ITT Industries, Microwave Systems

S-Band Synthesizer

The STEL-2375A from ITT Industries, Microwave Systems is a Direct Digital Chirp Synthesizer hybrid. Typically, chirp waveforms have been used to energize military communications, radar, and EW systems. Genrally speaking, however, they have seen little use in modern communications systems due to their complexity and sometimes elaborate hardware schemes. The design of this unique hybrid represents a new opportunity for communications professionals in many fields to take advantage of several benefits. First, the STEL-2375A Direct Digital Chirp Generator (DDCS) hybrid uses digital techniques to synthesize high fidelity, lung duration chirp waveforms (also known as Linear FM or swept frequency). In terms of Time-Bandwidth Product, this digital synthesis technique is superior to analog techniques such as dispersive delay lines. In addition 32-bit resolution and a 1 GHz update rate give the STEL-2375A high performance. To create an output waveform whose frequency changes continually with time (it actually chirps), the 2375A's GaAs NCO includes a phase accumulator and frequency accumulator, both with 32-bit resolution. The STEL-2375A includes a DAC and digital synthesizer ASIC in a small hybrid package. It operates on standard ECL supply voltages and is available with MIL-PRF-38534 screening. Double-buffered input latches allow the user to easily generate custom chirp waveforms. It is capable of an output bandwidth of 400 MHz, and the IC has been proven to perform at clock rates as high as 1.2 GHz. A test fixture is also available for evaluating and implementing this device. The evaluation board needs only power, an RF clock source, and an IBM PC compatible for control via an RS232 serial interface.