

Geo-Instruments: Wireless MPBX System

The rapidly expanding Dulles International Airport serves the Metro Washington D.C. market. The main terminal, with dramatic bold lines was designed by architect Eero Saarinen in 1958 to take the facility well into the next century. The yearly increases in passenger volume (from 1 million in 1966 to over 27 million in 2005) necessitated a more efficient way to move people between terminals.

The once state of the art "Mobile Lounges" clearly were exceeding their design parameters. The "lounge" consists of a 54-by-16-foot carriage mounted on a scissor truck, capable of carrying 102 passengers. They transport passengers across the airport taxiways between the majestic Main Terminal and the Satellite Terminals. The Metropolitan Washington Airport Authority (MWAA) solution is the planned "Aero Train" system which is an automated



What the future looked like in the late 1950's. The conveyances are sometimes nicknamed "moon buggies" for the similar appearance of their tires with those of the Lunar Rover.

subterranean train system providing a safe, efficient way to quickly move passengers between terminals.

Clark Construction, Bethesda, Maryland won the 3W and 3E contracts for excavation and construction of the tunnels. FEA, Fairfax, Virginia. and Geo-Instruments were retained by Clark to provide material and services to install instruments to monitor construction related movement due to construction operations

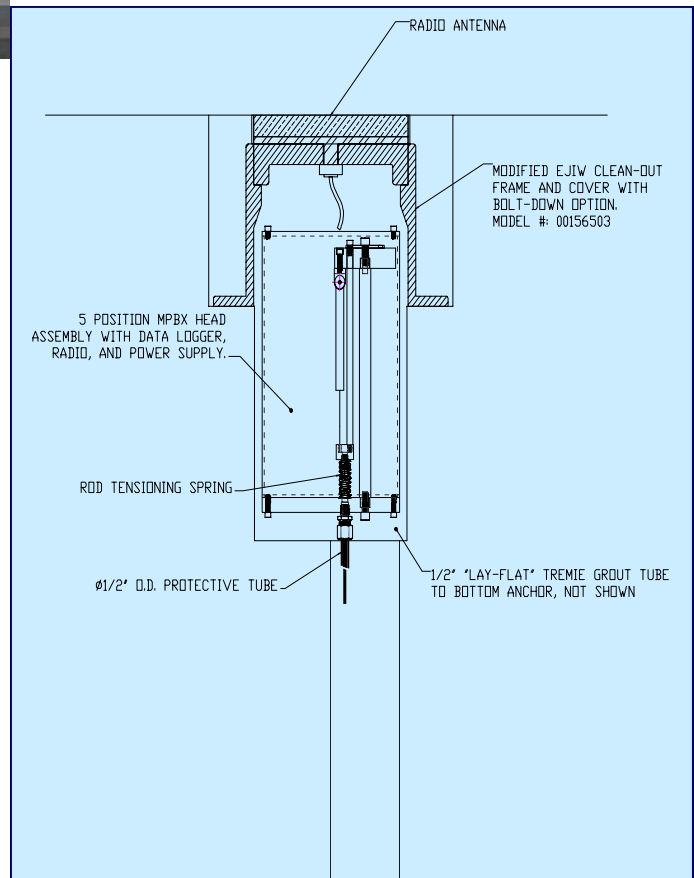
Construction of the new terminals and tunnels requires massive excavations for the terminal structures, and requires tunneling under active taxiways, without affecting airport operations.

MWAA engineers planned on extensometer systems, to provide an early warning system in the event of ground loss caused by tunneling operations, to avoid accidents. Taxiway settlement monitoring of the new tunnels between the main terminal and remote terminals was accomplished with



Dulles Main Terminal

a first of a kind **Wireless Multiple Position Borehole Extensometer (WMPBX)**, designed by Geo-Instruments for this project.



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Helping you get the
data you need.



The WMPBX system provides an automated, reliable, and safe method for automated collection of data from the taxiway installed extensometers.

The system uses a special long life (6 months or greater) battery pack, integrated datalogger, low power transceiver and a flush mount antenna. The system is rugged, and suitable for the harsh airport environment, providing unobstructed airport operations.

Project specs called for a minimum of one reading per day.



WMPBX installation insertion in borehole

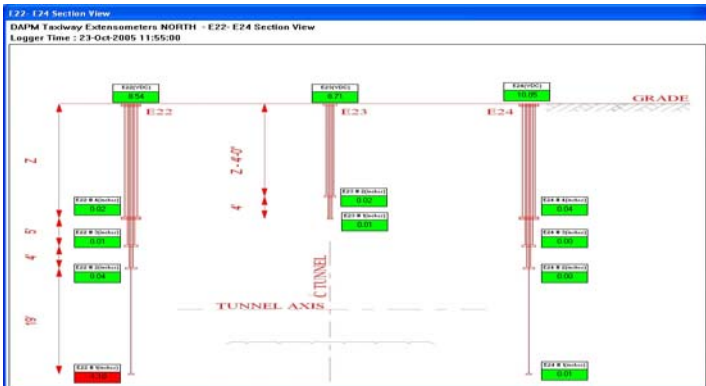
processed for end 24 hour user use on a project website. The WMPBX's installation is straightforward. The systems are shipped with rods preassembled, ready for installation in the borehole. For flush mount installations, the pavement must be over cored to accept the flush mount antenna. The 2 Contracts, 3E and 3W called for a total of 69 wireless MPBX's allowing construction engineers to access data 24/7 from extremely difficult locations. The Dulles Auto-



WMPBX head assembly installation at sur-

ated People Mover is the center piece of the MWAA Dulles Development capital construction project. The tunneling portion will be completed by spring 2007 and entire project by 2009.

Right: Completed installation showing flush mount antenna assembly



Above: Web Screen Shot showing Extensometer Array. Note color codes to indicate alarm conditions

The wireless MPBX provides automated readings every hour. MPBX readings are transmitted off site via a combination of local low power radio telemetry and Wireless IP based modems. Uploaded data is



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