

TC-229SD

*AEP Model
UK Model*



STEREO CASSETTE DECK

SPECIFICATIONS

Power Requirements:	110, 120, 220, 240V, 50/60 Hz	S/N Ratio:	DOLBY NR OFF
Power Consumption:	35W		With Ferri-Chrome cassette
Dimensions:	Approx. 430 (w) x 170 (h) x 310 (d) mm 17 (w) x 6 7/8 (h) x 12 1/2 (d) inches including projecting parts and controls		60 dB at peak level (NAB)
Weight:	Approx. 10.5 kg, 23 lb 3 oz		59 dB (DIN, 1975 rev.)
Track:	4-track 2-channel stereo		51 dB (DIN, old)
Fast Forward Rewind Time:	Approx. 70 seconds with Sony cassette C-60		With chromium dioxide cassette
Frequency Response:	DOLBY NR OFF		56 dB at peak level (NAB)
	With Ferri-Chrome cassette		DOLBY NR ON
	20-18,000 Hz (NAB)		Improved by 5 dB at 1 kHz, 10 dB above 5 kHz
	30-16,000 Hz ± 3 dB (NAB)	Total Harmonic Distortion:	1.3%
	30-16,000 Hz (DIN)	Record Bias Frequency:	105 kHz
	With chromium dioxide cassette	Inputs:	MIC (two phone jacks)
	20-17,000 Hz (NAB)		Sensitivity: 0.2 mV (-72 dB) for low-impedance microphone
	30-15,000 Hz ± 3 dB (NAB)		LINE IN (stereo binaural jack, two phono jacks)
	30-15,000 Hz (DIN)		Sensitivity: 0.06 V (-22 dB)
	With regular cassette		Impedance: 100 k Ω
	20-15,000 Hz (NAB)		REC/PB (connector)
	30-13,000 Hz (DIN)		Input impedance: less than 10 k Ω
Wow and Flutter:	0.06% WRMS (NAB) $\pm 0.12\%$ (DIN)		

- Continued on page 2 -

SAFETY-RELATED COMPONENT WARNING!!

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

SONY®

SERVICE MANUAL

SECTION 3 ADJUSTMENTS

PRECAUTION

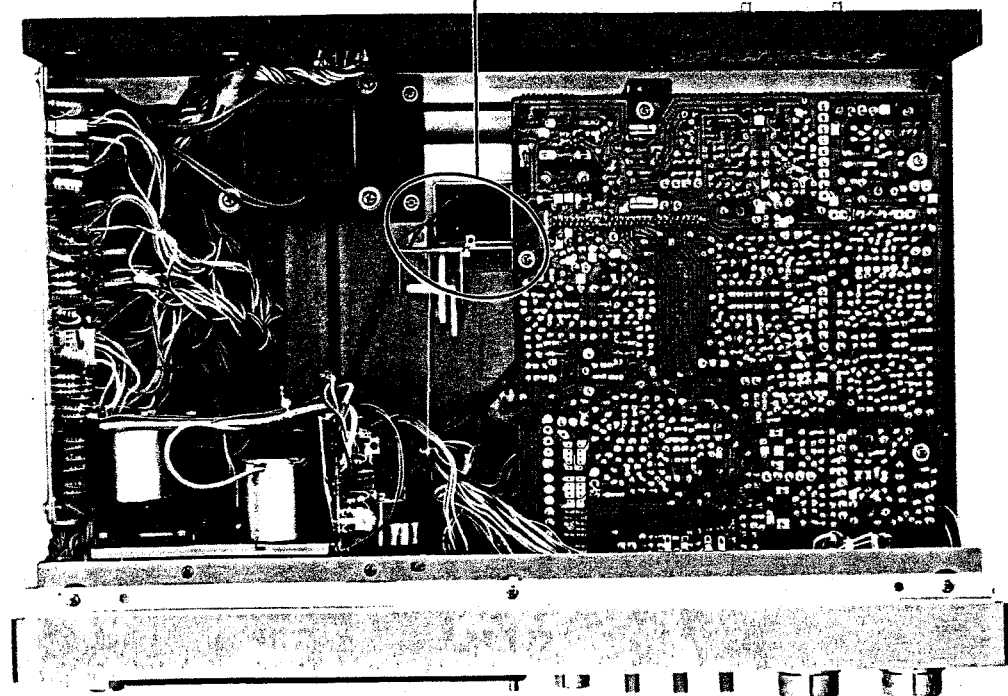
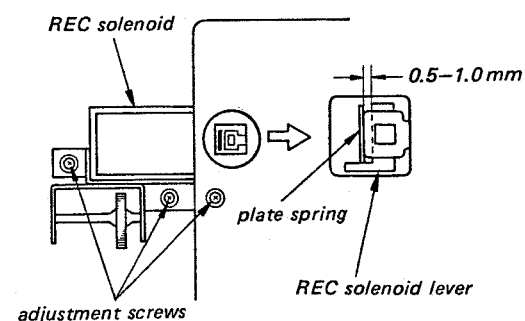
1. Clean the following parts with a denatured-alcohol-moistened swab:

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.

3-1. MECHANICAL ADJUSTMENT

Record Solenoid Position Adjustment

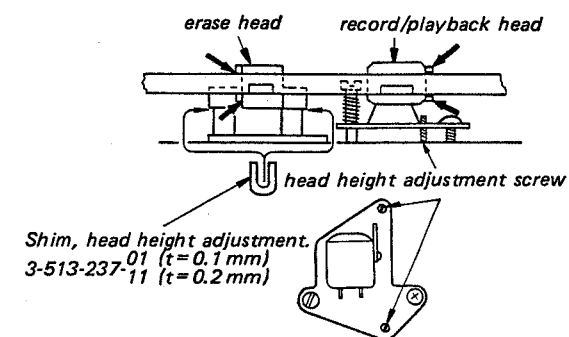
Adjust the record solenoid position to obtain the indicated clearance between plate spring and record solenoid lever.



Tape Path Adjustment

— playback mode —

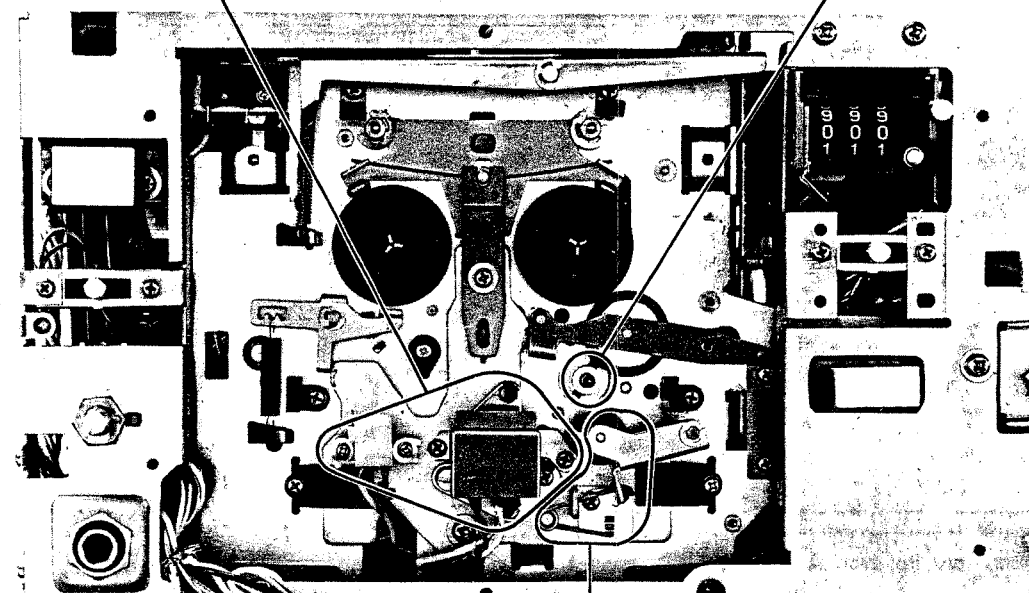
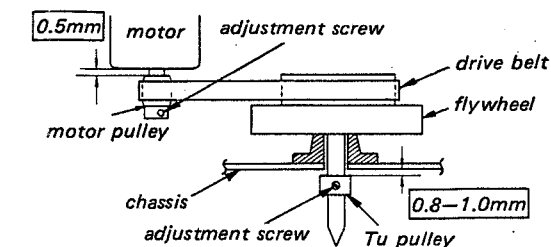
1. Adjust erase head height by adding or removing shim to eliminate tape curl at the erase head.
2. Adjust record/playback head height adjustment screw to eliminate tape curl at the record/playback head.



Pulley Height Adjustment

— stop mode —

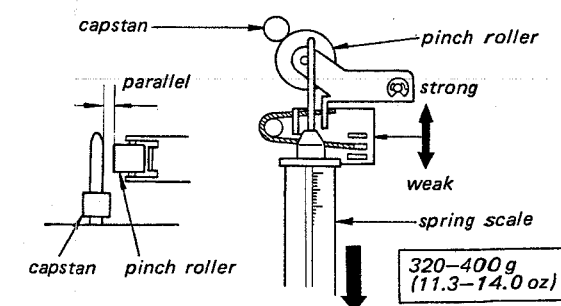
Adjust position of motor and TU pulleys to obtain indicated clearances between motor and chassis.



Pinch Roller Pressure Adjustment

— playback mode —

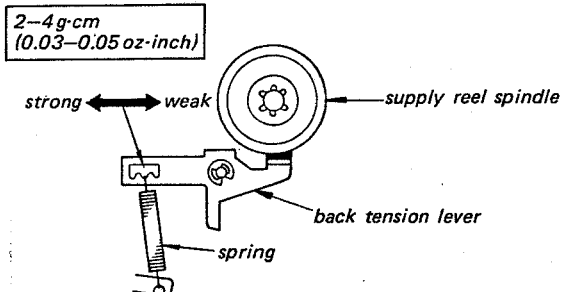
1. Pull the spring scale.
2. Slowly return the pinch roller and read the spring scale just when the pinch roller starts to rotate.
3. If necessary, change the hooking position.



Forward Back Tension Torque Adjustment

— playback mode —

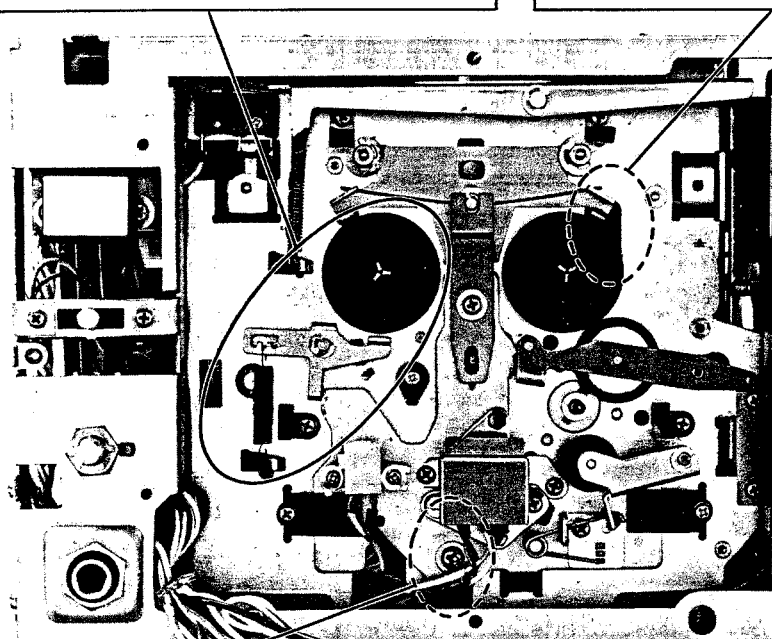
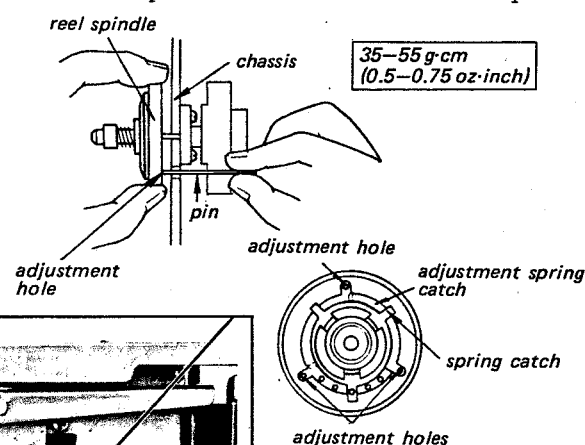
1. Place the type CQ-101 cassette torque meter in the set.
2. Adjust the spring-hook position to obtain the indicated torque.



Forward Torque Adjustment

— Playback Mode —

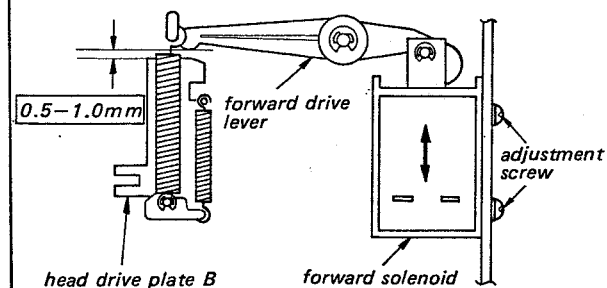
1. Place the type CQ-101 cassette torque meter in the set.
2. Adjust the position of the adjustment spring catch using a suitable pin and turning the reel spindle to obtain the indicated torque.



Forward Solenoid Position Adjustment

— playback mode —

Adjust the position of the forward solenoid to obtain the indicated clearance between the forward drive lever and head drive plate B.



Fast Forward and Rewind Torque Measurement

Use type CQ-201 cassette torque meter.
Fast Forward Torque: 75-130 g-cm
(1.1-1.8 g-cm)
Rewind Torque: 75-130 g-cm
(1.1-1.8 g-cm)

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.

Test Equipment/Tools Required:

audio oscillator (af osc)
VTVM
digital frequency counter
speed checker SONY LFM-30
oscilloscope
attenuator (600 Ω)
non-magnetic screwdriver
resistors ... 600 Ω (1/4 W), 10 k Ω (1/4 W), 100 k Ω (1/4 W)
blank tapes (completely erased with bulk eraser)
SONY CS-10 (HF), CS-20 (CrO₂), CS-30 (Fe-Cr)
BIAS and EQ switch settings in accordance with tape used are as follows.

Tape	BIAS switch	EQ switch
CS-10	NORMAL	NORMAL
CS-20	HIGH	CrO ₂
CS-30	NORMAL	Fe-Cr

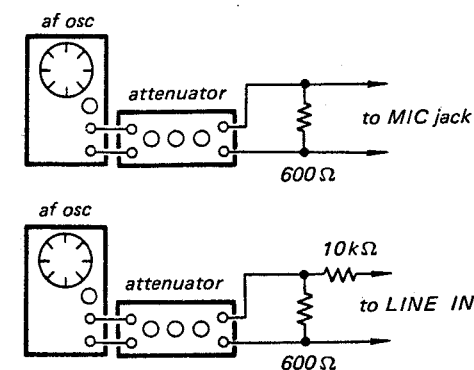
SONY test tapes
P-4-A81S (6.3 kHz, -10 dB)
P-4-A82 (10 kHz, -10 dB)
P-4-L81 (333 Hz, 0 dB)
WS-48 (3 kHz, 0 dB)

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

DOLBY NR switch: OFF
LINE OUT control: MAX
EQ switch: NORMAL
BIAS switch: NORMAL
HEADPHONE LEVEL: MAX
TIMER switch: OFF
MEMORY switch: OFF
LIMITER switch: OFF
REC MUTE switch: OFF

Test Equipment Connections:

Input side:



Standard Record:

Deliver the standard input signal level to the input jack and set the MIC or LINE control to obtain the standard output signal level. Set the LINE control to MIN when MIC is used or set MIC control to MIN when LINE IN is used.

Standard Input Level

	MIC	LINE IN	REC/PB (AEP, UK model)
source impedance	300 Ω	10 k Ω	100 k Ω
input level	0.77 mV (-60 dB)	0.25 V (-10 dB)	17 mV (-33 dB)

Standard Output Level

	LINE OUT	HEAD- PHONES	REC/PB (AEP, UK model)
load impedance	100 k Ω	8 Ω	50 k Ω
output level	0.775 V (0 dB)	0.12 V (-16 dB)	0.775 V (0 dB)

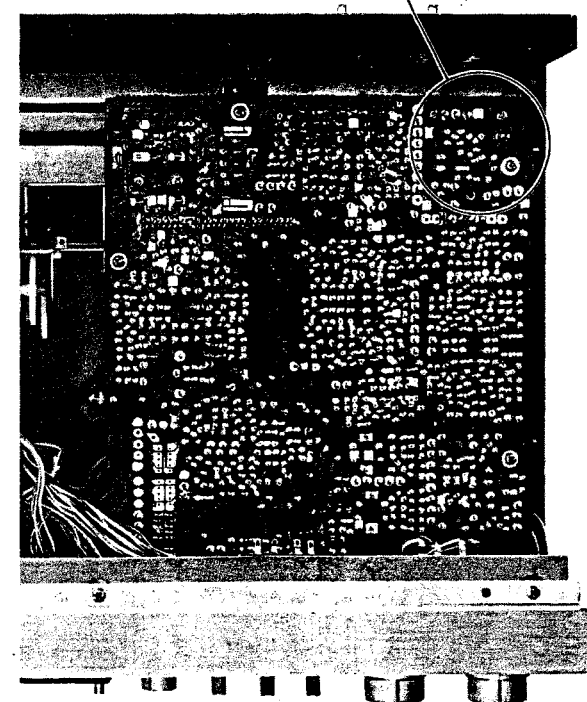
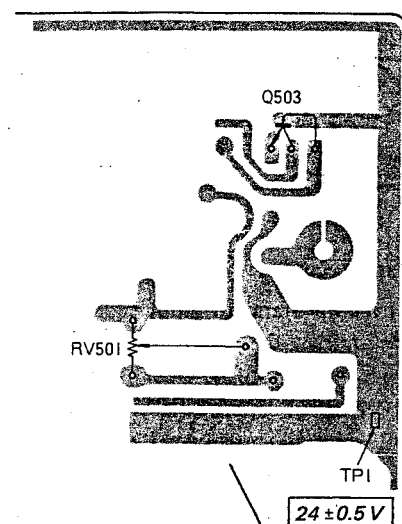
1. B+ Voltage Adjustment

Procedure:

Adjust RV501 for 24V VOM reading at TP1.

Adjustment Location:

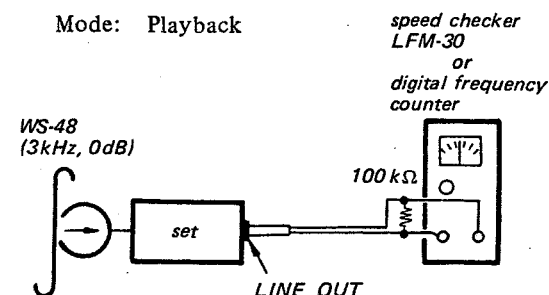
— record/playback amp board —



2. Tape Speed Adjustment

Procedure:

Mode: Playback



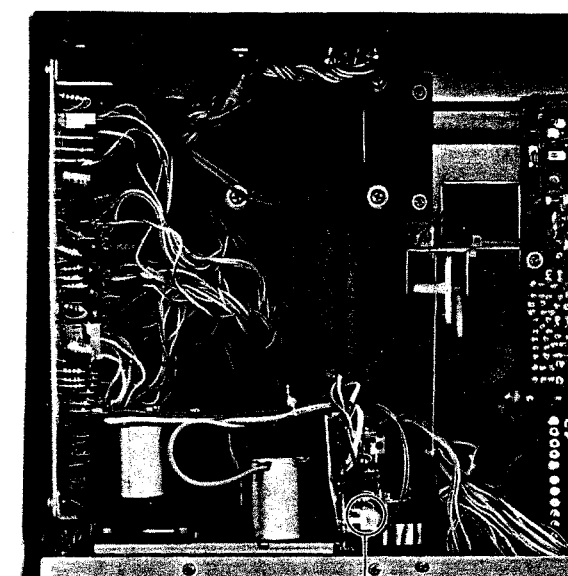
Adjust RV601 to obtain the specified values below.

Specification:

Speed checker	Digital frequency counter
-0.7—+0.7%	2,980—3,020 Hz

Frequency difference between beginning and end of tape should be within 0.7% (20 Hz).

Adjustment Location:

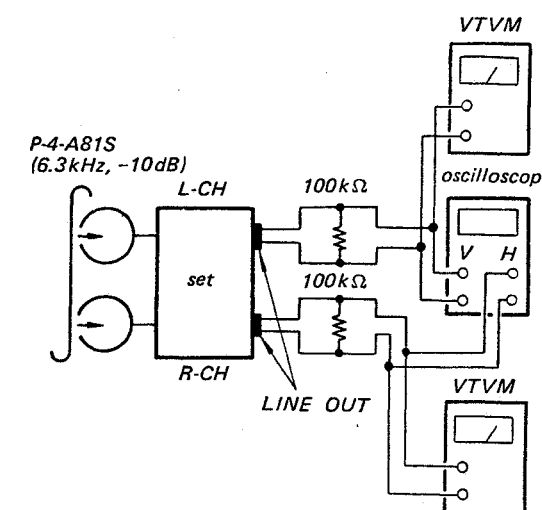


RV601

3. Record/playback Head Azimuth Adjustment

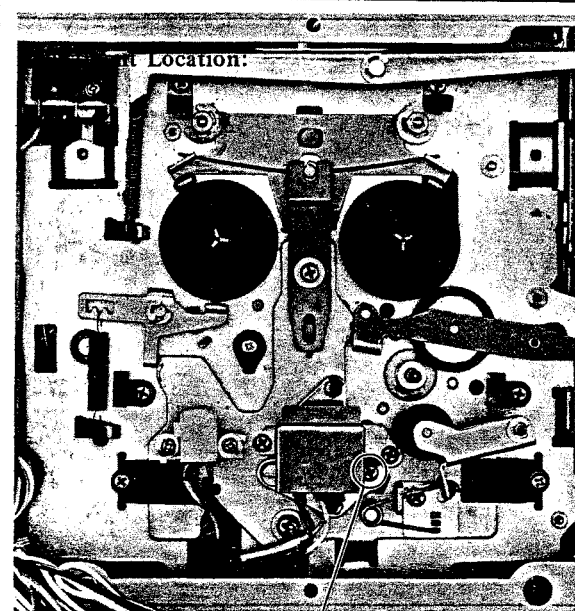
Procedure:

1. Mode: Playback



2.

Adjust	Oscilloscope patterns
azimuth adjustment screw to obtain the in-phase pattern around the highest VTVM readings.	[Allowance] in-phase (L) (R) 90° out-of-phase (L) (R) Level drop should be within 0.5 dB

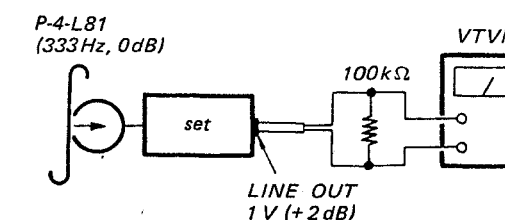


adjustment screw

4. Playback Level Adjustment

Procedure:

1. Mode: Playback



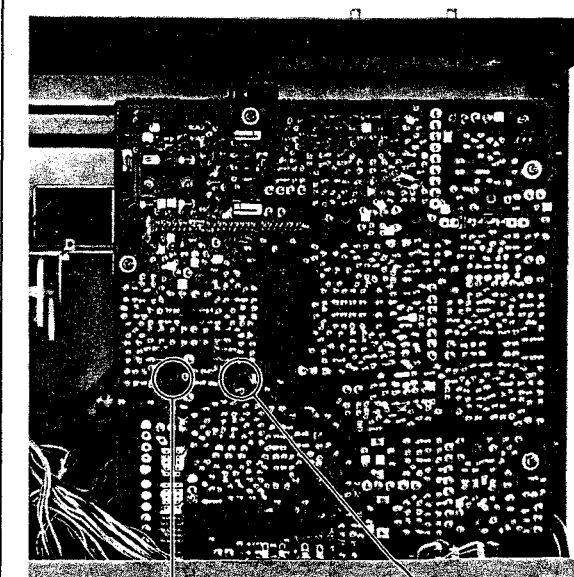
Adjust RV101 (L-CH) and RV201 (R-CH) to obtain 1V (+2 dB) VTVM reading.

2. Assume that the LINE OUT level does not change when the mode is changed from playback to stop several times.

Specification:

LINE OUT level: 0.94—1.05 V
(+1.5—+2.5 dB)
Level difference between channels:
less than 0.5 dB

Adjustment Location:



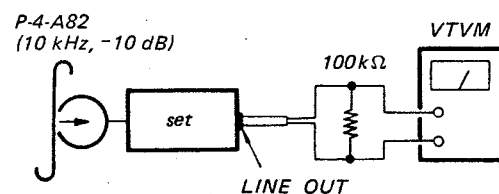
RV101 (L-CH)

RV201 (R-CH)

5. Playback Equalizer Adjustment

Procedure:

Mode: Playback

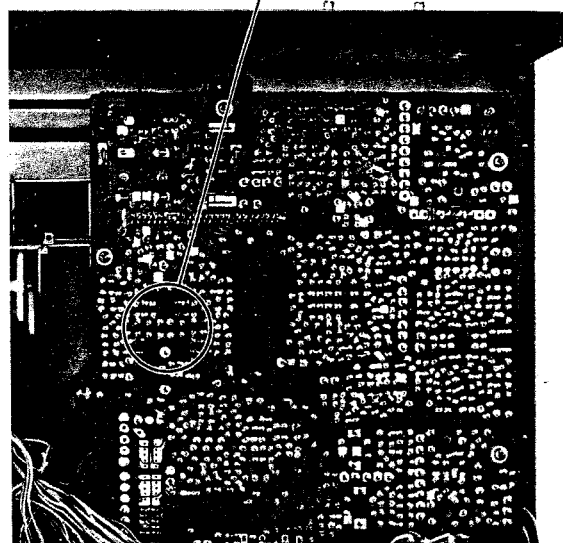
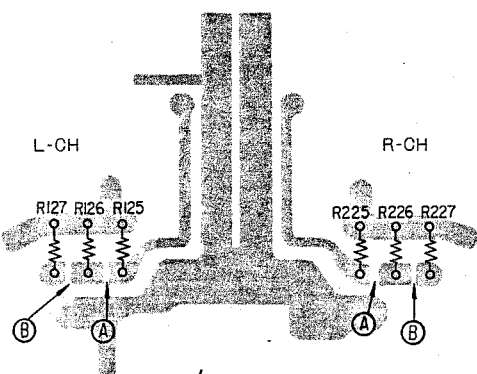


Adjust R125 (L-CH) and R225 (R-CH) for 0.27–0.37 V (–9.5––6.5 dB) VTVM reading.

With TAPE SELECT EQ switch set to Fe-Cr or CrO₂: 0.15–0.22 V (–14.5––11 dB)

Adjustment Location:

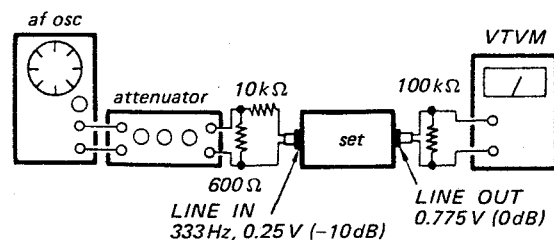
Bridge patterns	High frequency level
(open)	up
Ⓐ	down
Ⓐ and Ⓑ	down



6. VU Meter Calibration

Procedure:

1. Mode: Standard record (See page 11.)

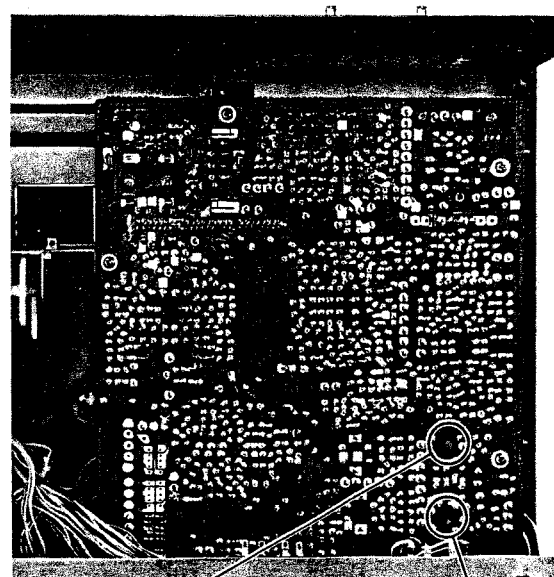


Adjust	VU meter reading: 0 VU
RV103 (L-CH)	
RV203 (R-CH)	

Specification:

When the LINE IN level is adjusted to make 0VU indication, VTVM reading should be 0.74–0.82 V (–0.5–+0.5 dB).

Adjustment Location:



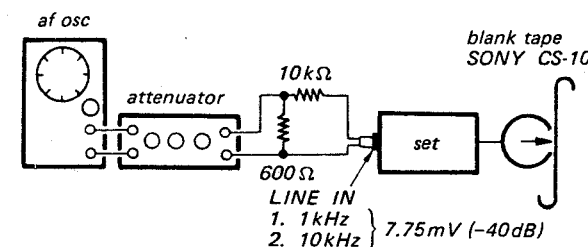
RV103 (L-CH)

RV203 (R-CH)

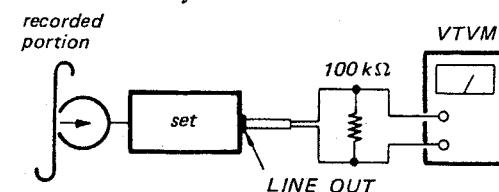
7. Record Bias Adjustment

Procedure:

1. Mode: Standard record (See page 11.)



2. Mode: Playback

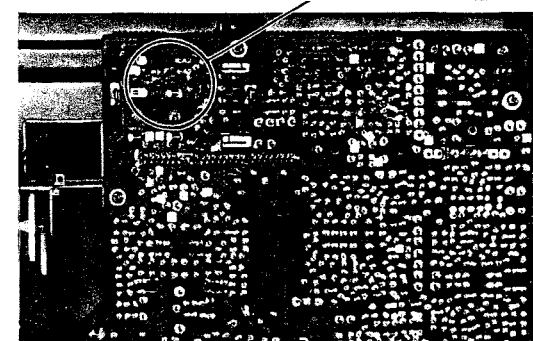
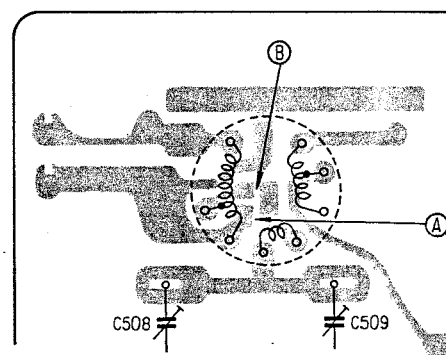


Adjust C508 (L-CH) and C509 (R-CH) to make 10 kHz and 1 kHz signal output levels equal.

Level difference between the two output levels: 0.74–0.82 V (0 dB ±0.5 dB)

Adjustment Location:

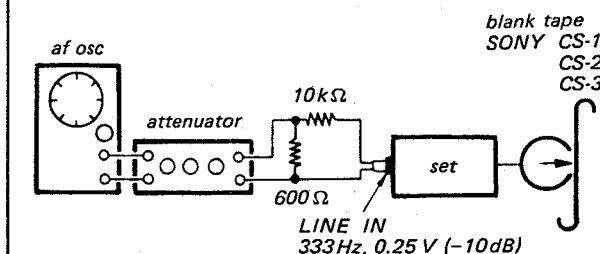
Note: Normally, patterns at Ⓐ are bridged. If adjustment is not made with trimmers fully tightened, remove solder bridge at Ⓐ and bridge patterns at Ⓑ, and repeat the adjustment.



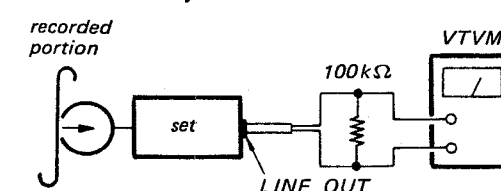
8. Record Level Adjustment

Procedure:

1. Mode: Standard record (See page 11.)



2. Mode: Playback



Adjust RV102 (L-CH) and RV202 (R-CH) to obtain 0.775 V (0 dB) VTVM reading.

3. Change the blank tape to CS-20 and CS-30, and perform the same record and playback procedure. Measure LINE OUT level.

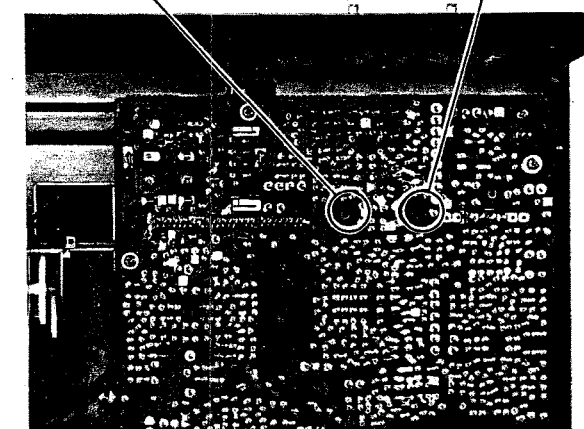
Specification:

SONY tape	LINE OUT level
CS-10	0.73–0.82 V (–0.5–+0.5 dB)
CS-20	0.61–0.775 V (–2–0 dB)
CS-30	0.61–0.82 V (–2–+0.5 dB)

Adjustment Location:

RV102 (L-CH)

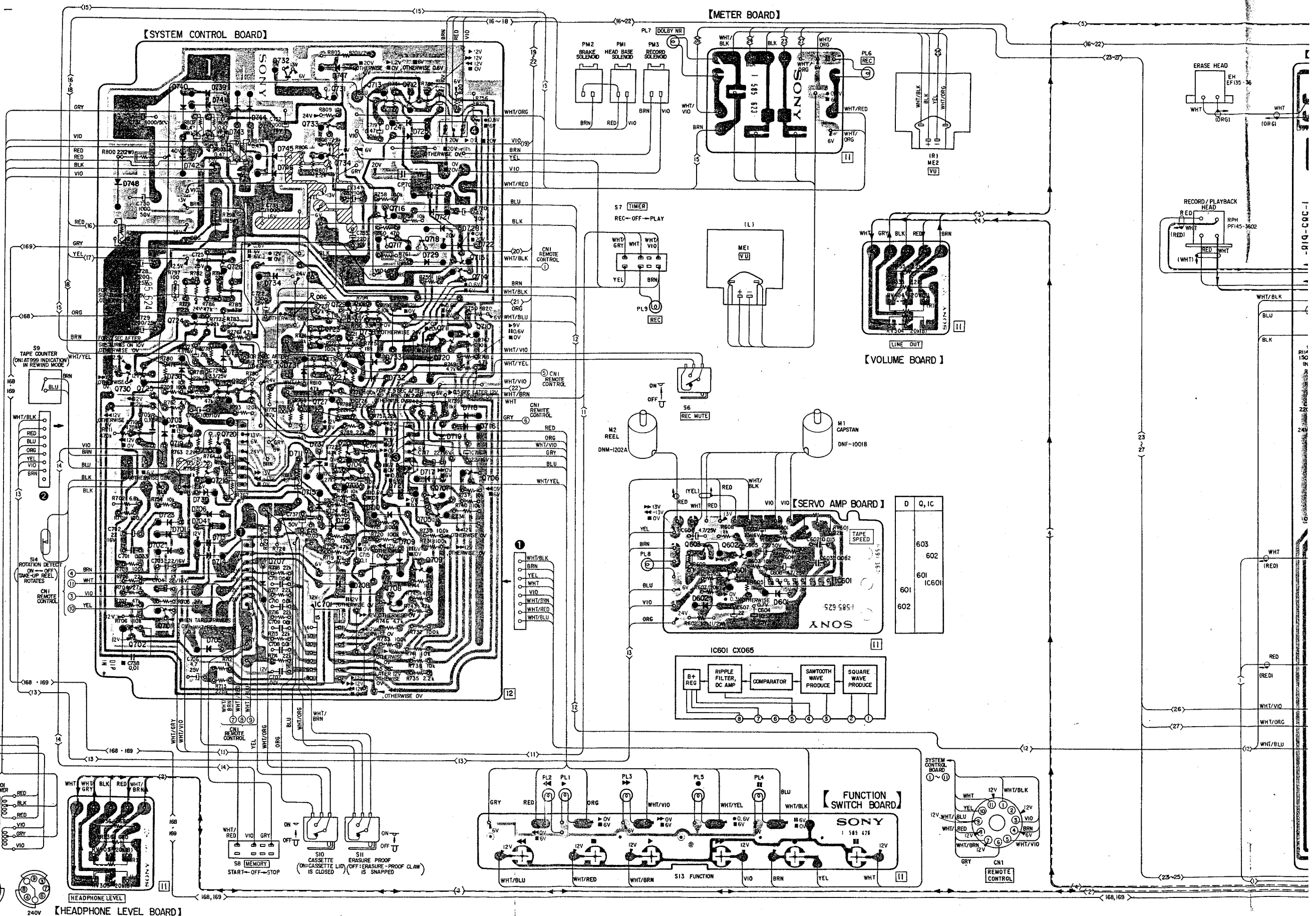
RV202 (R-CH)

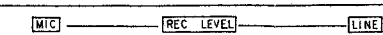


SECTION 4 DIAGRAMS

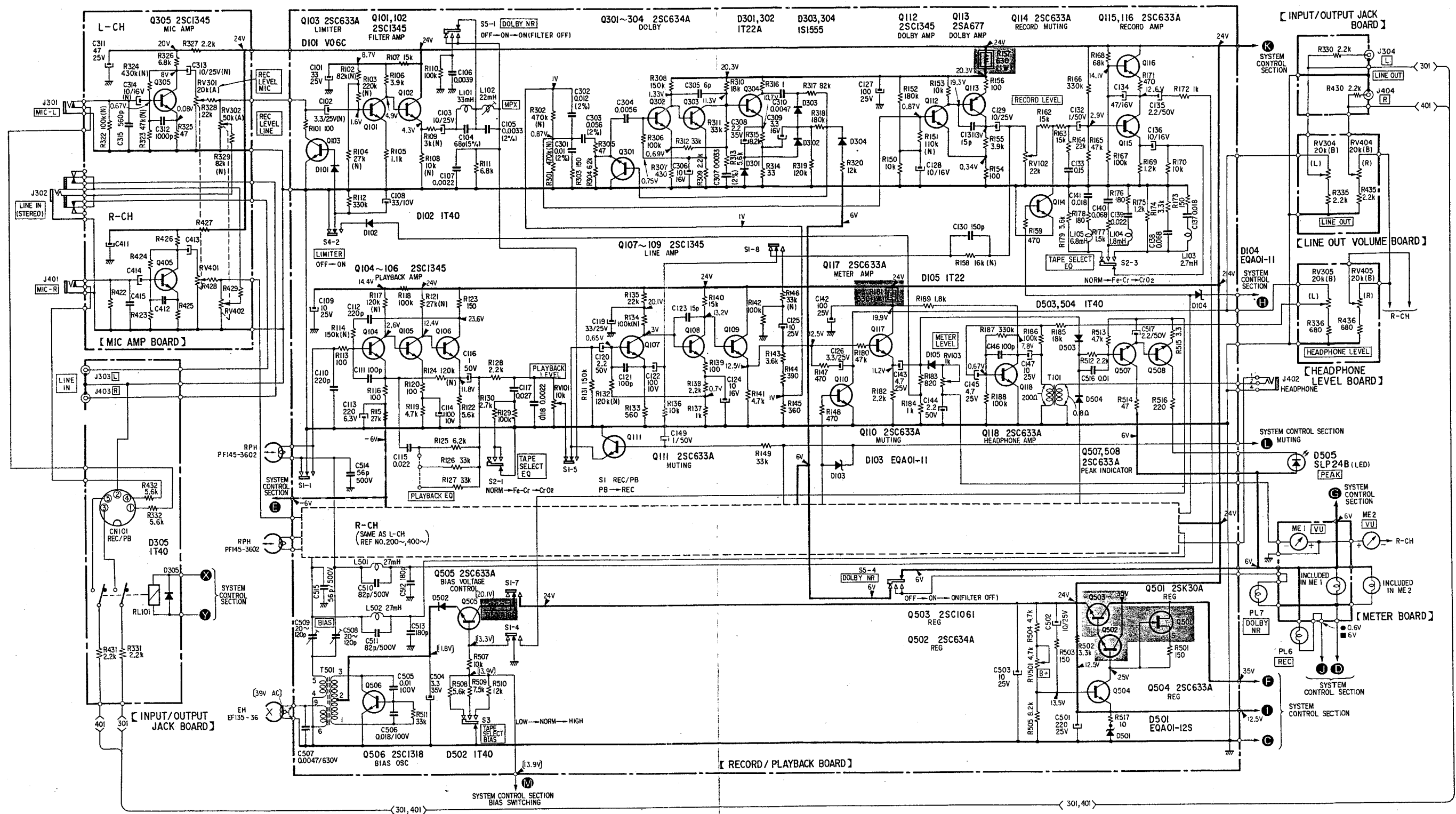
4-1. MOUNTING DIAGRAM — Conductor Side —

D	Q, IC
747	732
739	731 713, 712
740, 741 744 743	733
725	734
742	734
746	734
748	726
727	716
728	717, 718
722	715
729	714
734	729
738	724
735	723 710
733, 720	711
736 731 732	730, 725, 722
728, 727	704
718	703 706
716	707
719	705
711 737	709
717	708
730 721	701
715	702
706, 710	702
704, 712	702
701	702
713	702
702	702
709	702
707 708	702
705	702
	IC701





4-2. SCHEMATIC DIAGRAM — Amplifier Section —



Note:

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F}$ 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 variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- $\square$: nonflammable resistor.
- $\square$: fusible resistor.
- (N): low-noise capacitor and resistor.
- 2% indicates component tolerance.

- $\square$: B+ bus.
- $\square$: B- bus.
- $\square$: panel designation.
- $\square$: adjustment for repair.
- $\square$: chassis ground.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken in playback mode (indicated by $\blacktriangleright$) with a VOM (20 $\text{k}\Omega/\text{V}$).
- [] : record mode

- AC voltage readings in the bias oscillator circuit are taken with a VTVM.
- Switch

Ref. No.	Switch	Position
S1	REC/PB	PB
S2	TAPE SELECT EQ	NORMAL
S3	TAPE SELECT BIAS	LOW
S4	LIMITER	OFF
S5	DOLBY NR	OFF

54.

55.

- 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:
- 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.
 - (C) shows the number of coils in spring.

