The use of the GPS Steered Rubidium Oscillator, to derive time and frequency standards for the NASA Satellite Laser Ranging network, has been proposed as early as 1986. This is an initial feasibility study done at the Goddard Space Flight Center, involving a standard GPS Steered Rubidium Oscillator, configured to use the existing Cascade Beam Stearns Standard. This technology has now been developed, and is now ready for deployment. This paper will describe the basic theory of operation of the GPS Steered Rubidium Oscillator, along with the basic laboratory setup and operation. Important features of the GPS Steered Rubidium Oscillator are receptor position, time and frequency measurements, and the applications of these measurements.

**Introduction**

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**Basic Operation**

- The satellite search begins, multiple satellites are searched until the first satellite is acquired.
- With the first satellite acquired, data lock is attempted. After acquisition, data lock is confirmed to be more accurate than the GPS time.
- Additionally both channels are set to 50 Ohms, DC, X10 attenuation is set to OFF, and the 100 KHz Filter is turned OFF. This is the data recorded for analysis.
- The common oscillators frequency is offset by a desired amount from the other two oscillators. This offset frequency is referred to as the "delta" or "X" frequency. The output of one oscillator is used as a reference for the other.