

IF Recorder notes using Haigh-Farr 8310-3MD
and 15370-REV0 wrap-around antennas

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Following are a few notes from processing GPS L1 IF using the GNSS IF Recorder Pelican Case and the Haigh-Farr antennas. Recordings were taken on 12 December 2020 with the antenna rotational assembly shown in Figure 1. The rotational assembly spins the antennas in 5 second intervals in increments of 1 Hz from 0 to 7 Hz.

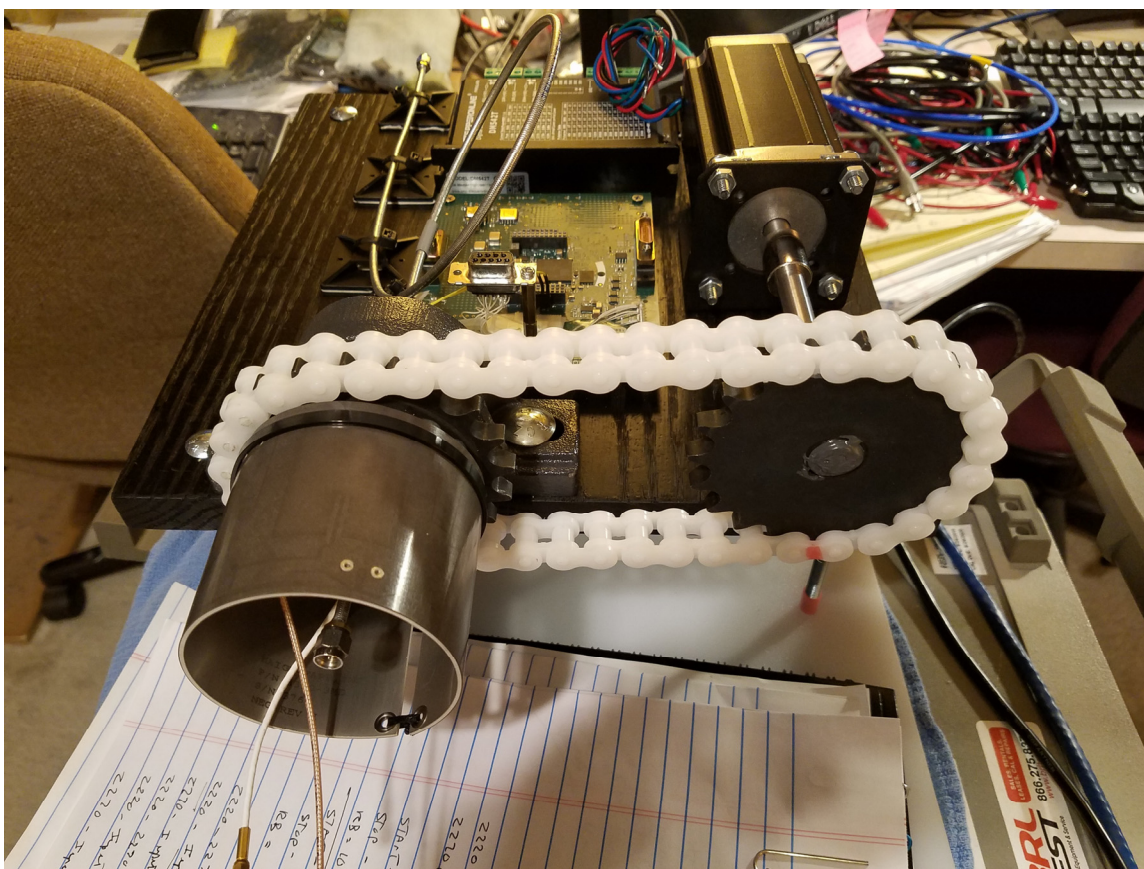


Figure 1. Antenna rotational assembly

The Haigh-Farr 8310_3MD antenna with 30 dB gain before the MAX2771 dev board with IF data recorded in file "[Haigh_Farr_8310_3MD_0dB_record3_21Dec2020_442PM.dat](#)" captured six satellites, two of which were very strong, and all trackable. The MAX2771 dev board used LNA2 with PGA gain of 55 dB. A report will be completed within a day or two showing position, velocity, acceleration, and

spin profiles for 2 minutes of record time. The same Haigh-Farr 8310-3MD antenna with 50 dB and 60 dB gains before the MAX2771 dev board provided very poor results.

The Haigh-Farr 15370-REV0 antenna with IF data recorded in file "[Haigh-Farr_15370_REV0_0dB_record7_21Dec2020_608PM.dat](#)" captured four satellites all of which were very weak, but trackable. For this recording, 30 dB gain was before the MAX2771 dev board. Recordings with the 15370-REV0 antenna at 50 dB and 60 dB gains before the MAX2771 dev board provided very poor results.

It's possible that the steel sprocket behind the antenna and to one side interfered with the antenna pattern of the Haigh-Farr antennas. To determine if this was the case, the rotational assembly was modified with nylon sprockets shown in Figures 2, 3, and 4. Recordings with the modified rotational assembly will be performed this week pending weather restrictions.

The bottom line with this discussion is that, at this point, I believe adding an additional 16 dB amplifier followed by an attenuator to the L1 and L2 RF paths of the new IF recorder board for Test 2 would be advisable.

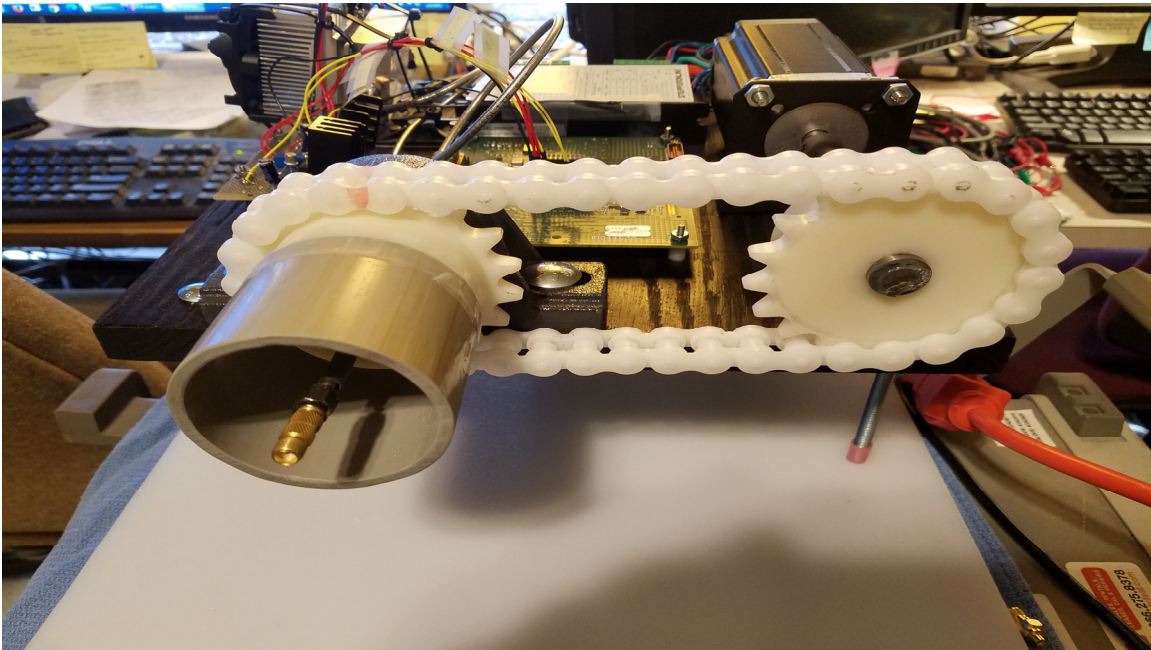


Figure 2. Rotational assembly with nylon sprockets

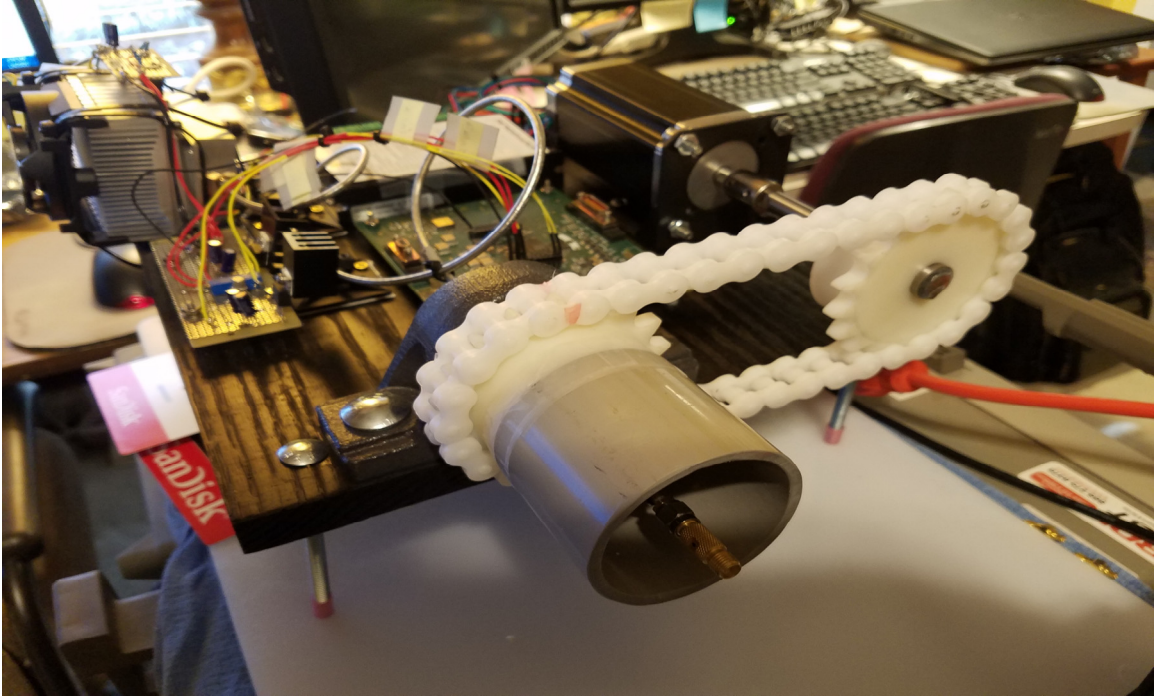


Figure 3. Rotational assembly with nylon sprockets

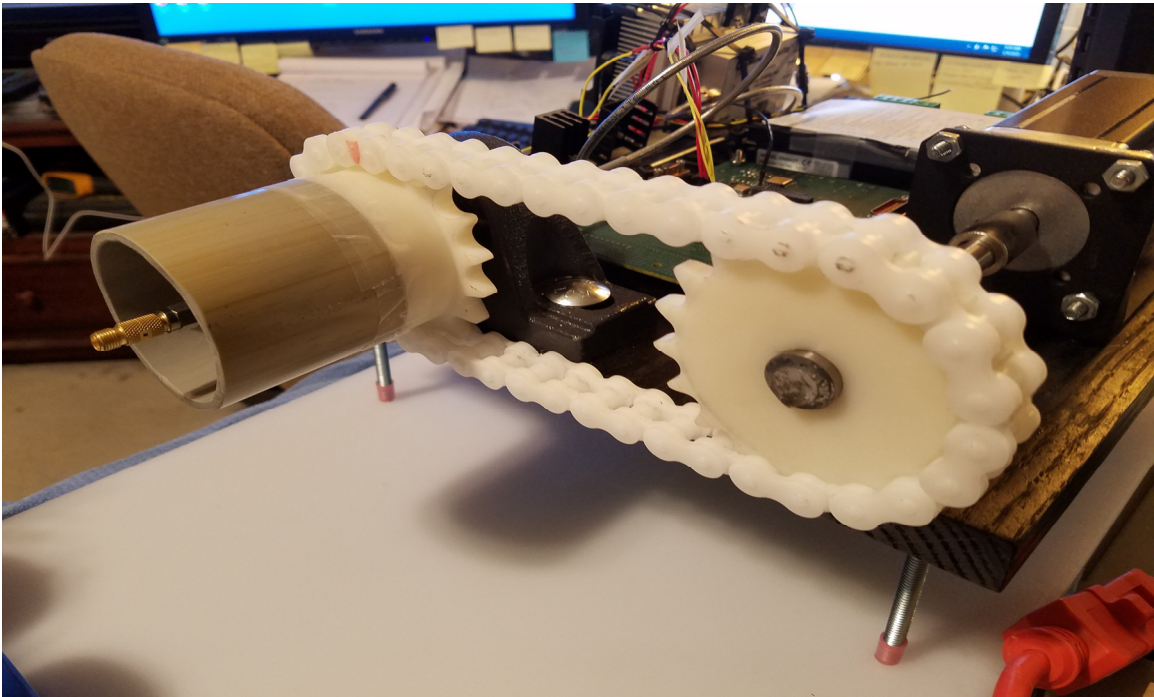


Figure 4. Rotational assembly with nylon sprockets