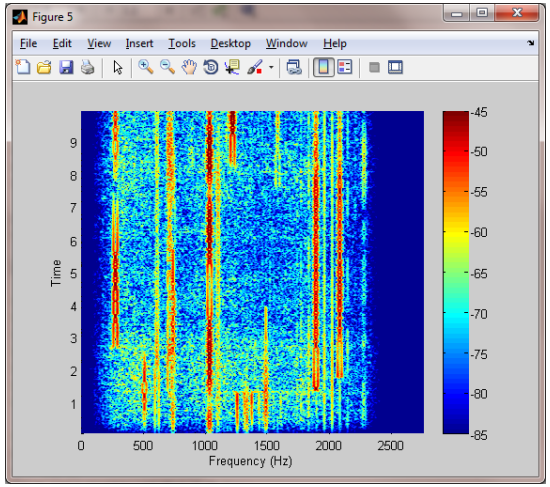
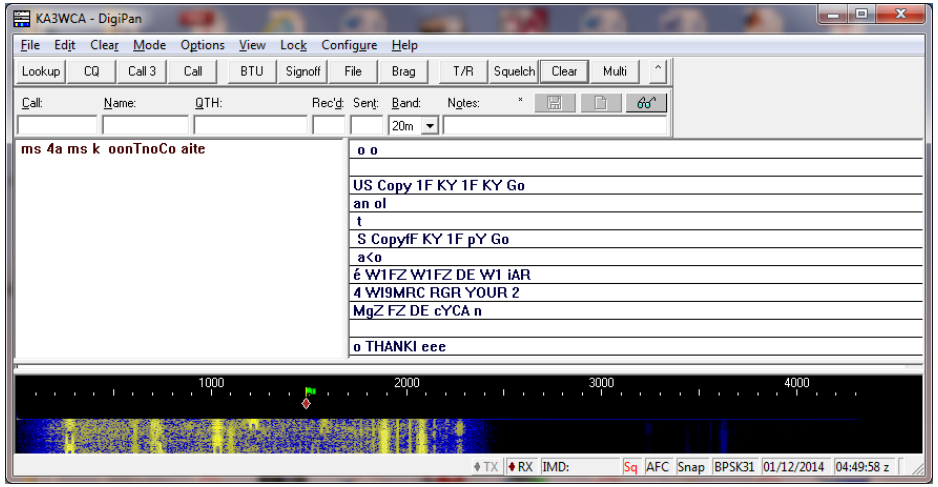
PSK-31 DigiPan Doppler Test - Failed

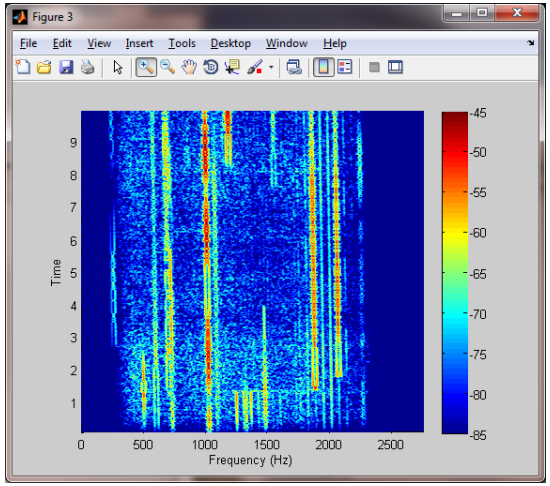
Pete Wyckoff, KA3WCA – Jan 11 2014.

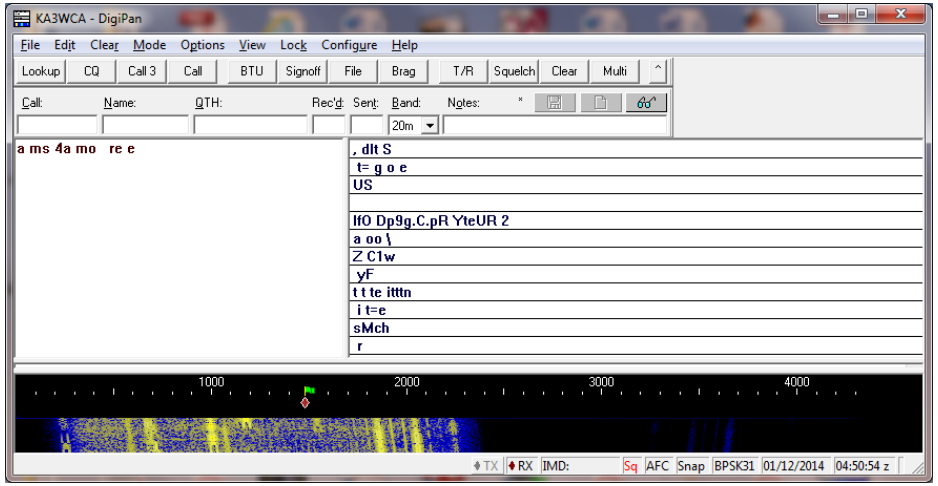
Original File: Good Copy W1FZ & WI9MRC





Same File with Doppler 4Hz/sec Added: Copy Failed





PSK-31 DigiPan Doppler Test - Rationale

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Assumptions

Satellite Speed = 6 [km/sec]

Uplink Frequency = 30MHz

Calculations

Doppler Range = +/- 30MHz ($6x10^3$ [m/s] / c) = +/-600Hz

Doppler Swing = 1200 [Hz]

Duration of Swing = 5 [minutes] to maybe 10[minutes]

Doppler Rate in [Hz/sec] is greatest in middle of pass. But for a simple model, assume Doppler is linear over contact. Realize peak rate might be higher.

Doppler Rate Estimate #1 = 1200 [Hz] / (5 * 60 [seconds]) = 4 [Hz/sec]

Doppler Rate Estimate #2 = 1200 [Hz] / (10 * 60 [seconds]) = 2 [Hz/sec]

Without a detailed orbit model, it seems 4[Hz/sec] is about what we expect for Doppler shift on orbit.