Airborne Inspection using PC-Mapper AI

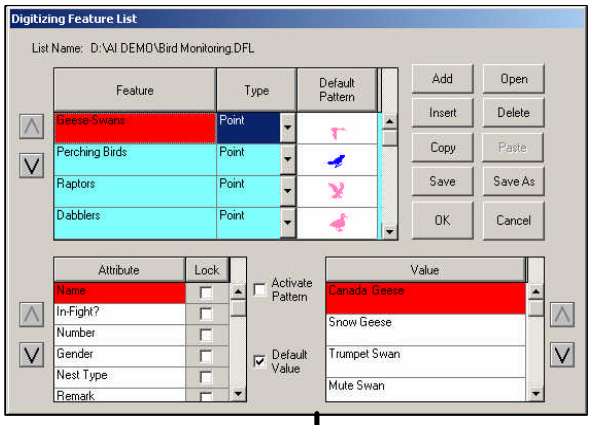
PC-MAPPER AI is a powerful tool for airborne applications such as **Seasonal Bird Migration**, **Firefighting**, **Natural Resources Inventory**, and **Military Reconnaissance**, as well as ground applications such as **GPS Surveying**, **Precision Farming** and **Automated Tree Harvesting**.

Runs on Microsoft **XP**, **VISTA, Windows 7** Desktop PC, Notebook PC and **Tablet PC**.

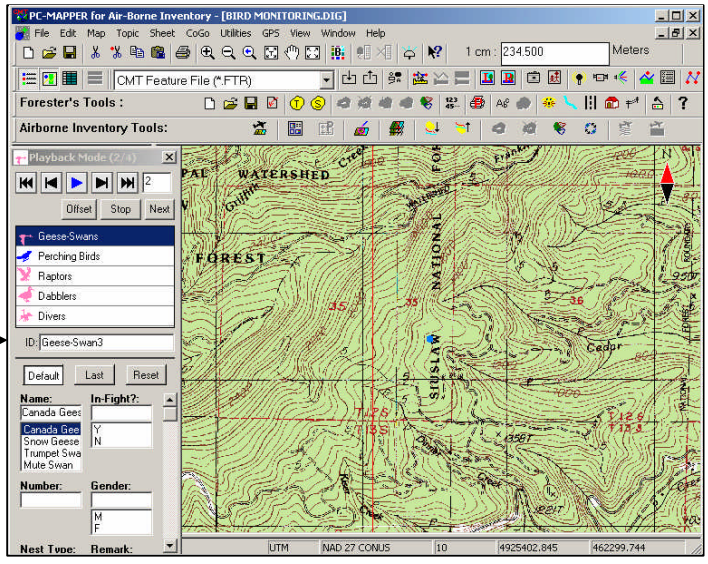
- **Real-Time Navigation**
  Track your **real-time GPS** position on top of a Basemap,
  a DRG map, or a georeferenced aerial photo.
  Moving Map automatically **re-orients** and **scrolls** as you move along.
  Navigate along a pre-defined route or select any destination on-the-fly.
  Use any GPS with **NMEA-183** output.

- **All-in-One Professional Mapping**
  Use the same PC to plan the mission, collect
  GPS/GIS data, digitize Points, Lines and Areas,
  label and print out the completed map,
  as well as manage the **GIS** databases.

- **Air-borne Inspection**
  Look down from an airplane and record
  what you see onto the displayed map.
  Forbidden Area Warning alerts you when
  approaching a sensitive area.
  Have your **Flight Line** automatically recorded.



Quickly digitize in Manual or Voice mode, using your own Digitizing Feature List.



Easily play back voice recording, and assign Feataure, Attributes, Values to the Points recorded in the Voice mode.

*Visit **www.cmtinc.com** to see a DEMO and download an evaluation version.*

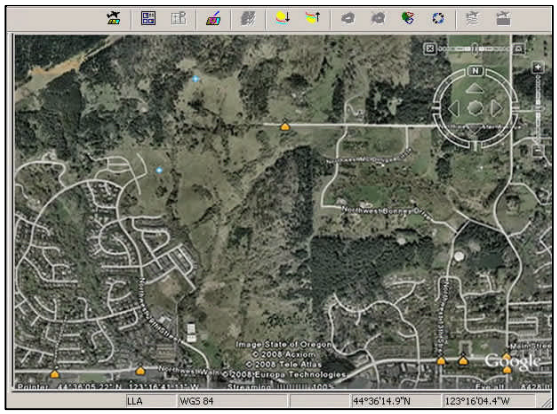
. . . Other Highlights (*Detailed function list available at www.cmtinc.com*)

- **Automation of Map File Loading**
  Select the mapsheet grid area of interest, and use the **Thematic Map File** to automatically load **GEOTIF**, GEOJPEG, *.SHP, *.DXF, ***.SID,** *.ECW files from the specified file folders.

- **Google Earth® Interface**
  Capture geo-referenced maps from **Google Earth**.

- **Image Transparency**
  Adjust the **transparency** of Area Features and bitmap image layers.

- **Labeling**
  Automatically label the Features with IDs, **areas**, distances and other attributes.

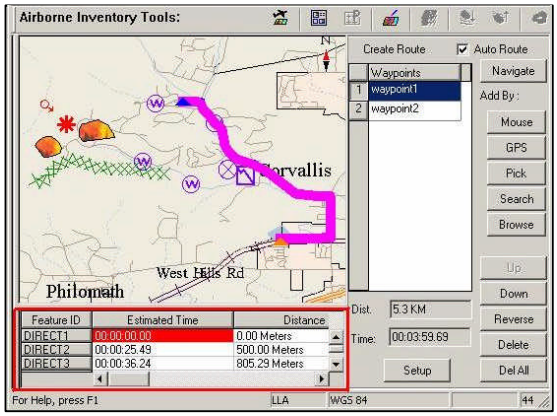


Capture Geo-referenced Map from Google Earth

- **Auto-Routing**
  Select start and end points and let PC-Mapper AI calculate the most efficient route on the road map. Follow the route with turn-by-turn directions (including time and distance).

- **GPS Stakeout Functions**
  Perform Point, **Line**, Offset, and Slope stakeout. (e.g. Line Stakeout for laying cables and pipes)

- **Surveyor CAD Functions**
  Deed Calls, Traverse and over 20 coordinate geometry (**COGO**) functions, including: Intersection, Offset Stakeout, Curves, etc.



Instantly create an Auto Route to your job site

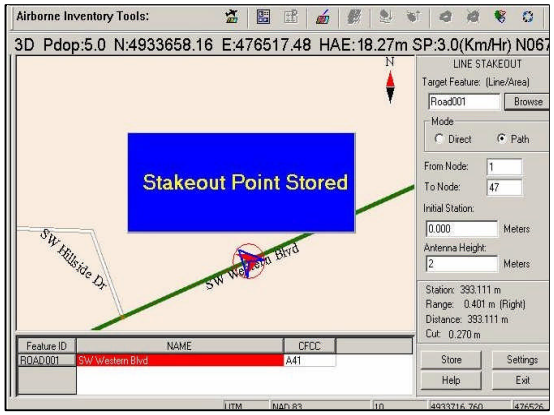
- **Create Grid**
  Create reference grid points and grid lines on your map.

- **Contour/Volume Functions**
  Use your GPS data to generate accurate Contour maps. Compute **Cut** and **Fill** Volumes **in the field**.

- **Single & Dual Frequency GPS Input**

- **Geoid Model and NEZ Coordinate System Support**

- **Import/Export Feature data from/to Microsoft® Excel and Access files.**



Use Line Stakeout for Pipeline Layout

*Visit **www.cmtinc.com** to see a DEMO and download an evaluation version.*

CANADIAN INFORMATION PRODUCTIVITY AWARDS

Ministère des Ressources naturelles, de la Faune et des Parcs Direction de la conservation des forêts-MRNFP

Revolutionizing the transmission of aerial surveys

The mission of the Ministère des Ressources naturelles, de la Faune et des Parcs is to promote knowledge acquisition and to ensure the development and optimal use of land, energy, forestry and mineral resources in Québec with regard to sustainable development for the benefit of the entire population.

The Direction de la conservation des forêts-MRNFP, the Forest Conservation Division, ensures effective protection of forests against fire, insects and disease, and coordinates the planning and involvement in civil security.

Challenge

The focus of this project was to optimize the protection of Québec forests and promote the distribution of information by developing a solution that could be used onboard an aircraft to digitize the coordinates of natural disturbances such as insects, disease or fire, through aerial observation and geo-referencing.

Traditionally, aerial observers used laminated maps joined together to form representations of strips of land. These maps were then mounted on rollers installed at the ends of a wooden box. Onboard an airplane, an aerial observer would gradually unroll the maps to track disturbances, while following the plane's course over the flight line. Upon returning, the technician would digitize the course and enter relevant information.

Objectives

The objectives of the RARS (Relevés aériens à référence spatiale) aerial survey geo-referencing system were to:

- Facilitate and optimize data collection related to aerial surveys of natural disturbances, through the use of digitization and geo-referencing specifically
- Include all the processes for compiling aerial surveys: preparation of thematic maps, digitization of aerial surveys, and real-time data transfer via cellular communications
- Offer an optimal, realizable technological solution, within a limited budget
- Meet relatively tight deadlines to complete the surveys
- Deliver a turnkey, user-friendly, highly flexible and evolutionary solution to meet other potential needs

Solution

The project initially involved using customized software to import digital maps from various suppliers, and scaling the maps to fit aerial surveys. Through an agreement with the Department's Forest Inventory Division, the project team used distribution products from Système d'information éco-forestier to import and process mapping data.

After classification, the maps were then overlaid to create geo-referenced -æ positioned in space according to their geographic coordinates æ customized, context images. Data about the region was then imported and processed. Two toolbars, operating as independent modules, were also developed for the application. Panasonic's portable Toughbook 18 computer was selected as the hardware for the system. Its user-friendly, touch-screen technology was adapted to provide easily accessible functionality.

Using the laptop computer's aerial inventory tool bar, an observer can select the type of disturbances to be studied from a set of predetermined symbols. Then, maps for the territory over which the aircraft will be flying are loaded in batches onto the system. Instantly, flight lines are automatically generated onto the selected area of the map on the screen.

Using the geographic locations in the image displayed, the observer can easily locate disturbances on the ground and track them on the system's touch screen using a stylus pen. While the plane continues along flight lines, a Global Positioning System (GPS) pinpoints the plane's location in real time and represents it with a symbol displayed on the screen. The map image changes as the plane moves. A geo-referenced context image also rotates to correspond to the plane's anticipated course. The territory over which it is about to pass in the following seconds appears in the upper part of the screen. Since the plane's position on the map can be pinpointed more quickly, the observer has more time in which to enter observations. This system revolutionizes data entry, without affecting the work habits of the observer.

Surveys can be transferred directly to the data server after landing, or by modem or a cellular connection while still in the air. This permits stakeholders and decision makers to act quickly in an emergency. Thanks to RARS, the data collection and transfer stages that originally took 24 to 48 hours, now take less than one hour, using cellular communications.

Furthermore, the map preparation and survey digitization that used to require approximately 300 hours per season, has been reduced to less than 100 hours.

Innovative Use of Technology

The system incorporates a number of technologies that were specifically adapted for the Forest Conservation Division's requirement. For example, two software suppliers improved their products' functionality for this project. ESRI developed a tool bar for ARCVIEW 8.x to import and process data on the region, while Corvallis Microtechnology customized its PC-MAPPER 5.x software to enable the preparation of aerial inventories and digitization of natural disturbances.

On an airplane, clarity is often a problem. For the application to work effectively, state-of-the-art technology that was not yet available on the market was needed. To that end, an innovative new screen was tested in the Summer of 2003 for the initial aerial surveys. The high-performance, bright touch screen was selected for its 'readability' even in sunlight.

Finally, the use of cellular communication to transmit aerial surveys is an innovation that allows them to be distributed faster than ever.

"We embarked on this project with a small budget and huge aspirations. What we developed turned out to provide the same kind of powerful capabilities as those typically found in industry sectors like defence, where cost is not an issue," remarks Jacques Tremblay, Director, Forest Conservation Division. "The RARS system has enabled us to improve the accuracy of our data entry and increase our productivity tremendously."

A 2004 CIPA Winner!

For its exceptional and innovative application of Information Technology to solve real-world business problems and bring greater benefit to all its stakeholders, The Québec Ministry of Natural Resources, Wildlife and Parks - Forest Conservation Division, was awarded a 2004 Canadian Information Productivity Award of Excellence in the Efficiency & Operational Improvements category.

La Reconnaissance:
la mémoire du cœur

Québec

Ce coup de cœur a fait l'objet d'un consensus au sein du CDDSI.

Après de bonnes discussions, tous se sont entendus pour choisir l'équipe du projet Relevés aériens à référence spatiale des perturbations naturelles (RARS)

Coup de cœur « Innovation »

Relevés aériens à référence spatiale des perturbations naturelles (RARS)

La Direction des services informatiques du Ministère des ressources naturelles, de la Faune et des Parcs du Gouvernement du Québec est fière de souligner la contribution de

Le directeur, Michel Gauthier

David Lin,

(Corvallis Microtechnology inc.)

2004