

Modernization and Characterization of the Riga SLR Timing System

Evan Hoffman[1], Kalvis Salmins[2],
Jorge D. Pino[2], Aivis Meijers[2]

[1] GFZ Potsdam

[2] Institute of Astronomy Univ. of Latvia



This paper was supported by the EU FP7 GRANT
REGPOT-CT-2011-285912-FOTONIKA

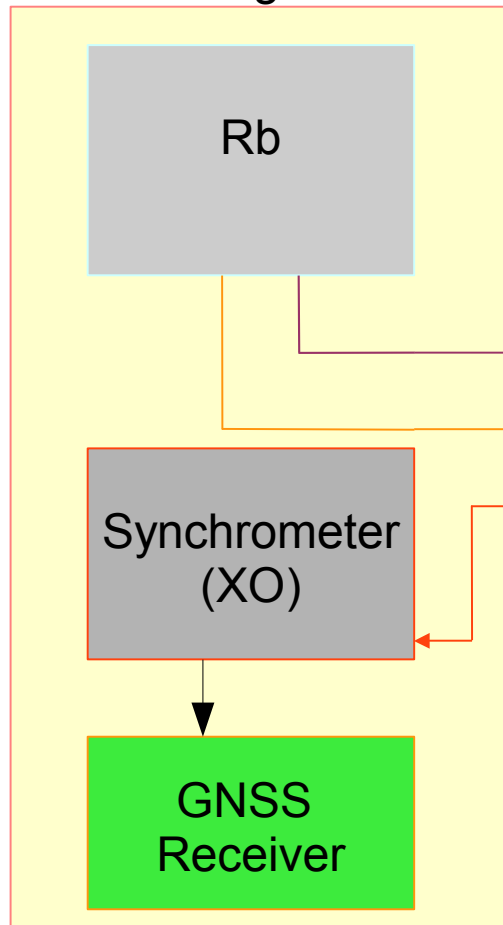


A Quick Glance Back

- Frequency standard was an unsteered rubidium oscillator
- Timing system and laser system are in separate buildings
- Time (1 PPS and Frequency) is delivered via a coaxial cable run between buildings
- Rubidium generated 1 PPS was sent to the laser system
- A synchrometer was located in each of the buildings, used to distribute time and generate signals
- 1 PPS from laser system synchrometer was synchronized to UTC by sending it back to timing building for comparison with GPS receiver

Old Setup

Temperature Controlled
Timing Room



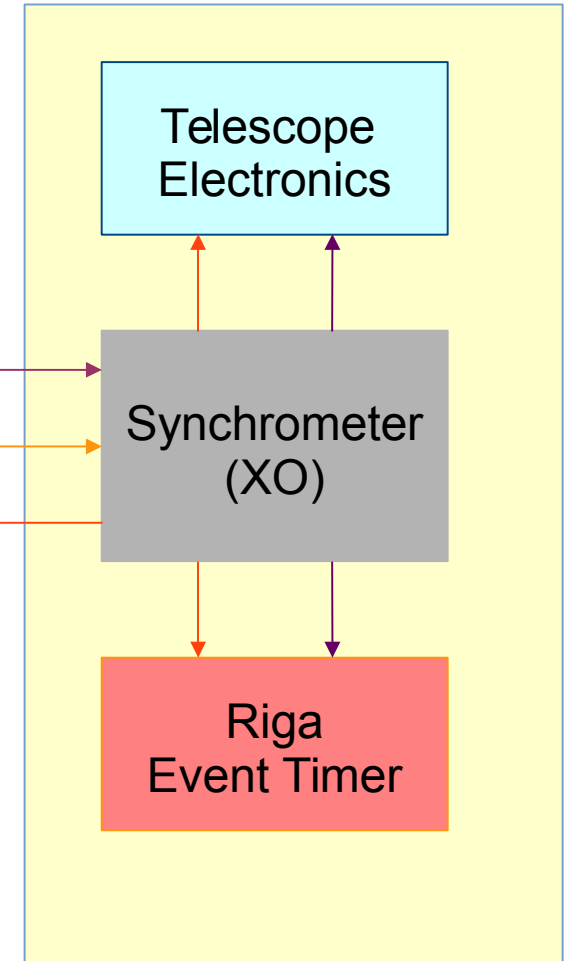
5 MHz

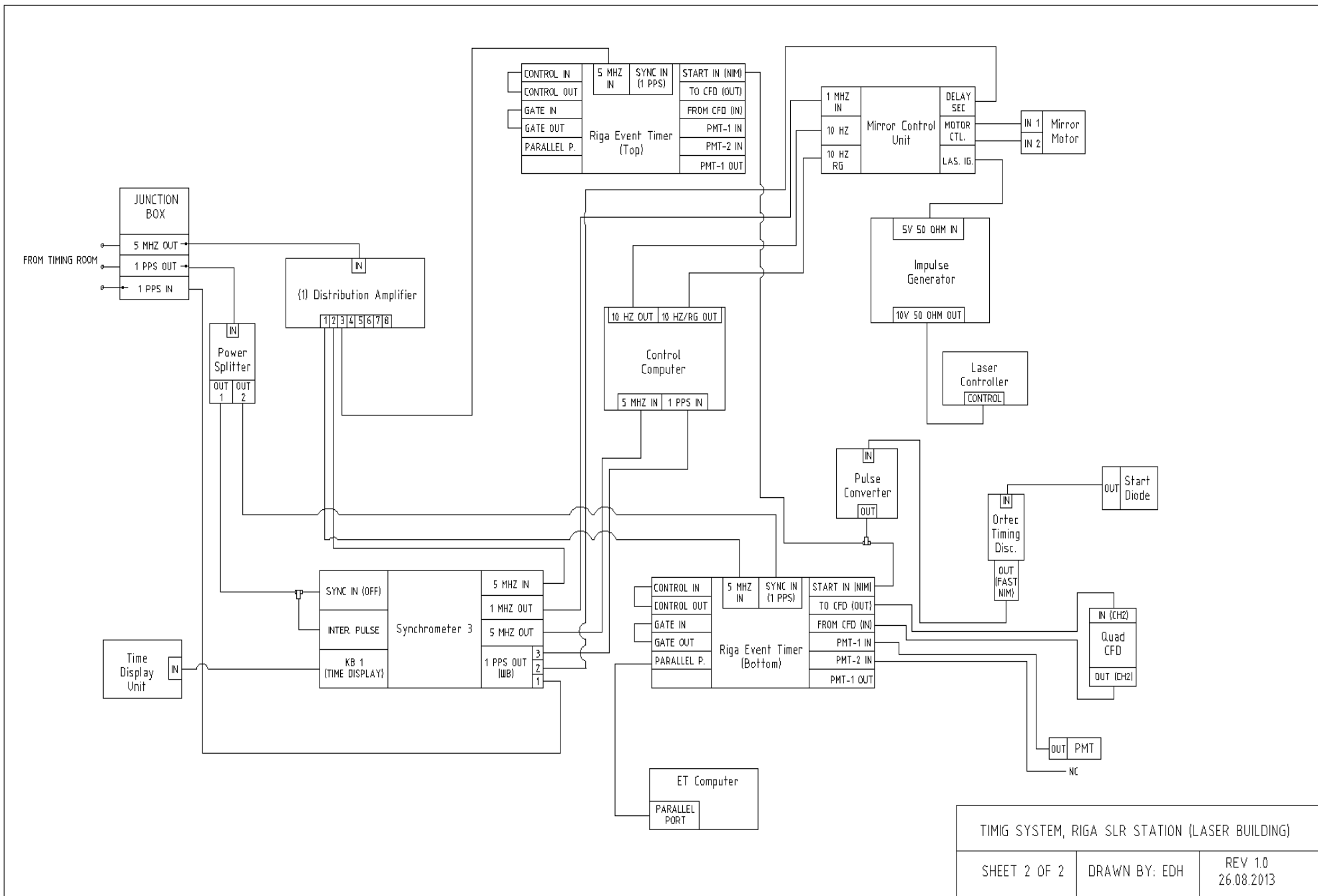
1 PPS

1 PPS

Coaxial

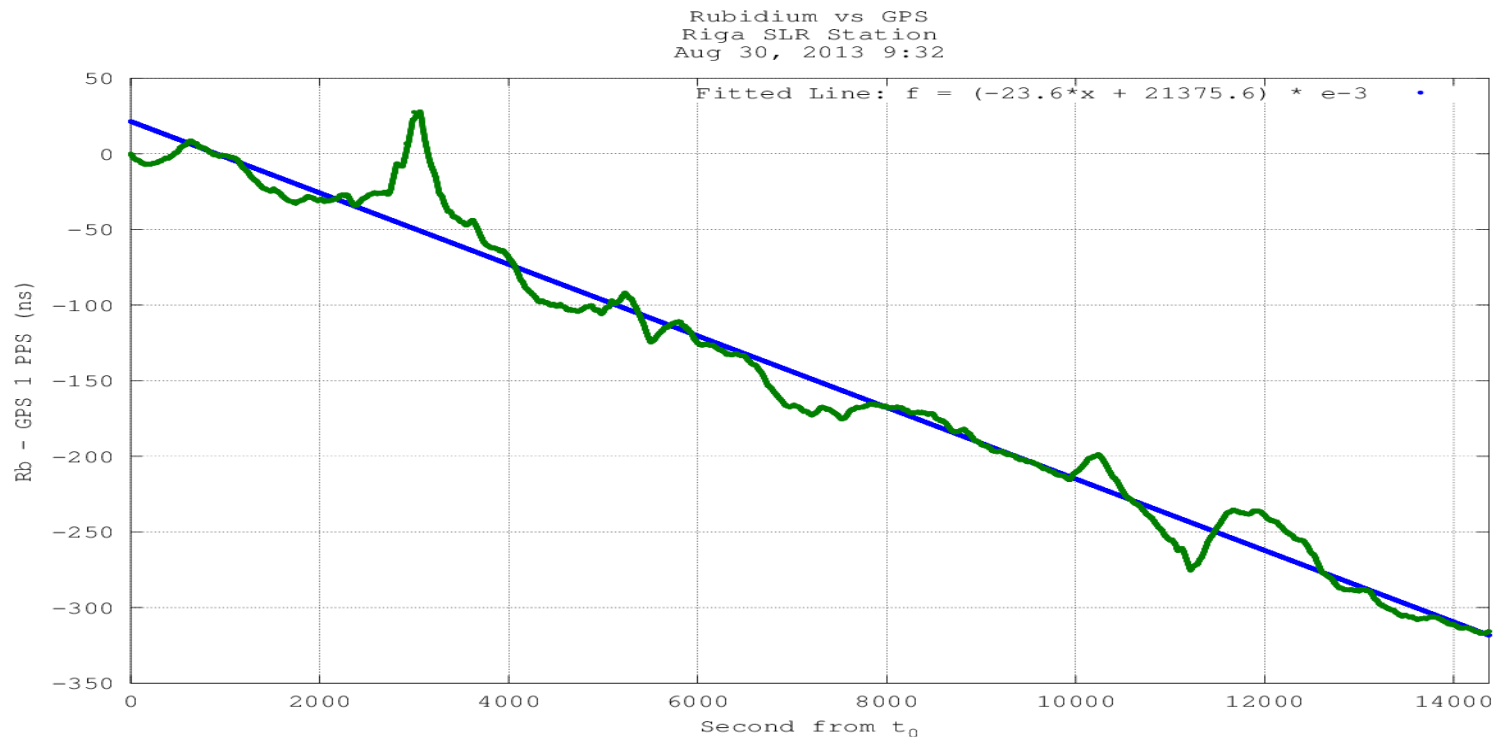
Telescope Building





Some Issues

- Rb Standard > 25 years old, significant drift
- Synchronization equipment equally as old, reliability untested
- Sync to UTC manually monitored
- Poor or non-existent documentation



Some Issues



New Timing System

- Based on Spectracom SecureSync timing unit with GNSS steered rubidium oscillator
- Replacement for frequency standard and Synchronization system

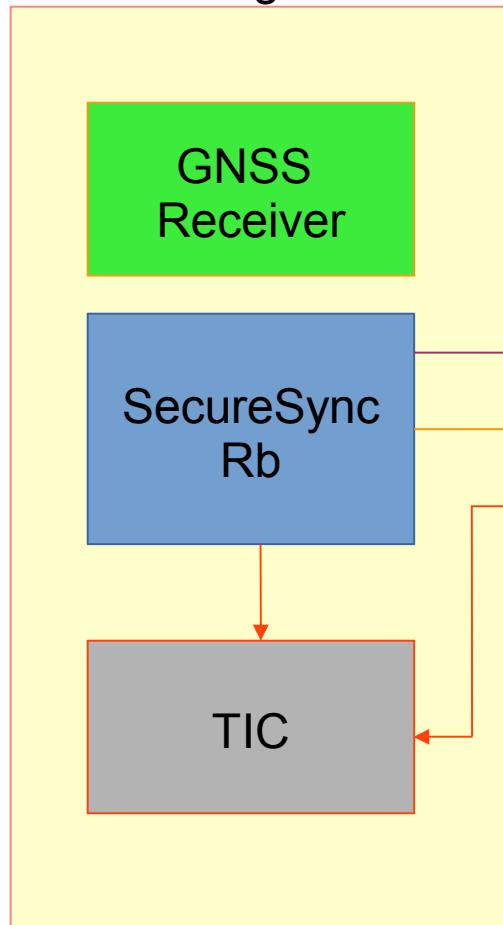


New Timing System

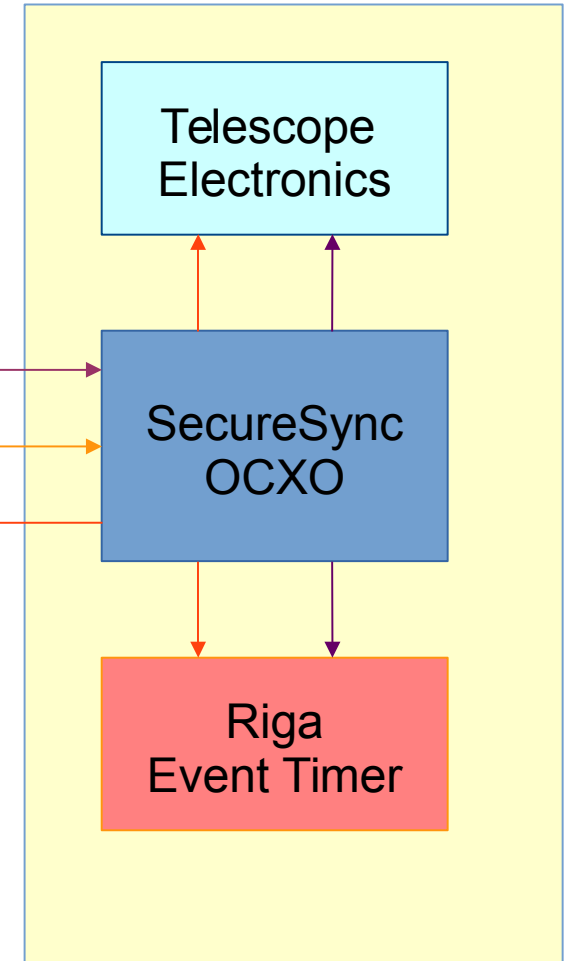


Planned Setup

Temperature Controlled
Timing Room



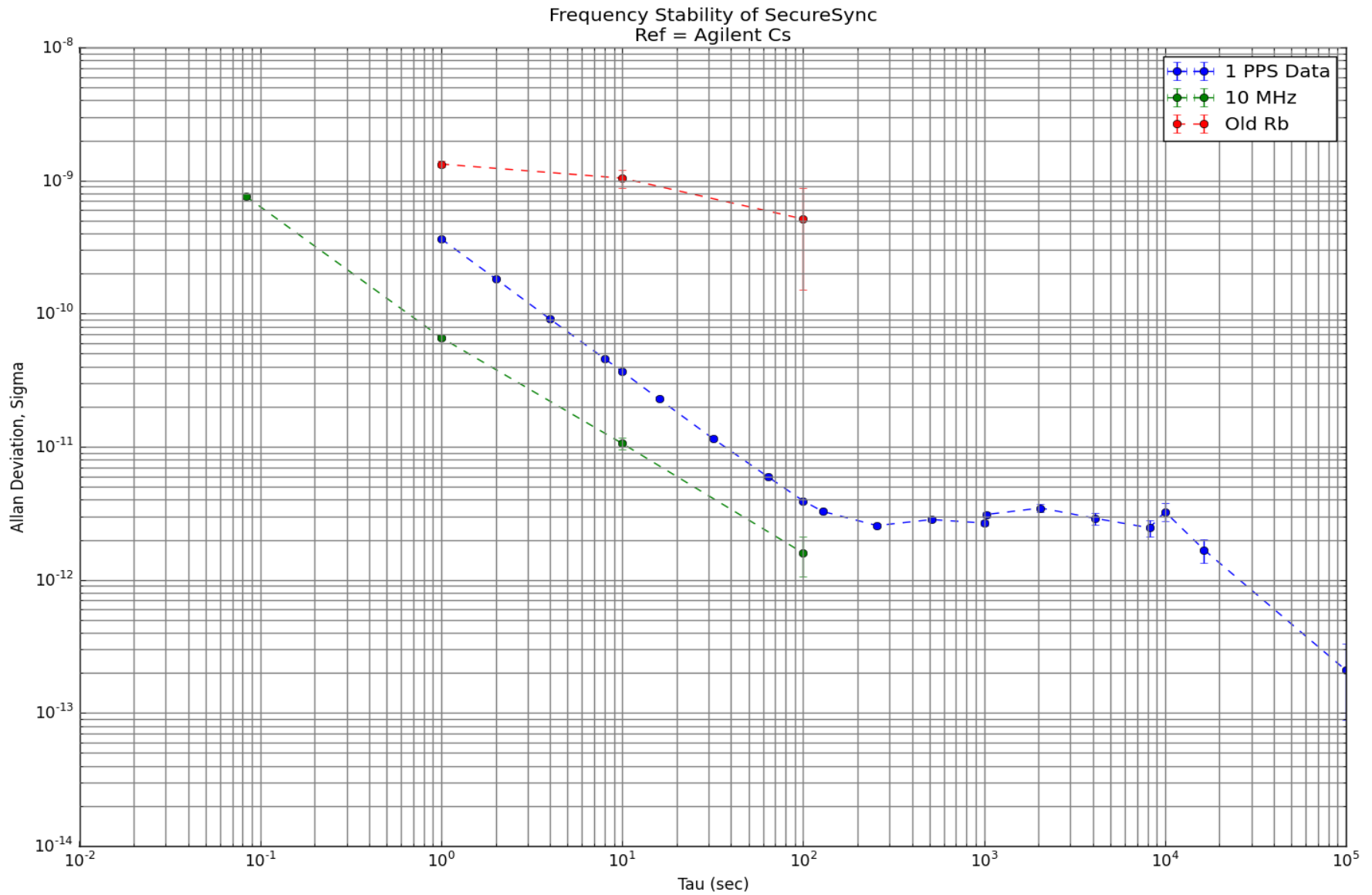
Telescope Building



10 MHz
IRIG B
1 PPS

Coaxial
(plans to
replace with
fiber in
future)

Allan Deviation Analysis



Signal Delay over Time

