

EL-5

STEREO
**MASTER
COPY**

*UK Model
AEP Model
AEP Model*



STEREO ELCASET DECK

SPECIFICATIONS

Power Requirements:	110, 120, 220 or 240 V ac, 50/60 Hz	Signal-to-noise Ratio:	DOLBY NR OFF
Power Consumption:	44W		With Type II ELCASET (FeCr)
Dimensions:	Approx. 430 (w) x 170 (h) x 320 (d) mm 17 (w) x 6 3/4 (h) x 12 1/2 (d) inches Including projecting parts and controls		62 dB at peak level (NAB)
Weight:	Approx. 10.5 kg, 23 lbs 2 oz		62 dB (DIN, 1975 rev.)
			54 dB (DIN, old)
			With Type I ELCASET (SLH)
			59 dB at peak level (NAB)
			59 dB (DIN, 1975 rev.)
			51 dB (DIN, old)
			DOLBY NR ON
			Improved by 5 dB at 1 kHz, 10 dB above 5 kHz
Tape Speed:	9.5 cm/s (3 3/4 ips)	Total Harmonic Distortion:	0.8%
Fast Forward and Rewind Time:	Approx. 75 seconds (By LC-60)		
Recording System:	4-track 2-channel stereo		
Bias Frequency:	160 kHz		

- Continued on page 2 -

"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 = 0.775V

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.

 **ELCASET**

Look for this mark on all products manufactured under the ELCASET standard.

SONY

SERVICE MANUAL

DOLBY NR OFF

With Type II ELCASET (FeCr)

15-25,000 Hz (NAB)

25-20,000 Hz ±3dB (NAB)

20-22,000 Hz (DIN)

With Type I ELCASET (SLH)

15-23,000 Hz (NAB)

25-18,000 Hz ±3dB (NAB)

20-20,000 Hz (DIN)

0.06% WRMS (NAB)

±0.12% (DIN)

MIC (phone jacks) 2

sensitivity 0.3 mV (-68 dB)

for low impedance microphone

LINE IN (stereo binaural jack) 1

(phono jacks) 2

sensitivity 0.095V (-18 dB)

input impedance 100k ohms

950 mV

Outputs: LINE OUT (phono jacks) 2

output level 0.775V (0 dB)

at load impedance 100k ohms with

LEVEL ADJUST control turned fully clockwise

suitable load impedance more than 10k ohms

HEADPHONES 1

suitable load impedance 8-32 ohms

REC/PB Connector:

Input impedance less than 10k ohms

Output impedance less than 10k ohms

ELCASET

STEREO ELCASET DECK

EL-5

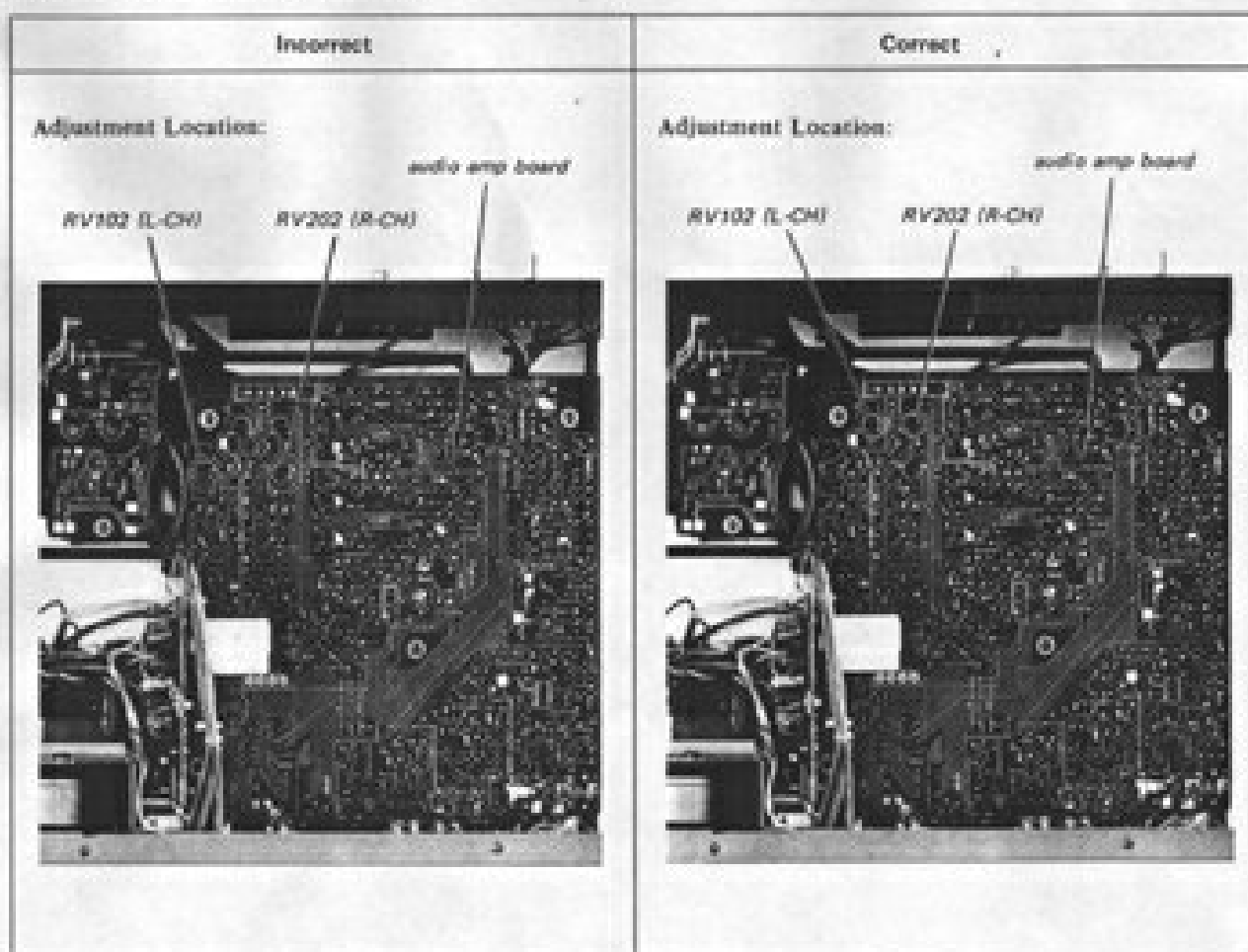
*UK Model
AEP Model*

CORRECTION

Correct the service manual as shown below.

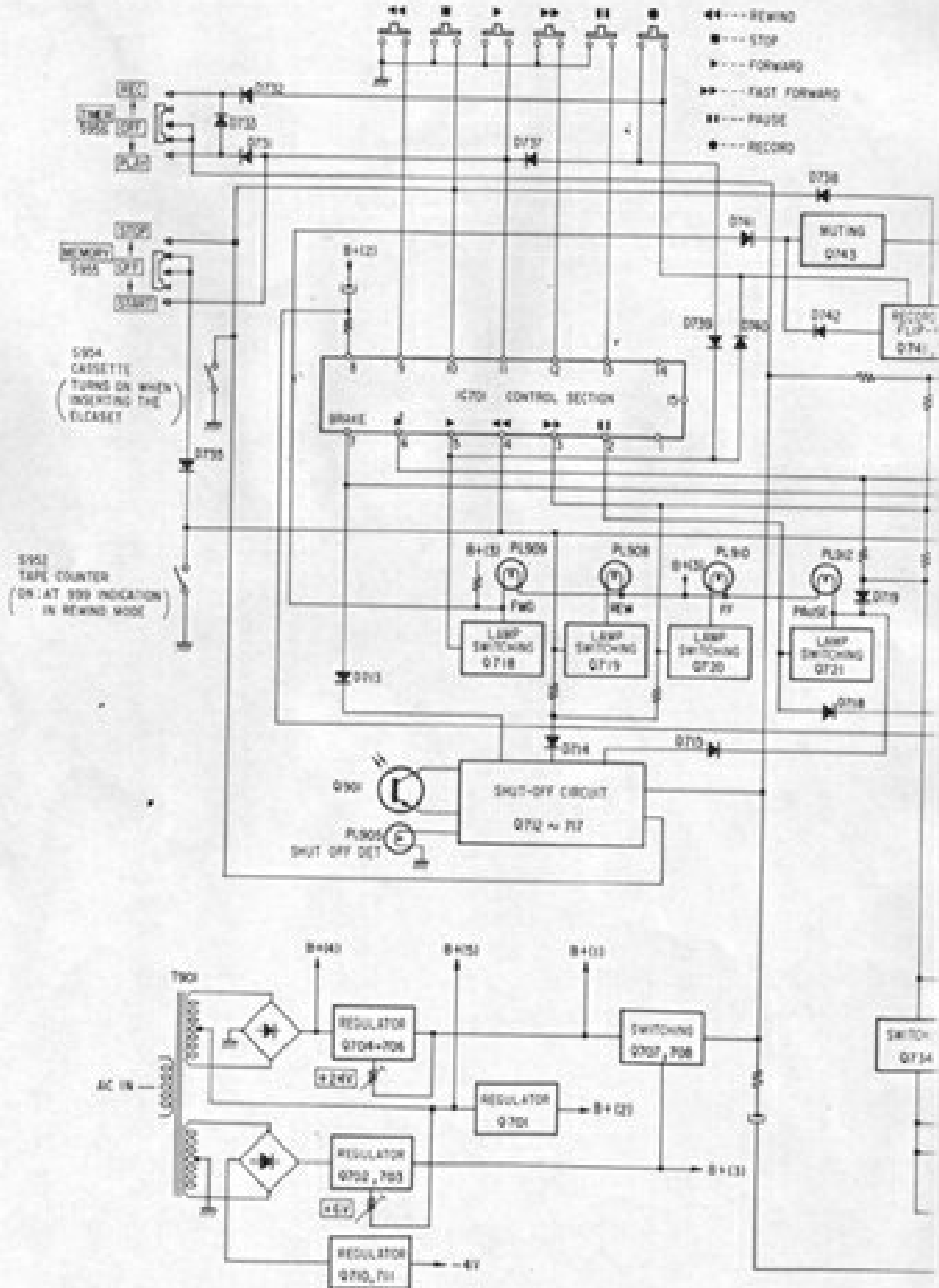
No. 1
November, 1976

Page 22 Playback Level Adjustment

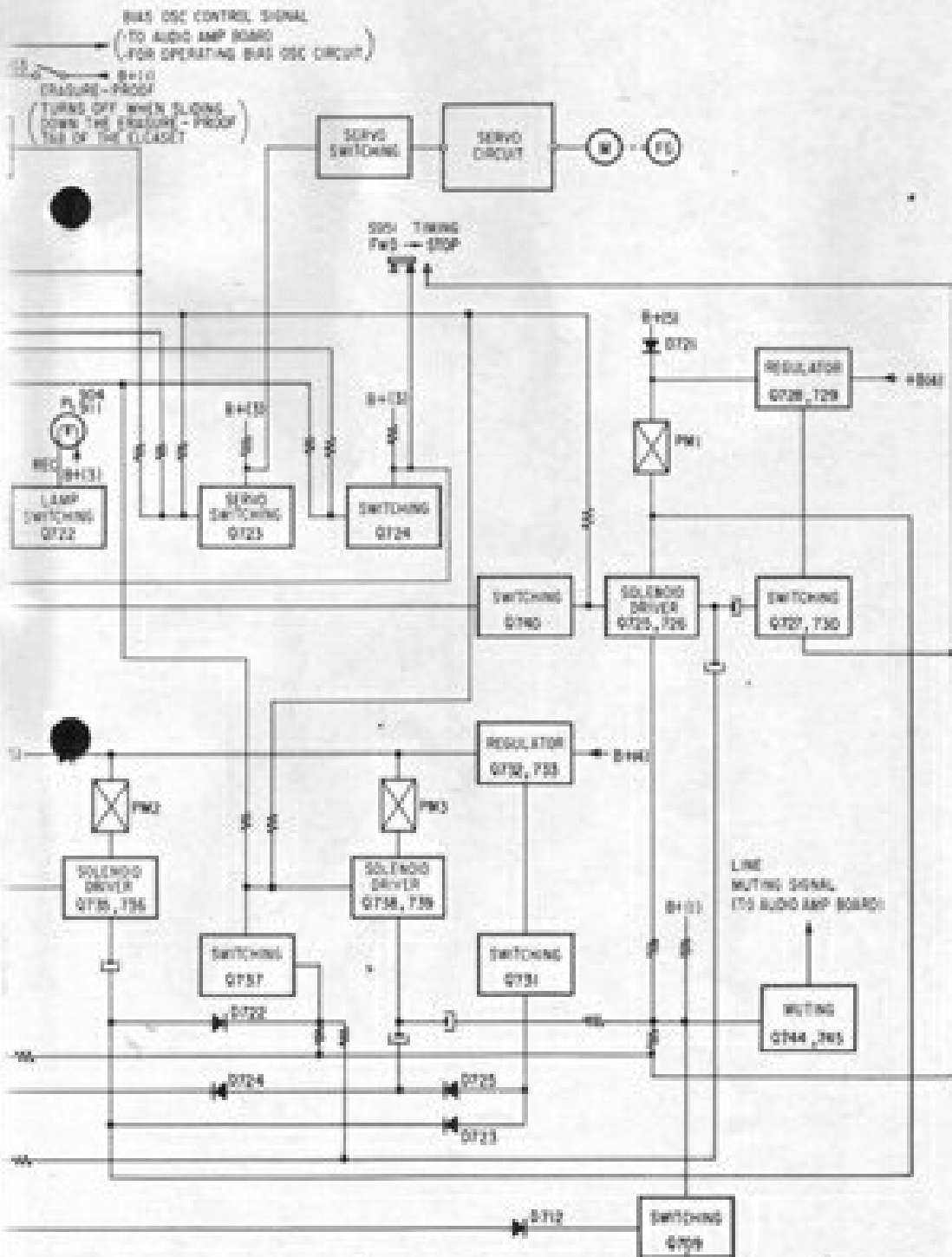


SECTION 1 OUTLINE

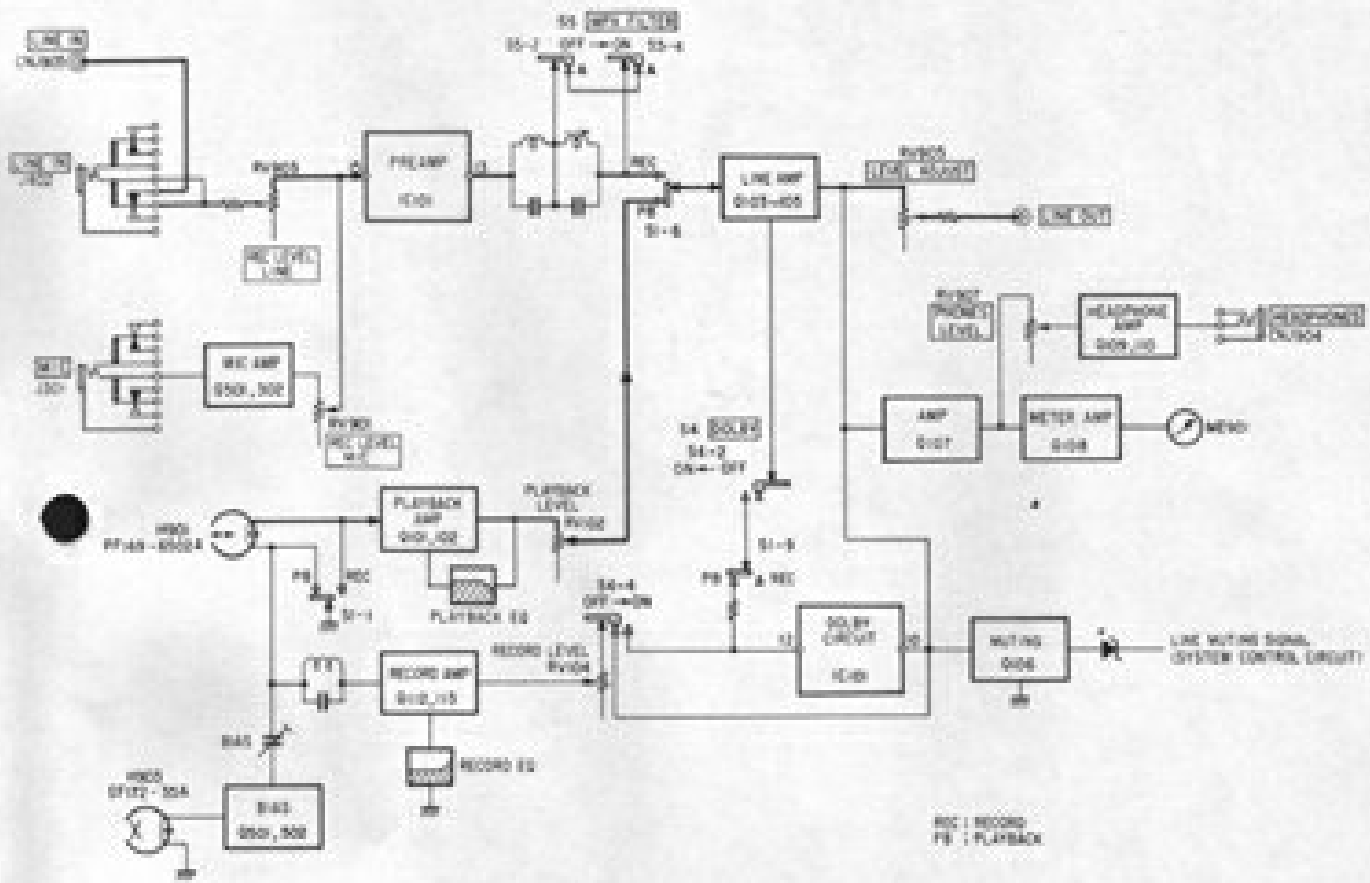
1-1. BLOCK DIAGRAM - System Control Section -



Note: REC: RECORD
 FWD: FORWARD
 FF: FAST FORWARD
 REW: REWIND



1-2. BLOCK DIAGRAM - Amplifier Section -



1-3. CIRCUIT DESCRIPTION

The EL-5 system control circuit employs IC701 (CX738) which supplies six different output signals (PAUSE, forward, fast forward, rewind, delay-forward, and brake). (See the detailed circuit description of EL-7).

SOLENOID DRIVE CIRCUITS

The following table indicates each operation of the three solenoids for each mode.

Solenoid \ Mode	Mode					
	Forward	Fast Forward	Rewind	PAUSE	Record	Record/PAUSE or Forward/PAUSE
PM1 (Shifter)	○	X	X	○	○	○
PM2 (Fast Forward)	○	○	X	X	○	X
PM3 (Rewind)	X	X	○	X	○	○

○ : energized X : de-energized

1. STOP mode - forward mode (energized PM1 and PM2) (See Figs. 1-2 and 1-3)

- When the delay forward signal is applied to the base of Q725 and Q726 from terminal 6 of IC701, Q725 and Q726 turn ON to energize PM1.
- When Q725 and Q726 are both ON, C720 discharges, and the Q727's base voltage is decreased. Q727 turn OFF. So Q728 and Q729 turn ON, and PM1 is energized by the high voltage while C720 is discharged.
- In this period, Q730 turns ON. Then Q734 turns ON by a base current flowing via R791. Therefore, the delay forward signal applied to the base of Q735 from terminal 6 of IC701 is grounded at Q734. Q735 and Q736 turn OFF, and PM2 is not energized.
- The other base current is also applied to Q734 via S951 and R791 during forward mode to secure the mechanical operation.
- After discharging C720, Q727 turns ON. (See Fig. 1-3). Consequently, Q728, Q729, Q730 and Q734 turn OFF, and Q735 and Q736 turn ON, so PM2 is energized. (Q731, Q732 and Q733 constitute the solenoid kick circuit. See the circuit description of EL-7).
- Energized both solenoids, PM1 and PM2, place EL-5 in the forward mode.

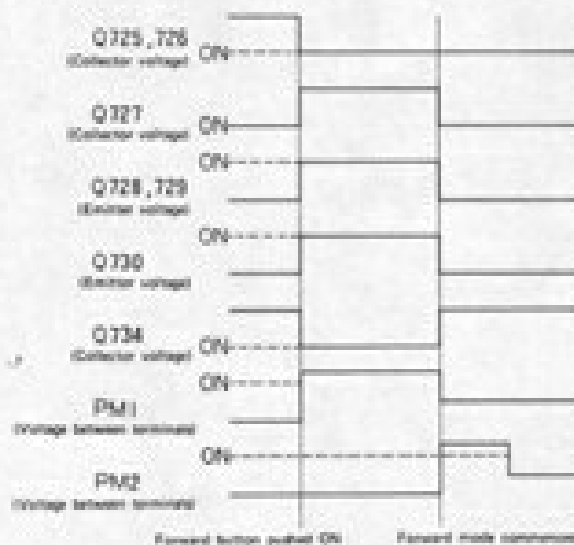


Fig. 1-1 Time Chart of Energizing PM1 and PM2

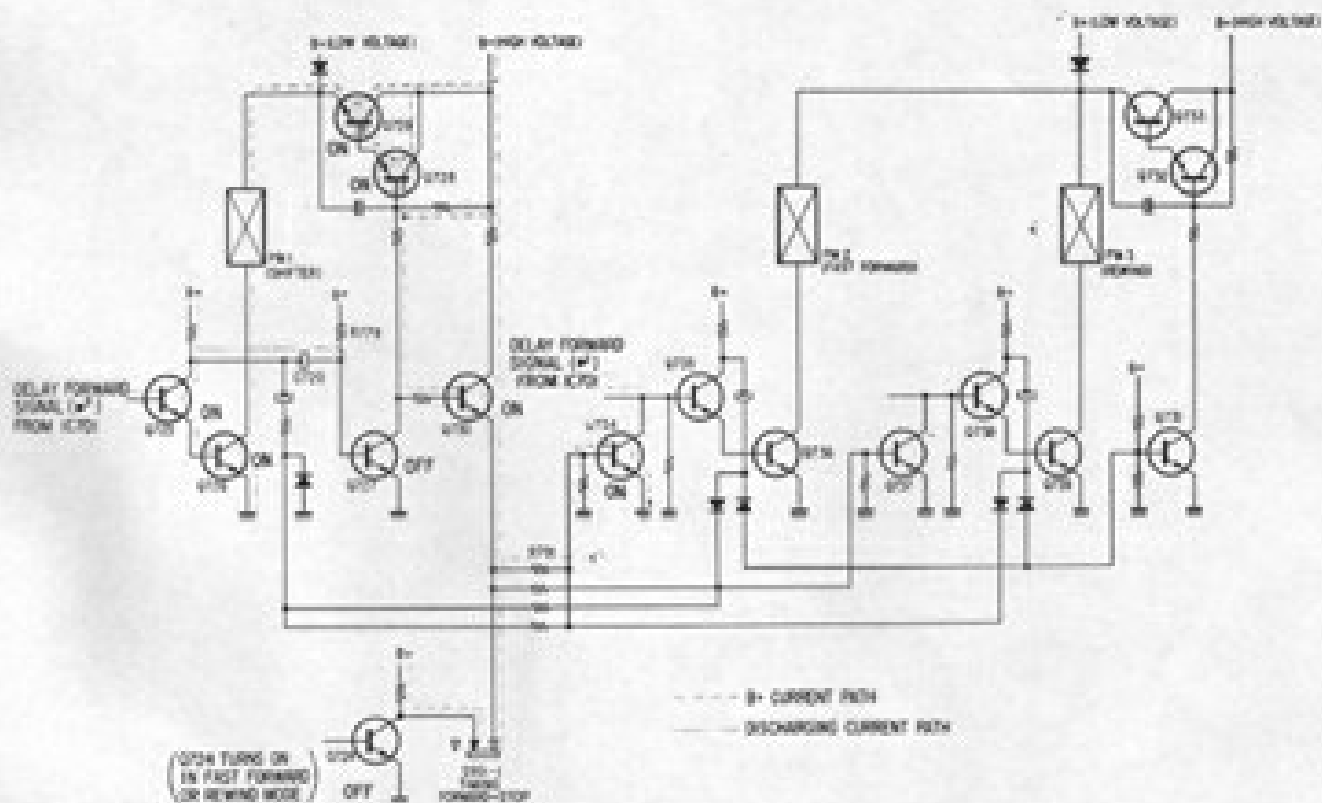


Fig. 1-2 Forward Button Pushed ON

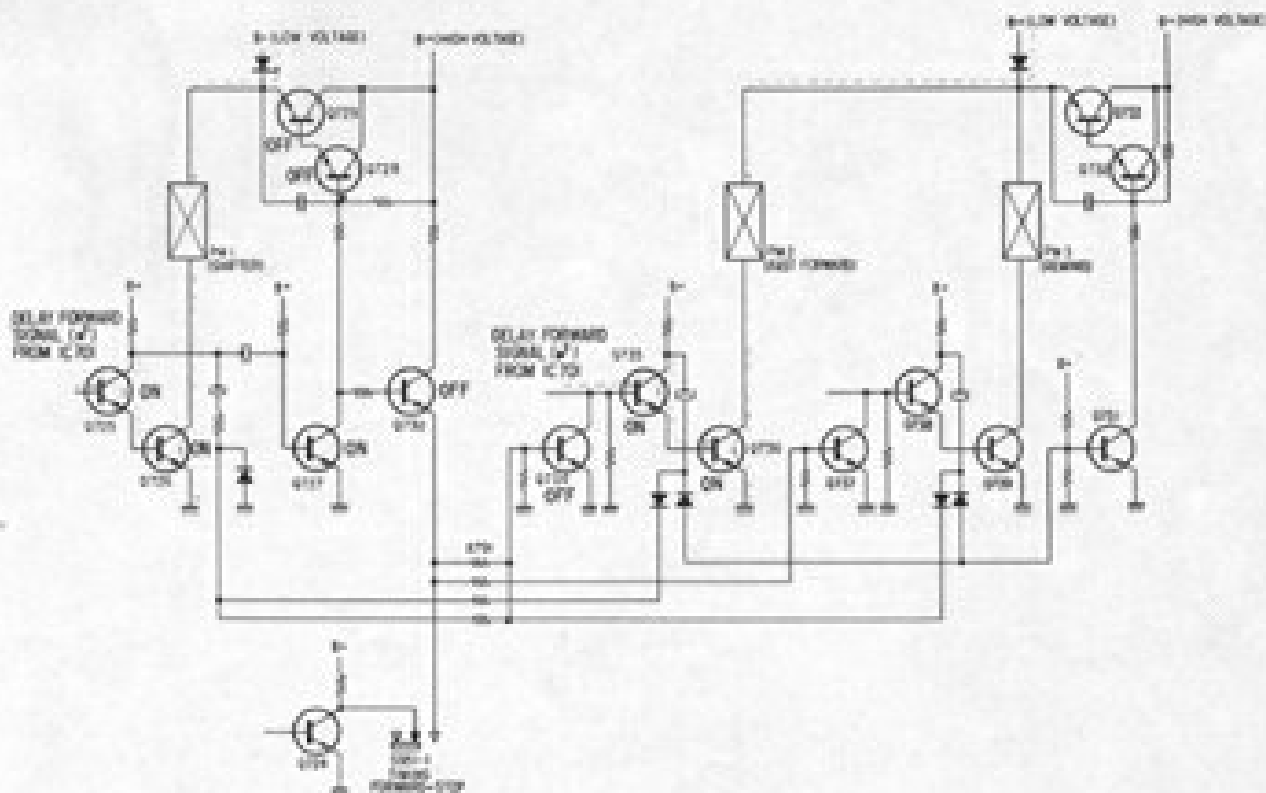


Fig. 1-3 Forward mode Commenced

2. STOP mode - fast forward or rewind mode (energized PM2 or PM3) (See Fig. 1-4)

When the fast forward signal is applied to the base of Q735 from terminal 3 of IC701, Q735 and Q736 turn ON, and PM2 is energized. The energized PM2 places EL-5 in the fast forward mode. For

rewind mode, Q738 and Q739 turn ON by the rewind signal from terminal 4 of IC701, and PM3 is energized. The energized PM3 places EL-5 in the rewind mode. (Q731, Q732 and Q733 constitute the solenoid kick circuit. See the circuit description of EL-7).

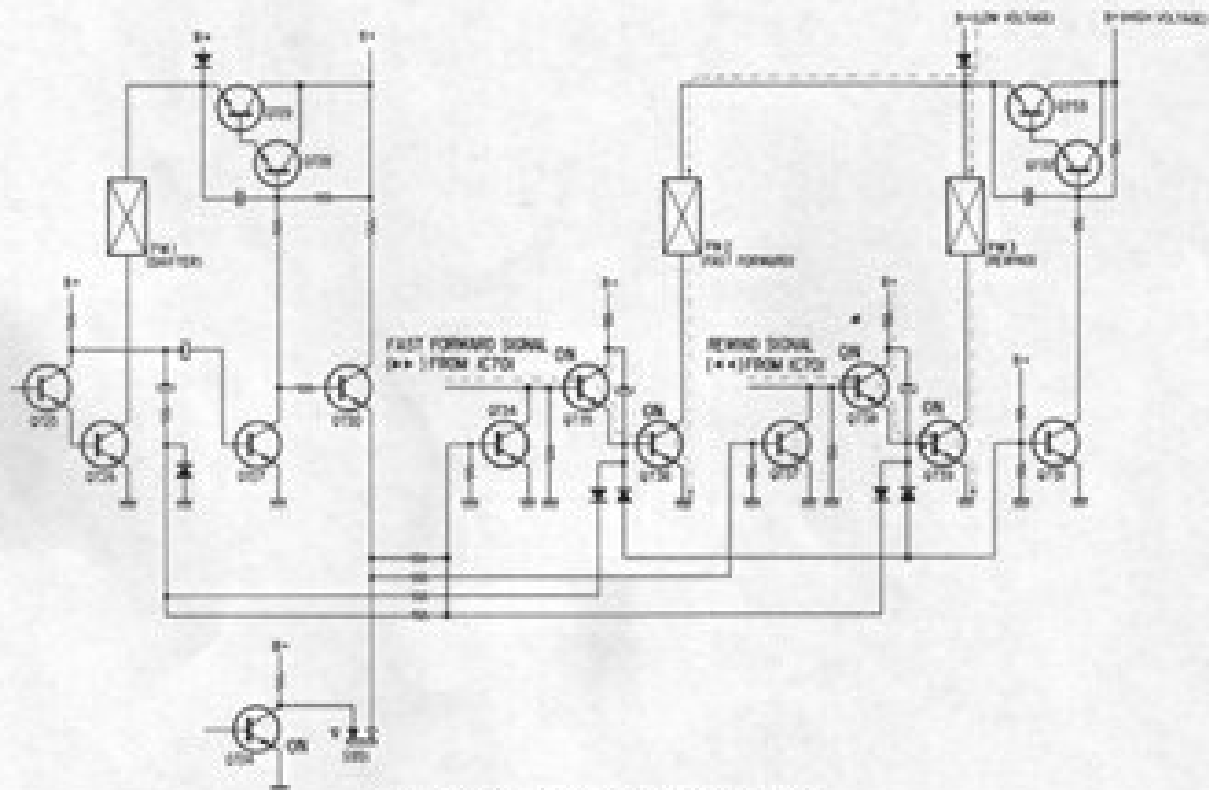


Fig. 1-4 Fast Forward or Rewind Mode

3. STOP mode - record mode (energized PM1, PM2, PM3) (See Fig. 1-5)

1. When the record button is pushed, the record control signal is applied to the base of Q725 and Q738 from the flip-flop Q741/Q742. Then Q725 and Q726 turn ON, and PM1 is energized. According to the operation of Q737 (as same as the operation of Q734 described on section 1), Q738 and Q739 turn ON after PM1 is energized, and PM3 is energized. Energizing of these two solenoids places EL-5 in the record STAND BY mode.
2. Then when the forward button is pushed with the record button pushed, the delay forward (P^D) signal from terminal 6 of IC701 is applied to the base of Q735, so Q735 and Q736 turn ON, and PM2 is energized to place EL-5 in record mode.

4. Record mode - PAUSE mode (energized PM1, PM2, PM3 - de-energized PM2) (See Fig. 1-5)

When the PAUSE button is pushed in forward mode, the PAUSE signal from terminal 2 of IC701 is applied to the base of Q721, so Q721 turns ON. The base of Q735 is grounded, then Q735 and Q736 turn OFF, PM2 is de-energized to place EL-5 in the PAUSE mode.

5. Record mode = fast forward or rewind mode (via temporary STOP mode) (See Fig. 1-7)

When changing directly to the fast forward mode from the record mode, Q725 and Q726 turn OFF and the charge-up current of C721 is applied to the base of Q734 via R778 and R790 while C721 is charged up. Q734 turns ON, and the fast forward (FF) signal from IC701 is temporarily grounded. Q734 turns OFF after C721 is fully charged, so the fast forward signal from IC701 energizes PM2 to place EL-5 in the fast forward mode. When changing directly to the rewind mode from the record mode, a similar chain of events, including the switching of Q737, places EL-5 in rewind mode. Switching of Q737 makes a temporary STOP during the rewind signal is momentarily grounded.

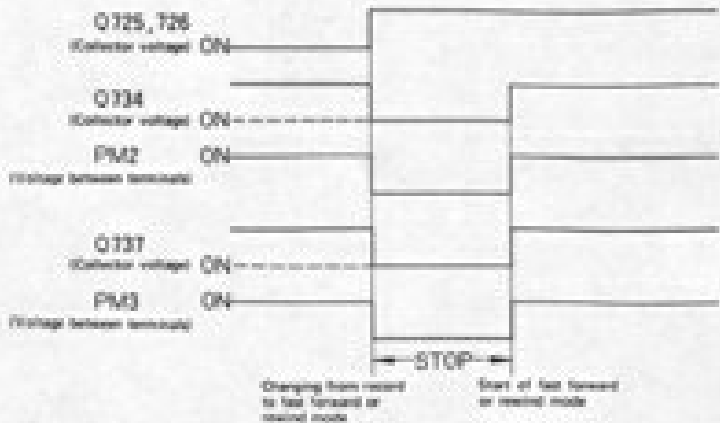


Fig. 1-6 Time Chart

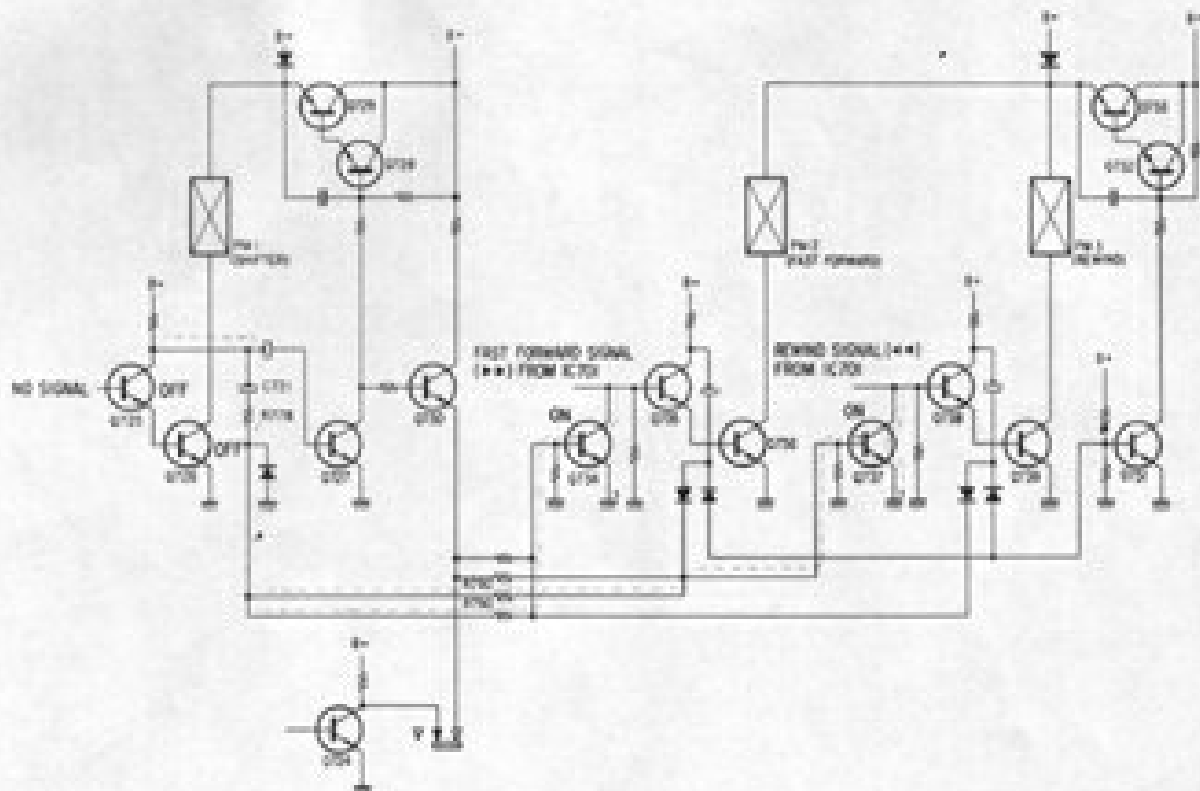


Fig. 1-7 Record Mode - Fast Forward or Rewind Mode

MUTING CIRCUIT

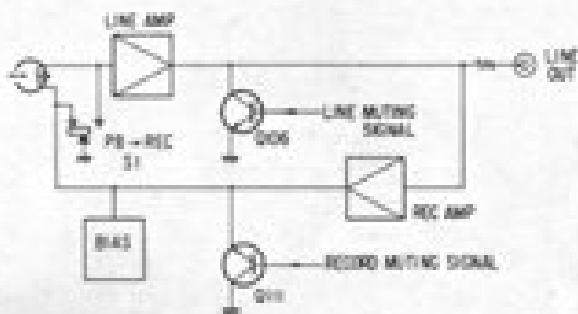


Fig. 1-8 Muting Signal

1. When power switch turned ON (See Fig. 1-9)

Stop signals are generated at Q707 and Q708 by the start-up of the power supply voltage. (See the circuit description of EL-7 for the details on stop signals).

1. Q707 and Q708 turn ON after 2 seconds from turning the power switch to ON. C713 discharges when Q707 and Q708 turn ON, thus Q709's base voltage is decreased and Q709 turns OFF.
2. Q744 turns ON by a base current flowing via R727 and R772, and then Q745 turns OFF. So the record muting signal (via R835, R951 and D952), and the LINE muting signal (via R835 and D951) are applied to the audio circuit.

2. STOP mode (See Fig. 1-10)

Q724 is OFF in STOP mode. And Q744 turns ON by the base current flowing via R770, S951-1 and R771. Thus Q745 turns OFF, so the LINE muting and record muting signals are applied to the audio circuit.

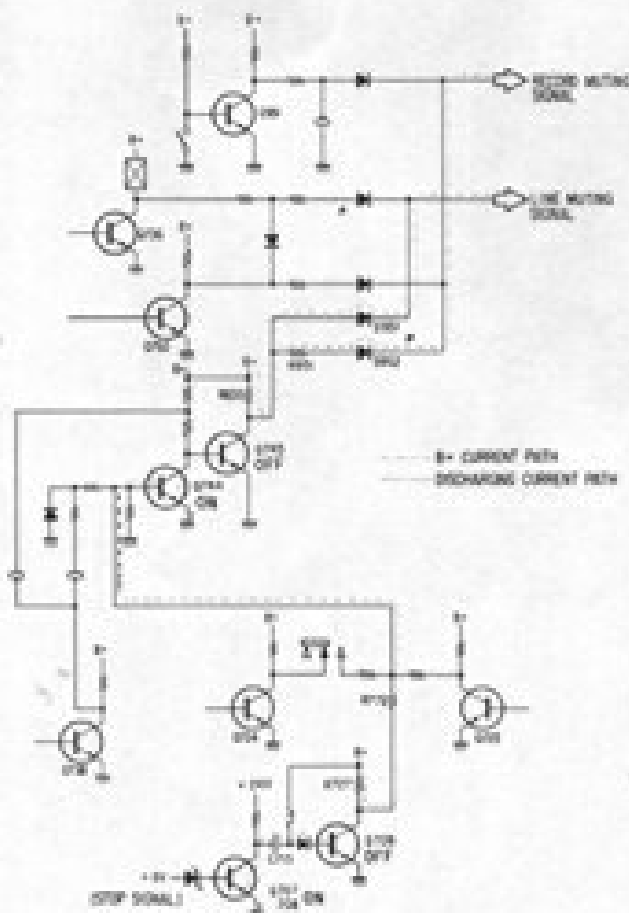


Fig. 1-9 Power Switch Turning ON

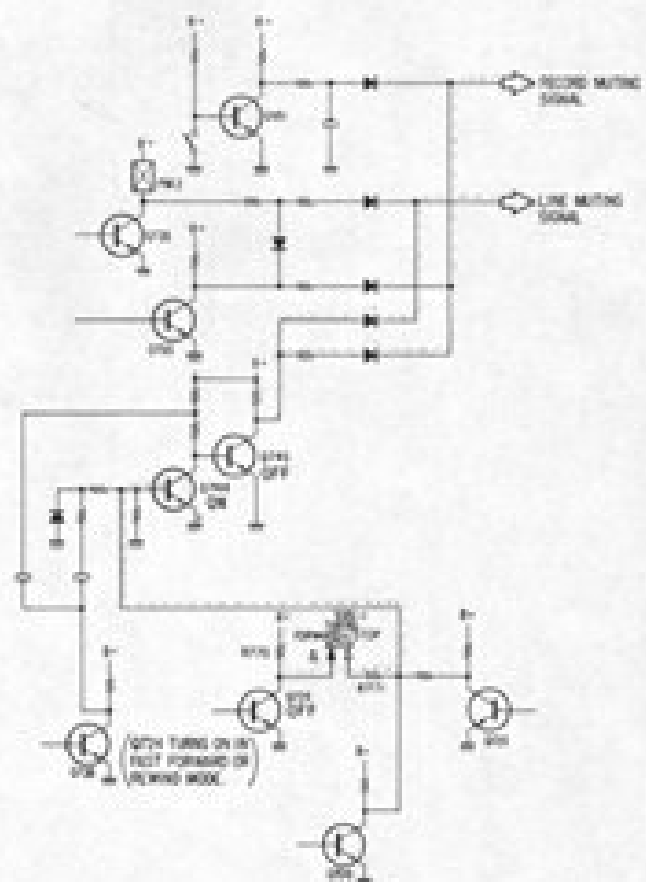


Fig. 1-10 Stop Mode

3. Forward mode (See Fig. 1-11)

Q739 is OFF in forward mode, so only the record muting signal is applied to the audio circuit via PM3, R957, and D955.

4. Fast forward or rewind mode (See Fig. 1-12)

Q725 is OFF in fast forward or rewind mode, so Q744 turns ON by the base current flowing via R776 and R733. Consequently, Q745 turns OFF, and the LINE muting and record muting signals are applied to the audio circuit.

5. STOP mode = record mode, or record mode = STOP mode (See Fig. 1-13)

1. When the record button is pushed in STOP mode, Q738 turns ON. Consequently Q745 turns OFF by the discharging current of C738. So the LINE muting and record muting signals are applied to audio circuit.
2. When the STOP button is pushed in record mode, Q738 turns OFF. Then Q744 turns ON by the charging current of C739, and Q745 turns OFF. So the LINE muting and record muting signals are applied to the audio circuit.

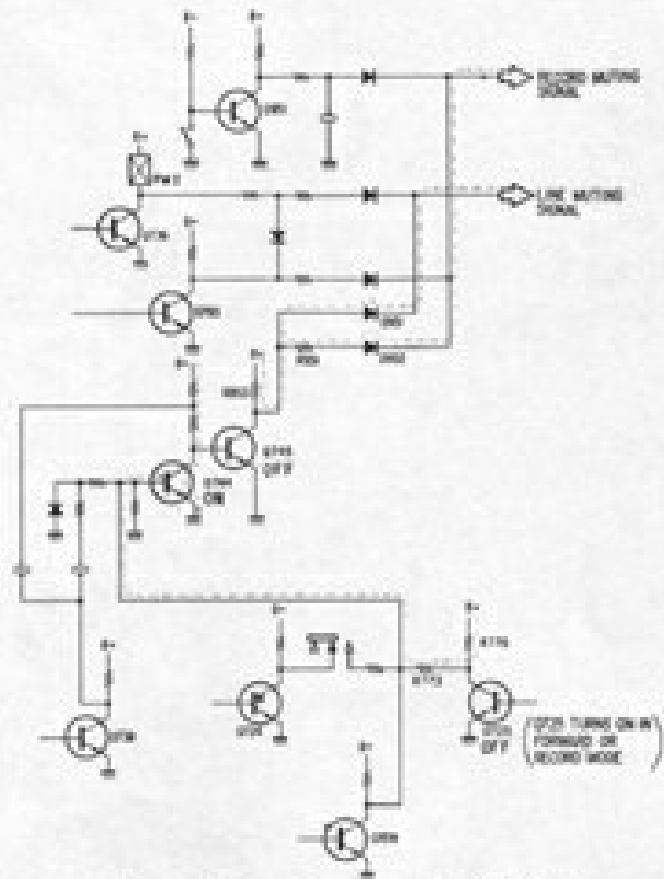


Fig. 1-12 Fast Forward or Rewind Mode

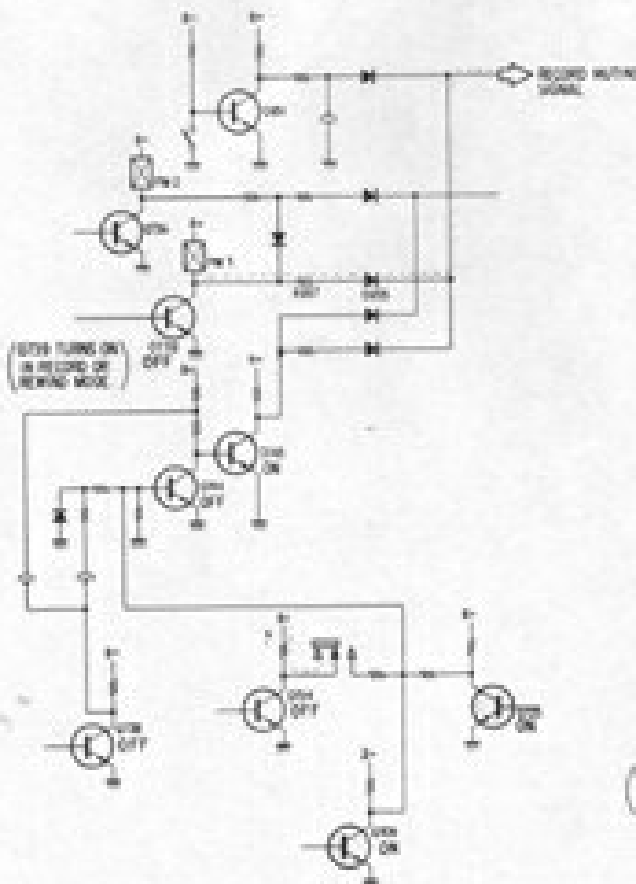


Fig. 1-11 Forward Mode

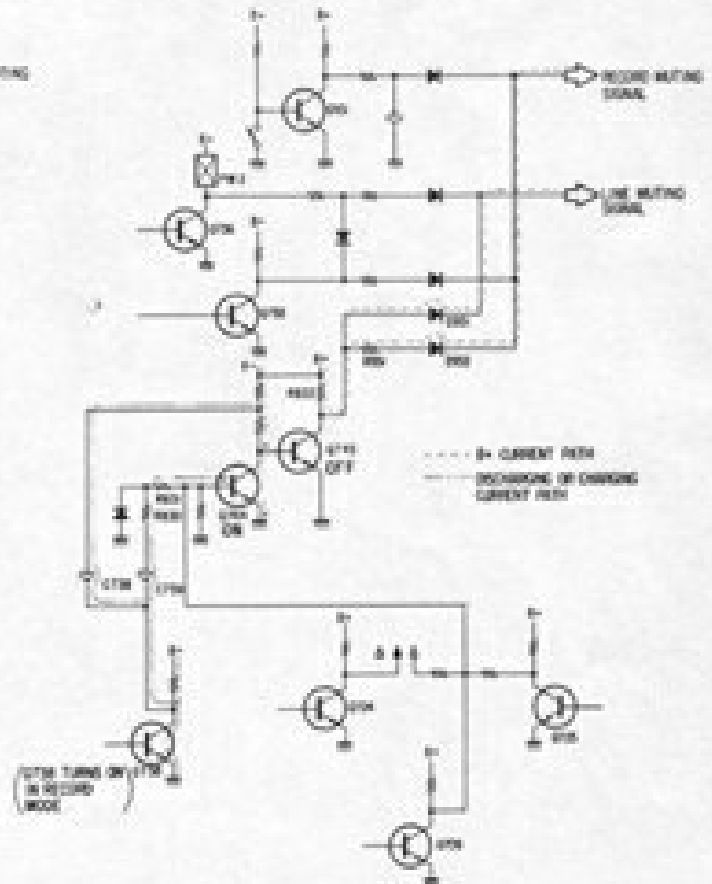


Fig. 1-13 Stop Mode - Record Mode
or
Record Mode - Stop Mode

6. PAUSE mode (See Fig. 1-14)

In the forward/PAUSE mode, Q721 is ON, and Q736 is OFF. Therefore, the LINE muting signal is applied to the audio circuit via PM2, R956, R955, and D954, and the record muting signal is applied via D956, R957, and D955. But in record/PAUSE mode Q739 is ON. So these signals are not applied.

7. REC MUTING (operated by remote control RM-30) (See Fig. 1-15)

When the REC MUTING button of RM-30 is pushed, Q951 turns OFF since its base is grounded. Consequently, only the record muting signal is applied to the audio circuit via R953, R954, and D953.

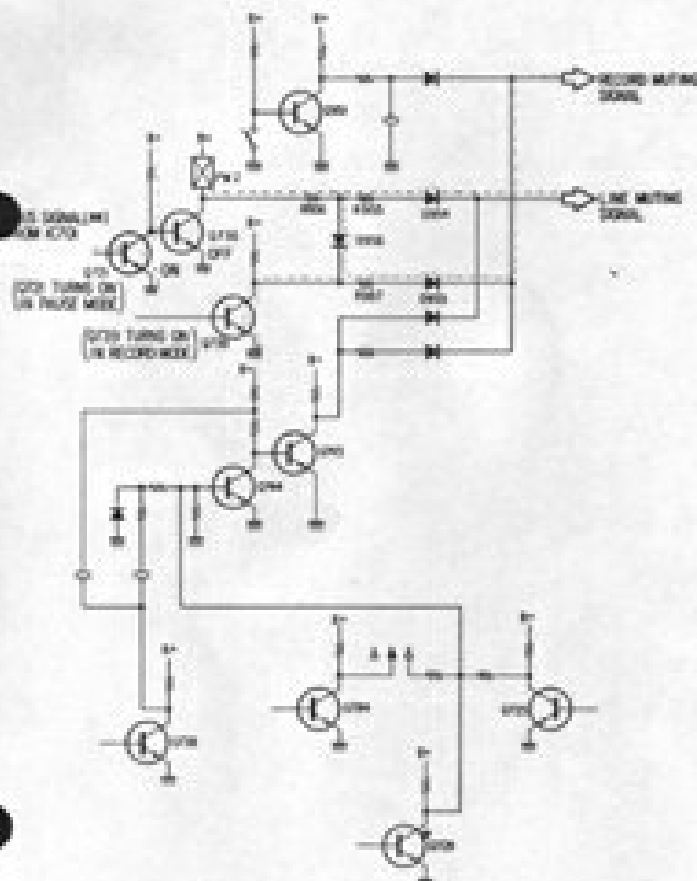


Fig. 1-14 PAUSE Mode

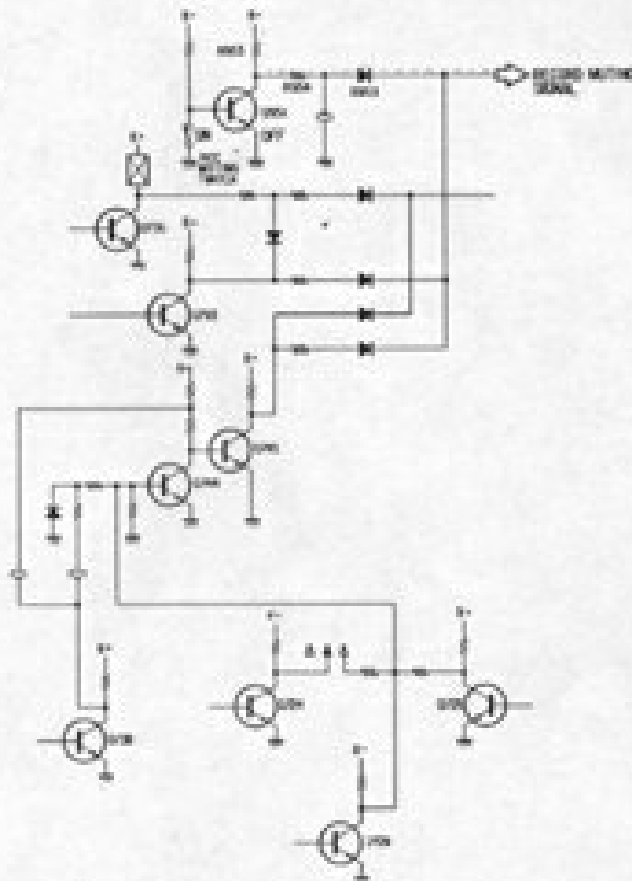
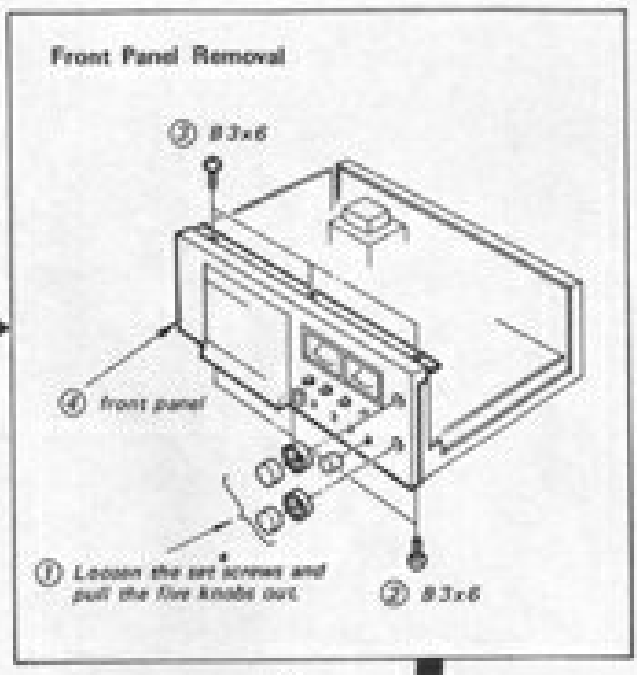
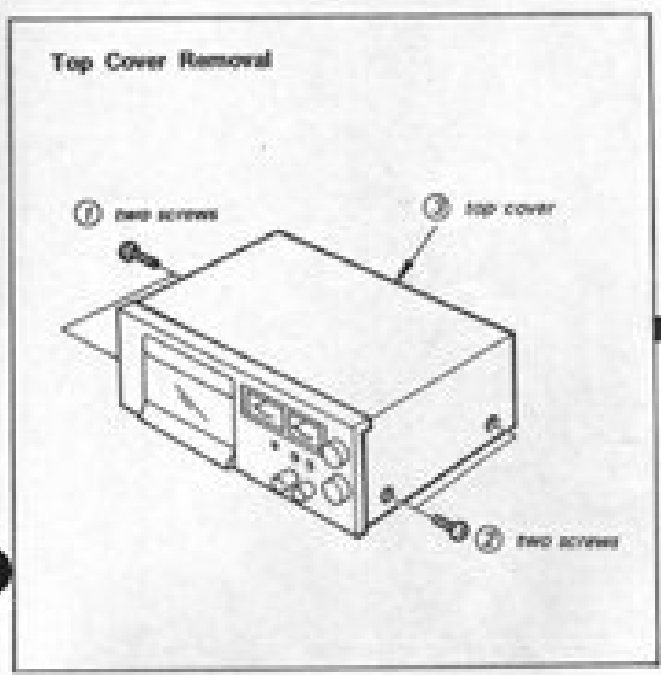
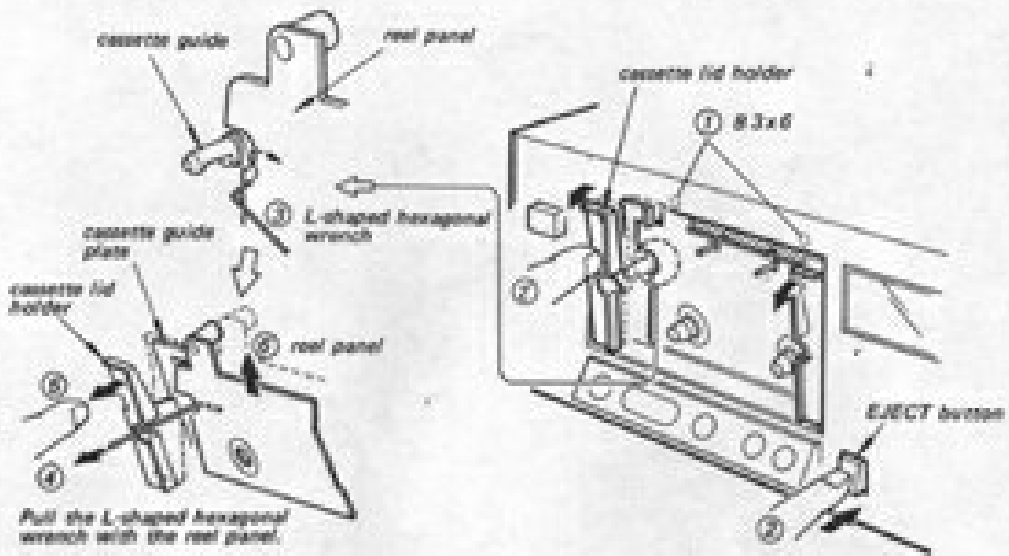


Fig. 1-15 REC MUTING

SECTION 2 DISASSEMBLY



Reel Panel Removal



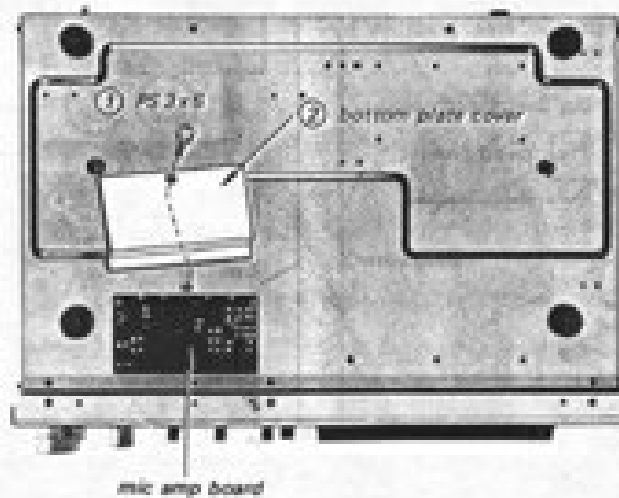
Pull the L-shaped hexagonal wrench with the reel panel.

① Open the cassette lid holder while keeping the reel panel between the cassette guide plate and the cassette lid holder.

Push the EJECT button and stop the cassette lid holder at ② before completely open.

Bottom Plate Cover Removal

(The voltage on the mic amp board can be checked.)



SECTION 3 ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

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

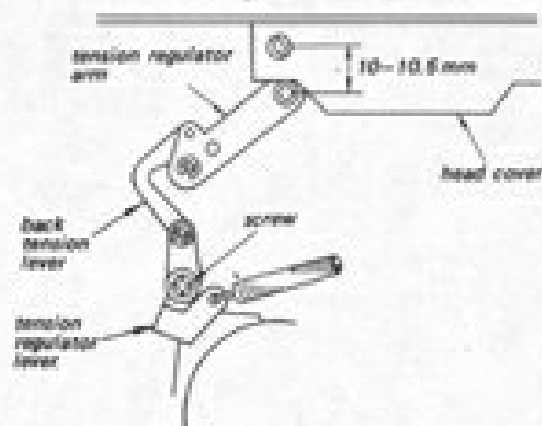
record/playback head	pinch roller
erase head	rubber belts
capstan	idlers
2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply a suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Test Tape L-9-MR (with a mirror) 8-918-064-15

section	1	2	3	4
frequency	315 Hz	7 kHz	12.5 kHz	3 kHz
level	0 dB	-10 dB	-10 dB	0 dB
time	40 sec.	60 sec.	40 sec.	180 sec.

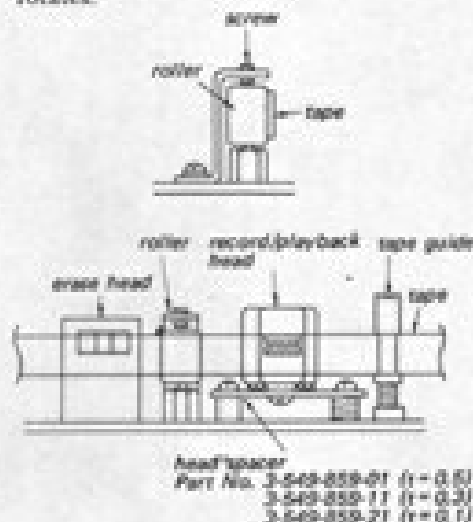
Tension Regulator Arm Position Adjustment — Playback mode —

Adjust the tension regulator arm position by loosening the screw.

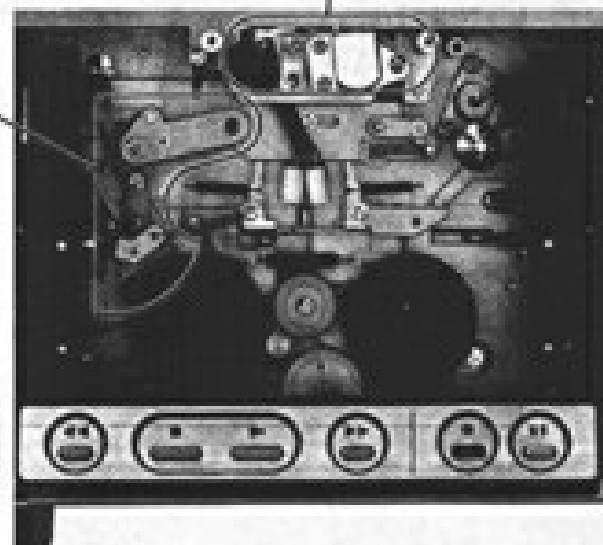
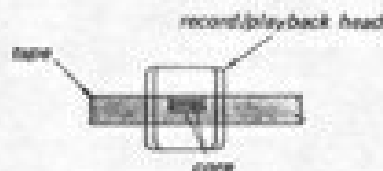


Tape Path Adjustment (Use the test tape L-9-MR) — Playback mode —

1. Adjust the roller height by turning the screw so that the tape runs through the middle of the roller, and make sure that the roller smoothly rotates.



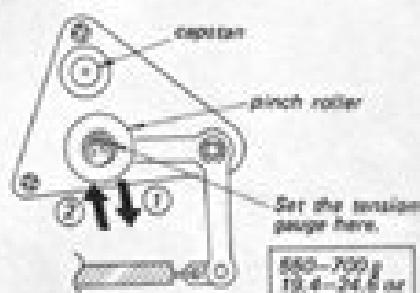
2. Adjust the tape guide height without tape curl.
3. Adjust the record/playback head height by head spacer so that the upper end of tape touches the upper end of core as shown below.



Pinch Roller Pressure Measurement

— Playback mode —

1. Set the tension gauge.
2. Push the tension gauge.
3. Slowly return the pinch roller and read the tension gauge just when the pinch roller starts to rotate.



Tape Retaining Cam Position Adjustment

1. Insert the ELCASET into the cassette holder and press the cassette holder to position the tape retainer as shown in Fig. A. Then, loosen the screws in Fig. C and adjust the tape retaining cam position to obtain the specified clearance *1 and *2 in Fig. B.

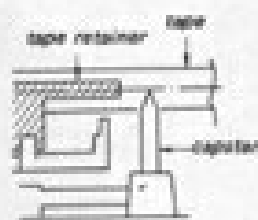


Fig. A

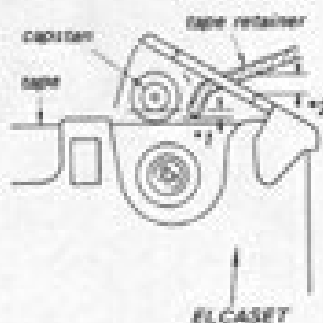


Fig. B

Specification:
 clearance *1: 1-1.5mm
 clearance *2: more than 1mm

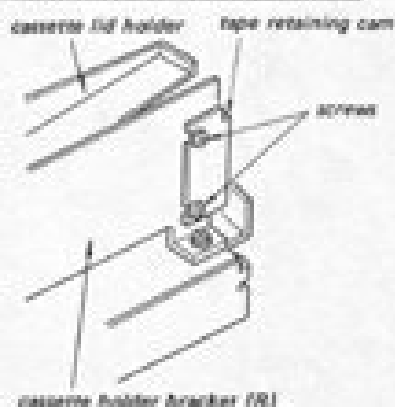
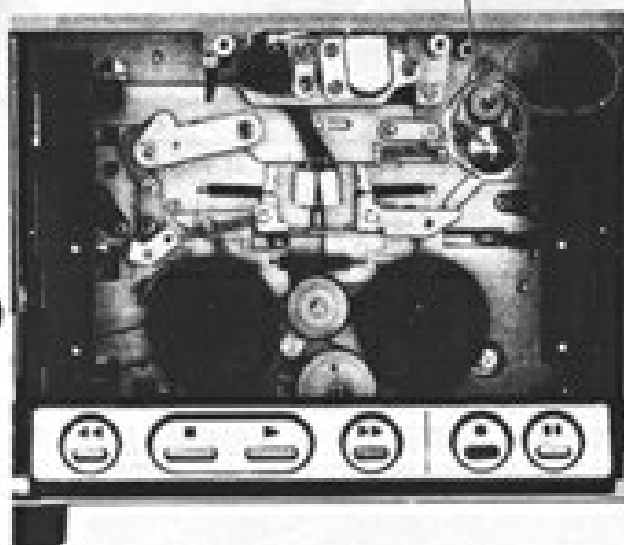
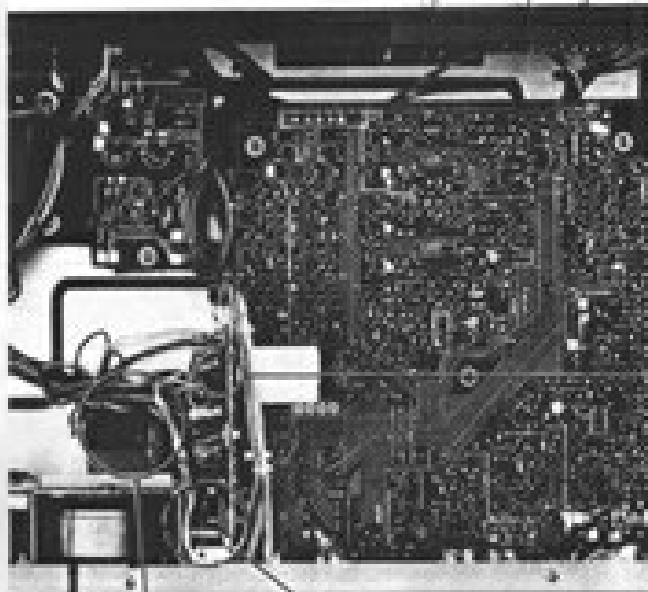


Fig. C

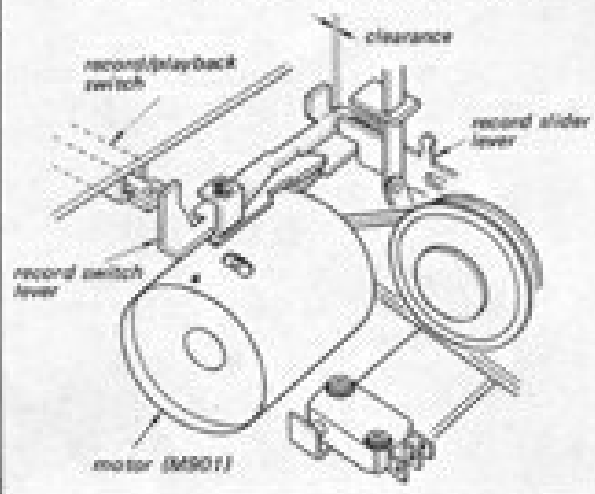
2. Push and lock the cassette holder in and make sure that the tape retainer does not touch the tape.





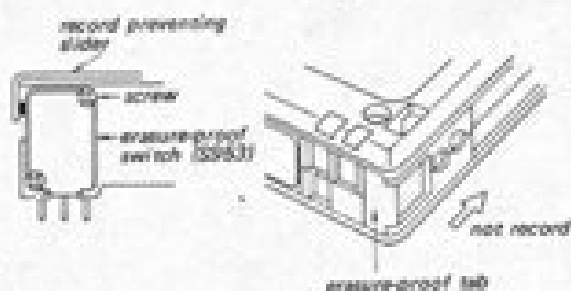
Record Slider Position Check

1. Install the ELCASET.
2. When pushing the record and forward buttons, make sure that the record switch lever completely pushes the record/playback switch (S1).
3. Make sure that the clearance exists between the record switch lever and the record slider.



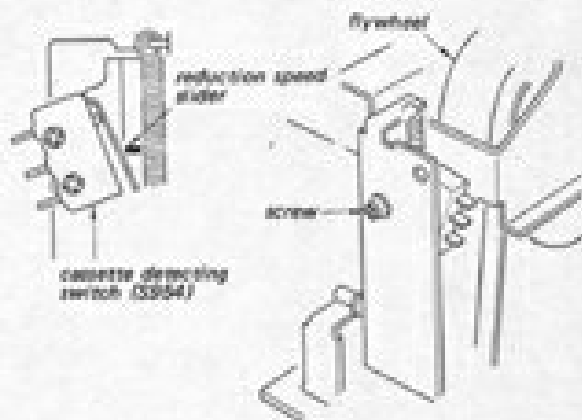
Erase-proof Switch (S953) Position Adjustment

1. When installing the ELCASET whose erase-proof tab does not slide in, make sure that the erase-proof switch (S953) is ON.
2. When installing the ELCASET whose erase-proof tab slides in, make sure that the erase-proof switch (S953) is OFF.
3. If necessary, adjust the erase-proof switch position by loosening the screw.



Cassette Detecting Switch (S954) Position Adjustment

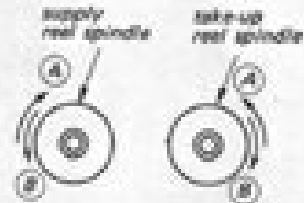
1. When pushing the cassette holder in, make sure that the cassette detecting switch (S954) turns ON and the reduction speed slider does not cross the cassette detecting switch over.
2. When ejecting the cassette holder, make sure that the cassette detecting switch turns OFF.
3. If necessary, adjust the cassette detecting switch position by loosening the screw.



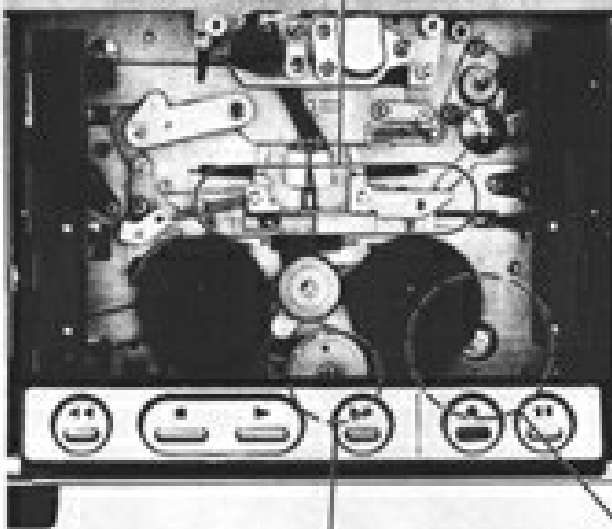
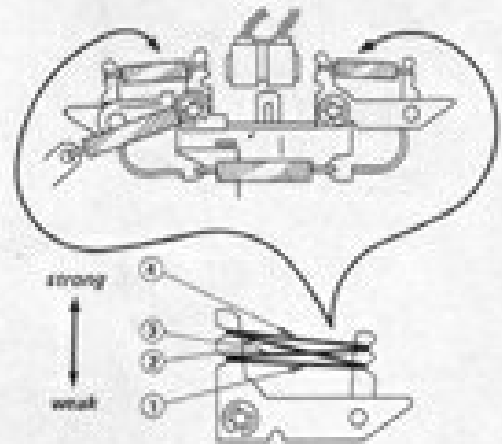
Brake Torque Adjustment

— Stop mode —

Direction	Torque meter reading
(A)	250-300 g.cm (3.5-4.1 oz.in)
(B)	30-40 g.cm (0.42-0.55 oz.in)



If necessary, change the spring position.

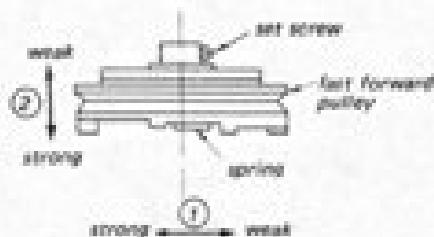


Fast Forward and Rewind Torque Adjustment

— Fast forward or rewind mode —

Torque meter	Meter reading
CQ-201L	200-250 g.cm (2.8-3.4 oz.in)

1. Change the spring position.
2. If necessary, change the fast forward pulley height.

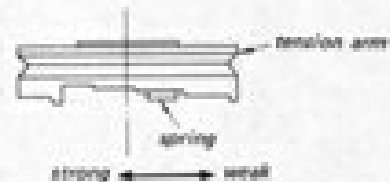


Forward Torque Adjustment

— Playback mode —

Torque meter	Meter reading
CQ-101L	90-120 g.cm (1.25-1.66 oz.in)

If necessary, change the spring position.



Back Tension Torque Measurement

— Playback mode —

Torque meter	Meter reading
CQ-101L	65-100 g.cm (0.91-1.38 oz.in)

3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustments 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.

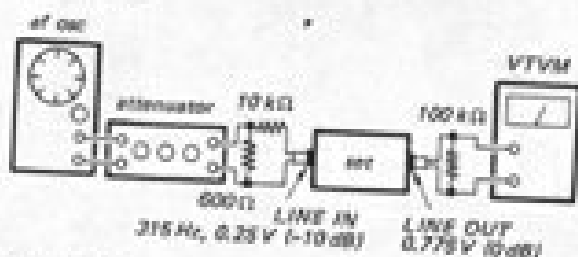
- | | |
|--------------------------|-------------------------------------|
| POWER switch: | ON |
| TIMER switch: | OFF |
| MEMORY switch: | OFF |
| DOLBY NR switch: | OFF |
| MPX FILTER switch: | OFF |
| TAPE SELECT EQ switch: | TYPE I |
| TAPE SELECT BIAS switch: | TYPE I |
| LEVEL ADJUST control: | fully clockwise (on the rear panel) |

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

Blank Tape	EQ switch	BIAS switch
CS-60 (SLR)	TYPE I	TYPE I
CS-70 (DUAD)	TYPE II	TYPE II

Standard Record

Set the REC LEVEL-LINE control for the specified output level. (REC LEVEL-MIC control: 0 position).



Standard Input Level

	MIC	LINE IN
source impedance	300 Ω	10 kΩ
input level	0.77 mV (-40 dB)	0.25 V (-10 dB)

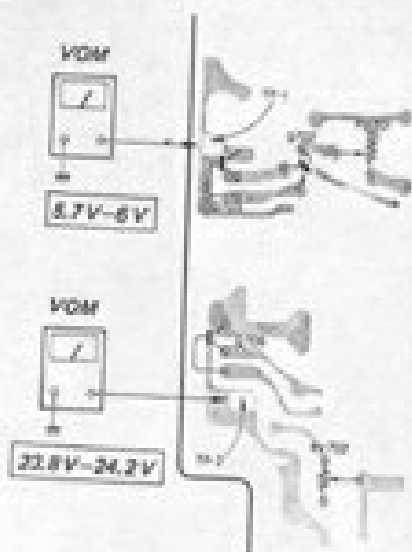
Standard Output Level

	LINE OUT	HEADPHONES
load impedance	100 kΩ	8 Ω
output level	0.775 V (0 dB)	0.12 V (-16 dB) (PHONES LEVEL: fully clockwise)

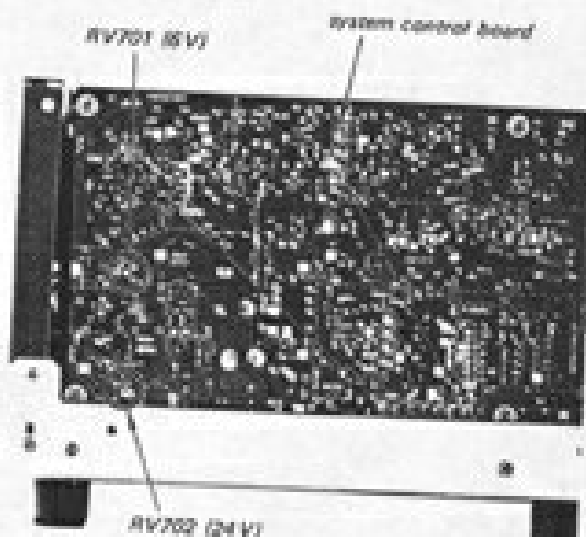
DC Voltage Adjustment

Procedure:

Adjust RV701 and RV702 for specified VOM readings.



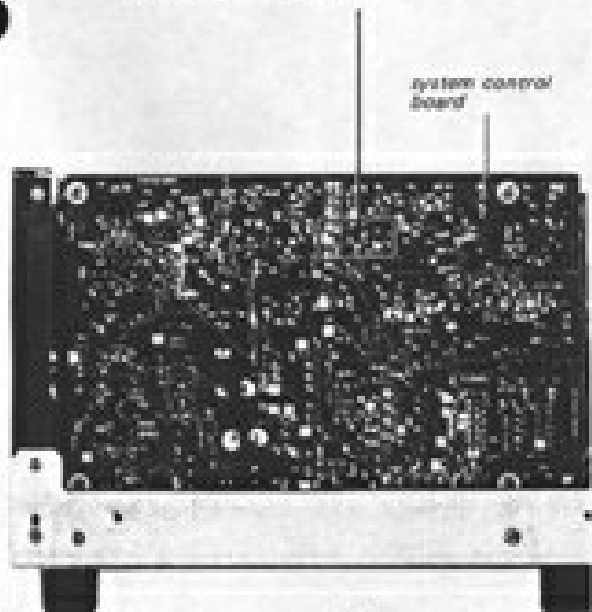
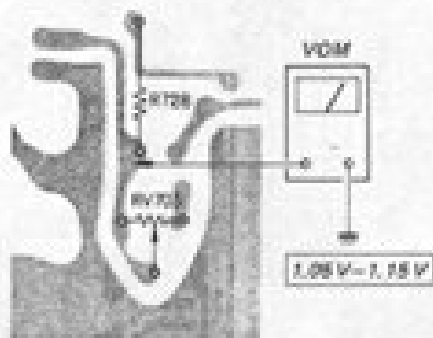
Adjustment Location:



Auto Shut-off Voltage Adjustment

Procedure:

1. Play back the leader tape portion of test tape.
2. Adjust RV703 for the specified VOM reading.

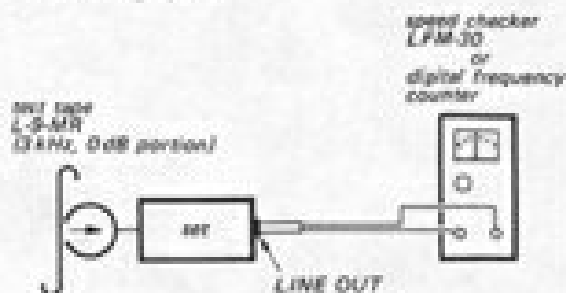


system control board

Tape Speed Adjustment

Procedure:

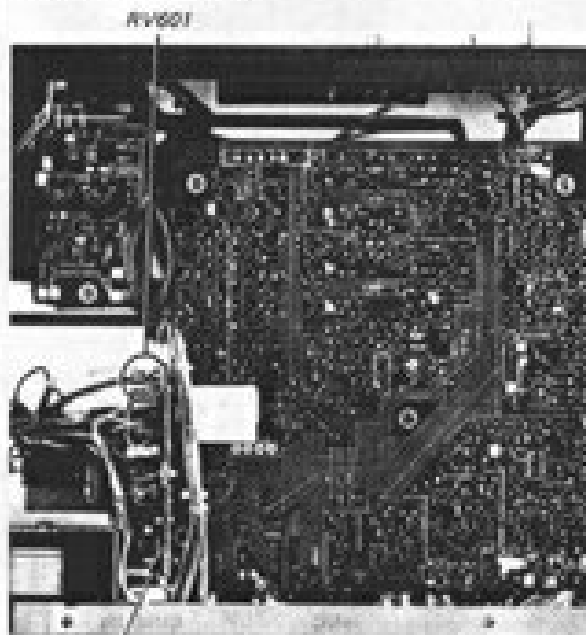
Mode: playback



Specification:

Speed checker	Digital frequency counter
± 0.65%	2,980-3,020 Hz

Adjustment Location:



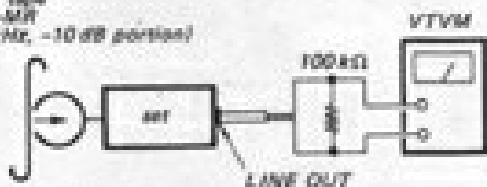
servo amp board

Record/playback Head Azimuth Adjustment

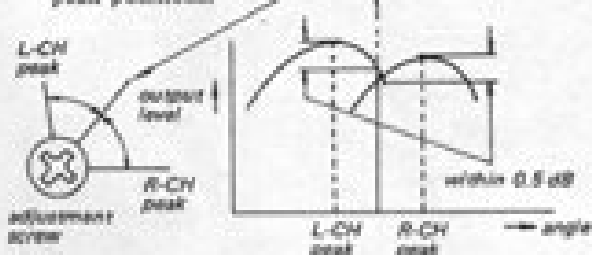
Procedure:

1. Mode: playback

test tape
L-3-MR
(7 kHz, -10 dB portion)

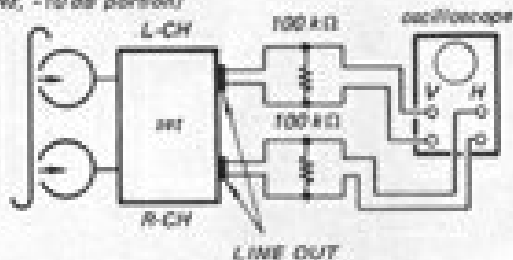


2. Turn the adjustment screw for the maximum level and set it to the mechanical mid position between L-CH and R-CH peak positions.



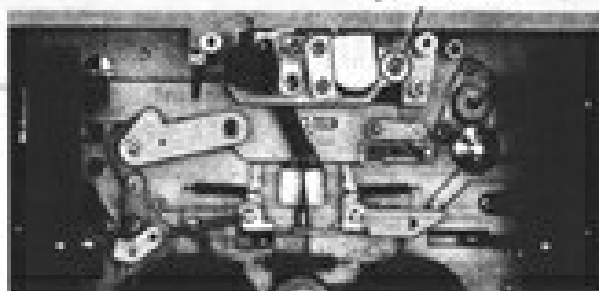
3. Mode: playback

L-3-MR
(7 kHz, -10 dB portion)



Screen pattern					
in-phase		30°	90°	135°	180°
good		wrong			

Adjustment Location:
(without head cover)

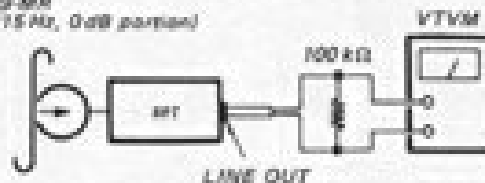


Playback Level Adjustment

Procedure:

- Mode: playback

test tape
L-3-MR
(7.5 kHz, 0 dB portion)



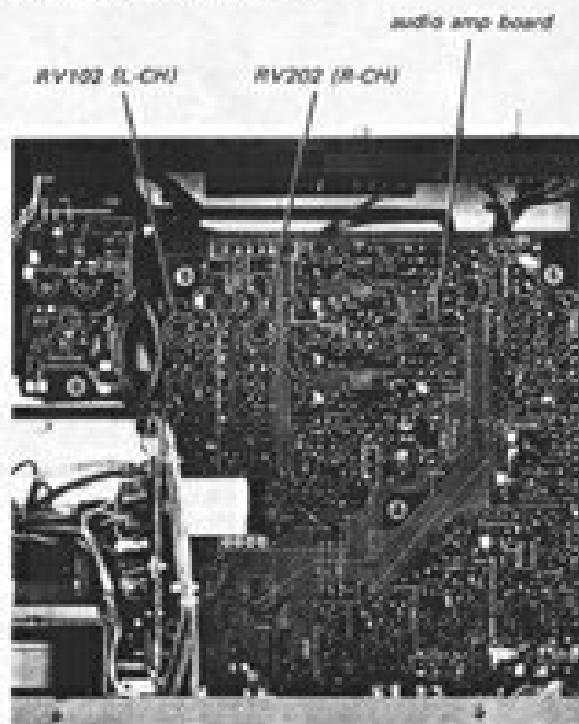
Specification:

LINE OUT Level: 0.73V-0.89V
(0 dB ± 0.5 dB)

Level difference between channels:
less than 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:

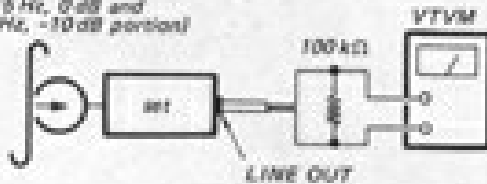


Playback Equalizer Adjustment

Procedure:

Mode: playback

test tape
 1/2-MW
 (315 Hz, 0 dB and
 7 kHz, -10 dB portions)



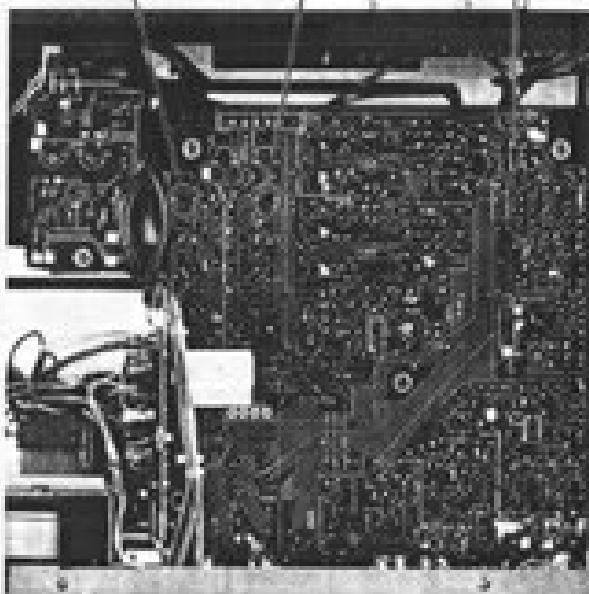
Specification:

7 kHz level difference from 315 Hz:
 -10 dB ± 0.5 dB

Note: After the playback equalizer adjustment
 make sure that 315 Hz level is between
 0.73V and 0.89V (0 dB ± 0.5 dB).

Adjustment Location:

RV101 (L-CH) RV201 (R-CH) audio amp board



Level Meter Calibration

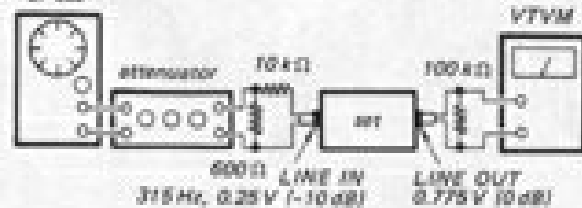
Setting:

RCC LEVEL-LINE control: standard record
 (See page 20)

Procedure:

1. Mode: record

af osc

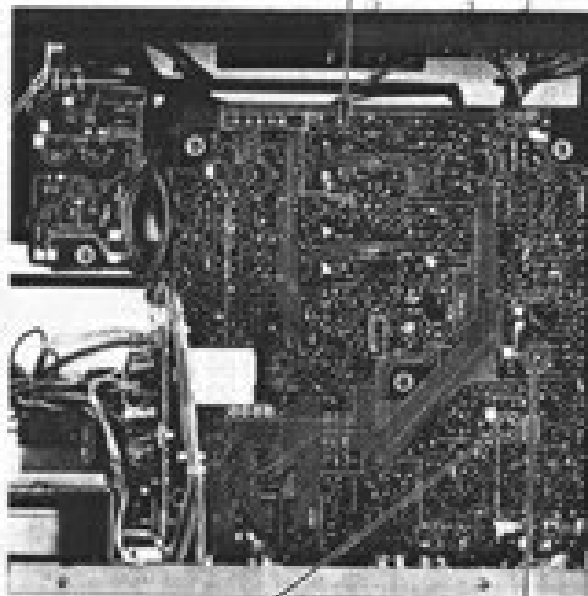


2.

Adjust	VU Meter indication
RV103 (L-CH)	
RV203 (R-CH)	

Adjustment Location:

audio amp board



Note: The pointer should move smoothly.

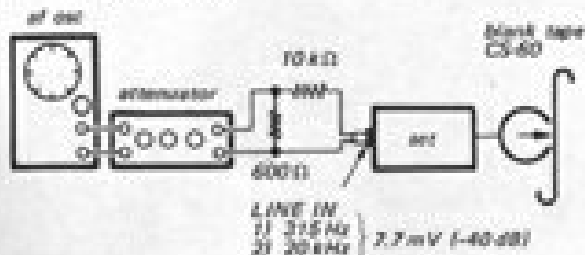
Record Bias Adjustment

Setting:

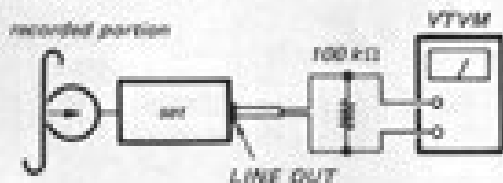
REC LEVEL-LINE control: standard record
(See page 20.)

Procedure:

1. Mode: record

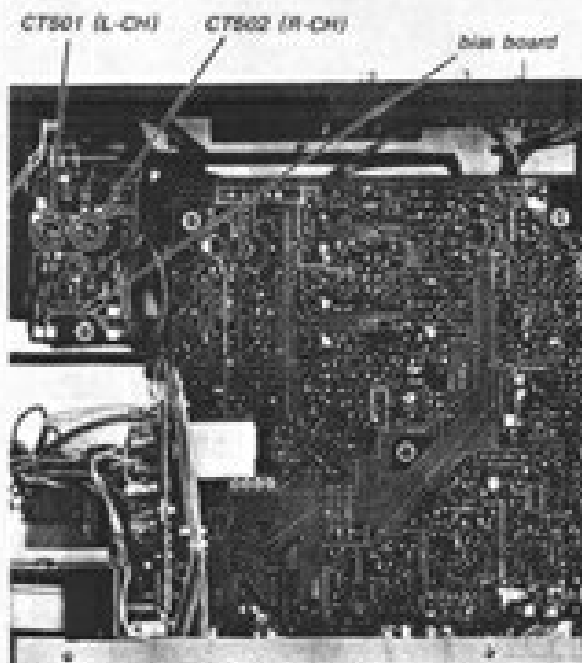


2. Mode: playback



3. Repeating above steps, adjust CT501 (L-CH) and CT502 (R-CH) to make 20 kHz and 315 Hz signal output levels equal.

Adjustment Location:



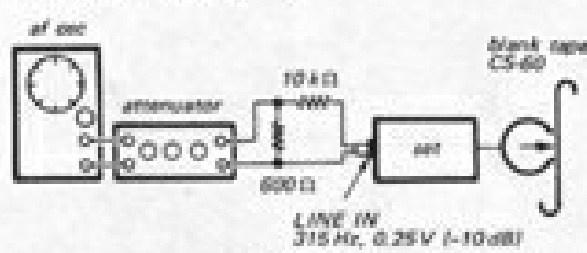
Record Level Adjustment

Setting:

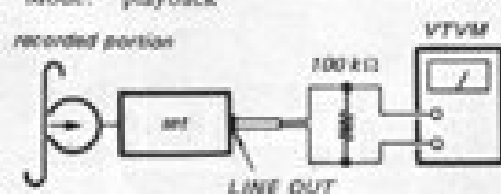
REC LEVEL-LINE control: standard record
(See page 20.)

Procedure:

1. Mode: record

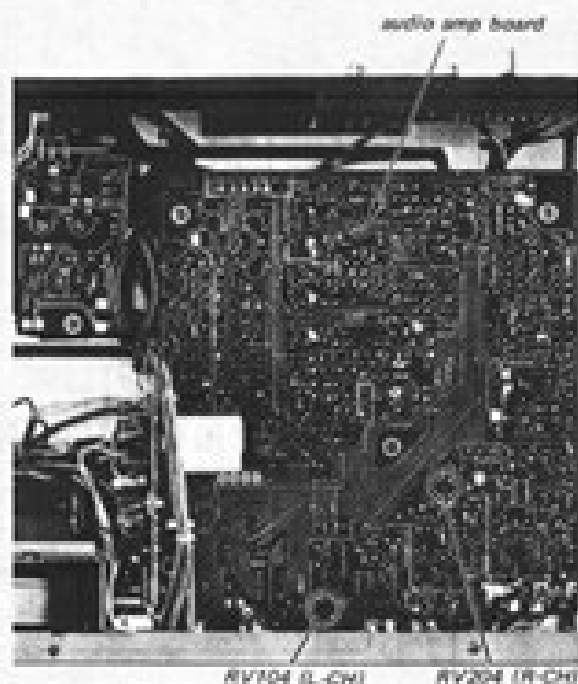


2. Mode: playback



3. Repeating above steps, adjust RV104 (L-CH) and RV204 (R-CH) to obtain 0.69 V-0.85 V (0 dB ± 1 dB) reading on VTVM.

Adjustment Location:

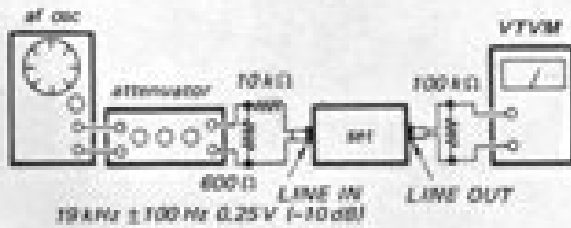


MPX Filter Adjustment

Setting:

MPX FILTER switch: ON
 REC LEVEL-LINE control: Standard record
 (See page 20.)

Procedure:

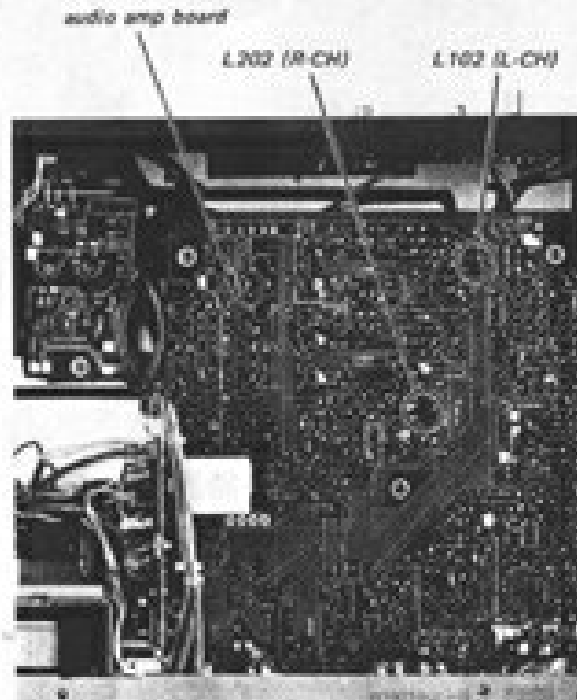


Adjust L102 (L-CH) and L302 (R-CH) for a minimum reading on VTVM.

Specification:

LINE OUT level: less than 22 mV (-32dB)

Adjustment Location:

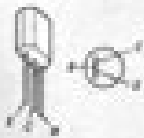


SECTION 4
DIAGRAMS

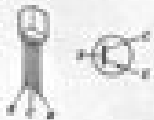
4-1. MOUNTING DIAGRAM — Amplifier Section —
— Conductor Side —

Note: [] : Replacement Semiconductors.

- Q102, 103
 - Q202, 203
 - Q301, 302
 - Q401, 402
 - Q104, 105
 - Q204, 205
 - Q107-110
 - Q207-210
 - Q112, 113
 - Q212, 213
 - Q115
 - Q301, 302
- } : 2SC633A
- } : 2SC634A



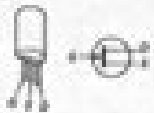
- Q108, 111
 - Q208, 211
 - Q114
- } : 2SC1474
- } : 2SC1475



- Q116 : 2SA478



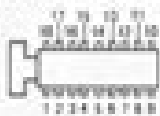
- Q101, 301 : 2SK43



- D-101, 201
 - D-102, 202
- } : 1T22 (1T22A)



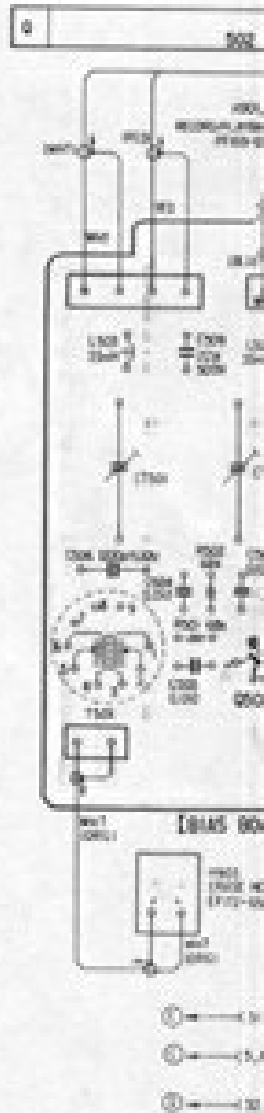
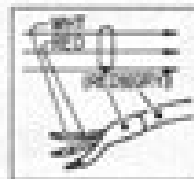
- IC101, 201 : CX604

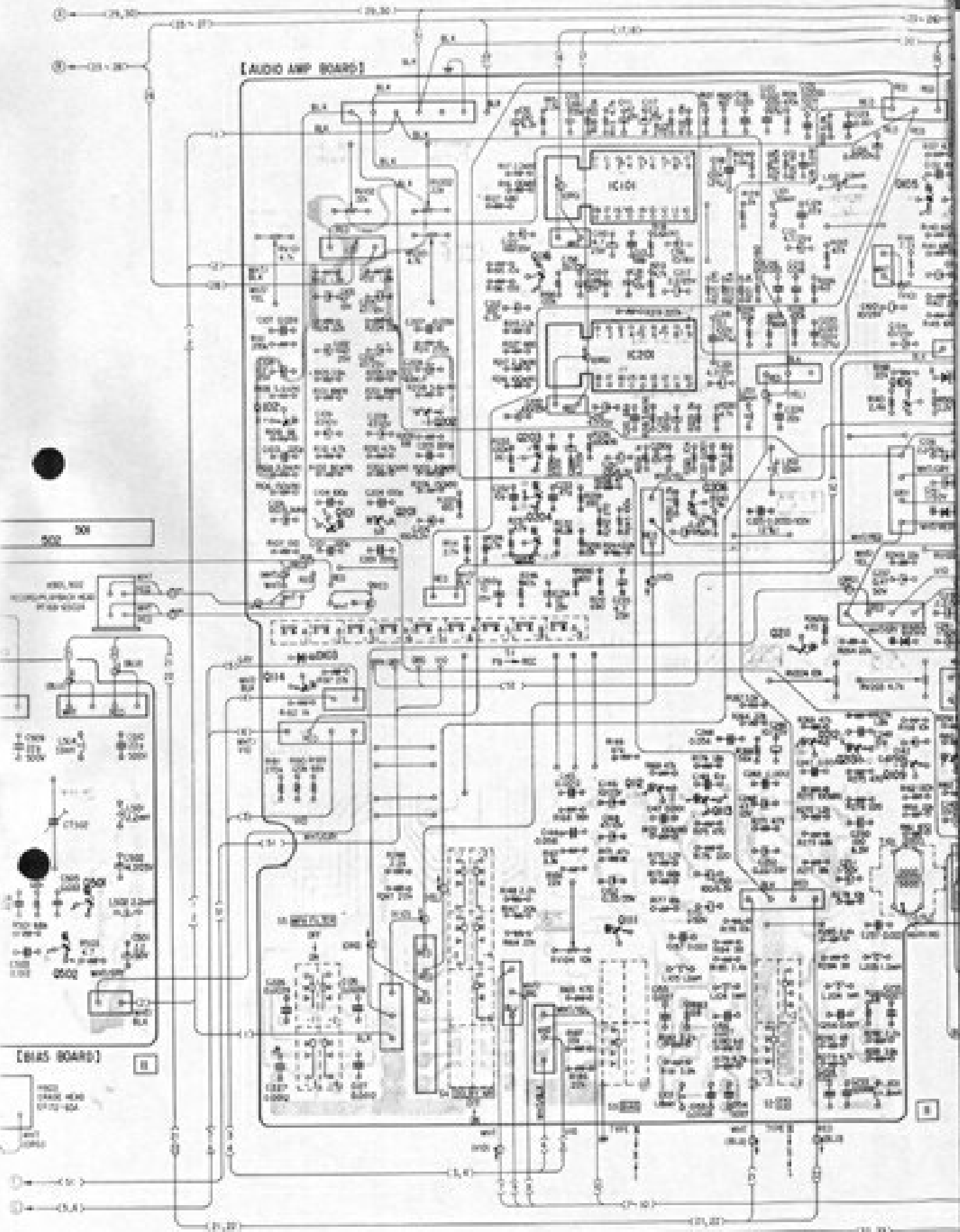


(Top view)

Note:

- [] : B+ pattern
- [] : B- pattern
- Color code of sleeving over the end of the jacket.

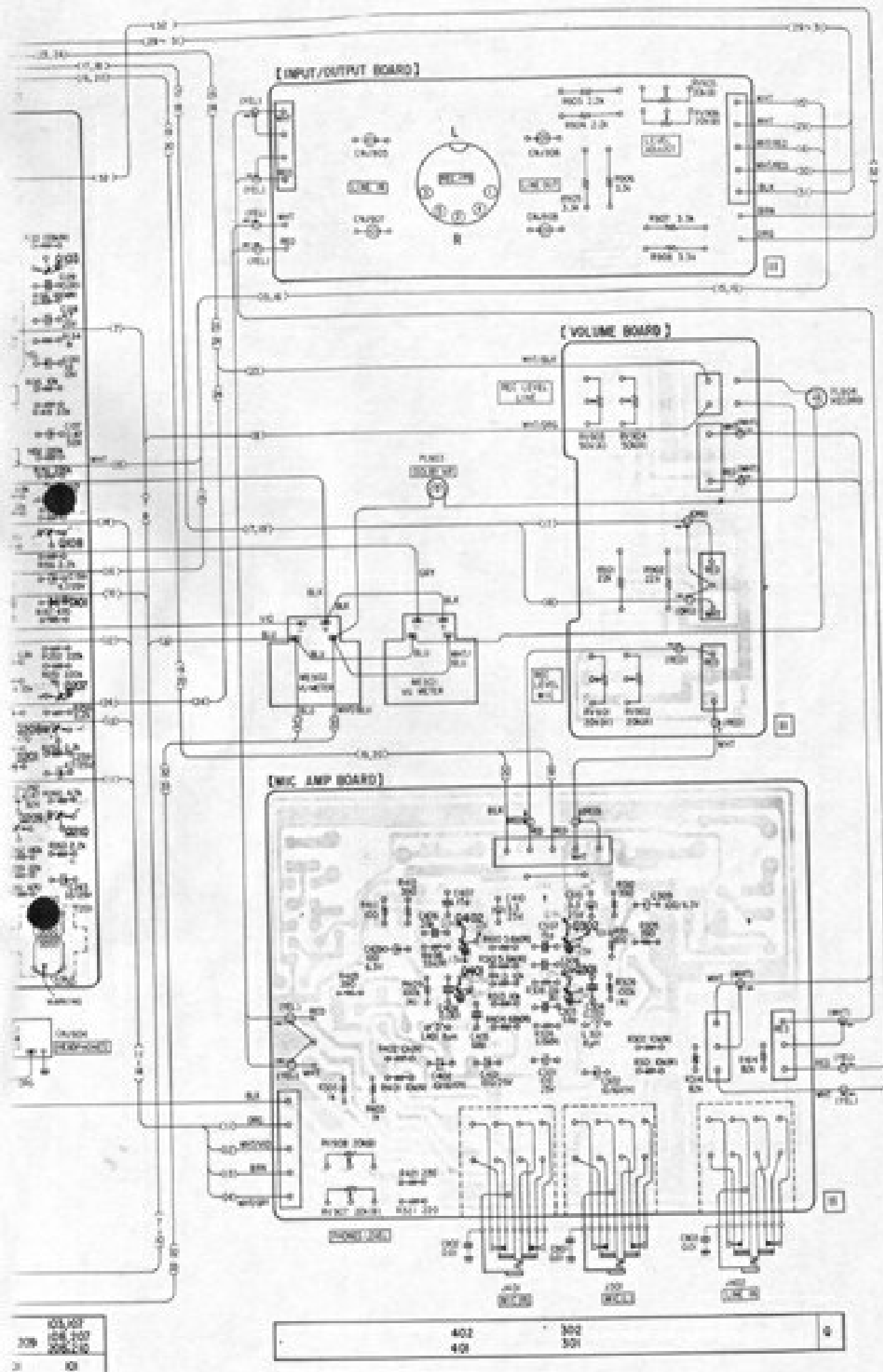




502 508

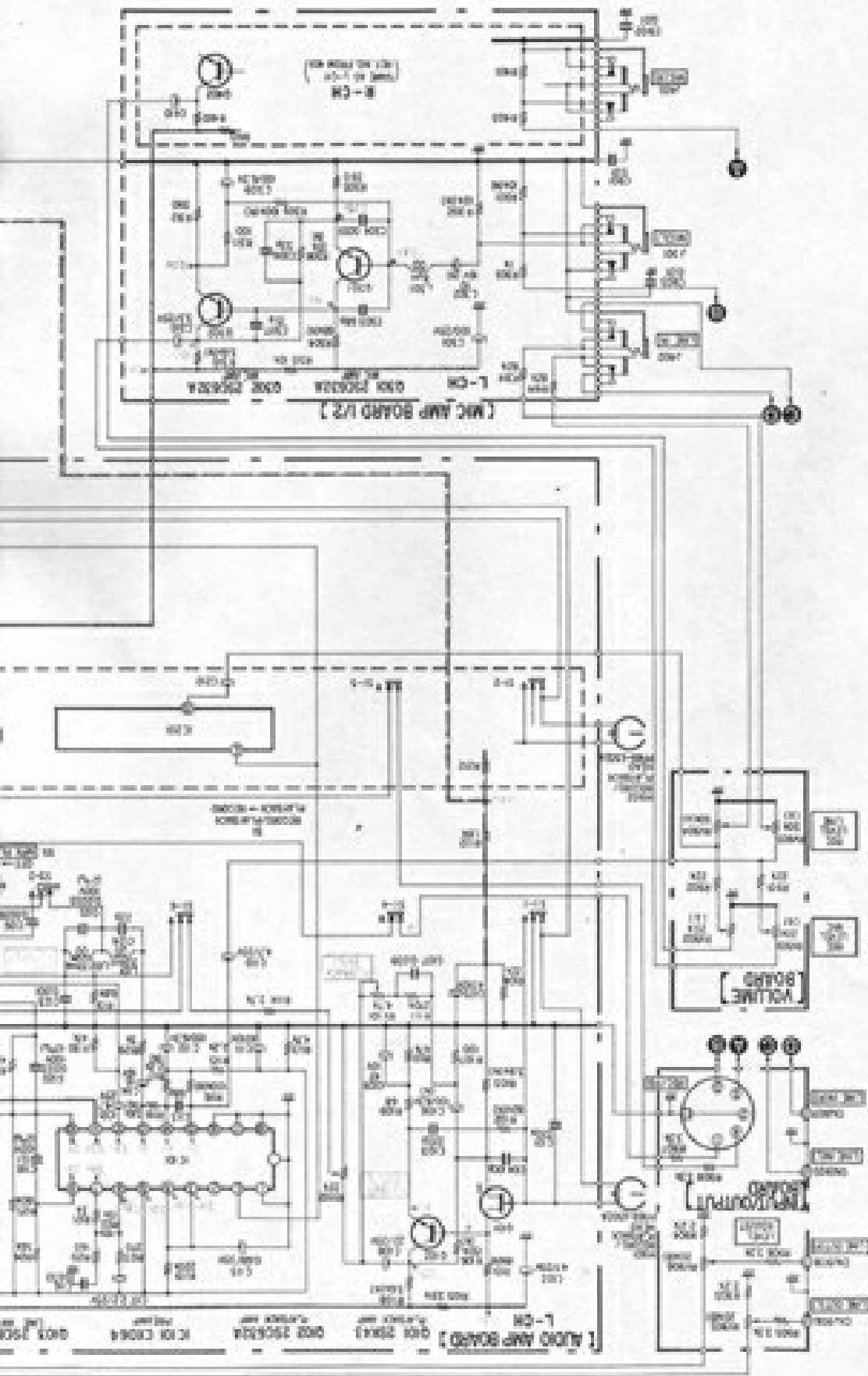
BIAS BOARD

0	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	
0	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99

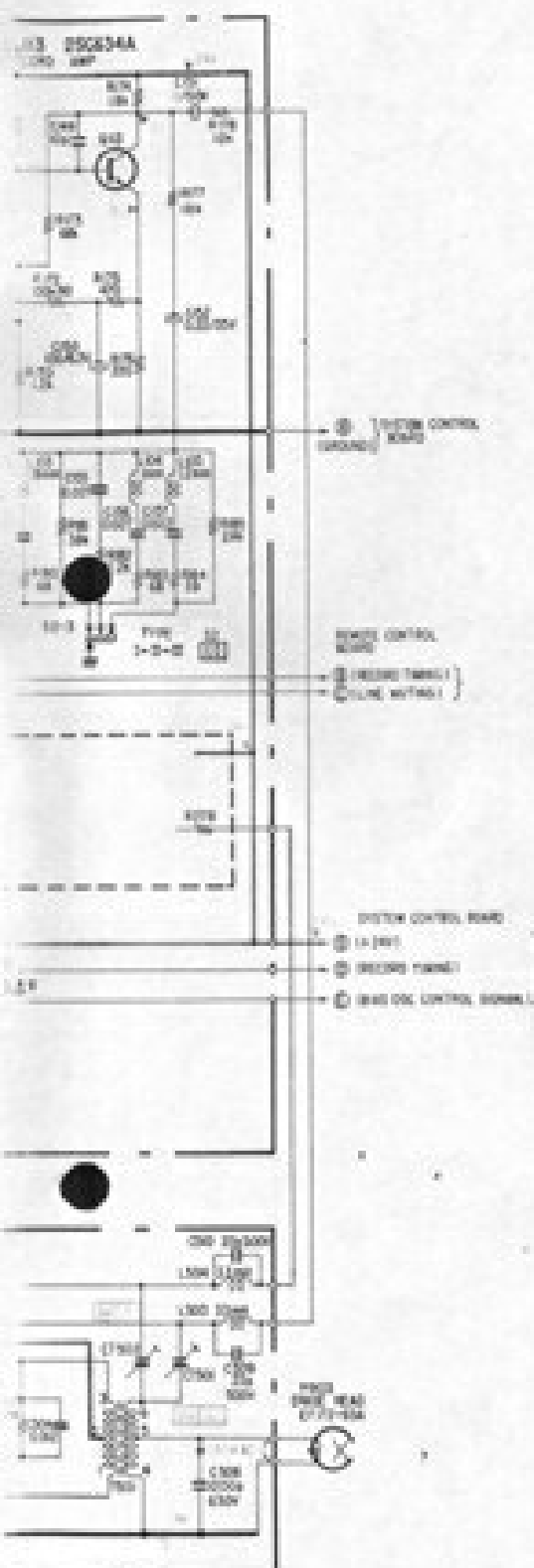


209	25.00
	100.00
	200.00
	300.00

402	302	4
401	301	



4-2. SCHEMATIC DIAGRAM - Amplifier Section -



Note:

- Components for right channel have the same values as for left channel.
- All capacitors are in μF unless otherwise noted. $\mu\text{F} = \mu\mu\text{F}$. 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, $\%W$ unless otherwise noted. $k\Omega = 1000\Omega$, $M\Omega = 1000k\Omega$.
- All adjustable resistors have characteristic curve B, unless otherwise noted.
- (N) : low-noise capacitor and resistor.
- 2% indicates component tolerance.
- Transistor is used for Q115.
- $\text{---} \text{---}$: B+ bus.
- $\text{---} \text{---}$: panel designation.
- $\text{---} \text{---}$: adjustment for repair.
- $\text{---} \text{---}$: chassis ground.
- $\text{---} \text{---}$: B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions in stop mode with a VOM (20 $k\Omega/V$).
 | : second
- 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.
- Switch:

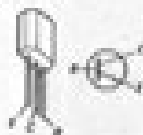
Ref. No.	Switch	Position
S1	RECORD/PLAYBACK	PLAYBACK
S2	EQ	TYPE III
S3	BIAS	TYPE III
S4	DOLBY NR	OFF
S5	MPX FILTER	OFF
S5S1	TIMING	STOP

4-3. MOUNTING DIAGRAM - System Control Section -

- Conductor Side -

Note: () : Replacement Semiconductors.

Q601, 602
Q701, 702, 704, 706
Q707-709, 713-721
Q723-725, 727, 728
Q730-732, 734, 735
Q737, 738, 740-745
Q801



D602, 718, 719, 734
D736, 739
D601, 712-717,
D722-725, 729
D731-733, 736
D737, 738, 740-743
D901-906



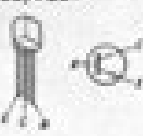
D603, 722: 25C1173
D703, 706: 25C1061



D701-708, 721 : 34801-02 (10E2)
D726-730 : EQA01-07S (EQ801-07)
D710 : EQA01-07S (EQ801-07)
D711 : EQA01-12R (EQ801-12Z)



Q732: 25C1318 (25C1475)
Q736, 739 : 25C1384 (25C1475)
Q738, 739



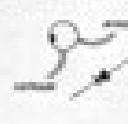
D603, 722: MV203V



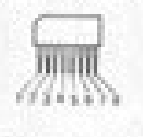
Q716, 711: 25A678



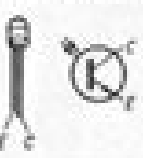
D709: VD1222



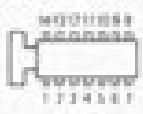
IC601: CX865



Q901: TP5603

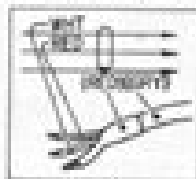


IC701: CX738

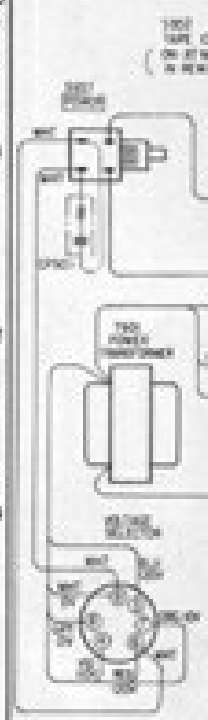


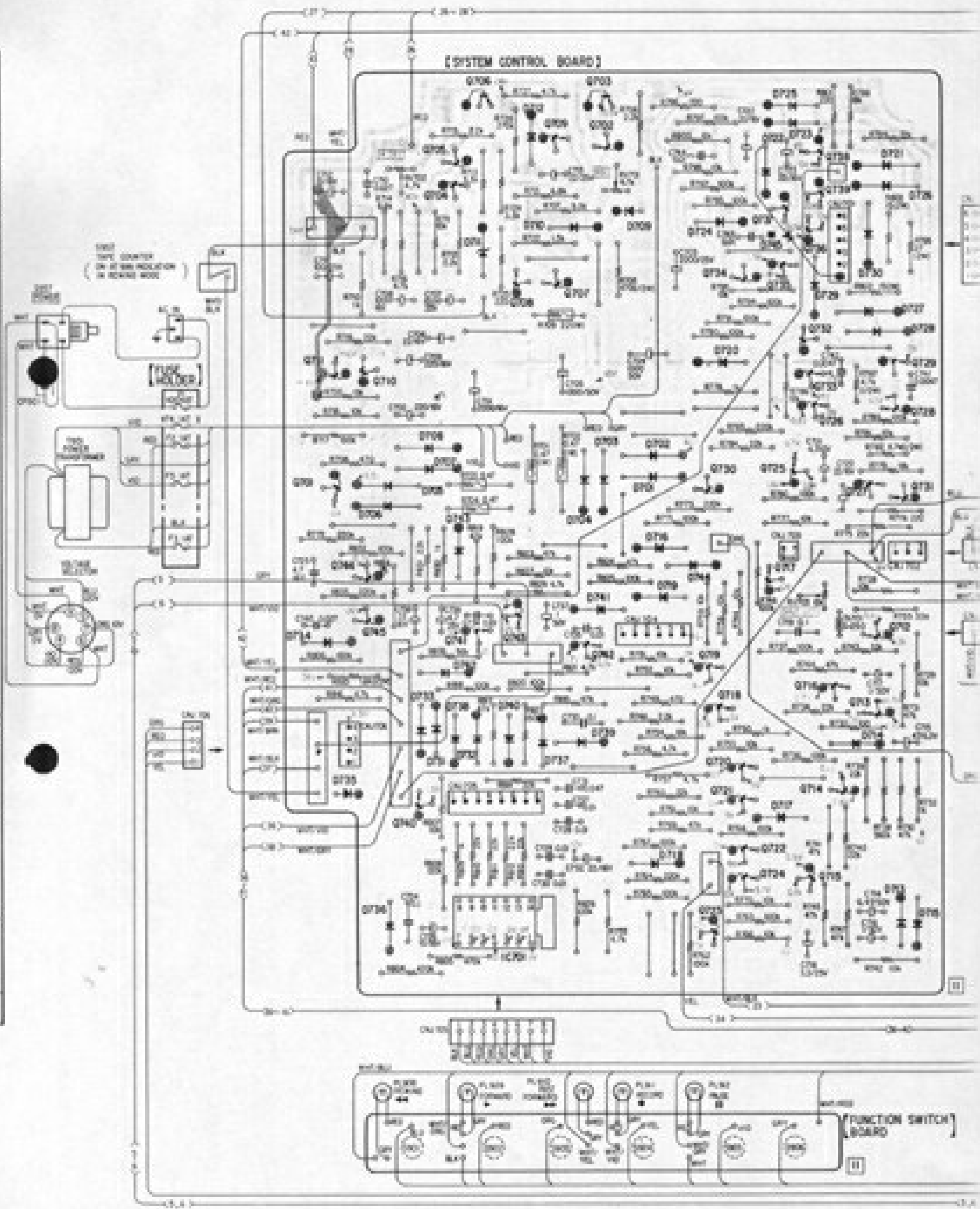
Note:

- : B+ pattern
- : B- pattern
- Color code of sleeving over the end of the jacket.



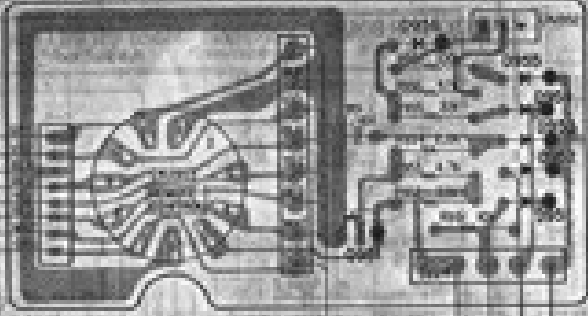
Q, IC	D
704, 705	725
	726
706, 707	727
708, 709	728, 729
704, 736	726
737	729
736	740, 724
	730
	741
733	728
734	
708, 707	
	727
732	728
709	729
70, 710, 735	
708, 738	
	708, 700
725	707
730, 727	705, 703
709	704, 710
	706
	703
	706
704, 717	744
	719
743	741
745, 742	
741	734
719	
746	742
718, 713	
	733, 738, 740
	731, 732, 737
	739, 714
720	
	714
721	735
740	717
723	
724	718
715	
IC701	734, 713, 715
729	
Q, IC	D





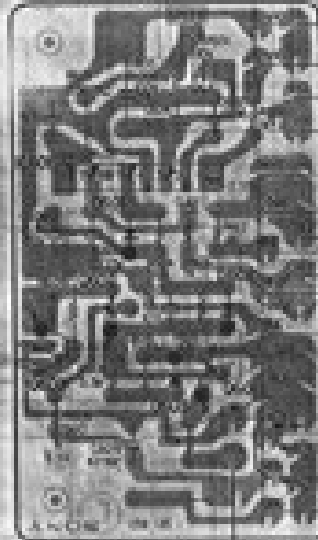
MARDAIG OYAMICO

[REMOTE CONTROL BOARD]



Q	D
994	
995	
994	
993	
992	
991	
990	

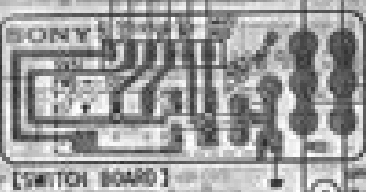
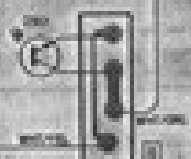
[SERVO AMP BOARD]



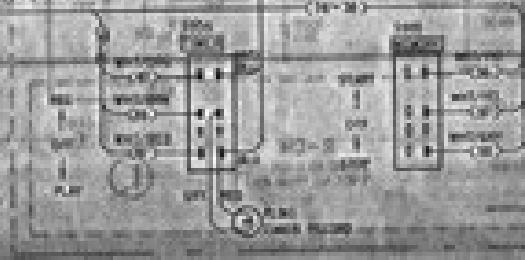
Q	D
990	
991	
992	
993	
994	
995	

DO NOT DISCONNECT THIS BOARD FROM THE SERVO MOTOR OR THE OTHER BOARD IN THE SYSTEM

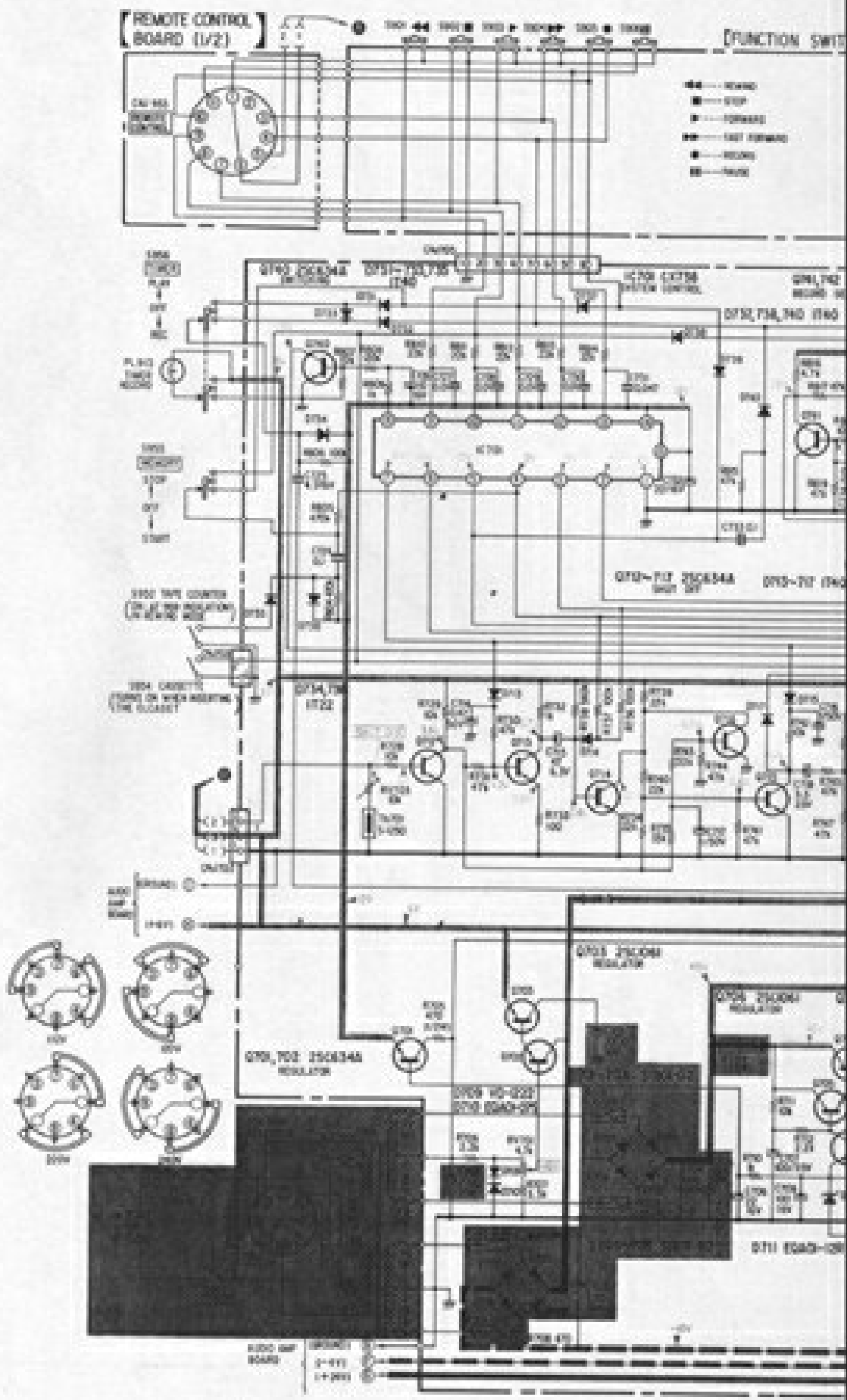
[PHOTO TRANSISTOR BOARD]



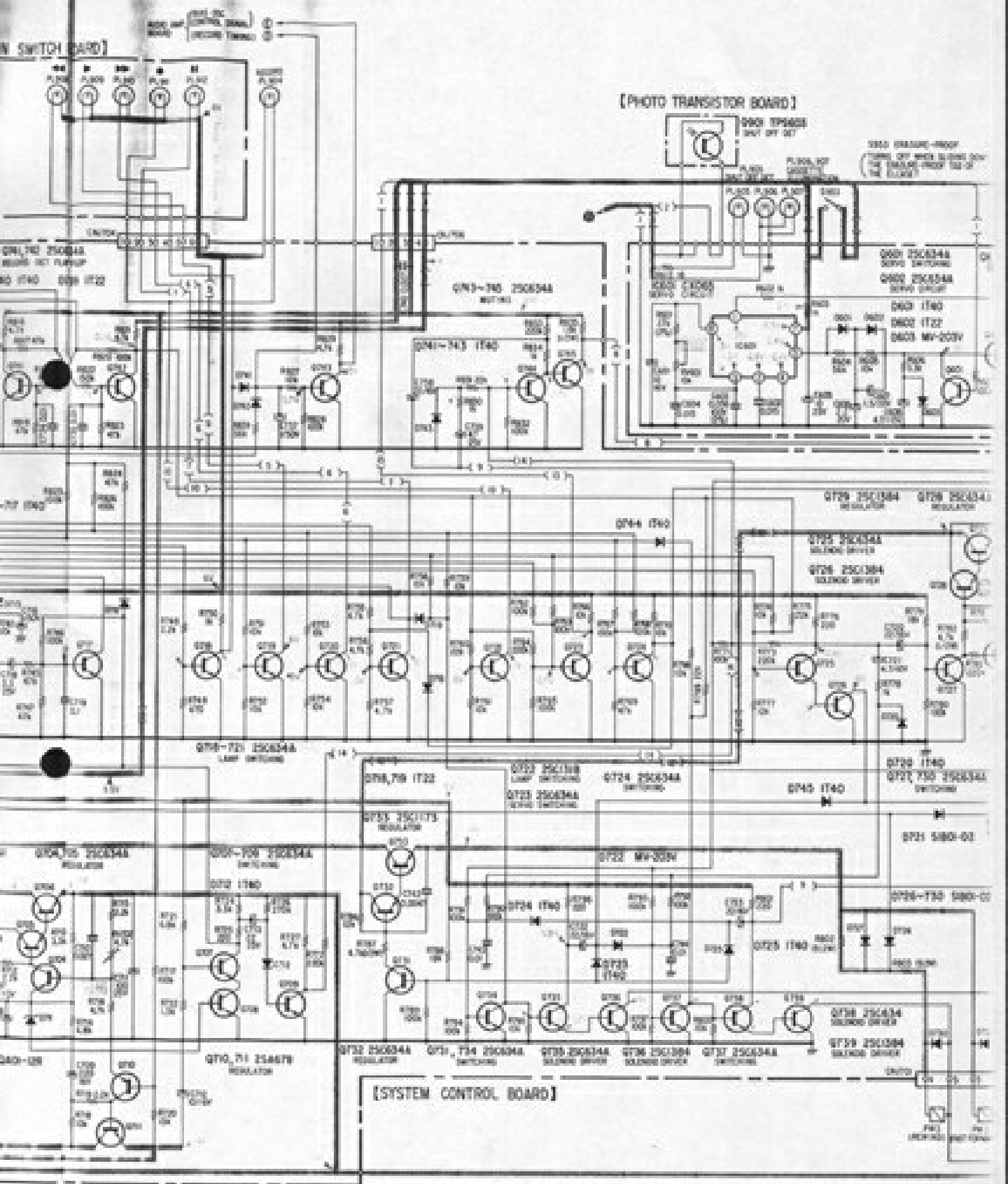
[SWITCH BOARD]

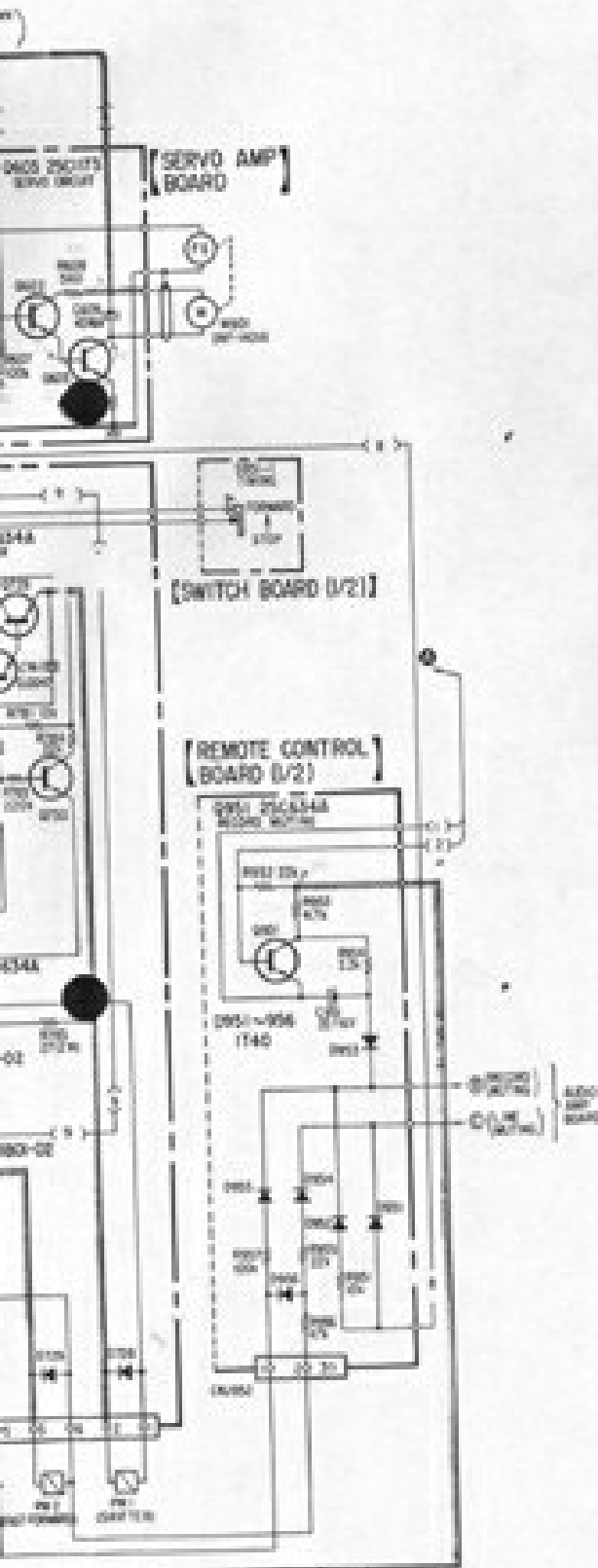


4-4. SCHEMATIC DIAGRAM - System Control Section -



EL-5 EL-5





Note:

- All capacitors are in μF unless otherwise noted. $\mu\text{F} = \mu\mu\text{F}$. 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, $\frac{1}{2}\text{W}$ 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.
- $\text{FR}\frac{1}{2}$: fusible resistor.
- (N): low-noise capacitor and resistor.
- 2% indicates component tolerance.
- --- : B+ bus.
- : panel designation.
- : adjustment for repair.
- \oplus : direct connection to points marked \oplus on the chassis.
- --- : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions in forward mode with a VOM (20k Ω/V).
- Voltage variations may be noted due to normal production tolerances.
- Switch:

Ref. No.	Switch	Position
S901	REWIND	OFF
S902	STOP	OFF
S903	FORWARD	OFF
S904	FAST FORWARD	OFF
S905	RECORD	OFF
S906	PAUSE	OFF
S951	TIMING	STOP
S952	TAPE COUNTER	OFF
S953	ERASURE-PROOF	OFF
S954	CASSETTE	OFF
S955	MEMORY	OFF
S956	TIMER	OFF
S957	POWER	OFF

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

A

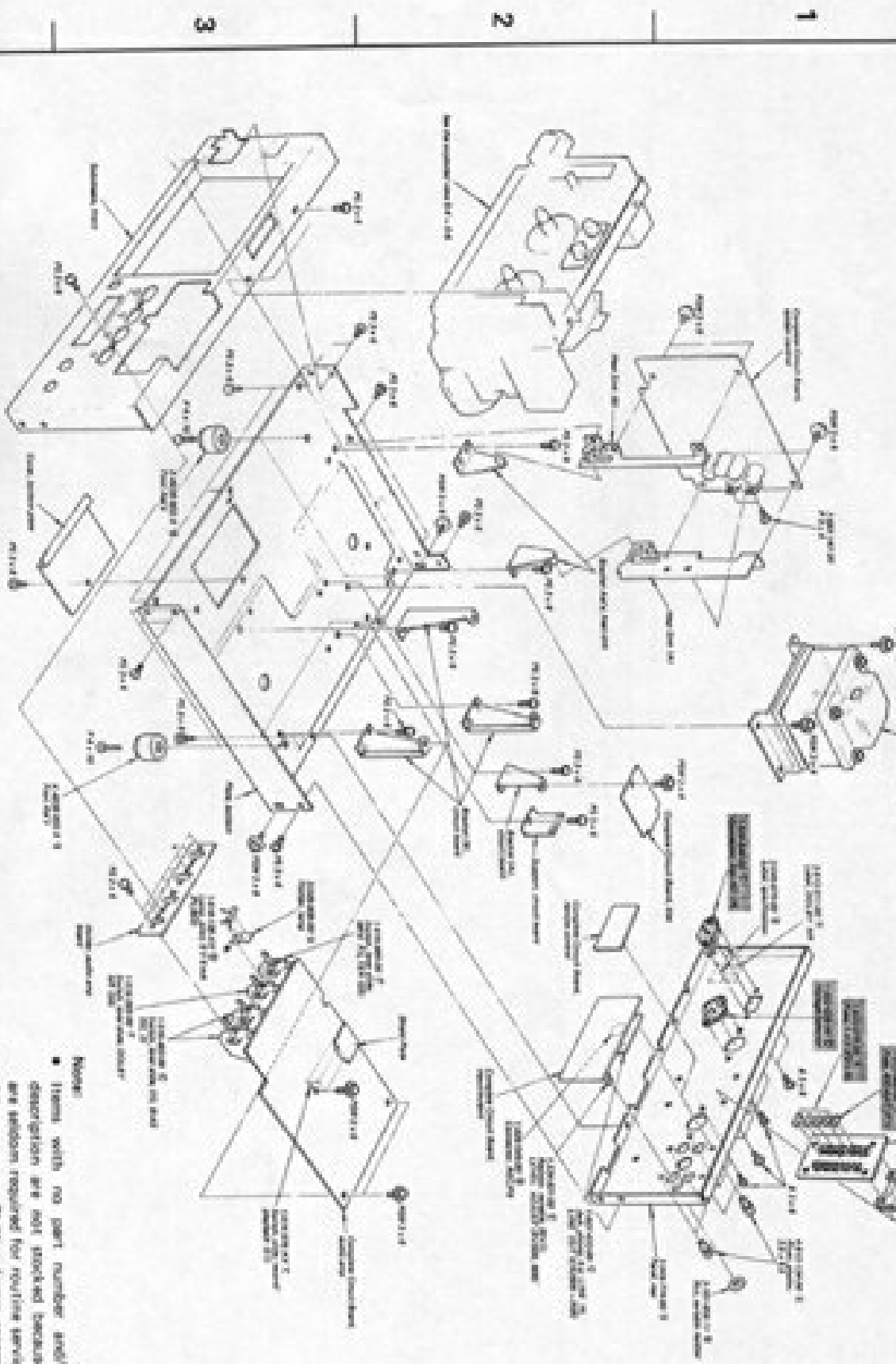
B

C

D

E

92



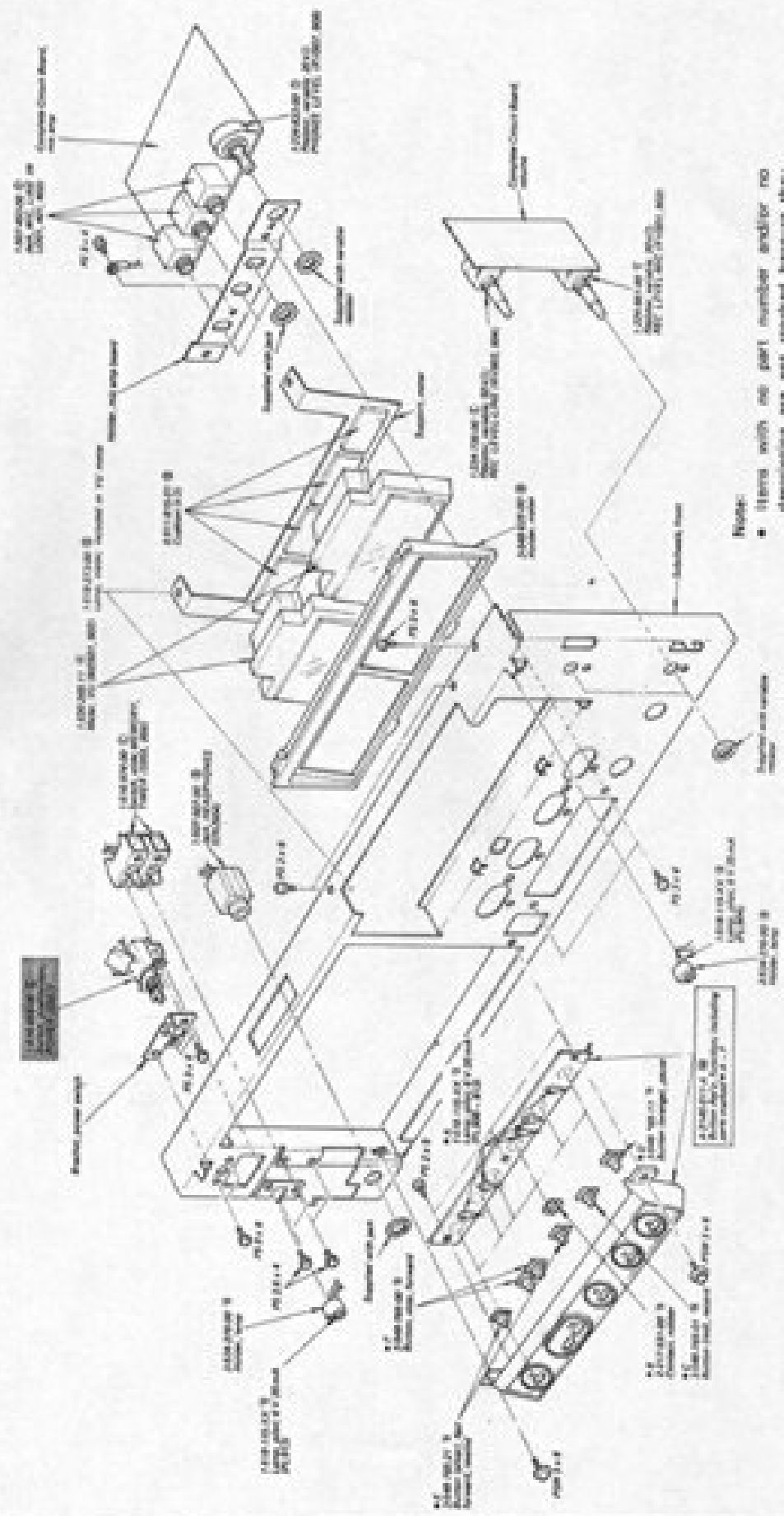
Note: The components identified by shading are critical for safety. Replace only with part number specified.

- 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.
 - (-) = socket head.
 - Crated items (⊗ to ⊙) are applicable to European models only.

1
2
3
4

A B C D E

5-3

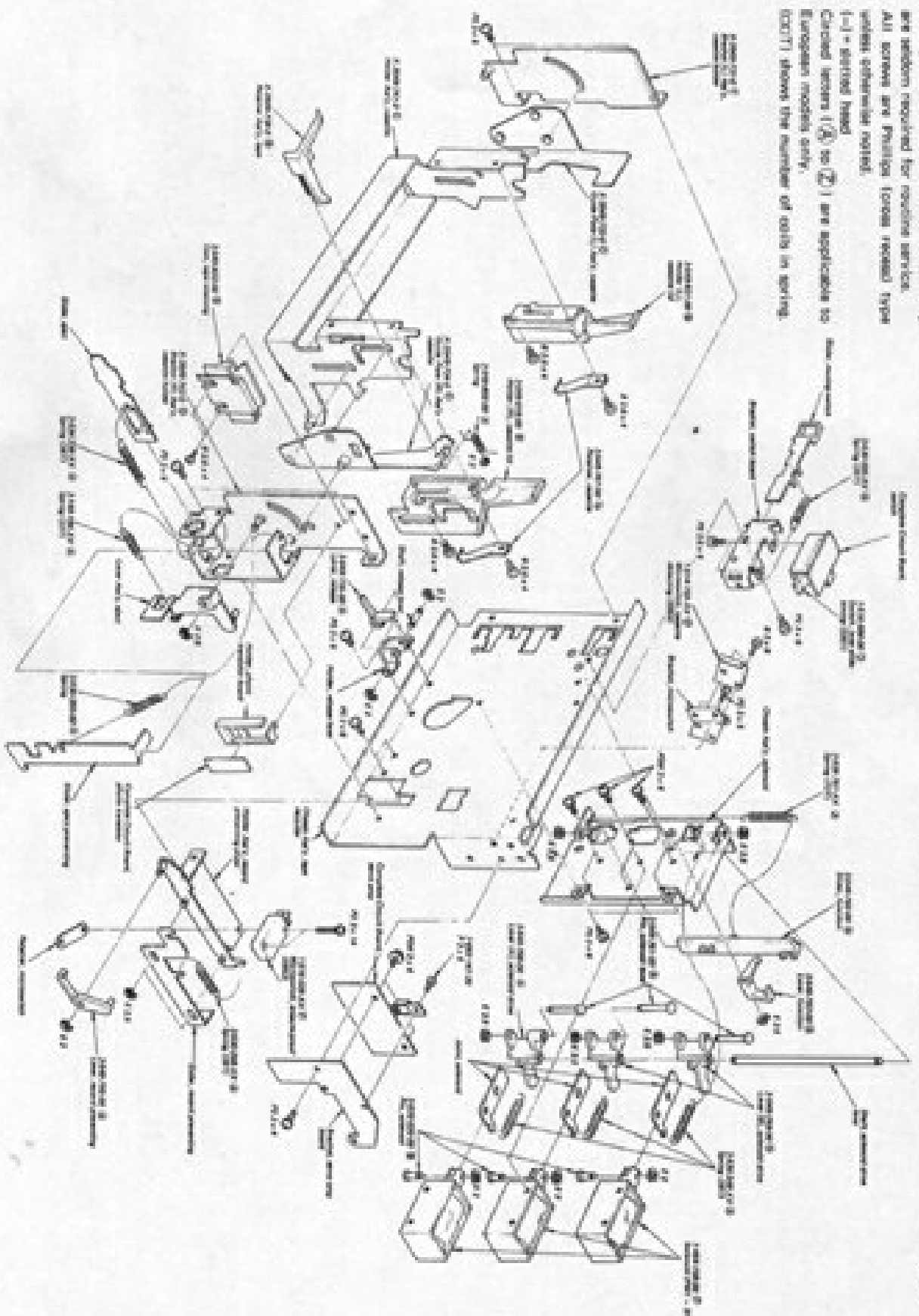


- Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
 - All screws are Phillips (cross recess) type unless otherwise noted.
 - Circled letters (A) to (Z) are applicable to European models only.

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

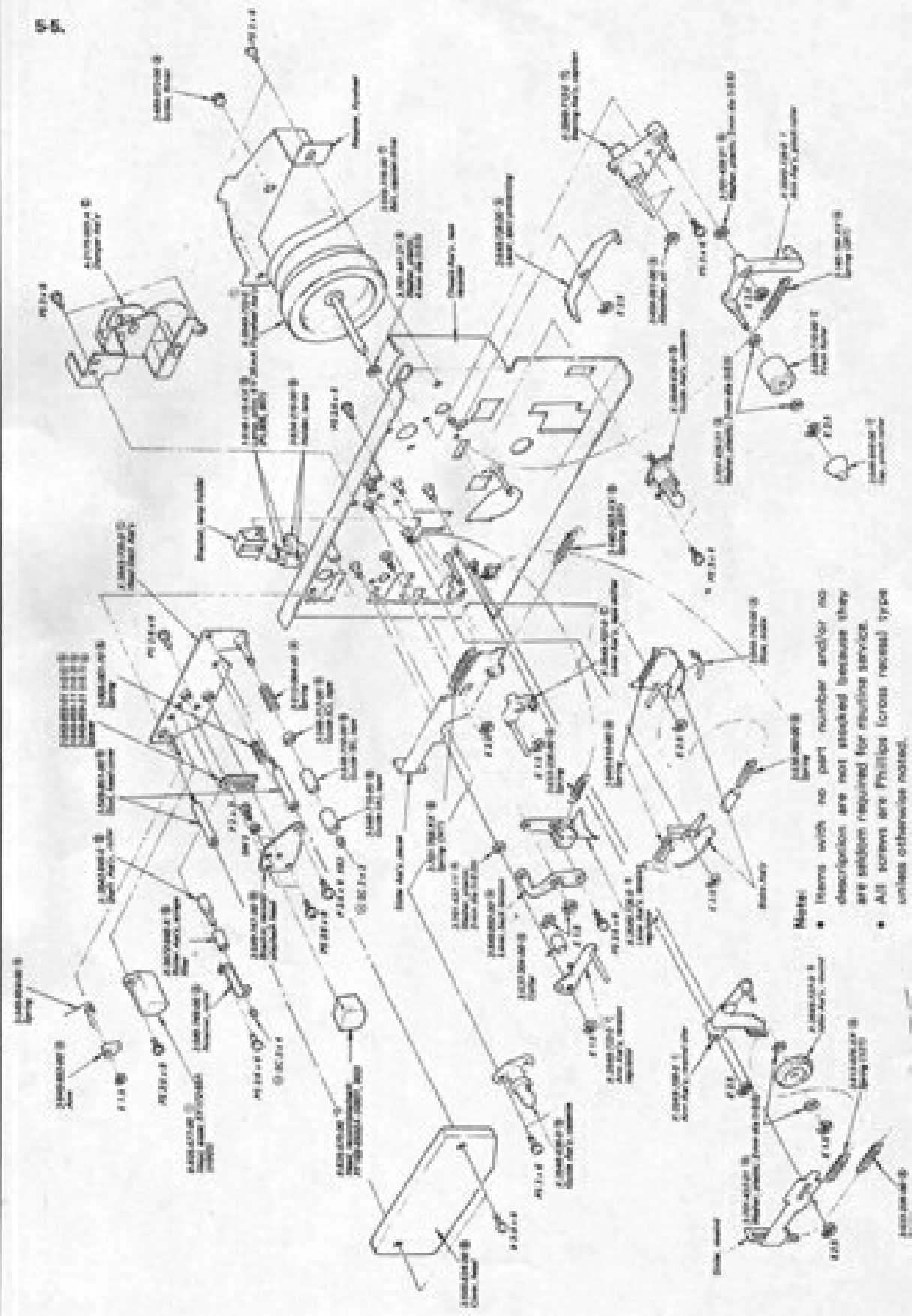
A B C D E

- 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.
 - (1) - dotted line
 - Circled items (1) or (2) are applicable to European models only.
 - EXC(T) shows the number of coils in spring.



1 2 3 4

A B C D E

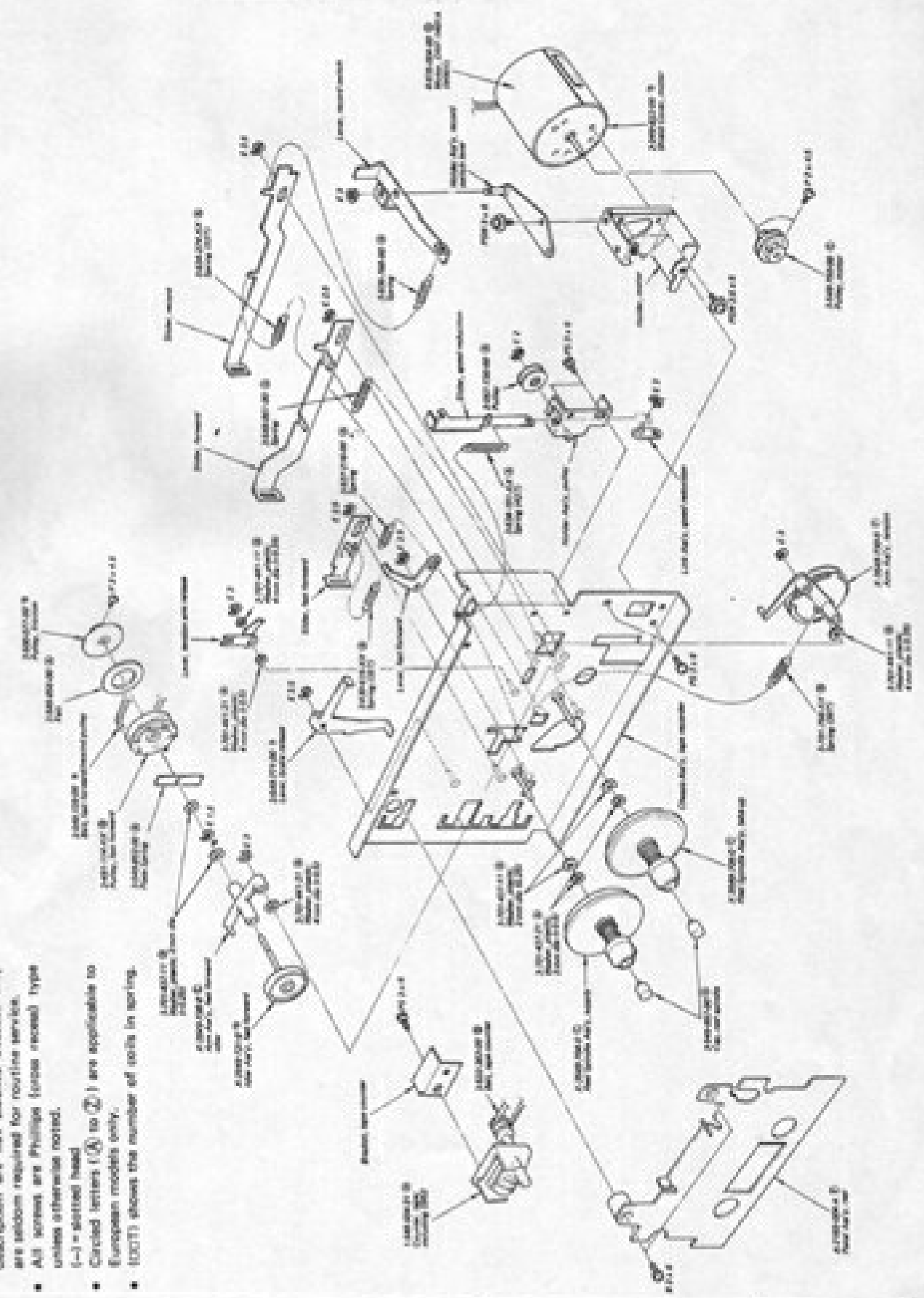


- Notes:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
 - All screws are Phillips (cross recess) type unless otherwise noted.
 - (—) = dotted line
 - Circled letters (A) to (D) are applicable to European models only.
 - (CCT) shows the number of coils in spring.

A B C D E

Notes:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (except recess type unless otherwise noted).
- (-) = dotted head
- Circled letters (A) to (D) are applicable to European models only.
- (000T) shows the number of teeth in spring.



1

2

3

4

SECTION 6 ELECTRICAL PARTS LIST

* Circled letters (Ⓐ to Ⓔ) are applicable to European models only.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
SEMICONDUCTORS					
Transistors					
Q101,301	Ⓕ	2SK43	Q737,738	Ⓔ	2SC634A
Q102,302			⇒ Q739	Ⓒ	2SC1475
Q103,303	Ⓔ	2SC632A	Q740~743	Ⓔ	2SC634A
Q104,304			Q901	Ⓔ	TPS600
Q105,305	Ⓔ	2SC634A	Q951	Ⓔ	2SC634A
Q106,306	Ⓔ	2SC1474	ICs		
Q107~110	Ⓔ	2SC634A	K101,301	Ⓔ	CX064
Q207~210	Ⓔ	2SC634A	K601	Ⓕ	CX065
Q111,311	Ⓔ	2SC1474	K701	Ⓔ	CX738
Q112,312	Ⓔ	2SC634A	Diodes		
Q113,313	Ⓔ	2SC634A	⇒ D601	Ⓔ	1S1535
Q114	Ⓒ	2SC1475	⇒ D602	Ⓔ	1T22A
Q115	Ⓔ	2SC634A	D603	Ⓔ	MV203V
Q116	Ⓒ	2SA678	⇒ D701~703 Ⓔ 10E2		
Q301,401			D709	Ⓔ	VD1222
Q302,402	Ⓔ	2SC632A	⇒ D710	Ⓔ	EQ601-07
Q501,502	Ⓔ	2SC634A	⇒ D711	Ⓔ	EQ601-12Z
Q601,602	Ⓔ	2SC634A	⇒ D712~717	Ⓔ	1S1535
Q603	Ⓒ	2SC1173	⇒ D718,719	Ⓔ	1T22A
Q701~702	Ⓔ	2SC634A	⇒ D720	Ⓔ	1S1535
Q703	Ⓔ	2SC1061	⇒ D721	Ⓔ	10E2
Q704,705	Ⓔ	2SC634A	D722	Ⓔ	MV203V
Q706	Ⓔ	2SC1061	⇒ D723~725	Ⓔ	1S1535
Q707~709	Ⓔ	2SC634A	⇒ D726~730	Ⓔ	10E2
Q710,711	Ⓒ	2SA678	⇒ D731~733	Ⓔ	1S1535
Q712~721	Ⓔ	2SC634A	D735	Ⓔ	1S1535
⇒ Q722	Ⓒ	2SC1475	⇒ D736	Ⓔ	1T22A
Q723~725	Ⓔ	2SC634A	⇒ D737,738	Ⓔ	1S1535
⇒ Q726	Ⓒ	2SC1475	⇒ D739	Ⓔ	1T22A
Q737,738	Ⓔ	2SC634A	⇒ D740~743	Ⓔ	1S1535
⇒ Q739	Ⓒ	2SC1475	⇒ D951~956	Ⓔ	1S1535
Q740~743	Ⓔ	2SC634A	Thermistor		
Q743	Ⓒ	2SC1173	Tt701	1-800-198-XX	Ⓔ S-1250
Q734,735	Ⓔ	2SC634A			
⇒ Q736	Ⓒ	2SC1475			

* ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

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

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

Ref. No.	Part No.	Description
COILS		
All coils are microinductors unless otherwise noted.		
L101,201	1-497-879-00	Ⓟ 33 mH
L102,202	1-497-340-00	Ⓟ 22 mH, variable inductor
L103,203	1-497-197-XX	Ⓜ 1.8 mH
L104,204	1-497-195-XX	Ⓜ 1 mH
L105,205	1-497-196-XX	Ⓟ 1.2 mH
L301,401	1-497-519-00	Ⓟ 8 μ H
L501,502	1-497-198-XX	Ⓟ 2.2 mH
L503,504	1-497-879-00	Ⓟ 33 mH

TRANSFORMERS

T101,201	1-427-284-00	Ⓟ Output
T501	1-433-193-00	Ⓞ Bias Osc
T901	1-412-726-00	Ⓞ L.F. Osc

CAPACITORS

All capacitors are in μ F and electrolytic unless otherwise noted.
50WV or less are not indicated except for electrolytics. pF = 10^{-12} F

C101,201	1-107-093-11	Ⓜ 220p	silvered mica
C102,202	1-121-410-11	Ⓟ 47	25V
C103,203	1-107-093-11	Ⓜ 220p	silvered mica
C104,204	1-107-085-11	Ⓜ 100p	silvered mica
C105,205	1-121-409-11	Ⓜ 47	10V
C106,206	1-121-180-11	Ⓟ 100	6.3V
C107,207	1-108-393-12	Ⓟ 0.039	mylar
C108,208	1-121-400-11	Ⓜ 22	25V
C109,209	1-121-409-11	Ⓜ 47	10V
C110,210	1-121-395-11	Ⓜ 4.7	25V
C111,211	1-121-409-11	Ⓜ 47	10V
C112,212	1-121-413-11	Ⓜ 100	6.3V
C113,213	1-107-081-11	Ⓜ 68p	silvered mica
C114,214	1-121-471-11	Ⓜ 10	16V

Ref. No.	Part No.	Description
C115,215	1-131-214-11	Ⓟ 0.68 35V tantalum
C116,216	1-108-391-12	Ⓟ 0.033 mylar
C117,217	1-131-205-11	Ⓟ 2.2 25V tantalum
C118,218	1-130-071-11	Ⓟ 0.1 \pm 2% 100V film
C119,219	1-108-585-12	Ⓟ 0.018 mylar
C120,220	1-130-072-11	Ⓟ 0.022 \pm 2% 100V film
C121,221	1-121-395-11	Ⓜ 4.7 25V
C122,222	1-121-416-11	Ⓜ 100 25V
C123,223	1-108-227-12	Ⓜ 0.001 mylar
C124,224	1-107-069-11	Ⓜ 22p silvered mica
C125,225	1-129-794-21	Ⓟ 0.0033 \pm 2% 100V film
C126,226	1-108-369-12	Ⓟ 0.0039 mylar
C127,227	1-108-337-12	Ⓟ 0.0012 mylar
C128,228	1-121-395-11	Ⓜ 4.7 25V
C129,229	1-108-227-12	Ⓜ 0.001 mylar
C130,230	1-121-403-11	Ⓜ 33 10V
C131,231	1-121-413-11	Ⓜ 100 6.3V
C132,232	1-107-061-11	Ⓜ 10p silvered mica
C133,233	1-107-077-11	Ⓜ 4.7p silvered mica
C134,234	1-121-398-11	Ⓜ 10 25V
C135,235	1-121-395-11	Ⓜ 4.7 25V
C136,236	1-121-726-11	Ⓜ 0.47 50V
C137,237	1-121-430-11	Ⓜ 2.2 50V
C138,238	1-121-395-11	Ⓜ 4.7 25V
C140,240	1-121-410-11	Ⓟ 47 25V
C141,241	1-121-391-11	Ⓜ 1 50V
C142,242	1-121-726-11	Ⓟ 0.47 50V
C143,243	1-121-404-11	Ⓜ 33 25V
C144,244	1-108-397-12	Ⓟ 0.036 mylar
C145,245	1-108-337-12	Ⓜ 0.0012 mylar
C146,246	1-121-398-11	Ⓜ 10 25V
C147,247	1-108-227-12	Ⓜ 0.001 mylar
C148,248	1-121-409-11	Ⓜ 47 10V
C149,249	1-107-061-11	Ⓜ 10p silvered mica
C150,250	1-121-413-11	Ⓜ 100 6.3V
C151,251	1-121-391-11	Ⓜ 1 50V
C152,252	1-131-211-11	Ⓟ 0.22 35V tantalum
C153,253	1-108-575-12	Ⓟ 0.0068 mylar
C154-156	1-108-589-12	Ⓜ 0.027 mylar
C154-256		

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

• Circled letters (Ⓐ to Ⓒ) are applicable to European models only.

Ref. No.	Part No.	Description
C157,257	1-108-587-12	Ⓑ 0.022 mylar
C158	1-121-464-11	Ⓐ 33 25V
C160,260	1-121-398-11	Ⓐ 10 25V
C301,401	1-121-416-11	Ⓐ 100 25V
C302,402	1-121-916-11	Ⓑ 10 16V
C303,403	1-107-081-11	Ⓐ 68p silvered mica
C304,404	1-108-227-11	Ⓐ 0.001 mylar
C306,406	1-107-073-11	Ⓐ 33p silvered mica
C307,407	1-107-065-11	Ⓐ 15p silvered mica
C309,409	1-121-413-11	Ⓐ 100 6.3V
C310-410	1-121-392-11	Ⓐ 3.3 25V
C501	1-121-450-11	Ⓐ 2.2 50V
C502	1-121-395-11	Ⓐ 4.7 25V
C503,504	1-108-581-12	Ⓑ 0.012 mylar
C505	1-108-591-12	Ⓑ 0.033 mylar
C506	1-129-800-11	Ⓑ 0.0012 630V plastic
C508,510	1-107-210-11	Ⓐ 22p 500V silvered mica
C601	1-121-471-11	Ⓐ 10 16V
C602	1-108-912-11	Ⓑ 0.015 mylar
C603	1-129-899-11	Ⓑ 0.056 ±2% 100V plastic
C604	1-108-583-12	Ⓑ 0.015 mylar
C605	1-121-398-11	Ⓐ 10 25V
C606	1-131-196-21	Ⓑ 2.2 20V tantalum
C607	1-131-202-21	Ⓑ 1.5 20V tantalum
C608	1-131-192-21	Ⓑ 4.7 10V tantalum
C609	1-121-409-11	Ⓐ 4.7 16V
C701	1-121-070-11	Ⓒ 2200 16V
C702	1-121-068-11	Ⓑ 220 16V
C703	1-121-067-11	Ⓒ 2200 25V
C704,705	1-121-061-11	Ⓒ 1000 50V
C706	1-121-479-11	Ⓐ 22 16V
C707	1-121-062-11	Ⓑ 100 33V
C708	1-121-415-11	Ⓑ 100 16V
C709	1-121-421-11	Ⓑ 220 16V
C710	1-108-359-12	Ⓐ 0.027 mylar
C711	1-121-416-11	Ⓐ 100 25V
C712	1-121-471-11	Ⓐ 10 16V
C713	1-121-988-11	Ⓑ 22 25V
C714	1-121-726-11	Ⓐ 0.47 50V
C715	1-131-191-21	Ⓒ 47 6.3V tantalum

Ref. No.	Part No.	Description
C716,717	1-121-391-11	Ⓐ 1 50V
C718	1-121-392-11	Ⓐ 3.3 25V
C719	1-108-290-12	Ⓑ 0.1 mylar
C720	1-131-201-21	Ⓑ 22 16V tantalum
C721	1-131-192-21	Ⓑ 4.7 10V tantalum
C722,723	1-121-990-11	Ⓐ 22 16V
C724	1-108-290-12	Ⓑ 0.1 mylar
C725	1-121-257-11	Ⓐ 4.7 16V (nonpolarized)
C726	1-121-968-11	Ⓑ 10 16V
C727-730	1-161-136-11	Ⓐ 0.01 ceramic
C731	1-161-140-11	Ⓐ 0.047 ceramic
C732	1-121-479-11	Ⓐ 22 16V
C733	1-108-290-12	Ⓑ 0.1 mylar
C734,735	1-161-136-11	Ⓐ 0.01 ceramic
C737	1-121-391-11	Ⓐ 1 50V
C738	1-121-479-11	Ⓐ 22 16V
C739	1-121-395-11	Ⓐ 4.7 25V
C740	1-108-359-12	Ⓐ 0.027 mylar
C741,742	1-161-166-11	Ⓐ 0.0047 ceramic
C743,744	1-161-136-11	Ⓐ 0.01 ceramic
C901-903	1-161-136-11	Ⓐ 0.01 ceramic
C951	1-121-479-11	Ⓐ 22 16V
CT501,502	1-141-010-XX	Ⓑ Trimmer

RESISTORS

All resistors are in ohms. Common 1/4W carbon resistors are omitted.

Check schematic diagram for values.

R601	1-212-488-11	Ⓑ 27k ±2% 1/4W	metal-oxide
R609	1-212-385-11	Ⓐ 1	1W metal-oxide
R701,702	1-217-463-11	Ⓑ 0.47	1W fusible
R703,704	1-217-371-11	Ⓑ 0.47	1/4W fusible
R705	1-244-863-11	Ⓐ 470	1/4W carbon
R709	1-217-463-11	Ⓑ 22	1W fusible
R782	1-244-889-11	Ⓐ 4.7k	1/4W carbon
R783	1-206-473-11	Ⓐ 27	2W metal-oxide
R787	1-244-889-11	Ⓐ 4.7k	1/4W carbon

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

• Circled letters (Ⓐ to Ⓔ) are applicable to European models only.

Ref. No.	Part No.	Description
RR02,803	1-206-467-11	Ⓐ 15 2W metal-oxide
RR35	1-244-879-11	Ⓐ 1.8 k 1/2W carbon
RV101,301	1-224-644-XX	Ⓑ 4.7 k, adjustable
RV102,302	1-224-646-XX	Ⓑ 22 k, adjustable
RV103,303	1-224-644-XX	Ⓑ 4.7 k, adjustable
RV104,304	1-224-645-XX	Ⓑ 10 k, adjustable
RV601	1-224-493-00	Ⓑ 10 k, adjustable
RV701,702	1-224-251-XX	Ⓒ 4.7 k, adjustable
RV703	1-224-253-XX	Ⓒ 10 k, adjustable
RV901,902	1-224-561-00	Ⓓ 20 k, variable; REC LEVEL-MIC
RV903,904	1-224-736-00	Ⓓ 50 k, variable; REC LEVEL-LINE
RV905,906	1-224-821-00	Ⓓ 20 k, variable; LEVEL ADJUST
RV907,908	1-224-823-00	Ⓓ 20 k, variable; PHONES LEVEL

SWITCHES

S1	1-514-976-XX	Ⓒ Slide, record/playback
S2,3	1-516-482-00	Ⓓ Lever Slide, EQ, BIAS
S4	1-516-992-00	Ⓓ Lever Slide, DOLBY NR
S5	1-516-685-00	Ⓓ Lever Slide, MPX FILTER
S951	1-516-686-00	Ⓒ Lever Slide, timing
S952		Included in tape counter
S953	1-516-028-XX	Ⓓ Micro, erasure-proof
S954	1-514-723-XX	Ⓒ Micro, cassette detecting
S955,956	1-516-974-00	Ⓒ Slide, MEMORY, TIMER
S957	1-516-835-00	Ⓒ Push-button, POWER

JACKS

CN1904	1-503-507-00	Ⓑ HEADPHONES
CN1905-908	1-507-433-00	Ⓒ Phone, 4-p; LINE IN, LINE OUT
J301,401	1-507-433-00	Ⓒ MIC
J402	1-507-433-00	Ⓒ LINE IN (STEREO)

MISCELLANEOUS

CP901	1-531-057-11	Ⓑ Escapement Component
FL	1-532-065-00	Ⓐ Fuse, 400 mA
F2-S	1-532-078-00	Ⓐ Fuse, 1 A

Ref. No.	Part No.	Description
HP01,902	8-825-675-00	Ⓒ Head, record/playback; PF169-6502A
HP03	8-825-677-00	Ⓒ Head, erase; EF173-65A
M901	8-835-004-00	Ⓒ Motor, DNF-1401A
ME901,902	1-520-265-11	Ⓒ Meter, VU
PL901,902	1-518-273-00	Ⓑ Lamp, meter
PL903	1-518-138-XX	Ⓑ Lamp, pilot, 5V 6mA
PL904	1-518-115-XX	Ⓑ Lamp, pilot, 6V 35mA
PL906-913		
PM1-3	1-454-158-00	Ⓓ Solenoid

1-309-346-00 Ⓒ Connector, 3-p, AC IN

1-509-549-00 Ⓑ Connector, REC/PH

1-533-327-00 Ⓒ Holder, fuse

1-552-026-00 Ⓒ Voltage Selector

ACCESSORIES AND PACKING MATERIALS

Part No.	Description
X-3545-408-0	Ⓑ Cushion Assy, upper (UK model)
X-3549-744-0	Ⓒ Carton Assy (AEP model)
X-3549-745-0	Ⓒ Cushion Assy, upper (AEP model)
X-3701-018-3	Ⓐ Tips Assy, head cleaning
1-534-049-31	Ⓓ Cord, connection; R.C./MH
1-534-819-00	Ⓑ Cord, power (UK model)
3-429-126-00	Ⓑ Bag, plastic; wt
3-548-768-00	Ⓑ Cushion, lower (front) (UK model)
3-548-769-00	Ⓑ Cushion, lower (back) (UK model)
3-548-770-00	Ⓐ Spacers, cassette lid
3-548-780-00	Ⓒ Cushion, lower (front) (AEP model)
3-548-781-00	Ⓒ Cushion, lower (back) (AEP model)
3-549-860-00	Ⓓ Carton (UK model)
3-701-985-00	Ⓑ Tape Driver
3-780-962-11	Ⓒ Manual, instruction
8-893-508-10	Ⓒ Tape, demonstration

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