

## MERLIN™ Avian Radar System User Training: Wind Energy, Bird Control & Environmental Management Applications

April 12 – 15, 2010

DeTect Training Center  
1902 Wilson Avenue Panama City, Florida 32405 USA

MERLIN Avian Radar System User Training is provided at no cost to current MERLIN users and to select prospective users several times each year. The course is designed to provide user introduction, training and updates on radar ornithology and the MERLIN Avian Radar System use and operation, software, and data analysis. The class includes classroom, lab and hands-on radar operation training.

This class is primarily focused on application of the MERLIN technology to wind energy project bird and bat pre-construction survey and mortality risk assessment; operational monitoring; and operational risk mitigation (MERLIN SCADA). The class will also cover use of the MERLIN systems for automated bird control at industrial facilities (MERLIN *detect & deter*) and for general research applications.



Customized and advanced user courses are also available. Classes are held in Panama City, Florida at DeTect's training facility in Panama City on a Monday through Thursday schedule (four 8-hour days starting at 0900 each day). Lodging information is available from DeTect and DeTect will provide local transportation for airport pickup/drop off and to/from the class each day.

To reserve space in the class, email to [julie.bullock@detect-inc.com](mailto:julie.bullock@detect-inc.com) or [helen.lewis@detect-inc.com](mailto:helen.lewis@detect-inc.com); you can also call 850-763-7200 (US). Space is limited and available on a first booked basis.

### Course Outline:

#### DAY 1:

- **Overview of avian radar systems & methodologies**
  - NEXRAD radar data
  - Small radars and systems
  - Manual and automated radar ornithology
- **MERLIN Avian Radar System introduction and overview**
  - Basic design and functionality
  - Features overview
  - Horizontal and vertical scanning

- Radar coverage
- **Radar Ornithology Principles:**
  - Radar Cross Section (RCS)
  - PPI Display
  - Heading Pulse
  - Azimuth Resolution
  - Beam width
  - Sampling
  - Size measurements and target size classes
  - Target types – birds and bat discrimination
  - Clear Air Threshold
  - CFAR Clutter Suppression
  - Clutter Map Principles
  - In-band Interference
  - Statistical Images

**DAY 2:**

- **Radar Installation, Operation & Safety**
  - System installation and startup
  - RF Radiation
  - Trailer towing
  - Other safety issues
- **Site Selection Issues**
  - Site modeling and analysis
  - Desktop analysis
- **Study Design**
  - Avian and bat survey considerations
  - Quality assurance and groundtruthing
  - Other sensors
- **System Setup and Operation**
  - Vertical Scanning Radar
  - Horizontal Surveillance Radar
  - Grounding and lightning protection
  - GPS & Electronic Compass
  - Power system: generator and commercial power
- **Merlin System Software**
  - Merlin Server
  - Merlin Server Administrator
  - Merlin Display
  - Merlin Display Administrator
  - MERLIN Remote Control
  - Error Logs
- **Database Fields and Metadata**
- **Raw Radar Recording**
  - File Size
  - Replay, analysis and post processing

### DAY 3:

- **Data Processing, Analysis & Interpretation**
  - Data processing – MS Access Query & SQL
  - Geographical Information System (GIS) analysis
  - MERLIN Track Plot
  - MERLIN Mask
  - Hourly and Altitude Plots
  - Passage Rate Analysis
  - Risk Assessment
- **MERLIN Applications**
  - **Wind Energy**
    - Survey and risk assessment methodologies
    - Monitoring strategies
    - Risk mitigation
      - MERLIN SCADA
      - Migratory bird mortality risk mitigation
      - Raptor mortality risk mitigation
  - **Bird Management & Control**
    - Applicable facility types: power plants, mines, oil & gas, other
    - MERLIN *detect* & *deter*
    - Deterrent components
      - Conventional devices (propane cannons, effigies, non-directional bioacoustics)
      - Advanced devices (Long Range Acoustic Device –LRAD, lasers)
  - **Environmental Research**
    - Migratory studies
    - Habitat analysis

### DAY 4:

- **New Technologies**
  - VESPER Fixed Beam Vertical Profile Radar
    - Bird, bat and insects
  - Future advances in hardware and software
- **Field Exercise**
  - Hands-on MERLIN Operation
- **Scheduled one-on-one consultation with instructors**

### Class instructors:

- T. Adam Kelly, MSc. Biology, Chief Scientist, DeTect, Inc.
- Jenny Davenport, MSc. Biology, Bat Specialist, DeTect, Inc.
- Jesse Lewis, MSc. Geography, Manager Data Services, DeTect, Inc.