



Minimal Cost Implementation of an Automatic Vehicle Locating System (AVLS) Utilizing Legacy Radios with Custom Channel Steering Modification and COTS GPS Modems

Background:

A military base installation of Motorola Astro Radios and Trunking infrastructure did not provide for cost effective system expansion to location awareness technology. To reduce redundant patrol routes, optimize dispatch operations, and provide fastest incident response, a solution was developed which enabled this new requirement with minimal acquisition of additional hardware and software.

Implementation:

The system was implemented with commercial off the shelf GPS modems and gateway server from CES Wireless, a custom small Windows services GPS data forwarding/translating program, and Intergraph Computer Aided Dispatch package with optional I/Tracker software upgrade. The system was tested to a range of approximately 10 miles. Due to limited radio repeater channels, a dedicated AVLS repeater was deployed to augment the existing radio infrastructure on the base. The system was configured for passive architecture whereby the vehicle GPS modem only transmits position updates when the modem detects the vehicle has materially changed position, i.e. elimination of redundant data protocol exchange. Because the system uses government assets and bandspace there are no recurring cellular service expenses. Also a function of passive architecture, the modem is programmed to give priority to voice operations on the radio, providing quiescent background vehicle position location awareness updates to dispatch when the radio is unused by the operator. The only major disadvantage of the system is the 2 second time requirement on the user's radio during which time the GPS modem intermittently channel steers the radio to the assigned AVL channel, transmits its position update, and then steers back to the original channel. The user is thereby inhibited from using the radio during this short time interval. An occasional position report may be delayed when the user is either actively receiving or transmitting. Notwithstanding, few systems offer 100% availability and the tradeoff on additional deployed assets vs. more efficient use of existing bandspace was deemed worthwhile. Diagrams show the HW and SW architecture as deployed and currently in use.