

Service Manual

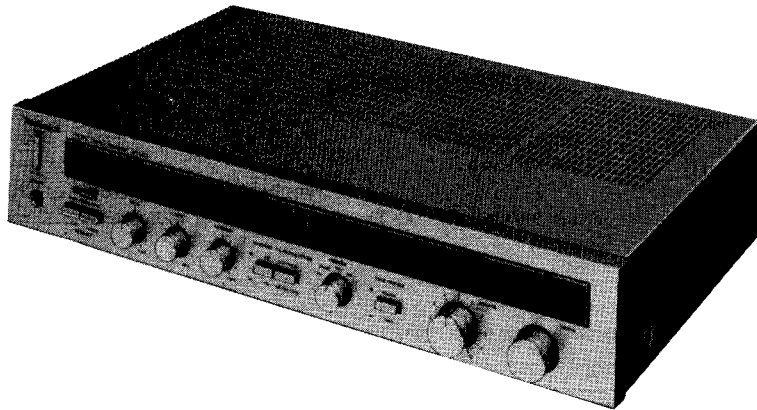
FM/AM Stereo Receiver

SA-203

[EGA]

SA-203(K)

[EGA]



- * The cabinet and front panel are available in black color and silver types.
- * The black type model is provided with (K) in the Service Manual.

Area

- * [EGA] is available in F.R. Germany.

TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz
beide Kanäle angesteuert $2 \times 30W (4 \Omega)$
 $2 \times 30W (8 \Omega)$

Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz
beide Kanäle angesteuert $2 \times 30W (4 \Omega)$
 $2 \times 30W (8 \Omega)$

Dauerton-Ausgangsleistung bei 1 kHz
beide Kanäle angesteuert $2 \times 35W (4 \Omega)$
 $2 \times 33W (8 \Omega)$

Gesamtklirrfaktor
Nennleistung bei 20 Hz ~ 20 kHz 0,08% (4 Ω)
0,04% (8 Ω)

Nennleistung bei 40 Hz ~ 16 kHz 0,08% (4 Ω)
0,04% (8 Ω)

Nennleistung bei 1 kHz 0,04% (4 Ω)
0,04% (8 Ω)

halbe Nennleistung bei 20 Hz ~ 20 kHz 0,025% (8 Ω)

halbe Nennleistung bei 1 kHz 0,009% (8 Ω)

-26 dB Leistung bei 1 kHz 0,1% (4 Ω)

50 mW Leistung bei 1 kHz 0,12% (4 Ω)

Intermodulationsfaktor
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω 0,08%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω 0,04%

Leistungsbandbreite
beide Kanäle angesteuert bei -3 dB
10 Hz ~ 30 kHz (4 Ω)
15 (4 Ω), 30 (8 Ω)

Dämpfungsfaktor 15 (4 Ω), 30 (8 Ω)

Eingangsempfindlichkeit und -impedanz

Phono 2,5 mV/47 k Ω

Aux 150 mV/22 k Ω

Tape 180 mV/22 k Ω

Maximale TA-Eingangsspannung (1 kHz, eff.) 130 mV

Klangregler

Baßregler (BASS) 50 Hz, +10 dB ~ -10 dB

Höhenregler (TREBLE) 20 kHz, +10 dB ~ -10 dB

Geräuschabstand

Nennleistung (4 Ω)

Phono 70 dB (nach IHF, A: 78 dB)

Aux, Tape 88 dB (nach IHF, A: 95 dB)

-26 dB Leistung (4 Ω)

Phono 64 dB

Aux, Tape 66 dB

50 mW Leistung (4 Ω)

Phono 62 dB

Aux, Tape 62 dB

Frequenzgang

Phono

RIAA-Standardkurve

$\pm 0,8$ dB (30 Hz ~ 15 kHz)

5 Hz ~ 70 kHz (-3 dB)

$\pm 0,2$ dB (20 Hz ~ 20 kHz)

Aux, Tape

Gehörliche Lautstärkekorrektur (Loudness)

(bei -30 dB Ausgangsleistung) 50 Hz, +9 dB

Ausgangsspannung und -impedanz

Tape Aufnahme (TAPE REC OUT) 150 mV

Kanalabweichung (Aux, 250 Hz ~ 6300 Hz) ± 1 dB

Übersprechdämpfung (Aux, 1 kHz) 55 dB

Kopfhörerpegel und -impedanz 260 mV/330 Ω

Lautsprecherimpedanz

MAIN oder REMOTE 4 Ω ~ 16 Ω

MAIN und REMOTE 8 Ω ~ 16 Ω

■ UKW-TUNERTEIL

Wellenbereich 87,5 ~ 108 MHz

Eingangsempfindlichkeit

S/R 30 dB 1,3 μ V (75 Ω)

S/R 26 dB 1,2 μ V (75 Ω)

S/R 20 dB 0,9 μ V (75 Ω)

Nutzempfindlichkeit nach IHF 1,5 μ V (nach IHF '58)

Gesamtklirrfaktor

Mono 0,15%

Stereo 0,2%

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Geräuschabstand	
Mono	60 dB (75 dB nach IHF)
Stereo	58 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ -2 dB)
Trennschärfe bei Störsender	75 dB
Einfangverhältnis	1,2 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	75 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
MW-Unterdrückung	50 dB
Übersprechdämpfung	40 dB
1 kHz	30 dB
10 kHz	30 dB
Trägerrest	19 kHz -30 dB (-35 dB nach IHF)
38 kHz	-50 dB (-50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,2 µV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	525 ~ 1605 kHz
Eingangsempfindlichkeit (S/R 20 dB)	30 µV, 300 µV/m
Trennschärfe	30 dB
Spiegelfrequenz-Dämpfung bei 1000 kHz	50 dB
ZF-Dämpfung bei 1000 kHz	40 dB

■ ALLGEMEINE DATEN

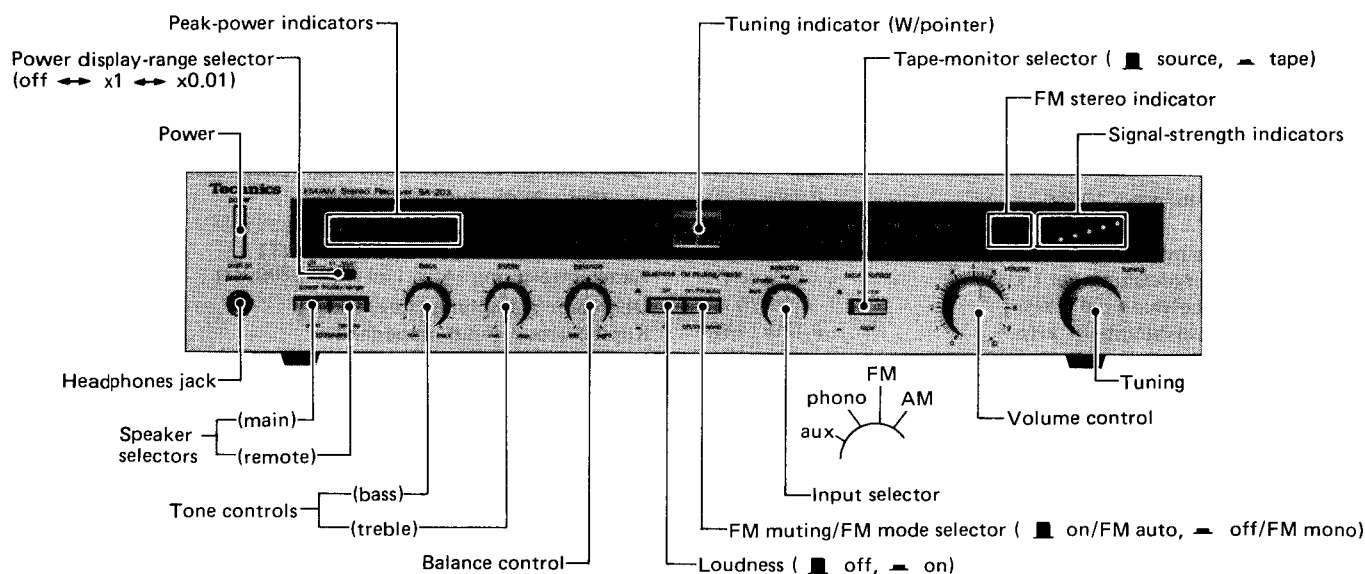
Leistungsaufnahme	300 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 220V
Abmessungen (B×H×T)	430 × 86 × 320 mm
Gewicht	6,6 kg

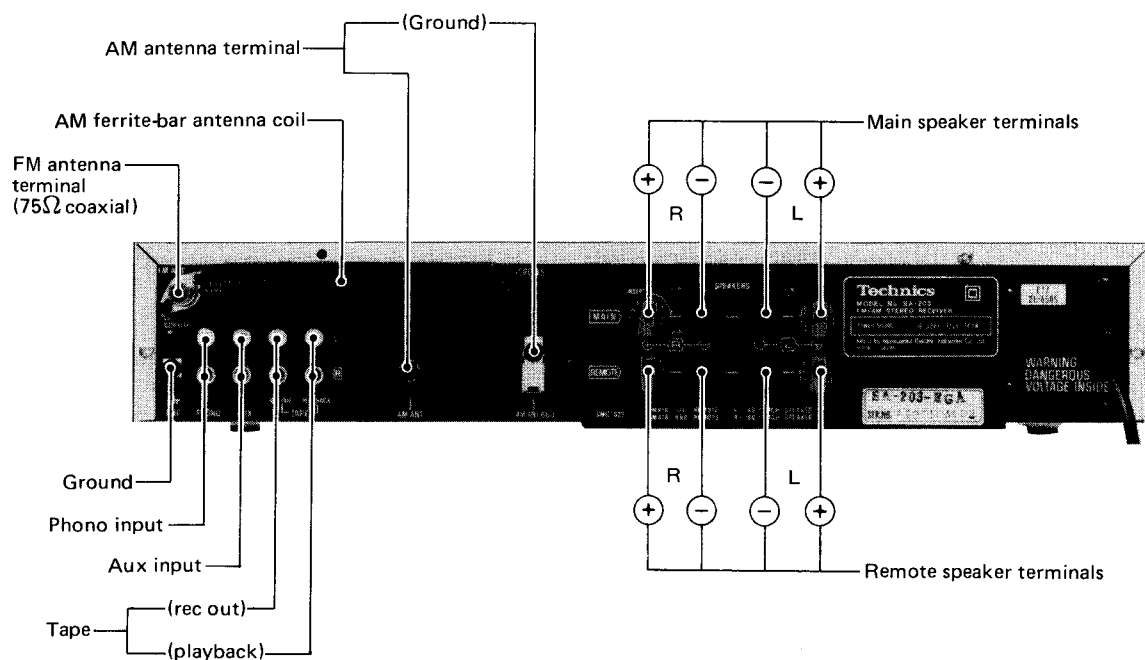
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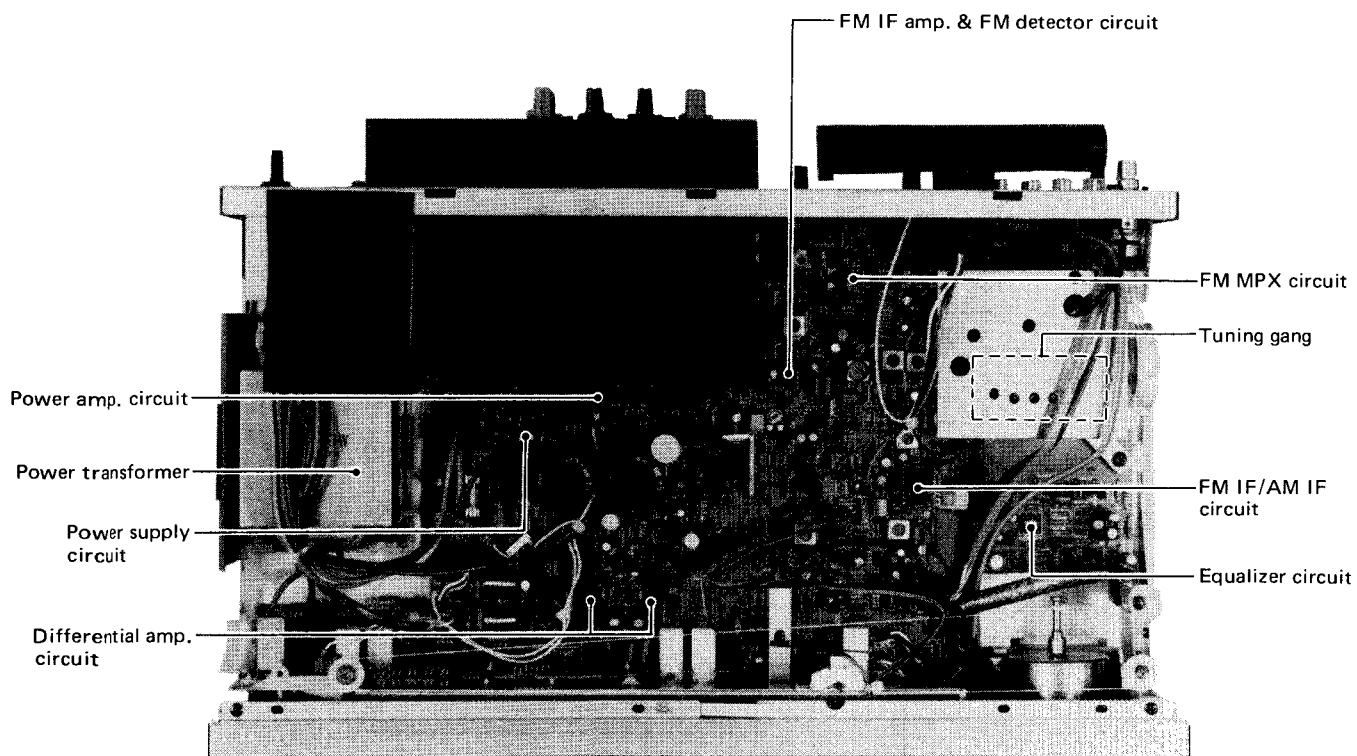
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■ LOCATION OF CONTROLS





* Phono input capacitance is about 150pF.



TECHNICAL GUIDE

The power amplifier IC (SVISTK2028) is provided with a protection circuit.

1. Muting (shock noise prevention) with power switch ON.

- (1) When power is supplied, negative voltage is applied to the emitter of switching transistor (Q703).
 - (2) Positive voltage flows from the regulator (Q707) to R709 and R708 to turn D705 and Q703 ON. (It takes a few seconds until Q703 turns ON due to time constant of C706).
 - (3) When Q703 turns ON, negative voltage is applied to the pin ⑤ of input amplifier IC (AN7060) causing the input amplifier to operate.
- * The signal is applied to the power amplifier a few seconds later so that shock noise can be prevented.

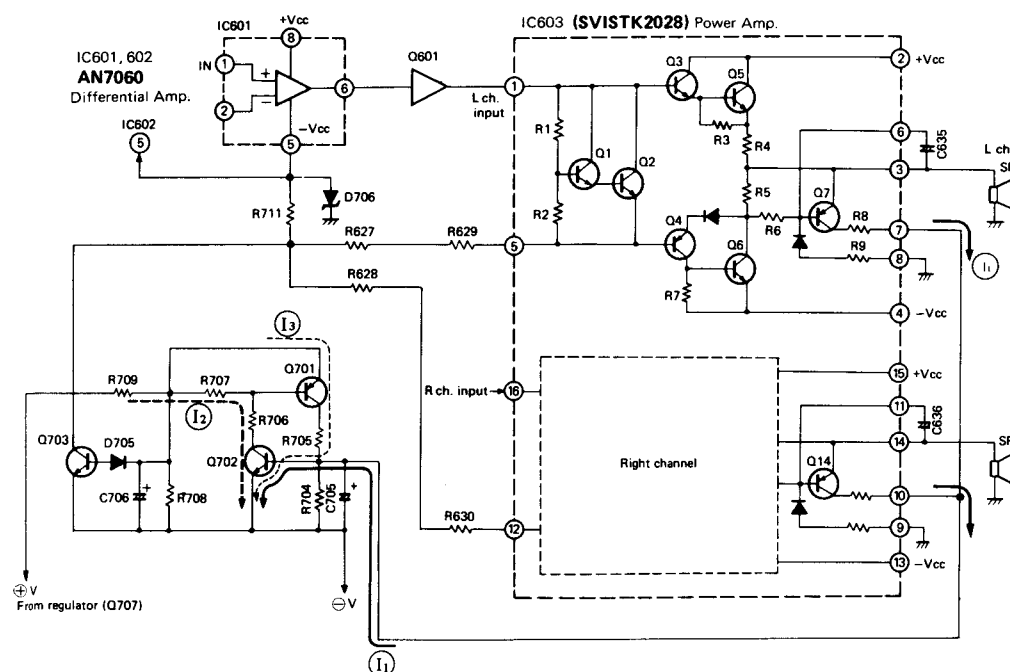
2. Muting (shock noise prevention) with power switch OFF.

- (1) When power supply is cut off, the voltage applied to Q703 drops at the base faster than the negative voltage at the emitter connected to the large capacity condenser, thus turning off D705 and Q703.
 - (2) Input amplifier is off with Q703 off.
- * The signal is cut off on the input side while the operation voltage of power amplifier still remains, thus preventing shock noise.

3. Operation of the protection circuit with speaker terminal short-circuited.

- (1) Transistor Q7 in the power amplifier IC (SVISTK2028) is usually OFF, but when the speaker terminal is short-circuited to the ground, a large amount of current flows to Q6, causing a voltage to be generated at R5.
 - (2) The voltage causes Q7 to turn ON, then ⑪ flows to raise the base potential of Q702. And Q702 turns ON.
 - (3) As Q702 is ON, ⑫ flows to generate a voltage at R707, and then Q701 turns ON.
 - (4) ⑬ flows with Q701 turned ON, ⑬ flows to hold Q702 ON.
 - (5) The current flowing in R709 increases due to ⑫, and the positive voltage from regulator (Q707) drops, causing D705 to turn off.
 - (6) In other words, Q703 turns OFF and the negative power supply to the input amplifier is discontinued.
- * This condition continues until power supply switch is set OFF.

A few minutes after the power switch is set to ON, if no sound is produced while the operation is normal, cut off the power supply and check the speaker connections and the input equipment.



DISASSEMBLY INSTRUCTIONS

● How to remove the cabinet

1. Remove the 5 setscrews (Fig. 1: ① ~ ⑤) of the cabinet.
2. Remove the cabinet.

● How to remove the front panel

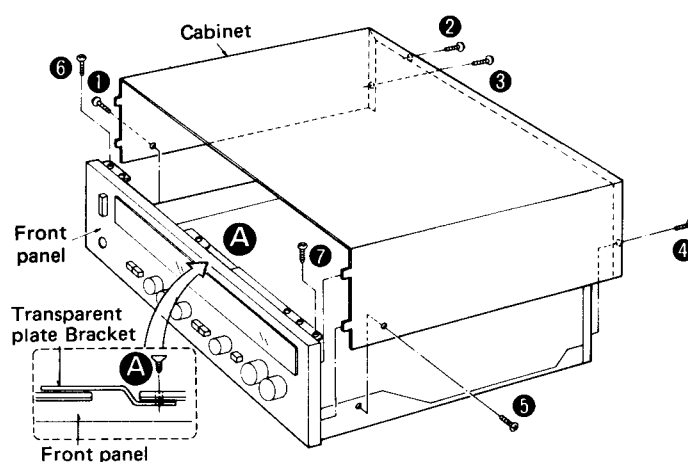
1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the 4 setscrews (Fig. 1: ⑥, ⑦ and Fig. 2: ⑧, ⑨) of the front panel.
3. Remove the 1 setscrew (Fig. 1: A) of the transparent plate bracket, then remove the front panel.

● How to remove the dial scale

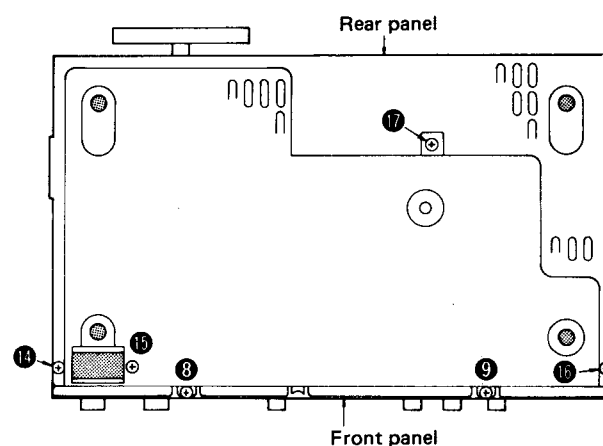
1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the front panel. (Refer to the section "How to remove the front panel.")
3. Pull up the two claws at the bottom of the transparent plate in the direction of the arrow B (Fig. 3).
4. Remove the dial indicator lamp and the 2 dial scale holder of the front chassis. (see Fig. 4)
5. Remove the dial scale.

● How to remove the peak-power indicators printed circuit board

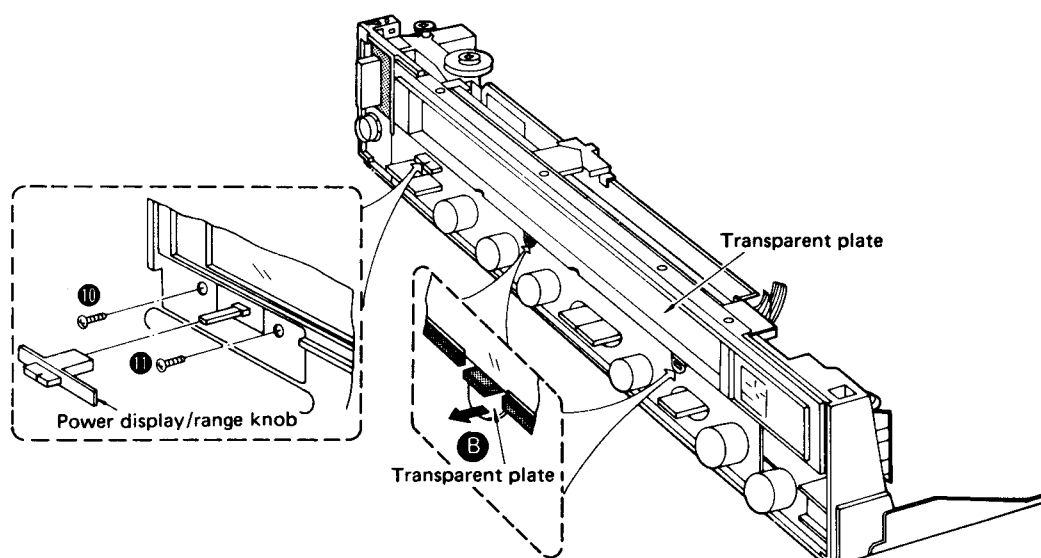
1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the front panel. (Refer to the section "How to remove the front panel.")
3. Remove the power display/range knob (Fig. 3).
4. Remove the 2 setscrews (Fig. 3: ⑩, ⑪) of the front chassis.
5. Remove the 2 lugs (Fig. 4: ⑫, ⑬) to detach the peak-power indicators printed circuit board.



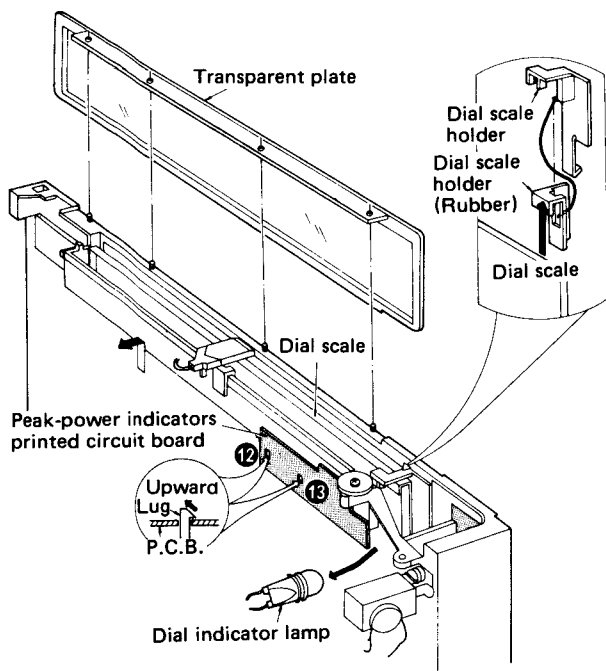
[Fig. 1]



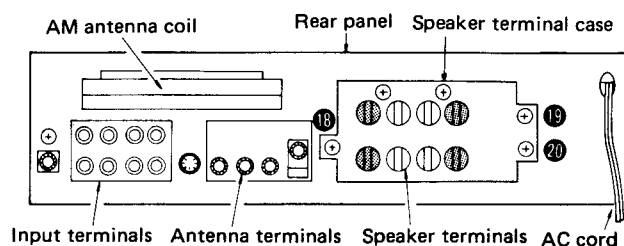
[Fig. 2]



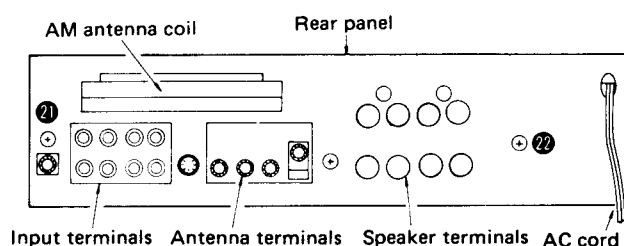
[Fig. 3]



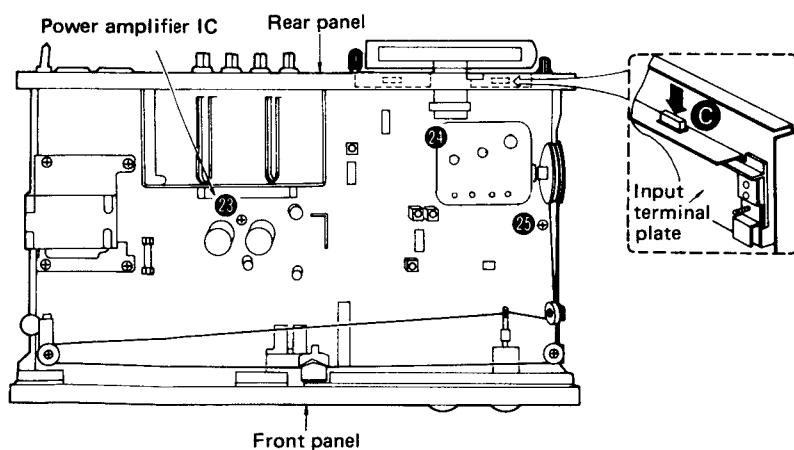
[Fig. 4]



[Fig. 5]



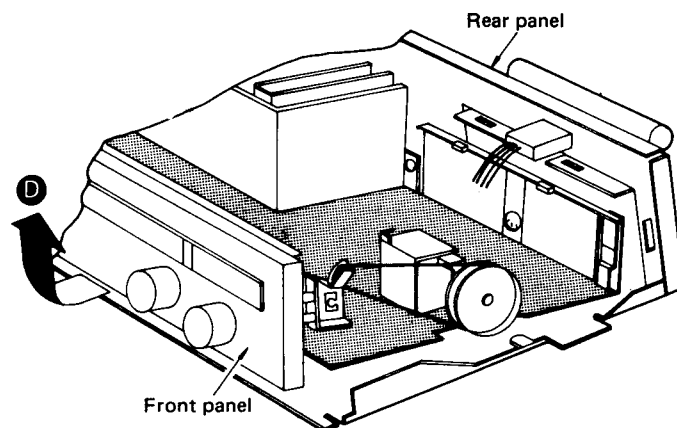
[Fig. 6]



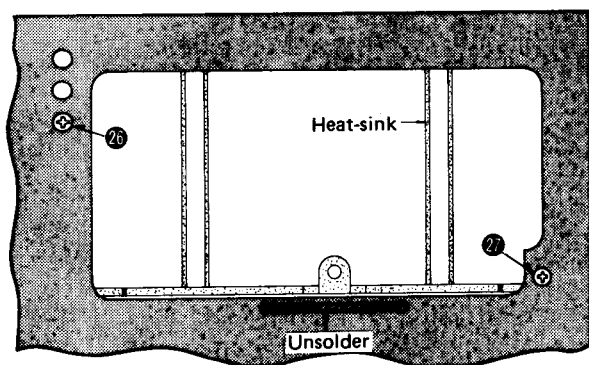
[Fig. 7]

• How to remove the power amplifier IC

1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the 6 setscrews (Fig. 2: 8, 9 and 14 ~ 17) and 3 setscrews (Fig. 5: 18 ~ 20) of the speaker terminal case.
3. Remove the speaker terminal case.
4. Remove the 2 setscrews (Fig. 6: 21, 22) of the heat-sink.
5. Remove the 3 setscrews (Fig. 7: 23 ~ 25).
6. Pressing the claws of the input terminal plate and antenna terminal plate in the direction of arrow C (Fig. 7), lift up the front panel in the direction of arrow D (Fig. 8). Then, the front panel can be removed from the rear panel.
7. Remove the 2 setscrews (Fig. 9: 26, 27) of the heat-sink.
8. Unsolder the power amplifier IC. (Fig. 9).
9. Remove the 2 setscrews (Fig. 10: 28, 29) used to secure the power amplifier IC on the heat-sink, and then pull the power amplifier IC.
10. When mounting the power amplifier IC, apply silicone compound (or equivalent heat diffuser) to the back of power amplifier IC.

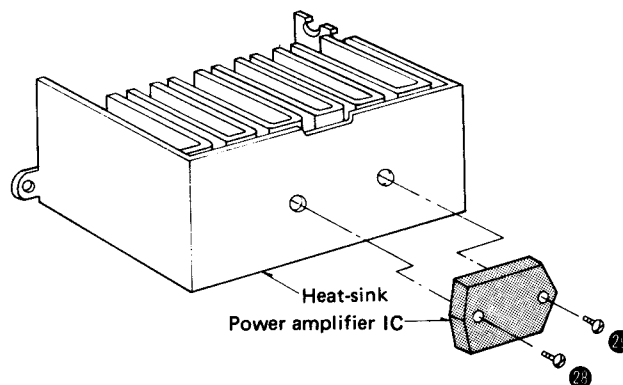


[Fig. 8]



P.C.B.
Bottom view

[Fig. 9]

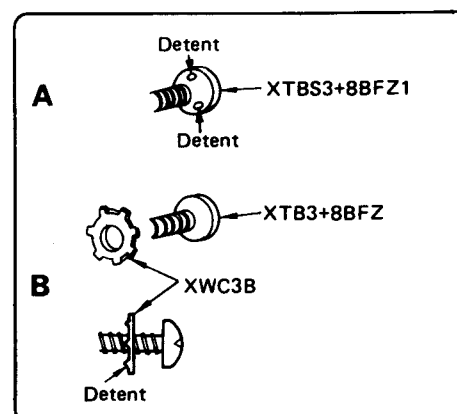


[Fig. 10]

Note 1: When checking or repairing, remove the speaker from the speaker terminal. If it is necessary to check or repair without removing the speaker from the terminal, short-circuit the phono input terminal beforehand.

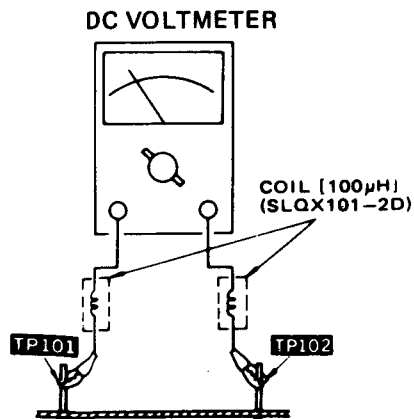
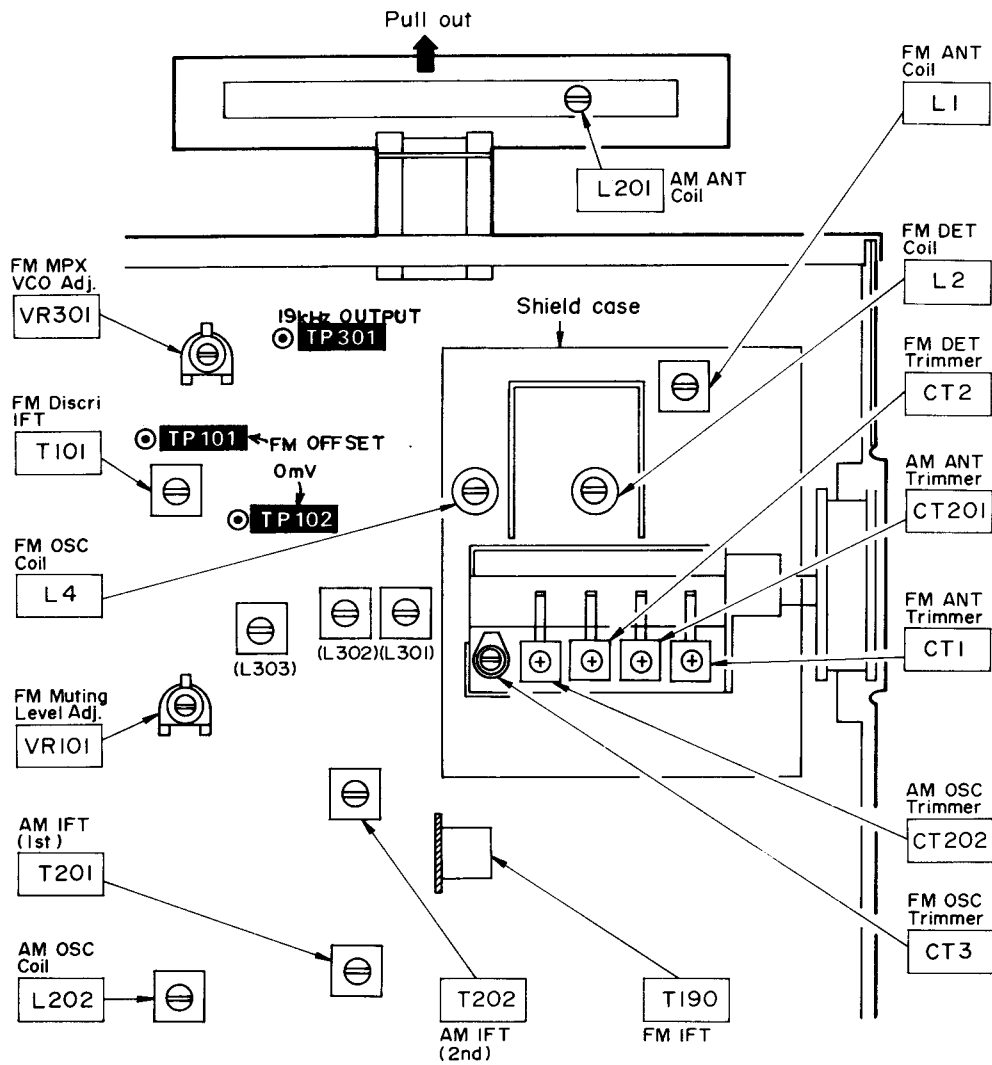
Note 2: Setscrew ② (Fig. 6) is screw with detents (Part No.: XTBS3+8BFZ) as shown in Fig. 11-A in order to make the contact of electric circuit perfect.

Take care not to mix up these screws with other screws. When substituting, use a 3 x 8mm tapping screw (Part No.: XTB3+8BFZ) and toothed lock washer (Part No.: XWC3B) as shown in Fig. 11-B. The teeth of the lock washer should be positioned on the chassis side.

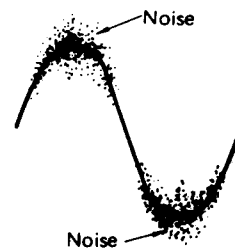


[Fig. 11]

MESSUNGEN UND JUSTIERUNGEN

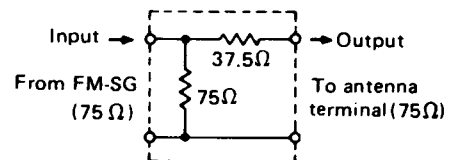


[Fig. 13]
(Abb. 13)

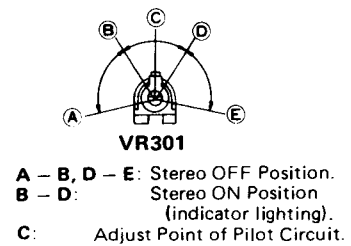


AF output wave form

[Fig. 14]
(Abb. 14)

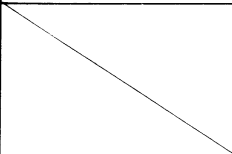


[Fig. 12]
(Abb. 12)



A - B, D - E: Stereo OFF Position.
B - D: Stereo ON Position (indicator lighting).
C: Adjust Point of Pilot Circuit.

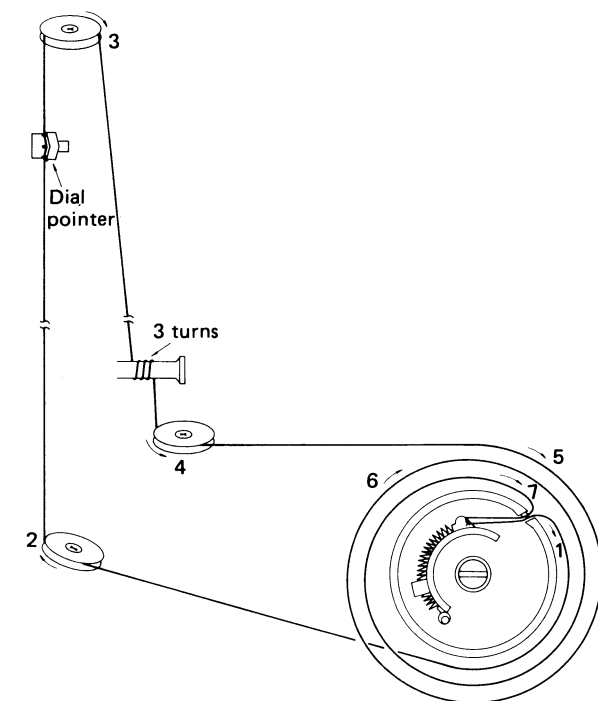
[Fig. 15]
(Abb. 15)

● Stellungen und zu benutzende Geräte 1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM) 2. AM (MW)-Meßsender (AM-SG) 3. Netzspannung auf ihren Sollwerthalten. 4. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung. 5. Die AM-Ferritstabantenne (L201) herausziehen. 6. Bereichsschalter AM (AM abgleich) FM (FM abgleich) 7. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden. 8. Wellenbereichsschalter main						
	FM/AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverfahren
Nr.	ANSCHLUSS	FREQUENZ				
AM (MW)-ZF-ABGLEICH						
1	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400Hz Modulat., 30%)	Kein Empfang	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	T201 (1. IFT) T202 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adjustieren, daß der Ausgang den maximalen Wert erreicht.
AM (MW)-HF-ABGLEICH						
2	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	600kHz (400Hz Modulat., 30%)	600kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	L201 (MW Ant. Spule) L202 (MW Osc. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L201 mit einem Schraubendreher justieren.
3		1500kHz (400Hz Modulat., 30%)	1500kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	CT201 (MW Ant. Trimmer) CT202 (MW Osc. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die schritte (2) und (3) wiederholen.
● Verwendete Einrichtungen 1. UKW-Meßsender (FM-SG) 2. Stereo-Modulator (oder Trennmesser) 3. Verzerrungsmesser 4. Oszilloskop 5. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM) 6. Signalfrequenzmesser (meßbar für 19kHz und 108MHz) 7. UKW 75-Ohm Kunstantenne (Abb. 12) ● Vorbereitung AM UKW-Messenger (FM-SG) 1. Stereo-Modulator an FM-SG anschließen. 2. SG-Ausgang über 75-Ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen. 3. Der normale Eingang des Gerätes beträß 60dB (1mV), 400Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12dB plus (1HF) sein: d.h. beim Eingang von 60dB soll der Signalausgang 72dB sein.)						
UKW-ZF-ABGLEICH						
4		Kein Signal	100.0MHz	Ein Gleichstromröhren-voltmeter zwischen TP101 und TP102 über eine Drosselspule verbinden (Siehe Abb. 13)	T101 (Diskriminator FT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträßt.
UKW-EMPFINDLICHKEITS-ABGLEICH						
5	Meßsender über eine Kunstantenna an den UKW-Antenneneingang schließen.	87.35MHz (400Hz Modulat., 100%)	87.35MHz (Anzeige-Frequenz min.)	Oszilloskop über den Lautsprecher schließen.	L4 (Osc. Spule)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertical symmetrisch wird. (Abb. 14) 3. Die Einstellung von (5) und (6) wider holen, bis die Frequenz mit der Skala übereinstimmt.
6		108.25MHz (400Hz Modulat., 100%)	108.25MHz (Anzeige-Frequenz max.)		CT3 (Osc. Trimmer)	
UKW-FREQUENZ-ABGLEICH						
7	Meßsender über eine Kunstantenna an den UKW-Antenneneingang schließen.	90MHz (400Hz Modulat., 100%)	90MHz	Oszilloskop über den Lautsprecher schließen.	L2 (HF Det. Spule) L1 (Ant. Spule)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertical symmetrisch wird. (Abb. 14) 3. Die Einstellung von (7) und (8) wieder holen, bis die Frequenz mit der Skale übereinstimmt.
8		106MHz (400Hz Modulat., 100%)	106MHz		CT2 (HF Det. Trimmer) CT1 (Ant. Trimmer)	
9	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90MHz (400Hz Modulat., 100%)	90MHz	Oszilloskop über den Lautsprecher schließen.	T190 (FM FT)	1. Auf max. Ausgang abgleichen.

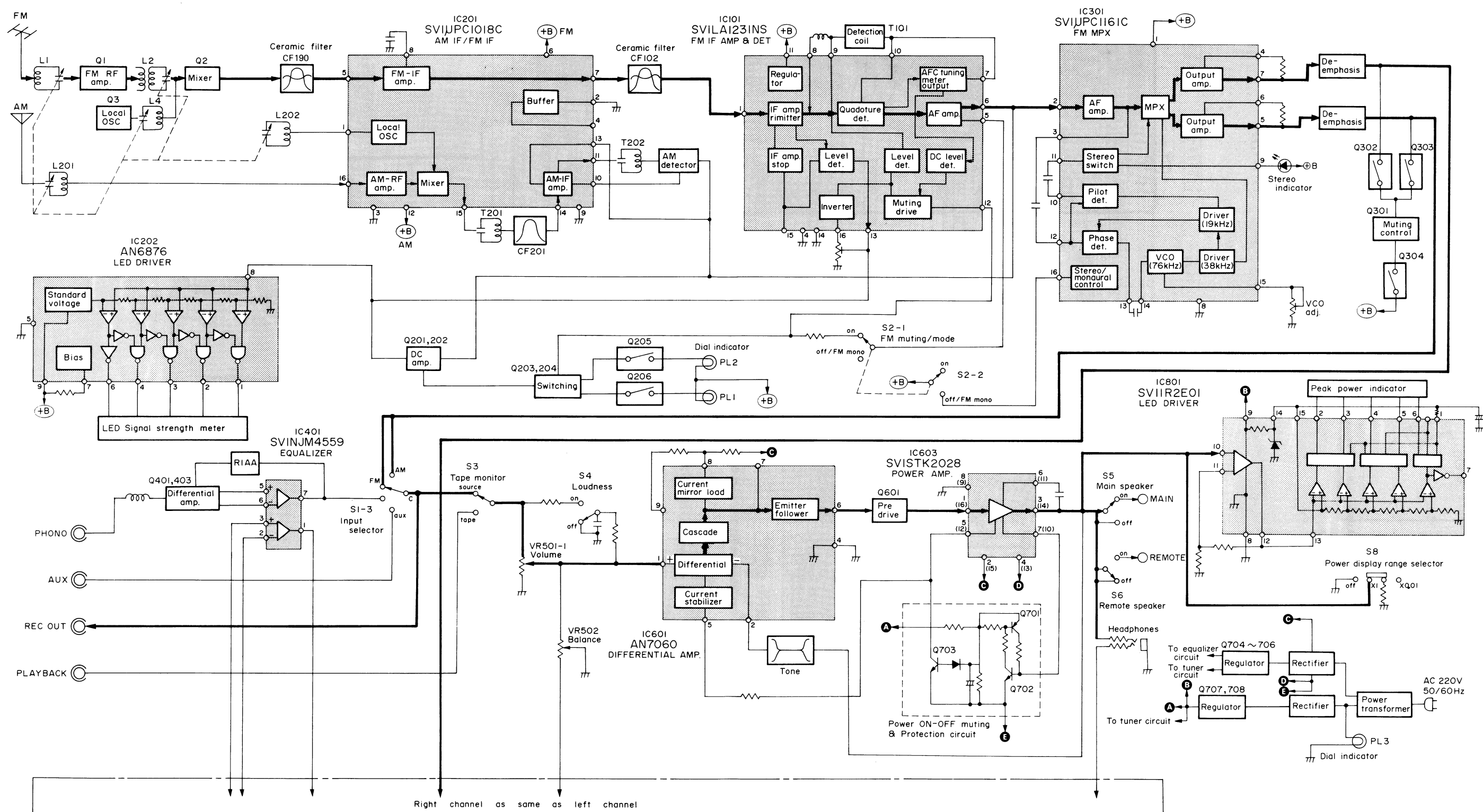
FM/AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverfahren
ANSCHLUSS	FREQUENZ				
ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (60dB in den Antenneneingang leiten.)	100MHz (400Hz Modulat., 100%)	100MHz	Ein Gleichstromröhren-voltmeter zwischen TP101 und TP102 über eine Drosselspule verbinden. (Siehe Abb. 13)	T101 (Diskriminator FT)	1. Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0mV im 300mV Bereich beträgt.
			Klirrfaktor-Meßbrücke an Ausgangsklemme (OUTPUT) schließen.	T101 (Diskriminator FT)	1. T101 Kern für minimale Verzerrung der rechten und linken Kanäle justieren.
UKW-STEREO-DEKODER-ABGLEICH					
UNTER VERWENDUNG EINES ZÄHLERS			ALTERNATIV-MEß METHODE		
1. Unmoduliertes Mono-Signal 100MHz in das Gerät speisen. 2. FM muting/mode-Schalter auf "on/auto" stellen. 3. Zähler über einen Widerstand 100K ohm an TP301 schließen. 4. VR301 auf 19kHz±30Hz einstellen.			1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. VR301 so einstellen, bis die Stereolampe auf leuchtet. Schleifer von VR301 sichern, wie in Abb. 15 gezeigt.		
UKW-STUMMABSTIMMUNGS PEGELANZEIGER					
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (16dB in den Antenneneingang leiten.)	100MHz (400Hz Modulat., 100%)	100MHz	Oszilloskopoder Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR101 (UKW-Muting)	1. "Muting" Schalter auf "on" stellen. VR101 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird.

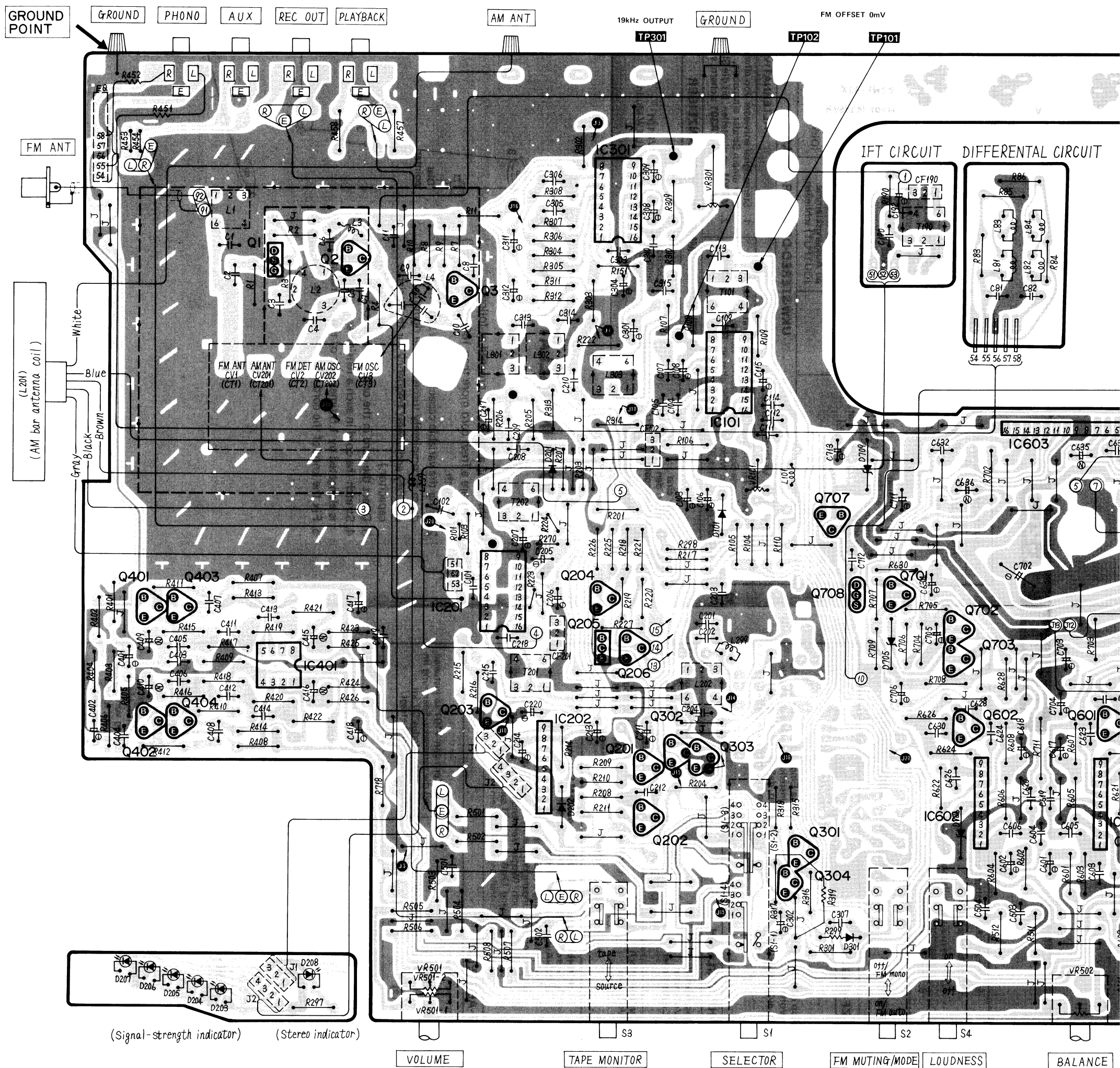
DIAL CORD INSTALLATION GUIDE

- * For threading a fresh cord, proceed as follows.
1. Prepare a fresh cord more than 180cm (70-15/16") in length.
 2. 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.)
 3. Direct the cord in the order from 1 to 7.
 4. Stretch the cord in such a tension as the spring length is elongated by 1.5 times that of the original state.
 5. Fix the knot of the cord with the adhesive.



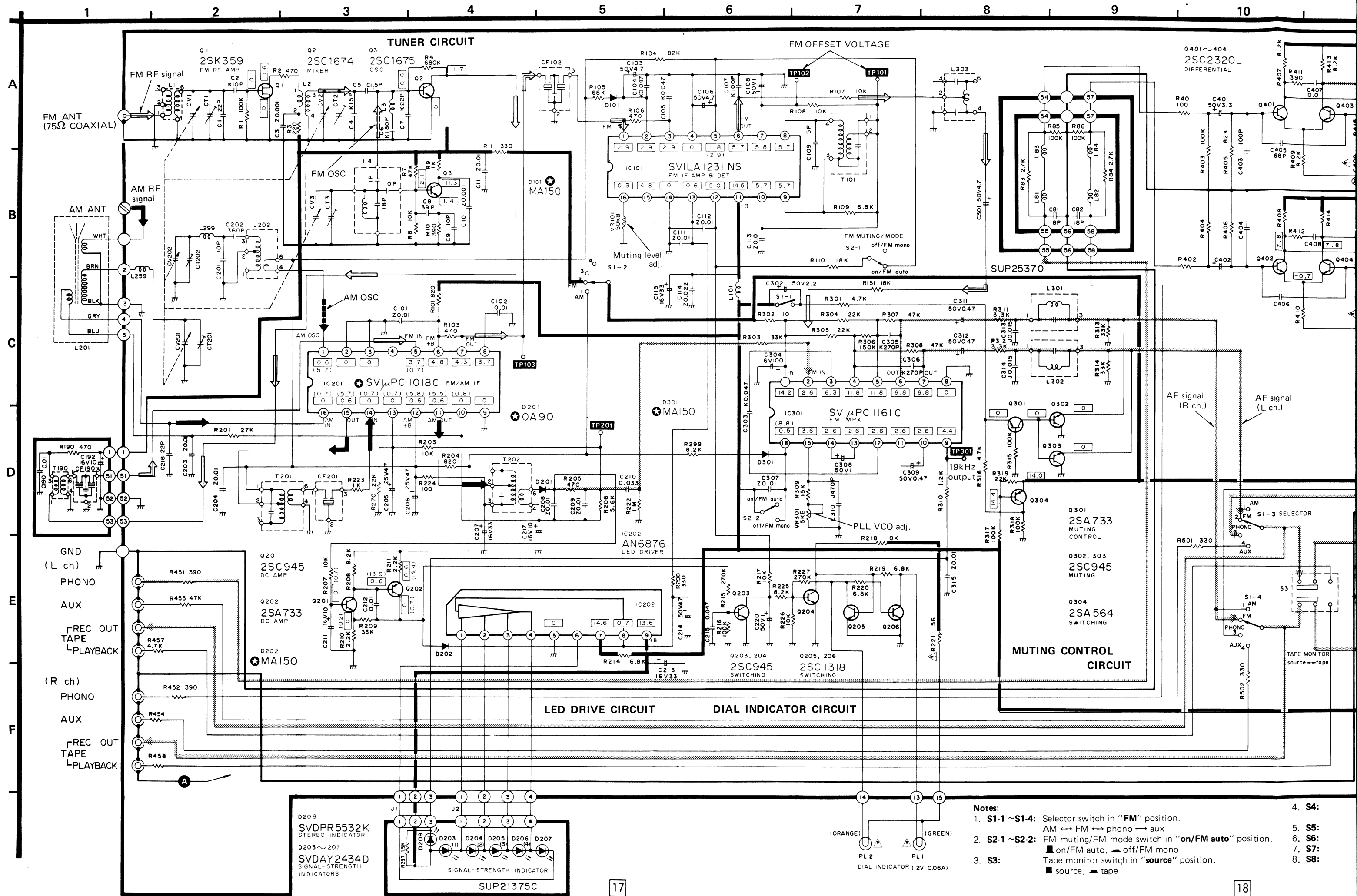
■ BLOCK DIAGRAM

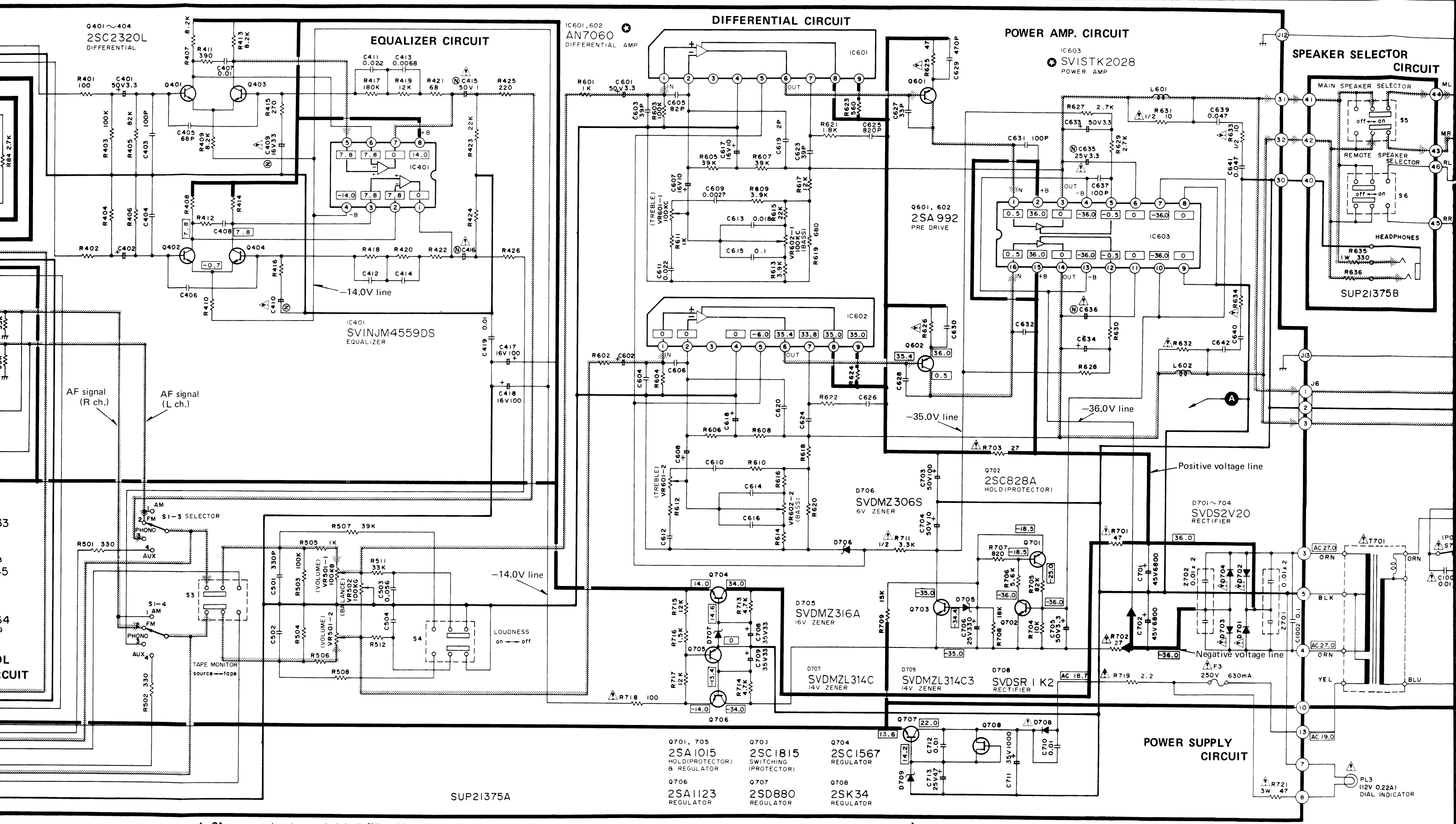




• Terminal guide of transistors & IC'S

SVILA1231NS, RVIM PC1018CF SVIM PC1161C	AN6876 AN7060F	SVINJM4559DD	SVISTK2028	SVIIR2E01	2SA722, 2SC1674, 2SC1675, 2SA564, 2SA733, 2SC945, 2SC1318, 2SC2320, 2SA992, 2SA1015, 2SC828, 2SA1123, 2SC1815	2
						Gate Source





- in "FM" position.
 phono ↔ aux
 mode switch in "on/FM auto" position.
 , off/FM mono
 switch in "source" position.
 ape

4. **S4:** Loudness switch in "off" position.
 ■ off, ▲ on

5. **S5:** Main speaker selector switch in "on" position.

6. **S6:** Remote speaker selector switch in "off" position.

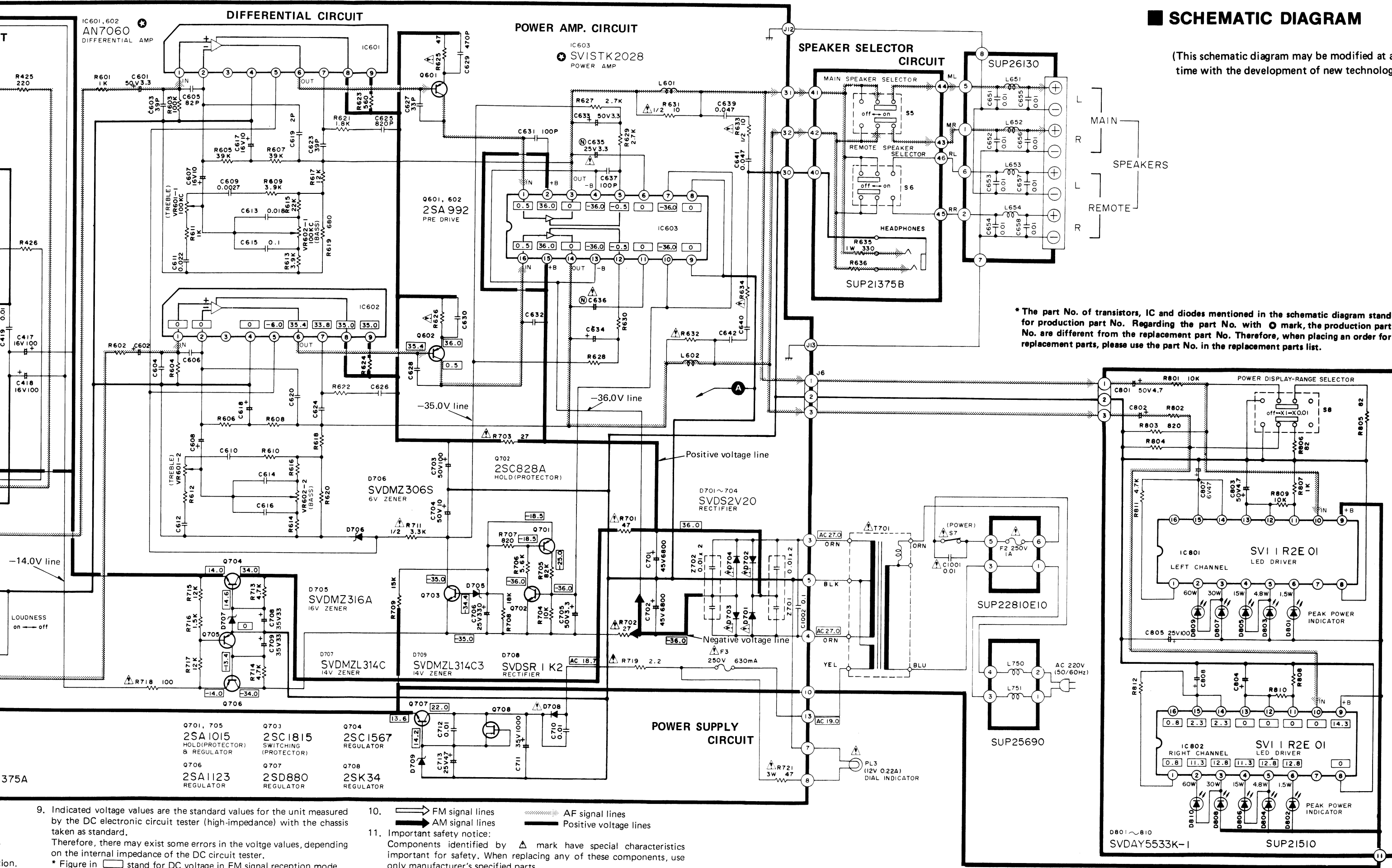
7. **S7:** Power source switch in "on" position.

8. **S8:** Power display range selector switch in "X1" position.
 off ↔ x1 ↔ x 0.01
9. 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 vltge values, depending on the internal impedance of the DC circuit tester.
 * Figure in stand for DC voltage in FM signal reception mode.
 * Figures in () stand for DC voltage in AM signal reception mode.
10. FM signal lines
 AF signal lines
 Positive voltage lines

11. 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.

SCHEMATIC DIAGRAM

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



9. 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.

* Figure in $\square$ stand for DC voltage in FM signal reception mode.

* Figures in () stand for DC voltage in AM signal reception mode.

10. $\Rightarrow$ FM signal lines $\Rightarrow$ AF signal lines
 $\Rightarrow$ AM signal lines $\Rightarrow$ Positive voltage lines

11. Important safety notice:
 Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

REPLACEMENT PARTS LIST (Electrical Parts)

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice:
Components identified by Δ 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. Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	SVILA1231NS	FMIF Amplifier
IC201	RVUUPC1018CF	AM Converter, FM IF Amplifier
IC202	AN6876	L.E.D. Amplifier
IC301	SVIUPC1161C3	FM Stereo Decoder (MPX)
IC401	SVINJ4559DDM	Equalizer Amplifier
IC601, 602	AN7060F	Differential Amplifier
IC603	SVISTK2028B	Power Amplifier
IC801, 802	SVIIR2E01	L.E.D. Driver
TRANSISTORS		
Q1	2SK359-D	FM, RF Amplifier
Q2	2SC1674-M	FM, Mixer
Q3	2SC1675-L	FM, Local Oscillator
Q201	2SC945-Q	DC Amplifier
Q202	2SA733-P1	DC Amplifier
Q203, 204	2SC945-Q	Switching
Q205, 206	2SC1318-Q	Switching
Q301	2SA733-P1	Muting Control
Q302, 303	2SC945-Q	Muting
Q304	2SA722-S	Switching
Q401-404	2SC2320L-F	Differential Amplifier
Q601, 602	2SA992	Pre Drive
Q701	2SA1015-Y	Hold
Q702	2SC828AQ	Hold
Q703	2SC1815-Y	Switching
Q704	2SC1567-Q	Regulator
Q705	2SA1015-Y	Regulator
Q706	2SA1123-R	Regulator
Q707	2SD880-Y	Regulator
Q708	2SK34-D1	Hold
DIODES		
D101, 202	MA162A	Switching
D201	2-OA99	AM Detector
D203-207	SVDAY2434D	L.E.D. Signal Strength (Yellow)
D208	SVDP5532K	L.E.D. Stereo Indicator (Red)
D301	MA162A	Detector
D701-704	SVDS2V20	Rectifier
D705	SVDMZ316A	16V, Zener
D706	SVDMZ306C	6V, Zener
D707	SVDMZL314C	14V, Zener
D708	SVDSR1K2	Rectifier
D709	SVDMZL314C3	14V, Zener
D801-810	SVDAY5533K-1	Peak Power Indicator
COILS		
L1	SLA4N15	FM Antenna
L2	SLD4P77-P	FM Detector
L3	ELQ5A77	Choke
L4	SLO4P107-P	FM Oscillator
L81-84	ELQ5S181KB	Choke
L101	SLQX101-3M	FM Discr
L201	SLF2C39	AM Antenna
L202	SLO2C1-P	AM Oscillator
L259	SLQZ10G1-D	Choke
L299	RLQY15G5-Y	Choke
L301, 302	SLM1C63-M	Choke
L303	SLM1C71-P	Choke
L601, 602	SLQY15G-30	Choke
L651-654	SLQY15G-10	Choke
L750, 751	SLQX400-D	Choke

Ref. No.	Part No.	Description
TRANSFORMERS		
T101	SLI4C527-Z	FM Detector
T190	SLI4C109	FM IFT
T201	SLI2C129R	AM IFT
T202	SLI2C413R	AM Oscillator
T701	SLT5M263-W	Power Source
COMPONENT COMBINATIONS		
Z701, 702	XXRFS203ZSM	0.01 μ F (X2)
CERAMIC FILTERS		
CF102	SVFT107MS2-A	10.7MHz, (Red)
	SVFT107MS2-B	10.675MHz, (Blue)
	SVFT107MS2-C	10.725MHz, (Orange)
	SVFT107MS2-D	10.650MHz, (Black)
CF190	SVFT107MS2-E	10.750MHz, (White)
	SVFE107MA8-A	10.7MHz, (Red)
	SVFE107MA8-B	10.68MHz, (Blue)
	SVFE107MA8-C	10.72MHz, (Orange)
CF201	SVFE107MA8-D	10.66MHz, (Brown)
	SVFE107MA8-E	10.74MHz, (Gray)
	(Use pair ranks as same as CF102 and CF190)	
	SVFSFU450B	AM, 450kHz
FUSES		
F2	Δ XBA2C10TRO	250V, 1A
F3	Δ XBA2C06TRO	250V, T630mA
LAMPS		
PL1	Δ XAMR86S300A	Dial, 12V, 0.06A (Green)
PL2	Δ XAMR86S300	Dial, 12V, 0.06A (Orange)
PL3	Δ XAMR78S250A	Dial Indicator, 12V, 0.22A
SWITCHES		
S1-1 ~ 1-3	SSH165	Function
S2-1 ~ 2-2, 4	SSH2015	FM Muting, Loudness and Speaker Selector
S3	SSH165	Tape Monitor
S5, 6	SSH2017	Speaker Selector
S7	ESB90619S	Power Source
S8	SSS53	Range Selector
VARIABLE RESISTORS		
VR101	Δ EVNM4AA00B54	Muting Level Adjustment, 50k Ω (B)
VR301	Δ EVTS3MA00B53	PLL Voltage Adjustment, 5k Ω (B)
VR501	EWJGFA066B15	Volume Control, 100k Ω (B)
VR502	EWHHMA531G15	Balance Control, 100k Ω (G)
VR601	EWJFC0066C15	Treble Control, 100k Ω (C)
VR602	EWJFCY066530	Bass Control
VARIABLE CAPACITOR		
CV1, 2, 3, 201, 202	ECV5MD34X71G	Tuning Gang, FM & AM (with Trimmer)
(CT1, 2, 3, 201, 202)		

Numbering System of Resistor

Example	25	F	J	101
ERD	Wattage	Shape	Tolerance	Value
Type				
ERD	Carbon	25	1/4W	J
ERG	Metal Oxide	50	1/2W	J
		1	1W	
		3	3W	

Numbering System of Capacitor

Example	1H	102	Z	F
ECKD	Voltage	Value	Tolerance	Peculiarity
Type				
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Ref. No.	Part No.	Value
RESISTORS		
R1	ERD25TJ104	100K
R2	ERD25FJ471	470
R3	ERD25FJ221	220
R4	ERD25TJ684	680K
R7	ERD25TJ473	47K
R8	ERD25FJ103	10K
R9	ERD25FJ102	1K
R10	ERD25FJ391	390
R11	ERD25FJ331	330
R83, 84	ERD25FJ272	2.7K
R85, 86	ERD25TJ104	100K
R101	ERD25FJ821	820
R103	ERD25FJ471	470
R104	ERD25TJ823	82K
R105	ERD25TJ683	68K
R106	ERD25FJ471	470
R107	ERD25FJ103	10K
R108	ERD25FJ103	10K
R109	ERD25FJ682	6.8K
R110	ERD25TJ183	18K
R151	ERD25TJ183	18K
R190	ERD25FJ471	470
R201	ERD25TJ273	27K
R203	ERD25FJ103	10K
R204	ERD25FJ821	820
R205	ERD25FJ471	470
R206	ERD25FJ562	5.6K
R207	ERD25FJ103	10K
R208	ERD25FJ822	8.2K
R209	ERD25TJ333	33K

Ref. No.	Part No.	Value
R210	ERD25FJ222	2.2K
R211	ERD25FJ222	2.2K
R214	ERD25FJ682	6.8K
R215	ERD25TJ274	270K
R216	ERD25TJ104	100K
R217, 218	ERD25FJ103	10K
R219, 220	ERD25FJ682	6.8K
R221	ERD25FJ560	56
R222	ERD25TJ105	1M
R223	ERD25FJ102	1K
R224	ERD25FJ101	100
R225	ERD25FJ822	8.2K
R226	ERD25FJ103	10K
R227	ERD25TJ274	270K
R270	ERD25TJ223	22K
R297	ERD25FJ152	1.5K
R298	ERD25FJ331	330
R299	ERD25FJ822	8.2K
R301	ERD25FJ472	4.7K
R302	ERD25FJ100	10
R303	ERD25TJ333	33K
R304, 305	ERD25TJ223	22K
R306	ERD25TJ154	150K
R307, 308	ERD25TJ473	47K
R309	ERD25TJ153	15K
R310	ERD25FJ122	1.2K
R311, 312	ERD25FJ332	3.3K
R313, 314	ERD25TJ333	33K
R315	ERD25TJ104	100K
R316	ERD25FJ472	4.7K
R317, 318	ERD25TJ104	100K
R319	ERD25TJ223	22K
R401, 402	ERD25FJ101	100

Ref. No.	Part No.	Value
R403, 404	ERD25TJ104	100K
R405, 406	ERD25TJ823	82K
R407, 408	ERD25FJ822	8.2K
R409, 410	ERD25FJ822	8.2K
R411, 412	ERD25FJ391	390
R413, 414	ERD25FJ822	8.2K
R415, 416	ERD25FJ271	270
R417, 418	ERD25TJ184	180K
R419, 420	ERD25TJ123	12K
R421, 422	ERD25FJ680	68
R423, 424	ERD25TJ223	22K
R425, 426	ERD25FJ221	220
R451, 452	ERD25FJ391	390
R453, 454	ERD25FJ472	4.7K
R457, 458	ERD25FJ472	4.7K
R501, 502	ERD25FJ331	330
R503, 504	ERD25TJ104	100K
R505, 506	ERD25FJ102	1K
R507, 508	ERD25TJ393	39K
R511, 512	ERD25TJ333	33K
R601, 602	ERD25FJ102	1K
R603, 604	ERD25TJ104	100K
R605, 606	ERD25TJ393	39K
R607, 608	ERD25TJ393	39K
R609, 610	ERD25FJ392	3.9K
R611, 612	ERD25FJ102	1K
R613, 614	ERD25FJ392	3.9K
R615, 616	ERD25TJ223	22K
R617, 618	ERD25TJ123	12K
R619, 620	ERD25FJ681	680
R621, 622	ERD25FJ182	1.8K

Ref. No.	Part No.	Value
R623, 624	ERD25FJ561	560
R625, 626	ERD25FJ470	47
R627, 628	ERD25FJ272	2.7K
R629, 630	ERD25FJ272	2.7K
R631, 632	ERD50FJ100	10
R633, 634	ERD50FJ100	10
R635, 636	ERG1ANJ331	330
R701	ERD25FJ470	47
R702, 703	ERD25FJ270	27
R704	ERD25FJ103	10K
R705	ERD25TJ823	82K
R706	ERD25FJ562	5.6K
R707	ERD25FJ821	820
R708	ERD25TJ183	18K
R709	ERD25TJ153	15K
R711	ERD50FJ332	3.3K
R713, 714	ERD25FJ472	4.7K
R715	ERD25TJ123	12K
R716	ERD25FJ152	1.5K
R717	ERD25TJ123	12K
R718	ERD25FJ101	100
R719	ERD25FAJ2R2	2.2
R721	ERG3ANJ470	47
R801, 802	ERD25FJ103	10K
R803, 804	ERD25FJ821	820
R805, 806	ERD25FJ820	82
R807, 808	ERD25FJ102	1K
R809, 810	ERD25FJ103	10K
R811, 812	ERD25FJ472	4.7K

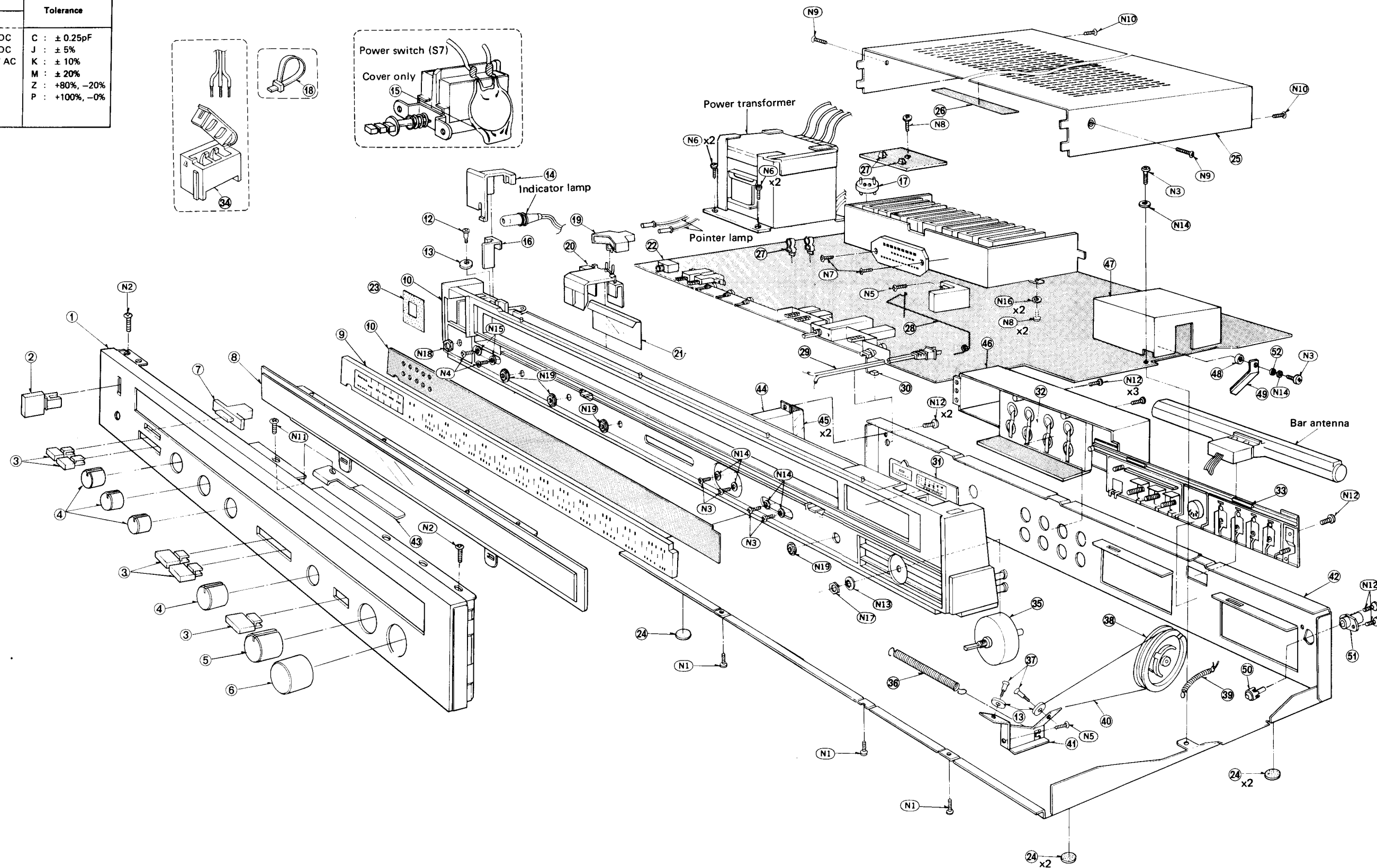
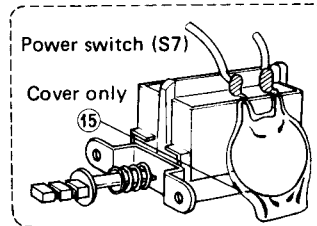
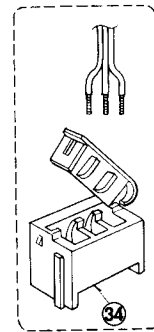
Ref. No.	Part No.	Value
CAPACITORS		
C1	ECCD1H220KC	22P
C2	ECCD1H100K	10P
C3	ECCD1H102ZF	0.001
C4	ECCD1H150KC	15P
C5	ECCD1H1R5CC	1.5
C6	ECCD1H181K	180P
C7	ECCD1H220K	22P
C8	ECCD1H390KC	39P
C9	ECCD1H100KC	10P
C10	ECCD1H102ZF	0.001
C11	ECCD1H103ZF	0.01
C81, 82	ECCD1H180KC	18P
C101	ECCD1H103ZF	0.01
C102	ECCD1H103ZF	0.01
C103	ECEA50Z4R7	4.7
C104, 105	ECQM1H473JZ	0.047
C106	ECEA50Z4R7	4.7
C107	ECCD1H101K	100P
C108	ECEA50Z1	1
C109	ECCD1H050CC	5P
C111	ECCD1H103ZF	0.01
C112, 113	ECCD1H103ZF	0.01
C114	ECCD1H223ZF	0.022
C115	ECEA1CS330	33
C190	ECCD1H103ZF	0.01
C192	ECEA1CS100	10

Ref. No.	Part No.	Value
C201	ECCD1H100KC	10P
C202	ECQP1361JZ	360P
C203, 204	ECCD1H103ZF	0.01
C205	ECEA1ES470	47
C206	ECEA1ES470	47
C207	ECEA1CS330	33
C208, 209	ECCD1H103ZF	0.01
C210	ECQM1H333JZ	0.033
C211	ECEA1HS100	10
C212	ECCD1H103ZF	0.01
C213	ECEA1CS330	33
C214	ECEA50Z4R7	4.7
C215	ECQM1H473JZ	0.047
C217	ECEA1CS100	10
C218	ECCD1H220K	22P
C220	ECEA50Z1	1
C301	ECEA50Z4R7	4.7
C302	ECEA50Z2R2	2.2
C303	ECQM1H473JZ	0.047
C304	ECEA1ES101	100
C305, 306	ECCD1H271KB	270P
C307	ECCD1H103ZF	0.01
C308	ECEA50Z1	1
C309	ECEA50Z R47	0.47
C310	ECQP1471JZ	470P
C311, 312	ECEA50Z47	0.47
C313, 314	ECQM1H153JZ	0.015

Ref. No.	Part No.	Value
C315	ECCD1H103ZF	0.01
C401, 402	ECEA50M3R3R	3.3
C403, 404	ECCD1H101K	100P
C405, 406	ECCD1H680K	68P
C407, 408	ECCD1H103MD	0.01
C409, 410	ECEA1CN330S	33

EXPLODED VIEW

Others	Tolerance
1H : 50V DC	C : $\pm 0.25\mu\text{F}$
45 : 45V DC	J : $\pm 5\%$
KC : 400V AC	K : $\pm 10\%$
	M : $\pm 20\%$
	Z : $+80\%, -20\%$
	P : $+100\%, -0\%$



REPLACEMENT

- Notes: 1. Part numbers are
Please use this p
2. Important safety
Components ide
characteristics in
When replacing a
manufacturer's s
3. -marked p
○-marked parts

Ref. No.	Part No.	Descr
CABINET and CHASSIS PARTS		
1	○ SYW405	Panel, Fr
1	SYW405-10	Panel, Fr
2	SBC301-5	Knob, Po
3	SBC369-2	Knob, Sp Loudnes
		Tape
4	SBN1019	Knob, Ba
5	SBN1049	Balance
6	SBN1051	Knob, Vo
		Knob, Tu
7	○ SBD35	Knob, Ra
7	SBD35-1	Knob, Ra
8	SGU215-1	Panel, Tra
9	○ SKD4090-4	Scale, Dia
9	SKD4090-5	Scale, Dia (Silver T Scale, Dia (Black T
10	SGX7047-1	Plate, Dia
11	○ SUF305	Panel, Fr
11	SUF305-2	Panel, Fr (Silver T Panel, Fr (Black T
12	SHD3X27	Shaft, Di
13	RDR8-1	Pulley, Di
14	SHR9557	Holder, D
15	SMXA65	Cover, Li
16	SHG1589	Rubber, D
17	SHE113	Clamper,
18	SHR301	Clamper,
19	SHG1587	Rubber, P
20	SDP5063	Pointer, D
21	SHP53-3	Slider, P
22	XCJ6P21B-A1	Jack, He
23	SHS1045	Fiber, Po
24	SKL245	Foot, Set
25	○ SKC751S1	Cabinet (
25	SKC751B1	Cabinet (
26	SHS1009	Fiber, Ca
27	SJT 347	Clip, Fusi
28	SUS233	Spring
29	SJA88	AC Cord,
		Source
30	SHR127	Bushing,
31	○ SGX7045-1	Plate, L E (Silver T

REPLACEMENT PARTS LIST (Cabinet and Chassis Parts)

- Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. $\blacksquare$ -marked parts are used for black only, while $\circ$ -marked parts are for silver type only.
4. Parts other than $\blacksquare$ - and $\circ$ -marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "S" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity pre set.

Black type model No. : SA-203 (K)

