Abstracts

A high-efficiency RF transmitter using VCO-derived synthesis: CALLUM

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The combined analog locked-loop universal modulator (CALLUM) is a radio-frequency (RF) transmitter topology which produces a linear output through the use of nonlinear, but highly efficient, RF power amplifiers. This is achieved through careful phasing of two constant-envelope vectors, each derived from voltage-controlled oscillators. The system up-converts and amplifies a baseband signal within a closed-loop feedback scheme. The optimal CALLUM system requires complex baseband processing, but a simplified version, known as CALLUM2, can be implemented using simple analog circuitry. This paper provides some insight into the behavior of such systems and gives results from an experimental CALLUM2 system in response to a modulating signal compatible with that used in the terrestrial trunked radio standard.

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