Radio Internet-Protocol Communications Module (RIC-M)

Presented by

Christine Wireless, Inc.

RIC-M Overview

- RIC-M is an external after-market protocol converter: Converts Motorola Conventional ASTRO™ V.24 serial communications into Project 25 standard Internet Protocol.
- RIC-M interoperates with multi-vendor Project 25-capable Dispatch Consoles.
- RIC-M can also connect with another RIC-M over IP without a Dispatch Console (autonomous mode).
- RIC-M handles analog, digital voice (encrypted and unencrypted), Packet Data, TSBKs as well as remote control commands.
- RIC-M firmware can be updated remotely over IP.

RIC-M History

- Concept addresses a requirement identified by the Department of Interior Radio Laboratory in Denver Colorado in early 2011.
- Christine Wireless, Inc. wrote a white paper on concept in March 2011.
- Department of Homeland Security Science and Technology Directorate funded initial development effort in November 2011.
- First demonstration of concept at DOI Radio Lab in August 2012.
- Follow-on project funded by DHS in late 2012.
- DHS Operational Field Assessment test at DOI Radio Lab in November 2013.
- Final Delivery of design (Tier 1 IPR) to DHS in December 2013-Intellectual Property Rights (IPR) owned by DHS.
- March 2015 Christine Wireless, Inc. receives license agreement under a CRADA for manufacture and sale of RIC-M from DHS.
- DHS RIC-M demonstration at IWCE in March 2015.
- July 2015 Avtec, Inc. receives license agreement under a CRADA for manufacture and sale of RIC-M from DHS.
- DHS RIC-M demonstration at APCO in August 2015.

RIC-M Applications

- Elimination of expensive and hard to get copper telephone circuits to interconnect Conventional Motorola ASTRO™ system elements.
- Allow addition of non-Motorola base stations (e.g. Codan, ICOM) and other equipment into a Conventional Motorola ASTRO™ system.
- Re-location of elements of a Conventional Motorola ASTRO™ system to diverse locations using IP connections.
- Use non-Motorola Dispatch Consoles with a Conventional Motorola ASTRO™ system.
- Dispatch consoles from Avtec, Catalyst, Telex-Bosch, Moducom and Zetron
- Applicable Products: Quantar™, GTR-8000™, PDR-3500™, ASTRO-TAC 3000™, and DIU-3000™.

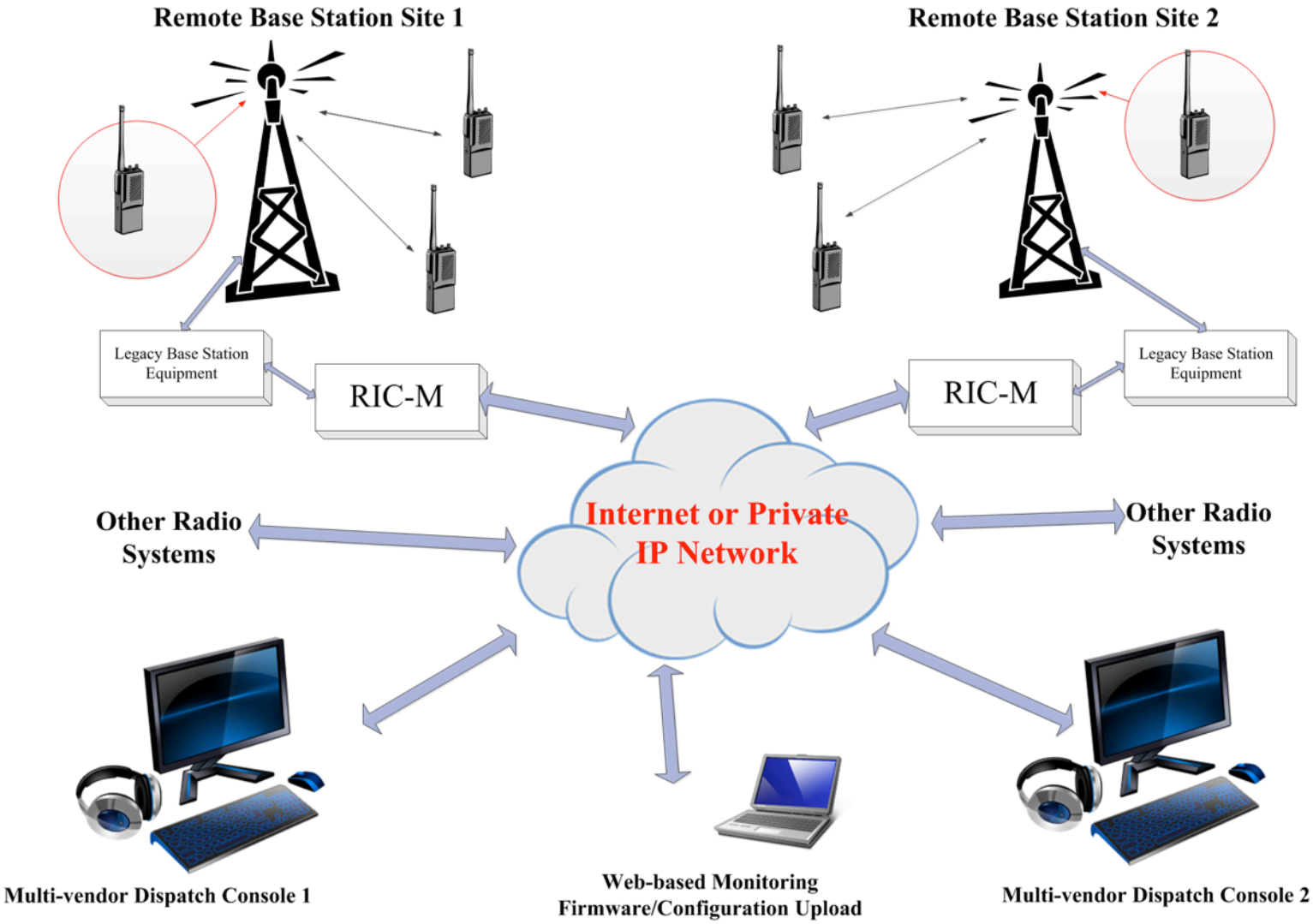
RIC-M Capabilities

- Digital Project 25 voice (Encrypted and unencrypted)
- Analog Voice (4 wire E&M)
- Confirmed and Unconfirmed Project 25 data including Over-the-Air-Rekey (OTAR)
- Virtual Com port for remote Radio Service Software (RSS) application via Internet Protocol
- Remote Control of connected equipment
- Conventional Control and Signaling (TSBKs)
- Authenticated Remote Firmware Update via Internet Protocol
- Connects to Conventional Motorola ASTRO™ system elements with and without V.24 board.
- Interconnects via Internet, private intranet, satellite, cellular and Virtual Private Networks.
- Web-based (browser) setup and monitoring

Project 25 TIA Standards

- RIC-M is compliant with the Project 25 TIA-102.BAHA published standard.
- RIC-M also incorporates Project 25 TIA Draft Standards for:
  - Packet Data
  - TIA-102.BAHA-A

RIC-M Network Application



RIC-M External Connections

RIC-M External Connections

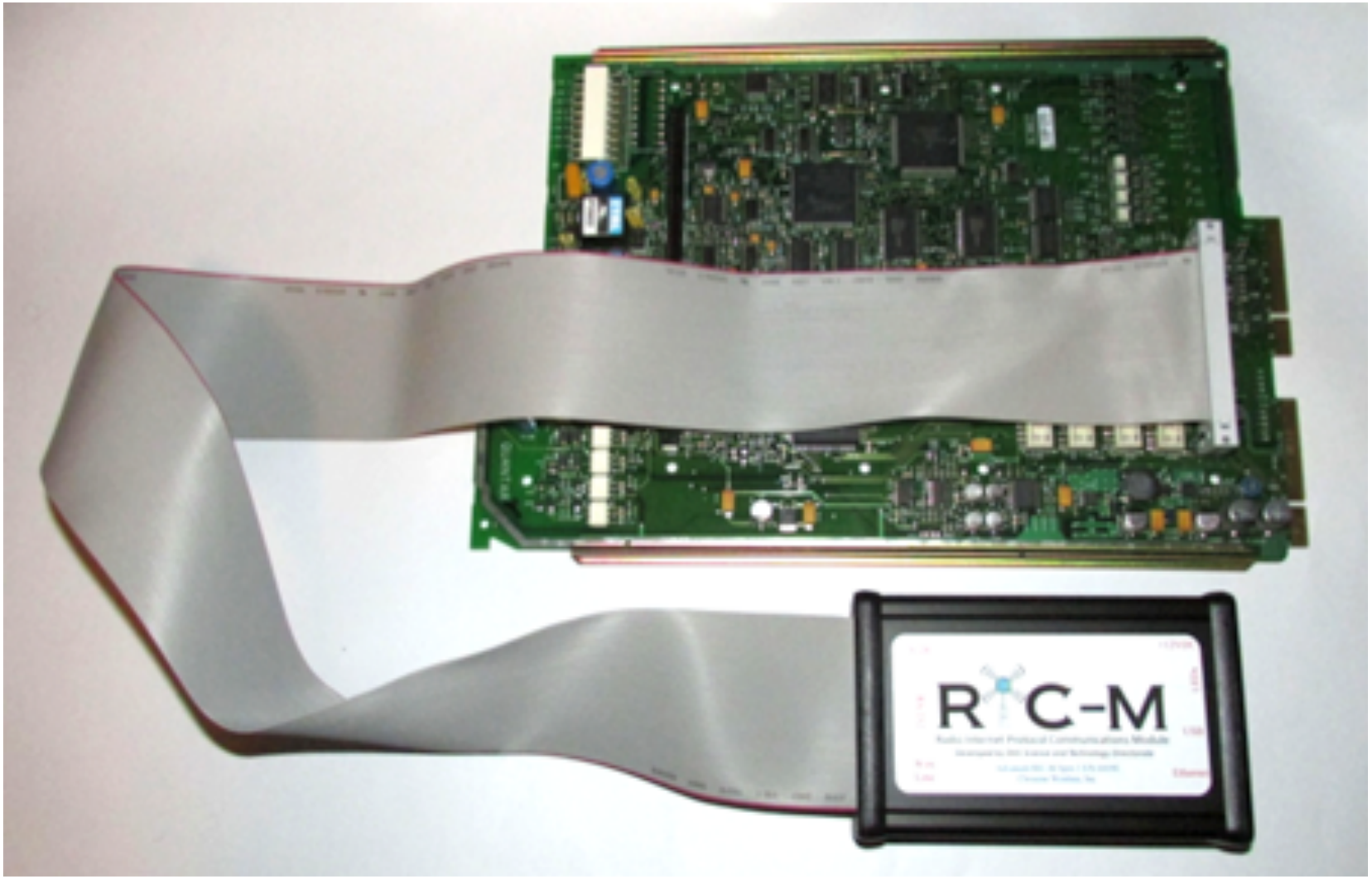
V.24 Legacy Base Station Interface

RS-232 Debug Input/Output
(also RSS connection for Virtual Com Port)

4 Wire E&M Wireline Connection (RJ-45)

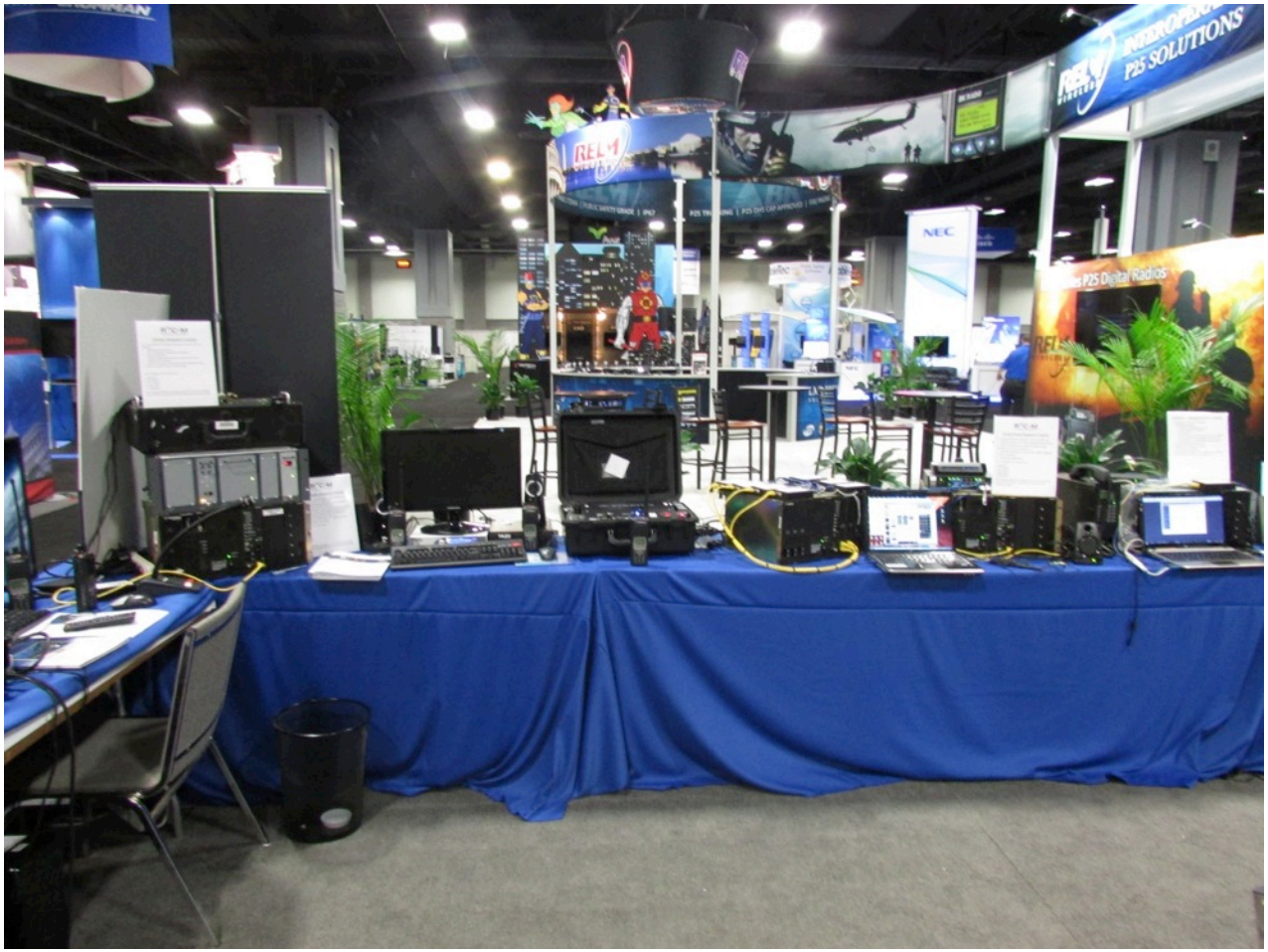
Clearance for routing Direct Wire Line 50 pin ribbon cable

RIC-M Direct Connection without V.24 Board



PDR-3500™/Codan Base Station/ Zetron Console with RIC-M

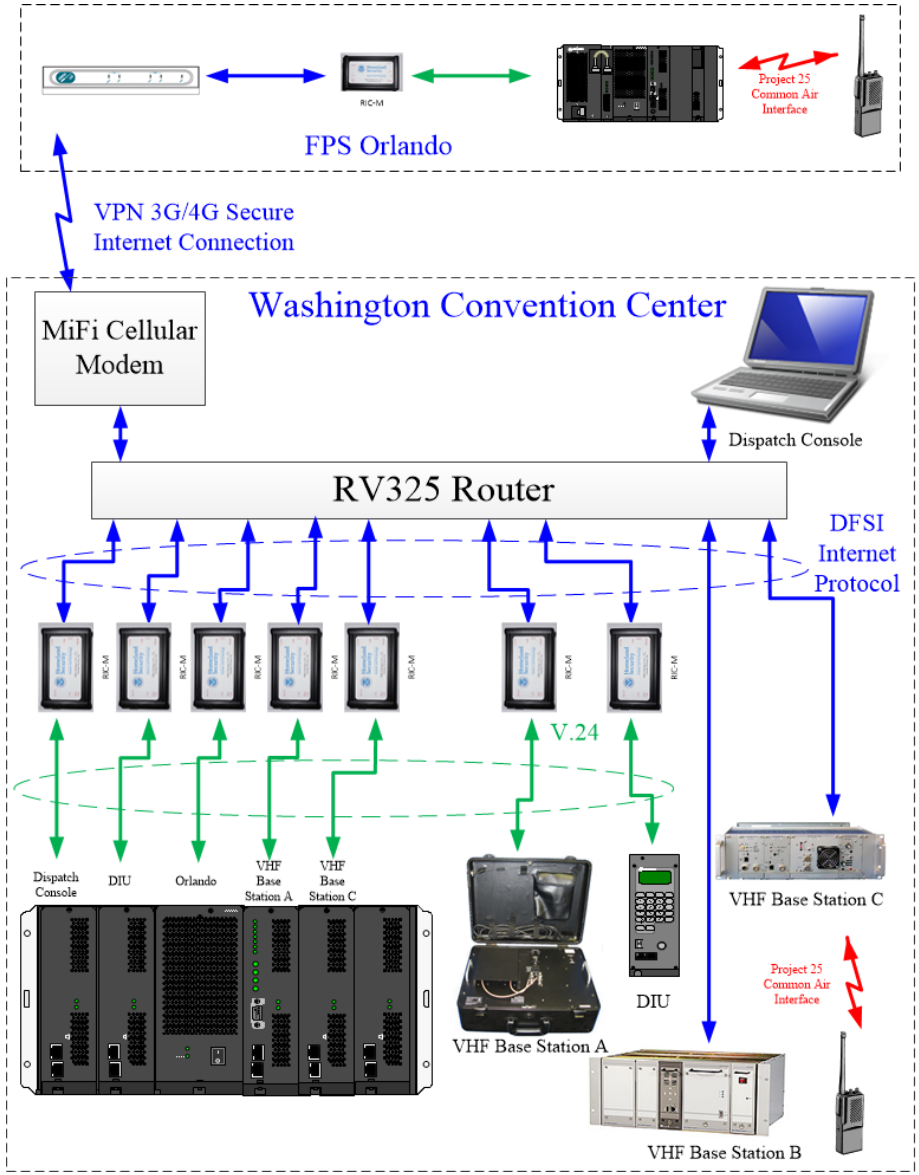
Quantar™/Codan Base Station/Telex-Bosch Dispatch Console/RIC-M



PDR-3500™/ICOM Base Station/Catalyst Dispatch Console/RIC-M

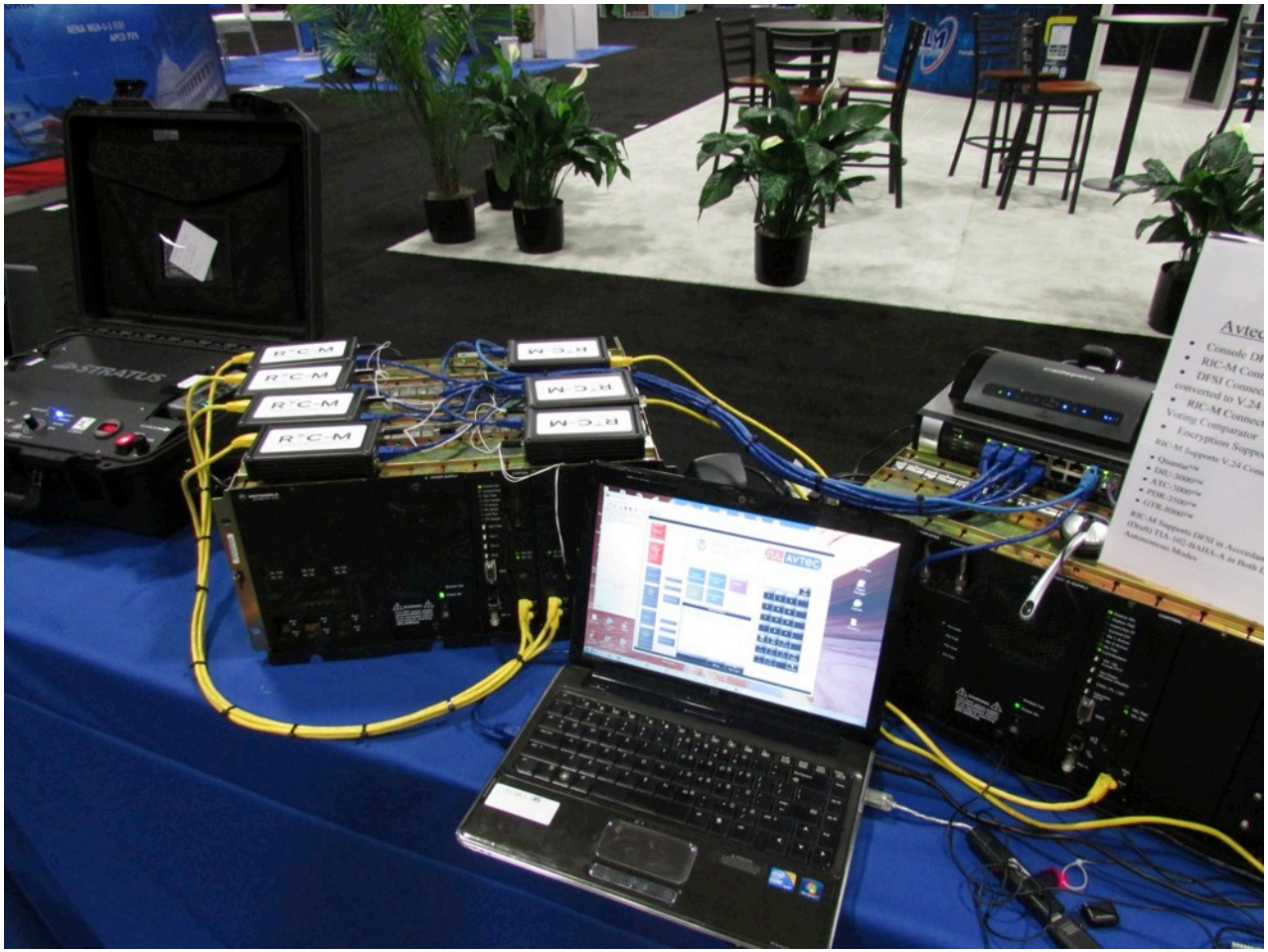
Quantar™/ICOM Base Station/Moducom Dispatch Console/RIC-M

APCO 2015 Main Demonstration Table



ATC-3000/Quantar™/Codan Base Station/ Avtec Dispatch Console/7-RIC-Ms

Close-up of Previous Configuration



RIC-M Testing

- Federal Agencies: US Marshals Service, FBI, FPS, CBP, etc.
- Department of Interior Radio Laboratory
- Dispatch Console Manufacturers
- DHS Test Report: http://www.firstresponder.gov/TechnologyDocuments/Conventional%20Fixed%20Station%20Interface%20Operational%20Field%20Assessment.pdf

RIC-M Availability

- Christine Wireless, Inc. currently with access to the DHS TACCOM contract via ACG Systems in Annapolis Maryland.
- Avtec, Inc. later this year.
- Potentially other US and International supply sources in future.

Web Resources

- www.christinewireless.com
- https://www.acgsys.com/product/ric-m-radio-ipcommunications-module/
- http://www.firstresponder.gov/TechnologyDocuments/Conventional%20Fixed%20Station%20Interface%20Operational%20Field%20Assessment.pdf
- http://www.dhs.gov/science-and-technology/can-you-hear-me-now

Tactical Key Management Device

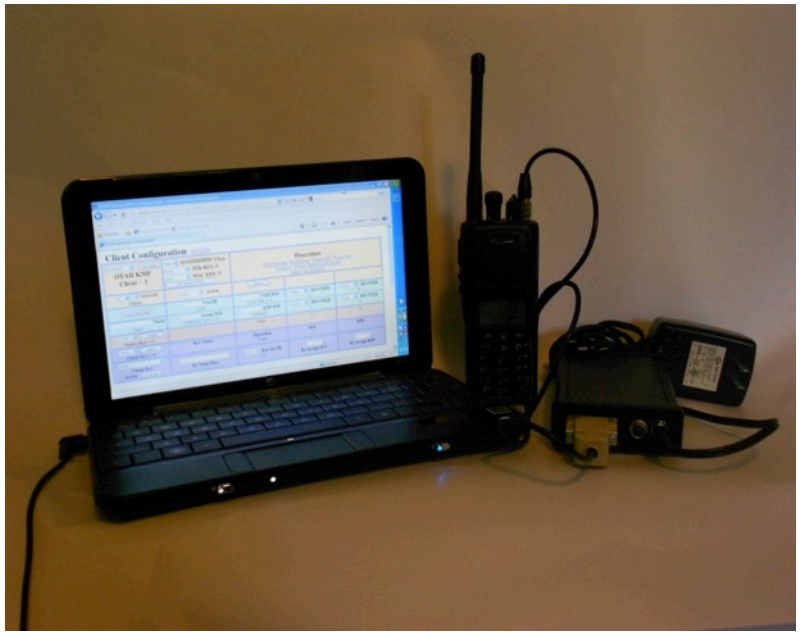
- Incorporates all RIC-M capabilities: Uses same hardware platform and underlying firmware-Adds OTAR/Key Fill application layer
- Acts like a Key Management Facility (KMF) or OTAR-Capable Portable (allowing rekey from Motorola or other KMF)
- Key Loads any radio compliant with TIA Project 25 Key Fill Standard
- Accepts Key Fill from standards-compliant device including KVL-3000+/KVL-4000
- Uses a portable/mobile radio or Motorola Base Station to transmit and receive OTAR Data Messages
- PC via Ethernet and web pages for control and display

Tactical Key Management Device

- Supports up to 500 individual subscribers/ 11 Rekey Groups- autonomous updates
- Full confirmed data OTAR for Individual Rekey operations ; Unconfirmed data for Group Rekey operations-Automatic subscriber key update on OTAR channel registration
- Secure sharing of updated subscriber data base with other networked TKMDs
- Secure Upload of Key Database via IP
- AES/DES Key Fill and OTAR Testing Successful :
  - Motorola XTS-5000/APX-7000
  - ICOM
  - Harris Unity
  - Relm
  - EFJ Viking
  - Thales Liberty
  - Midland

Tactical Key Management Device Base Station Options

Quantar™, PDR-3500 or GTR-8000



Portable or Mobile Radio

The Tactical Key Management Device provides a low-cost OTAR implementation for small and stand-alone networks