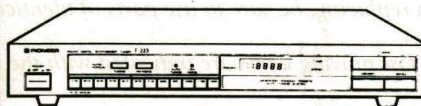




PIONEER®
The future of sound and vision.

001

Service Manual



ORDER NO.
ARP 1563

FM/AM DIGITAL SYNTHESIZER TUNER

F-223

F-223-S

F-223, F-223-S AND F-223L HAVE SIX VERSIONS:

Type	Applicable model			Power requirement	Export destination
	F-223	F-223-S	F-223L		
HEZ	○	○	—	AC220V, 240V (switchable) *	West Germany
HE	—	—	○	AC220V, 240V (switchable) *	European continent
HB	—	—	○	AC220V, 240V (switchable) *	United Kingdom
HP	○	—	—	AC220V, 240V (switchable) *	Australia
SD	○	—	—	AC110V, 120V-127V, 220V, 240V (switchable)	Kingdom of Saudi Arabia and General Market
HIOX1B	○	—	—	AC220V, 240V (switchable) *	Italy

* Change the connection of the power assembly primary pins.

- This manual is applicable to the HEZ and F-223-S/HEZ types.
- For the other types, refer to additional service manuals.

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.

PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada

PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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1. EXPLODED VIEWS AND PARTS LIST

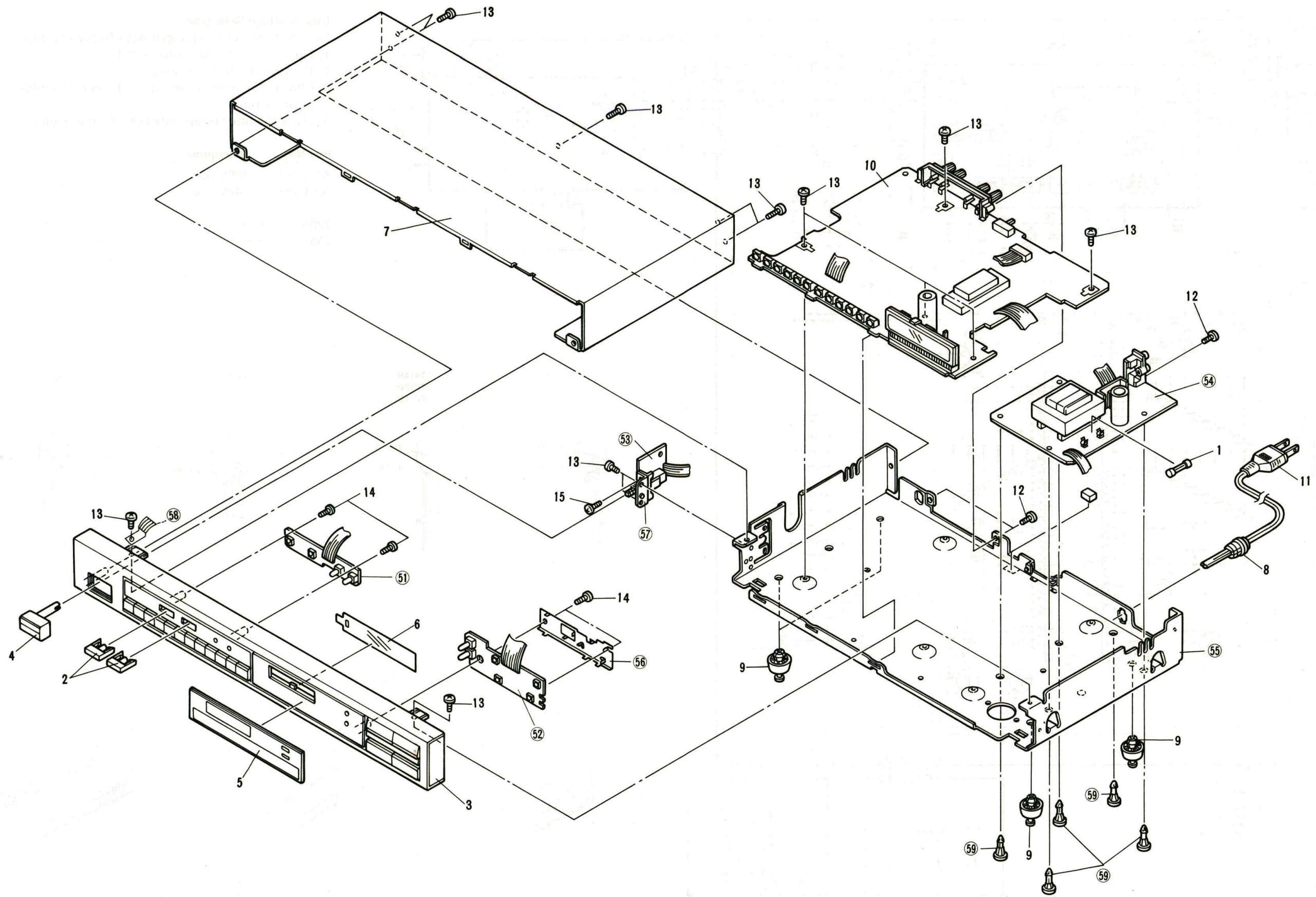
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your parts Stock Control, the fast moving items are indicated with the marks $\star\star$ and $\star$.
 $\star\star$ GENERALLY MOVES FASTER THAN $\star$
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

• Parts List

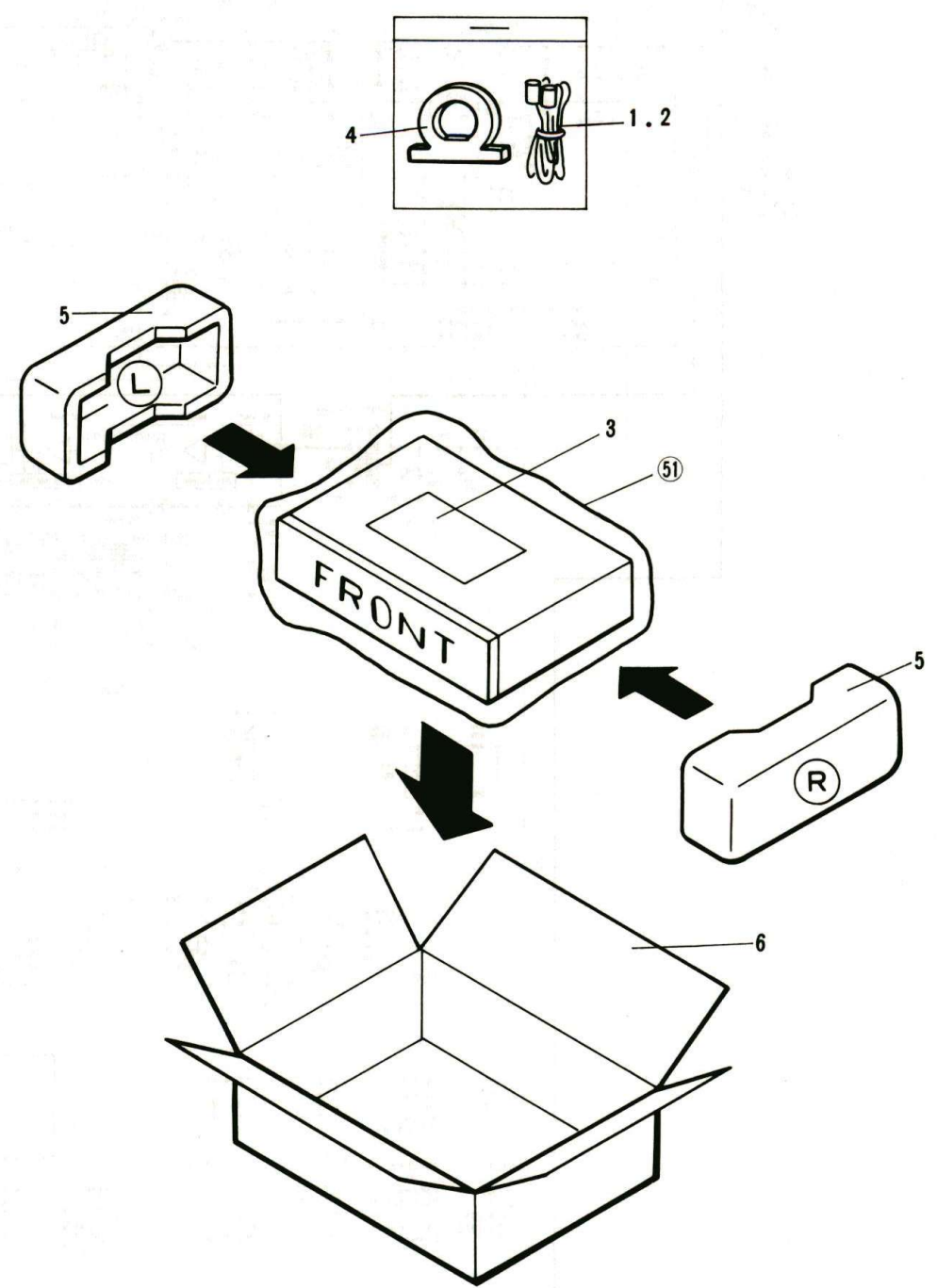
Mark	No.	Part No.	Description
Δ $\star\star$	1.	AEK-407	FU1, Fuse (T400mA, 250V)
	2.	ADD1107	Push knob B
	3.	AMB1325	Front panel assembly
	4.	ADD1329	Power button
	5.	AAK1189	FL filter
	6.	AAK1442	Plate
	7.	ANE1135	Bonnet
	8.	AEC-327	Strain relief
	9.	AEC1049	Leg assembly
	10.	AWZ1986	Tuner assembly
Δ	11.	ADG1012	AC power cord
	12.	ABA-298	Screw
	13.	ABA1009	Screw
	14.	BPZ30P080FZK	Screw
	15.	PMZ30P060FMC	Screw
	51.		SW A assembly
	52.		SW B assembly
	53.		Switch assembly
	54.		Power assembly
	55.		Chasis
	56.		PCB angle
	57.		Switch angle
	58.		GND plate
	59.		PCB holder

A
B
C
D



2. PACKING

A
B
C
D

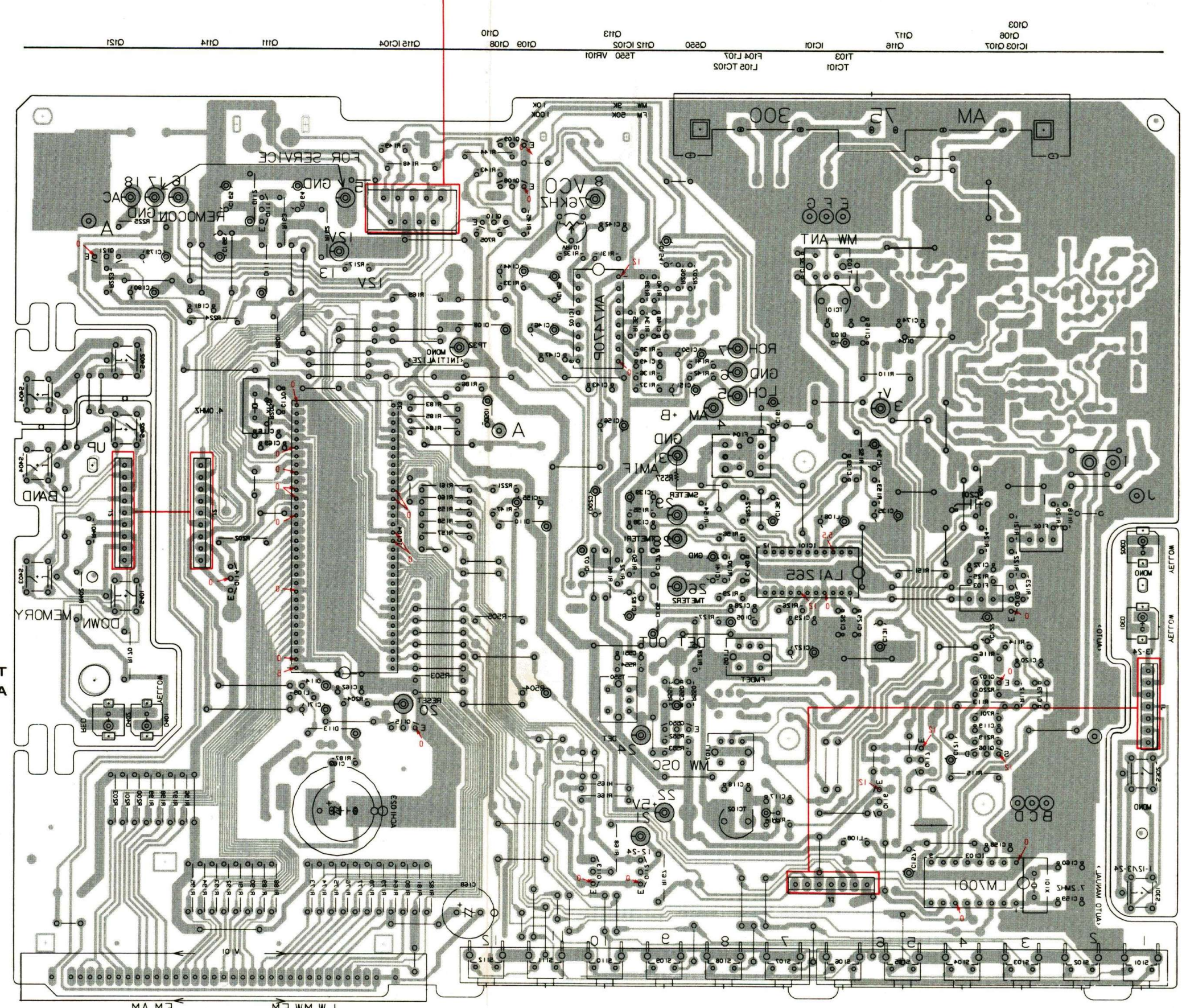


• Parts List of Packing

Mark	No.	Part No.	Description
	1.	ADE-052	Connection cord
	2.	ADH1002	FM antenna assembly
	3.	ARC1090	Operating instructions (German)
	4.	ATB-102	Loop antenna assembly
	5.	AHA1046	Side pad
	6.	AHD1471	Packing case
	51.		Sheet

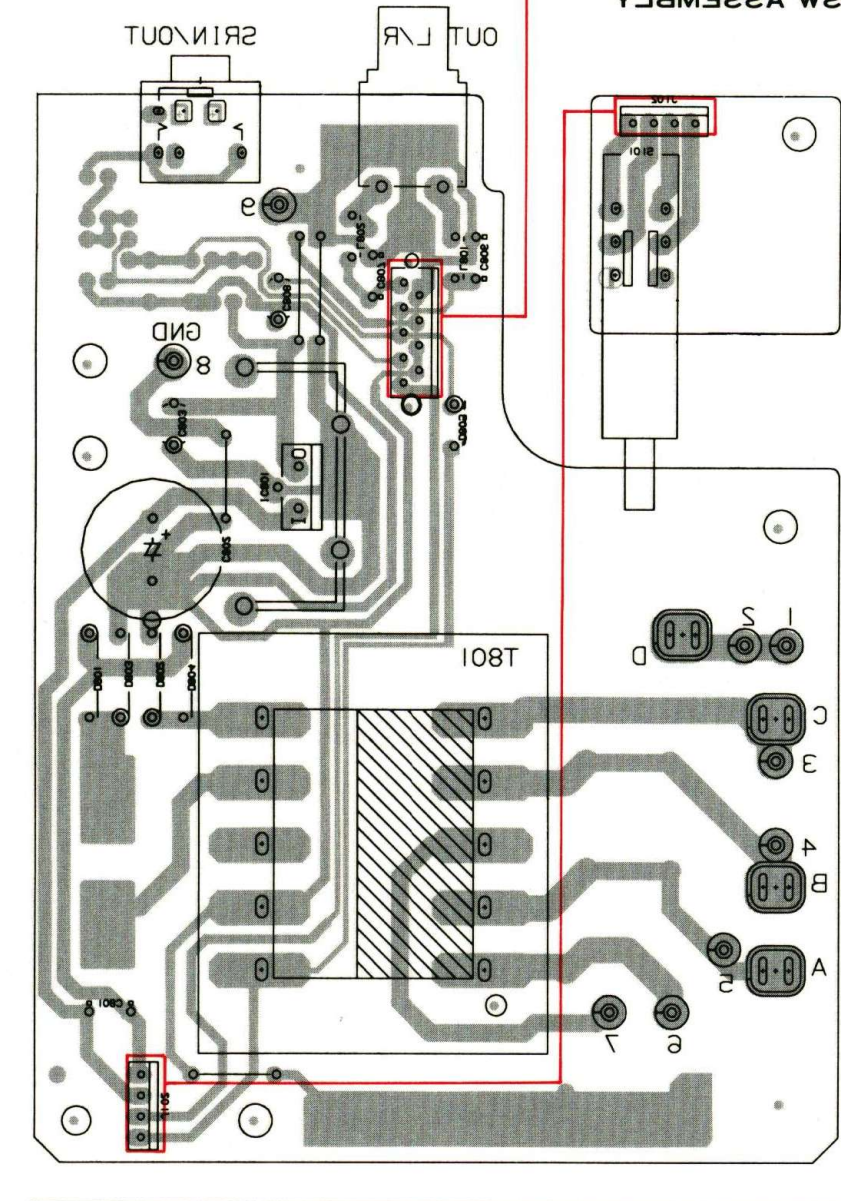
4. PCB CONNECTION DIAGRAM

TUNER ASSEMBLY (AW1188)



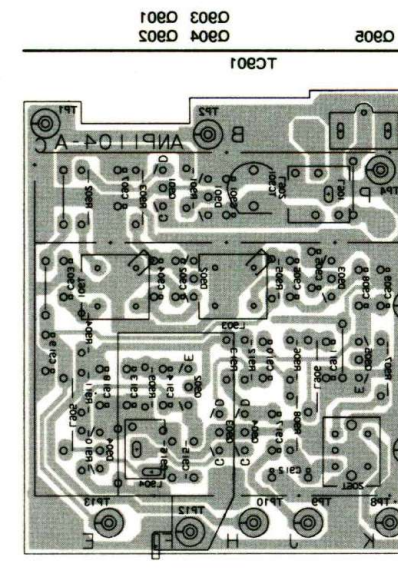
LED ASSEMBLY

2W ASSEMBLY



POWER ASSEMBLY

FE ASSEMBLY (AWB1004)



- NOTE
1. This P.C.B. connection diagram is viewed from the foil side.
 2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
		Transistor
		Radiator type transistor
		Diode
		Resistor
		Capacitor (Polarity)
		Capacitor (Non-polarity)

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capacitor terminal marked with (double circles) shows negative terminal.
4. The diode terminal marked with (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

5. ADJUSTMENT

PREPARATION

- Connect TP15 (GND) with TP17 (GND).

FM Tuner Adjustment

- Make the wire connections as shown in Fig. 5-1.
- Set the function to FM.
- The adjustment place and the test point are in the tuner assembly .

Step No.	FM SG (1kHz ± 75kHz dev.)		F-223 Reception Frequency Display	Adjustment		
	Frequency (MHz)	Level (dBμ)		Adjustment Location	Specifications	
1	98.0	60	98.0MHz	L105	Adjust so that DC voltage is 0V ±0.1V for TP28 (T METER 1) and TP26 (T METER 2).	
2	1	90.0	60	90.0MHz	L902, L903, T901	Adjust the output terminal (TP5: L ch, TP7: R ch) voltage to the maximum.
	2	106.0	60	106.0MHz	TC901, L903, T901	Adjust the output terminal (TP5: L ch, TP7: R ch) voltage to the maximum.
	3	90.0	60	90.0MHz	L902	Adjust the output terminal (TP5: L ch, TP7: R ch) voltage to the maximum.
	4	Repeat steps 2-2 and 2-3 above. When the 90.0 MHz and 106.0 MHz signals are received, adjust output to the maximum.				
3	—	—	98.0MHz	VR101	Grounding the D106 cathode through a 220μF capacitor sets the TP8 frequency to 76kHz±200Hz.	
4	98.0 *1 (stereo modulation)	60	98.0MHz	T102	Adjust the output terminal (TP5: Lch, TP7: Rch) distortion to the minimum.	

(* 1) Stereo Modulation: Main 1kHz L + R ± 68.25Hz dev.
Pilot 19kHz ± 6.75kHz dev.

AM Tuner Adjustment

- Make the connections as shown in Fig. 5-2.
- Set the function to AM.
- The adjustment place and the test point are in the tuner assembly .

Step No.	AM SG (400Hz, 30% modulation)		F-223 Reception Frequency Display	Adjustment	
	Frequency (kHz)	Level (dBμ)		Adjustment Location	Specifications
1	—	—	530kHz	L107	Adjust TP3 (VT) to 1.3V ± 0.1V.
2	—	—	1700kHz	TC102	Adjust TP3 (VT) to 10V ± 0.5V.
3	603	Level at which output is not saturated.	603kHz	T103	Adjust the output terminal (TP5: L ch, TP7: R ch) voltage to the maximum.
4	1395		1395kHz	TC101	

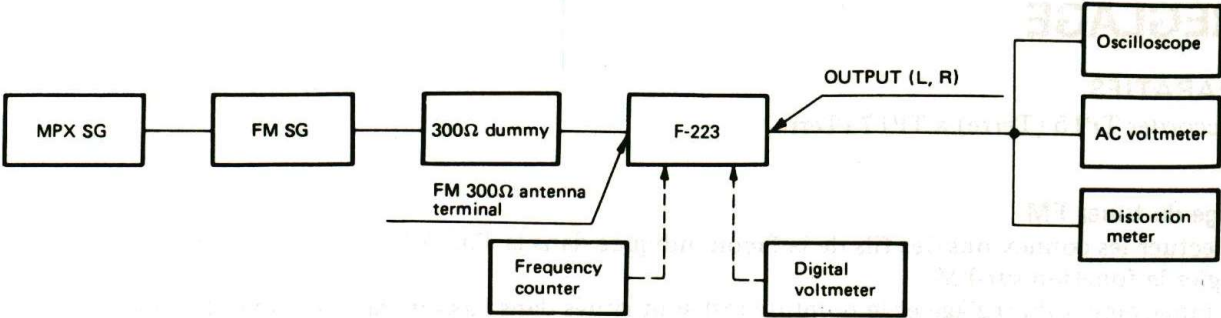


Fig. 5-1 FM Tuner Connection

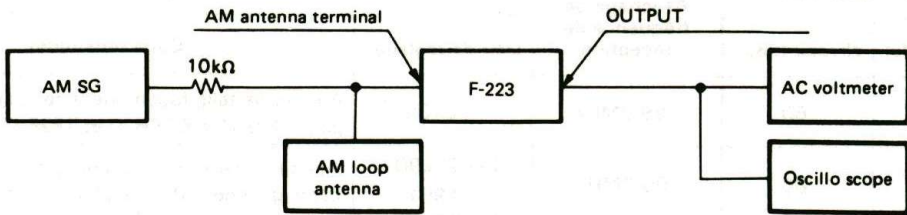


Fig. 5-2 AM Tuner Connection

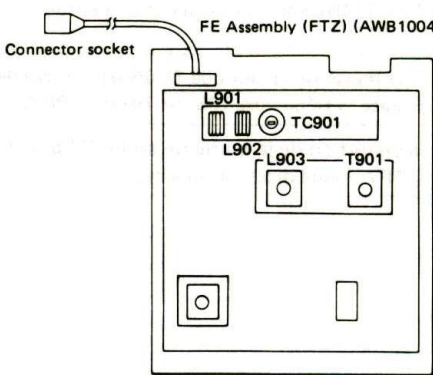


Fig. 5-3 Adjustment point of FE Assembly

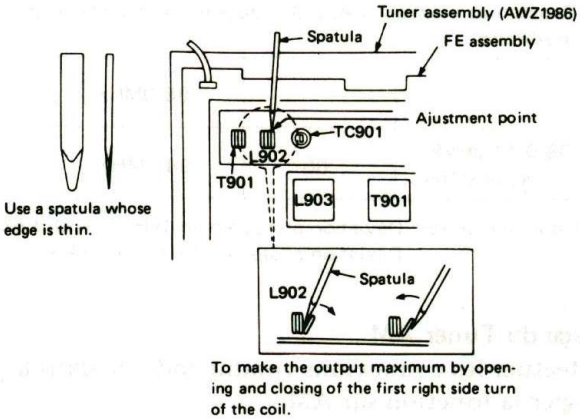
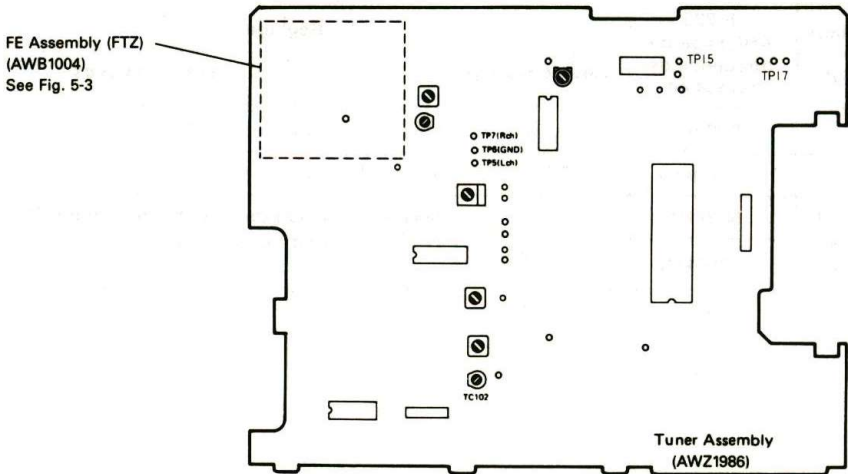


Fig. 5-4 Adjustment tuning coil L902



5. RÉGLAGE

PRÉPARATIFS

- Raccorder TP15 (Terre) à TP17 (Terre).

Réglage du tuner FM

- Effectuer les connexions des fils de la façon indiquée dans la Fig. 5-1.
- Régler la fonction sur FM.
- L'emplacement du réglage et le point de test sont situés dans l'assemblage du démodulateur.

Etape N°	FM SG (1kHz ± 75kHz dév.)		F-223 Affichage de fréquence de réception	Réglage	
	Fréquence (MHz)	Niveau (dBμ)		Lieu de réglage	Caractéristiques
1	98,0	60	98,0MHz	L105	Ajuster de telle façon que la tension CC soit de 0V ± 0,1V pour TP28 (T METER 1) et TP26 (T METER 2).
2	90,0	60	90,0MHz	L902, L903, T901	Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum.
	106,0	60	106,0MHz	TC901, L903, T901	Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum.
	90,0	60	90,0MHz	L902	Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum.
	Répéter les étapes 2-2 et 2-3 ci-dessus. Lorsque les signaux de 90,0 MHz et de 106,0 MHz sont reçus, ajuster la sortie au maximum.				
3	—	—	98,0MHz	VR101	La mise à la masse de la cathode D105 par un condensateur de 220μF place la fréquence TP8 sur 76kHz ± 200Hz.
4	98,0 *1 (modulation stéréo)	60	98,0MHz	T102	Ajuster la distortion de la borne de sortie (TP5: canal gauche, TP7: canal droit) au minimum.

(*1) Modulation stéréo: Déviation principale de 1kHz G + D ± 68,25Hz
Déviation pilote de 19kHz ± 6,75kHz

Réglage du Tuner AM

- Effectuer les connexions comme indiqué dans la Fig. 5-2.
- Régler la fonction sur AM.
- L'emplacement du réglage et le point de test sont situés dans l'assemblage du démodulateur.

Etape N°	AM SG (400Hz, 30% modulation)		F-223 Affichage de fréquence de réception	Réglage	
	Fréquence (kHz)	Niveau (dBμ)		Lieu de réglage	Caractéristiques
1	—	—	530kHz	L107	Ajuster TP3 (VT) sur 1,3V ± 0,1V.
2	—	—	1700kHz	TC102	Ajuster TP3 (VT) sur 10V ± 0,5V.
3	603	Niveau auquel la sortie n'est pas saturée.	603kHz	T103	Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum.
4	1395		1395kHz	TC101	

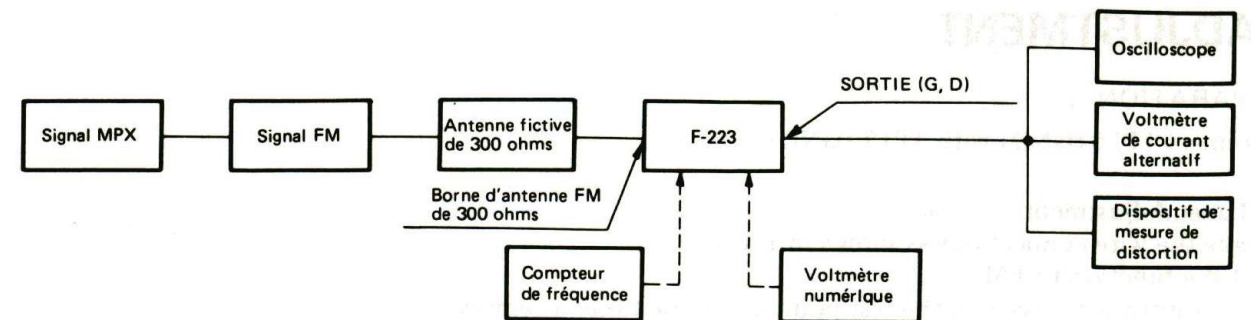


Fig. 5-1 Connexion du tuner FM

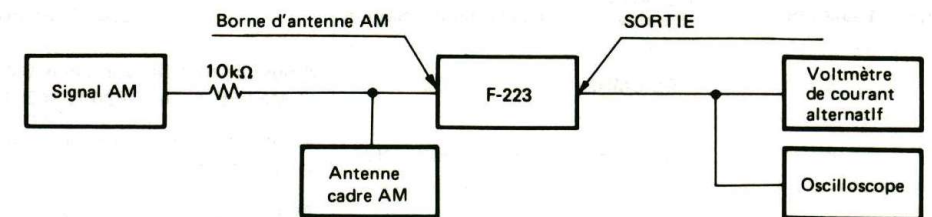


Fig. 5-2 Connexion du tuner AM

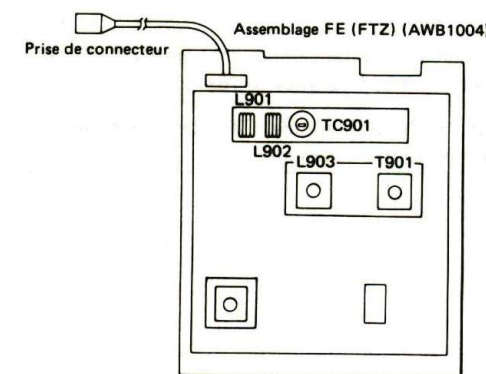


Fig. 5-3 Point d'ajustement du l'assemblage FE

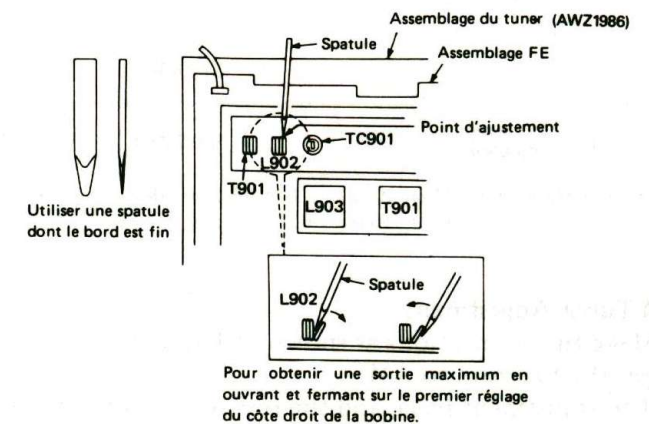


Fig. 5-4 Réglage du self d'accord L902

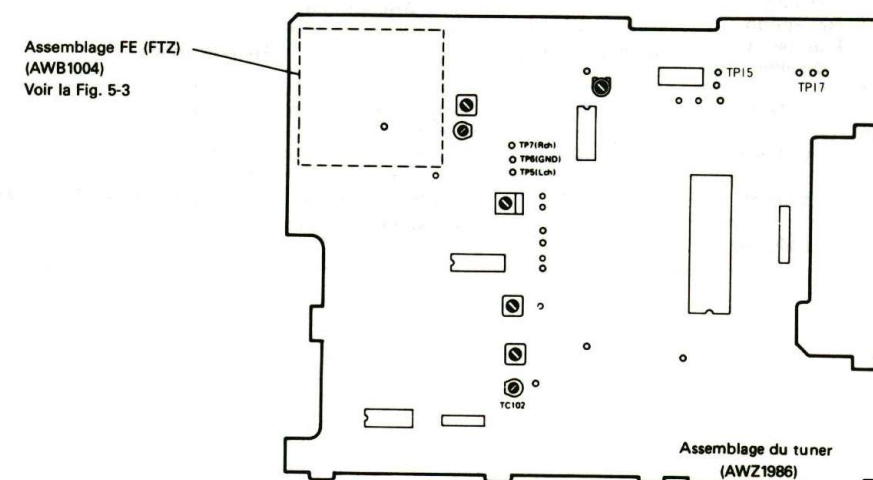


Fig. 5-5 Point d'ajustement

5. AJUSTE

PREPARATIVOS

- Conecte TP15 (masa) con TP17 (masa).

Ajuste del sintonizador de FM

- Realice las conexiones como se muestra en la Fig. 5-1.
- Ponga el selector de función en FM.
- El lugar de ajuste y el punto de prueba están en el conjunto del sintonizador.

No.de paso	FM SG (1kHz ± 75kHz dev.)		F-223 Frecuencímetro de recepción	Ajuste	
	Frecuencia (MHz)	Nivel (dBμ)		Lugar de ajuste	Especificaciones
1	98,0	60	98,0MHz	L105	Ajuste de forma que la tensión de CC sea de 0V ± 0,1V para TP28 (T METER 1) y TP26 (T METER 2).
2	1	90,0	60	L902, L903, T901	Ajuste la tensión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al máximo valor.
	2	106,0	60	106,0MHz TC901, L903, T901	Ajuste la tensión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al máximo valor.
	3	90,0	60	90,0MHz L902	Ajuste la tensión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al máximo valor.
	4	Repita los pasos 2-2 y 2-3 anteriores. Cuando se reciban las señales de 90,0 y 106,0 MHz, ajuste la salida al máximo.			
3	—	—	98,0MHz	VR101	La puesta a masa del cátodo de D105 a través de un capacitor de 220μF ajustará la frecuencia de TP8 a 76kHz±200Hz.
4	98,0 *1 (modulación estéreo)	60	98,0MHz	T102	Ajuste la distorsión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al mínimo estéreo)

(*1) Modulación estéreo: Principal 1kHz canal izquierdo + canal derecho ± 68,25Hz de desviación
Piloto 19kHz ± 6,75kHz de desviación

Ajuste del Sintonizador de AM

- Realice las conexiones como se muestra en la Fig. 5-2.
- Ponga el selector de función en AM.
- El lugar de ajuste y el punto de prueba están en el conjunto del sintonizador.

No.de paso	AM SG (400Hz, 30% modulation)		F-223 Frecuencímetro de recepción	Ajuste	
	Frecuencia (kHz)	Nivel (dBμ)		Lugar de ajuste	Especificaciones
1	—	—	530 kHz	L107	Ajuste TP3 (VT) a 1,3V ± 0,1V.
2	—	—	1700 kHz	TC102	Ajuste TP3 (VT) a 10V ± 0,5V.
3	603	Nivel en el que la salida no se satura	603 kHz	T103	Ajuste la tensión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al máximo valor.
4	1395		1395 kHz	TC101	

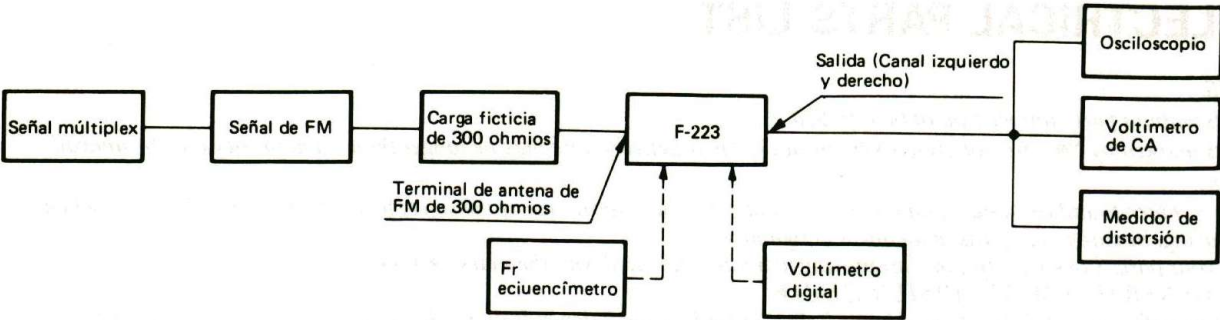


Fig. 5-1 Conexiones del sintonizador de FM

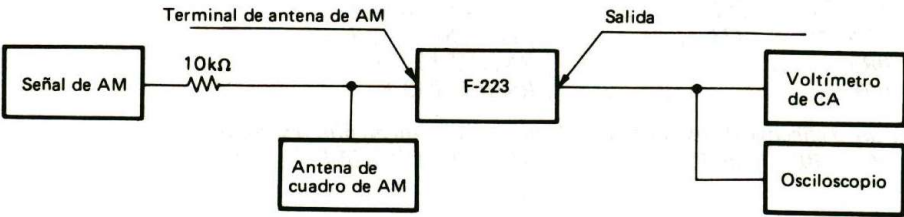


Fig. 5-2 Conexiones del sintonizador de AM

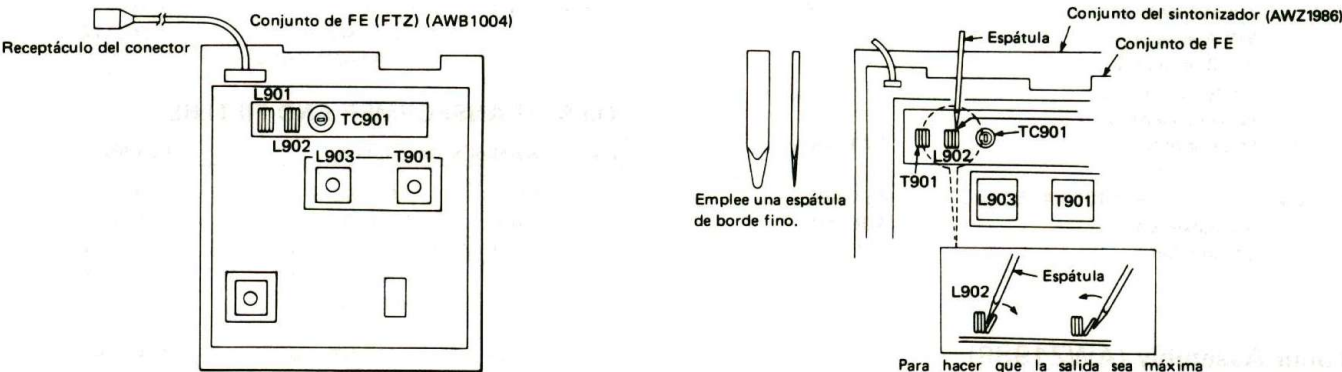


Fig. 5-3 Punto de ajuste del conjunto de FE

Fig. 5-4 Ajuste de la bobina de sintonía L902

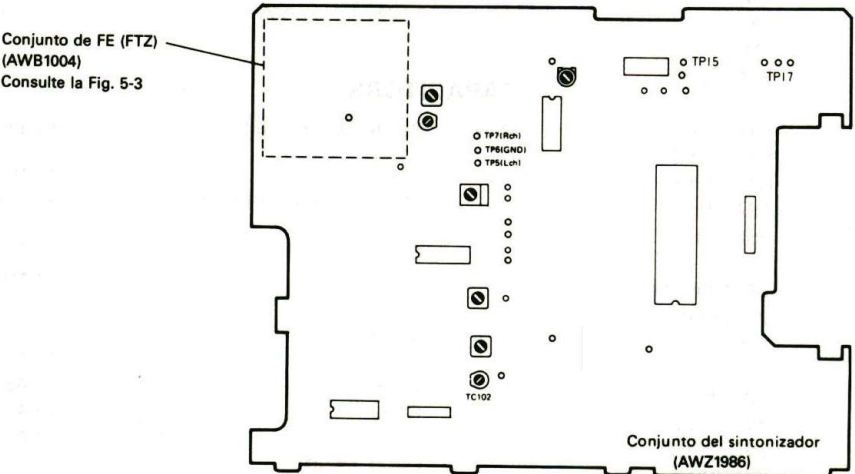


Fig. 5-5 Punto de ajuste

6. ELECTRICAL PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The △ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.

★★ GENERALLY MOVES FASTER THAN ★

- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 × 10 ¹	561.....	RD1/4PS	5	6	1	J
47kΩ	47 × 10 ³	473.....	RD1/4PS	4	7	3	J
0.5Ω	0R5.....		RN2H	0	5		K
1Ω	010.....		RS1P	0	1	0	K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562 × 10 ¹	5621.....	RN1/4SR	5	6	2	1	F
--------	-----------------------	-----------	---------	---	---	---	---	---

Miscellaneous

Mark	Symbol & Description	Part No.
	Tuner assembly	AWZ1986
	SW A assembly	
	SW B assembly	
	Switch assembly	
	Power assembly	
	FE assembly	AWB1004
△ ★★	FU1 Fuse (T400mA250V)	AEK-407
△	AC power cord	ADG1012
	Strain relief	AEC-327

Tuner Assembly (AWZ1986) SEMICOINDUCTORS

Mark	Symbol & Description	Part No.
★★	IC102	AN7470P
★★	IC101	LA1265S
★★	IC103	LM7001
★★	IC104	PD5083-B
★★	Q114, Q116, Q117	DTA143ES
★★	Q115, Q121	DTC124ES
★★	Q112, Q113	DTC143ES
★★	Q110	2SA933S
★★	Q108, Q109, Q111, Q550	2SC1740S
★★	Q107	2SC1740SLN
★★	Q103	2SC2668
★★	Q106	2SK246
★	D112	RD6.2ESB
★	D110, D501	RD7.5ESB
★	D103, D109	SVC321C2 (SVC321D2)
★	D105 — D108, D111, D113, D114	1SS252

SWITCHES

Mark	Symbol & Description	Part No.
★★	S101 — S107, S109 — S112 Tact switch (STATION CALL)	ASG1022 (ASG-712)

COILS, TRANSFORMER AND FILTERS

Mark	Symbol & Description	Part No.
	L107 AM OSC coil	ATB-114
	L105 FM DET coil	ATE-079
	L108, L501 Axial inductor	LAU2R2M
	L109 Axial inductor	LAU221K
	L106 Inductor	LTA472J
	T103 AM ANT. transformer	ATB-095
	F103 FM ceramic filter	ATF-107
	F102 FM ceramic filter	ATF-119
	F550 Beat eliminate filter	ATF-146
	F104 AM ceramic filter	ATF1042

CAPACITORS

Mark	Symbol & Description	Part No.
	C163 (22000)	ACH1023
	TC101, 102 Ceramic trimmer	ACM-015
	C128	CCDSL221J50
	C117	CCDUJ120J50
	C159, C160	CCMCH150J50
	C169, C170	CCMCH270J50
	C116, C181	CCMSL101J50
	C146	CEASR22M50
	C182	CEASOR1M50
	C141, C155, C157, C171, C179, C200, C550	CEASO10M50

Mark	Symbol & Description	Part No.
	C121, C145	CEAS1R5M50
	C164, C165	CEAS100M25
	C180	CEAS101M10
	C168	CEAS101M16
	C139, C150, C151	CEAS2R2M50
	C134, C144	CEAS3R3M50
	C122, C127, C131	CEAS330M16
	C135	CEAS4R7M50
	C136, C166	CEAS470M10
	C154, C156	CEAS470M16
	C138	CKCYB222K50
	C119, C132, C140	CKCYF103Z50
	C120	CKCYF223Z50
	C133, C143, C147	CKCYF473Z50
	C137	CKCYX473M25
	C551	CKDYB681K50
	C201, C172, C173	CKDYF103Z50
	C115, C125, C126, C129, C161	CKDYF223Z50
	C158, C162	CKDYF473Z50
	C148, C149	CKMYB102K50
	C118	CQSA431J50
	C142	CQSA471J50

RESISTORS

Mark	Symbol & Description	Part No.
★	VR1 Semi-fixed (4.7k)	VRTB6VS472
	R162, R167, R168, R170, R225, R557	RD1/4PM□□□J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	V101 Antenna terminal Fluorescent tube	AKA1004 AAV1040
	X102 Ceramic resonator	ASS-030
	X101 Crystal resonator	ASS1005

SW A Assembly SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D301, D302 LED Ass'y	AEL1003

SWITCHES

Mark	Symbol & Description	Part No.
★	S301, S302 Tact switch (FM MONO/STEREO, AUTO/MANUAL TUNING)	ASG-711

SW B Assembly SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D402 LED Ass'y	AEL1009
★	D401 LED Ass'y	AEL1024

SWITCHES

Mark	Symbol & Description	Part No.
★★	S401 — S404 Tact switch (TUNING, MEMORY, BAND)	ASG-711

RESISTOR

Mark	Symbol & Description	Part No.
	R401, R402, R170	RD1/8PM□□□J

Switch Assembly SWITCH

Mark	Symbol & Description	Part No.
★★	S1 Push switch	ASG-413

Power Assembly SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC801	μPC78M12H
★	D801 — D804	S5566
★	D805	1SS252

COILS AND TRANSFORMER

Mark	Symbol & Description	Part No.
	L801, L802 Axial inductor	LAU221K
	T801 Power transformer	ATT1072

CAPACITORS

Mark	Symbol & Description	Part No.
	C803	CEAS221M16
	C802	CEAS222M35
	C808	CEAS470M10
	C806, C807	CKDYB332K50
	C801	CKDYF473Z50

OTHER

Mark	Symbol & Description	Part No.
	2P pin jack	AKB1039

FE Assembly (AWB1004)**SEMICONDUCTORS**

Mark	Symbol & Description	Part No.
★ ★	Q902	2SC2668
★ ★	Q905	2SC2786
★ ★	Q901, Q903, Q904	2SK241
★	D901 — D904	1SV147

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L903 FM RF coil	ATC-247
	L901 FM coil	ATC1001
	L904 FM coil	ATC1003
	L902 FM coil	ATC1010
	L905, L906 Axial inductor	LAU2R2M
	T901 FM RF transformer	ATC-194
	T902 FM matching transformer	ATE-063

CAPACITORS

Mark	Symbol & Description	Part No.
	TC901	ACM-014
	C908	CCDCH010C50
	C909, C910	CCDCH020C50
	C917	CCDCH050C50
	C915	CCDCH080D50
	C913	CCDCH150J50
	C914	CCDCH330J50
	C901	CCDRH100D50
	C905	CCDRH330J50
	C902, C904, C906	CCDRH390J50
	C911	CCDSL101J50
	C916	CCDTH180J50
	C903, C912, C918, C919	CKDYF103Z50
	C907	CKDYF223Z50

RESISTORS

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

7. FOR F-223-S TYPE

- NOTES:
- Parts without part number cannot be supplied.
 - The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
 - For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
★★ **GENERALLY MOVES FASTER THAN ★**
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
 - Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

F-223-S is the same as the the F-223 with the except for following sections:

Mark	Symbol & Description	Part No.		Remarks
		F-223	F-223-S	
	Push knob B	AAD1107	AAD1418	
	Power button	AAD1329	AAD1417	
	Front panel assembly	AMB1325	AMB1365	
	Bonnet	ANE1135	ANE1136	
	Packing case	AHD1471	AHD1472	

8. SPECIFICATIONS

FM Tuner Section

Frequency range 87.5 MHz to 108 MHz
Usable Sensitivity (IHF) 12.7 dBf (1.2μV/75Ω)
50 dB Quieting Sensitivity Mono: 18 dBf (2.2μV/75Ω)
..... Stereo: 38.3 dBf (22.6μV/75Ω)
Sensitivity (DIN) Mono: 0.9μV/75Ω
..... Stereo: 31.5μV/75Ω
Signal-to-Noise Ratio Mono: 77 dB (at 85 dBf)
..... Stereo: 73 dB (at 85 dBf)
Signal-to-Noise Ratio (DIN) Mono: 62 dB
..... Stereo: 60 dB
Distortion 0.5% (1 kHz)
Alternate Channel Selectivity 60 dB (400 kHz)
Stereo Separation 40 dB (1 kHz)
Frequency Response 30 Hz to 15 kHz ±1 dB
Image Interference Ratio 38 dB
IF Interference Ratio 110 dB
Antenna Input
F-223L 300Ω balanced
..... 75Ω unbalanced
F-223 75Ω unbalanced
Output 650mV (100% MOD.)

AM (MW) Tuner Section

Frequency range 531 kHz to 1,602 kHz
Sensitivity (IHF, Loop antenna) 350μV/m
Selectivity 20 dB
Signal-to-Noise Ratio 45 dB
Image Interference Ratio 40 dB
IF Interference Ratio 50 dB
Antenna Loop Antenna
Output 150 mV (30% MOD.)

LW Tuner Section (F-223L only)

Frequency range 153 kHz to 281 kHz
Sensitivity (IHF, Loop antenna) 1500 μV/m
Selectivity 20 dB
Signal-to-Noise Ratio 45dB
Image Interference Ratio 30 dB
IF Interference Ratio 50dB
Antenna Loop Antenna
Output 150mV (30% MOD.)

Miscellaneous

Power requirements a.c. 220 volts ~, 50/60Hz
Power consumption 10 W
Dimensions 420 (W) × 60 (H) × 215 (D) mm
Weight (without package) 2.2 kg

Furnished Parts

FM T-type Antenna 1
AM Loop Antenna 1
Operating instructions 1
Connection cord with pin plug 1

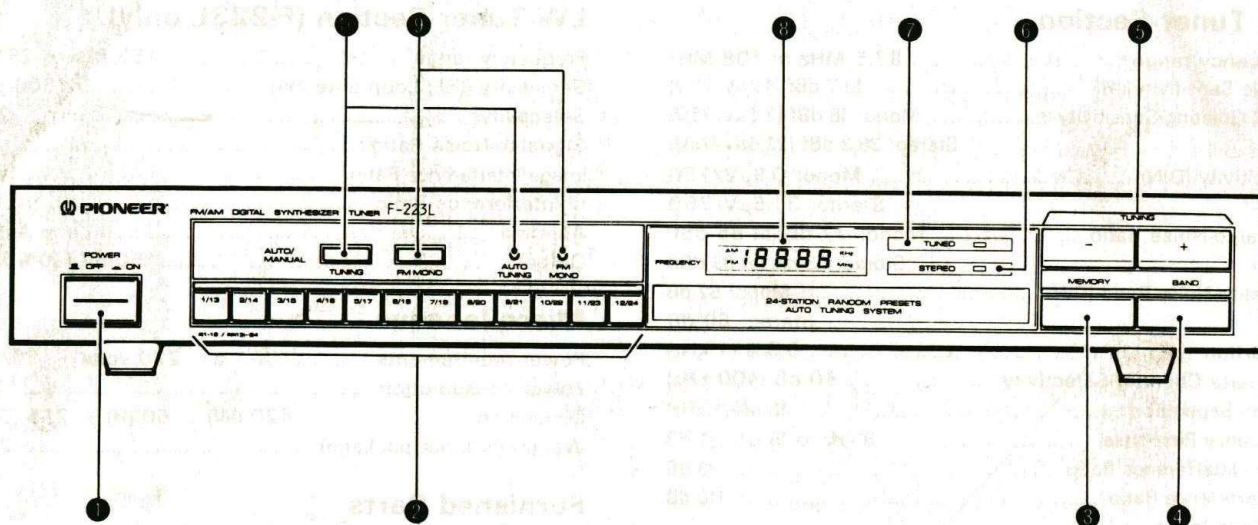
NOTE:
• Specifications and design subject to possible modification without notice due to improvements.

STATION CALL switch "memo"

It is recommended that you make a note of the preset stations.

S.C. switch	•	1	2	3	4	5	6	7	8	9	10	11	12
Name of broadcast station													
Frequency													
S.C. switch	••	13	14	15	16	17	18	19	20	21	22	23	24
Name of broadcast station													
Frequency													

9. PANEL FACILITIES



1 POWER switch

When this switch is set to the on position, power is supplied to the tuner's main circuits. The POWER switch is geared to selecting the transformer's secondary so that even in the off position, the unit's circuitry will work as long as the power cord is connected to a power outlet. Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

NOTE:

The memory will be backed up so long as the power cord is not unplugged.

If the power cord is unplugged, the memory will be retained for several days.

2 STATION CALL switches

These are used to recall preset broadcasting stations and to preset the station.

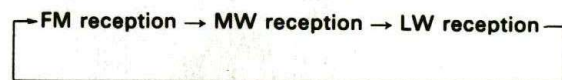
3 MEMORY switch

This switch is used to memorize stations. When the switch is pressed, the frequency indicator will flash. To memorize the frequency of any station, press the STATION CALL switch while the frequency display is flashing.

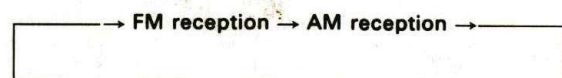
4 BAND selector switch

This is used to select the band of the desired station. The bands change alternately each time the switch is pressed.

(F-223L)



(F-223)



5 TUNING switches

These are used to locate the stations.

Push the "-" switch to go to a lower, and the "+" switch to go to a higher frequency.

6 STEREO indicator

This lights when a stereo program has been picked up during an FM broadcast.

7 TUNED indicator

This lights to indicate when the finest tuning of a station has been achieved.

8 FREQUENCY display

Permits reading the received frequency at a glance from the displayed figure. The FM band is indicated by MHz, and the AM band by kHz.

9 FM MONO switch/indicator

Normally this is set to the off position (the FM MONO indicator goes off). When noise spoils the reception of an FM program, press the switch to the on position (the FM MONO indicator will now light).

The program of an FM stereo broadcast will be heard in mono. The setting of the FM MONO switch (on or off) is memorized along with the station's frequency in the STATION CALL switches.

When using the preset tuning feature, reception will be in the mode selected when the station was memorized.

This switch will not function for AM reception.

10 AUTO/MANUAL TUNING switch/indicator

Use to select either the AUTO mode or MANUAL mode for FM/AM reception. (When the auto tuning mode is selected, the AUTO indicator will now light.)