DESCRIPTION OF CIRCUITS FOR DETERMINING AND STABILIZING FREQUENCY

Frequency generation is by PLL synthesizer and stabilization is by a 2-ppm crystal reference oscillator.

Refer to schematic page 2. The transmit and receive oscillator is composed of a VCO phase-locked by a 2-ppm crystal oscillator at 20.94MHz. The PLL IC2 is programmed by the microprocessor to have a reference frequency of 12.5KHz which is phase-compared to the divide-down VCO to generate the error voltage which is used to control the VCO. The VCO is composed of the dual-gate mosfet Q7, the main oscillator, and the buffer amp Q6. The tunning range of the VCO is 20Mhz per volt and covers the frequency for both receiver and transmitter. The supply to the whole circuitry is controlled by the microprocessor and is regulated to 3V by low-drop-out regulator.