

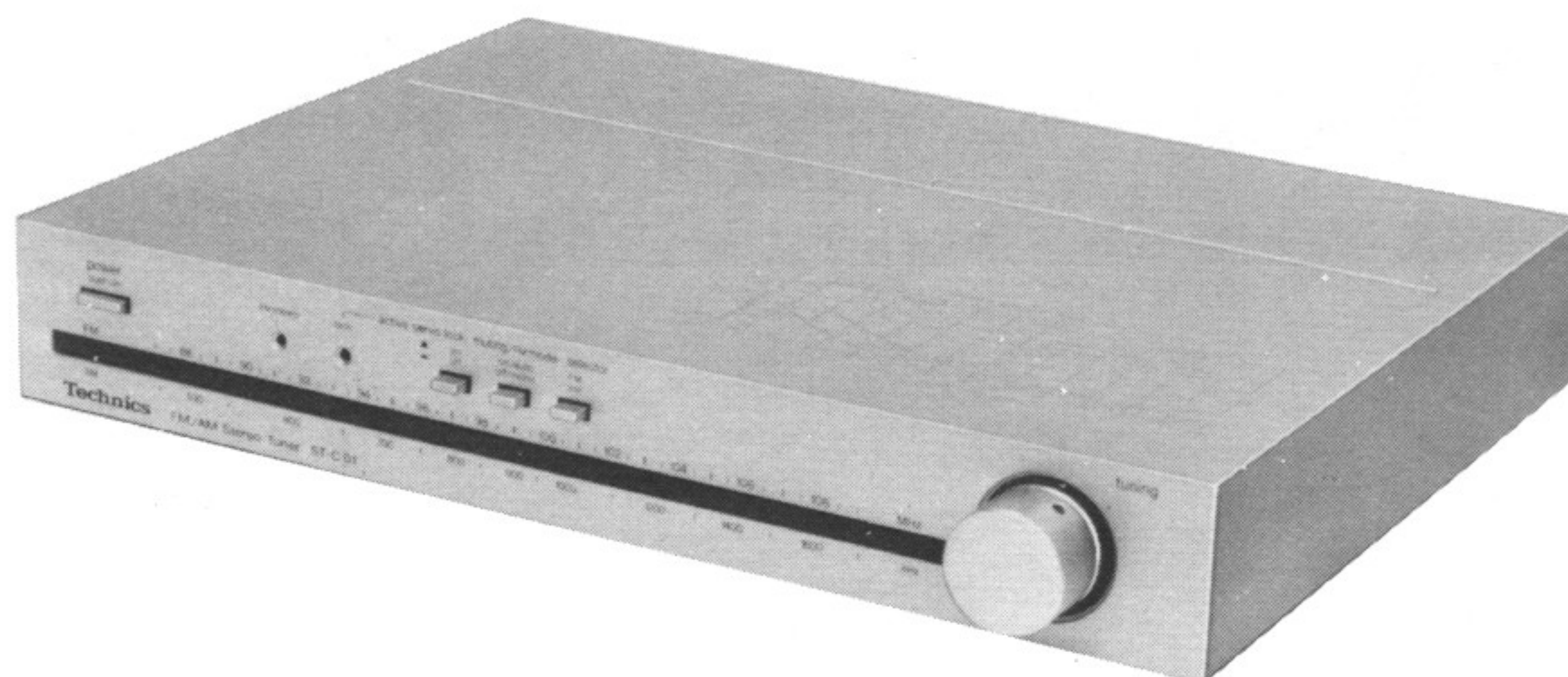
Service Manual

ST-C01

FM/AM Stereo Tuner

ST-C01

(M), (MC)



- * The model ST-C01(M) is available in America only.
- * The model ST-C01(MC) is available in Canada only.

TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

FM TUNER SECTION

Frequency range	88 ~ 108 MHz
Antenna terminals	300 ohms (balanced), 75 ohms (unbalanced)
Sensitivity	10.8 dBf 1.9 μ V (IHF '58)
50 dB quieting sensitivity	
MONO	17.0 dBf 3.9 μ V (IHF '58)
STEREO	38.3 dBf 45 μ V (IHF '58)
Total harmonic distortion	
MONO	100 Hz 0.1% 1 kHz 0.1% 6 kHz 0.15%
STEREO	100 Hz 0.25% 1 kHz 0.15% 6 kHz 0.25%
S/N	MONO 75 dB STEREO 70 dB
Frequency response	20Hz ~ 15 kHz, +0.5 dB, -1.5 dB
Alternate channel selectivity	75 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	50 dB

IF rejection at 98 MHz	85 dB
Spurious response rejection at 98 MHz	75 dB
AM suppression	55 dB
Stereo separation	1 kHz 45 dB, 10 kHz 35 dB
Leak carrier	19 kHz, 38 kHz -40 dB

AM TUNER SECTION

Frequency range	525 ~ 1605 kHz
Sensitivity	30 μ V, 250 μ V/m
Selectivity	30 dB
Image rejection at 1000 kHz	50 dB
IF rejection at 1000 kHz	40 dB

GENERAL

Output voltage	0.5V
Power consumption	8W
Power supply	AC 60Hz, 120V
Dimensions (W x H x D)	297 x 49 x 255 mm (11 $\frac{1}{16}$ x 1 $\frac{5}{16}$ x 10 $\frac{1}{2}$) inch
Weight	2.9 kg (6.4 lb.)

Weights and dimensions shown are approximate.

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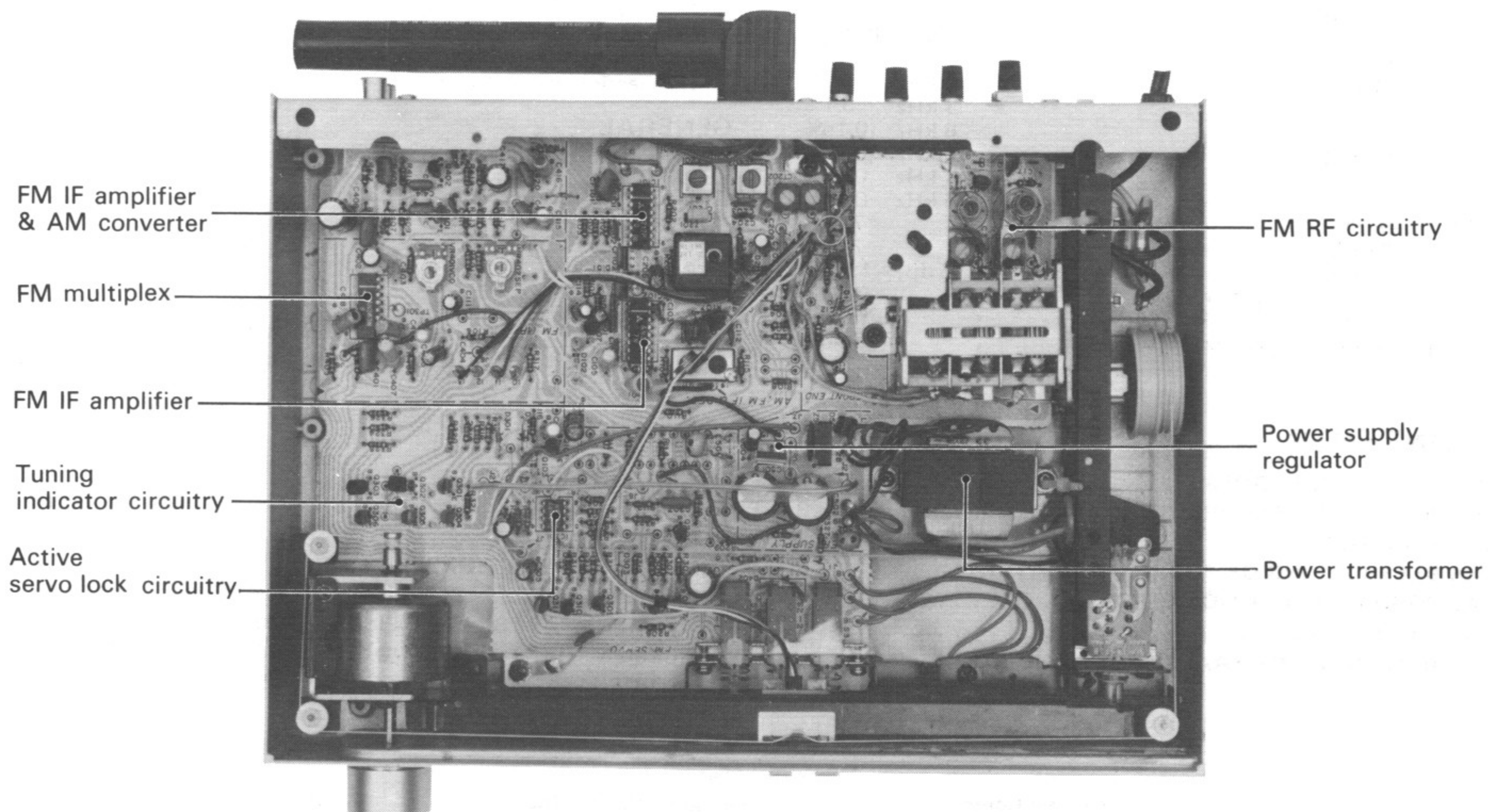
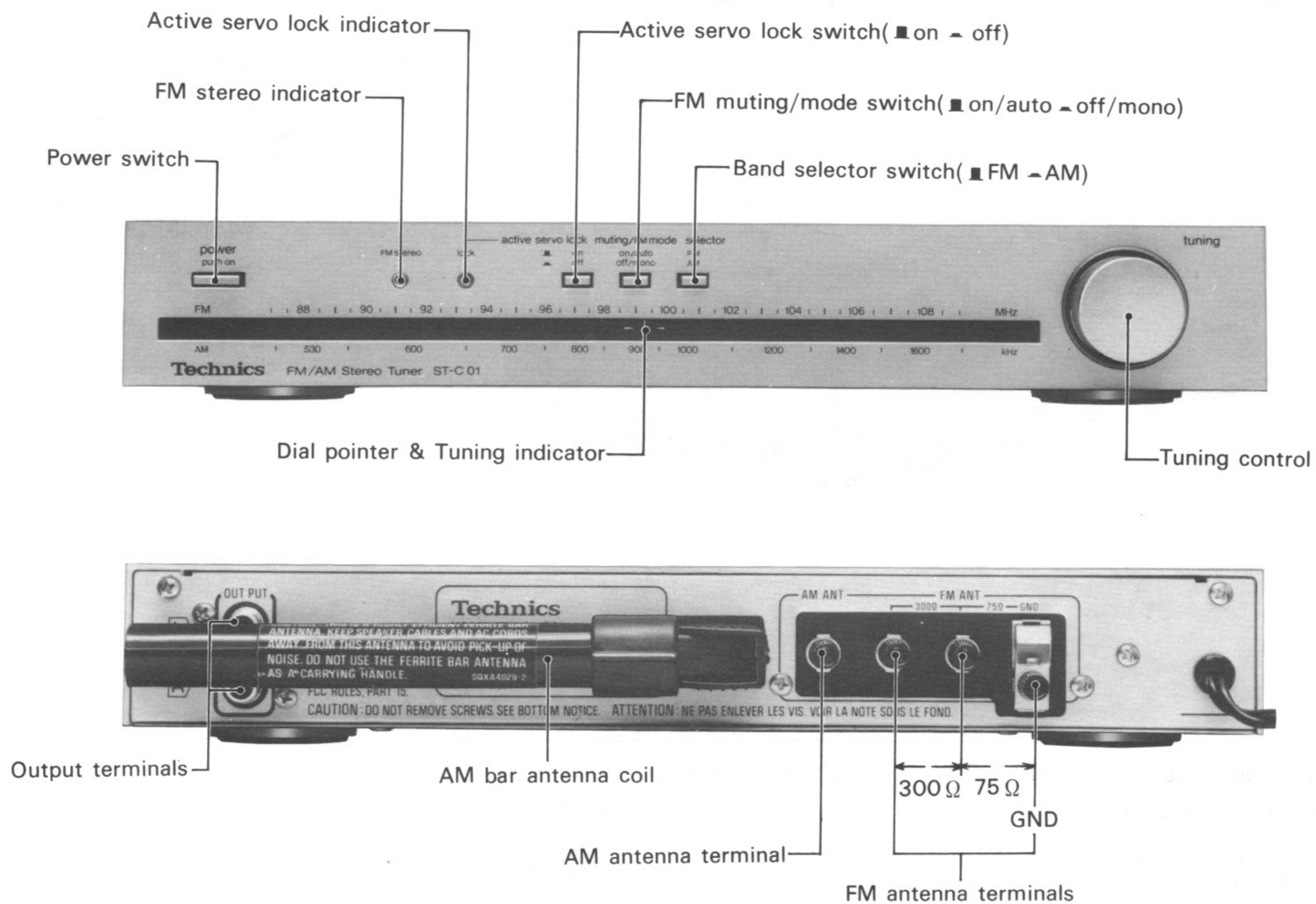
Technics

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Corporation of America
One Panasonic Way, Secaucus,
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Panasonic Hawaii, Inc
320 Waiakamilo Road, Honolulu,
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Matsushita Electric of Canada Ltd.
5770 Ambler Drive,
Mississauga, Ontario L4W 2K9

■ LOCATION OF CONTROLS



■ TO REMOVE PRINTED CIRCUIT BOARD

1. Remove the bottom board from the set.
2. Loosen the tuning knob setscrew with a hexagonal wrench and then pull out the knob. (fig. 1)
3. Remove the 5 setscrews (① ~ ⑤) in fig. 2) used to secure the printed circuit board on the cabinet.
4. Remove the 2 setscrews (⑥, ⑦) in fig. 3) used to fasten the rear plate.
5. Pull the printed circuit board backwards along with the rear panel. Then the printed circuit board can be removed from the cabinet.
6. When installing the printed circuit board, reverse the procedure 1 ~ 5.

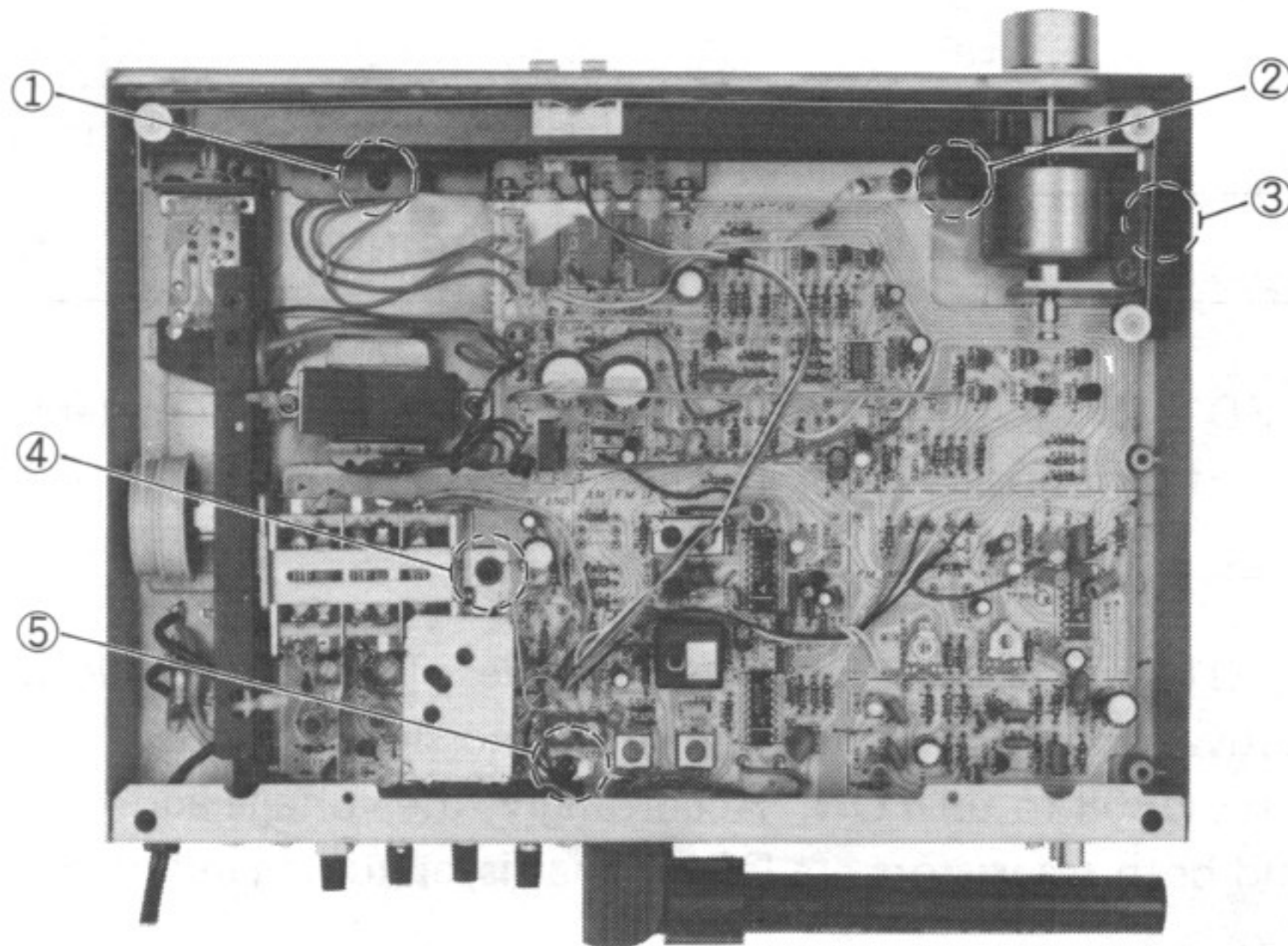


Fig. 2

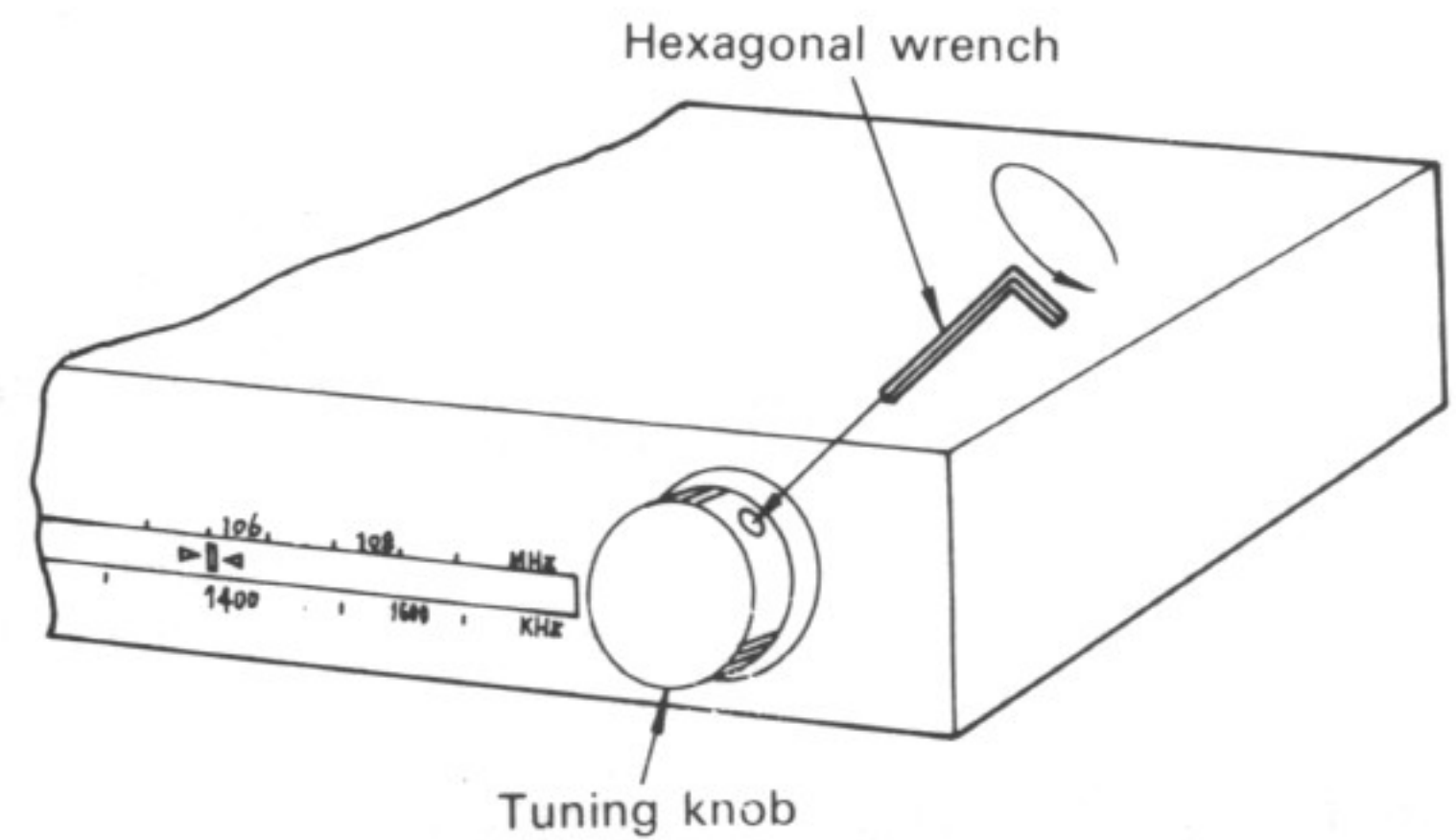


Fig. 1

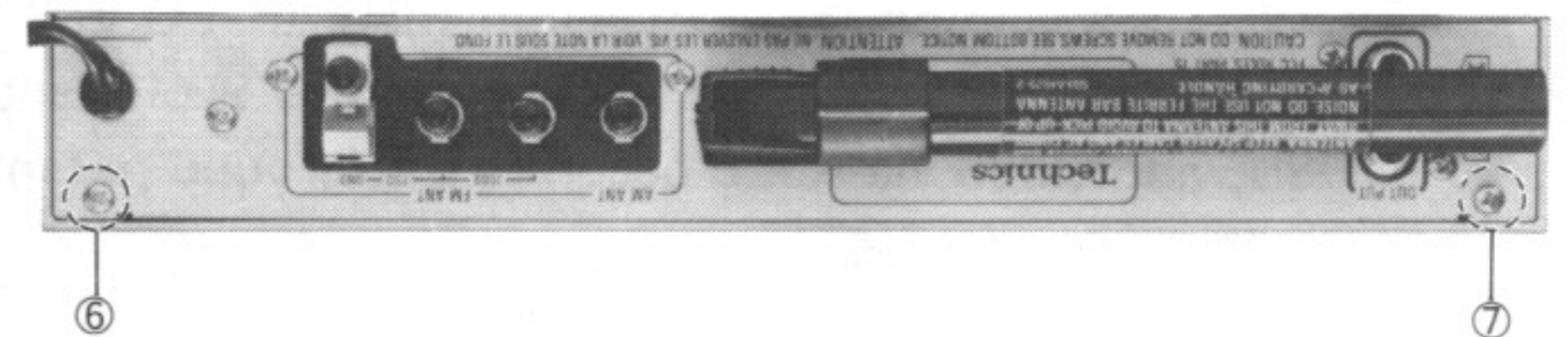
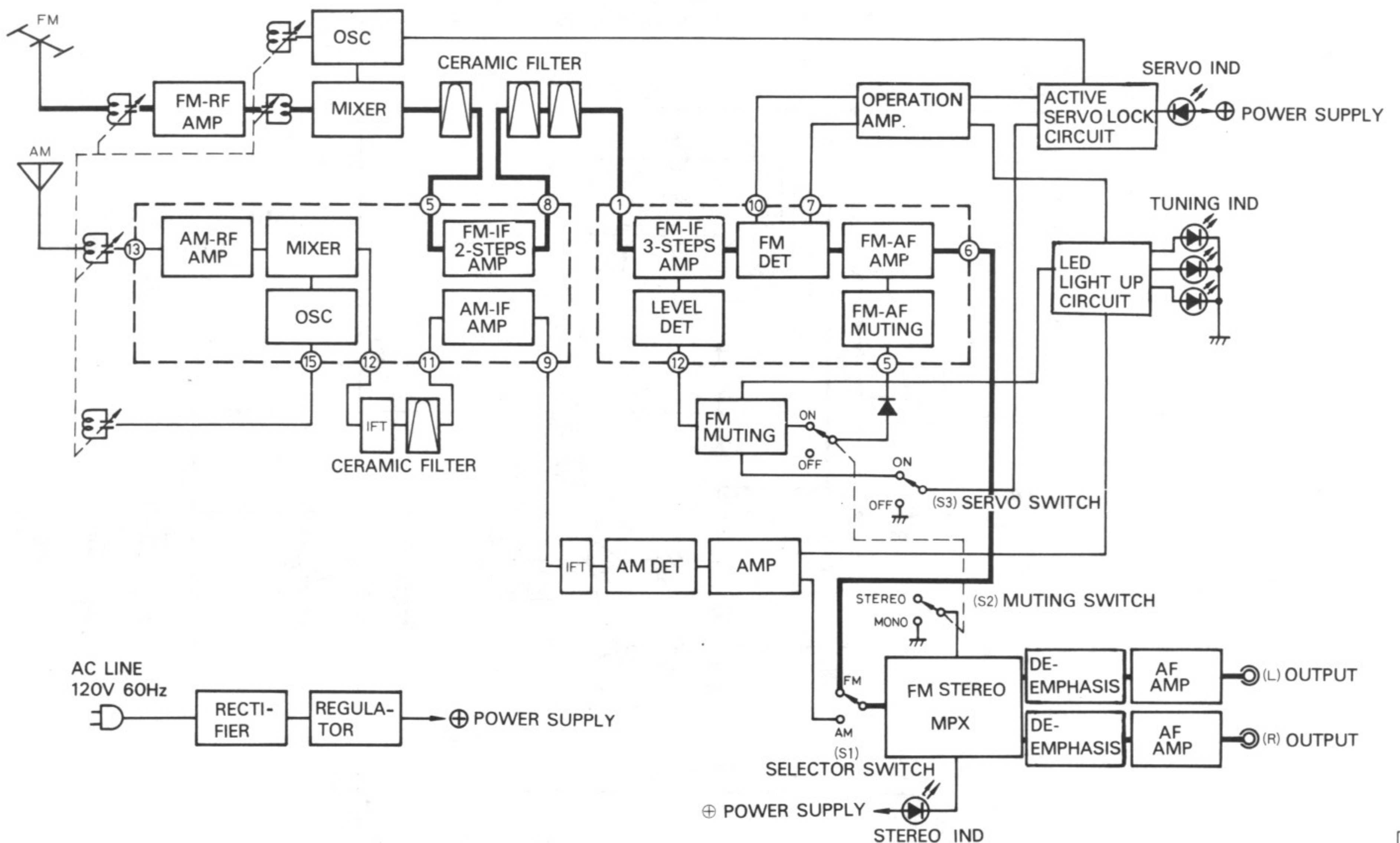


Fig. 3

■ BLOCK DIAGRAM

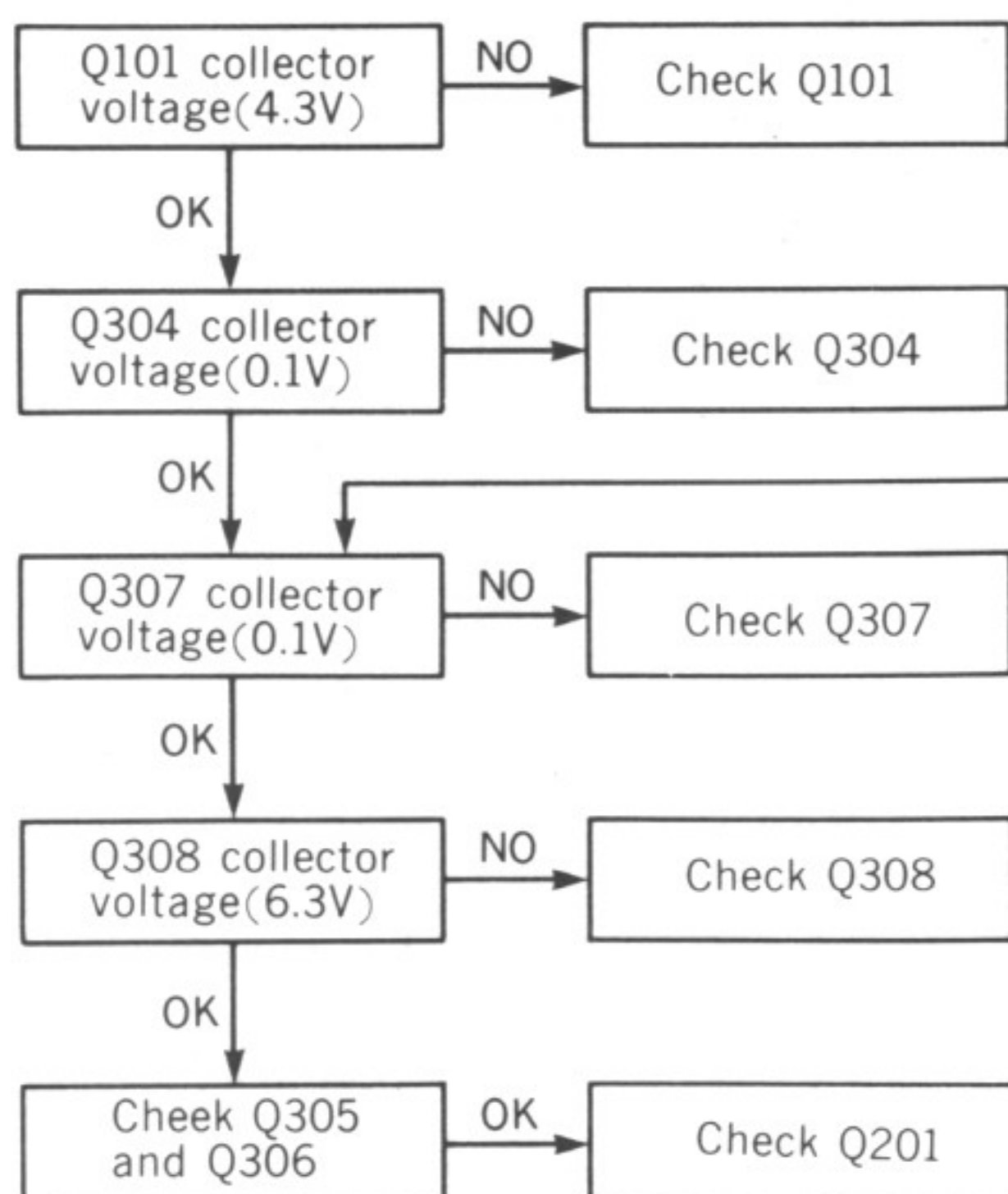


■ TROUBLESHOOTING OF TUNING INDICATOR

1. The tuning LED(Light Emitting Diode) doesn't go out with stereo signal received.

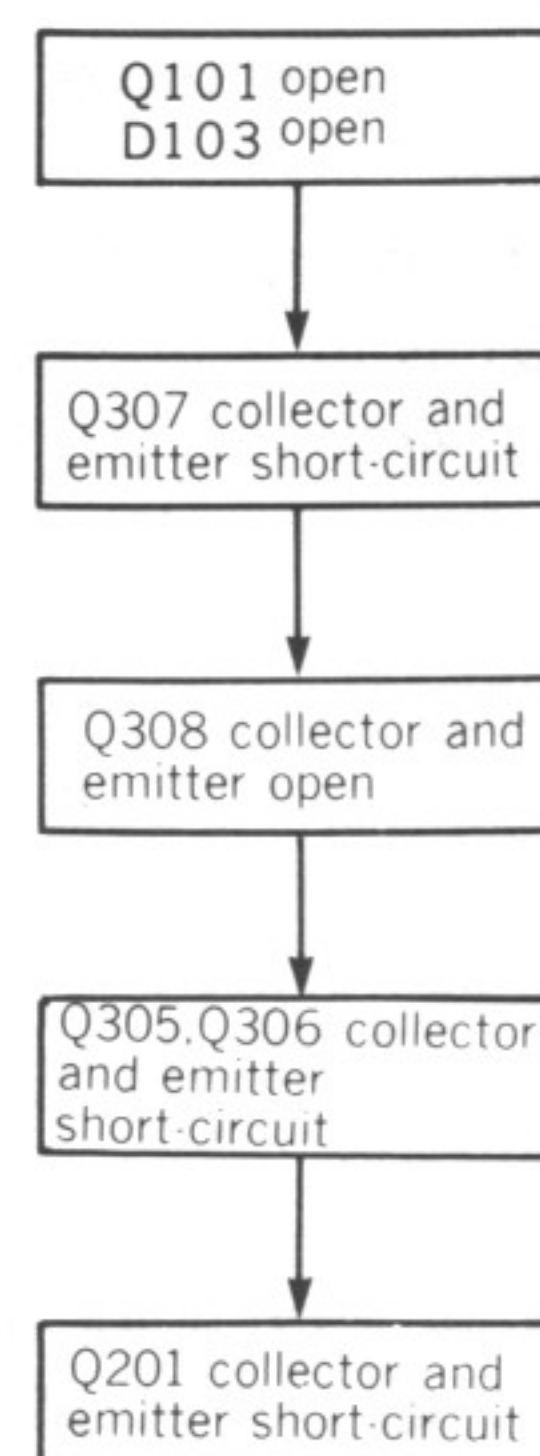
2. The tuning LED doesn't light up in no signal mode.

● LED doesn't go out with servo lock "ON"

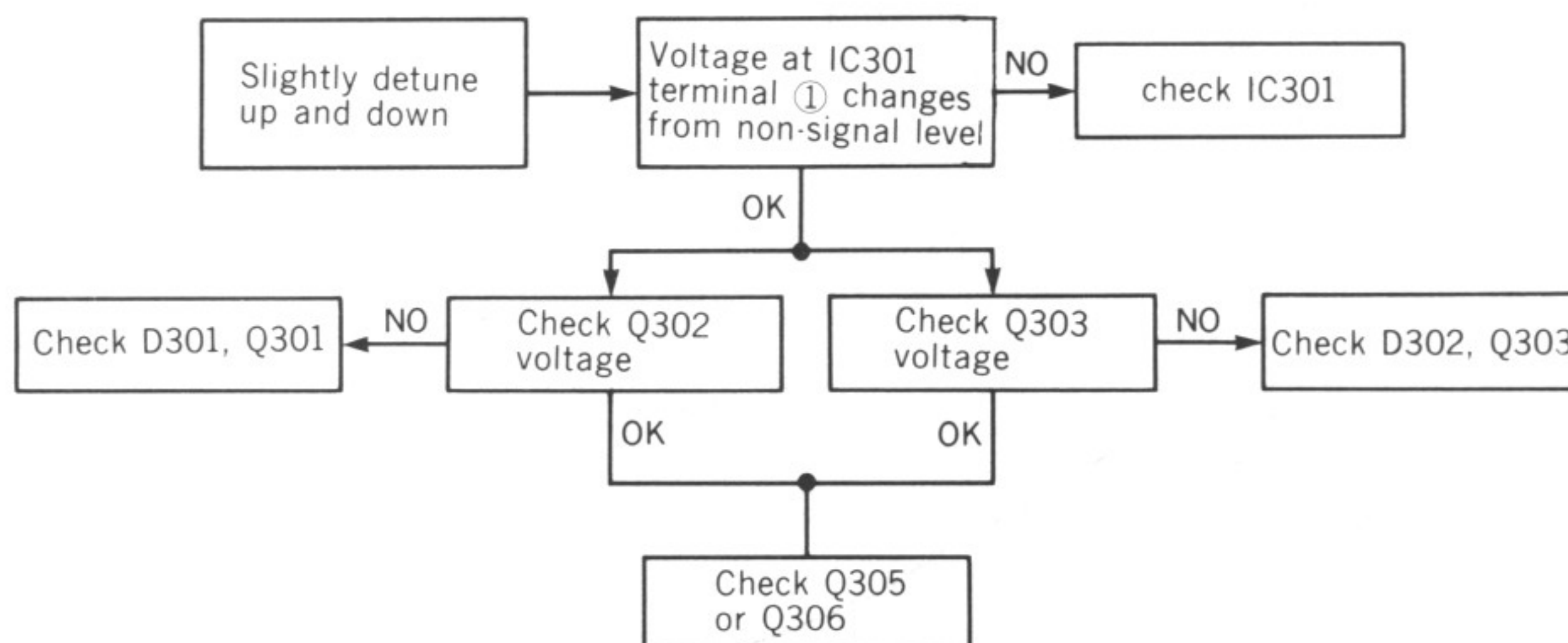


● LED doesn't go out with servo lock "OFF"

Q101 and Q304 are OK

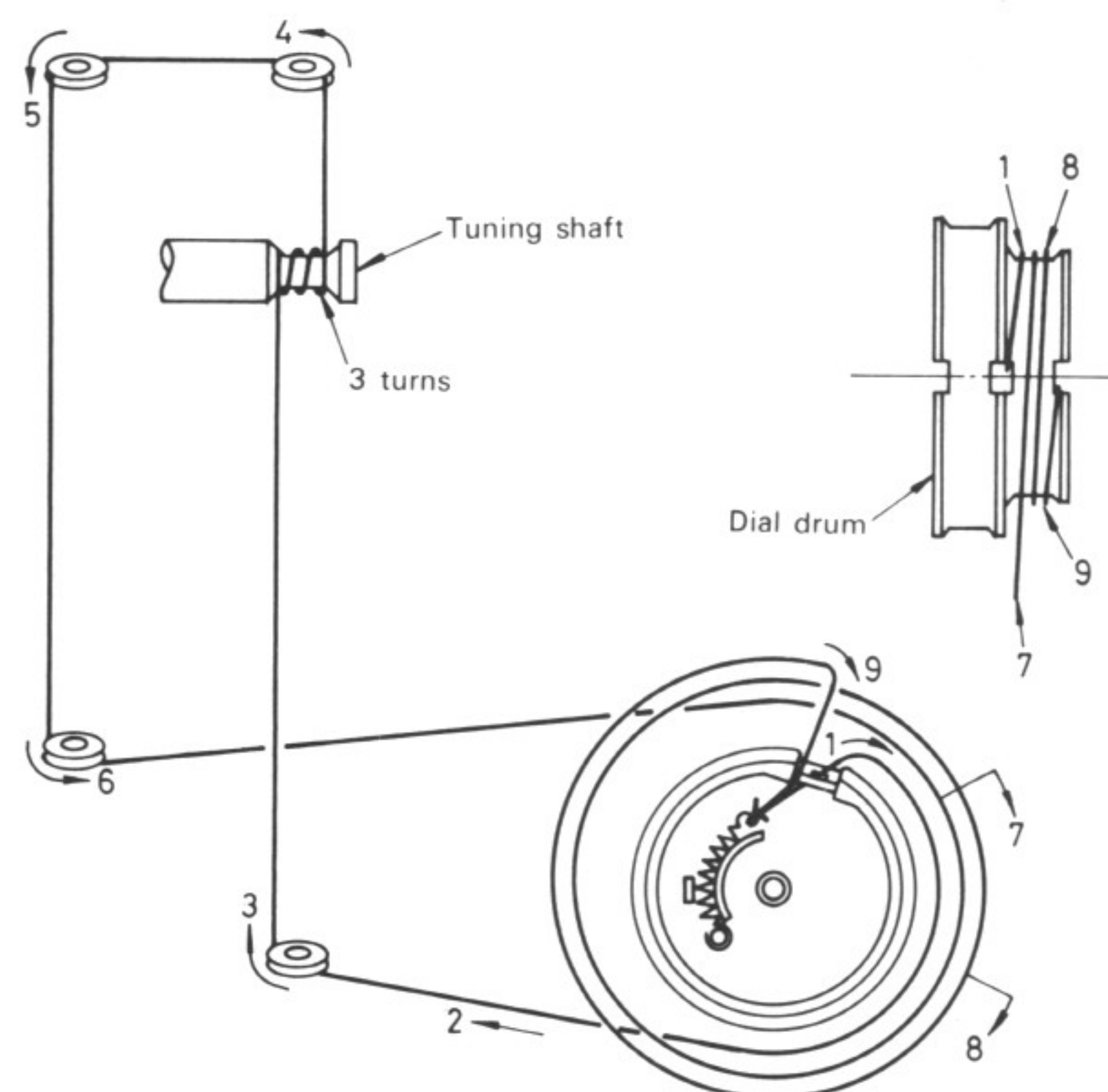


3. Only one tuning LED goes out with stereo signal received.



■ DIAL CORD INSTALLATION GUIDE

- For threading a fresh cord, proceed as follows.
 - Prepare a fresh cord more than 130 cm (51-1/4") in length.
 - Bring the variable capacitor into a state where the drum is completely turned to the right (maximum capacity and lowest frequency for the variable capacitor).
 - Direct the cord in the order from 1 to 9.
 - Stretch the cord in such a tension as the spring length is elongated by 1.5 times that of the original state.
 - Fix the knot of the cord with the bond.



■ TECHNICAL GUIDE

(A) ACTIVE SERVO LOCK CIRCUIT

This circuit is designed to maintain the exact tuning point even in case of frequency drift in the set or at the broadcasting station.

It watches the S curve of the FM IF detector and shifts the voltage to its original level if it is deflected from the reference voltage thus keeping the set in optimum "Tuned" condition at all times.

1. No signal reception mode

IC301 is dual operational amplifier plus voltage amplifier.

A reference voltage of about 5.6V is applied from terminal ⑩ of IC102 to terminal ⑤ of IC301. The IF detector output voltage is fed from terminal ⑦ of IC102 to terminals ⑥ and ③ of IC301. (Since this unit is a quadrature detection type, the output voltage at terminal ⑦ is about 5.6V in "No signal" and "Exact tuned" condition.)

IC301 detects the difference between the detector output voltage and the reference voltage to obtain an amplified difference voltage at terminal ⑦ of IC301.

This voltage controls Q309 which is turned off in the "Exact tuned" and in the "No signal" mode. (Reference voltage and detector output voltage are the same.)

Q101 located near IC102 is a switching transistor to operate in accordance with the FM-IF signal level.

It is ON in the "No signal" mode as its base potential is high at that time, and it turns OFF only, when the input level of the FM-IF signal reaches a certain level.

With the active servo lock switch "ON", and Q101 "ON", both the collector voltage of Q101 and the base voltage of Q307 are 0V (ground potential), while Q307 is OFF.

Consequently, Q308 is ON, Q311 is OFF and Q310 is ON, and voltage is being applied to the variable capacity diode D1 as in Fig. 5.

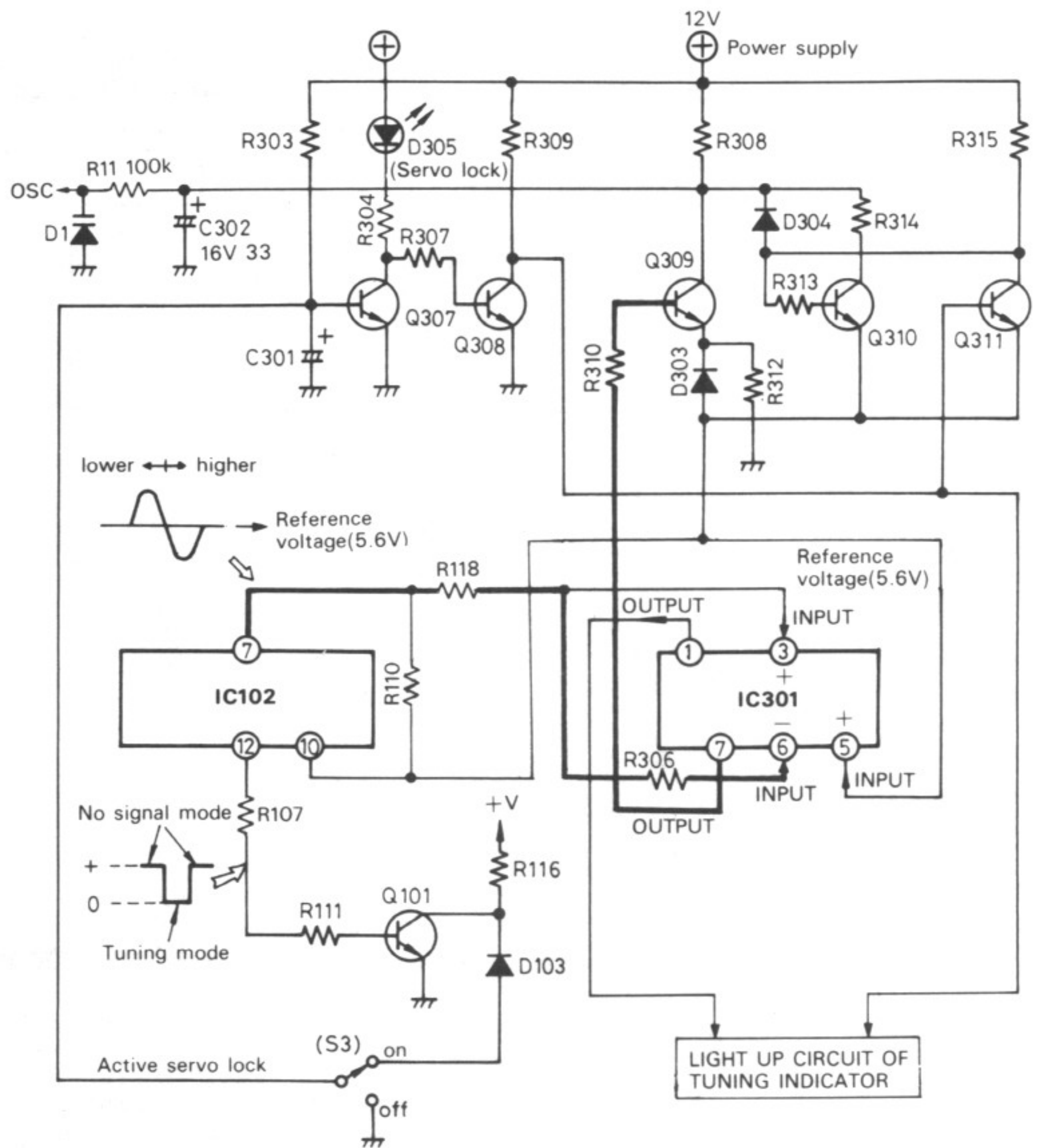
2. Signal reception mode

As explained above, Q101 turns OFF when a signal is received, causing the collector voltage to rise. D103 is reverse-biased and current stops to flow. In other words, the base of Q307 is electrically disconnected from the collector of Q101.

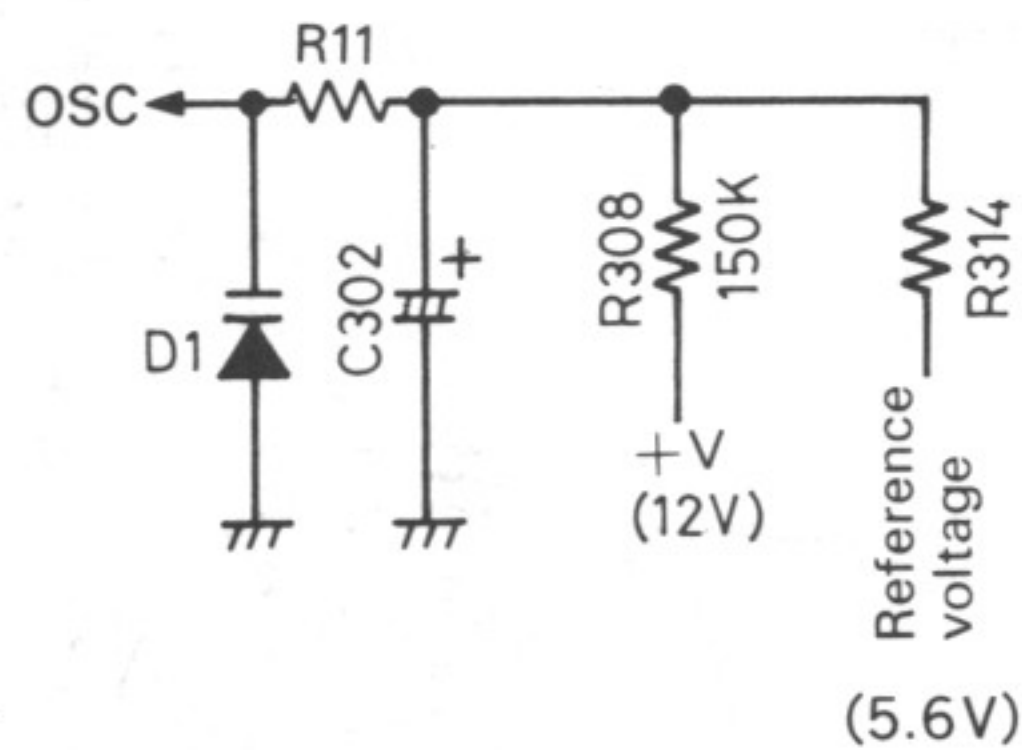
This causes C301 to be charged through R303. About 2 or 3 seconds later, Q307 turns ON and the servo lock circuit starts to operate.

Then, servo lock indicator D305 light up.

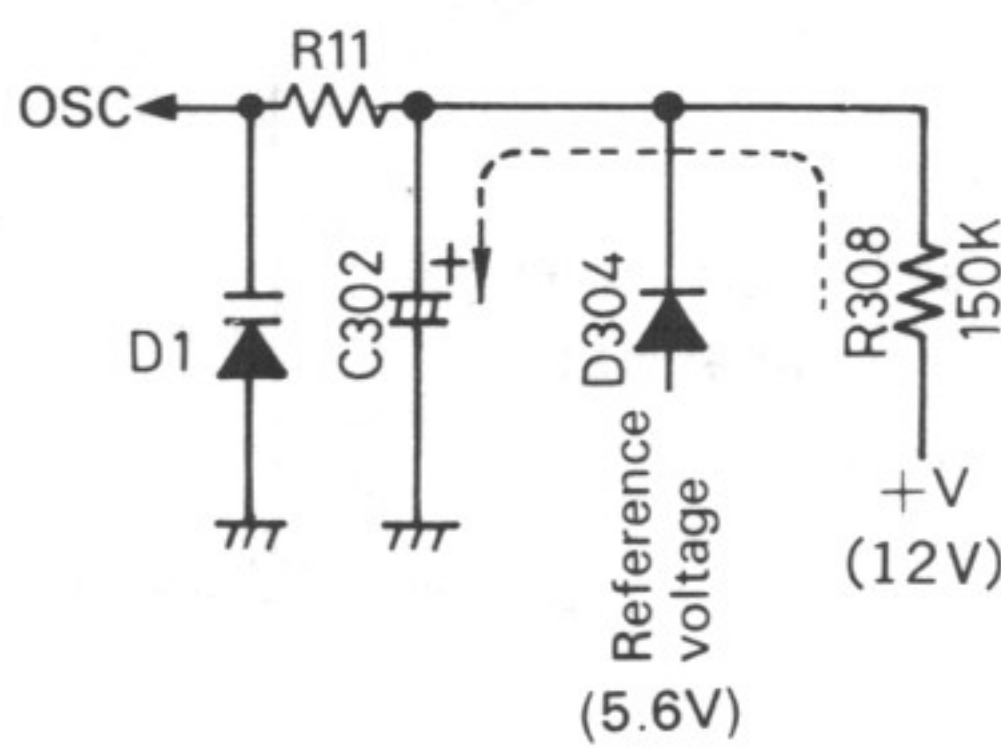
When Q307 is ON, then Q308 is OFF, Q311 is ON and Q310 is OFF and a constant voltage is applied to D1 as shown in Fig. 6.



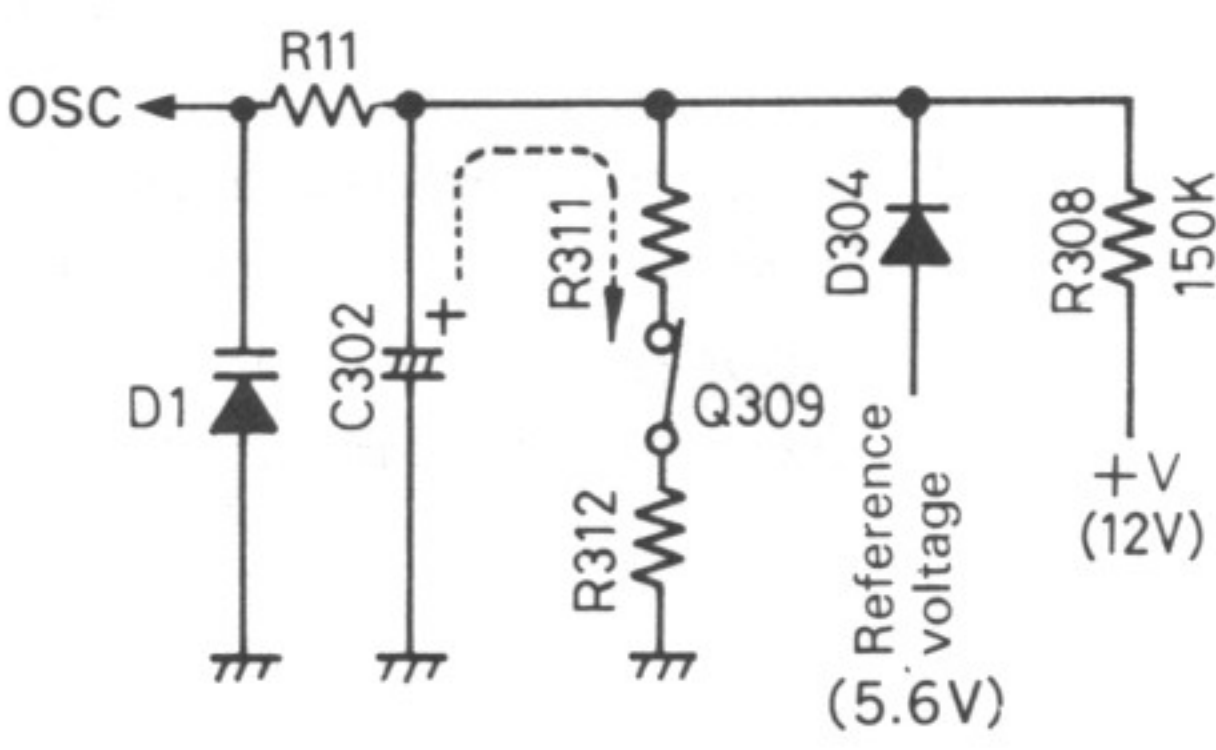
(Active servo lock circuit)
Fig. 4



(No signal mode)
Fig. 5



(Exact tuning & deviation to lower frequency)
Fig. 6



(Deviation to higher frequency)
Fig. 7

3. Deviation to higher frequency

If the frequency is deflected upward, the FM-IF detector output voltage (voltage at IC102 terminal ⑦) drops, while the output voltage at terminal ⑦ of IC301 rises above the reference voltage (5.6V). Then Q309 turns ON, resulting in the circuit as shown in Fig. 7. The voltage across D1 drops, causing the capacity to increase and the frequency of the local oscillator circuit to become lower, thus shifting the frequency back to the correct tuning point.

4. Deviation to lower frequency

If the frequency is deflected to the lower side, the if detector voltage goes up, dropping the output voltage at terminal ⑦ of IC301 below the reference level and Q309 turns OFF. C302 starts to charge up (see fig. 6). The voltage across D1 increases, capacity of D1 decreases, which causes the oscillator frequency to go up to the correct tuning point.

MODE	Q101	Q307	Q308	Q311	Q310	Q309	C302	D1 (CAPACITY)
NO SIGNAL	ON	OFF	ON	OFF	ON	OFF	FULLY CHARGED	CONSTANT
EXACT TUNING	OFF	AFTER 3 SEC ON	AFTER 3 SEC OFF	AFTER 3 SEC ON	AFTER 3 SEC OFF	OFF	FULLY CHARGED	CONSTANT
FREQUENCY IS HIGHER	OFF	ON	OFF	ON	OFF	ON	DISCHARGING	↑ UP
FREQUENCY IS LOWER	OFF	ON	OFF	ON	OFF	OFF	CHARGING	↓ DOWN

(B) TUNING INDICATOR CIRCUIT

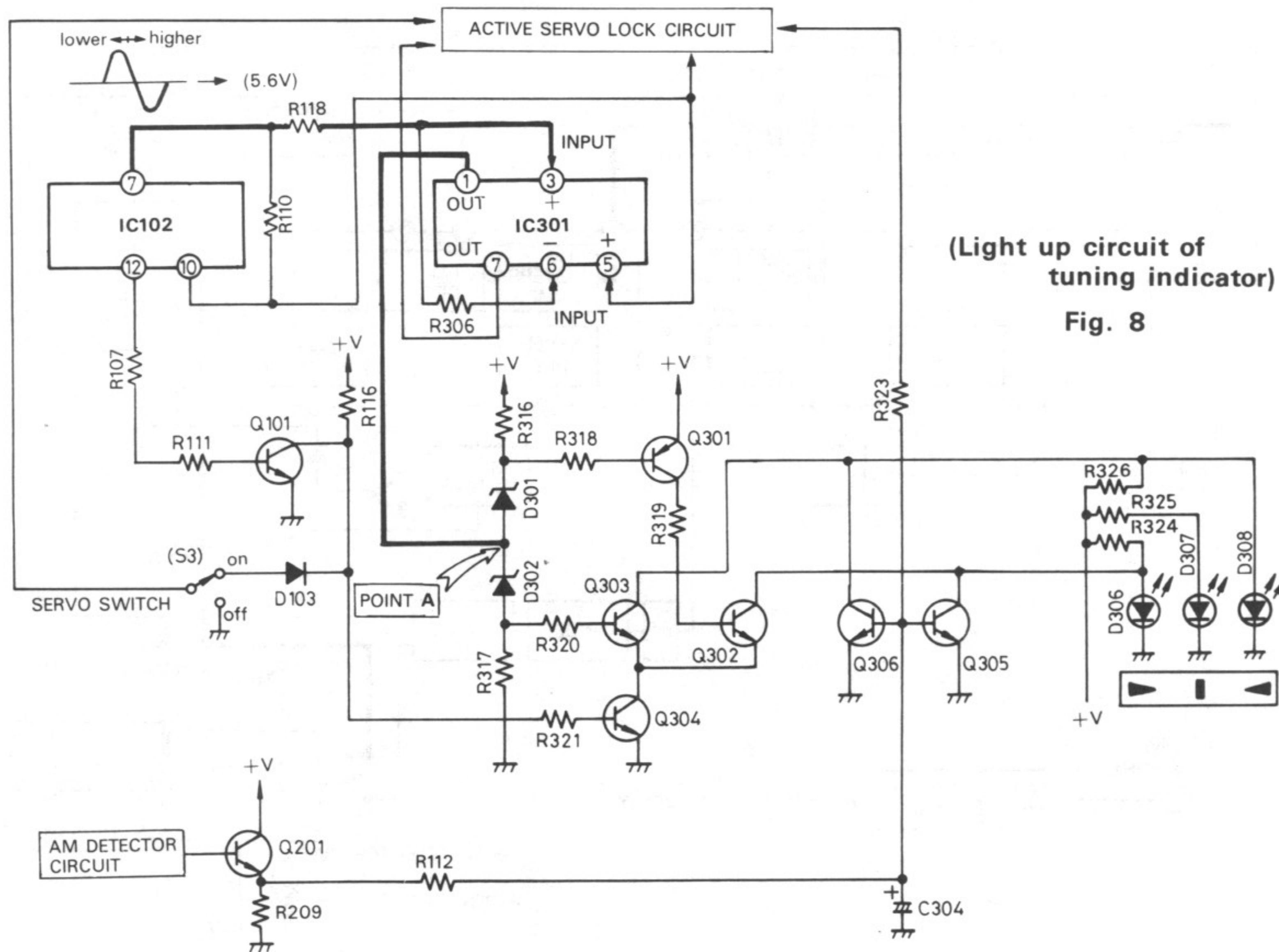
This circuit is designed to activate the arrow shaped indicator LED'S (▶◀) in place of conventionally employed meters. Since the circuit is interlocked with the active servo lock circuit, it is necessary to be familiar with the active servo lock circuit.

1. No signal mode

As explained in section (A)-1 "Active servo lock circuit", Q101 is ON in "no signal" mode. Therefore Q304 is OFF. This is important. Also remember that Q307 in the active servo lock circuit is OFF in "no signal" mode. At that time, the collector voltage of Q307 is plus and it causes Q308 to turn ON. Accordingly, the voltage added to Q305 and Q306 via R323 becomes 0V (ground potential), and both transistors are OFF. That is, all tuning indicators are showing. (▶◀)

2. Exact tuning

The output voltage from terminal ① of IC301 (see fig. 8) is applied to point A, causing Q301 and Q303 to turn ON. Q302 turns ON when Q301 is turned ON. Also, in exact tuning mode Q101 is OFF as previously explained. When Q101 is OFF, Q304 is ON, and accordingly, the collectors of Q303 and Q302 drop to 0V (ground potential), and the arrow tuning indicators go out and only the pointer indicator remains illuminated. (|)



(Light up circuit of tuning indicator)
Fig. 8

3. Deviation to lower frequency

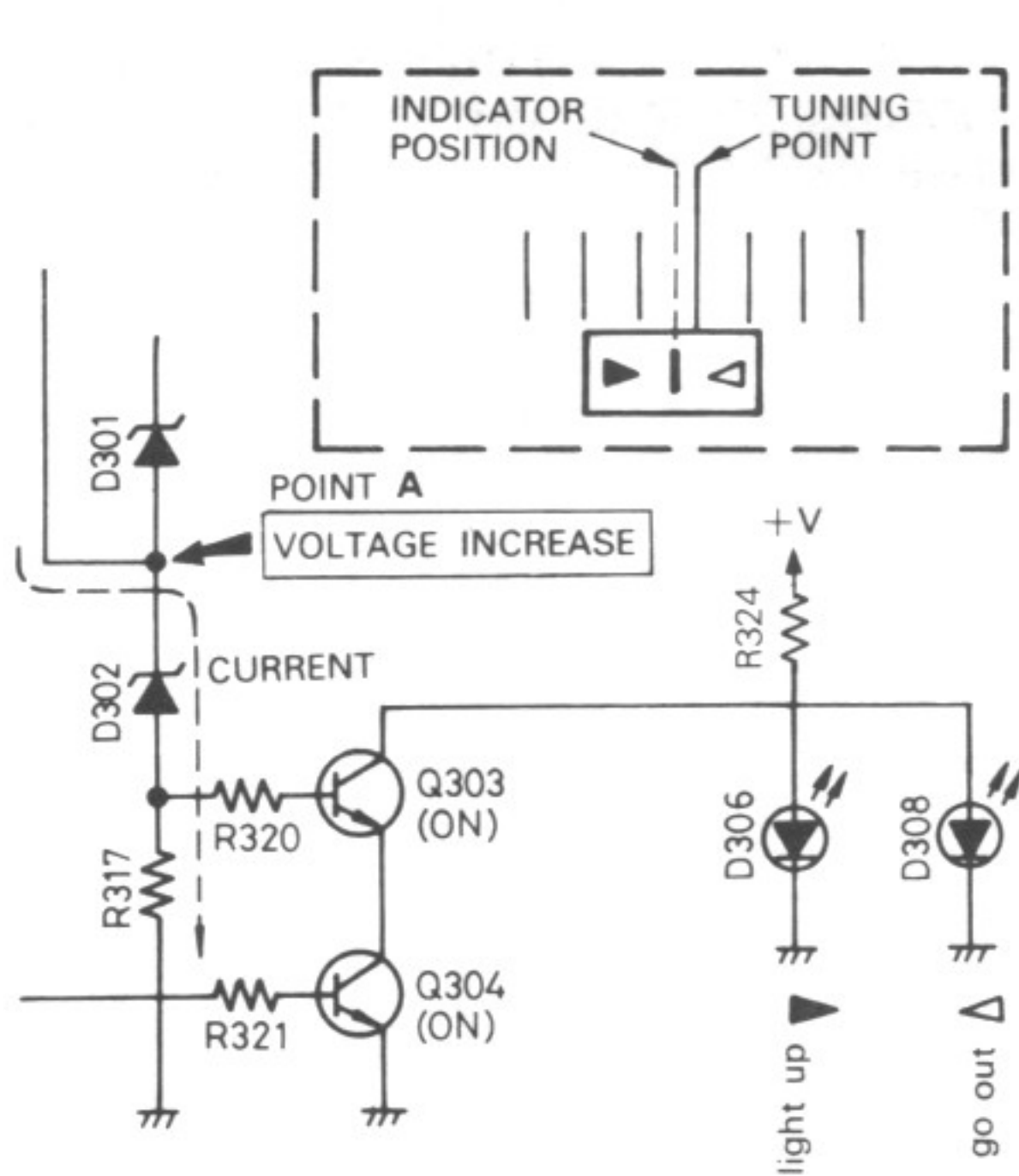
The voltage at terminal ① of IC301, that is, the voltage at point A increases. D301 loses its Zener effect and Q301 turns OFF as it is not biased. When Q301 is OFF, Q302 is OFF, too. Therefore, the ► shaped indicator D306 lights up. When the voltage at point A rises, the Zener effect of D302 becomes greater, and then Q303 is kept biased and turned ON. Accordingly, the ◀-mark LED (D308) goes out as its anode is of ground potential. That means you have to turn the dial in the direction of the ►-mark (higher frequency side).

4. Deviation to higher frequency

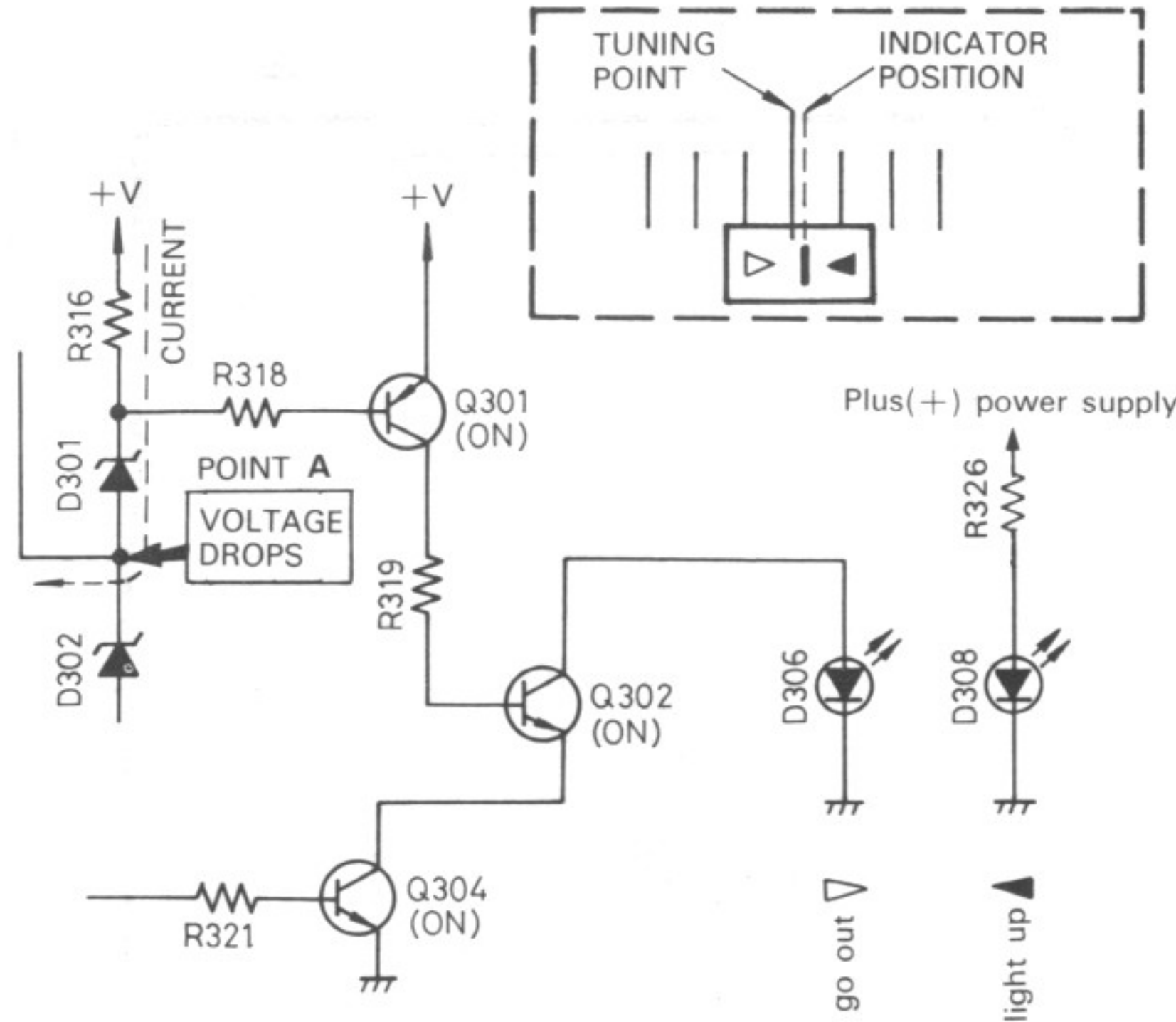
This time, the voltage at point A drops, D302 loses its Zener effect and Q303 turns OFF. Conversely the Zener effect of D301 increases causing Q301 to be biased and Q301 turns ON. Subsequently, Q302 turns ON. Then, the ►-mark LED goes out, while the ◀-mark LED lights up. That means you have to turn the dial in the direction of the ◀-mark (lower frequency side).

5. AM reception

With no signal received, the emitter voltage of Q201 is low, then Q305 and Q306 is not biased, so the arrow mark LED lights up. When the detection voltage rises with AM tuned, the emitter voltage of Q201 increases, therefore the bias applied to Q305 and Q306 also becomes greater. In complete tuning condition, Q305 and Q306 turn ON and both of the arrow mark LED's go out.



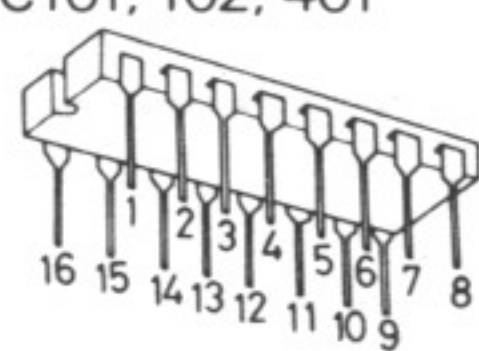
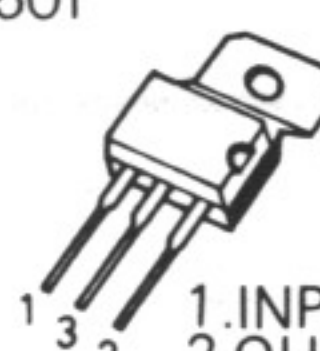
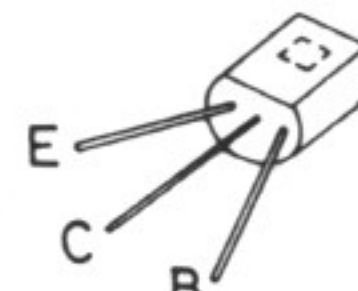
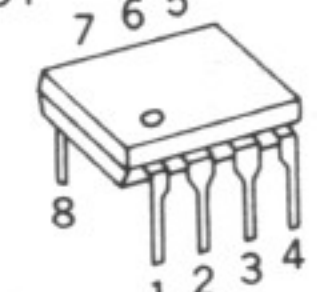
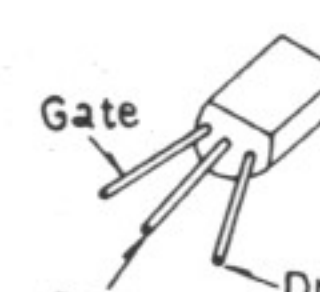
(Deviation to lower frequency)
Fig. 9



(Deviation to higher frequency)
Fig. 10

MODE	Q101	Q301	Q302	Q303	Q304	Q305	Q306	TUNING INDICATOR	SERVO INDICATOR
NO SIGNAL	ON	ON	ON	ON	OFF	OFF	OFF	►◀	
EXACT TUNING	OFF	AFTER 3 SEC ON	ON	ON	ON	OFF	OFF		LIGHT UP
FREQUENCY IS LOWER	OFF	ON	OFF	ON	ON	OFF	OFF	►	
FREQUENCY IS HIGHER	OFF	ON	ON	OFF	ON	OFF	OFF	◀	
A. M.	ON	ON	ON	ON	OFF	ON	ON		

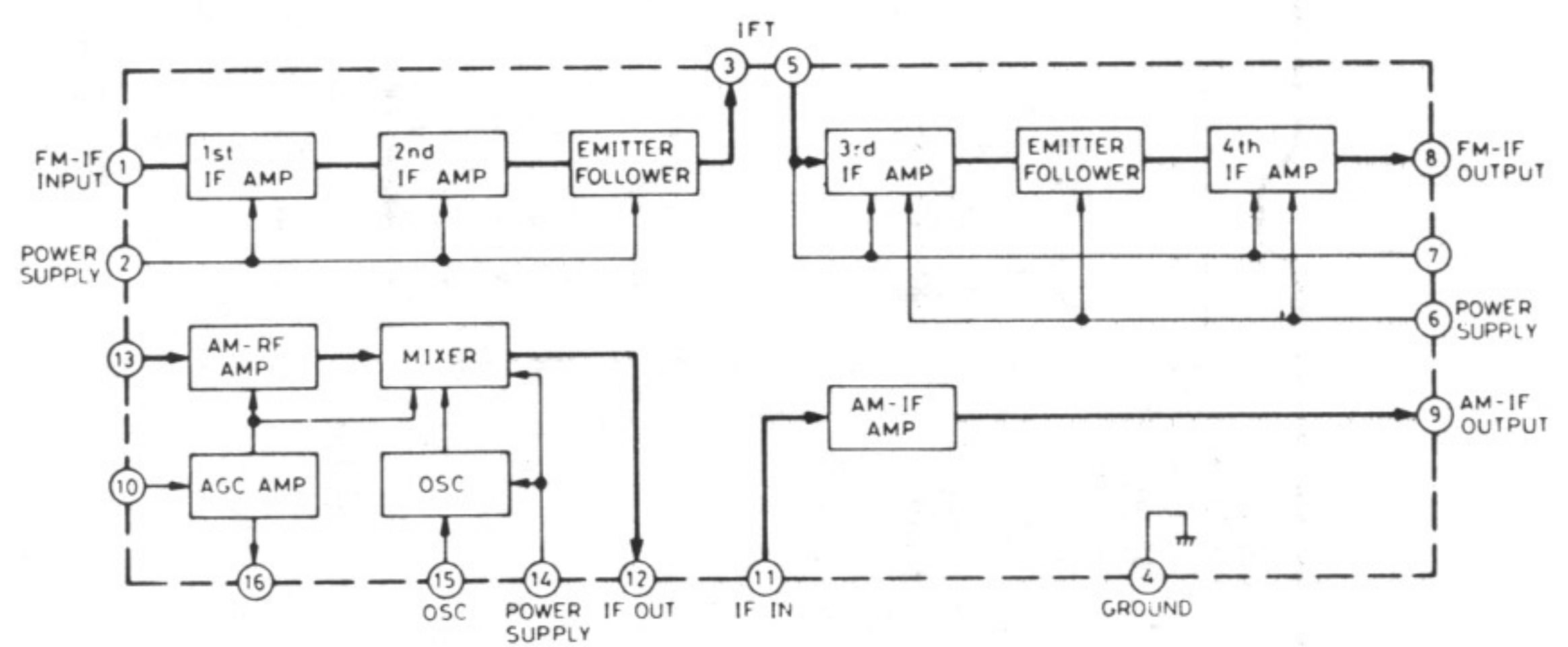
■ TERMINAL GUIDE OF TRANSISTORS AND IC'S

AN217,AN377,AN363N IC101, 102, 401 	SVIFS7812C IC501  1.INPUT 2.OUTPUT 3.COMMON	2SC1674 , 2SC1675 2SC945 , 2SA733 Q2,3,101,201,301~311, 401,402 
SVIμPC4558C IC301 	2SK49 Q1 	

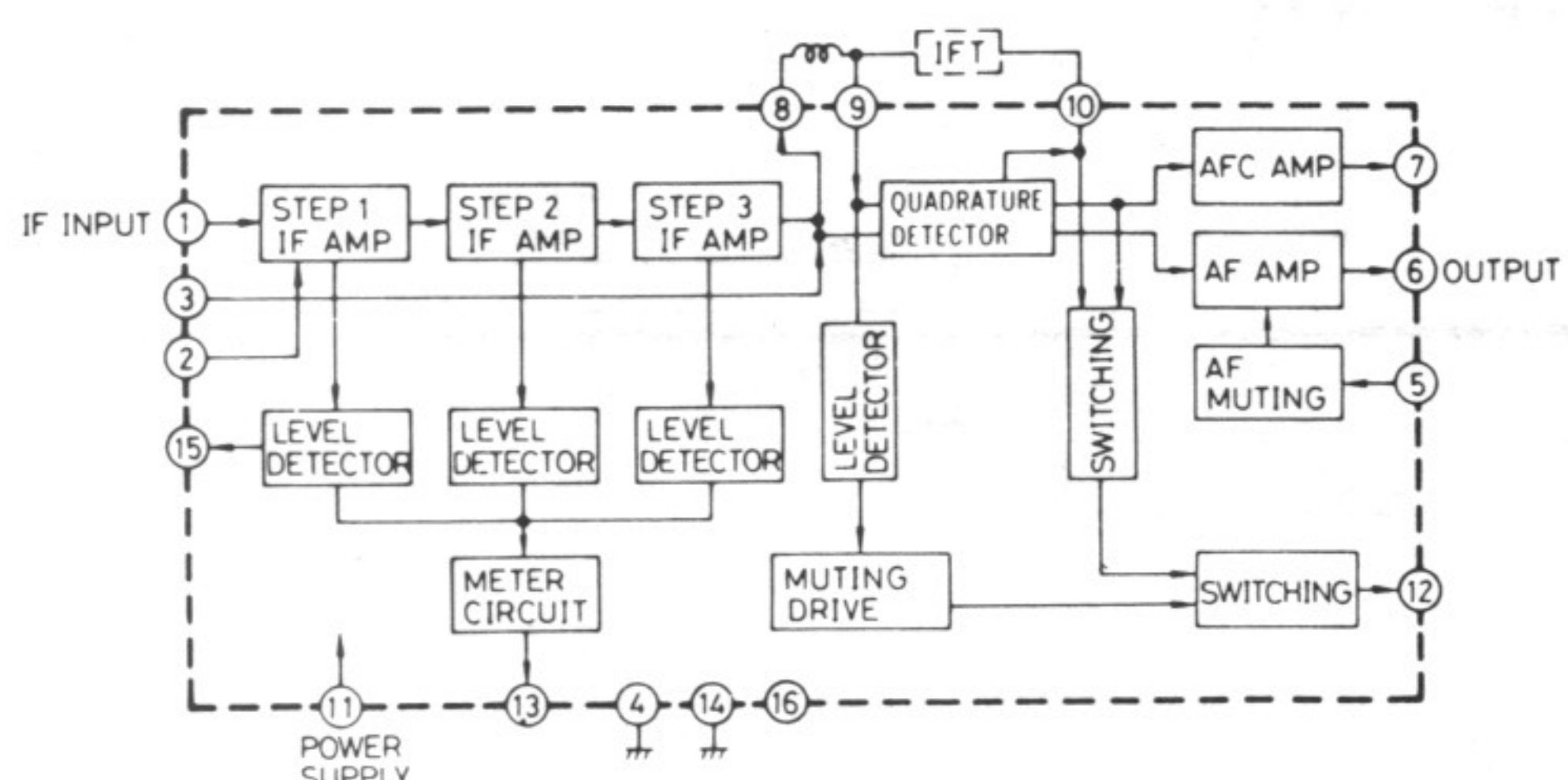
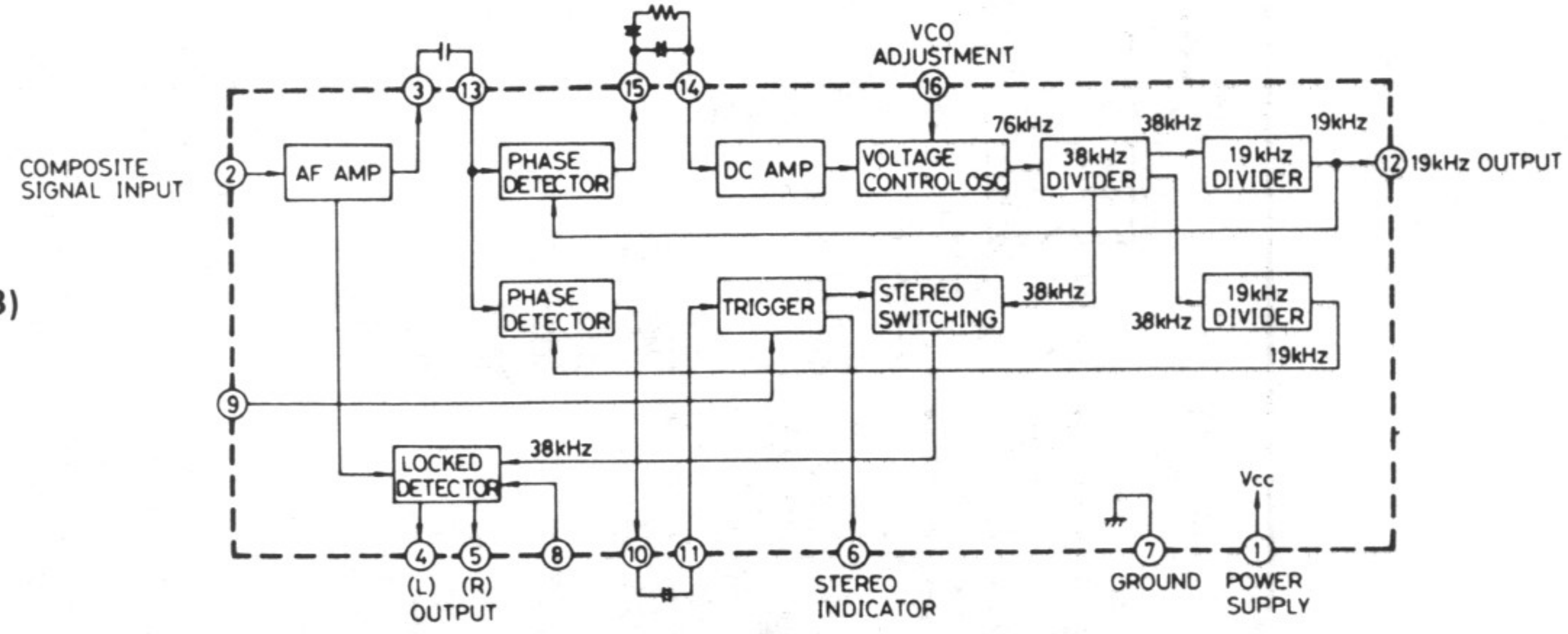
■ BLOCK DIAGRAM OF IC'S

- This is the basic block diagram of the inside circuit of IC. In an actual circuit, there may be sometimes idle terminals or some different functions other than the basic circuit.

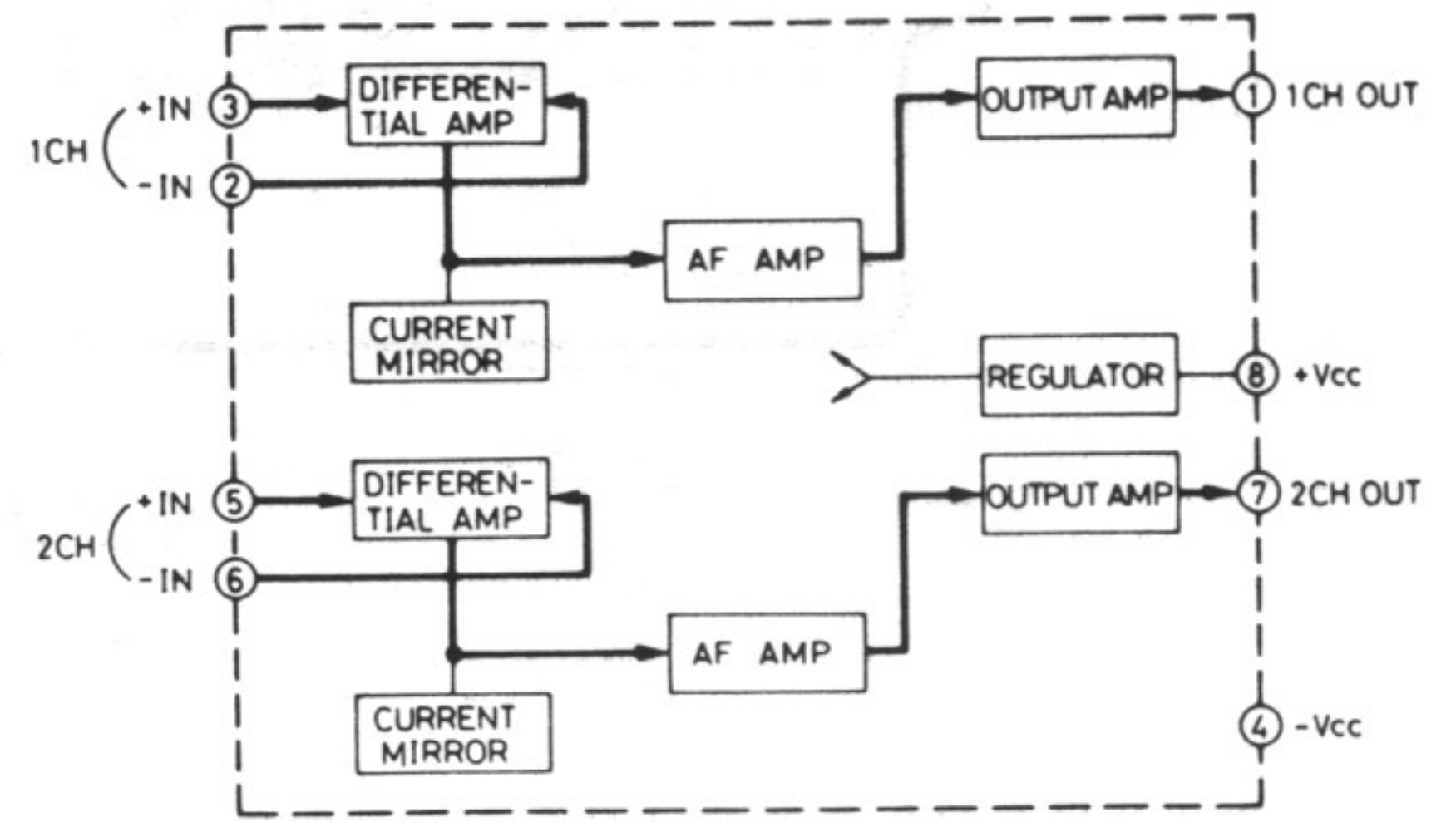
IC101 (AN217)
FM IF Amplifier &
AM Converter



IC401 (AN363)
FM Multiplex



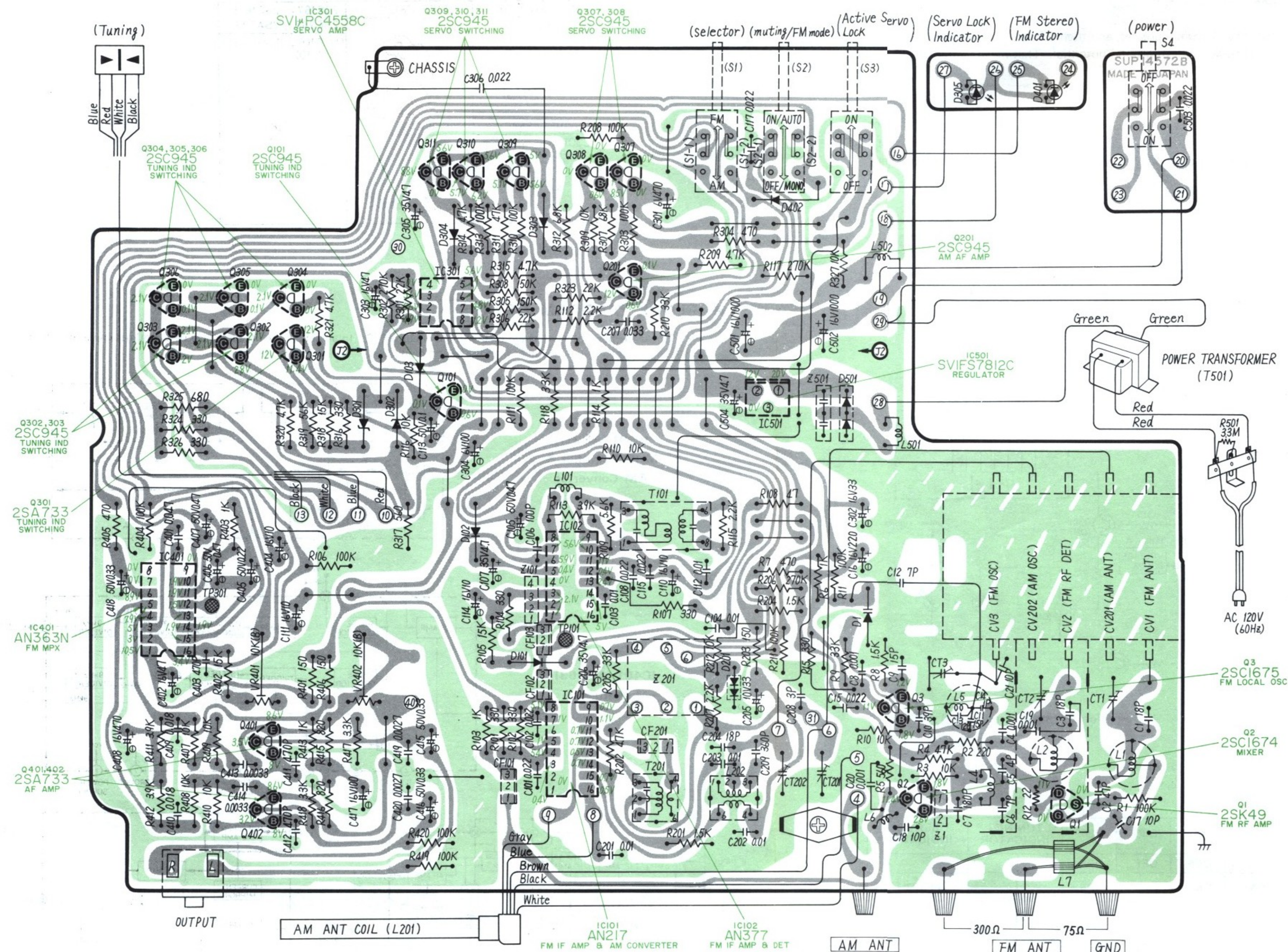
IC102 (AN377)
FM IF Amplifier & Detector



IC301 (SVIUPC4558C)
DC Amplifier

PRINTED CIRCUIT BOARD WIRING VIEW

Earth(Ground) Lines



Notes of schematic diagram

* This schematic diagram may be modified at any time with the development of new technology.

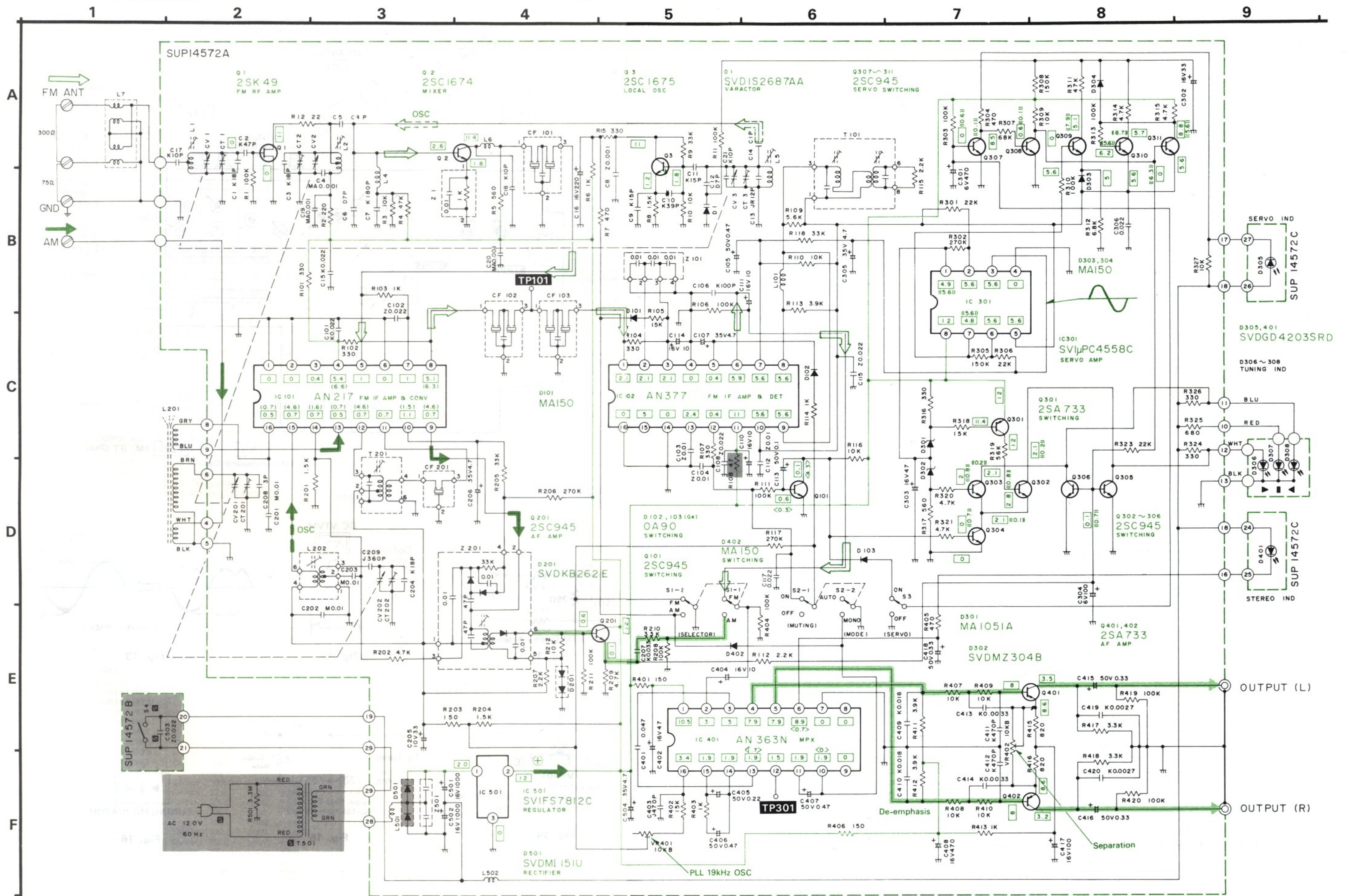
Notes:

1. S1-1 ~ S1-2 : Selector switch in "FM" position.
2. S2-1, S2-2 : FM muting/mode switch in "on/auto" position.
3. S3 : Active servo lock switch in "on" position.
4. S4 : Power source switch in "off" position.
5. Indicated voltage 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.
6. Figures in stand for DC voltage in FM no-signal mode.
7. Figures in () stand for DC voltage in AM mode.
8. Figures in < > stand for DC voltage in FM stereo signal reception mode.
9. Figures in () stand for DC voltage in servo lock circuit operation.
10. Signal lines → FM → AM → AF
11. To represent transistors Q is used instead of TR. (Ex. TR1 → Q1)

IMPORTANT SAFETY NOTICE

THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR SAFETY. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

■ SCHEMATIC DIAGRAM



■ ALIGNMENT POINTS

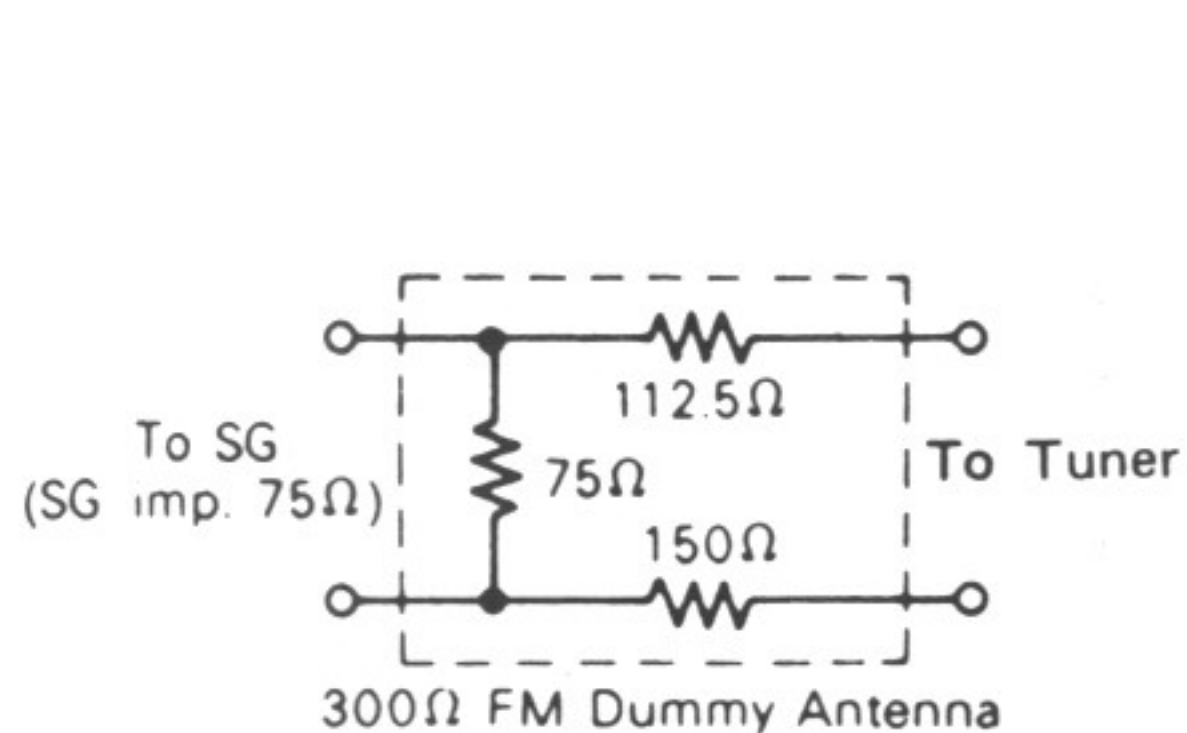
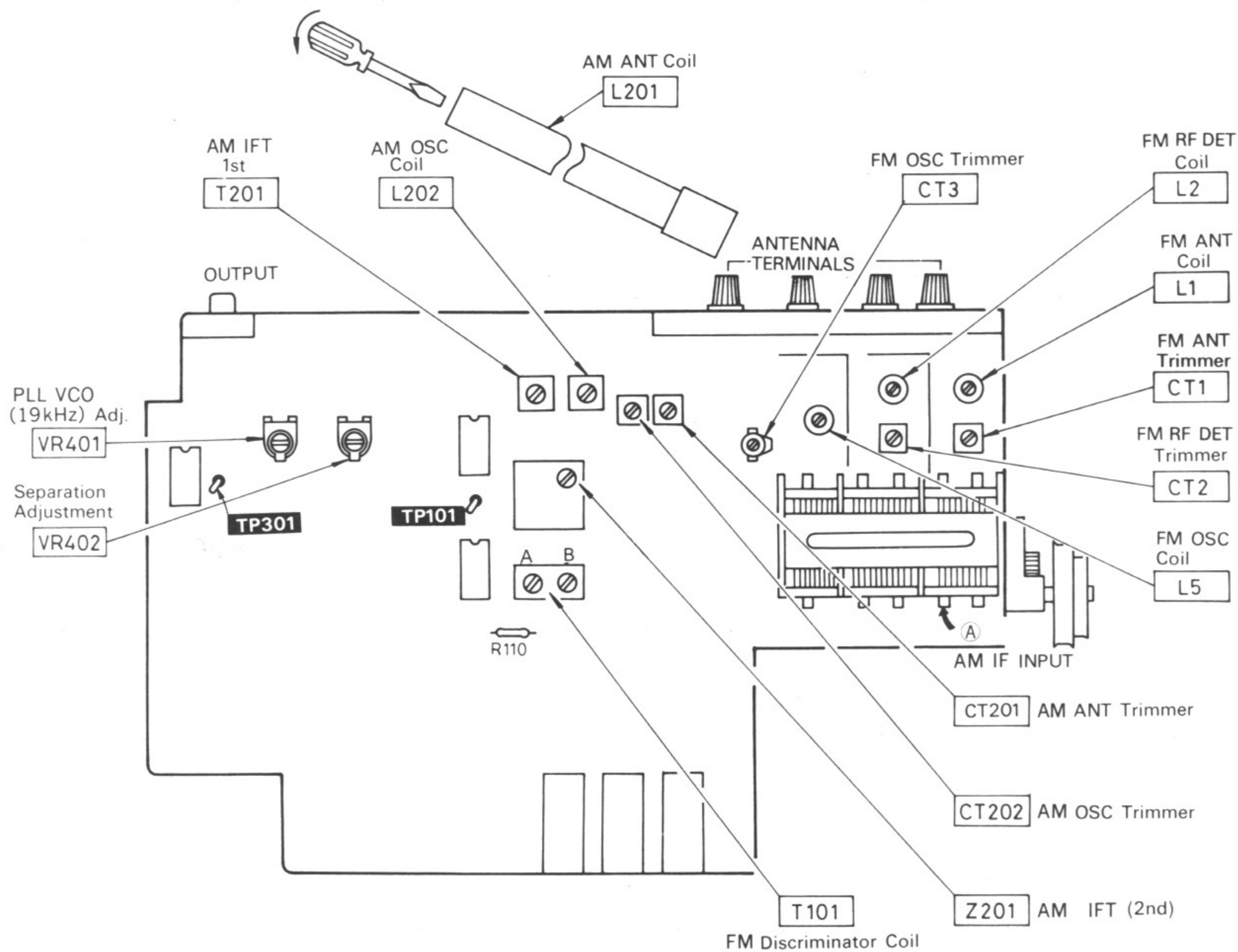


Fig. 11

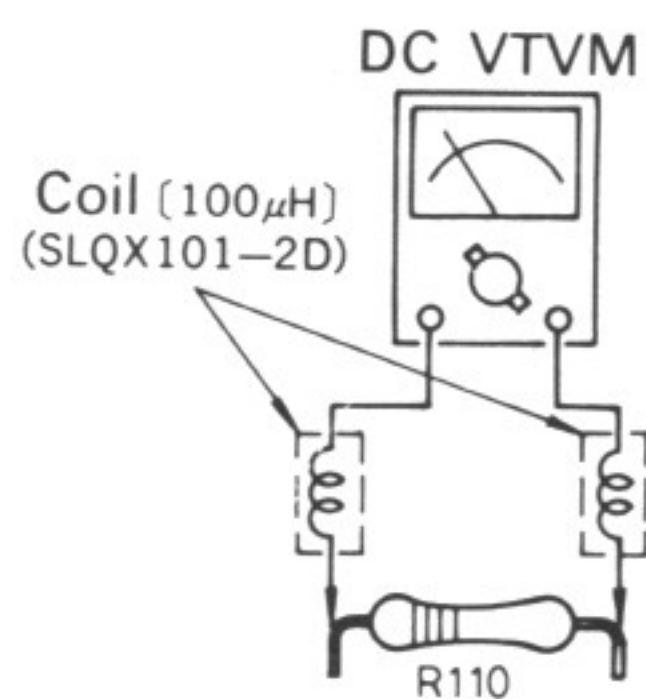


Fig. 12

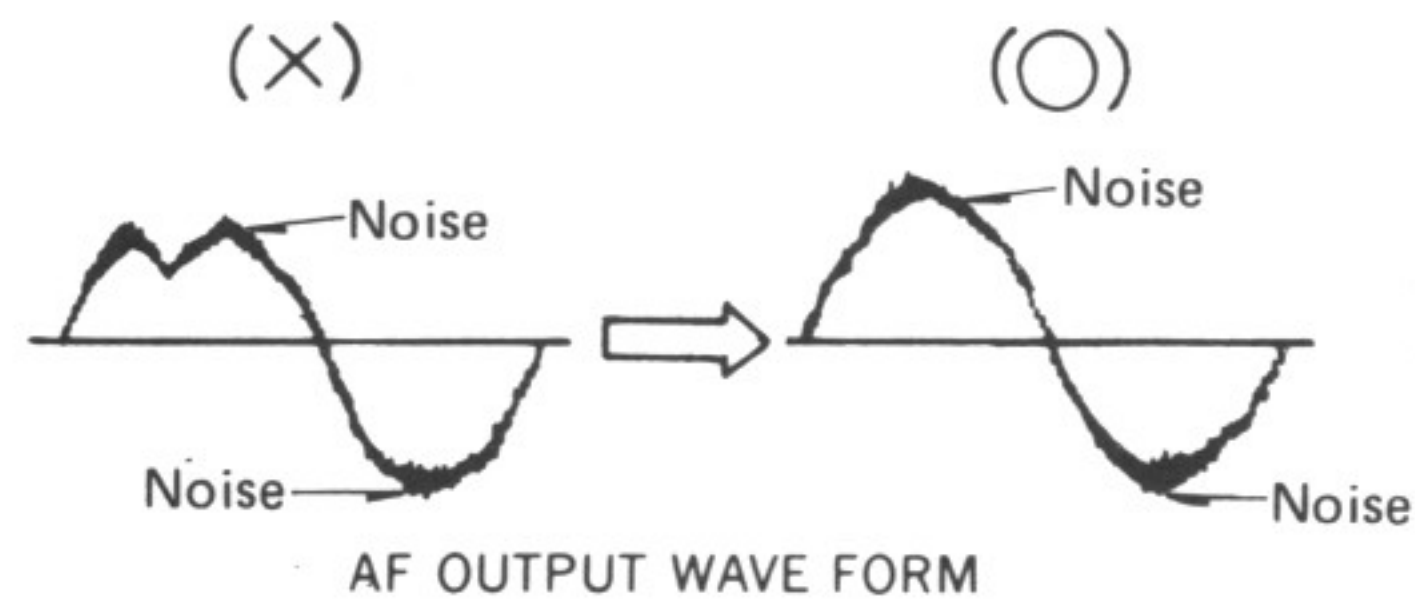


Fig. 13

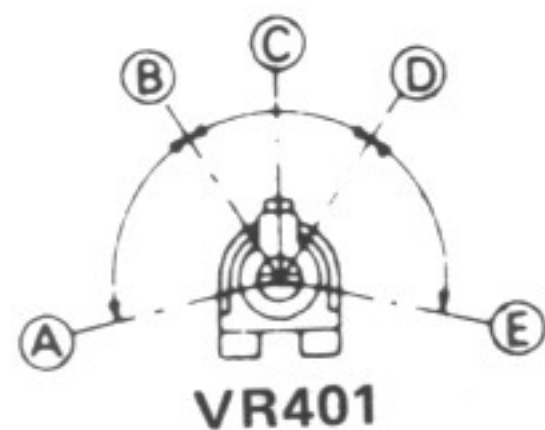


Fig. 14

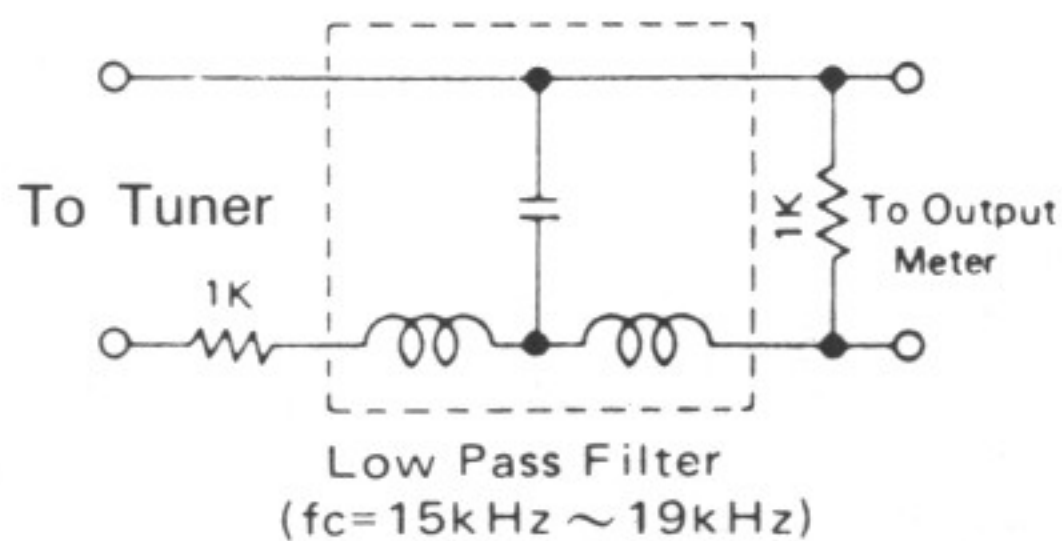


Fig. 15



Fig. 16

REPLACEMENT PARTS LIST Electric Parts

Important Safety Notice

Components identified by shaded area have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

NOTE: Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS		
IC101 IC102 IC301 IC401 IC501	AN217P-BB AN377N SVIUPC4558C AN363N SVIFS7812C	IC, FM IF Amplifier & AM Converter IC, FM IF Amplifier IC, DC Amplifier (Active servo lock) IC, FM Multiplex IC, Voltage Stabilizer
TRANSISTORS		
Q1 Q2 Q3 Q101, 201, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311 Q301, 401, 402	2SK49-H1 2SC1674-M 2SC1675-L1 2SC945-P2 2SA733-P1	Transistor, FM RF Amplifier (FET) Transistor, FM Mixer Transistor, FM Local Oscillator Transistor, Muting, AM Buffer, Switching, & Servo Lock Circuitry (Use in ranks P1, P2 or R) Transistor, Switching & AF Amplifier
DIODES		
D1 D101,303,304,402 D102,103 D201 D301 D302 D305,401 D501	SVD1S2687AA MA150 OA90 SVDKB262E MA1051A SVDMMZ304B SVDGD4203SRD SVDMI151U	Diode, Variable Capacitance Diode, Switching & Active Servo Lock Diode, Muting Switching Diode, AM AGC Diode, Zener 5.1V Diode, Zener 4V Light Emitting Diode, Servo Lock & Stereo Rectifier
COILS and TRANSFORMERS		
L1 L2 L4, 6, 501 L5 L7 L101 L201 L202 L502 T101 T201 T501 (M) only T501 (MC) only	SLD4P25-P SLD4P21-P RLQY15G5-Y SLO4P55-P SLAA4W1-3 SLQW180-1K SLF2C17 SLO2C9-P SLQX101-2D SLI4D513-Z SLI2C125-P SLT5J69 SLT5J93	Coil, FM RF Detector, 1st Coil, FM RF Detector, 2nd Coil, Choke Coil, FM Oscillator Coil, FM Balun Antenna Coil, Choke Coil, AM Antenna Coil, AM Oscillator Coil, Choke Transformer, FM Discriminator Transformer, AM IF Transformer, Power Source Transformer, Power Source

Ref. No.	Part No.	Part Name & Description
CERAMIC FILTERS		
CF101, 102	SVFE107MM-A SVFE107MM-B SVFE107MM-C	Ceramic Filter, FM 10.7MHz, Red Ceramic Filter, FM 10.67MHz, Blue Ceramic Filter, FM 10.73MHz, Orange
CF103	SVFE107ML-A SVFE107ML-B SVFE107ML-C (Use in pair ranks	Ceramic Filter, FM 10.7MHz, Red Ceramic Filter, FM 10.67MHz, Blue Ceramic Filter, FM 10.73MHz, Orange as same as CF101, 102 and CF103.)
CF201	SVFSFU450B	Ceramic Filter, AM 450kHz
COMPONENT COMBINATIONS		
Z1 Z101 Z201 Z501	EXRP103P102C EXF3SL04C SLI9F101-Z EXPFS203ZS	Component Combination, 1k Ω /0.01 μ F Component Combination, 0.01 μ F(X3) Component Combination, AM IFT & Detector Component Combination, 0.01 μ F (X2)
VARIABLE RESISTORS		
VR401 VR402	EVTS3MA00B14 EVLS3AA00B14	PLL VCO 19kHz Adjustment Separation Adjustment
VARIABLE CAPACITORS		
CV1, 2, 3, 201, 202 CT1, 2, 201, 202 CT3	ECV5MD34X72G SVCTY121B269 ECV1ZW06X32E	Tuning Gang, FM/AM Ceramic Trimmer Ceramic Trimmer
SWITCHES		
S1, 2, 3 S4	SSH359 SSH97	Switch, Servo Lock, Muting & Selector Switch, Power Source

(M) is available in America only.
(MC) is available in Canada only.

Ref. No.	Part No.	Part Name & Description
RESISTORS		
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10	ERD25TJ104 ERD25TJ221 ERD25TJ103 ERD25TJ473 ERD25TJ561 ERD25TJ102 ERD25TJ471 ERD25TJ152 ERD25TJ333 ERD25TJ103	Carbon, 100k Ω , 1/4W, $\pm$ 5% Carbon, 220 Ω , 1/4W, $\pm$ 5% Carbon, 10k Ω , 1/4W, $\pm$ 5% Carbon, 47k Ω , 1/4W, $\pm$ 5% Carbon, 560 Ω , 1/4W, $\pm$ 5% Carbon, 1k Ω , 1/4W, $\pm$ 5% Carbon, 470 Ω , 1/4W, $\pm$ 5% Carbon, 1.5k Ω , 1/4W, $\pm$ 5% Carbon, 33k Ω , 1/4W, $\pm$ 5% Carbon, 10k Ω , 1/4W, $\pm$ 5%
R11 R12 R15 R101, 102 R103 R104 R105 R106 R107 R108	ERD25TJ104 ERD25TJ220 ERD25TJ331 ERD25TJ331 ERD25TJ102 ERD25TJ331 ERD25TJ153 ERD25TJ104 ERD25TJ331 ERD18FJ470	Carbon, 100k Ω , 1/4W, $\pm$ 5% Carbon, 22 Ω , 1/4W, $\pm$ 5% Carbon, 330 Ω , 1/4W, $\pm$ 5% Carbon, 330 Ω , 1/4W, $\pm$ 5% Carbon, 1k Ω , 1/4W, $\pm$ 5% Carbon, 330 Ω , 1/4W, $\pm$ 5% Carbon, 15k Ω , 1/4W, $\pm$ 5% Carbon, 100k Ω , 1/4W, $\pm$ 5% Carbon, 330 Ω , 1/4W, $\pm$ 5% Carbon, 47 Ω , 1/8W, $\pm$ 5%

Ref. No.	Part No.	Part Name & Description
R109 R110 R111 R112 R113 R114 R115 R116 R117 R118	ERD25TJ562 ERD25TJ103 ERD25TJ104 ERD25TJ222 ERD25TJ392 ERD25TJ102 ERD25TJ222 ERD25TJ103 ERD25TJ274 ERD25TJ333	Carbon, 5.6k Ω , 1/4W, $\pm$ 5% Carbon, 10k Ω , 1/4W, $\pm$ 5% Carbon, 100k Ω , 1/4W, $\pm$ 5% Carbon, 2.2k Ω , 1/4W, $\pm$ 5% Carbon, 3.9k Ω , 1/4W, $\pm$ 5% Carbon, 1k Ω , 1/4W, $\pm$ 5% Carbon, 2.2k Ω , 1/4W, $\pm$ 5% Carbon, 10k Ω , 1/4W, $\pm$ 5% Carbon, 270k Ω , 1/4W, $\pm$ 5% Carbon, 33k Ω , 1/4W, $\pm$ 5%
R201 R202 R203 R204 R205 R206 R207 R208 R209 R210	ERD25TJ152 ERD25TJ472 ERD25TJ151 ERD25TJ152 ERD25TJ333 ERD25TJ274 ERD25TJ222 ERD25TJ104 ERD25TJ472 ERD25TJ333	Carbon, 1.5k Ω , 1/4W, $\pm$ 5% Carbon, 4.7k Ω , 1/4W, $\pm$ 5% Carbon, 150 Ω , 1/4W, $\pm$ 5% Carbon, 1.5k Ω , 1/4W, $\pm$ 5% Carbon, 33k Ω , 1/4W, $\pm$ 5% Carbon, 270k Ω , 1/4W, $\pm$ 5% Carbon, 2.2k Ω , 1/4W, $\pm$ 5% Carbon, 100k Ω , 1/4W, $\pm$ 5% Carbon, 4.7k Ω , 1/4W, $\pm$ 5% Carbon, 33k Ω , 1/4W, $\pm$ 5%

Ref. No.	Part No.	Part Name & Description
R211	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm 5\%$
R212	ERD25TJ103	Carbon, 10k Ω , 1/4W, $\pm 5\%$
R301	ERD25TJ223	Carbon, 22k Ω , 1/4W, $\pm 5\%$
R302	ERD25TJ274	Carbon, 270k Ω , 1/4W, $\pm 5\%$
R303	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm 5\%$
R304	ERD25TJ471	Carbon, 470 Ω , 1/4W, $\pm 5\%$
R305	ERD25TJ154	Carbon, 150k Ω , 1/4W, $\pm 5\%$
R306	ERD25TJ223	Carbon, 22k Ω , 1/4W, $\pm 5\%$
R307	ERD25TJ683	Carbon, 68k Ω , 1/4W, $\pm 5\%$
R308	ERD25TJ154	Carbon, 150k Ω , 1/4W, $\pm 5\%$
R309	ERD25TJ103	Carbon, 10k Ω , 1/4W, $\pm 5\%$
R310	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm 5\%$
R311	ERD25TJ473	Carbon, 47k Ω , 1/4W, $\pm 5\%$
R312	ERD25TJ682	Carbon, 6.8k Ω , 1/4W, $\pm 5\%$
R313	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm 5\%$
R314, 315	ERD25TJ472	Carbon, 4.7k Ω , 1/4W, $\pm 5\%$
R316	ERD25TJ331	Carbon, 330 Ω , 1/4W, $\pm 5\%$
R317	ERD25TJ561	Carbon, 560 Ω , 1/4W, $\pm 5\%$
R318	ERD25TJ153	Carbon, 15k Ω , 1/4W, $\pm 5\%$
R319	ERD25TJ563	Carbon, 56k Ω , 1/4W, $\pm 5\%$

Ref. No.	Part No.	Part Name & Description
R320, 321	ERD25TJ472	Carbon, 4.7k Ω , 1/4W, $\pm 5\%$
R323	ERD25TJ223	Carbon, 22k Ω , 1/4W, $\pm 5\%$
R324	ERD25TJ331	Carbon, 330 Ω , 1/4W, $\pm 5\%$
R325	ERD25TJ681	Carbon, 680 Ω , 1/4W, $\pm 5\%$
R326	ERD25TJ331	Carbon, 330 Ω , 1/4W, $\pm 5\%$
R327	ERD25TJ103	Carbon, 10k Ω , 1/4W, $\pm 5\%$
R401	ERD25TJ151	Carbon, 150 Ω , 1/4W, $\pm 5\%$
R402	ERD25TJ153	Carbon, 15k Ω , 1/4W, $\pm 5\%$
R403	ERD25TJ102	Carbon, 1k Ω , 1/4W, $\pm 5\%$
R404	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm 5\%$
R405	ERD25TJ471	Carbon, 470 Ω , 1/4W, $\pm 5\%$
R406	ERD25TJ151	Carbon, 150 Ω , 1/4W, $\pm 5\%$
R407, 408	ERD25TJ103	Carbon, 10k Ω , 1/4W, $\pm 5\%$
R409, 410	ERD25TJ103	Carbon, 10k Ω , 1/4W, $\pm 5\%$
R411, 412	ERD25TJ392	Carbon, 3.9k Ω , 1/4W, $\pm 5\%$
R413	ERD25TJ102	Carbon, 1k Ω , 1/4W, $\pm 5\%$
R415, 416	ERD25TJ821	Carbon, 820 Ω , 1/4W, $\pm 5\%$
R417, 418	ERD25TJ332	Carbon, 3.3k Ω , 1/4W, $\pm 5\%$
R419, 420	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm 5\%$
R501	ERC12GK335	Solid, 3.3M Ω , 1/2W, $\pm 10\%$

Ref. No.	Part No.	Part Name & Description
CAPACITORS		
C1	ECCD1H180KC	Ceramic, 18pF, 50V, $\pm 10\%$
C2	ECCD1H470KC	Ceramic, 47pF, 50V, $\pm 10\%$
C3	ECCD1H180KC	Ceramic, 18pF, 50V, $\pm 10\%$
C4	ECKD1H102MDA	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
C5	ECCD1H040CC	Ceramic, 4pF, 50V, ± 0.25 pF
C6	ECCD1H070DC	Ceramic, 7pF, 50V, ± 0.5 pF
C7	ECCD1H181K	Ceramic, 180pF, 50V, $\pm 10\%$
C8	ECKD1H102ZF	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
C9	ECCD1H150KC	Ceramic, 15pF, 50V, $\pm 10\%$
C10	ECCD1H390KC	Ceramic, 39pF, 50V, $\pm 10\%$
C12	ECCD1H070DC	Ceramic, 7pF, 50V, ± 0.5 pF
C15	ECQM1H223KZ	Polyester, 0.022 μ F, 50V, $\pm 10\%$
C16	ECEA1CS221	Electrolytic, 220 μ F, 16V, $\pm 20\%$
C17, 18	ECCD1H100KC	Ceramic, 10pF, 50V, $\pm 10\%$
C19, 20	ECKD1H102MDA	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
C21	ECCD1H100KC	Ceramic, 10pF, 50V, $\pm 10\%$
C101	ECQM1H223KZ	Polyester, 0.022 μ F, 50V, $\pm 10\%$
C102	ECKD1H223ZF	Ceramic, 0.022 μ F, 50V, $\pm 20\%$
C103, 104	ECKD1H103ZF	Ceramic, 0.01 μ F, 50V, $\pm 20\%$
C105	ECEA50ZR47	Electrolytic, 0.47 μ F, 50V, $\pm 20\%$
C106	ECCD1H101K	Ceramic, 100pF, 50V, $\pm 10\%$
C107	ECEA1JS4R7	Electrolytic, 4.7 μ F, 63V, $\pm 20\%$
C108	ECKD1H223ZF	Ceramic, 0.022 μ F, 50V, $\pm 20\%$
C110, 111	ECEA1HS100	Electrolytic, 10 μ F, 50V, $\pm 20\%$
C112	ECKD1H103ZF	Ceramic, 0.01 μ F, 50V, $\pm 20\%$
C113	ECEA50ZR1	Electrolytic, 0.1 μ F, 50V, $\pm 20\%$
C114	ECEA1HS100	Electrolytic, 10 μ F, 50V, $\pm 20\%$
C115	ECKD1H223ZF	Ceramic, 0.022 μ F, 50V, $\pm 20\%$
C117	ECKD1H223ZF	Ceramic, 0.022 μ F, 50V, $\pm 20\%$
C201, 202	ECKD1H103MD	Ceramic, 0.01 μ F, 50V, $\pm 20\%$

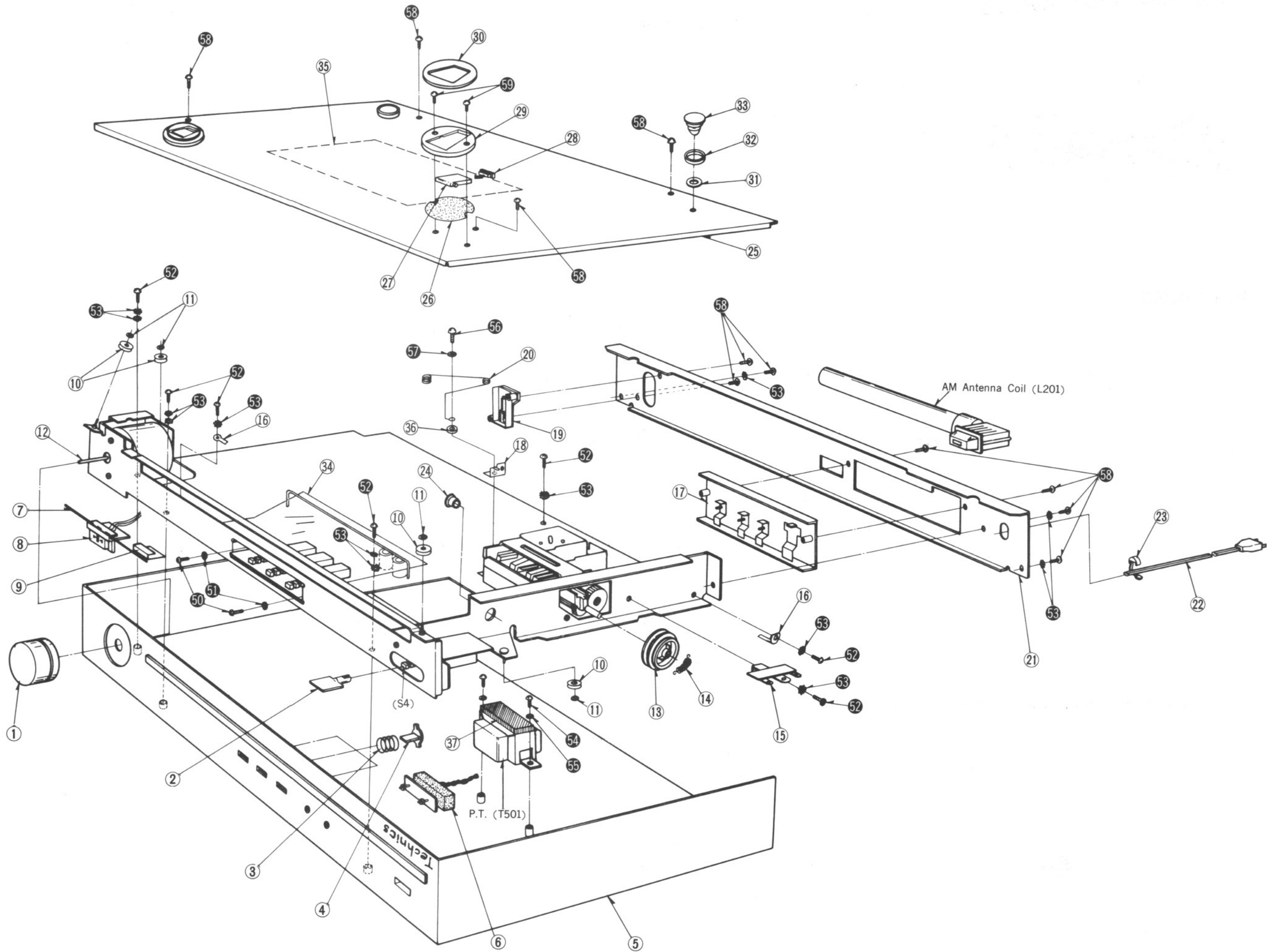
Ref. No.	Part No.	Part Name & Description
C203	ECKD1H103MD	Ceramic, 0.01 μ F, 50V, $\pm 20\%$
C204	ECCD1H180KC	Ceramic, 18pF, 50V, $\pm 10\%$
C205	ECEA1CS330	Electrolytic, 33 μ F, 16V, $\pm 20\%$
C206	ECEA1JS4R7	Electrolytic, 4.7 μ F, 63V, $\pm 20\%$
C207	ECQM1H333KZ	Polyester, 0.033 μ F, 50V, $\pm 10\%$
C208	ECCD1H030CC	Ceramic, 3pF, 50V, ± 0.25 pF
C209	ECQS1361JZ	Polystyrene, 360pF, 125V, $\pm 5\%$
C301	ECEA0JS471	Electrolytic, 470 μ F, 6.3V, $\pm 20\%$
C302	ECEA1CS330	Electrolytic, 33 μ F, 16V, $\pm 20\%$
C303	ECEA1ES470	Electrolytic, 47 μ F, 25V, $\pm 20\%$
C304	ECEA1AS101	Electrolytic, 100 μ F, 10V, $\pm 20\%$
C305	ECEA1JS4R7	Electrolytic, 4.7 μ F, 63V, $\pm 20\%$
C306	ECKD1H223ZF	Ceramic, 0.022 μ F, 50V, $\pm 20\%$
C401	ECQM1H473KZ	Polyester, 0.047 μ F, 50V, $\pm 10\%$
C402	ECEA1ES470	Electrolytic, 47 μ F, 25V, $\pm 20\%$
C403	ECQS1471JZ	Polystyrene, 470pF, 125V, $\pm 5\%$
C404	ECEA1HS100	Electrolytic, 10 μ F, 50V, $\pm 20\%$
C405	ECEA50ZR22R	Electrolytic, 0.22 μ F, 50V, $\pm 20\%$
C406	ECEA50ZR47	Electrolytic, 0.47 μ F, 50V, $\pm 20\%$
C407	ECEA50MR47S	Electrolytic, 0.47 μ F, 50V, $\pm 20\%$
C408	ECEA1CS471	Electrolytic, 470 μ F, 16V, $\pm 20\%$
C409, 410	ECQM1H183KZ	Polyester, 0.018 μ F, 50V, $\pm 10\%$
C411, 412	ECKD1H471KB	Ceramic, 470pF, 50V, $\pm 10\%$
C413, 414	ECQM1H332KZ	Polyester, 0.0033 μ F, 50V, $\pm 10\%$
C415, 416	ECEA50ZR33R	Electrolytic, 0.33 μ F, 50V, $\pm 20\%$
C417	ECEA1ES101	Electrolytic, 100 μ F, 25V, $\pm 20\%$
C418	ECEA50ZR33R	Electrolytic, 0.33 μ F, 50V, $\pm 20\%$
C419, 420	ECQM1H272KZ	Polyester, 0.0027 μ F, 50V, $\pm 10\%$
C501, 502	ECEA1CS102	Electrolytic, 1000 μ F, 16V, $\pm 20\%$
C503	ECKD1H223ZF	Ceramic, 0.022 μ F, 50V, $\pm 20\%$
C504	ECEA1JS4R7	Electrolytic, 4.7 μ F, 63V, $\pm 20\%$

REPLACEMENT PARTS LIST AND EXPLODED VIEW

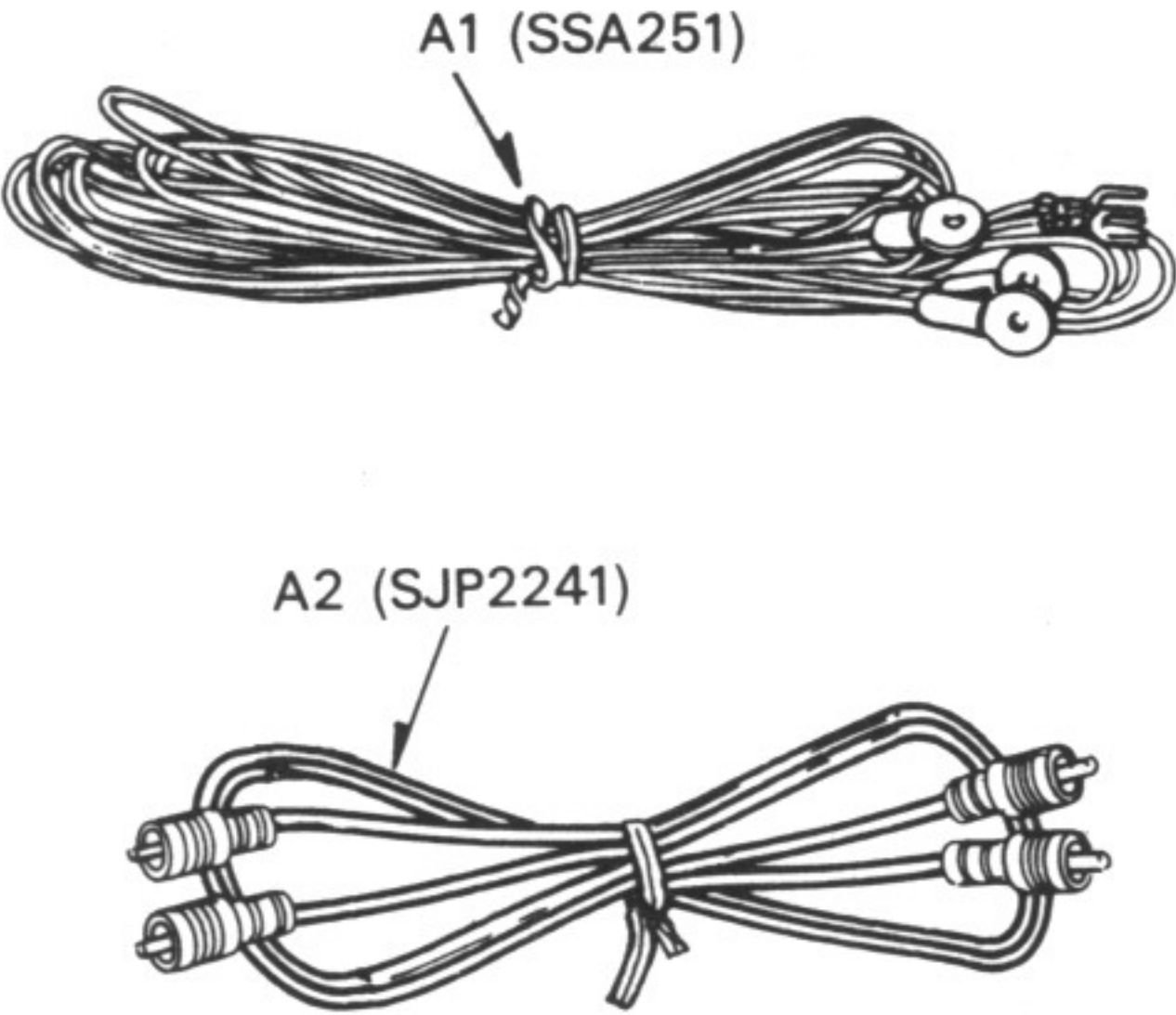
Important Safety Notice
Components identified by shaded area have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

NOTE: Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	SBN779	Knob, Tuning Control (with M'tg Screw)
2	SBC207-1	Button, Power Switch
3	SUS123-1	Spring, Push Switches Button
4	SBC205-1	Button, Push Switches
5	SGWTC01M	Panel, Front Ass'y (with Cabinet)
6	SHR9431	Cushion, Stereo & Servo Lock Indicators
7	SDZ051-2	Cord, Dial 130cm (51-1/4")
8	SWV5-1	Pointer, Dial (with Tuning Indicator)
9	SHP31-1	Paper, Pointer Slide
10	RDR20-3	Pulley, Dial Cord
11	RNW150-2	Washer, Pulley Lock
12	SDT8051	Shaft, Tuning Ass'y (with Flywheel)
13	SDD9021	Drum, Tuning Gang
14	SDSA4121	Spring, Dial Cord
15	RJR4B	Terminal Strip, 2P
16	RJT202B	Lug, Earth
17	SJF4419-1	Terminal, Antenna
18	SMV125-1	Lug, Tuning Gang Earth
19	SJF3225A	Terminal, Output
20	SUS149	Spring, Pointer Lead Wire
21	SGP1430B	Rear Panel
22	RJA9YA	AC Cord, Power Source
23	RHR111	Bushing, AC Cord
24	RHR110	Bushing, P.T. Secondary Lead Wire
25	SKU7290	Bottom Board
26	SHS2411	Fiber, Front Side Feet
27	SKX259	Stand Foot, Front Side
28	SHG1493	Rubber Cushion, Stand Feet
29	SKL217	Foot, Front Side
30	SHG1485	Rubber Cushion, Front Feet
31	SHR5013	Washer, Rear Side Feet
32	SGX803	Ring, Rear Side Feet
33	SHG1487	Foot, Rear Side
34	SHR9441-1	Cover, Transparency
35	SHR5015-1	Sheet, Dial Pointer Protection
36	SNWA351	Washer, Tuning Gang M'tg Lug
37	SHG6025	Rubber, Power Transformer Spacer
SCREWS and WASHERS		
60	XSN3+8S	Screw, Push Switches M'tg
61	XWA3B	Washer, Spring
62	XTB3+8BFZ	Screw, P.C.B. & Earth Lug M'tg
63	XWC3B	Washer
64	XTN3+8B	Screw, Power Transformer M'tg
65	XWG3	Washer
66	XTN3+8BFZ	Screw, Spring M'tg
67	XWG3FZ	Washer
68	XTB3+8BFN	Screw, Bottom Board & Rear Panel M'tg
69	XSS3+6S	Screw, Feet M'tg



■ ACCESSORIES



Ref. No.	Part No.	Part Name & Description
ACCESSORIES		
A1	SSA251	Cord, FM Indoor Antenna
A2	SJP2241	Cord, Connection
PACKING PARTS		
P1	SPP605	Polythylene Bag
P2	SPS1771-1	Pad, Upper Side
P3	SPS1769	Pad, Lower Side
P4 [M]only	SPG1885	Carton Box
P4 [MC]only	SPG1887	Carton Box
P5 [M]only	SQF10101	Instructions Book, Printed Matter
P5 [MC]only	SQF10103	Instructions Book, Printed Matter

■ PACKINGS

