ADDITIONAL

Service Manual

PIONEER

ORDER NO.
ARP-313-0

STEREO TUNER

TX-540L HE, HB

The basic performance of the model TX-540L is the same as the model TX-540. The AM tuner of TX-540L is a two wave-band tuner with MW (medium wave) and LW (long wave). Please refer to the TX-540/KU service manual (ARP-311) with the exception of this service manual. This additional service manual is applicable to the TX-540L/HE and TX-540L/HB.

CONTENTS

Line Voltage Selection

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Take out the jumper wire from the connector, and re-install the jumper wire in the correct voltage indication (see Fig. 1).
4. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label

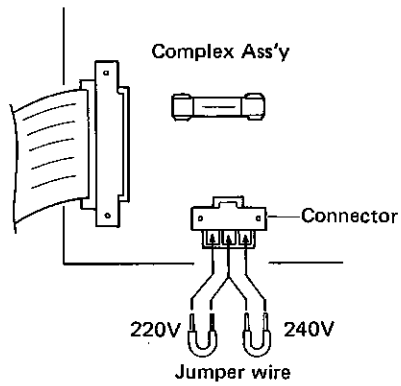


Fig. 1 Line voltage selection

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

1. SPECIFICATIONS

FM Tuner Section

Usable Sensitivity	Mono; 10.8dBf (0.95μV/75Ω)
50dB Quieting Sensitivity	Mono; 24.2dBf (4.5μV/75Ω)
	Stereo; 38dBf (21.6μV/75Ω)
Sensitivity (DIN)	Mono; 0.75μV/75Ω
	Stereo; 22μV/75Ω
Signal-to-Noise Ratio	Mono; 76dB (at 80dBf)
	Stereo; 70dB (at 80dBf)
Signal-to-Noise Ratio (DIN)	Mono; 70dB
	Stereo; 64dB
Distortion (at 65dBf)	
Stereo, Mono	1kHz; 0.25%
Capture Ratio	1.0dB
Alternate Channel Selectivity	400kHz; 55dB
Stereo Seperation	1kHz ; 45dB
Frequency Response	30Hz to 15kHz $^{+0.5}_{-1.0}$ dB
Spurious Response Ratio	70dB
Image Response Ratio	52dB
IF Response Ratio	85dB
AM Suppression Ratio	50dB
Muting Threshold	29.2dBf (7.9μV), 75Ω
Antenna Input	300 ohms balanced, 75 ohms unbalanced

LW Tuner Section

Sensitivity (loop antenna)	500μV
Selectivity	25dB
Signal-to-Noise Ratio	50dB
Image Response Ratio	40dB
IF Response Ratio	70dB
Antenna	Loop antenna

MW Tuner Section

Sensitivity (loop antenna)	200μV
Selectivity	25dB
Signal-to-Noise Ratio	50dB
Image Response Ratio	40dB
IF Response Ratio	70dB
Antenna	Loop antenna

Audio Section

FM (100% MOD)	600mV/3.3kΩ
LW/MW (30% MOD)	200mV/3.3kΩ

Miscellaneous

Power Requirements	a.c. 220 volts ~, 50/60Hz
Power Consumption	12W
Dimensions	420(W) x 60(H) x 234(D) mm
	16-1/2(W) x 2-3/8(H) x 9-1/4(D) in
Weight (without package)	2.5kg (5 lb 8oz)

Furnished Parts

FM T-type Antenna	1
AM Loop Antenna	1
Connection Cord with Pin Plugs	1
Operating Instructions	1

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

2. PARTS LIST

NOTES:

- *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 × 10¹*	*561 . . . . .*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 10³*	*473 . . . . .*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*	*. . . . . .*	*RN2H 0 R 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 × 10¹*	*5621 . . . .*	*RN¼SR 5 6 2 1 F*

- *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.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No. TX-540/KU type	Part No. TX-540L/HE type	Part No. TX-540L/HB type	Remarks
	Complex ass'y	GWM-301	GWM-290	GWM-290	
	Dial scal	AAG-249	AAG-248	AAG-248	
⚠ ★	T100 Power transformer (120V)	ATT-994	. . .	. . .	
	(220V, 240V)	. . .	ATT-991	ATT-991	
⚠ ★★	FU1 Fuse	. . .	AEK-406	AEK-406	
	AC power cord	ADG-073	ADG-071	ADG-078	
⚠	R401 (2.2M, 1/2W)	ACN-029	. . .	. . .	
	Operating instructions				
	(English)	ARB-559	. . .	ARB-568	
	(English, German, French, Italian)	. . .	ARE-062	. . .	
	Packing case	AHE-202	AHE-159	AHE-159	

Complex Assembly (GWM-290)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TA7640AP	Q102
★★	μPC1235C	Q107
★★	BA695	Q106
★★	2SD313-E (2SD880-Y)	Q205
★★	2SC2458/A/-GR (2SC2603/A/-F)	Q104
★★	2SK241-Y	Q1
★★	2SC2786-L	Q2
★★	2SC2668	Q3
★★	2SC535	Q101
★★	2SC2878	Q108, Q109
★★	2SC2458 (2SC945A) (2SC2603)	Q103, Q201 – Q203
★★	2SA1048 (2SA733A) (2SA1115)	Q204, Q206, Q110
★★	2SJ103	Q105
⚠ ★	10E2FD	D204, D205, D107
★	WZ-081 (MZ-081)	D203
★	1S1555 (1S2076) (US1035) (1S2473)	D101 – D106, D108, D201, D202, D206, D207

TRANSFORMER, COILS AND FILTERS

Mark	Part No.	Symbol & Description
	ATC-188	L1 FM ANT coil
	ATC-189	L2, L4 FM tuning coil
	ATC-190	L3 FM RF coil
	ATC-191	L5 FM OSC coil
	ATH-049	L6, L7 RF choke coil
	ATE-053	T1 FM IF transformer
	ATE-065	T101 FM DET transformer
	ATB-089	T104 AM ANT coil
	ATD-020	T106 LW ANT coil
	ATB-090	T103 AM OSC coil
	ATD-021	T105 LW OSC coil
	ATB-091	T102 AW DET transformer
	ATF-126	F101, F102 FM ceramic filter
	ATF-133	F103 AM ceramic filter

CAPACITORS

Mark	Part No.	Symbol & Description
	ACK-039	VC Tuning capacitor
	ACM-018	TC3 Ceramic trimmer
	ACM-020	TC101, TC102 Ceramic trimmer
	ACG-030	C1 Ceramic
	ACG-031	C139, C140 Ceramic
	CEA 471M 35L	C205
	CEA 471M 16L	C206, C207
	CEA 102M 16L	C126
	CEANP 4R7M 35	C117, C113
	CEA 0R1M 50L	C118
	CEA R22M 50L	C132
	CEA 010M 50L	C124, C141, C142
	CEA 1R5M 50L	C130
	CEA 3R3M 50L	C131, C201
	CEA 100M 16L	C113, C120, C135, C136
	CEA 220M 10L	C115
	CEA 470M 25L	C119, C202, C108
	CEA 101M 35L	C204, C203
	CCDCH 020C 50	C4
	CCDCH 040C 50	C6, C15
	CCDCH 050C 50	C5
	CCDRH 080D 50	C11
	CCDTH 070D 50	C144
	CCDCH 150J 50	C13
	CCDLH 220J 50	C10
	CCDPH 220J 50	C3
	CCDTH 270J 50	C110
	CCDCH 330J 50	C12
	CCDSL 101J 50	C7, C209, C134
	CKDYB 391K 50	C106
	CKDYB 471K 50	C127
	CKDYB 102K 50	C2, C14, C137, C138
	CKDYF 103Z 50	C8, C9, C101, C102, C104, C105, C121, C123, C125, C208
	CKDYF 473Z 50	C103, C107, C111, C112, C114, C116, C122, C128, C143, C304
	CQSA 680J 50	C301
	CQSA 151J 50	C303
	CQSA 221J 50	C302
	CQSA 431J 50	C109
	CQSA 471J 50	C129

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RS1L 5R6J	R217
	RN1/4PQ1502F	R151
★	RHB8AVS 502-T	VR2 Semifixed
★	RHB8AVS 203-T	VR1 Semifixed
	RD1/4PMFL 391J	R216
	RD1/4 PM □□□J	R212, R213, R215, R107, R210, R201, R136 – R138
	RD1/8PM □□□J	Other resistor

OTHERS

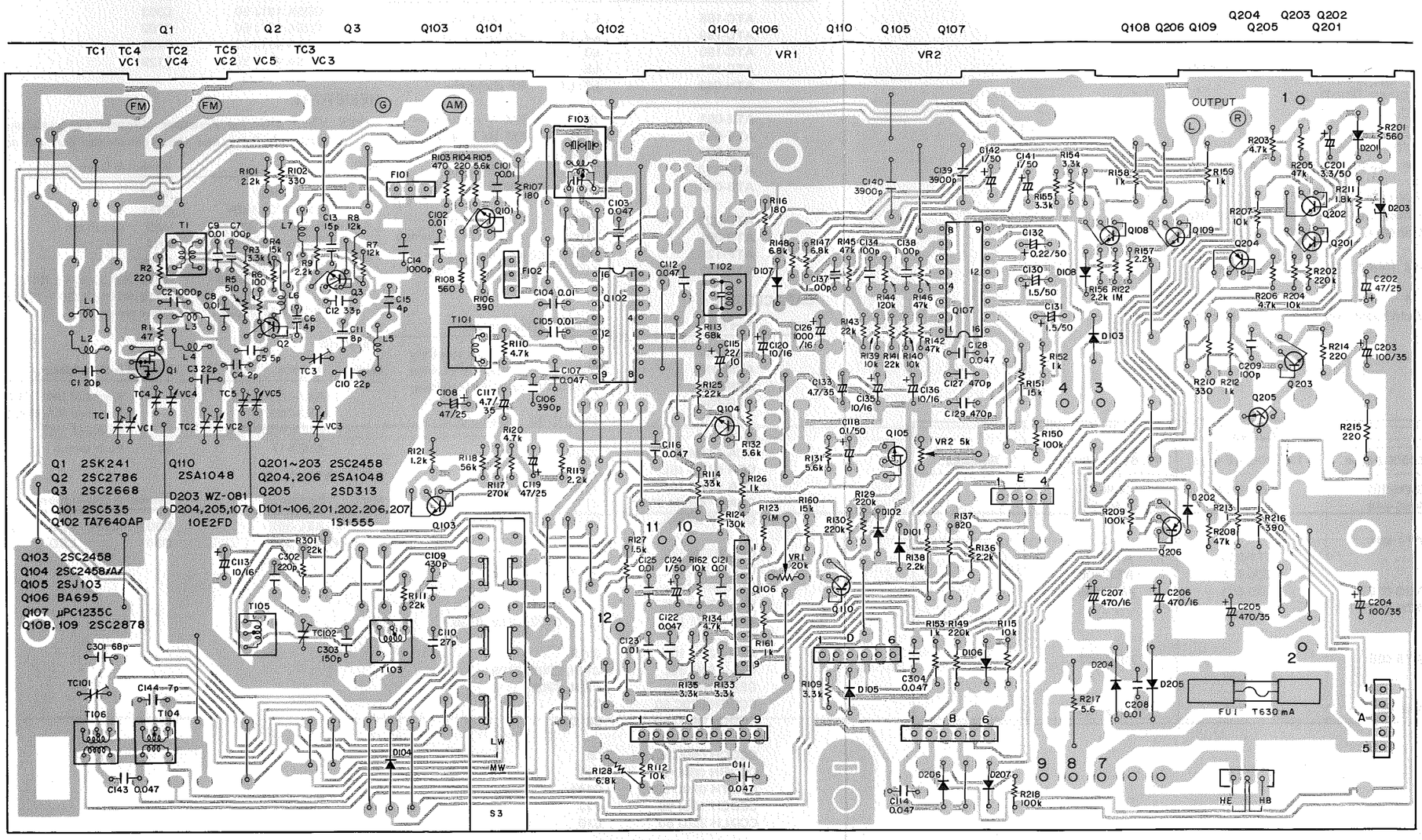
Mark	Part No.	Symbol & Description
	AKA-018	Terminal (ANTENNA)
	AKB-093	Terminal (OUTPUT)
	PBZ30P060FMC	Screw (3 x 6)
	ASG-417	S3 Push switch

LED Assembly

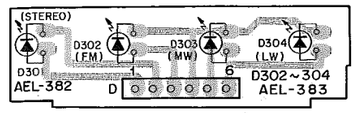
Mark	Part No.	Symbol & Description
★	AEL-383	D302 – D304 LED (Green)
★	AEL-382	D301 LED

3. P.C.BOARD PATTERNS

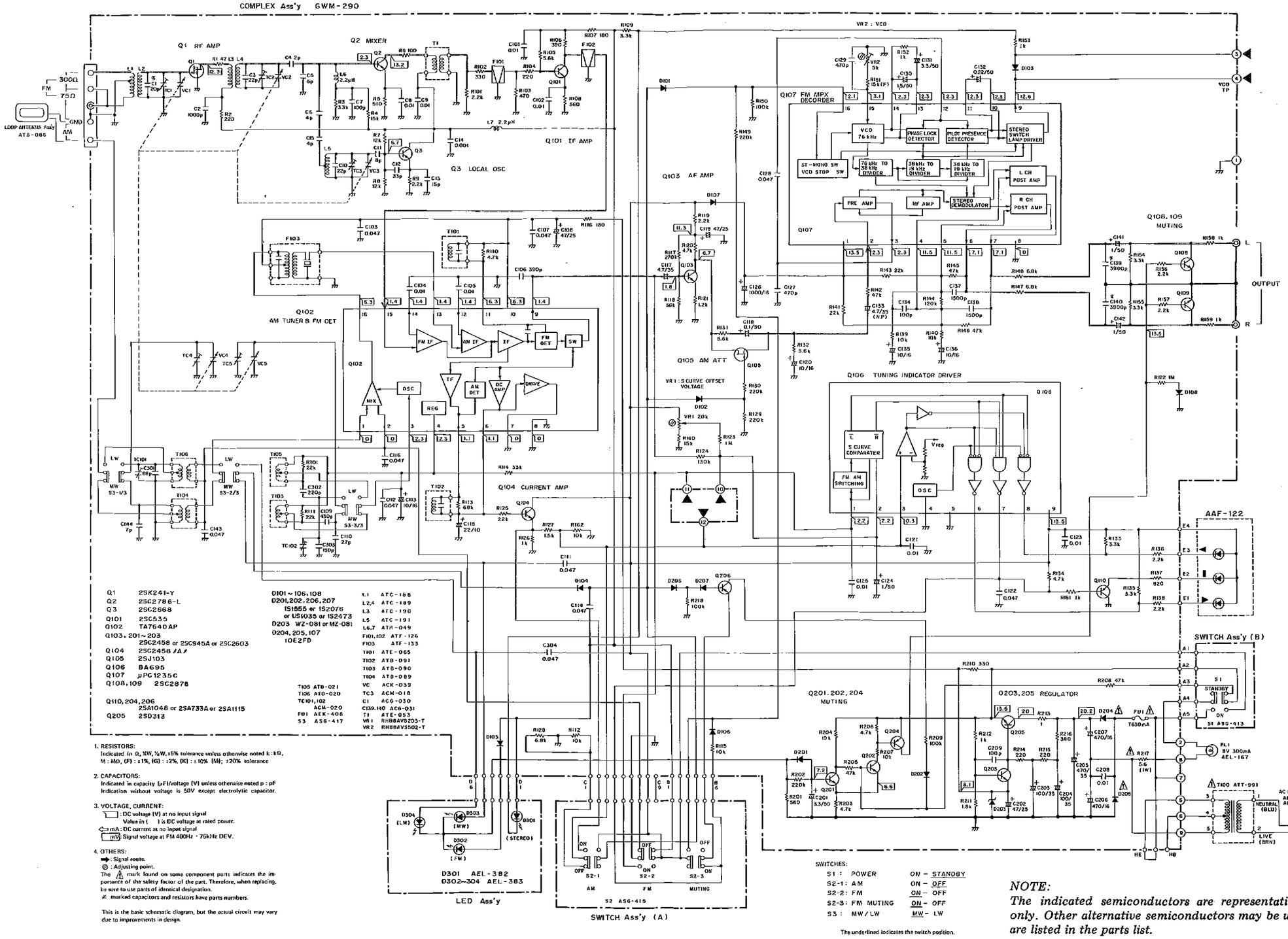
Complex Ass'y (GWM-290)



LED Ass'y



4. SCHEMATIC DIAGRAM



Q1 2SK241-Y
Q2 2SC2786-L
Q3 2SC2668
Q101 2SC535
Q102 TA7640AP
Q103, 201~203 2SC2458 or 2SC945A or 2SC2603
Q104 2SC2458 /A#
Q105 2SJ103
Q106 BA695
Q107 μPC1235C
Q108, 109 2SC2878
Q110, 204, 206 2SA1048 or 2SA733A or 2SA1115
Q205 2SD313

D101~106, 108
D201, 202, 206, 207 1S1555 or 1S2076 or 1S1035 or 1S2473
D203 WZ-081 or MZ-081
D204, 205, 107 10E2FD

L1 ATC-188
L2, 4 ATC-189
L3 ATC-190
L5 ATC-191
L6, 7 ATH-049
FIO1, IO2 ATF-126
FI03 ATF-133
TI01 ATE-065
TI02 ATB-091
TI03 ATB-090
TI04 ATB-089
VC ACK-039
TC3 ACH-018
C1 ACG-030
C139, 140 ACG-031
T1 ATE-053
VR1 RH88AV5203-T
VR2 RH88AV5502-T

TI05 ATB-021
TI06 ATB-020
TC101, 102 ACM-020
FB1 AEK-406
S3 ASG-417

1. RESISTORS:
Indicated in Ω, ¼W, ½W, ±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:
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
⇦mA: DC current at no input signal
mV: Signal voltage at FM 400Hz · 75kHz DEV.

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.

SWITCHES:

S1 : POWER	ON – STANDBY	
S2-1: AM	ON – OFF	
S2-2: FM	ON – OFF	
S2-3: FM MUTING	ON – OFF	
S3 : MW/LW	MW – LW	

The underlined indicates the switch position.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

5. ADJUSTMENTS

MW Tuner Section

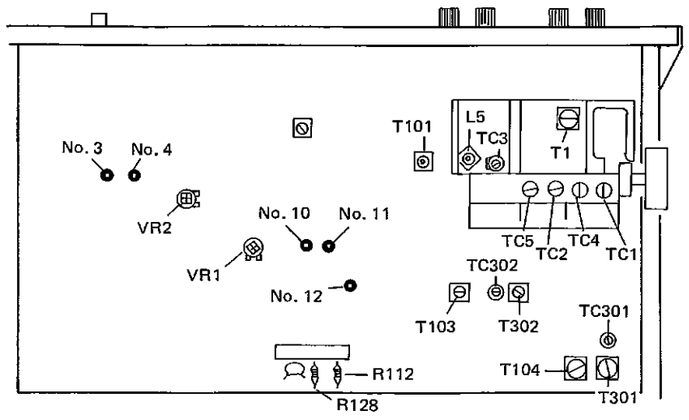
- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the TX-540L to the MW band.

Step	AM SG (400Hz, 30% modulation)		Position of dial pointer	Adjustment point	Adjustment procedure
	Frequency	Level			
1	600kHz	100dB	600kHz	T103	Adjust until DC voltage between terminal no. 12 and ground is maximum.
2	1400kHz	100dB	1400kHz	TC5	
3	Repeat steps 1 and 2 until maximum sensitivity is attaind.				
4	600kHz	30dB	600kHz	T104	Adjust until DC voltage between terminal no. 12 and ground is maximum.
5	1400kHz	30dB	1400kHz	TC4	
6	Repeat steps 4 and 5 until maximum sensitivity is attaind.				

LW Tuner Section

- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the TX-540L to the LW band.

Step	AM SG (400Hz, 30% modulation)		Position of dial pointer	Adjustment point	Adjustment procedure
	Frequency	Level			
1	164kHz	100dB	164kHz	T302	Adjust until DC voltage between terminal no. 12 and ground is maximum.
2	254kHz	100dB	254kHz	TC302	
3	Repeat steps 1 and 2 until maximum sensitivity is attaind.				
4	164kHz	30dB	164kHz	T301	Adjust until DC voltage between terminal no. 12 and ground is maximum.
5	254kHz	30dB	254kHz	TC301	
6	Repeat steps 4 and 5 until maximum sensitivity is attaind.				



5. RÉGLAGE

Section accordeur MW (PO)

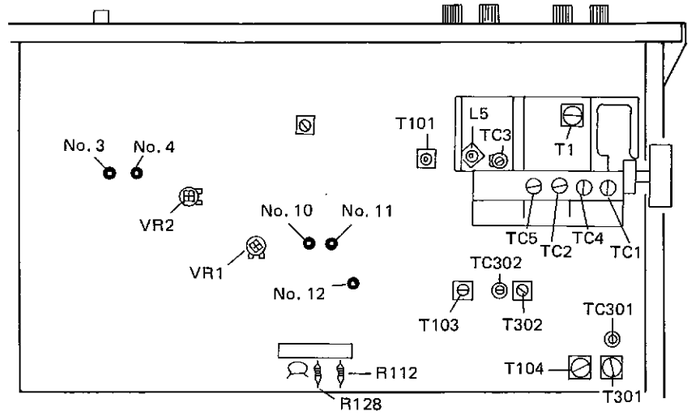
- Brancher l'antenne bouclée MA fournie entre les bornes d'antenne MA et la masse.
- Brancher le générateur de signal MA (AM SG) sur la borne d'antenne MA à travers uns résistance de 10 kOhms.
- Régler le TX-540L sur la bande MW (PO).

Phase	AM SG (400Hz, modulation de 30%)		Position de l'aiguille	Point de réglage	Méthode de réglage
	Frequence	Niveau			
1	600kHz	100dB	600kHz	T103	Régler jusqu'à ce que la tension CC entre la borne nº 12 et la masse soit au maximum.
2	1400kHz	100dB	1400kHz	TC5	
3	Répétir les phase 1 et 2 jusqu'à ce que soit atteint le maximum de sensibilité.				
4	600kHz	30dB	600kHz	T104	Régler jusqu'à ce que la tension CC entre la borne nº 12 et la masse soit au maximum.
5	1400kHz	30dB	1400kHz	TC4	
6	Répétir les phase 4 et 5 jusqu'à ce que soit atteint le maximum de sensibilité.				

Section accordeur LW (GO)

- Brancher l'antenne bouclée MA fournie entre les bornes d'antenne MA et la masse.
- Brancher le générateur de signal MA (AM SG) sur la borne d'antenne MA à travers uns résistance de 10 kOhms.
- Régler le TX-540L sur la bande LW (GO).

Phase	AM SG (400Hz, modulation de 30%)		Postion de l'aiguille	Point de réglage	Méthode de réglage
	Frequence	Niveau			
1	164kHz	100dB	164kHz	T302	Régler jusqu'à ce que la tension CC entre la borne nº 12 et la masse soit au maximum.
2	254kHz	100dB	254kHz	TC302	
3	Répéir les phase 1 et 2 jusqu'à ce que soit atteint le maximum de sensibilité.				
4	164kHz	30dB	164kHz	T301	Régler jusqu'à ce que la tension CC entre la borne nº 12 et la masse soit au maximum.
5	254kHz	30dB	254kHz	TC301	
6	Répétir les phase 4 et 5 jusqu'à ce que soit atteint le maximum de sensibiilité.				



5. AJUSTE

Sección del sintonizador de MW

- Conectar la antena de cuadro de AM suministrada entre los terminales AM ANTENNA y GND.
- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10kΩ.
- Ajustar el TX-540L en la banda de MW.

Paso	AM SG (400Hz, 30% de modulación)		Posición del indicador del cuadrante	Puntos de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	600kHz	100dB	600kHz	T103	Ajustar hasta que la tensión de CC entre el terminal no. 12 y masa sea la máxima.
2	1400kHz	100dB	1400kHz	TC5	
3	Repetir los pasos 1 y 2 hasta lograrse la máxima sensibilidad.				
4	600kHz	30dB	600kHz	T104	Ajustar hasta que la tensión de CC entre el terminal no. 12 y masa sea la máxima.
5	1400kHz	30dB	1400kHz	TC4	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				

Sección del sintonizador de LW

- Conectar la antena de cuadro de AM suministrada entre los terminales AM ANTENNA y GND.
- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10kΩ.
- Ajustar el TX-540L en la banda de LW.

Paso	AM SG (400Hz, 30% de modulación)		Posición del indica dor del cuadrante	Puntos de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	164kHz	100dB	164kHz	T302	Ajustar hasta que la tensión de CC entre el terminal no. 12 y masa sea la máxima.
2	254kHz	100dB	254kHz	TC302	
3	Repetir los pasos 1 y 2 hasta lograrse la máxima sensibilidad.				
4	164kHz	30dB	164kHz	T301	Ajustar hasta que la tensión de CC entre el terminal no. 12 y masa sea la máxima.
5	254kHz	30dB	254kHz	TC301	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.