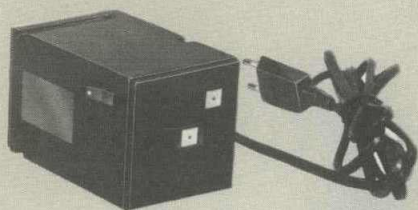
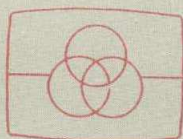


TC-164SD

AEP Model



AC-20
(supplied accessory)



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TC-164SD

STEREO CASSETTE-CORDER

* "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

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
14 $\frac{7}{8}$ (w) x 4 $\frac{3}{8}$ (h) x 9 $\frac{1}{2}$ (d) inches
Including projecting parts and controls

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

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.

Published in Heiloo Holland

— Continued on page 2 —

SONY®

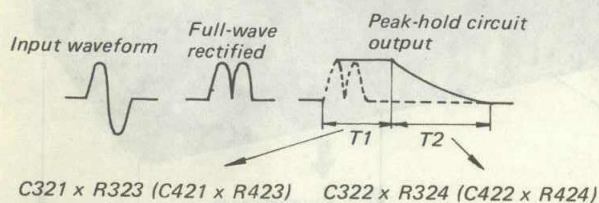
SERVICE MANUAL

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



Theoretically, it would be possible to remain in hold forever, if R324 (424) was not included. C322 (422) charges up in $80\mu\text{sec}$ 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) $\times$ 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).

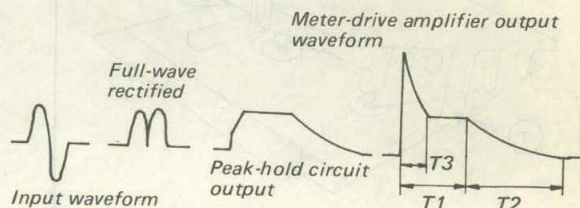
Since C322 (422) charge-up route is not involved in either method, the peak hold circuit may be switched ON. The TC-164SD employs method 1.

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.

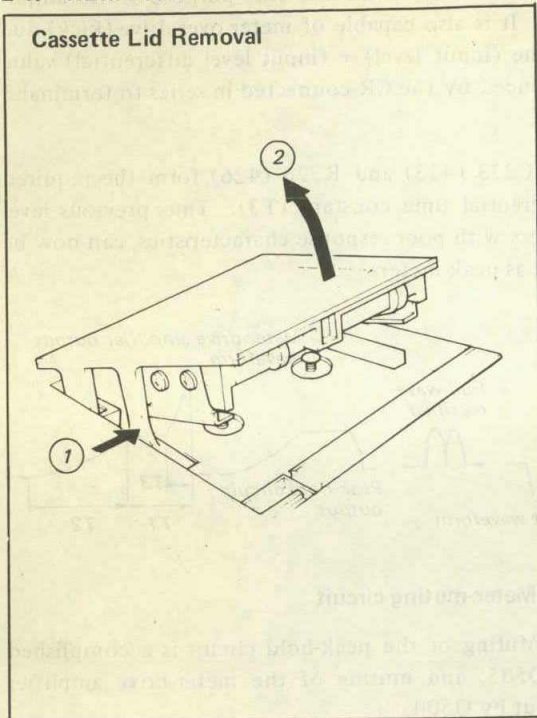
1. Q505 (PNP transistor employed) prevents T1 from becoming infinity since this transistor is always ON when the power supply is switched ON, irrespective of whether S12 is ON or OFF.
2. Since Q504 is in series with the meter, it remains OFF for about 2 sec. after the power supply is switched ON (as determined by time constant of the base circuit), in which time the power supply inside the IC is stabilized.

SECTION 2

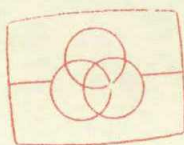
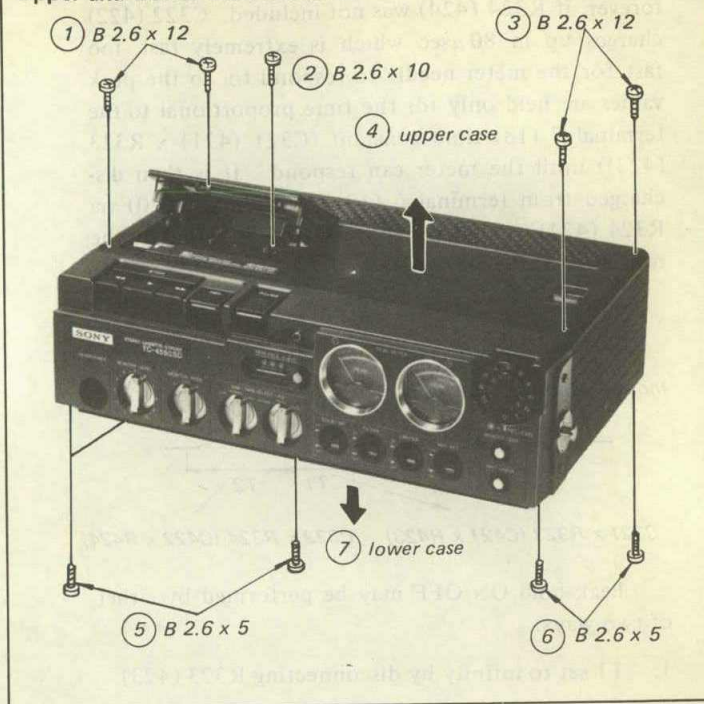
DISASSEMBLY

2-1. REMOVAL

Cassette Lid Removal



Upper and Lower Case Removal



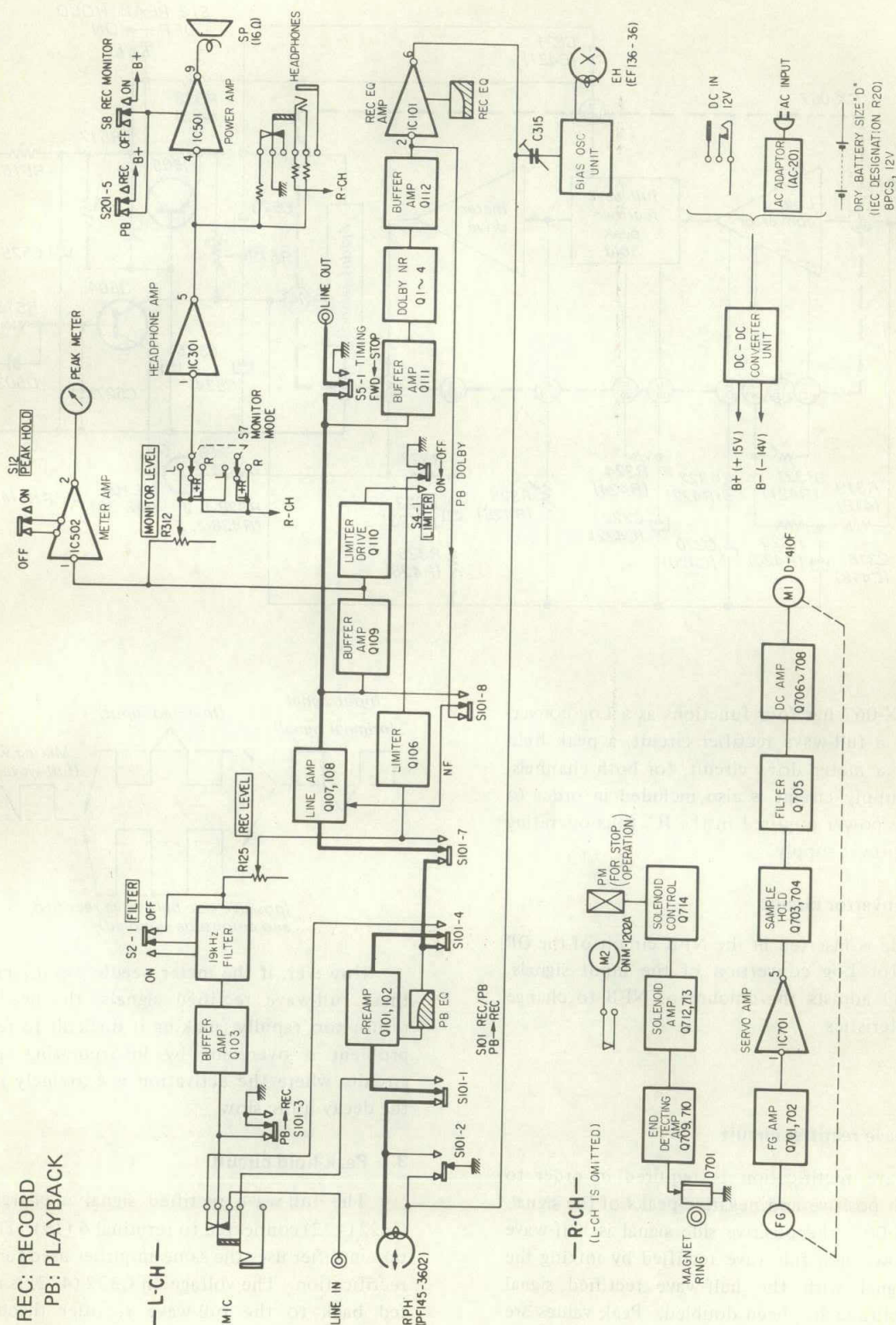
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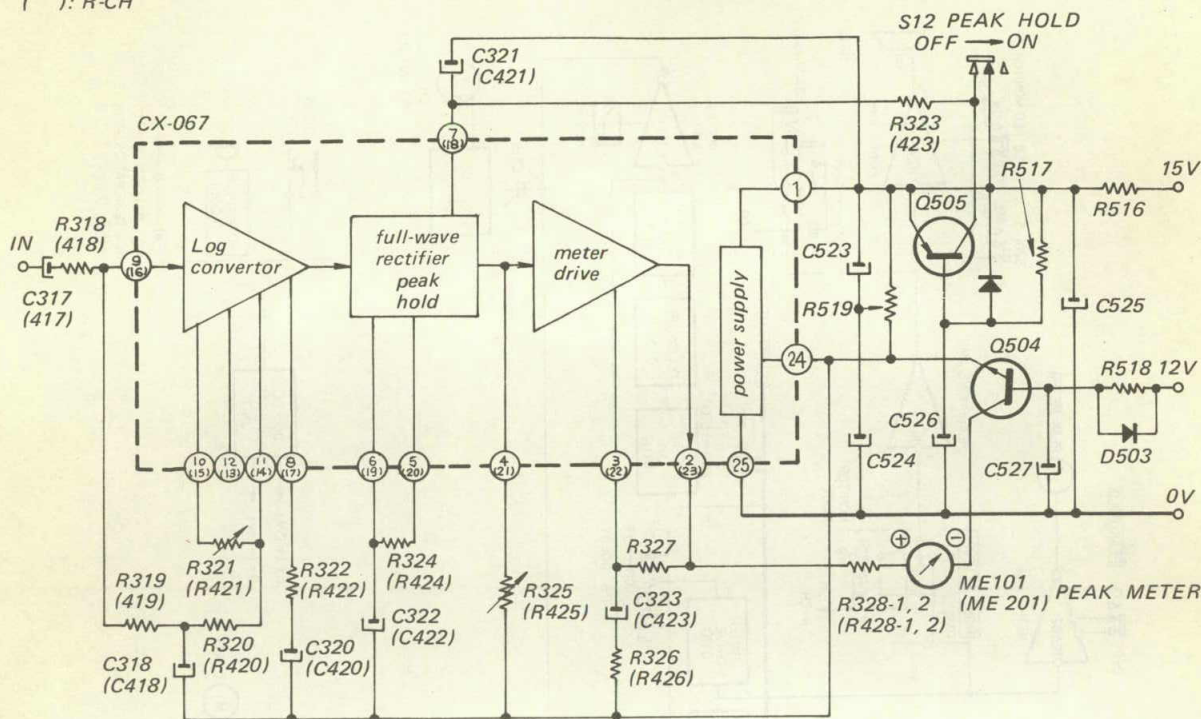
SECTION 1 OUTLINE

1-1. BLOCK DIAGRAM



1-2. CIRCUIT DESCRIPTION

(): R-CH



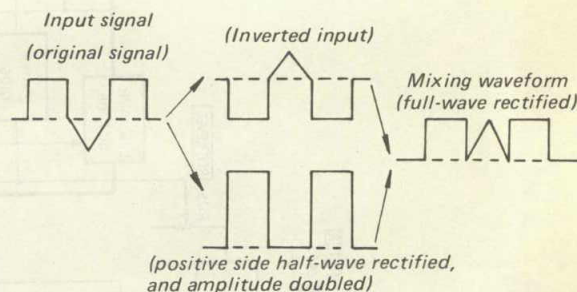
The CX-067 has four functions as a Log converter circuit, a full-wave rectifier circuit, a peak hold circuit and a meter drive circuit, for both channels. A power supply circuit is also included in order to provide the power required in the IC, thus operating of a single power supply.

1. Log converter circuit

A diode is inserted in the NFB circuit of the OP amplifier, for Log conversion 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.

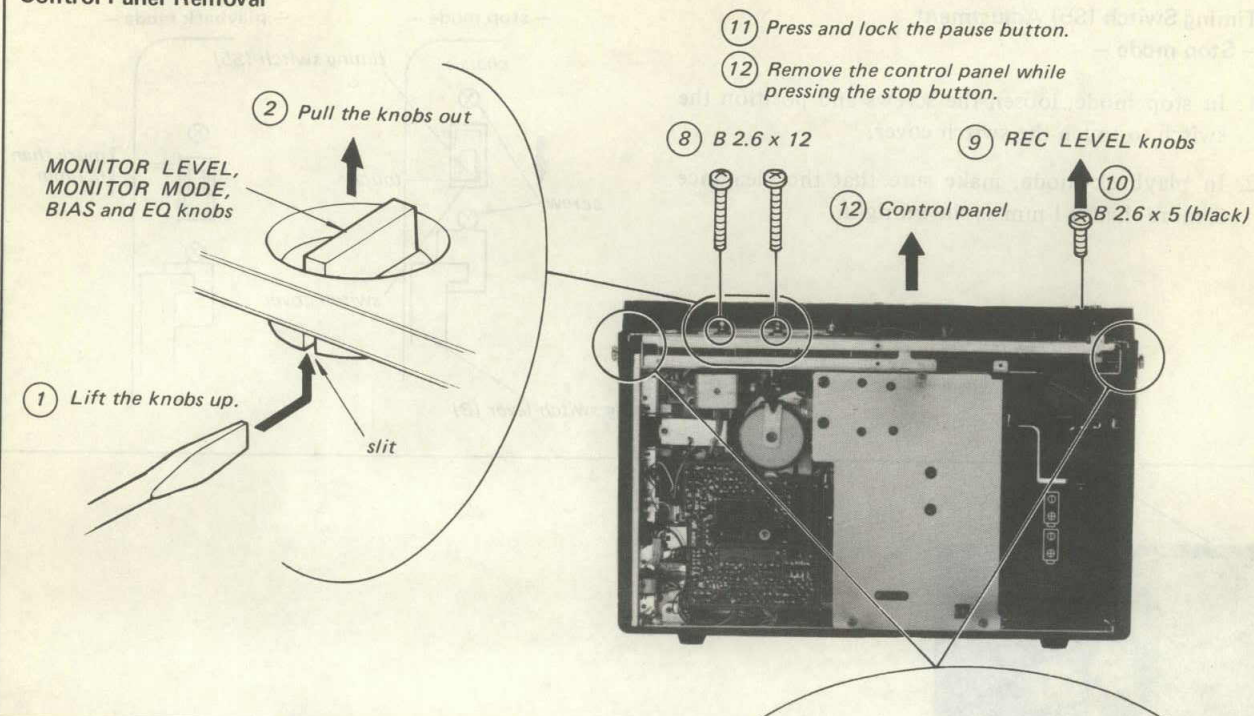


However, if the meter needle was driven only by these full-wave rectified signals, the needle would return too rapidly, making it difficult to read. This problem is overcome by incorporating peak-hold circuits where the activation is extremely rapid, but the decay quite slow.

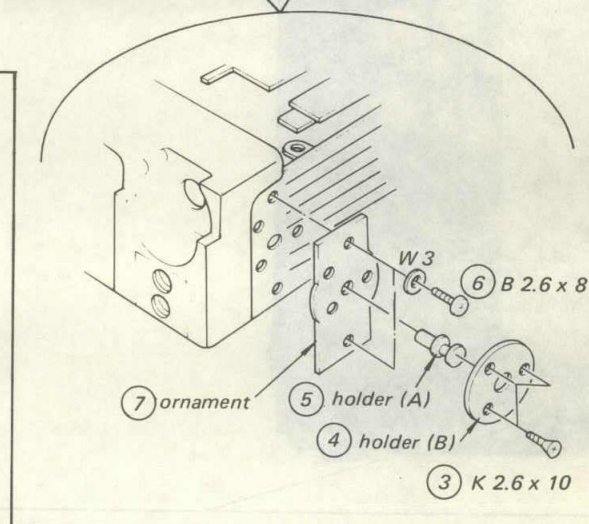
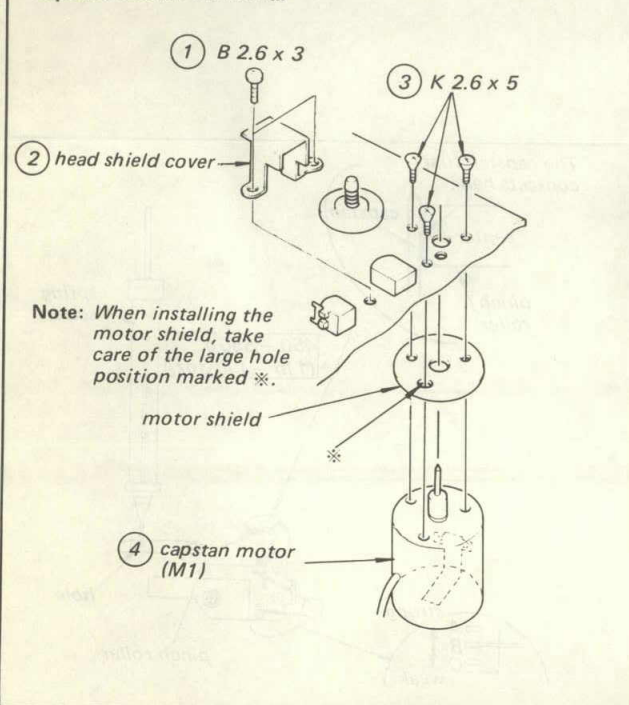
3. Peak-hold circuit

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.

Control Panel Removal



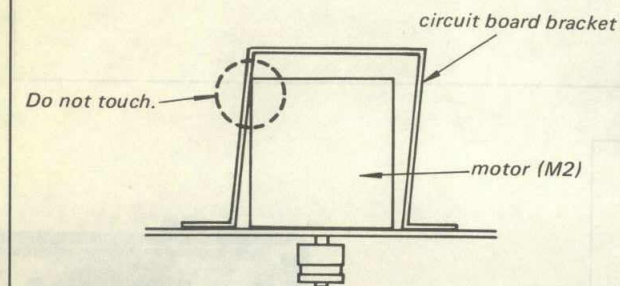
Capstan Motor Removal



2-2. CAUTION FOR INSTALLATION

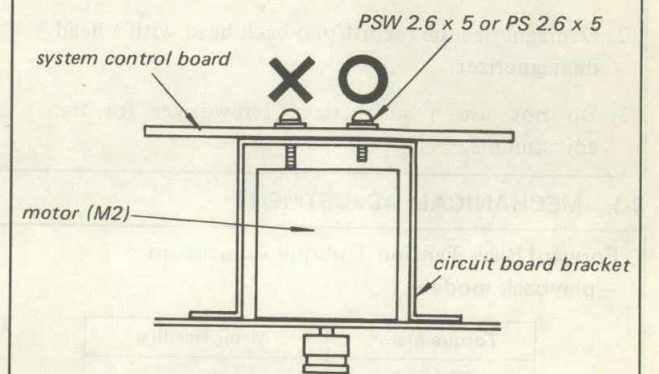
Circuit Board Bracket

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



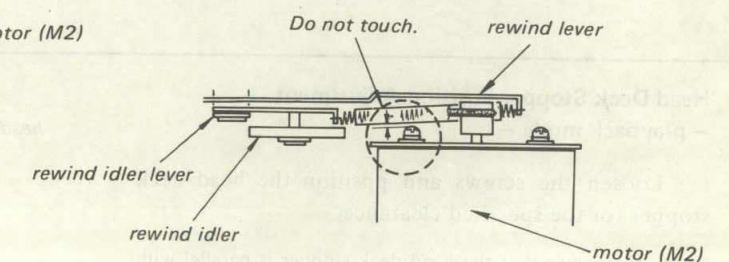
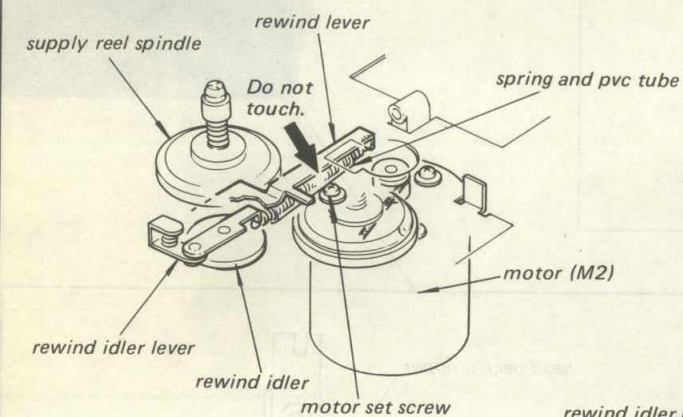
System Control Board

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

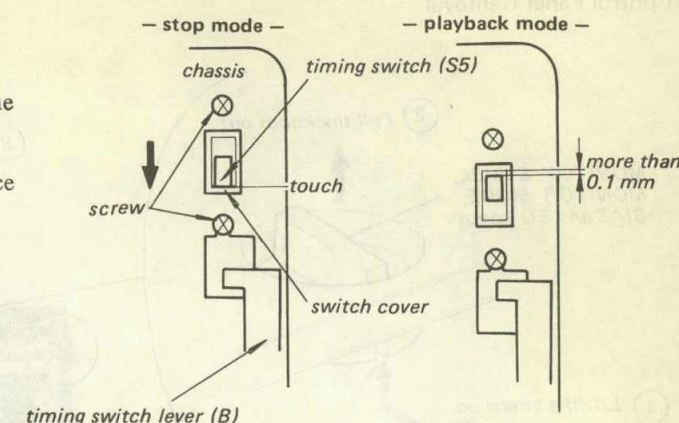
PRECAUTION

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.

Timing Switch (S5) Adjustment — Stop mode —

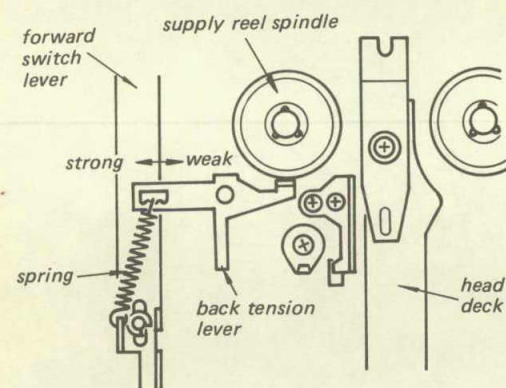
1. In stop mode, loosen the screws and position the switch to touch the switch cover.
2. In playback mode, make sure that the clearance is more than 0.1 mm as shown right.



3-1. MECHANICAL ADJUSTMENT

Forward Back Tension Torque Adjustment — playback mode —

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

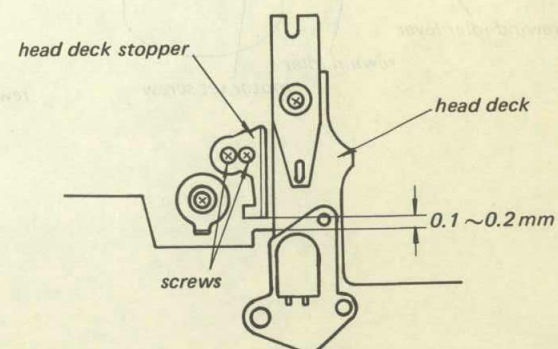


If necessary, change the spring hooking position.

Head Deck Stopper Position Adjustment — playback mode —

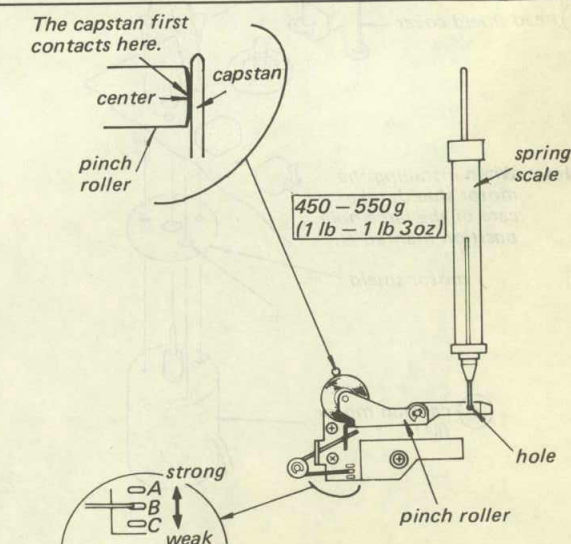
Loosen the screws and position the head deck stopper for the specified clearance.

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



Pinch Roller Pressure Adjustment — playback mode —

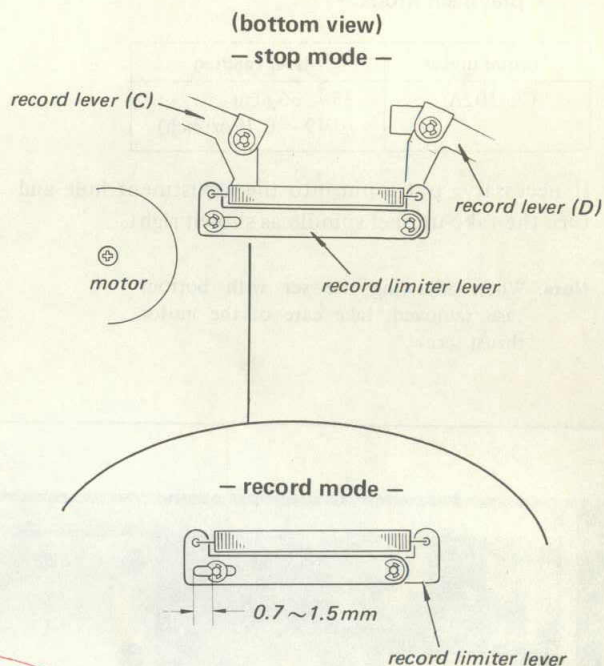
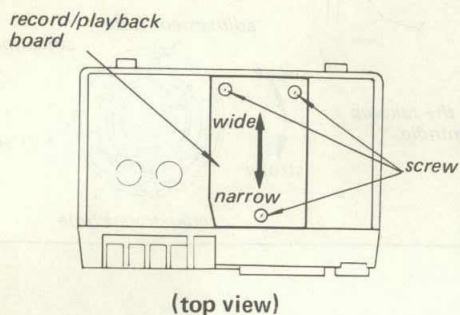
1. Pull the spring scale.
2. Slowly return the pinch roller and read the spring scale just when the pinch roller starts to rotate.
3. If necessary, change the spring hooking position.



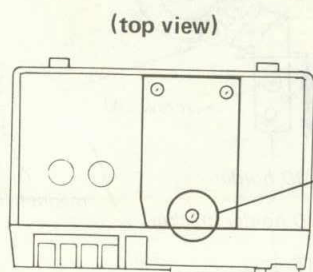
Record Limiter Lever Adjustment

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

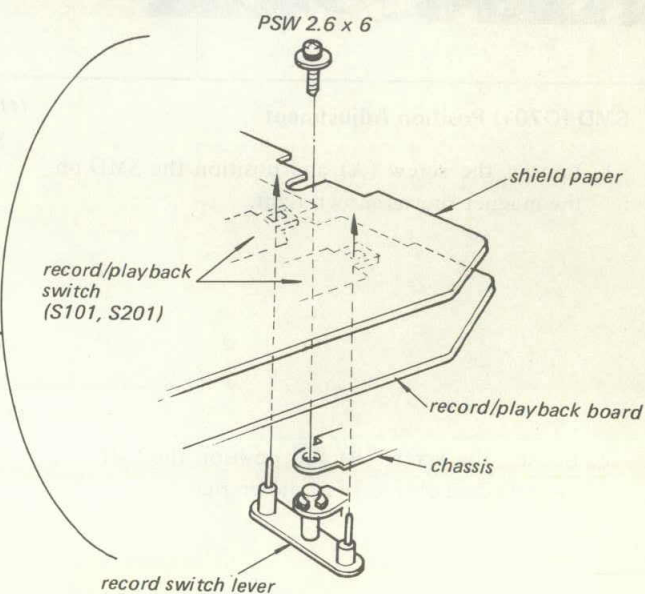
If necessary, loosen the screws and change the record/playback board position.



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.



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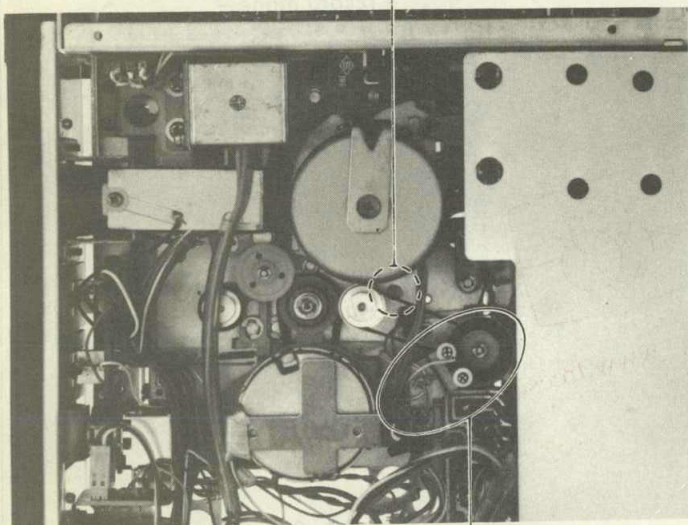
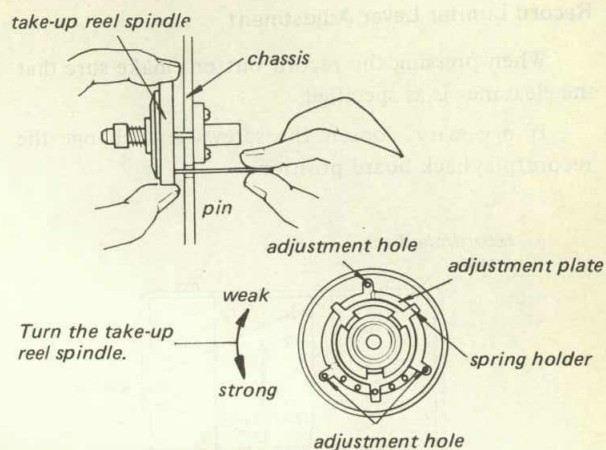


Forward Torque Adjustment — playback mode —

Torque meter	Meter reading
CQ-102A	35 – 55 g·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.

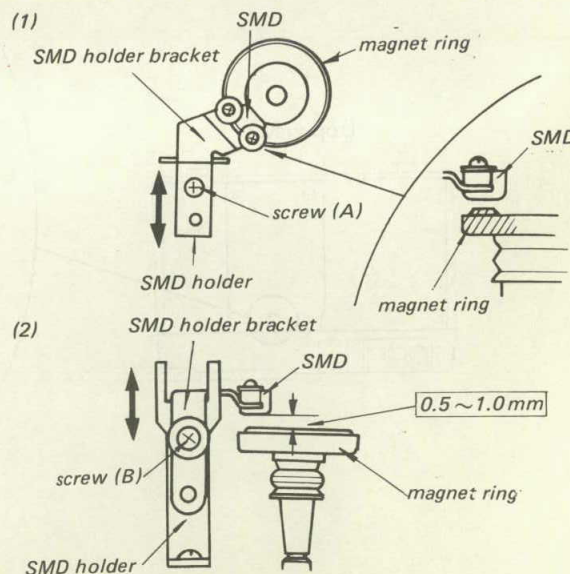


Reference Data

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

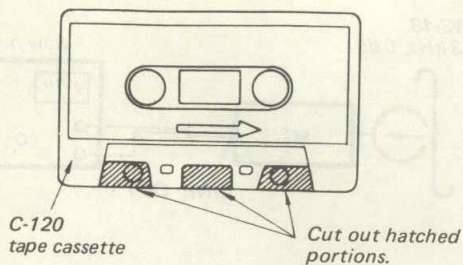
SMD (D701) Position Adjustment

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.

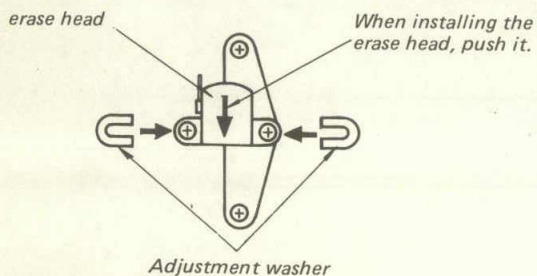
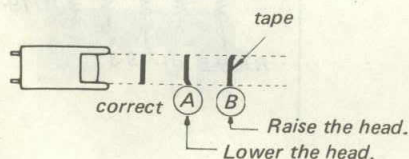
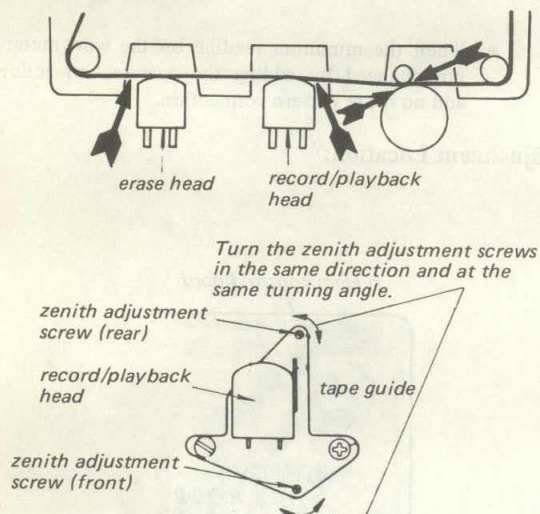


Record/playback and Erase Heads Height Adjustment — Playback Mode —

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 $t = 0.1 \text{ mm}$

3-513-237-11 $t = 0.2 \text{ mm}$

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.

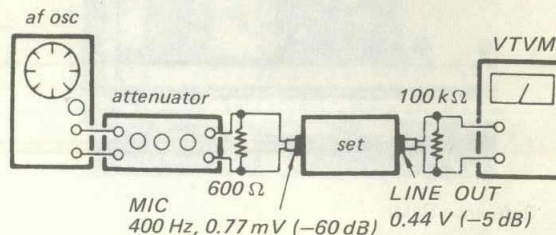
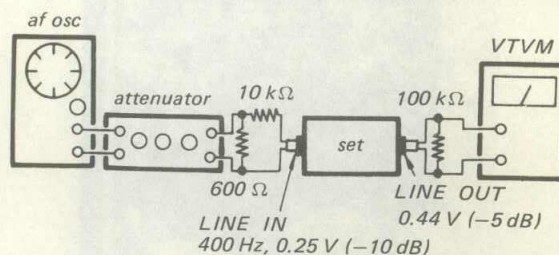
MIC ATT switch:	0 dB
LIMITER switch:	OFF
FILTER switch:	OFF
DOLBY NR switch:	OFF
EQ switch:	NORMAL
BIAS switch:	NORMAL
MONITOR MODE switch:	L + R
REC MONITOR switch:	OFF
SPEED TUNING switch:	OFF

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.

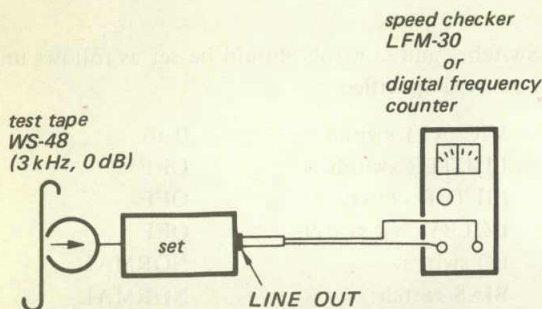
Set the REC LEVEL control for the specified output level.



Tape Speed Adjustment

Procedure:

Mode: playback

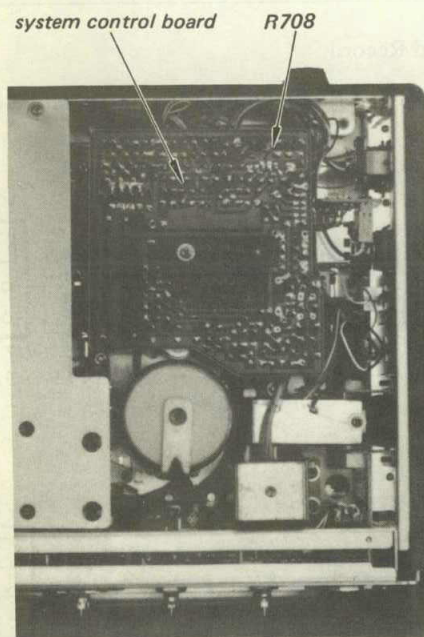


Specification:

Speed Checker	Digital Frequency Counter
$\pm 0.7\%$	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

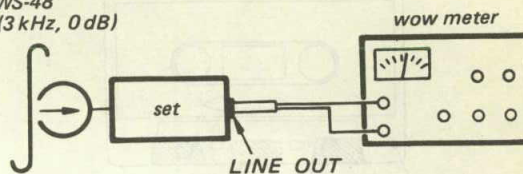
fully counterclockwise: less than 2,835 Hz (-5.5 %)

Wow and Flutter Adjustment

Procedure:

1. Mode: playback

WS-48
(3 kHz, 0 dB)



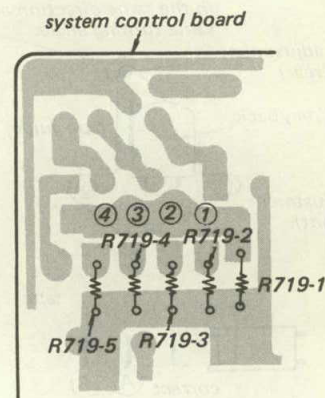
2. Adjust the pattern connection for a minimum reading on the wow meter.

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.

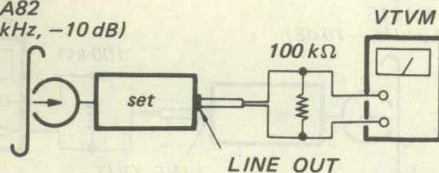
Adjustment Location:



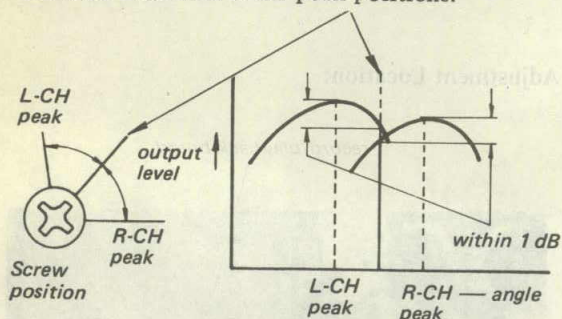
Record/playback Head Azimuth Adjustment

Procedure:

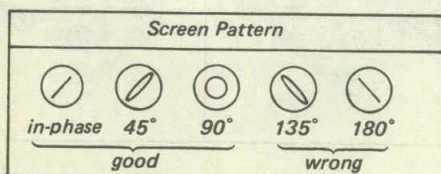
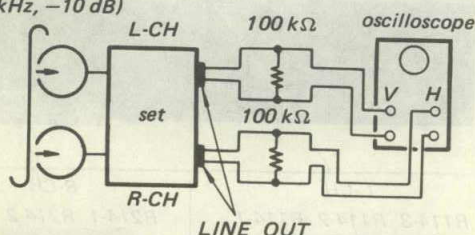
1. Mode: playback
test tape
P-4-A82
(10 kHz, -10 dB)



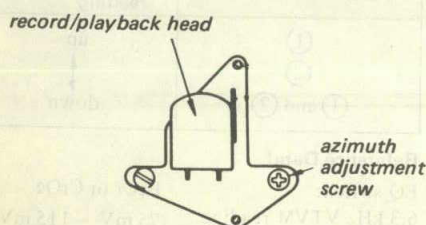
2. Turn the adjustment screw for the maximum level and set it to the mechanical mid position between L-CH and R-CH peak positions.



3. Mode: playback
test tape
P-4-A82
(10 kHz, -10 dB)



Adjustment Location:



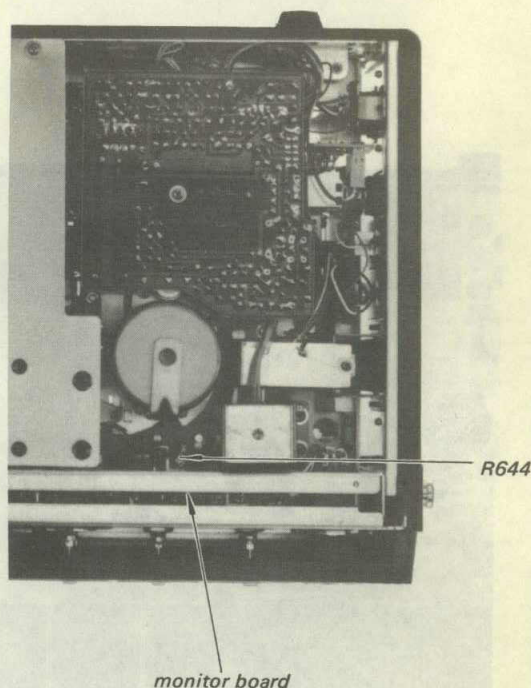
Battery Meter Calibration

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) 

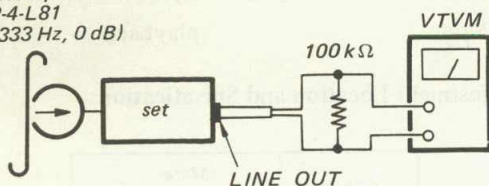


Playback Level Adjustment

Procedure:

Mode: playback

test tape
P-4-L81
(333 Hz, 0 dB)

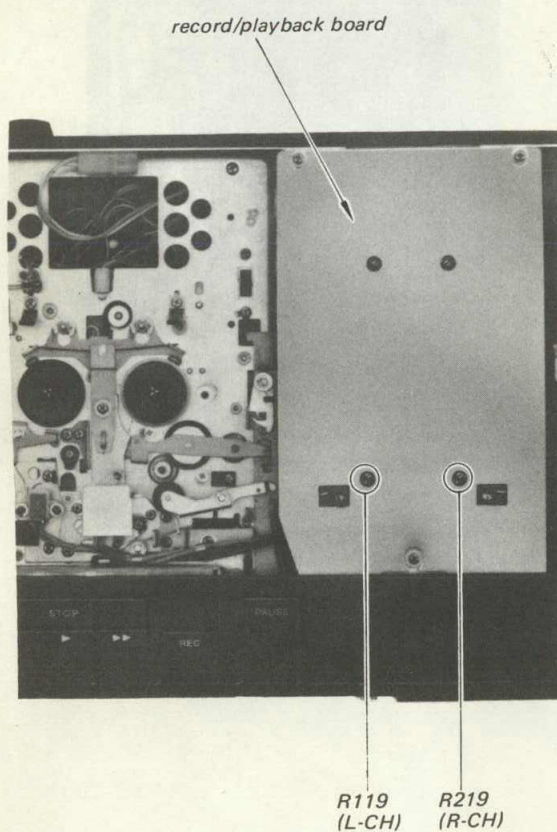


Specification:

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:

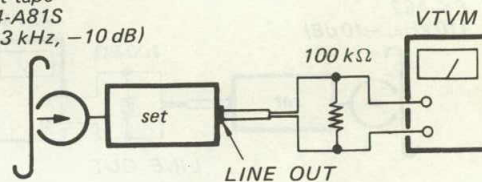


Playback Equalizer Adjustment

Procedure:

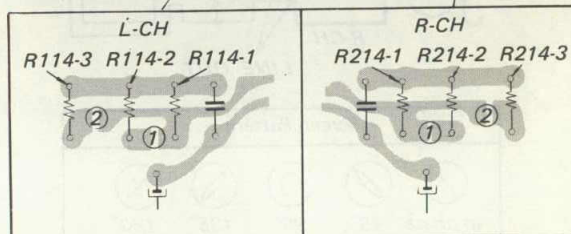
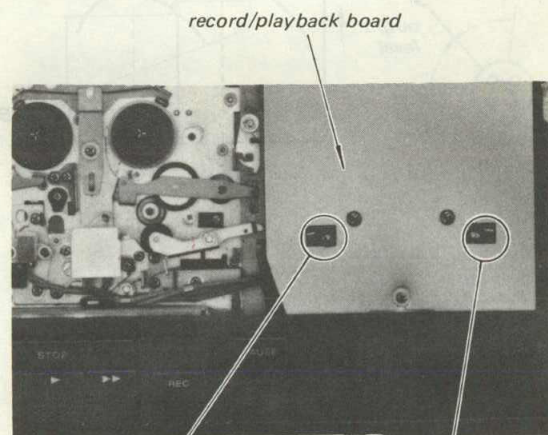
Mode: playback

test tape
P-4-A81S
(6.3 kHz, –10 dB)



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	up
②	down
① and ②	

Reference Data:

EQ switch: FeCr or CrO₂
6.3 kHz VTVM reading: 75 mV – 115 mV (–18.5 dB ± 2 dB)

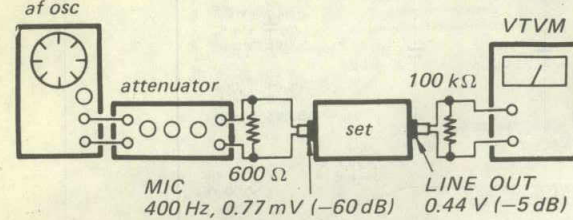
Level Meter 0dB Calibration

Setting:

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

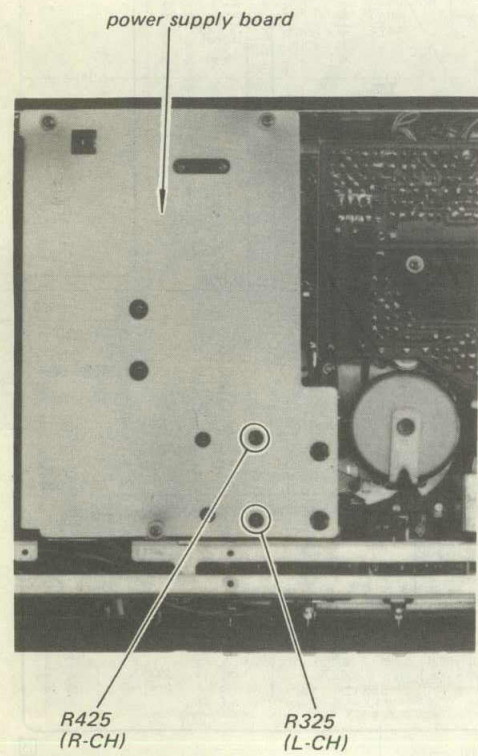
Procedure:

1. Mode: record



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

Adjustment Location:



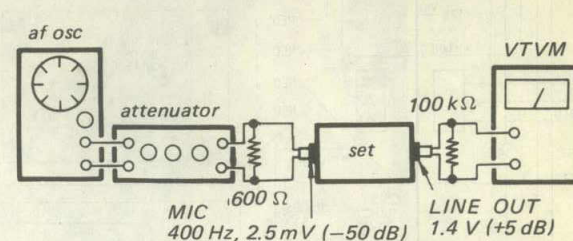
Level Meter +10 dB Calibration

Setting:

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

Procedure:

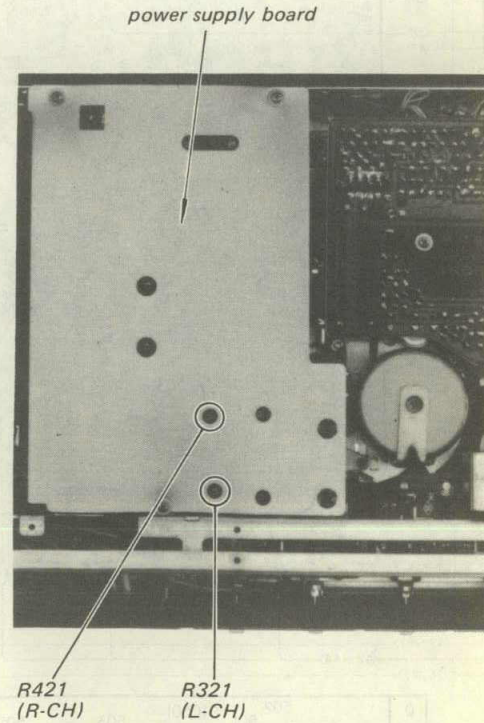
1. Mode: record



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:



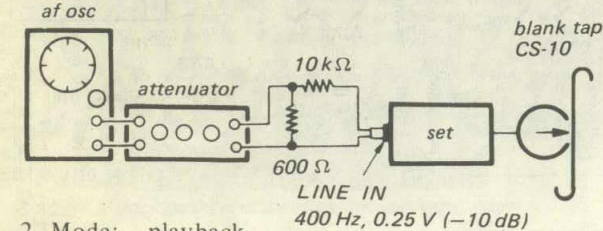
Record Level Adjustment

Setting:

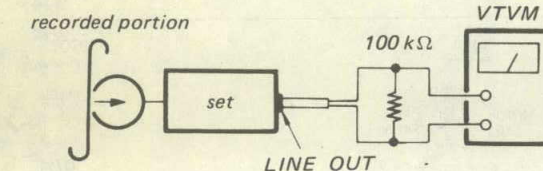
REC LEVEL control: standard record
(See page 13.)

Procedure:

1. Mode: record



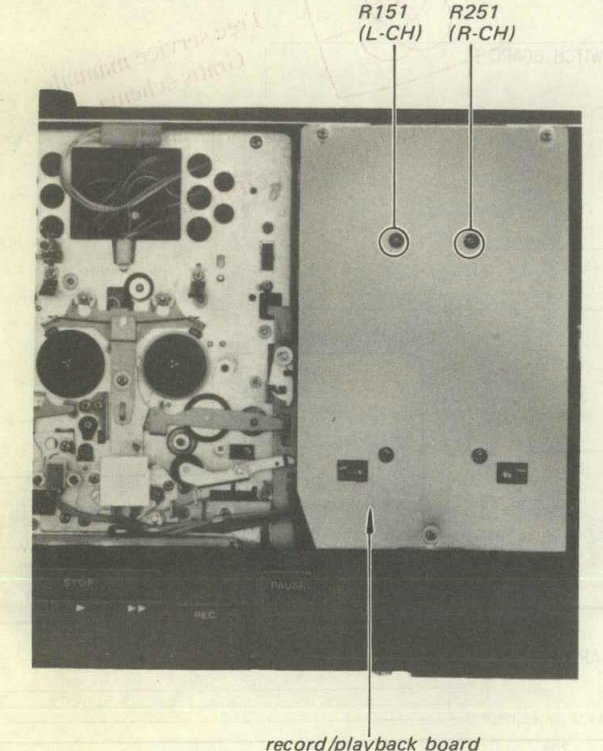
2. Mode: playback



Specification:

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

Adjustment Location:



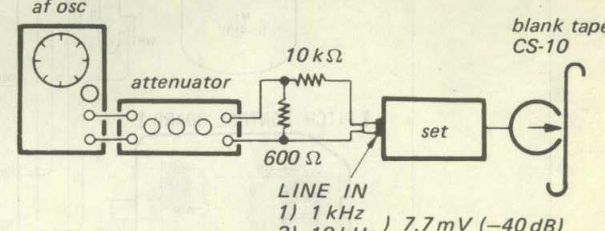
Record Bias (NORMAL) Adjustment

Setting:

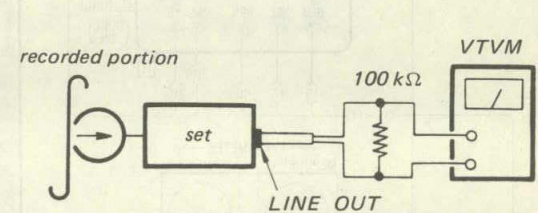
REC LEVEL control: standard record
(See page 13.)

Procedure:

1. Mode: record

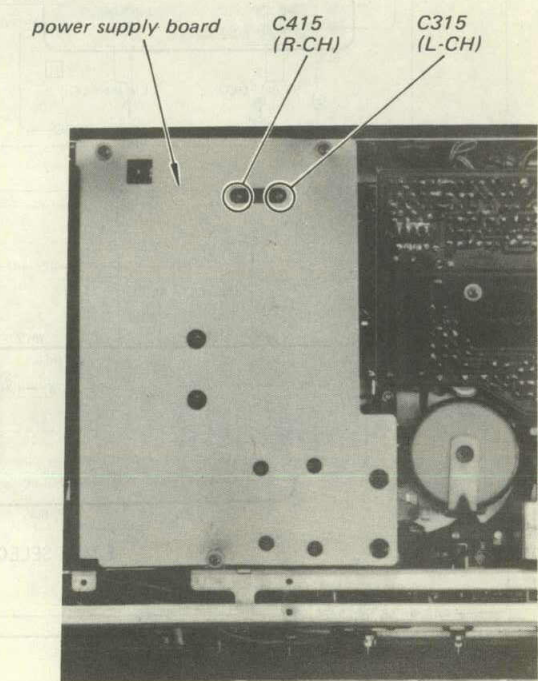


2. Mode: playback



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:



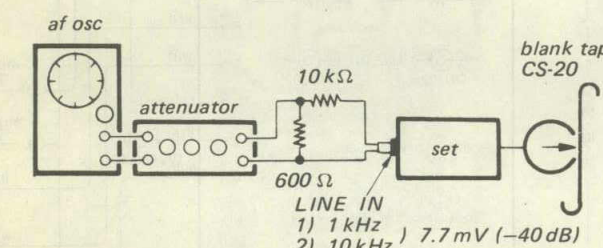
Record Bias (CrO2) Adjustment

Setting:

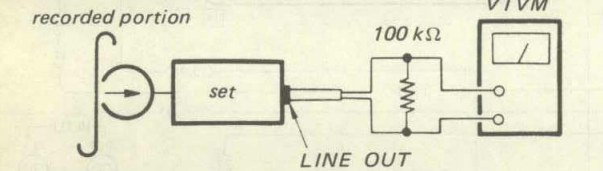
BIAS switch: HIGH
EQ switch: CrO2
REC LEVEL control: standard record
(See page 13.)

Procedure:

1. Mode: record



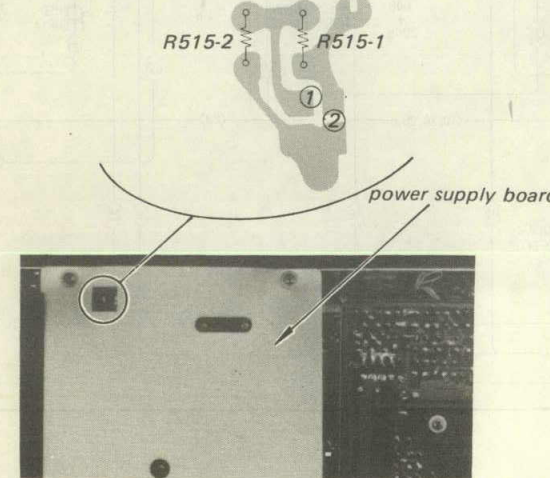
2. Mode: playback



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:



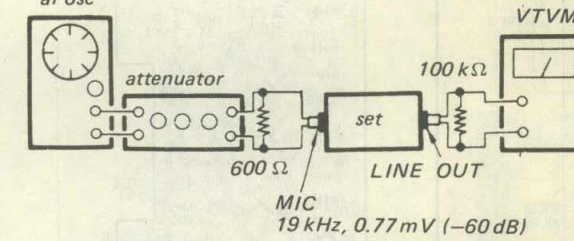
19 kHz Filter Adjustment

Setting:

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

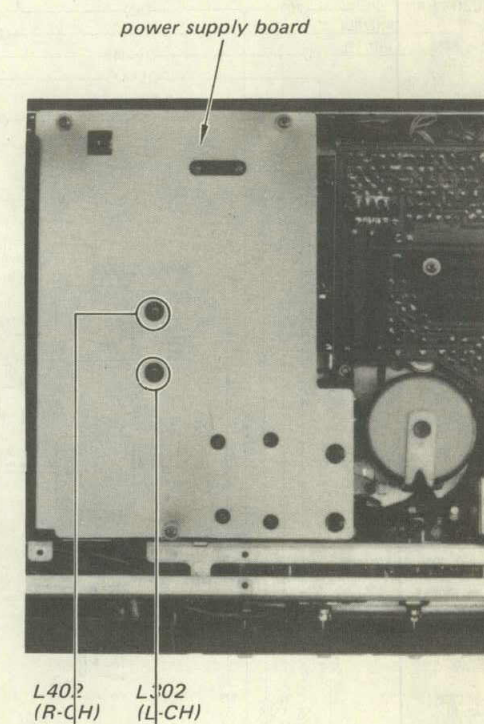
Procedure:

- Mode: record



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

Adjustment Location:



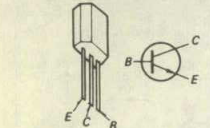
Reference Data:

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

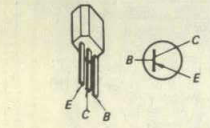
4-1. SEMICONDUCTORS

Replacement Semiconductors

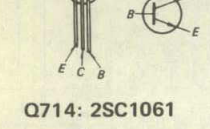
Q1 ~ 4
Q104 ~ 106
Q108 ~ 111
Q204 ~ 206
Q208 ~ 211
Q301 ~ 303
Q401 ~ 403
Q502 ~ 504
Q621
Q701, 702
Q705 ~ 707
Q709 ~ 713
Q101, 201
Q107, 207
Q112, 212
Q103, 203: 2SC632A



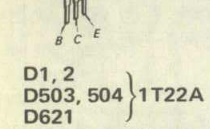
Q102, 202: 2SA705
Q505 : 2SA677
Q703, 704: 2SA678



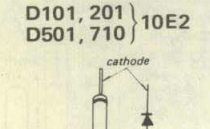
Q501, 708: 2SC1475



Q714: 2SC1061



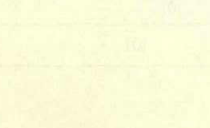
D1, 2
D503, 504 : 1T22A
D621
D3, 4
D711, 702 ~ 704 : 1S1555
D706, 707



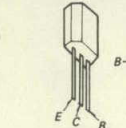
D101, 201 : 10E2
D501, 710



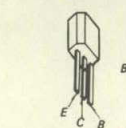
D641: EQA01-05B
D705: EQB01-07



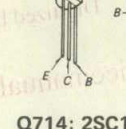
Q1 ~ 4
Q104 ~ 106
Q108 ~ 111
Q204 ~ 206
Q208 ~ 211
Q301 ~ 303
Q401 ~ 403
Q502 ~ 504
Q621
Q701, 702
Q705 ~ 707
Q709 ~ 713
Q101, 201
Q107, 207
Q112, 212
Q103, 203: 2SC632A



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



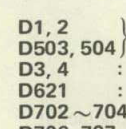
Q501: 2SC1209



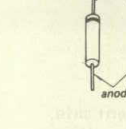
Q714: 2SC1061



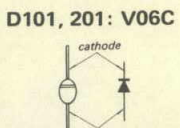
Q708: 2SC1475



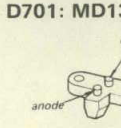
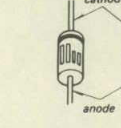
D1, 2
D503, 504 : 1T22A
D3, 4 : 1S1555
D621 : 1T22
D702 ~ 704 : 1T40
D706, 707
D711



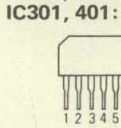
D101, 201: V06C



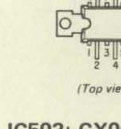
D501, 710: SIB01-02
D641: EQA01-05B
D705: EQA01-07



D701: MD130E



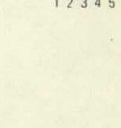
IC101, 201: TA7122AP
IC301, 401: TA7066P



IC501: HA1306W



IC502: CX067



IC701: CX065



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

Resistor.

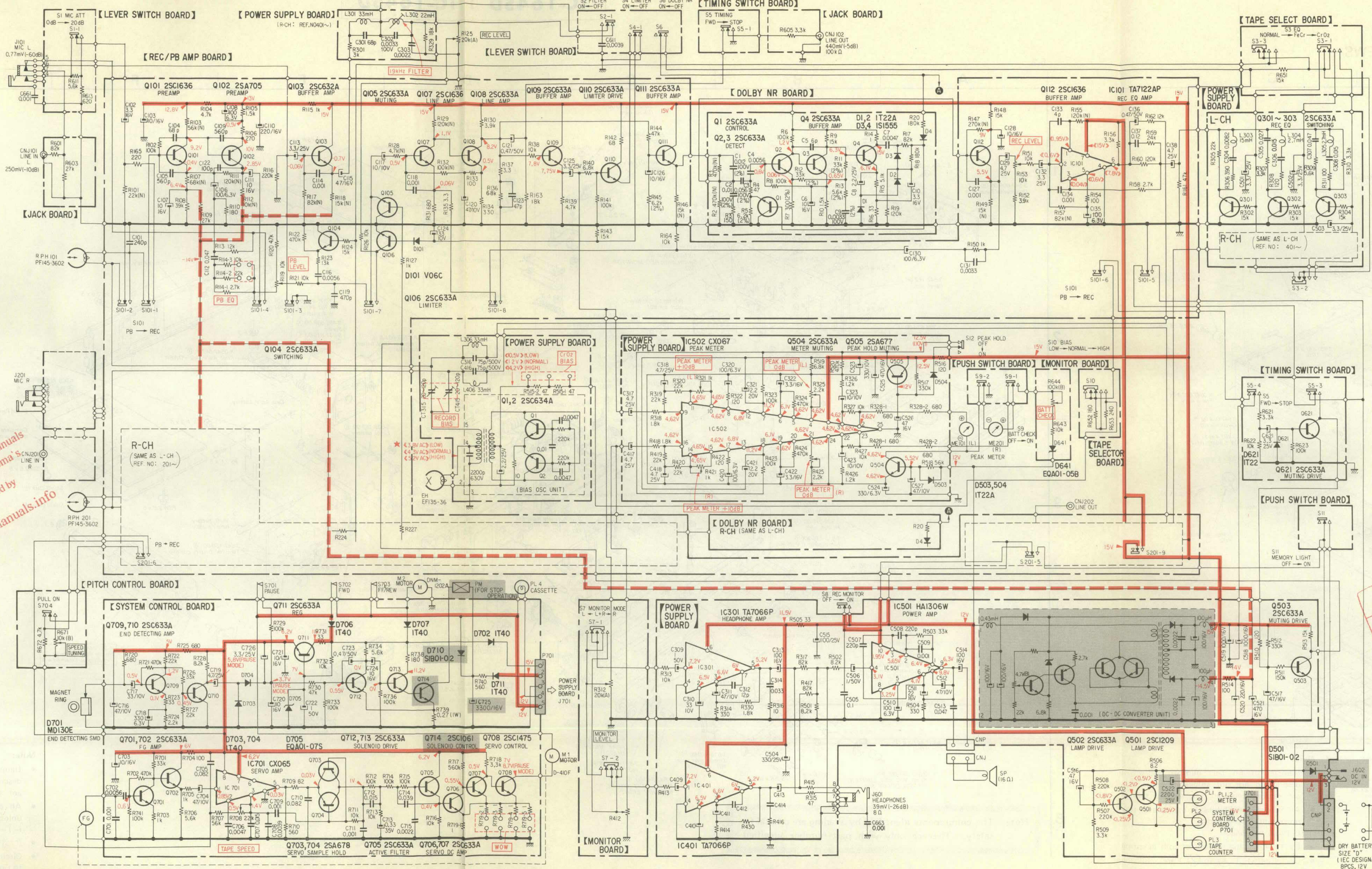
value *G code indicates*
 $\pm 2\%$ tolerance

red band indicates $\pm 2\%$ tolerance
(selected from resistors of $\pm 5\%$ tolerance)

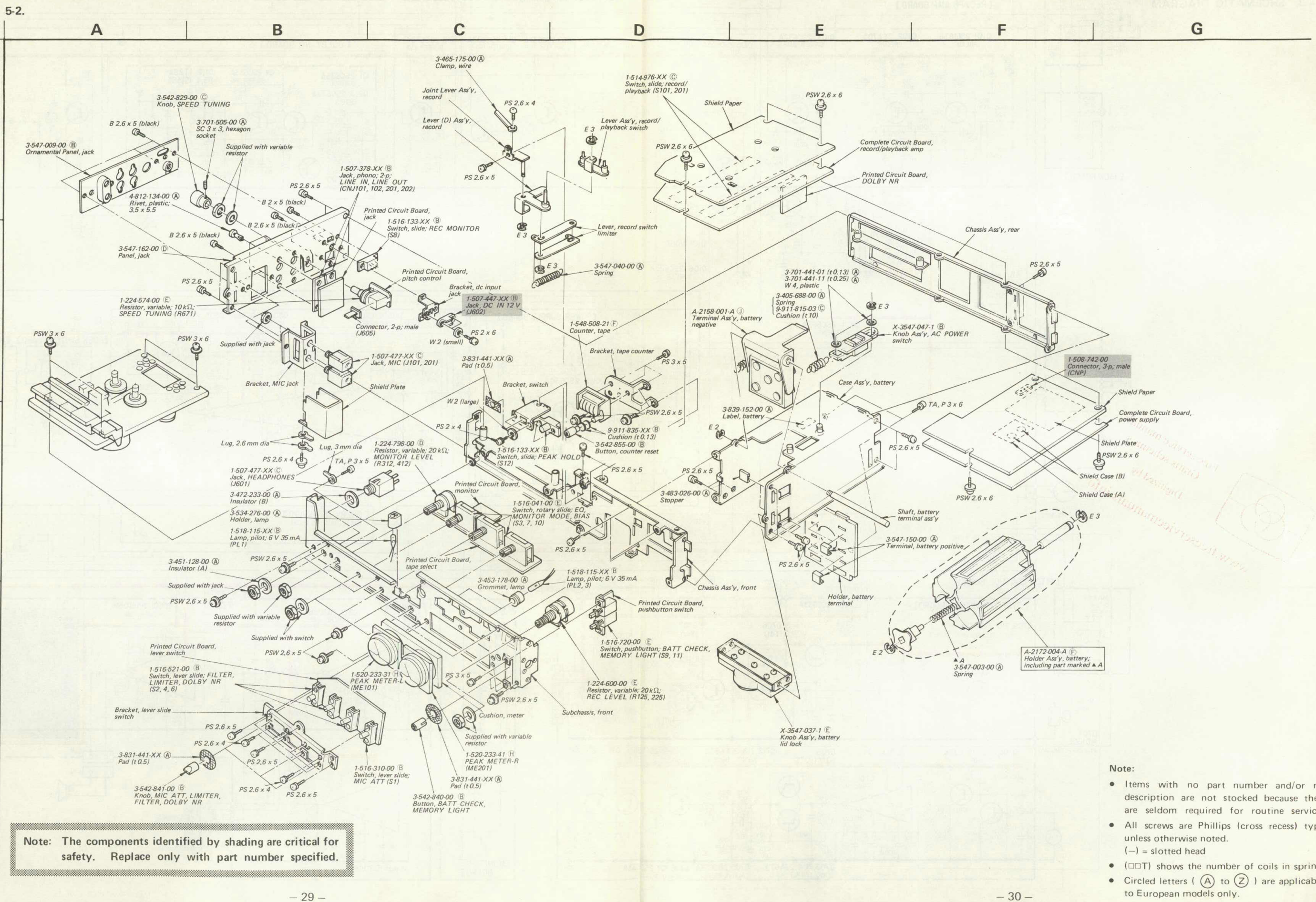
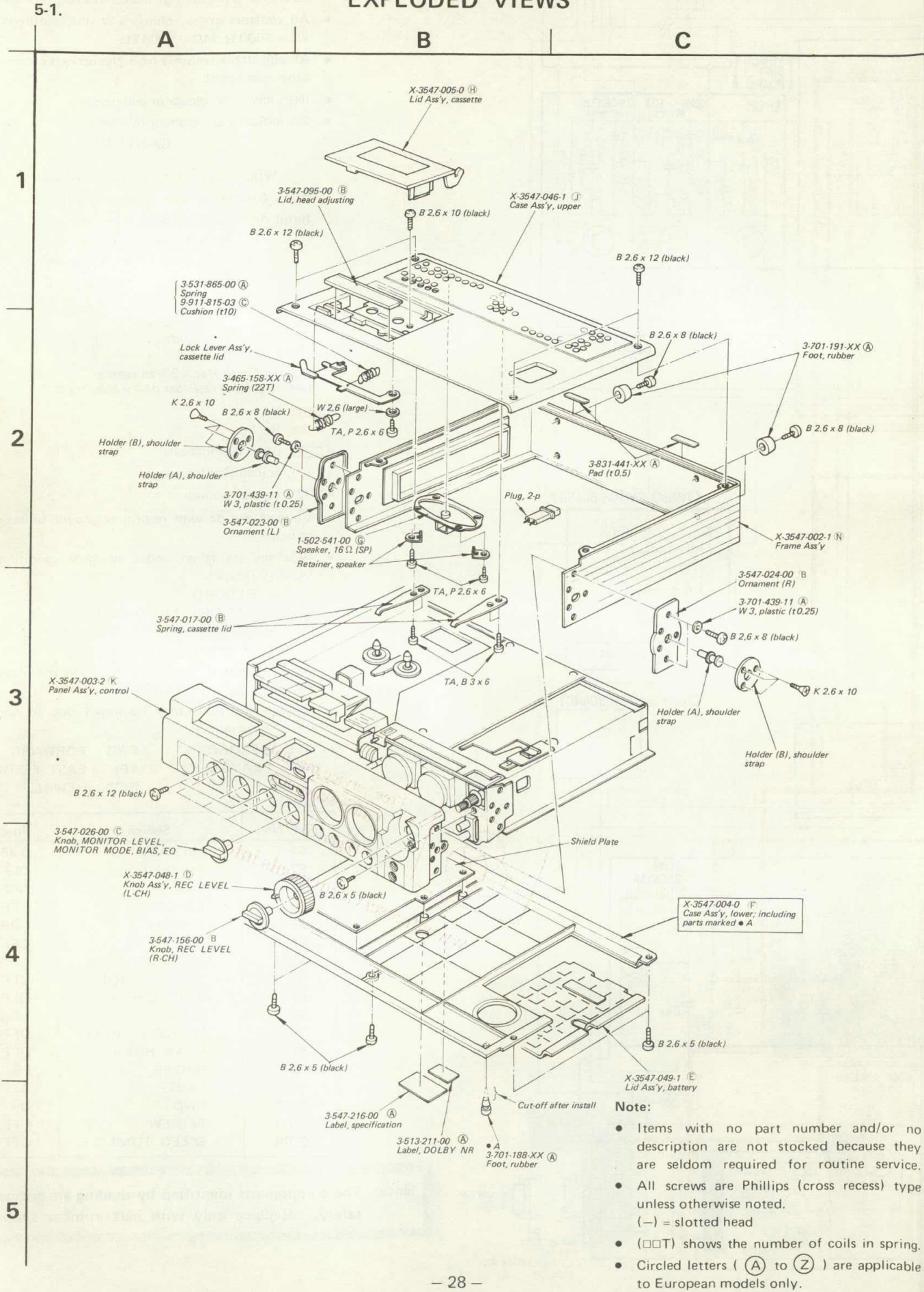
-  : B+ bus.
 -  : B- bus.
 -  : panel designation.
 -  : adjustment for repair.
 -  : chassis ground.
- Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken under no-signal conditions with a VOM (20 k Ω /V).
- ≪ ≫ : RECORD
 < > : MEMORY LIGHT (S11) ON
 () : PEAK HOLD (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 |

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	REAR 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.



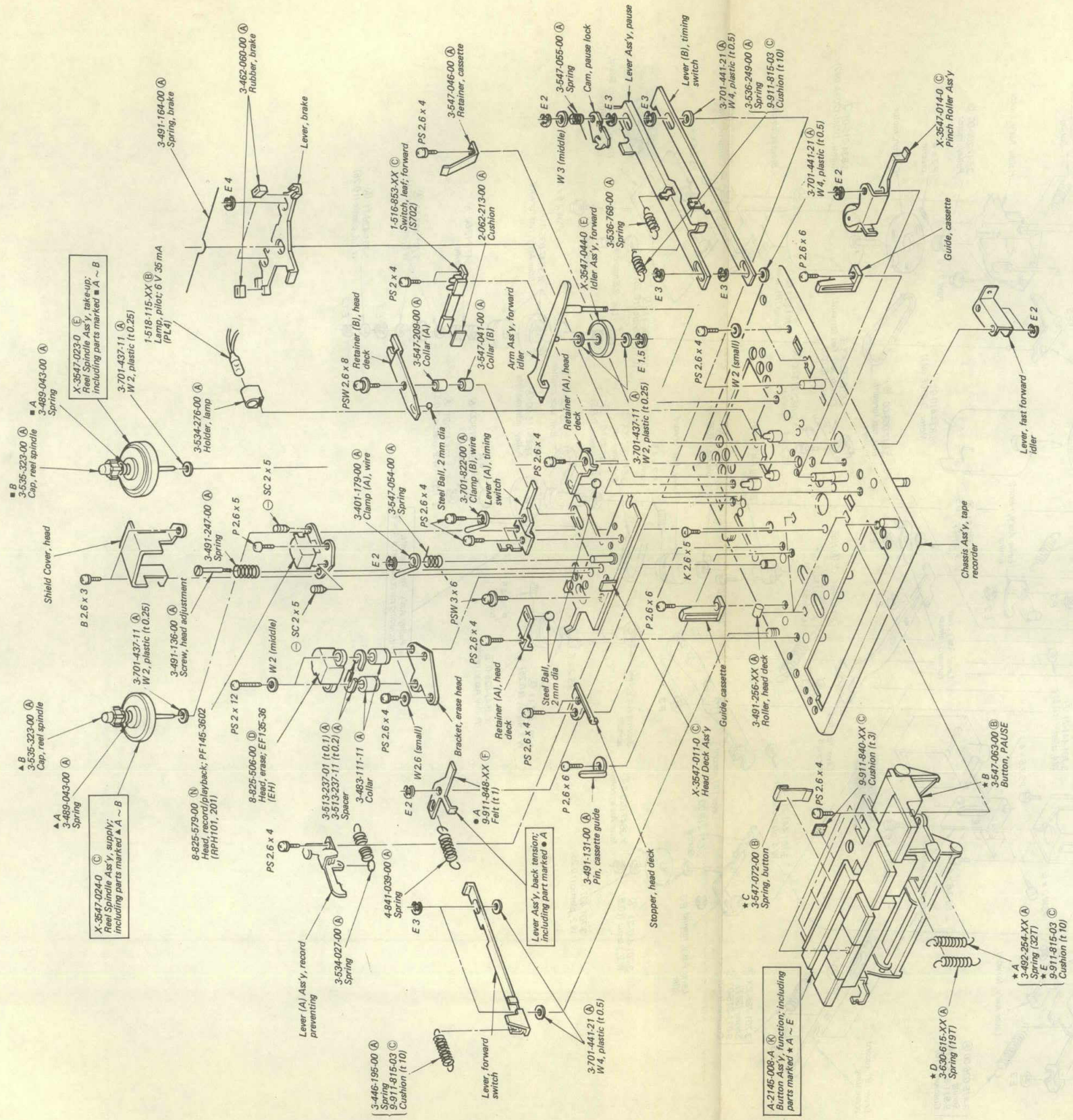
SECTION 5
EXPLODED VIEWS



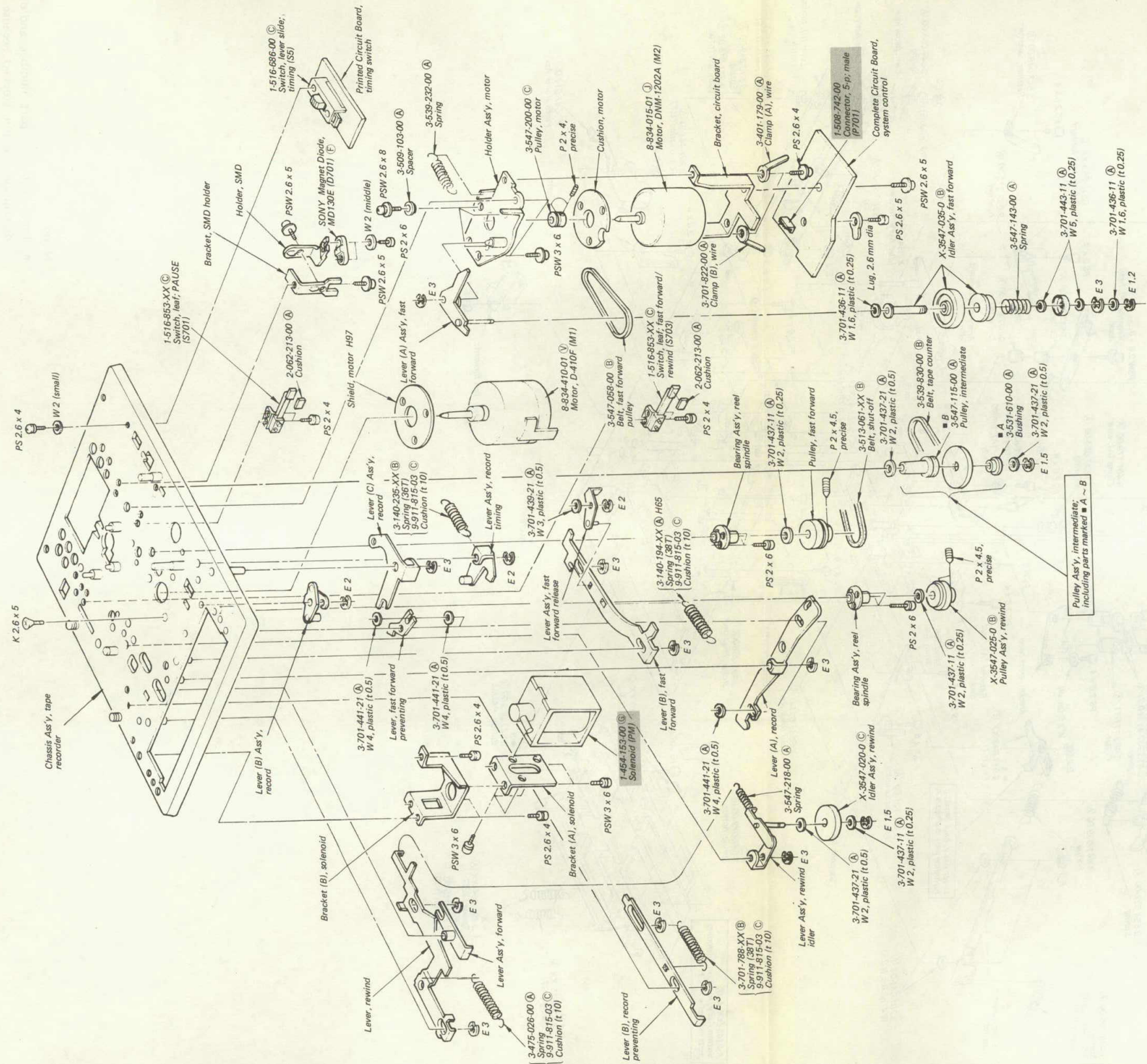
Note: The components identified by shading are critical for safety. Replace only with part number specified.

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.

5-3. A B C D E



- 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.
 - (□T) shows the number of coils in spring.
 - Circled letters (A) to (Z) are applicable to European models only.



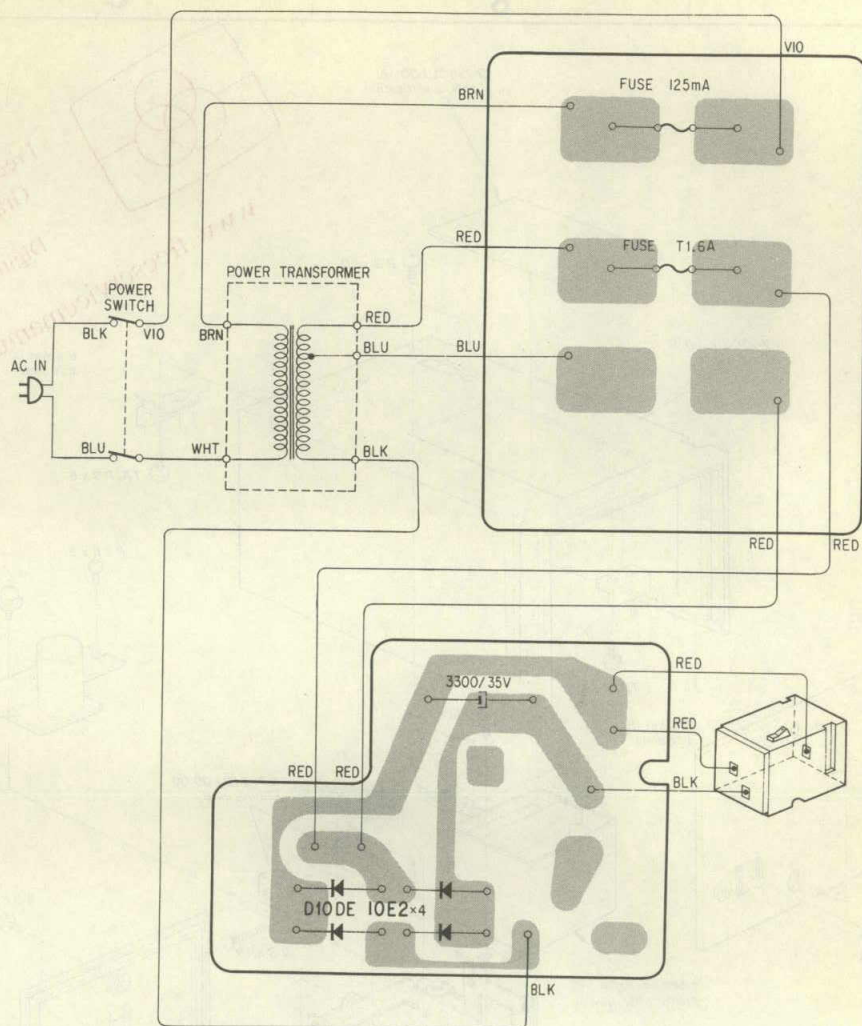
Note:

- 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 (**A** to **Z**) are applicable to European models only.

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

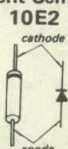
AC POWER ADAPTOR AC-20

1. MOUNTING DIAGRAM — Conductor Side —



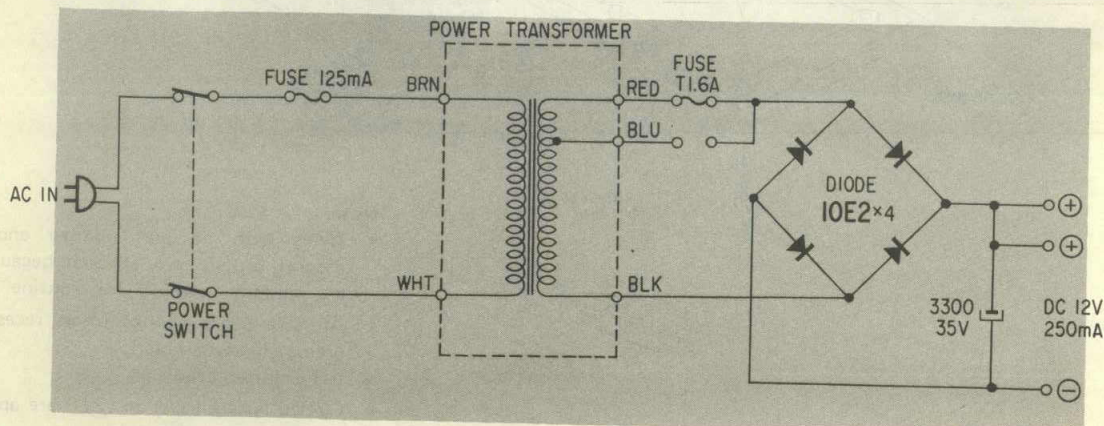
D801 ~ 804: SIB01-02

Replacement Semiconductor



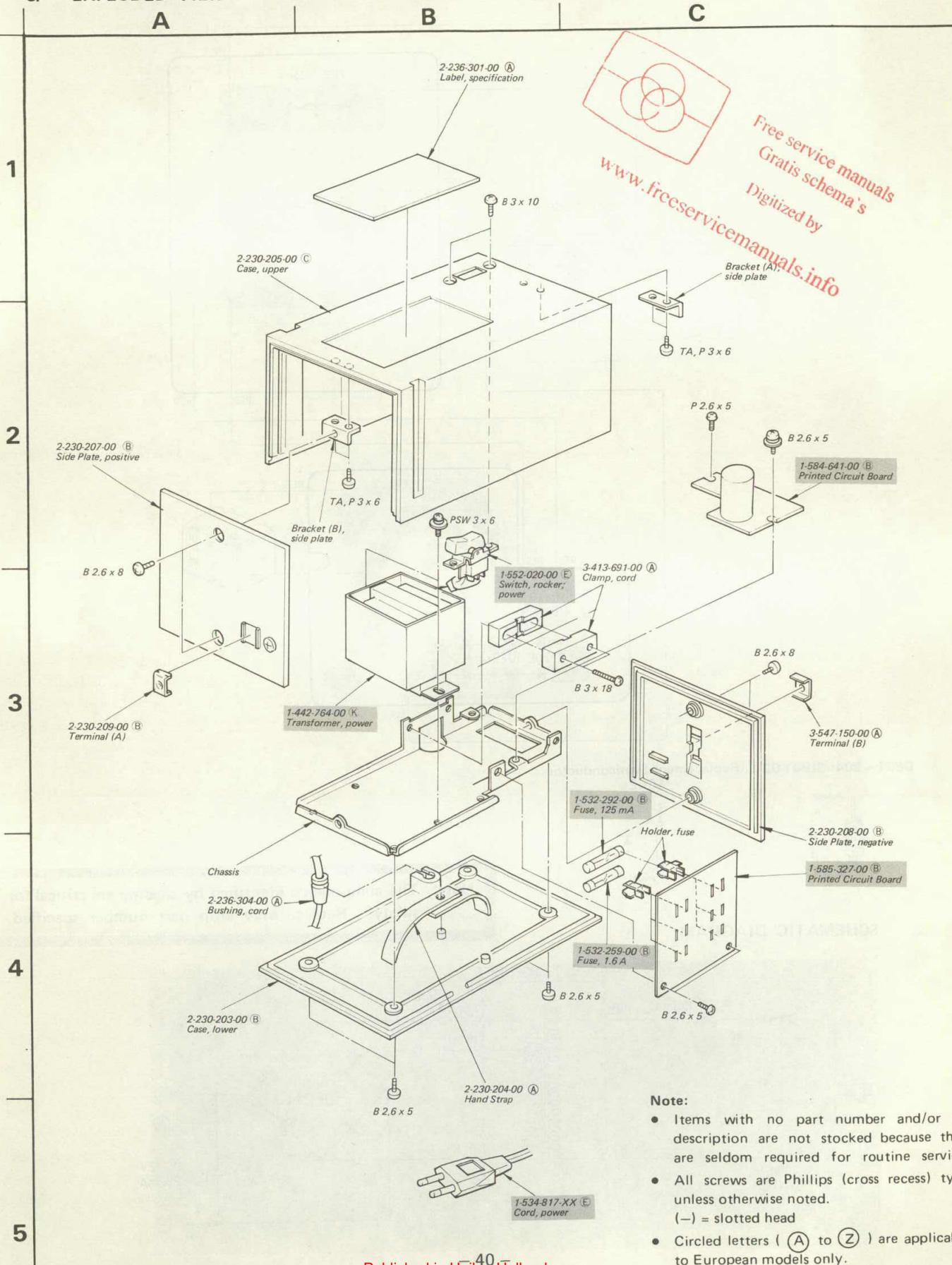
Note: The components identified by shading are critical for safety. Replace only with part number specified.

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 (A to Z) are applicable to European models only.

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SECTION 6
ELECTRICAL PARTS LIST

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

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

⇒: 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.

Ref. No.	Part No.	Description
Diodes		
D1, 2	(B) 1T22A	
D3, 4	(B) 1S1555	
⇒ D101, 201	(B) 10E2	
⇒ D501	(B) 10E2	
D503, 504	(B) 1T22A	
⇒ D621	(B) 1T22A	
D641	(B) EQA01-05B	
D701	(F) MD130E	
⇒ D702 ~704	(B) 1S1555	
⇒ D705	(B) EQB01-07	
⇒ D706, 707	(B) 1S1555	
⇒ D710	(B) 10E2	
⇒ D711	(B) 1S1555	
COILS		
L301, 401	1-407-879-00 (B) 33 mH, microinductor	
L302, 402	1-407-240-00 (B) 22 mH, variable inductor	
L303, 403	1-407-208-XX (A) 15 mH, microinductor	
L304, 404	1-407-195-XX (A) 2.7 mH, microinductor	
L305, 405		
L306, 406	1-407-212-XX (A) 33 mH, microinductor	
CAPACITORS		
All capacitors are in μF and electrolytic unless otherwise noted. 50 WV or less are not indicated except for electrolytics. $\mu\text{F} = \mu\text{F}$		
C1	1-129-896-11 (B) 0.012 $\pm 2\%$ 100 V film	
C2	1-129-701-11 (B) 0.01 $\pm 2\%$ 100 V film	
C3	1-129-899-11 (B) 0.056 $\pm 2\%$ 100 V film	
C4	1-108-573-12 (A) 0.0056 mylar	
C5	1-107-103-11 (A) 6 p silvered mica	
C6	1-121-471-11 (A) 10 16 V	
C7	1-108-234-12 (A) 0.0047 mylar	
C8	1-131-205-11 (B) 2.2 25 V tantalum	
C9	1-129-794-21 (B) 0.0033 $\pm 2\%$ 100 V film	
C10	1-131-197-11 (B) 3.3 16 V tantalum	

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

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

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

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

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

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

Ref. No.	Part No.	Description
C524	1-121-751-11 (A) 330	6.3 V
C525	1-121-426-11 (B) 470	16 V
C526	1-121-409-11 (A) 47	16 V
⇒ C527	1-121-409-11 (A) 47	16 V
C611, 612	1-106-015-11 (A) 0.0039	mylar
C621	1-121-392-11 (A) 3.3	25 V
C661, 662	1-102-074-11 (A) 0.001	ceramic
C663	1-101-445-11 (A) 0.001	ceramic
C701	1-106-001-12 (A) 0.001	mylar
C702	1-108-573-12 (A) 0.0056	mylar
C703	1-121-471-11 (A) 10	16 V
⇒ C704	1-121-409-11 (A) 47	16 V
C705	1-106-047-11 (B) 0.082	mylar
C706	1-106-017-11 (A) 0.0047	mylar
C707	1-108-240-11 (A) 0.015	mylar
C708	1-161-180-11 (A) 0.0039	ceramic (boundary layer)
C709	1-106-001-11 (A) 0.001	mylar
C710	1-106-047-11 (B) 0.082	mylar
C711	1-106-001-11 (A) 0.001	mylar
C712	1-106-029-11 (A) 0.015	mylar
C713	1-131-212-11 (B) 0.33	35 V tantalum
C714	1-106-039-11 (B) 0.039	mylar
C715	1-106-009-11 (A) 0.0022	mylar
⇒ C716	1-121-409-11 (A) 47	16 V
C717	1-121-402-11 (A) 33	10 V
C718	1-121-751-11 (A) 330	6.3 V
C719	1-121-395-11 (A) 4.7	25 V
C720, 721	1-121-471-11 (A) 10	16 V
C722	1-121-391-11 (A) 1	50 V
C723	1-121-726-11 (A) 0.47	50 V
C724	1-121-471-11 (A) 10	16 V
C725	1-123-071-11 (D) 3300	16 V
C726	1-121-392-11 (A) 3.3	25 V
CT315, 415	1-141-069-XX (B) 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 (A) 6.2 k	± 2 % ¼ W carbon
R7	1-210-850-11 (A) 300	± 2 % ¼ W carbon
R11, 12	1-210-855-11 (A) 33 k	± 2 % ¼ W carbon
R13	1-210-852-11 (A) 5.6 k	± 2 % ¼ W carbon
R119, 219	1-224-252-XX (C) 10 k	adjustable
R125, 225	1-224-600-00 (F) 20 k	variable, REC LEVEL
R145	1-210-853-11 (A) 6.2 k	± 2 % ¼ W carbon
R151, 251	1-224-252-XX (C) 10 k	adjustable
R312, 412	1-224-798-00 (D) 20 k	variable, MONITOR LEVEL
R321, 421	1-224-249-XX (B) 1 k	adjustable
R325, 425	1-224-250-XX (C) 2.2 k	adjustable
R644	1-224-255-XX (C) 100 k	adjustable
R671	1-224-574-00 (E) 10 k	variable, SPEED TUNING
R707	1-212-632-11 (B) 56 k	¼ W metal-oxide
R708	1-224-253-XX (C) 22 k	adjustable
R739	1-212-353-11 (A) 0.27	1 W metal-oxide
SWITCHES		
S1	1-516-310-00 (B) Lever Slide	MIC ATT
S2	1-516-521-00 (B) Lever Slide	FILTER
S3	1-516-041-00 (E) Rotary Slide	EQ
S4	1-516-521-00 (B) Lever Slide	LIMITER
S5	1-516-686-00 (C) Lever Slide	timing
S6	1-516-521-00 (B) Lever Slide	DOLBY NR
S7	1-516-041-00 (E) Rotary Slide	MONITOR MODE
S8	1-516-133-XX (B) Slide	REC MONITOR
S9	1-516-720-00 (E) Pushbutton	BATT CHECK
S10	1-516-041-00 (E) Rotary Slide	BIAS
S11	1-516-720-00 (E) Pushbutton	MOMORY LIGHT
S12	1-516-133-XX (B) Slide	PEAK HOLD
S101, 201	1-514-976-XX (H) Slide	record/playback
S701 ~ 703	1-516-853-XX (C) 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 (A to Z) are applicable to European models only.

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

ACCESSORIES & PACKING MATERIALS

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

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

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

4. ELECTRICAL PARTS LIST

<u>Part No.</u>	<u>Description</u>
-----------------	--------------------

Diode, 10E2

1-123-118-11	(E) Capacitor, electrolytic; 330 μ F 35 V
1-442-764-00	(K) Transformer, power
1-532-292-00	(B) Fuse, 125 mA
1-532-259-00	(B) Fuse, 1.6 AT
1-534-817-XX	(E) Cord, power
1-552-020-00	(E) Switch, rocker; power
1-584-641-00	(B) Printed Circuit Board
1-585-327-00	(B) Printed Circuit Board, fuse

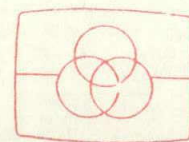
Note: The components identified by shading are critical for safety. Replace only with part number specified.

STEREO
CASSETTE-CORDER

TC-164SD

TC-164SD

AEP Model



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SUPPLEMENT

This supplement updates the service manual to include production change.

Mounting diagram, schematic diagram and the timing switch circuit board have been changed in new sets.

File this supplement with the service manual.

No. 1
July, 1977

1. ELECTRICAL PARTS LIST

Ref. No.	FORMER		NEW	
	Part No.	Description	Part No.	Description
Q622	_____	_____	_____	(B) 2SC634A
Q623, 624	_____	_____	_____	(C) 2SA678
D101, 201	_____	(B) 10E2	_____	(B) 2SC634A
C621	1-121-392-11	(A) 3.3 25 V	1-121-651-11	(A) 10 16 V
C622	_____	_____	1-121-395-11	(A) 4.7 25 V

SONY
SERVICE MANUAL

2. SEMICONDUCTORS

Replacement Semiconductors.

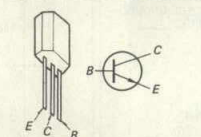
For replacement, use semiconductors except in ().

Q1 to 4
Q104 to 106
Q108 to 111
Q204 to 206
Q208 to 211
Q301 to 303
Q401 to 403
Q502, 504
Q621, 622
Q701, 702
Q705 to 707
Q709 to 713
D101, 201
Q101, 201
Q107, 207
Q112, 212
Q103, 203: 2SC632A

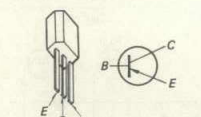
2SC634A

2SC1636

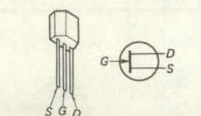
2SC632A



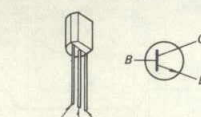
Q102, 202: 2SA705
Q505
Q623, 624
Q703, 704
Q505: (2SA677)



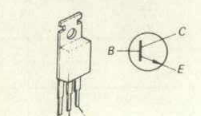
Q501, 708: 2SC1475



Q501: (2SC1209)

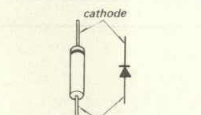


Q714: 2SC1061

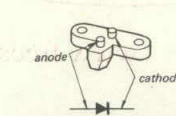


D1, 2
D503, 504) 1T22A
D621: 1T22A (1T22)
D3, 4: 1S1555
D711,
D702 to 704
D706, 707) 1S1555 (1T40)

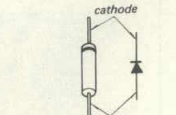
D501, 710: 10E2



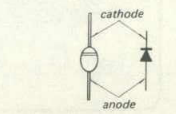
D701: MD130E



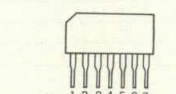
D501, 710: (S1B01-02)
D641: EQA01-05B
D705: EQB01-07



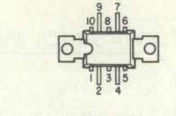
D101, 201: (V06C)



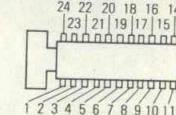
IC101, 201: TA7122AP
IC301, 401: TA7066P



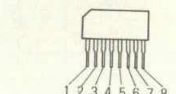
IC501: HA1306W



IC502: CX067



IC701: CX065

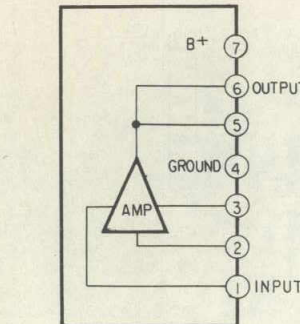


TC-164SD

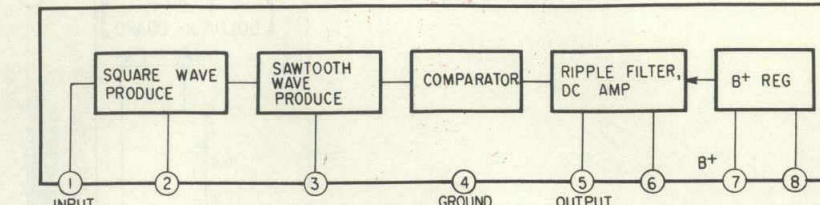
TC-164SD

3. BLOCK DIAGRAMS OF ICs

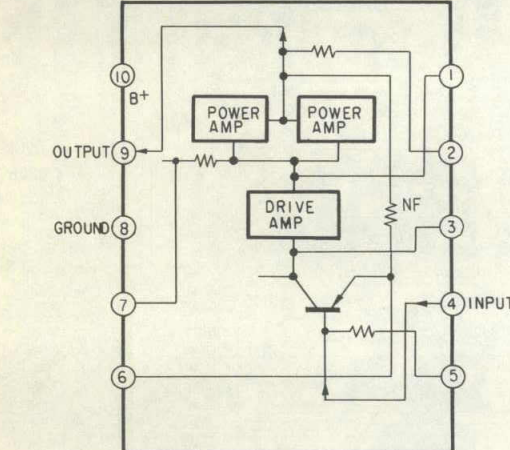
• IC101, 201 TA7122AP



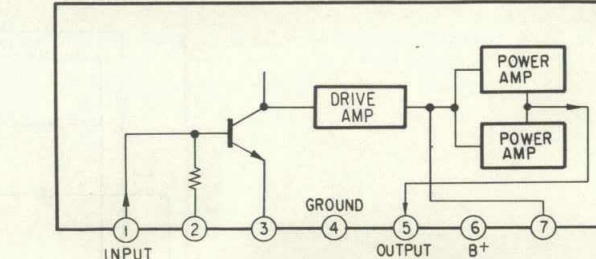
• IC701 CX065



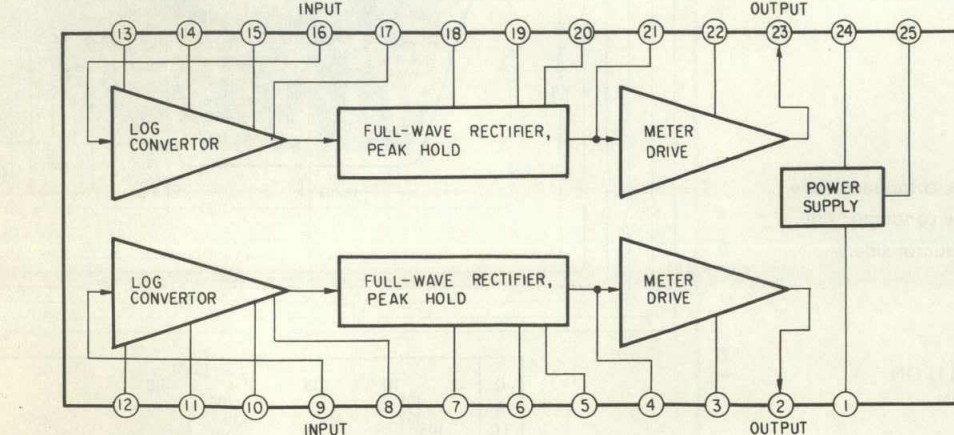
• IC501 HA1306W



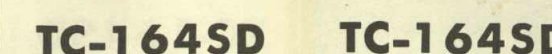
• IC301, 401 TA7066



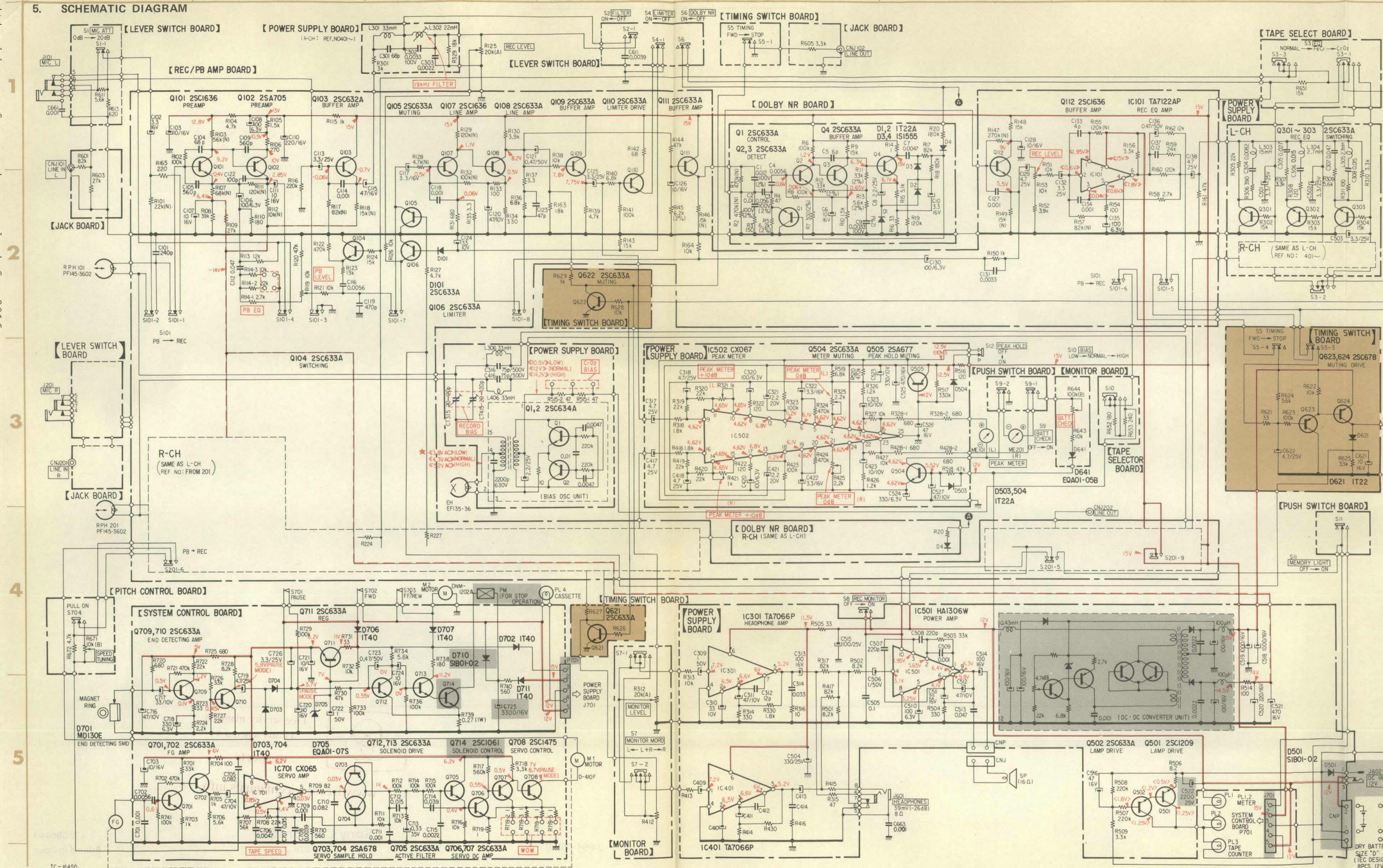
• IC502 CX067



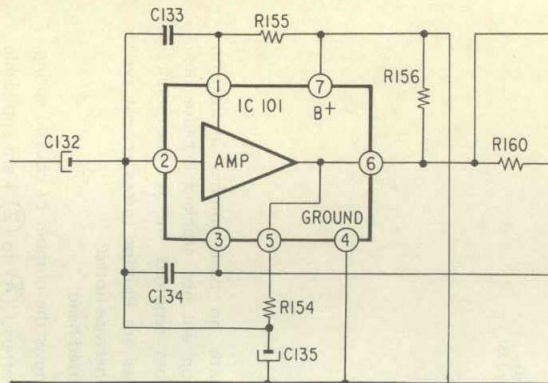
TC-1 64SD TC-1 64SD



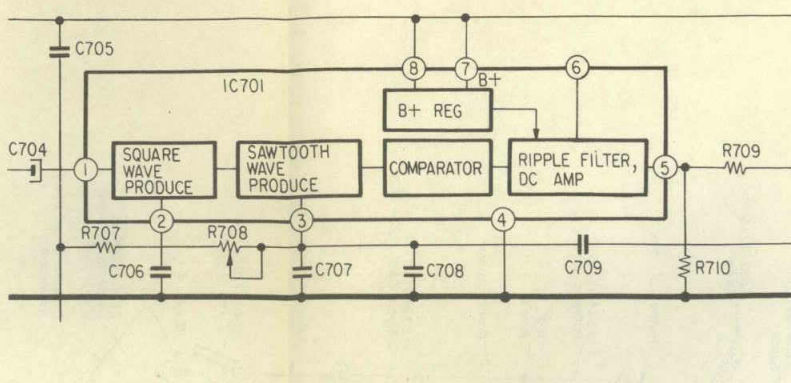
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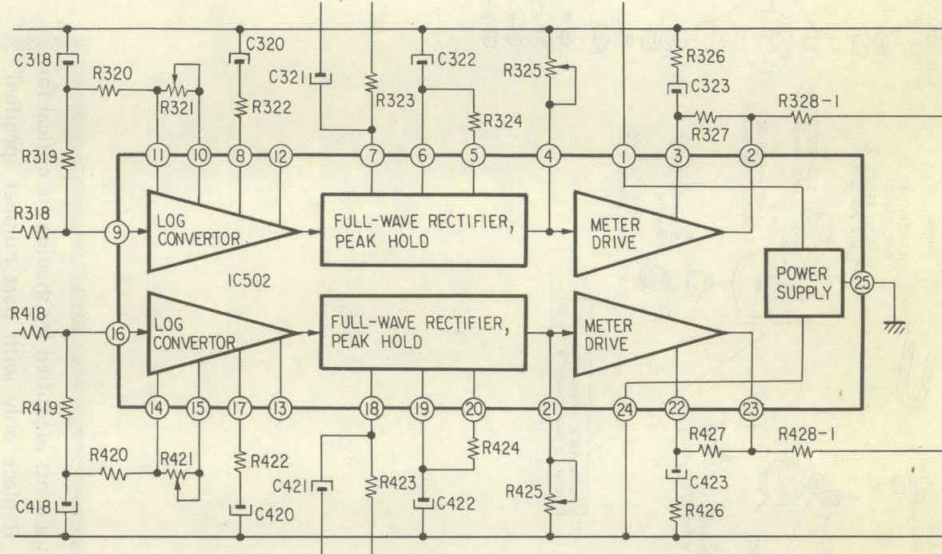
• IC101 TA7122AP



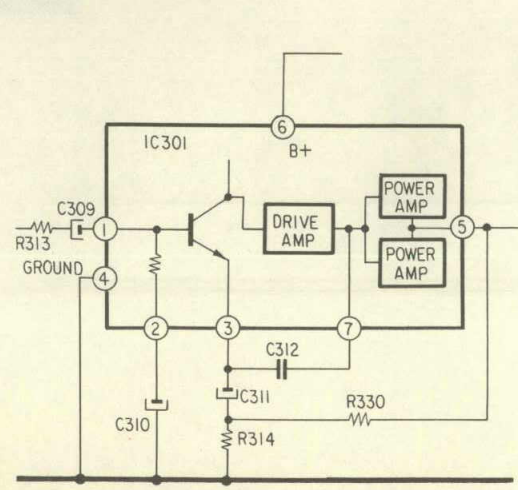
• IC701 CX065



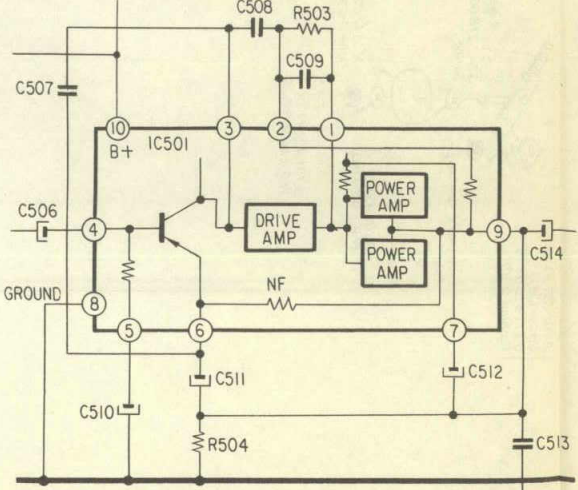
• IC502 CX067



• IC301 TA7066



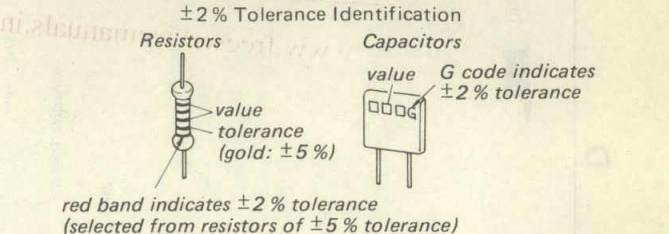
• IC501 HA1306W



- Note:**
- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F}$ 50 WV or less does not indicated except for electrolytics.
 - All resistors are in ohms, $\frac{1}{4}\text{W}$ unless otherwise noted. $\text{k}\Omega = 1000\Omega$; $\text{M}\Omega = 1000\text{k}\Omega$
 - 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 $\pm 2\%$ tolerance, use resistors with a red tolerance band or capacitors with a G code.

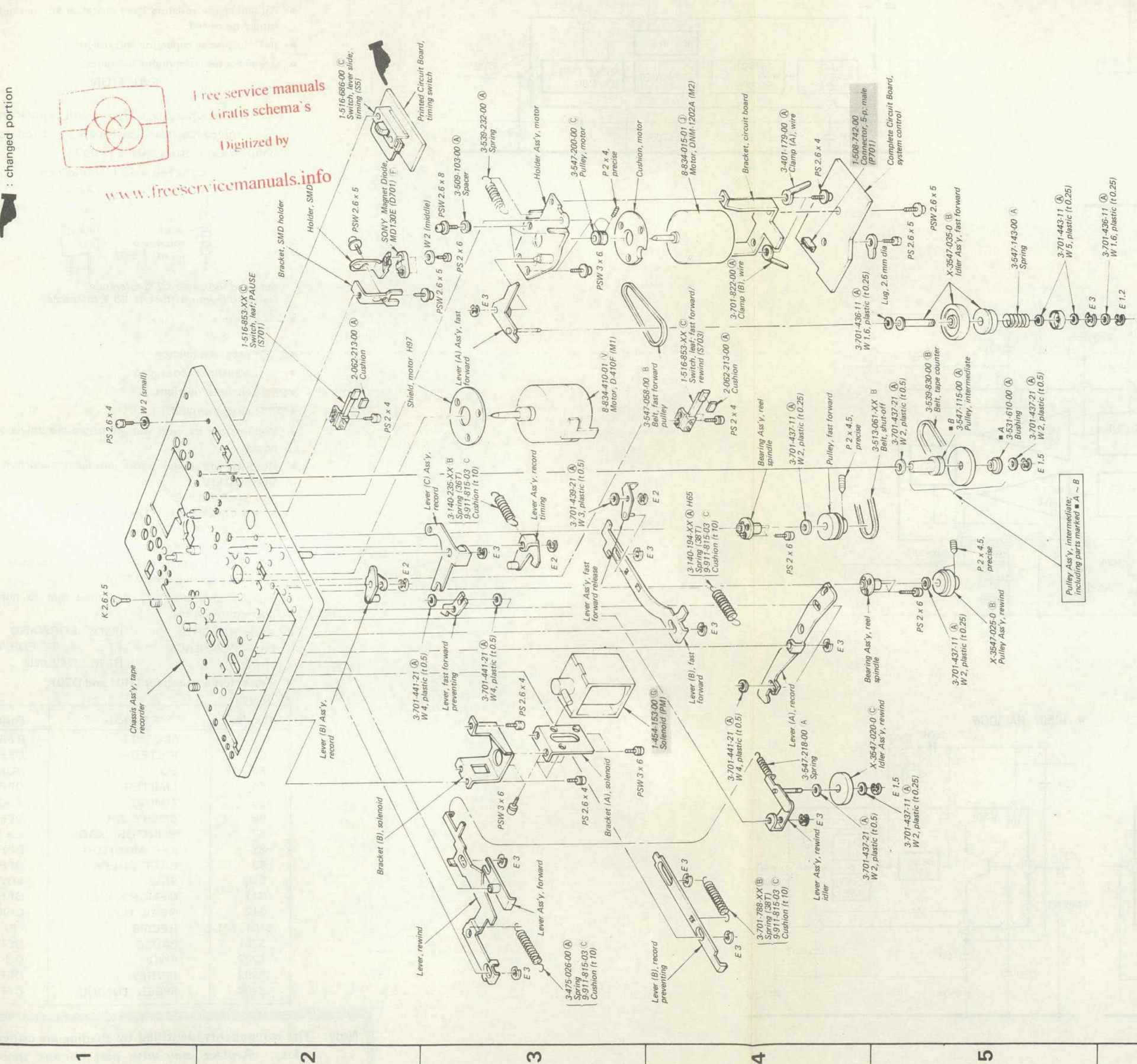


- — : B+ bus.
- --- : B- bus.
- : panel designation.
- : adjustment for repair.
- : changed portions.
- : chassis ground.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM ($20\text{k}\Omega/\text{V}$).
- <> : RECORD
- <> : MEMORY 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
- Transistors are used for D101 and D201.
- 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	REAR 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.

6. 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.
- (□□□) shows the number of coils in spring.
- Circled letters (A) to (Z) are applicable to European models only.

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

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