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Integrating GPS into a Videolog System	Final
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Supplementary Notes

Abstract

In 1994, a new videolog system using Global Positioning System (GPS) technology as location reference for the video images was built and tested by the department. It went to full production from July to October. The GVLS (GPS Videolog System) consisted of many off-the-shelf hardware components such as a broadcast-quality video tape recorder with a time encoder, a Horita SMPTE/GPS time code generator, a single frequency geodetic GPS receiver, and a linear distance counter. The link between the video and the GPS component was achieved through synchronization of the SMPTE time codes with the GPS time outputs. In order to obtain accurate differential GPS data, two Alberta Transportation and Utilities offices at Peace River and Red Deer were each equipped with a Trimble Pathfinder Community Station. A post-processing software package call C^3NAV (developed at the University of Calgary) was used to calculate the differentially corrected GPS positions.

The video images were found to be high enough resolution to provide legibility for the majority of the highway signing, even under situations when the camera was shooting into bright sunlight. This represents a significant improvement over an earlier videolog system maintained by the department. For GPS position data, the system was able to achieve a target accuracy level of $\pm$ 5 m (metre) errors in absolute terms of most places in Alberta, and $\pm$10 m for outlying regions.

The immediate application of the new GPS location data is to turn these into Geographical Information System – like (GIS) base maps. Planning, mapping and executive information systems will be able to use such an electronic base map. Future potential applications include asset management for operations and maitnenance; collision location systems reference base map; plotting of “as-is” design engineering drawings. A high performance inertial navigation system (INS) would have to be integrated into the GVLS to accommodate the “as-is” drawing application at sub-metres accuracy.

Key Words	Distribution
GPS, Global Positioning System, videolog, mapping	Unlimited
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