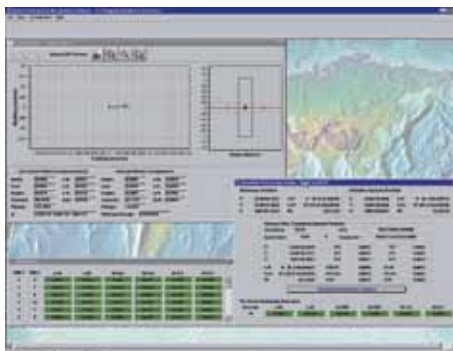


3D Tracker

Software

A sophisticated system for real-time motion detection, 3D Tracker's graphical user-interface provides up-to-the-second information about each site being monitored. As part of Applied Geomechanics PinnPoint monitoring system, 3D Tracker™ software uses Global Positioning System (GPS) technology to compute

3-dimensional positions in real time for deformation monitoring applications. 3D Tracker has been specifically designed for fixed structures like bridges, dams, and large buildings. The software can also be deployed to monitor natural features such as volcanoes, landslides, and ground subsidence.



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POWERFUL NEW TOOL

3D Tracker is the first software product to simultaneously compute millimeter level positions in real time for dozens of GPS receivers deployed on the target structure or natural feature. This

new GPS offering from Applied Geomechanics has been specifically designed for robust performance and continuous operation by implementing a custom tuned Kalman filter with double-difference carrier phase measurements calculated over time (known as triple differencing). The winning result is a sophisticated system for real-time motion detection at your region of interest.

USEFUL INFORMATION

A graphical user-interface provides information about each site being monitored. The 3D Tracker screens were carefully designed by engineers, scientists, and geologists to provide the information in the most logical and easy-to-understand manner. The 3D Tracker graphical screens are user configurable and clearly display information such as the current 3D displacement vector, the current rate of change, and the displacement history for each site. This easy-to-understand interface allows you to focus on what really matters—getting your work done.

REAL-TIME BENEFITS

3D Tracker provides valuable and timely deformation information to scientists, engineers, facility managers and others for the analysis of

RESOLUTION	Q*	LATENCY
±0.5 m	1	1-2 minutes
±1-2 cm	8	2-4 hours
±1-2 mm	13+	12-24 hours

*Q = Kalman filter constant

large man-made structures and natural hazards. Real-time information gives operators valuable lead time to mitigate potentially hazardous situations. Automated real-time processing eliminates the need for costly post-processing of data. In addition, operators have full remote control over a 3D Tracker system through the Internet. In fact, a single operator can manage dozens of different 3D Tracker installations from a single office location.

ROBUST DESIGN

The 3D Tracker system utilizes economical single-frequency GPS receivers. A series of user-configurable parameters allow 3D Tracker to be easily tuned for different monitoring applications. Unlike other GPS monitoring approaches, this control allows the software to be optimized





for your unique application (e.g., bridge, dam, building, oil platform, etc.).

INTEGRATION

The long-term stability of GPS and the fact that it constitutes a direct measurement of position (not an indirect one based on deformation shape) makes it an ideal source of 3-dimensional ground truth for constraining the unknowns or potential sources of instability inherent in other measurement techniques. In this way 3D Tracker is an ideal adjunct to our suite of monitoring technologies (InSAR, tiltmeters and geotechnical instrumentation), augmenting their capabilities and mitigating shortcomings, to produce a composite system with truly remarkable characteristics. Currently the only other measurement technique capable of providing this type of ground-truth involves manual GPS or optical survey techniques, and these systems can't provide the results generated by Applied Geomechanics truly automated 3D Tracker system.

GRAPHICAL INTERFACE

- Windows XP 32-bit architecture
- Multithreaded and multitasking design
- Graphical User Interface (GUI) displays the

following information in real time for each station:

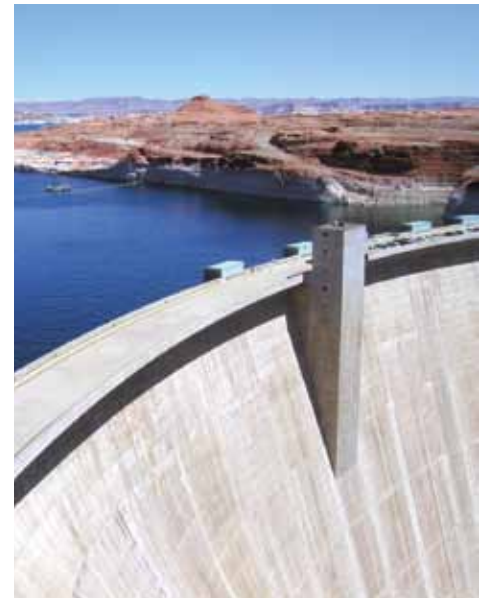
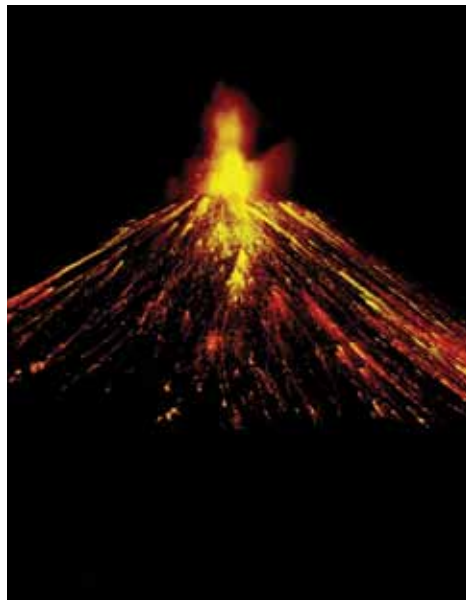
- 3D position map for each site monitored
- Strip chart of current and historical rate of change for each site
- Strip charts of component vectors for current and historical displacement at each site
- Graphical and numerical display of error estimates for each site
- Numerical display of all information for each site (vectors, azimuth, plunge, error estimates, etc.)

FLEXIBLE ARCHITECTURE

- Simultaneous real-time monitoring of multiple sites
- Multiple baseline processing for a single site (done simultaneously)
- Survey mode for accurately surveying sites prior to start of monitoring

AUTOMATED ALARMING

- User-definable automatic warning alarms based upon:



- North, South, East and West motion
- Up and Down motion
- Rate of change (for each of the above components)
- Absolute displacement

AUTOMATED DESIGN

- 3D Tracker allows for unattended operation
- 3D Tracker can be remotely accessed from anywhere in the world
- All system parameters can be updated remotely
- Web page module allows you to automatically route all 3D Tracker information in real-time to a secure web page

SUGGESTED PC REQUIREMENTS

- Pentium 4 or higher
- 1.4 GHz
- 1 GB RAM
- 80 GB hard drive
- 1280x1024 /128 MB Video Card
- Windows XP SP3 or later

APPLIED GEOMECHANICS

140 Chestnut St.
 San Francisco CA, 94111
 T: 1+415-364-3200
 F: 1+415-861-1448
 Geomechanics.com

A CARBO Company

