



An Innovative Approach to a Costly Radio Training Problem

IITSEC 2014 Innovation Showcase

+ The Challenge

A new radio for the Australian Army

- How to train an entire army on a new digital radio
- Couldn't use real radios for a number of reasons
 - Cost, availability and security
- More than PowerPoint and 3D models (not CBD)
- Accessible & available to everyone
- Cover basic radio operations through to intermediate & advanced features
- Simulate realistic radio communications as well





A Background in Radio

Comms Net Radio Simulator (CNR-Sim)

Commercial In Confidence

+ Background in Radio

Calytrix is the developer of CNR-Sim

- Comm Net Radio (CNR) is a family of virtual radio tools
- Enterprise users include the ADF, US Army, USMC, Swedish etc.
- Commonly used in the Virtual world



+ CNR Building Blocks

Core	Advanced	Hardware
 CNR-Sim Advanced Radio Simulator	 CNR-Effects Physics-based radio propagation	 CNR-Sidetone Audio processor
 CNR-Log Capture, save and replay all traffic	 CNR-Skins Touch screen faceplates	 CNR-Live Connects Live and Simulated Radios
 CNR-Monitor Capture, save and replay all traffic	 CNR-SDK Access CNR via the API	 CNR-Intercom A hardware based intercom

+ Making the Leap

CNR; Often heard but almost never seen

- CNR is most commonly used behind the scenes – VBS, Steel Beasts etc.
- CNR is a powerful radio simulator but wasn't a radio training tool
- BUT, we had all the building blocks





CNR Desk Top Training System

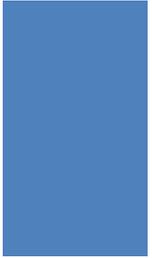
Innovative Approach to a Costly Training Problem

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Requirements for CNR DTTS

Full spectrum solution to meet the ADF's radio training



- Training Objectives
 - Introduction into service (IIS) training
 - Basic radio training – Radio functionality and RATEL procedures
- Technical Requirements:
 - Detailed interface that would emulate radio operations
 - Integrate with traditional/existing training material
 - Allow students to communicate (talk) with each other
 - Instructor control and AAR
 - Integrate with real radios when available
- For a fraction of the cost of real radios

+ Started with a new Skin

A new level of fidelity



+ Multiple Views

Front, back and center





Deep Feature Set to Support IIS

Ergonomics of the radio user interface

- Realistic timings
- Startup, self-tests etc
- Channel management
- GPS acquisition
- Crypto fills
- Clone modes
- Mission Planning
- Display brightness
- "Old man" mode
- Beacon mode
- Zero eyes
- Etc



+ Integrated Training Course

Same teaching material for real and simulated radios

The image shows a simulated radio interface with several overlaid training documents. The radio interface includes a display screen, a keypad, and a status bar. The display shows: R BAT [] VULOS [] PT [] 04-BEACON [] LOS VOC FM [] TYPE TRF MOD CHAM KEY. The keypad has buttons for 1 ABC CALL, 2 DEF LT, 3 GHI MODE, CLR, 4 JKL, 5 MNO ZERO, 6 POR, ENT, 7 STU OPT, 8 VWX PGM, 9 YZ?, + PRE, and 0. The status bar shows Mute, VOX, View, Help (highlighted with a red box), More, CNRSkins@sh, 1-1-1-47241, null, Hz 90.000 MHz, and Blue Team. Overlaid documents include: 1. A 'calytrix' logo and 'Basic AN/PRC-152 Welcome' screen. 2. A 'Configuration' document titled 'Options Menu Modes Overview' listing: T/PT key gives access to: LOCK KEYPAD, RADIO OPTIONS, VULOS OPTIONS, TX POWER OPTIONS, SYSTEM CLOCK, BATTERY INFORMATION, MISSION PLAN, TEST OPTIONS, RADIO LOCK, and VIEW KEY INFO. 3. An 'Introduction' document titled 'What does this mean?' with examples and a diagram showing connections between HARRIS, AN/PRC-152, and Raytheon radios.

+ Desk Top Training System

CNR DDTTS

- Run on any Windows PC or Tablet.
- Allows self paced learning or class based instruction
- Works as a real radio – users can setup channels, crypto fills etc. and talk to each other (not just a CBT).



+ CNR-Live

Because there is no substitute for Hands-On

- CNR-Sim provides unlimited radios over a computer network (VoIP)
- CNR-Live allows real radios to be connected into the training.
- Virtual and real radios work together.
- ADF: Ration 10:1 virtual to real radios



+ Instructor Station

You are being watched

- Configure, manage and listen to all radios
- Introduce faults, sound degradation and basic EW
- Log and replay all communications between radios (live and virtual).



The screenshot displays the CNR-Monitor software interface. The title bar reads "CNR-Monitor" and includes a "Radio" menu, a "Configuration Set" dropdown, and a "Status" button. The main content area is titled "Comms Course 1/14" and is described as "A Configuration Set". It features a "Preset Channels" section with a list of frequencies and names: 30.000 MHz (SIMCON), 33.000 MHz (ERCON), 40.000 MHz (BLUE TOCON), 33.100 MHz (SAFETY), 40.050 MHz (BATTALION), and 40.100 MHz (COMPANY). Below this is a "Radio Profile" section with fields for "Apply Radio Profile" (checked), "Minimum Frequency" (30.000 MHz), "Maximum Frequency" (148.000 MHz), "Channel Spacing" (23.000 kHz), "Power" (5.000 W), and "Crypto System" (PLAIN TEXT - SIMCIPHER V1.0).



ADF End State

400 training seats for the price of 30 real radios





The Future of Radio Training

Available training for Less money

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+ Analogy

Why are weapons training systems (WTTS) so prevalent

- Availability

Shot any time without live-range restrictions

- Access to Equipment

Unlike real weapons and ammunition, simulated firearms come with less restrictions

- Cost / Time

No more queuing to sign weapons in and out, traveling to and from the range or cleaning equipment.



+ Why CNR DTTS

A new approach to radio training

- Availability

Conduct radio training on any PC

- Access to Equipment

Not reliant on a scarce commodity and there are no security considerations

- Cost

Fraction of the cost of using and maintaining real radios



+ Thank You

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- www.calytrix.com
- www.calytrix.com/products/cnr/usecases/desktop-training.html
- www.youtube.com/user/CalytrixTechnologies

