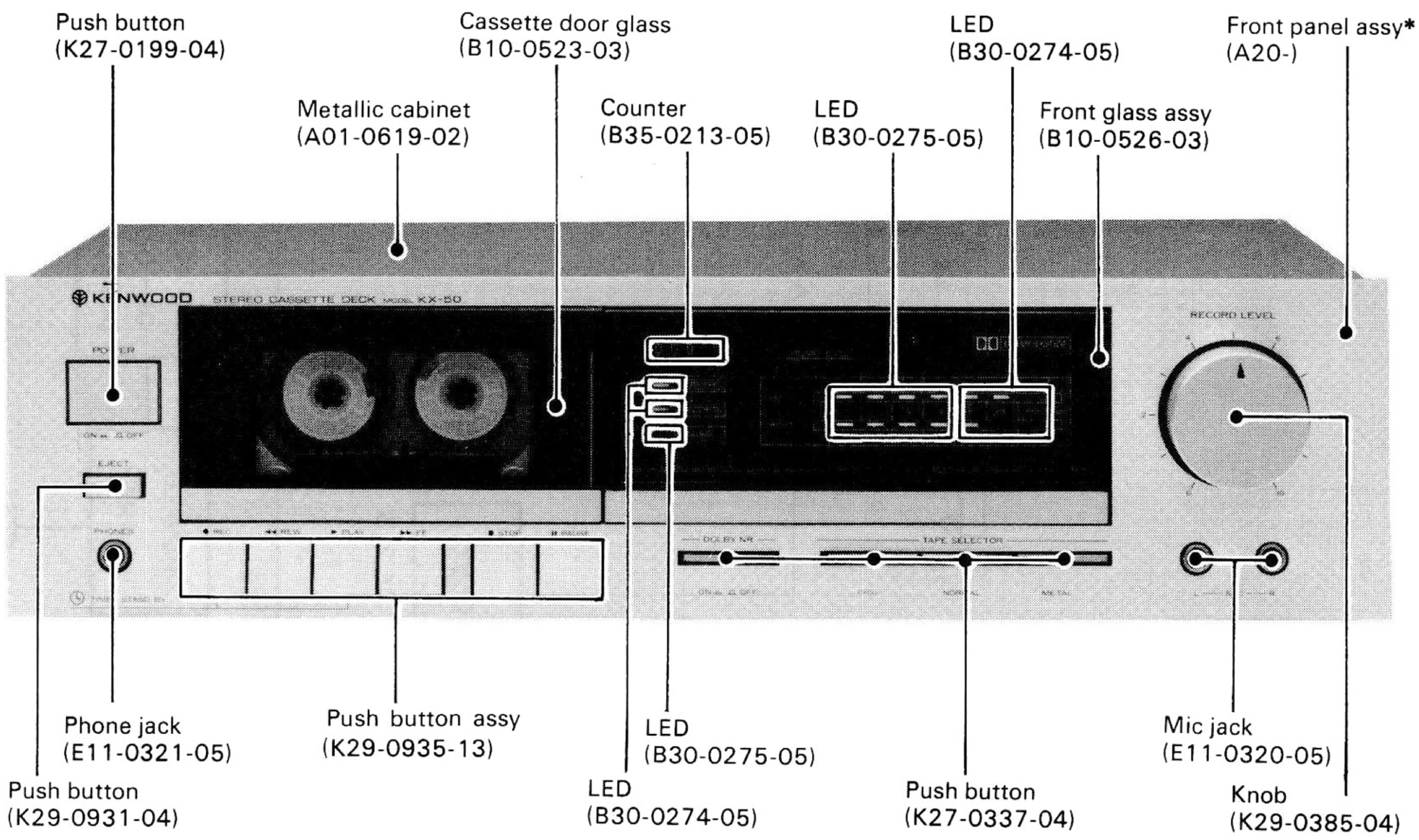
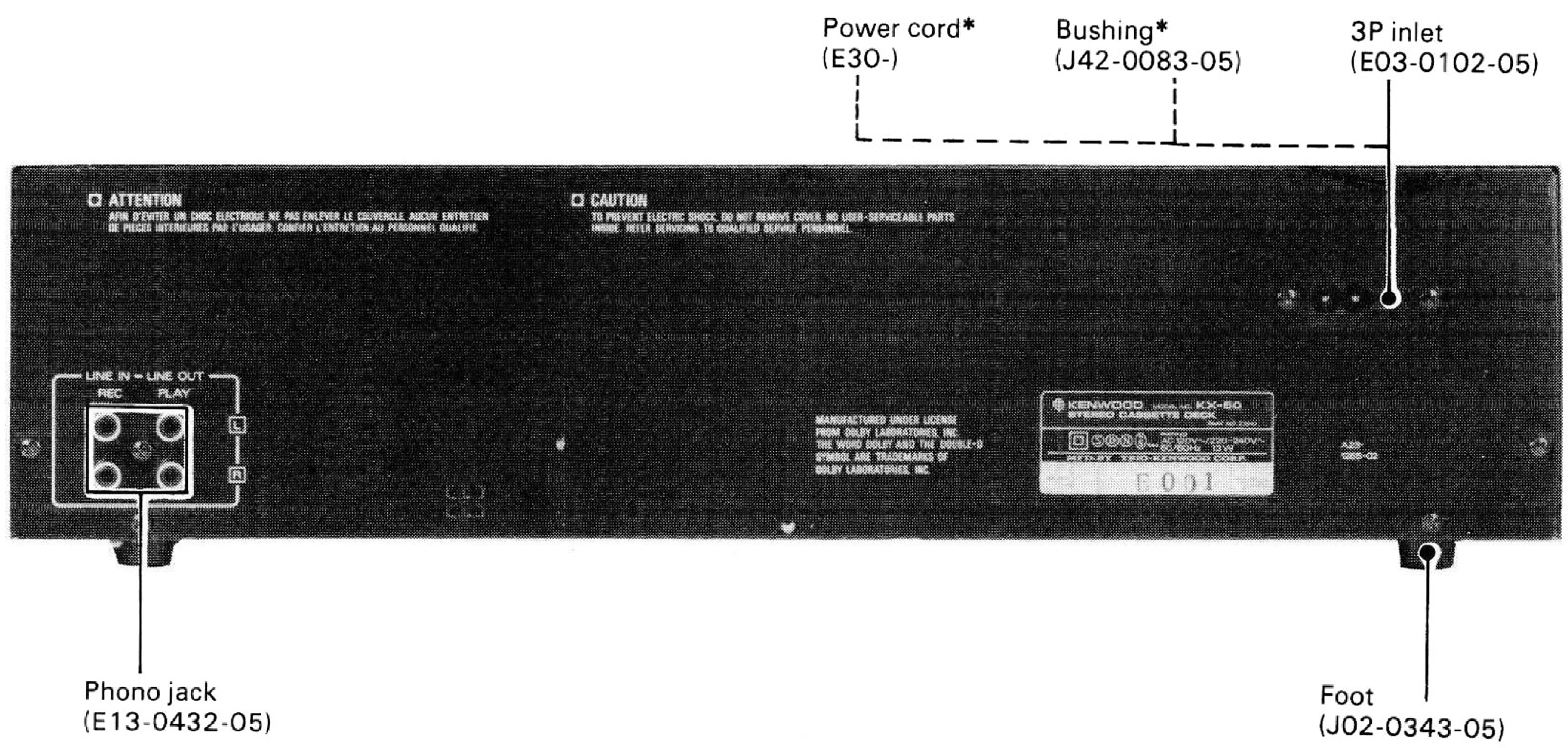
KENWOOD®

KX-50

STEREO CASSETTE DECK

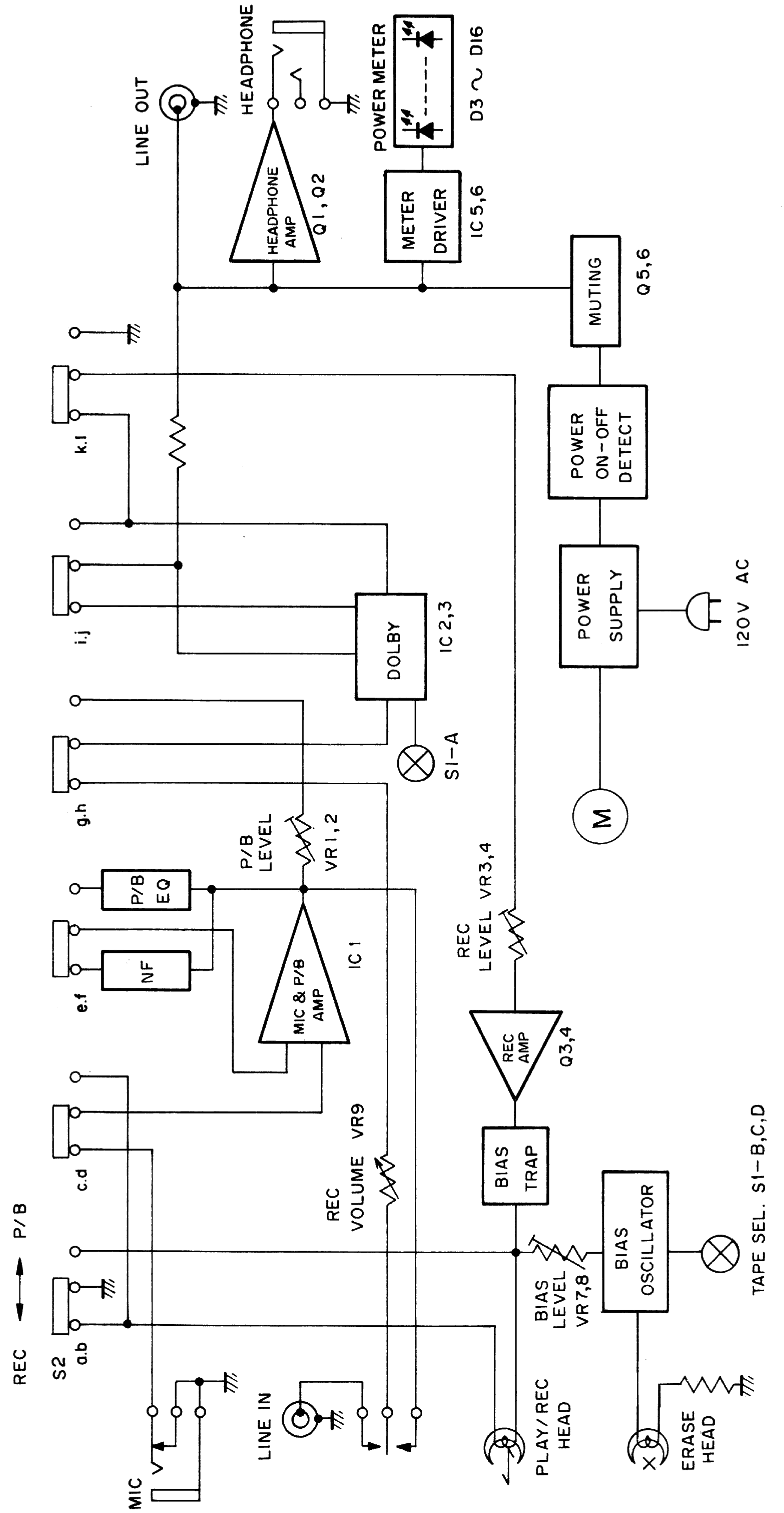
SERVICE MANUAL





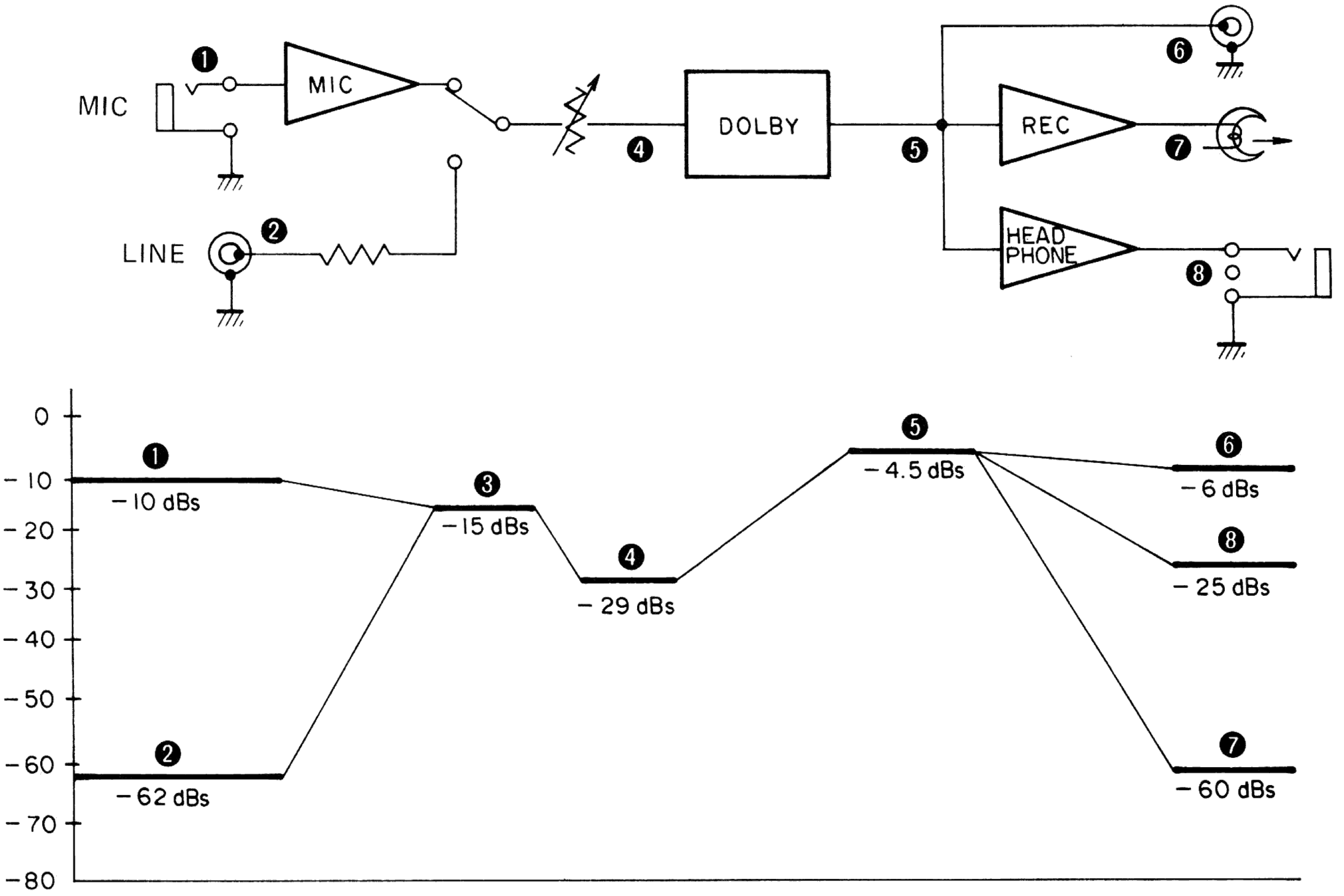
*Refer to parts list on page 10.

BLOCK DIAGRAM

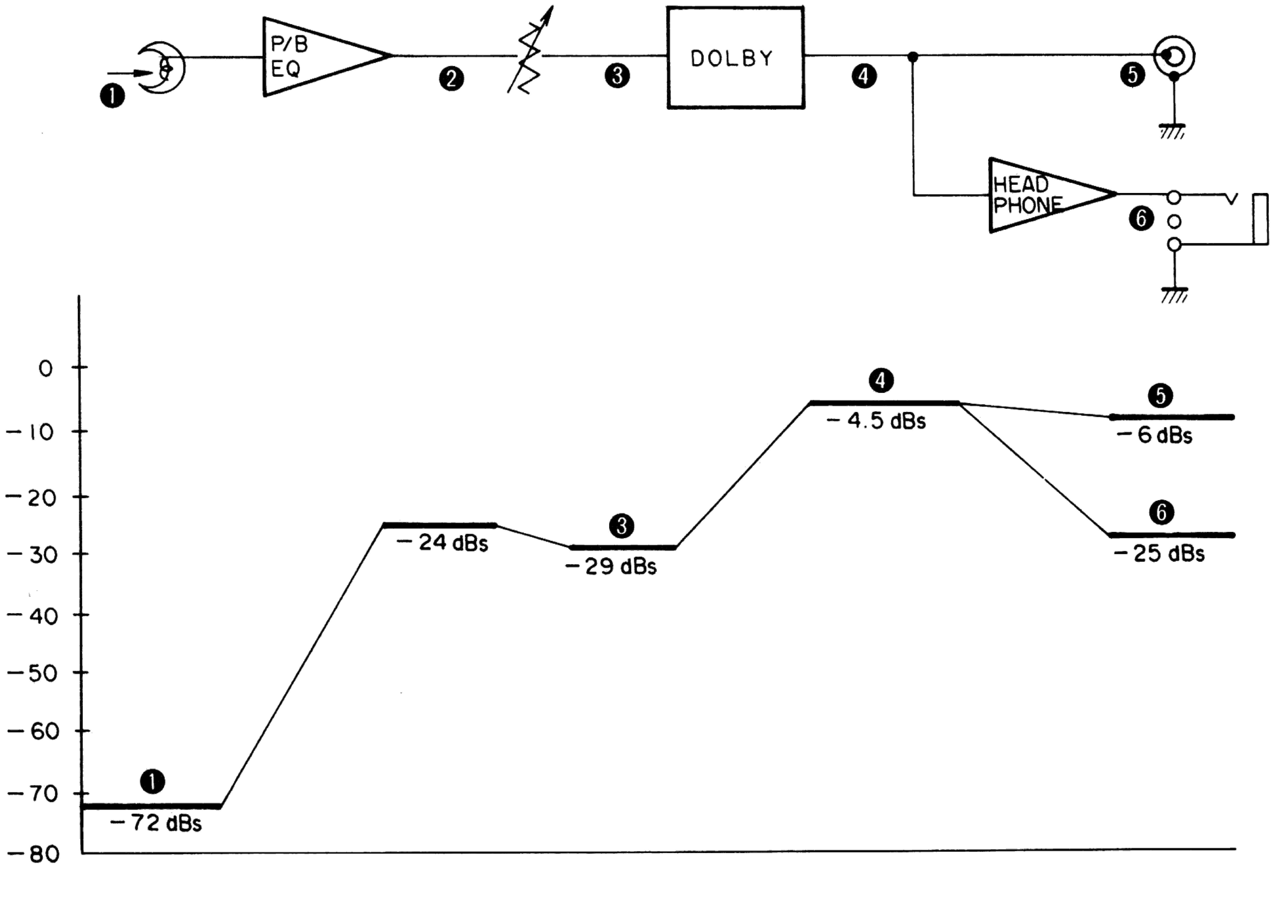


LEVEL DIAGRAM

RECORD : 1KHz 0 dBs = 0.775 V



PLAYBACK : TEST TAPE MTT-216 315 Hz 0 dBs



ADJUSTMENT

1. Test Instruments

- AC voltmeter (High input impedance)
- Audio signal generator: AG
- Oscilloscope
- Frequency counter
- Wow and flutter meter
- Weighting filter (ASA A characteristic with NAB curve)
- Band pass filter (Center frequency: 100 Hz, 1 kHz: Attenuation: 18 dB/oct. or more)
- Cassette type torque gage (TW-2111: T99-0208-00)
- Spring balance
- Head demagnetizer
- Cleaning tape (T93-0014-05)

2. Test Tapes

a) Test tapes for recording system adjustment
NORMAL:
MAXELL UD-XL1 (T93-0013-15)
CHROME (for measurement):
TDK AC-511 (T93-0010-05) or SAC-60
METAL: TDK AC-701 (T93-0018-00)

b) Test tape for playback measurement
TEAC MTT-111 (Tape speed. azimuth) (T93-0015-00)
TEAC MTT-216 (Frequency characteristic) (T93-0016-00)
TEAC MTT-216R (Frequency characteristic) (T93-0017-00)
Mirror tape (T93-0021-00)

3. Notes for Adjustments and Measurements

1. **Load resistance:** A pure resistance load of 100 kΩ should be connected to the LINE OUTPUT terminal.
2. **Standard level:** 0 dBs = 0.775V
3. The electrical system should be adjusted by dividing it into playback and recording.
   Adjustment of recording requires perfect performance of the playback system.
   No special adjustment should be required unless inner components are replaced.
4. When the head is replaced, its stray magnetism must be completely erased by the demagnetizer prior to mounting the tape.
5. Unless otherwise designated, measurement should be carried out with the Dolby NR switch off.

4. Meaning of Technical Word

a) **Standard playback condition:** The state obtained by reproducing the reference level 315 Hz signal (160 pWb/mm) of the test tape and by adjusting the playback level so that the standard output level (−6 dBs = 0.3875V) can be obtained at the LINE OUTPUT terminal.

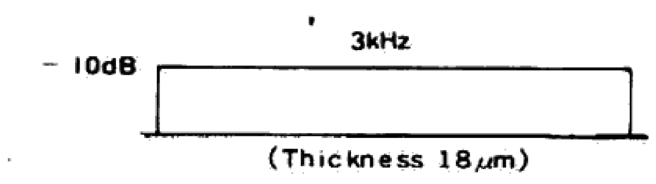
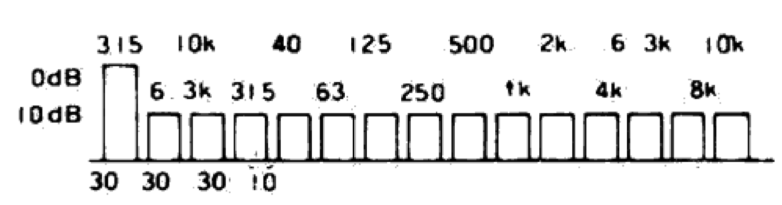
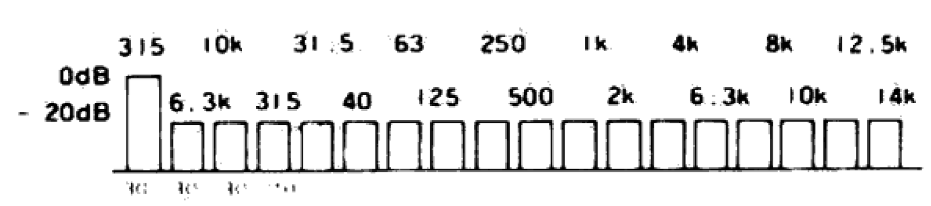
b) **Standard recording level:** A level to obtain residual magnetic flux of 160 pWb/mm on the standard recording tape, which is 4 dB below the level 315 Hz, 0 dB (250 pWb/mm) of the test tape (MTT-216R).

c) **Standard input level:** The standard input level necessary for obtaining the normal recording level. The levels at respective input jacks are as specified below. However 80kΩ resistor should be inserted in the input of the DIN connector in series.
MIC INPUT .... −62 dBs (0 VU)
LINE INPUT .... −10 dBs (0 VU)
DIN INPUT .... −24 dBs (0 VU)

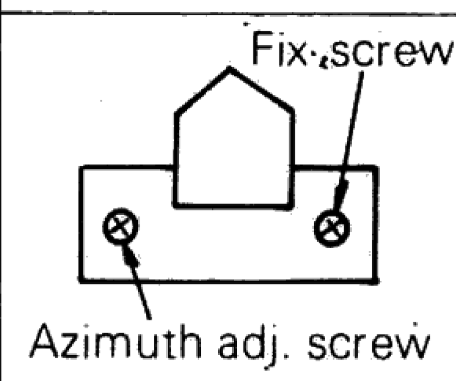
d) **Standard recording condition:** The state obtained by applying the 1 kHz signal to the LINE INPUT jack at the normal input level (−10 dBs) and by adjusting the RECORD LEVEL volume control so that recording can be carried out at the normal recording level.

e) **Standard output level:** The standard signal level obtained at the LINE OUTPUT jack when the reference level 315 Hz signal is reproduced from the test tape.
MTT-216R 315 Hz (250 pWb/mm)
Output level: 4 dBs
MTT-216 315 Hz (160 pWb/mm)
Output level: 0 dBs

TEST TAPE SPECIFICATION

MODEL	TITLE	TIME CONSTANT	DESCRIPTION		APPLICATION
			FREQ/LEVEL	PROGRAM	
MTT-111	FLUTTER	—	3 kHz −10 dB	 30 Min.	Tape Speed Test Wow and Flutter Test
MTT-116R (MTT-216R)	FREQUENCY	1590 μs and 120 μs	40 Hz∼10 kHz 0 dB/−10 dB 0 dB DIN REFERENCE LEVEL		Frequency Response Test
MTT-116U (MTT-216)	FREQUENCY	3180 μs and 120 μs	31.5 Hz∼14 kHz 0 dB/−20 dB 0 dB: DIN REFERENCE LEVEL −4 dB		Frequency Response Test

ADJUSTMENT

Step	Item	Input setup	Output setup	Cassette deck setting	Parts to be adjusted L	Parts to be adjusted R	Adjustment
I. Adjusting REC/PLAY head							
1.	**Demagnetization and cleaning**	—	—	Power: OFF	REC/PLAY HEAD erase head, capstan, pinch roller		Demagnetize the REC/PLAY head with a head demagnetizer or a cassette type demagnetizer. Clean the REC/PLAY head, erase head, capstan and pinch roller using an applicator soaked with alcohol.
2.	**Fine adjustment of head azimuth**	—	Ⓐ	Ⓑ MTT-216R,10kHz, −20dB PLAY DOLBY OFF TAPE SEL: NORMAL			Adjust screw so that the maximum output is obtained.
Check azimuth of the head again, then lock the screws with adhesive.							
II. Printed circuit board adjustment							
1.	**Tape speed**	—	Ⓒ	Ⓑ MTT-111 PLAY.	PC trimming potentiometer in the DC motor.		Adjust the PC trimming potentiometer so that the reproduced frequencey becomes 3000 Hz.
2.	**Playback level**	—	Ⓐ	Ⓑ MTT-216 (MTT-116U) 315 Hz, 0 dB PLAY OUTPUT: LINE OUT DOLBY: OFF TAPE SEL: NORMAL	VR1 X28-1390-**	VR2	Adjust VR1 (VR2) so that the output of −6 dBs is obtained.
3.	**Record current**	Ⓓ 1 kHz −10 dBs	ditto	Ⓑ UD-XL1 REC DOLBY: OFF INPUT: LINE IN TAPE SEL: NORMAL Adjust the RECORD volume control so that the monitor output becomes −6 dBs and perform recording then playback.	VR3 X28-1390-**	VR4	Adjust VR3 (VR4) so that the playback output becomes −6 dBs. The output increases as the VRs are turned clockwise. **Note:** Adjusting methodⒺ. If an output of −6 dBs cannot be obtained connect an AC voltmeter to the junction between C63 and R65 (C64 and R66). For example, when the playback output of −3.8 dBs is obtained, read the reading of the AC voltmeter with this connection during recording. Then, adjust VR3 (VR4) so that the reading of the AC voltmeter reduces by 1.2 dB. Now, the playback output is set to −6 dBs.
4.	**Bias current**	Ⓓ 1 kHz −30 dBs 10 kHz −30 dBs	ditto	Record 1 kHz and 10 kHz consecutively with the same setting as in Step 5.	VR7 X28-1390-**	VR8	Adjust VRs so that the playback output level at 10 kHz is equal to that at 1 kHz. The bias current increases and the output level at 10 kHz drops as the VRs are turned clockwise. If the VRs are turned too much, perform Step 3, then Step 4 again.
5.	**Peak level meter**	Ⓓ 1 kHz, −10 dBs	ditto	PAUSE: ON with other setting the same as in Step 3.	VR5 X28-1390-**	VR6	Adjust to 0 VU.

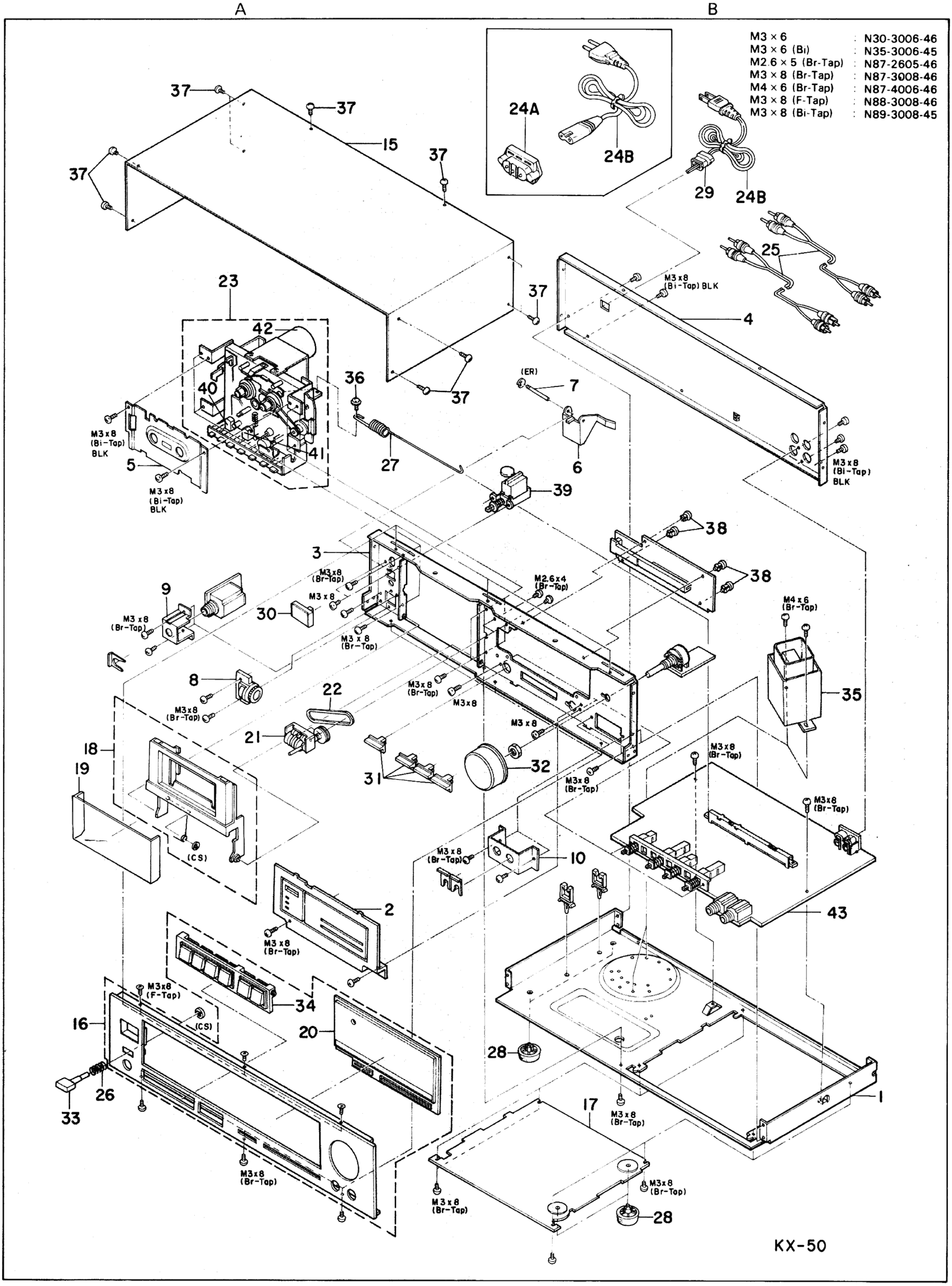
For measurements, refer to the KX-600 service manual with few modifications shown in the following.

Item	Column	For KX-50
1. Playback level (LINE OUT)	Standard and remarks	−6 dBs ±1.5 dB
9. Erase ratio	Input signal	125 Hz, −4 dBs
11. Crosstalk between tracks	Input signal	125 Hz, −10 dBs
12. Bias leak	Standard and remarks METAL	−40 dBs max.
14. Peak LED lighting level	All	Delete

ADJUSTMENT

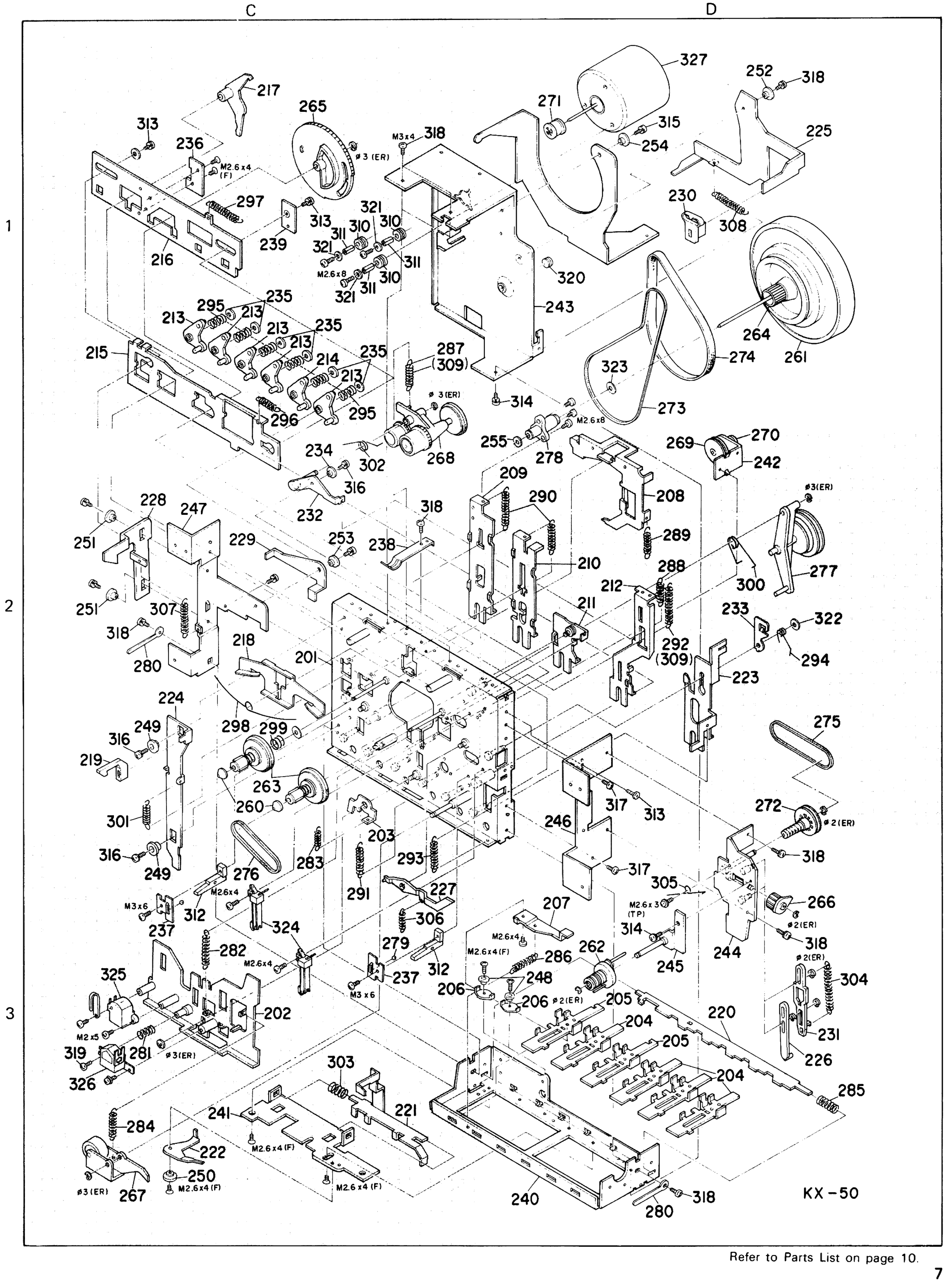
A
AC VOLTMETER
OSCILLOSCOPE
B
C
FREQUENCY COUNTER
D
AC VOLTMETER
AG
AC VOLTMETER
FREQUENCY COUNTER
E
AC VOLTMETER
OSCILLOSCOPE
OUT
IN
GND
VR2
C104
VR8
VR7
VR1
VR4
C64
R65
R66
VR5
VR6
C63
J63
GND

EXPLODED VIEW (UNIT)



Refer to Parts List on page 10.

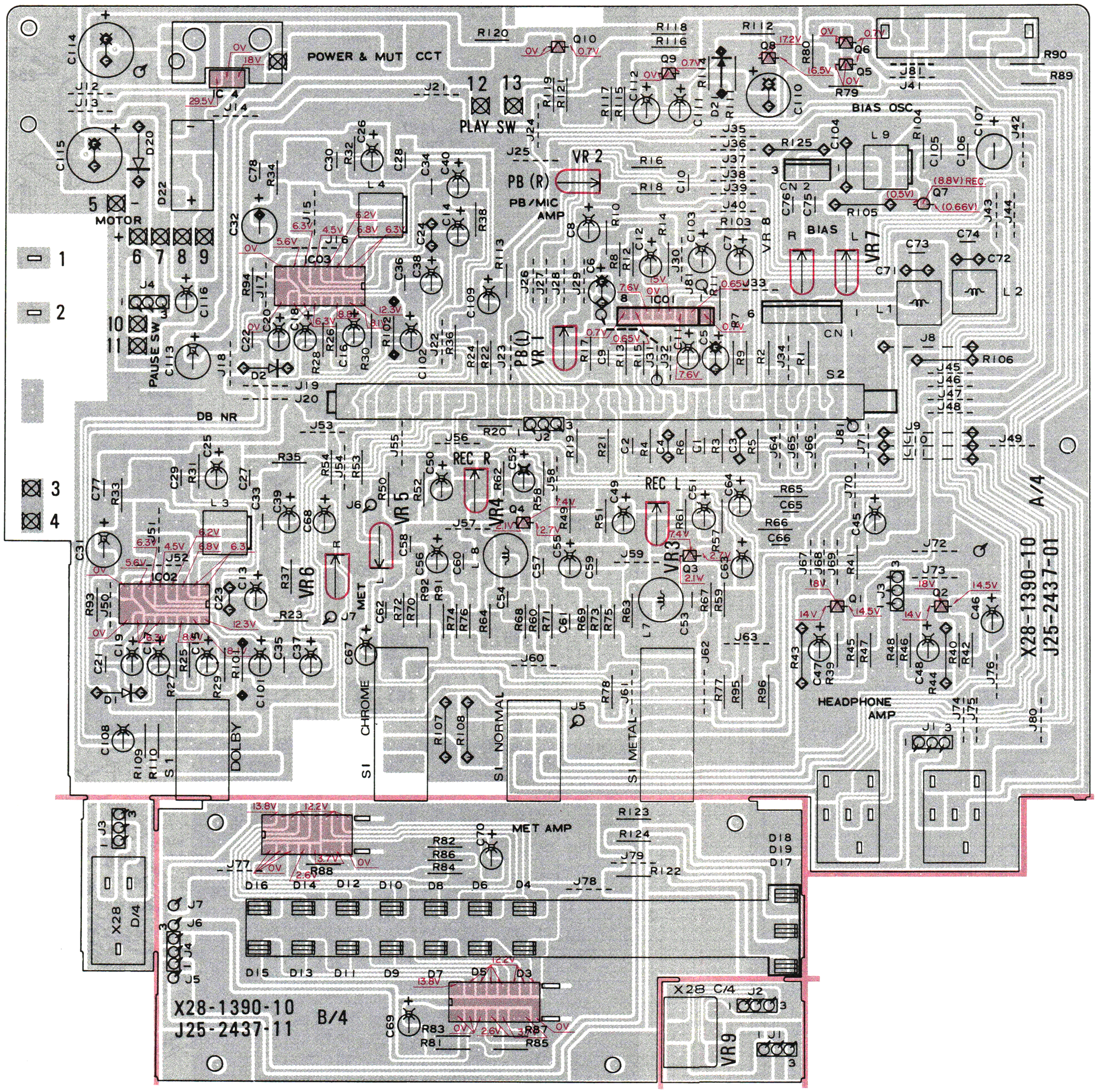
EXPLODED VIEW (MECHANISM)



Refer to Parts List on page 10.

PC BOARD

AMPLIFIER (X28-1390-**) Component Side View



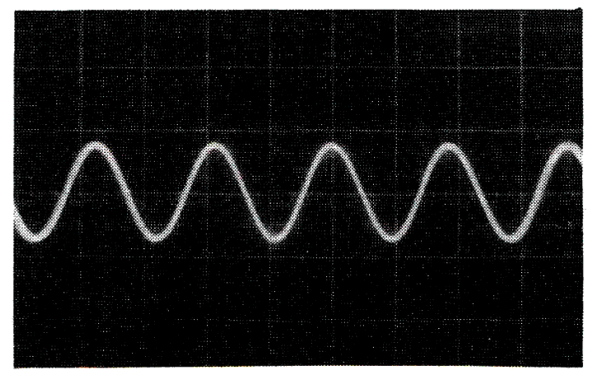
IC1	: MB3106M
IC2,3	: NE646B
IC4	: μPC78M18H
IC5,6	: AN6878
Q1～6,9,10	: 2SC945(A)(Q,P,K) or 2SC2320(E,F) or 2SC1740(Q,R) or 2SC828(Q,R,S)
Q7	: 2SC2060Q(P,Q,R)
Q8	: 2SA733(A)(Q,P,K) or 2SA999(E,F) or 2SA564A(Q,R,S)
D1,2,21	: 1S2076 or 1S1555 or 1S2473 or 1SS53
D3～10,18	: SLP-251B (GRN)
D11～17,19	: SLP-151B (RED)
D20	: W06B or ERB01-12R
D22	: SIRBA10 (4001)

KENWOOD

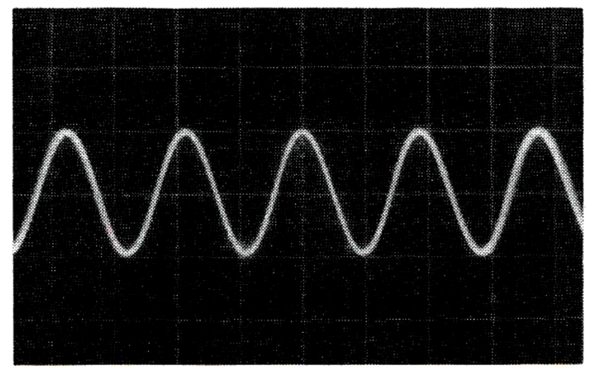
STEREO CASSETTE DECK

KX-50

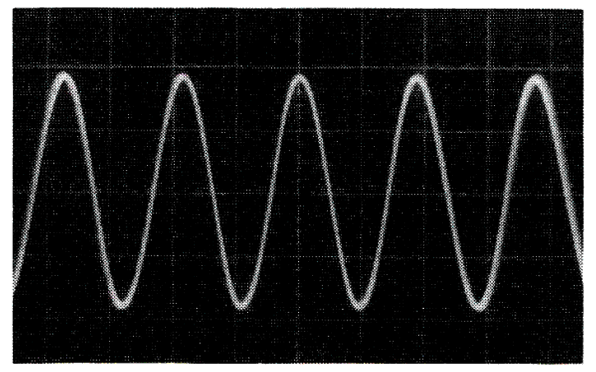
Waveforms of Bias Oscillator (Terminal 6 of L9)



Normal: 5μs/cm
100 V/cm



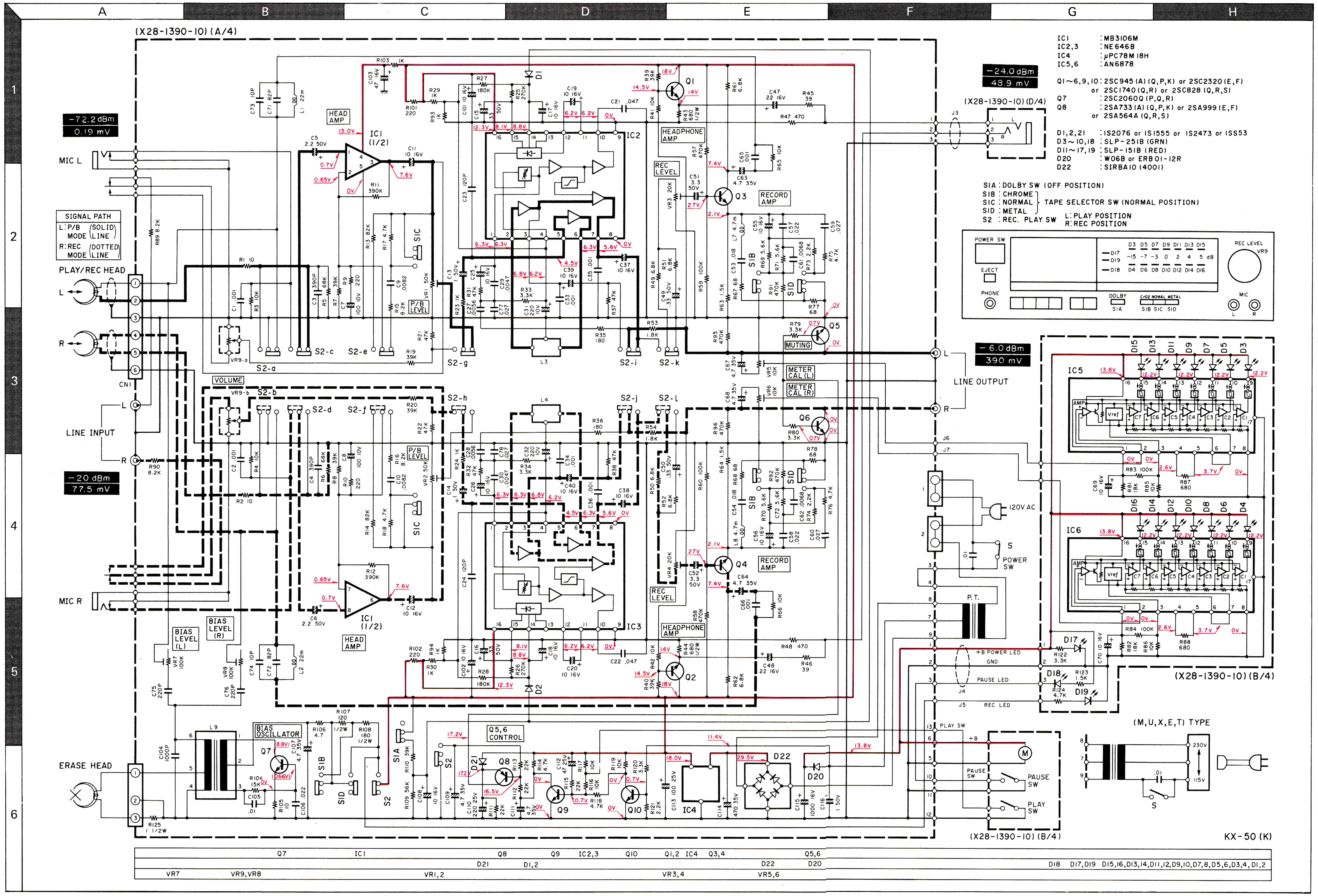
CrO_2: 5μs/cm
100 V/cm

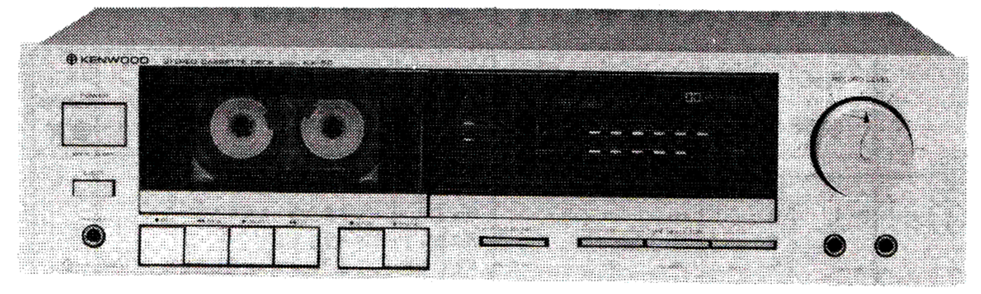


Metal: 5μs/cm
100V/cm

Semiconductor Substitutions

Name	Substitutions
NE646B	NE645
μPC78M18H	LM78M18, μPA78M18
2SC945(A)(Q,P,K)	2SC2320(E,F), 2SC1740(Q,R), 2SC828(Q,R,S)
2SA733(A)(Q,P,K)	2SA999(E,F), 2SA564A(Q,R,S)
1S2076	1S1555, 1S2473, 1SS53
W06B	ERB01-12R, V03C





SPECIFICATIONS

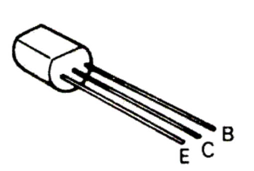
Type	Front Loading Stereo Cassette Deck with Dolby NR System
Track System	4-Track, 2-Channel Stereo/Mono, Recording/Playback
Recording System	AC Bias System (Bias Frequency: 105 kHz)
Erasing System	AC System
Tape Speed	4.76 cm/sec (1-7/8 ips)
Heads	Record and Playback Head × 1 (Hard Permalloy) Erase Head × 1 (Ferrite)
Motor	Electronically Controlled DC Motor
Fast Winding Time	Approx. 105 seconds with C-60 tape
Frequency Response:	
Normal Tape	20 Hz to 16,000 Hz (35 Hz to 15,000 Hz, ±3 dB)
CrO_2 Tape	20 Hz to 16,000 Hz (35 Hz to 15,000 Hz, ±3 dB)
Metal Tape	20 Hz to 16,000 Hz (35 Hz to 15,000 Hz, ±3 dB)
Signal to Noise Ratio:	
Dolby NR ON (Over 5 kHz)	67 dB (Normal and CrO_2 Tape), 68 dB (Metal Tape)
Dolby NR OFF	57 dB (Normal and CrO_2 Tape), 58 dB (Metal Tape)
Harmonic Distortion	Less than 1.0% (at 1 kHz, 0 VU with Metal Tape)
Wow and Flutter	0.05% (W.R.M.S.)
Input Sensitivity/Impedance:	
LINE × 2	77.5 mV/50 kohms
Microphones × 2	0.19 mV/10 kohms
Output Level/Load Impedance:	
LINE × 2	390 mV/100 kohms
Headphones × 1	48.9 mV/8 or 16 ohms
Built-in Features	Dolby Noise Reduction System Three Position Tape Selector (Normal/CrO_2/Metal) 7-LED Peak Level Meters (−15 dB to +5 dB) Full Auto Shut Off Mechanism in all Modes LED Recording, Pause and Power Indicators Timer Standby Mechanism Three Digit Tape Counter Two Microphone Jacks, Headphone Jack
Power Requirements	AC 120V, 60 Hz: U.S.A. and Canada Models AC 120V/220-240V (Switchable), 50/60 Hz: Other Countries
Power Consumption	13.0 watts
Dimensions	W: 440 mm (17-5/16") H: 119 mm (4-11/16") D: 237 mm (9-5/16")
Weight	4.5 kg (9.9 lbs.)
Supplied Accessories	Audio Connection Cables × 2 Head Cleaning Set × 1
Reference Tapes	Normal: MAXELL XLI C-60 CrO_2: TDK SA C-60 Metal: TDK MA-R C-60

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

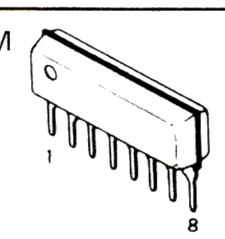
Kenwood poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

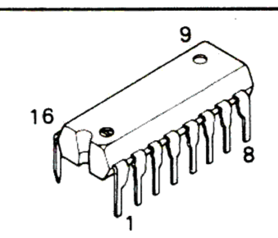
2SC945 2SC2060
2SC2320 2SA733(a)
2SC1740 2SA999
2SC828 2SA564A



MB3106M

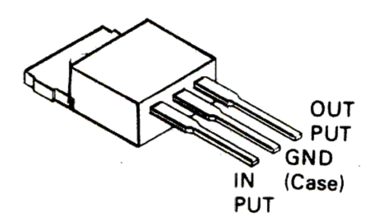


NE646B
NE645

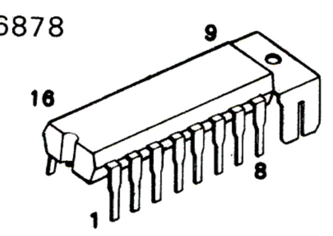


μPC78M18H
LM78M18
μPA78M18

μPC78M18H
LM78M18
μPA78M18



AN6878



DC voltages are measured by a VOM with 25 kΩ/V input impedance.

INSTRUCTION FOR PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
1 3A	-	MAIN CHASSIS ASS'Y	
2 2A	-	FRONT CHASSIS	
3 2A	-	FLUOR DISPLAY HOLDER	
4 1A,1B	-	FRONT PANEL	
5 1A	A20-1666-08	FRONT PANEL ASS'Y	*K
PS3	S42-3201-08	PUSH SW.(SELECTOR) 111	*
RS1	S01-1204-08	ROTARY SW.(FUNC.) 105	*
RL1	S51-2204-08	RELAY FIG.104	*M

① Exploded view drawing No.
② Position in exploded view.
③ Symbol of new parts
④ Area to which parts are shipped. Example: A20-1390-13 is the part No. of FRONT PANEL ASS'Y for the "K" type products (for U.S.A.). When this column is blank, it means that the same type of parts (same parts No.) are used for the products shipped to all areas.
⑤ Reference No. in schematic diagram.
⑥ Abbreviation of "ceramic capacitor"
All capacitors and resistors are listed using abbreviations.
Abbreviations

* Abbreviations of capacitors (Parts No. with initial letter "C").

ELECTRO .... Electrolytic capacitor
LL-ELEC .... Low leak electrolytic capacitor
NP-ELEC .... Non-pole electrolytic capacitor
MICA .... Mica capacitor
POLYSTY .... Polystyrene capacitor
MYLAR .... Mylar capacitor
CERAMIC .... Ceramic capacitor
TANTAL .... Tantalum capacitor
MF .... Metallized film capacitor
MP .... Metallized paper capacitor
OIL .... Oil capacitor

The unit "UF" is used in lieu of "μF"

* Abbreviations of resistors (Parts No. with initial letters "R").

RC .... Carbon composition resistor
RD .... Carbon film resistor
FL-PROOF RD .... Flame-proof carbon film resistor
RW .... Wire wound power resistor
FL-PROOF RS .... Flame-proof metal oxide film resistor
RN .... Metal film resistor
FUSE-RESIST .... Resistor with fuse function
2B .... Rated wattage 1/8W
2E .... Rated wattage 1/4W
2H .... Rated wattage 1/2W
3A .... Rated wattage 1W
3D .... Rated wattage 2W
3F .... Rated wattage 3W
3G .... Rated wattage 4W
3H .... Rated wattage 5W

All resistor values are indicated with the unit (Ω) omitted.

* Abbreviations common to capacitors and resistors.

C .... ±0.25pF (Used for capacitors only)
D .... ±0.5pF (Used for capacitors only)
F .... ±1%
G .... ±2%
J .... ±5%
K .... ±10%
M .... ±20%
Z .... +80%, −20%(Used for capacitors only)
P .... +100%, −0%(Used for capacitors only)

Resistors RD (carbon composition resistors) are not listed in the parts list. For values, refer to the schematic diagram.

PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
KX-50 UNIT			
1 3B	-	MAIN CHASSIS	
2 3A	-	DRESSING PANEL	
3 2A	-	SUB PANEL	
4 1B	-	REAR PANEL	
5 2A	-	DRESSING PLATE	
6 2B	-	EJECT LEVER	
7 1B	-	SHAFT	
8 2A	-	DAMPER	
9 2A	-	MOUNT HARDWARE(PHONE)	
10 3B	-	MOUNT HARDWARE(MIC)	
15 1A	A01-0619-02	METALLIC CABINET	*
16 3A	A20-2028-03	FRONT PANEL ASSY	*K
16 3A	A20-2028-03	FRONT PANEL ASSY	PU
16 3A	A20-2028-03	FRONT PANEL ASSY	MX
16 3A	A20-2029-03	FRONT PANEL ASSY	*T
16 3A	A20-2030-03	FRONT PANEL ASSY	*E
17 3B	A40-0556-03	BOTTOM PLATE	*
18 2A	A53-0239-02	CASSETTE HOLDER ASSY	*
-	B46-0055-30	WARRANTY CARD	P
-	B46-0060-00	WARRANTY CARD	T
-	B46-0061-30	WARRANTY CARD	K
-	B46-0062-30	WARRANTY CARD	U
-	B46-0063-13	WARRANTY CARD	U
-	B46-0064-20	WARRANTY CARD	X
-	B50-2457-00	INSTRUCTION MANUAL	*
-	B50-2458-00	INSTRUCTION MANUAL	*K
-	B50-2458-00	INSTRUCTION MANUAL	U
-	B50-2459-00	INSTRUCTION MANUAL	*P
-	B50-2459-00	INSTRUCTION MANUAL	MX
-	B50-2460-00	INSTRUCTION MANUAL	*M
-	B50-2461-00	INSTRUCTION MANUAL	*E
-	B50-2462-00	INSTRUCTION MANUAL	*T
-	B59-0018-00	SERVICE STATIONS'LIST	*U
19 2A	B10-0523-03	CASSETTE DOOR GLASS	*
20 3A	B10-0526-03	FRONT GLASS ASSY	*
21 2A	B35-0213-05	COUNTER	*
22 2A	D16-0226-04	BELT	
23 1A	D40-0519-05	MECHANISM ASSY	*
24A 1B	E03-0102-05	3P INLET	UM
24A 1B	E03-0102-05	3P INLET	XE
24A 1B	E03-0102-05	3P INLET	T
24B 1B	E30-0181-05	POWER CORD	KP
24B 1B	E30-1305-15	POWER CORD	UM
24B 1B	E30-1328-05	POWER CORD	T
24B 1B	E30-1329-05	POWER CORD	E
24B 1B	E30-1342-05	POWER CORD	X
25 1B	E30-0505-05	AUDIO CORD	*
26 3A	G01-1080-04	COILED SPRING(EJECT)	
27 2A	G01-1082-04	SPRING(REC/PLAY SW.)	
-	H01-2471-04	CARTON BOX	*K
-	H01-2471-04	CARTON BOX	PU
-	H01-2471-04	CARTON BOX	MX
-	H01-2471-04	CARTON BOX	E
-	H01-2474-04	CARTON BOX	*T
-	H10-2296-02	POLYSTYRENE FIXTURE	*
-	H20-1107-04	COVER	*K
-	H20-1107-04	COVER	PU
-	H20-1107-04	COVER	XE
-	H20-1107-04	COVER	T

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
-	H20-1109-04	COVER	*M
-	H25-0078-04	BAG	
28 3B	J02-0343-05	FOOT X4	
29 1B	J42-0083-05	BUSHING(POWER CORD)	*K
29 1B	J42-0083-05	BUSHING(POWER CORD)	P
30 2A	K27-0199-04	PUSH BUTTON(POWER)	*
31 2A	K27-0337-04	PUSH BUTTON(DOLBY,SEL)	*
32 2B	K29-0385-04	KNOB(REC LEVEL)	*
33 3A	K29-0931-04	PUSH BUTTON(EJECT)	*
34 3A	K29-0935-13	PUSH BUTTON ASSY	*
35 2B	L01-6411-05	POWER TRANSFORMER	*K
35 2B	L01-6411-05	POWER TRANSFORMER	P
35 2B	L01-6414-15	POWER TRANSFORMER	*U
35 2B	L01-6414-15	POWER TRANSFORMER	MX
35 2B	L01-6444-05	POWER TRANSFORMER	ET
36 1A	N09-0287-05	SCREW M3X8	*
37 1A,1B	N09-0373-05	SCREW M3X6(BI-TAP)SLV	*
38 2B	N29-0035-05	PUSH RIVET(LED)	
39 2B	S40-1035-05	PUSH SWITCH(POWER)	*K
39 2B	S40-1035-05	PUSH SWITCH(POWER)	P
39 2B	S40-1037-05	PUSH SWITCH(POWER)	*U
39 2B	S40-1037-05	PUSH SWITCH(POWER)	MX
39 2B	S40-1037-05	PUSH SWITCH(POWER)	ET
40 1A	T32-0010-05	ERASE HEAD	*
41 2A	T34-0016-05	REC/PLAYBACK HEAD	*
42 1A	T42-0108-05	DC MOTOR	*
-	W01-0301-05	HEAD CLEANING SWAB	
43 2B,3B	X28-1390-10	AMPLIFIER PC BOARD ASSY	*K
43 2B,3B	X28-1390-10	AMPLIFIER PC BOARD ASSY	P
43 2B,3B	X28-1390-81	AMPLIFIER PC BOARD ASSY	*U
43 2B,3B	X28-1390-81	AMPLIFIER PC BOARD ASSY	MX
43 2B,3B	X28-1390-81	AMPLIFIER PC BOARD ASSY	ET
AMPLIFIER (X28-1390-)**			
D3 -10	B30-0275-05	LED(GREEN)	
D11 -17	B30-0274-05	LED(RED)	
D18	B30-0275-05	LED(GREEN)	
D19	B30-0274-05	LED(RED)	
C1 ,2	C45-1710-25	MYLAR 0.001UF J	
C2 ,4	C52-1739-16	CERAMIC 390PF K	
C5 ,6	C25-6522-57	LL-ELEC 2.2UF 35WV	
C7 ,8	C24-1010-79	ELECTRO 100UF 10WV	
C9 ,10	C45-1782-25	MYLAR 0.0082UF J	
C11 ,12	C24-1210-69	ELECTRO 10UF 16WV	
C13 ,14	C26-1710-57	NP-ELEC 1UF 50WV	
C15 ,16	C25-1733-47	LL-ELEC 0.33UF 50WV	
C17 ,18	C25-1710-47	LL-ELEC 0.1UF 50WV	
C19 ,20	C24-1210-69	ELECTRO 10UF 16WV	
C21 ,22	C45-1747-35	MYLAR 0.047UF J	
C23 ,24	C65-1712-15	CERAMIC 120PF J	
C25 ,26	C24-1210-69	ELECTRO 10UF 16WV	
C27 ,28	C45-1756-25	MYLAR 0.0056UF J	
C29 ,30	C45-1747-25	MYLAR 0.0047UF J	
C31 ,32	C24-1022-71	ELECTRO 220UF 10WV	
C33 -36	C45-1710-25	MYLAR 0.001UF J	
C37 -40	C24-1210-69	ELECTRO 10UF 16WV	
C45 ,46	C24-1210-69	ELECTRO 10UF 16WV	
C47 ,48	C24-1222-61	ELECTRO 22UF 16WV	
C49 ,50	C25-1733-47	LL-ELEC 0.33UF 50WV	
C51 ,52	C25-1733-57	LL-ELEC 3.3UF 50WV	
C53 ,54	C45-1718-35	MYLAR 0.018UF J	

PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
C55 ,56	C24-1210-69	ELECTRO 10UF 16WV	
C57 ,58	C45-1722-35	MYLAR 0,022UF J	
C59 ,60	C45-1727-35	MYLAR 0,027UF J	
C61 ,62	C45-1768-25	MYLAR 0,0068UF J	
C63 ,64	C24-6547-57	ELECTRO 4,7UF 35WV	
C65 ,66	C45-1710-25	MYLAR 0,001UF J	
C67 ,68	C24-6547-57	ELECTRO 4,7UF 35WV	
C69 ,70	C24-1210-69	ELECTRO 10UF 16WV	
C71 ,72	C71-1782-05	CERAMIC 82PF J	
C73 ,74	C71-1710-02	CERAMIC 10PF D	
C75 ,76	C71-1722-15	CERAMIC 220PF J	
C77 ,78	C45-1727-35	MYLAR 0,027UF J	
C101,102	C24-1210-69	ELECTRO 10UF 16WV	
C103	C24-1247-61	ELECTRO 47UF 16WV	
C104	C91-0343-05	MYLAR 0,001UF 630WV	*
C105	C45-1710-35	MYLAR 0,01UF J	
C106	C45-1722-35	MYLAR 0,022UF J	
C107	C24-6547-57	ELECTRO 4,7UF 35WV	
C108	C24-1210-69	ELECTRO 10UF 16WV	
C109	C24-6547-57	ELECTRO 4,7UF 35WV	
C110	C24-1422-71	ELECTRO 220UF 25WV	
C111	C24-6547-57	ELECTRO 4,7UF 35WV	
C112	C24-1447-61	ELECTRO 47UF 25WV	
C113	C24-1410-71	ELECTRO 100UF 25WV	
C114	C24-6547-71	ELECTRO 470UF 35WV	
C114	C24-6547-71	ELECTRO 470UF 35WV	
C115	C24-1210-81	ELECTRO 1000UF 16WV	
C116	C26-1710-57	NP-ELEC 1UF 50WV	
101 3B	E11-0320-05	PHONE JACK(MICROPHONES)	*
102 2A	E11-0321-05	PHONE JACK(HEADPHONE)	*
103 2B	E13-0432-05	PHONO JACK	
L1 ,2	L40-2235-21	INDUCTOR 22MH	
L3 ,4	L79-0312-05	FILTER (DOLBY)	*
L7 ,8	L40-4725-21	INDUCTOR 4,7MH	
L9	L32-0513-05	OSCILLATING COIL	
R43 ,44	R43-1368-15	FL-PROOF RD680 J 2H	
R101,102	R43-1322-15	FL-PROOF RD220 J 2H	
R105	R43-1310-05	FL-PROOF RD10 J 2H	
R106	R92-0514-05	FUSE RESIST4,7 2E	
R107	R43-1312-15	FL-PROOF RD120 J 2H	
R108	R43-1318-15	FL-PROOF RD180 J 2H	
R125	R43-1301-05	FL-PROOF RD1 J 2H	
VR1 ,2	R12-4302-05	TRIMMING POT,(50KB)	
VR3 ,4	R12-3301-05	TRIMMING POT,(20KB)	
VR5 ,6	R12-3302-05	TRIMMING POT,(10KB)	
VR7 ,8	R12-5302-05	TRIMMING POT,(100KB)	
VR9	R06-5302-05	POTENTIOMETER(100KAX2)	
S1	S42-4305-05	PUSH SWITCH(DOLBY,SEL)	*
S2	S31-0310-05	SLIDE SWITCH(REC/PLAY)	*
D1 ,2	V11-0076-05	1S1555	
D1 ,2	V11-0271-05	1S2076	
D1 ,2	V11-1200-80	1SS53	
D1 ,2	V11-7700-30	1S2473	
D20	V11-0295-05	W06B	
D20	V11-7100-60	ERB12-01R	
D21	V11-0076-05	1S1555	
D21	V11-0271-05	1S2076	
D21	V11-1200-80	1SS53	
D21	V11-7700-30	1S2473	
D22	V11-1301-50	SIRBA10F(4001)	

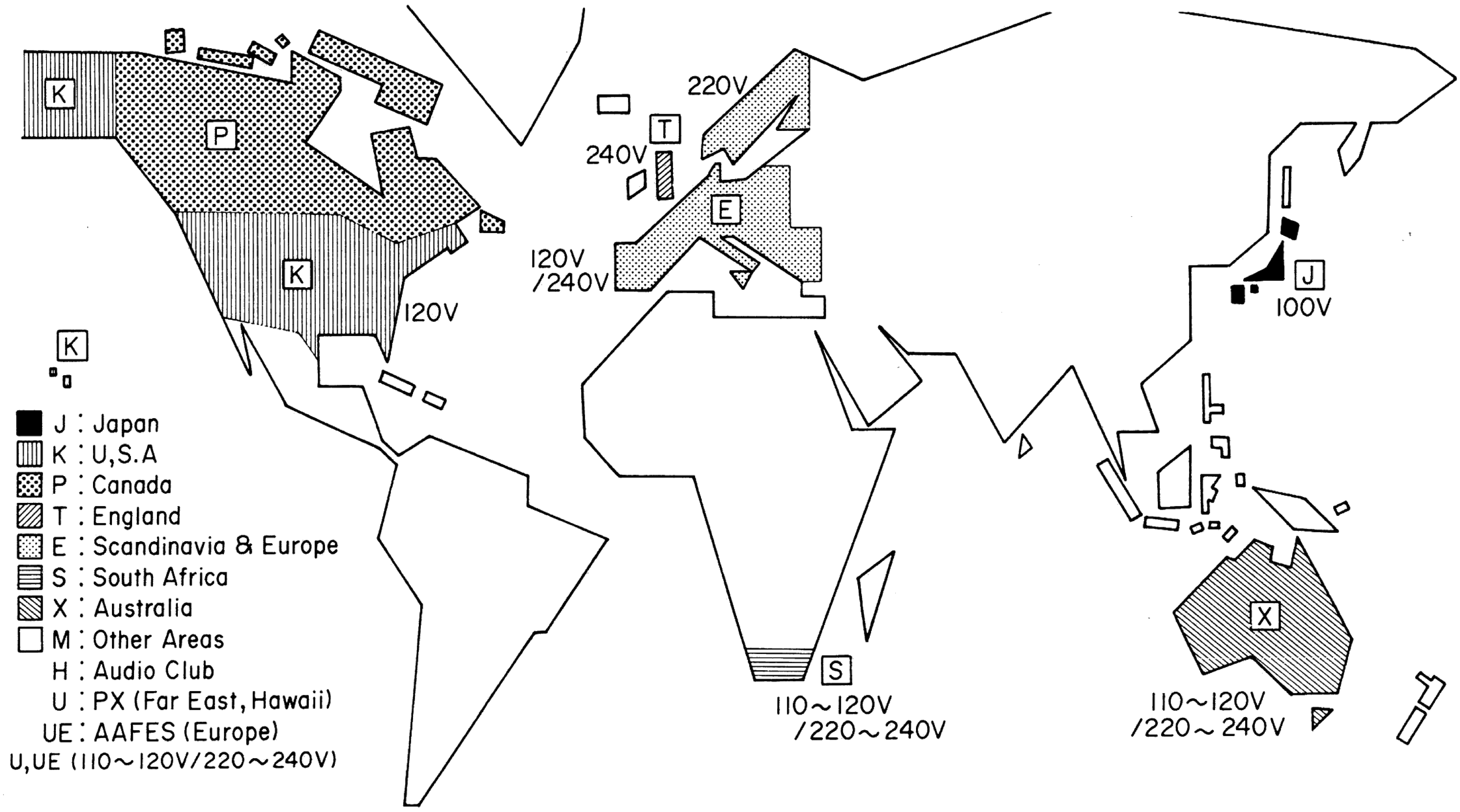
Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
IC1	V30-0495-10	MB3106	
IC2 ,3	V30-0316-20	NE646B	
IC4	V30-0558-10	UPC78M18H	
IC5 ,6	V30-0559-10	AN6878	
Q1 -6	V03-0828-60	2SC828(Q,R,S)	
Q1 -6	V03-0945-40	2SC945(Q,P,K)	
Q1 -6	V03-1740-30	2SC1740(Q,R)	
Q1 -6	V03-2320-10	2SC2320(E,F)	
Q7	V03-2060-10	2SC2060(Q,R)	
Q8	V01-0564-30	2SA564(Q,R,,S)	
Q8	V01-0733-40	2SA733A(Q,R,K)	
Q8	V01-0999-10	2SA999(E,F)	
Q9 ,10	V03-0828-60	2SC828(Q,R,S)	
Q9 ,10	V03-0945-40	2SC945(Q,P,K)	
Q9 ,10	V03-1740-30	2SC1740(Q,R)	
Q9 ,10	V03-2320-10	2SC2320(E,F)	
MECHANISM ASSY (D40-0519-05)			
201 2C	-	CHASSIS	
202 3C	-	HEAD PANEL	
203 2C	-	PREVENTION LEVER	
204 3D	-	PUSH BUTTON LEVER 3C	
205 3D	-	PUSH BUTTON LEVER 3G	
206 3D	-	PREVENTION PLATE X2	
207 3D	-	INTERCONNECTION LEVER	
208 2D	-	SWITCH ARM	
209 2D	-	REC ARM	
210 2D	-	REW ARM	
211 2D	-	PLAY ARM	
212 2D	-	FF ARM	
213 1C	-	OPERATION LEVER	
214 1C	-	OPERATION LEVER(STOP)	
215 1C	-	LOCK PLATE	
216 1C	-	DRIVE ARM	
217 1C	-	TRIGGER LEVER	
218 2C	-	BRAKE ARM	
219 2C	-	REC SENSOR	
220 3D	-	TRIGGER OPERATION PLATE	
221 3C	-	TIMER LOCK LEVER	
222 3C	-	TIMER STOP LEVER	
223 2D	-	PAUSE ARM	
224 2C	-	REC SENSOR ARM	
225 1D	-	STOP RELEASE LEVER	
226 3D	-	CAM ARM	
227 3C	-	DETECTION LEVER	
228 2C	-	CASE LOCK LEVER	
229 2C	-	STOP LEVER	
230 1D	-	CAM ARM RETAINER	
231 3D	-	AUTO CAM	
232 2C	-	RF LEVER	
233 2D	-	PAUSE CAM	
234 2C	-	RF LEVER METAL	
235 1C	-	LEVER SPRING STOPPER	
236 1C	-	CAM RETAINER	
237 3C	-	PANEL HOLDER	
238 2C	-	CASSETTE HOLDER SPRING	
239 1C	-	DRIVE ARM SUB PLATE	
240 3D	-	FRAME	
241 3C	-	LOCK LEVER HOLDER	
242 2D	-	INTERMEDIATE PUL HOLDER	
243 1D	-	FLYWHEEL HOLDER	
244 3D	-	AUTO PLATE HOLDER	
245 3D	-	INTERMEDIATE PUL HOLDER	

PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
246 2D	-	SIDE HARDWARE (R)	
247 2C	-	SIDE HARDWARE (L)	
248 3D	-	PREVENTION PLATE COLLAR	
249 2C,3C	-	REC SENSOR ARM COLLAR	
250 3C	-	TIMER LEVER METAL	
251 2C	-	STOP BUTTON COLLAR	
252 1D	-	STOP BTN LEVER COLLAR	
253 2C	-	PAUSE SW COLLAR	
254 1D	-	REC ARM COLLAR	
255 2D	-	OIL STOPPER WASHER	
260 2C	B09-0220-08	REEL CAP	
261 1D	D01-0308-08	FLYWHEEL	
262 3D	D01-0310-08	DETECTION WHEEL ASSY	
263 2C	D03-0021-08	REEL DISK ASSY	
264 1D	D13-0215-08	CAPSTAN GEAR	
265 1C	D13-0220-08	DRIVE GEAR	
266 3D	D13-0221-08	WORM WHEEL	
267 3C	D14-0229-08	PINCH ROLLER SUB ASSY	
268 2C	D14-0243-08	RF ASSY	*
269 2D	D15-0525-08	INTERMEDIATE PULLEY 3A	
270 2D	D15-0541-08	INTERMEDIATE PULLEY 3C	
271 1D	D15-0542-08	MOTOR PULLEY	*
272 2D	D15-0543-08	WORM GEAR PULLEY	
273 1D	D16-0232-08	SQUARE BELT(PUL,FLYWHL)	
274 1D	D16-0243-08	FLAT BELT (MOT,FLYWHL)	
275 2D	D16-0244-08	SQUARE BELT(AUTO STOP)	
276 3C	D16-0245-08	SQUARE BELT(REEL DISC)	
277 2D	D19-0234-08	CLUTCH ASSY	
278 2D	D23-0530-08	RETAINER	
279 3C	D90-0102-08	STEEL BALL M2.0	
280 2C,3D	E23-0305-08	CORD LUG	
281 3C	G01-0682-08	REC/PLAY HEAD SPRING	
282 3C	G01-0792-08	HEAD PANEL SPRING	
283 3C	G01-0795-08	PREVENTION LEVER SPRING	
284 3C	G01-0796-08	PINCH ROLLER SPRING	
285 3D	G01-0797-08	TRIGGER OPEP PLATE SP	
286 3D	G01-0798-08	PUSH BTN LEVER SPRING	
287 1C	G01-0799-08	RF ARM SPRING	
288 2D	G01-0800-08	SPRING	
289 2D	G01-1001-08	SWITCH ARM SPRING	
290 2D	G01-1002-08	REC ARM SPRING 3A	
291 3C	G01-1004-08	PLAY ARM SPRING	
292 2D	G01-1005-08	FF ARM SPRING 3A	
293 3C	G01-1006-08	PAUSE ARM SPRING	
294 2D	G01-1008-08	PAUSE CAM SPRING	
295 1C	G01-1009-08	OPERATION LEVER SPRING	
296 1C	G01-1010-08	LOCK PLATE SPRING	
297 1C	G01-1011-08	DRIVE ARM SPRING	
298 2C	G01-1012-08	BRAKE ARM SPRING	
299 2C	G01-1013-08	REW REEL ASSY	
300 2D	G01-1014-08	CLUTCH ARM SPRING	
301 2C	G01-1016-08	REC ARM SPRING A	
302 2C	G01-1058-08	RF ARM SPRING	
303 3C	G01-1103-08	TIMER LOCK LEVER SPRING	
304 3D	G01-1105-05	AUTO CAM SPRING	
305 3D	G01-1106-08	PAUSE DETECTION SPRING	
306 3C	G01-1107-08	FF ARM SPRING 1A	
307 2C	G01-1108-08	AM AUTO LEVER SPRING	*
308 1D	G01-1123-08	REC SENSOR SPRING	

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名／規格	Re-marks 備考
309 1C,2D	G13-0434-08	CUSHION D	
310 1C	G13-0446-08	CUSHION E	
311 1C	J31-0429-08	COLLAR	
312 3C	J90-0311-08	CASSETTE GUIDE	
313 1C	N09-0202-08	SCREW M2.6X6	
314 1D,3D	N09-0203-08	SCREW M2.6X4	
315 1D	N09-0231-08	SCREW M3X5	
316 2C,3C	N09-0246-08	SCREW M2.6X6	
317 2D,3D	N09-0555-08	SCREW M3X4	
318 2C,3D	N09-0828-08	SCREW M3X5	
319 3C	N09-0830-08	SCREW M2X5 (HEAD)	
320 1D	N09-0899-08	ADJUST SCREW(FLYWHEEL)	
321 1C	N19-0551-08	FLAT WASHER (MPTOR)	
322 2D	N19-0573-08	WASHER	
323 1D	N19-0588-08	PLASTIC WASHER	
324 3C	S46-1319-08	LEAF SWITCH	
325 3C	T32-0010-05	ERASE HEAD	
326 3C	T34-0016-05	REC/PLAY HEAD	*
327 1D	T42-0108-05	DC MOTOR	

WORLD MAP & AREA CODE



Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

There is no plan for producing units of S type.

A product of

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1981-1 PRINTED IN JAPAN B51-0760-00(G) 2413