

Key Features

- **Aircrew Situational Awareness**
- **Real time Operating System**
- **Extensive Graphical Interface Tools**
- **Video record and playback**
- **Records data for post mission playback**
- **Real time map server linked with GPS sensor**
- **Compact and upgradeable**



USAF E-9A

Orbital Network Engineering has recently developed a situational awareness system for the U.S. Air Force E-9A Airborne Telemetry Platform Program. The system provides the mission operators with real time command and control of a variety of sensors on the aircraft. The system design utilizes proven ONE ONEuP Server software along with industry standard eXtensible Markup Language (XML).

The final design includes a moving map display with aircraft position information and sea surveillance radar targets overlaid on the map. The operators can also save target tracks and range maps for later missions. Real time displays showing the operators the status of a telemetry phased array was also provided.

The goal of the ONE design team was to build a baseline system which can be easily adapted to other ground, airborne, and sea missions. Providing an interface to operators which has real time characteristics and is easily upgradeable for future mission capabilities was paramount.

As systems increase in complexity and require connections to more and more sensors a situational awareness system which is adaptable to new requirements is critical. The ONE situational awareness architecture is such a design.

The E-9A situational awareness system is the pathfinder to our architecture design. Future implementations will reap the benefits of the E-9A system. ONE is a systems engineering firm which fervently believes in software re-use. The ONEuP server and graphical tools and displays presented to the operator are all hybrids of other customer's designs.



Moving Map Display

ONE Baseline System Overview

ONE is our flagship product architecture, The ONE Universal Portal or ONEuP. The ONEuP is Linux based embedded system providing an open source platform to host dynamic data acquisition and signal processing applications. The system features ram based operation and a pre-emptive scheduler to optimize system reliability and performance.

5000 Series Situational Awareness Systems

The ONEuP provides:

- A pre-emptive Kernel
- Real-time schedulers – multiple
- Multi-threaded applications
- Open distributed architecture based on its embedded Linux OS
- Full network capabilities
- Low-latency task processing
- COTS hardware application cards
- Industry standard interfaces
- Custom application cards



Designed for Legacy and Modern Sensor Systems

At each start-up the system boots from a local compact flash disk, extracts a copy of the Linux real-time OS, then creates a fresh file system in its RAM; consequently, no file system corruptions can occur in the ONEuP! In addition, all configuration data are saved on non-volatile Flash in XML configuration files.

Embedded Linux OS

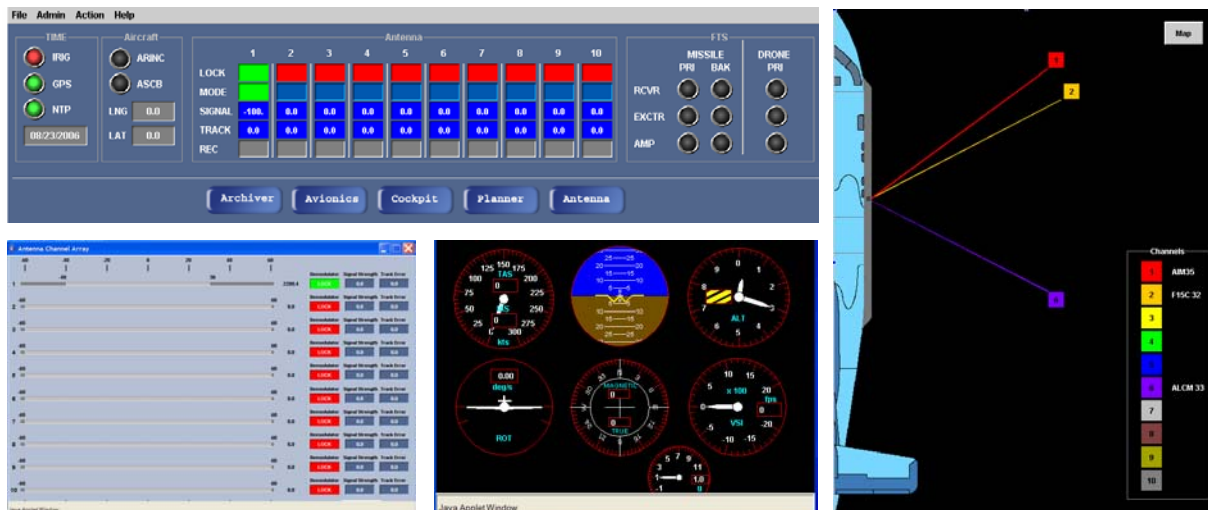
Our embedded Linux OS is a flexible open-source solution that eliminates issues with proprietary license-based software. Drivers for new hardware can be developed as new hardware becomes available and users can develop applications to run in the embedded real-time environment using readily available compilers and software development tools.



GUI and Operator Interfaces

ONE provides local and remote configuration and control of the Telemetry Processor components through Java based GUI's. These may be hosted locally or remotely and are platform independent. They may be viewed in any Java enabled web browser with network access. GUI's for determining and setting performance parameters and storing pre-set configurations is provided.

Typical examples of situational awareness system user interfaces are provided below.



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