

Service Manual

REPAIR & ADJUSTMENTS

**ORDER NO.
ARP-258-0**
STEREO CASSETTE TAPE DECK

CT-90R

MODEL CT-90R COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC120V only	U.S.A. model
KC	AC120V only	Canada model
HE	AC220V, 240V (switchable)	European continent model
HB	AC220V, 240V (switchable)	United Kingdom model
HP	AC220V, 240V (switchable)	Australia model
D	AC120V, 220V 240V (switchable)	General export model
D/G	AC120V, 220V, 240V (switchable)	U.S. Military model

- This service manual is applicable to the KU type. For servicing of the other types, please refer to pp. 76~86.
- For the circuit and mechanism descriptions, please refer to the CT-90R service manual (ARP-364-0).
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

CONTENTS

1. SPECIFICATIONS	3	9. ELECTRICAL PARTS LIST	34
2. FRONT PANEL FACILITIES	4	10. ADJUSTMENTS	40
3. DISASSEMBLY	8	RÉGLAGE	52
4. PARTS LOCATION	10	AJUSTE	64
5. EXPLODED VIEW	12	11. SUPPLEMENT FOR HE, HB AND HP TYPES . .	76
6. PACKING	18	12. SUPPLEMENT FOR KC TYPE	81
7. P.C. BOARDS CONNECTION DIAGRAM	20	13. SUPPLEMENT FOR D AND D/G TYPES	82
8. SCHEMATIC DIAGRAM	27		

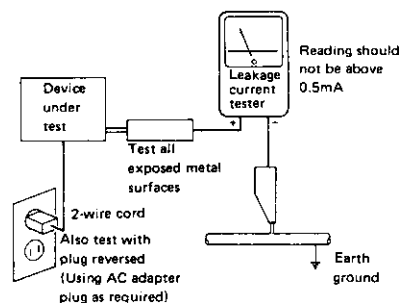
SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

1. SPECIFICATIONS

System	Compact cassette, 2-channel stereo
Heads	"Ribbon Sendust" recording/playback combination head x 1 erasing head x 2
Motor	DC servo capstan motor x 1 DC reel motor x 2
Wow/Flutter	No more than 0.03% (WRMS) No more than $\pm 0.16\%$ (DIN)
Fast Winding Time	Approx. 90 seconds (C-60 tape)
Frequency Response	
- 20 dB recording:	
Normal tape	20 Hz to 19,000 Hz (20 Hz to 18,000 Hz ± 3 dB)
Chrome tape	20 Hz to 19,000 Hz (20 Hz to 18,000 Hz ± 3 dB)
Metal tape	20 Hz to 20,000 Hz (20 Hz to 19,000 Hz ± 3 dB)
0 dB recording:	
Normal tape	20 Hz to 9,000 Hz
Chrome tape	20 Hz to 10,000 Hz
Metal tape	20 Hz to 15,000 Hz
Signal-to-Noise Ratio	
Dolby NR OFF	More than 58 dB
Noise Reduction Effect	
Dolby type B NR ON	More than 10 dB (at 5 kHz)
Dolby type C NR ON	More than 19 dB (at 5 kHz)
Harmonic Distortion (Metal tape)	No more than 0.8 % (0 dB)
Input (Sensitivity)	
MIC (L, R)	0.25 mV, 6 mm diam. jack (Source impedance 600 Ω)
LINE (INPUT)	70 mV (Input impedance 50 k Ω or more)
Output (Reference level)	
LINE (OUTPUT)	700 mV (Output impedance 10 k Ω or less)
Headphones	0.8 mW (Load impedance 8 Ω)

SUBFUNCTIONS

- Recording playback auto reverse (Quick reverse)
- AUTO BLE tuning system
- Dolby NR system (type B and C)
- Real time counter (indicates remaining tape)
- 16 segment, peak hold level meter (LED)
- Music search function
- Skip function
- Index scan
- Blank search
- Music repeat
- Auto tape selector function
- Wired remote control
- Timer standby function
- Output volume attached
- REC muting function

MISCELLANEOUS

Power Requirements	AC 120 V, 60 Hz
KU, KC models	AC 220/240 V, 50/60 Hz (switchable)
HE, HB and HP models	AC 220/240 V, 50/60 Hz (switchable)
D, D/G models	AC 120/220/240V, 50/60 Hz (switchable)
Power Consumption	
KU, KC models	55 watts
HE, HB and HP models	57 watts
D, D/G models	45 watts
Dimensions	420 (W) x 120 (H) x 355 (D) mm 16-9/16 (W) x 4-12/16 (H) x 14 (D) in
Weight (without packaging)	7.2 kg (15 lb 14 oz)

FURNISHED PARTS

Operating instructions	1
Connection cord assembly	2

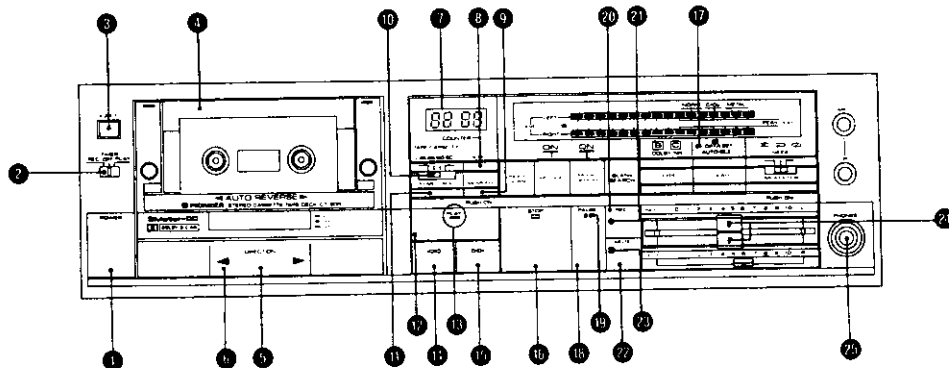
NOTES:

1. Reference Tapes:
Normal & LH: DIN 44513/BLATT6 or equiv.
CrO₂ DIN 44513/BLATT7 (CrO₂) or equiv.
2. Reference Recording Level: Meter 0 dB indicating level (160 nwb/m magnetic level = Philips cassette reference level)
3. Reference Signal: 315 Hz
4. Wow & Flutter: • JIS (3 kHz, with acoustic compensation (weighted) rms value); DIN 3,150Hz with acoustic compensation (weighted) PEAK value DIN 45507
5. Frequency Response: • Measured at - 20 dB level, DOLBY NR OFF, level deviation is ± 6 dB without indication.
6. Signal-to-Noise Ratio: • Measured at 3rd harmonic distortion 3% level, weighted (DIN 44513/BLATT7)
7. Sensitivity: Input level (mV) required for reference recording level with input (REC) level control set to maximum
8. Reference Output Level: Playback output level when output level control is set to maximum.
9. This model does not employ a recording/playback connector (DIN-type).

NOTE:

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

2. FRONT PANEL FACILITIES



1 POWER SWITCH (POWER)

The power is switched on when this switch is pressed. Release the switch to turn off the power.

- After the switch is set to the ON position, the muting circuit is activated and so the unit will not operate for about 4 seconds.
- When the POWER switch is set to OFF while the tape deck is operating, the operational mode is released and the unit is set to the stop mode.
- When the POWER switch is set to ON while the TIMER switch is at the REC or PLAY position, the recording or playback mode is established automatically. Make sure that the TIMER switch is at OFF when an unattended recording or wake-up playback operation is not to be performed.
- When the POWER switch is set to ON, the head section functions momentarily. This is normal and not an indication of a malfunction.

2 TIMER START SWITCH (TIMER)

This switch is used when an optional audio timer is employed for unattended recording or wake-up playback operations. Keep this switch at the OFF position when the timer is not being used.

REC: Set to this position to set the tape deck automatically to the recording mode at the time preset on the audio timer and to start the recording of programs unattended, for instance.

OFF: For when the timer is not being used.

PLAY: Set to this position to set the tape deck automatically to the playback mode at the time preset on the audio timer and to start the playback. The tape playback function can be used to wake-up in the morning instead of an alarm clock.

3 EJECT BUTTON (EJECT)

The cassette door opens when this button is pressed. When it is pressed while the tape is traveling or during a recording or playback standby operation, noise will be generated and possible malfunctioning may occur. Even if pressed, the cassette door will not open.

4 CASSETTE DOOR

5 DIRECTION SWITCH (DIRECTION)

Press this switch to select the direction in which the tape is to travel. When the tape is moving forward and the switch is pressed, the tape direction is reversed; when the tape is moving in the reverse direction, it starts moving forward. The direction indicator lights up to show the direction of the tape movement. Since the tape's direction can be reversed with a push of this switch, there is no need to turn over the tape and re-load it.

When this switch is pressed even in the playback or recording standby mode, the tape's direction is reversed.

6 DIRECTION INDICATORS

These indicate the direction of the tape transport.

7 DUAL MODE COUNTER (COUNTER)

This counter has two functions, "tape counter" and "real time counter," depending on the position of the counter mode switch (● TIME/TAPE).

When used as a "tape counter," the figures change as the tape travels and its transport position is indicated by a 4-figure number. When the RESET button is pressed, the counter is reset to "0000." When the power is switched on, the counter functions as a "tape counter."

When used as a "real time counter," the remaining time on the tape during recording or playback is indicated. Set the TAPE CAPACITY switch to the position corresponding to the type of tape length, (mm diameter) being used.

8 RESET BUTTON (RESET)

Press this to reset the tape counter to "0000." Before recording or playback, press this button to reset the tape counter to "0000." It will then be easy to find programs on the tape if a note is made of the tape counter numbers and of the recording or playback contents. The numbers provide you with a guideline for finding programs afterward which you want to listen to. The tape counter can be reset to "0000" even when it is being used as a real time counter. In this case, "0000" is displayed only while the RESET button is in the depressed position.

9 MEMORY SWITCH

Memory stop operations can be performed when this switch is pressed to the ON position. The tape counter is set to "0000" beforehand and the tape is rewound. As soon as the tape is rewound to the "0000" position, it stops automatically. Use this function to rewind a recorded program and play it back immediately or to repeatedly listen to the same program. Normally, this switch is kept at the released OFF position. The memory stop function also operates in the fast forward mode.

10 REMAINING TAPE DISPLAY SWITCH (TAPE CAPACITY)

When the dual mode counter is being used as a real time counter, this switch is set to the position corresponding to the type of cassette tape being used.

11 COUNTER MODE SWITCH (● TIME/TAPE)

Push this switch to select the dual mode counter function.

12 PLAY SWITCH (PLAY)

Depress this switch to playback a tape.

13 PLAY INDICATOR (■)

14 REW SWITCH (<<)

Depress this switch to rewind the tape at high speed (The tape will travel from right to left).

15 FF SWITCH (>>)

Depress this switch to send the tape-forward at high speed (The tape will travel from left to right).

16 STOP SWITCH (STOP)

Depress this switch to stop the tape travel and to release the operating switches.

17 AUTO BLE DATA INDICATOR

18 PAUSE SWITCH (PAUSE)

Press to temporarily stop the tape transport in the playback or recording mode. At times like this, the pause indicator (■) lights. When pressed again, the pause function is released and the tape starts to travel again. The switch does not function in the fast forward or rewind modes. When it is pressed in the stop mode, the pause indicator lights; when it is pressed again, the unit is reset to the stop mode and the tape does not move.

19 PAUSE INDICATOR (■)

This lights when the unit is set to the pause mode.

20 RECORDING SWITCH (REC)

This switch is depressed to record a tape. The recording indicator (●) will light. The switch cannot be placed in the ON position if the accidental erasure prevention tabs on the cassette have been broken off, or if no cassette is in the unit.

21 RECORDING INDICATOR (●)

This lights when the unit is set to the recording mode.

22 RECORDING MUTE SWITCH (REC MUTE)

When this switch is pressed during recording, unrecorded blanks can be created for as long as the switch is kept depressed. While depressed, the MUTE indicator (■) lights. Use this switch for efficient editing of tapes with sufficient blanks between the programs and for providing the unrecorded blanks which are required to operate the index scan, music search/skip, music repeat and blank search accessory functions.

This switch does not lock and so functions only while it is kept in the depressed position. When pressed during a recording, no sound is recorded and so the switch should not be pressed unless absolutely necessary.

23 RECORDING MUTE INDICATOR (■)

This lights while the REC MUTE switch is pressed during a recording.

24 RECORDING LEVEL CONTROLS (INPUT)

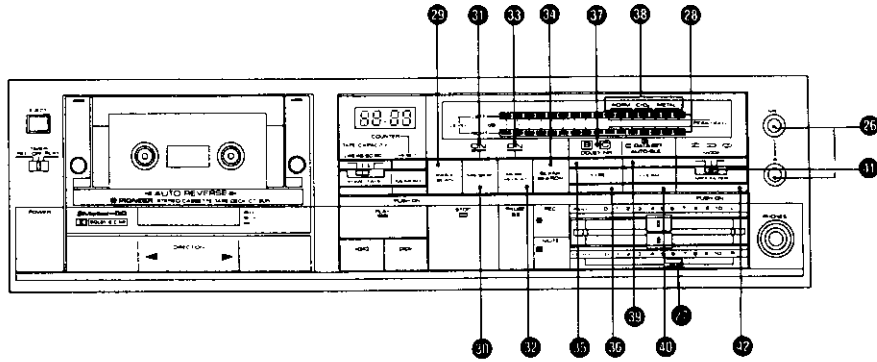
These controls adjust the input from the rear panel INPUT terminals or from the MIC jack. When slid toward the right, the recording level is increased; when slid toward the left, it is reduced. The top control is for the left (L) channel and the bottom control for the right (R) channel.

25 HEADPHONE JACK (PHONES)

This is the output jack for the stereo headphones. Plug the headphones into this jack to monitor the quality of a recording or to listen to a tape privately.

NOTE:

- Use headphones with a low impedance. Sufficient volume will not be obtained with high-impedance headphones.



25 MIC JACKS

These are the input jacks for microphone recording. Plug the left channel microphone into the L jack and the right channel microphone into the R jack.

27 OUTPUT LEVEL CONTROL (OUTPUT)

This is used to adjust the tape deck's output level. Normally, it is kept at the "6" position.

28 LEVEL METERS

These indicate the recording level during recording and the output level during playback. The left channel is indicated at the top and the right channel at the bottom. The meter has a high response speed and it indicates the ever-changing peak values faithfully so that level adjustments can be performed accurately. To make the levels easier to read out, a double indication system is adopted where, separate from the meter lighting, peak values of 0 dB or more are held on the meter for about 2 seconds.

29 INDEX SCAN SWITCH (INDEX SCAN)

Press this switch to listen to the beginnings of programs on a tape such as a music tape and to find the program which you want to listen to. When the switch is pressed, the tape is fast forwarded or rewound in the direction selected by the DIRECTION switch and the start of the program is searched. When the start of one program is played back for about 7 seconds, the tape is again fast forwarded or rewound.

The following mode change is repeated: fast forward (rewind) - play (approx. 7 seconds) - fast forward (rewind) - play (approx. 7 seconds). Press the PLAY switch when the desired program has been located.

If the tape direction is selected by the FF or REW switch during index scanning, the scanning operation will function in that direction too.

30 MUSIC SEARCH/SKIP SWITCH (MS/SKIP)

Push this switch and the FF switch (▶▶) or REW switch (◀◀). The unit is automatically set to the playback mode when it locates an unrecorded blank between the programs over 4 seconds long while the tape is being fast forwarded or rewound. This function is known as "music search."

When the unrecorded blank continues for more than 8 seconds in the playback mode, the tape is fast forwarded or rewound in the direction selected by the DIRECTION switch. When the next program is detected, the unit is again set to the playback mode. This function is convenient for listening efficiently to tapes with long unrecorded blanks between programs, and it is known as the "skip function."

When the MS/SKIP switch is pressed, the 31 indicator lights. To release these functions, press the switch again.

31 MUSIC SEARCH/SKIP INDICATOR (ON)

32 MUSIC REPEAT SWITCH (MUSIC REPEAT)

When this switch is pressed during tape playback, the 33 indicator lights and the desired program can be played back repeatedly up to 8 times.

33 MUSIC REPEAT INDICATOR (ON)

34 BLANK SEARCH SWITCH (BLANK SEARCH)

When this switch is pressed, the unit is set to the fast forward mode. When an unrecorded blank of more than 8 seconds is detected in this mode, the tape is rewound and an unrecorded blank of 4 seconds is automatically set.

35 *DOLBY NR SWITCH (DOLBY NR ON/OFF)

Press this switch to the ON (■) position when recording material with the Dolby noise reduction system or when playing back a tape which has been recorded with the system. Release the switch to the OFF (□) position when recording material without the Dolby system or when playing back a tape which has not been recorded with the system.

- If you make a note on the tapes of material recorded with the Dolby system, there will be less chance that the DOLBY NR switch will be set to the wrong position during playback.
- When a recording has been made with the system, ensure that it is played back with the system. Proper sound will not be reproduced if a tape recorded with the Dolby system is played back with the switch at the OFF position or if a tape recorded with the switch at the OFF position is played back with the Dolby system.

*The word "Dolby" and are trademarks of Dolby Laboratories Licensing Corporation. Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

36 DOLBY B/C SELECTOR SWITCH (DOLBY NR B/C)

This deck comes with both type B and type C Dolby noise reduction systems. After the DOLBY NR ON/OFF switch has been pressed, select type B or C using this switch. When pressed in (■), type C is selected; when released (□), type B is selected. The Dolby indicator corresponding to the switch position lights.

37 DOLBY INDICATORS (DOLBY NR)

These light when the DOLBY NR switch is set to ON (■).
 (B): This lights when the B type Dolby noise reduction system is operating.
 (C): This lights when the C type Dolby noise reduction system is operating.

38 TAPE INDICATORS (NORM/CR₂/METAL)

This mechanism uses the sensor holes on the cassette to detect the type of tape being used. It then automatically adjusts the proper recording bias and equalization for the tape. The type of tape is then shown on the tape indicator.

NORM: This indicator lights when normal tapes are used.
CR₂: This indicator lights when Cr₂ tapes are used.
METAL: This indicator lights when metal tapes are used.

NOTE:
 When using metal tapes without sensor holes, the tape selector will be set on the Cr₂ position. In this case, optimum recording and erasure may not be possible. We thus recommend that you use metal tapes with sensor holes. Pre-recorded metal tapes can be played as is on this unit.

39 AUTO BLE SWITCH

This is used when setting the bias, level and equalization automatically in accordance with the type of tape being used. **AUTO BLE** is an abbreviation for Automatic Bias Level Equalizer Tuning System.

40 AUTO BLE CLEAR SWITCH (CLEAR)

When this switch is pressed, the data set by the AUTO BLE system are cleared. After clearing, the bias, level and equalization are all set to the standard values selected by the auto tape selector.

41 MODE SWITCH (MODE)

This selects the tape transport mode during playback or recording.

- ▶ : One-way playback (one-way recording)
 When the tape is wound up onto one of the reels, the autostop mechanism is activated and the tape is automatically stopped. Set the switch to this position for playing back (recording) one side of a tape.
- ◁ : Auto reverse (both-ways playback, both-ways recording)
 When the tape finishes running in the forward direction and is fully wound up, its running direction is automatically reversed. When the tape comes to the end in the reverse direction, the auto-stop mechanism is activated and the tape is stopped automatically. When a start has been made from reverse playback (recording), the tape stops automatically at the end.
- ↻ : Auto repeat
 This function allows both sides A and B to be repeatedly played back four times each (8 times together). Side A is played back first, this is followed by side B and then side A is played back again, etc. When the tape comes to the end, the auto-stop mechanism is activated and the tape is stopped automatically.
- When the PAUSE switch is pushed during playback to set the unit to the pause mode and then the same switch is released to resume playback, sides A and B of a tape can be played back four times each (8 times together) anew.
- In the recording mode the tape runs through both sides and then stops whether the MODE switch is at the ◁ or ▷ position.

NOTE:
 The auto-stop mechanism (leader tape sensing mechanism) may malfunction in the following cases:
 • When a strong beam of light has been shone near the heads.
 • When any characters or marks have been printed on the leader tape.
 The tape direction is automatically reversed at the tape end even if there is a malfunction because of the leader tape sensing. (The tape stops at the ◁ MODE switch position but reverses at the ▷ or ↻ position.)

42 MULTIPLEX FILTER SWITCH (MPX FILTER)

Push this switch when recording FM stereo broadcasts or TV programs using the Dolby noise reduction system. Contained among the FM stereo signals are a 19 kHz pilot signal and the 38 kHz subcarrier. The MPX FILTER switch is pressed in order to safeguard against incorrect operation of the Dolby circuit due to these signals. Release the switch for any other recording. The switch does not function during playback.

3. DISASSEMBLY

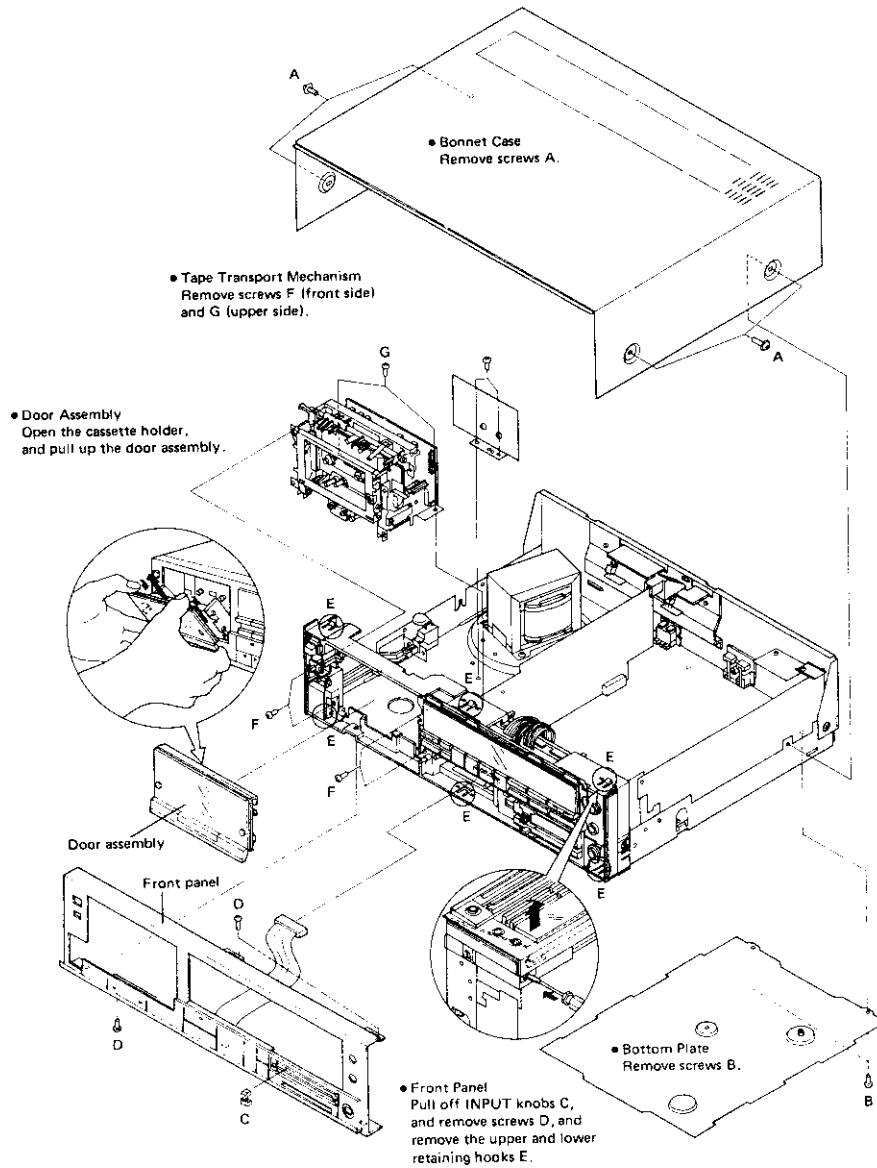


Fig. 3-1 Disassembly

Removing the Head Assembly

1. Remove the two azimuth adjustment screws and remove the stopper holder.
2. Remove the stopper.
3. Push the slide plate all the way to the right (the forward position) and pull the head assembly in the direction of the arrow to remove it.

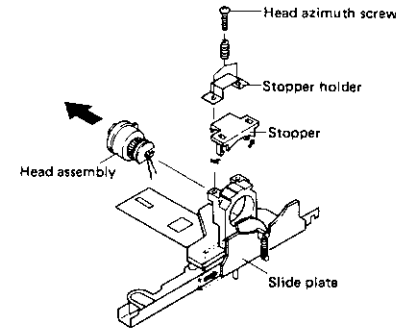


Fig. 3-2 Disassembly of the head assembly

Removal of the Capstan Belt

Undo screws (F), remove the capstan motor control assembly, and then remove the capstan belt.

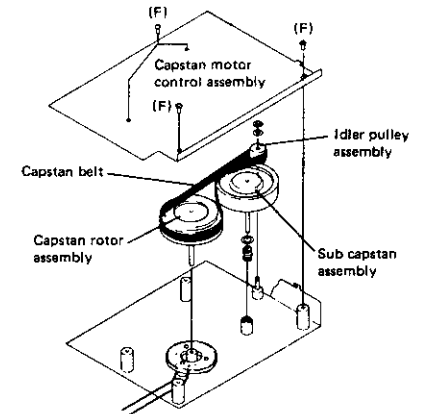


Fig. 3-4 Removal of the capstan belt

Reassembly Precautions

When replacing the head assembly, be sure the gears mesh as shown in Fig. 3-3.

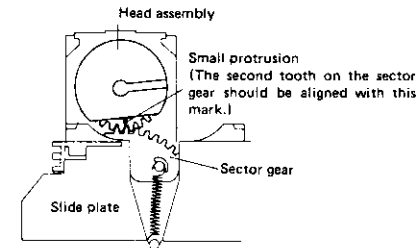
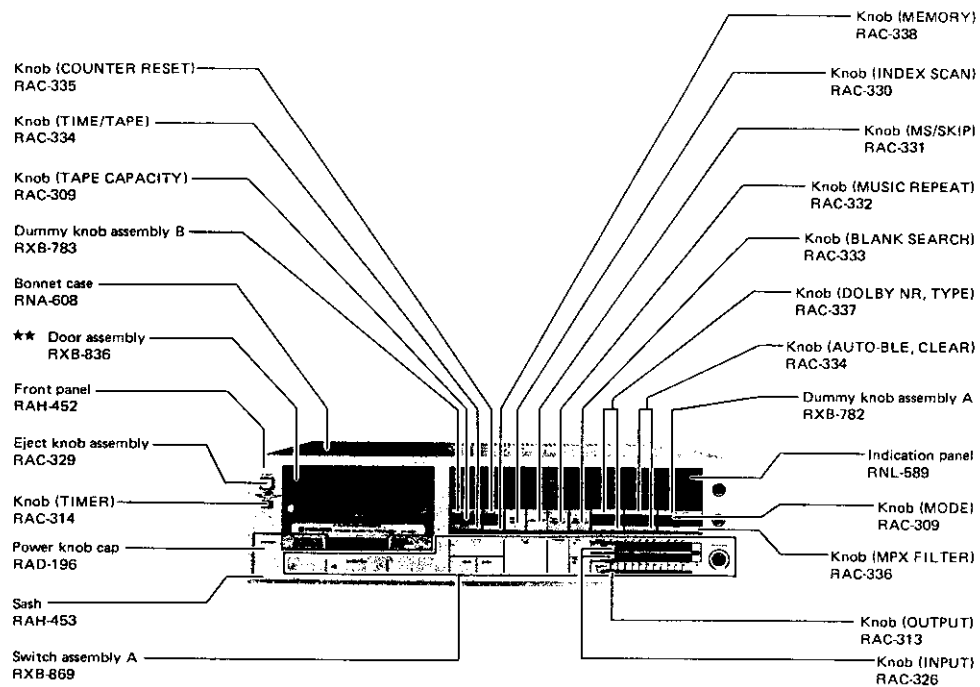


Fig. 3-3 Relationship between head assembly and sector gear

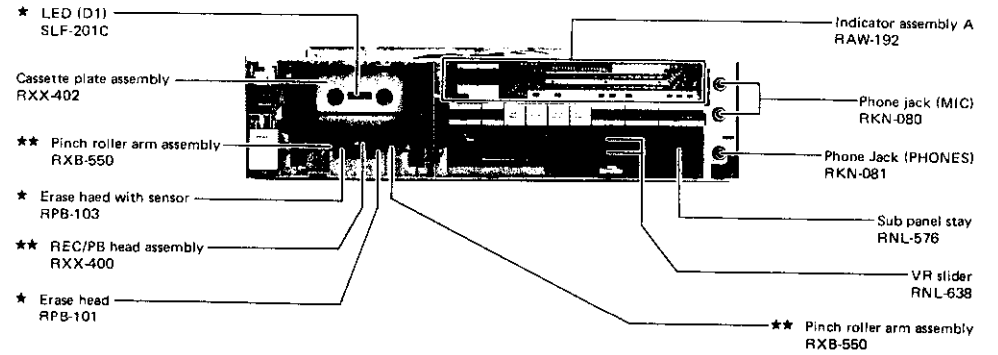
4. PARTS LOCATION

- 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.

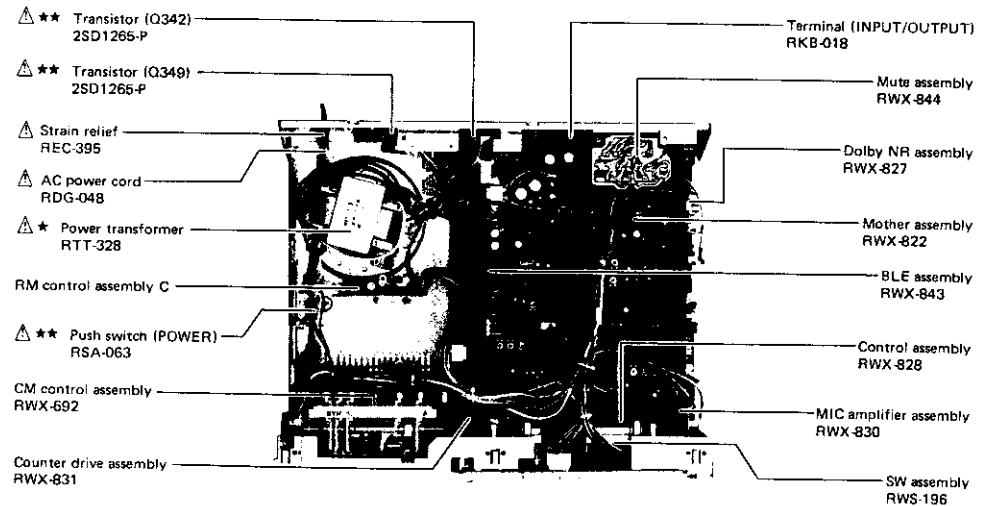
Front Panel View



Front View with Panel Removed



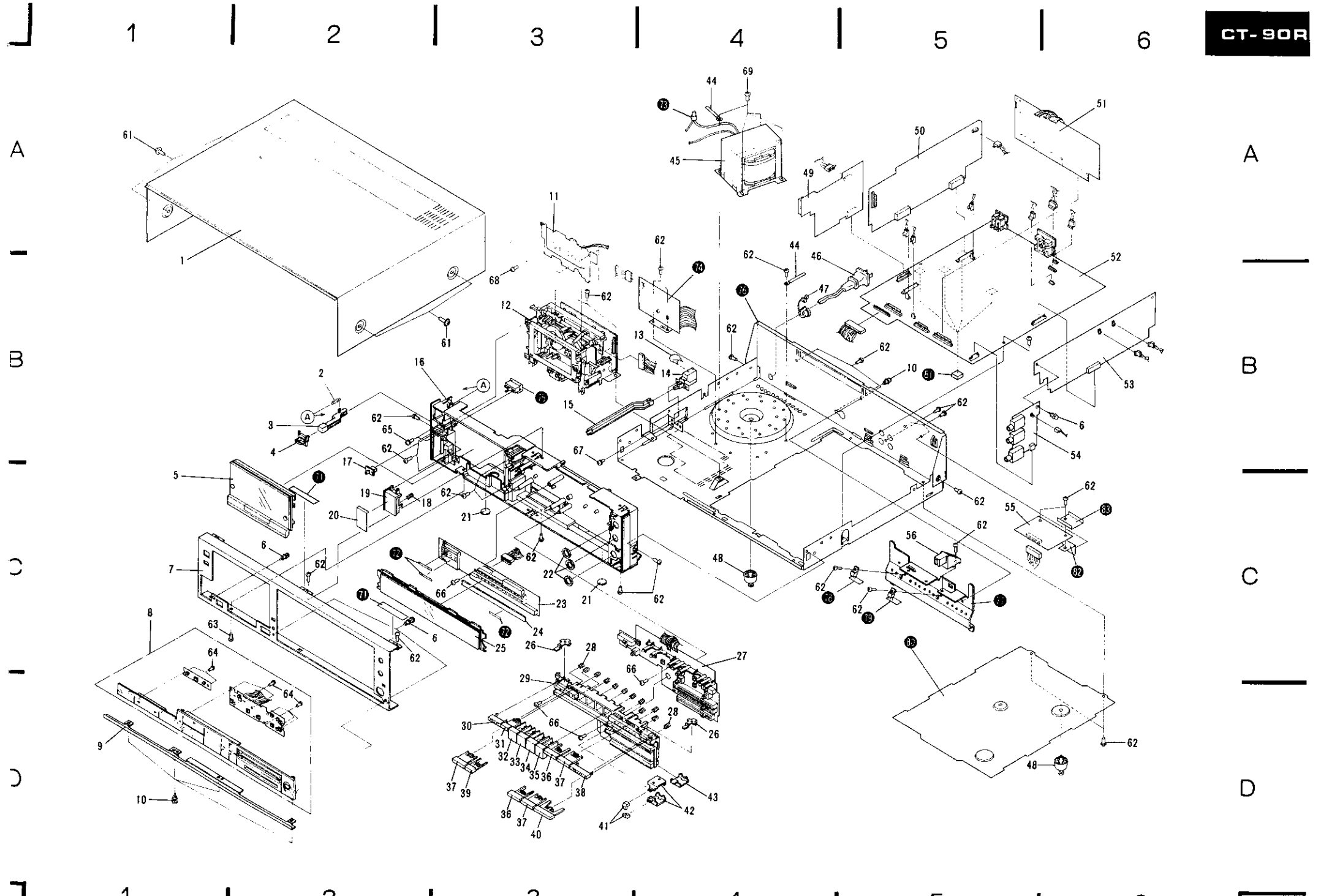
Top View



5. EXPLODED VIEW

- Parts without part number cannot be supplied.
- The Δ make 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.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	RNA-608	Bonnet case		41.	RAC-326	Knob (INPUT)
	2.	RBH-901	Eject spring		42.	RNL-638	VR slider
	3.	RAC-329	Eject knob assembly		43.	RAC-313	Knob (OUTPUT)
	4.	RNL-590	Spacer		44.	RNE-513	Cord fixer
**	5.	RXB-836	Door assembly	Δ *	45.	RTT-328	Power transformer
	6.	RBM-012	Plastic rivet	Δ	46.	RDG-048	AC power cord
	7.	RAH-452	Front panel	Δ	47.	REC-395	Strain relief
	8.	RXB-869	Switch assembly A		48.	REC-369	Foot assembly
	9.	RAH-453	Sash		49.	RWX-831	Counter drive assembly
	10.	RBM-011	Plastic rivet		50.	RWX-843	BLE assembly
	11.	RXX-402	Cassette plate assembly		51.	RWX-828	Control assembly
	12.	Refer pp. 15-18.	Tape transport mechanism		52.	RWX-822	Mother assembly
Δ	13.	RCG-006	Ceramic capacitor (C1)		53.	RWX-827	Dolby NR assembly
Δ **	14.	RSA-063	Push switch (S1, POWER)		54.	RWX-830	MIC amplifier assembly
	15.	RNL-623	Rod		55.	RWX-844	Mute assembly
	16.	RNT-033	Panel stay		56.	RNL-750	P.C. board holder (A)
	17.	RAC-314	Knob (TIMER)		57.	.....
	18.	RBH-982	Spring		58.	.....
	19.	RAC-315	Knob (POWER)		59.	.....
	20.	RAD-196	POWER knob cap		60.	.....
	21.	REC-355	Skid		61.	FBT40P080FNI	Screw 4 x 8
	22.	RBN-006	Nut		62.	BBZ30P080FMC	Screw 3 x 8
	23.	RAW-192	Indicator assembly A		63.	VB130P060FMC	Screw 3 x 6
	24.	REC-399	Diffusion sheet		64.	PBZ20P060FMC	Screw 2 x 6
	25.	RNL-589	Indication panel		65.	PMB26P050FMC	Screw 2.6 x 5
	26.	RAC-309	Knob (TAPE CAPACITY, MODE)		66.	VPZ30P080FMC	Screw 3 x 8
	27.	RWS-196	SW assembly		67.	PMB30P050FMC	Screw 3 x 5
	28.	RBH-981	Spring		68.	BBZ26P060FNI	Screw 2.6 x 6
	29.	RNL-576	Sub panel stay		69.	VB240P080FMC	Screw 4 x 8
	30.	RXB-783	Dummy knob assembly B		70.	.....
	31.	RAC-335	Knob (COUNTER RESET)		71.		Cushion
	32.	RAC-330	Knob (INDEX SCAN)		72.		Felt
	33.	RAC-331	Knob (MS/SKIP)		73.		Connection cap
	34.	RAC-332	Knob (MUSIC REPEAT)		74.		RM control assembly C
	35.	RAC-333	Knob (BLANK SEARCH)		75.		Timer switch assembly
	36.	RAC-337	Knob (DOLBY NR, TYPE)		76.		Chassis
	37.	RAC-334	Knob (AUTO-BLE TIME/TAPE, CLEAR)		77.		Heat sink
	38.	RXB-782	Dummy knob assembly A		78.		Transistor B assembly
	39.	RAC-338	Knob (MEMORY)		79.		Transistor A assembly
	40.	RAC-336	Knob (MPX FILTER)		80.		Bottom plate
					81.		Spacer
					82.		P.C. board holder
					83.		Stopper
					84.	
					85.	



A

B

C

D

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5

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1

2

3

4

5

6

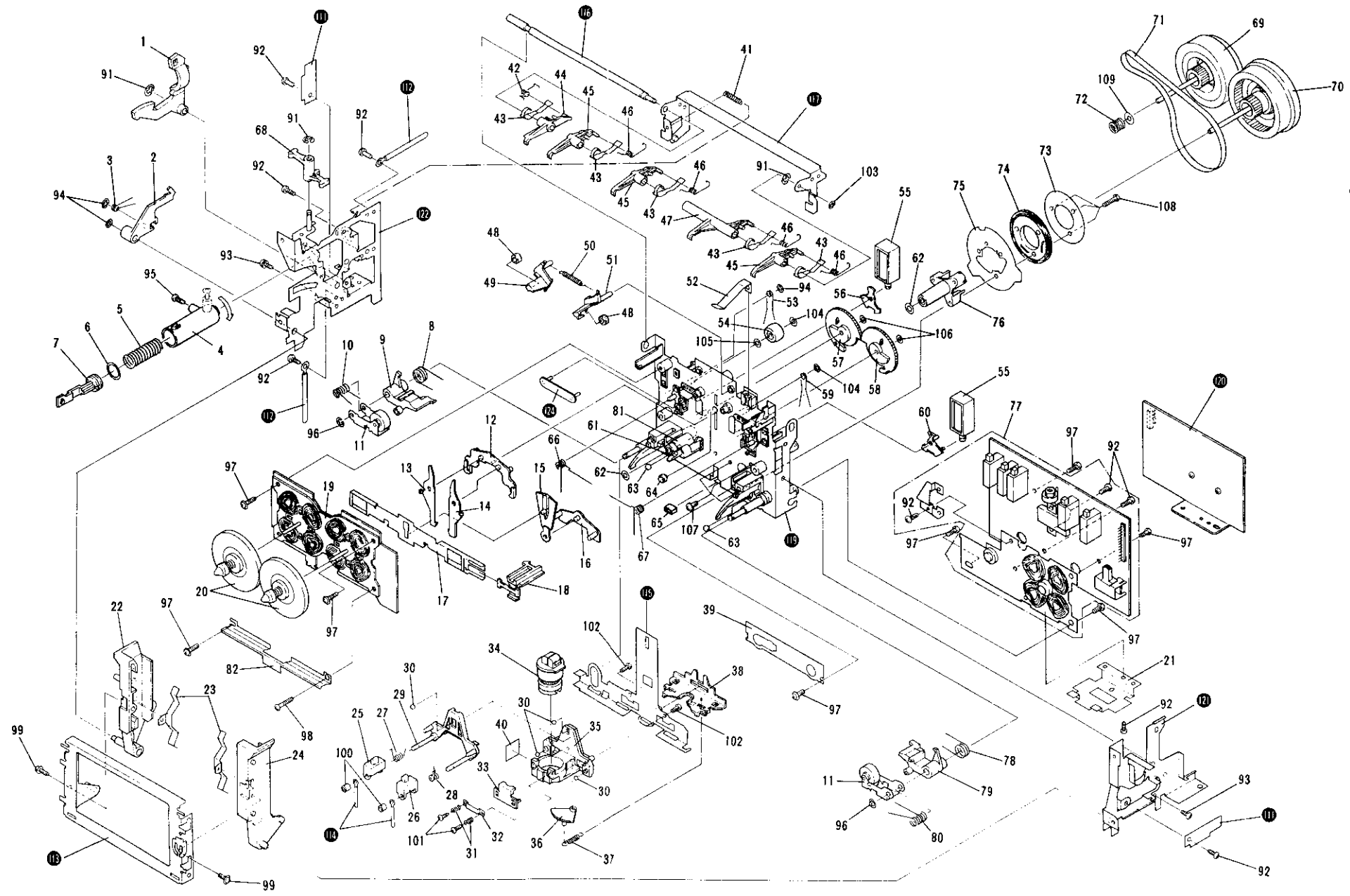
1 | 2 | 3 | 4 | 5 | 6

A

B

C

D



1 | 2 | 3 | 4 | 5 | 6

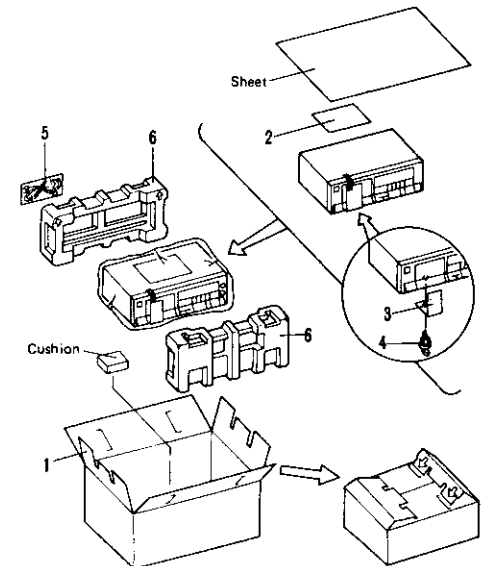
Parts List of Tape Transport Mechanism

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	RNL-266	Lock arm		46.	RBH-945	Switch lever spring B
	2.	RNL-266	Eject prevent lever		47.	RNL-608	Metal detector arm
	3.	RBH-957	Lever spring		48.	REB-473	Brake shoe (B)
	4.	RNL-261	Cylinder		49.	RNL-433	Brake plate L
	5.	RBH-937	Damper spring		50.	RBH-927	Brake spring
	6.	REB-447	O-ring		51.	RNL-434	Brake plate R
	7.	RNL-510	Piston		52.	RBK-176	Half set spring
	8.	RBH-861	Pinch return spring (L)		53.	RBH-847	Spring (R)
	9.	RNL-267	Sub pinch arm		54.	RXB-620	Idler pulley assembly
	10.	RBH-851	Pinch pressure spring (L)	★	55.	RXP-111	Plunger solenoid
★★	11.	RXB-550	Pinch roller arm assembly		56.	RNL-256	Trigger lever (L)
	12.	RNG-319	Cam follow lever		57.	RNL-307	Assist gear (L)
	13.	RNL-435	Hook (L)		58.	RNL-308	Assist gear (R)
	14.	RNL-436	Hook (R)		59.	RBH-846	Spring (L)
	15.	RNL-255	Connection plate		60.	RNL-257	Trigger lever (R)
	16.	RNL-306	Pinch plate		61.	RNL-309	Reference pin
	17.	RNH-077	Change plate		62.	RFB-030	Oil stopper washer
	18.	RNL-509	Actuator		63.	REF-023	Steel ball (4φ)
★★	19.	RXX-359	Reel motor assembly		64.	RLB-434	Guide roller
	20.	RXX-365	Rotor assembly		65.	REB-260	Stopper
	21.	RNH-252	Shield plate		66.	RBH-961	Ratch spring (L)
	22.	RNL-541	Pocket L		67.	RBH-962	Ratch spring (R)
	23.	RBK-174	Pressure spring		68.	RNL-264	Eject lever
	24.	RNL-542	Pocket R		69.	RXB-696	Sub capstan assembly
★	25.	RPB-103	Erase head with sensor		70.	RXX-395	Capstan rotor assembly
★	26.	RPB-101	Erase head	★★	71.	REB-480	Capstan belt
	27.	RBH-863	Height adjust spring (L)		72.	RBH-923	Spring (B)
	28.	RBH-864	Height adjust spring (R)		73.	RNH-064	FG plate
	29.	RXB-671	Erase head base assembly		74.	RXX-334	FG coil assembly
	30.	REF-022	Steel ball (3φ)		75.	RNH-202	FG shield plate
	31.	RBH-853	Azimuth spring		76.	RXB-697	Housing
	32.	RNH-140	Stopper holder		77.	RWX-692	CM control assembly
	33.	RNL-262	Stopper		78.	RBH-862	Pinch return spring (R)
★★	34.	RXX-400	REC/PB head assembly		79.	RNL-268	Sub pinch arm R
	35.	RXB-661	Housing		80.	RBH-852	Pinch pressure spring (R)
	36.	RNL-312	Sector gear		81.	RXB-699	Metal sleeve assembly
	37.	RBH-906	Gear spring		82.	RNH-220	Shield plate F
	38.	RNL-317	Slide plate		83.	.....
	39.	RNH-146	Head base spring		84.	.....
	40.	REC-377	Shield sheet		85.	.....
	41.	RBH-946	Arm spring		86.	.....
	42.	RBH-944	Switch lever spring A		87.	.....
	43.	RNH-198	Switch lever		88.	.....
	44.	RNL-506	REC detector arm		89.	.....
	45.	RNL-507	Chrome detector arm		90.	.....

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	91.	YE30FUC	Washer E-type		111.	.....
	92.	VCZ30P060FMC	Screw 3 x 6		112.	.....	Cord fixer
	93.	PMA30P060FMC	Screw 3 x 6		113.	.....	Holder B assembly
	94.	YS24FBT	Washer C-type		114.	.....	Cord fixer
	95.	VCZ26P060FMC	Screw 2.6 x 6		115.	.....	Head base assembly
	96.	YE25FUC	Washer E-type		116.	.....	Main shaft
	97.	ATZ26P080FMC	Screw 2.6 x 8		117.	.....	Arm assembly
	98.	VCZ26P140FMC	Screw 2.6 x 14		118.	.....
	99.	ATZ30P080FMC	Screw 3 x 8		119.	.....	Chassis
	100.	RBA-073	Special nut		120.	.....	RM control assembly C
	101.	RBA-080	Azimuth screw		121.	.....	Side frame R
	102.	BMZ26P050FMC	Screw 2.6 x 5		122.	.....	Side frame L assembly
	103.	YE20FUC	Washer E-type		123.	.....	Cushion
	104.	WA017D034D025	Washer		124.	.....	Stopper
	105.	WA21D040D025	Washer		125.	.....
	106.	RFB-058	Washer		126.	.....
	107.	PMA26P050FMC	Screw 2.6 x 5		127.	.....
	108.	BMZ26P080BNI	Screw 2.6 x 8		128.	.....
	109.	RFB-059	Washer		129.	.....
	110.	.....			130.	.....

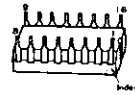
6. PACKING

Mark	No.	Part No.	Description
	1.	RHG-620	Packing case
	2.	RRB-213	Operating instructions
	3.	RRR-006	Label
	4.	RNL-480	Head base stopper (B)
	5.	RDE-010	Connection cord
	6.	RHA-251	Pad

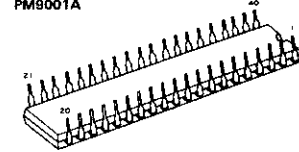


External Appearance of Transistors and ICs

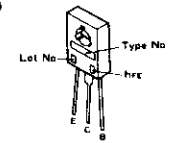
PA2011
PA2009
PA3010
M54517P
BA619



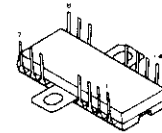
PM8001A



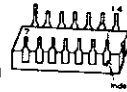
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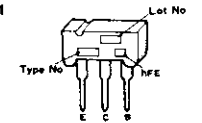
PA2012



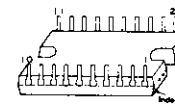
μPD4011BC
μPD4001C
TC4001BP
HD14001B
MB84001BM



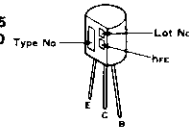
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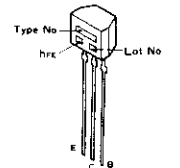
PA2010



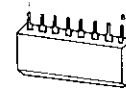
2S1815
2SA1015
2SC2240



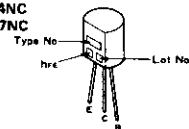
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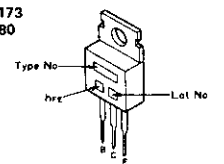
M5218L



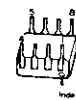
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2SA1127NC



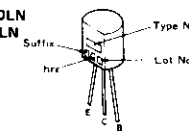
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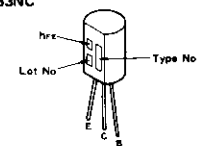
NJM4558D
BA4558
AN655Z
NJM2903



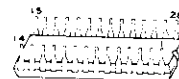
2SC1740LN
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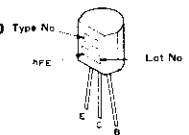
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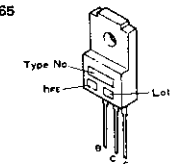
PA3012
PD4012



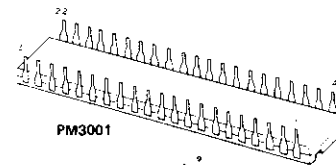
2SA934
2SC2060



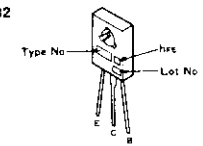
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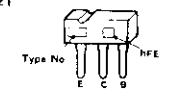
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PD6008A



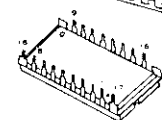
2SD882



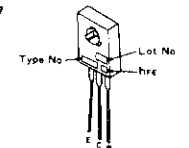
2SC2021



PM3001



2SC2497

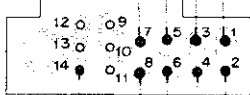


7. P.C.BOARDS CONNECTION DIAGRAM

TRANSISTOR A ASS'Y

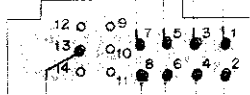


CONNECTOR ASS'Y



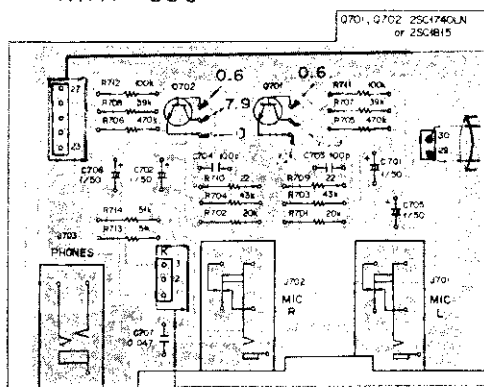
A

CONNECTOR ASS'Y



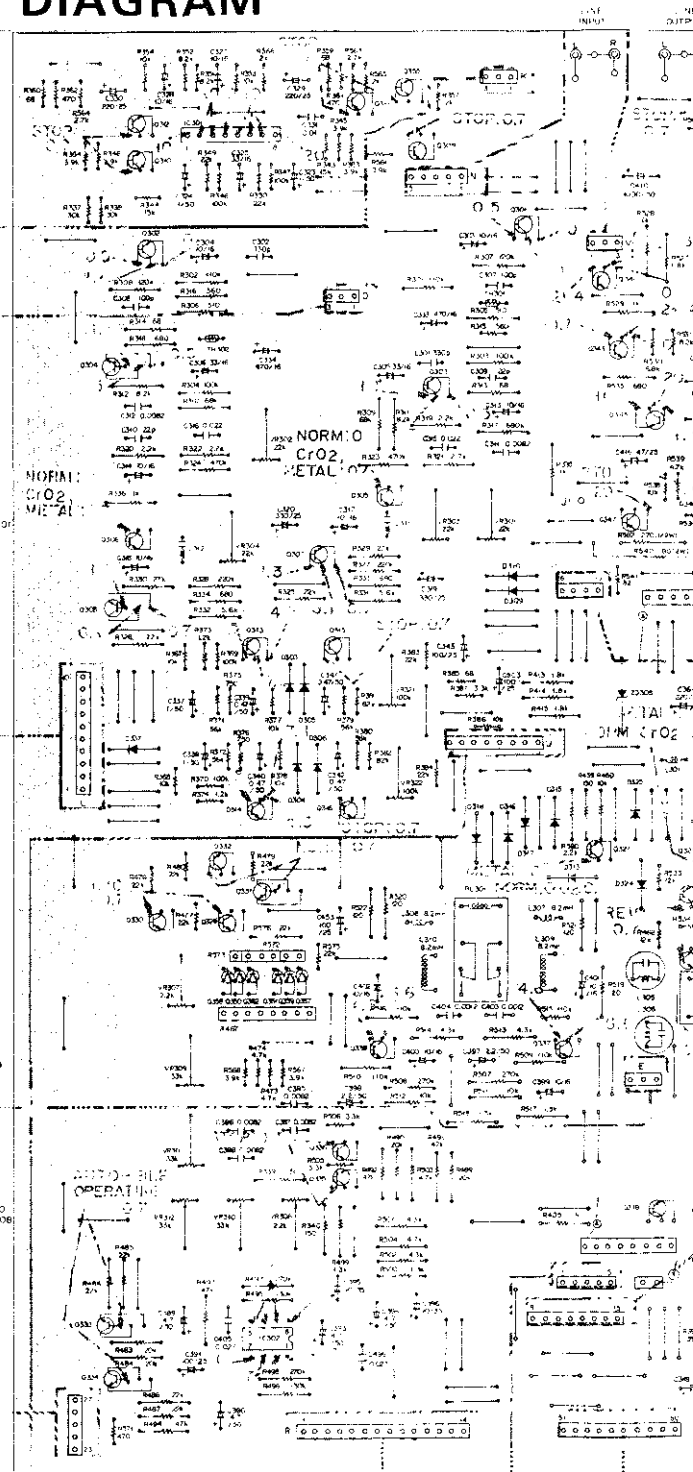
B

MIC AMP ASS'Y RWX - 830



C

MOTHER ASS'Y RWX - 822



D

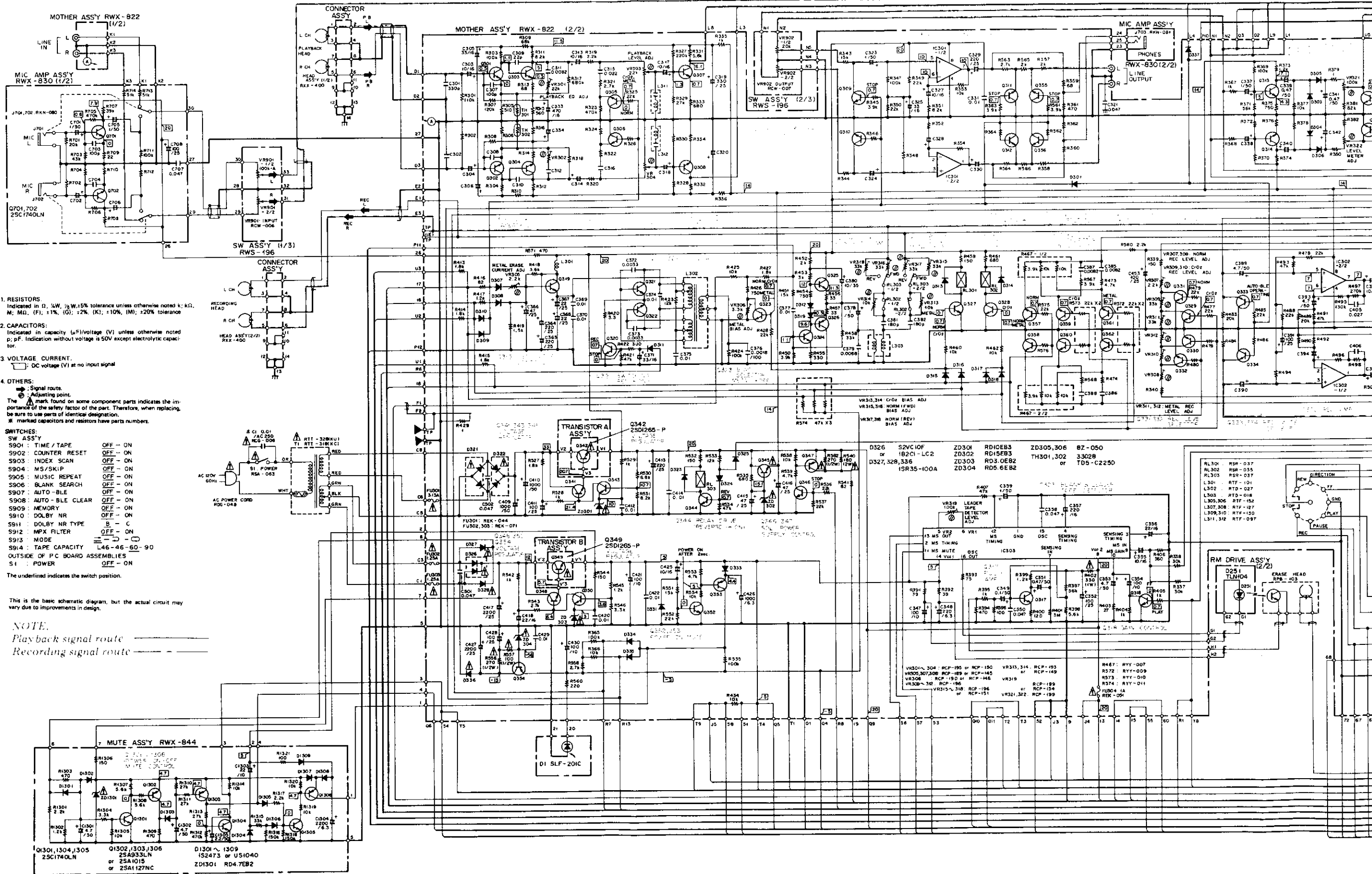
8. SCHEMATIC DIAGRAM

A

B

C

D



- RESISTORS:**
Indicated in Ω, ¼W, ½W, 1% tolerance unless otherwise noted; K: KΩ, M: MΩ, (F): 1%, (G): 2%, (K): 10%, (M): ±20% tolerance
- CAPACITORS:**
Indicated in capacity (μF)/voltage (V) unless otherwise noted; p: pF. Indication without voltage is 50V except electrolytic capacitor.
- VOLTAGE, CURRENT:**
⊖: DC voltage (V) at no input signal
- OTHERS:**
⊕: Signal route
⊙: Adjusting point
The **A** 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.
* marked capacitors and resistors have parts numbers.

SWITCHES:

SW ASSY	
S901: TIME / TAPE	OFF - ON
S902: COUNTER RESET	OFF - ON
S903: INDEX SCAN	OFF - ON
S904: MS/SKIP	OFF - ON
S905: MUSIC REPEAT	OFF - ON
S906: BLANK SEARCH	OFF - ON
S907: AUTO-BLE	OFF - ON
S908: AUTO-BLE CLEAR	OFF - ON
S909: MEMORY	OFF - ON
S910: DOLBY NR	OFF - ON
S911: DOLBY NR TYPE	B - C
S912: MPX FILTER	OFF - ON
S913: MODE	— - —
S914: TAPE CAPACITY	L46-46-60-90

OUTSIDE OF P.C BOARD ASSEMBLIES
S1: POWER OFF - ON

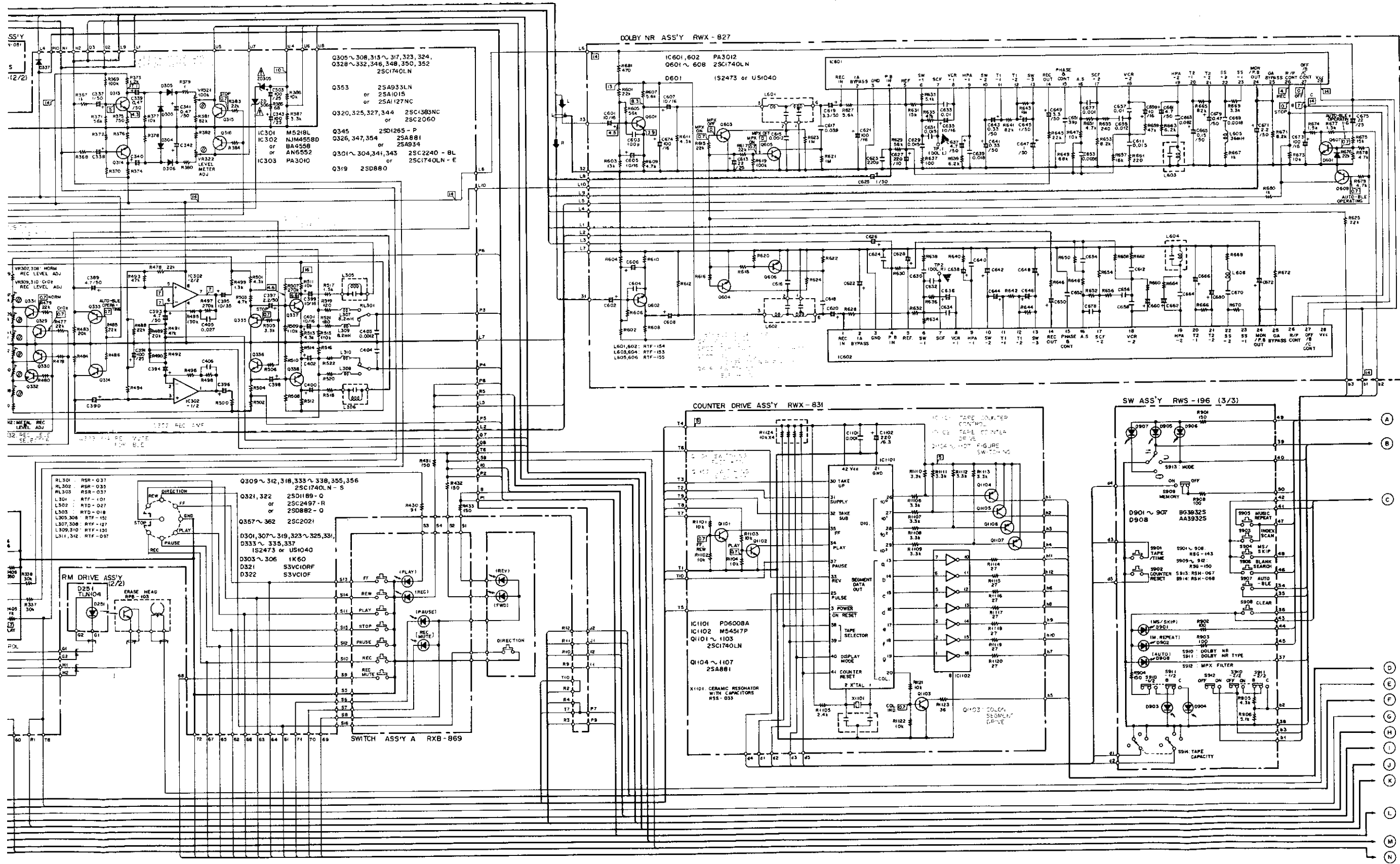
The underlined indicates the switch position.

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

NOTE:
Playback signal route ———
Recording signal route - - - - -

Q1301, 1304, 1305 25C1740LN	Q1302, 1303, 1306 25A833LN or 25A1015 or 25A1127NC	D1301 ~ 1309 15Z473 or U51040 ZD1301 RD4.7B2
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NOTE:
 The indicated semiconductors are representative ones only.
 Other alternative semiconductors may be used and are
 listed in the parts list.



A

B

C

D

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7

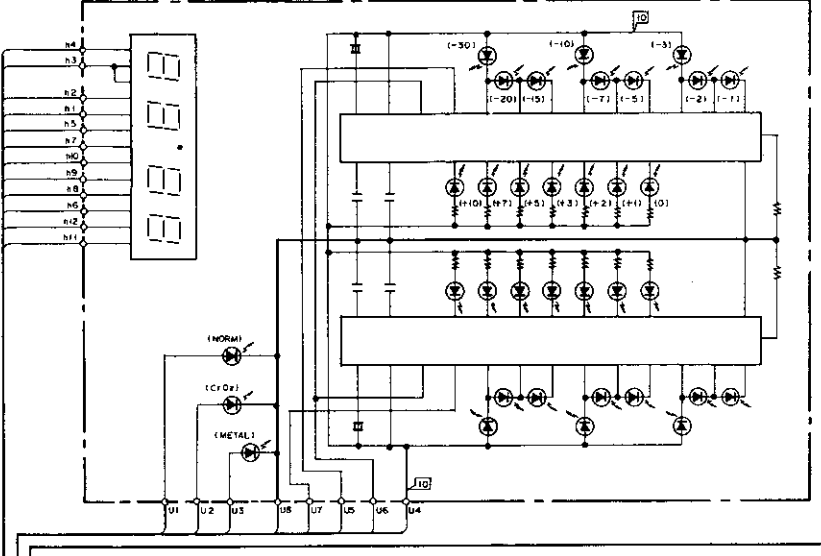
A

B

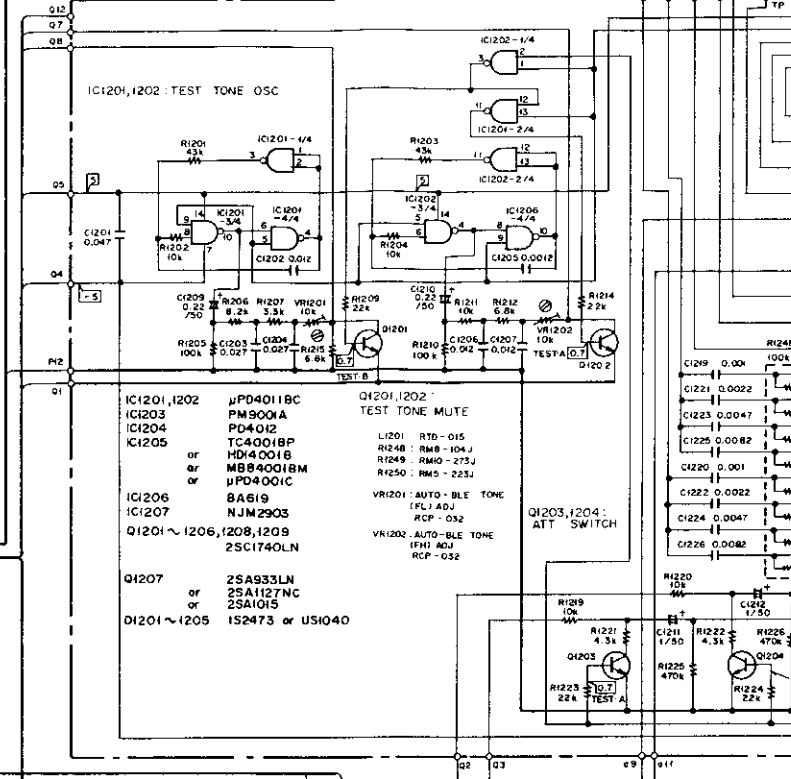
C

D

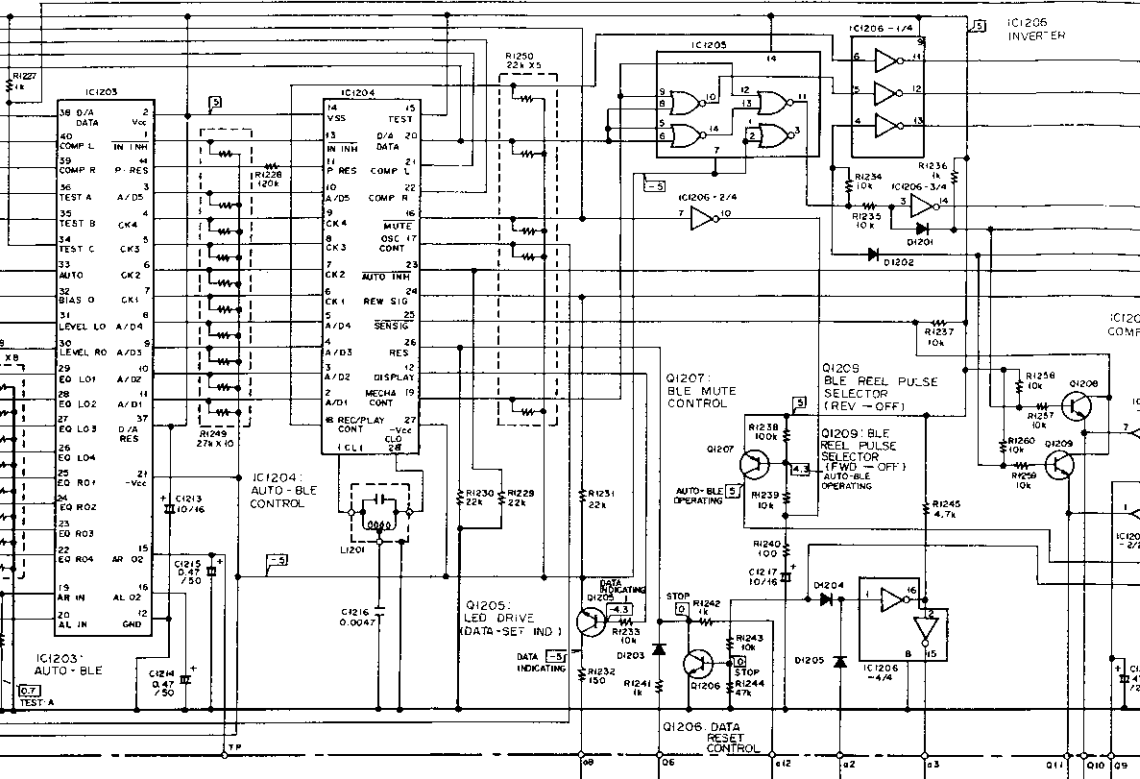
INDICATOR ASSY A RAW-192



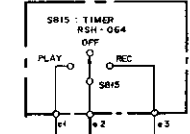
BLE ASSY RWX-843



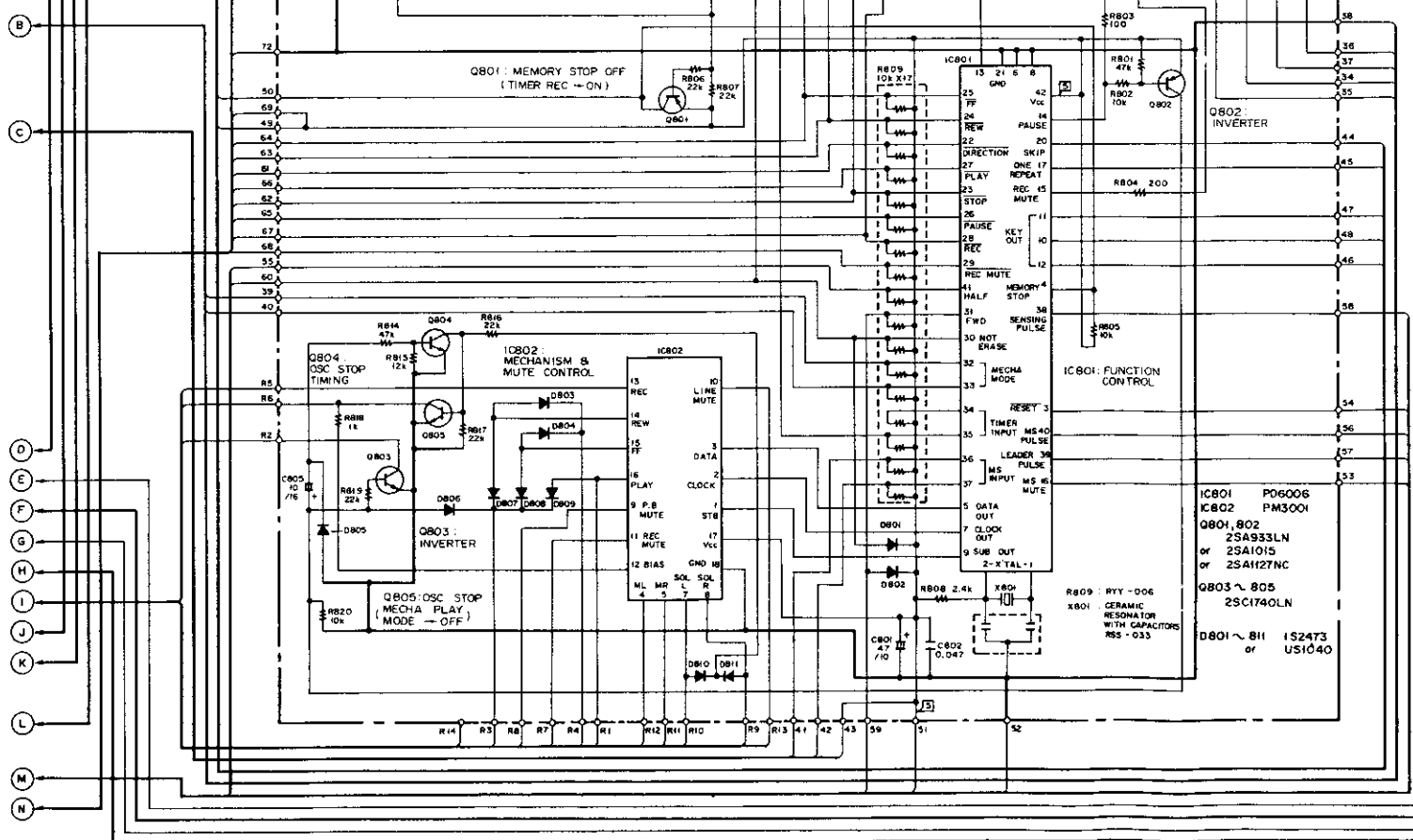
IC1205-MECHANISM CONTROL



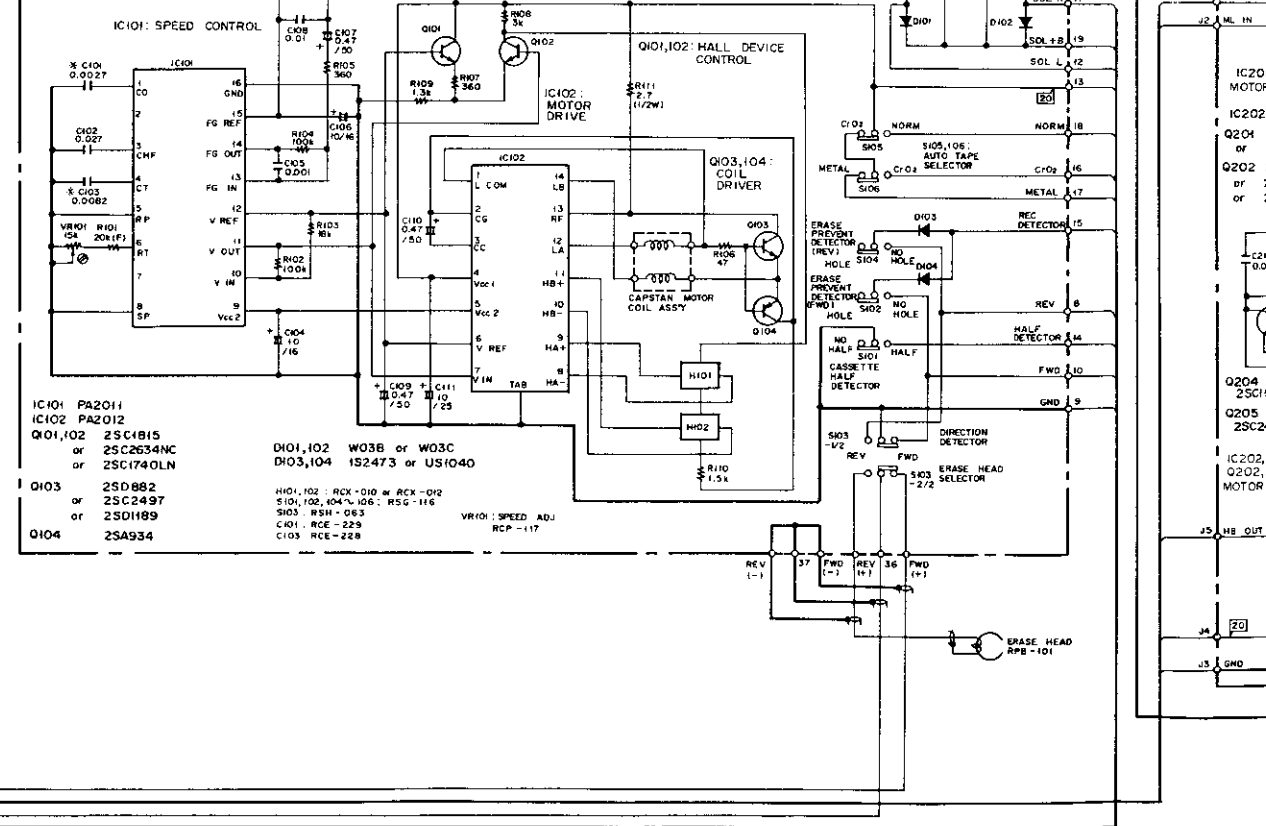
TIMER SWITCH ASSY



CONTROL ASSY RWX-828



CM CONTROL ASSY RWX-692



1

2

3

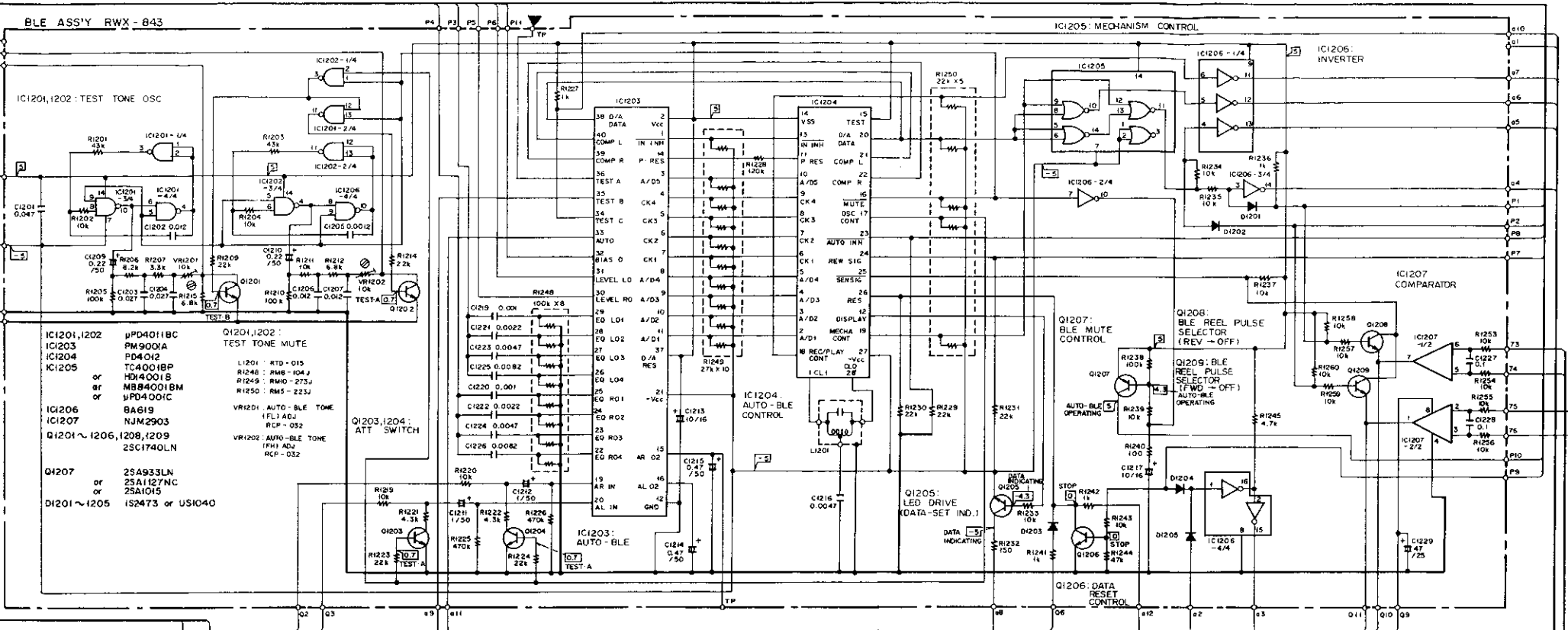
4

5

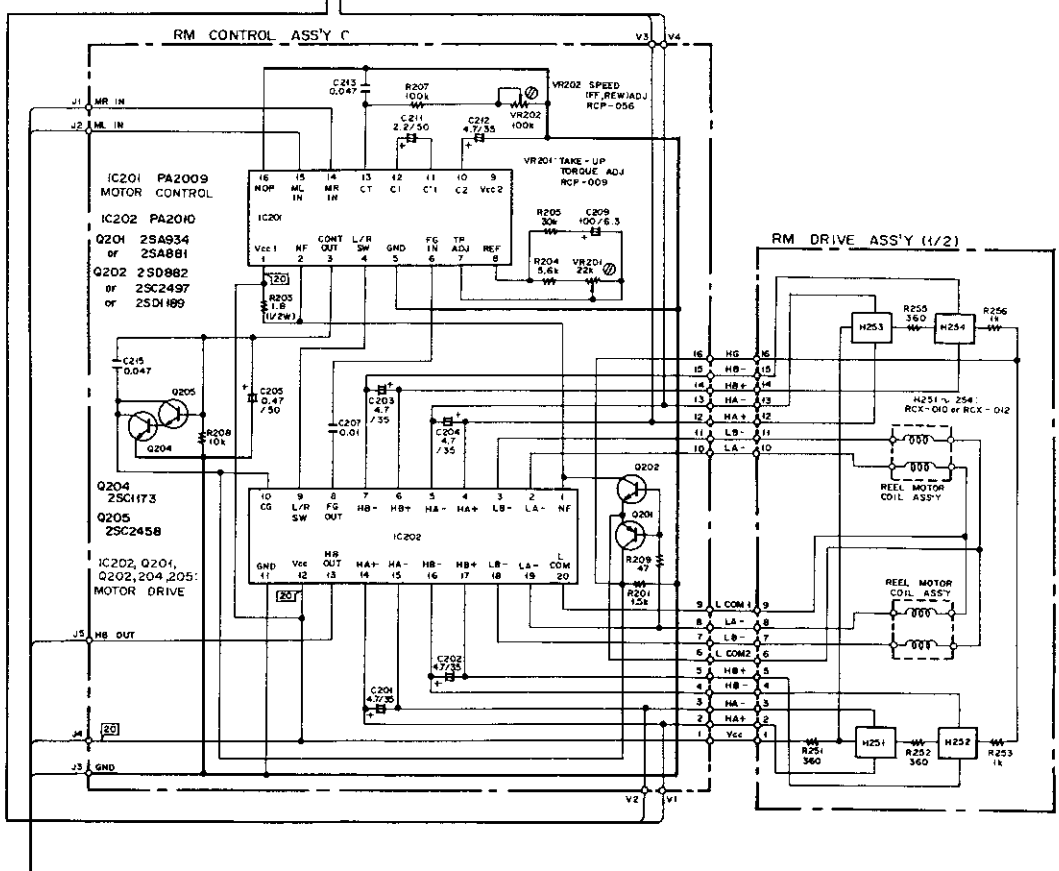
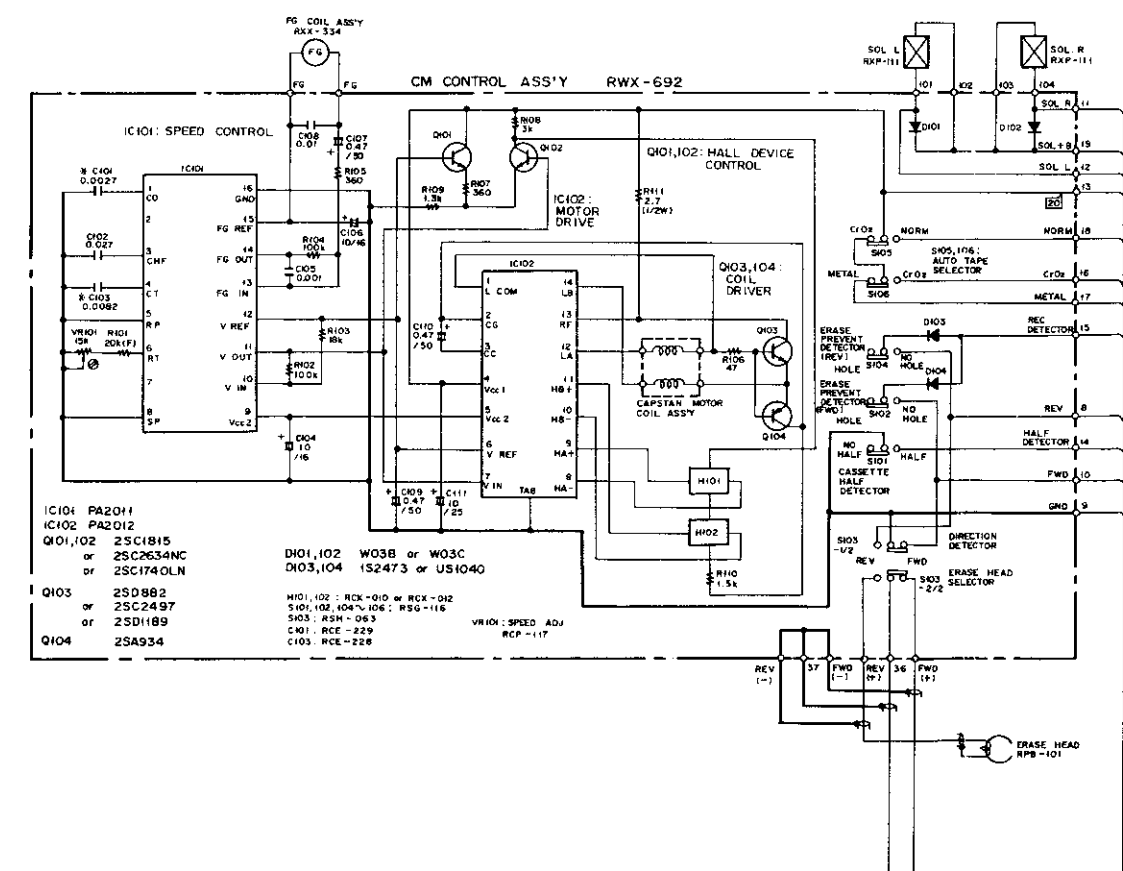
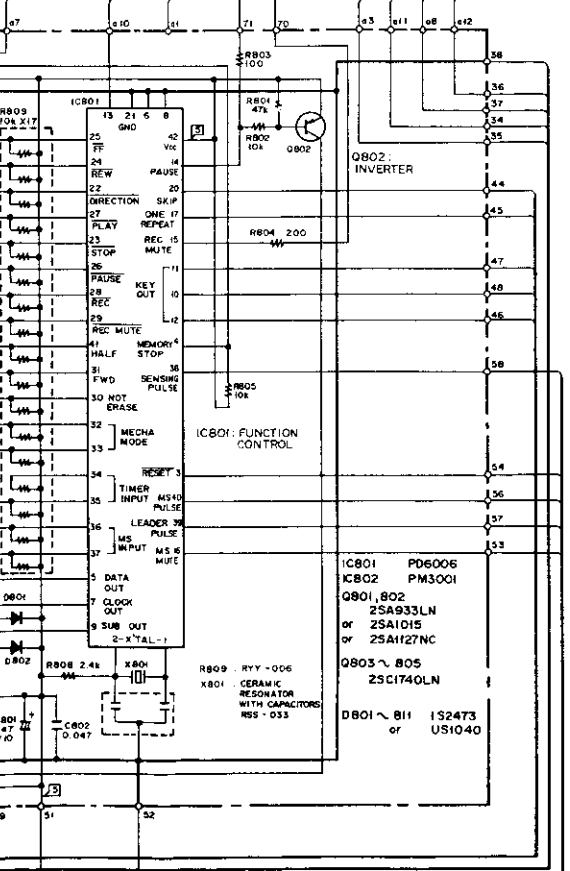
6

7

4 | 5 | 6 | 7 | 8 | 9



SWITCHES
 CM CONTROL ASS'Y
 S101 CASSETTE HALF DETECTOR NO HOLE - HALF
 S102 ERASE PREVENT DETECTOR (FWD) HOLE - NO HOLE
 S103-1/2 DIRECTION DETECTOR FWD-REV
 S103-2/2 ERASE HEAD SELECTOR FWD-REV
 S104 ERASE PREVENT DETECTOR (REV) HOLE - NO HOLE
 S105 AUTO TAPE SELECTOR HIGH - NORM
 S106 AUTO TAPE SELECTOR METAL - CrO2
 TIMER SWITCH ASS'Y
 S105 TIMER REC - OFF - Play
 The underlined indicates the switch position



4 | 5 | 6 | 7 | 8 | 9

A
B
C
D

9. 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 x 10¹ 561 RD¼PS [5][6][1]J
 47kΩ 47 x 10³ 473 RD¼PS [4][7][3]J
 0.5Ω 0R5 RN½H [0][5]K
 1Ω 010 RS1P [0][1][0]K

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

5.62kΩ 562 x 100 5621 RN¼SR [5][6][2][1]F

• 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

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	RWX-822	Mother assembly
	RWX-827	Dolby NR assembly
	RWX-828	Control assembly
	RWS-196	SW assembly
	RWX-830	MIC amplifier assembly
	RWX-831	Counter drive assembly
	RWX-843	BLE assembly
	RWX-844	Mute assembly
	RWX-692	CM control assembly
	Non supply	Timer switch assembly
	Non supply	Transistor A assembly
	Non supply	Transistor B assembly
	Non supply	RM drive assembly
	Non supply	RM control assembly C

FUSES

Mark	Part No.	Symbol & Description
Δ **	REK-044	FU301 Fuse (3.15A)
Δ **	REK-071	FU302, FU303 Fuse (1.25A)
Δ **	REK-051	FU304 Fuse (1A)

OTHERS

Mark	Part No.	Symbol & Description
Δ *	RTT-328	T1 Power transformer
Δ **	RSA-063	S1 Push switch (POWER)
Δ	RCG-006	C1 Ceramic capacitor
	SLF-201C	D1 LED (Tape lighting)

Mark	Part No.	Symbol & Description
Δ	RDG-048	AC power cord
Δ	REC-395	Strain relief (for AC power cord)
	RAW-192	Indicator assembly A
**	RXB-869	Switch assembly A (Operation keys)
	RXX-400	Head assembly (RS combination head)
*	RPB-101	Erase head
*	RPB-103	Erase head with photo sensor
Δ *	RXP-111	Plunger solenoid
	RKP-713	Connector assembly (3-P)
	RKP-714	Connector assembly (3-P)
	RXX-359	Reel motor assembly C

CM Control Assembly (RWX-692)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	PA2011	IC101
**	PA2012	IC102
**	2SC1815	Q101, Q102
	(2SC2634NC)	
	(2SC1740LN)	
**	2SA934	Q104
**	2SD882	Q103
	(2SC2497-R)	
	(2SD1189)	
*	W03B	D101, D102
	(W03C)	
*	1S2473	D103, D104
	(US1040)	
*	RCX-010	H101, H102
	(RCX-012)	Hall device A (Hall device C)

SWITCHES

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

CAPACITORS

Mark	Part No.	Symbol & Description
	RCE-229	C101 Film (0.0027)
	CEA R47M 50	C107, C109, C110
	CEA 100M 16	C104, C106
	CEA 100M 25	C111
	QOMA 273K 50	C102
	RCE-228	C103 Film (0.0082)
	CKDYF 102Z 50	C105
	CKDYF 103Z 50	C108, C112

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-117	VR101 Semi-fixed (15k-B)
	RNX4PQ 203F	R101
	RD¼PS 2R7J	R111
	RD¼PM □□□J	Other resistors

RM Drive Assembly

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
*	TLN-104	D251

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
	RD¼PM □□□J	R251-R253, R255, R256

RM Control Assembly C

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	PA2009	IC201
**	PA2010	IC202
**	2SA934	Q201
	(2SA881)	

Mark	Part No.	Symbol & Description
**	2SD882	Q202
	(2SC2497-R)	
	(2SD1189)	
**	2SC2458	Q205
**	2SC1173	Q204

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 4R7M 35	C201, C204, C212
	CEA R47M 50	C205
	CEA 2R2M 50	C211
	CEA 101M 6R3	C209
	CEA 4R7M 35	C202, C203
	QOMA 473K 50	C213
	CKDYF 103Z 50	C207
	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)
*	RCP-056	VR202 Semi-fixed (100k-B)
	RD¼PM □□□J	R201, R204, R205, R207-R209
	RD¼PS 1R8J	R203

OTHERS

Mark	Part No.	Symbol & Description
	REE-051	Spacer
	RKH-005	Transistor holder
	RBA-026	Screw
	RKP-280	Connector assembly 4-P

Mother Assembly (RWX-822)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	M5218L	IC301
**	NJM4558D	IC302
	(BA4558)	
	(AN8552)	
**	PA3010	IC303
**	2SC2021	Q357-Q362
**	2SC1740LN	Q305-Q308, Q313-Q317, Q323, Q324, Q328-Q332, Q346, Q348, Q350, Q352
**	2SA933LN	Q353
	(2SA1015)	
	(2SA1127NC)	

Mark	Part No.	Symbol & Description
**	2SC1383NC (2SC2060)	Q320, Q325, Q327, Q344
△ **	2SD1265-P	Q345
**	2SA881 (2SA934)	Q326, Q347, Q354
**	2SC2240-BL (2SC1740LN-E)	Q301-Q304, Q341, Q343
**	2SD880	Q319
**	2SC1740LN-S	Q309-Q312, Q318, Q333-Q338, Q355, Q356
**	2SD1189-Q (2SC2497-R) (2SD882-Q)	Q321, Q322
*	1K60	D303-D306
△ *	1SR35-100A	D327, D328, D336
*	1S2473 (US1040)	D301, D307-D319, D323-D325, D331, D333-D335, D337
△ *	RD3.0EB2	ZD303
△ *	RD5.6EB2	ZD304
△ *	RD10EB3	ZD301
△ *	RD15EB3	ZD302
△ *	S3VC10F	D322
△ *	S3VC10RF	D321
△ *	S2VC10F (1B2C1-LC2)	D326
△ *	BZ-050 33D28 (TD5-C225D)	ZD305, ZD306 TH301, TH302

COILS

Mark	Part No.	Symbol & Description
	RTF-101	L301 Line coil
	RTD-027	L302 OSC, coil
	RTD-018	L303 Step up transformer
	RTF-152	L305, L306 Trap coil
	RTF-127	L307, L308 Peaking coil 8.2mH
	RTF-150	L309, L310 Peaking coil 8.2mH
	RTF-097	L311, L312 Trap coil

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 221M 6R3	C348
	CEA 102M 6R3	C426
	CEA 101M 10	C347, C354, C421, C430
	CEA 100M 16	C313, C314, C327, C328, C355, C399-C402, C425
	CEANL 100M 16	C303, C304, C317, C318
	CEA 220M 16	C356, C418
	CEA 330M 16	C305, C306, C325, C371
	CEA 221M 16	C357
	CEA 471M 16	C333, C334

Mark	Part No.	Symbol & Description
	CEA 220M 25	C367, C368
	CEA 470M 25	C366, C415, C416
	CEA 101M 25	C343, C352, C391, C411, C428, C453, C503
	CEA 221M 25	C329, C330, C364, C365, C413
	CEA 331M 25	C319, C320
	CEA 222M 25	C417, C427
	CEA 100M 35	C380, C395, C396
	CEA R10M 50	C349
	CEA R22M 50	C341, C342
	CEA R47M 50	C339-C342, C351
	CEA 010M 50	C323, C324, C337, C338, C359, C378
	CEA 2R2M 50	C397, C398
	CEA 4R7M 50	C353, C389, C390, C393, C394
	CEA 102M 50	C409, C410
	QMA 122J 50	C403, C404
	QMA 332J 50	C372, C373
	QMA 103J 50	C374, C375
	QMA 682K 50	C379
	QMA 822K 50	C385-C388
	QMA 103K 50	C377
	QMA 223K 50	C315, C316
	QMA 273K 50	C405, C406
	QMA 473K 50	C358
	QMA 822K 50	C311, C312
	QPA 182J 100	C376
	QSA 220K 50	C309, C310
	QSA 101K 50	C307, C308
	QSA 181K 50	C381, C382
	QSA 331K 50	C301, C302
	CKDYF 103Z 50	C331, C369, C370, C412, C414, C420, C422, C429
	CKDYF 473Z 50	C321, C350, C501, C502

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-189 (RCP-145)	VR305, VR307, VR308 Semi-fixed (2.2k-B)
*	RCP-190 (RCP-146)	VR306 Semi-fixed (3.3k-B)
*	RCP-193 (RCP-149)	VR313, VR314 Semi-fixed (10k-B)
*	RCP-195 (RCP-150)	VR301-VR304 Semi-fixed (22k-B)
*	RCP-196	VR309-VR312 Semi-fixed (33k-B)
*	RCP-199 (RCP-154)	VR319 Semi-fixed (100k-B)
*	RCP-196 (RCP-151)	VR315-VR318 Semi-fixed (33k-B)
*	RCP-199	VR321, VR322 Semi-fixed (100k-B)

Mark	Part No.	Symbol & Description
△	RD1/8PM □□□ J	R541
△	RD½PSF □□□ J	R566, R557, R582
△	RS1LF □□□ J	R402
△	RS2LF □□□ J	R540
	RYY-007	R467 Resistor array 8-P
	RYY-009	R572 Resistor array 3-P
	RYY-010	R573 Resistor array 6-P
	RYY-011	R574 Resistor array 4-P
	RD¼PM □□□ JNL	R303, R304, R307, R308
	RD¼PM □□□ J	R301, R302, R305, R306, R309 -R336, R339, R340, R390, R391, R400, R401, R405, R413-R415, R430-R433, R459-R461, R483- R504, R507-R522, R527-R529, R532, R535, R542, R544, R576, R580
	RD1/6PM □□□ J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
**	RSR-037	RL301, RL303 Miniature relay
**	RSR-035	RL302 Reed relay
	RKB-018	Terminal (LINE INPUT/OUTPUT)
	RKP-720	Connector socket (REMOTE)
	RKP-692	CN318 Connector assembly 5-P
	RKP-695	CN319 Connector assembly 8-P
	RKP-693	CN320 Connector assembly 12-P
	RKP-779	CN321 Connector assembly 7-P
	RKP-698	Connector 3-P
	RKP-699	Connector 3-P

Transistor A Assembly

Mark	Part No.	Symbol & Description
△ **	2SD1265-P	Q342

Transistor B Assembly

Mark	Part No.	Symbol & Description
△ **	2SD1265-P	Q349

Dolby NR Assembly (RWX-827)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	PA3012	1C601, 1C602
**	2SC1740LN	Q601-Q608
*	1S2473 (US1040)	D601

COILS

Mark	Part No.	Symbol & Description
	RTF-154	L601, L602 MPX filter
	RTF-153	L603, L604 Trap coil
	RTF-155	L605, L606 Coil 36mH

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA R15M 50	C665, C666
	CEA R33M 50	C641-C644
	CEA R47M 50	C679, C680
	CEA 010M 50	C645-C648
	CEA 2R2M 50	C671, C672
	CEA 3R3M 50	C649, C650
	CEANL 3R3M 50	C619, C620
	CEANL 010M 50	C625, C626
	CEA 4R7M 50	C637, C638, C661, C662
	CEA 220M 25	C613, C675
	CEA 100M 16	C601, C602, C605-C608
	CEA 101M 16	C621, C622, C673, C674
	CEANL 100M 16	C635, C636, C659, C660
	CEA 221M 10	C627, C628
	QMA 122J 50	C615, C616
	QMA 182J 50	C669, C670
	QMA 392J 50	C617, C618
	QMA 102K 50	C677, C678
	QMA 562K 50	C653, C654
	QMA 103K 50	C633, C634, C657, C658
	QMA 123K 50	C655, C656
	QMA 153K 50	C611, C612, C629-C632
	QMA 183K 50	C639, C640
	QMA 823K 50	C663, C664
	CCDSL 390K 50	C652
	CCDSL 101K 50	C603, C604
	CCDSL 221K 50	C623, C624
	CCPSL 390J 50	C651

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
	RD¼PM □□□ J	All resistors

OTHERS

Mark	Part No.	Symbol & Description
	RKP-604	CN602 Connector socket 10-P

Control Assembly (RWX-828)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	PD6006	IC801
**	PM3001	IC802
**	2SA933LN (2SA1015) (2SA1127NC)	Q801, Q802
**	2SC1740LN	Q803-Q805
*	1S2473 (US1040)	D801-D811

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 16	C805
	CEA 470M 10	C801
	CKDYF 473Z 50	C802

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
	RY-006	R809 Resistor array 18-P
	RD4PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
*	RSS-033	X801 Ceramic resonator assembly (with pair capacitors)
	RKP-604	CN801 Connector socket 10-P
	RKP-605	CN802, CN803 Connector socket 12-P
	RKP-606	CN804 Connector socket 14-P
	RKP-687	Connector 3-P

SW Assembly (RWS-196)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
*	BG3932S	D901-D907
*	AA3932S	D908

SWITCHES

Mark	Part No.	Symbol & Description
**	RSG-143	S901-S908 Push switch
**	RSG-150	S909-S912 Push switch
**	RSH-067	S913 Slide switch
**	RSH-068	S914 Slide switch

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
*	RCW-006	VR901 Variable (100k-A)
*	RCW-007	VR902 Variable (20k-B)
	RD4PM □□□J	R901-R906, R908

OTHERS

Mark	Part No.	Symbol & Description
	RKP-688	CN901 Connector assembly 3-P
	RKP-689	CN902 Connector assembly 5-P
	RKP-690	CN903 Connector assembly 5-P
	RKP-685	CN904 Connector assembly 6-P

Timer Switch Assembly

SWITCH

Mark	Part No.	Symbol & Description
**	RSH-064	S815 Slide switch

MIC Amplifier Assembly (RWX-830)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	2SC1740LN	Q701, Q702

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 010M 50	C701, C702, C705, C706
	CEA 101M 25	C708
	CKDYF 473Z 50	C707
	CCDSL 101K 50	C703, C704

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
	RD4PM □□□J	R701-R714

OTHERS

Mark	Part No.	Symbol & Description
	RKN-080	J701, J702 Phone Jack (MIC)
	RKN-081	J703 Phone Jack (PHONES)
	RKP-599	CN702 Connector socket 5-P
	RKP-686	CN703 Connector assembly 3-P

Counter Drive Assembly (RWX-831)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	PD6008A	IC1101
**	M54517P	IC1102
**	2SA881	Q1104-Q1107
**	2SC1740LN	Q1101-Q1103

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 221M 6R3	C1102
	CCDSL 102K 50	C1101

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
	RM4-103J	R1124 Resistor array
	RD4PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
*	RSS-033	X1101 Ceramic resonator assembly (with pair capacitors)
	RKP-604	CN1102 Connector socket 10-P
	RKP-310	CN1103 Connector socket S 12-P

BLE Assembly (RWX-843)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	PM9001A	IC1203
**	PD4012	IC1204
**	μPD4011BC	IC1201, IC1202
**	TC4001BP (HD14001B) (M884001BM) (μPD4001C)	IC1205

**	6A619	IC1206
**	NJM2903	IC1207
**	2SA933LN (2SA1015) (2SA1127NC)	Q1207

**	2SC1740LN	Q1201-Q1206, Q1208, Q1209
*	1S2473 (US1040)	D1201-D1205

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA R22M 50	C1209, C1210
	CEA R47M 50	C1214, C1215
	CEA 010M 50	C1211, C1212
	CEA 470M 25	C1229
	CEA 100M 16	C1213, C1217

Mark	Part No.	Symbol & Description
	CQMA 472K 50	C1216
	CQMA 123K 50	C1206, C1207
	CQMA 273K 50	C1203, C1204
	CQMA 104K 50	C1227, C1228
	CQMA 122J 50	C1205
	CQMA 102J 50	C1219, C1220
	CQMA 222J 50	C1221, C1222
	CQMA 472J 50	C1223, C1224
	CQMA 822J 50	C1225, C1226
	CQMA 123J 50	C1202
	CKDYF 473Z 50	C1201

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-032	VR1201, VR1202 Semi-fixed 10k-B
	RMB-104J	R1248 Resistor array
	RM10-273J	R1249 Resistor array
	RM5-223J	R1250 Resistor array
	RD1/6PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
	RTD-015	L1201 Oscillator coil
	RKP-605	CN1203, CN1204 Connector socket 12-P

Mute Assembly (RWX-844)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
**	2SA933LN (2SA1015) (2SA1127NC)	Q1302, Q1303, Q1306
**	2SC1740LN	Q1301, Q1304, Q1305
*	1S2473 (US1040)	D1301-D1309
△	RD4.7E82	ZD1301

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 4R7M 50	C1301, C1302
	CEA 220M 10	C1303
	CEA 222M 6R3	C1304
	CEA 2R2M 50	C1305

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
	RD4PM □□□J	All resistors

10. ADJUSTMENTS

10.1 MECHANICAL ADJUSTMENT

10.1.1 Pinch Roller Pressure Check

*Use a tension gauge (GGK-047)

Mode	Specification rating	Measuring conditions
Playback mode	250g ~ 400g	Slowly pull the pinch roller away from the capstan, and read the value the moment the pinch roller stops turning.

*If the measured value does not lie within the rated specification range, replace the pinch roller pressure spring.

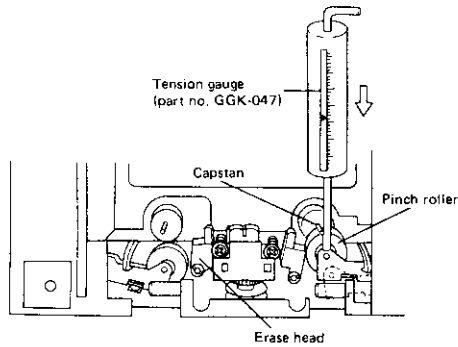


Fig. 10-1 Pinch roller pressure check

10.1.2 Head Azimuth Preliminary Adjustment

Mode	Adjustment location	Specifications
Stop mode when tape direction is "forward"	Head azimuth adjustment screw ①	Adjust gap A to 1.5mm (±0.3mm)
Stop mode when tape direction is "reverse"	Head azimuth adjustment screw ②	Adjust gap B to 1.5mm (±0.3mm)

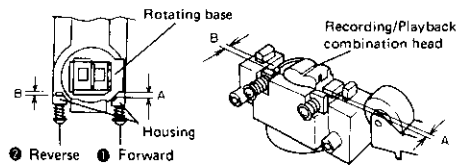


Fig. 10-2 Azimuth adjustment points

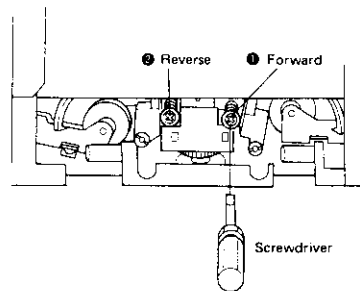


Fig. 10-3 Azimuth preadjustment

10.1.3 Tape Transport Adjustment

Mode	Adjustment location	Specifications
Forward direction playback mode	Adjustment nut ①	Tape curling at the erase and playback heads must conform with the following figures. Curling at the playback head: Less than 1/9 the tape width Curling at the erase head: Less than 1/5 the tape width.
Reverse direction playback mode	Adjustment nut ②	

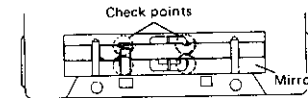


Fig. 10-4 Tape curling check points

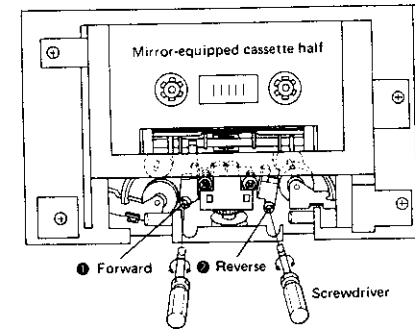


Fig. 10-5 Tape transport adjustment

10.1.4 FF and REW Rotational Speed Adjustment

*Use a frequency counter without a cassette half mounted in the cassette compartment.

Mode	Adjustment location	Specifications
Fast forward mode with tape in forward direction	VR202 (RM control assembly)	Adjust the frequency reading between MR HB out (5) and GND (3) on the RM control assembly to 36Hz ±1Hz.

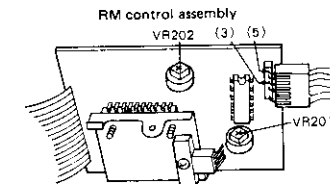


Fig. 10-6 FF/REW rotating speed adjustment

10.1.5 PLAY Take-Up Torque Adjustment

*Use a cassette-type torque meter.

Mode	Adjustment location	Specifications
Forward direction playback mode	VR102 (RM control assembly)	Take-up torque must be 35g·cm to 55g·cm by at least 10 seconds after PLAY mode has been started. Torque meter variation must not exceed 15g·cm.
Reverse direction playback mode	Check	

10.1.6 FAST (FF & REW) Torque Check

*Use a cassette-type torque meter.

Mode	Specifications rating	Remarks
Fast forward mode and rewinding mode	70g·cm ~ 130g·cm	Take-up torque

10.1.7 Back-Tension Torque Check

*Use a cassette-type torque meter.

Mode	Specifications rating	Remarks
Forward & reverse direction playback mode	2g·cm ~ 5g·cm	Supply reel base back-tension torque

10.1.8 Tape Speed Adjustment

*Use a frequency counter and the STD-301 test tape.

Mode	Adjustment location	Specification
Forward direction playback mode	VR101 (CM control assembly)	Playback frequency must be 3005 ±10Hz at the beginning of the STD-301 test tape.
Reverse direction playback mode	Check	Playback frequency must be 3000 ±30Hz at the beginning of the STD-301 test tape.

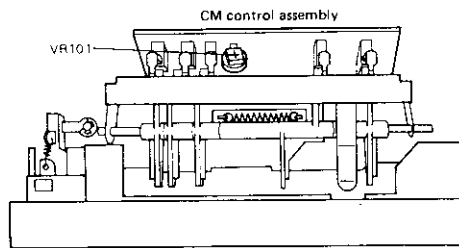


Fig. 10-7 Tape speed adjustment

10.1.9 Cassette Pocket Damper Adjustment

Adjustment location	Specifications
Damper cylinder adjustment screw	The door must open smoothly without going through a two-stage motion, and without any bouncing back when fully opened.

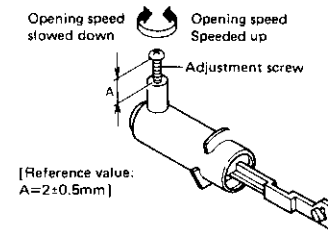


Fig. 10-8 Cassette pocket damper adjustment

10.1.10 Door Position Adjustment

Check 1	The dimensional ratio of A to B, and C to D must be within the 0.5 to 2 range (The dimensions taken when facing the deck from the front).
Check 2	The difference between E and G must not be greater than ±0.4mm, and all dimensions E, F, and G must be at least 0.5mm (the dimensions taken when facing the deck from the front).

If the above specifications are not met, remove the door and adjust the pocket frame with a screwdriver at the position indicated in the following diagram.

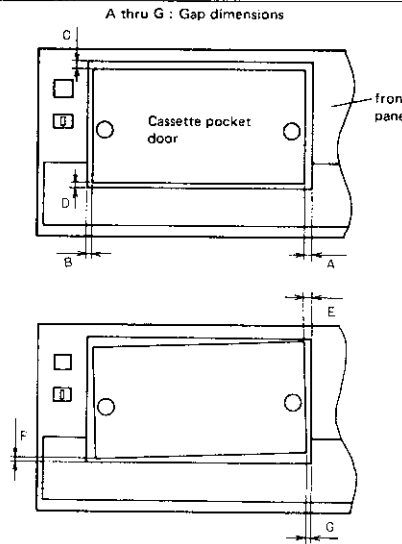


Fig. 10-9 Door position

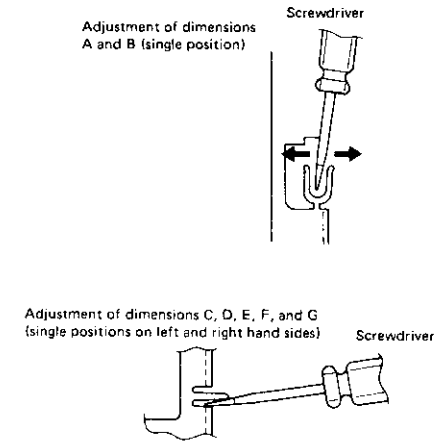


Fig. 10-10 Door position adjustment

10.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

- Commence electrical adjustments only after all mechanical adjustments have been completed.
- Also make sure that the heads have been cleaned and demagnetized.
- Let the tape deck warm up for a few minutes before commencing actual adjustments.
- Assume signal level of 0dBv = 1Vrms.
- Connect a 50kΩ load resistance to the OUTPUT terminals (any resistance in the 47kΩ to 52kΩ range is acceptable).
- Set the OUTPUT level control to maximum position unless otherwise specified.
- Set the control switches to the following positions unless otherwise specified.

TIMER : OFF
 MEMORY : OFF
 DOLBY NR : OFF
 MPX FILTER : OFF
 MODE : "—" display
 AUTO-BLE : CLEAR
 (with DATA SET indicator off)

Test Tape

STD-331B* : For playback system adjustments
 STD-608A : NORMAL blank tape
 STD-603 : CrO₂ blank tape
 STD-604 : METAL blank tape

*The recording levels for STD-331A and STD-331B differ. Whereas the STD-331A reference level is 333Hz, 250nwb/m, the corresponding STD-331B level is 315Hz, 160nwb/m.

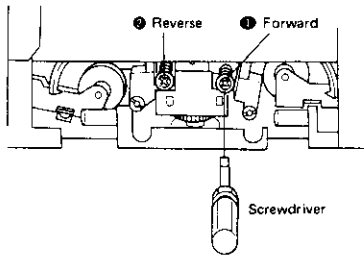


Fig. 10-11 Head azimuth adjustment

Adjustment Sequence

Adjustments must always be made in the following order.

- Head azimuth adjustment
- Tape transport adjustment
- Tape touch check (PLAY)
- Playback equalizer adjustment
- Playback level adjustment
- Level meter 0dB check
- Erase current adjustment
- Recording bias adjustment (1)
- Recording level adjustment
- Recording bias adjustment (2)
- Tape touch check (REC)
- Overall frequency response check and adjustment
- Built-in BLE oscillator adjustment
- Leader tape detector level adjustment

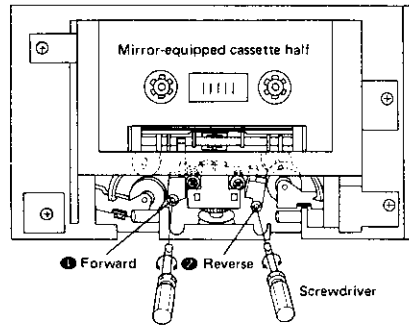
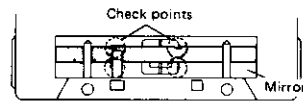


Fig. 10-12 Tape transport adjustment

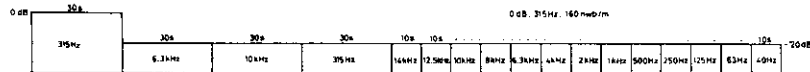


Fig. 10-13 STD-331B test tape

1. Head Azimuth Adjustment					
• Turn VR303 and VR304 (playback level ADJ) up to maximum levels, and adjust VR301 and VR302 (playback EQ ADJ) to the mechanical center position.					
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
Playback (forward and reverse)	Play the 10kHz/-20dB portion of the STD-331B test tape	Head azimuth adjustment screw ① & ② (see Fig. 10-11)	Left and right OUTPUT terminals	Maximum playback signal level	Screw ① for FWD Screw ② for REV
2. Tape Transport Adjustment					
• Use a mirror-equipped cassette half to check the tape transport condition. Adjust if the rated specifications are not met.					
Mode	Input signal & test tape	Adjustment location	Rated specifications	Remarks	
1 Playback (forward and reverse)	Mirror-equipped cassette half	Adjustment nuts ① & ② (see Fig. 10-12)	Absence of tape curling at the playback head and erase head tape guides during playback mode.	Nut ① for FWD Nut ② for REV	
2 When transport is adjusted, repeat the "Head azimuth adjustment".					
3. Tape Touch Check (PLAY)					
Mode	Input signal & test tape	Measuring location	Rated specifications	Remarks	
1	Playback (forward and reverse)	Left and right OUTPUT terminals	When the supply reel is braked lightly by hand, the playback signal level increase must not exceed 1.5dB.	Back-tension method	
2			When the cassette half is displaced upward, the playback signal level increase must not exceed 1.5dB.	Head protrusion variation method	
3 If the rated specifications for items 1 and 2 are not satisfied, repeat the "Tape transport adjustment".					
4. Playback Equalizer Adjustment					
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	
1 Forward playback	Play the 315Hz/-20dB and 10kHz/-20dB portions of the STD-331B test tape	VR301 (left ch.) VR302 (right ch.)	Left and right OUTPUT terminals	Adjust the 10kHz level to 0dB in respect to the 315Hz playback level.	
2 Reverse playback		Check		Check the 10kHz level to 0 ₀ ^{±2} dB in respect to the 315Hz playback level.	
3 Forward playback	Play the 315kHz/-20dB and 14kHz/-20dB portions of the STD-331B test tape	Check		Check the 14kHz level to 0±2dB in respect to the 315Hz playback level.	
4 Reverse playback		Check		Check the 14kHz level to 0 ₀ ^{±4} dB in respect to the 315Hz playback level.	
5 See Fig. 10-14 for the permitted playback frequency response zone.					

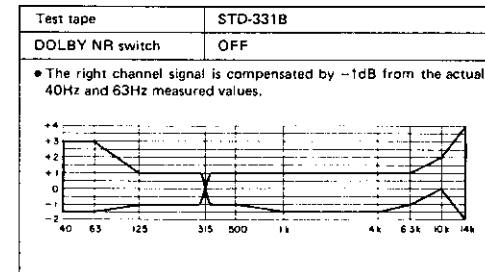


Fig. 10-14 Permitted playback frequency response zone

5. Playback Level Adjustment						
● Since the playback Dolby level and AUTO-BLE operating level are set by this adjustment, make sure the adjustments are accurate.						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks	
1 Forward playback	Play the 315Hz/0dB portion of the STD-331B test tape.	VR303 (left ch.) VR304 (right ch.)	TP.1 (left ch.) TP.2 (right ch.) (Dolby NR ass'y)	-7.7dBv (412.1mV)		
2 Reverse playback		Check		-7.7dBv±0.5dB		
6. Level Meter 0dB Adjustment						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks	
1	Apply a 315Hz/-10dBv (316mV) signal to the LINE INPUT terminals.	INPUT level control	TP.1 (left ch.) TP.2 (right ch.)	-7.7dBv (412.1mV)	INPUT level control position setting	
2 Recording pause		VR321 (left ch.) VR322 (right ch.)	After turning VR321 and VR322 full around counterclockwise, slowly turn them back clockwise and stop at the position where level meter "0" dB indicator segment comes on.			
3	Vary the input level	Check	The input level required to turn the "+5" dB display segment on is -5dBv ±3dB.			
4		Check	The input level required to turn the "-10" dB display segment on is -20 dBv±5dB.			

7. Erase Current Adjustment						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment Value	Remarks	
1 Forward recording	Load the STD-604 test tape with no input signal applied. (The auto tape selector is set to METAL position)	VR305	TP. (IE to GND)	160mV	Measure the voltage generated at R429 (1Ω) by the erase current.	
2 Reverse recording		Check		140mV~180mV		
3 If voltage does not lie in the 140mV to 180mV range during the reverse recording mode, adjust so that the voltage lies within this range during both forward recording and reverse recording.						
8. Recording Bias Adjustment (1)						
● Set the OUTPUT level control to maximum position, and VR313 and VR314 (CrO ₂ bias ADJ.) to the mechanical center positions.						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks	
1 Recording pause	Apply 6.3kHz/-20dBv (100mV) to LINE INPUT terminals	INPUT level control	Left and right OUTPUT terminals	-14dBv (199.5mV)	INPUT level control position setting	
2 Forward recording	Record on the STD-608A test tape (and monitor the playback simultaneously at TP.L and TP.R)	VR315 (left ch.) VR316 (right ch.)	TP.L (left ch.) TP.R (right ch.) (PB EQ OUT)	-14dBv (199.5mV)	After turning VR315 and VR316 fully counterclockwise, turn back clockwise and stop at a position where the measured value is 2.5dB lower than the maximum output level after passing the maximum position.	
3 Reverse recording		VR317 (left ch.) VR318 (right ch.)	The 3-head configuration used for AUTO-BLE* purposes enables simultaneous monitoring of playback signal. Note, however that the playback signal does not appear at the LINE OUTPUT terminals.		After turning VR317 and VR318 fully counterclockwise, turn back clockwise and stop at a position where the measured value is 2.5dB lower than the maximum output level after passing that maximum position.	
4 Forward recording	Record on the STD-604 test tape (and monitor the playback simultaneously at TP.L and TP.R)	VR306			After turning VR306 fully counterclockwise, turn back clockwise and stop at a position where the measured value is 2dB lower than the maximum output level after passing that maximum position.	
9. Recording Level Adjustment						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks	
1 Recording pause	Apply 315Hz/-10dBv (316mV) to LINE INPUT terminals	INPUT level control	TP.1 (left ch.) TP.2 (right ch.) (Dolby NR ass'y)	-7.7dBv (412.1mV)	INPUT level control position setting	
2 Recording /playback	Record the signal on the STD-608A test tape, and then play that section of the tape.	VR307 (left ch.) VR308 (right ch.)		-7.7dBv (412.1mV) (playback level)	Repeat the recording and playback, and adjust accordingly.	
3 Recording /playback	Record the signal on the STD-603 test tape, and then play that section of the tape.	VR309 (left ch.) VR310 (right ch.)	-7.7dBv (412.1mV) (playback level)			
4 Recording /playback	Record the signal on the STD-604 test tape, and then play that section of the tape.	VR311 (left ch.) VR312 (right ch.)	-7.7dBv (412.1mV) (playback level)			
5 VR307, VR309, and VR311 (left channel) and VR308, VR310, and VR312 (right channel) are to be adjusted in the specified adjustment order. If any single control is adjusted separately, always check (and adjust) the other controls which follow it in the adjustment procedure order.						

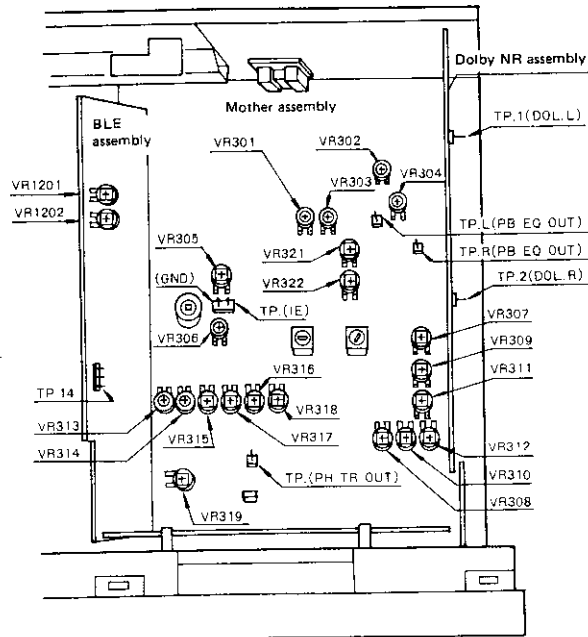


Fig. 10-15 Adjustment locations

Adjustment control	Adjustment item
VR301, 302	Playback equalizer
VR303, 304	Playback level
VR305	METAL erase current
VR306	METAL bias
VR307, 308	NORM recording level
VR309, 310	CrO ₂ recording level
VR311, 312	METAL recording level
VR313, 314	CrO ₂ bias
VR315, 316	NORM (FWD) bias
VR317, 318	NORM (REV) bias
VR319	Leader tape detector level
VR321, 322	Level meter 0dB
VR1201	AUTO-BLE FL (1kHz)
VR1202	AUTO-BLE FH (10kHz)

10. Recording Bias Adjustment (2)					
• Set the OUTPUT level control to maximum position, and set the LINE INPUT terminal input level to a constant value of -30dBv (31.6mV).					
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1 Forward recording/pause	Apply 315Hz/-30dBv to LINE INPUT terminals	INPUT level control	Left and right OUTPUT terminals	-24dBv (63.1mV)	INPUT level control position setting
2 Forward recording/playback	Record 315Hz and 10kHz signals onto the STD-608A test tape, and then play those recorded sections.	VR315 (left ch.) VR316 (right ch.)			
3 Reverse recording/playback	Record 315Hz and 10kHz signals onto the STD-603 test tape, and then play those recorded sections.	VR317 (left ch.) VR318 (right ch.)			
4 Forward recording/playback	Record 315Hz and 10kHz signals onto the STD-604 test tape, and then play those recorded sections.	VR313 (left ch.) VR314 (right ch.)			
5 Forward recording/playback	Record 315Hz and 10kHz signals onto the STD-604 test tape, and then play those recorded sections.	VR306			

11. Tape Touch Check (REC)					
Mode	Input signal & test tape	Measuring location	Rated specifications	Remarks	
1 Recording pause	Apply 15kHz/-30dBv to LINE INPUT terminals	Left and right OUTPUT terminals	Adjust the INPUT level control to obtain a -24dBv level (63.1mV).	INPUT level control position setting	
2 Recording /playback	Record the signal on the STD-608A test tape, and then play that section of the tape.		Lightly brake the supply reel by hand during recording mode, and check that the playback level increase is less than 2dB.	Back-tension method	
3 Recording /playback	Record the signal on the STD-608A test tape, and then play that section of the tape.		The increase in playback level as a result of displacing the cassette half upwards during recording mode must be less than 2dB.	Head protrusion variation method	
4 If the rated specifications for step 2 and 3 are not satisfied, repeat the "Tape transport adjustment".					
5 Also check in the same way with the STD-603 and STD-604 test tapes.					
6 After completing the adjustments up to this stage, secure the azimuth adjustment screw securely into position with "screw lock".					

12. Overall Frequency Response Check and Adjustment					
• Set the OUTPUT level control to maximum position, and set the LINE INPUT terminal input level to a constant value of -30dBv (31.6mV).					
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment	Remarks
1 Recording pause	Apply 315Hz/-30dBv to LINE INPUT terminals.	INPUT level control	Left and right OUTPUT terminals	-24dBv (63.1mV)	INPUT level control position setting
2 Record 315Hz -15kHz signals (-30dBv input) onto the STD-608A test tape, and then play the recorded signals back to check that the permitted frequency response zone (for STD-608A) shown in Fig. 10-16 is satisfied. If the results do not conform with the rated specifications, adjust in the following way.					
3 Forward recording/playback	Record 315Hz -15kHz signals (-30dBv input) onto the STD-608A test tape, and then play the recorded signals.	VR315 (left ch.) VR316 (right ch.)	Left and right OUTPUT terminals		Repeat the recording and playback (adjusting where necessary) until the permitted frequency response zone (for STD-608A) shown in Fig. 10-16 is satisfied.
4 Reverse recording/playback		VR317 (left ch.) VR318 (right ch.)			
5 Record 315Hz -15kHz signals (-30dBv input) onto the STD-603 test tape, and then play the recorded signals back to check that the permitted frequency response zone (for STD-603) shown in Fig. 10-17 is satisfied. If the results do not conform with the rated specifications, adjust in the following way.					
6 Recording /playback	Record 315Hz -15kHz signals onto the STD-603 test tape, and then play the recorded signals.	VR313 (left ch.) VR314 (right ch.)	Left and right OUTPUT terminals		Repeat the recording and playback (adjusting where necessary) until the permitted frequency response zone (for STD-603) shown in Fig. 10-17 is satisfied.
7 Record 315Hz -15kHz signals (-30dBv input) onto the STD-604 test tape, and then play the recorded signals back to check that the permitted frequency response zone (for STD-604) shown in Fig. 10-18 is satisfied. If the results do not conform with the rated specifications, adjust in the following way.					
8 Recording /playback	Record 315Hz -15kHz signals (-30dBv input) onto the STD-604 test tape, and then play the recorded signals.	VR306	Left and right OUTPUT terminals		Repeat the recording and playback (adjusting where necessary) until the permitted frequency response zone (for STD-604) shown in Fig. 10-18 is satisfied.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
9		Since the VR315 thru VR318 adjustments (NORM bias) effect the VR313, VR314 (CrO ₂ bias) and VR306 (METAL bias) adjustments, always check (and readjust) those controls which follow in order if a particular control is readjusted.				

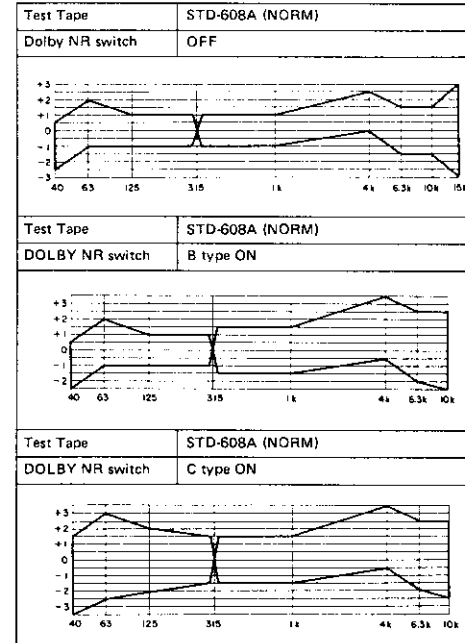


Fig. 10-16 Permitted recording/playback frequency response zone (NORM)

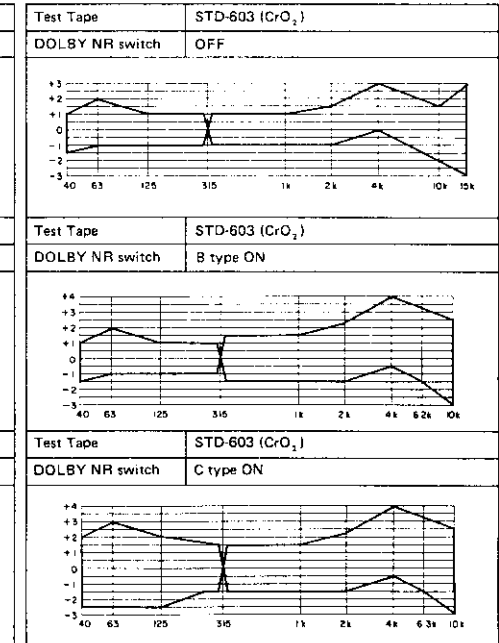


Fig. 10-17 Permitted recording/playback frequency response zone (CrO₂)

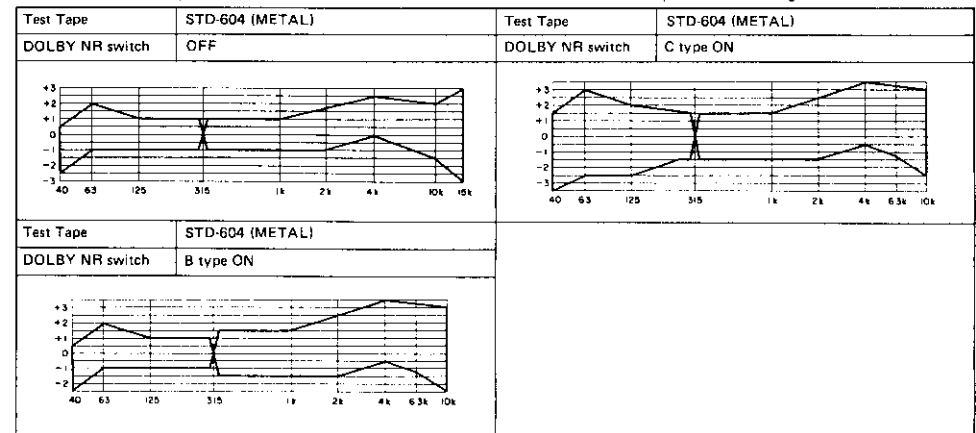


Fig. 10-18 Permitted recording/playback frequency response zone (METAL)

13. Built-In BLE Oscillator Adjustment						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks	
1 Connect TP. 14 on the BLE assembly to ground for a brief moment (thereby switching the AUTO BLE IC to TEST A mode).						
Recording	Load the STD-608A	VR1201	TP. 2	-7.7dBv (412.1mV)	TEST A mode is 1kHz	
3 Switch the tape deck from stop, rewind, and then stop mode again (thereby switching the AUTO BLE IC to TEST B mode).						
Recording	Load the STD-608A	VR1202	TP. 2	-18dBv (125.9mV)	TEST B mode is 10kHz	
5 Press the CLEAR button with the deck in stop mode (thereby cancelling TEST mode).						
6 Press the AUTO-BLE button (for AUTO-BLE operation with the STD-608A test tape). After completing AUTO-BLE, proceed to step 7.						
Recording pause	Apply 315Hz/-10dBv to LINE INPUT terminals	INPUT level control	TP. 2	-7.7dBv (412.1mV)	INPUT level control position setting	
Recording /playback	Record onto the STD-608A test tape, and then play the recorded signal.	Measure	TP. 2	Measure deviation in the playback level in respect to -7.7dBv. Example: Measured value of -7.2dBv denotes deviation of +0.5dB.		
9 After pressing the CLEAR button, connect TP. 14 to ground briefly (to set TEST A mode).						
Recording	Load the STD-608A	VR1201	TP. 2	Compensate for the deviation measured in step 8. Example: Set to -7.2dBv if deviation is +0.5dB.		
11 Press the CLEAR button with the deck in stop mode (thereby cancelling TEST mode).						
12 Press the AUTO-BLE button (for AUTO-BLE operation with the STD-608A test tape). After completing AUTO-BLE, proceed to step 13.						
Recording /playback	Record 10kHz and 315Hz (-30dBv input) signals onto the STD-608A test tape, and then play the recorded signals back.	Measure	TP. 2	Measure the deviation in playback level of the 10kHz signal in respect to the 315Hz signal.		
14 Press the CLEAR button with the deck in stop mode. Then after connecting TP. 14 briefly to ground, switch to rewind mode, and then back to stop mode (thereby switching to TEST B mode).						
Recording	Load the STD-608A	VR1202	TP. 2	Compensate for the deviation measured in step 13.		
16 Press the CLEAR button with the deck in stop mode.						
14. Leader Tape Detector Level Adjustment						
Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks	
1 Disconnect the CN304 connector.						
Stop	Apply a 2kHz/-17dBv (0.4Vp-p) signal to the TP (PH TR OUT) terminals.	VR319	Pin 4 of IC303 (PA3010)	DC10.5V±0.25V		
3 Reconnect the CN304 connector.						
Playback	Load a cassette half which is without any tape.	The position marked "A" in Fig. 10-20.	TP. (PH TR OUT)	If the waveform (square wave) at the measured location is greater than 0.6Vp-p, connect the section indicated by "A" in Fig. 10-20.		

Adjustment control	Adjustment item
VR301, 302	Playback equalizer
VR303, 304	Playback level
VR305	METAL erase current
VR306	METAL bias
VR307, 308	NORM recording level
VR309, 310	CrO ₂ recording level
VR311, 312	METAL recording level
VR313, 314	CrO ₂ bias
VR315, 316	NORM (FWD) bias
VR317, 318	NORM (REV) bias
VR319	Leader tape detector level
VR321, 322	Level meter 0dB
VR1201	AUTO-BLE FL (1kHz)
VR1202	AUTO-BLE FH (10kHz)

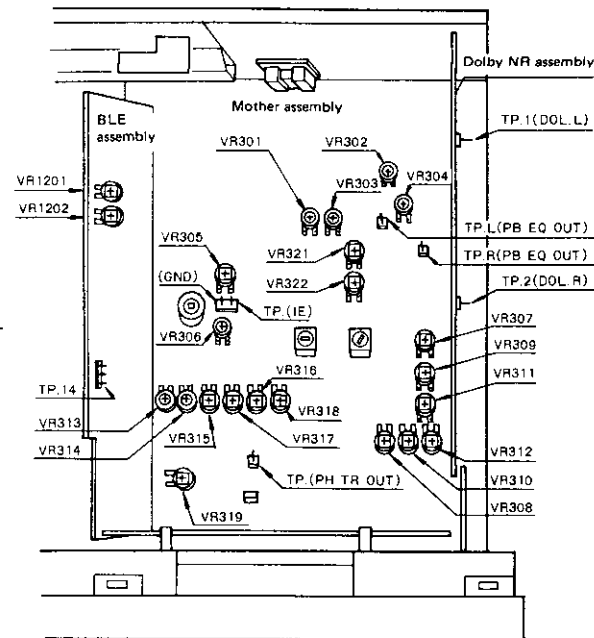


Fig. 10-19 Adjustment locations

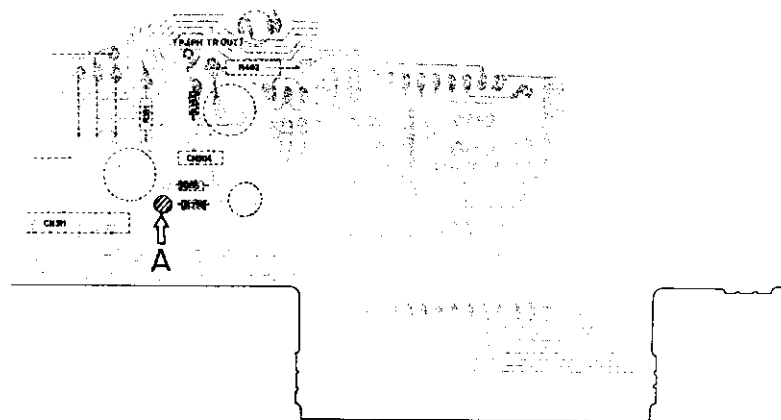


Fig. 10-20 Adjustment location (on foil side of Mother assembly)

10. RÉGLAGE

10.1 RÉGLAGES MÉCANIQUES

10.1.1 Vérification de pression du galet d'entraînement

*Utiliser une jauge de tension (GGK-047).

Mode	Normes	Conditions de mesure
Mode de lecture	250g ~ 400g	Ecarter lentement le galet d'entraînement du cabestan et lire la valeur dès que le galet cesse de tourner.

*Si la valeur mesurée ne correspond pas aux valeurs spécifiées, remplacer le ressort de pression du galet d'entraînement.

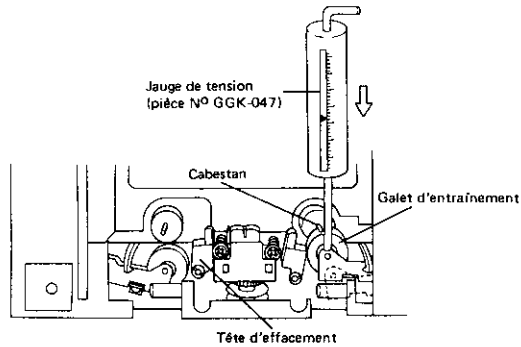


Fig. 10-1 Vérification de la pression du galet d'entraînement

10.1.2 Réglage préliminaire d'azimut de la tête.

Mode	Lieu de réglage	Spécifications
Mode d'arrêt quand la direction de la bande est vers l'avant.	Vis de réglage d'azimut de tête ①	Régler l'espace A à 1,5mm (±0,3mm).
Mode d'arrêt quand la direction de la bande est inversée.	Vis de réglage d'azimut de tête ②	Régler l'espace B à 1,5mm (±0,3mm).

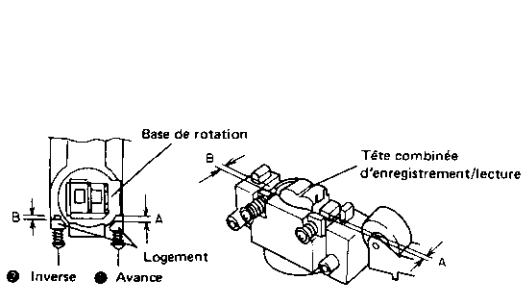


Fig. 10-2 Points de réglage d'azimut

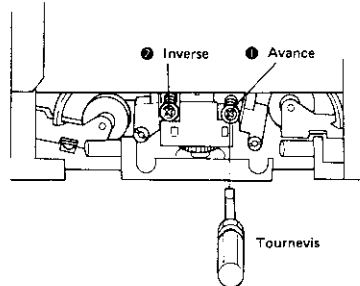


Fig. 10-3 Réglage préliminaire d'azimut

10.1.3 Réglage du défilement de bande

Mode	Lieu de réglage	Spécifications
Direction vers l'avant en mode de lecture	Ecrou de réglage ①	La courbure de la bande sur les têtes d'effacement et de lecture doit être conforme aux chiffres suivants. Courbure sur la tête de lecture: moins de 1/9 de la largeur de la bande.
Direction inverse en mode de lecture	Ecrou de réglage ②	Courbure sur la tête d'effacement: moins de 1/5 de la largeur de la bande.

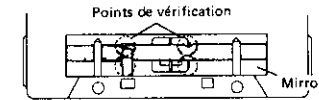


Fig. 10-4 Points de vérification de courbure de bande

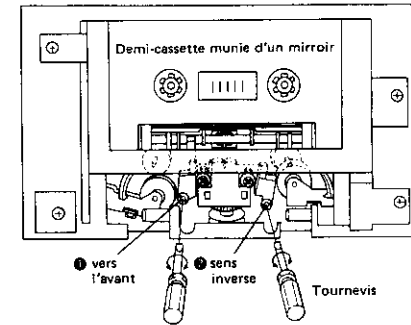


Fig. 10-5 Réglage du défilement de la bande

10.1.4 Réglage de la vitesse de rotation rapide vers l'avant et rembobinage

*Utiliser un compteur de fréquence sans demi-cassette dans le compartement de cassette.

Mode	Lieu de réglage	Spécifications
Avance rapide avec bande en direction vers l'avant	VR202 (montage RM)	Régler les lectures de fréquence entre la sortie MR HB (5) et GND (3) sur le montage RM à 36Hz±1Hz.

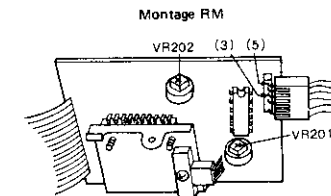


Fig. 10-6 Réglage de vitesse de rotation FF/REW

10.1.5 Réglage du couple de tendeur de LECTURE

*Utiliser un mesureur de couple de type cassette.

Mode	Lieu de réglage	Spécifications
Mode de lecture en direction vers l'avant	VR102 (montage RM)	Le couple du tendeur doit être de 35g-cm à 55g-cm dans les 10 secondes après le démarrage du mode de lecture. Les variations du mesureur de couple ne doivent pas dépasser 15g-cm.
Mode de lecture en direction inverse	Vérification	

10.1.6 Vérification du couple de RAPIDE (FF et REW)

*Utiliser un mesureur de couple de type cassette.

Mode	Normes de spécifications	Remarque
Mode avance rapide et rembobinage	70g-cm ~ 130g-cm	Couple de tendeur.

10.1.7 Vérification du couple de tension de recul

*Utiliser un mesureur de couple de type cassette.

Mode	Normes de spécifications	Remarque
En mode de lecture, direction vers l'avant et inverse.	2g-cm ~ 5g-cm	Fournir le couple de tension de recul à la base du rouleau.

10.1.8 Réglage de la vitesse de défilement de la bande

*Utiliser un compteur de fréquence et la bande d'essai STD-301.

Mode	Lieu de réglage	Spécifications
Mode de lecture vers l'avant	VR101 (ensemble de contrôle CM)	La fréquence de lecture doit être de 3005±10Hz au début de la bande d'essai STD-301.
Mode de lecture vers l'arrière	Vérification	La fréquence de lecture doit être de 3000±30Hz au début de la bande d'essai STD-301.

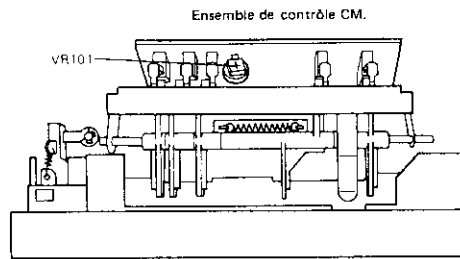


Fig. 10-7 Réglage de la vitesse de défilement de la bande

10.1.9 Réglage de l'amortisseur de poche de cassette

Lieu de réglage	Spécifications
Vis de réglage du cylindre d'amortisseur	La porte doit s'ouvrir sans accroc, sans passer par un mouvement en deux phases, et sans se refermer violemment lorsqu'elle est grande ouverte.

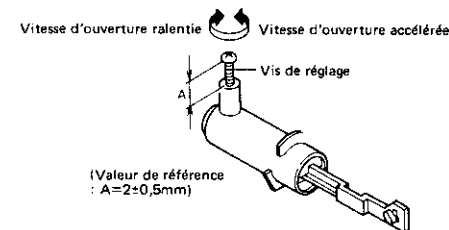


Fig. 10-8 Réglage de l'amortisseur de poche de cassette

10.1.10 Réglage de la position de porte

Vérification 1	Le rapport de dimension entre A et B, et entre C et D doit se trouver entre 0,5 et 2 (dimensions prises face à la platine).
Vérification 2	La différence entre E et G ne doit pas dépasser ±0,4mm et toutes les dimensions E, F et G doivent être au moins de 0,5mm (dimensions prises face à la platine).
Si les spécifications ne sont pas obtenues, déposer la porte et régler le cadre de poche à l'aide d'un tournevis à l'endroit indiqué sur les diagrammes suivants.	

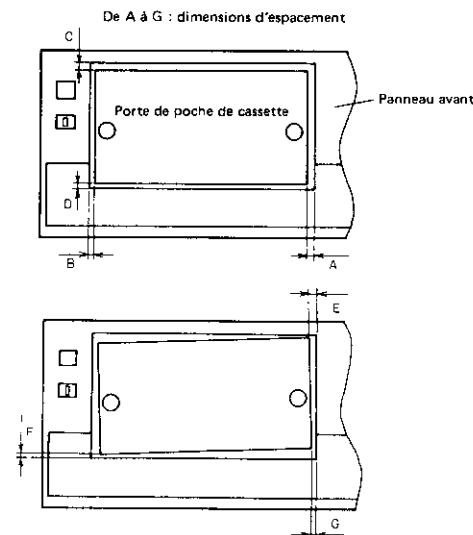


Fig. 10-9 Position de porte

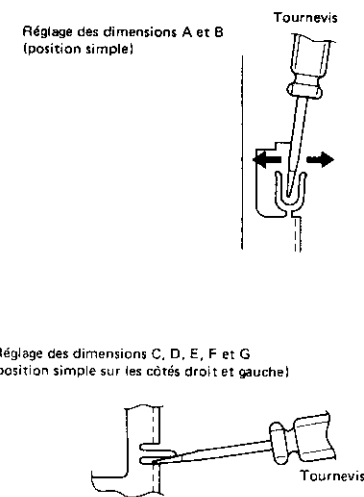


Fig. 10-10 Réglage de position de porte

10.2 RÉGLAGES ELECTRIQUES

Conditions de réglage

1. Ne commencer les réglages électriques qu'une fois terminés tous les réglages mécaniques.
2. S'assurer également que les têtes ont été nettoyées et démagnétisées.
3. Laisser chauffer la platine pendant quelques minutes avant de commencer les réglages réels.
4. Admettre que le niveau de signal de 0dB= 1Vrms.
5. Brancher la résistance de charge de 50 kOhms sur la borne de sortie (toute résistance comprise entre 47 et 52 kOhms est acceptable).
6. Positionner le volume de sortie au maximum sauf autre directive.
7. Positionner les interrupteurs de contrôle sur les positions suivantes sauf autre directive:
 Minuterie : OFF
 Mémoire : OFF
 Dolby NR : OFF
 Filtre MPX : OFF
 Mode : "←" affichage
 Auto-BLE : remis à zéro (indicateur de DATA SET hors tension)

Bandes d'essai

- STD-331B* : pour les réglages de système de lecture
- STD-608A : bande normale vierge
- STD-603 : bande CrO₂ vierge
- STD-604 : bande métal vierge

*Les niveaux d'enregistrement pour STD-331A et STD-331B diffèrent. Tandis que le niveau de référence du STD-331A est de 333Hz, 250nwb/m, le niveau correspondant pour STD-331B est 315Hz, 160nwb/m.

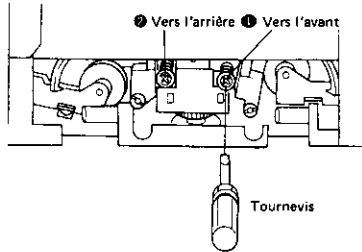


Fig. 10-11 Réglage d'azimuth de tête

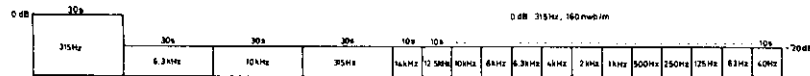


Fig. 10-13 Bande d'essai STD-331B

Séquence de réglage

Les réglages doivent toujours avoir lieu dans l'ordre suivant:

1. Réglage d'azimuth de tête
2. Réglage du défilement de bande
3. Vérification de contact de bande (Lecture)
4. Réglage de l'égaliseur de lecture
5. Réglage du niveau de lecture
6. Vérification 0dB du mesureur de niveau
7. Effacement des réglages courants
8. Réglage de la polarisation d'enregistrement (1)
9. Réglage du niveau d'enregistrement
10. Réglage de la polarisation d'enregistrement (2)
11. Vérification de contact de bande (REC)
12. Vérification et réglage de l'ensemble des réponses aux fréquences
13. Réglage de l'oscillateur incorporé BLE
14. Réglage du niveau de détecteur de guide de bande

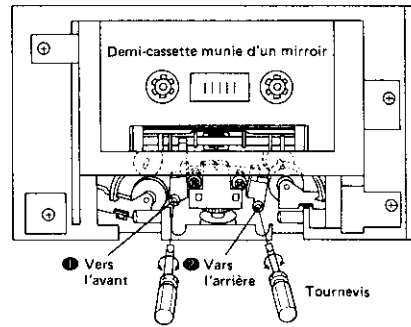
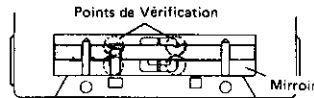


Fig. 10-12 Réglage de défilement de bande

1. Réglage d'azimuth de tête					
• Tourner les VR303 et VR304 (ADJ de niveau de lecture) sur le niveau maximum, puis régler VR301 et VR302 (EQ ADJ de lecture) sur la position centrale mécanique.					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
Lecture (vers l'avant et vers l'arrière)	Reproduire la portion de 10kHz/-20dB de la bande d'essai STD-331B.	Vis ① de réglage d'azimuth de tête (voir Fig. 10-11)	Bornes de sortie gauche et droite	Niveau de signal de lecture maximum	Vis ① pour lecture vers l'avant Vis ② pour lecture vers l'arrière
2. Réglage du défilement de bande					
• Utiliser une demi-cassette munie d'un miroir pour vérifier l'état du défilement de bande. Régler si les spécifications ne sont pas atteintes.					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Spécifications nominales		Remarques
1 Lecture (vers l'avant et vers l'arrière)	Demi-cassette munie d'un miroir	Ecrou de réglage ① et ② (voir Fig. 10-12)	Absence d'enroulement de bande aux guides de bande de la tête de lecture et de la tête d'effacement en mode de lecture.		Ecrou ① pour lecture vers l'avant Ecrou ② pour lecture vers l'arrière
2 Une fois que le réglage du défilement est terminé, refaire le réglage de l'azimuth de tête.					
3. Vérification du contact de bande (Lecture)					
Mode	Signal d'entrée et bande d'essai	Lieu de mesure	Spécifications nominales		Remarques
1 Lecture (vers l'avant et vers l'arrière)	Passer la partie de 10kHz/-20dB de la bande d'essai STD-331B.	Bornes de sortie droite et gauche	Lorsque la bobine de déroulement est légèrement freinée à la main, l'accroissement du niveau de signal de lecture ne doit pas dépasser 1,5dB.		Méthode de tension de recul.
2			Lorsque la demi-cassette est déplacée vers le haut, l'accroissement de niveau de signal de lecture ne doit pas dépasser 1,5dB.		Méthode de variation de saillie de tête.
3 Si les spécifications nominales ne sont pas atteintes pour les points 1 et 2, recommencer le réglage du défilement de bande.					
4. Réglage de l'égaliseur de lecture					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	
1 Lecture vers l'avant	Passer les parties 315Hz/-20dB et 10kHz/-20dB de la bande d'essai STD-331B.	VR301 (canal de gauche) VR302 (canal de droite)	Bornes de sortie droite et gauche	Régler le niveau de 10kHz à 0dB en considération du niveau de lecture de 315Hz.	
2 Lecture vers l'arrière		Vérifier		Vérifier le niveau de 10kHz à 0 ₂ dB en considération du niveau de lecture de 315Hz.	
3 Lecture vers l'avant	Passer les parties 315kHz/-20dB et 14kHz/-20dB de la bande d'essai STD-331B.	Vérifier	Bornes de sortie droite et gauche	Vérifier le niveau de 14kHz à 0 ₂ dB en considération du niveau de lecture de 315Hz.	
4 Lecture vers l'arrière		Vérifier		Vérifier le niveau de 14kHz à 0 ₂ dB en considération du niveau de lecture de 315Hz.	
5 Voir la Fig. 10-14 pour les zones de réponse à la fréquence de lecture permise.					

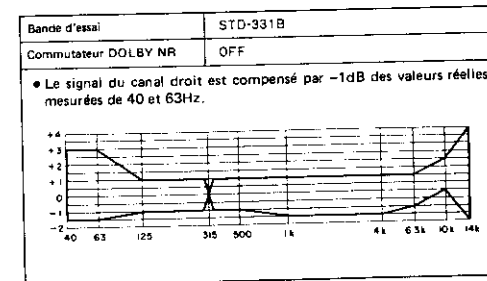


Fig. 10-14 Zone de réponse à la fréquence de lecture permise

5. Réglage du niveau de lecture					
• Comme le niveau de lecture de Dolby et le niveau de fonctionnement AUTO-BLE sont fixés par ce réglage, s'assurer que le réglage est précis.					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	
1 Lecture vers l'avant	Passer la partie de 315Hz/0dB de la bande d'essai STD-331B.	VR303 (canal de gauche) VR304 (canal de droite)	TP.1 (canal de gauche) TP.2 (canal de droite)	-7,7dB (412,1mV)	
2 Lecture vers l'arrière		Vérifier.	Ensemble Dolby NR	-7,7dB±0,5dB	

6. Réglage 0dB du mesureur de niveau					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
1	Appliquer un signal de 315Hz/ -10dB (316mV) aux bornes d'entrée de ligne.	Contrôle de niveau d'entrée	TP.1 (canal de gauche) TP.2 (canal de droite)	-7,7dB (412,1mV)	Réglage de la position de contrôle du niveau d'entrée.
2		VR321 (canal de gauche) VR322 (canal de droite)	Après avoir tourné à l'inverse du sens horaire, à fond, les VR321 et VR322, les faire tourner lentement dans le sens horaire et s'arrêter à la position où apparaît le segment d'indicateur "0" du mesureur de niveau.		
3	Varier le niveau d'entrée	Vérifier	Le niveau d'entrée nécessaire pour mettre le segment d'indicateur sur "+5" dB est de -5dB±3dB.		
4		Vérifier	Le niveau d'entrée nécessaire pour mettre le segment d'indicateur sur "-10" dB est de -20dB±5dB.		

7. Réglage du courant d'effacement					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
1 Enregistrement vers l'avant	Charger la bande d'essai STD-604 sans appliquer de signal d'entrée. (Le sélecteur de bande automatique est en position métal).	VR305	TP. (IE vers la masse)	160mV	Mesurer la tension (formée par le courant d'effacement à R429 (1 Ohm)).
2 Enregistrement vers l'arrière		Vérification		140mV-180mV	
3 Si la tension ne se trouve pas entre 140mV et 180mV pendant l'enregistrement en marche arrière, régler pour que la tension se trouve entre ces limites pendant l'enregistrement aussi bien en marche avant qu'en marche arrière.					

8. Réglage de la polarisation de l'enregistrement (1)					
• Positionner le contrôle de niveau de sortie au maximum, et les VR313 et VR314 (CrO ₂), polarisation ADJ à la position mécanique centrale.					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
1 Pause enregistrement	Appliquer un signal de 6,3kHz/ -20dB (100mV) aux bornes d'entrée (LINE INPUT).	Contrôle de niveau d'entrée (INPUT)	Bornes de sortie (OUTPUT) droite et gauche	-14dB (199,5mV)	Réglage de la position du potentiomètre d'entrée (INPUT)
2 Enregistrement avant	Enregistrer sur la bande d'essai STD-608A (et vérifier la reproduction simultanément au niveau des TP. L et TP. R, points de réglage droit et gauche).	VR315 (canal gauche) VR316 (canal droit)	TP. L (point de réglage canal gauche) TP. R (point de réglage canal droit)		Après avoir fait tourner les rhéostats VR315 et VR316 complètement dans le sens des aiguilles d'une montre, les faire tourner dans le sens inverse des aiguilles d'une montre, et s'arrêter sur la position pour laquelle la valeur mesurée est de 2,5dB inférieure au niveau maximal de sortie après avoir dépassé la position en question. (Sortie reproduction égaliseur PB EQ OUT) La disposition des 3 tétes adoptées pour l'AUTO-
3 Enregistrement arrière		VR317 (canal gauche) VR318 (canal droit)			* BLE permet d'effectuer une écoute simultanée de contrôle de reproduction. Il faut néanmoins remarquer que le signal de reproduction n'apparaît pas au niveau des bornes de sortie (LINE OUTPUT).
4 Enregistrement avant		VR306			* AUTO-BLE fait référence à un système automatique de polarisation et de correction (Automatic Bias Level Equalizer).

9. Réglage du niveau d'enregistrement					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
1 Enregistrement/ pause	Appliquer 315Hz/-10dB (316mV) sur les bornes d'entrée de ligne.	Contrôle de niveau d'entrée (INPUT)	TP.1 (canal gauche) TP.2 (canal droit) (ensemble de Dolby NR)	-7,7dB (412,1mV)	Réglage de position de contrôle de niveau d'entrée.
2 Enregistrement/ lecture	Enregistrer le signal sur la bande d'essai STD-608A, puis reproduire cette section de bande.	VR307 (canal gauche) VR308 (canal droit)		-7,7dB (412,1mV) (niveau de lecture)	Recommencer l'enregistrement et la reproduction et faire le réglage convenable.
3 Enregistrement/ lecture	Enregistrer le signal sur la bande d'essai STD-603, puis reproduire cette section de bande.	VR309 (canal gauche) VR310 (canal droit)		-7,7dB (412,1mV) (niveau de lecture)	
4 Enregistrement/ lecture	Enregistrer le signal sur la bande d'essai STD-604, puis reproduire cette section de bande.	VR311 (canal gauche) VR312 (canal droit)		-7,7dB (412,1mV) (niveau de lecture)	
5 Les VR307, VR309 et VR311 (canal gauche) et les VR308, VR310 et VR312 (canal droit) doivent être réglés dans l'ordre de réglage spécifié. Si aucun des contrôles est réglé séparément, toujours vérifier (et régler) les autres contrôles qui viennent à la suite dans l'ordre.					

Contrôle de réglage	Pièce de réglage
VR301, 302	Egaliseur de lecture
VR303, 304	Niveau de lecture
VR305	Courant d'effacement métal
VR306	Polarisation métal
VR307, 308	Niveau d'enregistrement normal
VR309, 310	Niveau d'enregistrement CrO ₂
VR311, 312	Niveau d'enregistrement métal
VR313, 314	Polarisation CrO ₂
VR315, 316	Polarisation normale (vers l'avant)
VR317, 318	Polarisation normale (vers l'arrière)
VR319	Niveau de détecteur d'amorce de bande
VR321, 322	QdB de mesureur de niveau
VR1201	AUTO-BLE FL (1kHz)
VR1202	AUTO-BLE FH (10kHz)

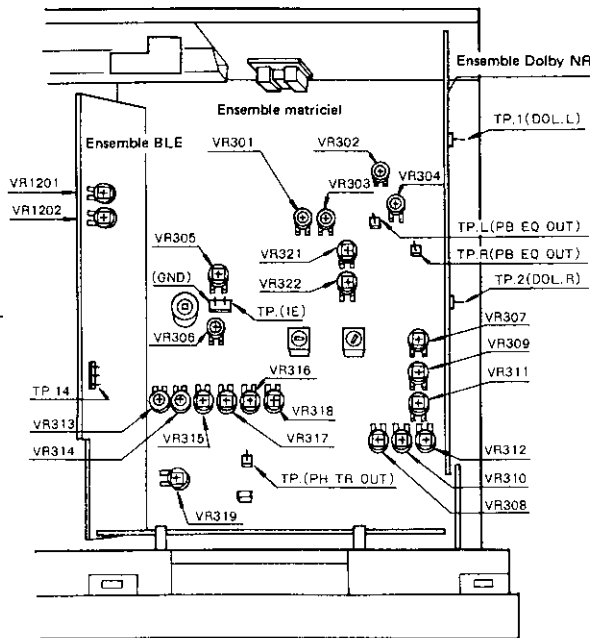


Fig. 10-15 Lieux de réglage

10. Réglage de polarisation d'enregistrement (2)					
* Positionner le contrôle de niveau de sortie au maximum et mettre le niveau d'entrée à une valeur constante de -30dBv (31,6mV).					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
1	Pause d'enregistrement vers l'avant	Appliquer 315Hz/-30dBv aux bornes d'entrée de ligne.	Contrôle de niveau d'entrée	-24dBv (63,1mV)	Réglage de position de contrôle de niveau d'entrée.
2	Enregistrement vers l'avant/lecture	Enregistrer des signaux de 315Hz et 10kHz sur la bande d'essai STD-608A, puis reproduire ces parties.	VR315 (canal gauche) VR316 (canal droit)	Bornes de sortie gauche et droite	Recommencer l'enregistrement et la reproduction et régler en conséquence jusqu'à ce que le niveau de lecture de 10kHz soit de +0,5dB par rapport au signal de 315Hz.
3	Enregistrement vers l'arrière/lecture	Enregistrer des signaux de 315Hz et 10kHz sur la bande d'essai STD-603, puis reproduire ces parties.	VR317 (canal gauche) VR318 (canal droit)		Recommencer l'enregistrement et la reproduction et régler en conséquence jusqu'à ce que le niveau de lecture de 10kHz soit de 0dB par rapport au signal de 315Hz.
4	Enregistrement vers l'avant/lecture	Enregistrer des signaux de 315Hz et 10kHz sur la bande d'essai STD-604, puis reproduire ces parties.	VR313 (canal gauche) VR314 (canal droit)		Recommencer l'enregistrement et la reproduction et régler en conséquence jusqu'à ce que le niveau de lecture de 10kHz soit de +0,5dB par rapport au signal de 315Hz.
5	Enregistrement vers l'avant/lecture	Enregistrer des signaux de 315Hz et 10kHz sur la bande d'essai STD-604, puis reproduire ces parties.	VR306		Recommencer l'enregistrement et la reproduction et régler en conséquence jusqu'à ce que le niveau de lecture de 10kHz soit de +0,5dB par rapport au signal de 315Hz.

11. Vérification de contact de bande (REC)					
Mode	Signal d'entrée et bande d'essai	Lieu de mesure	Spécifications nominales	Remarques	
1	Pause d'enregistrement	Appliquer 15kHz/-30dBv aux bornes d'entrée de ligne.	Bornes de sortie droite et gauche	Ajuster le contrôle de niveau d'entrée pour obtenir un niveau de -24dBv (63,1mV).	Réglage de position de contrôle de niveau d'entrée.
2	Enregistrement/lecture	Enregistrer le signal sur la bande d'essai STD-608A puis reproduire cette section de la bande.		Freiner légèrement la bobine débitrice avec la main pendant l'enregistrement et vérifier que l'accroissement de niveau de lecture est inférieur à 2dB.	Méthode de tension de recul.
3	Enregistrement/lecture	Enregistrer le signal sur la bande d'essai STD-608A puis reproduire cette section de la bande.		L'accroissement du niveau de reproduction en la cassette vers le haut pendant l'enregistrement doit être inférieur à 2dB.	Méthode de variation de saillie de tête.
4	Si les spécifications nominales des phases 2 et 3 ne sont pas satisfaites, recommencer le réglage de défilement de bande.				
5	Vérifier de la même façon avec les bandes d'essai STD-603 et STD-604.				
6	Après avoir atteint le présent stade de réglage, assurer le serrage de la vis de réglage d'azimut au moyen d'une pince à vis.				

12. Vérification et réglage de la réponse générale à la fréquence					
* Positionner le contrôle de niveau de sortie au maximum, et le niveau d'entrée de la borne d'entrée de ligne à une valeur constante de -30dBv (31,6mV).					
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Réglage	Remarques
1	Pause d'enregistrement	Appliquer 315Hz/-30dBv sur les bornes d'entrée de ligne.	Contrôle de niveau d'entrée	-24dBv (63,1mV)	Réglage de position de contrôle de niveau d'entrée.
2	Enregistrer des signaux de 315Hz-15kHz (entrée de -30dBv) sur la bande d'essai STD-608A, puis reproduire le signal enregistré pour vérifier que la zone de réponse à la fréquence permise (pour le STD-608A) illustré dans la Fig. 10-16, est satisfaisante. Dans le cas où les résultats ne sont pas conformes aux spécifications nominales, faire le réglage à la manière suivante.				
3	Enregistrement vers l'avant/lecture	Enregistrer des signaux de 315Hz -15kHz (entrée de -30dBv) sur la bande d'essai STD-608A	VR315 (canal gauche) VR316 (canal droit)	Bornes de sortie gauche et droite.	Répéter l'enregistrement et la reproduction (faisant le réglage quand cela est nécessaire) jusqu'à ce que la zone de réponse à la fréquence permise (pour STD-608A), illustré dans la Fig. 10-16, soit satisfaisante.
4	Enregistrement vers l'arrière/lecture	Enregistrer des signaux de 315Hz -15kHz (entrée de -30dBv) sur la bande d'essai STD-603	VR317 (canal gauche) VR318 (canal droit)		
5	Enregistrer des signaux de 315Hz -15kHz (entrée de -30dBv) sur la bande d'essai STD-603, puis reproduire le signal enregistré pour vérifier que la zone de réponse à la fréquence permise (pour le STD-603) illustré dans la Fig. 10-17, est satisfaisante. Dans le cas où les résultats ne sont pas conformes aux spécifications nominales, faire le réglage à la manière suivante.				
6	Enregistrement/lecture	Enregistrer des signaux de 315Hz -15kHz sur la bande d'essai STD-603, puis reproduire le signal.	VR313 (canal gauche) VR314 (canal droit)	Bornes de sortie gauche et droite.	Répéter l'enregistrement et la reproduction (faisant le réglage quand cela est nécessaire) jusqu'à ce que la zone de réponse de fréquence permise (pour STD-603), illustré dans la Fig. 10-17, soit satisfaisante.
7	Enregistrer des signaux de 315Hz -15kHz (entrée de -30dBv) sur la bande d'essai STD-604, puis reproduire le signal enregistré pour vérifier que la zone de réponse à la fréquence permise (pour STD-604) illustré dans la Fig. 10-18, est satisfaisante. Dans le cas où les résultats ne sont pas conformes aux spécifications nominales, faire le réglage à la manière suivante.				
8	Enregistrement/lecture	Enregistrer des signaux de 315Hz -15kHz (entrée de -30dBv) sur la bande d'essai STD-604, puis reproduire le signal enregistré.	VR306	Bornes de sortie gauche et droite.	Répéter l'enregistrement et la reproduction (faisant le réglage quand cela est nécessaire) jusqu'à ce que la zone de réponse de fréquence (pour le STD-604), illustré dans la Fig. 10-18, soit satisfaisante.

Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques
B	Comme les réglages des VR315 à VR318 (polarisation NORM) affectent les réglages des VR313, VR314 (polarisation CrO ₂) et VR306 (polarisation métal), toujours vérifier et régler les contrôles qui suivent dans l'ordre, tout au moins si un contrôle particulier est réglé à nouveau.				

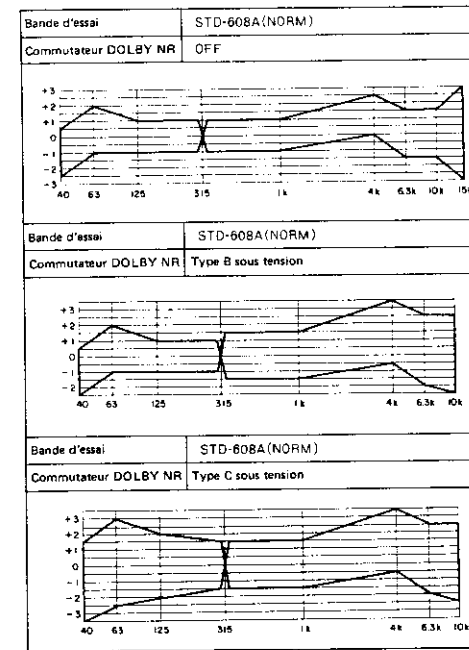


Fig. 10-16 Zone de réponse à la fréquence permise enregistrement/lecture (NORM)

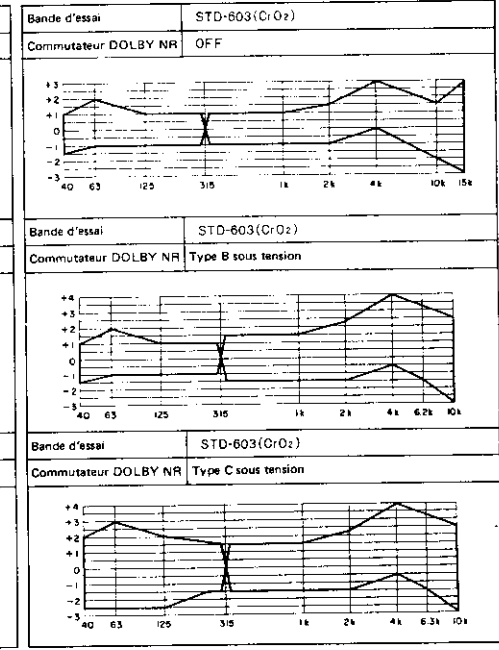


Fig. 10-17 Zone de réponse à la fréquence permise enregistrement/lecture (CrO₂)

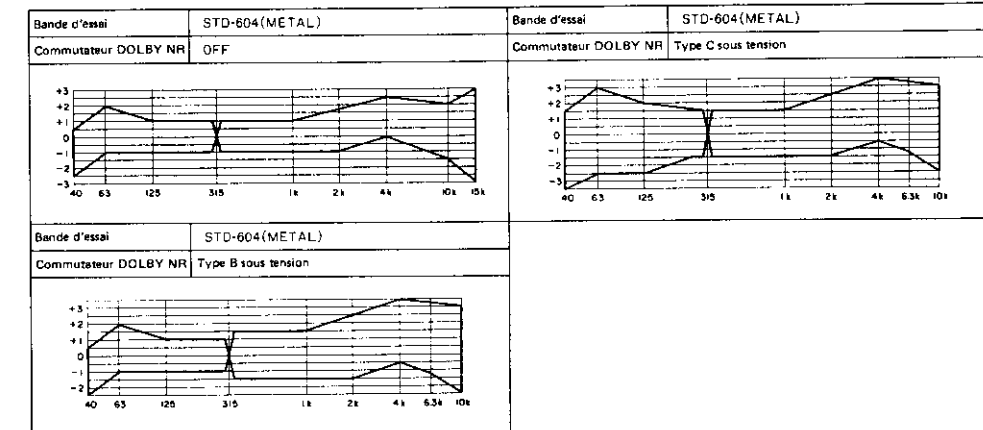


Fig. 10-18 Zone de réponse à la fréquence permise enregistrement/lecture (métal)

13. Réglages de l'oscillateur BLE incorporé						
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de réglage	Remarques	
1	Brancher le TP.14 sur l'ensemble BLE à la masse pour un court instant (commutant ainsi le AUTO BLE en mode de TEST A).					
2	Enregistrement Charger le STD-608A.	VR1201	TP.2	-7,7dBv (412,1mV)	Mode TEST A de 1kHz	
3	Commuter la platine de stop, rembobinage, puis à nouveau stop (commutant ainsi le AUTO BLE IC en mode TEST B).					
4	Enregistrement Charger le STD-608A.	VR1202	TP.2	-18dBv (125,9mV)	Mode TEST B de 10kHz	
5	Presser la touche de remise à zéro, la platine étant en mode d'arrêt (annulant ainsi le mode TEST).					
6	Presser la touche AUTO BLE (pour fonctionnement AUTO BLE avec la bande d'essai STD-608A). Après avoir terminé AUTO BLE, continuer sur la phase 7.					
7	Pause d'enregistrement Appliquer 315Hz/-10dBv sur les bornes d'entrée de ligne.	Contrôle de niveau d'entrée	TP.2	-7,7dBv (412,1mV)	Réglage de position de contrôle de niveau d'entrée.	
8	Enregistrement/lecture Enregistrer sur la bande d'essai STD-608A puis reproduire le signal enregistré.	Mesure	TP.2	-7,7dBv est la déviation de mesure au niveau de reproduction. Exemple: valeur mesurée de -7,2dBv prouve une déviation de +0,5dB.		
9	Après avoir dressé la touche de remise à zéro, connecter brièvement TP.14 à la masse (pour annuler le mode de TEST A).					
10	Enregistrement Charger la bande STD-608A.	VR1201	TP.2	Compenser pour la déviation mesurée en phase 8. Ex- emple: régler sur -7,2dBv si la déviation est de +0,5dB.		
11	Presser la touche de remise à zéro pendant que la platine est en mode d'arrêt (pour annuler le mode de test).					
12	Presser la touche AUTO BLE (pour fonctionnement AUTO BLE avec la bande STD-608A). Après avoir terminé AUTO BLE, poursuivre avec la phase 13.					
13	Enregistrement/lecture Enregistrer des signaux de 10kHz et 315Hz (entrée de -30dBv) sur la bande d'essai STD-608A, puis reproduire les signaux enregistrés.	Mesure	TP.2	Mesurer la déviation du niveau de lecture du signal de 10kHz par rapport au signal de 315Hz.		
14	Presser la touche de remise à zéro, la platine étant en mode d'arrêt. Puis après avoir brièvement connecté TP.14 à la masse, commuter le mode de rembobinage suivi d'arrêt (commutant ainsi en mode TEST B).					
15	Enregistrement Charger STD-608A	VR1202	TP.2	Compenser pour la déviation mesurée en phase 13.		
16	Presser la touche de remise à zéro, la platine étant en mode d'arrêt.					
14. Réglage de niveau de détection d'amorce de bande						
Mode	Signal d'entrée et bande d'essai	Lieu de réglage	Lieu de mesure	Valeur de mesure	Remarques	
1	Débrancher la connexion de CN304.					
2	Arrêt Appliquer un signal de 2kHz/-17 dBv (0,4Vp-p) aux bornes TP (PH TR OUT).	VR319	Broche 4 de IC303 (PA3010)	DC10,5V±0,25V		
3	Rebrancher la connexion de CN304.					
4	Lecture Charger une demi cassette sans bande.	La position marquée "A" dans la Fig. 10-20.	TP. (PH TR OUT)		Si la forme ondulatoire (onde carrée) au lieu de mesure est plus ample que 0,6Vp-p, brancher la section indiquée par "A" dans la Fig. 10-20.	

Contrôle de réglage

- | Contrôle de réglage | Pièce réglée |
|---------------------|--|
| VR301, 302 | Egaliseur de lecture |
| VR303, 304 | Niveau de lecture |
| VR305 | Courant d'effacement métal |
| VR306 | Polarisation métal |
| VR307, 308 | Niveau d'enregistrement NORM |
| VR309, 310 | Niveau d'enregistrement CrO ₂ |
| VR311, 312 | Niveau d'enregistrement métal |
| VR313, 314 | Polarisation CrO ₂ |
| VR315, 316 | Polarisation NORM (vers l'avant) |
| VR317, 318 | Polarisation NORM (vers l'arrière) |
| VR319 | Niveau de détection d'amorce de bande |
| VR321, 322 | Niveau 0dB de mesureur |
| VR1201 | AUTO BLE FL (1kHz) |
| VR1202 | AUTO BLE FH (10kHz) |

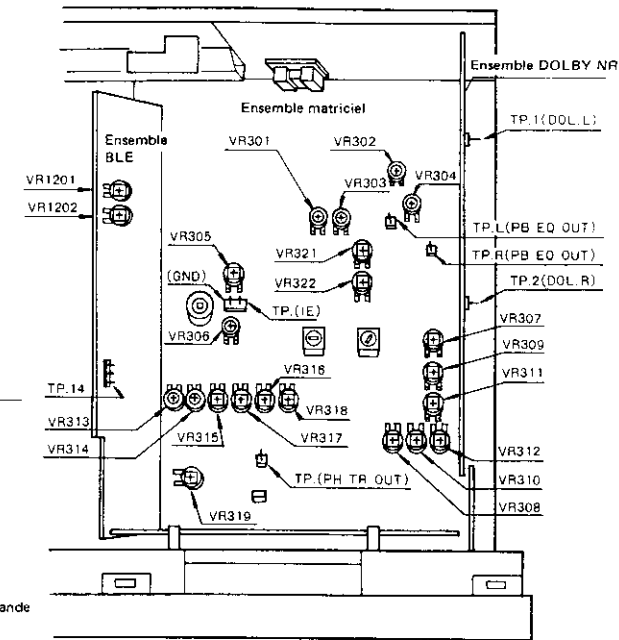


Fig. 10-19 Lieux de réglage

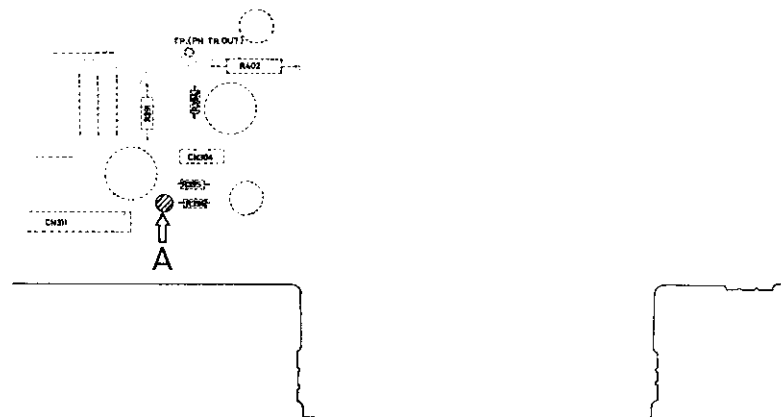


Fig. 10-20 Lieux de réglage (côté feuille de l'ensemble matriciel)

10. AJUSTE

10.1 AJUSTE MECANICO

10.1.1 Comprobación de la presión del rodillo de presión

* Emplear un medidor de tensión (GGK-047)

Modo	Valor de especificación	Condiciones de medición
Modo de reproducción	250 ~ 400g	Tirar lentamente del rodillo de presión separándolo del eje de arrastre, y leer el valor en el momento en que el rodillo de presión deja de girar.

* Si el valor medido no cae dentro del margen de especificación nominal, reemplazar el muelle de presión del rodillo de presión.

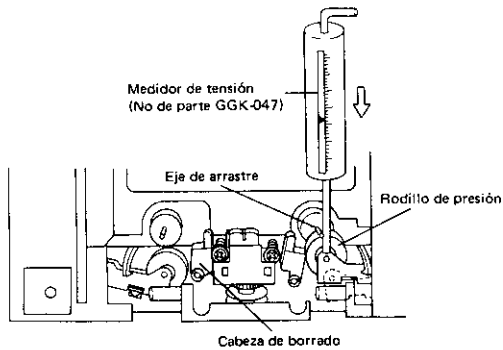


Fig. 10-1 Comprobación de la presión del rodillo de presión

10.1.2 Ajuste preliminar del acimut de la cabeza

Modo	Lugar de ajuste	Especificaciones
Modo de parada cuando la dirección de la cinta es la de "avance".	Tornillo de ajuste del acimut de la cabeza ①	Ajustar el entrehierros A a 1,5mm (±0,3mm)
Modo de parada cuando la dirección de la cinta es la "inversa"	Tornillo de ajuste del acimut de la cabeza ②	Ajustar el entrehierros B a 1,5mm (±0,3mm)

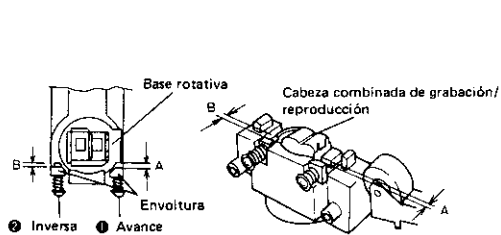


Fig. 10-2 Puntos de ajuste del acimut

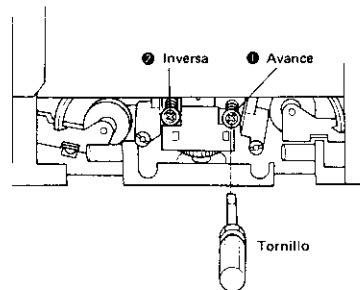


Fig. 10-3 Preajuste del acimut

10.1.5 Ajuste del par de arraste en reproducción (PLAY)

* Emplear un medidor del par tipo casete.

Modo	Lugar de ajuste	Especificaciones
Modo de reproducción en la dirección de avance	VR102 (conjunto de control RM)	El par de arrastre debe ser de 35g·cm a 55g·cm por los menos durante 10 segundos después de haberse iniciado el modo de reproducción (PLAY). La variación del medidor del par no debe exceder de 15g·cm.
Modo de reproducción en la dirección inversa	Comprobación	

10.1.6 Comprobación del par en desplazamiento rápido (FF y REW)

* Emplear un medidor del par tipo casete.

Modo	Valor de especificación	Observaciones
Modo de avance rápido y modo de rebobinado	70g·cm ~ 130g·cm	Par de arrastre

10.1.7 Comprobación del par de retrotensión

* Emplear un medidor del par tipo casete.

Modo	Valor de especificación	Observaciones
Modo de reproducción en la dirección de avance e inversa	2g·cm ~ 5g·cm	Par de retrotensión de la base del carrete de suministro.

10.1.8 Ajuste de la velocidad de la cinta

* Emplear un frecuencímetro y la cinta de prueba.

Modo	Lugar de ajuste	Especificación
Modo de reproducción en la dirección de avance	VR101 (conjunto de control RM)	La frecuencia de reproducción debe ser de 3005±10Hz al principio de la cinta de prueba STD-301.
Modo de reproducción en la dirección inversa	Comprobación	La frecuencia de reproducción debe ser de 3000±30Hz al principio de la cinta de prueba STD-301.

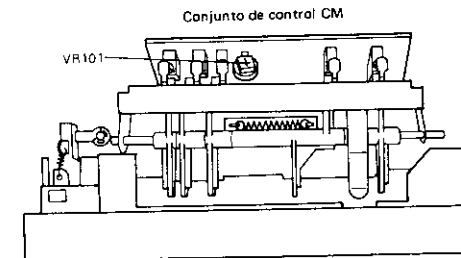


Fig. 10-7 Ajuste de la velocidad de la cinta

10.1.3 Ajuste del transporte de la cinta

Modo	Lugar de ajuste	Especificaciones
Modo de reproducción en la dirección de avance	Tuerca de ajuste ①	El enhebrado de la cinta en las cabezas de borrado y de reproducción debe conformar las figuras siguientes. En enhebrado en la cabeza de reproducción: menos del 1/9 de la anchura de la cinta. Enhebrado en la cabeza de borrado: Menos del 1/5 de la anchura de la cinta.
Modo de reproducción en la dirección inversa	Tuerca de ajuste ②	

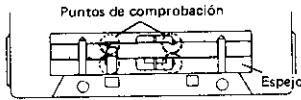


Fig. 10-4 Puntos de comprobación de enhebrado de la cinta

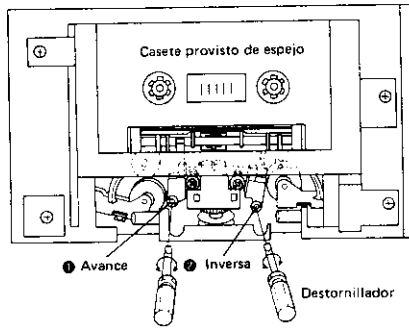


Fig. 10-5 Ajuste del desplazamiento de la cinta

10.1.4 Ajuste de la velocidad de rotación en avance rápido (FF) y en rebobinado (REW)

* Emplear un frecuencímetro sin casete insertado en el compartimiento del casete.

Modo	Lugar de ajuste	Especificaciones
Modo de avac rápido con la cinta en la dirección de avance	VR202 (conjunto de control RM)	Ajustar la indicación de la frecuencia entre MR HB (5) y GND (3) del conjunto de control RM a 36Hz ±1Hz.

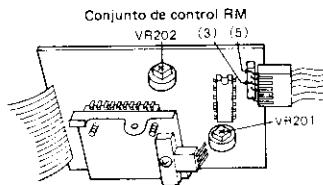


Fig. 10-6 Ajuste de la velocidad de rotación en FF/REW

10.1.9 Ajuste del amortiguador del compartimiento del casete

Lugar de ajuste	Especificaciones
Tornillo de ajuste del cilindro del amortiguador	La puerta deberá abrirse suavemente sin pasar por el movimiento de dos etapas y sin rebotar al abrirse por completo.

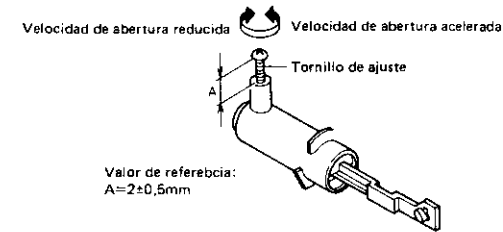


Fig. 10-8 Ajuste del amortiguador del compartimiento del casete

10.1.10 Ajuste de la posición de la puerta

Comprobación 1	La relación dimensional de A a B, y de C a D debe estar dentro del margen de 0,5 a 2. (Las dimensiones se toman encarando el magnetófono desde delante.)
Comprobación 2	La diferencia entre E y G no debe ser mayor de ±0,4mm, y todas las dimensiones E, F y G deben ser por lo menos de 0,5mm. (Las dimensiones se toman encarando el magnetófono desde delante.)

Si no se satisfacen las especificaciones de arriba, sacar la puerta y ajustar el marco del compartimiento con un destornillador en la posición indicada en el diagrama siguiente.

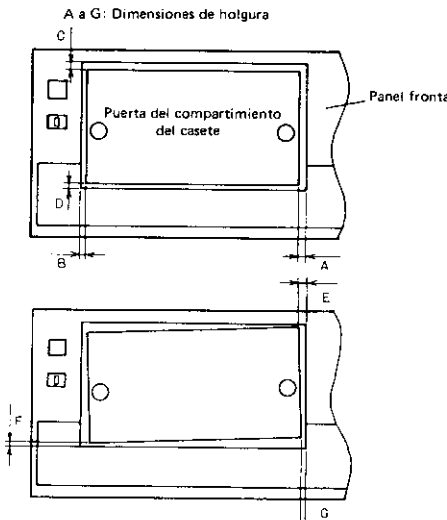


Fig. 10-9 Posición de la puerta

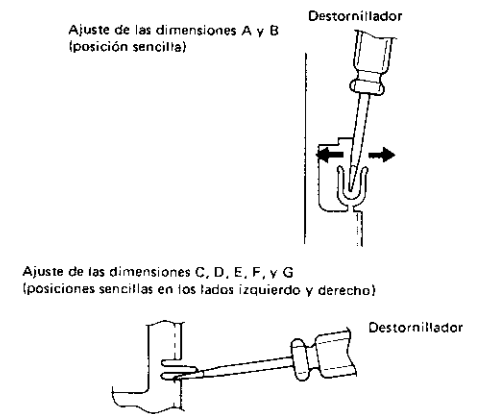


Fig. 10-10 Ajuste de la posición de la puerta

10.2 AJUSTES ELECTRICOS

Condiciones de ajuste

1. Iniciar los ajustes eléctricos sólo después de haber completado todos los ajustes mecánicos.
2. Cerciorarse también que se hayan limpiado y desmagnetizado las cabezas.
3. Dejar precalentarse el magnetófono durante algunos minutos antes de iniciar los ajustes.
4. Asumir un nivel de señal de 0dBv = 1Vrms.
5. Conectar una resistencia de carga de 50K ohmios a los terminales OUTPUT (cualquier resistencia en el margen de 47K ohmios a 52K ohmios es aceptable).
6. Ajustar el control de nivel OUTPUT a la posición máxima a menos que se especifique lo contrario.
7. Ajustar los controles en las posiciones siguientes a menos que se especifique lo contrario.
 TIMER : OFF
 MEMORY : OFF
 DOLBY NR : OFF
 MPX FILTER : OFF
 MODE : Indicación "↔"
 AUTO-BLE : CLEAR (con el indicador DATA SET desactivado)

Cintas de prueba

- STD-331D* : Para ajustes del sistema de reproducción
 STD-608A : Cinta en blanco NORMAL
 STD-603 : Cinta en blanco de Cr₂
 STD-604 : Cinta en blanco de METAL

*Los niveles de grabación para las STD-331A y STD-331B son distintos. Mientras que el nivel de referencia de la STD-331A es de 333Hz, 250nwb/m, el nivel correspondiente de la STD-331B es de 315Hz, 160nwb/m.

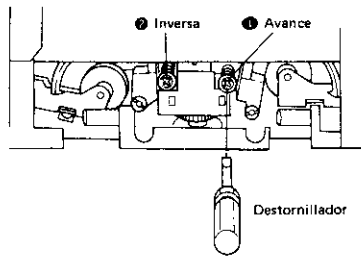


Fig. 10-11 Ajuste del acimut de la cabeza

Secuencia de ajuste

Los ajustes siempre deben efectuarse en el orden siguiente.

1. Ajuste del acimut de la cabeza
2. Ajuste del transporte de la cinta
3. Comprobación del contacto de la cinta (PLAY)
4. Ajuste del ecualizador de reproducción
5. Ajuste del nivel de reproducción
6. Comprobación de 0dB del medidor de nivel
7. Ajuste de la corriente de borrado
8. Ajuste de la polarización de grabación (1)
9. Ajuste del nivel de grabación
10. Ajuste de la polarización de grabación (2)
11. Comprobación del contacto de la cinta (REC)
12. Ajuste y comprobación de la respuesta en frecuencia global
13. Ajuste del oscilador BLE incorporado
14. Ajuste del nivel del detector de cinta guía

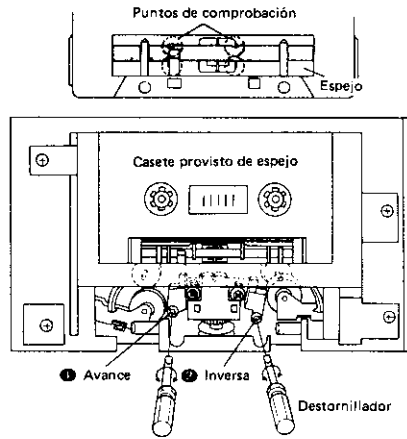


Fig. 10-12 Ajuste del transporte de la cinta

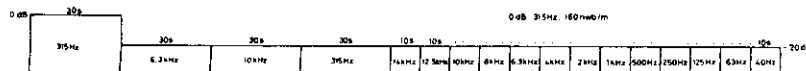


Fig. 10-13 Cinta de prueba STD-331B

1. Ajuste del acimut de la cabeza						
• Girar VR303 y VR304 (ADJ del nivel de reproducción) a los niveles máximos, y ajustar VR301 y VR302 (EQ ADJ de reproducción) a la posición del centro mecánico.						
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones	
1	Reproducción (de avance e inversa)	Reproducir la parte de 10kHz/-20dB de la cinta de prueba STD-331B	Tornillo de ajuste del acimut de la cabeza ① y ② (ver la Fig. 10-11)	Terminales OUTPUT izquierdo y derecho	Nivel máximo de la señal de reproducción	Tornillo ① para FWD Tornillo ② para REV
2. Ajuste del transporte de la cinta						
• Emplear un casete provisto de espejo para comprobar las condiciones de transporte de la cinta. Ajustar si no se satisfacen las especificaciones nominales.						
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Especificaciones nominales		Observaciones	
1	Reproducción (avance e inversa)	Casete provisto de espejo	Tuerca de ajuste ① y ② (ver la Fig. 10-12)	Ausencia de enhebrado de la cinta en las guías de cinta de las cabezas de reproducción y de borrado durante el modo de reproducción	Tuerca ① para FWD Tuerca ② para REV	
2	Cuando se haya ajustado el transporte, repetir el "ajuste de acimut de la cabeza".					
3. Comprobación de contacto de la cinta (PLAY)						
Modo	Señal de entrada y cinta de prueba	Lugar de medición	Especificaciones nominales		Observaciones	
1	Reproducción (avance e inversa)	Terminales OUTPUT izquierdo y derecho	Cuando el carrete de suministro se ayuda ligeramente con la mano, el incremento del nivel de la señal de reproducción no debe exceder de 1.5dB.		Método de retrotensión	
2			Cuando el pone el casete hacia arriba, el aumento del nivel de la señal de reproducción no debe exceder de 1.5dB.		Método de variación del saliente de la cabeza	
3	Si no se satisfacen las especificaciones nominales para los items 1 y 2, repetir el "ajuste del transporte de la cinta".					
4. Ajuste del ecualizador de reproducción						
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste		
1	Reproducción de avance	VR301 (canal izquierdo) VR302 (canal derecho)	Terminales OUTPUT izquierdo y derecho	Ajustar el nivel de 10kHz a 0dB con respecto al nivel de reproducción de 315Hz.		
2		Comprobación		Comprobar el nivel de 10kHz a 0.2dB con respecto al nivel de reproducción de 315Hz.		
3		Comprobación		Comprobar el nivel de 14kHz a 0.2dB con respecto al nivel de reproducción de 315Hz.		
4		Comprobación		Comprobar el nivel de 14kHz a 0.2dB con respecto al nivel de reproducción de 315Hz.		
5	Ver la Fig. 10-14 para la zona de respuesta en frecuencia de reproducción permitida.					

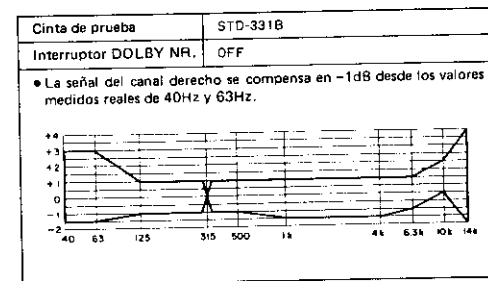
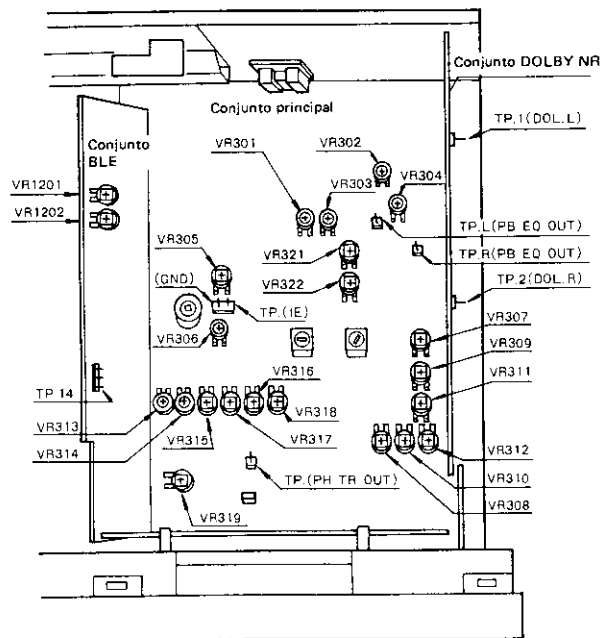


Fig. 10-14 Zona de respuesta en frecuencia de reproducción permitida

5. Ajuste del nivel de reproducción					
Puesto que el nivel de Dolby de reproducción y el nivel AUTO-BLE de operación se ajustan con este ajuste, cerciorarse de que el ajuste sea preciso.					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1 Reproducción de avance	Reproducir la parte de 315Hz/0dB de la cinta de prueba STD-331B	VR303 (canal izquierdo)	TP.1 (canal izquierdo) TP.2 (canal derecho) (Conjunto de DOLBY NR)	-7,7dBv (412,1mV)	
2 Reproducción inversa		VR304 (canal derecho)				Comprobación
6. Ajuste de 0dB del medidor de nivel					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Aplicar una señal de 315Hz-10 dBv (316mV) a los terminales LINE INPUT.	Control del nivel INPUT	TP.1 (canal izquierdo) TP.2 (canal derecho)	-7,7dBv (412,1mV)	Ajuste de la posición del control de nivel INPUT
2 Pausa de grabación		VR321 (canal izquierdo) VR322 (canal derecho)	Después de haber girado completamente VR321 y VR322 hacia la izquierda, volverlos a girar lentamente hacia la derecha y pararlos en la posición donde se ilumine el segmento indicador de "0" dB del medidor de nivel.		
3	Variar el nivel de entrada	Comprobación	El nivel de entrada requerido para que se ilumine el segmento indicador "+5" dB es de -5dBv±3dB.		
4		Comprobación	El nivel de entrada requerido para que se ilumine el segmento indicador "-10" dB es de -20dBv±5dB.		

7. Ajuste de la corriente de borrado					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1 Grabación de avance	Cargar la cinta de prueba STD-604 sin aplicar ninguna señal de entrada. (El selector automático de cintas se ajusta en la posición METAL).	VR305	TP. (IE a GND)	160mV	Medir la tensión generada en R429 (1 ohmios) mediante la corriente de borrado.
2 Grabación inversa		Comprobación		140mV ~ 180mV	
3 Si la tensión no está en el margen de 140mV a 180mV durante el modo de grabación inversa, ajustar de modo que la tensión dentro de este margen durante la grabación de avance y grabación inversa.					
8. Ajuste de la polarización de grabación (1)					
Poner el control del nivel OUTPUT en la posición máxima y VR313 y VR314 (ADJ de polarización de CrO ₂) en las posiciones de centro mecánico.					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1 Pausa en grabación	Aplicar 6,3kHz/±20dBv (100mV) a los terminales LINE INPUT.	Control del nivel INPUT	Terminales OUTPUT izquierdo y derecho	-14dBv (199,5mV)	Ajuste de la posición del nivel INPUT.
2 Grabación de avance	Grabar en la cinta de prueba STD-608A (y monitorizar simultáneamente la reproducción en TP. Izq. y TP. Der.)	VR315 (canal izquierdo) VR316 (canal derecho)	TL.L (canal izquierdo) TP.R (canal derecho) (PB, EQ OUT)	Después de haber girado completamente VR315 y VR316 hacia la izquierda, volverlos a girar hacia la derecha y parar en la posición en que el valor medido sea 2,5dB menor que el nivel de salida máximo después de pasar esta posición máxima.	
3 Grabación inversa		VR317 (canal izquierdo) VR318 (canal derecho)	BLE* permite la monitorización simultánea de la señal de reproducción. Téngase presente, sin embargo, que la señal de reproducción no aparece en los terminales LINE OUTPUT.		Después de haber girado completamente VR317 y VR318 hacia la izquierda, volverlos a girar hacia la derecha y parar en la posición en que el valor medido sea 2,5dB menor que el nivel de salida máximo después de pasar esta posición máxima.
4 Grabación de avances	Grabar en la cinta de prueba STD-604 (y monitorizar simultáneamente la reproducción en TP. Izq. y TP. Der.)	VR306		Después de haber girado completamente VR306 hacia la izquierda, girar otra vez hacia la derecha y parar en la posición donde el valor medido sea 2dB menor que el nivel de salida máximo después de pasar esta posición máxima.	
9. Ajuste del nivel de grabación					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1 Pausa en grabación	Aplicar 315Hz/±10dB (316mV) a los terminales LINE INPUT.	Control del nivel INPUT		-7,7dB (412,1mV)	Ajuste de la posición del nivel INPUT
2 Grabación/reproducción	Grabar la señal en la cinta de prueba STD-608A y reproducir esta parte de la cinta.	VR307 (canal izquierdo) VR308 (canal derecho)	TP.1 (canal izquierdo)	-7,7dBv (412,1mV)	
3 Grabación/reproducción			TP.2 (canal derecho)	(nivel de reproducción)	
4 Grabación/reproducción	Grabar la señal en la cinta de prueba STD-603 y reproducir esta parte de la cinta.	VR309 (canal izquierdo) VR310 (canal derecho)	(Conjunto DOLBY NR)	-7,7dBv (412,1mV)	Repetir la grabación y reproducción, y ajustar consecuentemente.
5	Grabar la señal en la cinta de prueba STD-604 y reproducir esta parte de la cinta.	VR311 (canal izquierdo) VR312 (canal derecho)		-7,7dBv (412,1mV)	(nivel de reproducción)
VR307, VR309 y VR311 (canal izquierdo) y VR308, VR310 y VR312 (canal derecho) tienen que ajustarse en el orden de ajuste especificado. Si alguno de los controles se ajusta por separado, comprobar siempre (y ajustar) los demás controles que le siguen el orden del procedimiento de ajuste.					

Control de ajuste	Item de ajuste
VR301, 302	Ecualizador de reproducción
VR303, 304	Nivel de reproducción
VR305	Corriente de borrado para METAL
VR306	Polarización para METAL
VR307, 308	Nivel de grabación para NORM
VR309, 310	Nivel de grabación para CrO ₂
VR311, 312	Nivel de grabación para METAL
VR313, 314	Polarización para CrO ₂
VR315, 316	Polarización para NORM (FWD)
VR317, 318	Polarización para NORM (REV)
VR319	Nivel de detector de cinta guía
VR321, 322	0dB del medidor de nivel
VR1201	AUTO-BLE FL (1kHz)
VR1202	AUTO-BLE FH (10kHz)



10-15 Lugares de ajuste

10. Ajuste de la polarización de grabación (2)					
• Ajustar el control del nivel OUTPUT en la posición máxima, y ajustar el nivel de entrada del terminal LINE INPUT a un valor constante de -30dBv (31.6mV).					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1 Pausa en grabación de avance	Aplicar 315Hz/-30dBv a los terminales LINE INPUT.	Control del nivel INPUT		-24dBv (63.1mV)	Ajuste de la posición del control de nivel INPUT.
2 Grabación/reproducción de avance	Grabar las señales de 315Hz y de 10kHz en la cinta de prueba STD-608A y reproducir estas partes grabadas.	VR315 (canal izquierdo) VR316 (canal derecho)			Repetir la grabación y reproducción y ajustar consecuentemente hasta que el nivel de reproducción de 10kHz sea de +0.5dB con respecto a la señal de 315Hz.
3 Grabación/reproducción inversa		VR317 (canal izquierdo) VR318 (canal derecho)	Terminales OUTPUT izquierdo y derecho		
4 Grabación/reproducción de avance	Grabar las señales de 315Hz y 10kHz en la cinta de prueba STD-603 y reproducir estas partes grabadas.	VR313 (canal izquierdo) VR314 (canal derecho)			Repetir la grabación y reproducción, y ajustar consecuentemente hasta que el nivel de reproducción de 10kHz sea de +0.5dB con respecto a la señal de 315Hz.
5 Grabación/reproducción de avance	Grabar las señales de 315Hz y 10kHz en la cinta de prueba STD-604 y reproducir estas partes grabadas.	VR306			Repetir la grabación y reproducción, y ajustar consecuentemente hasta que el nivel de reproducción de 10kHz sea de +0.5dB con respecto a la señal de 315Hz.

11. Comprobación de contacto de la cinta (REC)					
Modo	Señal de entrada y cinta de prueba	Lugar de medición	Especificaciones nominales	Observaciones	
1 Pausa en grabación	Aplicar 15kHz/-30dBv a los terminales LINE INPUT.		Ajustar el control del nivel INPUT para obtener un nivel de -24dBv (63.1mV).	Ajuste de la posición del control de nivel INPUT.	
2 Grabación/reproducción	Grabar la señal en la cinta de prueba STD-608A y reproducir esta parte de la cinta.	Terminales OUTPUT izquierdo y derecho	Frenar ligeramente el carrete de suministro con la mano durante la grabación, y comprobar que el incremento del nivel de grabación sea menor de 2dB.	Método de retención.	
3 Grabación/reproducción	Grabar la señal en la cinta de prueba STD-608A y reproducir esta parte de la cinta.		El incremento del nivel de reproducción resultante del desplazamiento del casete hacia arriba durante la grabación debe ser menor de 2dB.	Método de variación del saliente de la cabeza.	
4	Si no se satisfacen las especificaciones nominales para los pasos 2 y 3, repetir el "Ajuste del transporte de la cinta".				
5	Comprobar también del mismo modo con las cintas de prueba STD-603 y STD-604.				
6	Después de haber completado los ajustes hasta este punto, fijar bien el tornillo de ajuste del acimut en la posición con el "enclavamiento del tornillo".				

12. Comprobación y ajuste de la respuesta en frecuencia global					
• Ajustar el control de nivel OUTPUT a la posición máxima y ajustar el nivel de entrada del terminal LINE INPUT a un valor constante de -30dBv (31.6mV).					
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Ajuste	Observaciones
1 Pausa en grabación	Aplicar 315Hz/-30dBv a los terminales LINE INPUT.	Control del nivel INPUT	Terminales OUTPUT izquierdo y derecho	-24dBv (63.1mV)	Ajuste de la posición del control de nivel INPUT
2 Grabar las señales de 315Hz a -15kHz (entrada de -30dBv) en la cinta de prueba STD-608A y reproducir las señales grabadas para comprobar si se satisface la zona de respuesta en frecuencia permitida (para la STD-608A) mostrada en la Fig. 10-16. Si los resultados no conforman las especificaciones nominales, ajustar del modo siguiente.					
3 Grabación/reproducción de avance	Grabar las señales de 315Hz a -15kHz (entrada de -30dBv) en la cinta de prueba STD-608A y reproducir las señales grabadas.	VR315 (canal izquierdo) VR316 (canal derecho)	Terminales OUTPUT izquierdo y derecho		Repetir la grabación y reproducción (ajustando donde sea necesario) hasta que la respuesta en frecuencia permitida (para la STD-608A), mostrada en la Fig. 10-16, se satisfaga.
4 Grabación/reproducción inversa		VR317 (canal izquierdo) VR318 (canal derecho)			
5 Grabar las señales de 315Hz a -15kHz (entrada de -30dBv) en la cinta de prueba STD-603 y reproducir las señales grabadas para comprobar si se satisface la zona de respuesta en frecuencia permitida (para la STD-603) mostrada en la Fig. 10-17. Si los resultados no conforman las especificaciones nominales, ajustar del modo siguiente.					
6 Grabación/reproducción	Grabar las señales de 315Hz a 15kHz en la cinta de prueba STD-603 y reproducir las señales grabadas.	VR313 (canal izquierdo) VR314 (canal derecho)	Terminales OUTPUT izquierdo y derecho.		Repetir la grabación y reproducción (ajustando donde sea necesario) hasta que se satisfaga la zona de respuesta en frecuencia permitida (para la STD-603), mostrada en la Fig. 10-17.
7 Grabar las señales de 315Hz a -15kHz (entrada de -30dBv) en la cinta de prueba STD-604 y reproducir las señales grabadas para comprobar si se satisface la zona de respuesta en frecuencia permitida (para la STD-604) mostrada en la Fig. 10-18. Si los resultados no conforman las especificaciones nominales, ajustar del modo siguiente.					
8 Grabación/reproducción	Grabar las señales de 315Hz a 15kHz (entrada de -30dBv) en la cinta de prueba STD-604 y reproducir las señales grabadas.	VR306	Terminales OUTPUT izquierdo y derecho		Repetir la grabación y reproducción (ajustando donde sea necesario) hasta que se satisfaga la zona de respuesta en frecuencia permitida (para la STD-604), mostrada en la Fig. 10-18.

Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
9	Puesto que los ajustes de VR315 a VR318 (polarización NORM) afectan los ajustes de VR313, VR314 (polarización de V ₂ O ₃) y VR316 (polarización de METAL), comprobar siempre (y reajustar) los controles que siguen en el orden si se reajusta un control en particular.				

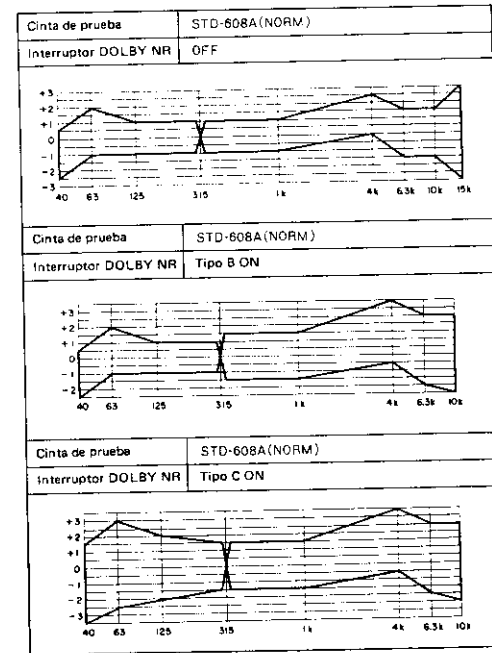


Fig. 10-16 Zona de respuesta en frecuencia permitida para grabación/reproducción (NORM)

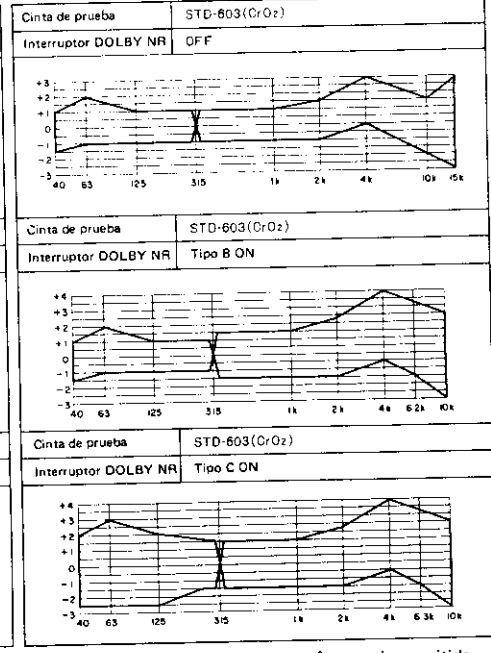


Fig. 10-17 Zona de respuesta en frecuencia permitida para grabación/reproducción (CrO₂)

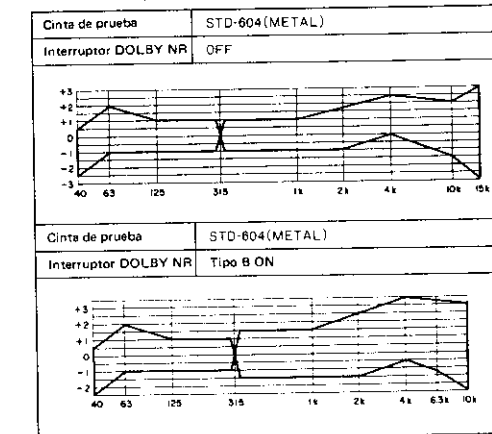


Fig. 10-18 Zona de respuesta en frecuencia permitida para grabación/reproducción (METAL)

13. Ajuste del oscilador BLE incorporado						
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones	
1	Conectar TP.14 del conjunto BLE a masa durante un momento (conmutando de este modo AUTO BLE IC al modo TEST A).					
2	Grabación	Cargar la STD-608A	VR1201	TP.2	-7,7dBv (412,1mV)	El modo TEST A es 1kHz
3	Conmutar el magnetofono del modo de parada, rebobinado, y luego otra vez de parada (conmutando de este modo AUTO BLE IC al modo TEST B).					
4	Grabación	Cargar la STD-608A	VR1202	TP.2	-18dBv (125,9mV)	El modo TEST B es 10kHz
5	Presionar el botón CLEAR con el magnetofono en el modo de parada (cancelando de este modo el modo TEST).					
6	Presionar el botón AUTO-BLE (para la operación de AUTO-BLE con la cinta de prueba STD-608A). Después de completar el AUTO-BLE, proceder con el paso 7.					
7	Pausa en grabación	Aplicar 315Hz/-10dBv a los terminales LINE INPUT.	Control de nivel INPUT	TP.2	-7,7dBv (412,1mV)	Ajuste de la posición del control de nivel INPUT
8	Grabación/reproducción	Grabar en la cinta de prueba STD-608A y reproducir la señal grabada.	Medición	TP.2	Medir la desviación en el nivel de reproducción con respecto a -7,7dBv. Ejemplo: El valor medido de -7,2dBv denota desviación de +0,5dB.	
9	Después de presionar el botón CLEAR, conectar TP.14 un momento a masa (para ajustar el modo TEST A).					
10	Grabación	Cargar la STD-608A	VR1201	TP.2	Compensar la desviación medida en el paso 8. Ejemplo. Ajustar a -7,2dBv si la desviación es de +0,5dB.	
11	Presionar el botón CLEAR con el magnetofono en el modo de parada (cancelando de este modo el modo TEST).					
12	Presionar el botón AUTO-BLE (para la operación de AUTO-BLE con la cinta de prueba STD-608A). Después de haber completado AUTO-BLE, proceder con el paso 13.					
13	Grabación/reproducción	Grabar las señales de 10kHz y 315Hz (entrada de -30dBv) en la cinta de prueba STD-608A y reproducir las señales grabadas.	Medición	TP.2	Medir la desviación en el nivel de reproducción de la señal de 10kHz con respecto a la señal de 315Hz.	
14	Presionar el botón CLEAR con el magnetofono en el modo de parada. Luego, después de conectar TP.14 un momento a masa, conmutar al modo de rebobinado y luego de nuevo al modo de parada (conmutando de este modo al modo TEST B).					
15	Grabación	Cargar la STD-608A	VR1202	TP.2	Compensar la desviación medida en el paso 13.	
16	Presionar el botón CLEAR con el magnetofono en el modo de parada.					

14. Ajuste del nivel de detector de cinta guía						
Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones	
1	Desconectar el conector CN304.					
2	Parada	Aplicar la señal de 2kHz/-17dBv (0,4Vp-p) a los terminales TP (PH TR OUT).	VR319	Patilla 4 del IC303 (PA3010)	10,5V CC-0,25V	
3	Volver a conectar el conector CN304.					
4	Reproducción	Cargar un cassette desprovisto de cinta.	La posición marcada con "A" en la Fig. 10-20.	TP. (PH TR OUT)	Si la forma de onda (onda cuadrada) en el lugar medido es mayor que 0,6 Vp-p, conectar la sección indicada con "A" en la Fig. 10-20.	

Control de ajuste	Item de ajuste
VR301, 302	Ecualizador de reproducción
VR303, 304	Nivel de reproducción
VR305	Corriente de borrado para METAL
VR306	Polarización para METAL
VR307, 308	Nivel de grabación para NORM
VR309, 310	Nivel de grabación para CrO ₂
VR311, 312	Nivel de grabación para METAL
VR313, 314	Polarización para CrO ₂
VR315, 316	Polarización para NORM (FWD)
VR317, 318	Polarización para NORM (REW)
VR319	Nivel de detector de cinta guía
VR321, 322	0dB del medidor del nivel
VR1201	AUTO-BLE FL (1kHz)
VR1202	AUTO-BLE FH (10kHz)

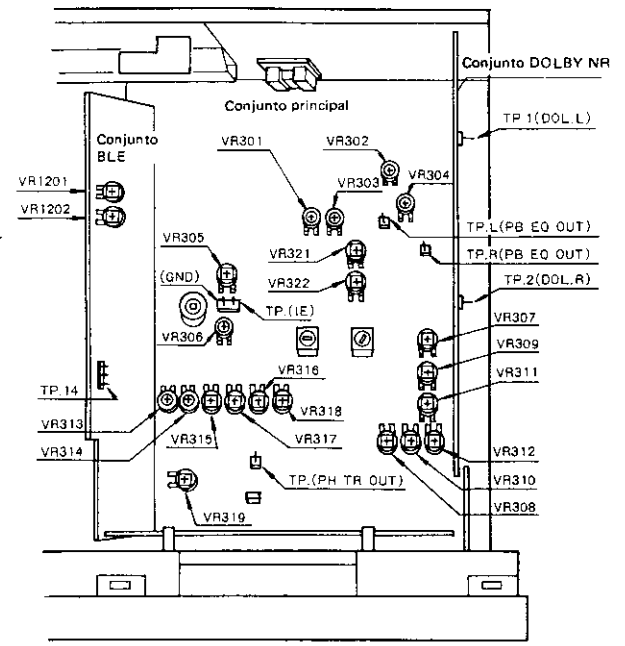


Fig. 10-19 Lugares de ajuste

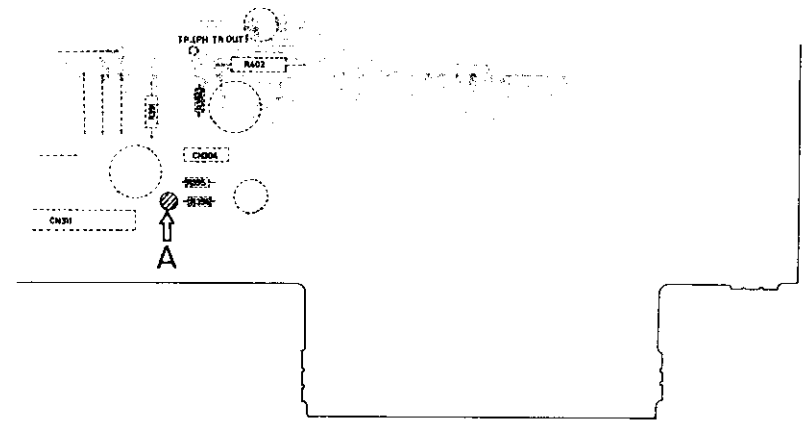


Fig. 10-20 Lugares de ajuste (en el lado de chapa del conjunto principal)

11. SUPPLEMENT FOR HE,HB AND HP TYPES

The basic performance of the CT-90R/HE (European continent model), CT-90R/HB (United Kingdom model) and CT-90R/HP (Australia model) is the same as the CT-90R/KU (U.S.A. model). Please refer to pp. 2~75 with exception of this supplement.

11.1 CONTRAST OF MISCELLANEOUS PARTS

- Parts without part number cannot be supplied.
 - The Δ make 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.

Mark	Symbol & Description	Part No.			
		KU type	HE type	HB type	HP type
Δ **	FU301 Fuse (3.15A)	REK-044	.....	.....	.....
Δ **	FU301 Fuse (T3.15A)	.....	REK-047	REK-047	REK-047
Δ **	FU302, FU303 Fuse (1.25A)	.....	REK-071	.....	.....
Δ **	FU302, FU303 Fuse (T630mA)	.....	REK-061	REK-061	REK-061
Δ **	FU304 Fuse (1A)	REK-051	.....	.....	.....
Δ	C1 Ceramic capacitor (0.01/AC250)	RCG-006	.....	.....	.....
Δ	C1 Ceramic capacitor (0.01/AC400)	.....	RCG-009	RCG-009	RCG-009
Δ *	T1 Power transformer (120V)	RTT-328	.....	.....	.....
Δ *	T1 Power transformer (220V/240V)	.....	RTT-319	RTT-319	RTT-319
Δ **	S2 Line voltage selector	.....	RSX-058	RSX-058	RSX-058
Δ	AC power cord	RDG-048	RDG-027	RDG-032	RDG-029
Δ	Strain relief (for AC power cord)	REC-395	REC-396	REC-396	REC-396
	Mother assembly	RWX-822	RWX-824	RWX-824	RWX-824
	Operating instructions (English)	RRB-213	.....	RRB-213	RRB-213
	(English/German/French/Italian)	.....	RRE-046	.....	.....
	Packing case	RHG-620	RHG-622	RHG-622	RHG-622

11.2 SCHEMATIC DIAGRAM FOR HE, HB AND HP TYPES

A

A

B

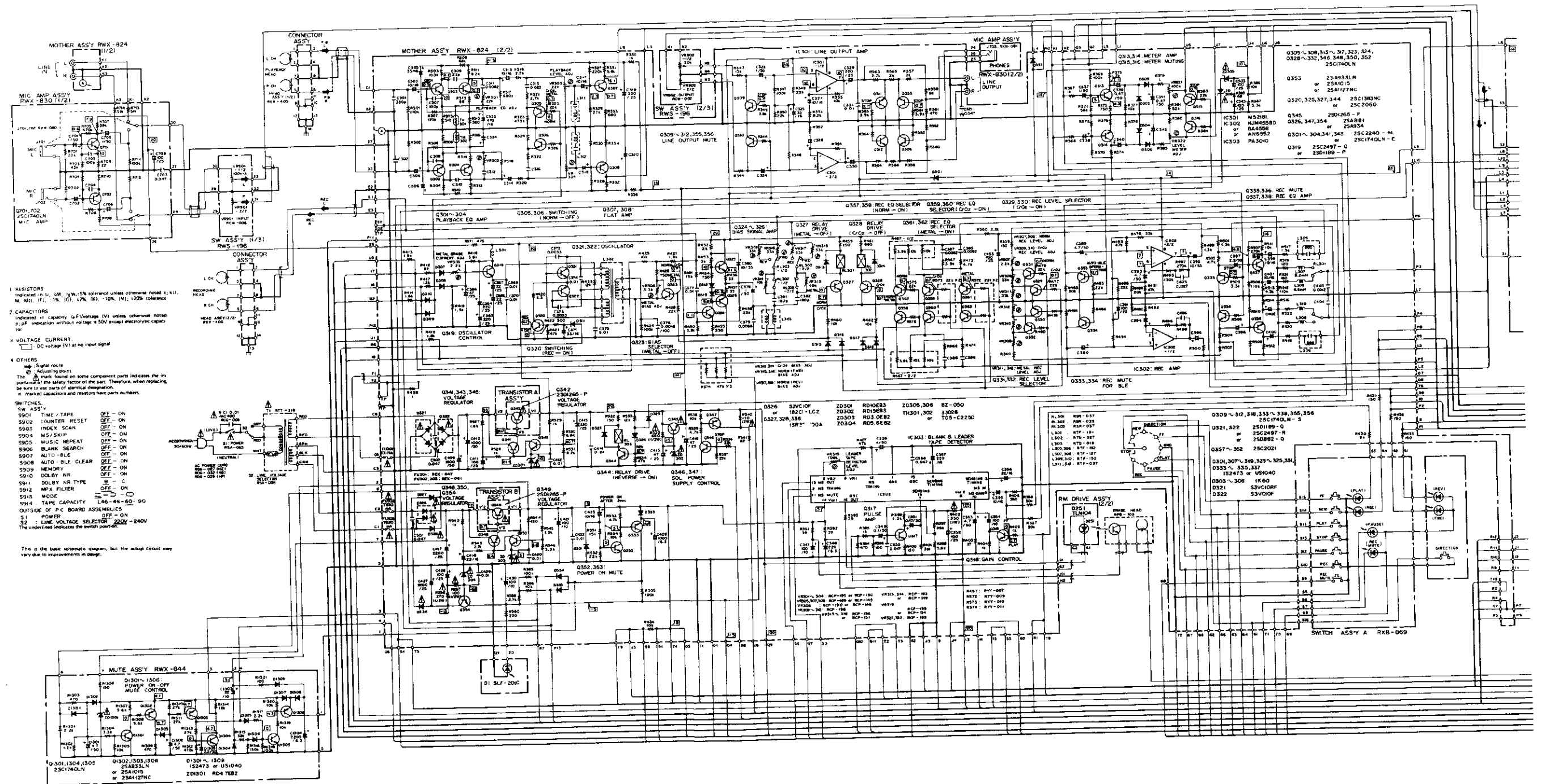
B

C

C

D

D

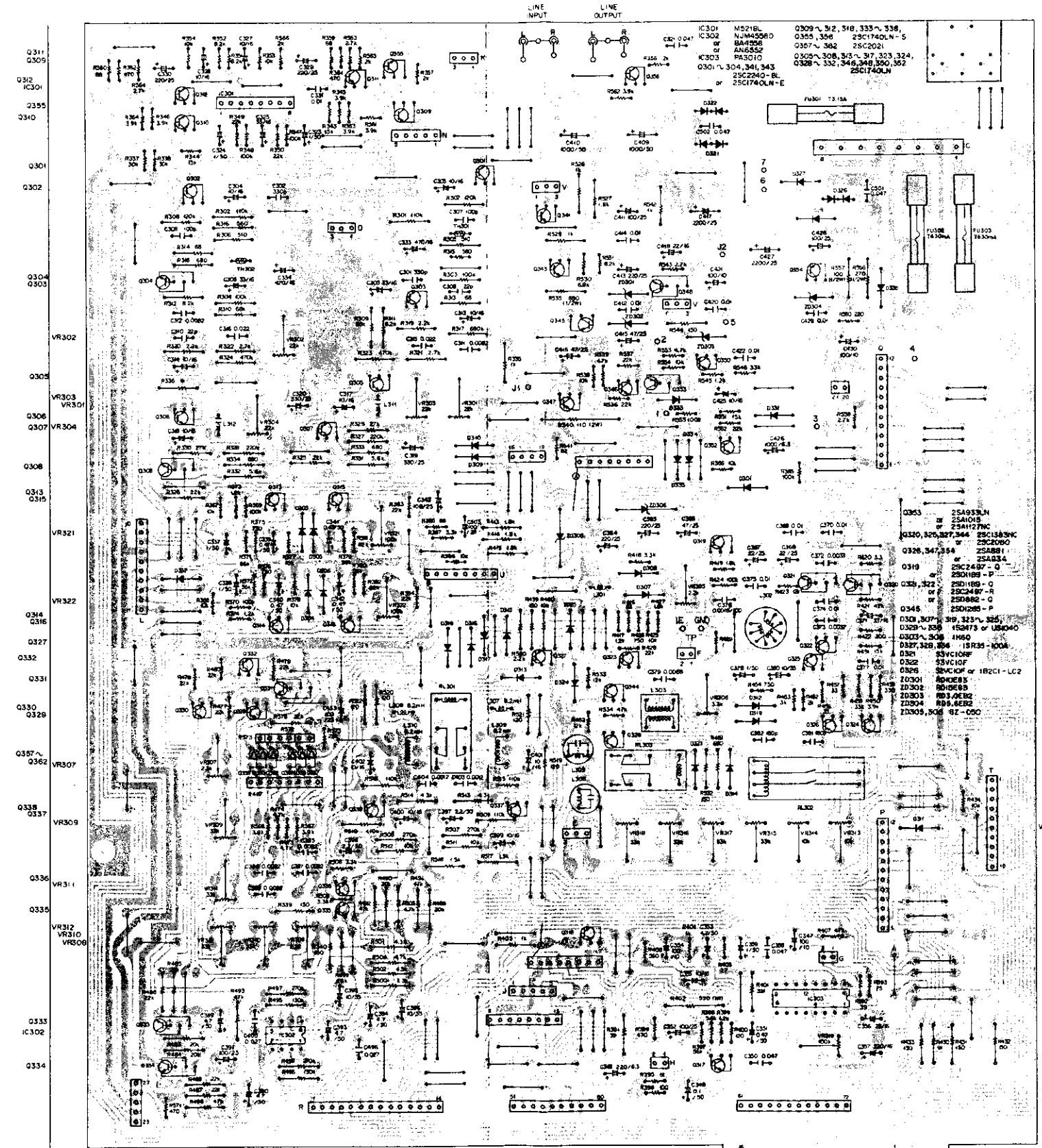


11.3 P.C. BOARD ASSEMBLIES

Mother Assembly (RWX-824)

The mother assembly RWX-824 (for HE, HB and HP types) is the same as the RWX-822 (for KU type) with the exception of the following parts.

Symbol	RWX-822	RWX-824
R535	RD1/4PM 681J	△ RS1/2LF 681J
R582	△ RD1/2PSF 271J	.....
R540	RS2LF 181J	RS2LF 111J
Q319	2SD880	2SC2497 (2SD1189)



12. SUPPLEMENT FOR KC TYPE

The basic performance of the CT-90R/KC (Canada model) is the same as the CT-90R/KU (U.S.A. model). Please refer to pp. 2~75 with exception of this supplement.

12.1 CONTRAST OF MISCELLANEOUS PARTS

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.

Mark	Symbol & Description	Part No.		Remarks
		KU type	KC type	
Δ *	T1 Power transformer (120V) Packing case	RTT-328 RHG-620	RTT-318 RHG-621	

13. SUPPLEMENT FOR D AND D/G TYPES

The basic performance of the CT-90R/D (General export model) and CT-90R/D/G (U.S. Military model) is the same as the CT-90R/KU (U.S.A. model). Please refer to pp. 2~75 with exception of this supplement.

13.3 CONTRAST OF MISCELLANEOUS PARTS

NOTES:

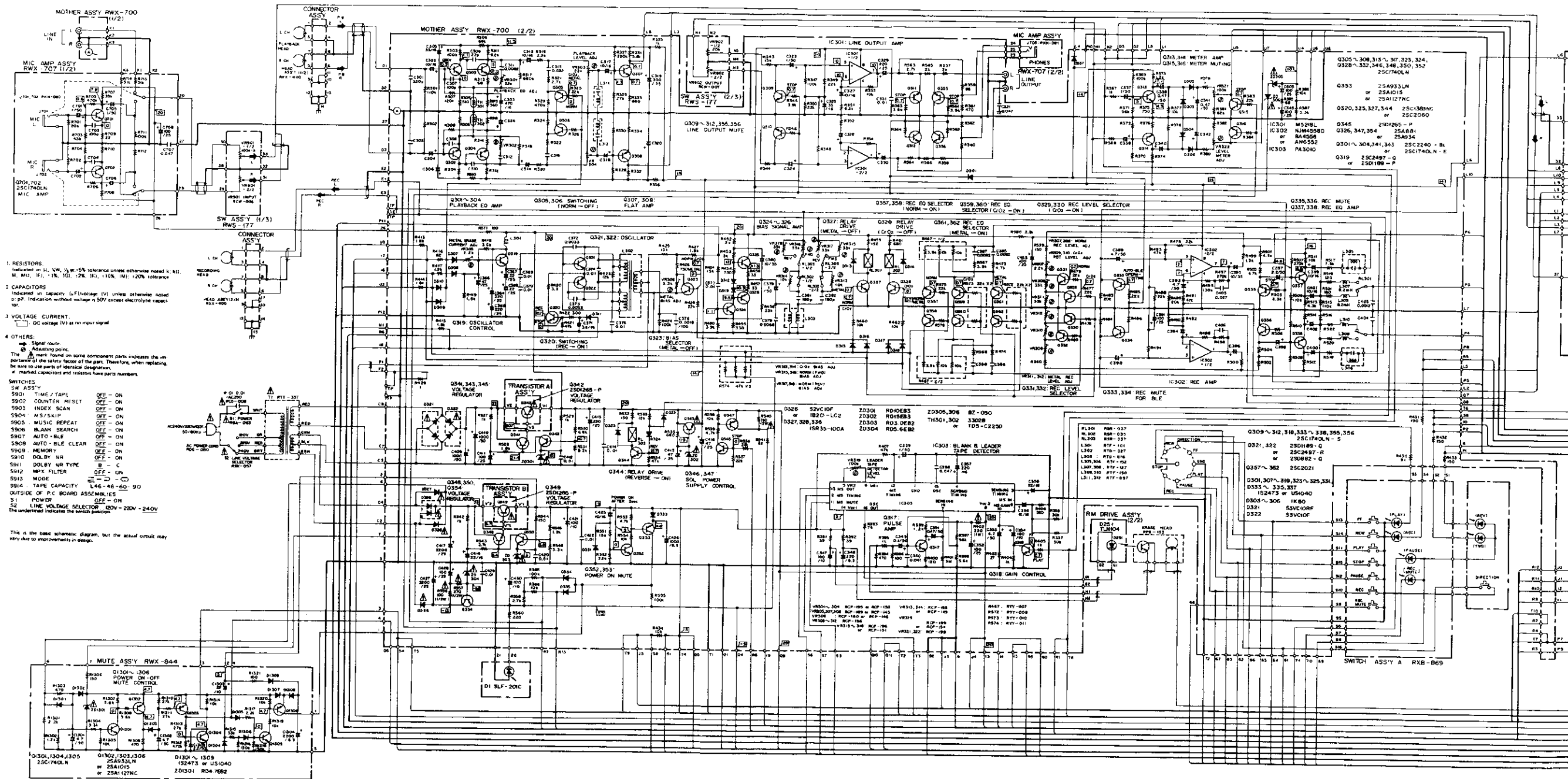
- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the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

Mark	Symbol & Description	Part No.			Remarks
		KU type	D type	D/G type	
Δ **	FU301 Fuse (3.15A)	REK-044	.....	.....
Δ **	FU302, FU303 Fuse (1.25A)	REK-071	.....	.....
Δ **	FU304 Fuse (1A)	REK-051	.....	.....
Δ	C1 Ceramic capacitor (0.01/AC250)	RCG-006	RCG-008	RCG-008	
Δ **	S2 Line voltage selector	.....	RSX-057	RSX-057	
Δ *	T1 Power transformer (120V)	RTT-328	.....	.....
Δ	(120V/220V/240V)	.....	RTT-337	RTT-337	
Δ	AC power cord	RDG-048	RDG-050	RDG-050	
	Mother assembly	RWX-822	RWX-700	RWX-700	
	Dolby NR assembly	RWX-827	RWX-703	RWX-703	
	Control assembly	RWX-828	RWX-704	RWX-704	
	SW assembly	RWS-196	RWS-177	RWS-177	
	MIC amplifier assembly	RWX-830	RWX-707	RWX-707	
	Counter drive assembly	RWX-831	RWX-705	RWX-705	
	BLE assembly	RWX-843	RWX-708	RWX-708	
	Packing case	RHG-620	RHG-623	RHG-637	

13.2 SCHEMATIC DIAGRAM FOR D AND D/G TYPES

A

A



B

B

C

C

D

D

1

2

3

4

5

6

13.3 P.C. BOARD ASSEMBLIES

Mother Assembly (RWX-700)

The mother assembly RWX-700 (for D and D/G types) is the same as the RWX-822 (for KU type) with the exception of the P.C. board material and following parts.

Symbol	RWX-822	RWX-700
C501, C502	CKDYF 473Z 50	.....
R556	△RD1/2PSF 271J	△RD1/2PSF 101J
R557	△RD1/2PSF 101J	△RD1/2PSF 271J
R527	RD1/4PM 182J	RD1/4PM 102J
R528	RD1/4PM 102J	RD1/4PM 182J
R582	△RD1/2PSF 271J	.....
R540	△RS2LF 181J	△RS2LF 111J
R402	△RS1LF 331J	△RS1LF 101J
R571	RD1/6PM 471J	RD1/6M 101J
Q319	2SD880	2SC2497 (2SD1189)

The other assemblies RWX-703, RWX-704, RWS-177, RWX-707, RWX-705, RWX-708 are the same as the assemblies for KU type with the exception of the P.C. board material.

