Air Rebound #91554
49.860 MHz Transmitter Operational Description

The Air Rebound transmitter is a low powered, hand held unit for controlling the movements of a toy vehicle. A 9 volt battery powers the transmitter. It is designed to operate on a single fixed frequency in the 49.82 – 49.90 MHz band. See the attached block diagram and schematic.

U2 is an RC clocked encoder IC that detects switch closures and transmits encoded control information. The modulation scheme uses on /off keying and 2 fixed duty cycles which comprise the data format. See attached transmission protocol document.
The carrier signal is generated by a crystal controlled oscillator/amplifier circuit comprised of (X1) a 49.860 MHz crystal, (Q2) a NPN transistor and associated passive components. The carrier output is capacitively coupled via (C7) to the digital output signal of the encoder IC at the base of the RF amplifier stage (Q1). The modulated output of the RF amplifier is capacitively coupled to the antenna via (C3) to the antenna through a "pi" matching network comprised of C2, L2, and C2. A permanently attached 15-inch whip antenna is used as the transmission radiator.

U2 receives its 4.3V regulated power from a 9 volt battery and zener regulator circuit. The RF oscillator and amplifier receive their power from an unregulated 9 volt source. LED (D2) is powered when the transmitter is powered.

The manufacturer performs all tuning and verifications and there are no adjustments, which can be made by the user. No external ground is required or used with this transmitter.