

Applications

- Stuck transmitters
- Fraudulent transmissions
- Spurious emissions
- Frequency monitoring

System Features

- Monitoring Frequency Range of 20 to 3000 MHz
- DF Frequency Range 12 to 1300 MHz (optional to 3000 MHz)
- Compact VXI Open Architecture includes VXI VHF/UHF DSP receivers with superior linear performance
- Mapping software provides LOB and enables triangulation to locate targets displayed on electronic area maps

System Description

The Airport Interference Monitoring System (AIMS) provides the user with a means to intercept, monitor, and locate interfering radio sources over a wide geographic area and extended frequency range. This system was developed using off-the-shelf hardware and software to provide a high performance cost effective solution for resolving undesired interference problems. AIMS is tailored to specific customer applications and comprises a network of stations including a master control station and up to eight remote fixed, transportable, or mobile DF and monitoring stations.

Simplicity of operation was a driving factor in selecting the Windows NT based applications software. This software allows the system operator at the master control station to use interactive windows for system control. Advanced RF monitoring enables signals to be acquired from a visual search of a wideband spectrum display, or from receiver sweep and scan modes.

The receivers that are used in the monitoring and DF functions are linear high performance DSP receivers. The high intercept points and wide dynamic range make these receivers particularly effective in dense signal high noise environments. The wide variety of IF filters enable the operator to isolate a signal from other in-band signals or noise.

Automatic Direction finding (ADF) integrated into the sweep, scan, and set-on functions allows the collection of DF bearing information. Mapping functions enable the display of bearing information on an electronic area map, and provides triangulation of transmissions when the remote stations are tuned to the same frequency. Data records, collected during scans and searches, can be sorted by frequency, date and time, and other useful parameters. The mobile and transportable stations can contain GPS receivers or compasses to provide station location and true bearings even while moving.

System Overview

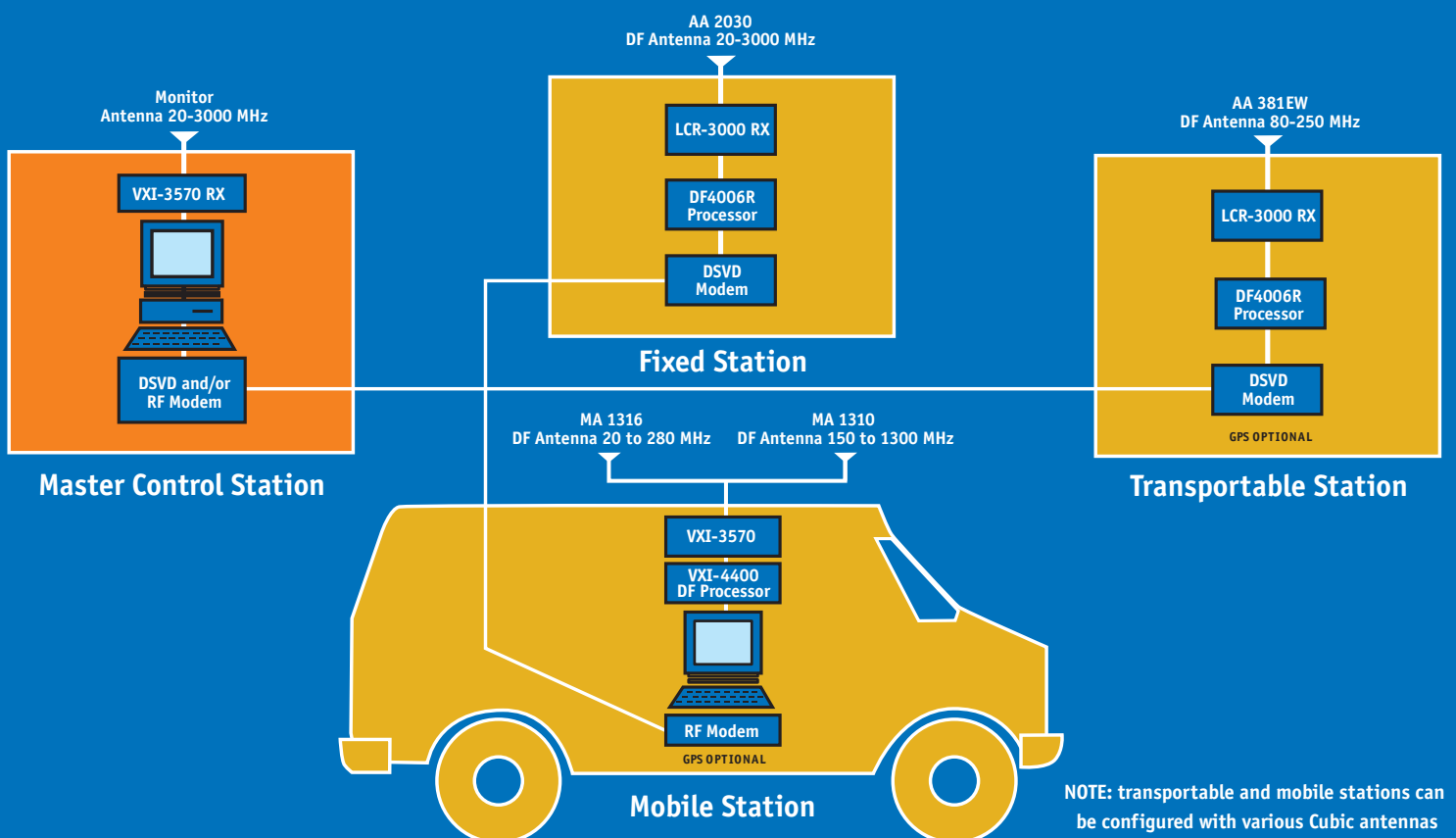
AIMS consists of a master control station and up to eight remote DF and monitoring stations. The remote stations can be fixed, transportable, or mobile configurations, depending upon customer requirements. The system controller is a computer, located in the master control station, that controls all equipment within the system (all stations) via modems or RF links.

System software is Windows NT based and provides the operator with a user friendly Graphic User Interface (GUI) to control equipment functions. All stations, including the master control station, are equipped with high performance VHF/UHF DSP receivers. The remote stations also have DF processors and antennas.

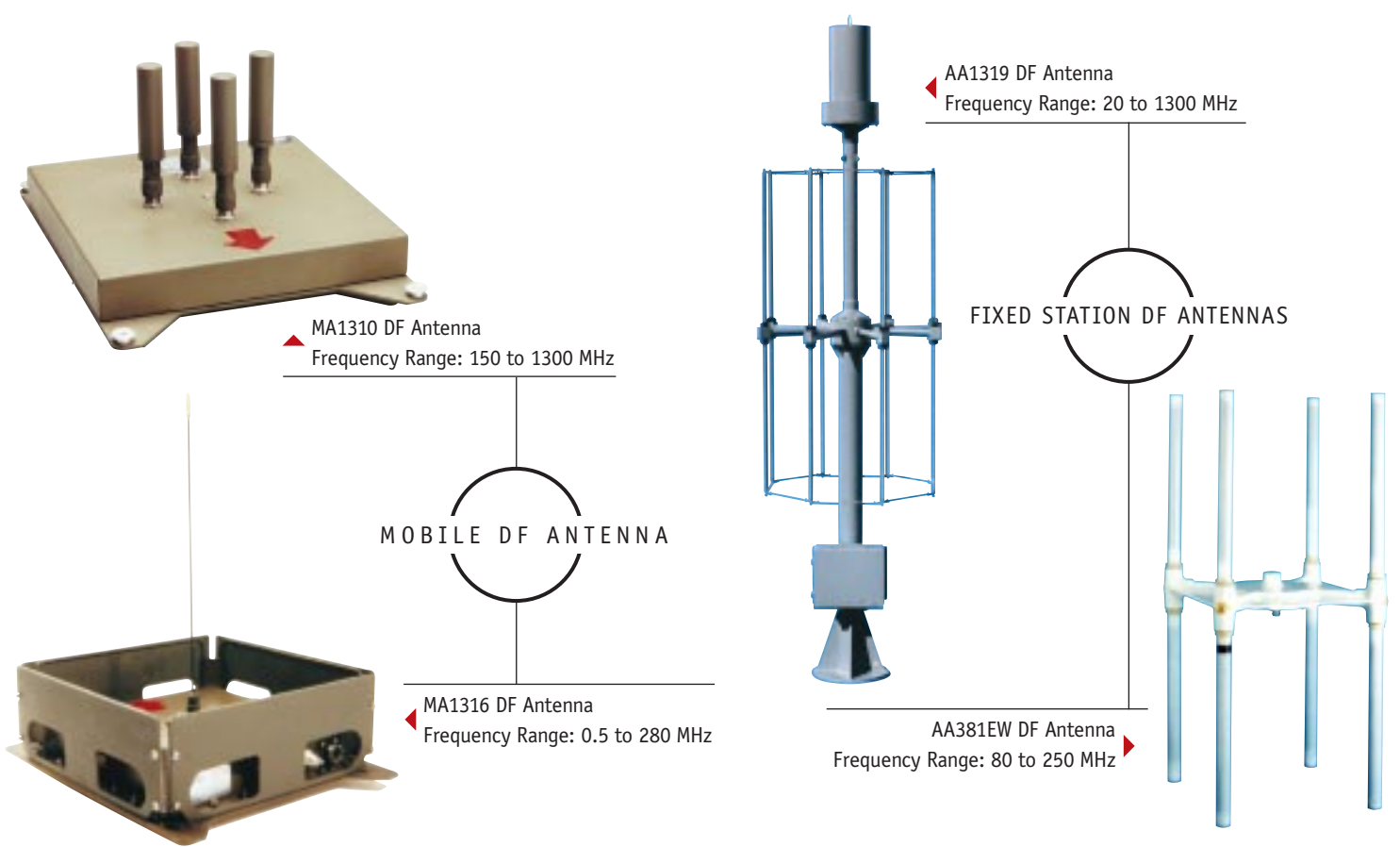
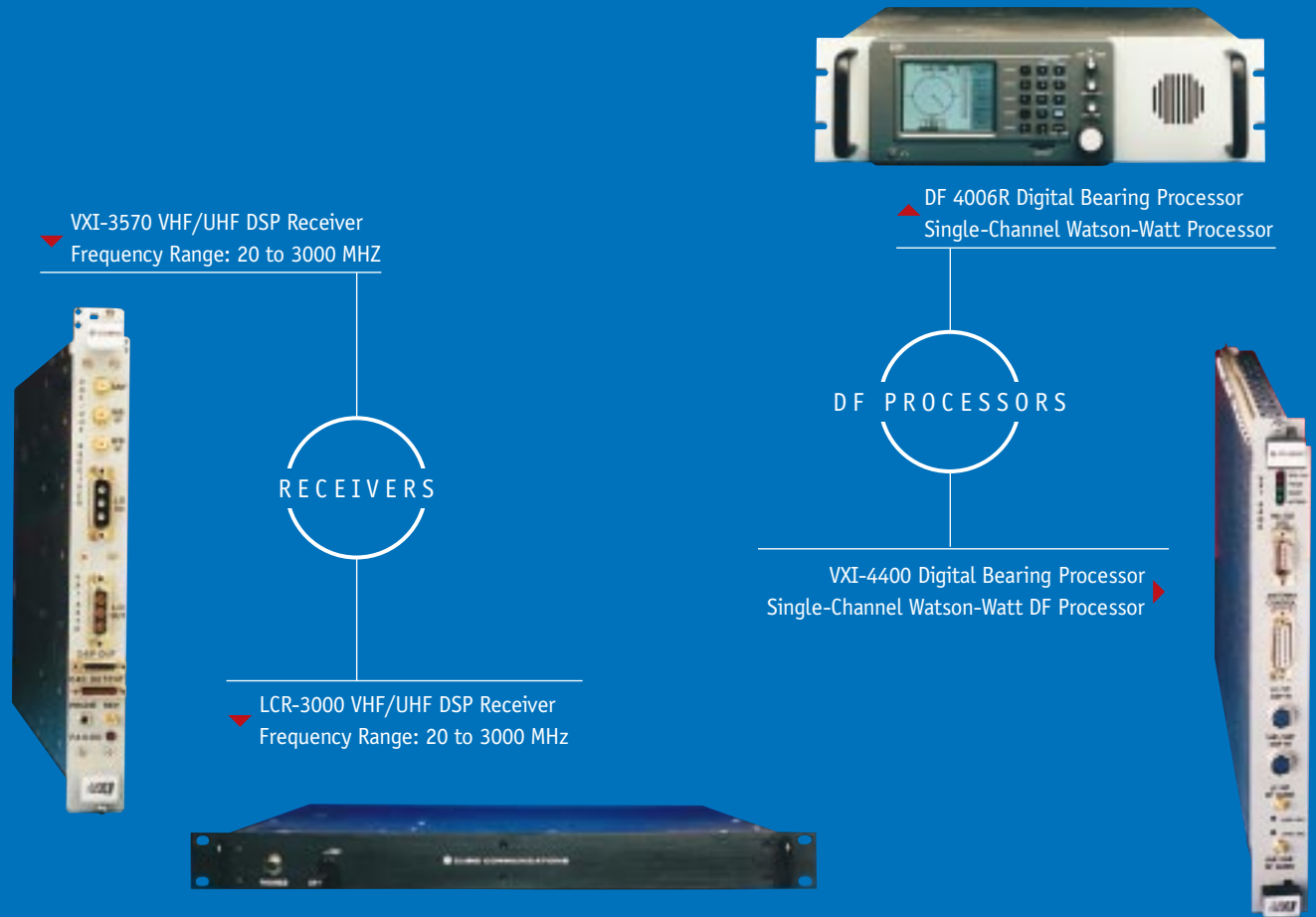
The operator at the master control station can operate a local receiver in a special "Spectrum Sweep" mode. The designated receiver sweeps a selected frequency spectrum and collects the signal amplitude information in each channel. At the completion of the sweep, the channel data is presented to the operator as a histogram. Each vertical bar of the histogram represents a channel and denotes signal amplitude. The operator can select a channel (bar) to monitor, store, hand off to another receiver, or establish a line of bearing to the signal's source. Selected signals can be cataloged and stored in a file (scan plan) for analysis or future monitoring. Additionally, a simple text editing function is provided as a "radio log" or to store accumulated hits during a scan function.

The DF processor and antennas in the remote stations use a modified Watson-Watt technique. This system provides high sensitivity and good bearing accuracy from compact antenna arrays and requires only a single receiver. The antennas are designed to provide seamless operation over an extended frequency range.

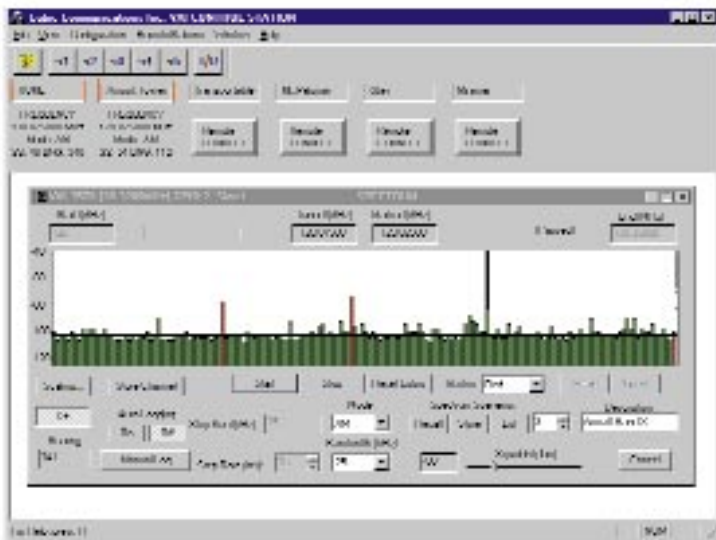
Bearing information from the remote sites is sent to the master station and the LOBs are displayed on electronic area maps. When remote stations are tuned to the same frequency, the multiple lines of bearing allow triangulation of a transmitter's location. Bearing information can be stored for later analysis.



Cubic System Components



Operator Interface



Receiver Control Window ▶

- Provides independent control of each receiver
- Individual receivers can be assigned specific tasks
- Line of Bearing (LOB) information logged manually or automatically

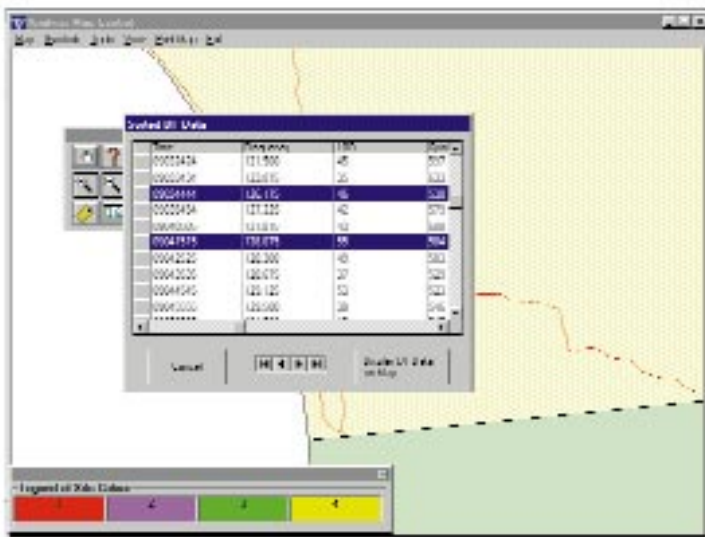
◀ Spectrum Window

- Provides a digital representation of the RF spectrum
- Operator can monitor activity and select signals of interest
- Save spectrum display as file for future reference



◀ Signal Collection Window

- Provides Signal Related Information (SRI) for target transmission
- Data can be sorted then selected for report generation
- Information logged in standard MS Access database format



Mapping Window ▶

- Provides geographical display of Control and Remote site location
- Displays LOB from multiple stations to triangulate signal
- Multiple site signals displayed while active or for post activity analysis

