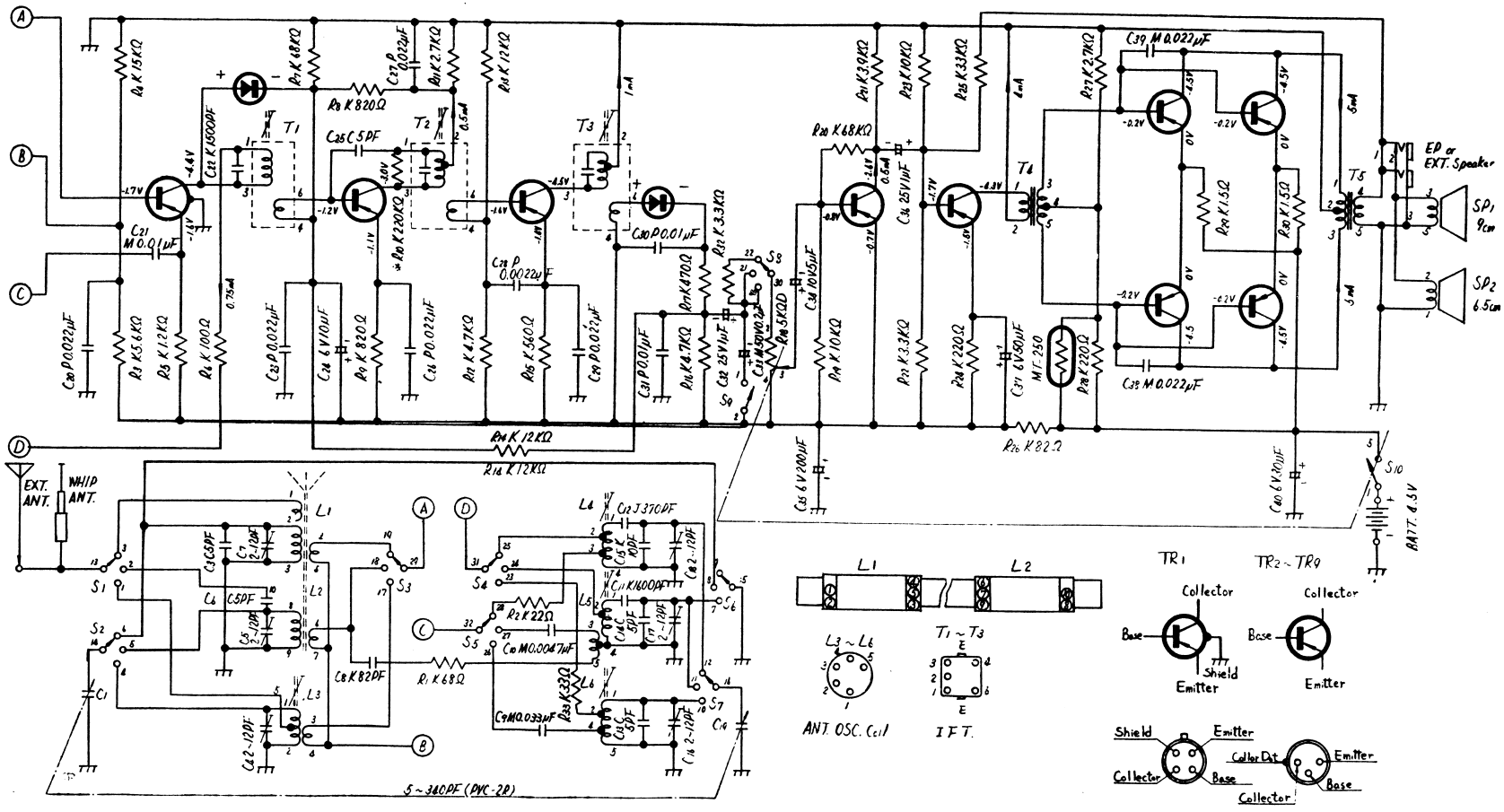
TR1	D1	TR2	TR3	D2	TR4	TR5	TR6, TR7, TR8 & TR9
2SA341	0A90	2SA101	2SA101	0A90	2SB173	2SB175	2SB176×4
CONV.	D. AGC	1st IF AMP.	2nd IF AMP.	DET. & AGC	1st AF AMP.	2nd AF AMP.	POWER AMP.



Notes:

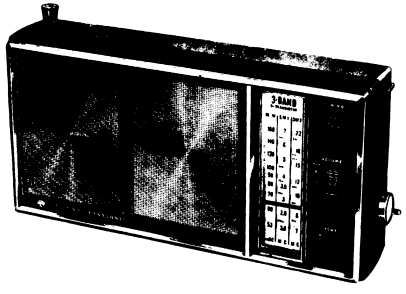
1. S1~S8 : Band selector switch in "MW" position.
2. S9 : Tone switch in "HIGH" position.
3. S10 : Power source switch in "OFF" position.
4. DC voltage measurements are taken with circuit tester (10KΩ/V).
5. Measured voltages for TR1~TR9 are from transistor terminal to positive side of battery.
6. Capital letters (J, K, M, P, C, D) in the circuit diagram show allowable tolerances of resistors and capacitors as follows:
   J=±5% K=±10% M=±20% P=+100% − 0%
   C=±0.25PF D=±0.5PF
7. PF=pico farad=mmf
   μF=micro farad=MF
8. Battery Current:
   No signal..... 26mA
   Maximum Output.....300mA

Fig. 5 Schematic Diagram.

NATIONAL PANASONIC

3-BAND 9-TRANSISTOR PORTABLE RADIO

MODEL R-321



SPECIFICATIONS

Frequency Range:	MW 525~1605 kc/s (571~187m) SW1 2.3~7 Mc/s (130~42.9m) SW2 7~22 Mc/s (42.9~13.6m)
Intermediate Frequency:	455 kc/s
Transistor:	2SA341 Converter 2SA101 1st IF Amplifier 2SA101 2nd IF Amplifier 2SB173 1st AF Amplifier 2SB175 2nd AF Amplifier 2SB176, 2SB176, 2SB176 Power Amplifier (Parallel Push-Pull)
Diode:	OA90 Detector & AGC OA90 Delayed AGC
Sensitivity	MW 70μV/m for 50mW Output SW1 70μV/m for 50mW Output SW2 20μV for 50mW Output
Power Output	400 mW Undistorted 700 mW Maximum
Batteries:	4.5 V (Three "D" size flashlight batteries)
Speaker:	9 cm (3½") plus 6.5 cm (2½") PM Dynamic speaker
Cabinet Dimensions:	260(Wide)×140(High)×57(Deep) mm (10¼"×5½"×2¼")
Weight:	1.2kg (2 lb 10 oz.) with batteries

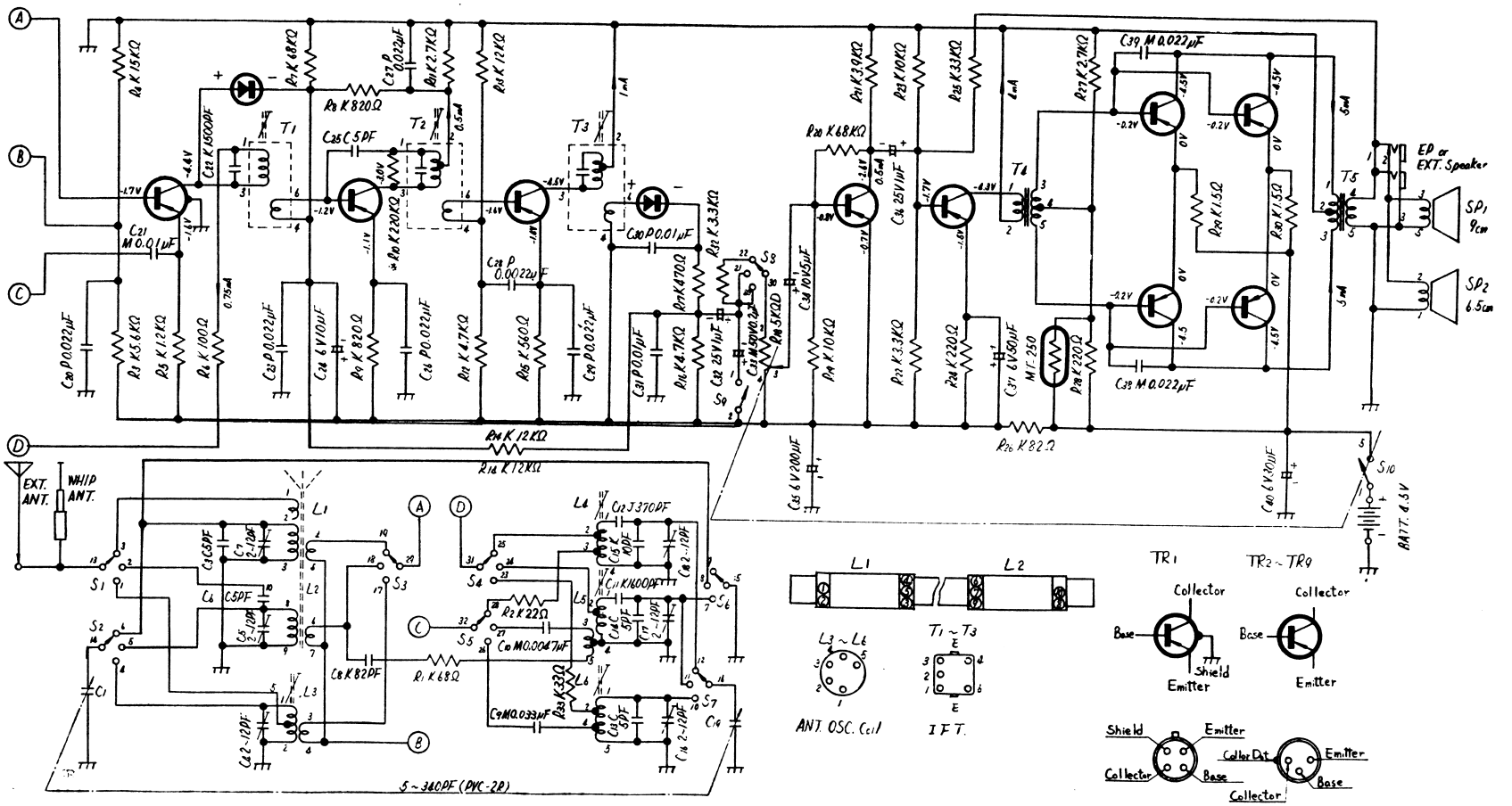
ALIGNMENT INSTRUCTIONS

Output of signal generator should be no higher than necessary to obtain an output reading.
Set volume control to maximum.
Set tone switch to high.
Set power voltage to DC 4.5V.

	Band Switch Position	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1	MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kc/s (400~ Mod.)	Point of non-interference (on/about 600 kc/s)	Output meter across voice coil.	T_1 (1st IFT) T_2 (2nd IFT) T_3 (3rd IFT)	Adjust for maximum output.
2	MW	〃	517 kc/s (400~ Mod.)	Tuning gang fully closed.	〃	L_4 (OSC Coil)	Adjust for maximum output.
3	MW	〃	600 kc/s (400~ Mod.)	600 kc/s	〃	L_1 (ANT Coil)	Adjust for maximum output by sliding coil (L_1) along ferrite core.
4	MW	〃	1500 kc/s (400~ Mod.)	1500 kc/s	〃	C_{18} (OSC Trimmer) C_7 (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) through (4).
5	SW_1	〃	2.3 Mc/s (400~ Mod.)	2.3 Mc/s	〃	L_5 (OSC Coil) L_2 (ANT Coil)	Adjust for maximum output by sliding coil (L_2) along ferrite core.
6	SW_1	〃	7 Mc/s (400~ Mod.)	7 Mc/s	〃	C_{17} (OSC Trimmer) C_8 (ANT Trimmer)	Adjust for maximum output. Repeat steps (5) and (6).
7	SW_2	High side thru. 10PF to EXT ANT Jack. Common to EXT GND Jack.	7 Mc/s (400~ Mod.)	7 Mc/s	〃	L_6 (OSC Coil) L_3 (ANT Coil)	Adjust for maximum output.
8	SW_2	〃	22 Mc/s (400~ Mod.)	22 Mc/s	〃	C_{29} (OSC Trimmer) C_{10} (ANT Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).

Note: Cement antenna bobbin with wax after completing alignment.

TR1	D1	TR2	TR3	D2	TR4	TR5	TR6, TR7, TR8 & TR9
2SA341	0A90	2SA101	2SA101	0A90	2SB173	2SB175	2SB176×4
CONV.	D. AGC	1st IF AMP.	2nd IF AMP.	DET. & AGC	1st AF AMP.	2nd AF AMP.	POWER AMP.



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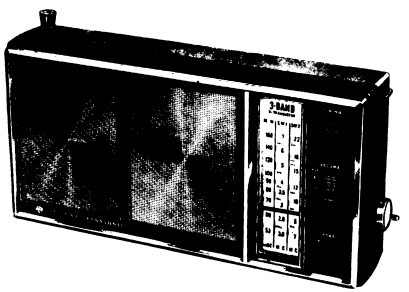
MODEL R-321



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Cabinet Dimensions:	260 (Wide) × 140 (High) × 57 (Deep) mm (10¼" × 5½" × 2¼")
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3	MW	〃	600 kc/s (400~ Mod.)	600 kc/s	〃	L1 (ANT Coil)	Adjust for maximum output by sliding coil (L1) along ferrite core.
4	MW	〃	1500 kc/s (400~ Mod.)	1500 kc/s	〃	C18 (OSC Trimmer) C7 (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) through (4).
5	SW1	〃	2.3 Mc/s (400~ Mod.)	2.3 Mc/s	〃	L5 (OSC Coil) L2 (ANT Coil)	Adjust for maximum output by sliding coil (L2) along ferrite core.
6	SW1	〃	7 Mc/s (400~ Mod.)	7 Mc/s	〃	C17 (OSC Trimmer) C5 (ANT Trimmer)	Adjust for maximum output. Repeat steps (5) and (6).
7	SW2	High side thru. 10PF to EXT ANT Jack. Common to EXT GND Jack.	7 Mc/s (400~ Mod.)	7 Mc/s	〃	L6 (OSC Coil) L3 (ANT Coil)	Adjust for maximum output.
8	SW2	〃	22 Mc/s (400~ Mod.)	22 Mc/s	〃	C29 (OSC Trimmer) C10 (ANT Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).

Note: Cement antenna bobbin with wax after completing alignment.