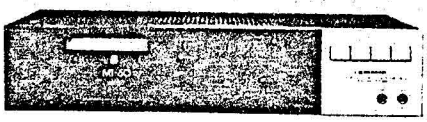
PIONEER

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP-144-0

STEREO CASSETTE TAPE DECK

CT-930

MODEL CT-930 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

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

- This service manual is applicable to the KU, HP, D and D/G types.
- Ce manuel d'instruction se refère au mode de réglage, en fançais.
- Este manual de servicio trata del método de ajuste escrito en español.

CONTENTS

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1. SPECIFICATIONS

Systems . . . . . Compact cassette, 2-channel stereo
Heads . . . . . "Ribbon Sendust" recording/playback head x 1
"Ferrite" erasing head x 1
Motor . . . . . D.D. servo motor X 3
Wow and Flutter . . . . . No more than 0.045% (WRMS)
Fast Winding Time . . . . . Approximately 90 seconds (C-60 tape)
Frequency Response
−20dB recording:
Normal tape . . . . . 25 to 15,000Hz (35 to 14,000Hz±3dB)
Chrome tape . . . . . 25 to 17,000Hz (35 to 16,000±3dB)
Metal tape . . . . . 25 to 18,000Hz (30 to 17,000Hz±3dB)
0dB recording:
Chrome tape . . . . . 30 to 8,000Hz
Metal tape . . . . . 30 to 12,5000Hz
Signal-to-Noise Ratio
Dolby NR OFF . . . . . More than 58dB
Noise Reduction Effect
Dolby NR ON (B Type) . . . . . More than 10dB (at 5kHz)
Dolby NR ON (C Type) . . . . . More than 19dB (at 5 kHz)
Harmonic Distortion . . . . . No more than 1.2% (0dB)
Input
(Sensitivity/Maximum allowable input/Impedance)
MIC (L, R) . . . . . 0.3mV/57mV/10kΩ, 6mm diam. jack
(Reference MIC impedance; 250Ω to 10kΩ)
LINE (INPUT) 50mV/25V/75kΩ
Output (Reference level/Load impedance)
LINE (OUTPUT) 450mV/50kΩ

Subfunctions

- Dolby NR system (B type/C type/OFF)
- 3 position tape selector (NORM/CrO_2/METAL)
- IC full logic control
- Air damp eject function
- Full automatic stop mechanism
- REC muting function
- Music search/Skip function
- Timer stand-by mechanism
- One-touch recording system
- LED level meter
- Auto function system
- Playback auto reverse, auto repeat functions

Miscellaneous

Power Requirements . . . . . AC 120V, 60Hz
Power Consumption . . . . . 41 watts
Dimensions . . . . . 420 (W) x 101 (H) x 235 (D) mm
16-9/16 (W) x 4 (H) x 9-1/4 (D) in
Weight (without package) . . . . . 5.25 kg (11 lb 9 oz)

Furnished Parts

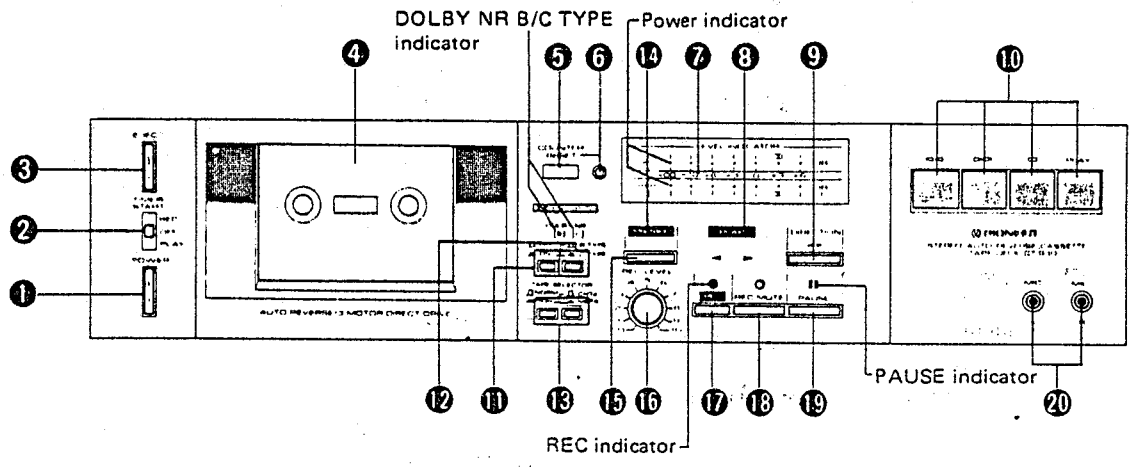
Operating instructions 1
Connection cord with pin plugs 2

NOTES:

1. Reference Recording Level: Meter 0dB indicating level (160 nwb/m magnetic level = Philips cassette reference level)
2. Reference Signal: 333Hz
3. Wow & Flutter: • JIS [3kHz, with acoustic compensation (weighted), rms value]
4. Frequency Response: • Measured at −20dB level, DOLBY NR OFF, level deviation is ±6dB without indication.
5. Signal to Noise Ratio: • Measured at the third harmonic distortion 3% level, weighted.
6. Sensitivity: Input level (mV) required for reference recording level with input (REC) controls set to maximum.
7. Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier output waveform becomes clipped.
8. Reference Output Level: Playback output level when meter indicates 0dB.

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

2. FRONT PANEL FACILITIES



❶ POWER SWITCH

When this switch is depressed, the power is turned on and the level indicator "−∞ " lights. Depress the switch again to release it when turning off the power to the deck.

- The muting circuit is actuated after the POWER switch has been set to ON and there will be no operation for about 4 seconds. This is not failure or malfunction.
- When the POWER switch is set to the OFF position while the tape deck is operating, the deck's operation is released and the stop mode is established.

❷ TIMER START SWITCH

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.

❸ EJECT BUTTON

Depress this button to open the cassette holder. To close the cassette holder, push the top back until it locks.
Do not press this button when the tape is in motion.

❹ CASSETTE HOLDER

❺ TAPE COUNTER

This counter shows the position of the tape using a three-digit meter.

❻ COUNTER RESET BUTTON

Depress this button to reset the tape counter display to 000 .

❼ LEVEL INDICATOR

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

❽ PLAY INDICATOR

This indicator lights during the playback or recording mode.

❾ DIRECTION SWITCH

Depress this switch to change over the tape's running direction. Using the DIRECTION switch obviates the need for unloading and re-loading the cassette in order to listen to the either since forward and reverse playback is enabled. The tape direction is shown by the indicator.

◁ ※: Forward playback (The tape runs from left to right)
※ ▷: Reverse playback (The tape runs from right to left)

❿ OPERATING SWITCHES

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

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

□ (Stop) : Depress this switch to stop the tape travel and to release the operating switches.

PLAY : Depress this switch to start tape playback.

⓫ DOLBY NR SWITCH

Depress this switch to ON for recording with the built-in Dolby Noise Reduction system and for playback of tapes which have been recorded using the Dolby Noise Reduction system.
For other tapes, do not press this switch.

⓬ B/C TYPE SELECTOR

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

⓭ TAPE SELECTOR SWITCHES

This selector allows the bias and equalizer characteristics to be selected during recording and equalizer characteristics during playback in line with the type of tape you are using.

Normal tape : Release the left switch to the "out" position (☐ NORM).

Chrome tape : Depress the left switch to the "in" position (⏥ HIGH) and release the right switch to the "out" position (☐ CrO_2).

Metal tape : Depress both the right and left switches to the "in" position.

⓮ MS·SKIP INDICATOR

⓯ MS/SKIP SWITCH

This switch has 2 functions: MS (Music Search) which finds the start of a program and SKIP which skips unrecorded blanks between programs.

MS (Music Search):

Depress this switch and then the ▷▷ (FF) or ◁◁ (REW) switch. Any unrecorded blanks between programs lasting for more than 4 seconds are detected and the unit is automatically set to the playback mode. This is a handy function for locating the program.

SKIP:

Depress this switch in the playback mode. If there is an unrecorded blank lasting more than 8 seconds between two programs, the tape first runs for 8 seconds in the playback mode and then automatically goes into the fast forward mode, after which it finds the start of the following program and then enters the playback mode. This function is particularly useful when tapes have lengthy unrecorded sections between programs. To release the function, press this switch again to release it.

⓰ REC LEVEL CONTROL

Use this to adjust the level of the input signals from the MIC jacks or rear panel LINE INPUT. Turning this control to the clockwise increase the level.

⓱ REC SWITCH

Depress this switch to start tape recording. This switch will not work when a cassette is not loaded or when the erasure prevention tabs of a loaded cassette have been broken off. When this switch is depressed to the ON position, the REC (●) and PLAY indicators will be illuminated.

Note

For recording, make sure that the tape is set up for moving in the forward direction (◁). Recording is not possible when the tape is moving in reverse.

⓲ REC MUTE SWITCH

Depressing this switch during recording makes it possible to create an unrecorded blank on the cassette tape only for the time during which the switch is kept depressed. This switch is used for providing blanks of the required length between programs and editing tapes so that they are easier to listen to and for creating the unrecorded blanks which are required for operating the MS (Music Search) facility.

- No signal is recorded when the switch is touched during recording. Do not touch the switch unless necessary.
- REC MUTE (○) is display only but does not illuminate.

⓳ PAUSE SWITCH

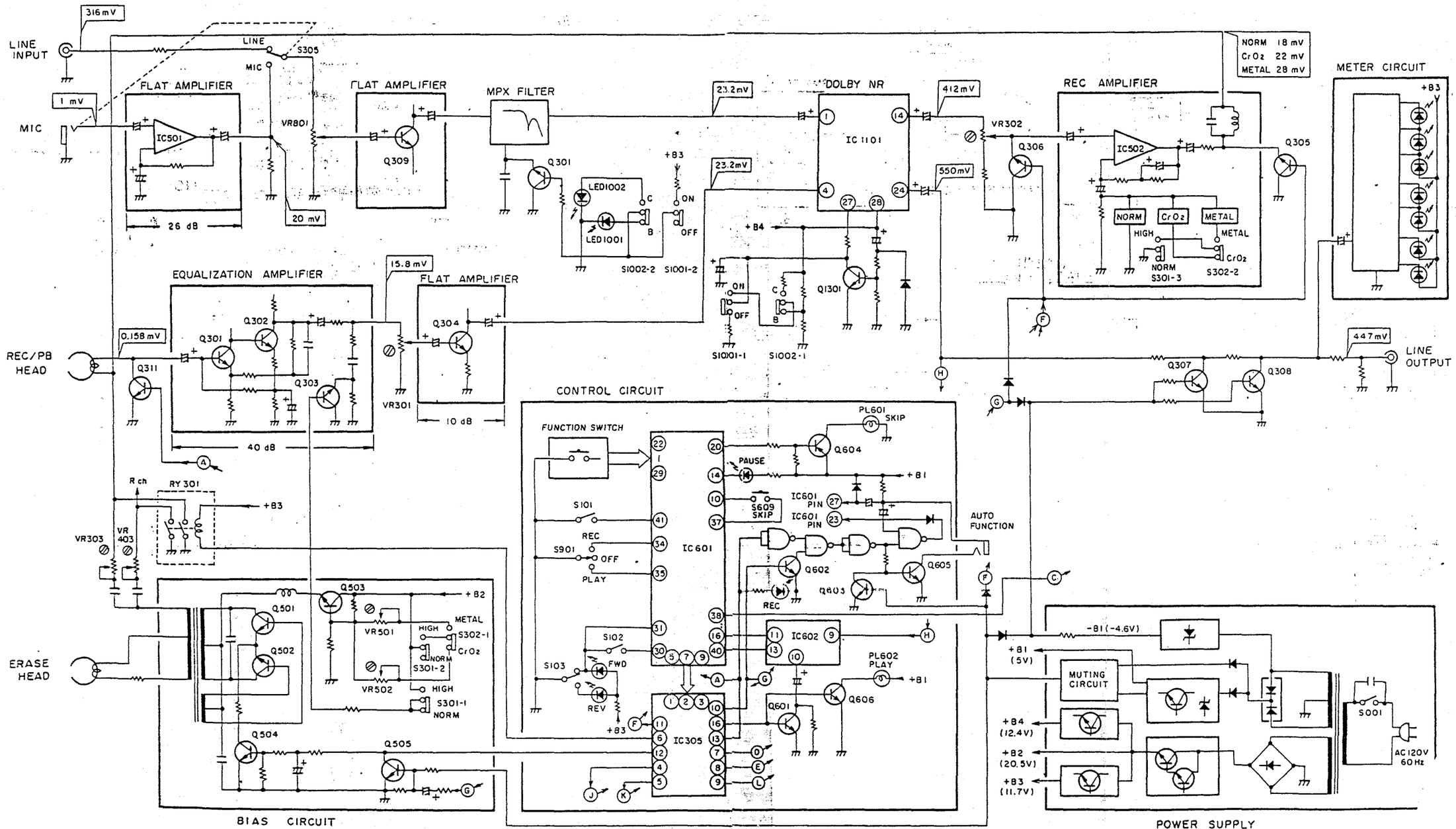
Depress this switch to stop the tape travel temporarily during recording or playback. Depress this switch again to allow the tape to continue to travel. When this switch is depressed to the ON position, the ❚❚ (PAUSE) indicator will be illuminated.

- The tape does not stop during fast forward or rewind operations even when the PAUSE switch is depressed.

⓴ 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.

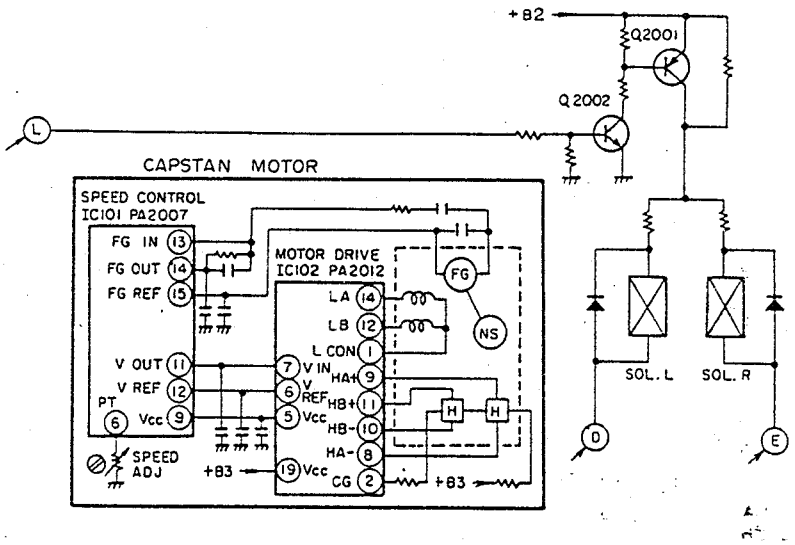
3. BLOCK DIAGRAM

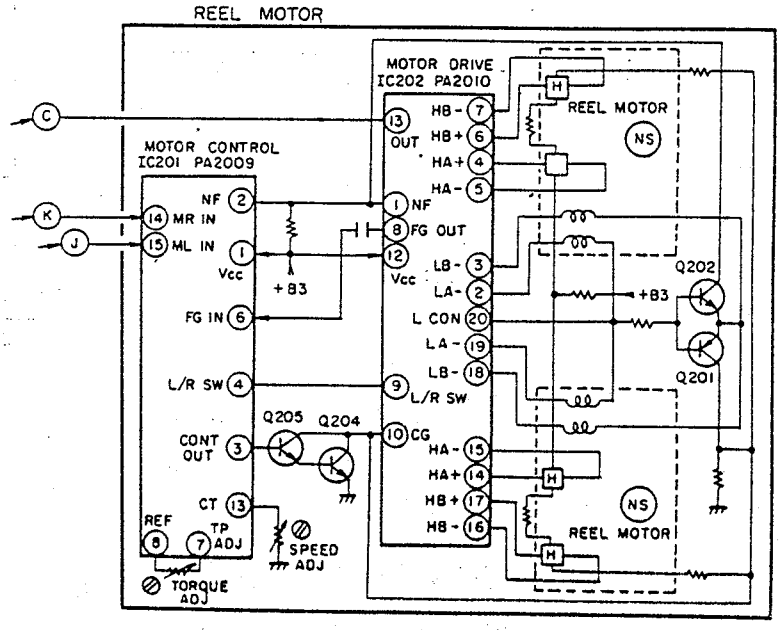


SWITCHES:

S001	POWER	ON — OFF
S101	CASSETTE HALF DETECTOR	NO HALF — HALF
S102	ERASE PREVENT DETECTOR	NO HOLE — HOLE
S103	FWD/REV SELECTOR	FWD — REV
S301	TAPE SELECTOR	NORM — HIGH
S302	TAPE SELECTOR	CrO_2 — METAL
S303	INPUT SELECTOR	MIC — LINE
S304	INPUT SELECTOR	MIC — LINE
S601	FF	ON — OFF
S602	REW	ON — OFF
S603	PLAY	ON — OFF
S604	PAUSE	ON — OFF
S605	REC	ON — OFF
S606	STOP	ON — OFF
S607	REC MUTE	ON — OFF
S608	DIRECTION	ON — OFF
S609	MUSIC SEARCH / SKIP	ON — OFF
S901	TIMER	REC — OFF — PLAY
S1001	DOLBY NR	ON — OFF
S1002	DOLBY NR	B TYPE — C TYPE

The underlined indicates the switch position.





4. CIRCUIT DESCRIPTIONS

4.1 PLAYBACK ROUTE

(See block diagram on page 5)

The signal from the playback head is amplified by a 2-stage direct-coupled amplifier stage consisting of Q301 and Q302. When the tape selector is in the NORM position, the playback equalization characteristics (120μs) are compensated by an NF circuit located between the collector of Q302 and the emitter of Q301. In the METAL and CrO_2 positions, Q303 is turned on, and the equalization characteristics are switched from 120μs to 70μs for proper compensation of the frequency response.

The level of the EQ AMP output is set by variable resistor control, and then further amplified by the Q309 flat amplifier. The output from this flat amplifier is passed via an MPX filter to pin 1 of the Dolby IC (IC1101, PA3012). The Dolby ON/OFF switch is coupled to the MPX filter ON/OFF switch. When the Dolby switch is off, therefore, the 19kHz filter is bypassed. The Dolby circuit output appears at pin 24 of IC1101, and is passed to the LINE OUTPUT terminals.

4.2 RECORDING ROUTE

The input signal from the mic jacks is amplified by the IC501 mic amplifier, passed via the MIC/LINE selector switch to the INPUT volume control where the signal level is adjusted. The level-adjusted signal is then passed to a flat amplifier, Q309. The signal amplified by the flat amplifier is then passed via the MPX filter to pin 1 of the Dolby IC, the subsequent output appearing at pin 14. The Dolby IC output is level-adjusted by a variable resistance control, compensated by the REC AMP (IC502) according to the type of tape, and finally applied to the recording head.

4.3 CONTROL CIRCUIT

The control circuit in this deck consists of a CPU (PD6006), an extended IC (PM3001), and an IC (PA3010) for MS purposes. 16-bit serial data is passed to PM3001 by the KEY signal applied to PD6006. This PM3001 subsequently controls all relevant circuits on the basis of this data.

When the mode KEY is switched on, the 16-bit serial data shown in Fig. 4-1 appears at pin 5 of PD6006, and a clock pulse output appears at pin 7 (data and clock outputs are generated each time a key is switched on, and also by each relevant timing). The 16-bit serial data is applied to pin 3 of the extended IC PM3001, and is read by the PM3001 shift register at the rising edge of the clock pulse applied to pin 2. Upon completion of the data reading, an STB (strobe) pulse is applied to pin 1, resulting in the appearance of control output signals at the relevant output pins of PM3001 according to the key input. (See Fig. 4-4).

Circuit operation when a mode key is switched on for forward mode is described below. Unless otherwise specified, all pin numbers are for PM3001.

1. STOP Key on

(1) Mechanical ass'y

Pins 7 and 8 of PM3001 are switched to H level by the 16-bit serial data from PD6006, and SOL.L and SOL.R are switched off. The mechanical ass'y is thus in stop mode.

(2) Motors

Since pins 4 and 5 are switched to L level, the reel motor is also in stop mode.

(3) Signal path and other circuits

Since pin 6 is switched to L level, reed relay RY301 is switched on, point A of the recording/playback head is grounded, the recording/playback head thus switched to playback mode.

Pins 10 and 11 are switched to H level, resulting in Q307, Q308, and Q306 being turned on, and the REC AMP input being grounded. The LINE OUTPUT terminals are also grounded to prevent the output of any sound.

Pins 12 and 13 are switched to L level, resulting in Q311 and Q504 being turned off, thereby halting oscillation of the OSC circuit. And the input from the recording/playback head is applied to the PB AMP.

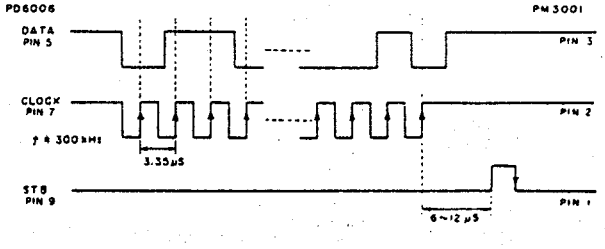


Fig. 4-1 PD6006 Data output

'lay key on

Mechanical ass'y

'ins 7 and 8 of PM3001 are switched to L evel, resulting in SOL.L and SOL.R being witched on (see Fig. 4-8 for the relevant iming). The mechanical ass'y is thus put into layback mode.

Motors

With pin 4 at L level and pin 5 at M level, the RM.R (reel motor R) is started.

'ignal path

'in 10 is switched to L level, resulting in the LINE MUTE transistors Q307 and Q308 being turned off to permit output from the LINE OUTPUT terminals.

3. FF Key on

(1) Mechanical ass'y

With pin 7 at H level and pin 8 at L level SOL.L is switched off and SOL.R on, thereby putting the mechanical ass'y into pause mode.

(2) Motors

Pin 4 is switched to L level and pin 5 to H level, resulting in RM.L being stopped and RM.R being started.

(3) Signal path, and other circuits

Same status as during stop mode.

4. REW Key on

(1) Mechanical ass'y

With pin 7 at H level and pin 8 at L level, SOL.L is switched off and SOL.R on, thereby putting the mechanical ass'y into pause mode.

(2) Motors

Pin 4 is switched to H level and pin 5 to L level, resulting in RM.L being started and R being stopped.

(3) Signal path, and other circuits

Same status as during stop mode.

5. REC/PLAY Key on

(1) Mechanical ass'y

Same status as when PLAY key is switched on.

(2) Motors

Same status as when PLAY key is switched on.

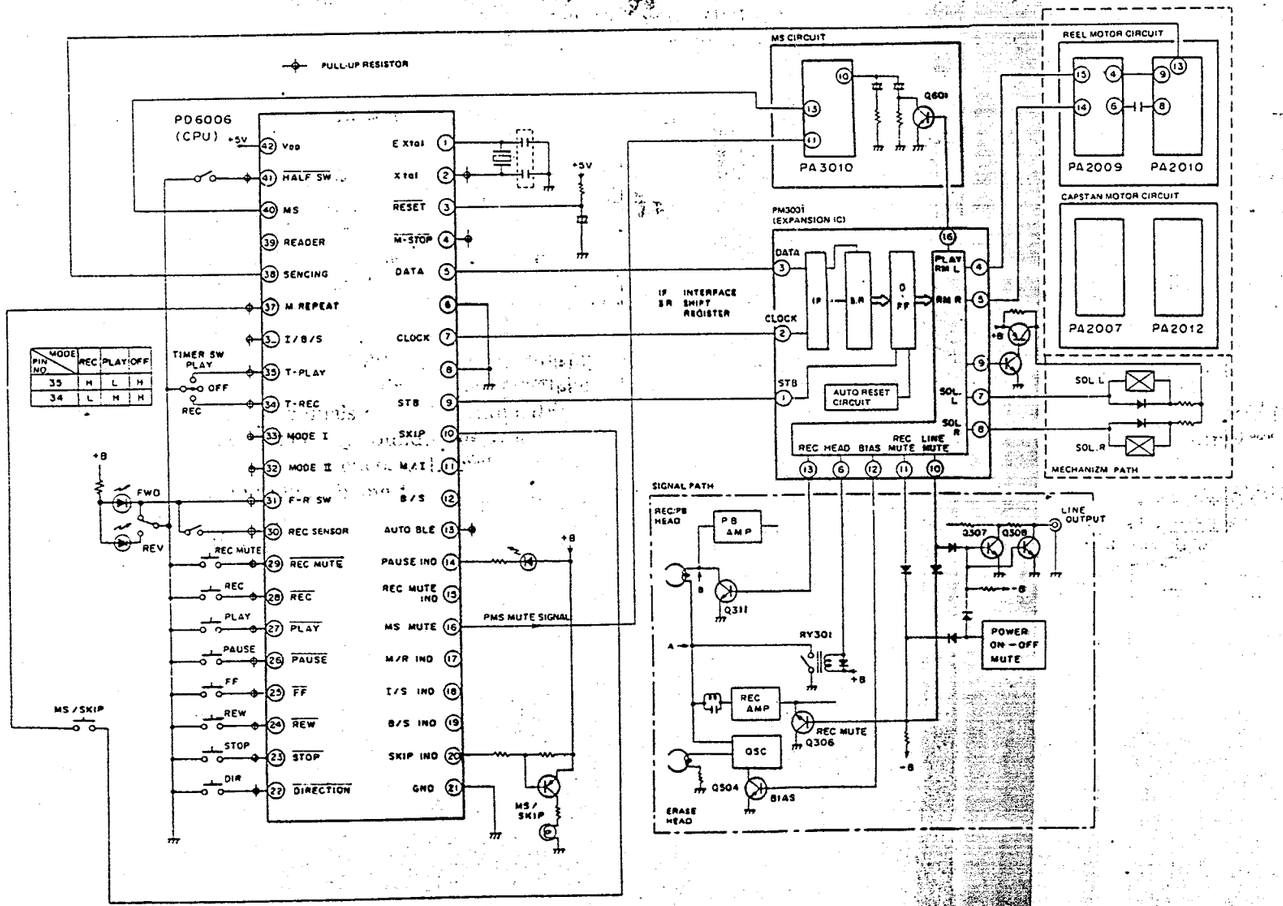


Fig. 4-2 Control system block diagram

(3) Signal path and other circuits

Pin 6 is switched to H level, resulting in the RY301 reed relay being switched off. The REC AMP output and the OSC circuit bias are thus applied to the recording/playback head.

Pins 10 and 11 are switched to L level, resulting in the LINE MUTE transistors Q307 and Q308 being turned off to permit output of the output signal. And since Q306 is turned off, the input signal is applied to the REC AMP.

Pins 12 and 13 are switched to H level, resulting in Q311 and Q504 being turned on. The bias OSC is thus activated and a bias signal applied to the head. And since Q311 is turned on, point B is grounded and the head is switched to recording mode.

6. PAUSE Key on during STOP Mode

(1) Mechanical ass'y

Pins 7 and 8 are both switched to H level, resulting in SOL.L and SOL.R being turned off, thereby putting the mechanical ass'y into stop mode.

(2) Motors

Same status as during stop mode.

(3) Signal path, and other circuits

Same status as during stop mode (with the exception of the PAUSE LED which lights up).

7. PAUSE Key on during REC/PLAY Mode

(1) Mechanical ass'y

With pin 7 at H level and pin 8 at L level, SOL.L is switched off and SOL.R on, thereby putting the mechanical ass'y into pause mode.

(2) Motors

Same status as during stop mode.

(3) Signal line

Pin 6 is switched to H level, resulting in the RY301 reed relay being switched off. The REC AMP output and the OSC circuit bias are thus applied to the REC AMP.

Pin 10 is switched to L level turning Q307 and Q308 off to permit output from the LINE OUTPUT terminals. Since pin 11 is switched to H level, Q306 is turned on, thereby muting the REC AMP input.

Pin 12 is switched to L level, resulting in Q504 being turned off and the OSC circuit being stopped. Pin 13 is switched to H level, resulting in Q311 being turned on and the head being switched to recording mode.

And since pin 14 of PD6006 is switched to L level, the PAUSE LED is turned on.

8. MS/SKIP Mode

When the MS/SKIP key is turned on, a pulse from pin 10 of PD6006 is applied to pin 37. If a reel motor is operating at this time, pin 16 of PD6006 is switched from H to L level. (Pin 16 remains at H level if there is no reel motor movement). Pin 11 of the tune-interval detector IC (PA3010) is also switched to L level, thereby releasing MS muting to start MS mode. After amplifying the signal applied to pin 9 of PA3010, the level is checked by the comparator in the next stage, resulting in the output of the signal shown at point A in Fig. 4-3. Transistor 1 is turned on by this output, and the charge on C connected to pin 12 is discharged, resulting in an L level output at pin 13. When the input signal is no longer applied to pin 9, transistor 1 is switched off, and charging up of C is started. The pin 13 output is switched to an H level output. The MS/SKIP mode is operated by this output.

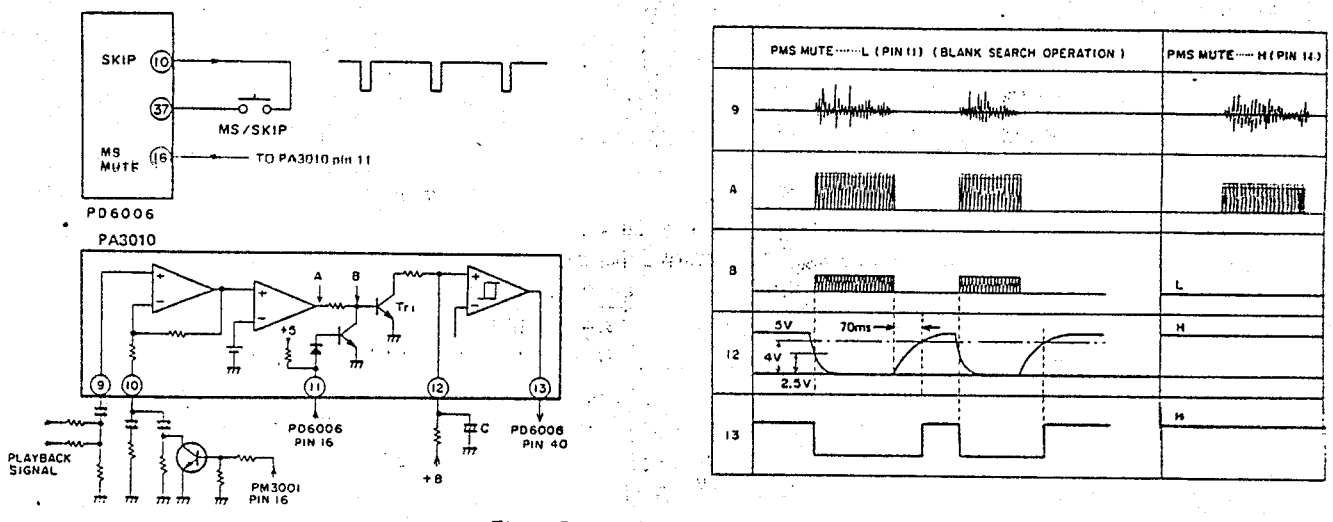


Fig. 4-3 MS/SKIP operation

PM3001 OUTPUT STATE BY MODE

Pin No.	MODE / FUNCTION	STOP		▷▷ FF		◁◁ REW		PLAY		REC/PLAY		STOP PAUSE		PLAY PAUSE		REC/PLAY PAUSE	
		FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV
4	RM. L	L (OFF)		L		H		L	M	L	M	L		L		L	
5	RM. R	L (OFF)		H		L		M	L	M	L	L		L		L	
6	HEAD SW	L (P.B MODE)		L		L		L		H		L		L		H	
7	SOL. L	H (OFF)		H	L	H	L	L		L		H		H	L	H	L
8	SOL. R	H (OFF)		L	H	L	H	L		L		H		L	H	L	H
9	P.B. MUTE	H (ON)		H		H		L		L		H		H		H	
10	LINE MUTE	H (ON)		H		H		L		L		H		H		L	
11	REC MUTE	H (ON)		H		H		H		L		H		H		H	
12	BIAS	L (OFF)		L		L		L		H		L		L		L	
13	REC	L (OFF)		L		L		L		H		L		L		H	
14	REW IND	L (OFF)		L		H		L		L		L		L		L	
15	FF IND	L (OFF)		H		L		L		L		L		L		L	
16	PLAY IND	L (OFF)		L		L		H		H		L		L		L	
PD6006 14	PAUSE IND	H (OFF)		H		H		H		H		L		L		L	

Fig. 4-4 PM3001 Output state by mode

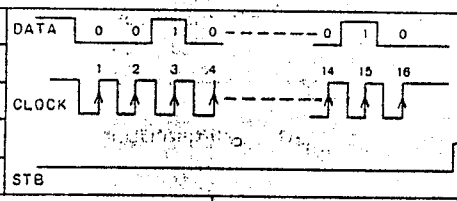
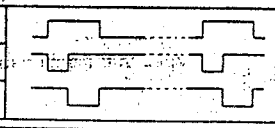
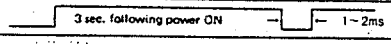
Pin No.	Symbol	I/O Status	Description		Applicable Model CT-930
1	Extal	——	Used by internal quartz oscillator		○
2	Xtal	——	External circuit terminal f = 3.58MHz  Pin 2 – GND		○
3	RESET	IN	CPU reset input (effective low, normally high)		○
4	M-STOP	IN	Memory STOP input (effective low)		X
5	DATA	OUT	DATA output to PM3001 	Serial output to PM3001	○
6			NC		
7	CLOCK	OUT	CLOCK output to PM3001		○
8			NC		
9	STB	OUT	STB output to PM3001		○
10	SKIP	OUT	SKIP key scan output 	KEY SCAN output	○
11	M/I	OUT	MUSIC REPEAT, INDEX SCAN key scan output		X
12	B/S	OUT	BLANK SEARCH key scan output		X
13	AUTO BLE	OUT	AUTO BLE start output 		X
14	PAUSE IND	OUT	PAUSE indicator output (effective low)	Indicator output	○
15	REC MUTE IND	OUT	REC MUTE indicator output (effective low)		X
16	MS MUTE	OUT	MS MUTE output, PA3010 MS signal MUTE output (low level while reel motor turning during blank detector operation		○
17	M/R IND	OUT	MUSIC REPEAT indicator output (effective low)	Indicator output	X
18	I/S IND	OUT	INDEX SCAN indicator output (effective low)		X
19	B/S IND	OUT	BLANK SEARCH indicator output (effective low)		X
20	SKIP IND	OUT	SKIP indicator output (effective low)		○
21	GND		GND		○
22	DIRECTION	IN	DIR (direction) key input	Mode Key input	○
23	STOP	IN	STOP key input		○
24	REW	IN	REW key input		○
25	FF	IN	FF key input		○
26	PAUSE	IN	Pause key input		○
27	PLAY	IN	PLAY key input		○
28	REC	IN	REC/PLAY key input		○
29	REC MUT	IN	REC MUTE key input		○
30	REC Sensor	IN	REC sensor switch input (enabled low, disabled high)	Mechanism SW input	○
31	F-R SW	IN	FWD/REV sensor switch input (FWD: L; REV: H)		○
32	MODE I	IN	Mode selector switch input	Mode selector SW input	X
33	MODE II	IN			X
34	T-REC	IN	Timer REC switch input	Timer mode SW input	○
35	T-PLAY	IN	Timer PLAY switch input		○
36	I/B/S	IN	INDEX SCAN, BLANK SEARCH, SKIP key input	Key matrix input	○
37	M.REPEAT	IN	MUSIC REPEAT key input		○
38	SENSING	IN	Sensing pulse input (from PA2010 pin)  ←Reel turning		X
39	LEADER	IN	Tape leader pulse detector input (from pin 2, PA3010)  ←Tape leader detected		X
40	MS	IN	Blank signal input (H level between selection in PLAY, FF, REW; L level during selection; H level all other times)		○
41	HALF SW	IN	Cassette loading switch input (Loaded: L ; Unloaded: H)		○
42	VDD		+5V power source		○

Fig. 4-5 PD6006 Pin description

Pin No.	Symbol	I/O Status	Descriptin
1	GND	—	
2	SENSING OUT	OUT	L level (0.5V max.) at magnetic coat portion of tape, and output of 100msec (min.) 4.9V (min.) pulse when leader portion of tape is reached.
3	SENSING T2	—	When the quantity of light received by the photo-senstive transistor increases sharply, a comparator located in a later stage is activated (thereby generating output pulses) due to the difference in the charging time constants of the capacitors connected to pins 3 and 4. Output pulses appear when there is a sharp increase of at least 6dB in the input voltage.
4	SENSING T1	—	
5	VR2	—	Terminals for control of the feedback current capable of a altering the gain of the compression circuit (compensation possible when there is fluctuation in the photo-sensitive transistor input).
6	VR1	—	
7	SENSING IN	IN	Photo-sensitive transistor output is applied to pin 7 after amplification (20dB).
8	Vcc1	—	20V DC
9	MS IN	IN	Tune interval detection input. A playback signal input above –73dBv denotes "tune", while an input level below that denotes a blank portion of tape between tunes. (Playback mode).
10	MS GAIN	—	Determines the gain of the tune-interval detection circuit.
11	MS MUTE	IN	Muting pin. Muting is applied if voltage greater then 1.6V is applied. Tune-interval detection circuit consequently stops operating (no tune-interval output).
12	MS T	—	Pin for determining the tune-interval detection time and the tune detection time by the capacitance of externally connected capacitors.
13	MS OUT	OUT	Tune-interval detection pin. L level (0.5V max.) for "tune" status, and H level (3.9V min.) for "tune-interval" status.
14	Vcc 2	—	5V DC
15	OSC C	—	Determination of the frequencies for activation of the infrared LED in the leader tape detector sensor utilizing externally connected capacitors.
16	OSC OUT	OUT	Infrared LED drive pin. 2kHz 40% duty pulse signal

NOTE:
The leader tape detector circuit generates pulse outputs when the leader tape is reached. Note, however, that PD6006 is not activated in the first few seconds after start of tape deck operation (playback, fast forward etc). Leader tape detection during that period, therefore, is not possible.

Fig. 4-6 PA3010 Pin description

9. Sensing end detector operation

A sensing pulse signal is sent continuously from the reel motor IC (PA2010) to pin 38 of PD6006 during recording, playback, fast forward, and rewind modes. (This sensing pulse is formed by rectifying the Hall element output in PA2010). If this sensing pulse remains at L or H level for any longer than three seconds, PD6006 interprets this as "tape end", and switches the deck to stop mode.

When tape end is reached during playback mode, direction is changed for REV PLAY operation. The PD6006 is programmed to stop playback after a tape has been played four times in both directions, that is, after direction has been changed eight times.

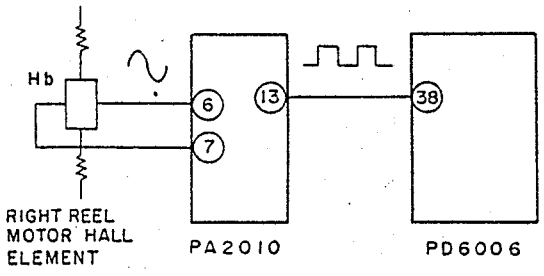


Fig. 4-7 End sensor diagram

Timing chart 1

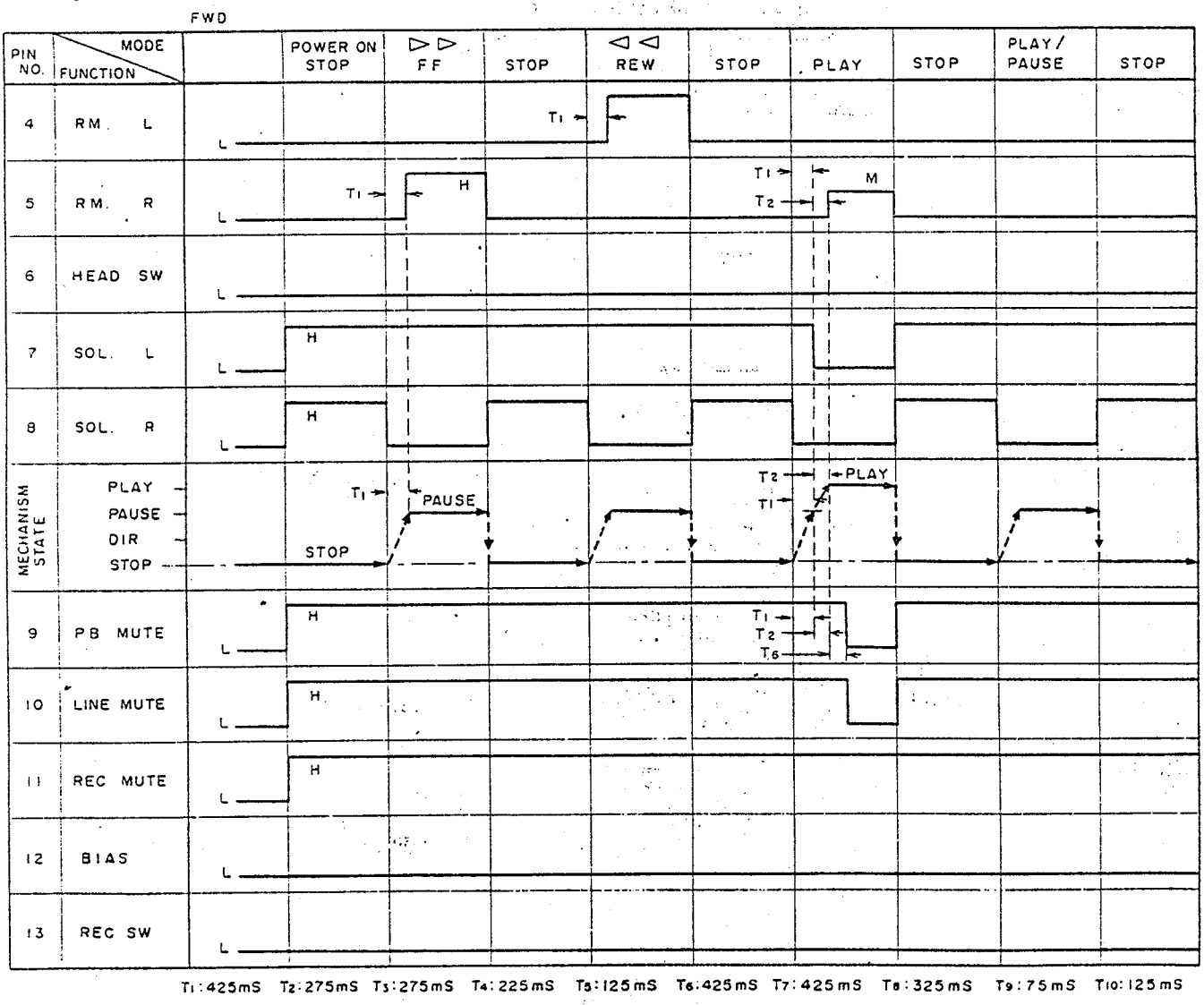


Fig. 4-8 Timing chart of PM3001, 1

10. Auto Function Operation

- Tape deck switched to PLAY

When the CT-930 is switched to playback mode, pin 10 of PM3001 is switched to L level, and the Q602 collector to H level. And since pin 13 of PM3001 is also switched to an L level output, the IC (3/4) output is switched to H level.

As a result, the IC (4/4) output is switched to L level, and the IC (2/4) output to H level, thereby turning Q605 on. A negative pulse is consequently passed to the amplifier unit, resulting in the amplifier being switched automatically to tape mode.

- Amplifier switched to TAPE

When the amplifier function selector is switched to the TAPE position, a negative output pulse is passed from the amplifier's automatic switching terminal. This pulse signal is differentiated by C608, and switches pin 27 of PD6006 to L level. The same status as when the PLAY switch (S603) is pressed is thereby achieved, putting the CT-930 into playback mode.

Timing chart 2

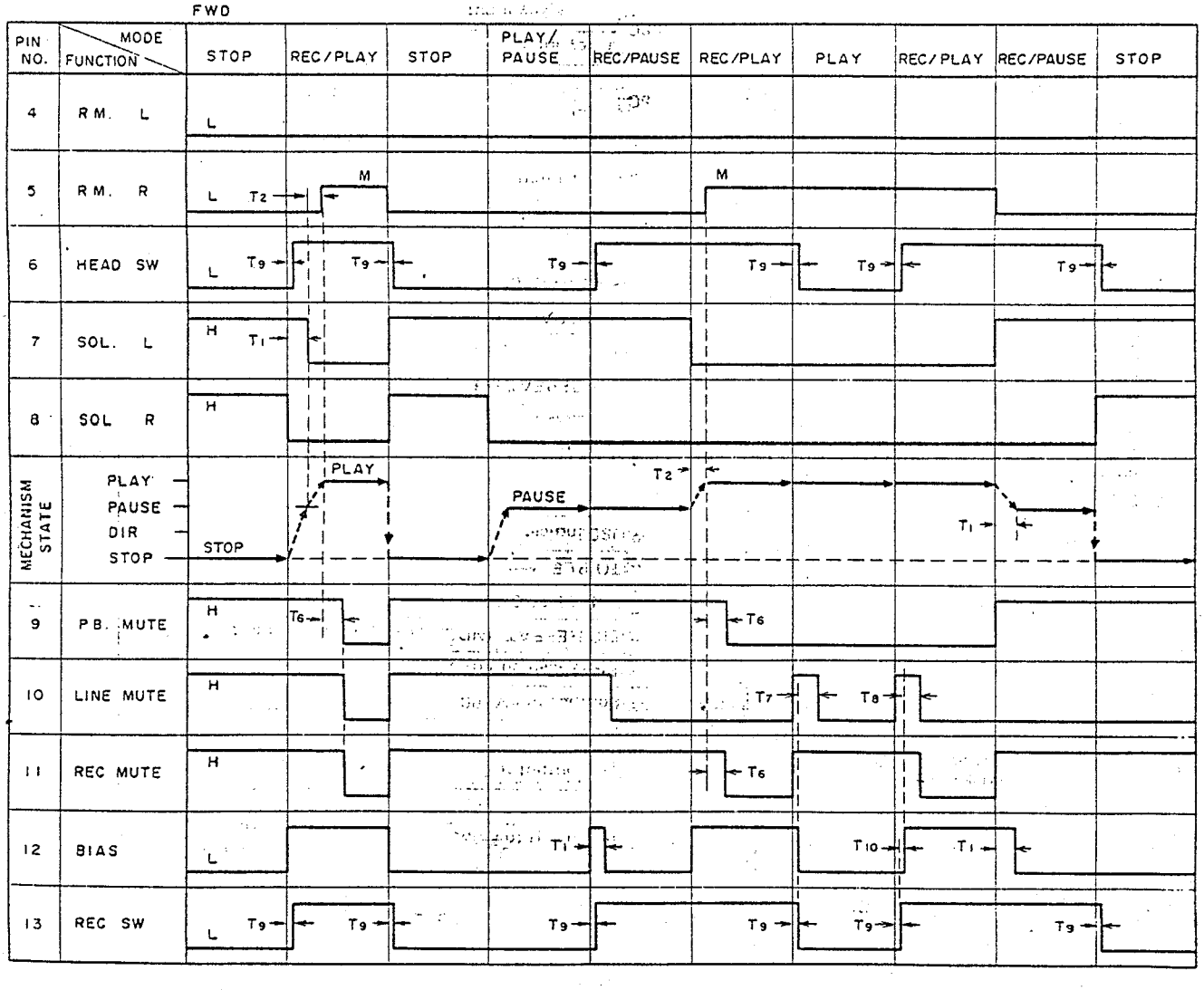


Fig. 4-9 Timing chart of PM3001, 2

- Amplifier switched to PHONO

  When the amplifier function selector is switched to another position apart from TAPE (for example, PHONO), a positive output pulse is passed from the amplifier's automatic switching terminals.

  This pulse is differentiated by C609, resulting in the application of an H level signal to IC (1/4) and the subsequent output of an L level signal. This is the same status as achieved when the STOP switch (S606) is pressd. The CT-930 is thus put into stop mode.

- When the tape deck is in recording mode

  Pin 13 of PM3001 is at H level while the tape deck is in recording mode. The IC (3/4) and IC (2/4) outputs are thus at L level. The IC (1/4) output therefore remains at H level if a positive pulse is applied from C609, thereby preventing the deck from being switched to stop mode. That is, the CT-930 remains in recording mode when the amplifier function selector is switched.

Timing chart 3

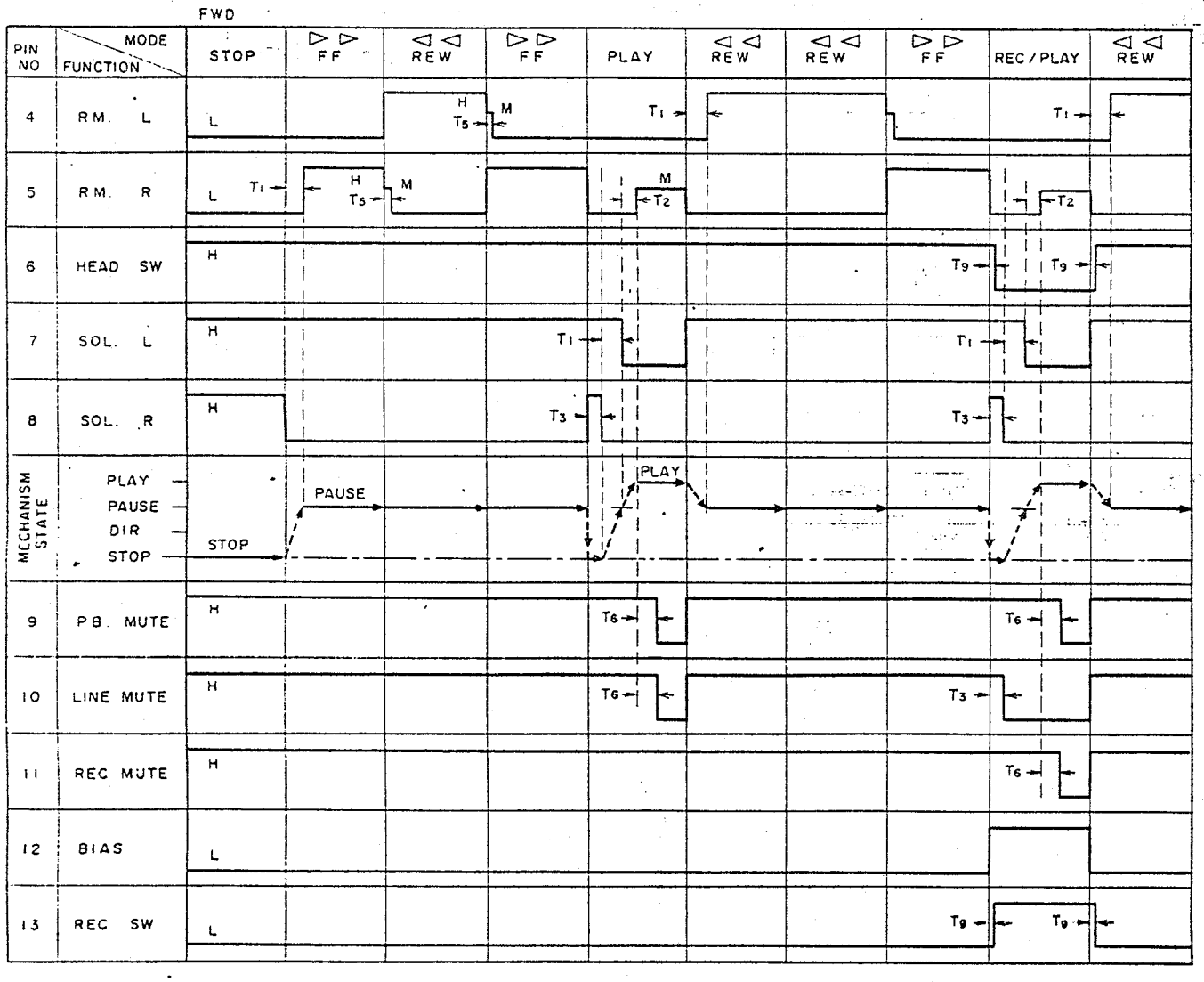


Fig. 4-10 Timing chart of PM3001, 3

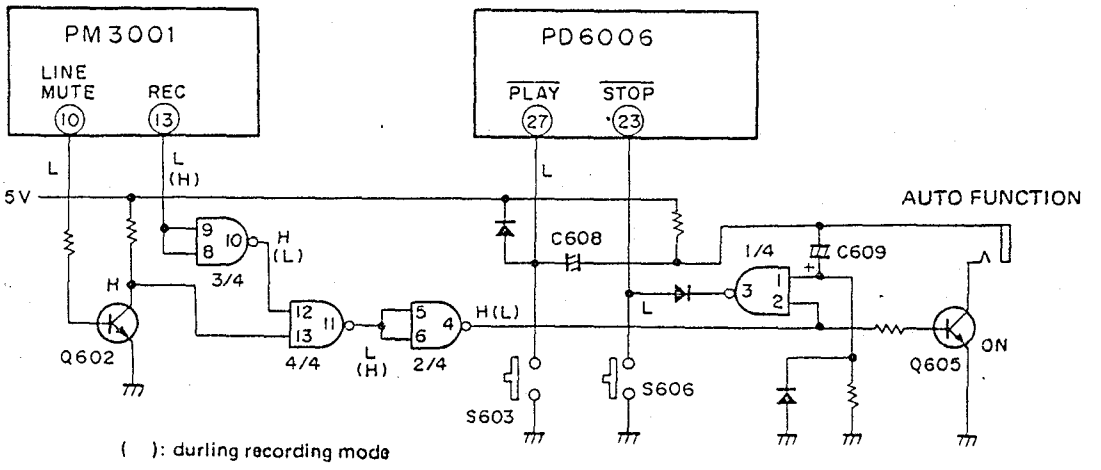


Fig. 4-11 Auto function operation

Timing chart 4

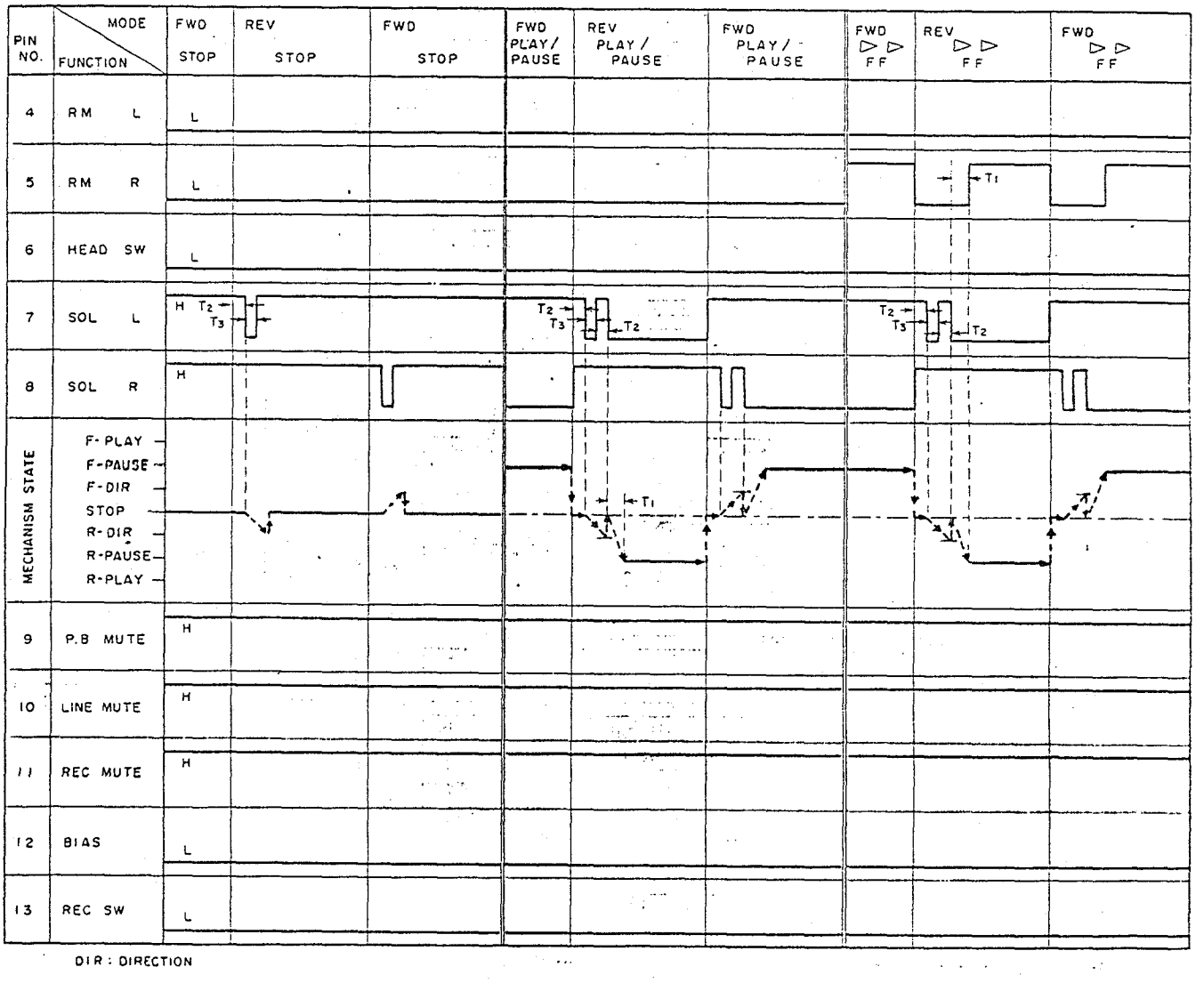
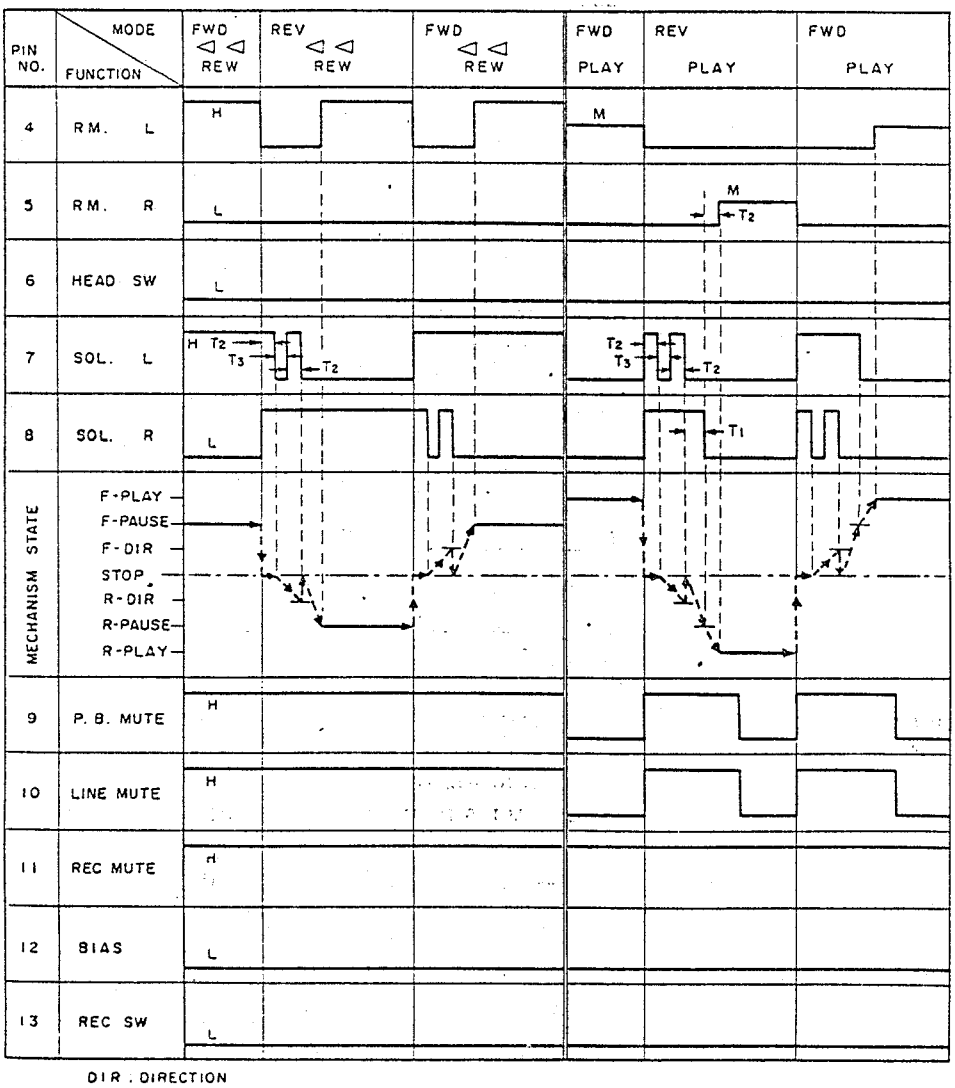


Fig. 4-12 Timing chart of PM3001, 4

Timing chart 5



DIR . DIRECTION

Fig. 4-13 Timing chart of PM3001, 5

5. DISASSEMBLY

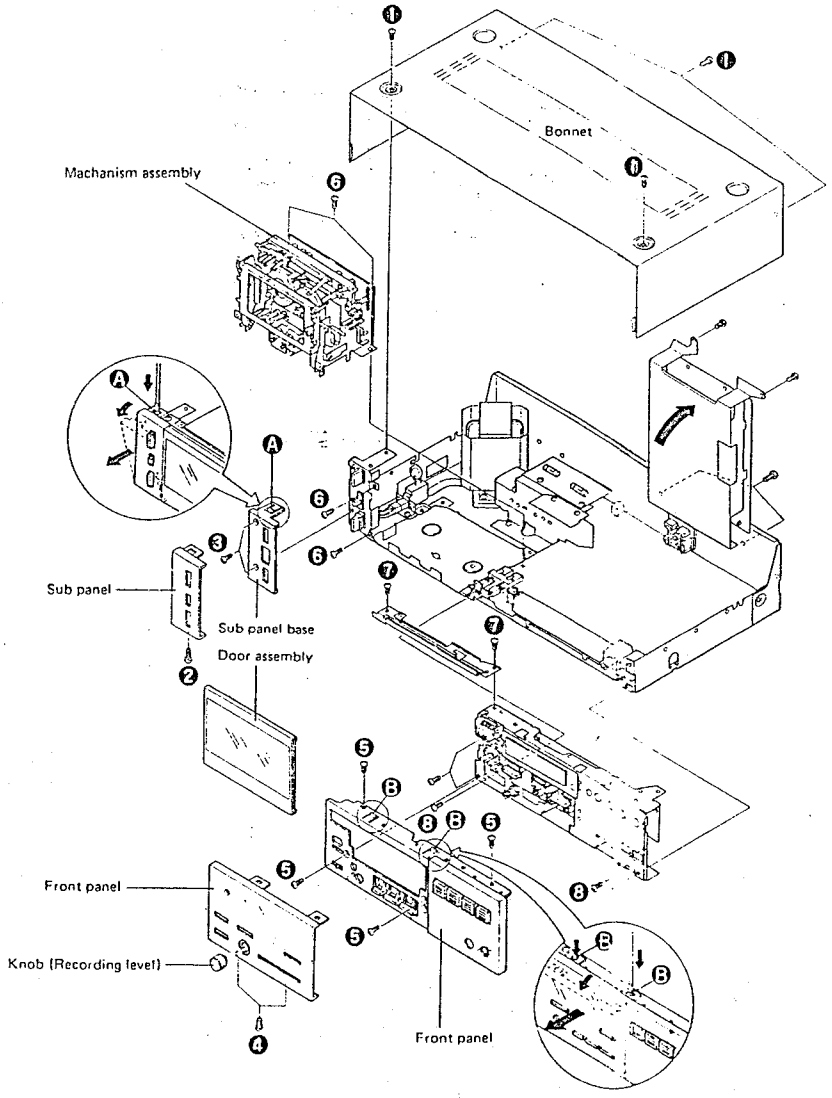


Fig. 5-1 Housing and mechanical assembly

Housing and Mechanical Ass'y

1. Remove the bonnet by pulling out towards the rear after undoing screws ❶ .
2. Remove the subpanel by undoing screw ❷ and releasing hook Ⓐ by gently depressing with a screwdriver.
3. Remove the subpanel base by undoing screw ❸ , and then remove the eject, standby, and power control knobs.
4. Remove the REC. VR control knob, undo screw ❹ , and gently depress hook Ⓑ with a screwdriver to enable removal of the front panel.
5. Remove the front panel base by undoing screws ❺ .
6. Remove the door ass'y and undo screws ❻ to remove the mechanical ass'y.

NOTE:
Caution when removing the door ass'y.
The door ass'y is fixed to kangaroo holder B by adhesive bond. If the door is removed for repair purposes etc., remount the door by using adhesive bond.

7. Remove the panel stay by undoing screws ❼, removing the coupling plate, then undoing screws ❽ .

Front Panel

1. Remove the meter ass'y by releasing rivet Ⓒ ,
2. Removing the counter by undoing screw ❾ ,
3. Remove the control ass'y by releasing rivets Ⓓ .
4. Remove the switch base plate ass'y by undoing screw ❿ .

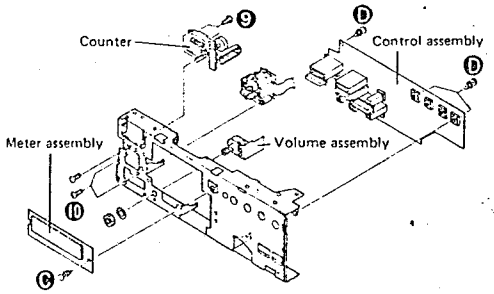


Fig.5-2 Front panel

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.

Reassembly Precautions

When replacing the head assembly, be sure the gears mesh as shown in Fig. 5-4.

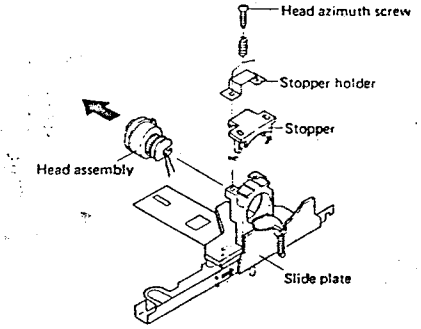


Fig. 5-3 Disassembly of the head assembly

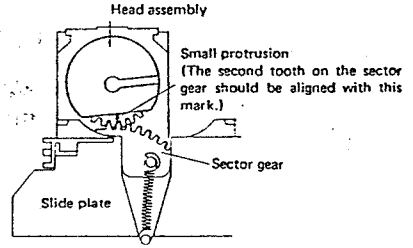


Fig. 5-4 Relationship between head assembly and sector gear

Removal of the Capstan Belt

Undo screws ⓫ , remove the capstan motor control ass'y, and then remove the capstan belt.

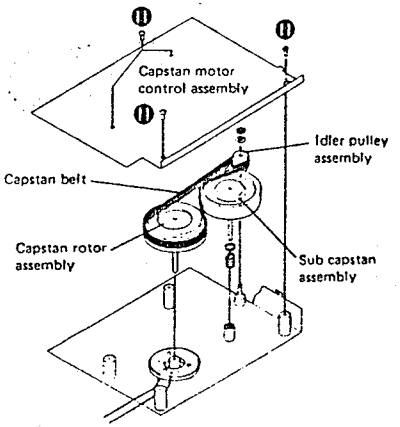


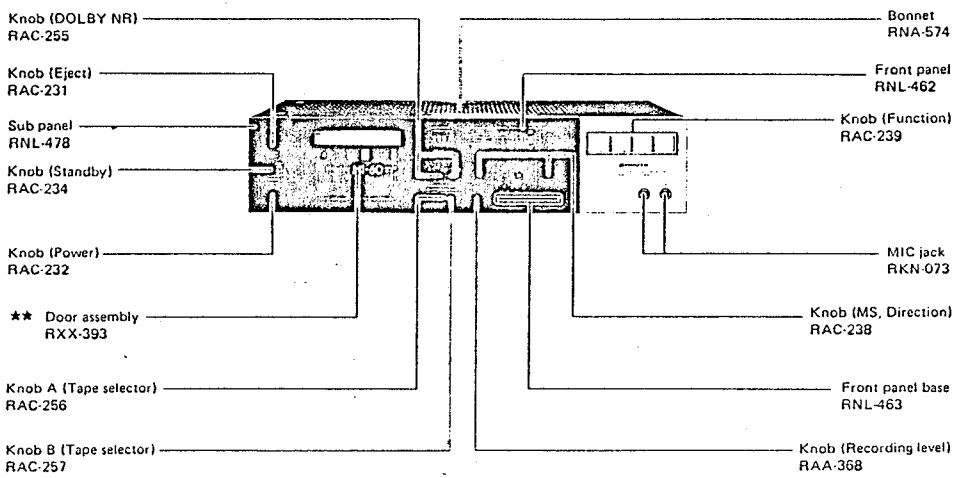
Fig. 5-5 Removal of the capstan belt

6. PARTS LOCATION

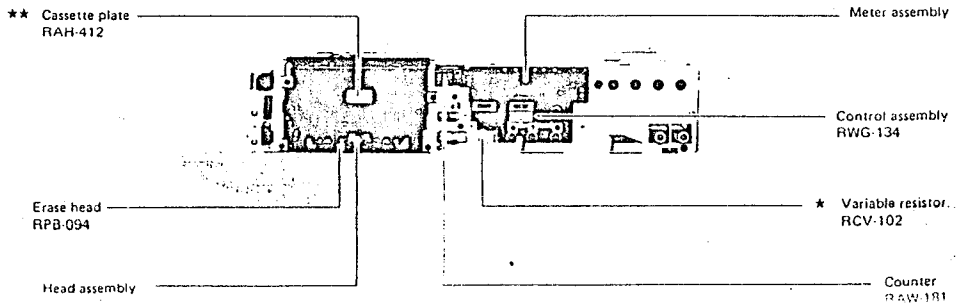
NOTES:

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

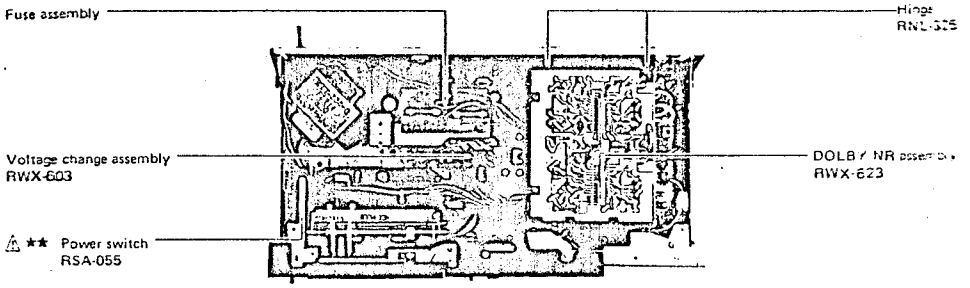
Front Panel View



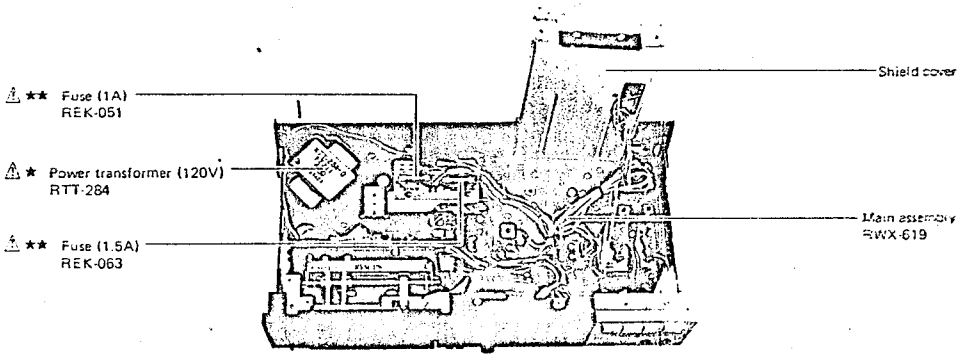
Front View with Front Panel Removed



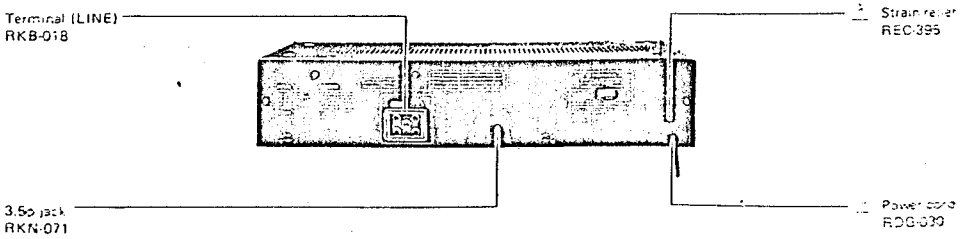
Top View with Bonnet Removed I



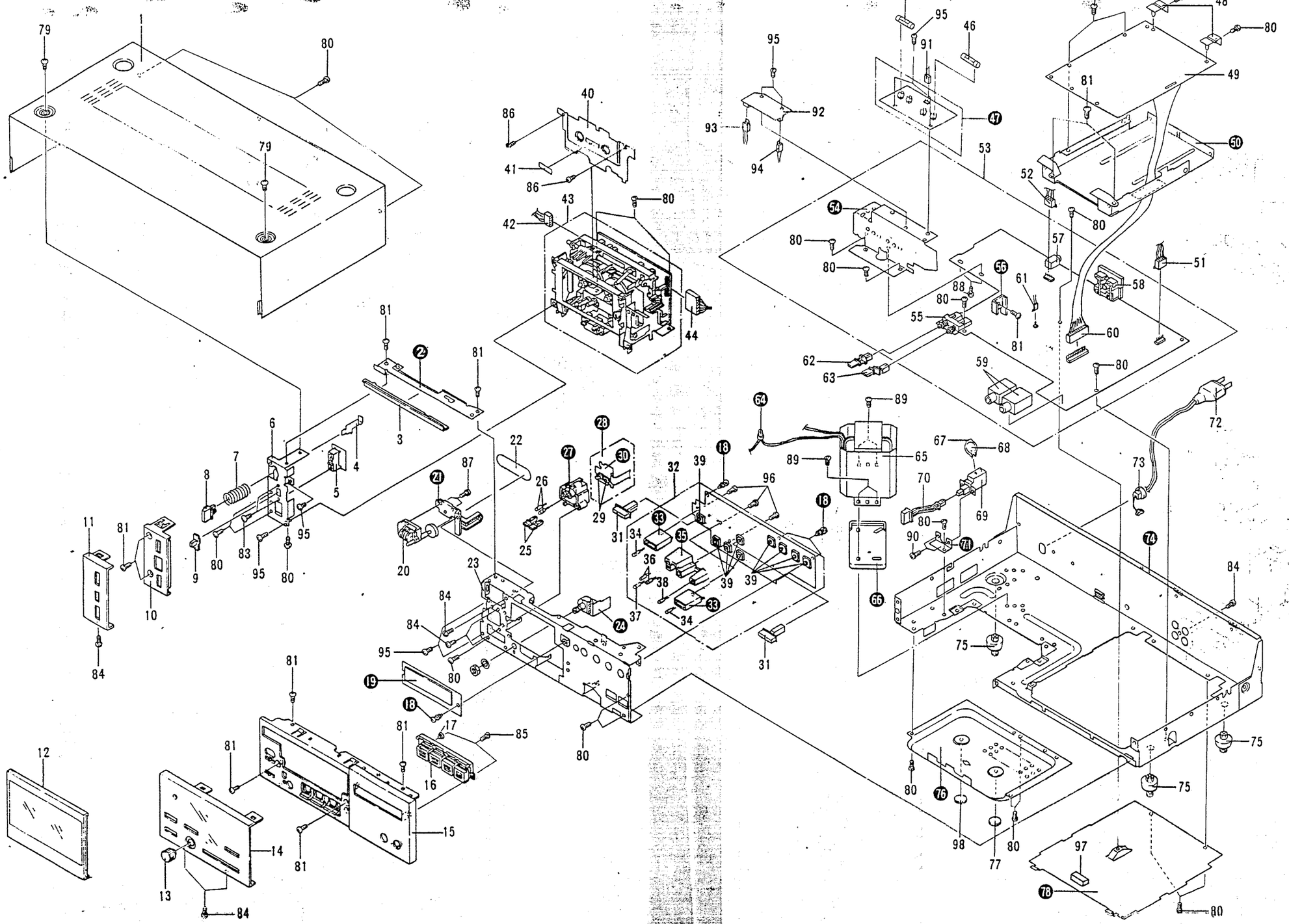
Top View with Bonnet Removed II



Rear Panel View



EXPLODED VIEWS AND PARTS LIST



Mark	No.	Part No.	Description
	91.		Connector assembly 2P
	92.	RWX-603	Voltage change assembly
	93.	RKP-621	Connector assembly 3P
	94.		Connector assembly 2P
	95.	VBZ30P060FZK	Screw
	96.	PBZ26P060FMC	Screw
	97.	REB-287	Cushon A
	98.	RED-197	Foot sponge
	99.	REE-093	Shield cover

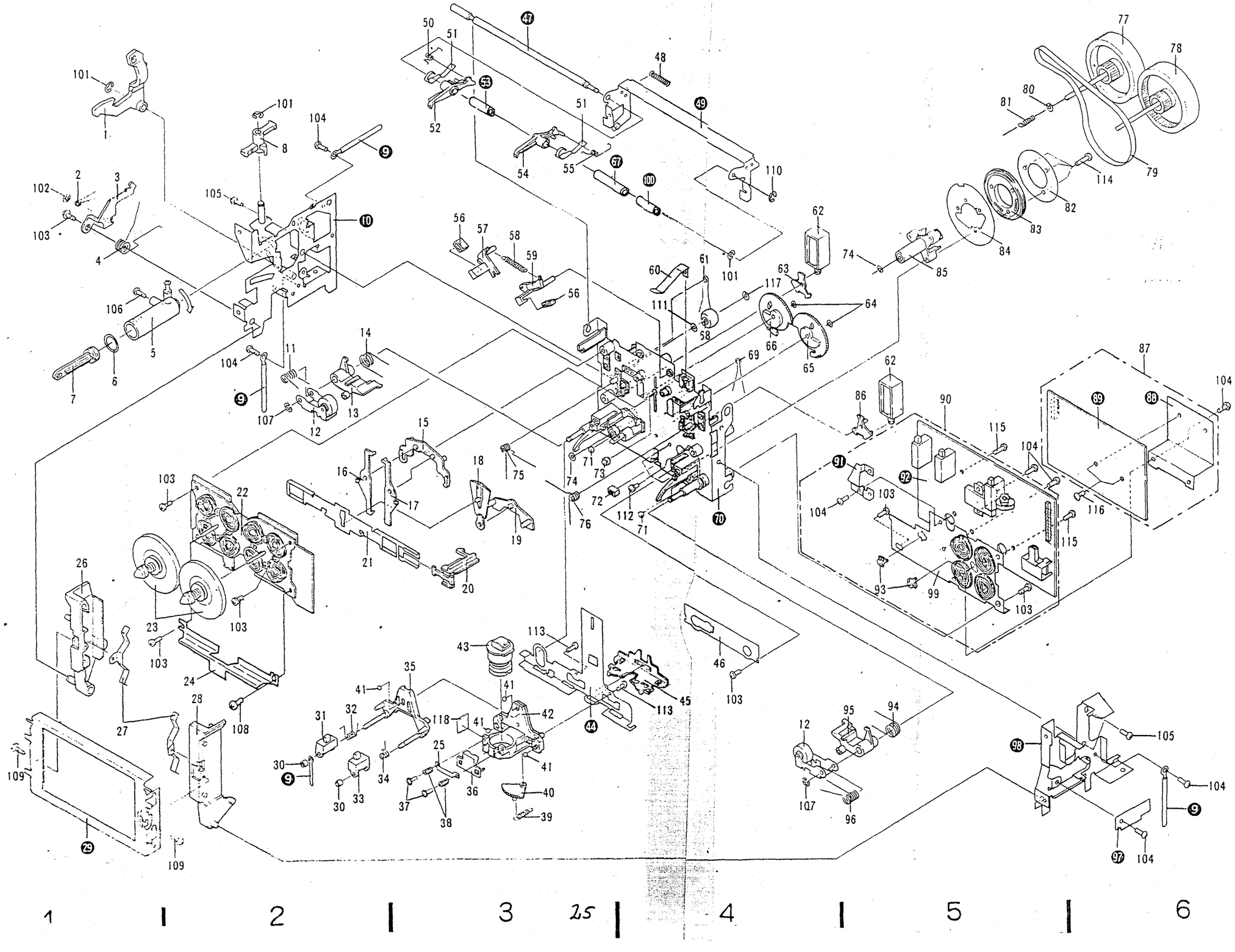
NOTES:

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

Parts List

Mark	No.	Part No.	Discription
	1.	RNA-594	Bonnet
	2.		Connection plate
	3.	RNL-400	Door escutcheon
	4.	RNH-135	Eject plate
★★	5.	RSH-064	Slide switch (Timer)
	6.	RNH-133	Sub panel stay
	7.	RBH-917	Eject spring
	8.	RAC-231	Knob (Eject)
	9.	RAC-234	Knob (Standby)
	10.	RNL-410	Sub panel base
	11.	RNL-478	Sub panel
★★	12.	RXX-393	Door assembly
	13.	RAA-368	Knob (Recording level)
	14.	RNL-462	Front panel
	15.	RNL-463	Front panel base
	16.	RAC-239	Knob (Function)
	17.	RBH-925	Earth spring
	18.		Nylon rivet
	19.		Meter assembly
	20.	RAW-181	Counter
	21.		Counter holder
★★	22.	REB-468	Counter belt
	23.	RNC-294	Panel stay
	24.		Volume assembly
	25.	RAC-255	Knob (DOLBY NR)
★	26.	BG5724S	LED
	27.		P.C.B. holder
	28.		DOLBY NR Switch assembly
★★	29.	RSG-131	Push switch
	30.		P.C.B.
	31.	RAC-238	Knob (MS, Direction)
	32.	RWG-134	Control assembly
	33.		Lamp holder
★★	34.	REL-093	Lamp
	35.		LED holder
★	36.	AA5704S	LED
★	37.	PR5724S	LED
★	38.	BG5724S	LED
★★	39.	RSG-063	Function switch
	40.	RAH-412	Cassette plate
	41.	REE-081	Paper
	42.	RKP-613	Connector assembly 5P (C)
	43.	RYM-128	Mechanism assembly
	44.	RKP-614	Connector assembly 8P
⚠ ★★	45.	REK-051	Fuse T1A (FU1)

Mark	No.	Part No.	Description
⚠ ★★	46.	REK-063	Fuse T1.5A (FU2)
	47.		Fuse assembly
	48.	RNL-325	Hinge
	49.	RWX-623	DOLBY NR assembly
	50.		Shield cover
	51.	RKP-273	Connector assembly 5
	52.	RKP-615	Connector assembly 4
	53.	RWX-619	Main assembly
	54.		Heat sink
★★	55.	RSG-130	Push switch assembly
	56.		Heat sink
	57.	RKN-071	3.5φ jack
	58.	RKB-018	Terminal (LINE)
	59.	RKN-073	MIC jack
	60.	RKP-572	Connector assembly 1
	61.		Connector assembly 2
	62.	RAC-256	Knob A (Tape selecto
	63.	RAC-257	Knob B (Tape selector
⚠	64.		Nut
⚠ ★	65.	RTT-284	Power transformer (1
	66.		Plate
	67.	REC-297	Capacitor cover
⚠	68.	RCG-006	Capacitor
⚠ ★★	69.	RSA-055	Power switch
	70.	RAC-232	Knob (Power)
	71.		Plate
⚠	72.	RDG-030	Power cord
⚠	73.	REC-395	Strain relief
	74.		Main chassis
	75.	REC-369	Foot assembly
	76.		Bottom cover
	77.	REC-355	Sliding stopper
	78.		Bottom plate
	79.	BMZ30P060FZK	Screw
	80.	VCZ30P060FMC	Screw
	81.	BCZ30P060FMC	Screw
	82.	VCZ30P060FZK	Screw
	83.	PMA26P050FMC	Screw
	84.	VPZ30P080FZK	Screw
	85.	VPZ30P060FMC	Screw
	86.	BBZ26P060FZK	Screw
	87.	VBZ26P060FMC	Screw
	88.	BMZ30P060FMC	Screw
	89.	VBZ40P120FMC	Screw
	90.	PMA30P060FMC	Screw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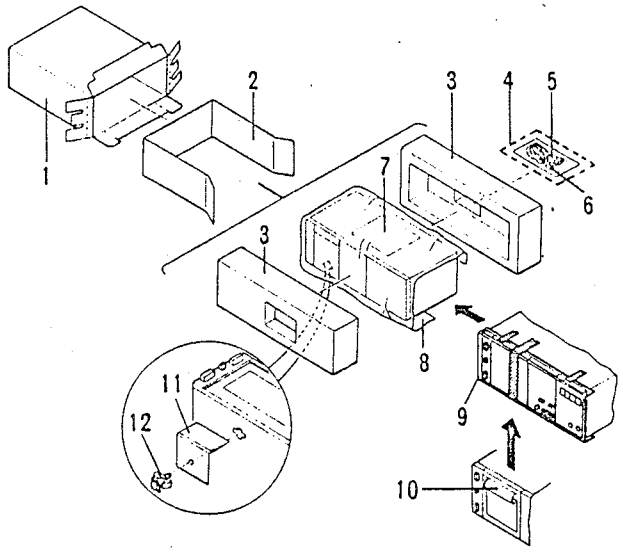
Mark	No.	Part No.	Description
	101.	YE30FUC	Washer
	102.	YS25FBT	Washer
	103.	ATZ26P080FMC	Screw
	104.	VCZ30P060FMC	Screw
	105.	BMZ30P060FMC	Screw
	106.	VCZ26P 100FMC	Screw
	107.	YE25FUC	Washer
	108.	VCZ26P140FMC	Screw
	109.	ATZ30P080FMC	Screw
	110.	YE20FUC	Washer
	111.	WA21D040D025	Washer
	112.	PMA26P050FMC	Screw
	113.	BMZ26P050FMC	Screw
	114.	BMZ26P080FMC	Screw
	115.	BBZ26P080FNi	Screw
	116.	VCZ30P100FMC	Screw
	117.	WA017D034D025	Washer
	118.	REC-387	Sheet
	22+87.	RXX-376	Reel motor full assembly IV

8. PACKING



Mark	No.	Part No.	Description
	1.	RHG-516	Packing case
	2.	RHC-138	Spacer
	3.	RHA-244	Pad
	4.	RDE-063	Connection cord assembly
	5.	RDE-064	Connection cord B
	6.	RDE-065	Connection cord A
	7.	RRB-191	Operating instructions
	8.	RHX-031	Sheet C
	9.	RHC-132	Sheet
	10.	RHC-119	Sheet
	11.	REE-083	Label
	12.	REC-383	Stopper

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*		*RN2H 0 R 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 ⚠ 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.

Parts List

Mark	No.	Part No.	Description
	1.	RNL-266	Lock arm
	2.	RBH-849	Lever spring
	3.	RNL-265	Eject prevent lever
	4.	RBH-012	Spring
	5.	RNL-261	Cylinder
	6.	REB-447	O ring
	7.	RNL-269	Piston
	8.	RNL-264	Eject lever
	9.		Cord clamper
	10.		Side frame L1 assembly
	11.	RBH-851	Pinch pressure spring L
★★	12.	RXB-550	Pinch roller arm assembly
	13.	RNL-267	Sub pinch arm L
	14.	RBH-861	Pinch return spring L
	15.	RNG-316	Cam follow lever
	16.	RNL-253	Hook L
	17.	RNL-254	Hook R
	18.	RNL-255	Connection plate
	19.	RNL-306	Pinch plate
	20.	RNL-305	Actuater
	21.	RNH-077	Change plate
	22.	RXX-363	Reel motor assembly BII
★★	23.	RXB-668	Rotor assembly
	24.	RNH-117	Shield plate B
	25.	RNH-140	Stopper holder
	26.	RNL-414	Pocket L
	27.	RBK-167	Pressure spring
	28.	RNL-398	Pocket R
	29.		Holder B
	30.	RBA-073	Special nut
★	31.	RPB-094	Erase head
	32.	RBH-863	Height adjust spring L
	33.	RNL-263	Dummy head
	34.	RBH-864	Height adjust spring R
	35.	RXB-671	Erase head base assembly
	36.	RNL-262	Stopper
	37.	RBA-074	Azimuth screw
	38.	RBH-853	Azimuth spring
	39.	RBH-906	Gear spring
	40.	RNL-312	Sector gear
	41.	REF-022	Steel ball (3φ)
	42.	RXB-608	Housing assembly
★★	43.	RXX-333	Head assembly
	44.		Head base assembly
	45.	RNL-317	Slide plate
	46.	RNH-146	Head base spring
	47.		Main shaft
	48.	RBH-913	Arm spring
	49.		Arm assembly
	50.	RBH-868	Switch lever spring A

Mark	No.	Part No.	Description
	51.	RNC-267	Switch lever
	52.	RNL-272	REC detector arm
	53.		Bush
	54.	RNL-271	Chrom detector arm
	55.	RBH-869	Switch lever spring B
★	56.	REB-450	Brake shoe
	57.	RNL-253	Brake plate L
	58.	RBH-848	Brake spring
	59.	RNL-259	Brake plate R
	60.	RBK-164	Half set spring
	61.	RBH-847	Spring R
⚠ ★	62.	RXP-111	Plunger solenoid
	63.	RNL-256	Trigger lever L
	64.	RBF-058	Washer
	65.	RNL-308	Assist gear R
	66.	RNL-307	Assist gear L
	67.		Bush A
	68.	RXB-620	Idler pulley assembly
	69.	RBH-846	Spring L
	70.		Chassis assembly
	71.	REF-023	Steel ball (4φ)
	72.	REB-260	Stopper
	73.	RLB-434	Guide roller
	74.	RBF-030	Oil stop washer
	75.	RBH-929	Ratch spring L
	76.	RBH-930	Ratch spring R
	77.	RXB-629	Sub capstan assembly
	78.	RXX-377	Capstan rotor assembly
★★	79.	REB-467	Capstan belt
	80.	RBF-059	Washer
	81.	RBH-923	Spring
	82.	RNH-064	FG plate
	83.	RXX-334	FG coil assembly
	84.	RNH-061	FG shield plate
	85.	RXB-553	Bearing housing assembly
	86.	RNL-257	Trigger lever R
	87.	~~RWX-491~~ NL	Reel motor control assembly B
	88.		Heat sink A
	89.		P.C.B.
	90.	RXX-381	Capstan motor assembly D II
	91.		Heat sink B
	92.		Capstan motor control assembly D
	93.	RNL-247	Thrust receptacle
	94.	RBH-862	Pinch return sping R
	95.	RNL-268	Sub pinch arm R
	96.	RBH-852	Pinch pressure spring R
	97.		Connector P.C.B.
	98.		Side frame R2 (B) assembly
	99.	RXB-679	Bottom plate A assembly
	100.		Bush B

Mark		Part NO.	Symbol & Description
⚠	★	1B2C1-LC2	D515, C516
⚠	★	1B2Z1-LC2	D517
⚠	★	WZ-056	ZD501
⚠	★	WZ-050	ZD503, ZD504
⚠	★	WZ-120	ZD502
⚠	★	WZ-125	ZD505

COIL AND SWITCHES

Mark	Part No.	Symbol & Description	
	RTF-084	L301, L401	Trap coil
	RTF-123	L303, L403	Peaking col (3.9mH)
	RTF-127	L304, L404	Peaking coil (8.2mH)
	RTF-1011	L501, L502	Line coil
	RTF-138	L302, L402	MPX filter
	RTD-027	T501	OSC coil
★★	RSG-130	S301, S302	Push switch assembly

OTHERS

Mark	Part No.	Symbol & Description
	RKN-073	MIC jack
	RKB-018	4P Pin jack
	RKN-071	3.5φ Jack
	RSR-035	RY301 Relay
	RKH-005	Insulator
	REE-051	Insulator
	RBA-026	Special screw
	RKP-619	Connector assembly 3P (A)
	RKP-610	Connector assembly 3P (B)
	RKP-611	Connector assembly 5P (A)
	RKP-620	Connector assembly 5P (B)
	RKP-613	Connector assembly 5P (C)
	RKP-614	Connector assembly 8P
	RKP-618	Connector assembly 3P (C)
	RKP-621	Connector assembly 3P
	RKP-623	Connector assembly 3P

Control Assembly (RWG-134)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 16	C601, C609
	CEA 010M 50	C604
	CEA 4R7M 50	C603
	CEA 101M 6R3	C602, C605
	CKDYF 103Z 50	C606
	CEA 100M 6R3NP	C608

RESISTORS

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

Mark	Part No.	Symbol & Description
	RM8-103J	R605
	RM9-103J	R606
	RD¼PM □□□ J	R601–R603, R608, R611, R612, R614–R616, R633–R644, R647

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PD6006	IC601
★★	PA3010	IC602
★★	HD14011B (TC4011BP) (MB84011BM)	IC603
★★	2SC1815 (2SC1740LN) (2SC2634NC)	Q601–Q603, Q605
★★	2SA934 (2SA881)	Q604
★★	2SC2060 (2SC2673) (2SC1383)	Q606
★	1S2473 (US1040)	D601, D602
★	1K34A (1K60A) (0A90)	D603
★	BG5724S	LED601
★	AA5704S	LED602, LED603
★	PR5724S	LED604

SWITCHES

Mark	Part No.	Symbol & Description
★★	RSC-063	S601–S609 Function switch

OTHERS

Mark	Part No.	Symbol & Description
★	RSS-033	X601 Ceramic resonator assemb C607
★★	REL-093	PL601, PL602 Lamp

DOLBY NR Switch Assembly

Mark	Part No.	Symbol & Description
★★	RSG-131	S1001, S1002 Push switch
★	BG5724S	LED1001, LED1002

Timer Switch Assembly

Mark	Part No.	Symbol & Description
★★	RSH-064	S901 Slide switch

Miscellaneous Part List

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	RWX-619	Main assembly
	RWG-134	Control assembly
		DOLBY NR switch assembly
		Timer switch assembly
		Volume assembly
	RWX-623	DOLBY NR assembly
		Meter assembly
		Fuse assembly
		Capstan motor control assembly D
	RXM-099	Reel Motor assembly F
		Reel Motor drive assembly B
	RWX-491	Reel Motor control assembly B
	RWX-603	Voltage change assembly

OTHERS

Mark	Part No.	Symbol & Description
⚠ ★	RTT-284	T001 Power transformer (120V)
⚠ ★★	RSA-055	S001 Power switch
⚠	RCG-006	C001 Capacitor
⚠ ★	REK-051	FU2 Fuse 1A
⚠ ★	REK-063	FU1 Fuse 1.5A

Main Assembly (RWX-619)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQSH 331K 50	C301, C401
	CEANL 3R3M 25	C321, C421
	CEANL 100M 16	C302, C402
	CEA R33M 50	C313, C413
	CEA 010M 50	C318, C319, C329, C418, C419, C429
	CEA 2R2M 50	C528
	CEA 4R7M 50	C312, C412
	CEA 100M 16	C306, C310, C314, C322–C325, C327, C406, C410, C414, C422–C425, C427, C525
	CEA 100M 35	C503
	CEA 220M 10	C518
	CEA 330M 16	C304, C404, C504, C519, C526, C516
	CEA 470M 10	C309, C409
	CEA 470M 16	C501, C502, C514, C515, C520, C534
	CEA 101M 10	C523
	CEA 101M 16	C535
	CEA 101M 35	C531
	CEA 221M 10	C505, C506
	CEA 221M 16	C521
	CEA 221M 25	C532
	CEA 471M 6R3	C527
	CEA 471M 16	C522
	CEA 102M 50	C529, C530
	CQPA 182J 100	C507
	CCDSL 220J 50	C305, C405
	CCDSL 101K 50	C303, C326, C403, C426
	CCDSL 101K 500	C330, C430
	CKDYF 102Z 50	C320, C420
	CKDYF 103Z 50	C512, C513, C524, C533, C536
	CKDYF 473Z 50	C537
	CKDYB 471K 50	C311, C411
	CQMA 332J 50	C328, C428, C509, C510
	CQMA 103J 50	C307, C407, C508, C511
	CQMA 123J 50	C316, C331, C416, C431
	CQMA 183J 50	C315, C317, C332, C415, C417, C432
	CQMA 223J 50	C308, C408

RESISTORS

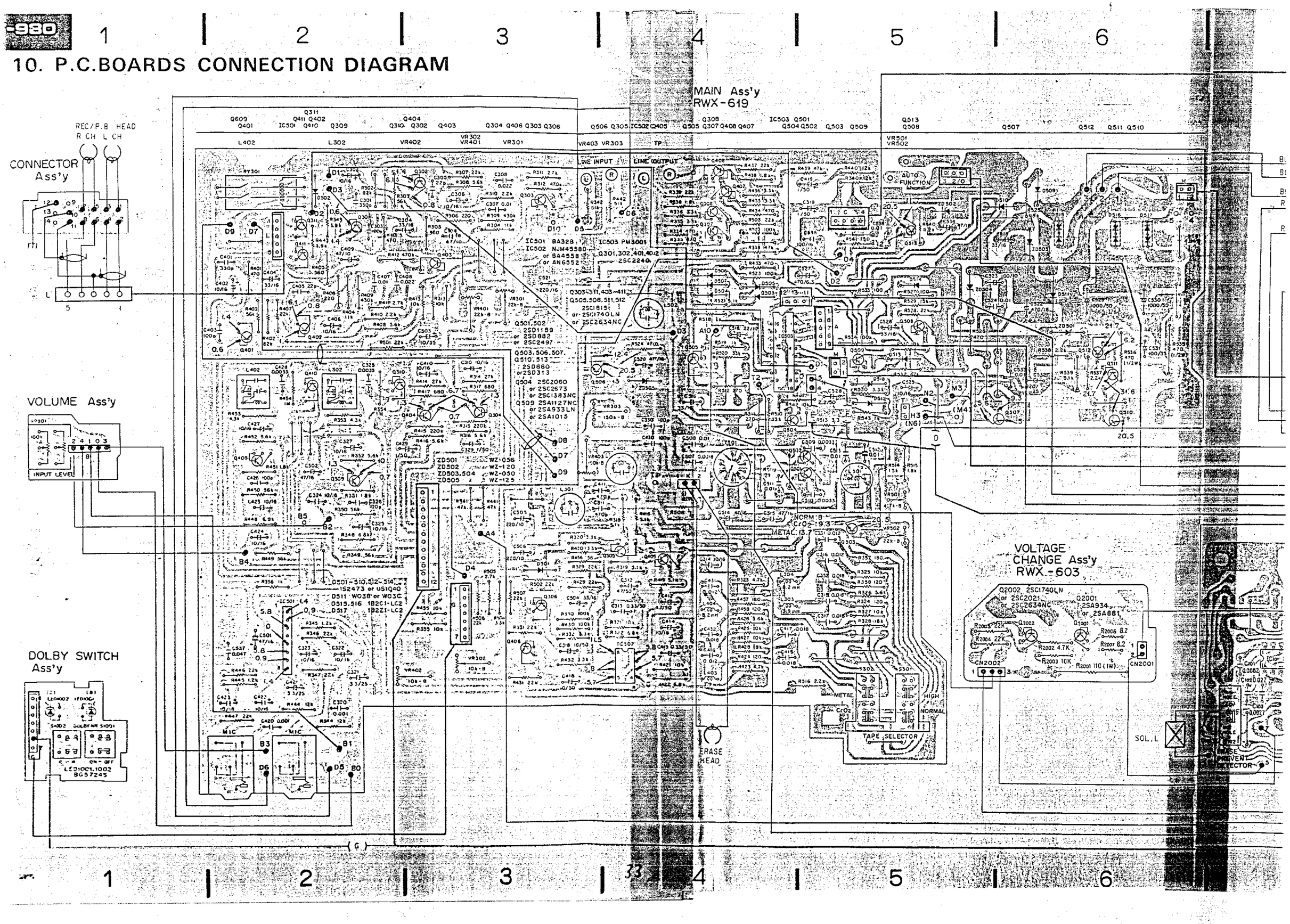
Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before

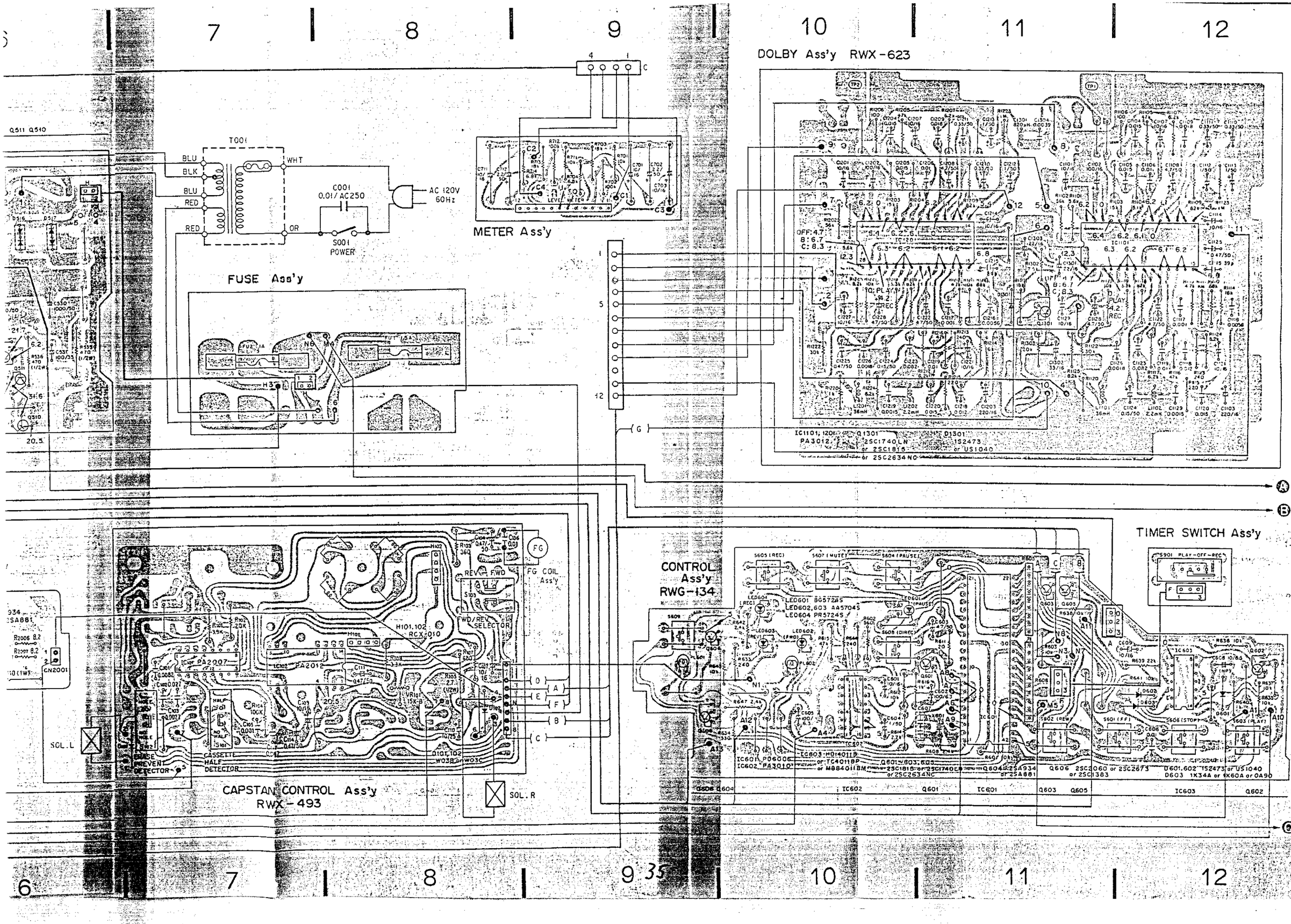
Mark	Part No.	Symbol & Description
★	RCP-150 (RCP-195)	VR301, VR401 Semi-fixed (22k-B)
★	RCP-149 (RCP-193)	VR302, VR402 Semi-fixed (10k-B)
★	RCP-155 (RCP-200)	VR303, VR403 Semi-fixed (150k-B
★	RCP-191	VR501 Semi-fixed (4.7k-B)
★	RCP-195	VR502 Semi-fixed (22k-B)
	RD¼PM □□□J	R301–R358, R401–R458, R501–R534, R537–R543
⚠	RD½PSF471J	R535, R536

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	BA328	IC501
★★	NJM4558D (BA4558) (AN6552)	IC502
★★	PM3001	IC503
★★	2SC2240	Q301, Q302, Q401, Q402
★★	2SC1815 (2SC1740LN) (2SC2634NC)	Q303–Q311, Q403–Q411, Q50 Q508, Q511, Q512
★★	2SC2947 (2SD1189) (2SD882)	Q501, Q502
★★	2SA1015 (2SA1127NC) (2SA933LN)	Q509
★★	2SC2060 (2SC2673) (2SC1383NC)	Q504
⚠ ★★	2SD880 (2SD313)	Q503, Q506, Q507, Q510, Q5
★	1S2473 (US1040)	D501–D507, D509, D510 D512–D514, D518
★	W03B (W03C) (1SR35-100)	D511

10. P.C.BOARDS CONNECTION DIAGRAM

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METER Ass'y
FUSE Ass'y
T001
BLU
BLK
BLU
RED
RED
WHT
OR
C001
0.01/AC250
AC 120V
60Hz
S001
POWER
CONTROL
Ass'y
RWG-134
TIMER SWITCH Ass'y
CAPSTAN CONTROL Ass'y
RWX-493
FG COIL
Ass'y
FWD/REV
SELECTOR
SOL. L
SOL. R
CN2001
CASSETTE
HALF
DETECTOR
REEL
REVOLUTION
DETECTOR
IC1101; 1201
PA3012
Q1301
2SC1740LN
or 2SC1815
D1301
1S2473
or US1040
or 2SC2634NC
IC601 P06006
or TC4011BP
or M88401BM
IC602 PA3010
IC603 HD14011B
Q601~603, 605
2SC1815 or 2SC1740LN
or 2SC2634NC
Q604 2SA934
or 2SA881
Q606 2SC2060 or 2SC2673
or 2SC1383
D601,602 1S2473 or US1040
D603 1K34A or 1K60A or 0A90

Volume Assembly

Mark	Part No.	Symbol & Description
★	RCV-102	VR801 Variable (100k-A)

DOLBY NR Assembly (RWX-623)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 16	C1101, C1114, C1127, C1201, C1214, C1227
	CEA R15M 50	C1124, C1224
	CEA R33M 50	C1110, C1111, C1210, C1211
	CEA R47M 50	C1125, C1225
	CEA 010M 50	C1112, C1113, C1212, C1213
	CEA 4R7M 50	C1108, C1122, C1128, C1208, C1222, C1228
	CEA 220M 16	C1301, C1303
	CEA 330M 16	C1302
	CEA 101M 16	C1102, C1202
	CEA 221M 16	C1103, C1203
	CEANL 100M 16	C1107, C1121, C1207, C1221
	CQMA 102K 50	C1117, C1217
	CQMA 103K 50	C1106, C1119, C1206, C1219
	CQMA 123K 50	C1118, C1218
	CQMA 562K 50	C1116, C1216
	CQMA 153K 50	C1104, C1105, C1120, C1204, C1205, C1220
	CQMA 183K 50	C1109, C1209
	CQMA 823K 50	C1123, C1223
	CQMA 152J 50	C1129, C1229
	CQMA 182J 50	C1126, C1226
	CQMA 392J 50	C1304
	CCDSL 390K 50	C1115, C1215

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	R1101–R1107, R1109–R1125, R1201–R1207, R1209–R1225, R1301–R1303

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA3012	IC1101, IC1201
★★	2SC1740LN (2SC1815) (2SC2634NC)	Q1301
★	1S2473 (US1040)	D1301

COILS

Mark	Part No.	Symbol & Description
	RTF-092	L1101, L1201 Coil (36mH)
	RTF-115	L1301 Coil (820μH)
	RTF-120	L1102, L1202 Coil (2.2mH)

OTHERS

Mark	Part No.	Symbol & Description
	RKP-527	Connector assembly 12P

Meter Assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	CEB 100M 16	C701, C703, C711
	CEB 2R2M 50	C702, C712

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	R701–R704, R711–R714

OTHERS

Mark	Part No.	Symbol & Description
	RAW-183	Level meter
	RKP-615	Connector assembly 4P

Capstan Motor Control Assembly D

CAPACITORS

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

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)
	RD¼PS 2R7J	R105
	RD¼ □□□ J	R101–R104, R106–R112, R115, R116

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA2007	IC101
★★	PA2012	IC102
★★	W03B (W03C)	D101, D102
★★	RCX-010 (RCX-012)	H101, H102 Hall element

SWITCHES

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

OTHERS

Mark	Part No.	Symbol & Description
	RKP-282	Connector 8P Connector assembly 2P

Reel Motor Assembly F (RXM-099)

Mark	Part No.	Symbol & Description
	RWX-490	Reel motor Drive Assembly B
	RWX-491	Reel Motor Control Assembly B

Reel Motor Drive Assembly B

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

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
	RCX-010 (RCX-012)	H251–H254 Hall element

Reel Motor Control Assembly B (RWX-491)

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
	CQMA 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)
	RD½PS1R8J	R203
	RD¼PM □□□ J	R201, R204, R205, R207–R209

SEMICONDUCTORS

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

OTHERS

Mark	Part No.	Symbol & Description
	REE-051	Insulator
	RKH-005	Insulator
	RBA-026	Special screw Heat sink

Voltage Change Assembly (RWX-603)

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
⚠	RS2PF 111J	R2001
	RD¼PM □□□ J	R2002–R2005
⚠	RD1/8PM 8R2J	R2006, R2007

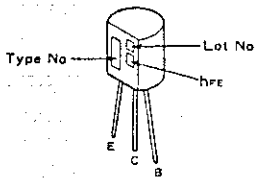
SEMICONDUCTORS

Mark	Part No.	Symbol & Description
	2SA934 (2SA881)	Q2001
	2SC1740LN (2SC2021) (2SC1815) (2SC2634NC)	Q2002

T-930

External Apperance of Transistors and ICs

2SA1015
2SC2240
2SC1815



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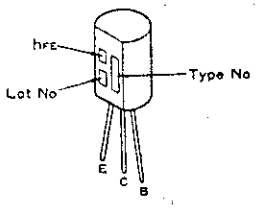

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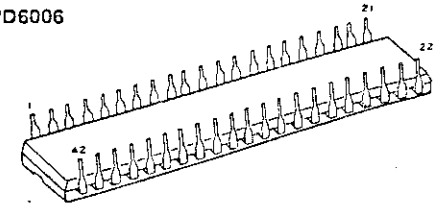

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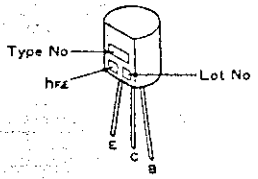

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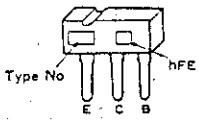

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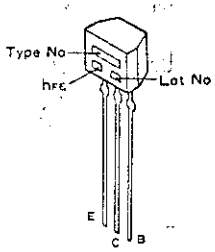

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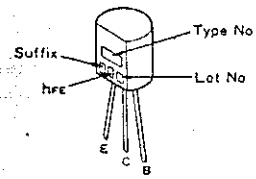

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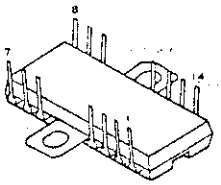

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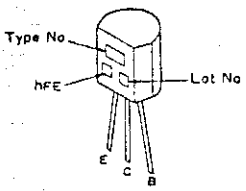

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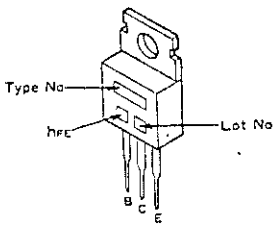

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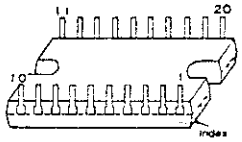

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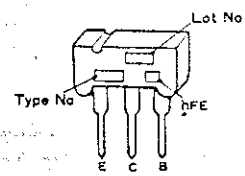

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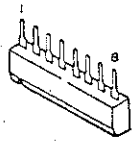

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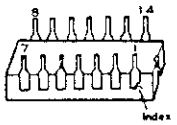
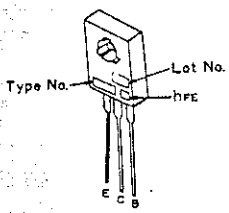
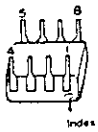


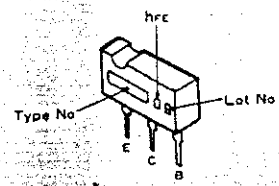
2SC2497



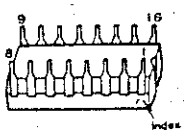
NJM4558D
BA4558
AN6552



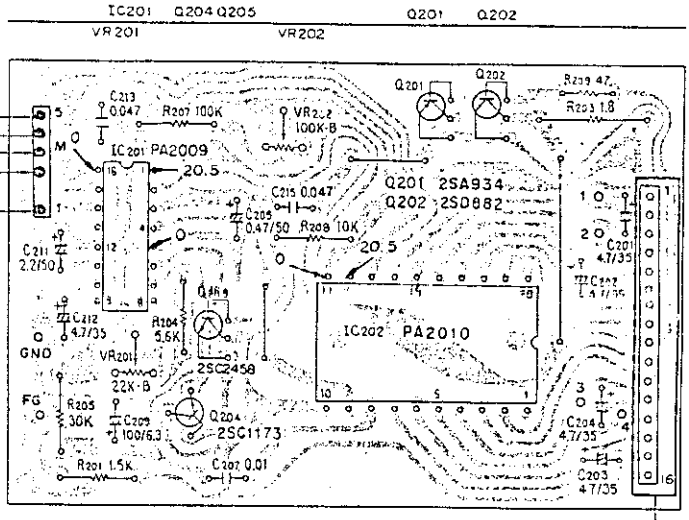
2SC2673



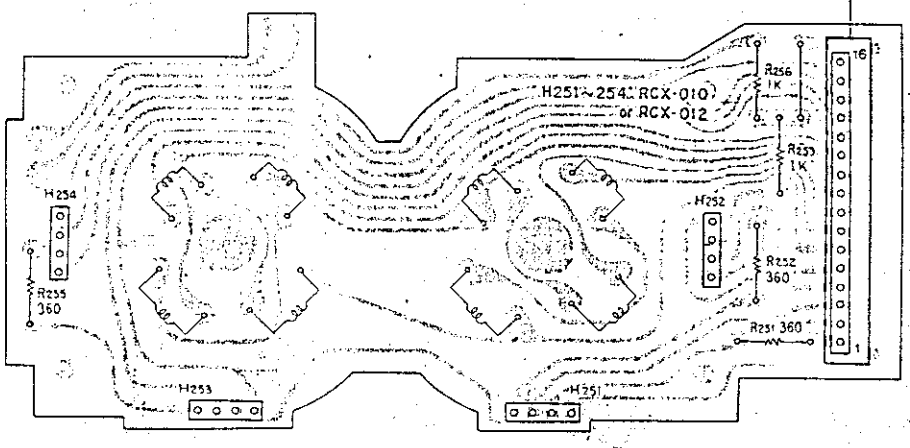
PM3001
PA3010
PA2007
PA2009



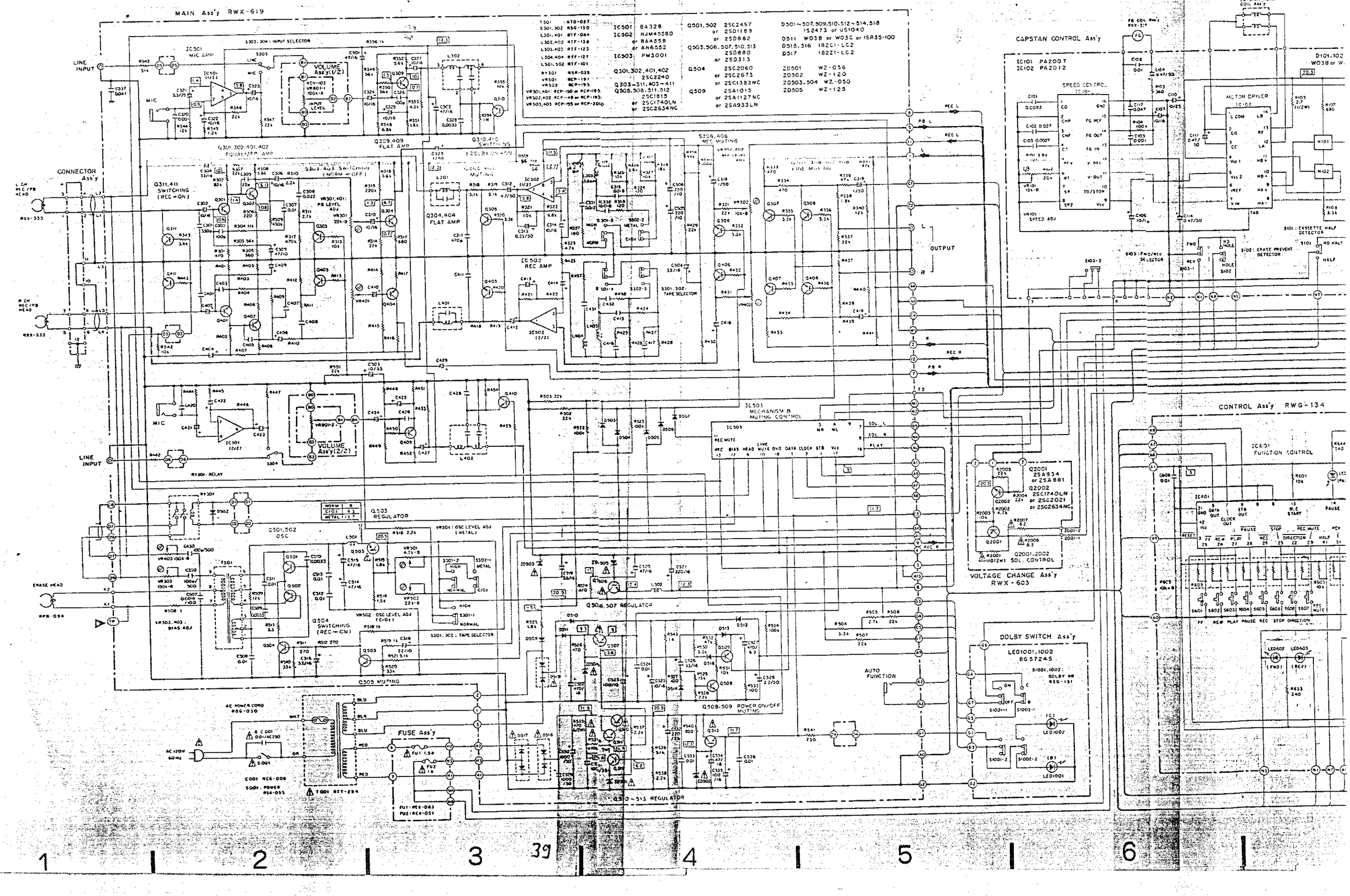
REEL MOTOR CONTROL Ass'y B
RWX-491



REEL MOTOR DRIVE Ass'y



SCHEMATIC DIAGRAM



6 | 7 | 8 | 9 | 10 | 11 | 12

NOTE:
The indicated semiconductors are represe only. Other alternative semiconductors may are listed in the parts list.

◀ Measurement point
Playback signal route
Recording signal route

CAPSTAN CONTROL Ass'y

IC101 PA2007
IC102 PA2012

SPEED CONTROL IC-101

MOTOR DRIVER IC-102

VR101: SPEED ADJ

REEL MOTOR CONTROL Ass'y B RWX-491_

IC201 PA2009
IC202 PA2010

Q201 2SA934 or 2SA881
Q202 2SD882 or 2SC2497 or 2SD1169
Q204 2SC1173
Q205 2SC2458

MOTOR CONTROL IC201

Q201, 202 Q204, 205 MOTOR DRIVER

IC202 Q201, 202 Q204, 205 MOTOR DRIVER

REEL MOTOR DRIVE Ass'y

REEL MOTOR COIL Ass'y

R251~254: * RCX-010 or RCX-012

METER Ass'y

LEVEL METER RAW-185

1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M) : ±20% tolerance

2. CAPACITORS:
Indicated in μF/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor

3. VOLTAGE, CURRENT:
▭ : DC voltage (V) at no input signal
⇦mA : DC current at no input signal

4. OTHERS:
⇨ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
⚠ marked capacitors and resistors have parts numbers.

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

SWITCHES:

S001	: POWER		ON — OFF
S101	: CASSETTE HALF DETECTOR	NO HALF	— HALF
S102	: ERASE PREVENT DETECTOR	NO HOLE	— HOLE
S103	: FWD/REV SELECTOR	FWD	— REV
S301	: TAPE SELECTOR	NORM	— HIGH
S302	: TAPE SELECTOR	CrO2	— METAL
S303	: INPUT SELECTOR	MIC	— LINE
S304	: INPUT SELECTOR	MIC	— LINE
S601	: FF		ON — OFF
S602	: REW		ON — OFF
S603	: PLAY		ON — OFF
S604	: PAUSE		ON — OFF
S605	: REC		ON — OFF
S606	: STOP		ON — OFF
S607	: REC MUTE		ON — OFF
S608	: DIRECTION		ON — OFF
S609	: MUSIC SEARCH / SKIP		ON — OFF
S901	: TIMER	REC — OFF	— PLAY
S1001	: DOLBY NR		ON — OFF
S1002	: DOLBY NR	B TYPE	— C TYPE

The underlined indicates the switch positions.

CONTROL Ass'y RWG-134

IC601 FUNCTION CONTROL

Q604 LAMP DRIVER

Q601 SWITCHING (PLAY — ON)

Q606 LAMP DRIVER

IC603 Q602, 603, 605 AUTO FUNCTION

IC602 BLANK DETECTOR (MUSIC SEARCH)

X601 : RSS-033
PL601, 602 : REL-093
S601~609 : RSH-063
R605 : RM3-103J8
R606 : RM3-102J8

IC601 PD6006
IC602 PA3010
IC603 HD14011B or TC4011BP or M5B4011BM
Q601~603, 605 2SC1015 or 2SC1740LN or 2SC2634NG
Q604 2SA934 or 2SA881
Q606 2SC2050 or 2SC2673 or 2SC1383
D601, 602 1S2473 or US1040
D603 1K34A or 1K60A or 0A90
LED601 SG5724S
LED602, 603 AA3704S
LED604 PR5724S

TIMER SWITCH Ass'y

S901 : TIMER RSH-064

DOLBY Ass'y RWX-623

IC1101 DOLBY NR (B&C TYPE)

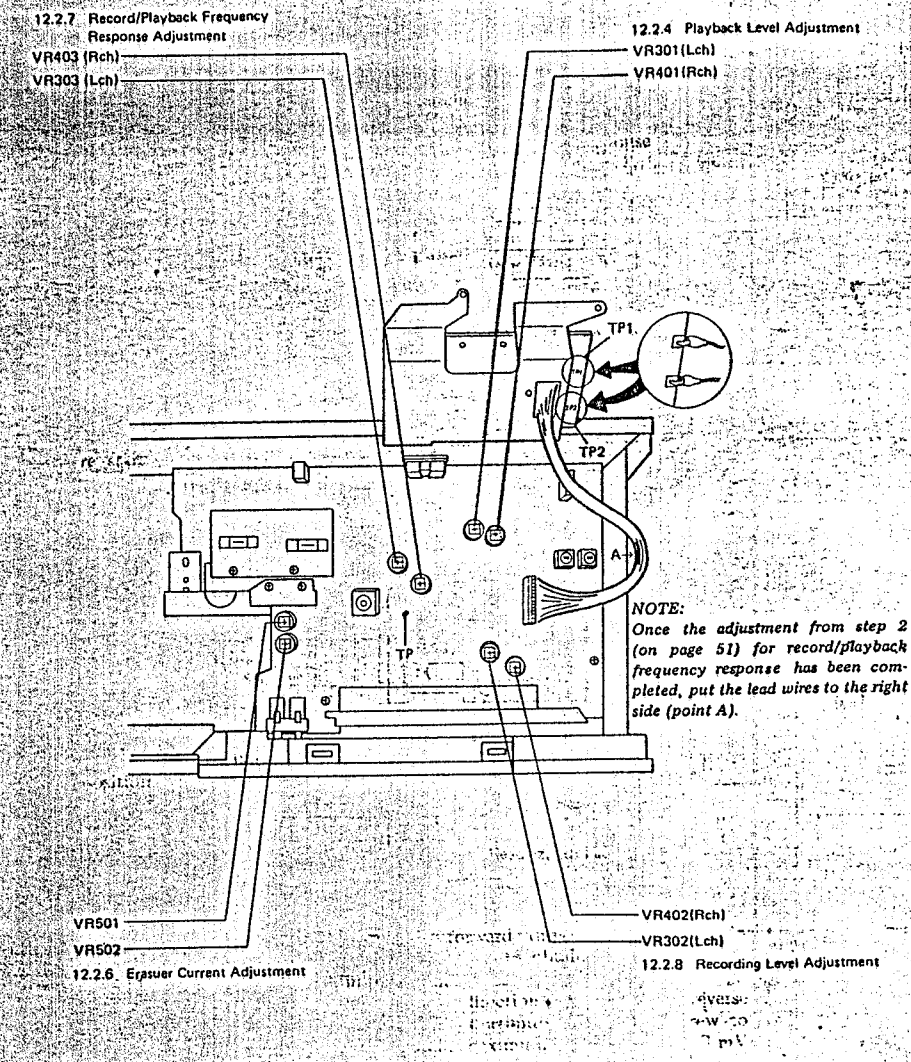
IC1201 DOLBY NR (B&C TYPE)

IC1101, 1201 PA3012
Q1301 2SC1740LN or 2SC1815 or 2SC2021 or 2SC2634NC
D1301 1S2473 or US1040
L1101, 1201 : RTF-092
L1102, 1202 : RTF-120
L1301 : RTF-115

Q1301 POWER ON MUTING

12.2 ELECTRICAL ADJUSTMENTS

• Adjust Points



NOTE:
Once the adjustment from step 2 (on page 51) for record/playback frequency response has been completed, put the lead wires to the right side (point A).

Fig. 12-8 Adjust points

- Check the following points before starting any electrical adjustments.

1. All mechanical adjustments must be completed.
2. Clean the heads and demagnetize the REC/PB head.
3. Level measurements are based on 0dBv = 1V. Connect a 50kΩ dummy resistor (47k~52kΩ) across the OUTPUT terminals.
4. Use the specified test tapes for each adjustment. Although test tapes have both A and B sides, use the side with the lable (side A).

   STD-341A : Playback adjustments
   STD-608A : NORMAL blank tape
   STD-603 : CrO_2 blank tape
   STD-604 : METAL blank tape
5. Prepare the following measuring equipment. AC millivoltmeter, audio oscillator, attenuator, and oscilloscope.
6. Unless otherwise specified, always adjust for both left and right channels.
7. Unless otherwise specified, adjust with the DOLBY NR switch in the OFF position.
8. Let the deck warm up for a few minutes before starting adjustments. Also leave the deck in playback and recording mode respectively for 3 to 5 minutes before starting playback and recording frequency response adjustments.
9. Proceed according to the specified adjustment sequence. Changing the sequence can prevent proper adjustments from being carried out, and subsequently result in loss of performance.

Adjustment sequence

1. Head azimuth
2. Tape travel check
3. Playback equalization check
4. Playback level
5. Level meter check
6. Erase current
7. Record/playback frequency response
8. Recording level

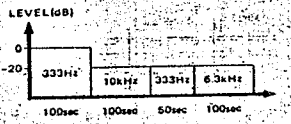


Fig. 12-9 STD-341A test tape

12.2.1 Head Azimuth Adjustment

Settings

AC mV meter	Connect to OUTPUT terminals
Test tape	STD-341A (10kHz, -20dB)
Tape selector	NORM
Direction switch	Forward
Mode	Playback
VR301 and VR401 ..	Turn clockwise to maximum position

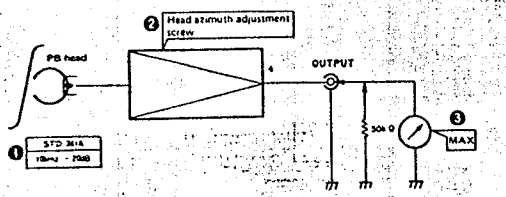


Fig. 12-10 Head azimuth adjustment

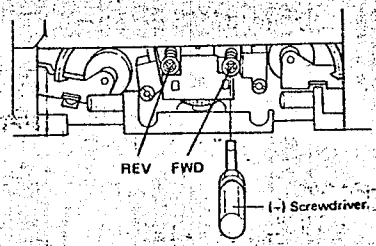


Fig. 12-11 Head azimuth adjustment

1. Turn the forward direction head azimuth adjustment screw to obtain maximum reading in the AC mV meter.
2. Reverse the direction, and turn the reverse direction head azimuth adjustment screw to again obtain maximum reading in the AC mV meter.

12. ADJUSTMENTS

12.1 MECHANICAL ADJUSTMENTS

12.1.1 Pinch roller pressure adjustment

1. Set to forward direction, and switch to playback mode without loading a cassette half.
2. Using a tension gauge as shown in Fig. 12-1, gently press against the pinch roller arm. The tension gauge reading should lie between 250g and 400g at the moment that the pinch roller is separated from the capstan, and the capstan stops rotating.
3. If the reading lies outside the above range, replace the pinch roller pressure spring.
4. Set to reverse direction and measure the pinch roller pressure for the pinch roller on the other side in the same way as described above.

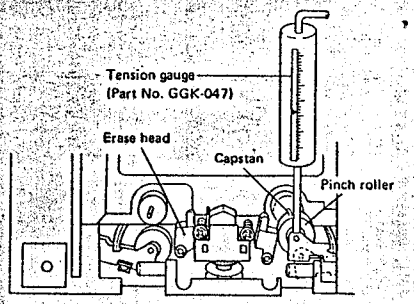


Fig. 12-1 Pinch roller pressure adjustment

12.1.2 Preliminary azimuth adjustment

1. Set to forward direction, and switch to stop mode.
2. Using a screwdriver as shown in Fig. 12-2, adjust gap A between the housing and the revolving base to 1.5mm by turning screw ❶.
3. Set to reverse direction.
4. Using the screwdriver again, adjust gap B between the housing and the revolving base to 1.5mm by turning screw ❷.

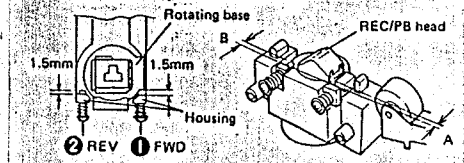


Fig. 12-2 Azimuth adjustment point

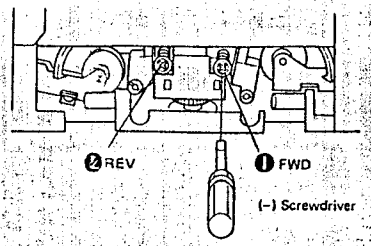


Fig. 12-3 Azimuth preadjustment

12.1.3 Tape travel adjustment

1. Set to forward direction, load a mirror-equipped cassette, and switch to playback mode.
2. Adjust nut ❶ to ensure that no tape curling occurs in the guide section of the recording and erase heads as shown in Fig. 12-4.
3. Set to reverse direction.
4. Adjust nut ❷ to ensure that no tape curling occurs in the guide section of the recording and dummy heads.
5. Check that there is no tape curling during repeated forward and reverse tape travel.

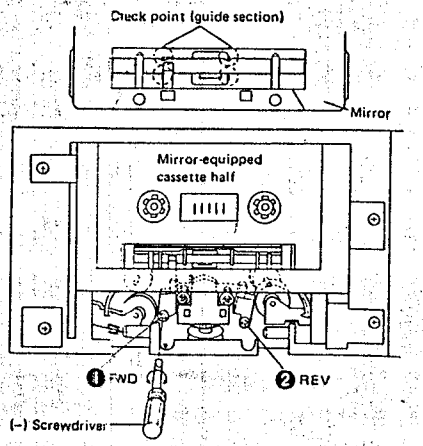


Fig. 12-4 Tape travel adjustment

12.1.4 Fast forward and rewind rotational speed adjustment

1. Connect a frequency counter between the FG and GND terminals on the reel motor control ass'y (see Fig. 12-5).
2. Set to forward direction, and switch to fast forward mode.
3. Adjust the frequency counter reading to 72Hz ±2Hz by means of VR202.
4. Switch to rewind mode, and check that the frequency counter reading lies in the 72Hz ±5Hz range.

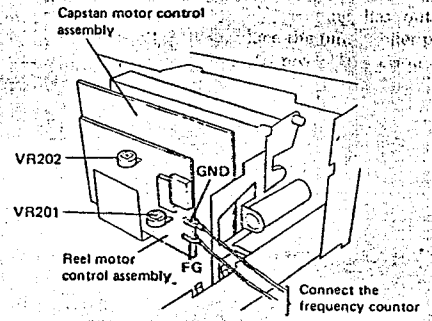


Fig. 12-5 FF/REW Rotating speed adjustment

12.1.5 Playback mode winding torque adjustment

1. Set to forward direction, mount a cassette-type torque meter, and switch to playback mode.
2. Adjust the winding torque to 45g.cm ±5g.cm by VR201.
3. Set to reverse direction.
4. Check that the winding torque is 45g.cm ±10g.cm.

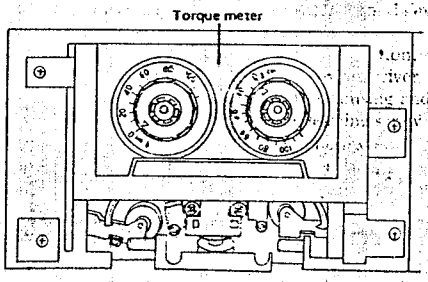


Fig. 12-6 Take-up torque adjustment

12.1.6 Tape speed adjustment

1. Connect the frequency counter to the OUTPUT terminals.
2. Set to forward direction, load a STD-301 test tape wound to the start of the tape, and switch to playback mode.
3. Adjust the frequency counter reading to 3005Hz ±10Hz by VR101.
4. Set to reverse direction, wind the test tape to the start of the tape, and switch to playback mode.
5. Check that the frequency counter reading lies within the 3005Hz ±20Hz range.

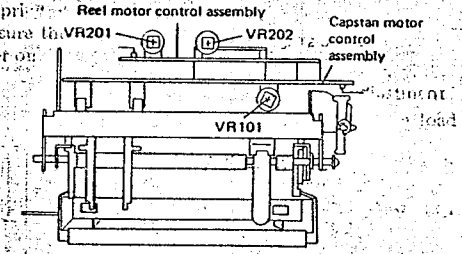


Fig. 12-7 Tape speed adjustment

12.1.7 Fast travel torque check

1. Set to forward direction, mount a cassette-type torque meter, and switch to fast forward mode.
2. Check that the fast forward torque is within the 100g.cm ±30g.cm range.
3. Switch the mode to rewind, and again check that the rewind torque lies within the 100g.cm ±30g.cm range.

12.1.8 Back-tension torque check

1. Set to forward direction, mount a cassette-type torque meter, and switch to playback mode.
2. Check that the supply reel back-tension lies within the 3.5g.cm ±1.5g.cm range.
3. Reverse the direction.
4. Check that the supply reel back-tension again lies within the 3.5g.cm ±1.5g.cm range.

3. Return to the forward direction and check that there has been no change in the azimuth adjustment. If there is considerable change, readjust by repeating step 1 and 2. (Lock the screws with screw lock after completing the adjustment).

12.2.2 Tape travel check

Setting

Test tape ..... Mirror-equipped cassette half
Tape selector ..... NORM
Direction switch ..... Forward
Mode ..... Playback

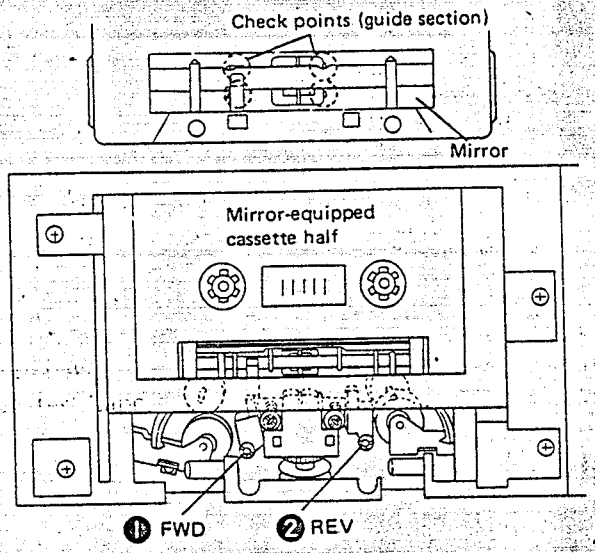


Fig. 12-12 Tape travel check

Procedure

1. Check that tape curling does not occur in the guide section between the recording and erase heads.
2. Reverse the direction of tape travel, and check that tape curling does not occur in the guide section between the recording and dummy heads.
3. If tape curling does occur, adjust tape travel as described in section 12.1.3 on p.45, and repeat the adjustment procedures from section 12.2.1.

12.2.3 Playback Equalization Check

Settings

AC mV meter ..... Connect to OUTPUT terminals
Test tape ..... STD-341A (333Hz, -20dB) (6.3kHz, -20dB)
Tape selector ..... NORM
Direction switch ..... Forward
Mode ..... Playback

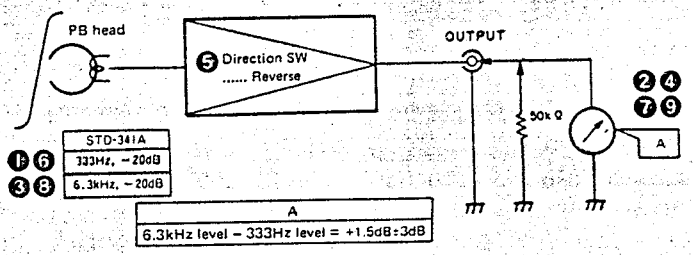


Fig. 12-13 Playback equalization adjustment

Procedure

1. Play the 333Hz, -20dB portion and record the AC mV meter reading.
2. Then play the 6.3kHz, -20dB portion, and check that the meter reading lies within +1.5dB ±3dB of the reading obtained in step 1 above.
3. Reverse the direction, and paly the test tape again as described in steps 1 and 2, checking that the output difference is no greater than +1.5dB ±3dB.

12.2.4 Playback Level Adjustment

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

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Test tape STD-341A (333Hz, 0dB)
Tape selector ..... NORM
Direction switch ..... Forward
Mode ..... Playback

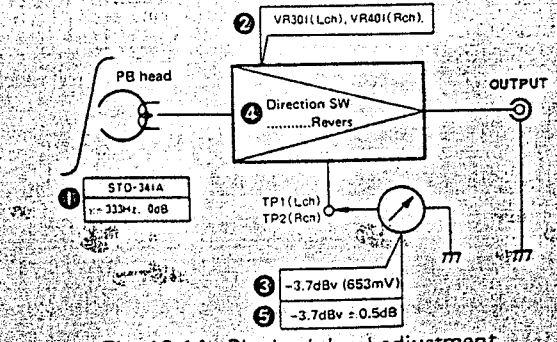


Fig. 12-14 Playback level adjustment

Procedure

1. Adjust VR301 (L ch) and VR401 (R ch) so that the meter reads of -3.7dBv (653mV).
2. Set to reverse direction, and check that the AC mV meter reading lies within the -3.7dBv ±0.5dB range.
3. If the reading does not lie within the specified range, check tape travel and repeat this adjustment from step 1.

12.2.5 Level Meter Check

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Input signal ..... 333Hz, -10dBv (316mV) to INPUT terminals
Mode ..... Record

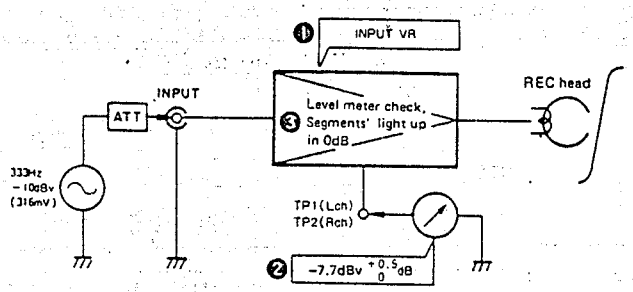


Fig. 12-15 Level meter chech

Procedure

Adjust the INPUT level control so that the meter reads of -7.7dBv (0.41V), and check that the level meter segments light up in a 0dB±1 segment range.

12.2.6 Erase Current Adjustment

Settings

AC mV meter ..... Connect to TP
Tape selector ..... METAL
INPUT volume control ..... Minimum level
VR303 and VR403 ..... Center position
Mode ..... Record

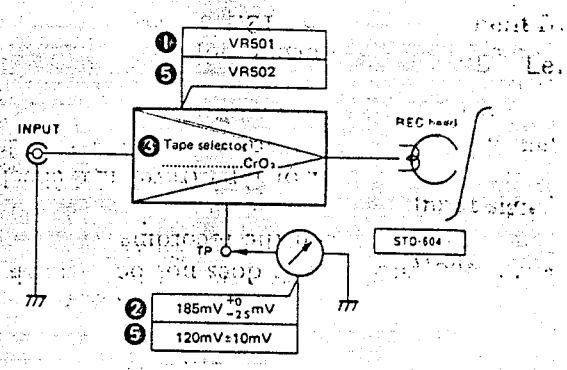
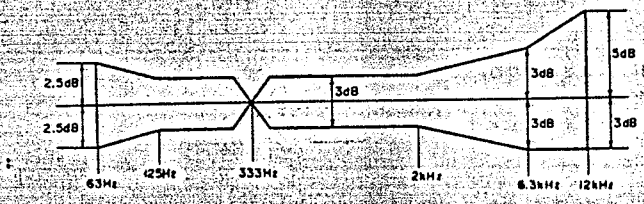


Fig. 12-16 Erase current adjustment

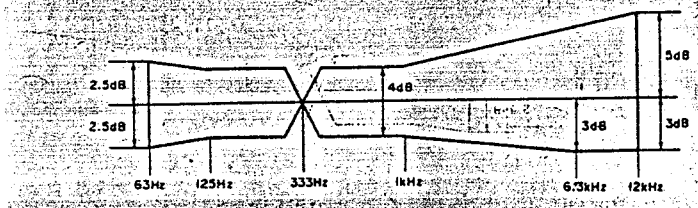
Procedure

1. Adjust VR501 to obtain a meter reading of 185mV $^{+0}_{-2.5}$ mV in the AC mV meter.
2. Switch the tape selector to the CrO_2 position, and adjust VR502 to obtain a meter reading of 120mV±10mV.

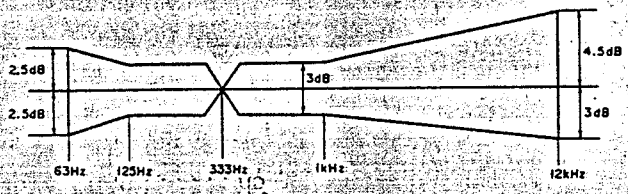
Test tape STD-603
Tape selector ..... CrO_2
DOLBY NR switch ..... OFF



Test tape STD-603
Tape selector ..... CrO_2
DOLBY NR switch ..... ON (B and C types)



Test tape STD-604
Tape selector ..... METAL
DOLBY NR switch ..... OFF



Test tape STD-604
Tape selector ..... METAL
DOLBY NR switch ..... ON (B and C types)

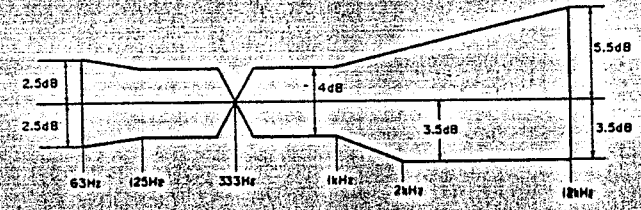


Fig. 12-19 Frequency response

12.2.8 Recording Level Adjustment

Settings

AC mV meter ..... Connect to TP1 (L ch) and TP2 (R ch)
Input signal ..... 333Hz, -10dBv (316mV) to LINE INPUT terminals
Test tape STD-608A (STD-603, STD-604)
Tape selector ..... NORM (CrO_2, METAL)
Mode ..... Record

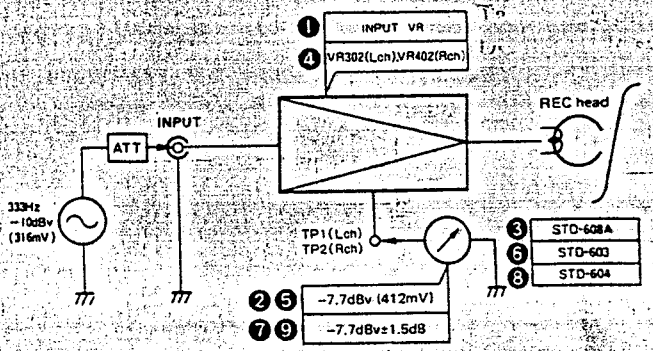


Fig. 12-20 Recording level adjustment

Procedure

1. Adjust the INPUT level control so that the meter reads -7.7dBv (412mV).
2. Record the 333Hz, -10dBv signal on the STD-608A test tape. Then adjust VR302 (L ch) and VR402 (R ch) so that the meter reads of -7.7dBv (412mV) when the recorded signal is played back.
3. Switch the tape selector to the CrO_2 position and repeat step 3 using the STD-603 test tape. The playback output level should lie within -7.7dBv ±1.5dB.
4. Then switch to the METAL position and repeat using the STD-604 test tape. The playback output level should again lie within the -7.7dBv ±1.5dB range.

12.2.7 Record/Playback Frequency Response Adjustment

Settings

AC mV meter ..... Connect to OUTPUT terminals
Input signal ..... 333Hz, -30dBv (31.6mV) to LINE INPUT terminals
Test tape STD-608A (STD-603, STD-604)
Tape selector ..... NORM (CrO_2, METAL)
Mode ..... Record

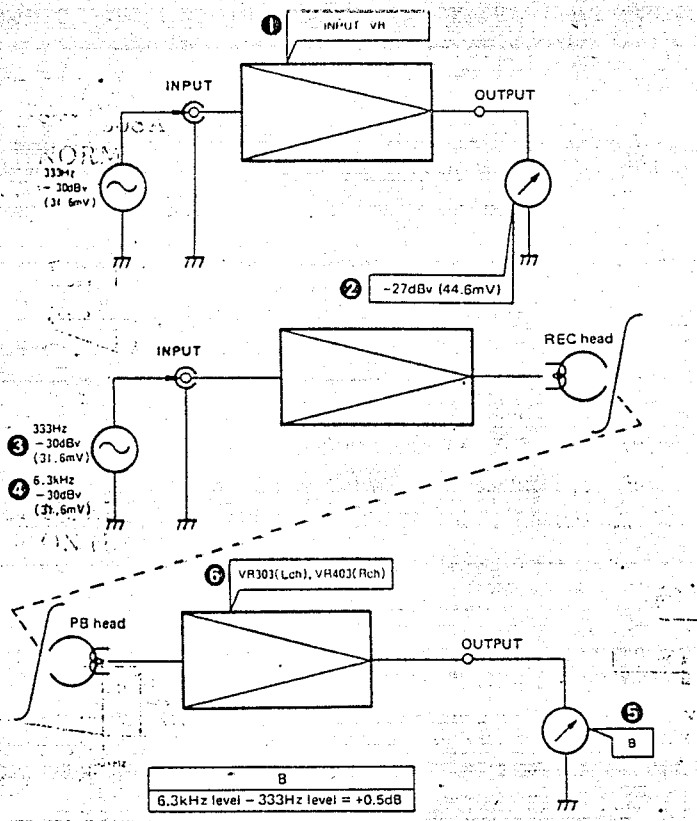


Fig. 12-17 Record/playback frequency response adjustment

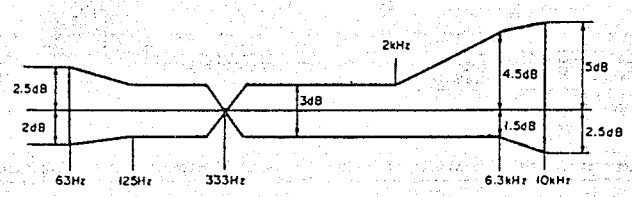
Procedure

1. Adjust the INPUT level control so that the meter reads -27dBv (44.6mV).
2. Record the 333Hz, -30dBv and 6.3kHz, -30dBv signals, and adjust VR303 (L ch) and VR403 (R ch) so that the difference in the playback output signal level with the 333Hz level as the reference level is +0.5dB.
3. Change the tape selector and DOLBY NR switch positions (See Fig. 12-18 and 19), and check that the frequency response is satisfactory.

Playback Frequency Response

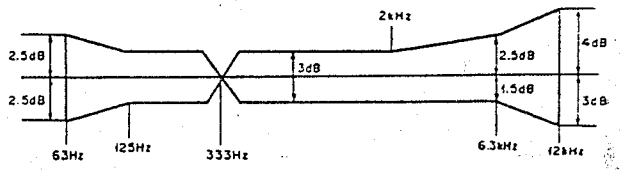
Test tape STD-341A
Tape selector ..... NORM
DOLBY NR switch ....OFF

NOTE:
Due to "edge effect", compensate the right channel by -0.5dB at 125Hz and -1dB at 63Hz.

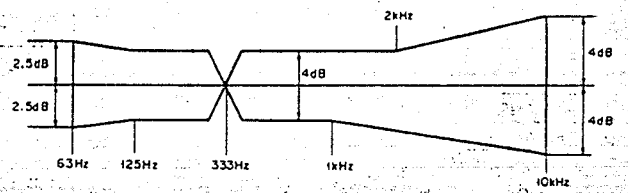


Overall Frequency Response

Test tape STD-608A
Tape selector ..... NORM
DOLBY NR switch ..... OFF



Test tape STD-608A
Tape selector ..... NORM
DOLBY NR switch ..... ON (B type)



Test tape STD-608A
Tape selector ..... NORM
DOLBY NR switch ..... ON (C type)

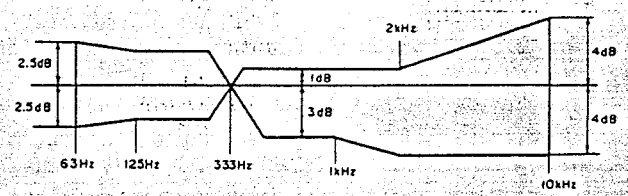


Fig. 12-18 Frequency response

ADDITIONAL

Service Manual

PIONEER®

STEREO CASSETTE TAPE DECK

CT-930

This additional service manual is applicable to the HP type (Australia model), D type (General export model) and D/G type (U.S. military model). Please refer to KU type (U.S.A. model) service manual (P2~P68) with the exception of this supplement.

Wow and Flutter . . . . . No more than 0.045% (WRMS)
No more than ±0.16% (DIN)

Miscellaneous

Power Requirements;
D and D/G models . . . . . AC 120V/220V/240V (switchable) 50/60Hz
HP model . . . . . AC 220V/240V (switchable) 50/60Hz

Power Consumprion;
D and D/G models 34W
HP model 41W

Dimensions . . . . . 420(W) x 101(H) x 242(D) mm
16-9/16(W) x 4(H) x 9-1/2(D) in

Weight (without package) . . . . . 5.25kg (11 lb 9 oz)

NOTES:
1. Reference Tapes: Normal & LH: DIN 45513/BLATT6 or equiv.
CrO_2 DIN 45513/BLATT7 (CrO_2) or equiv.

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *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.

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.			
		KU type	HP type	D type	D/G type
	Main assembly	RWX-619	RWX-620	RWX-621	RWX-621
	Fuse assembly	Use	Use	Non used	Non used
	Voltage change assembly	RWX-603	RWX-603	RWX-590	RWX-590

NOTE: The circuitry of the Main assembly RWX-619 is the same as the RWX-620 and RWX-621 with exception of the wiring.

ELECTRICAL PARTS

Mark	Symbol & Description	Part No.			
		KU type	HP type	D type	D/G type
⚠ ★	T001 Power transformer (120V)	RTT-284	.....	.....	.....
	(220V/240V)	.....	RTT-283	.....	.....
	(120V/220V/240V)	.....	.....	RTT-285	RTT-285
⚠ ★★	S001 Power switch	RSA-055	RSA-047	RSA-057	RSA-057
⚠	C001 Capacitor	RCG-006	RCG-009	RCG-008	RCG-008
	Capacitor cover	REC-297	REC-297	.....	.....
	Line voltage selector (switchable 2 positions 220V/240V)	.....	RSX-045	.....	.....
	Line voltage selector (Switchable 3 positions 120V/240V)	.....	.....	RKR-020	RKR-020
	Power cord	RDG-030	RDG-029	RDG-039	RDG-039
⚠ ★★	FU Fuse (T 1A)	REK-051	.....	.....	.....
	(T 1.5A)	REK-063	.....	.....	.....
	FU001 (T3.15A)	.....	REK-047	REK-044	REK-044
	FU002 (T 2.5A)	.....	REK-054	.....	.....
	FU003, FU004 (T500mA)	.....	REK-049	.....	.....

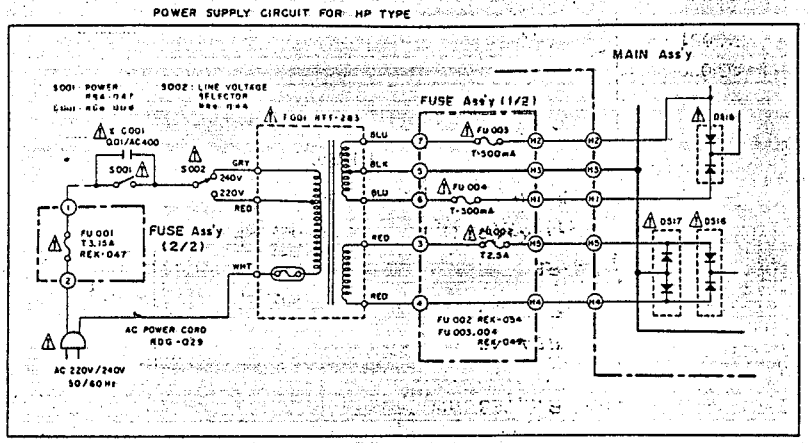
OTHERS

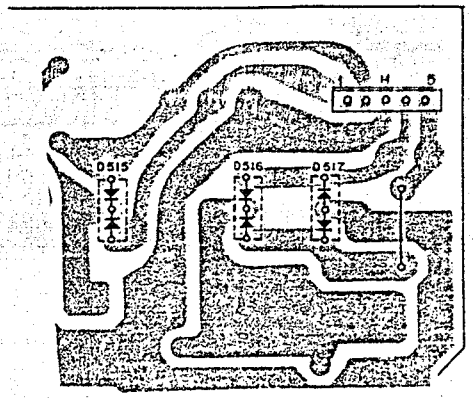
Mark	Symbol & Description	Part No.			
		KU type	HP type	D type	D/G type
	Relay terminal	.....	RKC-032	.....	.....

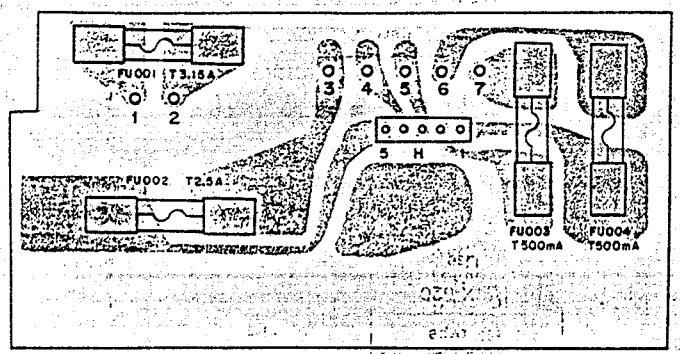
PACKING AND FURNISHED PARTS

Mark	Symbol & Description	Part No.			
		KU type	HP type	D type	D/G type
	Packing case	RHG-516	RHG-518	RHG-519	RHG-519
	Operating instructions				
	(English)	RRB-191	RRB-192	RRB-192	RRB-192
	(Spanish)	.....	.....	RRD-058	RRD-058

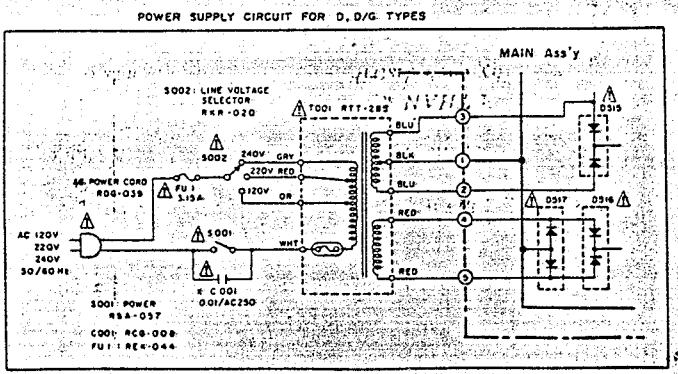
- For HP type

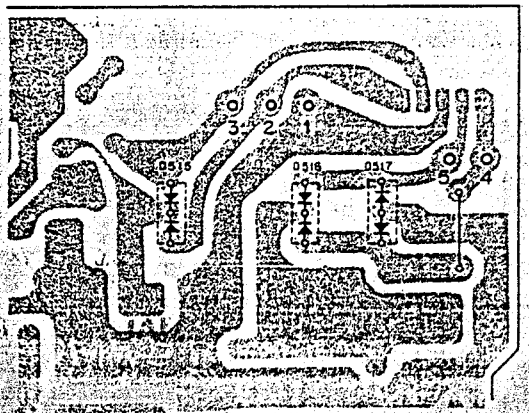






- For D, D/G types





CORRECTION TO SERVICE MANUAL

PIONEER

No. SI-T38037
Date. June 21, 1984

MODEL: CT-930 [ARP-281]

PAGE: a cover.

Please correct Service Manual as follows:

ORIGINAL

- In CT-930, a new cassette mechanism is incorporated with the following serial No. For the electrical adjustment, please see the service manual ARP-000.
- Ce manuel d'instruction se refère au mode de réglage, en fançais.
- Este monual de servicio trata del método de ajuste escrito en español.

CORRECTION

- In CT-930, a new cassette mechanism is incorporated with the following serial No. For the electrical adjustment, please see the service manual ARP-144.
- Ce manuel d'instruction se refère au mode de réglage, en fançais.
- Este monual de servicio trata del método de ajuste escrito en español.

PIONEER ELECTRONIC CORPORATION (38-087, SMM-KM-AK 30)

T. Nakagawa, Manager
Service Section, International Division

CORRECTION TO SERVICE MANUAL

PIONEER

No. SI-T39012
Date. Jan. 10, 1985

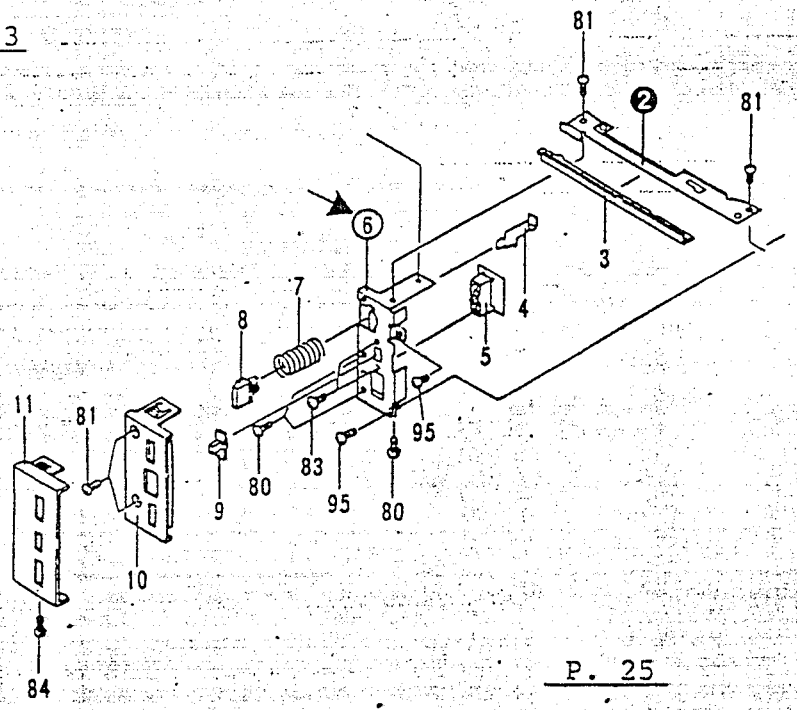
MODEL: CT-930 [ARP-144]

25. Feb. 1985
Scheuer

PAGE: 23 & 25

Please correct your Service Manual.

P. 23



P. 25

Deleted

6.		Sub panel stay
7.	RBH-917	Eject spring
8.	RAC-231	Knob (Eject)
9.	RAC-234	Knob (Standby)
10.	RNL-410	Sub panel base

12. RÉGLAGE

12.1 RÉGLAGES MÉCANIQUES

12.1.1 Réglage de la pression du rouleau de serrage

1. Faire marcher le magnétophone en direction avant et commuter le mode de lecture sans insérer de cassette.
2. Pousser doucement contre le bras du rouleau de serrage avec un étalon de tension comme indiqué Fig. 12-1. La lecture doit se situer entre 250 et 400gr. au moment où le rouleau de serrage est séparé du cabestan, et où le cabestan se arrêter à tourner.
3. Si la lecture se situe hors de ces limites, remplacer le ressort de serrage.
4. Faire marcher en direction opposée et mesurer la pression du rouleau de serrage de l'autre côté de la même manière que précedemment.

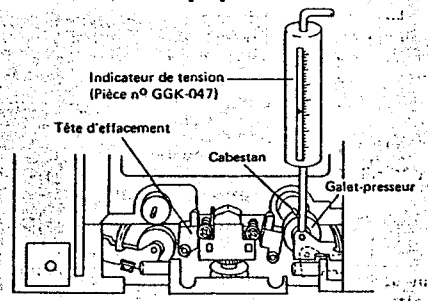


Fig. 12-1 Réglage de la pression du rouleau de serrage

12.1.2 Réglage préliminaire d'azimuth

1. Mettre en marche le magnétophone vers l'avant, en mode d'arrêt.
2. Au moyen d'un tournevis, comme il est montré Fig. 12-2 régler l'intervalle A à 1,5mm. entre le logement et la base tournante, en tournant la vis ❶.
3. Faire marcher en direction inverse.
4. Au moyen du même tournevis, régler l'intervalle B à 1,5mm entre le logement et la base tournante, en tournant la vis ❷.

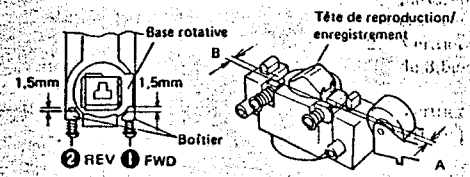


Fig. 12-2 Réglage préliminaire d'azimuth

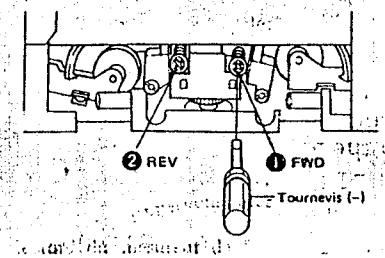


Fig. 12-3 Préréglage d'azimuth

12.1.3 Réglage du défilement de bande

1. Faire marcher en direction avant et insérer une cassette munie d'un mirroir, puis commuter en mode de lecture.
2. Régler l'écrou ❶ pour assurer qu'entre les guides et les têtes d'enregistrement et d'effacement, la bande ne se gondole pas. Voir Fig. 12-4.
3. Faire marcher en direction opposée.
4. Régler l'écrou ❷ pour assurer qu'entre les guides et la tête d'enregistrement et la tête factice, la bande ne se gondole pas.
5. Vérifier qu'il n'y a pas de gauchissement de la bande en répétant plusieure fois le défilement dans les deux sens.

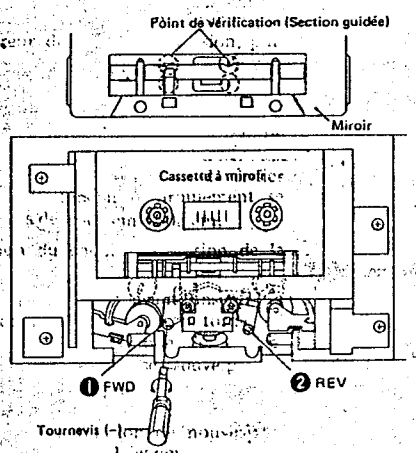


Fig. 12-4 Réglage du défilement de bande

12.1.4 Réglage de la vitesse de rotation rapide de déroulement de d'enroulement

1. Brancher un mesureur de fréquence entre les bornes FG et GND sur l'ensemble de contrôle du tambour de moteur. Voir Fig. 12-5.
2. Mettre en marche vers l'avant et commuter en mode de déroulement rapide.
3. Régler la lecture du mesureur à 72Hz ±2Hz au moyen de VR202.
4. Commuter en mode d'enroulement et vérifier que la lecture du mesureur se trouve proche de 72Hz ±5Hz.

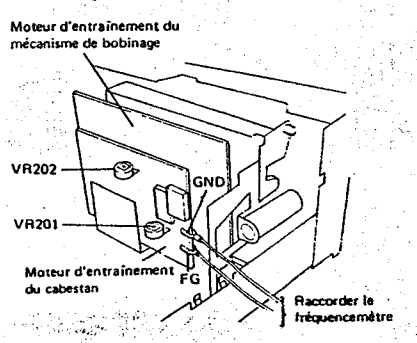


Fig. 12-5 Réglage de la vitesse de rotation rapide de déroulement de d'enroulement

12.1.5 Réglage du couple de torsion à l'enroulement en mode de lecture

1. Mettre en marche en direction avant, insérer une cassette mesureur de couple de tension et commuter en mode de lecture.
2. Régler le couple de torsion d'enroulement à 45g-cm ± 5g-cm au moyen de VR201.
3. Faire marcher en direction opposée.
4. Vérifier que le couple de torsion d'enroulement est de 45g-cm ±10g-cm.

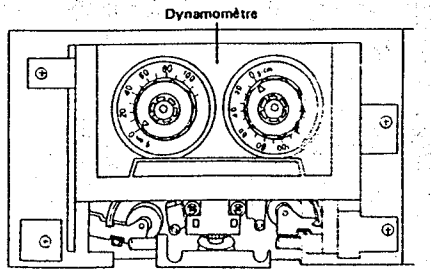


Fig. 12-6 Réglage du couple de torsion à l'enroulement en mode de lecture

12.1.6 Réglage de la vitesse de défilement de la bande

1. Brancher le mesureur de fréquence sur les bornes de sortie.
2. Faire marcher en direction avant, insérer une bande d'essai STD-301 enroulée à son début et commuter en mode de lecture.
3. Régler la lecture du mesureur de fréquence à 3005Hz ±10Hz au moyen du VR101.
4. Faire marcher en direction opposée, enrouler la bande à son commencement, puis commuter en mode de lecture.
5. Vérifier que la lecture du mesureur de fréquence est proche de 3005Hz ±20Hz.

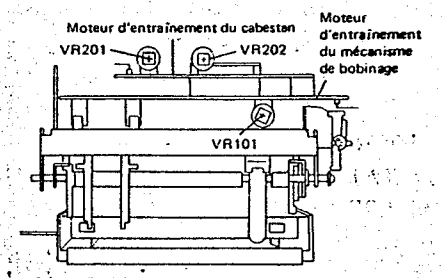


Fig. 12-7 Réglage de la vitesse de défilement de la bande

12.1.7 Vérification du couple de torsion en défilement rapide

1. Faire marcher en direction avant, insérer une cassette mesureur de couple de torsion, puis commuter en mode de défilement rapide vers l'avant.
2. Vérifier que le couple de torsion de défilement rapide vers l'avant se situe aux environs de 100g-cm ±30g-cm.
3. Commuter en mode d'enroulement et vérifier que le couple de torsion d'enroulement se situe aux environs de 100g-cm ±30g-cm.

12.1.8 Vérification du couple de torsion de la contre-tension

1. Faire marcher en direction avant, insérer un mesureur de couple de tension en forme de cassette, et commuter en mode de lecture.
2. Vérifier que la contre-tension se trouve proche de 3,5g-cm ± 1,5g-cm
3. Faire marcher en direction inverse.
4. Vérifier que la contre-tension de nouveau se trouve proche de 3,5g-cm ±1,5g-cm.

12.2 RÉGLAGES ÉLECTRIQUES

• Points de réglage

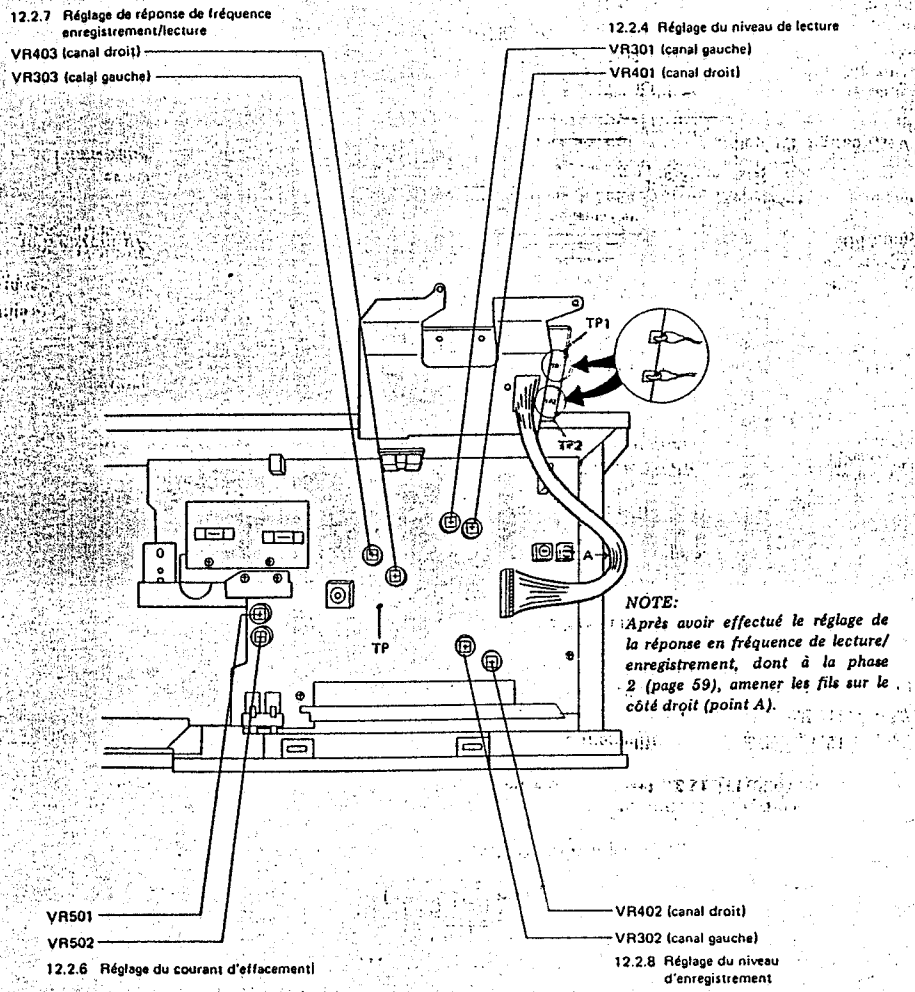


Fig. 12-8 Points de réglage

- Vérifier les points suivants avant de faire aucun réglage électrique.

1. Tous les réglages mécaniques doivent être terminés.
2. Nettoyer les têtes et démagnétiser la tête d'enregistrement/lecture.
3. Les mesures de niveau sont basées sur 0dBv = 1V. Brancher une fausse résistance de 50kΩ (47k~52kΩ) sur les bornes de sortie.
4. Utiliser les bandes d'essai spécifiées pour chaque réglage. Bien que ces bandes aient deux côtés, A et B, utiliser le côté identifié par A.

   STD-341A : Réglage de lecture (PLAYBACK)
   STD-608A : Bande vierge NORMALE
   STD-603 : Bande vierge CrO_2
   STD-604 : Bande vierge MÉTAL
5. Préparer les instruments de mesure suivants: Millivoltmètre AC, oscillateur audio, atténuateur et oscilloscope.
6. Sauf indication contraire, régler toujours les canaux droite et gauche.
7. Sauf indication contraire, régler avec le bouton DOLBY NR en position OFF.
8. Laisser chauffer le magnétophone pendant quelques minutes avant de faire un réglage. Également, faire marcher le magnétophone en mode lecture et enregistrement respectivement de 3 à 5 minutes avant d'opérer les réglages de réponse de fréquence de lecture et d'enregistrement.
9. Procéder en suivant la séquence spécifiée de réglage. Un changement dans la séquence peut empêcher un réglage correct d'être fait et peut produire, par la suite, une perte de qualité.

Séquence de réglage

1. Azimuth de têtes
2. Vérification du défilement de bande
3. Vérification du filtre de lecture
4. Niveau de lecture
5. Vérification du niveau de mesureur
6. Courant d'effacement
7. Réponse de fréquence enregistrement/lecture
8. Niveau d'enregistrement

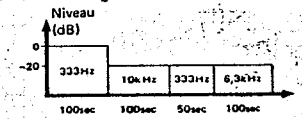


Fig. 12-9 Bande d'essai STD-341A

12.2.1 Réglage de l'azimuth de têtes

Positions

Millivoltmètre AC . . . Brancher sur les bornes de sortie
Bande d'essai . . . . . STD-341A (10kHz, -20dB)
Sélecteur de bande . . NORM
Commutateur de direction . . . . . Vers l'avant
Mode . . . . . Lecture
VR301 et VR401 . . . Tourner vers la droite pour position maximum

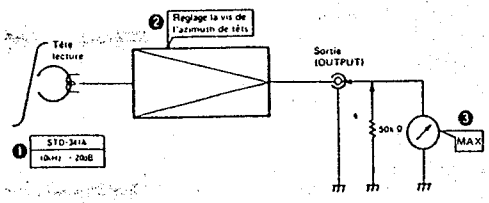


Fig. 12-10 Réglage de l'azimuth de têtes

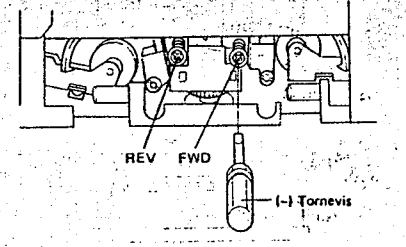


Fig. 12-11 Réglage de l'azimuth de têtes

Marche à suivre

1. Tourner la vis de réglage de l'azimuth vers l'avant pour obtenir une indication maximum du millivoltmètre AC.
2. Changer de direction et tourner la vis de réglage de l'azimuth pour la direction opposée afin d'obtenir une indication maximum du millivoltmètre AC.

3. Reprendre la direction vers l'avant et vérifier qu'il n'y a aucun changement dans le réglage de l'azimuth. Dans le cas de différence notable, refaire le réglage en suivant 1 et 2. (Bloquer les vis avec un vernis de blocage une fois le réglage terminé.)

12.2.2 Vérification du défilement de bande

Disposition

Bande d'essai ..... Demi-cassette équipée d'un mirroir
Sélecteur de bande ..... NORM
Commutateur de direction ..... Vers l'avant
Mode ..... Lecture

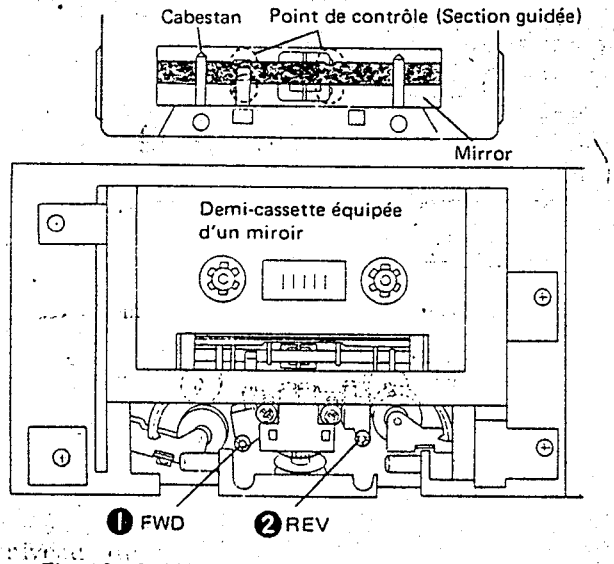


Fig. 12-12 Vérification du défilement de bande

Marche à suivre

1. Vérifier que la bande ne se gondole pas dans la section guidée entre les têtes d'enregistrement et d'effacement.
2. Renverser la direction du défilement de la bande et vérifier que la bande ne se gondole pas dans la section guidée entre la tête d'enregistrement et la tête factice.
3. S'il y a gondolement de la bande, régler le défilement ainsi qu'il est décrit dans la section 12.1.3, page 53, et répéter la marche à suivre de réglage de la section 12.2.1.

12.2.3 Vérification du filtre de lecture

Positions

Millivoltmètre AC ... Brancher les sur bornes d sortie
Bande d'essai ..... STD-341A (333Hz, -20dB (6,3kHz, -20dB)
Sélecteur de bande .. NORM
Commutateur de direction ..... Vers l'avant
Mode ..... Lecture

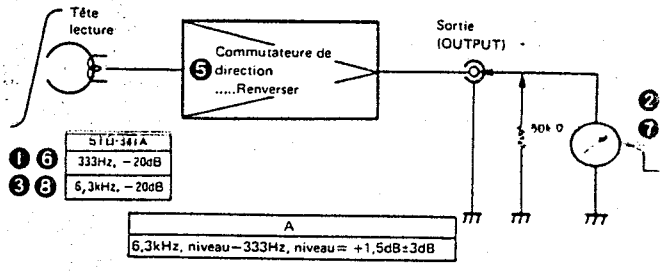


Fig. 12-13 Vérification du filtre de lecture

Marche à suivre

1. Faire marcher la portion de 333Hz, -20dB e enregistrer les lectures du millivoltmètre AC
2. Ensuite, faire marcher la portion de 6,3kHz -20dB, et vérifier que les indications du mesureur sont proches de +1,5dB ±3dB de la lecture faite en 1 ci-dessus.
3. Renverser la direction et lire la bande d'essa à nouveau comme il est décrit en 1 et 2 vérifier que la différence de sortie n'est pa au-delá de +1,5dB ±3dB.

12.2.4 Réglage du niveau de lecture

Comme ce réglage détermine le niveau du DOLBY NR pendant la lecture, il doit être fait avec précision.

Positions

Millivoltmètre AC ... Brancher sur TP1 (canal gauche) et TP2 (canal droite)
Bande d'essai STD-341A (333Hz, 0dB)
Sélecteur de bande .. NORM
Commutateur de direction ..... Vers l'avant
Mode ..... Lecture

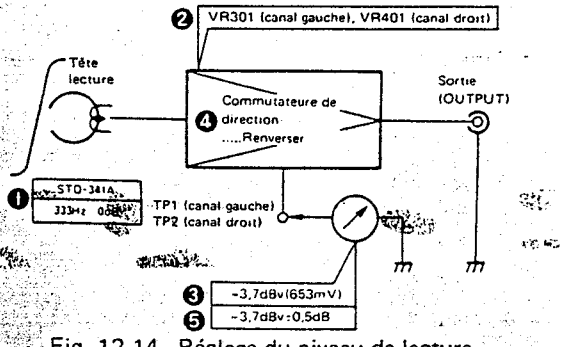


Fig. 12-14 Réglage du niveau de lecture

Marche à suivre

1. Régler VR301 (canal gauch) et VR401 (canal droite) de telle sorte que le mesureur indique -3,7dBv (653mV).
2. Mettre en direction inverse et vérifier que le millivoltmètre AC indique une position proche de -3,7dBv ±0,5dB.
3. Si l'indication n'est pas dans les limites spécifiées, vérifier le passage de la bande et recommencer le réglage à partir de 1.

12.2.5 Vérification du niveau de mesureur

Positions

Millivoltmètre AC ... Brancher sur TP1 (canal gauche) et TP2 (canal droite)
Signal d'entrée ..... 333Hz, -10dBv (316mV) aux bornes d'entrée
Mode ..... Enregistrement

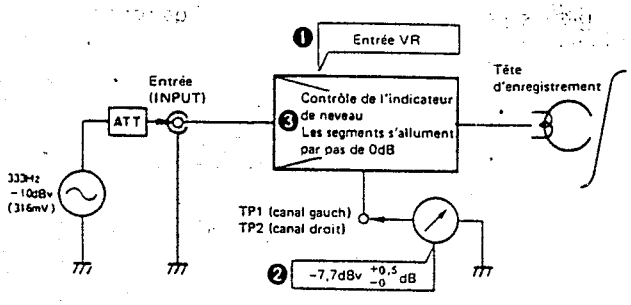


Fig. 12-15 Vérification du niveau de mesureur

Marche à suivre

Ajuster le contrôle de niveau d'entrée de telle sorte que le mesureur indique -7,7dBv (0,41V) et vérifier que le segment du mesureur de niveau s'allume dans la bande de 0dB±1.

12.2.6 Réglage du courant d'effacement

Dispositions

Millivoltmètre AC ..... Branché sur TP
Sélecteur de bande ..... METAL
Contrôle de volume d'entrée ..... Niveau Minimum
VR303 et VR403 ..... Positions centrales.
Mode ..... Enregistrement

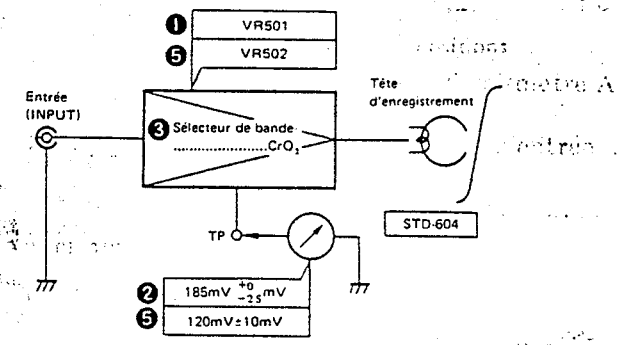


Fig. 12-16 Réglage du courant d'effacement

Marche à suivre

1. Régler VR501 pour obtenir une lecture de 185mV $^{+0}_{-25}$ mV sur le millivoltmètre AC.
2. Commuter le sélecteur de bande sur la position CrO_2 et régler VR502 pour obtenir une lecture de 120mV±10mV.

12.2.7 Réglage de réponse de fréquence enregistrement/lecture

Positions

Millivoltmètre AC . . . Brancher sur les bornes de sortie
Signal d'entrée . . . . . 333Hz, -30dBv (31,6mV) aux bornes de LINE INPUT
Bande d'essai STD-608A (STD-603, STD-604)
Sélecteur de bande . . NORM (CrO_2, METAL)
Mode . . . . . Enregistrement

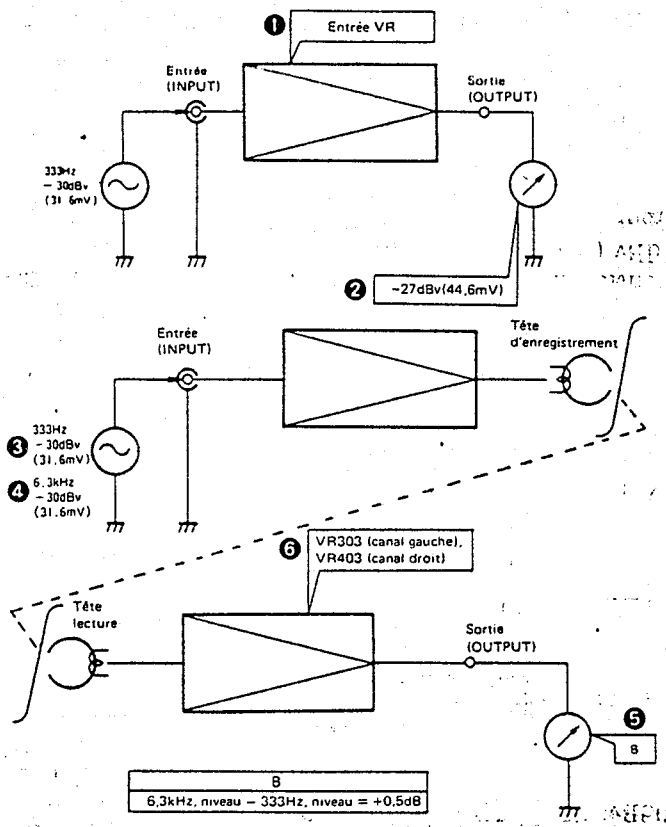


Fig. 12-17 Réglage de réponse de fréquence enregistrement/lecture

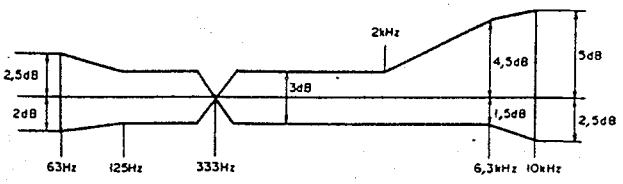
Marche à suivre

1. Ajuster le contrôle de niveau d'entrée de telle sorte que le mesureur indique -27dBv (44,6 mV).
2. Enregistrer les signaux de 333Hz, -30dBv et 6,3kHz, -30dBv et ajuster le VR303 (canal gauche) et le VR403 (canal droite) de telle sorte que la différence du niveau du signal de sortie avec le niveau de 333Hz pris comme référence est de +0,5dB.
3. Changer les positions de comutateurs de sélecteur de bande et de DOLBY NR (Voir Figs. 12-18 et 19), et vérifier que la réponse de fréquence est satisfaisante.

Réponse de fréquence de lecture

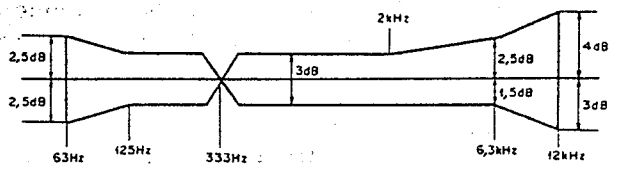
Bande d'essai STD-341A
Bande d'essai . . . . . NORM
Commutateur de DOLBY NR . . . . . OFF

REMARQUE:
En raison d'un effet d'émoussement, compenser le canal droit par -0,5dB à 125Hz et -1dB à 63Hz.

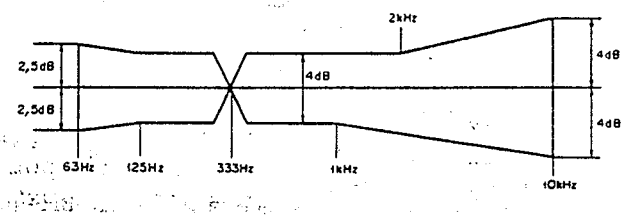


Réponse de fréquence générale

Bande d'essai STD-608A
Sélecteur de bande . . . . . NORM
Commutateur de DOLBY NR . . . . . OFF



Bande d'essai STD-608A
Sélecteur de bande . . . . . NORM
Commutateur de DOLBY NR . . . . . ON (Type B)



Bande d'essai STD-608A
Sélecteur de bande . . . . . NORM
Commutateur de DOLBY NR . . . . . ON (Type C

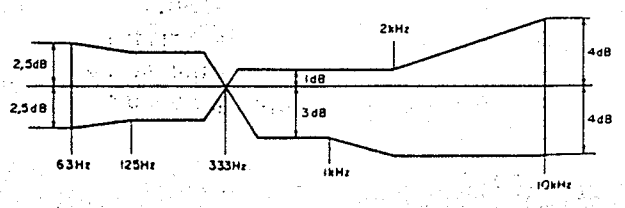
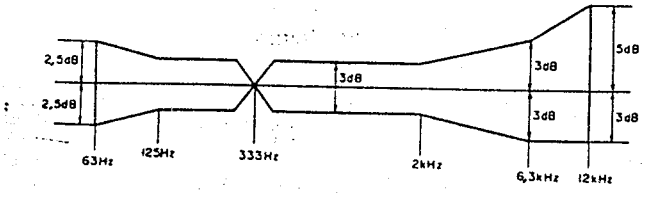
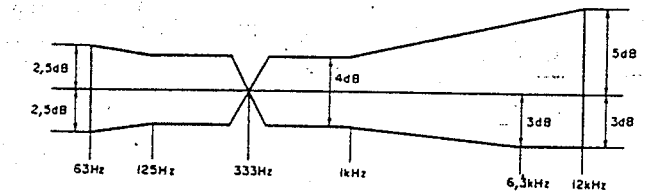


Fig. 12-18 Réponse de fréquence

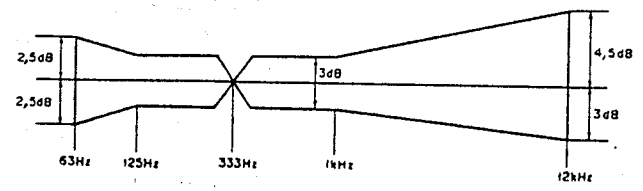
Bande d'essai STD-603
Sélecteur de bande ..... CrO_2
Commutateur de DOLBY NR ..... OFF



Bande d'essai STD-603
Sélecteur de bande ..... CrO_2
Commutateur de DOLBY NR ..... ON (Types B et C)



Bande d'essai STD-604
Sélecteur de bande ..... METAL
Commutateur de DOLBY NR ..... OFF



Bande d'essai STD-604
Sélecteur de bande ..... METAL
Commutateur de DOLBY NR ..... ON (Types B et C)

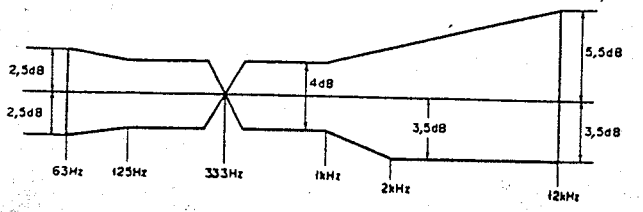


Fig. 12-19 Réponse de fréquence

12.2.8 Réglage du niveau d'enregistrement

Positions

Millivoltmètre AC ... Brancher sur TP1 (canal gauche) et TP2 (canal droite)
Signal d'entrée ..... 333Hz, -10dBv (316mV) sur bornes LINE INPUT
Bande d'essai STD-608A (STD-603, STD-604)
Sélecteur de bande .. NORM (CrO_2, METAL)
Mode ..... Enregistrement

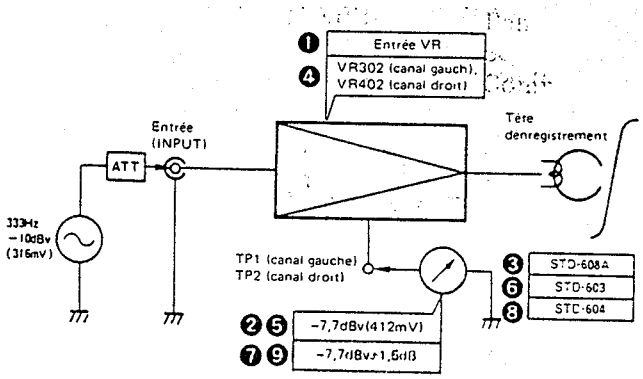


Fig. 12-20 Réglage du niveau d'enregistrement

Marche à suivre

1. Ajuster le contrôle de niveau d'entrée de telle sorte que le mesureur indique -7,7dBv (412 mV).
2. Enregistrer le signal de 333Hz, -10dBv sur la bande STD-608A. Puis ajuster VR302 (canal gauche) et VR402 (canal droite) de telle sorte que le mesureur indique -7,7dBv (412mV) quand le signal enregistré est passé en lecture.
3. Commuter le sélecteur de bande sur la position CrO_2 et répéter le No. 3 en utilisant la bande d'essai STD-603. Le niveau de sortie de lecture devrait se trouver proche de -7,7dBv±1,5dB.
4. Puis, commuter à la position METAL et répéter l'opération en utilisant la bande d'essai STD-604. Le niveau de sortie de lecture devrait se trouver proche de -7,7dBv±1,5dB.

12. AJUSTE

12.1 AJUSTES MECÁNICOS

12.1.1 Ajuste del rodillo de presión

1. Ajustar la dirección hacia adelante y cambiar al modo de reproducción sin cargar ningún casete.
2. Empleando un calibrador de tensión, como se muestra en la figura 12-1, presionar con cuidado contra el brazo del rodillo de presión. El calibrador de tensión deberá indicar entre 250 y 400g en el momento en que el rodillo de presión se separe del eje de arrastre y parar a girar el eje de arrastre.
3. Si la indicación cae fuera del margen mencionado, reemplazar el muelle de presión del rodillo.
4. Ajustar la dirección inversa y medir la presión del rodillo de presión del otro lado del mismo modo descrito anteriormente.

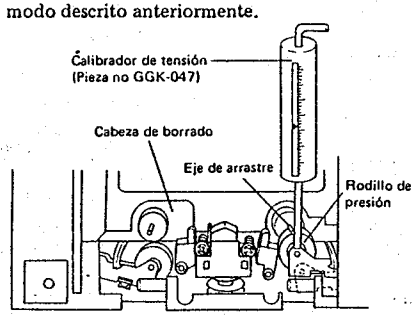


Fig. 12-1 Ajuste del rodillo de presión

12.1.2 Ajuste Preliminar del acimut

1. Ajustar la dirección hacia adelante y establecer el modo de parada.
2. Empleando un destornillador como se muestra en la figura 12-2, ajustar el huelgo entre la envoltura y la base rotativa a 1,5mm girando el tornillo de ajuste ❶ .
3. Ajustar la dirección inversa.
4. Empleando un destornillador de nuevo, ajustar el huelgo B entre la envoltura y la base rotativa a 1,5mm girando el tornillo ❷ .

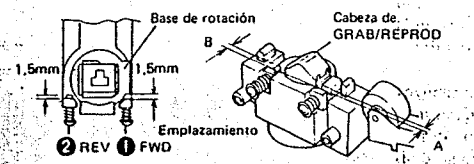


Fig. 12-2 Ajuste preliminar del acimut

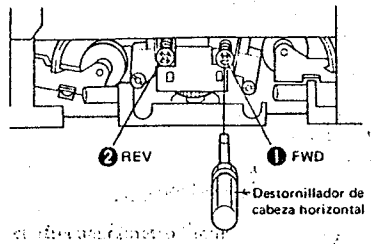


Fig. 12-3 Preajuste del aciment

12.1.3 Ajuste del transporte de la cinta

1. Ajustar la dirección hacia adelante, cargar el casete con espejo y establecer el modo de reproducción.
2. Ajustar la tuerca ❶ para asegurarse de que no ocurre enrollamiento de la cinta en la sección guía de las cabezas de grabación y de borrado como se muestra en la figura 12-4.
3. Ajustar la dirección inversa.
4. Ajustar la tuercas ❷ para asegurarse de que no ocurre enrollamiento de la cinta en la sección de las cabezas de grabación y ficticia.
5. Comprobar que no se enrolla la cinta durante el transporte de la cinta repetido hacia adelante y hacia atrás.

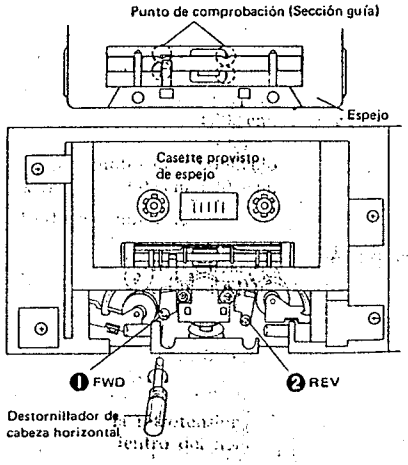


Fig. 12-4 Ajuste del transporte de la cinta

12.1.4 Ajuste de la velocidad de rotación de avance rápido y de rebobinado

1. Conectar un frecuencímetro entre el FG y los terminales de GND del ensamble de control del motor de los carretes (ver la figura 12-5).
2. Ajustar la dirección hacia adelante y establecer el modo de avance rápido.
3. Ajustar la indicación del frecuencímetro a 72 Hz ±2Hz con el VR202.
4. Establecer el modo de rebobinado y comprobar que la indicación del frecuencímetro cae en el margen de 72Hz ±5Hz.

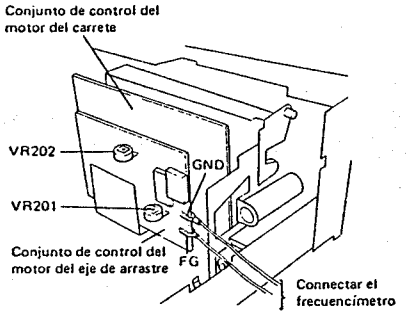


Fig. 12-5 Ajuste de la velocidad de rotación de avance rápido y de rebobinado

12.1.5 Ajuste del par motor de bobinado en el modo de reproducción

1. Ajustar la dirección hacia adelante, cargar un medidor de par motor tipo casete y establecer el modo de reproducción.
2. Ajustar el par motor de bobinado a 45g·cm ± 5g·cm con el VR201.
3. Ajustar la dirección inversa.
4. Comprobar que el par motor de bobinado sea de 45g·cm ±10g·cm.

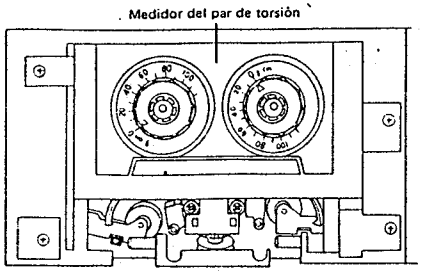


Fig. 12-6 Ajuste del par motor de bobinado en el modo de reproducción

12.1.6 Ajuste de la velocidad de la cinta

1. Conectar un frecuencímetro a los terminales OUTPUT.
2. Ajustar la dirección hacia adelante, cargar una cinta de prueba STD-301, bobinar la cinta hasta el principio y establecer el modo de reproducción.
3. Ajustar la indicación del frecuencímetro a 3005Hz ±10Hz con el VR101.
4. Ajustar la dirección inversa, bobinar la cinta de prueba hasta el principio y establecer el modo de reproducción.
5. Comprobar que el frecuencímetro indique dentro del margen de 3005Hz ±20Hz.

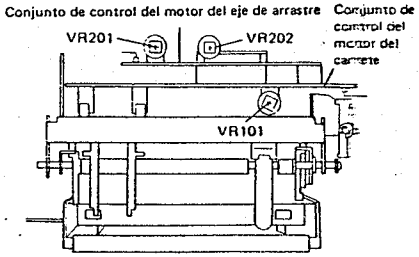


Fig.12-7 Ajuste de la velocidad de la cinta

12.1.7 Comprobación del par motor de desplazamiento rápido de la cinta

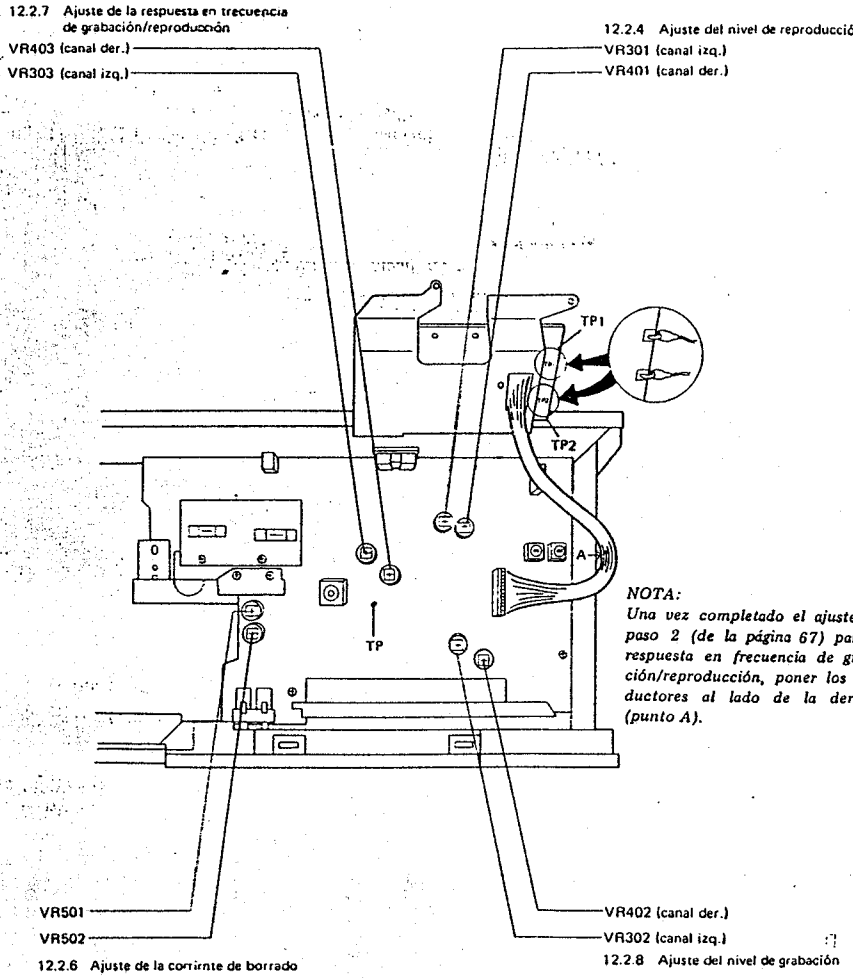
1. Ajustar la dirección hacia adelante, cargar un medidor de par motor tipo casete y establecer el modo de avance rápido.
2. Comprobar que el par motor de avance rápido esté dentro del margen de 100g·cm ±30g·cm.
3. Establecer el modo de rebobinado, y comprobar de nuevo que el par motor de rebobinado esté dentro del margen de 100g·cm ±30g·cm.

12.1.8 Comprobación del par motor de retrotensión

1. Ajustar la dirección hacia adelante, cargar un medidor de par motor tipo casete y establecer el modo de reproducción.
2. Comprobar que la retrotensión del carrete de suministro esté dentro del margen de 3,5g·cm. ±1,5g.cm.
3. Invertir la dirección.
4. Comprobar de nuevo que la retrotensión del carrete de suministro esté dentro del margen de 3,5g·cm ±1,5g.cm.

12.2 AJUSTES ELÉCTRICOS

• Puntos de ajuste



NOTA:
Una vez completado el ajuste del paso 2 (de la página 67) para la respuesta en frecuencia de grabación/reproducción, poner los conductores al lado de la derecha (punto A).

Fig. 12-8 Puntos de ajuste

• Comprobar los puntos siguientes antes de empezar los ajustes eléctricos.

1. Deben estar terminados todos los ajustes mecánicos.
2. Limpiar las cabezas y desmagnetizar la cabeza de grabación/reproducción.
3. Las mediciones de nivel se basan en 0dBv = 1V. Conectar un resistor ficticio de 50K ohmios (47K~52K ohmios) entre los terminales de salida (OUTPUT).
4. Emplear las cintas de pruebas especificadas para cada ajuste. Aunque las cintas de pruebas tienen los lados A y B, utilizar el lado de la etiqueta (lado A).
   STD-341 : Ajustes de la reproducción
   STD-608A : Cinta en blanco NORMAL
   STD-603 : Cinta en blanco de CrO_2
   STD-604 : Cinta en blanco de METAL
5. Preparar el siguiente equipo de medición: Un milivoltímetro de CA, oscilador de audio, atenuador, y un osciloscopio.
6. A menos que se especifique lo contrario, ajustar siempre los canales izquierdo y derecho.
7. A menos que se especifique lo contrario, efectuar el ajuste con el interruptor DOLBY NR en la posición OFF.
8. Dejar precalentar el magnetófono durante algunos minutos antes de iniciar los ajustes. Dejar también el magnetófono en los modos de reproducción y de grabación, respectivamente, durante 3 a 5 minutos antes de iniciar los ajustes de la respuesta en frecuencia de reproducción y de grabación.
9. Proceder de acuerdo con la secuencia de ajuste especificada. Si se cambia la secuencia se puede ocasionar el ajuste incorrecto, dando como resultado en una pérdida del rendimiento.

Secuencia de ajuste

1. Acimut de la cabeza
2. Comprobación del tromsporte de la cinta
3. Comprobación de la ecualización en reproducción
4. Nivel de reproducción
5. Comprobación del medidor del nivel
6. Corriente de borrado
7. Respuesta en frecuencia de grabación/reproducción
8. Nivel de grabación

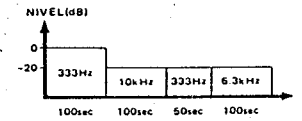


Fig. 12-9 Cinta de prueba STD-341A

12.2.1 Ajuste del acimut de la cabeza

Ajustes

Milivoltímetro de CA ..	Conectar a los terminales OUTPUT
Cinta de prueba	STD-341A (10kHz, -20dB)
Selector de cintas	NORM
Interruptor de dirección	Hacia adelante
Modo	Reproducción
VR301 y VR401	Girar hacia la derecha a la posición máxima

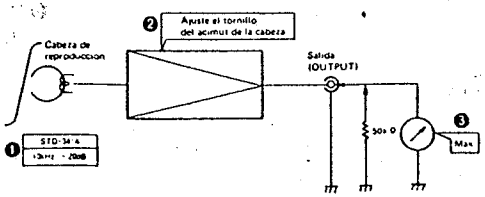


Fig. 12-10 Ajuste del acimut de la cabeza

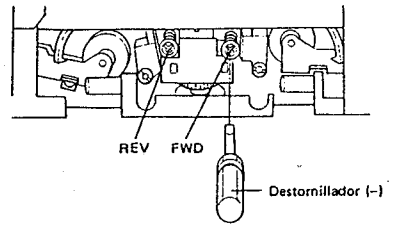


Fig. 12-11 Ajuste del acimut de la cabeza

Procedimiento

1. Girar el tornillo de asjuste del acimut de la cabeza en la dirección hacia adelante para obtener la indicación máxima en el voltímetro de CA.
2. Invertir la dirección y girar el tornillo de ajuste del acimut de la cabeza en la dirección inversa para obtener de nuevo la indicación máxima en el voltímetro de CA.

3. Volver a la dirección hacia adelante y comprobar si no ha habido cambio en el ajuste del acimut. Si ha occurrido un cambio considerable, reajustar repitiendo los pasos 1 y 2. (Enclavar los tornillos con el enclavador de tornillos después de haber completado el ajuste.)

12.2.2 Comprobación del transporte de la cinta

Ajuste

Cinta de prueba ..... Casete provisto de espejo
Selector de cintas .... NORM
Interruptor de dirección ..... Hacia adelante
Modo ..... Reproducción

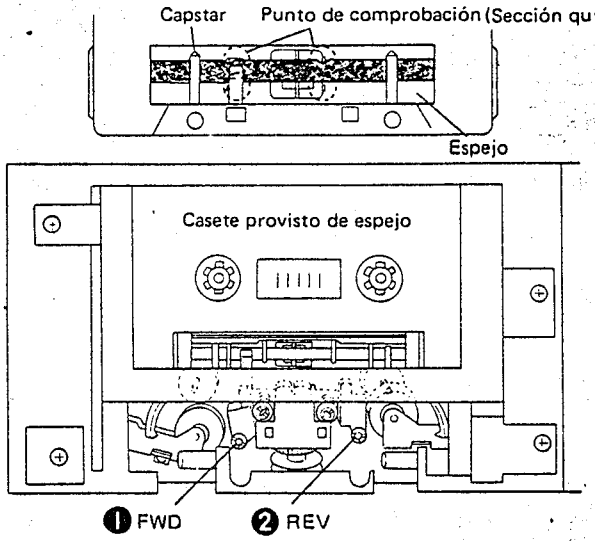


Fig. 12-12 Comprobación del transporte de la cinta

Procedimiento

1. Compruebe que no se enrolle la cinta en la sección guía entre las cabezas de grabación y de borrado.
2. Invierta la dirección del transporte de la cinta y compruebe que no se enrolle la cinta en la sección guía entre las cabezas de grabación y ficticia.
3. Si se enrolla la cinta, ajustar el transporte de la cinta tal y como se ha descrito en la sección 12.1.3 de la página 61 y repetir los procedimentos de ajuste de la sección 12.2.1.

12.2.3 Comprobación del ecualización de reproducción

Ajustes

Milivoltímetro de CA .. Conectar a los terminales OUTPUT
Cinta de prueba ..... STD-341A (333Hz, -20 dB) (6,3kHz, -20dB)
Selector de cintas ..... NORM
Interruptor de dirección ..... Hacia adelante
Modo ..... Reproducción

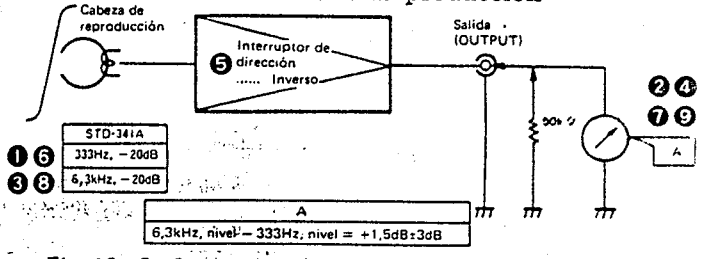


Fig. 12-13 Comprobación del ecualización de reproducción

Procedimiento

1. Reproducir la parte de 333Hz, -20dB y registrar la indicación del voltímetro de CA.
2. Entonces, reproducir la parte de 6,3kHz, -20dB y comprobar que la indicación del voltímetro esté entre +1,5dB a ±3dB de la indicación obtenida en el paso 1 anterior.
3. Invertir la dirección y reproducir de nuevo la cinta de prueba tal y como se ha descrito en los pasos 1 y 2, comprobando que la diferencia de salida no sea mayor de +1,5dB ±3dB.

12.2.4 Ajuste del nivel de reproducción

Puesto que este ajuste determina el nivel de DOLBY NR durante la reproducción, deberá efectuarse con precisión.

Ajustes

Milivoltímetro de CA .. Conectar a TP1 (canal izq.) y TP2 (canal der.)
Cinta de prueba STD-341A (333Hz, 0dB)
Selector de cintas ..... NORM
Interruptor de dirección ..... Hacia adelante
Modo ..... Reproducción

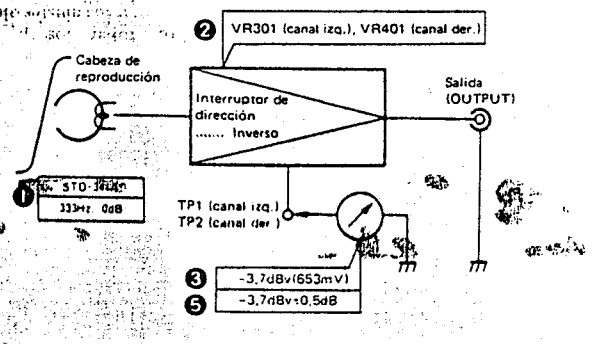


Fig. 12-14 Ajuste del nivel de reproducción

Procedimiento

1. Ajustar VR301 (canal izq.) y VR401 (canal der.) de modo que el voltímetro indique -3,7dBv (653mV).
2. Ajustar la dirección inversa, y comprobar que la indicación del voltímetro de CA esté dentro del margen de -3,7dBv ±0,5dB.
3. Si la indicación no cae dentro del margen especificado, comprobar el transporte de la cinta y repetir este ajuste desde el paso 1.

12.2.5 Comprobación del medidor de nivel

Ajustes

Milivoltímetro de CA	Conectar a TP1 (canal izq.) y TP2 (canal der.)
Señal de entrada	333Hz, -10dBv (316mV) a los terminales INPUT
Modo	Grabación

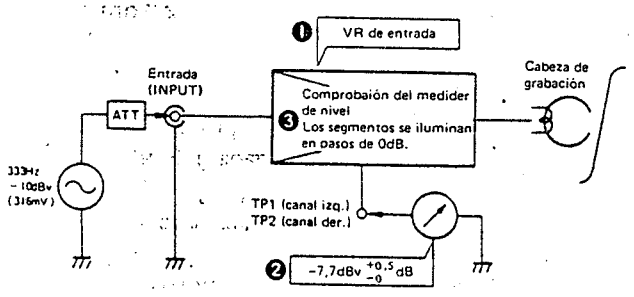


Fig. 12-15 Comprobación del medidor de nivel

Procedimiento

Ajustar el control del nivel de entrada (INPUT) de modo que el voltímetro indique -7,7dBv (0,41V), y comprobar que los segmentos del medidor de nivel se iluminan en un margen de segmento de 0dB±1.

12.2.6 Ajuste de la corriente de borrado

Ajustes

Voltímetro de CA	Conectar al TP
Selector de cintas	METAL
Control de volumen	
INPUT	Nivel mínimo
VR303 y VR403	Posiciones centrales
Modo	Grabación

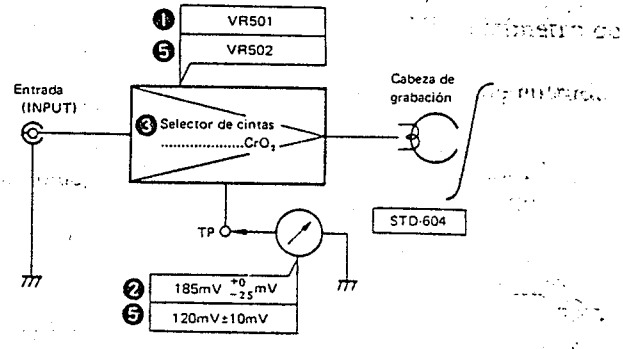


Fig. 12-16 Ajuste de la corriente de borrado

Procedimiento

1. Ajustar el VR501 para obtener una indicación del voltímetro de 185mV $^{+0}_{-25}$ mV en el voltímetro de CA.
2. Poner el selector de cintas en la posición CrO_2, y ajustar el VR502 para obtener una indicación del voltímetro de 120mV±10mV.

12.2.7 Ajuste de la respuesta en frecuencia de grabación/reproducción

Ajustes

Milivoltímetro de CA .. Conectar a los terminales OUTPUT
Señal de entrada ..... 333Hz, - 30dBv (31,6mV) a los terminales LINE INPUT
Cinta de prueba STD-608 (STD-603, STD-604)
Selector de cintas ..... NORM (CrO_2, METAL)
Modo ..... Grabación

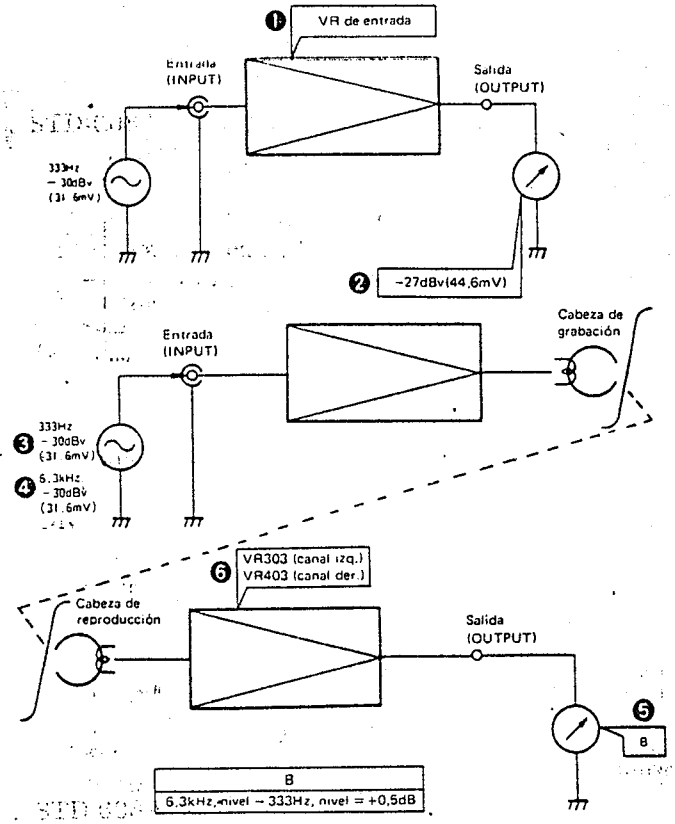


Fig. 12-17 Ajuste de la respuesta en frecuencia de grabación/reproducción

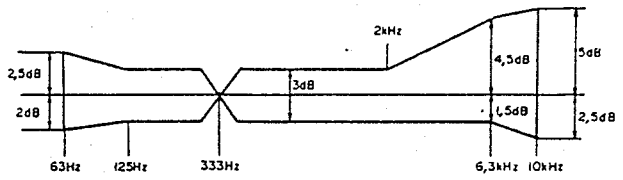
Procedimiento

1. Ajustar el control del nivel de entrada (INPUT) de modo que el voltímitro indique - 27dBv (44,6mV).
2. Grabar las señales de 333Hz, - 30dBv y 6,3kHz, - 30dB, y ajustar el VR303 (canal izq.) y VR403 (canal der.) de modo que la diferencia en el nivel de la señal de salida de reproducción con el nivel de 333Hz como nivel de referencia sea +0,5dB.
3. Cambiar las posiciones del selector de cintas e interruptor DOLBY NR (ver la figuras 12-18 y 19), y comprobar que la respuesta en frecuencia sea satisfactoria.

Respuesta en frecuencia de reproducción

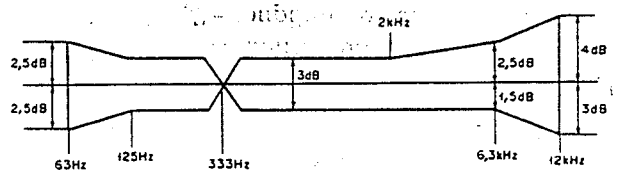
Cinta de preuba STD-341A
Selector de cintas ..... NORM
Interruptor DOLBY NR ..... OFF

NOTA:
Debido al efecto de borde, compensar el canal derecho en -0,5dB a 125Hz y -1dB a 63Hz.

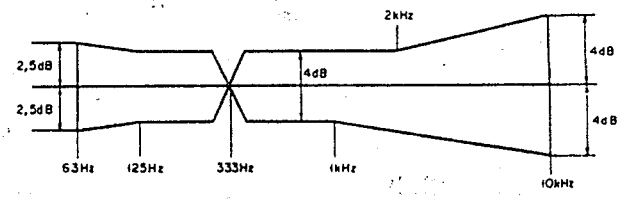


Respuesta en frecuencia global

Cinta de prueba STD-608A
Selector de cintas ..... NORM



Cinta de prueba STD-608A
Selector de cintas ..... NORM
Interruptor DOLBY NR ..... ON



Cinta de prueba STD-608A
Selector de cintes ..... NORM
Interruptor DOLBY NR ..... ON (Tipo C)

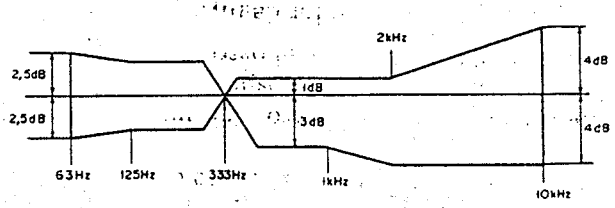
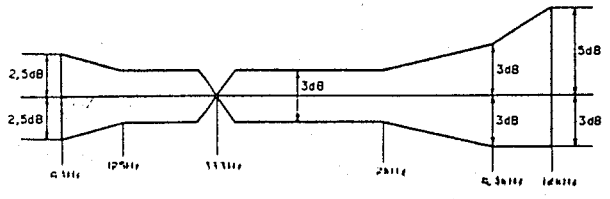
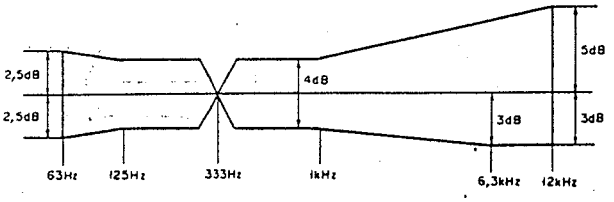


Fig. 12-18 Respuesta en frecuencia

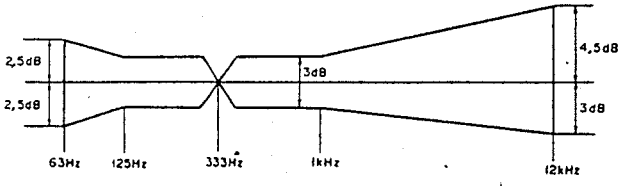
Cinta de prueba STD-603
Selector de cintas ..... CrO_2
Interruptor DOLBY NR ..... OFF



Cinta de prueba STD-603
Selector de cintas ..... CrO_2
Interruptor DOLBY NR ..... ON (Tipos B y C)



Cinta de prueba STD-604
Selector de cintas ..... METAL
Interruptor DOLBY NR ..... OFF



Cinta de prueba STD-604
Selector de cintas ..... METAL
Interruptor DOLBY NR ..... ON (Tipos B y C)

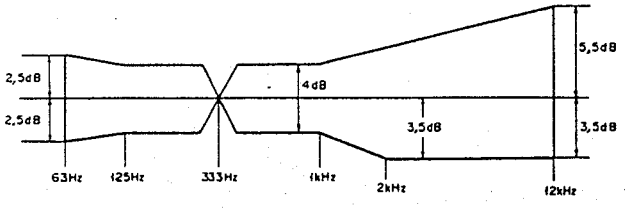


Fig. 12-19 Respuesta en frecuencia

12.2.8 Ajuste del nivel de grabación

Ajustes

Milivoltímetro de CA .. Conectar a TP1 (canal izq.) y TP2 (canal der.)
Señal de entrada ..... 333Hz, -10dBv (316mV) a los terminales LINE INPUT
Cinta de prueba STD-608A (STD-603, STD-604)
Selector de cintas ..... NORM (CrO_2, METAL)
Modo ..... Grabación

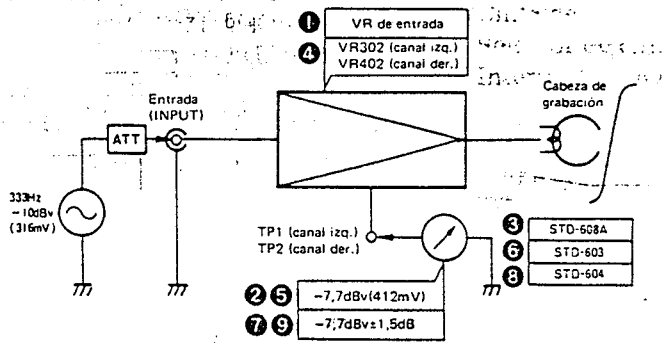


Fig. 12-20 Ajuste del nivel de grabación

Procedimiento

1. Ajustar el control del nivel de entrada (INPUT) de modo que el voltímetro indique -7,7dBv (412mV).
2. Grabar la señal de 333Hz, -10dBv en la cinta de prueba STD-608A. Entonces, ajustar el VR302 (canal izq.) y VR402 (canal der.) de modo que el voltímetro indique -7,7dBv (412mV) cuando la señal grabada se reproduzca.
3. Poner el selector de cintas en la posición de CrO_2 y repetir el paso 3 empleando la cinta de prueba STD-603. El nivel de salida de reproducción deberá esta entre -7,7dBv± 1,5dB.
4. Entonces, ponerlo en la posición de METAL y repetir el paso empleando la cinta de prueba STD-604. El nivel de salida de reproducción deberá estar de nuevo entre -7,7dBv±1,5dB.