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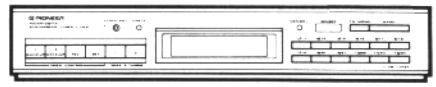
The future of sound and vision.

Service Manual



ORDER NO.
ARP 1917

FM/AM DIGITAL SYNTHESIZER TUNER

F-Z93L

MODEL F-Z93L and F-Z93 HAVE FOLLOWING VERSIONS:

Type	Applicable model		Power requirement	Destination
	F-Z93L	F-Z93		
ZEB	○	×	(DC power supply)	European continent and United Kingdom
Z	×	○	(DC power supply)	General market
ZEWZ	×	○	(DC power supply)	West Germany
ZUC	×	○	(DC power supply)	U.S.A. and Canada
ZEOX1B	○	×	(DC power supply)	European continent
ZIOX1B	×	○	(DC power supply)	Italy

- **This manual is applicable to the F-Z93L/ZEB type.**
- **As to the other types, refer to applicable service manuals.**
- **The F-Z93L covers MW/LW bands while the F-Z93 covers MW only.**

- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**
- **As to the system composition, refer to following service manuals.**

Applicable model	ORDER NO.	Applicable model	ORDER NO.
S-333	ARP1935	S-115 CDT	ARP1938
S-222	ARP1936	S-115 CDM	ARP1939

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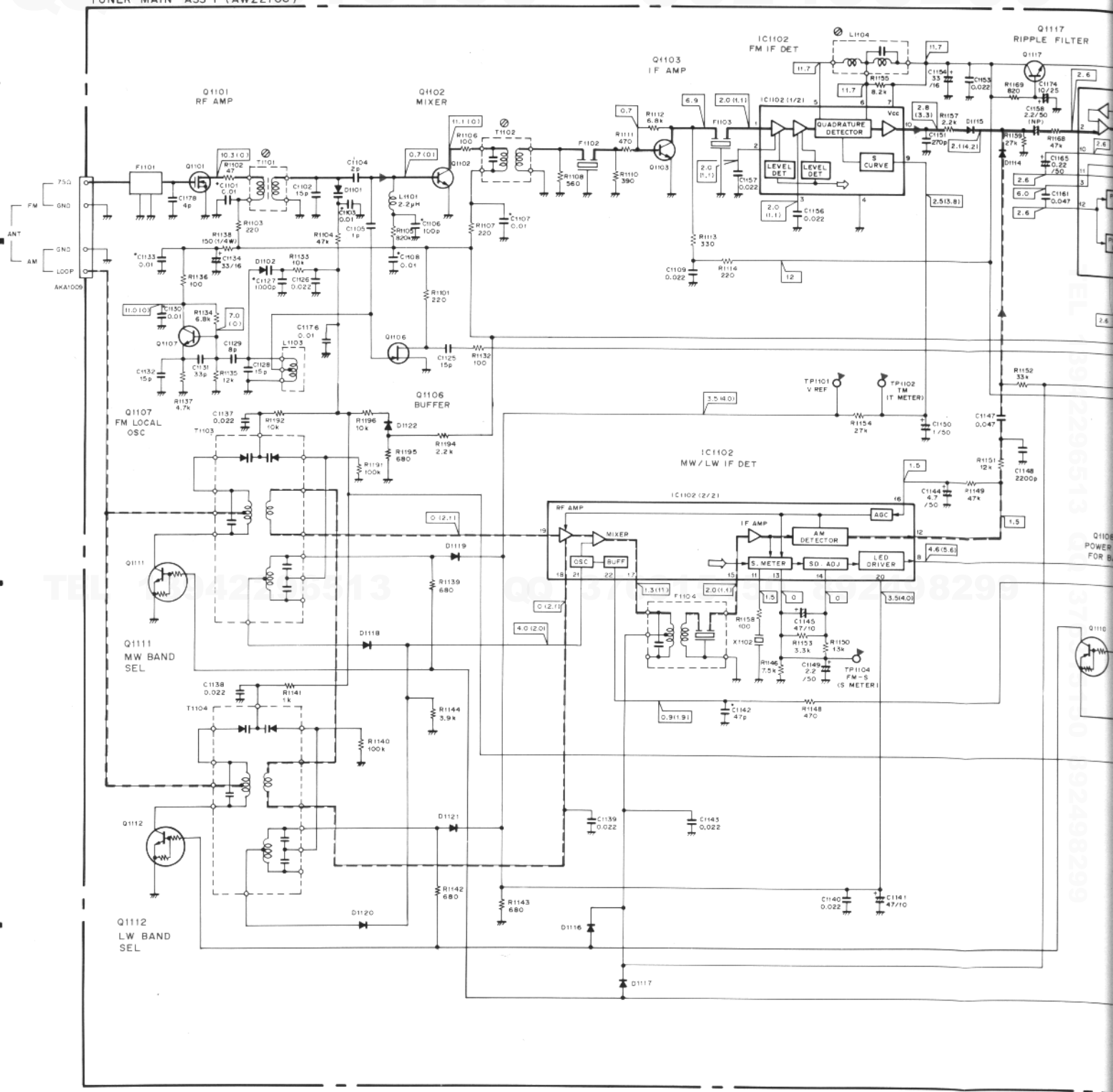
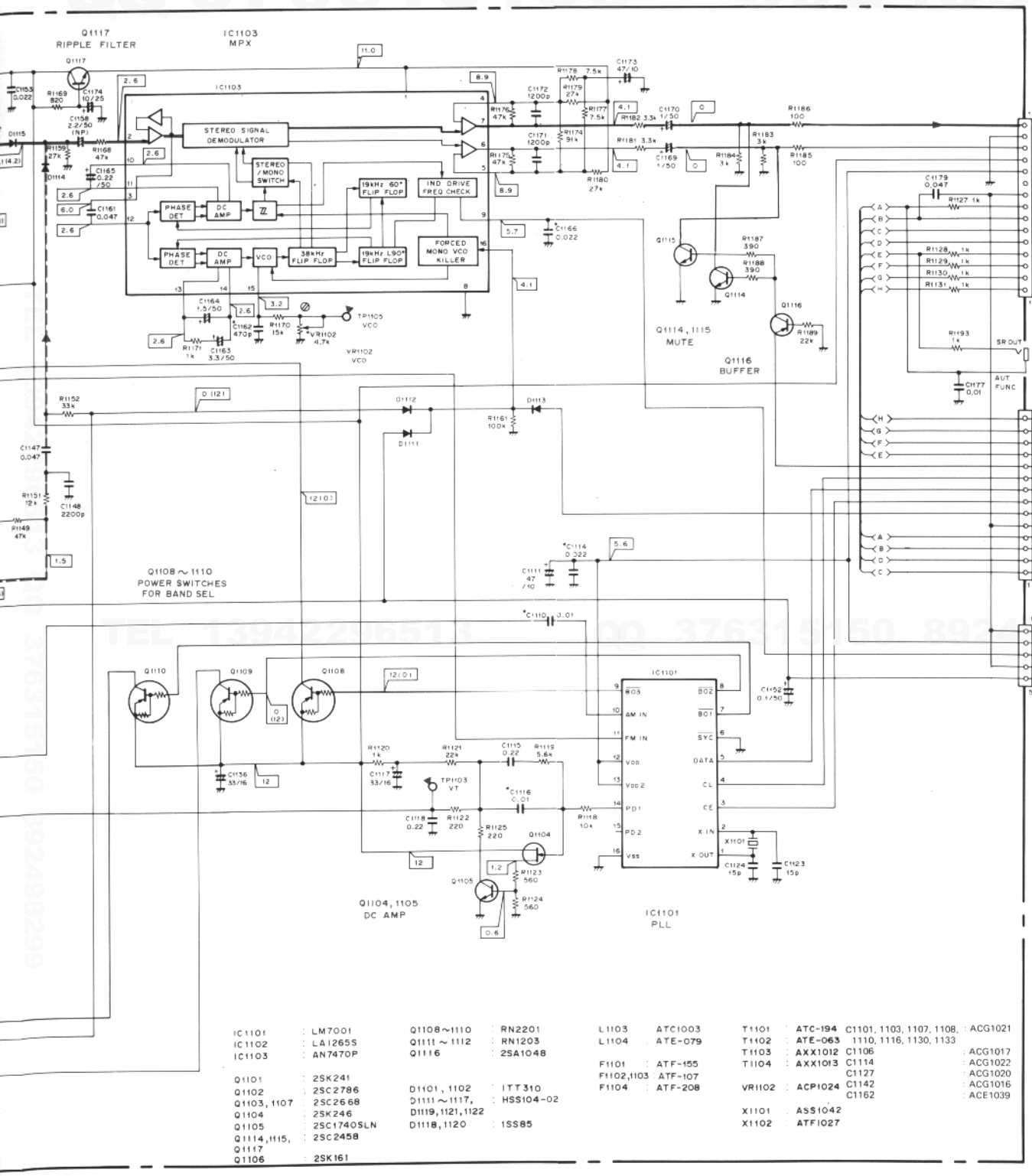
FV JAN. 1990 Printed in Japan

3. SCHEMATIC DIAGRAM

TUNER MAIN ASS'Y (AWZ2766)





IC1101	: LM7001	Q1108~1110	: RN2201	L1103	: ATC1003	T1101	: ATC-194 C1101, 1103, 1107, 1108, : ACG1021
IC1102	: LA1265S	Q1111 ~ 1112	: RN1203	L1104	: ATE-079	T1102	: ATE-063 1110, 1116, 1130, 1133
IC1103	: AN7470P	Q1116	: 2SA1048			T1103	: AXX1012 C1106 : ACG1017
				F1101	: ATF-155	T1104	: AXX1013 C1114 : ACG1022
Q1101	: 2SK241			F1102,1103	: ATF-107		C1127 : ACG1020
Q1102	: 2SC2786	D1101, 1102	: ITT310	F1104	: ATF-208	VR1102	: ACP1024 C1142 : ACG1016
Q1103, 1107	: 2SC2668	D1111 ~ 1117,	: HSS104-02				C1162 : ACE1039
Q1104	: 2SK246	D1119,1121,1122				X1101	: ASS1042
Q1105	: 2SC1740SLN	D1118,1120	: 1SS85			X1102	: ATF1027
Q1114,1115, Q1117	: 2SC2458						
Q1106	: 2SK161						

1. RESISTORS :
Indicated in Ω, 1/4
unless otherwise no
(G) ; ± 2%, (K) ; ±

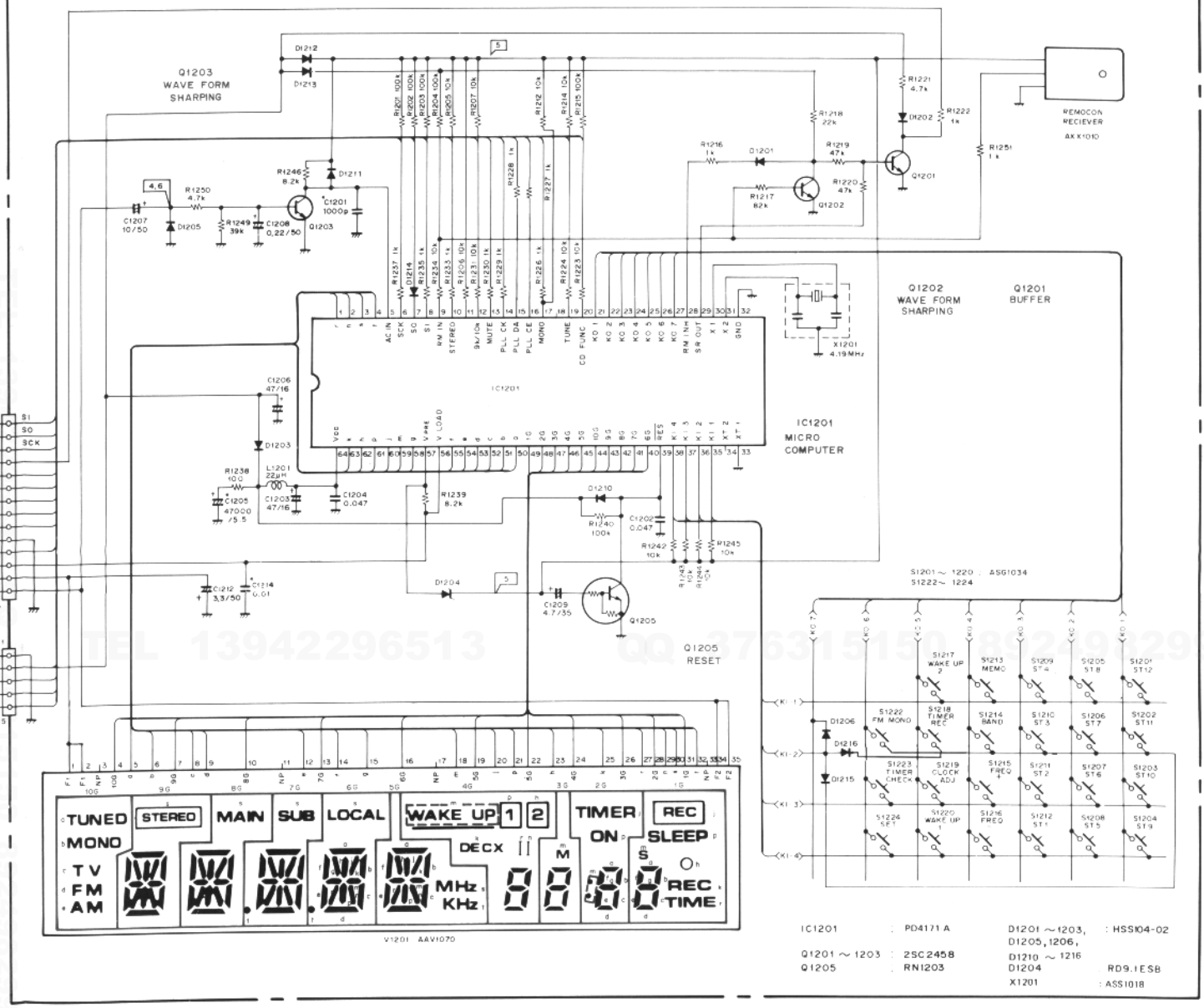
2. CAPACITORS :
Indicated in capacit
noted p ; pF. Indic
electrolytic capacito

3. VOLTAGE, CURRENT
V ; Signal vo
; DC voltag
Value in
⇦mA ; DC curren

4. OTHERS :
➡ ; Signal route.
Ø ; Adjusting point.
The ⚠ mark found
importance of the sa
replacing, be sure t
※ marked capacitor

This is the basic sc
may vary due to im

TUNER DISPLAY ASS'Y (AWZ2771)



IC1201 : PD4171A
Q1201 ~ 1203 : 2SC2458
Q1205 : RN1203
D1201 ~ 1203, D1205, 1206, : HSS104-02
D1210 ~ 1216
D1204 : RD9.1ESB
X1201 : ASS1018

1. RESISTORS :
Indicated in Ω, 1/4W, and 1/8W, ± 5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ± 1%, (G) : ± 2%, (K) : ± 10%, (M) : ± 20% tolerance.

2. CAPACITORS :
Indicated in capacity (μF) / voltage (V) unless otherwise noted p : pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :
V ; Signal voltage
; DC voltage (V) at FM position, no input signal. Value in ( ) is DC voltage at AM position.
⇦mA ; DC current at no input signal.

4. OTHERS :
➡ ; Signal route.
⊘ ; Adjusting point.
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.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES :

S1201: 12/24	S1213: MEMORY
S1202: 11/23	S1214: BAND
S1203: 10/22	S1215: +
S1204: 9/21	S1216: –
S1205: 8/20	S1217: WAKE-UP 2
S1206: 7/19	S1218: REC
S1207: 6/18	S1219: CLOCK ADJ
S1208: 5/17	S1220: WAKE-UP 1
S1209: 4/16	S1222: FM MONO
S1210: 3/15	S1223: CHECK
S1211: 2/14	S1224: SET
S1212: 1/13	

The underlined indicates the switch position.

4. P.C. BOARDS CONNECTION DIAGRAM

NOTE

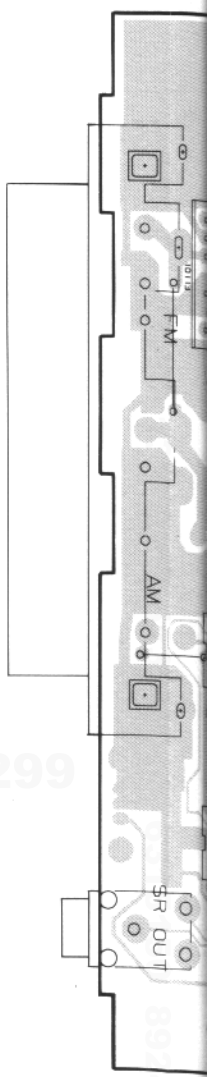
1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wirng symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 (E)	E or E	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

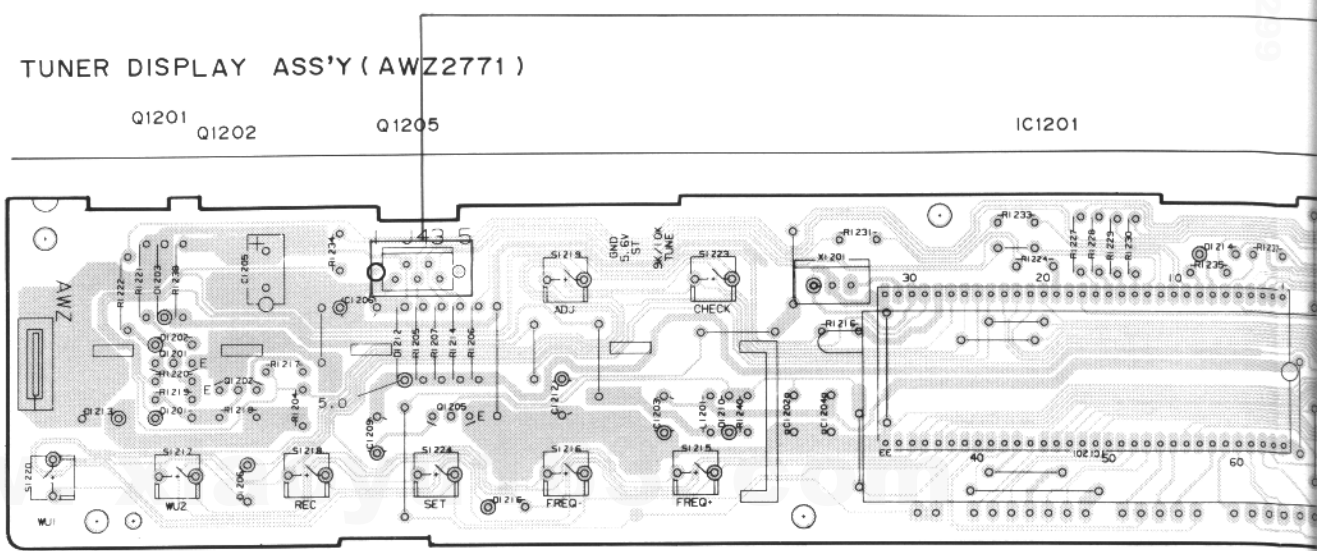
3. The capactor terminal marked with ◎ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

Others

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



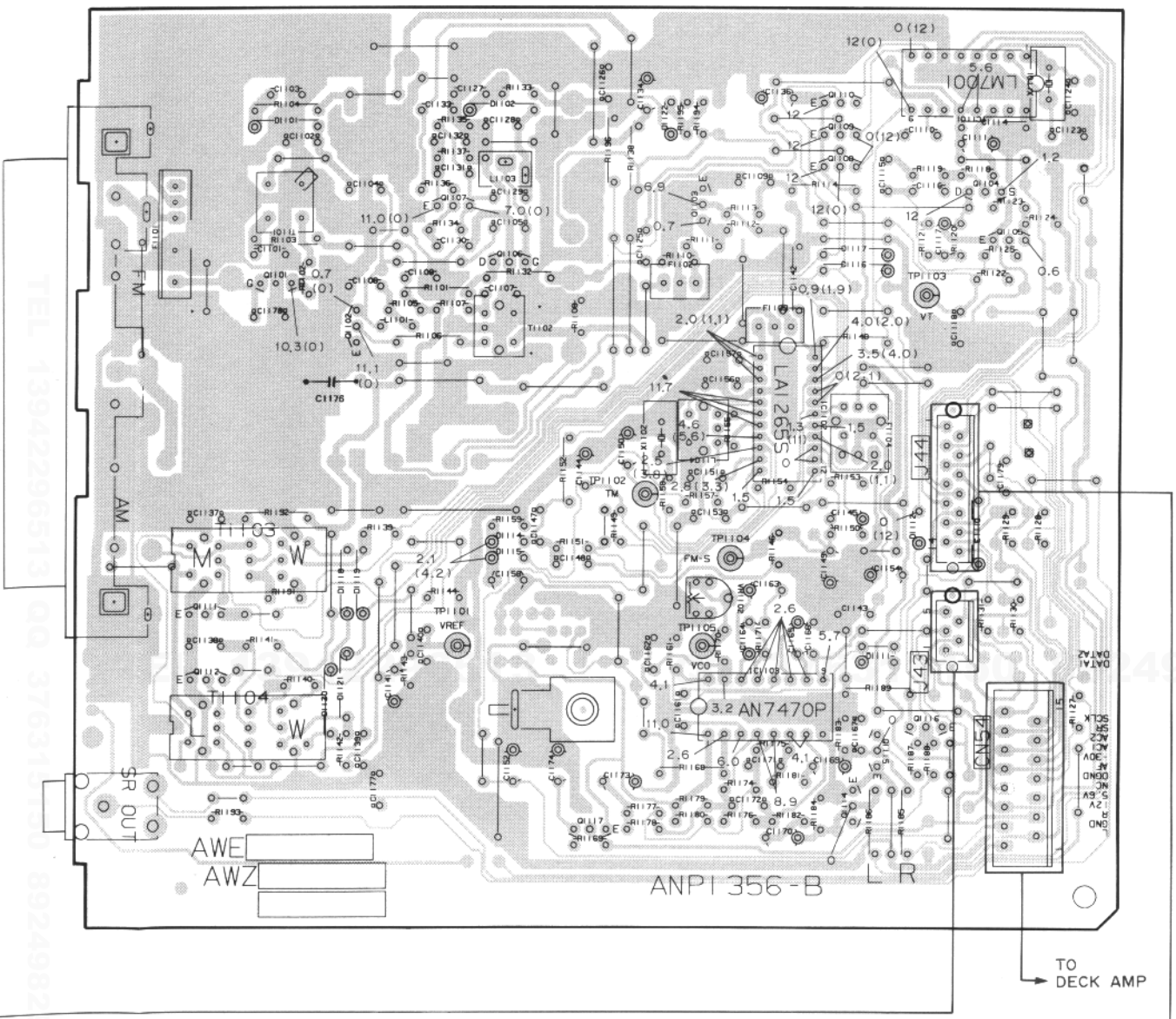
TUNER DISPLAY ASS'Y (AWZ2771)



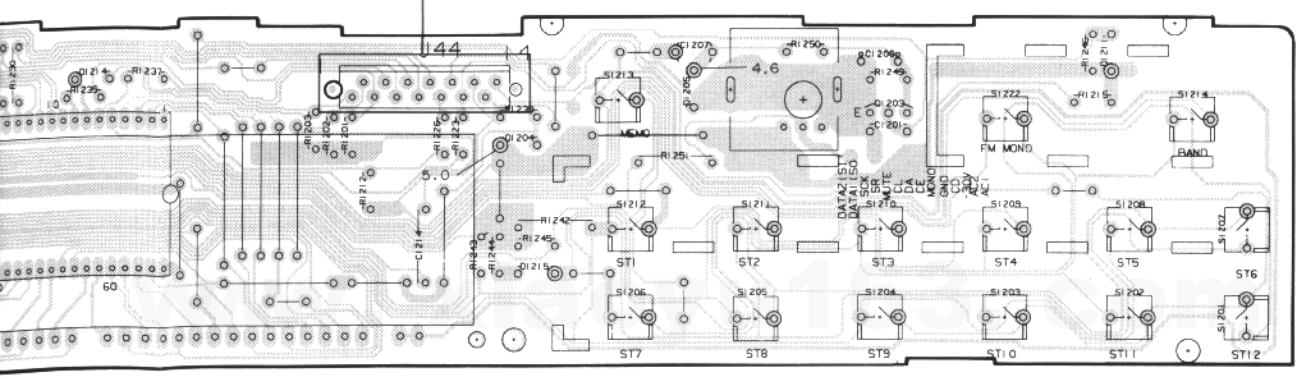
4 5 6

TUNER MAIN ASS'Y (AWZ2766)

Q1111 Q1101 Q1102 Q1107 Q1106 Q1103 IC1102 Q1110 Q1109 Q1108 IC1101 Q1104 Q1105
Q1112 Q1117 IC1103 Q1114 Q1115 Q1116



Q1203



A B C D

6. ADJUSTMENTS

- For connections and points to be adjusted, refer to Fig. 6-1 and Fig. 6-2.
- Where an asterisk (*) is given for "level dBμ," set to the level (dBμ) at which the voltage is roughly half the voltage between TP1104 and GND at 60 dB.

6.1 AM TUNER ADJUSTMENT

- Set the BAND selector to "AM".

Step No.	Adjustment Title	AM SG (400Hz, 30% modulation)		Reception Frequency Display	Adjustment	
		Frequency (kHz)	Level (dBμ)		Adjustment Location	Specifications
1	Tracking adjustment (ZEWZ and ZIOX1B types only)	603	*	603kHz	MW block ANT coil (T1103)	Adjust so that the DC voltage between TP1104 and GND is maximum.
2		1395		1395kHz	TC1101	
3		Repeats 1 and 2 above				
4	IFT adjustment (ZIOX1B type only)	603	*	603kHz	F1104	

6.2 FM TUNER ADJUSTMENT

- Set the BAND selector to "FM".
- Perform VCO adjustment two minutes or more after turning the power ON.

Note: Stereo modulation: Main 1kHz L + R ±68.25Hz dev.
Pilot 19kHz ±6.75kHz dev.

Step No.	Adjustment Title	FM SG (1kHz ± 75kHz dev.)		Reception Frequency Display	Adjustment	
		Frequency (MHz)	Level (dBμ)		Adjustment Location	Specifications
1	FM local oscillator control voltage check	No signal	—	87.5MHz	—	Confirm that DC voltage between TP1103 and GND is 3.4 ± 1.5V.
				108MHz	—	Confirm that the DC voltage between TP1103 and GND is $8.7\ ^{+1.8}_{-2}$ V.
2	Adjustment to improve sensitivity (Other than ZEWZ, ZIOX1B types)	98.0	*	98.0MHz	T1101, T1102	Adjust so that the DC voltage between TP1104 and GND is maximum.
3	Detector coil T-meter adjustment	98.0 (No modulation)	60	98.0MHz	L1104	Adjust so that the DC voltage between TP1101 and TP1102 is 0 V.
4	VCO adjustment	98.0 (No modulation)	60	98.0MHz	VR1102	Adjust so that the frequency between TP1105 and GND is 76 ± 0.1 kHz.
5	MPX distortion adjustment (Other than ZEWZ, ZIOX1B types)	98.0	60	98.0MHz	T1102	Minimize distortion in both left and right channel outputs (adjust T1102 to with in ±90°).
		Stereo modulation (Note)				

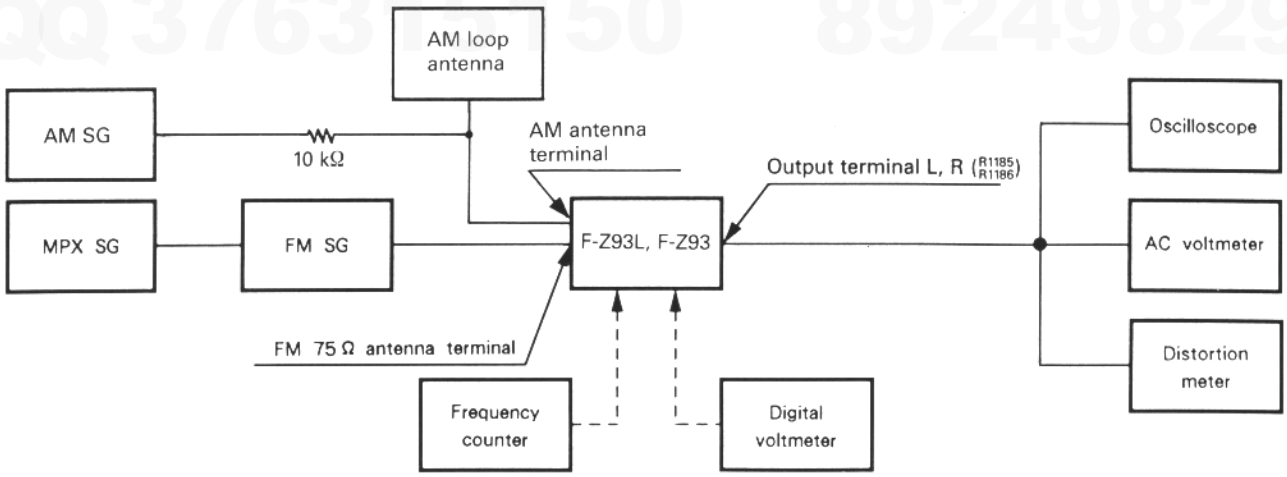


Fig. 6-1 AM and FM adjustment wiring diagram

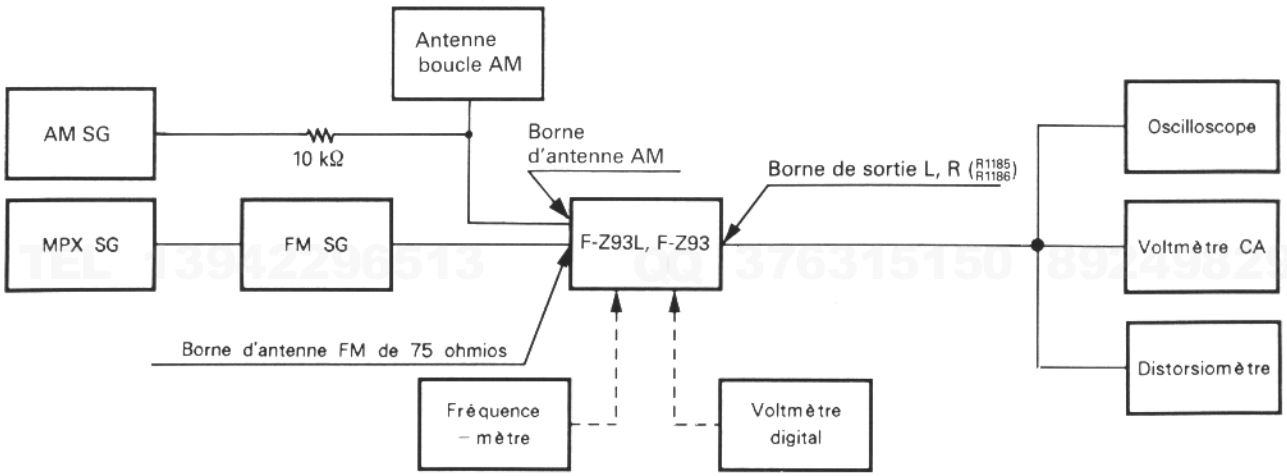


Fig. 6-1 Diagramme de càblage de réglage AM et FM

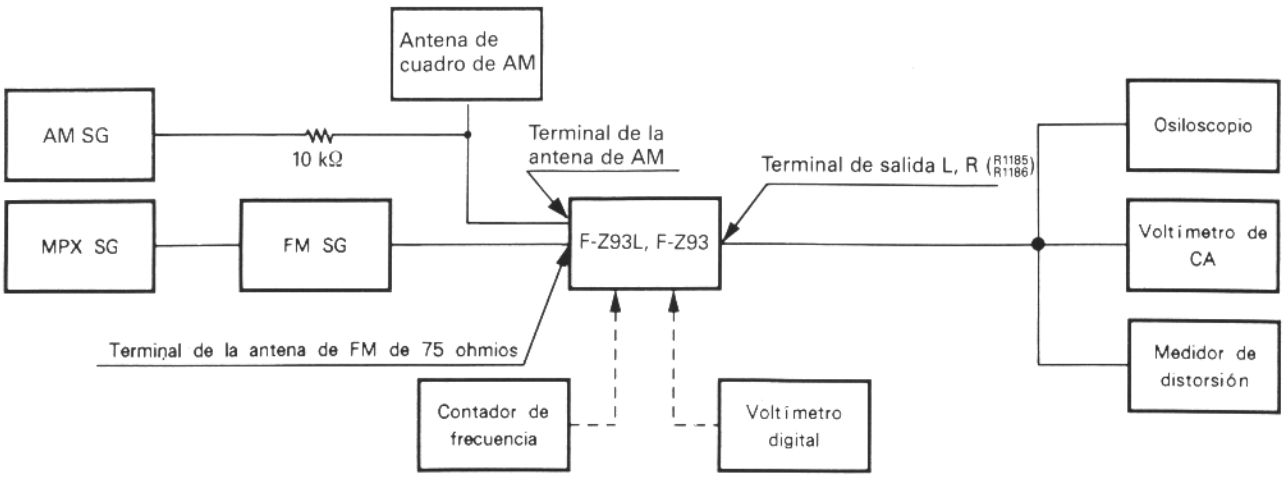


Fig. 6-1 Diagramma de conexión de ajuste de AM y FM

*1: Only ZEWZ and ZIOX1B types
Seuls les types ZEWZ et ZIOX1B
Sólo los tipos ZEWZ y ZIOX1B

*2: Other than ZEWZ, ZIOX1B types
Autres que les types ZEWZ, ZIOX1B
Que no sea del tipo ZEWZ y ZIOX1B

*3: For LW-equipped models only
Uniquement pour les modèles munis de la gamme GO
Para modelos equipados con LW solamente

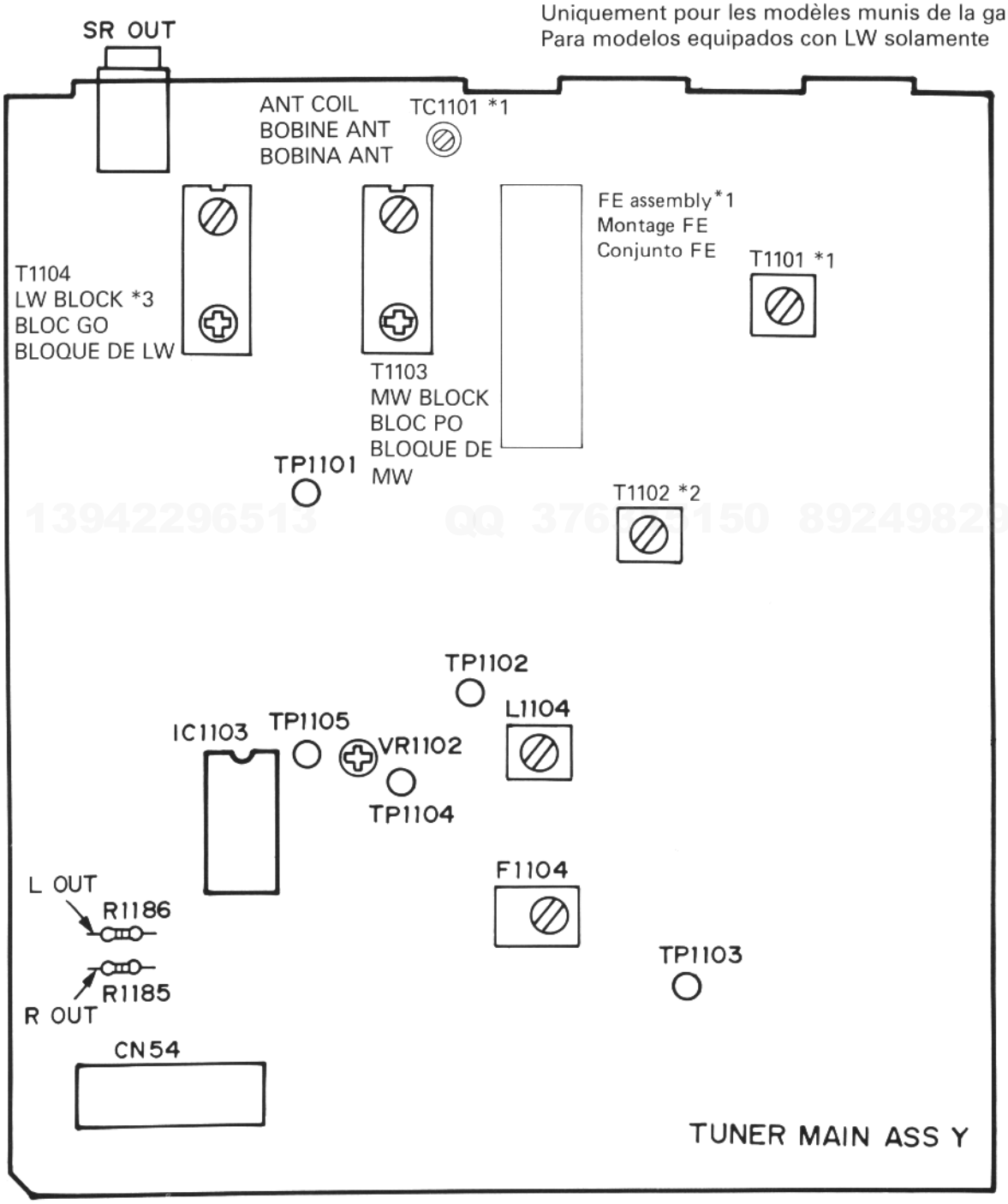


Fig. 6-2 Adjustment points
Fig. 6-2 Points de réglage
Fig. 6-2 Puntos de ajuste