

APPENDIX 6
TRANSMITTER ALIGNMENT

ONE (1) PAGE ALIGNMENT PROCEDURE FOLLOWS THIS SHEET

TRANSMITTER TUNE-UP PROCEDURE
FCC ID: JFZT52B

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ATW-T52 Alignment Procedure**1. Audio/Oscillator/Modulator/Multiplier Stages.**

VR2 serves as the deviation adjustment potentiometer. The system is a direct FM system and deviates on average $\pm 10\text{KHz}$ with a 1KHz tone at 3.5 mV on the microphone input.

The oscillator is comprised of the crystal, X1, which operates at a fundamental frequency of $F_c/16$. Adjust L4 and L12 to put on the channel frequency.

The fundamental is passed through the first multiplier circuit which includes Q4. This circuit is tuned via TL1. The signal is then fed to the circuit associated with Q5. By adjusting TL2, the carrier is set to the desired carrier frequency.

2. RF Amplifier/band pass Filter.

Connecting test point JK1 to a spectrum analyzer set to F_c , adjust TC1, L8, L9 & L10 for a carrier power not to exceed 50mW . Using the wide span setting of the spectrum analyzer, check that all spurious emissions and harmonics from $0-4\text{GHz}$ are at least -40dBc . If they are not, adjust BPF1.

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CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

Operating frequency is determined and stabilized by a crystal-controlled oscillator operating at $F_c/16$.

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CIRCUITS TO SUPPRESS SPURIOUS RADIATION, ETC.

Circuits to Suppress Spurious Radiation

The last 3 transistors, all 2SC3606 types, comprise the amplifier chain culminating with a nominal transmitter output of 10 mW. BPF is a band pass filter which suppresses the output harmonics and matches the output to the antenna.

Circuits to Control Modulation

The audio signal is injected via the HRS connector into the circuit composed of a op amp and compandor, (IC1 & IC2). The signal is compressed via the compandor circuit at a 2:1 ratio and is pre-emphasized at 50 us. The level of the output signal is controlled by the pot, VR3.

Circuit Performing Frequency Modulation

The modulator circuit is a direct FM type built around the varactor diode, D3. the swing from the diode is presented to the crystal, XTAL 1 and is multiplied 16X to the carrier frequency through multiplier stages Q3 and Q4.

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