Timing System Notes

VCXOs are in. Initial testing of a VCXO PLL after the synthesizer did NOT improve system noise.

System noise is still 3X specification.

Will install a VCXO PLL on the fiber end receiver. Then use DC mixer detection. May improve noise. (Should gain X2 for ideal systems).


Still to do on this system
Fix new noise problem.
Install both PLLs, measure final phase noise.
Publish report
Fiducial transmission.
General purpose Lab equipment to order

FFT signal analyzer DC-100KHz: For general ~audio frequency noise, performance analysis. 2 channels, with signal source.
SRS SR785 options 078RM rack mount, 07801M 32MB memory.
Total = $11,835 - Recommended

RF Spectrum Analyzer 200Hz - 26.5GHz, with gated input for pulsed measurements
Tektronix R3271A w high stability timebase $32.5K - Optional

Generic test equipment: connectors, cables, voltmeters, power supplies, etc, etc. Can probably spend $10K. Recommended.

High stability test oven (X2). $??? - Recommended.
Next Stage Timing test system

Need to test less compute-intensive data acquisition system. Try to use IQ demodulators operating at DC. Will reduce data rate to a few KHz. (from 200KHz).

PC board optics and analog electronics: Should include laser transmitter, receivers, VCXO PLLs, etc. Board design is difficult due to interference problems. Probably need multi-layer, buried traces. Should produce a “transmitter” board and a “Receiver” board.

Countdown timer: Use a Xilinx or similar. Devices now available at >200MHz external clock. Look for 357MHz, or use divide by 2 for testing.

DAQ system: Can probably construct on a PC board with a dedicated micro controller.

Oven: Need to construct compact, fast response time TEC oven.

Overall: Probably construct a ~8” rack mount box with transmitter board, micro controller, and oven. Construct a VME or CAMAC module receiver with countdown timer (should fit on one card).