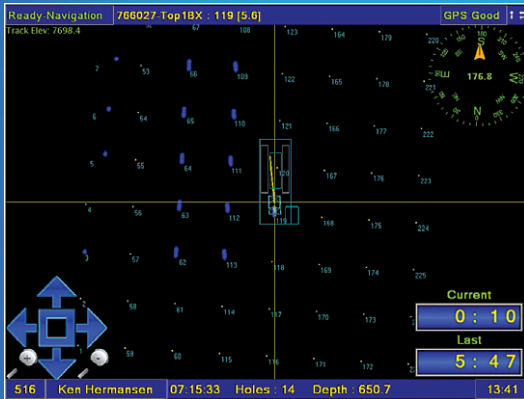
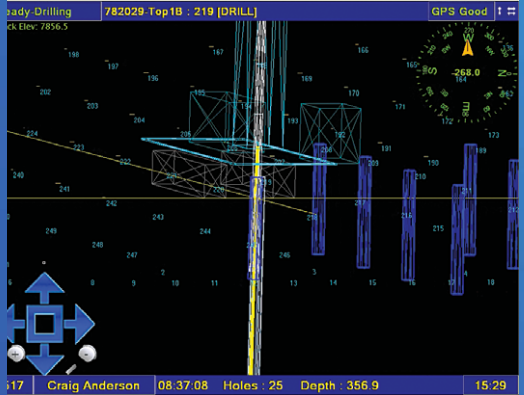


# DEI+ NAV

## Drill Navigation



### Drill Pattern- Navigation Mode



### Drill Pattern-3D View



### NAV Module & GPS Mast

With the introduction of Thunderbird's DEI+NAV HPGPS Guidance system, a new standard for blasthole drill instrumentation has been established. The DEI+NAV has been designed from the ground up by a team that pioneered the development of the first drill monitoring and GPS navigation systems. This experience has allowed the team to design a lower cost system with many unique features not available in competitive systems which will provide its mining customers with a higher rate of return on their investment.

### DEI+NAV FEATURES

- Drill monitoring and logging
- Easily upgraded to Navigation from the DEI-X system
- Handles angle drilling applications
- Supports remote tramming of drill with second display
- Drill-to-Drill communications—know status of all the holes
- Show bench terrain and contours
- Surface features including operator warnings for “no entry” or danger zones
- Augmented GPS option provides for more drilling time
- Backbone for remote and autonomous drilling
- Unparalleled internet support
- Localization program allows for easy translation of display to multiple languages
- Access to the drill status and database by foremen or supervisors in the field
- Interface to Datavis drill and blast software

### DEI+NAV BENEFITS

- Reduce surveying costs
- Faster tramming between holes—no looking for stakes or markers during low visibility
- Calculates a target depth based on the elevation of the new bench—this allows all holes to be drilled to the proper elevation regardless of the elevation of the drill
- Records precise location of each hole
- Decrease over or under drilling
- Records all delays—account for every minute of 24 hour period
- Track all drill stem consumables
- Pre-shift inspections sent to office
- More accurate blasting—reduce loss of coal, better fragmentation, and lower blasting costs
- Interface with Fleet Management Systems



Improve Drilling and Blasting Efficiency