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PERFORMANCE OF CONTINUOUS GPS STATIONS AT REMOTE LOCATIONS IN ANTARCTICA: LESSONS FOR IPY - POLENET

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A series of continuously operating GPS stations were installed at remote sites in southern Victoria Land, Antarctica, between 2000 and 2003. Low power GPS receivers drawing less than 2.5 watts when tracking a full constellation of satellites were powered by 160 W solar panels that fed a battery bank of twelve 86 or 100 amp hour batteries. The battery banks successfully provided power through the 3-4 months of total darkness during the winter. Receivers collected data for between 100 and 349 days, recording to 512 Mb or 1 Gb compact flash cards installed inside the receiver. R-40 vacuum panel insulated boxes conserved internal heat generated by the receiver and showed that active heating is unnecessary at locations where the ambient temperature is warmer than -45C. In spite of overall system success, a variety of problems were encountered, including:

Failure to record L2 signals

Erratic power systems, resulting in generation of more than 512 files and termination of logging

Apparent receiver memory management issues which stopped logging even though the units were operational

Faulty wiring

Wind damage

During 2005 and 2006 UNAVCO engineers helped upgrade three systems to provide remote direct download of the data. Four systems remain in place, three of which are providing reliable satellite or LOS communications links at present. Performance data will be obtained over the coming 2006 austral winter and we will learn if the problems encountered in previous years have been corrected by upgrades this season.