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ACOUSTICS & FERRITES

Chairman: Bruce McAvoy—Westinghouse R&D Center

Session Abstract: This session presents recent developments in oscillator, resonator, circulator design and measurement techniques. Direct generation of frequency tones in the gigahertz range using an acoustic wave device is described which eliminates the need for multiplication, thus reducing spurious mode content and phase noise inherent in the multiplication process. Results for a 2 GHz oscillator device will be presented. A dielectric resonator will be shown to be a current viable alternative to SAW devices for application to hundreds of Mb/s clock recovery systems. As future data rates extend beyond 2 Gb/s, where SAW devices are not readily available, the dielectric resonator becomes a prime candidate. An attractive alternative which is difficult to achieve in a 35 GHz ferrite circulator structure is the use of a quasi-optical technique. Key to this achievement is the development of a 45 degree Faraday rotator. An experimental demonstration on the feasibility of achieving such a device is provided. Millimeter wave ferromagnetic resonance in powdered magnetoplumbite suspended in paint has been achieved. Thin coatings absorbing a particular band of radar frequencies is one suggested application. An example at 240 GHz is provided but different chemical compositions will produce different natural resonance. The session concludes by describing both theoretically and experimentally, a technique to measure the complex permittivity and initial scalar permeability of microwave ferrites without magnetization of the tested material. This provides a simple technique for measurement of resonators coupled to microstrip line.

10:30 a.m.–12:00 noon, May 25, 1988
Jacob Javits Convention Center, Hall 1E
Room 2