Operational Performance of GPS Steered Rubidium Oscillators

Loyal Stewart, Honeywell Technology Solutions, Inc, 7515 Mission Dr., Lanham, MD 20706, USA
Voice: 301 805-3939; Fax: 301 805-3974; Email: loyal.stewart@honeywell-tsi.com.

ABSTRACT

The use of the GPS Steered Rubidium Oscillator as a Time and Frequency Standard for the NASA Satellite Laser Ranging Network had been proposed as early as 1994. This is when initial field-testing was done at the Greenbelt station, operating a custom GPS Steered Rubidium Oscillator concurrently with the stations Cesium Beam Standard (HP 5061A). As this technology made steady improvements, it was decided in May of 1999 to replace all of the networks aging Cesium Beam Standards with the TrueTime XL-DC GPS Time and Frequency Receiver. This poster will describe the basic theory of operation of the GPS Steered Rubidium Oscillator. It will offer examples of actual system performance of the XL-DC units installed at various NASA SLR Stations. Also it will show pre and post Selective Availability performance, as well as laboratory data detailing Allan Deviation and phase performance of various GPS steered oscillators.