

Recent Trends in PSK Demodulation



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ABSTRACT: Increased usage of PSK signals in TT&C formats has generated unique challenges for ground support equipment developers. DSI has met this challenge with the introduction of its model 7133 BPSK / QPSK modem. Enhanced on the Aerojet / USAF GS-14 program, the 7133 is the latest addition to the company's modem product line. The 7133 uses a dual mode cross arm Costas loop to demodulate BPSK or QPSK data. With an implementation loss averaging 0.8 dB, the 7133 demodulates asynchronous 2.56 MBps QPSK data. It also processes BPSK data at rates up to 2.56 MBps, with a loss of less than 0.5 dB. We present the 7133 demod design and test results.

Current work at DSI extends the basic 7133 design to handle unbalanced QPSK formats. DSI's new model 7750 receiver-demodulator processes quadrature input signals either in pairs or independently. The 7750 uses phase locked loops to demodulate PSK, FM, PM or AM. We present the 7750 extended Costas loop design and preliminary test results. Finally, we look at applying recent DSP and NCO IC's to multi-mode TT&C demodulation.