

Circuit description

Transmitter

Left and right stereo audio signals presented to the transmitter via JP1 are pre-emphasized with C1, R38, R39, C3, R35, and R34. U4 (LM358) is connected as two low pass filters to limit the bandwidths of these signals before they are multiplexed by U1 (NJM2035) to give the MPX signal with a 19KHz pilot. This MPX signal is buffered with Q1 and used by the transmitter RF box to modulate the RF carrier to be radiated with the antenna.

Transmitter RF Box

Q1 is configured as an RF oscillator. Microstrip 1 on the PCB, together with C4, C5, C6, C7, C8, C21, D1, and VC1, as well as the collector-base and base-emitter capacitance of Q1, form a tank circuit determining the oscillator frequency. The MPX signal presented to the base of Q1 will change the collector-base capacitor, and will therefore modulate the oscillator frequency accordingly.

Signal at the oscillator frequency, between 913MHz to 915MHz, is picked up by microstrip 2 and amplified by U1 (uPC2709). It is then filtered by a ceramic filter FT1 before radiating through the antenna printed on the PCB.

Receiver

912MHz~916MHz MPX modulated RF signal picked up by the antenna (A1) printed on the PCB is down converted to a 36MHz IF with the receiver RF box. This 36MHz signal is then filtered by the band pass filter (T1, T2, C29, C25, C35), and further down converted to 10.7MHz and decoded to the stereo audio signals by IC4 (CXA1538) and its associated circuitry. The audio signals are de-emphasized by R17, C21, R19, C22, and filtered by a low pass filter (L6, L7, C30, C32, C37, C38, R9, C39) before further amplification.

Receiver RF Box

RF signal entering the receiver RF box first passes through a SAW filter (SAW1) before down converting to 36MHz IF by IC2 (uPC1687). Microstrip S1 printed on the PCB, together with C1, C8, TRC2, C2, C6, and C7, form the tank circuit of the local oscillator in IC2. Two low pass filter (L3, C13, C14, and L2, C3, C12) are used to remove RF leakage on the power line and IF output.