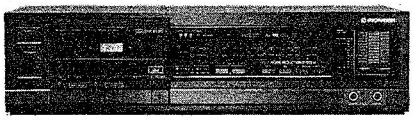
PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS



• The photo shows the black version of CT-970.

ORDER NO.
ARP1034-0

STEREO CASSETTE TAPE DECK

CT-970(BK), CT-970
CT-770(BK), CT-770
CT-670(BK), CT-670

- For the servicing these models, please refer to the following Repair and Adjustments service manual.
- CT-970 (BK)/HEM type and CT-970/HEM type; ARP1035.
- CT-770 (BK)/HEM type and CT-770/HEM type; APR1038.
- CT-670 (BK)/HEM type and CT-670/HEM type; ARP1041.

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1. CIRCUIT DESCRIPTIONS

1.1 MODEL COMPARISONS

This series of cassette tape decks features power-assisted "soft touch" tape transport mechanisms. Although there is considerable variety in terms of appearance and design, the series is divided into the following four functional classes in terms of the built-in noise reduction system.

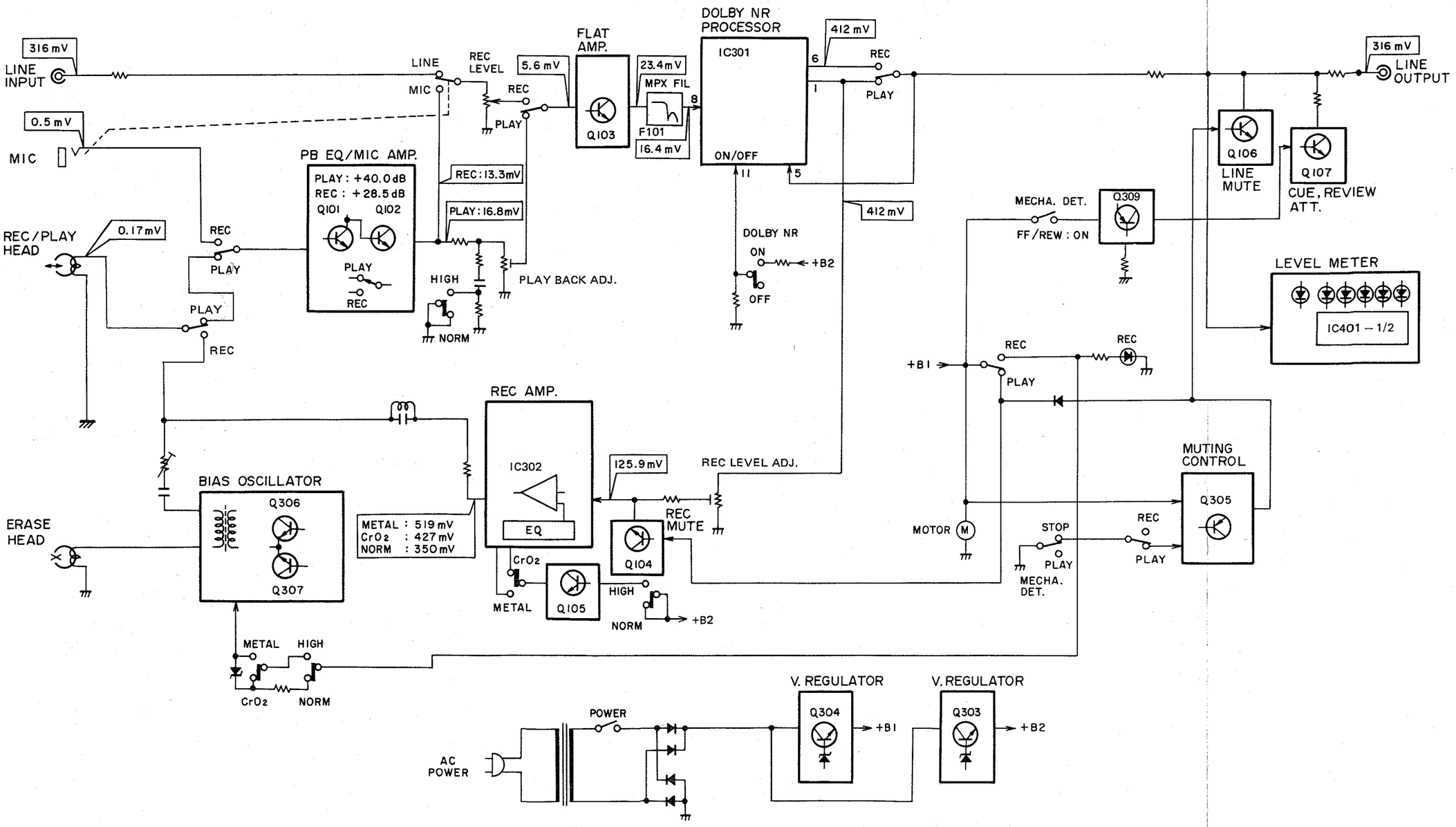
1. Built-in dbx plus types B and C Dolby NR systems
   CT-970 [BK], CT-970.
2. Built-in types B and C Dolby NR systems
   CT-770 [BK], CT-770.
3. Built-in type B Dolby NR system
   CT-670 [BK], CT-670.

Each model is further divided into several versions which differ according to power supply and other specification differences in the various export destination regions (see Fig. 1-1).

Type (Version)	HEM	HB	D	HP	KC
Destination / Model	European Continent	United Kingdom	General market	Australia	Canada
CT-970 [BK]	O	O	O	–	–
CT-970	O	–	–	–	–
CT-770 [BK]	O	O	–	–	–
CT-770	O	O	–	–	–
CT-670 [BK]	O	O	O	O	O
CT-670	O	O	–	–	–

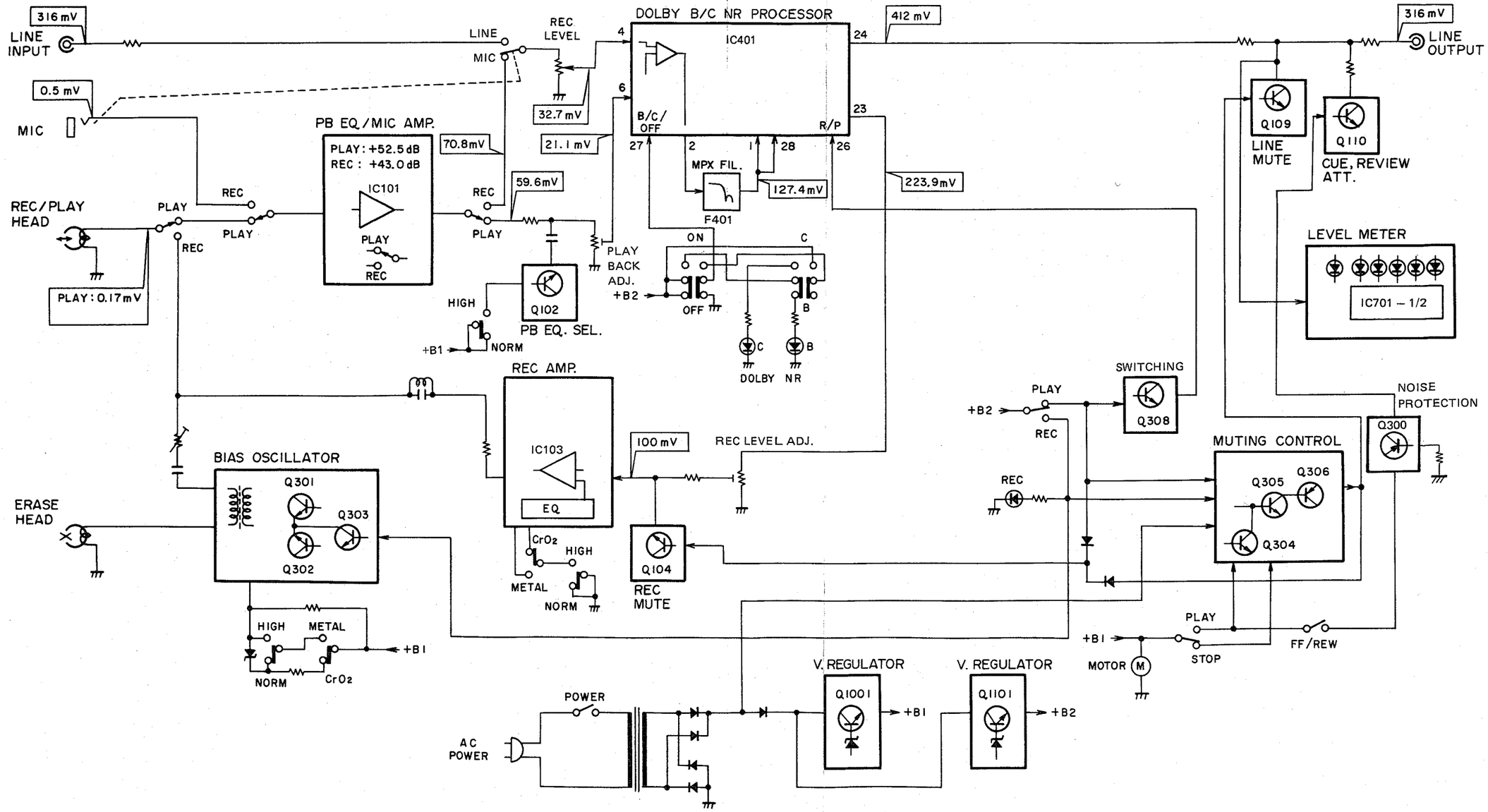
Fig. 1-1 Model version destinations

1.2 BLOCK DIAGRAMS
CT-670 [BK], CT-670



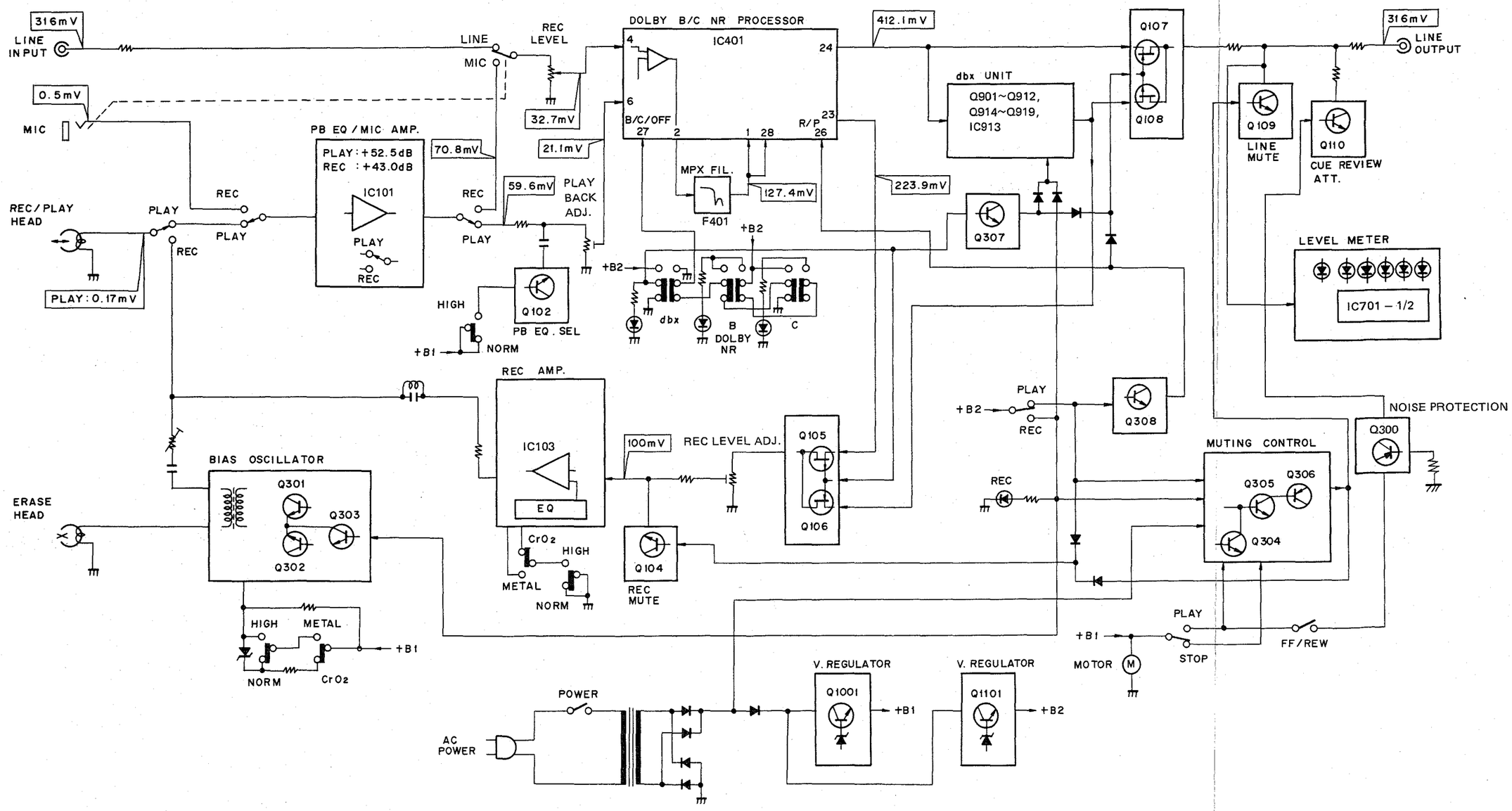
1.2 BLOCK DIAGRAMS

CT-770 [BK], CT-770



1.2 BLOCK DIAGRAMS

CT-970 [BK], CT-970



1.3 GENERAL OUTLINE OF MAJOR COMPONENT CIRCUITS

Refer to the block diagrams on pages 3 thru 8 for outlines of the signal routes in each model.

Playback Equalizer

- **CT-670 [BK], CT670**

The equalizer amplifier is a two stage direct coupled amplifier which also serves as the microphone amplifier in recording mode.

- **CT-770 [BK], CT-770, CT-970 [BK] and CT-970**

Low-noise operational amplifier IC101 (M5220L) also used as microphone input amplifier in recording mode.

Dolby NR Stage

- **CT670 [BK] and CT-670 (type B only)**

These decks feature an IC301 (HA12045) with two built-in type B Dolby NR processors — one for each channel.

- **CT770 [BK], CT-770, CT-970 [BK] and CT-970 (types B and C)**

These decks feature an IC401 and IC501 (AN-7370K) with built-in switchable type B and type C Dolby NR processors.

dbx System (CT-970 [BK] and CT970)

The "dbx system" is a decilinear noise reduction system developed by the dbx Incorporated of America. In this system, audio signals are subject to accurate logarithmic compression and expansion over a very wide level range and with little distortion.

The dbx system consists of an encoder and a decoder. Input signals are compressed to 1/2 the decibel level by the dbx encoder and are recorded on tape in accordance with the recording characteristics shown in Figure 1-3 with the dynamic range reduced by half. The tape deck playback output signal (compressed signal) is passed to the decoder where the constantly changing level is expanded to twice the decibel level in accordance with the playback characteristics shown in Figure 1-3. -30dB signals are expanded to -60dB, and the noise level, too, is reduced by 30dB in what is effectively a noise reduction system. And +10dB playback outputs are expanded to +20dB, thereby improving the tape saturation characteristics by 10dB by the so-called increased saturation level effect. The end result is an effective expansion of the dynamic range. And since these compression and expansion operations are linear logarithmic changes, there is little chance of misoperations occurring. For example, failure to match the recording and playback levels does not result in deterioration of the overall frequency response.

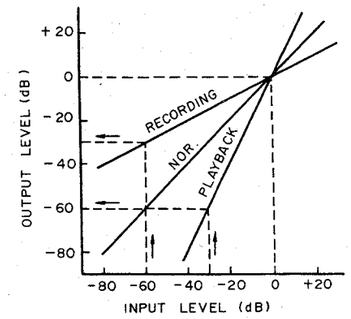


Fig. 1-3 Level compression and expansion

dbx System configuration

The major components of the dbx system are the encoder (route amplifier) where the dynamic range of input signals is compressed by 1/2, and a decoder (square-law amplifier) where signals are expanded by the factor of 2. (See Figure 1-2.)

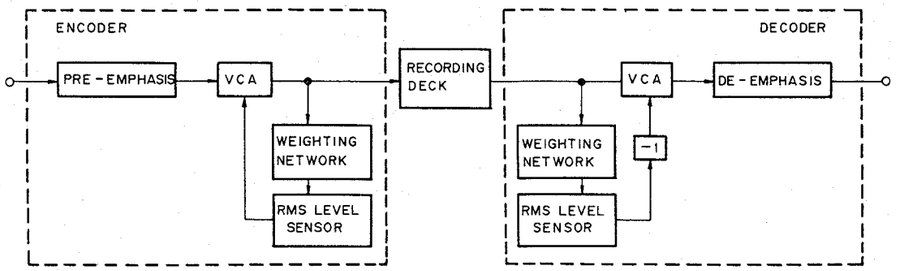


Fig. 1-2 dbx System block diagram

VCA: The VCA (Voltage controlled Amplifier) is one of the most important component circuits in the dbx system. VCA amplification can be changed linearly by external DC control currents (that is, doubling the control current doubles the amplification in decibel terms). The dynamic range of input signals can thus be compressed and expanded.

RMS level sensor: The next most important dbx system circuit is the RMS level sensor which generates a DC voltage proportional to the size of the input signal. The RMS sensor detects the root mean square value of the input signal and converts it to a DC voltage proportional to the logarithm of the detected level.

Emphasis: Since high frequencies in the input signal are boosted by pre-emphasis, and returned to the original level by de-emphasis during playback, the high end noise is reduced by some 10dB in addition to the intrinsic noise reduction effect achieved by compression and expansion. This emphasis action is also effective in reducing harmonic distortion generated during recording and in improving the hiss envelope tracing.

Weighting network: If signals where the high frequencies have been boosted by pre-emphasis in the encoder are recorded directly onto tape, the tape's high end saturation point may be exceeded resulting in generation of distortion. To avoid this, the VCA amplification must be

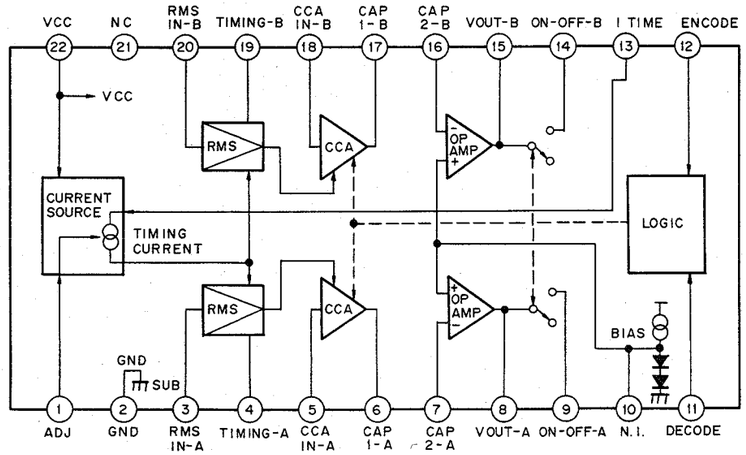


Fig. 1-4 AN6291 Block diagram

Pin No.	Pin name	Description	Pin No.	Pin name	Description
1	ADJ	Timing current adjustment pin	12	ENCODE	Encode/decode selector switch (encode)
2	GND	Ground	13	I TIME	Timing current circuit power
3	RMS IN-A	Channel A RMS circuit input	14	ON-OFF-B	Channel B electronic switch
4	TIMING-A	Channel A timing capacitor pin	15	VOUT-B	Channel B output
5	CCA IN-A	Channel A CCA circuit input	16	CAP-2-B	Channel B output circuit input
6	CAP-1-A	Channel A CCA circuit output	17	CAP-1-B	Channel B CCA circuit output
7	CAP-2-A	Channel A output circuit input	18	CCA-IN-B	Channel B CCA circuit input
8	VOUT-A	Chanel A output	19	TIMING-B	Channel B timing capacitor pin
9	ON-OFF-A	Channel A electronic switch	20	RMS IN-B	Channel B RMS circuit input
10	N.I.	Bias circuit decoupling	21	NC	Internal connection pin
11	DECODE	Encode/decode selector switch (decode)	22	Vcc	Power supply

Fig. 1-5 AN6291 Pin description

reduced by an appropriate degree for signals containing a relatively high proportion of high frequency components. This is achieved by inserting weighting networks before and after the RMS level sensor to increase the sensitivity of the level sensor for signals with a large high frequency content, thereby lowering the VCA amplification.

dbx System operation

The input signal is passed to the VCA via a pre-emphasis stage. Part of the VCA output is passed to the RMS level sensor via a weighting network, resulting in the generation of a DC voltage at the RMS level sensor output in proportion to the size of the input signal. The VCA amplification is varied according to the size of this DC voltage, and the dynamic range of the input signal is reduced by 1/2 in terms of decibel level before.

The CT970 [BK] and CT-970 dbx system

The dbx system featured in the CT-970 [BK] and CT-970 are incorporated in an IC913 (AN-6291) containing dbx circuits for two channels. Although the VCA in AN6291 is a CCA (Current Controlled Amplifier) type of variable gain amplifier, it is basically the same as the VCA. This type of dbx system, therefore, is called the type II system. The main difference between the type I and type II systems is the larger weighting network time constant in type II, resulting in a higher sensitivity to high frequency components. As a result, the encoder amplification is lower at higher frequencies, thereby enabling the system to operate more effectively in respect to the saturation point of the cassette tape.

Recording Amplifier

Employing an operational amplifier IC103 (M5218L), this amplifier is capable of handling METAL, CrO_2, and NORMAL tapes by switching peaking elements in the feedback circuit.

Muting Circuit

- **CT-670 [BK] and CT-670**

Switches S1 and S2 shown in Fig. 1-6 are mechanical mode detector switches located in the tape transport mechanism, and S301 is the record/playback selector switch. The line output is muted when Q106 (Q206) is turned on by Q305 which in turn is turned on by switches S301-1 and S1.

Line output muting when the power is switched on (Fig. 1-7)

When the power is switched on, the +12V line current is passed via D305, Q305, R305, and C307 to turn Q305 on, thereby muting noise generated when the circuitry is first energized. If the deck is in stop mode, R306 in parallel with C307 is connected and the C307 charge level is suppressed. Therefore, Q305 remains on to keep the line output in muted status. If the deck is in recording or playback mode, on the other hand, R306 is open and C307 is charged up, resulting in Q305 being turned off to cancel the muted condition.

Line output muting when power is switched off

When the power is switched off, Q305 is turned on by the residual charge on C305, thereby muting the line output.

Line output muting when switching from playback to stop mode

When S1 is switched from the PLAY position to STOP, Q305 is turned on to mute the output line.

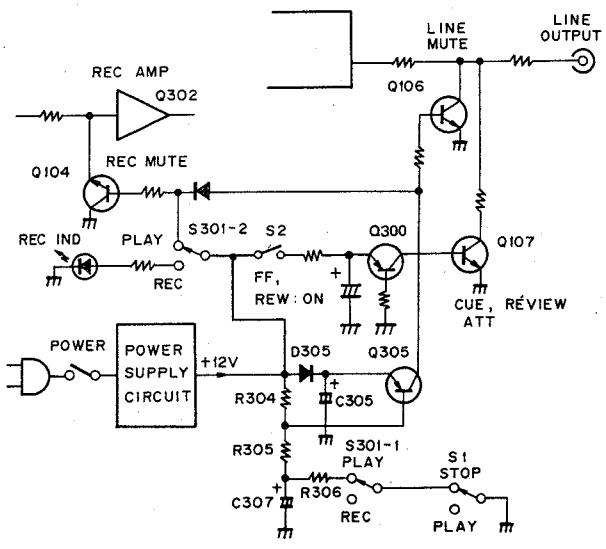


Fig. 1-6 Muting circuit (CT-670 [BK] and CT670)

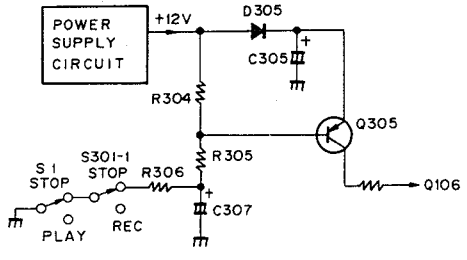


Fig. 1-7 Muting when the power is switched on

Line output muting when switching from stop to playback mode

When S1 is switched from the STOP position to PLAY, C307 is charged up and Q305 is turned off about 0.5 seconds later to cancel the output line muted condition.

Line output muting in recording/pause mode

Since S301-1 is switched to the REC position in recording/pause mode, the line output is not muted irrespective of the S1 position. And since S301-2 is switched to the REC position, Q104 (Q204) is turned off and muting of the recording amplifier input is cancelled.

- **CT-970 [BK], CT-970, CT-770 [BK] and CT-770**

Switches S1 and S2 shown in Fig. 1-8 are mechanical mode detector switches located in the tape transport mechanism, and S301 is the record/playback selector switch. The line output is muted when Q306 and Q109 are turned on by Q305 which in turn is turned on by switches S301-1 and S1.

Line output muting when the power is switched on (Fig. 1-9)

1. Current is passed from the power transformer to Q305 via D601, R312, C316, R319, and D305 to turn Q305 on while C316 is being charged up.
2. Q306 and Q109 (Q209) are turned on while Q305 is on, thereby muting noise generated when the circuitry is first energized.
3. If the deck is in stop mode, current is passed from the +12V line to Q305 via S1 (STOP), R321, and R320. Therefore, Q305, Q306, and Q109 (Q209) remain on the keep the muted status.

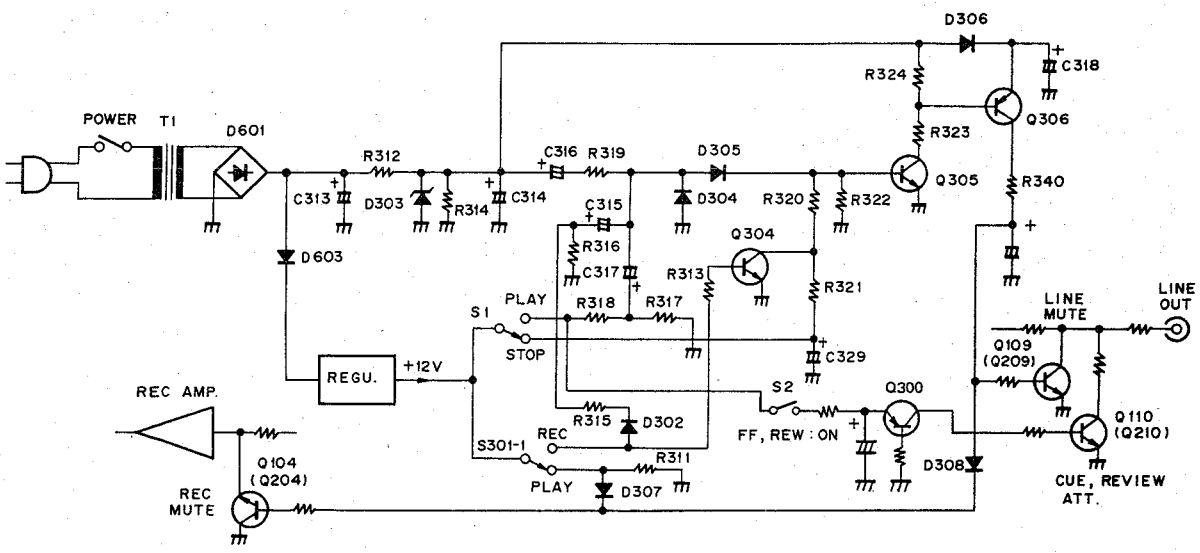


Fig. 1-8 Muting circuit (CT-970 [BK], 970, 770 [BK] and 770)

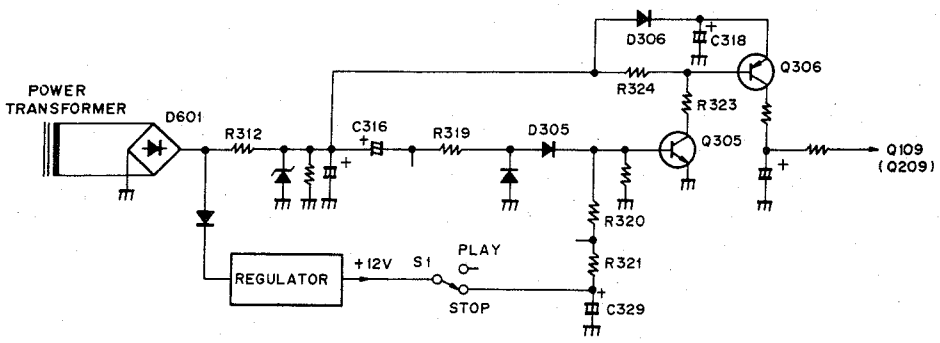


Fig. 1-9 Muting when the power is switched on

Line output muting when power is switched off

When the power is switched off, Q306 is turned on by the residual charge on C318, thereby muting the line output.

Line output muting when switching from stop to playback mode (see Fig. 1-10)

When S1 is switched from the STOP position to PLAY, Q305 remains on until C317 is charged up via +12V, S1 (PLAY), R318, C317, D305, and Q305, thereby cancelling the muted condition after a short delay to prevent output of unwanted noise.

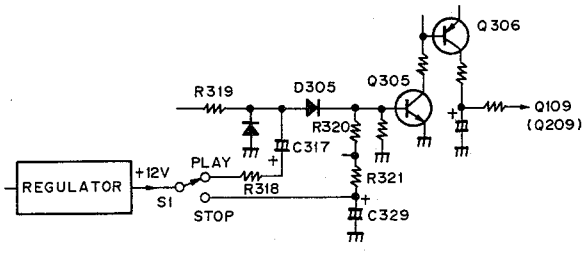


Fig. 1-10 Muting when switching from stop to playback mode

Line output muting when switching from playback to stop mode

When S1 is switched from the PLAY position to STOP, Q305 and Q306 are turned on by the current passed from +12V to Q305 via S1 (STOP), R321, and R320, thereby muting the output line.

Line output muting in recording mode (see Fig. 1-11)

Since S301-1 is switched from the PLAY to REC position in recording mode, Q304 is turned on by the current passed from +12V to S301-1 (REC), R313, and Q304. And since Q305 remains on until C315 is charged up via +12V, S301-1 (REC), D302, R315, C315, D305, and Q305, thereby delaying cancellation of the muted condition to prevent output of unwanted switching noise. (Since Q304 is on, Q305 is turned on only by the C315 charging route.)
And since S301-1 is in the REC position, Q104 (Q204) is turned off and muting of the recording amplifier input is cancelled.

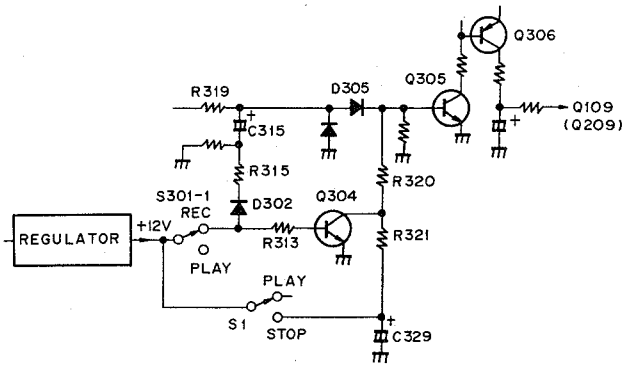


Fig. 1-11 Muting in recording mode

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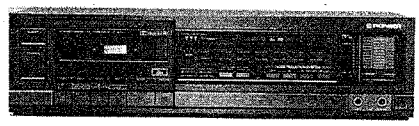
PIONEER®

Service Manual

REPAIR & ADJUSTMENTS



The photo shows the black version of CT-970.

ORDER NO.
ARP1035-0

STEREO CASSETTE TAPE DECK

CT-970(BK)
CT-970

MODEL CT-970 (BK) and CT-970 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Applicable model		Power requirement	Destination
	CT-970 (BK)	CT-970		
HEM	○	○	AC220V, 240V *	European continent
HB	○	–	AC220V, 240V *	United Kingdom
D	○	–	AC120V, 220V 240V (switchable)	General market

*Change the primary wiring of the power transformer.

- This service manual is applicable to the HEM type.
- As to the HB and D types, please refer to the additional service manual (ARP1036).
- As to the circuit and mechanism descriptions, please refer to the CT-970 (BK) and CT-970 service manual (ARP1034).
- Ce manuel d'instruction se refère au mode de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

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TEL: (03) 580-9911

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CONTENTS

1. SPECIFICATIONS

System . . . . . 4 track, 2-channel stereo
Heads . . . . . "Hard Permalloy" recording/playback head x 1
"Ferrite" erasing head x 1
Motor . . . . . DC servo motor x 1
Wow and Flutter . . . . . No more than 0.07% (WRMS)
No more than ±0.19% (DIN)
Fast Winding Time . . . . Approximately 90 seconds (C-60 tape)
Frequency Response
–20dB recording:
Normal tape . . . . . 30 to 14, 000Hz
Chrome tape . . . . . 30 to 15, 000Hz
Metal tape . . . . . 30 to 15, 000Hz
Signal-to-Noise Ratio
Dolby NR OFF . . . . . More than 57dB
dbx ON 92dB
Noise Reduction Effect
Dolby B-type NR ON . . . . . More than 10dB (at 5kHz)
Dolby C-type NR ON . . . . . More than 19dB (at 5kHz)
Dynamic range (dbx ON) 110dB
Harmonic Distortion . . . . . No more than 1.5% (0dB)
Input
(Sensitivity)
MIC (L, R) . . . . . 0.3mV, 6mm diam. jack
(Source impedance 600Ω)
LINE (INPUT) 50mV
(Input impedance 91kΩ)
Output (Reference level)
LINE (OUTPUT) 316mV
(Output load impedance 4kΩ)

Furnished Parts

Operating instructions 1
Connection cord with pin plugs 2

Subfunctions

- Cue and Review function
- Noise reduction system (dbx, DOLBY NR, B/C types)
- 3 position tape selector (NORM/CrO_2/METAL)
- Oil damped eject function
- Full automatic stop function
- Timer stand-by function
- LED level meter
- One-touch recording

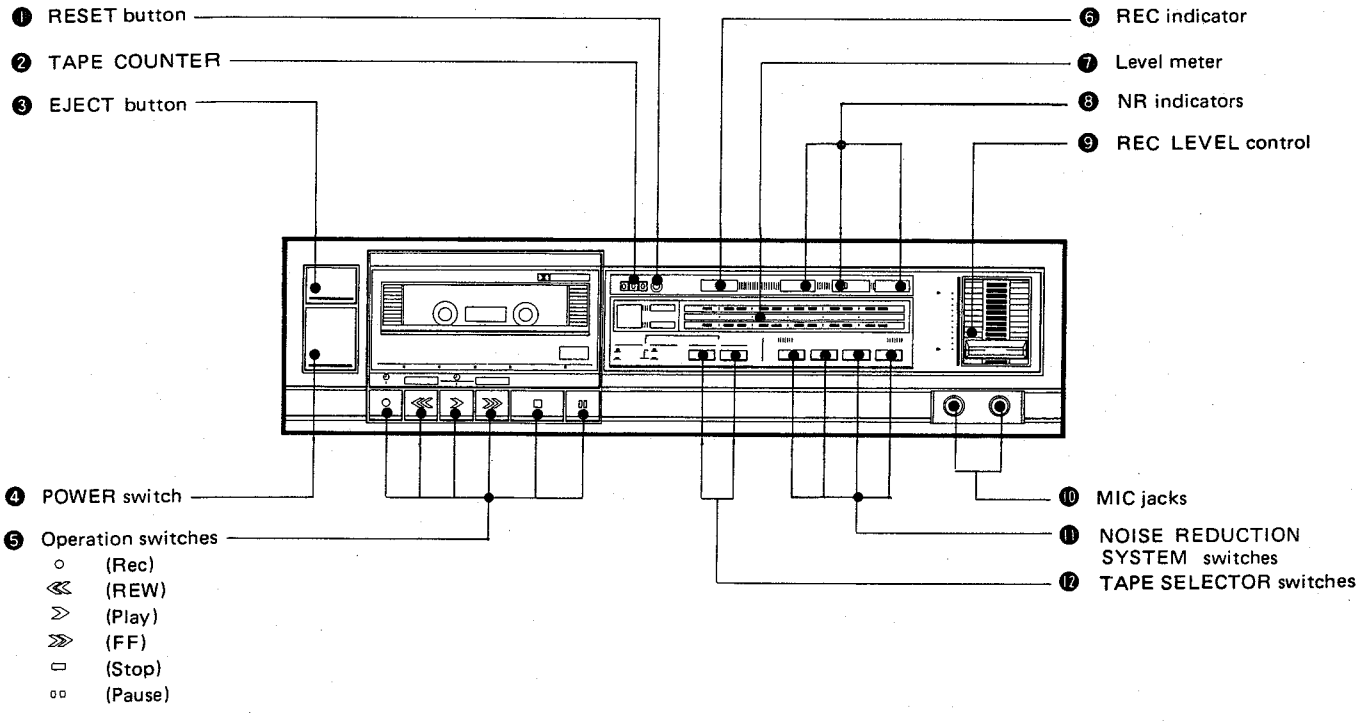
Miscellaneous

Power Requirements
European model ..... AC 220 V, 50/60 Hz
U.K. ..... AC 240 V, 50/60 Hz

Power Consumption
European model ..... 12 watts
Dimensions ..... 420 (W) x 109 (H) x 214 (D) mm
16-9/16 (W) x 4-5/16 (H) x 8-7/16 (D) in
Weight (without package) ..... 3.5 kg (7 lb 11 oz)

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

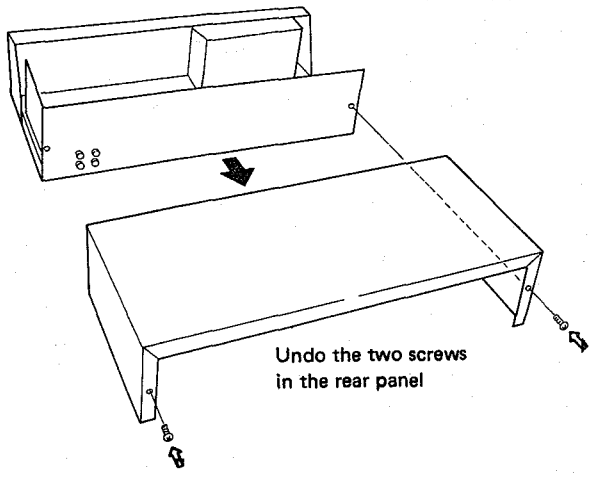
2. FRONT PANEL FACILITIES



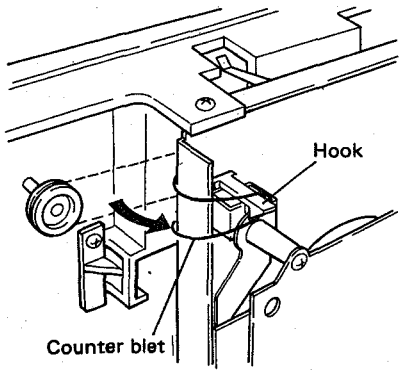
3. DISASSEMBLY

Disassembly of Tape Transport Unit

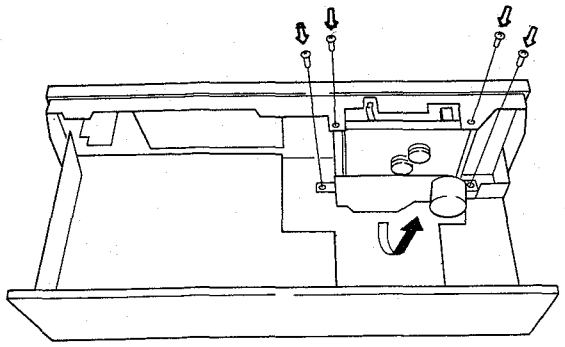
1. Remove the bonnet.



2. Temporarily pass the counter belt around a chassis hook.

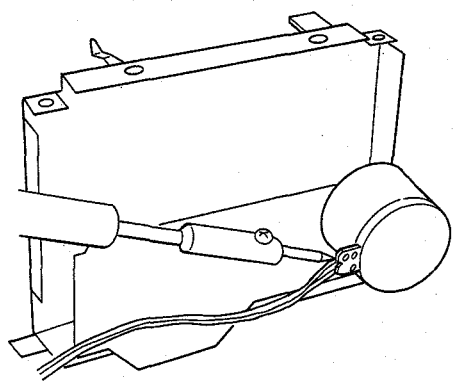


3. Open the cassette door.
4. Undo the four screws securing the tape transport unit, pull the unit out towards the rear.

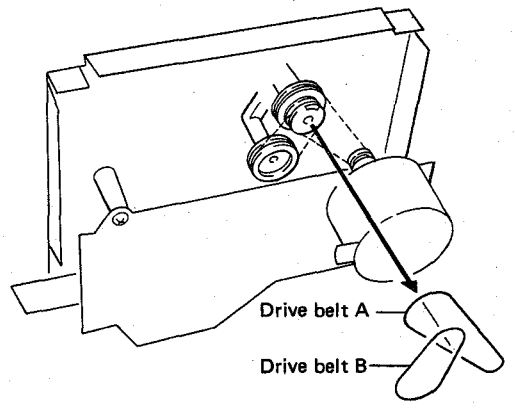


Motor Replacement

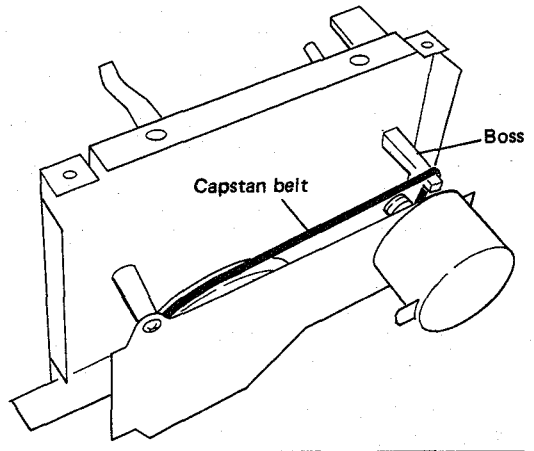
1. Remove the tape transport unit from the deck.
2. Disconnect the motor lead wires from the motor.



3. Remove the drive belt B and then remove the drive belt A.

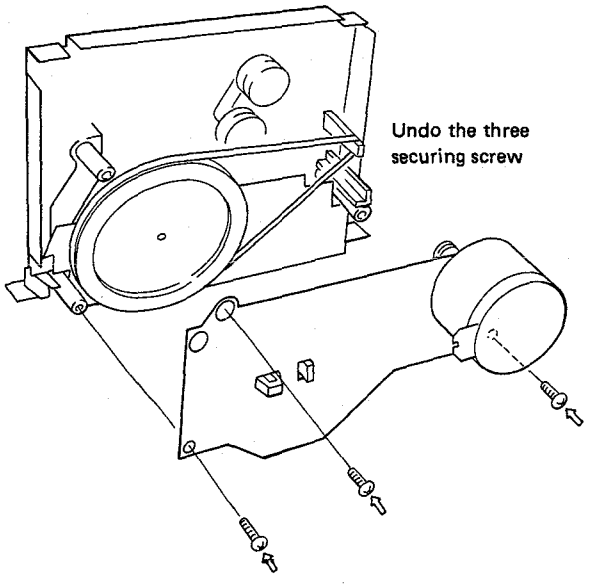


4. Temporarily pass the capstan belt around a chassis boss.

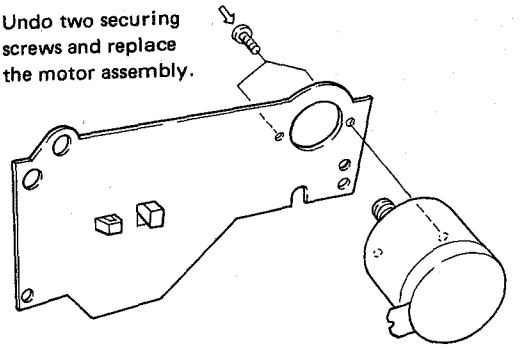


Capstan Belt Replacement

5. Remove the flywheel holder plate.



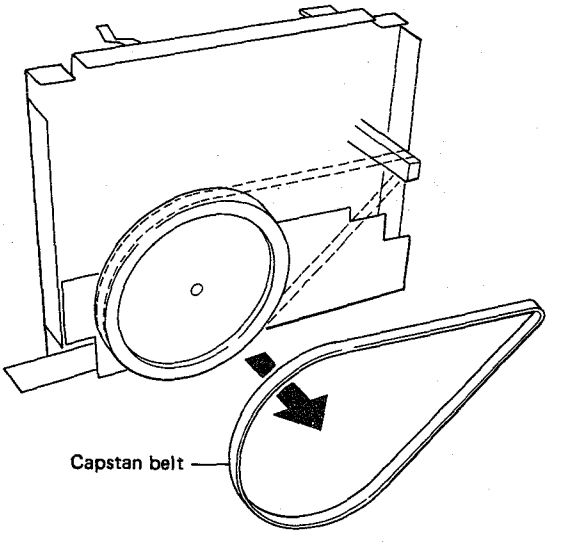
6. Replace the motor assembly



7. Pass the belt around the pulley, and re-assemble in the reverse order.

8. Adjust tape speed according to the "Tape Speed Adjustment" procedure.

1. Remove the tape transport unit from the deck.
2. Remove the drive belt B and then remove the drive belt A.
3. Temporarily pass the capstan belt around a chassis boss.
4. Remove the flywheel holder plate.
5. Replace the capstan belt.



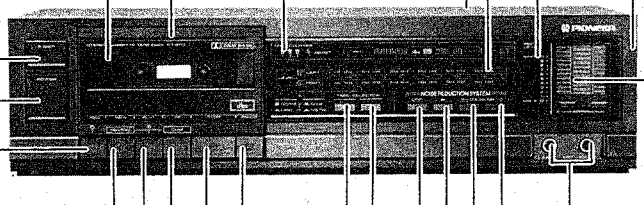
6. Reassembly in the reverse order.

4. 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



Door
RNM-180 (BLACK)
RNM-261 (SILVER)

Door panel
RAH-823 (BLACK)
RAH-855 (SILVER)

Knob (EJECT)
RAC-717 (BLACK)
RAC-767 (SILVER)

Knob (POWER)
RAC-715 (BLACK)
RAC-765 (SILVER)

Knob (REC)
RAC-650 (BLACK)
RAC-644 (SILVER)

Knob (REW)
RAC-651 (BLACK)
RAC-645 (SILVER)

Knob (PLAY)
RAC-648 (BLACK)
RAC-642 (SILVER)

Knob (FF)
RAC-652 (BLACK)
RAC-646 (SILVER)

Knob (STOP)
RAC-653 (BLACK)
RAC-647 (SILVER)

Tape counter
RAW-211

Bonnet case
RNA-813 (BLACK)
RNA-836 (SILVER)

Meter panel
RAH-826

Display panel
RAH-820 (BLACK)
RAH-852 (SILVER)

Front panel
RAH-819 (BLACK)
RAH-851 (SILVER)

Slide knob L
(REC LEVEL)
AAE1011 (BLACK)
AAE1026 (SILVER)

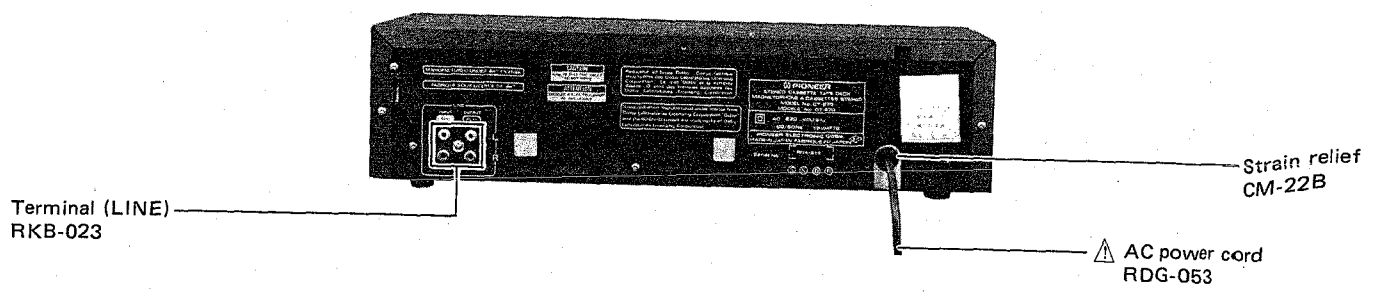
Phone jack with switch (MIC)
RKN-087
(RKN-092)

Knob (DOLBY NR, dbx)
RAC-577

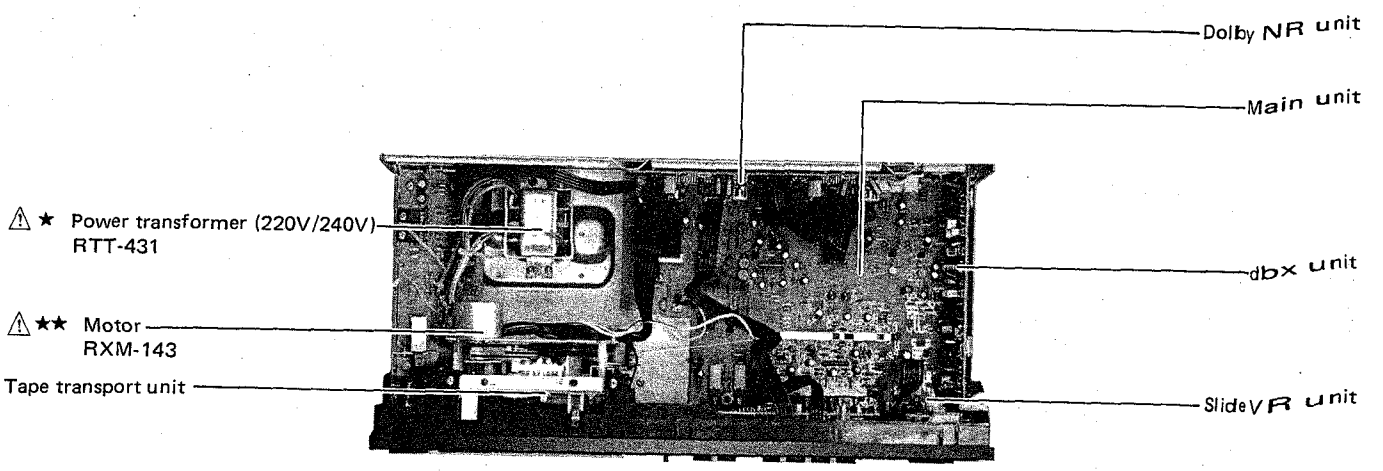
Knob (TAPE SELECTOR)
RAC-577

Knob (PAUSE)
RAC-649 (BLACK)
RAC-643 (SILVER)

Rear Panel View



Top View



5. 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 × 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 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 × 10¹*	*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 marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Main unit	Non supply
	Dolby NR unit	Non supply
	Power supply unit	Non supply
	Indicator unit	Non supply
	Slide VR unit	Non supply
	Transistor (A) unit	Non supply
	Transistor (B) unit	Non supply
	dbx unit	Non supply

OTHERS

Mark	Symbol & Description	Part No.
⚠ ★	T1 Power transformer (AC220V, 240V)	RTT-431
⚠	AC power cord	RDG-053
	Strain relief (for AC power cord)	CM-22B
	Tape counter	RAW-211
★★	Motor	RXM-143 or 144
★★	REC/PB head	RPB-122
★	Erase head	RPB-127
★★	S1 Lever switch (Play)	RSN-034
★★	S2 Spring switch (FF/REW)	RSN-035
★★	FU1 Fuse (T630mA, 250V)	REK-061

Main Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101	M5220L
★★	IC103	M5218L
★★	Q105, Q108, Q205, Q208	2SJ103
★★	Q106, Q107, Q206, Q207	2SK246
★★	Q303	2SC1741
★★	Q102, Q104, Q109, Q110, Q202, Q204, Q209, Q210, Q304, Q305, Q307, Q308	2SC1740S
★★	Q301, Q302	2SC1815
★★	Q306, Q300	2SA933S
⚠ ★	D303	RD15FB1
★	D301	MTZ3.9A (RD3.9EB1)
★	D302, D304 – D313	1SS254

SWITCHES

Mark	Symbol & Description		Part No.
★★	S301	Slide switch (REC/PLAY SELECT)	RSH-075
★★	S302–S305	Push switch assembly (NOISE REDUCTION, dbx, DOLBY NR B/C)	RSG-169
★★	S306, S307	Push switch (TAPE SELECT)	RSG-166

COILS

Mark	Symbol & Description		Part No.
	L301	OSC coil	RTD-041
	L101, L201	Trap coil	RTF-152
	L302	Line coil	RTF-101
	L102, L202	Peaking coil (12mH)	RTF-129

CAPACITORS

Mark	Symbol & Description	Part No.
	C318	CEAS221M16
	C309, C313	CEAS101M25
	C105, C205, C310, C319, C321, C327	CEAS330M16
	C304, C305, C314, C316	CEAS220M16
	C109, C117, C120, C121, C124, C209, C217, C220, C221, C224, C315, C317, C326, C300	CEAS100M16
	C323, C328	CEAS4R7M50
	C104, C204,	CEANL100M16
	C112, C116, C122, C212, C216, C222, C312, C322	CEAS010M50
	C113, C213	CEJAR15M50
	C329	CEAS2R2M50
	C119, C219	CQMA681K50
	C118, C218	CQMA822J50
	C110, C210	CQMA153J50
	C106, C206	CCDSL101J50
	C108, C111, C208, C211, C226, C126	CKDYB471K50
	C101, C201	CCDSL101K500
	C306, C308	CKDYX332K25
	C115, C215	CKDYX562K25
	C102, C202	CKDYX182K25
	C114, C214, C311	CKDYX682K25
	C107, C207, C307	CKDYX103K25
	C324, C325	CKDYX473K25
	C302	CQPA103J100
	C103, C203	CQSA471J50

RESISTORS

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

Mark	Symbol & Description	Part No.
★	VR101, VR102, VR201, VR202 Semi-fixed (22k)	VRTB6VS223
★	VR103, VR203 Semi-fixed (150k)	VRTB6VS154
⚠	R306, R312	RD1/2PMF561J
	R101, R105 – R111, R139 – R141, R201, R205 – R211, R218, R223, R239, R240, R241, R301, R305, R307, R326, R329, R334, R335, R338	RD1/4PM□□□J
	Other resistors	RD1/6PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	S101, S201 Phone jack with switch (MIC)	RKN-087 (RKN-092)
	Terminal (LINE)	RKB-023
	Connector 8P	RKP-590

Dolby NR Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC401, IC501	AN7370K

COILS & FILTERS

Mark	Symbol & Description	Part No.
	F401, F501 MPX filter	RTF-138
	L403, L503 Trap coil	RTF-153
	L402, L502 Coil (36mH)	RTF-155

CAPACITORS

Mark	Symbol & Description	Part No.
	C404, C504	CEAS471M16
	C421, C521	CEAS330M16
	C403, C413, C418, C419, C503, C513, C518, C519, C523	CEAS100M16
	C401, C402, C501, C502	CEAS010M50
	C410, C510	CEJAR47M50
	C522	CEAS102M16
	C409, C509	CEJAR33M50
	C411, C511	CEJAR15M50
	C408, C508	CEJAR10M50
	C414, C514	CKDYX472K25
	C416, C516	CQMA822J50
	C406, C506	CKDYX103K25
	C412, C417, C512, C517	CKDYX273K25
	C407, C415, C507, C515	CKDYX333K25
	C405, C505	CKDYX182K25
	C420, C520	CCDSL101J50
	C424, C524	CKDYB471K50

RESISTORS

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

Mark	Symbol & Description	Part No.
	R516	RD1/4PM103J
	Other resistors	RD1/6PM□□□J

Power Supply Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠ ★	D601	1B2Z1-LC2
⚠ ★	D602	1B2C1-LC2
⚠ ★	D604, D605	MTZ13A/B (RD13EB1/2)
⚠ ★	D603	1SR35-100A

SWITCH

Mark	Symbol & Descripton		Part No.
⚠★★	S601	Push switch (POWER)	RSA-063

CAPACITORS

Mark	Symbol & Description	Part No.
	C605	CEA102M35
	C608	CEAS471M16
	C606, C607	CEAS101M25
	C603, C604	CEAS470M16
	C609	CKDYX473K25
⚠	C601 Ceramic (0.01/AC400V)	RCG-009 (VCG-044)

RESISTORS

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

Mark	Symbol & Description	Part No.
⚠	R601, R602	RD1/2PMF □□□J
	R603	RD1/4PM561J

Indicator Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q701	IR2E27A
★	D701, D704, D709–D714 LED (dbx, REC, LEVEL)	SEL4214S
★	D705–D708, D715, D716 LED (LEVEL)	SEL4914A-X/Y
★	D702, D703 LED (DOLBY NR B/C)	SEL4414E

CAPACITORS

Mark	Symbol & Description	Part No.
	C701, C702	CEA330M16
	C703	CKDYX473K25

RESISTORS

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

Mark	Symbol & Description	Part No.
	All resistors	RD1/6PM □□□J

Slide VR Unit

RESISTOR

Mark	Symbol & Description		Part No.
★	VR801	Variable resistor (REC LEVEL, 100kΩ)	RCW-016

Transistor (A) Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠★★	Q1001	2SD1265

Transistor (B) Unit

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
⚠★★	Q1101	2SD1265

dbx Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC913	AN6291
★★	IC914	M5218L
★★	Q901 – Q912, Q915, Q919	2SC1740SLN
★★	Q916 – Q918	2SA933S
⚠ ★	D903	RD5.6EB1 (RD5.6EB2) (MTZ5.6A) (MTZ5.6B)
★	D901, D902	1SS254

CAPACITORS

Mark	Symbol & Description	Part No.
	C946	CEAS101M16
	C947	CEAS331M10
	C939, C940, C945	CEAS330M16
	C925, C926, C948	CEAS470M10
	C929, C930, C936, C943, C944	CEAS100M16
	C949	CEAS4R7M50
	C935, C937, C938	CEAS010M50
	C917, C918 Electrolytic (10/16, NL)	RCH-069 (RCH-070)
	C919, C920 Electrolytic (0.68/50)	RCH-073
	C913, C914	CEAR33M50
	C901, C902	CEAR22M50
	C941, C942	CCDSL181J50
	C903 – C906	CQMA104J50
	C915, C916	CQMA333J50
	C923, C924, C933, C934	CQMA223J50
	C927, C928	CQMA472J50
	C907, C908, C909, C910	CQMA332J50
	C921, C922	CQSA471J50
	C931, C932	CQSA391J50
	C911, C912	CQSA331J50

RESISTORS

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

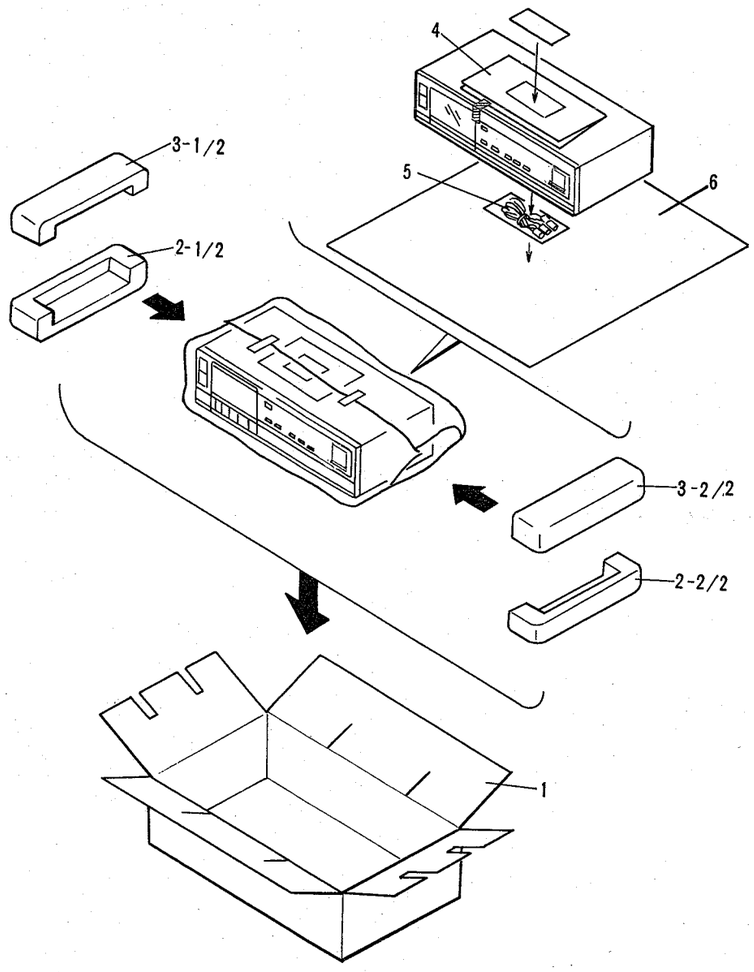
Mark	Symbol & Description	Part No.
★	VR901 Semif-fixed (2.2k)	VRTB6VS222
	R912, R914, R916, R942, R957 – R959	RD1/4PM □□□J
	Other resistors	RD1/6PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Connector socket 8-P	RKP-602

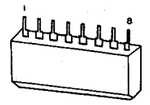
6. PACKING

Mark	No.	Part No.	Description
	1	RHG-881	Packing case (BLACK)
		RHG-894	Packing case (SILVER)
	2	RHA-274	Pad A
	3	RHA-275	Pad B
	4	RRE-089	Operating instructions (English/German/French/Italian)
	5	RDE-010	Connection cord
	6	RHC-1003	Styrene paper

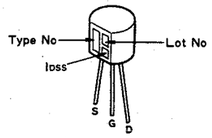


External Appearance of Transistors and ICs

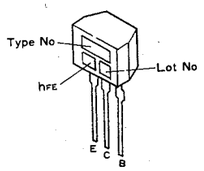
M5220L
M5218L



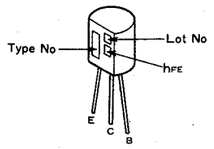
2SJ103
2SK246



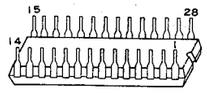
2SA933S
2SC1740S
2SC1740SLN



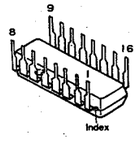
2SC1815



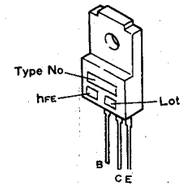
AN7370K



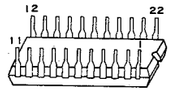
IR2E27A



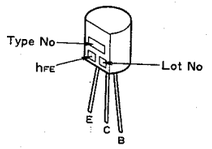
2SD1265



AN6291

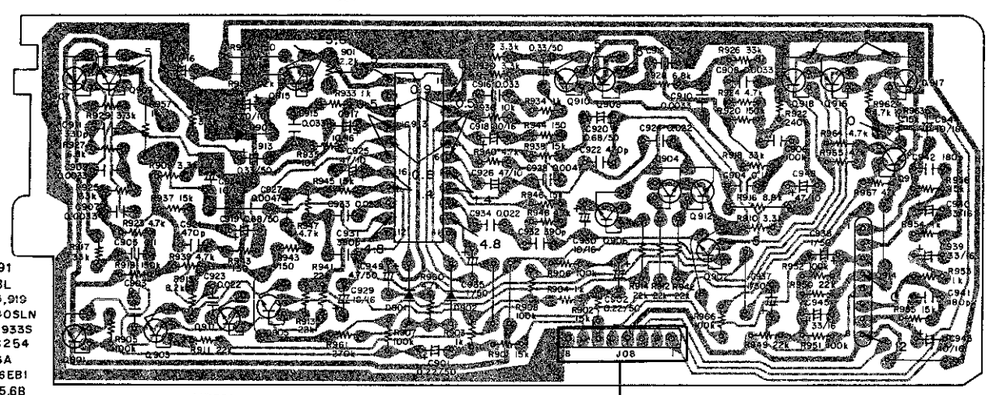


2SC1741



7. P.C.BOARDS CONNECTION DIAGRAM

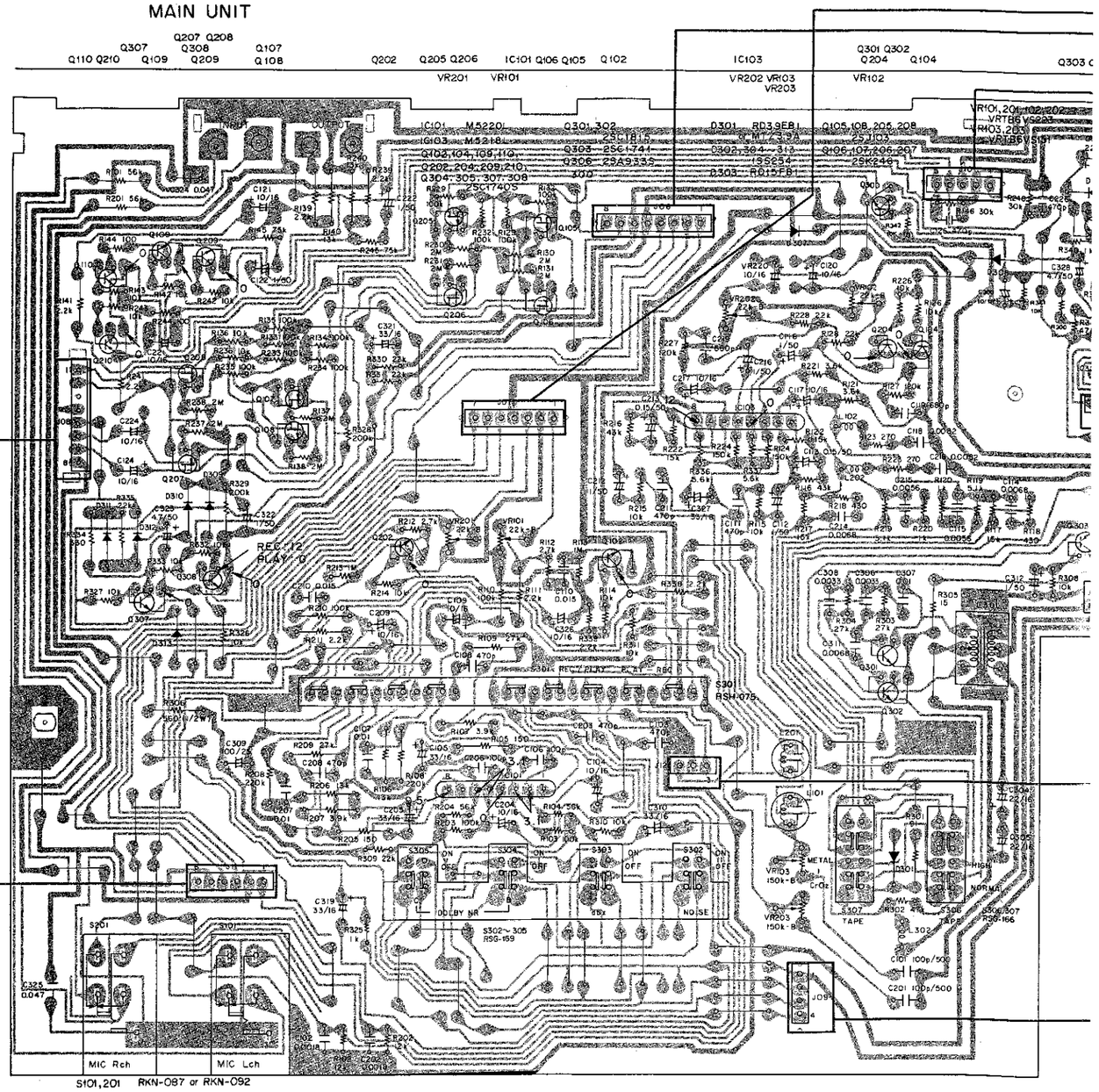
dbx UNIT



IC913 AN6291
IC914 M5218L
Q901 ~ 912, 915, 919
2SC1740SLN
Q916~918 2SA933S
D901, 902 1SS254
D903 MTZ5.6A
or RD5.6EB1
or MTZ5.6B
or RD5.6EB2

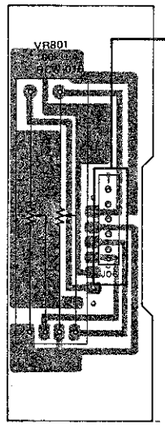
VR901 VRT86VS222

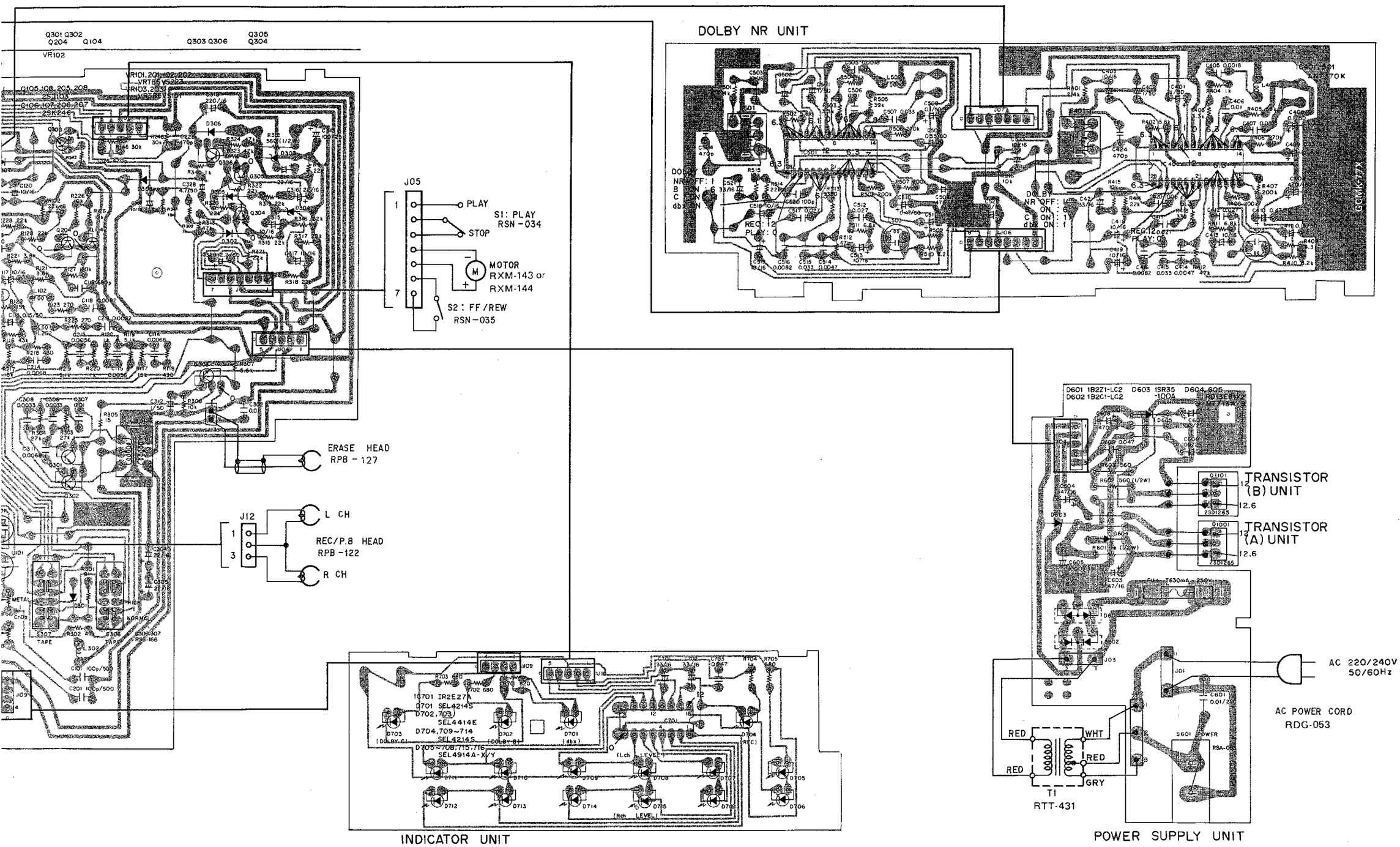
MAIN UNIT



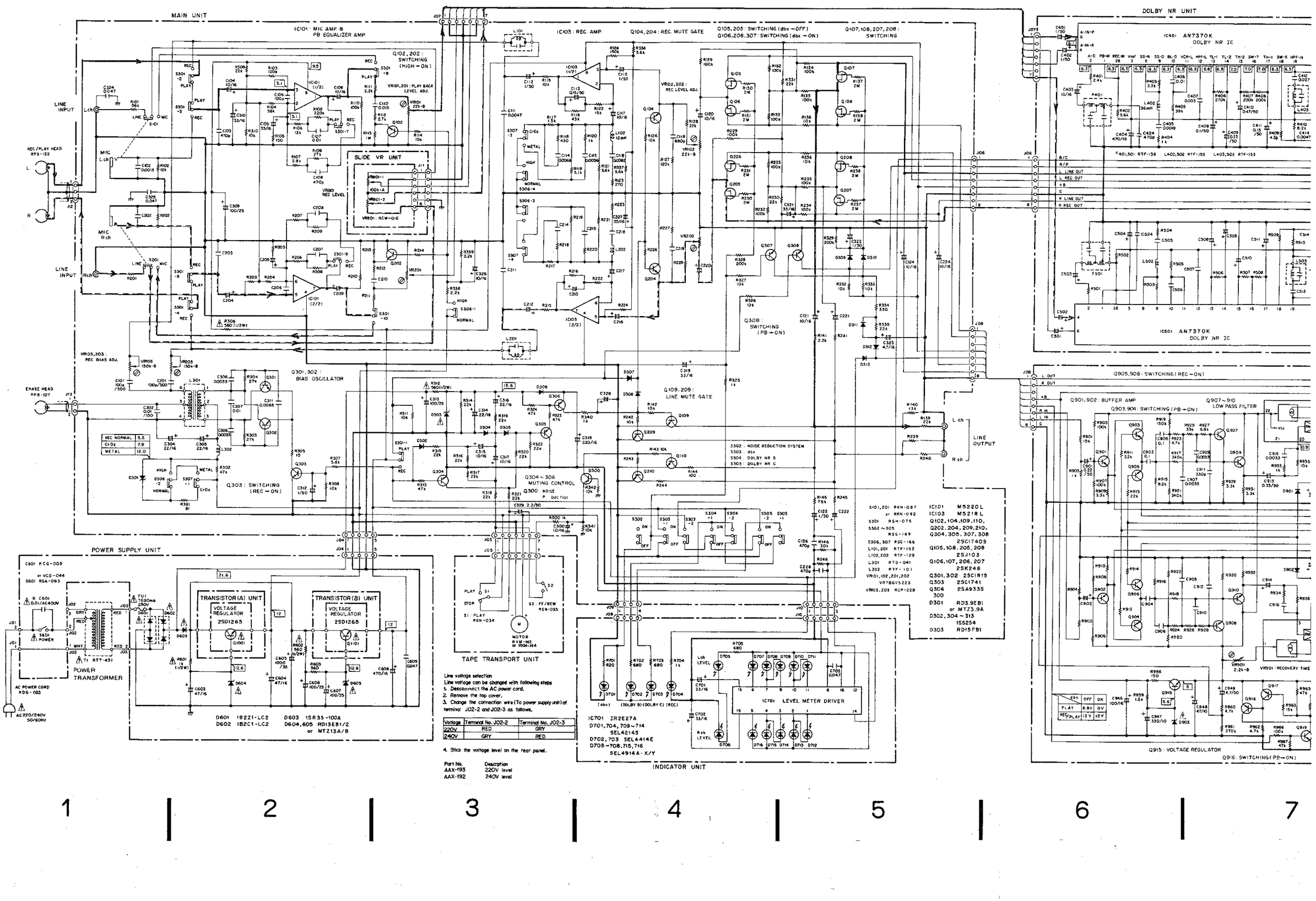
S101,201 RKN-087 or RKN-092

SLIDE VR UNIT




DOLBY NR UNIT
J05
PLAY
STOP
S1: PLAY
RSN-034
MOTOR
RXM-143 or
RXM-144
S2: FF/REW
RSN-035
ERASE HEAD
RPB-127
J12
L CH
REC/P.8 HEAD
RPB-122
R CH
INDICATOR UNIT
TRANSISTOR
(B) UNIT
TRANSISTOR
(A) UNIT
AC 220/240V
50/60Hz
AC POWER CORD
RDG-053
RED
WHT
RED
RED
GRY
T1
RTT-431
POWER SUPPLY UNIT

8. SCHEMATIC DIAGRAM



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

1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M): ±20% tolerance

2. CAPACITORS:
Indicated in capacity (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

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:

TAPE TRANSPORT UNIT

S1 : PLAY	PLAY — STOP
S2 : FF/REW	FF/REW — OFF

MAIN UNIT

S101 : INPUT SELECTOR (Lch)	MIC — LINE
S201 : INPUT SELECTOR (Rch)	MIC — LINE
S301 : REC PLAY SELECTOR	REC — PLAY
S302 : NOISE REDUCTION SYSTEM	ON — OFF
S303 : dbx	ON — OFF
S304 : DOLBY NR B	ON — OFF
S305 : DOLBY NR C	ON — OFF
S306 : TAPE SELECTOR	HIGH — NORMAL
S307 : TAPE SELECTOR	METAL — CrO2

POWER SUPPLY UNIT

S601 : POWER	ON — OFF

The underlined indicates the switch position.

NOTE :
Playback signal route ——— (Lch)
Recording signal route - - - - (Rch)

9. EXPLODED VIEW

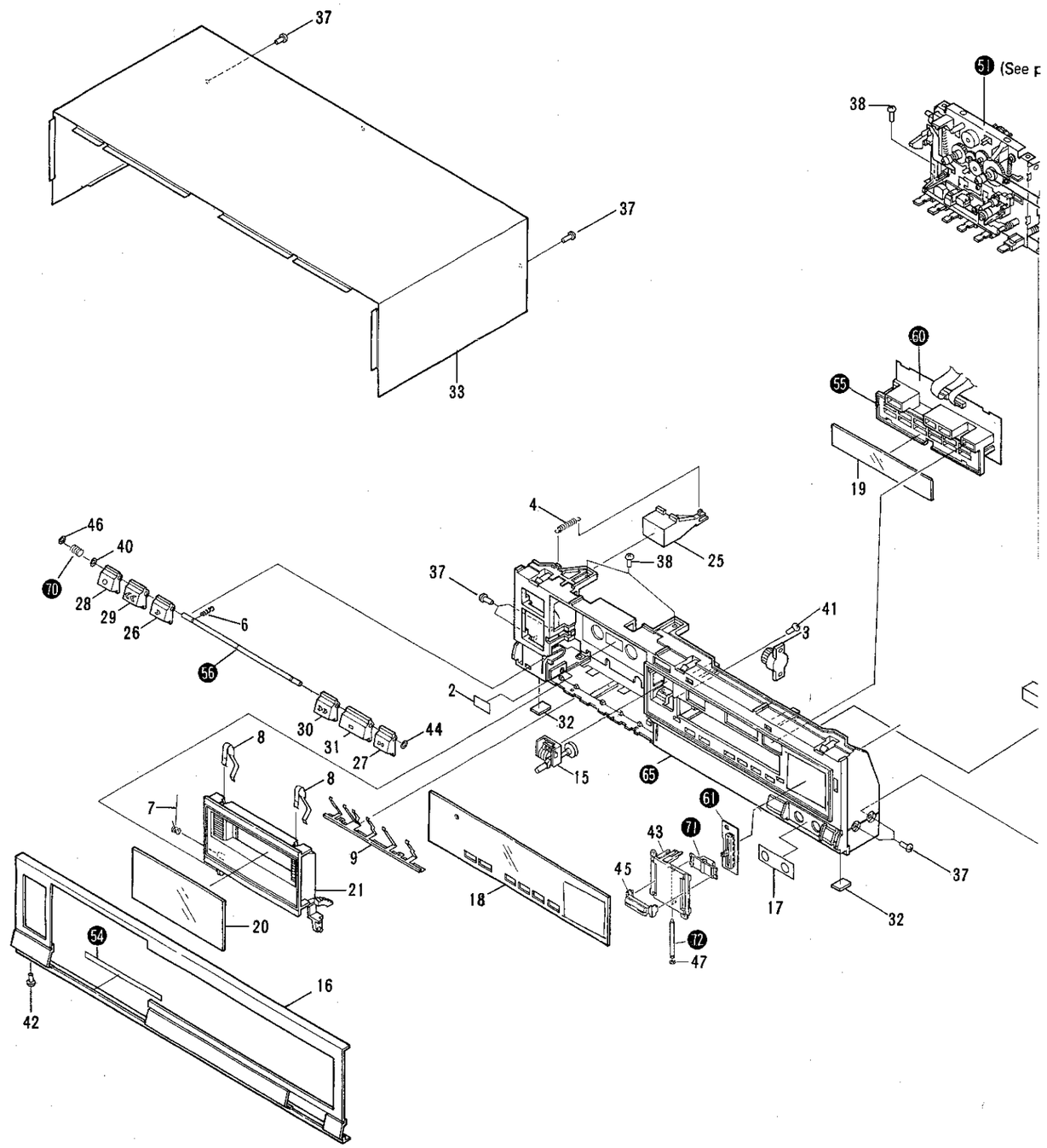
NOTES:

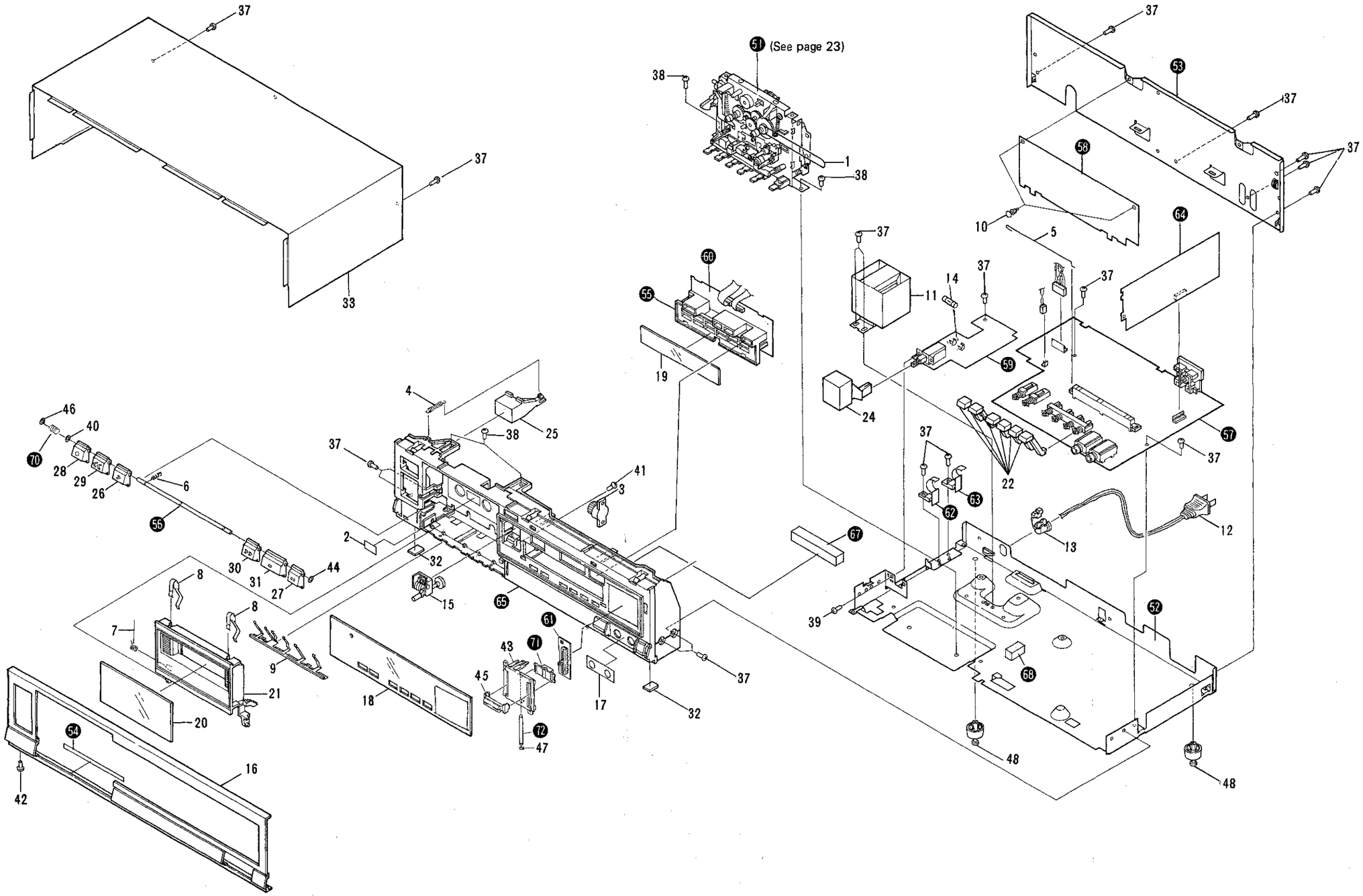
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Parts List

Mark	No.	Part No.	Description
★★	1	REB-468	Counter belt
	2	REE-113	Remain display paper
	3	REC-436	Door damper
	4	RBL-137	Eject spring
	5	RBL-123	REC Joint
	6	RBL-124	Grounding spring (Only silver type)
	7	RBL-125	Door spring
	8	RBK-177	Hold spring
	9	RNH-433	Knob spring
	10	RBM-003	Nylon rivet
⚠ ★	11	RTT-431	Power transformer (AC220V/240V, T1)
⚠	12	RDG-053	AC Power cord
⚠	13	CM-22B	Strain relief
⚠ ★★	14	REK-061	Fuse (T630mA: FU1)
	15	RAW-211	Tape counter
	16	RAH-819	Front panel (BLACK)
		RAH-851	Front panel (SILVER)
	17	RAH-827	Jack label (BLACK)
		RAH-858	Jack label (SILVER)
	18	RAH-820	Display panel (BLACK)
		RAH-852	Display panel (SILVER)
	19	RAH-826	Meter panel
	20	RAH-823	Door panel (BLACK)
		RAH-855	Door panel (SILVER)
	21	RNM-180	Door (BLACK)
		RNM-261	Door (SILVER)
	22	RAC-577	Knob (DOLBY NR, TAPE SELECTOR, dbx)
	23	.....	.....
	24	RAC-715	Knob (POWER)(BLACK)
		RAC-765	Knob (POWER)(SILVER)
	25	RAC-717	Knob (EJECT)(BLACK)
		RAC-767	Knob (EJECT)(SILVER)
	26	RAC-648	Knob (PLAY)(BLACK)
		RAC-642	Knob (PLAY)(SILVER)
	27	RAC-649	Knob (PAUSE)(BLACK)
		RAC-643	Knob (PAUSE)(SILVER)
	28	RAC-650	Knob (REC)(BLACK)
		RAC-644	Knob (REC)(SILVER)
	29	RAC-651	Knob (REW)(BLACK)
		RAC-645	Knob (REW)(SILVER)
	30	RAC-652	Knob (FF)(BLACK)
		RAC-646	Knob (FF)(SILVER)

Mark	No.	Part No.	Description
	31	RAC-653	Knob (STOP)(BLACK)
		RAC-647	Knob (STOP)(SILVER)
	32	REB-513	Skid
	33	RNA-813	Bonnet case (BLACK)
		RNA-386	Bonnet case (SILVER)
	37	BBZ30P080FMC	Screw 3 x 8
	38	BBZ30P060FMC	Screw 3 x 6
	39	PMA30P060FMC	Screw 3 x 6
	40	YE25FUC	Washer E-type
	41	ARZ26P060FMC	Screw 2.6 x 6
	42	BBT30P100FZK	Screw
	43	RNM-181	Slide base (BLACK)
		RNM-262	Slide base (SILVER)
	44	RBF-073	Washer
	45	AAE1011	Slide knob L (REC LEVEL) (BLACK)
		AAE1026	Slide knob L (REC LEVEL) (SILVER)
	46	WC30FMC	Washer
	47	YE30FUC	E-ring
	48	REC-434	Leg assembly
	51		Tape transport unit
	52		Chassis
	53		Rear panel
	54		.....
	55		LED holder
	56		Knob shaft
	57		Main unit
	58		Dolby NR unit
	59		Power supply unit
	60		Indicator unit
	61		Slide VR unit
	62		Transistor (A) unit
	63		Transistor (B) unit
	64		dbx Unit
	65		Panel stay
	66		.....
	67		Cushion
	68		Cushion
	69		.....
	70		Pause button spring
	71		Slider
	72		Shaft

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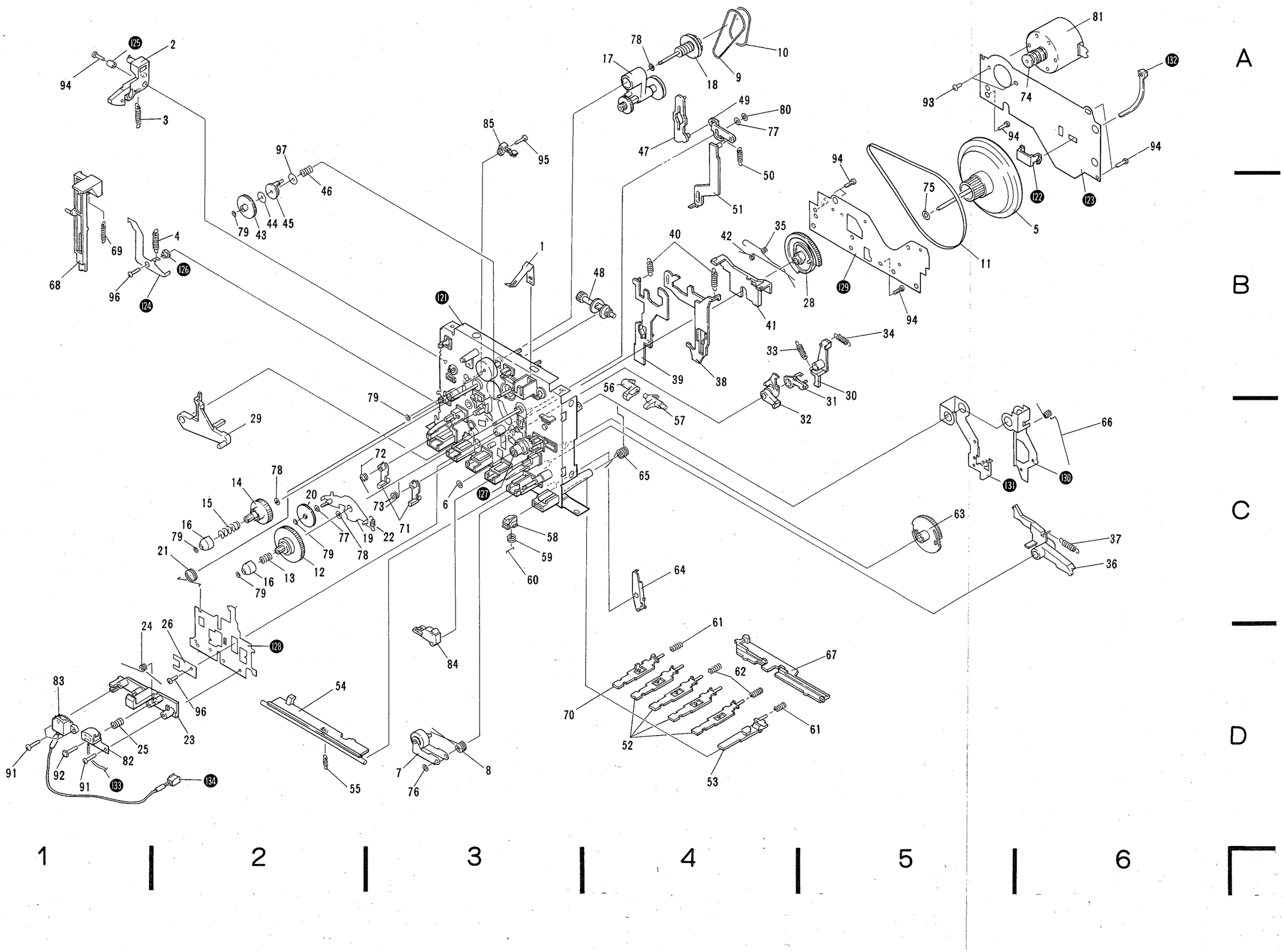
Tape Transport Unit



10. ADJUSTMENTS

10.1 MECHANICAL ADJUSTMENTS

Prior to Adjustment

Clean the both reel base, the capstan and the pinch roller with an alcohol moistened swab.

Pinch Roller Pressure Adjustment

1. Put the tape deck into the playback mode.
2. Gently push against the pinch roller arm with the tension gauge and separate the pinch roller slightly from the capstan.
3. Then the pinch roller back onto the capstan, and read the value when the pinch roller starts to rotate. If the reading fails to lie within 300g ~ 500g, replace the pinch pressure spring.

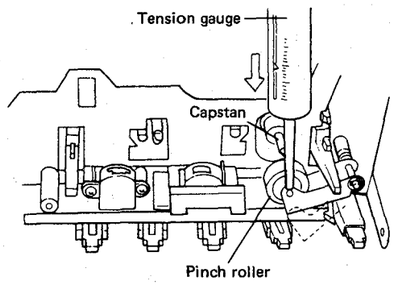


Fig. 10-1 Pinch roller pressure adjustment

Reel Base Torque Adjustment

Measure the torque with the torque meter during playback, fast forward (FF) and rewind (REW) modes. The measured values should normally lie within the allowably ranges listed in the table 1.

If the measured values lie outside the relevant ranges, replace the TU (take-up) reel base assembly and/or supply reel base assembly, TU idler, or drive arm full assembly.

Table 1

	TU reel base	Supply reel base
Playback mode	38 – 57g.cm	* 1.5 – 5g.cm
FF mode	75 – 135g.cm	* 1.5 – 5g.cm
REW mode	* 1.5 – 5g.cm	75 – 135g.cm

**Denotes back tension torque.*

Tape Speed Adjustment

1. Connect the frequency counter to the DOL.L terminal on the deck assembly.
2. Playback the 3kHz portion of the STD-301 test tape. At the beginning, the frequency should be lie within the 3000Hz~3010Hz range, and may be adjusted by turning the semi-fixed resistor located in the capstan motor adjustment hole as shown in Fig. 10-2.

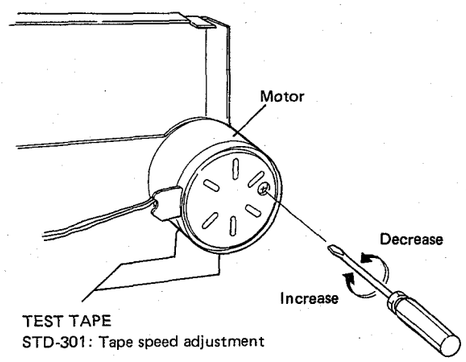


Fig. 10-2 Tape speed adjustment

REC Joint Check and Adjustment

Move the REC joint mechanism catching position if the slide switch is not fully switched when the tape transport unit is in recording mode.

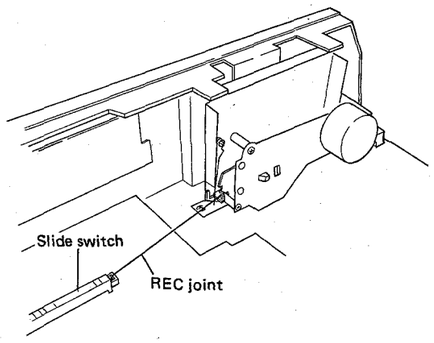


Fig. 10-3 REC joint check and adjustment

10-2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Allow the deck to age for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0dB=1Vrms.
5. Connect a 50 kilo-ohm (or between 47 to 52 kilo-ohm) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD-331B : Playback adjustments (See Fig. 10-4)
STD-608A : NORMAL blank tape
STD-620 : CrO_2 blank tape
STD-610 : METAL blank tape

List of Adjustments

1. Head azimuth adjustment.
2. Playback equalizer check.
3. Playback time constant switching check.
4. Playback level adjustment.
5. Level meter check.
6. Recording and playback frequency repsonse adjustment.
7. Recording level adjustment.
8. Recovery time adjustment

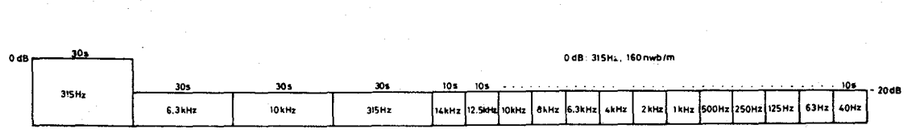


Fig. 10-4 Contents of the test tape STD-331B

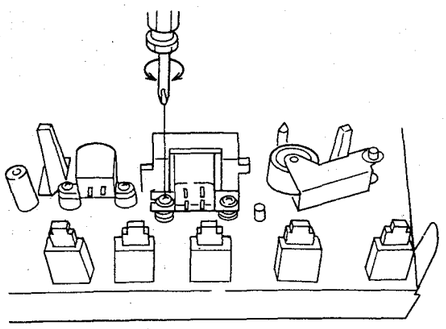


Fig. 10-5 Head azimuth adjustment

Test tape	STD-331B
Tape selector	NORM
DOLBY NR switch	OFF

• Due to "edge effect", compensate the right changed by –1dB at 63Hz.

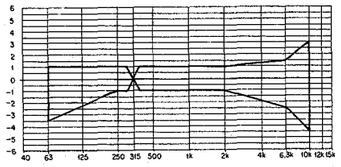


Fig. 10-6 Allowable playback frequency response zone

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.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Parts List of Tape Transport Unit

Mark	No.	Part No.	Description
	1	RBK-166	Half set spring
	2	RNM-003	Eject lever
	3	RBL-106	Return spring
	4	RBL-103	Stopper return spring
	5	RXC-065	Flywheel assembly
	6	RBF-030	Oil stopper washer
★★	7	RXC-156	Pinch arm assembly
	8	RBL-162	Pinch pressure spring
★★	9	REB-530	Drive belt A
★★	10	REB-531	Drive belt B
★★	11	REB-529	Capstan belt
★★	12	RXC-078	TU reel base assembly
	13	RBL-132	Hub spring A
★★	14	RNL-988	Supply reel base
	15	RBL-105	Hub spring B
	16	RNL-984	Hub
	17	RXC-079	Drive arm assembly
	18	RXC-068	Drive pulley assembly
	19	RXC-155	Gear arm assembly
	20	RNM-106	Idler gear
	21	RBL-163	HB return spring
	22	RBL-114	Detector arm spring
	23	RNM-138	Sub-head base
	24	RBL-219	HB drive spring
	25	RBH-723	Head adjust spring
	26	RBK-192	HB hold spring
	27	.....	.....
	28	RNM-078	Cam gear
	29	RNM-007	Action lever
	30	RNM-008	Gear lever A
	31	RNM-009	Gear lever B
	32	RNM-010	Gear lever C
	33	RBL-119	Gear lever spring A
	34	RBL-151	Gear lever spring B
	35	RBL-131	Trigger spring
	36	RNM-011	Pause lever
	37	RBH-880	Pause lever spring
	38	RNM-012	FF action plate
	39	RNM-013	REW action plate
	40	RBL-110	Action plate spring
	41	RNM-014	Brake plate
	42	RBL-120	Brake spring
	43	RNK-998	Idler gear
	44	RED-194	Detector felt
	45	RNL-318	Detector disk
	46	RBH-885	Detector spring
	47	RNM-015	Detector lever
	48	RNL-322	Cam gear
	49	RNL-275	Link
	50	RBH-886	Link return spring
	51	RNM-016	Stop lever
	52	RNM-017	Operation button
	53	RNM-018	Pause button
	54	RNM-019	Lock plate
	55	RBL-111	Lock plate spring
	56	RNM-020	Joint L
	57	RNM-021	Joint R
	58	RNL-334	Ratchet holder
	59	RBH-888	Ratchet spring
	60	RBL-169	Ratchet pin
	61	RBL-158	Pause button spring A
	62	RBH-889	Button return spring
	63	RNL-831	Cam gear R
	64	RNM-022	Gear lever R
	65	RBL-112	Trigger spring R
	66	RBL-113	REC action spring
	67	RNM-023	REC joint arm
	68	RNM-024	REC detector arm
	69	RBL-114	Detector arm spring
	70	RNM-025	REC button
	71	RNL-285	HB lock lever
	72	RBL-117	Lock lever spring L
	73	RBH-908	Lock lever spring R
	74	RNM-026	Motor pulley
	75	WA026D047D025	Washer
	76	RBF-083	Washer
	77	WA021D040D025	Washer
	78	RBF-071	Washer
	79	RBF-076	Washer
	80	YS20FBT	Washer CS-type
★★	81	RXM-143 or RXM-144	Motor
★★	82	RPB-122	REC/PB head
★	83	RPB-127	Erase head
★★	84	RSN-034	Lever switch (PLAY, S1)
★★	85	RSN-035	Spring switch (FF/REW, S2)

Mark	No.	Part No.	Description
	91	PMZ20P120FMC	Screw 2 x 12
	92	IMZ20Y120FMC	Screw 2 x 12
	93	BMZ26P030FMC	Screw 2.6 x 3
	94	BBZ26P080FZK	Screw 2.6 x 8
	95	BBZ20P080FMC	Screw 2 x 8
	96	BBZ26P100FMC	Screw 2.6 x 10
	97	RBF-081	Washer
	121		Chassis
	122		Thrust receptacle
	123		Flywheel receptacle
	124		Eject stopper
	125		Collar A
	126		Collar B
	127		Metal holder assembly
	128		Head base
	129		Plate
	130		REC action lever
	131		REC action plate
	132		Binder
	133		Connector assembly 3-p
	134		Connector assembly 2-p

- Set the DOLBY NR switch to the OFF position.

1. Head Azimuth Adjustment
- Turn VR101 and VR201 to maximum position (fully clockwise).

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 10kHz/–20dB section of the STD-331B test tape.	Head azimuth adjustment screw. (See Fig. 10-5)	Left and right OUTPUT terminals.	Maximum playback signal level.	
3	STOP	Lock the screw with screw lock after completing the adjustment.				

2. Playback Equalizer Check

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 315Hz/–20dB and 6.3kHz/–20dB section of the STD-331B test tape.	Confirm	Left and right OUTPUT terminals.	The 6.3kHz playback level is –0.5±2dB against 315Hz level.	

3. Playback Time Constant Switching Check
- Put the deck into playback mode with no cassette loaded.
- Check that the noise level changes at the line playback output terminals when the chrome detector switch in the top of the tape transport unit is switched on and off.

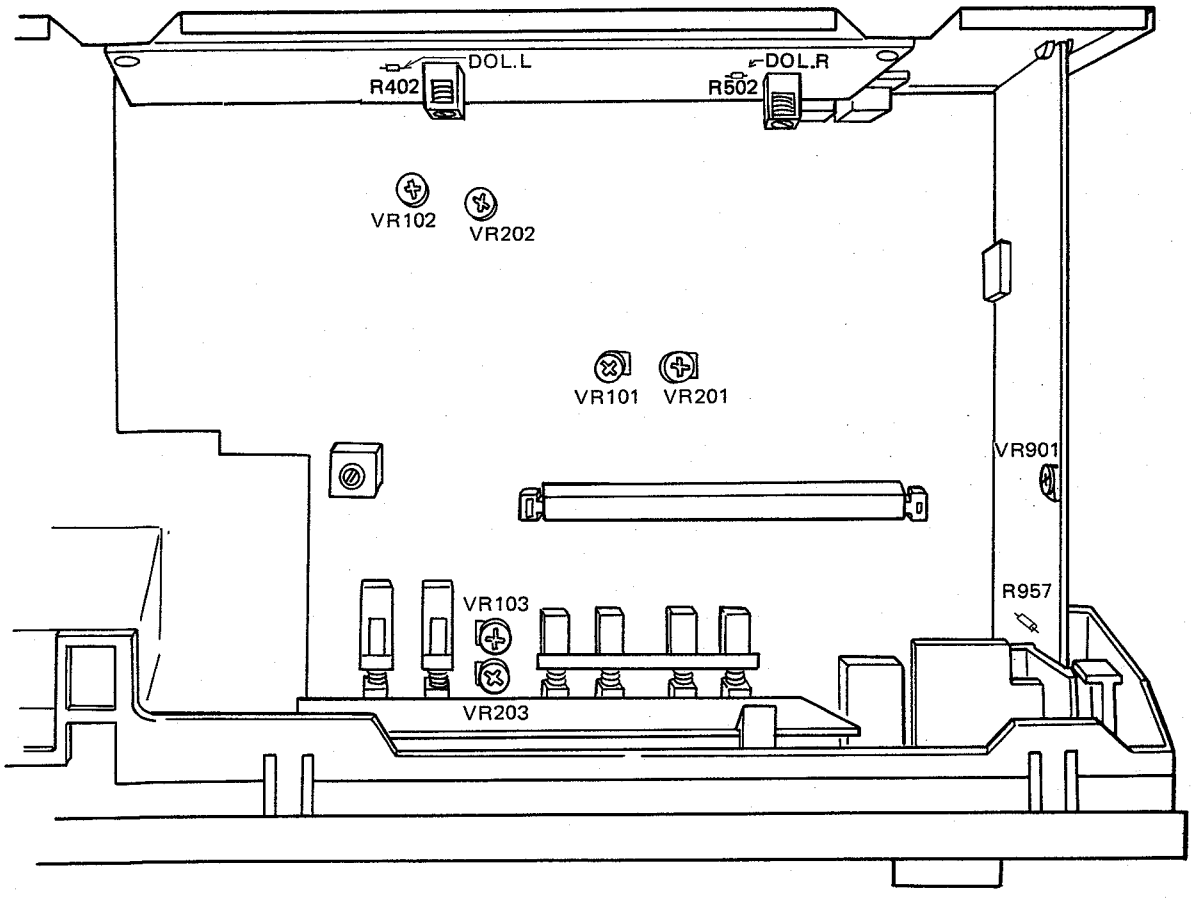


Fig. 10-7 Adjustments locations

4. Playback Level Adjustment

• This adjustment determines the DOLBY NR level, and must be performed with great care.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 315Hz/0dB section of the STD-331B test tape.	VR101 (Left channel) VR201 (Right channel)	TP.DOL L (L ch.) TP.DOL R (R ch.)	−17.9dBv (127.3mV)	

5. Level Meter Check

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	REC-PAUSE	Apply a 315Hz/−10dBv (316mV) signal to the LINE INPUT terminals.	REC LEVEL control	TP.DOL L (L ch.) TP.DOL R (R ch.)	Check that the level meters "0dB" light up within −17.9dBv ± 1.8dB of the signal output level.	

6. Recording and Playback Frequency Response Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	REC-PAUSE	Apply a 315Hz/−30dBv (31.6mV) signal to the LINE INPUT terminals.	REC LEVEL control	TP.DOL L (L ch.) TP.DOL R (R ch.)	−37.9dBv (12.7mV)	
3	REC/PLAY	Record the above signal level onto the STD-608A test tape at 315Hz and 6.3kHz, and playback.	VR103 (Left channel) VR203 (Right channel)	Left and right OUTPUT terminals.	The 6.3kHz playback level is 0dB against 315Hz level (Playback the signals recorded on the STD-608A)	
4		Change the test tape, tape selector and DOLBY NR switch positions, and check that the frequency response is satisfactory (See Fig. 10-8). If the response does not lie within the specified range, readjust VR103 and VR203 that the 6.3kHz playback level is +1 ~ −0.5dB against 315Hz level in the step 3.				

7. Recording Level Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	REC-PAUSE	Apply a 315Hz/−10dBv (316mV) signal to the LINE INPUT terminals.	REC LEVEL control	TP.DOL L (L ch.) TP.DOL R (R ch.)	−17.9dBv (127.3mV)	
3		Set the DOLBY NR switch to the ON position.				
4	REC/PLAY	Record the above signal level onto the STD-608A test tape, and playback.	VR102 (Left channel) VR202 (Right channel)	TP.DOL L (L ch.) TP.DOL R (R ch.)	−17.9dBv (127.3mV)	
5		Set the TAPE SELECTOR switch to the CrO_2 position.				
6		Record the above signal onto the STD-620 test tape, and playback.	Confirm	TP.DOL L (L ch.) TP.DOL R (R ch.)	−17.9dBv ± 1.5dB	
7		Set the TAPE SELECTOR switch to the METLAL position.				
8		Record the above signal onto the STD-610 test tape, and playback.	Confirm	TP.DOL L (L ch.) TP.DOL R (R ch.)	−17.9dBv ± 1.5dB	

8. Recovery Time Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
	STOP	.....	VR901	Both ends of R957	DC 15mV	

Test Tape: STD-608A
TAPE SELECTOR: NORM

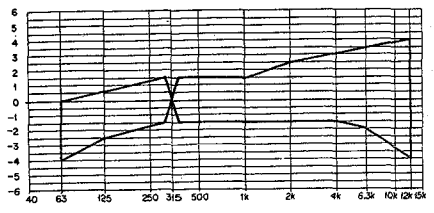
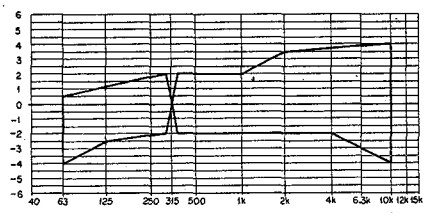
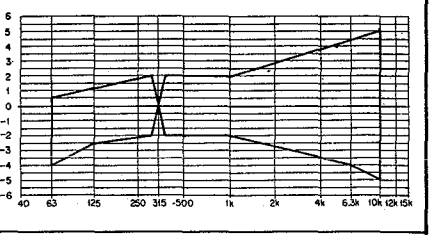
DOLBY NR: OFF	DOLBY NR: B-TYPE ON	DOLBY NR: C-TYPE ON
		

Fig. 10-8-1 Allowable recording and playback frequency response zone (NORM)

Test Tape: STD-620
TAPE SELECTOR: CrO_2

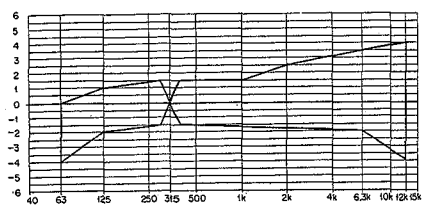
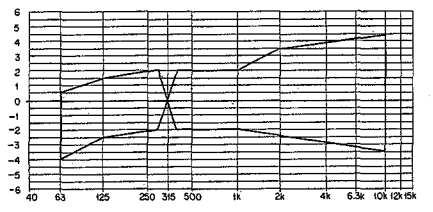
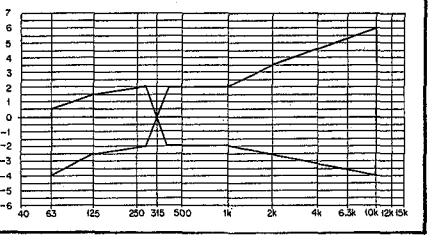
DOLBY NR: OFF	DOLBY NR: B-TYPE ON	DOLBY NR: C-TYPE ON
		

Fig. 10-8-2 Allowable recording and playback frequency response zone (CrO_2)

Test Tape: STD-610
TAPE SELECTOR: METAL

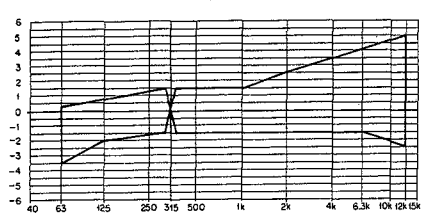
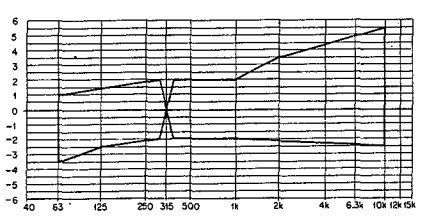
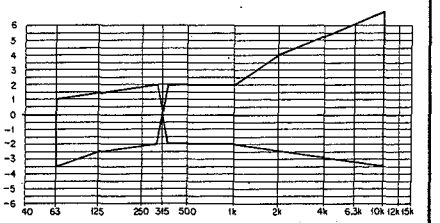
DOLBY NR: OFF	DOLBY NR: B-TYPE ON	DOLBY NR: C-TYPE ON
		

Fig. 10-8-3 Allowable recording and playback frequency response zone (METAL)

10. RÉGLAGE

10.1 RÉGLAGES DES MÉCANISMES

Avant de faire les réglages

Nettoyer les deux supports de bobine, le cabestan et le galet-presseur avec un bâtonnet imprégné d'alcool.

Réglage de pression du galet-presseur

1. Régler la platine-cassette en mode de lecture.
2. Repousser progressivement le bras supportant le galet-presseur à l'aide du tensiomètre et séparer légèrement le galet-presseur du cabestan.
3. Laisser revenir le galet-presseur contre le cabestan et interpréter la valeur indiquée dès que le galet-presseur commence à tourner. Si l'indication obtenue ne se trouve pas dans les limites de 300 à 500gr., remplacer le ressort du galet-presseur.

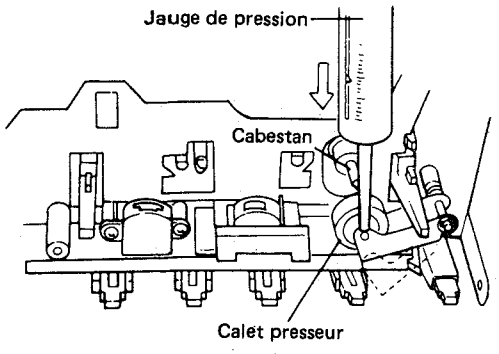


Fig. 10-1 Réglage de la force d'appui du galet-presseur

Réglage du couple de support de bobine

Mesurer le coupledu support de bobine à l'aide d'un couplemètre au cours des modes de lecture, avance rapide (FF) et de retour rapide (REW). Les valeurs relevées doivent normalement se trouver dans les limites admissibles qui sont indiquées dans le tableau 1.

Si les valeurs mesurées sont en-dehors de la gamme indiquée, remplacer l'ensamble support de bobine réceptrice (TU) et/or l'ensemble support de bobine débitrice, la poulie intermédiaire TU ou l'ensemble complet du bras d'entraînement.

Tableau 1

	Support de bobine débitrice	Support de bobine réceptrice
Mode de lecture	38 à 57 gr.cm	*1,5 à 5 gr.cm
Mode d'avance rapide	75 à 135 gr.cm	*1,5 à 5 gr.cm
Mode de retour rapide	*1,5 à 5 gr.cm	75 à 135 gr.cm

**Indiquent des valeurs de contre-tension.*

Réglage de la vitesse de défilement de la bande

1. Raccorder un fréquencemètre à la prise "DOL. L" de l'ensemble platine.
2. Lire le passage préenregistré de 3kHz de la bande d'étalonnage STD-301. Dès le début, la fréquence indiquée doit se trouver entre 3000 et 3010Hz, celle-ci pouvant être ajustée en tournant la résistance ajustable qui se trouve dans le trou de réglage du moteur d'entraînement du cabestan, comme représenté sur la figure 10.2.

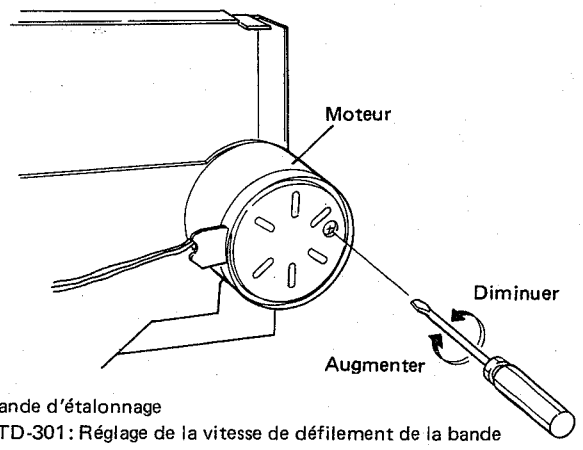


Fig. 10-2 Réglage de la vitesse de défilement de la bande

Réglage et vérification du raccord d'enregistrement (REC)

Déplacez la position d'arrêt du mécanisme du raccord d'enregistrement (REC) si le commutateur à curseur n'est pas complètement enclenché lorsque l'ensemble de transport de bande est placé en mode d'enregistrement.

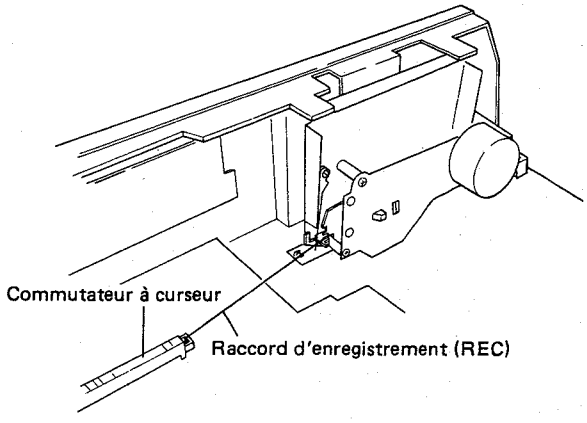


Fig. 10-3 Réglage et vérification du raccord d'enregistrement (REC)

10.2 RÉGLAGES ÉLECTRIQUES

Conditions nécessaires pour effectuer les réglages

1. Les réglages des mécanismes doivent avoir été faits avant.
2. La tête magnétique doit être propre et démagnétisée.
3. La platine-cassette doit avoir fonctionnée pendant quelques minutes avant de commencer les réglages électriques.
4. Le signal de référence est de 0dB=1V effi.
5. Raccorder une résistance de charge de 50 k-ohms (ou de 47 à 52 k-ohms) aux prises de sortie "OUTPUT".
6. A moins d'une indication contraire, les commutateurs mentionnés ci-dessous doivent se trouver dans la position indiquée.
   DOLBY NR : Sur OFF
   TAPE SELECTOR : Sur NORM

Bandes de mesure

STD-331B : Réglage de lecture (Fig. 10-4)
STD-608A : Bande vierge ordinaire (NORMAL)
STD-620 : Bande vierge au chrome (CrO_2)
STD-610 : Bande vierge au fer (METAL)

Liste des réglages à exécuter

1. Réglage d'azimut de tête magnétique
2. Contrôle de l'égaliseur de lecture
3. Vérification de la commutation de la constante temps d'enregistrement
4. Réglage de niveau de lecture
5. Contrôle de fonctionnement de décibelmètre
6. Calage de réponse en fréquence d'enregistrement et de lecture
7. Réglage du niveau d'enregistrement
8. Durée de rétablis sement

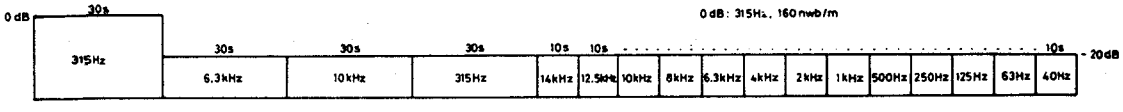


Fig. 10-4 Signaux préenregistrés sur la bande d'étalonnage STD-331B

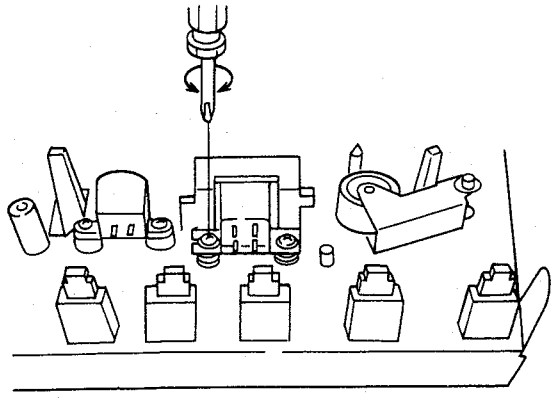


Fig. 10-5 Réglage d'azimut de tête magnétique

Bande d'étalonnage	STD-331B
Sélecteur de bande	NORM
Commutateur DOLBY NR	OFF

• A cause de "l'effet d'arête", compenser le canal droit de −1dB à 63Hz.

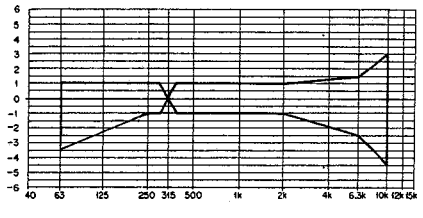


Fig. 10-6 Réponse en fréquence admissible en lecture

- Le commutateur DOLBY NR doit être placé en position OFF.

1. Réglage d'azimut de tête magnétique

- Tourne VR101 et VR201 sur leur position maximum (dans le sens maximum des aiguilles d'une montre).

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 10kHz/–20dB de la bande d'étalonnage STD-331B.	Vis de réglage d'azimut de tête. (Consulter la fugure 10-5).	Bornes de sortie droite et gauche "OUTPUT".	Niveau maximal du signal de lecture.	
3	ARRÊT	Bloquer la vis de réglage à la peinture lorsque le réglage est terminé.				

2. Contrôle de l'égaliseur de lecture

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 315kHz/–20dB et de 6,3kHz/–20dB de la bande d'étalonnage STD-331B.	Contrôler	Bornes de sortie droite et gauche "OUTPUT".	Le niveau de lecture de 6,3kHz est de –0,5±2dB par rapport au niveau de 315Hz.	

3. Vérification de la commutation de la constante temps d'enregistrement.

- Faire passer la platine en mode de reproduction sans insérer de cassette.
- Vérifier que le niveau de bruit au niveau des bornes de sortie de ligne reproduction lorsque le commutateur de détection de chrome situé en baut de l'unité de transport de bande est enclenché/désenclenché.

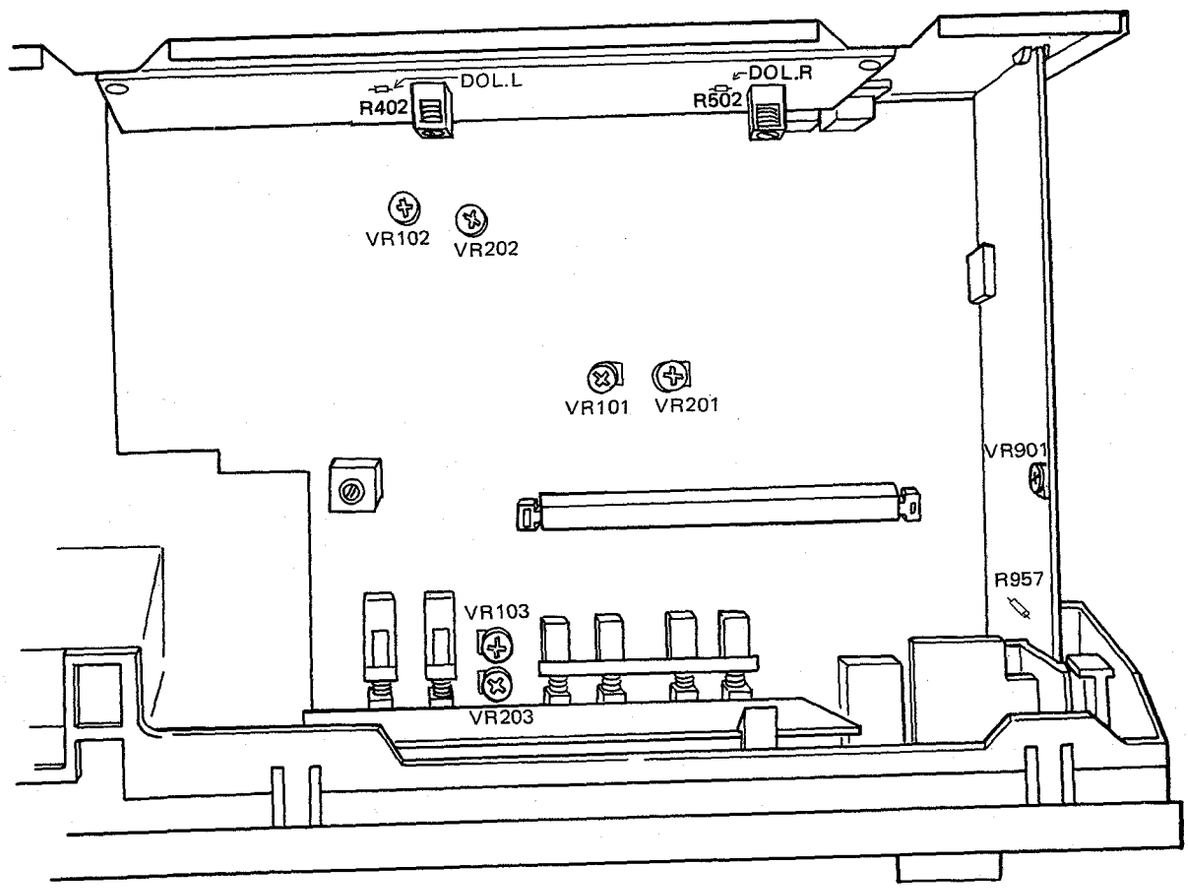


Fig. 10-7 Emplacements des dispositifs de réglage

4. Réglage du niveau de lecture

• Ce réglage servant à étalonner le niveau DOLBY NR doit être exécuté avec un grand soin.

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÈT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 315kHz/0dB de la bande d'étalonnage STD-331B.	VR101 (canal gauche) VR201 (canal droit)	TP.DOL L (canal gauche) TP.DOL R (canal droit)	−17,9dBv (127,3mV)	

5. Contrôle de fonctionnement des décibelmètres

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	PAUSE À L'ENREGISTREMENT	Injecteur un signal de 315Hz/−10dBv (316mV) per les bornes d'entrée de ligne "LINE INPUT".	Potentiomètre de réglage de niveau d'enregistrement "REC LEVEL".	TP.DOL L (canal gauche) TP.DOL R (canal droit)	Vérifier si les décibelmètres "0dB" s'alument sous un niveau de sortie de signal de −17,9dBv±1,8dB.	

6. Calage de réponse en fréquence d'enregistrement et de lecture

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÈT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 315Hz/−30dBv (31,6mV) per les bornes d'entrée de ligne "LINE INPUT".	Potentiomètre de réglage de niveau d'enregistrement "REC LEVEL".	TP.DOL L (canal gauche) TP.DOL R (canal droit)	−37,9dBv (12,7mV)	
3	ENREGISTREMENT/ LECTURE	Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-608A à 315Hz et 6,3kHz et lire ce passage.	VR103 (canal gauche) VR203 (canal droit)	Bornes de sortie droite et gauche "OUTPUT"	Le niveau de reproduction de 6,3kHz est de 0dB par rapport au niveau de 315Hz (lire les signaux enregistrés sur STD-608A).	
4		Changer la bande d'essai, le sélecteur de bande et les positions du commutateur de réduction de bruit DOLBY, et vérifier que la fréquence en réponse est satisfaisante (voir la fig. 10-8). Si la réponse en fréquence n'est pas dans la plage spécifiée, re-régler VR103 et VR203 de façon à ; ce que le niveau de reproduction de 6,3kHz se situe entre +1 et −0,5dB par rapport au niveau de 315Hz.				

7. Réglage du niveau d'enregistrement

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÈT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 315Hz/−10dBv (316mV) par les bornes d'entrée de ligne "LINE INPUT".	Potentiomètre de réglage de niveau d'enregistrement "REC LEVEL".	TP.DOL L (canal gauche) TP.DOL R (canal droit)	−17,9dBv (127,3mV)	
3		Régler le commutateur DOLBY NR en position ON.				
4	ENREGISTREMENT/ LECTURE	Enregistrer le niveau de signal indique plus haut sur la bande d'étalonnage STD-608A et lire ce passage.	VR102 (canal gauche) VR202 (canal droit)	TP.DOL L (canal gauche) TP.DOL R (canal droit)	−17,9dBv (127,3mV)	
5		Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2".				
6		Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-620 et lire ce passage.	Contrôler	TP.DOL L (canal gauche) TP.DOL R (canal droit)	−17,9dBv±1,5dB	
7		Placer le sélecteur de bande (TAPE SELECTOR) en position "METAL".				
8		Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-610 et lire ce passage.	Contrôler	TP.DOL L (canal gauche) TP.DOL R (canal droit)	−17,9dBv±1,5dB	

8. Durée de rétablis sement

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
	ARRÈT	.....	VR901	Deux extremités de R957	15mVc-c	

Brade d'étalonnage: STD-608A
Tape selector: NORM

DOLBY NR: OFF (arrêt)	DOLBY NR: TYPE B ON (marche)	DOLBY NR: TYPE C ON (marche)

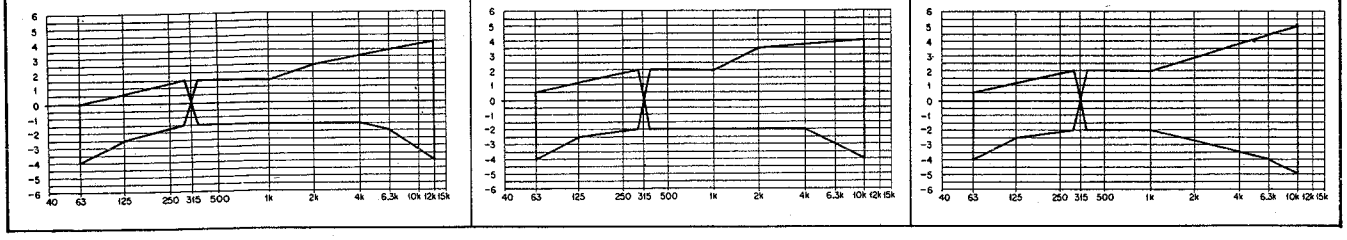


Fig. 10-8-1 Zone de réponse en fréquence admissible de lecture et d'enregistrement (NORM)

Barde d'étalonnage: STD-620
Tape selector: CrO_2

DOLBY NR: OFF (arrêt)	DOLBY NR: TYPE B ON (marche)	DOLBY NR: TYPE C ON (marche)

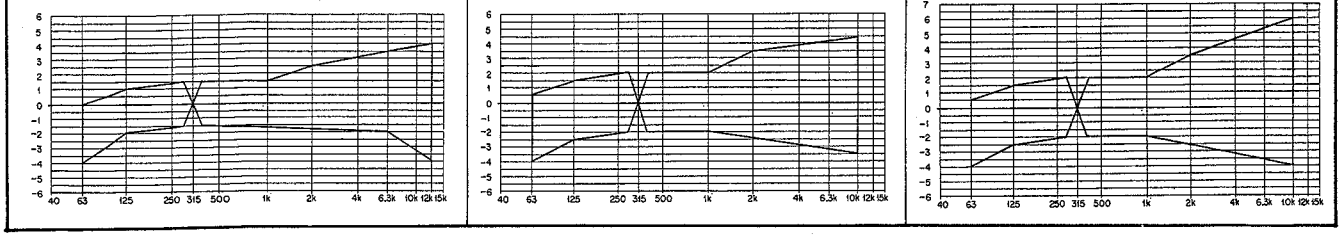


Fig. 10-8-2 Zone de réponse en fréquence adissible de lecture et d'enregistrement (CrO_2)

Barde d'étalonnage: STD-610
Tape selector: METAL

DOLBY NR: OFF (arrêt)	DOLBY NR: TYPE B ON (marche)	DOLBY NO: TYPE C ON (marche)

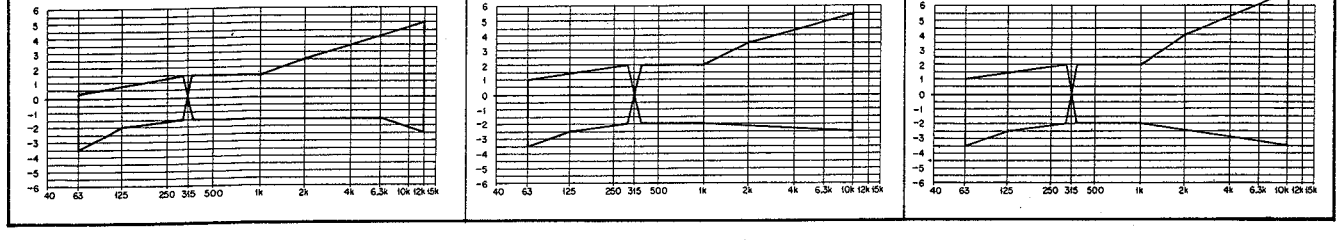


Fig. 10-8-3 Zone de réponse en fréquence adissible de lecture et d'enregistrement (METAL)

10. AJUSTE

10.1 AJUSTES MECANICOS

Antes del ajuste

Limpiar ambas bases de los carretes, el eje de arrastre y el rodillo de presión con algodón remojado en alcohol.

Ajuste de la prasción del rodillo de presión

1. Establecer el magnetófono en el modo de reproducción.
2. Con el calibrador de tensión, presionar ligeramente contra el brazo del rodillo de presión y separar un poco dicho rodillo del eje de arrastre.
3. Luego reponer el rodillo de presión sobre el eje de arrastre, y leer el valor en el momento que el rodillo de presión empieza a girar. Si la indicación no está dentro de 300—500g, reemplazar el muelle del rodillo de presión.

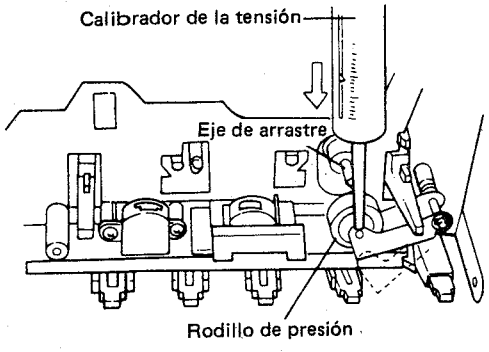


Fig. 10-1 Ajuste de la presión del rodillo de presión

Ajuste de la torsión de la base del carrete

Utilizar el medidor de torsión para medir la torsión durante las funciones de reproducción, avance rápido (FF) y rebobinado (REW). Los valores obtenidos deben estar normalmente dentro de los límites permisibles enumerados en la tabla 1.

Si los valores obtenidos no están dentro de tales límites, reemplazar el conjunto de la base del carrete tensor (TU) y/o el conjunto de la base del carrete de suministro, la rueda de guía TU, o todo el conjunto del brazo de arrastre.

Tabla 1

	Base del carrete TU	Base del carrete de suministro
Modo de reproducción	38 – 57g.cm	*1,5 – 5g.cm
Modo de avance rápido	75 – 135g.cm	*1,5 – 5g.cm
Modo de rebobinado	1,5 – 5g.cm	75 – 135g.cm

**Indica par de torsión de contratensión.*

Ajuste de la velocidad de la cinta

1. Conectar el frecuentímetro al terminal DOL.L del conjunto del magnetófono.
2. Reproducir la parte de 3kHz de la cinta de prueba STD-301. Al principio, la frecuencia deberá estar entre 3000Hz~3010Hz, y podrá ajustarse girando el resistor semifijo ubicado en el orificio de ajuste del motor, como se muestra en la Fig. 10-2.

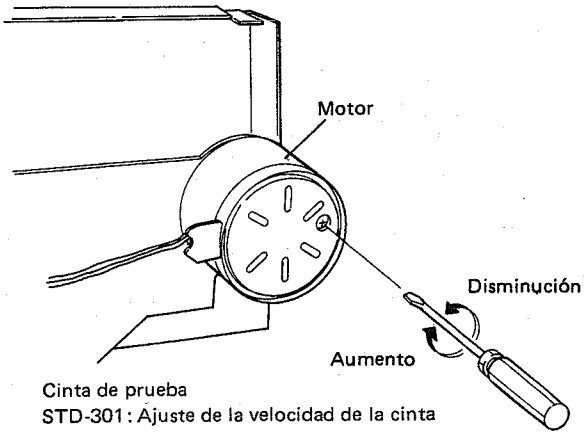


Fig. 10-2 Ajuste de la velocidad de la cinta

Comprobación y ajuste de la unión de grabación (REC)

Si, al poner el mecanismo de transporte en el modo de grabación, el conmutador deslizante no se conmuta completamente, mover la posición de engrane del mecanismo de unión REC.

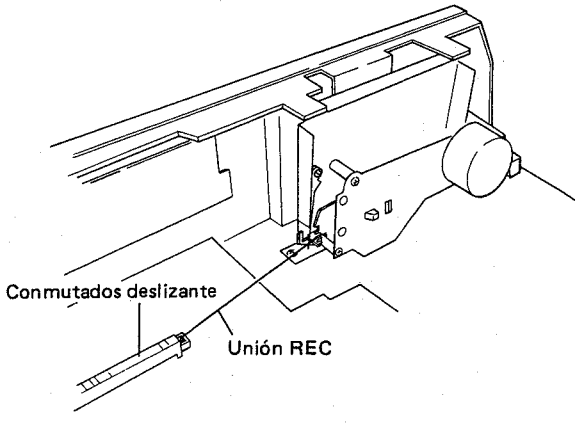


Fig. 10-3 Comprobación y ajuste de la unión de gravación

10.2 AJUSTES ELECTRICOS

Condiciones de ajuste

1. Los ajustes mecánicos deben terminarse primero.
2. Limpiar y desimanar la cabeza de grabación.
3. Dejar que el magnetófono se precaliente por unos minutos antes de iniciar los ajustes eléctricos.
4. La señal de referencia es de 0dB=1Vrms.
5. Conectar una resistancia de carga de 50 kilo-ohmios (o entre 47 y 52 kilo-ohmios) a los terminales de salida (OUTPUT).
6. A menos que se especifique de otra manera, los siguientes interruptores deben estar en las posiciones indicadas:
   DOLBY NR : OFF
   SELECTOR DE CINTA : NORM

Cintas de prueba

STD-331B : Para ajustes de reproducción (Referirse a la Fig. 10-4)
STD-608A : Cinta NORMAL en blanco.
STD-620 : Cinta CrO_2 en blanco.
STD-610 : Cinta de METAL en blanco.

Lista de ajustes y comprobaciones

1. Ajuste azimutal de la cabeza de grabación
2. Comprobación del ecualizador de reproducción
3. Comprobación de conmutación constante del tiempo de grabación.
4. Ajuste del nivel de reproducción
5. Comprobación del indicador de nivel
6. Ajuste de la respucsta de frecuencia de grabación y reproducción
7. Ajuste del nivel de grabación
8. Ajuste del tiempo de recuperación

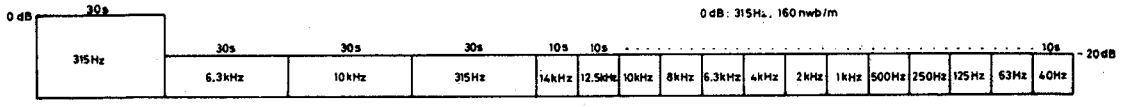


Fig. 10-4 Contenido de la cinta de prueba STD-331B

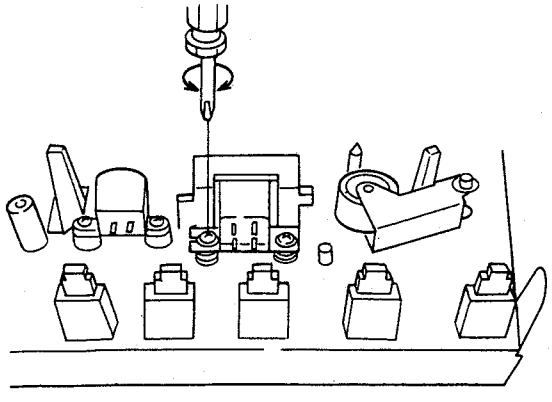


Fig. 10-5 Ajuste azimutal de la cabeza de grabación

Cinta de prueba	STD-331B
Selector de cinta	NORM
Interruptor DOLBY NR	OFF

• Debido al "efecto de borde", compensar −1dB el canal derecho a 63Hz.

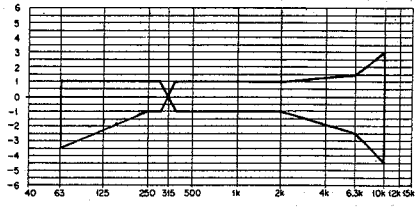


Fig. 10-6 Zona de respuesta de frecuencia de reproducción permisible

- Poner el interruptor DOLBY NR en la posición OFF.

1. Ajuste azimutal de la cabeza de grabación.

- Girar VR101 y VR201 a la posición máxima (completamente a la derecha)

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir la parte de 10kHz/–20dB de la cinta de prueba STD-331B.	Tornillo de ajuste azimutal de la cabeza de reproducción. (Referirse a la Fig. 10.5).	Terminales de salida (OUTPUT) derecho e izquierdo.	Nivel máximo de la señal de reproducción.	
3	Parada (STOP)	Dejar trabado el tornillo después de terminar el ajuste.				

2. Comprobación del ecualizador de reproducción.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir las partes de 315Hz/–20dB y 6,3kHz/–20dB de la cinta de prueba STD-331B.	Confirmación	Terminales de salida (OUTPUT) derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de –0,5±2dB con relación al nivel de 315Hz.	

3. Comprobación de conmutación constante del tiempo de grabación.

- Poner el magnetófono en el modo de reproducción sin casete cargado.
- Comprobar que cambie el nivel de ruido en los terminales de salida de línea al abrir y cerrar el interruptor detector de cintas de cromo situado en la parte superior de la unidad de transporte.

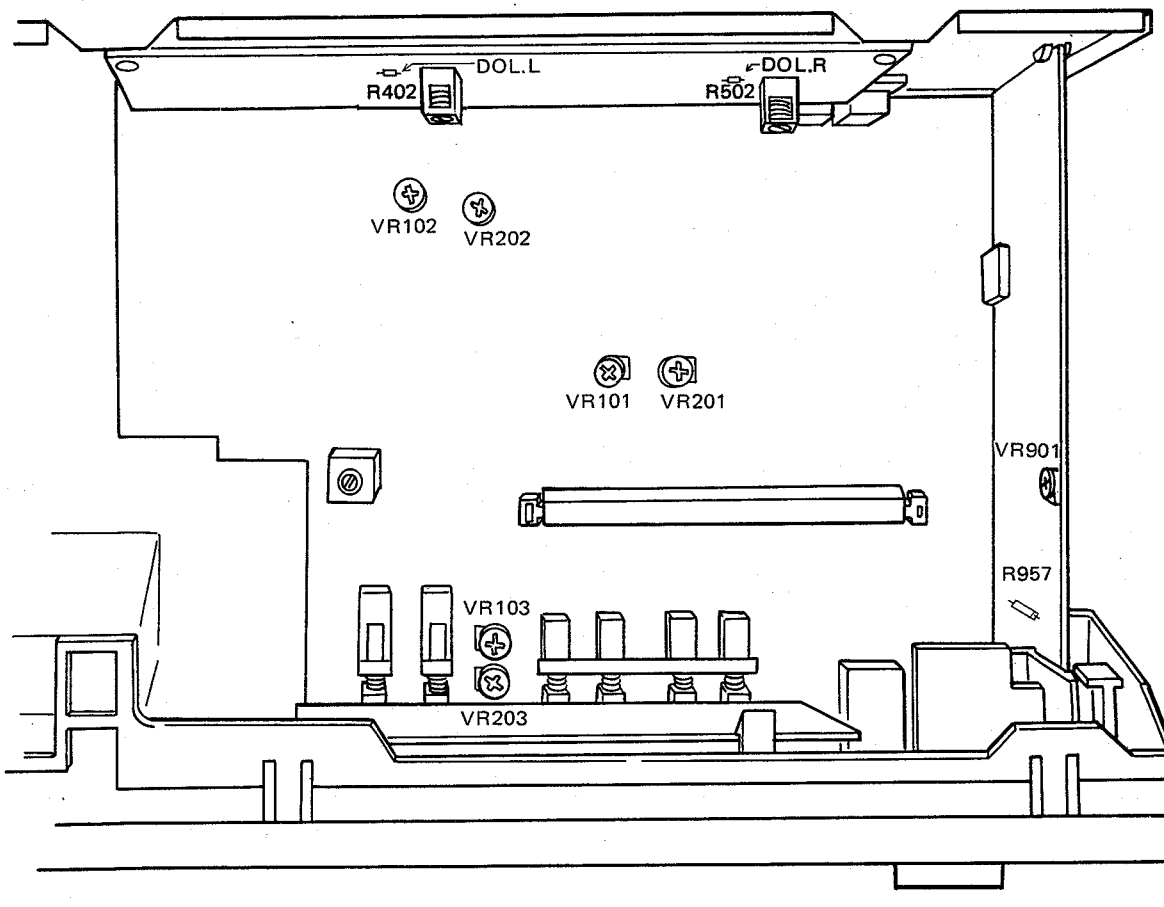


Fig. 10-7 Puntos de ajuste

4. Ajuste del nivel de reproducción

● Este ajuste determina el nivel DOLBY NR, y debe efectuarse con sumo cuidado.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproduce la parte de 315 Hz/0dB de la cinta de prueba STD-331B.	VR101 (canal izq.) VR201 (canal der.)	TP.DOL L (canal izq.) TP.DOL R (canal der.)	−17,9dBv (127,3mV)	

5. Comprobación del indicador de nivel

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Grabación/ pausa (REC/ PAUSE)	Aplicar una señal de 315Hz −10dBv (316mV) a los terminales de entrada de línea (LINE INPUT).	Control del nivel de grabación. (REC LEVEL)	TP.DOL L (canal izq.) TP.DOL R (canal der.)	Comprobar que los indicadores de nivel "0dB" se encienden dentro de −17,9dBv±1,8dB del nivel de señal de salida.	

6. Ajuste de la respuesta de frecuencia de grabación y reproducción.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Grabación/ pausa (REC/ PAUSE)	Aplicar una señal de 315Hz/ −30dBv (31,6mV) a los terminales de entrada de línes (LINE INPUT).	Control de nivel de grabación (REC LEVEL)	TP.DOL L (canal izq.) TP.DOL R (canal der.)	−37,9dBv (12,7mV)	
3	Grabación/ reproducción (REC/ PLAY)	Grabar el nivel de señal en la cinta de prueba STD-608A a 315Hz y 6,3kHz, y reproducir.	VR103 (canal izq.) VR203 (canal der.)	Terminales de salida (OUTPUT) derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de 0dB en comparación con el nivel de 315Hz. (Reproducir las señales grabadas en el STD-608A.)	
4		Cambiar la cinta de prueba, y las posiciones del interruptor selector de cinta y el interruptor DOLBY NR, y comprobar si la respuesta en frecuencia es satisfactoria. (Referirse a la Fig. 10-8.) Si la respuesta no está dentro de la gama especificada, reajustar VR103 y VR203 hasta que el nivel sea +1 — −0,5dB en comparación con el nivel de 315Hz del paso 3.				

7. Ajuste del nivel de grabación

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Grabación/ pause (REC/ PAUSE)	Aplicar una señal de 315Hz/ −10dBv (316mV) a los terminales de entrada de línea (LINE INPUT).	Control de nivel de grabación (REC LEVEL).	TP.DOL L (canal izq.) TP.DOL R (canal der.)	−17,9dBv (127,3mV)	
3		Regular el interruptor DOLBY NR a la posición ON.				
4	Grabación/ reproducción (REC/ PLAY)	Grabar el nivel de señal en la cinta de prueba STD-608A, y reproducir.	VR102 (canal izq.) VR202 (canal der.)	TP.DOL L (canal izq.) TP.DOL R (canal der.)	−17,9dBv (127,3mV)	
5		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2.				
6		Grabar la señal en la cinta de prueba STD-620, y reproducir.	Confirmación	TP.DOL L (canal izq.) TP.DOL R (canal der.)	−17,9dBv±1,5dB	
7		Reguler el interruptor selector de cinta (TAPE SELECTOR) a la posición METAL.				
8		Grabar la señal en la cinta de prueba STD-610, y reproducir.	Confirmación	TP.DOL L (canal izq.) TP.DOL R (canal der.)	−17,9dBv±1,5dB	

8. Ajuste del tiempo de recuperación

	Modeo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
	Parada(STOP)	.....	VR901	Ambos extremos del R957	15mVc-c	

Cinta de prueba: STD-608A
Selector de cinta: NORM

DOLBY NR: OFF	DOLBY NR: TIPO B ON	DOLBY NR: TIPO C ON

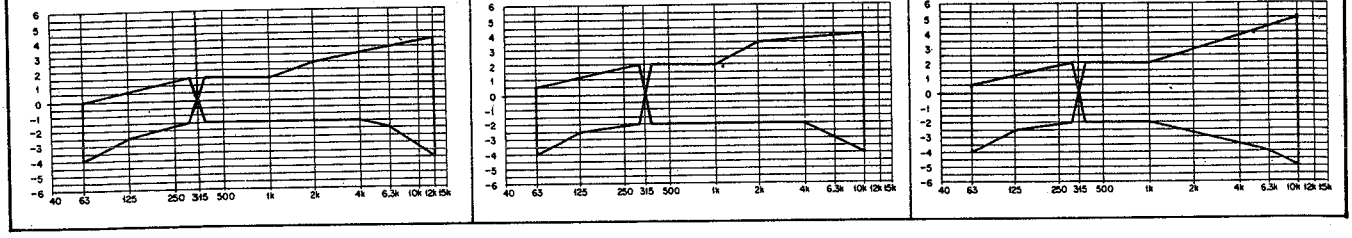


Fig. 10-8-1 Zona de respuesta de frecuencia de grabación y reproducción permisible (NORM)

Cinta de prueba: STD-620
Selector de cinta: CrO_2

DOLBY NR: OFF	DOLBY NR: TIPO B ON	DOLBY NR: TIPO C ON

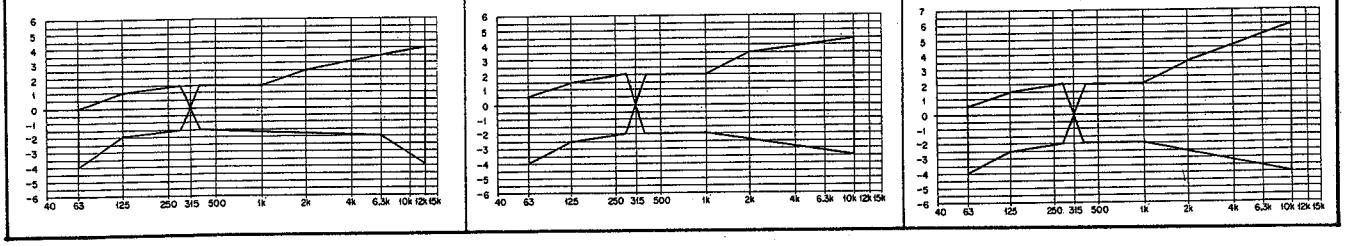


Fig. 10-8-2 Zona de respuesta de frecuencia de grabación y reproducción permisible (CrO_2)

Cinta de prueba: STD-610
Selector de cinta: METAL

DOLBY NR: OFF	DOLBY NR: TIPO B ON	DOLBY NR: TIPO C ON

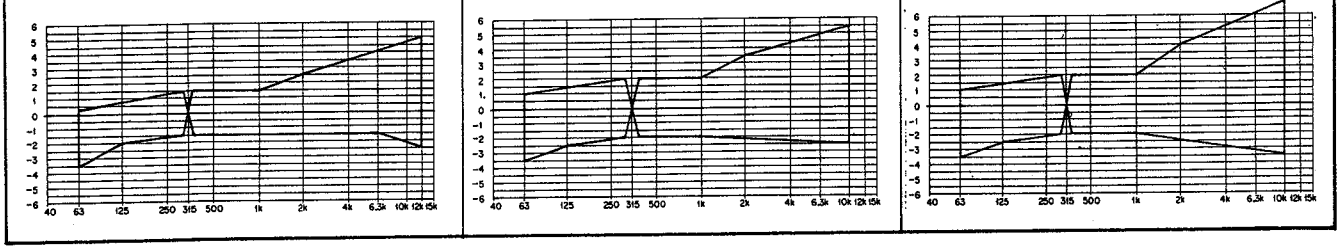


Fig. 10-8-3 Zona de respuesta de frecuencia de grabación y reproduccion permisible (METAL)