CONNECTIVITY AND DATA COLLECTION SOLUTIONS

NOMAD Workshop | Amman Jordan | January 2016
Contents

1. Motorola Solutions: Intelligence-led Situational Awareness
2. Digital Radio and the Connected Humanitarian Worker
3. Mobile Infrastructure components
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INTELLIGENCE-LED PUBLIC SAFETY

PRIVATE DATA

PUBLIC DATA

INTEGRATE

ANALYZE

ACTIONABLE INTELLIGENCE

CORRELATE

APPLY

OPERATIONS

DEVICES

USERS

DRIVING BETTER DECISIONS, SAFER OUTCOMES
CommandCentral Inform allows the command center to view all resources (officers on foot, vehicles, etc), as well as any video source on a map layer. This information is also shared with officers on their smart devices.
SOCIAL MEDIA INTEGRATION

Search by keyword, geographic location, username or meta-data

Share this information with officers on-scene through smart devices
Supporting UN/NGOs Globally

MOTOROLA SOLUTIONS

UN & International Account Team

Project Managers  Field Engineers  System Engineers

Customer Support  Service  Trainers

AUTHORIZED CHANNEL PARTNERS
Local Presence in 100+ countries

400+ APPLICATION PARTNERS
### ANALOG VS. DIGITAL COMPARISON

#### GP380 vs. DP4800/1

<table>
<thead>
<tr>
<th>Feature</th>
<th>GP380</th>
<th>DP4800/1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>255 channels</td>
<td>1000 channels</td>
</tr>
<tr>
<td>Band</td>
<td>LB: 29.7-50MHz</td>
<td>VHF: 136-174MHz</td>
</tr>
<tr>
<td></td>
<td>VHF: 136-174MHz</td>
<td>300MHz: 300-400MHz (DP4801)</td>
</tr>
<tr>
<td></td>
<td>300MHz: 300-400MHz (DP4801)</td>
<td>UHF: 403-470MHz</td>
</tr>
<tr>
<td></td>
<td>4W UHF / 5W VHF / 6W LB</td>
<td>4W UHF, 300MHz / 5W VHF</td>
</tr>
<tr>
<td>Display</td>
<td>Two-line monochrome display</td>
<td>Five-line colour display</td>
</tr>
<tr>
<td>Keypad</td>
<td>Alphanumeric keypad</td>
<td>Alphanumeric keypad</td>
</tr>
<tr>
<td>Battery Life</td>
<td>Up to 11hrs</td>
<td>Up to 18 hrs (analogue) 23.5 hrs (digital)</td>
</tr>
<tr>
<td>Programmable Buttons</td>
<td>3 programmable buttons</td>
<td>5 programmable buttons</td>
</tr>
<tr>
<td>Tone</td>
<td>PL/5 tone</td>
<td>PL/DPL/QC II/MDC/5 tone</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP54</td>
<td>IP57</td>
</tr>
<tr>
<td>Voice Compression</td>
<td>X-Pand™ voice compression</td>
<td>MOTOTRBO™ noise cancellation</td>
</tr>
<tr>
<td>Whisper Mode</td>
<td>Whisper mode</td>
<td>Automatic gain control</td>
</tr>
<tr>
<td>Option Board Capable</td>
<td>Option board capable</td>
<td>Option board capable</td>
</tr>
<tr>
<td>IMPRES™ Energy</td>
<td>IMPRES™ energy</td>
<td>IMPRES™ energy</td>
</tr>
<tr>
<td>Emergency Alarm</td>
<td>Emergency alarm</td>
<td>Emergency alarm</td>
</tr>
<tr>
<td>Lone Worker</td>
<td>Lone worker</td>
<td>Lone worker</td>
</tr>
<tr>
<td>FM Certified Option</td>
<td>FM certified option</td>
<td>FM certified option</td>
</tr>
</tbody>
</table>

#### MOTOTRBO Features

- DMR Signalling
- GPS and GLONASS®
- Bluetooth®
- Intelligent Audio
- IMPRES audio
- Text Messaging
- Transmit Interrupt
- 16, 40 and 256* bit encryption
- Voice Announcement
- Radio Management
- Over The Air Programming
- Dual Capacity Direct Mode
- VOX
- IP Site Connect
- Capacity Plus
- Linked Capacity Plus
- Connect Plus®
Drivers to “Go Digital Radio”

**Coverage**
Meet the specific user requirements, from a single building to multiple locations or wide area coverage.

**Capacity**
Use dedicated licensed spectrum and right-size system design to handle normal operation and peak usage so calls always get through.

**Control**
High degree of control over system design, priorities, features and operation means system can be configured for specific user requirements.

**Cost**
Predictable capital and operating expenses with no additional airtime or usage fees, unlike mobile phones.

**Capability**
Built-in GPS, telemetry, text and data capability allows use of applications to provide advanced systems for efficient operations, security and safety management.

**Better Staff Utilisation**
Enabling workers to execute everyday tasks faster and more accurately, increases productivity and helps control staffing costs too.

**Enhanced Personnel Safety**
Automated systems and procedures can help keep staff, clients and members of the public safe day-to-day or during critical events.

**Unparalleled Team Collaboration**
Connecting team members, no matter where they are, so that they are instantly accessible and interconnected, means they can act as a single, unified group to better serve their customers.

**More Effective Management**
With visibility into real-time information like maintenance schedules, location of people and assets or room availability, managers are better equipped to make better decisions.

**Reduced Administrative Time**
Replacing paper-based systems with automated processes which enable the entry of information just once reduces admin time and the opportunity for errors.
VHF Mobile Repeater Solution
Container for Mobile RF Site

- 10’ Sea Container
- Insulated, Air Conditioned
- Access Control System
- Power solutions
- 12m Telecopic Mast
- 19” rack for IT Equipment
- 18KW Diesel Generator
- External Alarm System
Providing Wireless Broadband

Point-to-Multipoint solution: PMP450
Can deliver over 1 Gbps to more than 1,000 users per tower
Pricing below LTE and 4G coverage

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>PMP 450</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Bands (GHz)</td>
<td>2.4, 3.5, 5.4-6</td>
</tr>
<tr>
<td>Max. Throughput</td>
<td>125 Mbps Per sector</td>
</tr>
<tr>
<td>Tx Power</td>
<td>Up to 25dBm</td>
</tr>
<tr>
<td>SM per sector/AP</td>
<td>Up to 200</td>
</tr>
<tr>
<td>Max. LOS Range</td>
<td>48 km</td>
</tr>
<tr>
<td>NLOS</td>
<td>Yes</td>
</tr>
<tr>
<td>Security</td>
<td>128/256-bit AES, FIPS 140-2</td>
</tr>
</tbody>
</table>
Deployable LTE Solution

- 10x LEX L10 subscribers
- 10x MotoTBBO subscribers
- 5x Sensor locations
- Wi-Fi hotspot
- Sensor
- LTE rugged modem VML750
- LTE EPC
- MotoTRBO
- PTT Server
- PTT Gateway
- LTE eNB
- Application Servers
**WAVE MOBILE COMMUNICATOR**

- Android and iOS, BYOD Support
- Group PTT across Broadband & LMR
- Private PTT across Broadband
- Secure Communications
- Activity Indication
- Location Mapping of Contacts
- Call History
- Any Carrier
- Unique User Profile
Connected Field Worker Application User Cases

Job Ticketing
Alarm Management
Telemetry Sensors
Payment Authorisation
Mobile Identification
Container Tracking
Integrated CCTV-Radio Control Room
# Job Ticketing

## Job Ticketing Interface

### Table

<table>
<thead>
<tr>
<th>Subject</th>
<th>Text</th>
<th>Radio</th>
<th>Start Time</th>
<th>End Time</th>
<th>Specified End Time</th>
<th>Disp.</th>
<th>Priority</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>call Tom</td>
<td>call Tom</td>
<td>Radio 4</td>
<td>10/1/2012 1:17:27 PM</td>
<td>10/2/2012 1:18:06 PM</td>
<td>10/2/2012 1:18:06 PM</td>
<td>Admin</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Clean room #34</td>
<td>Clean room #34</td>
<td>Radio 4</td>
<td>10/15/2012 11:24:43 AM</td>
<td>10/16/2012 11:23:03 AM</td>
<td>10/16/2012 11:23:03 AM</td>
<td>Admin</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Clean the room</td>
<td>room #23</td>
<td>Radio 4</td>
<td>11/8/2012 1:07:42 PM</td>
<td>11/9/2012 1:08:30 PM</td>
<td>11/9/2012 1:08:30 PM</td>
<td>Admin</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>ticket 1</td>
<td>311</td>
<td>Radio 4</td>
<td>11/20/2012 3:35:47 PM</td>
<td>11/20/2012 3:36:00 PM</td>
<td>11/20/2012 3:36:00 PM</td>
<td>Admin</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>ticket 2</td>
<td>2222</td>
<td>Radio 4</td>
<td>11/20/2012 3:36:00 PM</td>
<td>11/20/2012 3:36:00 PM</td>
<td>11/20/2012 3:36:00 PM</td>
<td>Admin</td>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>

### Summary Pie Chart

- **Completed:** 80
- **In Progress:** 82
- **New:** 35
- **Rejected:** 21
Alarm Management

Source: Radio 1, Control Panel

TRBOnetServer

Alarm Management

Target: Radio 2, Dispatcher, Outlook, Text Mobile Phone

Actions:
- Emergency
- Text
- Telemetry
- Voice Message
- Job Ticket
- Alarm
- Email
- SMS/Text/Email

Sources:
- Emergency
- Text
- Telemetry
- DTMF
- Lone Worker Alarm
- Geofencing Alarm

Targets:
- Radio 2
- Dispatcher
- Outlook
- Text Mobile Phone
Telemetry User Case: Camps

- SIRENS
- CONTROL ROOM
- FENCES
- LIGHTING
- WATER
- POWER
AVAILABLE DEMO KIT
Payment Authorisation

MotoTRBO Network

cardreader

DMR921

RS232

USB

Acquire/Bank

MNIS

Ethernet

Ethernet

Ethernet

Ethernet

Acquire/Bank
Mobile Identification

- FOR SECURE IDENTIFICATION, eg GATE Control
- Personnel or Goods REGISTRATION

- Smartcard with a biometric fingerprint
- Biometric matcher running on the mobile device
- Log archive
- Real time upload via Mototrbo

Connected via Bluetooth

Laptop with Application
Container Tracking
Solution Concept

Current UN issues
- Container location can be unknown
- Container content not always accurate
- No overall container management solution

Concept
Report over MotoTrbo:
- ✓ Container GPS position
- ✓ Container content (via RFID tag)

Solution components
- telemetry module
- Combined GPS/MotoTrbo antennas
- Motion detection sensor
- Durable battery
- RFID sensor
- RFID tag
- MC9090 PDA to program/read RFID tag
- Motolocator client or extra management software
CCTV integrated into Radio
Solution concept

Current UN issues
- Most UN CCTV systems are passive
- Limited human resources to watch live videos
- Video recordings not always helpful

Concept
Build up on existing CCTV system and make it smarter
- Add analytics layer
- Create video management interface
- Pass on alarms triggered by analytics into MotoTrbo system

Solution components
- Existing cameras (if IP cameras)
- Video Management System
- Physical Information Management (PSIM)
- Installation Services
THANK YOU