

Service Manual

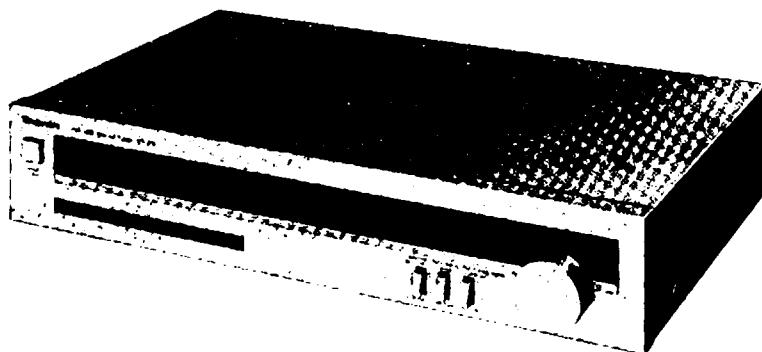
FM/AM Stereo Tuner

ST-Z11

[EX], [EG], [EH],
[XL], [XA], [EI]

ST-Z11(K)

[EX], [EG], [EH], [EA]



05290052 06003283 34
SM-STZ11 1 ST
SERVICE MANUAL

* The cabinet and front panel are available in black color and silver types.

* The black type model is provided with (K) in the Service Manual.

Areas

- [EX] is available in Switzerland and Scandinavia.
- [EG] is available in F.R. Germany.
- [EH] is available in Holland.
- [EA] is available in Austria.
- [XL] is available in Australia.
- [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- [EI] is available in Italy.

English

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ FM TUNER SECTION

Frequency range	88~108 MHz
Sensitivity	2.0 μ V (IHF, usable)
S/N 30 dB	2.0 μ V (300 Ω), 1.3 μ V (75 Ω)
S/N 26 dB	1.8 μ V (300 Ω), 1.2 μ V (75 Ω)
S/N 20 dB	1.6 μ V (300 Ω), 0.9 μ V (75 Ω)
IHF 46 dB stereo quieting sensitivity	25 μ V/75 Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.25%
S/N	
MONO	70 dB (78 dB, IHF)
STEREO	65 dB (70 dB, IHF)
Frequency response	20 Hz~15 kHz, +0.5 dB~-1.5 dB
Alternate channel selectivity	
normal ($\pm$ 400 kHz)	60 dB
super narrow ($\pm$ 200 kHz)	20 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	80 dB
AM suppression	55 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB

Carrier leak	
19 kHz	-30 dB (-35 dB, IHF)
38 kHz	-45 dB (-50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	$\pm$ 1.5 dB
Limiting point	1.2 μ V
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	300 Ω (balanced) 75 Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	525~1605 kHz
Sensitivity (S/N 20 dB)	30 μ V, 250 μ V/m
Selectivity	27 dB
Image rejection at 1,000 kHz	50 dB
IF rejection at 1,000 kHz	40 dB

■ GENERAL

Output voltage	0.3V, (0.6V, IHF)
Power consumption	6.5W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 86 × 289 mm (16-15/16" × 3-3/8" × 11-3/8")
Weight	3.0 kg (6.6 lb.)

Technics

Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN

(Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	88~108 MHz
Eingangsempfindlichkeit	2,0 μ V (nutzbar nach IHF)
S/R 30 dB	2,0 μ V (300 Ω), 1,3 μ V (75 Ω)
S/R 26 dB	1,8 μ V (300 Ω), 1,2 μ V (75 Ω)
S/R 20 dB	1,6 μ V (300 Ω), 0,9 μ V (75 Ω)
Stereoumschaltsschwelle bei 46 dB nach IHF	25 μ V/75 Ω
Gesamtklirrfaktor	
Mono	0,15%
Stereo	0,25%
Geräuschabstand	
Mono	70 dB (78 dB nach IHF)
Stereo	65 dB (70 dB nach IHF)
Frequenzgang	20 Hz~15 kHz (+0,5 dB~-1,5 dB)
Trennschärfe bei Störsender	
normal ($\pm$ 400 kHz)	60 dB
super narrow ($\pm$ 200 kHz)	20 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	70 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
AM-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	40 dB
10 kHz	30 dB

Trägerrest

19 kHz	-30 dB (-35 dB nach IHF)
38 kHz	-45 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	75 Ω (unsymmetrisch)

■ AM-TUNERTEIL

Wellenbereiche	525~1605 kHz
Eingangsempfindlichkeit (S/R 20 dB)	30 μ V, 250 μ V/m
Trennschärfe	27 dB
Spiegelfrequenz-Dämpfung bei 1000 kHz	50 dB
ZF-Dämpfung bei 1000 kHz	40 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	0,3 V, (0,6V, IHF)
Leistungsaufnahme	6,5W
Netzspannung	
Wechselstrom	50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 × 86 × 289 mm
Gewicht	3,0 kg

CARACTERISTIQUES

(Sujet à changement sans préavis.)

(DIN 45 500)

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	88~108 MHz
Sensibilité	2,0 μ V (IHF utilisable)
S/B 30 dB	2,0 μ V (300 Ω), 1,3 μ V (75 Ω)
S/B 26 dB	1,8 μ V (300 Ω), 1,2 μ V (75 Ω)
S/B 20 dB	1,6 μ V (300 Ω), 0,9 μ V (75 Ω)
Sensibilité stéréo au seuil de 46 dB, IHF	25 μ V/75 Ω
Distorsion harmonique totale	
MONO	0,15%
STEREO	0,25%
Signal/Bruit	
MONO	70 dB (78 dB, IHF)
STEREO	65 dB (70 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +0,5 dB~-1,5 dB
Sélectivité alternée par canal	
normal ($\pm$ 400 kHz)	60 dB
super narrow ($\pm$ 200 kHz)	20 dB
Taux de capture	1,0 dB
Rejection d'image à 98 MHz	55 dB
Rejection FI à 98 MHz	70 dB
Rejection de réponse parasite à 98 MHz	80 dB
Suppression AM	55 dB
Séparation stéréophonique	
1 kHz	40 dB
10 kHz	30 dB

Fuite de porteuse

19 kHz	-30 dB (-35 dB, IHF)
38 kHz	-45 dB (-50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	$\pm$ 1,5 dB
Point de limite	1,2 μ V
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
Bornes d'antenne	300 Ω (symétrique) 75 Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

Gamme de fréquence	525~1605 kHz
Sensibilité (S/B 20 dB)	30 μ V, 250 μ V/m
Sélectivité	27 dB
Réjection d'image à 1,000 kHz	50 dB
Réjection FI à 1,000 kHz	40 dB

■ DIVERS

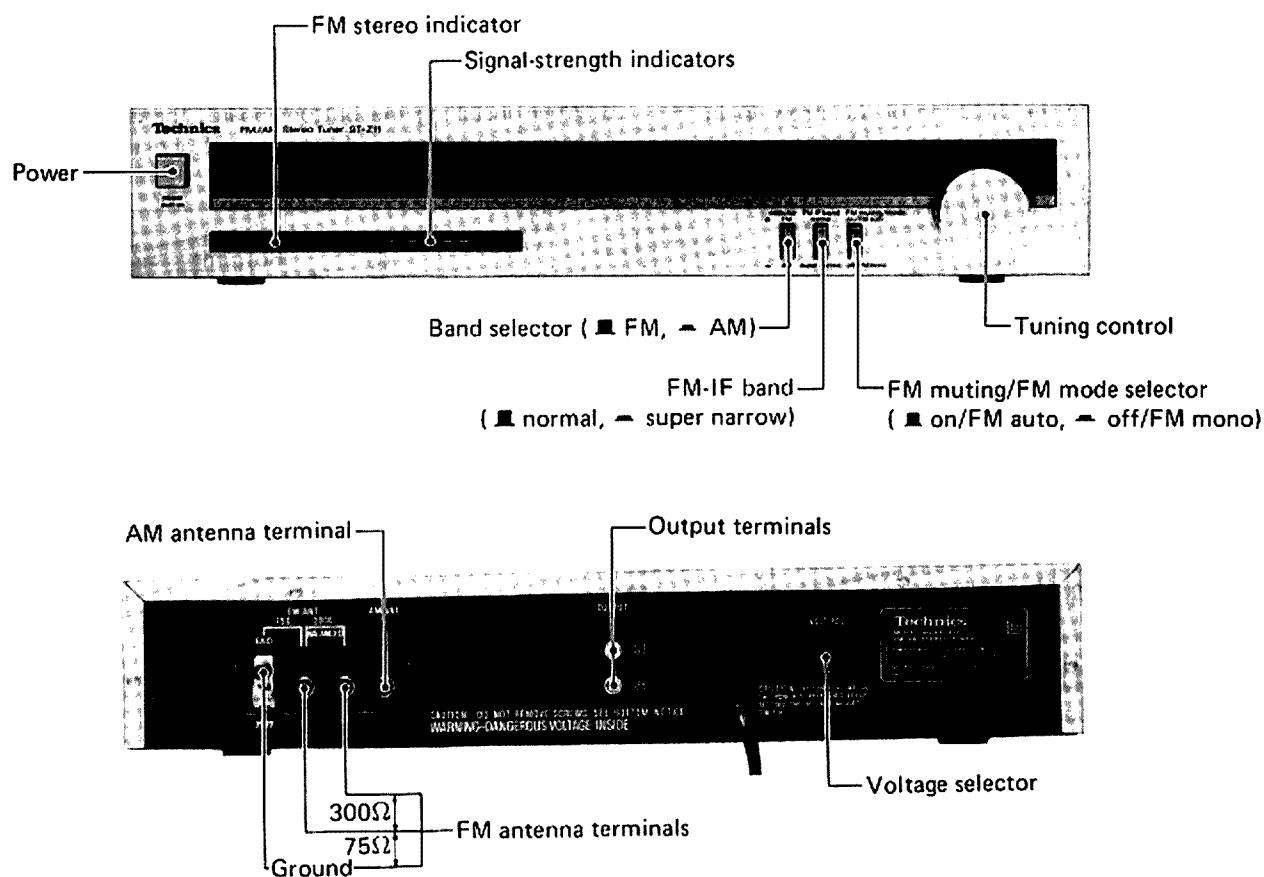
Tension de sortie	0,3 V, (0,6V, IHF)
Consommation	6,5W
Alimentation	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 86 × 289 mm
Poids	3,0 kg

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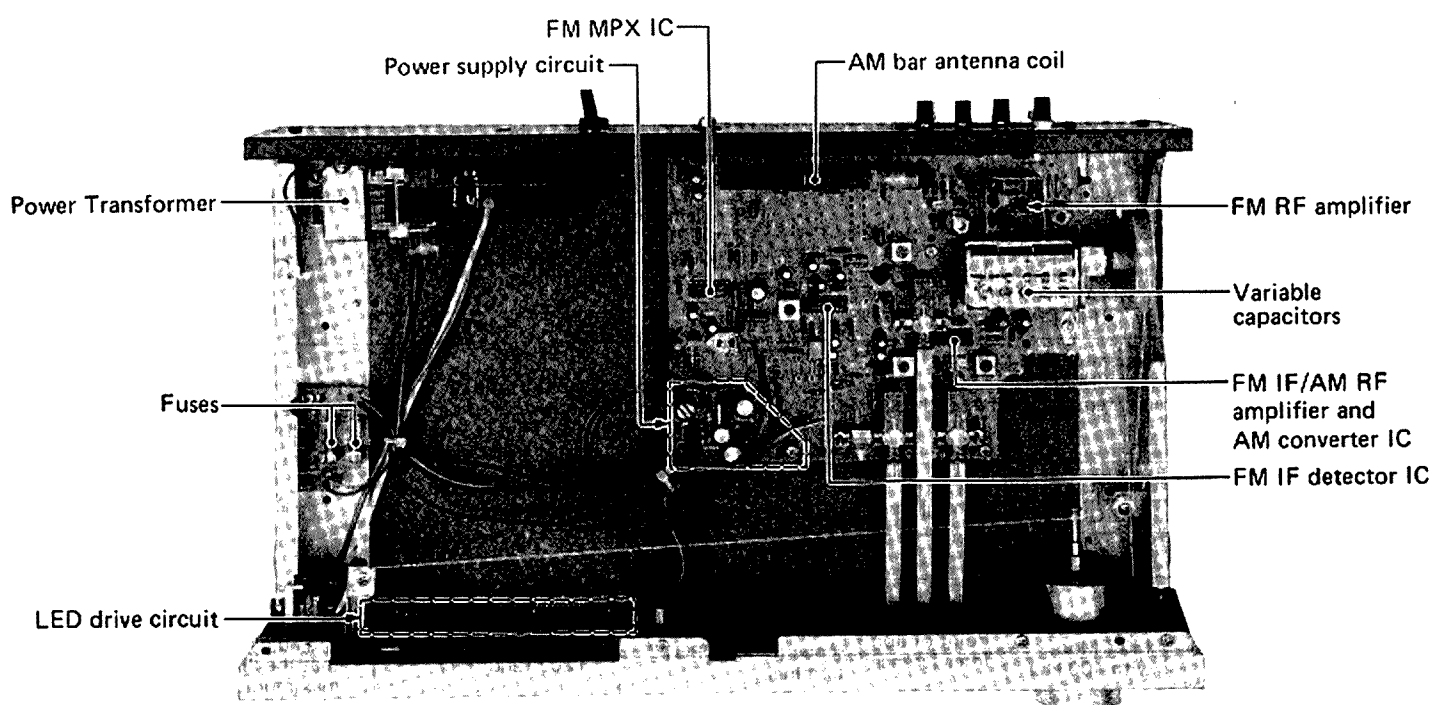
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■ LOCATION OF CONTROLS



Note: FM Antenna

Note that the FM antenna terminals used on products for F.R. Germany are the 75 Ω type only.



AM/FM SIGNAL GENERATOR		DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS	
CONNECTION	FREQUENCY					
AM-RF ADJUSTMENT						
2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	600kHz (30% Mod. with 400 Hz)	600kHz	Connect AC VTVM or scope to "OUTPUT" terminals.	L252 (AM OSC Coil) L250 (AM ANT Coil)	• Adjust for maximum output. Adjust L250 by moving coil bobbin along ferrite core.
3		1500kHz (30% Mod. with 400 Hz)	1500kHz	Connect AC VTVM or scope to "OUTPUT" terminals.	CT202 (AM OSC Trimmer) CT201 (AM ANT Trimmer)	• Adjust for maximum output. • Repeat steps (2) and (3).
FM-IF ADJUSTMENT						
4	_____	No Signal	Point of non-interference	Connect DC VTVM between 17 and 18 terminal through choke coil. (Refer to Fig. 4)	T101 (Discri. IFT)	• FM muting/ mode switch to "on/FM auto" position. • Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
FM-RF ADJUSTMENT						
5	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna.	90MHz (100% Mod. with 400 Hz) weak input.	90MHz	Connect scope to "OUTPUT" terminal.	L4 (OSC Coil) L1 (ANT Coil) L2 (RF DET Coil)	• 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. 5) • Repeat the steps (5) and (6) until the frequency correctly matches the dial scale.
6		106MHz (100% Mod. with 400 Hz) weak input.	106MHz	Connect scope to "OUTPUT" terminal.	CT3 (OSC Trimmer) CT1 (ANT Trimmer) CT2 (RF DET Trimmer)	
FM MPX V.C.O ADJUSTMENT						
USING A FREQUENCY COUNTER				USING ALTERNATE SYSTEM		
7	1. 100MHz 60 dB Non-modulated mono signal applied to set. 2. FM muting/mode switch to "on/FM auto". 3. Connect frequency counter to 11301 through resistor (100kΩ). 4. Adjust VR301 to 19kHz ± 30 Hz.			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. 6.		

EINSTELLUNGSANWEISUNGEN Deutsch

(Für Deutschland)

- **Stellungen und zu benutzende Geräte**
 1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM).
 2. AM (MW)-Meßsender (AM-SG)
 3. UKW-Meßsender (FM-SG)
 4. Oszilloskop
 5. Signalfrequenzmesser (meßbar für 19kHz und 108MHz).
 6. Bereichsschalter

.....	AM (MW Abgleich)
.....	FM (UKW Abgleich)
 - **Vorbereitung AM UKW-Meßsender (FM-SG)**
 1. Stereo-Modulator an FM-SG anschließen.
 2. SG-Ausgang über 75-ohm UKW Konstantenne an den Antenneneingang des Gerätes schließen.
 3. Der normale Eingang des Gerätes beträt 60 dB (1mV), 400 Hz 100% Modulation. (Wegen Verwendung der Konstantenne muß der Signalausgang 12 dB plus (IHF) sein: d.h. beim Eingang von 60 dB soll der Signalausgang 72 dB sein.)

AM MESSENDER		SKALENZEIGEREINSTELLUNG DES TUNER	ANZEIGEGERÄT (Röhrenvoltmeter oder Oszillograph)	ABGLEICHSPUNKTE	BEMERKUNGEN
ANSCHLUSS	FREQUENZ				
AM (MW)-ZF-ABGLEICH					
Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400 Hz Modulat., 30%)	Kein Empfang	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	T201 (1. IFT) T202 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adjustieren, daß der Ausgang den maximalen Wert erreicht.

AM/UKW MESSENDER		SKALENZEIGEREINSTELLUNG DES TUNER	ANZEIGEGERÄT (Röhrenvoltmeter oder Oszillograph)	ABGLEICHSPUNKTE	BEMERKUNGEN
ANSCHLUSS	FREQUENZ				
AM (MW)-HF-ABGLEICH					
Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	600kHz (400 Hz Modul., 30%)	600kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	L252 (Osc. Spule) L250 (Ant. Spule)	• Auf max. Ausgang abgleichen. • L250 (Spule) wird abgleichen, in dem die Spule am Ferritstab entlanggeschoben wird.
	1500kHz (400 Hz Modul., 30%)	1500kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	CT202 (Osc. Trimmer) CT201 (Ant. Trimmer)	• Auf max. Ausgang abgleichen. • Schritt (2) und (3) sind zu wiederholen.
UKW-ZF-ABGLEICH					
_____	Kein Signal	Kein Empfang	Ein Gleichstromröhrenvoltmeter zwischen 17 und 18 über eine Drosselspule verbinden. (Siehe Abb. 2)	T101 (Diskriminator FT)	• FM muting/mode-Schalter auf "on/auto" stellen. • Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt.
UKW-HF-ABGLEICH					
Meßsender über eine Kuntantenne an den UKW-Antenneneingang schließen.	87.5MHz (400 Hz Modul., 100%) Schwacher Eingang	87.5MHz (Frequenz min.)	Oszillograph über den Ausgang "OUTPUT" schließen.	L4 (Osc. Spule)	• Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. • So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 3) • Die Einstellung von (5), (6) und (7) wieder holen, bis die Frequenz mit der Skala übereinstimmt.
	90MHz (400Hz Modul., 100%) Schwacher Eingang	90MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	L1 (Ant. Spule) L2 (Det. Spule)	
	106MHz (400 Hz Modul., 100%) Schwacher Eingang	106MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	CT3 (Osc. Trimmer) CT1 (Ant. Trimmer) CT2 (Det. Trimmer)	
UKW-STEREO-DEKODER-ABGLEICH					
UNTER VERWENDUNG EINES ZÄHLERS			ALTERNATIV-MEß METHODE		
1. Unmoduliertes Mono-Signal 100MHz in das Gerät speisen. 2. FM muting/mode-Schalter auf "on/FM auto" stellen. 3. Zähler über einen Widerstand 100k ohm an TP301 schließen. 4. VR301 auf 19kHz $\pm$ 30 Hz einstellen.			1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. VR301 so einstellen, bis die Stereolampe auf leuchtet. Schleifer von VR301 sichern, wie in Abb. 4 gezeigt.		

INSTRUCTIONS DE REGLAGE Français

• Réglage et équipement utilisé

1. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
2. Générateur du signal AM (AM-SG).
3. Générateur du signal FM (FM-SG).
4. Oscilloscope
5. Compteur de fréquence (19kHz et 108MHz mesurable).
6. Sélecteur de gamme. { AM (Alignement AM)
 FM (Alignement FM)

7. Commutateur de silencieux/mode. . . off/FM mono.
8. Conserver la tension du secteur à la tension nominale.
9. Antenne fictive FM 300Ω Voir fig. 3.
10. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.

• Préparation du générateur de signal FM (FM-SG)

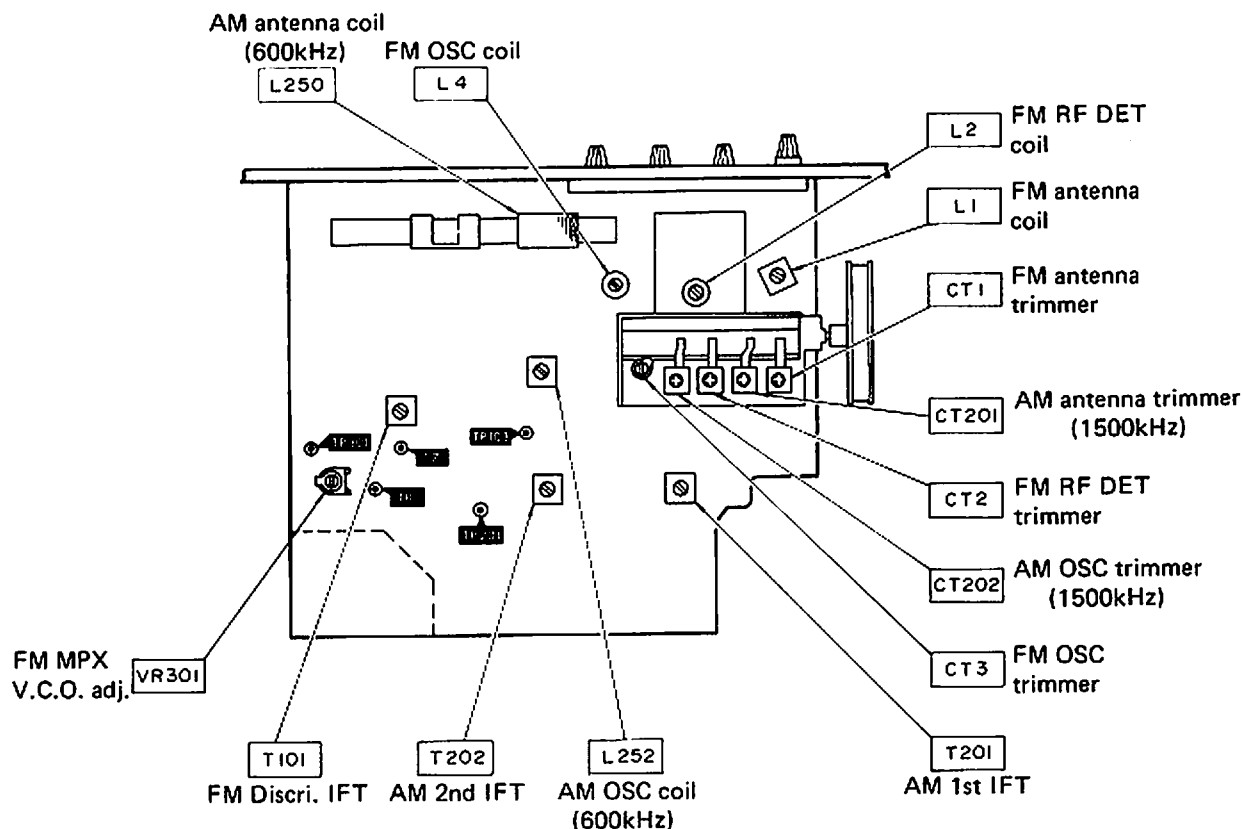
1. Brancher la commande de réglage stéréophonique à FM-SG.
2. Alimenter la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 300 ohms.

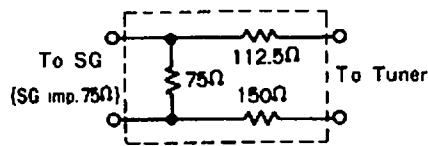
3. L'entrée standard de l'appareil est de 60 dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenne fictive, la sortie SG doit être de plus 12 dB (1HF). Ce qui signifie que quand l'entrée est de 60 dB, la sortie SG doit être de 72 dB.)

AM GENERATEUR		AIGUILLE SUR LE CADRAN	INDICATEUR (VOLT- METRE ELECTRONIQUE OSCILLOSCOPE)	POINTS DE REGLAGE	OBSERVATIONS
BRANCHEMENT	FREQUENCE				
REGLAGE DE FI-AM					
Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis (Entrée sous puissance)	450kHz (modulé à 30% par 400 Hz)	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.

AM/FM GENERATEUR		AIGUILLE SUR LE CADRAN	INDICATEUR (VOLT- METRE ELECTRONIQUE OSCILLOSCOPE)	POINTS DE REGLAGE	OBSERVATIONS
BRANCHEMENT	FREQUENCE				
REGLAGE DE RF-AM					
2 Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	600kHz (modulé à 30% par 400 Hz)	600kHz	C.A. voltmètre électroni- que ou oscilloscope sur prise de sortie de l'appareil.	L252 (bobine OSC) L250 (bobine ANT)	• Réglez au maximum de signal de sortie. • Régler L250 (bobine AM) en déplaçant la bobine le long du noyau de ferrite.
	3 1500kHz (modulé à 30% par 400 Hz)	1500kHz	C.A. voltmètre électroni- que ou oscilloscope sur prise de sortie de l'appareil.	CT202 (trimmer OSC) CT201 (trimmer ANT)	• Réglez 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 a.c. aux bornes 17 et 18. (Voir la Fig. 4)	T101 (Transfo FI discr.)	• Commutateur de silencieux sur "on/FM auto". • 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 Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	90 MHz (modulé à 100% par 400 Hz) Entrée faible	90 MHz	Oscilloscope sur prise de sortie du tuner.	L4 (bobine OSC) L1 (bobine ANT) L2 (bobine DET)	• Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. • Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 5) • Refaire les réglages (5) et (6). jusqu'à ce que la fréquence corresponde correctement avec l'échelle du cadran.
	6 106 MHz (modulé à 100% par 400 Hz) Entrée faible	106 MHz	Oscilloscope sur prise de sortie du tuner.	CT3 (trimmer OSC) CT1 (trimmer ANT) CT2 (trimmer DET)	
ALIGNEMENT DU PILOTE MULTIPLEX FM					
AVEC UN FREQUENCEMETRE			PAR UN AUTRE SYSTEME		
1. Signal mono 100MHz non modulé appliqué à l'appareil. 2. Commutateur de silencieux sur "on/FM auto". 3. Branchez le fréquencemètre sur TP301 à travers une 4. Régler VR301 sur 19kHz ± 30 Hz.			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 le VR301 comme indiqué sur la fig. 6.		

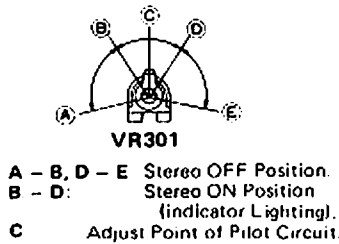
■ ADJUSTMENT POINTS



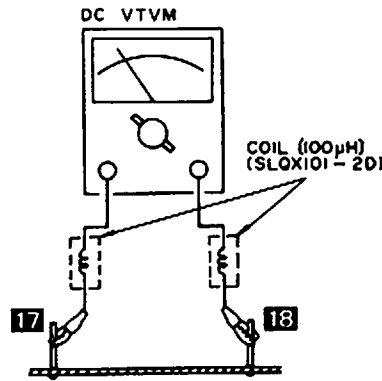


300Ω FM Dummy Antenna

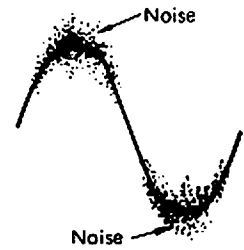
[Fig. 3]
Abb. 1



[Fig. 6]
Abb. 4

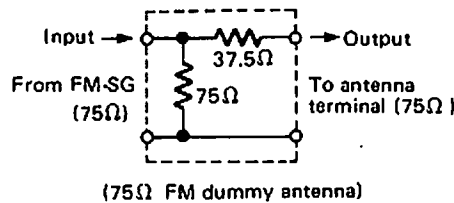


[Fig. 4]
Abb. 2



AF output wave form

[Fig. 5]
Abb. 3



(75Ω FM dummy antenna)

[Fig. 7]
Abb. 5

REPLACEMENT PARTS LIST...Electrical Parts

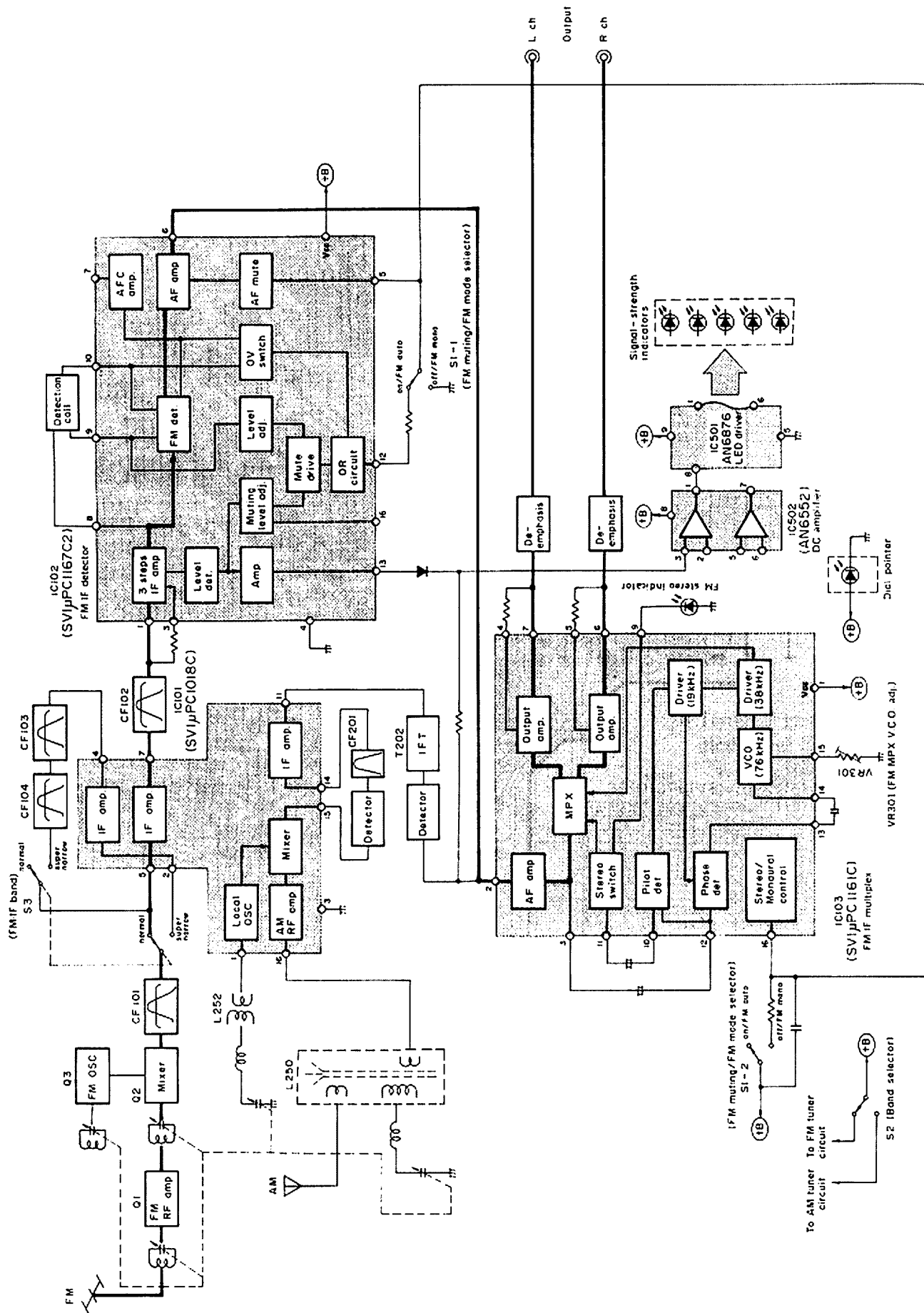
- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
 - Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUIT					
IC101	RVIUPC1018CF	IC, FM IF/AM RF Amplifier and AM Converter	L4	SLO4P95-P	Coil, FM Local Oscillator
IC102	SVIUPC1167C2	IC, FM IF Detector	L101	SLQX101-3M	Coil, Choke
IC103	SVIUPC1161C	IC, FM Multiplex	L250	SLF2C35-O	Coil, AM Ferrite Bar Antenna
IC501	AN6876	IC, LED Driver	L252	SLO2C1-P	Coil, AM Oscillator
IC502	AN6552F	IC, DC Amplifier	L254, 255	RLQY15G5-Y	Coil, Choke
TRANSISTORS			T101	SLI4C521	Transformer, FM IF
Q1	2SK195-H2	Transistor, FM RF Amplifier [FET]	T201	SLI2C129R-M	Transformer, AM IF
Q2	2SC1874-M	Transistor, FM Mixer	T202	SLI2C413R	Transformer, AM IF
Q3	2SC1675-L	Transistor, FM Oscillator	T401	SLT5J141-W	Transformer, Power Source
Q401	2SD762-O	Transistor, Regulator	T401 [XL] only	SLT5J147-W	Transformer, Power Source
DIODES			CERAMIC FILTERS		
D101, 202	20A90	Diode	CF101, 102	SVFE107MM-A	Ceramic Filter, FM 10.7MHz Red
D201, 203, 204	MA162A	Diode		SVFE107MM-B	Ceramic Filter, FM 10.68MHz Blue
D401	SVDEQA0113RA	Diode, 13V Zener		SVFE107MM-C	Ceramic Filter, FM 10.72MHz Orange
D402, 403	SVDSR1K2	Rectifier	CF103, 104	SVFE107M22-A	Ceramic Filter, FM 10.7MHz Red
D502, 503, 510	MA162A	Diode		SVFE107M22-B	Ceramic Filter, FM 10.675MHz Blue
D504 ~ 508	LN417YP	Light Emitting Diode, Yellow		SVFE107M22-C	Ceramic Filter, FM 10.725MHz Orange
D509	LN217RP	Light Emitting Diode, Red	CF201	SVFSFU450B3	Ceramic Filter, AM 457kHz (Use pair ranks as same as CF101, CF102, CF103, and CF104)
COILS and TRANSFORMERS			VARIABLE CAPACITORS		
L1	SLA4N15	Coil, FM Antenna	VC1 ~ 3, 201, 202	ECV5MD34X71G	Variable Capacitor, FM & AM
L2	SLD4P57-P	Coil, FM RF Detector	ICT1 ~ 3, 201, 202		
L3	ELQ5A77	Coil, Choke			

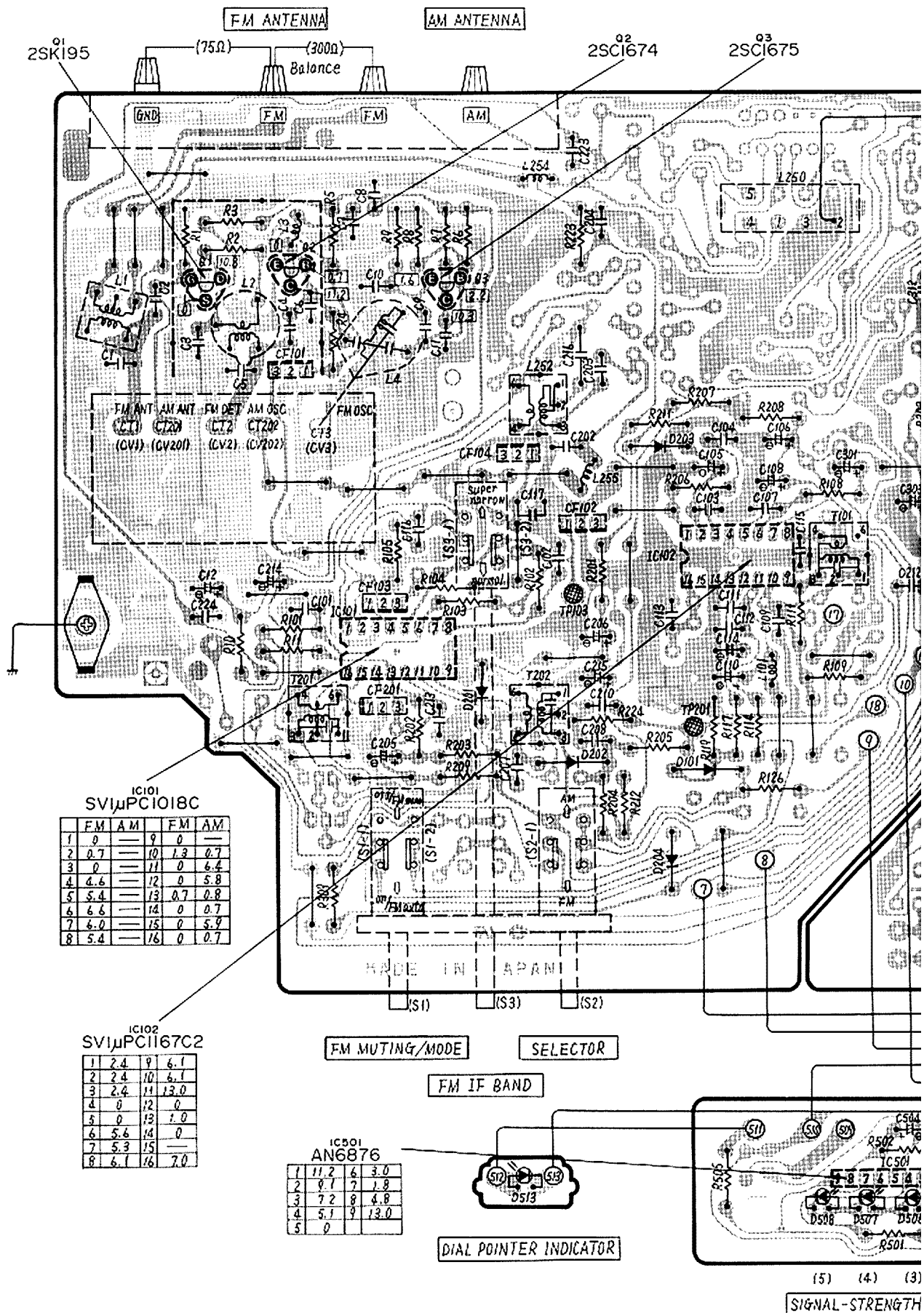
Ref. No.	Part No.	Part Name & Description
VARIABLE RESISTOR		
VR301	EVT53MA00853	FM MPX V.C.O. Adjustment
FUSES		
F1	Δ XBA2C06TR0	Fuse, T630mA (250V)
F2	Δ XBA2C03TR0	Fuse, T315mA (250V)
SWITCHES		
S1, 2	SSH2009	Switch, FM/AM Selector, Muting
S3	SSH187-1	Switch, FM IF Band
S6	Δ ESE372	Switch, Voltage Selector
S8	Δ ESB90619A	Switch, Power Source
RESISTORS		
R1	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R2	ERD25FJ220	Carbon, 22Ω, 1/4W, ± 5%
R3	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R4	ERD25TJ474	Carbon, 470kΩ, 1/4W, ± 5%
R5	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R6	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R7	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R8	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R9	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R10	ERD25FJ181	Carbon, 180Ω, 1/4W, ± 5%
R11	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R101	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R102	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R103	ERD25FJ331	Carbon, 330Ω, 1/4W, ± 5%
R104	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R105	ERD25FJ680	Carbon, 68Ω, 1/4W, ± 5%
R108	ERD25TJ393	Carbon, 39kΩ, 1/4W, ± 5%
R109	ERD25FJ682	Carbon, 6.8kΩ, 1/4W, ± 5%
R111	ERD25FJ182	Carbon, 1.8kΩ, 1/4W, ± 5%
R114	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R117	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R119	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%
R126	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R201	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R202	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R203	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R204	ERD25FJ272	Carbon, 2.7kΩ, 1/4W, ± 5%
R205	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R206	ERD25FJ271	Carbon, 270Ω, 1/4W, ± 5%
R207, 208	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R209	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R210	ERD25TJ273	Carbon, 27kΩ, 1/4W, ± 5%
R211	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R212	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R223	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R224	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R302	ERD25FJ470	Carbon, 47Ω, 1/4W, ± 5%
R303, 304	ERD25TJ223	Carbon, 22kΩ, 1/4W, ± 5%
R305, 306	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R307	ERD25TJ274	Carbon, 270kΩ, 1/4W, ± 5%
R308	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%
R309	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R310	ERD25FJ391	Carbon, 390Ω, 1/4W, ± 5%
R311, 312	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R313, 314	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R316	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R401	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R402	ERD25FJ681	Carbon, 680Ω, 1/4W, ± 5%
R501	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%

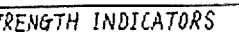
Ref. No.	Part No.	Part Name & Description
R502	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R503	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R504	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R505	ERD25FJ152	Carbon, 1.5kΩ, 1/4W, ± 5%
R506	ERD25TJ123	Carbon, 12kΩ, 1/4W, ± 5%
R507	ERD25TJ883	Carbon, 68kΩ, 1/4W, ± 5%
R510	ERD25FJ122	Carbon, 1.2kΩ, 1/4W, ± 5%
CAPACITORS		
C1	ECCD1H150K	Ceramic, 15pF, 50V, ± 10%
C2	ECCD1H070D	Ceramic, 7pF, 50V, ± 0.5pF
C3	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
C4	ECCD1H030C	Ceramic, 3pF, 50V, ± 0.25pF
C5	ECCD1H150K	Ceramic, 15pF, 50V, ± 10%
C6	ECCD1H060C	Ceramic, 6pF, 50V, ± 0.25pF
C7	ECCD1H181K	Ceramic, 180pF, 50V, ± 10%
C8	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C9	ECCD1H390KC	Ceramic, 39pF, 50V, ± 10%
C10	ECCD1H150KC	Ceramic, 15pF, 50V, ± 10%
C11	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
C12	ECEA1E5101	Electrolytic, 100μF, 25V, ± 20%
C101, 102	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C103, 104	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C105	ECEA1H5100	Electrolytic, 10μF, 50V, ± 20%
C106	ECEA50Z1	Electrolytic, 1μF, 50V, ± 20%
C107	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
C108	ECEA50Z1	Electrolytic, 1μF, 50V, ± 20%
C109	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C110	ECEA1CS330	Electrolytic, 33μF, 16V, ± 20%
C111	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C112, 113	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 20%
C114	ECEA1H5100	Electrolytic, 10μF, 50V, ± 20%
C115	ECCD1H030C	Ceramic, 3pF, 50V, ± 0.25pF
C117	ECCD1H470K	Ceramic, 47pF, 50V, ± 10%
C202	ECCD1H150KC	Ceramic, 15pF, 50V, ± 10%
C203	ECQP1361JZ	Polypropylene, 360pF, 100V, ± 5%
C204	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C205	ECEA1H5100	Electrolytic, 10μF, 50V, ± 20%
C206	ECEA25Z4R7	Electrolytic, 4.7μF, 25V, ± 80%
C207, 208	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C210	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C212	ECQM1H223KZ	Polyester, 0.022μF, 50V, ± 10%
C213	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C214	ECEA1H5100	Electrolytic, 10μF, 50V, ± 20%
C216	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C223	ECKD1H103MD	Ceramic, 0.01μF, 50V, ± 20%
C224	ECCD1H220K	Ceramic, 22pF, 50V, ± 10%
C251	ECCD1H030C	Ceramic, 3pF, 50V, ± 0.25pF
C301	ECEA25Z4R7	Electrolytic, 4.7μF, 25V, ± 80%
C302	ECQM1H473KZ	Polyester, 0.047μF, 50V, ± 10%
C303	ECEA1E5101	Electrolytic, 100μF, 25V, ± 20%
C305, 306	ECKD1H271KB	Ceramic, 270pF, 50V, ± 10%
C307	ECEA50ZR47	Electrolytic, 0.47μF, 50V, ± 80%
C308	ECEA50Z1	Electrolytic, 1μF, 50V, ± 20%
C310	ECQP1471JZ	Polypropylene, 470pF, 100V, ± 5%
C311, 312	ECQM1H153KZ	Polyester, 0.015μF, 50V, ± 10%
C313, 314	ECEA50ZR47	Electrolytic, 0.47μF, 50V, ± 80%
C316	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 20%
C401	ECEA1CS331	Electrolytic, 330μF, 16V, ± 20%
C402	ECEA1VS221	Electrolytic, 220μF, 35V, ± 20%
C404, 405	ECEA1CS331	Electrolytic, 330μF, 16V, ± 20%
C406	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C407	ECKD1H271KB	Ceramic, 270pF, 50V, ± 10%
C408	Δ ECKDKC103PF	Ceramic, 0.01μF, 400VAC, ± 10%
C502, 503	ECEA1H5470	Electrolytic, 47μF, 50V, ± 80%
C504	ECEA25Z4R7	Electrolytic, 4.7μF, 25V, ± 80%
C507	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C508	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 20%

BLOCK DIAGRAM

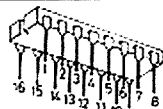
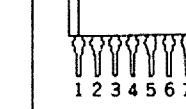
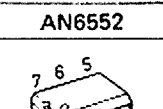
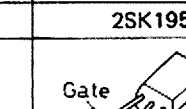
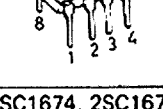
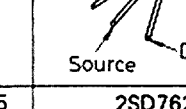
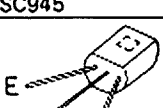


CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM





- **Terminal guide of transistors, diodes and IC's**

SVIUPC1018C, SVIUPC1167C2 SVIUPC1161C 	AN6876 
AN6552 	2SK195 
2SC1674, 2SC1675 2SC945 	2SD762 
LN417YP, LN217RP 	LN220RP 

1

2

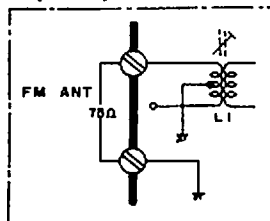
3

4

5

A

- Product for F.R. Germany only



Note:

FM Antenna

Note that the FM antenna terminals used on products for F.R. Germany are the 75Ω type only.

C

D

E

F

G

FM ANT

GND

FM signal

AM ANT

AM signal

AM OSC

DS13
LN220RPDIAL
POINTER
INDICATORQ1
2SK195
FM RF AMPQ2
2SC1674
FM MIXERQ3
2SC1675
OSC

FM OSC

FM signal

(FM-IF BAND)

normal

super narrow

R105

C101

R101

R103

R104

C102

C103

R102

C104

R106

C105

R107

C106

R108

C107

R109

C108

R110

C109

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R253

C252

R254

C253

R255

C254

R256

C255

R257

C256

R258

C257

SCHEMATIC DIAGRAM

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

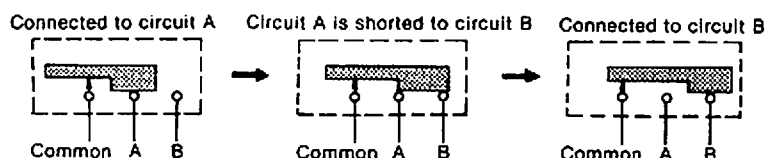
Notes:

- S1-2, 1-2 :** FM muting/FM mode selector switch in "on/FM auto" position.
on/FM auto $\longleftrightarrow$ off/FM mono
- S2-1 :** Band selector switch in "FM" position.
FM $\longleftrightarrow$ AM
- S3-1, 3-2 :** FM IF-band selector switch in "normal" position.
normal $\longleftrightarrow$ super narrow
- S6 :** Voltage selector switch in "240V" position.
④ 110V $\longleftrightarrow$ ③ 120V $\longleftrightarrow$ ② 220V $\longleftrightarrow$ ① 240V
- S8 :** Power 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 $\square$ stand for DC voltage in FM/AM signal reception mode.
 * Figures in $\langle \rangle$ stand for DC voltage in FM stereo signal reception mode.
 * Figures in $\sqcap$ stand for DC voltage in FM (no signal) muting to on mode.
 * Figures in $()$ stand for DC voltage with the band selectors circuit set at AM.
- Signal lines
 $\longrightarrow$ FM signal
 $\cdots\cdots\cdots$ Audio frequency signal
 $\text{---}+$ Positive (+B) voltage line
 $\text{---} \blacktriangleleft / \blacktriangleright$ AM signal
- Important safety notice:
 Components identified by $\triangle$ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

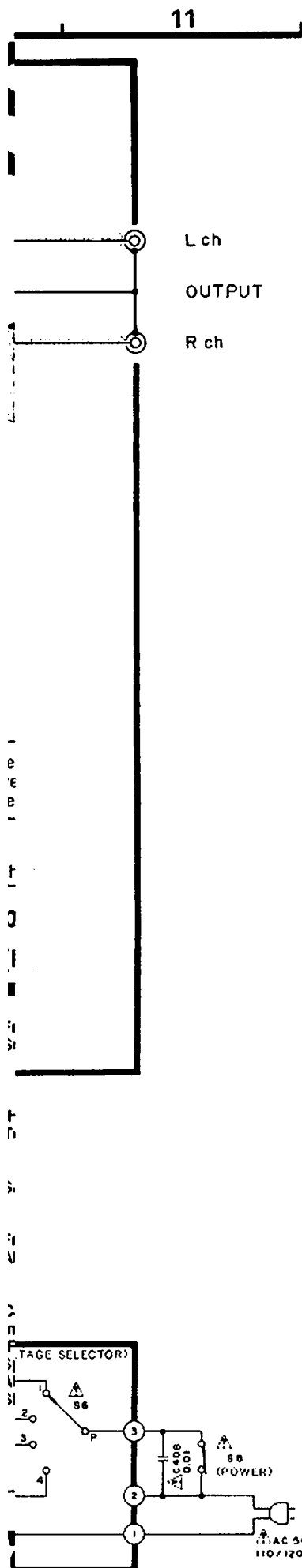
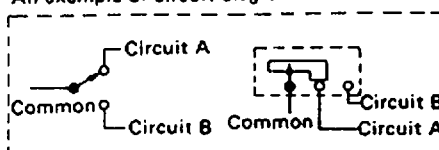
Shorting Switch

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



REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety Notice:
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
 - $\square$ -marked parts are used for black only, while $\bigcirc$ -marked parts are for silver type only.

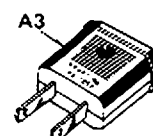
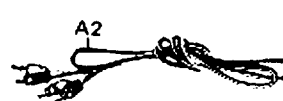
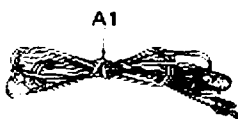
- Parts other than $\square$ and $\bigcirc$ marked are used for both black and silver types.
- Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas

Black type Model No. : ST-Z11 (K)

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS			SCREWS, WASHERS and NUT		
1	$\bigcirc$ SGWTZ11E	Front Panel	N1	XTB3+8BFZ	Screw, Tapping, $\pm 3 \times 8$
1	$\square$ SGWTZ11KE	Front Panel (Black)	N2	XNS11	Nut, $\phi 11$
2	SBN1007	Knob, Tuning	N3	XWD11B	Washer, External Toothed Lock $\phi 11$
3	SHP671-1	Spacer, Knob	N4	XSN3+6S	Screw, $\pm 3 \times 6$
4	SBC307-1	Button, Power Source	N5	XWA3B	Washer, Spring $\phi 3$
5	SGU211	Transparent Cover	N6	$\bigcirc$ XTB4+8BFN	Screw, Tapping $\pm 4 \times 8$
6	SDP1155	Pointer, Dial	N6	$\square$ XTB4+8BFZ	Screw, Tapping $\pm 4 \times 8$ (Black)
7	SMP15-2	Spacer, Pointer	N7	XSN3+6S	Screw, $\pm 3 \times 8$
8	SBC339	Button, Push Switch	N8	XWC3B	Washer, External Toothed Lock $\phi 3$
9	SHR401-1	Lock Pin, P.C.B	N9	XTB3+8BFZ	Screw, Tapping $\pm 3 \times 8$
10	$\bigcirc$ SUFTZ11E	Sub Panel	N10	SHD3X21F-1	Screw
10	$\square$ SUFTZ11KE	Sub Panel	N11	XTS3+8B	Screw, Tapping $\pm 3 \times 8$
11	$\bigcirc$ SKC750S	Cabinet	N12	XTN3+10B	Screw, Tapping $\pm 3 \times 10$
11	$\square$ SKC750B	Cabinet (Black)	N13	XWG3	Washer, Plain, $\phi 3$
12	RJT202B	Terminal	N14	XWC3B	Washer, External Toothed Lock $\phi 3$
13	SJT347	Terminal, Fuse	N15	$\bigcirc$ XTB3+8BFN	Screw, Tapping $\pm 3 \times 8$
14	SDR3	Roller	N15	$\square$ XTB3+8BFZ	Screw, Tapping $\pm 3 \times 8$ (Black)
15	SUR125	Bracket, Roller	N16	XTB3+10BFZ	Screw, Tapping $\pm 3 \times 10$
16	SUG67	Guide, Pointer	N17	XTN3+8B	Screw, Tapping $\pm 3 \times 8$
18	SUB71	Coupling Rod	N18	XWG3	Washer, Plain $\phi 3$
19	SUB69	Coupling Rod	N19	XTN3+10BFZ	Screw, Tapping $\pm 3 \times 10$
20	SDT8083	Shaft Tuning Ass'y (W/Flywheel)	N20	XWG3FZ	Washer, Plain $\phi 3$
21	SUR123	Bracket, Roller	N21	XTN3+12B	Screw, Tapping $\pm 3 \times 12$
22	SHE73	Spacer, P.C.B	N22	SHD3X1F-1	Screw
23	SJF3247-1N	Terminal, Output	ACCESSORIES		
24 [EX] only	SGP2630-1A	Rear Panel	A1	SSA267	Cord, FM Indoor Antenna
24	SGP2630-1B	Rear Panel	A2	SJP2129-5	Cord, Connection
24 [EG] only	SGP2630-1H	Rear Panel	A3 [XA] only	Δ SJP5213-1	Plug Adapter, AC Power
24 [EI] only	SGP2630-1D	Rear Panel, (Made in Singapore)	A4	SQF20323	Instruction Book, Printed Matter
25	SHR127	Bushing, AC Cord	PACKING PARTS		
26 [EX, EG, XA]	Δ SJA88	AC Cord	P1	SPP649	Polyethylene Bag
26 [XL] only	Δ QFC1208M	AC Cord	P2	SPS3073	Pad, Left Side
27	SHR401-1	Lock Pin, P.C.B	P2 [XL] only	SPS3073-1	Pad, Left Side
28	SJF4419-4	Terminal, Antenna	P3	SPS3075	Pad, Right Side
28 [EG] only	SJF4311-4	Terminal, Antenna	P3 [XL] only	SPS3075-1	Pad, Right Side
29	SHG711	Spacer	P4 [EG, EH]	$\bigcirc$ SPG2931	Carton Box
30	SDD47-1	Dram, Dial	P4 [EX] only	$\bigcirc$ SPG2933	Carton Box
31	SDSA4121	Spring, Dial	P4 [XA] only	$\bigcirc$ SPG2935	Carton Box
32	SKU9110	Bottom Board	P4 [XL] only	$\bigcirc$ SPG2937	Carton Box
33	SKL249	Foot	P4 [EI] only	$\bigcirc$ SPG3001	Carton Box, (Made in Singapore)
34	SHR9527-1	Spacer	P4	$\square$ SPG2939	Carton Box

Areas

- * [EX] is available in Switzerland and Scandinavia.
- * [EG] is available in F.R. Germany.
- * [EH] is available in Holland.
- * [EA] is available in Austria.
- * [XL] is available in Australia.
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.
- * [EI] is available in Italy.



EXPLODED VIEWS

