

192 C Description of device and circuitry for Determining and stabilizing operating frequency

The ESTeem 192 utilizes 2 VCO's for the transmitter. The local oscillator (540 to 560 MHz) consists of a synthesized VCO locked to a 9.6 Mhz TCXO. The Exciter 90 MHz VCO uses a 12MHz TCXO. Each VCO uses a low pass filter and is independently shielded. The loop bandwidth of each VCO is optimized for frequency stability and low susceptibility to microphonics. See overall transceiver block diagram.

The transmitter power up circuit consist of 3 stages. The first stage starts the Exciter VCO. Stage two turns on stages 1 and 2 of the power amp, while allowing time for the Exciter VCO to stabilize. Stage three turns on stages 3 and 4 of the power amp, and ramps the final section of the power amplifier on. Upon turn off the stages are delayed from each other in the reverse order. This power up sequence provides a clean stable turn on and off sequence of the transmitter.

Suppression of Spurious Radiation Modulation and Power Limiting

Spurious Radiation Suppression

The transmit signal is passed through 2, three pole band pass filters before amplified by the power amp. The power amp output is fed to a 2 pole filter for harmonic attenuation and suppression of spurious emissions.

Modulation

Modulation is supplied by a 4 level FSK modem data pump. The signal is passed through a RC low pass filter. Then through a 3 pole low pass Gaussian pre-mod filter with a cut off of 6.8 kHz, 18db per octave. Note: Primary bandwidth control is by the data pump. Clock spurs and quantization are filtered in the Gaussian pre-mod filter.

The signal is modulated using a VCXO with a maximum worst case mod of 5 kHz.

Power Limiting

The RF power output is limited by regulator U707 which supplies 8 VDC to stages 1 and 2 of the power amp U702. The power amp U702 is also limited in design.