Abstracts

High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals

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In this paper we report on progress towards developing AM lightwave links for the transmission of multiple TV signals. While the signal quality objectives and transmission distances are appropriate for the CATV trunking application, the technology is ultimately expected to have applicability to the distribution of video signals in the subscriber loop. Highly linear 1.3 μm DFB lasers, designed expressly for analog requirements, were used to transmit 42 continuous wave carriers according to the standard U.S. CATV frequency plan. For our best lasers, when evaluated over 12 km of fiber, carrier to noise, composite second-order distortion, and composite triple beat were >52 dB, >70 dBc, and >70 dBc, respectively. The relationship between measurements with CW carriers and actual video signals is discussed. System design rules are offered. Properties that lead to superior analog performance are discussed. Data from >700 links indicate that composite third-order distortion generally scales with product count but that composite second-order distortion has a significant frequency-dependent component.

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