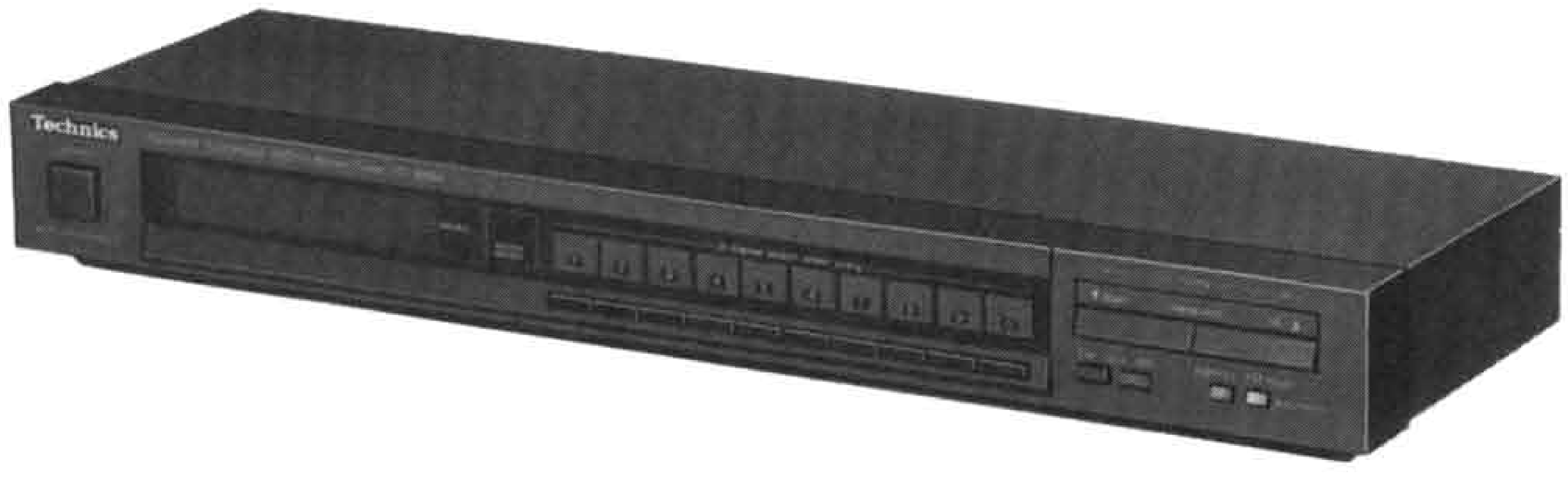
ORDER NO. AD8903040C1
A2

Service Manual

Tuner

QUARTZ Synthesizer
AM/FM Stereo Tuner

ST-S98A



Color

(K) ....Black Type

Country Code	Area	Color
(M)	U.S.A.	(K)
(MC)	Canada	(K)

System
SC-S100 • SC-S200
SC-S300 • SC-S400
SC-S500

The main difference between the ST-S98A and ST-S98 (Service Manual No. HAD8803050C1) is the change of the tuner pack.

SPECIFICATIONS (IHF '78)

■ FM TUNER SECTION

Frequency range	87.9 ~ 107.9 MHz (100 kHz step)
Sensitivity	10.8 dBf (0.95 μV/75Ω,IHF '58)
50 dB quieting sensitivity	
MONO	18.1 dBf(2.2 μV/75Ω,IHF '58)
STEREO	38.1 dBf(22 μV/75Ω,IHF '58)
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	75 dB
STEREO	70 dB
Frequency response	20 Hz ~ 15 kHz, +0.5 dB ~ -1.5 dB
Alternate channel selectivity ±400 kHz	65 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	-35 dB
38 kHz	-50 dB
Antenna terminals	300 ohms (balanced) 75 ohms (unbalanced)

■ AM TUNER SECTION

Frequency range	530 kHz ~ 1720 kHz (10 kHz step)
Sensitivity (S/N 20 dB)	20 μV,300 μV/m
Selectivity (± 10 kHz)	50 dB
Image rejection at 1000 kHz	40 dB
IF rejection at 1000 kHz	60 dB

■ GENERAL

Output voltage	0.6V
Power consumption	9W
Power supply	AC 120V,60 Hz
Dimensions (W x H x D)	430 x 53 x 150 mm (16-15/16" x 2-3/32" x 5-28/32")
Weight	1.5 kg (3.3 lb.)

Notes:
1.Specifications are subject to change without notice. Weight and dimensions are approximate.
2.Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

CONTENTS

Technics

Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Hawaii, Inc.
99-859, Iwaiwa Street
P.O. Box 774
Honolulu, Hawaii 96808-0774

Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc.
San Gabriel Industrial Park
65th Infantry Ave. Km.9.5
Carolina, P.R. 00630

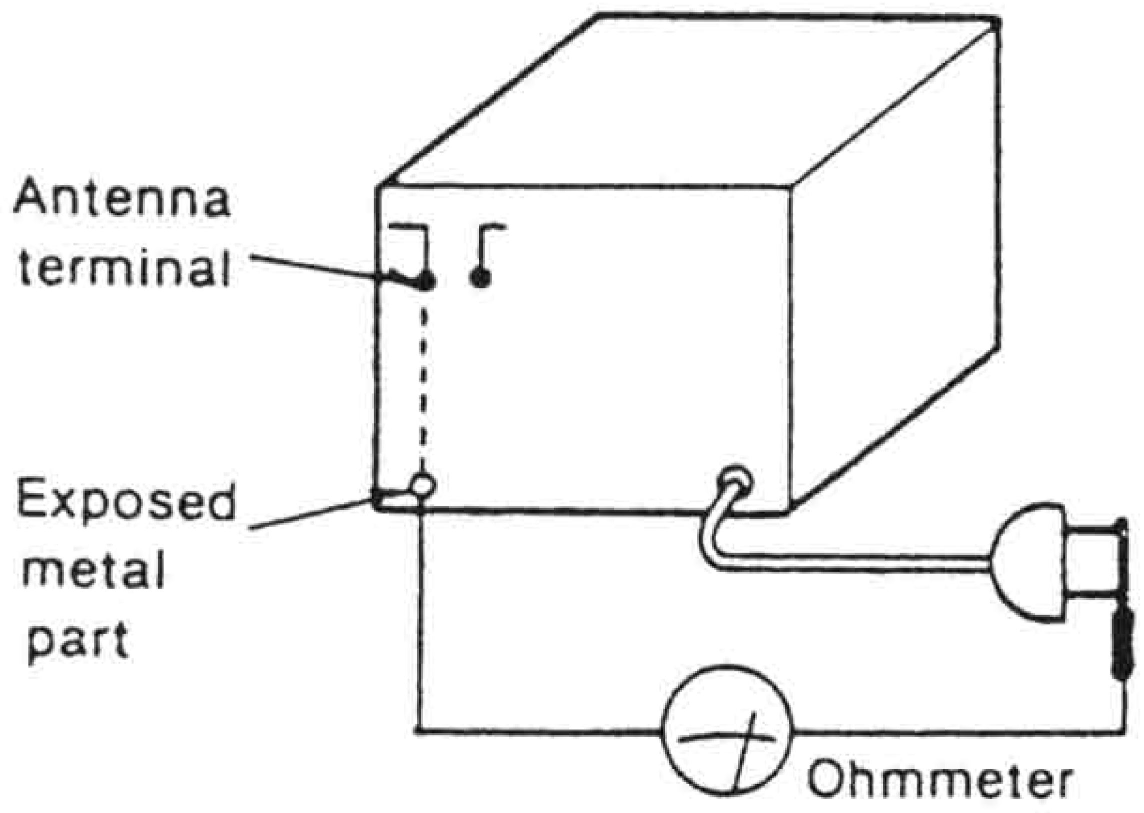
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

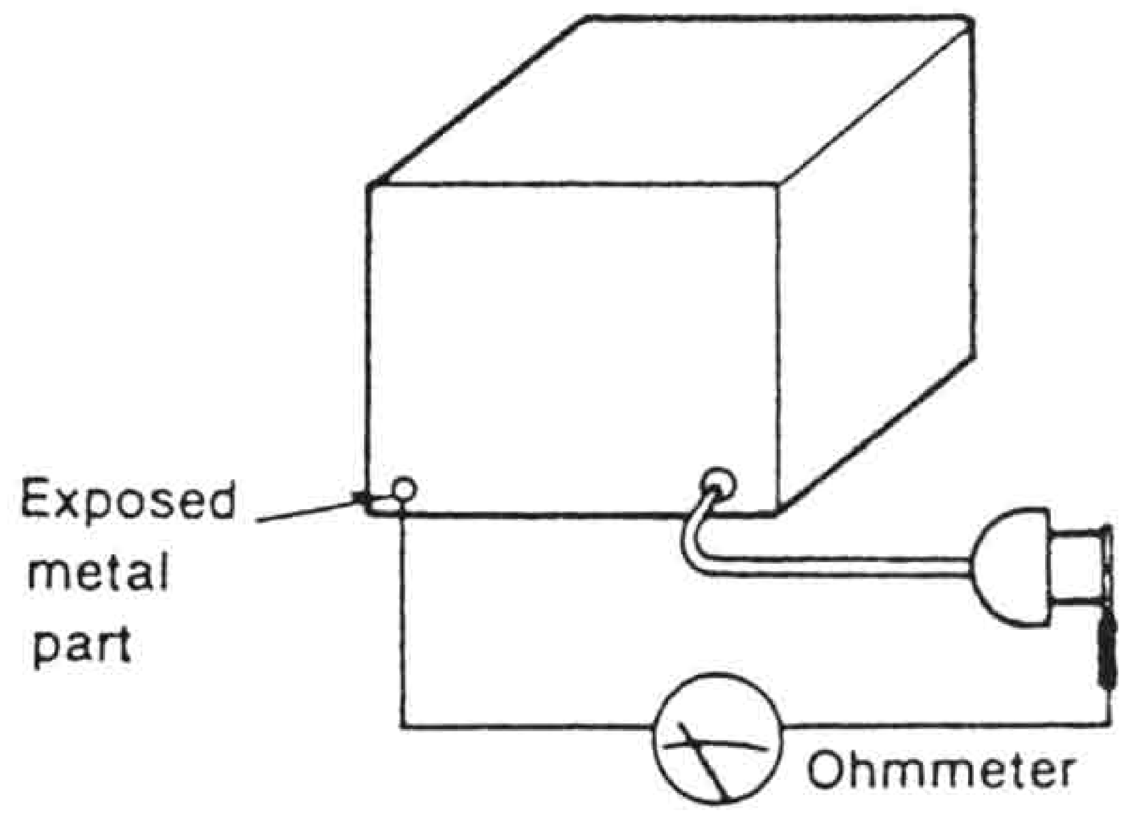
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



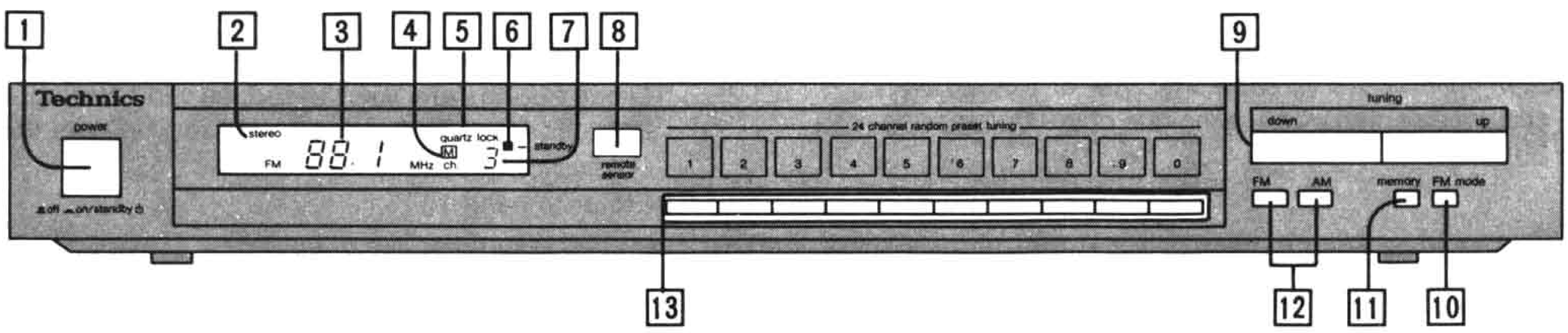
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS

•Front panel



1 **Power switch (power)**

2 **FM stereo indicator (stereo)**

3 **Digital frequency display**

4 **Memory indicator (M)**

5 **Quartz-lock indicator (quartz lock)**

6 **Power indicator (standby)**

7 **Channel display**

8 **Remote-control signal receptor (remote sensor)**

9 **Tuning buttons (tuning)**

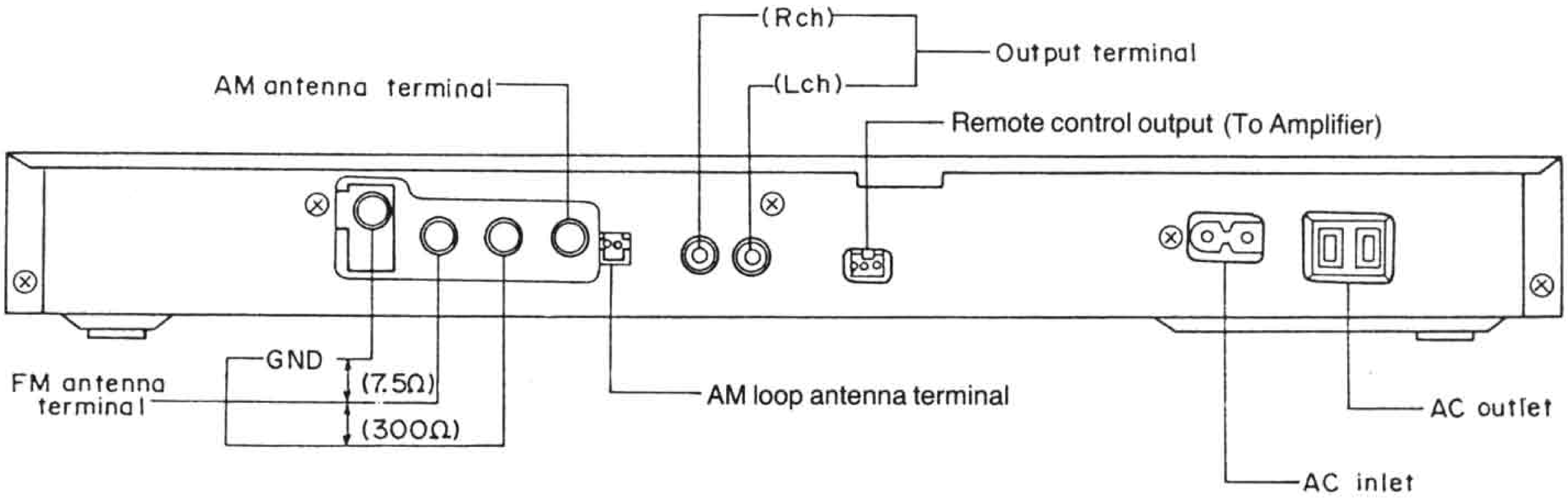
10 **FM mode selector (FM mode)**

11 **Memory button (memory)**

12 **Band selectors (band)**

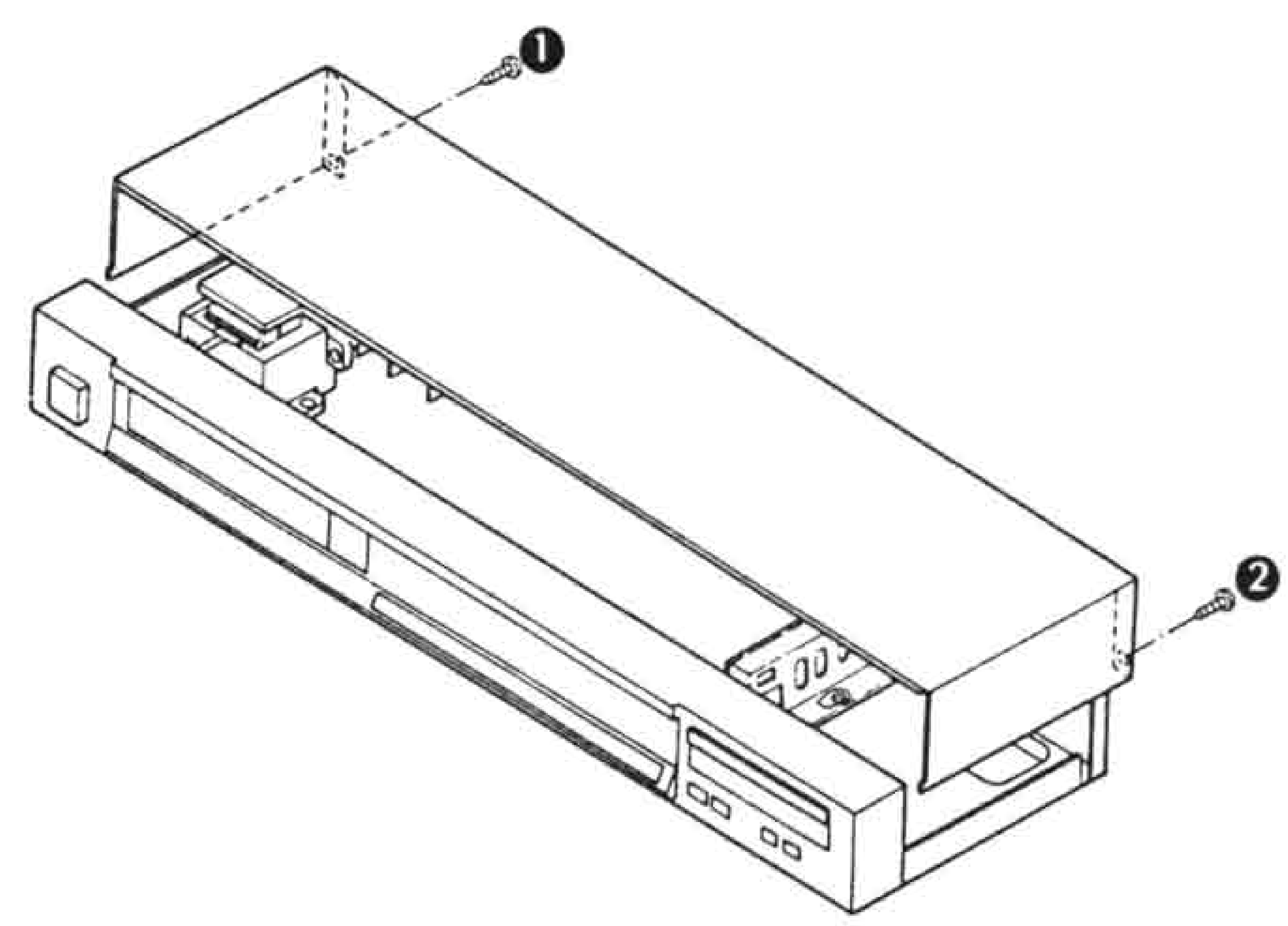
13 **Preset-tuning buttons (1 – 0) (24 channel random preset tuning)**

•Rear panel

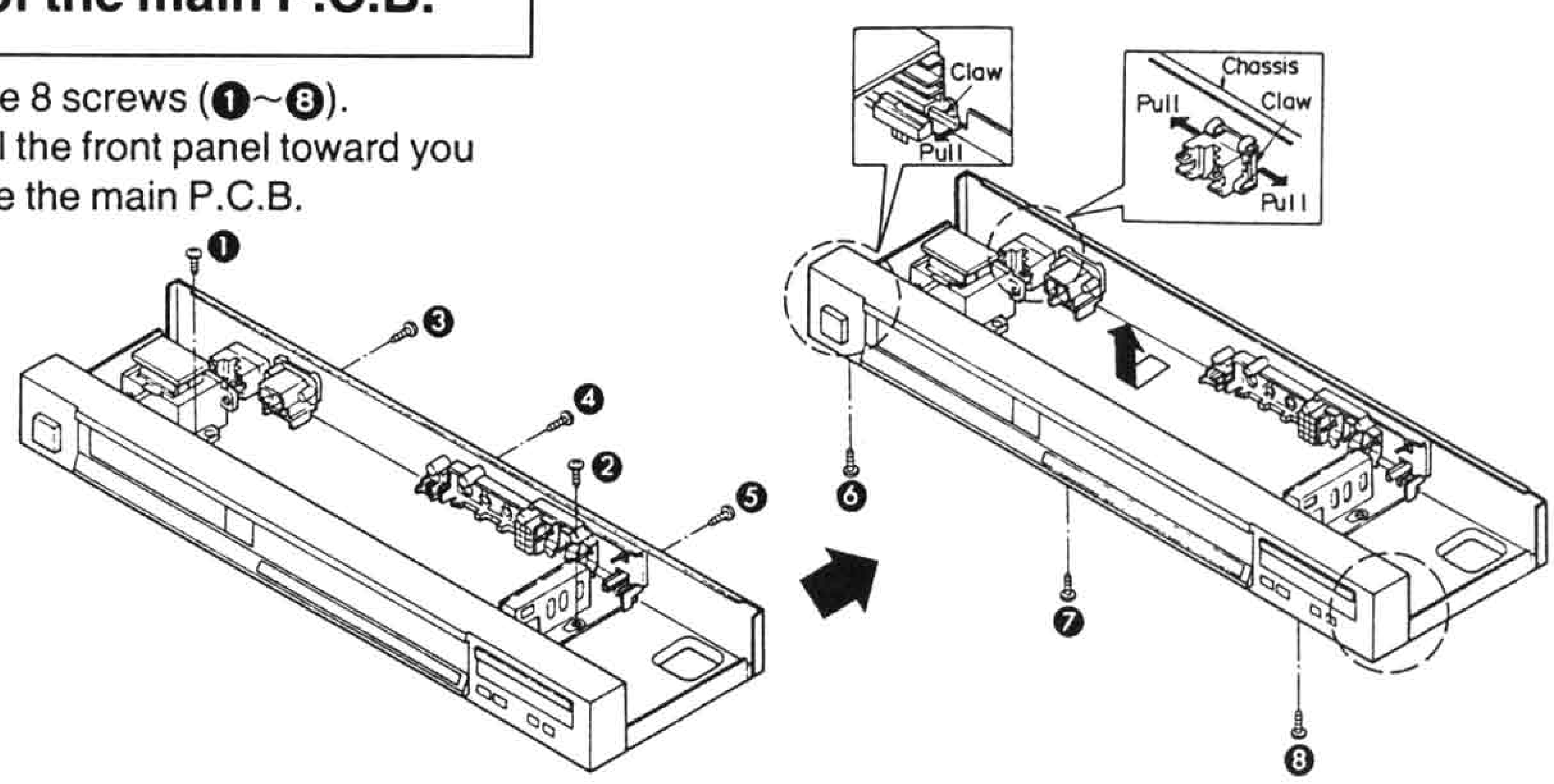


■ DISASSEMBLY INSTRUCTIONS

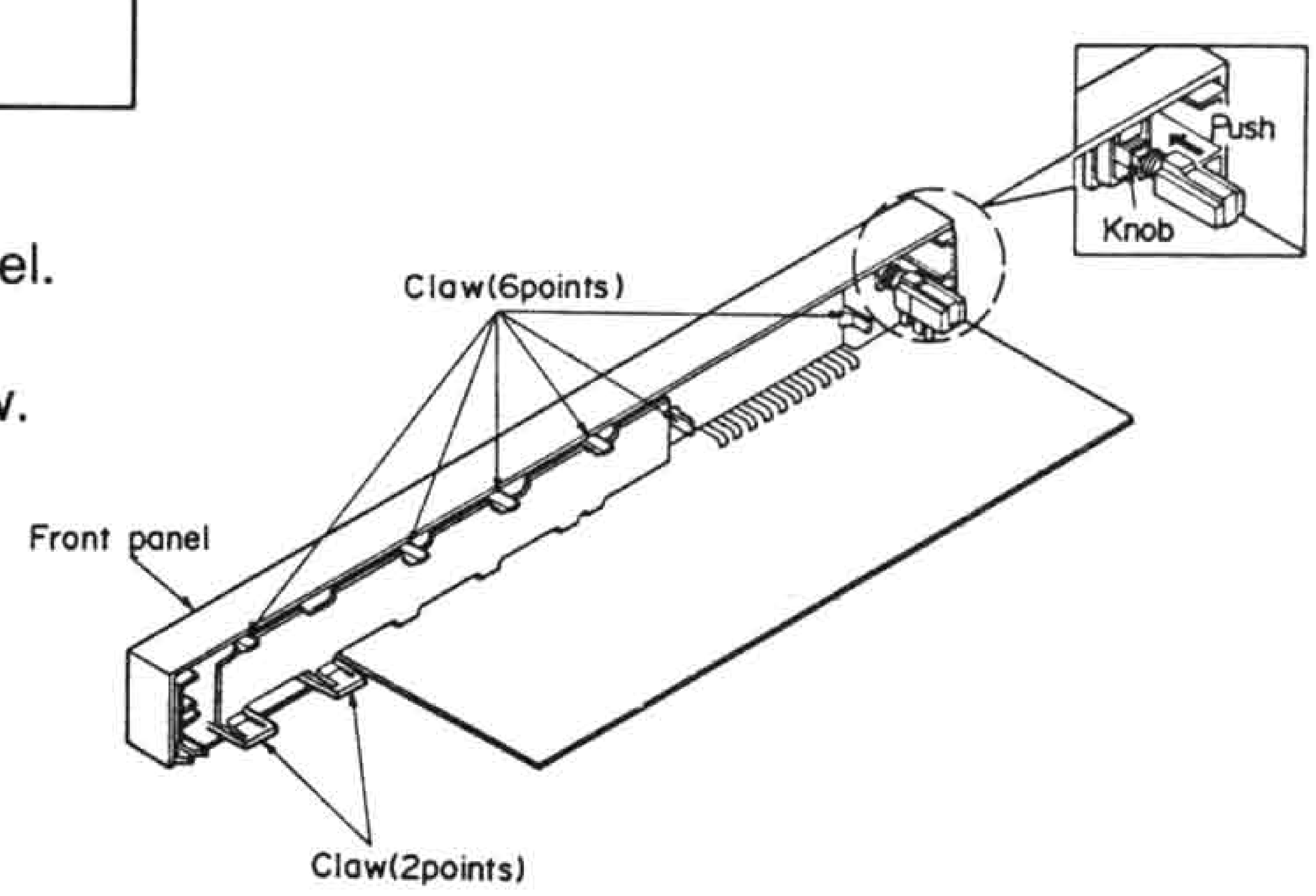
Ref. No. 1	Removal of the cabinet
Procedure 1	•Remove the 2 screws (❶, ❷).



Ref. No. 2	Removal of the main P.C.B.
Procedure 1→2	1. Remove the 8 screws (❶~❽). 2. Slightly pull the front panel toward you and remove the main P.C.B.



Ref. No. 3	Removal of the front panel
Procedure 1→2→3	1. Remove the power switch knob by pushing it from behind the front panel. 2. Release the 8 claws. 3. Remove in the direction of the arrow.



"ATTENTION SERVICER"
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

■ MEASUREMENTS AND ADJUSTMENTS

FM ADJUSTMENT

Control positions and equipment used

- FM signal generator(FM-SG)
- Stereo modulator
- DC electronic voltmeter(EVM)
- Frequency counter
- Choke coil(100µH)
- Resistor(100kΩ)

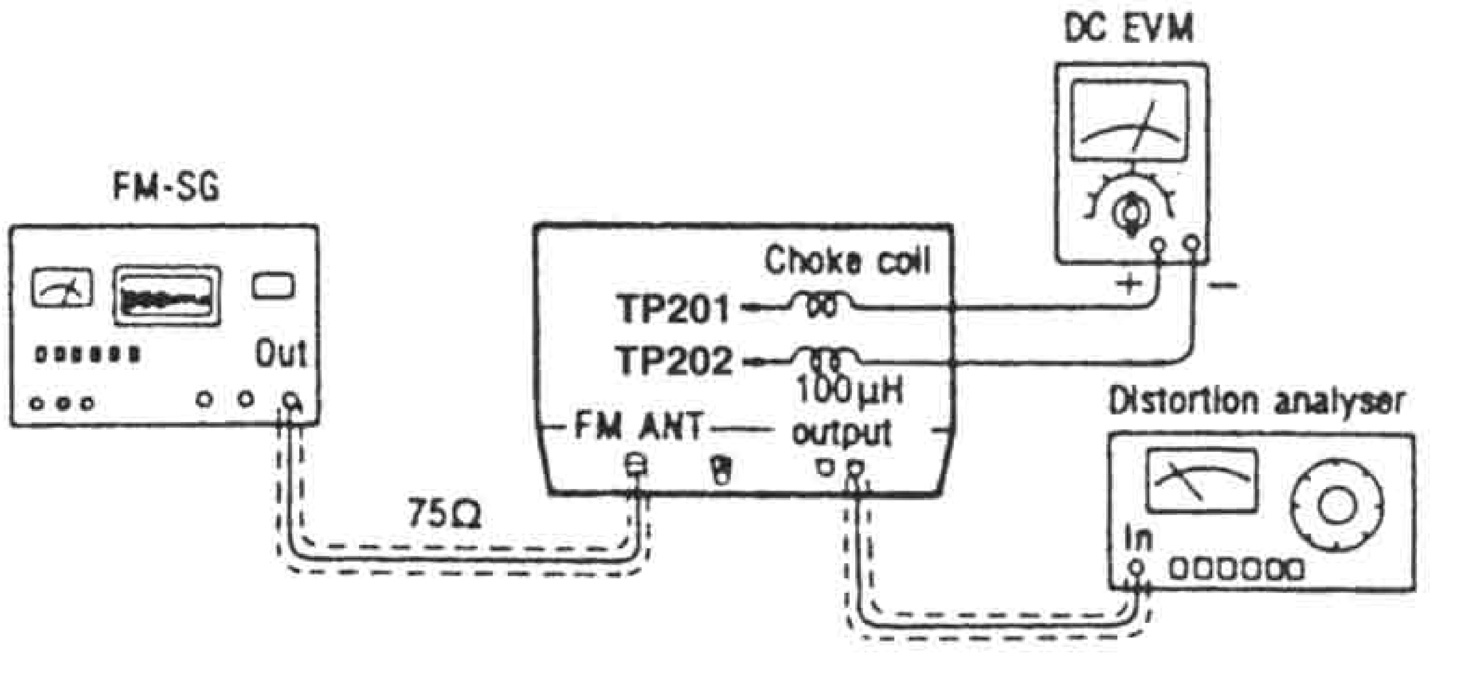
Note: For Z202(AM-IFT), and Z201(AM ANT and OSC coil), they are supplied as adjusted parts. So, do not turn the cores of the parts. It is not necessary to adjust the AM circuit.

FM MONO DISTORTION ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to "FM" mode.
3.Set the radio frequency display and signal generator to **100.10MHz.**
4.Adjust the core of **T201** so that the voltage measured in signal mode is **0mV(0±20mV)** in 300mV range.

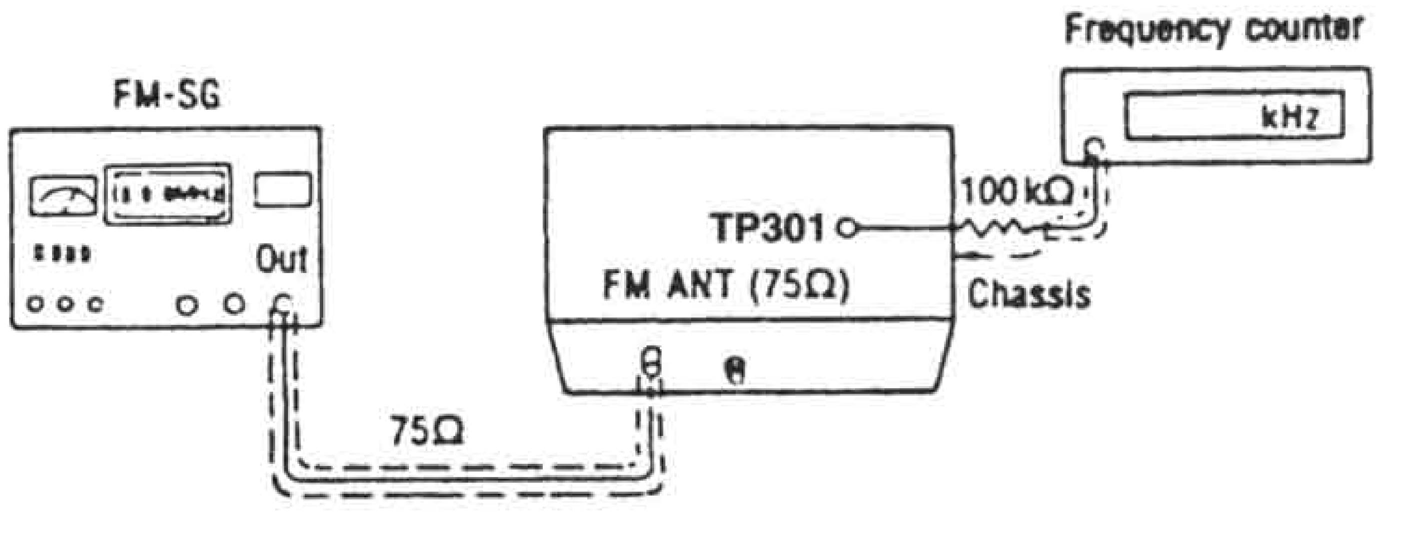
Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency 1kHz
Output level........................66dB



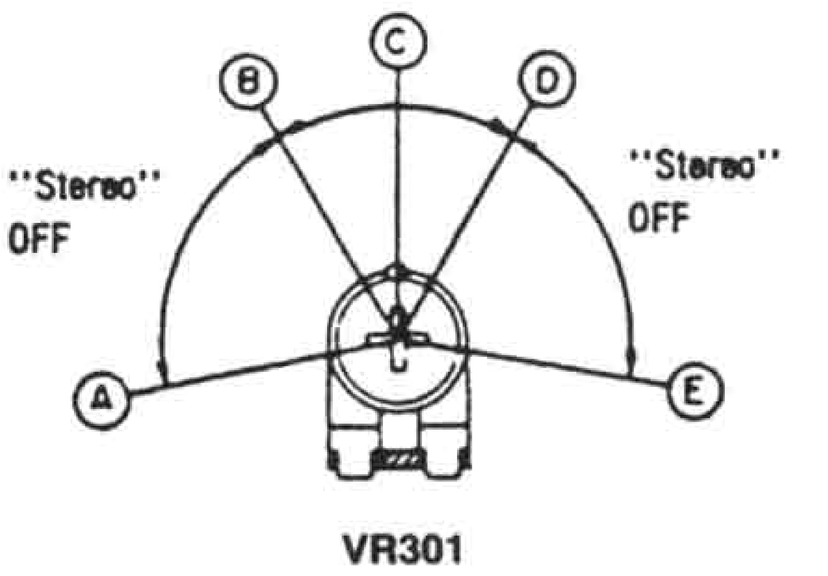
MPX VCO ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"on/auto"** position.
3.Set the radio dial and signal genarator to **100.10MHz.**
4.Adjust **VR301** for **19kHz±30Hz** on frequency counter reading.



USING ALTERNATE SYSTEM
1.Receive the stereo broadcast.
2.Adjust **VR301** until stereo indicator lights up. Fix the arm of **VR301** as shown in figure.

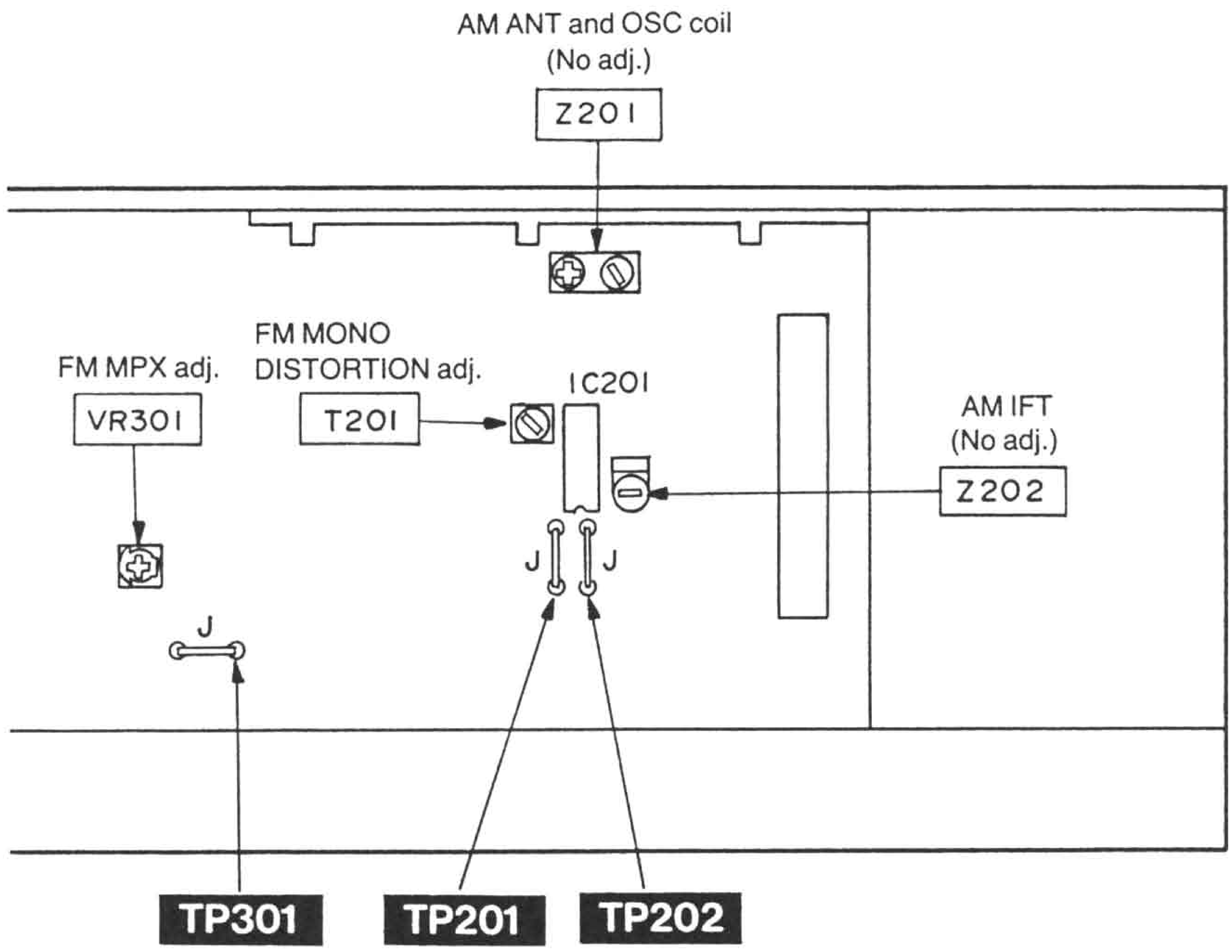
FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency ....0 kHz
Output level........................66dB



VR301

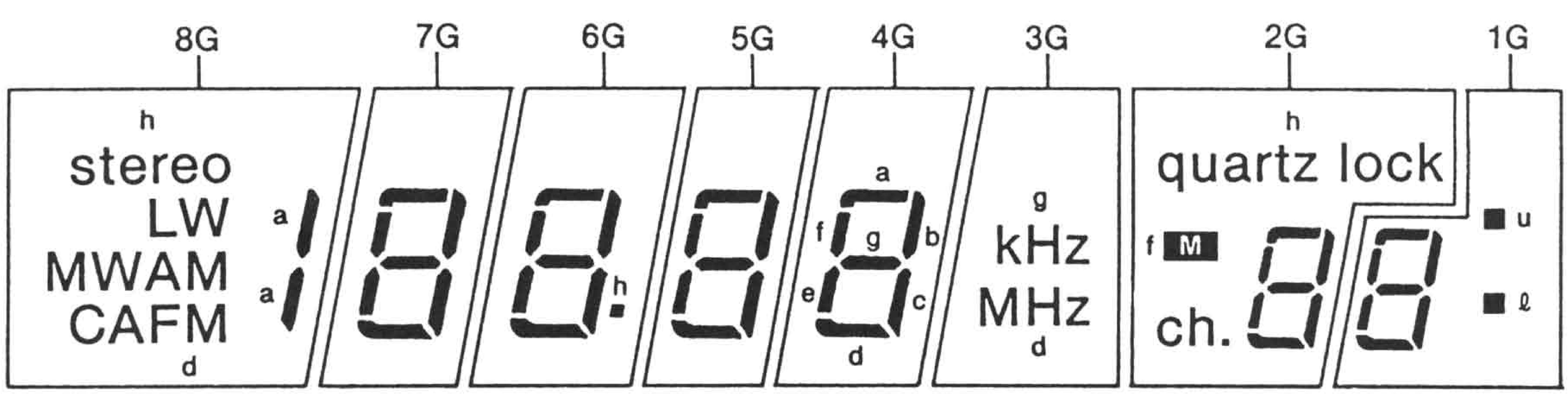
Ⓐ−Ⓑ,
Ⓓ−Ⓔ....... "Stereo" OFF position
Ⓑ−Ⓓ....... "Stereo" ON position (Indicator lighting)
Ⓒ.............. Adjust point of pilot circuit

•Adjustment points



■ DESCRIPTION OF FL PANEL

• GRID ASSIGNMENT

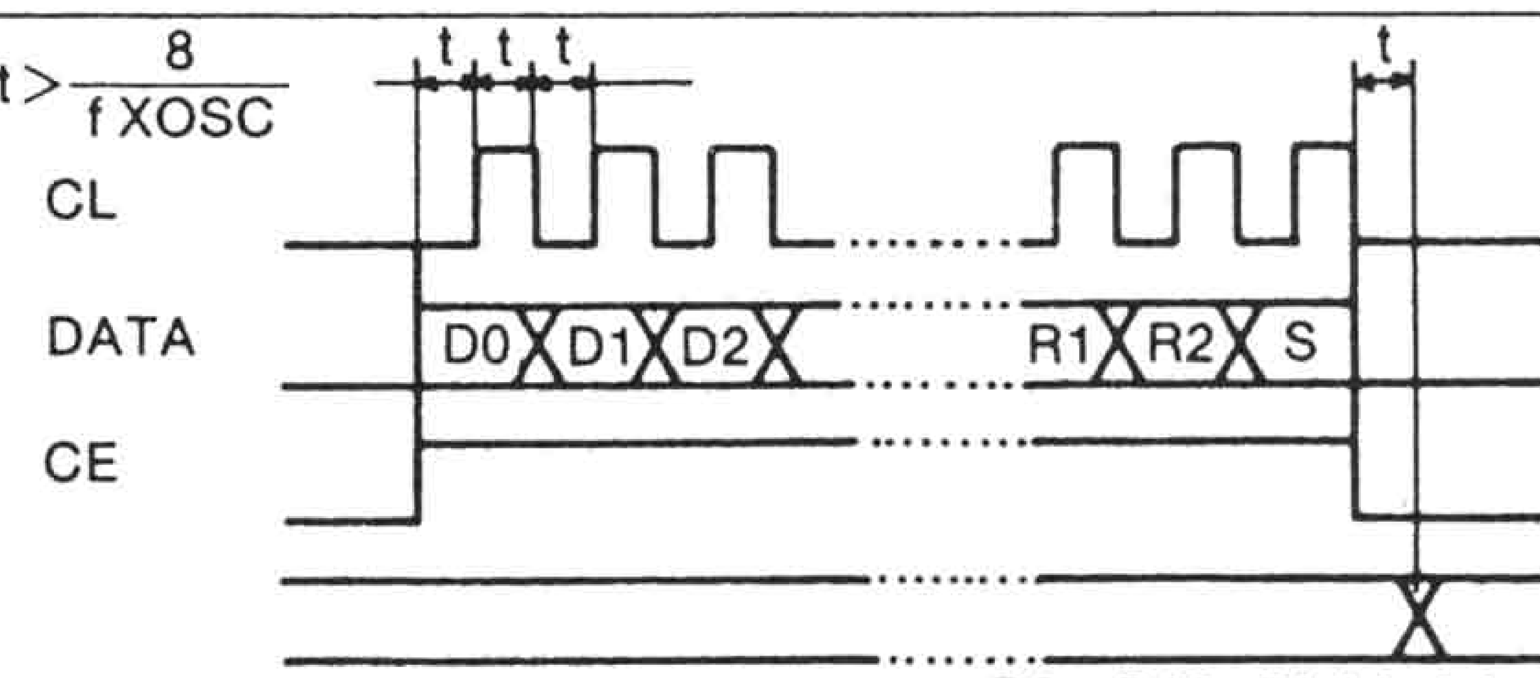


Note: The grid of 3G and 8G are used for external connection.

• PIN CONNECTION

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CONNECTION	F1	F1	NP	h	f	8G	AM	MW	CA	LW	7G	c	a	6G	e	d	g	5G
PIN NO.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
CONNECTION	b	NP	4G	NP	NP	3G	NP	NP	ch	2G	NP	u	1G	ℓ	NP	F2	F2	

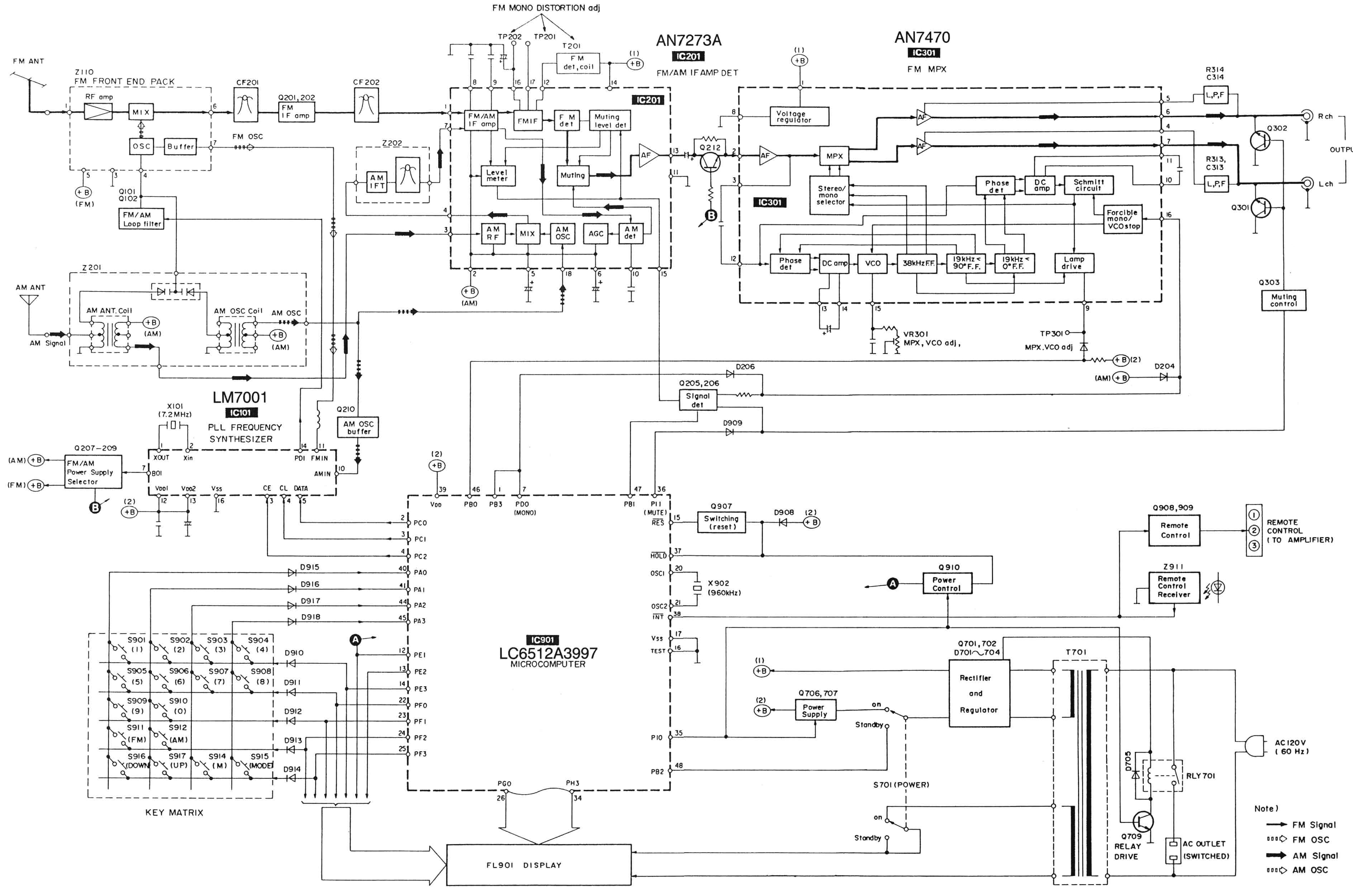
FUNCTION OF IC TERMINALS (IC901: LC6512A3997)

PIN NO.	IN/OUT	MARK	DESCRIPTION OF TERMINAL
1	INPUT	PB3	Computer drive terminal.
2	OUTPUT	DATA	Data output $t > \frac{8}{f\,XOSC}$  f XOSC: Crystal OSC; D0~D13: Divided frequency data; R0~R2: Reference frequency data
3	OUTPUT	CL	
4	OUTPUT	CE	
5	—	PC3	Not used in this unit.
6	—	NC	Not used in this unit.
7	OUTPUT	PD0	Auto/mono changeover terminal. (auto → 0V, mono → 5V)
8	OUTPUT	PD1	Computer drive terminal.
9	—	PD2	Not used in this unit.
10	—	PD3	Not used in this unit.
11	—	PE0	Not used in this unit.
12 ~ 14 • 22 ~ 25	OUTPUT	PE1 ~ PE3 • PF0 ~ PF3	Digital signal terminal for display. Terminal for key return signal to external key matrix.
15	INPUT	$\overline{RES}$	Reset terminal.
16	—	TEST	Ground terminal.
17	—	V_{SS}	Ground terminal.
18	—	NC	Not used in this unit.
19	—	NC	Not used in this unit.
20	INPUT	OSC1	Connecting terminal for crystal oscillator.
21	OUTPUT	OSC2	Connecting terminal for crystal oscillator.
26 ~ 29 • 31 ~ 34	OUTPUT	PG0 ~ PG3 • PH0 ~ PH3	Segment signal terminal for display.
30	—	NC	Not used in this unit.
35	OUTPUT	P10	Control signal terminal for relay (RLY701).
36	OUTPUT	P11	Muting signal terminal. (Muting → High level)
37	INPUT	$\overline{HOLD}$	Terminal for power failure detection.
38	INPUT	$\overline{INT}$	Terminal for remote control cord.
39	INPUT	V_{DD}	Power supply terminal of device. Voltage of 5V is supplied during operation of device.
40	INPUT	PA0 ~ PA3	Terminal for key return signal to external key matrix.
41	INPUT	PA0 ~ PA3	
44	INPUT	PA0 ~ PA3	
45	INPUT	PA0 ~ PA3	
42 • 43	—	NC	Not used in this unit.
46	INPUT	PB0 ~ PB2	Stereo signal terminal.
47	INPUT	PB0 ~ PB2	SD signal terminal.
48	INPUT	PB0 ~ PB2	Tuner select terminal. (Ground connection)

[KEY MATRIX]

Pin No.	45	44	41	40
14	CH4	CH3	CH2	CH1
22	CH8	CH7	CH6	CH5
23	—	—	CH0	CH9
24	—	—	AM	FM
25	MODE	MEMORY	UP	DOWN

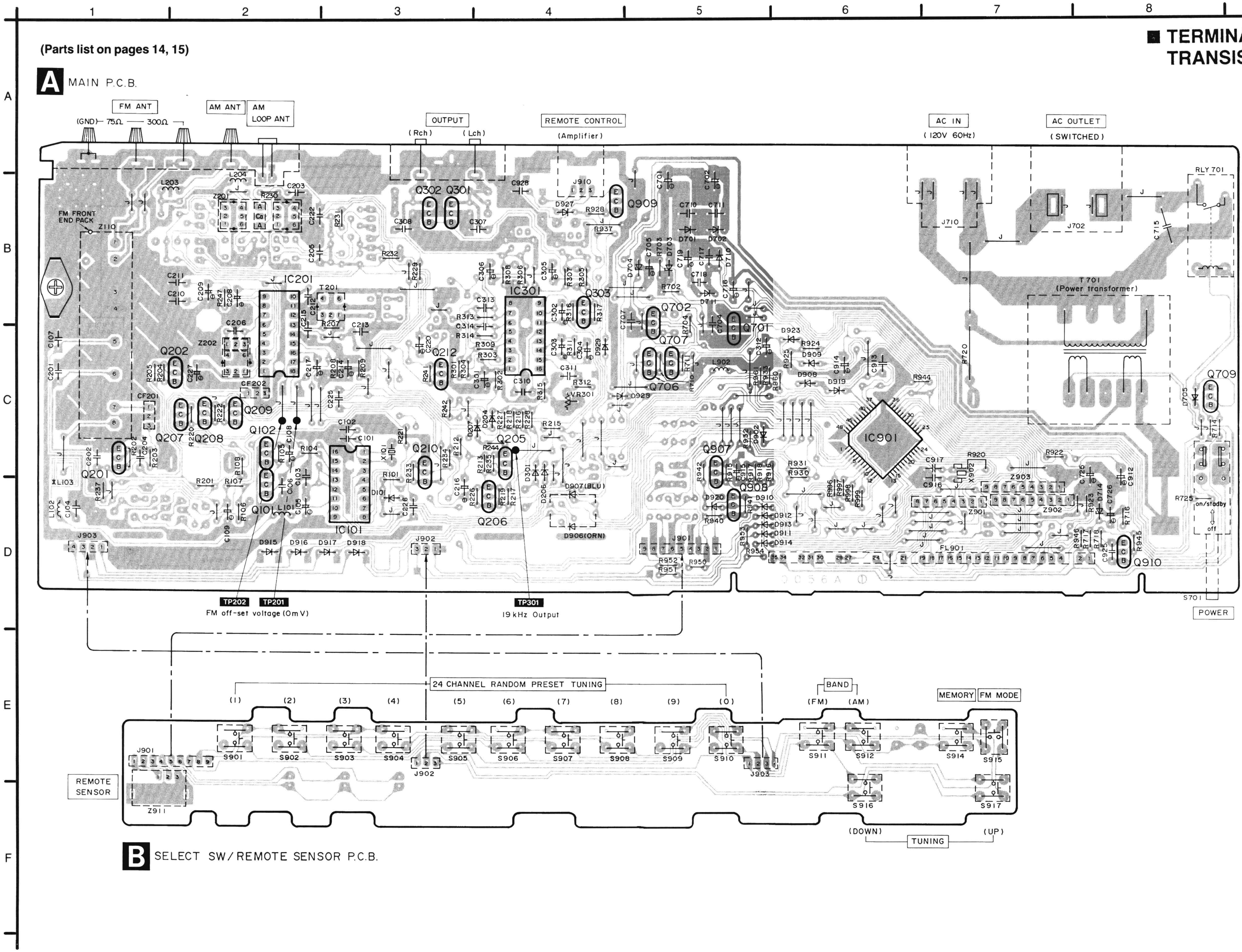
■ BLOCK DIAGRAM



■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

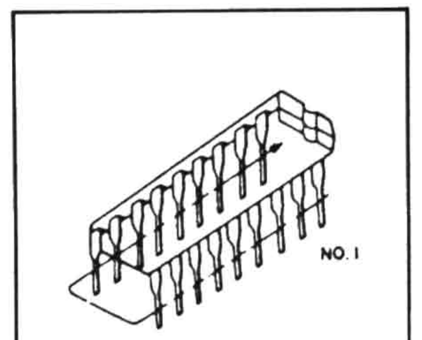
(Parts list on pages 14, 15)

A MAIN P.C.B.

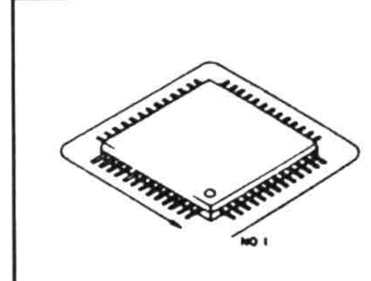


B SELECT SW/REMOTE SENSOR P.C.B.

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

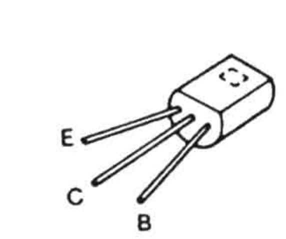


SVIUPC 1161C3	16Pin
LM7001	16Pin
AN7273B	18Pin

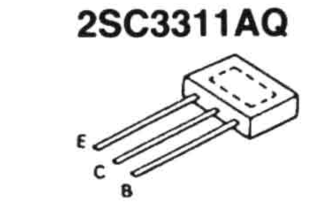


LC6512A3997	48 pin

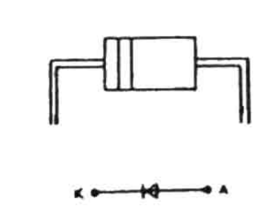
2SC3940A-Q



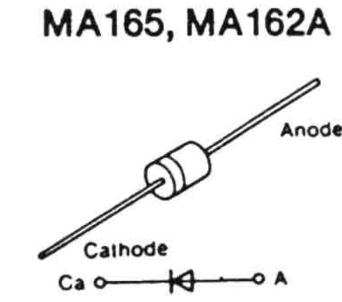
2SC2787L
2SC1740SQ
2SA933SQR
2SC3311AQ



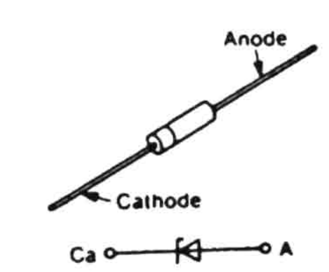
ISR35200

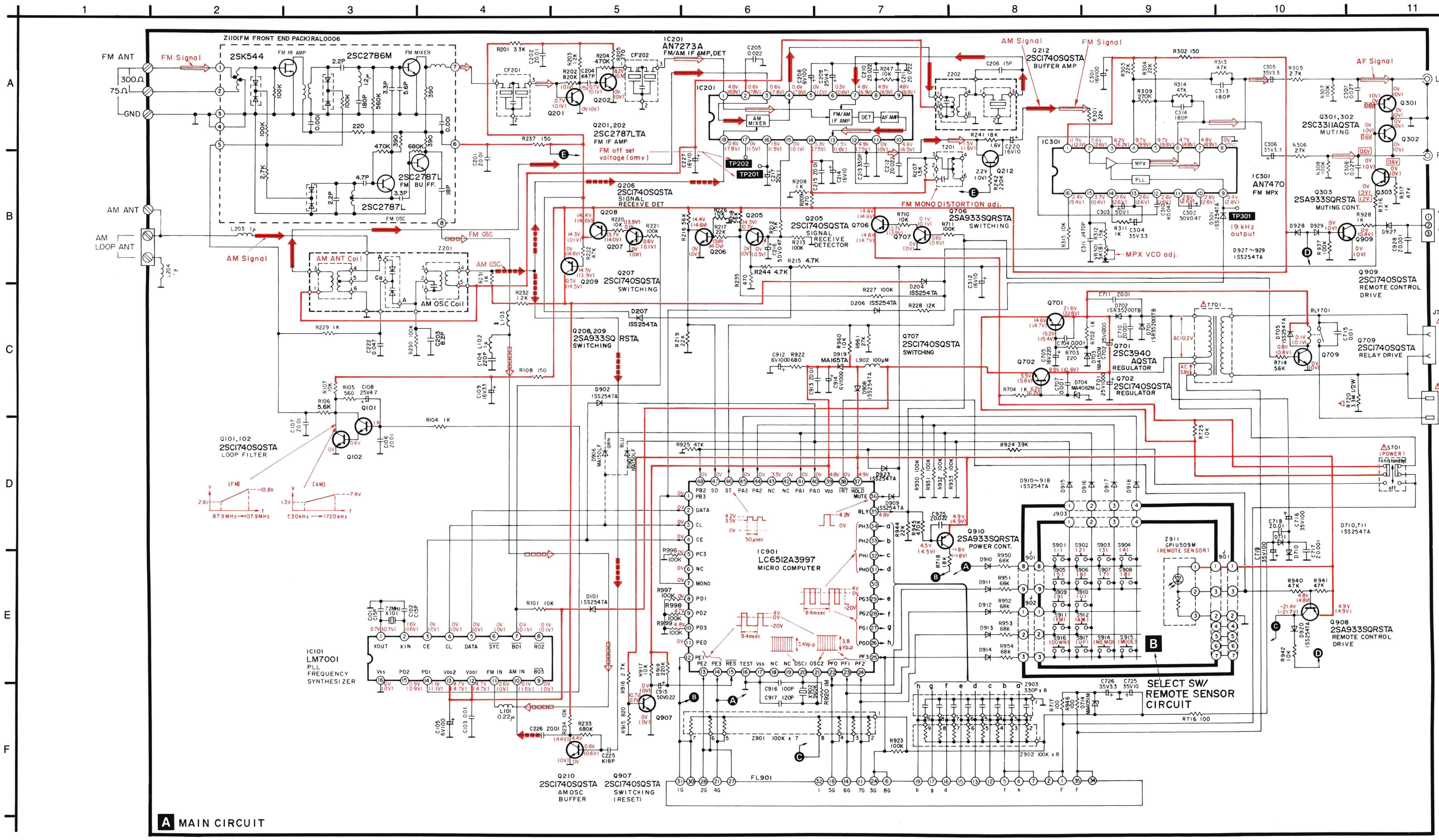


MA165, MA162A



MA4051M,
MA4062M,
MA4150M





■ SCHEMATIC DIAGRAM

(Parts list on pages 14, 15)

Note 1:

- **S701** : Power source switch in "**on**" position.
- **S901～S910** : Preset tuning switch.
  (S901: CH1, S902: CH2, S903: CH3, S904: CH4, S905: CH5, S906: CH6, S907: CH7, S908: CH8, S909: CH9, S910: CH0)
- **S911** : FM select switch.
- **S912** : AM select switch.
- **S914** : Memory set switch. (manual ↔ auto memory)
- **S915** : FM mode switch.
- **S916** : Tuning (down) switch.
  [down: tuning to lower frequency]
- **S917** : Tuning (up) switch.
  [up: tuning to higher frequency]
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester. ( ): AM voltage
- Positive voltage lines
  FM OSC
  AM OSC
  AF signal lines
  FM signal
  AM signal
- Important safety notice
  Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

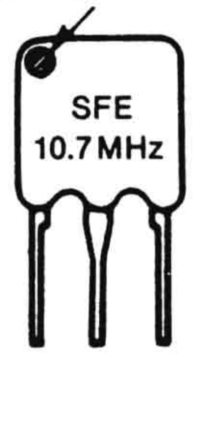
Note 2:

- **Use of ceramic filters in pairs**

The ceramic filters (CF201, CF202) for FM-IF circuit are available in three ranks. For this circuit, be sure to use the ceramics of the same rank in a pair.

At repairing and replacement, pay close attention to the diodes (D906, D907) for use as different diodes must be used depending on each rank of the ceramic filters.

Color marking
(Red, Black or White)



RANK (Color)	D906	D907	CENTER FREQUENCY
Orange	○	×	10.72 MHz
Red	×	×	10.70 MHz
Blue	×	○	10.67 MHz

Note: ○ mark: Diode is used.
× mark: Diode is not used.

∗ Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

∗ Cover the parts boxes made of plastics with aluminum coil.
∗ Ground the soldering iron.
∗ Put a conductive mat on the work table.
∗ Do not touch the legs of IC or LSI with the fingers directly.

■ RESISTORS AND CAPACITORS

Notes : ＊Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
＊Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System For Resistors

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)

ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System For Capacitors

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Unique

ECEA	50	M	330
Type	Voltage (50V)	Characteristics	Value (33μF)

● Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
● Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Chip Resistor			
ERJ	: Chip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : $^{+80}_{-20}$ %
ECQM	: Polyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC (UL)		D : ±0.5pF
ECUX	: Ceramic (Chip Type)			
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R101	ERDS2TJ103	10K 1/4
R104	ERDS2TJ102	1K 1/4
R105	ERDS2TJ561	560 1/4
R106	ERDS2TJ562	5.6K 1/4
R107	ERDS2TJ103	10K 1/4
R108	ERDS2TJ151	150 1/4
R201	ERDS2TJ122	1.2K 1/4
R202	ERDS2TJ824	820K 1/4
R203	ERDS2TJ122	1.2K 1/4
R204	ERDS2TJ474	470K 1/4
R205	ERDS2TJ331	330 1/4
R207	ERDS2TJ152	1.5K 1/4
R208	ERDS2TJ102	1K 1/4
R209	ERDS2TJ471	470 1/4
R212	ERDS2TJ153	15K 1/4
R213	ERDS2TJ104	100K 1/4
R215	ERDS2TJ472	4.7K 1/4
R216	ERDS2TJ563	56K 1/4
R217	ERDS2TJ223	22K 1/4
R218	ERDS2TJ563	56K 1/4
R219	ERDS2TJ223	22K 1/4
R220	ERDS2TJ103	10K 1/4
R221	ERDS2TJ104	100K 1/4
R222	ERDS2TJ473	47K 1/4
R226	ERDS2TJ103	10K 1/4
R227	ERDS2TJ104	100K 1/4
R228	ERDS2TJ123	12K 1/4
R229	ERDS2TJ102	1K 1/4
R230	ERDS2TJ104	100K 1/4
R231	ERDS2TJ102	1K 1/4
R232	ERDS2TJ122	1.2K 1/4
R233	ERDS2TJ684	680K 1/4
R234	ERDS2TJ103	10K 1/4
R235	ERDS2TJ471	470 1/4
R237	ERDS2TJ151	150 1/4
R241	ERDS2TJ183	18K 1/4
R242	ERDS2TJ224	220K 1/4
R244	ERDS2TJ472	4.7K 1/4
R247	ERDS2TJ103	10K 1/4
R301	ERDS2TJ223	22K 1/4

Ref. No.	Part No.	Value.
R302	ERDS2TJ151	150 1/4
R303	ERDS2TJ223	22K 1/4
R304	ERDS2TJ223	22K 1/4
R305	ERDS2TJ272	2.7K 1/4
R306	ERDS2TJ272	2.7K 1/4
R307	ERDS2TJ104	100K 1/4
R308	ERDS2TJ104	100K 1/4
R309	ERDS2TJ274	270K 1/4
R311	ERDS2TJ102	1K 1/4
R312	ERDS2TJ153	15K 1/4
R313	ERDS2TJ473	47K 1/4
R314	ERDS2TJ473	47K 1/4
R315	ERDS2TJ103	10K 1/4
R316	ERDS2TJ102	1K 1/4
R317	ERDS2TJ473	47K 1/4
R702	ERDS2TJ102	1K 1/4
R703	ERDS2TJ221	220 1/4
R704	ERDS2TJ102	1K 1/4
R710	ERDS2TJ103	10K 1/4
R711	ERDS2TJ104	100K 1/4
R714	ERDS2TJ562	5.6K 1/4
R716	ERDS2TJ101	100 1/4
R717	ERDS2TJ101	100 1/4
R718	ERDS2TJ183	18K 1/4
R720	ERC12ZGK335	3.3M 1/2
R725	ERDS2TJ103	10K 1/4
R915	ERDS2TJ821	820 1/4
R916	ERDS2TJ272	2.7K 1/4
R917	ERDS2TJ103	10K 1/4
R918	ERDS2TJ224	220K 1/4
R920	ERDS2TJ105	1M 1/4
R922	ERDS2TJ681	680 1/4
R923	ERDS2TJ104	100K 1/4
R924	ERDS2TJ392	3.9K 1/4
R925	ERDS2TJ473	47K 1/4
R926	ERDS2TJ102	1K 1/4
R930	ERDS2TJ104	100K 1/4
R931	ERDS2TJ104	100K 1/4
R932	ERDS2TJ104	100K 1/4
R933	ERDS2TJ104	100K 1/4
R937	ERDS2TJ104	100K 1/4
R940	ERDS2TJ473	47K 1/4

Ref. No.	Part No.	Value.
R941	ERDS2TJ473	47K 1/4
R942	ERDS2TJ103	10K 1/4
R944	ERDS2TJ223	22K 1/4
R945	ERDS2TJ474	470K 1/4
R946	ERDS2TJ101	100 1/4
R950	ERDS2TJ683	68K 1/4
R951	ERDS2TJ683	68K 1/4
R952	ERDS2TJ683	68K 1/4
R953	ERDS2TJ683	68K 1/4
R954	ERDS2TJ683	68K 1/4
R960	ERDS2TJ103	10K 1/4
R961	ERDS2TJ273	27K 1/4
R996	ERDS2TJ104	100K 1/4
R997	ERDS2TJ104	100K 1/4
R998	ERDS2TJ104	100K 1/4
R999	ERDS2TJ104	100K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C101	RCBS1H150JCY	15P 50
C102	RCBS1H150JCY	15P 50
C103	ECKF1H103ZF	0.01 50
C104	ECCC1H221K	220P 50
C105	ECEA0JU101	100 6.3
C106	ECKF1H103ZF	0.01 50
C107	ECKF1H103ZF	0.01 50
C108	ECEA25M4R7R	4.7 25
C109	ECEA1CU330	33 16
C201	ECKF1H103ZF	0.01 50
C202	ECKF1H103ZF	0.01 50
C203	RCBS1H8R2KCY	8.2P 50
C204	ECCD1H470K	47P 50
C205	ECKD1H223PF	0.022 50
C206	RCBS1H150JCY	15P 50
C208	ECEA0JU101	100 6.3
C209	ECEA1EK4R7	4.7 25
C210	ECKD1H223PF	0.022 50
C211	ECKD1H223PF	0.022 50
C212	ECBT1E223ZF	0.022 25
C213	ECKD1H331KB	330P 50
C214	ECEA1CKS100	10 16
C215	ECBT1C103NS5	0.01 16
C216	ECEA1HKR47	0.47 50

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
C217	ECEA1HK010	1 50	C308	ECFTD273KXL	0.027 25	C715	ECKWNS103ZV	0.01 125
C220	ECEA1CKS100	10 16	C310	ECFTD473KXL	0.047 25	C716	ECEA1VU101	100 35
C222	ECFTD473KXL	0.047 25	C311	ECQP1471JZ	470P 125	C717	ECKD2H102ZF	0.001 500
C225	ECCD1H180KC	18P 50	C312	ECEA1CKS100	10 16	C718	ECKF1H103ZF	0.01 50
C226	ECKF1H103ZF	0.01 50	C313	RCBS1H181KBY	180P 50	C719	ECEA1VU101	100 35
C227	ECEA1CKS100	10 16	C314	RCBS1H181KBY	180P 50	C725	ECEA1VK100B	10 35
C301	ECEA1CU101	100 16	C701	ECEA1EU102B	1000 25	C726	ECEA1VK3R3	3.3 35
C302	ECEA1HKR47	0.47 50	C702	ECEA1EU102B	1000 25	C912	ECEA0JS102	1000 6.3
C303	ECEA1HK010	1 50	C704	ECKD1H102PF	0.001 50	C913	ECKF1H103ZF	0.01 50
C304	ECEA1VK3R3	3.3 35	C705	ECEA1CU221	220 16	C914	ECEA0JS102	1000 6.3
C305	ECEA1VK3R3	3.3 35	C707	ECKD1H102PF	0.001 50	C915	ECEA1HKR22	0.22 50
C306	ECEA1VK3R3	3.3 35	C710	ECKD2H102ZF	0.001 500	C916	RCBC1H101KBY	100P 50
C307	ECFTD273KXL	0.027 25	C711	ECKF1H103ZF	0.01 50	C917	RCBS1H121KBY	120P 50
						C925	ECBT1E223ZF	0.022 25
						C928	ECBT1H102KB5	0.001 50

■ REPLACEMENT PARTS LIST

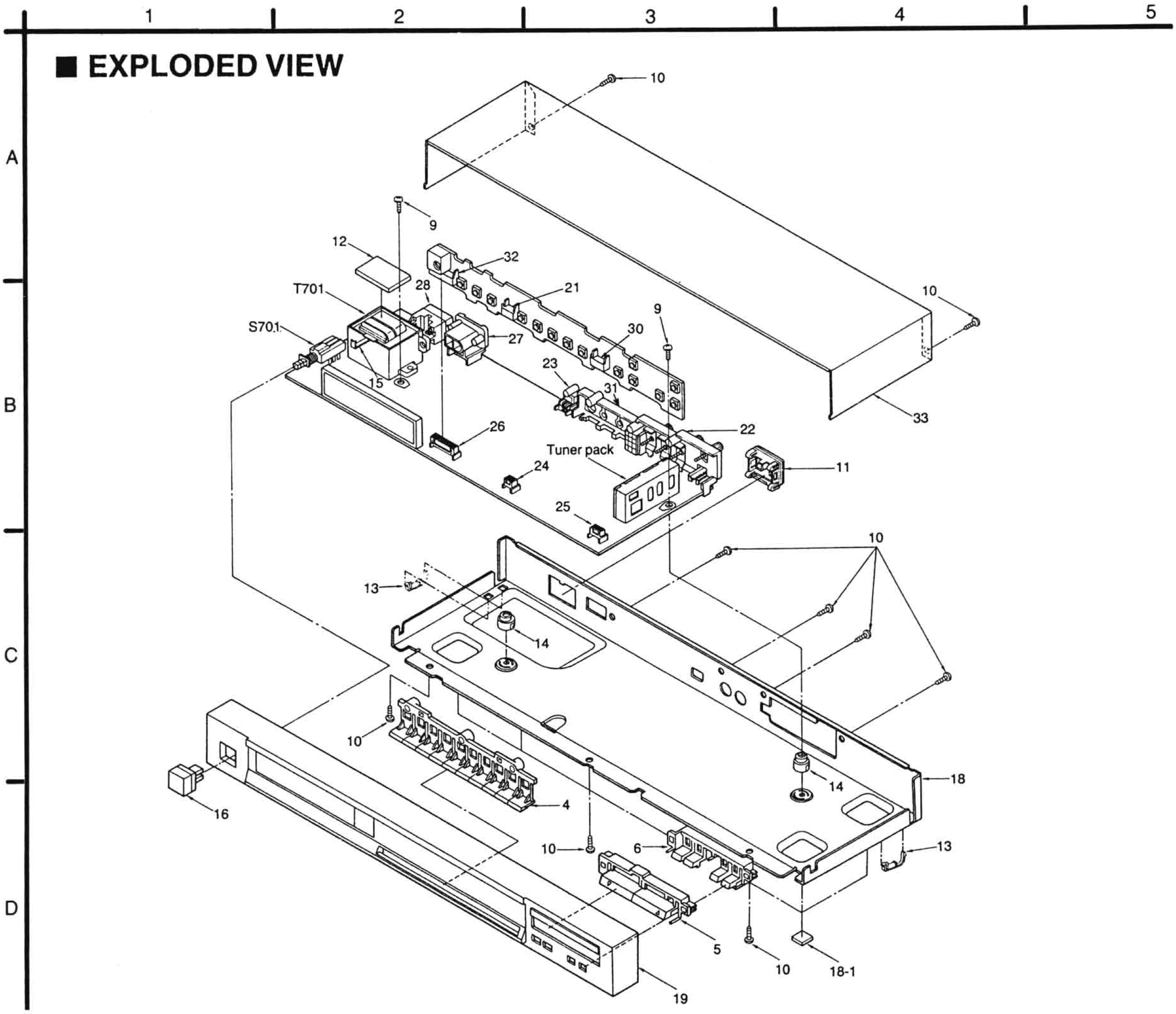
Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	LM7001	I.C. SYNTHESIZER
IC201	AN7273B	I.C. FM/AM IF
IC301	SVIUPC1161C3	I.C. FM MPX
IC901	LC6512A3997	I.C.. MICROCOMPUTER
TRANSISTORS		
Q101	2SC1740SQ	TRANSISTOR
Q102	2SC1740SQ	TRANSISTOR
Q201	2SC2787L	TRANSISTOR
Q202	2SC2787L	TRANSISTOR
Q205	2SC1740SQ	TRANSISTOR
Q206	2SC1740SQ	TRANSISTOR
Q207	2SC1740SQ	TRANSISTOR
Q208	2SA933SQR	TRANSISTOR
Q209	2SA933SQR	TRANSISTOR
Q210	2SC1740SQ	TRANSISTOR
Q212	2SC1740SQ	TRANSISTOR
Q301	2SC3311A-Q	TRANSISTOR
Q302	2SC3311A-Q	TRANSISTOR
Q303	2SA933SQR	TRANSISTOR
Q701	2SC3940AQSTA	TRANSISTOR
Q702	2SC1740SQ	TRANSISTOR
Q706	2SA933SQR	TRANSISTOR
Q707	2SC1740SQ	TRANSISTOR
Q709	2SC1740SQ	TRANSISTOR
Q907	2SC1740SQ	TRANSISTOR
Q908	2SA933SQR	TRANSISTOR
Q909	2SC1740SQ	TRANSISTOR
Q910	2SA933SQR	TRANSISTOR
DIODES		
D101	MA165	DIODE
D204	MA165	DIODE
D206	MA165	DIODE
D207	MA165	DIODE
D301	MA165	DIODE
D701 ⚠	SVD1SR35200A	DIODE
D702 ⚠	SVD1SR35200A	DIODE
D703	MA4150M	DIODE
D704	MA4062M	DIODE
D705	MA165	DIODE
D710	MA165	DIODE
D711	MA165	DIODE
D714	MA4051-M	DIODE
D902	MA165	DIODE
D906	MA162A	DIODE
D908	MA165	DIODE
D909	MA165	DIODE
D910	MA165	DIODE
D911	MA165	DIODE
D912	MA165	DIODE
D913	MA165	DIODE
D914	MA165	DIODE
D915	MA165	DIODE
D916	MA165	DIODE
D917	MA165	DIODE
D918	MA165	DIODE
D919	MA165	DIODE
D920	MA165	DIODE
D923	MA165	DIODE
D927	MA165	DIODE
D928	MA165	DIODE
D929	MA165	DIODE
VARIABLE RESISTORS		
VR301	EVNDXAA00B53	V.R. MPX VCO
COILS AND TRANSFORMERS		
L101	RLQZPR22KT-Y	COIL
L102	RLQZP1R0KT-Y	COIL
L203	ELEPKR68MA	CHOCK COIL
L204	ELEPKR68MA	CHOCK COIL
L902	RLQZP101KT-Y	COIL
T201	RLI4B001-Z	COIL
T701 ⚠	SLT5J248	POWER TRANSFORMER
COMPONENT COMBINATIONS		
Z110	REN0071	FRONT-END PACK(FM)
Z201	RLA2Z001-T	COMBINATION PART
Z202	SLI7Z101-T	I.F.TRANSFORMER
Z901	EXBF8E104J	COMPONENT COMBINATION
Z902	EXBF9E104J	COMBINATION
Z903	EXFP8331MW	COMBINATION
Z911	A1QH3027H0	COMBINATION
FILTERS		
CF201	RLFETNGM02LB	CERAMIC FILTER(BLUE)
CF201	RLFETNGM02LC	CERAMIC FILTER(ORANGE)
CF202	RLFETNGM02LB	CERAMIC FILTER(BLUE)
CF202	RLFETNGM02LC	CERAMIC FILTER(ORANGE)
OSCILLATORS		
X101	SVQ49U722-S	CRYSTAL OSCILLATOR
X902	EF0A960K04A	CRYSTAL OSCILLATOR
DISPLAYS		
FL901	SAD8MT10Z	DISPLAY TUBE
SWITCHES		
S701 ⚠	SSH1196-1	SW. POWER
S901	EVQQB005R	SW. CH1
S902	EVQQB005R	SW. CH2
S903	EVQQB005R	SW. CH3
S904	EVQQB005R	SW. CH4
S905	EVQQB005R	SW. CH5
S906	EVQQB005R	SW. CH6
S907	EVQQB005R	SW. CH7
S908	EVQQB005R	SW. CH8
S909	EVQQB005R	SW. CH9
S910	EVQQB005R	SW. CH0
S911	EVQQB005R	SW. FM
S912	EVQQB005R	SW. AM
S914	EVQQB005R	SW. MEMO
S915	EVQQB005R	SW. MODE
S916	EVQQB005R	SW. TUNING(DOWN)
S917	EVQQB005R	SW. TUNING(UP)
RELAYS		
RLY701 ⚠	SSY138	RELAY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CABINET AND CHASSIS			18-1	SKL293	FOOT
4	SBC941-4	BUTTON, PRESET	19	RYP0058-K	FRONT PANEL
5	SBC942	BUTTON, TUNING	21	SJT30345JQ	CONNECTOR(3P)
6	RGU0128	BUTTON, BAND	22	SJF8512NJ	TERMINAL, ANT
9	XTB3+12F	SCREW	23	RJS1A0203-0M	SOCKET(3P)
10	XTBS3+8JFZ1	SCREW	24	SJS50378JQ	SOCKET(3P)
11	SJS9331A	AC OUTLET COVER	25	SJS50478JQ	SOCKET(4P)
12	SHG6412	RUBBER	26	SJS50978JQ	SOCKET(9P)
13	SHR9826	RUBBER	27 ⚠	SJS9237	AC INLET
14	SHE170-2	SPACER	28 ⚠	SJS9331B	AC OUTLET
15	SUS808	SPRING	30	SJT30445JQ	CONNECTOR(4P)
16	SBC666-1	BUTTON, POWER	31	SJFD4	TERMINAL, OUT PUT
18	RGR0023	BOTTOM BOARD	32	SJT30945JQ	CONNECTOR(9P)
			33	SKC1931K99	CABINET

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
PACKING MATERIAL			P2	SPS4717-3	PAD
P1	RPG0178	PACKING CASE	P3	SPS4718-2	PAD
			P4	SPP697	PROTECTION BAG

■ EXPLODED VIEW



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