

Service Manual



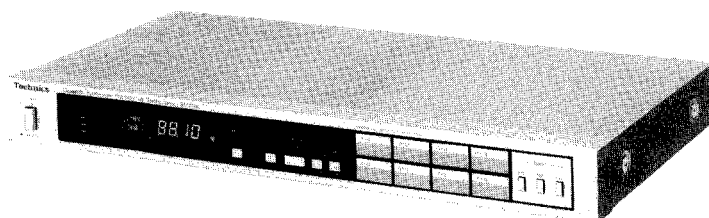
Synthesizer FM/MW/LW Stereo Tuner

ST-Z55L

[EX], [EK], [EF], [EB]

ST-Z55L(K)

[EX], [EK], [EB]



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

Areas

- * [EX] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [EF] is available in France.
- * [EB] is available in Belgium.

Specifications

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

(DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz
Sensitivity	
S/N 30 dB	1.0 μ V (75 Ω)
S/N 26 dB	0.9 μ V (75 Ω)
S/N 20 dB	0.8 μ V (75 Ω)
IHF usable sensitivity	0.95 μ V (IHF '58)
IHF 46 dB stereo quieting sensitivity	22 μ V/75 Ω
Total harmonic distortion	
MONO	0.08%
STEREO	0.15%
S/N	
MONO	70 dB (78 dB, IHF)
STEREO	65 dB (73 dB, IHF)
Frequency response	20 Hz~15 kHz, +0.5 dB~ -1.5 dB
Alternate channel selectivity	
normal $\pm$ 400 kHz	65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	80 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)	$\pm$ 1.0 dB
Limiting point	1.9 μ V
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz

Antenna terminals

75 Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
MW	522~1611 kHz (9 kHz step)
LW	530~1620 kHz (10 kHz step)
	155~353 kHz (9 kHz step)
	153~351 kHz (-2 kHz shift)
Sensitivity (S/N 20 dB)	
MW	20 μ V, 300 μ V/m
LW	50 μ V
Selectivity	
MW ($\pm$ 9 kHz)	55 dB
LW	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 254 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	65 dB
LW (at 254 kHz)	35 dB

■ GENERAL

Output voltage	0.3V, (0.6V IHF)
Power consumption	8W
Power supply	
For continental Europe	AC 50 Hz/60 Hz, 220V
For United Kingdom	AC 50 Hz/60 Hz, 240V
Dimensions (W×H×D)	430 × 53 × 245 mm
	(16-15/16" × 2-3/32" × 9-21/32")
Weight	2.4 kg
	(5.3 lb.)

Technics

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P.O. Box 288, Central Osaka Japan

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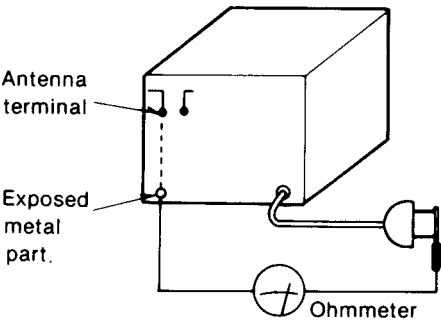
SAFETY PRECAUTION

- 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

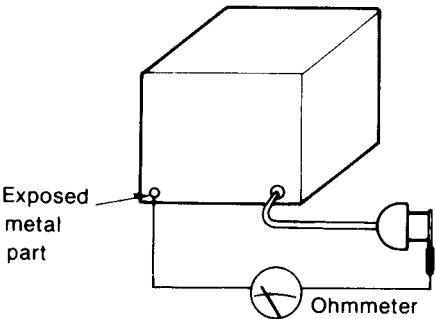
- 1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
- 2. Turn on the power switch.
- 3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ 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 = 3MΩ—5.2MΩ



(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.

QUARTZ Synthesizer
FM/AM Stereo Tuner

ST-Z55L/ST-Z55L(K)

- This booklet includes the specifications and adjustment of Model ST-Z55L (Order No. SD83072587C2) written in German, French and Spanish.
- File this booklet together with the service manual of Model ST-Z55L.
- Dieses Büchlein umfaßt die technischen Daten und Justierungsanleitungen von Modell ST-Z55L (Bestell Nr. SD83072587C2) in den Sprachen Deutsch, Französisch und Spanisch.
- Bewahren Sie dieses Büchlein zusammen mit dem Service-Handbuch von Modell ST-Z55L auf.
- Cette brochure comprend les spécifications et la mise au point du Modèle ST-Z55L (N° d'Ordre SD83072587C2) écrites en allemand, en français et en espagnol.
- Classer cette brochure en même temps qu'avec le manuel de service du Modèle ST-Z55L.

DEUTSCH

■ TECHNISCHE DATEN (Die technischen Daten können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)		Bandbreite	
■ UKW-TUNERTEIL		ZF-Verstärker	180 kHz
Wellenbereich	87,50 ~ 108,00 MHz	UKW-Demodulator	1000 kHz
Eingangsempfindlichkeit		Antennenanschluß	75 Ω (unsymmetrisch)
S/R 30 dB	1,0 µV (75 Ω)	■ MW-TUNERTEIL	
S/R 26 dB	0,9 µV (75 Ω)	Wellenbereiche	
S/R 20 dB	0,8 µV (75 Ω)	MW	522 ~ 1611 kHz (9-kHz-Schritte)
Nutzempfindlichkeit nach IHF	0,95 µV (nach IHF '58)		530 ~ 1620 kHz (10-kHz-Schritte)
Stereoumschaltsschwelle bei 46 dB nach IHF	22 µV/75 Ω	LW	155 ~ 353 kHz (9-kHz-Schritte)
Gesamtklirrfaktor			153 ~ 351 kHz (–2 kHz shift)
Mono	0,08%	Eingangsempfindlichkeit (S/R 20 dB)	
Stereo	0,15%	MW	20 µV, 300 µV/m
Geräuschabstand		LW	50 µV
Mono	70 dB (78 dB nach IHF)	Trennschärfe	
Stereo	65 dB (73 dB nach IHF)	MW (±9 kHz)	55 dB
Frequenzgang	20 Hz ~ 15 kHz +0,5 dB ~ –1,5 dB	LW	55 dB
Trennschärfe bei Störsender		Spiegelfrequenz-Dämpfung	
normal ±400 kHz	65 dB	MW (bei 999 kHz)	40 dB
Einfangverhältnis	1,0 dB	LW (bei 254 kHz)	40 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB	ZF-Dämpfung	
ZF-Dämpfung bei 98 MHz	80 dB	MW (bei 999 kHz)	65 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB	LW (bei 254 kHz)	65 dB
MW-Unterdrückung	55 dB	■ ALLGEMEINE DATEN	
Übersprechdämpfung		Ausgangsspannung	0,3 V (0,6 V IHF)
1 kHz	40 dB	Leistungsaufnahme	8W
10 kHz	30 dB	Netzspannung	
Trägerrest		Für Kontinentaleuropa	Wechselstrom 50 Hz/60 Hz, 220V
19 kHz	–30 dB (–35 dB nach IHF)	Abmessungen (B×H×T)	430 × 53 × 245 mm
38 kHz	–45 dB (–50 dB nach IHF)	Gewicht	2,4 kg
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,0 dB		
Begrenzereinsatz	1,9 µV		

■ MESSUNGEN UND JUSTIERUNGEN

Anmerkung: Die AM-OSC-Spule (L203), AM ZFT (T201) und LW ant. Spule (L251) sind bereits justiert und benötigt daher keine Justierung.

AM (MW)-EINSTELLUNG

- * **Stellungen und zu benutzende Geräte**

 1. Elektronisches Voltmeter für Wechselstrom (VTVM).
 2. AM (MW)-Meßsender (AM-SG).
 3. Bereichsschalter,AM
 4. AM (MW) Wellenverteilungs-Wahlschalter auf Position "9 kHz" stellen.
5. Netzspannung auf ihrem Sollwert halten.
 6. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
 7. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.

AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverFAHREN	
ANSCHLUSS	FREQUENZ					
Nr.	AM (MW)-HF-ABGLEICH *Bandwahlschalter in die "MW"-position stellen.					
1	AM-MO über 200 pF Kondensator an den AM-Antennenanschluß anschließen, wie in Abb. 6 gezeigt. (Schwacher Eingang.)	612 kHz (400 Hz Modulat., 30%)	612 kHz	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "OUTPUT" anschließen.	L202 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L202 mit einem Schraubendreher justieren.
2		1503 kHz (400 Hz Modulat., 30%)	1503 kHz		CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (1) und (2) wiederholen, bis die Frequenz genau mit der Skalanzeige übereinstimmt.
LW-HF-ABGLEICH *Bandwahlschalter in die "LW"-position stellen.						
3	AM-MO über 200 pF-Kondensator an den AM-Antennenanschluß anschließen, wie in Abb. 6 gezeigt. (Schwacher Eingang.)	155 kHz (400 Hz Modulat., 30%)	155 kHz	Wechselstrom Röhren-voltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	L253 (LW Osc. Spule)	● Auf max. Ausgang abgleichen.
4		353 kHz (400 Hz Modulat., 30%)	353 kHz	Wechselstrom Röhren-voltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	CT251 (LW Ant. Trimmer)	● Auf max. Ausgang abgleichen. ● Schritt (3) und (4) sind zu wiederholen.

FM (UKW)-EINSTELLUNG*** Stellungen und zu benutzenden Geräte**

1. UKW-Meßsender (FM-SG)
2. Klirrfaktor-Meßbrücke.
3. Oszillograph.
4. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM).
5. Signalfrequenzmesser (meßbar für 19 kHz und 108 MHz)
6. Bereichsschalter, FM
7. Den UKW-Betriebsartenschalter auf die "mono"-Position stellen.
8. Die anderen Einstellungen sind gleich wie beider MW-Justierung.

*** Vorbereitung des UKW-Meßoszillators (UKW-MO)**

Die Normal-Eingangsleistung dieses Gerätes beträgt 60 dB (1 mV), 400 Hz, 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.

FM (UKW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverfahren
ANSCHLUSS	FREQUENZ				
ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
UKW-MO an FM Antennende anschließen, wie in Abb. 7 gezeigt. (60 dB in den Antenneneingang anlegen.)	100,10 MHz (400 Hz Modulat. 100%)	100,10 MHz	Ein Gleichstrom-Voltmeter zwischen TP101 (—) und TP102 (+) über eine Drosselspule anschließen.	T101 (Diskriminator FT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Zustand 0 mV im 300 mV Bereich beträgt.
			Klirrfaktor-Meßbrücke an Ausgangsklemme "OUTPUT" anschließen.	T102 (Diskriminator FT)	Kern von T102 für minimale Verzerrung der rechten und linken Kanäle justieren.
UKW-STEREO-DEKODER-ABGLEICH					
UNTER VERWENDUNG EINES ZÄHLERS			ALTERNATIV-MESSMETHODE		
1. Unmoduliertes Mono-Signal 100,10 MHz in das Gerät speisen. 2. FM mode-Schalter auf "FM auto" stellen. 3. Zähler über einen Widerstand von 100k Ohm an TP301 anschließen, (Vgl. Abb. 8) 4. VR301 auf 19 kHz ± 30 Hz einstellen.			1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. VR301 so einstellen, bis die Stereolampe aufleuchtet. Schleifer von VR301 sichern, wie in Abb. 9 gezeigt.		

FRANÇAIS

■ CARACTERISTIQUES

(Sujet à changement sans avertissement préalable.)

(DIN 45 500)

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	87,50~108,00 MHz
Sensibilité	
S/B 30 dB	1,0 μ V (75 Ω)
S/B 26 dB	0,9 μ V (75 Ω)
S/B 20 dB	0,8 μ V (75 Ω)
Sensibilité utilisable IHF	0,95 μ V (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μ V/75 Ω
Distorsion harmonique totale	
MONO	0,08%
STEREO	0,15%
Signal/Bruit	
MONO	70 dB (78 dB, IHF)
STEREO	65 dB (73 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +0,5 dB~ -1,5 dB
Sélectivité alternée par canal	
normal $\pm$ 400 kHz	65 dB
Taux de capture	1,0 dB
Rejection d'image à 98 MHz	55 dB
Rejection FI à 98 MHz	80 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)	$\pm$ 1,0 dB
Point de limite	1,9 μ V

Largeur de bande

Amplificateur FI

180 kHz

Démodulateur FM

1000 kHz

Bornes d'antenne

75 Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

Gamme de fréquence	
PO (MW)	522~1611 kHz (par palier 9 kHz)
	530~1620 kHz (par palier 10 kHz)
GO (LW)	155~353 kHz (par palier 9 kHz)
	153~351 kHz (-2 kHz shift)
Sensibilité (S/B 20 dB)	
PO (MW)	20 μ V, 300 μ V/m
GO (LW)	50 μ V
Sélectivité	
PO (MW) ($\pm$ 9 kHz)	55 dB
GO (LW)	55 dB
Réjection d'image	
PO (MW) (à 999 kHz)	40 dB
GO (LW) (à 254 kHz)	40 dB
Réjection FI	
PO (MW) (à 999 kHz)	65 dB
GO (LW) (à 254 kHz)	35 dB

■ DIVERS

Tension de sortie	0,3 V (0,6V IHF)
Consommation	8W
Alimentation	
Pour l'Europe	CA 50 Hz/60 Hz, 220V
Dimensions (L×H×Pr)	430 × 53 × 245 mm
Poids	2,4 kg

■ MESURAGES ET RÉGLAGES

Nota: La bobine oscillatrice de modulation d'amplitude (L203) et le transformateur de fréquence intermédiaire de modulation d'amplitude (T201) et le bobine ANT LW (L251) ont déjà été ajustée et ne nécessite pas de réglage.

REGLAGE DE AM

* Réglage et équipement utilisé

1. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
2. Générateur de signaux AM (AM-SG)
3. Sélecteur du gamme AM
4. Régler le sélecteur d'attribution AM sur la position "9 kHz step".
5. Conserver la tension du secteur à la tension nominale.
6. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
7. Utiliser un tournevis non-métallique pour le réglage.

GENERATEUR AM		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIFS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
BRANCHEMENT	FREQUENCE				
N°	REGLAGE DE IF-MW *Régler le commutateur de gammes d'ondes sur la position "MW".				
	1	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200 pF. Commun au châssis. (Eintée faible) (Se référer à la Fig. 6.)	612 kHz 612 kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	L202 (Bobine Ant.)
2		1503 kHz (Modulé à 30% par 400 Hz)	1503 kHz		CT201 (Trimmer Ant.)

GENERATEUR FM		FREQUENCE D’AFFICHAGE PAR PREREGLAGE	PREPARATIFS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
BRANCHEMENT	FREQUENCE				
RÉGLAGE DE RE-LW (GO) * Régler le commutateur de gammes d’ondes sur la position “LW”.					
Raccorder le générateur de signaux AM (modulation d’amplitude) à la borne d’antenne AM par l’intermédiaire d’un condensateur de 200pF, en se référant à la Fig. 6. (Entrée faible)	155 kHz (modulé à 30% par 400 Hz)	155 kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l’appareil.	L251 (Bobine OSC LW)	● Réglez au maximum de signal de sortie.
	353 kHz (modulé à 30% par 400 Hz)	353 kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l’appareil	CT251 (Trimmer ANT LW)	● Réglez au maximum de signal de sortie. ● Recommencez les étapes (3) et (4).

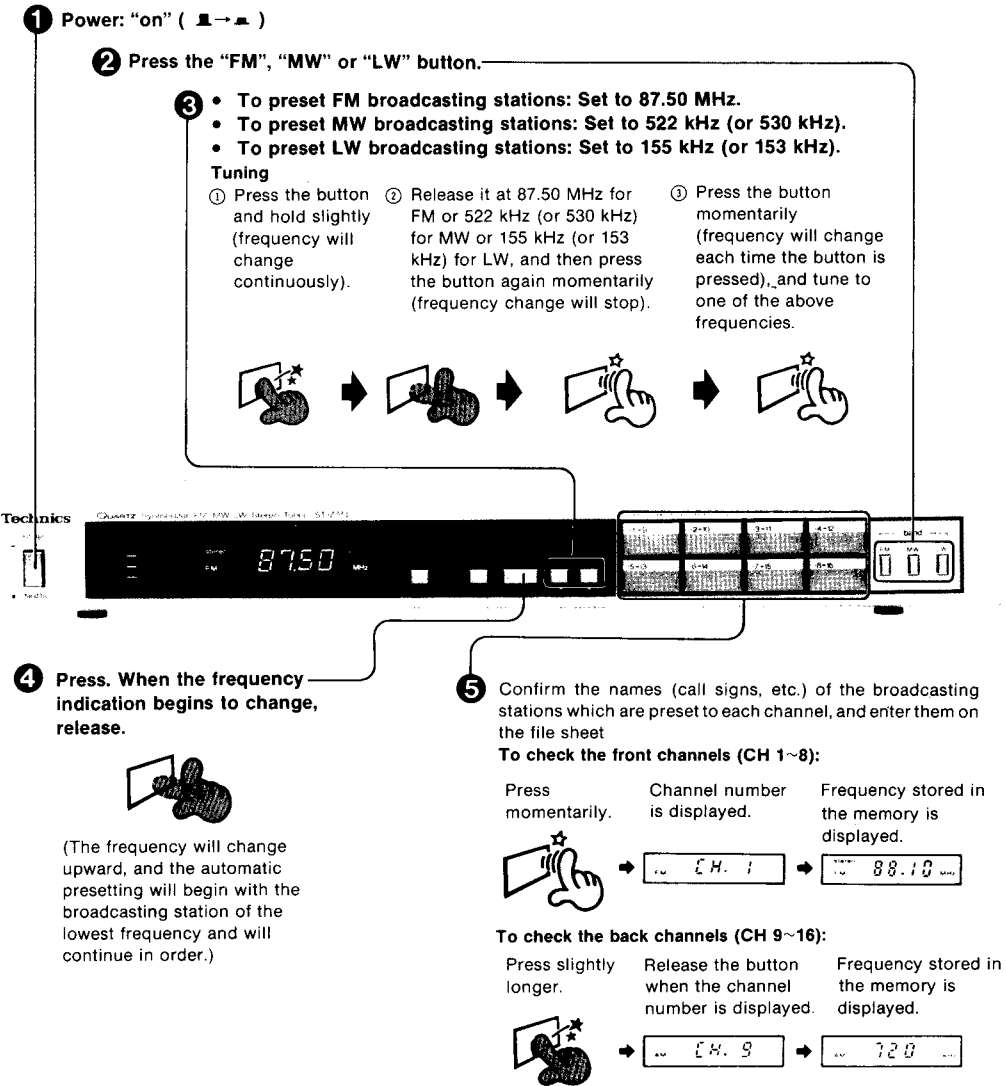
REGLAGE DE FM

* Réglage et équipement utilisé 1. Générateur de signaux FM (FM-SG) 2. Commande de réglage stéréophonique (ou vu-mètre de séparation). 3. Eralonneur de distorsion. 4. Oscilloscope. 5. Voltmètres électronique de courant alternatif et de courant continue (VTVM). 6. Compteur de fréquence (19 kHz et 108 MHz mesurable). 7. Sélecteur d'entrée sur la position "FM". 8. Placer le sélecteur de mode FM sur la position "mono". 9. Les autres réglages sont les mêmes que pour la mise au point de l'amplitude modulée (AM).		* Préparatifs pour le générateur de signaux FM (FM-SG). 1. L'entrée normale de l'appareil est de 60 dB (1 mV), 400 Hz, modulation de 100%. (Du fait de l'atténuation, utiliser des câbles coaxiaux. La sortie du générateur de signaux devra être de plus de 6 dB. C'est-à-dire, que lorsque l'entrée est de 60 dB, la sortie du générateur de signaux devra être de 66 dB.)			
GENERATEUR FM		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIFS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
BRANCHEMENT	FREQUENCE				
RÉGLAGE DE LA DISTORSION FM EN MONO					
Raccorder le générateur de signaux FM à la borne d'antenne FM, en se référant à la Fig. 7. (Niveau de sortie du générateur 60 dB.)	100,10 MHz (modulé à 100% par 400 Hz)	100.10 MHz	Brancher le voltmètre électronique à C.C. aux bornes TP101 (–) et TP102 (+)	T101 (Transfor. FI discri.)	Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0 mV dans la gamme des 300 mV.
			Brancher un mesureur de distorsion sur les bornes de hautparleur de l'appareil.	T102 (Transfor. FI discri.)	Régler le noyau T102 de telle sorte que la distorsion des canaux de droite et de gauche soit la plus faible.
RÉGLAGE PILOTE MULTIPLEX FM					
AVEC UN FRÉQUENCÈMÈTRE			EN UTILISANT UN SYSTÈME ALTERNATIF		
1. Signal mono de 100,10 MHz 60 dB non modulé appliqué à l'appareil. 2. Commutateur de mode/accord silencieux FM sur "auto". 3. Branchez le fréquencèmètre sur TP301 par l'intermédiaire d'une résistance (100kΩ). (Voir Fig. 8) 4. Régler VR301 sur 19 kHz ± 30 Hz.			1. Appliquer un signal stéréophonique à l'appareil ou recevoir une émission stéréophonique. 2. Ajuster VR301 et régler le contact à glissement de VR301 au milieu de la plage en circuit de l'indicateur stéréophonique. (Voir Fig. 9)		

HOW TO OPERATE

Automatic memory presetting

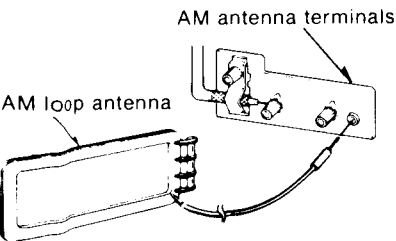
Beginning at the frequency indicated by the digital display, the FM broadcasting stations, MW broadcasting stations, and LW broadcasting stations will be automatically preset in "channels" 1 through 8 for FM, 9 through 16 for MW, and 13 through 16 for LW, respectively, in order upward from the broadcasting station of the lowest frequency. Note that in mountainous or remote areas, broadcasting stations which have weak broadcasting signals cannot be automatically preset into the memory.



How to use the AM loop antenna

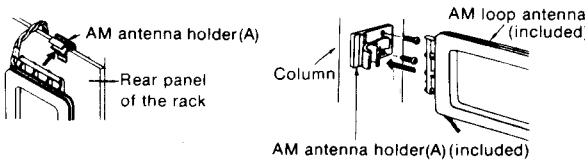
This unit includes a highly sensitive loop antenna for AM broadcast reception. If this antenna is not installed, AM broadcast will not be received. No outdoor antenna is necessary unless this unit is used in an area where signals are especially weak. (Connect the AM loop antenna even when an outdoor antenna is used.)

1. Connect the AM loop antenna to the AM antenna terminals located on the rear panel of the unit.



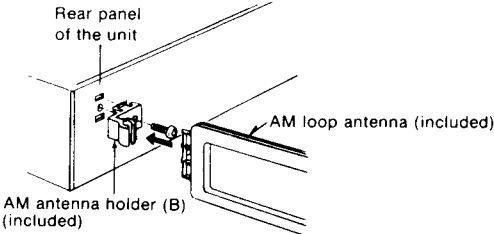
2. Find the height and direction of the antenna where reception is best and then fix it vertically to the wall, rack, etc.

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



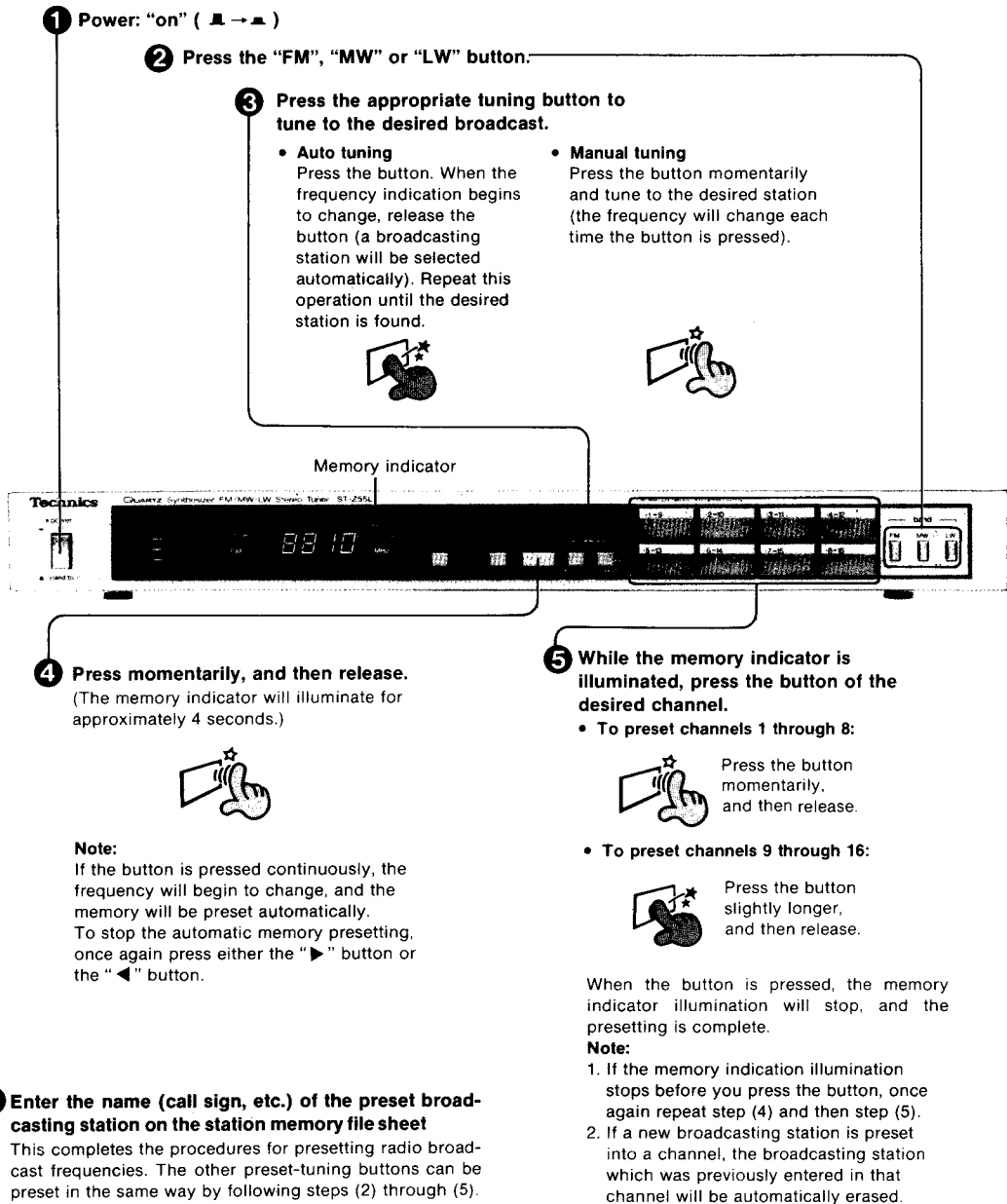
- 2) When attaching the antenna to the unit.

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



Manual memory presetting

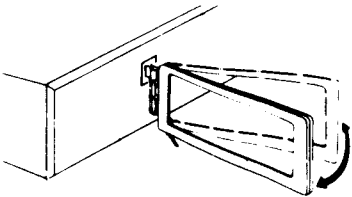
Stations can be freely preset to any desired channel.



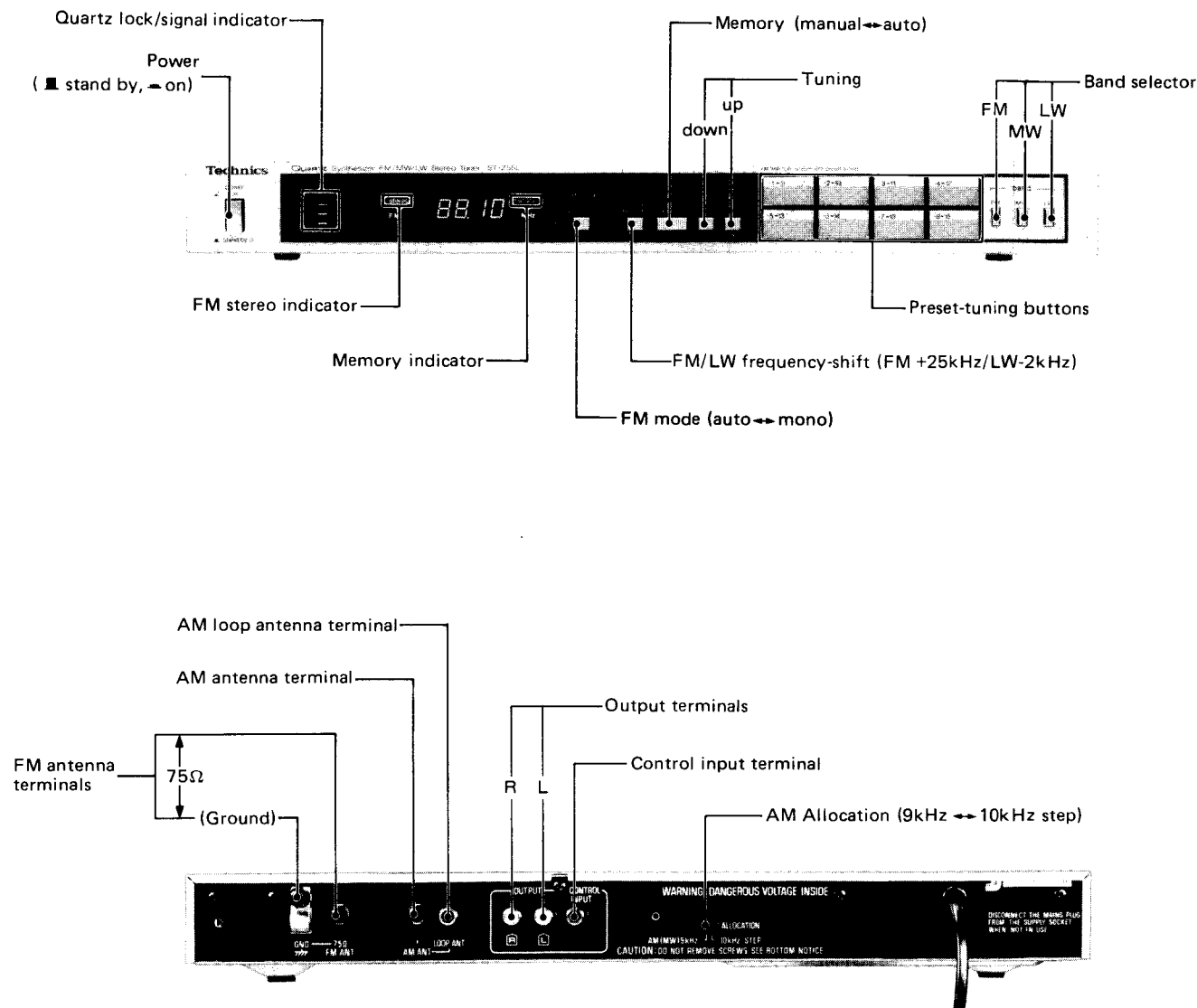
Pay attention to the following points when attaching the antenna.

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

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



LOCATION OF CONTROLS



- The power supply for this unit varied depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list;
- * 220V (50/60 Hz) for Continental Europe.
- * 240V (50/60 Hz) for United Kingdom.

DISASSEMBLY INSTRUCTIONS

When repairing the FM front-end pack, replace it with the adjusted pack for repair.

How to remove the printed circuit board

- Remove the 4 setscrews (1 ~ 4 in Fig. 1) of the cabinet.
- Move the cabinet in the direction of the arrow A in Fig. 1.
- Remove the 5 setscrews (5 ~ 7 in Fig. 1 and 8, 9 in Fig. 2) of the front panel and the 7 setscrews (10 ~ 14 in Fig. 2 and 15, 16 in Fig. 3) of the printed circuit board or rear panel.
- Pressing the 2 claws on the right and left sides of front panel in the direction of arrow B (Fig. 4), remove the front panel along with the P.C.B. in the direction of arrow C (Fig. 4).

(Raise the printed circuit board when repairing.)

How to remove the front sub-panel

- Remove the printed circuit board. (Refer to "How to remove the printed circuit board".)
- Remove the set screw (17 in Fig. 4) which fastens the bracket of FL. Next, remove the bracket by pushing it in the direction of arrow D with a screwdriver.
- The claws projected (at 9 portions) from the front sub-panel are engaged with the front panel. Disengage the claws from by screwdriver or the like to remove the front sub-panel. (See Fig. 5)

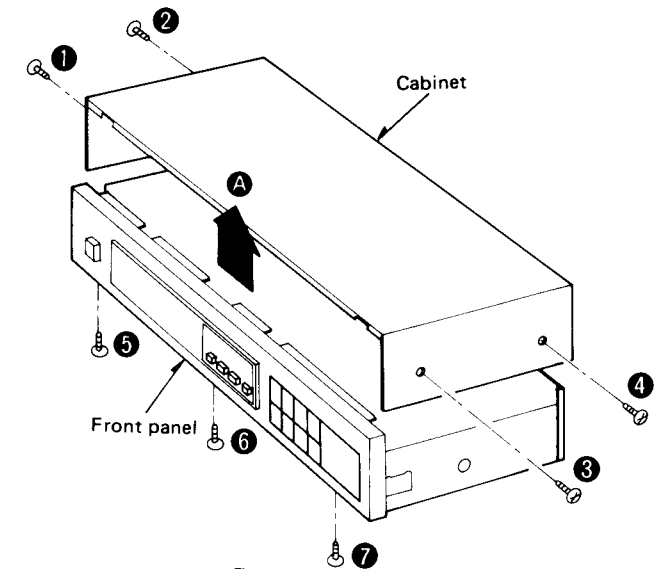


Fig. 1

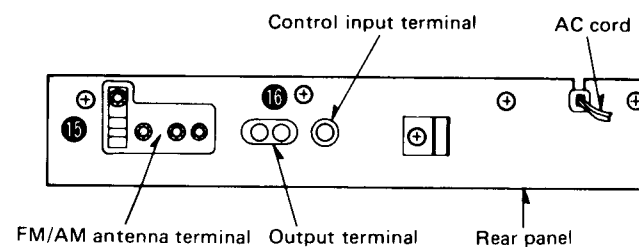


Fig. 3

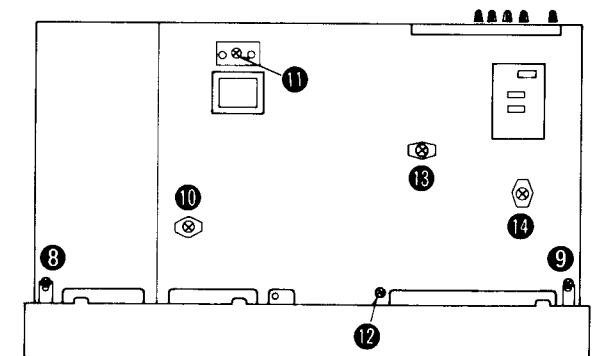


Fig. 2

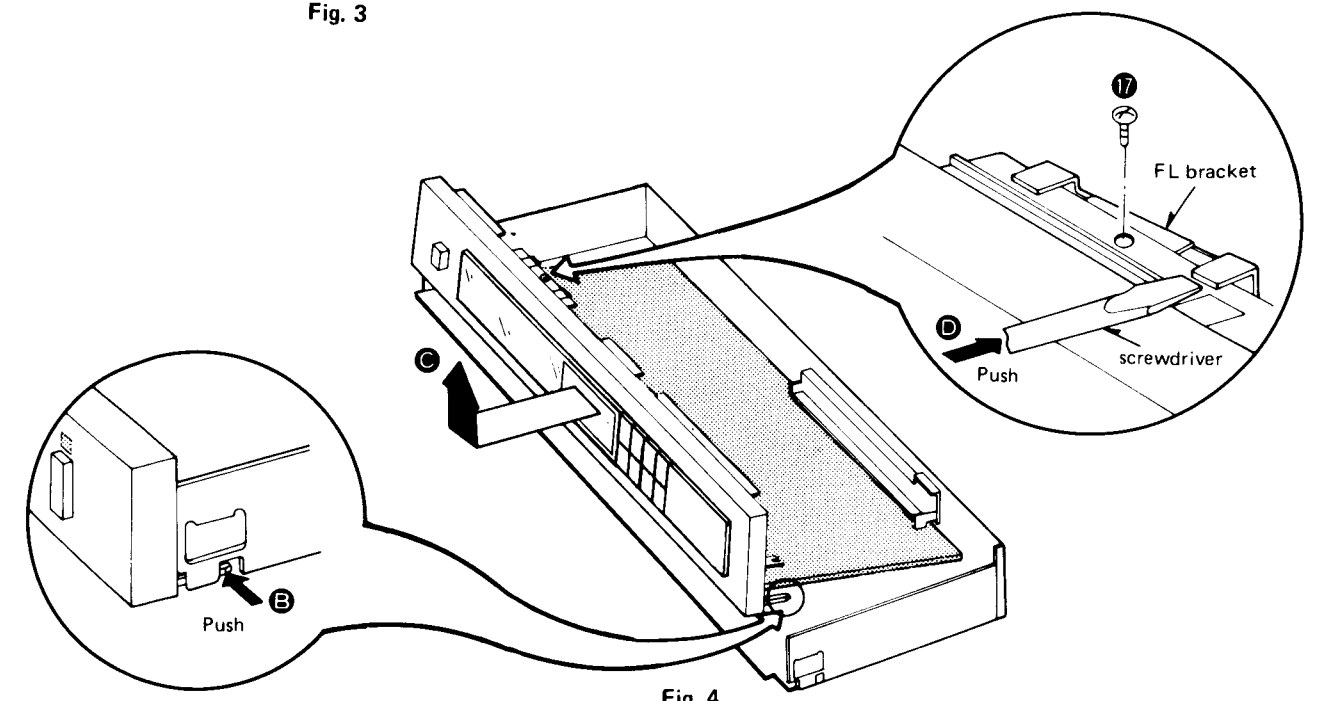
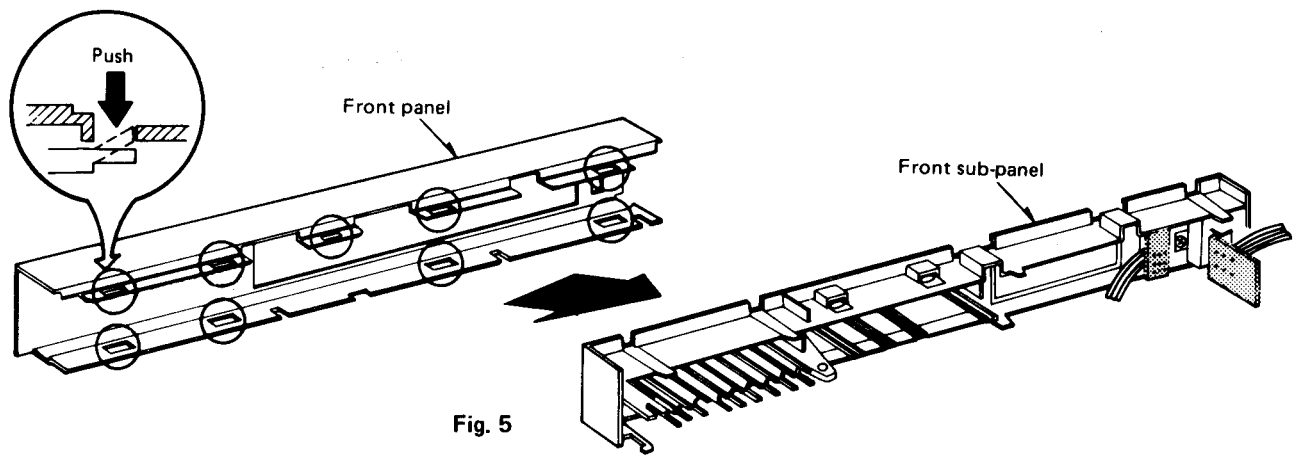


Fig. 4



MEASUREMENTS AND ADJUSTMENTS

Note: AM OSC coil (L203), AM IFT (T201) and LW antenna coil (L251) 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 (allocation 9 kHz)" position.
4. Maintain line voltage at rated voltage.

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		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
CONNECTION	FREQUENCY				
MW-RF ADJUSTMENT*Set band selector to “MW” position.					
Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input) (Refer to Fig. 6)	612 kHz 30% Mod. with 400 Hz)	612 kHz	Connect AC VTVM or scope to “OUTPUT” terminals.	L202 (ANT Coil)	1. Adjust for maximum output. 2. Adjust core of L202 by screwdriver.
	1503 kHz (30% Mod. with 400 Hz)	1503 kHz	Connect AC VTVM or scope to “OUTPUT” terminals.	CT201 (ANT trimmer)	1. Adjust for maximum output. 2. Repeat steps (1) and (2) until the frequency correctly matches the frequency display.
LW-RF ADJUSTMENT * Set band selector to “LW” position.					
Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input) (Refer to Fig. 6)	155 kHz (30% Mod. with 400 Hz)	155 kHz	Connect AC VTVM or scope to “OUTPUT” terminals.	L253 (OSC Coil)	1. Adjust for maximum output. 2. Adjust core of L253 by screwdriver.
	353 kHz (30% Mod. with 400 Hz)	353 kHz	Connect AC VTVM or scope to “OUTPUT” terminals.	CT251 (ANT Trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the frequency display.

FM ADJUSTMENT

* Setting and Equipment used

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

* Preparation of FM signal generator (FM-SG)

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

FM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
CONNECTION	FREQUENCY				
FM MONO DISTORTION ADJUSTMENT					
Connect FM-SG to FM antenna terminal referring to Fig. 7. (Apply 60 dB to antenna terminal.)	100.10 MHz (100% Mod. with 400 Hz)	100.10 MHz	Connect DC VTVM between TP101 (–) and TP102 (+) through choke coil. (Refer to Fig. 7)	T101 (Discr. IFT)	1. Adjust T101 core so that voltage measured in signal mode is 0 mV in 300 mV range. 2. Adjust T102 core so that distortion of right and left channels are minimized.
			Connect distortion analyser to “OUTPUT” terminals.	T102 (Discr. IFT)	
FM MPX V.C.O. ADJUSTMENT					
USING A FREQUENCY COUNTER			USING ALTERNATE SYSTEM		
1. 100.10 MHz, 60 dB Non-modulated mono signal applied to set. 2. FM mode switch to “auto” position. 3. Connect frequency counter to TP301 through resistor (100k Ω) referring to Fig. 8. 4. Adjust VR301 to 19 kHz $\pm$ 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. 9.		

AM Signal generator (AM-SG)

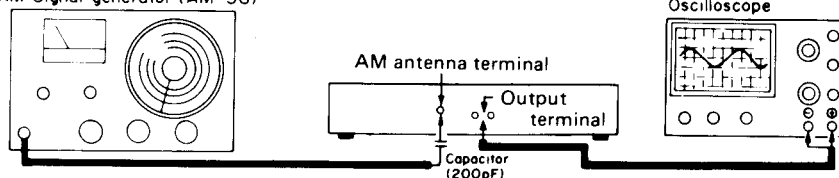


Fig. 6 (Adjustment of AM)

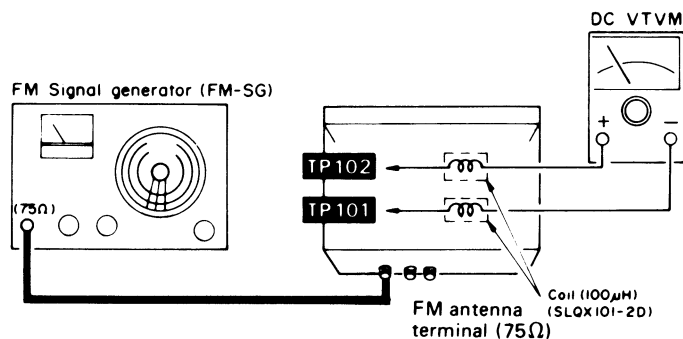
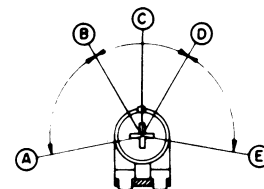


Fig. 7 (Adjustment of FM offset)



VR301

- (A)-(B), (D)-(E) : Stereo OFF position.
- (B)-(D) : Stereo ON position. (indicator lighting)
- (C) : Adjust point of pilot circuit

Fig. 9 (Adjustment of FM MPX VCO)

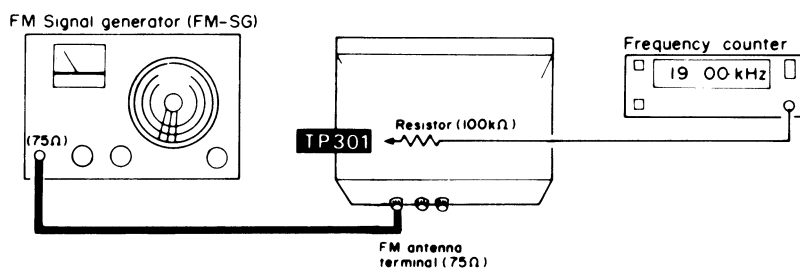
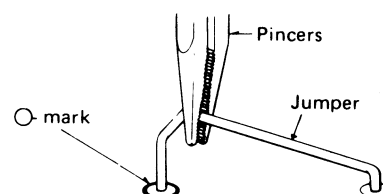
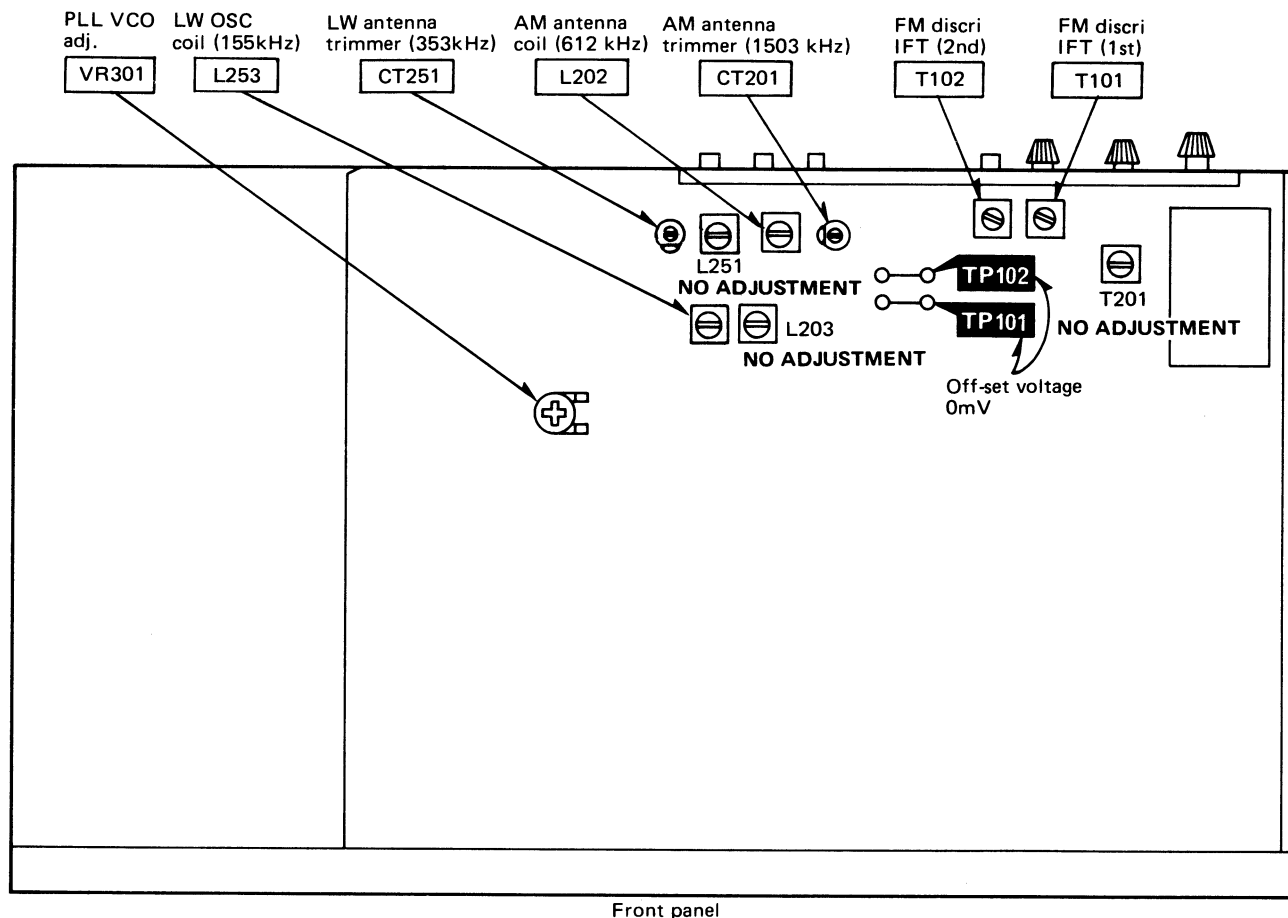


Fig. 8 (Adjustment of FM MPX VCO)



It can be removed by pulling the ○ - marked side by use of pincers. Insert it into the original hole when not needed.

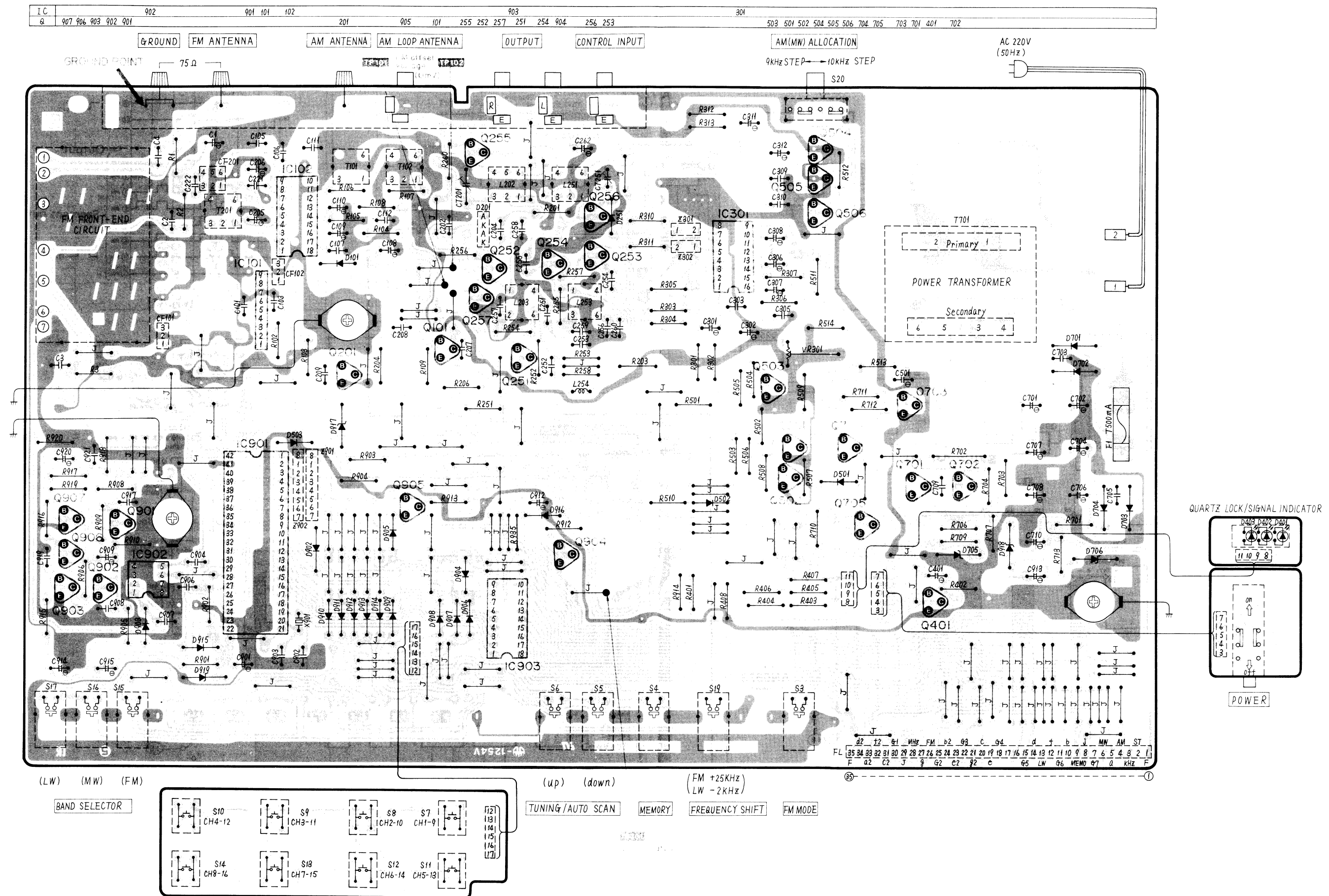
Fig. 10

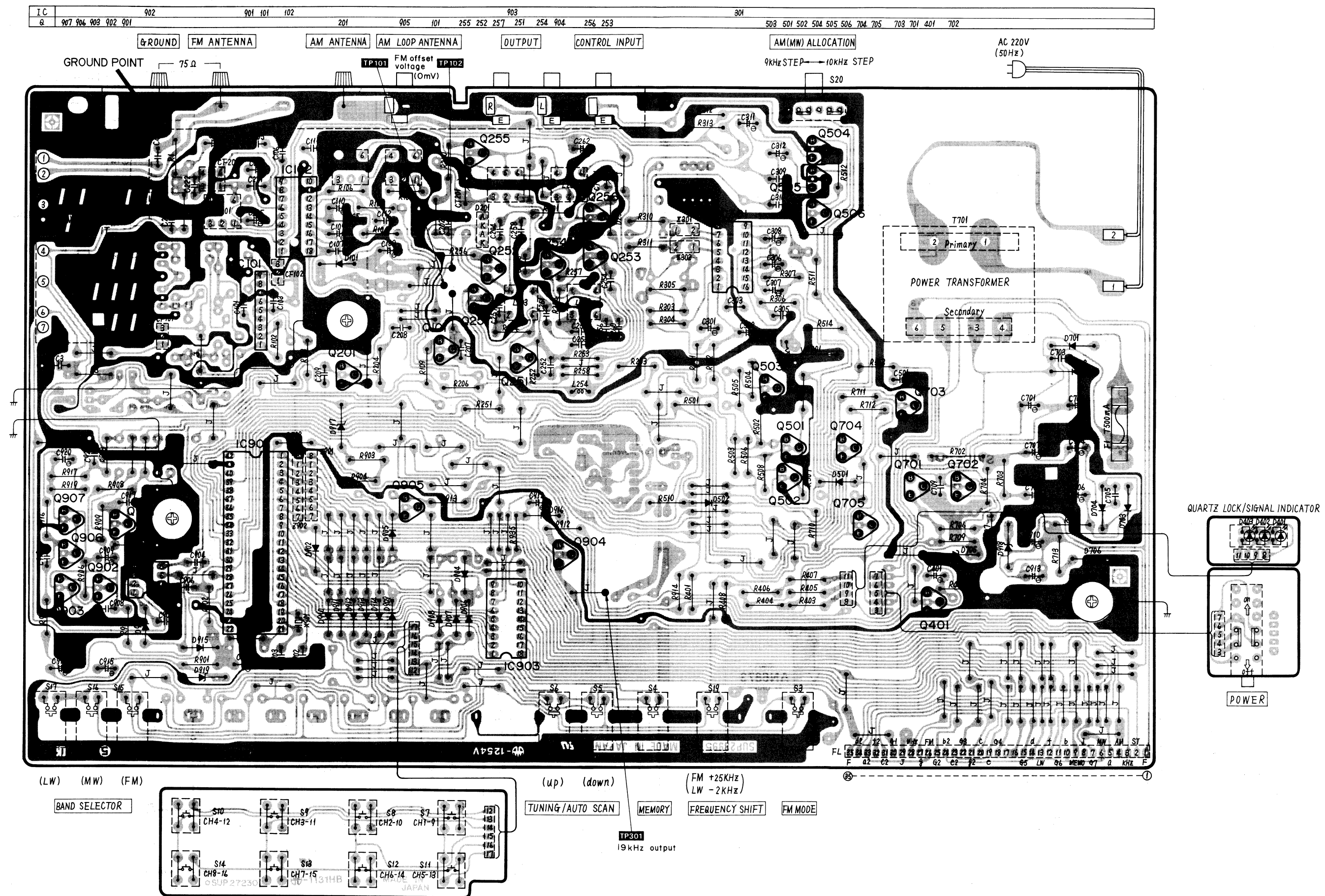


Front panel

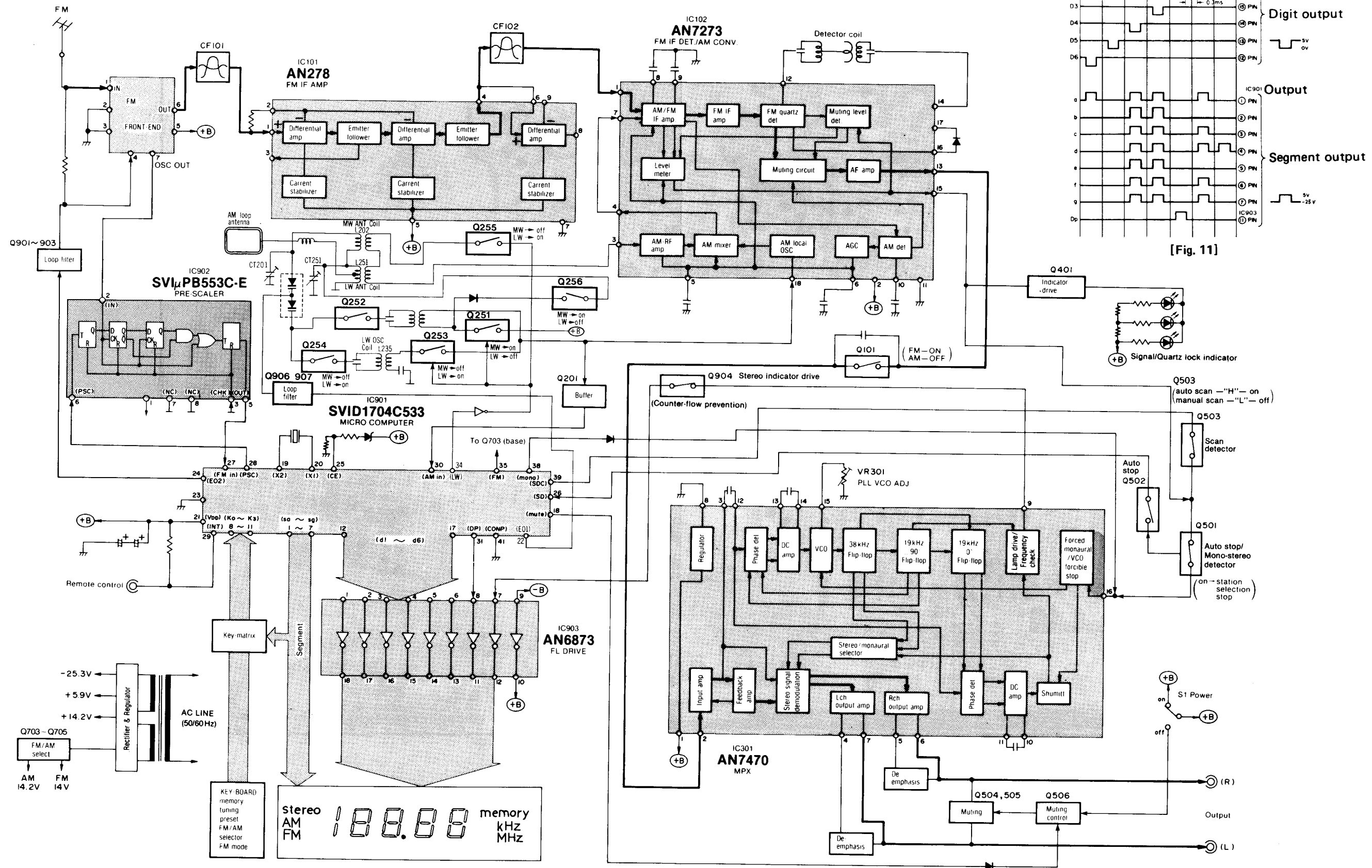
CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines





BLOCK DIAGRAM



FUNCTION

Pin No.	Mark	Function
1	Sa	Signal input
2	Sb	Signal input
3	Sc	Signal input
4	Sd	Signal input
5	Se	Signal input
6	Sf	Signal input
7	Sg	Signal input
8	K0	Key input
9	K1	Key input
10	K2	Key input
11	K3	Key input
12	D6	Digit output
13	D5	Digit output
14	D4	Digit output
15	D3	Digit output
16	D2	Digit output
17	D1	Digit output
18	MT	Memory/Mode input
19	X2	External component
20	X1	External component
21	VDD	Power supply
22	E01	External component
23	GND	Ground
24	E02	External component
25	CE	Chip Enable

RESISTORS AND CAPACITORS

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
 - 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.
 - The "S" mark is service standard parts and may differ from production parts.
 - The unit of resistance is OHM (Ω).
K = 1000 Ω M = 1000k Ω
 - The unit of capacitance is MICROFARAD (μ F)
P = 10⁻⁶ μ F

Numbering System of Resistor

Example	ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value	

Numbering System of Capacitor

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

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : $\pm$ 5%
ERQ : Fuse Type	1 : 1W	
Metal		

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	QJ : 6.3V	1H : 50V DC	C : $\pm$ 0.25 μ F
ECCD : Ceramic	1A : 10V	2H : 500V DC	J : $\pm$ 5%
ECKD : Ceramic	1C : 16V	2R3 : 2.3V DC	K : $\pm$ 10%
ECQM : Polyester	1E : 25V		Z : +80%, -20%
ECQP : Polypropylene	1H : 50V		
EECW : Liquid electrolyte double layer capacitor	50 : 50V		
	25 : 25V		

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
RESISTORS											
R1	Δ ERD25TJ104	100K	R258	Δ ERD25FJ562	5.6K	R504	Δ ERD25TJ473	47K	R901	Δ ERD25FJ681	680
R2	Δ ERD25TJ273	27K	R260	Δ ERD25TJ333	33K	R505	Δ ERD25TJ273	27K	R902	Δ ERD25FJ103	10K
R3	Δ ERD25FJ151	150	R301	Δ ERD25TJ473	47K	R506	Δ ERD25TJ154	154K	R903	Δ ERD25FJ102	1K
R102	Δ ERD25FJ331	330	R302	Δ ERD25FJ151	150	R507	Δ ERD25TJ823	82K	R904	Δ ERD25FJ562	5.6K
R103	Δ ERD25FJ102	1.2K	R303,304	Δ ERD25TJ223	22K	R508,509	Δ ERD25TJ563	56K	R905	Δ ERD25FJ102	1K
R104	Δ ERD25FJ471	470	R305	Δ ERD25TJ274	270K	R510	Δ ERD25TJ103	10K	R906	Δ ERD25FJ561	560
R105	Δ ERD25FJ102	1K	R306	Δ ERD25TJ153	15K	R511	Δ ERD25FJ102	1K	R908	Δ ERD25FJ682	6.8K
R106	Δ ERD25FJ472	4.7K	R307	Δ ERD25FJ102	1K	R512	Δ ERD25TJ104	100K			
R107	Δ ERD25FJ272	2.7K	R310,311	Δ ERD25FJ332	3.3K				R909	Δ ERD25TJ123	12K
R108	Δ ERD25FJ471	470				R513	Δ ERD25FJ103	10K	R910	Δ ERD25FJ682	6.8K
R109	Δ ERD25TJ104	100K	R312,313	Δ ERD25TJ333	33K	R514	Δ ERD25TJ104	100K	R912,913	Δ ERD25TJ104	100K
R201	Δ ERD25TJ104	100K	R401	Δ ERD25FJ182	1.8K	R701	Δ ERD25FJ121	120	R914	Δ ERD25TJ104	100K
R203	Δ ERD25FJ102	1K	R402	Δ ERD25FJ562	5.6K	R702	Δ ERQ1CJ680	68	R915	Δ ERD25FJ102	1K
R204	Δ ERD25TJ684	680K	R403	Δ ERD25FJ821	820	R703	Δ ERD25FJ122	1.2K	R916	Δ ERD25FJ472	4.7K
R206	Δ ERD25FJ102	1K	R404	Δ ERD25FJ331	330	R704	Δ ERD25FJ282	2.2	R917	Δ ERD25FJ471	470
R251	Δ ERD25TJ473	47K	R405	Δ ERD25FJ151	150	R706	Δ ERD25FJ472	4.7K	R918	Δ ERD25FJ222	2.2K
R252	Δ ERD25TJ563	56K	R406	Δ ERD25FJ121	120	R707	Δ ERD25FJ392	3.9K	R919	Δ ERD25TJ153	15K
R253	Δ ERD25FJ182	1.8K	R407	Δ ERD25FJ100	10	R709	Δ ERD25FJ331	330	R920	Δ ERD25TJ684	680K
R254	Δ ERD25FJ332	3.3K	R408	Δ ERD25FJ122	1.2K	R710	Δ ERD25TJ473	47K			
R255,256	Δ ERD25FJ562	5.6K	R501	Δ ERD25TJ153	15K				R935	Δ ERD25FJ390	39
R257	Δ ERD25TJ153	15K	R502	Δ ERD25TJ104	100K	R711	Δ ERD25FJ103	10K			
			R503	Δ ERD25TJ563	56K	R712	Δ ERD25TJ473	47K			
						R713	Δ ERD25FJ471	470			

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
CAPACITORS											
C1	Δ ECEA50Z3R3	3.3	C209	Δ ECKD1H103ZF	0.01	C305	Δ ECQP1471JZ	470P	C901	Δ ECEA0JS102	1000
C2,3	Δ ECKD1H103ZF	0.01	C221	Δ ECCD1H080CC	8P	C306	Δ ECEA50Z1	1	C902	Δ ECCD1H070CC	7P
C4	Δ ECKD1H103ZF	0.01	C222	Δ ECCD1H470K	47P	C307	Δ ECEA50Z3R3	3.3	C903	Δ ECCD1H180KC	18P
C101	Δ ECCD1H101K	100P				C308	Δ ECEA50Z4R7	0.47	C904	Δ ECKD1H103ZF	0.01
C103	Δ ECKD1H103ZF	0.01	C251	Δ ECKD1H223ZF	0.022	C309,310	Δ ECQM1H153KV	0.015	C906,907	Δ ECKD1H103ZF	0.01
C105,106	Δ ECKD1H223ZF	0.022	C252	Δ ECKD1H103ZF	0.01	C311,312	Δ ECEA50Z4R7	0.47	C908	Δ ECKD1H103ZF	0.01
C107	Δ ECKD1H223ZF	0.022	C253	Δ ECKD1H223ZF	0.022	C401	Δ ECEA50Z3R3	3.3	C909	Δ ECEA25M4R7R	4.7
C108	Δ ECEA50Z1	1	C254	Δ ECQM1H223KV	0.022				C912	Δ ECEA1AS101	100
C109,110	Δ ECEA1HS100	10	C255	Δ ECQP1271JZ	270P	C501	Δ ECEA50Z1	1	C913	Δ ECEA50Z3R3	3.3
C111	Δ ECKD1H223ZF	0.022	C256,257	Δ ECKD1H223ZF	0.022	C701,702	Δ ECEA1ES471	470	C914,915	Δ EECW2R3A3R3	3.3F
			C258	Δ ECCD1H050CC	5P	C703	Δ ECKD2H681KB	680P			
C112	Δ ECCD1H101K	100P	C259	Δ ECQM1H223KV	0.022	C704	Δ ECEA1HS470	47	C917	Δ ECKD1H103ZF	0.01
C202	Δ ECQM1H473KV	0.047	C260	Δ ECCD1H101KC	100P	C705	Δ ECKD2H681KB	680P	C919	Δ ECKD1H223ZF	0.022
C204	Δ ECQP1471JZ	470P	C262	Δ ECEA1ES101	100	C706	Δ ECEA1HS470	47	C920	Δ ECEA1HSR33	0.33
C205	Δ ECEA1AS101	100				C707	Δ ECEA1HS221	220	C921	Δ ECKD1H223ZF	0.022
C206	Δ ECEA25Z4R7	4.7	C301	Δ ECEA1HS100	10	C708	Δ ECEA1CS471	470			
C207	Δ ECQM1H183KV	0.018	C302	Δ ECEA1ES101	100	C709	Δ ECKD1H103ZF	0.01			
C208	Δ ECCD1H390K	39P	C303	Δ ECQM1H473KV	0.047	C710	Δ ECEA1HS470	47			

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 Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
 - Δ - marked parts are used for black only, while Δ - marked parts are for silver type only.
 - Part other than Δ - and Δ - marked are use 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.

Black type model No. ST-Z55L (K)

Areas

- * [EX] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [EF] is available in France.
- * [EB] is available in Belgium.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			VARIABLE COMBINATIONS			CABINET AND CHASSIS PARTS		
IC101	AN278	FM IF Amp	Z301,302	EXRP181K473T	180pF,47KΩ	24[EX] only	QFC1205M	AC Cord
IC102	AN7273A	FM IF Det.& AN Converter	Z901	EXBP87104K	100KΩ(X7)	24[other]	SJA138-3	AC Cord
IC301	SVIUPC1161C3	MPX	Z902	EXFP7331MW	330pF(X7)			
IC901	SVID1704C533	PLL-Controller	CRYSTAL			25[EX]	SGPTZ55L-E	Rear Panel
IC902	SVIUPB553AC	Pre-Scaler	X901	SVQ49U452-T	4.5MHz Counter OSC	25[EB]	SGPTZ55L-K	Rear Panel
IC903	AN6873N	FL Driver	FLOURESCENT DISPLAY TUBE			25[EB]	SGPTZ55L-B	Rear Panel
TRANSISTORS			FLOURESCENT DISPLAY TUBE			25[EF]	SGPTZ55L-F	Rear Panel
Q101,201,401,251,256,257,501~505,702,703,904,906	2SC1685-Q	Switching,AM OSC Buffer Regulator	FL	SAD7MT29ZA		MELUK		(Made in United Kingdom)
907			FM FRONT END			25-1	[SKL245-2	Foot
Q252~255,506,704,705,905	2SA564AR	Muting,Switching		SNVFE306E05	FM RF	26	SHR5169-2	Spacer,Switch
Q701	2SD762-O	Regulator	FUSE			27[EX] only	SJF8803N	Terminal Board
Q901~903	2SC945-Q	Loop Filter	F1	XBA2C05TRO	250V,T500mA	27[other]	SJF8709N	Terminal Board
DIODES			SWITCHES			28[EX] only	SUW1959	Bracket
D101	MA27W-A		S1	SSH1049	Power Source	SCREWS		
D201	SVDKV1236Z	AM Variable Capacitance L.E.D.Signal, Quartz Lock Switching	S3~6,15,16,17,19	SSG11	FM Mode, Memory,Tuning, FM Mode, AM Mode,FM 25kHz Shift Preset Tuning AM Allocation	N1	XTB3+8BFZ	Tapping,±3X8
D401,402,403	LN417YP		S7~14	SSG13		N2	XTN3+8BFN	Tapping,±3X8
D501~503,251	MA162A		S20	SSS67		N3	XSN3+6S	±3X6
902~916			CABINET AND CHASSIS PARTS			N4	XTB3+8BFN	Tapping,±3X8
D701~704	SVDSR1K2	Rectifier	Ref. No.	Part No.	Description	N5	XTB3+16BFN	Tapping,±3X16
D705	SVDMZ306A	6V,Zener	1	SGWTZ55L-SE	Front Panel,(Silver)	N6	XTBS3+8FFYR1	Tapping with Detent, ±3X8
D706	SVDMZ324B	24V,Zener	1	SGWTZ55L-KE	Front Panel,(Black)	N7	SNE2095-2	Tapping(Silver)
D917	SVDMZ309A	9V,Zener	2	SGUTZ55L-SE	Transparent Panel	N7	SNE2095-3	Tapping(Black)
D918	SVDMZ307A	7V,Zener	3	SBC585	Button,Band	N8	XTB3+10BFZ	Tapping,±3X10
D919	SVDMZ305A	5V,Zener	4	SBC587	Button,Preset (CH1-9)	WASHERS		
COILS and TRANSFORMERS			5	SBC587-1	Button,Preset (CH2-10)	N10	XWA3B	Spring,φ 3
L202	SLA2C7-P	MW Antenna	6	SBC587-2	Button,Preset (CH3-11)	N11	XWG3	Plain,φ 3
L203	SL02C31R-P	MW OSC	7	SBC587-3	Button,Preset (CH4-12)	ACCESSORIES		
L251	SLA1C15R-P	LW Antenna	8	SBC587-4	Button,Preset (CH5-13)	A1	SJP2249	Cord
L253	SL01C17-P	LW OSC	9	SBC587-5	Button,Preset (CH6-14)	A2	SSA267-1	Cord,FM Indoor Antenna
L254	SLQX101-3M	Choke	10	SBC587-6	Button,Preset (CH7-15)	A3	SSA611-1	Loop Antenna
T101	SLI4C535-Z	FM IFT	11	SBC587-7	Button,Preset (CH8-16)	A4	XTN3+10AFZ	Screw
T102	SLI4C537-Z	FM IFT	12	SBC451-4	Button	A5	SMA231	Holder
T201	SLI2C143-M	AM IFT	13	SBU89-1	Filter,FL	A6	SMA233-1	Holder
1701[EX] only	SLT5K143	Power Source	14	SBC337-1	Button,Power Switch	A7[EX,EB]	SQF11761	Instruction Book
1701[other]	SLT5K141	Power Source	15	SGX7527	Front Sub Panel (Silver)	A7[EX]	SQF11779	Instruction Book
CERAMIC FILTERS			15	SGX7527-1	Front Sub Panel (Black)	A7[EF]	SQF11781	Instruction Book
CF101,102	SVFE107MM-A	10.7MHz (Red)	16	SUW1893-1	Bracket,Power Switch	MELUK		(Made in United Kingdom)
	SVFE107MM-D	10.65MHz (Black)	17	SUW1891-1	Bracket,FL	PACKING PARTS		
	(Use pair ranks as same as CF101 and CF102)		18	SKL245-2	Rubber	P1	SPP697	Polyethylene Bag
CF201	SVFSFZ450F7L	AM,450kHz	19	SKCTZ55L-SE	Cabinet (Silver)	P1	SPP659	Polyethylene Bag
VARIABLE RESISTOR			19	SKCTZ55L-KE	Cabinet (Black)	P2	SPS3493	Pad,Front Side
VR301	EVN75AA00B53	MPX VCO Adj, 5KΩ(B)	20	SJT347	Holder,Fuse	P3	SPS3495	Pad,Rear Side
VARIABLE CAPACITOR			21	SGP3110-1	Rear Sub Panel	P4[EF] only	SPG4519	Carton Box
CT201	SVCTZ03T110F	MW Antenna Trimmer	22	SHR5181	Spacer	MELUK		Made in United Kingdom
CT251	SVCTZ03R200F	LW Antenna Trimmer	23[other]	SHR127	Bushing,AC Cord	P4[other]	SPG4473	Carton Box
			23[EX] only	SHR129	Bushing,AC Cord	P5	SGK1413	Label(Black only)

EXPLODED VIEW

ns specify the
e used for all
nd may differ
of description

Description	
RTS	
C Cord	(1)
C Cord	(1)
ear Panel	(1)
ear Panel	(1)
ear Panel	(1)
ear Panel	(1)
ade in United ngdom)	
oot	(4)
oacer,Switch	(1)
terminal Board	(1)
terminal Board	(1)
acket	(1)
apping,⊕3×8	(10)
apping,⊕3×8	(2)
3×6	(2)
apping,⊕3×8	(1)
apping,⊕3×16	(1)
apping with Detent, 3×8	(4)
apping(Silver)	(4)
apping(Black)	(4)
apping,⊕3×10	(2)
oring, ϕ 3	(2)
ain, ϕ 3	(2)
ord	(1)
ord,FM Indoor	(1)
ntenna	(1)
op Antenna	(1)
rew	(2)
older	(1)
older	(1)
struction Book	(1)
struction Book	(1)
struction Book	(1)
ade in United ngdom)	
lyethylene Bag	(1)
lyethylene Bag	(1)
d,Front Side	(1)
d,Rear Side	(1)
orton Box	(1)
ade in United ngdom	
orton Box	(1)
bel(Black only)	(2)

