Abstracts

1.6-Gb/s 16-Level Superposed APSK Modem with Baseband Signal-Processing Coherent Demodulator (Dec. 1978 [T-MTT])

M. Washio, T. Shimamura, N. Komiyama and Y. Takimoto. "1.6-Gb/s 16-Level Superposed APSK Modem with Baseband Signal-Processing Coherent Demodulator (Dec. 1978 [T-MTT])." 1978 Transactions on Microwave Theory and Techniques 26.12 (Dec. 1978 [T-MTT] (1978 Symposium Issue)): 945-951.

A 1.6-Gb/s 16-level superposed APSK modem using a newly developed baseband signal-processing coherent demodulator is described. In the modulator, the superposing modulation method is adopted in which two QPSK carriers having different levels are superposed so that the combined signal forms a 16-level APSK carrier. Sixteen signal points are arranged in lattice form on the signal space. In the demodulator, a newly developed carrier recovery loop is adopted in which quantizing error signals are detected in the process of data regeneration; they are used for generating the phase error signal to control a VCO. The principles of operation and theoretical analysis of this carrier recovery loop is described, through which it is shown that the recovered carrier has inherently low-pattern jitter power. Furthermore, it features a very simple circuit configuration. The circuit configurations of an experimental modem and some important test results are deseribed in detail. It is shown that the modem has improved performance characteristics in such a high-speed region as 1.6 Gb/s while its circuit configuration is much simplified.

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