Sensor Networking for Enhanced Airspace Monitoring

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Who we are .. Company Profile

- Founded 1985
- Grown at an annual average of 30%
- ~$50 Million in Fiscal 2002
- At present ~250 employees

Facilities
- Headquarters - Dewitt, New York
- Branch Office - Long Island, New York
- Branch Office - Atlantic City, New Jersey
- Field Office - Washington DC

Key Programs
- Prime Contractor on FAA ASDE-X
- Sensor Data Sub System Lead on the USMCC CAC2S Program
- Key Interface roles on STARS, DASR, BI-6 programs
- Partnered with Harris on FTI
Generally Speaking, we don’t make radars nor do we make Air Traffic Control Consoles, we provide hardware and software to improve surveillance coverage as well as systems to convert data into useful information.
What we do - 10,000ft High Level Overview

Existing Sensors of Opportunity

Multilateration and ADS-B

Wireless Link

CMC

Gateways
- Fusion
- Data Processing

Web Based Decision Support Server

Non-Real Time Data
- Flight Plans
- Weather
- Geography
- Approach Plans

High Performance Situational Awareness Display

Inputs into Existing Systems

Customer Furnished Format

Inputs into Existing Systems

Clients

Detect the Difference
What we do - Capabilities

Start with Available Sensors
**What we do - Capabilities**

- **Analog Radar**
- **Short Range Digital Radar**
- **Long Range Digital Radar**
- **Wide Area Multilateration and ADS-B**

**Step 1 - Distributed Message Processing**

- Convert Digital Radars to IP Formats
- Convert Analog Radars to IP Formats
- Multilaterate Beacon Returns to a High Precision IP Radar Format
What we do - Capabilities

Step 2 - Sensor Optimization and Communication Gateways

- Management of All Sensor Sources
- All radars have different characteristics
  - Clutter Reduction, Geo Filtering
  - Optimizing each sensor to the requirements of the application

Before

After

Step 1 - Distributed Message Processing

Detect the Difference
What we do - Capabilities

Step 3 - Multi-Sensor Fusion

- Taking the information from **ALL** relevant sensors to produce the best possible air picture
- Better accuracies
- Higher Update rates

Step 2 - Clutter Reduction and Sensor Management

Step 1 - Distributed Message Processing
What we do - Capabilities

Step 4 - Data Processing
- Putting real-time and non-realtime data in a modern database
- Producing web pages of distilled information for decision support
- Can be used to create usage reports and analysis for airspace usage

Step 1 - Distributed Message Processing

Step 2 - Clutter Reduction and Sensor Management
CGW and SSDP

Step 3 - True Plot Level Fusion

Command and Maintenance Console Plus Advisory Display

Multi-Sensor Fusion

Non-Real Time Data
- Flight Plans
- Weather
- Geography
- Approach Plans

Detect the Difference
What we do - Capabilities

Step 5 - Interfacing into existing systems

- Translating Digital Data to existing digital systems
- Synthesizing Analog Video for analog displays

Step 1 - Distributed Message Processing

Step 2 - Clutter Reduction and Sensor Management

Step 3 - True Plot Level Fusion

Step 4 - Data Processing and Web Based Distributed Decision Support Tools

Detect the Difference
What we do - Capabilities

Step 1 - Distributed Message Processing

Step 2 - Clutter Reduction and Sensor Management

Step 3 - True Plot Level Fusion

Step 4 - Data Processing and Web Based Distributed Decision Support Tools

Step 6 - Wireless Links

- TIS-B Broadcast of an Air Picture to planes in the sky and ships at sea
- Experience in Mode S, UAT, Link 16, CEC, and TCN
What we do - Product Level Overview

Step 1 - Distributed Message Processing

Target Data Extractor

Step 2 - Clutter Reduction and Sensor Management

System Interface Unit

Step 3 - True Plot Level Fusion

Central Processing Station

Step 4 - Data Processing and Web Based Distributed Decision Support Tools

Non-Real Time Data
- Flight Plans
- Weather
- Geography
- Approach Plans

Step 5 - Optional Video Generation for Legacy Displays

Step 6 - Wireless Link

CGW and SSDP

Command and Maintenance Console Plus Advisory Display

Multi-Sensor Fusion

Detect the Difference
How we can help

- Fuse Local FAA Sensors of Opportunity to provide better surveillance over the desired coverage area.
- Use Wide-Area Multilateration to enhance sensors to provide GPS like accuracy at a 1 second update rate without any additional aircraft equipage
- Distill and present a broad set of data products to many interested parties via a web enabled decision support tool
- Uplink the air picture via a number of data links