

SERVICE MANUAL



MODEL 4MM-4600

4-CHANNEL MUSIC CENTER

DIMENSIONS

Center Unit : H — 5-5/8", W — 19", D — 15-3/4"
 Speaker System (Each) : H — 17-1/2", W — 10", D — 5-3/4"

WEIGHT

22 lbs.
 8.8 lbs.

SPECIFICATIONS

Type : 4-Channel Music Center with 4 Speaker Systems
Transistor : 1 FET, 38 Transistors
Diodes : 32 Diodes
FM Tuner Section
 Front End : 3-Gang Tuned Capacitor, 1 FET, 2 Silicon Transistors
 Tuning Range : 88~108MHz
 Sensitivity : 2.2 μ V (IHF)
 Stereo Separation : 35dB at 1kHz
 S/N : 70dB
 Image Rejection : 55dB
 Antenna Impedance : 300 Ω Balanced
AM Tuner Section
 Tuning Range : 535~1605kHz
 Sensitivity : 170 μ V/m (S/N 20dB)
 Image Rejection : 45dB
 S/N : 45dB

Audio Section
 Peak Music Power : 60W(15W $\times$ 4)
 IHF Dynamic Power : 32W(8W $\times$ 4)
 Continuous Power : 28W(7W/CH Driven $\times$ 4)
 Total Harmonic Distortion : 3% at Rated Power
 Input Sensitivity :
 PHONO : 150mV/1M Ω
 TAPE IN : 300mV/100K Ω
 Recording Out Level : 150mV/80K Ω

Speaker System
 Type : 2-Way, 2 Speakers Acoustic Suspension
 Speaker : Woofer — 6 1/2" (SK-2162He)
 Tweeter — 2" (SK-2131Be)
 Impedance : 8 Ω

Power Consumption : 75 Watts

Power Supply : AC 120V, 60Hz

DISASSEMBLY

■To remove chassis

Remove eight screws Fig. 1, ① on bottom of cabinet, then pull chassis out in a forward direction (See Fig. 2).

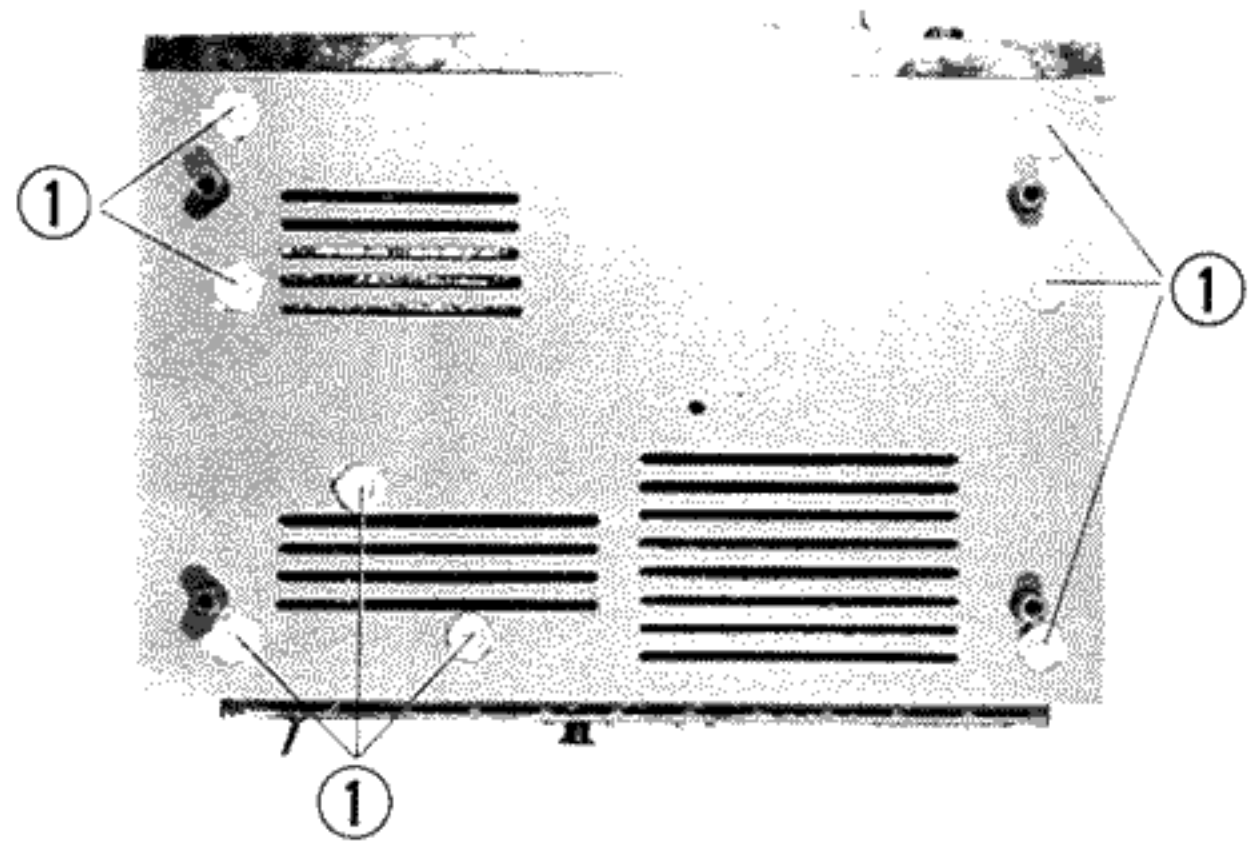


Fig. 1

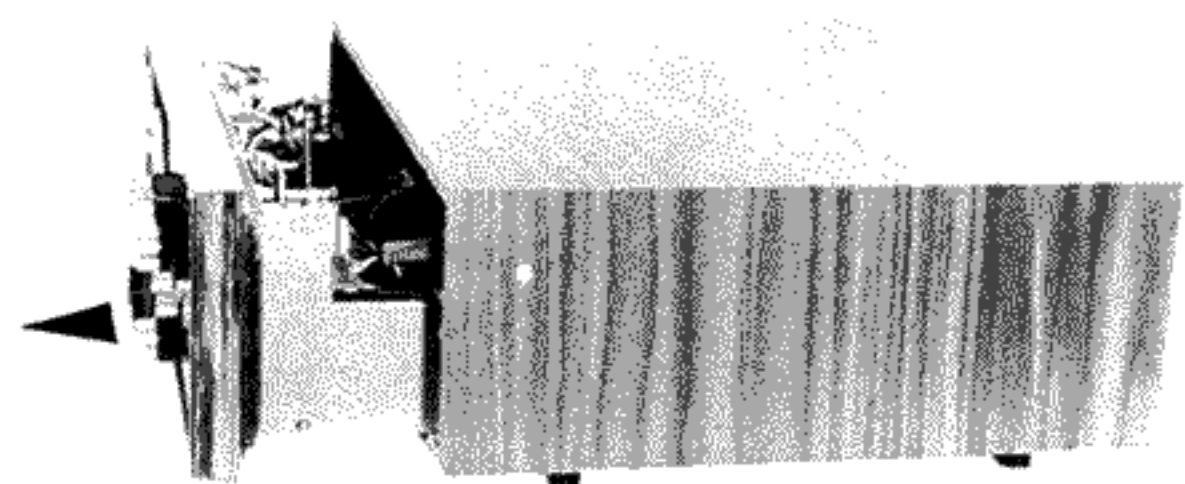


Fig. 2

■To remove front panel

- 1. Remove chassis from cabinet, and pull off all knobs.
- 2. Remove five screws Fig. 3, ②.
- 3. Front panel is now accessible for removal.

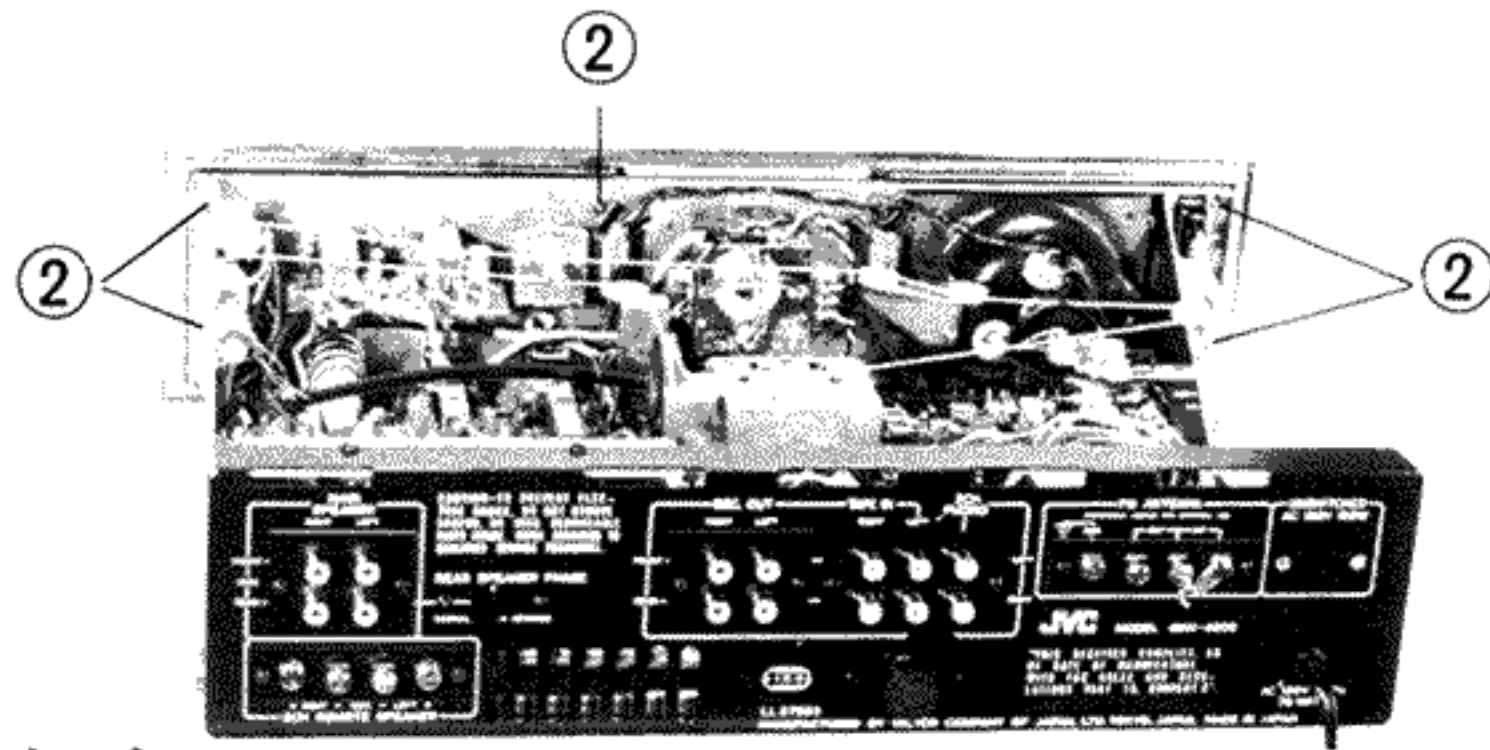


Fig. 3

■To replace control parts on front panel

- 1. Remove front panel as explained before.
- 2. Any parts on the front bracket can then be simply replaced.

FRONT PANEL DISASSEMBLY

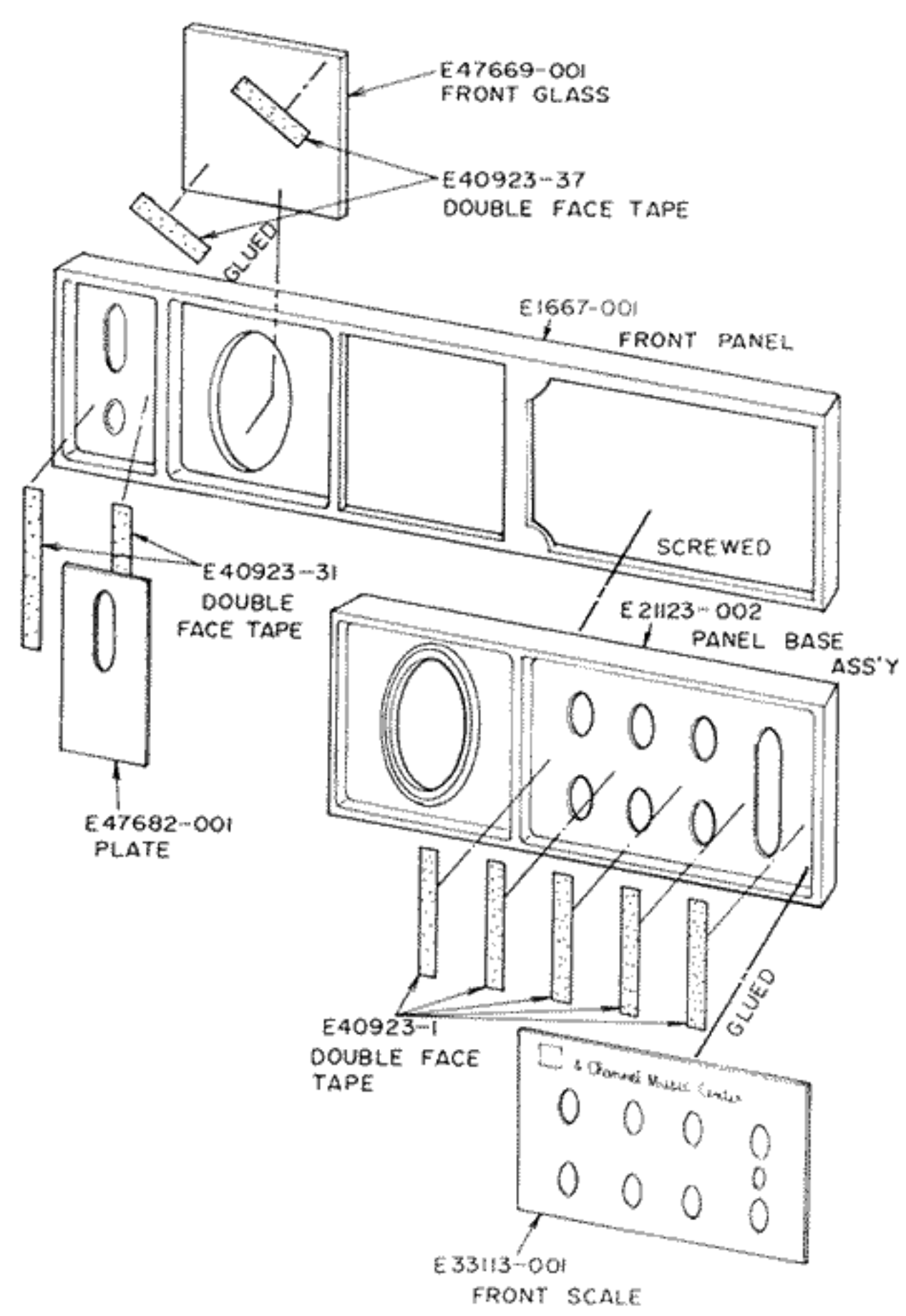


Fig. 4

MAIN PARTS ARRANGEMENT

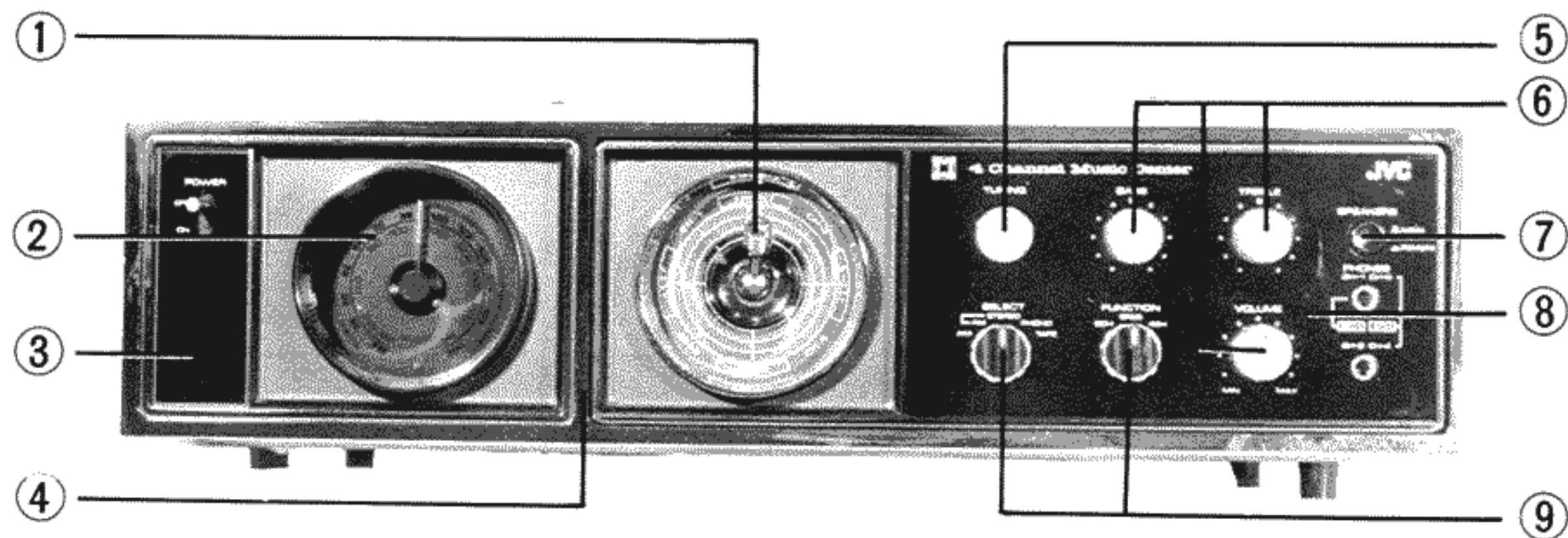


Fig. 5

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E47008-002S	P.P.C. Balance Knob	6	E47686-002	Knob
2	E47669-001	Front Glass	7	E03422-001	Push Switch Knob
3	E47682-001	Plate	8	E33113-001	Front Scale
4	E1667-001	Front Panel	9	E03422-001	Knob
5	E47686-001	Tuning Knob			

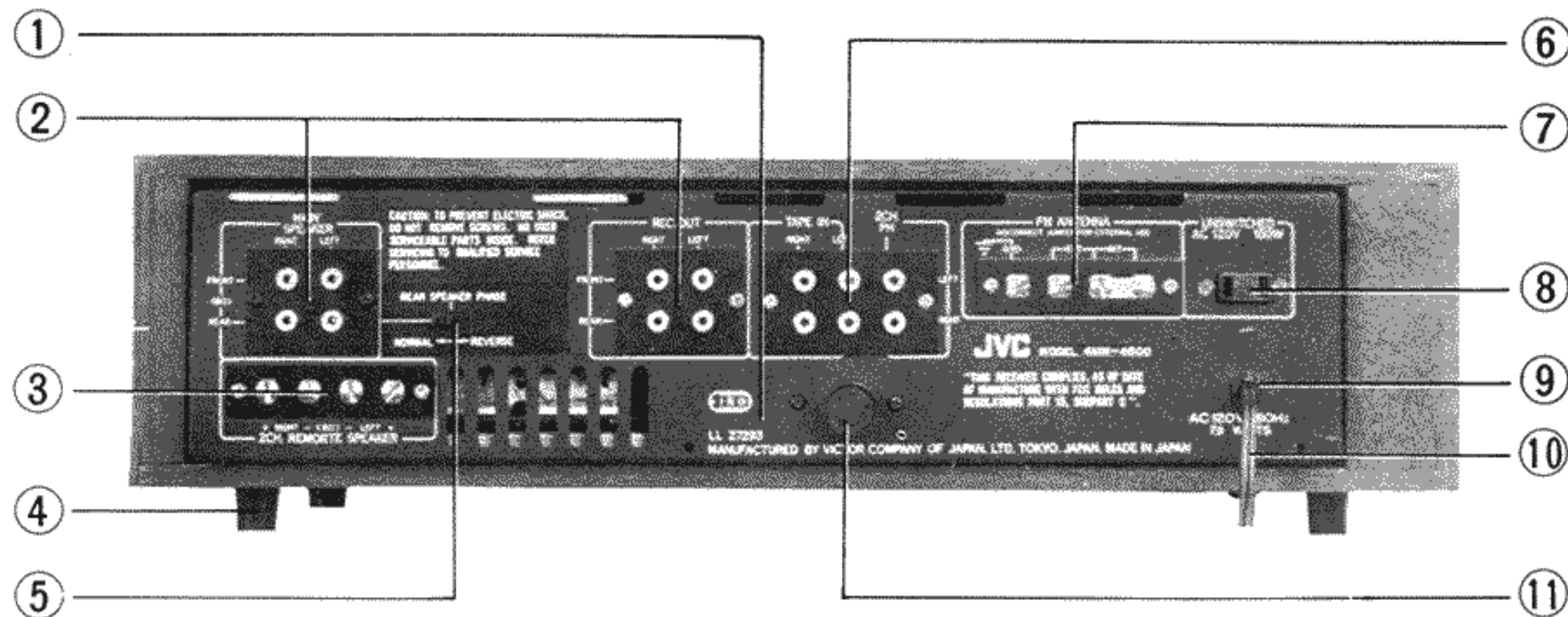


Fig. 6

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E21122-001	Rear Panel	7	Q30156-005	Terminal Board Ass'y
2	E03043-40	Pin Jack Ass'y	8	Q30120-1	AC Socket Ass'y
3	Q30156-002	Terminal Board Ass'y	9	E31704-001	Strain Releif
4	QZF-1720-001	Foot	10	Q03056-14	Power Cord with Plug
5	Q03752-001S	Slide Switch	11	Q30090-1	Plug Ass'y
6	E03043-60	Pin Jack Ass'y			

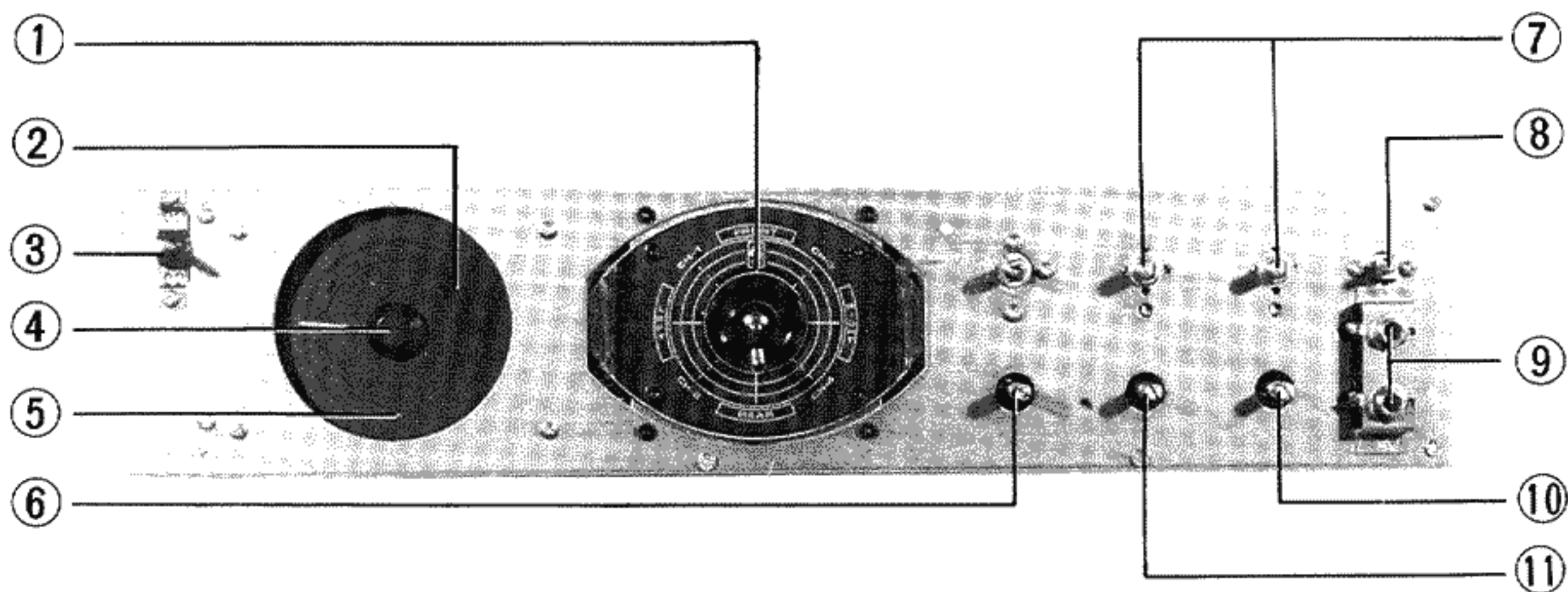


Fig. 7

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E33112-001	P.P.C. Scale	7	E03443-001	Variable Resistor
2	E33095-001	Dial Scale	8	Q30510-001	Push Switch
3	QSU1220-002	Lever Switch	9	Q03958-001	Headphone Jack
4	E47660-001	Dial Pointer Ass'y	10	E03485-001	Variable Resistor
5	E45503-001	Rabbit Eye	11	QSR4663-500	Slide Rotary Switch
6	QSR4665-500	Slide Rotary Switch			

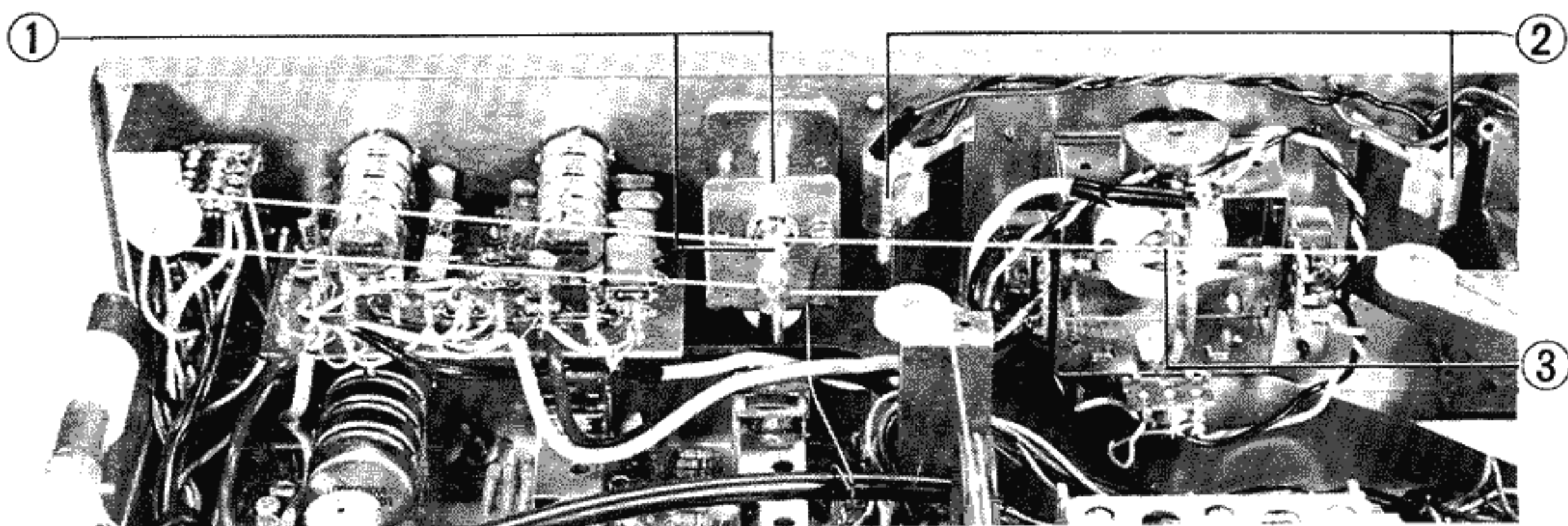


Fig. 8

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E46702-002	Tuning Shaft Ass'y	3	E03440-002	Pin Point Balance Control
2	50689	Lamp Socket			

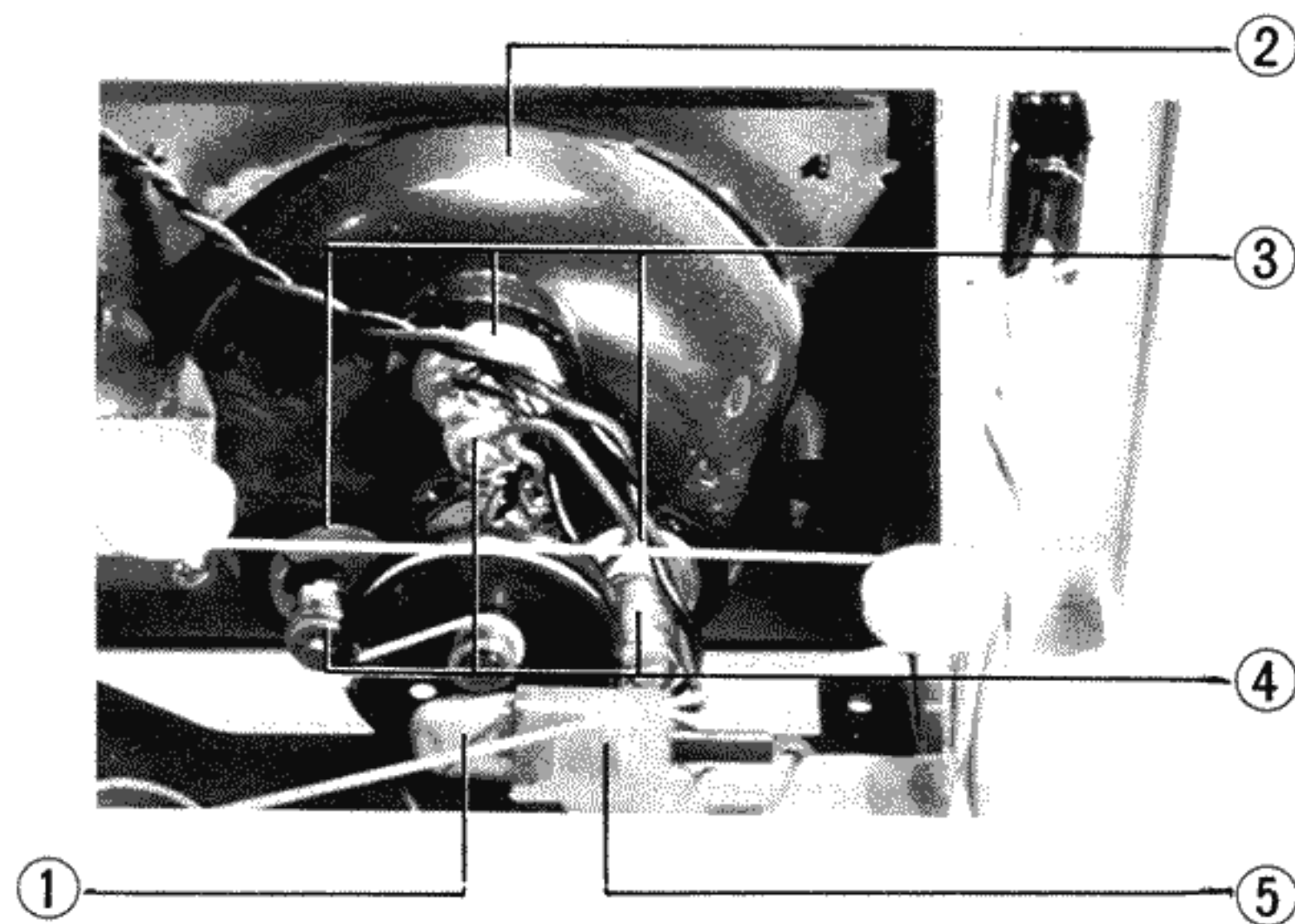


Fig. 9

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E5507	Lamp Cap	4	Q30110-A	Lamp Socket
2	E33094-001	Lamp Housing	5	50689	Lamp Socket
3	E44920-001	Rubber Bushing			

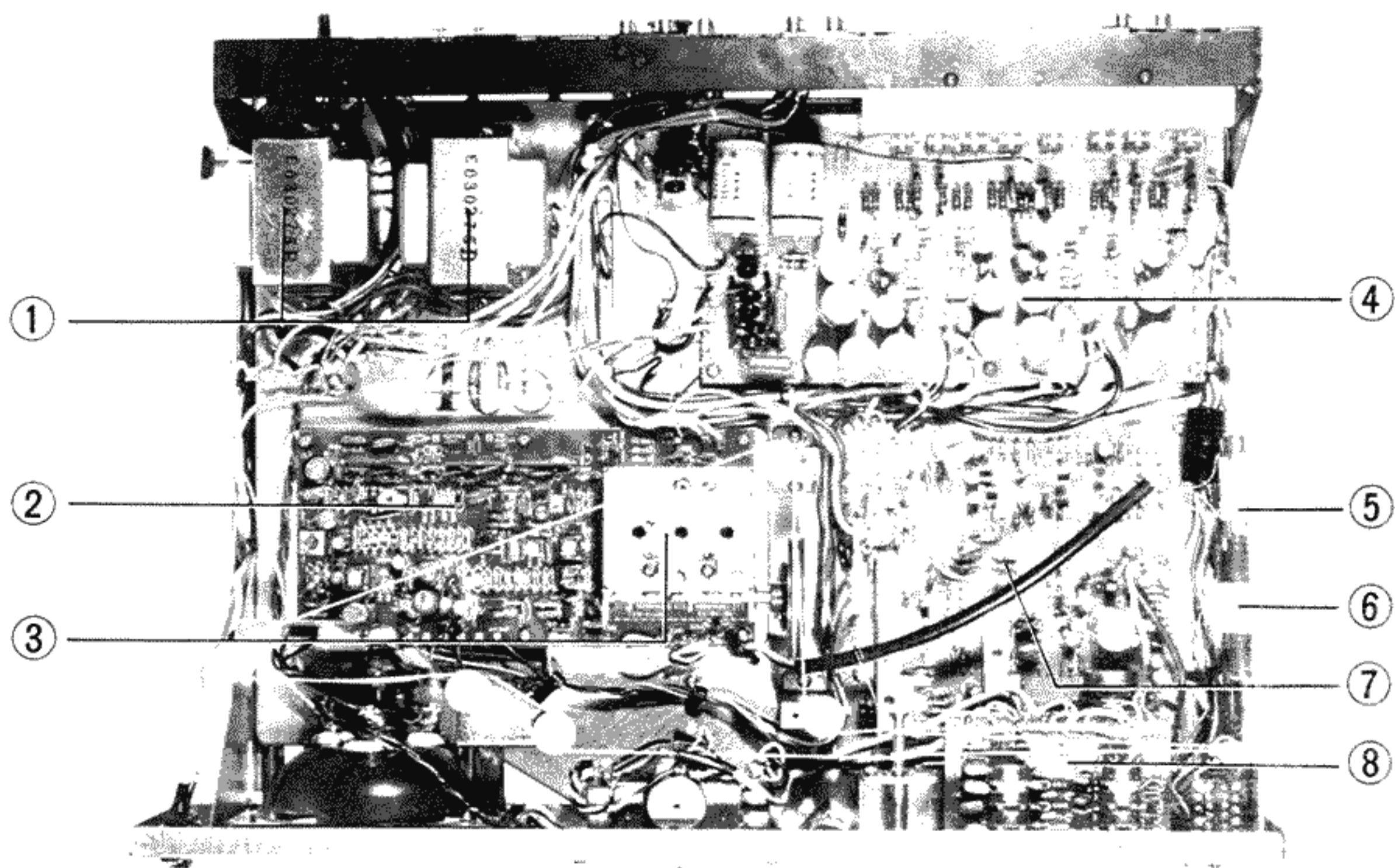


Fig. 10

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E03027-5B	Power Transformer	5	E03145-010	Ferrite Core Antenna
2	TFM-311UA-3	FM/AM Tuner Ass'y	6	E43674-001	Bar Antenna Holder
3	E03365-006	FM Tuner Head	7	TAE-61	Pre-Amp. Circuit Ass'y
4	TAP-159	Main Amp. & Rectifier Circuit Ass'y	8	TAC-225	Tone Control Circuit Ass'y

TUNER ALIGNMENT INSTRUCTION

Maintain regular line voltage. Use only enough generator output to obtain suitable indication. Allow a few minutes warm up for receiver and equipment.

[NOTE] Before aligning, connect 8 ohms speakers to FRONT speaker jacks on the rear of center unit, and set Volume to MAX position, tone controls to center position and Function Selector to 2CH position.

AM ALIGNMENT — Input Selector to AM position —

Test Equipment

a) Signal Generator : Fashion loop of several turns of wire and connect generator across loop. Then set it to 455kHz (When IF alignment), and place the loop as shown in Fig. 11.

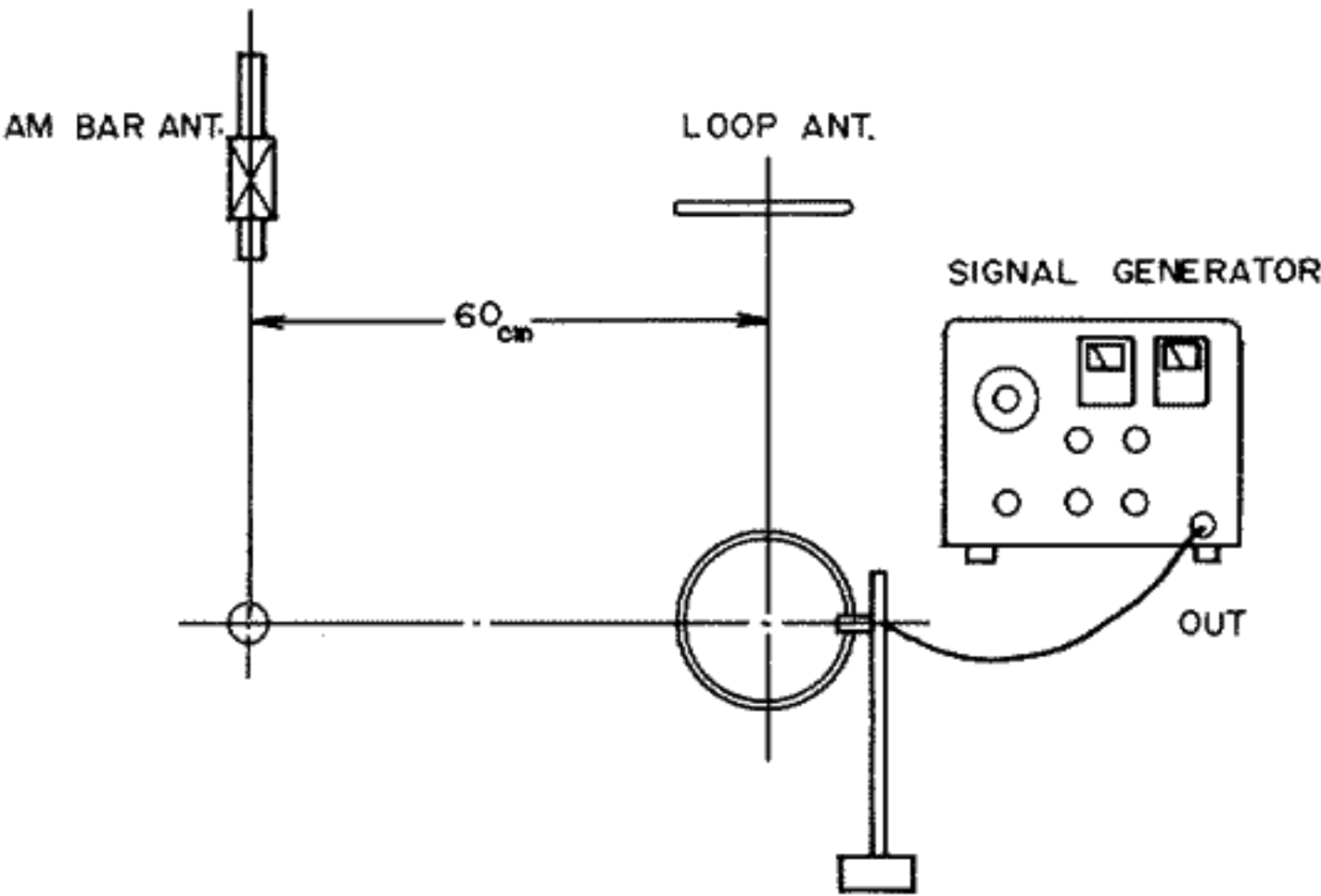


Fig. 11

b) VTVM : Set to AC lowest range and connect to FRONT speaker jacks. Adjust generator output so that the VTVM reading becomes 2V (500mW/8 ohms) approximately.

1. IF Alignment

Set the tuning to minimum position, and adjust T202 to maximum gain and symmetric characteristic.

2. RF Alignment

STEP	GENERATOR FREQUENCY	DIAL SETTING	ADJUST (See Fig. 17.)	REMARKS
1	530kHz (400Hz, 30%, Mod.)	Starting point	T201	Rock tuning gang.
2	1650kHz (400Hz, 30%, Mod.)	180° from starting point	TC202	Rock tuning gang. Repeat steps 1 and 2.
3	1400kHz (400Hz, 30%, Mod.)	Tune to signal	TC201	Adjust for maximum.
4	600kHz (400Hz, 30%, Mod.)	Tune to signal	Ferrite Antenna	Adjust for maximum. Repeat steps 1 through 4.

FM ALIGNMENT AND CHECK

— Input Selector to FM Position —

1. IF Wave Form Check

- Connect FM IF Sweeper Output to the test point of front end and Input to the test point (No.4) of ICF-1 or ICF-2. (See Figs. 12 and 16.)
- Be sure IF wave forms are normally as illustrated in Fig. 14.

2. S Curve Check

- Connect FM IF Sweeper Output as explained before and Input between R209 and C215. (See Figs. 13 and 16.)
- Be sure S curve is normally as illustrated in Fig. 15.

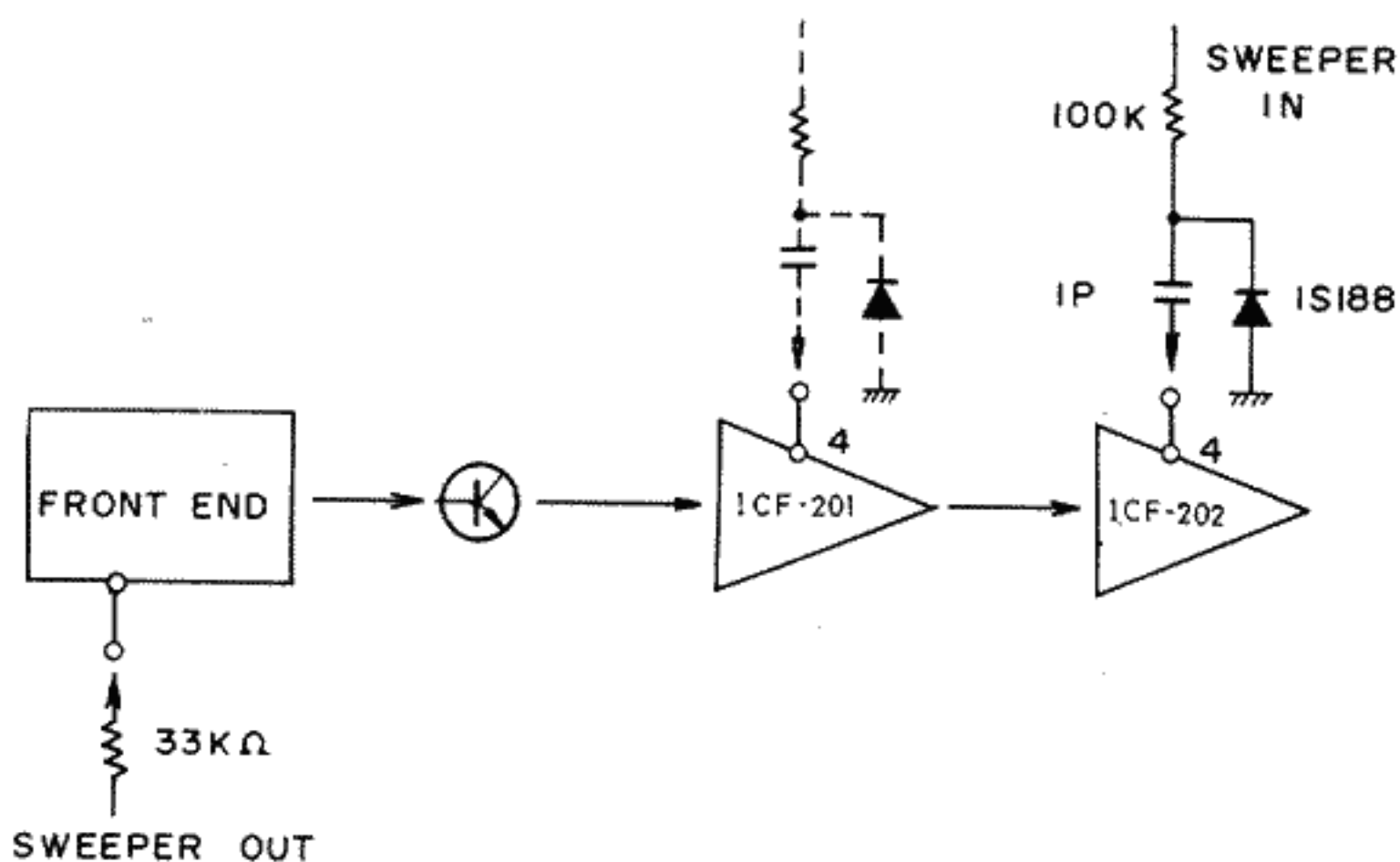


Fig. 12

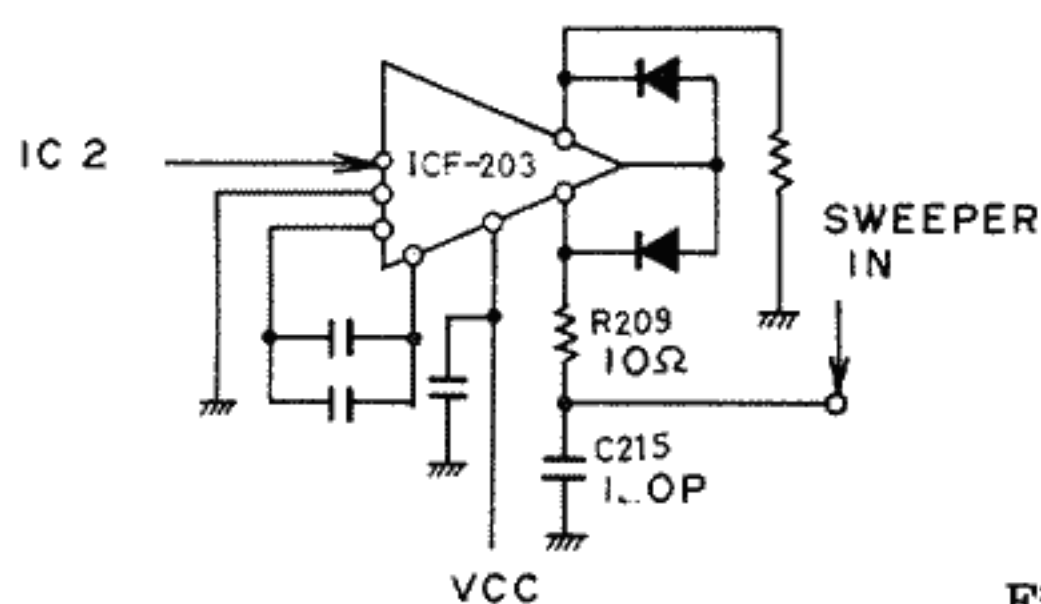


Fig. 13

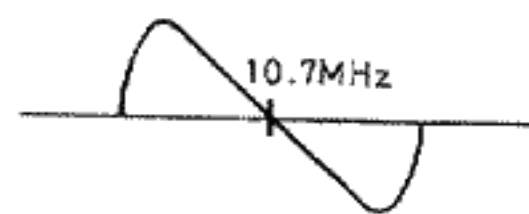


Fig. 14

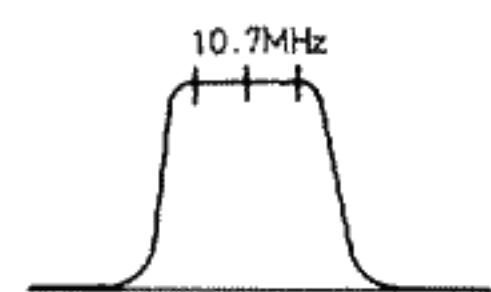


Fig. 15

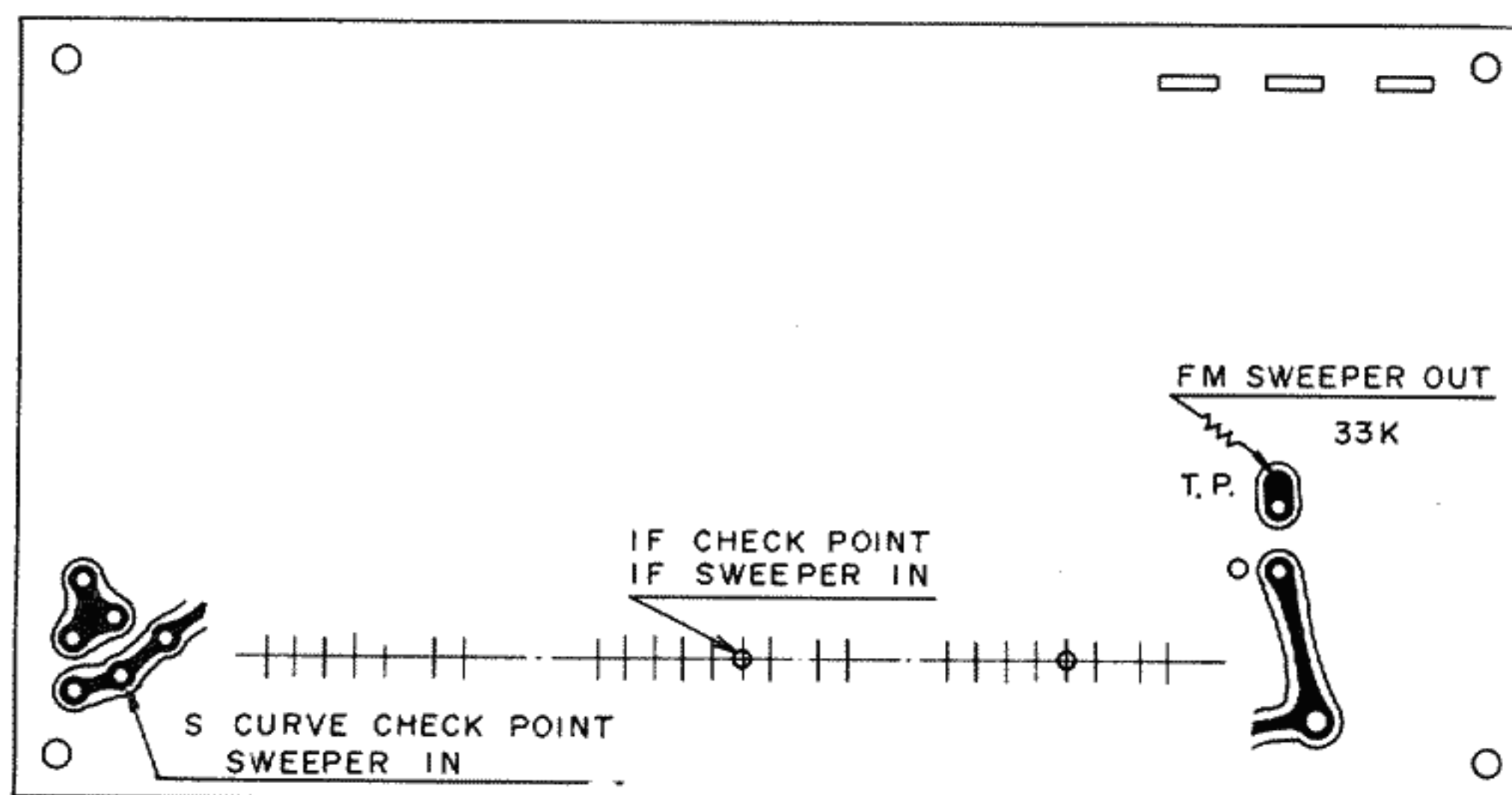


Fig. 16

3. RF Alignment

Connect FM Signal Generator Output to FM antenna terminals on the rear.

STEP	GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST (See Fig.17.)	REMARKS
1	88MHz (400Hz, 30%, Mod.)	10° from starting point	Connect V.T.V.M. to FRONT speaker jacks.	LO	Rock tuning gang.
				LA LR	Adjust for maximum.
2	108MHz (400Hz, 30%, Mod.)	165° from starting point		CTO	Rock tuning gang.
				CTA CTR	Adjust for maximum.
3	98MHz (400Hz, 30%, Mod.)	84° from starting point.			Check dial scale. Repeat steps 1 through 3 until no further improvement can be made.

TUNER ALIGNMENT POINT

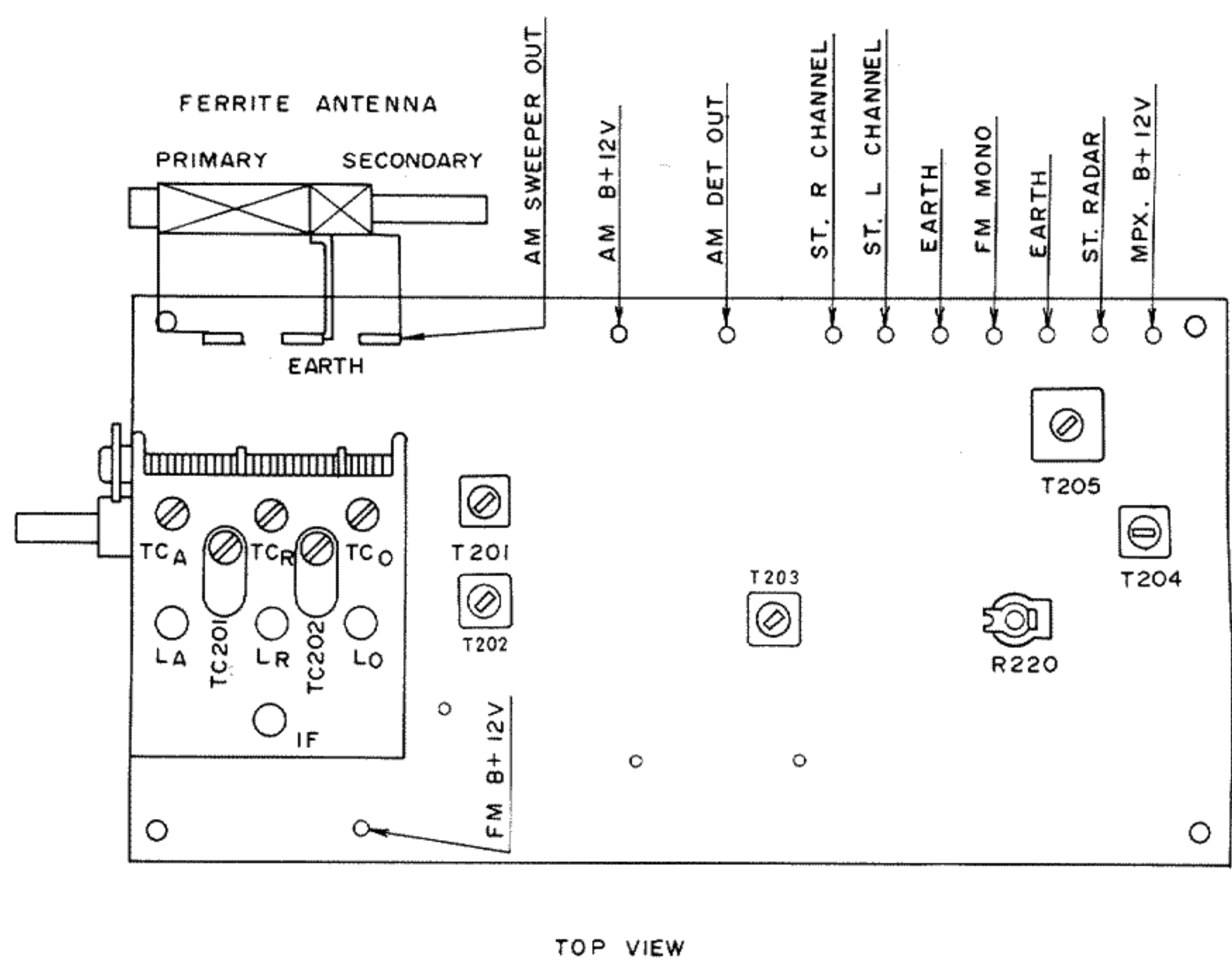


Fig. 17

DIAL CORD STRINGING

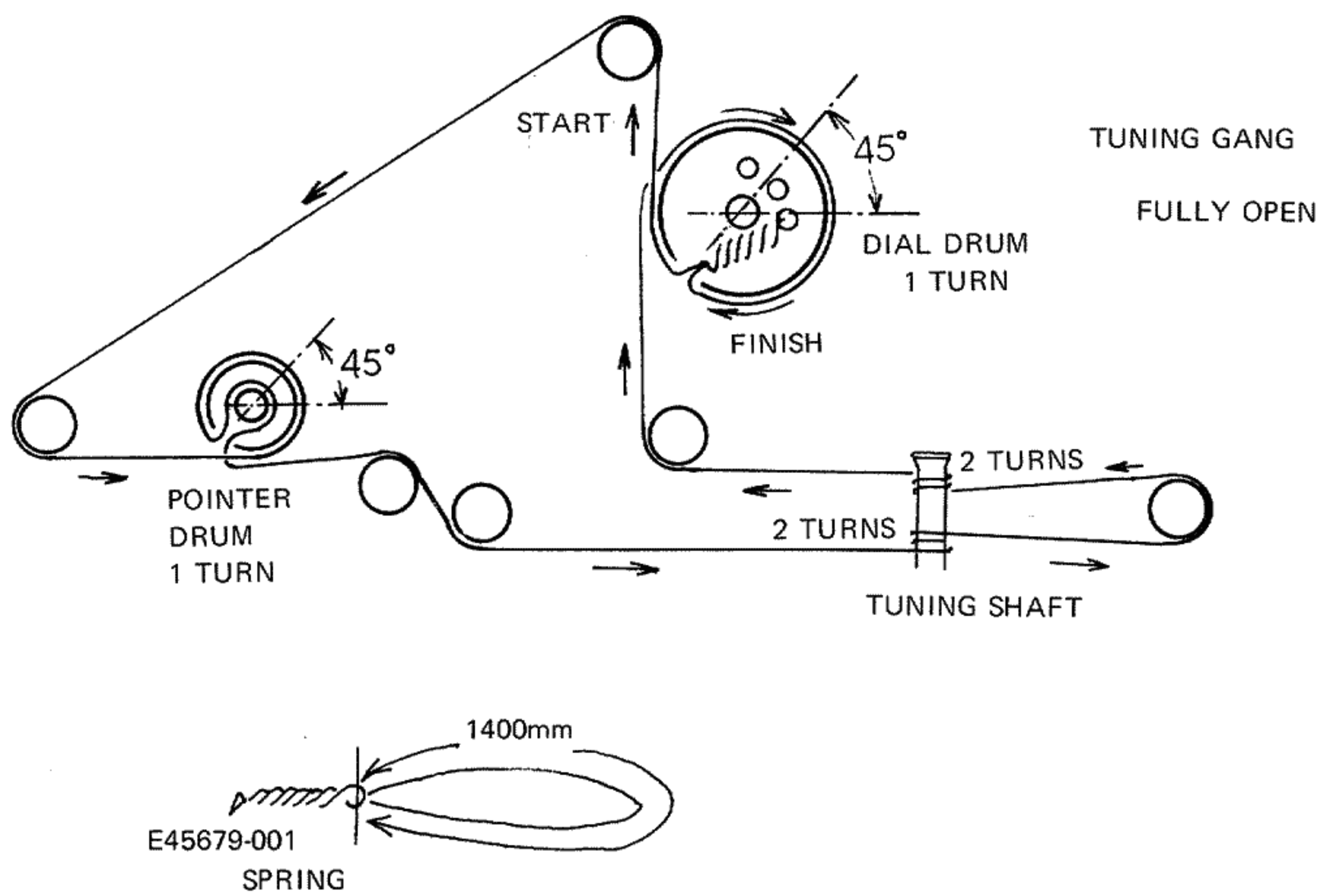


Fig. 18

PARTS ARRANGEMENT ON CIRCUIT BOARD

TAP-159 MAIN AMP. CIRCUIT

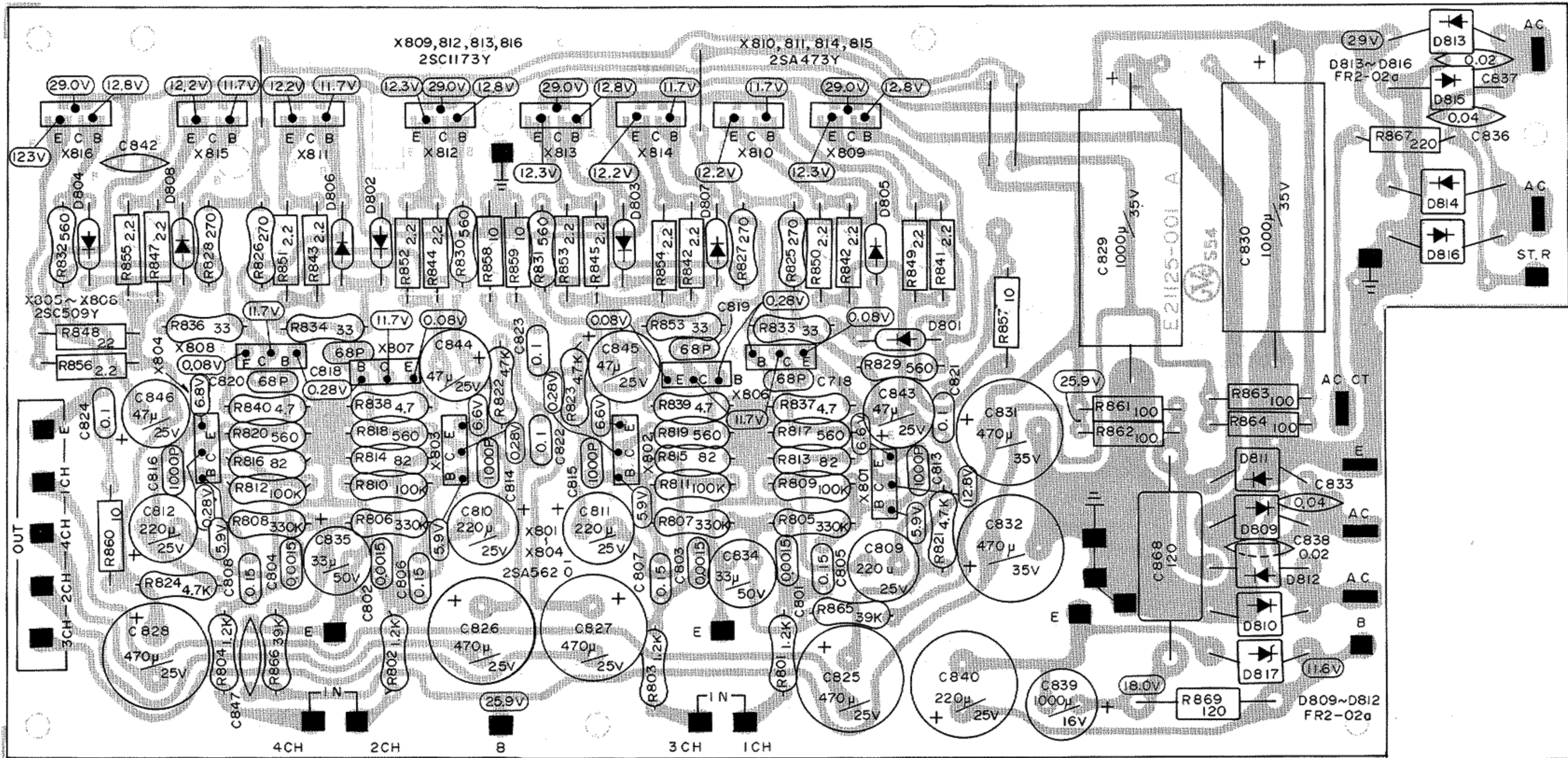


Fig. 19 Bottom View

Parts No.	Parts Name	Symbol No.	Description
Transistors			
2SA562(O)V	Silicon Transistor	X801~804	Toshiba
2SC509Y	"	X805~808	"
2SC1173Y	"	X809,812,813,816	"
2SA473Y	"	X810,811,814,815	"
Diodes			
1S990	Varistor	D801~808	JRC
FR2-02	Silicon Diode	D809~816	Fuji
E0771-7	Zener Diode	D817	Fuji (ZB1-12)
Resistors			
Q04772-120	Oxidized Metal Film Resistor	R868,869	120Ω, 2W, ±10%
※ Q04800-	Carbon Resistor		¼W, ±10%
		R837~840	4.7Ω
		R817~820	560Ω
		R801~804	1.2kΩ
		R821~824	4.7K
		R865~866	39K
		R809~812	100K
		R805~808	330K
Q04799-82	"	R813~816	82Ω, ¼W, ±5%
" -33	"	R833~836	33Ω "

Parts No.	Parts Name	Symbol No.	Description
※ 04091-	Composition Resistor		¼W, ±10%
		R841~856	2.2Ω
		R857~860	10Ω
		R861~864	100Ω
		R867,870~873	220Ω
		R829~832	560Ω
Capacitors			
Q03108-1000	Electrolytic Capacitor	C839	1000μF, 16V
Q03110-50	"	C843~846	47μF, 25V
" -200	"	C809~812,840	220μF, "
" -500	"	C825~828	470μF, "
Q03112-30	"	C834,835	33μF, 35V
Q03138-470	"	C831,832	470μF, 50V
Q03137-1000E	"	C829,830	1000μF, 50V
Q04051-68	Ceramic Capacitor	C817~820	68pF, 50V, ±10%
Q46962-1000	"	C813~816	1000pF, 50V
" -022	"	C837,838	0.022μF, 50V
" -04	"	C833,836,842,847	0.04μF, 50V
※ Q03244-	Mylar Capacitor		50V, ±10%
		C801~804	0.0015μF
		C821~824	0.1μF,
		C805~808	0.15μF

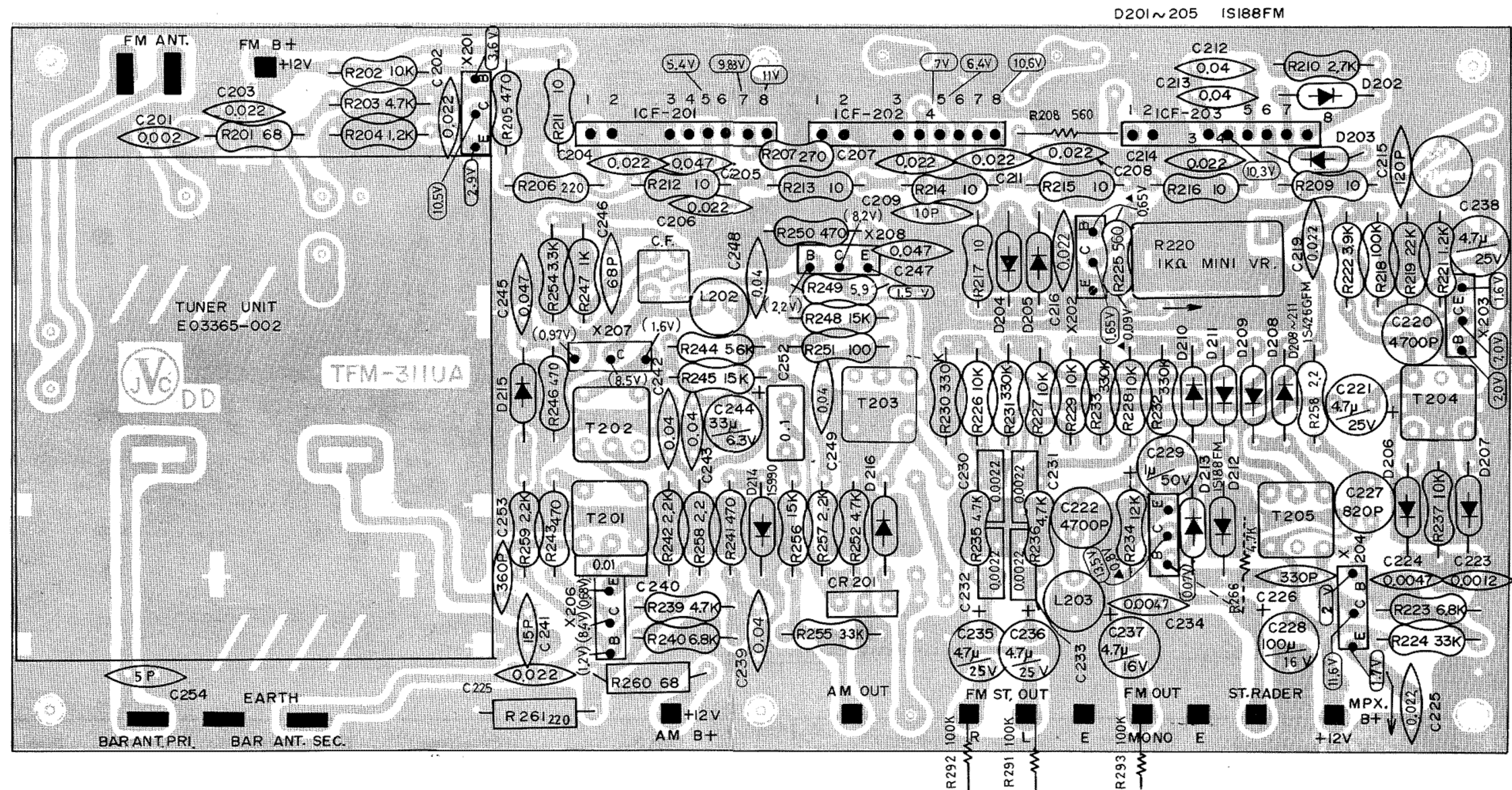


Fig. 20 Bottom View

Parts No.	Parts Name	Symbol No.	Description
Tuner Head E03365-006	FM Tuner Head		
Transistors 2SC710B 2SC711F 2SC711E 2SC710C	Silicon	X201 X202,205 X203,204 X206,207,208	Mitsubishi " " "
Diodes 1S426GFM 1S188FM 1S990	Germanium " Varistor	D208~211 X202~207,212,213, 216 D214,215	Sanyo " JRC
Coils & Transformers E03145-010 E03079-13 E03117-003 " -010 E0747-1	Ferrite Core Antenna MW Osc. Coil Multiplex Coil " Ferrite Inductor	T201 T204 T205 L203	AM 15mH

Parts No.	Parts Name	Symbol No.	Description
E03062-26 " -29 E0747-14	AM IF Transformer " Ferrite Inductor	T202 T203 L201	AM Detector 15mH
ICs & Me.cha. Filter E03450-001 " -002 " -003 E03391-001	FM IC Amp. " " Ceramic Filter	ICF-201 ICF-202 ICF-203 CF-201	FM, 1st FM, 2nd FM, 3rd AM, 2nd
Resistors * Q04800-	Carbon	R209,213~217 R201 R206,251 R207 R205,241,243,246, 250 R208,225 R247,259	1/4W, ±10% 10Ω 68Ω 100Ω 270Ω 470Ω 560Ω 1K 1.2K

Parts No.	Parts Name	Symbol No.	Description
※Q04800-	Carbon	R210 R242,259 R254 R203,239,252,265, 235,236 R222 R249 R240,223 R202,237,226~229 R234 R245,248,256 R219 R224,255 R244 R218,291~293 R230~233 R260 R261	2.7K 2.2K 3.3K 4.7K 3.9K 5.6K 6.8K 10K 12K 15K 22K 33K 56K 100K 330K 68Ω, ½W, ±10% 220Ω "
04091-68 " -220	Composition "		
Capacitors			
Q03104-30	Electrolytic	C244	33μ, 6.3V
Q03108-5	"	C221,235~238	4.7μ, 16V
Q03108-100	"	C228	100μ, 16V
Q03112-1	"	C229	1μ, 50V
※Q04051-	Ceramic		DC 50V, ±5%
		C254 C241 C209 C246 C226 C215 C253,208	5P 15P 10P 68P 330P 120P 360P DC 50V,
※Q46962-	Ceramic		
		C208~211,214,216, 238 C212,213,239,242, 243,248,249 C245,247,205	0.022μ 0.04μ 0.047μ, DC 50V DC 50V, ±10%
E03375-047 ※Q03244-	Ceramic Mylar	C223 C230,231~233 C224,234 C219,225 C240 C252 C220,222 C227	0.0012μ 0.0022μ 0.0047μ 0.022μ 0.01μ 0.1μ 4700P, DC 125V, ±5% 820P, "
Q03269-472 " -821	Polystyrol "		
Other Q0752-9	CR. Block	CR201	

[NOTE] When you request the resistor or capacitor marked with ※, write the required resistance or capacitance value in addition to the right-hand side of hyphen.
(For example : 04090-1K, Q03244-0.01μF)

TAE-61 PRE AMP. CIRCUIT

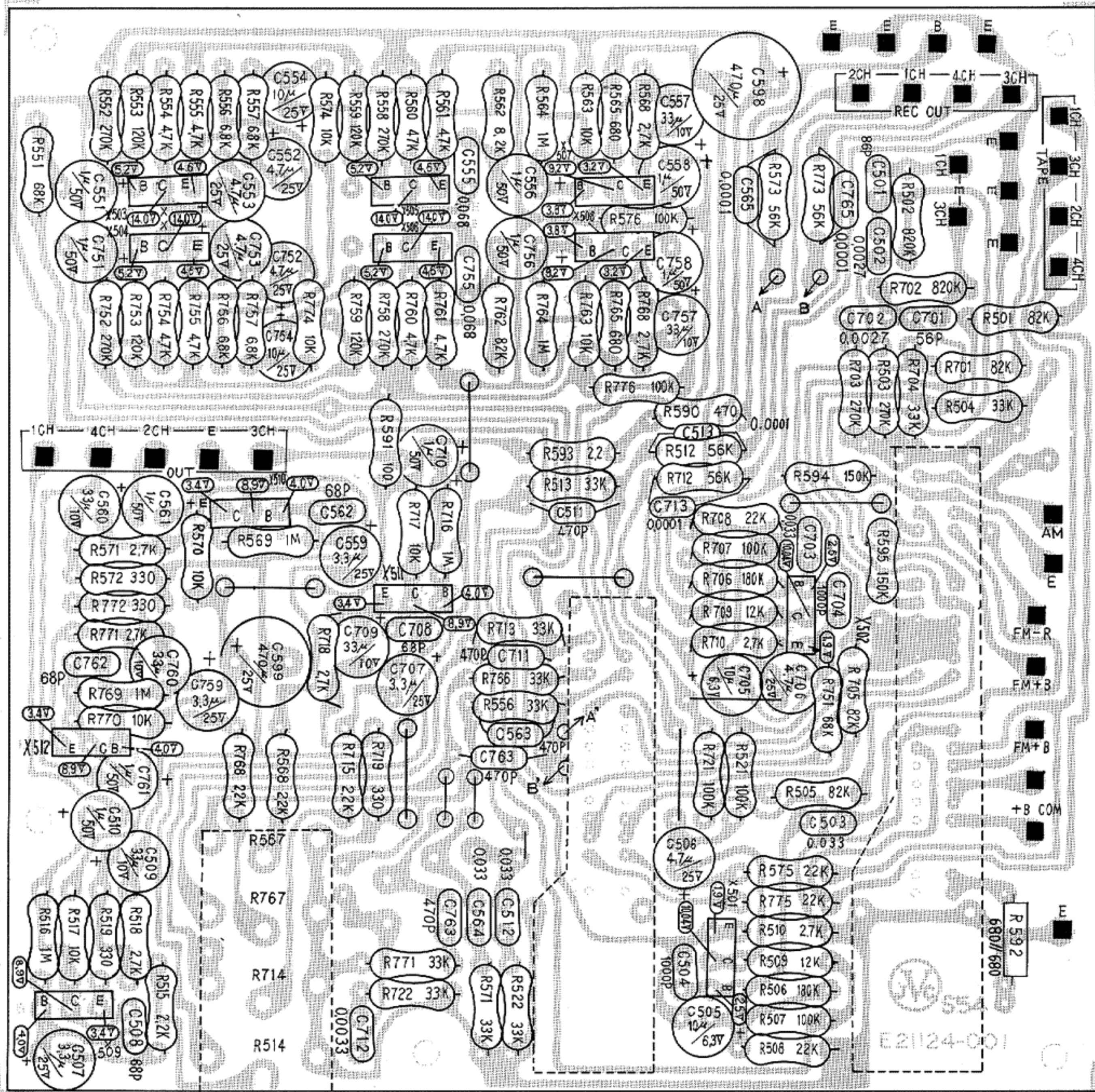


Fig. 21 Bottom View

TAE-61 PRE AMP. CIRCUIT

Parts No.	Parts Name	Symbol No.	Description
Transistors 2SC458LGC	Silicon Transistor	X501~512	Hitachi
Resistors E03485-001 ※ Q04800-	Variable Resistor Carbon Resistor	R514,567,714,767 R593 R591 R519,572,719,772 R590 R565,765 R515,518,715,768 R510,518,571,577,710,718, 771 R554,555,560,561,754,755, 760,761 R556,557,756,757,762 R562 R517,563,570,574,717,763, 770,774 R509,709 R508,575,708,775 R504,513,566,704,713,766 R512,573,712,773 R551,751 R501,505,701,705 R507,521,576,707,721,776 R553,559,753,759 R593~595 R506,706 R503,552,558,703,752,758 R502,702 R516,564,569,716,764,769 R592	100k Ω (B), Volume $\frac{1}{4}$ W, $\pm 10\%$ 2.2 Ω 100 Ω 330 Ω 470 Ω 680 Ω 2.2K 2.7K 4.7K 6.8K 8.2K 10K 12K 22K 33K 56K 68K 82K 100K 120K 150K 180K 270K 820K 1M 680 Ω , $\pm 10\%$, $\frac{1}{2}$ W
04091-680	Composition Resistor		
Capacitors QEB41EM-335 Q03106-10 " -30 Q03110-4.7 " -10 " -500 Q03112-1 ※ Q03244-	Electrolytic Capacitor " " " " " " Mylar Capacitor	C507,559,707,759 C505,705 C509,557,560,709,757,760 C506,552,553,706,752,753 C510,554,561,710,754,761 C598,599 C551,556,558,751,756,758 C513,565,713,765 C502,596,702 C755 C503,512,564,703,712,764 C555 C501,701 C508,562,708,762 C511,563,711,763 C504,704	3.3 μ F, 25V 10 μ F, 10V 33 μ F, " 4.7 μ F, 35V 10 μ F, 35V 470 μ F, 35V 1 μ F, 50V 50V, $\pm 10\%$ 0.001 μ F 0.0027 μ F 0.015 μ F 0.033 μ F 0.068 μ F 56pF, 50V, $\pm 5\%$ 68pF, " 470pF, " 100pF, 50V
Q04051-56 " -68 " -470 Q46962-1000	Ceramic Capacitor " " "		
Others QSR4663-500 QSR4665-500	Slide Rotary Switch "		Function Select

THE LIST OF MAIN PARTS FOR REPLACEMENT

Parts No.	Parts Name	Symbol No.	Description
Housing (Control Unit)			
DL-ED92297 E7857-1 LPSP4010ZS E1667-001 E21123-002 E47682-001 E33113-001 E47669-001 E21122-001	Cabinet Case Washer Assembly Screw Front Panel Panel Base Assembly Plate Front Scale Front Glass Rear Panel		Hold Cabinet to Chassis for Power Switch for Controls for Dial Front Panel Ass'y
Chassis Mechanism			
E46702-002 E33111-001 E33112-001 E46891-006 E47113-001 E33094-001 E33095-001 E47660-001 E43552-001S Q03990-C E45679-001	Tuning Shaft Ass'y P.P.C. Back Panel P.P.C. Scale P.P.C. Plate P.P.C. Ring Lamp Housing Dial Scale Dial Pointer Ass'y Drum Ass'y Dial Drum Ass'y Spring		for Dial Pointer for Dial Stringing for Dial Stringing
Knobs			
E47686-001 E47686-002 E47687-001 E03422-001 E47008-003	Knob " " " "		Tuning Volume, Bass, Treble Select, Function Speaker P.P.C. Balance
Switches			
QSU1220-002 QSR4663-500 QST4665-500 Q30510-001 Q03752-001S	Lever Switch Slide Rotary Switch Slide Rotary Switch Push Switch Slide Switch		Power, UL Aprovod Function Select Speaker Select Speaker Phase Shift Switch
Sockets, Jacks & Plugs (Center Unit)			
QMC0889-002 Q30091-1 Q30120-1 Q30110-A 50689 Q30090-1 Q03056-14 E03043-40 E03043-60 Q03958-001 Q30156-002 Q30156-005	8-pin Socket Ass'y 7-pin Socket Ass'y AC Socket Ass'y Lamp Socket Ass'y Lamp Socket Plug Ass'y Power Cord with Plug Pin Jack Ass'y Pin Jack Ass'y Headphone Jack Terminal Board Ass'y Terminal Board Ass'y		Remote Control for Speaker Phase Switch AC Outlet for P.P.C. Indicator & Pointer Lamps for Dial Illumination Lamp for Speaker Phase Switch UL, CSA Approved Main Speaker, Rec. Out Tape In. & Phono Remote Speaker FM Antenna

Parts No.	Parts Name	Symbol No.	Description
Transistors			
2SC710B	Silicon Transistor	X201	Mitsubishi
2SC711F	"	X202,205	"
2SC711E	"	X203,204	"
2SC710C	"	X206~208	"
2SC458LGC	"	X501~512	Hitachi
2SA562OV	"	X801~804	Toshiba
2SC509Y	"	X805~808	"
2SC1173Y	"	X809,812,813,816	"
2SA473Y	"	X810,811,814,815	"
Diodes			
1S188FM	Silicon Diode	D202~207,212,213	Sanyo
1S426GFM	"	D208~211	"
1S990	Varistor	D214,215,801~808	JRC
FR2-02	Silicon Diode	D809~816	Fuji
E0771-7	Zener Diode	D817	Fuji (ZB1-12)
Tuner Head, Filter & ICs (Integrated Circuit Ass'y)			
E03365-006	Tuner Head		FM
E03399-001	Ceramic Filter	CF-201	AM IF
E03450-001	FM IC Amp.	ICF-201	FM IF 1st
E03450-002	"	ICF-202	FM IF 2nd
E03450-003	FM IC Discriminator	ICF-203	FM IF 3rd
Coils, Transformers & Inductors			
E03145-010	Ferrite Core Antenna		AM Antenna
E03079-13	OSC Coil	T201	AM Oscillator
E03074-4	Chock Coil	L202	3.3mH
E03117-003	MPX Coil	T204	
E03117-010	"	T205	
E03062-26	AM IF Transformer	T202	AM IF 1st
E03062-29	AM Det. Transformer	T203	AM IF 3rd
E0747-14	Ferrite Inductor	L201	15mH
E0747-1	Ferrite Inductor	L203	
E03027-5B	Power Transformer		
E03108-011	Choke Coil	L601~604	
E0747-10	Ferrite Inductor	L605,606	
E0747-9	Ferrite Inductor	L607,608	
Resistors			
E03443-001	Variable Resistor	R601~604,609~612	100k Ω (A), Bass & Treble
E03485-001	"	R514,567,714,767	100k Ω (B), Volume
Q04843-5	"	R222	1k Ω , FM Stereo Separation
Q04772-120	Oxided Metal Film Resistor	R868,869	2W, $\pm 10\%$
E03440-002	Variable Resistor	R1~4	Pin Point Balance Control
Capacitors (Center Unit)			
Q03269-472	Polystyrol Capacitor	C220,222	4700pF, DC 125V, $\pm 5\%$
Q03269-821	"	C227	820pF, DC 125V, $\pm 5\%$
Q03137-1000E	Electrolytic Capacitor	C829,830	1000 μ F, DC 50V
Q03108-1000	"	C839	1000 μ F, DC 16V

Parts No.	Parts Name	Symbol No.	Description
Miscellaneous (Center Unit)			
Q04967-4FK	Pilot Lamp		8V, 150mA, for Dial Pointer & Dial Illumination
Q04967-9FK	Pilot Lamp		8V, 300mA, for P.P.C.
Q04962-003	Pilot Lamp		6V, 25mA, for Stereo Indicator
E5507	Lamp Cap		
E47659-001	Bushing		
E44920-001	Rubber Bushing		for Dial Illumination Lamp
E46029-001	Rubber Bushing		for Stereo Indicator Lamp
E43323-003	Nut		for Lamp Housing
E31704-001	Strain Relief		for Power Cord
E33107-001	Heat Sink		for Power Transistor
E47725-001	Sub Heat Sink		for Power Transistor
4MM-4600-PK	Packing Case Ass'y		for Center Unit & Speaker System
Speaker System (MSB-210UA)			
DL-ED92271	Cabinet		Complete Assembly with Back Board
SK-2162He	6½" Speaker		Woofer
SK-2131Be	2" Speaker		Tweeter
Q03160-2	Non-Polarized Capacitor		2μF, 25V
E31801-007	Speaker Cable Assembly		with Pin Plug
E47328-002	Rating Label		
Accessories			
E30580-313A	Instruction Book		
E30539-324A	Schematic Diagram		
BT-20001	Warranty Card		
BT-10001	Service Station List		

Requirement to Customers

To ensure prompt supply of service parts, list part number, part name and model number correctly when you ordering.

JVC AMERICA, INC.

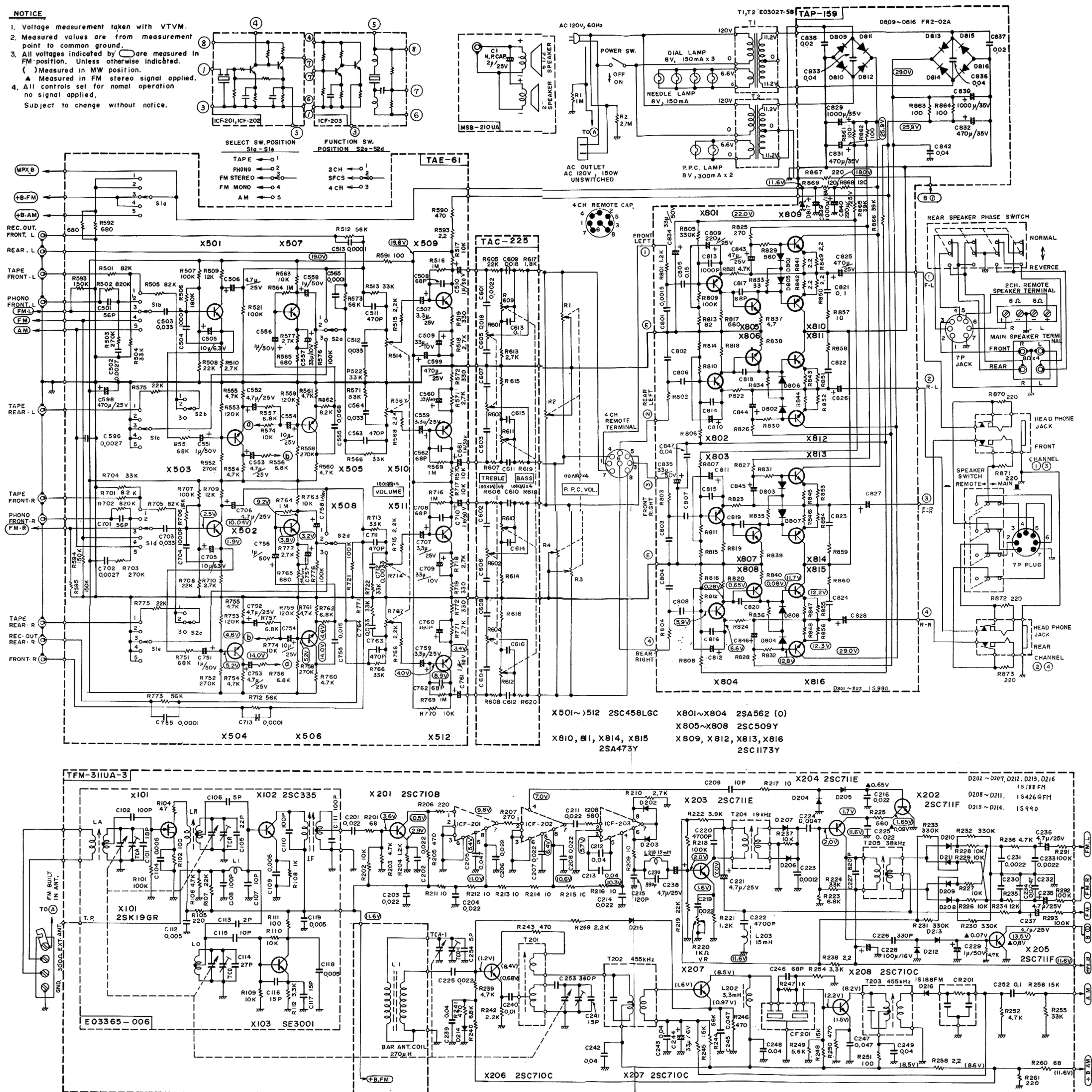
New York, N. Y. 11378

**Manufactured by
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NOTICE

1. Voltage measurement taken with VTVM.
 2. Measured values are from measurement point to common ground.
 3. All voltages indicated by  are measured in FM position. Unless otherwise indicated. () Measured in MW position.
 4. All controls set for normal operation no signal applied.
- Subject to change without notice.



Schematic Diagram of Model 4MM-4600

Subject to change without notice