CODAN COMMUNICATIONS | BE HEARD

HF TECHNOLOGY IMPLEMENTATIONS

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AGENDA

- CODAN INTRODUCTION
- HF RELEVANCE
- HF MARKET TRENDS & DRIVERS
- HF – PRODUCT DESIGN FOCUS AREAS
- INTEROPERABILITY
- 3G ALE
- DIGITAL VOICE
- SECURE INTEROP
- HF VOTING
- QUESTIONS & DISCUSSION

MANY YEARS AGO…

Codan HF radio – 7 channel crystal based oscillator design

Lived on a 100,000 acre sheep/cattle property in remote Australia
HF Radio was the only means for receiving primary education via local School Of the Air

SCHOOL OF THE AIR
PARTED BUT UNITED
BROKEN HILL

CODAN TACTICAL COMMUNICATIONS

OVERVIEW

- Parent company founded in 1959
- 60 years of HF communications solutions design and development
- 3 Divisions – Mintec, Minelab, Radio Communications
- HF radios tested and proven in over 125 countries around the world in some of the harshest conditions imaginable
- Customer focussed product design and manufacture
- Business migrating from professional remote area communications to tactical military solutions
- Customer base extending from Humanitarian, Government through to defence sector

HIGH FREQUENCY TECHNOLOGY

WHY IS IT STILL RELEVANT?

- Budget pressures in defence sectors – lower cost of ownership to alternatives
- EMP threat – resilient emergency communications
- Mitigation of satellite dependency
- Satellite vulnerability
- Next generations waveforms offering new advantages
- Troop deployments in remote austere global locations
- Limited infrastructure environments
- Flexible fluid solution adaptable to the mission – less infrastructure for longer range

HIGH FREQUENCY TECHNOLOGY

HF MARKET TRENDS & DRIVERS

- Traditional markets on the decline – roll out of cellular networks and decreasing cost of satellite solutions creating headwinds
- SAT PTT improving but still has reliability, cost and practicality issues
- HF for military experiencing a resurgence
- Militaries looking for easier to use, more cost effective operationally focussed equipment and solutions
- Interoperability is an ongoing issue
- Increasing shift to data communications

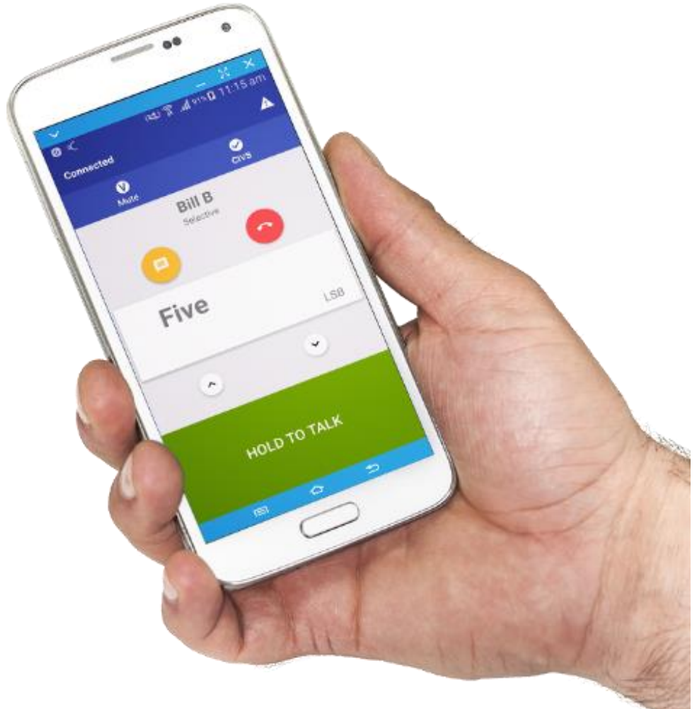
MNJTF Chad -2110M

HIGH FREQUENCY TECHNOLOGY

PRODUCT DESIGN FOCUS AREAS

- Make it easier to use
  - Design that appeals to the modern generation
  - Native language UI
  - Utilise good UX principles in the design
  - Configuration simplicity
  - High level of integration
- Modern interfaces (IP, USB)
- Standards
- Better linking probability
- Better voice quality
- Higher data throughput – make it fast and robust
- Smaller and lighter
- Better antenna solutions (smaller, less obtrusive)
- Improved upgradeability
- Training and education

LISTEN TO YOUR USERS



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CODAN TACTICAL COMMUNICATIONS SOLUTIONS

ADRESSING THE INTEROPERABILITY CHALLENGE

Codan

RIOS Lite
Smartphone App

DMR

TETRA

Thales

Datron

Harris

Harris

Datron

CODAN COMMUNICATIONS | BE HEARD

CODAN TACTICAL COMMUNICATIONS SOLUTIONS

ADRESSING THE INTEROPERABILITY CHALLENGE

Digital Voice & AES 256

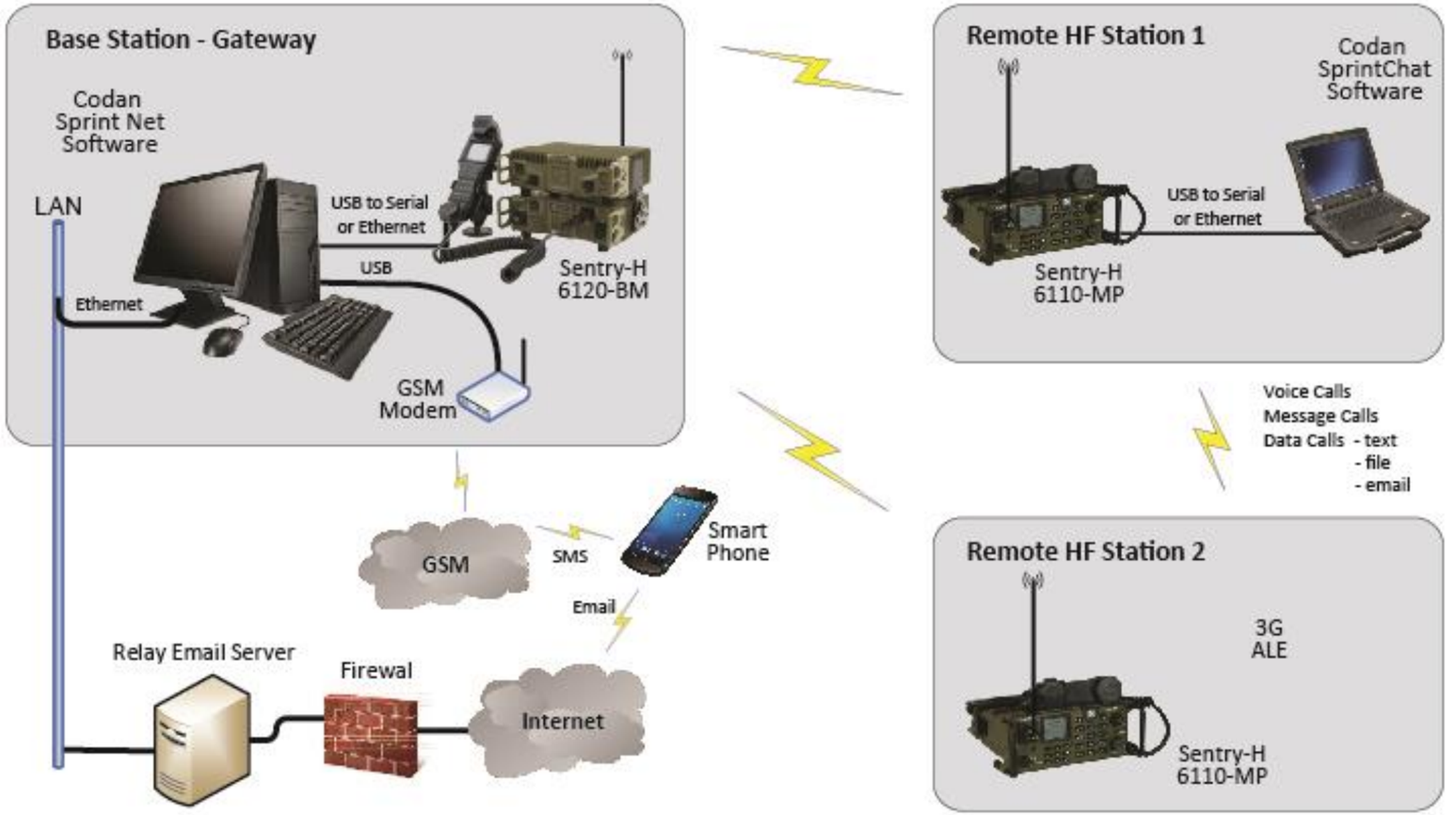
APPLICATION OF TECHNOLOGY

3G ALE

Codan 3G ALE

Compliant and enhanced implementation

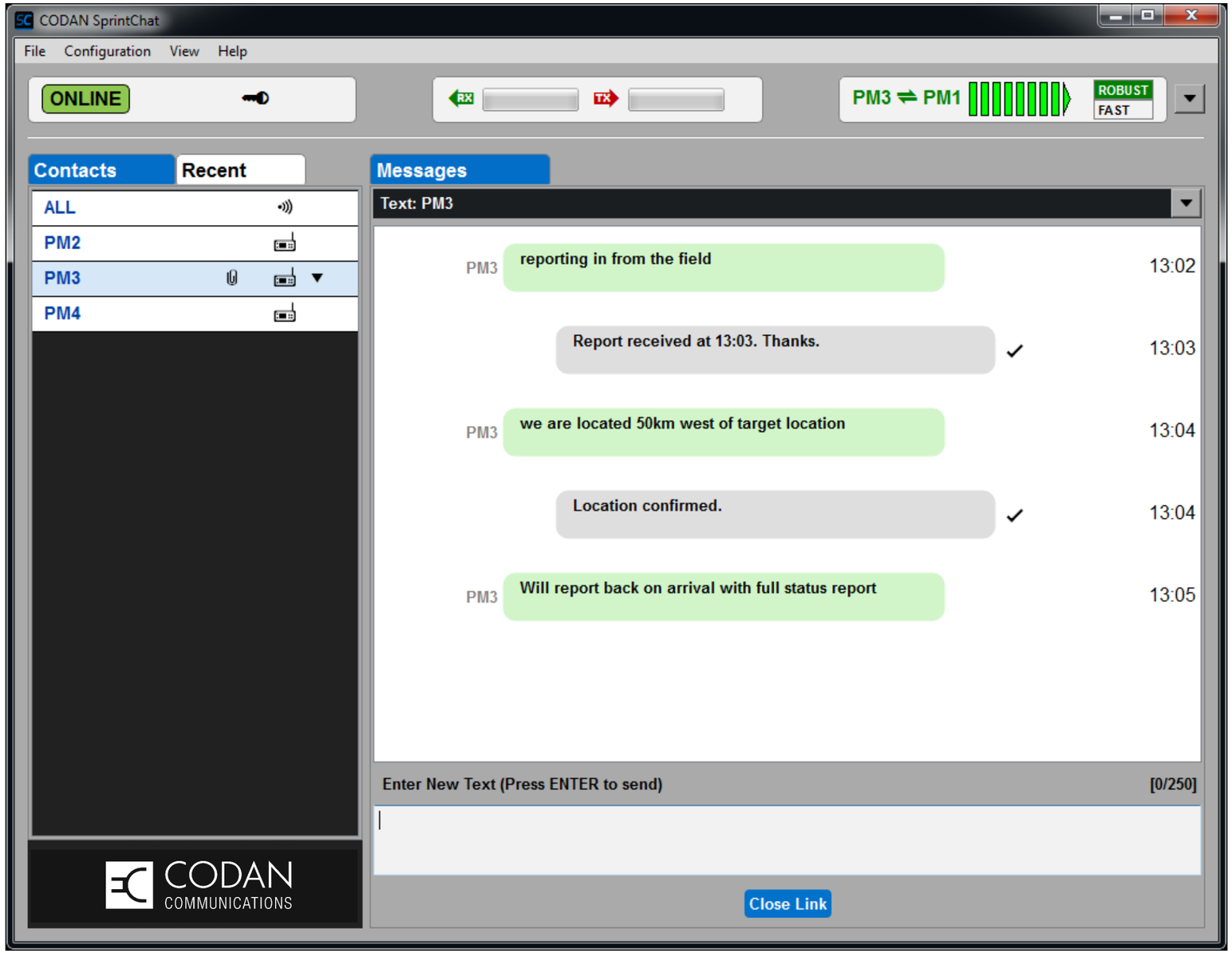
- Sync from non-master station
- Asynchronous calling when time sync unavailable
- Non-network member calling capability
- Simultaneous 2G/3G ALE scanning
- Enhanced LQA management – time stamping
- Call types to support operational needs
- Automatic voice encryption activation
- Voice Message call
- Sprint software applications
  - Text/email/file transfer
  - Easy to use UX
  - SMS / Email gateway services



APPLICATION OF TECHNOLOGY

3G ALE - APPLICATIONS

- Sprint suite of applications
  - Tactical text / email / file transfer
  - SMS / Email gateway services
- Codan SDR supports IP/USB/Serial interfaces
- Uncluttered UI for ease of use
- Linking and radio status data limited to only important information
  - Online/offline
  - Secure status
  - TX/RX % progress or Scanning
  - Link status
  - Robust / Fast waveform status
- Image file size compression
- Bi-directional text chat and concurrent file transfer
- AES-256 encryption



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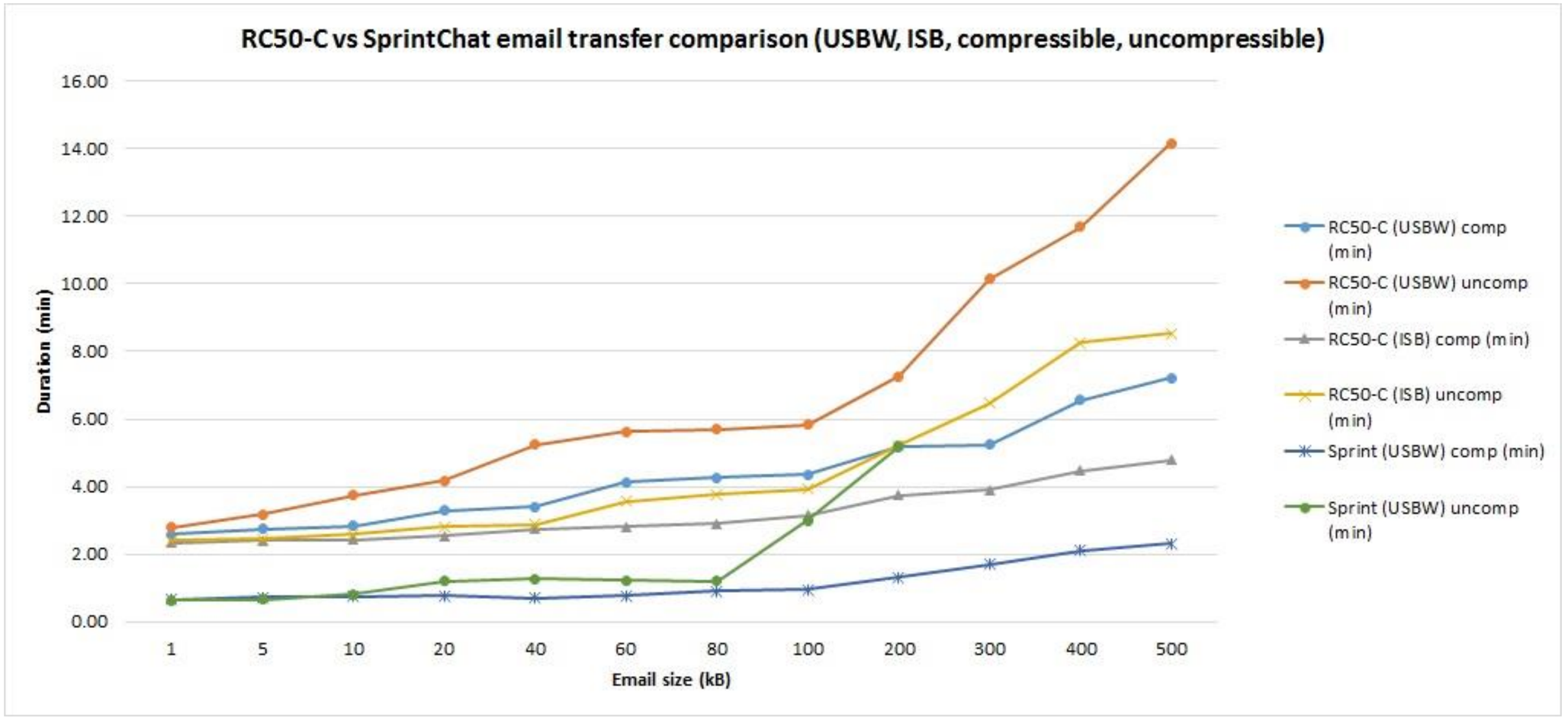
APPLICATION OF TECHNOLOGY

3G ALE VS MIL-STD-188-110B Data transfer time comparisons



APPLICATION OF TECHNOLOGY

DIGITAL VOICE

DIGITAL VOICE

- TWELP Vocoder technology resulting in superior voice quality in poor conditions
- Digital voice mute providing clear voice only
- Voice Message Call (VMC) providing crystal clear voice in otherwise unusable channel environment
  - Provides effective operation in highly compromised comms scenarios e.g. covert tactical
  - Record, Pause, Replay, Forward
  - 200 messages store capacity
    - Max 2 minutes @ 1200 bps
    - Max 1 minute @ 2400 bps
- AES-256 encrypted / non-encrypted switching for cross agency scenarios

HF DIGITAL VOICE

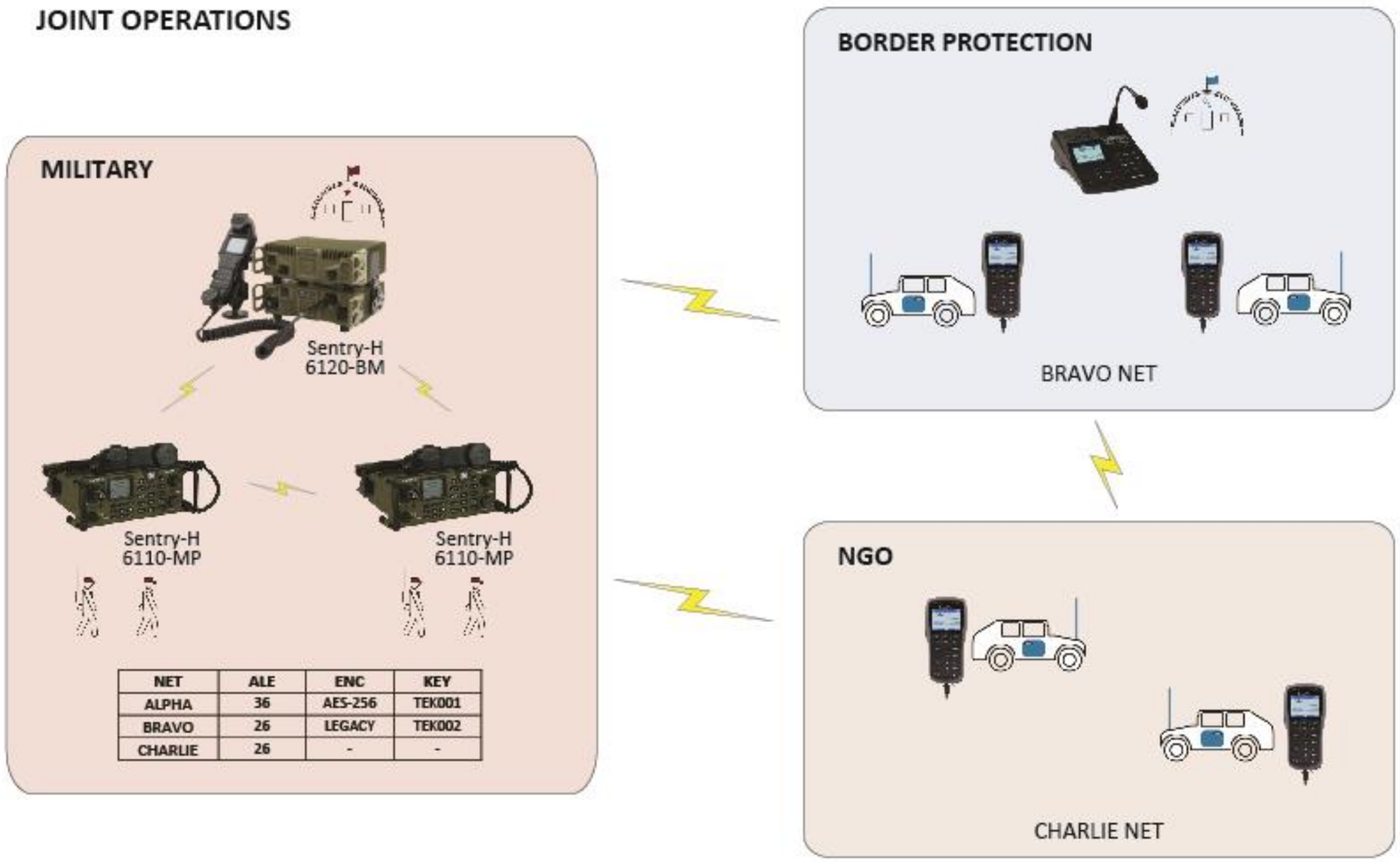
CHANNEL CONDITION (SNR)	ANALOG VOICE	DIGITAL VOICE					NON REAL TIME DIGITAL VOICE
		2400 BPS	1200 BPS	600 BPS	480 BPS	300 BPS	
GOOD (+16 dB)	✓	✓	✓	✓	✓	✓	✓
AVERAGE (+6 dB)	✓	✓	✓	✓	✓	✓	✓
POOR (0 dB)	✓		✓	✓	✓	✓	✓
VERY POOR (-3 dB)	✓			✓	✓	✓	✓
EXTREMELY POOR (-4 dB)	✓				✓	✓	✓
UNUSABLE (-6 dB)	✓						✓

*300/480 BpS vocoder rates not available on Envoy radio

APPLICATION OF TECHNOLOGY

SECURE INTEROP

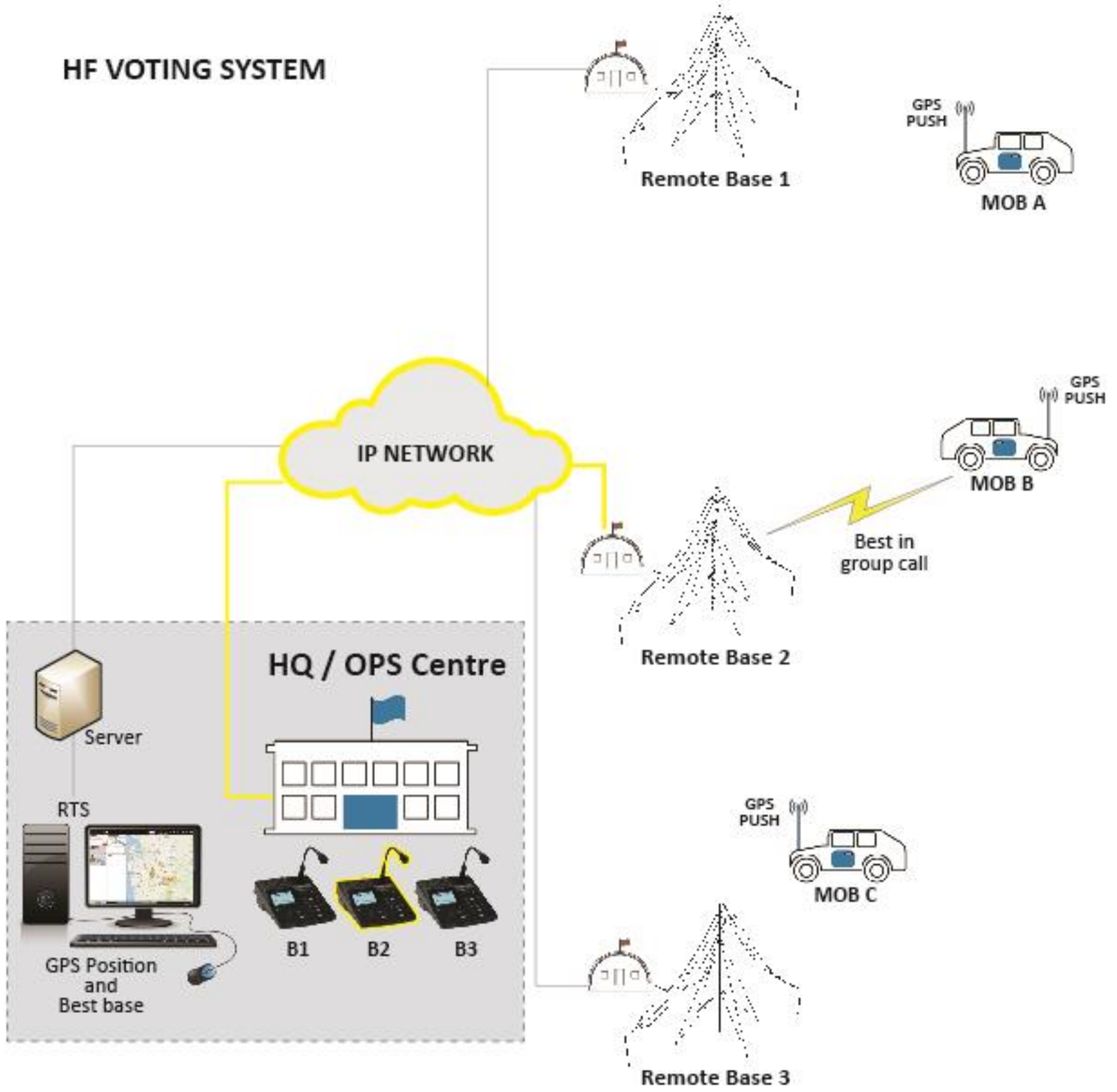
- Multi network scanning
  - Multi agency operations
  - Integration/interoperability
  - Real time ground truth – information flow
- Secure Mode and Key index
  - Channel
  - Network
- Simplification of operation
  - Lessens compromise
  - Guaranteed network security
- On the fly - Select Active Networks



APPLICATION OF TECHNOLOGY

HF VOTING

- Improved probability of linking
- Improved quality of service
- Solving HF black spots with geographical diversity
  - Codan best-in-group call (2G ALE)
- VCP or Consoles providing IP networked centralised command and control



QUESTIONS & DISCUSSION

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