Mobile GIS Technology for Forest Mapping

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Mobile GIS in Forestry

- Mapping & GIS technology is field proven in public agencies and private timber companies worldwide
- The Forestry industry was one of the very earliest users of mobile GPS units
- Companies such as Trimble began providing GPS/GIS data collection systems to public forest agencies in the mid-1990s and have continuously evolved its technology to meet the demands of this market
Mobile GIS in Forestry

- GPS data collection systems have now developed into Mobile GIS systems
- Moving from Data Collection to Data Management
- Generally built using industry standard mobile applications and operating systems
- Systems now require little specialised knowledge to operate

Mobile GIS in Forestry

- Mapping & GPS/GIS data collections systems should be based upon open operating systems such as Microsoft Windows Mobile 5
- Windows Mobile 5 provides support for industry standard applications such as:
  - Trimble TerraSync
  - ESRI ArcPad
  - Intergraph OnDemand
  - TDS SOLO Forest
  - And many custom applications developed for Windows Mobile 5
Features of modern systems

• Bluetooth and WiFi
  - Allows wireless connectivity with many applications in areas where cables may be snagged:
    • Data Loggers
    • Laser rangefinders
    • Digital camera
    • Digital Calipers
    • Bluetooth enabled mobile phones for access to GPS corrections and/or back-office GIS

Hardware Characteristics

• Integrated technology
• Rugged
• Various accuracy standards
• Optional data logger capability
• Open Standards
• Modern Connectivity
• Runs industry standard mobile GIS applications
• Integrates into back-end GIS systems
System Examples

• Using Trimble’s suite of products
  – Hardware
  – Software
• Using 3rd Party applications

GeoXH/XT/XM

• Integrated GPS receiver
  – RTCM ready
• Choice of Accuracy
  – GeoXH: Subfoot (30cm)
  – GeoXT: Submeter
  – GeoXM: 1-3 meter
• Rugged handheld with all-day battery
• Microsoft Windows Mobile 5.0 software for PocketPC, allowing maximum flexibility in software choice
• 512MB onboard memory plus removable SD memory
• Bluetooth and wireless LAN connectivity options
New GPS Pathfinder Pro series receivers

- GPS Pathfinder ProXT and ProXH receivers

Integrated GPS receiver and antenna
Bluetooth® wireless technology
Power button – GPS and Bluetooth
Status LEDs
External antenna connector
Accessory interface (underneath)
Power supply connector
Battery
Serial Port

Next Generation Accuracy

- **Subfoot** (30cm) postprocessed
  - New H-Star technology
  - Small integrated form factor
    - 525g
    - No cables
    - Bluetooth
  - Ultra-rugged
  - All-day battery
    - User replaceable
  - Handheld choice
    - Recon / TSCe
    - Tablet / Notebook
    - PDA
What's inside a ProXH receiver?

• H-Star technology
  - Firmware enhancements
  - Provides H-Star data to the field software
• 12 L2 carrier channels
  - Used when a Zephyr antenna is connected
• Advanced anti-jamming and noise reduction techniques
• Internal dual-feed patch antenna with integrated groundplane for L1 performance

Bluetooth connectivity

• Pre-configure field computer
  - Turn off authentication for serial port
• Scan for devices
• Select ProXT or ProXH receiver
• Select Bluetooth GPS port
• Run application, select COM port
• Connect!
ProXH and ProXT Receivers

<table>
<thead>
<tr>
<th></th>
<th>ProXT</th>
<th>ProXH</th>
<th>ProXH with Zephyr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real-time</strong></td>
<td>Submeter</td>
<td>Submeter</td>
<td>Submeter</td>
</tr>
<tr>
<td><strong>Postprocessed</strong></td>
<td>Submeter</td>
<td>Subfoot (30 cm)</td>
<td>8 inches (20 cm)</td>
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</tbody>
</table>

ProXH receiver with H-Star processing

<table>
<thead>
<tr>
<th></th>
<th>ProXH Internal</th>
<th>ProXH Zephyr</th>
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</thead>
<tbody>
<tr>
<td>HRMS</td>
<td>0.13m</td>
<td>0.10m</td>
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<tr>
<td>2 minute points</td>
<td>188</td>
<td>195</td>
</tr>
</tbody>
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Forest-TECH 2007
GPS Pathfinder XC receiver

- Postprocessed differential correction
- Seamless integration with your existing system
- Compact and lightweight
- Simple to use
- Open field software support

Trimble Recon

- Ultra-rugged and lightweight
- Integrated wireless options (Bluetooth and wireless LAN)
- Two CompactFlash expansion slots
- Microsoft Windows Mobile version 5.0 software
- GPS functionality easily added
**Trimble Ranger**

- Microsoft Windows Mobile version 5.0 software maximizes your choice of field applications
- Ultra-rugged design enable you to keep working in all conditions
- Full alphanumeric keypad for efficient data entry
- Integrated wireless options (Bluetooth and wireless LAN) for cable-free connectivity
- Expandable and versatile with two CompactFlash expansion slots and one SDIO slot

**Application Choice**

- **TerraSync**
  - Sophisticated data collection & maintenance
- **GPScorrect extension for ArcPad**
  - Bringing full GPS control and postprocessing to ESRI’s ArcPad software
Application Choice

- IntelliWhere® OnDemand
- PLOTSAFE
- Customized solutions
  - GPS Pathfinder Tools SDK
    - Robust GPS integration
  - NMEA
    - Standard ASCII data stream
    - 3rd Party applications

Complementing Software

- GPS Pathfinder Office
  - Managing the flow of data between the field and the GIS, and data processing
- Trimble GPS Analyst extension for ESRI ArcGIS software
- Full DGPS capability available with:
  - TerraSync
  - GPScorrect
  - GPS Pathfinder Tools SDK