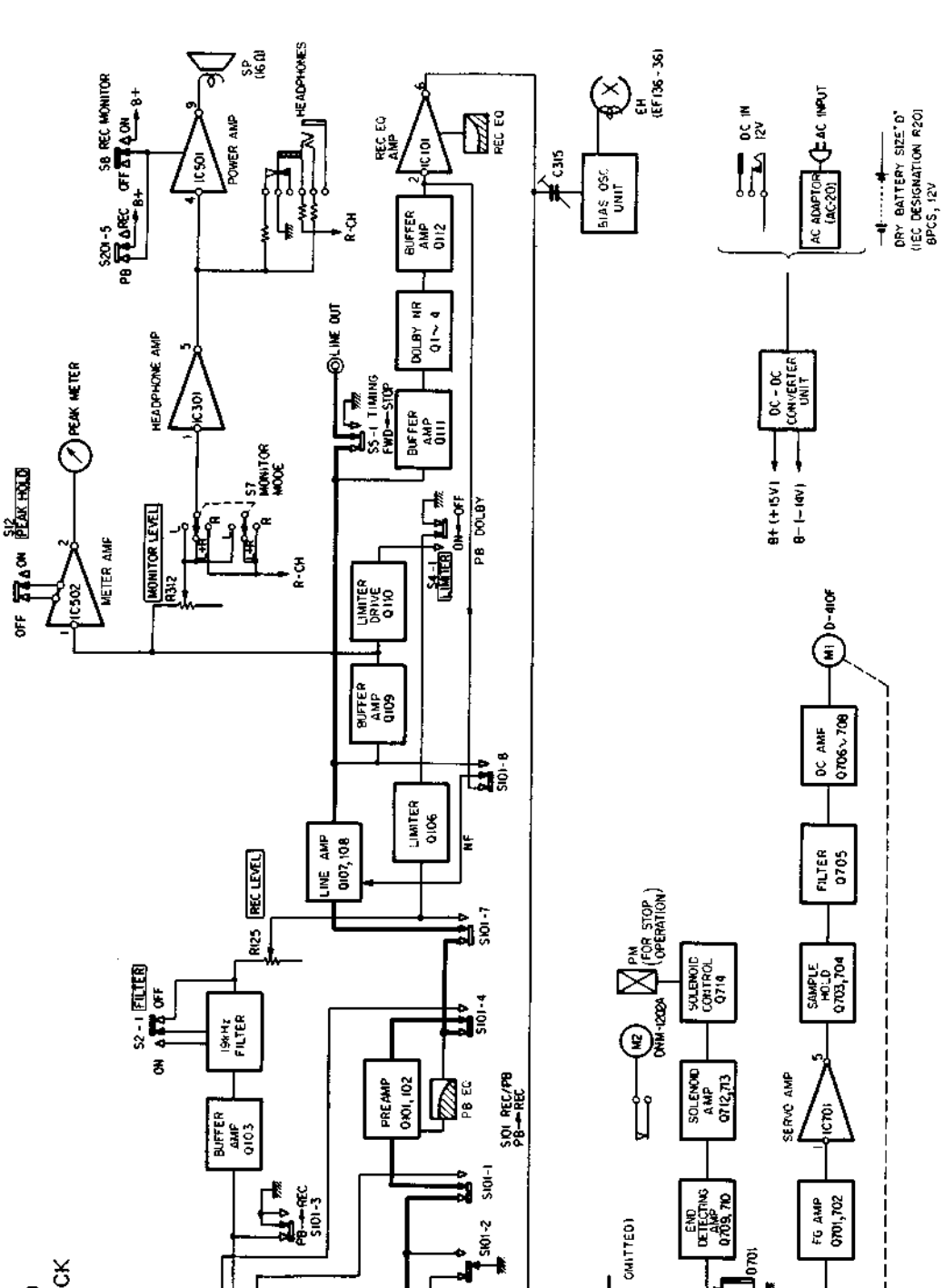
SERVICE MANUAL

AC-20 (supplied accessory)

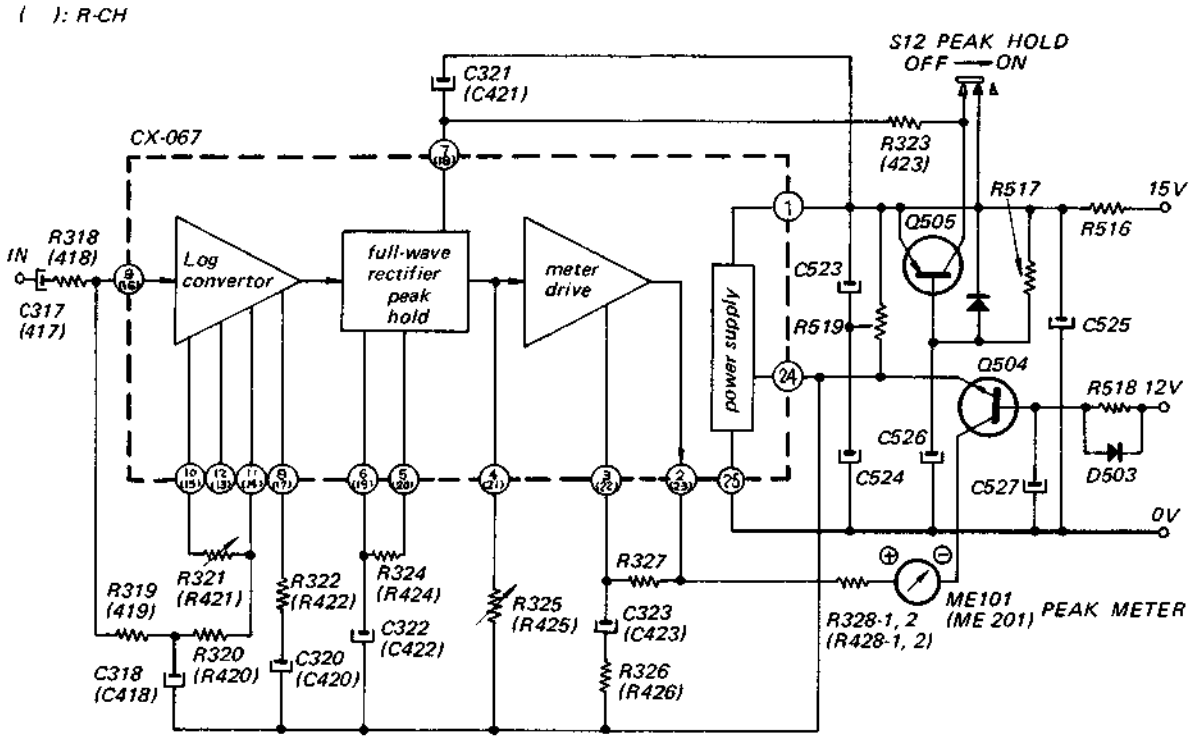
Input Voltage:	AC 220 V, 50/60 Hz
Output Voltage:	DC 12 V
Output Current:	DC 250 mA (nominal)
Power Consumption:	18 VA

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM



1-2. CIRCUIT DESCRIPTION



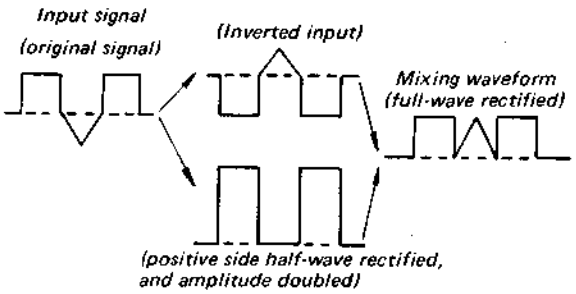
The CX-067 has four functions as a Log convertor circuit, a full-wave rectifier circuit, a peak hold circuit and a meter drive circuit, for both channels. A power supply circuit is also included in order to provide the power required in the IC, thus operating of a single power supply.

1. Log convertor circuit

A diode is inserted in the NFB circuit of the OP amplifier, for Log convertion of the input signals. R321 (421) adjusts the amount of NFB to change Log characteristics.

2. Full-wave rectifier circuit

Full-wave rectification is required in order to detect both positive and negative peaks of the signal. In the CX-067, the positive side signal is half-wave rectified, and then full-wave rectified by mixing the original signal with the half-wave rectified signal whose amplitude has been doubled. Peak values are then compared with this, and indicated on the meter.

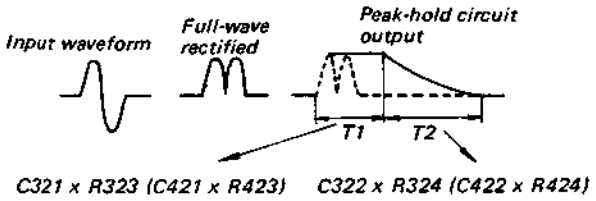


However, if the meter needle was driven only by these full-wave rectified signals, the needle would return too rapidly, making it difficult to read. This problem is overcome by incorporating peak-hold circuits where the activation is extremely rapid, but the decay quite slow.

3. Peak-hold circuit

The full-wave rectified signal is charged up on C322 (422) connected to terminal 6 (19). The charge-up amplifier uses the same amplifier used for full-wave rectification. The voltage on C322 (422) is negatively fed back to the full-wave rectifier through R324 (424) in proportion to its voltage.

Theoretically, it would be possible to remain in hold forever, if R324 (424) was not included. C322 (422) charges up in 80 μsec which is extremely fast, too fast for the meter needle to respond to, so the peak values are held only for the time proportional to the terminal 7 (18) time constant (C321 (421) x R323 (423)) until the meter can respond. It is then discharged from terminal 6 (19) to terminal 5 (20) via R324 (424). (That is, recovery time is varied by the resistance of R324 (424)).



Peak hold ON/OFF may be performed by either of two ways.

1. T1 set to infinity by disconnecting R323 (423).
2. T2 set to infinity by disconnecting R324 (424).

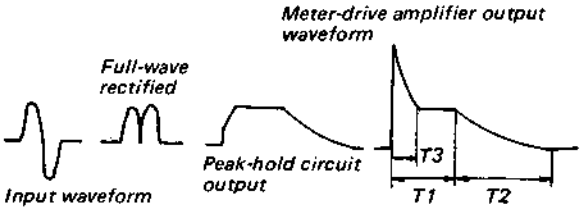
Since C322 (422) charge-up route is not involved in either method, the peak hold circuit may be switched ON. The TC-164SD employs method 1.

4. Meter-drive circuit

Meter-drive amplifier input is varied by R325 (R425) at IC terminal 4 (21), thus adjusting sensitivity of meter current.

Meter drive is not the only purpose of this amplifier. It is also capable of meter over-drive (kick) due to the (input level) + (input level differential) value produced by the CR connected in series to terminal 3 (22).

C323 (423) and R326 (426) form the required differential time constant (T3). Thus previous level meters with poor response characteristics, can now be used as peak meters.



5. Meter-muting circuit

Muting of the peak-hold circuit is accomplished by Q505, and muting of the meter-drive amplifier output by Q504.

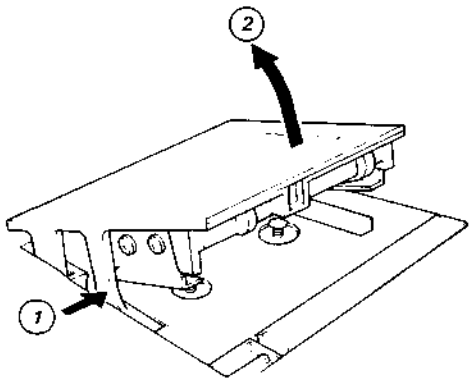
1 Q505 (PNP transistor employed) prevents T1 from becoming infinity since this transistor is always ON when the power supply is switched ON, irrespective of whether S12 is ON or OFF.

2 Since Q504 is in series with the meter, it remains OFF for about 2 sec. after the power supply is switched ON (as determined by time constant of the base circuit), in which time the power supply inside the IC is stabilized.

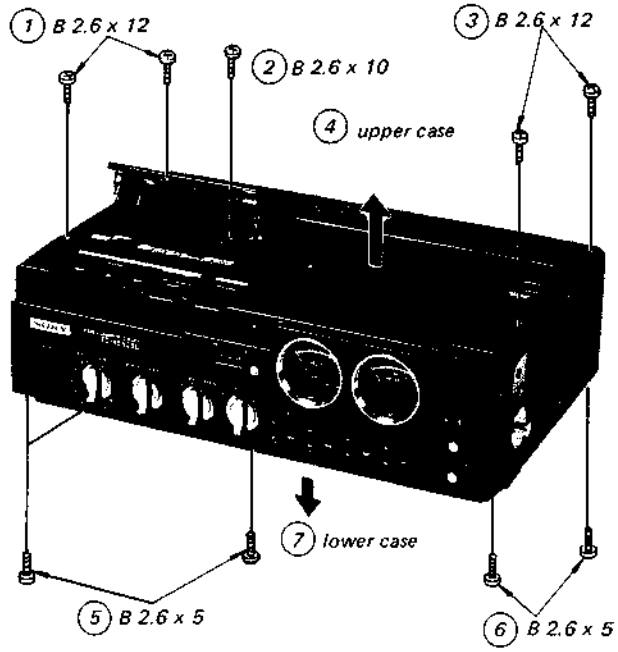
SECTION 2
DISASSEMBLY

2-1. REMOVAL

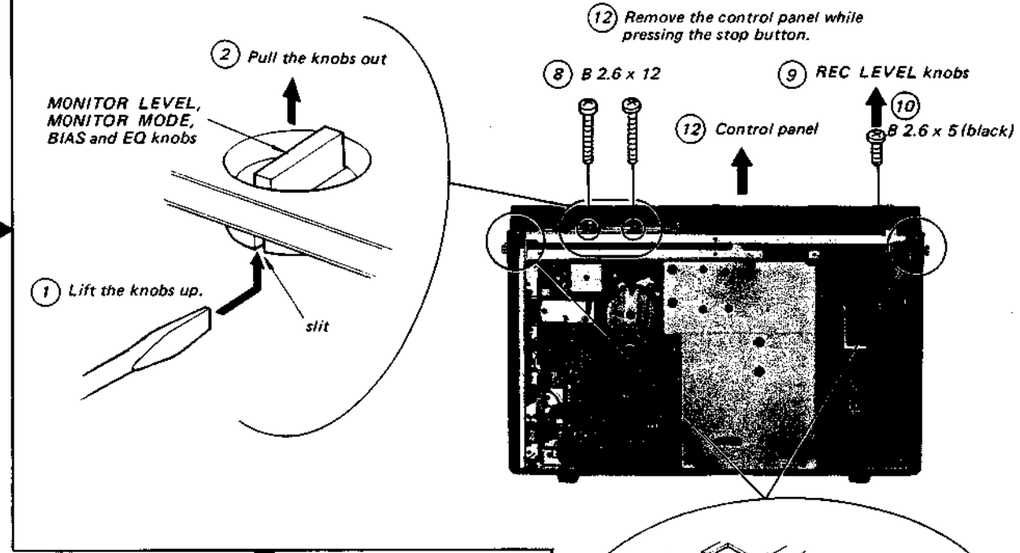
Cassette Lid Removal



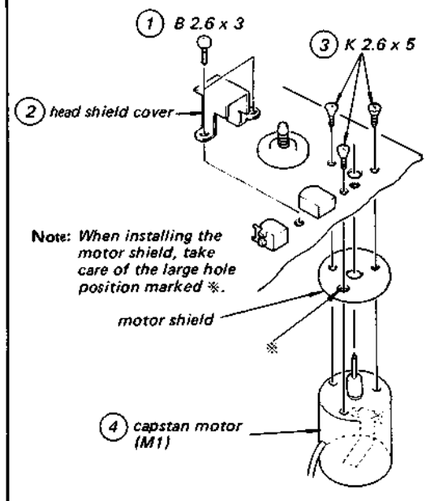
Upper and Lower Case Removal



Control Panel Removal



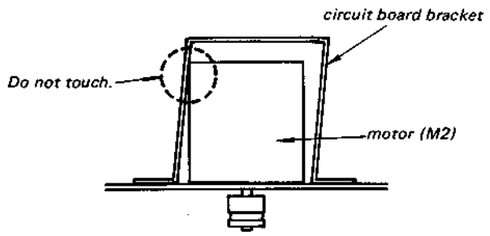
Capstan Motor Removal



2-2. CAUTION FOR INSTALLATION

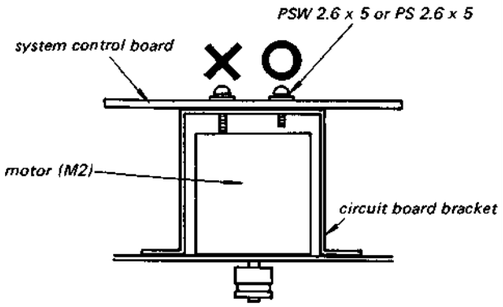
Circuit Board Bracket

Make sure that the circuit board bracket does not touch the motor (M2).



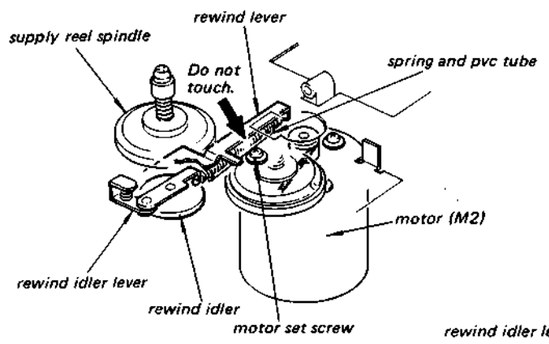
System Control Board

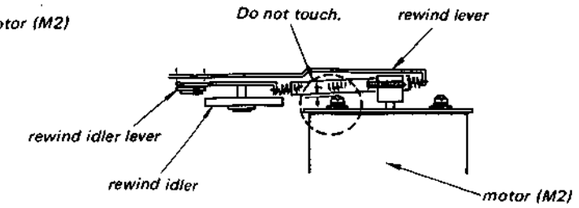
Use the screws shown below to hold the system control board. (Do not use the long screw.)



Rewind Lever or Rewind Idler Lever

Cover the spring with a pvc tube and make sure that the spring does not touch the motor set screw.





SECTION 3
ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

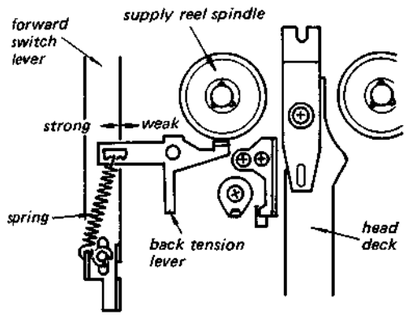
   record/playback head — pinch roller
   erase head — rubber belts
   capstan — idlers

2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply a suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
6. When adjusting the set with the bottom case removed, take care of the motor thrust screw.

3-1. MECHANICAL ADJUSTMENT

Forward Back Tension Toruque Adjustment
– playback mode –

Torque Meter	Meter Reading
CQ-102A	2 – 4 g·cm (0.03 ~ 0.05 oz·inch)

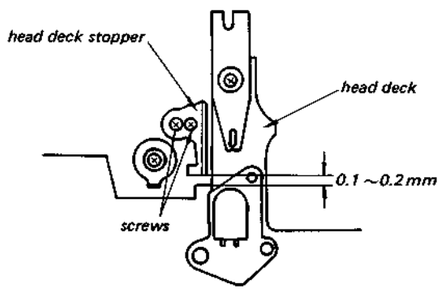


If necessary, change the spring hooking position.

Head Deck Stopper Position Adjustment
– playback mode –

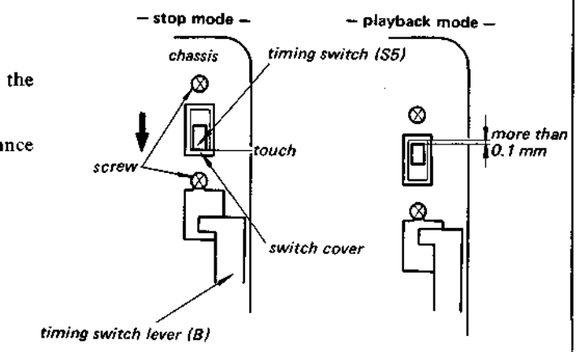
Loosen the screws and position the head deck stopper for the specified clearance.

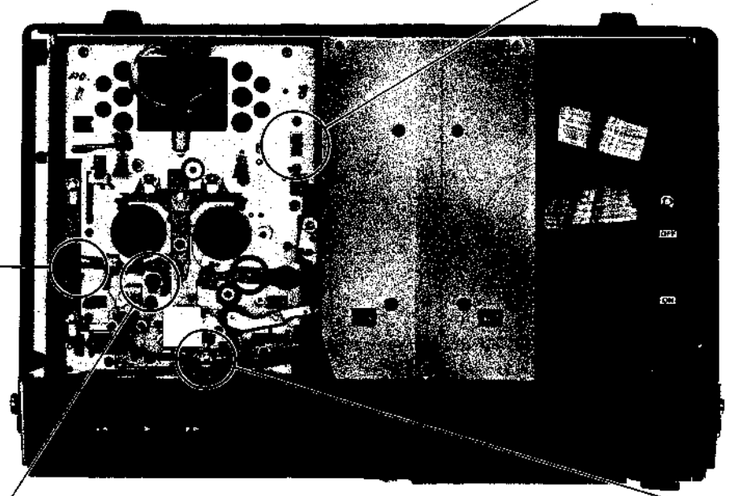
Note: Make sure that the head deck stopper is parallel with the head deck.



Timing Switch (S5) Adjustment
– Stop mode –

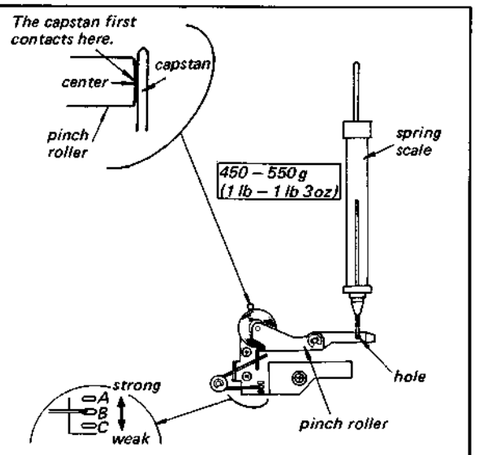
1. In stop mode, loosen the screws and position the switch to touch the switch cover.
2. In playback mode, make sure that the clearance is more than 0.1 mm as shown right.





Pinch Roller Pressure Adjustment
– playback mode –

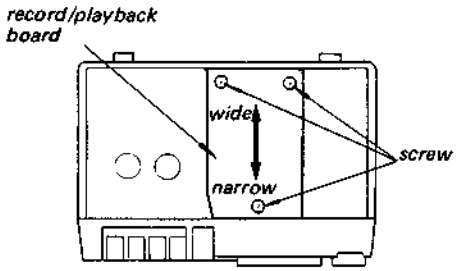
1. Pull the spring scale.
2. Slowly return the pinch roller and read the spring scale just when the pinch roller starts to rotate.
3. If necessary, change the spring hooking position.



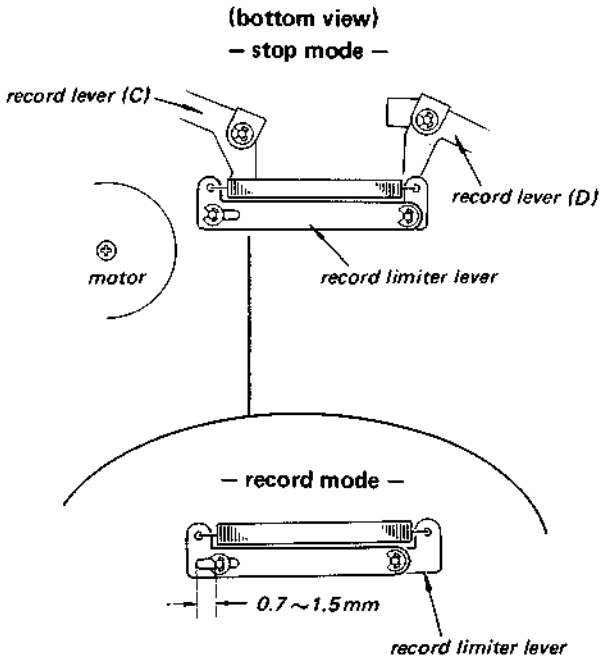
Record Limiter Lever Adjustment

When pressing the record button, make sure that the clearance is as specified.

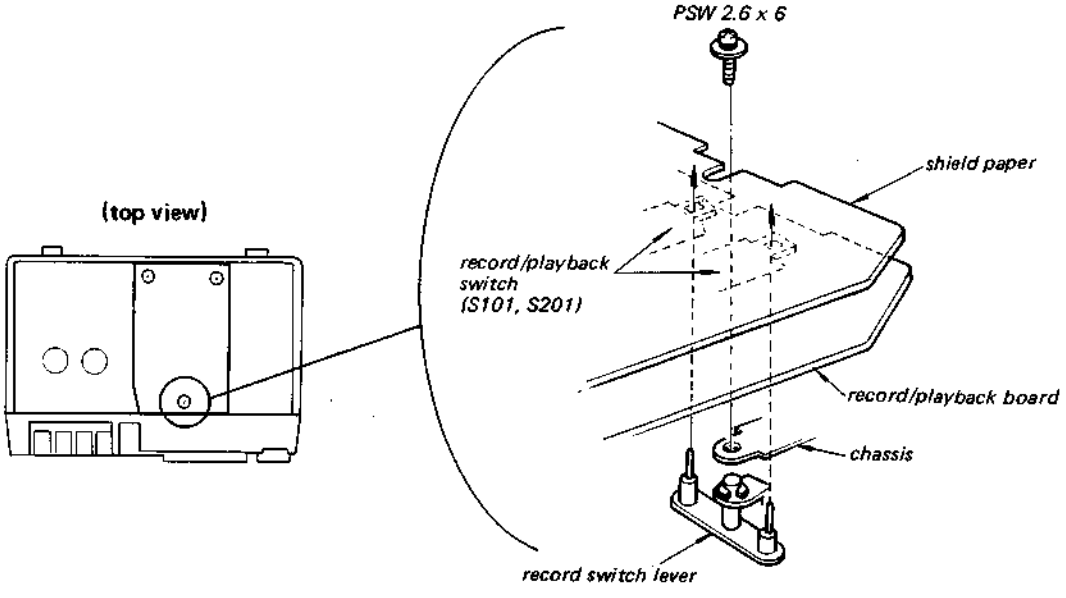
If necessary, loosen the screws and change the record/playback board position.



(top view)



Note: When installing the record/playback board, make sure that the record switch lever pins are inserted into the holes of the record/playback switch (S101, 201) slides.

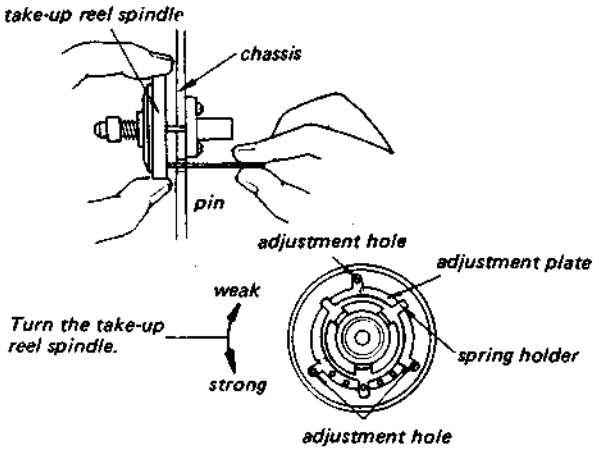


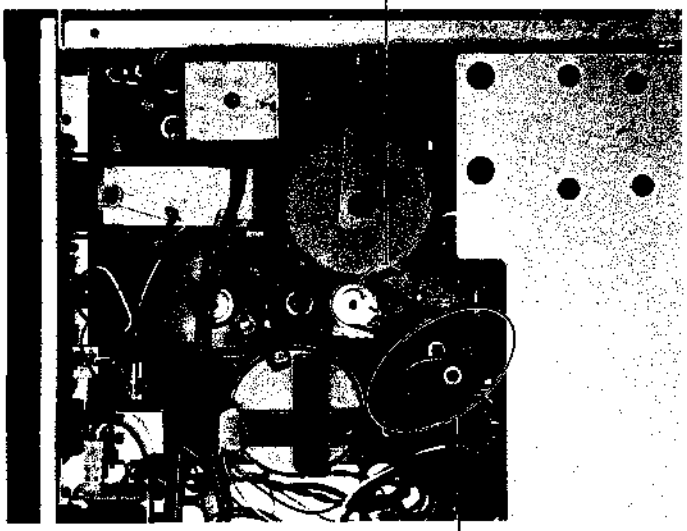
Forward Torque Adjustment
– playback mode –

Torque meter	Meter reading
CQ-102A	35 – 55g·cm (0.49 – 0.76 oz·inch)

If necessary, put a pin into the adjustment hole and turn the take-up reel spindle as shown right.

Note: When adjusting the set with bottom case removed, take care of the motor thrust screw.





Reference Data

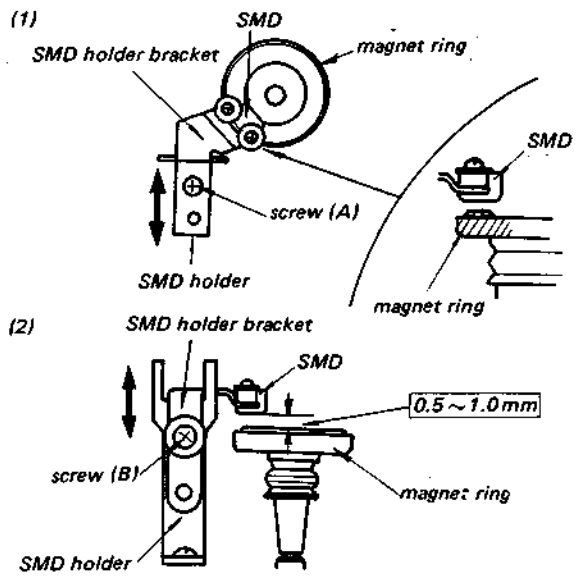
Fast forward Torque: 75 – 130g·cm (1.05 – 1.8oz·inch)

Rewind Torque: 75 – 130g·cm (1.05 – 1.8oz·inch)

SMD (D701) Position Adjustment

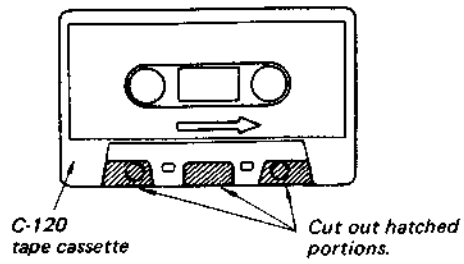
1. Loosen the screw (A) and position the SMD on the magnet ring as shown right.

2. Loosen the screw (B) and position the SMD for the specified clearance as shown right.

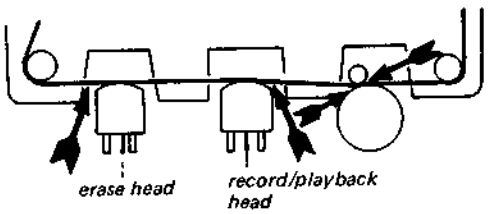


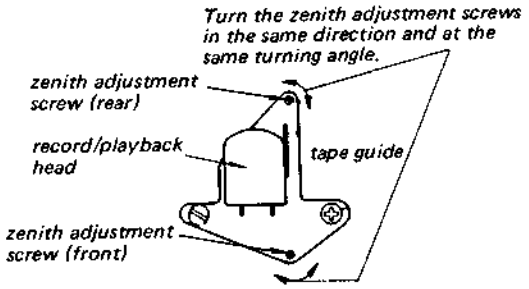
Record/playback and Erase Heads Height Adjustment
– Playback Mode –

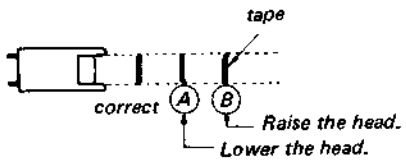
1. Prepare an adjustment cassette as shown below.

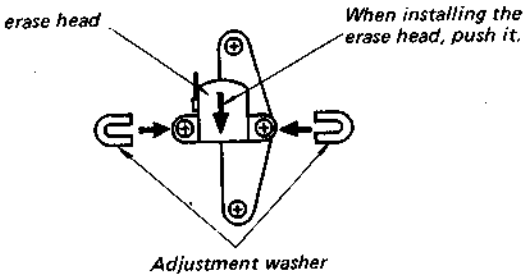


2. In playback mode and viewing from the top, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.









Part No.

3-513-237-01	t = 0.1 mm
3-513-237-11	t = 0.2 mm

3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual.

The adjustments should be performed for both L-CH and R-CH.

Switches and controls should be set as follows unless otherwise specified.

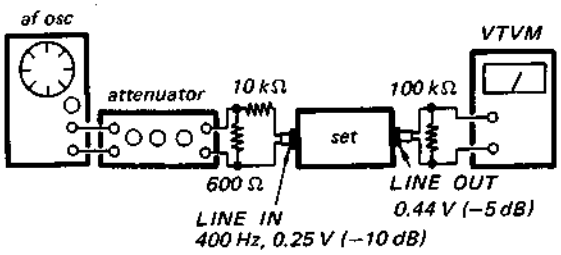
MIC ATT switch:	0 dB
LIMITER switch:	OFF
FILTER switch:	OFF
DOLBY NR switch:	OFF
EQ switch:	NORMAL
BIAS switch:	NORMAL
MONITOR MODE switch:	L + R
REC MONITOR switch:	OFF
SPEED TUNING switch:	OFF

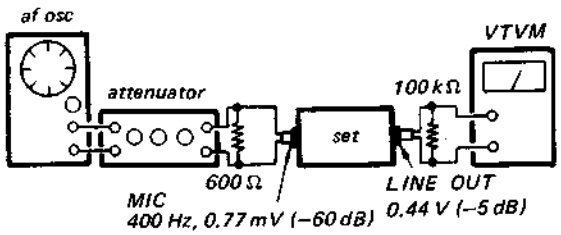
BIAS and EQ switch settings in accordance with tape used are as follows.

Test Tape	EQ switch	BIAS switch
CS-10	NORMAL	NORAML
CS-20	CrO_2	HIGH
CS-30	Fe-Cr	NORMAL

Standard Record.

Set the REC LEVEL control for the specified output level.

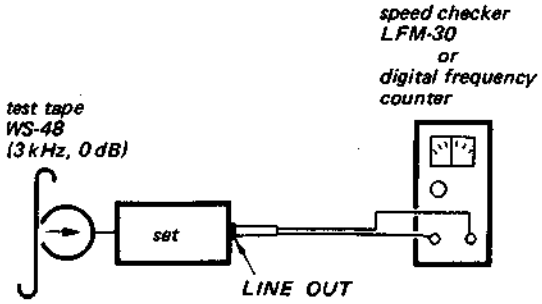




Tape Speed Adjustment

Procedure:

Mode: playback

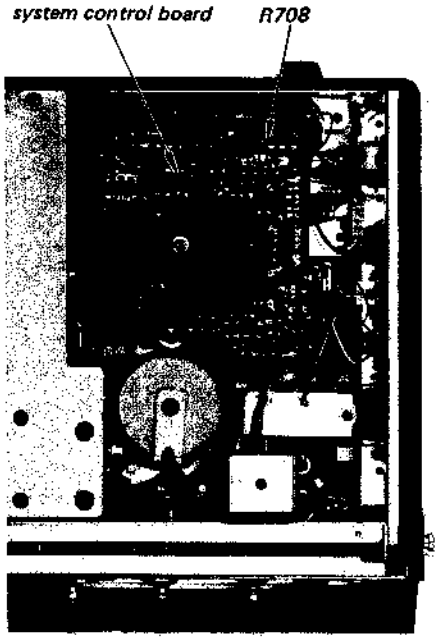


Specification:

Speed Checker	Digital Frequency Counter
±0.7%	2,980~3,020 Hz

Frequency difference between beginning and end of tape should be within 1% (30 Hz).

Adjustment Location:



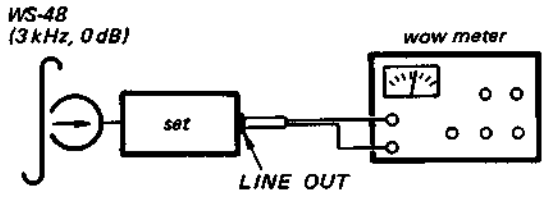
Reference Data:

SPEED TUNING switch: ON
SPEED TUNING knob
fully clockwise: more than 3,195 Hz (+6.5%)
SPEED TUNING knob
fully counterclockwise: less than 2,835 Hz (−5.5%)

Wow and Flutter Adjustment

Procedure:

1. Mode: playback

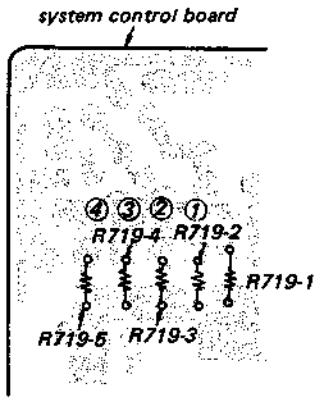


2. Adjust the pattern connection for a minimum reading on the wow meter.

Note: • connecting order
①→①, ②→①, ②, ③→①, ②, ③, ④

• When the minimum reading on the wow meter is not changed by adding the pattern connections, add no more pattern connection.

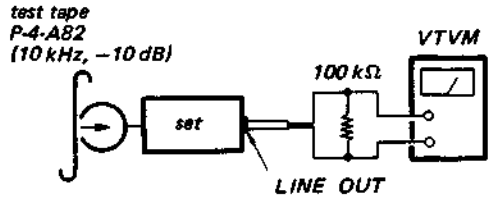
Adjustment Location:



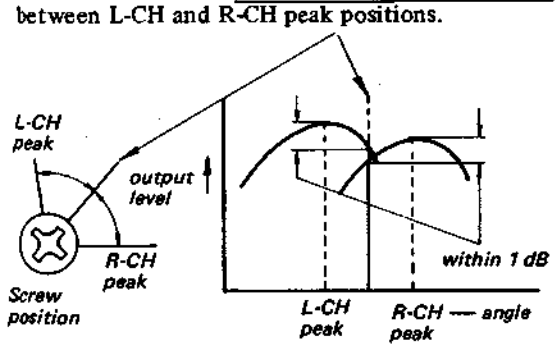
Record/playback Head Azimuth Adjustment

Procedure:

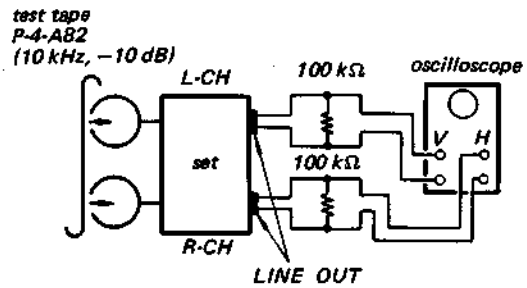
1. Mode: playback

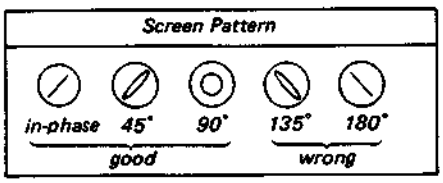


2. Turn the adjustment screw for the maximum level and set it to the mechanical mid position between L-CH and R-CH peak positions.

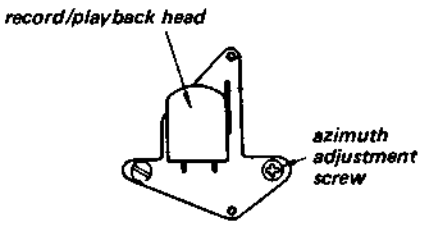


3. Mode: playback





Adjustment Location:



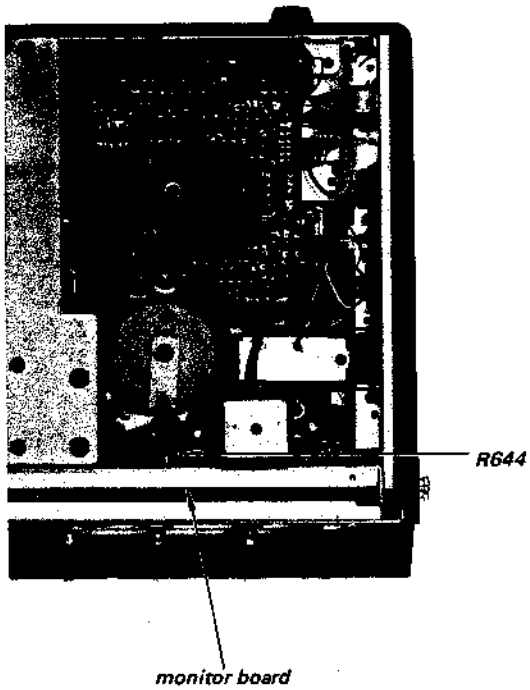
Battery Meter Calibration

Setting:

Power Supply Voltage:	8.7 V dc
BATT CHECK switch:	ON (Press.)
Mode:	playback

Adjustment Location and Specification:

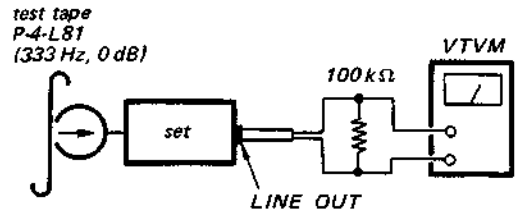
Adjust	Meter Indication
R644	(R-CH) 



Playback Level Adjustment

Procedure:

Mode: playback

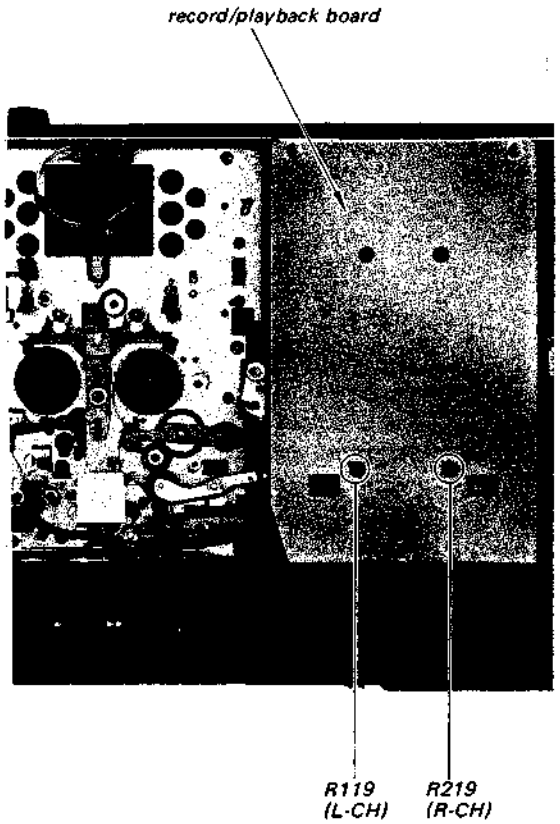


Specification:

LINE OUT Level: 0.53 V – 0.6 V (–3 dB ±0.5 dB)

Check that LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

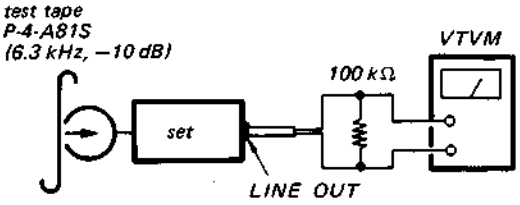
Adjustment Location:



Playback Equalizer Adjustment

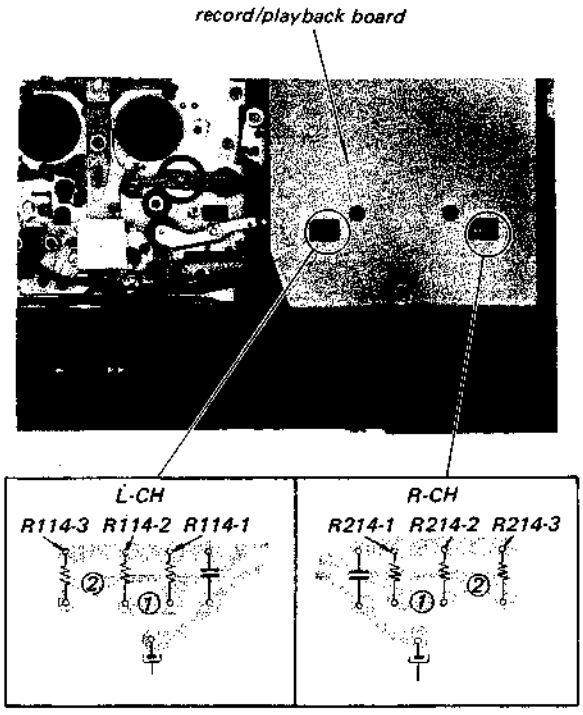
Procedure:

Mode: playback



Adjust the pattern connection for 0.13 V – 0.18 V (–14 dB ± 1.5 dB) reading on VTVM.

Adjustment Location:



Pattern Connection	6.3 kHz VTVM reading
① ② ① and ②	up ↓ down

Reference Data:

EQ switch:	FeCr or CrO_2
6.3 kHz VTVM reading:	75 mV – 115 mV (–18.5 dB ±2 dB)

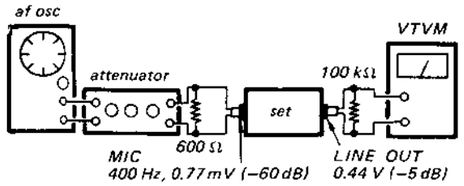
Level Meter 0 dB Calibration

Setting:

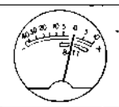
REC LEVEL control: standard record
(See page 13.)

Procedure:

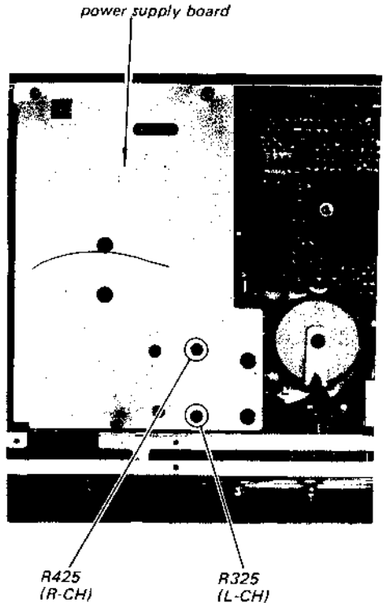
1. Mode: record



2.

Adjust	PEAK METER Indication
R325 (L-CH) R425 (R-CH)	

Adjustment Location:



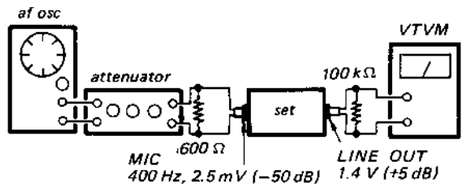
Level Meter +10 dB Calibration

Setting:

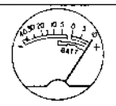
REC LEVEL control: standard record
(See page 13.)

Procedure:

1. Mode: record

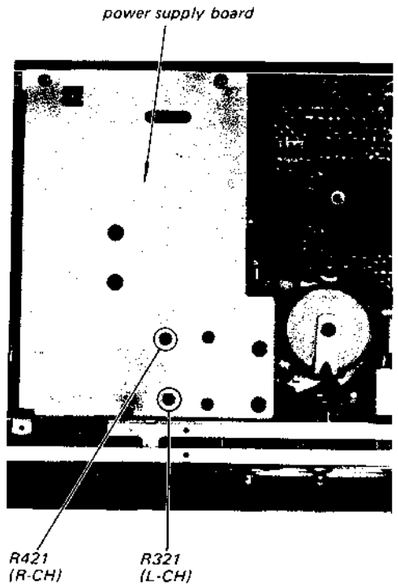


2.

Adjust	PEAK METER Indication
R321 (L-CH) R421 (R-CH)	

3. Decrease the input level to 0.25 mV (– 70 dB) and make sure that the PEAK METER indicates –10 dB.

Adjustment Location:



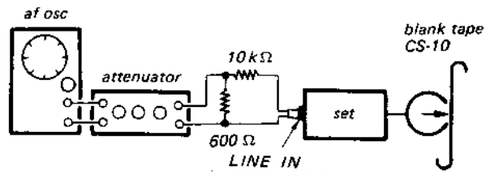
Record Level Adjustment

Setting:

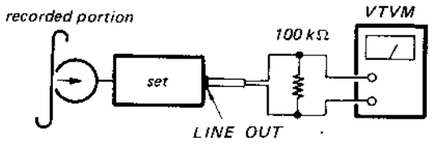
REC LEVEL control: standard record
(See page 13.)

Procedure:

1. Mode: record



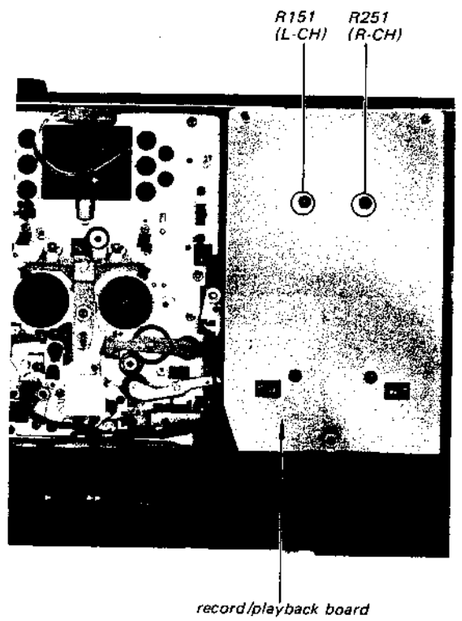
2. Mode: playback



Specification:

LINE OUT Level: 0.42 V – 0.47 V
(– 5 dB ± 0.5 dB)

Adjustment Location:



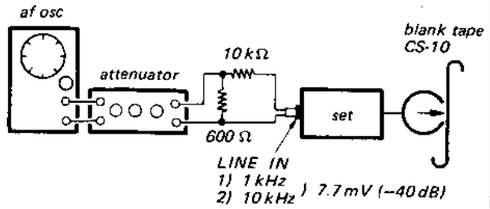
Record Bias (NORMAL) Adjustment

Setting:

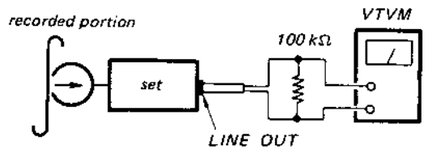
REC LEVEL control: standard record
(See page 13.)

Procedure:

1. Mode: record

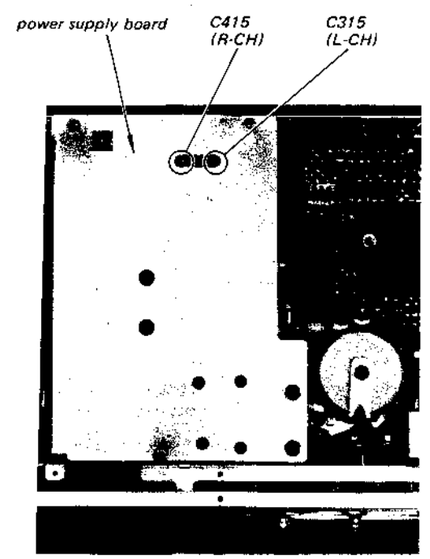


2. Mode: playback



3. Repeating above steps, adjust C315 (L-CH) and C415 (R-CH) to make 10 kHz and 1 kHz signal output levels equal.

Adjustment Location:



l record
;e 13.)

blank tape
CS-10

-40dB)

VM

-CH) and
Hz signal

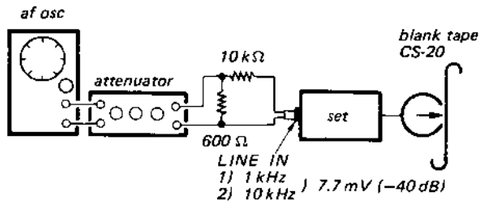
Record Bias (CrO2) Adjustment

Setting:

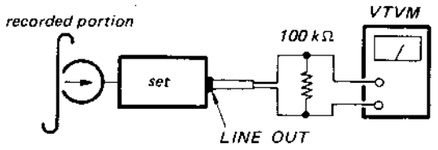
BIAS switch:	HIGH
EQ switch:	CrO2
REC LEVEL control:	standard record (See page 13.)

Procedure:

1. Mode: record



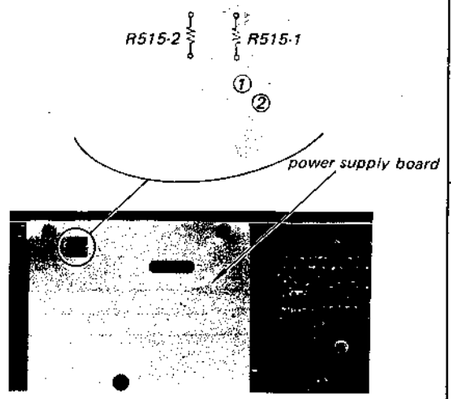
2. Mode: playback



3. Repeating above steps, adjust the pattern connection to make 10 kHz and 1 kHz signal output levels equal.

Pattern connection	10 kHz VTVM reading
①	up
②	down

Adjustment Location:



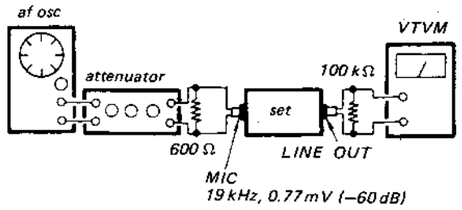
19 kHz Filter Adjustment

Setting:

FILTER switch:	ON
REC LEVEL control:	standard record (See page 13.)

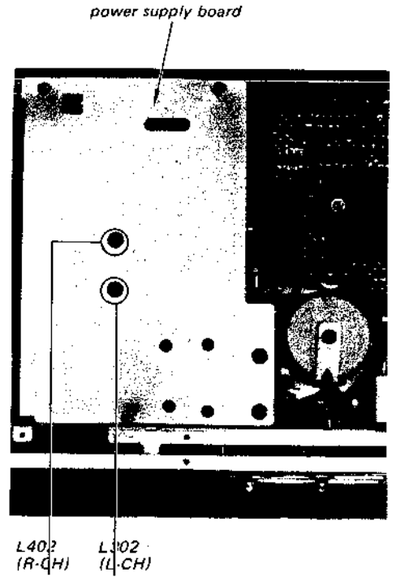
Procedure:

Mode: record



Adjust L302 (L-CH) and L402 (R-CH) for a minimum reading on VTVM.

Adjustment Location:



Reference Data:

Overall Signal-to-Noise Ratio: (with CS-10)	more than 41 dB
Bias Leakage: (BIAS switch: HIGH)	less than 4.4 mV (–45 dB)
Erase Ratio: (with CS-20 or CS-30)	more than 60 dB

SECTION 4
DIAGRAMS

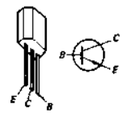
4-1. SEMICONDUCTORS

Replacement Semiconductors

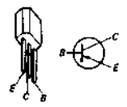
Q1 ~ 4, Q104 ~ 106, Q108 ~ 111, Q204 ~ 206, Q208 ~ 211, Q301 ~ 303, Q401 ~ 403, Q502 ~ 504, Q621, Q701, 702, Q705 ~ 707, Q709 ~ 713: 2SC634A

Q101, 201, Q107, 207, Q112, 212: 2SC1636

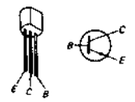
Q103, 203: 2SC632A



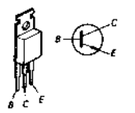
Q102, 202: 2SA705
Q505, Q703, 704: 2SA678



Q501, 708: 2SC1475



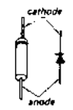
Q714: 2SC1061



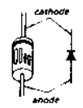
D1, 2, D503, 504, D621: 1T22A

D3, 4, D711, D702 ~ 704, D706, 707: 1S1555

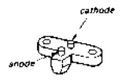
D101, 201, D501, 710: 10E2



D641: EQA01-05B
D705: EQB01-07

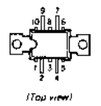


D701: MD130E

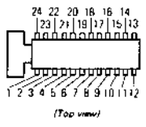


IC101, 201: TA7122AP
IC301, 401: TA7066P

IC501: HA1306W



IC502: CX067

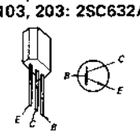


IC701: CX065

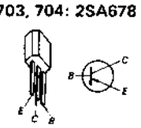
Q1 ~ 4, Q104 ~ 106, Q108 ~ 111, Q204 ~ 206, Q208 ~ 211, Q301 ~ 303, Q401 ~ 403, Q502 ~ 504, Q621, Q701, 702, Q705 ~ 707, Q709 ~ 713: 2SC633A

Q101, 201, Q107, 207, Q112, 212: 2SC1636

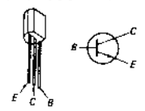
Q103, 203: 2SC632A



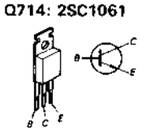
Q102, 202: 2SA705
Q505: 2SA677
Q703, 704: 2SA678



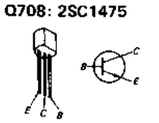
Q501: 2SC1209



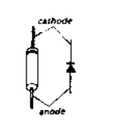
Q714: 2SC1061



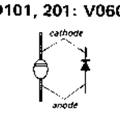
Q708: 2SC1475



D1, 2, D503, 504: 1T22A
D3, 4: 1S1555
D621: 1T22
D702 ~ 704, D706, 707, D711: 1T40

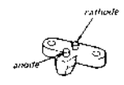


D101, 201: V06C



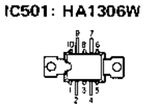
D501, 710: SIB01-02
D641: EQA01-05B
D705: EQA01-07

D701: MD130E

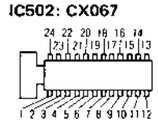


IC101, 201: TA7122AP
IC301, 401: TA7066P

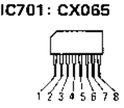
IC501: HA1306W



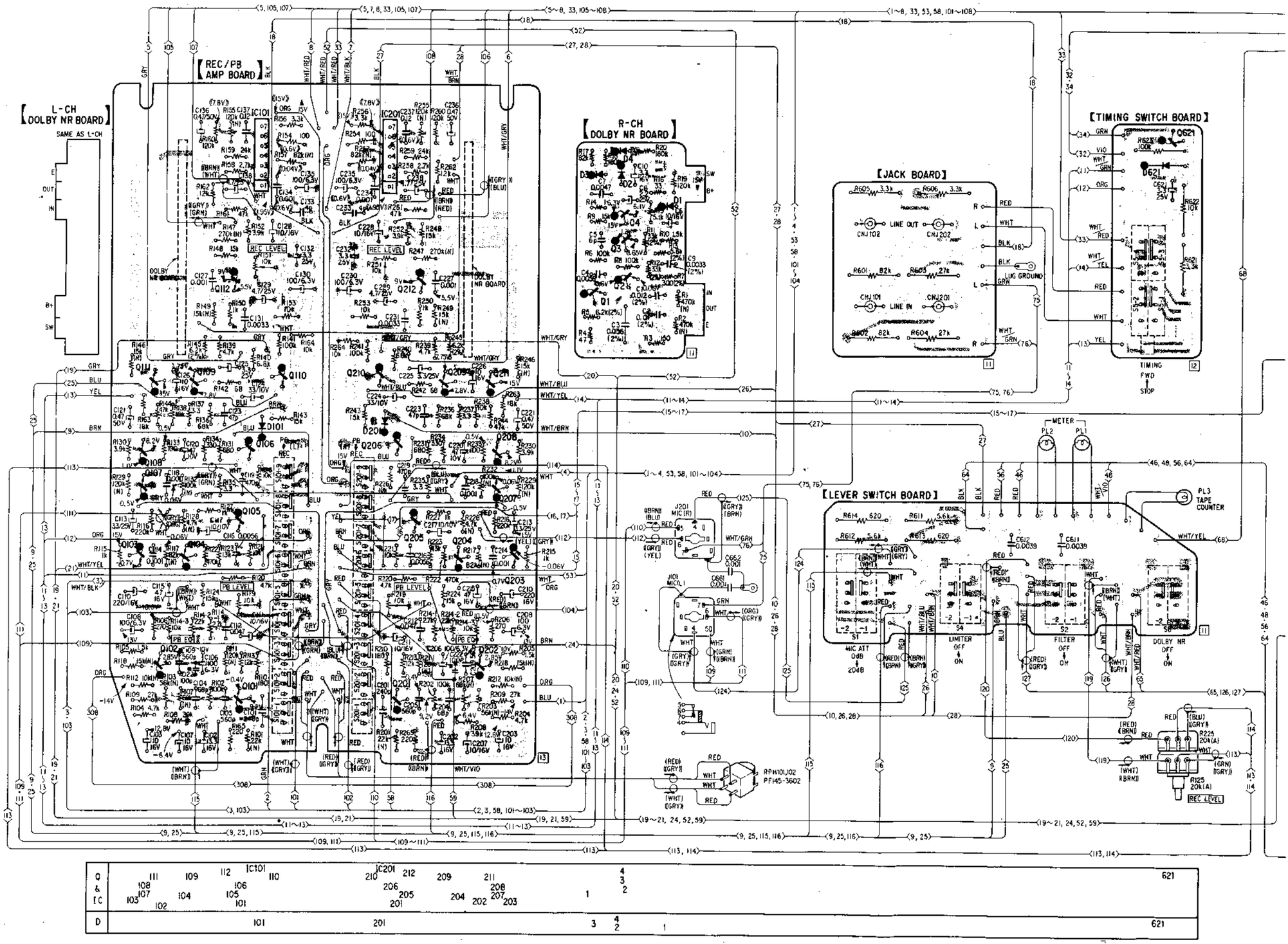
IC502: CX067



IC701: CX065

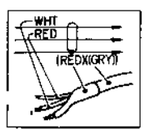


4-2. MOUNTING DIAGRAMS – Conductor Side –



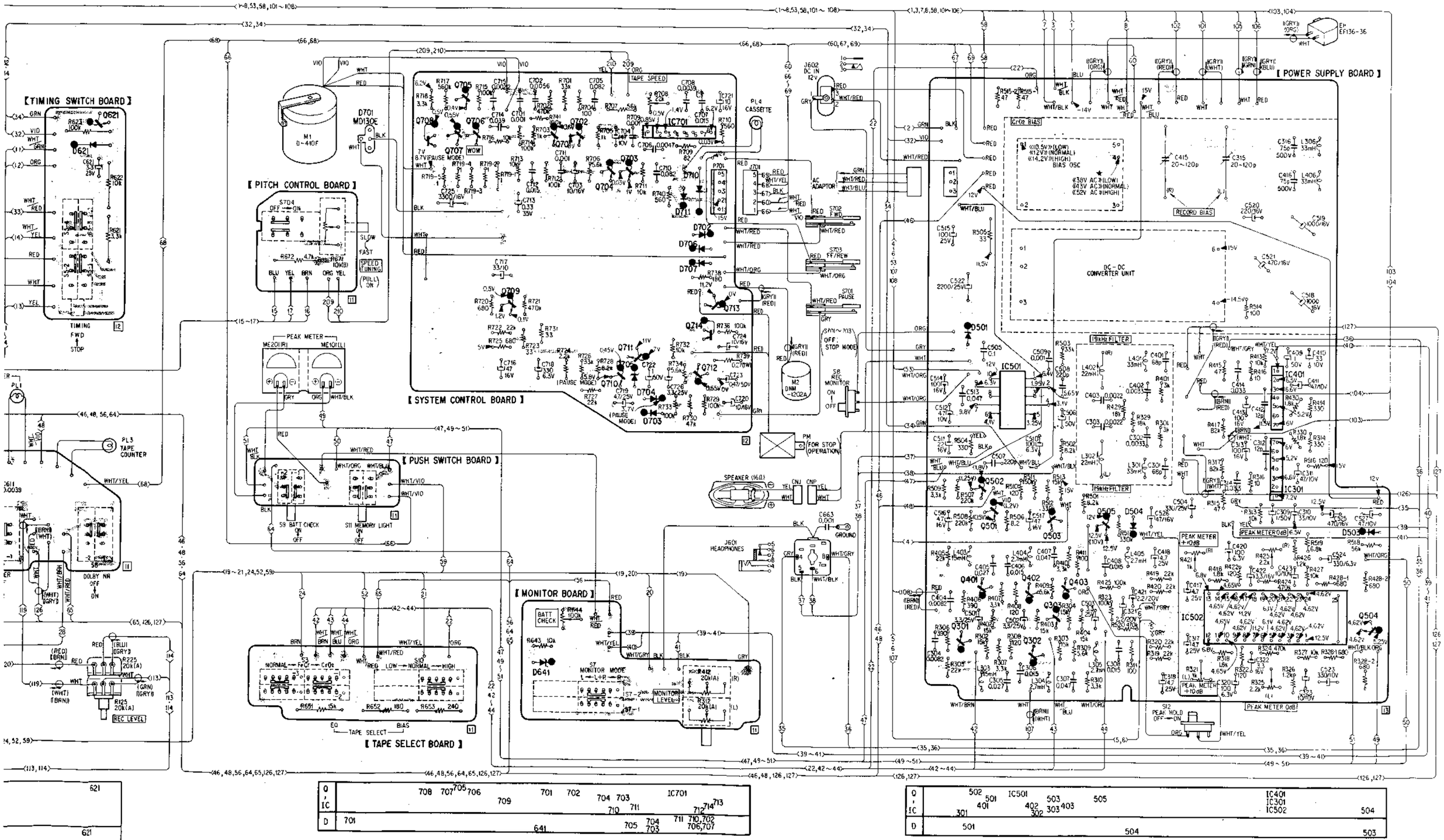
Note:

- Color code of sleeving over the end of the jacket.

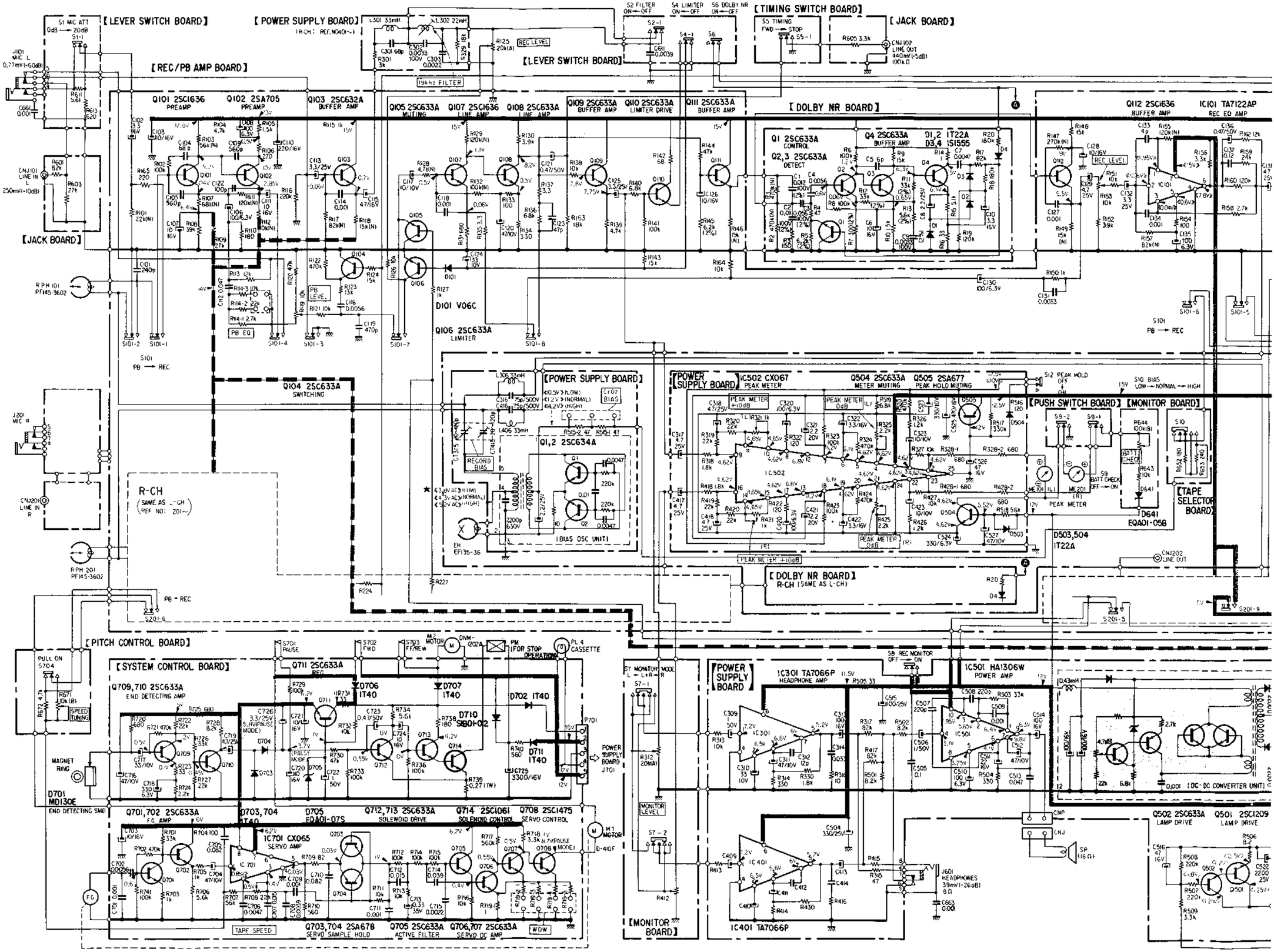


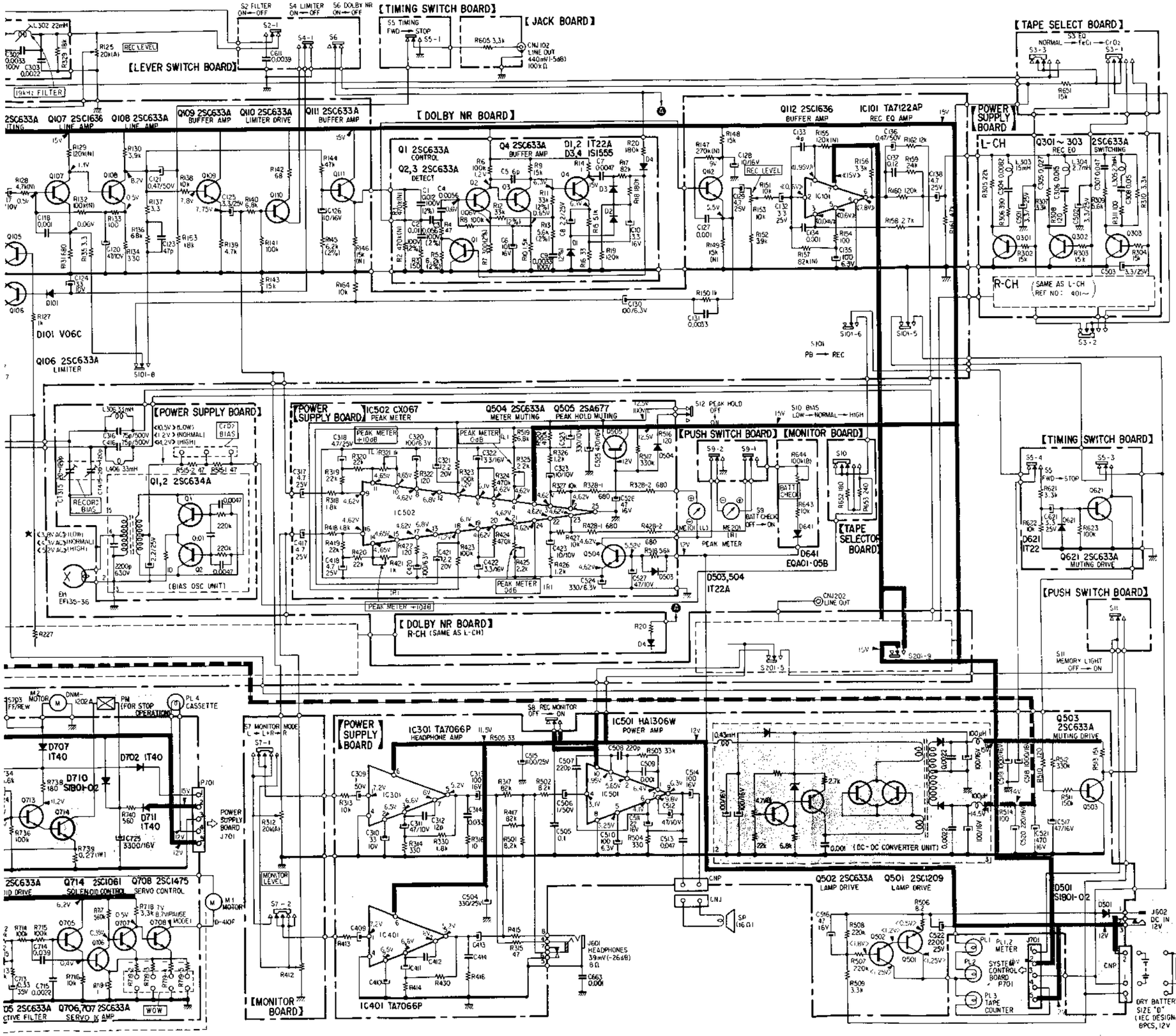
- ○—: parts extracted from the component side.
- ●—: parts extracted from the conductor side.
- ● : part mounted on the conductor side.
- : B+ pattern
- : B– pattern

Q & IC	103 107 108 111 102 104 109 112 105 106 101 IC101 110 210 IC201 206 201 205 212 209 204 202 211 208 207 203 1 4 3 2 621
D	101 201 3 4 2 1 621


【TIMING SWITCH BOARD】
TIMING
FWD
STOP
【PITCH CONTROL BOARD】
S704
SLOW
FAST
SPEED TUNING
(PULL) ON
M1
D-410F
D701
MD130E
【SYSTEM CONTROL BOARD】
IC701
TAPE SPEED
WOW
PL4
CASSETTE
P701
J701
AC ADAPTOR
J602
DC IN
12V
S702 FWD
S703 FF/REW
S701 PAUSE
S701-703
OFF : STOP MODE
M2
DNM-1202A
S8
REC MONITOR
ON
OFF
PM
FOR STOP OPERATION
SPEAKER (16Ω)
CNJ
CNP
J601
HEADPHONES
GROUND
PEAK METER
ME201(R)
ME101(L)
【PUSH SWITCH BOARD】
S9 BATT CHECK
ON
OFF
S11 MEMORY LIGHT
ON
OFF
PL1
PL3
TAPE COUNTER
DOLBY NR
OFF
ON
REC LEVEL
【MONITOR BOARD】
BATT CHECK
D641
S7
MONITOR MODE
L+R
R
L
MONITOR LEVEL
【TAPE SELECT BOARD】
NORMAL
FeCr
CrO2
LOW
NORMAL
HIGH
EQ
TAPE SELECT
BIAS
【POWER SUPPLY BOARD】
EH
EF136-36
CrO2 BIAS
BIAS OSC
RECORD BIAS
DC-DC CONVERTER UNIT
19kHz FILTER
IC501
IC401
IC301
IC502
PEAK METER +10dB
PEAK METER 0dB
S12
PEAK HOLD
OFF ON
Q
IC
D
621
708 707 705 706 709 701 702 704 703 710 711 IC701 712 714 713
701 641 705 704 703 711 710,702 706,707
502 501 IC501 401 402 302 301 503 303 403 505 IC401 IC301 IC502 504
501 504 503

4-3. SHCEMATIC DIAGRAM





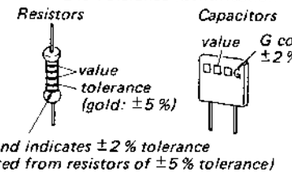
Note:

- All capacitors are in μF unless otherwise noted. pF = μμF 50 WV or less does not indicated except for electrolytics.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ = 1000 Ω; MΩ = 1000 kΩ
- All adjustable resistors have characteristic curve B, unless otherwise noted.
- (N) : low-noise capacitor and resistor.
- 2 % indicates component tolerance.

CAUTION

When replacing resistors and capacitors with a ±2 % tolerance, use resistors with a red tolerance band or capacitors with a G code.

±2 % Tolerance Identification



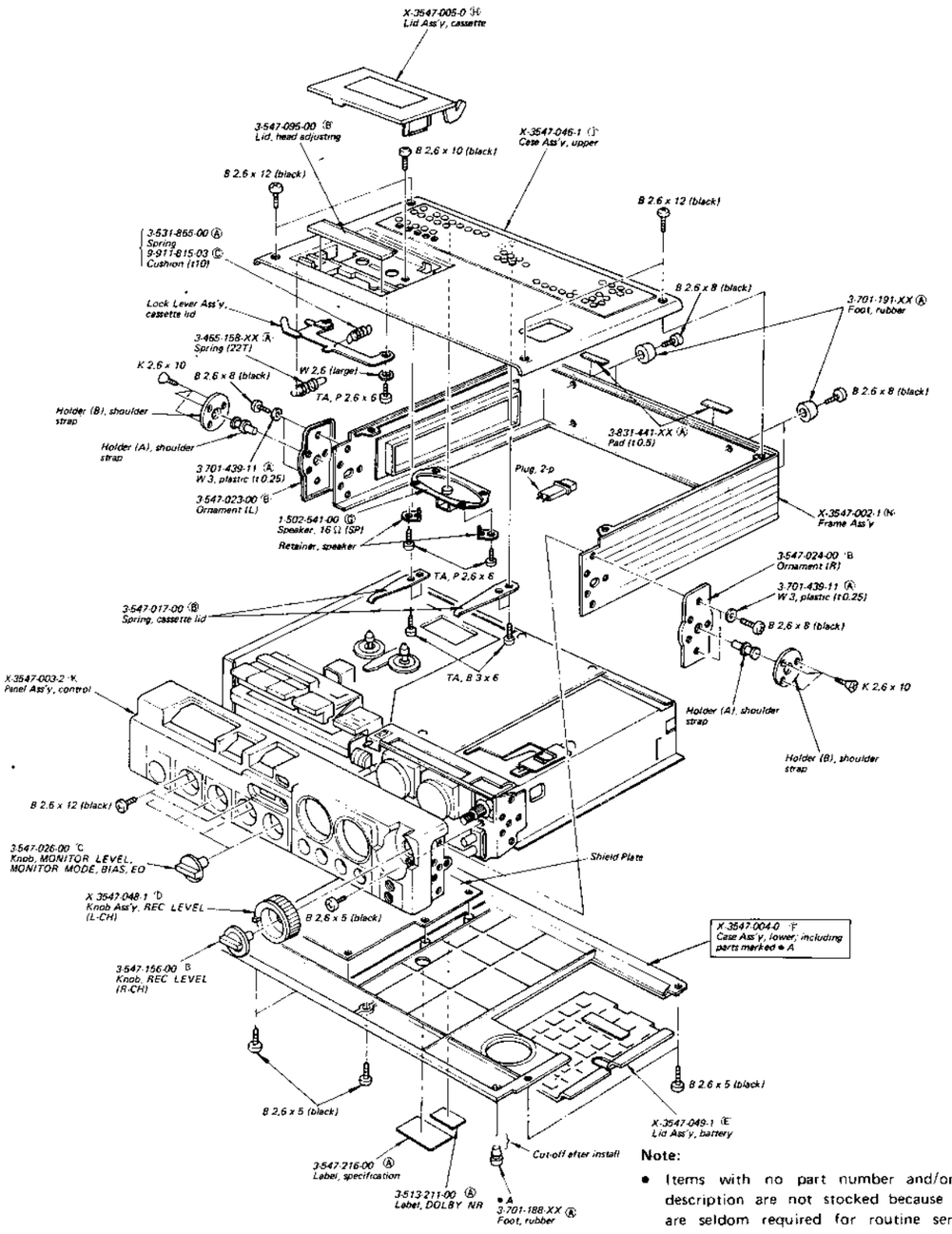
- ▬: B+ bus.
- ▬▬: B− bus.
- ▭: panel designation.
- ▭: adjustment for repair.
- ⏚: chassis ground.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
  ⩽ ⩾ : RECORD
  < > : MEMORY LIGHT (S11) ON
  (( )) : PEAK HOLD (S12) ON
  no mark: common
- AC voltage readings indicated by ✱ in the bias oscillator circuit are taken with a VTVM.
- Voltage variations may be noted due to normal production tolerances.
- REC: RECORD FWD: FORWARD
  PB: PLAYBACK FF: FAST FORWARD
  REW: REWIND
- Switch

Ref. No.	Switch	Position
S1	MIC ATT	0 dB
S2	FILTER	OFF
S3	EQ	NORMAL
S4	LIMITER	OFF
S5	TIMING	FORWARD
S6	DOLBY NR	OFF
S7	MONITOR MODE	L + R
S8	REC MONITOR	OFF
S9	BATT CHECK	OFF
S10	BIAS	LOW
S11	MEMORY LIGHT	OFF
S12	REAK HOLD	OFF
S101, 201	REC/PB	PB
S701	PAUSE	OFF
S702	FWD	ON
S703	FF/REW	OFF
S704	SPEED TUNING	OFF

Note: The components identified by shading are critical for safety. Replace only with part number specified.

SECTION 5
EXPLODED VIEWS

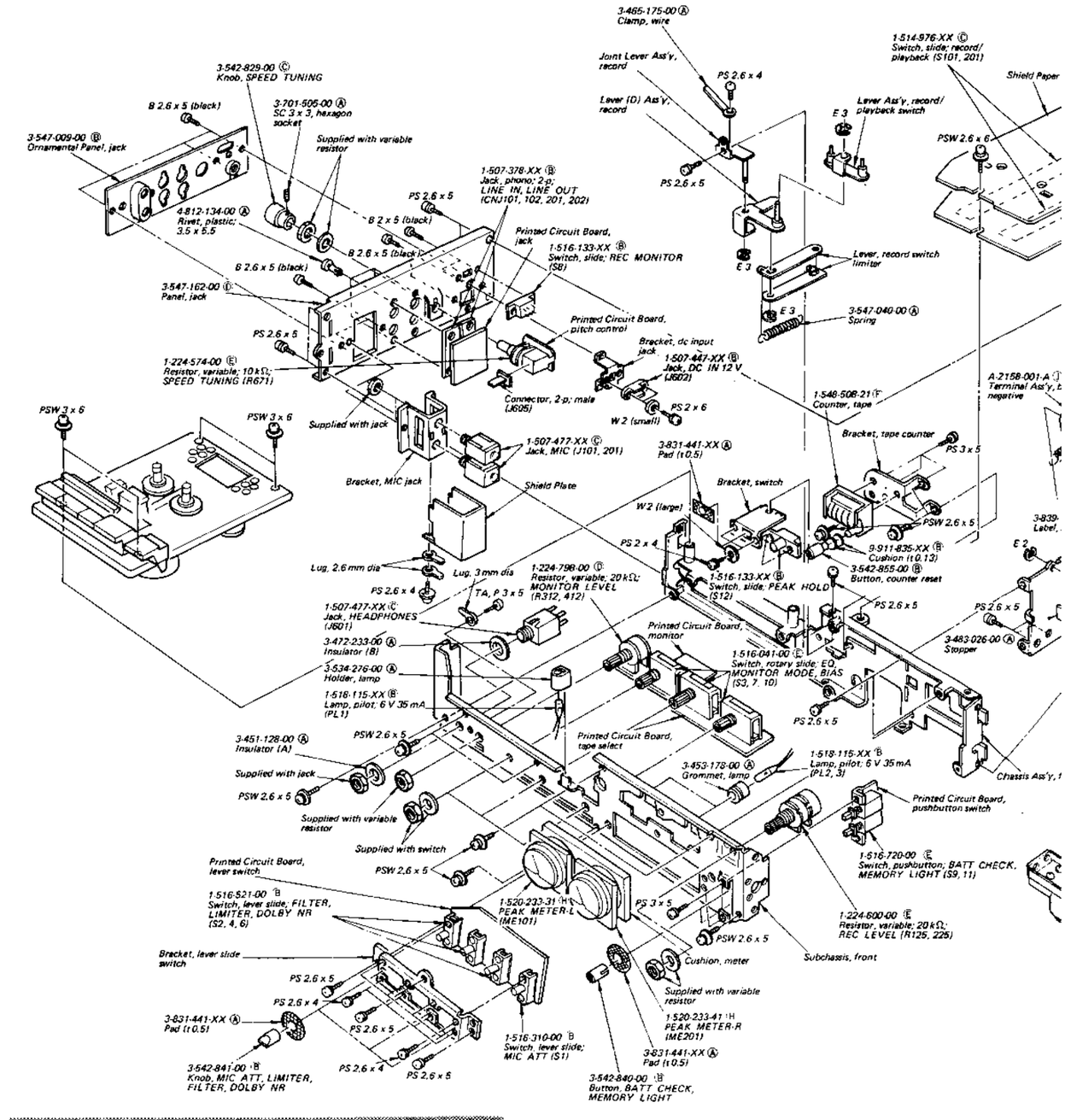
5-1.



Note:

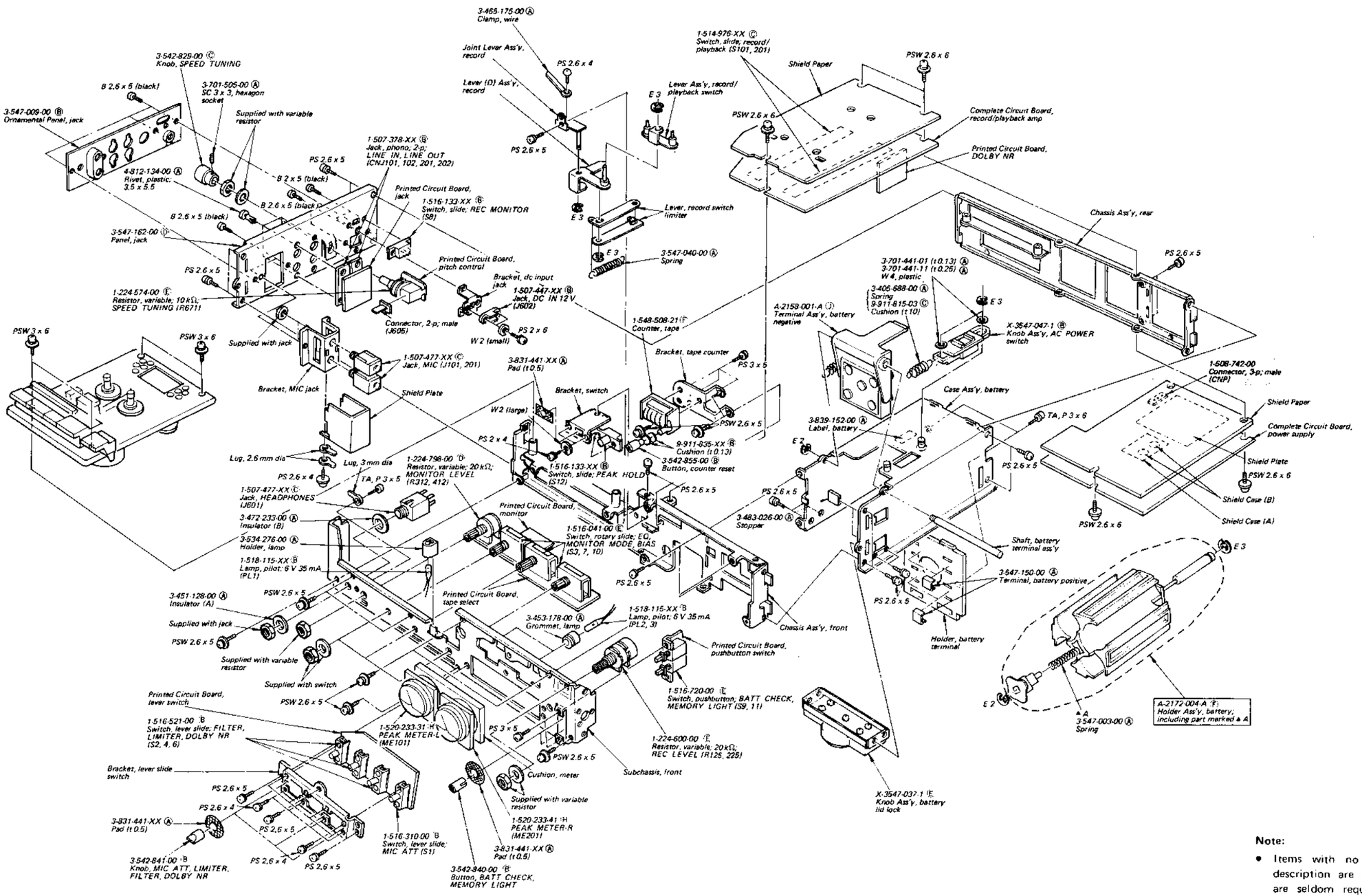
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

5-2.



Note: The components identified by shading are critical for safety. Replace only with part number specified.

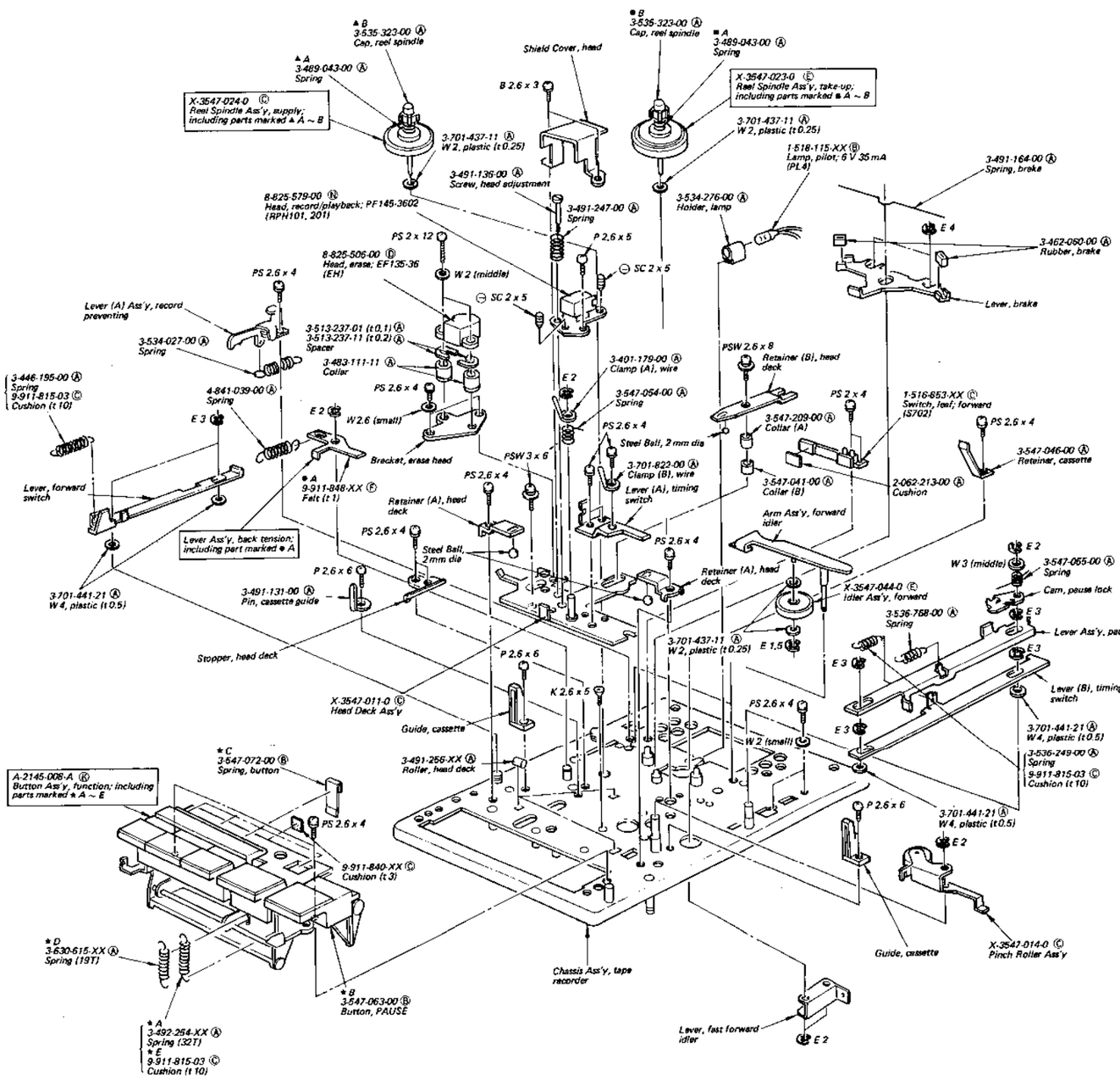
5-2.



Note: The components identified by shading are critical for safety. Replace only with part number specified.

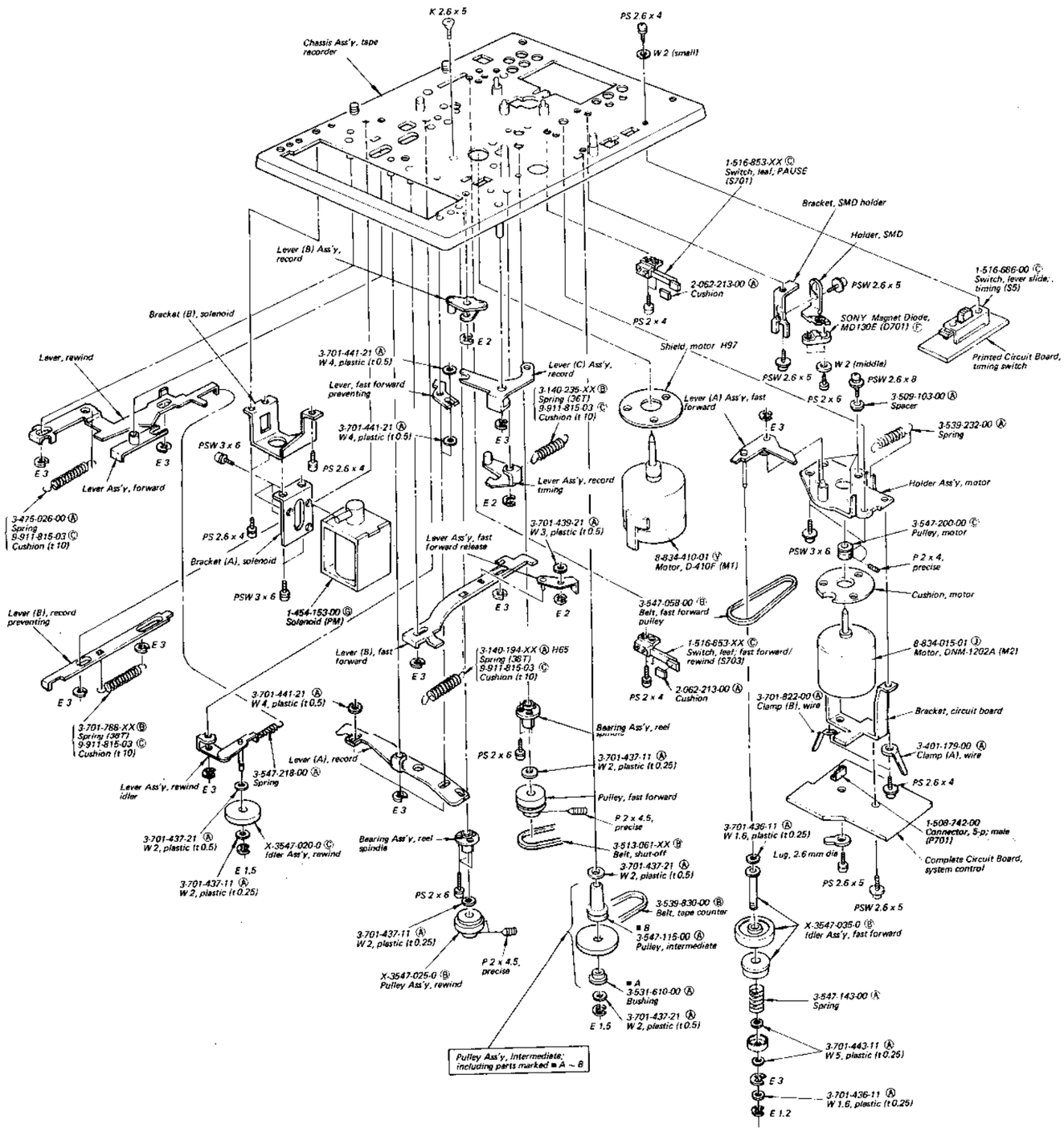
Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters ((A) to (Z)) are applicable to European models only.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  {–} = slotted head
- {□□T} shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

SECTION 6
ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
		SEMICONDUCTORS
		Transistors
⇒Q1 ~4		Ⓑ2SC634A
Q101, 201		Ⓑ2SC1636
Q102, 202		Ⓑ2SA705
Q103, 203		Ⓑ2SC632A
⇒Q104 ~106 ⇒Q204 ~206		Ⓑ2SC634A
Q107, 207		Ⓑ2SC1636
⇒Q108 ~111 ⇒Q208 ~211		Ⓑ2SC634A
Q112, 212		Ⓑ2SC1636
⇒Q301 ~303 ⇒Q401 ~403		Ⓑ2SC634A
⇒Q501		Ⓒ2SC1475
⇒Q502 ~504		Ⓑ2SC634A
⇒Q505		Ⓒ2SA678
⇒Q621		Ⓑ2SC634A
⇒Q701, 702		Ⓑ2SC634A
Q703, 704		Ⓒ2SA678
⇒Q705 ~707		Ⓑ2SC634A
Q708		Ⓑ2SC1475
⇒Q709 ~713		Ⓑ2SC634A
Q714		Ⓓ2SC1061
		ICs
IC101, 201		ⒸTA7122AP
IC301		ⒹTA7066P
IC401		ⒹTA7066P
IC501		ⒽHA1306W
IC502		ⓀCX067
IC701		ⒾCX065

Ref. No.	Part No.	Description
		Diodes
D1, 2		Ⓑ1T22A
D3, 4		Ⓑ1S1555
⇒D101, 201		Ⓑ10E2
⇒D501		Ⓑ10E2
D503, 504		Ⓑ1T22A
⇒D621		Ⓑ1T22A
D641		ⒷEQA01-05B
D701		ⒸMD130E
⇒D702 ~704		Ⓑ1S1555
⇒D705		ⒷEQB01-07
⇒D706, 707		Ⓑ1S1555
⇒D710		Ⓑ10E2
⇒D711		Ⓑ1S1555
		COILS
L301, 401	1-407-879-00	Ⓑ33 mH, microinductor
L302, 402	1-407-240-00	Ⓑ22 mH, variable inductor
L303, 403	1-407-208-XX	Ⓐ15 mH, microinductor
L304, 404 L305, 405	1-407-195-XX	Ⓐ2.7 mH, microinductor
L306, 406	1-407-212-XX	Ⓐ33 mH, microinductor
		CAPACITORS

All capacitors are in μF and electrolytic unless otherwise noted. 50 WV or less are not indicated except for electrolytics.
pF = μμF

C1	1-129-896-11	Ⓑ0.012	±2%	100 V	film
C2	1-129-701-11	Ⓑ0.01	±2%	100 V	film
C3	1-129-899-11	Ⓑ0.056	±2%	100 V	film
C4	1-108-573-12	Ⓐ0.0056			mylar
C5	1-107-103-11	Ⓐ6 p			silvered mica
C6	1-121-471-11	Ⓐ10		16 V	
C7	1-108-234-12	Ⓐ0.0047			mylar
C8	1-131-205-11	Ⓑ2.2		25 V	tantalum
C9	1-129-794-21	Ⓑ0.0033	±2%	100 V	film
C10	1-131-197-11	Ⓑ3.3		16 V	tantalum

⇒: Due to replacement parts, the descriptions are different from the schematic diagram.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description		
C101, 201	1-102-979-11	Ⓐ240 p		ceramic
C102, 202	1-131-197-11	Ⓑ3.3	16 V	tantalum
C103, 203	1-131-199-11	Ⓐ10	16 V	tantalum
C104, 204	1-101-888-11	Ⓐ68 p		ceramic
C105, 205	1-102-115-11	Ⓐ560 p		ceramic
C106, 206	1-121-413-11	Ⓐ100	6.3 V	
C107, 207	1-131-199-11	Ⓒ10	16 V	tantalum
C108, 208	1-131-413-11	Ⓑ100	6.3 V	tantalum
C109, 209	1-102-115-11	Ⓐ560 p		ceramic
C110, 210	1-121-421-11	Ⓑ220	16 V	
C111, 211	1-121-471-11	Ⓐ10	16 V	
C112, 212	1-106-041-12	Ⓑ0.047		mylar
C113, 213	1-121-392-11	Ⓐ3.3	25 V	
C114, 214	1-106-058-12	Ⓐ0.001		mylar
C115, 215	1-121-409-11	Ⓐ47	16 V	
C116, 216	1-105-510-12	Ⓐ0.0056		mylar
C117, 217	1-131-193-11	Ⓑ10	10 V	tantalum
C118, 218	1-106-058-12	Ⓐ0.001		mylar
C119, 219	1-102-824-11	Ⓐ470 p		ceramic
⇒C120, 220	1-121-409-11	Ⓐ47	16 V	
C121, 221	1-121-726-11	Ⓐ0.47	50 V	
C122, 222	1-102-973-11	Ⓐ100 p		ceramic
C123, 223	1-101-880-11	Ⓐ47 p		ceramic
C124, 224	1-121-402-11	Ⓐ33	10 V	
C125, 225	1-121-392-11	Ⓐ3.3	25 V	
C126, 226	1-121-471-11	Ⓐ10	16 V	
C127, 227	1-106-058-12	Ⓐ0.001		mylar
C128, 228	1-121-471-11	Ⓐ10	16 V	
C129, 229	1-121-395-11	Ⓐ4.7	25 V	
C130, 230	1-121-413-11	Ⓐ100	6.3 V	
C131, 231	1-106-013-12	Ⓐ0.0033		mylar
C132, 232	1-121-392-11	Ⓐ3.3	25 V	
C133, 233	1-102-941-11	Ⓐ4 p		ceramic
C134, 234	1-106-058-12	Ⓐ0.001		mylar
C135, 235	1-121-413-11	Ⓐ100	6.3 V	
C136, 236	1-121-726-11	Ⓐ0.47	50 V	
C137, 237	1-106-108-11	Ⓑ0.12		mylar
C138, 238	1-121-395-11	Ⓐ4.7	25 V	

⇒: Due to replacement parts, the values are different from the diagrams.

Ref. No.	Part No.	Description		
C301, 401	1-101-888-11	Ⓐ68 p		ceramic
C302, 402	1-129-794-11	Ⓑ0.0033	100 V	film
C303, 403	1-106-009-11	Ⓐ0.0022		mylar
C304, 404	1-108-577-11	Ⓐ0.0082		mylar
C305, 405	1-108-589-11	Ⓐ0.027		mylar
C306, 406	1-106-029-12	Ⓐ0.015		mylar
C307, 407	1-106-041-11	Ⓑ0.047		mylar
C308, 408	1-106-029-11	Ⓐ0.015		mylar
C309, 409	1-121-391-11	Ⓐ1	50 V	
C310, 410	1-121-402-11	Ⓐ33	10 V	
⇒C311, 411	1-121-409-11	Ⓐ47	16 V	
C312, 412	1-102-955-11	Ⓐ12 p		ceramic
C313, 413	1-121-415-11	Ⓑ100	16 V	
C314, 414	1-106-037-11	Ⓑ0.033		mylar
C316, 416	1-107-167-11	Ⓐ75 p	500 V	silvered mica
C317, 417 C318, 418	1-121-395-11	Ⓐ4.7	25 V	
C320, 420	1-121-413-11	Ⓐ100	6.3 V	
C321, 421	1-131-196-11	Ⓑ2.2	20 V	tantalum
C322, 422	1-131-197-11	Ⓑ3.3	16 V	tantalum
C323, 423	1-131-193-11	Ⓑ10	10 V	tantalum
C501 ~503	1-121-392-11	Ⓐ3.3	25 V	
C504	1-121-654-11	Ⓑ330	25 V	
C505	1-106-106-11	Ⓑ0.1		mylar
C506	1-121-391-11	Ⓐ1	50 V	
C507, 508	1-102-110-11	Ⓐ220 p		ceramic
C509	1-106-058-11	Ⓐ0.001		mylar
C510	1-121-413-11	Ⓐ100	6.3 V	
C511	1-121-479-11	Ⓐ22	16 V	
⇒C512	1-121-409-11	Ⓐ47	16 V	
C513	1-106-041-11	Ⓑ0.047		mylar
C514	1-121-415-11	Ⓐ100	16 V	
C515	1-121-416-11	Ⓐ100	25 V	
C516, 517	1-121-409-11	Ⓐ47	16 V	
C518, 519	1-121-186-11	Ⓑ1000	16 V	
C520	1-121-421-11	Ⓑ220	16 V	
C521	1-121-426-11	Ⓑ470	16 V	
C522	1-123-067-11	Ⓓ2200	25 V	
C523	1-121-805-11	Ⓑ330	10 V	

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description		
C524	1-121-751-11	Ⓐ 330	6.3 V	
C525	1-121-426-11	Ⓑ 470	16 V	
C526	1-121-409-11	Ⓐ 47	16 V	
⇒C527	1-121-409-11	Ⓐ 47	16 V	
C611, 612	1-106-015-11	Ⓐ 0.0039		mylar
C621	1-121-392-11	Ⓐ 3.3	25 V	
C661, 662	1-102-074-11	Ⓐ 0.001		ceramic
C663	1-101-445-11	Ⓐ 0.001		ceramic
C701	1-106-001-12	Ⓐ 0.001		mylar
C702	1-108-573-12	Ⓐ 0.0056		mylar
C703	1-121-471-11	Ⓐ 10	16 V	
⇒C704	1-121-409-11	Ⓐ 47	16 V	
C705	1-106-047-11	Ⓑ 0.082		mylar
C706	1-106-017-11	Ⓐ 0.0047		mylar
C707	1-108-240-11	Ⓐ 0.015		mylar
C708	1-161-180-11	Ⓐ 0.0039		ceramic (boundary layer)
C709	1-106-001-11	Ⓐ 0.001		mylar
C710	1-106-047-11	Ⓑ 0.082		mylar
C711	1-106-001-11	Ⓐ 0.001		mylar
C712	1-106-029-11	Ⓐ 0.015		mylar
C713	1-131-212-11	Ⓑ 0.33	35 V	tantalum
C714	1-106-039-11	Ⓑ 0.039		mylar
C715	1-106-009-11	Ⓐ 0.0022		mylar
⇒C716	1-121-409-11	Ⓐ 47	16 V	
C717	1-121-402-11	Ⓐ 33	10 V	
C718	1-121-751-11	Ⓐ 330	6.3 V	
C719	1-121-395-11	Ⓐ 4.7	25 V	
C720, 721	1-121-471-11	Ⓐ 10	16 V	
C722	1-121-391-11	Ⓐ 1	50 V	
C723	1-121-726-11	Ⓐ 0.47	50 V	
C724	1-121-471-11	Ⓐ 10	16 V	
C725	1-123-071-11	Ⓓ 3300	16 V	
C726	1-121-392-11	Ⓐ 3.3	25 V	
CT315, 415	1-141-069-XX	Ⓑ Trimmer		

⇒: Due to replacement parts, the values are different from the diagrams.

Ref. No.	Part No.	Description
		RESISTORS
		All resistors are in ohms. Common ¼ W carbon resistors are omitted. Check schematic diagram for values.
R5	1-210-853-11	Ⓐ 6.2 k ±2% ¼ W carbon
R7	1-210-850-11	Ⓐ 300 ±2% ¼ W carbon
R11, 12	1-210-855-11	Ⓐ 33 k ±2% ¼ W carbon
R13	1-210-852-11	Ⓐ 5.6 k ±2% ¼ W carbon
R119, 219	1-224-252-XX	Ⓒ 10 k, adjustable
R125, 225	1-224-600-00	Ⓕ 20 k, variable, REC LEVEL
R145	1-210-853-11	Ⓐ 6.2 k ±2% ¼ W carbon
R151, 251	1-224-252-XX	Ⓒ 10 k, adjustable
R312, 412	1-224-798-00	Ⓓ 20 k, variable, MONITOR LEVEL
R321, 421	1-224-249-XX	Ⓑ 1 k, adjustable
R325, 425	1-224-250-XX	Ⓒ 2.2 k, adjustable
R644	1-224-255-XX	Ⓒ 100 k, adjustable
R671	1-224-574-00	Ⓔ 10 k, variable, SPEED TUNING
R707	1-212-632-11	Ⓑ 56 k ¼ W metal-oxide
R708	1-224-253-XX	Ⓒ 22 k, adjustable
R739	1-212-353-11	Ⓐ 0.27 1 W metal-oxide
		SWITCHES
S1	1-516-310-00	Ⓑ Lever Slide, MIC ATT
S2	1-516-521-00	Ⓑ Lever Slide, FILTER
S3	1-516-041-00	Ⓔ Rotary Slide, EQ
S4	1-516-521-00	Ⓑ Lever Slide, LIMITER
S5	1-516-686-00	Ⓒ Lever Slide, timing
S6	1-516-521-00	Ⓑ Lever Slide, DOLBY NR
S7	1-516-041-00	Ⓔ Rotary Slide, MONITOR MOD
S8	1-516-133-XX	Ⓑ Slide, REC MONITOR
S9	1-516-720-00	Ⓔ Pushbutton, BATT CHECK
S10	1-516-041-00	Ⓔ Rotary Slide, BIAS
S11	1-516-720-00	Ⓔ Pushbutton, MOMORY LIGHT
S12	1-516-133-XX	Ⓑ Slide, PEAK HOLD
S101, 201	1-514-976-XX	Ⓗ Slide, record/playback
S701 ~ 703	1-516-853-XX	Ⓒ Leaf PAUSE, forward, fast forward/rewind
S704	—	Included in R671

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
		JACKS
J101, 201	1-507-477-XX	Ⓒ MIC
J601	1-507-477-XX	Ⓒ HEADPHONES
J602	1-507-447-XX	Ⓑ DC IN 12 V
J701	1-508-743-00	Ⓑ Connector, female
CNJ101, 201 CNJ102, 202	1-507-378-XX	Ⓑ Phono, 2-p; LINE IN, LINE OUT
P701	1-508-742-00	Ⓑ Connector, male
		MISCELLANEOUS
EH	8-825-506-00	Ⓓ Head, erase; EF135-36
M1	8-834-410-01	Ⓥ Motor, D-410F
M2	8-834-015-01	Ⓙ Motor, DNM-1202A
ME101	1-520-233-31	Ⓗ PEAK METER-L
ME201	1-520-233-41	Ⓗ PEAK METER-R
PL1 ~ 4	1-518-115-XX	Ⓑ Lamp, pilot; 6 V 35 mA
PM	1-454-153-00	Ⓖ Solenoid
RPH101, 201	8-825-579-00	Ⓝ Head, record/playback; PF145-3602
SP	1-502-541-00	Ⓖ Speaker, 16 Ω
	1-464-059-00	Ⓞ Unit, bias osc
	1-464-060-00	Ⓛ Unit, dc-dc converter

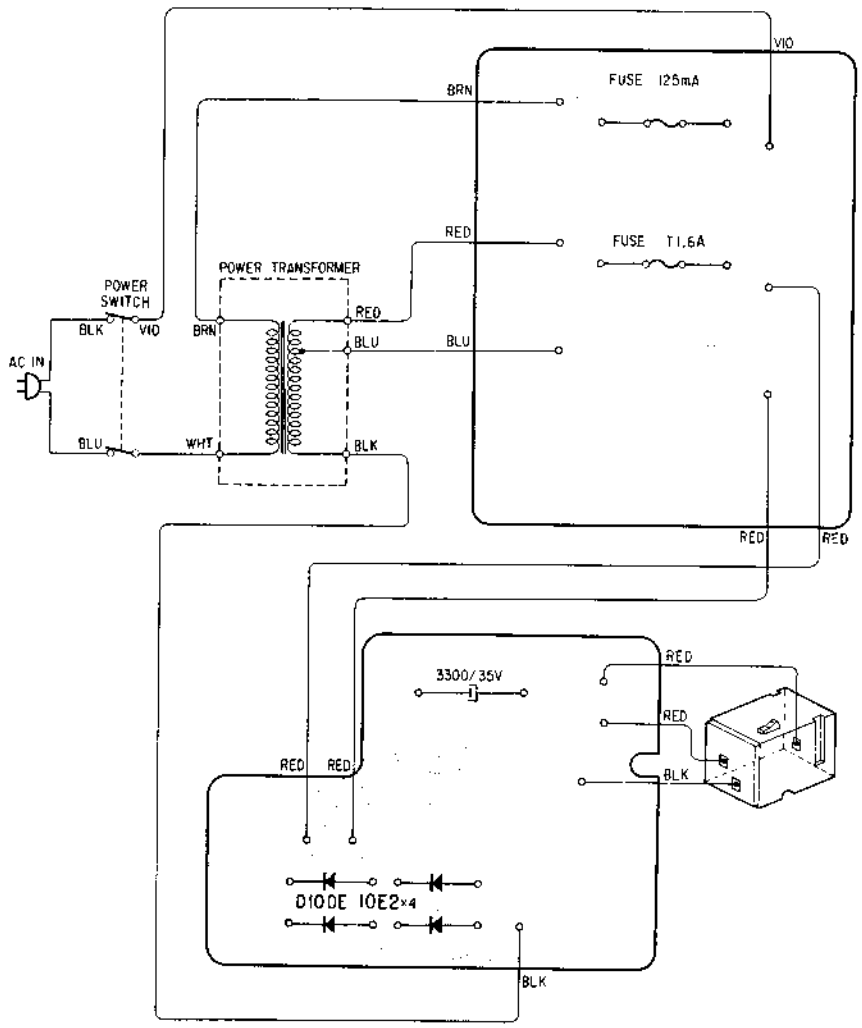
ACCESSORIES & PACKING MATERIALS

Part No.	Description
X-3701-018-3	Ⓐ Tips Ass'y, head cleaning
1-534-049-31	Ⓓ Cord, connection; RK-74
3-533-950-00	Ⓘ Shoulder Strap
3-533-962-00	Ⓒ Bag, plastic; set
3-547-213-00	Ⓓ Case, ac adaptor (AC-20)
3-547-214-00	Ⓒ Cushion
3-547-219-00	Ⓔ Carton
3-770-019-11	Ⓙ Manual, instruction
3-793-749-00	Ⓑ Card, DOLBY
3-793-828-11	Ⓐ Card, caution; cassette

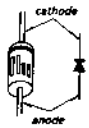
Note: The components identified by shading are critical for safety. Replace only with part number specified.

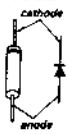
AC POWER ADAPTOR AC-20

1. MOUNTING DIAGRAM – Conductor Side –



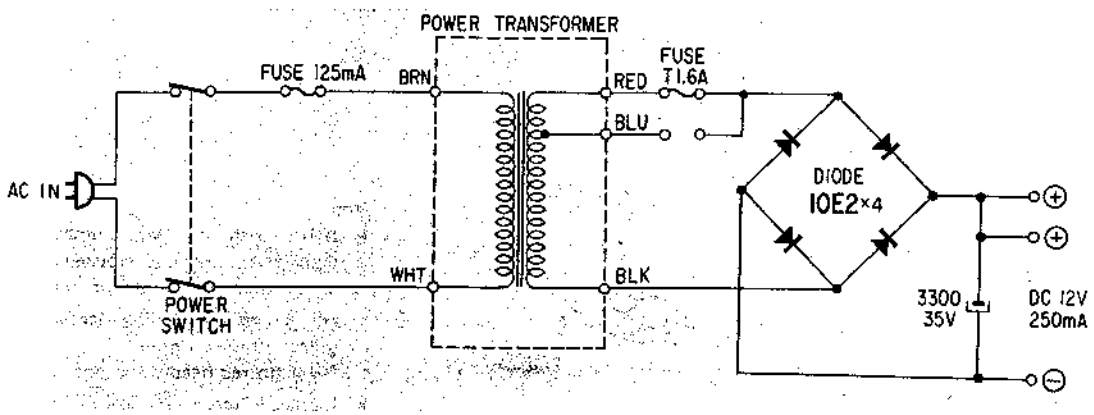
D801~804: SIB01-02 **Replacement Semiconductor 10E2**





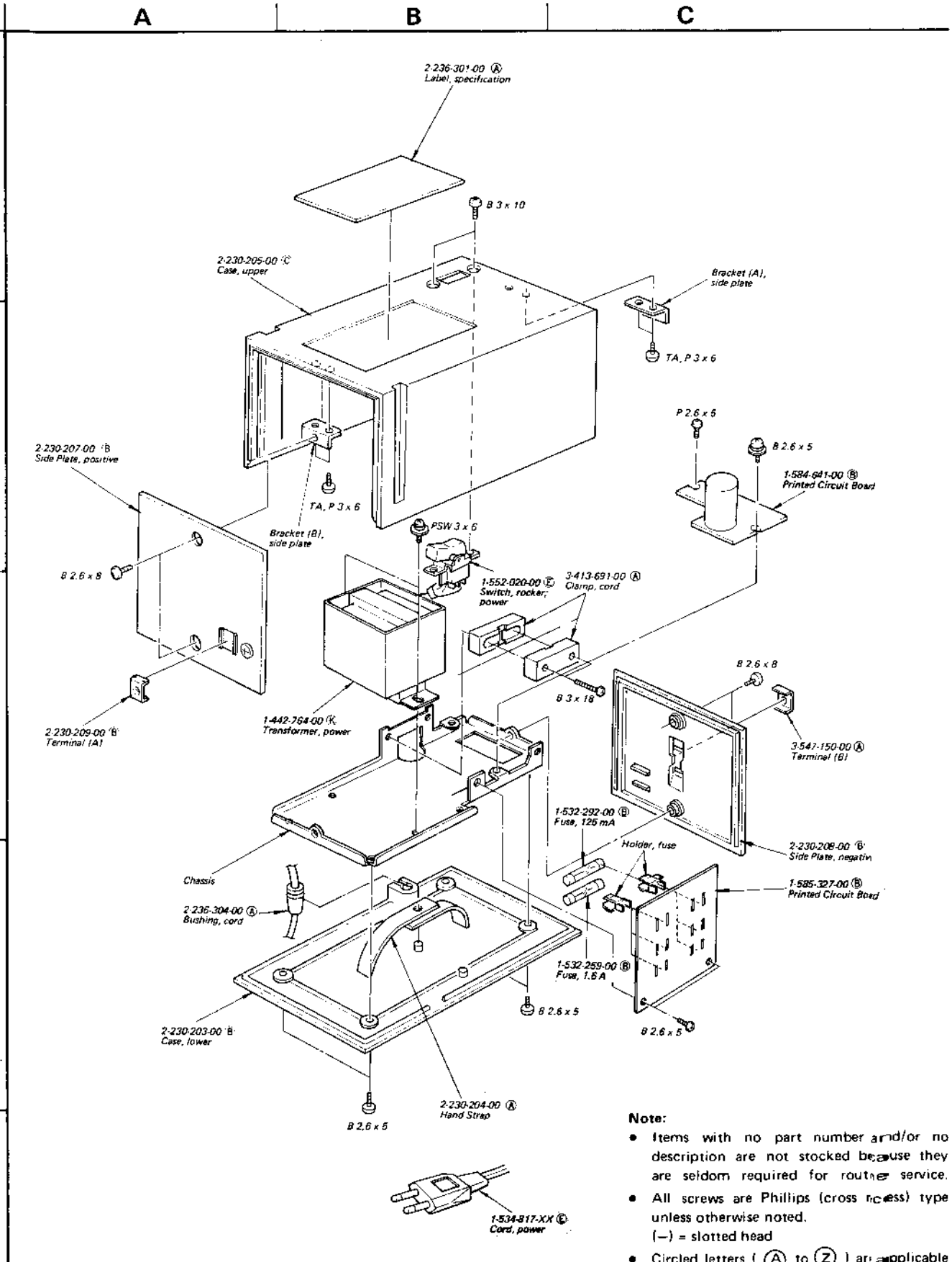
Note: The components identified by shading are critical for safety. Replace only with part number specified.

2. SCHEMATIC DIAGRAM



Note: The components identified by shading are critical for safety. Replace only with part number specified.

3. EXPLODED VIEW



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

4. ELECTRICAL PARTS LIST

Part No.	*Description*
	Diode, 10E2
1-123-118-11	Ⓔ Capacitor, electrolytic; 330 µF 35 V
1-442-764-00	Ⓚ Transformer, power
1-532-292-00	Ⓑ Fuse, 125 mA
1-532-259-00	Ⓑ Fuse, 1.6 AT
1-534-817-XX	Ⓔ Cord, power
1-552-020-00	Ⓔ Switch, rocker; power
1-584-641-00	Ⓑ Printed Circuit Board
1-585-327-00	Ⓑ Printed Circuit Board, fuse

Note: The components identified by shading are critical for safety. Replace only with part number specified.