Abstracts

High-Speed Fiber-Optic Links for Distribution of Satellite Traffic

A.S. Daryoush, E. Ackerman, R. Saedi, R. Kunath and K. Shalkhauser. "High-Speed Fiber-Optic Links for Distribution of Satellite Traffic." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 510-517.

Large-aperture phased array antennas operating at millimeterwave frequencies are designed for space-based communications and imaging platforms. Array elements are comprised of active T/R modules which are linked to the central processing unit through high-speed fiber-optic networks. The system architecture that best satisfies system requirements at millimeter-wave frequencies is T/R level data mixing, in which data frequency and reference signals are distributed independently before mixing at the T/R modules. This paper demonstrates the design procedures for a low-loss, high-speed fiber-optic link used for transmission of data signals over a 500-1000 MHz bandwidth as part of a data link in the T/R level mixing architecture. The FO link is characterized for transmission of analog and digital data. A dynamic range of 88 dB/MHz was measured for analog data over this bandwidth. On the other hand, for bursted SMSK satellite traffic at 200 Mb/s rates, a BER of 10/sup -9/ was measured for E/sup b/N/sup 0/ of 15.5 dB.

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