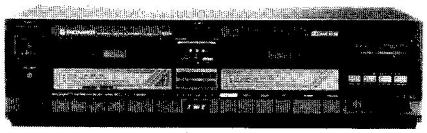
PIONEER

Service Manual



• CT-1060W [BK]

• CT-S77W [BK]

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP-782-0

STEREO DOUBLE CASSETTE TAPE DECK

CT-1060W
CT-1060W(BK)
CT-S77W
CT-S77W(BK)

- CT-S77W is the same as the CT-1060W except for the exterior design.
- CT-1060W [BK] is black version of CT-1060W.
- CT-S77W [BK] is black version of CT-S77W.
- Models CT-1060W (silver), CT-1060W [BK] (black), CT-S77W (silver) and CT-S77W [BK] (black) come in versions distinguisehd as follows:

Type	Applicable model				Power requirement	Destination
	CT-1060W	CT-1060W[BK]	CT-S77W	CT-S77W[BK]		
KU	–	○	○	○	AC120V only	U.S.A.
KC	–	○	–	–	AC120V only	Canada
HEM	○	○	–	–	AC220V (240V)*	European continent
HB	○	○	–	–	AC240V (220V)*	United Kingdom
HP	–	○	–	–	AC240V (220V)*	Australia
D	○	○	–	–	AC120/220/240V (switchable)	General market
D/G	–	–	–	○	AC120/220/240V (switchable)	U.S. Military

*Change the primary wiring of the power transformer.

- This service manual is applicable to the KU, HEM, HB, HP, D and D/G types.
- As to the HEM, HB, HP, D and D/G types, please refer to pages 90 – 92.
- As to the KC type, please refer to the additional service manual (ARP-783-0).
- Ce manual d'instruction se refère au mode de réglage en français. (p. 40 – p. 46)
- Este manual de servicio trata del método ajuste escrito en español. (p. 47 – p. 54)

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
TEL: [800] 421-1404, [800] 237-0424
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775-28-08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: [03] 580-9911

CONTENTS

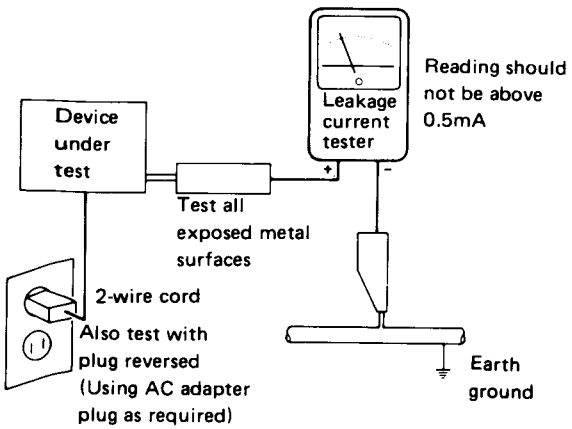
SAFETY INFORMATION

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

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

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

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

1. SPECIFICATIONS

Systems ..... 4 track, 2-channel stereo
Heads ..... "Hard Permalloy" recording/playback head x 1
"Hard Permalloy" playback head x 1
"Double-gap Ferrite" erasing head x 1
Motor ..... DC servo motor x 2
Wow and Flutter ..... No more than 0.07% (WRMS)
No more than ± 0.17% (DIN)
Fast winding Time ..... Approximately 110 seconds
(C-60 tape)
Frequency Response
−20 dB recording:
Normal tape ..... 25 to 14,500 Hz
Chrome tape ..... 25 to 15,000 Hz
Metal tape ..... 25 to 16,000 Hz
0 dB recording:
Normal tape ..... 25 to 11,000 Hz
Chrome tape ..... 25 to 11,500 Hz
Metal tape ..... 25 to 15,000 Hz
Signal-to-Noise Ratio
Dolby NR OFF ..... More than 58 dB
Noise Reduction Effect
Dolby NR B type ON ..... More than 10 dB (at 5 kHz)
Dolby NR C type ON ..... More than 19 dB (at 5 kHz)
Harmonic Distortion ..... No more than 0.8% (0 dB)
Input (Sensitivity)
LINE (INPUT) ..... 60 mV (Input impedance 80 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 316 mV (Output impedance 4.8 kΩ)

Subfunctions

- Relay playback (Deck I ⇄ Deck II)
- Synchronized copy start
- High-speed and normal-speed tape copying (Deck I → Deck II)
- Dolby NR B/C types
- Auto tape selector (Deck I)
- 6 segment LED level meter
- Cue and Review (Deck I)
- Full automatic stop function
- Timer stand-by function
(Unattended recording: DeckII)
(Wake-up playback: Deck I and Deck II)
- One-Touch recording

Miscellaneous

Power Requirements
KU, KC models ..... AC 120 V, 60 Hz
HEM model ..... AC 220 V, 50/60 Hz
HB, HP models ..... AC 240 V, 50/60 Hz
D, D/G models ..... AC 120 V/220 V/240 V, 50/60 Hz
(switchable)
Power Consumption
KU, KC models ..... 19 W
HEM, HB, HP models ..... 26 W
D, D/G models ..... 19 W
Dimensions ..... 420 (W) x 113 (H) x 263 (D) mm
16-9/16 (W) x 4-7/16 (H) x 10-6/16 (D) in
Weight (without package) ..... 4.8 kg (10 lb 9 oz)

Accessories

Operating instructions 1
Connection cord with pin plugs 2

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

INFORMATION TO USER [FOR U.S.A. MODEL]

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate this component with respect to the receiver
- move this component away from the receiver
- plug this component into a different outlet so that component and receiver are on different branch circuits.

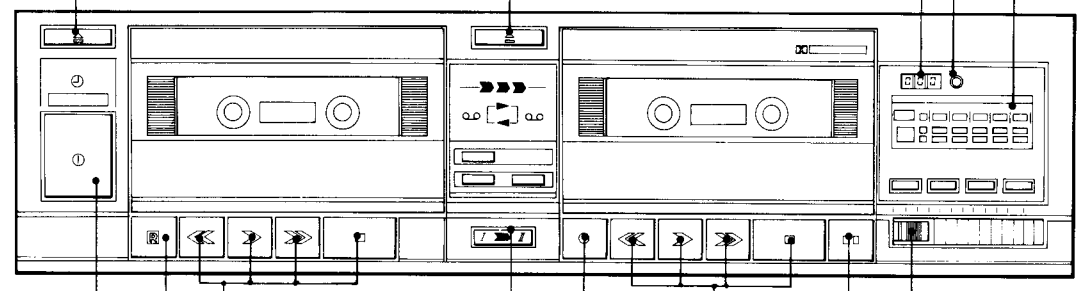
If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:
"How to Identify and Resolve Radio-TV Interference Problems".
This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

The above instructions apply only to units which will be operated in the United States.

2. FRONT PANEL FACILITIES

Deck I: For playback

Deck II: For playback/recording



TAPE COUNTER

Indicates the transport position of the tape loaded in Deck II.

EJECT button

RESET button

LEVEL meter

Operating switches

≪ : Rewind switch
≫ : Fast forward switch
□ : Stop switch.
▷ : PLAY switch.

POWER switch

REC LEVEL control

Pause switch (▮▮)

Press to temporarily stop the tape travel. To restart the tape travel, press once again. The pause function does not operate when the deck is in the fast forward or rewind mode.

Operating switches

Release switch (R)

Press this switch after finding a non-recorded interval between tracks using the CUE or REVIEW mode. The unit will automatically go into the playback mode.

Recording switch (●)

The deck cannot be placed in the recording mode if a cassette with broken erasure prevention tabs is loaded, or if no tape cassette is loaded.

SYNCHRO COPY START switch

Press to start a synchronized tape copying operation

*

- Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
- "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

*DOLBY NR switch (ON/OFF)

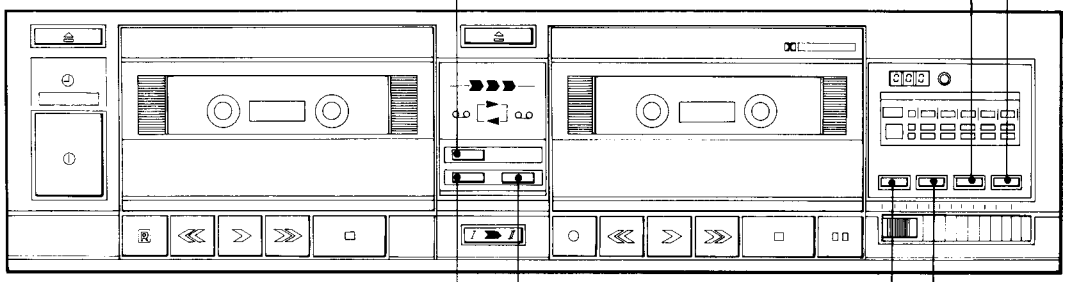
Press this switch to ON (■) for recording with the built-in Dolby Noise Reduction system and for playback of tapes which have been recorded using the Dolby Noise Reduction system. For other tapes, do not press this switch.

DOLBY NR switch (TYPE B/C)

After the DOLBY NR switch (ON/OFF) is pressed, select type B or C using this switch.

RELAY PLAY swtich

Press to relay play.



COPY I ►II switch (ON/OFF)

NOTE:
When not performing tape copy, be sure to set the COPY switch to OFF (■). If the COPY switch is ON (■), normal recording (of program from LINE INPUT terminal) will not be possible.

SPEED switch (HIGH/NORM)

HIGH (■): Pressing this switch will cause high speed copying to take place only when the unit is in the tape copy mode.

NORM (■): Tapes are copied at the normal speed.

TAPE SELECTOR II switches

This selectors allows Deck II, 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 on Deck II.

Normal tape : Release the left switch (■ **NORM**).

CrO_2 tape : Press the left switch (■ **HIGH**) and release the right switch (■ **CrO_2**).

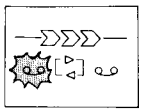
Metal tape : Depress both the right and left switches (■ **HIGH**, ■ **METAL**).

NOTE:
Deck I is provided with an automatic tape selector mechanism.

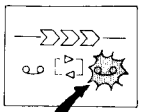
ABOUT THE COPY INDICATOR

This indicator lights and goes out in accordance with the following operating modes:

• When playing back Deck I



• When performing recording or playback on Deck II.

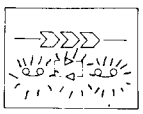


Lights red during recording.
Lights green during playback.

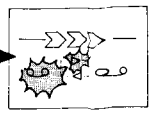
: Glowing lamp
: Flashing lamp

• During relay play:

When RELAY PLAY switch is set to ON, indicators flash.



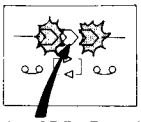
When both decks' play (≫) switches are pressed, the indicator for the switch pressed first lights.



Example, when Deck I's play switch is pressed first:

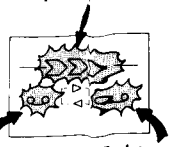
• During tape copying

When COPY I ► II switch is ON, indicators light.



When the SPEED switch is set to the HIGH (■) position, this indicator lights.

When the SYNCHRO COPY START switch is pressed, indicators flash in sequence. During HIGH speed flashing speeds up.



Lights green. Lights red.

3. DISASSEMBLY

Disassembly of Tape Transport Unit

1. Remove the bonnet.
- Undo the three screws securing the bonnet to the rear panel.

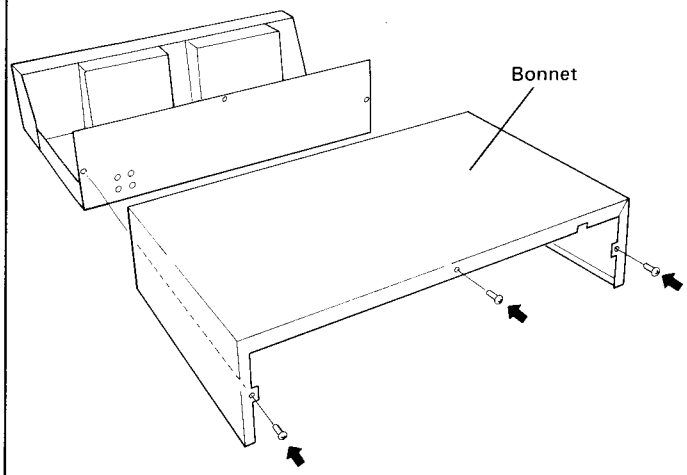


Fig. 3-1

2. Remove the front panel.
- Undo the three screws in the bottom, and disengage the three upper and three lower hook catches.

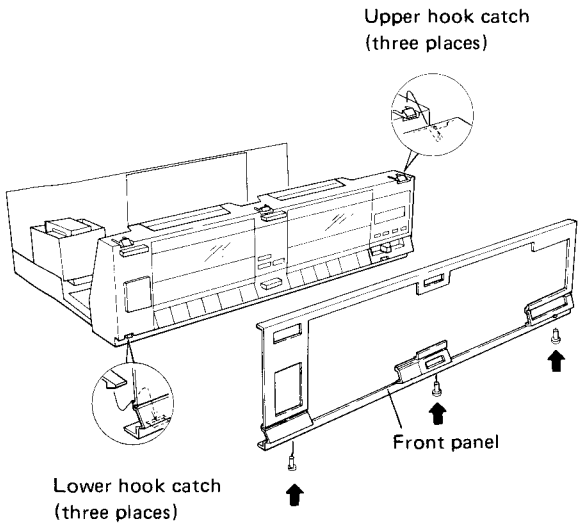


Fig. 3-2

3. Pull off the COPY knob.
4. Pull off the POWER knob.

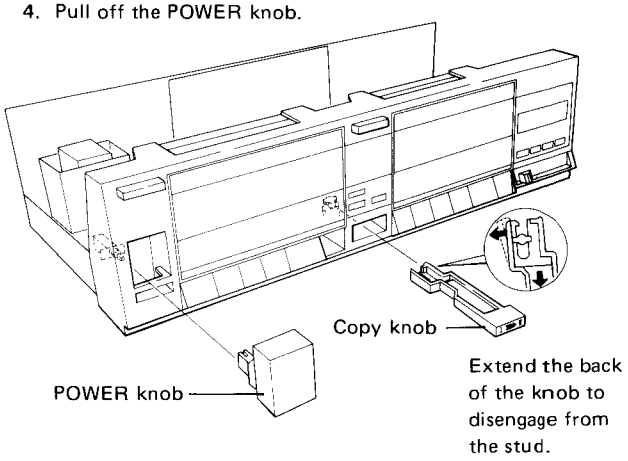


Fig. 3-3

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

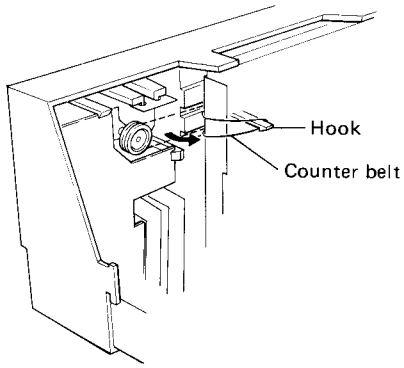


Fig. 3-4

6 Remove the panel stay.
- Undo the four screws from the left and right hand sides of the panel stay. Undo the four screw along the top of the panel stay. Open the cassette pockets (Push the EJECT buttons). Disengage the three lower hook catches.

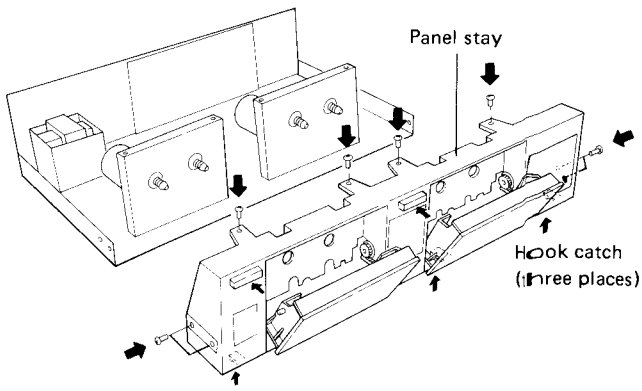


Fig. 3-5

7. Remove the tape transport units.
- Undo the two screws securing each transport unit.

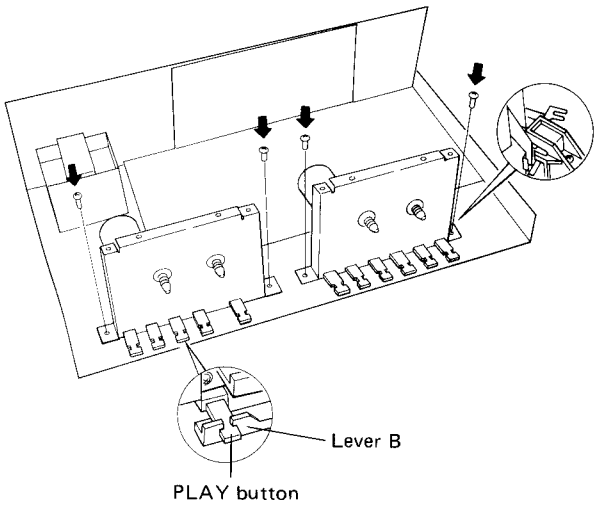


Fig. 3-6

- PRECAUTIONS FOR REASSEMBLY
  (1) When attaching the tape transport unit (deck 1), engage the groove section of the PLAY button with the lever B.
  (2) When attaching the tape transport unit (deck 2), set the REC action lever in the lever A.

Main Unit Disassembly

1. Remove the bonnet. (Refer to Fig. 3-1)
2. Remove the rear panel.
- Undo the four screws, and remove by lifting out (disengage the two hooks from the Main unit vertical section).

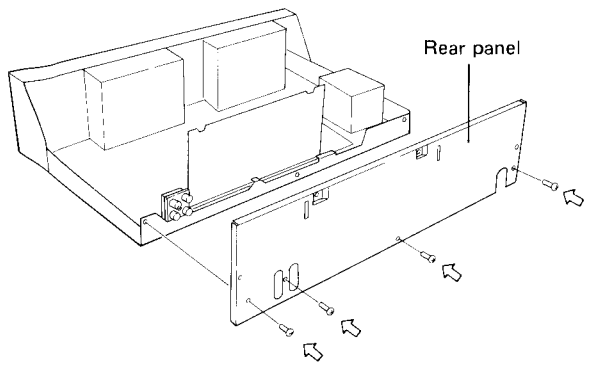


Fig. 3-7

3. Remove the Main unit.
- Undo the five screws securing the Main unit.

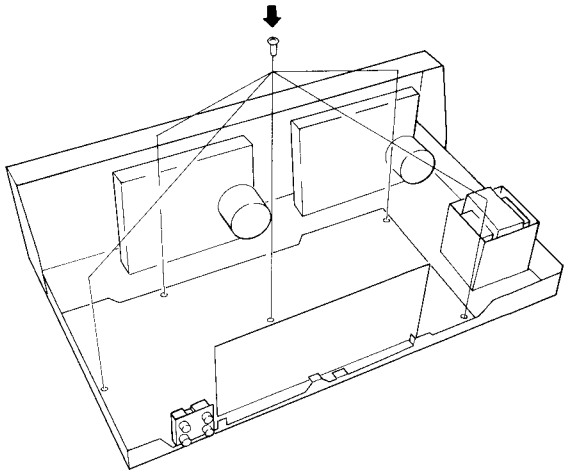


Fig. 3-8

- Remove the push knobs A and B.

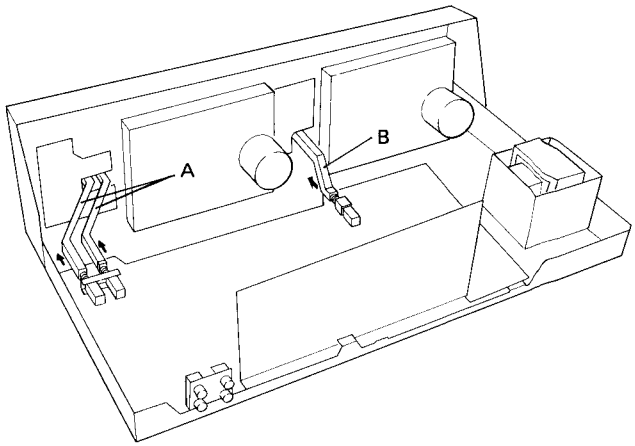


Fig. 3-9

- Rest the Main unit.

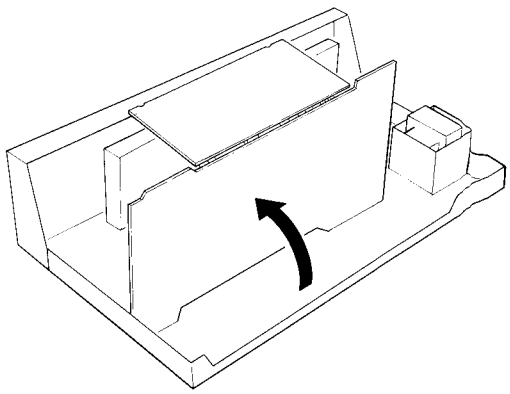


Fig. 3-10

Door Removal

1. Remove the bonnet. (Refer to Fig. 3-1)
2. Remove the front panel. (Refer to Fig. 3-2)
3. Pull off the COPY and POWER knobs. (Refer to Fig. 3-3)
4. Remove the counter belt. (Refer to Fig. 3-4)
5. Remove the panel stay. (Refer to Fig.3-5)
6. Remove the door spring.
7. Remove the door damper.
   - Undo the screw securing the door damper.

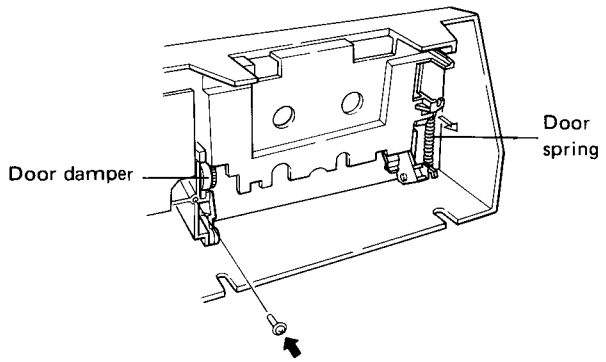


Fig. 3-11

8. Remove the operation buttons.
   - Swivel the operation buttons forward. Pushing in the button shaft securing hooks, pull the button shaft with the operation buttons forward away from the panel stay.

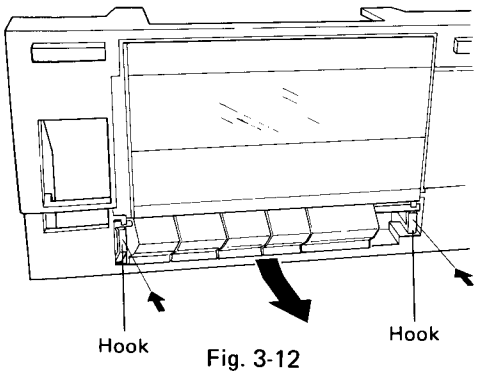


Fig. 3-12

9. Remove the door.
   - Dislodge the door supporting point from the boss by bending it towards the door center, and pull out forwards.

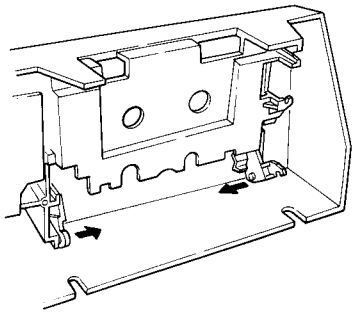


Fig. 3-13

Tape Counter Removal

1. Remove the bonnet. (Refer to Fig. 3-1)
2. Remove the counter belt. (Refer to Fig. 3-4)
3. Remove the tape counter.
   - Disengaging the two panel stay hook catches, pull the tape tape counter out towards the rear.

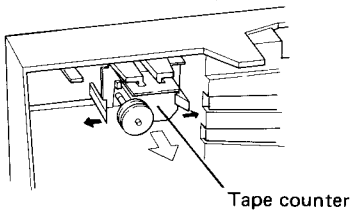


Fig. 3-14

Meter Unit Removal

1. Remove the bonnet. (Refer to Fig. 3-1)
2. Remove the meter unit.
   - Disengaging the four panel stay hook catches, pull the Meter unit out towards the rear.

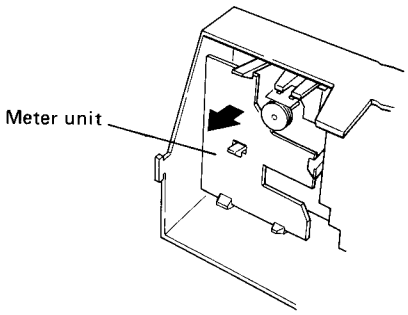


Fig.3-15

Indicator Unit Removal

1. Remove the bonnet. (Refer to Fig. 3-1)

- Undo the screw, and disengaging the two panel stay hook catches, pull the Indicator unit out towards the rear.

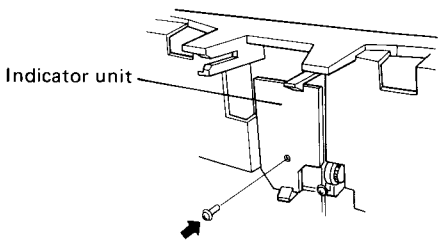
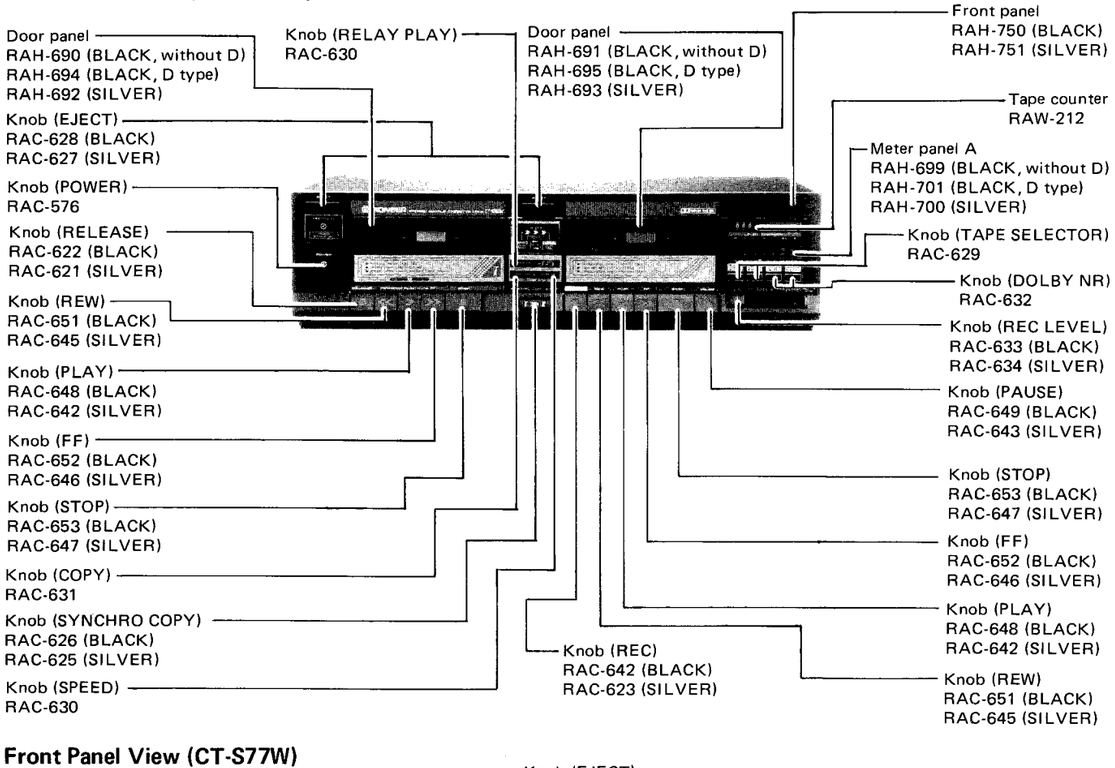


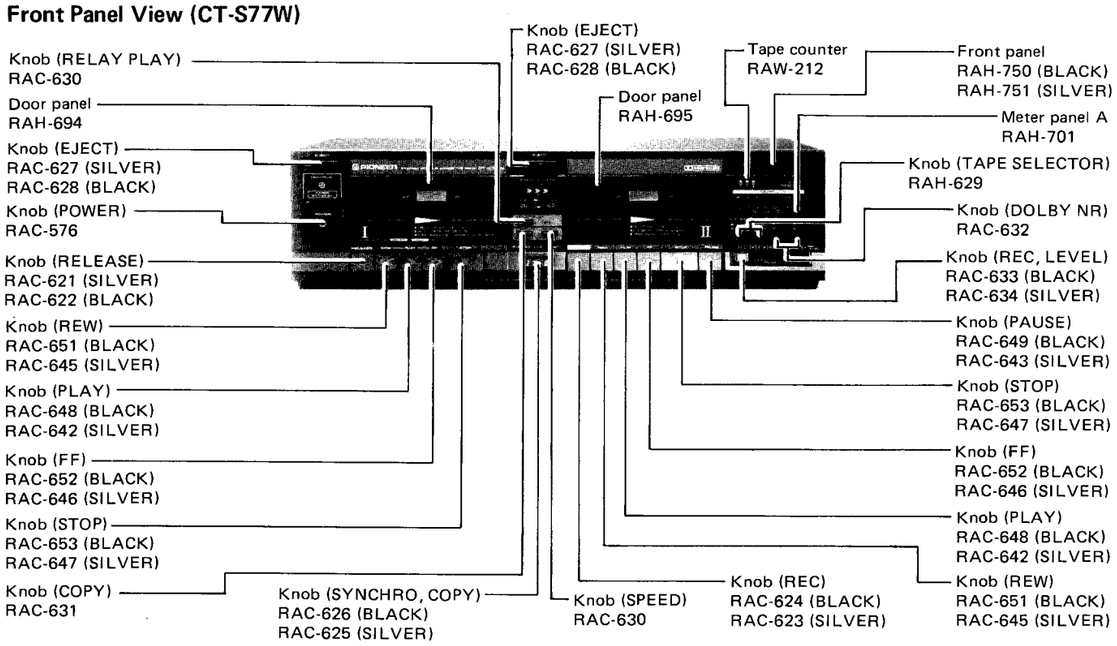
Fig. 3-16

4. PARTS LOCATION

Front Panel View (CT-1060W)



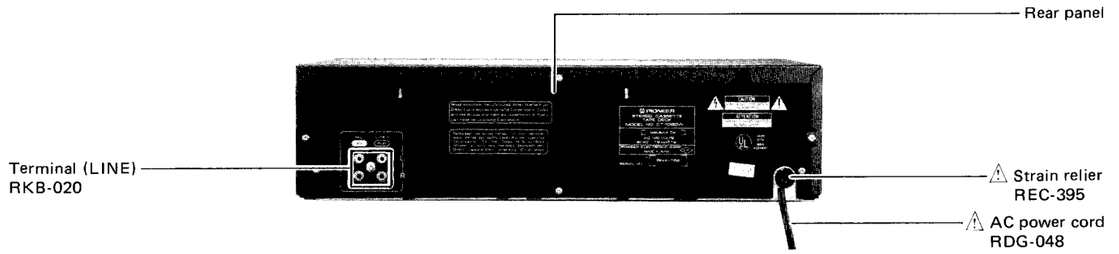
Front Panel View (CT-S77W)



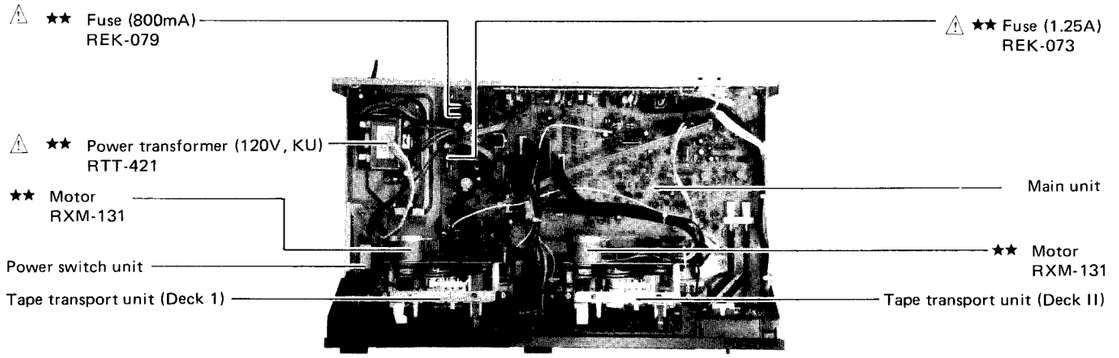
NOTES:

- *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.

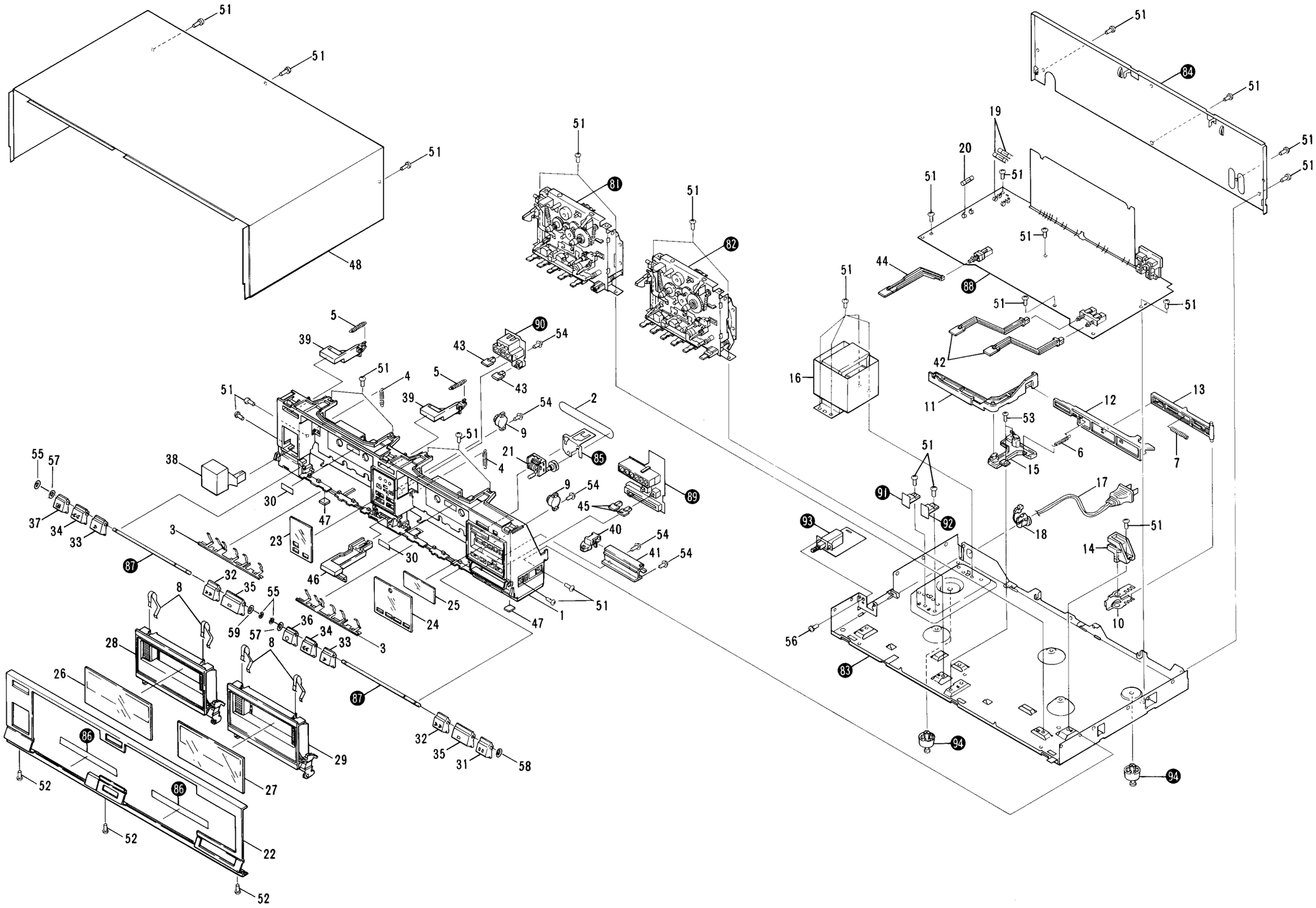
Rear Panel View (KU type)



Top View (KU type)



5. EXPLODED VIEWS AND PARTS LIST



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.

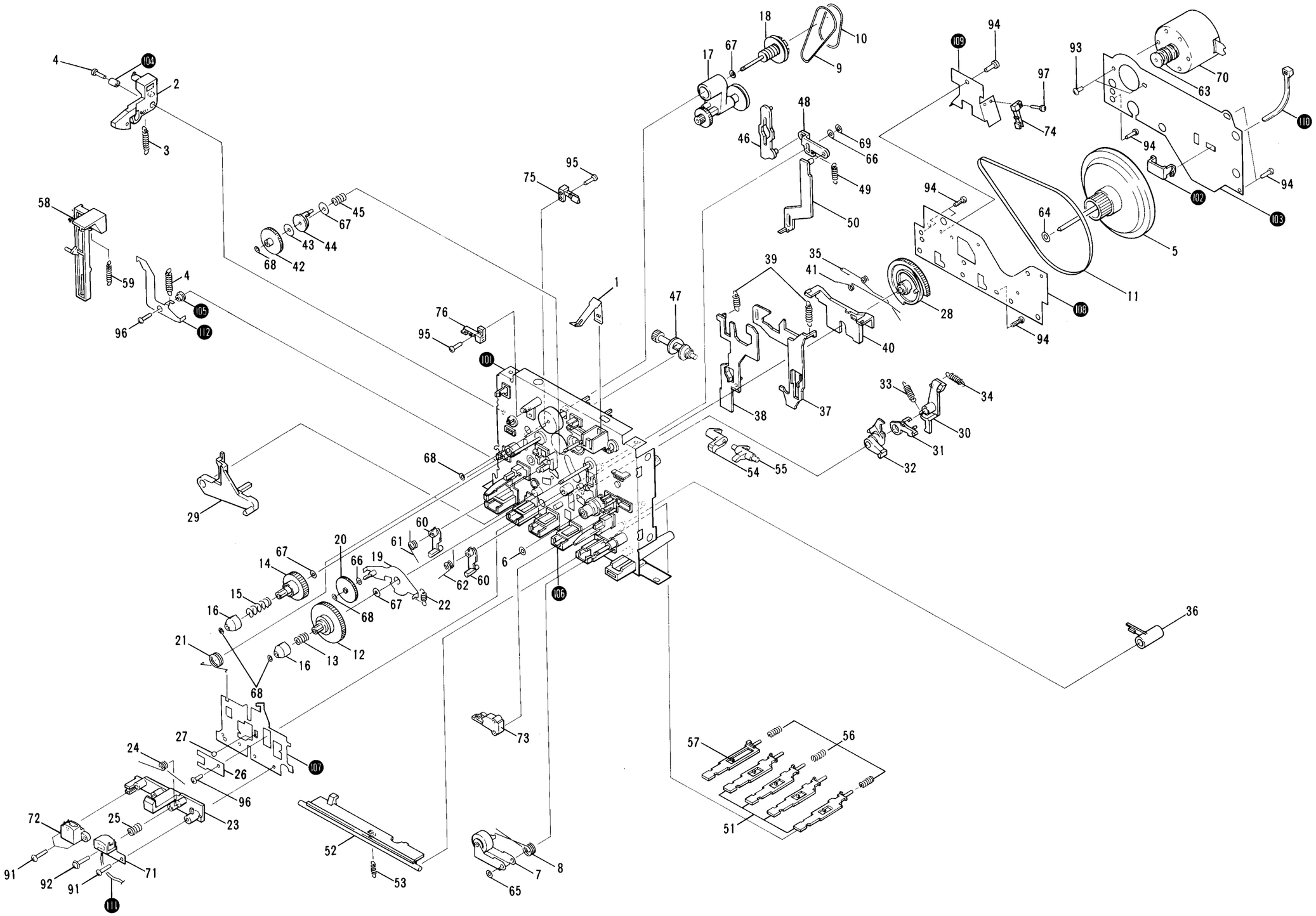
Parts List of Exploded View (Exterior Components)

Mark	No.	Part No.	Description
	1	RNT-062	Panel stay
★★	2	REB-492	Counter belt
	3	RNH-433	Knob spring
	4	RBL-133	Door spring
	5	RBL-150	Eject spring
	6	RBL-135	Joint spring
	7	RBL-159	OS absorption spring
	8	RBK-177	Hold spring
	9	REC-436	Door damper
	10	RNH-424	Lever A
	11	RNM-095	Lever B
	12	RNM-093	Joint A
	13	RNM-094	Jont B
	14	RNM-091	Stud A
	15	RNM-092	Stud B
⚠ ★	16	RTT-421	Power transformer (120V, KU)
⚠	17	RDG-048	AC power cord
⚠	18	REC-395	Strain relief
⚠ ★★	19	REK-079	Fuse (800mA, FU301, 302, KU)
⚠ ★★	20	REK-073	Fuse (1.25A, FU303, KU)
	21	RAW-216	Tape counter
	22	Refer to p. 14	Front panel
	23	Refer to p. 14	Display panel
	24	Refer to p. 14	Meter panel A
	25	RAH-702	Meter panel B
	26	Refer to p. 14	Door panel
	27	Refer to p. 14	Door panel
	28	Refer to p. 14	Door
	29	Refer to p. 14	Door
	30	REE-104	Remain display paper
	31	Refer to p. 14	Knob (PAUSE)
	32	Refer to p. 14	Knob (FF)
	33	Refer to p. 14	Knob (PLAY)
	34	Refer to p. 14	Knob (REW)
	35	Refer to p. 14	Knob (STOP)
	36	Refer to p. 14	Knob (REC)
	37	Refer to p. 14	Knob (RELEASE)
	38	RAC-576	Knob (POWER)
	39	Refer to p. 14	Knob (EJECT)
	40	Refer to p. 14	Knob (REC LEVEL)
	41	RNM-088	Knob guide
	42	RAC-629	Knob (TAPE SELECTOR)
	43	RAC-630	Knob (RELAY PLAY, HIGH SPEED)
	44	RAC-631	Knob (COPY)
	45	RAC-632	Knob (DOLBY NR)
	46	Refer to p. 14	Knob (SYNCHRO COPY)
	47	REB-513	Skid
	48	Refer to p. 14	Bonnet
	51	BBZ30P080FMC	Screw 3 x 8
	52	BBT30P080FZK	Screw 3 x 8
	53	BBZ30P060FZK	Screw 3 x 6
	54	ARZ26P080FMC	Screw 2.6 x 8
	55	RBF-073	Washer
	56	PMA30P060FMC	Screw 3 x 6
	57	WA32N060D020	Washer
	58	RBF-082	Washer
	59	WA32N060D020	Washer (for black model)
		WA32N060D030	Washer (for silver model)
	81		Tape transport unit (Deck II)
	82		Tape transport unit (Deck I)
	83		Chassis
	84		Rear panel
	85		Counter holder
	86		Cushion
	87		Knob shaft
	88		Main unit
	89		Meter unit
	90		Indicator unit
	91		Transistor A unit
	92		Transistor B unit
	93		Power switch unit
	94		Leg assembly

Contrast of Exterior Components

Key No.	Descriptions	CT-1060W[BK] without D	CT-1060W[BK] /D	CT-1060W /HEM, HB, D	CT-S77W[BK] /KU, D/G	CT-S77W /KU
22	Front panel	RAH-750	RAH-750	RAH-751	RAH-750	RAH-751
23	Display panel	RAH-696	RAH-698	RAH-697	RAH-698	RAH-698
24	Meter panel A	RAH-699	RAH-701	RAH-700	RAH-701	RAH-701
26	Door panel	RAH-690	RAH-694	RAH-692	RAH-694	RAH-694
27	Door panel	RAH-691	RAH-695	RAH-693	RAH-695	RAH-695
28	Door	RNM-082	RNM-082	RNM-084	RNM-086	RNM-087
29	Door	RNM-083	RNM-083	RNM-085	RNM-083	RNM-085
31	Knob (PAUSE)	RAC-649	RAC-649	RAC-643	RAC-649	RAC-643
32	Knob (FF)	RAC-652	RAC-652	RAC-646	RAC-652	RAC-646
33	Knob (PLAY)	RAC-648	RAC-648	RAC-642	RAC-648	RAC-642
34	Knob (REW)	RAC-651	RAC-651	RAC-645	RAC-651	RAC-645
35	Knob (STOP)	RAC-653	RAC-653	RAC-647	RAC-653	RAC-647
36	Knob (REC)	RAC-624	RAC-624	RAC-623	RAC-624	RAC-623
37	Knob (RELEASE)	RAC-622	RAC-622	RAC-621	RAC-622	RAC-621
39	Knob (EJECT)	RAC-628	RAC-628	RAC-627	RAC-628	RAC-627
40	Knob (REC LEVEL)	RAC-633	RAC-633	RAC-634	RAC-633	RAC-634
46	Knob (SYNCHRO COPY)	RAC-626	RAC-626	RAC-625	RAC-626	RAC-625
48	Bonnet	RNA-752	RNA-752	RNA-753	RNA-752	RNA-753

Tape Transport Unit (Deck I)



Parts List of Tape Transport Unit (Deck I)

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-070	Flywheel assembly
	6	RBF-030	Oil stopper washer
★★	7	RXB-495	Pinch arm assembly
	8	RBH-890	Pinch pressure spring
★★	9	REB-532	Drive belt A2
★★	10	REB-531	Drive belt B
★★	11	REB-533	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-092	Gear arm assembly
	20	RNM-106	Midway gear
	21	RBL-118	HB return spring
	22	RBL-108	Arm return spring
	23	RNM-006	Sub-head base
	24	RBL-152	HB drive spring
	25	RBH-723	Head adjust spring
	26	RBK-192	HB hold spring
	27	REF-026	Steel ball
	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-079	Stopper
	37	RNM-012	FF action plate
	38	RNM-013	REW action plate
	39	RBL-110	Action plate spring
	40	RNM-014	Brake plate
	41	RBL-120	Brake spring
	42	RNK-998	Idler gear
	43	RED-194	Detector felt
	44	RNL-318	Detector disk
	45	RBH-885	Detector spring
	46	RNM-015	Detector lever
	47	RNL-322	Cam gear
	48	RNL-275	Link
	49	RBH-886	Link return spring
	50	RNM-016	Stop lever

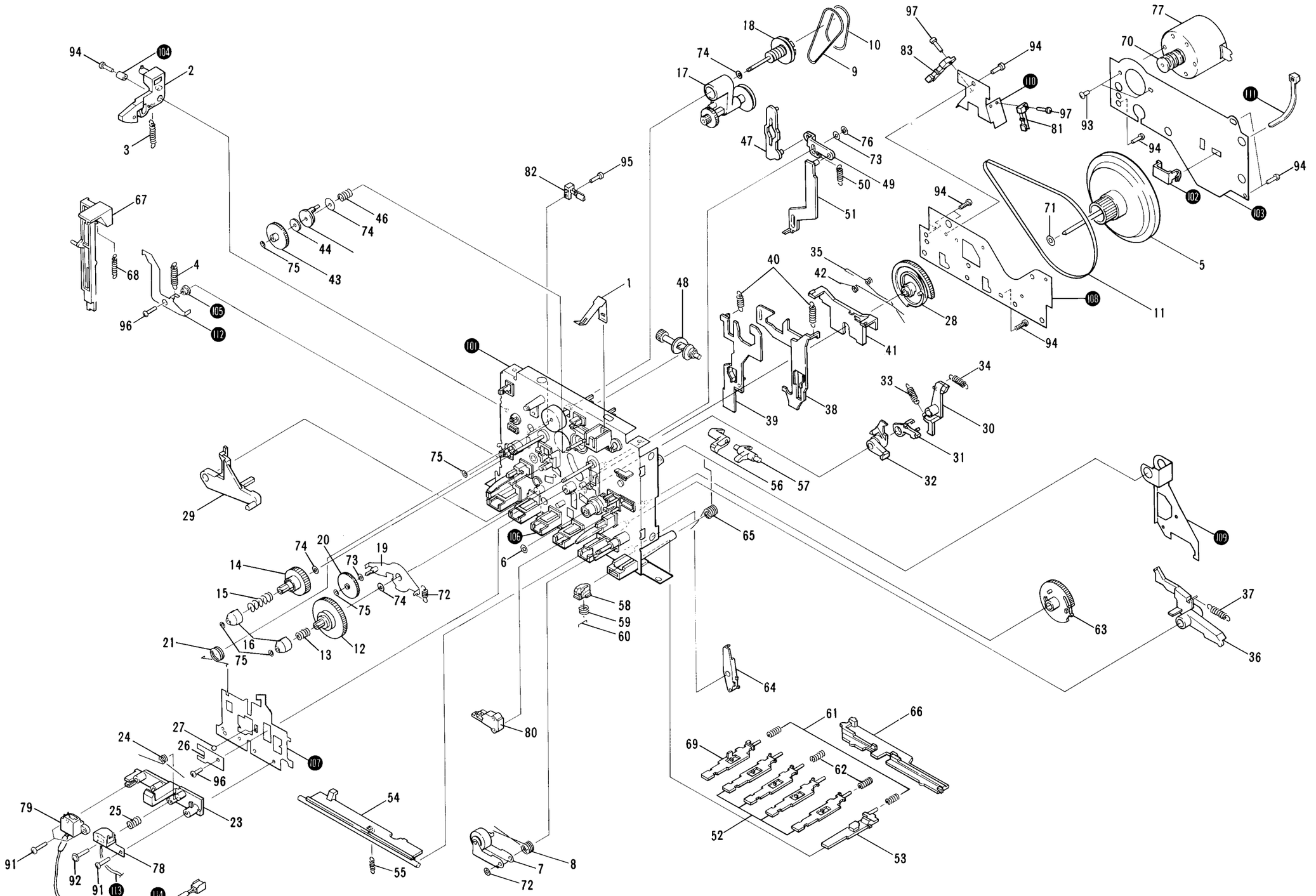
Mark	No.	Part No.	Description
	51	RNM-017	Operation button
	52	RNM-019	Lock plate
	53	RBL-111	Lock plate spring
	54	RNM-020	Joint L
	55	RNM-021	Joint R
	56	RBH-889	Button return spring
	57	RNM-028	Release button
	58	RNM-027	CrO_2 detector arm
	59	RBL-114	Detector arm spring
	60	RNL-285	HB lock lever
	61	RBL-117	Lock lever spring L
	62	RBH-908	Lock lever spring R
	63	RNM-029	Motor pulley
	64	WA026D047D025	Washer
	65	RBF-083	Washer
	66	WA021D040D025	Washer
	67	RBF-071	Washer
	68	RBF-076	Washer
	69	YS20FBT	Washer CS-type
★★	70	RXM-131	Motor
★★	71	RPB-122	REC/PB head
	72	RPB-112	Dummy head
★★	73	RSK-064	Lever switch (S903)
★★	74	RSN-036	Spring switch (S901)
★★	75	RSN-035	Spring switch (S902)
★★	75	RSN-037	Spring switch (S904)
	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	BBZ26P100FMZ	Screw 2.6 x 10
	97	PMZ20P080FMC	Screw 2 x 8
	101		Chassis
	102		Thrust receptacle
	103		Flywheel receptacle
	104		Collar A
	105		Collar B
	106		Metal holder assembly
	107		Head base
	108		Plate
	109		SW bracket
	110		Binder
	111		Connector assembly 3-P
	112		Eject stopper

Parts List of Tape Transport Unit (Deck II)

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-070	Flywheel assembly
	6	RBF-030	Oil stopper washer
★★	7	RXB-495	Pinch arm assembly
	8	RBH-890	Pinch pressure spring
★★	9	REB-532	Drive belt A2
★★	10	REB-531	Drive belt B
★★	11	REB-533	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-092	Gear arm assembly
	20	RNM-106	Midway gear
	21	RBL-118	HB return
	22	RBL-108	Arm return spring
	23	RNM-006	Sub-head base
	24	RBL-152	HB drive spring
	25	RBH-723	Head adjust spring
	26	RBK-192	HB hold spring
	27	REF-026	Steel ball
	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

Mark	No.	Part No.	Description
	56	RNM-020	Joint L
	57	RNM-021	Joint R
	58	RNL-334	Ratchet holder
	59	RBH-888	Ratchet spring
	60	RBH-870	Ratchet pin
	61	RBH-909	Pause button spring
	62	RBH-889	Button return sring
	63	RNM-030	Cam gear R2
	64	RNM-022	Gear lever R
	65	RBL-121	Trigger spring R2
	66	RNM-023	REC joint arm
	67	RNM-024	REC detector arm
	68	RBL-114	Detector arm spring
	69	RNM-025	REC button
	70	RNM-029	Motor pulley 2
	71	WA026D047D025	Washer
	72	RBF-083	Washer
	73	WA021D040D025	Washer
	74	RBF-071	Washer
	75	RBF-076	Washer
	76	YS20FBT	Washer CS-type
★★	77	RXM-131	Motor
★★	78	RPB-122	REC/PB head
★	79	RPB-085	Erase head
★★	80	RSK-064	Lever switch (S1004)
★★	81	RSN-036	Spring switch (S1002)
★★	82	RSN-035	Spring switch (S1003)
★★	83	RSN-037	Spring switch (S1001)
	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	PMZ20P080FMC	Screw 2 x 8
	101		Chassis
	102		Thrust receptacle
	103		Flywheel receptacle
	104		Collar A
	105		Collar B
	106		Metal holder assembly
	107		Head base
	108		Plate
	109		REC action spring
	110		SW bracket
	111		Binder
	112		Eject stopper
	113		Connector assembly 6-P
	114		Connector assembly 2-P

Tape Transport Unit (Deck II)

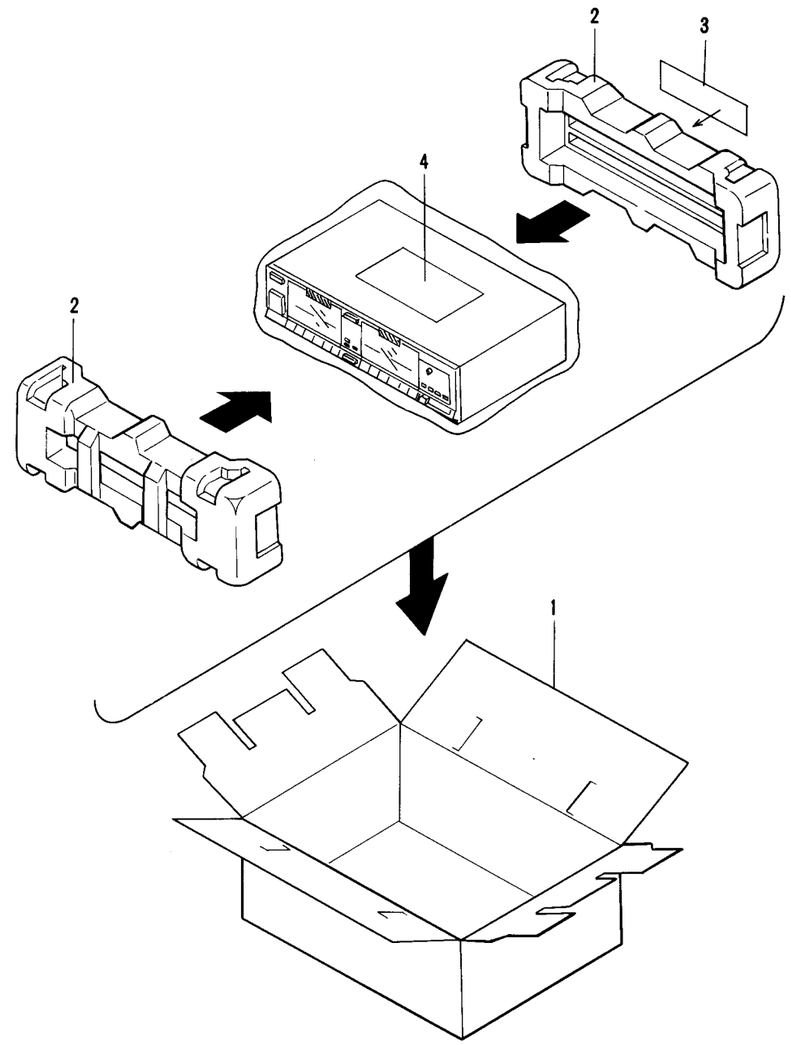


6. PAC

Mark	No.	P
	1	P
		P
		P
	2	P
	3	P
	4	P
		P

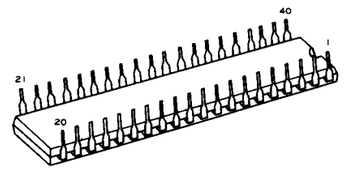
6. PACKING

Mark	No.	Part No.	Description
A	1	RHG-842	Packing case (CT-1060W [BK]/KU)
		RHG-846	Packing case (CT-S77W [BK]/KU)
		RHG-847	Packing case (CT-S77W/KU)
	2	RHA-276	Side pad
	3	RDE-010	Connection cord
	4	RRB-263	Operating instructions (CT-1060W, English)
—		RRB-264	Operating instructions (CT-S77W, English)

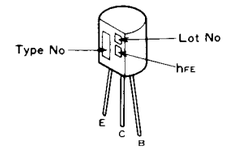


External Appearance of Transistors and ICs

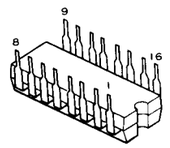
PD4061



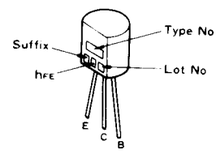
2SC2240



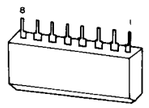
BA618



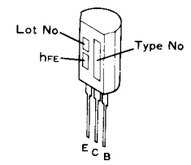
2SD1302



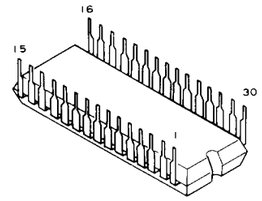
M5220L
M5218L



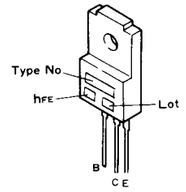
2SC3246



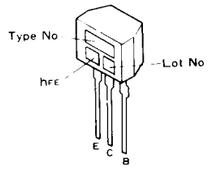
HA12058NT



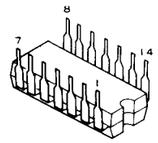
2SD1266
2SB1015
2SD1276



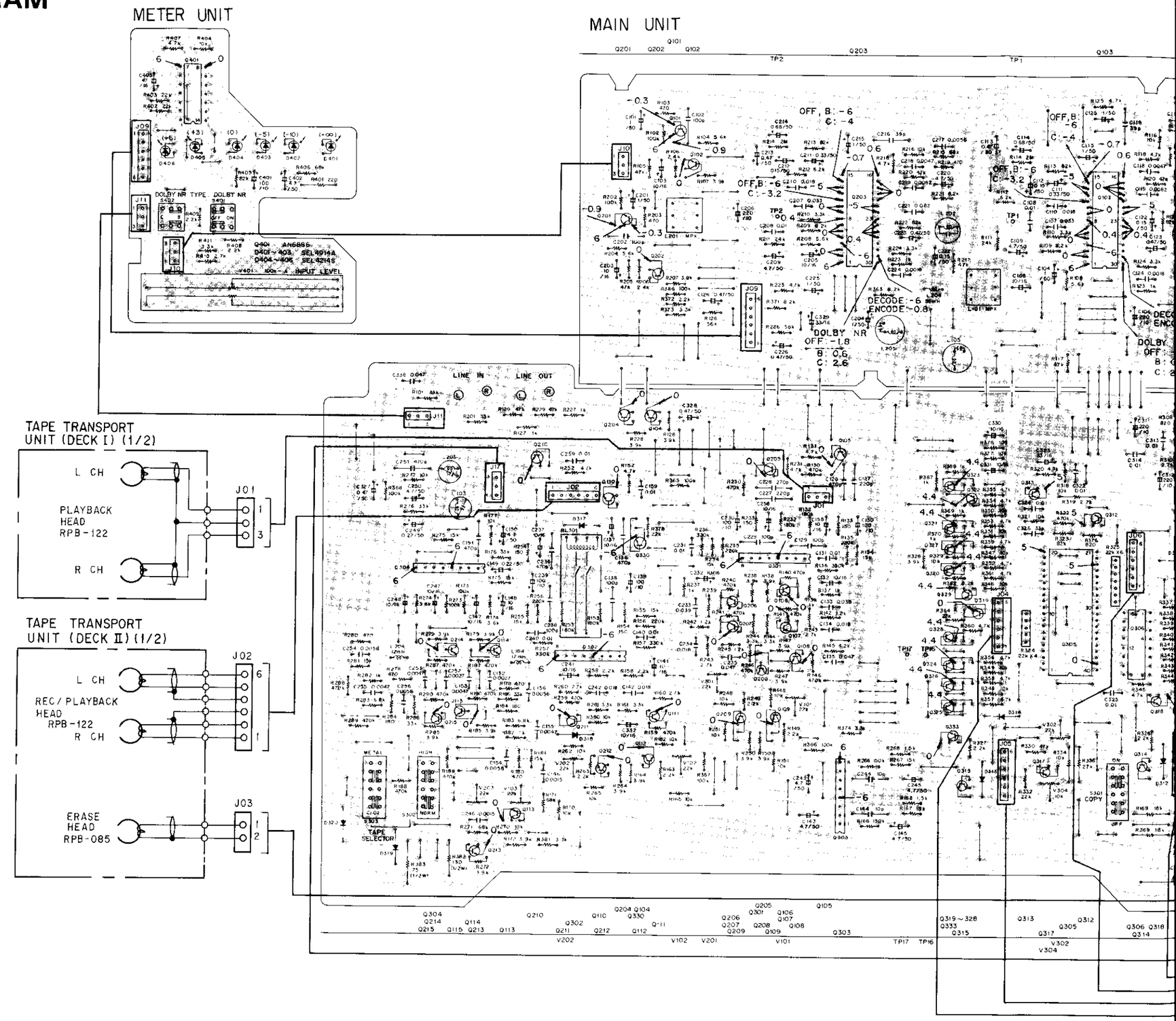
2SC1740S
2SA933S

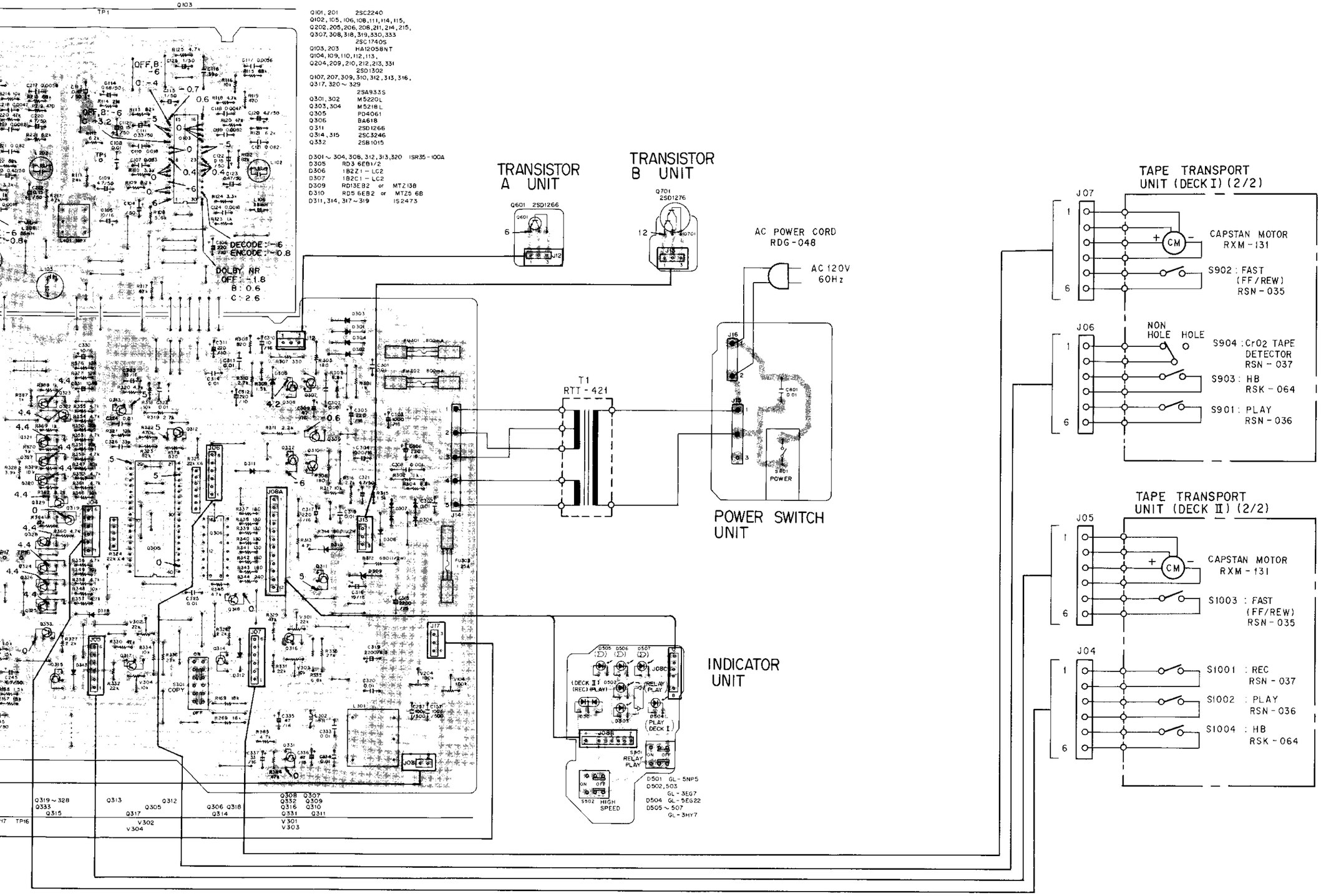


AN6886



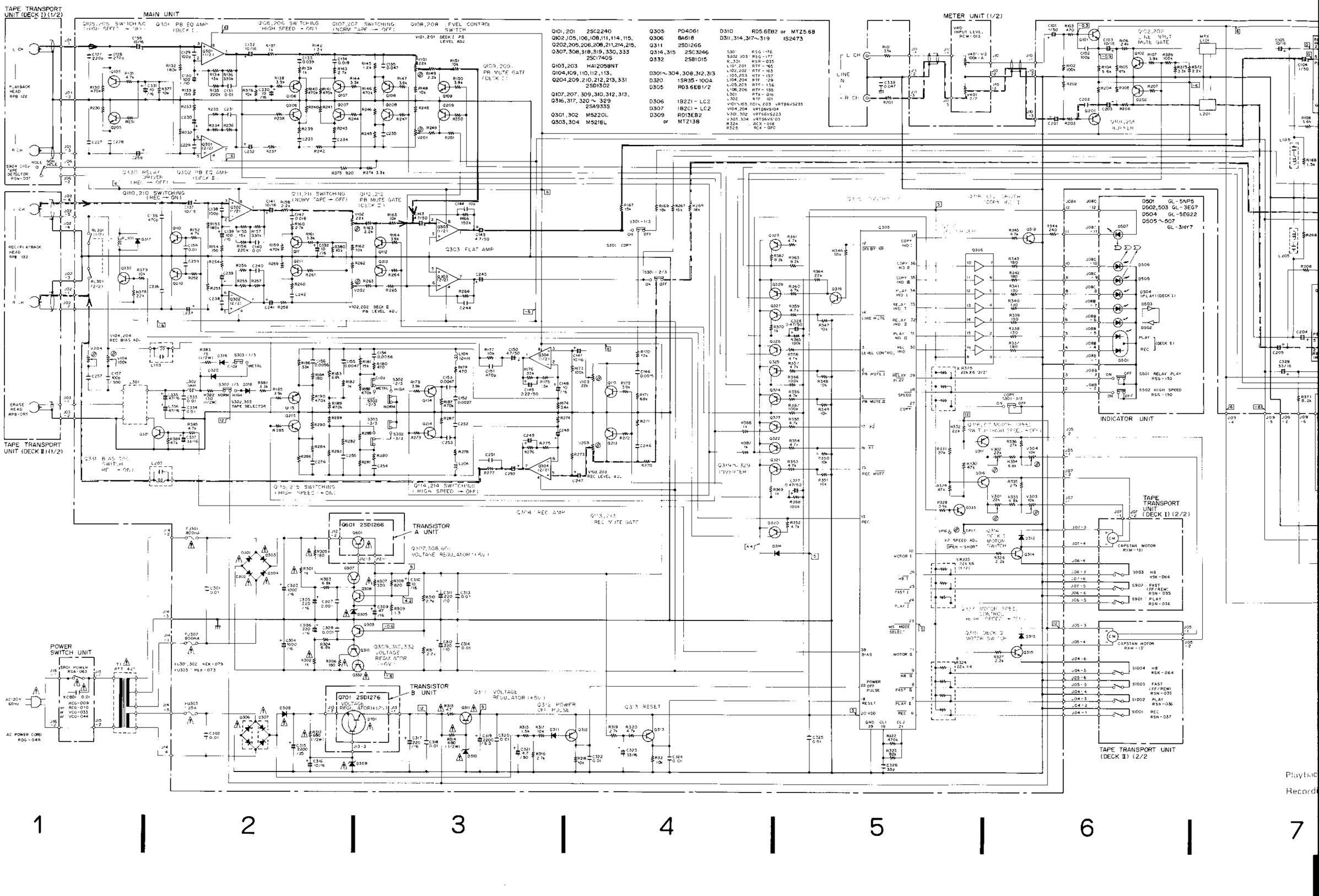
7. P.C.BOARDS CONNECTION DIAGRAM



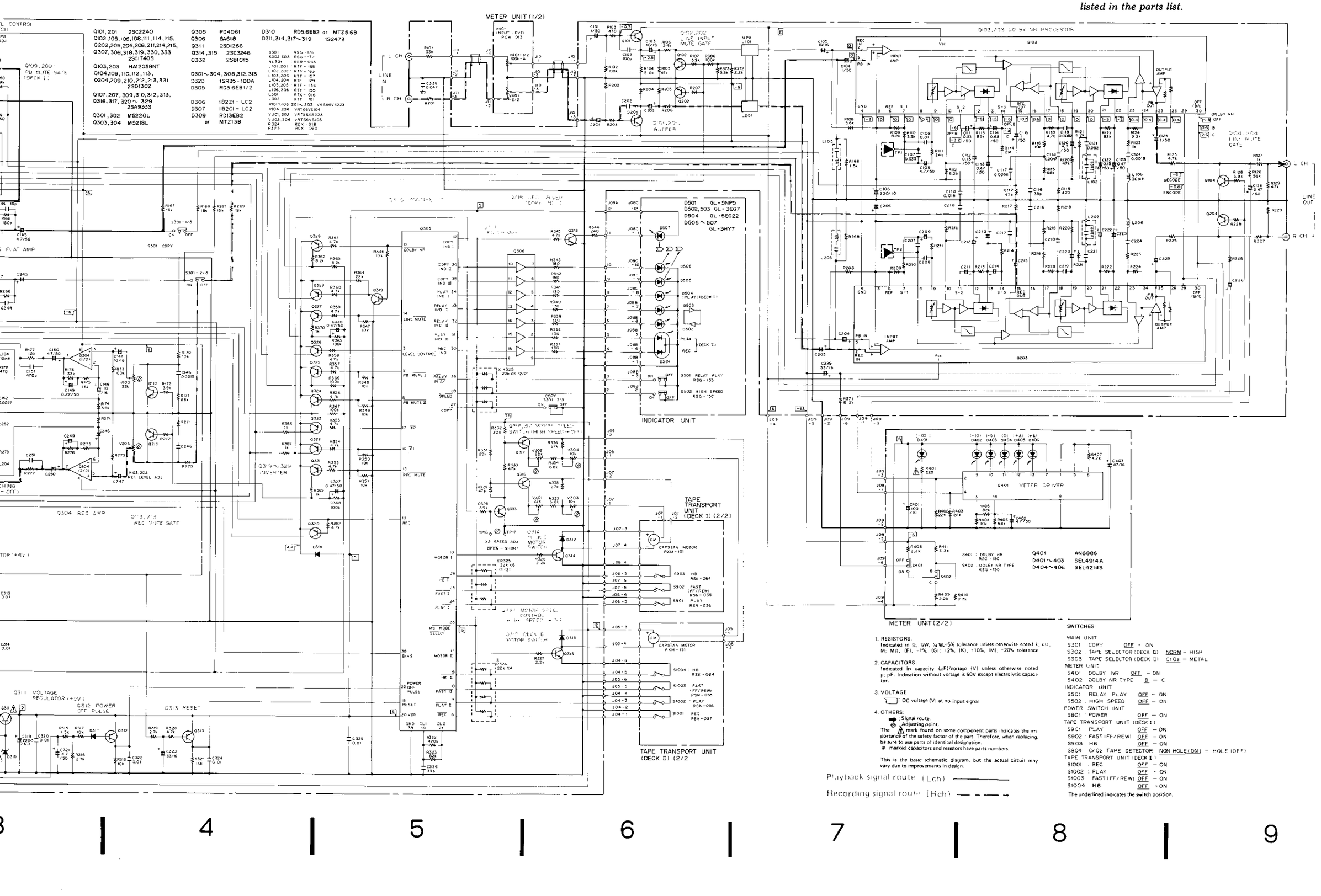

Q103
TP1
OFF, B: -6
C: -4
OFF, B: -6
C: -3.2
DECODE: -6
ENCODE: -0.8
DOLBY NR
OFF: -1.8
B: 0.6
C: 2.6
Q101, 201 2SC2240
Q102, 105, 106, 108, 111, 114, 115, Q202, 205, 206, 208, 211, 214, 215, Q307, 308, 318, 319, 330, 333 2SC1740S
Q103, 203 HA12058NT
Q104, 109, 110, 112, 113, Q204, 209, 210, 212, 213, 331 2SD1302
Q107, 207, 309, 310, 312, 313, 316, Q317, 320 ~ 329 2SA933S
Q301, 302 M5220L
Q303, 304 M5218L
Q305 PD4061
Q306 BA618
Q311 2SD1266
Q314, 315 2SC3246
Q332 2SB1015
D301 ~ 304, 308, 312, 313, 320 ISR35 - 100A
D305 RD3.6EB1/2
D306 1B2Z1 - LG2
D307 1B2C1 - LG2
D309 RD13EB2 or MTZ13B
D310 RD5.6EB2 or MTZ5.6B
D311, 314, 317 ~ 319 1S2473
TRANSISTOR A UNIT
Q601 2SD1266
TRANSISTOR B UNIT
Q701 2SD1276
AC POWER CORD RDG-048
AC 120V 60Hz
T1 RTT-421
POWER SWITCH UNIT
INDICATOR UNIT
D501 GL-5NP5
D502, 503 GL-3EG7
D504 GL-5EG22
D505 ~ 507 GL-3HY7
S902 HIGH SPEED
S801 POWER
S301 COPY
Q319 ~ 328 Q333 Q315
Q313 Q317 V302 V304
Q312 Q305
Q306 Q318 Q314
Q308 Q307 Q332 Q309 Q316 Q310 Q331 Q311
V301 V303

TAPE TRANSPORT UNIT (DECK I) (2/2)
J07
CAPSTAN MOTOR RXM-131
S902 : FAST (FF/REW) RSN-035
J06
NON HOLE
HOLE
S904 : CrO2 TAPE DETECTOR RSN-037
S903 : HB RSK-064
S901 : PLAY RSN-036
TAPE TRANSPORT UNIT (DECK II) (2/2)
J05
CAPSTAN MOTOR RXM-131
S1003 : FAST (FF/REW) RSN-035
J04
S1001 : REC RSN-037
S1002 : PLAY RSN-036
S1004 : HB RSK-064

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
: 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.

Playback signal route (Lch) ——————
Recording signal route (Rch) — — — →

SWITCHES

MAIN UNIT
S301 COPY OFF - ON
S302 TAPE SELECTOR (DECK II) NORM - HIGH
S303 TAPE SELECTOR (DECK II) CrO2 - METAL
METER UNIT
S401 DOLBY NR OFF - ON
S402 DOLBY NR TYPE B - C
INDICATOR UNIT
S501 RELAY PLAY OFF - ON
S502 HIGH SPEED OFF - ON
POWER SWITCH UNIT
S801 POWER OFF - ON
TAPE TRANSPORT UNIT (DECK I)
S901 PLAY OFF - ON
S902 FAST (FF/REW) OFF - ON
S903 HB OFF - ON
S904 CrO2 TAPE DETECTOR NON HOLE (ON) - HOLE (OFF)
TAPE TRANSPORT UNIT (DECK II)
S1001 REC OFF - ON
S1002 PLAY OFF - ON
S1003 FAST (FF/REW) OFF - ON
S1004 HB OFF - ON

The underlined indicates the switch position.

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 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.

Miscellaneous Parts

P.C. BOARD UNITS

Mark	Symbol & Description	Part No.
	Main unit	Non supply
	Meter uni	
	Indicator unit	
	Transistor A unit	
	Transistor B unit	
	Power switch unit	

FUSES

Mark	Symbol & Description		Part No.
⚠ ★★	FU301, FU302	Fuse (800mA)	REK-079
	FU303	Fuse (1.25A)	REK-073

SWITCHES

Mark	Symbol & Description		Part No.
★★	S901	Spring switch (PLAY)	RSN-036
★★	S902	Spring switch (FAST)	RSN-035
★★	S903	Lever switch (HB)	RSK-064
★★	S904	Spring switch (CrO_2)	RSN-037
★★	S1001	Spring switch (REC)	RSN-037
★★	S1002	Spring switch (PLAY)	RSN-036
★★	S1003	Spring switch (FAST)	RSN-035
★★	S1004	Lever switch (HB)	RSK-064

OTHERS

Mark	Symbol & Description	Part No.
⚠ ★	Power transformer (120V)	RTT-421
⚠	AC power cord	RDG-048
⚠	Strain relief	REC-395
★★	Motor	RXM-131
★★	REC/PB head	RPB-122
★	Erase head	RPB-085

Main Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q305	PD4061
★★	Q306	BA618
★★	Q301, Q302	M5220L
★★	Q303, Q304	M5218L
★★	Q103, Q203	HA12058NT
★★	Q102, Q105, Q106, Q108, Q111, Q114, Q115, Q202, Q205, Q206, Q208, Q211, Q214, Q215, Q307, Q308, Q318, Q319, Q330, Q333	2SC1740S
★★	Q107, Q207, Q309, Q310, Q312, Q313, Q316, Q317, Q320 – Q329	2SA933S
★★	Q101, Q201	2SC2240
★★	Q104, Q109, Q110, Q112, Q113, Q204, Q209, Q210, Q212. Q213, Q331	2SD1302
★★	Q314, Q315	2SC3246
⚠ ★★	Q311	2SD1266
⚠ ★★	Q332	2SB1015
⚠ ★	D301 – D304, D308, D312, D313, D320	1SR35-100A
⚠ ★	D307	1B2C1-LC2
⚠ ★	D306	1B2Z1-LC2
⚠ ★	D305	RD3.6EB1 (RD3.6EB2)
⚠ ★	D310	RD5.6EB2 (MTZ5.6B)
⚠ ★	D309	RD13EB2 (MTZ13B)
★	D311, D314, D317 – D319	1S2473

SWITCHES

Mark	Symbol & Description		Part No.
★★	S302, S303	Push switch assembly (TAPE SELECTOR)	RSG-177
★★	S301	Push switch (COPY)	RSG-176

COILS

Mark	Symbol & Description		Part No.
	L301	OSC block	RTX-016
	L101, L201	MPX filter	RTF-165
	L302	Line coil	RTF-101
	L104, L204	Peaking coil	RTF-129
	L106, L206	Coil (36mH)	RTF-155
	L105, L205	Trap coil	RTF-156
	L103, L203	Trap coil	RTF-157
	L102, L202	Trap coil	RTF-163

CAPACITORS

Mark	Symbol & Description	Part No.
	C112, C122, C212, C222	CEJAR15M50
	C149, C249	CEJAR22M50
	C111, C211	CEJAR33M50
	C114, C214	CEJAR68M50
	C113, C123, C126, C213, C223, C226, C327, C328	CEAR47M50
	C101, C104, C115, C125, C201, C204, C215, C225	CEA010M50
	C109, C120, C143, C145, C150, C209, C220, C243, C245, C250, C321	CEA4R7M50
	C103, C105, C132, C137, C141, C147, C148, C158, C203, C205, C232, C237, C241, C247, C248, C258, C310, C316, C330 – C332	CEA100M16
	C323, C329, C337	CEA330M16
	C309, C335, C336	CEA470M16
	C130, C139, C230, C239	CEA101M10
	C106, C206, C311, C312	CEA221M10
	C305, C306, C317	CEA221M16
	C303, C304	CEA102M16
	C319	CEA222M6R3
	C315	CEA222M25
	C146, C246	CQMA152J50
	C124, C224	CQMA182J50
	C152, C252	CQMA272J50
	C118, C153, C155, C218, C253, C255	CQMA472J50
	C117, C154, C156, C217, C254, C256	CQMA562J50
	C119, C219	CQMA822J50
	C108, C131, C140, C208, C231, C240	CQMA103J50
	C110, C134, C142, C210, C234, C242	CQMA183J50
	C107, C207	CQMA333J50

Mark	Symbol & Description	Part No.
	C133, C233	CQMA393J50
	C135, C235	CQMA473J50
	C121, C221	CQMA823J50
	C144, C244	CCPSL100J50
	C116, C216	CCPSL390J50
	C102, C129, C138, C202, C229, C238	CCPSL101J50
	C127, C227	CKPYB221K50
	C128, C228	CKPYB271K50
	C136, C236, C151, C251	CKPYB471K50
	C307, C308	CKPYB102K50
	C159, C259, C301, C302, C313, C314, C318, C320, C322, C324, C325, C333, C334	CKDYF103Z50
	C338	CKDYF473Z50
	C326	CCDCH330J50
	C157, C257	CCDSL101K50

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.
★	V101 – V103, V201 – V203	Semi-fixed (22k-B)	VRTB6VS223
★	V104, V204	Semi-fixed (100k-B)	VRTS6VS104
★	V303, V304	Semi-fixed (10k-B)	VRTS6VS103
★	V301, V302	Semi-fixed (22k-B)	VRTS6VS223
	R324	Resistor array 22kx4	RCX-018
	R325	Resistor array 22kx6	RCX-020
⚠	R312, R314		RD1/2PMF 681J
	R382, R383		RD1/2PMF □□□J
⚠	R313		RFA1/4L4R7J
	R333 – R336		RN1/4PQ □□□J
⚠	R301, R302, R305 – R307		RD1/4PM □□□J
	R169, R269, R310, R311, R319		RD1/4PM □□□J
	Other resistors		RD1/6PM □□□J

OTHERS

Mark	Symbol & Description		Part No.
	Terminal (LINE)		RKB-020
★★	RL301	Reed relay	RSR-035

Meter Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q401	AN6886
★	D401 – D403	SEL4914A
★	D404 – D406	SEL4214S

SWITCHES

Mark	Symbol &
★★	S401, S40

CAPACITORS

Mark	Symbol &
	C402
	C403
	C401

RESISTORS

Note: When ord into code

Mark	Symbol &
★	V401
⚠	R401
	Other resi

Indicator Unit

SEMICONDUCTO

Mark	Symbol &
★	D502, D5
★	D505 – D
★	D504
★	D501

SWITCHES

Mark	Symbol &
★★	S502 Pu
★★	S501 Pu

Transistor A Un

SEMICONDUCTO

Mark	Symbol &
⚠ ★★	Q601

Transistor B Un

SEMICONDUCTO

Mark	Symbol &
⚠ ★★	Q701

SWITCHES

Mark	Symbol & Description		Part No.
★★	S302, S303	Push switch assembly (TAPE SELECTOR)	RSG-177
★★	S301	Push switch (COPY)	RSG-176

COILS

Mark	Symbol & Description		Part No.
	L301	OSC block	RTX-016
	L101, L201	MPX filter	RTF-165
	L302	Line coil	RTF-101
	L104, L204	Peaking coil	RTF-129
	L106, L206	Coil (36mH)	RTF-155
	L105, L205	Trap coil	RTF-156
	L103, L203	Trap coil	RTF-157
	L102, L202	Trap coil	RTF-163

CAPACITORS

Mark	Symbol & Description	Part No.
	C112, C122, C212, C222	CEJAR15M50
	C149, C249	CEJAR22M50
	C111, C211	CEJAR33M50
	C114, C214	CEJAR68M50
	C113, C123, C126, C213, C223, C226, C327, C328	CEAR47M50
	C101, C104, C115, C125, C201, C204, C215, C225	CEA010M50
	C109, C120, C143, C145, C150, C209, C220, C243, C245, C250, C321	CEA4R7M50
	C103, C105, C132, C137, C141, C147, C148, C158, C203, C205, C232, C237, C241, C247, C248, C258, C310, C316, C330 – C332	CEA100M16
	C323, C329, C337	CEA330M16
	C309, C335, C336	CEA470M16
	C130, C139, C230, C239	CEA101M10
	C106, C206, C311, C312	CEA221M10
	C305, C306, C317	CEA221M16
	C303, C304	CEA102M16
	C319	CEA222M6R3
	C315	CEA222M25
	C146, C246	CQMA152J50
	C124, C224	CQMA182J50
	C152, C252	CQMA272J50
	C118, C153, C155, C218, C253, C255	CQMA472J50
	C117, C154, C156, C217, C254, C256	CQMA562J50
	C119, C219	CQMA822J50
	C108, C131, C140, C208, C231, C240	CQMA103J50
	C110, C134, C142, C210, C234, C242	CQMA183J50
	C107, C207	CQMA333J50

Mark	Symbol & Description		Part No.
	C133, C233		CQMA393J50
	C135, C235		CQMA473J50
	C121, C221		CQMA823J50
	C144, C244		CCPSL100J50
	C116, C216		CCPSL390J50
	C102, C129, C138, C202, C229, C238		CCPSL101J50
	C127, C227		CKPYB221K50
	C128, C228		CKPYB271K50
	C136, C236, C151, C251		CKPYB471K50
	C307, C308		CKPYB102K50
	C159, C259, C301, C302, C313, C314, C318, C320, C322, C324, C325, C333, C334		CKDYF103Z50
	C338		CKDYF473Z50
	C326		CCDCH330J50
	C157, C257		CCDSL101K50

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.
★	V101 – V103, V201 – V203	Semi-fixed (22k-B)	VRTB6VS223
★	V104, V204	Semi-fixed (100k-B)	VRTS6VS104
★	V303, V304	Semi-fixed (10k-B)	VRTS6VS103
★	V301, V302	Semi-fixed (22k-B)	VRTS6VS223
	R324	Resistor array 22kx4	RCX-018
	R325	Resistor array 22kx6	RCX-020
⚠	R312, R314		RD1/2PMF 681J
	R382, R383		RD1/2PMF □□□J
⚠	R313		RFA1/4L4R7J
	R333 – R336		RN1/4PQ □□□J
⚠	R301, R302, R305 – R307		RD1/4PM □□□J
	R169, R269, R310, R311, R319		RD1/4PM □□□J
	Other resistors		RD1/6PM □□□J

OTHERS

Mark	Symbol & Description		Part No.
	Terminal (LINE)		RKB-020
★★	RL301	Reed relay	RSR-035

Meter Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q401	AN6886
★	D401 – D403	SEL4914A
★	D404 – D406	SEL4214S

SWITCHES

Mark	Symbol & Description		Part No.
★★	S401, S402	Push switch (DOLBY NR)	RSG-150

CAPACITORS

Mark	Symbol & Description	Part No.
	C402	CEA4R7M50
	C403	CEA470M16
	C401	CEA101M10

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.
★	V401	Variable (REC LEVEL)	RCW-013
⚠	R401		RD1/4PM221J
	Other resistors		RD1/6PM □□□J

Indicator Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D502, D503	GL-3EG7
★	D505 – D507	GL-3HY7
★	D504	GL-5EG22
★	D501	GL-5NP5

SWITCHES

Mark	Symbol & Description		Part No.
★★	S502	Push switch (HIGH SPEED)	RSG-150
★★	S501	Push switch (RELAY PLAY)	RSG-153

Transistor A Unit

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
⚠★★	Q601	2SD1266

Transistor B Unit

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
⚠★★	Q701	2SD1276

Power Switch Unit

SWITCHES

Mark	Symbol & Description		Part No.
★★	S801	Push switch (POWER)	RSA-063

CAPACITORS

Mark	Symbol & Description		Part No.
	C801	Ceramic (0.01/AC400V)	RCG-009 (RCG-010) (VCG-033) (VCG-044)

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 300 ~ 500g, replace the pinch pressure spring.

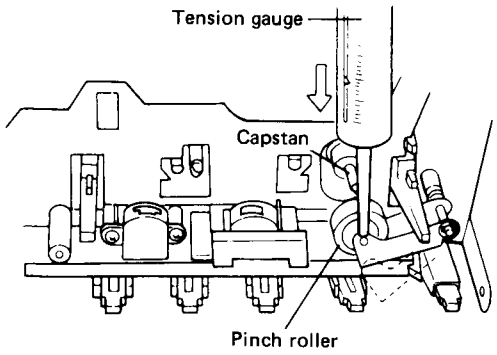


Fig. 10-1 Pinch roller pressure adjustment

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. Load the STD-301 test tape into the deck I, and any blank tape into the deck II.
2. Press the SYNCHRO COPY START key and let the deck warm up for at least ten seconds.
3. Short circuit between the TP16 and TP17 terminals. (double speed playback)
4. Check that the deck I playback frequency is 6000Hz±20Hz. If the frequency lies outside of this range, adjust V303 to 6000Hz±20Hz.
5. Open circuit between the TP16 and TP17 terminals.
6. Check that the deck I playback signal frequency is 3000Hz±5Hz. If the frequency lies outside of this range, adjust V301 to 3000Hz ±5Hz.
7. Load the STD-301 test tape into the deck II.
8. Press the deck II PLAY key, and short circuit between the TP16 and TP17 terminals.
9. Adjust V304 to obtain a double speed playback frequency within ±10Hz of the adjusted value in deck I.
10. Open circuit between the TP16 and TP17 terminals.
11. Adjust V302 to obtain a normal speed playback frequency within ±5Hz of the adjusted value in deck I.

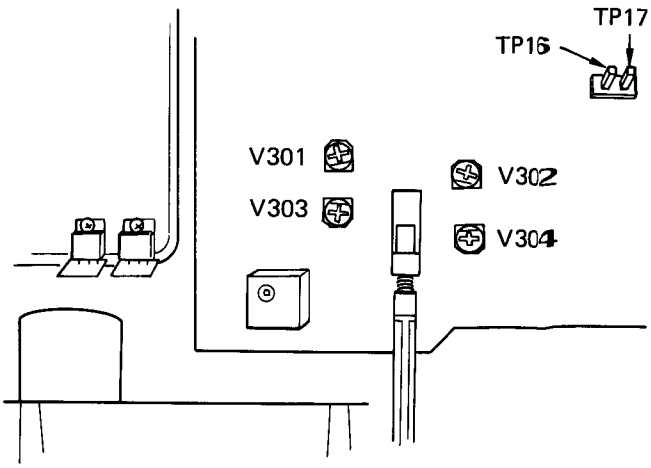


Fig. 10-2 Tape speed adjustment

Door Damping Check and Adjustment

Press the EJECT buttons (deck I, II) at the same time, and check that the door opening speed difference between the deck I and II is approx. 17mm max. when fully open (normal temperature). If the outside of this range, move the door spring catching position (deck I only).

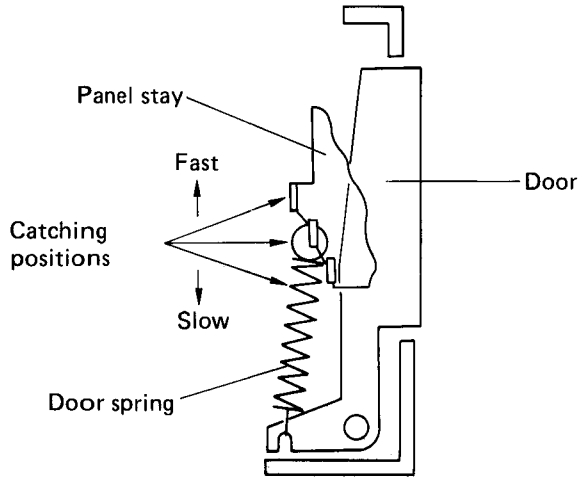


Fig. 10-3 Door damping adjustment (deck I)

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 signals is 0dBv=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-603 : CrO_2 blank tape
STD-610 : METAL blank tape

List of Adjustments

Deck I

1. Head azimuth adjustment.
2. Playback equalizer check.
3. Playback time constant switching check.
4. Playback level adjustment.

Deck II

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 response adjustment.
7. Recording level adjustment.
8. Copy mode frequency response check.

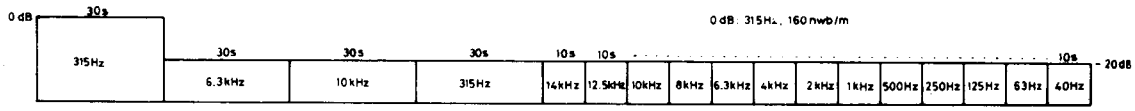


Fig. 10-4 Contents of the test tape STD-331B

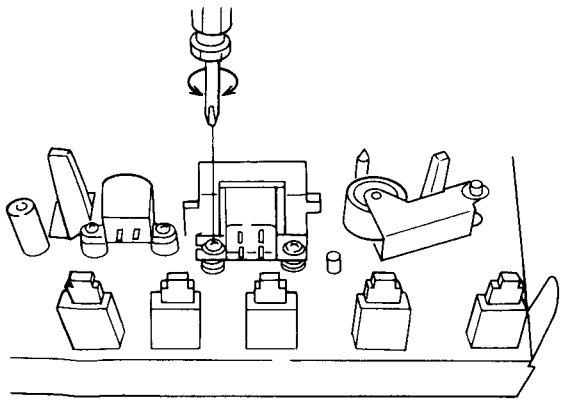


Fig. 10-5 Head azimuth adjustment

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

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

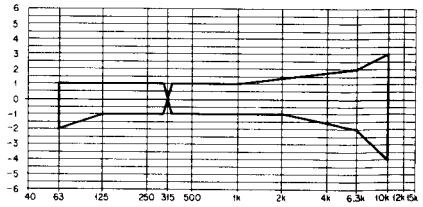


Fig. 10-6 Allowable playback frequency response zone

Deck I

1. Head Azimuth Adjustment
- Turn V102 and V202 to mechanical center positions.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	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.	
2	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	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±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.

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	PLAY	Play the 315Hz/0dB section of the STD-331B test tape.	V101 (Left channel) V201 (Right channel)	TP1 (L ch) TP2 (R ch)	–7.7dBv (412mV)	

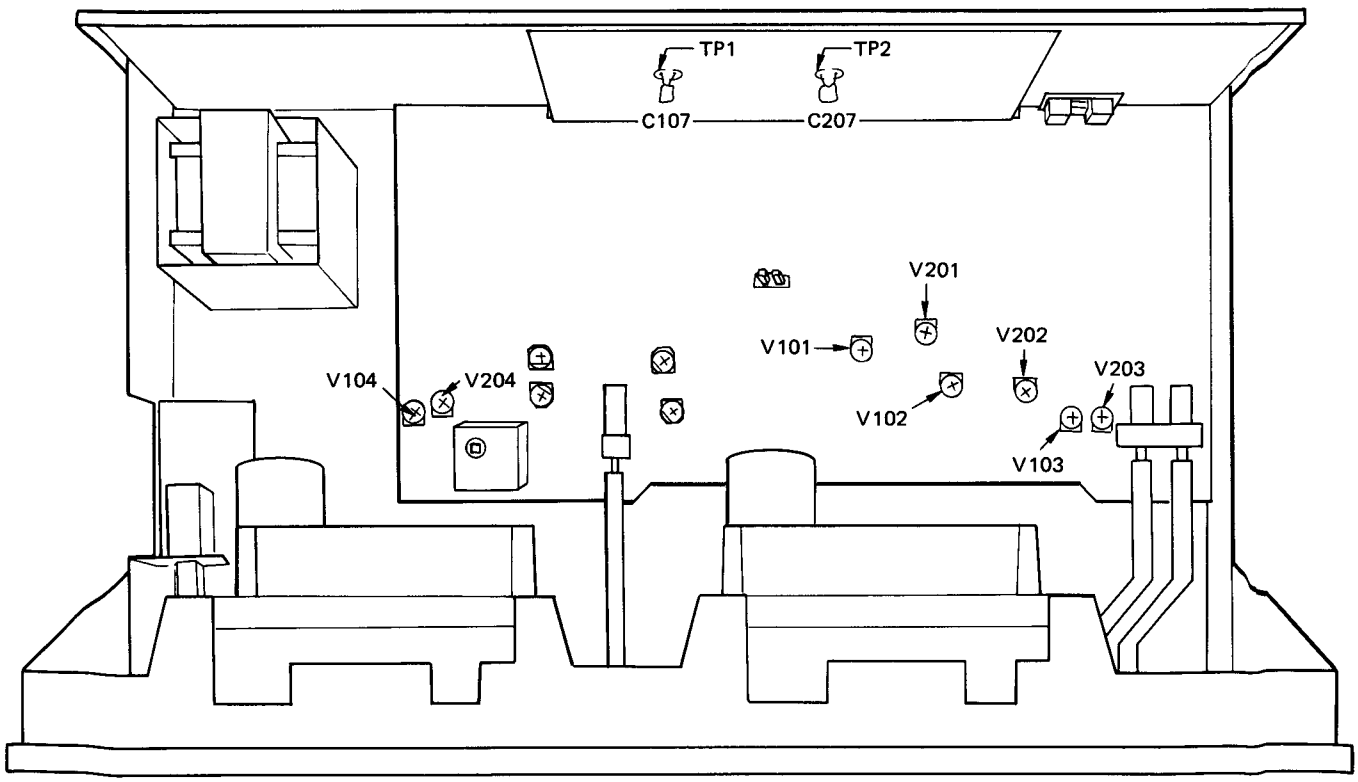


Fig. 10-7 Adjustments locations

Deck II

1. Head Azimuth Adjustment
- Turn V102 and V202 to mechanical center positions.

	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±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 TAPE SELECTOR switch is changed.

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	Paly the 315Hz/0dB section of the STD-331B test tape.	V102 (Left channel) V202 (Right channel)	TP1 (L ch) TP2 (R ch)	–7.7dBv (412.1mV)	

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	TP1 (L ch) TP2 (R ch)	Check that the level meters "0dB" light up within –7.7dBv±2dB 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 315H/–30dBv (31.6mV) signal to the LINE INPUT terminals.	REC LEVEL control	TP1 (L ch) TP2 (R ch)	–27.7dB (41.2mV)	
3	REC/PLAY	Record the above signal level onto the STD-608A test tape at 315Hz and 6.3kHz, and playback.	V104 (Left channel) V204 (Right channel)	Left and right OUTPUT terminals.	The 6.3kHz playback level is +0.5 $^{+1}_{-0}$ dB against 315Hz level (Playback the signals 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 V104 and V204 that the 6.3kHz playback level is –2 ~ +3.5dB 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	TP1 (L ch) TP2 (R ch)	–7.7dBv (412.1mV)	
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.	V103 (Left channel) V203 (Right channel)	TP1 (L ch) TP2 (R ch)	–7.7dBv (412.1mV)	
5		Set the TAPE SELECTOR switch to the CrO_2 position.				
6		Record the above signal onto the STD-603 test tape, and playback.	Confirm	TP1 (L ch) TP2 (R ch)	–7.7dBv±1.5dB	
7		Set the TAPE SELECTOR switch to the METAL position.				
8		Record the above signal onto the STD-610 test tape, and playback.	Confirm	TP1 (L ch) TP2 (R ch)	–7.7dBv±1.5dB	

8. Copy Mode Frequency Response Check

- To be executed after all other adjustments have been completed.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	COPY & HIGH SPEED	Load the STD-331B test tape into deck I, and the STD-608A test tape into deck II.	–	–	Copy recorded signal from STD-331B (at both normal and double speeds)	
3	PLAY (Deck II)	Play the signal recorded on the STD-608A test tape in the previous adjustment procedure.	Check	Left and right OUTPUT terminals	The allowable zone shown in Fig.10-9 is to be satisfied.	
4	STOP	Set the TAPE SELECTOR switch to the CrO_2 position.				
5	Load the STD-603 test tape into deck II, and repeat steps 1 and 2 to check that the allowable zone shown in Fig. 10-9 is satisfied.					
6	STOP	Set the TAPE SELECTOR switch to the METAL position.				
7	Load the STD-610 test tape into deck II, and repeat steps 1 and 2 to check that the allowable zone shown in Fig. 10-9 is satisfied.					

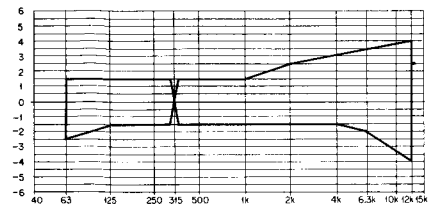
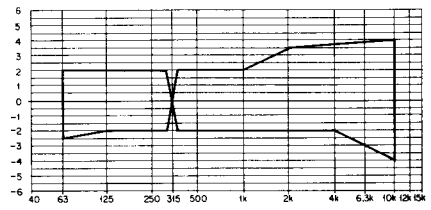
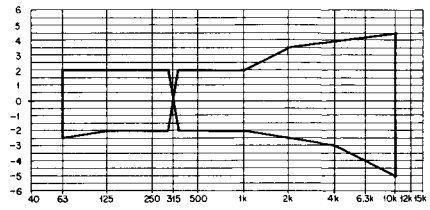
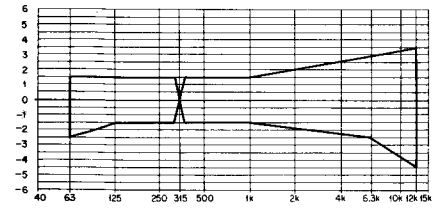
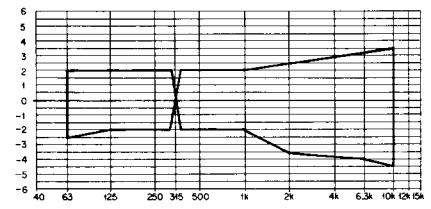
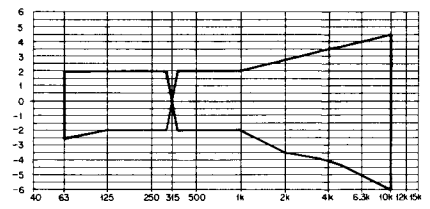
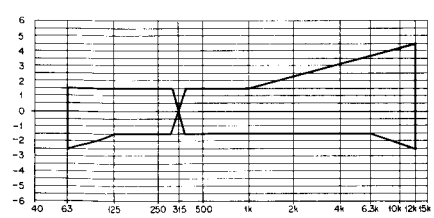
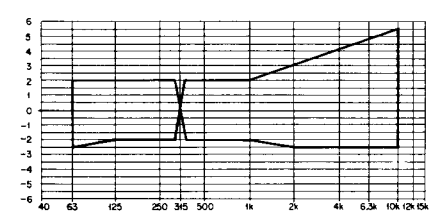
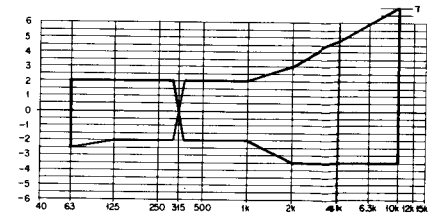
Test Tape : STD-608A		
TAPE SELECTOR : NORM		
DOLBY NR : OFF	DOLBY NR : B-TYPE ON	DOLBY NR : C-TYPE ON
		
Test Tape : STD-603		
TAPE SELECTOR : CrO_2		
DOLBY NR : OFF	DOLBY NR : B-TYPE ON	DOLBY NR : C-TYPE ON
		
Test Tape : STD-610		
TAPE SELECTOR : METAL		
DOLBY NR : OFF	DOLBY NR : B-TYPE ON	DOLBY NR : C-TYPE ON
		

Fig. 10-8 Allowable recording and playback frequency response zone

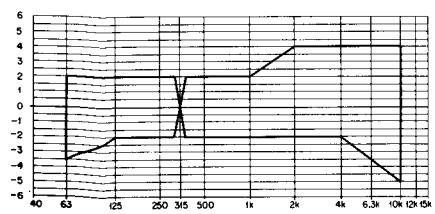
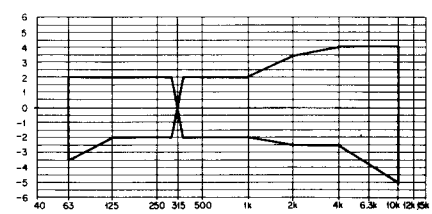
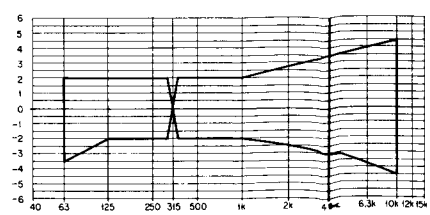
Test Tape : STD-608A	Test Tape : STD-603	Test Tape : STD-610
TAPE SELECTOR : NORM	TAPE SELECTOR : CrO_2	TAPE SELECTOR : METAL
DOLBY NR : OFF	DOLBY NR : OFF	DOLBY NR : OFF
		

Fig. 10-9 Copy mode allowable recording and playback frequency response zone

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.

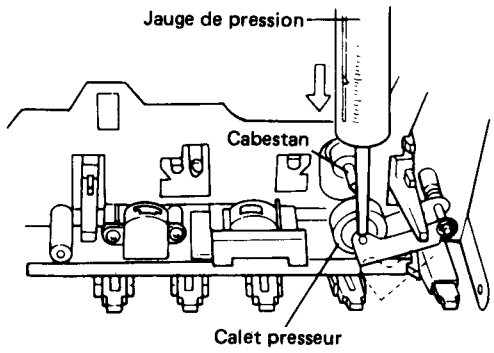


Fig. 10-1 Réglage de la force d'appui du galet-presseur

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

1. Charger la bande d'étalonnage STD-301 dans la platine I et n'importe quelle bande vierge dans la platine II.
2. Presser la touche SYNCHRO COPY START et laisser la platine chauffer pendant au moins dix secondes.
3. Etablir un court-circuit entre les bornes TP16 et TP17. (lecture en double vitesse)
4. Contrôler la fréquence de lecture de la platine I et s'assurer qu'elle est bien de 6000Hz±20Hz. Si la fréquence indiquée se trouve en dehors de cette marge, refaire un réglage de V303 pour obtenir 6000Hz±20Hz.
5. Libérer le court-circuit entre les bornes TP16 et TP17.
6. Contrôler la fréquence de lecture de la platine II et s'assurer qu'elle est bien de 3000Hz±5Hz. Si la fréquence indiquée se trouve en dehors de cette marge, refaire un réglage de V301 pour obtenir 3000Hz±5Hz.
7. Charger la bande d'étalonnage STD-301 dans la platine II.
8. Presser la toucher PLAY de la platine II et établir un court-circuit entre les bornes TP16 et TP17.
9. Régler V304 de façon à obtenir la fréquence de lecture en double vitesse avec une tolérance de ±10Hz de la valeur ajustée à la platine I.
10. Libérer le court-circuit entre les bornes TP16 et TP17.
11. Faire un réglage de V302 de façon à obtenir la fréquence de lecture en vitesse normale avec une tolérance de ±5Hz de la valeur ajustée à la platine I.

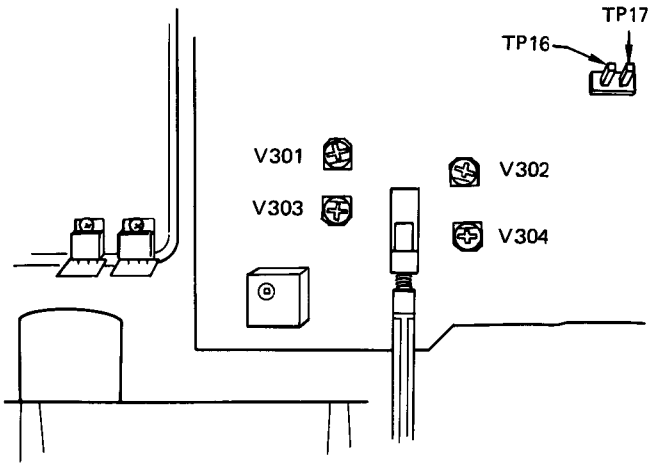


Fig. 10-2 Réglage de la vitesse de défilement

Contrôle et réglage de l'amortisseur de trappe

Presser simultanément les touches EJECT (des platines I, II) et vérifier si la différence de vitesse d'ouverture entre la trappe de la platine I et de la platine II est d'environ 17mm maxi. en ouverture totale (à la température normale). Si la différence se trouve en dehors de cette marge, changer de position d'accrochage de ressort (Platine I seulement).

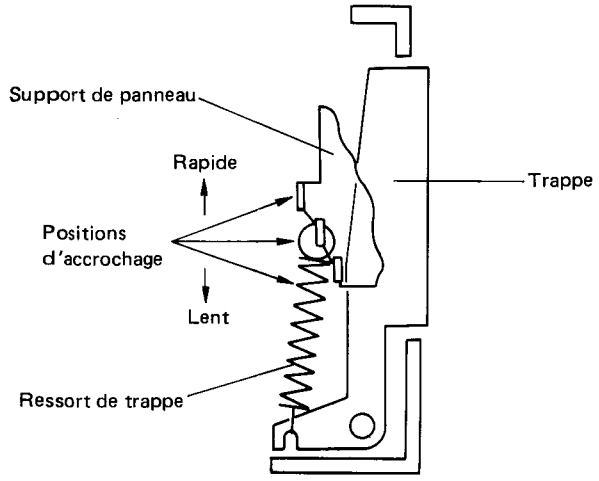


Fig. 10-3 Réglage de l'amortisseur de trappe (Platine I)

10.2 RÉGLAGES ÉLECTRIQUES

Conditions nécessaires pour réaliser les réglages

1. Tous les réglages des mécanismes doivent avoir été faits au préalable.
2. La tête magnétique doit être propre et démagnétisée.
3. Laisser chauffer les platines pendant quelques minutes avant de commencer les réglages électriques.
4. Caler le signal de référence à 0dBv=1V effi.
5. Raccorder une résistance de charge de 50 K-ohms (ou dans les limites comprises entre 47K à 52 K-ohms) aux bornes de sortie de ligne de lecture "OUTPUT".
6. A moins d'une indication contraire, les commutateurs mentionnés ci-dessous doivent se trouver sur les positions indiquées.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Bandes d'étalonnage

STD-331B : Réglages de lecture (voir la Fig. 10-4)
STD-608A : Bande vierge ordinaire (NORMAL)
STD-603 : Bande vierge au chrome (CrO_2)
STD-610 : Bande vierge au fer (METAL)

Liste des réglages à exécuter

Platine I

1. Réglage d'azimut de tête magnétique
2. Contrôle de l'égalisateur de lecture
3. Contrôle de commutation de constante de temps de lecture
4. Réglage du niveau de lecture

Platine II

1. Réglage d'azimut de tête magnétique
2. Contrôle de l'égalisateur de lecture
3. Contrôle de commutation de constante de temps de lecture
4. Réglage du 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. Contrôle de réponse en fréquence de mode de duplication

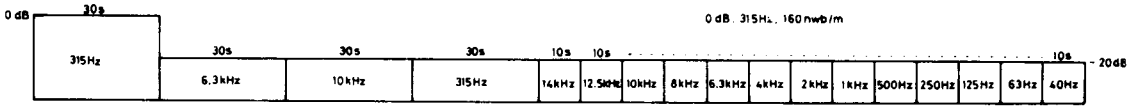


Fig. 10-4 Fréquences enregistrées sur la bande d'étalonnage STD-331B

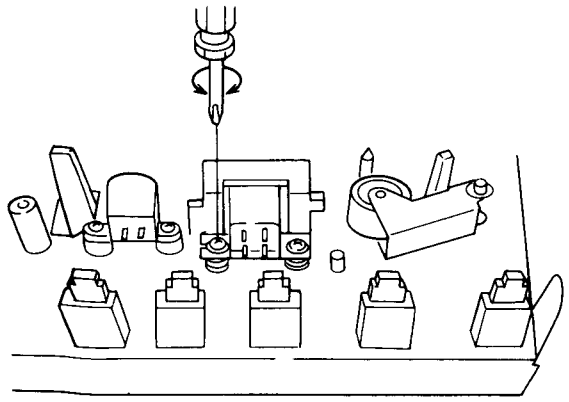


Fig. 10-5 Réglage d'azimut de tête

Bande d'étalonnage	STD-331B
Position du sélecteur de bande	NORM
Position du commutateur DOLBY NR	OFF

• Le canal droit doit être corrigé de −1dB sous 63Hz de façon à compenser l'effet marginal.

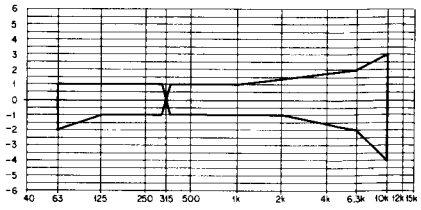


Fig. 10-6 Zone de tolérance de réponse en fréquence de lecture

Platine I

1. Réglage d'azimut de tête magnétique

- Régler les résistances variables V101 et V201 de façon à obtenir la position centrale mécanique.

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	LECTURE	Lire le passage préenregistré de 10kHz/–20dB de la bande d'étalonnage STD-331B.	Vis de réglage d'azimut de tête. (voir la figure 10-5).	Bornes de sortie droite et gauche en lecture (OUTPUT).	Niveau maximum du signal de lecture.	
2	ARRÊT	Freiner la vis de réglage à l'aide d'un produit spécial lorsque le réglage est terminé.				

2. Réglage de l'égalisateur de lecture

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

3. Contrôle de commutation de constante de temps de lecture

- Placer la platine en mode de lecture sans présence de cassette.
- Vérifier si le niveau du bruit change aux bornes de sortie de lecture lorsque le sélecteur de bande au chrome installé à la partie supérieure du blocde transport de bande est commuté en position de marche et d'arrêt.

4. Réglage du niveau de lecture

- Ce réglage servant à étalonner le niveau du DOLBY NR doit être exécuté avec une grande précision.

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	LECTURE	Lire le passage préenregistré de 315Hz/0dB de la bande d'étalonnage STD-331B.	V101 (canal gauche) V201 (canal droit)	TP1 (canal gauche) TP2 (canal droit)	–7,7dBv (412mV)	

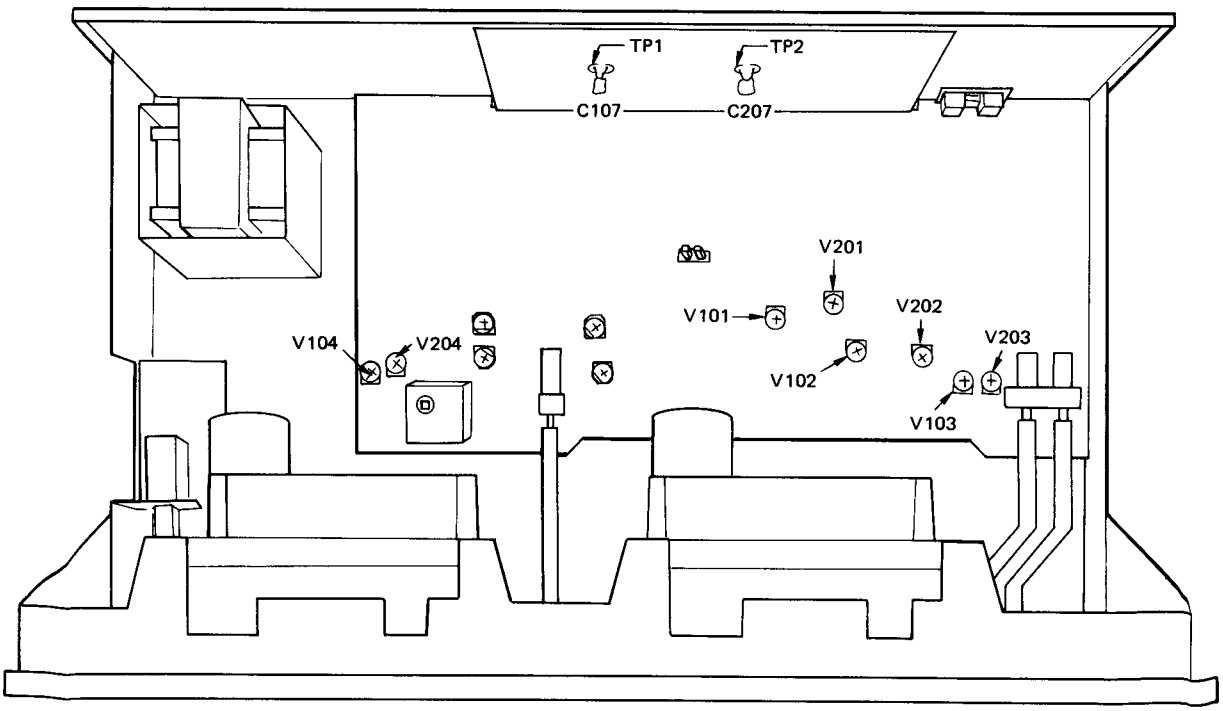


Fig. 10-7 Emplacements des composants de réglage

Platine II

1. Réglage d'azimut de tête magnétique
- Régler les résistances variables V101 et V201 de façon à obtenir la position centrale mécanique.

	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 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. (voir la figure 10-5).	Bornes de sortie droite et gauche en lecture (OUTPUT).	Niveau maximum du signal de lecture.	
3	ARRÊT	Freiner la vis de réglage à l'aide d'un produit spécial lorsque le réglage est terminé.				

2. Réglage de l'égalisateur 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 en position NORM.				
2	LECTURE	Lire le passage préenregistré de 315Hz/–20dB et 6,3kHz/–20dB de la bande d'étalonnage STD-331B.	Confirmer	Bornes de sortie droite et gauche en lecture (OUTPUT).	Le niveau de lecture de 6,3 kHz doit être de 0±2dB par rapport au niveau de 315Hz.	

3. Contrôle de commutation de constante de temps de lecture
- Placer la platine en mode de lecture sans présence de cassette.
- Vérifier si le niveau du bruit change aux bornes de sortie de lecture lorsque le sélecteur de bande est placé sur une autre position.

4. Réglage du niveau de lecture
- Ce réglage servant à étalonner le niveau de DOLBY NR doit être exécuté avec une grande précision.

	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 en position NORM.				
2	LECTURE	Lire le passage préenregistré de 315Hz/0dB de la bande d'étalonnage STD-331B.	V102 (canal gauche) V202 (canal droit)	TP1 (canal gauche) TP2 (canal droit)	–7,7dBv (412,1mV)	

5. Contrôle de décibelmètre

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	PAUSE À L'ENREGISTREMENT	Appliquer un signal de 315 Hz/–10dB (316mV) aux bornes d'entrée de ligne (LINE INPUT).	Potentiomètre de niveau d'enregistrement.	TP1 (canal gauche) TP2 (canal droit)	S'assurer que les voyants "0dB" des décibelmètres s'allument dans les limites de –7,7dBv±2dB du niveau du signal de sortie.	

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

	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 en position NORM.				
2	PAUSE À L'ENREGISTREMENT	Appliquer un signal de 315 Hz/–30dB (31,6mV) aux bornes d'entrée de ligne (LINE INPUT).	Potentiomètre de niveau d'enregistrement.	TP1 (canal gauche) TP2 (canal droit)	–27,7dB (41,2mV)	
3	ENREGISTREMENT LECTURE	Enregistrer le niveau du signal mentionné plus haut sur la bande d'étalonnage STD-608A à 315Hz et à 6.3kHz et la lire.	V104 (canal gauche) V204 (canal droit)	Bornes de sortie gauche et droite (OUTPUT).	Le niveau de lecture de 6,3kHz est de $+0{,}5^{+1}_{-0}$ dB par rapport au niveau de 315Hz (lire les signaux préenregistrés sur la bande d'étalonnage).	
4		Changer de bande d'étalonnage et de position du commutateur DOLBY NR puis vérifier si la réponse en fréquence est satisfaisante (voir la figure 10-8). Si la réponse en fréquence ne se trouve pas dans les limites spécifiées, refaire le réglage de V104 dt V204 pour que le niveau de lecture de 6,3kHz de –2 à +3,5dB soit obtenu par rapport au niveau de 315Hz, comme indiqué à l'opération 3 plus haut.				

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	ARRÊT	Placer le sélecteur de bande 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 du niveau d'enregistrement.	TP1 (canal gauche) TP2 (canal droit)	−7,7dBv (412,1mV)	
3		Régler le commutateur de DOLBY NR en position de marche.				
4	ENREGISTREMENT LECTURE	Enregistrer le signal mentionné plus haut sur la bande d'étalonnage STD-608A et lire ce passage préenregistré.	V103 (canal gauche) V203 (canal droit)	TP1 (canal gauche) TP2 (canal droit)	−7,7dBv (412,1mV)	
5		Placer le sélecteur de bande en position CrO_2.				
6		Enregistrer le signal mentionné plus haut sur la bande d'étalonnage STD-603 et lire ce passage préenregistré.	Confirmer	TP1 (canal gauche) TP2 (canal droit)	−7,7dBv±1,5dB	
7		Placer le sélecteur de bande en position METAL.				
8		Enregistrer le signal mentionné plus haut sur la bande d'étalonnage STD-610 et lire ce passage préenregistré.	Confirmer	TP1 (canal gauche) TP2 (canal droit)	−7,7dBv±1,5dB	

8. Contrôler de réponse en fréquence du mode de duplication

• Ce contrôle doit être fait après que tous les autres réglages aient étét réalisés.

	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 en position NORM.				
2	DUPLICATION ET DUPLICATION À GRANDE VITESSE	Charger la bande d'étalonnage STD-331B dans la platine I et la bande d'étalonnage STD-608A dans la platine II.	—	—	Effectuer une copie du signal préenregistré sur la bande STD-331B (à la vitesse normale et la vitesse double).	
3	LECTURE (platine II)	Lire le signal préenregistré de la bande d'étalonnage STD-608A du réglage précédent.	Contrôler	Bornes de sortie gauche et droite (OUTPUT).	Les valeurs d'étalonnage (de la figure 10-9) doivent être satisfaites.	
4	ARRÊT	Placer le sélecteur de bande en position CrO_2.				
5	Charger la bande d'étalonnage STD-603 dans la platine II et refaire les réglages 1 et 2 mentionnés plus haut pour s'assurer que la valeur se trouve dans les limites admissibles représentées sur la figure 10-9.					
6	ARRÊT	Placer le sélecteur de bande en position METAL.				
7	Charger la bande d'étalonnage STD-610 dans la platine II et refaire les réglages 1 et 2 mentionnés plus haut pour s'assurer que la valeur se trouve dans les limites admissibles représentées sur la figure 10-9.					

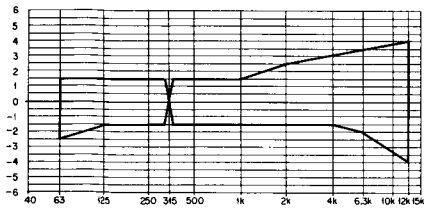
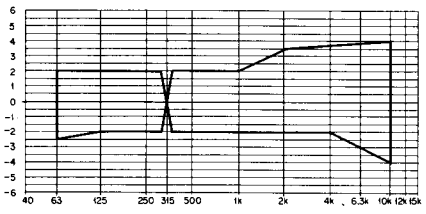
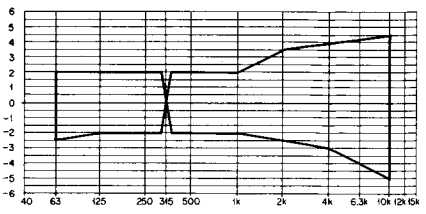
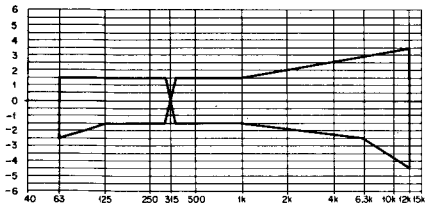
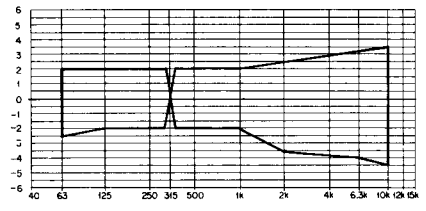
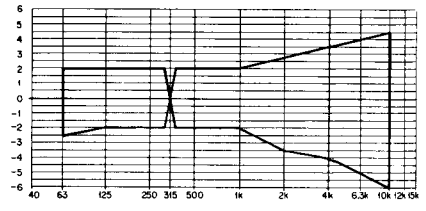
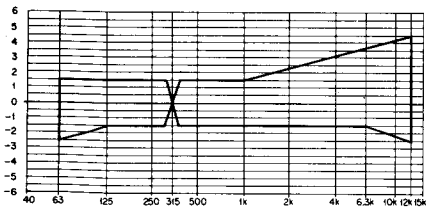
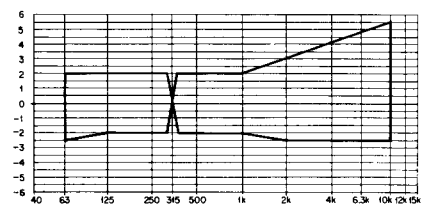
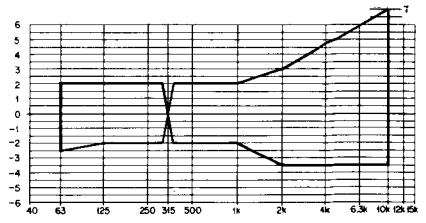
Bande d'étalonnage: STD-608A		
Sélecteur de bande: sur NORM		
Commutateur DOLBY NR: sur OFF	Commutateur DOLBY NR type-B: sur ON	Commutateur DOLBY NR type-C: sur ON
		
Bande d'étalonnage: STD-603		
Sélecteur de bande: sur CrO_2		
Commutateur DOLBY NR: sur OFF	Commutateur DOLBY NR type-B: sur ON	Commutateur DOLBY NR type-C: sur ON
		
Bande d'étalonnage: STD-610		
Sélecteur de bande: sur METAL		
Commutateur DOLBY NR: sur OFF	Commutateur DOLBY NR type-B: sur ON	Commutateur DOLBY NR type-C: sur ON
		

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

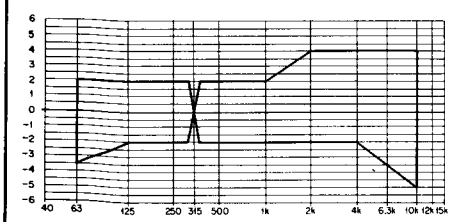
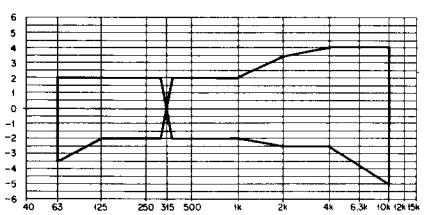
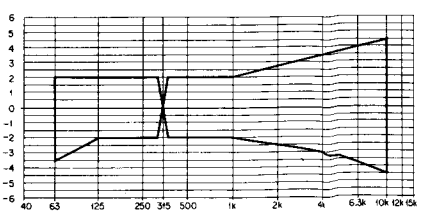
Bande d'étalonnage: STD-608A	Bande d'étalonnage: STD-603	Bande d'étalonnage: STD-610
Sélecteur de bande: sur NORM	Sélecteur de bande: sur CrO_2	Sélecteur de bande: sur METAL
Commutateur DOLBY NR: sur OFF	Commutateur DOLBY NR: sur OFF	Commutateur DOLBY NR: sur OFF
		

Fig. 10-9 Zone admissible de réponse en fréquence d'enregistrement et de lecture de mode de duplication

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.

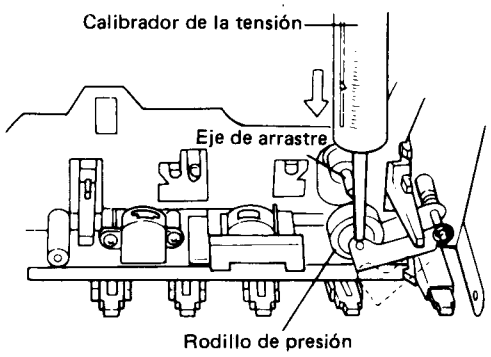


Fig. 10-1 Ajuste de la presión del rodillo de presión

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.*

Ajueste de velocidad de la cinta

1. Coloque la cinta de prueba STD-301 en el deck I, y una cinta en blanco en el deck II.
2. Presione la tecla SYNCHRO COPY START y deje calentando el deck por lo menos 10 segundos.
3. Cortocircuite entre los terminales TP16 y TP17. (reproducción de velocidad doble)
4. Confirme que la frecuencia de reproducción del deck I es de 6000Hz±20Hz. Si la frecuencia está fuera de este alcance, regule el V303 a 6000Hz±20Hz.
5. Abra el circuito entre los terminales TP16 y TP17.
6. Confirme que la frecuencia de señal de reproducción del deck I es de 3000Hz±5Hz. Si la frecuencia está fuera de este alcance, regule el V301 a 3000Hz±5Hz.
7. Coloque una cinta de prueba STD-301 en el deck II.
8. Presione del deck II la tecla PLAY y cortocircuite entre los terminales TP16 y TP17.
9. Regule el V304 para obtener una frecuencia de reproducción de velocidad doble dentro de ±10Hz del valor ajustado en el deck I.
10. Abra el circuito entre los terminales TP16 y TP17.
11. Regule el V302 para obtenerla frecuencia de velocidad normal dentro de ±5Hz del valor ajustado en el deck I.

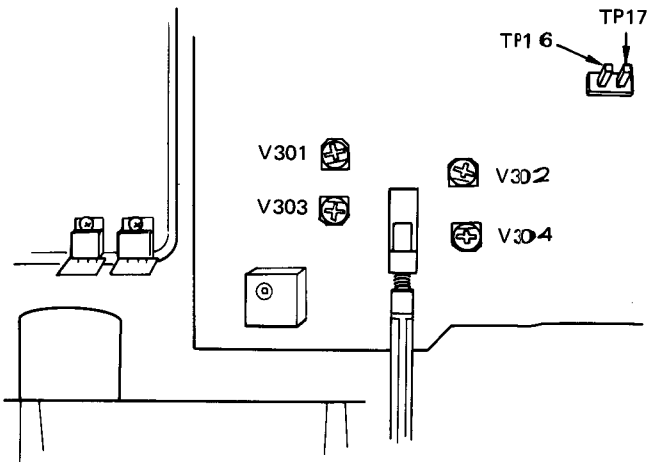


Fig. 10-2 Ajuste de la velocidad de la cinta

Inspección y ajuste de amortiguación de puerta

Presione los botones de expulsión (deck I, II) al mismo tiempo, y confirme que la diferencia de velocidad de abertura de puerta entre el deck I y el II es de aproximadamente 17mm como máximo al abrirse completamente (temperature normal). Si está fuera de este valor, mueva la posición de enganche del resorte de puerta (sólo el deck I).

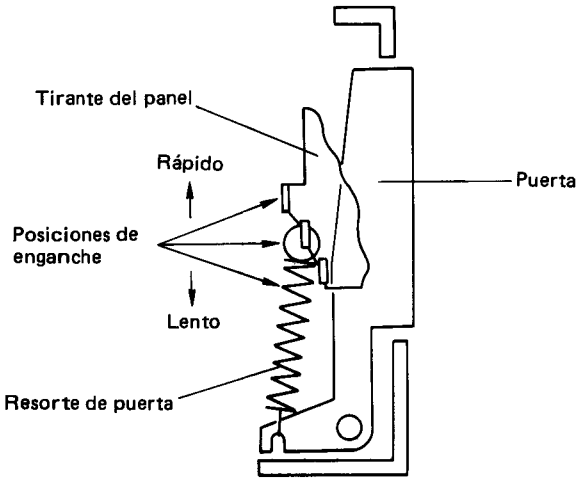


Fig. 10-3 Ajuste de amortiguación de puerta (deck I)

10.2 AJUSTES ELECTRICOS

Condiciones para el ajuste

1. Los ajustes mecánicos deben terminarse primero.
2. El cabezal debe limpiarse y desimanarse.
3. Deje el deck por unos minutos antes iniciar los ajustes eléctricos.
4. La señal de referencia es de 0dBv=1Vrms.
5. Conecte una resistencia de carga de 50 kilo-ohmios (o entre 47 y 52 kilo-ohmios) a los terminales de salida.
6. A menos que se espefique de otra manera, los siguientes interruptores se dejan en las posiciones indicadas.
   Interruptor DOLBY NR : OFF
   TAPE SELECTOR : NORM
   (SELECTOR DE CINTA)

Cintas de prueba

STD-331B : Ajustes de reproducción (Véase la Fig. 10-4)
STD-608A : Cinta en blanco NORMAL
STD-603 : Cinta en blanco CrO_2
STD-610 : Cinta en blanco METAL

Lista de ajustes

Deck I

1. Ajuste azimutal del cabezal.
2. Inspección del ecualizador de reproducción.
3. Inspección de conmutación constante del tiempo de reproducción.
4. Ajuste del nivel de reproducción.

Deck II

1. Ajuste azimutal del cabezal.
2. Inspección del ecualizador de reproducción.
3. Inspección de conmutación constante del tiempo de reproducción.
4. Ajuste del nivel de reproducción.
5. Inspección del indicador de nivel.
6. Ajuste de la respuesta de frecuencia de grabación y reproducción.
7. Ajuste del nivel de grabación.
8. Inspección de la respuesta de frecuencia en el modo de copia.

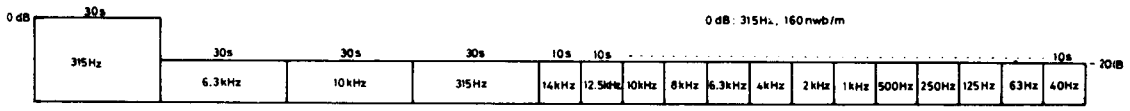


Fig. 10-4 Contenido de la cinta de prueba STD-331B

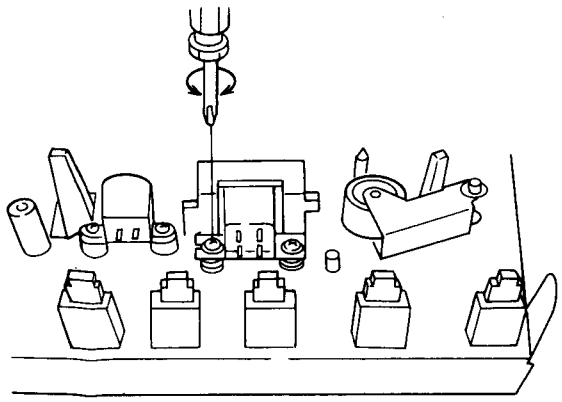


Fig. 10-5 Ajuste azimutal del cabezal

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

• Debido al "efecto del borde", compense el canal derecho por -1dB a 63Hz.

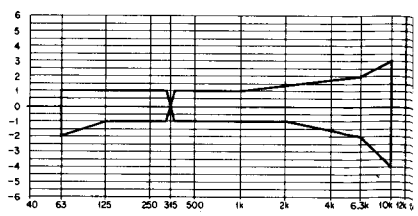


Fig. 10-6 Zona de respuesta de frecuencia de reproducción permisible

Deck I

1. Ajuste azimutal del cabezal
- Gire el V101 y V201 a la posición del centro mecánico.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Reproducción "PLAY"	Reproduzca la porción de 10kHz/–20dB de la cinta de prueba STD-331B.	Tornillo de ajuste azimutal del cabezal. (Véase la Fig. 10-5).	Terminales de salida "OUTPUT" derecho e izquierdo.	Máximo nivel de señal de reproducción.	
2	Parada "STOP"	Trabe el tornillo con el compuesto "screw lock" al término del ajuste.				

2. Inspección del ecualizador de reproducción

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Posición de medición	Valor de ajuste	Observaciones
1	Reproducción "PLAY"	Reproduce las porciones de 315Hz/–20dB y 6,3kHz/ –20dB de la cinta de prueba STD-331B.	Confirme	Terminales de salida "OUTPUT" derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de 0±2dB con relación al nivel de 315Hz.	

3. Inspección de conmutación constante del tiempo de reproducción
- Ponga el deck en el modo de reproducción sin cassette.

- Confirme que el nivel de ruido cambia en los terminales de salida de reproducción cuando es conmutado a ON y OFF el interruptor detector de cromo ubicado en la parte superior de la unidad de transporte de la cinta.

4. Ajuste del nivel de reproducción
- Este ajuste determina el nivel de DOLBY NR, y debe efectuarse con cuidado.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Reproducción "PLAY"	Reproduzca la porción de 315Hz/0dB de la cinta de prueba STD-331B.	V101 (Canal izquierdo) V201 (Canal derecho)	TP1 (Can. Izq.) TP2 (Can. Der.)	–7,7dBv (412mV)	

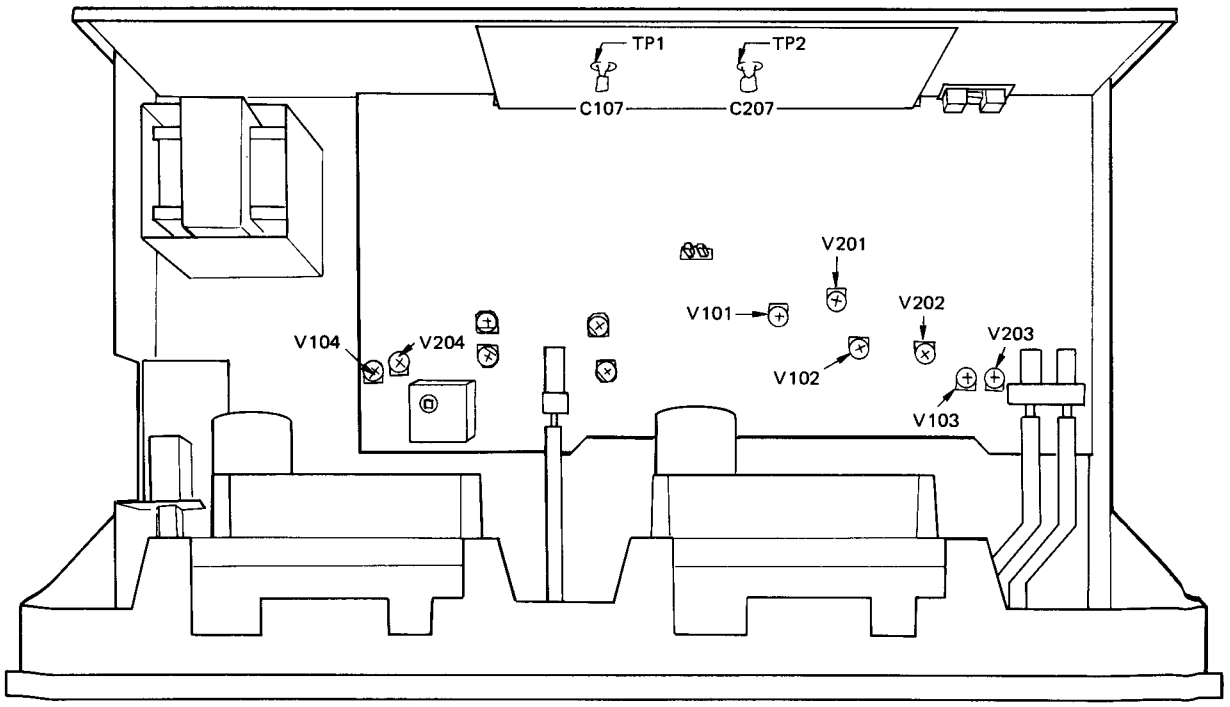


Fig. 10-7 Puntos de ajuste

Deck II

1. Ajuste azimutal del cabezal
- Gire el V101 y V201 a la posición del centro mecánico.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada "STOP"	Trabe el tornillo con el compuesto "screw lock" al término del ajuste.				
2	Reproducción "PLAY"	Reproduzca la porción de 10kHz/–20dB de la cinta de prueba STD-331B.	Tornillo de ajuste azimutal del cabezal. (Véase la Fig. 10-5).	Terminales de salida "OUTPUT" derecho e izquierdo.	Máximo nivel de señal de reproducción.	
3	Parada "STOP"	Trabe el tornillo con el compuesto "screw lock" al término del ajuste.				

2. Inspección 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"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición NORM.				
2	Reproducción "PLAY"	Reproduzca las porciones de 315Hz/–20dB y 6,3kHz/–20dB de la cinta de prueba STD-331B.	Confirme	Terminales de salida "OUTPUT" derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de 0±2dB con relación al nivel de 315Hz.	

3. Inspección de conmutación constante del tiempo de reproducción
- Ponga el deck en el modo de reproducción sin cassette.
- Confirme que el nivel de ruido cambia en los terminales de salida de reproducción cuando es conmutado el interruptor selector de cinta "TAPE SELECTOR".

4. Ajuste del nivel de reproducción
- Este ajuste determina el nivel de DOLBY NR, y debe efectuarse con cuidado.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada "STOP"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición NORM.				
2	Reproducción "PLAY"	Reproduzca la porción de 315Hz/0dB de la cinta de prueba STD-331B.	V102 (Canal izquierdo) V202 (Canal derecho)	TP1 (Can. Izq.) TP2 (Can. Der.)	–7,7dBv (412,1mV)	

5. Inspección 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"	Aplique una señal de 315Hz/–10dBv (316mV) a los terminales de entrada de línea "LINE INPUT".	Control del nivel de grabación "REC LEVEL"	TP1 (Can. Izq) TP2 (Can. Der)	Confirme que los indicadores de nivel "0dB" se encienden dentro de –7,7dBv±2dB del nivel de salida de señal.	

6. Ajuste de la respuesta 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"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición NORM.				
2	Grabación/pausa "REC/PAUSE"	Aplique una señal de 315Hz/–30dBv (31,6mV) a los terminales de entrada de línea "LINE INPUT"	Control del nivel de grabación "REC LEVEL".	TP1 (Can. Izq.) TP2 (Can. Der.)	–27,7dB (41,2mV)	
3	Grabación/reproducción "REC/PLAY"	Grabe el nivel de señal arriba mencionado en la cinta de prueba STD-608A a 315Hz y 6,3kHz, y reproduzca la señal.	V104 (Canal izquierdo) V204 (Canal derecho)	Terminales de salida "OUTPUT" derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de $+0{,}5^{+1}_{-0}$ dB con relación al nivel de 315Hz (Reproduzca las señales grabadas en el STD-608A).	
4		Cambie la cinta de prueba, las posiciones del interruptor selector de cinta e interruptor DOLBY NR, y confirme que es satisfactoria la respuesta de frecuencia (Véase la Fig. 10-8). Si la respuesta no está dentro del alcance especificado, reajuste el V104 y V204 de manera que el nivel de grabación de 6,3kHz sea de –2~+3,5dB con relación al nivel de 315Hz en el procedimiento 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"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición NORM.				
2	Grabación/ pausa "REC/ PAUSE"	Aplique una señal de 315Hz/ −10dBv (31,6mV) a los terminales de entrada de línea "LINE INPUT".	Control del nivel de grabación "REC LEVEL".	TP1 (Can. Izq.) TP2 (Can. Der.)	−7,7dBv (412,1mV)	
3		Regule el interruptor DOLBY NR a la posición ON.				
4	Grabación/ reproducción "REC/ PLAY"	Grabe el nivel de señal arriba mencionado en la cinta de prueba STD-608A y reprodúzca.	V103 (Canal izquierdo) V203 (Canal derecho)	TP1 (Can. Izq.) TP2 (Can. Der.)	−7,7dBv (412,1mV)	
5		Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición CrO_2.				
6		Grabe la señal arriba mencionada en la cinta de prueba STD-603, y reprodúzcala.	Confirme	TP1 (Can. Izq.) TP2 (Can. Der.)	−7,7dBv ±1,5dB	
7		Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición METAL.				
8		Grabe la señal arriba mencionada en la cinta de prueba STD-610 y reprodúzcala.	Confirme	TP1 (Can. Izq.) TP2 (Can. Der.)	−7,7dBv±1,5dB	

8. Inspección de la respuesta de frecuencia en el modo de copia
- A efectuarse después de terminar todos los otros ajustes.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada "STOP"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición NORM.				
2	COPIA Y COPIA DE ALTA VELOCIDAD	Coloque la cinta de prueba STD-331B en el deck I y la cinta de prueba STD-608 en el deck II.	–	–	Copie la señal grabada de la cinta de prueba STD-331B (en la velocidad normal y doble).	
3	Reproducción "PLAY" (Deck II)	Reproduzca la señal grabada en la cinta de prueba STD-608A en el procedimiento de ajuste anterior.	Revise	Terminales de salida "OUTPUT" derecho e izquierdo.	Debe estar de acuerdo con la zona permisible mostrada en la Fig. 10-9.	
4	Parada "STOP"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición CrO_2.				
5	Coloque la cinta de prueba STD-603 en el deck II, y repita los procedimientos 1 y 2 para confirmar que está de acuerdo con la zona permisible mostrada en la Fig. 10-9.					
6	Parada "STOP"	Regule el interruptor selector de cinta "TAPE SELECTOR" a la posición METAL.				
7	Coloque la cinta de prueba STD-610 en el deck II, y repita los procedimientos 1 y 2 para confirmar que está de acuerdo con la zona permisible mostrada en la Fig. 10-9.					

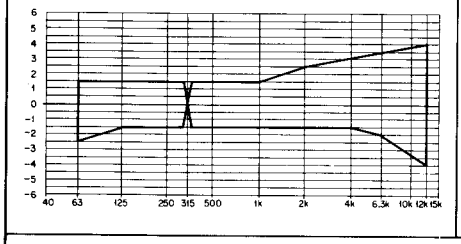
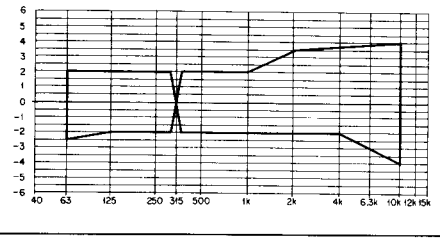
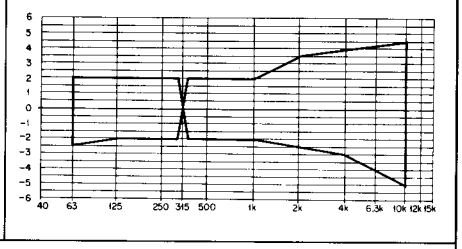
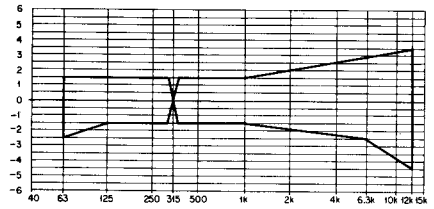
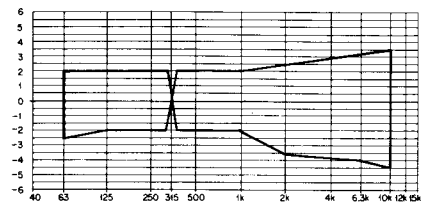
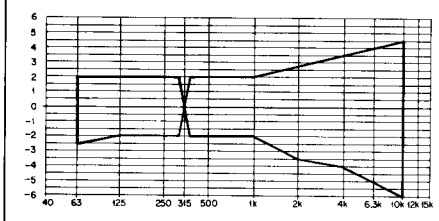
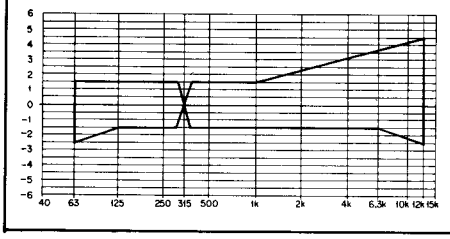
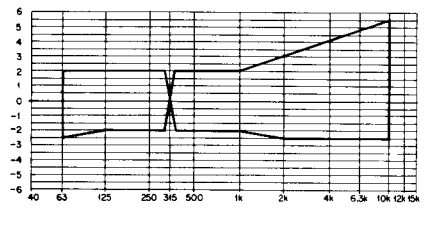
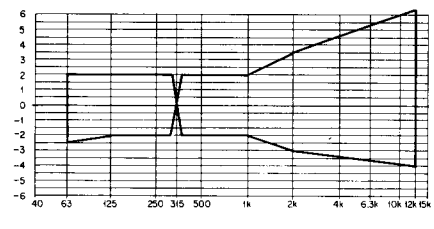
Cinta de prueba: STD-608A		
SELECTOR DE CINTA: NORM		
DOLBY NR: OFF	DOLBY NR: TIPO B EN ON	DOLBY NR: TIPO C EN ON
		
Cinta de prueba: STD-603		
SELECTOR DE CINTA: CrO_2		
DOLBY NR: OFF	DOLBY NR: TIPO B EN ON	DOLBY NR: TIPO C EN ON
		
Cinta de prueba: STD-610		
SELECTOR DE CINTA: METAL		
DOLBY NR: OFF	DOLBY NR: TIPO B EN ON	DOLBY NR: TIPO C EN ON
		

Fig. 10-8 Zona de respuesta de frecuencia de grabación y reproducción permisible

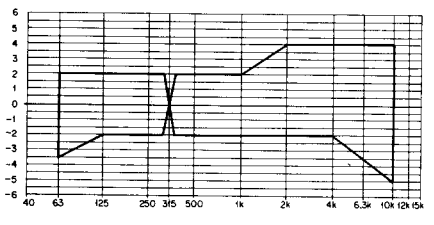
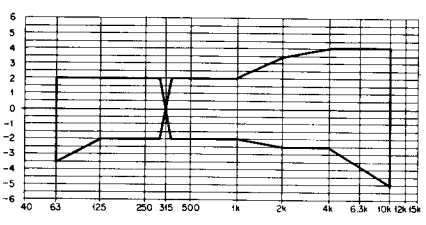
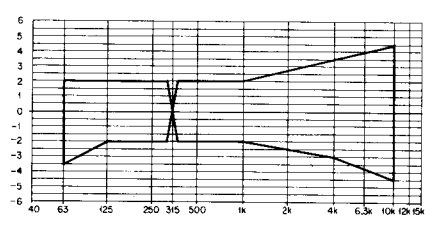
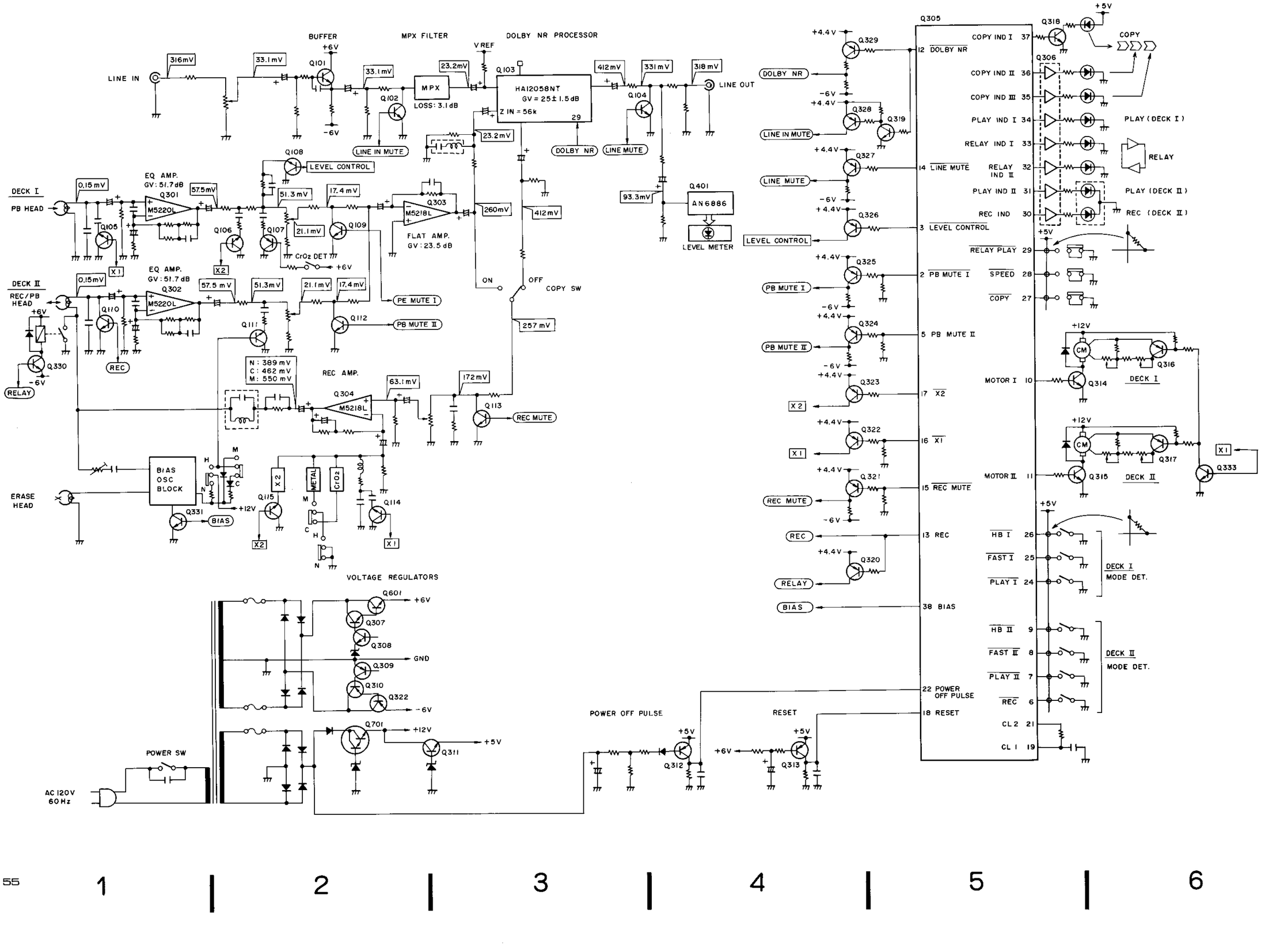
Cinta de prueba: STD-608A	Cinta de prueba: STD-603	Cinta de prueba: STD-610
SELECTOR DE CINTA: NORM	SELECTOR DE CINTA: CrO_2	SELECTOR DE CINTA: METAL
DOLBY NR: OFF	DOLBY NR: OFF	DOLBY NR: OFF
		

Fig. 10-9 Zona de respuesta de frecuencia de grabación y reproducción permisible en el modo de copia

11. BLOCK DIAGRAM



12. CIRCUIT DESCRIPTIONS

The CT-1060W (CT-S77W) Stereo Dual Cassette Tape Deck features two separate cassette deck sections — one for recording and playback, and the other for playback only.

12.1 OUTLINE OF MAIN SECTIONS

Playback Equalizer

A low-noise operational amplifier IC (M5220L) is used for both deck I and II. Playback equalization is switched to match the type of tape by transistor switching of the equalizer element in the equalizer amplifier output circuit. This switching is automatic when the chrome tape detector hole is detected in deck I, but requires manual switching of the TAPE SELECTOR switch in deck II.

- **CUE and REVIEW signal attenuator**

When deck I is switched to cue or review mode, the transistor switch in the output stage of the playback equalizer circuit is turned on, resulting in the high end frequency response being lowered in addition to the overall level being reduced. (Deck I is switched to cue or review mode by pressing the FF or REW button together with the PLAY button. The RELEASE button is pressed to release the FF or REW key and return to normal playback mode.)

Dolby NR Section

An IC (HA12058NT) is used to switch to type B or type C Dolby NR. When in copy mode, the Dolby NR section is bypassed, the deck I playback signal being recorded directly in deck II.

Recoding Amplifier

Employing an operational amplifier IC (M5218L), the required recording characteristics are obtained by switching peaking elements in the feedback circuit.

Level Meter

A 5-point LED drive IC (AN6886) equipped with two input circuits is used to connect and combine left and right channels and drive the logarithmic (dB) bar type meter.

Control Section

Signal and indicator circuits are controlled by a microcomputer (PD4061). (See 12.3 "Signal and Indicator Circuit Control".)

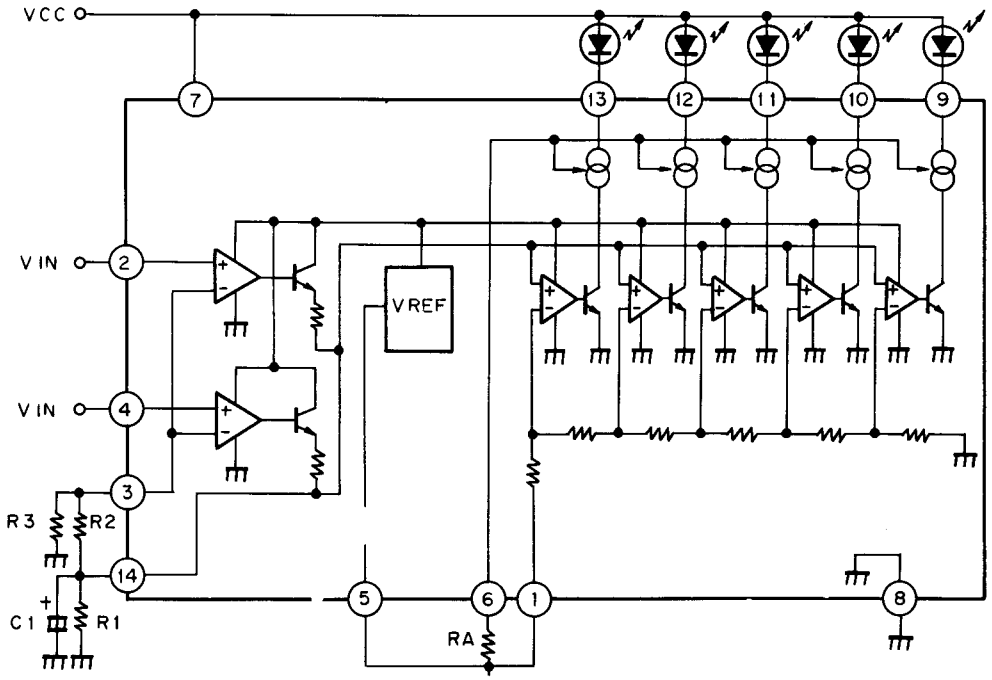


Fig. 12-1 Block diagram of AN6886

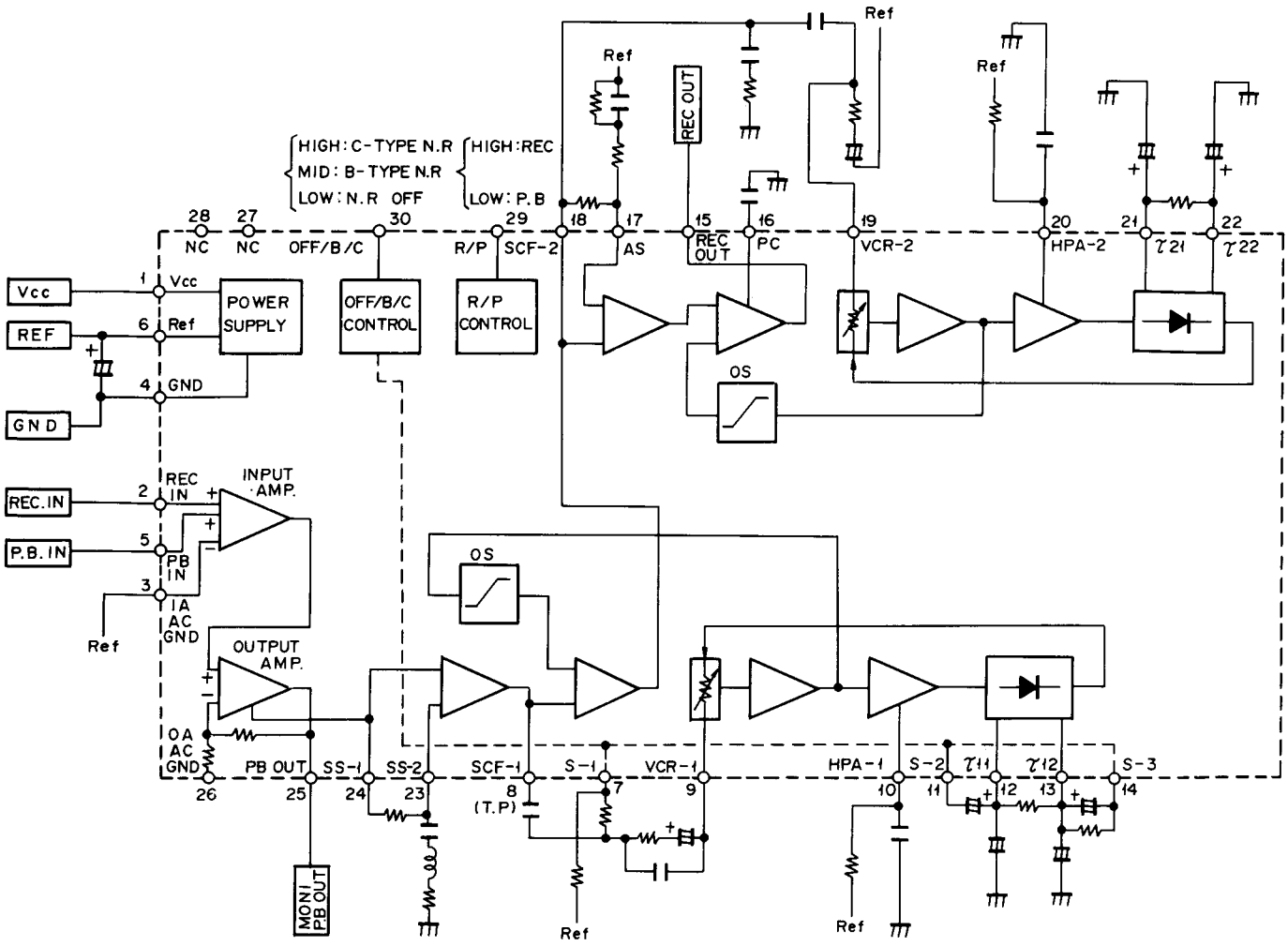
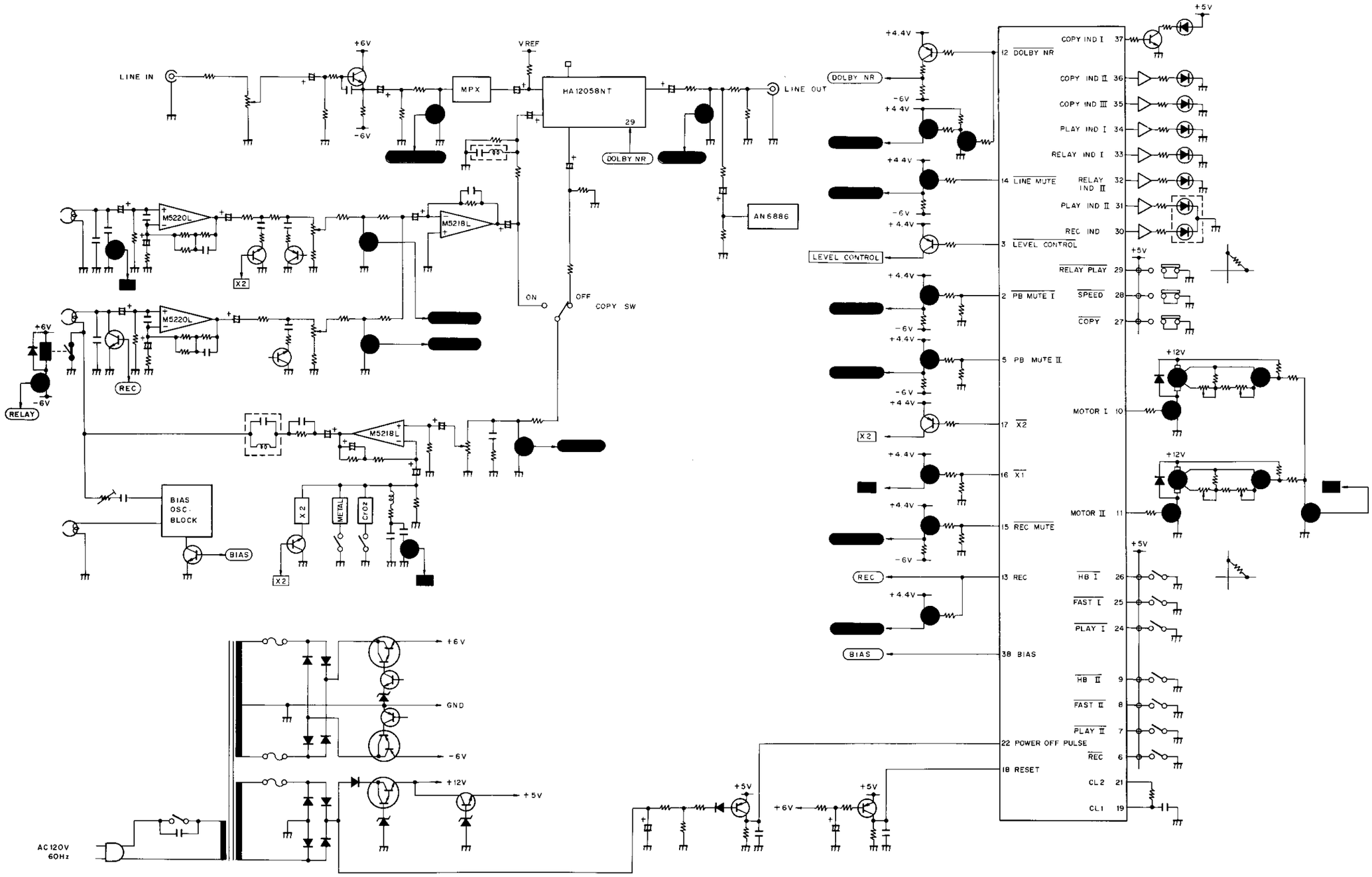


Fig. 12-2 Block diagram of HA12058NT

12.2 SIGNAL ROUTES

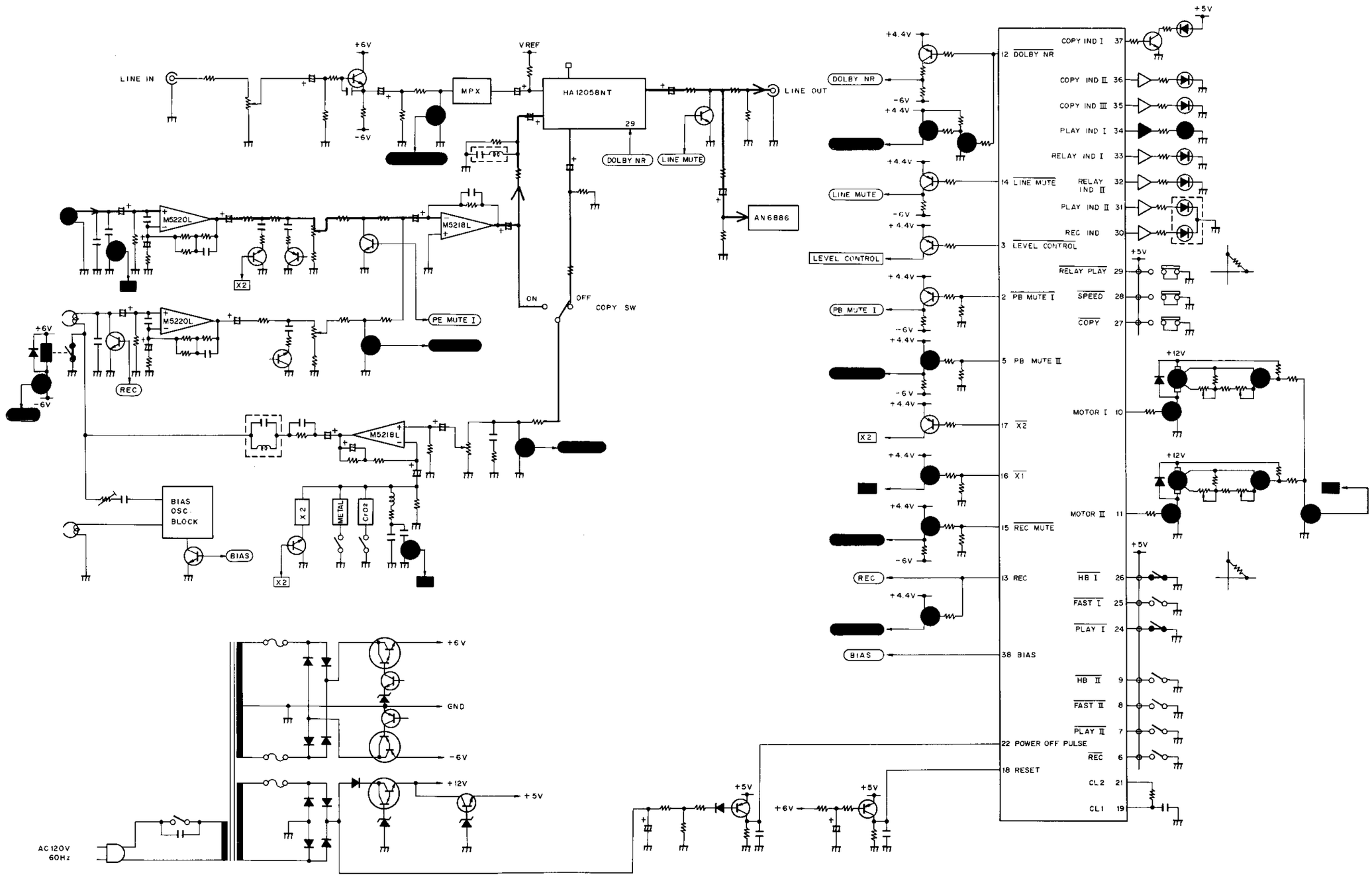
Deck I : STOP
Deck II: STOP

- The deck I route is also the same in FF and REW modes.
- The deck II route is also the same in FF, REW, STOP/PAUSE and PLAY/PAUSE modes.



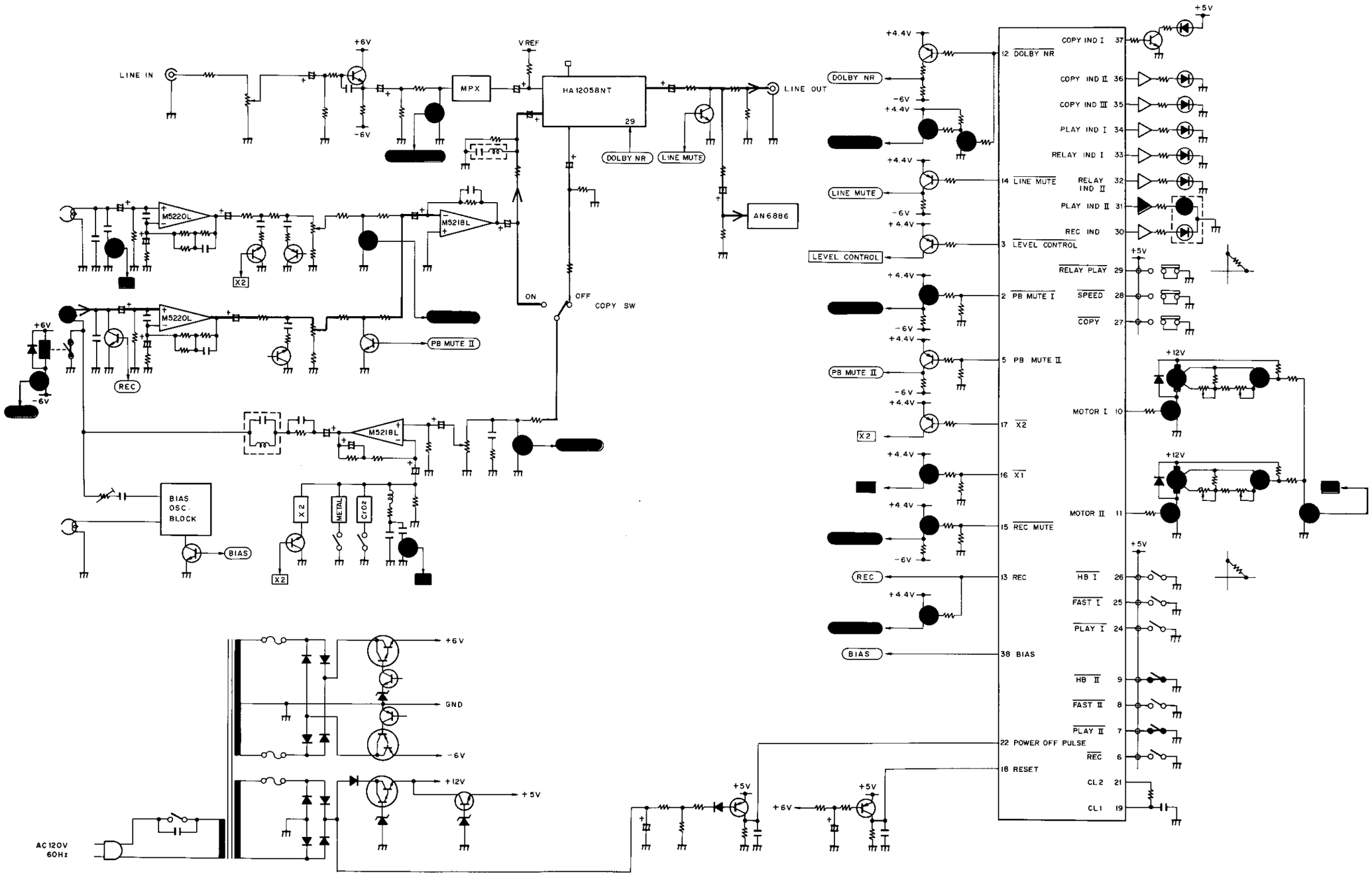
Deck I : PLAY
Deck II: STOP

- The deck II route is also the same in FF, REW, STOP/PAUSE and PLAY/PAUSE modes.



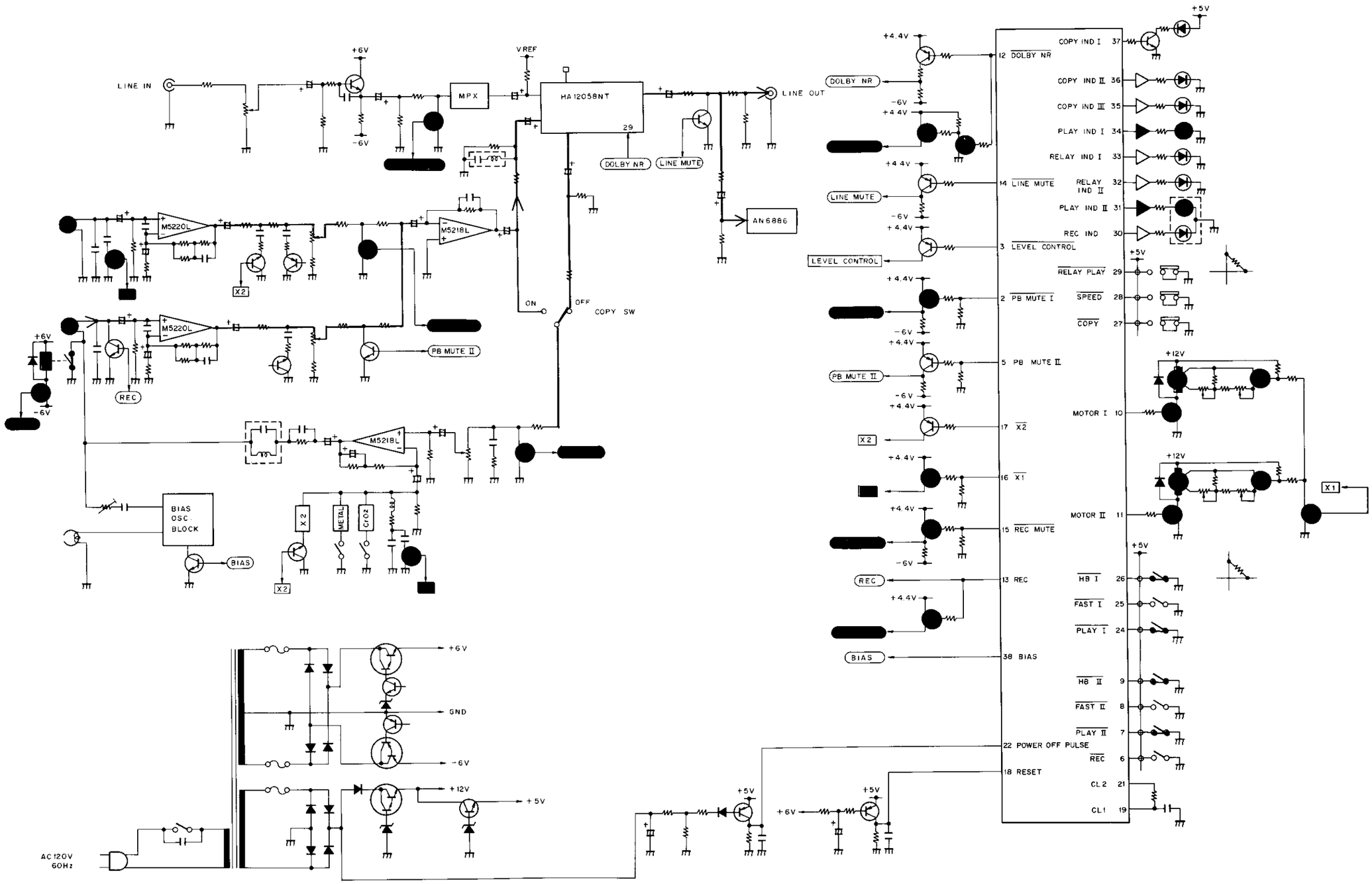
Deck I : STOP
Deck II: PLAY

- Deck I route is also the same in FF and REW modes.



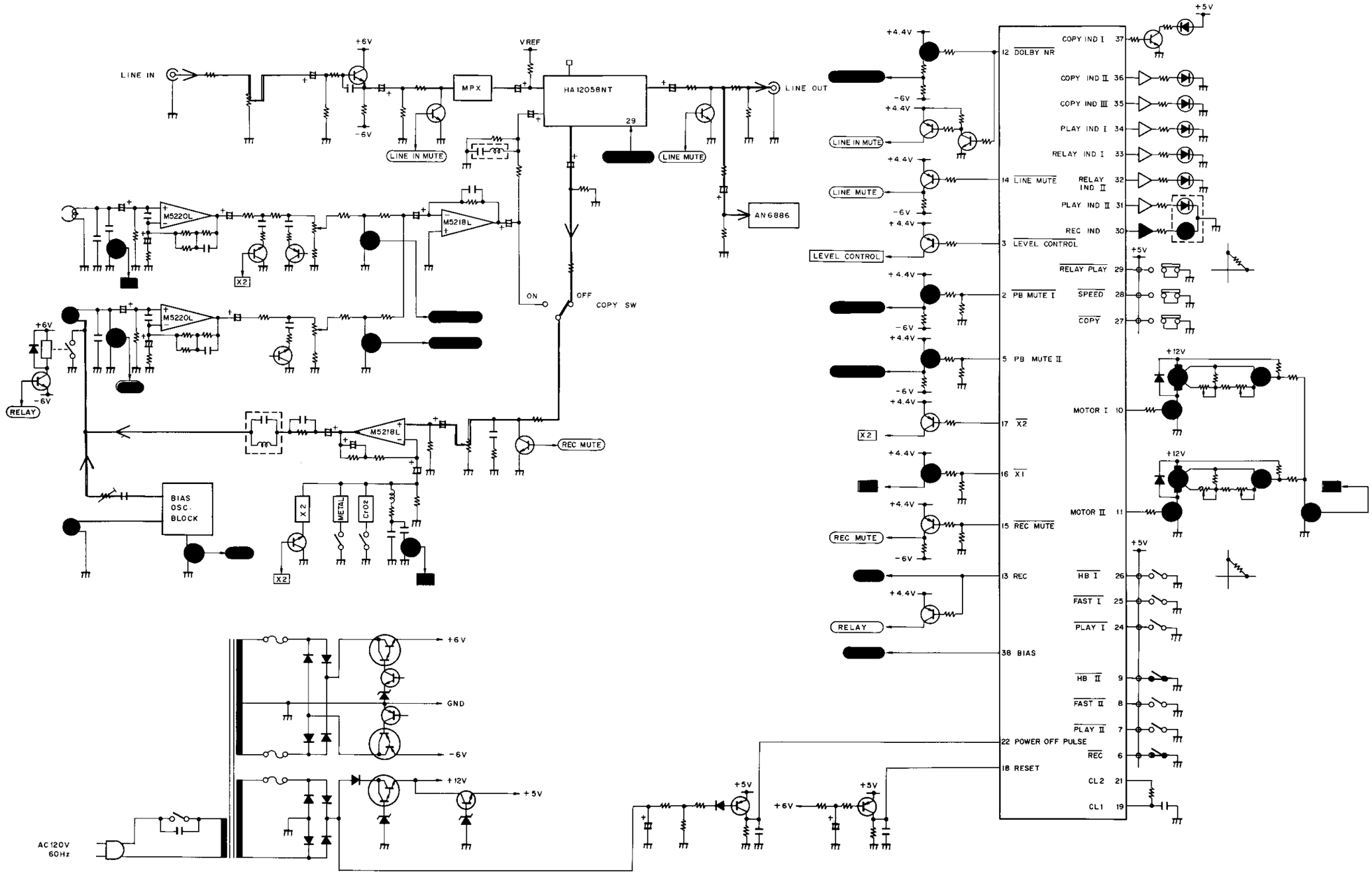
Deck I : PLAY
Deck II: PLAY

- The deck II playback signal output is obtained at the LINE OUT terminals.
- If the deck II is switched to PLAY/PAUSE mode by pressing the PAUSE key during PLAY mode, the deck I playback signal output is obtained via route shown in pages 61, 62.



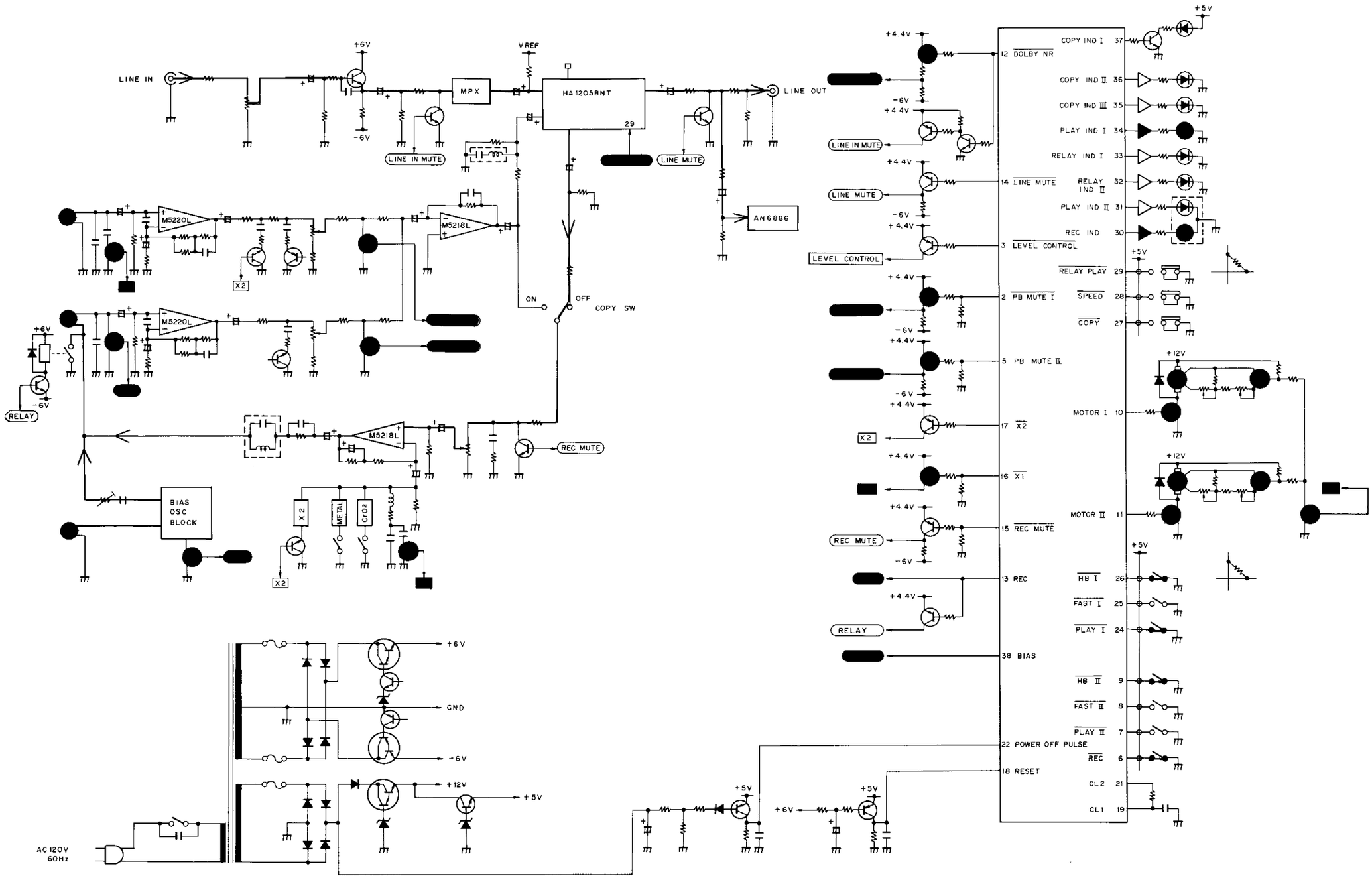
Deck I : STOP
Deck II : REC

- The deck I route is also the same in FF and REW modes.



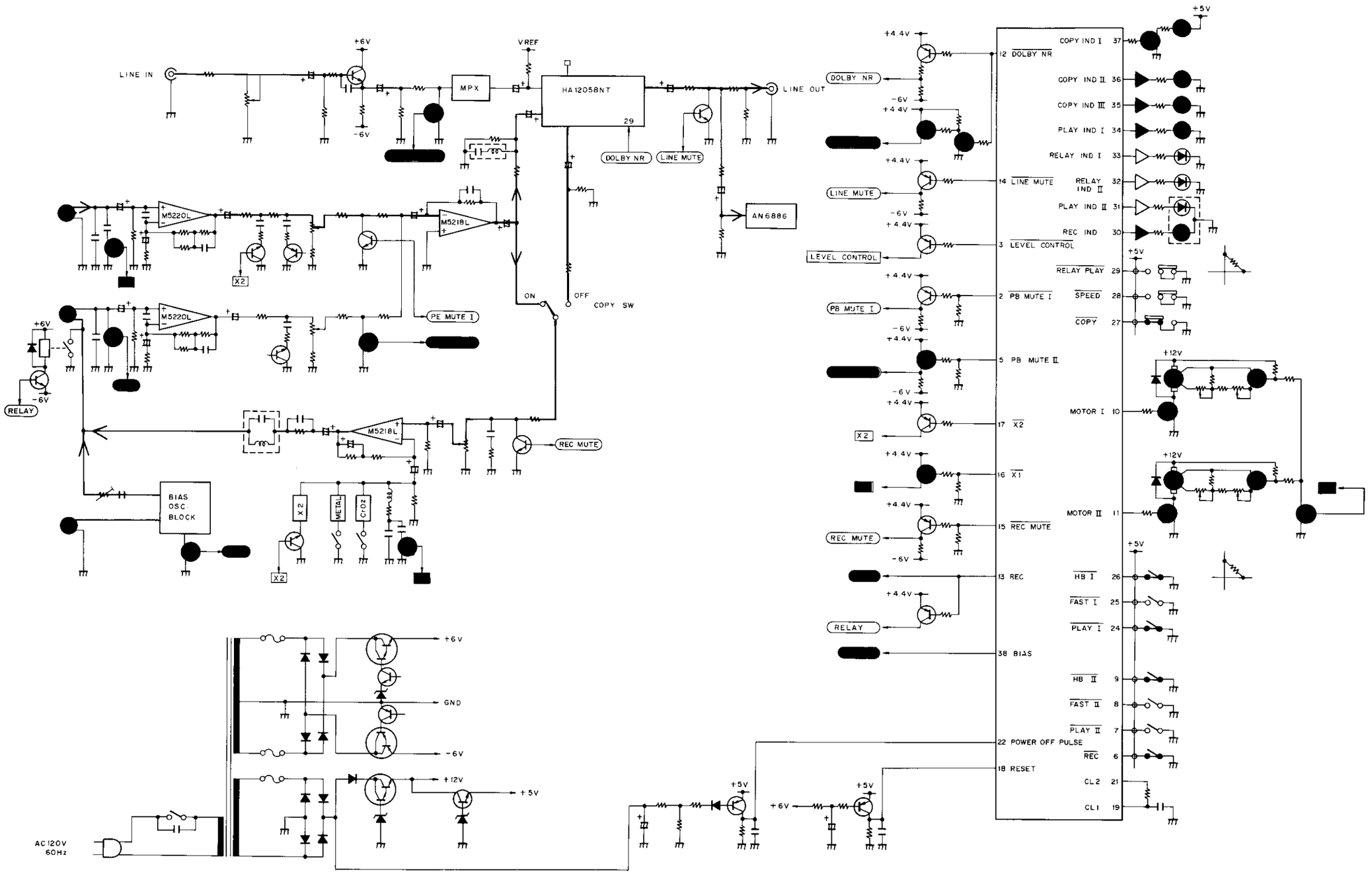
Deck I: PLAY
Deck II: REC (COPY OFF)

- The LINE IN signal appears at the LINE OUT terminals.



Deck I : PLAY
Deck II : REC **(COPY ON)**

- The deck I playback signal output appears at the LINE OUT terminals (and can be decoded by the Dolby NR system).
- The deck I playback signal is recorded directly in the deck II (without Dolby NR decording or encording).



12.3 SIGNAL AND INDICATOR CIRCUIT CONTROL

The signal and indicator circuits are controlled by the PD4061 microcomputer. The tape transport units in this model are switched to the various operating modes mechanically by the respective mode buttons. (Since the capstan motor is used as a drive source, the mode buttons can be operated by light touch.) When the COPY buttons is pressed to start tape copy mode, both tape decks are switched mechanically — tape I (on the left hand side) to playback mode, and tape II (on the right hand side) to recording mode. Although there is no need for microcomputer control of the tape transport mechanism itself, signal circuit switching, muting circuit timing control, and indicator control is all handled by the microcomputer.

PD4061 Specifications

1. System Clock

System clocks are generated by an RC oscillator employing a built-in oscillator circuit. Oscillating frequency is 200 kHz.
The specified timing set time is the set time when the system clock frequency is 200 kHz.

2. Input Reception Conditions

Input sampling of 5 to 10 ms prevents chattering when inputs are received, and also prevents misoperation by external noise.

3. Relay Play Mode

A major feature of this tape deck is relay playback from deck I to deck II and from deck II to

Current transport mode		Switch input	Mode button input		Final transport mode		Deck I detector switch			Deck II detector switch				Output					
														PLAY IND		RELAY IND		MOTOR	
Deck I tape transport	Deck II tape transport	RELAY SW	Deck I tape transport	Deck II transport	Deck I tape transport	Deck II tape transport	H.B	PLAY	FAST	H.B	PLAY	FAST	REC	(I)	(II)	(I)	(II)	(I)	(II)
STOP	STOP or STOP/PAUSE	Push ON			(STOP)	(STOP) or (STOP/PAUSE)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Blinking on and off	Blinking on and off	Blinking on and off	Blinking on and off	L	L
(STOP)	(STOP) or (STOP/PAUSE)		PLAY		PLAY	↑	ON	ON	↑	↑	↑	↑	↑	ON	↑	OFF	↑	H	↑
PLAY	↑			PLAY	↑	(PLAY) or (PLAY/PAUSE)	↑	↑			ON			↑	OFF	↑	ON	↑	↑
↑	(PLAY) or (PLAY/PAUSE)		STOP		(STOP)	PLAY or PLAY/PAUSE	OFF	OFF		ON or OFF	↑			Blinking on and off	ON or Blinking on and off	Blinking on and off	OFF	L	H
(STOP)	PLAY or PLAY/PAUSE		PLAY		(PLAY)	↑	↑	ON	↑	↑		↑	↑	OFF	↑	ON	↑	↑	↑
(PLAY)	↑			STOP	PLAY	(STOP) or (STOP/PAUSE)	ON	↑		OFF	OFF			ON	Blinking on and off	OFF	Blinking on and off	H	L
PLAY	(STOP) or (STOP/PAUSE)			PLAY	↑	(PLAY) or (PLAY/PAUSE)	↑	↑		↑	ON			↑	OFF	↑	ON	↑	↑
↑	↑	Push OFF			↑	PLAY or PLAY/PAUSE	↑	↑		ON or OFF	↑			↑	ON or Blinking on and off	↑	OFF	↑	H
PLAY	STOP or STOP/PAUSE						ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	H	H
↑	↑	Push ON			PLAY	(STOP) or (STOP/PAUSE)	↑	↑	↑	↑	↑	↑	↑	↑	Blinking on and off	↑	Blinking on and off	↑	L
STOP	PLAY or PLAY/PAUSE						OFF	OFF	OFF	ON or OFF	ON	OFF	OFF	OFF	ON or Blinking on or off	OFF	OFF	H	H
↑	↑	Push ON			(STOP)	PLAY or PLAY/PAUSE	↑	↑	↑	↑	↑	↑	↑	Blinking on and off	↑	Blinking on and off	↑	L	↑

* ( ) denotes mode with motor stopped.

Fig. 12-3 PD4061 Input/output table at RELAY PLAY mode

deck I. The method used to set relay playback mode involves stopping the motor of one or both decks by the relay play switch, and putting one of the decks into playback standby status (*1) in advance.

Deck I is switched to playback mode when the deck I PLAY button is pressed while in relay playback ready status, and deck II is switched to playback standby status (*1) when the deck II PLAY button is pressed after that. When deck I stops again (*2), the deck I motor stops turning (*3) and the deck II motor starts up to switch deck II from playback standby mode to regular playback mode. That is, playback mode is relayed from deck I to deck II, and the operation is the same when playback mode is relayed from deck II to deck I. This operation can be executed repeatedly by simply pressing the PLAY button of one deck while the other deck is in playback mode.

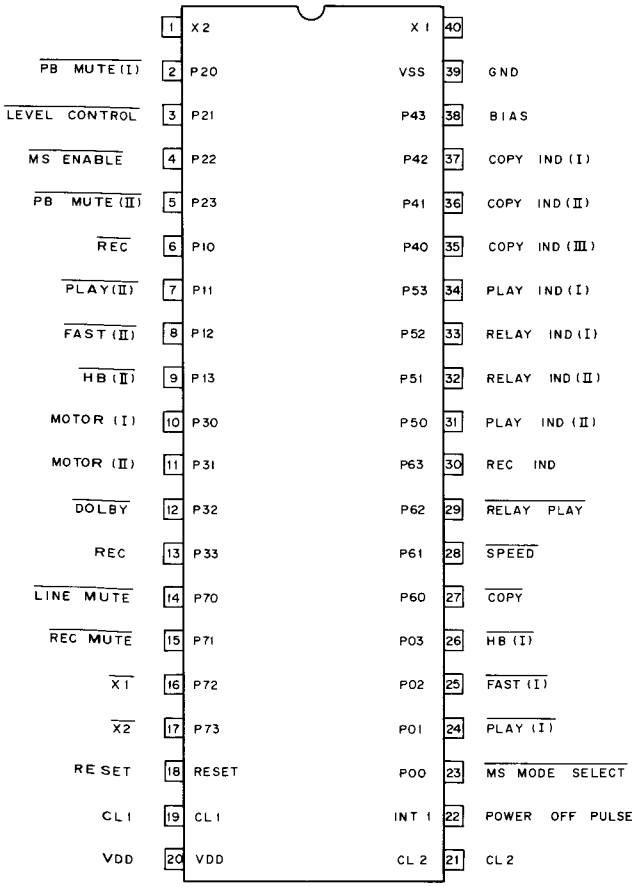


Fig. 12-4 PD4061 Pin layout

The tape transport units feature a power assist mechanism where capstan torque is used as a source of drive power to move the head base. If the PLAY button is pressed while the motor is stationary, the capstan does not come in contact with the pinch roller, nor does the head come in contact with the tape.

Relay playback can be activated when either RELAY PLAY indicator I or II is on, or blinking on and off.

*1. *PLAY button is in pressed status with the motor off.*
*2. *When the deck playback detector switch is turned off.*
*3. *Motor does not stop if the deck FAST detector switch is on.*

- **Relay playback mode start conditions**

(1) The COPY switch must be off.
(2) Deck II must not be in recording or recording-pause mode.
(3) Both decks must not be in playback (or playback-pause mode together.

The PD4061 is receptive to RELAY PLAY inputs only when the above conditions are satisfied. The subsequent outputs are listed in Fig. 12-3.

- **Relay playback mode cancellation conditions**

(1) RELAY switch pressed a second time.
(2) COPY switch pressed (switched on).
(3) Deck II switched to recording or recording-pause mode.

Relay playback mode is cancelled, and RELAY indicator I or II is switched off when any one of these conditions is met. If the FAST detector switch comes on during relay playback mode, the corresponding motor output is switched to H level (but only while the detector switch is on). That is, the deck which is not in playback mode can be switched to fast forward or rewind mode.

4. Copy

Playback sound from deck I can be recorded in deck II by this copy function at two different speeds — normal speed and double speed.

During double speed copying, the x1 output pin is at "H" level, and the x2 output pin is at "L" level.

COPY and SPEED switch inputs can be received at any time. When not in normal or double speed copy mode nor in the special modes indicated in Fig. 12-5,

COPY indicators I and III come on ("H" output) when the COPY switch is switched on, and

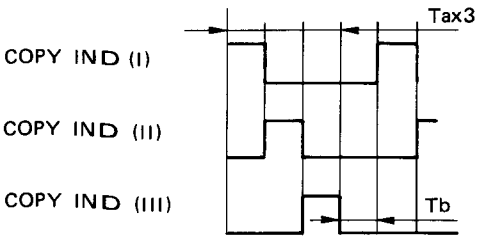
COPY indicator II comes on ("H" output) when the SPEED switch (high speed) is switched on.

			Deck I detector switches			Deck II detector switches				Indicator				
	COPY SW	SPEED SW	H.B	PLAY	FAST	H.B.	PLAY	FAST	REC	COPY IND (I)	COPY IND (II)	COPY IND (III)	PLAY IND (I)	REC IND
Normal speed copy mode	ON	OFF	ON	ON	OFF	ON	OFF	OFF	ON	Switched on and off sequentially			ON	ON
Double speed copy mode	ON	ON	ON	ON	OFF	ON	OFF	OFF	ON	Switched on and off sequentially			ON	ON
Special mode 1	ON	OFF	*1	*1	—	ON	OFF	OFF	ON	Blinking on and off	OFF	Blinking on and off	OFF	ON
Special mode 2	ON	ON	*1	*1	—	ON	OFF	OFF	ON	Blinking on and off	Blinking on and off	Blinking on and off	OFF	ON

Switch on: "L" input

*1) When HB, SW and PLAY SW are not on together.

Sequential on/off switching



The indicator on time Ta is
- 800 ms during normal speed copy mode
- 400 ms during double speed copy mode

The intervening time Tb is
- 800 ms during normal speed copy mode
- 400 ms during double speed copy mode

Fig. 12-5 PD4061 Input/output table at COPY mode

Indicator Output Conditions

		Deck I tape transport				Deck II tape transpot							
		PLAY	H.B	FAST	MOTOR	PLAY	H.B	FAST	REC	MOTOR	RELAY	COPY	SPEED
PLAY IND (I)	ON	ON	ON	OFF	H	–	–	–	–	–	–	–	–
	Blinking on and off	OFF	OFF	OFF	L	–	–	(OFF)	(OFF)	–	ON	(OFF)	–
PLAY IND (II)	ON	–	–	–	–	ON	ON	OFF	OFF	H	–	–	–
	Blinking on and off	–	–	–	–	ON	OFF	OFF	OFF	H	–	–	–
		–	–	(OFF)	–	OFF	OFF	OFF	OFF	L	ON	(OFF)	–
REC IND	ON	–	–	–	–	OFF	ON	OFF	ON	(H)	–	–	–
	Blinking on and off	–	–	–	–	OFF	OFF	OFF	ON	–	–	–	–

Fig. 12-6 Indicator output conditions

Deck I Transport Mode Change

Button operation / Mode	STOP	FF	REW	PLAY FF	PLAY REW	PLAY	RELEASE
STOP		FF	REW	CUE	REVIEW	PLAY	
FF	STOP		REW	CUE	REVIEW	PLAY	STOP
REW	STOP	FF		CUE	REVIEW	PLAY	STOP
CUE	STOP		REVIEW		REVIEW		PLAY
REVIEW	STOP	CUE		CUE			PLAY
PLAY	STOP	CUE	REVIEW	CUE	REVIEW		

Note: The RELEASE button only releases fast forward and rewind modes.

Fig. 12-7 Deck I transport mode changes

Deck II Transport Mode Change

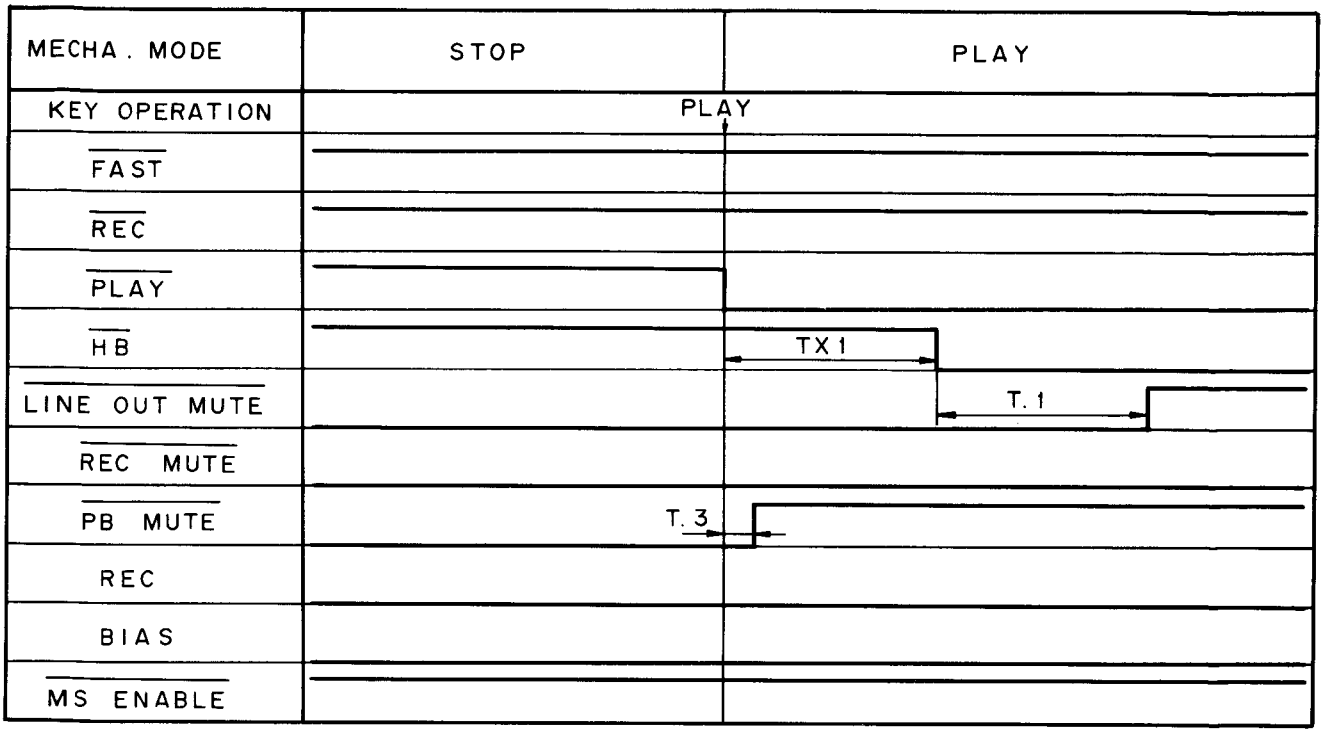
Button operation / Mode	STOP	PAUSE	FF	REW	PLAY FF	PLAY REW	PLAY	PLAY PAUSE	REC	REC PAUSE
STOP		STOP*	FF	REW	FF#	REW#	PLAY	PLAY/ PAUSE	REC	REC/ PAUSE
STOP*		STOP	FF*	REW*	FF*#	REW*#	PLAY/ PAUSE	PLAY	REC/ PAUSE	REC
FF	STOP	FF*		REW	FF#	REW#	PLAY	PLAY/ PAUSE		FF*
REW	STOP	REW*	FF		FF#	REW#	PLAY	PLAY/ PAUSE		REW*
PLAY	STOP	PLAY/ PAUSE	FF#	REW#	FF#	REW#		PLAY/ PAUSE		PLAY/ PAUSE
PLAY/ PAUSE	STOP*	PLAY	FF*#	REW*#	FF*#	REW*#		PLAY	REC/ PAUSE	PLAY
REC	STOP	REC/ PAUSE						REC/ PAUSE		REC/ PAUSE
REC/ PAUSE	STOP*	REC						REC		REC

Note: * denotes that PAUSE button has also be pressed.
For example, FF* denotes that both the FF and PAUSE buttons have been pressed. Tape transport is the same as in fast forward mode.
# denotes that although the PLAY and FF buttons have been pressed together, the tape transport mechanism is the same as in fast forward mode.
For example, REW*# denotes the mode where the PLAY, REW, and PAUSE buttons have all been pressed, but that the transport is switched to rewind mode since the HB switch is off. This also denotes that the PAUSE button has no effect on the operation when in fast forward mode.

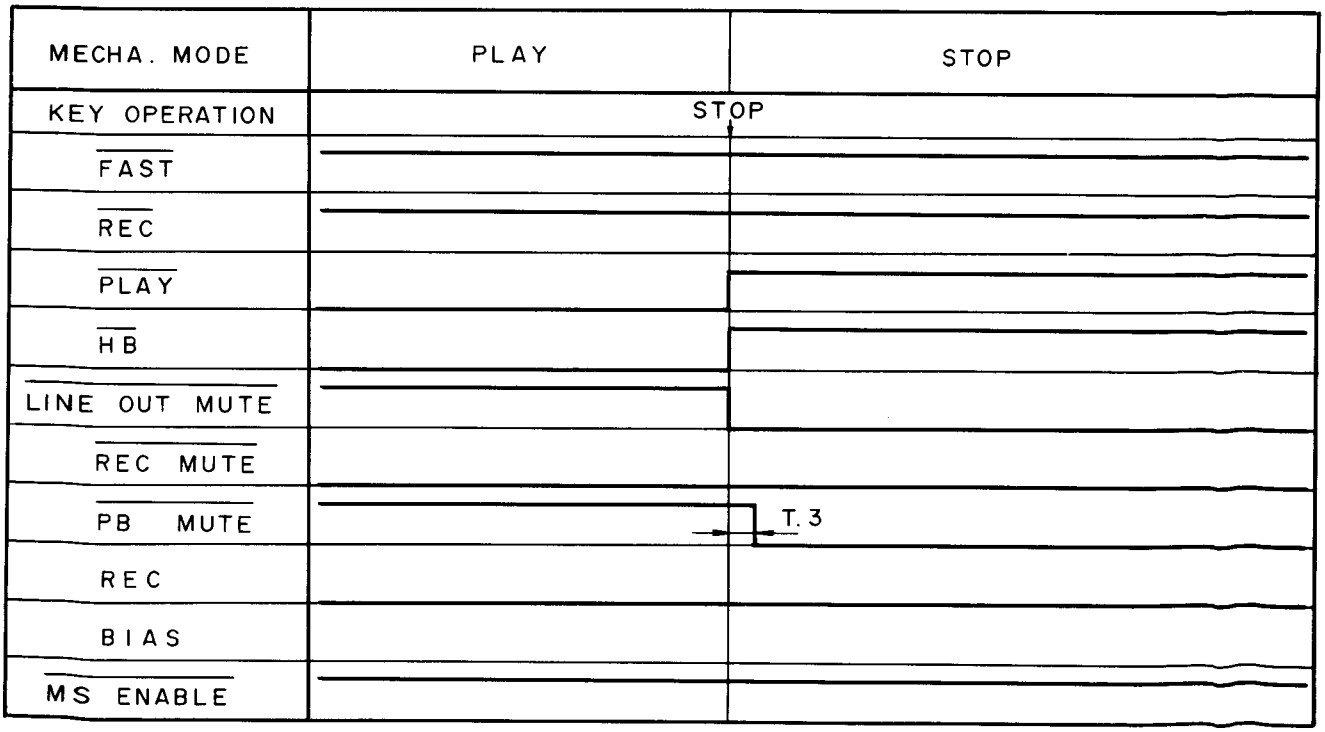
Fig. 12-8 Deck II transport mode changes

12.4 TIMING CHARTS

STOP → PLAY

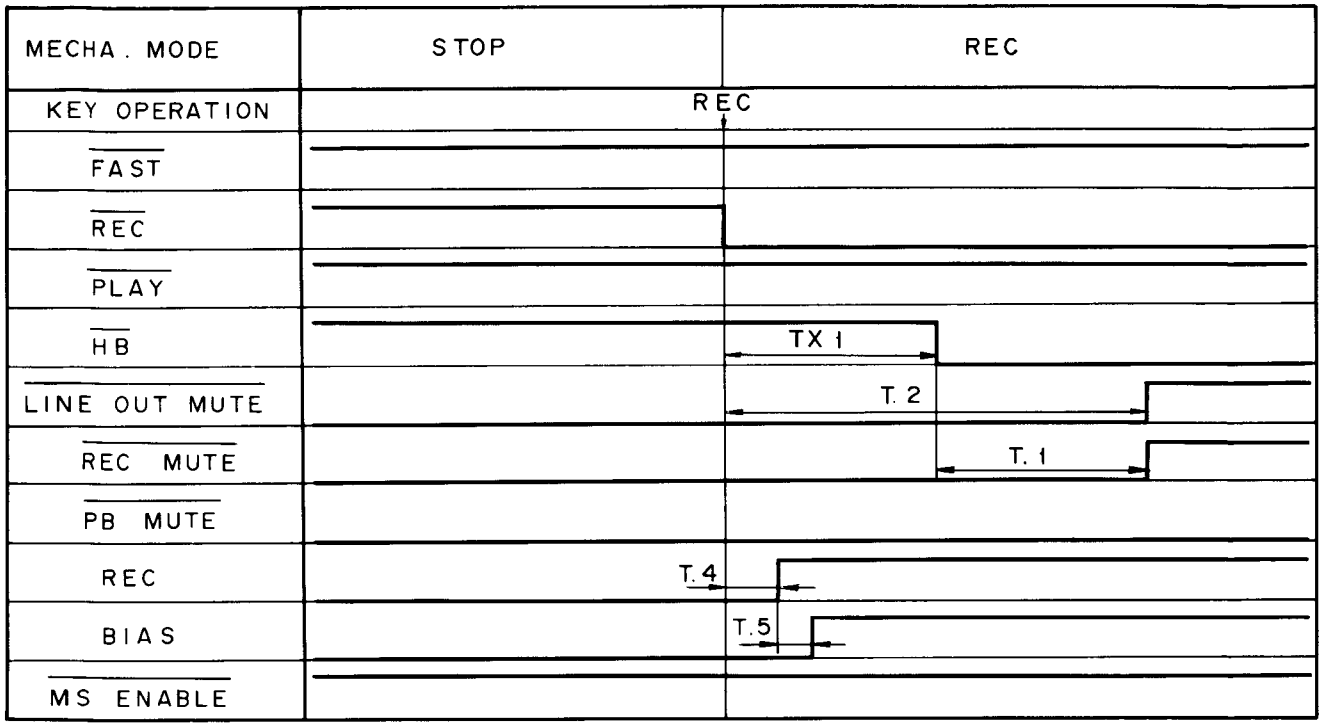


PLAY → STOP

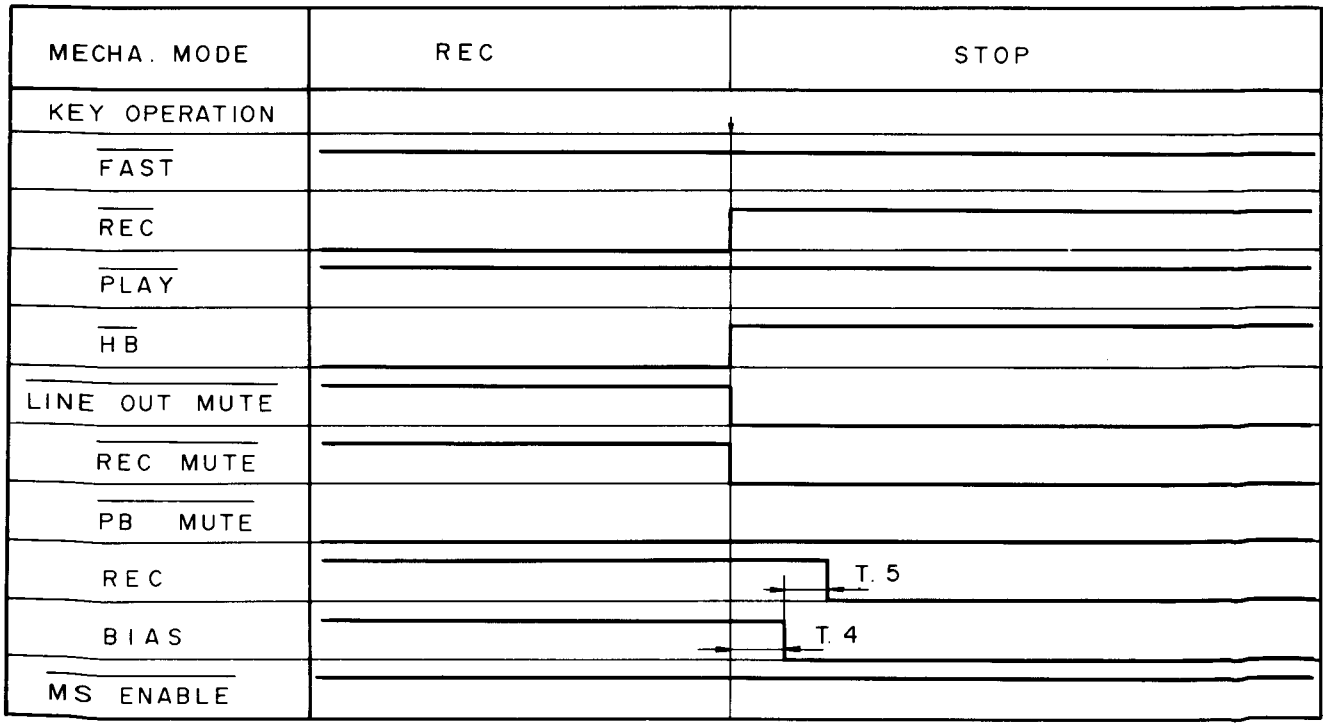


MS MODE SELECT — HIGH (NON MS)

STOP → REC

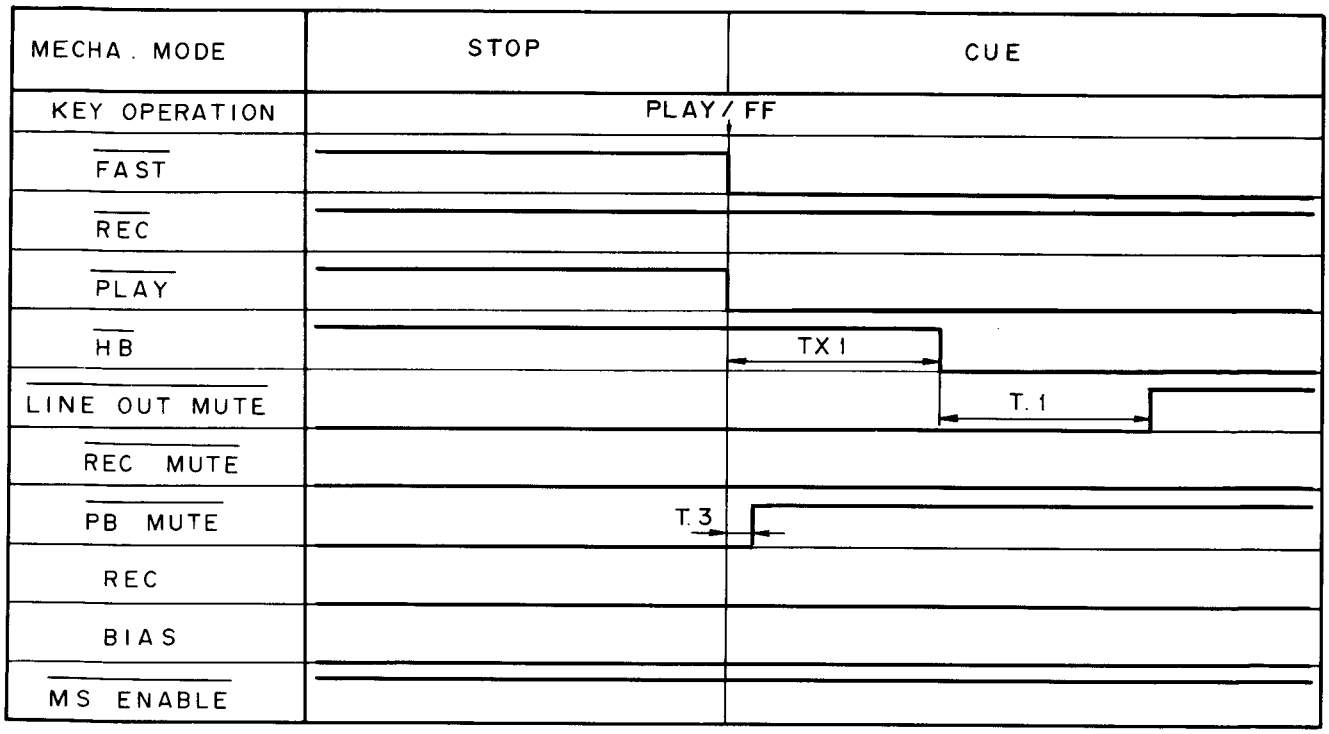


REC → STOP

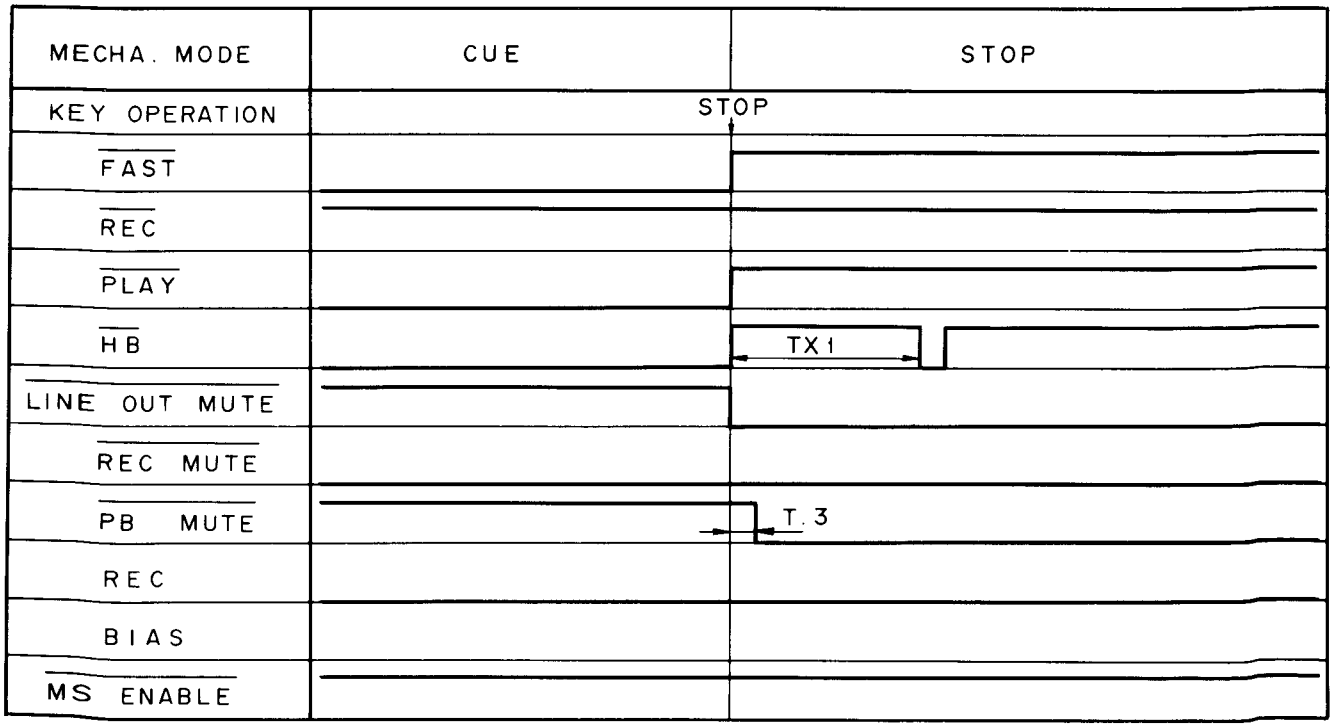


MS MODE SELECT — HIGH (NON MS)

STOP → CUE

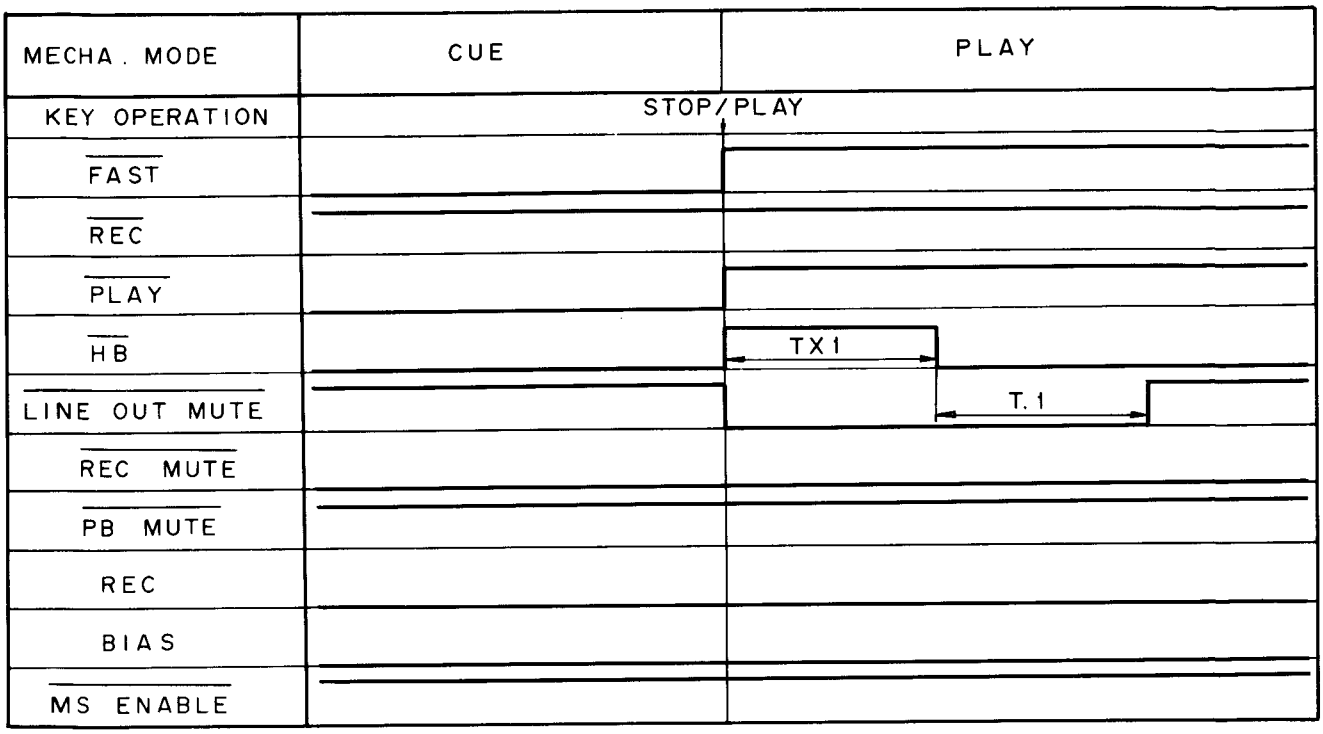


CUE → STOP

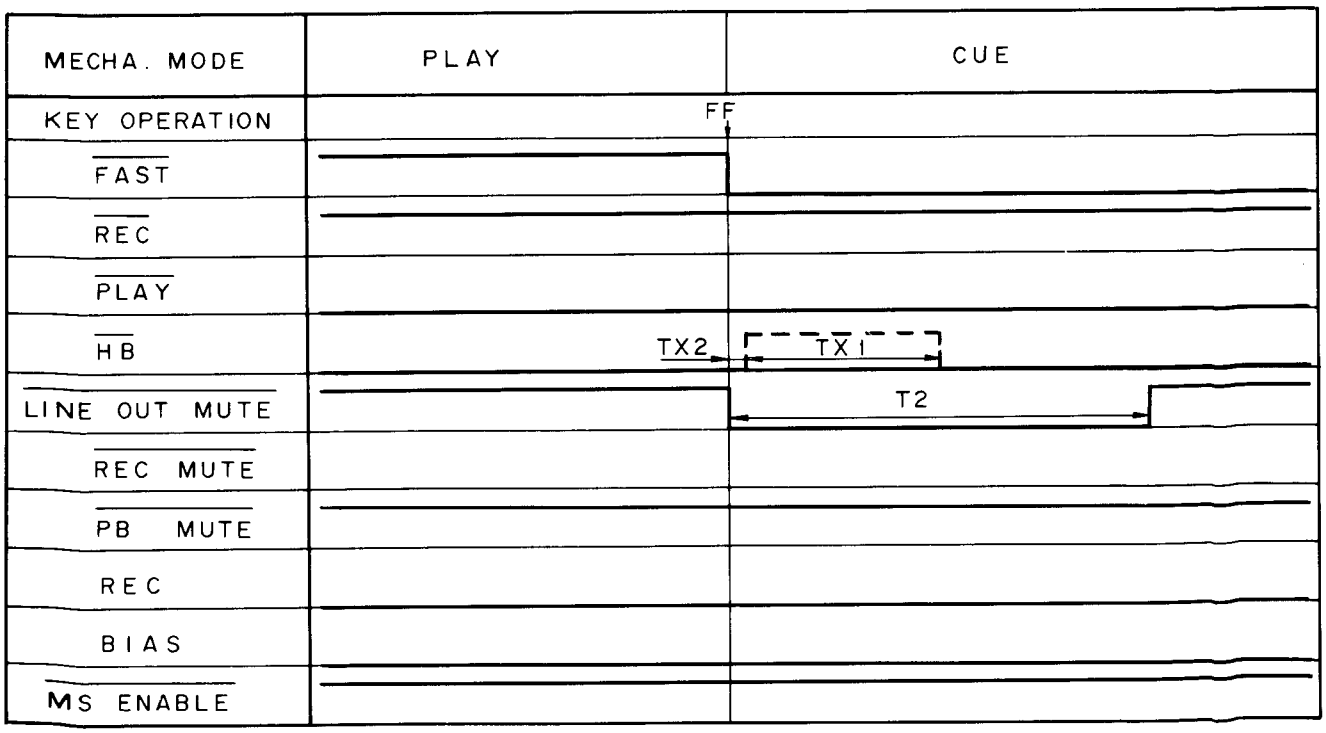


MS MODE SELECT — HIGH (NON MS)

CUE → PLAY

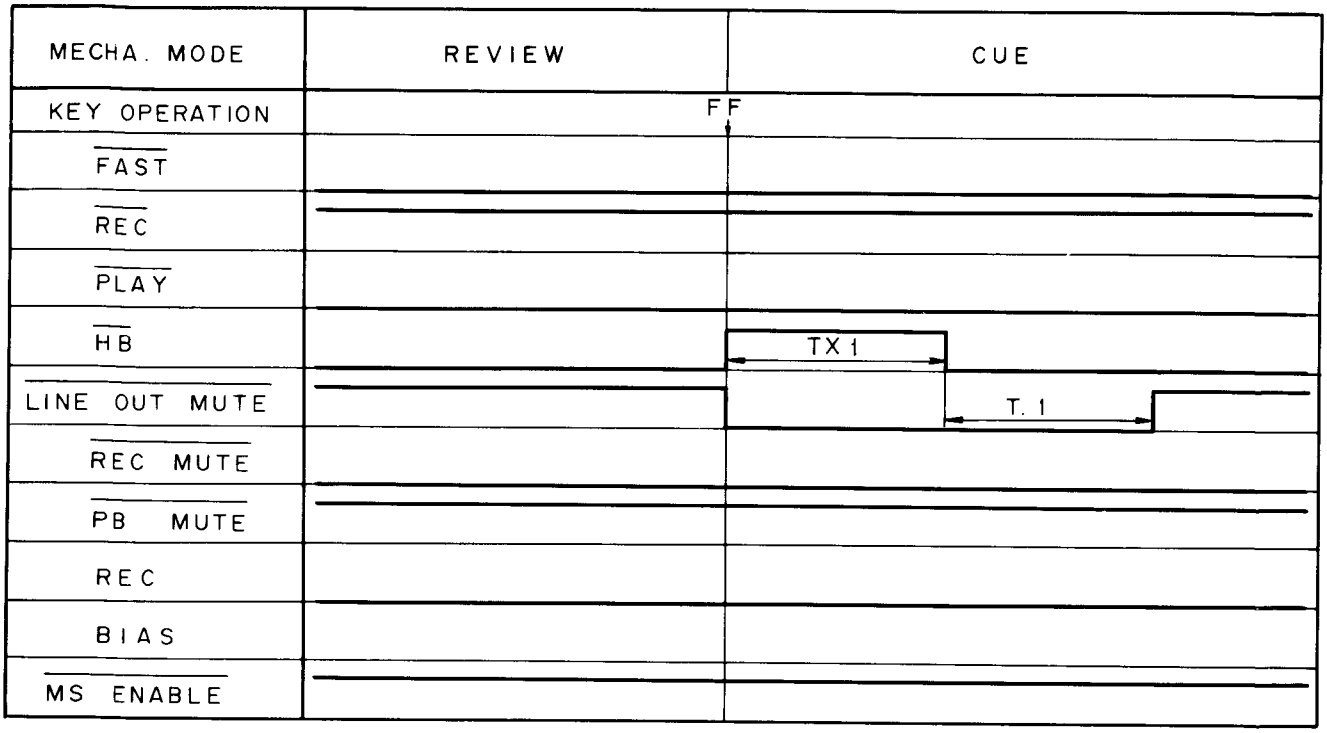


PLAY → CUE



MS MODE SELECT — HIGH (NON MS)

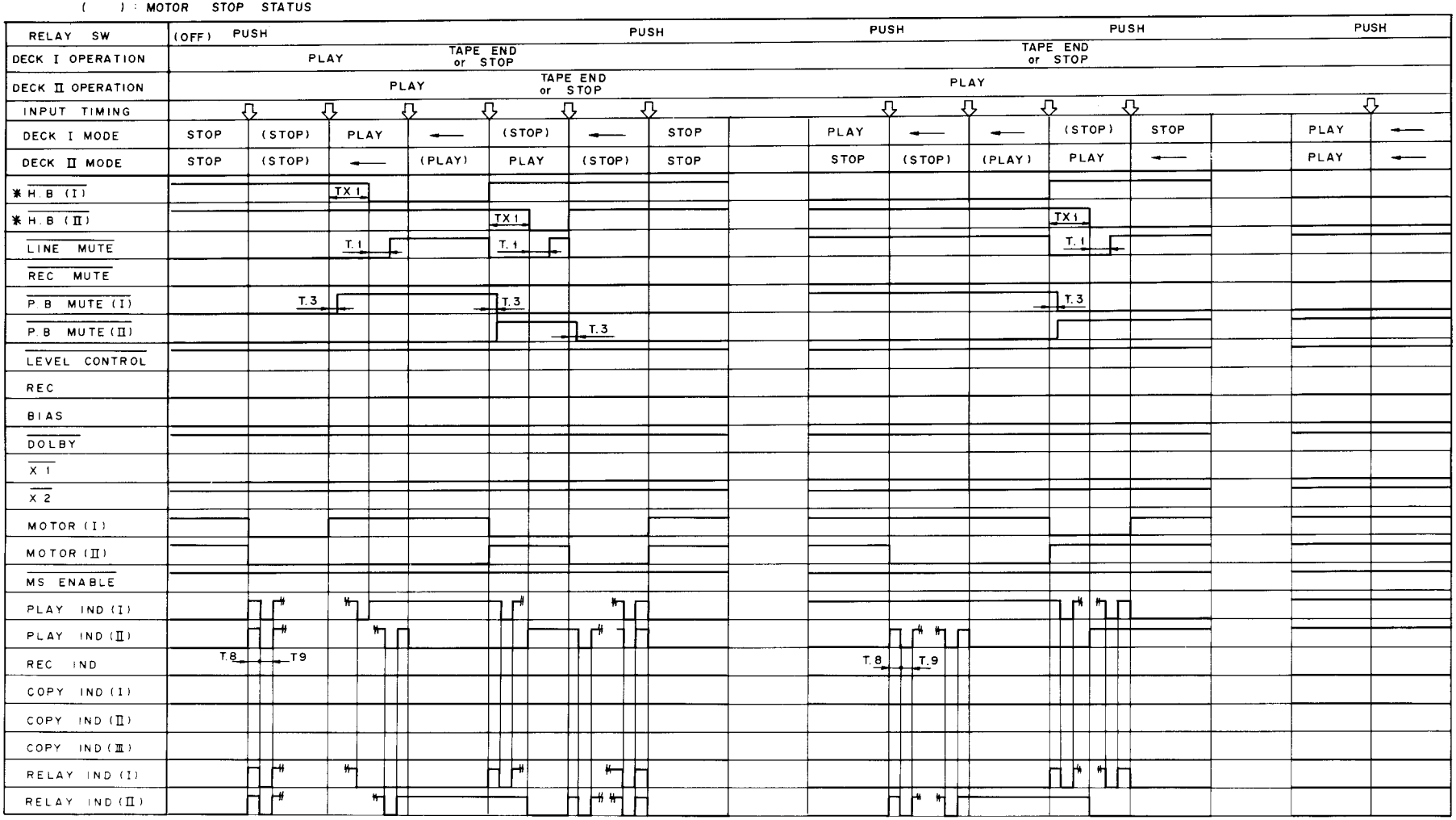
REVIEW → CUE



MS MODE SELECT — HIGH (NON MS)

RELAY PLAY 1

( ) : MOTOR STOP STATUS



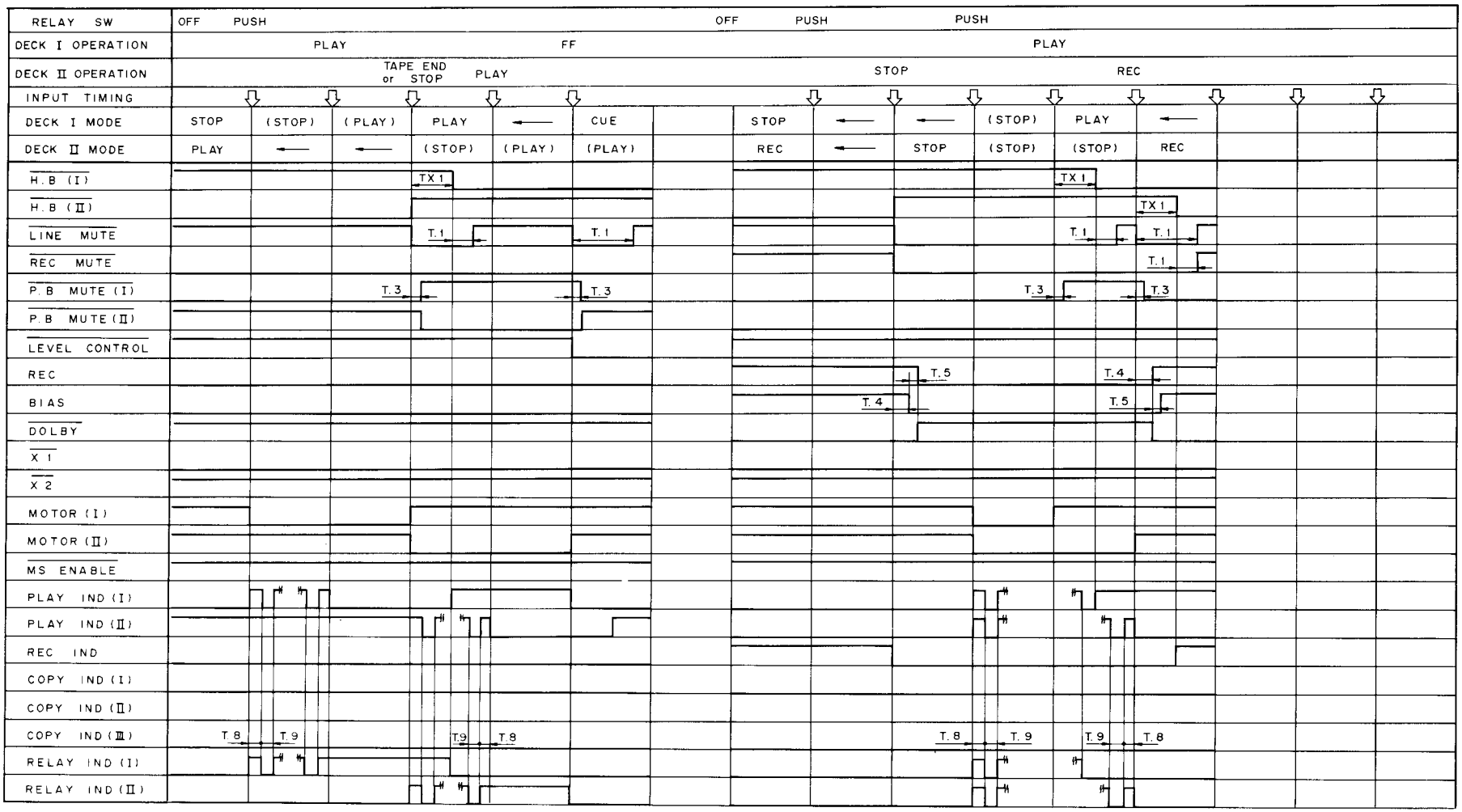
TIMING (mS)

T.1	300	T.8	500
T.2		T.9	500
T.3	10	T.10	
T.4		T.11	
T.5		TX1	(200)
T.6		TX2	
T.7			

COPY SW	—	OFF
SPEED SW	—	—
RELAY SW	—	
MS MODE SELECT	—	—

RELAY PLAY 2

( ) : MOTOR STOP STATUS

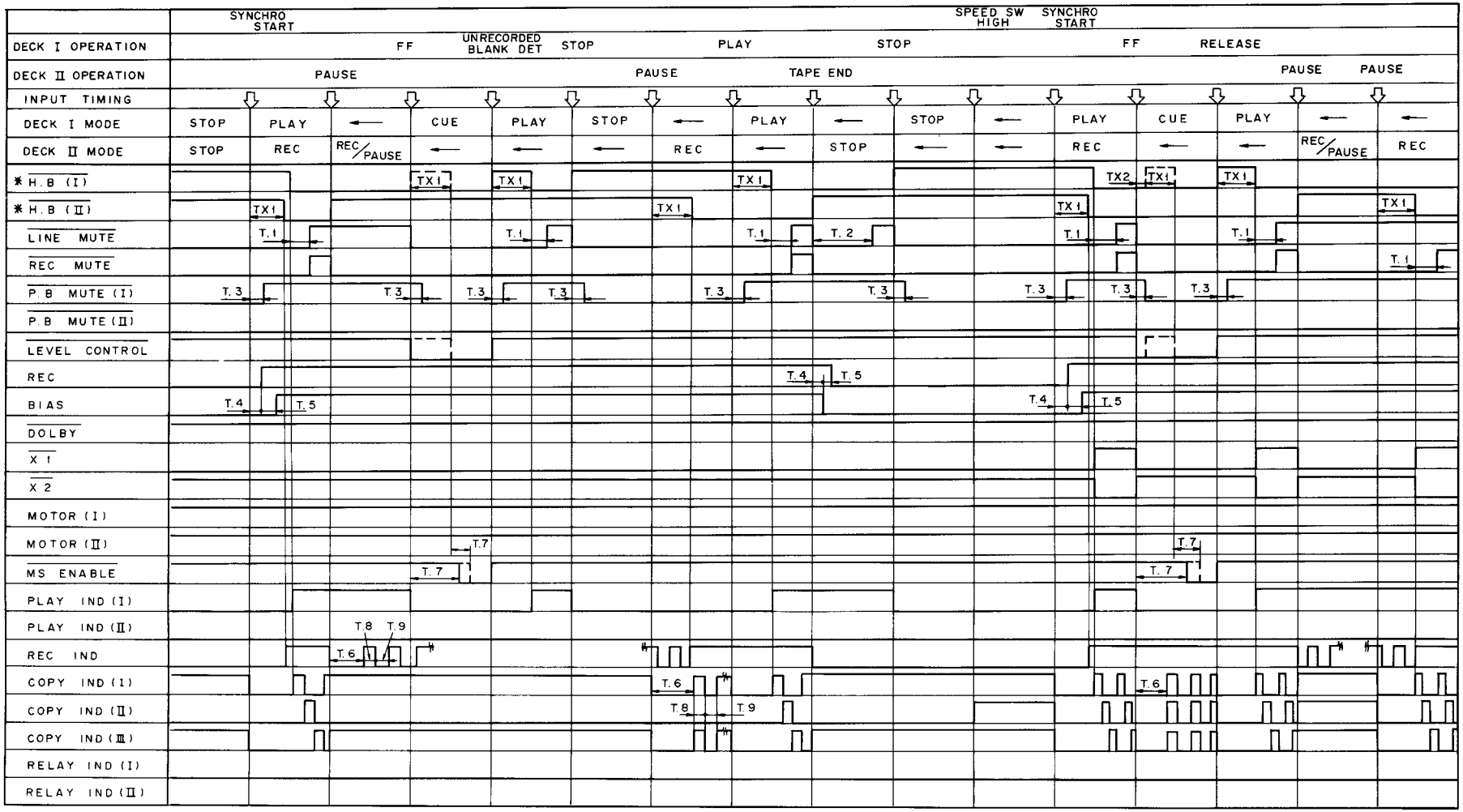


TIMING (mS)

T. 1	300	T. 8	500
T. 2	500	T. 9	500
T. 3	10	T. 10	
T. 4	50	T. 11	
T. 5	50	TX1	(200)
T. 6		TX2	
T. 7			

COPY SW — OFF
SPEED SW — ——
RELAY SW —
MS MODE SELECT — ——

COPY 1

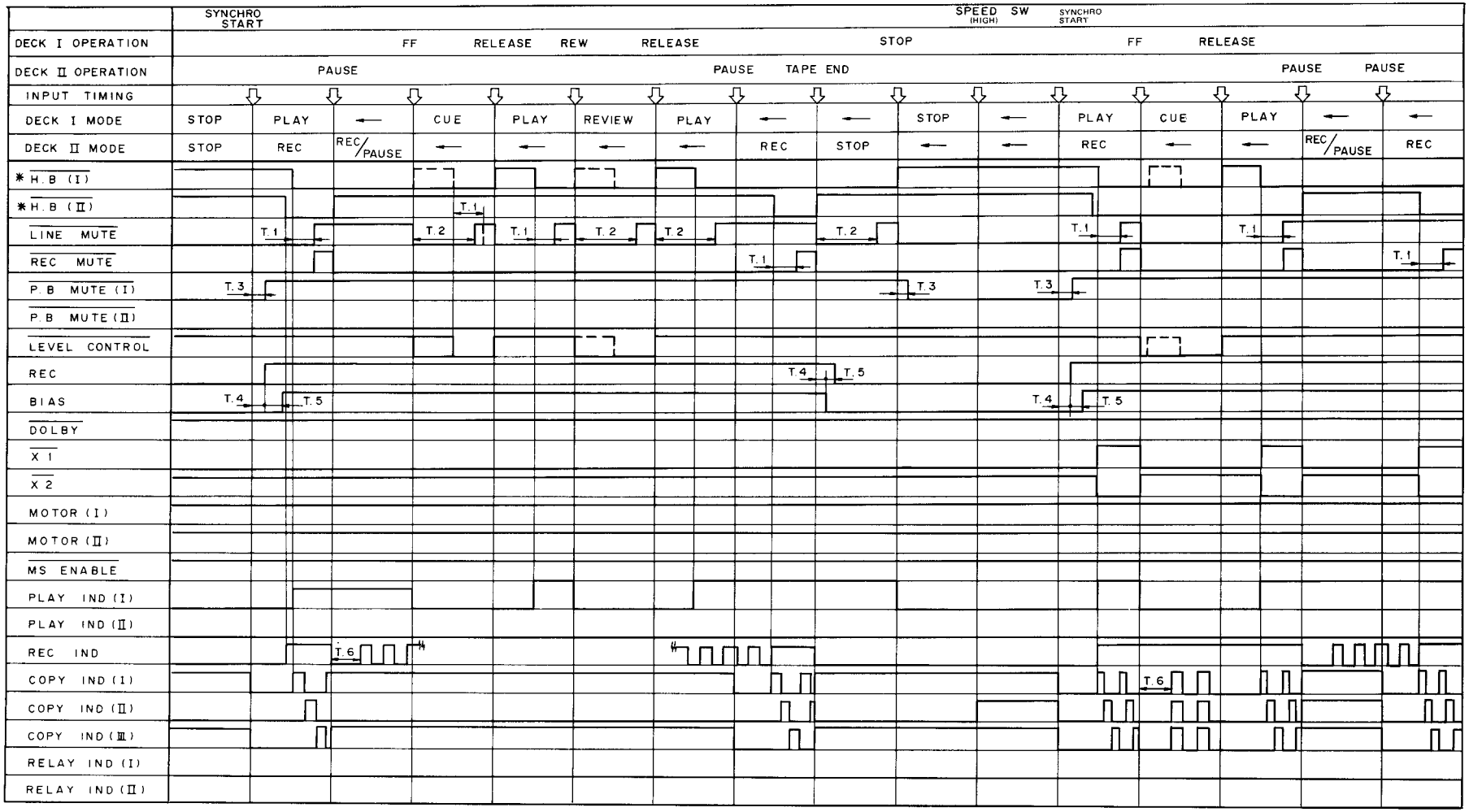


TIMING (mS)

T.1	300	T.8	500
T.2		T.9	500
T.3	10	T.10	
T.4		T.11	
T.5		TX1	(200)
T.6	500	TX2	
T.7	200		

COPY SW	–	ON
SPEED SW	–	—
RELAY SW	–	OFF
MS MODE SELECT	–	LOW (MS)

COPY 2

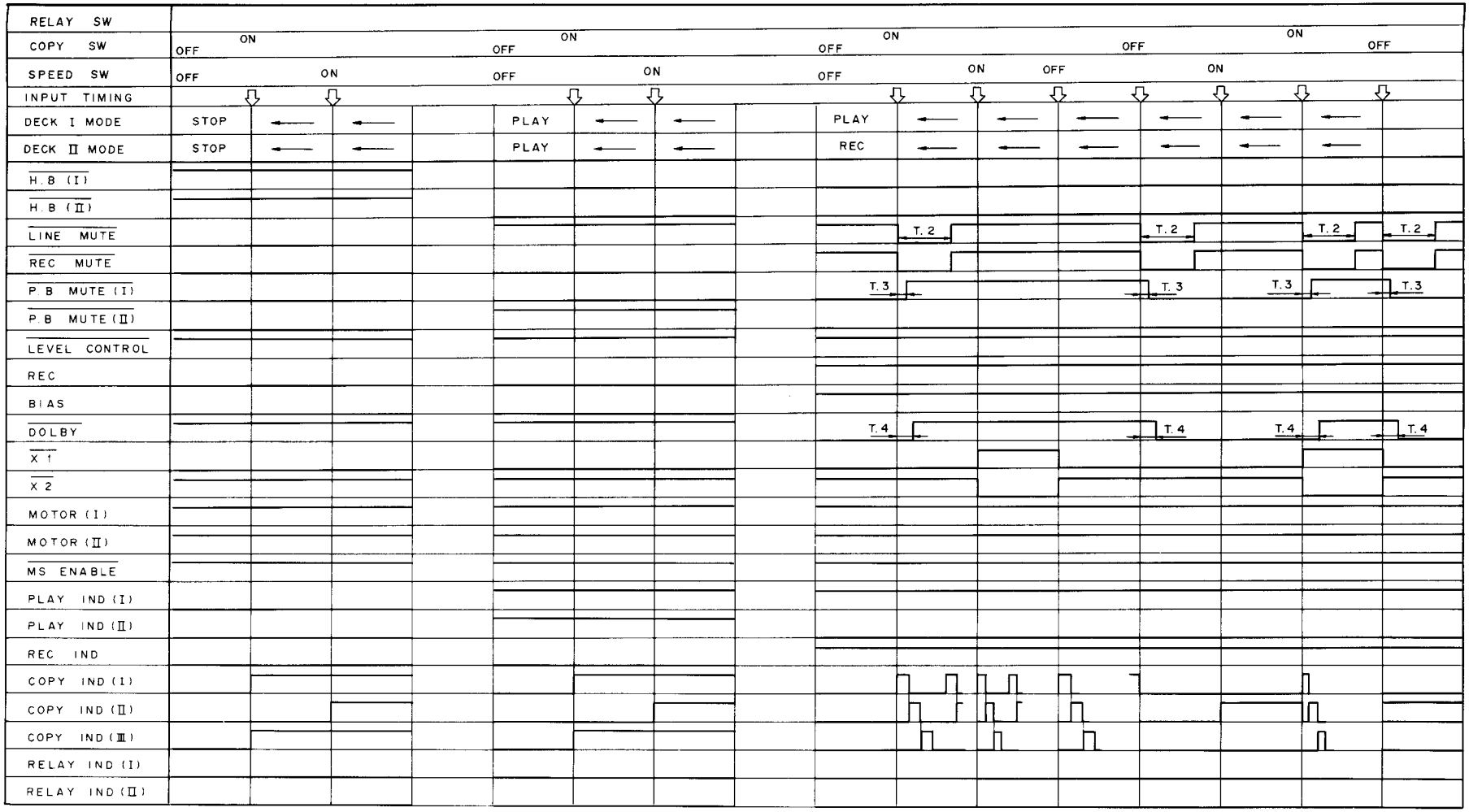


TIMING (mS)

T.1	300	T.8	500
T.2	500	T.9	500
T.3	10	T.10	
T.4	50	T.11	
T.5	50	TX1	(200)
T.6	500	TX2	
T.7			

COPY SW	—	ON
SPEED SW	—	—
RELAY SW	—	OFF
MS MODE SELECT	—	HIGH (NON MS)

Function Key Operation

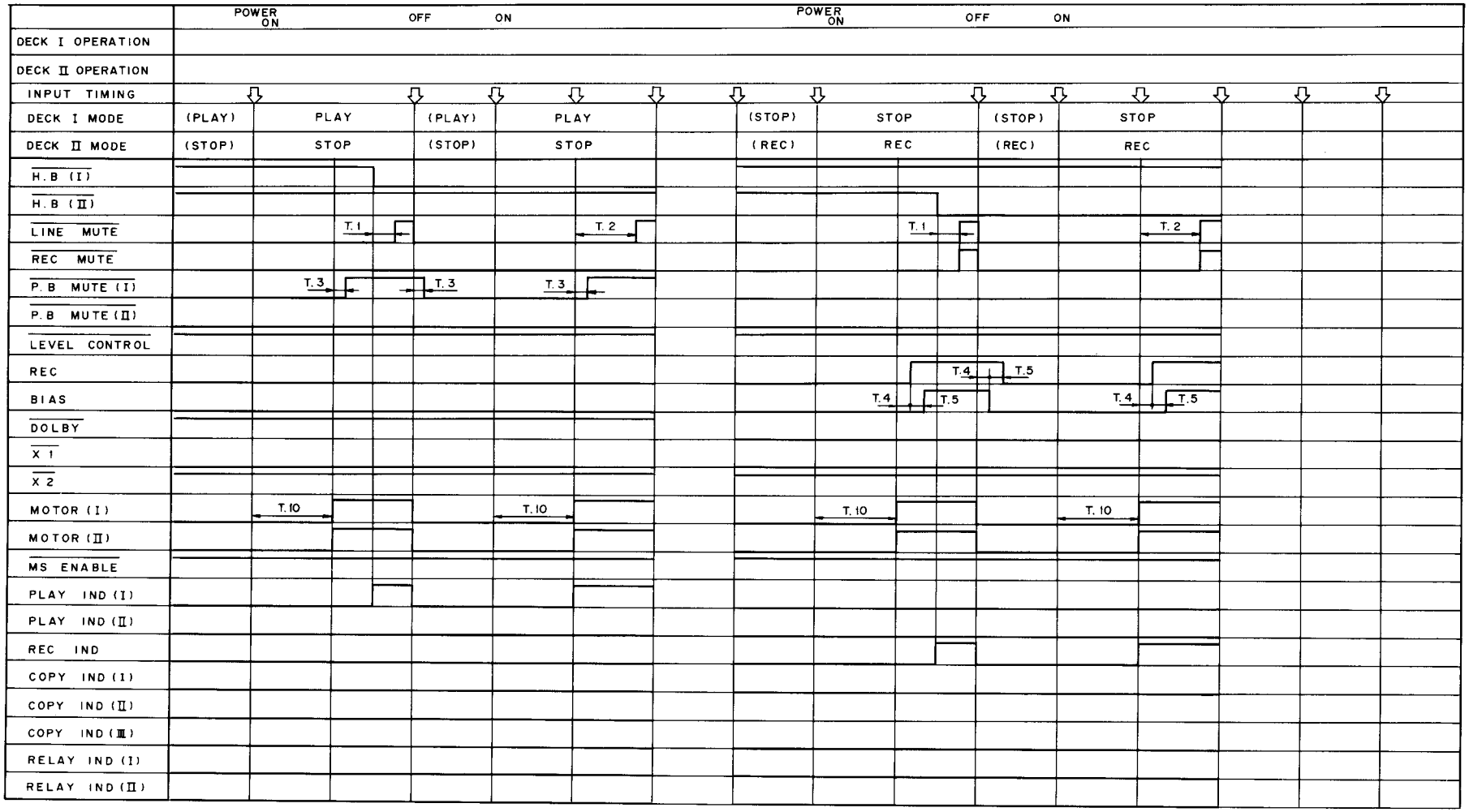


TIMING (mS)

T. 1		T. 8	
T. 2	500	T. 9	
T. 3	10	T.10	
T. 4		T.11	
T. 5		TX1	
T. 6		TX2	
T. 7			

COPY SW	—
SPEED SW	—
RELAY SW	—
MS MODE SELECT	—

TIMER START (PLAY & REC)



TIMING (mS)

T. 1	300	T. 8	
T. 2	500	T. 9	
T. 3	10	T. 10	2000
T. 4	50	T. 11	
T. 5	50	TX1	(200)
T. 6		TX2	
T. 7			

COPY SW	–	OFF
SPEED SW	–	NORM
RELAY SW	–	OFF
MS MODE SELECT	–	

13. SUPPLEMENT FOR HEM, HB, HP, D AND D/G TYPES

The HEM, HB, HP, D and D/G types are the same as the KU type with the exception of following sections.

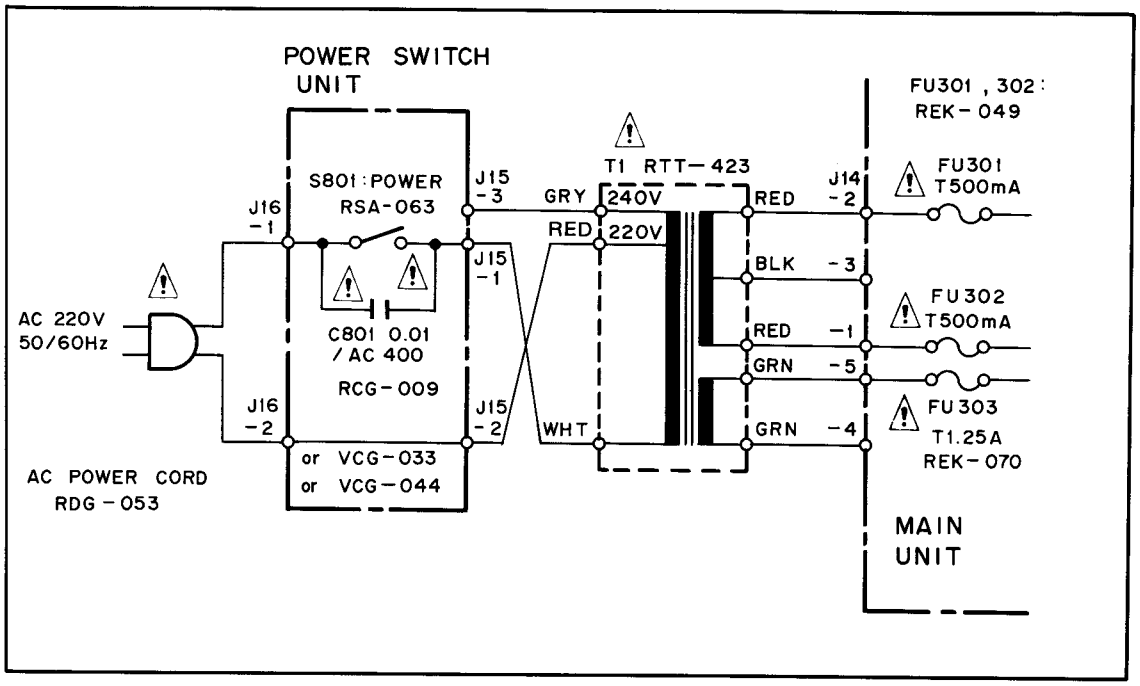
Mark	Symbol & Description	Part No.					
		KU type	HEM type	HB type	HP type	D type	D/G type
⚠ ★	T1 Power transformer (120V)	RTT-421	.....	.....	.....	.....	.....
	(220V/240V)	.....	RTT-423	RTT-423	RTT-423	.....	.....
	(110V/220V/240V)	.....	.....	.....	.....	RTT-424	RTT-424
⚠★★	FU301, FU302 Fuse (800mA)	REK-079	.....	.....	.....	REK-079	REK-079
	Fuse (T500mA)	.....	REK-049	REK-097	REK-049	.....	.....
⚠★★	FU303 Fuse (1.25A)	REK-073	.....	.....	.....	REK-073	REK-073
	Fuse (T1.25A)	.....	REK-070	REK-101	REK-070	.....	.....
⚠★★	S1 Line voltage selector	.....	.....	.....	.....	RSX-057	RSX-057
⚠	AC power cord	RDG-048	RDG-053	RDG-052	RDG-040	RDG-058	RDG-058
⚠	Strain relief (for AC power cord)	REC-395	REC-396	REC-396	REC-396	REC-395	REC-395
	Packing case (CT-S77W [BK])	RHG-846	.....	.....	.....	.....	RHG-848
	Packing case (CT-1060W[BK])	RHG-842	RHG-844	RHG-844	RHG-844	RHG-844	.....
	Packing case (CT-1060W)	.....	RHG-845	RHG-845	.....	RHG-845	.....
	Operating instructions (English)	RRB-263	.....	RRB-263	RRB-263	RRB-263	RRB-264
	(English/German/French/Italian)	.....	RRE-085	.....	.....	.....	.....
	(Spanish – auxiliary)	.....	.....	.....	.....	RRD-081	.....

Line Voltage Selection for HEM, HP and HB Types

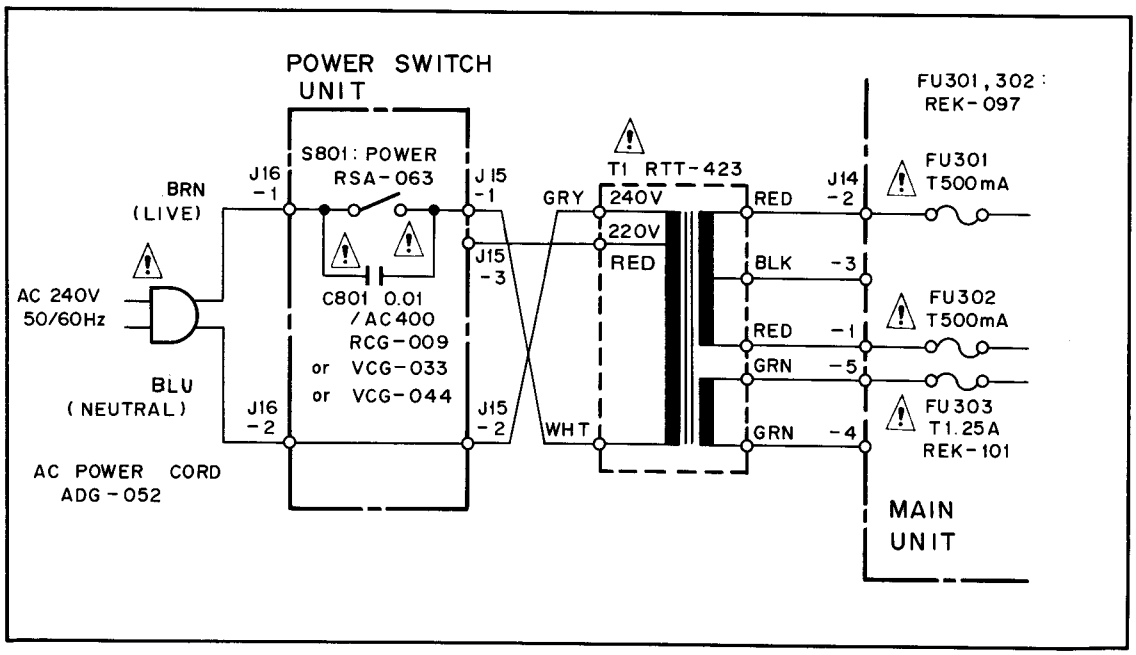
1. Disconnect the AC power cord.
2. Remove the bonnet case.
3. Change the connection of the power transformer primary lead wires as follows:
   - 220V: Connect the gray lead wire to the J15-3 terminal on the power supply unit, and connect the red lead wire to the J15-2 terminal.
   - 240V: Connect the gray lead wire to the J15-2 terminal on the power supply unit, and connect the red wire to the J15-3 terminal.
4. Stick the line voltage label on the rear panel.

Description	Part No.
220V label	AAX-193
240V label	AAX-192

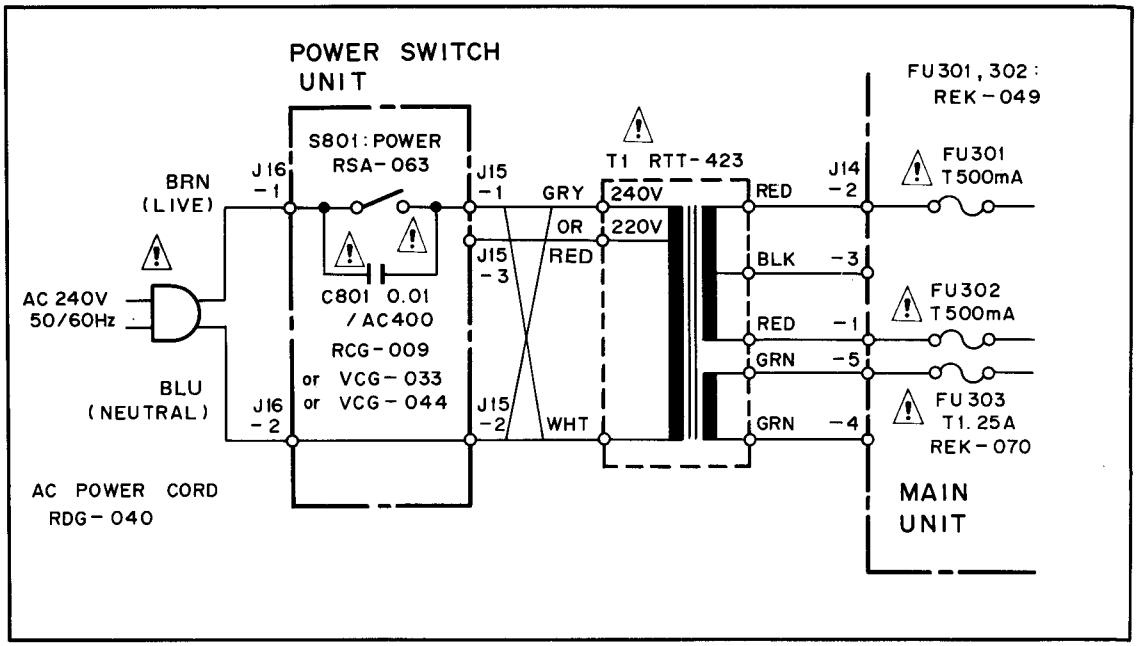
Power Supply Circuit for HEM Type



Power Supply Circuit for HB Type



Power Supply Circuit for HP Type



Power Supply Circuit for D and D/G Types