

Service Manual

FM/AM Stereo Receiver

SA-202

[E],[EG],[XGH],
[XAL],[XA]

SA-202(K)

[E],[XGH]

SA-202

SA-202(K)



* The colors of this model include silver and black. The black type model is provided with (K) in the Service Manual.

Areas

- * [E] and [EG] are available in European and Scandinavia.
- * [XGH] is available in Holland.
- * [XAL] is available in Australia.
- * [XA] is available in Asia, Latin America, Middle East and Africa.

TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

[DIN 45 500]

AMPLIFIER SECTION

30 Hz~20 kHz continuous power output both channels driven	2 × 30W (4Ω) 2 × 30W (8Ω)
40 Hz~16 kHz continuous power output both channels driven	2 × 30W (4Ω) 2 × 30W (8Ω)
1 kHz continuous power output both channels driven	2 × 34W (4Ω) 2 × 32W (8Ω)
Total harmonic distortion	
rated power at 30 Hz~20 kHz	0.08% (4Ω) 0.04% (8Ω)
rated power at 40 Hz~16 kHz	0.08% (4Ω) 0.04% (8Ω)
rated power at 1 kHz	0.04% (4Ω, 8Ω)
half power at 30 Hz~20 kHz	0.025% (8Ω)
half power at 1 kHz	0.009% (8Ω)
-26 dB power at 1 kHz	0.1% (4Ω)
50 mW power at 1 kHz	0.12% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.08%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.04%
Power bandwidth	
both channels driven, -3 dB	10 Hz~25 kHz (4Ω)
Damping factor	10 (4Ω), 20 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
AUX	150 mV/27kΩ
TAPE REC/PLAY	180 mV/27kΩ
PHONO maximum input voltage (1 kHz, RMS)	130 mV

S/N

rated power (4Ω) PHONO	70 dB (78 dB, IHF, A, 8Ω)
AUX	88 dB (95 dB, IHF, A, 8Ω)

-26 dB power (4Ω) PHONO	64 dB
AUX	66 dB

50 mW power (4Ω) PHONO, AUX	62 dB
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Frequency response

PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
AUX	7 Hz~45 kHz (-1 dB) ±0.8 dB (20 Hz~20 kHz)

Tone controls

BASS	50 Hz, +10 dB~-10 dB
TREBLE	20 kHz, +10 dB~-10 dB

Loudness control (volume at -30 dB)	50 Hz, +9 dB
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Output voltage and impedance

TAPE, REC OUT	150 mV
TAPE, REC/PLAY	30 mV/82kΩ

Channel balance, AUX 250 Hz~6,300 Hz	±1.0 dB
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Channel separation, AUX 1 kHz	55 dB
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Headphones output level and impedance	400 mV/330Ω
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Load impedance

MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

FM TUNER SECTION

Frequency range	88~108 MHz
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Sensitivity

S/N 30 dB	1.9 μV (300Ω), 1.3 μV (75Ω)
S/N 26 dB	1.7 μV (300Ω), 1.2 μV (75Ω)
S/N 20 dB	1.5 μV (300Ω), 0.9 μV (75Ω)
IHF usable sensitivity	1.9 μV (IHF '58)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω

Total harmonic distortion		Channel balance (250 Hz~6,300 Hz)	±1.5 dB
MONO	0.18%	Limiting point	1.2 µV
STEREO	0.3%	Power bandwidth	
S/N		IF amplifier	180 kHz
MONO	60 dB (75 dB, IHF)	FM demodulator	1000 kHz
STEREO	58 dB (70 dB, IHF)	Antenna terminals	300Ω (balanced) 75Ω (unbalanced)
Frequency response	20 Hz~15 kHz, +1 dB~-2 dB 20 Hz~14 kHz, +1.5 dB~-1.5 dB	AM TUNER SECTION	
Alternate channel selectivity	68 dB	Frequency range	525~1605 kHz
Capture ratio	1.2 dB	Sensitivity (S/N 20 dB)	30 µV, 300 µV/m
Image rejection at 98 MHz	55 dB	Selectivity	30 dB
IF rejection at 98 MHz	70 dB	Image rejection at 1,000 kHz	50 dB
Spurious response rejection at 98 MHz	80 dB	IF rejection at 1,000 kHz	40 dB
AM suppression	50 dB	GENERAL	
Stereo separation		Power consumption	360W
1 kHz	45 dB	Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
10 kHz	35 dB	Dimensions (W×H×D)	430 × 142 × 291 mm (16-15/16" × 5-19/32" × 11-15/16")
Carrier leak		Weight	7.1 kg (15.7 lb.)
19 kHz	-30 dB (-40 dB, IHF)		
38 kHz	-50 dB (-50 dB, IHF)		

TECHNISCHE DATEN

Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

[DIN 45 500]**VERSTÄRKERTEIL****Dauerton-Ausgangsleistung bei 30 Hz ~ 20 kHz**

beide Kanäle angesteuert	2 × 30W (4 Ω)
	2 × 30W (8 Ω)

Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz

beide Kanäle angesteuert	2 × 30W (4 Ω)
	2 × 30W (8 Ω)

Dauerton-Ausgangsleistung bei 1 kHz

beide Kanäle angesteuert	2 × 34W (4 Ω)
	2 × 32W (8 Ω)

Gesamtklirrfaktor

Nennleistung bei 30 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, 8 Ω)
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halbe Nennleistung bei 30 Hz ~ 20 kHz	0.025% (8 Ω)
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halbe Nennleistung bei 1 kHz	0.009% (8 Ω)
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-26 dB Leistung bei 1 kHz	0.1% (4 Ω)
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50 mW Leistung bei 1 kHz	0.12% (4 Ω)
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Intermodulationsfaktor

Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0.08%
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Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0.04%
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Leistungsbandbreite

beide Kanäle angesteuert bei -3 dB	10 Hz ~ 25 kHz (4 Ω)
	10 (4 Ω), 20 (8 Ω)

Dämpfungsfaktor**Eingangsempfindlichkeit und -impedanz**

Phono	2.5 mV/47 kΩ
Aux	150 mV/27 kΩ

Tape Aufnahme/Wiedergabe (TAPE REC/PLAY)	180 mV/27 kΩ
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Maximale TA-Eingangsspannung (1 kHz, eff.)**Geräuschabstand**

Nennleistung (4 Ω) Phono	70 dB (78 dB, IHF, A, 8Ω)
Aux	88 dB (95 dB, IHF, A, 8Ω)

-26 dB Leistung (4 Ω) Phono	64 dB
Aux	66 dB

50 mW Leistung (4 Ω) Phono, Aux	62 dB
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Frequenzgang

Phono	RIAA-Standardkurve ±0.8 dB (30 Hz ~ 15 kHz)
Aux	7 Hz ~ 45 kHz (-1 dB) ±0.8 dB (20 Hz ~ 20 kHz)

Klangregler

Bauregler (BASS)	50 Hz, +10 dB ~ -10 dB
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Höhenregler (TREBLE)	20 kHz, +10 dB ~ -10 dB
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Gehörriichtige Lautstärkekorrektur (Loudness)

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

Tape Aufnahme (TAPE, REC OUT)	150 mV
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Tape Aufnahme/Wiedergabe (TAPE REC/PLAY)	30 mV/82 kΩ
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Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)

Übersprechdämpfung (Aux, 1 kHz)	±1.0 dB
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Kopfhörerpegel und -impedanz

Lautsprecherimpedanz	400 mV/330 Ω
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MAIN oder REMOTE	4 Ω ~ 16 Ω
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MAIN und REMOTE	8 Ω ~ 16 Ω
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UKW-TUNERTEIL

Wellenbereich	88 ~ 108 MHz
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Eingangsempfindlichkeit

S/R 30 dB	1.9 µV (300 Ω), 1.3 µV (75 Ω)
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S/R 26 dB	1.7 µV (300 Ω), 1.2 µV (75 Ω)
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S/R 20 dB	1.5 µV (300 Ω), 0.9 µV (75 Ω)
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Nutzempfindlichkeit nach IHF

Stereoschaltswelle bei 46 dB nach IHF	1.9 µV (nach IHF '58) 22 µV/75 Ω
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Gesamtklirrfaktor

Mono	0.18%
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Stereo	0.3%
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Geräuschabstand

Mono	60 dB (75 dB nach IHF)
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Stereo	58 dB (70 dB nach IHF)
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Frequenzgang

20 Hz ~ 15 kHz (+1 dB ~ -2 dB)	
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20 Hz ~ 14 kHz (+1.5 dB ~ -1.5 dB)	
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Trennschärfe bei Störsender

Einfangverhältnis	68 dB
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Spiegelfrequenz-Dämpfung bei 98 MHz

ZF-Dämpfung bei 98 MHz	1.2 dB
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Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz

AM-Unterdrückung	55 dB
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Übersprechdämpfung

1 kHz	70 dB
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10 kHz	80 dB
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Trägerrest

19 kHz	45 dB
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38 kHz	35 dB
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Kanalabweichung (250 Hz ~ 6300 Hz)

	-30 dB (-40 dB nach IHF)
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	-50 dB (-50 dB nach IHF)
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	±1.5 dB
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Begrenzereinsatz	1.2 μ V
Bandbreite	180 kHz
ZF-Verstärker	1000 kHz
UKW-Demodulator	300 Ω (symmetrisch)
Antennenanschluss	75 Ω (unsymmetrisch)

AM-TUNERTEIL

Wellenbereiche	525 ~ 1605 kHz
Eingangsempfindlichkeit (S/R 20 dB)	30 μ V, 300 μ V/m

Trennschärfe	30 dB
Spiegelfrequenz-Dämpfung bei 1000 kHz	50 dB
ZF-Dämpfung bei 1000 kHz	40 dB

ALLGEMEINE DATEN

Leistungsaufnahme	360 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 × 142 × 291 mm
Gewicht	7.1 kg

CARACTERISTIQUES TECHNIQUES Sujet à changement sans préavis.**[DIN 45 500]****SECTION AMPLIFICATEUR**

Puissance de sortie continue de 30 Hz~20 kHz, les deux canaux en circuit	2 × 30W (4 Ω) 2 × 30W (8 Ω)
Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit	2 × 30W (4 Ω) 2 × 30W (8 Ω)
Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 × 34W (4 Ω) 2 × 32W (8 Ω)
Distorsion harmonique totale à puissance nominale (30 Hz~20 kHz)	0.08% (4 Ω) 0.04% (8 Ω)
à puissance nominale (40 Hz~16 kHz)	0.08% (4 Ω) 0.04% (8 Ω)
à puissance nominale (1 kHz)	0.04% (4 Ω , 8 Ω)
à demi-puissance (30 Hz~20 kHz)	0.025% (8 Ω)
à demi-puissance (1 kHz)	0.009% (8 Ω)
puissance de -26 dB à 1 kHz	0.1% (4 Ω)
puissance de 50 mW à 1 kHz	0.12% (4 Ω)
Distorsion d'intermodulation à puissance nominale à 250 Hz: 8 kHz=4:1, 4 Ω	0.08%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8 Ω	0.04%
Réponse de fréquences les deux canaux en circuit, -3 dB	10 Hz~25 kHz (4 Ω)
Coefficient d'amortissement	10 (4 Ω), 20 (8 Ω)
Sensibilité et impédance d'entrée	
PHONO	2.5 mV/47k Ω
AUX (AUX)	150 mV/27k Ω
BANDE ENREGISTREMENT/LECTURE (TAPE REC/PLAY)	180 mV/27k Ω
PHONO (tension d'entrée maximum, 1 kHz RMS)	130 mV
Signal/Bruit	
à puissance nominale (4 Ω)	
PHONO	70 dB (78 dB, IHF, A, 8 Ω)
AUX	88 dB (95 dB, IHF, A, 8 Ω)
puissance de -26 dB (4 Ω)	
PHONO	64 dB
AUX	66 dB
puissance de 50 mW (4 Ω)	
PHONO, AUX	62 dB
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0.8 dB (30 Hz~15 kHz)
AUX	7 Hz~45 kHz (-1 dB) ±0.8 dB (20 Hz~20 kHz)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB ~ -10 dB
AIGUS (TREBLE)	20 kHz, +10 dB ~ -10 dB
Compensateur physiologique (volume à -30 dB)	50 Hz, +9 dB
Tension de sortie et impédance	
SORTIE ENREGISTREMENT/BANDE, (TAPE, REC OUT)	150 mV
ENREGISTREMENT/LECTURE BANDE (TAPE REC/PLAY)	30 mV/82k Ω

Equilibrage des canaux, AUX 250 Hz~6 300 Hz	±1.0 dB
Séparation des canaux, AUX 1 kHz	55 dB
Niveau de sortie des casques et impédance	400 mV/330 Ω
Impédance de charge	

PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)4 Ω ~16 Ω **PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)**8 Ω ~16 Ω **SECTION SYNTONISATEUR FM**

Gamme de fréquence	88~108 MHz
Sensibilité	
S/B 30 dB	1.9 μ V (300 Ω), 1.3 μ V (75 Ω)
S/B 26 dB	1.7 μ V (300 Ω), 1.2 μ V (75 Ω)
S/B 20 dB	1.5 μ V (300 Ω), 0.9 μ V (75 Ω)
Sensibilité utilisable IHF	1.9 μ V (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μ V/75 Ω
Distorsion harmonique totale	
MONO	0.18%
STEREO	0.3%
Signal/Bruit	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +1 dB ~ -2 dB 20 Hz~14 kHz, +1.5 dB ~ -1.5 dB
Sélectivité alternée par canal	68 dB
Taux de capture	1.2 dB
Rejection d'image à 98 MHz	55 dB
Rejection FI à 98 MHz	70 dB
Rejection de réponse parasite à 98 MHz	80 dB
Suppression AM	50 dB
Séparation stéréophonique	
1 kHz	45 dB
10 kHz	35 dB
Fuite de porteuse	
19 kHz	-30 dB (-40 dB, IHF)
38 kHz	-50 dB (-50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	±1.5 dB
Point de limite	1.2 μ V
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
Bornes d'antenne	300 Ω (symétrique) 75 Ω (asymétrique)

SECTION SYNTONISATEUR AM

Gamme de fréquence	525~1605 kHz
Sensibilité (S/B 20 dB)	30 μ V, 300 μ V/m
Sélectivité	30 dB
Réjection d'image à 1,000 kHz	50 dB
Réjection FI à 1,000 kHz	40 dB

DIVERS

Consommation	360W
Alimentation	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 142 × 291 mm
Poids	7.1 kg

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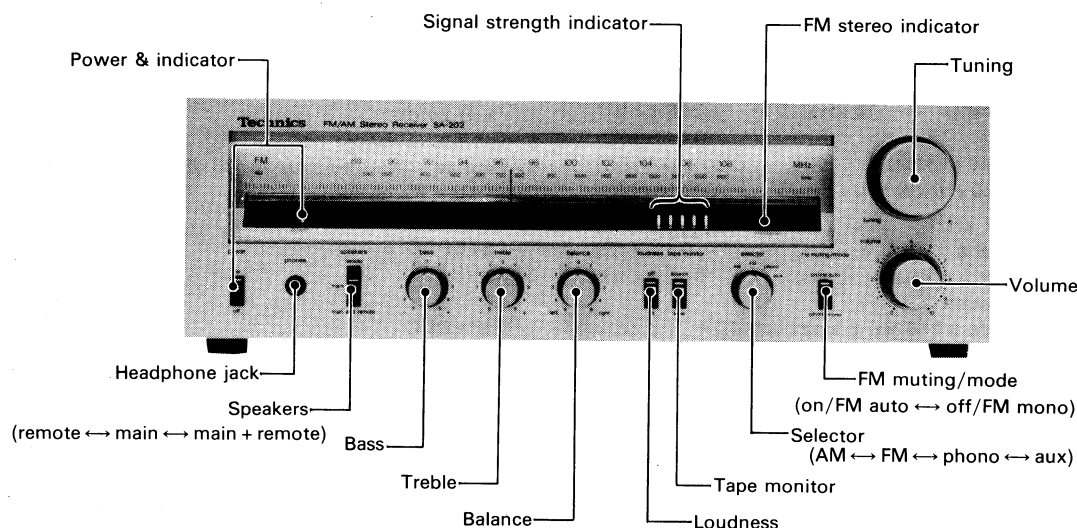
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NOTE (Speaker circuit fuses)

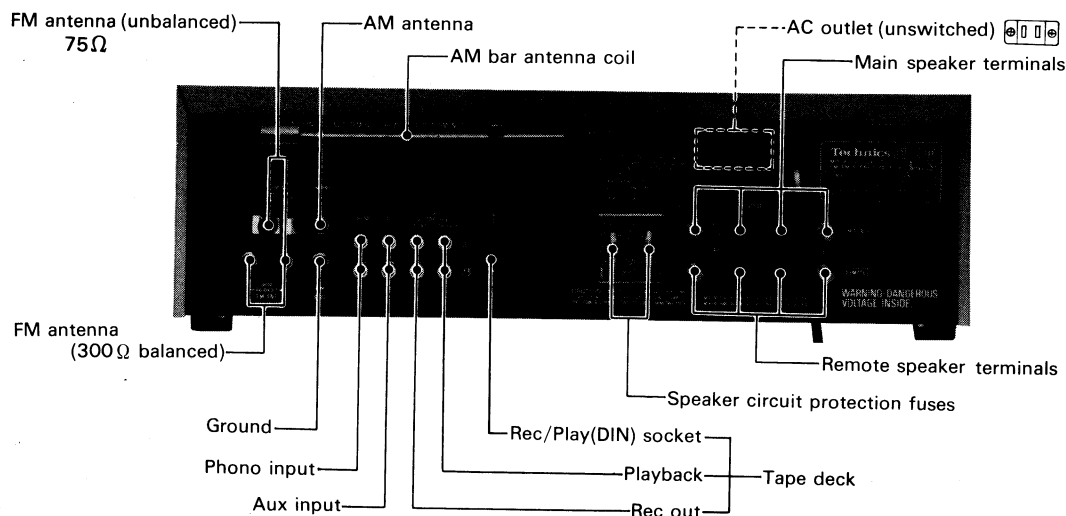
The unit is provided with the speaker circuit protection fuses at the right and left channels respectively. The fuse is to prevent the power IC from destruction, should the speaker terminals be short-circuited. Accordingly, if the unit fails to function upon completion of the speaker connections, check the speaker circuit protection fuses first of all for possible blowing.

LOCATION OF CONTROLS

Front side view

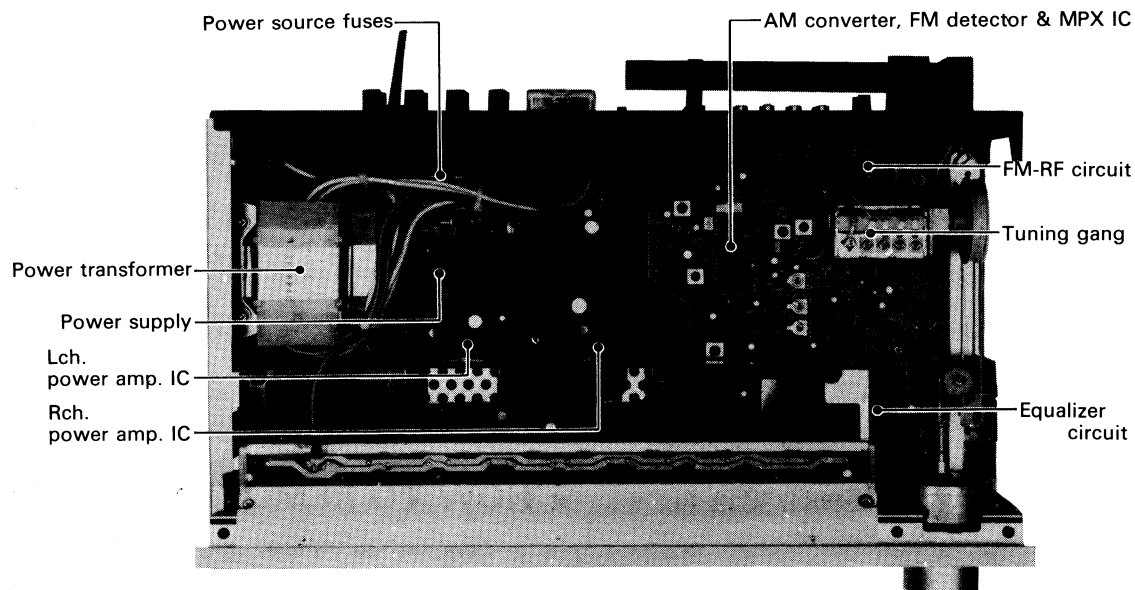


Rear side view



AC outlet is not equipped on units some areas.

● Inside view



■ HOW TO REMOVE THE CABINET

1. Remove the 8 setscrews on the side and 3 setscrews on the back of the cabinet. [Fig. 1: A]
2. Remove the cabinet.

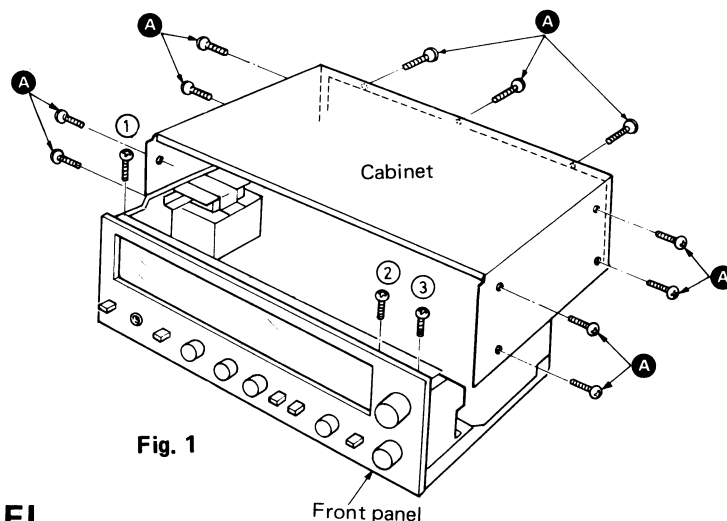


Fig. 1

■ HOW TO REMOVE THE FRONT PANEL AND THE BOTTOM BOARD

1. Remove the cabinet.
2. Remove the 3 setscrews [Fig. 1: ①~③] detach the front panel and remove the 4 setscrews [Fig. 2: ④~⑦] detach the bottom board and front panel.
3. pull the front panel outward from the front of the unit.
4. To remove the bottom board, remove the 11 setscrews [Fig. 2: ⑤, ⑥ and ⑧~⑯] detach the bottom board.

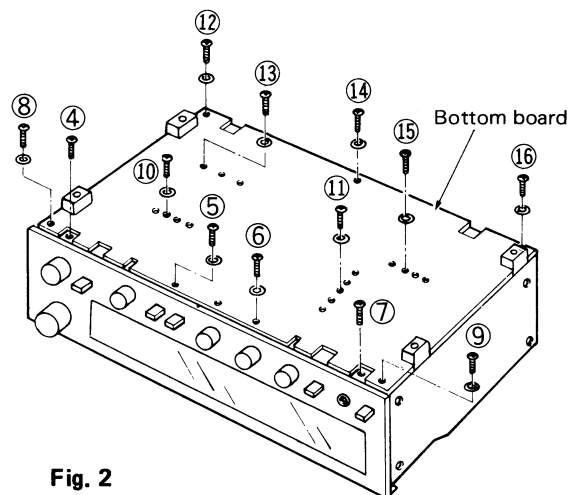
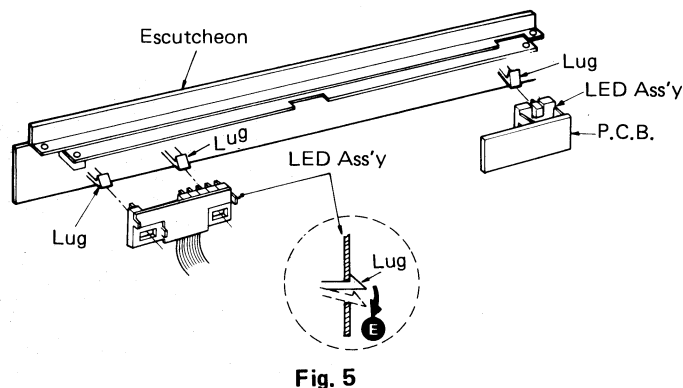
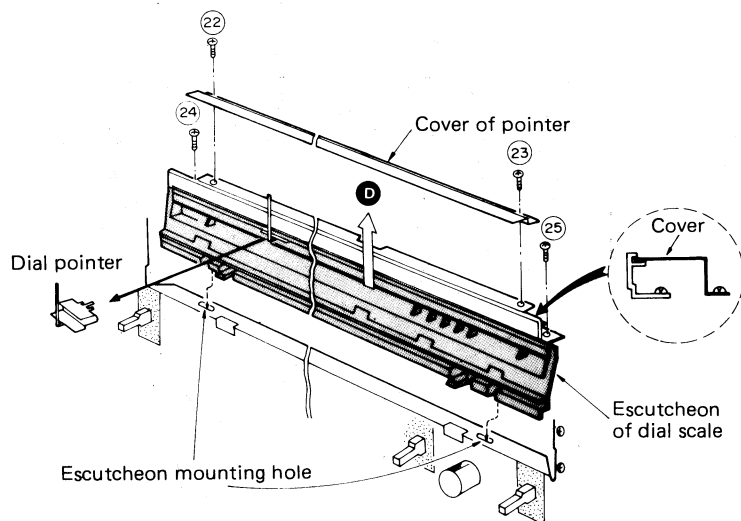
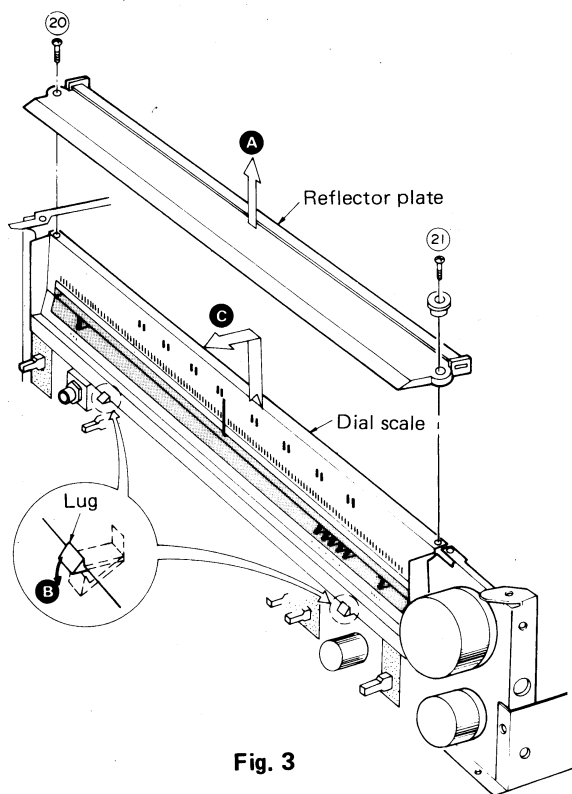


Fig. 2

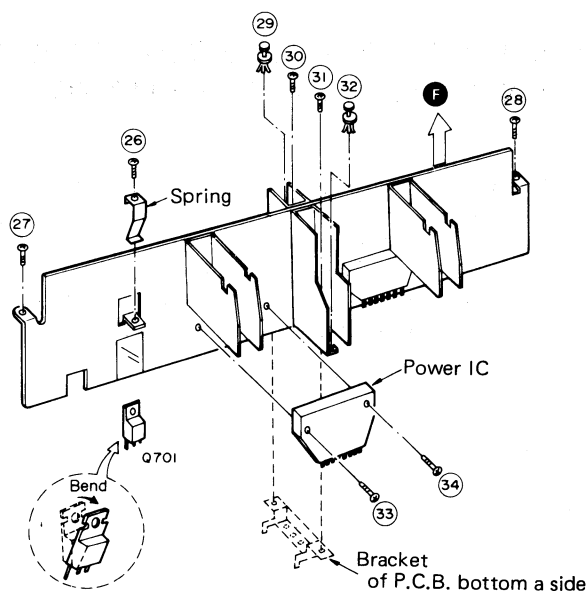
■ HOW TO REMOVE THE LED INDICATOR P.C.B.

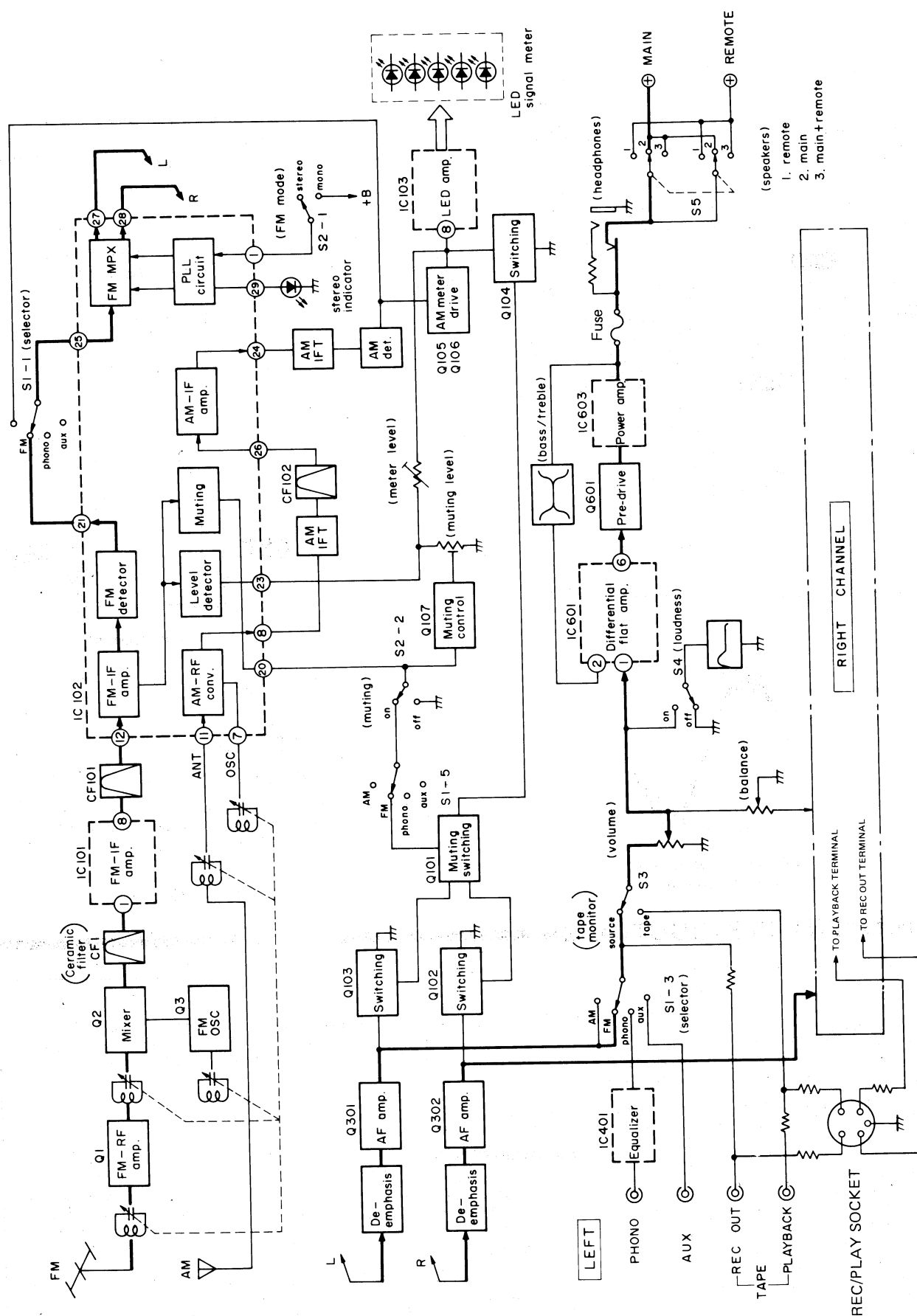
1. Remove the cabinet and front panel.
2. Remove the 2 setscrews [Fig. 3: ⑳,㉑] to detach the reflector plate in the direction of the arrow **A**.
3. The dial scale is secured with the 2 lugs projected from the escutcheon of dial scale. Bend the lugs in the direction of the arrow **B** to detach the dial scale in the direction of the arrow **C**.
4. Remove the 2 setscrews [Fig. 4: ㉒,㉓] to detach the cover of dial pointer.
5. Remove the dial cord and pull out the dial pointer. Next, remove the 2 setscrews [Fig. 4: ㉔,㉕] to detach the escutcheon of dial scale in the direction of the arrow **D**.
6. The LED(indicator) assembly is secured with the lugs projected from the escutcheon of dial scale. So, bend the lugs in the direction of the arrow **E** to detach the LED(indicator) assembly. [Fig. 5].



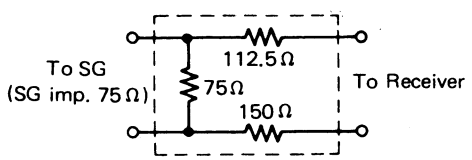
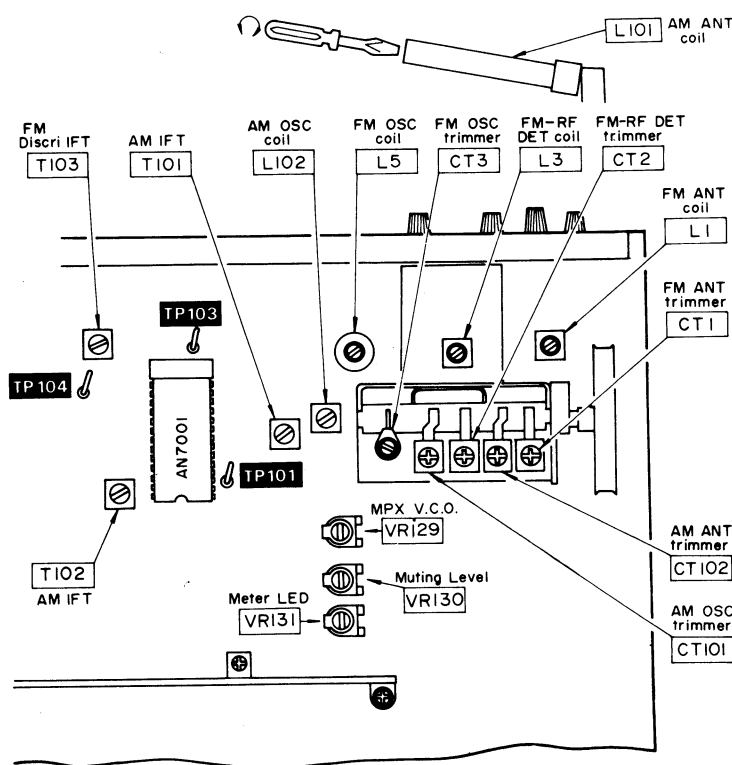
■ HOW TO REMOVE THE POWER IC

1. Remove the cabinet and bottom board. (Refer to the sections "How to remove the cabinet" and "How to remove the front panel and the bottom board".)
2. Unsolder of power IC for both left channel and right channel.
3. Remove the transistor (Q701) press spring setscrew [Fig. 6: ㉖] to detach the spring.
4. Remove the 2 setscrews [Fig. 6: ㉗,㉘] the front chassis.
5. Remove the heat sink mounting 2 setscrews and 2 lock pins [Fig. 6: ㉙~㉚] from P.C.B. and bracket.
6. Remove the heat sink along with the power IC in the direction of the arrow **F**. [Fig. 6]
7. Remove the 2 setscrews [Fig. 6: ㉛,㉜] used to secure the power IC on the heat sink, and then pull the power IC.
8. When mounting the power IC, apply silicone compound (or equivalent heat diffuser) to the back of power IC.





ADJUSTMENT POINTS



300 Ω FM dummy antenna
Fig. 7 (Abb. 7)

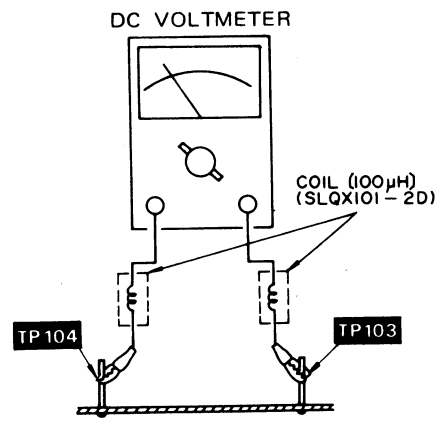
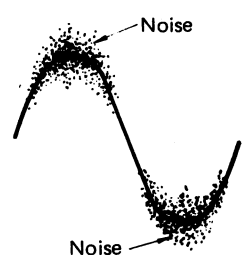
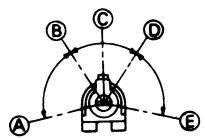


Fig. 8 (Abb. 8)



AF output wave form
Fig. 9 (Abb. 9)



VR129
A-B,D-E: Stereo OFF Position.
B-D: Stereo ON Position (Indicator Lighting).
C: Adjust Point of MPX Circuit.

Fig. 10 (Abb. 10)

ADJUSTMENT INSTRUCTIONS

ENGLISH

Notes:

1. Band selector switch

AM (AM Adjustment)

FM (FM Adjustment)
2. FM muting & mode switch

off/mono
3. Maintain line voltage at rated voltage.
4. 300 Ω FM dummy antenna

Refer to fig. 7.
5. Output of signal generator should be no higher than

necessary to obtain an output reading.
6. Fix the bottom board before adjustment to chassis.
7. Adjustment the AM antenna coil (L101) position by using a screw driver so that it is at approximately 25 degrees to the rear panel.

AM SIGNAL GENERATOR		DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS
CONNECTION	FREQUENCY				
AM ADJUSTMENT					
Higher side through 0.001 μ F to AM antenna trimmer terminal. Common to chassis.	450kHz (30% Mod. with 400 Hz)	Point of non-interference	Connect AC VTVM or scope to "SPEAKER" terminals.	T101 (1st IFT) T102 (2nd IFT)	Adjust the input frequency and adjustment points so that the output becomes maximum.
Fashion loop of several turns of wire and radiate signal into loop of receiver.	600kHz (30% Mod. with 400Hz)	600kHz	Connect AC VTVM or scope to "SPEAKER" terminals.	L102 (OSC Coil) L101 (ANT Coil)	Adjust for maximum output. Adjust ferrite core of L101 by screw driver.
Fashion loop of several turns of wire and radiate signal into loop of receiver.	1500kHz (30% Mod. with 400Hz)	1500kHz	Connect AC VTVM or scope to "SPEAKER" terminals.	CT101 (OSC Trimmer) CT102 (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).

UKW MESSENDER		SKALENZEIGEREINSTELLUNG DES TUNER	ANZEIGEGEIRÄT (Röhrenvoltmeter oder Oszillograph bzw. Klirrfaktor-Meßgerät)	ABGLIECHS-PUNKTE	BEMERKUNGEN
ANSCHLUSS	FREQUENZ				
MW-HF-ABGLEICH					
Das Meßsendersignal induktiv in den Tuner speisen. Hierzu behelfsmäßig eine Rahmenantenne fertigen und an den Eingang schließen.	600kHz (400Hz Modulat., 30%)	600kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Lautsprecher schließen.	L102 (Osc. Spule) L101 (Ant. Spule)	Auf max. Ausgang abgleichen. Den Ferritkern von L101 mit einem Schraubendreher justieren.
Das Meßsendersignal induktiv in den Tuner speisen. Hierzu behelfsmäßig eine Rahmenantenne fertigen und an den Eingang schließen.	1500kHz (400Hz Modulat., 30%)	1500kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Lautsprecher schein.	CT101 (Osc. Trimmer) CT102 (Ant. Trimmer)	Auf max. Ausgang abgleichen. Schritt (2) und (3) sing zu wiederholen.
UKW-HF-ABGLEICH					
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	87,5MHz (400Hz Modulat., 100% Schwacher Eingang	87,5MHz (Frequenz min.	Oszillograph über den Lautsprecher schließen.	L5 (Osc. Spule)	• Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. • So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 9) • Die Einstellung von (4), (5) und (6) wiederhoten, bis die Frequenz mit der Skala übereinstimmt.
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90MHz (400Hz Modulat., 100%) Schwacher Eingang	90MHz	Oszillograph über den Lautsprecher schließen.	L3 (Det. Spule) L1 (Ant. Spule)	
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	106MHz (400Hz Modulat., Schwacher Eingang	106MHz	Oszillograph über den Lautsprecher schließen.	CT3 (Osc. Trimmer) CT2 (Det. Trimmer) CT1 (Ant. Trimmer)	
UKW-ZF-ABGLEICH					
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	Kein Signal	100MHz	Gleichstrom-Voltmeter zwischen TP104 und TP103 über Schutzdrossel anschließen. Vgl. Abb. 8	T103 (Diskriminator IFT)	• Den Kern von T103 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt. • Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. • So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 9) • Den Kern von T103 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt • Schritt (7) und (8) sing zu wiederholen.
	100MHz (400Hz Modulat., 100%) Schwacher Eingang	100MHz	Gleichstrom-Voltmeter zwischen TP104 und TP103 über Schutzdrossel anschließen. Vgl. Abb. 8. Oszillograph über den Lautsprecher schließen.		
ABGLEICHEN DES SIGNALMETER-LED (LICHTERZEUGENDE DIODE) – ANZEIGERS					
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. Meßsender auf 45dB (178µV) einstellen.	100MHz (400Hz Modulat., 100%)	100MHz	Signalmeter-LED	VR131 (Metervolumen)	Unter Beobachtung der Signalmeter-LED VR131so justieren, daß der Anzeiger am 5. fast aufzuleuchten beginnt.
UKW-MUTING-ABGLEICH					
Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. Meßsender auf 16dB (6.3µV) einstellen.	100MHz (400Hz Modulat., 100%)	100MHz	Röhrenvoltmeter oder Oszillograph über den Lautsprecher schließen.	VR130	FM Muting-Schalter auf "on/auto" So einstellen, daß ein Ausgang zu vernehmen ist.
UKW-STEREO-DEKODER-ABGLEICH					
Unter Verwendung eines Zählers			Alternativ-Meßmethode		
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 TP101 schließen. 4. VR129 auf 19kHz ±30Hz einstellen.			1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. VR129 so einstellen, bis die Stereolampe auf leuchtet. Schleifer von VR129 sichern, wie in Abb. 10 gezeigt.		

INSTRUCTIONS D'ALIGNEMENT

FRANÇAIS

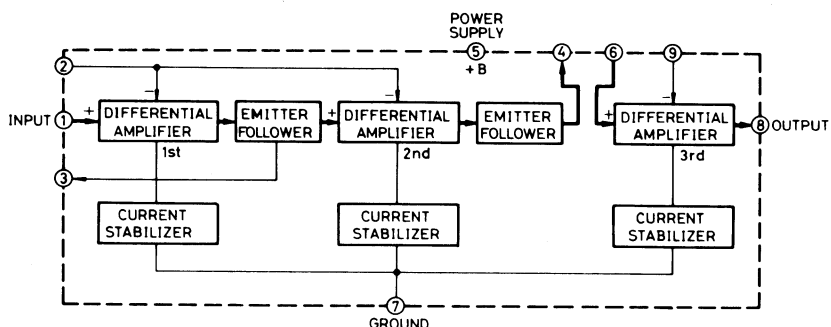
Notes:

- Sélecteur de gamme { AM (Alignement AM)
FM (Alignement FM)
- Commutateur de silencieux/mode . . . off/mono
- Conserver la tension du secteur à la tension nominale.
- Antenne fictive FM 300Ω Voir fig. 7.
- Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
- Fixer la plaque de base au châssis avant le réglage.
- Régler la position de la bobine (L101) de l'antenne en utilisant un tournevis de telle sorte qu'elle soit environ à 25 degrés de la plaque arrière.

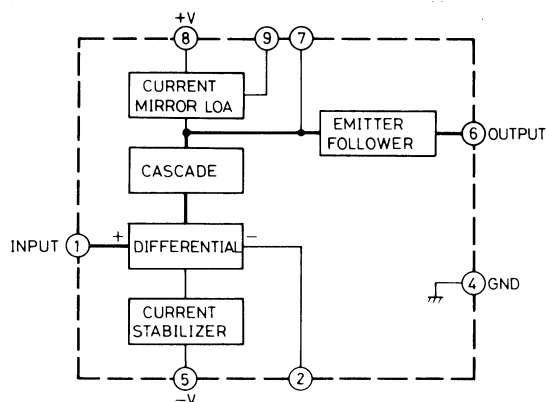
AM/FM GENERATEUR		AIGUILLE SUR LE CADRAN	INDICATEUR (VOLT- METRE ELECTRONIQUE OSCILLOSCOPE OU DISTORSIONMETRE)	POINTS DE REGLAGE	OBSERVATIONS
BRANCHEMENT	FREQUENCE				
ALIGNMENT AM					
Côté chaud, à travers 0.001μF, sur le trimmer de l'antenne AM, point (A) commun au châssis	450kHz (modulé à 30% par 400Hz)	Point sans signal	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	T101(1 transfo FI) T102(2 transfo FI)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
Faire une boucle de quelques tours et rayonner le signal dans le cadre de l'ampli-tuner.	600kHz (modulé à 30% par 400Hz)	600kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	L102 (bobine OSC) L101 (bobine ANT)	Régler au maximum de signal de sortie. Réglez le noyau ferrite de L101 à l'aide d'un tournevis.
Faire une boucle de quelques tours et rayonner le signal dans le cadre de l'ampli-tuner	1500kHz (modulé à 30% par 400Hz)	1500kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	CT101 (trimmer OSC) CT102 (trimmer ANT)	Régler au maximum de signal de sortie. Recommencez les étapes (2) et (3).
ALIGNEMENT RF-FM					
Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	90MHz (modulé à 100% par 400Hz) Entrée faible	90MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	L5 (bobine OSC) L3 (bobine DET) L1 (bobine ANT)	● Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. ● Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 9) ● Refaire les réglages (4) et (5) jusqu'à ce que la fréquence corresponde correctement avec l'échelle du cadran.
Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	106MHz (modulé à 100% par 400Hz) Entrée faible	106MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	CT3 (trimmer OSC) CT2 (trimmer DET) CT1 (trimmer ANT)	
ALIGNEMENT FI-FM					
Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	Point sans signal	100MHz	Brancher le voltmètre électronique à c.c. aux bornes TP104 et TP103. Voir fig. 8.	T103 (Transfo FI discri.)	● Régler le noyau T103 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0V dans la gamme des 300mV. ● Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. ● Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 9) ● Régler le noyau T103 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0V dans la gamme des 300mV. ● Recommencez les étapes (6) et (7)
	100MHz (modulé à 100% par 400Hz) Entrée faible	100MHz	Brancher le voltmètre électronique à c.c. aux bornes TP104 et TP103. Branchez un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.		
ALIGNEMENT DE L'INDICATEUR DE SIGNAL DE LA DIODE A EMISSION DE LUMIERE (DEL).					
Branchez sur la prise d'antenne FM à travers une antenne fictive FM. Niveau de sortie du générateur 45 dB (178μV).	100MHz (modulé à 100% par 400Hz)	100MHz	DEL du compteur à signal	R144 (Registor variable du compteur)	● Régler VR131 en observant la DEL du compteur à signal afin que l'indicateur au 5ème est à presque tourner.
REGLAGE DU SEUIL DU SILENCIEUX D'ACCORD					
Branchez sur la prise d'antenne FM à travers une antenne fictive FM. Niveau de sortie du générateur 16 dB (6.3μV).	100MHz (modulé à 100% par 400Hz)	100MHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	VR130	Commutateur de silencieux sur "on/auto". Régler pour obtenir une lecture en sortie.
ALIGNEMENT DU PILOTE MULTIPLEX FM					
Avec un fréquencemètre			Par un autre système		
1. Signal mono 100MHz non modulé appliqué à l'appareil. 2. Commutateur de silencieux sur "on/auto". 3. Branchez le fréquencemètre sur TP101 à travers une résistance de 100kΩ. 4. Régler VR129 sur 19kHz ±30Hz.			1. Appliquez à l'appareil un signal stéréo provenant d'un générateur ou de la réception d'un émetteur. 2. Régler VR129 jusqu'à ce que l'indicateur de stéréophonie s'allume. Collez le curseur de VR129 comme indiqué sur la fig. 10.		

■ BLOCK DIAGRAM OF IC'S

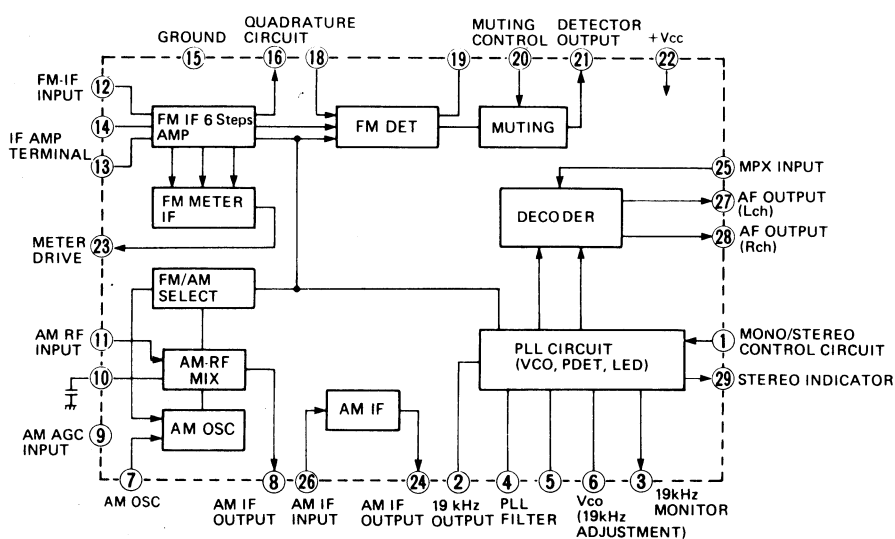
- This is the basic block diagram of the inside circuit of IC. In an actual circuit, there may be sometimes idle terminals or some different functions other than the basic circuit.



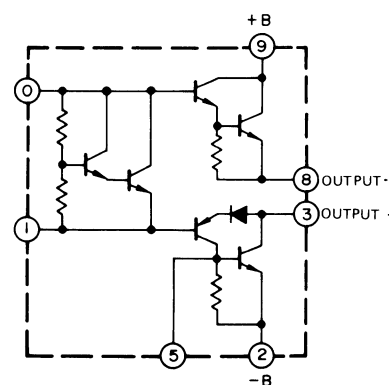
IC101 (AN278)
FM IF amplifier



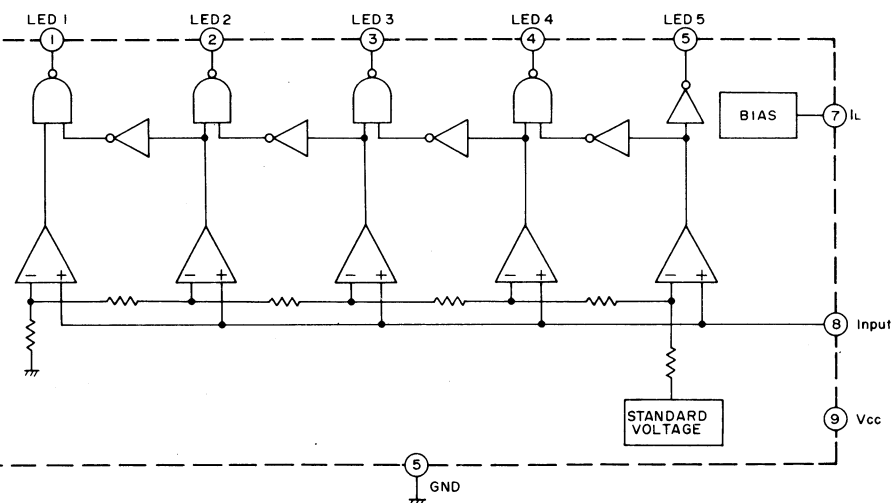
IC601, 602 (AN7060)
Differential amplifier



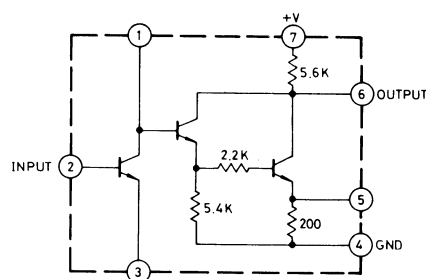
IC102 (AN7001ST)
AM converter, FM IF amplifier, detector & MPX



IC603, 604 (SVISTK0029N)
Power amplifier



IC103 (AN6876)
LED drive amplifier

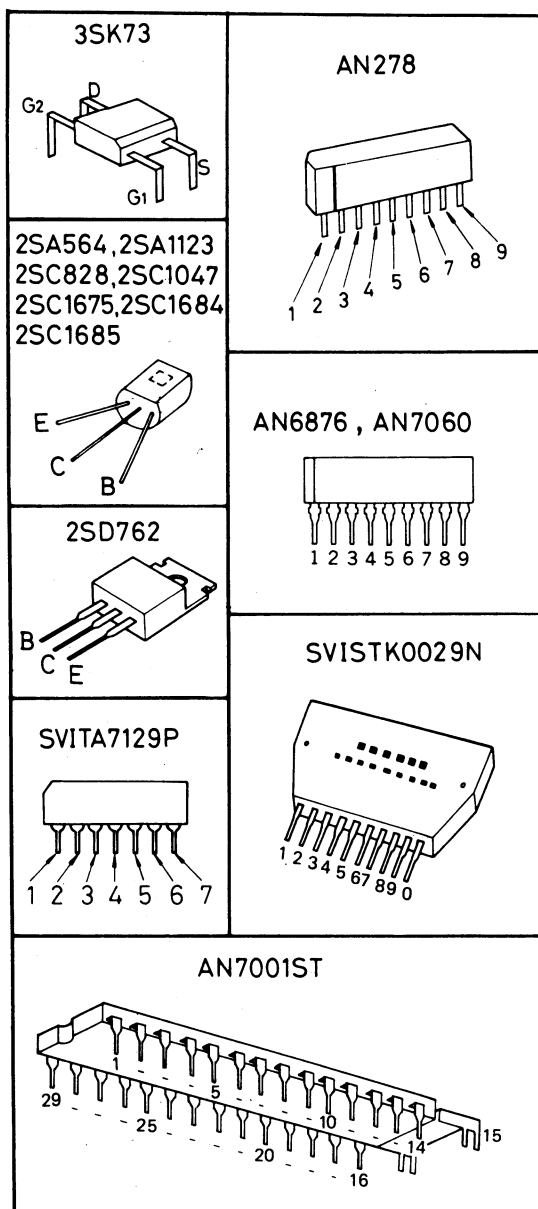


IC401, 402 (SVITA7129P)
Equalizer amplifier

PRINTED CIRCUIT BOARD WIRING VIEW

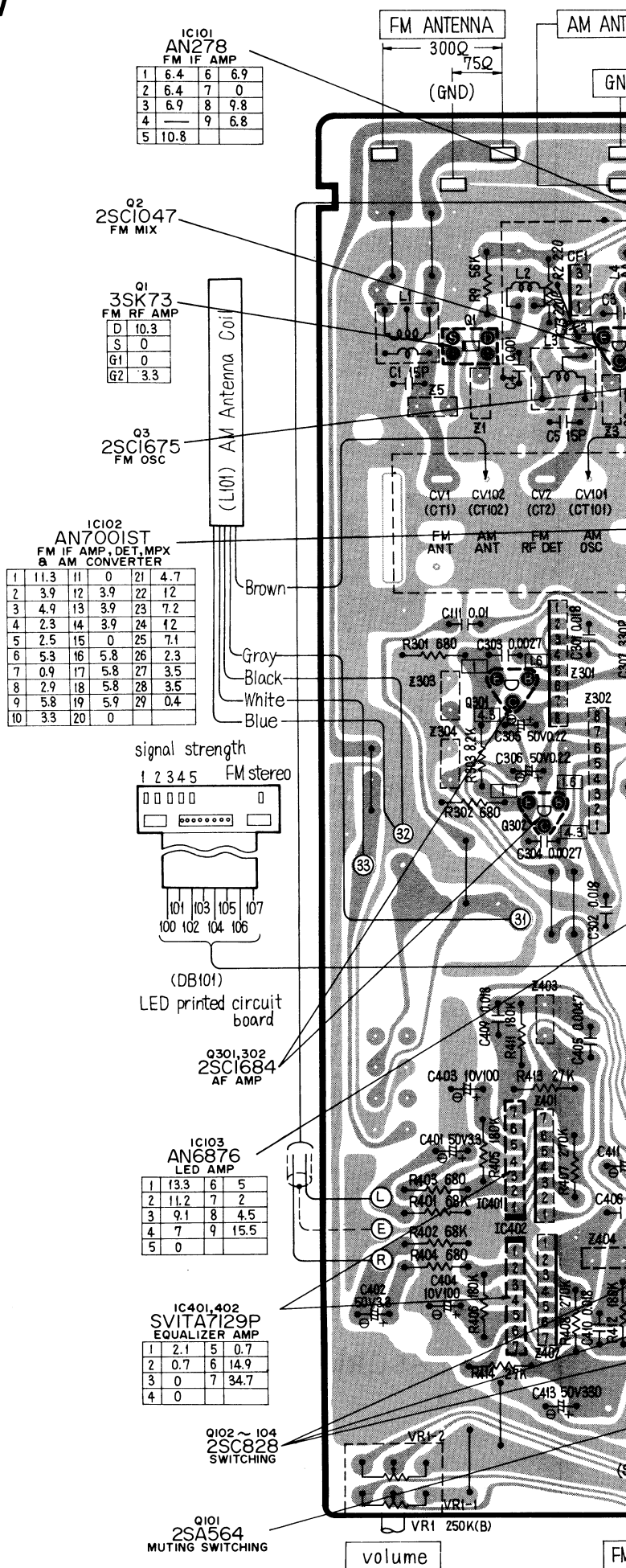
Ground (Earth) lines

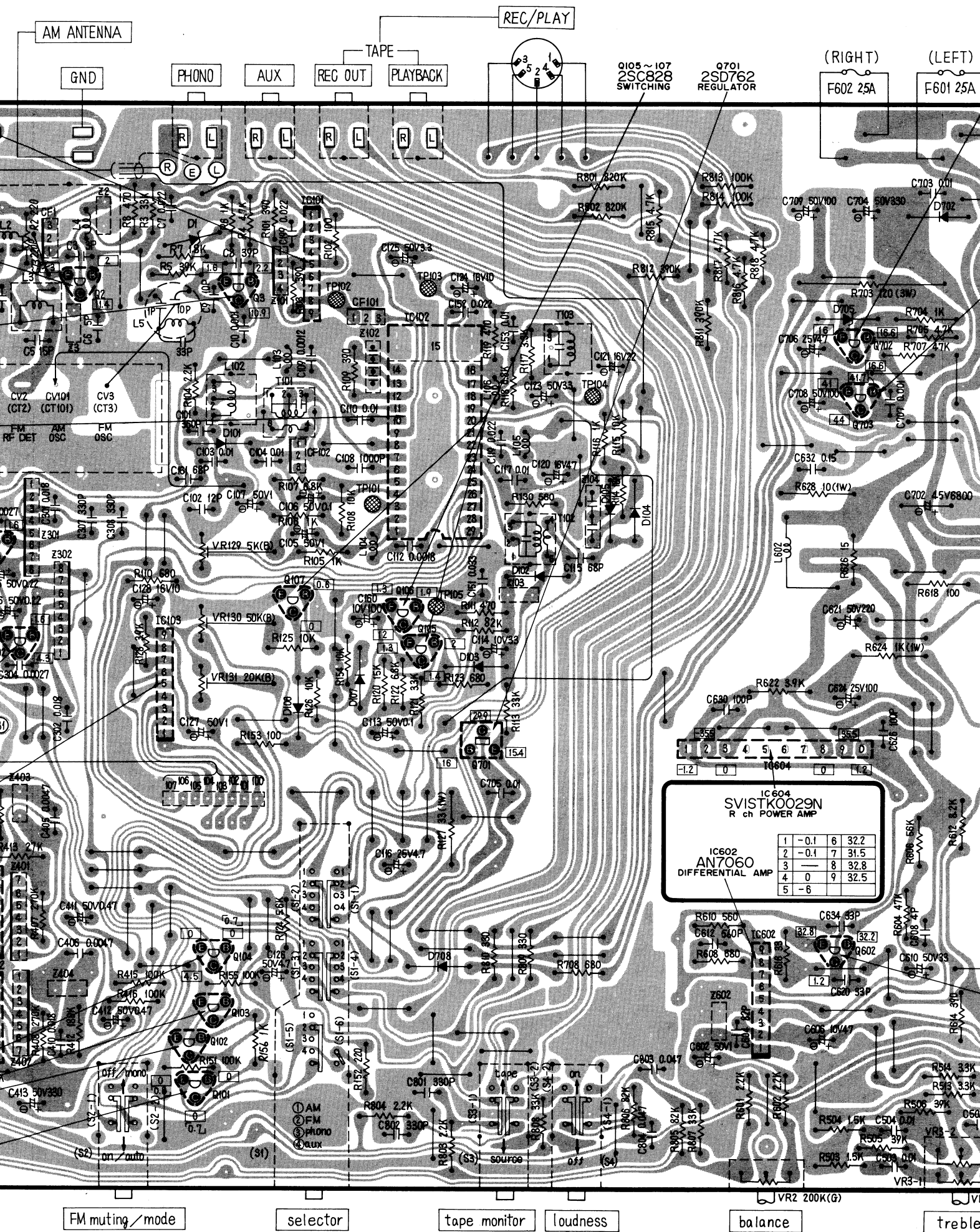
Terminal guide of transistors and IC's

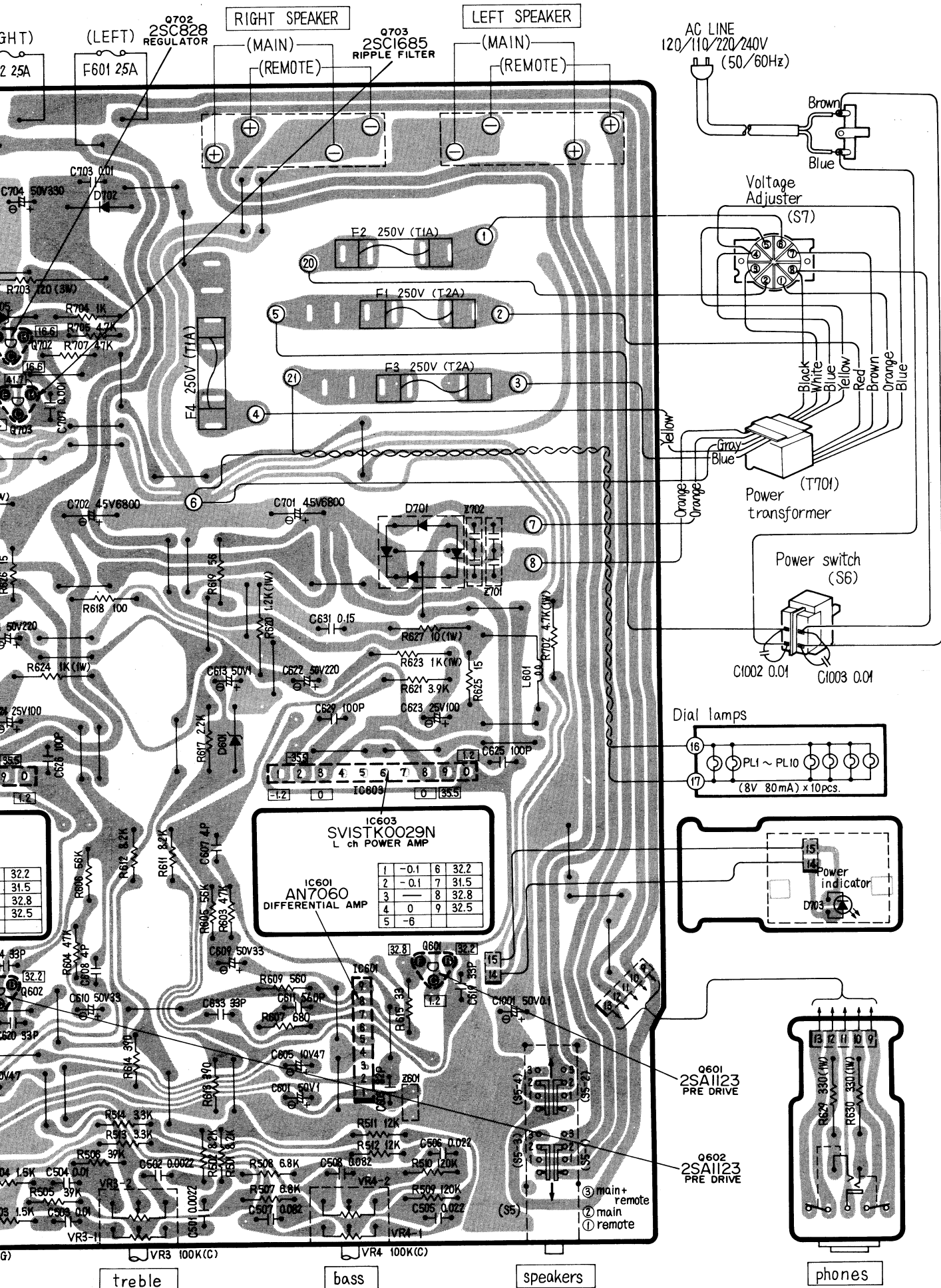


Production part and standardized part of transistors and diodes

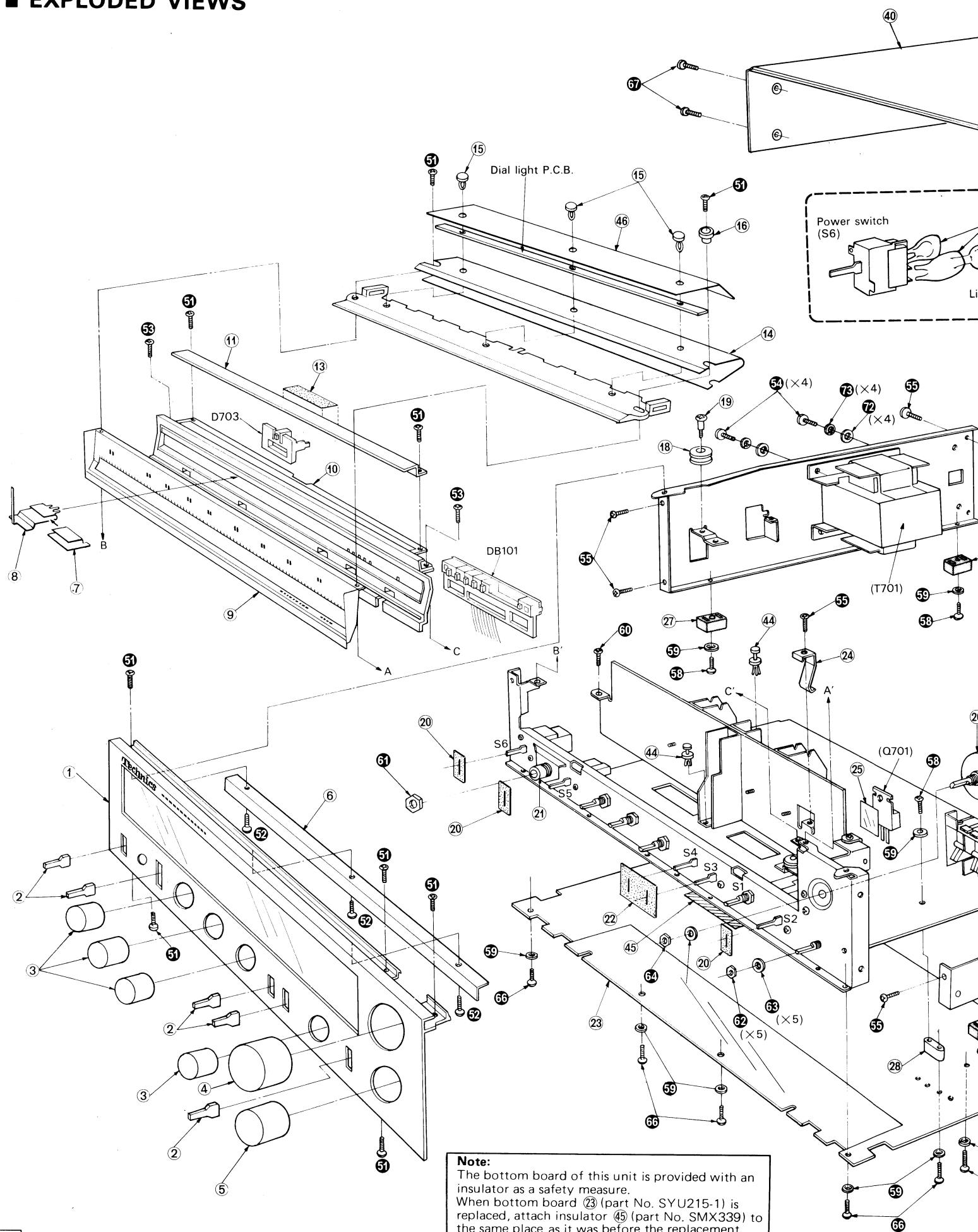
Ref. No.	Production Parts No.	Standardized Parts No.
Q101	2SA564	2SA666A1-R
Q102~107, 702	2SC828	2SC1328-T
D101, 103~106, 708	MA150	MA162
D107	SVDKB262E	RVDKB262C
D601	SVDMZ306B	RVDEQA0106S

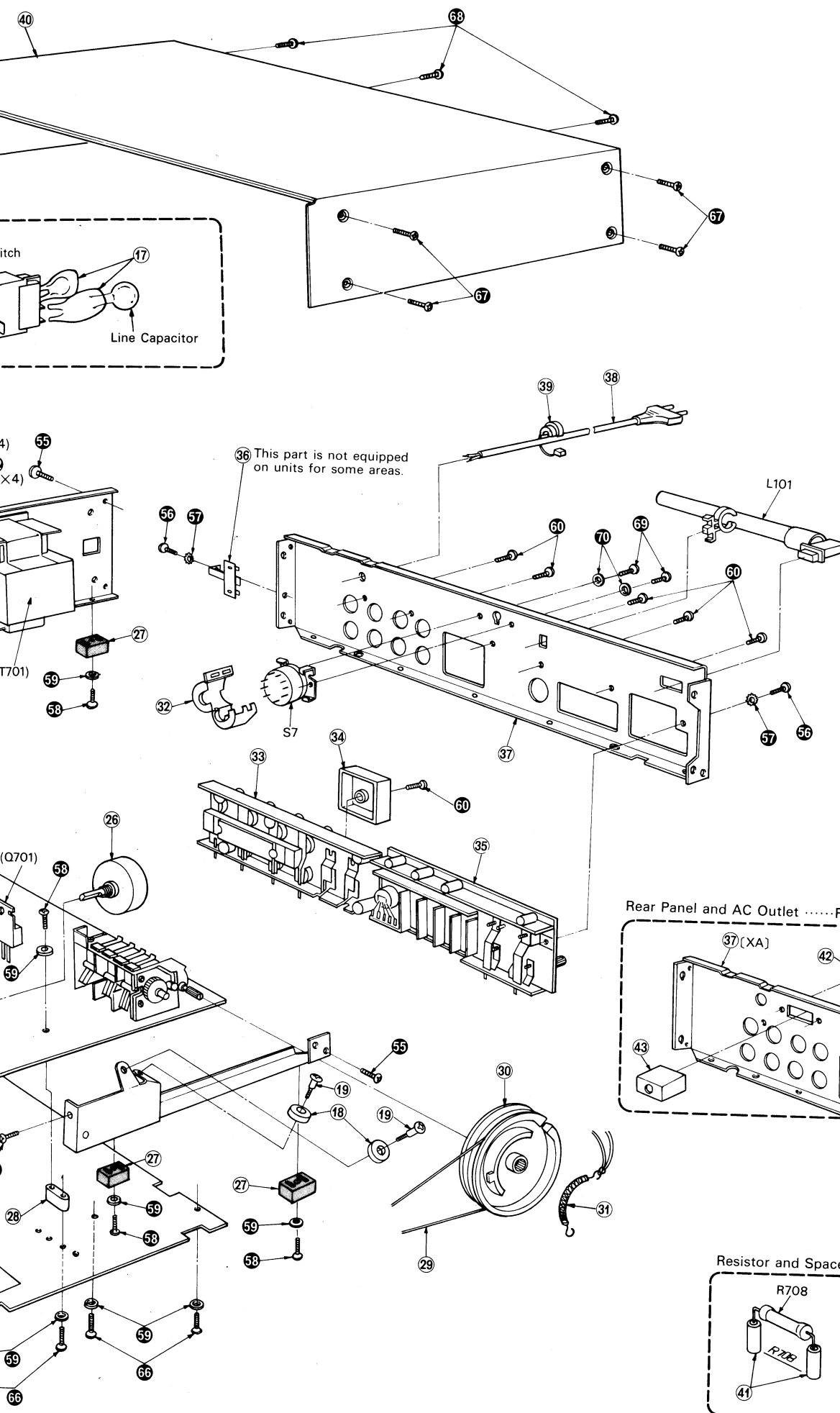






■ EXPLODED VIEWS





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31	
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33	
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37 [E]	
37 [XA]	
37 [XAL]	
37 [XGH]	
38 [XAL]	
38 [Other]	
39 [XAL]	
39 [Other]	
40	
40	
41	
42 [XA] or	
43 [XA] or	

REPLACEMENT PARTS LIST Cabinet and Chassis Parts

- NOTES:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - △ indicates that only parts specified by the manufacturer be used for safety.
 - Ⓚ-marked parts are used for black type only, while ○-marked parts are for silver type only.
 - Parts other than Ⓚ- and ○-marked are used for both black and silver types.
 - Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. : SA-202(K)

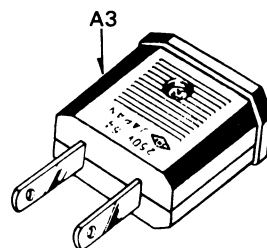
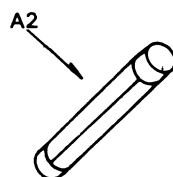
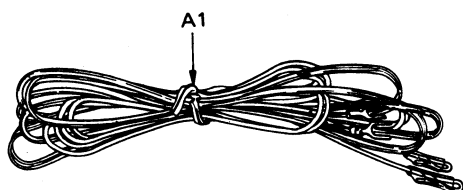
Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	○ SGWA202D	Panel, Front Ass'y
1	Ⓚ SGWA202KD	Panel, Front Ass'y (Black)
2	○ SBD29	Knob, Lever Switches
2	Ⓚ SBD29-1	Knob, Lever Switches (Black)
3	○ SBN887-1	Knob, Bass, Treble, Balance & Selector
3	Ⓚ SBN887-2	Knob, Bass, Treble, Balance & Selector (Black)
4	○ SBN881-1	Knob, Tuning
4	Ⓚ SBN881-2	Knob, Tuning (Black)
5	○ SBN885-1	Knob, Volume
5	Ⓚ SBN885-2	Knob, Volume (Black)
6	○ SDH491	Bracket, Front Panel
6	Ⓚ SDH491-1	Bracket, Front Panel (Black)
7	SDA81	Paper, Pointer Slide
8	SDP1143	Pointer
9	○ SKD3791	Scale, Dial
9	Ⓚ SKD3793	Scale, Dial (Black)
10	SXE889-1	Escutcheon, Dial Scale
11	SUV455	Cover, Dial Pointer
12	SDL23	Reflector Plate
13	SHS1013	Fiber, Dial Pointer Cover
14	SHP9293	Paper, Reflector
15	SHRA916-2	Latch, Dial
16	SHR9339	Spacer, Reflector M'tg Screw
17	SMXA65	Cover, Line Capacitor
18	SDR8-1	Pulley, Dial Cord
19	SHD3X1F	Shaft, Dial Pulley
20	SHS2425	Fiber, Lever Switch
21	XCJS6P21E-A	Jack, Headphones
22	SHS2427	Fiber, Lever Switch
23	SYU215-1	Bottom Board
24	SUS181	Spring, Transistor (Q701) Press
25	SMX181	Mica Plate, Transistor (Q701)
26	SDT8065	Shaft, Tuning (with Flywheel)
27	SKL237	Foot
28	SHE101	Mounting, Printed Circuit Board
29	SDZ051-2	Cord, Dial 200cm (78 1/2")
30	SDD47-1	Drum, Variable Capacitor
31	SDSA4121	Spring, Dial Cord
32	SUV453	Cover, Voltage Adjust Switch
33	SJF8021-1	Terminal, Speaker & Fuse
34	SUV337	Cover, Speaker Circuit Fuse
35	SJF8019-1	Terminal, Input
36	SJR205	Terminal, 2 pin
37 [E]	SGP2051-1A	Rear Panel
37 [XAL]	SGP2051-2A	Rear Panel
37 [XAL]	SGP2051-3A	Rear Panel
37 [XGH, EG]	SGPA202K	Rear Panel (SGP2051-1A with Name Plate SGT21850)
38 [XAL] only	△ QFC1207M	AC Cord, Power Source
38 [Other Areas]	△ SJA88	AC Cord, Power Source
39 [XAL] only	SHR131	Bushing, AC Cord
39 [Other Areas]	SFSR4N4	Bushing, AC Cord
40	○ SKC250H	Cabinet
40	Ⓚ SKC250B	Cabinet (Black)
41	SMX51-3	Spacer, Resistor (R708)
42 [XA] only	△ SJS9205-1	Socket, AC Outlet
43 [XA] only	SMX13	Cover, AC Outlet

Ref. No.	Part No.	Part Name & Description
44	SHR401-1	Latch, Heat Sink M'tg
45	SMX339	Insulator, Bottom Board
46	SHP9311	Reflector, Paper
NUTS, SCREWS and WASHERS		
51	XTB3+10BFN	Screw, Tapping, ⊕3x10 (Panel)
52	XTB3+6BFN	Screw, Tapping, ⊕3x6 (Bracket)
53	XTS3+10B	Screw, Tapping, ⊕3x10 (Escutcheon)
54	XSN4+12BVS	Screw, Tapping, ⊕4x10 (Transformer)
55	XTB3+8BFZ	Screw, Tapping, ⊕3x8 (Chassis)
56	XTB3+8BFZ	Screw, Tapping, ⊕3x8 (Terminal)
57	XWC3B	Washer, External Toothed Lock, φ3
58	XTV3+10BFN	Screw, Tapping, ⊕3x10 (Foot)
59	XWG3	Washer, Plain, φ3
60	XTB3+10BFZ	Screw, Tapping, ⊕3x10 (Rear Panel)
61	XNS12	Nut, M12 (Headphones Jack)
62	XNS8	Nut, M8 (Volume, Bass, Treble etc.)
63	XWV8	Washer, Plain, φ8
64	XNS11	Nut, M11 (Tuning Shaft)
65	XWV11	Washer, Plain, φ11
66	XTV3+12BFN	Screw, Tapping, ⊕3x12 (Bottom Board)
67	XTB4+8BFN	Screw, Tapping, ⊕4x8 (Cabinet)
68	XTB4+8BFZ	Screw, Tapping, ⊕4x8 (Cabinet)
69	XTB3+8BFN	Screw, Tapping, ⊕3x8 (Cabinet)
70	XTB3+8BFN	Screw, Tapping, ⊕3x8 (Cabinet)
71 [XA] only	○ XSN3+6BVS	Screw, ⊕3x6 (Voltage Adjustor)
72	XWA3BFZ	Washer, Spring, φ3
73	XTN3+8BFZ	Screw, Tapping, ⊕3x8 (AC Outlet)
74	XWG4FZ	Washer, Plain, φ4
75	XWA4BFZ	Washer, Spring, φ4
ACCESSORIES		
A1	SSA267	Cord, FM Indoor Antenna
A2	△ XBA2C25SSO	Fuse, Speaker Circuit (2.5A 250V)
A3 [XA] only	△ SJP5213-1	Plug Adaptor
PACKING PARTS		
P1	SPP649	Polyethylene Bag
P2 [XAL] only	SPS2535-1	Pad, Left Side
P2 [Other Areas]	SPS2535	Pad, Left Side
P3 [XAL] only	SPS2537-1	Pad, Right Side
P3 [Other Areas]	SPS2537	Pad, Right Side
P4 [E]	○ SPG2391	Carton Box
P4 [E]	Ⓚ SPG2393	Carton Box (Black Type Model)
P4 [XAL]	SPG2397	Carton Box
P4	SPG2395	Carton Box
P5	SQF10287	Instructions Book, Printed Matter

Areas

- * [E] and [EG] are available in European and Scandinavia.
- * [XGH] is available in Holland.
- * [XAL] is available in Australia.
- * [XA] is available in Asia, Latin America, Middle East and Africa.

ACCESSORIES



REPLACEMENT PARTS LIST Electric Parts

- NOTES: 1. Part numbers are indicated on most mechanical parts
Please use this part number for parts orders
2. Δ indicates that only parts specified by the manufacturer
be used for safety.

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUIT		
C101 C102	AN278 AN7001SW	IC, FM IF Amplifier IC, AM Converter, FM IF Amplifier, Detector & Stereo Decoder (MPX)
C103 C401, 402 C601, 602 C603, 604	AN6876 SVITA7129P AN7060F SVISTK0029N	IC, LED Amplifier IC, Equalizer Amplifier IC, Differential Amplifier IC, Power Amplifier
TRANSISTORS		
Q1 Q2 Q3 Q101 Q102~107, 702 Q301, 302	3SK73-GR 2SC1047-C 2SC1675-L1 2SA666AI-R 2SC1328-T 2SC1684-R	Transistor, FM RF Amplifier Transistor, FM Mixer Transistor, FM Local Oscillator Transistor, Switching Transistor, Switching & Regulator Transistor, AF Amplifier (Use in ranks R, S or T)
Q601, 602	2SA1123-R	Transistor, Pre Drive (Use in ranks R, S or T)
Q701	2SD762-O	Transistor, Regulator (Use in ranks O or P)
Q703	2SC1685-T	Transistor, Ripple Filter (Use in ranks S or T)
DIODES		
D1 D101, 103~106 708 D102 D107 D601 D701 D702 D703 D705 DB101	SVDMZ303B MA162A 2-OA99 RVDKB262C RVDEQA0106S SVDS4VB10 SVDSR1K2 LN01229P SVDRD16EB LN06126P	Diode, 3V Zener Diode, AGC & Switching Diode, AM Detector Diode, Muting & Meter detector Diode, 6V, Zener Rectifier Rectifier Light Emitting Diode, Power Diode, 16V Zener Light Emitting Diode, Ass'y Signal Strength & Stereo Indicator
COILS and TRANSFORMERS		
L1 L2 L3 L4 L5 L101 L102 L103 L104 L105 L106 L601, 602	SLA4N15 RLQY25S2 SLD4P13 RLQY15G5 SLO4P63-P SLF2D61 SLO2C17 SLQX101-3M SLQX393-1Z SLQX471-M SLQX180-2 SLQY15G-3P	Coil, FM Antenna Coil, Choke Coil, FM RF Detector Coil, Choke Coil, Oscillator Coil, AM Antenna Coil, MW Oscillator Coil, Choke Coil, Choke Coil, Choke Coil, Choke Coil, Power Amplifier Output
T101 T102 T103 T701	SLI2C129R-M SLI2C413R SLI4C509-P SLT5N339	Transformer, AM IF Transformer, AM IF Transformer, FM Discriminator Transformer, Power Source
COMPONENT COMBINATIONS		
1 2 3 5 101 102 103 104, 701, 702 301, 302 303, 304 401, 402 403, 404 601, 602	EXRP102Z223C EXRP181K682C EXRP103P102C EXRP220K104C EXF3YL01C EXF3SL04C EXRP103P472C EXRFS203ZS EXBH85085K EXRP182K104C EXA6SD01C EXRP331K153C EXRP820K104C	Component Combination, 22k Ω & 0.001 μ F Component Combination, 6.8k Ω & 180pF Component Combination, 1k Ω & 0.01 μ F Component Combination, 100k Ω & 22pF Component Combination, 0.01 μ F (x3) Component Combination, 0.01 μ F (x3) Component Combination, 4.7k Ω & 0.01 μ F Component Combination, 0.01 μ F (x2) Component Combination, 10k Ω (x2) & 4.7k Ω (x3) Component Combination, 100k Ω & 0.0018 μ F Component Combination, Equalizer Component Combination, 15k Ω & 330pF Component Combination, 100k Ω & 82pF

Ref. No.	Part No.	Part Name & Description
CERAMIC FILTERS		
CF1, 101	SVFE107MS8-A SVFE107MS8-B SVFE107MS8-C SVFE107MS8-D SVFE107MS8-E	Ceramic Filter, Red, 10.7MHz Ceramic Filter, Blue, 10.67MHz Ceramic Filter, Orange, 10.73MHz Ceramic Filter, Black, 10.64MHz Ceramic Filter, White, 10.76MHz (Use pair ranks as same as CF1 and CF101)
CF102	SVFSFU450B	Ceramic Filter, AM 450kHz
FUSES		
F1 F2 F3 F4 F601, 602	Δ XBA2C20TRO Δ XBA2C10TRO Δ XBA2C20TRO Δ XBA2C10TRO Δ XBA2C25SSO	Fuse, T2A (250V) P.T. Primary Fuse, T1A (250V) P.T. Primary Fuse, T2A (250V) Fuse, T1A (250V) Fuse, 2.5A (250V) Speaker Circuit
LAMPS		
PL1 ~ 10	Δ XAMR68S8	Lamp, Dial (8V 80mA)
SWITCHES		
S1 S2 S3 S4 S5 S6 S7	SSR147 SSL149 SSL147 SSL149 SSL163 Δ ESL21210S Δ ESE37200	Switch, Program Selector Switch, FM Muting/Mode Switch, Tape Monitor Switch, Loudness Switch, Speakers Selector Switch, Power Source Switch, Voltage Adjuster
VARIABLE RESISTORS		
VR129 VR130 VR131 VR1 VR2 VR3, 4	EVTS3MA00B53 EVLS3AA00B54 EVLS3AA00B24 EWKK6A092BF5 EVHFDA505G25 EWKGSA091C15	PLL Voltage Adjustment, 5k Ω (B) FM Muting Level Adj., 50k Ω (B) Meter Sensitivity Adj., 20k Ω (B) Volume Control, 250k Ω (B) Balance Control, 200k Ω (G) Treble & Bass Control, 100k Ω (C)
VARIABLE CAPACITOR		
CV1, 2, 3, 101, 102 [CT1, 2, 3, 101, 102]	ECV5MD34X71G	Tuning Gang, FM & AM (with Trimmer)

● Resistors and Capacitors

Ref. No.	Part No.	Part Name & Description
RESISTORS		
R2 R3 R4 R5 R6 R7 R8 R9 R101 R102	ERD25FJ221 ERD25TJ333 ERD25FJ472 ERD25TJ393 ERD25FJ102 ERD25FJ182 ERD25FJ471 ERD25TJ563 ERD25FJ391 ERD25FJ101	Carbon, 220 Ω , 1/4W, $\pm$ 5% Carbon, 33k Ω , 1/4W, $\pm$ 5% Carbon, 4.7k Ω , 1/4W, $\pm$ 5% Carbon, 39k Ω , 1/4W, $\pm$ 5% Carbon, 1k Ω , 1/4W, $\pm$ 5% Carbon, 1.8k Ω , 1/4W, $\pm$ 5% Carbon, 470 Ω , 1/4W, $\pm$ 5% Carbon, 56k Ω , 1/4W, $\pm$ 5% Carbon, 390 Ω , 1/4W, $\pm$ 5% Carbon, 100 Ω , 1/4W, $\pm$ 5%

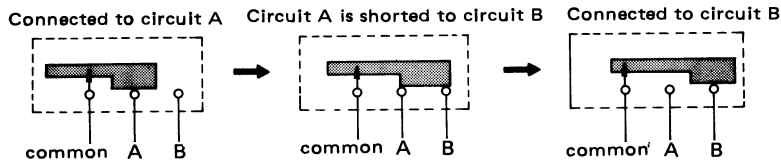
Ref. No.
R103 R104 R105, 106 R107 R108 R109 R110 R111 R112 R113 R114 R115 R116 R117 R118 R119 R120 R121 R122 R123 R124 R125, 126 R127 R128 R130 R151 R152 R153 R154 R155 R156 R301, 302 R303 R401, 402 R403, 404 R405, 406 R407, 408 R411, 412 R413, 414 R415, 516 R501, 502 R503, 504 R505, 506 R507, 508 R509, 510 R511, 512 R513, 514 R601, 602 R603, 604 R605, 606 R607, 608 R609, 610 R611, 612 R613, 614 R615, 616 R617 R618 R619 R620 R621, 622 R623, 624 R625, 626 R627, 628 R629, 630 R702 R703 R704 R705 R707 R708 R801, 802 R803, 804 R805, 806 R807, 808 R809, 810 R811, 812 R813, 814 R815, 816 R817, 818

Ref. No.	Part No.	Part Name & Description
R103	ERD25FJ391	Carbon, 390Ω, 1/4W, ± 5%
R104	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R105, 106	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R107	ERD25FJ682	Carbon, 6.8kΩ, 1/4W, ± 5%
R108	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R109	ERD25FJ391	Carbon, 390Ω, 1/4W, ± 5%
R110	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R111	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R112	ERD25TJ823	Carbon, 82kΩ, 1/4W, ± 5%
R113	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R114	ERD25TJ183	Carbon, 18kΩ, 1/4W, ± 5%
R115	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R116	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R117	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R118	ERD25FJ682	Carbon, 6.8kΩ, 1/4W, ± 5%
R119	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R120	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%
R121	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R122	ERD25FJ682	Carbon, 6.8kΩ, 1/4W, ± 5%
R123	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R124	ERD25FJ562	Carbon, 5.6kΩ, 1/4W, ± 5%
R125, 126	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R127	ERG1ANJ330	Metal Oxide, 33Ω, 1W, ± 5%
R128	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R130	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R151	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R152	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R153	ERD25FJ101	Carbon, 100Ω, 1/4W, ± 5%
R154	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R155	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R156	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R301, 302	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R303	ERD25TJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R401, 402	ERO25CKF6802	Metal Film, 68kΩ, 1/4W, ± 1%
R403, 404	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R405, 406	ERO25CKF1803	Metal Film, 180kΩ, 1/4W, ± 1%
R407, 408	ERO25CKF2703	Metal Film, 270kΩ, 1/4W, ± 1%
R411, 412	ERD25TJ184	Carbon, 180kΩ, 1/4W, ± 5%
R413, 414	ERD25TJ273	Carbon, 27kΩ, 1/4W, ± 5%
R415, 516	ERO25CKF1003	Metal Film, 100kΩ, 1/4W, ± 1%
R501, 502	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R503, 504	ERD25FJ152	Carbon, 1.5kΩ, 1/4W, ± 5%
R505, 506	ERD25TJ393	Carbon, 39kΩ, 1/4W, ± 5%
R507, 508	ERD25FJ682	Carbon, 6.8kΩ, 1/4W, ± 5%
R509, 510	ERD25TJ124	Carbon, 120kΩ, 1/4W, ± 5%
R511, 512	ERD25TJ123	Carbon, 12kΩ, 1/4W, ± 5%
R513, 514	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R601, 602	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R603, 604	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R605, 606	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%
R607, 608	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R609, 610	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R611, 612	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R613, 614	ERD25FJ391	Carbon, 390Ω, 1/4W, ± 5%
R615, 616	ERD25FJ330	Carbon, 33Ω, 1/4W, ± 5%
R617	ERD50FJ222	Carbon, 2.2kΩ, 1/2W, ± 5%
R618	ERD50FJ101	Carbon, 100Ω, 1/2W, ± 5%
R619	ERD50FJ560	Carbon, 56Ω, 1/2W, ± 5%
R620	ERG1ANJ122	Metal Oxide, 1.2kΩ, 1W, ± 5%
R621, 622	ERD50FJ392	Carbon, 3.9kΩ, 1/2W, ± 5%
R623, 624	ERG1ANJ102	Metal Oxide, 1kΩ, 1W, ± 5%
R625, 626	ERD25FJ150	Carbon, 15Ω, 1/4W, ± 5%
R627, 628	ERG1ANJ100	Metal Oxide, 10Ω, 1W, ± 5%
R629, 630	ERG1ANJ331	Metal Oxide, 330Ω, 1W, ± 5%
R702	ERG1ANJ472	Metal Oxide, 4.7kΩ, 1W, ± 5%
R703	ERG3ANJ121	Metal Oxide, 120Ω, 3W, ± 5%
R704	ERD50FJ102	Carbon, 1kΩ, 1/2W, ± 5%
R705	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R707	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R708	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R801, 802	ERO50CKF8203	Metal Film, 820kΩ, 1/2W, ± 1%
R803, 804	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R805, 806	ERD25TJ823	Carbon, 82kΩ, 1/4W, ± 5%
R807, 808	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R809, 810	ERD25FJ331	Carbon, 330Ω, 1/4W, ± 5%
R811, 812	ERD25TJ394	Carbon, 390kΩ, 1/4W, ± 5%
R813, 814	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R815, 816	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R817, 818	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%

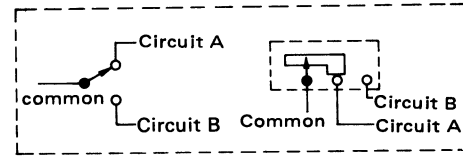
Ref. No.	Part No.	Part Name & Description
CAPACITORS		
C1	ECCD1H150KC	Ceramic, 15pF, 50V, ± 10%
C3	ECCD1H030CC	Ceramic, 3pF, 50V, ± 0.25pF
C4	ECKD1H102MDA	Ceramic, 0.001μF, 50V, ± 20%
C5	ECCD1H150KC	Ceramic, 15pF, 50V, ± 10%
C6	ECCD1H050CC	Ceramic, 5pF, 50V, ± 0.25pF
C7	ECQM1H223KZ	Polyester, 0.022μF, 50V, ± 10%
C8	ECCD1H390KC	Ceramic, 39pF, 50V, ± 10%
C9	ECCD1H100KC	Ceramic, 10pF, 50V, ± 10%
C10	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 88%
C15	ECCD1H050CC	Ceramic, 5pF, 50V, ± 0.25pF
C71, 72 [XAL] only	ECKDHS101MB	Ceramic, 100pF, 400VAC, ± 20%
C73	ECKD1H221KB	Ceramic, 220pF, 50V, ± 10%
C101	ECQP1361JZ	Polypropylene, 360pF, 100V, ± 5%
C102	ECCD1H120KC	Ceramic, 12pF, 50V, ± 10%
C103, 104	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 88%
C105	ECEA50Z1	Electrolytic, 1μF, 50V
C106	ECEA50ZR1	Electrolytic, 0.1μF, 50V
C107	ECEA50Z1	Electrolytic, 1μF, 50V
C108	ECQS1102JZ	Polystyrene, 1000pF, 125V, ± 5%
C109	ECQM1H122JZ	Polyester, 0.0012μF, 50V, ± 5%
C110, 111	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 88%
C112	ECQM1H182JZ	Polyester, 0.0018μF, 50V, ± 5%
C113	ECEA50ZR1	Electrolytic, 0.1μF, 50V
C114	ECEA1CS330	Electrolytic, 33μF, 16V
C115	ECCD1H680K	Ceramic, 68pF, 50V, ± 10%
C116	ECEA25Z4R7	Electrolytic, 4.7μF, 25V
C117	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 88%
C118	ECKD1H331KB	Ceramic, 330pF, 50V, ± 10%
C119	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 88%
C120	ECEA1ES470	Electrolytic, 47μF, 25V
C121	ECEA1ES220	Electrolytic, 22μF, 25V
C123	ECEA50ZR3	Electrolytic, 3.3μF, 50V
C124	ECEA1HS100	Electrolytic, 10μF, 50V
C125	ECEA50ZR3	Electrolytic, 3.3μF, 50V
C126	ECEA1JS4R7	Electrolytic, 4.7μF, 63V
C127, 128	ECEA1HS100	Electrolytic, 10μF, 50V
C129	ECCD1H070DC	Ceramic, 7pF, 50V, ± 0.5pF
C151	ECKD1H333ZF	Ceramic, 0.033μF, 50V, ± 88%
C152	ECQM1H223KZ	Polyester, 0.022μF, 50V, ± 10%
C153	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 88%
C160	ECEA1AS470	Electrolytic, 47μF, 10V
C161	ECCD1H680K	Ceramic, 68pF, 50V, ± 10%
C171 [XAL] only	ECKDHS102MD	Ceramic, 0.001μF, 400VAC, ± 20%
C199	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 88%
C301, 302	ECQM1H183JZ	Polyester, 0.018μF, 50V, ± 5%
C303, 304	ECQM1H272KZ	Polyester, 0.0027μF, 50V, ± 10%
C305, 306	ECEA50ZR22	Electrolytic, 0.22μF, 50V
C307, 308	ECKD1H331KB	Ceramic, 330pF, 50V, ± 10%
C401, 402	ECEA50M3R3R	Electrolytic, 3.3μF, 50V
C403, 404	ECEA1AS101	Electrolytic, 10μF, 10V
C405, 406	ECQM1H472JZ	Polyester, 0.0047μF, 50V, ± 5%
C409, 410	ECQM1H183JZ	Polyester, 0.018μF, 50V, ± 5%
C411, 412	ECEA50MR47R	Electrolytic, 0.47μF, 50V
C413	ECEA1HS331	Electrolytic, 330μF, 50V
C501, 502	ECQM1H222KZ	Polyester, 0.0022μF, 50V, ± 10%
C503, 504	ECQM1H103KZ	Polyester, 0.01μF, 50V, ± 10%
C505, 506	ECQM1H223KZ	Polyester, 0.022μF, 50V, ± 10%
C507, 508	ECQM1H823KZ	Ceramic, 0.082μF, 50V, ± 10%
C601, 602	ECEA50M1R	Electrolytic, 1μF, 50V
C603, 604	ECCD1H820K	Ceramic, 82pF, 50V, ± 10%
C605, 606	ECEA1AS470	Electrolytic, 47μF, 10V
C607, 608	ECCD1H040CC	Ceramic, 4pF, 50V, ± 0.25pF
C609, 610	ECEA1JS330	Electrolytic, 33μF, 63V
C611, 612	ECKD1H561KB	Ceramic, 560pF, 50V, ± 10%
C613	ECEA50Z1	Electrolytic, 1μF, 50V
C619, 620	ECCD2H330K	Ceramic, 33pF, 500V, ± 10%
C621, 622	ECEA1VS221	Electrolytic, 220μF, 35V
C623, 624	ECEA1ES101	Electrolytic, 100μF, 25V
C625, 626	ECCD2H101K	Ceramic, 100pF, 500V, ± 10%
C629, 630	ECCD2H101K	Ceramic, 100pF, 500V, ± 10%
C631, 632	ECQM1H154KZ	Polyester, 0.15μF, 50V, ± 10%
C633, 634	ECCD2H330K	Ceramic, 33pF, 500V, ± 10%
C701, 702	ECETS45V682U	Electrolytic, 6800μF, 45V
C703	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 88%
C704	ECEA1HS331	Electrolytic, 330μF, 50V
C705	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 88%
C706	ECEA1ES470	Electrolytic, 47μF, 25V
C707	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 88%
C708, 709	ECEA1HS101	Electrolytic, 100μF, 50V
C801, 802	ECKD1H331KB	Ceramic, 330pF, 50V, ± 10%
C803, 804	ECQM1H473KZ	Polyester, 0.047μF, 50V, ± 10%
C1001	ECEA50ZR1	Electrolytic, 0.1μF, 50V
C1002, 1003	ECKDKC103PF	Ceramic, 0.01μF, 400VAC, ± 10%

● Shorting Switch

This unit uses a shorting switch. As illustrated below, the circuit is shorted to the next circuit without being opened. In the circuit diagram, the shaded area represents the common terminal.



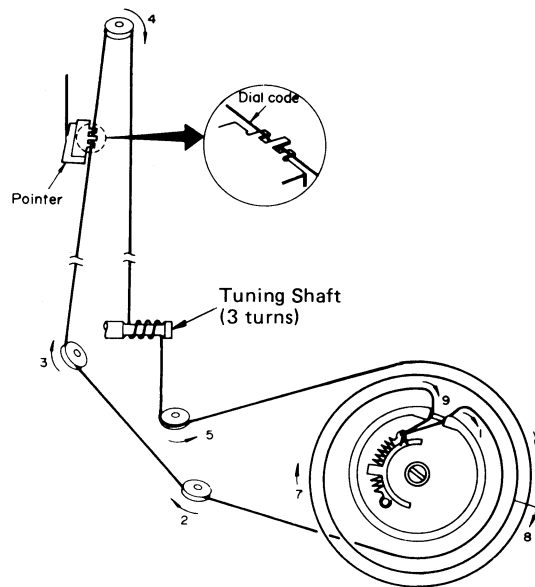
An example of circuit diagram



■ DIAL CORD INSTALLATION GUIDE

● For threading a fresh cord, proceed as follows.

1. Prepare a fresh cord more than 200cm (78-3/4") 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 9.
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.



opened.

it B
it A

— MEMO —

101
2
3BM
0

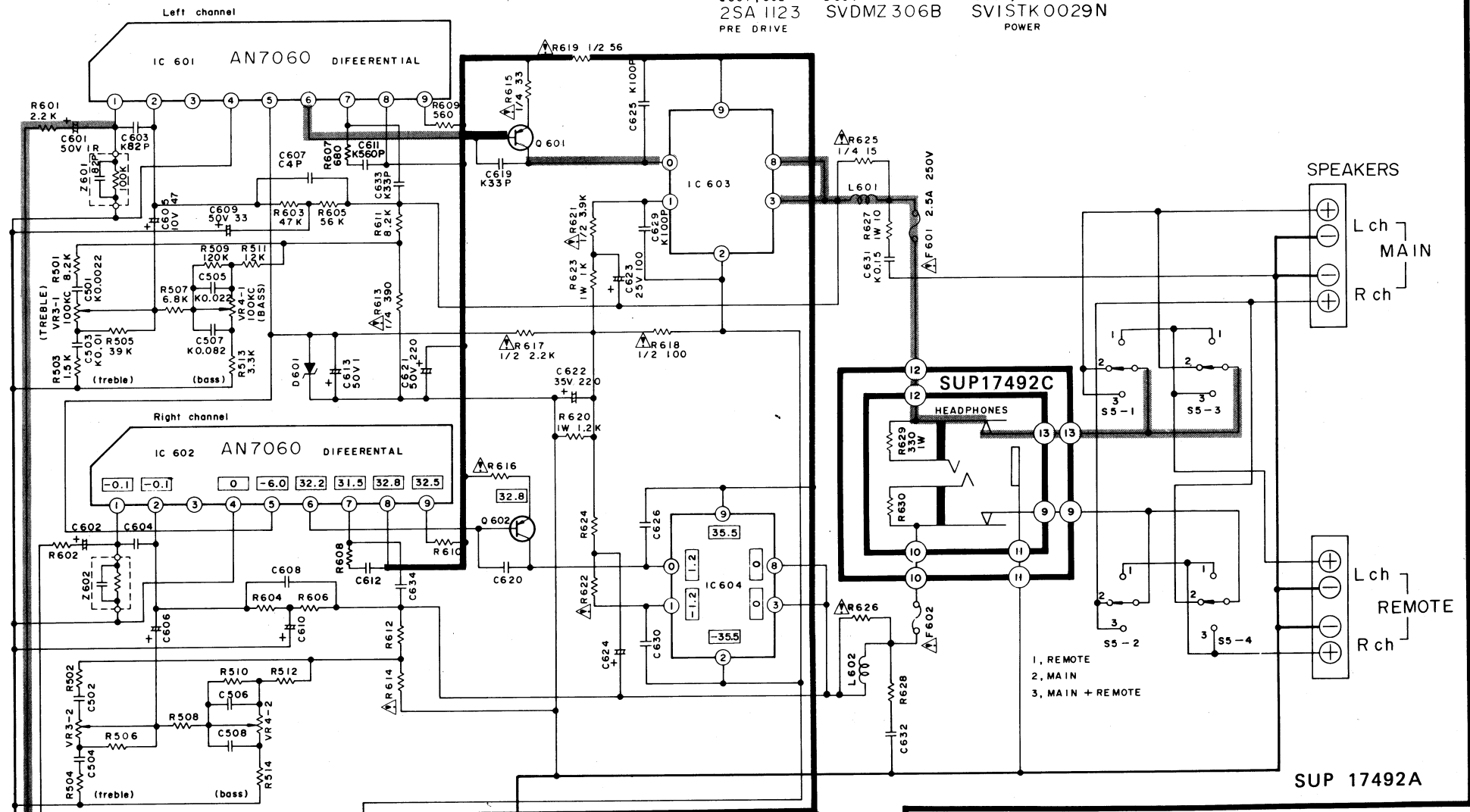
06
0
B262E

64
6
07
28
6

127
33
W

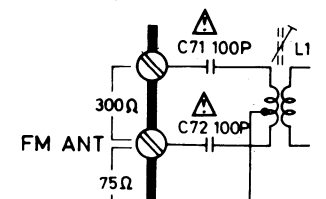
Q 701 2SD 762 REGULATOR
Q 702 2SC 828 REGULATOR
Q 703 2SC 1685 RIPPLE FILTER
D 702 SVDSR 1K2
D 705 SVDMZ 316B
D 708 MA 150

Q 601, 602 2SA 1123 PRE DRIVE
D 601 SVDMZ 306B
IC 603, 604 SVISTK 0029N POWER

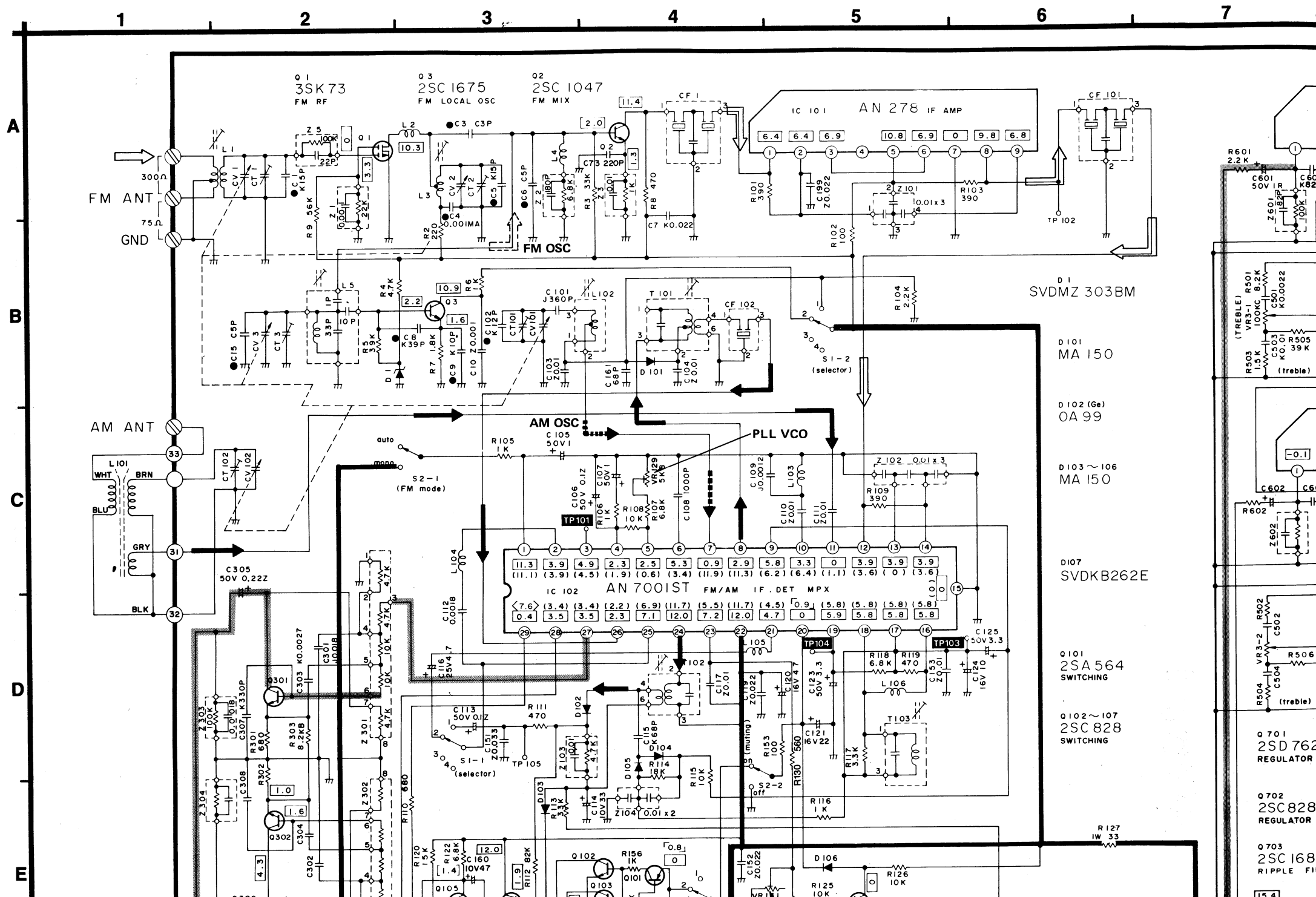


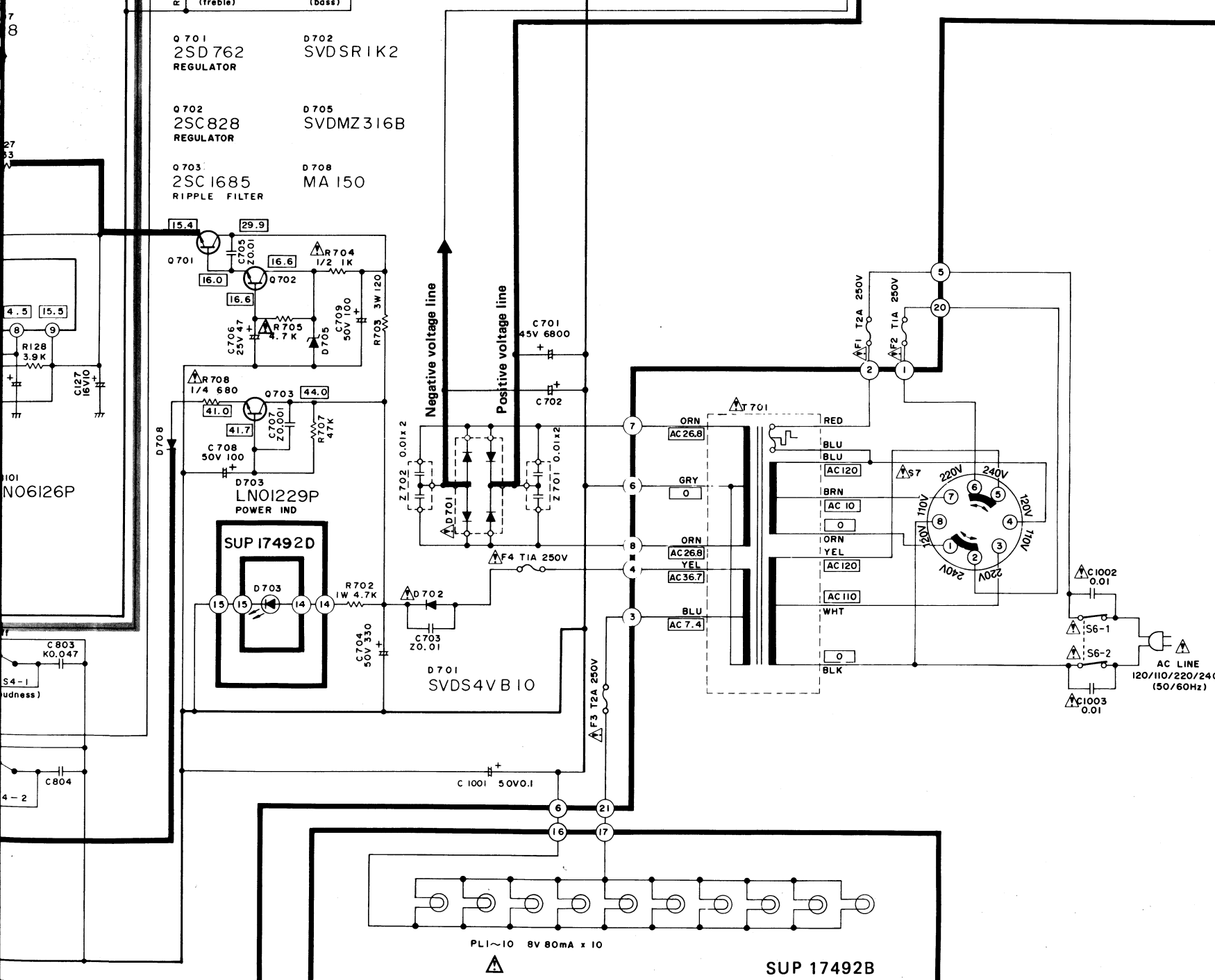
• Antenna circuit

(XAL) Available in Australia



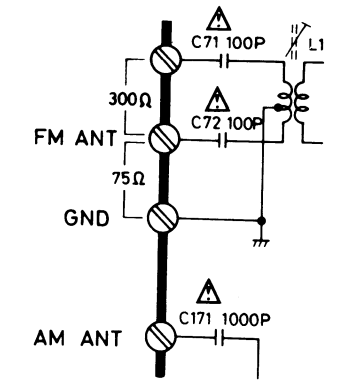
* This schematic diagram may be modified at any time with the development of new technology.





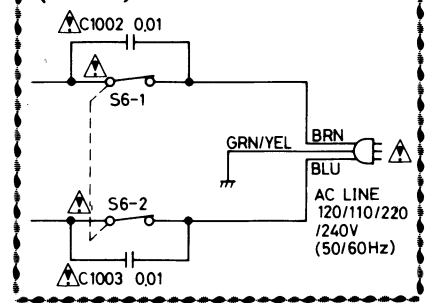
- **Antenna circuit**

(XAL) Available in Australia

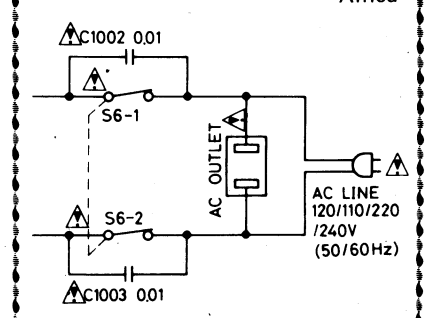


● Power source circuit

(XAL) Available in Australia



(XA) Available in Asia, Latin America, Middle East and Africa

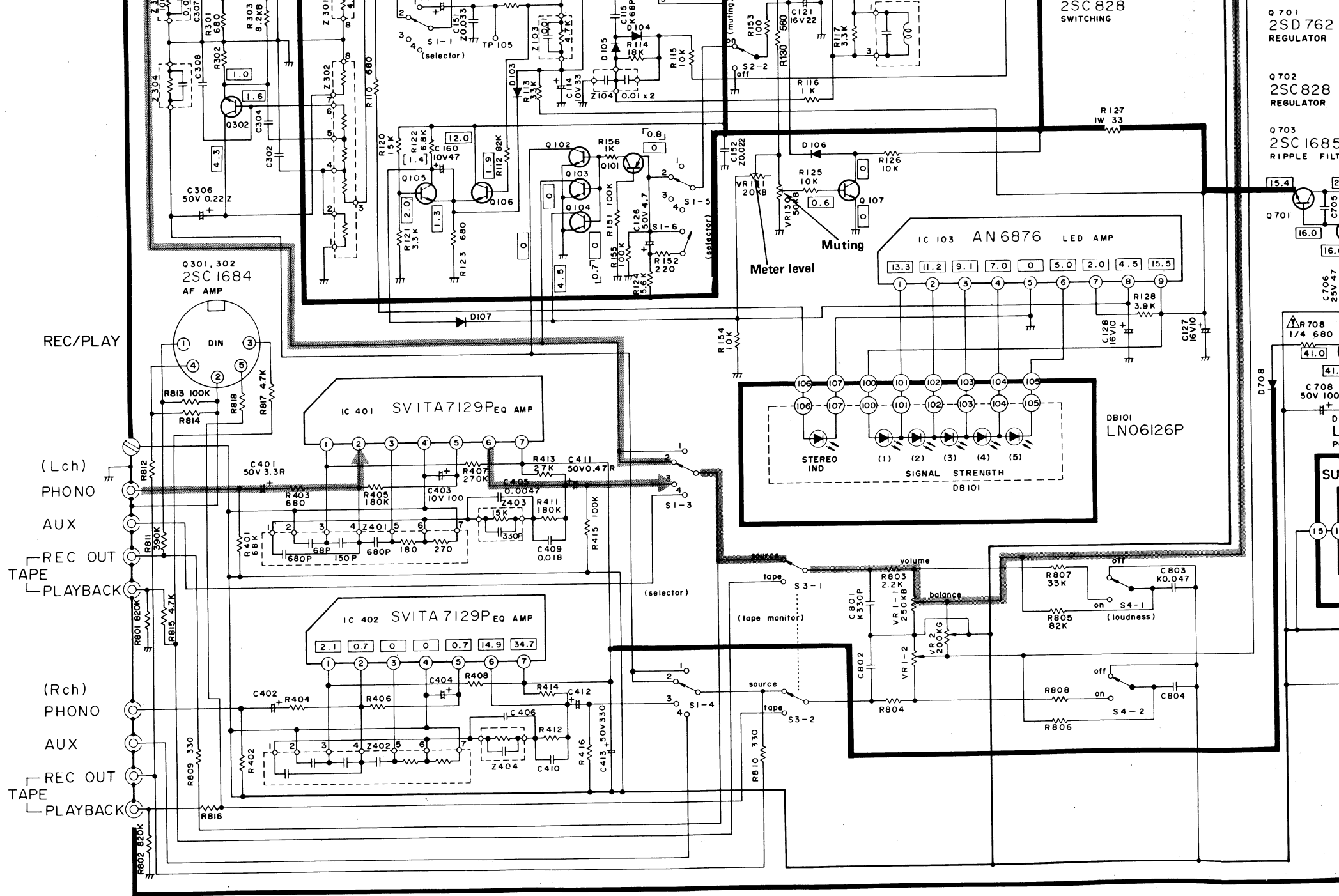


standard values for the unit measured by the DC impedance) with the chassis taken as standard. The errors in the voltage values, depending on the DC circuit tester.

- Figures in  stand for DC voltage in FM (60dB signal reception) mode.
- Figures in  stand for DC voltage in AM mode.
- Figures in  stand for DC voltage in FM stereo signal reception mode.
- Figures in  stand for DC voltage in FM (no signal) muting to on mode.

9. Signal lines
 FM  AM  Audio Frequency
10.  Positive voltage lines
11.  indicates that only parts specified by the manufacturer be used for safety.

E
F
G
H



Notes:

- S1-1~S1-6:** Selector switch in "FM" position.
①AM ↔ ②FM ↔ ③phono ↔ ④aux
- S2-1, S2-2:** FM muting/mode switch in "on/FM auto" position.
- S3-1, S3-2:** Tape monitor switch in "source" position.
- S4-1, S4-2:** Loudness switch in "off" position.
- S5-1~S5-4:** Speakers switch in "main" position.
①remote ↔ ②main ↔ ③main + remote
- S6-1, S6-2:** Power source switch in "on" position.
- S7:** Voltage adjust switch in "240V" position.
120V ↔ 110V ↔ 220V ↔ 240V
- Indicated voltage are the standard values for the unit measured electronic circuit tester (high-impedance) with the chassis taken. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.