

Circuit description of monitor

Transmitter

The transmitter is a narrow band FM transmitter for the 900 Mhz ISM band. A crystal oscillator is modulated with a varactor diode to generate a 14 mhz reference signal. This frequency can be changed to a different channel by a switch that changes crystals. This signal is then multiplied to 453 Mhz with a divided Phase Locked Loop. The 453 Mhz signal is multiplied by 2 with a rectifying circuit. The output of the X2 circuit has components at $F_o/2$ and $F_o*3/2$. These are then filtered with a PC board bandpass filter. The output then is inductively coupled to a loop antenna made from a metal strap and trimmed with a small cap.

There is a divider inside the chip that is not used in this circuit that produces spurious outputs at about ± 1.8 Mhz offsets from the carrier. These are inside the ISM band.

Spurious outputs from the transmitter are at:

F_o = output frequency = crystal frequency $\times 64$

F_c = crystal frequency: Channel 1, 14.15625 Mhz

Channel 2, 14.166667 Mhz

1	$F_o + - (F_c) (2*F_c) (3*F_c) \dots$	PLL reference spurs
2	$F_o/2$	X2 spur
3	$F_o*3/2$	X2 spur
4	$F_o + - (F_c/8) (F_c*2/8) \dots$	unused divide by 8 spur

Receiver

The receiver is a standard Superhet design with a 10.7 Mhz IF and high side LO injection. The LO and its harmonics are the only signals that should be visible from the receiver.

Channel 1 $F_{lo} = 916.7$ Mhz

Channel 2 $F_{lo} = 917.366667$ Mhz