Abstracts

Broad-band microwave-optical fiber links transmitting over long distances with optical amplification

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We describe long-distance analog microwave-fiber optic links with bandwidths larger than six and a half octaves at an upper frequency in the 1.5-2 GHz range. The links exhibit highly linear performance with harmonic and intermodulation distortions determining the overall spurious-free dynamic ranges. Two configurations are presented, each capable of overcoming limitations imposed by fiber nonlinearities and each employing a custom optical amplifier which maintains a low-noise figure under saturated conditions. For fiber lengths of tens of kilometers, representing losses of 10-16 dB, the basic links have a noise figure of 38 dB and second and third order spurious free dynamic ranges of 103 dB/Hz/sup 1/2/ and 105 dB/Hz/sup 2/3/, respectively, over their entire bandwidth.

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