The TCI Model 917 provides the location of cellular handsets and base stations in real time, by integrating the functionality of the TCI Model 803E DF system with a GSM cellular intercept system and controlling each system from a TCI 8230 Operator Workstation.

Geolocation of Cellular signals.
The TCI 917 Cellular Geolocation System can rapidly DF and triangulate cellular signals using only off-the-air (RF) signal information, transmitted either by the base station or the handset. Mapping of base station locations and their frequency usage is a powerful tool for frequency regulators and law enforcement organizations alike. The rapid location of cellular handsets is of special interest to law enforcement organizations.

KEY FEATURES
- Provides real-time DF and location of GSM cellular signals
- Optional extension to cover iDEN
- Locates signals transmitted either by base station or handset
- DF results available in real time and recorded for later analysis
- Available in two configurations for fixed and mobile applications

FULL MISSION REPLAY FOR:
- Post-facto analysis with selective signal isolation using powerful, interlinked graphical displays
- Post-facto triangulation of all signals
- Client-Server architecture with full networking capability
- Rugged design minimizes size, weight and power consumption
TCI 917 Operational Description

Each Geolocation System is controlled by the Operator Workstation:

- The TCI DF Processor is controlled using the TCI 8230 client software running on the workstation.
- The Operator sets up the TCI DF processor. As part of the setup, the TCI 8230 Client software sends the operating parameters appropriate for processing cellular signals of interest to the TCI 6085 processor (frequency list, and scan parameters).
- The TCI DF processor begins scanning and producing DF measurements on all active cellular signals.
- The TCI 8230 workstation groups the DF measurements in accordance with the frequency channels and time slots of interest provided by the external cellular analyzer supplied by the Purchaser.

Real Time Mode

A geographic map as the primary screen displays data received from the RMS service in real time.

- Geographic location and orientation of mobile unit appears as a green dot on a digital map of the area, accompanied by roads, streets, buildings, parks, water, etc.
- Summary DF results (“tips”) calculated by the RMS service are displayed as a blue Line of Bearing originating from the mobile unit.
- The 917 GUI automatically analyzes the Summary DF bearings from successive locations until it has enough bearings to compute and display triangulation fixes. Each fix is displayed in the shape of a bright-red handset. Once several handsets are displayed, the operator can confidently predict the general location where the handset of interest is operating. Summary DF results are automatically saved locally on the Workstation for later analysis, replay and re-fix.

TCI 917 System Architecture

The TCI 917 Cellular Geolocation System consists of the following:

- TCI DF processor, with built-in GPS and dual-channel receiver system
- TCI 645 DF and Monitoring antenna in roof-mounted Thule case
- TCI 8230 Cellular Geolocation Workstation (laptop).
CheckMate™ Cellular Geolocation System

Analysis and Reporting Mode

Allows the operator to:

- Select and enter the Mission ID corresponding to a specific task.
- Select and edit the data corresponding to that target.
- Review and replay Summary DF bearings.
- Manually select individual LOB results to be included or excluded from the Fix calculation.
- Using edited data, re-run a single integrated Fix calculation.

Emitter Report File Format

For each detected signal, the TCI 8230 Workstation automatically creates a file in CSV format. The file can be easily transferred in real time to any external system located on the same TCP/IP network, for offline processing and analysis. The file can be customized to different formats, as necessary.

Operational Examples

The System was used to identify and locate a particular handset (MS), using a Mobile Unit consisting of the following equipment items:

- TCI 8230 Cellular Geolocation Workstation
- TCI 803E DF system
- Cellular GSM Signal Analyzer

The TCI 803E DF System consists of the TCI 6085 DF Processor and the TCI 645 compact DF and Monitoring antenna concealed inside a roof-mounted Thule® Case. Initially the system was used to identify BCCH channels that could potentially be used by the handset. At the beginning of the test, the handset was collocated with the Mobile Unit. For the drive test, the handset was placed at sites with different propagation conditions:

- Open space
- Residential
- Industrial
- Urban

The handset was mostly stationary at each site. A few times the person holding the target handset changed positions within the same general area. As the Mobile Unit was driven around the handset location, DF data was collected along the route, displayed in real time, and saved for later analysis. DF results with acceptable confidence were automatically analyzed, wild bearings discarded, and an average DF Summary line of bearing was calculated.

The following items were displayed on the map in real time:

- Location of Mobile Unit
- Summary DF line of bearing
- Triangulation fix
- All real-time data are stored for later analysis, re-play and re-fix.

The TCI 8230 Client software operates in one of the following modes:

- Real Time mode
- Analysis and Reporting mode
- Built-in self-test
Summary Specifications

The TCI 8230 Cellular Geolocation Workstation software can be supplied on a rugged laptop.

FOR operation against cellular signals, the TCI 917 Cellular Geolocation System requires a TCP/IP interface to a Cellular Analyzer such as the Engage P12 from Verint to be collocated with the TCI equipment in the same vehicle. The Cellular Signal Analyzer is not part of the TCI system and must be supplied by the purchaser.

Export of TCI International, Inc. systems and products may be subject to U.S. export controls. U.S. Export License may be required. (Specifications subject to change without notification.)

FEATURE SPECIFICATION

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Windows® 7 Professional</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Core i5-540M vPro Processor, 2.53GHz with Turbo Boost up to 3.07GHz, 3MB</td>
</tr>
<tr>
<td>Storage</td>
<td>Shock-mounted flex-connect hard drive with quick-release, 250GB (540M CPU)</td>
</tr>
<tr>
<td>Memory</td>
<td>2GB SDRAM</td>
</tr>
<tr>
<td>Display</td>
<td>13.1” XGA touchscreen</td>
</tr>
</tbody>
</table>
| Standards     | • MIL-STD-810G & IP65 certified (6’ drop)  
                • MIL-STD-461F certified  
                • UL1604 certified |
| Dimensions & Weight | 11.5”(L) x 11.9”(W) x 2.9”(H) • 8.0 lbs |

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Cellular Signal Analyzer

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