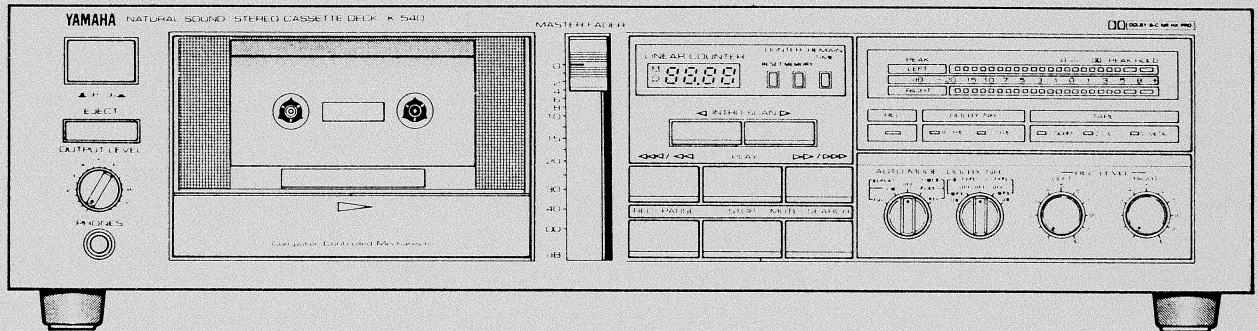


STEREO CASSETTE DECK K-540

SERVICE MANUAL



IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

CONTENTS

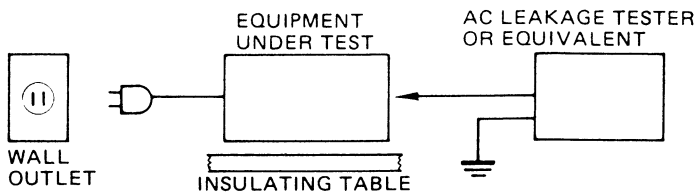
TO SERVICE PERSONNEL	1	TIMING CHART	11
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TO SERVICE PERSONNEL

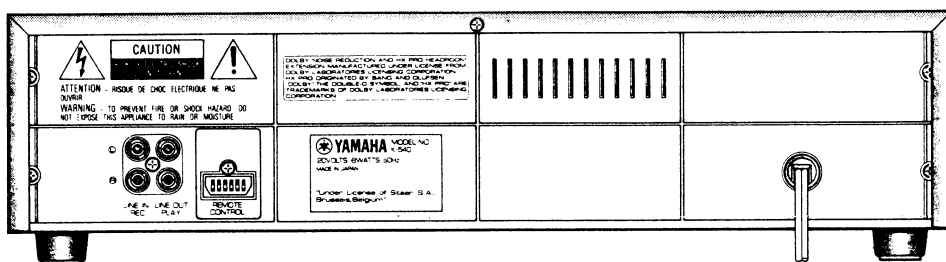
- Critical Components Information.**
Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
- Leakage Current Measurement (For 120V Model Only).**
When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.

 - Meter impedance should be equivalent to 1500 ohm shunted by 0.15μF.
 - Leakage current must not exceed 0.5mA.
 - Be sure to test for leakage with the AC plug in both polarities.

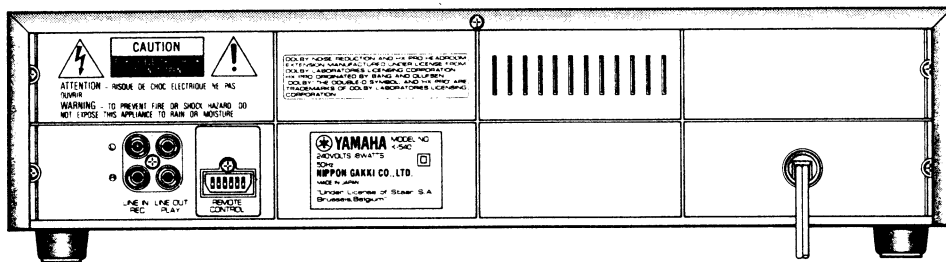


REAR PANELS

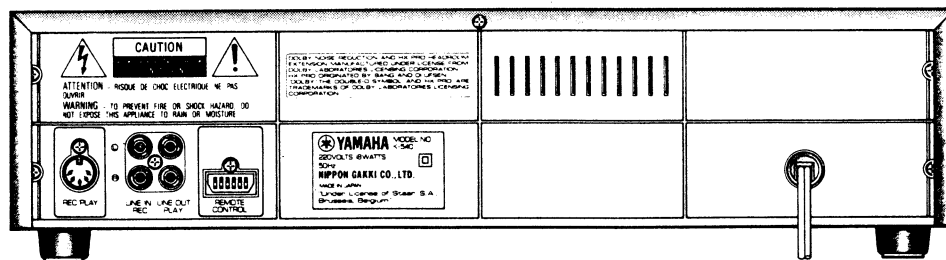
U.S.A. & Canadian models



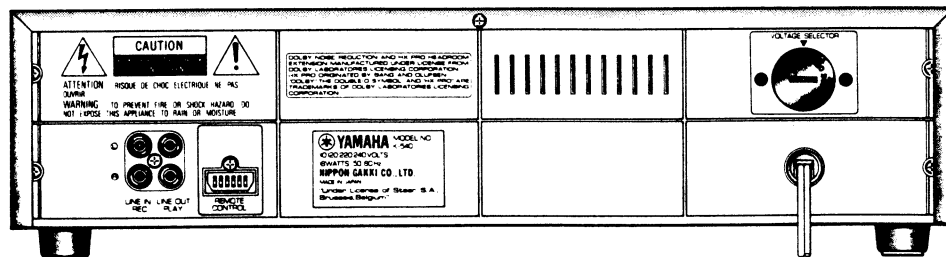
Australian & British models



European model



Other model



SPECIFICATIONS

Type	4-track, 2-channel recording and playback stereo cassette tape deck
Heads	
Rec/Play head	Sendust
Erase head	Dubble gap Ferrite
Motors	
Capstan	DC servo motor
Reel	Flat torque DC motor
Mecha drive	DC motor
Wow and Flutter	Less than $\pm 0.08\%$ W. Peak Less than 0.05% W. RMS
Fast winding time (C-60)	Approx. 70 seconds Approx. 45 seconds (High speed)
Frequency response	
Normal tape (-20dB)	25 to 17,000 Hz ± 3 dB
CrO ₂ tape (-20dB)	25 to 19,000 Hz ± 3 dB
Metal tape (-20dB)	25 to 20,000 Hz ± 3 dB
Signal to Noise ratio	
Dolby off	59 dB
Dolby B on	66 dB
Dolby C on	74 dB
Harmonic distortion	Less than 1%
Input Sensitivity/Impedance	
Line	60 mV/40 k-ohms

Output Level/Load Impedance

Line	360 mV/1.5 k-ohms
Headphones	1.2 mW/8 ohms

Bias Oscillation Frequency

105kHz

Power Supplies

U.S. & Canadian Models	120V AC, 60 Hz
European Model	220V AC, 50 Hz
British & Australian Models	240V AC, 50 Hz
Other Model	110/120/220/240V AC, 50/60 Hz

Power Consumption

18W

Dimensions (W x H x D)

435 x 112 x 273 mm
(17-1/8" x 4-7/16" x 10-3/4")

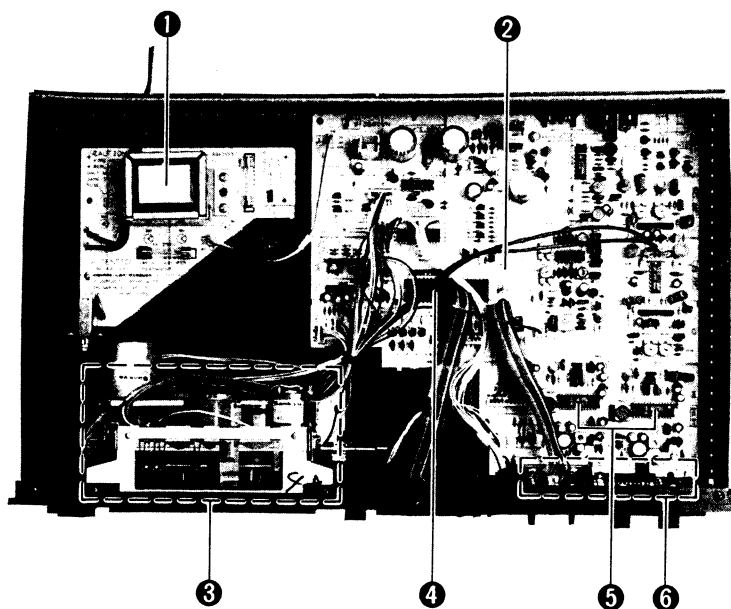
Weight

4.4 kg (9 lbs. 11 oz)

Specifications subject to change without notice.

- (U) U.S.A. model
 (C) Canadian model
 (A) Australian model
 (G) European model
 (B) British model
 (R) Other model

INTERNAL VIEW



- ① POWER TRANSFORMER
 U.S.A. & Canadian models: GA68710
 European model: GA68730
 Australian & British models: GA68740
 Other model: GA68721
- ② MAIN CIRCUIT BOARD
- ③ CASSETTE MECHANISM UNIT
- ④ μ -COM IC (IC106): LM6405G-1919
- ⑤ DOLBY IC (IC104, 105): AN7370K
- ⑥ METER UNIT

DISASSEMBLY PROCEDURES

1. Removal of Top Cover

Remove 5 screws (①) in Fig. 1.

2. Removal of Cassette Mechanism Unit

- Remove the Top Cover.
- Remove the Lid (②) in Fig. 1.
- Detach 6 connectors (# 1 ~ #5) in Fig. 1.
- Remove 6 screws (③) in Fig. 1 and then pull off the mechanism unit to the back side gently.

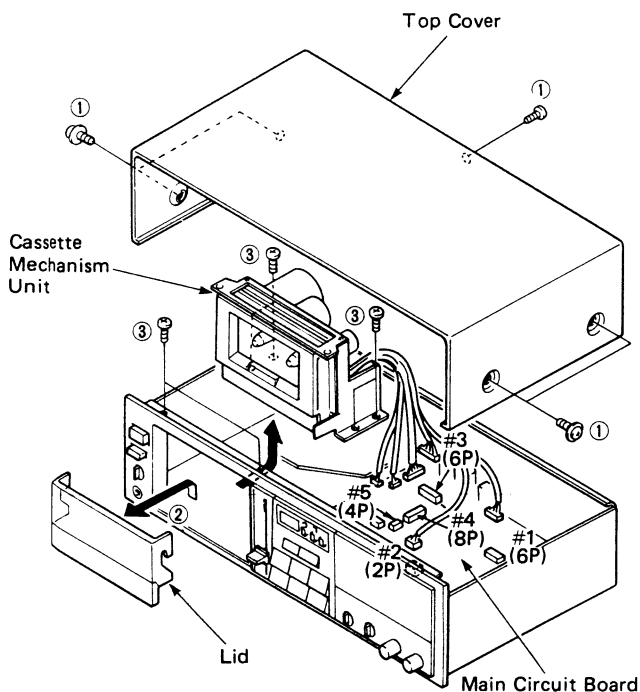


Fig. 1

3. Removal of Heads and Pinch Roller

- Remove 2 screws (④) in Fig. 2 and then remove the Recording/Playback Head.
- Remove 2 screws (⑤) in Fig. 2 and then remove the Erase Head.
- Remove the E ring (⑥) in Fig. 2.
- Detach the Pinch Roller by removing the spring of pinch roller frame.

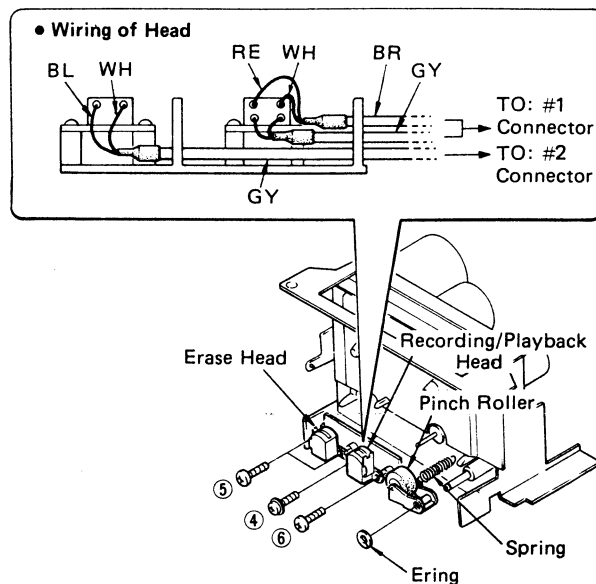


Fig. 2

4. Removal of Capstan Motor and Flywheel Belt

- Remove 3 screws (⑦) in Fig. 3 and then remove the back plate.
- Remove 2 screws (⑧) in Fig. 3 and then remove the Capstan Motor.

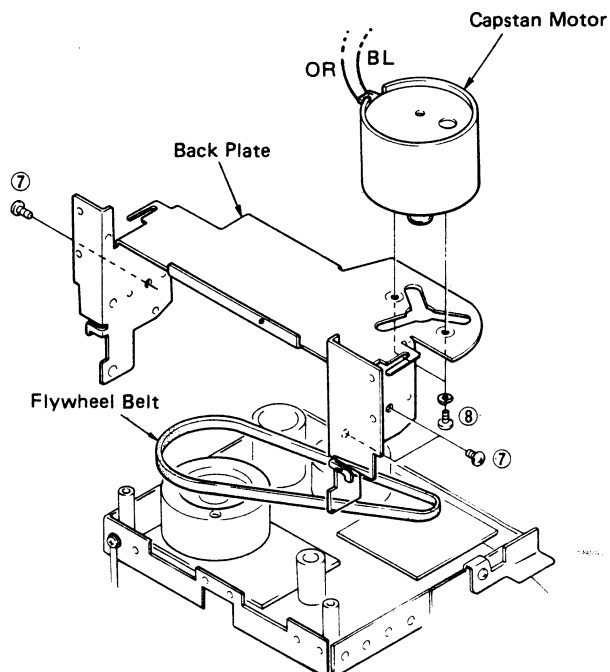


Fig. 3

ADJUSTMENTS

1. Before adjustment:

- Since head magnetization, dust accumulations, etc. are likely to introduce error in the various characteristics, it is very important that the heads are properly demagnetized and cleaned.

2. Instruments required

- Audio frequency oscillator (AF OSC)
- ACVM or dual channel ACVM
- Wow/flutter meter
- Oscilloscope
- Torque meter
 - TW-2111 (TX911580)
 - CT160L (TX911120)
- DCVM

3. Test tape required

- MTT-111N (TX911650)
- MTT-114N (TX911680)
- MTT-212CN (TX911670)
- MTT-212N (TX911660)
- MTT216C
- MTT316C
- Reference tape
 - Normal (LH): TDK AD-60 or TDK AC223 (TX911600)
 - CrO₂: TDK SA-60 or TDK AC512 (TX911610)
 - METAL: TDK MA-60 or TDK AC712 (TX911590)

"MECHANICAL ADJUSTMENT"

Step	Item to be Adjusted	Tape	Instrument required	Mode	Adjustment part	Rating	Remarks
1	Check each torque		Torque meter			Take-up torque: 25 ~ 60g·cm FF, REW torque: more than 70g·cm Back tension: 1.5 ~ 6g·cm	
2	Check FF and REW take up times	AC-512				Normal: 60 ~ 85 seconds High speed: Less than 60 seconds	
3	Check tape movement		Mirror cassette (MC-109C)	PLAY		Tape should move in the center of head smoothly.	
4	Azimuth	MTT-114N 10kHz, -10dB	ACVM Oscilloscope	PLAY	Azimuth adjustment screw. (Fig. A)	Playback output of L and R is maximum and phase difference should be minimum.	After the adjustment, make sure to apply screw lock paint.
5	Tape speed	MTT-111N 3kHz, -10dB	Wow/flutter meter or Frequency counter	PLAY	Semi fixed variable resistor at the back of the capstan motor. (Fig. B)	3000 ± 15Hz	*Perform adjustment at the center of the test tape length if possible.
6	Wow/flutter	MTT-111N 3kHz, -10dB	Wow/flutter meter	PLAY		Less than 0.065% (JIS W. RMS)	

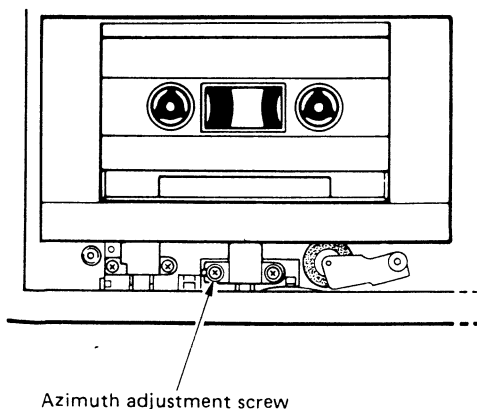


Fig. A

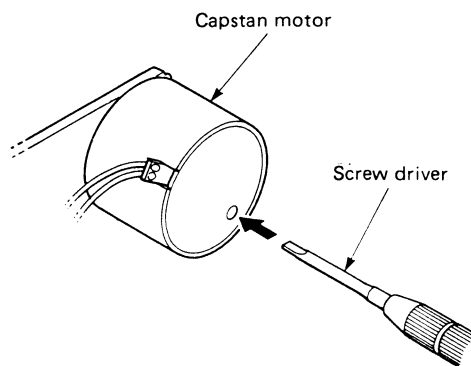


Fig. B

“ELECTRICAL ADJUSTMENT”

- Proceed with the following adjustment after having finished the mechanical adjustments.
- Proceed with the recording section adjustment after having finished the playback section adjustment.

< Playback section >

Step	Item to be Adjusted	Tape	Instrument required	Mode	Measurement conditions	Points of measurement	Adjustment parts	Rating
1	Playback level	MTT-212C 315Hz, 160nwb/m or MTT-212 315Hz, 250nwb/m	ACVM	PLAY		LINE OUT	VR103 (Lch) VR104 (Rch)	160nwb/m: 360mV ± 25mV 250nwb/m: 570mV ± 25mV
2	Confirmation of playback frequency response	Test tape for frequency check. 3180µs + 120µs (LH) (MTT-256) 3180µs + 70µs (CrO ₂) (MTT-356)	ACVM Oscilloscope	PLAY		LINE OUT		Check that the 10kHz playback level lies within 0 ± 3dB of the 315Hz playback level. (Fig. C)

• PLAYBACK FREQUENCY RESPONSE

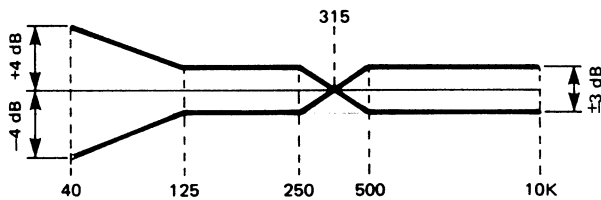


Fig. C

< Recording section >

Step	Item to be Adjusted	Tape	Instrument required	Mode	Measurement conditions	Points of measurement	Adjustment parts	Rating
1	Bias level HX PRO	AC-712 (METAL)	ACVM	REC/ PAUSE	VR107, 108 → MAX 	TP101 (Lch) TP102 (Rch)	L109 (Lch) L110 (Rch)	Set the Output levels to maximum Check the recording/playback frequency response of the metal tape. If the high frequency level is found low, adjust the frequency response by turning the cores of L109 and 110 clockwise.
2	Meter		ACVM AF OSC	REC/ PAUSE	Apply a 1kHz signal to LINE IN terminals. Set the REC LEVEL knob so that LINE OUT voltage is 360mV.	Peak level meter	Semi fixed variable resistor of Meter circuit board	Adjust the adjustment parts to the lowest level where the 0dB display part of the level meter light up.
3	Record level	AC-512 (CrO ₂)	ACVM AF OSC	REC PLAY	Apply a 315Hz signal to LINE IN terminals. Set the REC LEVEL knob so that LINE OUT voltage is 360mV.	LINE OUT	VR105 (Lch) VR106 (Rch)	Set the same level of the record and playback level PLAY BACK 360mV ± 25mV
4	Record bias (Total frequency response)	AC-512 (CrO ₂)	ACVM AF OSC	REC PLAY	Apply a 1kHz signal to LINE IN terminals. Set the REC LEVEL knob so that LINE OUT voltage is -20dBV	LINE OUT	VR107 (Lch) VR108 (Rch)	Set the same level of the record and playback level. (Table 1)

• TOTAL FREQUENCY RESPONSE (-20dB)

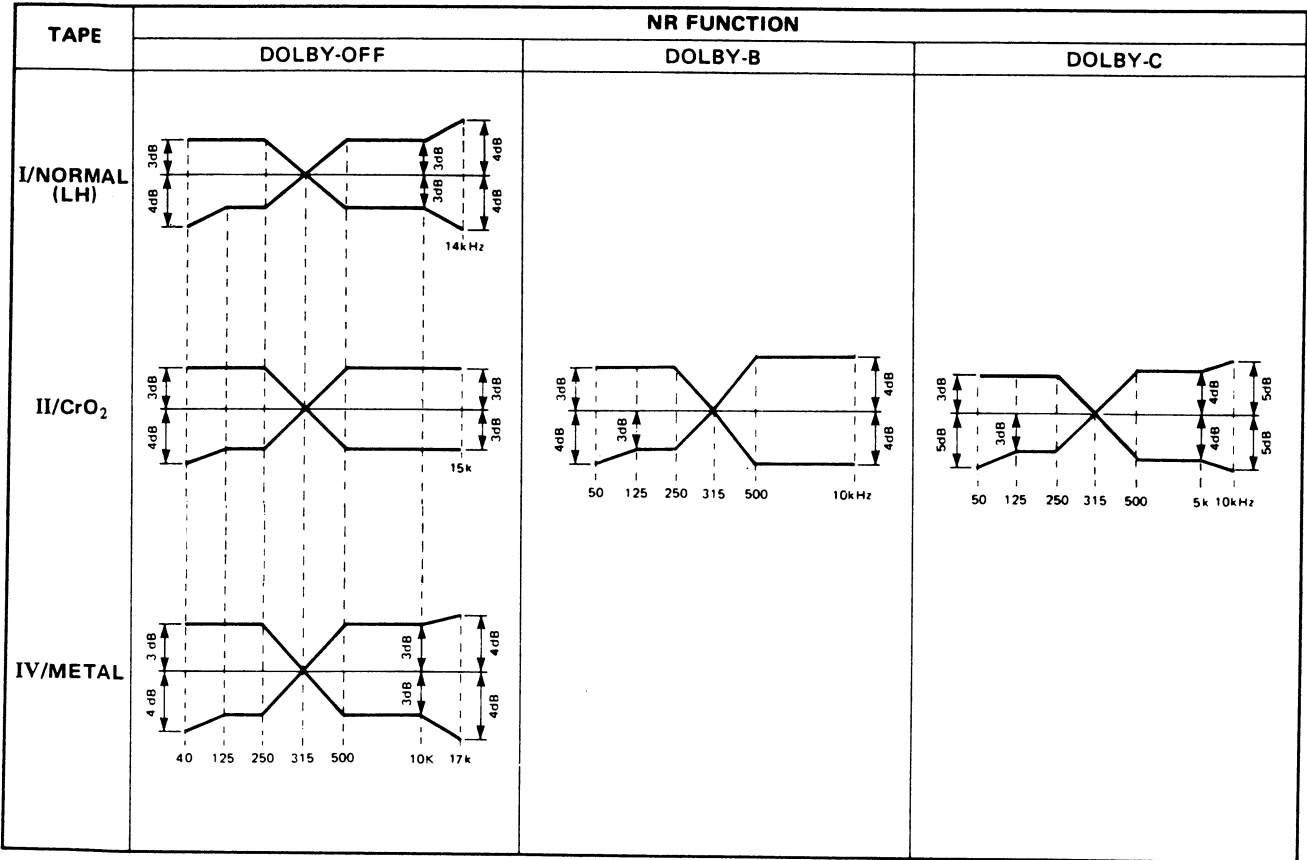
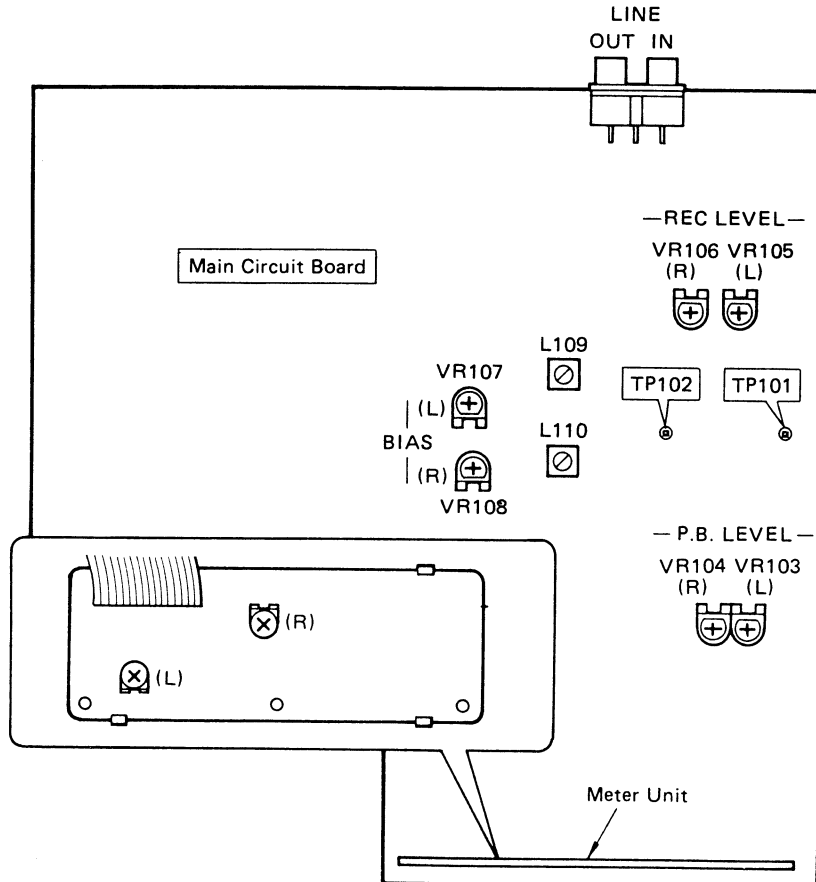


Table 1

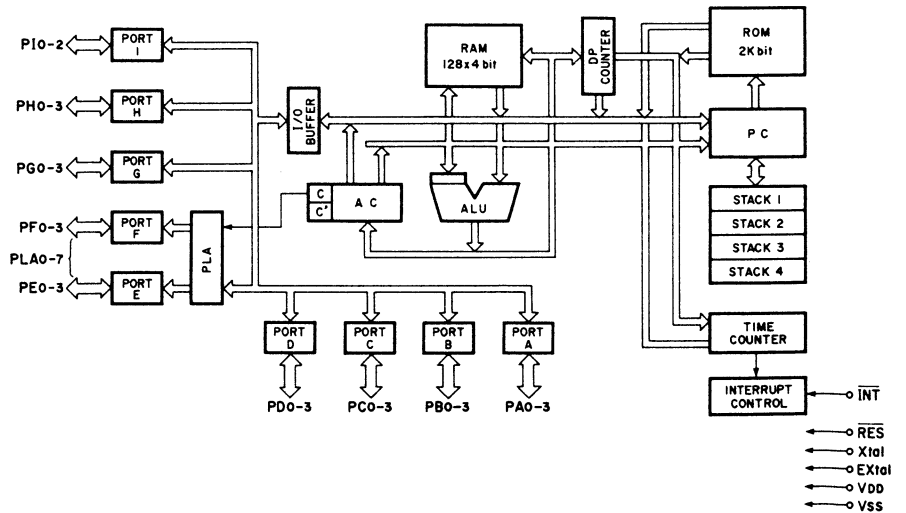
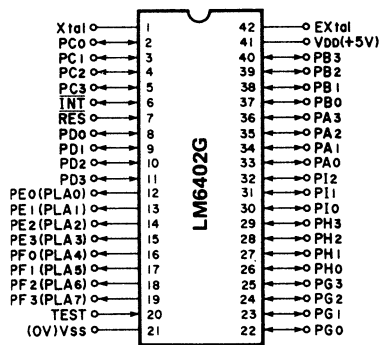
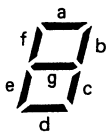
• TEST POINTS



μ-COM DATA

• IC111: LM6402G-1919

PIN NO.	NAME	FUNCTION	PIN NO.	NAME	FUNCTION
1	Xtal	CLOCK, Microcomputer 800kHz	42	EXtal	CLOCK, Microcomputer 800kHz
2	C ₀	LED DIGITAL OUTPUT (1 figure) · KEY SCAN 1	41	VDD	+5V
3	C ₁	" (2 figure) · " 2	40	B ₃	PULSE INPUT, Reel stand (Supply side)
4	C ₂	" (3 figure) · " 3	39	B ₂	Sensor Detection of mechanism A
5	C ₃	" (4 figure) · " 4	38	B ₁	" B
6	INT	POWER OFF Detection INPUT (Power off at "L")	37	B ₀	" C
7	RES	RESET, Microcomputer (Reset at "L" Level)	36	A ₃	INPUT PORT Operation key and control switches
8	D ₀	LED DIGIT OUTPUT (Dot seg.) KEY SCAN 5	35	A ₂	
9	D ₁	" (") " 6	34	A ₁	
10	D ₂	TAPE Selector OUTPUT CrO ₂	33	A ₀	
11	D ₃	" METAL	32	I ₂	PULSE INPUT, Reel stand (Take-up side)
12	E ₀	LED SEGMENT OUTPUT a. M	31	I ₁	Speed control of Reel Motor
13	E ₁	" b. -	30	I ₀	
14	E ₂	" c. R	29	H ₃	Assist R
15	E ₃	" d. .	28	H ₂	Assist Motor drive output Assist F
16	F ₀	" e. REC	27	H ₁	Reel Motor drive output Reel F Reel R
17	F ₁	" f. NORM	26	H ₀	
18	F ₂	" g. CrO ₂	25	G ₃	LINE MUTE OUTPUT (Mute ON at "L" level)
19	F ₃	" METAL	24	G ₂	REC MUTE OUTPUT (Mute ON at "L" level)
20	TEST	Gnd.	23	G ₁	REC/PB AMP. Selector Output
21	Vss	Gnd.	22	G ₀	REC BIAS control output (Bias ON at "H" level)



● Matrix Input

Digit	Input Port	Name	Function	IC7800 Pin No.
SCAN1 (C ₀)	A ₀	REW KEY	REW	4
	A ₁	FF KEY	FF	3
	A ₂	PLAY KEY	PLAY	2
	A ₃	REC KEY	REC	1
SCAN2 (C ₁)	A ₀	INTRO-F KEY	INTRO SCAN (CUE side)	8
	A ₁	MUTE/SEARCH KEY	MUTE SEACK	7
	A ₂	INTRO-R KEY	INTRO SCAN (REVIEW side)	6
	A ₃	STOP KEY	STOP	5
SCAN3 (C ₂)	A ₀	MUSIC PULSE	MUSIC ON at "L"	12
	A ₁	REMAIN KEY	REMAINING TIME	11
	A ₂	MEMORY KEY	COUNTER MEMORY	10
	A ₃	RESET KEY	COUNTER RESET	9
SCAN4 (C ₃)	A ₀	METAL HOLE	Metal tape detection hole OFF at "L"	18
	A ₁	CrO ₂ HOLE	CrO ₂ tape detection hole OFF at "L"	17
	A ₂	ERASE PROTECTION	Erase protection hole ON at "L"	16
	A ₃	CASSETTE IN	Cassette OFF at "L"	15
SCAN5 (D ₀)	A ₀	O-M REPEAT	O-M repeat playback	AUTO MODE SW101
	A ₁	FULL REPEAT	Full repeat playback	
	A ₂	TIMER REC	Timer recording	
	A ₃	TIMER PLAY	Timer playback	
SCAN6 (D ₁)	A ₀	REMOTE TR0	} REMOTE CONTROL	REMOTE CONTROL JK104
	A ₁	REMOTE TR1		
	A ₂	REMOTE TR2		
	A ₃	REMOTE TR3		

Note: With the SCAN 1 through 4, the input is converted to the static input by using the LC7800.

Note: With the SCAN 6, the input is performed through the transistor switch.

● Static Input

Pin No.	Name	Function
6 (INT)	Power OFF detect	Stop mode at H → L
32 (I ₂)	Reel base revolution pulse T	Revolution pulse of reel base on take-up side
37 (B ₀)	Mechanism position detect A	Mechanism position detect switch · A
38 (B ₁)	Mechanism position detect B	Mechanism position detect switch · B
39 (B ₂)	Mechanism position detect C	Mechanism position detect switch · C
40 (B ₃)	Reel base revolution pulse S	Revolution pulse of reel base on supply side

● Remote Control Terminal



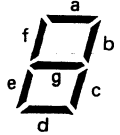
NC
TR0
TR1
TR2
TR3
NC

Note: H 3V ~ 5V
L Less than 0.6V
* Either L or H
Pulse More than 30msec

TR3	TR2	TR1	TR0	MODE
L	L	L	L	—
L	L	L	H	STOP
L	L	H	L	FF
L	L	H	H	REW
L	H	L	L	PLAY
L	H	L	H	REC/PAUSE
L	H	H	L	REC MUTE
L	H	H	H	—
H	*	*	*	—

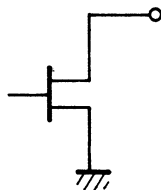
● Input terminal Description

Pin No.	Name	Function	Output Type	Section	
26	Reel motor	Runs reel motor toward REW side at "H".	PL	Mechanism drive	
27	Reel motor	Runs reel motor toward FF side at "H".			
28	Assist motor	Runs assist motor toward "+" side at "H".			
29	Assist motor	Runs assist motor toward "-" side at "H".			
30	Reel motor voltage select	Set reel motor voltage to low-speed FF voltage at "L".	OD		
31	Reel motor voltage select	Set reel motor voltage to PLAY voltage at "L".			
10	Chrome tape	"H" when chrome tape is used.	PL	Amplifier control	
11	Metal tape	"H" when metal tape is used.			
22	Rec bias	Recording bias oscillation ON at "H"			
23	Amp select	"L" at recording "H" at playback			
24	Rec mute	REC mute ON at "L"			
25	Line mute	LINE mute ON at "L"	PL	Key scan LED digit	
2	Key scan 1	"L" when counte LED (1 figure) is light · key scan 1			
3	Key scan 2	"L" when counte LED (1 figure) is light · key scan 2			
4	Key scan 3	"L" when counte LED (1 figure) is light · key scan 3			
5	Key scan 4	"L" when counte LED (1 figure) is light · key scan 4			
8	Key scan 5	"L" when dot LED is light. key scan 5			
9	Key scan 6	"L" when dot LED is light. key scan 6	OD	Display	
12	LED segment	LED segment a			dot LED : M
13	LED segment	LED segment b			dot LED : -
14	LED segment	LED segment c			dot LED : R
15	LED segment	LED segment d			dot LED : `
16	LED segment	LED segment e			dot LED : REC
17	LED segment	LED segment f			dot LED : NORM
18	LED segment	LED segment g			dot LED : CrO ₂
19	LED segment	LED segment h	dot LED : METAL		



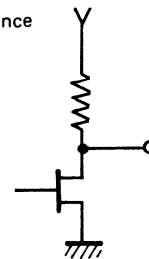
Note) Output Type

OD: Open Drain



Current: About 40mA flow possible

PL: Pull Up with resistance



Resistance: about 1.5kΩ - 5kΩ

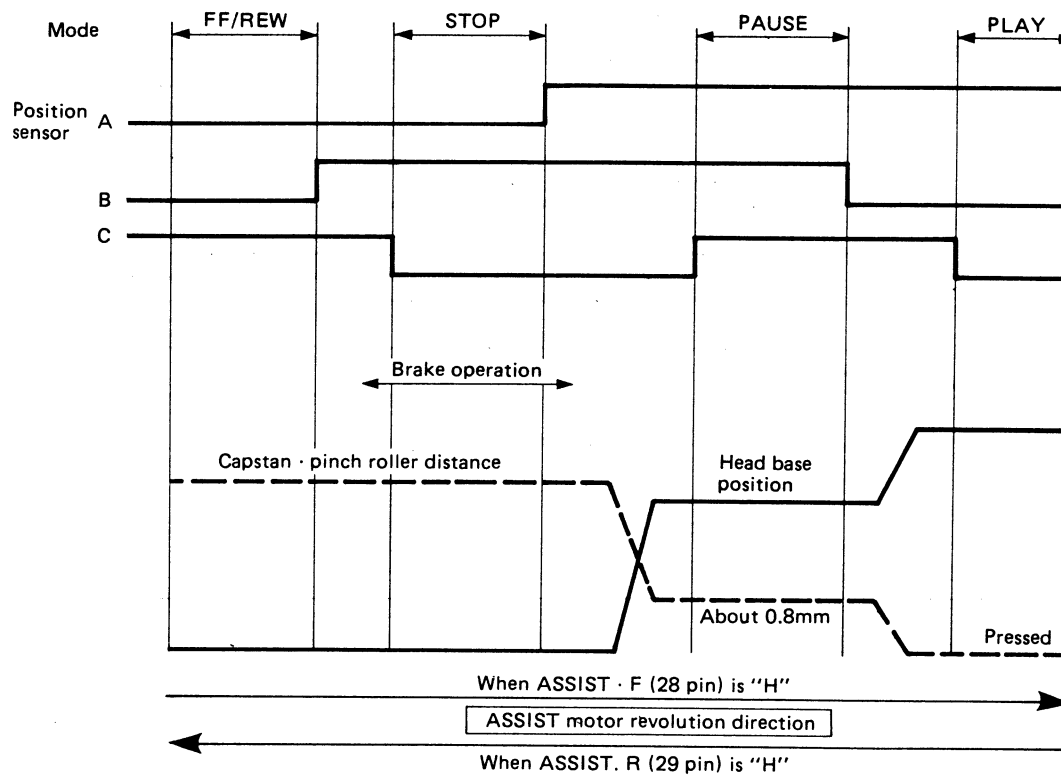
● MODE VS OUTPUT

OUTPUT (Pin No.)	MODE								
	STOP	PLAY	REC/ PAUSE	REC/ PLAY	FF	REW REVIEW	High FF	High REW	
G ₀ (22 pin) REC bias	L	L	L*	H	L	L	L	L	
G ₁ (23 pin) Amp select	H	H	L	L	H	H	H	H	
G ₂ (24 pin) REC mute	L	L	L	H	L	L	L	L	
G ₃ (25 pin) LINE mute	L	H	H	H	L	L	L	L	
H ₀ (26 pin) Reel motor R	L	L	L	L	L	H	L	H	
H ₁ (27 pin) Reel motor F	L	H	L	H	H	L	H	L	
I ₀ (30 pin) Reel motor voltage	L	L	L	L	L	L	H	H	
I ₁ (31 pin) Reel motor voltage	L	L	L	L	H	H	H	H	

* Note) REC bias becomes "H" at REC/PAUSE after REC/PLAY.

■ SMD MECHANISM DESCRIPTION

- **Component:** 3 motor
- **Operation:** Cam assist mechanism operation by confirming the mechanism position by means of the mechanism position sensor switch.
- **Mode-to-sensor relationship**



- **Operation**

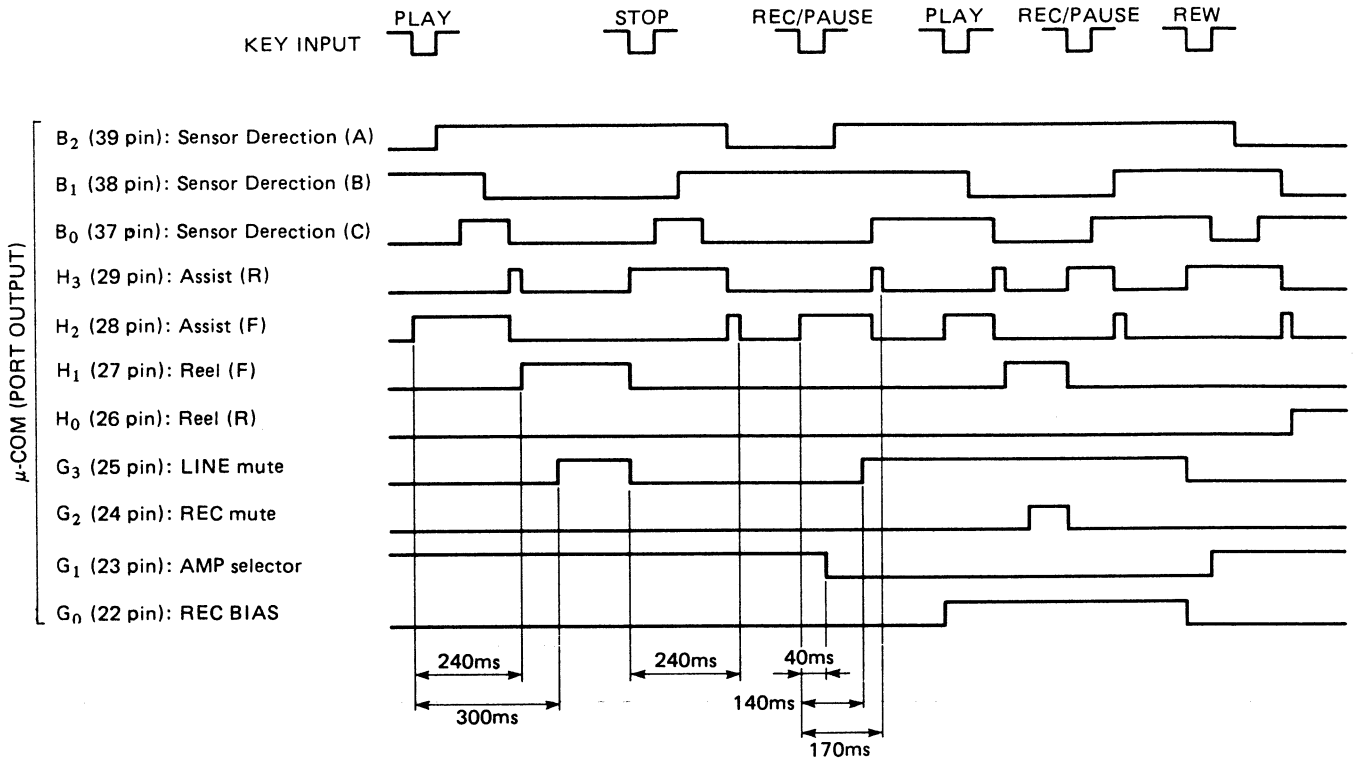
- Example: From STOP to PLAY**

The assist motor is driven after detecting the direction of the PLAY mechanism position against the STOP mechanism position. (The ASSIST.F terminal is "H".)

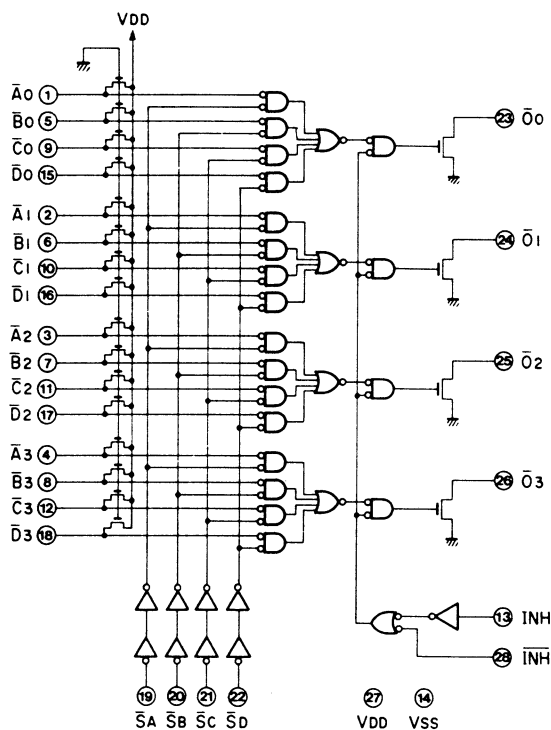
It is driven till the mechanism position reaches the PLAY position (position sensor switches: A: H, B: L, C: L), where it is stopped. (The assist motor is braked with about 10 to 20m sec. inverse voltage applied to prevent overshoot.)

TIMING CHART

● MECHANISM DRIVE TIMING



IC109: LC7800

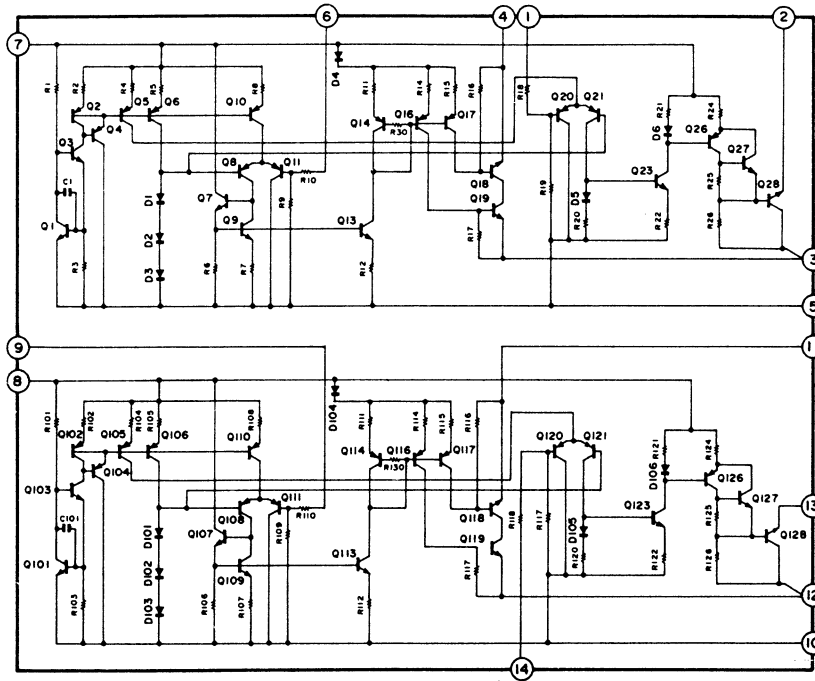


"1" High Level
 "0" Low Level
 "*" don't Care Case

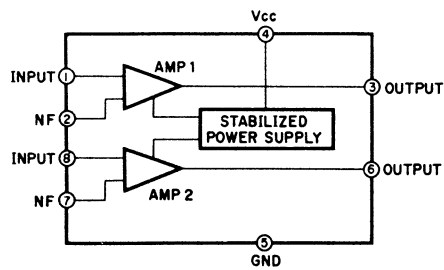
Pin No.	INPUTS																OUTPUTS									
	DATA IN												SELECT IN				INHIBIT IN									
	A				B				C				D													
	A ₀	A ₁	A ₂	A ₃	B ₀	B ₁	B ₂	B ₃	C ₀	C ₁	C ₂	C ₃	D ₀	D ₁	D ₂	D ₃	S _A	S _B	S _C	S _D	I _{NH}	I _{NH}	O ₀	O ₁	O ₂	O ₃
	1	2	3	4	5	6	7	8	9	10	11	12	15	16	17	18	19	20	21	22	13	28	23	24	25	26
	0																0				0		0			
		0															0				0			0		
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				0	0													0			0		0			
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IC BLOCK

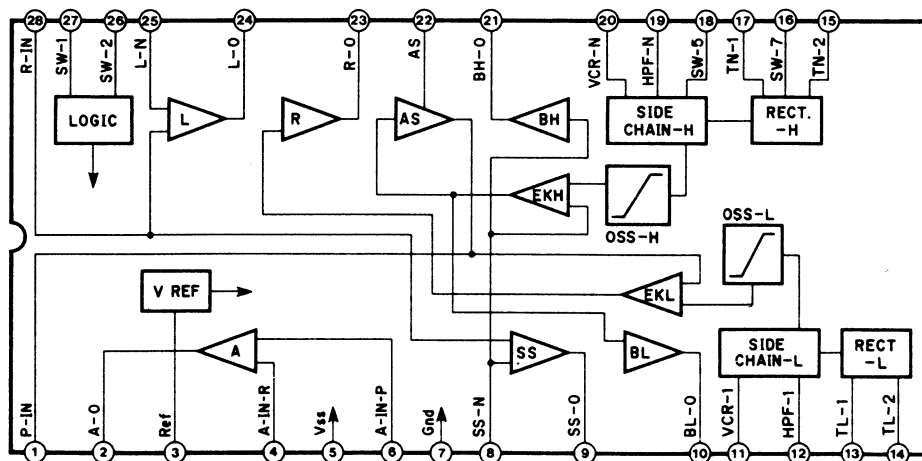
IC101: μ PC1290C



IC102: LA3161

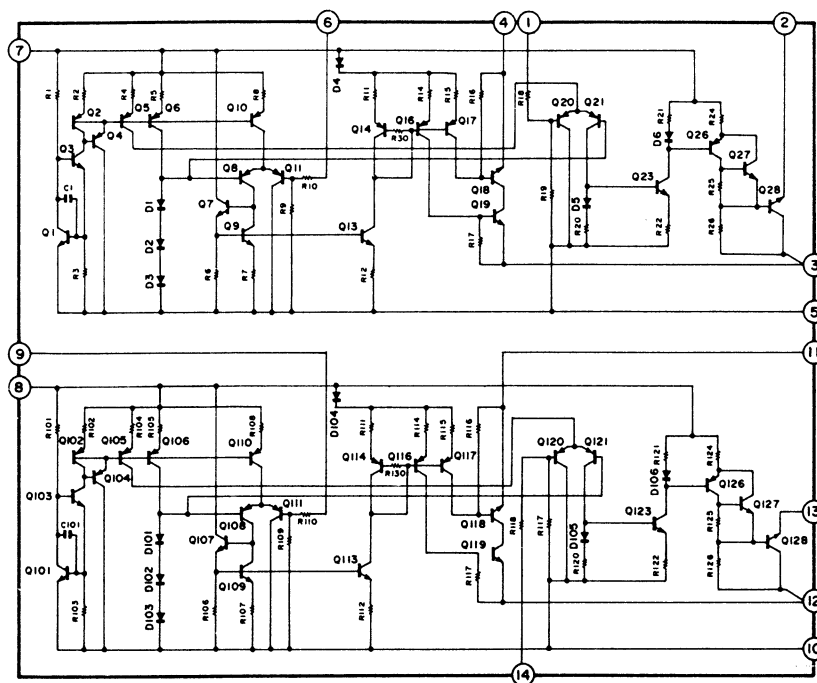


IC103, 104: AN7370K

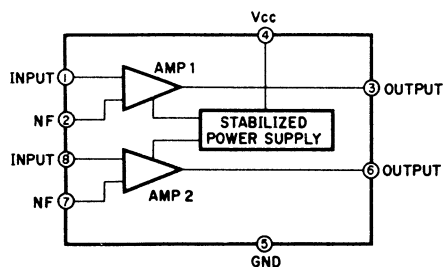


IC BLOCK

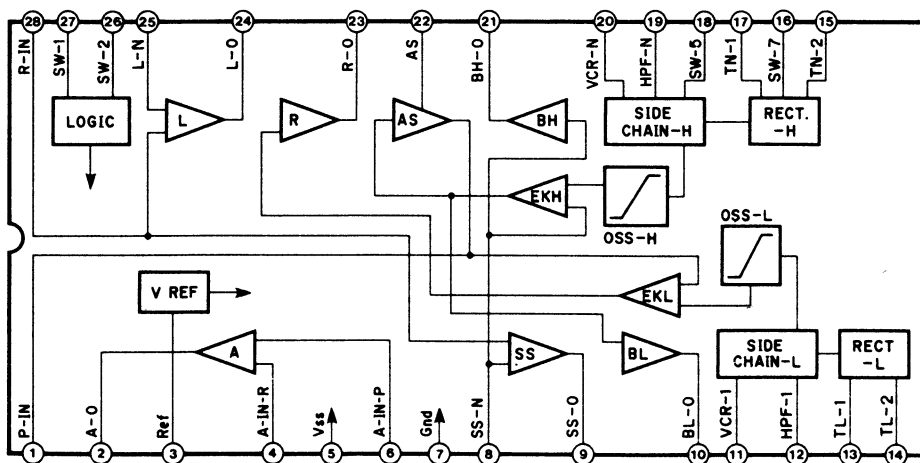
IC101: μ PC1290C



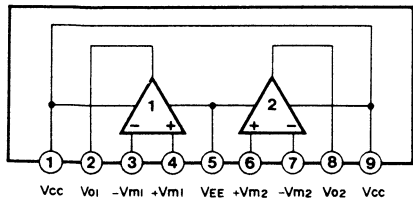
IC102: LA3161



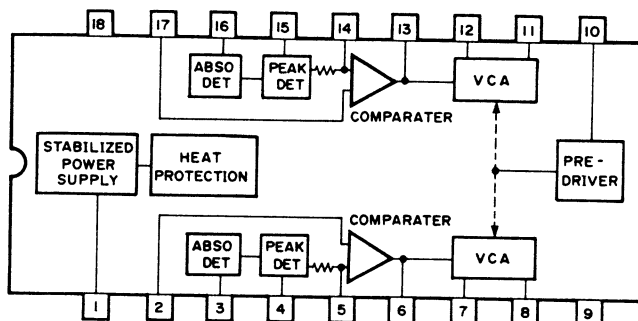
IC103, 104: AN7370K



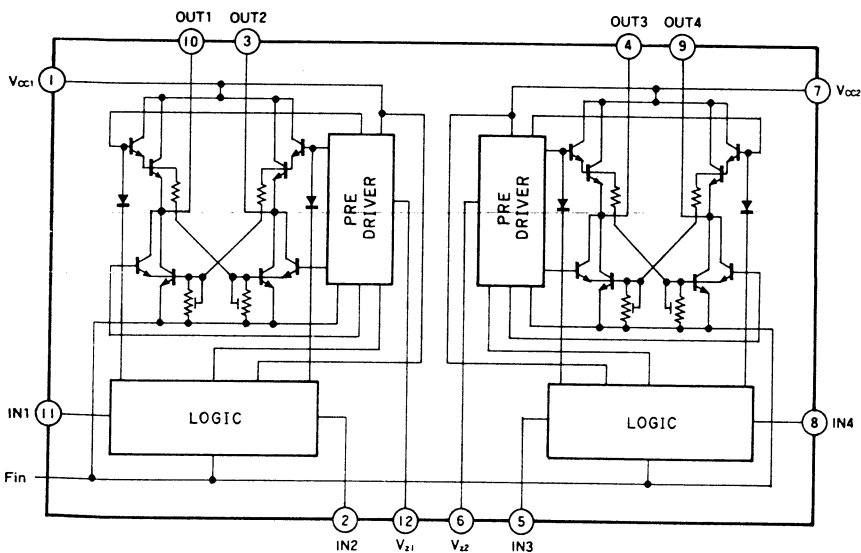
IC105, 107: NJM4556S
 IC112: AN6551, NJM4558S or BA715



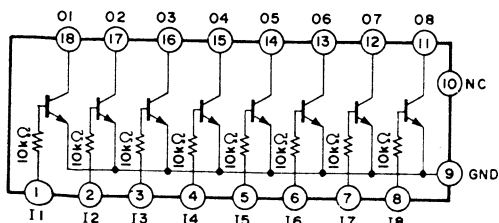
IC108: μ PC1297CA



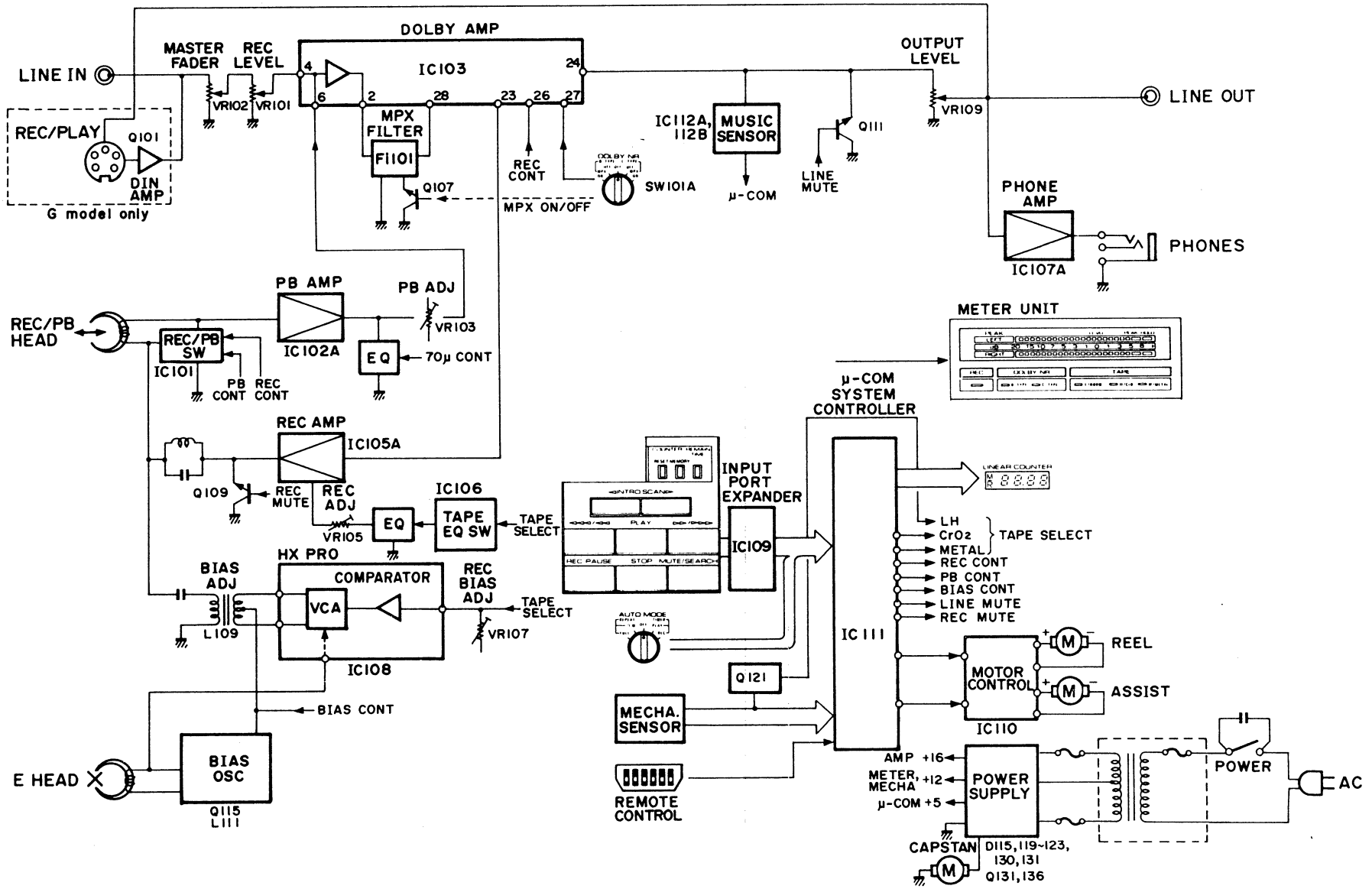
IC110: LB1649



IC106: AN90B20



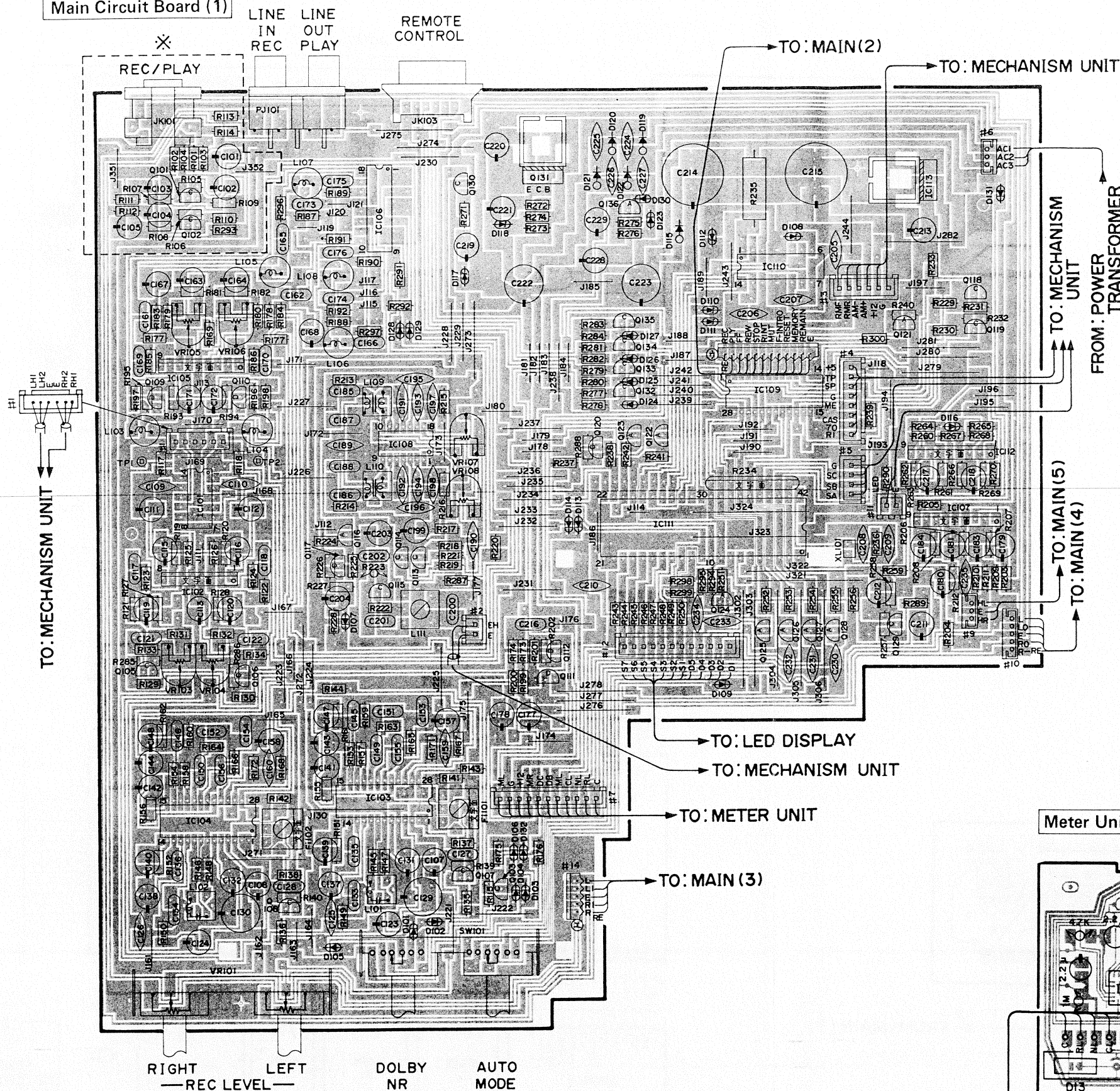
BLOCK DIAGRAM



PRINTED CIRCUIT BOARD(Pattern side)

Note) 文字面 : Component side

Main Circuit Board (1)

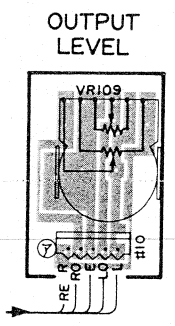
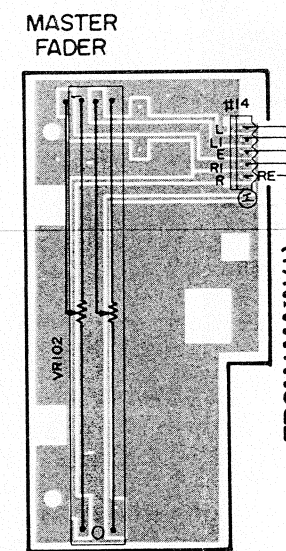


Note: * marked

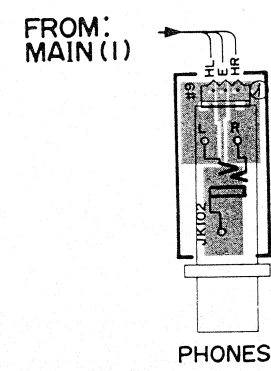
	R, U, A, C, B	G
R113, 114	18k	12k
R101, 102, 111, 112	OPEN	47k
R103, 104, 293	OPEN	1k
R105, 106	OPEN	1M
R107, 108	OPEN	5.6k
R109, 110	OPEN	47
C101 ~ 104	OPEN	1/50
C105	OPEN	33/16
Q101, 102	OPEN	2SC2603 (E, F) or 2SC3312 (R, S, T)
JK101	OPEN	Set

Main Circuit Board (3)

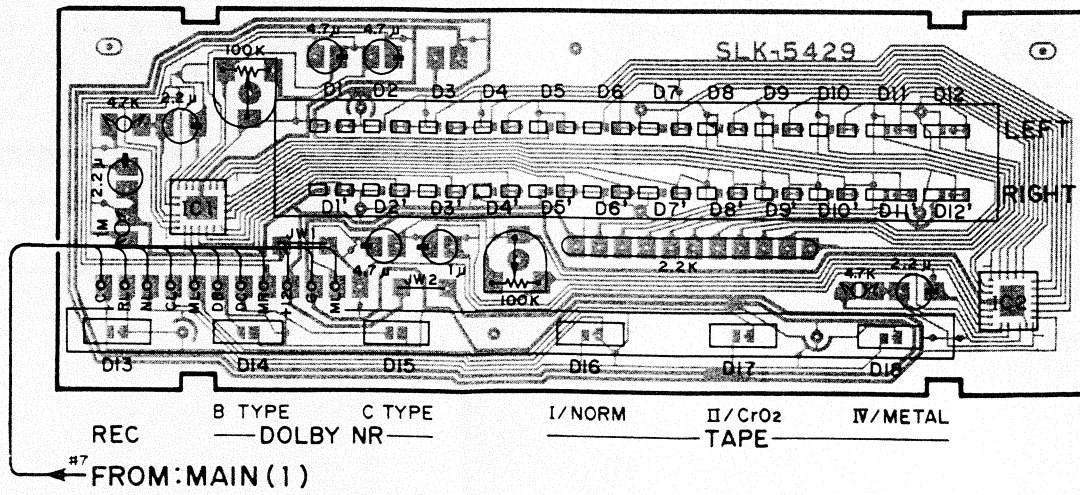
Main Circuit Board (4)



Main Circuit Board (5)



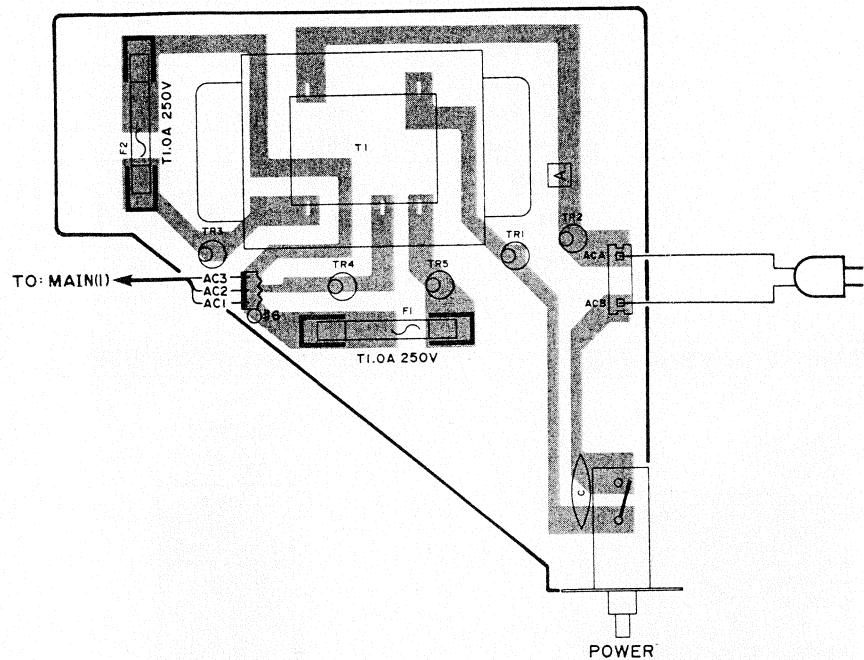
Meter Unit



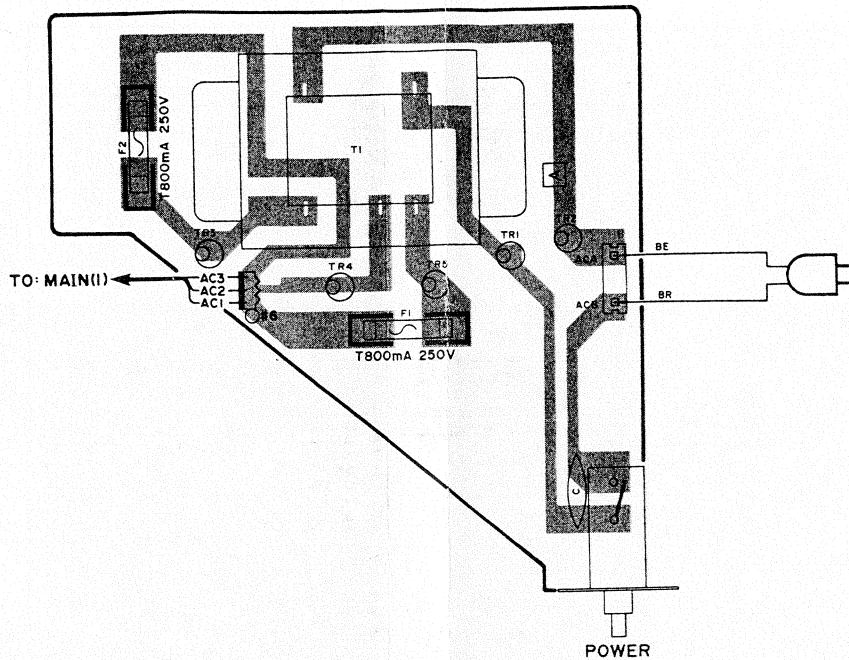
PRINTED CIRCUIT BOARD (Pattern side)

Transformer Circuit Board

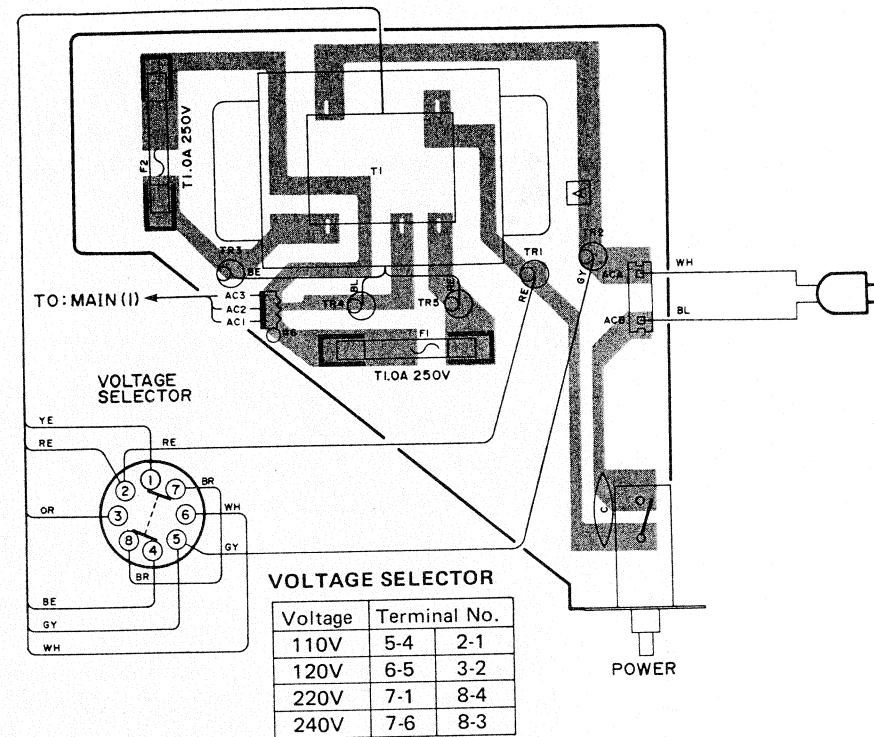
U,C MODELS



A,B,G MODELS

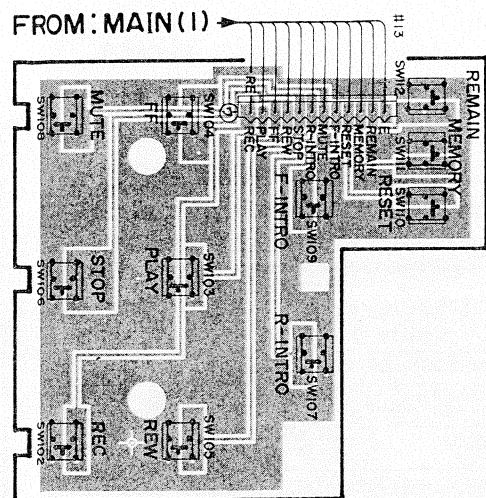


R MODEL

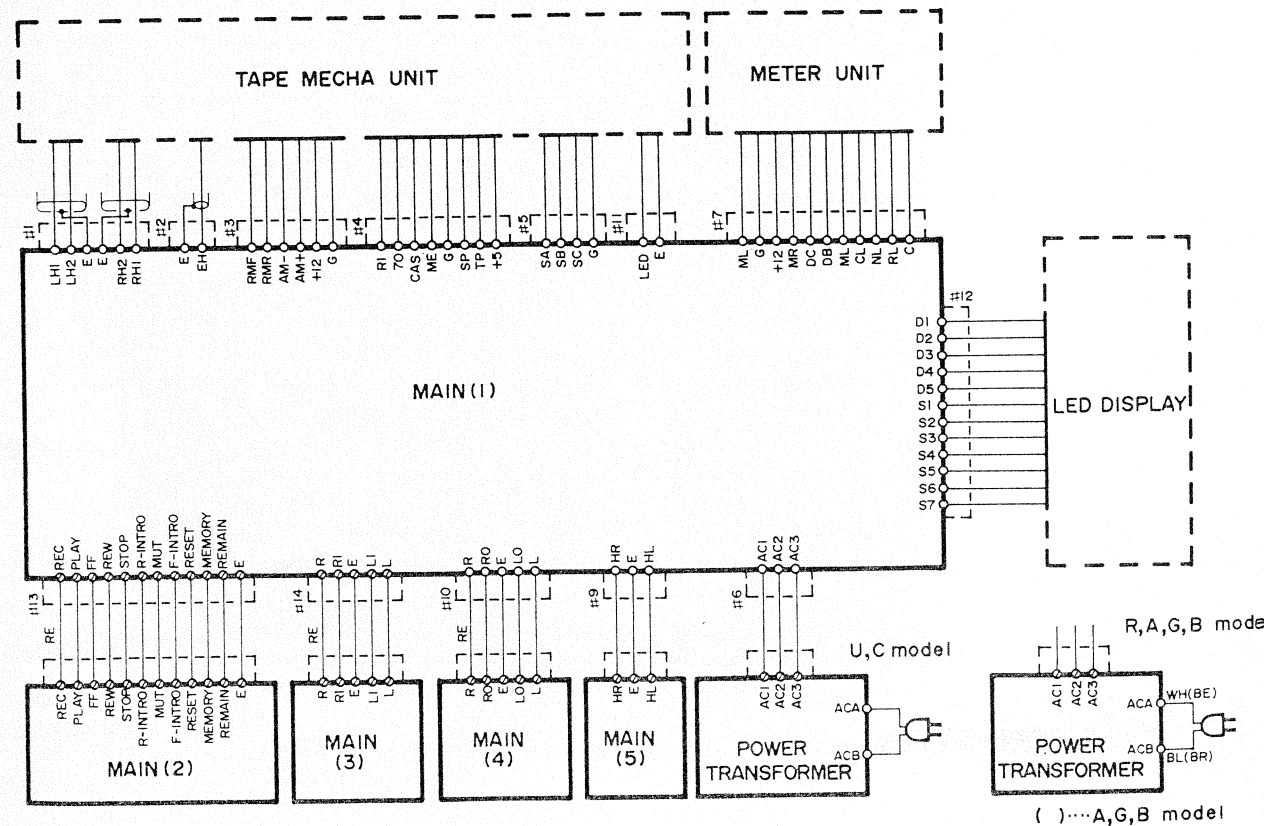
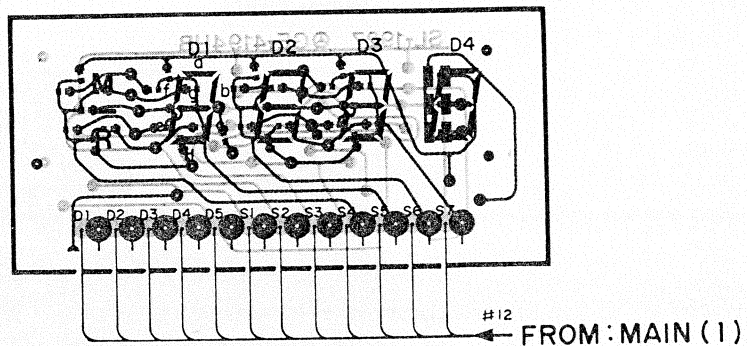


WIRING

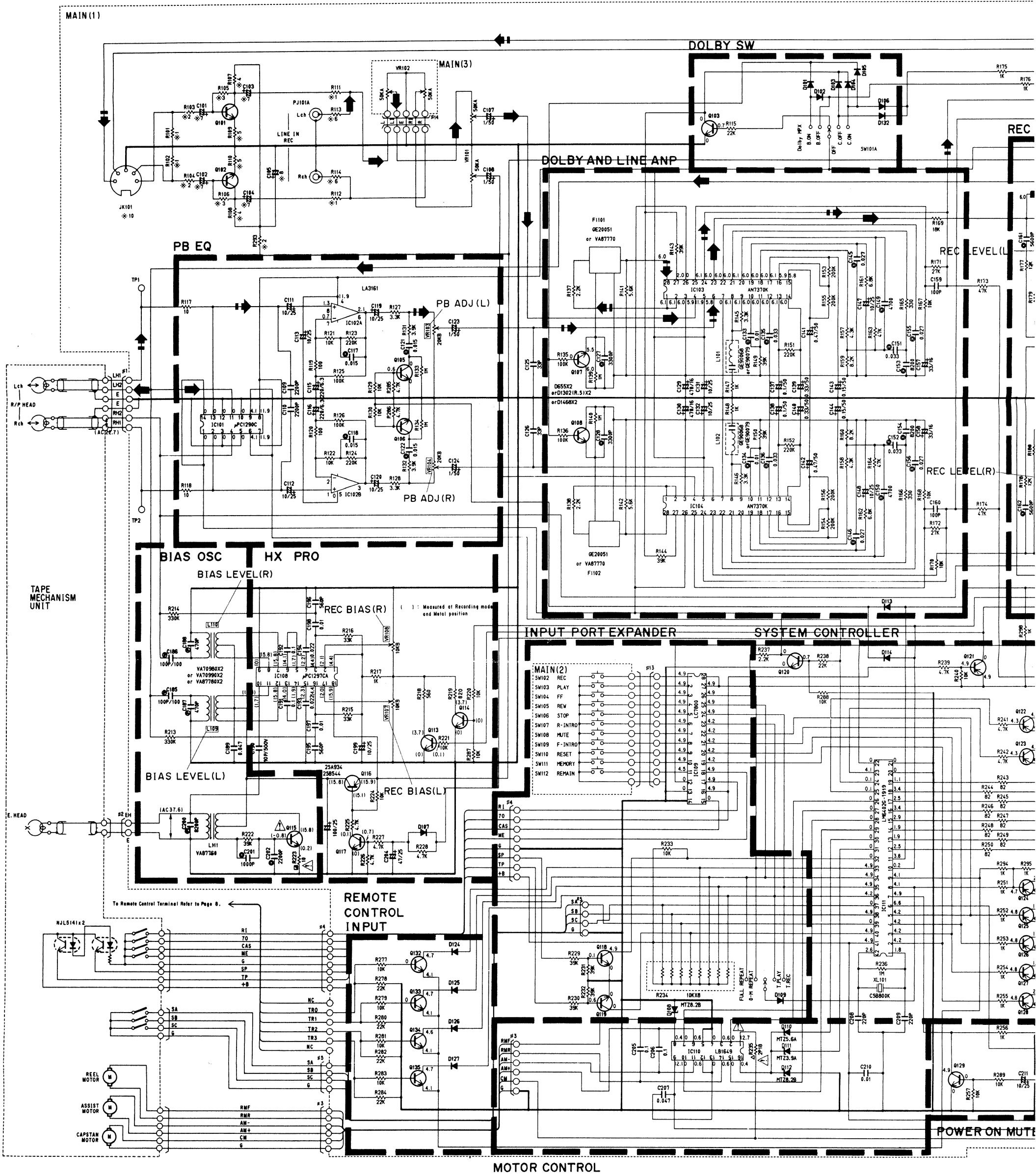
Main Circuit Board (2)



LED DISPLAY



SCHEMATIC DIAGRAM



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

2SA934 2SB544 2SA1115 (E, F) 2SA1310 (R, S, T) 2SC2603 (E, F) 2SC3312 (R, S, T) 2SC2060 2SD400	2SD655 (E, F) 2SD1302 (R, S)	2SC1983 2SD1273 (Q, P) 2SD1052 (A)	ISS133 ISR35-100AT-93X MTZ13A MTZ18A MTZ8.2B MTZ3.9A MTZ5.6A	AN78M05 NJM78M05	LA3161	AN6551 NJM4558S BA715	NJM4556S	LB1649	μ PC1290C	AN90

Unless Otherwise Specified

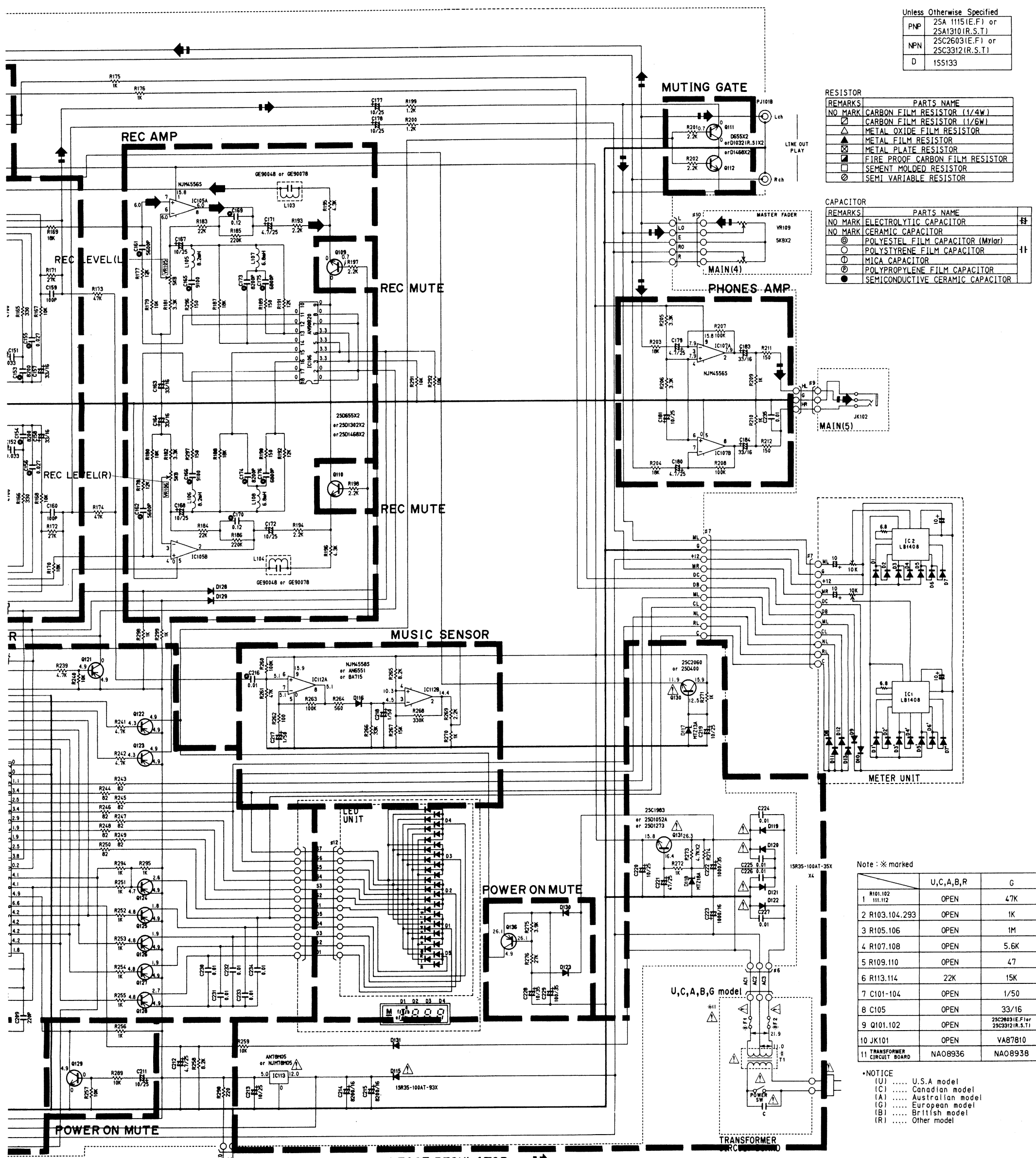
PNP	2SA 1115(E,F) or 2SA1310(I,R,S,T)
NPN	2SC2603(E,F) or 2SC3312(I,R,S,T)
D	ISS133

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/4W)
□	CARBON FILM RESISTOR (1/6W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
■	FIRE PROOF CARBON FILM RESISTOR
□	SEMENT MOLDED RESISTOR
⊙	SEMI VARIABLE RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊙	POLYESTER FILM CAPACITOR (Mylar)
○	POLYSTYRENE FILM CAPACITOR
⊖	MICA CAPACITOR
⊕	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR



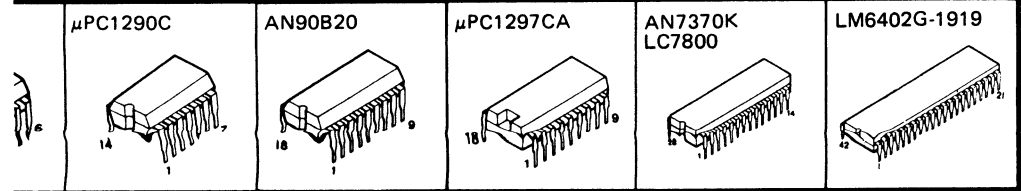
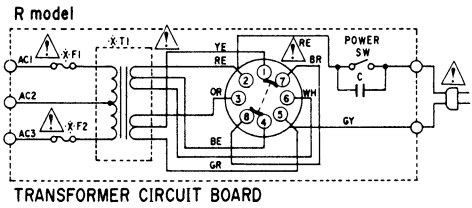
Note : * marked

	U,C,A,B,R	G
1	R101,102	47K
2	R103,104,293	1K
3	R105,106	1M
4	R107,108	5.6K
5	R109,110	47
6	R113,114	15K
7	C101-104	1/50
8	C105	33/16
9	Q101,102	2SC2603(E,F) or 2SC3312(I,R,S,T)
10	JK101	VA87810
11	TRANSFORMER CIRCUIT BOARD	NAO8936 NAO8938

•NOTICE
 (U) U.S.A model
 (C) Canadian model
 (A) Australian model
 (G) European model
 (B) British model
 (R) Other model

Note : * marked

	U,C	A,B	G	R
T1	NAO89360	NAO89370	NAO89380	NAO89350
F1,F2	1.0A 250V	T800mA 250V	T800mA 250V	T1.0A 250V



• All voltages are measured with a 10MΩ/V DC electric volt meter.
 • Components having special characteristics are marked △ and must be replaced with parts having specifications equal to those originally installed.
 • Schematic diagram is subject to change without notice.

PARTS LIST

■WARNING

- Components having special characteristics are marked \triangle and must be replaced with parts having specifications equal to those originally installed.
- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS list. For the parts No. of the carbon resistor, refer to p. 31.

■ELECTRICAL PARTS

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	NA 08 92 60	Main Circuit Board Ass'y	メ イ ン シ ー ト			R,U,A,C,B	
※	NA 08 92 70	"	"			G	
	FG 41 13 30	Ceramic Cap.	セ ラ コ ン	C125,126			
	FG 41 21 00	"	"	C159,160			
	FG 41 22 20	"	"	C208,209			
	FG 41 25 60	"	"	C195,196			
	FG 41 32 20	"	"	C109,110			
	FG 44.41 00	"	"	C197,198,210,235 224~227,230~234			
	FG 44.42 20	"	"	C193,194			
	FG 44.44 70	"	"	C189,207			
	FH 61.11 00	"	"	C190			
	FZ 00.41 30	Semiconductive Ceramic Cap.	半 導 体 セ ラ コ ン	C191,192,205,206			
	FA 15.31 00	Mylar Cap.	マ イ ラ ー コ ン	C201			
	UA 25 32 20	"	"	C202			
	FA 15 33 30	"	"	C127,128			
	UA 25 34 70	"	"	C149,150			
	UA 25 35 60	"	"	C161,162			
	FA 15 36 80	"	"	C175,176			
	UA 25 38 20	"	"	C153,154,173,174			
	UA 25 39 10	"	"	C165,166			
	UA 25 41 00	"	"	C133,134,216			
	FA 15 41 50	"	"	C121,122,117,118			
	UA 25 42 70	"	"	C145,146,155,156			
	UA 25 43 30	"	"	C135,136,151,152			
	FA 15 51 20	"	"	C169,170			
	UJ 11 82 20	Electrolytic Cap.	ケ ミ コ ン	C115,116			
	UH 13 73 30	"	"	C157,158,163,164,183, 184			
	UH 13 73 30	"	"	C105		G	
	UH 14 64 70	"	"	C171,172,179,180,212			
	UH 14 71 00	"	"	C111~113,119,120,131,132,147,148,167, 168,177,178,181,199,211,213,219,220			
	UH 14 74 70	"	"	C204,221			
	UH 14 81 00	"	"	C203			
	UH 15 71 00	"	"	C228			
	UH 15 81 00	"	"	C229			
	UJ 16 51 00	"	"	C137,138			
	UW 56 51 50	"	"	C143,144			
	UW 56 53 30	"	"	C139,140			
	UH 16 54 70	"	"	C141,142			
	UH 16 61 00	"	"	C107,108,123,124,217, 218			
	UH 16 61 00	"	"	C101~104		G	
	UH 13 84 70	"	"	C129,130			
※	UH 13 91 00	"	"	C223			
※	Ui 93 98 20	"	"	C214,215			
※	UH 15 91 00	"	"	C222			
※	UT 45 21 00	Polypropylene Film Cap.	ポ リ プ ロ コ ン	C185,186			
	UT 45 24 70	"	"	C187,188			
	UT 65 38 20	"	"	C200			
	GE 20 05 10	Dolby Filter	ド ル ビ ー フ ィ ル タ ー	Fi101,102			
※	VA 87 77 00	"	"	"	Inter-changeable		

*New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名		Remarks	Common Model	Markets	ランク
	GE 90:04:80	Bias Trap Coil	105kHz	バイアストラップコイル	L103,104 } Inter-changeable			
	GE 90:07:80	"	105kHz	"		"		
	GE 90:06:80	SKewing Coil	20kHz	スキューイングコイル	L101,102			
*	VA 70:98:00	Coil		ステップアップコイル	L109,110 } Inter-changeable			
*	VA 70:99:00	"		"		"		
*	VA 87:76:00	Bias Trap Coil		バイアストラップコイル	L111			
	GE 90:16:10	Inductor	6.8mH	固定インダクター	L107,108			
	GE 90:16:20	"	8.2mH	"	L105,106			
	GG 00:07:60	Ceramic Resonator	CSB800K	セラミック振動子	XL101			
	HL 72:41:80	Metal Oxide Film Resistor	18Ω 2P	酸金抵抗	R235			△
	HV 45:41:00	Flame Proof Carbon Resistor	10Ω 1/4W	不燃化カーボン抵抗	R223			△
	HZ 00:28:80	Resistor Array	10kΩ×8	抵抗アレー	R234			
	HS 11:06:10	Potentiometer	50kA+50kA	可変抵抗器	VR101			
*	VA 87:79:00	"	5kA×2	"	VR109			
*	VA 87:80:00	"	50kA×2	"	VR102			
	HT 37:03:70	Pre-Set Potentiometer	B5K	半固定抵抗	VR105,106 } Inter-changeable			
	HT 77:02:30	"	B5K	"		"		
	HT 37:03:80	"	B10K	"	VR107,108 } Inter-changeable			
	HT 77:02:40	"	B10K	"		"		
	HT 37:03:90	"	B20K	"	VR103,104			
	iA 09:34:00	Transistor	2SA934	トランジスタ	Q116 } Interchangeable			
	iB 05:44:10	"	2SB544	"		"		
	iA 11:15:10	"	2SA1115(E,F)	"	Q121~128,136 } Inter-changeable			
	iX 60:31:70	"	2SA1310(R,S,T)	"		"		
	iC 19:83:00	"	2SC1983	"	Q131 } Inter-changeable			△
	iD 12:73:00	"	2SD1273(Q,P)	"		"		
	iC 26:03:10	"	2SC2603(E,F)	"	Q103,105,106,113~115,117~120,129,132~135 } Inter-changeable			△
	iX 60:31:80	"	2SC3312(R,S,T)	"		"		
	iC 26:03:10	"	2SC2603(E,F)	"	Q101,102 } Inter-changeable		G	
	iX 60:31:80	"	2SC3312(R,S,T)	"		"		G
	iC 20:60:00	"	2SC2060	"	Q130 } Interchangeable			△
	iD 04:00:10	"	2SD400	"		"		
	iD 06:55:10	"	2SD655(E,F)	"	Q107~112 } Inter-changeable			
	iD 13:02:00	"	2SD1302(R,S)	"		"		
	iF 00:34:50	Diode	ISS133	ダイオード	D101~107,109,113,114,116,123~132			
	iF 00:84:80	"	ISR35-100AT-93X	"		D115,119~122		
	iF 00:89:60	Zener Diode	MTZ18A	ツェナーダイオード	D118			
	iF 00:88:80	"	MTZ13A	"	D117			
	iF 01:08:30	"	MTZ8.2B	"	D108,112			
	iF 01:05:90	"	MTZ3.9A	"	D111			
	iF 01:07:10	"	MTZ5.6A	"	D110			
	iG 03:47:00	IC	AN6551	I C	IC112 } Interchangeable			
	iG 07:68:00	"	NJM4558S	"		"		
	iG 07:56:00	"	NJM78M05	"	IC113			△
	iG 07:74:00	"	NJM4556S	"	IC105,107			
	iG 11:65:00	"	AN7370K	"	IC103,104			
	iG 14:55:00	"	LA3161	"	IC102			

*New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	iG 14 63 00	IC	LC7800	I C	IC109		
*	XA 29 90 01	"	LB1649	"	IC110		
*	XA 30 00 01	"	μPC1297CA	"	IC108		
*	XA 50 80 01	"	μPC1290C	"	IC101		
*	XA 51 10 01	"	LM6402G-1919	"	IC111		
	iG 08 99 00	Transistor Array	AN90B20	トランジスタアレー	IC106		
	KA 90 63 50	Switch	KHH10902	タクトスイッチ	SW102~112		
	KA 90 63 80	"	5M EVQ-QRB-04M	ライトタッチスイッチ	"	} Inter-changeable	
*	VA 87 73 00	Rotary Switch		ロータリースイッチ	SW101		
	LB 40 10 50	Pin Jack	4P	ピンジャック	PJ101		
	LB 30 16 90	Phones Jack		ヘッドホンジャック	JK102		
*	VA 87 81 00	DIN Socket	5P	D I N ソ ケ ッ ト	JK101	G	
*	LB 60 83 90	Socket	6P	S P コ ネ ク タ ソ ケ ッ ト	JK103		
	LB 91 80 20	Base Pin	2P i-Type	X H ベースピンi型			
	LB 91 80 40	"	4P i-Type	"			
	LB 91 80 60	"	6P i-Type	"			
	LB 91 80 80	"	8P i-Type	"			
	LB 91 81 10	"	11P i-Type	"			
	LB 91 81 20	"	12P i-Type	"			
	LB 92 50 30	Short Plug	3P i-Type	シ ョ ー ト プ ラ グ			
	LB 92 50 50	"	5P i-Type	"			
*	CB 65 02 70	P.C.B Bracket		P C B ブ ラ ケ ッ ト			
	BA 08 40 00	Heat Sink		放 熱 板			
	Ei 03 00 66	Binding Head Tapping Screw	3×6 ZMC2-Y	バインドタッピングネジ	PACK		

*New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	NA 08 93 50	Power Transformer Ass'y	パワートランスAss'y			R	
	NA 08 93 60		"			U,C	
	NA 08 93 70		"			A,B	
	NA 08 93 80		"			G	
	Fi 41 41 00	Ceramic Cap	セラコン	Interchangeable			△
	Fi 50 41 00	"	"				△
	VA 89 08 00	"	"				△
	KA 80 36 10	Power Switch	ESB8213A-F	パワースイッチ			△
	KA 80 51 50	"	ESB-8215V-F	"			△
	KB 00 03 30	Fuse	T1.0A 250V	ヒューズ		R	△
	KB 00 10 60	"	1.0A 250V	"		U,C	△
	KB 00 07 20	"	T800mA 250V	"		A,B,G	△
	GA 68 72 10	Power Transformer	電源トランス			R	△
	GA 68 71 00	"	"			U,C	△
	GA 68 74 00	"	"			A,B	△
	GA 68 73 00	"	"			G	△
	LA 00 21 40	Lapping Terminal	P=10,2P i-Type	i型ラッピング端子			
	LB 20 18 80	Fuse Holder Pin	PC-FH1	ヒューズホルダーピン			
	Mi 08 54 10	Connector		ボードインコネクター		U,C,A, B,G	
	Mi 08 54 90	"		"		R	
	Ei 03 00 86	Bind Tapping Screw	3×8 ZMC2-Y	バインドタッピングネジ	PACK		
	LB 20 14 80	Voltage Selector		電圧切換器		R	△

*New Parts (新規部品)

A

B

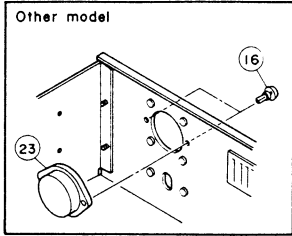
C

D

K-540

EXPLODED VIEW

1



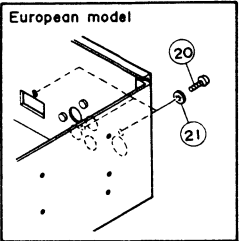
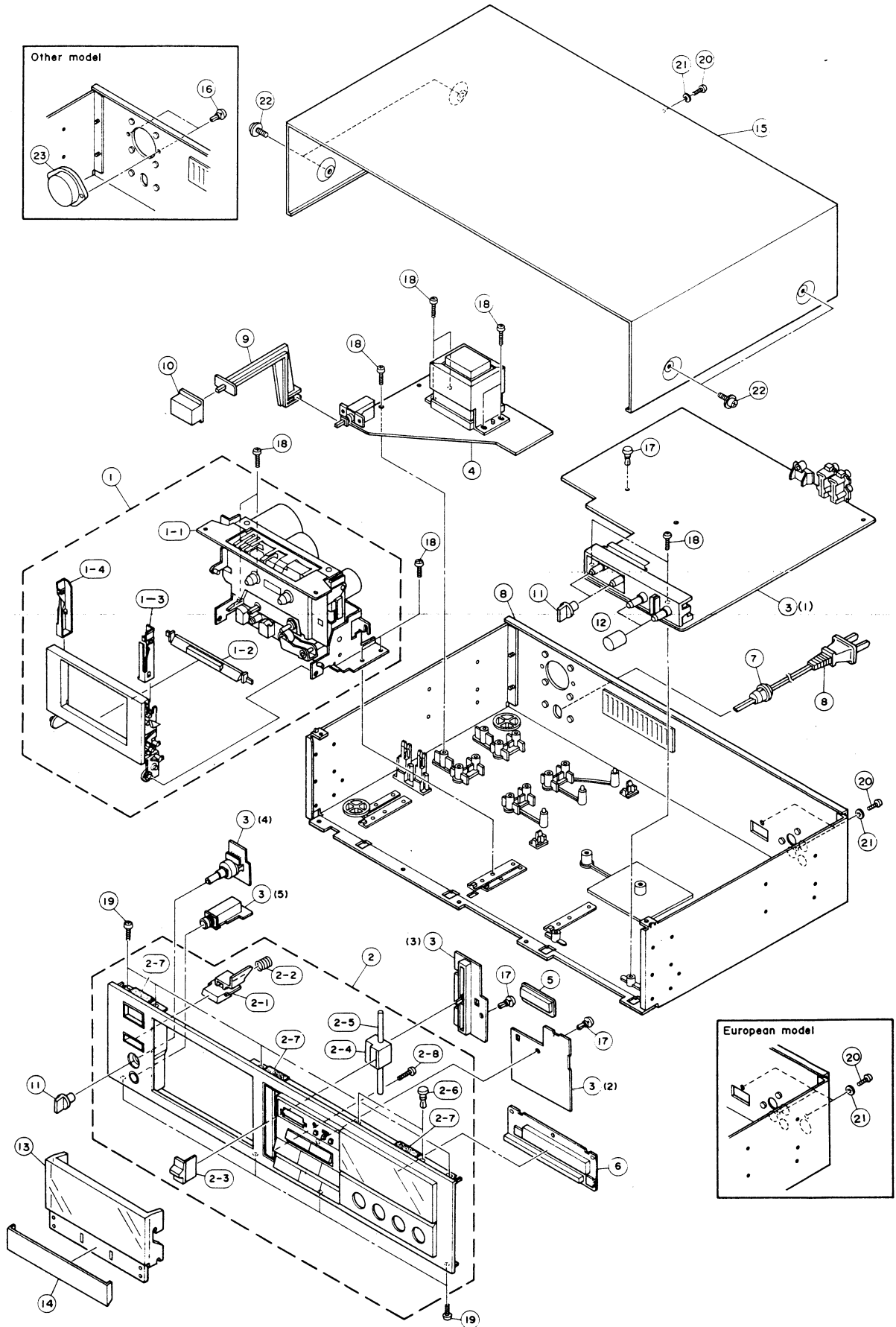
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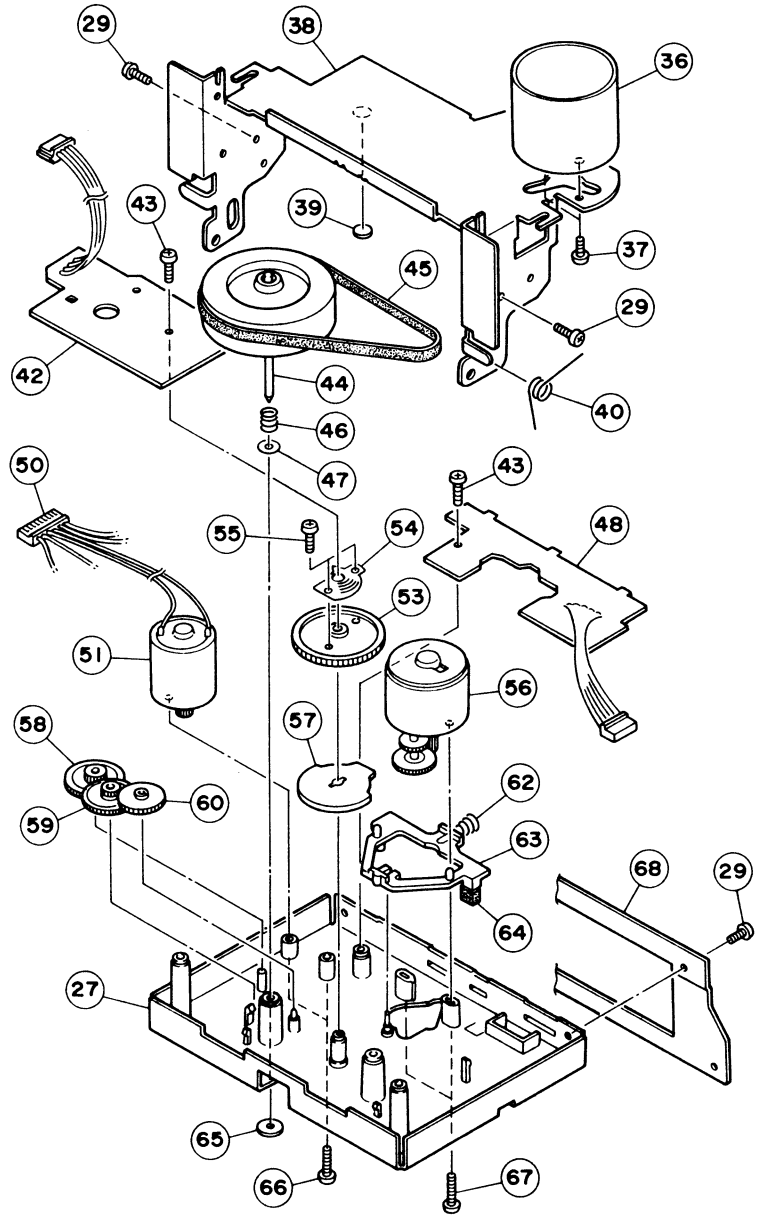
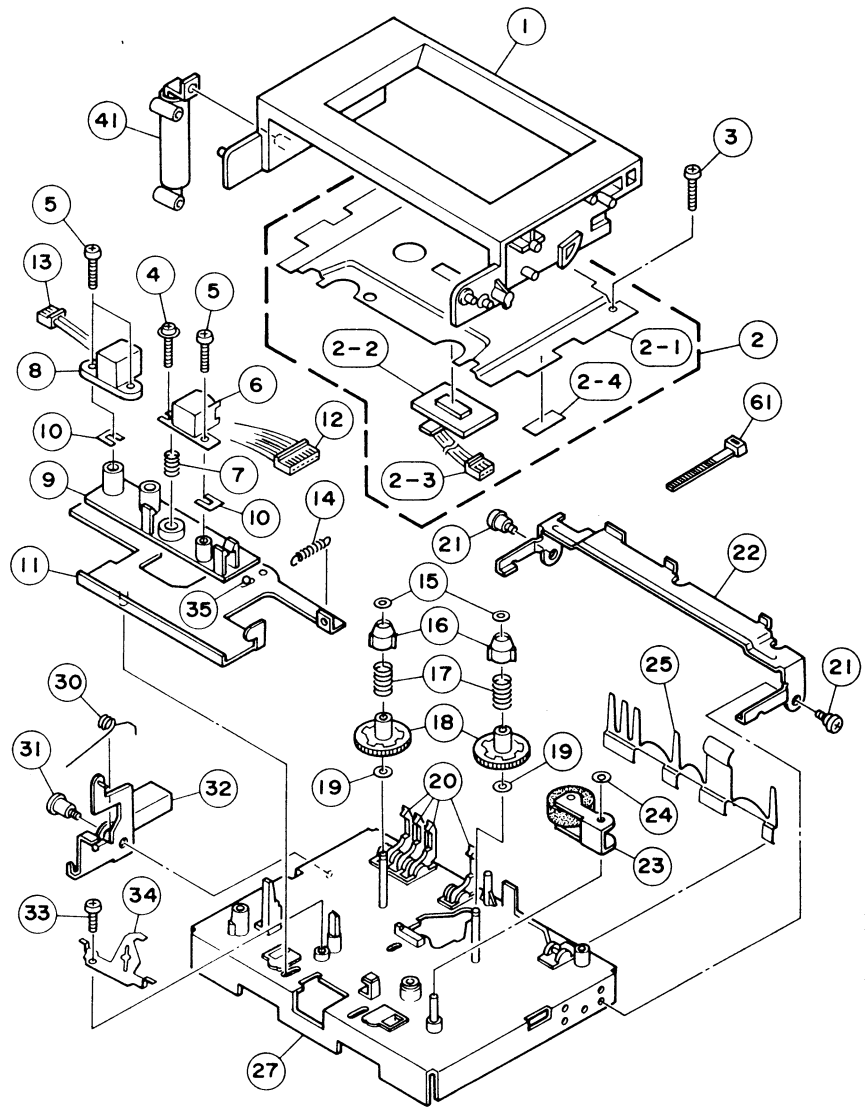
MECHANISM PARTS

Note) φ : Diameter

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
* 1	NB:63:24:80	Tape Mechanism Unit	テープメカユニット	Silver			
* "	NB:63:24:90	"	"	Black			
* 1-1	PB:06:55:20	Cassette Mechanism Unit	カセットデッキメカ				
1-2	CB:62:64:70	Emblem	エンブレム	Silver	TM-7		
"	CB:62:64:80	"	"	Black	TM-7		
1-3	CB:60:98:80	Cassette Guide (R)	カセットガイド(R)		TM-5		
1-4	CB:62:85:70	" (L)	" (L)		TM-7		
* 2	NB:63:04:40	Panel Unit	パネルユニット	Silver			
* "	NB:63:04:50	"	"	Black			
* 2-1	CB:63:63:70	Button	ボ タ ン	Silver EJECT			
* "	CB:63:63:80	"	"	Black "			
* 2-2	AA:62:89:60	Spring	ス プ リ ン グ				
* 2-3	VA:85:24:00	Knob	ノ ブ	Silver MASTER, FADER			
* "	VA:85:25:00	"	"	Black "			
2-4	CB:63:64:30	Slider	ス ラ イ ダ ー		K-1020		
* 2-5	AA:62:89:50	Shaft	4×87 シ ャ フ ト				
2-6	CB:06:88:80	Plastic Rivet	プラスチックリベット				
2-7	CB:64:24:90	Damper	ダ ン パ ー				
2-8	Ei:03:01:06	Binding Head Tapping Screw	3×10 ZMC2-Y バインドタッピングネジ	PACK			
* 3	NA:08:92:60	Main Circuit Board	メ イ ン シ ー ト			R, U, A, C, B	
* "	NA:08:92:70	"	"			G	
* 4	NA:08:93:50	Power Transformer Ass'y	パワートランス Ass'y			R	
* "	NA:08:93:60	"	"			U, C	
* "	NA:08:93:70	"	"			A, B	
* "	NA:08:93:80	"	"			G	
* 5	VA:87:70:00	LED Display	LED ディスプレイ	Silver			
* "	VA:91:52:00	"	"	Black			
* 6	VA:87:71:00	Meter Circuit Board	メ ー タ ー シ ー ト	Silver			
* "	VA:91:54:00	"	"	Black			
7	CB:61:68:10	Cord Stopper	CM-22A コ ー ド ス ト ッ パ ー			U, C	
"	CB:62:01:90	"	CM-22B "			R, A, G, B	
8	MG:00:09:80	Power Cord	10A 125V 2m 電 源 コ ー ド	Inter-changeable		U, C	△
"	MG:00:12:40	"	10A 125V 2m "			U, C	△
"	MG:00:09:20	"	7.5A 250V 2.5m "	Inter-changeable		A	△
"	MG:00:14:90	"	7.5A 250V 2.5m "			A	△
"	MG:00:23:10	"	7.5A 250V 2m "	Inter-changeable		A	△
"	MG:00:09:60	"	2.5A 250V 2m "			G	△
"	MG:00:16:20	"	2.5A 250V 2m "			G	△
"	MG:00:23:20	"	2.5A 250V 2m "			G	△
* "	MG:00:16:30	"	6A 250V 2m "			R	△
"	MG:00:18:60	"	2.5A 250V 2m "			B	△
9	CB:63:42:80	Rod	ロ ッ ヅ ド	Power	K-220		
10	CB:63:67:50	Button	ボ タ ン	Silver Power	CD-X2		
"	CB:65:20:60	"	"	Black Power	LV-X1		
11	CB:63:42:60	Knob	ノ ブ	Silver AUTO MODE DOLBY NR	K-720		
"	CB:63:42:70	"	"	Black "	K-720		
"	CB:62:60:30	"	"	Silver REC LEVEL	K-520		
"	CB:62:60:40	"	"	Black "	K-520		
12	CB:62:52:50	Lid Cover	リ ッ ド カ バ ー		K-320		
13	CB:65:04:10	Lid Panel	リ ッ ド パ ネ ル	Silver	K-340		
"	CB:65:04:20	"	"	Black	K-340		
14	AA:62:87:70	Top Cover	ト ッ プ カ バ ー	Silver	K-340		
"	AA:62:87:80	"	"	Black	K-340		

*New Parts (新規部品)

EXPLODED VIEW (Cassette Mechanism Unit)



MECHANISM PARTS (Cassette Mechanism Unit)

Note) φ : Diameter

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	PB 06 55 20	Cassette Mechanism Unit	カセットメカユニット				
※	1	XX 67 42 00	Cassette Holder	カセットホルダー			
※	2	XX 67 42 10	Blind Plate Ass'y	ブラインドプレート Ass'y			
※	2-2	XX 67 42 20	LED	L E D			
※	2-3	XX 67 42 30	Connector	コネクター			
※	3	XX 67 46 90	Pan Head Tapping Screw	ナベスタイト			
※	4	XX 67 47 00	Screw with Washer	ギザフランジナベ小ネジ			
※	5	ED 02 01 26	Binding Head Screw	2×12 ZMC2-Y	バインド小ネジ	PACK	
※	6	XX 67 42 40	REC/PLAYBACK Head	録再ヘッド			
※	7	XX 67 42 50	Coil Spring	圧縮コイルバネ			
※	8	XX 67 42 60	Erase Head	消去ヘッド			
※	9	XX 67 42 70	Head Base	ヘッド台座			
※	10	XX 64 06 50	Spacer	スペーサー			
※	11	XX 67 42 80	Head Base Plate	ヘッドベース			
※	12	XX 67 42 90	Connector	6P	コネクター		
※	13	XX 67 43 00	"	2P	"		
※	14	XX 67 43 10	Coil Spring	引張コイルバネ			
※	15	XX 64 12 10	Washer	平座金			
※	16	XX 67 43 20	Reel	リール爪			
※	17	XX 67 43 30	Spring	圧縮バネ			
※	18	XX 67 43 40	Reel Base Ass'y	リール台 Ass'y			
※	19	XX 64 03 60	Washer	平座金			
※	20	XX 67 43 50	Switch Lever Ass'y	スイッチレバー Ass'y			
※	21	XX 67 43 60	Screw Shaft	軸			
※	22	XX 67 43 70	Release Arm	解除アーム			
※	23	XX 67 43 80	Pinch Roller Ass'y	ピンチローラー Ass'y			
※	24	XX 64 03 40	Washer	平座金			
※	25	XX 67 43 90	Spring	戻しバネ			
※	27	XX 67 44 00	Chassis	シャーシ			
※	29	EA 02 60 66	Pan Head Screw	2.6×6 ZMC2-Y	ナベ小ネジ	PACK	
※	30	XX 67 44 10	Coil Spring	コイルバネ			
※	31	XX 67 44 20	Shaft	軸			
※	32	XX 67 44 30	Lock Lever Ass'y	ロックレバー Ass'y			
※	33	EA 02 60 86	Pan Head Screw	2.6×8 ZMC2-Y	ナベ小ネジ	PACK	
※	34	XX 67 44 40	Head Base Holder Plate	ヘッドベース押え板			
※	35	EZ 00 15 30	Steel Ball	スチールボール			
※	36	XX 67 44 50	Motor, Capstan	キャプスタンモーター			
※	37	EA 02 50 36	Pan Head Screw	2.5×3 ZMC2-Y	ナベ小ネジ	PACK	
※	38	XX 67 44 60	Motor Bracket	モーターブラケット			
※	39	XX 67 44 70	Thrust Bearing	スラスト受			
※	40	XX 67 44 80	Coil Spring	コイルバネ			
※	41	XX 67 44 90	Damper Unit	ダンパーユニット			
※	42	XX 67 45 00	Control PCB Ass'y	コントロール基板 Ass'y			
※	43	XX 67 47 10	Screw	タッピンネジ			
※	44	XX 67 45 10	Flywheel	フライホイール			
※	45	XX 67 45 20	Belt	平ベルト			
※	46	XX 67 45 30	Coil Spring	圧縮コイルバネ			
※	47	XX 67 45 40	Washer	平座金			
※	48	XX 67 45 50	Senser Switch PCB Ass'y	検地SW基板 Ass'y			
※	50	XX 67 45 60	Connecter	6P	コネクター		
※	51	XX 67 45 70	Assist Motor Ass'y	アシストモーター Ass'y			
※	53	XX 67 45 80	Gear	接片歯車			
※	54	XX 67 45 90	Contact Rotary	ロータリー接片			

*New Parts (新規部品)

Parts List for Carbon Resistor

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ353100	※	12KΩ	HJ357120	HF857120
1.8 "	HJ353180	※	15 "	HJ357150	HF857150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF857180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF857220
4.7 "	HJ353470	HF853470	27 "	HJ357270	HF857270
5.6 "	HJ353560	HF853560	33 "	HJ357330	HF857330
10 "	HJ354100	HF854100	39 "	HJ357390	HF857390
15 "	HJ354150	HF854150	47 "	HJ357470	HF857470
22 "	HJ354220	HF854220	56 "	HJ357560	HF857560
27 "	HJ354270	HF854270	68 "	HJ357680	HF857680
33 "	HJ354330	HF854330	82 "	HJ357820	HF857820
39 "	HJ354390	HF854390	91 "	HJ357910	HF857910
47 "	HJ354470	HF854470	100 "	HJ358100	HF858100
56 "	HJ354560	HF854560	120 "	HJ358120	HF858120
68 "	HJ354680	HF854680	150 "	HJ358150	HF858150
82 "	HJ354820	HF854820	180 "	HJ358180	HF858180
100 "	HJ355100	HF855100	220 "	HJ358220	HF858220
110 "	HJ355110	HF855110	270 "	HJ358270	HF858270
120 "	HJ355120	HF855120	330 "	HJ358330	HF858330
150 "	HJ355150	HF855150	390 "	HJ358390	HF858390
160 "	HJ355160	※	470 "	HJ358470	HF858470
180 "	HJ355180	HF855180	560 "	HJ358560	HF858560
220 "	HJ355220	HF855220	680 "	HJ358680	HF858680
270 "	HJ355270	HF855270	820 "	HJ358820	HF858820
330 "	HJ355330	HF855330	1.0MΩ	HJ359100	HF859100
390 "	HJ355390	HF855390	1.2 "	HJ359120	※
470 "	HJ355470	HF855470	1.5 "	HJ359150	HF859150
510 "	※	HF855510	1.8 "	HJ359180	HF859180
560 "	HJ355560	HF855560	2.2 "	HJ359220	HF859220
680 "	HJ355680	HF855680	3.3 "	HJ359330	HF859330
820 "	HJ355820	HF855820	3.9 "	HJ359390	※
910 "	HJ355910	HF855910	4.7 "	HJ359470	※
1.0KΩ	HJ356100	HF856100			
1.2 "	HJ356120	HF856120			
1.5 "	HJ356150	HF856150			
1.8 "	HJ356180	HF856180			
2.0 "	HJ356200	HF856200			
2.2 "	HJ356220	HF856220			
2.4 "	HJ356240	HF856240			
2.7 "	HJ356270	HF856270			
3.0 "	HJ356300	HF856300			
3.3 "	HJ356330	HF856330			
3.6 "	HJ356360	HF856360			
3.9 "	HJ356390	HF856390			
4.7 "	HJ356470	HF856470			
5.1 "	HJ356510	HF856510			
5.6 "	HJ356560	HF856560			
6.8 "	HJ356680	HF856680			
8.2 "	HJ356820	HF856820			
9.1 "	HJ356910	HF856910			
10 "	HJ357100	HF857100			

1/4W Type

HJ35○○○○

10mm

1/6W Type

HF85○○○○

5mm