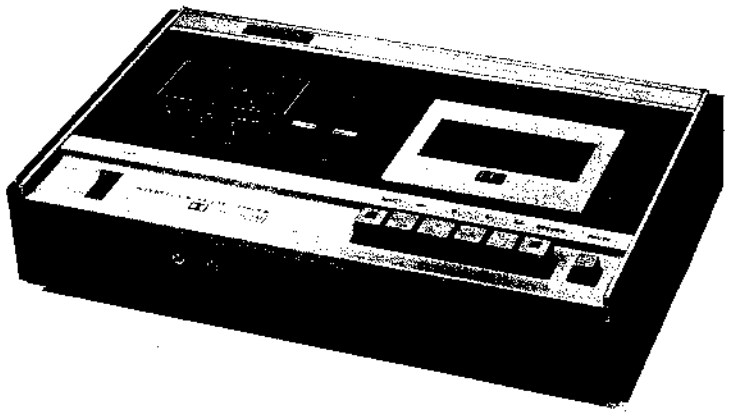
TC131SD



SPECIFICATIONS

Power Requirements: AC 120V 60Hz (USA, Canada)
110, 127, 220, 240V 50/60Hz (AEP, AUS) 100, 110, 120, 127, 220, 240V 50/60Hz (E)

Power Consumption: 11W

Track: Two-track two-channel stereo

Frequency Response: With chromium dioxide cassette
40 ~ 15000Hz (NAB)
50 ~ 12000Hz (DIN)
With ordinary cassette
40 ~ 13000Hz (NAB)
50 ~ 10000Hz (DIN)

Overall Signal-to-Noise Ratio: 48dB (DOLBY NR switch to OFF)
(With DOLBY NR switch to ON, S/N ratio improves 5dB at 1kHz and 10dB at 5kHz.)

Wow and Flutter: (RMS weighted) 0.22% (NAB)
±0.38% (DIN)

Record Bias Frequency: Approximately 85kHz

Inputs: MICROPHONE (2)
Impedance: low
Maximum sensitivity: 0.2mV (-72dB)
LINE IN (2)
Impedance: 100kΩ or more
Maximum sensitivity: 0.06V (-22dB)

Outputs: LINE OUT (2)
Load impedance: greater than 10kΩ
Level: 0.775V (0dB) with 100kΩ load
HEADPHONE
Load impedance: 8Ω
Level: 31mV (-28dB)

REC/PB Connector: (AEP, E, AUS)
Input impedance: less than 10kΩ
Output impedance: less than 50kΩ

Semiconductors: 32 transistors and 20 diodes

Record/playback Head: PF145-3602A6 (ferrite)

Erase Head: EF135-36

Motor: D-015G (DC governor)

Accessories: Connection cord RK-74 (2)
Printed matters
Cleaning tips (AEP, Canada, E, AUS)

Dimensions: 388 (w) x 95 (h) x 230 (d) mm
$15\frac{5}{16}$ (w) x $3\frac{3}{4}$ (h) x $9\frac{1}{16}$ (d) inches

Weight: 4.1kg, 9lb 1oz (USA, Canada)
4.5kg, 9lb 15oz (AEP, E, AUS)

SERVICE MANUAL

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MC-Service

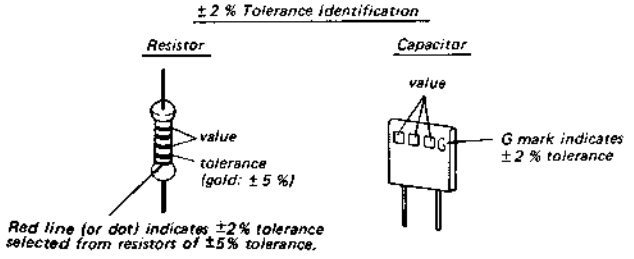
TABLE OF CONTENTS

MODEL IDENTIFICATION
(See specification label)

Model	Identification on specification label
USA	AC 120V 60Hz
Canada	AC 120V 60Hz
E	AC 100, 110, 120, 127, 220, 240V 50/60Hz
AEP	110, 127, 220, 240V 50/60Hz
AUS	110, 127, 220, 240V 50/60Hz

CAUTION

1. *Record and playback level adjustments should be carefully made. The levels must be as specified for correct DOLBY circuit operation.*
2. *When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.*



When ordering replacement parts, use PART NUMBERS listed in Parts Lists or shown in EXPLODED VIEWS.
Parts List reference numbers should not be used.

All screws in this service manual are Phillips type (cross recess type) unless otherwise indicated.
(−) : slotted head

SECTION 1
OUTLINE

1-1. DOLBY NOISE REDUCTION SYSTEM *

1. OUTLINE

The TC-131SD uses a DOLBY NOISE REDUCTION system to reduce hissing noise during low level or zero level sound passages. This system pre-emphasizes the low-level high-frequency recorded signals which are disturbed by hissing noise. During playback, it de-emphasizes these signals along with tape hiss and thus improves signal-to-noise ratio.

(1) The DOLBY system differs from other noise reduction systems as follows:
- * High-fidelity sound cannot be obtained if the DOLBYIZED tape is played back on other systems or vice versa.
- * Signal levels must be precisely adjusted since these levels control the DOLBY system.

(2) The DOLBY system of the TC-131SD has the following features:
The DOLBY unit (DCB-020) contains a variable high-pass filter controlled by input level.
During Record:
The DOLBY unit (DCB-020) is series-connected to boost the low-level high-frequency signal.

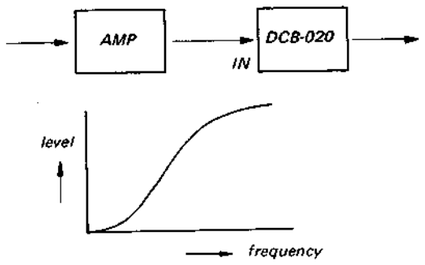


Fig. 1-1. Unit connection in record mode and frequency response

During Playback:
The DOLBY unit is connected as a negative feedback circuit to decrease the gain for low-level high frequency signals boosted during record.

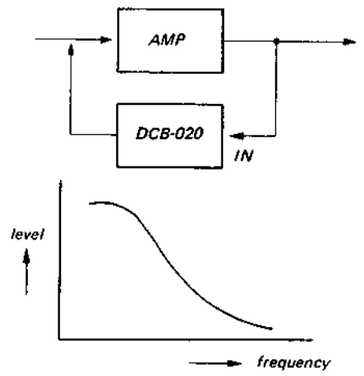
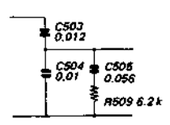


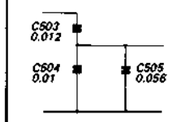
Fig. 1-2. Unit connection in playback mode and frequency response

2. CIRCUIT OPERATION

(Refer to schematic diagram on page 30.)

Stage/Control	*Function*
R501, R502	These resistors attenuate signal level 20 dB. High resistance value is due to high output impedance of LINE OUT jack since DOLBY unit input is connected to LINE OUT jack.
Q501	This emitter-follower amplifier is an impedance-translator for the low-impedance high-pass filter.
filter C503, C504, C505 R509, Q502	Q502 changes the filter curve determined by C503, C504, C505 and R509.

Q502: OFF	Attenuation at 10 kHz:
	6 dB

Q502: ON	Attenuation at 10 kHz:
	16 dB

Q502-control amplifier Q505, Q506, Q507	This high gain (more than 50 dB) amplifier is used for flat frequency response. Normal input level of this amplifier is −56 dB (1.2 mV) at 1,000 Hz.
rectifier D501, D502	These diodes performing as a voltage doubler rectify amplified signals to obtain a dc component greater than 1 V.
C507	This capacitor prevents abnormal oscillation of high frequency signals. The capacitance value is small (6 pF) because the amplifier requires a short attack time.
release time C517, R534	C517 and R534 effect a release time of about 10 m sec.
C515, R530	C515 and R530 connected to the negative feedback circuit of Q502-control amplifier boost the high frequency signal input attenuated by the filter.
C518, R537	For increasing-transient inputs, C518 and R537 reduce attack time to 25 μsec. When signal level increases suddenly, attack time−time until DOLBY system begins to operate − causes a click noise due to over-shoot as shown in Fig. 1-3. To prevent the click noise, by-pass circuits are added. See Fig. 1-4.

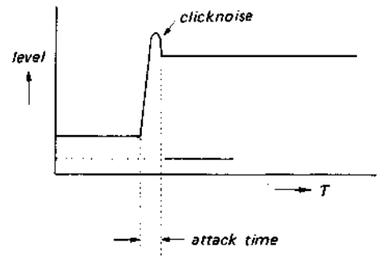


Fig. 1-3.

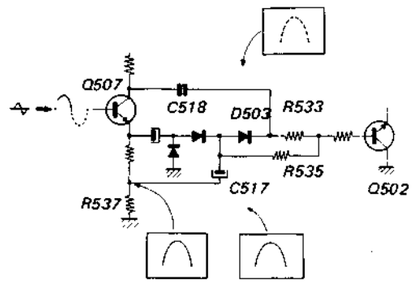


Fig. 1-4.

C513, R525	R525 is series-connected to the by-pass capacitor C513 of Q505 emitter. R525 and a small value coupling-capacitor C512 decrease the control amplifier gain of low frequencies.
flat amplifier Q503, Q504	This stage amplifies the filter output signals.

* The word DOLBY is a trade mark of Dolby Laboratories, Inc.

1-2. AUTOMATIC SHUT-OFF MECHANISM .OPERATION

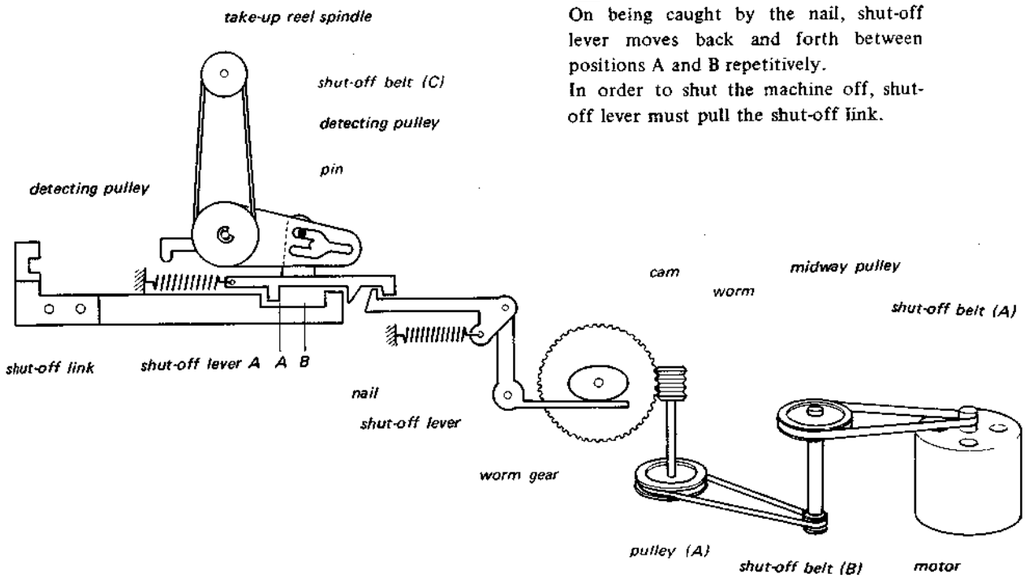
The TC-131SD mechanism is designed so that the unit will shut itself off automatically at tape end in any mode by detecting stop mode of take-up reel spindle.

As an example, the mechanism operation in playback mode is illustrated step by step.

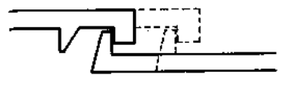
Playback – Normal Operation –

4

As long as tape remains on the spindle, take-up reel spindle continues to rotate. Shut-off belt (C) transmits turning force to the detecting pulley and then to the detecting pulley lever.



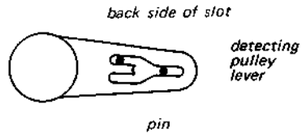
2



1

This worm gear rotates constantly, causing cam to move nail as shown in step 2.

Detecting pulley lever operation in playback mode.



5

As a result of rotational friction on the detecting pulley lever, the pin always wants to hug the back side of the slot, (upper side as shown). The constant motion of a shut-off lever A slides the pin back and forth along the back side of the slot.

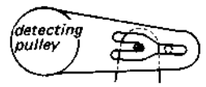
3

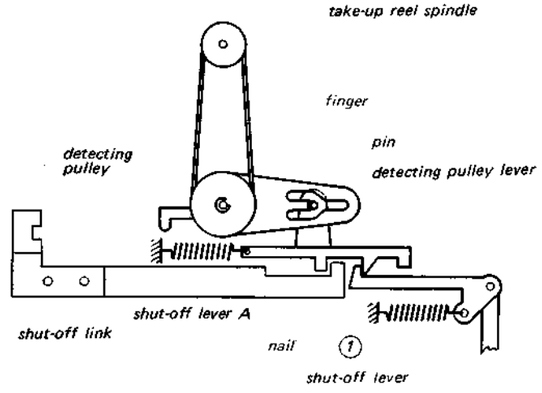
On being caught by the nail, shut-off lever moves back and forth between positions A and B repetitively.
In order to shut the machine off, shut-off lever must pull the shut-off link.

Playback – Automatic Shut-off Operation –

6

When tape runs out on the spindle, the turning force on the detecting pulley lever halts. When the pin starts to move inward in the slot, it no longer wants to hug the side of the slot as previously, but stops in the middle on the finger.





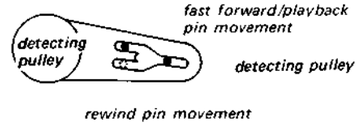
7

The finger holds the pin (and shut-off lever A) playback far enough so that the nail is able to catch shut-off lever A in position (1) as shown.

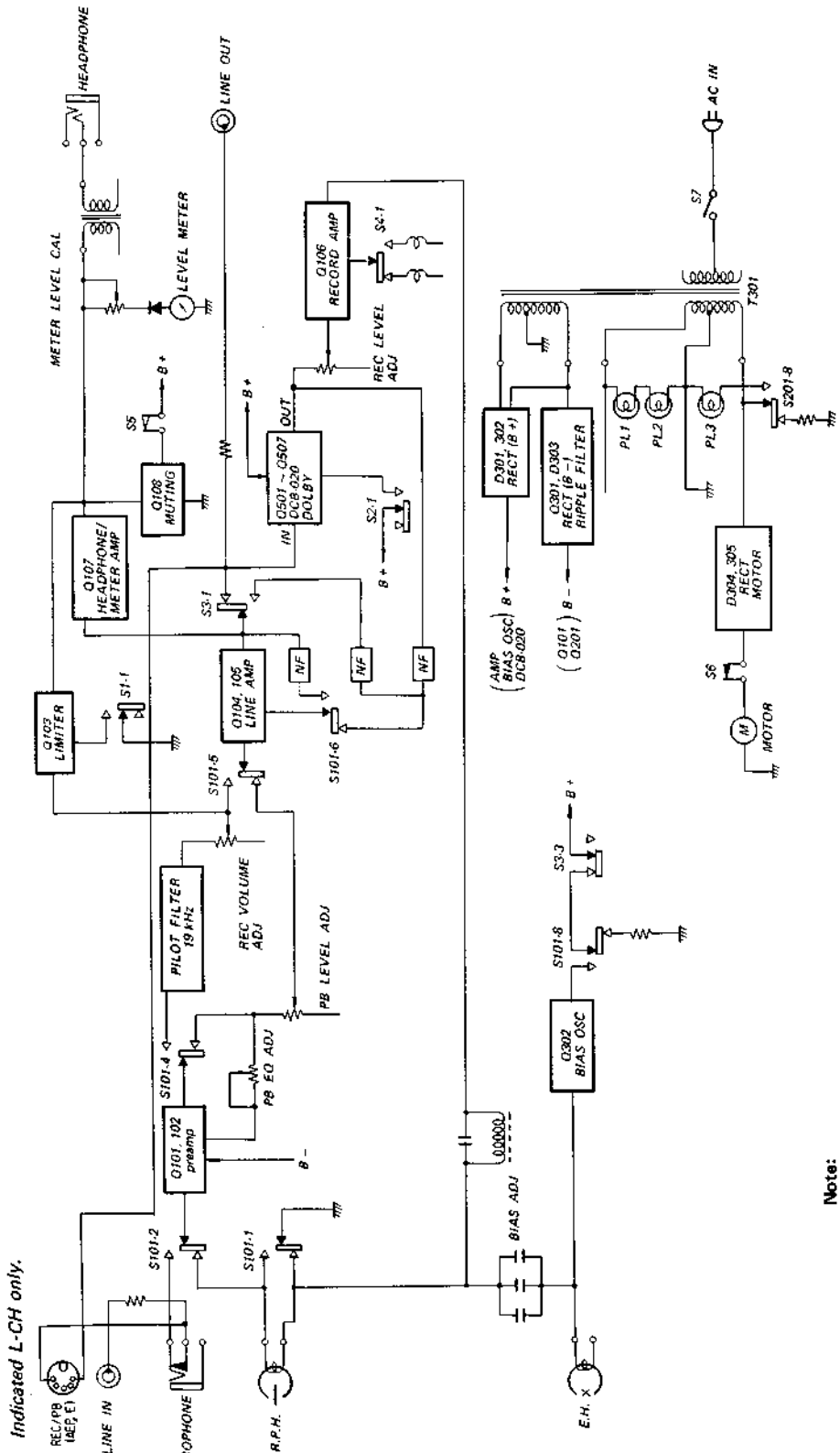
8

Now shut-off lever A can move far enough to pull the shut-off link which shuts the machine off.

For fast forward, automatic operation is the same as for the playback mode. For rewind mode, the pin hugs the opposite side of the slot, as shown below.



1-3. BLOCK DIAGRAM



Note:

1. Switch Mode:

Ref. No.	Switch	Mode
S101,201	record/playback	playback
S1	LIMITER	ON
S2	DOLBY NR	ON
S3	timing	playback
S4	TAPE SELECT	NORMAL
S5	muting	OFF
S6	motor	ON
S7	POWER	OFF

2. Timing Switch (S3) Functions in stop mode:

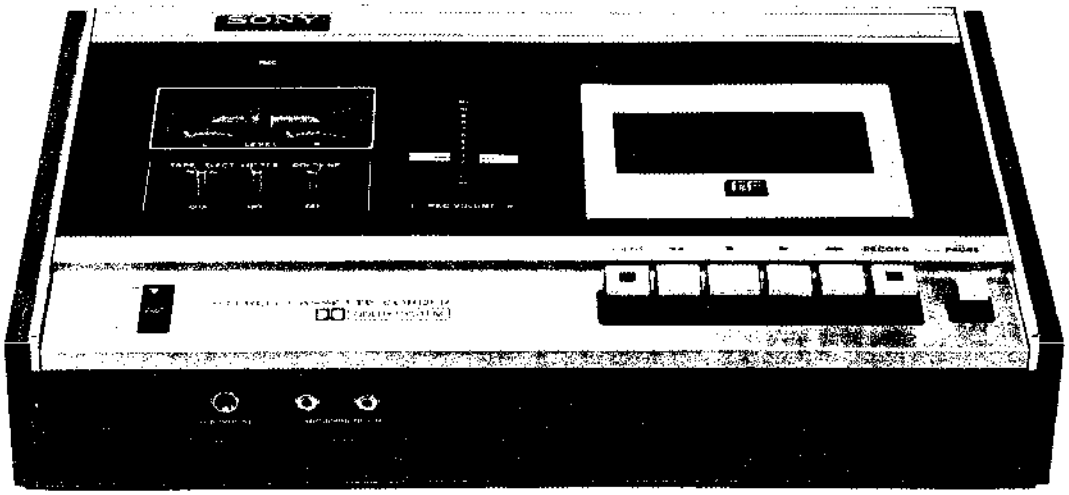
* Timing switch stops the LINE OUT signal.
* Timing switch stops the bias oscillation.
* Timing switch cuts the DOLBY circuit OFF.

3. Muting Switch (S5) Functions:

When record/playback switch is changed, muting switch grounds HEADPHONE/METER AMP circuit and prevents misoperation of limiter circuit caused by click noise.

(Muting switch is turned ON for a moment to ground click noise when record/playback switch is changed or when each button is depressed.)

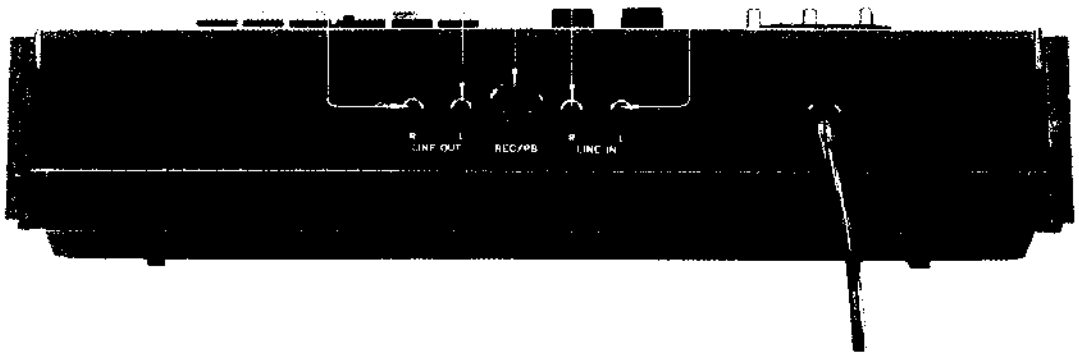
1-4. EXTERNAL VIEW (1)



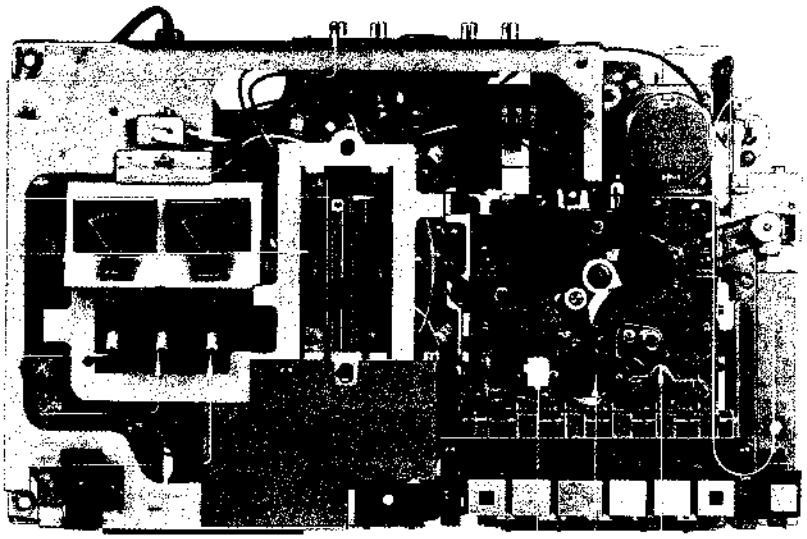
1-5. EXTERNAL VIEW (2)

(CNJ301)
(AEP, AUS, E)

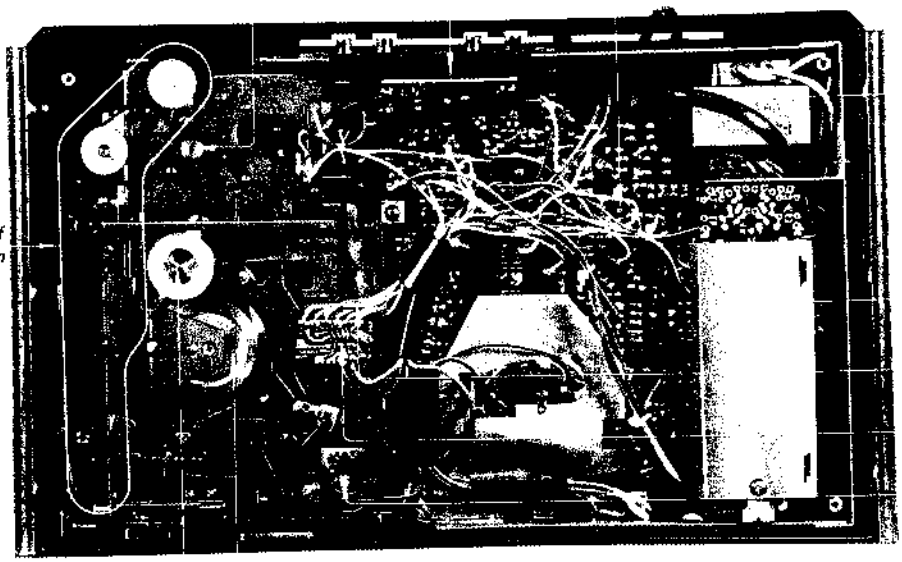
(CNJ202) *(CNJ102)* *(CNJ201)* *(CNJ101)*



1-6. INTERNAL VIEW (1)

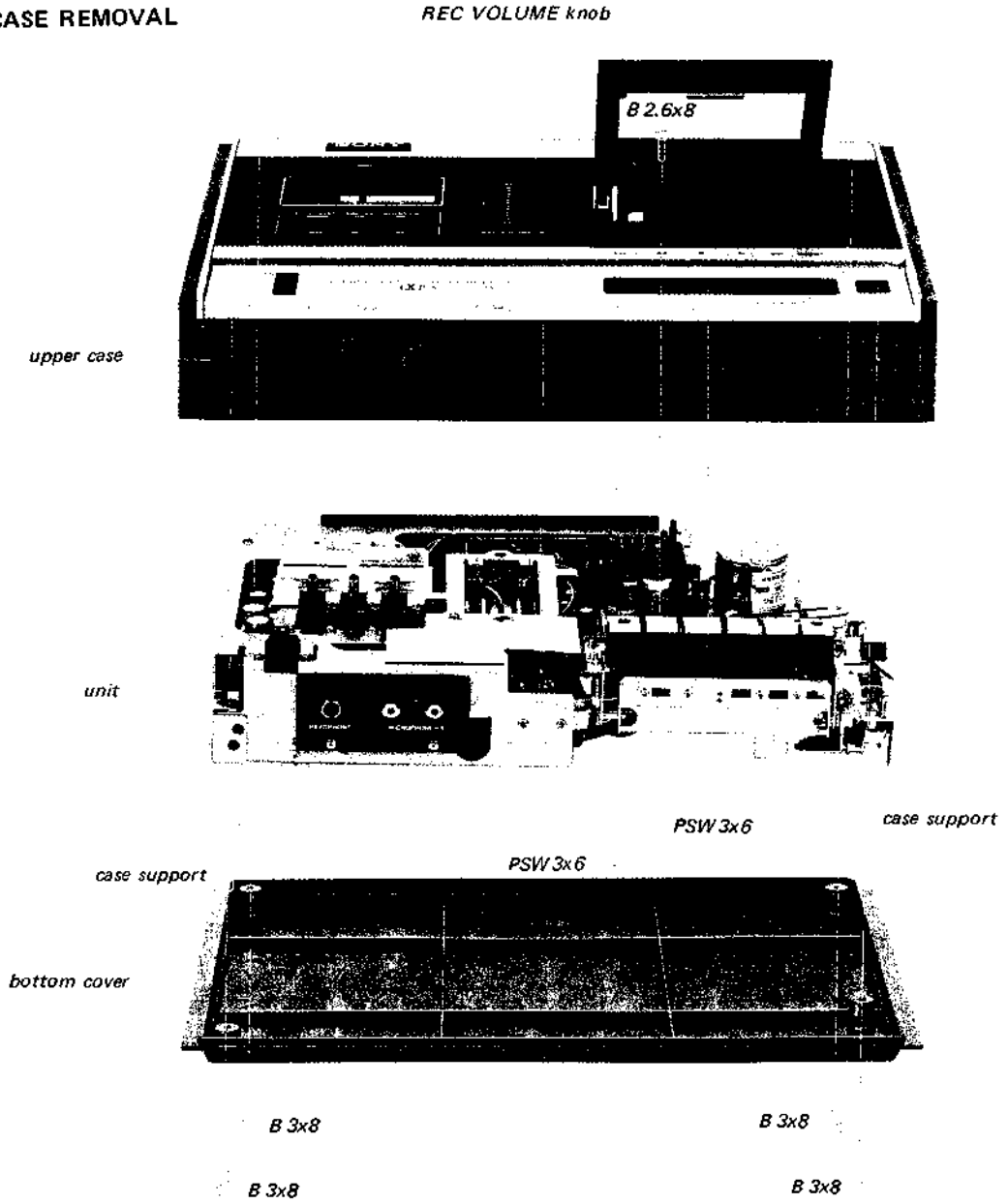


1-7. INTERNAL VIEW (2)

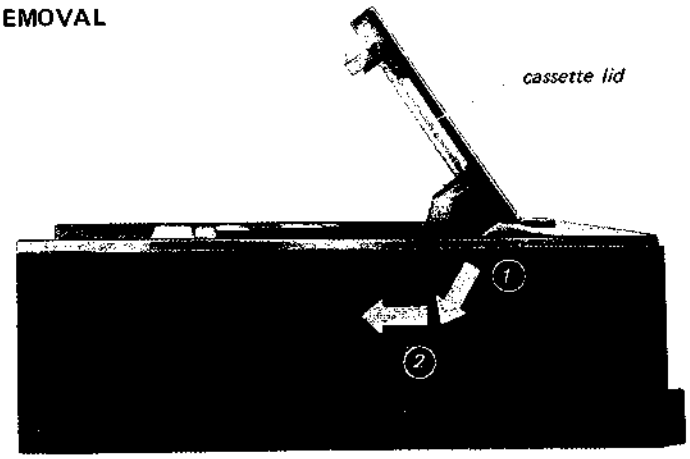


SECTION 2
DISASSEMBLY

2-1. CASE REMOVAL



2-2. CASSETTE LID REMOVAL



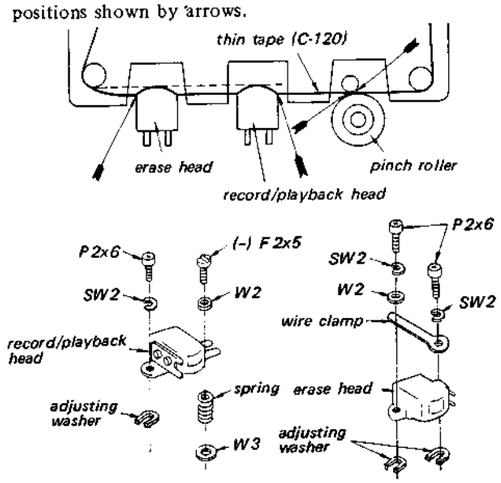
SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

Head Height Adjustment

– playback mode –

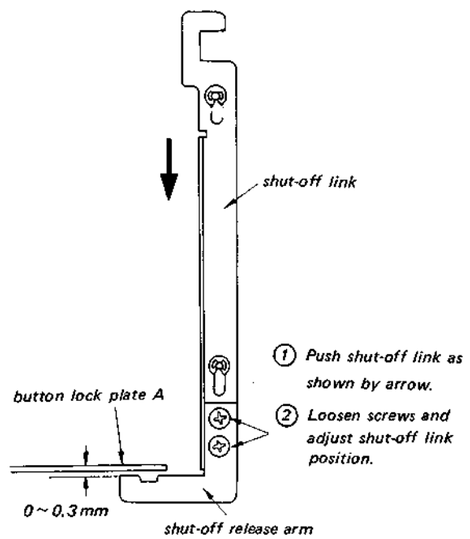
Adjust by removing or adding the adjusting washer so that tape straight runs without curl at positions shown by arrows.



Part. No.	Description
3-513-237-01	adjusting washer (t = 0.1)
3-513-237-11	adjusting washer (t = 0.2)

Shut-off Release Arm Adjustment

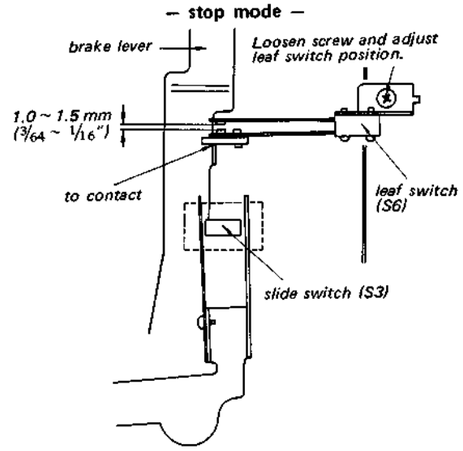
– stop mode –



Note: If above adjustment is not correctly made, automatic shut-off mechanism will operate during pause mode.

Motor Leaf Switch (S6) Adjustment

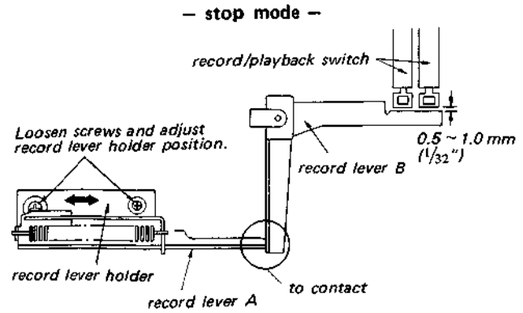
– stop mode –

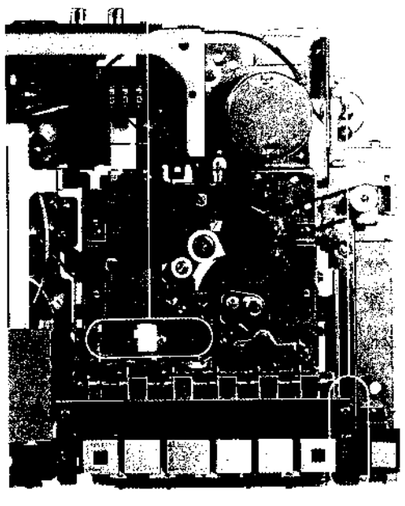


Note: When slowly depressing forward button, ensure that slide switch is changed after leaf switch is closed.

Record Lever Holder Adjustment

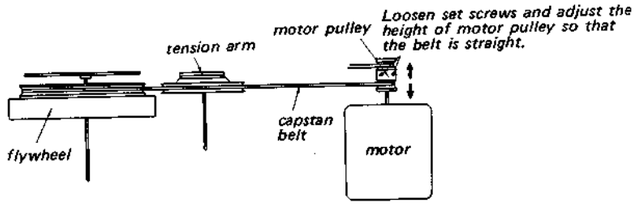
– stop mode –



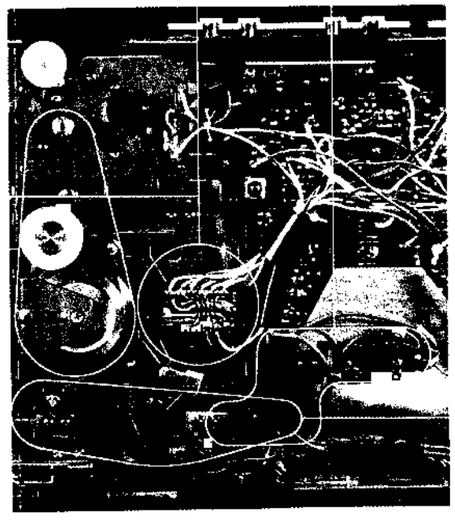


Motor Pulley Height Adjustment

– stop mode –



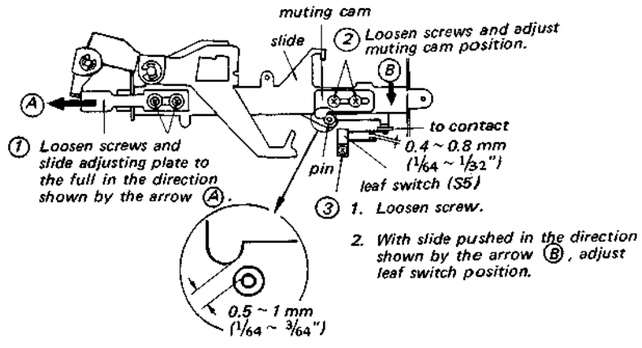
Note: Ensure that capstan belt is installed without twist and dirt.



Muting Leaf Switch (S5) Adjustment

– stop mode –

Perform in numerical order .



Note: After this adjustment.

1. When depressing RECORD button without tape cassette, ensure that record/playback switch is not changed.
2. When depressing RECORD button with a tape cassette that has safety tab, ensure that record/playback switch is changed.

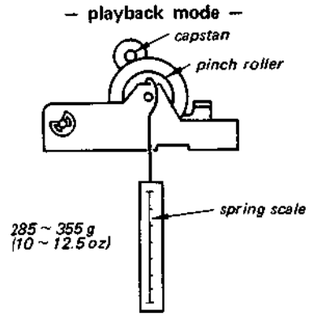
Button Operation Check

Depress	Results
forward button fast forward button rewind button REC button	locked
stop button EJECT button	not locked
PAUSE button	first depressing .....locked second depressing .....released

Mode	Depress	Results
playback	fast forward button	fast forward mode
	rewind button	rewind mode
	stop button	stop mode
	REC button	not depressed
	EJECT button	playback mode with cassette lid opened
fast forward	forward button	playback mode
	rewind button	rewind mode
	stop button	stop mode
	EJECT button	eject, stop mode
	REC button	not depressed
rewind	forward button	playback mode
	fast forward button	fast forward mode
	stop button	stop mode
	EJECT button	eject, stop mode
	REC button	not depressed
record	fast forward button	fast forward mode
	rewind button	rewind mode
	stop button	stop mode
	EJECT button	record mode with cassette lid opened

Pinch Roller Pressure Measurement

— playback mode —

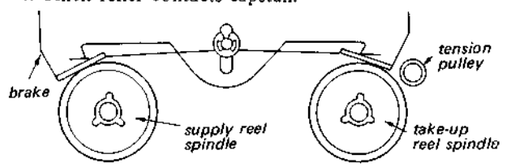


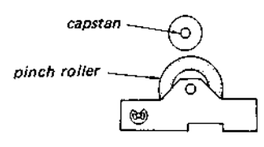
Note: The pressure should be measured just when the pinch roller contacts the capstan after being separated.

Forward Button Timing Check

When slowly depressing forward button, ensure that the following functions occur in the numerical order. (or simultaneously.)

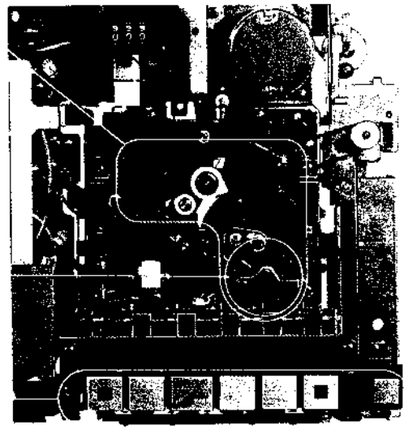
1. Brake separates from each reel spindle.
2. Tension pulley contacts take-up reel spindle.
3. Motor switch turns on and capstan starts to rotate.
4. Pinch roller contacts capstan.





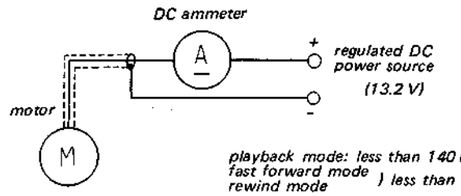
Torque Measurement

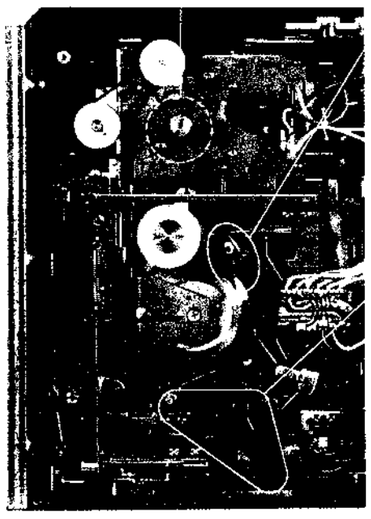
Mode	Torque
Playback	40 ~ 60 g · cm (0.56 ~ 0.83 oz · inch)
Fast forward Rewind	70 ~ 150 g · cm (0.84 ~ 2.1 oz · inch)



Motor Current Measurement

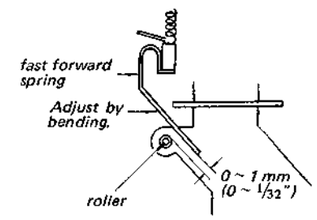
Measure current as shown.





Fast Forward Spring Check

— stop mode —

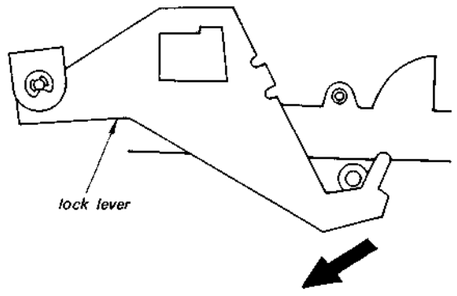


Note: When fast forward and rewind torques are poor, clean idlers and adjust fast forward spring.

Lock Lever Operation Check

— record mode —

1. With forward button kept depressed, depress stop button.
   (REC button is only released and record function is not completely released.)
2. With forward button gradually returned, ensure that lock lever releases in the direction shown by the arrow.



Note: If lock lever does not release, REC button may not be depressed with a cassette loaded.

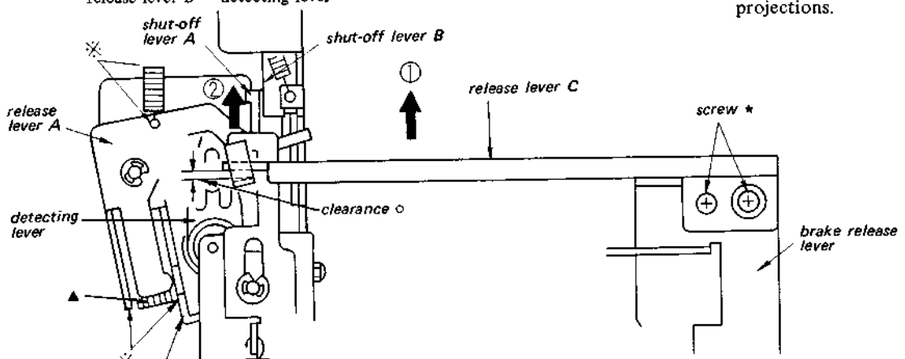
Checks After Mechanical Adjustments (2)

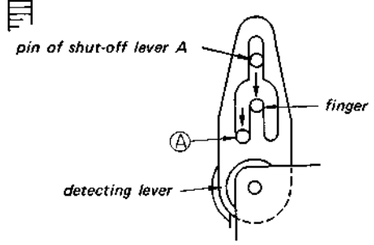
Automatic Shut-off Mechanism Operation Check

Release-Lever-C Operation Check

1. Turn POWER switch OFF and place the unit in stop mode.
2. Pull brake release lever in the direction shown by the arrow ① to obtain the clearance marked ○.
3. Pull shut-off lever A in the direction shown by the arrow ② to interlock shut-off lever B with shut-off lever A.
4. Lift shut-off lever B to stop the pin of shut-off lever A at finger of detecting lever.
5. When returning release lever C, ensure that the pin of shut-off lever A returns to position A.

Note: Release Function Order:
release lever C → release lever A → release lever B → detecting lever





Do not break marked ※, apply lock paint there.

If the pin of shut-off lever A does not return to position A in Step 5, automatic shut-off mechanism will operate, as soon as mode changes from stop to playback, fast forward or rewind.

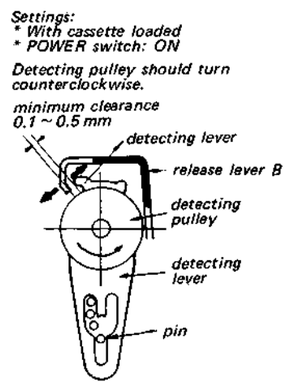
This trouble is caused by the following:

Cause	Remedy
Lengthened spring marked ▲	Replace.
Clearance marked ○	Loosen screws marked ★ and adjust release-lever-C position for no clearance.
Unsmooth return of brake release lever	Make the lever free from being caught by other levers or projections.

Detecting-Lever and Release-Lever-B Operation Check

1. Rewind Mode

Check as shown below:

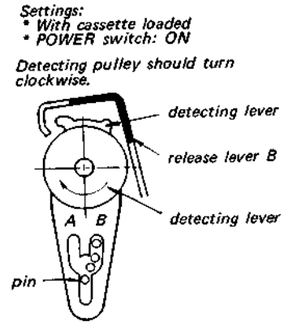


If necessary, adjust by bending release lever B. (Do not bend the portion of release lever B shown in black.)

Note: If the above adjustment is not correctly made, automatic shut-off mechanism will operate during rewind mode.

2. Playback and Fast Forward Modes

Check as shown below:

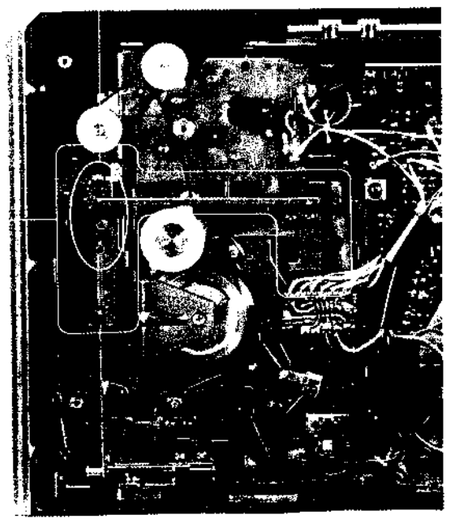


- Ensure that the pin moves along the slot B.

If the pin does not move along the slot B, automatic shut-off mechanism will operate during playback and fast forward modes.

Check the following:

- Friction between detecting pulley and detecting lever should not week.
- Detecting pulley belt should not slip.



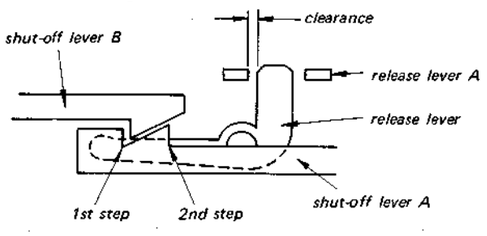
Shut-off Lever-A and Shut-off Lever-B Operation Check (1)

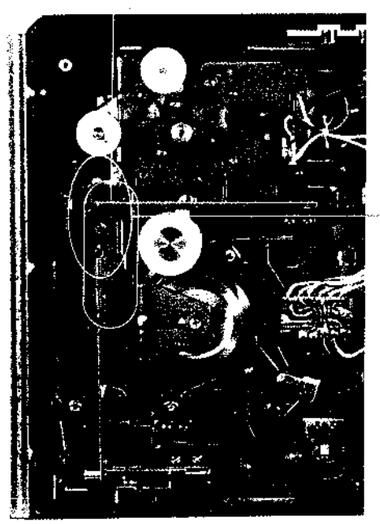
– playback, fast forward and rewind mode – (during tape running)

Check the following:

1. Shut-off lever B should completely interlock shut-off lever A at 1st step.
2. The release lever should not push shut-off lever B.
3. There should be a clearance between the release lever and release lever A.

Note: If the above checks are not satisfied, automatic shut-off mechanism will operate during tape running or will not operate even at end of tape. Perform Release-Lever-C Operation Check on Page 15.

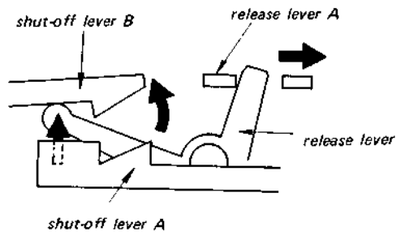




Shut-off Lever-A and Shut-off Lever-B Operation Check (2)

With stop button or PAUSE button depressed in playback, fast forward and rewind mode, and with automatic shut-off mechanism operated at end of tape.
Check the following:

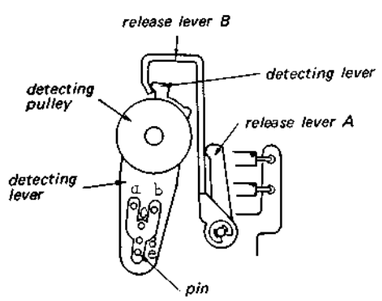
1. Release lever A should push the release lever which pushes shut-off lever B.
2. Shut-off lever B should repeat constant motion not to interlock shut-off lever A.



Release-Lever-B Operation Check.

Check the following:

1. When the pin comes at position "d" or "e" before automatic shut-off operation at end of tape in playback mode, the pin should be stopped at position "b" by depressing PAUSE button.
2. When the pin comes at position "d" in playback, fast forward and rewind modes, the pin should be stopped at position "a" or "b" by depressing stop button.
3. After automatic shut-off mechanism has operated at end of tape in playback, fast forward and rewind modes, the pin should be stopped at position "b".



3-2. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

Precaution:

1. Clean the following parts with an alcohol moistened swab:
   * record/playback head
   * erase head
   * capstan
   * pinch roller
   * rubber belts
   * idlers
2. Demagnetize record/playback head with a head demagnetizer.
3. Do not use magnetized screwdriver for adjustments.
4. After adjustments, apply locking paint to the parts adjusted.
5. Adjustments should be performed in the order arranged in this service manual.
6. Adjustments and measurements should be performed for both L-CH and R-CH with rated power supply voltage unless otherwise specified.
7. Record and playback level adjustments should be carefully performed. In case the levels are not as specified, DOLBY circuit will not correctly operate.

Test Equipment/Tools Required:

audio oscillator (af osc)
VTVM
digital frequency counter
oscilloscope
wow meter
1 kHz, 5 kHz } bandpass filter
attenuator (600Ω)
non-magnetic screwdriver
blank tape cassette (completely erased with bulk eraser) C-60 HF
C-60 CR
resistors ..... 100kΩ (¼W), 600 Ω (¼W)
300 Ω (¼W),
SONY test tapes
SPC-4 (1kHz, 0 dB)
WS-48 (3kHz, 0 dB)
P-4-L81 (333Hz, 0 dB)
P-4-A81 (6.3kHz, –10 dB)

Normal Input Level

	MICROPHONE	LINE IN
impedance	600 Ω	100 kΩ or more
input level	-60 dB (0.77 mV)	-10 dB (0.25 V)

Normal Output Level

	LINE OUT
load impedance	100 kΩ
output level	0 dB (0.775 V)

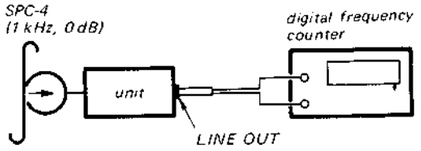
1. Tape Speed Adjustment

Settings:

LIMITER switch: OFF
TAPE SELECT switch: NORMAL
DOLBY NR switch: OFF

Procedure:

1. Mode: Playback



Specification: 985 ~ 1015 Hz
Frequency difference between beginning and end is within 10 Hz.

2. If necessary, change motor pulley.

Part No.	Motor Pulley (groove)	Tape Speed
3-533-357-01		faster
3-533-357-11		
3-533-357-21		
3-533-357-31		slower

Note: After the motor pulley is changed, perform Motor Pulley Height Adjustment on Page 11.

2. Head Azimuth Adjustment

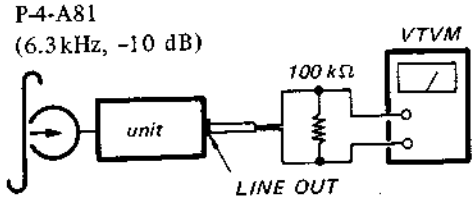
Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF

Procedure:

1. Mode: Playback

P-4-A81
(6.3 kHz, -10 dB)

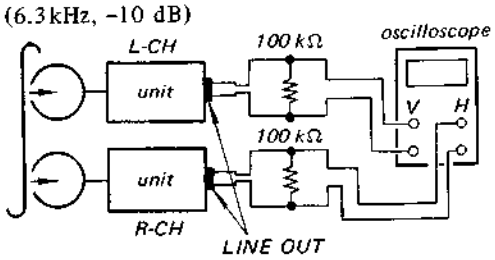


2.

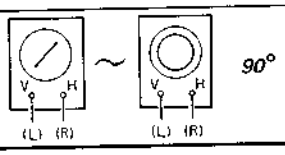
Adjust	VTVM reading	Remarks
azimuth adjusting screw	highest peak	If the azimuth angles of L-CH and R-CH are not the same, set the screw midway between two screw positions.

3. Mode: Playback

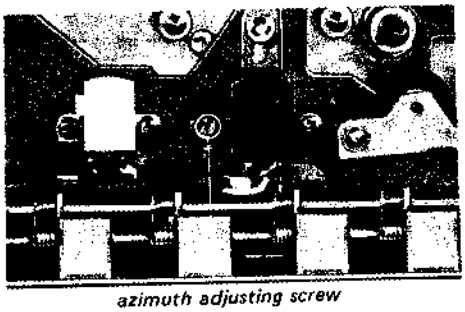
P-4-A81
(6.3 kHz, -10 dB)



4.

Adjust	On the oscilloscope
azimuth adjusting screw	in phase  90°

Adjustment Location:



azimuth adjusting screw

3. Playback Level Adjustment

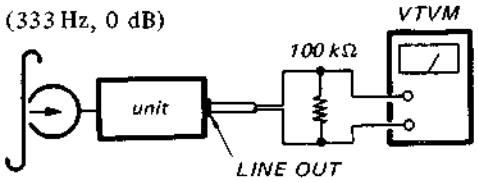
Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF

Procedure:

1. Mode: Playback

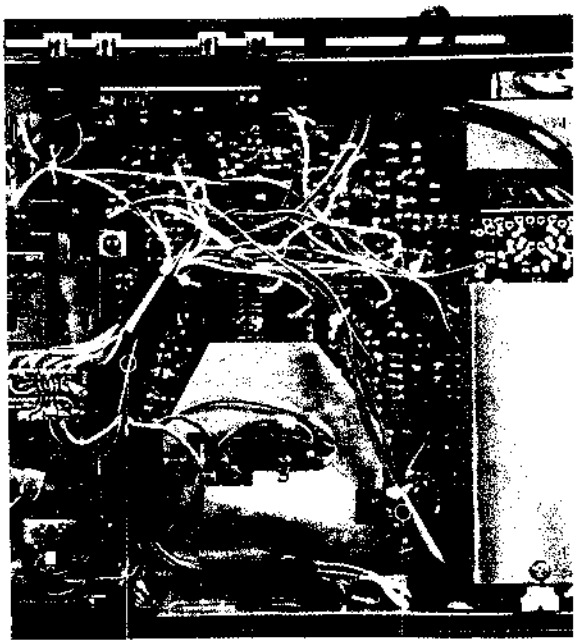
P-4-L81
(333 Hz, 0 dB)



2.

Adjust	VTVM reading	Remarks
R115 R215	0 dB (0.775 V)	1. Allowance: within ±0.5 dB 2. Level difference between the L-CH and R-CH should be within 1 dB.

Adjustment Location:



R215 (R-CH) R115 (L-CH)

4. Playback Equalizer Adjustment

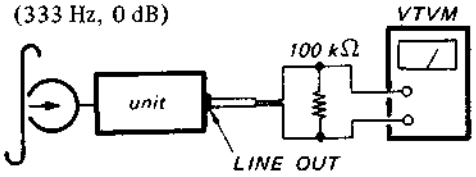
Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF

Procedure:

1. Mode: Playback

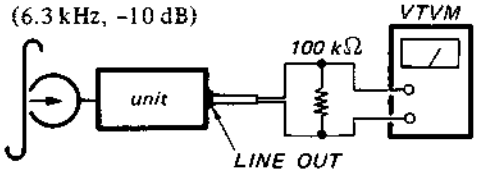
P-4-L81
(333 Hz, 0 dB)



Memorize the VTVM reading.

2. Mode: Playback

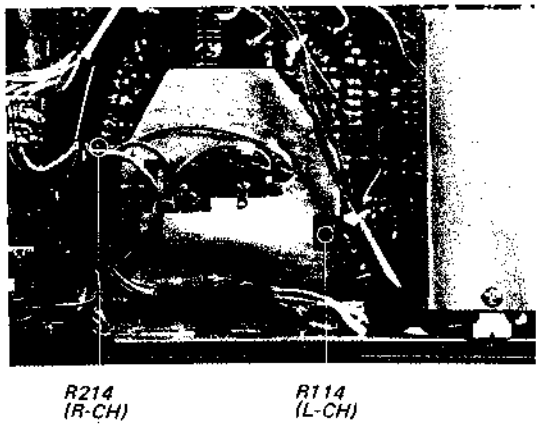
P-4-A81
(6.3 kHz, -10 dB)



Adjust	VTVM reading	Remarks
R114 (L-CH) R214 (R-CH)	Level in Step 2 are lower by 10 dB than level in Step 1.	Allowance: within ±1 dB

Note: When adjustable resistors R114 and R214 are much turned, perform playback level adjustment on Page 19.

Adjustment Location:



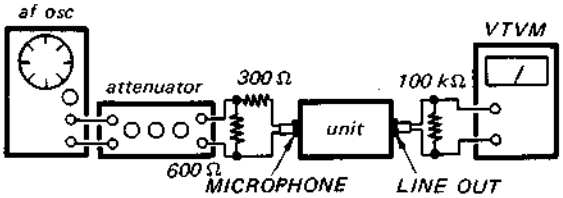
5. LEVEL Meter Calibration

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, -60 dB (0.77 mV) MICROPHONE signal in record mode.

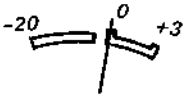
Procedure:

1. Mode: Record

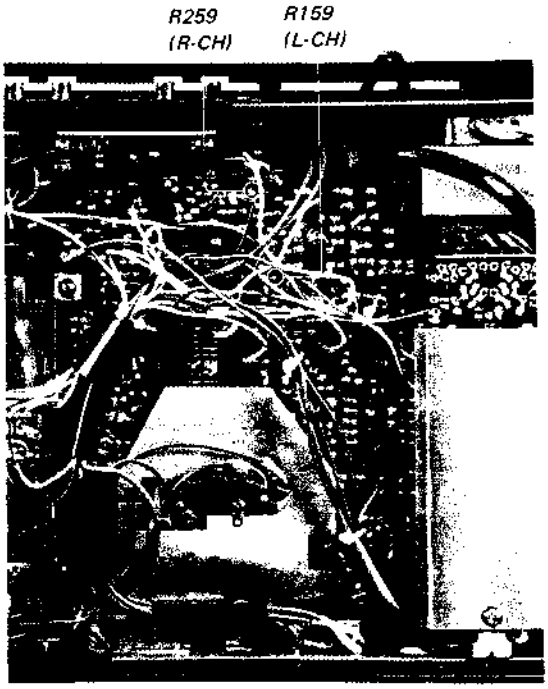


333 Hz, -60 dB (0.77 mV)

2.

Adjust	LEVEL meter reading
R159 (L-CH) R259 (R-CH)	

Adjustment Location:



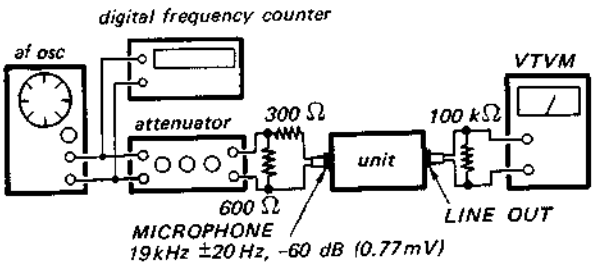
6. 19 kHz Filter Adjustment

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, −60 dB (0.77 mV) MICROPHONE signal in record mode.

Procedure:

1. Mode: Record



Note: 19 kHz pilot signal of stereo signal generator may be used for input signal.

Adjust	VTVM reading	Remarks
L102 (L-CH) L202 (R-CH)	minimum (less than −28 dB, 31 mV)	Frequency Allowance: within ±20 Hz.

Adjustment Location:

L202 (R-CH) L102 (L-CH)

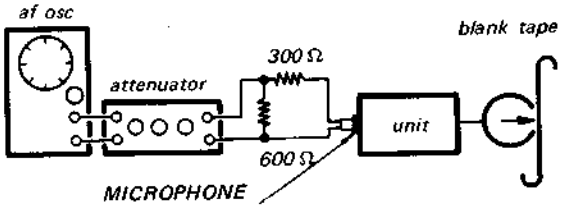
7. Record Bias Adjustment

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, −60 dB (0.77 mV) MICROPHONE signal in record mode.

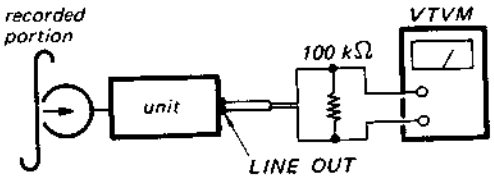
Procedure:

1. Mode: Record



(1) 1 kHz, −90 dB (25 μV)
(2) 7.5 kHz, −90 dB (25 μV)

2. Mode: Playback



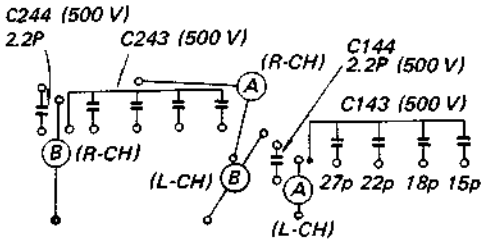
Adjust	VTVM reading
C143 (L-CH) C243 (R-CH) C144 (L-CH) C244 (R-CH)	1 kHz level = 7.5 kHz level Allowance: within ±0.5 dB

Level	Capacitance Value
7.5 kHz > 1 kHz	increase
7.5 kHz < 1 kHz	decrease

Adjust by soldering and repeat steps 1 and 2.

– Continued on next page –

Adjustment Location:



If the specified results are not obtained, connect additional capacitor:

Level	Adjust
7.5 kHz > 1 kHz	Connect capacitor 56pF at Ⓐ position and repeat Steps 1 to 2.
7.5 kHz < 1 kHz	Connect capacitor 56pF at Ⓑ position and repeat Steps 1 to 2.

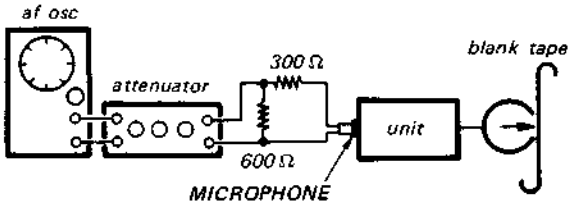
8. Record Level Adjustment

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, −60 dB (0.77 mV) MICROPHONE signal in record mode.

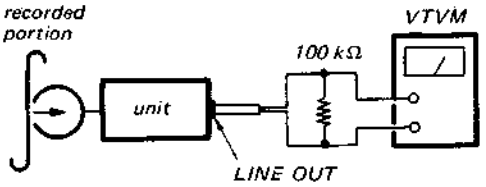
Procedure:

1. Mode: Record



333 Hz, −60 dB (0.77 mV)

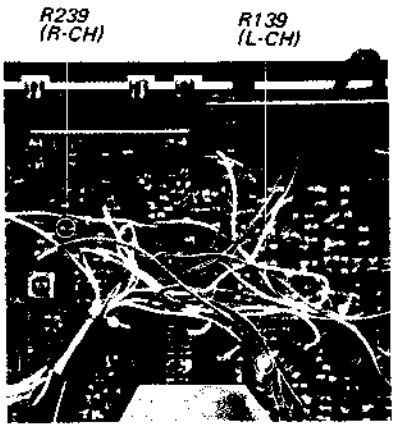
2. Mode: Playback



Adjust	VTVM reading	Remarks
R139 (L-CH) R239 (R-CH)	0 dB (0.775 V)	Allowance: within ±0.5 dB

Adjust R139 and R239 and repeat steps 1 and 2.

Adjustment Location:



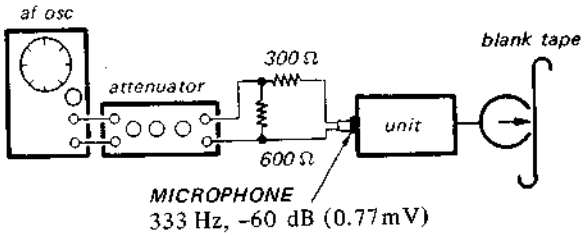
9. Overall Signal-to-Noise Ratio Measurement

Settings:

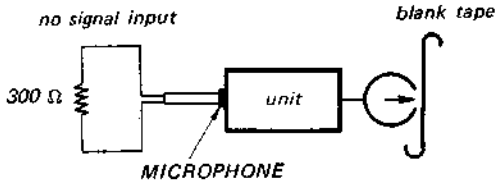
LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
REC VOLUME control:	for 0 dB (0.775 V) LINE OUT level with 333 Hz, -60 dB (0.77 mV) MICROPHONE signal in record mode.

Procedure:

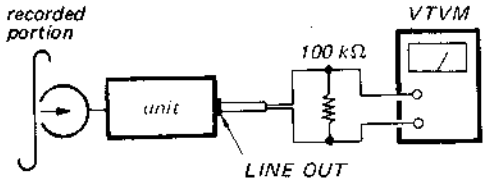
1. Mode: Record



2. Mode: Record



3. Mode: Playback



Playback	VTVM reading
333 Hz	level difference: greater than 44 dB
no signal	

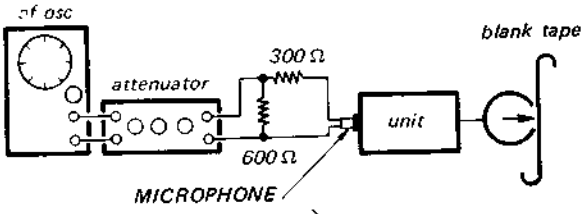
10. Overall Frequency Response Measurement

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, -60 dB (0.77 mV) MICROPHONE signal in record mode.

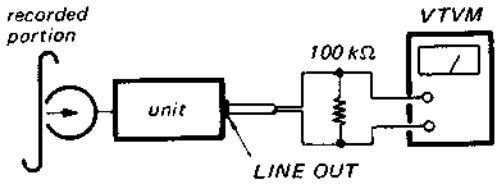
Procedure:

1. Mode: Record



333 Hz, 40 Hz, 70 Hz, 1 kHz, 5 kHz, 7.5 kHz, 12 kHz, 15 kHz } -90 dB (25 μV)

2. Mode: Playback



Playback	Output level difference from 333 Hz level		
	DOLBY NR switch: ON	DOLBY NR switch: OFF	
	TAPE: C-60 HF C-60CR	TAPE: C-60 CR TAPE SELECT switch: CrO_2	TAPE: C-60 HF
333 Hz	0 dB	0 dB	0 dB
40 Hz	——	$\pm^{3}_{13}$ dB	$\pm^{3}_{13}$ dB
70 Hz	±3 dB	±3 dB	±3 dB
1 kHz	±4 dB	——	——
5 kHz	±4 dB	±3 dB	±3 dB
7.5 kHz	±4 dB	±3 dB	±3 dB
12 kHz	——	——	$\pm^{3}_{13}$ dB
15 kHz	——	$\pm^{3}_{13}$ dB	——

—— : not specified

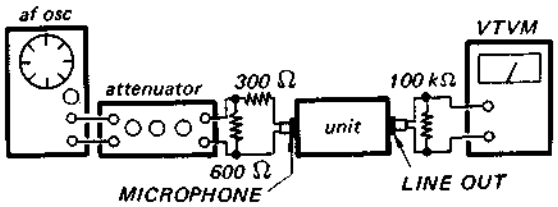
11. LIMITER Response Measurement

Settings:

LIMITER switch:	ON
TAPE SELECT switch:	NORMAL
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, -60 dB (0.77 mV) MICROPHONE signal in record mode.

Procedure:

1. Mode: Record



333 Hz, -60 dB (0.77 mV)
333 Hz, -30 dB (25 mV)

Input signal	VTVM reading
333 Hz, -60 dB (0.77 mV)	-0.5 dB (0.73 V) ±1 dB
333 Hz, -30 dB (25 mV)	+4 dB (1.2 V) ±1.5 dB

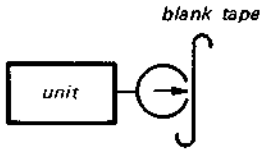
12. DOLBY System Signal-to-Noise Ratio Improvement Measurement

Settings:

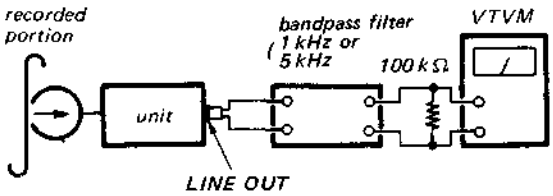
LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
REC VOLUME control:	MIN
DOLBY NR switch:	OFF

Procedure:

1. Mode: Record
   no signal input



2. Mode: Playback



3. With DOLBY NR switch set to ON position, perform Steps 1 and 2.
4. Ensure that DOLBY system improves S/N ratio. S/N ratio should be improved.
   4 dB or more at 1 kHz
   8 dB or more at 5 kHz

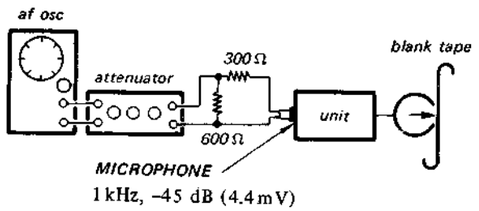
13. Erase Ratio Measurement

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	CrO_2
DOLBY NR switch:	OFF
REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, −60 dB (0.77 mV) MICROPHONE signal in record mode.
blank tape:	C-60 CR

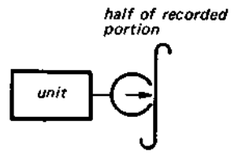
Procedure:

1. Mode: Record

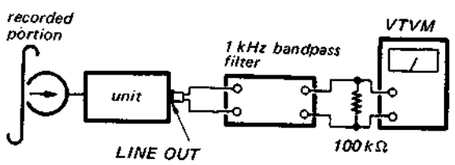


2. Rewind half of recorded portion.
3. Set the REC VOLUME control to MIN position.
4. Mode: Record

no signal input (erase)



5. Mode: Playback



Playback	VTVM reading
1 kHz	level difference: greater than 60 dB
erased portion	

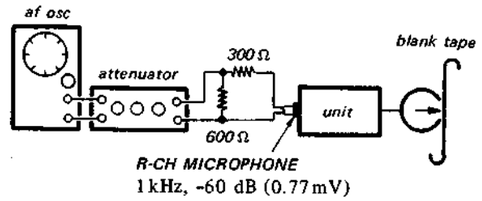
14. Cross-talk Measurement (between channels)

Settings:

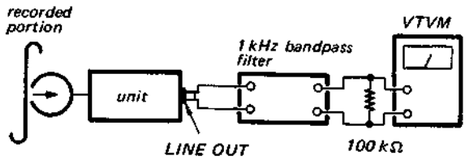
LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
R-CH REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, −60 dB (0.77 mV) MICROPHONE signal in record mode.

Procedure:

1. Set L-CH REC VOLUME control to the same as R-CH REC VOLUME control position.
2. Terminate L-CH MIC jack with 300 Ω resistor.
3. Mode: Record



4. Mode: Playback



Play back	VTVM reading
R-CH (1 kHz)	level difference: greater than 25 dB
L-CH (no signal)	

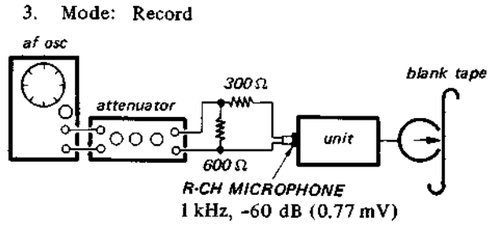
15. Cross-talk Measurement (between tracks)

Settings:

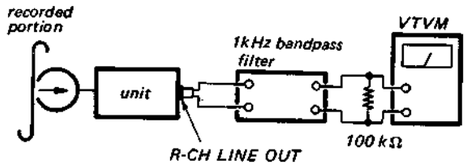
LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF
R-CH REC VOLUME control:	For 0 dB (0.775 V) LINE OUT level with 333 Hz, −60 dB (0.77 mV) MICROPHONE signal in record mode.

Procedure:

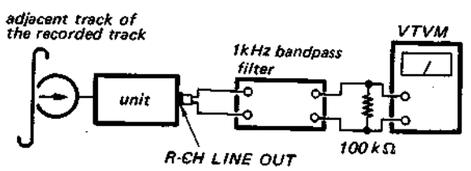
1. Set L-CH REC VOLUME control to the same as R-CH REC VOLUME position.
2. Terminate L-CH MIC jack with 300 Ω resistor.
3. Mode: Record



4. Mode: Playback



5. Turn the cassette over.
6. Mode: Playback



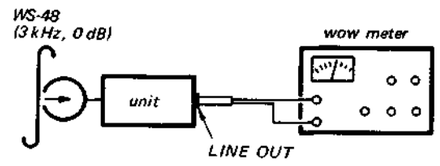
Playback	VTVM reading
1 kHz	level difference: greater than 60 dB
adjacent track of the recorded track	

16. Wow and Flutter Measurement

Settings:

LIMITER switch:	OFF
TAPE SELECT switch:	NORMAL
DOLBY NR switch:	OFF

Procedure:



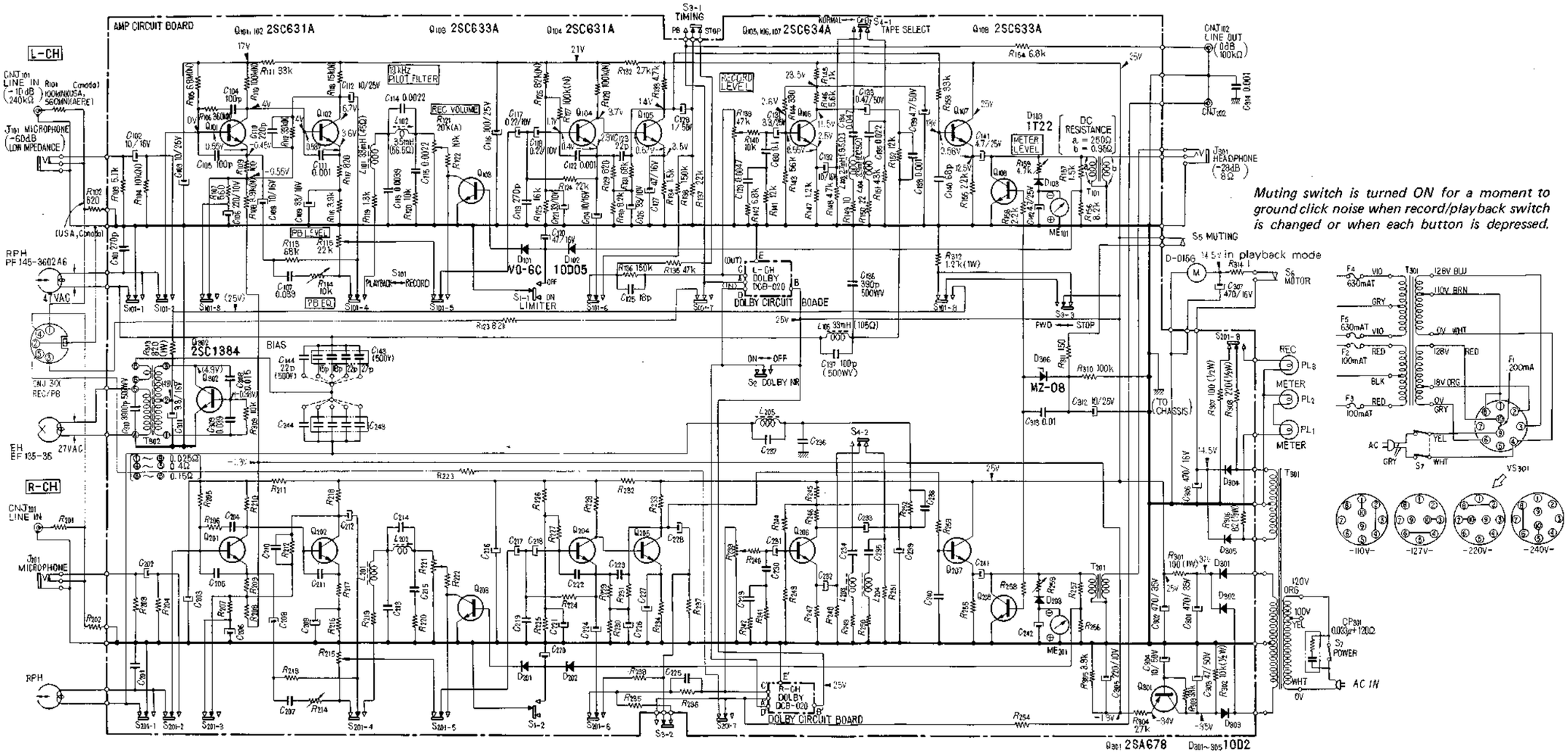
Specification: 0.25 % (RMS) weighted

Note: Measure wow and flutter for beginning and end portion of tape (WS-48).

SECTION 4
DIAGRAMS

4-1. SCHEMATIC DIAGRAM

Amp Circuit



Muting switch is turned ON for a moment to ground click noise when record/playback switch is changed or when each button is depressed.

Red Line Circuit: AEP, E, AUS

Note:

- All resistors and capacitors are in Ω and μF unless otherwise specified.
- Letter in ( ) suffixed to variable resistor value indicates characteristics.
- ⏚ : chassis ground
- Components for R-CH have the same values as for L-CH.
- {N} : Low noise resistor
- Voltage values shown are measured with a voltmeter (20kΩ/V). Variations may be noted due to normal production tolerances.
  - no mark : stop mode
  - ( ) : record mode
- AC voltage values across heads are measured with a VTVM in record mode.

- Switch mode:

Ref. No.	Switch	Mode
S101, 201	record/playback	playback
S1	LIMITER	ON
S2	DOLBY NR	ON
S3	timing	STOP
S4	TAPE SELECT	CrO_2
S5	muting	OFF
S6	motor	OFF
S7	POWER	ON

- When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.

2% Tolerance Identification

Resistor: *value*, *tolerance (gold: ±5%)*

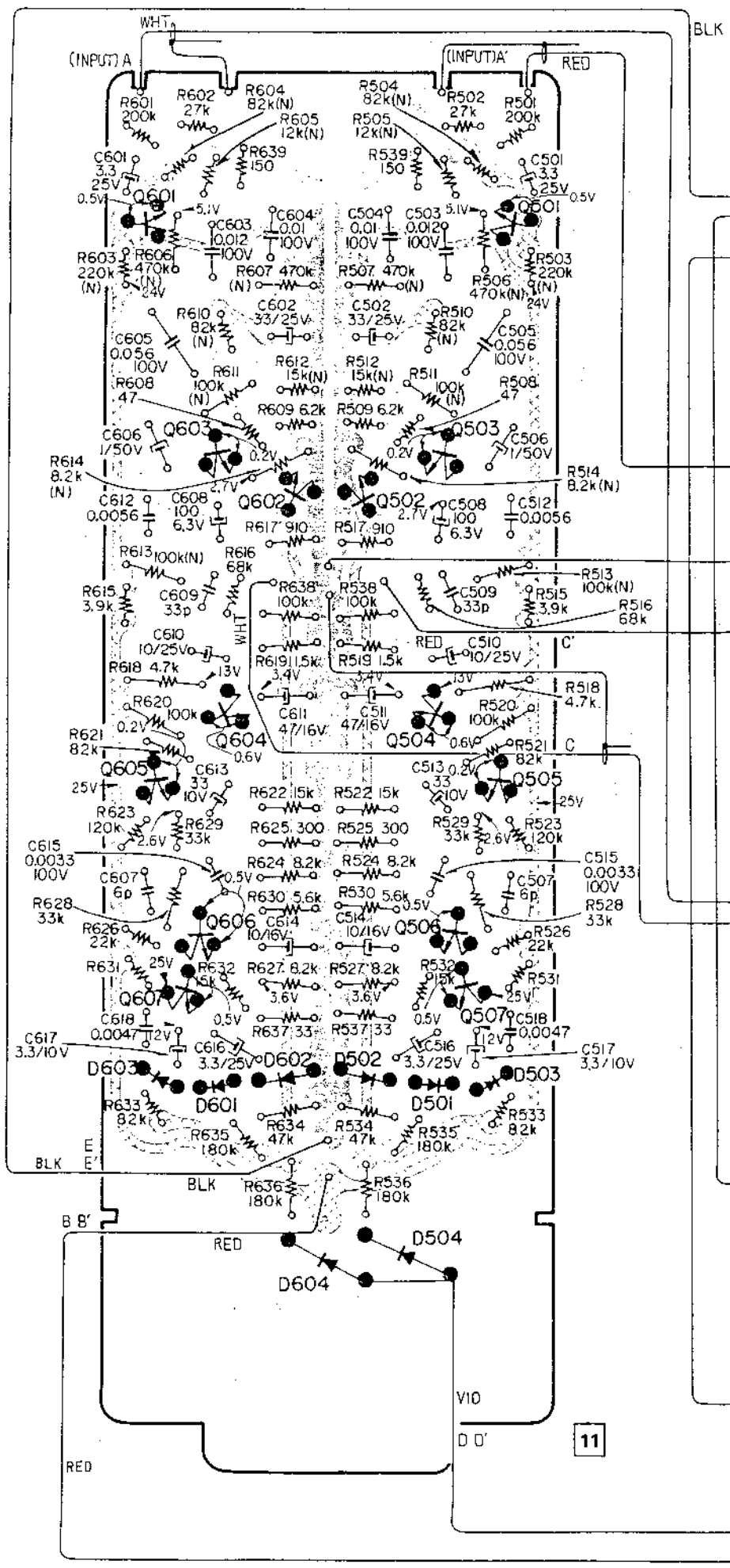
Capacitor: *value*, *G mark indicates ±2% tolerance*

Red line (or dot) indicates ±2% tolerance selected from resistors of ±5% tolerance

4-2. MOUNTING DIAGRAMS

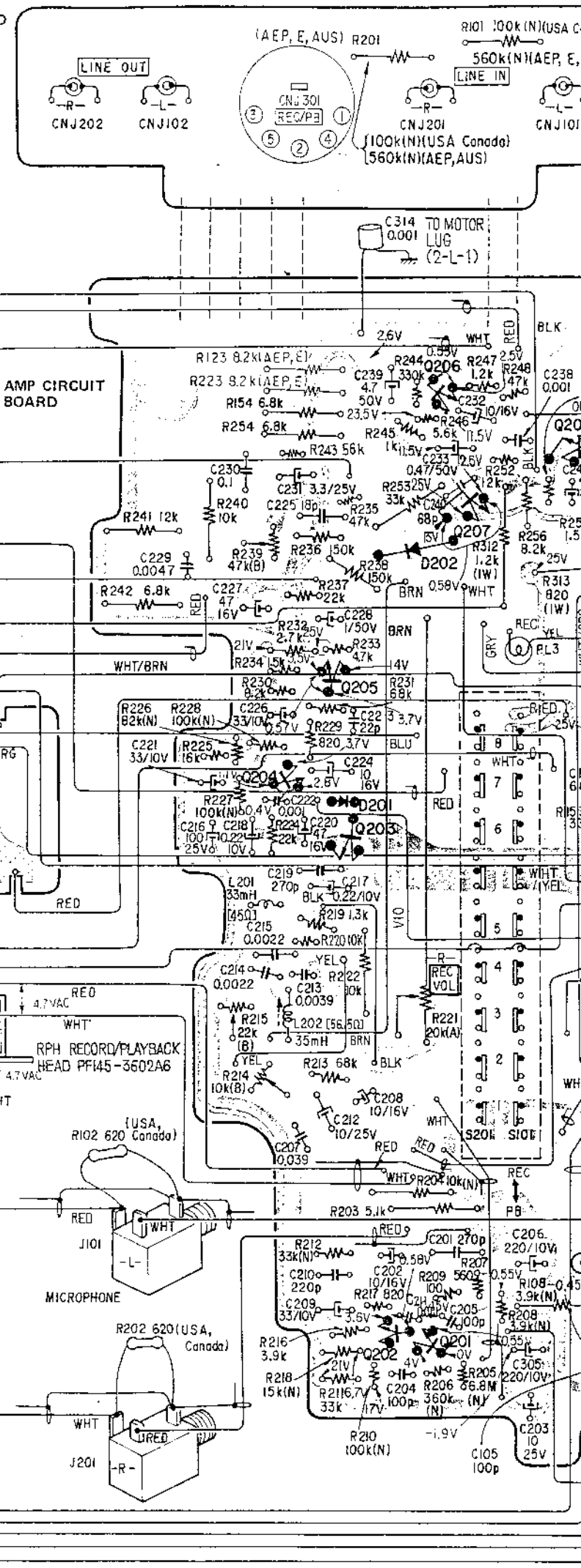
– Conductor Side –

DOLBY CIRCUIT BOARD
DCB-020



Q	D
601 501	
603 503	
602 502	
604 504	
605 505	
606 506	
607 507	
603 601 602 502 501 503	
604 504	

JACK CIRCUIT BOARD
(Component Side)



sistors and capacitors are in Ω and μF otherwise specified.
in ( ) suffixed to variable resistor ndicates characteristics.
: chassis ground
ponents for R-CH have the same values as CH.

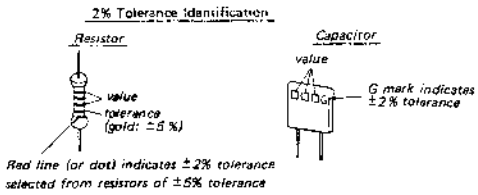
- (N) : Low noise resistor
- Voltage values shown are measured with a voltmeter (20kΩ/V). Variations may be noted due to normal production tolerances.
  no mark : stop mode
  ( ) : record mode
- AC voltage values across heads are measured with a VTVM in record mode.

- Switch mode:

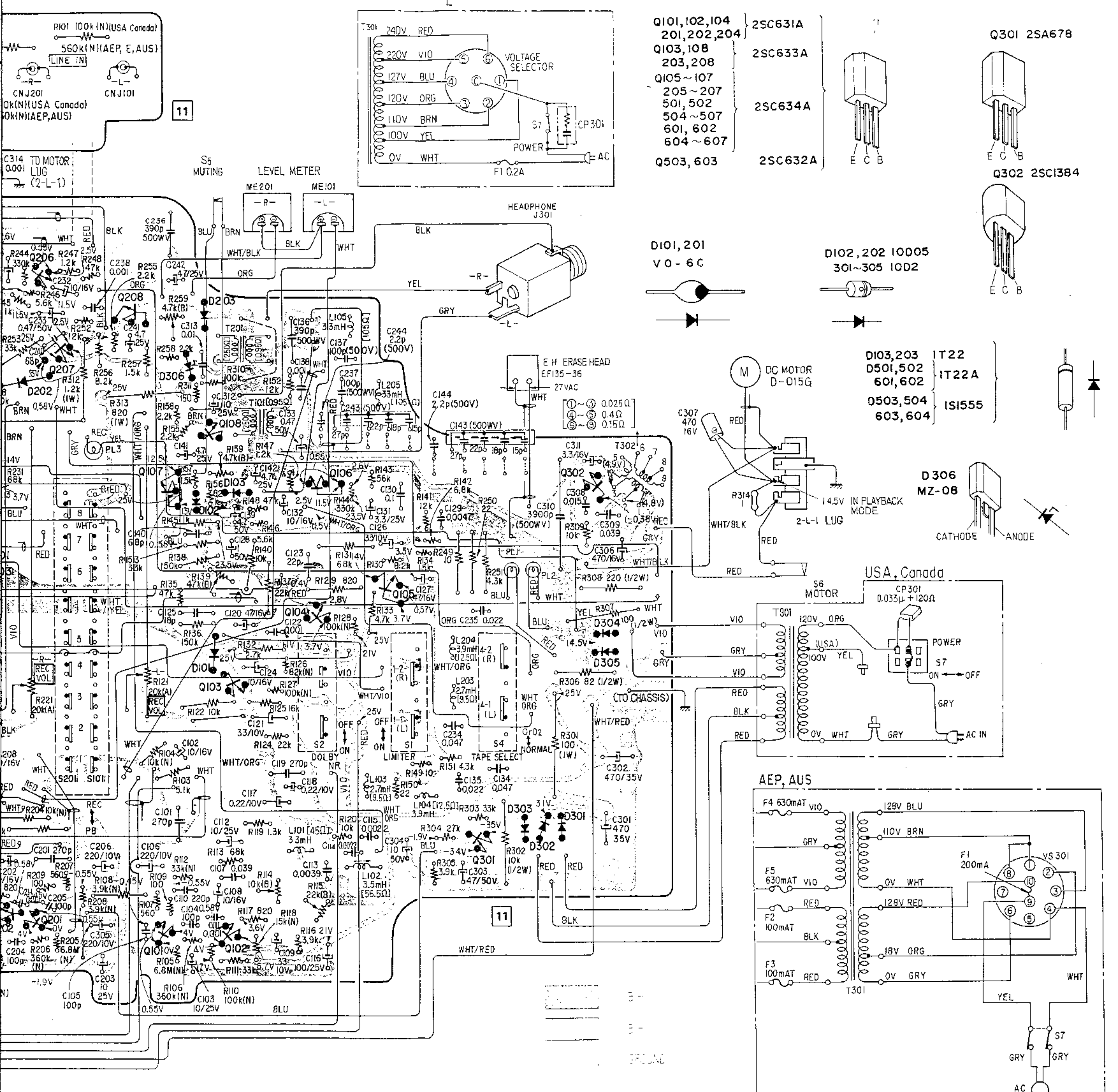
Ref. No.	Switch	Mode
S101, 201	record/playback	playback
S1	LIMITER	ON
S2	DOLBY NR	ON
S3	timing	STOP
S4	TAPE SELECT	CrO_2
S5	muting	OFF
S6	motor	OFF
S7	POWER	ON

- When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.

2% Tolerance identification



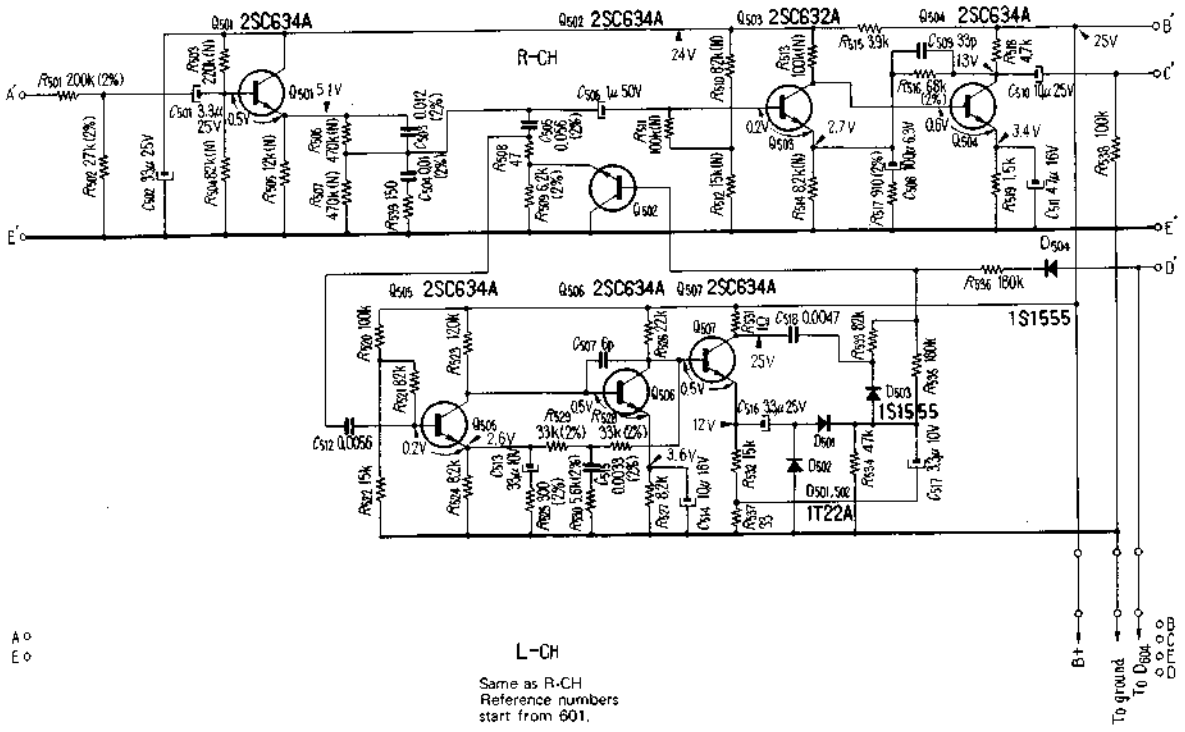
Q	204 205 203 206 202 201 207
D	201 202
ADJ	R239, L202 R215, R214 R221



3 202	206 201 207	208 101,107	103 108,102	106 104	105	301		302	
202			306,203 102,101,103				303,302,301	304 305	
R221		R121 R259	R159 R139	R114	C244,243 R115 L102	C144,143			

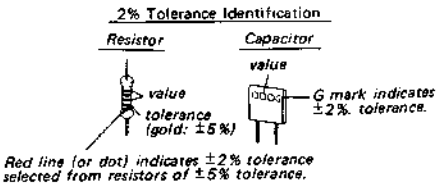
4-3. SCHEMATIC DIAGRAM

DOLBY Circuit



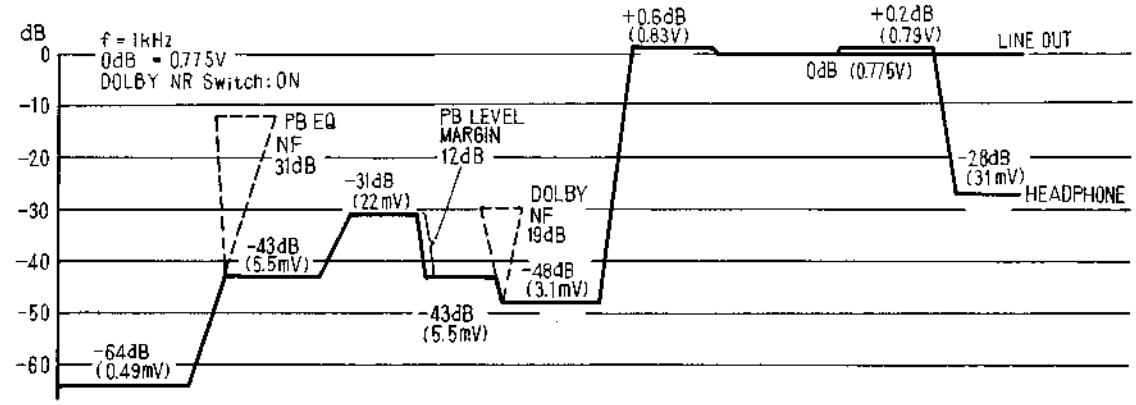
Note:

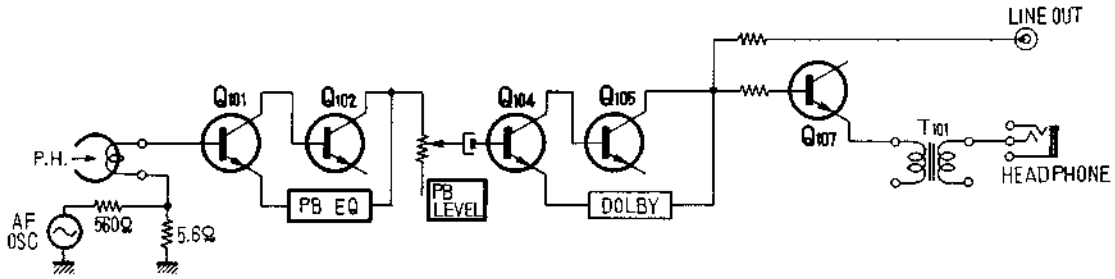
1. All resistors and capacitors are rated in Ω and μF unless otherwise indicated.
2. The letter (N) which is suffixed to rating values shows a low noise resistor.
3. Voltage values shown are measured with a voltmeter (20kΩ/V) in playback mode. Variations may be noted because of normal production tolerances.
4. Components for R-CH are the same value as for L-CH.
5. When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.



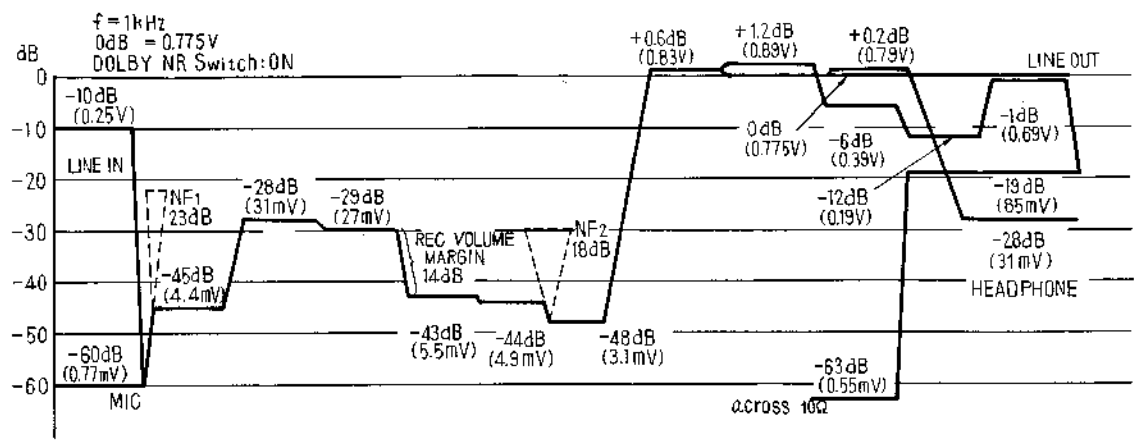
4-4. LEVEL DIAGRAMS

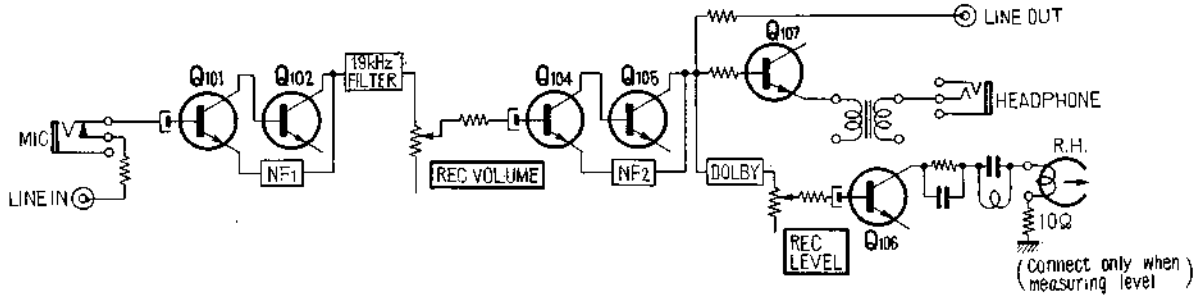
Playback





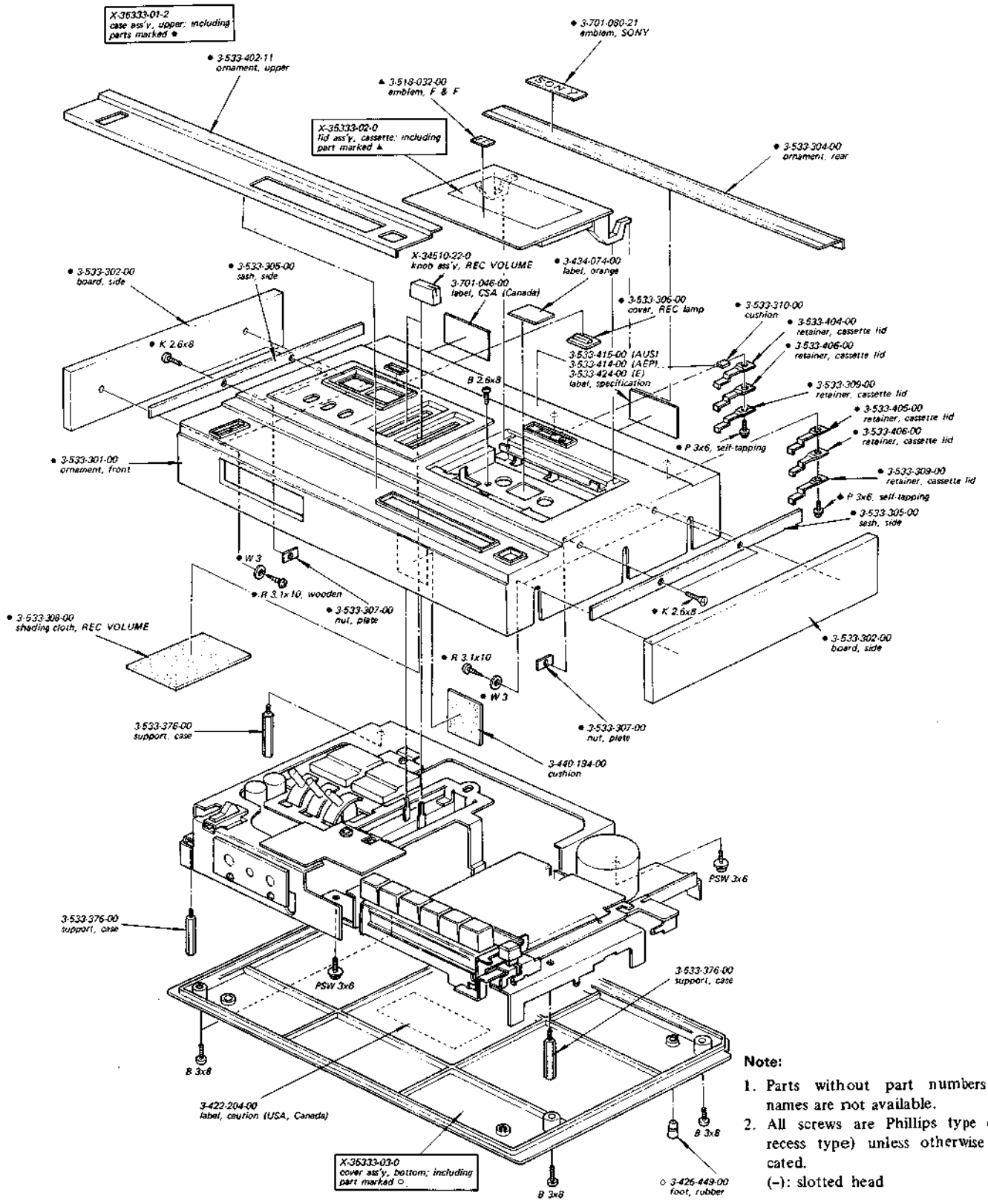
Record





SECTION 5
EXPLODED VIEWS AND PACKING

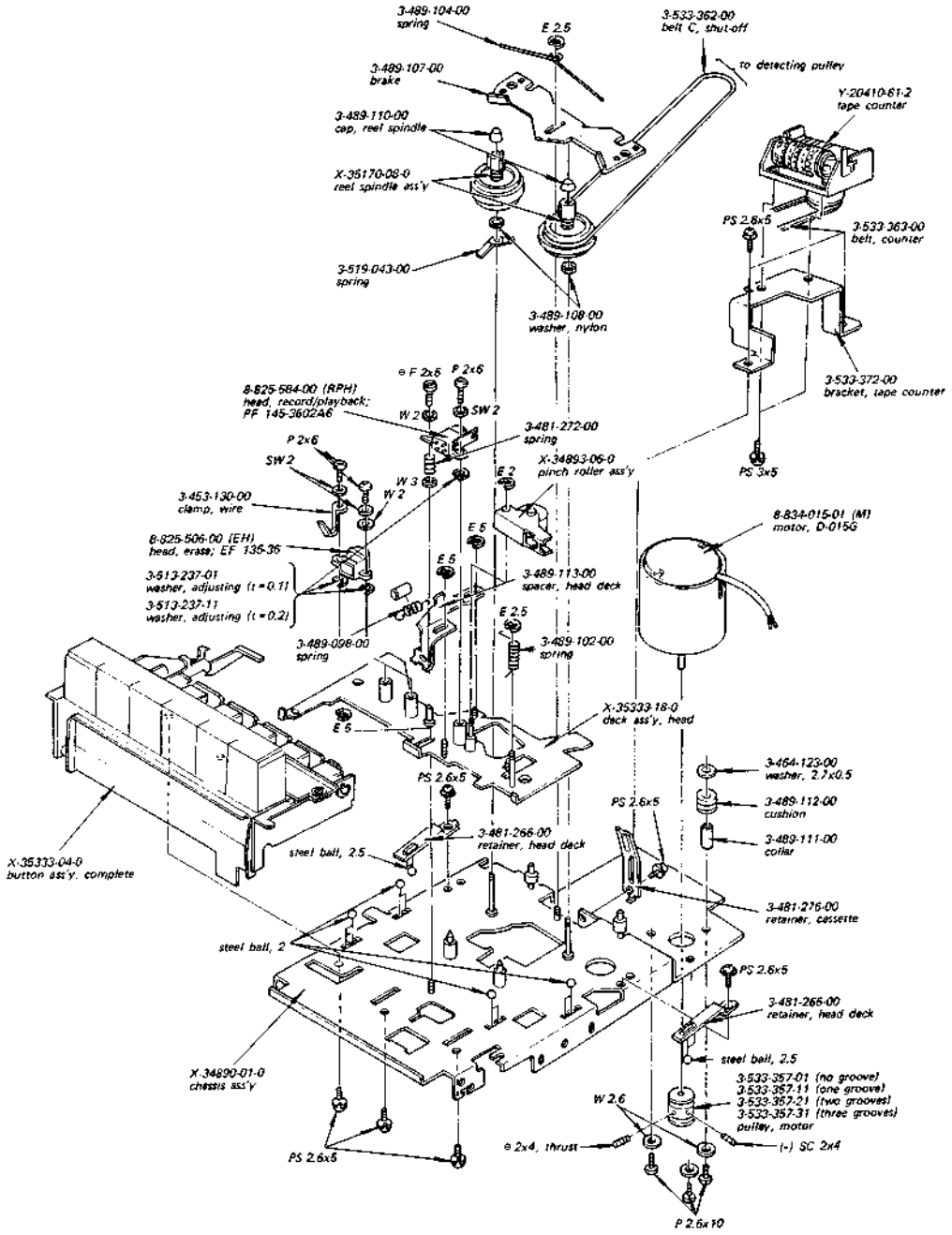
5-1. EXPLODED VIEW (1)



Note:

1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
   (–): slotted head

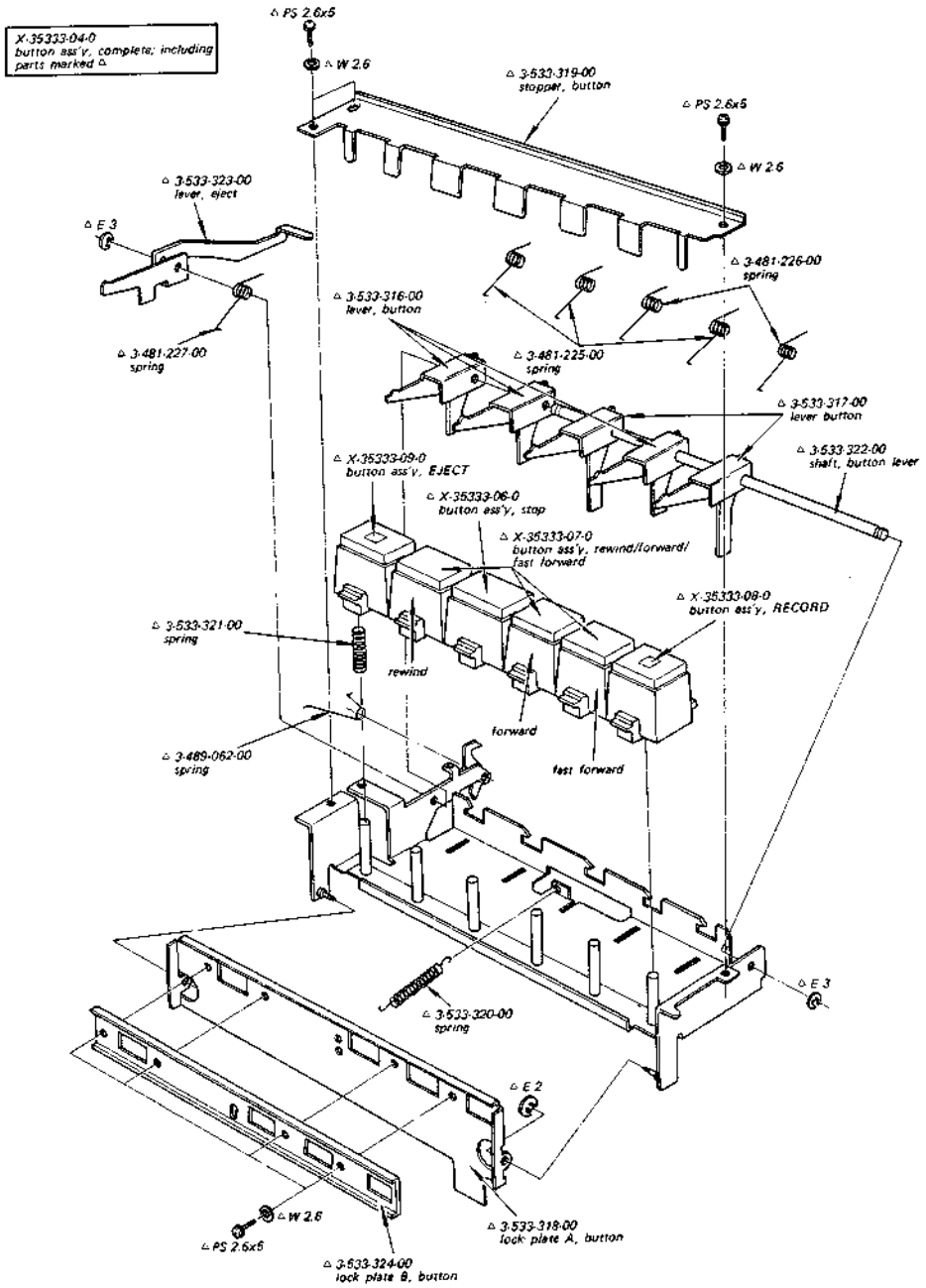
5-2. EXPLODED VIEW (2)



Note: 1. Parts without part numbers and names are not available.

2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

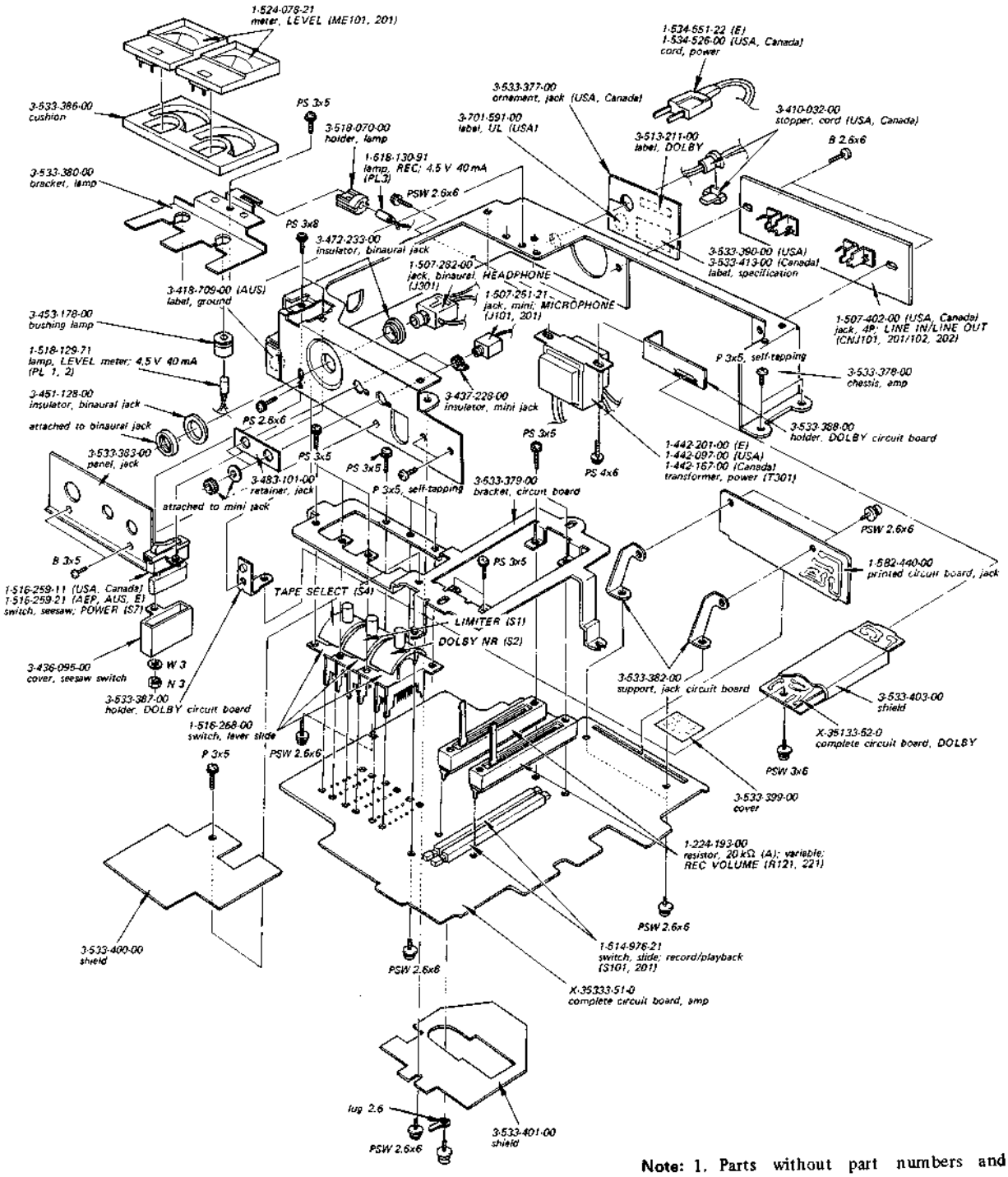
5-3. EXPLODED VIEW (3)



Note: 1. Parts without part numbers and names are not available.

2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

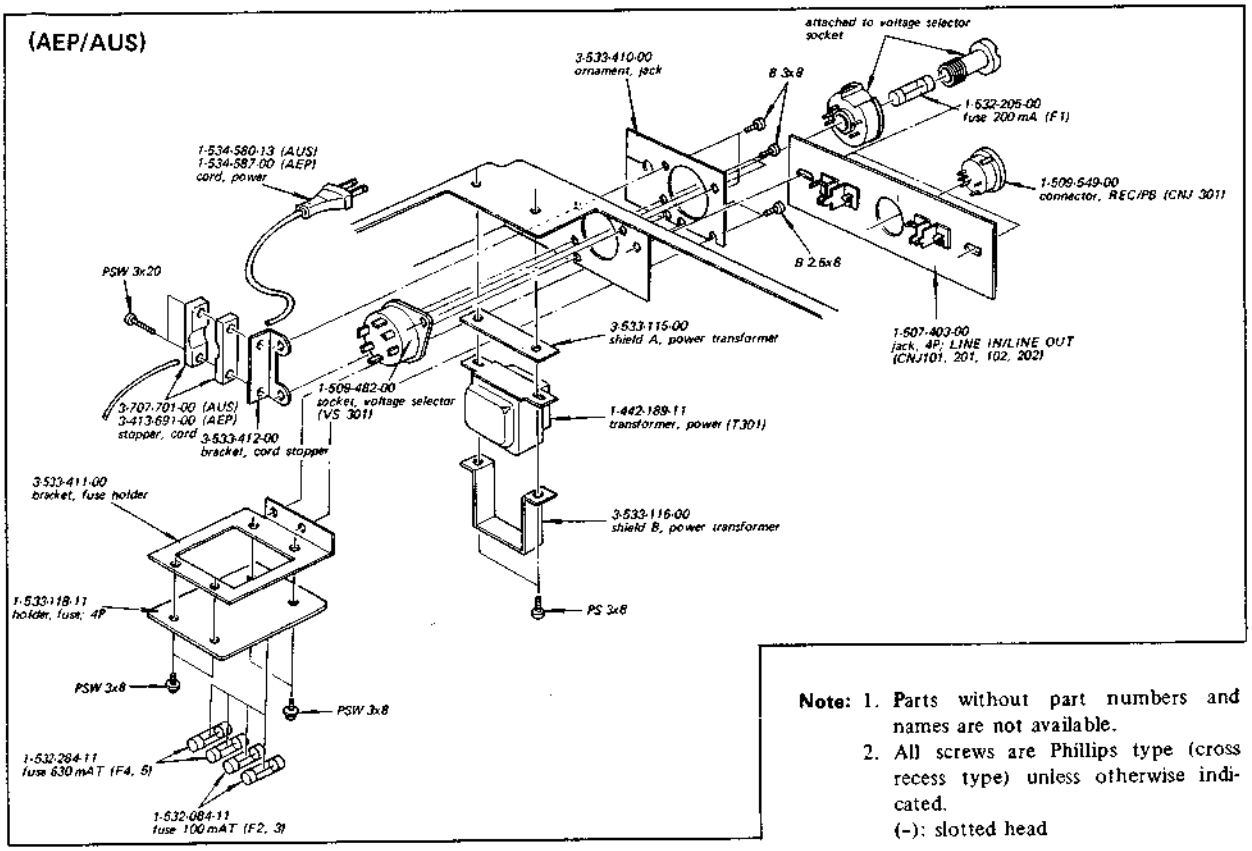
5-4. EXPLODED VIEW (4)



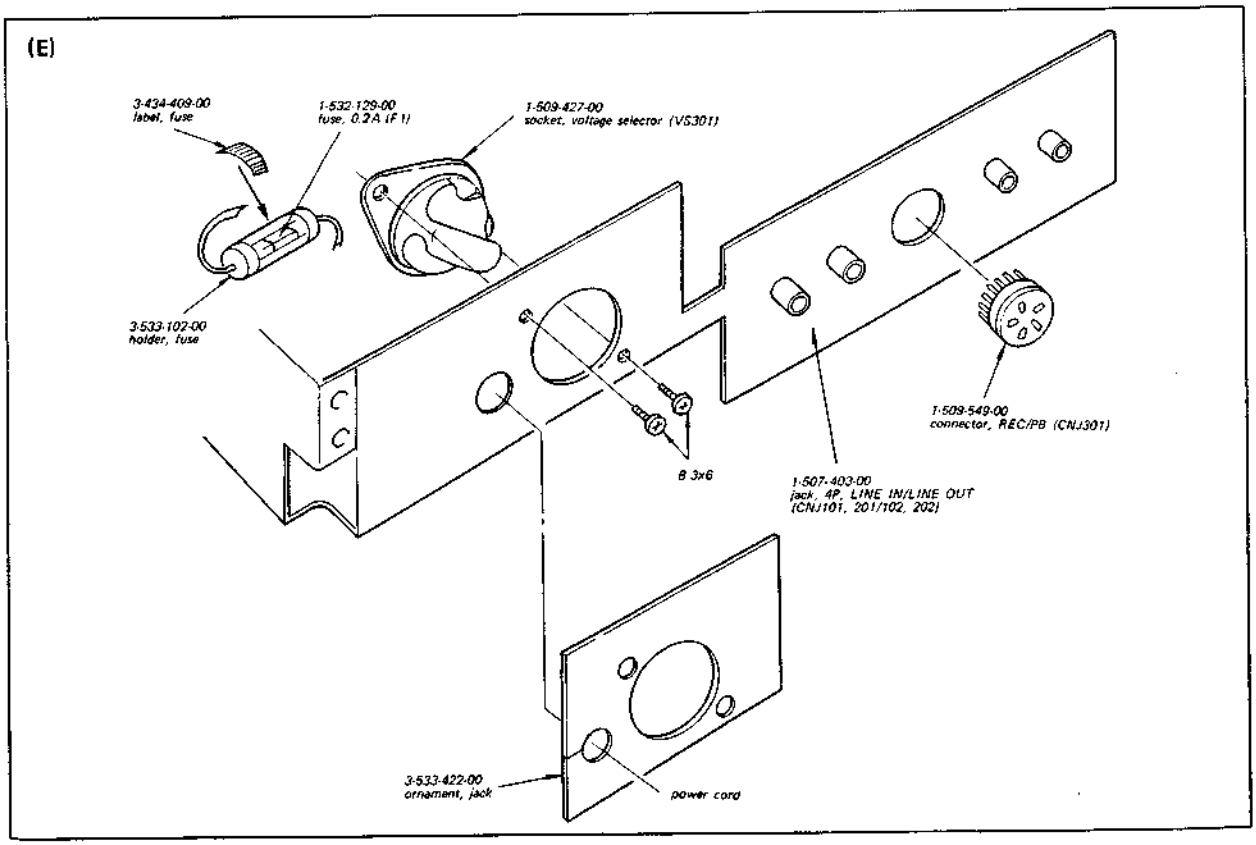
Note: 1. Parts without part numbers and names are not available.

2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(–): slotted head

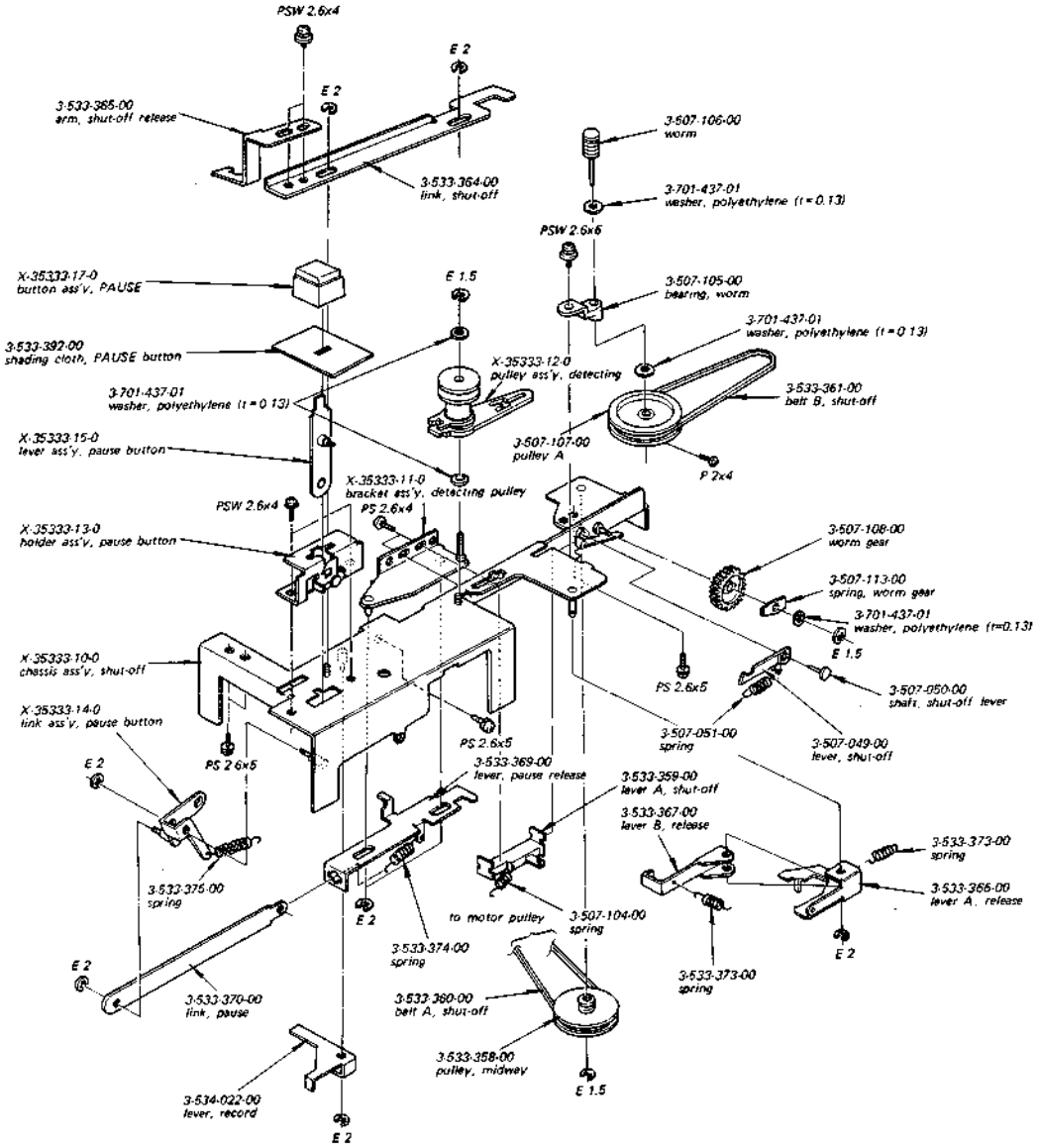
5-5. EXPLODED VIEW (5)



Note: 1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

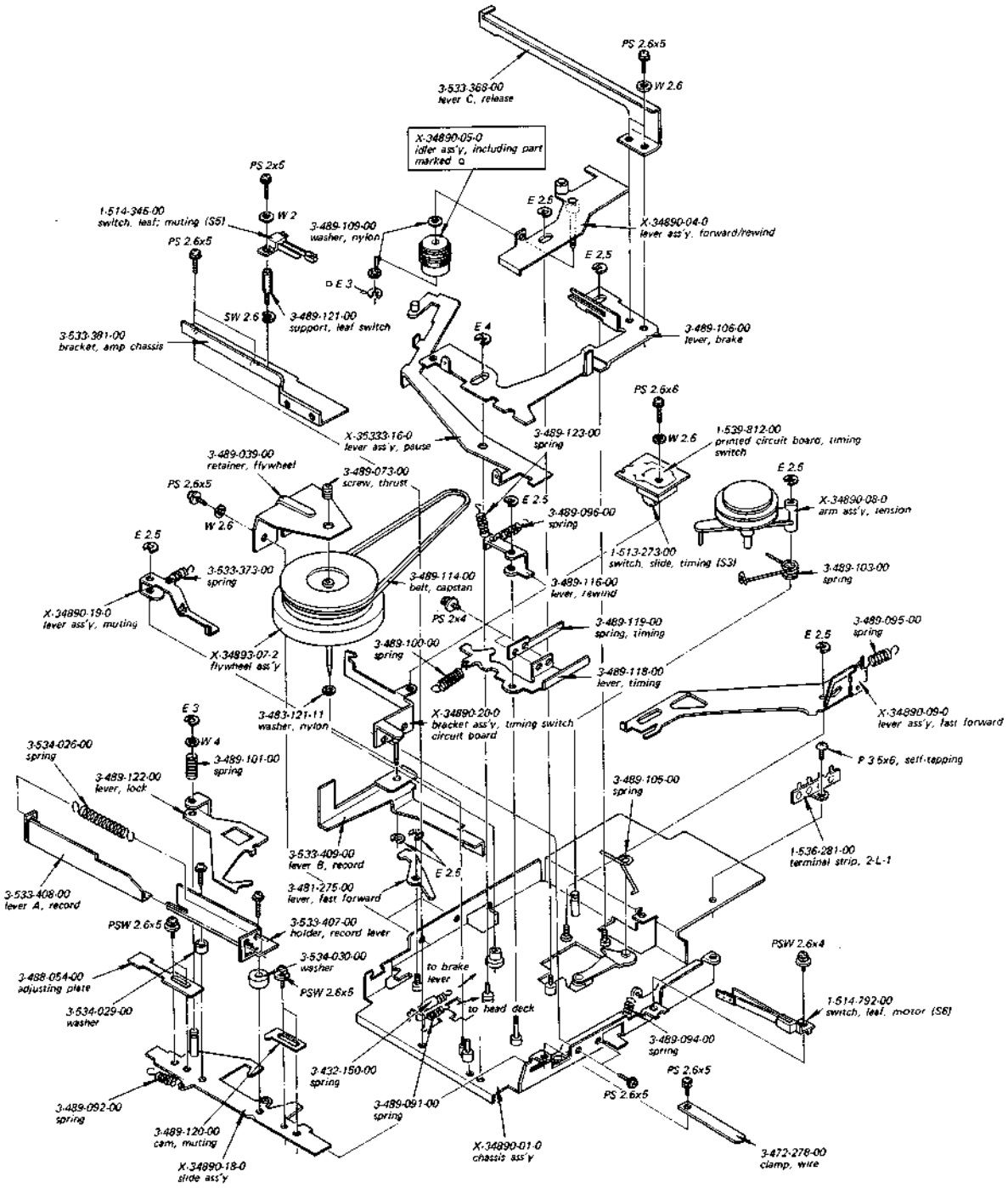


5-6. EXPLODED VIEW (6)



Note: 1. Parts without part numbers and names are not available.
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

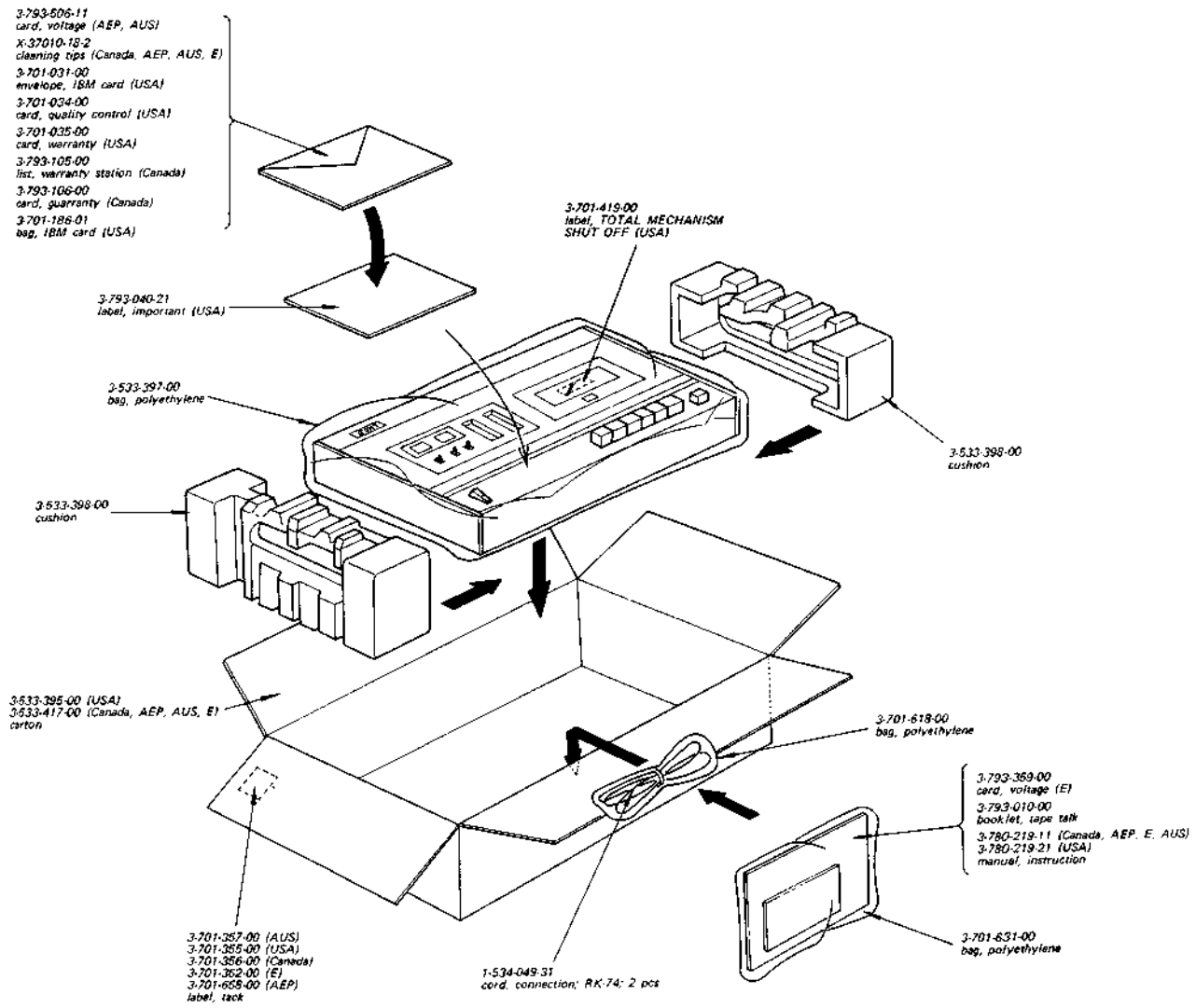
5-7. EXPLODED VIEW (7)



Note: 1. Parts without part numbers and names are not available.

2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(-): slotted head

5-8. PACKING



Note: Parts without part numbers and names are not available.

SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description

COMPLETE CIRCUIT BOARDS

	X-35133-52-0	DOLBY
	X-35333-51-0	amp

PRINTED CIRCUIT BOARDS

	1-539-812-00	timing switch
	1-582-440-00	jack

SEMICONDUCTORS

Q101, 201	transistor	2SC631A
Q102, 202	transistor	2SC631A
Q103, 203	transistor	2SC633A
Q104, 204	transistor	2SC631A
Q105, 205	transistor	2SC634A
Q106, 206	transistor	2SC634A
Q107, 207	transistor	2SC634A
Q108, 208	transistor	2SC633A
Q301	transistor	2SA678
Q302	transistor	2SC1384
Q501, 601	transistor	2SC634A
Q502, 602	transistor	2SC634A
Q503, 603	transistor	2SC632A
Q504, 604	transistor	2SC634A
Q505, 605	transistor	2SC634A
Q506, 606	transistor	2SC634A
Q507, 607	transistor	2SC634A
D101, 201	diode	VO-6C
D102, 202	diode	10D-05
D103, 203	diode	1T-22
D301	diode	10D-2
D302	diode	10D-2
D303	diode	10D-2
D304	diode	10D-2
D305	diode	10D-2
D306	diode	MZ-08
D501, 601	diode	1T-22
D502, 602	diode	1T-22
D503, 603	diode	1S1555
D504, 604	diode	1S1555

COILS

L101, 201	1-407-561-00	microinductor, 33 mH
L102, 202	1-407-658-00	trap, 35 mH
L103, 203	1-407-497-00	microinductor, 2.7 mH
L104, 204	1-407-499-00	microinductor, 3.9 mH
L105, 205	1-407-212-00	microinductor, 33 mH

TRANSFORMERS

T101, 201	1-427-299-00	output
T301	1-442-097-00	power (USA)
	1-442-167-00	power (Canada)
	1-442-189-11	power (AEP, AUS)
	1-442-201-00	power (E)
T302	1-433-132-14	bias osc

CAPACITORS

All capacitors are in μF unless otherwise indicated.
(p = μμ, elect = electrolytic)

C101, 201	1-107-095-11	270 p	50 V	silvered mica
C102, 202	1-121-651-11	10	16 V	elect
C103, 203	1-121-398-11	10	25 V	elect
C104, 204	1-107-131-11	100 p	50 V	silvered mica
C105, 205	1-107-131-11	100 p	50 V	silvered mica
C106, 206	1-121-420-11	220	10 V	elect
C107, 207	1-105-680-12	0.039	50 V	mylar
C108, 208	1-121-651-11	10	16 V	elect
C109, 209	1-121-402-11	33	10 V	elect
C110, 210	1-107-139-11	220 p	50 V	silvered mica
C111, 211	1-105-821-12	0.001	50 V	mylar
C112, 212	1-121-398-11	10	25 V	elect
C113, 213	1-105-668-12	0.0039	50 V	mylar
C114, 214	1-105-665-12	0.0022	50 V	mylar
C115, 215	1-105-665-12	0.0022	50 V	mylar
C116, 216	1-121-416-11	100	25 V	elect
C117, 217	1-127-020-11	0.22	10 V	solid aluminum
C118, 218	1-127-020-11	0.22	10 V	solid aluminum
C119, 219	1-107-141-11	270 p	50 V	silvered mica
C120, 220	1-121-409-11	47	16 V	elect
C121, 221	1-121-402-11	33	10 V	elect
C122, 222	1-105-821-12	0.001	50 V	mylar
C123, 223	1-107-115-11	22 p	50 V	silvered mica
C124, 224	1-121-651-11	10	16 V	elect
C125, 225	1-107-113-11	18 p	50 V	silvered mica
C126, 226	1-121-402-11	33	10 V	elect
C127, 227	1-121-409-11	47	16 V	elect
C128, 228	1-121-391-11	1	50 V	elect

Ref. No.	Part No.				Description
C129, 229	1-105-509-12	0.0047		50 V	mylar
C130, 230	1-105-685-12	0.1		50 V	mylar
C131, 231	1-121-392-11	3.3		25 V	elect
C132, 232	1-121-651-11	10		16 V	elect
C133, 233	1-121-726-11	0.47		50 V	elect
C134, 234	1-105-521-12	0.047		50 V	mylar
C135, 235	1-105-517-12	0.022		50 V	mylar
C136, 236	1-107-060-11	390 p		500 V	silvered mica
C137, 237	1-107-004-11	100 p		500 V	silvered mica
C138, 238	1-105-501-12	0.01		50 V	mylar
C139, 239	1-121-396-11	4.7		50 V	elect
C140, 240	1-107-127-11	68 p		50 V	silvered mica
C141, 241	1-121-395-11	4.7		50 V	elect
C142, 242	1-121-395-11	4.7		50 V	elect
C143, 243	1-107-253-11	15+18+22+27 p		500 V	silvered mica
C144, 244	1-107-042-11	2.2 p		500 V	silvered mica
C301	1-121-361-11	470		35 V	elect
C302	1-121-361-11	470		35 V	elect
C303	1-121-411-11	47		50 V	elect
C304	1-121-738-11	10		50 V	elect
C305	1-121-420-11	220		10 V	elect
C306	1-121-426-11	470		16 V	elect
C307	1-121-426-11	470		16 V	elect
C308	1-105-675-12	0.015		50 V	mylar
C309	1-105-680-12	0.039		50 V	mylar
C310	1-129-795-11	3900 p		500 V	polystyrol
C311	1-131-197-11	3.3		16 V	solid tantalum
C312	1-121-398-11	10		25 V	elect
C313	1-105-833-12	0.01		50 V	mylar
C314	1-105-821-12	0.001		50 V	mylar
C501, 601	1-121-392-11	3.3		25 V	elect
C502, 602	1-121-404-11	33		25 V	elect
C503, 603	1-129-896-21	0.012	±2%	100 V	polypropylene
C504, 604	1-129-701-21	0.01	±2%	100 V	polypropylene
C505, 605	1-129-899-11	0.056	±2%	100 V	polypropylene
C506, 606	1-121-391-11	1		50 V	elect
C507, 607	1-107-103-11	6 p		50 V	silvered mica
C508, 608	1-121-413-11	100		6.3 V	elect
C509, 609	1-107-119-11	33 p		50 V	silvered mica
C510, 610	1-121-398-11	10		25 V	elect
C511, 611	1-121-409-11	47		16 V	elect
C512, 612	1-105-670-12	0.0056		50 V	mylar
C513, 613	1-121-402-11	33		10 V	elect
C514, 614	1-121-651-11	10		16 V	elect
C515, 615	1-129-794-21	0.0033	±2%	100 V	polypropylene
C516, 616	1-121-392-11	3.3		25 V	elect
C517, 617	1-127-025-11	3.3		10 V	solid aluminum
C518, 618	1-105-669-12	0.0047		50 V	mylar

When ordering 2%- tolerance resistor and capacitor, note "2%" in addition to part number.

Ref. No.	Part No.		Description
		RESISTORS	
		All resistors are ¼W, carbon type and in Ω unless otherwise indicated. (k = 1000, M = 1000 k)	
R101, 201	1-244-721-09	100 k	low noise (USA, Canada)
	1-244-739-09	560 k	low noise (AEP, E, AUS)
R102, 202	1-242-668-11	620	(USA, Canada)
R103	1-242-690-11	5.1 k	
R203	1-244-690-11	5.1 k	
R104	1-242-697-09	10 k	low noise
R204	1-244-697-09	10 k	low noise
R105, 205	1-210-832-11	6.8 M	low noise
R106, 206	1-242-734-09	360 k	low noise
R107, 207	1-242-667-11	560	
R108, 208	1-242-687-09	3.9 k	low noise
R109, 209	1-242-649-11	100	
R110, 210	1-242-721-09	100 k	low noise
R111, 211	1-242-709-11	33 k	
R112, 212	1-242-709-09	33 k	low noise
R113, 213	1-242-717-11	68 k	
R114, 214	1-222-701-00	10 k (B),	adjustable: playback equalizer
R115, 215	1-221-979-00	22 k (B),	adjustable: playback level
R116, 216	1-242-687-11	3.9	
R117, 217	1-242-671-11	820	
R118, 218	1-242-701-09	15 k	low noise
R119, 219	1-242-676-11	1.3 k	
R120, 220	1-242-697-11	10 k	
R121, 221	1-224-193-00	20 k (A),	variable: REC VOLUME
R122, 222	1-244-697-11	10 k	
R123, 223	1-244-695-11	8.2 k (AEP, E, AUS)	
R124, 224	1-242-705-11	22 k	
R125, 225	1-242-702-11	16 k	
R126, 226	1-242-719-09	82 k	low noise
R127, 227	1-242-721-09	100 k	low noise
R128, 228	1-242-721-09	100 k	low noise
R129	1-244-671-11	820	
R229	1-242-671-11	820	
R130, 230	1-242-695-11	8.2 k	
R131	1-244-717-11	68 k	
R231	1-242-717-11	68 k	
R132, 232	1-242-683-11	2.7 k	
R133, 233	1-242-689-11	4.7 k	
R134, 234	1-242-677-11	1.5 k	
R135, 235	1-242-713-11	47 k	
R136, 236	1-242-725-11	150 k	
R137	1-244-705-11	22 k	
R237	1-242-705-11	22 k	
R138, 238	1-242-725-11	150 k	
R139, 239	1-222-783-00	47 k (B),	adjustable: record level
R140, 240	1-244-697-11	10 k	
R141	1-242-699-11	12 k	
R241	1-244-699-11	12 k	

Ref. No.	Part No.	Description		
R142	1-242-693-11	6.8 k		
R242	1-244-693-11	6.8 k		
R143, 243	1-242-715-11	56 k		
R144, 244	1-242-733-11	330 k		
R145, 245	1-242-673-11	1 k		
R146, 246	1-242-691-11	5.6 k		
R147, 247	1-242-675-11	1.2 k		
R148, 248	1-242-713-11	47 k		
R149	1-242-625-11	10		
R249	1-244-625-11	10		
R150	1-242-633-11	22		
R250	1-244-633-11	22		
R151	1-242-688-11	4.3 k		
R251	1-244-688-11	4.3 k		
R152, 252	1-242-699-11	12 k		
R153, 253	1-242-709-11	33 k		
R154, 254	1-244-693-11	6.8 k		
R155, 255	1-242-681-11	2.2 k		
R156, 256	1-242-695-11	8.2 k		
R157, 257	1-242-677-11	1.5 k		
R158, 258	1-242-681-11	2.2 k		
R159, 259	1-221-978-00	4.7 k (B), adjustable: meter level		
R301	1-206-081-11	100	1W	metal oxide
R302	1-244-897-11	10 k	½W	
R303	1-242-709-11	33 k		
R304	1-242-707-11	27 k		
R305		----------		
R306	1-202-547-31	82	½W	composition
R307	1-202-549-31	100	½W	composition
R308	1-202-557-31	220	½W	composition
R309	1-242-697-11	10 k		
R310	1-242-721-11	100 k		
R311	1-242-651-11	150		
R312	1-206-094-11	1.2 k	1W	metal oxide
R313	1-206-092-11	820	1W	metal oxide
R314	1-242-619-11	1		
R501, 601	1-210-858-11	200 k	±2%	
R502, 602	1-210-854-11	27 k	±2%	
R503, 603	1-242-729-09	220 k		low noise
R504, 604	1-242-719-09	82 k		low noise
R505, 605	1-242-699-09	12 k		low noise
R506, 606	1-242-737-09	470 k		low noise
R507, 607	1-242-737-09	470 k		low noise
R508, 608	1-242-641-11	47		
R509, 609	1-210-853-11	6.2 k	±2%	
R510, 610	1-242-719-09	82 k		low noise
R511, 611	1-242-721-09	100 k		low noise
R512, 612	1-242-701-09	15 k		low noise

When ordering 2%- tolerance resistor and capacitor, note "2%" in addition to part number.

Ref. No.	Part No.	Description		
R513, 613	1-242-721-09	100 k		low noise
R514, 614	1-242-695-09	8.2 k		low noise
R515, 615	1-242-687-11	3.9 k		
R516, 616	1-210-856-11	68 k	±2%	
R517, 617	1-210-815-11	910	±2%	
R518, 618	1-242-689-11	4.7 k		
R519, 619	1-242-677-11	1.5 k		
R520, 620	1-242-721-11	100 k		
R521, 621	1-242-719-11	82 k		
R522, 622	1-242-701-11	15 k		
R523, 623	1-242-723-11	120 k		
R524, 624	1-242-695-11	8.2 k		
R525, 625	1-210-850-11	300	±2%	
R526, 626	1-242-705-11	22 k		
R527, 627	1-242-695-11	8.2 k		
R528, 628	1-210-855-11	33 k	±2%	
R529, 629	1-210-855-11	33 k	±2%	
R530, 630	1-210-852-11	5.6 k	±2%	
R531, 631	1-242-601-11	1		
R532, 632	1-242-701-11	15 k		
R533, 633	1-242-719-11	82 k		
R534, 634	1-242-713-11	47 k		
R535, 635	1-242-727-11	180 k		
R536, 636	1-242-727-11	180 k		
R537, 637	1-242-637-11	33		
R538, 638	1-242-721-11	100 k		
R539, 639	1-242-653-11	150		

SWITCHES

S1	1-516-268-00	lever slide, LIMITER
S2	1-516-268-00	lever slide, DOLBY NR
S3	1-513-273-00	slide, timing
S4	1-516-268-00	lever slide, TAPE SELECT
S5	1-514-346-00	leaf, muting
S6	1-514-792-00	leaf, motor
S7	1-516-259-11	seesaw, POWER (USA, Canada)
	1-516-259-21	seesaw, POWER (AEP, E, AUS)
S101, 201	1-514-976-21	slide, record/playback

JACKS

J101, 201	1-507-251-21	mini, MICROPHONE
J301	1-507-282-00	binaural, HEADPHONE
CNJ101, 201	1-507-402-00	4P, LINE IN (USA, Canada)
	1-507-403-00	4P, LINE IN (AEP, E, AUS)
CNJ102, 202	1-507-402-00	4P, LINE OUT (USA, Canada)
	1-507-403-00	4P, LINE OUT (AEP, E, AUS)
CNJ301	1-509-549-00	connector, REC/PB (AEP, E, AUS)
VS301	1-509-482-00	socket, voltage selector (AEP, AUS)
	1-509-427-00	socket, voltage selector (E)

Ref. No.	Part No.	Description
		MISCELLANEOUS
CP301	1-231-057-31	encapsulated component C-R, 0.033μF + 120Ω (USA, Canada)
	1-231-057-12	encapsulated component C-R, 0.033μF + 120Ω (E)
ME101, 201	1-524-078-21	meter, LEVEL
PL1, 2	1-518-129-71	lamp, LEVEL meter; 4.5 V 40 mA
PL3	1-518-130-91	lamp, REC; 4.5 V 40 mA
EH	8-825-506-00	head, erase (EF 135-36)
RPH	8-825-584-00	head, record/playback (PF145-3602A6)
M	8-834-015-01	motor, D-015G
	1-534-526-00	cord, power (USA, Canada)
	1-534-551-22	cord, power (E)
	1-534-587-00	cord, power (AEP, AUS)
F1	1-532-205-00	fuse 200 mA (AEP, AUS)
	1-532-129-00	fuse 0.2A (E)
F2, 3	1-532-084-11	fuse 100 mAT (AEP, AUS)
F4, 5	1-532-284-11	fuse 630 mAT (AEP, AUS)
	1-533-118-11	holder, fuse; 4 P (AEP, AUS)
	1-533-102-00	holder, fuse (E)

SECTION 7
HARDWARE

SCREWS

All screws are phillips type (cross recess type) unless otherwise indicated. (-): slotted head.

Part No.		Description
7-621-255-25	P	2 x 4
7-621-255-45	P	2 x 6
7-621-259-01	PS	2.6 x 4
7-621-259-15	P	2.6 x 3
7-621-259-25	P	2.6 x 4
7-621-305-35	(-) F	2 x 5
7-621-559-52	K	2.6 x 8
7-621-710-39	(-) SC	2 x 4
7-621-759-45	PSW	2.6 x 6
7-621-759-75	PSW	2.6 x 10
7-621-770-62	B	2.6 x 5
7-621-771-13	B	2.6 x 6
7-621-771-38	B	2.6 x 8
7-621-843-25	R	3.1 x 10, wooden
7-628-253-15	PS	2 x 5
7-628-253-35	PS	2 x 8
7-628-254-03	PS	2.6 x 5
7-628-254-05	PS	2.6 x 5
7-628-254-12	PS	2.6 x 6
7-628-254-25	PS	2.6 x 8
7-682-548-04	B	3 x 8
7-682-646-01	PS	3 x 5
7-682-648-01	PS	3 x 8
7-682-659-01	PS	4 x 5
7-682-947-01	PSW	3 x 6
7-682-953-00	PSW	3 x 20
7-685-144-41	P	3 x 5, self-tapping
7-685-145-23	P	3 x 6, self-tapping

RETAINING RINGS

Part No.		Description
7-624-102-01	E	1.5
7-624-104-01	E	2
7-624-106-01	E	3
7-624-108-01	E	4
7-624-118-01	E	2.5

WASHERS

Part No.		Description
7-623-105-02	2	(small)
7-623-105-12	2	(middle)
7-623-107-02	2.6	(small)
7-623-107-12	2.6	(middle)
7-623-108-02	3	(small)
7-623-108-12	3	(middle)
7-623-108-15	3	(middle)
7-623-110-02	4	(small)

SPRING WASHERS

Part No.	Description
7-623-205-11	2
7-623-207-22	2.6

MISCELLANEOUS

Part No.	Description
7-623-507-01	lug, 2.6; egg type
7-671-112-01	steel ball, 2
7-671-112-11	steel ball, 2.5
7-684-013-01	nut, 3

Hardware Nomenclature

P – Pan Head Screw

PS – Pan Head Screw with Spring Washer

K – Flat Countersunk Head Screw

B – Binding Head Screw

RK – Oval Countersunk Head Screw

T – Truss Head Screw

R – Round Head Screw

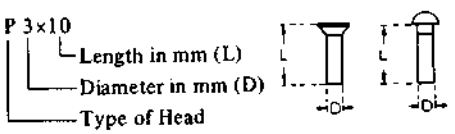
F – Flat Fillister Head Screw

SC – Set Screw

E – Retaining Ring (E Washer)

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

– Example –



Sony Corporation

9-954-122-01

77J0605-7
Printed in Japan

SUPPLEMENT

This supplement updates the service manual to include production changes starting with **Serial No. 45,601 and later.**
File this supplement with the service manual.

No. 1
December, 1973

Subject: Change and Addition of Circuit Board

ADDED PARTS

Part No.	Description
A-2095-004-A	complete circuit board, filter
1-582-966-00	printed circuit board, shield
3-533-428-00	bracket, circuit board
3-533-430-00	shield
3-533-431-00	shield C
3-533-432-00	shield D

CHANGED PARTS

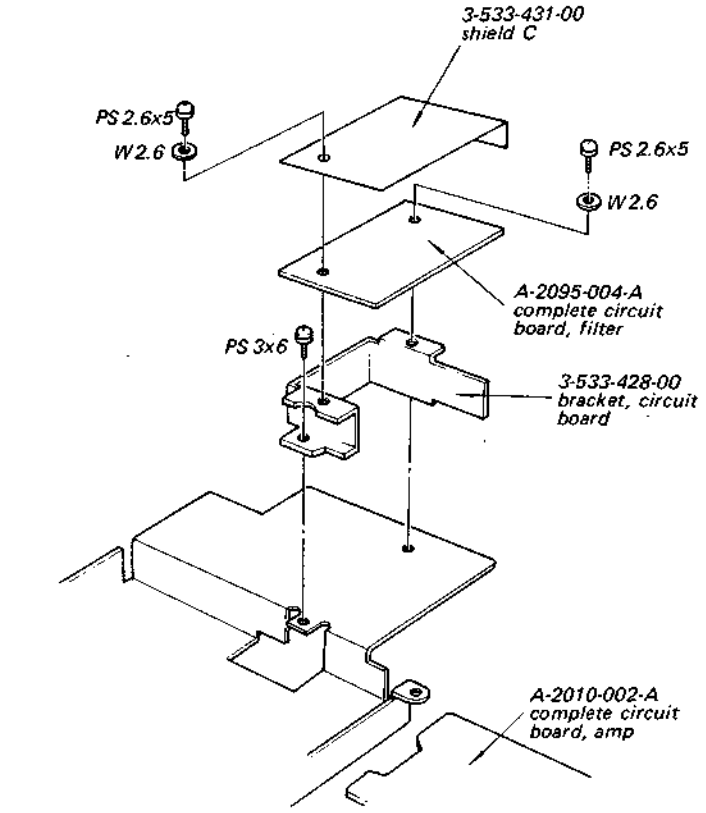
Part No.		Description
Former	New	
X-35333-51-0	A-2010-002-A	complete circuit board, amp
3-489-122-00	3-533-429-00	lever, lock

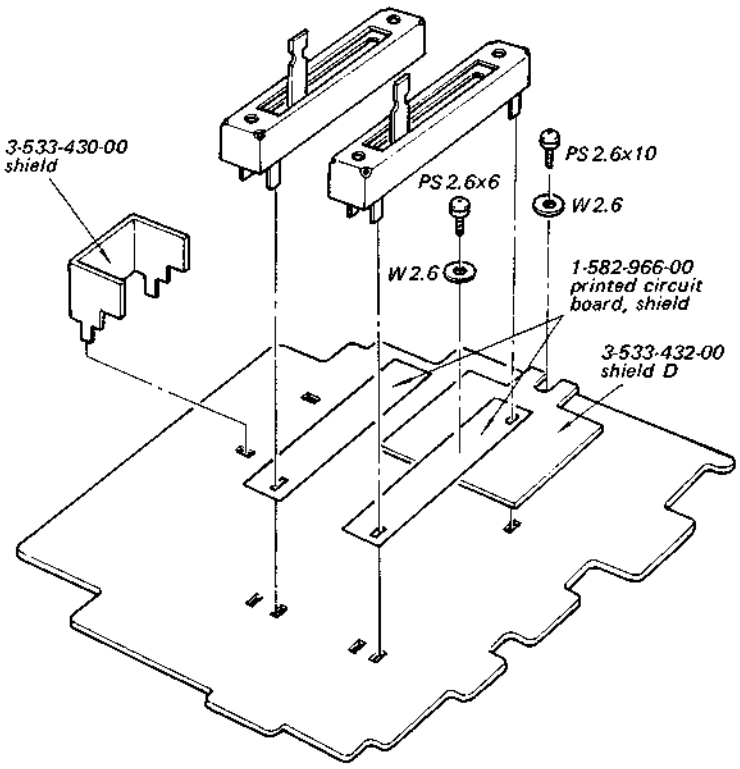
OMITTED PARTS

Part No.	Description
3-533-401-00	shield

SERVICE MANUAL

1. CHANGED PORTIONS OF EXPLODED VIEW





2. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	COMPLETE CIRCUIT BOARDS	
	X-35133-52-0	DOLBY
	A-2010-002-A	Amp
	A-2095-004-A	Filter
	PRINTED CIRCUIT BOARDS	
	1-539-812-00	Timing Switch
	1-582-440-00	Jack
	SEMICONDUCTORS	
Q101,201		Transistor 2SC631A
Q102,202		Transistor 2SC631A
Q103,203		Transistor 2SC633A
Q104,204		Transistor 2SC631A
Q105,205		Transistor 2SC634A
Q106,206		Transistor 2SC634A
Q107,207		Transistor 2SC634A
Q108,208		Transistor 2SC633A
Q301		Transistor 2SA678
Q302		Transistor 2SC1384
Q501,601		Transistor 2SC634A
Q502,602		Transistor 2SC634A
Q503,603		Transistor 2SC632A
Q504,604		Transistor 2SC634A
Q505,605		Transistor 2SC634A
Q506,606		Transistor 2SC634A
Q507,607		Transistor 2SC634A
D101,201		Diode VO6C
D102,202		Diode 10D-05
D103,203		Diode 1T22
D301		Diode SIB01-02
D302		Diode SIB01-02
D303		Diode SIB01-02
D304		Diode SIB01-02
D305		Diode SIB01-02
D306		Diode SIB01-02
D307		Diode MZ08
D501,601		Diode 1T22A
D502,602		Diode 1T22A
D503,603		Diode 1S1555
D504,604		Diode 1S1555
	COILS	
L101,201	1-407-561-00	33 mH, microinductor
L102,202	1-407-658-00	35 mH, trap
L103,203	1-407-500-00	4.7 mH, microinductor
L104,204	1-407-500-00	4.7 mH, microinductor
L105,205	1-407-561-00	33 mH, microinductor
	TRANSFORMERS	
T101,201	1-427-299-00	Output
T301	1-442-167-00	Power (Canada)
	1-442-185-11	Power (USA)
	1-442-189-11	Power (AEP, AUS)
	1-442-201-11	Power (E)
T302	1-433-132-00	Bias Osc

CAPACITORS

All capacitors are μF unless otherwise indicated. (p = μμF, elect = electrolytic)

C101,201	1-107-097-11	330p	50V	silvered mica
C102,202	1-121-651-11	10	16V	elect
C103,203	1-121-398-11	10	25V	elect
C104,204	1-107-137-11	180p	50V	silvered mica
C105,205	1-107-131-11	100p	50V	silvered mica
C106,206	1-107-141-11	270p	50V	silvered mica
C107,207	1-121-420-11	220	10V	elect
C108,208	1-105-680-12	0.039	50V	mylar
C109,209	1-105-513-12	0.01	50V	mylar
C110,210	1-121-402-11	33	10V	elect
C111,211	1-105-821-12	0.001	50V	mylar
C112,212	1-121-398-11	10	25V	elect
C113,213	1-105-668-12	0.0039	50V	mylar
C114,214	1-105-665-12	0.0022	50V	mylar
C115,215	1-105-665-12	0.0022	50V	mylar
C116,216	1-121-416-11	100	25V	elect
C117,217	1-131-211-11	0.22	35V	solid tantalum
C118,218	1-131-211-11	0.22	35V	solid tantalum
C119,219	1-107-141-11	270p	50V	silvered mica
C120,220	1-121-409-11	47	16V	elect

Ref. No.	Part No.	Description			
C121,221	1-121-402-11	33		10V	elect
C122,222	1-105-821-12	0.001		50V	mylar
C123,223	1-107-115-11	22p		50V	silvered mica
C124,224	1-121-651-11	10		16V	elect
C125,225	1-107-113-11	18p		50V	silvered mica
C126,226	1-121-402-11	33		10V	elect
C127,227	1-121-409-11	47		16V	elect
C128,228	1-121-391-11	1		50V	elect
C129,229	1-105-505-12	0.0022		50V	mylar
C130,230	1-131-211-11	0.22		35V	solid tantalum
C131,231	1-121-392-11	3.3		25V	elect
C132,232	1-121-651-11	10		16V	elect
C133,233	1-121-726-11	0.47		50V	elect
C134,234	1-105-518-12	0.027		50V	mylar
C135,235	1-105-517-12	0.022		50V	mylar
C136,236	1-107-060-11	390p		500V	silvered mica
C137,237	1-107-004-11	100p		500V	silvered mica
C138,238	1-105-501-12	0.001		50V	mylar
C139-239	1-121-396-11	4.7		50V	elect
C140,240	1-107-127-11	68p		50V	silvered mica
C141,241	1-121-395-11	4.7		25V	elect
C142,242	1-121-395-11	4.7		25V	elect
C143,243	1-107-253-11	15+18+22+27p		500V	silvered mica
C144,244	1-107-042-11	2.2p		500V	silvered mica
C145,245	1-107-050-11	12p		500V	silvered mica
C146,246	1-107-056-11	56p		500V	silvered mica
C147,247	1-107-015-11	47p		500V	silvered mica
C148,248	1-105-515-12	0.015		50V	mylar
C301	1-121-361-11	470		35V	elect
C302	1-121-361-11	470		35V	elect
C303	1-121-411-11	47		50V	elect
C304	1-121-738-11	10		50V	elect
C305	1-121-420-11	220		10V	elect
C306	1-121-426-11	470		16V	elect
C307	1-121-426-11	470		16V	elect
C308	1-105-675-12	0.015		50V	mylar
C309	1-105-680-12	0.039		50V	mylar
C310	1-129-795-11	3900p		500V	polystyrol
C311	1-131-197-11	3.3		16V	solid tantalum
C312	1-121-398-11	10		25V	elect
C313	1-105-833-12	0.01		50V	mylar
C314	1-105-821-12	0.001		50V	mylar
C501,601	1-121-392-11	3.3		25V	elect
C502,602	1-121-404-11	33		25V	elect
C503,603	1-129-896-11	0.012	±2%	100V	polypropylene
C504,604	1-129-701-11	0.01	±2%	100V	polypropylene
C505,605	1-129-899-11	0.056	±2%	100V	polypropylene
C506,606	1-121-391-11	1		50V	elect
C507,607	1-107-103-11	6p		50V	silvered mica
C508,608	1-121-413-11	100		6.3V	elect
C509,609	1-107-119-11	33p		50V	silvered mica
C510,610	1-121-398-11	10		25V	elect
C511,611	1-121-409-11	47		16V	elect
C512,612	1-105-670-12	0.0056		50V	mylar
C513,613	1-121-402-11	33		10V	elect
C514,614	1-121-651-11	10		16V	elect
C515,615	1-129-794-11	0.0033	±2%	100V	polypropylene
C516,616	1-121-392-11	3.3		25V	elect
C517,617	1-127-025-11	3.3		10V	solid aluminum
C518,618	1-105-669-12	0.0047		50V	mylar

RESISTORS

All resistors are in Ω, carbon type and ¼W unless otherwise indicated. (k = 1000)

R101,201	1-244-721-09	100k, low noise (USA, Canada)
	1-244-739-09	560k, low noise (E, AEP, AUS)
R102,202	1-242-668-11	620 (USA, Canada)
R103,203	1-242-690-11	5.1k
R104,204	1-242-697-09	10k, low noise
R105,205	1-242-729-09	220k, low noise
R106,206	1-242-687-09	3.9k, low noise
R107,207	1-242-653-11	150
R108,208	1-242-721-09	100k, low noise
R109,209	1-244-709-11	33k
R110,210	1-242-717-09	68k, low noise
R111,211	1-242-693-11	6.8k
R112,212	1-222-701-00	10k, adjustable
R113,213	1-242-685-11	3.3k
R114,214	1-242-687-11	3.9k
R115,215	1-221-979-00	22k, adjustable
R116,216	1-242-679-11	1.8k
R117,217	1-242-667-11	560
R118,218	1-244-697-09	10k, low noise
R119,219	1-242-679-11	1.8k
R120,220	1-242-697-11	10k
R121,221	1-224-193-00	20k (A), variable slide; REC VOLUME
R122,222	1-244-697-11	10k
R123,223	1-244-695-11	8.2k (E, AEP, AUS)
R124,224	1-242-705-11	22k
R125,225	1-242-702-11	16k
R126,226	1-242-719-09	82k, low noise
R127,227	1-242-721-09	100k, low noise
R128,228	1-242-721-09	100k, low noise
R129	1-244-671-11	820
R229	1-242-671-11	820
R130,230	1-242-695-11	8.2k
R131,231	1-242-717-11	68k
R132,232	1-242-683-11	2.7k

Ref. No.	Part No.	Description		
R133,233	1-242-689-11	4.7k		
R134,234	1-242-677-11	1.5k		
R135,235	1-242-713-11	47k		
R136,236	1-242-725-11	150k		
R137,237	1-242-705-11	22k		
R138	1-242-725-11	150k		
R238	1-244-725-11	150k		
R139,239	1-222-783-00	47k, adjustable		
R140	1-244-697-11	10k		
R240	1-242-697-11	10k		
R141,241	1-244-697-11	10k		
R142,242	1-244-697-11	10k		
R143,243	1-242-715-11	56k		
R144	1-244-733-11	330k		
R244	1-242-733-11	330k		
R145,245	1-242-673-11	1k		
R146,246	1-242-691-11	5.6k		
R147,247	1-242-675-11	1.2k		
R148,248	1-242-713-11	47k		
R149	1-242-625-11	10		
R249	1-244-625-11	10		
R150	1-242-647-11	82		
R250	1-244-647-11	82		
R151,251	1-244-688-11	4.3k		
R152	1-244-699-11	12k		
R252	1-242-699-11	12k		
R153,253	1-242-709-11	33k		
R154,254	1-244-693-11	6.8k		
R155,255	1-242-681-11	2.2k		
R156,256	1-242-695-11	8.2k		
R157,257	1-242-677-11	1.5k		
R158,258	1-242-681-11	2.2k		
R159,259	1-221-978-00	4.7k, adjustable		
R160	1-242-693-11	6.8k		
R260	1-244-693-11	6.8k		
R301	1-206-081-11	100	1W	metal oxide
R302	1-244-897-11	10k	½W	
R303	1-242-709-11	33k		
R304	1-242-707-11	27k		
R305	1-242-683-11	2.7k		
R306	1-202-547-31	82	½W	composition
R307	1-202-549-31	100	½W	composition
R308	1-202-557-31	220	½W	composition
R309	1-242-697-11	10k		
R310	1-242-721-11	100k		
R311	1-242-653-11	150		
R312	1-206-093-11	1k	1W	metal oxide
R313	1-206-091-11	680	1W	metal oxide
R314	1-242-601-11	1		
R501,601	1-210-858-11	200k ±2%		

Ref. No.	Part No.	Description		
R502,602	1-210-854-11	27k ±2%		
R503,603	1-242-729-09	220k, low noise		
R504,604	1-242-719-09	82k, low noise		
R505,605	1-242-699-09	12k, low noise		
R506,606	1-242-737-09	470k, low noise		
R507,607	1-242-737-09	470k, low noise		
R508,608	1-242-641-11	47		
R509,609	1-210-853-11	6.2k ±2%		
R510,610	1-242-719-09	82k, low noise		
R511,611	1-242-721-09	100k, low noise		
R512,612	1-242-701-09	15k, low noise		
R513,613	1-242-721-09	100k, low noise		
R514,614	1-242-695-09	8.2k, low noise		
R515,615	1-242-687-11	3.9k		
R516,616	1-210-856-11	68k ±2%		
R517,617	1-210-815-11	910 ±2%		
R518,618	1-242-689-11	4.7k		
R519,619	1-242-677-11	1.5k		
R520,620	1-242-721-11	100k		
R521,621	1-242-719-11	82k		
R522,622	1-242-701-11	15k		
R523,623	1-242-723-11	120k		
R524,624	1-242-695-11	8.2k		
R525,625	1-210-850-11	300 ±2%		
R526,626	1-242-705-11	22k		
R527,627	1-242-695-11	8.2k		
R528,628	1-210-855-11	33k ±2%		
R529,629	1-210-855-11	33k ±2%		
R530,630	1-210-852-11	5.6k ±2%		
R531,631	1-242-601-11	1		
R532,632	1-242-701-11	15k		
R533,633	1-242-719-11	82k		
R534,634	1-242-713-11	47k		
R535,635	1-242-727-11	180k		
R536,636	1-242-727-11	180k		
R537,637	1-242-637-11	33		
R538,638	1-242-721-11	100k		
R539,639	1-242-653-11	150		

SWITCHES

S1	1-516-268-00	lever slide, LIMITER
S2	1-516-268-00	lever slide, DOLBY NR
S3	1-513-273-00	slide, timing
S4	1-516-268-00	lever slide, TAPE SELECT
S5	1-514-346-00	leaf, muting
S6	1-514-792-00	leaf, motor
S7	1-516-259-11	seesaw, POWER (USA, Canada)
	1-516-259-21	seesaw, POWER (E, AEP, AUS)
S101,201	1-514-976-21	slide, record/playback

Ref. No.	Part No.	Description

JACKS

J101,201	1-507-251-21	mini, MICROPHONE
J301	1-507-282-31	binaural, HEADPHONE
CNJ101,201	1-507-402-00	4p, LINE IN (USA, Canada)
	1-507-403-00	4p, LINE IN (E, AEP, AUS)
CNJ102,202	1-507-402-00	4p, LINE OUT (USA, Canada)
	1-507-403-00	4p, LINE OUT (E, AEP, AUS)
CNJ301	1-509-549-00	Connector, REC/PB (E, AEP, AUS)

MISCELLANEOUS

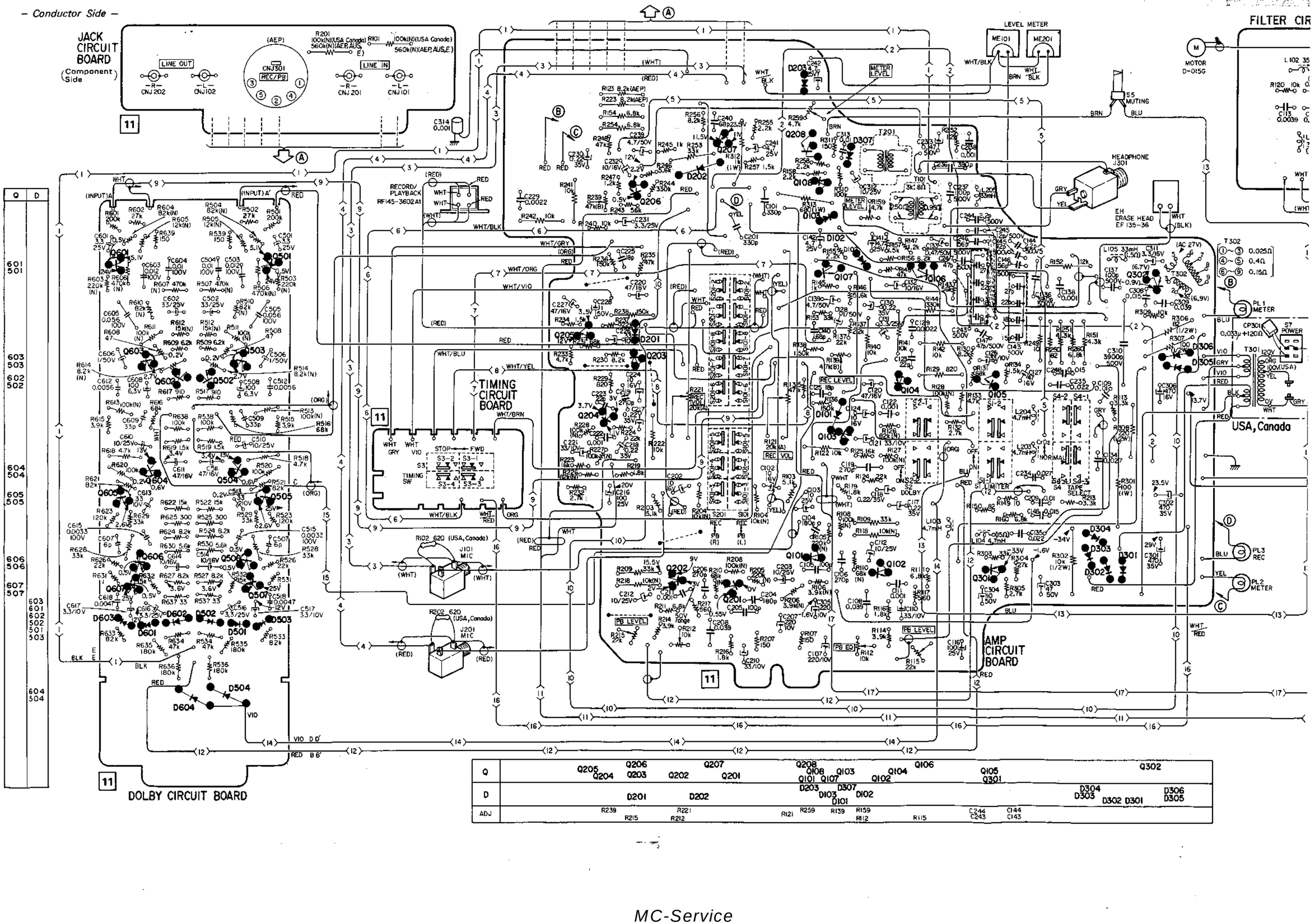
E.H	8-825-506-00	Head, erase; EF135-36
F1	1-532-129-11	Fuse, 0.2A (E)
	1-532-205-11	Fuse, 200 mA (AEP, AUS)
F2	1-532-084-11	Fuse, 100 mA (AEP, AUS)
F3	1-532-084-11	Fuse, 100 mA (AEP, AUS)
F4	1-532-284-11	Fuse, 630 mA (AEP, AUS)
F5	1-532-284-11	Fuse, 630 mA (AEP, AUS)
M	8-834-015-01	Motor, D-015G
PL1	1-518-129-00	Lamp, 4.5 V 40 mA
PL2	1-518-129-00	Lamp, 4.5 V 40 mA
PL3	1-518-130-71	Lamp, 4.5 V 40 mA
CP301	1-231-057-12	Encapsulated Component C-R, 0.033 μF + 120 Ω (E)
	1-231-057-21	Encapsulated Component C-R, 0.033 μF + 120 Ω (USA, Canada)
	1-524-078-21	Meter, level
	1-533-102-11	Holder, fuse (E)
	1-533-118-11	Holder, fuse (AEP, AUS)
	1-534-526-21	Cord, power (USA, Canada)
	1-534-551-00	Cord, power (E)
	1-534-580-13	Cord, power (AUS)
	1-534-587-11	Cord, power (AEP)
	1-509-427-12	Socket, voltage selector (E)
	1-509-482-11	Socket, voltage selector (AEP, AUS)

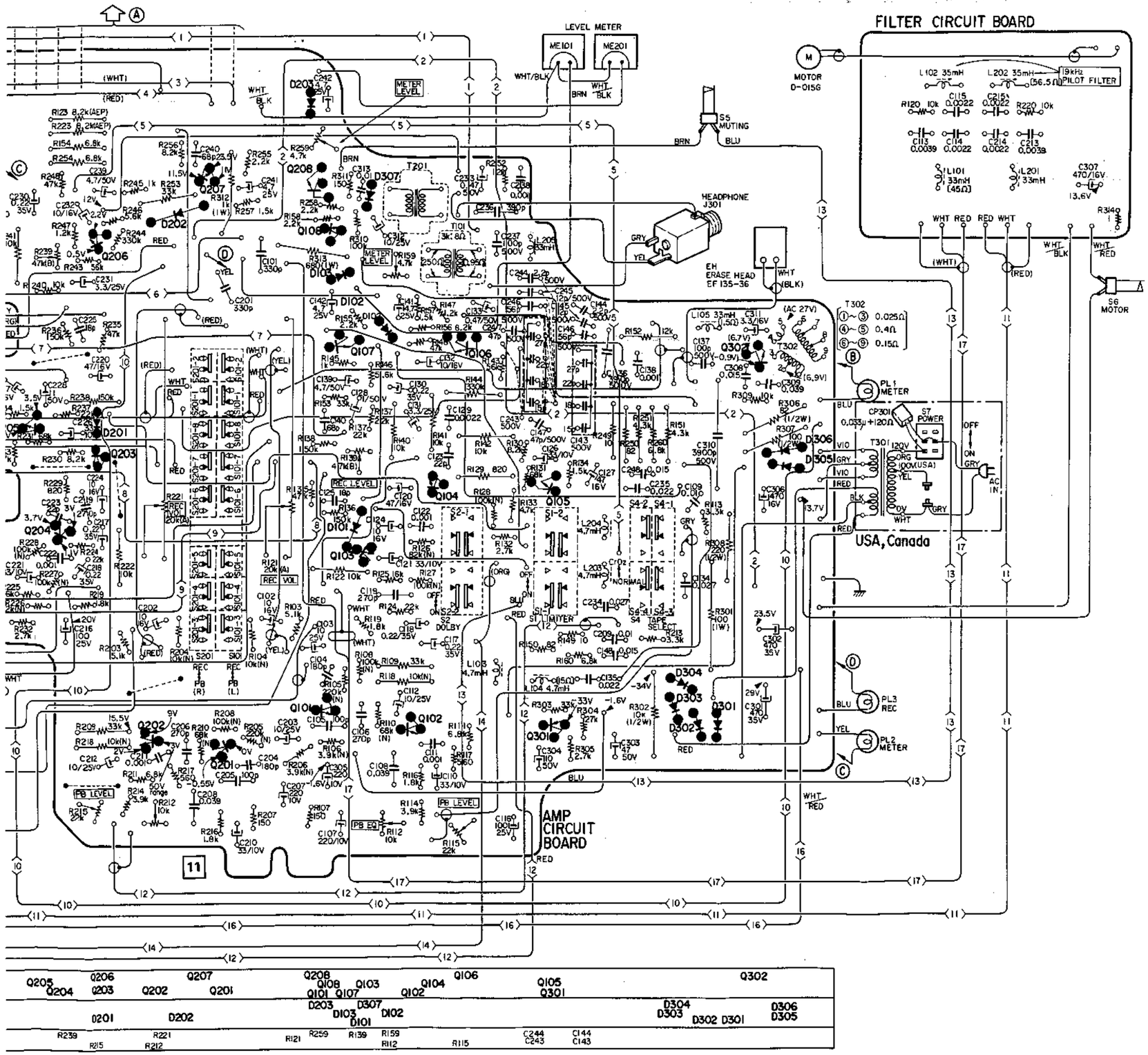
Ref. No.	*Part No.*	*Description*
		JACKS
J101,201	1-507-251-21	mini, MICROPHONE
J301	1-507-282-31	binaural, HEADPHONE
CNJ101,201	1-507-402-00	4p, LINE IN (USA, Canada)
	1-507-403-00	4p, LINE IN (E, AEP, AUS)
CNJ102,202	1-507-402-00	4p, LINE OUT (USA, Canada)
	1-507-403-00	4p, LINE OUT (E, AEP, AUS)
CNJ301	1-509-549-00	Connector, REC/PB (E, AEP, AUS)
		MISCELLANEOUS
E.H	8-825-506-00	Head, erase; EF135-36
F1	1-532-129-11	Fuse, 0.2A (E)
	1-532-205-11	Fuse, 200 mA (AEP, AUS)
F2	1-532-084-11	Fuse, 100 mA (AEP, AUS)
F3	1-532-084-11	Fuse, 100 mA (AEP, AUS)
F4	1-532-284-11	Fuse, 630 mA (AEP, AUS)

Ref. No.	*Part No.*	*Description*
F5	1-532-284-11	Fuse, 630 mA (AEP, AUS)
M	8-834-015-01	Motor, D-015G
PL1	1-518-129-00	Lamp, 4.5 V 40 mA
PL2	1-518-129-00	Lamp, 4.5 V 40 mA
PL3	1-518-130-71	Lamp, 4.5 V 40 mA
CP301	1-231-057-12	Encapsulated Component C-R,
	1-231-057-12	0.033 μF + 120 Ω (E)
	1-231-057-21	Encapsulated Component C-R,
		0.033 μF + 120 Ω (USA, Canada)
	1-524-078-21	Meter, level
	1-533-102-11	Holder, fuse (E)
	1-533-118-11	Holder, fuse (AEP, AUS)
	1-534-526-21	Cord, power (USA, Canada)
	1-534-551-00	Cord, power (E)
	1-534-580-13	Cord, power (AUS)
	1-534-587-11	Cord, power (AEP)
	1-509-427-12	Socket, voltage selector (E)
	1-509-482-11	Socket, voltage selector (AEP, AUS)

3. MOUNTING DIAGRAM

– Conductor Side –





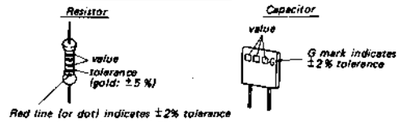
Note:

- All resistors and capacitors are in Ω and μF unless otherwise specified.
- Letter in ( ) suffixed to variable resistor value indicates characteristics.
- ⏚ : chassis ground
- Components for R-CH have the same values as for L-CH.
- Switch mode:

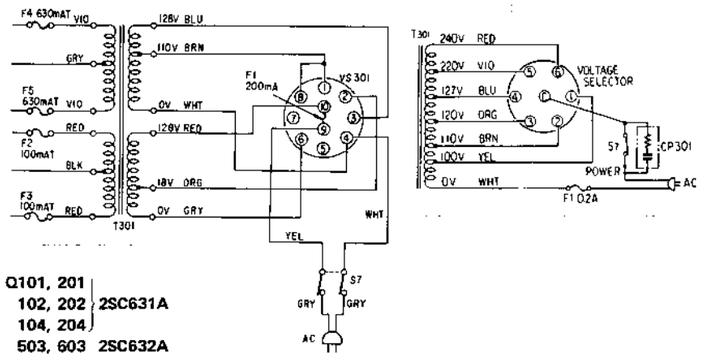
Ref. No.	Switch	Mode
S101, 201	record/playback	playback
S1	LIMITER	ON
S2	DOLBY NR	ON
S3	timing	STOP
S4	TAPE SELECT	CrO_2
S5	muting	OFF
S6	motor	OFF
S7	POWER	ON

- INI : Low noise resistor
- Voltage values shown are measured with a voltmeter (20kΩ/V). Variations may be noted due to normal production tolerances.
  - no mark : stop mode
  - ( ) : record mode
- AC voltage values across heads are measured with a VTVM in record mode.
- When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.

2% Tolerance Identification



- Color in ( ) indicates tube color of lead wire.



Q101, 201 / 102, 202 / 104, 204 2SC631A

503, 603 2SC632A

103, 203 / 108, 208 2SC633A

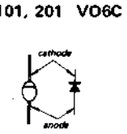
105, 205 ~ 107, 207 / 501, 601 ~ 502, 602 / 504, 604 ~ 507, 607 2SC634A

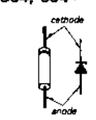
D103, 203 1T22

D501, 601 / 502, 602 1T22A

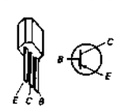
D503, 603 / 504, 604 1S1555

D101, 201 VO6C

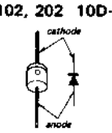




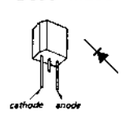
Q301 2SA678



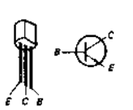
D102, 202 10D-05



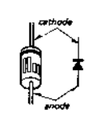
D306 MZ08



Q302 2SC1384



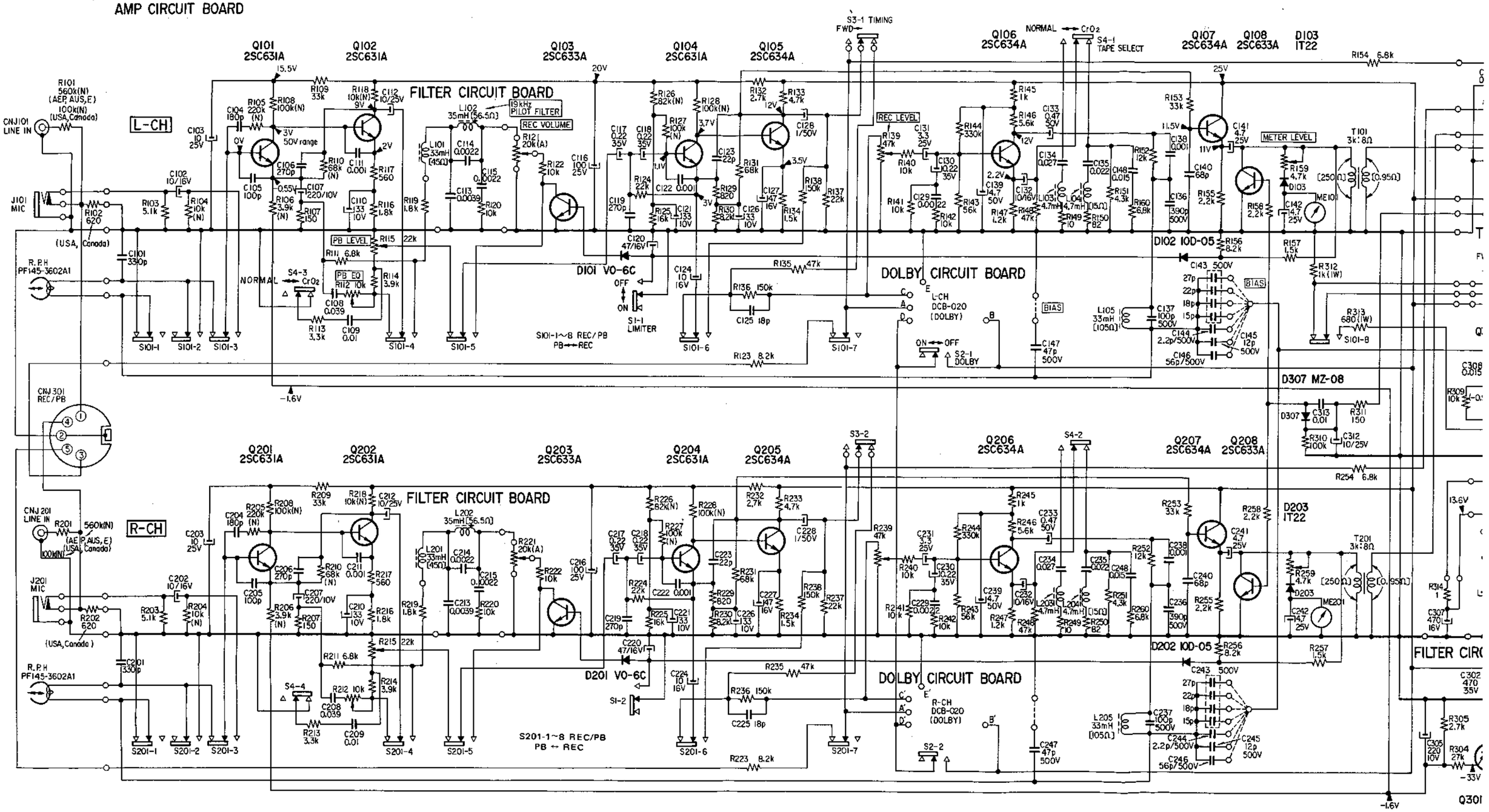
D301~306 SIB01-02



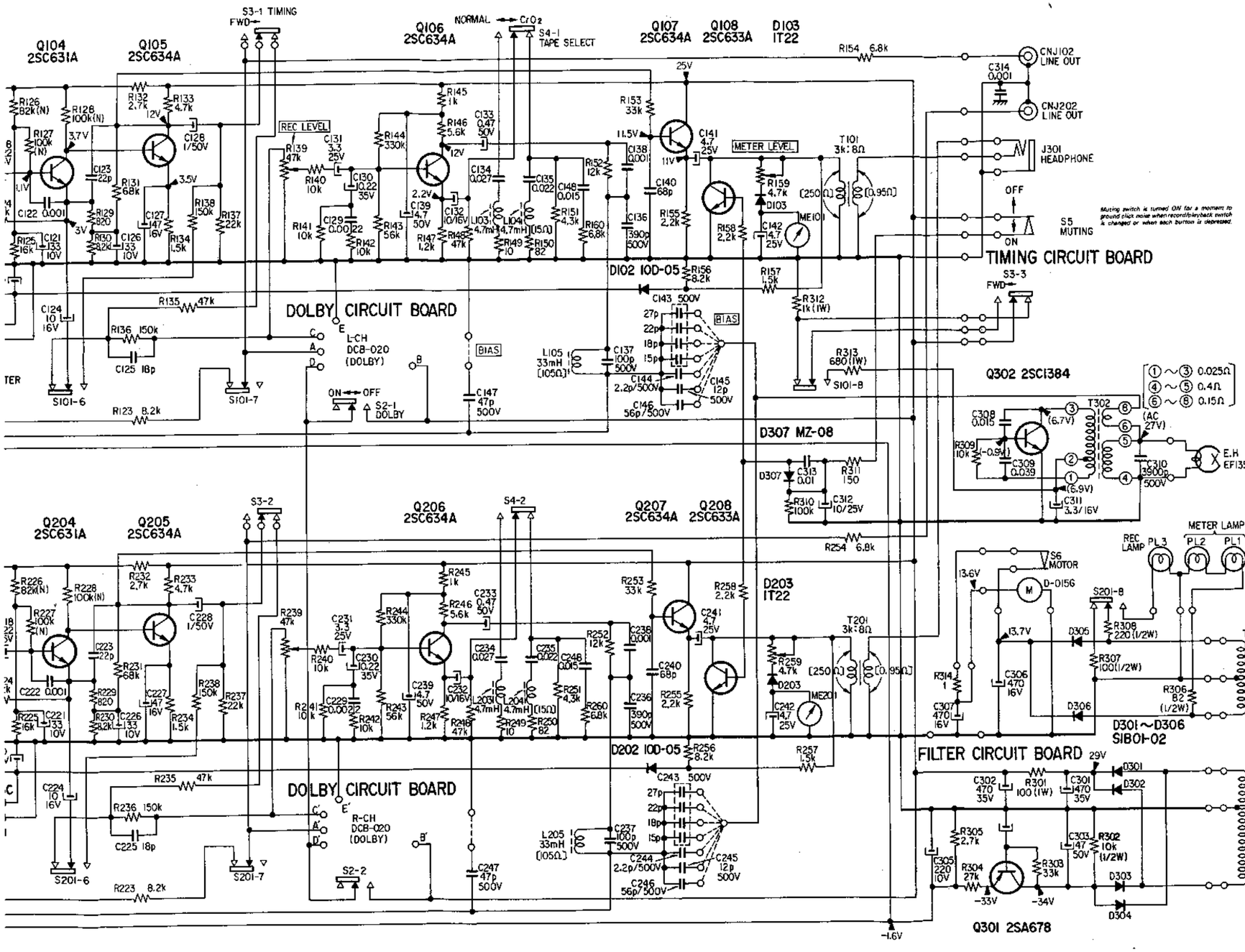
4. SCHEMATIC DIAGRAM

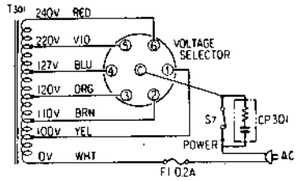
– Amp Circuit –

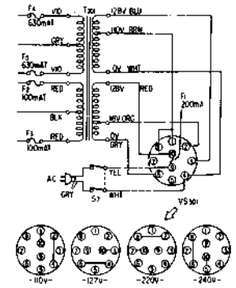
AMP CIRCUIT BOARD



Red Line Circuit: AEP, E, AUS



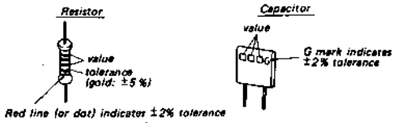




Note:

- All resistors and capacitors are in Ω and μF unless otherwise specified.
- Letter in ( ) suffixed to variable resistor value indicates characteristics.
- ⏚ : chassis ground
- Components for R-CH have the same values as for L-CH.
- (N) : Low noise resistor
- Voltage values shown are measured with a voltmeter (20kΩ/V). Variations may be noted due to normal production tolerances.
  - no mark : stop mode
  - ( ) : record mode
- AC voltage values across heads are measured with a VTVM in record mode.
- When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.

2% Tolerance Identification

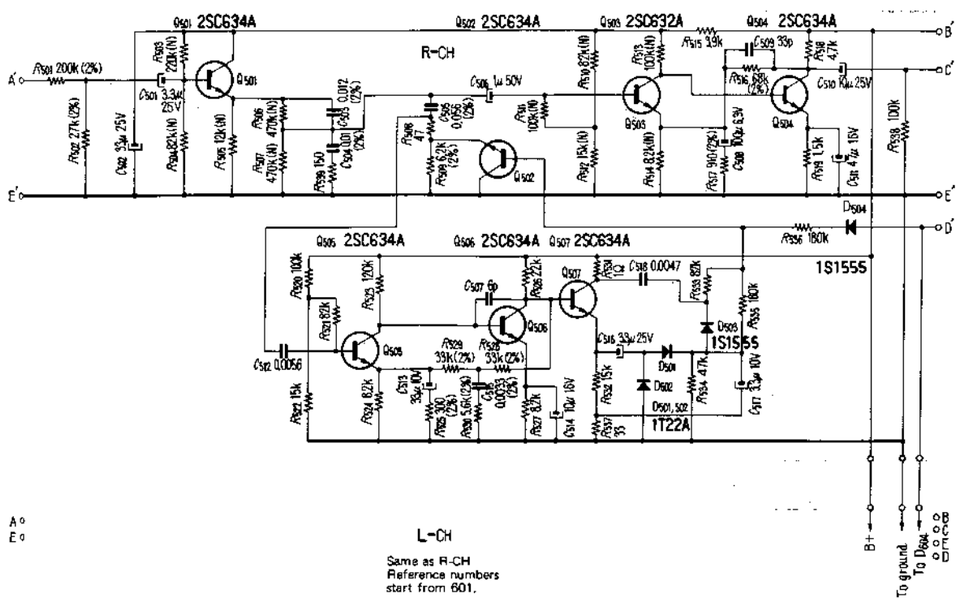


- Switch mode:

Ref. No.	Switch	Mode
S101, 201	record/playback	playback
S1	LIMITER	ON
S2	DOLBY NR	ON
S3	timing	STOP
S4	TAPE SELECT	CrO_2
S5	muting	OFF
S6	motor	OFF
S7	POWER	ON

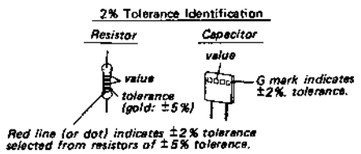
5. SCHEMATIC DIAGRAM

– DOLBY Circuit –



Note:

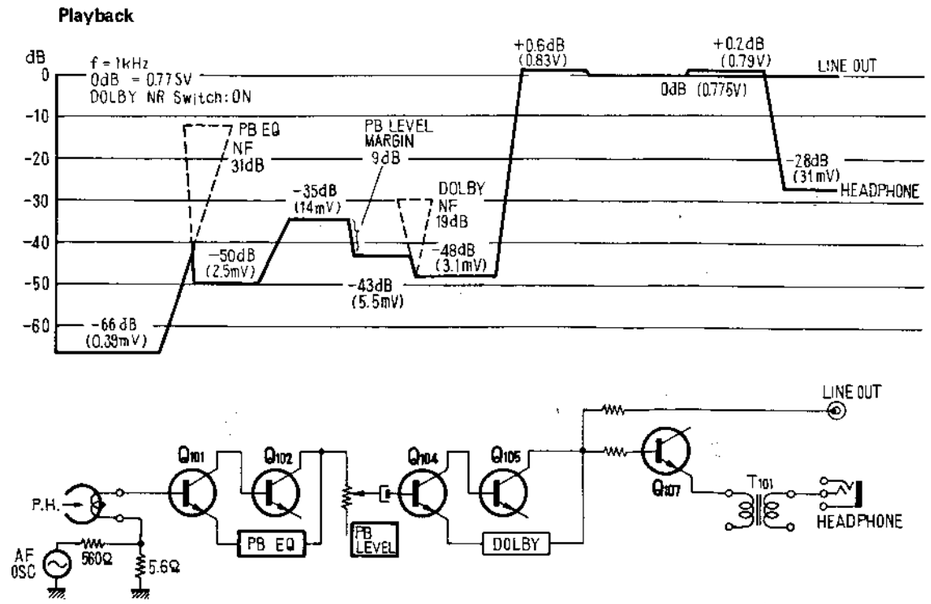
1. All resistors and capacitors are rated in Ω and μF unless otherwise indicated.
2. The letter (N) which is suffixed to rating values shows a low noise resistor.
3. Voltage values shown are measured with a voltmeter (20kΩ/V) in playback mode. Variations may be noted because of normal production tolerances.
4. Components for R-CH are the same value as for L-CH.
5. When replacing resistors and capacitors needing ±2% tolerance, use only those with red line (or dot) or G mark, as DOLBY system requires precise circuit operation.



6. CHANGED PORTIONS OF ELECTRICAL ADJUSTMENT

Page	Former	New
20	4. Playback Equalizer Adjustment Adjust R114 (L-CH) R214 (R-CH)	 R112 (L-CH) R212 (R-CH) **Note:** After the playback equalizer adjustment, setting the TAPE SELECT switch to CrO_2, play back the SONY test tape P-4-A81 and ensure that VTVM reading drops 4.5 dB ±1 dB.
21	7. Record Bias Adjustment Input signal (1) 1 kHz, –90 dB (25 μV)	 750 Hz, –90 dB (25 μV)
22	8. Record Level Adjustment Adjust R139 (L-CH) R239 (R-CH)	 R140 (L-CH) R240 (R-CH)

7. CHANGED PLAYBACK LEVEL DIAGRAM

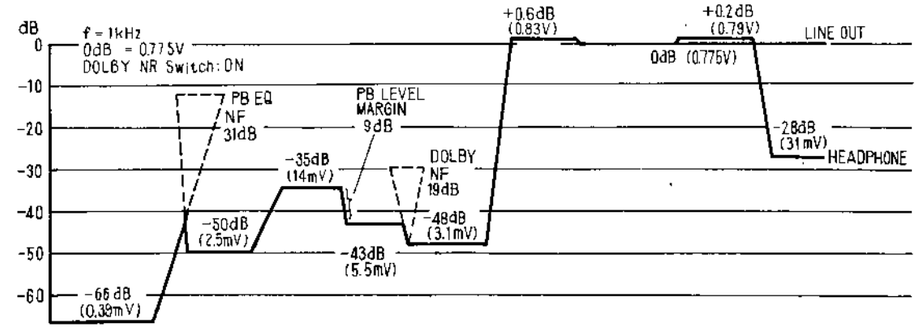


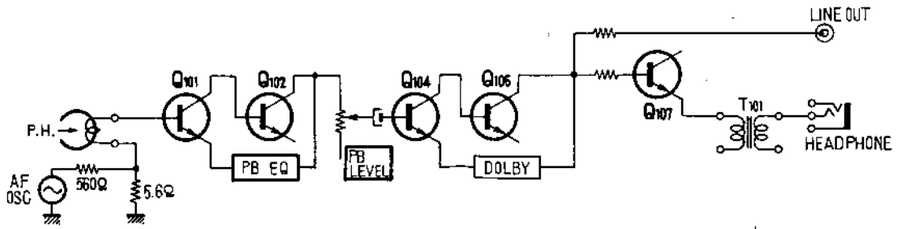
6. CHANGED PORTIONS OF ELECTRICAL ADJUSTMENT

Page	Former	New
20	4. Playback Equalizer Adjustment Adjust R114 (L-CH) R214 (R-CH)	 R112 (L-CH) R212 (R-CH) **Note:** After the playback equalizer adjustment, setting the TAPE SELECT switch to CrO_2, play back the SONY test tape P-4-A81 and ensure that VTVM reading drops 4.5 dB ± 1 dB.
21	7. Record Bias Adjustment Input signal (1) 1 kHz, −90 dB (25 μV)	 750 Hz, −90 dB (25 μV)
22	8. Record Level Adjustment Adjust R139 (L-CH) R239 (R-CH)	 R140 (L-CH) R240 (R-CH)

7. CHANGED PLAYBACK LEVEL DIAGRAM

Playback





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