

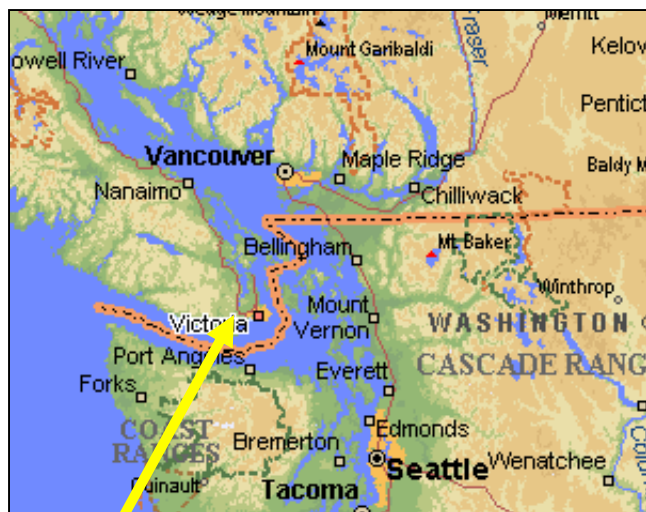
Daniels Electronics Ltd.

- Specialize in Land Mobile Radio (LMR) systems
 - Analog, Aviation and P25 Digital Radios
 - Base Stations and Repeaters only
 - **Active Member of TIA P25 Standards committee**
- Located in Victoria, B.C.
 - Established in 1950
 - 68 Employees
 - Engineering, Manufacturing and Sales & Marketing
 - ISO-9001-2008 Quality Assurance Program
 - Originally made marine radio telephones.
 - \$20 M in sales annually



P25 Trunked Radio

Victoria, BC



CODAN Radio Communications



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Codan LMR Customers



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LMR Customer Base

World Market Breakdown:

- US - 70%
- Canada - 25%
- International - 5%

Key Vertical Markets

Public Safety

Medical
Aviation
Coast Guard
Emergency Management
Fire Fighting
Military
Police
Telecommunications
Transit

Natural Resources

Forestry
Highways
Mining and Exploration Companies
National Parks
Oil and Gas Companies
Railways
Remote Land Management
Utilities

Major Customers

Federal Government

Canadian Coast Guard

Parks Canada

Dept. of National Defense

Industry Canada

RCMP

Fisheries and Oceans

Foreign Affairs

Customs and Border Services Agency

Provincial & Local Governments

BC Forest Service

SK Forest Service

AB MDMRS

Surrey Fire

Victoria Police

AB Forest Service

BC Highways

Delta Fire

Commercial

CN Rail

BC Hydro

Terasen

Trans Canada Pipeline

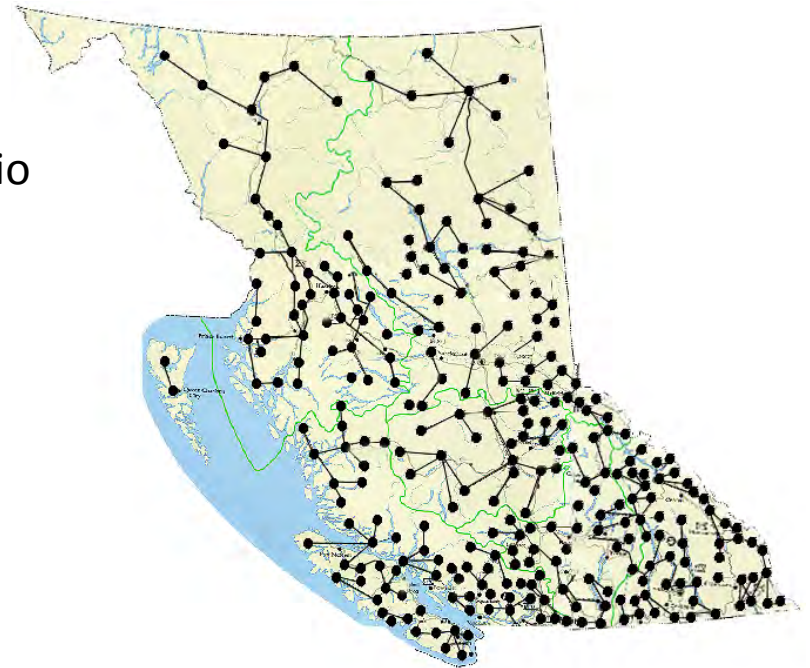
Duke Energy

Fortis

Telus

BC MOF System

- British Columbia
- Forestry Radio System for Fire Protection and Emergency Radio Services
 - 350+ Radio Sites
 - 2-3 Radios per site FM / AM
 - 365,948 Square Miles



Taiwan NFA and CDCC



Communication Solutions



FEMA – 9/11 Disaster Response

Daniels Transportable Repeater used in the 9/11 Search & Rescue recovery effort
Repeaters were installed on the Empire State Building & the USS Enterprise
27 Sites in Total (NY State Bldg., Union Stn. ...)
First Response
Urban Search and Rescue Teams

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Communication Solutions



Columbine, Colorado

With 46 separate agencies responding it was inevitable that they would be operating different emergency radio channels and in different parts of the radio spectrum

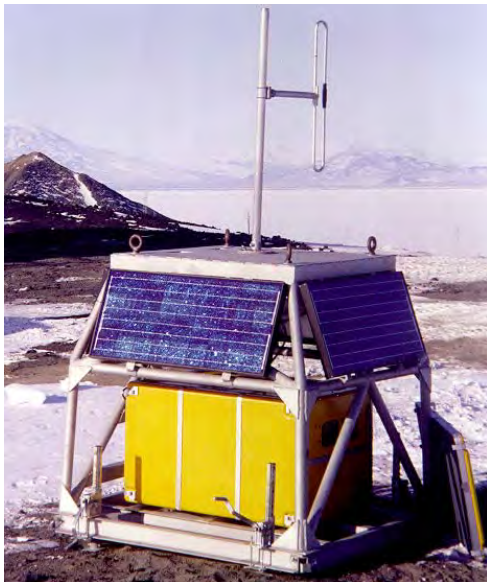
Daniels provided equipment to the Denver Fire Department that was crucial in enabling interagency communications

Communication Solutions

Antarctica

Deployed in 1993 on the Ross Ice Shelf, this transportable station provides VHF coverage for scientists at McMurdo Station.

Scientists depend on the repeater for their safety. The low temperatures faced by the repeater are the perfect climate for a Daniels Repeater!



Communication Solutions

Bradley International Airport

De-icing crews at the Hartford, CT airport were forced to carry walkie-talkies, one AM for aircraft coms and one VHF FM for regular terminal use.

A Daniels VHF AM-VHF FM crossband repeater was installed which allows the crews to carry a single VHF FM handheld. When they change to channel two the crossband repeater repeats the message on the AM channel for the aircraft.



Communication Solutions

Alameda County, California

When responding to any type of major incidents, first responders in Alameda County had a problem communicating with each other due to different agencies on different bands. The solution: Provide deployable crossband repeaters that covered all 5 bands in use in the County. Each system contained a 30W Lowband, VHF, UHF, T-Band and 800 MHz repeater. All repeaters are crossbanded with the other repeaters allowing for a single point of contact across all the bands.

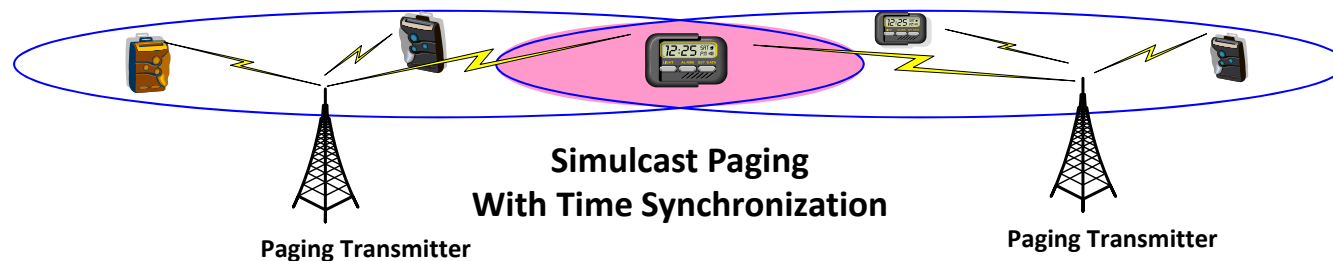


Communication Solutions

Peel Regional Police Simulcast Paging System

Peel Regional Police required a 6 site simulcast paging system. Daniels Electronics provided the VHF paging stations fully integrated with a Zetron control system and a GPS Simulcast high-stability reference with time stamping system.

The system continues to be an integral part of the communication system for the Police Department



**Peel Regional
Police**
A Safer Community

Axys Buoys

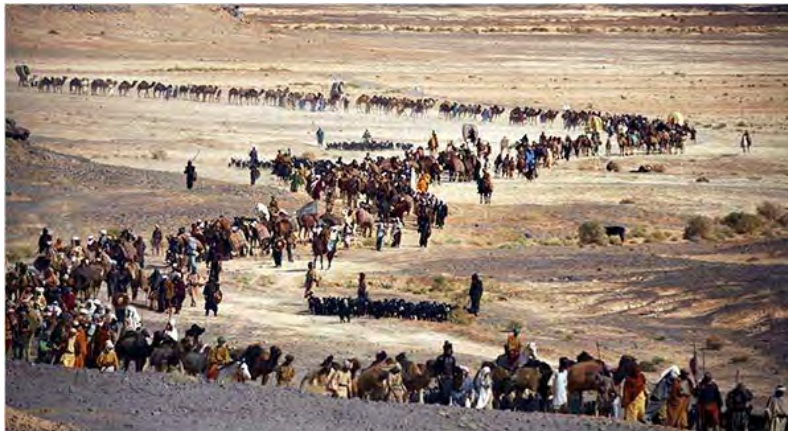
- AXYS Technologies Inc. is Canadian company with over 30 years experience in the design, manufacture and installation of remote environmental monitoring systems worldwide. AXYS applies its extensive knowledge and experience to marine, freshwater, land-based monitoring stations, and offshore wind resource assessment systems that measure aquatic, oceanic and atmospheric parameters



Success Stories & Opportunities

Saudi Arabia – Red Crescent Authority

- Using helicopters to monitor incidents
- Ground crew on UHF
- Choppers on VHF AM
- Daniels crossband UHF/VHF AM stations provide communications between ground crew and aircraft



Success Stories & Opportunities



PIRATES!!!

- Canadian Navy boards pirate ships in the Red Sea. Using the ET-5 to provide communications for boarding party on-board, as well as comm's back to ship and support aircraft



Codan LMR Differentiators



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Designed for Reliability

- A typical site for a Daniels radio:
 - Remote Radio Site
 - Harsh Environment
 - Helicopter Access only
 - Solar / Battery Site
 - VHF / UHF Radio System
 - Rapid Hot swappable modules
 - Optional redundancy
 - Temperature ranges -40°C (shown) to $+60^{\circ}\text{C}$ (not shown)



Differentiators

- Low Power – Solar / Battery
- Transportable Solutions
- Rugged and Reliable
- Modular and Customizable
 - Crossbanding
 - Interoperability
- Specialized
 - Paging
 - Lowband
 - Aviation band (air to ground)



**You're here.
Ready to respond?**

Daniels transportable repeater systems provide a complete temporary radio site. Set up in just minutes!

- > Long operational battery life
- > Rapid deployment
- > Full P25 encryption
- > Stealth & Tactical Packaging
- > Supports all frequency bands + crossbanding

1. Collapsible Antenna Tripod Mast
2. Transportable Repeater
3. 60 Watt Solar Panel
4. 35 Ah Battery Kit
5. Solar Case and Regulator



DANIELS™
ELECTRONICS LTD.

www.danelec.com
800.664.4066 or 250.382.8268
sales@danelec.com



MT-4E LMR Radio Platform



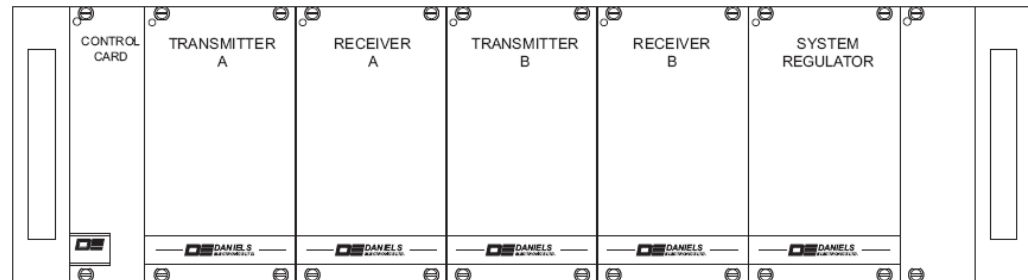
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Flexibility through



Transmitter and Receiver slots are completely independent of each other.

Any band may populate any slot

Control Card, System Regulator and supporting equipment determine functionality of system

Common Features of Daniels System

- Low power, 12VDC operation
- All modules are hot-swappable
- Motherboard on Subrack provides analog audio and power bus
- Core building block of ALL systems... Analog or Digital

MT-3 Analog Systems

- TX/RX modules available in the 29-50MHz Lowband and 118-136MHz AM band
- ALL interconnections between modules go through the Subrack
- Can be crossbanded to MT-3 or MT-4E bands



MT-4E Analog/P25 Systems

- Bands Available:
 - 136-172 MHz
 - 380-520 MHz
 - 768-824 MHz, 851-869 MHz
 - 890 – 960 MHz
- Software Programmed
- P25 is just a firmware upgrade
- Interconnections may be via Subrack/Front Panel LVDS or both

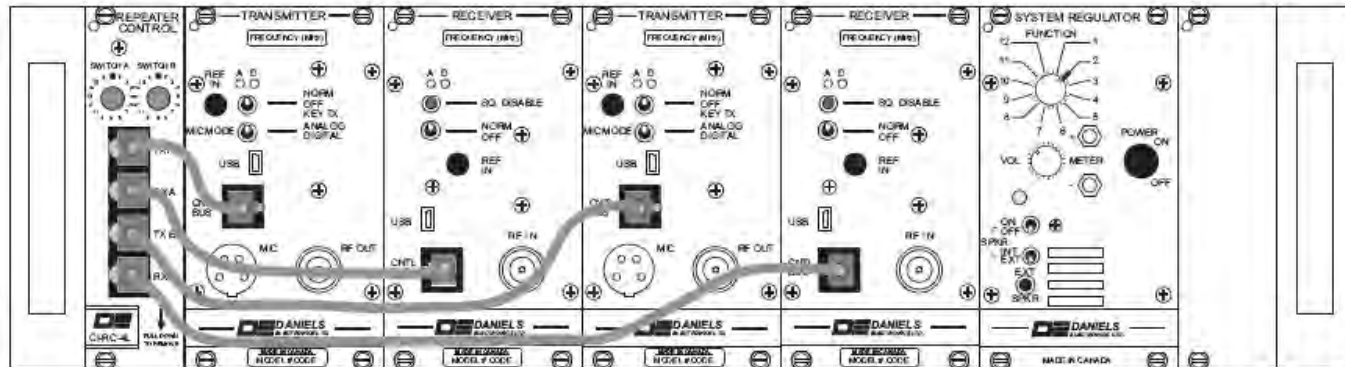


MT-4E



- Our latest generation radio platform
- Compatible with MT-3 and MT-4 systems
- Used for Repeater, Base Station and Trunked applications
- Firmware upgrade enables P25 now or in the future
- Shipping now in VHF, UHF, T-band and 700 / 800 MHz
- Optional AES or DES compliant encryption modules
- Software programmable
- Available with Class A or Class B Receivers (more details below)
- Tunable over entire VHF band or 2 sub bands in UHF and 800
- USB plug for programming and firmware upgrades

Building a basic system...

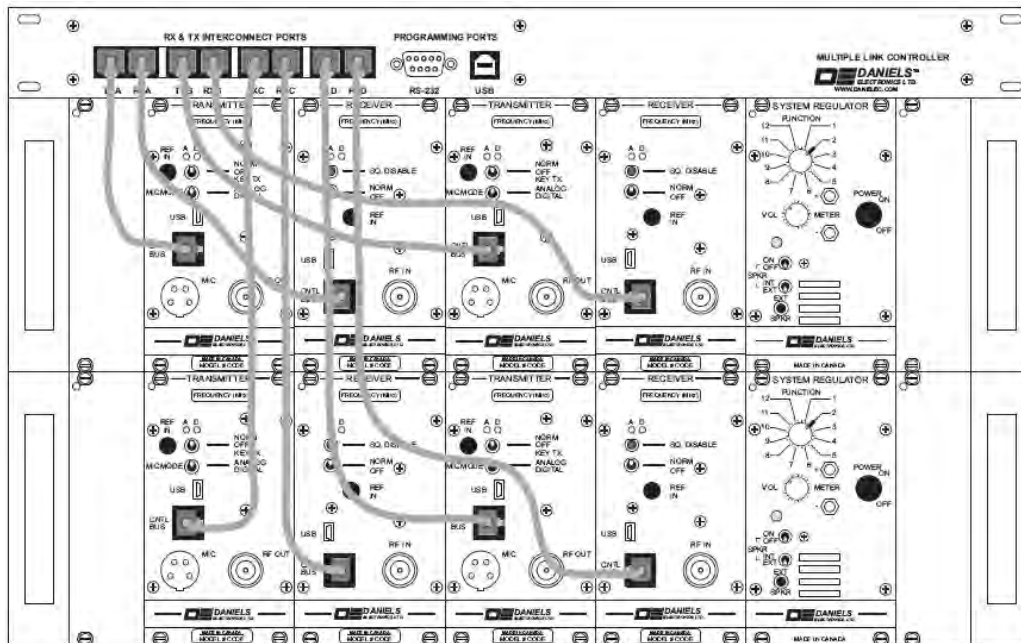


Functionality of the system typically resides inside the control card
Based on the configuration used in the control card, this system could be:

- Two individual repeaters – Same or different bands
- Crossband repeater
- Repeater/Link

Any of these systems can be either Analog, P25 or Mixed-Mode.

Building a complex system



Functionality for larger, more complex systems, now resides in the external control devices, such as the CI-RC-4M. Some Third Party devices can also be used to create a number of different types of systems, including:

- Voting
- Trunking – Analog and P25
- ROIP
- Paging

Analog Capabilities

- Basic Configurations, including Repeaters and base stations.
- Hybrid systems including crossbanding, remote base station, linking systems, paging
- Voting, simulcast, trunking
- Mix and match

P25 Capabilities

- Basic configurations such as repeaters and base stations
- Hybrid systems including transparent crossbanding for linking or interoperability
- P25 DFSI controlled station
- P25 trunking – Standalone site
- P25 Voting and Simulcast

MT-4E TX Specs TIA 603C

Frequency Band	136 – 174 MHz	406-430 MHz or 450-470 MHz
Channel Spacing	12.5, 15, 25 and 30 KHz	12.5, 15, 25 and 30 KHz
RF Output Power	0.5 – 8.0 Watts adjustable	0.5 – 8.0 Watts adjustable
Duty Cycle	100% continuous duty	100% continuous duty
Undesired Emissions (Conducted Spurious)	<-70 dBc	<-70 dBc
Undesired Emissions (Adjacent Channel Power Ratio (Analog & Digital)	<-70 dBc	<-70 dBc
FM Hum & Noise Ratio (300 Hz – 3.4 KHz)	<- 40 dB	<- 40 dB
Carrier Frequency Stability	+/- 1.0 ppm	+/- 0.5 ppm
Modulation Type (Analog)	11K0F3E (FM) or 16K0F3E (FM)	11K0F3E (FM) or 16K0F3E (FM)
Modulation Type (Digital)	8K10F1E (FM), 8K10F1D (FM), 9K2F1D	8K10F1E (FM), 8K10F1D (FM), 9K2F1D
Operating Temperature	-30°C to +60°C	-30°C to +60°C
Standby Current	<70 mA no encryption <100 mA encryption	<70 mA no encryption <100 mA encryption
FCC ID (Parts 22, 80 & 90)	H4JVT-4E150	H4JUT-4E450

Class A & B TIA 603C



Frequency Band	Class A 136 – 174 MHz 406-430 MHz or 450-470 MHz	Class B 136 – 174 MHz 406-430 MHz or 450-470 MHz
Channel Spacing	12.5, 15, 25 and 30 KHz	12.5, 15, 25 and 30 KHz
Reference Sensitivity (12 dB SINAD)	≤ -118 dBm (0.28 μV)	≤ -118 dBm (0.28 μV)
Reference Sensitivity (5% BER)	≤ -118 dBm (0.28 μV)	≤ -118 dBm (0.28 μV)
Adjacent Channel Rejection (Selectivity)	≥ 45 dB Analog Narrowband ≥ 75 dB Analog Wideband ≥ 60 dB P25 Digital	≥ 40 dB Analog Narrowband ≥ 70 dB Analog Wideband ≥ 60 dB P25 Digital
Spurious Response Rejection	≥ 75 dB Analog ≥ 90 dB P25	≥ 70 dB Analog ≥ 70 dB P25
Intermodulation Rejection	≥ 75 dB Analog ≥ 80 dB P25 Digital	≥ 70 dB Analog ≥ 70 dB P25 Digital
Hum & Noise Ratio	≥ 34 dB Analog Narrowband ≥ 40 dB Analog Wideband	≥ 34 dB Analog Narrowband ≥ 40 dB Analog Wideband
Modulation Type (Analog)	11K0F3E (FM) or 16K0F3E (FM)	11K0F3E (FM) or 16K0F3E (FM)
Modulation Type (Digital)	8K10F1E (FM), 8K10F1D (FM), 9K2F1D	8K10F1E (FM), 8K10F1D (FM), 9K2F1D
Squelch Threshold	-121 to -115 dBm	-121 to -115 dBm
Operating Current (Squelched)	400 mA maximum	105 mA

Current Comparison

Module	Standby (mA)	Transmit (mA)
MT-4 VHF 8 Watt Repeater		
SR-39	3	3
SM-3	3	3
VT-4E	75	1,700
VR-4E	105	105
CI-RC-4L	3.5	3.5
CTCSS Decode Included in RX	0	0
CTCSS Encode Included in TX	0	0
TOTAL	189.5	1,814.5

- Mastr III – RX Only: 2A TX: 2A
- Quantar – RX Only: 3.8A TX: 8A

Frequency Bands Supported

Band	Frequency (MHz)	Analog	P25
Low Band	29-50	Yes	No
VHF AM	118-138	Yes	No
VHF	136-174	Yes	Yes
UHF	380-406	Yes	Yes
UHF	406-470	Yes	Yes
T- Band	470-520	Yes	Yes
700 MHz	764-806	Yes	Yes
800 MHz	806-869	Yes	Yes
900 MHz	896-960	Yes	Linking

Power Saving Mode

- This will be a software selected mode to put parts of the radio into Power Save or Sleep mode.
- Some delay in start up will be expected
- Sellable feature per TX or RX module
- It is expected that we can save 70 mA per system in Standby mode which will approach our current consumption with a MT-2 Crystal radio
- Firmware release in late 2010

TX Programming Screen

Daniels Electronics: MT-4E Transmitter Configuration

File Edit Transmitter Help

Transmitter Global Settings

Frequency Band: 136 - 174 MHz
Unit ID: \$000001
Secure Hardware: Not installed

Hang Time
Duration: Disabled
Courtesy tone: Off

Timeout Options
Timeout 1: 300 sec
Timeout 2: 300 sec

Transmitter Channel Settings

Bank Select: Bank A
Channel: Channel 01
Channel Name: (A01)
Channel Type: Mixed Mode
Frequency: 136 MHz
Timeout Value: Timeout 1

P25 Digital Settings
Network Access Code (NAC): \$293
Talk Group ID: \$0001

Analog Settings
Signaling: CTCSS
Bandwidth: 12.5 kHz
Pre-emphasis: Enabled
CTCSS Tone: 67 Hz
Reverse Burst: Disabled

Read
Program
Service
Tx ID
Channel Matrix
Report
Cancel

Status : Reading.. 78%

RX Programming Screen

Daniels Electronics: MT-4E - Receiver Configuration

File Edit Receiver Help

Receiver Global Settings

Frequency Band: 450 - 470 MHz
Unit ID: \$000001

Base Station
Secure Hardware: Not installed
Monitor Type: Open

Squelch Settings
Threshold: 50
Hysteresis: 25

Receiver Channel Settings

Bank Select: Bank A
Channel Name: (A01)
Channel Type: Mixed Mode


Channel: Channel 01
Frequency: 452.4 MHz
Simplex Unmute Delay: Disabled

P25 Digital Settings
Unmute on: TGID and NAC
Network Access Code: \$F76
Talk Group ID: \$0001

Analog Settings
Squelch Type: DCS
Analog Bandwidth: 25.0 kHz
Audio De-emphasis: Disabled
Subaudible Tones: Don't pass

Squelch Settings
DCS Code: 174
Invert DCS: Normal DCS

Read
Program
Service
Rx ID
Channel Matrix
Report
Cancel

Status : Reading..  72%

Base Control Card

Digital Base Control Card (CI-BC-4E-00)



The P25 base control card is used with the P25 base receiver and transmitter in a MT-4 base station and provides audio routing, COR and PTT routing and front panel control. It can drive an external speaker directly and can select up to 32 programmed channels in each radio module. Selection of encrypted or clear transmission is made from the front panel. As well, a pushbutton is mounted to erase all encryption keys in both radio modules. Separate volume controls are provided for speaker and handset volume.

The base control card includes the following features:

- Jumper selectable audio routing, PTT, and muting.
- Low power analog and CMOS control circuitry.
- True balanced 600 Ω inputs and outputs for external equipment connection.
- Optically isolated inputs and outputs for control by external equipment.
- Front panel control of channel and bank select for receiver and transmitter.
- Front panel selection of clear / secure (encrypted) operation and clear keys operation
- Front panel selection of local or remote control of base station functions.

Digital Repeater Card



The P25 repeater control module is used with a P25 receiver and transmitter system. The repeater control card allows P25 digital or analog signals to pass transparently from the receivers to the transmitters in repeater, crossband, or linked repeater systems.

The P25 repeater control module provides serial data routing, COR-PTT routing, and receiver priority settings for an MT-4 radio system. The repeater control card includes the following features:

- Jumper selectable serial data and COR-PTT routing (repeater configuration).
- Receiver priority setting jumpers for certain configurations (where required).
- Jumpers for disabling serial data and COR-PTT routing on simplex links.
- Optional CTCSS interface board for 1 of 10 CTCSS tone decode selection (used for custom systems only).

Analog Control



The AC-3E Audio Control Card has cross linking audio, audio switching, custom tone signaling and adjustable hang-timers. The E Version has the above features and includes an E & M interface providing 600 Ω RX and TX audio paths with buffered / independent level controls, opto - coupler isolated COR and opto - coupler switched PTT controls. This card allows a remote to seize control of the radio system.

The AC-3E audio control card includes four potentiometers on the front panel for adjusting internal audio levels. Optional CTCSS and frequency select rotary switches can also be mounted on the front panel of the audio control cards, giving easy access to 10 pre-programmed CTCSS tones and 16 pre-programmed receiver and transmitter operating frequencies. Two switches are mounted on the front of the audio control card that can be configured to control CTCSS on / off or repeat disable. Configuration of all switches on the audio control card is set up at the factory at the time of order.

Paging



The CI-PM-3 Paging Interface card supports encoder interfaces for analog and digital paging formats. Both analog and digital paging formats are supported and it can transmit POCSAG, Flex™, Golay, and other 2-level modulation schemes at data transfer rates of 512, 1200, and 2400 Baud. It can also be configured as a data repeater, whereby 2-level paging data is recovered, reshaped and retransmitted to an additional repeater/paging transmitter.

It supports 4-level modulation formats in non-repeater mode only at data transfer rates up to 3200 bps. Each of the four modulation deviation levels can be independently set. The CI-PM-3 Paging Modulator also includes an on-board 0.1-0.35 ppm 10-MHz OCXO and an external connection for higher OCXO stability if a Simulcast system is required. An internal CTCSS encoder/decoder is optional.

System Regulator

The System regulator modules provide voltage regulation, system metering and audio monitoring for the MT-3 or MT-4 Radio System. The System regulator includes a +9.5 VDC high current (5A) voltage regulator with an anti-latch hysteresis circuit. Selected options can include antenna relay drivers, front panel switch selectable meter outputs to check supply voltages, carrier strengths, etc, and audio amplifier and loudspeaker.

A rotary switch on the front panel allows the various functions to be selected for monitoring. Two front panel jacks are provided for monitoring of selected functions. An audio amplifier and loudspeaker allow for audio monitoring. Front panel controls allow for audio volume adjustment and for selecting audio from receivers A or B, or turning the audio circuits off reducing power consumption. A LED indicator illuminates when the audio circuits are on. A front panel switch enables PTT on both transmitters for testing.

Stock Code	Basic Features
SM-3-HO-014-00	Standard SM-3 with no relays or meters (14 HP width)
SM-3-HO-R1N-00	SM-3 with single antenna relay on the front panel (21 HP width)
SM-3-HO-R2N-00	SM-3 with dual antenna relays on the front panel (21 HP width)

A rotary switch on the front panel allows the various functions to be selected for monitoring. Two front panel jacks are provided for monitoring of selected functions. An audio amplifier and loudspeaker allow for audio monitoring. Front panel controls allow for audio volume adjustment and for selecting audio from receivers A or B, or turning the audio circuits off to reduce power consumption. A LED indicator illuminates when the audio circuits are on. A front panel switch enables PTT on both transmitters for testing.



SM-3-HO-014-00

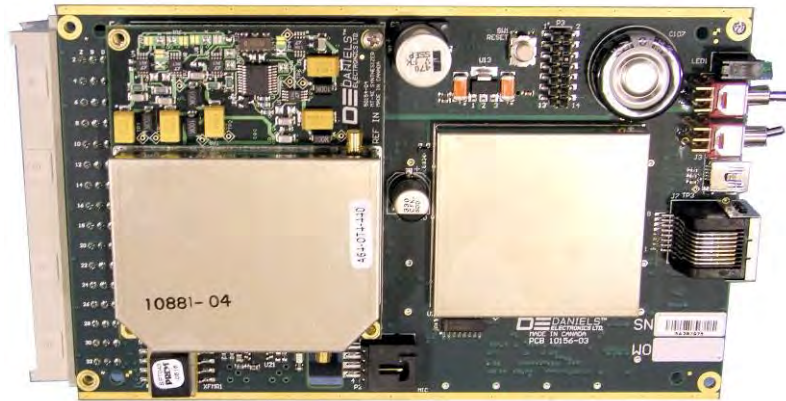


SM-3-HO-R1N-00



SM-3-HO-R2N-00

The Insides



DSP Based
Firmware Driven
Surface Mount Technology

MT-4E

Lowband Base Stations and Repeaters



- Offer a high quality replacement to existing lowband infrastructure in the 29-50 MHz band
- Existing customers looking to move to congested bands, lowband far less congested
- In most cases can replace old equipment on a site by site basis

Lowband Cont'

- Configurations include:
 - Base Stations (most common)
 - Repeaters (Duplexers are challenging)
 - Analog Paging
 - Simulcast
 - Voted receivers
- Most manufacturers have left the Lowband market.

Lowband Cont'

- The Daniels Lowband product line still makes use of the MT-3 platform.
 - Hardware programming
 - 16 Channels
 - 1-3W Power Output
- Daniels offers Lowband Stations in 3W, 20-40W, 100W and 250W outputs.

Applications and Solutions



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Applications

- [Repeater](#)
- [Base Stations](#)
- [Paging](#)
- [Trunking](#)
- [Other Applications](#)
- [Product Deployment Photos](#)
- [Customer Profiles](#)



The following section provides an overview of the range of applications in which Daniels Radio equipment can be used. Both Digital (P25) and analog applications are covered including:

- Repeaters
- Base Stations
- Paging
- Satellite Telephone Interfaces
- Ground to Air, and
- Trunked Radio

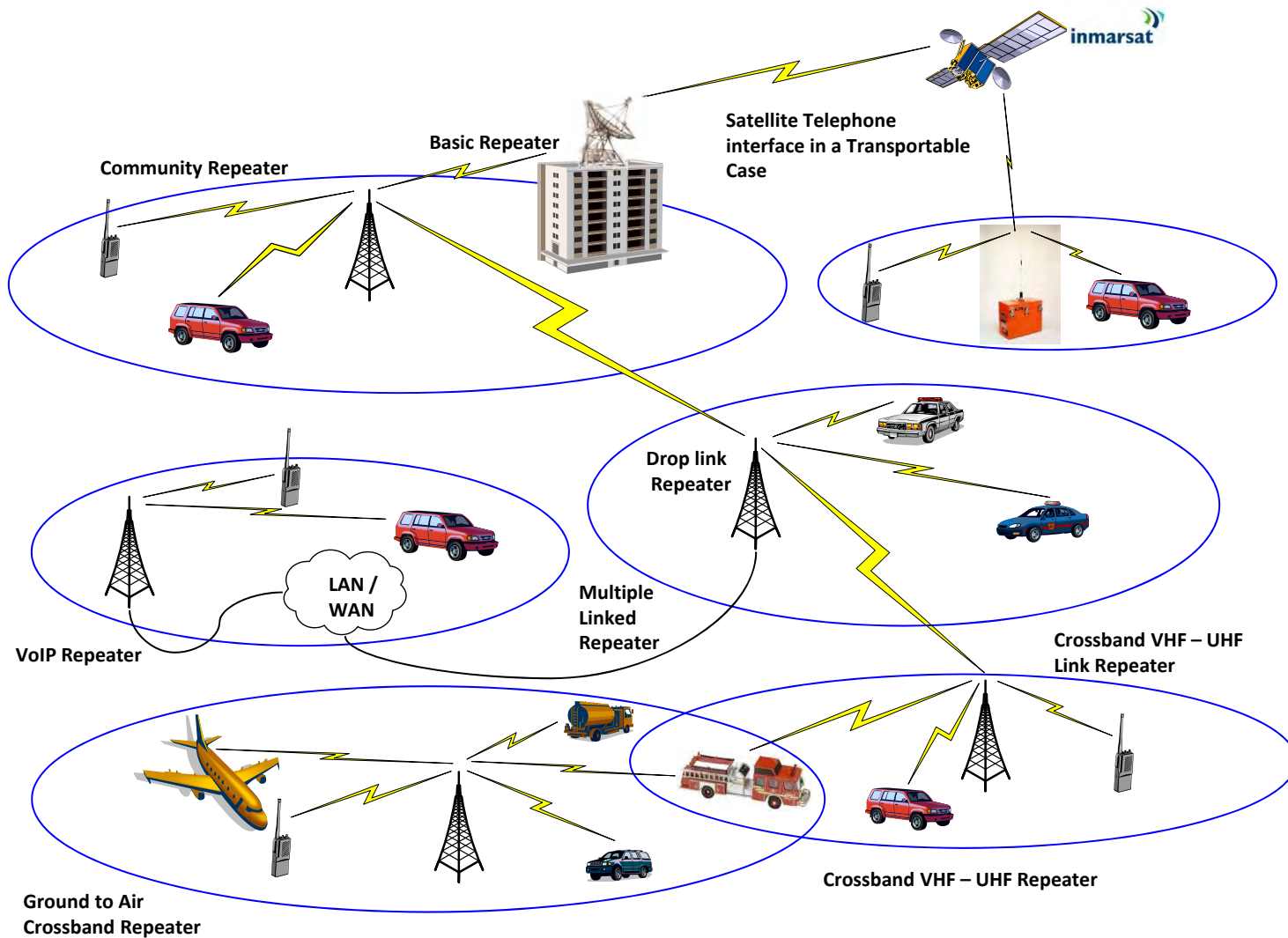
Daniels has developed a family of products that provide flexibility in addressing most applications for Repeaters and Base Stations. We have also developed a number of applications for Paging. The following table details the range of applications we have to offer by frequency.

Repeaters								
Description	Application Note (s)	Analog	P25	29-50 MHz	VHF AM	136-174 MHz	380-520 MHz	768-869 MHz
Basic Repeater System	AN100 AN1600	x	x	x	x	x	x	x
Community Repeater	AN100	x		x		x	x	x
Multiple-Linked Repeater System	AN100 AN300	x	x	x	x	x	x	x
VoIP Linked Repeater Systems	AN350	x	x	x	x	x	x	x
Crossband Repeater System	AN400 AN1600	x	x	x	x	x	x	x
Crossband Link Repeater System	AN410	x	x	x	x	x	x	x
Radio Router	TN651	x	x	x	x	x	x	x
Radio-Satellite Telephone Interface	AN430 AN1600	x	x	x	x	x	x	x

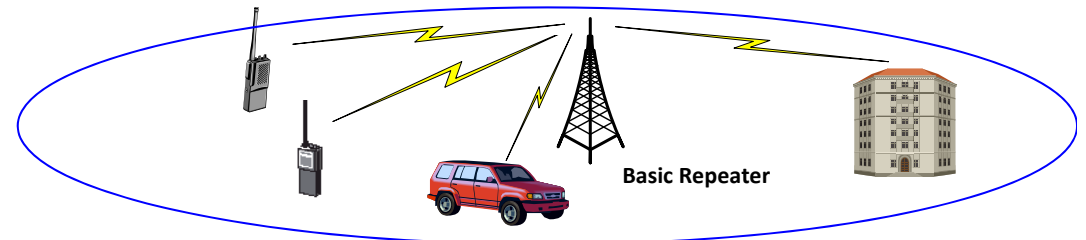
Applications Supported

Description	Analog	P25	29-50 MHz	VHF AM	136-174 MHz	406-520 MHz	806-869 MHz
Repeaters							
Basic Repeater System	x	x	x	x	x	x	x
Community Repeater	x		x		x	x	x
Multiple-Linked Repeater System	x	x	x	x	x	x	x
VoIP Linked Repeater Systems	x	x	x	x	x	x	x
Crossband Repeater System	x	x	x	x	x	x	x
Crossband Link Repeater System	x	x	x	x	x	x	x
Radio Router	x	x	x	x	x	x	x
Radio-Satellite Telephone Interface	x	x	x	x	x	x	x
Ground to Air Crossband System	x	x	x	x	x	x	x
Microwave Backbone	x	x	x	x	x	x	x
Data: 1200/2400 Baud FSK	x	x	x		x	x	x
Base Stations							
Tone or DC Remote Base Station	x	x	x	x	x	x	x
RF Link Controlled Base Station	x	x	x	x	x	x	x
Base Station with Monitor Receiver	x	x	x	x	x	x	x
VoIP P25 Digital Universal Interface	x	x	x	x	x	x	x
Radio Station with Tone Conversion	x	x	x	x	x	x	x
Radio Stations with Channel Selection	x	x	x	x	x	x	x
Secure Encrypted Base Stations		x			x	x	x
Paging							
Simulcast Paging	x		x		x	x	x
Base Station Paging	x		x		x	x	x
Remote Paging	x		x		x	x	x
NTIA Compliant Narrowband Paging	x				x	x	x
Miscellaneous							
Voting	x	x	x		x	x	x
Trunking (5-channel)	x		x		x	x	x

Repeaters



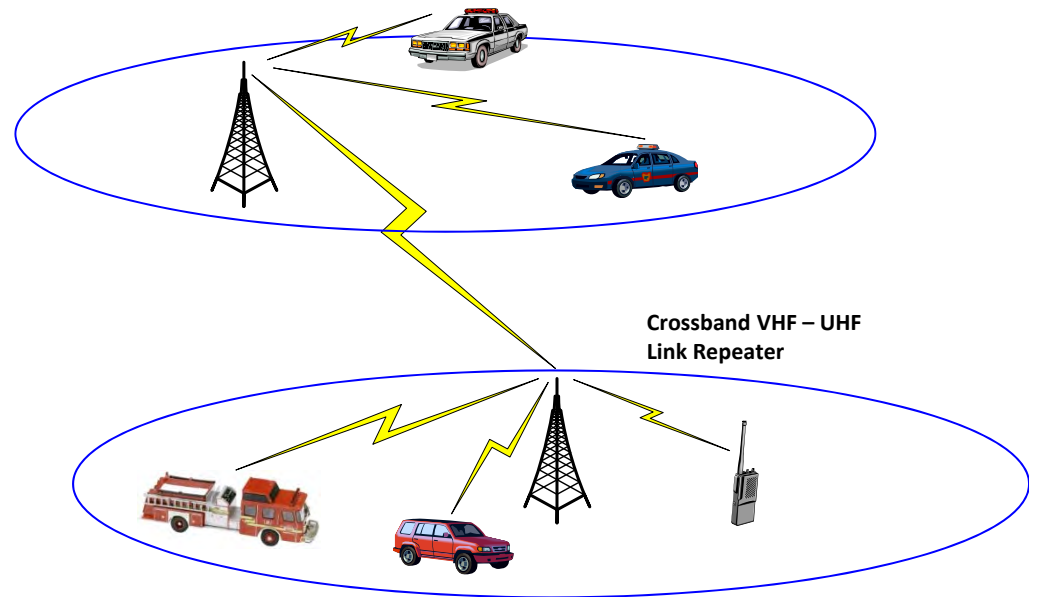
Basic Repeater



FEATURES / OPTIONS:

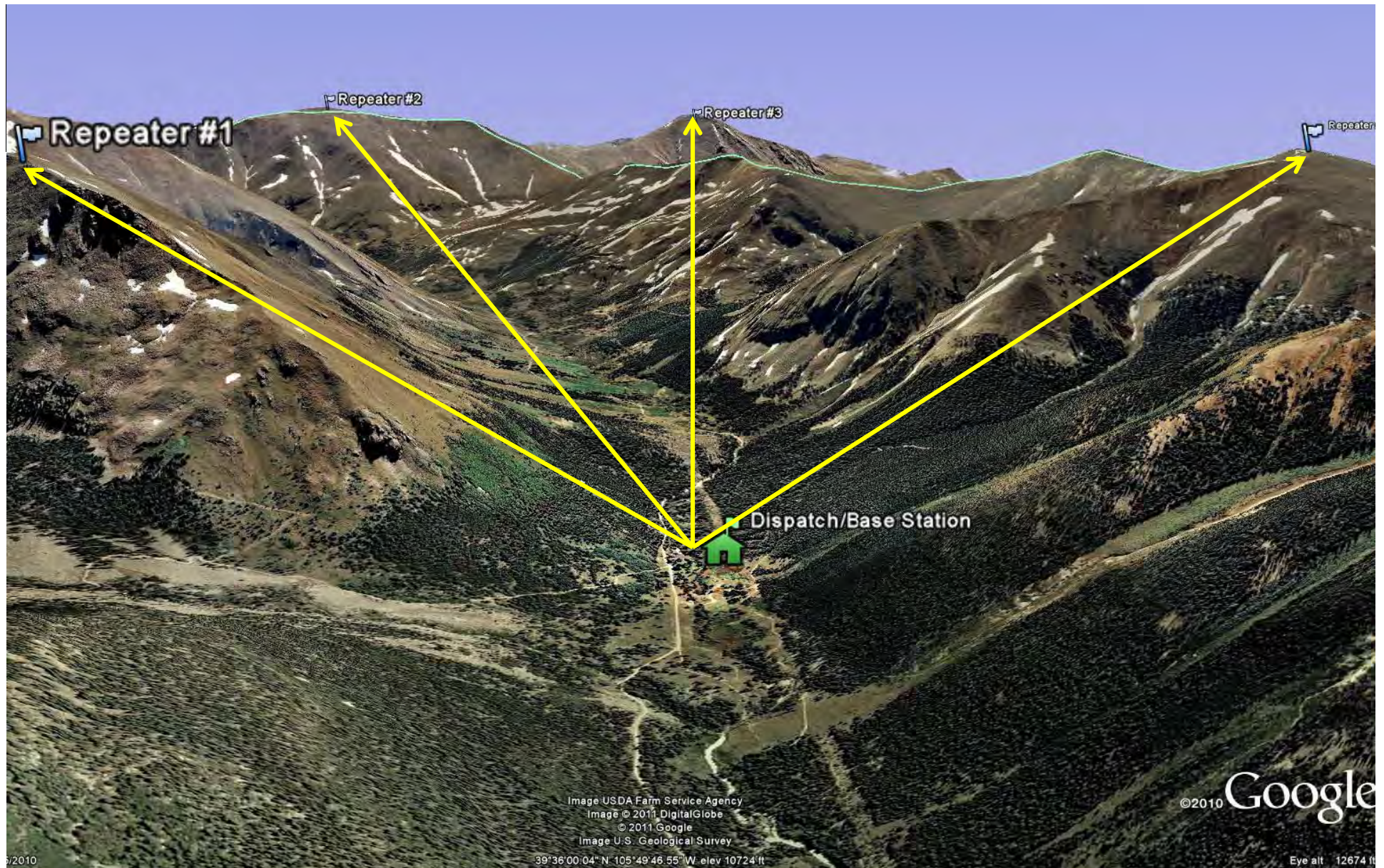
- tone or DC remote controlled repeaters;
- 4 wire E & M microwave interface;
- various RF modules from 29 - 960 MHz. (including 118 - 136 MHz. AM ground to air);
- internal control module or external third party repeater controller;
- optional second, third or fourth transmitter / receiver subracks.

FM Cross band Repeater - Extended Radio Coverage



FEATURES / OPTIONS:

- tone or DC remote controlled repeaters;
- 4 wire E & M (type 2) microwave interface;
- various tone signaling formats to access the local or control the link;
- various RF modules from 29 - 960 MHz. (including 118 - 136 MHz. AM ground to air);
- internal control module or external third party repeater controller;
- antenna relay(s) for simplex operation.



- RF Linking of dispatch to various repeaters through different freqs or NAC codes
- Add multi-channel base capability to repeater sites using CI-RC-4M
- Keep entire chain of communication via encryption, even across multi-bands

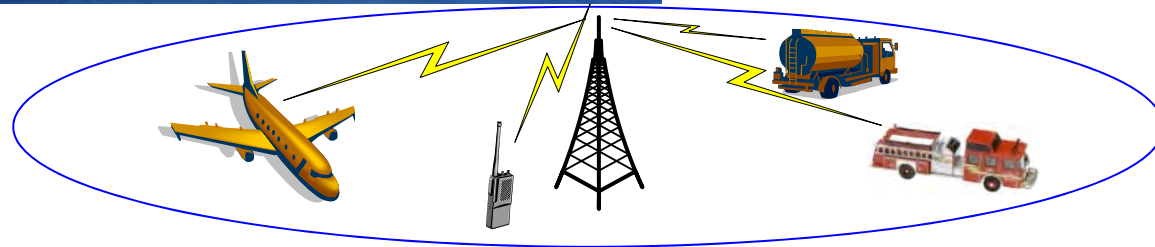
Low Power

- Not just good for solar applications
- Ideal for situations with heat concerns
- Many state and local agencies wanting “green” products
- Battery back-up for public safety can be critical
- When possible, have a low-current spec included in a bid

Format/Band Conversion

- Custom application for agencies wanting to transition from a format or band
- P25 to analog conversion, via mixed-mode and custom wiring can allow a P25 user speak with a non-P25 user. Good transportable application
- Re-banding repeaters, particularly 800 MHz

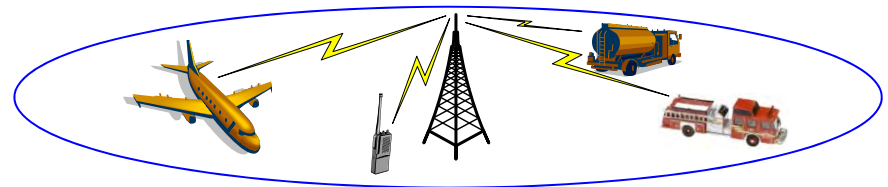
AM Cross band Repeater



Ground to Air Crossband Repeater

To extend coverage from a fixed location to an aircraft, a repeater communication system is required. A ground FM station or control tower would signal an aircraft through a FM link to a distant location. This signal would be cross banded to a VHF AM radio which would allow a greater coverage area. The aircraft communicates through an AM signal to the repeater station which is cross banded to an FM radio that communicates back to the control point.

AM/FM Transportable Base Station/Repeater



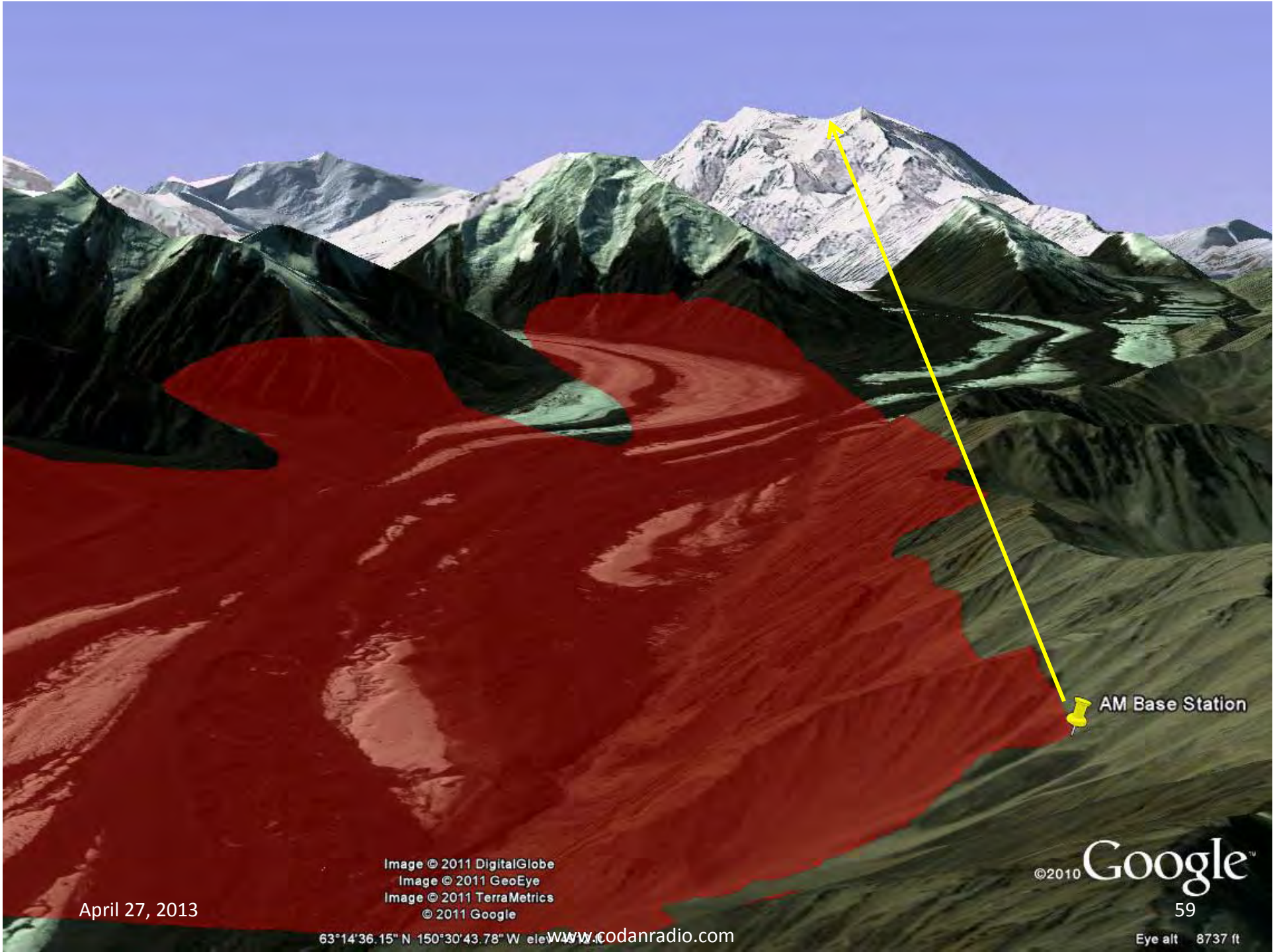
Ground to Air Crossband Repeater

FEATURES / OPTIONS:

- Water tight pressure tested transportable case;
- Light weight, smooth lockable latches;
- Designed for extended outdoor uses;
- Magnetic Antenna mounting, pressure sealed connectors.

Air to Ground

- Military – Ground troops or bases supporting flight ops directly. P25 to AM!
- Forest Fire Fighting/Search and Rescue – Air Asset management
- Airport Facilities – De-icing crews to pilots
- Flight management – extended air-to-ground via UHF link
- Law Enforcement – Surveillance ops



AM Base Station

Image © 2011 DigitalGlobe
Image © 2011 GeoEye
Image © 2011 TerraMetrics
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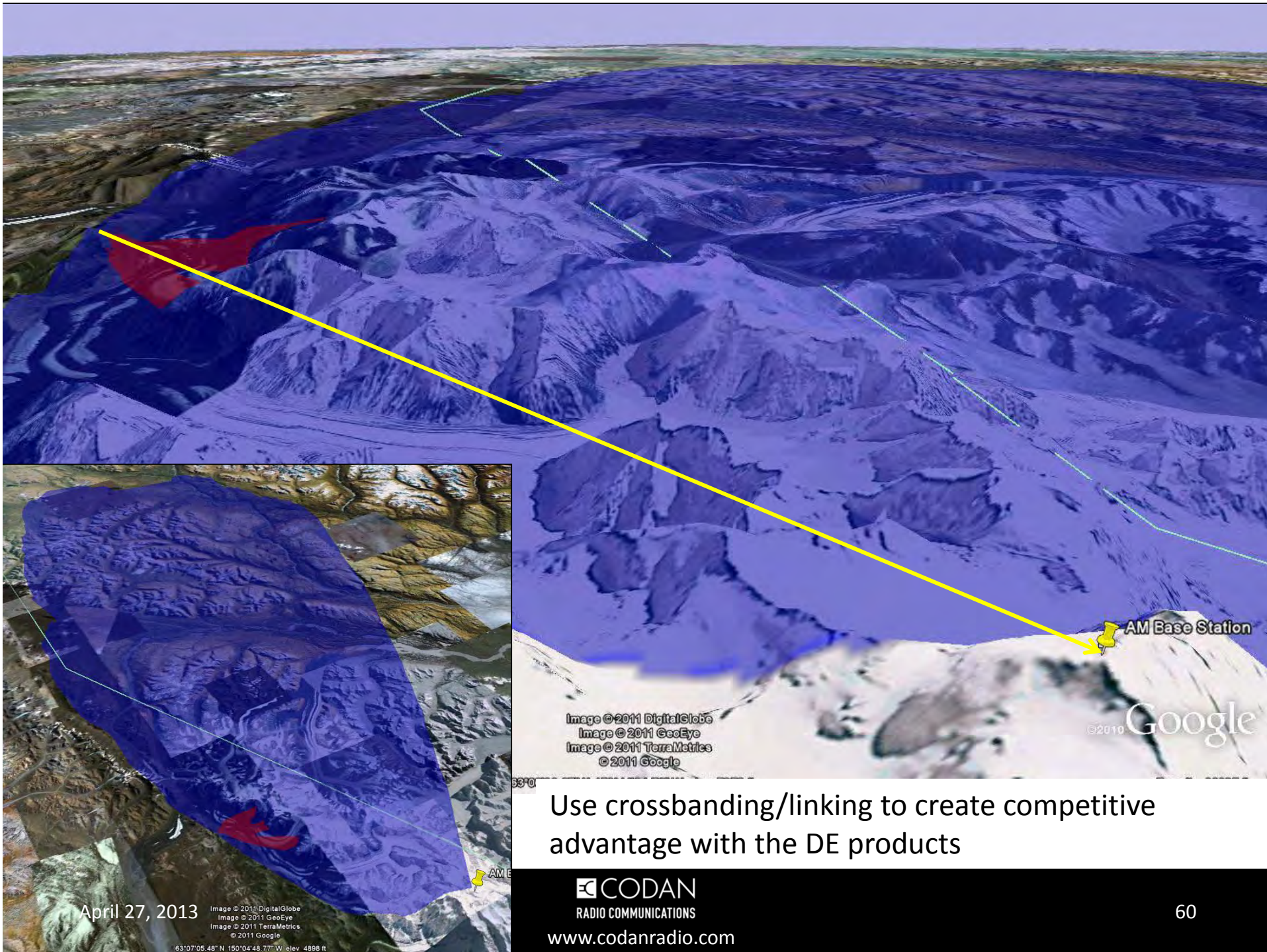
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April 27, 2013

63°14'36.15" N 150°30'43.78" W elevation www.codanradio.com

Eye alt 8737 ft



Use crossbanding/linking to create competitive advantage with the DE products

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Rapid Deployment Radios

The Daniels Electronics family of transportable cases accommodating our subracks and modules includes:

- ET-1 Polyethylene case
- ET-3 Aluminum case
- ET-4 Briefcase Repeater
- ET-5 Tactical Repeater
- ET-6 Stealth Repeater



Custom configured to suit the customer's specific applications and requirements

Solar Panels, Battery Packs and Antenna available as accessories



ET-1 Polyethylene Case

- Weatherproof and shock-mounted
- Available in 6U or 9U to accommodate 2 or 3 standard Daniels subracks
- Racks can be mounted in the front and the back
- Optional Duplexers can be included



Communication Solutions

Alameda County, California

When responding to any type of major incidents, first responders in Alameda County had a problem communicating with each other due to different agencies on different bands. The solution: Provide deployable crossband repeaters that covered all 5 bands in use in the County. Each system contained a 30W Lowband, VHF, UHF, T-Band and 800 MHz repeater. All repeaters are crossbanded with the other repeaters allowing for a single point of contact across all the bands.



ET-3 Aluminum Case

Waterproof and pressurized
5U to accommodate standard and optional modules
Available in black and orange
Mil spec 810 approved
Satellite Phone Options

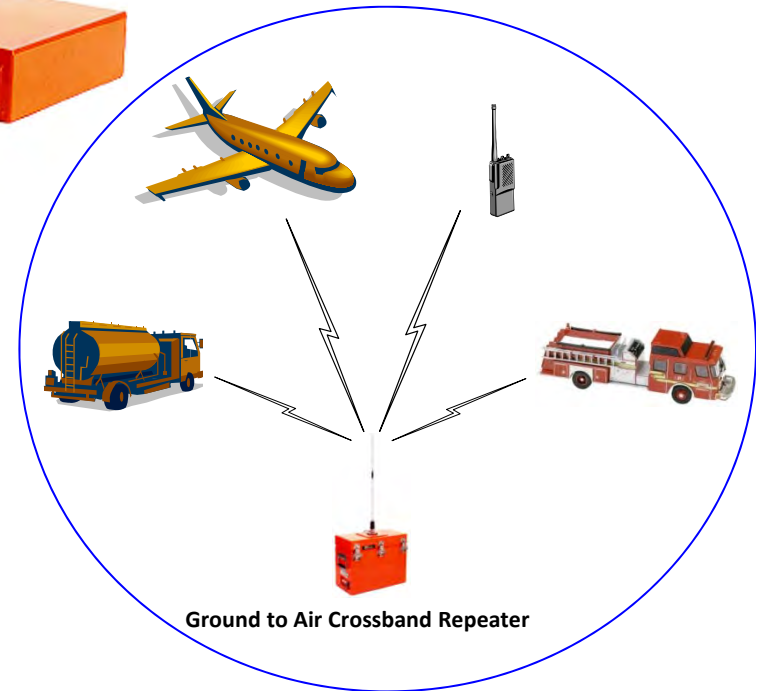


AM/FM Transportable

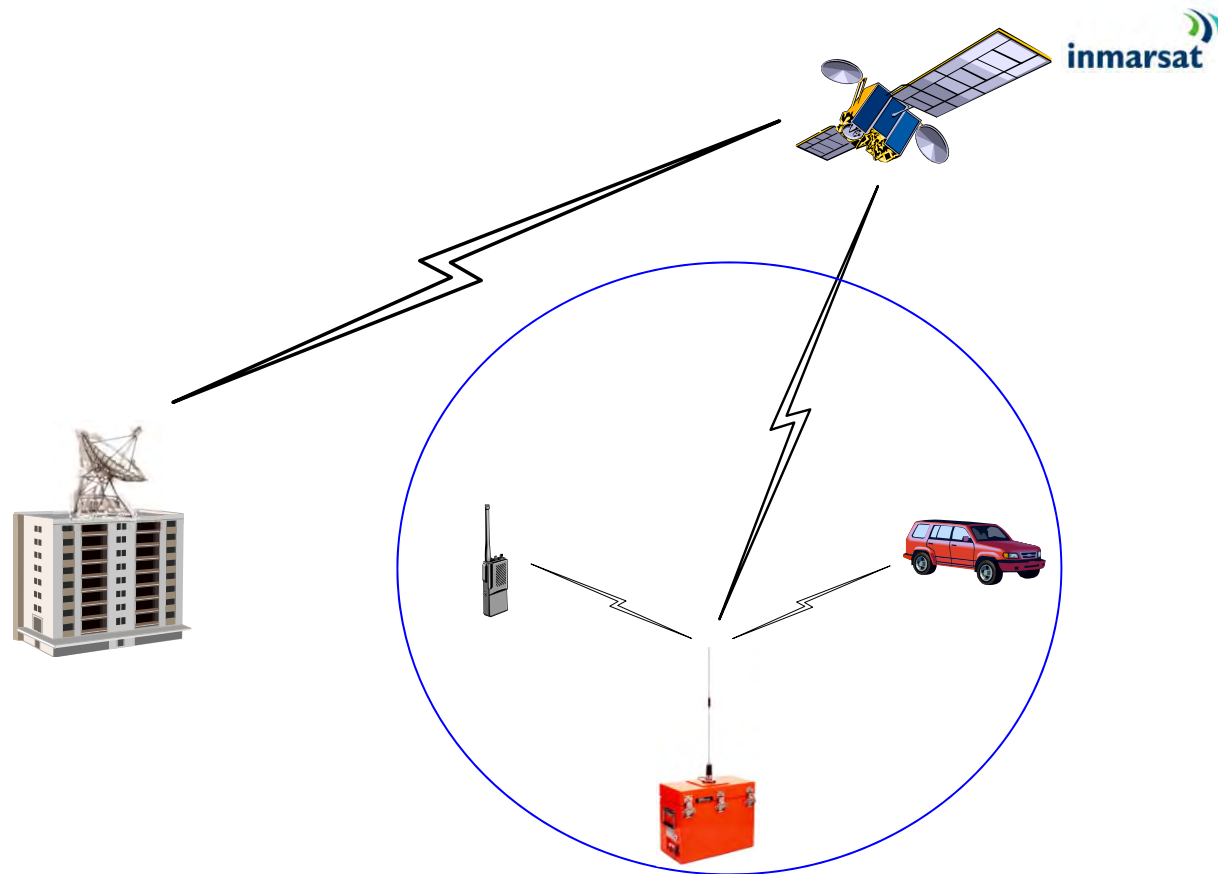


FEATURES / OPTIONS:

- Water tight pressure tested transportable case
- Light weight, smooth lockable latches
- Designed for extended outdoor uses
- Magnetic Antenna mounting, pressure sealed connectors.



Satellite Interface



Satellite Telephone interface in a Transportable Case

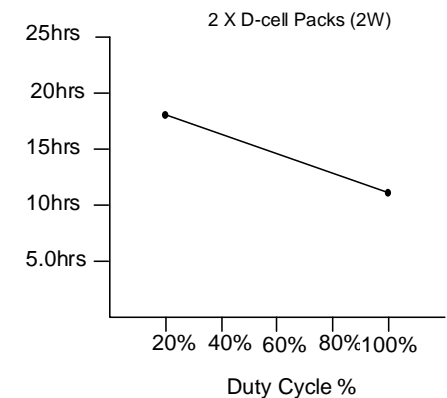
ET-4 Briefcase Repeater



ET-5 Tactical Repeater

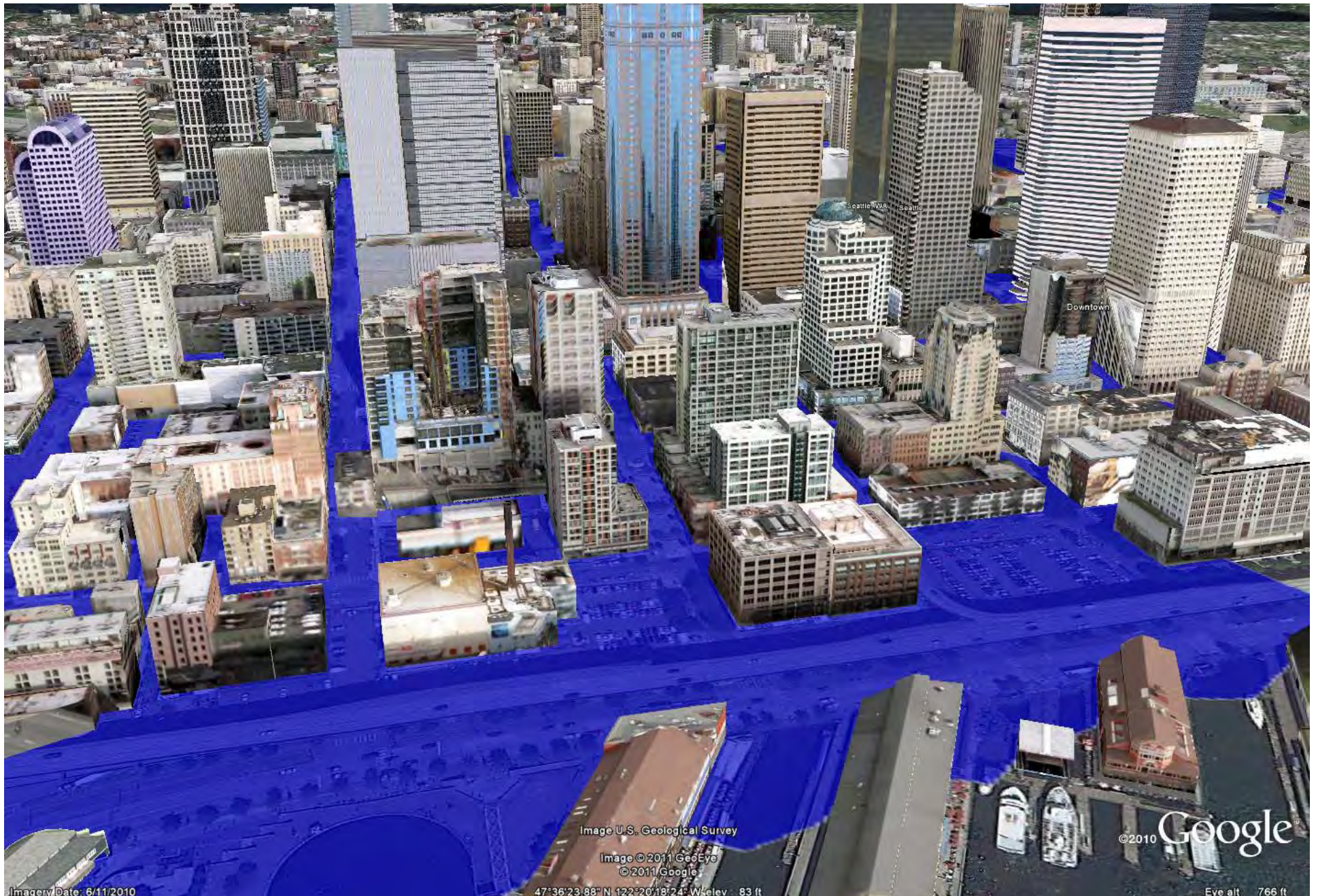
“The World’s smallest transparent P25 encrypted repeater that runs on D-Cell batteries”.

- Adheres to the P25 standards TSB-102 and EIA-603
- Available in VHF, UHF or 800 MHz frequencies
- Transparent passing of P25 encryption (e.g. AES or DES-OFB)
- No double vocoding of the P25 signal
- Runs on Commercial Off The Shelf D-cell alkaline batteries or other rechargeable batteries
- Supports up to 19 Hours operation with alkaline D-Cells
- 0.5 – 6 Watts of RF output power –VHF and UHF
- 0.5 – 3 Watts RF output power – 800 MHz
- Weights <20 lbs (9 kgs)
- Compact case 14” x 11” x 6” (36 x 29 x 16.5 cm)
- Available with integral duplexer 4.5 MHz – VHF , 5 MHz – UHF, 45 MHz – 800 MHz

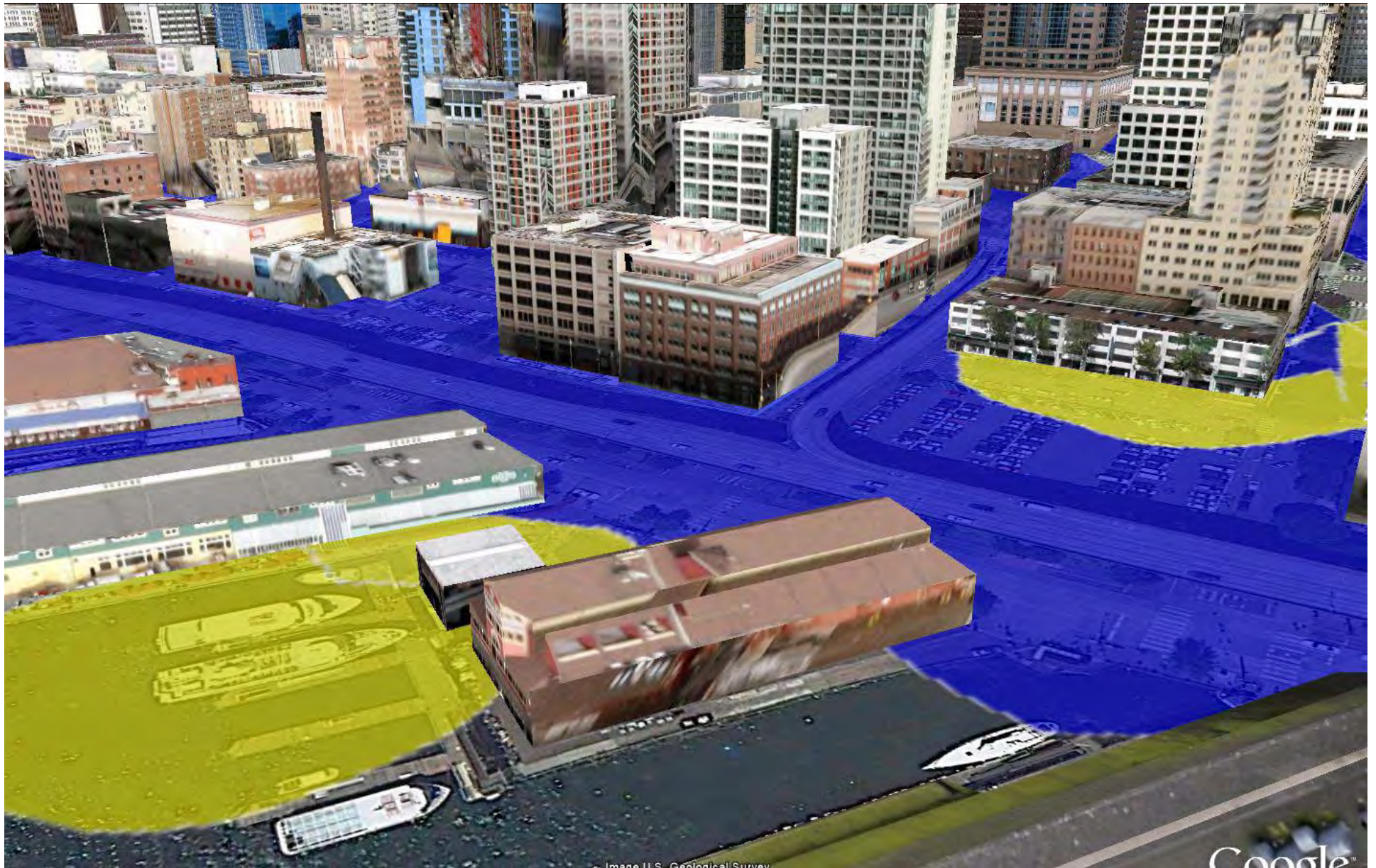


Shown to Scale





City of Seattle PD 700MHz Trunked System



System not designed for the needs of SWAT.
Current trunked system capabilities not needed – “Just let us talk on scene”
Can also provide gateways to allow patching to trunked system

Memphis Convention Center – Body Wire/No Repeater Coverage

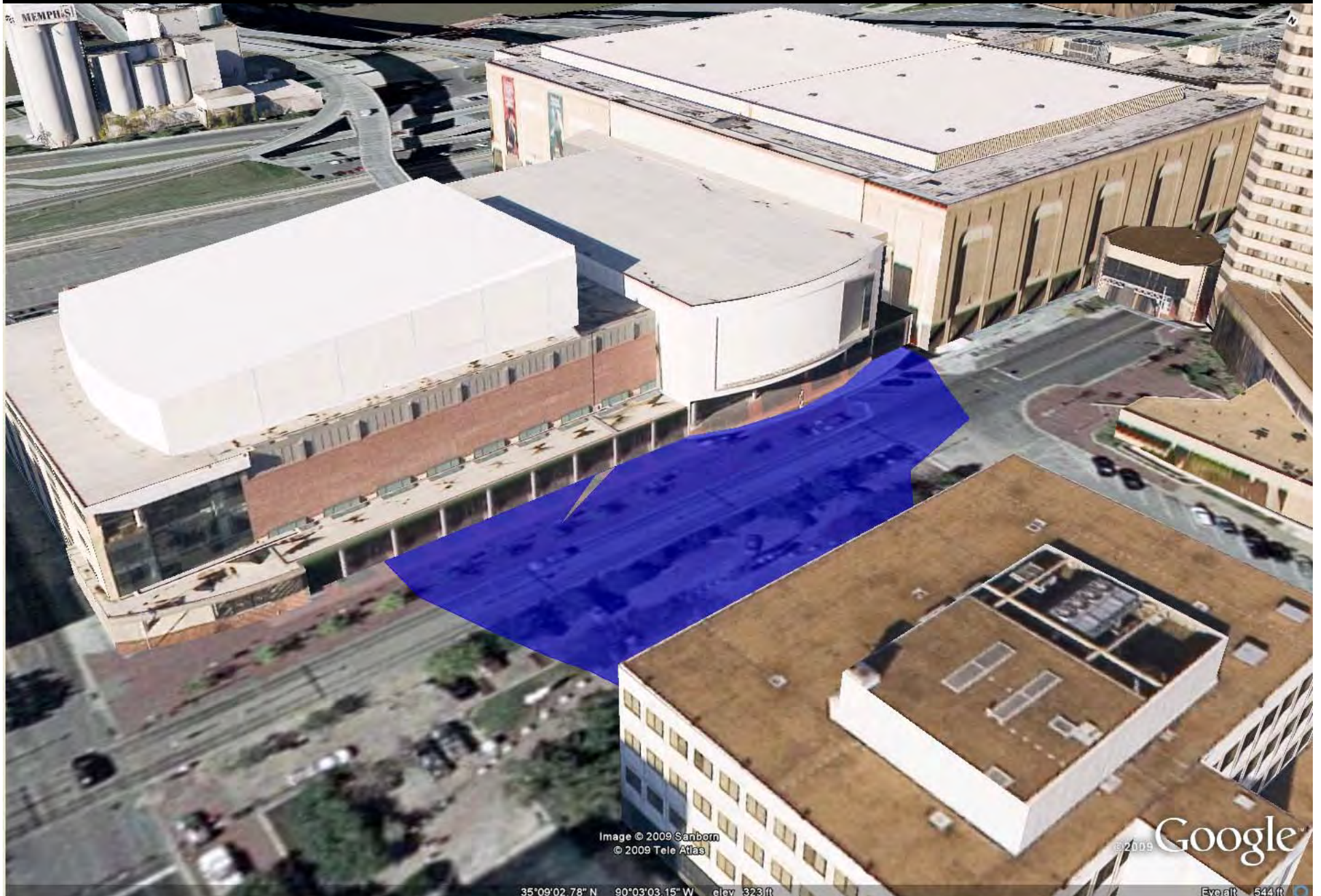


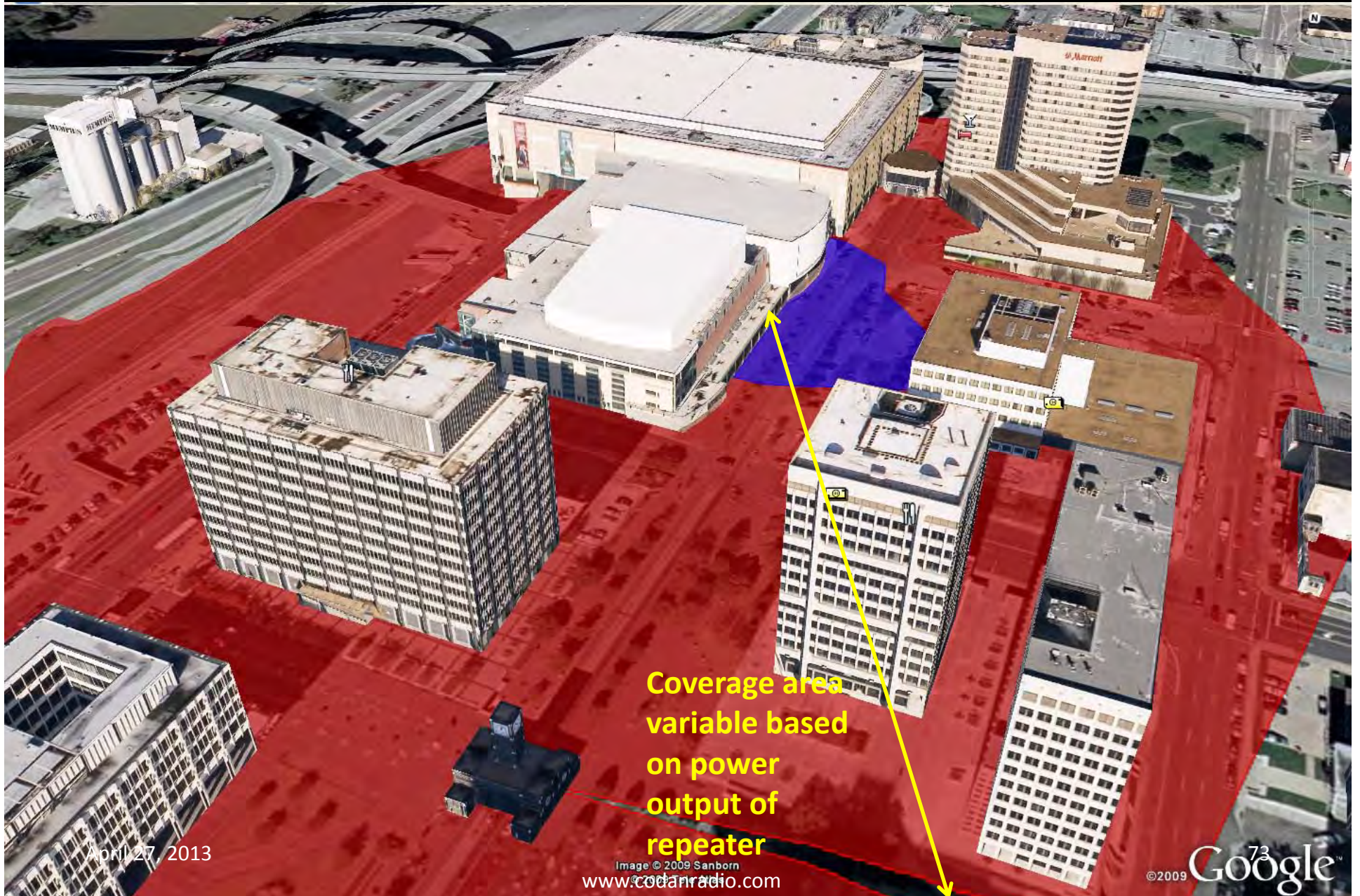
Image © 2009 Sanborn
© 2009 Tele Atlas

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35°09'02.78" N 90°03'03.15" W elev 323 ft

Eye alt 544 ft

Memphis Convention Center – Body Wire w/ Repeater Coverage



Coverage area
variable based
on power
output of
repeater

April 27, 2013

Image © 2009 Sanborn
www.comrad.io.com

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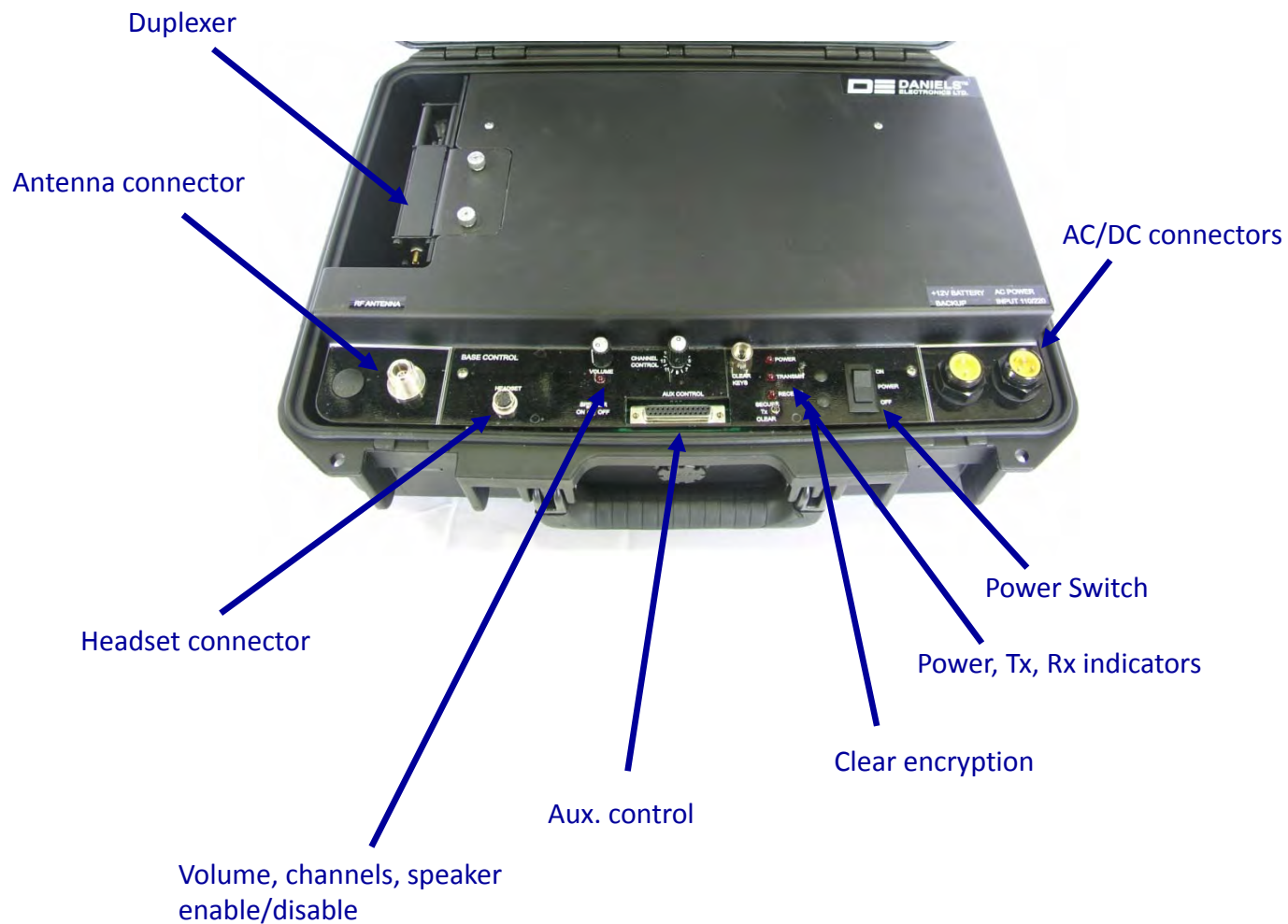
ET-6 Stealth Repeater



- Repeater or base station operation
- Headset connector (headset included)
- Internal or external power & RF connections
- Transparent passing of P25 encryption (e.g. AES or DES-OFB)
- No double vocoding of the P25 signal
- 20-30 Watts of RF output power –VHF and UHF
- Weights 28 lbs
- Compact case 18" x 13.5" x 7"
- Designed based on input from the FBI



ET-6 Stealth Repeater



ET-6 Transportable Stealth Repeater

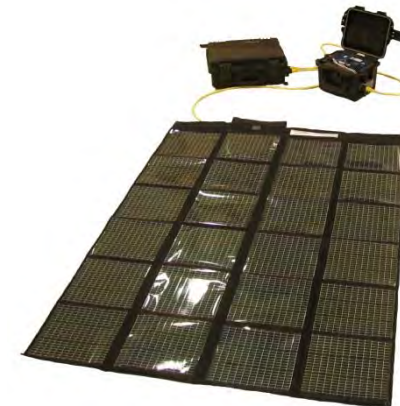
Features Comparison with the Motorola PDR3500 Transportable Digital Repeater:

Feature	Motorola PDR	Daniels ET-6
Mode of Operation	Repeater or Base Station	Repeater or Base Station or Repeater/Base
P25 Compliant operation?	Optional	Optional – Firmware only
Size	7.75" x 20" x 15"	6.7" x 18.2" x 13.4"
Weight (fully equipped)	46 lbs	28 lbs
Closed Case Operation	Yes	Yes
Duty Cycle	50%	100%
RF Output Power	30W Nominal – VHF 25W Nominal - UHF	30W Nominal – VHF 30W Nominal – UHF
Power Source	External AC or DC power only	External AC or DC power only – low current; run off solar
Crosspatch Capability?	Yes	Yes
Hardware Configuration	Field Replaceable Units	Field Replaceable Units

Battery Back Up

ET-6			
Input:		Output:	
Battery Consumption for 1 day of operation:			
Standby Current Draw:	0.2	---->	AHrs used per day: 19.2
Active Current Draw:	6.2		
Duty Cycle:	10%		
Solar Array Size			
AHrs used per day:	19.2	---->	Solar Array Watts Required: 54.24658
Solar Insolation (select from table):	5.84		
Battery Bank Sizing			
AHrs used per day:	19.2	---->	Battery Bank Required(AHrs): 38.4
Days of required operation without recharge:	1		

PDR3500			
Input:		Output:	
Battery Consumption for 1 day of operation:			
Standby Current Draw:	3.5	---->	AHrs used per day: 92.16
Active Current Draw:	6.9		
Duty Cycle:	10%		
Solar Array Size			
AHrs used per day:	92.16	---->	Solar Array Watts Required: 260.3836
Solar Insolation (select from table):	5.84		
Battery Bank Sizing			
AHrs used per day:	92.16	---->	Battery Bank Required(AHrs): 184.32
Days of required operation without recharge:	1		



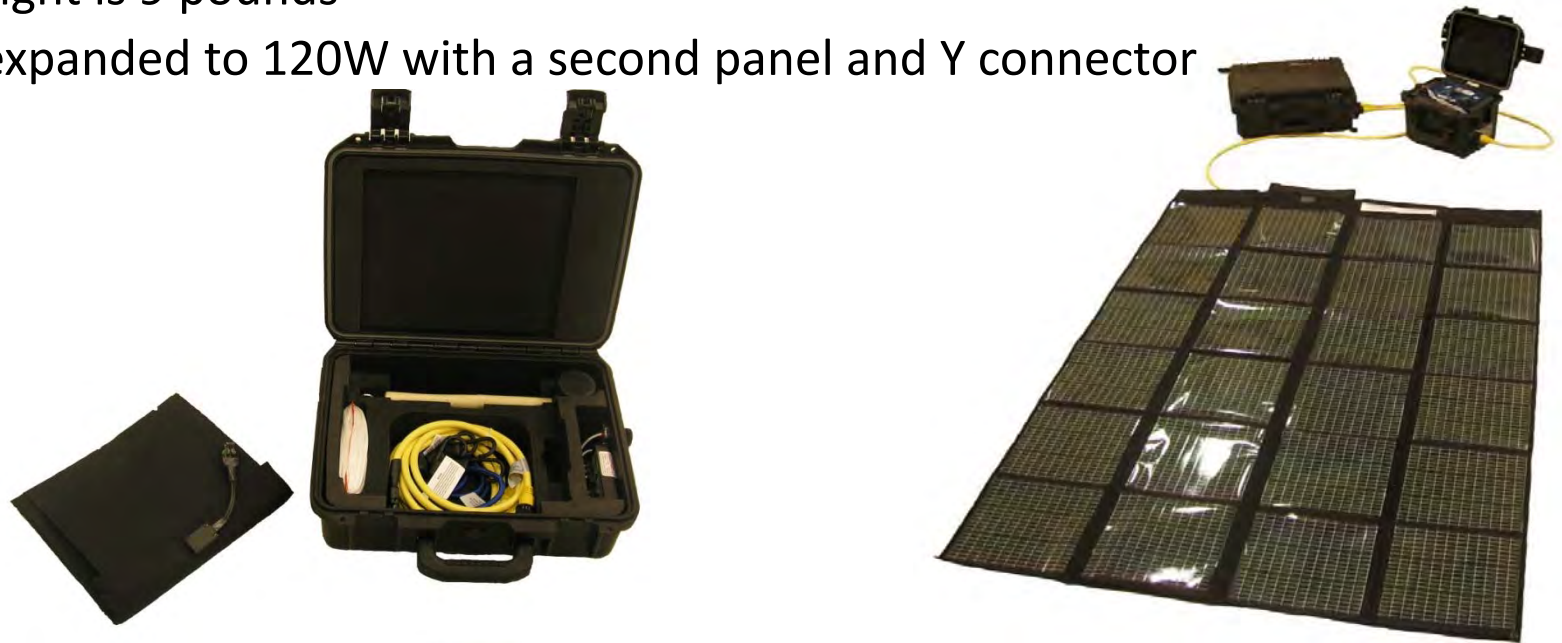
Portable Accessories

- Battery Backup System – 100 or 35 A-H
- Antenna assemblies
- Anti-vibration module fasteners



60W Solar Kit

- 60W foldable solar panel
- Charge controller
- Mounting accessories – bungee cords, ground pegs, hammer
- Compass for alignment
- All housed in a polyethylene briefcase (16" x 12" x 6")
- Total weight is 9 pounds
- Can be expanded to 120W with a second panel and Y connector



Antenna Mast

- The AL1 Standard Mast is available from 2 to 15 Meters.
- It is the most popular of the BlueSky Line due to its speed, portability, versatility and dependability.
- Made from 100% corrosive free alloys, it can be deployed in the harshest of environments
- Breaks down into a rugged wheeling carry bag for easy transport of the antenna mast.



Thank you.



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