

Service Manual

FM/AM Stereo Receiver

SA-303

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

SA-303(K)

[E], [EG], [XGH]



SA-303



SA-303(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 Scandinavia and European.
- * [XGH] is available in Holland.
- * [XA] is available in Asia, Latin America, Middle East and Africa.
- * [XAL] is available in Australia.

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TECHNICAL SPECIFICATIONS

[DIN 45 500]

AMPLIFIER SECTION

20 Hz ~ 20 kHz continuous power output both channels driven	2 x 42W (4Ω), 2 x 40W (8Ω)
40 Hz ~ 16 kHz continuous power output both channels driven	2 x 42W (4Ω), 2 x 40W (8Ω)
1 kHz continuous power output both channels driven	2 x 50W (4Ω), 2 x 45W (8Ω)
Total harmonic distortion	
rated power at 20 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), 0.04% (8Ω)
half power at 20 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%

Specifications are subject to change without notice for further improvement.

Power bandwidth	both channels driven, -3 dB	10 Hz ~ 35 kHz (4Ω)
Damping factor		10(4Ω), 20(8Ω)
Input sensitivity and impedance	PHONO	2.5 mV/47kΩ
	AUX	150 mV/27kΩ
	TAPE 2	150 mV/27kΩ
	TAPE 1 REC/PLAY	180 mV/27kΩ
PHONO maximum input voltage (1 kHz, RMS)		150 mV
S/N		
rated power (4Ω)	PHONO	70 dB (80 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	62 dB
	AUX	62 dB
Frequency response	PHONO	RIAA standard curve
	AUX	±0.8 dB (30 Hz ~ 15 kHz)
		7 Hz ~ 45 kHz (-1 dB)
		±0.2 dB (20 Hz ~ 20 kHz)

Technics

Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

Tone controls	BASS TREBLE	50 Hz, +10 dB ~ -10 dB 20 kHz, +10 dB ~ -10 dB	Capture ratio	1.2 dB
High-cut filter		7 kHz, -6 dB/oct.	Image rejection at 98 MHz	60 dB
Loudness control (volume at -30 dB)		50 Hz, +9 dB	IF rejection at 98 MHz	75 dB
Output voltage and impedance	TAPE 1, 2 REC OUT TAPE 1 REC/PLAY	150 mV 30 mV/82 kΩ	Spurious response rejection at 98 MHz	82 dB
Channel balance, AUX 250 Hz ~ 6,300 Hz		±1.0 dB	AM suppression	55 dB
Channel separation, AUX 1 kHz		55 dB	Stereo separation	45 dB
Headphones output level and impedance		420 mV/330Ω	Carrier leak	35 dB
Load impedance	MAIN or REMOTE MAIN and REMOTE	4Ω ~ 16Ω 8Ω ~ 16Ω	Channel balance (250 Hz ~ 6,300 Hz)	±1.5 dB
			Limiting point	1.2μV
			Power bandwidth	180 kHz
			Antenna terminals	1000 kHz
				300Ω (balanced)
				75Ω (unbalanced)
FM TUNER SECTION				
Frequency range		88 ~ 108 MHz	Antenna terminals	300Ω (balanced)
Sensitivity	S/N 30 dB S/N 26 dB S/N 20 dB	1.9μV (300Ω), 1.3μV (75Ω) 1.7μV (300Ω), 1.2μV (75Ω) 1.5μV (300Ω), 0.9μV (75Ω)	Antenna terminals	75Ω (unbalanced)
IHF usable sensitivity		1.9μV (IHF '58)	AM TUNER SECTION	
IHF 46 dB stereo quieting sensitivity		22μV/75Ω	Frequency range	525 ~ 1605 kHz
Total harmonic distortion	MONO STEREO	0.15% 0.3%	Sensitivity (S/N 20 dB)	30 μV, 300 μV/m
S/N	MONO STEREO	60 dB (75 dB, IHF) 58 dB (70 dB, IHF)	Selectivity	30 dB
Frequency response		20 Hz ~ 15 kHz, +1 dB ~ -2 dB 20 Hz ~ 14 kHz, +1.5 dB ~ -1.5 dB	Image rejection at 1,000 kHz	50 dB
Alternate channel selectivity		70 dB	IF rejection at 1,000 kHz	40 dB
			GENERAL	
			Power consumption	430 W
			Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
			Dimensions (W x H x D)	430 x 142 x 291 mm
				(16-15/16" x 5-19/32" x 11-15/16")
			Weight	8.0 kg, (17.6 lb.)

TECHNISCHE DATEN [DIN 45 500]

Spezifikationen können infolge von verbesserungen ohne Ankündigung geändert werden.

VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	2 x 42W (4Ω), 2 x 40W (8Ω)
beide Kanäle angesteuert	
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	2 x 42W (4Ω), 2 x 40W (8Ω)
beide Kanäle angesteuert	
Dauerton-Ausgangsleistung bei 1 kHz	2 x 50W (4Ω), 2 x 45W (8Ω)
beide Kanäle angesteuert	
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0.08% (4Ω), 0.04% (8Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0.08% (4Ω), 0.04% (8Ω)
Nennleistung bei 1 kHz	0.04% (4Ω), 0.04% (8Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0.025% (8Ω)
halbe Nennleistung bei 1 kHz	0.009% (8Ω)
-26 dB Leistung bei 1 kHz	0.1% (4Ω)
50 mW Leistung bei 1 kHz	0.12% (4Ω)
Intermodulationsfaktor	
Nennleistung bei 250Hz: 8 kHz = 4:1, 4Ω	0.08%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8Ω	0.04%
Leistungsbandbreite beide	10 Hz ~ 35 kHz (4Ω)
Kanäle angesteuert bei -3 dB	10 (4Ω), 20 (8Ω)
Dämpfungsfaktor	
Eingangsempfindlichkeit und -impedanz	
Phono	2.5mV/47kΩ
Aux	150mV/27kΩ
Tape 2	150mV/27kΩ
Tape 1 Aufnahme/wiedergabe (TAPE 1 REC/PLAY)	180mV/27kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.)	150mV
Geräuschabstand	
Nennleistung (4Ω)	Phono 70 dB (80 dB, IHF, A, 8Ω) Aux 88 dB (95 dB, IHF, A, 8Ω)
-26 dB Leistung (4Ω)	Phono 64 dB Aux 66 dB
50 mW Leistung (4Ω)	Phono 62 dB Aux 62 dB
Frequenzgang	Phono RIAA-Standardkurve Aux ±0.8 dB (30 Hz ~ 15 kHz) 7 Hz ~ 45 kHz (-1 dB) ±0.2 dB (20 Hz ~ 20 kHz)
Klangregler	
Baßregler (BASS)	50 Hz, +10 dB ~ -10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ -10 dB
Rauschfilter	7 kHz, -6 dB/Okt.
Gehörliche Lautstärkekorrektur (Loudness)	50 Hz, +9 dB
(bei -30 dB Ausgangsleistung)	
Ausgangsspannung und -impedanz	
Tape 1/2 Aufnahme (TAPE 1, 2 REC OUT)	150 mV
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	30 mV/82 kΩ

Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	±1.0 dB
Übersprechdämpfung (Aux, 1 kHz)	55 dB
Kopfhörerpegel und -impedanz	420 mV/330Ω
Lautsprecherimpedanz MAIN oder REMOTE	4Ω ~ 16Ω
MAIN und REMOTE	8Ω ~ 16Ω

UKW-TUNERTEIL

Wellenbereich	88 ~ 108 MHz
Eingangsempfindlichkeit	
S/R 30 dB	1.9μV (300Ω), 1.3μV (75Ω)
S/R 26 dB	1.7μV (300Ω), 1.2μV (75Ω)
S/R 20 dB	1.5μV (300Ω), 0.9μV (75Ω)
Nutzempfindlichkeit nach IHF	1.9μV (nach IHF '58)
Stereoumschaltsschwelle bei 46 dB nach IHF	22μV/75Ω
Gesamtklirrfaktor	0.15% Stereo 0.3%
Geräuschabstand	60 dB (75 dB nach IHF) 58 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ -2 dB) 20 Hz ~ 14 kHz (+1.5 dB ~ -1.5 dB)
Trennschärfe bei Störsender	70 dB
Einfangverhältnis	1.2 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	60 dB
ZF-Dämpfung bei 98 MHz	75 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	82 dB
AM-Unterdrückung	55 dB
Übersprechdämpfung	1 kHz 45 dB 10 kHz 35 dB 19 kHz -30 dB (-40 dB nach IHF) 38 kHz -50 dB (-50 dB nach IHF)
Trägerrest	
Kanalabweichung (250 Hz ~ 6300 Hz)	±1.5 dB
Begrenzereinsatz	1.2μV
Bandbreite ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	300Ω (symmetrisch) 75Ω (unsymmetrisch)

AM-TUNERTEIL

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

ALLGEMEINE DATEN

Leistungsaufnahme	430 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (BxHxT)	430 x 142 x 291 mm
Gewicht	8.0 kg

DONNEES TECHNIQUES Sujet à changement sans préavis.

[DIN 45 500]

SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz ~ 20 kHz, les deux canaux en circuit	2 x 42W (4Ω), 2 x 40W (8Ω)
Puissance de sortie continue de 40 Hz ~ 16 kHz, les deux canaux en circuit	2 x 42W (4Ω), 2 x 40W (8Ω)
Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 x 50W (4Ω), 2 x 45W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz ~ 20 kHz)	0.08% (4Ω), 0.04% (8Ω)
à puissance nominale (40 Hz ~ 16 kHz)	0.08% (4Ω), 0.04% (4Ω)
à puissance nominale (1 kHz)	0.04% (4Ω), 0.04% (8Ω)
à demi-puissance (20 Hz ~ 20 kHz)	0.025% (8Ω)
à demi-puissance (1 kHz)	0.009% (8Ω)
puissance de -26 dB à 1 kHz	0.1% (4Ω)
puissance de 50 mW à 1 kHz	0.12% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz= 4:1, 4Ω	0.08%
à puissance nominale à 60 Hz: 7 kHz= 4:1, SMPTE, 8Ω	0.04%
Réponse de fréquences	
les deux canaux en circuit, -3 dB	10 Hz ~ 35 kHz (4Ω)
Coefficient d'amortissement	10 (4Ω), 20 (8Ω)
Sensibilité et impédance d'entrée	
PHONO	2.5 mV/47 kΩ
AUX (AUX)	150 mV/27 kΩ
BANDE 2 (TAPE 2)	150 mV/27 kΩ
BANDE 1, ENREGISTREMENT/LECTURE (TAPE 1 REC/PLAY)	180 mV/27 kΩ
PHONO (tension d'entrée maximum, 1 kHz RMS)	150 mV
Signal/Bruit	
à puissance nominale (4Ω)	PHONO 70 dB (80 dB, IHF, A, 8Ω)
à puissance de -26 dB (4Ω)	AUX 88 dB (95 dB, IHF, A, 8Ω)
à puissance de 50 mW (4Ω)	AUX 64 dB
	PHONO 66 dB
	AUX 62 dB
	PHONO 62 dB
Réponse de fréquence	
	PHONO
	Courbe nominale RIAA
	±0.8 dB (30 Hz ~ 15 kHz)
	7 Hz ~ 45 kHz (-1 dB)
	±0.2 dB (20 Hz ~ 20 kHz)
	50 Hz, +10 dB ~ -10 dB
	20 kHz, +10 dB ~ -10 dB
	7 kHz, -6 dB/oct.
	50 Hz, +9 dB
Réglage de la tonalité	
BASSES (BASS)	
AIGUS (TREBLE)	
Filtre coupe-hauts	
Compensateur physiologique (volume à -30 dB)	
Tension de sortie et impédance	
SORTIE ENREGISTREMENT/BANDE 1, 2 (TAPE 1, 2 REC OUT)	150 mV
ENREGISTREMENT/LECTURE BANDE 1 (TAPE 1 REC/PLAY)	30 mV/82 kΩ

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	420 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 μV (300 Ω), 1.3 μV (75 Ω)
	S/B 26 dB 1.7 μV (300 Ω), 1.2 μV (75 Ω)
	S/B 20 dB 1.5 μV (300 Ω), 0.9 μV (75 Ω)
Sensibilité utilisable IHF	1.9 μV (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μV/75 Ω
Distorsion harmonique totale	MONO 0.15%
	STEREO 0.3%
Signal/Bruit	MONO 60 dB (75 dB, IHF)
	STEREO 56 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	70 dB
Taux de capture	1.2 dB
Rejection d'image à 98 MHz	60 dB
Rejection FI à 98 MHz	75 dB
Rejection de réponse parasite à 98 MHz	82 dB
Suppression AM	55 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 μV
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 μV, 300 μV/m
Sélectivité	30 dB
Réjection d'image à 1,000 kHz	50 dB
Réjection FI à 1,000 kHz	40 dB

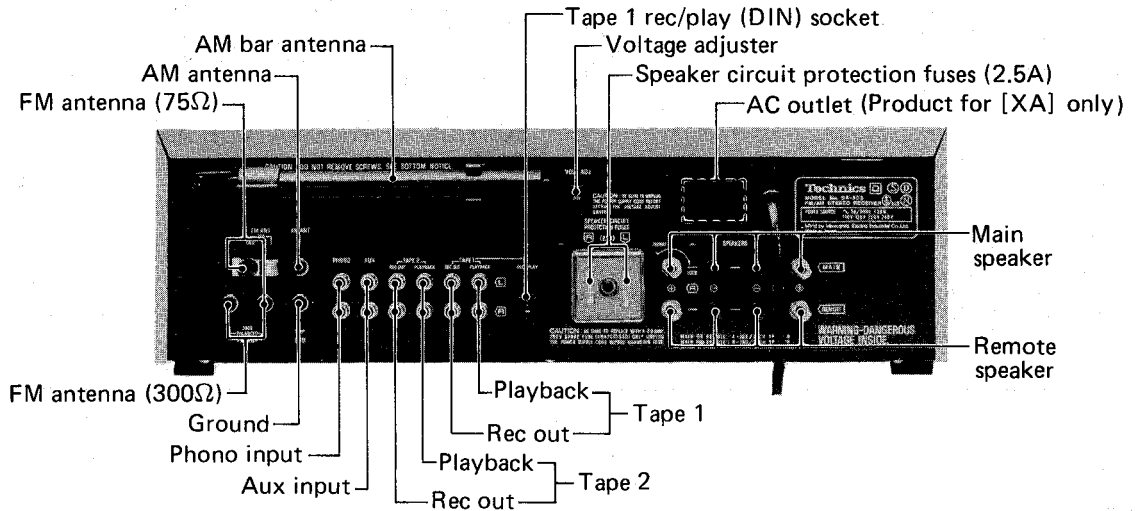
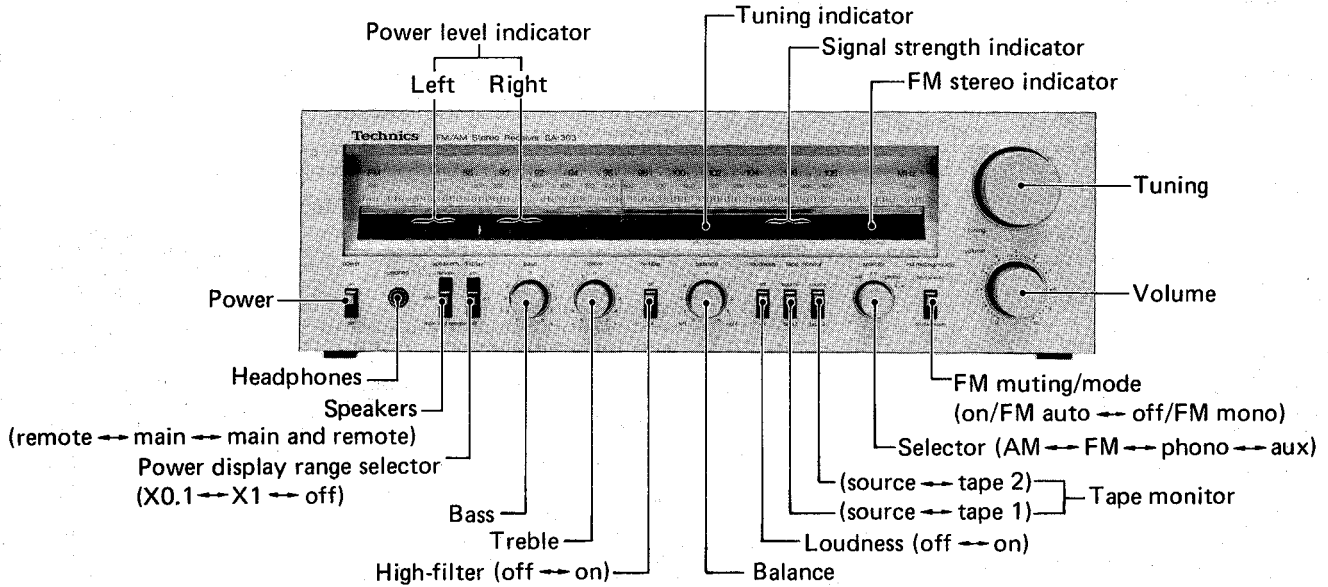
DIVERS

Consommation	430 W
Alimentation	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L x H x Pr)	430 x 142 x 291 mm
Poids	8.0 kg

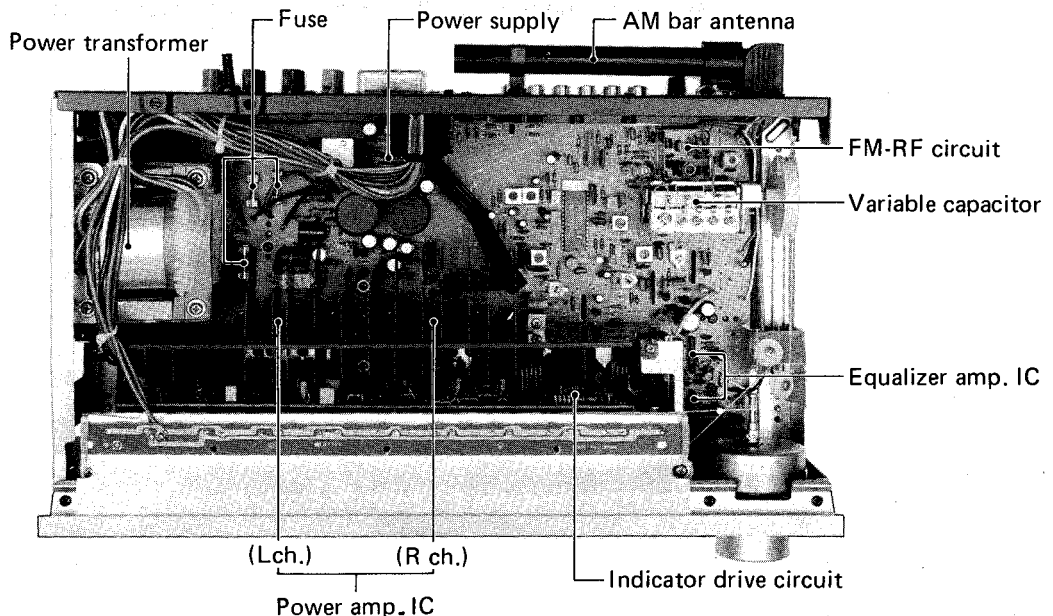
NOTE

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



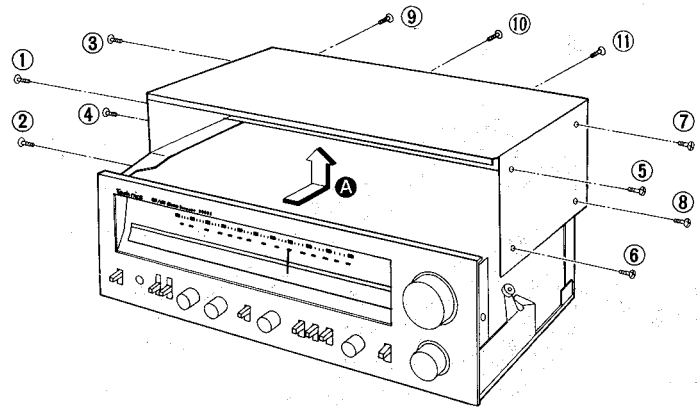
- The products for destination [XA] is equipped with AC outlet.



■ DISASSEMBLY INSTRUCTIONS

● How to remove the cabinet

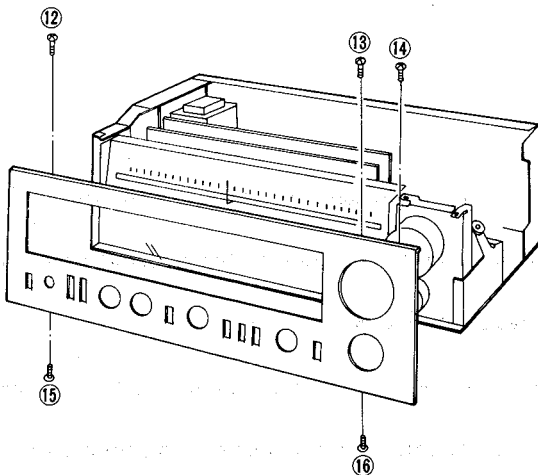
1. Remove the 8 setscrew (Fig. 1: ① ~ ⑧) on the side and 3 setscrews (Fig. 1: ⑨ ~ ⑪) on the back of the cabinet.
2. Shift the cabinet backward and lift it upward. (Arrow **A** in Fig. 1)



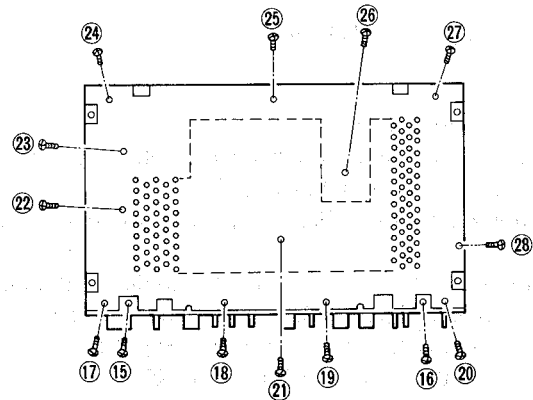
[Fig. 1]

● How to remove the front panel and the bottom board.

1. Remove the 5 setscrews (Fig. 2 : ⑫ ~ ⑯) of the front panel and remove the 2 setscrews (Fig. 3 : ⑱, ⑲) of the bottom board.
2. Pull the front panel outward from the front of the unit.
3. To remove the bottom board, remove the 12 setscrews (Fig. 3 : ⑳ ~ ㉓) of the bottom board.



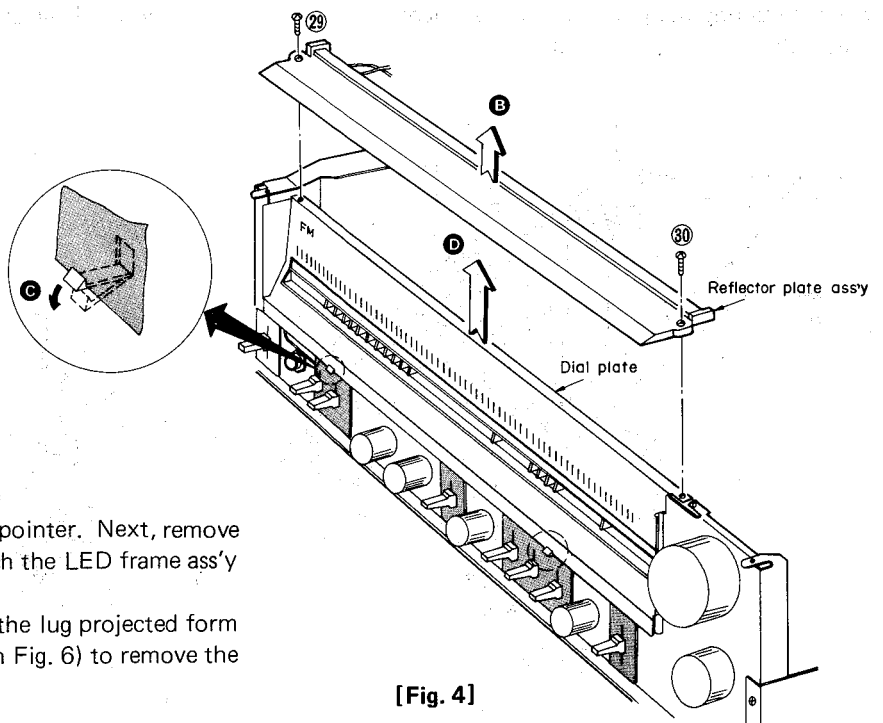
[Fig. 2]



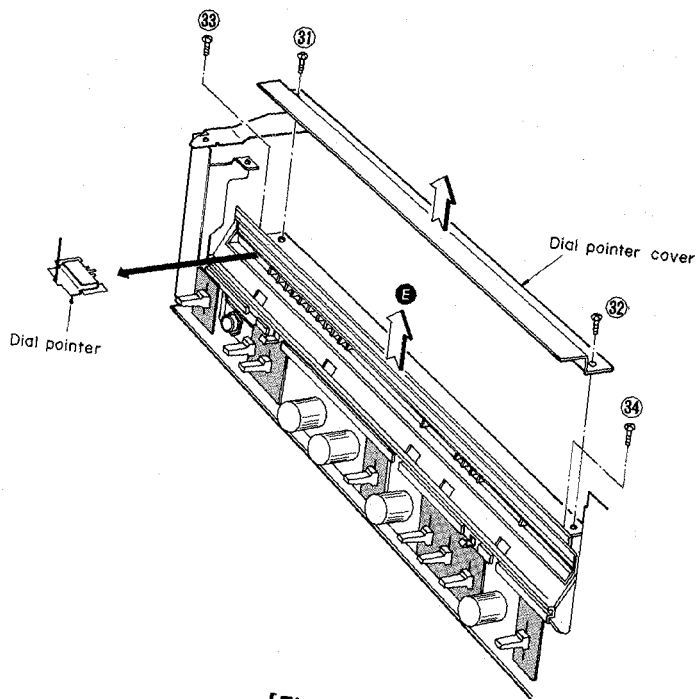
[Fig. 3]

● How to remove the LED indicator P.C.B.

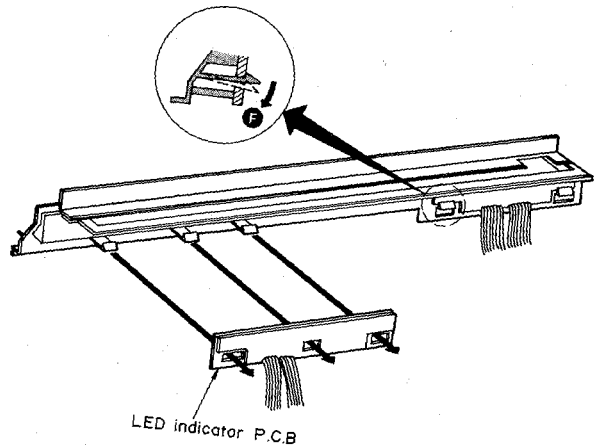
1. Remove the cabinet (Refer to the section "How to remove the cabinet")
2. Remove the 2 setscrews (Fig. 4 : ㉑, ㉒) to detach the reflector plate ass'y in the direction of the arrow **B** (Refer to Fig. 4).
3. The dial plate is secured with the two lugs projected from the LED frame ass'y. Press the lugs in the direction of the arrow **C** to detach the dial plate in the direction of the arrow **D**.
4. Remove the 2 setscrews (Fig. 5 : ㉓, ㉔) to detach the dial pointer cover.
5. Remove the dial cord and pull out the dial pointer. Next, remove the 2 setscrews (Fig. 5 : ㉕, ㉖) to detach the LED frame ass'y in the direction of the arrow **E**.
6. The LED indicator P.C.B. is secured with the lug projected from the LED frame. So, bend the down (**F** in Fig. 6) to remove the LED indicator P.C.B.



[Fig. 4]



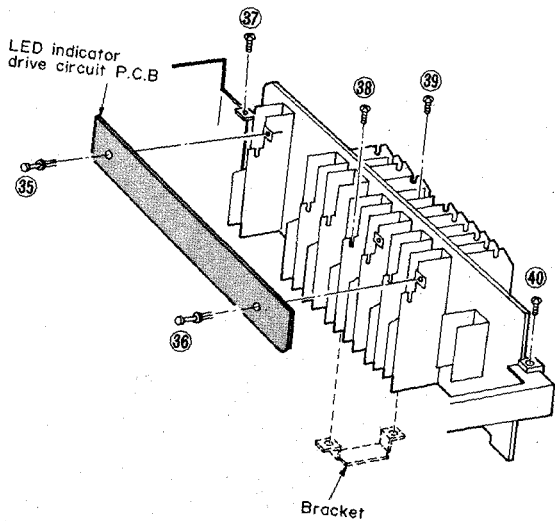
[Fig. 5]



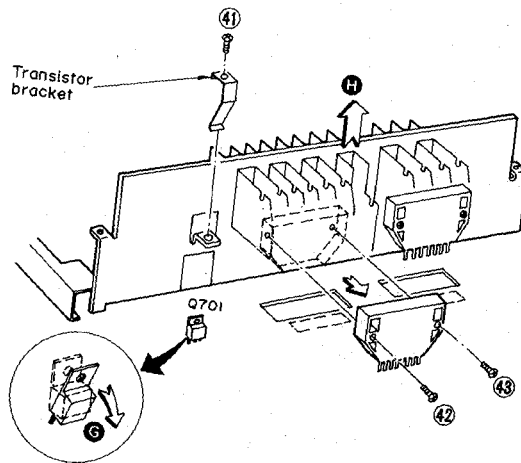
[Fig. 6]

• 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. Remove the 2 setscrews (Fig. 4 : 29 , 30) to detach the reflector plate ass'y in the direction of the arrow **E** (Refer to Fig. 4).
3. Remove the 2 Lock pins (Fig. 7 : 35 , 36) to detach the LED indicator drive circuit P.C.B.
4. Remove the solder of power IC for both Lch and Rch.
5. Remove the transistor bracket setscrew (Fig. 8 : 41) to detach the transistor bracket. Unsolder the transistor Q701 and bend it down in the direction of the arrow **G**.
6. Remove the 4 setscrews (Fig. 7 : 37 ~ 40) at the front chassis and bracket, and then remove the heat sink along with the power IC in the direction of the arrow **H**.
7. Remove the 2 setscrews (Fig. 8 : 42 ~ 43) used to secure the power IC on the heat sink, and then pull the power IC.
8. When mounting the power IC, apply silicone compounded (or equivalent heat diffuser) to the back of power IC, and then follow the steps 1 ~ 7 reversely.

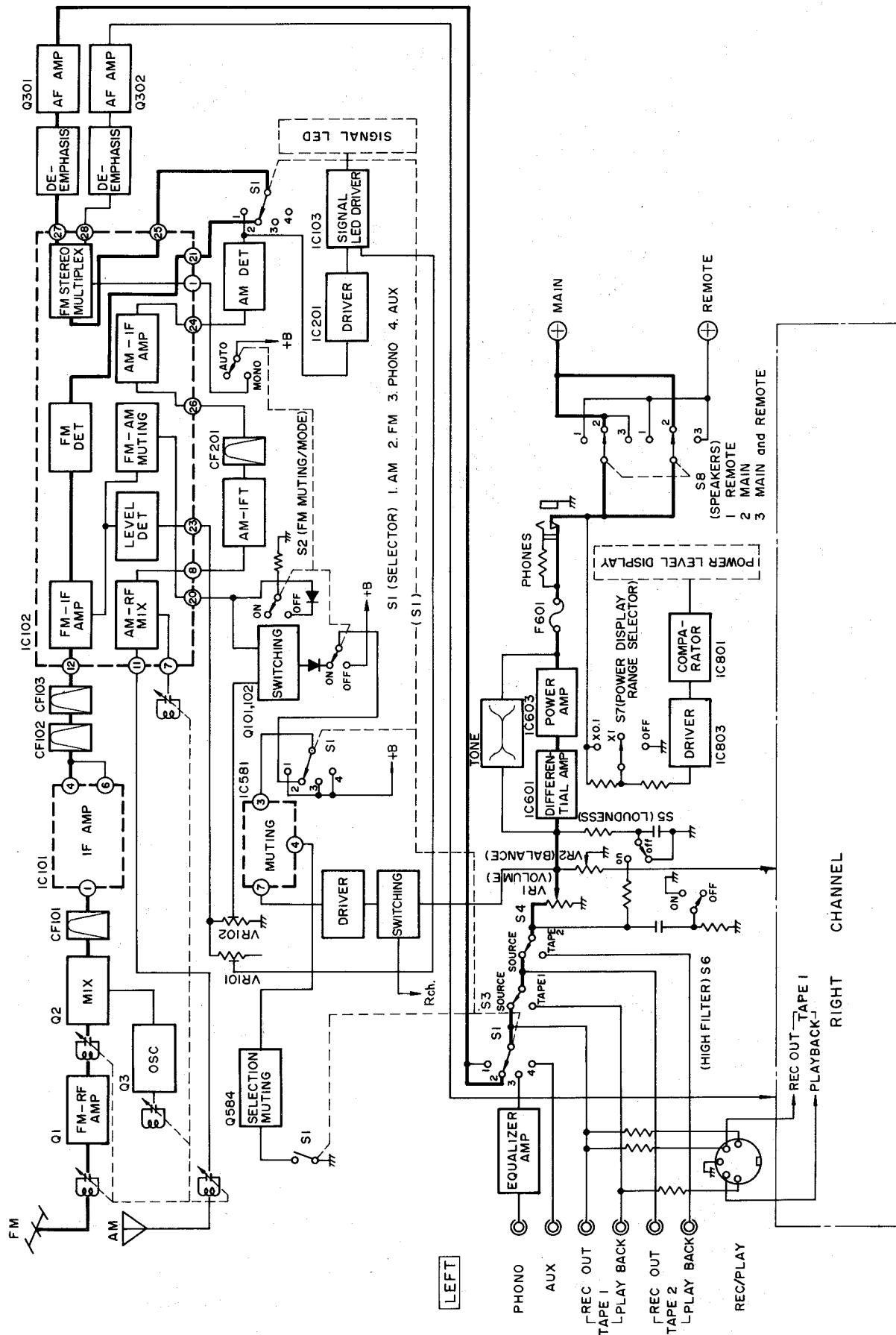


[Fig. 7]

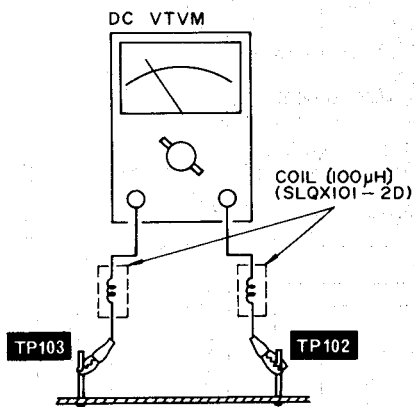
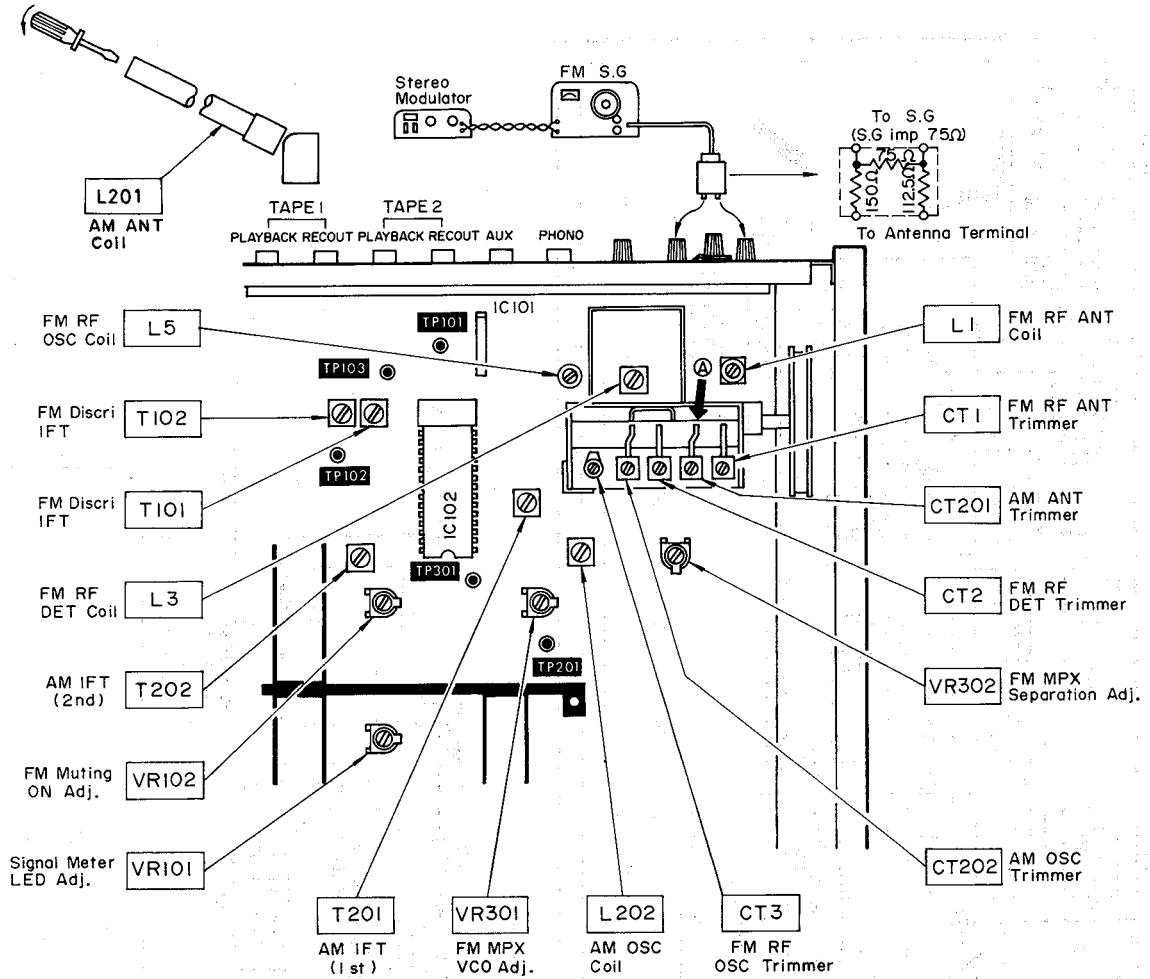


[Fig. 8]

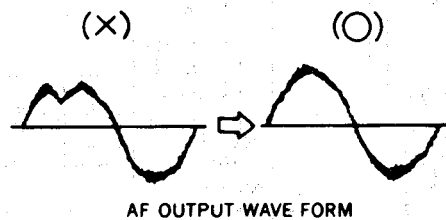
■ BLOCK DIAGRAM



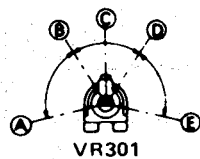
ADJUSTMENT POINTS



[Fig. 10]
(Abb. 1)

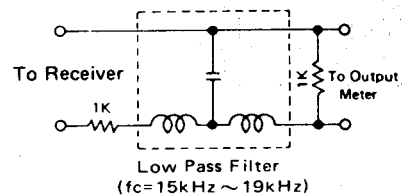


[Fig. 11]
(Abb. 2)



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

[Fig. 12]
(Abb. 3)



[Fig. 13]
(Abb. 4)

ADJUSTMENT INSTRUCTIONS ENGLISH

Notes:

- Band selector switch } AM (AM Alignment)
 } FM (FM Alignment)
- FM muting & mode switch off/mono
- Fix the bottom board to chassis before adjustment.
- Maintain line voltage at rated voltage.
- 300Ω FM dummy antenna.
- Output of signal generator should be no higher than necessary to obtain an output reading.
- Adjust the antenna coil (L201) position by using a screw driver so that it is at approximately 25 degrees to the rear panel.

AM/FM SIGNAL GENERATOR CONNECTION		DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS
AM ADJUSTMENT					
1	High side through 0.001μF to AM antenna trimmer terminal. (point A). Common to chassis.	450kHz (30% Mod. with 400Hz)	Point of non-interference	T201 (1st IFT) T202 (2nd IFT)	Adjust the input frequency and adjustment points so that the output becomes maximum.
2	Fashion loop of several turns of wire and radiate signal into loop of receiver	600kHz (30% Mod. with 400Hz)	600kHz	L202 (OSC Coil) L201 (ANT Coil)	Adjust for maximum output. Adjust ferrite core of L201 by screw drive.
3	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1500kHz (30% Mod. with 400Hz)	1500kHz	CT202 (OSC Trimmer) CT201 (ANT Trimmer)	Adjust for maximum output. Repeat steps 2 and 3.
FM IF ADJUSTMENT					
4	No-Signal	Point of non-interference	Connect DC VTVM to TP102, TP103 terminals. (Refer to fig. 10)	T101 (Discriminator IFT)	<ul style="list-style-type: none"> FM muting/mode switch to on/auto" position Adjust T101 core so that voltage measured in signal mode is 0V in 300 mV range
FM RF ADJUSTMENT					
5	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna.	90MHz (100% Mod. with 400Hz) weak input	90MHz	L5 (OSC Coil) L3 (RF DET Coil) L1 (ANT Coil)	<ul style="list-style-type: none"> Add weak input so that noise is included in the output wave form Make the adjustment so that the output wave form is vertically symmetrical. (Fig. 11)
6		106MHz (100% Mod. with 400Hz) weak input	106MHz	CT3 (OSC Trimmer) CT2 (RF DET Trimmer) CT1 (ANT Trimmer)	<ul style="list-style-type: none"> Repeat the steps (5) and (6) until the frequency correctly matches the dial scale
FM MONO DISTORTION ADJUSTMENT					
7	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna.	100MHz (100% Mod. with 400Hz) weak input	100MHz	T101 (Discriminator IFT)	<ul style="list-style-type: none"> FM muting/mode switch to "on/auto" position Add weak input so that noise is included in the output wave form. Make the tuning so that the output wave form is vertically symmetrical (Fig. 11) Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
8	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna. Apply 16dB (6.3μV) to receiver.	100MHz (100% Mod. with 400Hz)	100MHz	T102 (Discriminator IFT)	<ul style="list-style-type: none"> Set the FM muting/mode switch to "on/auto" and then check steps in (4) and (7) If it is deflected, re-adjust T101. Adjust T102 core so that distortion of right and left channels are minimized. Repeat steps (4) (7) and (8).
FM MUTING LEVEL ADJUSTMENT					
9	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna. Apply 16dB (6.3μV) to receiver. (Product for [XA] only apply 12dB to receiver)	100MHz (100% Mod. with 400Hz)	100MHz	VR102 (MUTING LEVEL)	FM muting/mode switch to "on/auto". Adjust so that output can be obtained.
SIGNAL METER LED LIGHT LEVEL ADJUSTMENT					
10	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna.	100MHz (100% Mod. with 400Hz)	100MHz	VR101 (LED LIGHT LEVEL)	<ul style="list-style-type: none"> With weak input signal (noise produced) at 100MHz (100% Mod. with 400Hz) applied, make tuning so that the upper and lower wave forms are symmetrical. With the input set at 45dB (signal generator at 57dB), adjust VR101 so that all the signal strength LED's light up.

FM MPX V.C.O. ADJUSTMENT	
Using frequency counter	Using alternate system
1 100MHz Non-modulated mono signal applied to set. 2 FM muting/mode switch to "on/FM auto". 3 Connect frequency counter to TP301 through resistor (100kΩ). 4 Adjust VR301 to 19kHz, ±30Hz.	1 Apply stereo signal from generator or stereo station to receiver. 2 Adjust VR301 until stereo indicator lights up. Cement arm of VR301 as shown in fig. 12.
SEPARATION ADJUSTMENT	
PREPARATIONS	ADJUSTING PROCEDURE
1 Add 100MHz, 1kHz, 30% pilot 10% modulation, 60dB stereo signal to the receiver. 2 Connect AC VTVM or scope to "SPEAKER" terminal through low pass filter. Refer to fig. 13.	1 FM muting/mode switch to "on/auto". 2 Adjust VR302 so that R output is minimized when stereo modulator is in L (Lch. modulation) mode and that L output is minimized in R mode.

ANWEISUNGEN FÜR ABGLEICHUNG DEUTSCH

(Für Deutschland)

Anmerkungen:

- Bereichsschalter } AM (MW Abgleich)
 } FM (UKW Abgleich)
- FM Muting/Mode Schalter off/mono
- Netzspannung auf ihren Sollwert halten.
- UKW-Kunstantenne, 300 ohm.
- Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
- Nittels eines Schraubenziehers die Stellung der Antennenspule (L201) so einstellen, daß, sie gegen die Rückenplatte einen Winkel von ca. 25° macht.
- Vor Einstellungen, die Bodenplatte des Chassis befestigen.

MW/UKW MESSENDER ANSCHLUSS	FREQUENZ DES TUNER	FREQUENZ DES TUNER	ANZEIGEGEIRÄT (Röhrevoltmeter oder Oszillograph bzw. Klirrfactor-Meßgerät)	ABGLEICHSPUNKTE	BEMERKUNGEN
MW-ABGLEICH					
1	Heißes Ende des meßsenders über einen 0.001μF. Kondensator an den AM Antenneneingang schließen. Kaltes Ende an Masse.	450kHz (400Hz Modul., 30%)	Kein Empfang	T201 (1. IFT) T202 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adustieren, daß der Ausgang den maximalen Wert erreicht.
2	Das Meßsendersignal induktiv in den Tuner speisen. Hierzu behelfsmäßig eine Rahmenantenne fertigen und an den Eingang schließen.	600kHz (400Hz Modul., 30%)	600kHz	L202 (Osc. Spule) L201 (Ant. Spule)	Auf max. Ausgang abgleichen. Den Ferritkern von L201 mit einem Schraubendreher justieren.
3	Das Meßsendersignal induktiv in den Tuner speisen. Hierzu behelfsmäßig eine Rahmenantenne fertigen und an den Eingang schließen.	1500kHz (400Hz Modul., 30%)	1500kHz	CT202(Osc. Trimmer) CT201(Ant. Trimmer)	Auf max. Ausgang abgleichen. Schritt (2) und (3) sing zu wiederholen.
UKW-ZF-ABGLEICH					
4	Kein Signal	Kein Empfang	Elektronisches (GS-Voltmeter an Klemmen TP102 und TP103 anschließen.(Vgl. Abb. 1)	T101 (Diskriminator IFT)	1. FM muting/mode-Schalter auf "on/auto". 2. Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt.
UKW-HF-ABGLEICH					
5	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	87.5MHz (400Hz Modul., 100%)	87.5MHz (Frequenz Min.)	L5 (Osc. Spule)	1. FM Muting-Schalter auf OFF stellen. 2. Auf max. Ausgang abgleichen.
6	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90MHz (400Hz Modul., 100%)	90MHz	L3 (1. Det. Spule) L1 (Ant. Spule)	1. Einen schwachen Eingang geben, bei den Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb 2)
7	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	106MHz (400Hz Modul., 100%)	106MHz	CT3 (Osc. Trimmer) CT2 (RF DET Trimmer) CT1 (Ant. Trimmer)	3. Die Einstellung von (5). (6) und (7) wiederhoten, bis die Frequenz mit der Skala übereinstimmt.

MW/UKW MESSENDER		FREQUENZ STELLUNG DES TUNER	ANZEIGEGERÄT (Röhrenvoltmeter oder Oszillograph bzw. Klirrfactor-Meßgerät)	ABGLEICHS- PUNKTE	BEMERKUNGEN
ANSCHLUSS	FREQUENZ				
ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW- MONO					
8	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	100MHz (400Hz Modulat., 100%)	100MHz	T101 (Diskriminator IFT)	<ol style="list-style-type: none"> 1. FM muting/mode-Schalter auf "on/auto" 2. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 3. So einstellen daß die Ausgangswellenform vertikal symmetrisch wird (Abb. 2)
9	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. Meßsender auf 16dB einstellen.	100MHz (400Hz Modulat., 100%)	100MHz	T102 (Diskriminator IFT)	<ol style="list-style-type: none"> 4. Den kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt. 5. FM muting/mode-Schalter auf "on/auto" stellen, dann in signalloser Mode den Schritt (4) und (7) feststellen. 6. Wenn Abweichung vorliegt, A (primäre Seite) von T101 wieder einstellen 7. T102 (B) kern für minimale verzerrung der rechten und linken Kanäle justieren. 8. Schritt (4), (8) und (9) sing zu wiederholen.
UKW-MUTING-ABGLEICH					
10	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. Meßsender auf 16dB einstellen.	100MHz (400Hz Modulat., 100%)	100MHz	VR102 (UKW-Muting)	Muting Schalter auf "ON" stellen. So einstellen, daß ein Ausgang zu vernehmen ist.
ABGLEICHEN DES SIGNALMETER-LED (LICHTERZEUGENDE DIODE)-ANZEIGERS					
11	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	100MHz (400Hz Modulat., 100%)	100MHz	VR101 (Meter volume)	<ol style="list-style-type: none"> 1. Bei schwachem Eingangssignal (Geräusch erzeugt) von 100MHz (100% moduliert bei 400Hz), so abstimmen, daß die obere und untere Wellenform symmetrisch werden. 2. Mit Eingang auf 45dB (Signalgenerator auf 57dB) gestellt, den einstellbaren Widerstand VR102 so regulieren, daß alle LED (Leuchtdioden) des Signalometers aufleuchten.
UKW-STEREO-DEKODER-ABGLEICH					
Unter Verwendung eines Zählers			Alternativ-Meßmethode		
12	<ol style="list-style-type: none"> 1. Unmoduliertes Mono-Signal 100MHz in das Gerät speisen. 2. FM Muting/mode-Schalter auf "on/auto" stellen. 3. Zähler über einen Widerstand 100kΩ an TP301 schließen. 4. VR301 auf 19kHz ± 30Hz einstellen. 	<ol style="list-style-type: none"> 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. 3 gezeigt. 			
KANALTRENNUNG-ABGLEICH					
13	<ol style="list-style-type: none"> 1. Das gerät auf 100MHz, 1kHz, Pilot 10% Modulation, 60dB Stereosignal einstellen. 2. Wechselstrom-Röhrenvoltmeter oder, Oszillograph durch Tiefpaß filter (fc = 15 ~ 19KHz) an Ausgangsanschlüsse des Gerätes anschließen. (Abb. 4) 	<ol style="list-style-type: none"> 3. FM muting/mode-Schalter auf "on/auto". 4. VR302 auf minimale Anzeige des R-Ausgangs bei Stereo-modulator in L-(L-Kanalmodulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen. 			

INSTRUCTIONS D'ALIGNMENT FRANÇAIS

Notes:

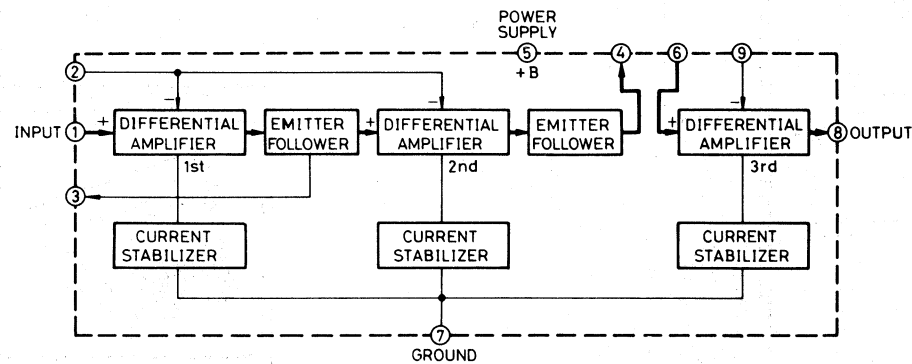
1. Sélecteur de gamme AM (Alignement AM) FM (Alignement FM)
2. Commutateur de silencieux/mode. . . off/mono
3. Conservez la tension du secteur à la tension nominale.
4. Antenne fictive FM 300Ω.
5. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
6. Régler la position de la bobine (L201) de l'antenne en utilisant un tournevis de telle sorte qu'elle soit environ à 25 degrés de la plaque arrière.
7. Fixer la plaque de base au châssis avant le réglage.

	AM/FM GENERATEUR		AIGUILLE SUR LE FREQUENCE	INDICATEUR (VOLT-METRE ELECTRONIQUE OSCILLOSCOPE OU DISTORSIONMETRE)	POINTS DE REGLAGE	OBSERVATIONS
	BRANCHEMENT	FREQUENCE				
ALIGNEMENT AM						
1	Côté chaud à travers 0,001µF, sur le trimmer de l'antenne AM, commum an shâssis.	450kHz (modulé à 30% par 400Hz)	Point sans signal	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	T201 (1 transfo FI) T202 (2 transfo FI)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
2	Faire une boucle de quelques tours et rayonner le signal dans le cadre de l'ampli-tuner.	600kHz (modulé à 30% par 400Hz)	600kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	L202 (bobine OSC) L201 (bobine ANT)	Régler au maximum de signal de sortie. Régler le noyau ferrite de L201 à l'aide d'un tournevis.
3	Faire une boucle de quelques tours et rayonner le signal dans le cadre de l'ampli-tuner.	1500kHz (modulé à 30% par 400Hz)	1500kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	CT202 (trimmer OSC) CT201 (trimmer ANT)	Régler au maximum de signal de sortie. Recommencez les étapes (2) et (3).
ALIGNEMENT FI-FM						
4		Sans signal	Point sans signal	Brancher le voltmètre électronique à C.C. aux bornes TP102 et TP103. (Voir fig. 10)	T101 (transfo FI discri)	<ol style="list-style-type: none"> 1. Commutateur de silencieux sur "on/auto". 2. Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0V dans la gamme des 300mV.
ALIGNEMENT RF-FM						
5	Brancher sur la prise d'antenne FM à traves une antenne fictive FM.	90MHz (modulé à 100% par 400Hz)	90MHz	Oscilloscope sur prise de sortie du tuner	L5 (bobine OSC) L3 (1er détecteur) L1 (bobine ANT)	<ol style="list-style-type: none"> 1. Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. 2. Faire le réglage de telle sorte que le forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 11)
6	Brancher sur la prise d'antenne FM à travers une antenne fictive FM.	106MHz (modulé à 100% par 400Hz)	106MHz	Oscilloscope sur prise de sortie du tuner.	CT3 (trimmer OSC) CT2 (trimmer DET) CT1 (trimmer ANT)	<ol style="list-style-type: none"> 3. Refaire les réglages (5) et (6) jusqu' à ce que la fréquence corresponde correctement avec l'échells du cadran.
REGLAGE DE LA DISTORSION FM EN MONO						
7	Brancher sur la prise d'antenne FM à travers une antenne fictive FM.	100MHz (modulé à 100% par 400Hz)	100MHz	Brancher le voltmètre électronique à c.c. aux bornes TP102 et TP103 Oscilloscope sur prise de sortie du l'ampli-tuner.	T101 (Transfo FI discri.)	<ol style="list-style-type: none"> 1. Commutateur de silencieux sur "on/auto". 2. Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. 3. Faire le réglage de telle sorte que le forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 11)
8	Brancher sur la prise d'antenne FM à traves une antenne fictive FM. Niveau de sortie du générateur 16 dB.	100MHz (modulé à 100% par 400Hz)	100MHz	Distorsiomètre sur prise de sortie, par l'intermédiaire du filtre passe-bas (fig. 13)	T102 (Transfor FI discri.)	<ol style="list-style-type: none"> 4. Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0V dans la gamme des 300mV. 5. Placer la commutateur Sourdine FM/Mode sur "on/auto" et vérifier l'étape (4) et (7) dans un mode sans signal. 6. S'il est déplacé., re-régler A (côté primaire) de T101. 7. Régler le noyau T102 (B) de telle sorte que la distorsion des canaux droit et gauche soit la plus faible. 8. Recommencez les étapes (4), (7) et (8).
9	Brancher sur la prise d'antenne FM à travers une antenne fictive FM. Niveau de sortie du générateur 16dB.	100MHz (modulé à 100% par 400Hz)	100MHz	Brancher un voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	VR101	<ol style="list-style-type: none"> 1. Commutateur de silencieux sur "ON" 2. Régler pour obtenir une lecture en sortie.

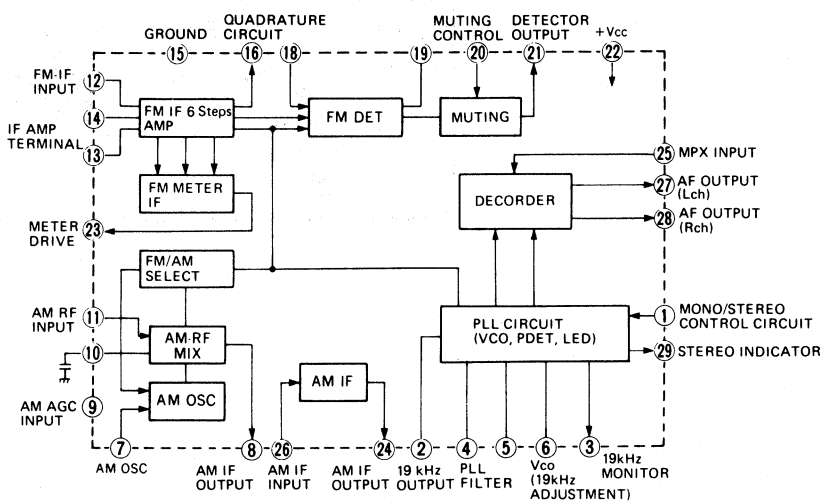
AM/FM GENERATEUR		AIGUILLE SUR LE FREQUENCE	INDICATEUR (VOLT-METRE ELECTRONIQUE OSCILLOSCOPE OU DISTORSIONMETRE)	POINTS DE REGLAGE	OBSERVATIONS
BRANCHEMENT	FREQUENCE				
ABGLEICHEN DES SIGNLMETER-LED (LICHTERZEUGENDE DIODE)-ANZEIGERS					
10	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	100MHz (modulé à 100% par 400Hz)	100MHz	Oscilloscope sur prise de sortie du tuner.	VR101
1. Après avoir appliqué un faible signal d'entrée (bruit produit) de 100 MHz (100% modulé à 400Hz), accorder de telle sorte que les formes d'onde supérieure et inférieure soient symétriques. 2. Après avoir réglé l'entrée sur 45dB (oscilloscope à 57dB), régler la VR102 de telle sorte que toutes les LED de puissance de signal, s'allument.					
ALIGNEMENT DU PILOTE MULTIPLEX FM					
Avec un fréquencemètre			Par un autre système		
11	1. Signal mono 100MHz non modulé appliqué à l'appareil. 2. Commutateur de silencieux sur "on/auto". 3. Branchez le fréquencemètre sur TP301 à travers une résistance de 100kΩ. 4. Régler VR301 sur 19kHz ± 30Hz.		1. Appliquez à l'appareil un signal stéréo provenant d'un générateur ou de la réception d'un émetteur. 2. Régler VR301 jusqu'à ce que l'indicateur de stéréophonie s'allume. Collez le curseur de VR301 comme indiqué sur la fig. 12.		
REGLAGE DE LA SEPARATION DES CANAUX					
Préparations			Procédure de réglage		
12	1. Ajouter 100MHz, 1kHz, Modulation, pilote 10%, signal stéréophonique 60dB, à l'appareil. 2. Brancher un voltmètre électronique C.A. ou un oscilloscope aux bornes de sortie, par l'intermédiaire du filtre passe-bas (fc = 15 ~ 19kHz).		1. Commutateur de silencieux sur "on/auto". 2. Régler VR302 de telle sorte que la sortie droite soit minimale quand la commande d'accord stéréophonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans le mode droit.		

■ 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.

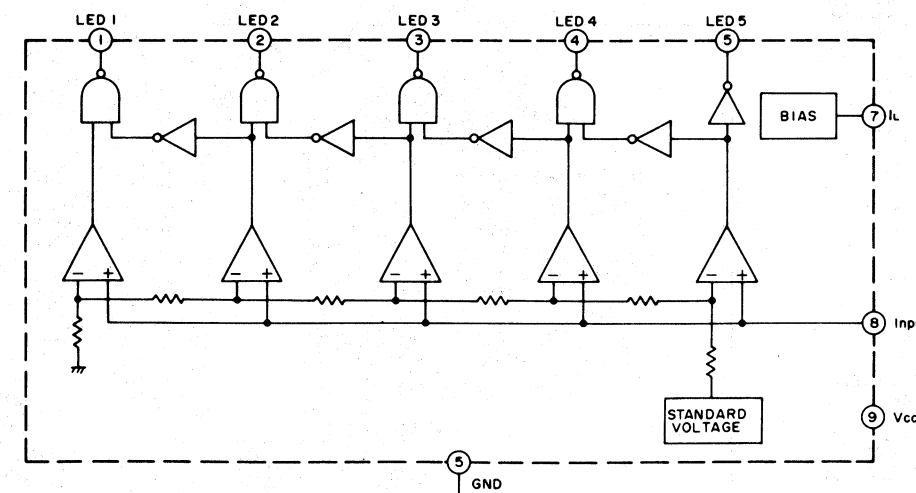
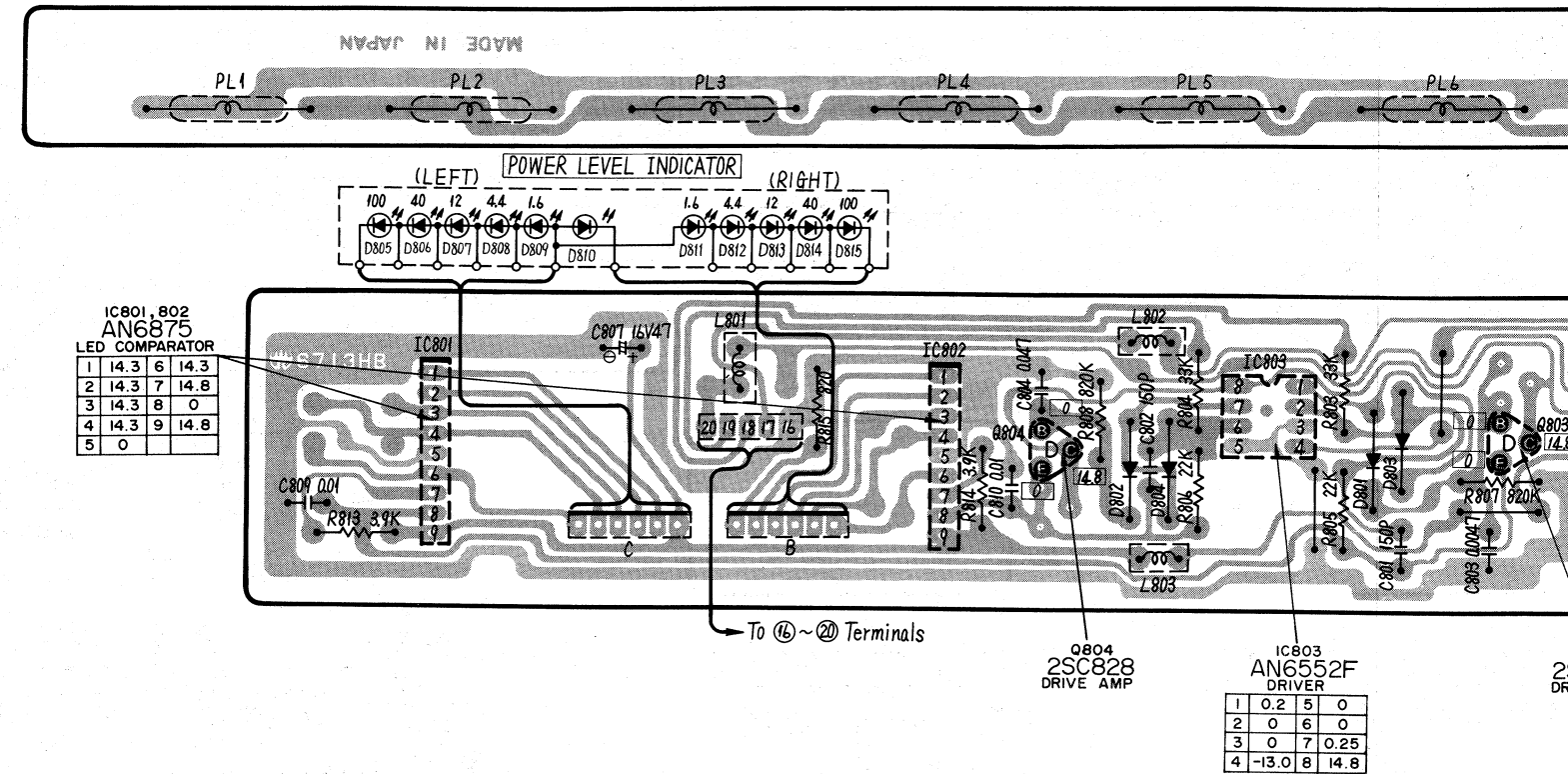


IC101 (AN278)
FM IF amplifier

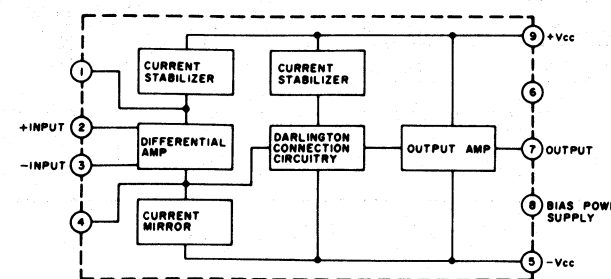


IC102 (AN7001SW)
AM Converter, FM IF amplifier,
FM detector & MPX

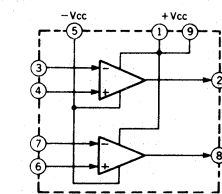
■ PRINTED CIRCUIT BOARD WIRING VIEW (LED driver circuit P.C.B.)



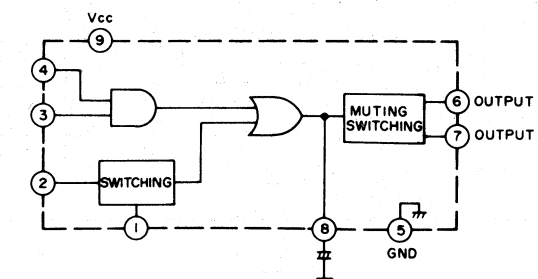
IC103 (AN6876)
Signal LED driver



IC401, 402 (SVITA7322P)
Equalizer amplifier



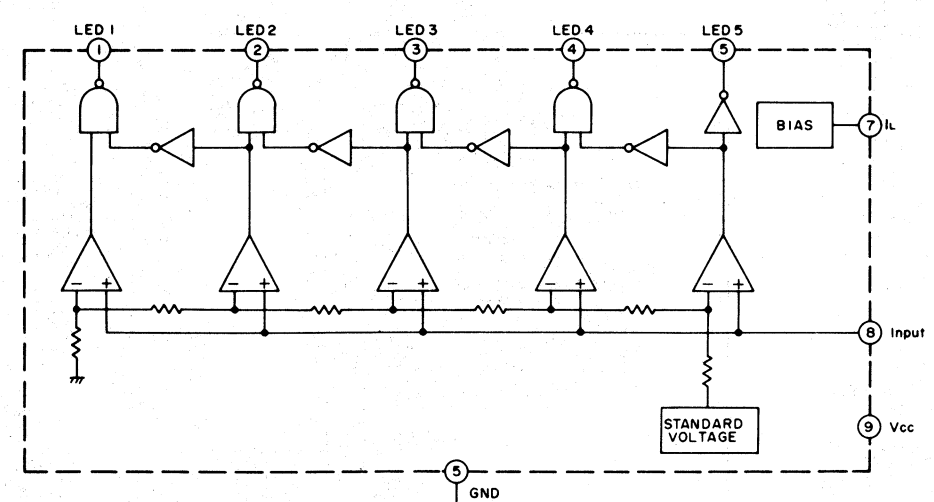
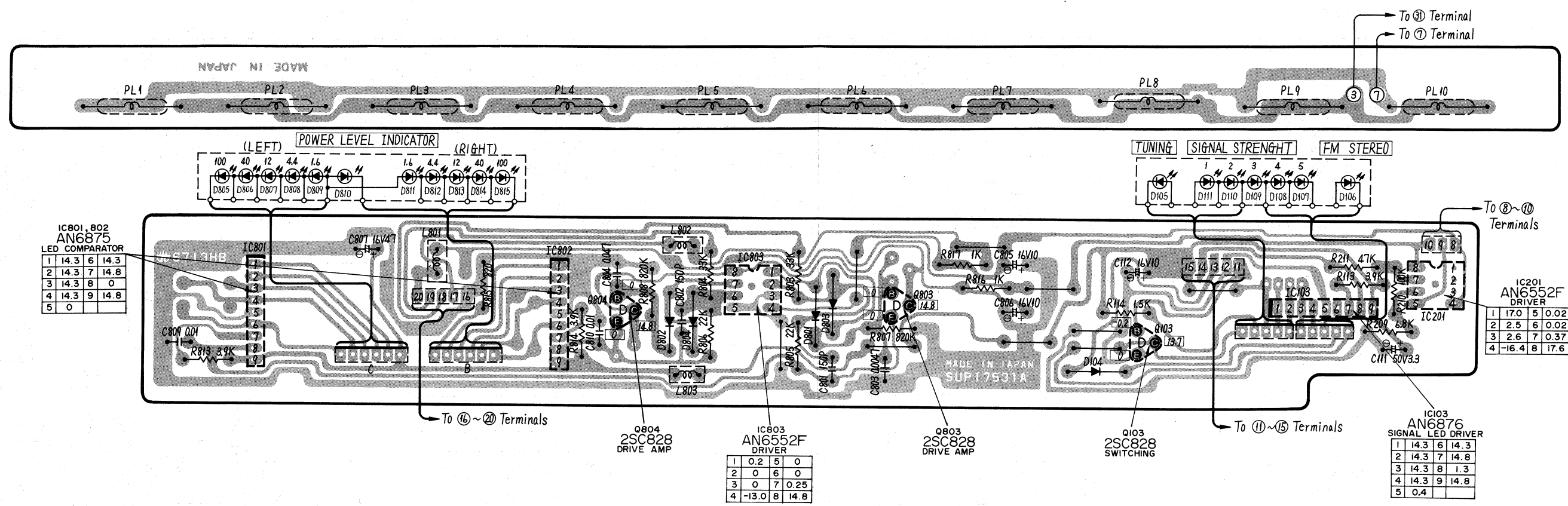
IC201, 803 (AN6552F)
Operation amplifier



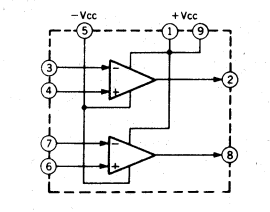
IC581 (AN 6136)
AF muting amplifier

PRINTED CIRCUIT BOARD WIRING VIEW (LED driver circuit P.C.B.)

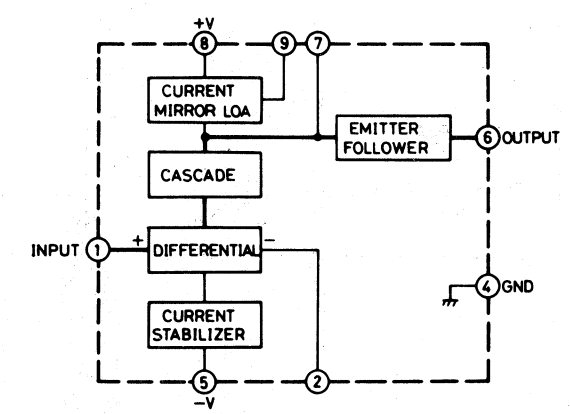
Earth (Ground) Lines



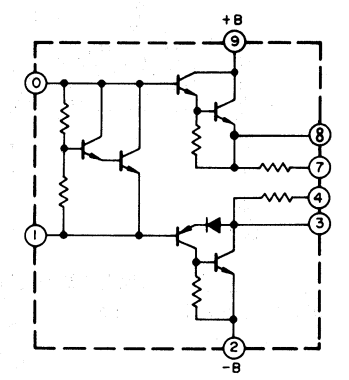
IC103 (AN6876) Signal LED driver



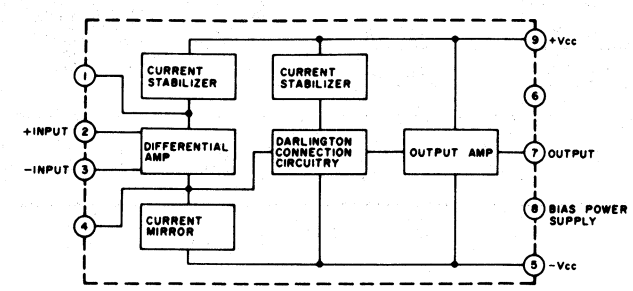
IC201, 803 (AN6552F) Operation amplifier



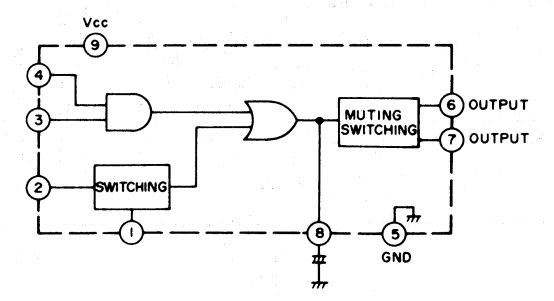
IC601, 602 (AN7060F) Differential amplifier



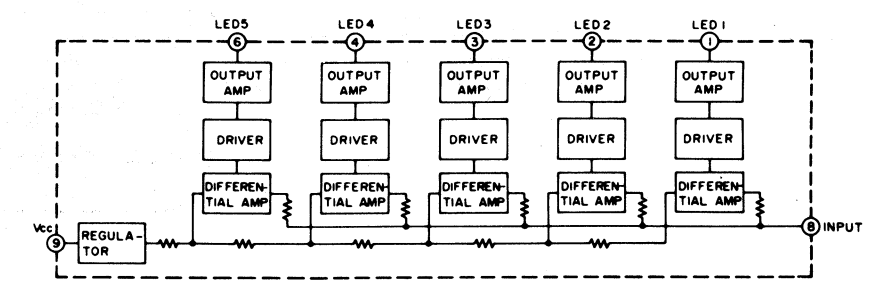
IC603, 604 (SV1STK1039) Power amplifier



IC401, 402 (SV1TA7322P) Equalizer amplifier



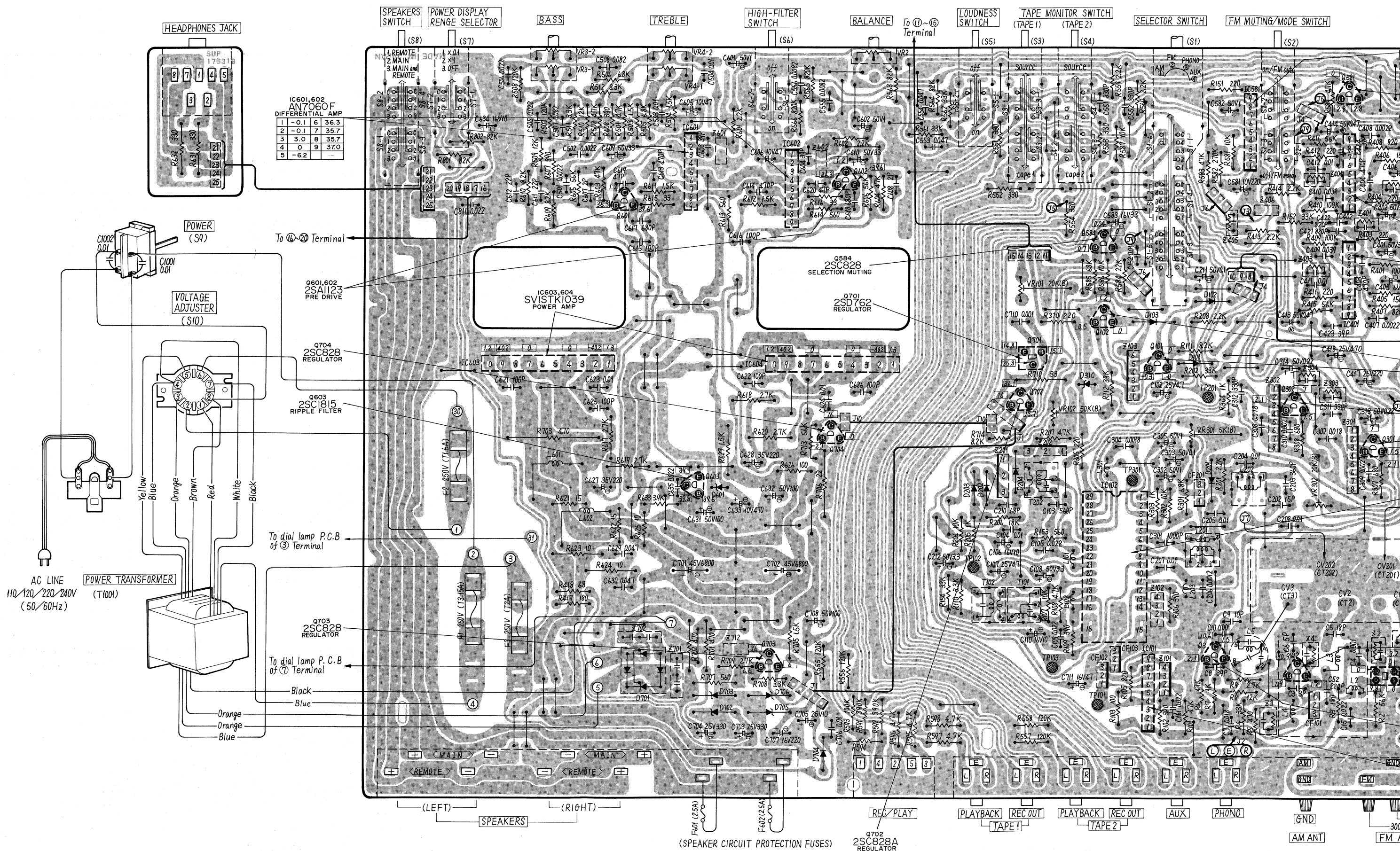
IC581 (AN 6136) AF muting amplifier



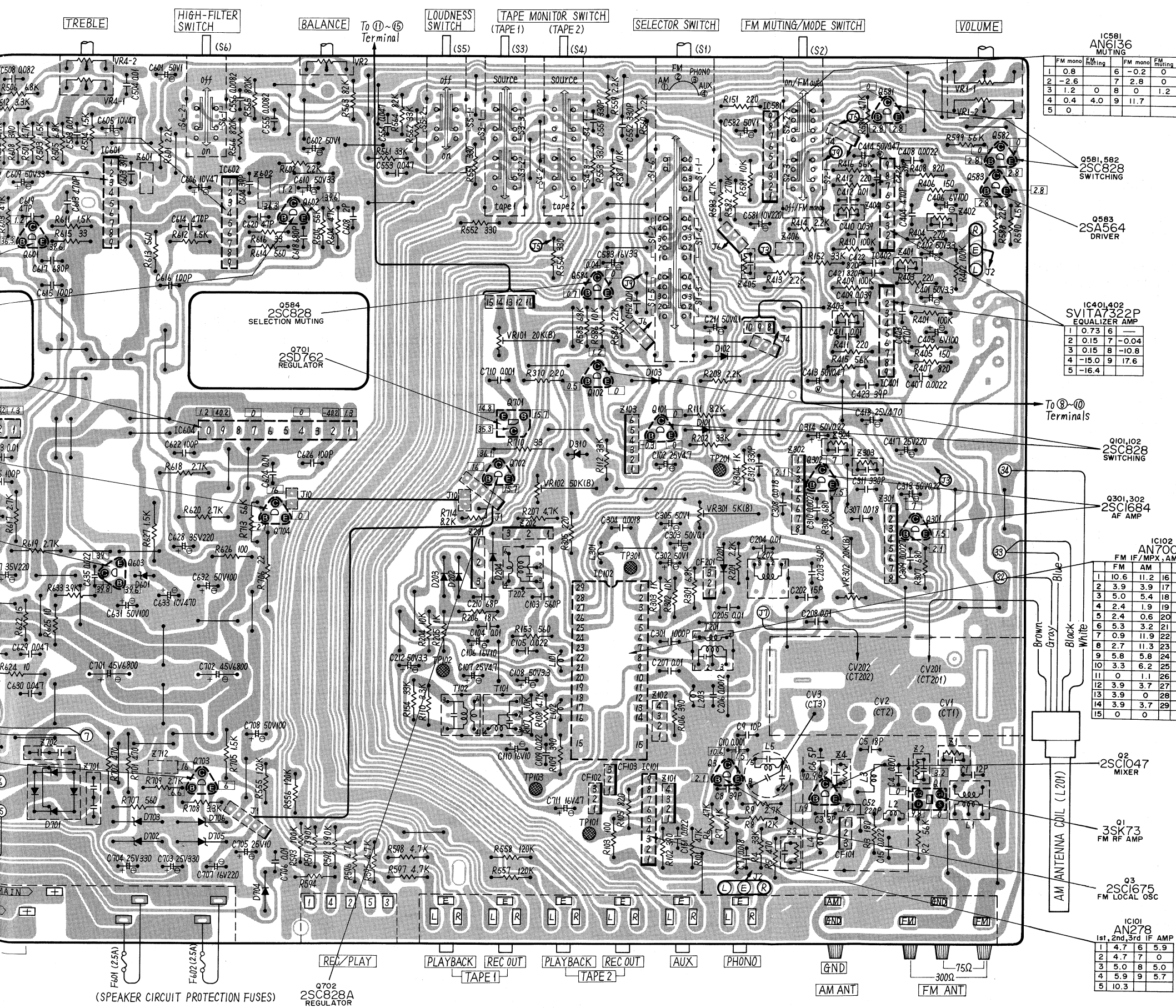
IC801, 802 (AN6875) LED Comparator

PRINTED CIRCUIT BOARD WIRING VIEW

Earth (Ground) Lines



Earth (Ground) Lines



IC581 AN6136 MUTING

FM mono	FM muting	FM mono	FM muting
1 0.8	6 -0.2	7 2.8	0
2 -2.6	0	8 0	1.2
3 1.2	0	9 11.7	
4 0.4	4.0		
5 0			

IC401,402 SVITA7322P EQUALIZER AMP

1	0.73	6	
2	0.15	7	-0.04
3	0.15	8	-10.8
4	-15.0	9	17.6
5	-16.4		

IC102 AN7001SW FM IF/MPX, AM RF/IF

1	10.6	11.2	16	5.8	5.8
2	3.9	3.9	17	5.8	5.8
3	5.0	5.4	18	5.8	5.8
4	2.4	1.9	19	5.8	5.8
5	2.4	0.6	20	0.6	0.6
6	5.3	3.2	21	4.5	4.6
7	0.9	11.9	22	11.9	11.9
8	2.7	11.3	23	3.1	0
9	5.8	5.8	24	11.4	11.4
10	3.3	6.2	25	6.8	7.0
11	0	1.1	26	2.3	2.3
12	3.9	3.7	27	3.4	3.6
13	3.9	0	28	3.4	3.6
14	3.9	3.7	29	0	0
15	0	0			

IC101 AN278 1st, 2nd, 3rd IF AMP

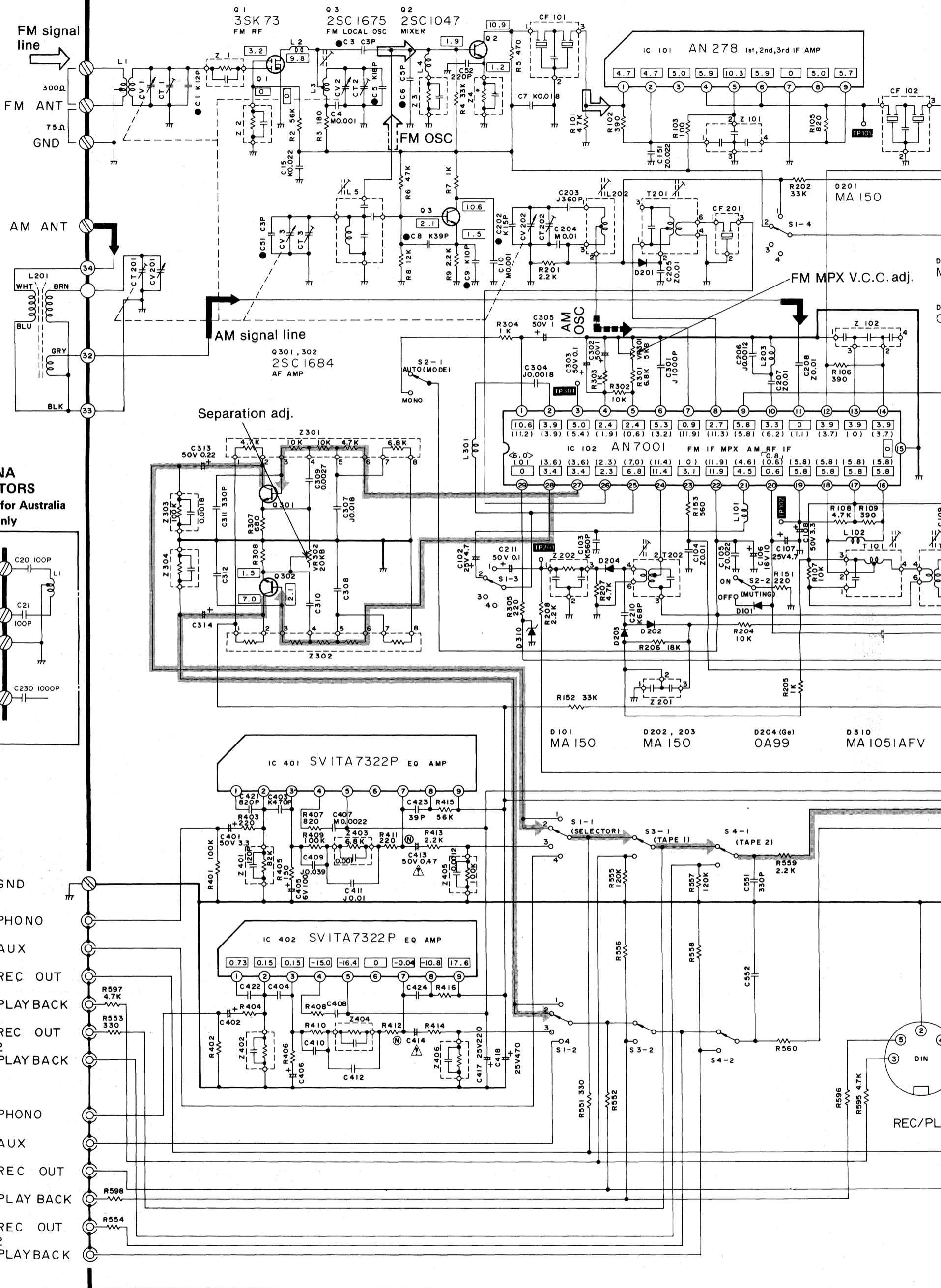
1	4.7	6	5.9
2	4.7	7	0
3	5.0	8	5.0
4	5.9	9	5.7
5	10.3		

■ TERMINAL GUIDE OF TRANSISTORS AND IC'S

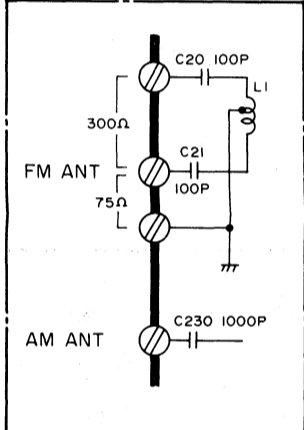
<p>AN278</p>	<p>AN6876, AN6136 AN7060, AN6875</p>
<p>AN7001SW</p>	
<p>AN6552F</p>	<p>SVITA7322P</p>
<p>SVISTK1039</p>	<p>3SK73</p>
<p>2SC1047, 2SC1675 2SC828, 2SC1684 2SA564, 2SA1123 2SC1815, 2SC828A</p>	<p>2SD762</p>

1 2 3 4 5 6 7

A
B
C
D
E
F
G
H
I



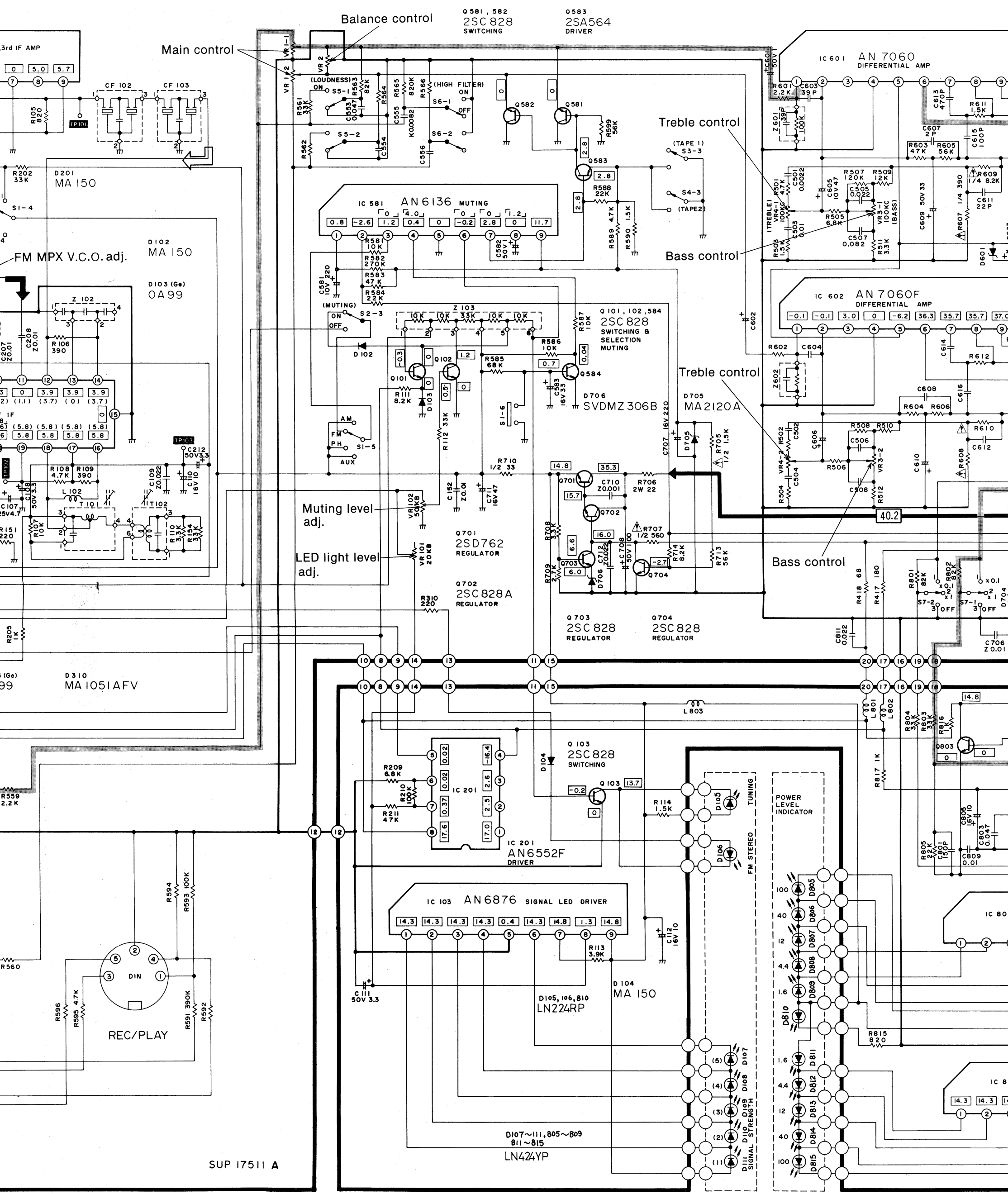
ANTENNA CAPACITORS
● Product for Australia [XAL] only



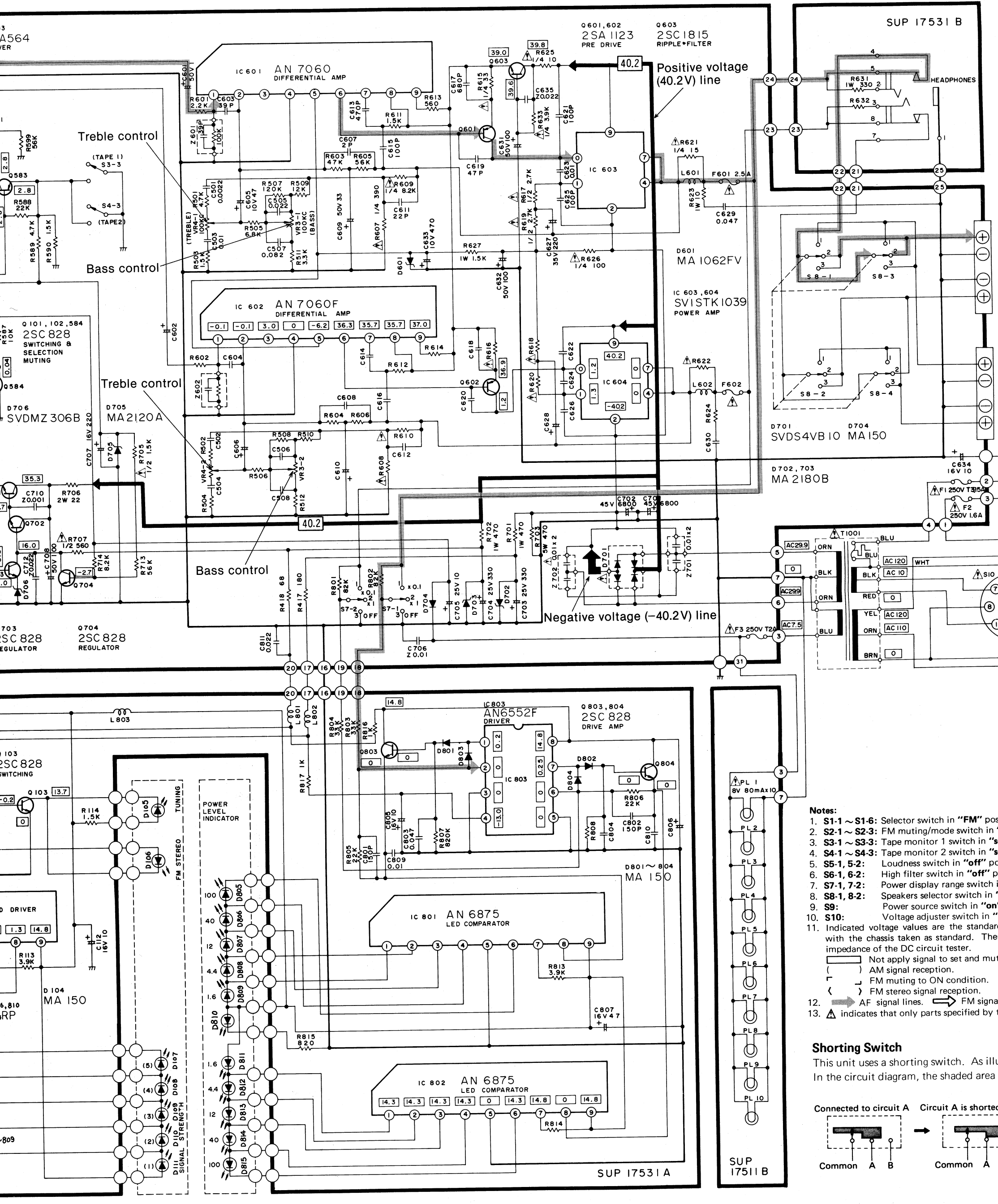
23

24

REC/PLA

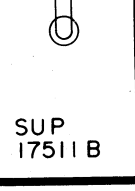
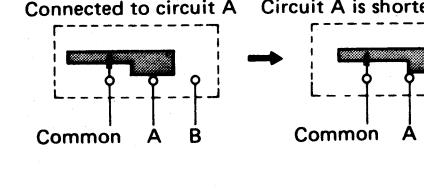


SUP 17511 A



- Notes:**
- S1-1 ~ S1-6: Selector switch in "FM" position.
 - S2-1 ~ S2-3: FM muting/mode switch in "off" position.
 - S3-1 ~ S3-3: Tape monitor 1 switch in "off" position.
 - S4-1 ~ S4-3: Tape monitor 2 switch in "off" position.
 - S5-1, 5-2: Loudness switch in "off" position.
 - S6-1, 6-2: High filter switch in "off" position.
 - S7-1, 7-2: Speaker display range switch in "off" position.
 - S8-1, 8-2: Speakers selector switch in "off" position.
 - S9: Power source switch in "on" position.
 - S10: Voltage adjuster switch in "off" position.
 - Indicated voltage values are the standard values with the chassis taken as standard. The impedance of the DC circuit tester is 100 ohms.
 - Not apply signal to set and muting control.
 - AM signal reception.
 - FM muting to ON condition.
 - FM stereo signal reception.
 - AF signal lines.
 - FM signal lines.
 - Indicates that only parts specified by the manufacturer are to be used.

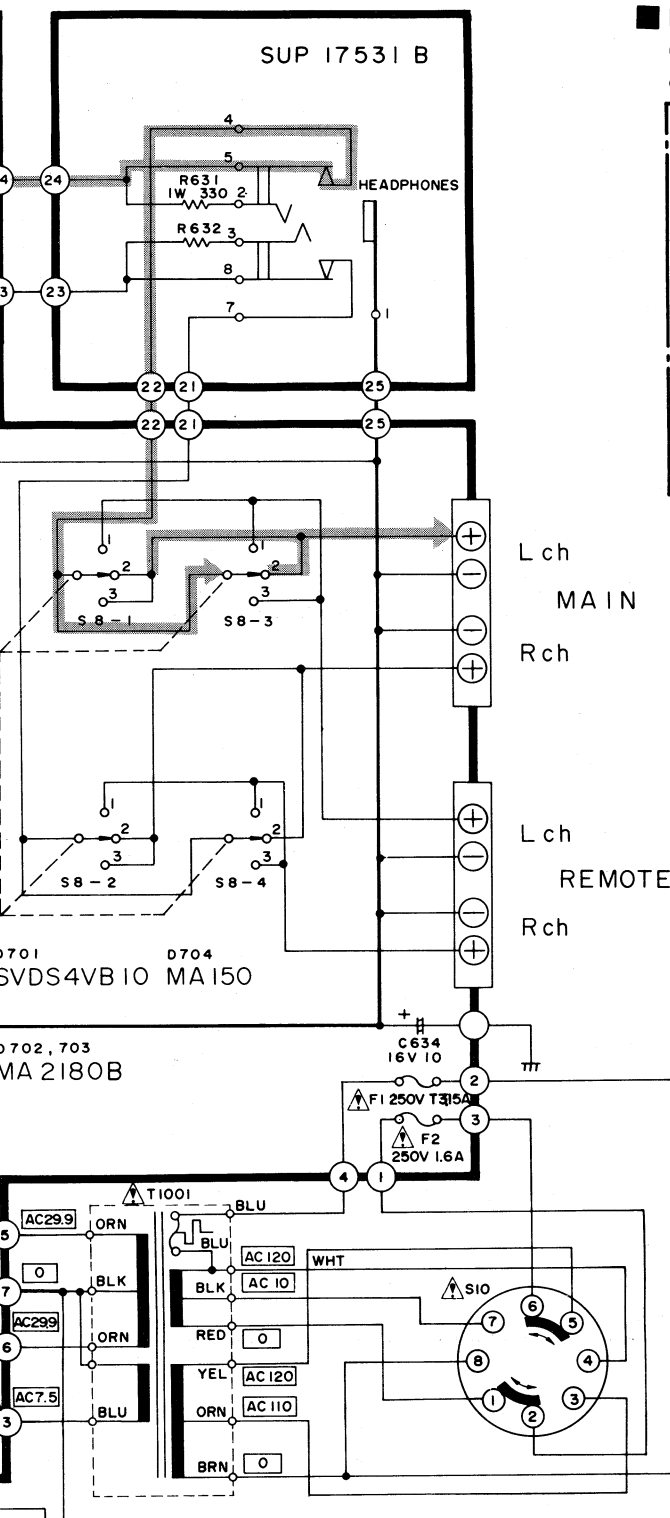
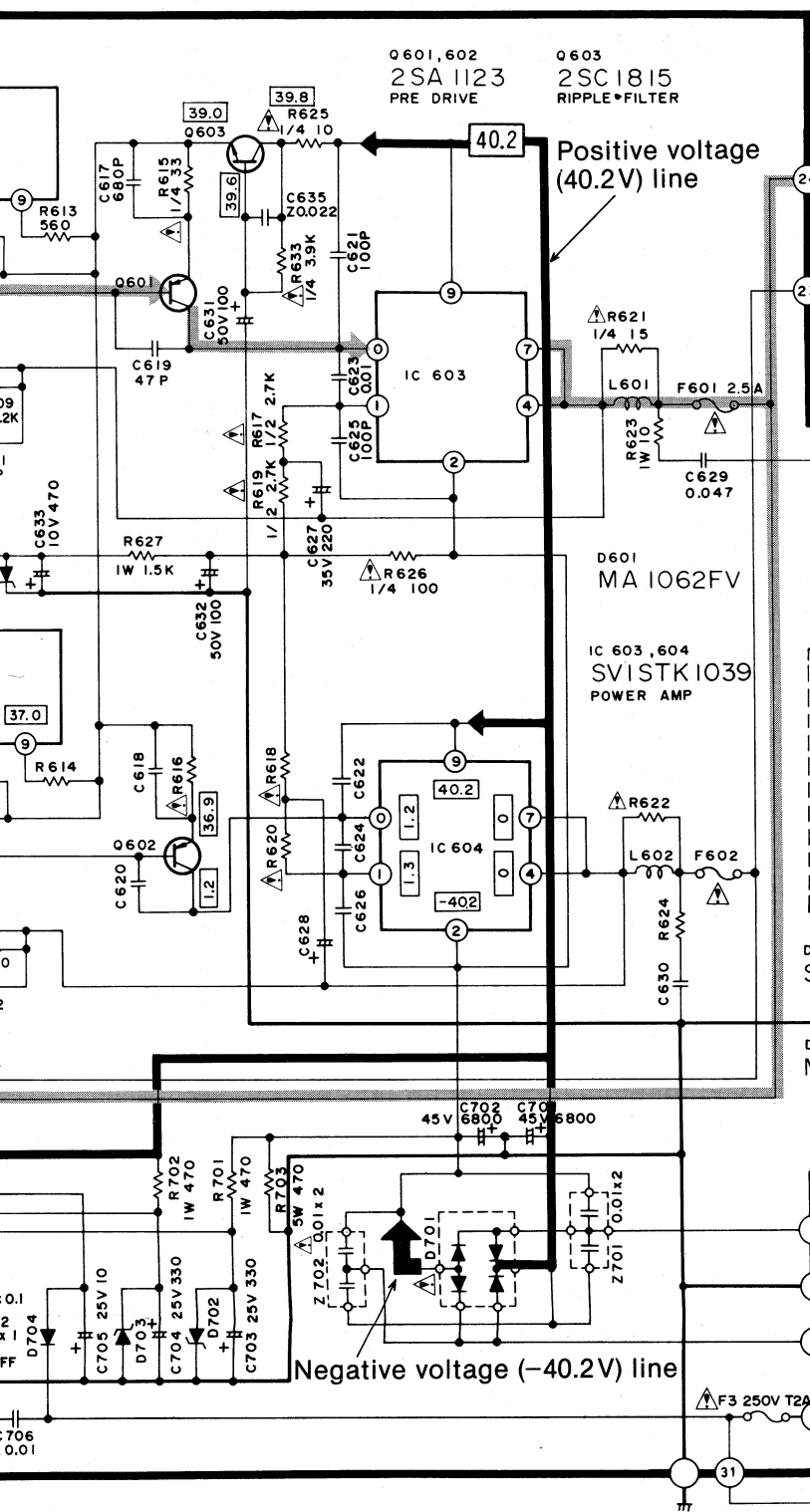
Shorting Switch
 This unit uses a shorting switch. As illustrated in the circuit diagram, the shaded area indicates the switch position.



SUP 17511 B

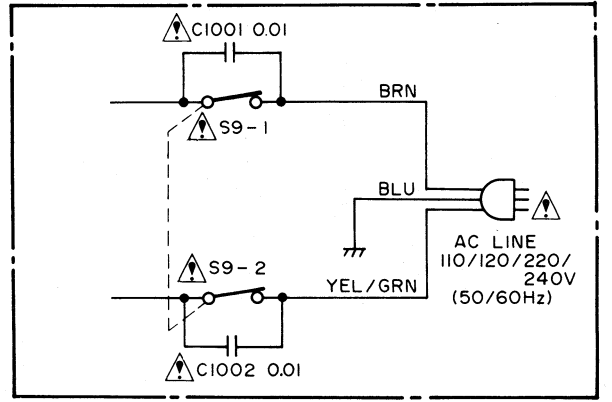
SUP 17531 A

SUP 17531 B

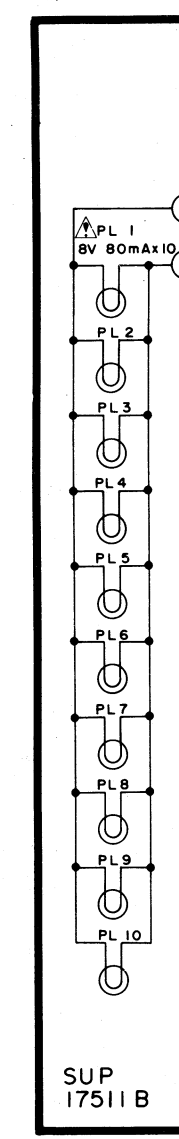
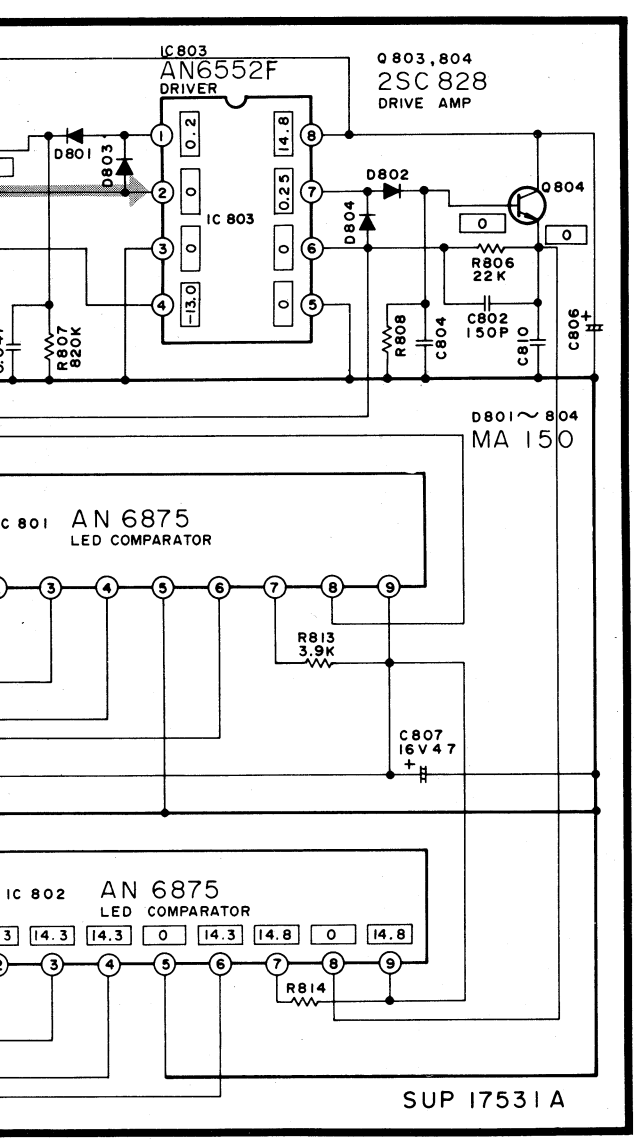
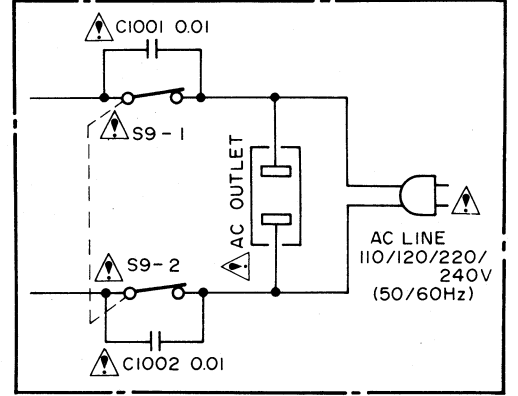


POWER SOURCE CIRCUIT OF OTHER PRODUCTS

Product for Australia [XAL] only



Product for Asia, Latin America, Middle East and Africa [XA]

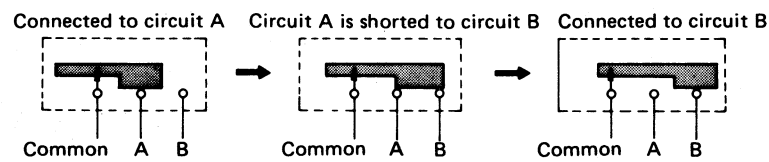


Notes:

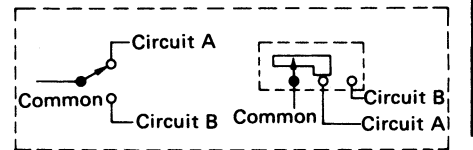
- S1-1 ~ S1-6: Selector switch in "FM" position. ① AM ↔ ② FM ↔ ③ phono ↔ ④ aux
- S2-1 ~ S2-3: FM muting/mode switch in "on/FM auto" position.
- S3-1 ~ S3-3: Tape monitor 1 switch in "source" position. source ↔ tape 1
- S4-1 ~ S4-3: Tape monitor 2 switch in "source" position. source ↔ tape 2
- S5-1, 5-2: Loudness switch in "off" position.
- S6-1, 6-2: High filter switch in "off" position.
- S7-1, 7-2: Power display range switch in "X1" position ① X0.1 ↔ ② X1 ↔ ③ off
- S8-1, 8-2: Speakers selector switch in "main" position ① remote ↔ ② main ↔ ③ main and remote
- S9: Power source switch in "on" position.
- S10: Voltage adjuster switch in "240V" position. 120V ↔ 110V ↔ 220V ↔ 240V
- 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.
- Not apply signal to set and muting switch to OFF condition.
- AM signal reception.
- FM muting to ON condition.
- FM stereo signal reception.
- AF signal lines. FM signal lines. AM signal lines.
- Indicates that only parts specified by the manufacturer be used for safety.

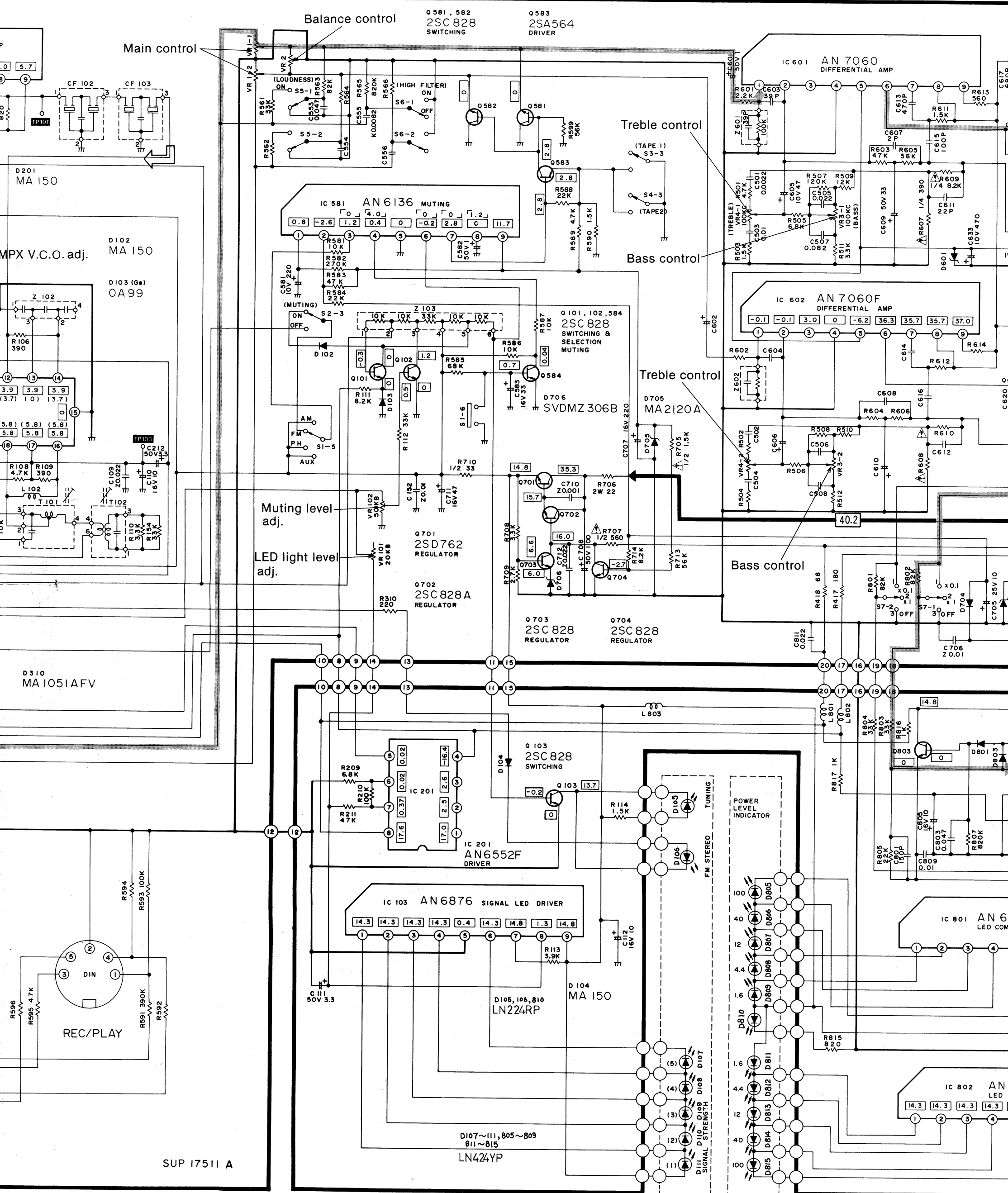
Shorting Switch

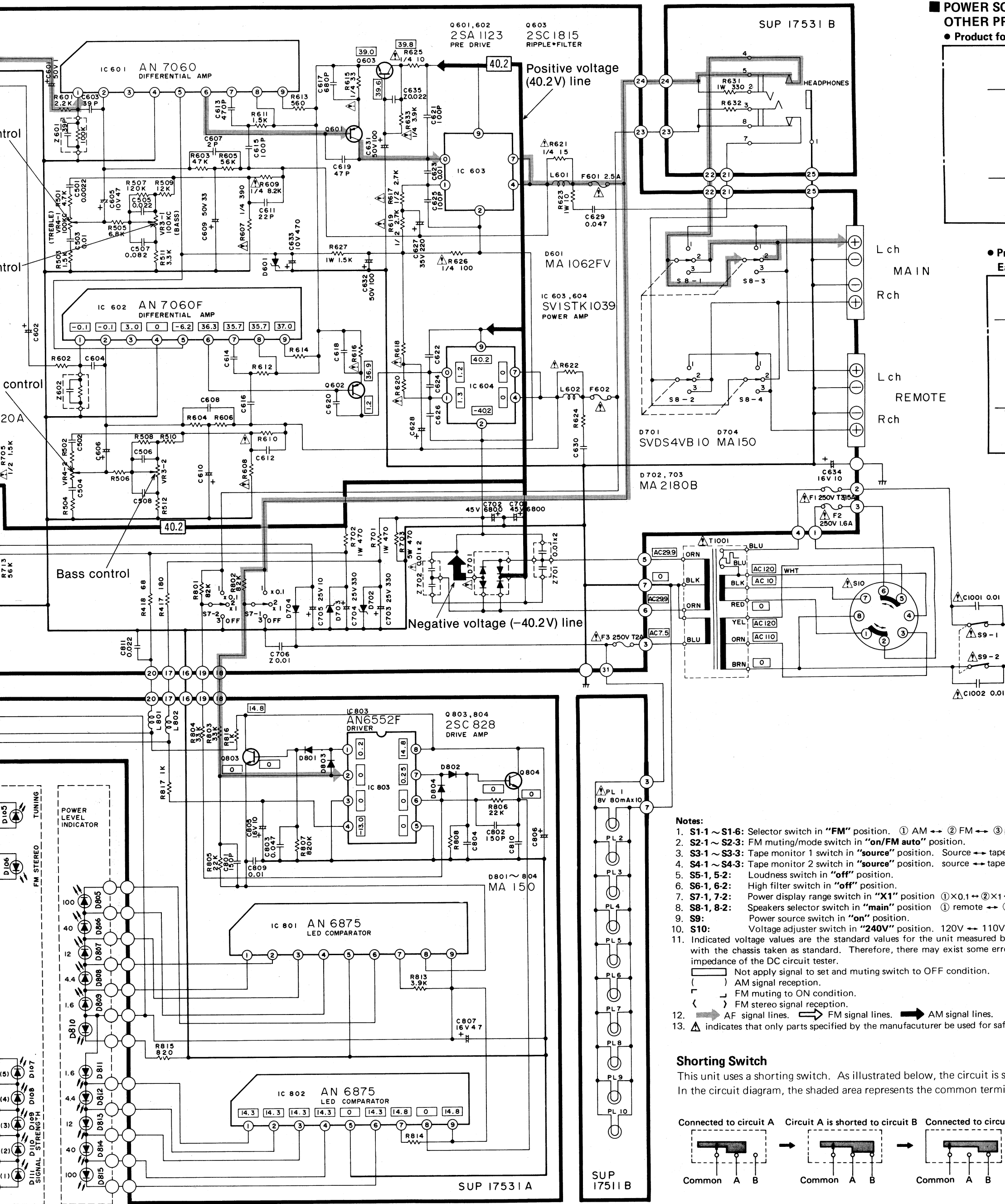
This unit uses a shorting switch. As illustrated below, the circuit is shorted to the next circuit without being opened. In the circuit diagram, the shaded area represents the common terminal.



An example of circuit diagram





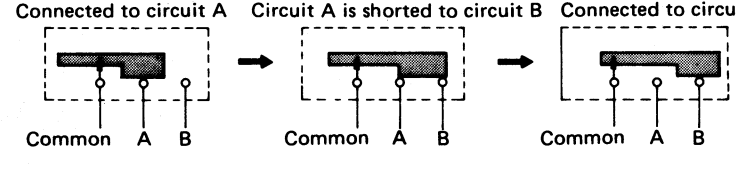


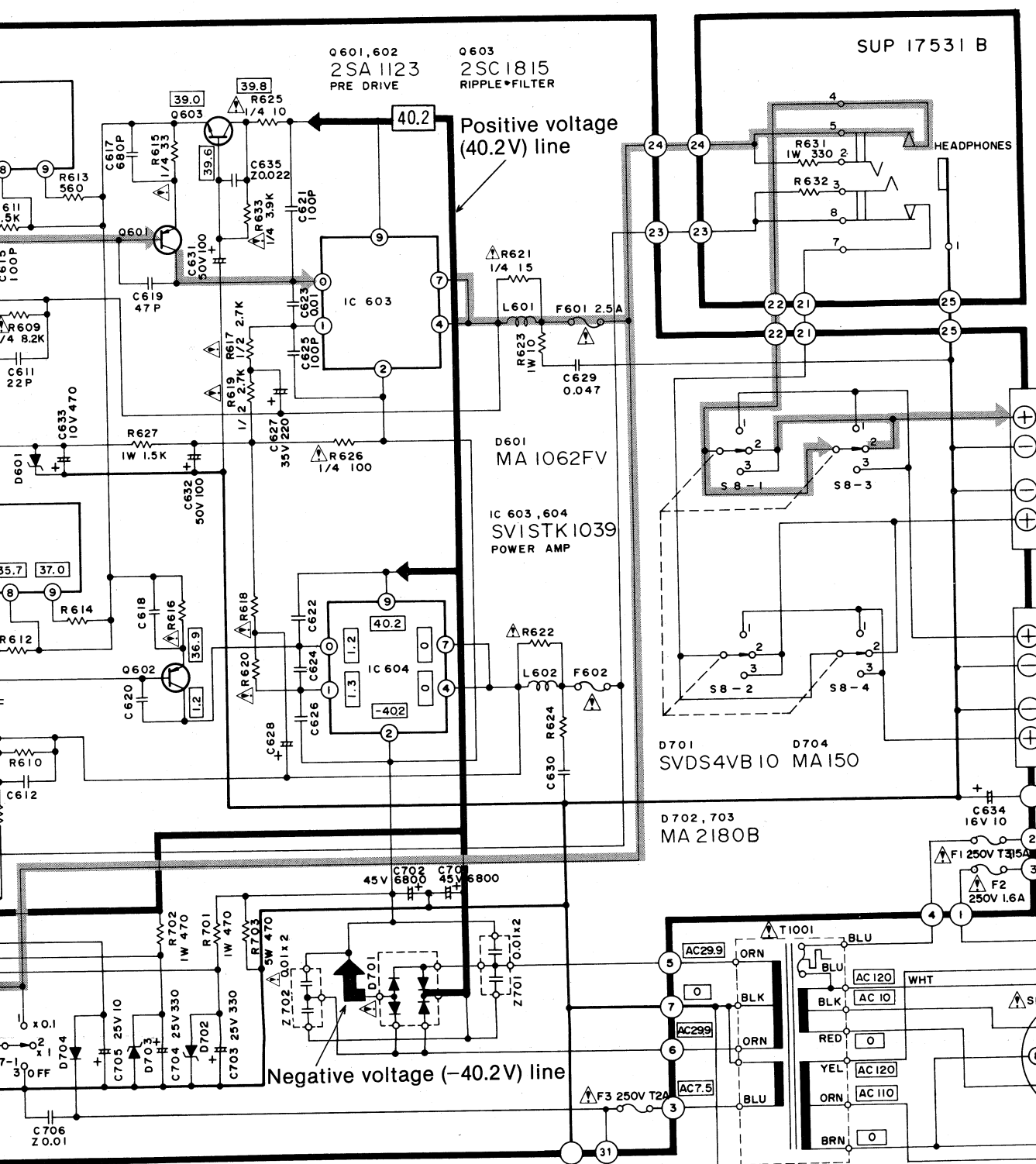
POWER SO
OTHER PR
Product for

- Notes:**
- S1-1 ~ S1-6: Selector switch in "FM" position. ① AM ↔ ② FM ↔ ③ p
 - S2-1 ~ S2-3: FM muting/mode switch in "on/FM auto" position.
 - S3-1 ~ S3-3: Tape monitor 1 switch in "source" position. Source ↔ tape
 - S4-1 ~ S4-3: Tape monitor 2 switch in "source" position. source ↔ tape 2
 - S5-1, 5-2: Loudness switch in "off" position.
 - S6-1, 6-2: High filter switch in "off" position.
 - S7-1, 7-2: Power display range switch in "X1" position ① ×0.1 → ② ×1 →
 - S8-1, 8-2: Speakers selector switch in "main" position ① remote ↔ ②
 - S9: Power source switch in "on" position.
 - S10: Voltage adjuster switch in "240V" position. 120V ↔ 110V
11. Indicated voltage values are the standard values for the unit measured by with the chassis taken as standard. Therefore, there may exist some error impedance of the DC circuit tester.
- Not apply signal to set and muting switch to OFF condition.
 - () AM signal reception.
 - () FM muting to ON condition.
 - () FM stereo signal reception.
12. → AF signal lines. → FM signal lines. → AM signal lines.
13. ⚠ indicates that only parts specified by the manufacturer be used for safe

Shorting Switch

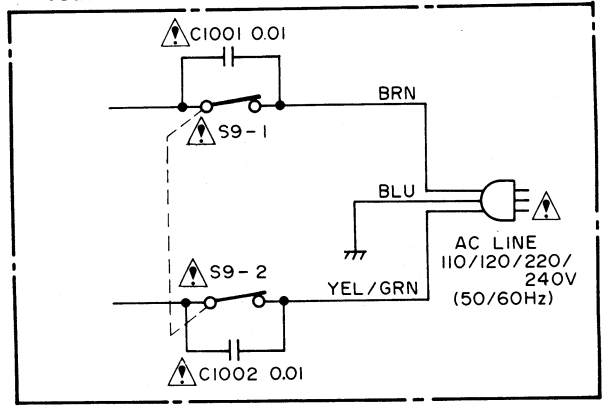
This unit uses a shunting switch. As illustrated below, the circuit is shunted. In the circuit diagram, the shaded area represents the common terminal.



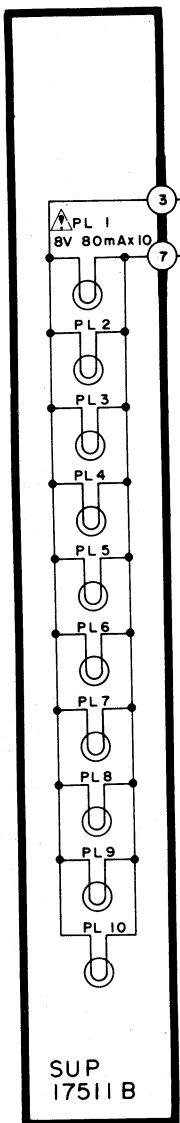
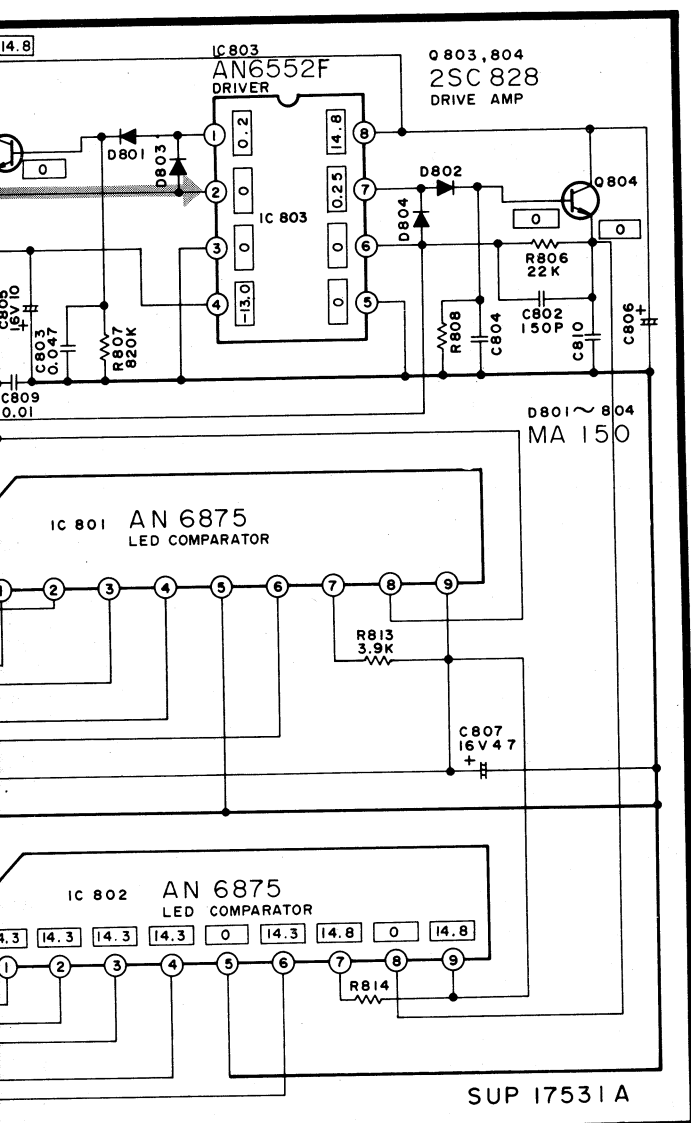
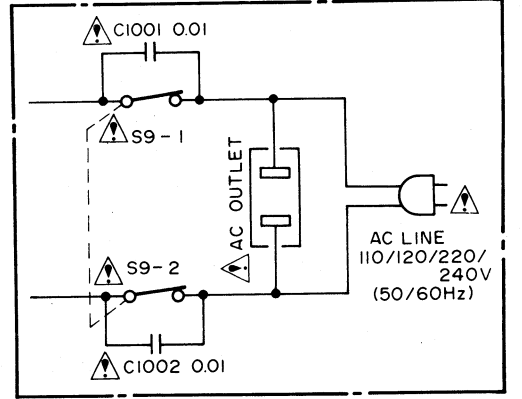


POWER SOURCE CIRCUIT OF OTHER PRODUCTS

Product for Australia [XAL] only



Product for Asia, Latin America, Middle East and Africa [XA]

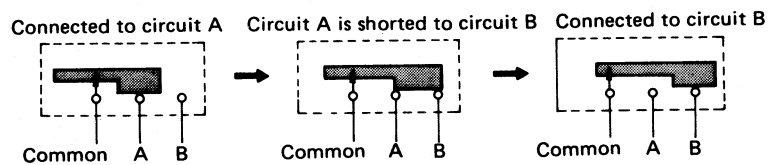


Notes:

- S1-1 ~ S1-6: Selector switch in "FM" position. ① AM ↔ ② FM ↔ ③ phono ↔ ④ aux
- S2-1 ~ S2-3: FM muting/mode switch in "on/FM auto" position.
- S3-1 ~ S3-3: Tape monitor 1 switch in "source" position. source ↔ tape 1
- S4-1 ~ S4-3: Tape monitor 2 switch in "source" position. source ↔ tape 2
- S5-1, 5-2: Loudness switch in "off" position.
- S6-1, 6-2: High filter switch in "off" position.
- S7-1, 7-2: Power display range switch in "X1" position ① X0.1 ↔ ② X1 ↔ ③ off
- S8-1, 8-2: Speakers selector switch in "main" position ① remote ↔ ② main ↔ ③ main and remote
- S9: Power source switch in "on" position.
- S10: Voltage adjuster switch in "240V" position. 120V ↔ 110V ↔ 220V ↔ 240V
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the voltage standards. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- Not apply signal to set and muting switch to OFF condition.
- AM signal reception.
- FM muting to ON condition.
- FM stereo signal reception.
- ➡ AF signal lines. ➡ FM signal lines. ➡ AM signal lines.
- △ indicates that only parts specified by the manufacturer be used for safety.

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

