

Introducing the ACU-M™

Purpose—General Overview

The purpose of this white paper is to provide a general overview of the new ACU-M™.



Figure 1: ACU-M™ Front View

Product Description

For more than a decade Raytheon has been recognized as the industry leader for radio interoperability solutions. The field-proven ACU interoperability products have become the preferred solutions for first responders due to their ability to interconnect disparate audio devices quickly, easily, and reliably for both tactical and day-to-day operations. This proven technology forms the basis for our new ACU-M interoperability unit, designed specifically for the demands of tactical operations- It's small in size with a control panel that provides a full intuitive control, set up, and diagnostics capability. Weighing less than 3 pounds, the ACU-M is easily deployed and affordably priced, making it ideal for mission-critical interoperability. It is designed to minimize the time necessary to have the system functional, and requires little training. The controls are engineered to be user-friendly and easy to operate.

The feature-rich ACU-M can be fully configured, operated, and monitored by its intuitive control panel. The unit can interface up to four radios, the local operator, and two VoIP channels. Control panel push buttons quickly establish interoperability nets among any or all of these interfaces. LEDs show connection status, as well as the receive and transmit status of all interfaces. This facilitates the quick establishment of interoperable communications, incident command and situational awareness. A speaker and a handset with a PTT switch are provided as the local operator interface.

Built on the proven ACU-1000 technology, the ACU-M is small enough to be used in almost any application. It can be installed in a vehicle or transported in the optional rugged foam-lined case which includes batteries & charger. The unit can be powered by batteries, an automotive +12V source, or the AC adapter provided. Its small size, light weight, and low power requirements make it the ultimate portable interoperability package.

Two versions are available: with or without the network option. This option enables the two VoIP channels, which can be interconnected with any radio ports or with the handset. This option also offers Raytheon's Wide Area Interoperability System (WAIS™) compatibility, network operation, remote diagnostics, and SNMP. The ACU Controller icon-based GUI control program (provided with both versions) can also be used to monitor and control the ACU-M locally or over an IP network.



Figure 2: ACU-M Rear View

Features

Among the many features built into the new ACU-M are:

- Quick deployment and setup using built in radio configuration templates
- Four DB-15 ports for connections to radios
- Compatible with any existing ACU-1000 radio interface cables
- Voice prompts (English standard)
- Local Operator can monitor any or all interfaces
- Usable for any frequency band, VHF, UHF, 800 MHz, Nextel, P25, etc.
- LCD and LED displays that provide connection status and diagnostics
 - Current Net status
 - Monitor status
 - COR, PTT, Signal, and Network Link LEDs
- Balanced or unbalanced audio input, 600Ω or 47kΩ, -26 to +12 dBm
- Unbalanced audio output, 600 ohms, -26 to +12 dBm
- Full COR and PTT support
- DB-9 Serial port
- RJ-45 Ethernet port
- RJ-12 Handset port

- Power input +12 VDC, 1 amp max, ½ Amp typical
- Speaker, Volume up/down switches
- VOX, VMR and Hardwired COR support
- TX audio delay, Up to 2.6 seconds
- RX audio delay, Up to 300 milliseconds
- 18 month warranty
- FCC Part 15, CE and TUV compliant

Applications

The quick and easy deployment makes the ACU-M suitable for a multitude of applications:

- Temporary repeater controller
- Located in a remote area and operated by solar or batteries
- First response vehicles
- Hospitals
- Airports
- Power generating facilities
- Sports stadiums
- Fairgrounds
- Cargo ports
- Military bases
- Event security



Figure 3: Typical ACU-M Vehicle Installation

ACU-M Accessories

Included:

- AC to +12 VDC Power Adapter
- Self-Paced Training CD
- Quick Start Guide
- Automotive Lighter Adapter
- ACU Controller Software

Optional:

- Extended Warranty
- Network Capability
- Rugged Foam-Lined Case with Batteries and Charger
- Professional Interoperability System Design Services

Installation

The installation and setup requirements for the new ACU-M are minimal. The necessary components are:

- Up to four radios or other four-wire devices
- Applicable cabling to connect the radios to the ACU-M
- Antennas for the radios (if required)
- +9 to +15 Volt DC Power Source
- Computer to control & monitor via the ACU Controller (If desired, but not required)

Once the radios and cables are connected, the set-up requires only a few simple steps.

- Power up the ACU-M
- For each radio channel connected to the ACU-M
 - Enter the radio manufacturer and model to load set up template
 - Test the audio
 - Make minor adjustments
- The ACU-M is now configured and ready for interoperable communications

Summary

When emergencies occur, reliable on time communications are critical. As responders arrive on scene, they quickly evaluate the situation and determine the needs of the incident. As other mutual aid responders arrive on scene, the need for communications increase. The new ACU-M can be an important component of your total communications interoperability solution. The small size, low weight and easy deployment make it an invaluable tool in your first responder vehicles.

References

Raytheon Engineering Department, Mar 2006

Raytheon Customer Service/ Field Applications Engineering Department, Mar 2006