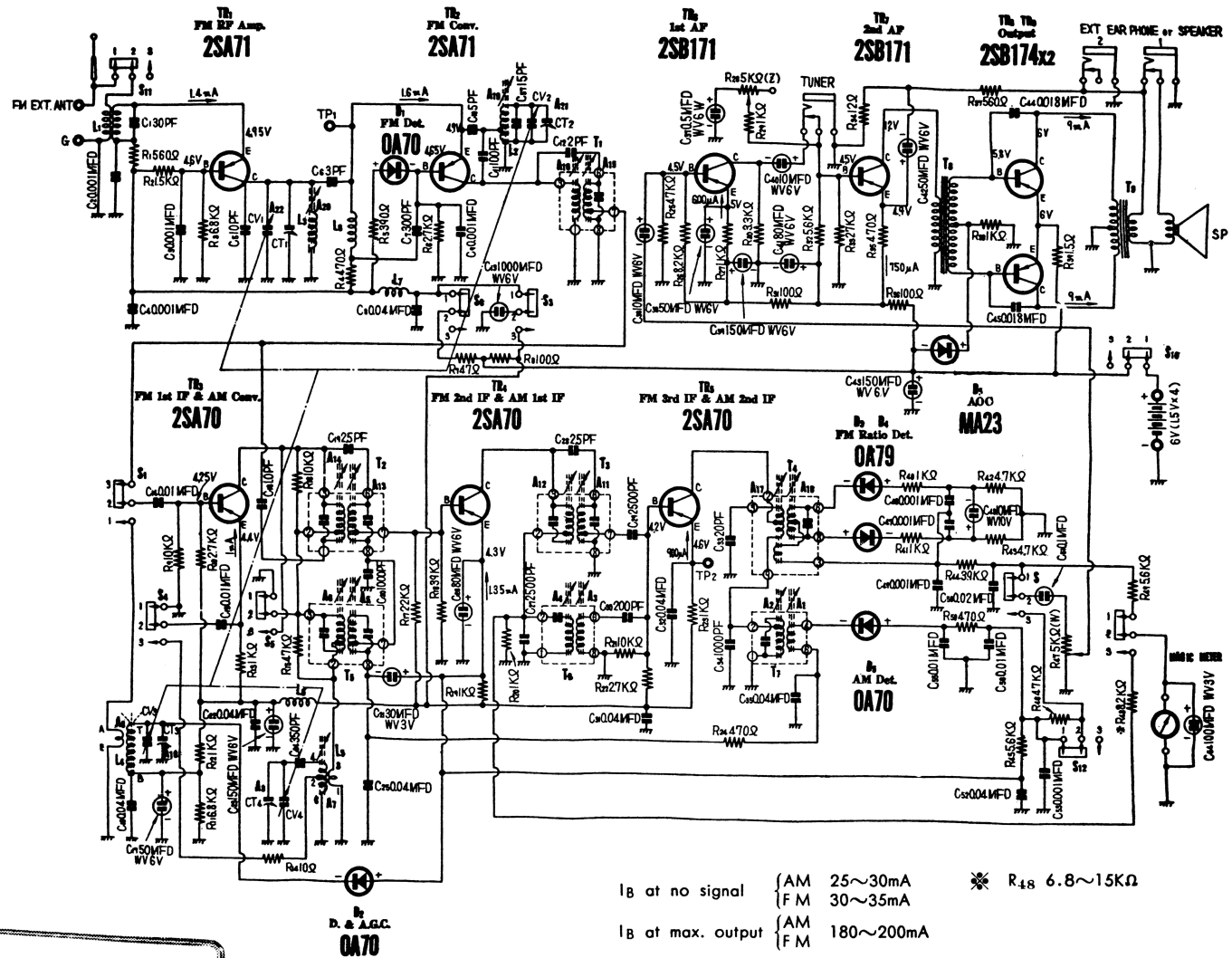
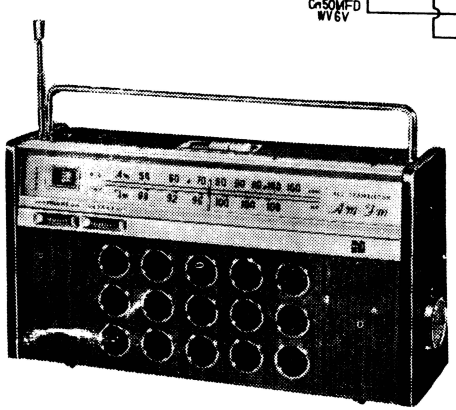




Frequency Range :	AM 535~1605 KC (560 ~ 187 m) FM 88~ 108MC (3.4 ~ 2.8 m)
Intermediate Frequency :	AM 455 KC FM 10.7 MC
Sensitivity :	AM 300 μV / m / 50 mW FM 30 μV / m / 50 mW (30 db quieting)
Power Output :	450 mW undistorted 600 mW maximum
Batteries :	Four No. 2 flashlight dry cells (NATIONAL UM-2 or equivalents)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS

- Volume control should be at maximum position.
- Output of signal generator should be no higher than necessary to obtain an output reading.

AM ALIGNMENT

	Dummy Antenna	Signal Generator Coupling	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Output Meter Adjustment	Adjustment	Remarks
1	.01MFD	High side to Ant. stator lug of AM variable cap. Low side to chassis.	455KC (400c/s Mod.)	AM	Point of noninterference.	Across voice coil	A_1, A_2, A_3, A_4, A_5, A_6	Adjust for maximum output.
2	Fashion loop of several turns of wire and radiate signal into loop of receiver.		600KC	〃	600KC	〃	A_7, A_8	〃
3	〃		1500KC	〃	1500KC	〃	A_9, A_{10}	〃 Repeat steps 2 and 3.

INDUCTANCE ADJUSTMENT FOR A_8

Inductance increase or decrease of AM antenna coil can be made by changing the location of the coil bobbin.

Move the bobbin toward the center on the core to increase the inductance value, or toward either end to decrease.

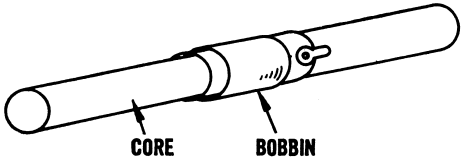


Fig. 1

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VACUUM TUBE VOLT METER

	Dummy Antenna	Signal Generator Coupling	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Connect VTVM	Adjust	Remarks
4	0.001μF	High side to point TP_1. Lowside to Frontend unit chassis.	10.7MC (Unmod.)	FM	Point of noninterference.	DC probe to point [A]. Common to chassis.	A_{11}, A_{12}, A_{13}, A_{14}, A_{15}, A_{16}	Adjust for maximum deflection.
5	〃	〃	〃	〃	〃	DC probe to point [B]. Common to chassis.	A_{17}, A_{18}	Adjust zero reading. A positive and negative will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60c/s modulation and 450KC sweep.

Use 120c/s sawtooth voltage in scope for horizontal deflection.

	Dummy Antenna	Signal Generator Coupling	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Connect Scope	Adjust	Remarks
4	0.001μF	High side to point TP_1. Low side to Frantend unit chassis.	10.7MC (450KC Sweep)	FM	Point of noninterference.	Vert. Amp. to point TP_2. Low side to chassis.	A_{11}, A_{12}, A_{13}, A_{14}, A_{15}, A_{16}	Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
5	〃	High side to TP_1. Low side to chassis.	〃	〃	〃	Vert. Amp. to point [B]. Low side to chassis.	A_{17}, A_{18}	Adjust A_{17} for maximum amplitude straightness of crossover lines and A_{18} so that 10.7MC occurs at center of crossover lines similar to Fig. 4.

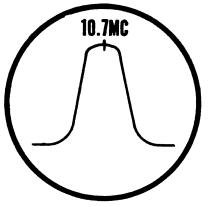


Fig.-3

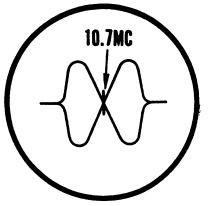
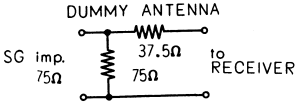


Fig.-4

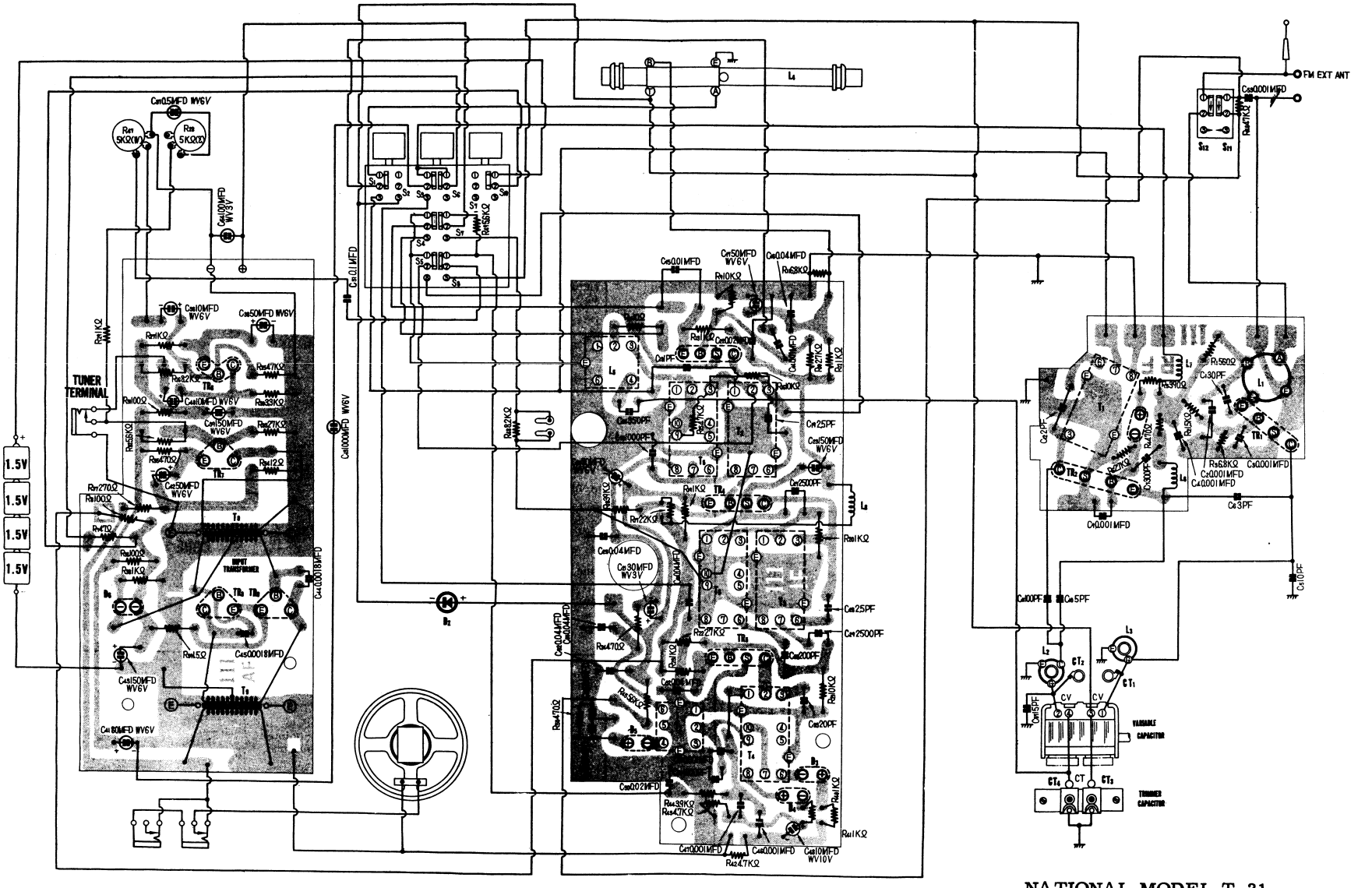
FM RF ALIGNMENT

	Dummy Antenna	Signal Generator Coupling	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Connect RF Type VTVM & Output Meter	Adjust	Remarks
6	See Fig. 5	Across FM Antenna terminals.	90MC (400c/s Mod.)	FM	90MC	Output Meter to across voice coil.	A_{19}, A_{20}	Adjust for maximum output.
7	〃	〃	106MC (〃)	〃	106MC	〃	A_{21}, A_{22}	〃

Fig.-5

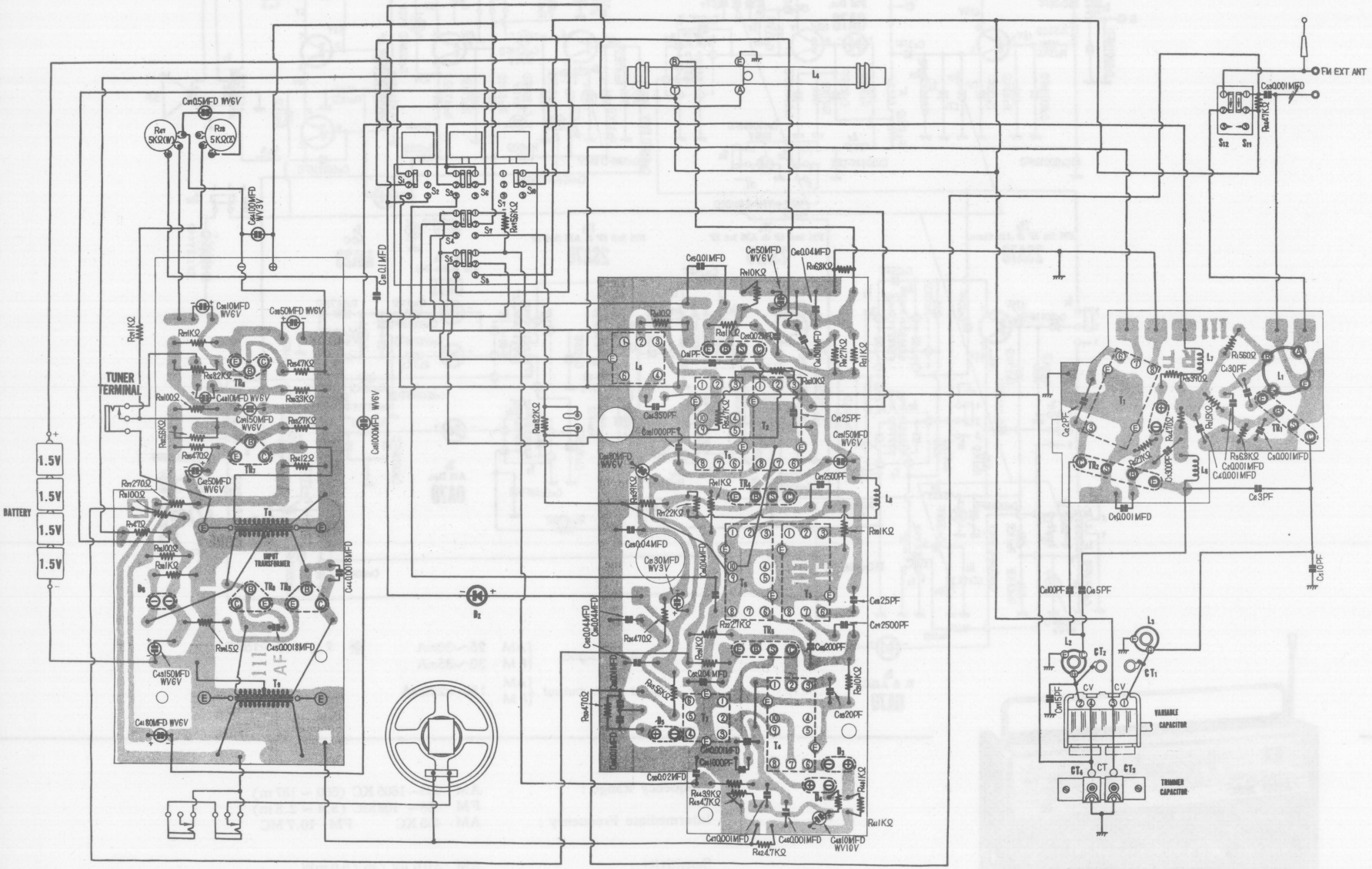


PRINTED CIRCUIT BOARD



NATIONAL MODEL T-31

PRINTED CIRCUIT BOARD



NATIONAL MODEL T-31