

Service Manual

REPAIR & ADJUSTMENTS



**ORDER NO.
ART-667-0**

STEREO CASSETTE TAPE DECK

CT-7R

MODEL CT-7R COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	120V only	U.S.A. model
KC	120V only	Canada model
HE	220V and 240V (Switchable)	Europe model
HB	220V and 240V (Switchable)	U.K. model
HP	220V and 240V (Switchable)	Australia model
D	120V, 220V and 240V (Switchable)	General export model
D/G	120V, 220V and 240V (Switchable)	U.S. military model

- This service manual is applicable to the KU type. For servicing of the other types, please refer to the additional service manual.
- For the circuit & mechanism description, please refer to the supplement of CT-7R service manual (ARP-001-0).
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

1. SPECIFICATIONS

Systems	Compact cassette, 2-channel stereo
Motor	DC servo motor x 1 (For driving the capstan) DC high-torque motor x 2 (For driving the reel)
Heads	"Ribbon Sendust" recording/playback head x 1 Erasing head x 2
Fast Winding Time	Approximately 90 seconds (C-60 tape)
Wow and Flutter	No more than 0.04% (WRMS)
Frequency Response	-20dB recording:
Normal, LH tapes	20 to 16,000Hz (25 to 14,000Hz \pm 3dB)
Chromium dioxide tape	20 to 18,000Hz (25 to 16,000Hz \pm 3dB) (0dB recording; 25 to 10,000Hz)
Metal tape	20 to 20,000Hz (25 to 17,500Hz \pm 3dB) (0dB recording; 25 to 15,000Hz)
Signal-to-Noise Ratio	
Dolby NR OFF	More than 59dB
Dolby NR ON	B Type more than 69dB C Type more than 79dB (at 5kHz)
Harmonic Distortion	No more than 1.2% (0dB)
Input (Sensitivity/Maximum allowable input/Impedance)	
MIC (L,R)	0.3mV/30mV/12k Ω , 6mm diam. jack (Reference MIC impedance; 250 Ω to 10k Ω)
LINE (INPUT) x 2	50mV/25V/100k Ω , Pin jack
Output (Reference level/Load impedance)	
LINE (OUTPUT) x 2	450mV/50k Ω , Pin jack
Headphones	60mV/8 Ω , 6mm diam. jack

Subfunctions

- Auto reverse, auto repeat functions
- MS/SKIP (Music Search/Skip) system
- REC MUTE switch
- Dolby NR system (B type/C type/OFF) with LED indicator lamp
- Stand-by mechanism with unattended recording and playback
- 3 position Auto tape selector (NORM/CrO₂/METAL)
- Full automatic stop mechanism
- MEMORY STOP function (FF, REW)
- 2 color digital level meter
- 3 digit mechanical tape counter
- IC-based logic control
- Cassette compartment illumination
- INDEX SCAN system
- MUSIC REPEAT system
- SKIP
- BLANK SEARCH system

Miscellaneous

Power Requirements	AC120V/60Hz
Power Consumption	43Watts
Dimensions	.420 (W) x 99.5 (H) x 270 (D) mm 16-9/16 (W) x 3-15/16 (H) x 10-5/8 (D) in.
Weight (without package)	5.3kg (12 lb)

Furnished Parts

Connection cord with pin plugs	2
Operating instructions	1

NOTE:

Specifications and the design subject to possible modifications without notice due to improvements.

NOTE:

1. Reference Tapes: Normal & LH: DIN 45513/BLATT 6 or equiv.
CrO₂ DIN 45513/BLATT7 (CrO₂) or equiv.
2. Reference Recording Level: Meter 0dB indicating level (160nwb/m magnetic level = Philips cassette reference level)
3. Reference Signal: 333Hz
4. Wow & Flutter: • JIS [3kHz, with acoustic compensation (weighted), rms value]
5. Frequency Response: • Measured at -20dB level, DOLBY NR OFF, level deviation is \pm 6dB without indication.
6. Signal to Noise Ratio: • Measured at the third harmonic distortion 3% level, weighted.
7. Sensitivity: Input level (mV) required for reference recording level with input (REC) controls set to maximum.
8. Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier output waveform becomes clipped.
9. Reference Output Level: Playback output level when meter indicates 0dB.
10. This model doesn't employ with a recording/playback connector (DIN-type).

Indicator Assembly Removal

Remove the two hooks **(D)** of the panel stay and pull the indicator assembly toward you.

Level Meter Assembly Removal

Remove the hook **(E)** of the panel stay and pull the level meter assembly toward you.

Control Switch Assembly Removal

Remove the two hooks **(F)** of the panel stay and pull the control switch assembly toward you.

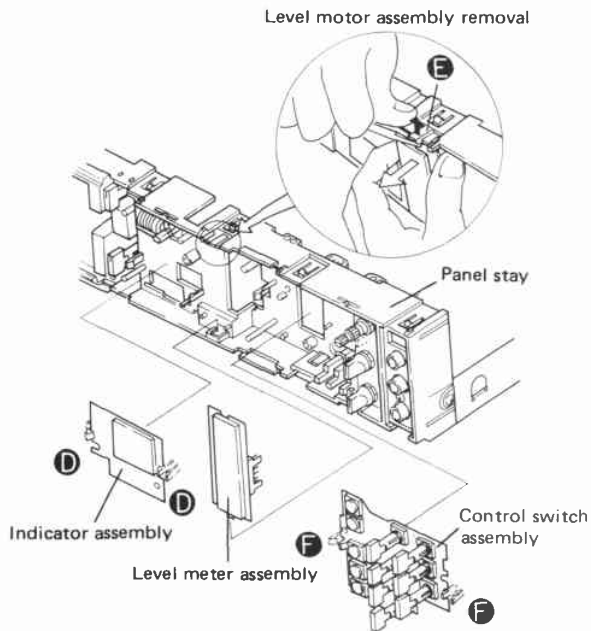


Fig. 3-3 Disassembly

Capstan Belt Removal

1. Remove the four screws **(3)** and remove the capstan motor control assembly.
2. Remove the capstan belt from the capstan assembly.

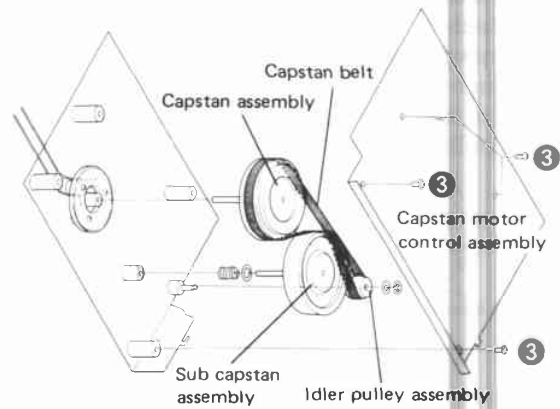


Fig. 3-5 Capstan belt removal

Head Assembly Removal

1. Remove the stopper.
2. Turn the head assembly clockwise (FWD direction).
3. Pull up the head assembly and remove it.

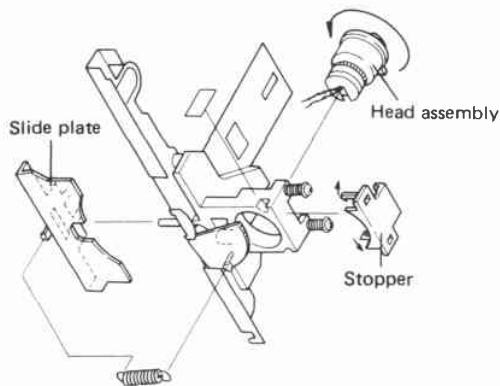
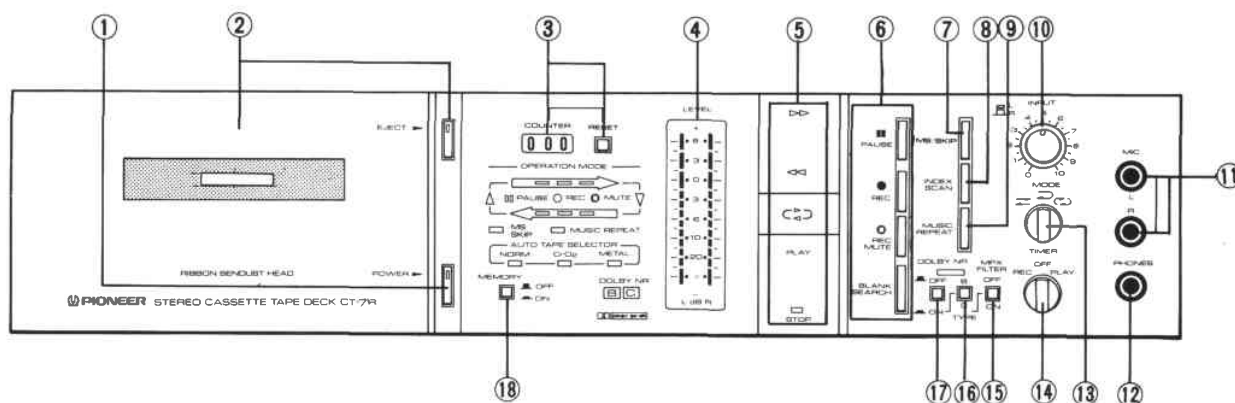


Fig. 3-4 Head assembly removal

2. FRONT PANEL FACILITIES



① POWER switch

The power comes on when this switch is depressed; it is turned off when the switch is released.

② EJECT switch/cassette door

The cassette door opens when this switch is depressed.

NOTE:

The door will not open when the tape is running or when the pause function is working.

③ Tape COUNTER/RESET switch

The tape counter indicates the tape's traveling position. Depress the reset switch before recording or playback to reset the counter to "000."

④ LEVEL meters

These indicate the input or output level during recording or playback.

⑤ Playback function switches

Playback operations can be performed when the sections with the following symbols are depressed:

▷▷ (fast forward): The tape runs at high speed from left to right.

◁◁ (rewind): The tape runs at high speed from right to left.

↔ (direction): The direction of the tape travel is reversed (even in the pause mode).

PLAY: The tape is played.

STOP: The tape is stopped.

⑥ Recording function switches

Recording operations can be performed when the switches with the following symbols are depressed:

PAUSE: The tape travel (during recording) can be temporarily suspended (recording standby mode). Depress this switch again to resume recording.

NOTE:

The tape will not stop when this switch is depressed during fast forward or rewind operations.

REC: Recording can be started.

REC MUTE: This enables unrecorded blanks to be created between programs for convenient play functions (MS/SKIP, MUSIC REPEAT, INDEX SCAN, BLANK SEARCH).

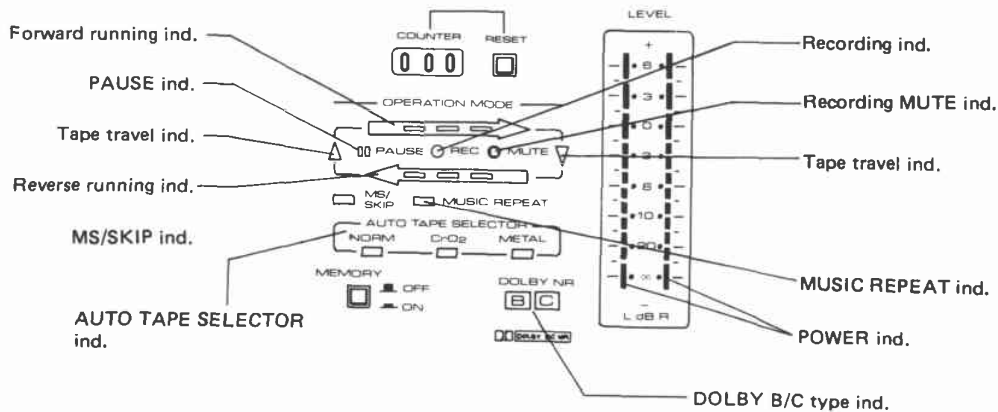
BLANK SEARCH: This automatically searches for the remaining part of the loaded tape which has not been recorded.

⑦ MS/SKIP switch

This switch is for skipping the program now being heard and finding the start of the next program. When this switch is depressed during play (ON; MS/SKIP indicator lights) and then the fast forward switch (rewind switch when traveling in other direction) is depressed, play starts from the next program.

Whenever there is a long interval between tape programs (unrecorded blanks of over 8 seconds), the tape is automatically fast forwarded and playback resumes.

Indicators below show the ON-OFF position of each switch



⑧ INDEX SCAN switch

This plays only the start of the recorded program for about 7 seconds and then fast forwards the tape. When used in combination with the rewind (◀) switch, this operation can be performed with the tape being rewind.

⑨ MUSIC REPEAT switch

This repeats only the program now being heard for up to eight plays (ON; MUSIC REPEAT indicator lights).

⑩ INPUT level controls

These are used to adjust the input signal level during recording. The inside left channel and outside right channel controls can be used separately.

⑪ MIC jacks

Insert the microphone plugs (L and R) into these jacks when recording with microphones.

⑫ PHONES jack

Insert the plug of the stereo headphones into this jack.

⑬ MODE selector

- ⊞ : When the tape has been wound up on one of the reels, it automatically stops traveling (one-side travel).
- ▷ : The tape starts moving in the forward direction, the direction is reversed at the end of the tape, the tape starts moving in the reverse direction and then stops at the end (two-side travel).
- ↺ : The tape is repeatedly played back.
The repeat function stops when the direction of tape travel has been reversed eight times.

⑭ TIMER start switch

This switch is operated for unattended recording or playback using the timer.

REC: For automatically recording at the time set on the timer.

OFF: For when the timer is not being used.

PLAY: For automatic playback at the time set on the timer.

⑮ MPX FILTER switch

Depress this when recording an FM stereo broadcast using the Dolby noise reduction system.

⑯ DOLBY NR B/C type selector

Depress this to select type B or type C Dolby NR system with the Dolby NR switch in the ON position. (The indicator B or C lights).

⑰ DOLBY NR ON/OFF switch

Depress this to the ON position when recording or playing back a tape with the Dolby noise reduction system.

⑱ MEMORY ON/OFF switch

When the tape is to be stopped automatically at a desired position, use this switch along with the tape counter/reset switch and rewind switch (fast forward switch during reverse tape travel). Normally, it is kept at the released (OFF) position.

The word "Dolby" and ⊞ are trademark of Dolby Laboratories Corporation.

Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

3. DISASSEMBLY

Door Assembly Removal

1. Depress the EJECT button and open the cassette holder.
2. Remove the door assembly from the hooks attached to cassette holder with the small screwdriver.
3. Remove the spring with the small screwdriver.
4. Slid the door assembly to the left and remove it pulling toward you.

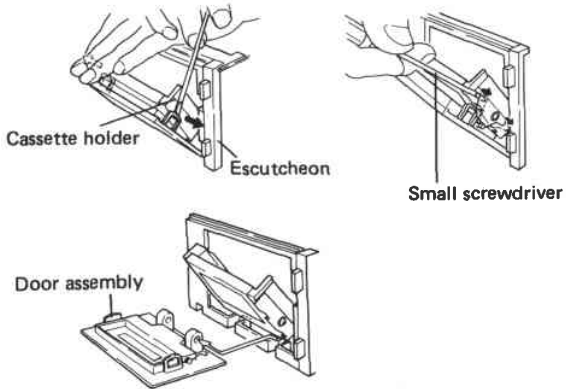


Fig. 3-1 Door assembly removal

Bonnet Removal

Remove the four screw ①

Indicator Panel Removal

1. Push the two hooks (A) of the panel stay with the small screwdriver.
2. Pull the indicator panel toward you and remove it.

Sub panel R Removal

1. Pull off the INPUT knobs.
2. Push the four hooks (B) of the panel stay with small screwdriver.
3. Pull the sub panel R toward you and remove it.

Switch Escutcheon Removal

1. Push the three hooks (C) of the escutcheon.
2. Pull the escutcheon toward you and remove it.

Mechanism Assembly Removal

1. Remove the counter belt.
2. Remove the six screws ②

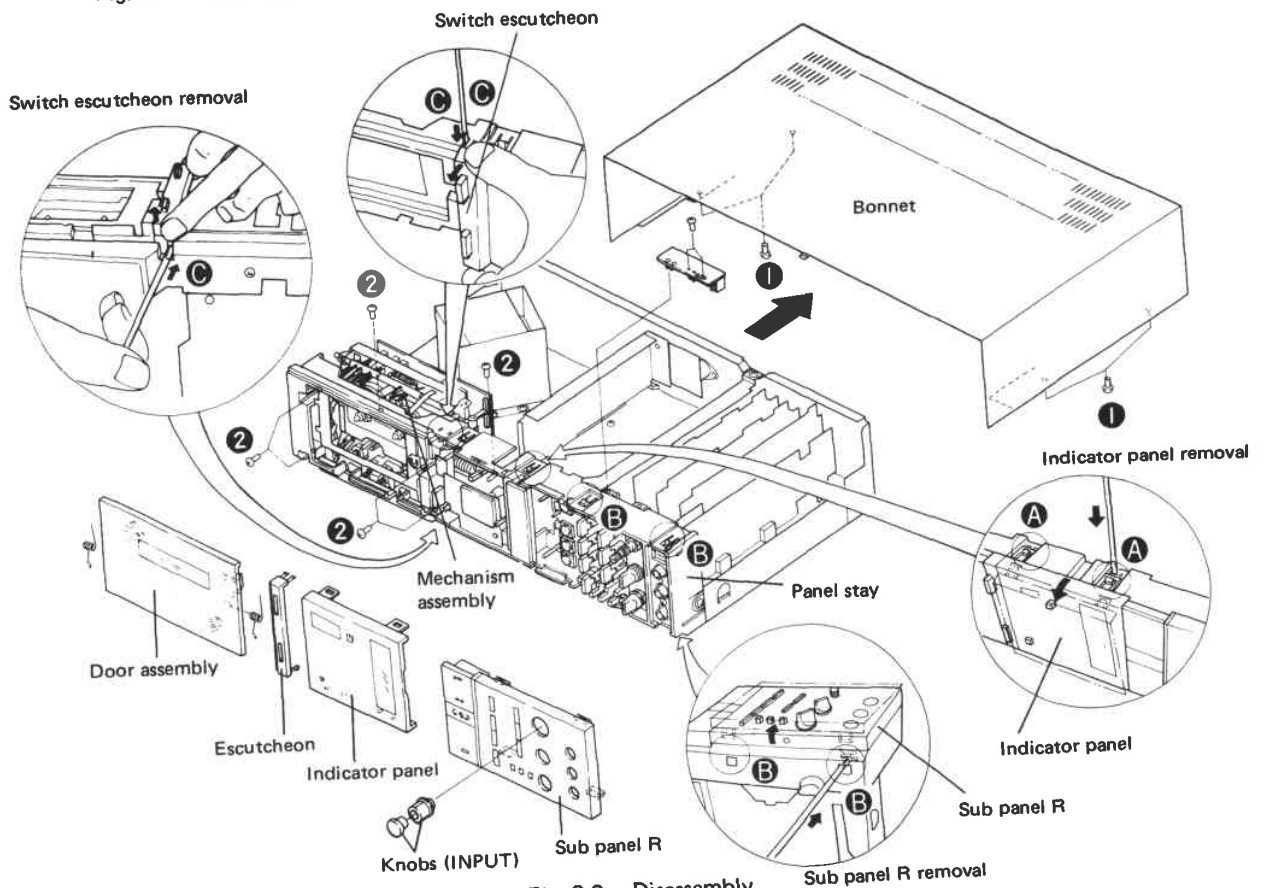


Fig. 3-2 Disassembly

5. EXPLODED VIEWS AND PARTS LIST

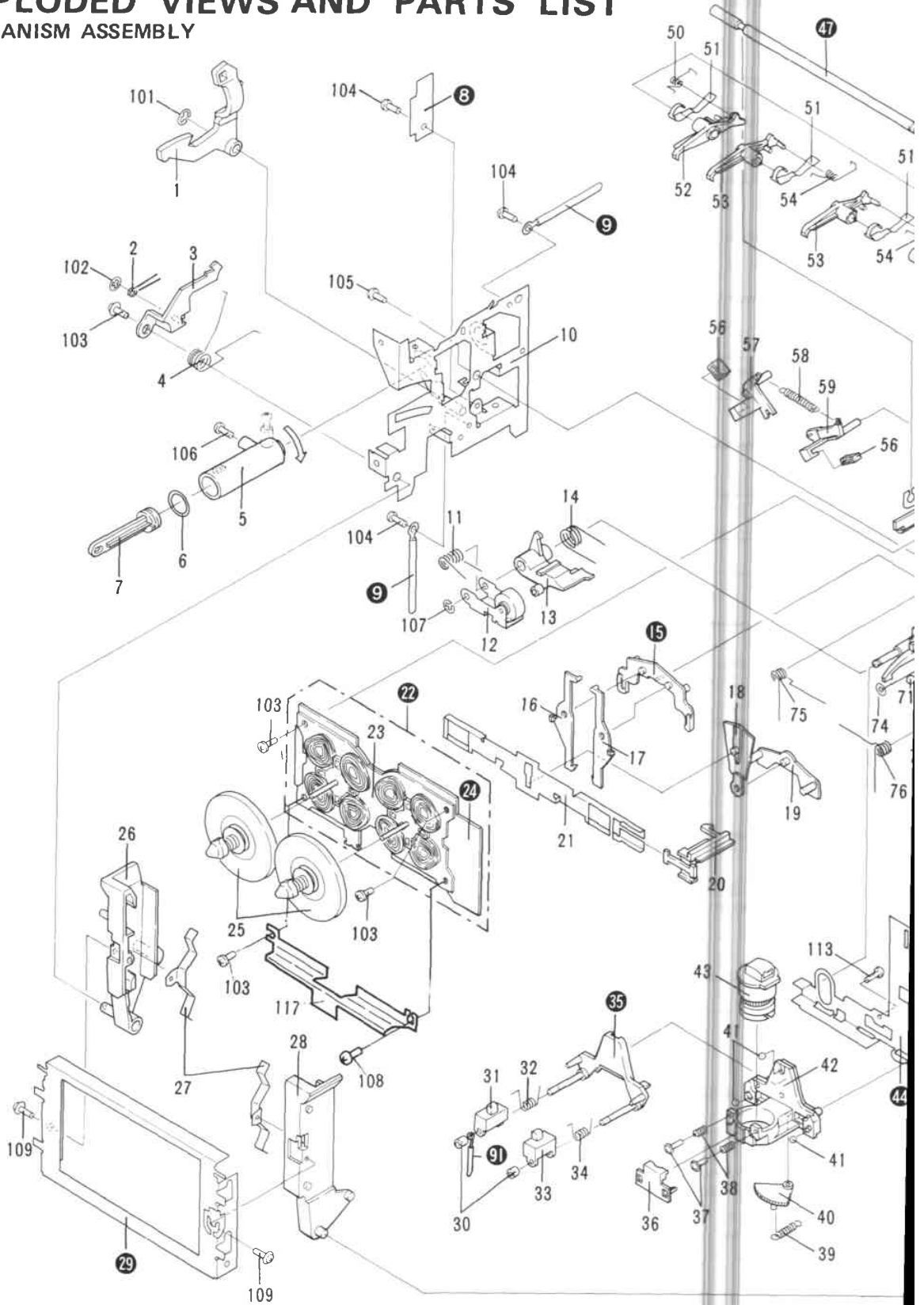
5.1 MECHANISM ASSEMBLY

A

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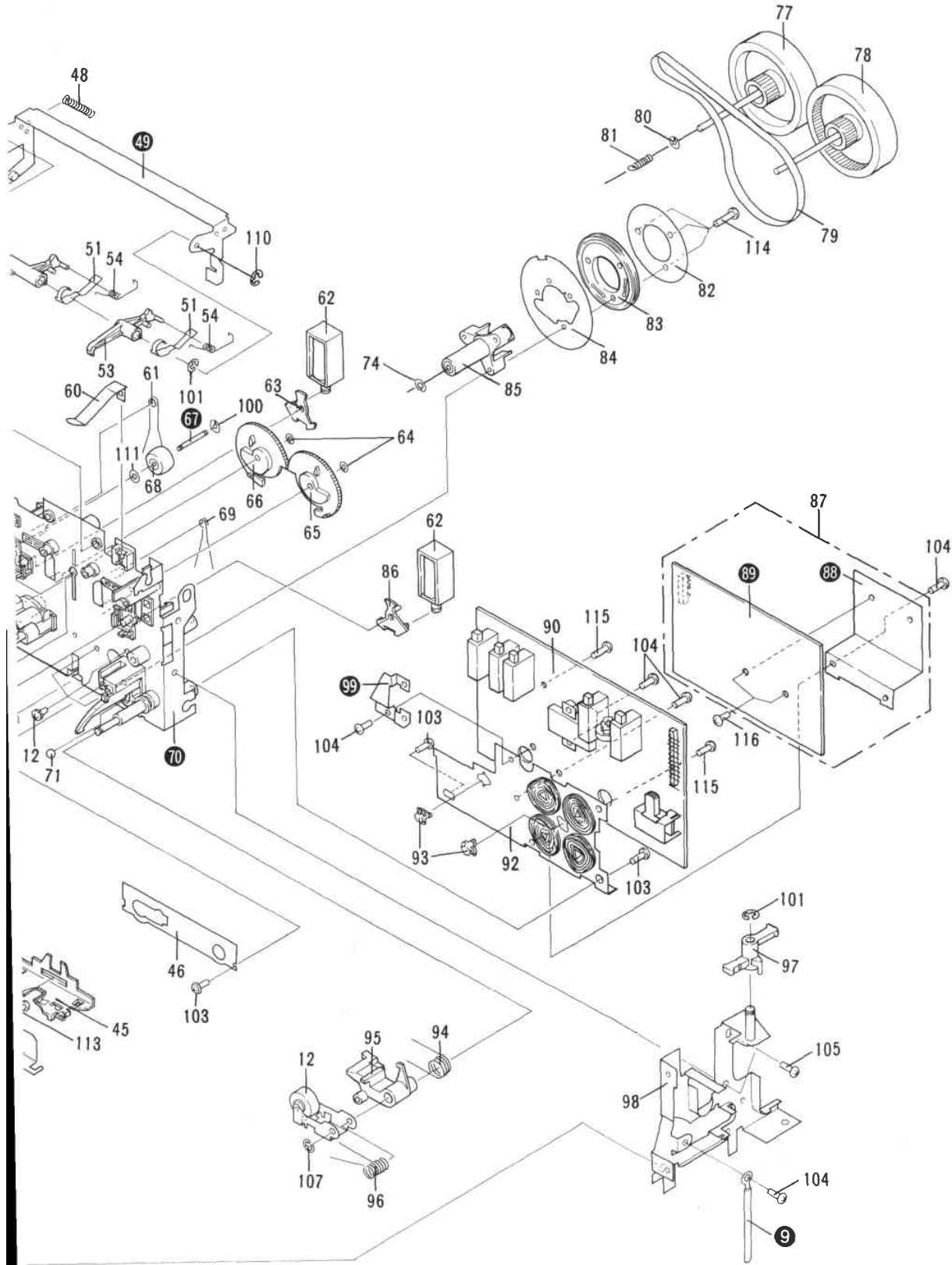
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B

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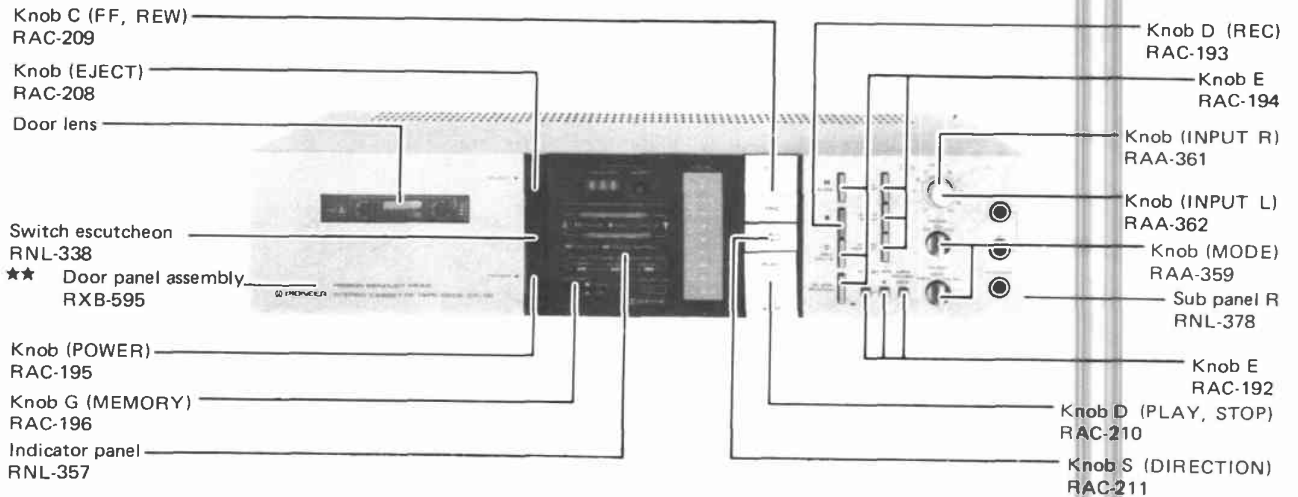
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4. PARTS LOCATION

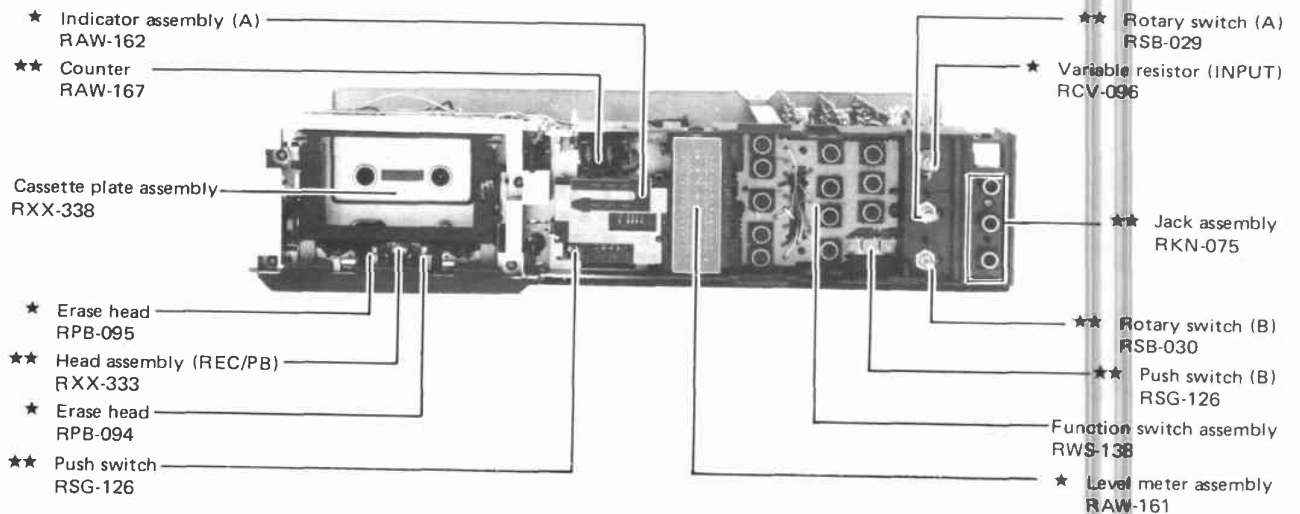
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

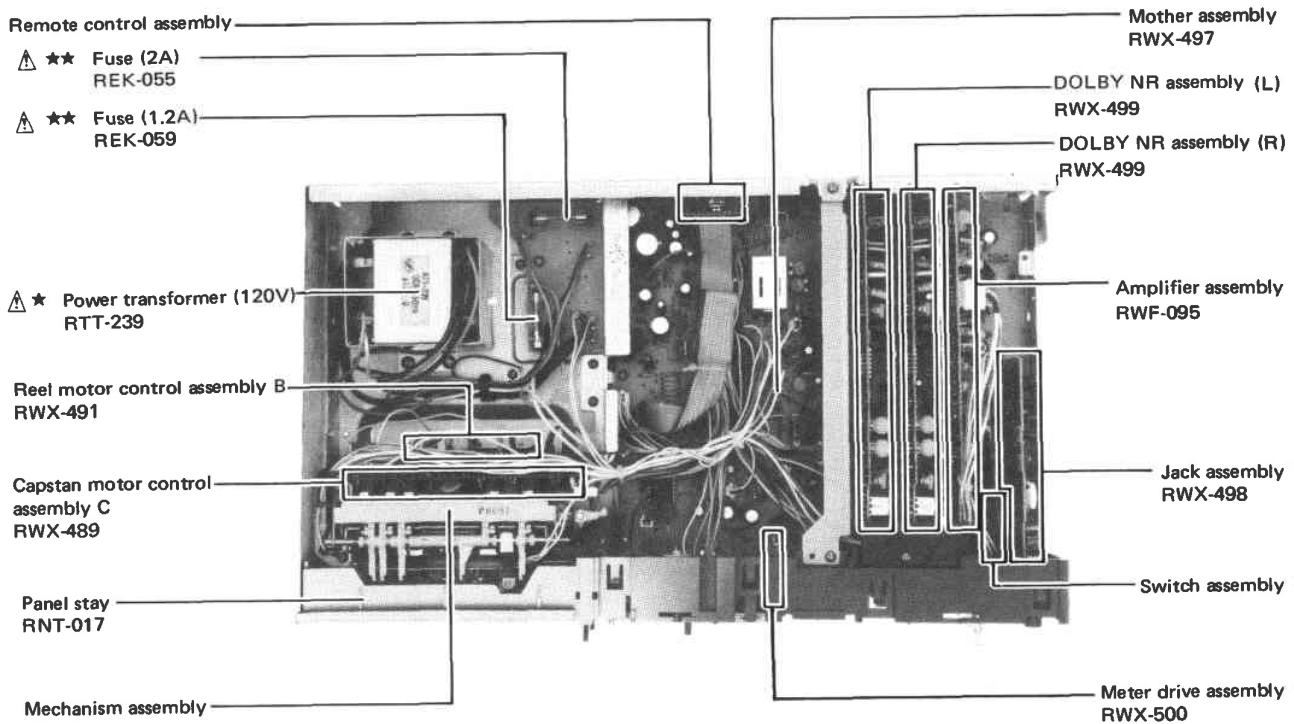
Front Panel View



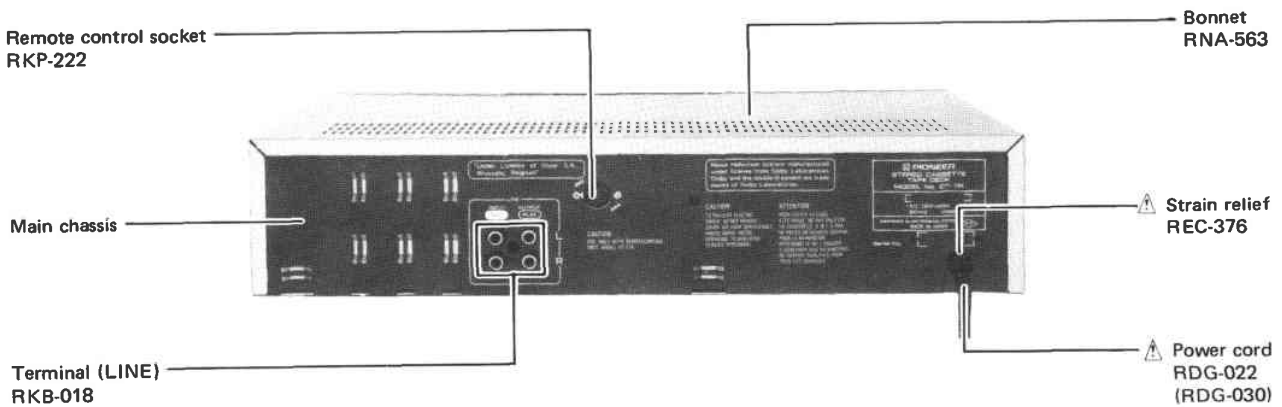
Front View with Front Panel Removed



Top View with Bonnet Removed



Rear Panel View



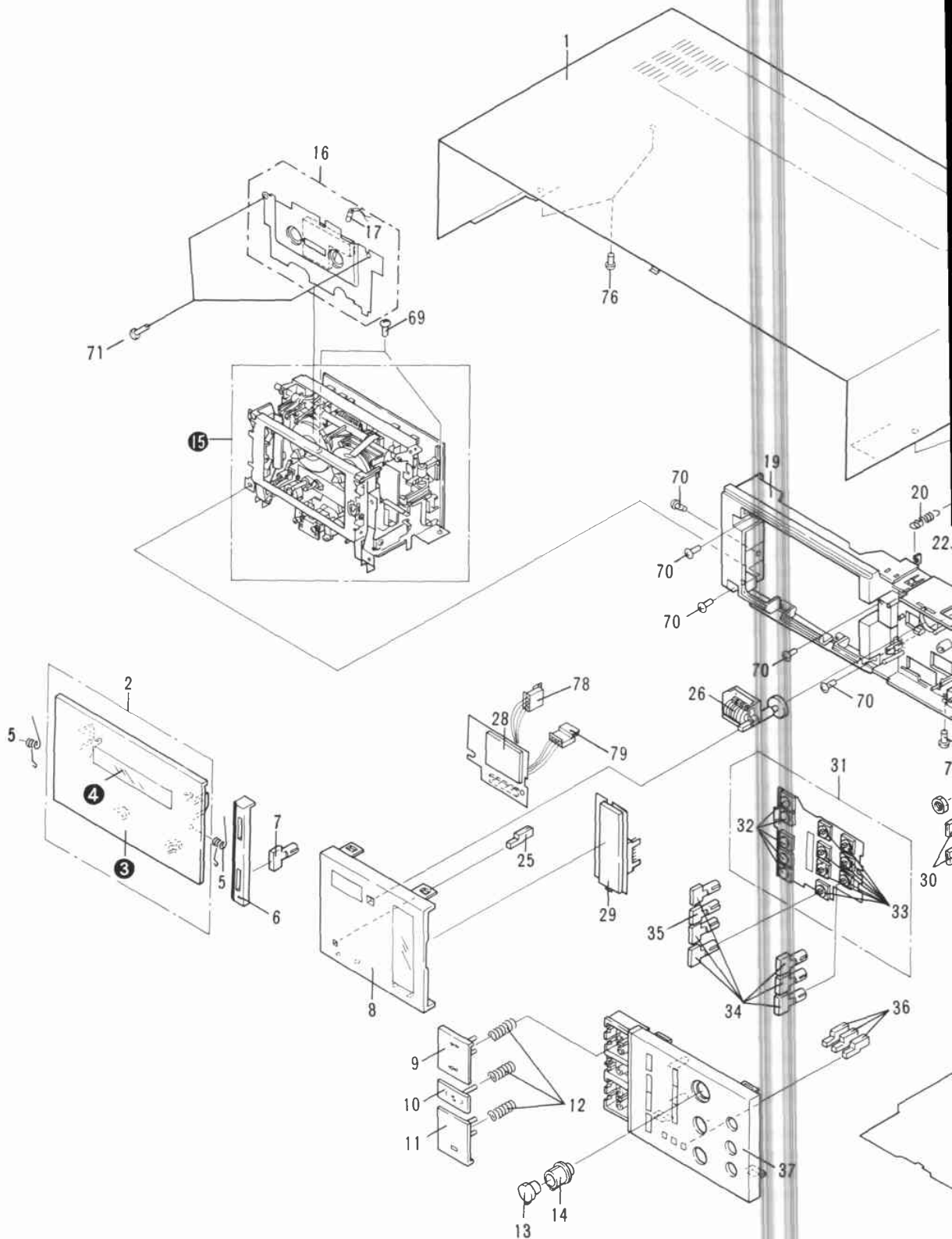
5.2 EXTERIOR

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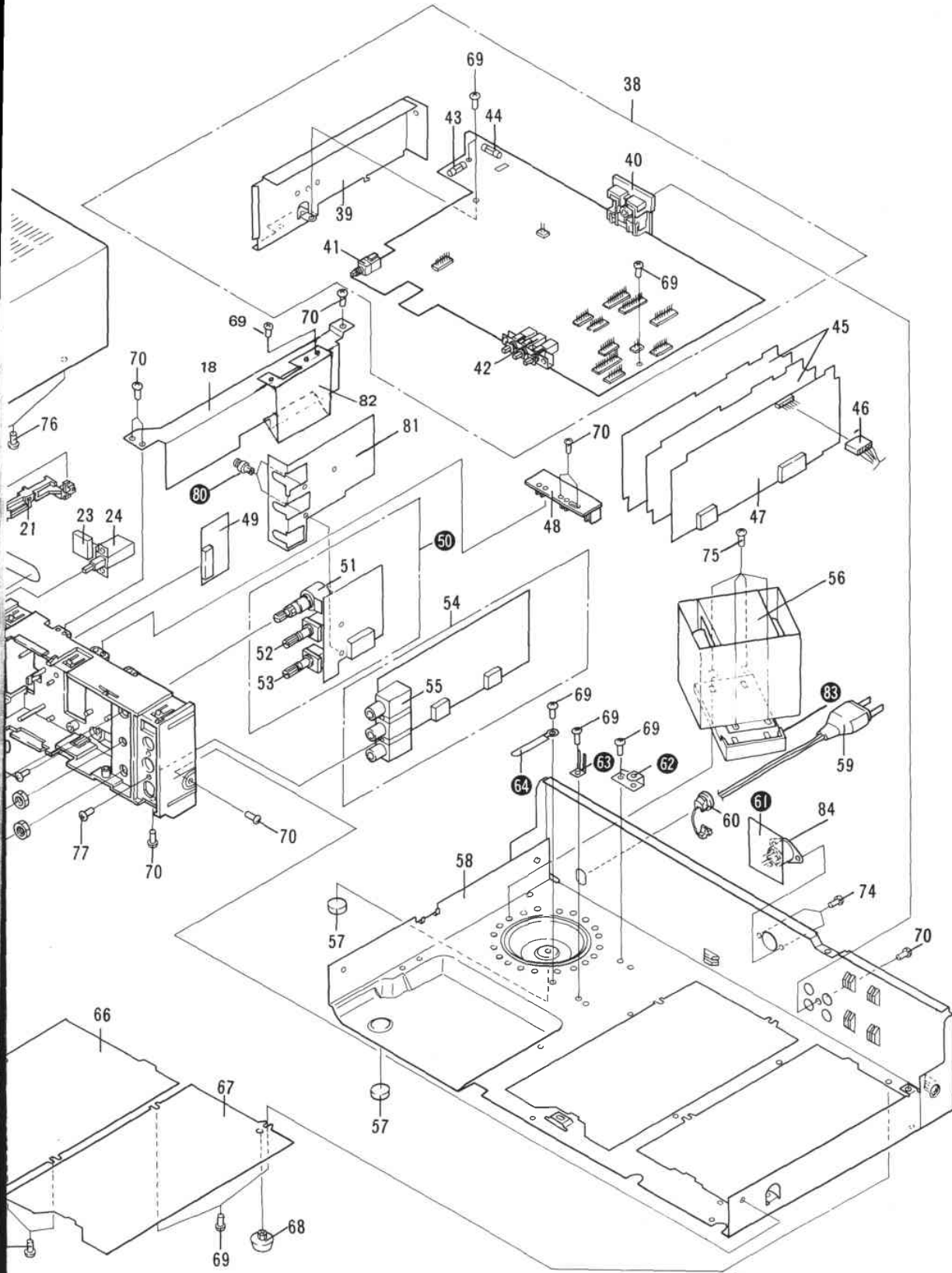
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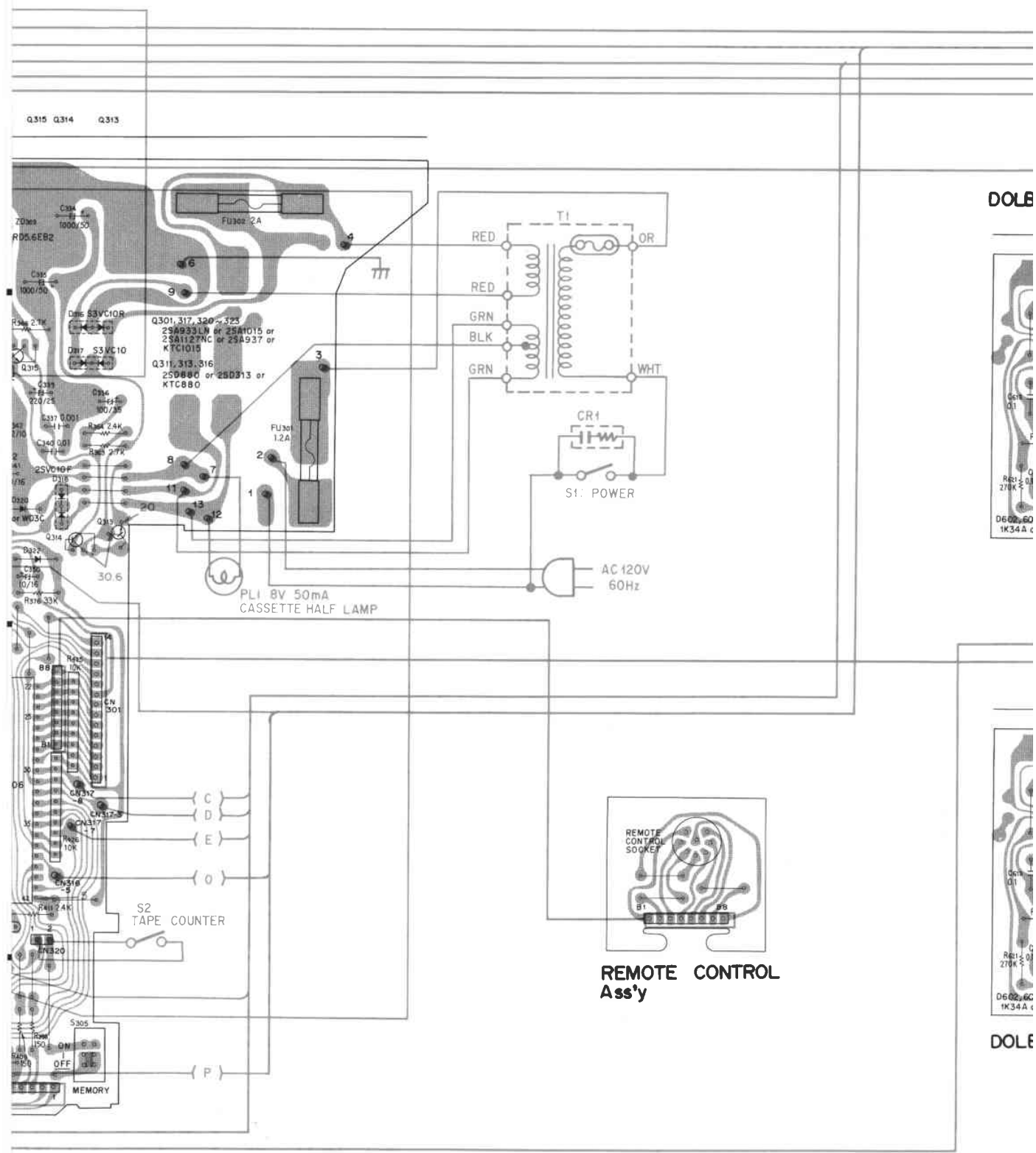
Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	81.	RBH-855	Spring		101.	YE30FUC	Washer
	82.	RNH-064	FG plate		102.	YS25FBT	Washer
	83.	RXX-334	FG coil assembly		103.	ATZ26P080FMC	Screw
	84.	RNH-061	FG shield plate		104.	VCZ30P060FMC	Screw
	85.	RXB-553	Bearing housing assembly		105.	BMZ30P060FMC	Screw
	86.	RNL-257	Trigger lever R		106.	VCZ26P100FMC	Screw
	87.	RWX-491	Reel motor control assembly B		107.	YE25FUC	Washer
	88.		Heat sink A		108.	VCZ26P140FMC	Screw
	89.		P.C.B.		109.	ATZ30P080FMC	Screw
	90.	RWX-489	Capstan motor control assembly C		110.	YE20FUC	Washer
	91.		Cord clasper		111.	WA21D040D025	Washer
	92.	RXX-335	Capstan motor coil assembly		112.	PMA26P050FMC	Screw
	93.	RNL-247	Thrust receptacle		113.	BMZ26P050FMC	Screw
	94.	RBH-862	Pinch return spring R		114.	BMZ26P080FMC	Screw
	95.	RNL-268	Sub pinch arm R		115.	BBZ26P080FNi	Screw
	96.	RBH-852	Pinch pressure spring R		116.	VCZ30P100FMC	Screw
	97.	RNL-264	Eject lever		117.	RNH-117	Shield plate B
	98.		Side frame R2 assembly				
	99.		Heat sink B				
	100.	WA017D035D025	Washer				

NOTES:

- Parts without part number cannot be supplied.
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- For your Parts Stock Control, the fast moving items are indicated with the marks ****** and *****.
****** *GENERALLY MOVES FASTER THAN **.
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	RNL-266	Lock arm		41.	REF-022	Steel ball (3 ϕ)
	2.	RBH-849	Lever spring		42.	RNG-306	Housing
	3.	RNL-265	Eject prevent lever	**	43.	RXX-333	Head assembly
	4.	RBH-850	Spring		44.		Head base assembly
	5.	RNL-261	Cylinder		45.	RNL-317	Slide plate
	6.	REB-447	O ring		46.	RNH-076	Head base spring
	7.	RNL-269	Piston		47.		Main shaft
	8.		Connector P.C.B.		48.	RBH-859	Arm spring
	9.		Cord damper		49.		Arm assembly
	10.		Side frame L2 assembly		50.	RBH-868	Switch lever spring A
	11.	RBH-851	Pinch pressure spring L		51.	RNC-267	Switch lever
**	12.	RXB-550	Pinch roller arm assembly		52.	RNL-272	REC detector arm
	13.	RNL-267	Sub pinch arm L		53.	RNL-271	Detector arm
	14.	RBH-861	Pinch return spring L		54.	RBH-869	Switch lever spring B
	15.		Cam follow lever		55.	RNL-273	METAL detector arm
	16.	RNL-253	Hook L	*	56.	REB-450	Brake shoe
	17.	RNL-254	Hook R		57.	RNL-258	Brake plate L
	18.	RNL-255	Connection plate		58.	RBH-848	Brake spring
	19.	RNL-306	Pinch plate		59.	RNL-259	Brake plate R
	20.	RNL-305	Actuator		60.	RBK-164	Half set spring
	21.	RNH-077	Change plate		61.	RBH-847	Spring R
	22.		Reel motor drive assembly A	Δ *	62.	RXP-111	Plunger solenoid
	23.	RXX-336	Reel motor coil assembly		63.	RNL-256	Trigger lever L
	24.		Reel motor P.C.B.		64.	RBF-058	Washer
**	25.	RXB-548	Rotor assembly		65.	RNL-308	Assist gear R
	26.	RNL-313	Pocket L		66.	RNL-307	Assist gear L
	27.	RBK-167	Pressure spring		67.		Pulley shaft
	28.	RNL-314	Pocket R		68.	RXB-620	Idler pulley assembly
	29.		Holder B		69.	RBH-846	Spring L
	30.	RBA-073	Special nut		70.		Chassis assembly
*	31.	RPB-095	Erase head		71.	REF-023	Steel ball (4 ϕ)
	32.	RBH-863	Height adjust spring L		72.	REB-260	Stopper
	33.	RPB-094	Erase head		73.	RLB-434	Guide roller
	34.	RBH-864	Height adjust spring R		74.	RBF-030	Oil stop washer
	35.		Erase head base assembly		75.	RBH-857	Ratch spring L
	36.	RNL-262	Stopper		76.	RBH-858	Ratch spring R
	37.	RBA-074	Azimuth screw		77.	RXB-552	Sub capstan assembly
	38.	RBH-853	Azimuth spring		78.	RXB-551	Capstan assembly
	39.	RBH-906	Gear spring	**	79.	REB-467	Capstan belt
	40.	RNL-312	Sector gear		80.	RBF-059	Washer



DOLE



DOLE

P.C. BOARDS CONNECTION DIAGRAM

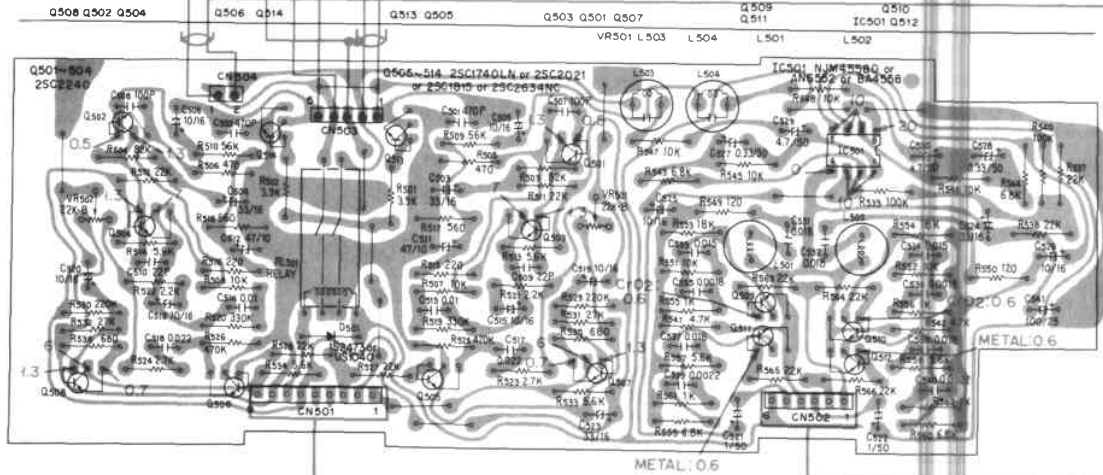
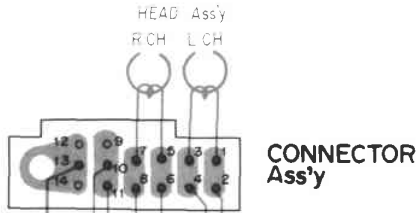
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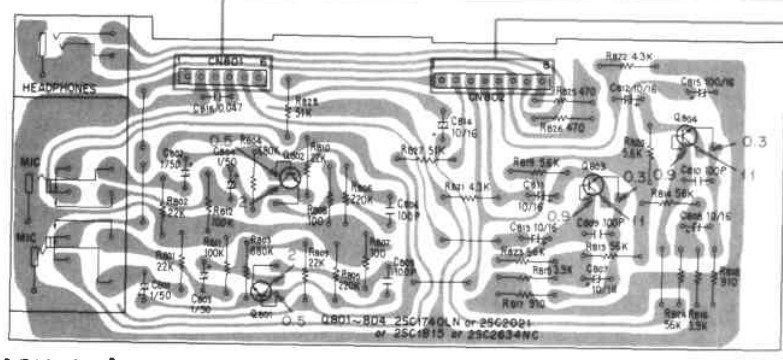
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A

**AMP Ass'y
RWF-095**

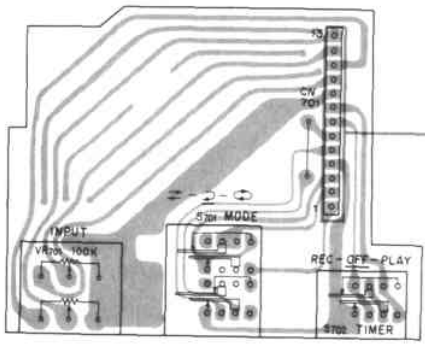


B



JACK Ass'y RWX-498

C



SWITCH Ass'y

D

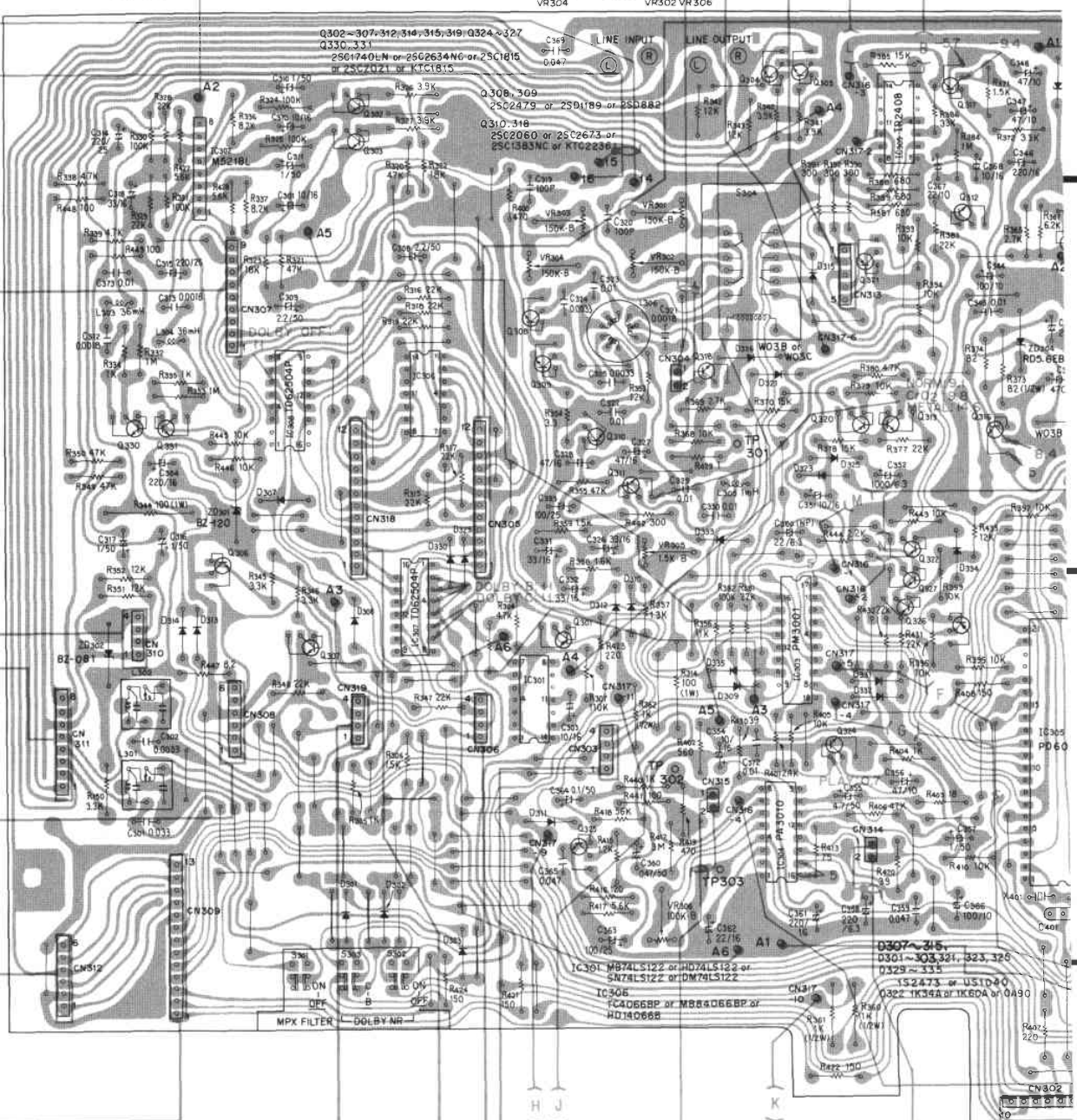
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MOTHER Ass'y RWX-497

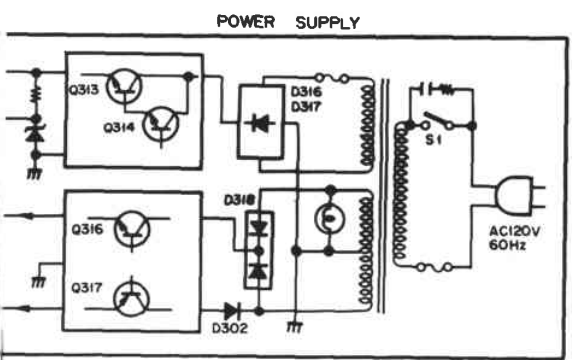
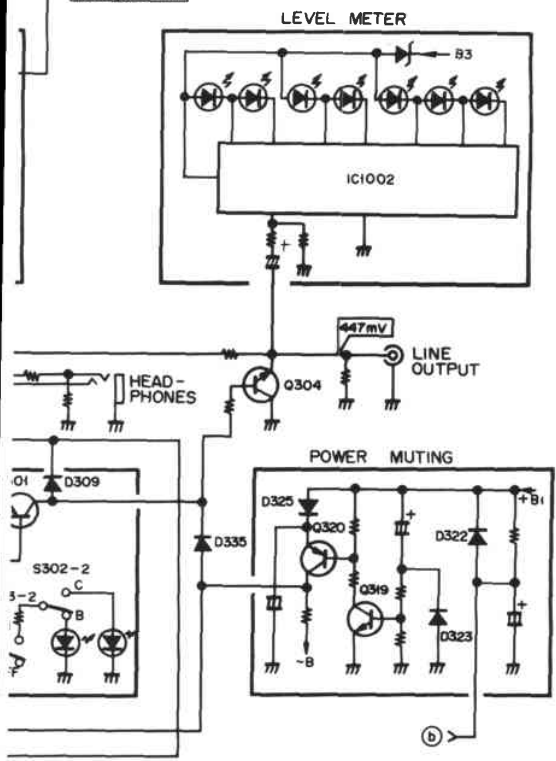
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Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	RNA-563	Bonnet		51.	RCV-096	Variable resistor (INPUT)
	2.	RXB-595	Door panel assembly	★★	52.	RSB-029	Rotary switch (A)
	3.		Door panel	★★	53.	RSB-030	Rotary switch (B)
	4.		Door lens		54.	RWX-498	Jack assembly
	5.	RBH-892	Door spring		55.	RKN-07F	Jack assembly
	6.	RNL-338	Switch escutcheon	⚠	★	RTT-239	Power transformer (120V)
	7.	RAC-195	Knob (POWER)		57.	REC-355	Slide stopper
	8.	RNL-357	Indicator panel		58.		Main chassis
	9.	RAC-209	Knob C (FF, REW)	⚠	59.	RDG-022 (RDG-030)	Power cord
	10.	RAC-211	Knob S (DIRECTION)				
	11.	RAC-210	Knob D (PLAY, STOP)	⚠	60.	REC-376	Strain relief
	12.	RBH-902	Spring		61.		Remote control assembly
	13.	RAA-362	Knob (INPUT L)		62.		Stud A
	14.	RAA-361	Knob (INPUT R)		63.		Earth terminal (2P)
	15.		Mechanism assembly		64.		UL cord clamp
	16.	RXX-338	Cassette plate assembly		65.	
★★	17.	REL-091	Lamp		66.		Bottom plate A
	18.		P.C.B. Bracket		67.		Bottom plate B
	19.	RNT-017	Panel stay		68.	REC-369	Foot assembly
	20.	RBH-901	Eject spring		69.	VBZ30P060FMC	Screw
	21.	RAC-208	Knob (EJECT)		70.	VBZ30P080FMC	Screw
★★	22.	REB-456	Counter belt		71.	BBZ26P080FNi	Screw
⚠	23.	RWX-109 (RWX-234)	Spark killer		72.	PMZ30P060FMC	Screw
⚠	★★	24.	Power switch		73.	FBT40P060FMC	Screw
	25.	RAC-196	Knob G (MEMORY)		74.	PMZ30P060FZK	Screw
★★	26.	RAW-167	Counter		75.	VBZ40P120FMC	Screw
	27.			76.	VBT30P060FMC	Screw
★	28.	RAW-162	Display assembly A		77.	VPZ30P100FMC	Screw
★	29.	RAW-161	Level meter assembly		78.	RKP-353	Connector socket assembly (4P)
	30.	RAA-359	Knob (MODE, TIMER)		79.	RKP-352	Connector socket assembly (5P)
	31.	RWS-138	Function switch assembly		80.		Rivet
★★	32.	RSG-063	Function switch		81.	REC-378	VR shield paper
★★	33.	RSG-088	Push switch		82.	REC-380	Shield paper
	34.	RAC-194	Knob E		83.	RNL-390	Transformer plate
	35.	RAC-193	Knob D (REC)		84.	RKP-222	Remote control socket
	36.	RAC-192	Knob E				
	37.	RNL-378	Sub panel R				
	38.	RWX-497	Mother assembly				
	39.		Heat sink				
	40.	RKB-018	Terminal (LINE)				
★★	41.	RSG-125	Push switch (A)				
★★	42.	RSG-126	Push switch (B)				
⚠	★★	43.	Fuse (1.2A)				
⚠	★★	44.	Fuse (2A)				
	45.	RWX-499	DOLBY NR assembly				
	46.	RKP-273	Connector socket assembly C				
	47.	RWF-095	Amplifier assembly				
	48.	RNL-375	P.C.B. Holder				
	49.	RWX-500	Meter drive assembly				
	50.		Switch assembly				

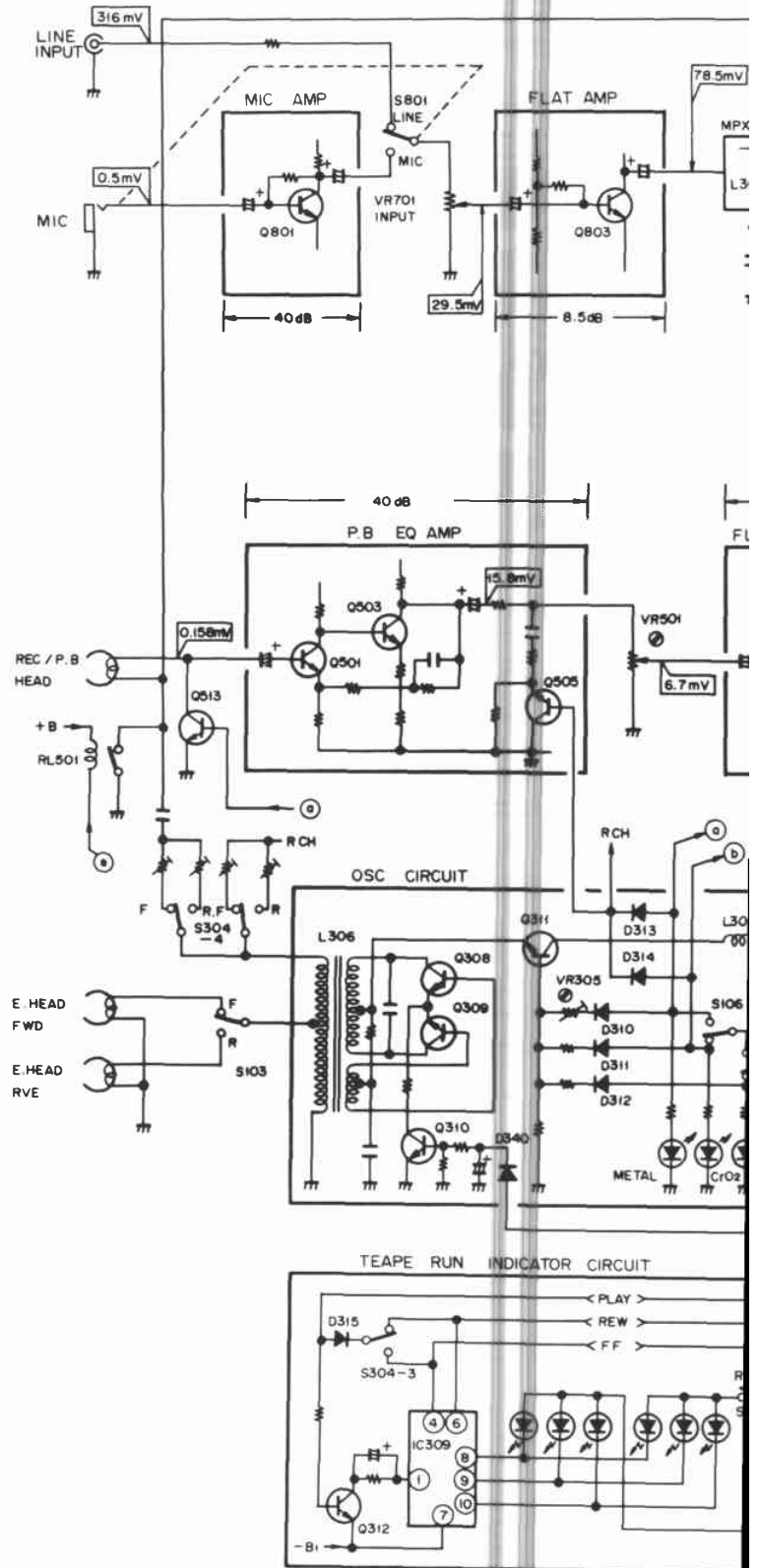
NORM	398 mV
CrO2	468 mV
METAL	575 mV

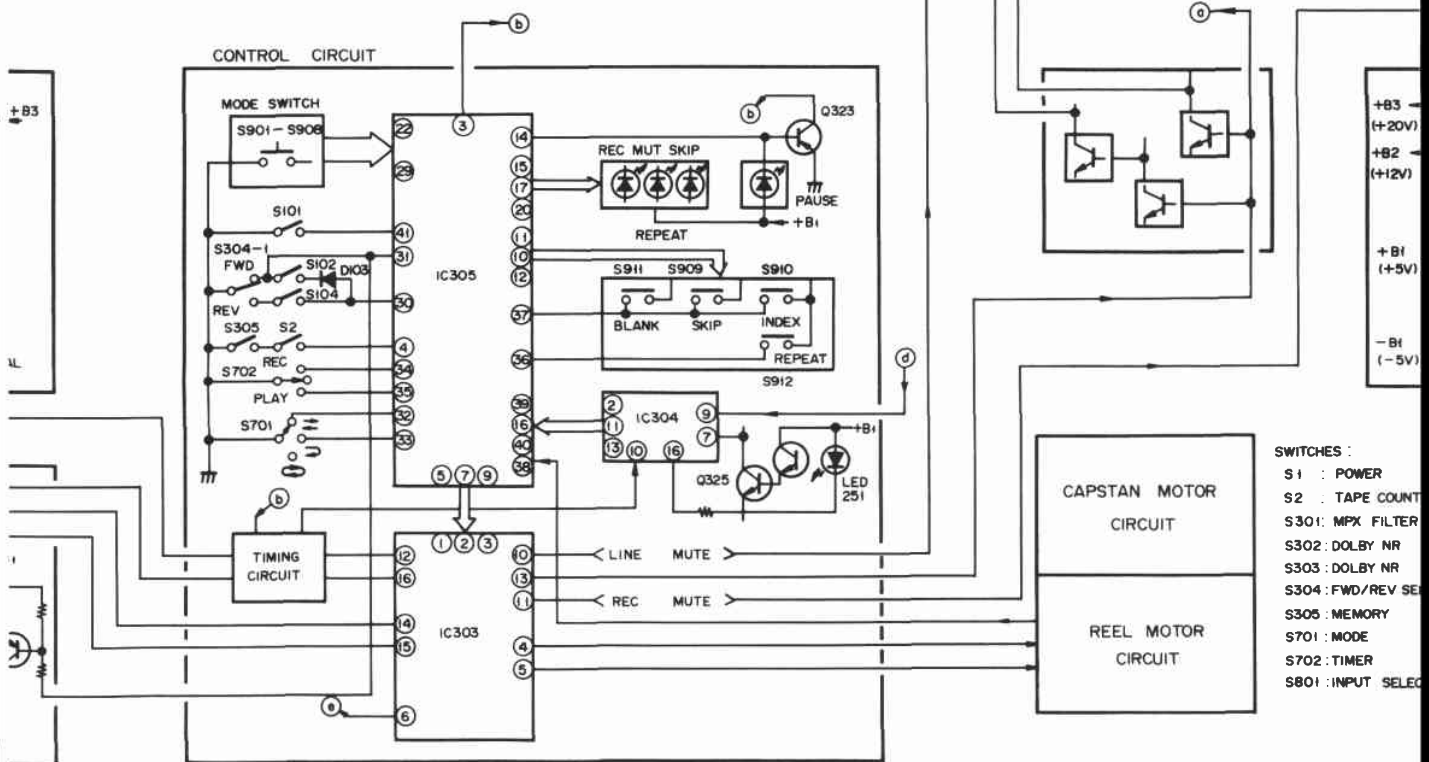
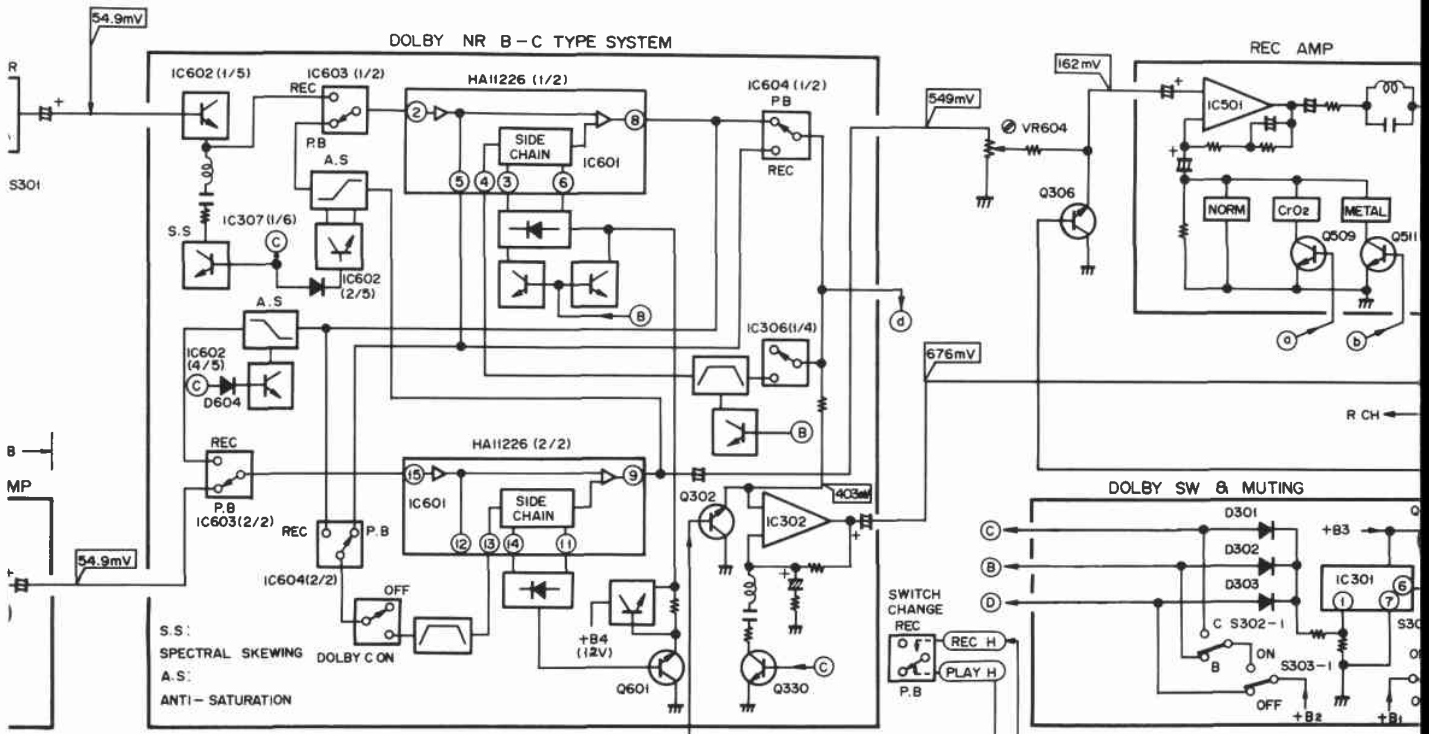


ER	ON - OFF	S901 : REC MUTE	ON - OFF
	ON - OFF	S902 : REC	ON - OFF
	ON - OFF	S903 : PLAY	ON - OFF
	<u>TYPE B</u> - TYPE C	S904 : PAUSE	ON - OFF
	ON - OFF	S905 : FF	ON - OFF
ECTOR	<u>FWD</u> - REV	S906 : REW	ON - OFF
	ON - OFF	S907 : STOP	ON - OFF
	<u>REC</u> - OFF - PLAY	S908 : DIRECTION	ON - OFF
OR	<u>LINE</u> - MIC	S909 : SKIP	ON - OFF
		S910 : INDEX SCAN	ON - OFF
		S911 : BLANK SEARCH	ON - OFF
		S912 : MUSIC REPEAT	ON - OFF

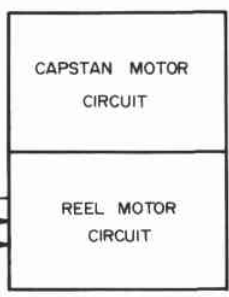
The underlined indicates the switch position.

6. BLOCK DIAGRAM

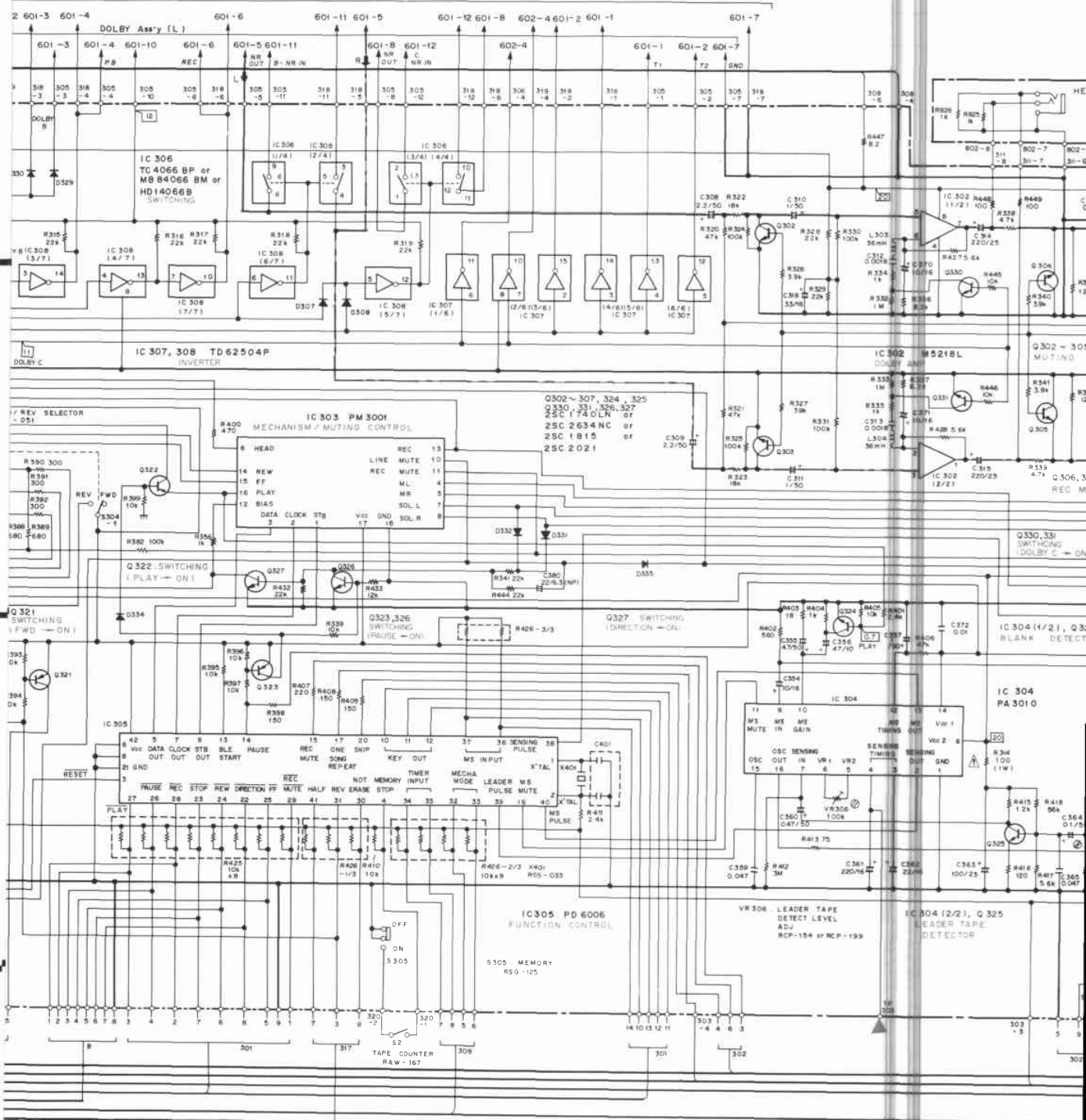




- SWITCHES :**
- S1 : POWER
 - S2 : TAPE COUNT
 - S301: MPX FILTER
 - S302: DOLBY NR
 - S303: DOLBY NR
 - S304: FWD/REV SEL
 - S305: MEMORY
 - S701: MODE
 - S702: TIMER
 - S801: INPUT SELEC



DOLBY Assy (R)



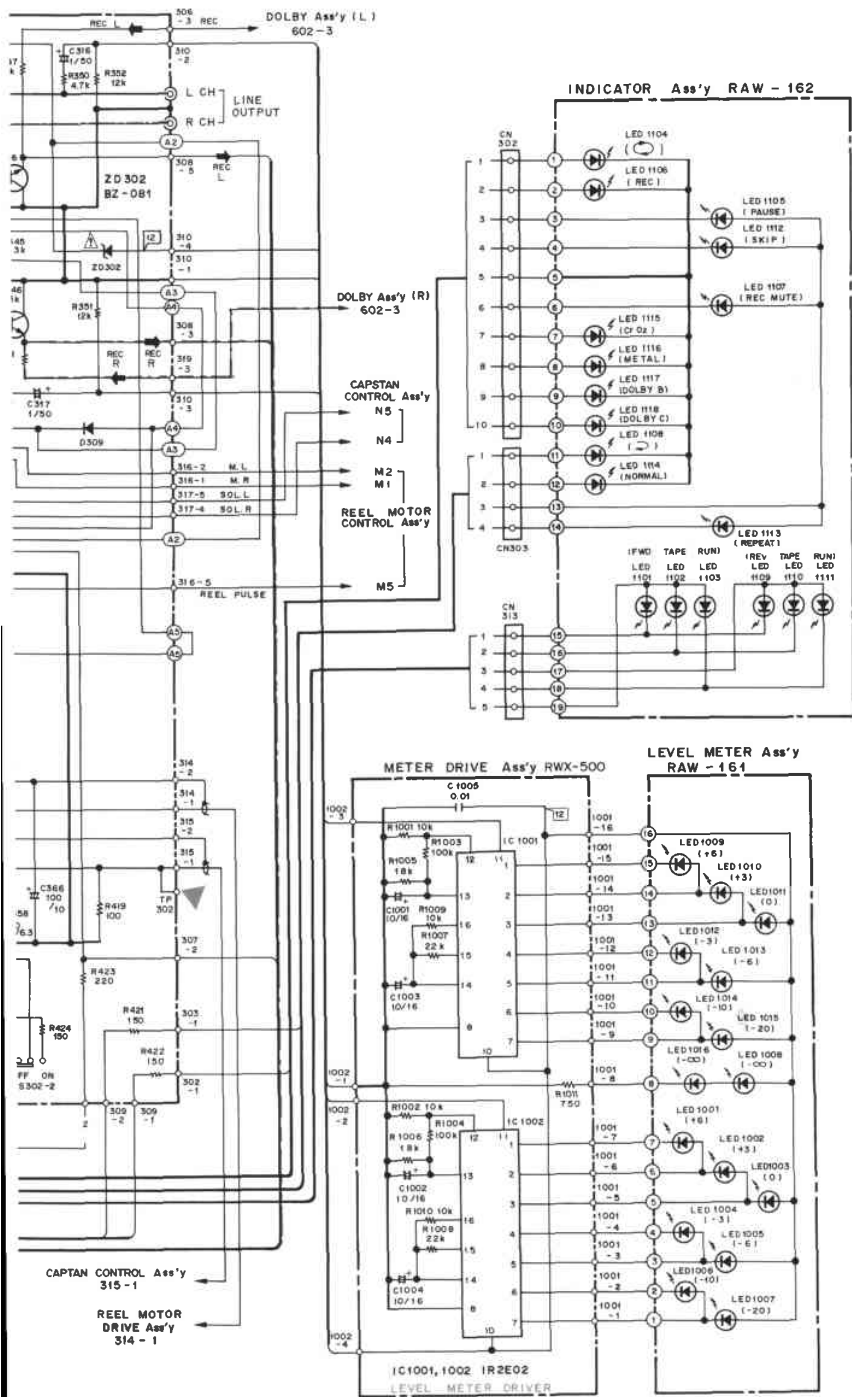
N3, 7, 8
CAPSTAN CONTROL Assy

1. RESISTORS:
Indicated in Ω , $\text{k}\Omega$, $\text{M}\Omega$, $\text{G}\Omega$, $\text{T}\Omega$, unless otherwise noted. $\pm 1\%$, $\pm 5\%$, $\pm 10\%$ tolerance.
 2. CAPACITORS:
Indicated in capacitance (pF), voltage (V) unless otherwise noted. $\pm 1\%$, $\pm 5\%$, $\pm 10\%$ tolerance. Indication without voltage is 50V except electrolytic capacitor.
 3. VOLTAGE:
 \square DC voltage (V) at no input signal.
 4. OTHERS:
 \circ Signal source
 \otimes Adjusting point
The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

NOTE:

The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

JACK Ass'y (2/2)



A

B

C

D

1

2

3

A
B
C
D
E

A

B

C

D

F

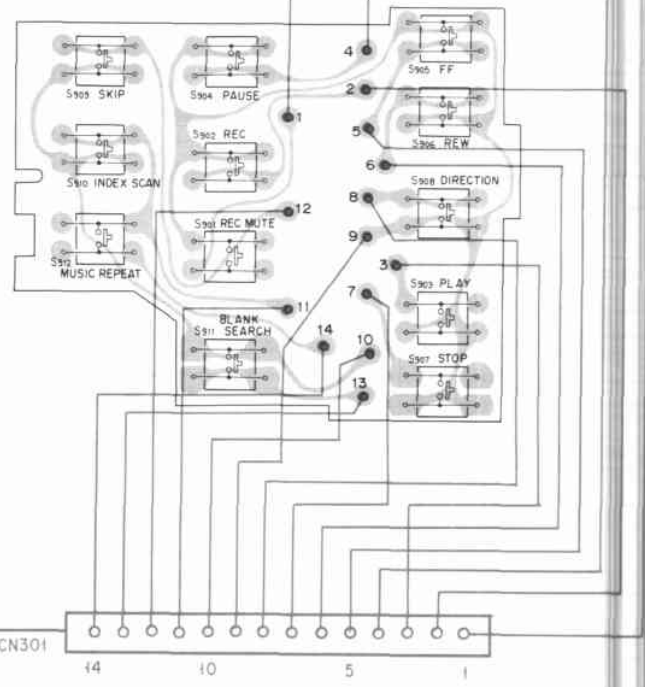
G
H
I
J

1

2

3

FUNCTION SWITCH Ass'y RWS-138



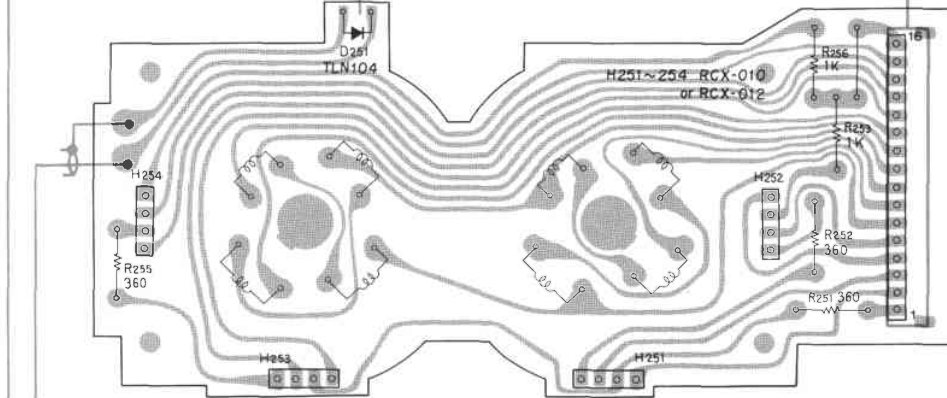
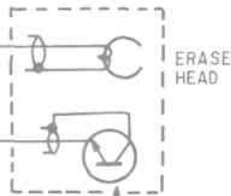
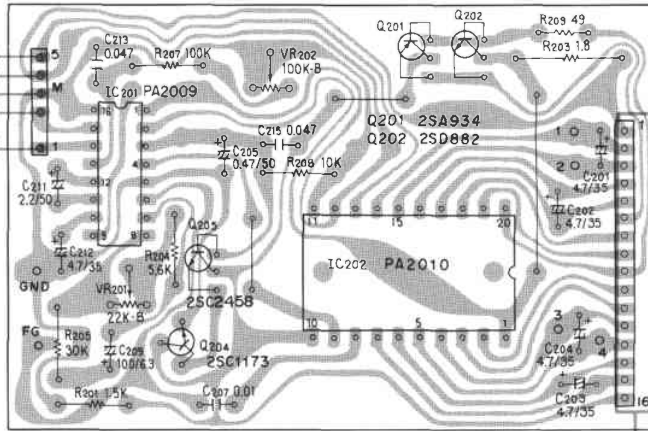
CN30

CN30

CN313

REEL MOTOR CONTROL Ass'y RWX-491

IC201 Q204 Q205 Q201 Q202
VR201 VR202



REEL MOTOR DRIVE Ass'y

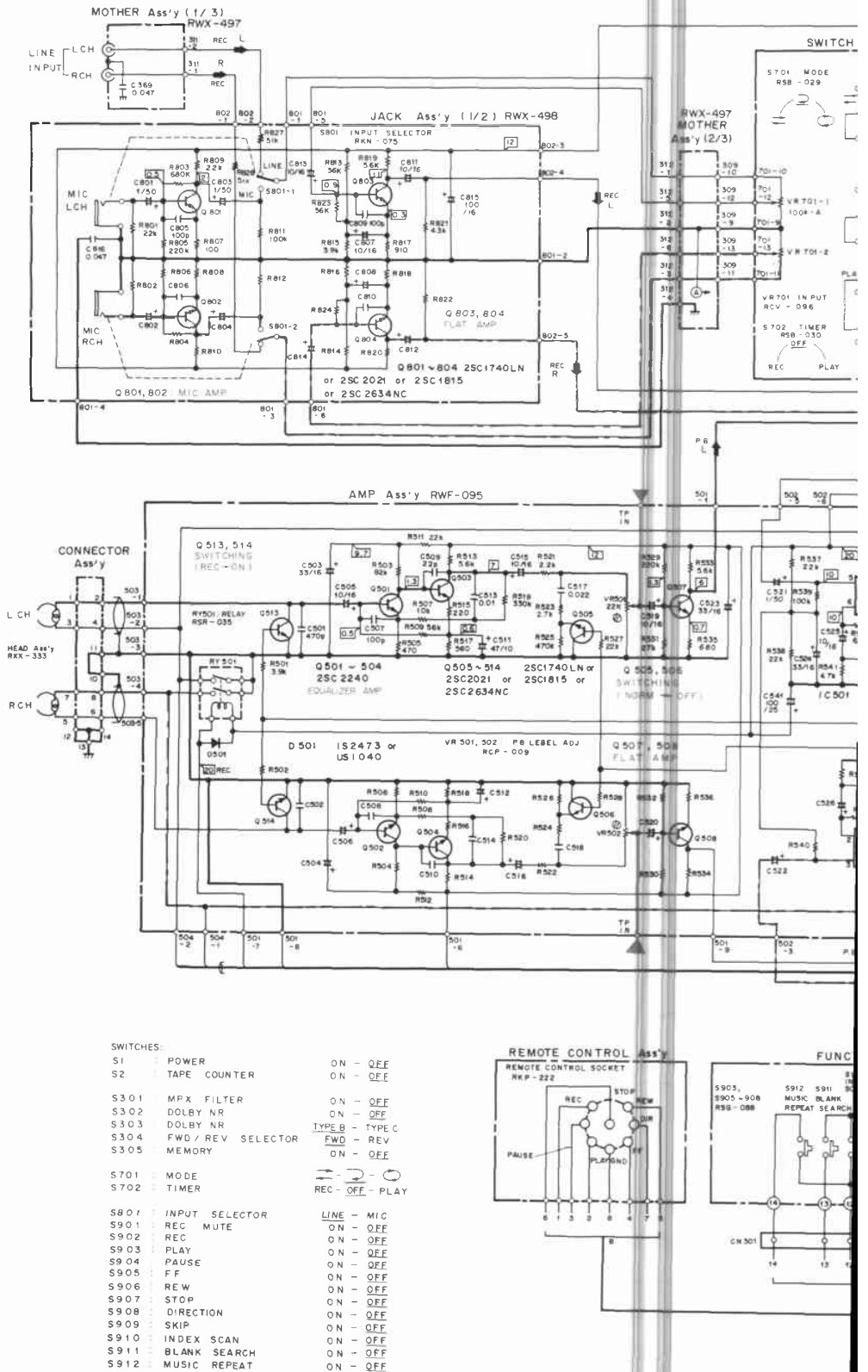
A

B

C

D

8. SCHEMATIC DIAGRAM



- SWITCHES:
- | | | |
|-------|--------------------|------------------|
| S1 | POWER | ON - QFF |
| S2 | TAPE COUNTER | ON - QFF |
| S3 01 | MPX FILTER | ON - QFF |
| S3 02 | DOLBY NR | ON - QFF |
| S3 03 | DOLBY NR | ON - QFF |
| S3 04 | FWD / REV SELECTOR | TYPE B - TYPE C |
| S3 05 | MEMORY | FWD - REV |
| S7 01 | MODE | ON - QFF |
| S7 02 | TIMER | REC - OFF - PLAY |
| S8 01 | INPUT SELECTOR | LINE - MIC |
| S9 01 | REC MUTE | ON - QFF |
| S9 02 | REC | ON - QFF |
| S9 03 | PLAY | ON - QFF |
| S9 04 | PAUSE | ON - QFF |
| S9 05 | FF | ON - QFF |
| S9 06 | REW | ON - QFF |
| S9 07 | STOP | ON - QFF |
| S9 08 | DIRECTION | ON - QFF |
| S9 09 | SKIP | ON - QFF |
| S9 10 | INDEX SCAN | ON - QFF |
| S9 11 | BLANK SEARCH | ON - QFF |
| S9 12 | MUSIC REPEAT | ON - QFF |
- The underlined indicates the switch position.

A

B

C

D

1

2

3

A
B
C
D
E

A

B

C

D

F

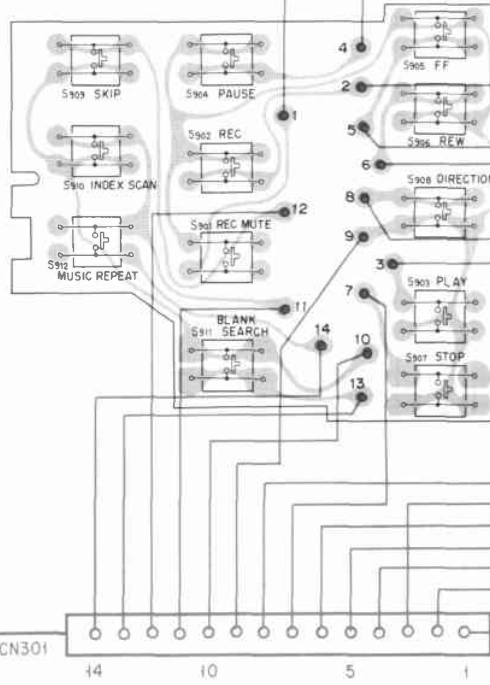
G
H
I
J

1

2

3

FUNCTION SWITCH Ass'y RWS-138



CN30

1
C
C
C
C
C

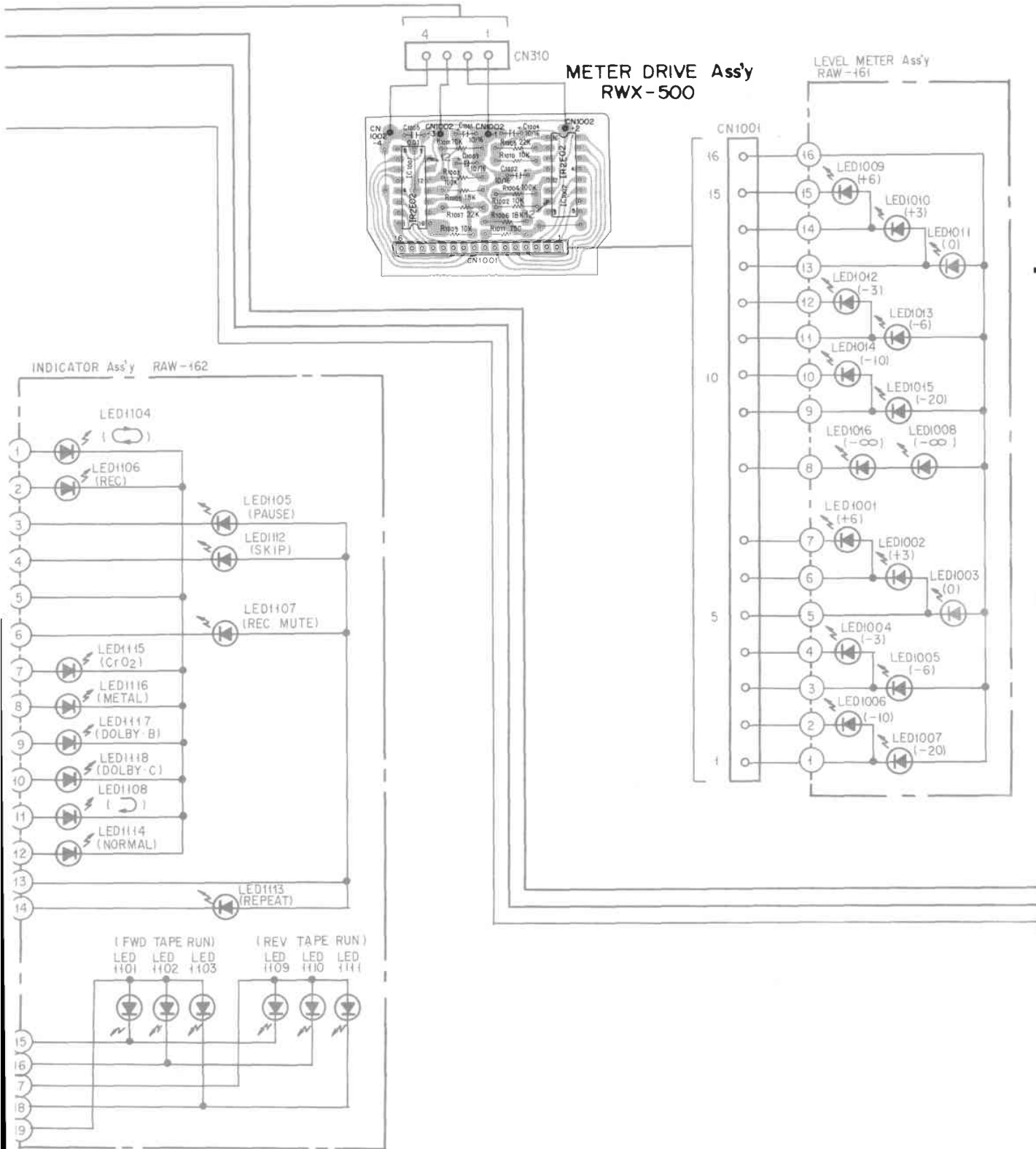
5
C
C
C
C
C

10
C
C
C
C
C

1
C
C
C
C
C

4
C
C
C
C
C

5
C
C
C
C
C



Jack Assembly (RWX-498)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 010M 50	C801-C804
	CEA 100M 16	C807, C808, C811-C814
	CEA 101M 16	C815
	CCDSL 101K 50	C805, C806, C809, C810
	CKDYF 473Z 50	C816

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/4PM□□□J	R801-R828

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1740LN (2SC2021) (2SC1815) (2SC2634NC)	Q801-Q804

OTHERS

Mark	Part No.	Symbol & Description
★★	RKN-075	S801 Jack assembly

Amplifier Assembly (RWF-095)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQSH 471K 50	C501, C502
	CEANL 100M 16	C505, C506
	CEA 100M 16	C515, C516, C519, C520, C525, C526
	CEA 4R7M50	C529, C530
	CEA 330M 16	C503, C504, C523, C524
	CEA 470M 10	C511, C512
	CEA R33M 50	C527, C528
	CCDSL 101K 50	C507, C508
	CCDSL 220K 50	C509, C510
	CQMA 103J 50	C513, C514
	CQMA 153J 50	C533, C534
	CQMA 183J 50	C531, C532, C537, C538
	CQMA 182K50	C535, C536
	CQMA 222K 50	C539, C540
	CQMA 223K 50	C517, C518
	CQSH 471K 50	C501, C502
	CEA 010M50	C521, C522
	CEA 101M25	C541

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	RCP-009	VR501, VR502 Semi-fixed 22k-B (P.B. LEVEL)
	RD1/4PM□□□J	R501-R566

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558D (AN6552) (BA4558)	IC501
★★	2SC2240	Q501-Q504
★★	2SC1740LN (2SC2021) (2SC1815) (2SC2634NC)	Q505-Q514
★	1S2473 (US1040)	D501

OTHERS

Mark	Part No.	Symbol & Description
★★	RSR-035 RTF-085 RTF-084	RY501 Relay L501, L502 Peaking coil (3.9mH) L503, L504 Trap coil

DOLBY NR Assembly (RWX-499)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 16	C601, C614, C619, C627, C631
	CEA 471M 10	C630
	CEA 101M 16	C604
	CEA 010M 50	C610, C625
	CEA R47M 50	C621, C606
	CEA R10M 50	C612, C615, C616
	CEA R33M 50	C617, C618
	CEA R15M 50	C629
	CQMA 394K 50	C626
	CQMA 104K 50	C613
	CQMA 473K 50	C628
	CQMA 183K 50	C620
	CQMA 153K 50	C608, C611, C622, C623
	CQMA 472K 50	C609, C624
	CQMA 182J 50	C602
	CKDYF 103Z 50	C603
	CCDSL 221K 50	C607
	CQMA 393K 50	C605
	CKDYB 222K 50	C640, C641

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	RCP-055	VR601, VR602 Semi-fixed 2.2k-B (P.B. GAIN, REC GAIN)
★	RCP-032	VR603, VR604 Semi-fixed 10k-B (DOLBY LEVEL, REC LEVEL)
	RD1/4PM□□□J	R601-R641

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	HA11226	IC601
★★	TC4066BP (MB84066BM) (HD14066B)	IC602, IC603
★★	TD62507P	IC604
★★	2SA933LN (2SA937) (2SA1127NC) (2SA1015)	Q601
★	1S2473 (US1040)	D601, D603, D604, D607
★	1K34A (1K60A) (0A90)	D602, D605, D606

OTHERS

Mark	Part No.	Symbol & Description
	RTF-092	L601 Coil (36mH)

Meter Drive Assembly (RWX-500)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 16	C1001-C1004
	CKDYF 103Z 50	C1005

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/4PM□□□J	R1001-R1011

SEMICONDUCTOR

Mark	Part No.	Symbol & Description
★★	IR2E02	IC1001, IC1002

OTHERS

Mark	Part No.	Symbol & Description
	RKP-355	CN1002 Connector socket assembly (4P)

Switch Assembly

Mark	Part No.	Symbol & Description
★★	RSB-029	S701 Rotary switch (A)
★★	RSB-030	S702 Rotary switch (B)
★	RCV-096	VR701 Variable resistor (100k-A)

Remote Control Assembly

Mark	Part No.	Symbol & Description
	RKP-222	Remote control socket

Function Switch Assembly (RWS-138)

Mark	Part No.	Symbol & Description
★★	RSG-063	S901, S902, S904, S909-S912 Function switch
★★	RSG-088	S903, S905-S908 Push switch
	RKP-350	CN901 Connector socket assembly (4P)

10. ELECTRICAL PARTS LIST

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 × 10 ¹	561	RD¼PS	561J
47kΩ	47 × 10 ³	473	RD¼PS	473J
0.5Ω	0R5		RN2H	0R5K
1Ω	010		RS1P	010K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562 × 100	5621	RN¼SR	5621F
--------	-----------	------	-------	-------

- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN **★**.
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts List

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	RWX-497	Mother assembly
	RWX-498	Jack assembly
	RWF-095	Amplifier assembly
	RWX-499	DOLBY NR assembly
	RWX-500	Meter Drive assembly
		Switch assembly
		Remote Control assembly
	RWS-138	Function Switch assembly
	RWX-489	Capstan Motor Control assembly C
	RWX-491	Reel Motor Control assembly B Reel Motor Drive assembly A

Mark	Part No.	Symbol & Description
★	RPB-095	Erase head
★	RAW-162	Indicator assembly (A)
	RKP-353	CN1102 Connector socket assembly (4P)
	RKP-352	CN1103 Connector socket assembly (5P)

Mother Assembly (RWX-497)

CAPACITORS

Mark	Part No.	Symbol & Description
	QOMA 332K 50	C301, C302, C324, C325
	CEA 102M 50	C334, C335
	CEA 471M 16	C341
	CEA 221M 25	C314, C315, C339
	CEA 221M 16	C304, C346, C361
	CEA 221M 6.3	C358
	CEA 101M 35	C336
	CEA 101M 25	C333, C363
	CEA 101M 10	C344, C366
	RCH-042	C327
	CEA 470M 10	C347, C348, C356
	CEA 330M 16	C318, C331, C332, C326
	CEA 220M 16	C362
	CEA 220M 10	C342, C367
	CEA 100M 16	C303, C350, C351, C354 C368, C370, C371
	CEA R47M 50	C360
	CEA 2R2M 50	C308, C309
	CEA 010M 50	C310, C311, C316, C317, C357
	CEA 4R7M 50	C355
	CEA R10M 50	C364

OTHERS

Mark	Part No.	Symbol & Description
Δ ★	RTT-239	T1 Power transformer (120V)
Δ ★★	RSA-046	S1 Power switch
Δ	RDG-022 (RDG-030)	Power cord
Δ	REC-376	Strain relief
Δ	RWX-109 (RWX-234)	CR1 Spark killer
★★	REL-091	Lamp
★	RAW-161	Level Meter assembly
★★	RAW-167	S2 Counter
Δ ★★	REK-059	Fuse (1.2A)
Δ ★★	REK-055	Fuse (2A)
Δ ★	RXP-111	Plunger solenoid
★★	RXX-333	Head assembly (REC/PB)
★	RPB-094	Erase head

Mark	Part No.	Symbol & Description
	CQMA 473K 50	C359
	CQMA 103K 50	C322
	CQMA 182J 50	C312, C313
	CQMA 103J 50	C323
	CKDYF 473Z 50	C365, C369
	CKDYF 103Z 50	C329, C330, C340, C345, C372, C373
	CKDYB 102K 50	C337
	CCDSL 101K 500	C319, C320 (100p/500)
	CQPA 182J 100	C321 (0.0018/100)
	CEA 102M 6.3	C352
	CEA 220M 6.3NP	C380
	CEA 470M 16	C328

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	RCP-155 (RCP-200)	VR301-VR304 Semi-fixed 150k-B (BIAS ADJ)
★	RCP-188	VR305 Semi-fixed 1.5k-B (OSC LEVEL ADJ/METAL)
★	RCP-154 (RCP-199)	VR306 Semi-fixed 100k-B (LEADER TAPE DETECT LEVEL)
	RD1/4PM□□□J	R303-R307, R315-R343, R345-R359, R363-R372, R374, R376-R393, R395, R397, R398, R400-R409, R411-R413, R415-R424, R427-R433, R440-R450
	RM8-103J-B RM9-103J-B	R425 8-resistors network (10k) R426 9-resistors network (10k)
△	RS1PF101J	R314, R344
△	RD1/2PSF102J	R360-R362
△	RD1/2PSF820J	R373

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	MB74LS122 (HD74LS122) (SN74LS122) (DM74LS122)	IC301
★★	PD6006	IC305
★★	PA3010	IC304
★★	PM3001	IC303
★★	IR2408	IC309
★★	M5218L	IC302
★★	TC4066BP (MB84066BM) (HD14066B)	IC306
★★	TD62504P	IC307, IC308
★★	2SA933LN (2SA937) (2SA1015) (2SA1127NC)	Q301, Q317, Q320-Q323

Mark	Part No.	Symbol & Description
★★	2SC1740LN (2SC2021) (2SC1815) (2SC2634NC)	Q302-Q307, Q312, Q314, Q315, Q319, Q324-Q327, Q330, Q331
★★	2SC2060 (2SC2673) (2SC1383NC)	Q310, Q318
△★★	2SD880 (2SD313)	Q311, Q313, Q316
★★	2SC2497 (2SD1189) (2SD882)	Q308, Q309
★	1S2473 (US1040)	D301-D303, D307-D315, D321, D323 D325, D329-D335
★	1K34A (1K60A) (0A90)	D322

△★	S3VC10	D317
△★	S3VC10R	D316
△★	S2VC10F	D318
△★	W03B (W03C)	D320, D326
△★	BZ-120	ZD301
△★	BZ-081	ZD302
△★	RD5.6EB2	ZD303, ZD304

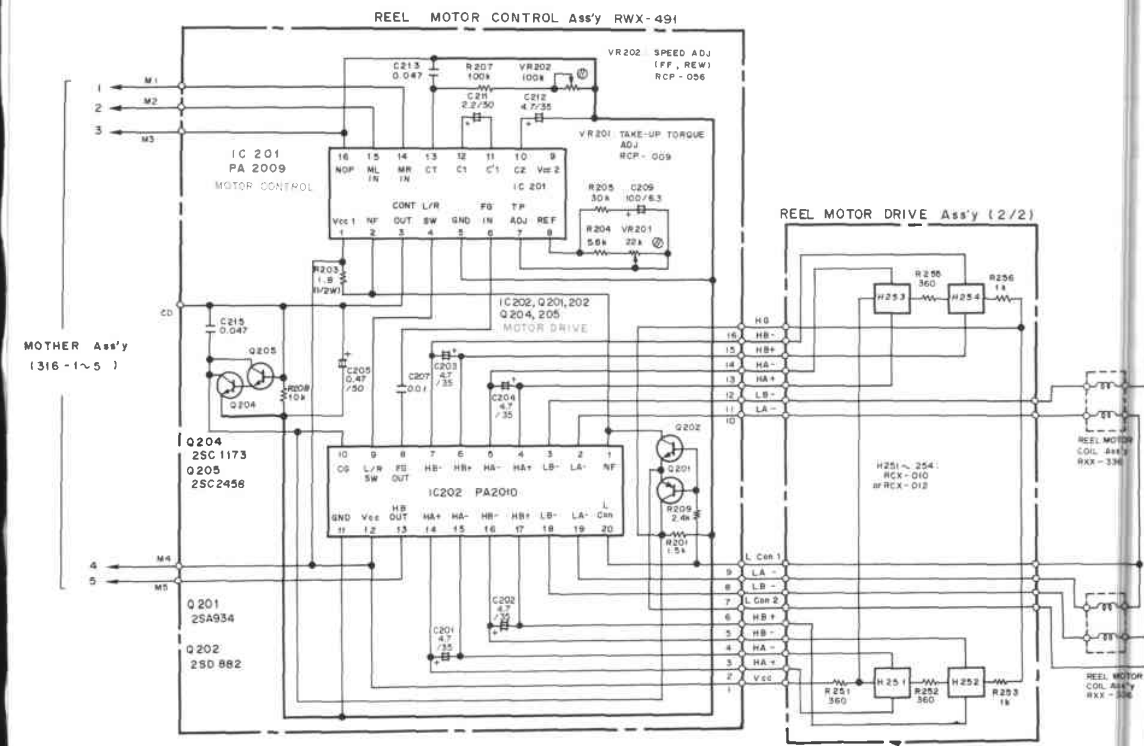
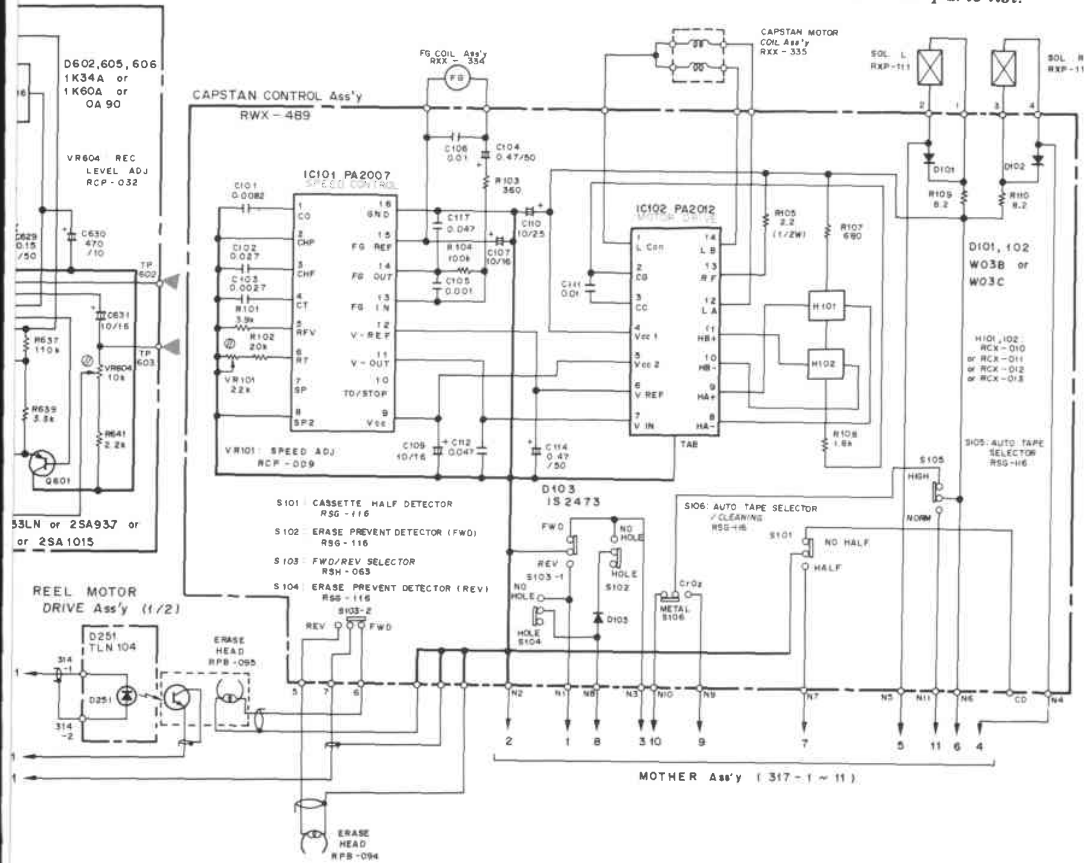
SWITCHES AND COILS

Mark	Part No.	Symbol & Description
★★	RSG-126	S301-S303 Push switch (B)
★★	RSX-051	S304 Slide switch
★★	RSG-125	S305 Push switch (A)
	RTF-089	L301, L302 MPX filter
	RTD-027	L306 OSC coil
	RTF-090	L303, L304 Coil (36mH)
	RTF-057	L305 Line coil

OTHERS

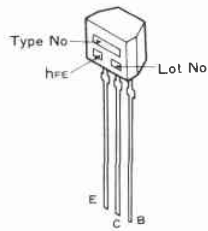
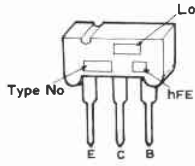
Mark	Part No.	Symbol & Description
△	RKH-005	Insulator wafer
△	REE-051	Insulator wafer
	RKB-018	Terminal (LINE)
★	RSS-033	X401 (C401) Ceramic resonator assembly
△★★	REK-059	FU301 Fuse 1.2A
△★★	REK-055	FU302 Fuse 2A
	RKP-347	Connector socket assembly 10P
	RKP-348	Connector socket assembly 5P
	RBA-039	Special screw

NOTE:
 The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

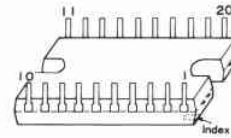


External Appearance of Transistors and ICs

4881 2SC2458

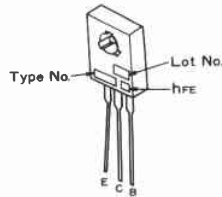
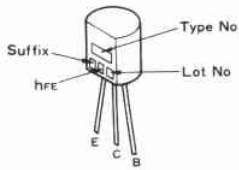


PA2010

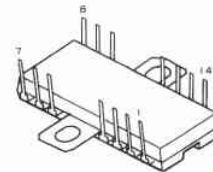


A

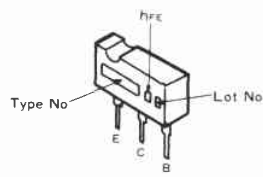
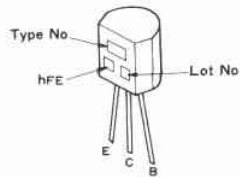
1933LN 2SC2497
1740LN



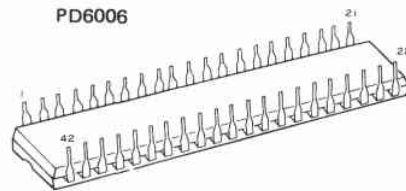
PA2012



1934 2SC2673
2060

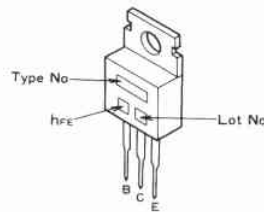
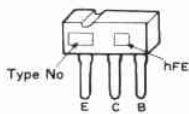


PD6006

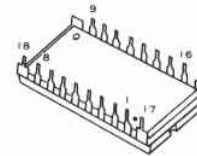


B

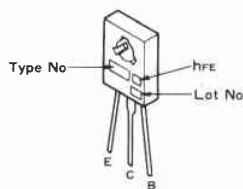
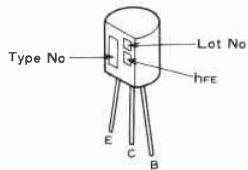
1937 2SD313 2SD880 2SC1173
2021



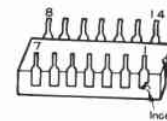
PM3001
HA11226



1015 2SD882
1815
2240

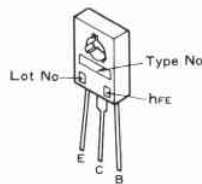
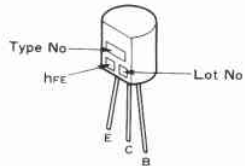


TC4066BP
MB84066BM
HD14066B
MB74LS122
HD74LS122
SN74LS122
DM74LS122
IR2408

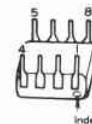


C

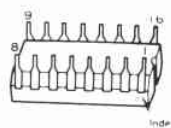
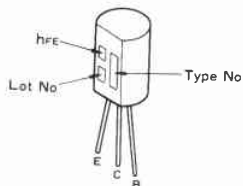
1127NC 2SD1189
1634NC



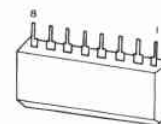
AN6552
BA4558
NJM4558D



383NC PA2007 PA2009 PA3010 TD62504P TD62507P IR2E02



M5218L



D

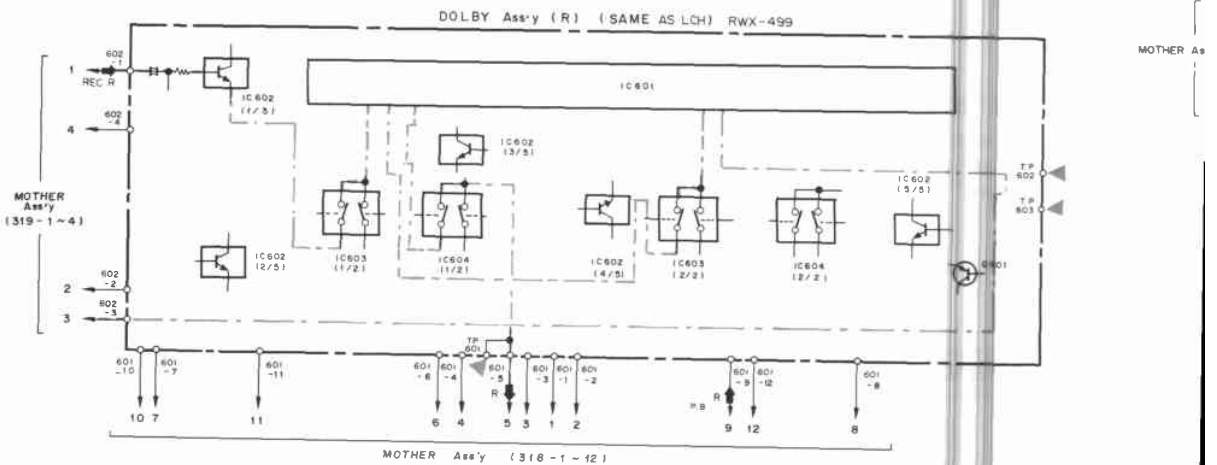
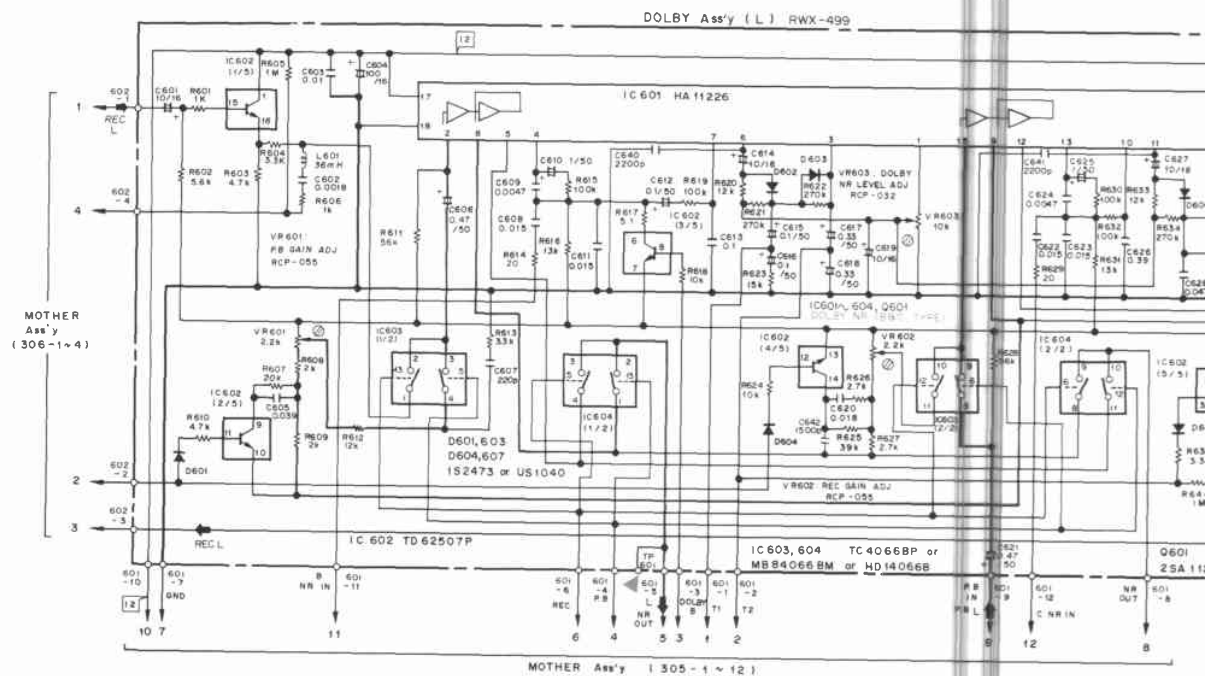
1 2 3

A

B

C

D



- 1 RESISTORS:
Indicated in () %W, -5% tolerance unless otherwise noted k (k), M (M), (F) -1%, (G) -2%, (K) -10% tolerance
- 2 CAPACITORS:
Indicated in capacity (uF)/voltage (V) unless otherwise noted n (nF) pF
Indication without voltage is 50V except electrolytic capacitor.
- 3 VOLTAGE
□ DC voltage (V) at no input signal
- 4 OTHERS:
⇒ Signal route
⊕ Adjusting point
⚠ The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

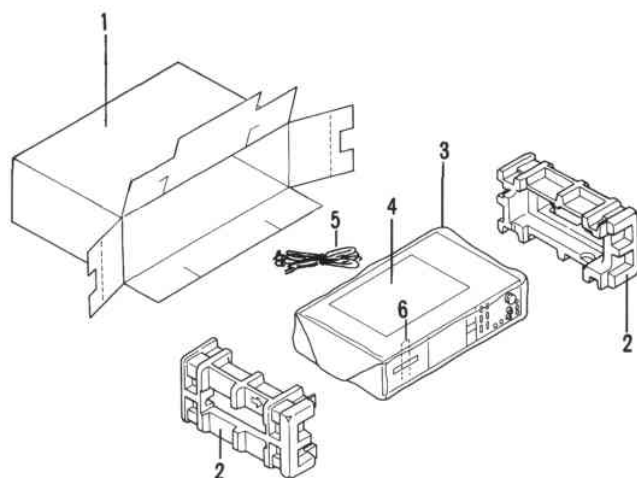
- SWITCHES
S101 CASSETTE HALF DETECTOR NO HALF - HALF
S102 ERASE PREVENT DETECTOR (FWD) HOLE - NO HOLE
S103 FWD/REV SELECTOR FWD - REV
S104 ERASE PREVENT DETECTOR (REV) HOLE - NO HOLE
S105 AUTO TAPE SELECTOR NORM - HIGH
S106 AUTO TAPE SELECTOR / CLEANING C/O2/ON - METAL/OFF
- The underlined indicates the switch position

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

NOTE:
Playback signal route
Recording signal route

1 2 3

9. PACKING



Parts List

Mark	No.	Part No.	Description
	1.	RHG-437	Packing case
	2.	RHA-239	Pad
	3.	RHX-031	Sheet C
	4.	RRB-152	Operating instructions
	5.	RDE-010	Connection cord
	6.	RCH-119	Styrene paper

12. ELECTRICAL ADJUSTMENTS

Precaution

1. Mechanical adjustment should be completed.
2. Clean the following parts with an alcohol moistened swab; Record/Playback head, Pinch roller, Erase head, Rubber belts and Capstan.
3. Demagnetize record/playback head with a head demagnetizer.
4. Do not use magnetized screwdriver for adjustments.
5. Adjustment and measurements should be performed for both L-ch and R-ch with rated power supply voltage.
6. Adjustments should be performed in the order given in this service manual. Altering the order can hinder proper adjustments, resulting in loss of performance.
7. Level during measurements are based on 0dBv=1V. Connect a 50kΩ dummy resistor across the OUTPUT terminals.
8. Let the CT-7R warm up (aging) for a few minutes before proceeding with the adjustment.
9. Set the DOLBY NR switch OFF unless directed otherwise.

Test Equipment/Tools Required;

1. Test tape
 STD-331A for general playback purpose
 STD-341A for playback adjustment
 STD-608A NORMAL blank tape
 STD-603 CrO₂ blank tape
 STD-604 METAL blank tape
2. Audio oscillator
3. AC millivoltmeter (AC mV)
4. Attenuator
5. Oscilloscope
6. Resistor 50kΩ (1/4W)

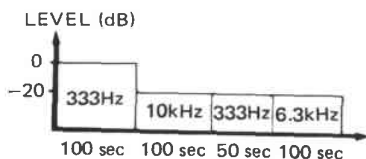


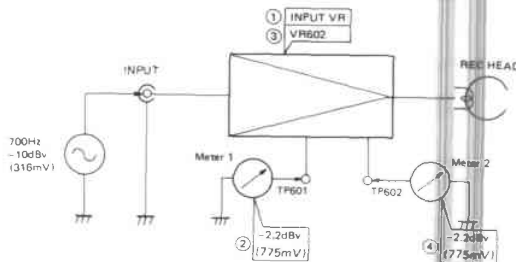
Fig. 12-1 Contents of the test tape STD-341A

12.1 DOLBY NR ADJUSTMENT

Step 1.

Setting:

- Mode Record/Pause
 Input Signal 700Hz, -10dBv (316mV)
 (from INPUT) (316mV)
 AC mV meter 1 TP601 of the DOLBY NR assembly (L & Rch)
 AC mV meter 2 TP602 of the DOLBY NR assembly (L & Rch)



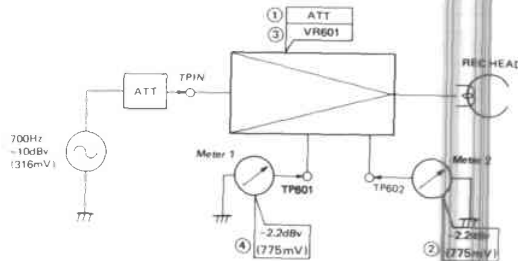
Procedure:

1. Adjust the INPUT level control so that the AC mV meter 1 reads -2.2dBv (775mV).
2. Adjust the VR602 so that AC mV meter 2 reads -2.2dBv (775mV).

Step 2.

Setting:

- Mode Playback
 Input Signal 700Hz, -10dBv (316mV) to TPIN of the AMP assembly
 AC mV meter 1 TP601 of the DOLBY NR assembly (L & Rch)
 AC mV meter 2 TP602 of the DOLBY NR assembly (L & Rch)



Procedure:

1. Adjust the ATT so that the AC mV meter 2 reads -2.2dBv (775mV).
2. Adjust the VR601 so that the AC mV meter 1 reads -2.2dBv (775mV).

Capstan Control Assembly C (RWX-489)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 822K 50	C101
	CEA R47M 50	C104, C114
	CEA 100M 16	C107, C109
	CEA 100M 25	C110
	CQMA 473K 50	C112
	CQMA 272K 50	C103
	CQMA 273K 50	C102
	CKDYF 473Z 50	C117
	CKDYF 103Z 50	C106, C111
	CKDYF 102Z 50	C105

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	RCP-009	VR101 Semi-fixed 22k-B (SPEED)
	RD1/4PM□□□J	R101-R104, R107-R110
	RD1/2PS 2R2J	R105

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA2007	IC101
★★	PA2012	IC102
★	WO3B (WO3C)	D101, D102
★	1S2473	D103
★	RCX-010 (RCX-011) (RCX-012) (RCX-013)	H101, H012 Hall device

SWITCHES

Mark	Part No.	Symbol & Description
★★	RSG-116	S101, S102, S104-S106 Push switch
★★	RSH-063	S103 Slide switch

Reel Motor Control Assembly B (RWX-491)

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYF 103Z 50	C207
	CEA R47M 50	C205
	CEA 4R7M 35	C201-C204, C212
	CEA 2R2M 50	C211
	CEA 101M 6R3	C209

Mark	Parts No.	Symbol & Description
	CQMA 473K 50	C213
	CKDYF 473Z 50	C215

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	RCP-009	VR201 Semi-fixed 22k-B (TORQUE ADJ/TAKE-UP)
★	RCP-056	VR202 Semi-fixed 100k-B (SPEED ADJ/FF, REW)
	RD1/4PM□□□J	R201, R204, R205, R207, R208, R209
	RD1/2PS 1R8J	R203

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA2009	IC201
★★	PA2010	IC202
★★	2SA934 (2SA881)	Q201
★★	2SD882 (2SC2497) (2SD1189)	Q202
★★	2SC2458	Q205
★★	2SC1173	Q204

OTHERS

Mark	Part No.	Symbol & Description
	REE-051	Insulator
	RKH-005	Insulator
	RBA-026	Screw

Reel Motor Drive Assembly A

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/4PM□□□J	R251-R253, R255, R256
★	TLN104	D251
★	RCX-010 (RCX-012)	H251-H254 Hall device

11.4 FF/REW ROTATING SPEED ADJUSTMENT

1. Connect the frequency counter between FG of reel motor control assembly and GND (Fig. 11-5).
2. Set the DIRECTION switch to FORWARD and then the mode to FF.
3. Adjust VR202 so that the frequency counter indicates $72 \text{ Hz} \pm 2\text{Hz}$.
4. Set the mode to REW and at this time check that a reading of frequency counter is within $72 \text{ Hz} \pm 5 \text{ Hz}$.

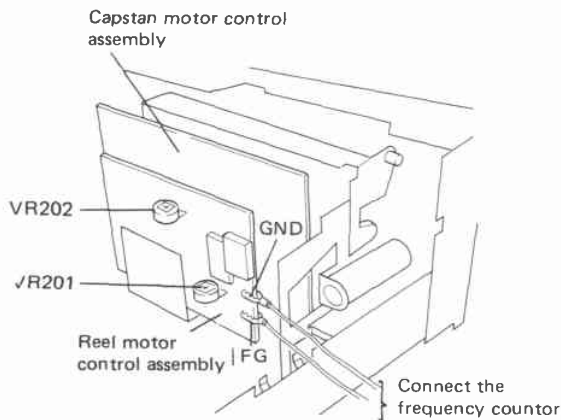


Fig. 11-5 FF/REW Rotating speed adjustment

11.5 TAKE-UP TORQUE ADJUSTMENT

1. Mount a cassette type torque meter.
2. Set the DIRECTION switch to FORWARD and then the mode to PLAY.
3. Adjust VR201 so that the take-up torque is $45 \pm 5 \text{ g-cm}$ (Fig. 11-5).
4. Set the DIRECTION switch to REVERSE.
5. Check that the take-up torque is within $45 \pm 10 \text{ g-cm}$ (Fig. 11-6).

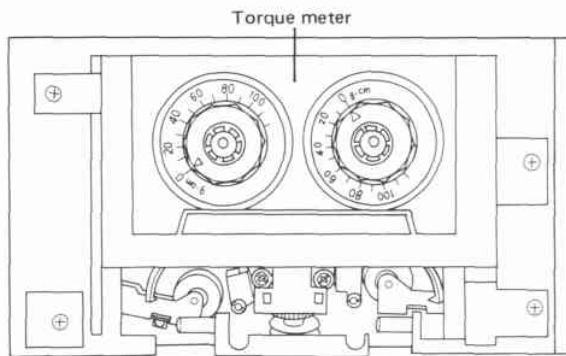


Fig. 11-6 Take-up torque adjustment

11.6 TAPE SPEED ADJUSTMENT

1. Connect the frequency counter to the OUTPUT terminal (L or R).
2. Load the STD-301 test tape and set it at the beginning of REW.
3. Set the DIRECTION switch to FORWARD and then the mode to PLAY.
4. Adjust VR101 so that a reading of frequency counter is $3005 \pm 10 \text{ Hz}$ at the beginning of tape rewinding.
5. Set the DIRECTION switch to REVERSE and a reading of frequency counter is within $3000 \pm 20\text{Hz}$ at the beginning of tape rewinding.

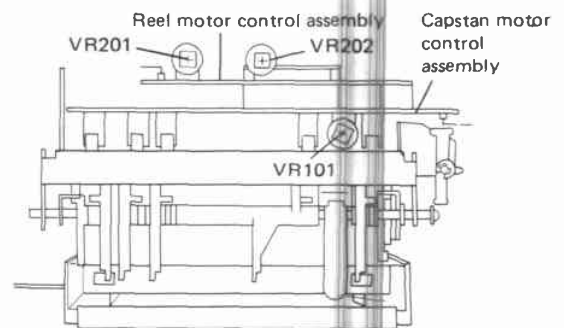


Fig. 11-7 Tape speed adjustment

11.7 FAST TORQUE CHECK

1. Mount a cassette type torque meter.
2. Set the DIRECTION switch to FORWARD and then the mode to FF.
3. Check that the FAST torque is within $100 \pm 30 \text{ g-cm}$ in the condition described in above 2.
4. Set the mode to REW and at this time check that the FAST torque is within $100 \pm 30 \text{ g-cm}$.

11.8 REEL BASE BACK TENSION TORQUE CHECK

1. Mount a cassette type torque meter.
2. Set the DIRECTION switch to FORWARD and then the mode to PLAY.
3. At this time, check that the back tension on a supply reel side (left reel base) is within $3.5 \pm 1.5 \text{ g-cm}$.
4. Set the DIRECTION switch to REVERSE.
5. At this time, check that the back tension on the supply reel side (right reel base) is within $3.5 \pm 1.5 \text{ g-cm}$.

11. MECHANICAL ADJUSTMENTS

11.1 PINCH ROLLER PRESSURE CHECK

1. Put the tape deck into the playback mode (FORWARD and REVERSE).
2. Gently push against the pinch roller arm with the tension gauge (Part No. GGK-047) and read the value when the pinch roller stops rotating. If the reading fails to lie within 250 ~ 400g, replace the pinch roller pressure spring.

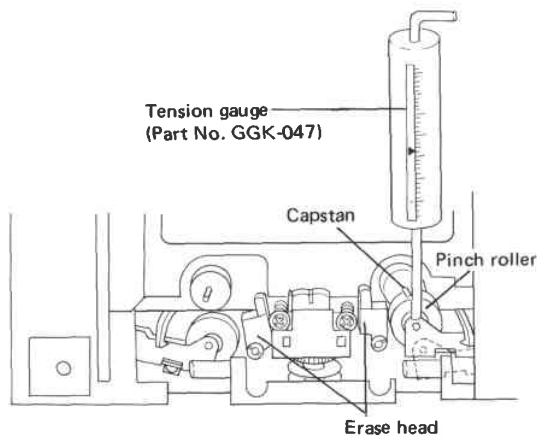


Fig. 11-1 Pinch roller pressure adjustment

11.2 AZIMUTH PREADJUSTMENT

1. Set the DIRECTION switch to FORWARD and then the mode to STOP.
2. Adjust the azimuth screw ① using a (-) screwdriver as shown in Fig. 11-2, 3 so that the distance (A) between housing and rotating base is 1.5 mm.
3. Set the DIRECTION switch to REVERSE.
4. Adjust the azimuth screw ② using a (-) screwdriver as shown in Fig. 11-2, 3 so that the distance (B) between housing and rotating base is 1.5 mm.

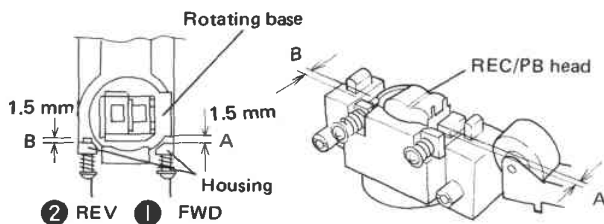


Fig. 11-2 Azimuth adjustment point

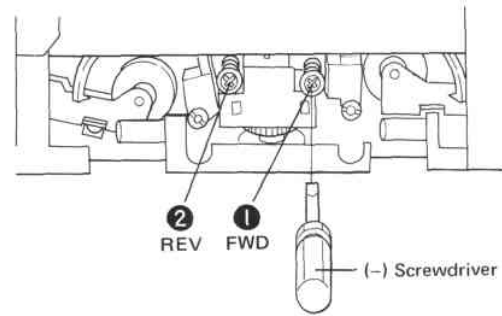


Fig. 11-3 Azimuth preadjustment

11.3 TAPE TRANSPORT ADJUSTMENT

1. Load a mirror-equipped cassette half.
2. Set the DIRECTION switch to FORWARD and then the mode to PLAY.
3. Adjust the adjust nut ① so that no curling takes place on REC/PB head guide and erase head guide as shown in Fig. 11-4.
4. Set the DIRECTION switch to REVERSE.
5. Adjust the adjust nut ② so that no curling occurs on REC/PB head guide and dummy head guide.
6. Play a tape in both FORWARD and REVERSE directions and check that no curling on tape is found.

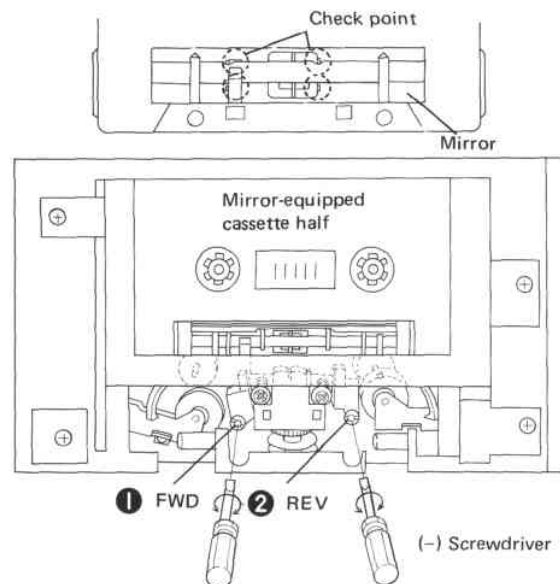


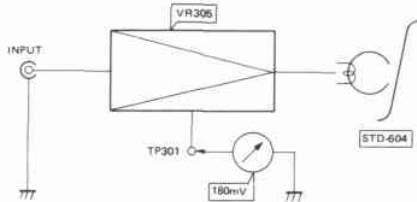
Fig. 11-4 Tape transport adjustment

12.6 ERASURE CURRENT ADJUSTMENT

The adjustment procedure is the same for both the FWD and REV directions, but if there is a difference between the two indications, adjust so that the lower of the two erasure current indications is $180\text{mV}^{+0}_{-40}\text{mV}$.

Setting:

Mode Record
 INPUT Level Control ... Min.
 AC mV meter TP301 of the Mother assembly
 Test tape STD-604



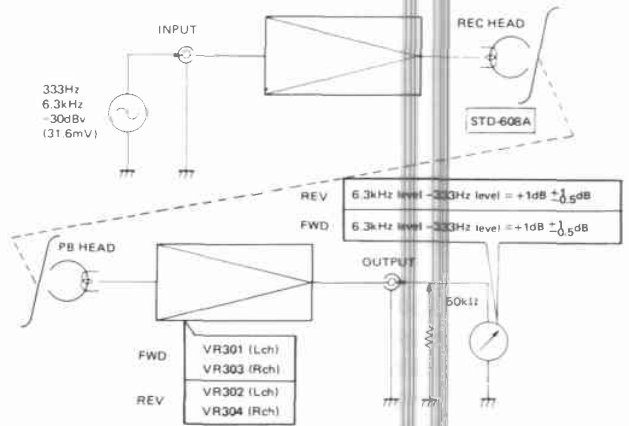
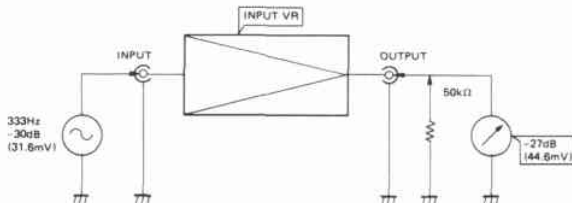
Procedure:

1. Set the CT-7R to the FWD position and adjust the VR305 so that the AC mV meter reads 180mV.
2. Likewise, set the CT-7R to the REV position and confirm that AC mV meter reads $180\text{mV}^{+0}_{-40}\text{mV}$.

12.7 RECORDING/PLAYBACK FREQUENCY RESPONSE ADJUSTMENT

Setting:

Mode Record
 Record/Playback
 Input Signal 333Hz, -30dBv (31.6mV)
 (from INPUT) 6.3kHz, -30dBv (31.6mV)
 Test tape STD-608A
 AC mV meter OUTPUT terminals



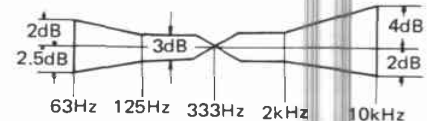
Procedure:

1. Adjust the INPUT level control so that the AC mV meter reads -27dBv (44.6mV).
2. Set the CT-7R to the FWD position and record and playback the input signals (333Hz and 6.3kHz) onto the STD-608A. Adjust the VR301 (Lch) and VR303 (Rch) so that the difference between two is $+1\text{dB}^{+1}_{-0.5}\text{dB}$.
3. Likewise, set the CT-7R to the REV position and record and playback the input signals (333Hz and 6.3kHz) onto the STD-608A. Then adjust the VR302 (Lch) and VR304 (Rch) so that the difference two outputs is $+1\text{dB}^{+1}_{-0.5}\text{dB}$.

* As listed in the specifications in Fig. 12-5 and check to see that performance meets specifications.

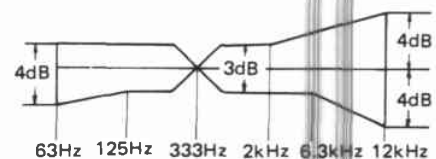
Frequency Response

Using STD-331A with DOLBY NR OFF
 However, the right channel is compensated by -1dB at 63Hz, and -0.5dB at 125Hz because of the insulation effect.

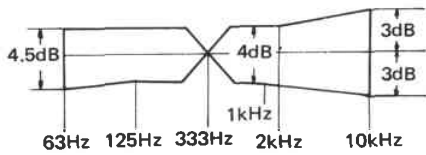


Overall Frequency Response

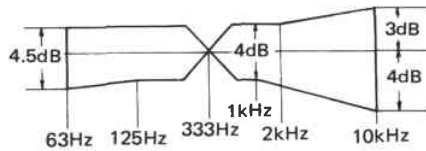
Using STD-608A with DOLBY NR OFF



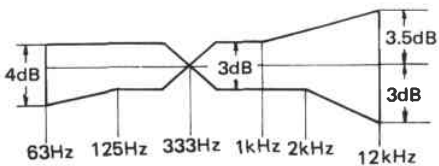
Using STD-608A with DOLBY NR ON (B type)



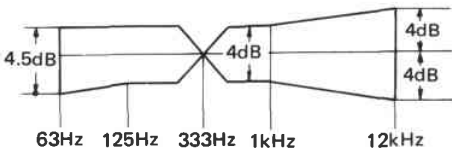
Using STD-608A with DOLBY NR ON (C type)



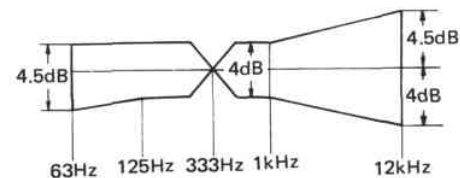
Using STD-603 with DOLBY NR OFF



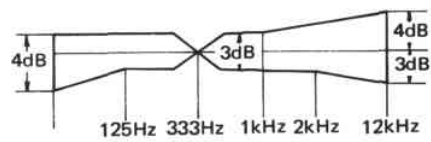
Using STD-603 with DOLBY NR ON (B type)



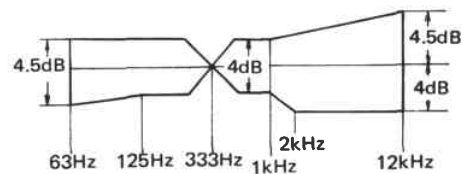
Using STD-603 with DOLBY NR ON (C type)



Using STD-604 with DOLBY NR OFF



Using STD-604 with DOLBY NR ON (B type)



Using STD-604 with DOLBY NR ON (C type)

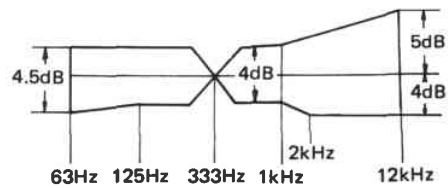
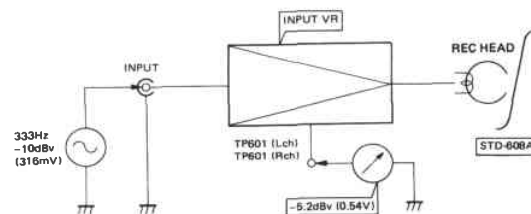


Fig. 12-5 Frequency response

12.8 RECORDING LEVEL ADJUSTMENT

Setting:

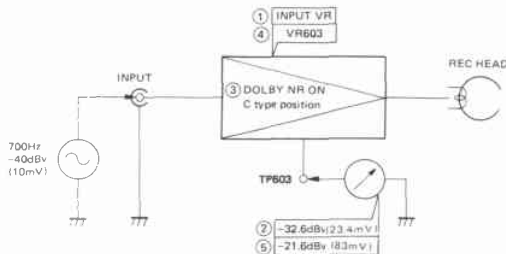
- Mode Record
- Record/Playback
- Input Signal 333Hz, -10dBv
- (from INPUT) (316mV)
- Test tape STD-608A (NORM)
- STD-603 (CrO₂)
- STD-604 (METAL)
- AC mV meter TP601 of the DOLBY
- NR assembly L
- TP601 of the DOLBY
- NR assembly R



Step 3.

Setting:

Mode Record/Pause
 Input Signal 700Hz, -40dBv
 (from INPUT) (10mV)
 AC mV meter TP603 of the DOLBY NR
 assembly



Procedure:

1. Adjust the INPUT level control so that the AC mV meter reads -32.6dBv (23.4mV).
2. Set the DOLBY NR switch ON, and C type position.
3. Adjust the VR603 so that the AC mV meter reads -21.6dBv (83mV).

12.2 HEAD AZIMUTH ADJUSTMENT

Setting:

Mode Playback
 (FWD and REV)
 Test tape STD-341A, 10kHz
 portion
 AC mV meter OUTPUT terminals
 VR501, VR502 Max.

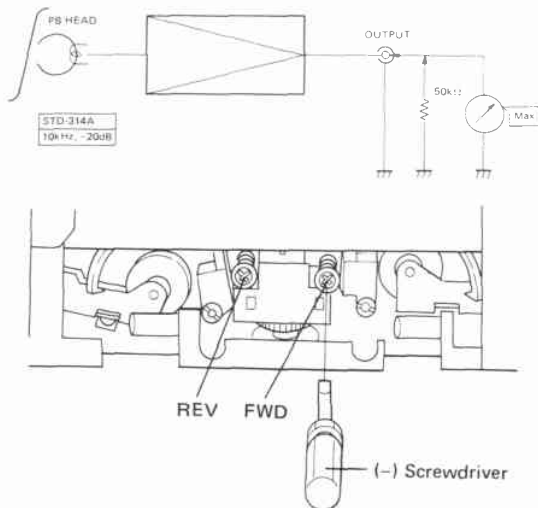


Fig. 12-2 Azimuth preadjustment

Procedure:

Play a tape in both forward and reverse directions. Adjust the head azimuth screw to the position of maximum output level.

12.3 TAPE TRANSPORT ADJUSTMENT

1. Load a mirror-equipped cassette half.
2. Set the DIRECTION switch to FORWARD and then the mode to PLAY.
3. Adjust the adjust nut ① so that no curling takes place on REC/PB head guide and erase head guide as shown in Fig. 12-3.
4. Set the DIRECTION switch to REVERSE.
5. Adjust the adjust nut ② so that no curling occurs on REC/PB head guide and erase head guide.
6. Play a tape in both FORWARD and REVERSE directions and check that no curling on tape is found.

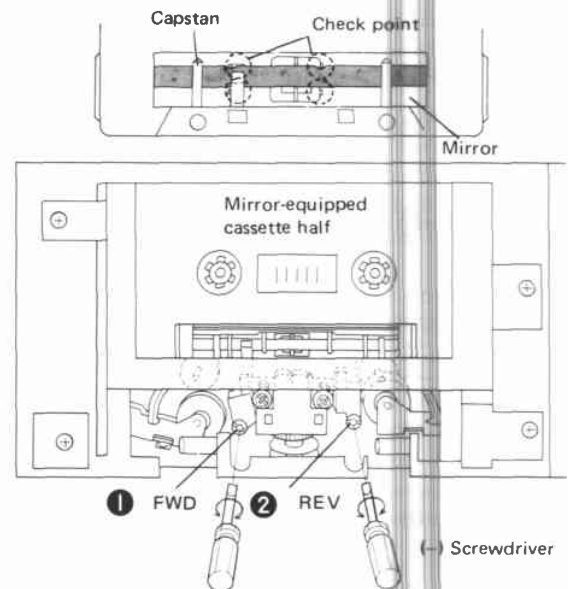


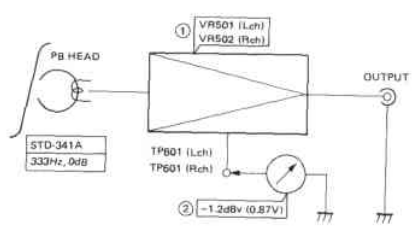
Fig. 12-3 Tape transport adjustment

12.4 PLAYBACK LEVEL ADJUSTMENT

Since this adjustment determines the DOLBY NR level during playback, it should be performed precisely.

Setting:

Mode Playback (FWD)
 Test tape STD-341A, 333Hz 0dB
 portion
 AC mV meter TP601 of the DOLBY
 NR assembly L
 TP601 of the DOLBY
 NR assembly R



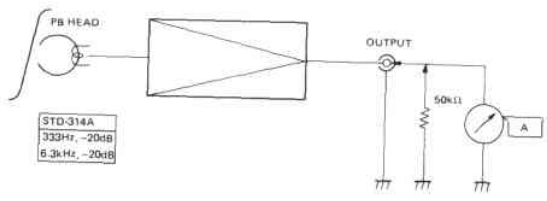
12.5 PLAYBACK EQUALIZER CHECK

Setting:

- Mode Playback (FWD and REV)
- Test tape STD-341A, 333Hz and 6.3kHz portions
- AC mV meter OUTPUT terminals

Procedure:

Adjust the VR501 (Lch) and VR502 (Rch) of the AMP assembly so that the AC mV meter reads -1.2dBv (871mV).



A
333Hz level-6,3kHz level= +0,5dB±2dB

Procedure:

Play the 333Hz and 6.3kHz portions of the test tape. Check that the difference between the two output levels does not exceed +0.5dB±2dB.

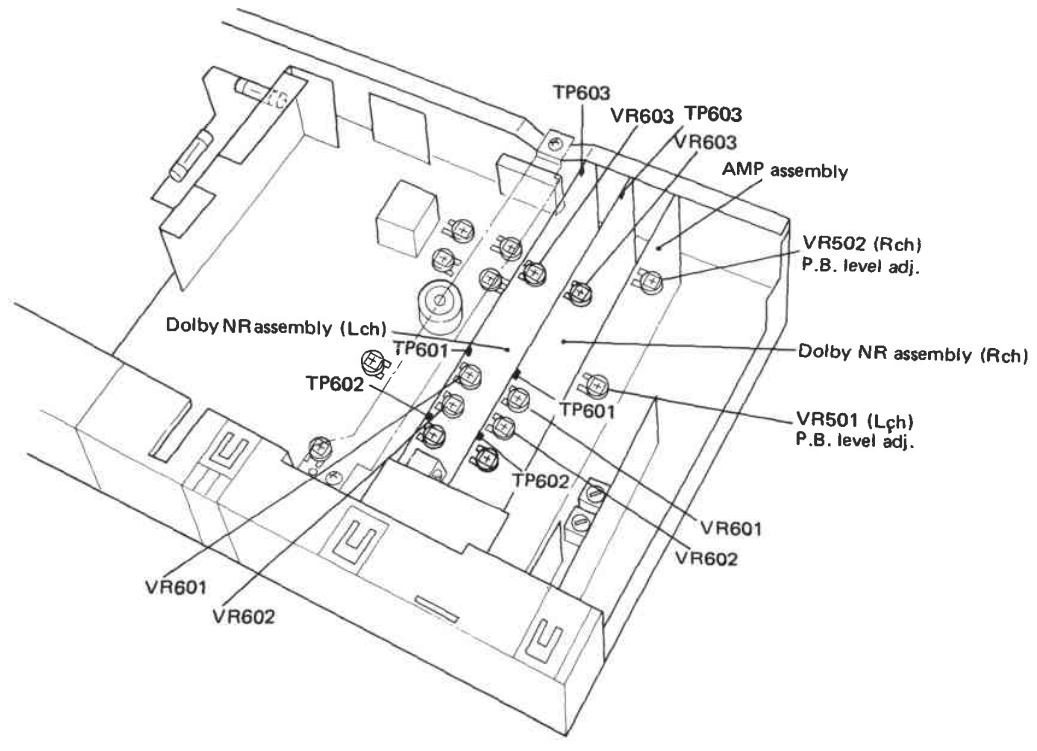
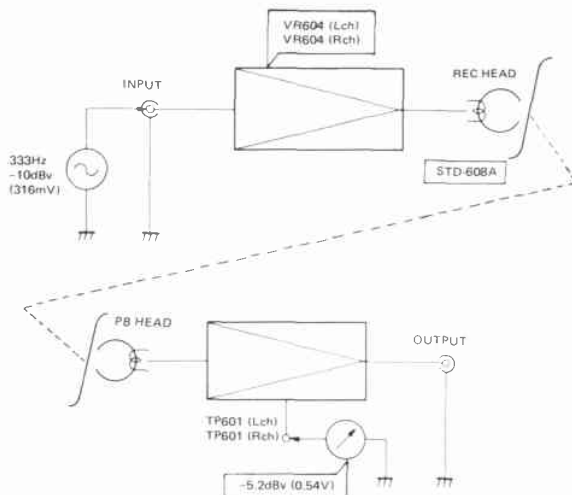


Fig. 12-4 Adjustment points



Procedure:

1. Set the test tape STD-608A and adjust the INPUT level control so that the AC mV meter reads -5.2dBV (549mV).
2. Set the DOLBY NR switch to ON position. Set the CT-7R to the FWD position and record and playback the input signal onto the STD-608A. Adjust the VR604 (Lch) and VR604 (Rch) so that the AC mV meter reads -5.2dBV (549mV).
3. Set the test tape STD-603 and DOLBY NR switch to the ON position and record and playback the input signal onto the STD-603. Confirm that the AC mV meter -5.2dBV±1.5dB (653mV ~ 462mV).
4. Set the test tape STD-604 and DOLBY NR switch to the ON position and record and playback the input signal onto the STD-604. Confirm that the AC mV meter -5.2dBV±1.5dB (653mV ~ 462mV).

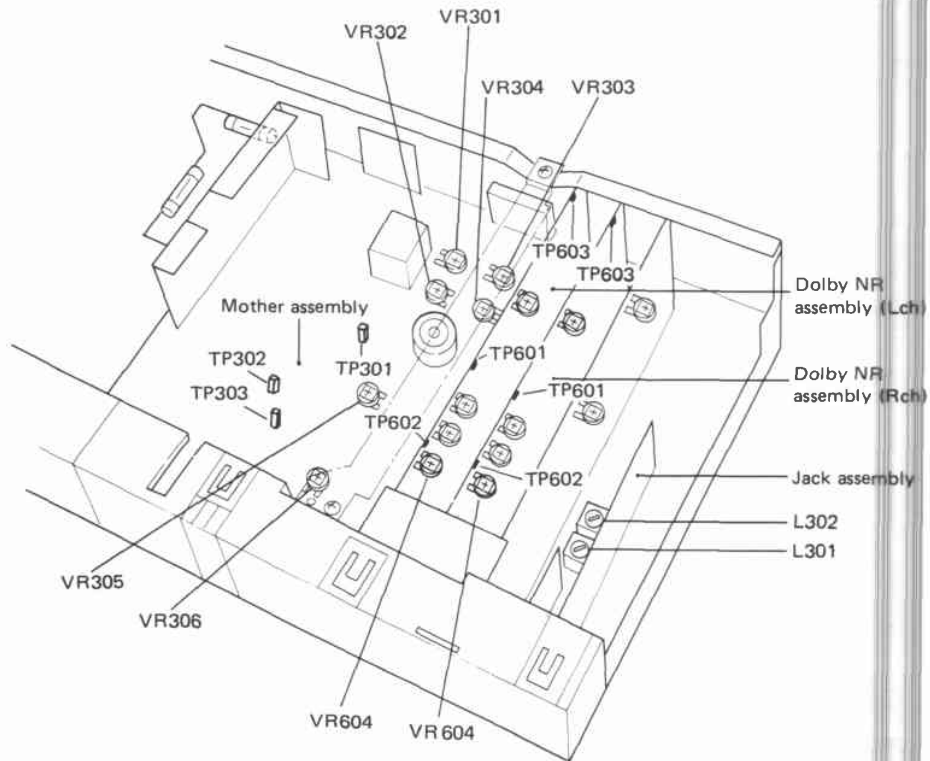
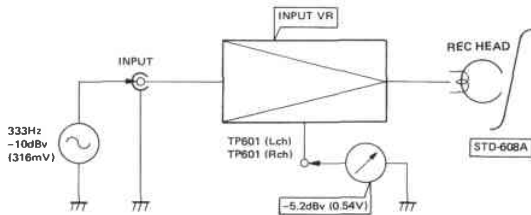


Fig. 12-6 Adjustment points

12.9 LEVEL METER CHECK

Setting:

MODE Record pause
 Input signal 333Hz, -10dBv (316mV)
 (from INPUT)
 AC mV meter TP601 of the DOLBY NR assembly L
 TP601 of the DOLBY NR assembly R



Procedure:

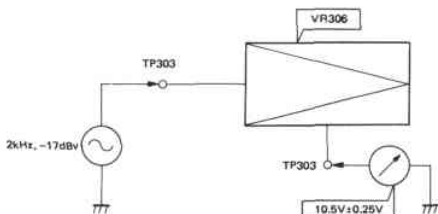
Adjust the INPUT level control so that the level meter reads 0 VU. Then check the AC mV meter reads -5.2dBv±2dB.

12.10 LEADER TAPE DETECT ADJUSTMENT

Step 1.

Setting:

Mode Stop
 Input Signal 2kHz, -17dBv (0.4V P-P Sin wave) to TP302 of the Mother assembly
 DC mV meter TP303 of the Mother assembly



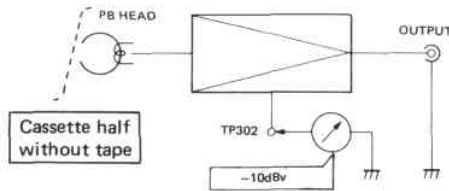
Procedure:

1. Remove the connector CN315 of the Mother assembly.
2. Adjust the VR306 so that the DC mV meter reads 10.5V±0.25V.
3. Return the connector CN315 to the original position.

Step 2.

Setting:

Mode Playback
 Tape Cassette half without tape
 AC mV meter TP302 of the Mother assembly



Procedure:

1. Confirm that the AC mV meter reads -10dBv (0.6V P-P square wave).
2. If |-10dBv is exceeded, bridge the section shown in Fig. 12-7 by soldering.

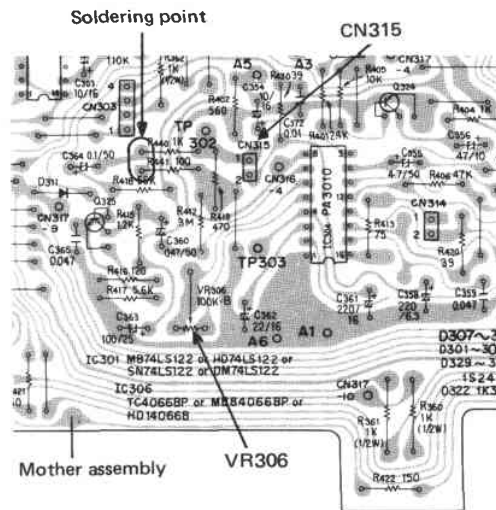


Fig. 12-7 Soldering point

12. RÉGLAGES ÉLECTRIQUES

Précautions

1. Les réglages mécaniques doivent être terminés.
2. Nettoyer les pièces suivantes à l'aide d'un bâtonnet imbibé d'alcool: tête d'enregistrement/lecture, galet presseur, tête d'effacement, courroies en caoutchouc et cabestan.
3. Démagnétiser la tête d'enregistrement/lecture à l'aide d'un démagnétiseur de tête.
4. Ne pas utiliser de tournevis magnétisé pour les réglages.
5. Les réglages et les mesures doivent être réalisés pour les canaux de gauche et de droite avec la tension d'alimentation nominale.
6. Les réglages doivent être effectués dans l'ordre indiqué dans ce manuel de service. Une modification de cet ordre peut empêcher la réalisation de réglages corrects et peut provoquer une baisse de performance.
7. Les niveaux en cours de mesure sont basés sur $0\text{dBv} = 1\text{V}$. Raccorder une charge fictive de $50\text{ k}\Omega$ entre les bornes de sortie (OUTPUT).
8. Laisser chauffer (vieillessement) le CT-7R pendant quelques minutes avant de procéder aux réglages.
9. Placer le commutateur DOLBY NR sur OFF sauf indication contraire.

Equipements/outils d'essai requis

1. Bande d'essai
 - STD-331A Pour la reproduction générale.
 - STD-341A Pour le réglage de la reproduction
 - STD-608A Bande "NORMAL" vierge
 - STD-603 Bande "CrO₂" vierge
 - STD-604 Bande "METAL" vierge
2. Oscillateur BF
3. Millivoltmètre alternatif (mV CA)
4. Atténuateur
5. Oscilloscope
6. Résistance $50\text{ k}\Omega$ (1/4W)

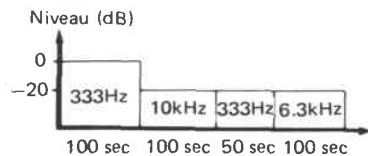


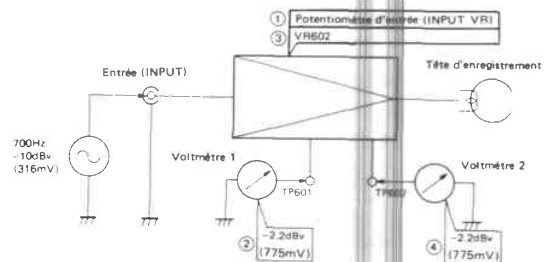
Fig. 12-1 Contenu de la bande d'essai STD-341A

12.1 RÉGLAGE DU CIRCUIT DOLBY NR

Etape 1.

Montage:

- Mode Enregistrement/pause
 Signal d'entrée 700Hz, -10dBv (316mV) (de INPUT)
 Millivoltmètre TP601 de l'ensemble alternatif 1
 (Canaux de gauche et de droite)
 Millivoltmètre TP602 de l'ensemble alternatif 2
 (canaux de gauche et de droite)



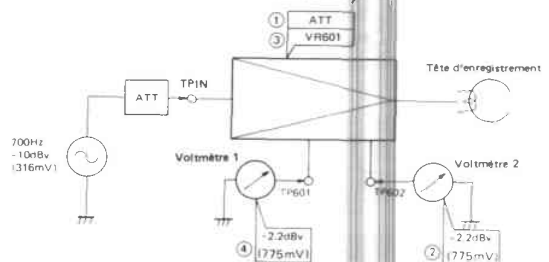
Procédure:

1. Régler la commande de niveau d'entrée INPUT de manière à ce que le millivoltmètre alternatif 1 indique -2,2dBv (775mV).
2. Régler VR602 de manière à ce que le millivoltmètre alternatif 2 indique -2,2dBv (775mV).

Etape 2.

Montage:

- Mode Lecture
 Signal d'entrée 700Hz, -10dBv (316mV) à TPIN de l'ensemble AMP.
 Millivoltmètre TP601 de l'ensemble alternatif 1
 (canaux de gauche et de droite)
 Millivoltmètre TP602 de l'ensemble alternatif 2
 (canaux de gauche et de droite)



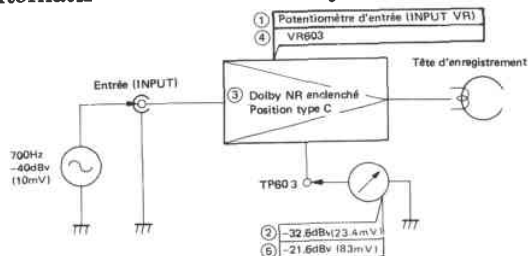
Procédure:

1. Régler ATT de manière à ce que le millivoltmètre alternatif 2 indique $-2,2\text{dBv}$ (775mV).
2. Régler VR601 de manière à ce que le millivoltmètre alternatif 1 indique $-2,2\text{dBv}$ (775mV).

Etape 3.

Montage:

Mode Enregistrement/pause
 Signal d'entre 700Hz , -40dBv
 (de INPUT) (10mV)
 Millivoltmètre TP603 de l'ensemble
 alternatif Dolby NR



Procédure:

1. Régler la commande de niveau d'entrée INPUT de manière à ce que le millivoltmètre CA indique $-32,6\text{dBv}$ ($23,4\text{mV}$).
2. Enclencher le circuit Dolby NR (ON) et le régler sur la position C.
3. Régler VR603 de manière à ce que le millivoltmètre alternatif indique $-21,6\text{dBv}$ (83mV).

12.2 RÉGLAGE DE L'AZIMUT DE TÊTE

Montage:

Mode Lecture (FWD et REV)
 Bande d'essai STD-314A, partie de
 10kHz
 Millivoltmètre Bornes de sortie
 alternatif OUTPUT
 VR501, VR502 Maximum

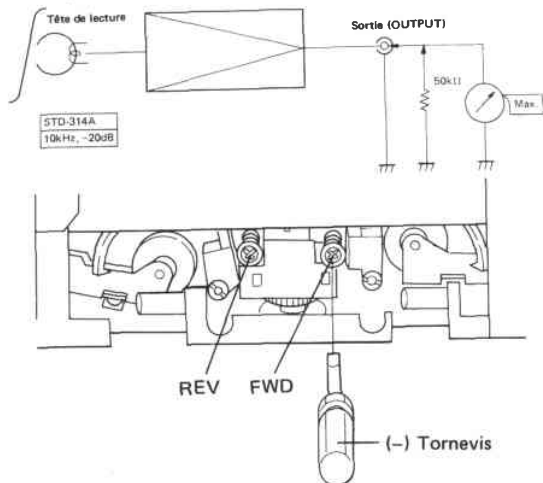


Fig. 12-2 Préréglage d'azimut

Procédure:

Lire la bande en sens avant et en sens arrière. Régler la vis d'azimut de tête sur la position donnant le niveau de sortie maximum.

12.3 RÉGLAGE DE L'ENTRAÎNEMENT DE LA BANDE

1. Charger une demi-cassette munie d'un miroir.
2. Placer le commutateur de DIRECTION sur la position FORWARD (avant) et le mode sur PLAY (lecture).
3. Régler l'écrou de réglage ① de manière à ce qu'aucune ondulation ne se produise sur la pièce de guidage de la tête d'enregistrement/lecture (REC/PB) ni sur le guide de la tête d'effacement, comme indiqué à la Fig. 12-3.
4. Placer le commutateur de DIRECTION sur la position REVERSE (arrière).
5. Régler l'écrou de réglage ② de manière à ce qu'aucune ondulation ne se produise sur le guide de la tête d'enregistrement/lecture (REC/PB) ni sur le guide de la tête d'effacement.
6. Faire défiler une bande en avant (FORWARD) et en arrière (REVERSE) et vérifier qu'aucune ondulation ne se produit.

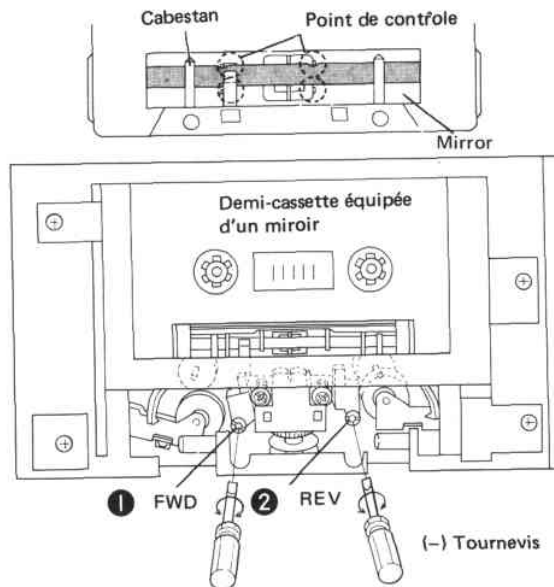


Fig. 12-3 Réglage de l'entraînement de la bande

12.4 RÉGLAGE DU NIVEAU DE LECTURE

Ce réglage doit être effectué avec précision car il détermine le niveau Dolby NR pendant la lecture.

11. RÉGLAGES MÉCANIQUES

11.1 CONTRÔLE DE LA PRESSION DU GALET-PRESSEUR

1. Régler la platine de magnétophone sur le mode de reproduction [Avant (FORWARD) et Inverse (REVERSE)].
2. Pousser doucement sur le bras du galet-presseur avec l'indicateur de tension (Pièce n° GGK-047) et observer le niveau de l'indicateur de tension lorsque le galet-presseur arrête à tourner. Remplacer le ressort de pression du galet-presseur lorsque la lecture de l'indicateur de tension est inférieure à 250 ± 400 g.

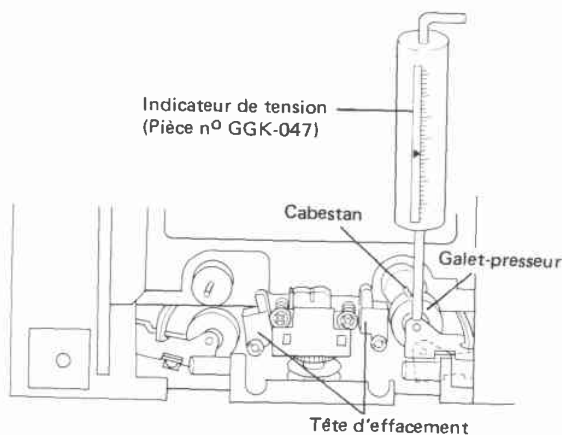


Fig. 11-1 Réglage de la pression du galet-presseur

11.2 PRÉRÉGLAGE DE L'AZIMUT

1. Régler le commutateur DIRECTION sur FORWARD et la position de fonctionnement sur STOP.
2. Régler la vis d'azimut ① en utilisant un tournevis (-) comme indiqué sur la Fig. 11-2, 3 afin que la distance (B) entre le boîtier et la base rotative soit égale à 1,5 mm.
3. Régler le commutateur DIRECTION sur REVERSE.
4. Régler la vis d'azimut ② en utilisant un tournevis (-) comme indiqué sur la Fig. 11-2, 3 afin que la distance (B) entre le boîtier et la base rotative soit égale à 1,5 mm.

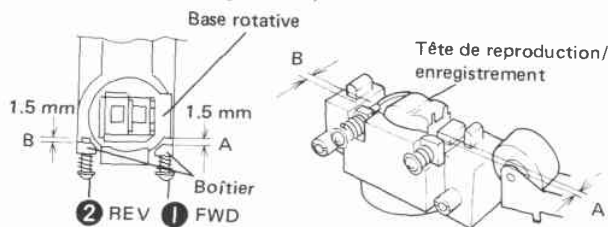


Fig. 11-2 Niveau de réglage de l'azimut

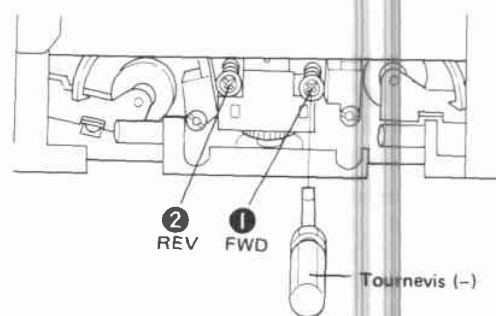


Fig. 11-3 Préréglage de l'azimut

11.3 RÉGLAGE D'ENTRAÎNEMENT DE LA BANDE

1. Charger une cassette à miroir.
2. Régler le commutateur DIRECTION sur FORWARD et la position de fonctionnement sur PLAY.
3. Régler l'écrou de réglage ① afin que la bande ne s'enroule pas sur le guide de la tête de reproduction/enregistrement et sur le guide de la tête d'effacement comme indiqué sur la Fig. 11-4.
4. Régler le commutateur DIRECTION sur REVERSE.
5. Régler l'écrou de réglage ② afin que la bande ne s'enroule pas sur le guide de la tête de reproduction/enregistrement et sur le guide de la tête factice.
6. Faire défiler une bande dans le sens avant (FORWARD) et dans le sens inverse (REVERSE) et s'assurer que la bande ne présente pas d'ondulations.

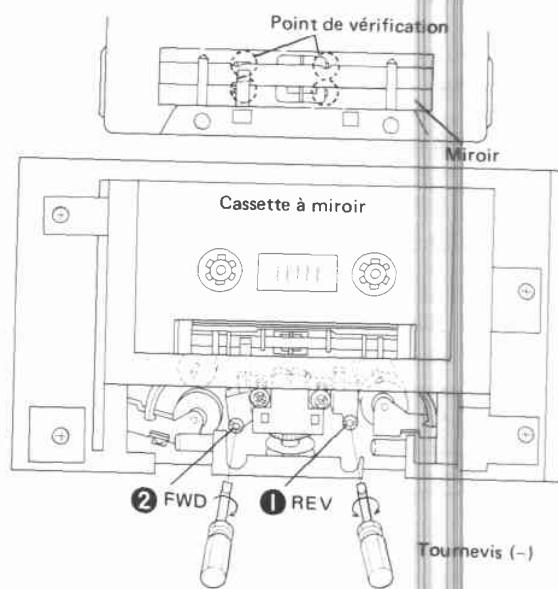


Fig. 11-4 Réglage d'entraînement de la bande

11.4 RÉGLAGE DE LA VITESSE DE ROTATION D'AVANCE RAPIDE ET DE REBOBINAGE DE LA BANDE

1. Raccorder le fréquencemètre entre FG du moteur d'entraînement du mécanisme de bobinage et GND (Fig. 11-5).
2. Régler le commutateur DIRECTION sur FORWARD et le mode de fonctionnement sur FF (avance rapide).
3. Régler le VR202 de manière à ce que le fréquencemètre indique $72 \text{ Hz} \pm 2 \text{ Hz}$.
4. Régler le mode de fonctionnement sur REW et vérifier alors que l'indication du fréquencemètre n'est pas supérieure à $72 \text{ Hz} \pm 5 \text{ Hz}$.

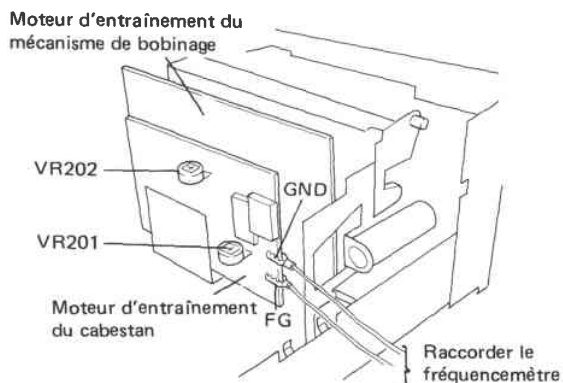


Fig. 11-5 Réglage de la vitesse de rotation d'avance rapide et de rebobinage de la bande

11.5 RÉGLAGE DU COUPLE D'ENROULEMENT

1. Introduire un dynamomètre à cassette.
2. Régler le commutateur DIRECTION sur FORWARD et le mode de fonctionnement sur PLAY.
3. Régler le VR201 de manière à ce que le couple d'enroulement soit égal à $45 \pm 5 \text{ g-cm}$. (Fig. 11-5).
4. Régler le commutateur DIRECTION sur REVERSE.
5. Vérifier si le couple d'enroulement est égal à $45 \pm 10 \text{ g-cm}$ (Fig. 11-6).

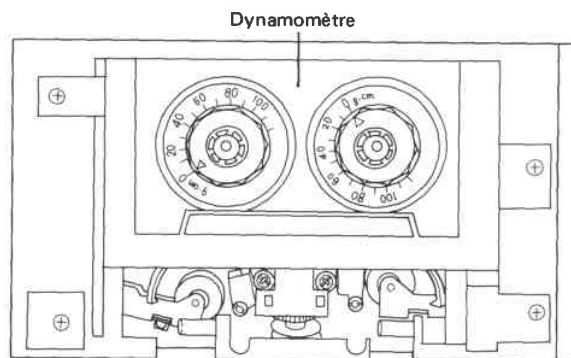


Fig. 11-6 Réglage du couple d'enroulement

11.6 RÉGLAGE DE LA VITESSE DE LA BANDE

1. Raccorder le fréquencemètre à la borne OUTPUT (L ou R).
2. Introduire la bande d'essai STD-301, le début de la bande étant dirigé dans le sens inverse.
3. Régler le commutateur DIRECTION sur FORWARD et le mode de fonctionnement sur PLAY.
4. Régler le VR101 de manière à ce que le fréquencemètre indique $3005 \pm 10 \text{ Hz}$ au début du rebobinage de la bande.
5. Régler le commutateur DIRECTION sur REVERSE. Le fréquencemètre doit indiquer $3000 \pm 20 \text{ Hz}$ au début du rebobinage de la bande.

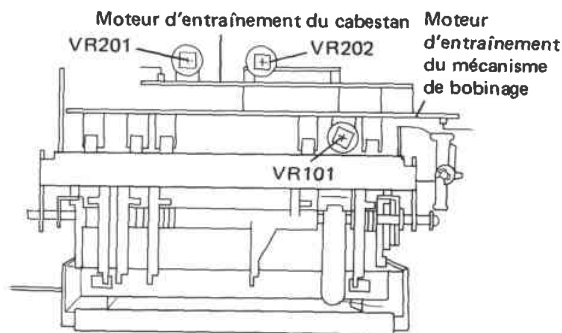


Fig. 11-7 Réglage de la vitesse de la bande

11.7 VERIFICATION DU COUPLE RAPIDE

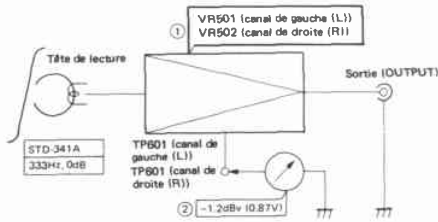
1. Introduire un dynamomètre à cassette.
2. Régler le commutateur DIRECTION sur FORWARD et le mode de fonctionnement sur FF (avance rapide).
3. Vérifier si le couple rapide (FAST) est égal à $100 \pm 30 \text{ g-cm}$ lorsque l'appareil est réglé de la manière indiquée ci-dessus dans le chapitre 2.
4. Régler le mode de fonctionnement sur REW et vérifier si le couple rapide (FAST) est égal à $100 \pm 30 \text{ g-cm}$.

11.8 RÉGLAGE DU COUPLE DE TENSION INVERSE DU SUPPORT DE DE BOBINE

1. Introduire un dynamomètre à cassette.
2. Régler le commutateur DIRECTION sur FORWARD et le mode de fonctionnement sur PLAY.
3. Vérifier alors si la tension inverse sur la bobine dérouleuse gauche (support de bobine gauche) est égale à $3,5 \pm 1,5 \text{ g-cm}$.
4. Régler le commutateur DIRECTION sur REVERSE.
5. Vérifier alors si la tension inverse sur la bobine dérouleuse droite (support de bobine droit) est égale à $3,5 \pm 1,5 \text{ g-cm}$.

Montage:

Mode Lecture (avant (FWD))
 Bande d'essai STD-341A, partie de 333Hz, 0dB
 Millivoltmètre TP601 de l'ensemble alternatif
 alternatif Dolby NR de gauche (L)
 TP601 de l'ensemble Dolby NR de droite (R)



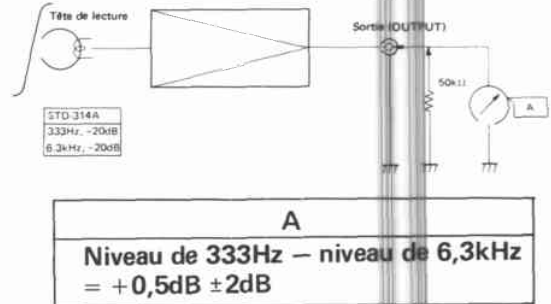
Procédure:

Régler VR501 (canal de gauche) et VR502 (canal de droite) de l'ensemble AMP, de manière à ce que le millivoltmètre alternatif indique -1,2dBv (871mV).

12.5 CONTRÔLE DE L'EGALISEUR DE LECTURE

Montage:

Mode Lecture (avant (FWD) et arrière (REV))
 Bande d'essai STD-341A, parties de 333Hz et de 6,3kHz
 Millivoltmètre Bornes de sortie alternatif (OUTPUT)



Procédure:

Lire les parties 333Hz et 6,3kHz de la bande d'essai. Vérifier que la différence entre les deux niveaux de sortie ne dépasse pas +0,5dB ±2dB.

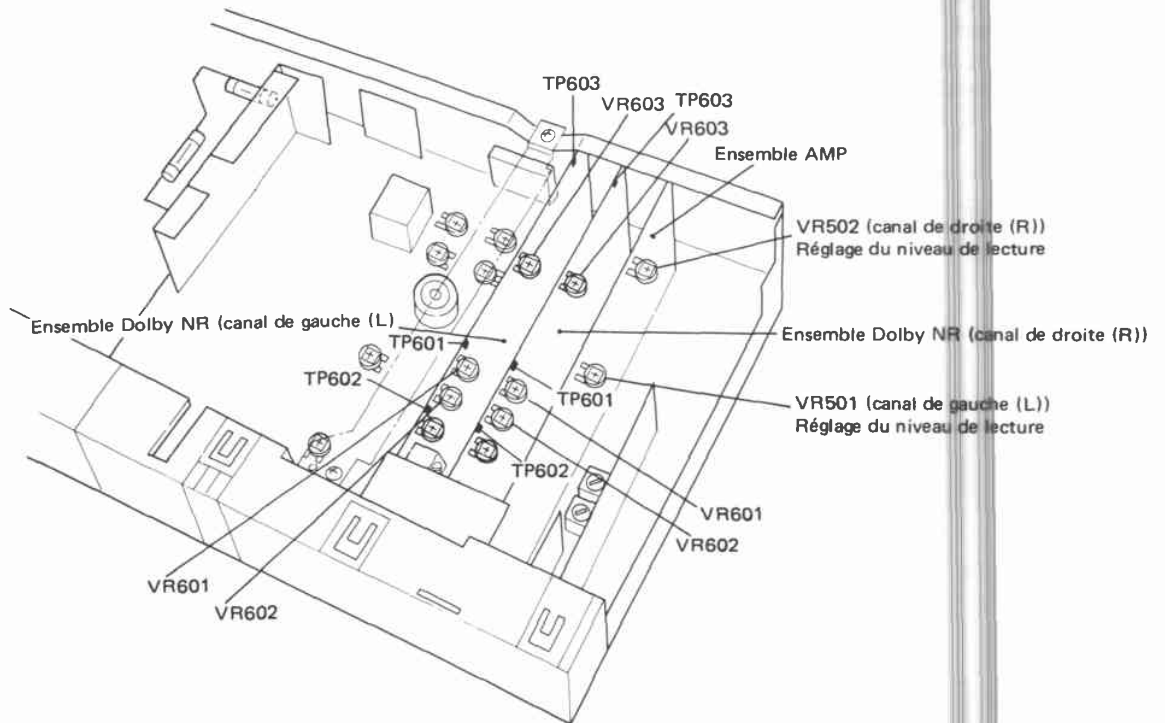
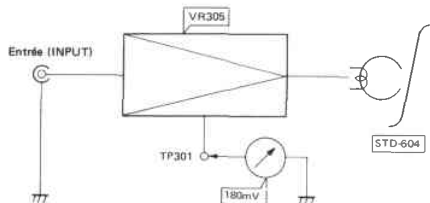


Fig. 12-4 Points de réglage

12.6 RÉGLAGE DU COURANT D'EFFACEMENT

La procédure de réglage est la même dans les deux directions, avant (FWD) et arrière (REV), mais les deux valeurs indiquées sont différentes. Le réglage doit être effectué de manière à ce que le plus faible des deux courants d'effacement soit de $180mV^{+0}_{-40} mV$.



Montage:

- Mode Enregistrement
- Réglage du niveau d'entrée (INPUT) Minimum
- Millivoltmètre alternatif TP301 de l'ensemble principal
- Bande d'essai STD-604

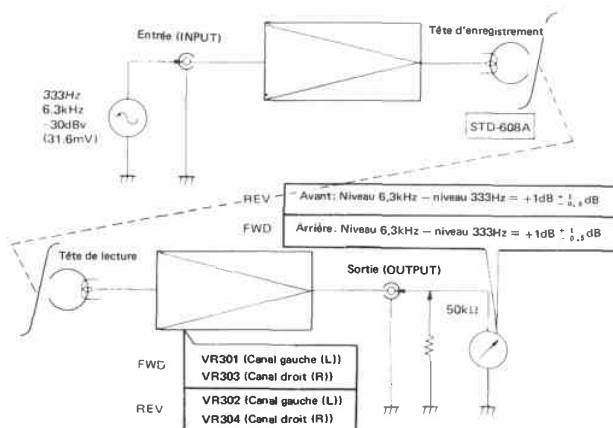
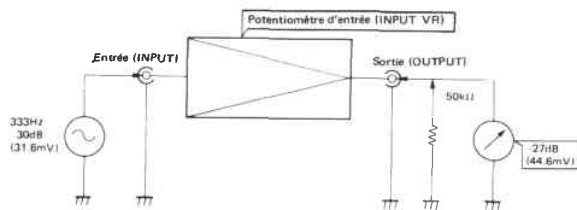
Procédure:

1. Régler le CT-7R sur la position de défilement avant (FWD) et régler VR305 de manière à ce que le millivoltmètre alternatif indique 180mV.
2. De la même manière, régler le CT-7R sur la position de défilement arrière (REV) et vérifier que le millivoltmètre alternatif indique $180mV^{+0}_{-40}$.

12.7 RÉGLAGE DE LA REPONSE EN FREQUENCE D'ENREGISTREMENT/LECTURE

Montage:

- Mode Enregistrement
- Enregistrement/lecture
- Signal d'entree (à INPUT) 333Hz, -30dBv (31,6mV)
- 6,3kHz, 30dBv (31,6mV)
- Bande d'essai STD-608A
- Millivoltmètre alternatif Bornes de sortie (OUTPUT)



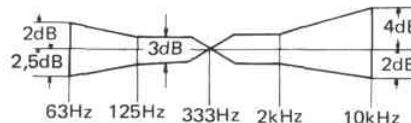
Procédure:

1. Régler le niveau d'entrée (INPUT) de manière à ce que le millivoltmètre alternatif indique -27dBv (44,6mV).
2. Placer le CT-7R en position de défilement avant (FWD) puis enregistrer et lire les signaux d'entrée (333Hz et, 6,3kHz) sur STD-608A. Régler VR301 (canal de gauche (L)) et VR303 (canal de droite (R)), de manière à ce que la différence entre les deux soit de $+1dB^{+1}_{-0,5} dB$.
3. De la même manière, placer le CT-7R en position de défilement arrière (REV) puis enregistrer les signaux d'entrée (333Hz et, 6,3kHz) sur STD-608A. Régler VR-302 (canal de gauche (L)) et VR304 (canal de droite (R)), de manière à ce que la différence entre les deux sorties soit de $+1dB^{+1}_{-0,5} dB$.

* Comme indiqué dans les spécifications de la Fig. 12-5, et vérifier que les performances correspondent aux spécifications.

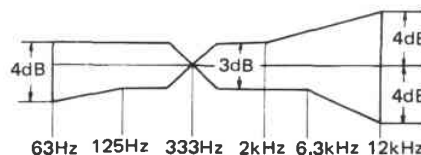
Réponse en fréquence

Utilisation de STD-331A, avec Dolby NR DECLENCHE A cause de l'effet d'isolement, le canal de droite est compensé de -1dB à 63Hz et de -0,5dB à 125Hz.



Réponse en fréquence globale

Utilisation de STD-608A, avec Dolby NR DECLENCHE



11. AJUSTES MÉCÁNICOS

11.1 COMPROBACIÓN DE LA PRESIÓN DEL RODILLO DE PRESIÓN

1. Establecer el magnetófono en el modo de reproducción [Avance (FORWARD) y Rebobinado (REVERSE)].
2. Presionar con cuidado contra el brazo del rodillo de presión con el calibrador de tensión (pieza número GGK-047) y leer el valor cuando el rodillo de presión para a girar. Si el valor no está dentro del margen de 250~400g., reemplazar el meulle del rodillo de presión.

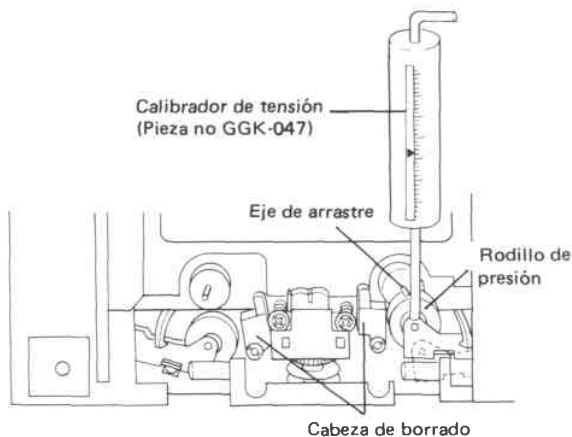


Fig. 11-1 Ajuste de la presión del rodillo de presión

11.2 PREAJUSTE DEL ACIMUT

1. Poner el selector de DIRECTION en la posición de avance FORWARD y el de modo en la posición STOP.
2. Ajustar el tornillo del acimut ① empleando un destornillador de cabeza horizontal como se muestra en la Fig. 11-2, 3 de modo que la distancia (A) entre el emplazamiento y la base de rotación sea de 1,5 mm.
3. Poner el selector de DIRECTION en la posición de inversión REVERSE.
4. Ajustar el tornillo del acimut ② empleando un destornillador de cabeza horizontal como se muestra en la Fig. 11-2, 3 de modo que la distancia (B) entre el emplazamiento y la base de rotación sea de 1,5 mm.

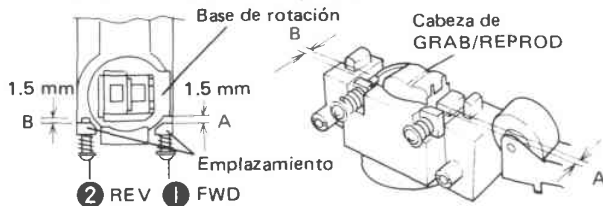


Fig. 11-2 Punto de ajuste del acimut

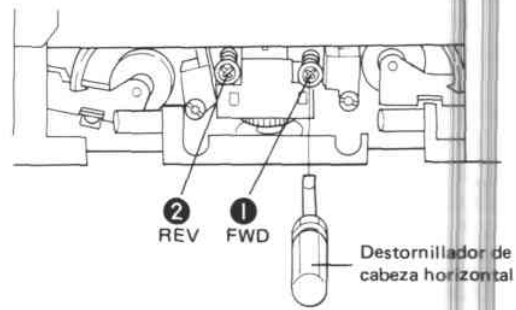


Fig. 11-3 Preajuste del acimut

11.3 AJUSTE DEL TRANSPORTE DE LA CINTA

1. Insertar un casete provisto de espejo.
2. Poner el selector de DIRECTION en la posición FORWARD y el de modo en la posición PLAY.
3. Ajustar el tornillo de ajuste ① de modo que no haya enrollamiento en la guía de la cabeza de GRAB/REPROD y guía de la cabeza de borrado como se muestra en la Fig. 11-4.
4. Poner el selector de DIRECTION en la posición REVERSE.
5. Ajustar el tornillo de ajuste ② de modo que no haya enrollamiento en la guía de la cabeza de GRAB/REPROD y guía de la cabeza ficticia.
6. Reproducir una cinta en las direcciones de avance (FORWARD) y de rebobinado (REVERSE) y comprobar que no se enrolla la cinta.

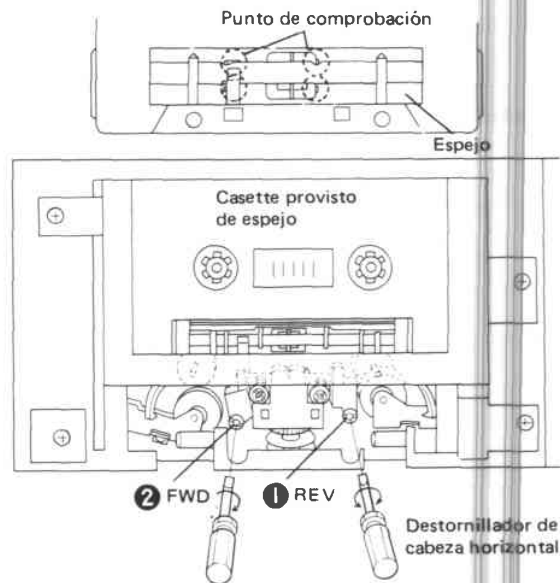


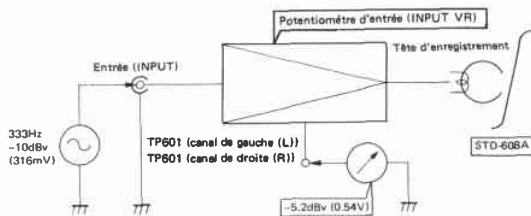
Fig. 11-4 Ajuste del transporte de la cinta

12.9 CONTRÔLE DE L'INDICATEUR DE NIVEAU

Montage:

Mode Enregistrement/pause
 Signal d'entrée
 (à INPUT) 333Hz, 10dBv
 (316mV)

Millivoltmètre
 alternatif TP601 de l'ensemble
 Dolby NR de gauche
 (L)
 TP601 de l'ensemble
 Dolby NR de droite
 (R)



Procédure:

Régler le niveau d'entrée (INPUT) de manière à ce que l'indicateur de niveau affiche 0 VU. Contrôler alors que le millivoltmètre alternatif indique -5,2dBv ±2dB.

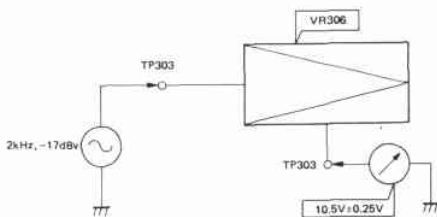
12.10 RÉGLAGE DE LA DETECTION D'AMORCE

Etape 1.

Montage:

Mode Arrêt (STOP)
 Signal d'entrée 2kHz, -17dBv
 (onde sinusoïdale de 0,4Vc-c) à TP302 de l'ensemble principal

Millivoltmètre
 continu TP303 de l'ensemble
 principal



Procédure:

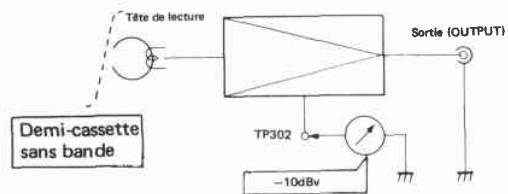
1. Retirer le connecteur CN315 de l'ensemble principal.
2. Régler VR306 de manière à ce que le millivoltmètre continu indique 10,5V ± 0,25V.
3. Remettre le connecteur CN315 à sa position originale.

Etape 2.

Montage:

Mode Lecture
 Bande Demi-cassette sans bande

Millivoltmètre
 alternatif TP302 de l'ensemble
 principal



Procédure:

1. Vérifier que le millivoltmètre alternatif indique -10dBv (onde carrée de 0,6Vc-c).
2. Si la valeur -10dBv est dépassée, ponter par soudure la partie indiquée à la Fig. 12-7.

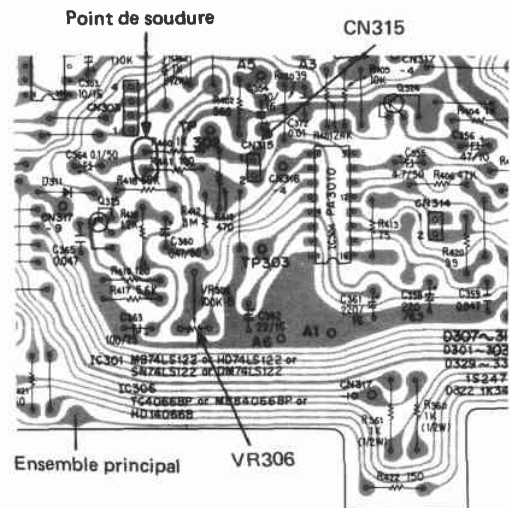
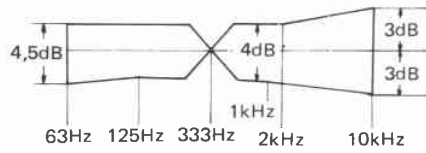
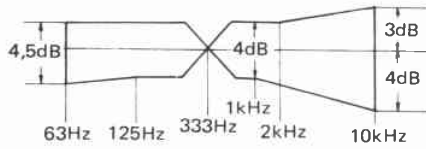


Fig. 12-7 Point de soudure

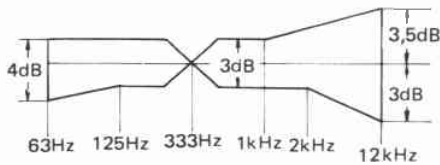
Utilisation de STD-608A, avec Dolby NR ENCLENCHE (type B)



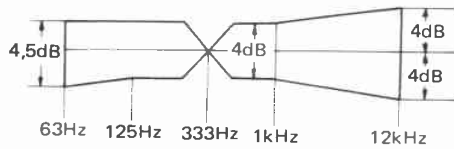
Utilisation de STD-608A, avec Dolby NR ENCLENCHE (type C)



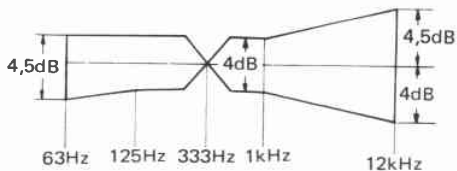
Utilisation de STD-603, avec Dolby NR DECLENCHE



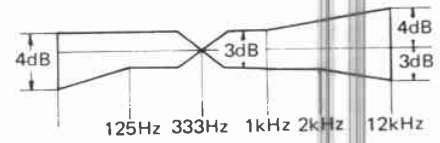
Utilisation de STD-603, avec Dolby NR ENCLENCHE (type B)



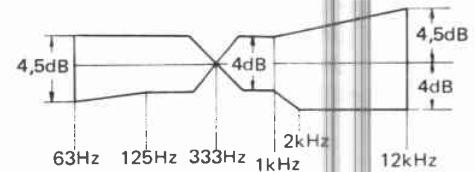
Utilisation de STD-603, avec Dolby NR ENCLENCHE (type C)



Utilisation de STD-604, avec Dolby NR DECLENCHE



Utilisation de STD-604, avec Dolby NR ENCLENCHE (type B)



Utilisation de STD-604, avec Dolby NR ENCLENCHE (type C)

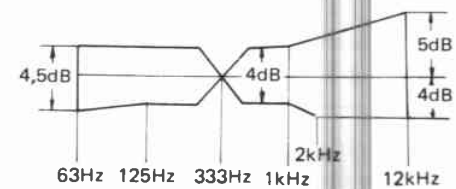


Fig. 12-5 Réponse en fréquence

12.8 RÉGLAGE DU NIVEAU D'ENREGISTREMENT

Montage:

Mode Enregistrement

Signal d'entrée

(à INPUT) 333Hz, -10dBv
(316mV)

Bande d'essai STD-608A (NORM)

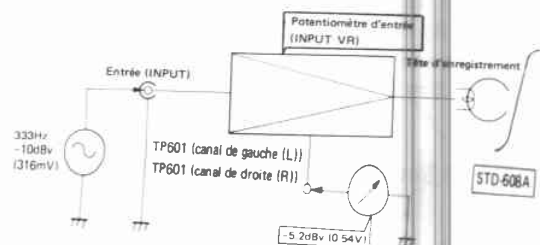
STD-603 (CrO₂)

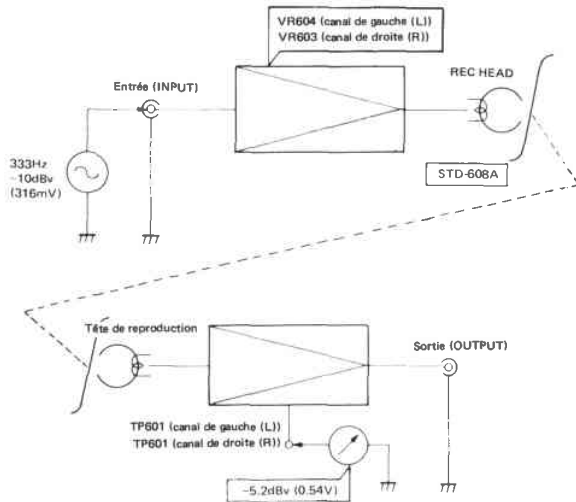
STD-604 (METAL)

Millivoltmètre

alternatif TP601 de l'ensemble
Dolby NR de gauche
(L)

TP601 de l'ensemble
Dolby NR de droite
(R)





Procédure:

1. Installer la bande d'essai STD-608A et régler le niveau d'entrée (INPUT) de manière à ce que le millivoltmètre alternatif indique $-5,2\text{dBv}$ (549mV).
2. Placer le commutateur Dolby NR sur la position ON (enclenché). Placer le CT-7R en position de défilement avant (FWD) puis enregistrer et lire le signal d'entrée sur STD-608A. Régler VR604 (canal de gauche (L)) et VR604 (canal de droite (R)) de manière à ce que le millivoltmètre alternatif indique $-5,2\text{dBv}$ (549mV).
3. Installer la bande d'essai STD-603 et placer le commutateur Dolby NR sur la position ON (enclenché), puis enregistrer et lire le signal d'entrée sur STD-603. Vérifier que le millivoltmètre alternatif indique $-5,2\text{dBv} \pm 1,5\text{dB}$ (653mV à 462mV).
4. Installer la bande d'essai STD-604 et placer le commutateur Dolby NR sur la position ON (enclenché), puis enregistrer et lire le signal d'entrée sur STD-604. Vérifier que le millivoltmètre alternatif indique $-5,2\text{dBv} \pm 1,5\text{dB}$ (653mV à 462mV).

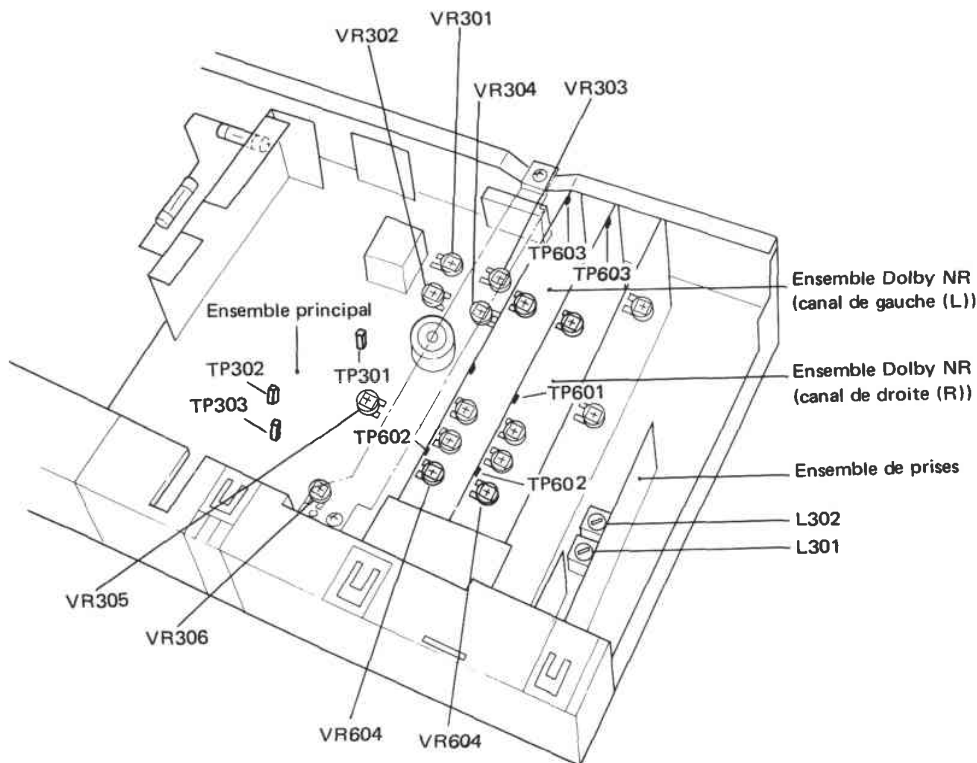


Fig. 12-6 Points de réglage

11.4 AJUSTE DE LA VELOCIDAD DE ROTACIÓN EN AVANCE RÁPIDO Y REBOBINADO (FF/REW)

1. Conectar un frecuencímetro entre el FG del conjunto de control del motor del carrete y GND (Fig. 11-5).
2. Poner el selector de DIRECTION en la posición FORWARD y el de modo en la posición FF.
3. Ajustar el VR202 de modo que el frecuencímetro indique $72 \text{ Hz} \pm 2 \text{ Hz}$.
4. Poner el selector de modo en REW y esta vez comprobar que la indicación del frecuencímetro esté dentro del margen de $72 \text{ Hz} \pm 5 \text{ Hz}$.

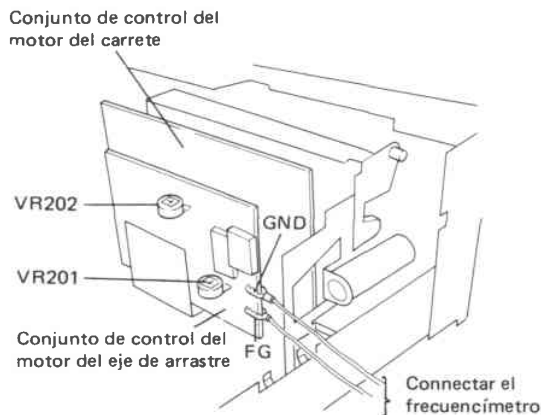


Fig. 11-5 Ajuste de la velocidad de rotación en los modos de FF y REW

11.5 AJUSTE DEL PAR DE TORSIÓN DE ARRASTRE

1. Montar un casete tipo medidor del par de torsión.
2. Poner el selector de DIRECTION en la posición FORWARD y el de modo en la posición PLAY.
3. Ajustar el VR201 de modo que el par de torsión de arrastre esté dentro del margen de $45 \pm 5 \text{ g-cm}$ (Fig. 11-5).
4. Poner el selector de DIRECTION en la posición REVERSE.
5. Comprobar que el par de torsión de arrastre esté dentro del margen de $45 \pm 10 \text{ g-cm}$ (Fig. 11-6).

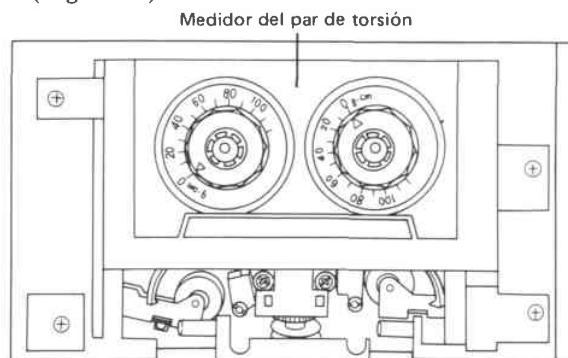


Fig. 11-6 Ajuste del par de torsión de arrastre

11.6 AJUSTE DE LA VELOCIDAD DE LA CINTA

1. Conectar el frecuencímetro al terminal de salida [OUTPUT (L, izquierdo, o R, derecho)].
2. Cargar la cinta de prueba STD-301 y establecerla en el principio de REW.
3. Poner el selector de DIRECTION en la posición FORWARD y el de modo en la posición PLAY.
4. Ajustar el VR101 de modo que la indicación del frecuencímetro esté dentro del margen de $3005 \pm 10 \text{ Hz}$ al principio del rebobinado de la cinta.
5. Poner el selector de DIRECTION en la posición REVERSE y hacer para que la indicación del frecuencímetro esté dentro del margen de $3000 \pm 20 \text{ Hz}$ al principio del rebobinado de la cinta.

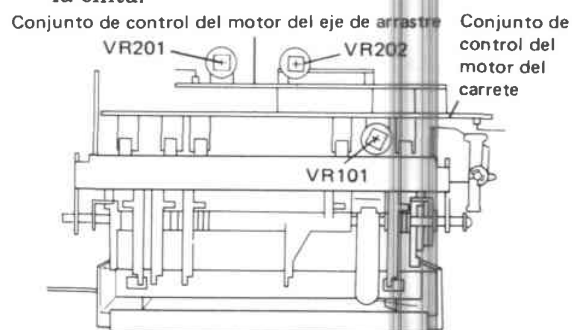


Fig. 11-7 Ajuste de la velocidad de la cinta

11.7 COMPROBACIÓN DEL PAR DE TORSIÓN DE TRANSPORTE RÁPIDO (FAST)

1. Montar un casete tipo medidor del par de torsión.
2. Poner el selector de DIRECTION en la posición FORWARD y el de modo en la posición FF.
3. Comprobar que el par de torsión de FAST esté dentro del margen de $100 \pm 30 \text{ g-cm}$ en la condición descrita en el paso 2 de arriba.
4. Poner el selector de modo en REW y esta vez comprobar que el par de torsión de FAST esté dentro del margen de $100 \pm 30 \text{ g-cm}$.

11.8 COMPROBACIÓN DEL PAR DE TORSIÓN POSTERIOR DE LA BASE DEL CARRETE

1. Montar un casete tipo medidor del par de torsión.
2. Poner el selector de DIRECTION en la posición FORWARD y el de modo en la posición PLAY.
3. Entonces, comprobar que la tensión posterior del lado del carrete de suministro (base del carrete de la izquierda) esté dentro del margen de $3,5 \pm 1,5 \text{ g-cm}$.
4. Poner el selector de DIRECTION en la posición REVERSE.
5. Entonces, comprobar que la tensión posterior del lado del carrete de suministro (base del carrete de la derecha) esté dentro del margen de $3,5 \pm 1,5 \text{ g-cm}$.

12. AJUSTES ELÉCTRICOS

Precauciones

1. Deberán completarse los ajustes mecánicos.
2. Limpiar las partes siguientes con algodón humedecido en alcohol: cabeza de grabación/reproducción, rodillo de arrastre, cabeza de borrado, correas de goma y eje de arrastre.
3. Desmagnetizar la cabeza de grabación/reproducción con un desmagnetizador de cabezas.
4. No utilizar destornilladores magnetizados para los ajustes.
5. Los ajustes y las mediciones deberán realizarse para la tensión nominal de suministro de los canales izquierdo y derecho.
6. Los ajustes deberán realizarse en el orden dado en este manual de servicio. Si se altera el orden los ajustes pueden resultar inútiles, dando como resultado una pérdida de rendimiento.
7. El nivel durante las mediciones se basa en $0dBv = 1V$. Conectar un resistor fícticio de $50Kohmios$ a los terminales de salida (OUTPUT).
8. Dejar que el CT-7R se precaliente durante algunos minutos antes de proceder con el ajuste.
9. Poner el interruptor de reducción de ruido Dolby (DOLBY NR) en la posición OFF a menos de que se diga otra cosa.

Equipos/herramientas de pruebas requeridos:

1. Cinta de prueba
 - STD-331A Para el propósito de reproducción general.
 - STD-341A para el ajuste de reproducción
 - STD-608A cinta NORMAL en blanco
 - STD-603 cinta CrO₂ en blanco
 - STD-604 cinta de METAL en blanco
2. Oscilador sonoro
3. Milivoltímetro de CA (AC mV)
4. Atenuador
5. Osciloscopio
6. Resistor de $50Kohmios$ (1/4W)

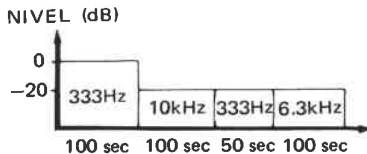


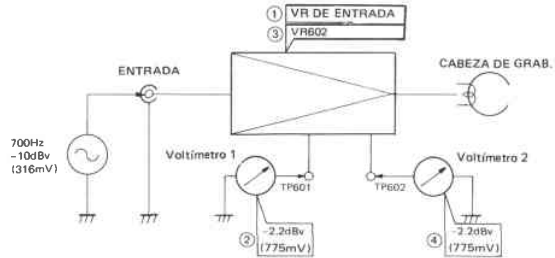
Fig. 12-1 Contenido de la cinta de prueba STD-341A

12.1 AJUSTE DE DOLBY NR

Paso 1.

Ajuste:

- Modo Grabación/pausa
 Señal de entrada 700Hz, -10dBv (316 mV) (desde INPUT)
 Voltímetro de CA1.... TP601 del conjunto DOLBY NR (canales izq. y der.)
 Voltímetro de CA2.... TP602 del conjunto DOLBY NR (canales izq. y der.)



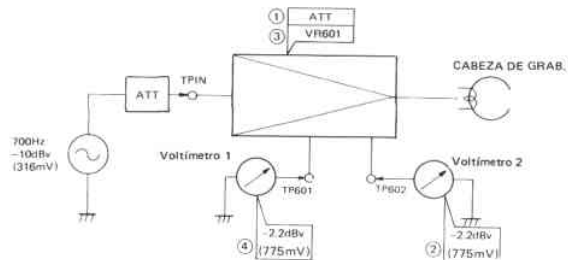
Procedimiento:

1. Ajustar el control de nivel de entrada (INPUT) de modo que el voltímetro de CA (escala de mV) 1 indique -2,2dBv (775 mV).
2. Ajustar el VR602 de modo que el voltímetro de CA (escala de mV) 2 indique -2,2dBv (775 mV).

Paso 2.

Ajuste:

- Modo Reproducción
 Señal de entrada 700Hz, -10dBv (316 mV) a TPIN del conjunto del AMP
 Voltímetro de CA1.... TP601 del conjunto DOLBY NR (canales izq. y der.)
 Voltímetro de CA2.... TP602 del conjunto DOLBY NR (canales izq. y der.)



Procedimiento:

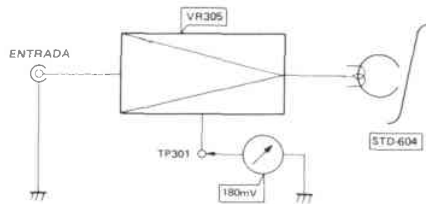
1. Ajustar el ATT de modo que el voltímetro de CA (escala de mV) indique -2,2dBv (775 mV).
2. Ajustar el VR601 de modo que el voltímetro de CA (escala de mV) 1 indique -2,2dBv (775 mV).

12.6 AJUSTE DE LA CORRIENTE DE BORRADO

El procedimiento de ajuste es el mismo para ambas direcciones, FWD y REV, pero si existe alguna diferencia entre las dos indicaciones, ajustar de modo que la inferior de ellas sea $180\text{ mV} \pm 0,40\text{ mV}$.

Ajuste:

Modo Grabación
 Control del nivel Min.
 de entrada
 Voltímetro de CA TP301 del conjunto
 (escala de mV) principal
 Cinta de prueba STD-604



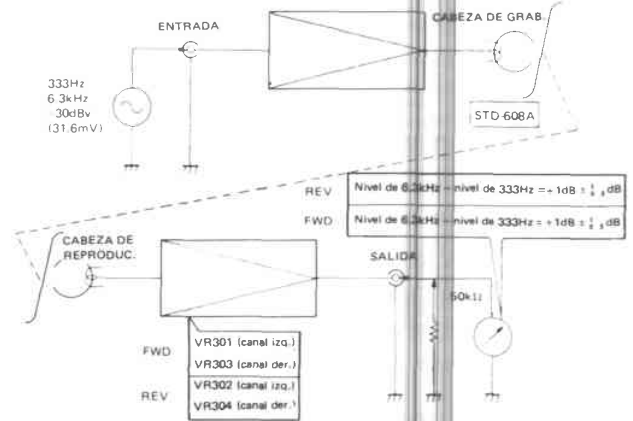
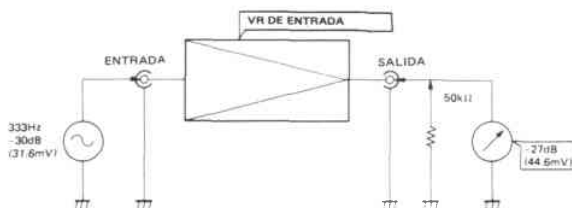
Procedimiento:

1. Ajustar el CT-7R en la posición FWD y el VR-305 de modo que el voltímetro de CA indique 180 mV.
2. De igual forma, ajustar el CT-7R en la posición REV y confirmar que el voltímetro de CA indique $180\text{ mV} \pm 0,40\text{ mV}$.

12.7 AJUSTE DE LA RESPUESTA EN FRECUENCIA DE GRABACIÓN/REPRODUCCIÓN

Ajuste:

Modo Grabación
 Grabación/reproducción
 Señal de entrada 333Hz, -30dBv
 (desde INPUT) (31,6 mV)
 6,3kHz, -30dBv
 (31,6 mV)
 Cinta de prueba STD-608A
 Voltímetro de CA Terminales OUTPUT
 (escala mV)

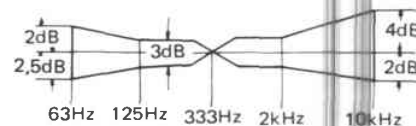


Procedimiento:

1. Ajustar el control de nivel de entrada de modo que el voltímetro de CA indique -27dBv (44,6 mV).
 2. Ajustar el CT-7R en la posición FWD y grabar y reproducir señales de entrada (333Hz y 6,3kHz) en la STD-608A. Ajustar el VR301 (canal izq.) y el VR303 (canal der.) de modo que la diferencia entre ambos sea de $+1\text{dB} \pm 0,5\text{ dB}$.
 3. De igual forma ajustar el CT-7R en la posición REV y grabar y reproducir señales de entrada (333Hz y 6,3kHz) en la STD-608A. Después, ajustar el VR302 (canal izq.) y el VR304 (canal der.) de modo que la diferencia entre las dos salidas sea de $+1\text{dB} \pm 0,5\text{ dB}$.
- * Como indica en las especificaciones de la figura 12-5, comprobar que el rendimiento satisfaga dichas especificaciones.

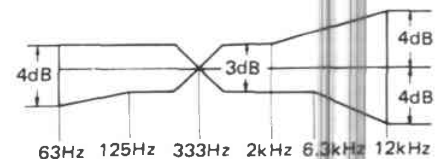
Respuesta en frecuencia

Utilizando la STD-331A con el interruptor DOLBY NR en la posición OFF
 El canal izquierdo se compensa en -1dB a 63Hz y a -0,5 a 125Hz debido al efecto de aislamiento.

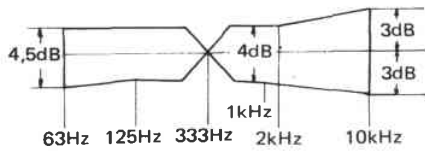


Respuesta global en frecuencia

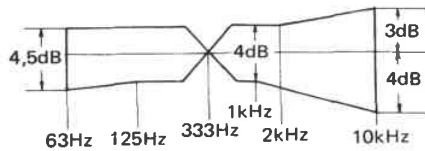
Utilizando la STD-608A con el interruptor DOLBY NR en la posición OFF.



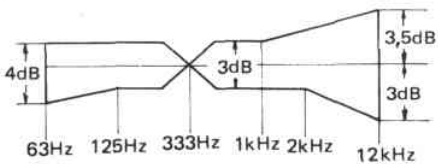
Utilizando la STD-608A con el interruptor DOLBY NR en la posición ON (tipo B).



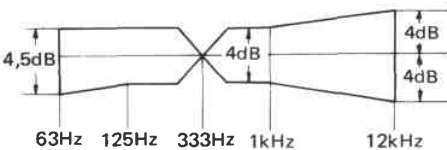
Utilizando la STD-608A con el interruptor DOLBY NR en la posición ON (tipo C).



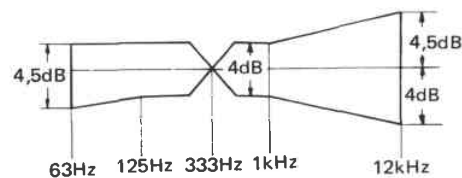
Utilizando la STD-603 con el interruptor DOLBY NR en la posición OFF.



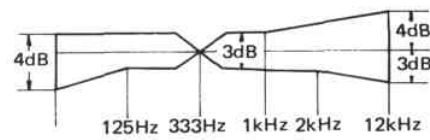
Utilizando la STD-603 con el interruptor DOLBY NR en la posición ON (tipo B).



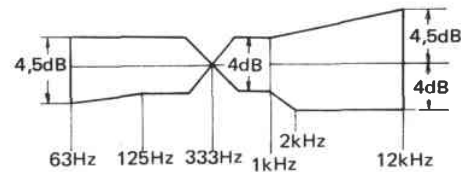
Utilizando la STD-603 con el interruptor DOLBY NR en la posición ON (tipo C).



Utilizando la STD-604 con el interruptor DOLBY NR en la posición OFF.



Utilizando la STD-604 con el interruptor DOLBY NR en la posición ON (tipo B).



Utilizando la STD-604 con el interruptor DOLBY NR en la posición ON (tipo C).

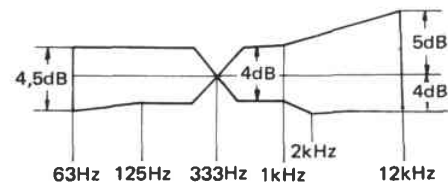
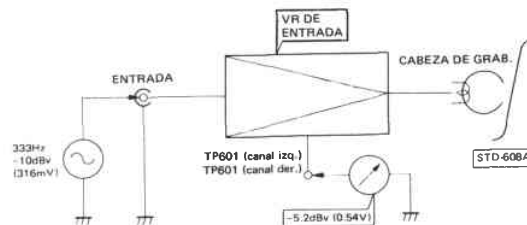


Fig. 12-5 Respuesta en frecuencia

12.8 AJUSTE DEL NIVEL DE GRABACIÓN

Ajuste:

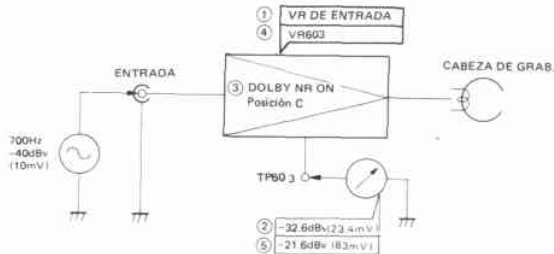
- Modo Grabación
Grabación/reproducción
- Señal de entrada 333Hz, -10dBV
(desde INPUT) (316 mV)
- Cinta de prueba STD-608A (NORM)
STD-603 (CrO₂)
STD-604 (METAL)
- Voltímetro de CA TP601 del conjunto L
(escala de mV)
TP601 del conjunto R
de DOLBY NR



Paso 3.

Ajuste:

Modo Grabación/pausa
 Señal de entrada 700Hz, -40dBv
 (desde INPUT) (10 mV)
 Voltímetro de CA TP603 del conjunto
 (en escala de mV) DOLBY NR



Procedimiento:

1. Ajustar el control del nivel de entrada (INPUT) de modo que el milivoltímetro de CA indique -32,6dBv (23,4 mV).
2. Poner el interruptor DOLBY NR en la posición ON, y en la posición C.
3. Ajustar el VR603 de modo que el voltímetro de CA (escala de mV) indique -21.6dBv (83mV).

12.2 AJUSTE DEL AZIMUT DE LA CABEZA

Ajuste:

Modo Reproducción (FWD y REV)
 Cinta de prueba STD-341A, parte de 10kHz
 Voltímetro de CA Terminales OUTPUT (escala de mV)
 VR501, VR502 Máx.

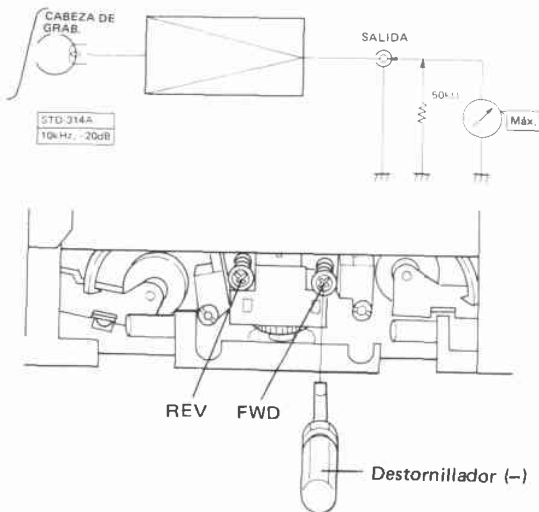


Fig. 12-2 Preajuste del azimut

Procedimiento:

Poner una cinta en reproducción en ambas direcciones, de ida y retorno. Ajustar el tornillo del azimut de la cabeza hasta la posición que ofrezca el mayor nivel de salida.

12.3 AJUSTE DEL TRANSPORTE DE LA CINTA

1. Insertar un casete provisto de espejo.
2. Poner el selector DIRECTION en la posición FORWARD y el de modo en PLAY.
3. Ajustar la tuerca de ajuste 1 de modo que no oscile la quía de la cabeza REC/PB ni la quía de la cabeza de borrado como muestra la figura 12-3.
4. Poner el selector DIRECTION en la posición REVERSE.
5. Ajustar la tuerca de ajuste 2 de modo que no oscile la quía de la cabeza REC/PB ni la quía de la cabeza de borrado
6. Poner la cinta en reproducción en ambas direcciones, de ida y retorno, y comprobar que no ocurra oscilación en la cinta.

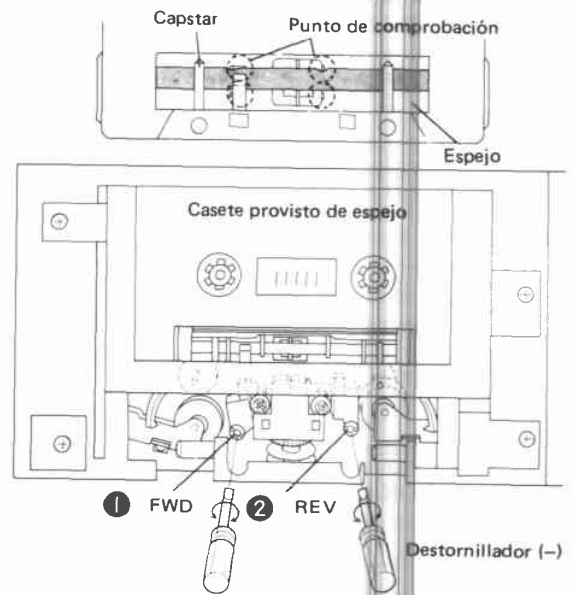


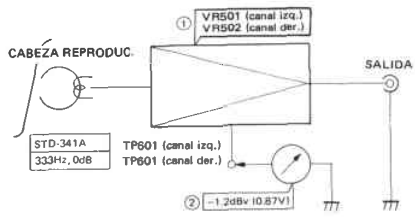
Fig. 12-3 Ajuste del transporte de la cinta

12.4 AJUSTE DEL NIVEL DE REPRODUCCION

Puesto que este ajuste determina el nivel de reducción de ruido DOLBY de grabación, deberá realizarse de modo preciso.

Ajuste:

Modo Reproducción (FWD)
 Cinta de prueba STD-341A, posición 333Hz, 0dB
 Voltímetro de CA TP601 del conjunto L de DOLBY NR
 TP601 del conjunto R de DOLBY NR



Procedimiento:

Ajustar el VR501 (canal izq.) y el VR502 (canal der.) del conjunto del AMP de modo que el voltímetro de CA indique -1,2dBv (871 mV).

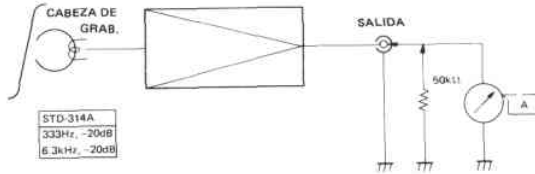
12.5 COMPROBACIÓN DEL ECUALIZADOR DE REPRODUCCIÓN

Ajuste:

Modo Reproducción (FWD y REV)

Cinta de prueba STD-341A, posiciones 333Hz y 6,3kHz

Voltímetro de CA Terminales OUTPUT (escala de mV)



A
Nivel de 333Hz - 6,3kHz = +0,5dB ± 2dB

Procedimiento:

Poner en reproducción la cinta de prueba en las posiciones de 333Hz y 6,3kHz. Comprobar que la diferencia entre los dos niveles de salida no supere +0,5dB ± 2dB.

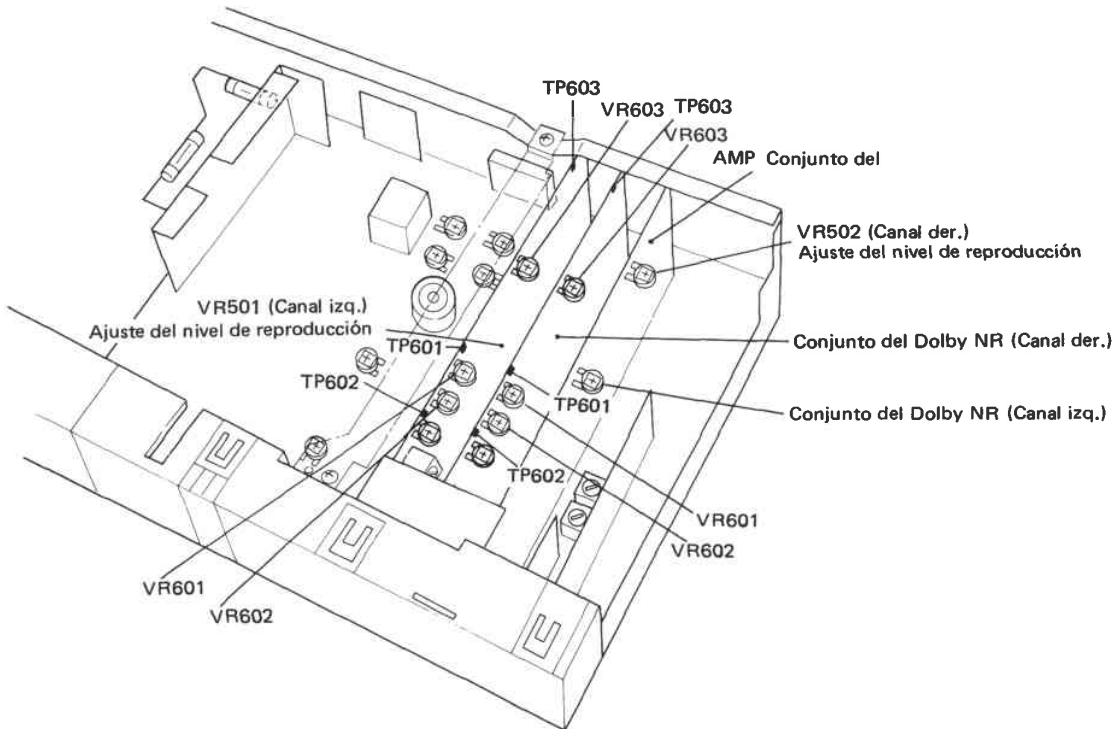
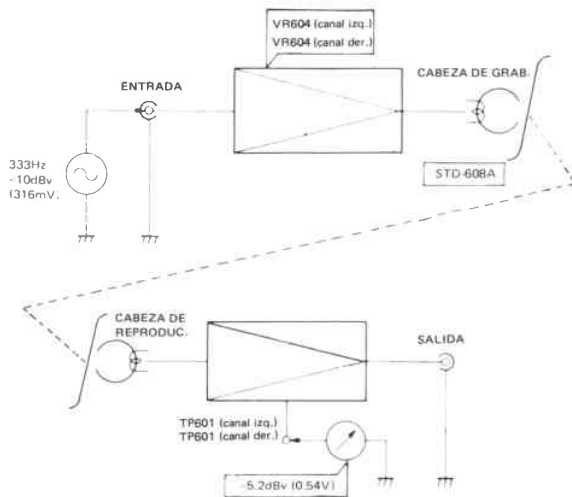


Fig. 12-4 Puntos de ajuste



Procedimiento:

1. Poner la cinta de prueba STD-608A y ajustar el control de nivel de entrada (INPUT) de modo que el voltímetro de CA indique -5,2dBv (549 mV).
2. Poner el interruptor DOLBY NR en la posición ON. Ajustar el CT-7R en la posición FWD y grabar y reproducir señales de entrada en la STD-608A. Ajustar el VR-604 (canal izq.) y el VR-604 (canal der.) de modo que el voltímetro indique -5,2dBv (549 mV).
3. Poner la cinta de prueba STD-603 y el interruptor DOLBY NR en la posición ON y el grabar y reproducir señales de entrada en la STD-603. Confirmar que el voltímetro de CA indique -5,2dBv ± 1,5dB (653 mV a 462 mV).
4. Poner la cinta de prueba STD-604 y el interruptor DOLBY NR en la posición ON y grabar y reproducir señales de entrada en la STD-604. Confirmar que el voltímetro de CA indique -5,2dBv ± 1,5dB (653 mV a 462 mV).

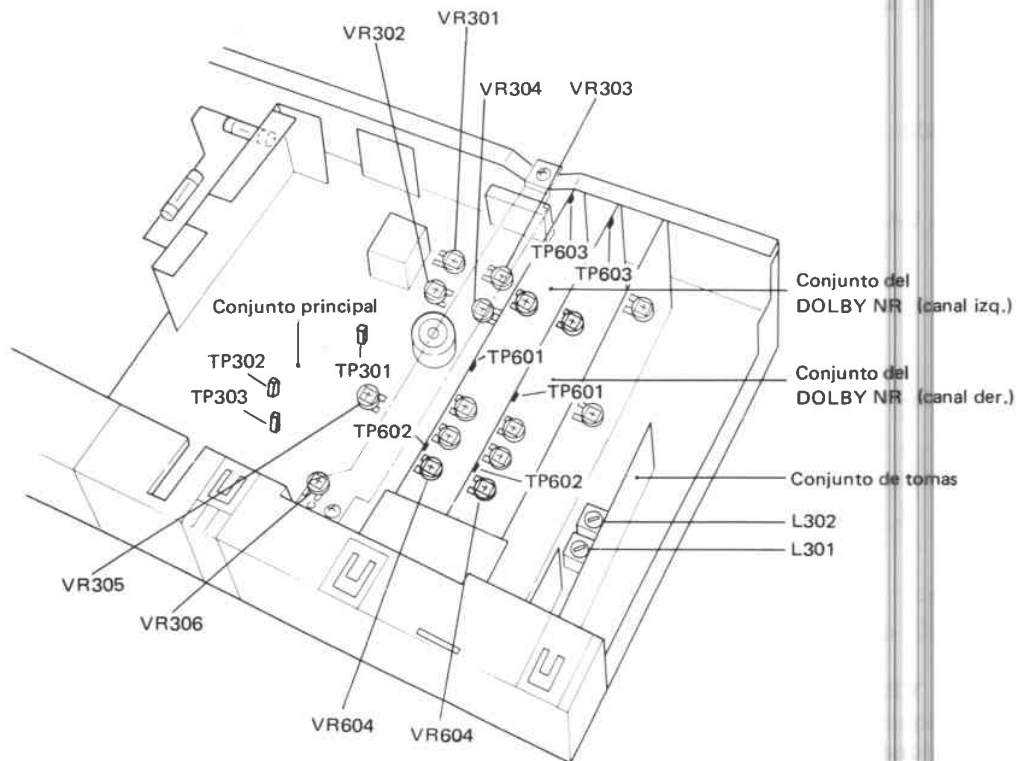
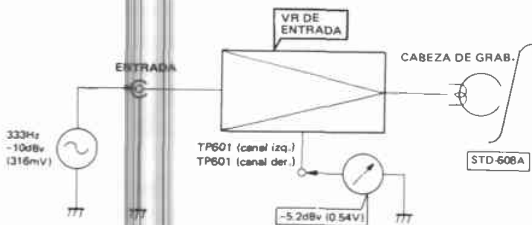


Fig. 12-6 Puntos de ajuste

12.9 COMPROBACIÓN DEL MEDIDOR DE NIVEL

Ajuste:

Modo Pausa de grabación
 Señal de entrada 333Hz, -10dBv (315 mV)
 (desde INPUT)
 Voltímetro de CA TP601 del conjunto L de DOLBY NR
 TP601 del conjunto R de DOLBY NR



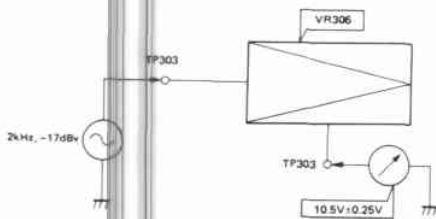
Procedimiento:

Ajustar el control de nivel de entrada (INPUT) de modo que el medidor de nivel indique 0 VU. Después comprobar que el voltímetro de CA indique $-5,2dBv \pm 2dB$.

12.10 AJUSTE DE DETECCIÓN DE LA CINTA GUIA

Ajuste.

Modo Parada
 Señal de entrada 2kHz, -17dBv (0,4V P-P, onda senoidal) a TP302 del conjunto principal
 Voltímetro de CA TP303 del conjunto principal



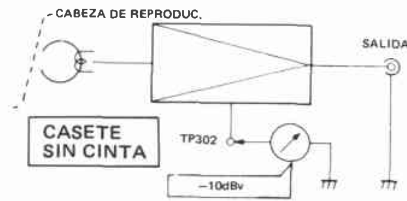
Procedimiento:

1. Extraer el conector CN315 del conjunto principal.
2. Ajustar el VR306 de modo que el voltímetro de CA indique $10,5V \pm 0,25V$.
3. Volver a poner el conector CN315 en su posición original.

Paso 2.

Ajuste:

Modo Reproducción
 Cinta Casete sin cinta
 Voltímetro de CA TP302 del conjunto principal



Procedimiento:

1. Confirmar que el voltímetro de CA indique -10dBv (0,6V P-P, onda cuadrada).
2. Si se sobrepasan los 10dBv, puentear la sección mostrada en la figura 12-7 mediante soldadura.

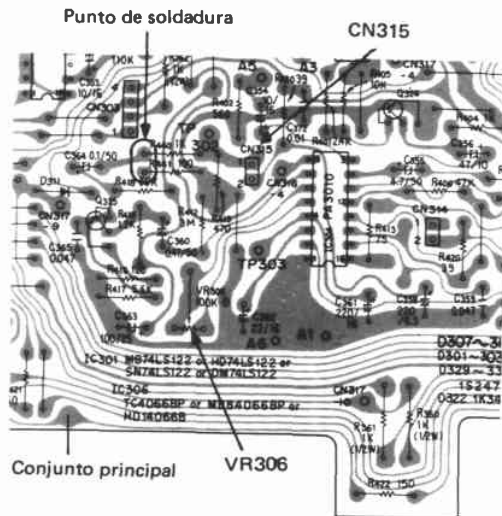
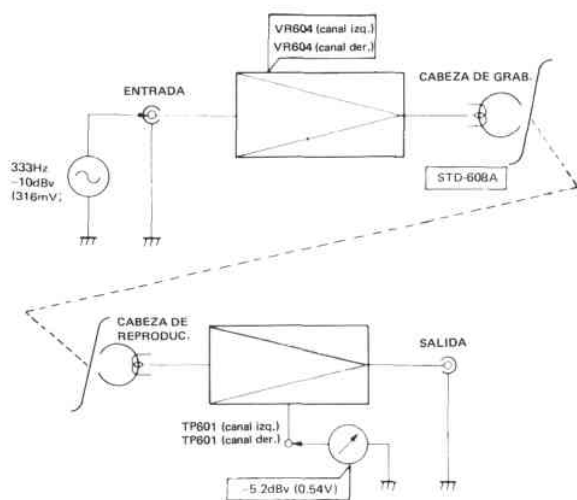


Fig. 12-7 Punto de soldadura



Procedimiento:

1. Poner la cinta de prueba STD-608A y ajustar el control de nivel de entrada (INPUT) de modo que el voltímetro de CA indique $-5,2\text{dBv}$ (549 mV).
2. Poner el interruptor DOLBY NR en la posición ON. Ajustar el CT-7R en la posición FWD y grabar y reproducir señales de entrada en la STD-608A. Ajustar el VR-604 (canal izq.) y el VR-604 (canal der.) de modo que el voltímetro indique $-5,2\text{dBv}$ (549 mV).
3. Poner la cinta de prueba STD-603 y el interruptor DOLBY NR en la posición ON y el grabar y reproducir señales de entrada en la STD-603. Confirmar que el voltímetro de CA indique $-5,2\text{dBv} \pm 1,5\text{dB}$ (653 mV a 462 mV).
4. Poner la cinta de prueba STD-604 y el interruptor DOLBY NR en la posición ON y grabar y reproducir señales de entrada en la STD-604. Confirmar que el voltímetro de CA indique $-5,2\text{dBv} \pm 1,5\text{dB}$ (653 mV a 462 mV).

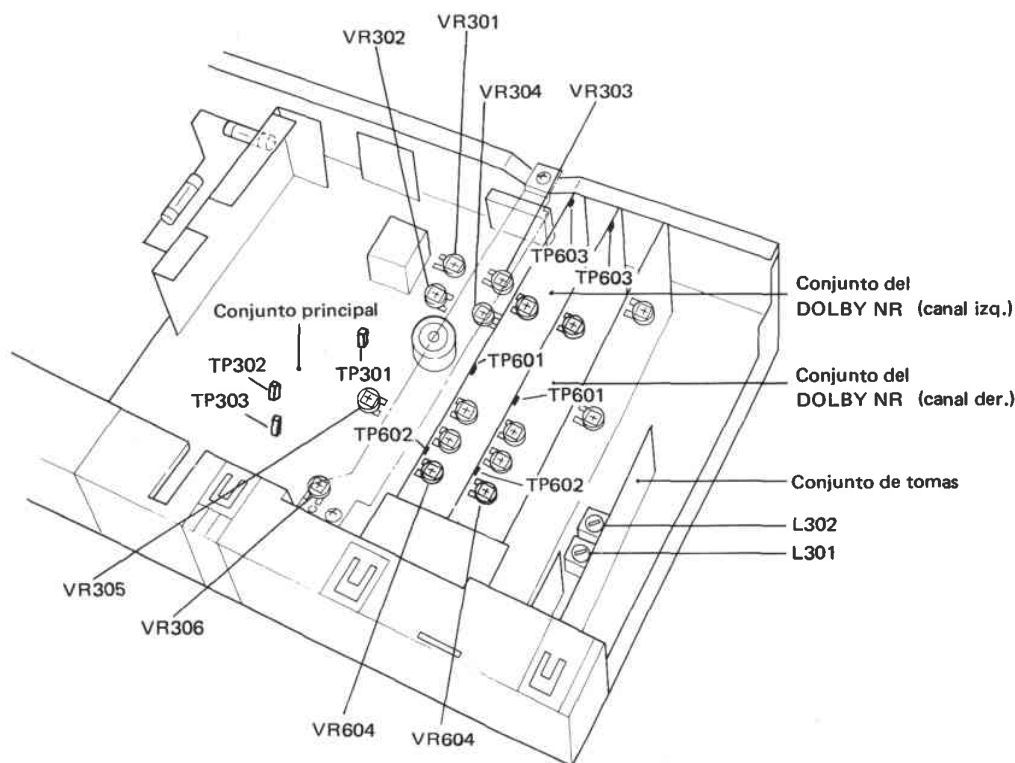


Fig. 12-6 Puntos de ajuste