

Service Manual

FM/AM Stereo Receiver

Receiver

SA-120



Color

(K) Black Type
(S) Silver Type

Color	Area
(K),(S)	[EX] Scandinavia and Switzerland
(K),(S)	[EH] Holland
(S)	[XA] Asia, Oceania, Africa and Middle Near East
(K),(S)	[XL] Australia
(S)	[XM] Latin America

Please use this manual together with the service manual for Model No. SA-120[M], Order No. HAD84022713C1

English

SPECIFICACIONES

(DIN 45 500)

■ AMPLIFIER SECTION

1 kHz continuous power output both channels driven	2 × 35W (8Ω)
Total harmonic distortion half power at 1 kHz	0.07% (8Ω)
Intermodulation distortion rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.5%
Power bandwidth both channels driven, -3 dB	10 Hz~30 kHz (8Ω)
Damping factor	30 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
CD/VIDEO/AUX, TAPE	150 mV/18kΩ
PHONO maximum input voltage (1 kHz, RMS)	130 mV
S/N	
rated power (8Ω)	
PHONO	68 dB (IHF, A: 71 dB)
CD/VIDEO/AUX, TAPE	88 dB (IHF, A: 95 dB)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
CD/VIDEO/AUX, TAPE	5 Hz~70 kHz (-3 dB)
Tone controls	
BASS	50 Hz, +10 dB~ -10 dB
TREBLE	20 kHz, +10 dB~ -10 dB
Output voltage	
REC OUT	150 mV
Channel balance, CD/VIDEO/AUX 250 Hz~6,300 Hz	±1 dB
Channel separation, CD/VIDEO/AUX	55 dB
Headphones output level and impedance	390 mV/330Ω
Load impedance	
MAIN or REMOTE	8Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz
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	
MONO	0.15%
STEREO	0.3%
S/N	
MONO	60 dB (76 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Frequency response	20 Hz~15 kHz, +1 dB~-2 dB
Alternate channel selectivity ±400 kHz	60 dB
Capture ratio	1 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	60 dB
Spurious response rejection at 98 MHz	70 dB
AM suppression	50 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	-33 dB (-35 dB, IHF)
38 kHz	-50 dB (-50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1,000 kHz
Antenna terminals	300Ω (balanced) 75Ω (unbalanced)

Technics

Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

■ AM TUNER SECTION

Frequency range	525~1,605 kHz
Sensitivity (S/N 20 dB)	20 μ V, 300 μ V/m
Selectivity	27 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

Deutsch

TECHNISCHE DATEN

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 x 35W (8 Ω)
Gesamtklirrfaktor	
halbe Nennleistung bei 1 kHz	0,07% (8 Ω)
Intermodulationsfaktor	
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,5%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei -3 dB	10 Hz ~ 30 kHz (8 Ω)
Dämpfungsfaktor	30 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 k Ω
CD/VIDEO/AUX, TAPE	150 mV/18 k Ω
Maximale TA-Eingangsspannung (1 kHz, eff.)	130 mV
Geräuschabstand	
Nennleistung (8 Ω)	
Phono	68 dB (nach IHF, A: 71 dB)
CD/VIDEO/AUX, TAPE	88 dB (nach IHF, A: 95 dB)
Frequenzgang	
Phono	RIAA-Standardkurve
	$\pm 0,8$ dB (30 Hz ~ 15 kHz)
CD/VIDEO/AUX, TAPE	5 Hz ~ 70 kHz (-3 dB)
Klangregler	
Baßregler (BASS)	50 Hz, +10 dB ~ -10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ -10 dB
Ausgangsspannung	
Aufnahmeausgang (REC OUT)	150 mV
Kanalabweichung (CD/VIDEO/AUX, 250 Hz ~ 6300 Hz)	± 1 dB
Übersprechdämpfung (CD/VIDEO/AUX)	55 dB
Kopfhörerpegel und -impedanz	390 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	8 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz
Eingangsempfindlichkeit	
S/R 30 dB	1,9 μ V (300 Ω), 1,3 μ V (75 Ω)
S/R 26 dB	1,7 μ V (300 Ω), 1,2 μ V (75 Ω)
S/R 20 dB	1,5 μ V (300 Ω), 0,9 μ V (75 Ω)
Nutzempfindlichkeit nach IHF	1,9 μ V (nach IHF '58)

■ GENERAL

Power consumption	180W
Power supply	
For United Kingdom and Australia	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
For others	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 x 97 x 249 mm
	(16-15/16" x 3-13/16" x 9-13/16")
Weight	5.0 kg
	(11.0 lb.)

Specifications are subject to change without notice for further improvement.

Stereoumschaltsschwelle bei 46 dB nach IHF	22 μ V/75 Ω
Gesamtklirrfaktor	
Mono	0,15%
Stereo	0,3%
Geräuschabstand	
Mono	60 dB (76 dB nach IHF)
Stereo	58 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ -2 dB)
Trennschärfe bei Störsender ± 400 kHz	60 dB
Einfangverhältnis	1 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	40 dB
ZF-Dämpfung bei 98 MHz	60 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	70 dB
MW-Unterdrückung	50 dB
Übersprechdämpfung	
1 kHz	40 dB
10 kHz	30 dB
Trägerrest	
19 kHz	-33 dB (-35 dB nach IHF)
38 kHz	-50 dB (-50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	$\pm 1,5$ dB
Begrenzereinsatz	1,2 μ V
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	300 Ω (symmetrisch)
	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	525 ~ 1605 kHz
Eingangsempfindlichkeit (S/R 20 dB)	20 μ V, 300 μ V/m
Trennschärfe	27 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	40 dB
ZF-Dämpfung bei 999 kHz	55 dB

■ ALLGEMEINE DATEN

Leistungsaufnahme	180 W
Netzspannung	
Für Kontinentaleuropa	Wechselstrom 50 Hz/60 Hz, 220V
Für andere Länder	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 x 97 x 249 mm
Gewicht	5,0 kg

Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

CARACTERISTIQUES

(DIN 45 500)

SECTION AMPLIFICATEUR

Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 × 35W (8Ω)
Distorsion harmonique totale à demi-puissance (1 kHz)	0,07% (8Ω)
Distorsion d'intermodulation à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,5%
Réponse de fréquences les deux canaux en circuit, −3 dB	10 Hz~30 kHz (8Ω)
Coefficient d'amortissement	30 (8Ω)
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
CD/VIDEO/AUX, TAPE	150 mV/18kΩ
PHONO (tension d'entrée maximum, 1 kHz RMS)	130 mV
Signal/Bruit	
à puissance nominale (8Ω)	
PHONO	68 dB (IHF, A: 71 dB)
CD/VIDEO/AUX, BANDE (CD/VIDEO/AUX, TAPE)	88 dB (IHF, A: 95 dB)
Réponse de fréquence	
PHONO	Courbe nominale RIAA ±0,8 dB (30 Hz~15 kHz)
CD/VIDEO/AUX, BANDE (CD/VIDEO/AUX, TAPE)	5 Hz~70 kHz (−3 dB)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Tension de sortie	
SORTIE ENREGISTREMENT (REC OUT)	150 mV
Equilibrage des canaux, CD/VIDEO/AUX 250 Hz~6 300 Hz	±1 dB
Séparation des canaux, CD/VIDEO/AUX	55 dB
Niveau de sortie des casques et impédance	390 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	8Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

SECTION SYNTONISATEUR FM

Gamme de fréquence	87,50~108,00 MHz
Sensibilité	
S/B 30 dB	1,9 μV (300Ω), 1,3 μV (75Ω)
S/B 26 dB	1,7 μV (300Ω), 1,2 μV (75Ω)
S/B 20 dB	1,5 μV (300Ω), 0,9 μV (75Ω)

Sensibilité utilisable IHF	1,9 μV (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μV/75Ω
Distorsion harmonique totale	
MONO	0,15%
STEREO	0,3%
Signal/Bruit	
MONO	60 dB (76 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +1 dB~ −2 dB
Sélectivité alternée par canal ±400 kHz	60 dB
Taux de capture	1 dB
Rejection d'image à 98 MHz	40 dB
Rejection FI à 98 MHz	60 dB
Rejection de réponse parasite à 98 MHz	70 dB
Suppression AM	50 dB
Séparation stéréophonique	
1 kHz	40 dB
10 kHz	30 dB
Fuite de porteuse	
19 kHz	−33 dB (−35 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	300Ω (symétrique) 75Ω (asymétrique)

SECTION SYNTONISATEUR AM

Gamme de fréquence	525~1605 kHz
Sensibilité (S/B 20 dB)	20 μV, 300 μV/m
Sélectivité	27 dB
Réjection d'image à 999 kHz	40 dB
Réjection FI à 999 kHz	55 dB

DIVERS

Consommation	180W
Alimentation	
Pour l'Europe	CA 50 Hz/60 Hz, 220V
Autres	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 97 × 249 mm
Poids	5,0 kg

Sujet à changement sans preavis.

ESPECIFICACIONES

(DIN 45 500)

SECCION AMPLIFICADOR

Potencia continua de 1 kHz en ambos canales	2 × 35W (8Ω)
Distorsión armónica total mitad de potencia a 1 kHz	0,07% (8Ω)
Distorsión por intermodulación potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,5%
Ancho de banda de potencia con ambos canales, −3 dB	10 Hz~30 kHz (8Ω)
Factor de amortiguamiento	30 (8Ω)
Sensibilidad e impedancia de entrada	
TOCADISC. (PHONO)	2,5 mV/47kΩ
CD/VIDEO/AUX., TAPE (CD/VIDEO/AUX, TAPE)	150 mV/18kΩ
Voltaje máximo de entrada de PHONO (1 kHz, RMS)	130 mV
Relación de señal a ruido potencia de régimen (8Ω)	
TOCADISC. (PHONO)	68 dB (IHF, A: 71 dB)
CD/VIDEO/AUX., GRAB. (CD/VIDEO/AUX, TAPE)	88 dB (IHF, A: 95 dB)
Respuesta de frecuencia TOCADISC. (PHONO)	curva RIAA estándar ±0,8 dB (30 Hz~15 kHz)
CD/VIDEO/AUX., GRAB. (CD/VIDEO/AUX, TAPE)	5 Hz~70 kHz (−3 dB)
Controles de tono	
BAJOS (BASS)	50 Hz, +10 dB~ −10 dB
AGUDOS (TREBLE)	20 kHz, +10 dB~ −10 dB
Voltaje de salida	
SAL. GRAB. (REC OUT)	150 mV
Equilibrio de canales, CD/VIDEO/AUX 250 Hz~6 300 Hz	±1 dB
Separación de canales, CD/VIDEO/AUX	55 dB
Impedancia y nivel de salida de los auriculares	390 mV/330Ω
Impedancia de carga	
MAIN o REMOTE	8Ω~16Ω
MAIN y REMOTE	8Ω~16Ω

SECCION PARA SINTONIZADOR FM

Gama de frecuencias	87,50~108,00 MHz
Sensibilidad	
Señal a ruido 30 dB	1,9 μV (300Ω), 1,3 μV (75Ω)
Señal a ruido 26 dB	1,7 μV (300Ω), 1,2 μV (75Ω)
Señal a ruido 20 dB	1,5 μV (300Ω), 0,9 μV (75Ω)
Sensibilidad utilizable IHF	1,9 μV (IHF '58)

Sensibilidad de acallamiento estéreo de 46 dB IHF	22 μV/75Ω
Distorsión armónica total	
MONO. (MONO)	0,15%
ESTEREO (STEREO)	0,3%
Relación de señal a ruido	
MONO. (MONO)	60 dB (76 dB, IHF)
ESTEREO (STEREO)	58 dB (70 dB, IHF)
Respuesta de frecuencia	20 Hz~15 kHz, +1 dB~ −2 dB
Selectividad alternada de canal ±400 kHz	60 dB
Relación de captura	1 dB
Rechazo de imagen a 98 MHz	40 dB
Rechazo de F.I. a 98 MHz	60 dB
Rechazo de respuesta espuria a 98 MHz	70 dB
Supresión AM	50 dB
Separación estereofónica	
1 kHz	40 dB
10 kHz	30 dB
Fuga de onda portadora	
19 kHz	−33 dB (−35 dB, IHF)
38 kHz	−50 dB (−50 dB, IHF)
Equilibrio de canales 250 Hz~6 300 Hz	±1,5 dB
Punto de límite	1,2 μV
Ancho de banda	
Amplificador FI	180 kHz
Demodulador FM	1000 kHz
Bornes de antena	300Ω (equilibrado) 75Ω (no equilibrado)

SECCION PARA SINTONIZADOR AM

Gama de frecuencias	525~1605 kHz
Sensibilidad (Relación de señal a ruido de 20 dB)	20 μV, 300 μV/m
Selectividad	27 dB
Rechazo de imagen a 999 kHz	40 dB
Rechazo de F.I. a 999 kHz	55 dB

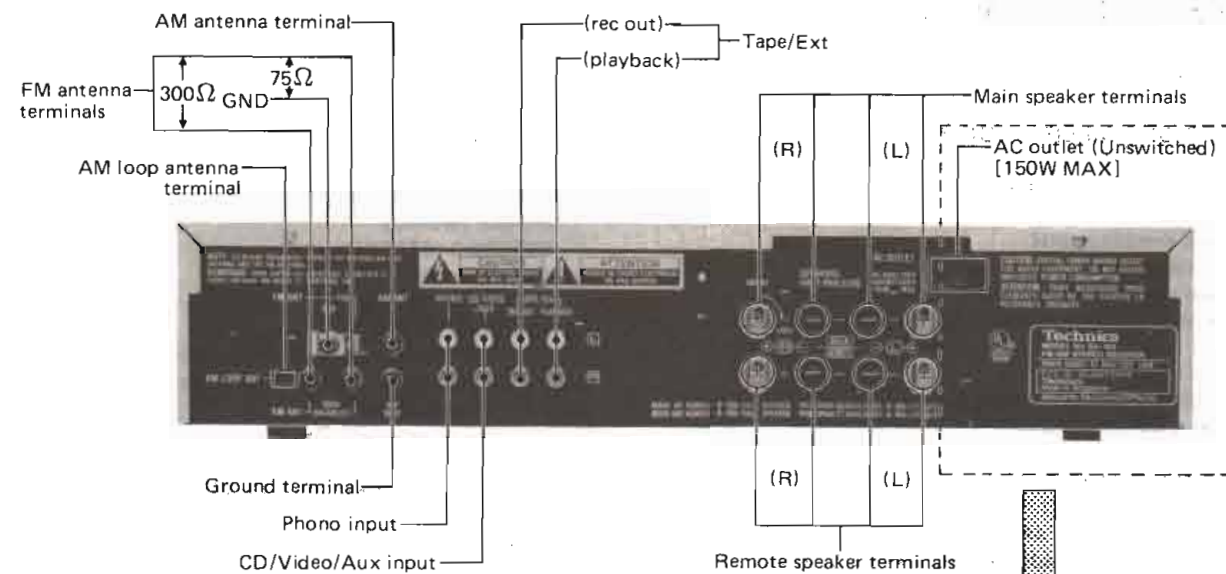
GENERAL

Consumo de energía	180W
Alimentación de energía	
Para Europa continental	CA 50 Hz/60 Hz, 220V
Para otros países	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensiones (An.×Al.×Prof.)	430 × 97 × 249 mm
Peso	5,0 kg

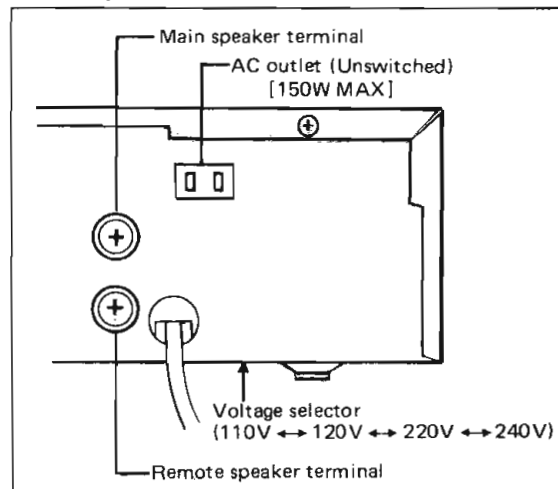
Estas especificaciones están sujetas a cualquier cambio sin previo aviso.

LOCATION OF CONTROLS

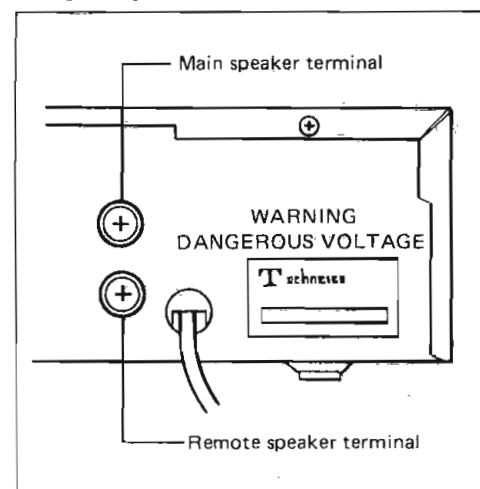
• Change of the Rear panel



For [XA, XM] areas



For [other] areas



- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.

- * [XA, XM] areas is provided with voltage selector and AC outlets.
- * 240V (50/60Hz) for Australia.
- * 220V (50/60Hz) for Continental Europe.
- * 110V/120V/220V/240V (50/60Hz) for other [XA, XM] areas.
- * Phono input capacitance is about 150pF.

BEFORE REPAIR AND ADJUSTMENT

1. Turn off the power supply and short-circuit of power supply capacitors (C701, C702, 4700μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Do not short between C701 and C702 by screwdriver. It may damage the component.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current is free of abnormality. The consumed current at 60Hz/50Hz in no signal mode is shown below with respect to supply voltage 110V/120V/220V/240V.

Power supply voltage		AC110V	AC120V	AC220V	AC240V
Consumed current	50/60Hz	100 ~ 300 mA	100 ~ 300 mA	50 ~ 150 mA	50 ~ 150 mA

MESSUNGEN UND JUSTIERUNGEN

Anmerkung: Die AM OSC-Spule (L201) und AM ZFT (T202) sind bereits justiert und benötigen keine Justierung.

AM (MW)-EINSTELLUNG

• Stellungen und zu benutzende Geräte

1. Elektronische Voltmeter für Wechselstrom (VTVM).
2. AM (MW)-Meßsender (AM-SG).
3. Bereichsschalter AM (MW/LW Abgleich)
4. Die Netzspannung auf ihren Sollwert einstellen.

5. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
6. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.

Nr.	AM (MW) MESSENDER		SKALENZEIGEREINSTELLUNG DES TUNER	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverfahren
	ANSCHLUSS	FREQUENZ				
	MW-HF-ABGLEICH * Bandwahlschalter in die "MW"-position stellen.					
1	AM-MO über 200 pF-Kondensator an den AM-Antennenanschluß anschließen, wie in Abb. 10 gezeigt. (Schwacher Eingang.)	600kHz (400Hz Modul., 30%)	600kHz	Wechselstrom Voltmeter oder Oszilloskop über den Lautsprecher schließen.	L205 (MW Ant. Spule) L206 (MW Osc. Spule)	• Auf max. Ausgang abgleiche.
2		1500kHz (400Hz Modul., 30%)	1500kHz	Wechselstrom Voltmeter oder Oszilloskop über den Lautsprecher schließen.	CT204 (MW Osc. Trimmer) CT203 (MW Ant. Trimmer)	• Auf max. Ausgang abgleichen. • Schritt (1) und (2) sind zu wiederholen.

FM (UKW)-EINSTELLUNG

• Stellungen und zu benutzenden Geräte

1. UKW-Meßsender (FM-SG).
2. Oszilloskop
3. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM).
4. Signalfrequenzmesser (meßbar für 19kHz und 108MHz).
5. Den Eingangswähler auf die "FM" position stellen.
6. Den UKW-Betriebsart-Wahlschalter in die position "off/FM mono" stellen.
7. Die anderen Einstellungen sind gleich wie bei der MW-position.

- * TP201 mit einer Kurzschlußbrücke an TP202 Kurzschließen (nur während der UKW-HF-Justierung), und diese Kurzschlußbrücke für alle anderen Justierungen entfernen.

• Vorbereitung des UKW-Meßoszillators (UKW-MO)

- Die Normal-Eingangsleistung dieses Gerätes beträgt 60 dB (1 mV), 400Hz, 100% Modulation. (Wegen der Dämpfung bei Verwendung von Koaxialkabeln, muß die MO-Ausgangsleistung 6 dB oder mehr betragen; d.h. wenn die Eingangsleistung 60 dB beträgt, muß der MO-Ausgang 66 dB betragen.)

UKW-ZF-ABGLEICH						
3	FM-SG an den FM-Antennenanschluß entsprechend Abb. 11. (60 dB an den Antennenanschluß legen.)	100MHz (100% Mod. with 400Hz)	100MHz	Ein Gleichstrom Voltmeter zwischen TP201 (+) und TP202 (-) über eine Drosselspule verbinden (siehe Abb. 11)	T201 (Diskriminator FT)	• Den Kern von T201 so justieren, daß die gemessene Spannung im signallosen Modus 0mV im 150mV Bereich beträgt.
UKW-HF-ABGLEICH * TP201 mit einer Kurzschlußbrücke an TP202 Kurzschließen.						
4	FM-SG an den FM-Antennenanschluß entsprechend Abb. 11. (60 dB an den Antennenanschluß legen.)	90MHz (400Hz Modul., 100%) Schwacher Eingang	90MHz	Oszilloskop über den Lautsprecher schließen.	L204 (Osc. Spule) L202 (HF DET Spule)	• Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. • So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 13)
5		106MHz (400Hz Modul., 100%) Schwacher Eingang	106MHz	Oszilloskop über den Lautsprecher schließen.	CT202 (OCS. Trimmer)	• Bei Einstellung von (4) und (5) wiederholen, bis die Frequenz mit der Skala übereinstimmt.

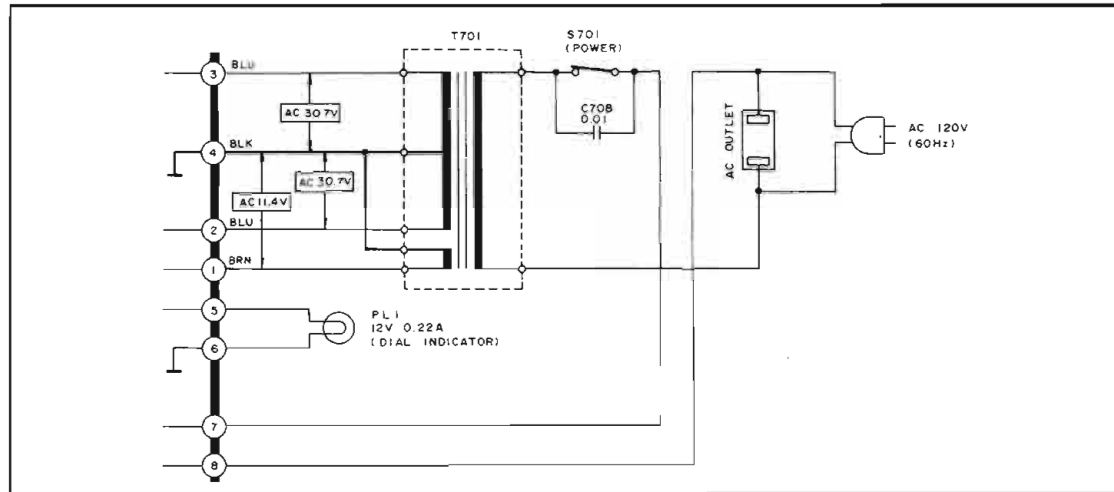
UKW-STEREO-DEKODER-ABGLEICH

UNTER VERWENDUNG EINES ZÄHLERS		ALTERNATIVE-MEß METHODE	
1. Unmoduliertes Mono-Signal 100MHz in das Gerät speisen.		1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen.	
2. FM muting/mode-Schalter auf "on/FM auto" stellen.		2. VR301 so einstellen, bis die Stereolampe aufleuchtet.	
3. Zähler über einen Widerstand 100k ohm an TP301 schließen. (Vgl. Abb. 12)		Schleifer von VR301 sichern, wie in Abb. 14 gezeigt.	
4. VR301 auf 19kHz ± 30Hz einstellen.			
• Prüfpunkte Überlastungs-Detektorschaltung (1) 4Ω-Last an den Lautsprecheranschluß anschließen. (2) 1kHz-Signal vom Niederfrequenzoszillator an das Gerät anlegen und den Lautstärkeregler so einstellen, daß die Ausgangsspannung 5V beträgt.		(3) 3,3Ω-(2W)-Last an den Lautsprecheranschluß anschließen. (4) Überprüfen, daß keine Ausgangsleistung ausgegeben wird. • Falls die Schutzschaltung wegen Überlastung ausschaltet, werden die Schaltung und die Last nur dann in den normalen Zustand zurückversetzt, wenn der Netzschalter zuerst aus- und dann wieder eingeschaltet wird.	

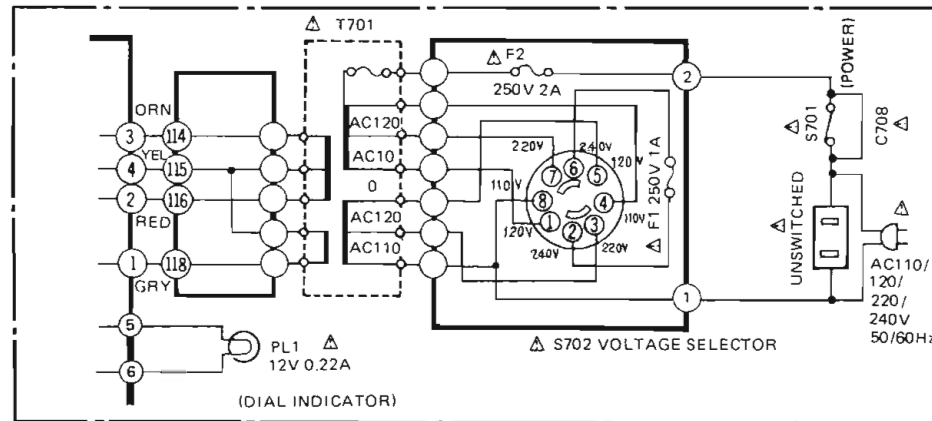
SCHEMATIC DIAGRAM

• Change of power supply

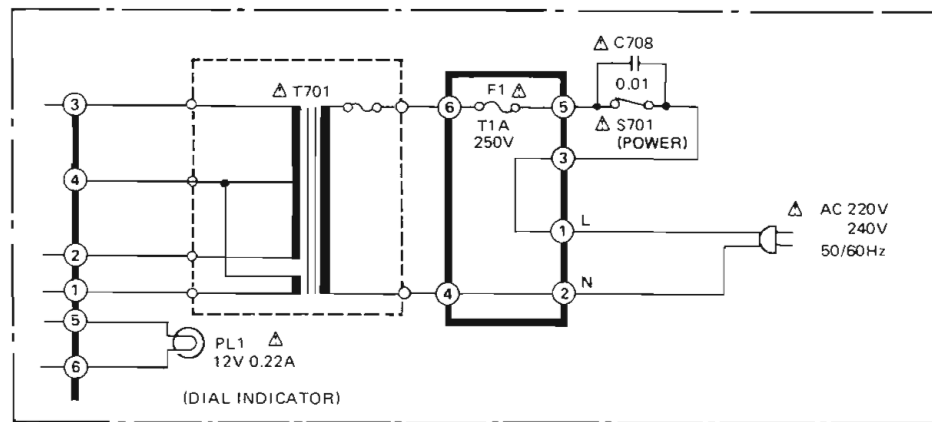
For [M] area



For [XA, XM] areas



For [other] areas

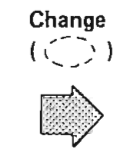
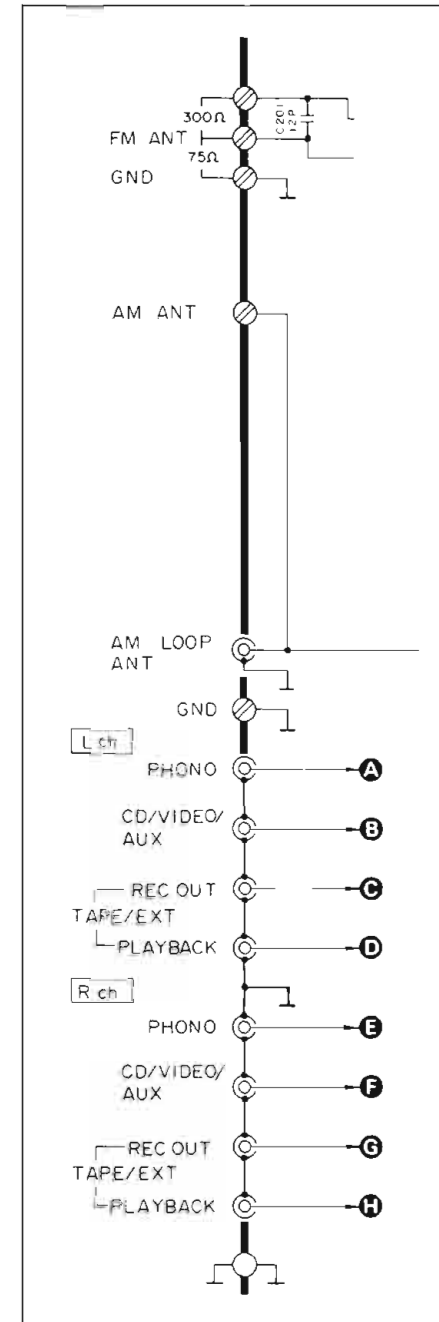


Important safety notice:

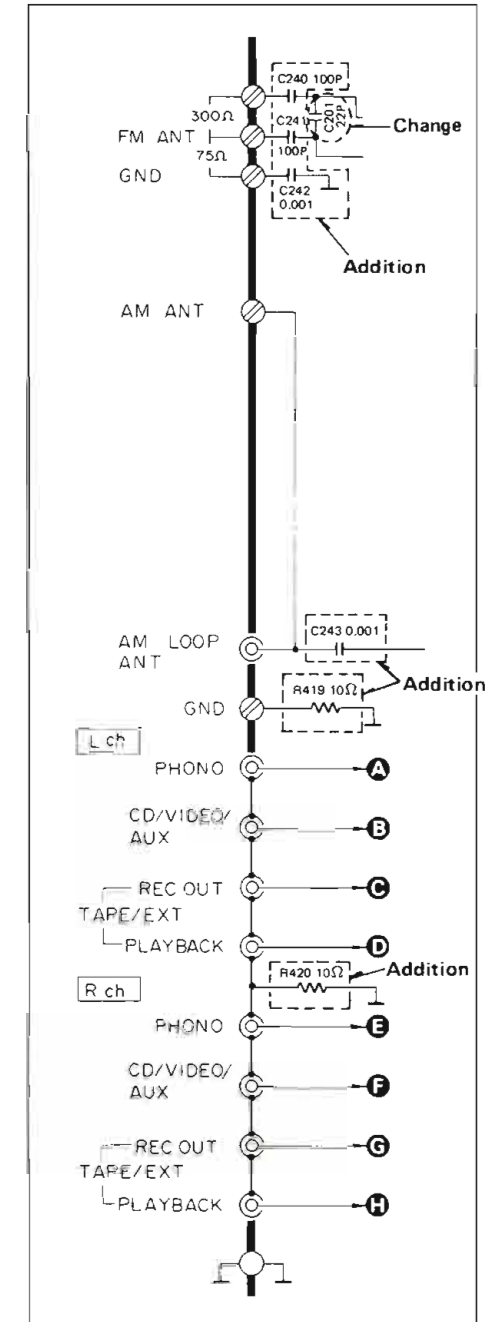
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

• Change of the terminal

For [M] area

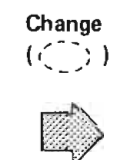
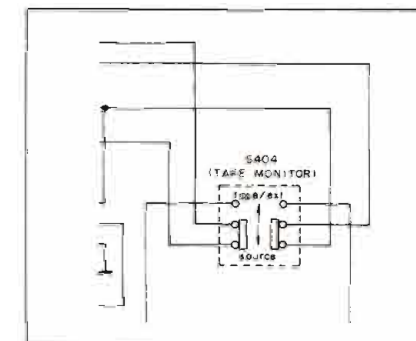


For [XL] area

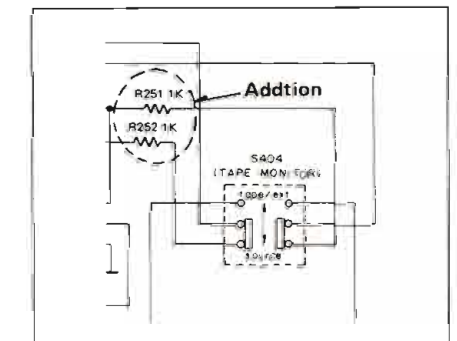


• Change of the resistors (R251, 252)

For [M] area

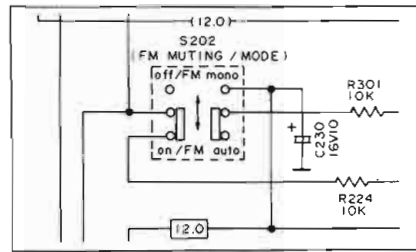


For [EX, EH, XA, XL, XM] areas



Change of the capacitors

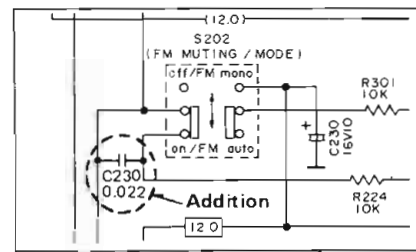
For [M] area



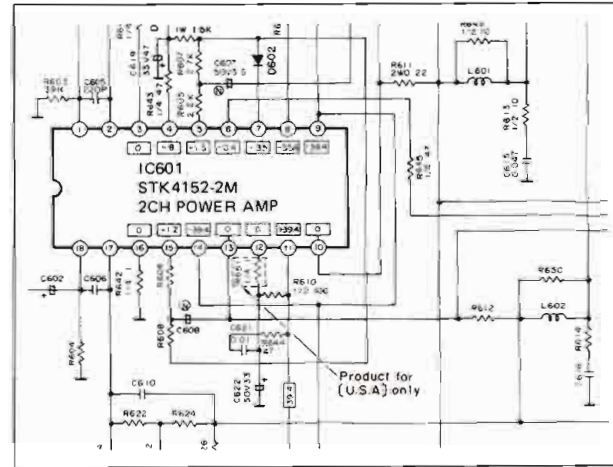
Change



For [EX,EH,XA,XL,XM] areas



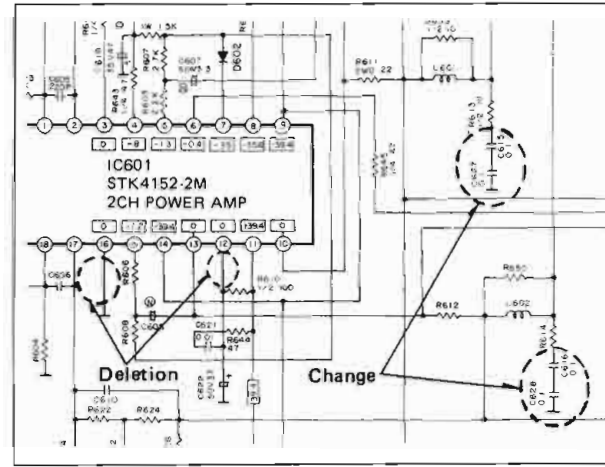
For [M] area



Change



For [EX,EH,XA,XL,XM] areas



Change of the replacement parts list

CHANGE

Ref. No.	Change of Part No.	Part Name & Description
SA-120 [M]	SA-120 [EX,EH,XA,XL,XM]	
TRANSFORMERS		
T701	SLT5M373	SLT5M383 [EX, EH] SLT5M385 [XL] SLT5M387 [XA, XM]
FUSE		
F1	XBA1F30NU14	XBA2C10TR0 [EX, EH]
F2	Addition	XBA2C20TR0 [XA, XM] only
SWITCHES		
S702	Addition	ESE37219 [XA, XM] only
RESISTORS		
R307, 308	ERD25FJ332	ERD25FJ222 Carbon, 1/4W 2.2KΩ
R311	ERD25TJ274	ERD25TJ334 Carbon, 1/4W 330KΩ
R251, 252	Addition	ERD25FJ102 Carbon, 1/4W 1KΩ
R419, 420	Addition	ERD25FJ100 Carbon, 1/4W, 10Ω [XL] only
R642	ERD25FJ1R0	Deration
R651	ERD25FJ1R0	Deration
CAPACITORS		
C201	ECCD1H120KC	ECCD1H220KC Ceramic, 50V, 22PF
C230	Addition	ECKD1H223ZF Ceramic, 50V, 0.022μF
C240, 241	Addition	ECKDHS101MB Ceramic, AC400V, 100pF, [XL] only
C242, 243	Addition	ECKDHS102MD Ceramic, AC400V, 0.001μF, [XL] only
C245	Addition	ECKD1H102ZF Ceramic, 50V, 0.01μF
C615, 616, 627, 628	ECKD1H473ZF	ECQM1H104KV Polyester, 50V, 0.1μF
C701, 702	ECETS45V472U	ECET42V472Z 45V, 4700μF [XA, XM] only ECET42V472Z 42V, 4700μF [Other]
C703	ECKD2H103PE	ECKD2H103PE DC500V, 0.01μF [XA, XL, XM] ECQE1104KN DC100V, 0.1μF [EX, EH]

Ref. No.	Change of Part No.	Color	Part Name & Description
SA-120 [M]	SA-120 [EX,EH,XA,XL,XM]		
CABINET and CHASSIS PARTS			
2	SGWA120-SM	SGWA120-SE [EX, EH, XL] SGWA120-KE [XA, XM]	Front Panel, Ass'y
3	SGU333-13	SGU333-14 [EX, EH, XL] SGU333-15 [XA, XM]	Dial Scale
5	SGX7657	SGX7657 [EX, EH, XL] SGX7657-2 [XA, XM]	Front Sub Panel
6	SBD69-2T	SBD69-1T [EX, EH, XL] SBD69-2T [XA, XM]	Knob, Tone
8	SHS1068-1	SHG6363 [EX, EH, XL] SHS1068-1 [XA, XM]	Spacer, Button
20	SHR411	XTB3+8G [EX, EH, XL] XTB3+8G [XA, XM]	Screw, Tapping, 3x8
21	SBD77T	SBD77T [EX, EH, XL] SBD77-1T [XA, XM]	Knob, Volume
25	SBC483-6T	SBC483-6T [EX, EH, XL] SBC483-8T [XA, XM]	Button, Speaker
33	SKC1352S1	SKCA121-SM [EX, EH, XL] SKCA121-KC [XA, XM]	Cabinet, Ass'y
34	SKUA120-SM	SKUA120-SE [EX, EH, XL] SKUA120-SX [XA, XM]	Bottom Board
35	SJF8035-8N	SJF8035-8N [EX, EH, XA, XM] SJF8035-9N [XL] only	Terminal Board
37	SGP6130A	SGP6130-2A [EX, EH] SGP6130-3A [XA, XM] SGP6130-4A [XL]	Rear Panel
38	SJS9221	SJS9221 [XA, XM] only Deration [EX, EH, XL]	Socket
39	RHR111	SHR127 [EX, EH, XA, XM] SHR131 [XL] only	Bushing

REPLACEMENT PARTS LIST

Notes:

- Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
- Important safety notice: Components identified by mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- ⊗ —marked parts are used for black only, while ○ —marked parts are for silver type only.
- Part other than ⊗ — and ○ —marked are used for both black and silver type.
- Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
- The "S" mark is service standard parts and may differ from production parts.
- The parenthesized numbers in the column of description stand for the quantity per set.

Areas

- * [EX] is available in Scandinavia and Switzerland.
- * [EH] is available in Holland.
- * [XA] is available in Asia, Oceania, Africa and Middle Near East.
- * [XL] is available in Australia.
- * [XM] is available in Latin America.

Black type model No. SA-120(K)

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS		
IC201	AN7273A	FM IF Det. & AM Converter
IC301	SVIUPC1161C3	MPX
IC401	AN6553F	Equalizer
IC601	STK4152-2M	Power
TRANSISTORS		
Q201	2SK241-GR	FM-RF Amp.
Q202	2SC1047-D	Mixer
Q203	2SC1675-L	FM OSC
Q204, 205	2SC829-C	FM-IF Amp.
Q206, 207, 604, 702	2SC828AS	LED Drive, Muting Regulator
Q601, 602	2SA921-R	Over Load Det.
Q603	2SA564AR	Regulator
Q701	2SD1265-O	Regulator

Ref. No.	Part No.	Part Name & Description
DIODES		
D201	1S2687AA	FM AFC
D202	MA27W-A	
D203	LN446YP	L. E. D. (Tuning)
D301	LN846RP	L. E. D. (Stereo)
D302, 602~606	MA162A	Switching
D601	SVDRD8.2EB	Zener, 8.2V
D607	SVDSR1K2	Rectifier
D701~704	SVDS2V20	Rectifier
D705	MA1160M	Zener, 16V
D706	MA1062M	Zener, 6.2V
COILS		
L201	SLA4N39	FM Antenna
L202	SLD4P71-P	FM Detector
L203	SLQ212G1-D	Choke

Ref. No.	Part No.	Part Name & Description
COILS		
L204	SL04P121-P	FM Oscillator
L205	SLA2C9-P	AM Antenna
L206	SL02C33-P	AM Oscillator
L601, 602	SLQY07G-30	Choke
TRANSFORMERS		
T201	SLI4C539-P	FM IFT
T202	SLI2C139-M	AM IFT
T701 (EX, EH)	SLT5M383	Power Source
T701 (XA, XM)	SLT5M387	Power Source
T701 (XL)	SLT5M385	Power Source

● Change of the exploded view

CHANGE

Ref. No.	Part No.	Part Name & Description
CERAMIC FILTERS		
CF201, 202	SVFE107MS2-A	FM, 10.7MHz (Red)
	SVFE107MS2-B	FM, 10.675MHz (Blue)
	SVFE107MS2-C	FM, 10.725MHz (Orange)
	SVFE107MS2-D	FM, 10.650MHz (Black)
	SVFE107MS2-E	FM, 10.750MHz (White)
(Use pair ranks as same as CF201 and CF202)		
CF203	SVFSFU450B3	AM, 450KHz

VARIABLE RESISTORS		
VR301	EVN75AA00B53	VCO Adjustment, 5kΩ (B)
VR501	EWE00605A15S	Volume Control, 100kΩ (A)
VR502	EVD00305G15S	Balance Control, 100kΩ (G)
VR503, 504	EWD00205C15S	Tone Control, 100kΩ (C)

VARIABLE CAPACITORS		
CT202	ECV1ZW10X32E	Trimmer, FM OSC
CT203	ECRHA007A11	Trimmer, AM Antenna
CT204	ECRHA010A11	Trimmer, AM OSC
CV201~204	SVCCB41T914	Tuning Gang

COMPONENT COMBINATIONS		
Z301, 302	EXRP181K473C	180pF, 47kΩ

LAMP		
PL1	XAMR78S250	12V, 0.22A

FUSE		
F1	XBA2C10TRO	250V, T1A
F2(XA, XM) only	XBA2C20TRO	250V, T2A

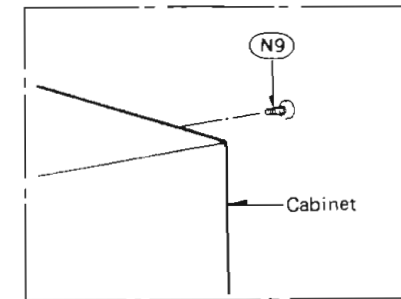
SWITCHES		
S201	SSH1151	Band Selector (FM/AM)
S202, 404	SSH1031	Mode, Tape Monitor
S401, 402, 403	SSH3069	Input Selector
S601	SSH1149	Speaker (Main)
S602	SSH1073	Speaker (Remote)
S701	SSH1071	Power Source
S702	ESE37219	Voltage Selector
[XA, XM] only		

CABINET and CHASSIS PARTS		
1	SUS305	Bracket (1)
2	SGWA120-SE	Front Panel, Ass'y (Silver Type) (1)
2	SGWA120-KE	Front Panel, Ass'y (Black Type) (1)
3	SGU333-13	Dial Scale (Silver Type) (1)
3	SGU333-14	Dial Scale (Black Type) (1)
4	SBN1091	Knob, Tuning (1)
5	SGX7657	Front Sub Pane (Silver Type) (1)
5	SGX7657-2	Front Sub Pane (Black Type) (1)
6	SBD69-2T	Knob, Tone (Silver Type) (3)
6	SBD69-1T	Knob, Tone (Black Type) (3)
7	SBC627	Button, Power Switch (1)
8	SHG6363	Spacer, Button (1)

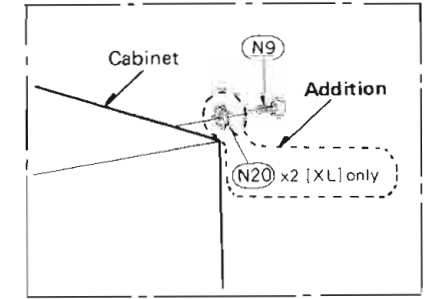
CABINET and CHASSIS PARTS		
9	SUS257	Spring, Button (8)
10	SBC583-1T	Button, Input Selector (3)
11	SBC483-7T	Button, Band Selector (1)
12	SUR152M	Bracket, Tuning Shaft (1)
13	\$HR5253	Spacer, Drum (1)
14	\$DD105	Drum, Dial (1)
15	\$US295-1	Spring, Dial Drum (1)
16	SDZ051-2	Cord, Dial (1.8m)
17	SDT8095-1	Tuning Shaft (1)
18	SDR31	Roller, Dial (4)
19	SGX7463-3	Ornament, Volume (1)
20	SHR411	Lock Pin (2)
21	○ SBD77T	Knob, Volume (Silver Type) (1)
21	Ⓚ SBD77-1T	Knob, Volume (Black Type) (1)
22	SBZ657-1	Slider (1)
23	SBC423T	Button (2)
24	SHR9727	Sheet (1)
25	○ SBC483-6T	Button, Speaker (Silver Type) (2)
25	Ⓚ SBC483-8T	Button, Speaker (Black Type) (2)
26	SUG181	Guide, Pointer (1)
27	SGX7461-3	Ornament (1)
28	SBZ663-1	Slider (3)
29	SHP59	Spacer, Pointer (1)
30	SDP1167-1	Dial, Pointer (1)
31	SJJ71B	Jack, Headphone (1)
32	SUW1989	Bracket (1)
33	○ SKCA121-SM	Cabinet (Silver Type) (1)
33	Ⓚ SKCA121-KC	Cabinet (Black Type) (1)
34(XA, XM) only	SKUA120-SX	Bottom Board (1)
34 other areas [34-1]	SKUA120-SE [SKL245-2]	Bottom Board (1)
35(XL) only	SJF8035-9N	Terminal Board (1)
35 other areas	SJF8035-8N	Terminal Board (1)
36	SJF4815-2	Terminal Board (1)
37(EX, EH)	SGP6130-2A	Rear Panel (1)
37(XA, XM)	SGP6130-3A	Rear Panel (1)
37(XL)	SGP6130-4A	Rear Panel (1)
38(XA, XM) only	SJS9221	Socket, AC Outlet (1)
39(XL) only	SHR131	Bushing, AC Cord (1)
39 other areas	SHR127	Bushing, AC Cord (1)
40(XL) only	QFC1207MA	AC Cord (1)
40 other areas	SJA138-3	AC Cord (1)
41	SJS5327	Holder, Fuse (2)
42	SMN1823	Socket (1)
43(EX, EH, XL) only	SMN1823	Bracket, P.C.B (1)
44(EX, EH, XL) only	SMX435	Insulation Cover (1)
SCREWS		
N1	XTBS3+8BFZ1	Tapping with Detent, 3×8 (1)
N2(XL)	XTBS3+8BFYR1	Tapping, 3×8 (8)
N2 other areas	XTBS3+8BFYR	Tapping with Detent, 3×8 (8)

SCREWS		
N3	XTN3+8B	Tapping, 3×8 (1)
N4	XTB3+8BFZ	Tapping, 3×8 (7)
N5	XSN26+5FZ	3×5 (1)
N6	XSN3+8BVS	3×8 (2)
N7	XTB3+16BFN	Tapping, 3×16 (2)
N8	○ SNE2095-4	(Silver Type) (4)
N8	Ⓚ SNE2095-5	(Black Type) (4)
N9	XTB3+8BFN	Tapping, 3×8 (Silver Type) (2)
N9	Ⓚ XTB3+8BFZ	Tapping, 3×8 (Black Type) (2)
N16(XA, XM) only	XSN3+8BNS	3×8 (1)
N17(EX, EH, XL) only	XTBS3+8BFZ1	Tapping with Detent, 3×8 (2)
N18(EX, EH, XL) only	XTW3+8H	Tapping, 3×8 (1)
N19	XTB3+8G	Tapping, 3×8 (1)
WASHERS		
N10	RNW150-2	(8)
N11	XWD11B	External Toothed Lock, φ11 (1)
N12	XWG3	Plain, φ3 (2)
N13	XWA26BFZ	Spring, φ2.6 (1)
N14	XWC3B	External Toothed Lock, φ3 (2)
N20(XL) only	XWC3BFN	External Toothed Lock, φ3 (2)
N20(XL) only	XWC3BFZ	(Silver Type) External Toothed Lock, φ3 (2)
N21(XA, XM) only	XWG3	Plain, φ3 (1)
N22(XA, XM) only	XWA3B	Spring, φ3 (1)
NUT		
N15	XNS11	φ11 (1)
ACCESSORIES		
A1	SSA269	Cord, FM Antenna (1)
A2	SSA902	Loop Antenna (1)
A3	SMA231	Holder (1)
A4	SMA233-1	Holder (1)
A5	XTN3+10AFZ	Screw, Loop Antenna Holder (2)
A6(EX, XL)	SQF12083	Instruction Book (1)
A6(XA, XM)	SQF12084	Instruction Book (1)
A6(EX)	SQF12085	Instruction Book (1)
A7(XA, XM) only	SJP5213-1	Plug Adaptor (1)
PACKING PARTS		
P1	○ SPP699	Polyethylene Bag (Silver Type) (1)
P1	Ⓚ SPP649	Polyethylene Bag (Black Type) (1)
P2	SPS4039	Pad, Front Side (1)
P3(XA, XM) only	SPS3515-4	Pad, Left Side (1)
P3 other areas	SPS3515-3	Pad, Left Side (1)
P4(XL) only	SPS3517-3	Pad, Right Side (1)
P4 other areas	SPS3517-2	Pad, Right Side (1)
P5(EX, EH)	SPG4874	Carton Box (2)
P5(XA, XM)	SPG4875	Carton Box (1)
P5(XL)	SPG4876	Carton Box (1)
P6	SGK1413	Label, (Black Type only) (2)

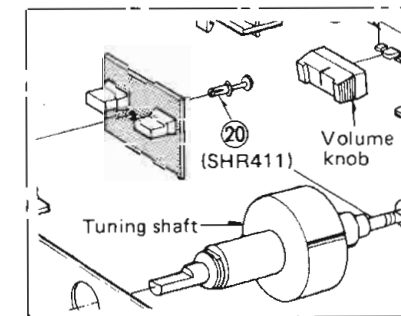
For [M] area



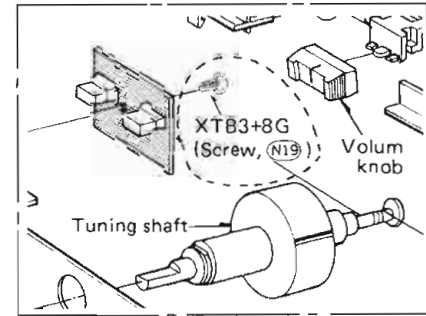
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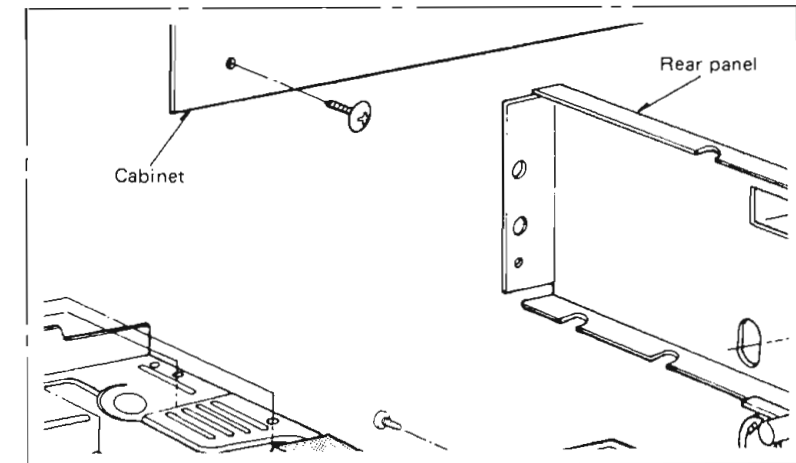
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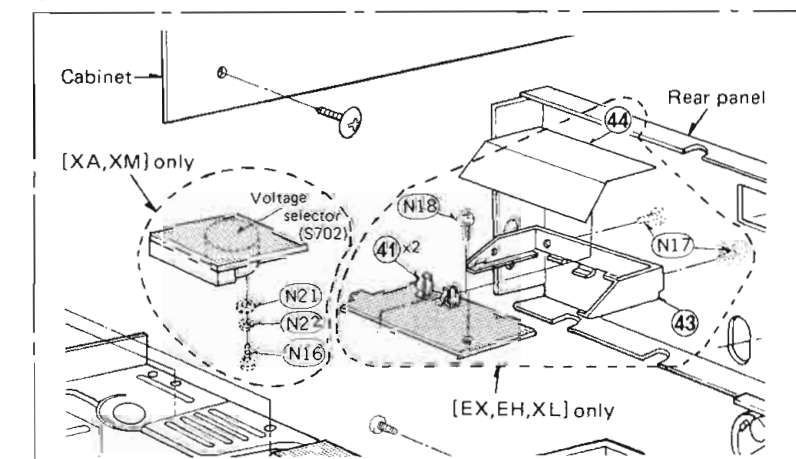
For [EX, EH, XA, XL, XM] areas



For [M] area



For [EX, EH, XA, XL, XM] areas



Service Manual

FM/AM Stereo Receiver

SA-120

[M], [MC]



Areas

- * [M] is available in the U.S.A.
* [MC] is available in Canada.

Specifications

(Specifications are subject to change without notice for further improvement.)
(Weights and dimensions shown are approximate.)

(IHF '78)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output

40 Hz~20 kHz both channels driven

0.5% total harmonic distortion

35W per channel (8 ohms)

1 kHz continuous power output

both channels driven

0.5% total harmonic distortion

38W per channel (8 ohms)

Dynamic headroom

1.0 dB (8 ohms)

Total harmonic distortion

rated power at 40 Hz~20 kHz

0.5% (8 ohms)

half power at 1 kHz

0.07% (8 ohms)

SMPTE intermodulation distortion

0.5% (8 ohms)

Frequency response

PHONO

RIAA standard curve ± 0.8 dB

TAPE/AUX

5 Hz~70 kHz, -3 dB

Input sensitivity

PHONO

0.45 mV (2.5 mV, IHF '66)

TAPE/AUX

25 mV (150 mV, IHF '66)

S/N (IHF, A)

PHONO

73 dB (71 dB, IHF '66)

TAPE/AUX

82 dB (95 dB, IHF '66)

Maximum input voltage

PHONO

120 mV (130 mV, 1 kHz)

Input impedance

PHONO

47 kilohms

TAPE/AUX

18 kilohms

Tone controls

BASS

50 Hz, +10 dB~-10 dB

TREBLE

20 kHz, +10 dB~-10 dB

Loudness control (volume at -30 dB) (built-in)

50 Hz, +5 dB

Low frequency damping factor

30 (8 ohms)

Load impedance

MAIN or REMOTE

8~16 ohms

MAIN and REMOTE

8~16 ohms

■ FM TUNER SECTION

Frequency range

88~108 MHz

Sensitivity

10.8 dBf (1.9 μ V, IHF '58)

50 dB quieting sensitivity

MONO

16.1 dBf (3.5 μ V IHF '58)

STEREO

38.3 dBf (45 μ V IHF '58)

Total harmonic distortion

100 Hz

0.15% (MONO), 0.3% (STEREO)

1 kHz

0.15% (MONO), 0.3% (STEREO)

6 kHz

0.3% (MONO), 0.4% (STEREO)

S/N

MONO

76 dB

STEREO

70 dB

Frequency response

20 Hz~15 kHz, +1 dB, -2 dB

Alternate channel selectivity

60 dB

Capture ratio

1 dB

Image rejection at 98 MHz

40 dB

IF rejection at 98 MHz

60 dB

Spurious response rejection at 98 MHz

70 dB

AM suppression

50 dB

Stereo separation

1 kHz

40 dB

10 kHz

30 dB

Carrier leak

19 kHz

-35 dB

38 kHz

-50 dB

Antenna terminals

300 ohms (balanced)

75 ohms (unbalanced)

Technics

Matsushita Engineering
and Service Company
50 Meadowland Parkway,
Secaucus,
New Jersey 07094

Panasonic Hawaii, Inc.
91-238 Kauhū St., Ewa Beach
P.O. Box 774
Honolulu, Hawaii 96808-0774

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

Panasonic Sales Company
Division of Matsushita Electric
of Puerto Rico, Inc.
Ave. 65 De Infantería, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

■ AM TUNER SECTION

Frequency range	525~1605 kHz
Sensitivity	20 μ V, 300 μ V/m
Selectivity	27 dB
Image rejection at 1000 kHz	40 dB
IF rejection at 1000 kHz	55 dB

■ GENERAL

Power consumption	150W
Power supply	AC 120V, 60 Hz
Dimensions (W×H×D)	430 × 97 × 249 mm (16-15/16" × 3-13/16" × 9-13/16")
Weight (for USA)	4.9 kg (10.8 lb.)
(for Canada)	5 kg (11 lb.)

■ CONTENTS

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■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ BEFORE REPAIR AND ADJUSTMENT

1. Turn off the power supply and short-circuit of power supply capacitors (C701 and C702, 4700 μ F) at resistance (about 10 Ω , 5W) in order to discharge the charged voltage. Do not short between C701 and C702 by screwdriver. It may damage the component.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 120V, 60Hz in no-signal mode is 150 ~ 400mA.

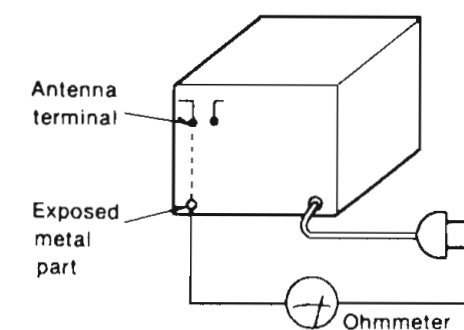
■ SAFETY PRECAUTION

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

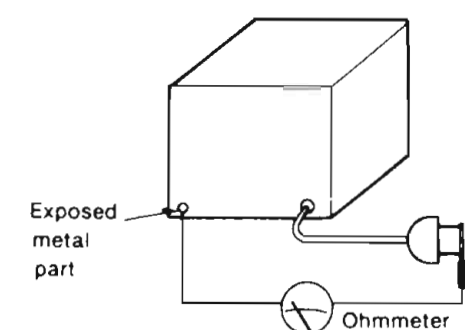
● INSULATION RESISTANCE TEST

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

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



(Fig. A)

Resistance = 3M Ω —5.2M Ω 

(Fig. B)

Resistance = Approx ∞

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

■ HOW TO USE THE AM LOOP ANTENNA

This unit includes an AM loop antenna. No outdoor antenna is necessary unless the broadcast signals in your area are especially weak. (Connect the loop antenna even if an outdoor antenna is used; if it is not connected, AM reception will not be possible.)

Pay attention to the following points when attaching the antenna.

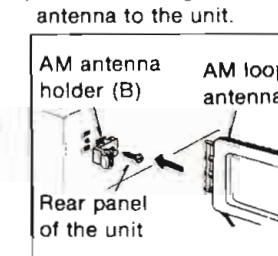
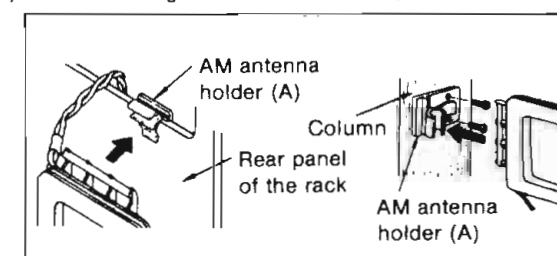
- 1) Do not attach it horizontally (to do so would impair reception).
- 2) Do not attach it close to metal surfaces (to do so would result in noise).
- 3) Do not attach it close to power cords, speaker wires, etc. (to do so would result in noise).
- 4) Do not attach it close to a tape deck (when the tape deck is being used, chirping or beeping sounds may be received).

Steps

1. Connect the AM loop antenna to the AM antenna terminals located on the rear panel of the unit.
2. Find the height and direction of the antenna where reception is best and then fix it vertically to the wall, rack, etc.

1) When attaching the antenna to a wall, column or rack.

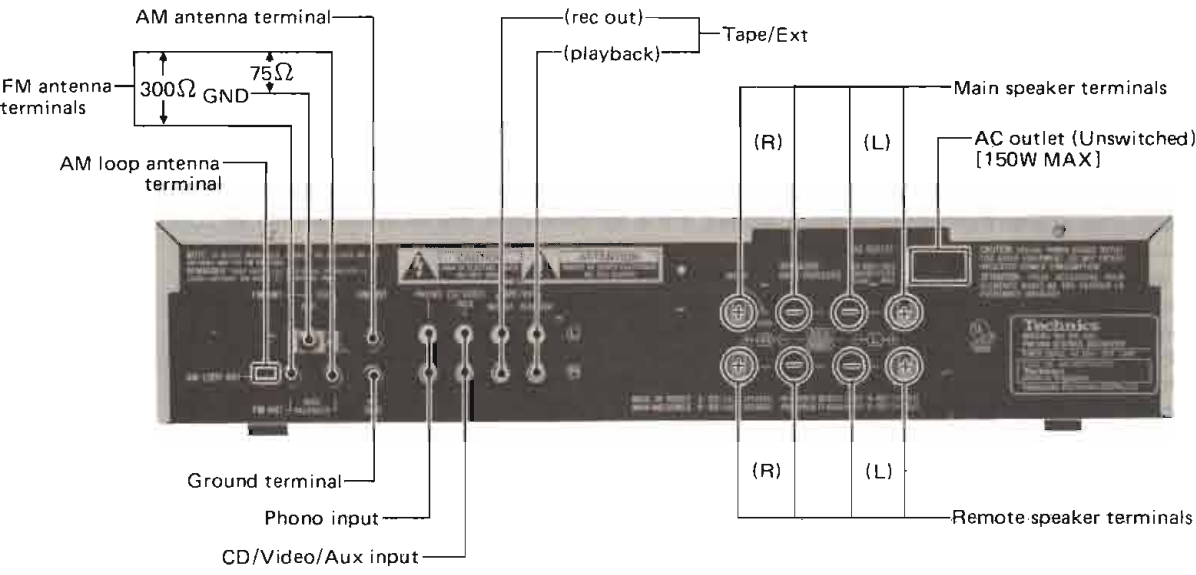
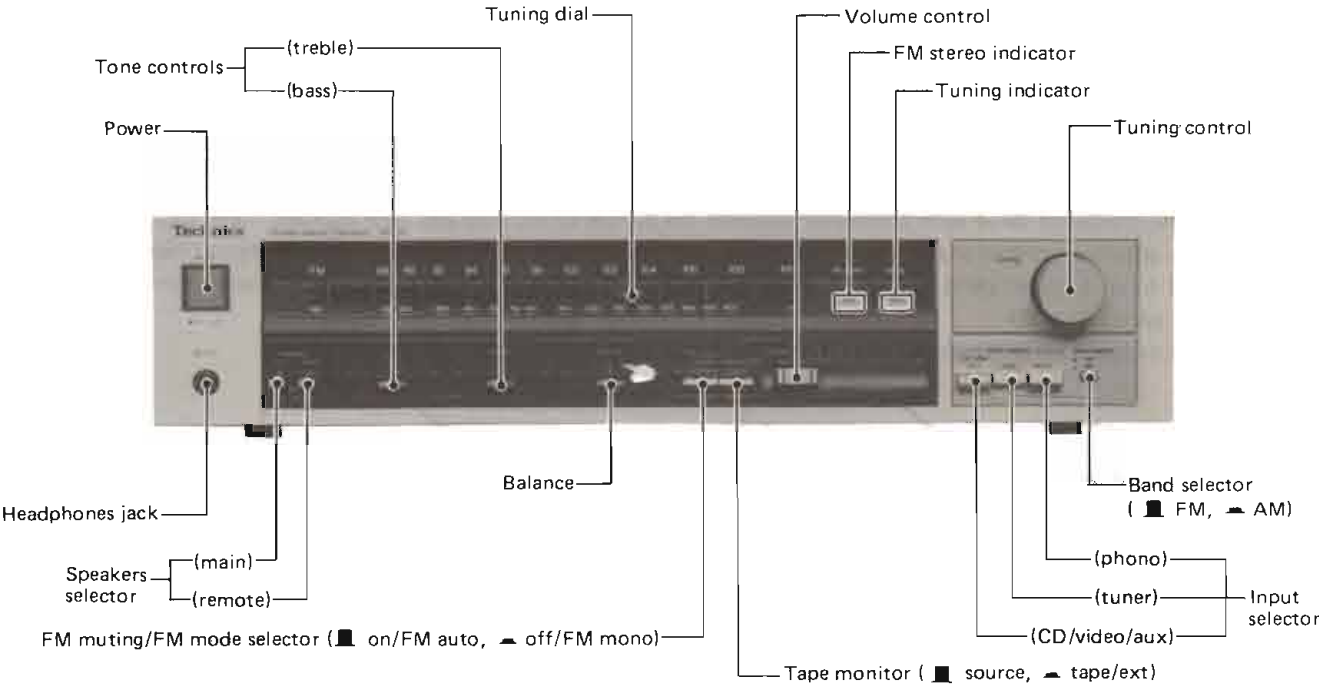
2) When attaching the antenna to the unit.

**Note:**

The installation of the antenna to the unit may cause impaired reception or result in signal noise. If possible, attach the antenna to the rack, a wall, or a column.

3. Move the antenna toward the right or left to find the point of best reception.

LOCATION OF CONTROLS



- Phono input capacitance is about 150pF.
- Series connection method is employed for the main and remote speaker connections of this set. Therefore, if both speaker changeover switches (main and remote) are turned "on" with the speaker unit connected only to main or remote speaker terminal, then no output signal will be delivered from the speaker unit.

DISASSEMBLY INSTRUCTIONS

How to remove the cabinet

1. Remove the 6 setscrews (Fig. 1: ①~⑥) of the cabinet.

How to remove the bottom board

1. Remove the cabinet.
2. Remove the 10 setscrews (Fig. 2 : ⑦ ~ ⑯) of the bottom board.

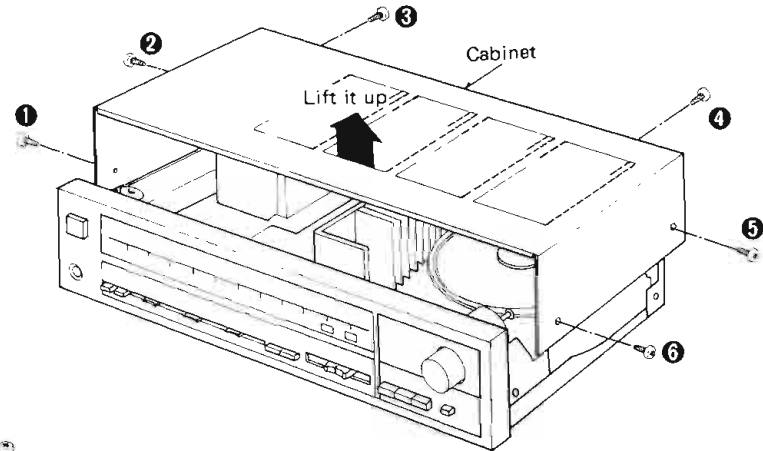


Fig. 1

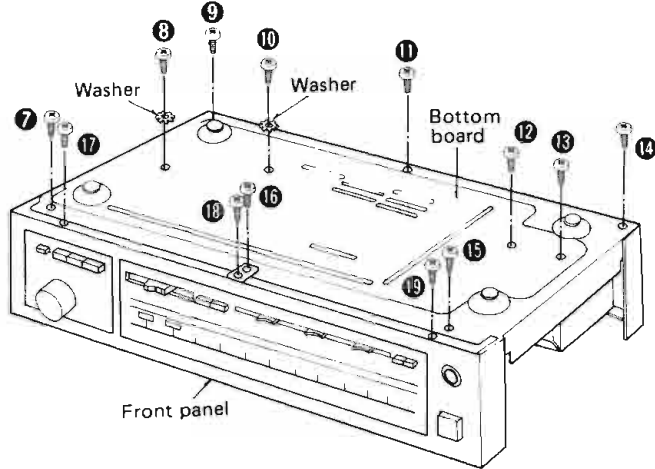


Fig. 2

How to remove the front panel

1. Remove the cabinet.
2. Remove the 3 setscrews (Fig. 2: ⑰ ~ ⑲) of the front panel.
3. The claws projected (at 5 portions) from the front panel are engaged with the front sub-panel. Disengage the claws from by screwdriver or the like to remove the front sub-panel. (See Fig. 3)

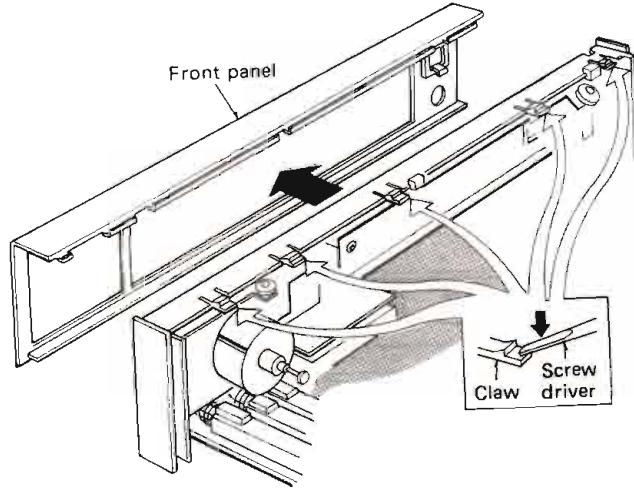


Fig. 3

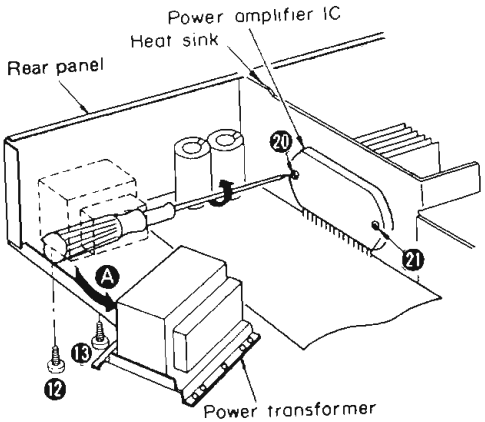


Fig. 4

How to remove the power amplifier IC

1. Remove the cabinet and bottom board.
2. Remove the 2 setscrews (Fig. 4 : ⑫, ⑬) to detach the power transformer from rear panel in the direction of arrow A.
3. Unsolder of power amplifier IC.
4. Remove the 2 setscrews (Fig. 4 : ⑳, ㉑) used to secure the power amplifier IC on the heat sink, and then pull the power amplifier IC.
5. When mounting the power amplifier IC, apply silicone compound (SZZ0L15) to the rear side of power amplifier IC, and then follow the steps 1 ~ 4 reversely.

● How to remove the slide volume.

1. Remove the cabinet and bottom board.
2. Set the dial to the start position (minimum frequency), then stick a cellophane tape to the contact **(B)** of dial cord (Fig. 5) so that the dial drum will not come loose from the dial cord.
3. Remove the 1 setscrew (Fig. 5 : **(22)**) from the dial drum.
4. Remove the dial cord from the pulley. (Fig. 5 : **(C)**)
5. Remove the 3 setscrews (Fig. 6 : **(23) ~ (25)**) and 1 connector (Fig. 6 : **(26)**)
6. Remove the front panel in the direction of the arrow as in Fig 7.
7. The claws projected (at 4 portions) from the slide volume printed circuit board are engaged with the slide volume. Disengage the claws from by screw driver or the like to remove the slide volume case. (Fig. 8)
8. Unsolder the slide volume.

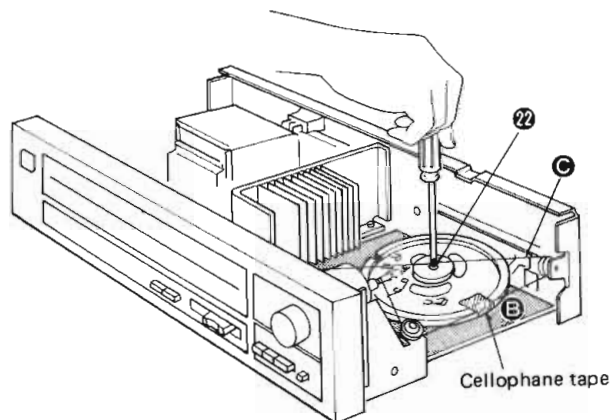


Fig. 5

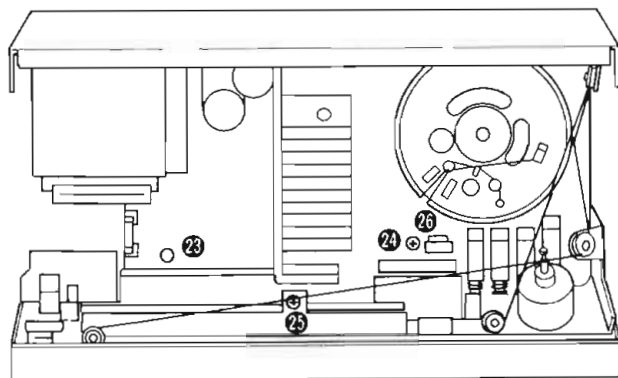


Fig. 6

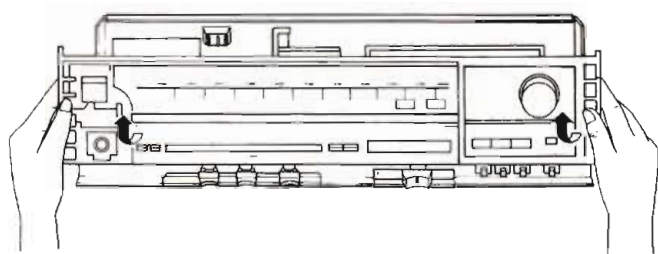


Fig. 7

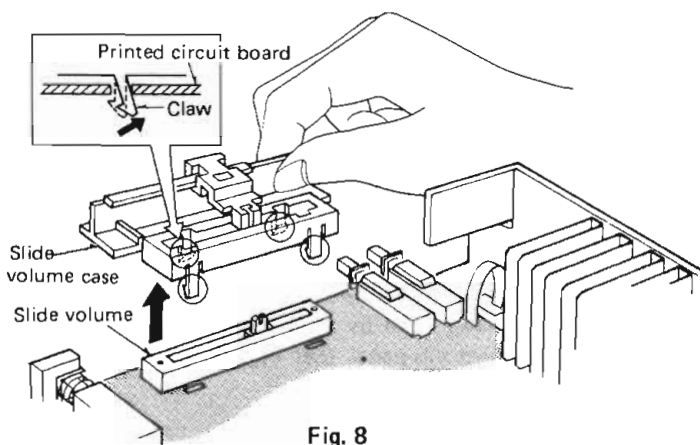


Fig. 8

■ DIAL CORD INSTALLATION GUIDE

● When setting the cord, follow the procedure given below

1. The cord should be at least 180 cm long.
2. Completely turn the tuning gang (variable capacitor) counterclockwise. (Variable capacity : max. Frequency; min.)
3. Make a knot at the cord and as shown in Fig. 9
4. Set the spring to the knot, and set the cord in the order of 1 - 10.

Note: At step 7, pull the cord strongly, slacken the spring up to the mark of the drum, then go to steps 9 - 10 to set the cord.

5. Fix the cord terminal with adhesive.
6. Cut off the cord about 5 mm at its either end.

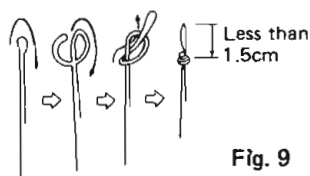
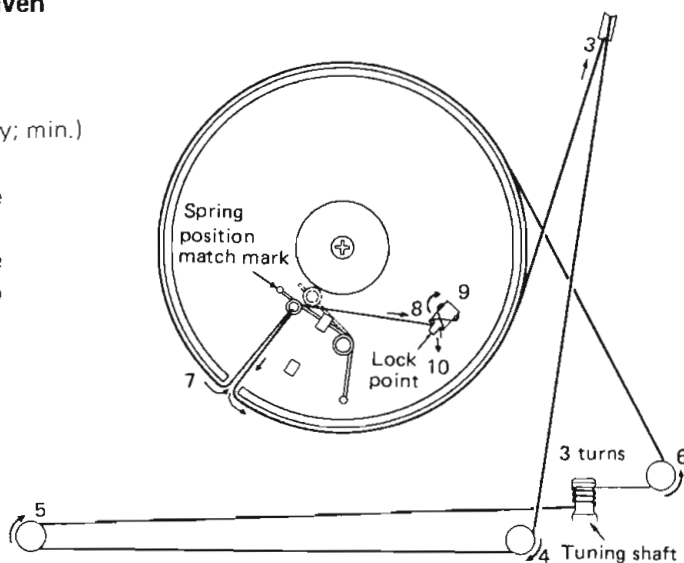


Fig. 9



MEASUREMENTS AND ADJUSTMENTS

Note: AM OSC Coil (L201) and AM IFT (T202) have been already adjusted, and require no adjustment.

AM ADJUSTMENT

• Setting and Equipment used

1. AC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. Set Band selector to "AM" position.
4. Maintain line voltage at 120 volts.
5. Output of signal generator should be no higher than necessary to obtain an output reading.
6. Use a non-metal screwdriver for the adjustment.

Step No.	AM SIGNAL GENERATOR		DIAL SETTING	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
	AM-RF ADJUSTMENT					
1	Connect AM-SG to AM antenna terminal through 200pF capacitor referring to Fig. 10. (Weak input)	600kHz (30% Mod. with 400Hz)	600kHz	Connect AC VTVM or scope to "speaker" terminal of the set.	L205 (ANT Coil) L206 (OSC Coil)	1. Adjust for maximum output.
2		1500kHz (30% Mod. with 400Hz)	1500kHz	Connect AC VTVM or scope to "speaker" terminal of the set.	CT204 (OSC Trimmer) CT203 (ANT Trimmer)	1. Adjust for maximum output. 2. Repeat steps (1) and (2).

FM ADJUSTMENT

• Setting and Equipment used

1. FM signal generator (FM-SG)
2. Oscilloscope.
3. DC electronic voltmeters (VTVM).
4. Frequency counter (19kHz and 108MHz measurable).
5. Set band selector to "FM" position.
6. FM muting/FM mode switch ... off/FM mono.
7. Other setting are the same as in AM adjustment.

• FM signal generator (FM-SG)

1. The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of attenuation, using coaxial cables, SG output must be 6dB plus. That is, when input is 60dB, SG output is to be 66dB.)

Step No.	FM SIGNAL GENERATOR		DIAL SETTING	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
	FM IF ADJUSTMENT					
3	Connect FM-SG to FM antenna terminal referring to Fig. 11 (Apply 60dB to antenna terminal)	100MHz (100% Mod. with 400Hz)	100MHz	Connect DC VTVM to between TP201 and TP202 through choke coil (Refer to Fig. 11.)	T201 (Discri. IFT)	1. Adjust T201 core so that voltage measured in signal mode is 0mV in 150mV range.

FM-RF ADJUSTMENT * Connect TP201 and TP202

4	Connect FM-SG to FM antenna terminal referring to Fig. 11 (Apply 60dB to antenna terminal)	90MHz (100% Mod. with 400Hz) weak input	90 MHz	Connect scope to "speaker" terminal	L204 (OSC Coil) L202 (RF DET Coil)	• Add weak input so that noise is included in the output waveform. • Make the adjustment so that the output wave form is vertically symmetrical. (Fig. 13) • Repeat the steps (4) and (5) until the frequency correctly matches the dial scale.
		106MHz (100% Mod. with 400Hz) weak input.	106 MHz	Connect scope to "speaker" terminal	CT202 (OSC Trimmer)	

FM MPX V.C.O. ADJUSTMENT

USING A FREQUENCY COUNTER

USING ALTERNATE SYSTEM

1. 100MHz 60dB Non-modulated mono signal applied to set.
2. FM muting/FM mode switch to "on/FM auto".
3. Connect frequency counter to TP301 through resistor (100k Ω).
4. Adjust VR301 to 19kHz $\pm$ 30 Hz. (Fig. 12)
1. Apply stereo signal from generator or stereo station to tuner.
2. Adjust VR301 until stereo indicator lights up. Cement arm of VR301 as shown in Fig. 14.

• Check points

Overload detection circuit

- ① Connect 4 Ω load to speaker terminal.
- ② Add 1kHz signal from the audio frequency oscillator to the set and adjust the sound volume control knob so that the output voltage is 5 volts.
- ③ Connect 3.3 Ω (2W) load to speaker terminal.
- ④ Make sure that relay in the set is OFF and no output is delivered.

* If protection circuit turns OFF due to overload, the circuit and load will not restore their normal conditions unless power supply is once turned OFF and again turned ON.

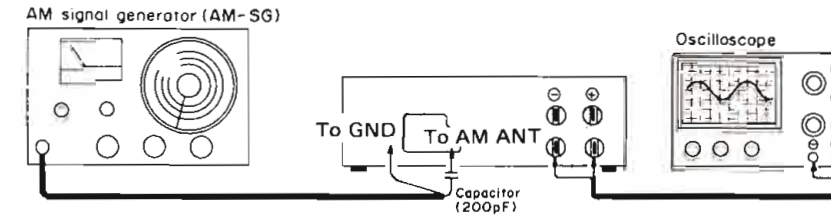


Fig. 10

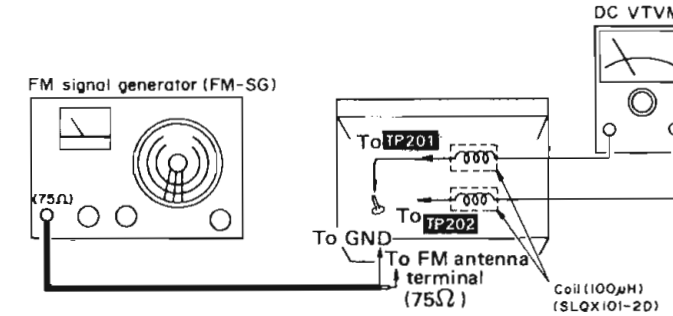


Fig. 11

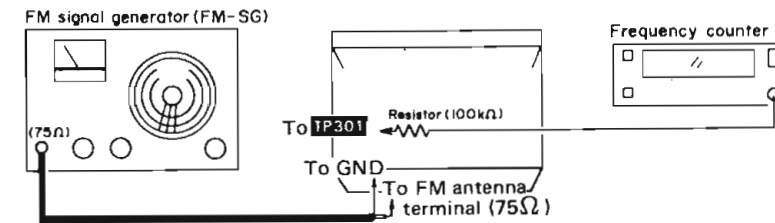
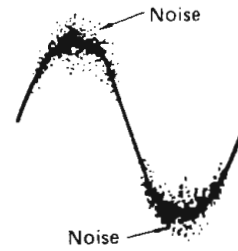
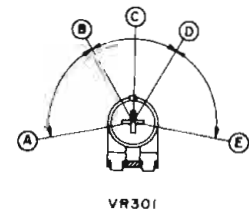


Fig. 12



AF output wave form

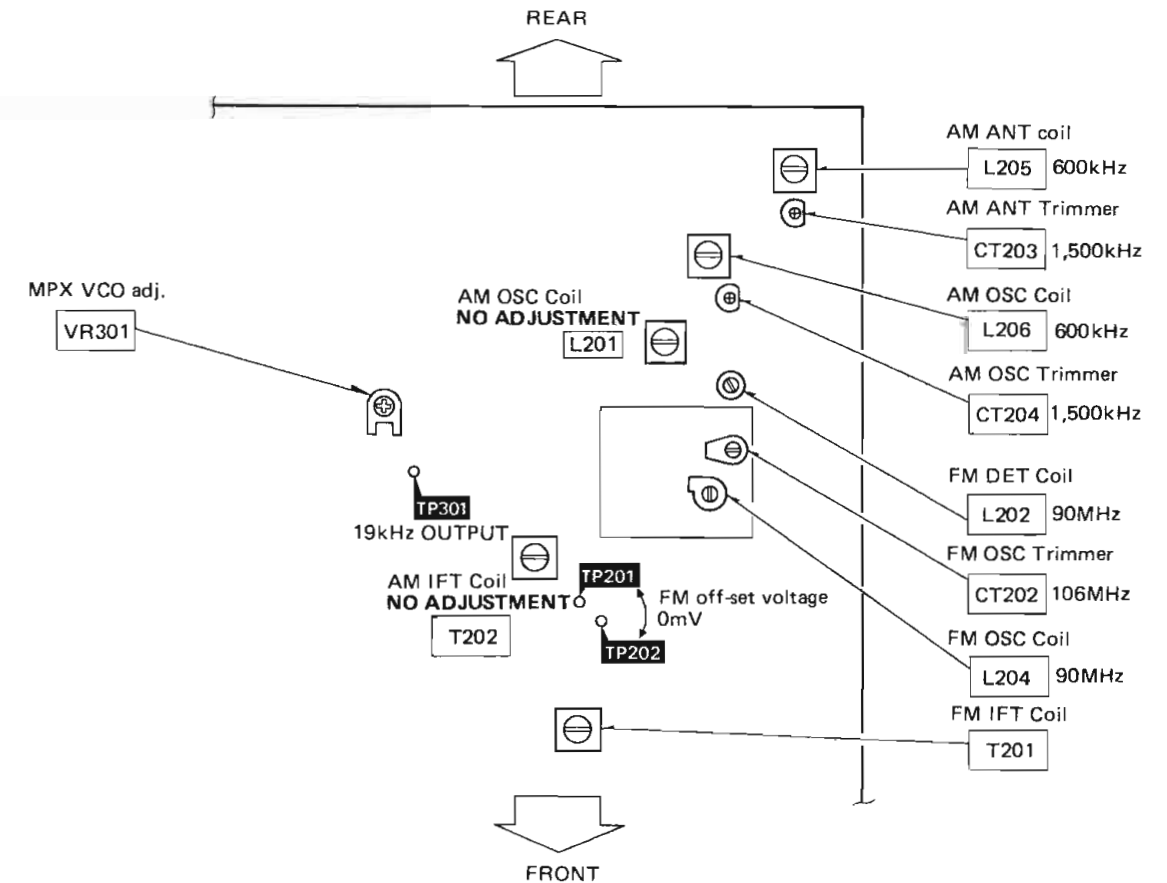
Fig. 13



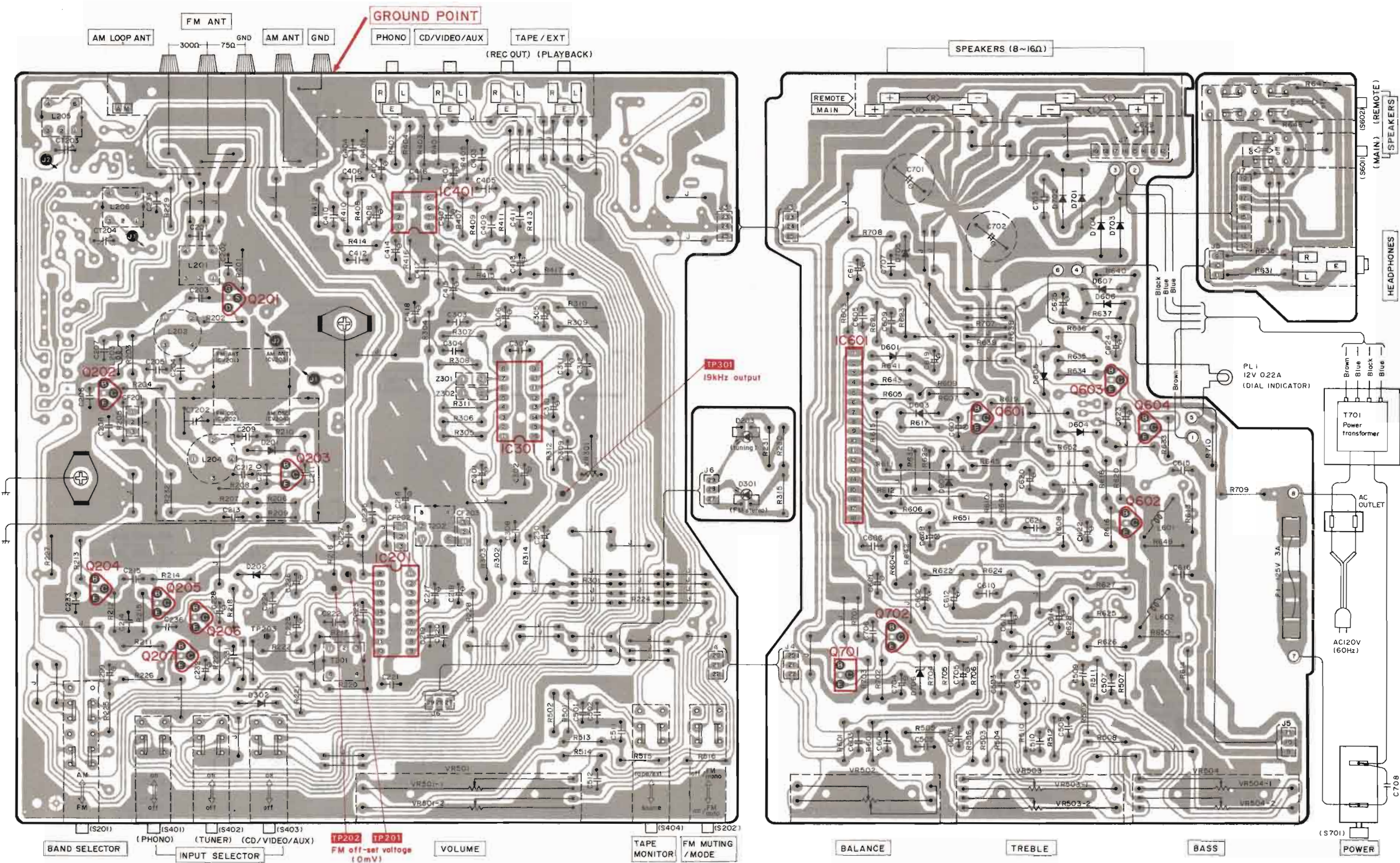
A-B, D-E Stereo OFF Position.
B-D Stereo ON Position.
(indicator Lighting)
C Adjust Point of Pilot Circuit.

Fig. 14

• Adjustment points



CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



RESISTORS & CAPACITORS

- Notes:**
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 2. Important safety notice:
Components identified by  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 3. The "S" mark is service standard parts and may differ from production parts.
 4. The unit of resistance is Ω . (ohm) $K=1000\Omega$, $M=1000k\Omega$.
 5. The unit of capacitance is μF . (microfarad) $P=10^{-6}\mu F$.

Numbering System of Capacitor

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

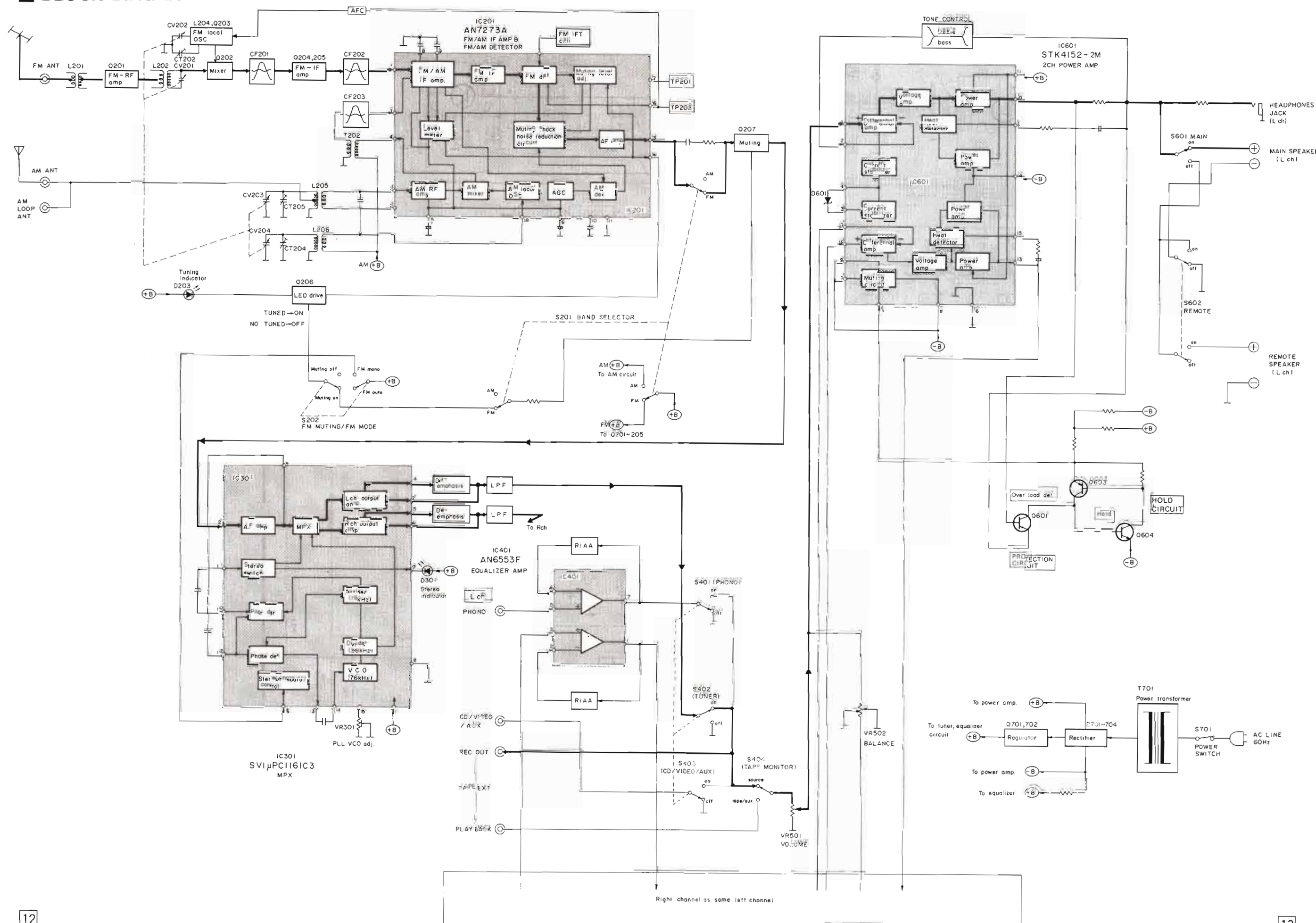
Numbering System of Resistor

Example	25	F	J	101
ERD				
Type	Wattage	Shape	Tolerance	Value
Resistor Type	Wattage	Tolerance		
ERD : Carbon	25 : 1/4W	J : $\pm 5\%$		
ERX : Metal Film	S1 : 1/2W	K : $\pm 10\%$		
ERG : Metal Oxide	1 : 1W			
ERC : Solide	2 : 2W			
	12 : 1/2W			

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	C : $\pm 0.25\mu\text{F}$
ECCD : Ceramic	1C : 16V	KC : 400V AC	J : $\pm 5\%$
ECKD : Ceramic	1E : 25V	2H : 500V DC	K : $\pm 10\%$
ECQM : Polyester	45 : 45V		Z : $+80\%, -20\%$
ECQP : Polypropylene	1H : 50V		P : $+100\%, -0\%$
ECET : Electrolytic	50 : 50V		
	25 : 25V		
	1J : 63V		

RESISTORS			CAPACITORS		
Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R201	ERD25FJ102	1K	C309	ECQP1471JZ	470P
R202	ERD25FJ220	22	C310	ECEA502R47	0.47
R203	ERD25FJ221	220	C311	ECEA502I1	0.1
R204	ERD25TJ474	470K	C312	ECCKD1H103ZF	0.01
R205	ERD25FJ471	470	C401, 402	ECEA5023R3	3.3
R206	ERD25TJ123	12K	C403, 404	ECCKD1H101K	100P
R207	ERD25FJ822	8.2K	C405, 406	ECCKD1H471KB	470P
R208	ERD25FJ102	1K	C407, 408	ECEA1CS330	33
R209	ERD25FJ562	5.6K	C409, 410	ECQM1H223KV	0.022
R210	ERD25TJ224	220K	C411, 412	ECQM1H682KV	0.0068
R211	ERD25FJ472	4.7K	C413, 414	ECEA502I1	1
R212	ERD25FJ152	1.5K	C415	ECEA1CS330	33
R213	ERD25TJ564	560K	C416	ECCKD1H473ZF	0.047
R214	ERD25TJ684	680K	C417	ECCKD1H103ZF	0.01
R215	ERD25FJ471	470	C418	ECEA1CS330	33
R216	ERD25TJ824	820K	C501, 502	ECCKD1H331KB	330P
R217	ERD25FJ152	1.5K	C503, 504	ECCKD1H222KV	0.0022
R218	ERD25FJ122	1.2K	C505, 506	ECQM1H223KV	0.022
R220	ERD25FJ102	1K	C507, 508	ECQM1H183KV	0.018
R221	ERD25FJ331	330	C509, 510	ECQM1H104KV	0.01
R222	ERD25FJ103	10K	C511, 512	ECQM1H333KV	0.033
R223	ERD25FJ562	5.6K	C601, 602	ECEA5022R2	2.2
R224	ERD25FJ103	10K	C603, 604	ECCKD1H101K	100P
R225, 226	ERD25FJ472	4.7K	C605, 606	ECCKD1H221KB	220P
R227	ERD25TJ154	150K	C607, 608	ECEA1HN3R3S	3.3
R228	ERD25FJ122	1.2K	C609, 610	ECCKD1H050CC	5P
R229	ERD25FJ821	820	C611, 612	ECEA1AS470	47
R230	ERD25FJ471	470	C613, 614	ECEA1HS100	10
R231	ERD25FJ102	1K	C615, 616	ECCKD1H473ZF	0.047
R232	ERD25FJ151	15K	(M)		
R301, 302	ERD25FJ103	10K	C615, 616	ECQM1H104KV	0.1
R303	ERD25TJ104	100K	(MC)		
R304	ERD25FJ470	47	C619	ECEA1AS470	47
R305, 306	ERD25TJ223	22K	C620	ECEA1HS101	100P
R307, 308	ERD25FJ332	3.3K	C621	ECCKD1H103ZF	0.01
R309, 310	ERD25TJ333	33K	C622	ECEA1J5330	33
R311	ERD25TJ274	270K	C623	ECEA1HS100	100
R312	ERD25TJ153	15K	C624, 625	ECEA1J5330	33
R314	ERD25FJ561	560	C627, 628	ECQM1H104KV	0.1
R315	ERD25FJ102	1K	(MC)only		
R401, 402	ERD25FJ391	390	C701, 702	ECET545V472U	4700
R403, 404	ERD25TJ224	220K	C703	ECCKD2H103PE	0.01
R405, 406	ERD25TJ563	56K	C704	ECEA1ES101	100
R407, 408	ERD25FJ271	270	C705	ECEA1HS100	100
R409, 410	ERD25FJ680	680	C706, 707	ECCKD1H103ZF	0.01
R411, 412	ERD25TJ164	180K	C708	ECCKD1H103PF2	0.01
R413, 414	ERD25TJ123	12K			
R415, 416	ERD25TJ563	56K			
R417, 418	ERD25FJ102	1K	C201	ECCKD1H120KC	12P
R501, 502	ERD25FJ222	2.2K	C202	ECCKD1H180KC	18P
R503, 504	ERD25FJ222	2.2K	C203	ECCKD1H103ZF	0.01
R505, 506	ERD25FJ561	560	C204	ECCKD1H220KC	22P
R507, 508	ERD25TJ183	18K	C205	ECCKD1H030CC	3P
R509, 510	ERD25FJ222	2.2K	C206	ECCKD1H070CC	7P
R511, 512	ERD25TJ124	120K	C207	ECCKD1H181K	180P
R513, 514	ERD25TJ3823	82K	C208	ECCKD1H103ZF	0.01
R515, 516	ERD25TJ473	47K	C209	ECCKD1H080CC	8P
R601, 602	ERD25FJ102	1K	C210	ECCKD1H390KC	39P
R603, 604	ERD25TJ393	39K	C211	ECCKD1H100KC	10P
R605, 606	ERD25FJ222	2.2K	C212	ECCKD1H102ZF	0.001
R607, 608	ERD25FJ272	2.7K	C213, 214	ECCKD1H103ZF	0.01
R609	ERGIANJ152	1.5K	C215	ECCKD1H151K	150P
R610	ERDSIFJ101	100	C216	ECEA1HS100	10
R611, 612	ERXZANJ22	0.22	C217	ECEA1AS101	100
R613, 614	ERDSIFJ100	10	C218	ECEA5254R7	4.7
R615, 616	ERD25FJ222	2.2K	C219, 220	ECCKD1H223ZF	0.022
R617, 618	ERD25TJ153	15K	C221	ECQM1H333KV	0.033
R619, 620	ERD25TJ123	12K	C222	ECCKD1H101K	100P
R621, 622	ERD25TJ123	12K	C223, 224	ECCKD1H223ZF	0.022
R623, 624	ERD25TJ473	47K	C225	ECEA1AS470	47
R625, 626	ERD25TJ153	15K	C226	ECEA502I1	1
R627, 628	ERD25FJ102	1K	C227	ECCKD1H223ZF	0.022
R629	ERD25FJ102	1K	C228	ECEA1HS100	10
R630	ERD25TJ223	22K	C229	ECEA1HS100	10
R631, 632	ERGIANJ331	330	C230	ECQM1H183KV	0.018
R633	ERD25FJ562	5.6K	C231	ECEA5022R2	2.2
R634	ERD25TJ123	12K	C232	ECCKD1H270KC	27P
R635	ERD25TJ473	47K	C234	ECCKD1H223ZF	0.022
R636	ERD25TJ154	150K	C235	ECCKD1H330KC	33P
R637	ERD25TJ104	100K	C236	ECCKD1H223ZF	0.022
R638	ERGIANJ152	1.5K	C239	ECEA1HS100	10
R639	ERD25TJ184	180K	C301	ECEA502I1	1
R640, 641	ERD25FJ470	47	C302	ECEA1ES101	100
R642	ERD25FJ180	1.0	C303, 304	ECQM1H223KV	0.022
R643	ERD25FJ470	47	C305, 306	ECEA5254R7	4.7
R644	ERD25FJ470	47	C307	ECQM1H473KV	0.047
R645	ERD25FJ470	47	C308	ECCKD1H103ZF	0.01
R647, 648	ERD25TJ104	100K			
R649, 650	ERDSIFJ100	10			
R651	ERD25FJ180	1.0			
(M)only					
R652	ERDSIFJ101	100			
(M)only					
R701	ERDSIFJ270	27			
R702	ERD25FJ821	820			
R703	ERDSIFJ152	1.5K			

■ BLOCK DIAGRAM

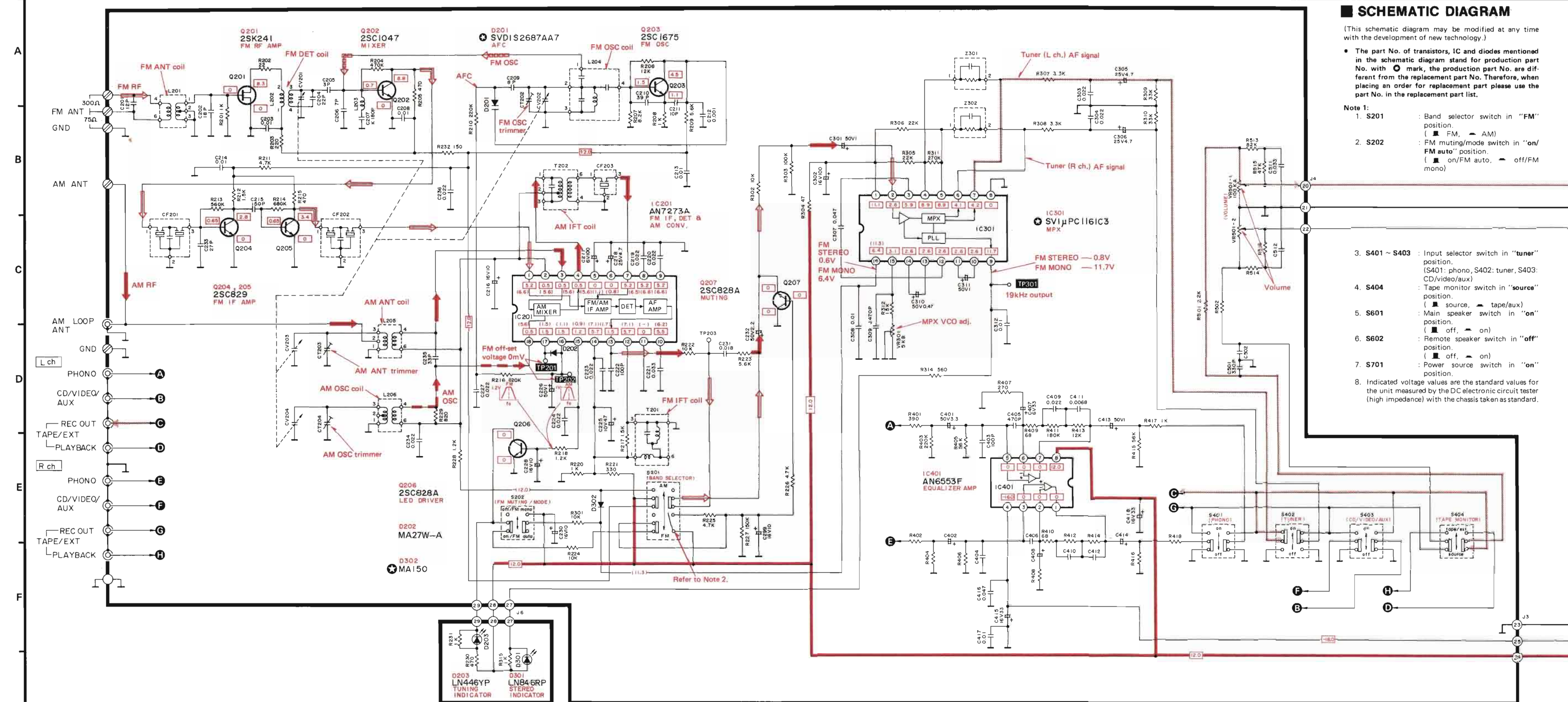


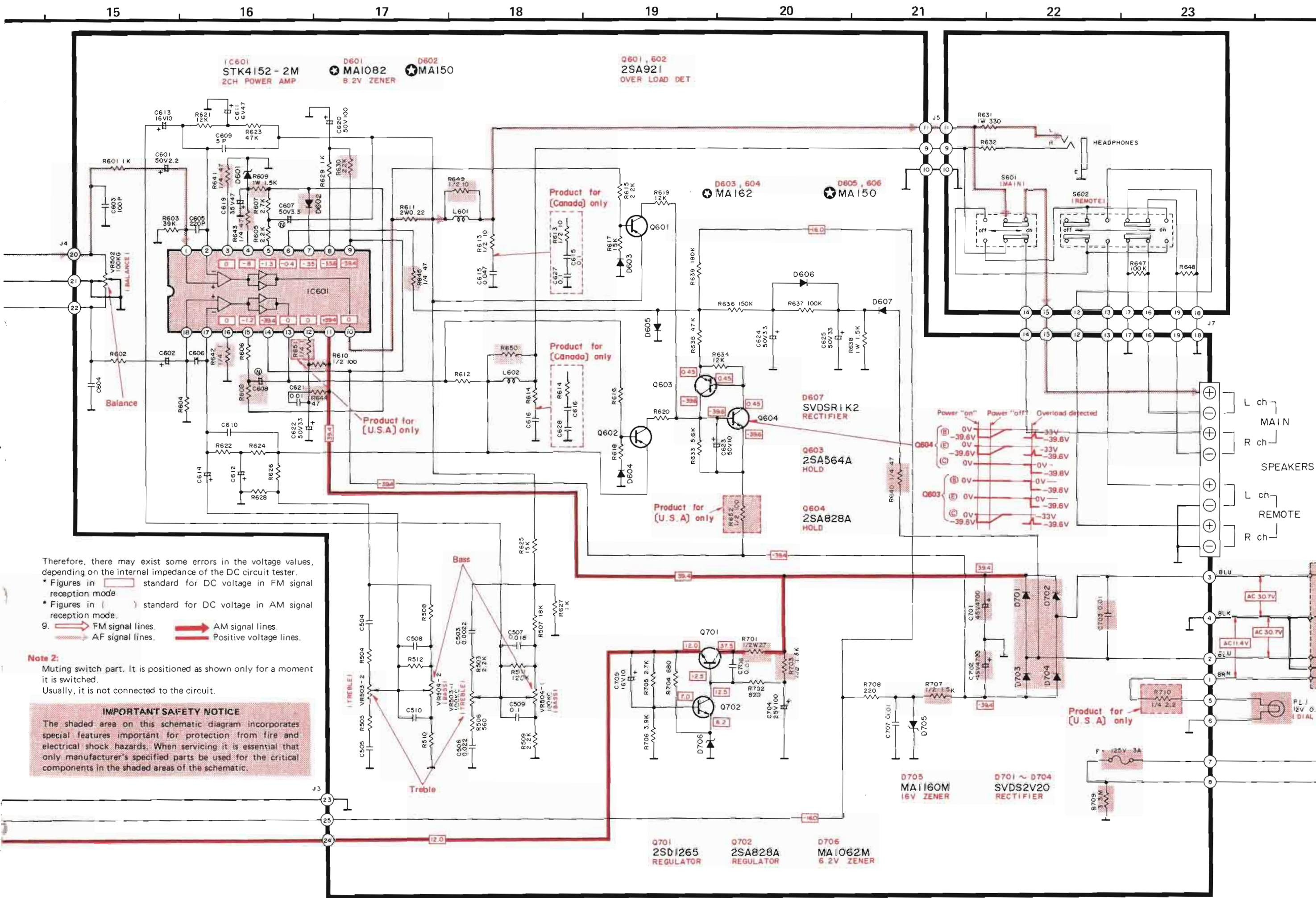
SCHEMATIC DIAGRAM

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

• The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. with  mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part please use the part No. in the replacement part list.

- Note 1:
- S201 : Band selector switch in "FM" position.
( FM,  AM)
 - S202 : FM muting/mode switch in "on/FM auto" position.
( on/FM auto,  off/FM mono)
 - S401 ~ S403 : Input selector switch in "tuner" position.
(S401: phono, S402: tuner, S403: CD/video/aux)
 - S404 : Tape monitor switch in "source" position.
( source,  tape/aux)
 - S601 : Main speaker switch in "on" position.
( off,  on)
 - S602 : Remote speaker switch in "off" position.
( off,  on)
 - S701 : Power source switch in "on" position.
 - 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.

* Figures in () standard for DC voltage in FM signal reception mode

* Figures in [] standard for DC voltage in AM signal reception mode.

9. → FM signal lines. → AM signal lines.

→ AF signal lines. → Positive voltage lines.

Note 2:
Muting switch part. It is positioned as shown only for a moment it is switched. Usually, it is not connected to the circuit.

IMPORTANT SAFETY NOTICE
The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

REPLACEMENT PARTS LIST

- Notes:**
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 2. Important safety notice:
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.
 3. The "S" mark is service standard parts and many differ from production parts.
 4. The parenthesized numbers in the column of description stand for the quantity per set.
 5. Bracketed indications in Ref. No. columns specify the areas. Parts without these indications can be used for all areas.
- Areas**
- * [M] is available in the U.S.A.
 - * [MC] is available in Canada.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS			VARIABLE CAPACITORS			CABINET and CHASSIS PARTS		
IC201	AN7273A	FM IF Det. & AM Converter	CT202	ECV1ZW10X32E	Trimmer, FM OSC	[34-1]	[SKL245-2	Foot (4)
IC301	SVIUPC1161C3	MPX	CT203	ECRHA007A11	Trimmer, AM Antenna	35	SJF8035-8N	Terminal Board (1)
IC401	AN6553F	Equalizer	CT204	ECRHA010A11	Trimmer, AM OSC	36	SJF4815-2	Terminal Board, Speaker (1)
IC601	Δ STK4152-2M	Power	CV201~204	SVCGB41T914	Tuning Gang	37(M)	SGP6130A	Rear Panel (1)
TRANSISTORS			Z301, 302	EXRP181K473C	180pF, 47k Ω	37(MC)	SGP6130-1A	Rear Panel (1)
Q201	2SK241-GR	FM-RF Amp.	LAMP			38(M)	SJS9221	Socket, AC Outlet (1)
Q202	2SC1047-D	Mixer	PL1	Δ XAMR78S250	12V, 0.22A	38(MC)	SJS9223	Socket, AC Outlet (1)
Q203	2SC1675-L	FM OSC	FUSE			39(M)	RHR111	Bushing, AC Cord (1)
Q204, 205	2SC829-C	FM-IF Amp.	F1	Δ XBA1F30NU14	Power Source, 125V, 3A	39(MC)	SHR129	Bushing, AC Cord (1)
Q206, 207, 604, 702	2SC828AS	LED Drive, Muting, Regulator, Hold	SWITCHES			40(M)	RJA9Y	AC Cord (1)
Q601, 602	2SA921-R	Over Load Det.	S201	SSH1151	Band Selector (FM/AM) Mode.	40(MC)	SJA109	AC Cord (1)
Q603	2SA564AR	Hold	S202, 403	SSH1031	Tape Monitor	41	SJT345	Holder (2)
Q701	2SD1265-O	Regulator	S401, 402, 404	SSH3069	Input Selector	42	SJS5327	Socket (1)
DIODES			S601	SSH1149	Speaker(Main)	SCREWS		
D201	1S2687AA	FM AFC	S602	SSH1073	Speaker(Remote)	N1	XTB3+8BFZ1	Tapping with Detent, $\phi 3 \times 8$ (1)
D202	MA27W-A	L. E. D. (Tuning)	S701	SSH1071	Power Source	N2	XTB3+8BFYR	Tapping, $\phi 3 \times 8$ (9)
D203	LN446YP	L. E. D. (Stereo) Switching	CABINET and CHASSIS PARTS			N3	XTN3+8B	Tapping, $\phi 3 \times 8$ (1)
D301	LN486RP		1	SUS305	Bracket (1)	N4	XTB3+8BFZ	Tapping, $\phi 3 \times 8$ (6)
D302, 602~606	MA162A	Zener, 8.2V Rectifier	2	SGWA120-SM	Front Panel, Ass'y (1)	N5	XSN26+5FZ	$\phi 2.6 \times 5$ (1)
D601	SVDRD8.2EB	Zener, 16V Rectifier	3	SGU333-13	Dial Scale (1)	N6	XSN3+8BVS	$\phi 3 \times 8$ (2)
D607	SVDSR1K2	Zener, 16V Rectifier	4	SBN1091	Knob, Tuning (1)	N7	XTB3+16BFN	Tapping, $\phi 3 \times 16$ (2)
D701~704	SVDS2V20	Zener, 6.2V	5	SGX7657	Front Sub Panel (1)	N8	SNE2095-4	Tapping, $\phi 3 \times 8$ (2)
D705	MA1160M		6	SBD69-2T	Knob, Tone Selector (3)	N9	XTB3+8BFN	Tapping, $\phi 3 \times 8$ (2)
D706	MA1062M		7	SBC627	Button, Power Switch (1)	N10	RNW150-2	Tapping, $\phi 3 \times 8$ (8)
COILS			8	SHS1068-1	Spacer, Button Spring, Button (1)	WASHERS		
L201	SLA4N39	FM Antenna	9	SUS257	Button, Input Selector (3)	N11	XWD11B	External Tooted Lock, $\phi 11$ (1)
L202	SLD4P71-P	FM Detector Choke	10	SBC583-1T	Button, Band Selector (1)	N12	XWG3	Plain, $\phi 3$ (2)
L203	SLQ212G1-D	FM Oscillator	11	SBC483-7T	Bracket, Tuning Shaft (1)	N13	XWA26BFZ	Spring, $\phi 2.6$ (1)
L204	SLQ4P121-P	AM Antenna	12	SUR152M	Spacer, Drum (1)	N14	XWC3B	External Toothed Lock, $\phi 3$ (1)
L205	SLA2C9-P	AM Oscillator	13	SHR5253	Drum, Dial Spring, Dial Drum (1)	NUT		
L206	SLQ2C33-P	Choke	14	SDD105	Drum, Dial (1)	N15	XNS11	$\phi 11$ (1)
L601, 602	SLQY07G-30		15	SUS295-1	Cord (1.8m) Tuning Shaft (1)	ACCESSORIES		
TRANSFORMERS			16	SDZ051-2	Roller, Dial (4)	A1	SSA269	Holder (1)
T201	SLI4C539-P	FM IFT	17	SDT8095-1	Ornament, Volume (1)	A2	SSA902	Loop Antenna (1)
T202	SLI2C139-M	AM IFT	18	SDR31	Lock Pin (3)	A3	SMA231	Holder (1)
T701	SLT5M373	Power Source	19	SGX7463-3	Knob, Volume (1)	A4	SMA233-1	Holder (1)
CERAMIC FILTERS			20	SHR411	Slider (1)	A5	XTN3+10AFZ	Screw, Loop Antenna Holder (2)
CF201, 202	SVFE107MS2-A	FM, 10.7MHz (Red)	21	SBD777	Sheet (1)	A6(M)	SQF12046	Instruction Book (1)
	SVFE107MS2-B	FM, 10.675MHz (Blue)	22	SBZ657-1	Button, Speaker (2)	A6(MC)	SQF12047	Instruction Book (1)
	SVFE107MS2-C	FM, 10.725MHz (Orange)	23	SUG181	Guide, Pointer (1)	PACKING PARTS		
	SVFE107MS2-D	FM, 10.650MHz (Black)	24	SGX7461-3	Ornament, Tone, Balance (1)	P1	SPP699	Polyethylene Bag (1)
CF203	SVFE107MS2-E	FM, 10.750MHz (White)	25	SBZ663-1	Slider (3)	P2	SPS4039	Pad, Front Side (1)
		(Use pair ranks as same as CF201 and CF202)	26	SHP59	Spacer, Pointer (1)	P3	SPS3515-3	Pad, Left Side (1)
VARIABLE RESISTORS			27	SDP1167-1	Dial Pointer (1)	P4	SPS3517-2	Pad, Right Side (1)
VR301	EVN75AA00B53	VCO Adjustment, 5k Ω (B)	28	SJJ71B	Jack, Headphone (1)	P5(M)	SPG4811	Carton Box (1)
VR501	EWE0060SA15S	Volume Control, 100k Ω (A)	29	SUW1989	Bracket (1)	P5(MC)	SPG4812	Carton Box (1)
VR502	EVD00305G15S	Balance Control, 100k Ω (G)	30	SKC1352S1	Cabinet (1)			
VR503, 504	EWD00205C15S	Tone Control, 100k Ω (C)	31	SKUA120-SM	Bottom Board (1)			

EXPLODED VIEW

