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It survived the toughest environments... 400G shock, 20G vibration, and passed the toughest JSTC Certification. The AR-50 operates perfectly every time, boosting your radio’s power to 50 watts providing clear, dependable multi-communication networking. It operates from 30 to 512 MHz and works with all modern and legacy waveforms.

It’s compact, lightweight, easy to use. Nothing stops it. To learn more, visit us at www.arworld.us/tactical or call 425-485-9000.
ESSOR, the European Software Defined Radio (SDR) project will be High Data Waveform (HDR WF) compliant with such architecture, thus offering the normative referential required for development and production of software radios in Europe.

The twelve months since Armada’s 2019 Tactical Radios Compendium has witnessed energetic activity in the global tactical communications domain.

by Thomas Withington

Front cover: The Army Futures Command demonstrated its Radio Interoperability Capability - Universal (RIC-U) at the Aberdeen Proving Ground in May, 2019. It provides a voice bridge for tactical radios that will allow US forces to talk with allies during multi-national operations, yet still protect access to the Army’s tactical network. (DVDS)
Large-scale ongoing acquisitions continue in the United States and across several North Atlantic Treaty Organisation (NATO) and non-NATO members. Meanwhile, a resurgent Russia is embarking on a long-overdue modernisation of its army’s tactical communications and Battle Management Systems (BMSs).

**UNITED STATES**

The US Army’s Handheld, Manpack, Small Form Fit (HMS) programme retains its place as the leading tactical radio acquisition in North America. The programme is procuring new handheld and manpack Very/Ultra High Frequency (V/UHF: 30 megahertz/MHz to three gigahertz) radios for the US armed forces. A report published in early June on US defence acquisitions published by the Government Accountability Office (GAO), the US government spending watchdog, gave a snapshot of the programme’s health to date.

Adjusting for inflation HMS development costs have experienced an increase of over 133 percent from the estimated $627.6 million outlined in 2004 at the programme’s inception to the $1.4 billion calculated by the GAO in August 2019. There is good news. The GAO calculates that overall acquisition costs have reduced by almost 24 percent from $10.9 million to $8.3 million. Unit costs have remained the same at circa $40,000 per radio in spite of estimated total radio procurements falling from 328,674 in May 2004 to 271,202 in August 2019. Yet the overall HMS initiative is by not out of the woods. Several testing and production milestones are still on the horizon before the HMS roll-out is complete, possibly by the end of this decade.

**EUROPE**

Beyond the US, other significant acquisitions are ongoing elsewhere in the NATO sphere. The Heer (German Army) SVFUA (Streitkräftegemeinsame verbundfähige Funkgeräteausstattung/Joint Armed Forces Radio Equipment) programme is furnishing the force with the MOTAKO IP (Internet Protocol) BMS which uses the army’s MOTIV software. MOTAKO and MOTIV will be carried across the army’s new Rohde and Schwarz Soveron family V/UHF radios.

Like the Heer, the British Army is following a dual track of acquiring a BMS and new radios via the Project Morpheus initiative. This takes the army’s existing Bowman BMS/communications architecture as the building block for its new communications and BMS. Morpheus uses an open architecture approach to allow new computers and radios to work with the architecture as and when they are acquired. Competitions are expected to be held by the United Kingdom’s Ministry of Defence to acquire new radios to replace legacy transceivers supporting Bowman. Initial plans had called for the Morpheus architecture to be deployed from 2023. Whether this date is feasible with a contracting UK economy on the horizon, courtesy of the COVID-19 pandemic,
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INTRODUCTION

remains to be seen.

Tactical radio developments in Europe are not just about the hardware. The pan-European ESSOR (European Secure Software Defined Radio) high data rate waveform could help to improve command and control, and situational awareness among deployed coalition forces. The ESSOR partner nations and companies include Finland (Bittium), France (Thales), Germany (Rohde and Schwarz), Italy (Leonardo), Poland (Radmor) and Spain (Indra). The ESSOR waveform will use UHF frequencies of 225MHz to 400MHz and accommodate up to 200 nodes per network. It should be ready for porting into radios from 2021. Coincidentally, both Finland and Sweden are in the process of renewing their tactical radios with acquisitions of new V/UHF sets from Elbit and Bittium.

France, meanwhile, will roll out ESSOR on its new Thales CONTACT tactical radio family furnishing the country’s armed forces.

RUSSIA

The Russian Army is performing an ambitious BMS and communications modernisation. Launched in 2009 these efforts have seen the force taking delivery of new NPO Angstrem R-187VE vehicular/fixed base tactical radios and R-187-P1E Azart handheld radios. The former is used by headquarters and mounted forces, with the latter utilised by squad/platoon commanders. Both radios cover V/UHF wavebands of 1.5MHz to 2.5GHz. These radios will carry voice and data, notably traffic relevant to the army’s Acacia-M BMS. This is thought to equip the force’s manoeuvre elements from operational to tactical levels. An equivalent for airborne forces, dubbed the Andromeda-D is being introduced in Russian airborne forces.

OUTLOOK

While the tactical communications market has remained buoyant in recent years, there is no guarantee that this trend will continue. Any global economic slowdown resulting from the COVID-19 pandemic will almost certainly make its presence felt in defence budgets around the world. Tactical communications could feel the brunt of these reductions should lawmakers believe these to be relatively ‘risk free’ cost centres to cut to safeguard the big ticket platform acquisitions so beloved of politicians.
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ALL OF THEM.

Keeping you connected with 360-degree situational awareness is critical, now more than ever. For dismounted warfighters on the ground to pilots supporting from the sky, Viasat’s BATS-D AN/PRC-161 radio brings a common operational picture to those who need it most — even in highly contested environments.

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Learn more at viasat.com/batsd-4
### PRC-9651 V/UHF Handheld

**Aselsan**

**Power:**
- 100mW EIRP max
- 70W PEP (Selectables) output power

**Frequencies/waveforms:**
- 2GHz and 3G ALE options MIL110, 3G (STANAG) & CLOVER data options
- PRC-2091 is a 12.85kg tactical mobile transceiver with a vehicle docking station and extra power (125W setting)
- PRC-2092 is a 14.3kg tactical base station with extra power (125W setting) and a mains power supply.

**Security:**
- Encryption standards: AES256 & DES56. Frequency Hopping: 5 or 25 hops per second

**Weight:**
- ≤ 0.6kg (with 3800mAh battery)
- 3.90kg (5.2kg with Barrett high performance Li-ion Battery with built in charge controller)

**Notes:**
- Provides voice and data comms in talk groups of up to five with others monitoring, range up to 1km in rural terrain. Full duplex capability enables conferencing and VOX.

### PRR 1M

**Aselsan**

**Power:**
- 100mW EIRP max
- 1.6MHz to 30MHz/ Modes: J3E (USB, LSB), H3E (AM), J2A (CW), J2B (AFSK) modes. Digital Voice: 600/700, 1200, 2400Bps (MELP/TWELP)

**Frequencies/waveforms:**
- 1.8MHz to 30MHz/ Modems: J3E (USB, LSB), H3E (AM), J2A (CW), J2B (AFSK) modes. Digital Voice: 600/700, 1200, 2400Bps (MELP/TWELP)

**Security:**
- Encryption: AES 256/Customised COMSEC and ECCM

**Weight:**
- 1kg

**Notes:**
- PRR designed for operation within groups of up to 30 users allows for full duplex communication in ad-hoc digital networks, needs no additional infrastructure. Can link to another network through transceiver connected via USB.

### PRC-5433 V/UHF Handheld

**Aselsan**

**Power:**
- 5W max

**Frequencies/waveforms:**
- 30MHz to 512MHz, wideband and narrowband networking waveforms, proprietary SK2 V/UHF. Fixed frequency operating band 225MHz to 512MHz, frequency hopping operating band 50MHz to 512MHz.

**Security:**
- COMSEC & TRANSC measures include built-in hardware based encryption, frequency hopping, red/black data separation, emergency clear, user access control with Crypto Ignition Key (CIK).

**Weight:**
- 1kg with battery, without antenna

**Notes:**
- New Software Defined Networking Radio (SDNR) for continuous audio, high speed data and video comms & situational awareness. Built-in GNSS, 13 MP camera, 1.77 inches Colour RGB TFT Display

### PR9560

**AT Electronic and Communication International**

**Power:**
- 0.5/2/4W

**Frequencies/waveforms:**
- 30MHz to 87.975MHz. Combat Net Radio (CNR), Voice Relay Network (VRN) and Packet Radio Network (PRN) waveforms

**Security:**
- AES 256/Customised COMSEC and ECCM

**Weight:**
- ≤ 0.6kg (with 3800mAh battery)

**Notes:**
- PR9560 is intended for land forces such as infantry, forward observers, snipers, special forces and anti-terrorist units, and can be deployed at the platoon or company level. CNR’s primary role is voice or data transmission in battlefield via point to point/ point to multi-points communication. VRN extends voice communication distance by chaining. PRN mainly serves as data transmission for man to machine and machine to machine in battlefield.

### PRC-2090 HF manpack transceiver

**Barrett Communications**

**Power:**
- 30W/10W PEP (Selectables) output power

**Frequencies/waveforms:**
- 1.8MHz to 30MHz/ Modems: J3E (USB, LSB), H3E (AM), J2A (CW), J2B (AFSK) modes. Digital Voice: 600/700, 1200, 2400Bps (MELP/TWELP)

**Security:**
- Encryption standards: AES256 & DES56. Frequency Hopping: 5 or 25 hops per second

**Weight:**
- 3.90kg (5.2kg with Barrett high performance Li-ion Battery with built in charge controller)

**Notes:**
- 26 and 3G ALE options MIL110, 3G (STANAG) & CLOVER data options. PRC-2091 is a 12.85kg tactical mobile transceiver with a vehicle docking station and extra power (125W setting). PRC-2092 is a 14.3kg tactical base station with extra power (125W setting) and a mains power supply.
Sat-Com designs and manufactures state of the art military communication equipment, systems and add-on accessories.

Our multiband radio systems provides seamless secure communication across the HF, VHF and UHF band in a single radio system in various configurations simplifying training, implementation, operation, mission planning, maintenance and logistics which saves the end user lots of money.

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WEBSITE: https://www.sat.com.na
<table>
<thead>
<tr>
<th>Model</th>
<th>Barrett Communications</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>5W hand portable, 25W manpack, 50W mobile, base station &amp; rebroadcast</td>
<td>30MHz to 88MHz, 25kHz channel resolution, 10 channels</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td></td>
<td>Multiple levels of encryption and frequency hopping security available: Analogue Voice - Fixed Frequency, Digital Unencrypted Data - Fixed Frequency, Digital Encrypted Voice - Fixed Frequency (DEFH), Digital Encrypted Voice - Frequency Hopping (DEFF), Digital Encrypted Voice - Free Channel Search (DEFCS), Digital Encrypted Data - Fixed Frequency, Digital Encrypted Data - Frequency Hopping</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>1.3kg with battery pack</td>
<td>Military grade portable communication transceiver specifically designed for tactical applications. It is designed to meet complete immersion, vibration, drop to MIL-STD 810G. Available in both handheld and man-pack forms.</td>
</tr>
</tbody>
</table>

**PRC-2081+ – 25 W VHF Manpack**

<table>
<thead>
<tr>
<th>Model</th>
<th>Barrett Communications</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td></td>
<td>25W</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>30MHz to 88MHz, 25kHz channel resolution, 10 channels</td>
<td>Multiple levels of encryption and frequency hopping security available: Analogue Voice - Fixed Frequency, Digital Unencrypted Data - Fixed Frequency, Digital Encrypted Voice - Fixed Frequency (DEFH), Digital Encrypted Voice - Frequency Hopping (DEFF), Digital Encrypted Voice - Free Channel Search (DEFCS), Digital Encrypted Data - Fixed Frequency, Digital Encrypted Data - Frequency Hopping</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>7.1kg with backpack frame and 16.8V 10 Ah Li-Ion battery pack</td>
<td>Military grade portable communication transceiver specifically designed for tactical applications. It is designed to meet complete immersion, vibration, drop to MIL-STD 810G. Available in both handheld and man-pack forms.</td>
</tr>
</tbody>
</table>

**PRC-4090 HF Tactical Manpack Transceiver**

<table>
<thead>
<tr>
<th>Model</th>
<th>Barrett Communications</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>1x 30W/10W PEP (Selectables), Rx current consumption</td>
<td>250mA</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>1.6MHz to 30MHz/ Modes: J3E (USB, LSB), H3E (AM), J2A (CW), CF (Custom Filter) ISB (Data) modes, Digital Voice: 600/700, 1200, 2400 Bps (MELP/TWELP) Encryption Standards: AES256 &amp; DES56. Frequency Hopping: 5 or 25 hops per second</td>
<td>1.35kg with 11.15kg base station with extra power (additional 125W &amp; 150W settings) and a docking station and AC mains power supply.</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>2.95kg (4.55kg with BB2590 Battery / 5.00kg with Barrett high performance Li-Ion Battery with built in charge controller)</td>
<td>Military grade portable communication transceiver specifically designed for tactical applications. It is designed to meet complete immersion, vibration, drop to MIL-STD 810G. Available in both handheld and man-pack forms.</td>
</tr>
</tbody>
</table>

**Notes:**

The ability to design, develop and implement waveforms and cryptology myself allows me to create a national solution.

**TURNING MILITARY NETWORKS INTO A SOVEREIGN TERRITORY**

Rohde & Schwarz’ capabilities for system design, development, production and integration of secure communication architectures and networks are summarized under the SOVERON® concept. SOVERON® takes national interests into account and contributes to digital sovereignty and technological independence.

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### TACTICAL RADIOS LISTINGS

<table>
<thead>
<tr>
<th>Model</th>
<th>Supplier</th>
<th>Power</th>
<th>Frequencies/waveforms</th>
<th>Security</th>
<th>Weight</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4090 HF Manpack Transceiver</strong></td>
<td>Barrett Communications</td>
<td>Tx 30W/10W PEP (Selectable), Rx current consumption 250 mA</td>
<td>1.6MHz to 30MHz/ Modes: J3E (USB, LSB), H3E (AM), J2A (CW), CF (Custom Filter) ISB (Data) modes. Digital Voice: 600/700, 1200, 2400 Bps (MELP)/TWELP</td>
<td>Encryption Standards: AES256 &amp; DES56. Frequency Hopping: 5 or 25 hops per second</td>
<td>2.95kg (4.55kg with BB2590 Battery / 5.00kg with Barrett high performance Li-ion Battery with built in charge controller)</td>
<td>Provides secure telephone, data and email services, uses 2G and 3G ALE standards, can operate in temperatures of -30°C to +70°C.</td>
</tr>
<tr>
<td><strong>4050 HF SDR Transceiver</strong></td>
<td>Barrett Communications</td>
<td>Tx 150W PEP (with 24V supply), current consumption 350MA standby (muted)</td>
<td>1.6MHz to 30MHz, J3E (USB, LSB), H2B (AM), J2A (CW), CF (Custom Filter) and ISB (data option).</td>
<td>5 or 25 hops per second frequency hopping</td>
<td>Undisclosed</td>
<td></td>
</tr>
<tr>
<td><strong>BLD100 Tactical Radio</strong></td>
<td>Benelec</td>
<td>1W to 3W</td>
<td>VHF 30MHz to 88MHz, full civilian CTSS squelch, standard military 150Hz sub-audio tone</td>
<td>external encryption modules</td>
<td>0.295kg including battery &amp; antenna</td>
<td>Designed for platoon communications, BLD100 is a fixed frequency handheld radio family in IP67 housing, complies with Mil Std 810C, D, E &amp; F. Features built-in data modem.</td>
</tr>
<tr>
<td><strong>BL350U UHF FM tactical radio</strong></td>
<td>Benelec</td>
<td>2W to 4W selectable</td>
<td>380MHz to 420 MHz, up to 128 channels with 12.5Hz or 25Hz spacing</td>
<td>AES 256bit encryption optional</td>
<td>0.285kg inc 1700mAh Li-ion battery</td>
<td>Up to 14 hour battery life, IP54 water &amp; dust protection, priority channel &amp; talkback scanning, 1,200/2,400 baud modem, programming via USB, voice operated transmission (VOX).</td>
</tr>
<tr>
<td><strong>Tough SDR Handheld</strong></td>
<td>Bittium</td>
<td>5W (PEP)</td>
<td>30MHz to 2500MHz/ Bittium Narrowband Waveform, Bittium TAC WIN Waveform with data throughput up to 25Mbps, ESSDR High Data Rate Waveform, supports porting of legacy and national waveforms</td>
<td>Red/black separation, secured boot, tampering detection &amp; response, emergency erase, COMSEC and TRANSEC allowing implementation of national algorithms, Application Sandbox for customer applications</td>
<td>950g with battery</td>
<td>SDR-based tactical handheld radio for individual soldiers, such as squad or platoon leader, providing a uniquely wide frequency range. With flexible configuration options and routing networks, supporting ‘thousands’ of radios in one network. Built-in UNSS, camera, transflective TFT LCD (320 x 428) display.</td>
</tr>
<tr>
<td><strong>Tough SDR Vehicular</strong></td>
<td>Bittium</td>
<td>12V DC to 32V DC according to MIL-STD-1275E</td>
<td>30MHz to 2.5GHz. Bittium Narrowband Waveform, Bittium TAC WIN Waveform, ESSDR High Data Rate Waveform. Supports also porting of legacy and national proprietary waveforms.</td>
<td>Red/Black separation, secured boot, tampering detection and response, emergency erase, COMSEC and TRANSEC allowing implementation of national algorithms, application sandbox for customer applications.</td>
<td>15kg</td>
<td>The Tough SDR Vehicular forms part of Bittium’s Tough SDR product line which also includes the Tough SDR Handheld radio, both of which are being supplied to the Finnish armed forces.</td>
</tr>
</tbody>
</table>
## TACTICAL RADIOS LISTINGS

### PRQ-7 Combat Survivor Evader Locator (CSEL)
- **Power:** 5W (PEP)
- **Frequencies/waveforms:** VHF, UHF, satcom
- **Security:** TNSA certified encryption and decryption of OTH and LOS messages
- **Weight:** 0.9kg
- **Notes:** When activated by the Isolated Person (IP), 6-channel CSEL handheld automatically transmits the IP's GPS location and identification and enables the IP and rescue centres to exchange messages.

### Sentry-U 6160-PR (Personal Radio)
- **Power:** 100 mW; 400 mW; 650 mW transmitter RG power
- **Frequencies/waveforms:** 2405 to 2480 MHz (unlicensed ISM band); 16 programmable pre-sets (channels)
- **Weight:** <345 g with batteries and antenna
- **Security:** AES-128 encryption algorithm
- **Notes:** Provides a secure inter/intra communications platform that can be deployed to the forward edge of operations or with specialized units who require robust real time reporting. With improved waveform technology reduces the risk of interception and detection.

---

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The more compact size connector evolution, low profile, only 3mm depth inside the box and 25mm height when connected up to 24 contacts!
### TACTICAL RADIOS LISTINGS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sentry-H 6110-MP (Man pack)</strong></td>
<td><strong>Codan Communications</strong>&lt;br&gt;&lt;br&gt;<strong>Power:</strong> 30W RF + 18dB (two-tone or voice), user-programmable in 1W steps (low/medium/high) &lt;br&gt;<strong>Frequencies/waveforms:</strong> 1.8MHz to 30MHz Tx, 250kHz to 30MHZ Rx with up to 1,000 channels. Codan 2400 bit/s robust data modem waveform, FED-STD-1045; MIL-STD-188-141B; STANAG 4538 3G ALE waveforms, MIL-STD-188-110A/B (STANAG 4539) data capability with data rates up to 192kbps data waveforms, CDR 493-4 proprietary and open standard waveforms, TWELP 2400bit/s, 1200bit/s, 600bit/s, 480bit/s, 300bit/s MELPe (STANAG 4591) 2400bit/s, 1200bit/s digital voice waveforms.&lt;br&gt;<strong>Security:</strong> AES-256 digital voice and data (256 keys, direct entry and programmable via Codan KMS/KFS &amp; USB memory stick), CES-128 voice (16x16-digit keys, direct entry and programmable via Codan KMS/KFS &amp; USB memory stick, 4-digit session PIN)&lt;br&gt;<strong>Weight:</strong> &gt; 4.65kg inc battery&lt;br&gt;<strong>Notes:</strong> Integrated GPS antenna and receiver built-in to the front panel and optional 2300 Handset with GPS, GLONASS and BEIDOU navigation systems supported.</td>
</tr>
<tr>
<td><strong>Sentry-H 6120-BM (Base Mobile)</strong></td>
<td><strong>Codan Communications</strong>&lt;br&gt;&lt;br&gt;<strong>Power:</strong> 150W PEP ±1dB (two-tone or voice), user-programmable in 1W steps (low/medium/high) with up to 1000 channels. MIL-STD-188-110A/B (STANAG 4539) data capability with data rates up to 192kbps. CDR 493-4 proprietary and open standard waveforms. TWELP 2400bit/s, 1200bit/s, 600bit/s, 480bit/s, 300bit/s MELPe (STANAG 4591) 2400bit/s, 1200bit/s digital voice waveforms.&lt;br&gt;<strong>Frequencies/waveforms:</strong> Transmit: 1.8 to 30MHz. Receive: 250 kHz to 30MHz&lt;br&gt;<strong>Security:</strong> AES-256 digital voice and data (256 keys, direct entry and programmable via Codan KMS/KFS &amp; memory stick), CES-128 voice (16x16-digit keys, direct entry and programmable via Codan KMS/KFS &amp; memory stick, 4-digit session PIN).&lt;br&gt;<strong>Weight:</strong> 2.82 kg; Handset: 280 g (no cable)&lt;br&gt;<strong>Notes:</strong> This product delivers a rugged SDR solution for military organisations that demand uncompromised, secure long-range voice and data communications. With 150W RF power, it has been specifically designed to deliver the smallest and lightest form factor for no-fuss integration into base and mobile platforms.</td>
</tr>
<tr>
<td><strong>PRC7700H manpack</strong></td>
<td><strong>Datron</strong>&lt;br&gt;&lt;br&gt;<strong>Power:</strong> 100W&lt;br&gt;<strong>Frequencies/waveforms:</strong> TX: 1.5MHz to 30 MHz (10Hz steps), RX: 100kHz to 30MHz waveforms, modulation types, wide &amp; narrow bands, and communications security can be updated via software&lt;br&gt;<strong>Security:</strong> Integrated high-level encryption option with front panel quick-connect key fill port and zeroize button&lt;br&gt;<strong>Notes:</strong> IP-addressable, digital, ALE-capable HF manpack SDR combining DSP-IF circuitry and powerful microprocessors, also suitable for mobile, rack-mounting or desktop use. Can be used as a man-pack or vehicle-mounted set. Features an internal GPS receiver with external TNC antenna connector mounted on the front panel.</td>
</tr>
<tr>
<td><strong>PRCI099A HF tactical manpack</strong></td>
<td><strong>Datron</strong>&lt;br&gt;&lt;br&gt;<strong>Power:</strong> 5W to 20W, PEP or average, man-pack; 5/20/100/400W in mobile configuration. Capable of continuous duty service at 5W&lt;br&gt;<strong>Frequencies/waveforms:</strong> TX: 1.6MHz to 30MHz, 16kHz Steps, 100 programmable channels&lt;br&gt;<strong>Security:</strong> optional add-on&lt;br&gt;<strong>Weight:</strong> 4.4kg plus 2.4kg battery pack&lt;br&gt;<strong>Notes:</strong> Rugged (MIL-STD-810), immersible man-pack with internal automatic antenna tuner, remotely controllable and with FED-STD-1045A ALE capability. Can be used as core of high-power vehicle system based on core man-pack, which retains emergency &quot;jerk-and-run&quot; capability.</td>
</tr>
<tr>
<td><strong>PRC2100V</strong></td>
<td><strong>Datron</strong>&lt;br&gt;&lt;br&gt;<strong>Power:</strong> 500mW to 10W (Manpack) &amp; 500mW to 75W (mobile or base station)&lt;br&gt;<strong>Frequencies/waveforms:</strong> 30MHz to 88MHz, 100 programmable channels&lt;br&gt;<strong>Security:</strong> Embedded ECCM, COMSEC for voice and data. Full- or partial-band frequency hopping, digital encryption, and internal GPS receiver with external TNC antenna connector&lt;br&gt;<strong>Weight:</strong> 4.2kg plus 1.8kg battery pack&lt;br&gt;<strong>Notes:</strong> Interoperable in all encryption and hopping modes with the HH2100V handheld radio, can be used in a network to provide base station, vehicle, man-pack, or retransmit capabilities.</td>
</tr>
<tr>
<td><strong>PRCI077 VHF tactical manpack</strong></td>
<td><strong>Datron</strong>&lt;br&gt;&lt;br&gt;<strong>Power:</strong> 500mW, 2W and 5W selectable&lt;br&gt;<strong>Frequencies/waveforms:</strong> 30MHz to 88MHz in 25kHz steps, 10 programmable channel presets&lt;br&gt;<strong>Security:</strong> encryption module, KRC1077, high-security voice scrambler optional&lt;br&gt;<strong>Notes:</strong> Interoperable in FM clear-voice mode with Datron Squad Radio family and most other single-channel 30MHz to 88MHz VHF/FM radios using a 150Hz tone-squelch or CTCSS squelch system</td>
</tr>
</tbody>
</table>
HH2100V Spectre-V tactical VHF handheld

- **Power:** Up to 5W output power in three programmable steps
- **Frequencies/waveforms:** 30MHz to 87.975MHz, 100 programmable channels
- **Security:** Full- or partial-band frequency hopping and digital encryption, 2 COMSEC modes (40bit and 64bit)
- **Weight:** 1.2kg with battery
- **Notes:** Meets MIL-STD-810 for reliable operation in harsh environments, accurate position and time-of-day capability is afforded by the embedded GPS receiver, offers short messaging

Datron

HH7700

- **Power:** 500mW, 2W and 5W, user selectable
- **Frequencies/waveforms:** 30MHz to 88MHz, 2,320 channels at 25kHz spacing with 15 programmable presets
- **Security:** optional embedded voice scrambler
- **Notes:** compact and lightweight VHF/FM handheld transceiver, offers VOX for hands free operation and whisper mode, interoperable in FM clear-voice mode with Datron Squad Radio family

Datron

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DTC Communications announced in late-September that the firm has integrated its MeshUltra COFDM waveform into the US Army’s tactical communications networks.

DTC told Armada that its MeshUltra Coded Orthogonal Frequency-Division Multiplexing (COFDM) waveform was designed from the outset to provide optimal performance in heavily contested and congested electromagnetic environments. Using multiple-in multiple-out transmission techniques, by which several transmission paths are used to send traffic to reduce the disruption that physical obstacles can cause to line-of-sight communications, the MeshUltra waveform can handle 87 megabits-per-second (mbps) of data across 20 megahertz/MHz channels, or 5.6mbps across 1.25MHz channels.

**SOL8SDR**

The company launched the MeshUltra waveform in 2019. It is carried by the firm’s SOL8SDR series of software-defined radios. These transceivers cover bandwidths of zero to six gigahertz. One important feature of the SOL8SDR family is the low trans-mission power of these radios of circa 200 milliwatts. This contributes greatly to their Low Probability of Detection/Interception (LPD/I) characteristics. LPD/I techniques are further enhanced by the Cognitive Radio Dynamic Spectrum Access technique that DTC include in their systems. This is a clever approach by which radios in a network will sense the level of interference or jamming affecting a network and alter their frequencies accordingly to avoid or minimise this. The company refers to this concept as “every radio a sensor”. This is emblematic of the cognitive radio techniques increasingly prevalent on the battlefield. DTC describes its MeshUltra waveform as “ground-breaking” saying it has been “designed from the ground up for optimal performance in the presence of heavy mul-tipath interference.” The company continues that the waveform “employs over 800 carriers in contrast to the 50 carriers of Wi-Fi, allowing for a lower symbol rate on each carrier and therefore much better resistance to long-range multipath reflections.”

**TOKENS**

Another important contribution that the MeshUltra waveform makes in contrast to other MANET (Mobile Ad Hoc Networking) waveforms is that it does not employ the principle of contention. Conventional MANET radios wait for a clear channel before sending data. This causes contention when two or more radios try to transmit at the same time. This can cause latency in data transmissions when radios are waiting for a clear channel, or when they keep trying the same channels until they are clear. DTC says that this causes “multiple retries and significantly reduces real world network capacity, particularly in a large network.” Instead MeshUltra uses a token-based managed channel access mechanism. This approach is analogous to a single-track railway where only a train holding a specific token can travel down the stretch of track to avoid collisions. Likewise, only a radio holding a channel access token can transmit: “This completely removes self-interference and allows networks to operate extremely efficiently, and with low and predictable latency, even at very high utilisation.” Alongside this token system, the firm says that it employs the Internet Group Management Protocol multicast technique “in order to avoid the unnecessary repetition of transmission intended for multiple recipients.”
### HH3100 Spectre M multiband tactical transceiver

| Power: | up to 7W in three programmable settings |
| Frequencies/waveforms: | 30MHz to 512MHz (depending on model), 100 programmable channels |
| Security: | Embedded ECCM & COMSEC with Spectre 40, 64, and new AES-256, frequency hopping and digital encryption. Fully compatible with PRC2100V and HH2100V Spectre V ECCM |
| Weight: | 1.2kg inc battery |
| Notes: | Spectre M family offer secure communications in ruggedised form-factors, provide a sophisticated feature-set, and utilise a simplified user interface, includes three versions: HH3100V, HH3100A, and HH3100M. Ground-to-Air AM operation in some models. |

### TWH-101 and TWH-104 Personal Radios

| Power: | 100mW for TWH-101R |
| Frequencies/waveforms: | Operates in the 2.4GHz ISM band with low-probability-of-detection TDMA waveform. |
| Security: | AES encryption, user downloadable keys |
| Weight: | 300g to 680g including batteries. |
| Notes: | Provides full-duplex audio conference, simultaneous data, dual PTT, stereo operation, VOX, whisper mode, voice prompt menus, automatic network management, embedded GPS/GLONASS. |

### TWH-104G1 and TWH-104G3 Portable Gateways

| Power: | up to 7W in three programmable settings |
| Frequencies/waveforms: | 30MHz to 512MHz (depending on model), 100 programmable channels |
| Security: | Embedded ECCM & COMSEC with Spectre 40, 64, and new AES-256, frequency hopping and digital encryption. Fully compatible with PRC2100V and HH2100V Spectre V ECCM |
| Weight: | 1.2kg inc battery |
| Notes: | Spectre M family offer secure communications in ruggedised form-factors, provide a sophisticated feature-set, and utilise a simplified user interface, includes three versions: HH3100V, HH3100A, and HH3100M. Ground-to-Air AM operation in some models. |

### Micom 3 Pathfinder manpack

| Power: | 25W |
| Frequencies/waveforms: | 1.6MHz to 30MHz HF-SSB, 200 preset channels |
| Security: | Digital AES vocoder encryption, internal modem with optional AES encryption |
| Weight: | 3.6kg without battery |
| Notes: | Provides long-range communications in demanding dismounted operations. Automatic Link Establishment per MIL-STD-188-141B standard. |

### PNR-500 Personal Network Radio

| Power: | up to 800mW |
| Frequencies/waveforms: | 380MHz to 430MHz or 400MHz to 450MHz UHF, 100kHz channel spacing, 15 presets |
| Security: | AES encryption |
| Weight: | Less than 450g including battery |
| Notes: | Offers SOF, snipers & CT units simultaneous voice and data communication at ranges to 1,500m, long-range links via VIC-500 vehicle intercom or tactical VHF/HF radio. |

### PNR-1000A Personal Network Radio

| Power: | 0.5W, 1W, 2W adjustable |
| Frequencies/waveforms: | 225MHz to 512MHz, AES 256 encryption based on FIPS 197 standards |
| Weight: | < 0.36kg |
| Notes: | E-Lynx family SDR for dismounts providing full-duplex voice, data and video, ad hoc networking for 64 members. Self-synchronises without master station or GPS, features embedded GPS position reporting. |
### CNR-710 Handheld

**Elbit Systems**

<table>
<thead>
<tr>
<th><strong>Power:</strong></th>
<th>5W, 20W with amplifier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>30MHz to 88MHz VHF/FM, 25kHz channel spacing, 20 presets, software controls programming, network management, data comms etc.</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>Digital encryption with very long non-linear “white” sequences, clear over-ride and COMSEC alarm</td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td>Handheld member of CNR family. Features synchronous/asynchronous data transmission, error correction coding, automatic data rate adaptation. More powerful manpack, airborne &amp; vehicle configurations available.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Weight:</strong></th>
<th>approx 1W UHF &amp; 121.5MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Notes:</strong></td>
<td>ASARS- and NATO-compatible radio featuring automatic activation, transmission of GPS location data and digital emergency messages, can be activated by another PRC-434. Endurance of 30 hours at 1:10 Tx/Rx ratio.</td>
</tr>
</tbody>
</table>
### Hook 3 combat survival radio

**General Dynamics Mission Systems**

- **Power:** 1W – UHF; capable of 5W (FM), 200mW – VHF; capable of 2W (FM), 406 SARSAT 5.0W min, UHF SATCOM 5.0W ± 2dB
- **Frequencies/waveforms:** 121.5MHz, 123.1MHz; 225MHz to 320MHz; capable of 100MHz to 512MHz; 406 SARSAT, Hook 2 & satcom
- **Security:** Hook 2 waveform is secure, 256bit AES encryption for satcom
- **Weight:** 0.680kg
- **Notes:** New Hook family CSAR radio that is smaller, lighter and more power-efficient than its predecessors. Fully compatible with existing Hook 2 radios, Quickdraw2 interrogator, satcom base station.

### AN/PRC-112G Transceiver

**General Dynamics Mission Systems**

- **Power:** Selectable up to 5W
- **Frequencies/waveforms:** 225MHz to 450MHz, 1250MHz to 1390MHz, 1755MHz to 1850MHz, SRW and future waveforms
- **Security:** Programmable COMSEC and TRANSEC, Type 1, Type 2, not a Controlled Cryptographic Item (non-CCI)
- **Weight:** 0.767kg with battery, 0.43kg without
- **Notes:** Small handheld networking radio providing secret or sensitive-but-unclassified communication for leaders or squad members in a single non-CCI device, designed to operate with AN/PRC-155. Compatible with Sidewinder vehicle mount.

### AN/PRC-154A Rifleman Radio

**General Dynamics Mission Systems**

- **Power:** Selectable up to 5W
- **Frequencies/waveforms:** 225MHz to 450MHz, 1250MHz to 1390MHz, 1755MHz to 1850MHz, SRW and future waveforms
- **Security:** Programmable COMSEC and TRANSEC, Type 1, Type 2, not a Controlled Cryptographic Item (non-CCI)
- **Weight:** 0.767kg with battery, 0.43kg without
- **Notes:** Small handheld networking radio providing secret or sensitive-but-unclassified communication for leaders or squad members in a single non-CCI device, designed to operate with AN/PRC-155. Compatible with Sidewinder vehicle mount.

### Pro & Pro X goTenna

**goTenna**

- **Power:** up to 5W
- **Frequencies/waveforms:** 142MHz to 175MHz; VHF; 445MHz to 480 MHz; UHF; channel spacing 6.25kHz, 12.5kHz, 25kHz (user selectable); 4GFSK modulation
- **Security:** end-to-end PKI encryption (256-bit AES)
- **Weight:** 78g
- **Notes:** Small, light digital mesh-networking tactical radio designed to work with an iOS and Android smartphone apps. Designed to enable 100 percent off-grid communications using Android Team Awareness Kit, also supports custom apps. Offers text messaging, GPS team tracking, collaborative mapping, point sharing of targets, friendly, rally points, medevac locations etc. Pro X radios transmit critical data up to four miles point-to-point, and securely hop messages across six devices. Both offered with multi-device deployment kits.

### SR600 UHF Soldier Radio

**Kongsberg Defence Systems**

- **Power:** 10mW to 1W
- **Frequencies/waveforms:** 225MHz to 400MHz, to 5MHz bandwidth
- **Security:** Embedded AES256 encryption
- **Weight:** 0.7kg
- **Notes:** Software-defined, IP-based SR600 connects all soldiers within a squad while offering full integration into the platoon/company network. Allows the squad leader full intra- and inter squad radio communication with a single radio. Also features high data capacity to share video over realistic combat distances.

### MH300 Handheld Multi-Role Radio (MRR)

**Kongsberg Defence Systems**

- **Power:** 15mW, 1W
- **Frequencies/waveforms:** 30MHz to 87.975MHz, 2,320 channels
- **Security:** Built in encryption, up to level secret, comprehensive crypto and key management provided
- **Weight:** 1.055kg
- **Notes:** Software configurable handheld MRR suited to CNR voice and advanced data networks. Features include tactical SMS with free-text or predefined messages (individual or group), “grab and run” from vehicle installation.
### MP300

**Power:** 10mW, 0.5W, 5W, 50W/MRR special waveform  
**Frequencies/waveforms:** 30MHz to 87.975MHz, 2,320 channels  
**Security:** Built-in COMSEC; electronic protective measures including Narrow Band Direct Sequence Spread Spectrum (NBDS) in fixed-frequency operation, frequency hopping, multi-hop packet radio service with automatic routing, multipath integration.  
**Notes:** Software upgradable man-pack for CNR and advanced data network services. Features: up to 19.2kbps data with forward error correction, voice, transparent and packet data, interference cancelling.

### AN/PRC-150(C) HF Manpack Radio

**Power:** 1W, 5W, 20W PEP, 1/2-2dB (1W, 5W, 10W FM)  
**Frequencies/waveforms:** 1.6MHz to 83MHz/HF features: encrypted data, ALE, frequency hopping, vocoder, data link layer protocol, VHF features: vocoder, encrypted data  
**Security:** US Type-1 and coalition encryption, enhanced data frequency hopping  
**Weight:** 4.7kg without battery, 5.44kg with battery  
**Notes:** Falcon II family advanced HF-SSB/VHF-FM secure voice and data manpack radio. Provides up to 9.600bps (HF), and selectable ARQ modes reduce on-the-air transmission time and enhance secure data transmission. In addition to MIL-STD-188-141B ALE, the AN/PRC-150(C) includes STANAG 4538 third generation HF Link Automation.

### AN/PRC-152A Wideband Networking Radio

**Power:** user selectable 250mW to 5W, 10W satcom mode  
**Frequencies/waveforms:** 30MHz to 520MHz and 762MHz to 870MHz; NB: AM/FM, VULOS, SINCgars & HAVEQUICK I/II standard, HPW, HPW IP, APCO P25 Phase 1 trunking, conventional and OTAR (optional); WB: ANW2C (standard), SWW (optional); UHF satcom; MIL-Std-188-191B dedicated channel is standard, MIL-Std-188-191A, 183A DAMA, MIL-Std-188-191C, 181B IVM Phase 1, High Performance Waveform (HPW) & HPW IP SATCOM capability waveform, all optional.  
**Security:** Sierra II programmable crypto, secret or sensitive but unclassified  
**Weight:** 1.2kg max with GPS, battery and antenna  
**Notes:** Handheld networking SDR for simultaneous voice and data, including video.

### AN/PRC-117G Wideband Multi-band Multi-mission Radio

**Power:** NB 10W, satcom 20W; WB 20W peak, 5W average  
**Frequencies/waveforms:** 30MHz to 2GHz; NB: AM/FM, VHF/UHF LOS, SINCgars, Havequick I/II standard, SATURN, APCO P25 & P25 OTAR optional; WB: SWR, ANW2C, ROVER III L-Band receive (optional)  
**Security:** Sierra II-based, Type 1 encryption for WB/NB NSA-certified top secret and below  
**Weight:** 3.7kg without battery, 5.44kg with battery  
**Notes:** Software defined tactical radio focused on wideband data, interoperability with fielded waveforms.

### Falcon III AN/PRC-158 Multi-Channel Manpack

**Power:** Narrowband: 10W, SATCOM: 20W; Wideband: 20W peak, 10W average (max)  
**Frequencies/waveforms:** 30MHz to 2.5GHz NB; VHf: 30MHz to 225MHz, UHF: 225MHz to 500MHz & 750MHz to 874MHz; NB: AM, FM, VHF, UHF LOS, SINCgars, Havequick, SATURN, APCO P25 capable. SATCOM: Rx 243MHz to 270MHz, Tx 292MHz to 318MHz, MUOS: Rx 360MHz to 380MHz, Tx 300MHz to 320MHz, UHF: 225MHz to 500MHz  
**Security:** Sierra II-based, Type 1 (Suite A/B) NSA certified Top Secret and below.  
**Weight:** 5.76kg inc battery.  
**Notes:** Multi-channel man-pack includes MUOS-ready hardware for SATCOM connectivity while on the move. NSA-certified for voice and data up to U.S. TOP SECRET with L3Harris Sierra II encryption, the man-pack is fully JTRS COMSEC and TRANSEC compliant.

### RF-330-E-HH wideband networking handheld

**Power:** UHF: 225MHz to 450MHz, 99 channel presets (L-Band: 1250MHz to 1390MHz and 1750MHz to 1850MHz, extension to 2.5GHz optional)/ANW2C, others available.  
**Frequencies/waveforms:** Type 3 AES 256 for voice, video & data.  
**Security:** Type 3 AES 256 for voice, video & data.  
**Weight:** 0.780kg with battery  
**Notes:** Lightweight radio designed for operations in geographically challenging environments. Can serve as a ‘black’ relay for secure, encrypted video and data between multiple Type 1 tactical sets. Can be deployed as a leave-behind device.
## TACTICAL RADIOS LISTINGS

### RF-7800H-MP Wideband HF/VHF Radio

<table>
<thead>
<tr>
<th>Power:</th>
<th>HF: 1W, 5W, 20W PEP; VHF: 1W, 5W, 10W FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>1.5MHz to 59.999MHz/ Fixed frequency, 2G ALE, 3G ALE, Serial Tone ECCM Falcon II interoperable, VHF FM, 75 channel presets</td>
</tr>
<tr>
<td>Security:</td>
<td>Citadel encryption, CAM (Customer Algorithm Modification), AES, AVS (Analog Voice Security)</td>
</tr>
<tr>
<td>Weight:</td>
<td>3.9kg without batteries</td>
</tr>
<tr>
<td>Notes:</td>
<td>RF-7800H-MP Falcon III man-pack provides wideband data performance and interoperability with fielded Falcon II HF radios. Synchronous and IP applications include Harris Wireless Messaging Terminal, Tactical Chat IP and HC2 Patrol.</td>
</tr>
</tbody>
</table>

### RF-7800V-HH VHF Handheld Radio

<table>
<thead>
<tr>
<th>Power:</th>
<th>Selectable 0.25W, 1W, 2W, 5W and up to 10W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>30MHz to 108MHz/ Quicklook 1A, Quicklook 2, Quicklook 3, Free Channel Search, Quicklook Wide, TNW, Export SINCgars with Pavillion encryption (optional)</td>
</tr>
<tr>
<td>Security:</td>
<td>128bit &amp; 256bit Harris proprietary (Citadel) and AES Customer Algorithm</td>
</tr>
<tr>
<td>Weight:</td>
<td>1.09kg with battery</td>
</tr>
<tr>
<td>Notes:</td>
<td>Designed for traditional CNR missions, ground-to-air and company, and below comms, provides high-speed narrowband networking, manpack performance in a handheld, can be used with 50W amplifier for mid-tier networking.</td>
</tr>
</tbody>
</table>

### RF-7800H-MP Wideband HF/VHF Set

<table>
<thead>
<tr>
<th>Power:</th>
<th>HF: 1W, 5W, 20W PEP; VHF: 1W, 5W, 10W FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>1.5MHz to 59.999MHz, 75 channel presets/ Narrowband: fixed frequency, 2G ALE, 3G ALE, Serial Tone ECCM Falcon II interoperable, VHF FM; Wideband: MIL-STD-188-110C Appendix D, DTE synchronous data and IP data</td>
</tr>
<tr>
<td>Security:</td>
<td>Citadel, CAM (Customer Algorithm Modification), AES, AVS (Analog Voice Security)</td>
</tr>
<tr>
<td>Weight:</td>
<td>3.9kg without battery</td>
</tr>
<tr>
<td>Notes:</td>
<td>Light, compact manpack. Wideband waveform supports data rates up to 120kbps in bandwidths from 3kHz to 24kHz. Synchronous and IP applications include Harris Wireless Messaging Terminal, Tactical Chat IP and HC2 Patrol.</td>
</tr>
</tbody>
</table>

### RF-7850S Advanced Wideband Secure Personal Radio

<table>
<thead>
<tr>
<th>Power:</th>
<th>3.2W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>225MHz to 2500MHz/ NB: TDMA Networking Waveform with optimised voice and guaranteed GPS reporting, frequency hopping, VHF-UHF Line-Of-Sight interoperable with Harris radios; WB: Soldier-TDMA Networking Waveform serves team, squad, platoon deployments, simultaneous voice &amp; data</td>
</tr>
<tr>
<td>Security:</td>
<td>256bit Citadel, 256bit AES</td>
</tr>
<tr>
<td>Weight:</td>
<td>0.77kg with standard battery</td>
</tr>
<tr>
<td>Notes:</td>
<td>RF-7850S enables networked platoon-wide full duplex audio, multiple, concurrent talk-groups, simultaneous voice, position reporting and IP data up to 1.5Mbps, ad hoc mesh networking.</td>
</tr>
</tbody>
</table>

### RF-7850M-HH Multiband Networking Handheld

<table>
<thead>
<tr>
<th>Power:</th>
<th>Selectable 0.25W, 1W, 2W, 5W and up to 10W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>Narrowband: 30MHz to 512 MHz, Wideband: 225MHz to 512 MHz, AM: 108MHz to 512MHz/ NB: TDMA Networking Waveform (TNW) 25k and 75K; WB: M-TNW, ANWZ C (optional)</td>
</tr>
<tr>
<td>Security:</td>
<td>Quicklook 1A, 2, 3 and Quicklook-Wide ECCM, 1128bit &amp; 256bit Harris proprietary Citadel AES 128 &amp; 256, Customer Algorithm Modification encryption less than 1kg with battery</td>
</tr>
<tr>
<td>Weight:</td>
<td>Intended for traditional CNR missions, ground-to-air and company and below voice and data comms. Optional 50W amplifier enables use in mid-tier tactical networks. Provides manpack performance in a handheld, interoperable with Falcon II and III sets.</td>
</tr>
</tbody>
</table>

### RO Tactical Radio

<table>
<thead>
<tr>
<th>Frequencies/waveforms:</th>
<th>Defence Information Systems Agency Enhanced Mobile Satellite Services. NIST certified AES 256 voice and data encryption (can be used by coalition troops).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security:</td>
<td>0.510kg without antenna.</td>
</tr>
<tr>
<td>Weight:</td>
<td>Using Distributed Tactical Communications System satcom service, operator can reach thousands of other RO tactical radios within a 100-250 mile range anywhere with sight of sky. Described as a global push-to-talk satcom tactical handheld radio.</td>
</tr>
</tbody>
</table>

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**L3Harris Tactical Communications**
### TACTICAL RADIOS LISTINGS

<table>
<thead>
<tr>
<th>Device Description</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SINCGARS RT-1523 VHF Radio</strong></td>
<td>L3Harris Tactical Communications</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>1mW, 100mW, 5W, 50W (with power amplifier)</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms</strong></td>
<td>30MHz to 87.9575MHz/ SINCGARS</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>Internal Encryption Module, CT/PT, frequency hopping</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>3.5kg with battery</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>Offered in vehicle and man-pack configurations. In the mobile role, the radio works with an embedded tactical data router, and as a man-pack it features a standard point-to-point-protocol interface. Both allow a C2 application to access the tactical internet.</td>
</tr>
</tbody>
</table>

| **SINCGARS RT-1702 VHF Combat Net Radio**                    | L3Harris Tactical Communications                  |
| **Power**                                                   | 1mW (LO), 100mW (MED), 5W (HI), 50W (PA with RFPA power amplifier) |
| **Frequencies/waveforms**                                    | NB: STANAG 4204 compliant (SC); WB: SINCGARS (FH) |
| **Security**                                                | Country unique Pavilion SINCGARS                  |
| **Weight**                                                  | 3.5kg including BB-2580 battery                   |
| **Notes**                                                   | Man-pack or vehicle-mount radio that provides situational awareness through real-time maps, location and IP data with an optional, embedded 12-channel GPS. |

| **Tactical Network Rover (TNR)**                             | L3 Harris Communications Systems West             |
| **Notes**                                                   | Handheld transceiver that provides a multi-megabit, bidirectional data link capability to dismounted combat troops. Combines video downlink receiver functionality with broadband IP networking capability. TNR uses the existing Rover communications infrastructure for air-to-ground interoperability and ground-to-air networking within a Net-T network, supporting digitally aided close air support, ground force position sharing, chat and large file transfers. |

| **Tactical Network Rover e (TNRe) video receiver**           | L3 Harris Communications Systems West             |
| **Frequencies/waveforms**                                    | Supports UHF, L-, S-, C- and Ku-Band operations/ capabilities include DDL, DVB-T, Tactical, BE-CDL, CDL, Legacy digital, 466ER, VNW and FM analog |
| **Security**                                                | NSA-approved Type 1 and AES encryption            |
| **Notes**                                                   | Small-form-factor hand-held radio provides full bidirectional connectivity to vehicles or the dismounted user. Receives full-motion video and sensor data, enables secure digital video, chat, VoIP and other network-enabled applications. Fully interoperable with ROVER. Antenna can be connected directly to radio or remotely through cables. |

| **Tactical Rover e (TACE) video receiver**                    | L3 Harris Communications Systems West             |
| **Notes**                                                   | Pocket-sized receiver that provides encrypted digital and analog video with aircraft and sensor positional data directly to the dismounted user for real-time situational awareness. Interoperable with fielded ISR and fighter aircraft video transmitters. Receives and displays video, aircraft position and sensor point of interest simultaneously. Features automatic waveform search, speed dial preset recall allows quick switching between multiple video feeds. |

| **Tactical Rover p (TACP)**                                  | L3 Harris Communications Systems West             |
| **Frequencies/waveforms**                                    | L, S, C & Ku bands/ DDL, DVB-T, Tactical, CDL, legacy digital (455), 466ER, VNW, FM analogue. Handles H.261, H.264, MPEG-2, MPEG-4, MJPEG, analog NTSC/PAL video feeds. |
| **Security**                                                | AES & triple DES supported.                       |
| **Weight**                                                  | 0.5kg                                            |
| **Notes**                                                   | Small, light, IP-based, multiband, secure, digital and analog receiver designed for ease of integration. Interfaces allow connection with ‘virtually any’ warfighter system, existing display device, computer and power source. |
**Personal Role Radio (PRR)**

**Power:** 50mW

**Frequencies/waveforms:** 2.4GHz direct sequence spread spectrum modulation

**Security:** Encryption optional

**Notes:** Compact and lightweight PRR with a typical operating range of 500m in open terrain, and through three floors of a building, features wireless press to talk with up to 2m range, operates independently of any infrastructure, interfaces with combat net radios.

**Leonardo**

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**Enhanced Personal Role Radio (EZPRR)**

**Power:** 100mW

**Frequencies/waveforms:** 2.4GHz direct sequence spread spectrum modulation

**Security:** Encrypted

**Notes:** Typical operating range is 800m in open terrain, and through three floors of a building; wireless Press To Talk (PTT) with 2m range; features interchangeable switch pack, tailorable audio ancillaries; independent of infrastructure. Enhancements include extended range, more capable antenna, goose neck antenna, data capabilities, rebroadcast, C2 base station, special purpose ancillaries.

**Leonardo**

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**SWave Enhanced Handheld (HH-E)**

**Power:** 5W [50W in vehicles]

**Frequencies/waveforms:** 25MHz to 146MHz / LOS FM/AM (STANAG 4204/4205), IP MIL-STD-188-220C (datalink), SelfNET EASY II (EPM/ECCM), SelfNET Networking Soldier Broadband Waveform (WB MANET), SelfNET Narrowband Adaptive Waveform (NB MANET)

**Security:** Embedded customisable COMSEC, TRANSEC

**Weight:** 0.63kg with standard battery

**Notes:** Handheld or body-worn radio for soldier and commander use at platoon or section level, offering simultaneous voice and data communications at the tactical edge, configurable for vehicle use.

**Leonardo**

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**SWave MBI manpack/vehicle radio**

**Power:** Up to 20W, or 50W with vehicle amplifier


**Security:** Embedded programmable COMSEC up to national restricted and TRANSEC, embedded AES 256 crypto engine, support for custom crypto algorithms.

**Weight:** under 8kg inc battery

**Notes:** Family of reconfigurable man-pack radios for dismounted and vehicular use, supporting wide-band IP voice and data, secure CNR voice and video.

**Leonardo**

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**DICOM RF13 Portable VHF Transceiver**

**Power:** 0.2W, 5W

**Frequencies/waveforms:** 30MHz to 88MHz, 2,320 channels with 25kHz spacing, nine presets, internal digital voice encryption

**Security:** Transceiver weighs 2.5kg without batteries or accessories, < 10.9kg for complete set in carrying bag with spare battery

**Notes:** Voice and data transceiver for tactical command; features enhanced resistance to EW. Uses TNC connector to expand range of antennas; features inbuilt GPS receiver with location information distributed with voice or data as a part of the waveform.

**MESIT Defence**

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**DICOM RF23 EPM Multiband Handheld Transceiver**

**Power:** 2W nominal, 0.2W reduced, 5W increased (FM), 1W nominal, 0.1W reduced (JAM)

**Frequencies/waveforms:** 25MHz to 146MHz / LOS FM/AM (STANAG 4204/4205), HW20 (VHF EPM waveform)

**Security:** TRANSEC - frequency hopping technology. COMSEC - communications secured using AES based encryption, emergency erasing of operational data

**Weight:** 0.65kg (transceiver), 0.3kg or 0.45kg (battery pack)

**Notes:** Handheld or body-worn radio for soldier and commander use at platoon or section level, offering simultaneous voice and data communications at the tactical edge, configurable for vehicle use.

**MESIT Defence**
## TACTICAL RADIOS LISTINGS

<table>
<thead>
<tr>
<th>Model</th>
<th>Manufacturer</th>
<th>Power</th>
<th>Frequencies/waveforms</th>
<th>Security</th>
<th>Weight</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICOM RF2305 Manpack</td>
<td>MESIT Defence</td>
<td>5W FM, 1W AM</td>
<td>25MHz to 146MHz / LOS FM/AM (STANAG 4204/4205), HW20 (VHF EPM waveform)</td>
<td>TRANSEC - frequency hopping technology, COMSEC - communications secured using AES based encryption, emergency erasing of operational data</td>
<td>4kg</td>
<td>Tactical command radio based on RF23, range increased to 15km with improved antenna &amp; counterweight, maintains complete RF23 functionality</td>
</tr>
<tr>
<td>DICOM RF40 Handheld</td>
<td>MESIT Defence</td>
<td>5W normal 10W burst</td>
<td>30MHz to 512MHz, LOS FM/AM (STANAG 4204/4205), WF40 (VHF/UHF MANET waveform), HW20 (VHF EPM waveform).</td>
<td>AES-based encryption, up to 384bit key length</td>
<td>0.9kg inc. battery pack</td>
<td>Back compatible with system RF20, multi-channel radio with simultaneous voice &amp; data capability, integral GNSS receiver for GPS, GLONASS &amp; Galileo systems, will accept further legacy and custom waveforms</td>
</tr>
<tr>
<td>SRX 2200 Enhanced single band portable</td>
<td>Motorola Solutions</td>
<td>1W to 3W @ 700MHz to 800MHz, 1-6W VHF, 1-5W UHF range 1</td>
<td>126MHz to 174MHz VHF, 380MHz to 470MHz UHF range 1, 700MHz to 800 MHz</td>
<td>Supports ADP, AES, DES-XL, DES-OFB, DVP-XL encryption algorithms, and WPA-2, WPA, WEP WiFi security protocols</td>
<td>&lt; 1kg</td>
<td>SRX 2200 P25 two-way portable radio is evolving to support new technologies like WiFi, Adaptive Audio Engine, and Bluetooth 4.0 wireless technology. Ultra-low power operation allows military personnel to communicate in 0.25-watt transmission for low detection (UHF range 1 only).</td>
</tr>
<tr>
<td>COMP@N H07 VHF/UHF handheld</td>
<td>Radmor</td>
<td>1W to 6W (PEP)</td>
<td>20MHz to 520MHz and 30MHz to 137MHz/25kHz narrowband waveform providing secure voice transmission, 25kHz channels, digital voice transmission, 100 hops per second in frequency hopping mode, fixed frequency. Analog voice transmission at a fixed frequency in FM and AM, Radmor Serial Data (RSD) data transmission.</td>
<td>TRANSEC &amp; COMSEC cryptographic protection, AES-256 voice protection</td>
<td>&lt; 309g</td>
<td>Handheld SDR radio, developed using a common hardware platform for all COMP@N family radios, on which there are a number of waveforms implemented. H07 is designed for voice communication, including: tactical short-range VHF and UHF communication for land forces; tactical short-range communication VHF for air force; communication with civilian services.</td>
</tr>
</tbody>
</table>

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### Astronotics

**COMMONALITY that keeps you calm and connected**

Portable and benchtop radio test sets providing legacy, current SDR, and future exotic waveform support for ground and airborne tactical radios.

**SUPPORT FOR**

- SINCgars, PRC-150/152/117G, MBITR, CUB, Shadow, and ARC-231/210/201 radios
- HAVE QUICK, TRM/TSM-X, SINCgars, MUOS, SWR, and SATURN waveforms

**KEY FEATURES**

- 1MHz to 6GHz, software-defined hardware, 16+ discrete instruments with scripted automated testing per OEM's IMM

**LEARN MORE AT** [ASTRONOTICS.COM/MILITARY-RADIO-TEST](http://www.astronotics.com/military-radio-test)
<table>
<thead>
<tr>
<th>Model</th>
<th>Company</th>
<th>Power</th>
<th>Frequencies/waveforms</th>
<th>Security</th>
<th>Weight</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP@N H08</td>
<td>Radmor</td>
<td>Programmable FM max 5W, programmable AM max 4 W-PEP, CPM (W2FH): 0.1W, 1W, 5W</td>
<td>20MHz to 520 MHz and 30MHz to 137MHz/BMS IP WF – narrowband EPM (Electronic Protective Measures) waveform can operate in the frequency hopping mode or at fixed frequency, STANAG 4204 – working at a fixed frequency VHF FM, STANAG 4205 – working at a fixed frequency UHF FM/AM</td>
<td>TRANSEC &amp; COMSEC cryptographic protection</td>
<td>&lt; 1kg</td>
<td>Handheld SDR developed using a common hardware platform for all COMP@N family radios. W2FH waveform allows simultaneous transmission of voice and data, while the synchronization mechanism does not require GNSS.</td>
</tr>
<tr>
<td>COMP@N H09</td>
<td>Radmor</td>
<td>Programmable FM max 5W, programmable AM max 4 W-PEP, CPM (BMS IP WF): 0.1W, 1W, 5W</td>
<td>20MHz to 520 MHz / 30MHz to 137MHz/BMS IP WF – narrowband MANET waveform that can operate in frequency hopping mode or at fixed frequency, STANAG 4204 – working at a fixed frequency VHF FM, STANAG 4205 – working at a fixed frequency UHF FM/AM</td>
<td>TRANSEC &amp; COMSEC cryptographic protection</td>
<td>&lt; 1kg</td>
<td>Handheld SDR developed using a common hardware platform for all COMP@N family radios. Has implemented several waveforms, which allow a smooth transition from classical systems to modern BMS. BMS IP WF allows integration with IP networks, simultaneous voice and data transmission.</td>
</tr>
<tr>
<td>BNET-HH</td>
<td>Rafael Advanced Defense Systems</td>
<td>5W</td>
<td>Narrowband waveform 30MHz-88MHz, 225-512MHz [108MHz-174MHz] optional. Wideband waveform 225MHz-512MHz [L-band/S-band optional]. Can support additional waveforms.</td>
<td>Networking ECCM capabilities, frequency hopping spread spectrum techniques.</td>
<td>1.2kg</td>
<td>The airborne variant of BNET, known as BNET-AR has been acquired by the Brazilian, Colombian, German and Indian air forces. Sales of the radio series to land forces remain unknown.</td>
</tr>
<tr>
<td>BNET-MPS/V</td>
<td>Rafael Advanced Defense Systems</td>
<td>5W/20W (BNET-MPS), 50W per channel (BNET-V)</td>
<td>Narrowband waveform 30MHz-88MHz, 225-512MHz [108MHz-174MHz] optional. Wideband waveform 225MHz-512MHz [L-band/S-band optional]. Can support additional waveforms.</td>
<td>Networking ECCM capabilities, frequency hopping spread spectrum techniques.</td>
<td>6kg (BNET-MPS), 13kg (BNET-V)</td>
<td>The BNET-MPS is the manpack member of the overall BNET family with the BNET-V being its vehicular counterpart.</td>
</tr>
<tr>
<td>Microlight DH500</td>
<td>Raytheon</td>
<td>0.1W to 4W</td>
<td>225MHz to 2GHz/ Eight-hop relay, CPSM with DSSS, TDMA, CDMA and FDMA.</td>
<td>supports commercial Advanced Encryption Standard (AES) for Secure But Unclassified (SBU) transmission</td>
<td>0.76kg</td>
<td>Provides simultaneous voice, data and video, automatic position location reporting, giving commanders the ability to see the location of all people and assets at all times, even in GPS-denied environments.</td>
</tr>
<tr>
<td>EPLRS-XF-I</td>
<td>Raytheon</td>
<td>50W max</td>
<td>225MHz to 450MHz/ enhanced positioning, TCP/IP MANET</td>
<td>AES encryption</td>
<td>8kg</td>
<td>Man-pack vehicle and airborne EPLRS radio providing robust, on-the-move, high-speed, automated data exchange using a contention-free networking architecture.</td>
</tr>
</tbody>
</table>
# Tactical Radios Listings

<table>
<thead>
<tr>
<th>Model</th>
<th>Make</th>
<th>Power</th>
<th>Frequencies/waveforms</th>
<th>Security</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTR3005 Manpack</td>
<td>Reutech</td>
<td>10W max</td>
<td>118MHz to 400MHz V/UHF</td>
<td>User definable tamper proof QCM-R module for full INFOSEC and TRANSEC autonomy, LPI via DSSS</td>
<td>LANDSEC HMI features integrated texting from front panel. Has CNS Link-ZA compliant tactical data link, Bluetooth for peripherals, automatic GPS position reporting, local/networked remote control, Li-ion battery with gauge.</td>
</tr>
<tr>
<td>MTR2005 Manpack</td>
<td>Reutech</td>
<td>10W max</td>
<td>30MHz to 88MHz</td>
<td>User definable tamper proof QCM-R module for full INFOSEC and TRANSEC autonomy. LANDSEC HMI features integrated texting from front panel. Has CNS Link-ZA compliant data link, Bluetooth for peripherals, auto GPS position reporting, local/networked RC, built-in antenna tuning, Li-ion battery with gauge.</td>
<td></td>
</tr>
<tr>
<td>MTR1025 Manpack</td>
<td>Reutech</td>
<td>5W</td>
<td>30MHz to 30MHz, HF</td>
<td>User definable tamper proof INFOSEC, TRANSEC module</td>
<td>Features integrated texting from front panel, CNS Link-ZA compliant data link, Bluetooth for peripherals, auto GPS position reporting, ALE to MIL-STD-188-141A, APP A, data to MIL-STD-188-110A and STANAG 4285 local/networked RC, built-in antenna tuning, Li-ion battery with gauge.</td>
</tr>
<tr>
<td>PWH4001</td>
<td>Reutech</td>
<td></td>
<td>Anti-jamming, LPD waveform</td>
<td>LANDSEC family personal role networked radio for short-range intra-team communications with integral GPS position reporting. Provides multiple talker capability with PTT priority override and access to two external CNRs. Offers simultaneous voice, data and image transfer, built-in rebroadcast and gateway functions. PTT keys access four independent networks. Hot-swappable battery lasts up to 18 hours.</td>
<td></td>
</tr>
<tr>
<td>TR620</td>
<td>Reutech</td>
<td>5W</td>
<td>30MHz to 88MHz FM ground-to-ground and 118MHz to 137MHz AM ground-to-air communications.</td>
<td>Analogue voice scrambling compatible with the TR610 and TR6000 in FM mode; provides AES 256 encryption for secure FH voice. Handheld transceiver based on flexible DSP/SDR technology that allows configuration flexibility and an upgrade path; qualified to MIL-STD-810F.</td>
<td>Handheld transceiver based on flexible DSP/SDR technology that allows configuration flexibility and an upgrade path; qualified to MIL-STD-810F.</td>
</tr>
<tr>
<td>EPLRS-XF-I</td>
<td>Raytheon</td>
<td>10W to 20W</td>
<td>30MHz to 512MHz, 142 channel pre-sets/ SINC-GARS, SATCOM, DAMA, HAVEQUICK I/I, AM, FM, FSK, B/SB/ DSB/SSB FSK</td>
<td>embedded encryption engine, embedded COMSEC for voice and data</td>
<td>Provides lightweight, secure, network-capable, multi-band/multi-mission, anti-jam, voice/ imagery/ data communications capability in a single package.</td>
</tr>
<tr>
<td>Model</td>
<td>Description</td>
<td>Power</td>
<td>Frequencies/waveforms</td>
<td>Security</td>
<td>Notes</td>
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<tr>
<td>TR2000 Manpack/Vehicle set</td>
<td>25W on internal battery or 100W on 26V vehicle battery</td>
<td>HF with Automatic Link Establishment waveform.</td>
<td>ECCM for voice and data</td>
<td>Part of tactical HF product range for modern battlefield, offers ALE to MIL-STD-188-110A, built-in GPS, Bluetooth connectivity for peripherals. Micro DSP technology allows configuration flexibility and provides upgrade path.</td>
<td></td>
</tr>
<tr>
<td>TR2400 Manpack/Vehicle set</td>
<td>25W on internal battery or 100W on 26V vehicle battery</td>
<td>HF</td>
<td>ECCM for voice and data, user-defined digital encryption</td>
<td>Configurable as man-pack, vehicle and fixed-installation HF radio. External co-location filter enables multi-transceiver operation. Features ALE to MIL-STD-188-141A, embedded STANAG 5066 data link protocol. Environmental &amp; EM compliance to MIL-STD-810E and MIL-STD-461C.</td>
<td></td>
</tr>
<tr>
<td>TR6000 Manpack/Vehicle set</td>
<td>10W on man-portable battery, 40W on 27V vehicle battery typical</td>
<td>Low band VHF ground-to-ground, ATC band ground-to-air</td>
<td></td>
<td>Can be used as vehicle transceiver without need for external power amplifier. Features wireless peripheral connectivity via Bluetooth, GPS position reporting via internet. Micro DSP technology allows configuration flexibility, upgrade path.</td>
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</tr>
<tr>
<td>MR300xH/U multiband HF/VHF/UHF tactical radio</td>
<td>Several output power classes up to 50W (VHF/UHF) ad 500W (HF) with external amplifiers</td>
<td>Multiband capability (1.5-512MHz with external devices). R&amp;S MR300xH for HF/VHF (1.5MHz to146MHz). R&amp;S MR300xH for VHF/UHF (25MHz to 512MHz). Multi-Waveform capability (HF House, VHF/UHF tactical and G-A-O waveforms)</td>
<td>Embedded EPM (ECCM) in line with R&amp;S SECOM and R&amp;S SECOS, HAVE QUICK II. Secure digital voice and data (AES 256)</td>
<td>A member of the SOVERON software defined radio family available in man-pack and vehicular configurations. Integrated GPS enables position reporting. Front panel is removable for flexible use and integrations. Features IP over-the-air capability (R&amp;S IPoA) and SIP based remote voice operation.</td>
<td></td>
</tr>
<tr>
<td>HR5000 handheld tactical radio</td>
<td>Transmit output power: up to 5W</td>
<td>Frequency range: 30MHz to 512MHz without gaps. A3E/F3E; SOVERON WAVE AJ-NB-S (German origin, encryption using 256bit AES (COMSEC); high date rate for two parallel voice channels with IP-based data transmission, anti-jam frequency hopping [TRANSEC], optimised for use by dismounted soldiers in rocky and urban terrain [multipath robustness]; MANET for increased range and interoperability)</td>
<td>Frequency hopping (TRANSEC), AES encryption (COMSEC)</td>
<td>A member of the SOVERON HR family, the HR5000 provides two parallel voice channels and IP-based data transmission</td>
<td></td>
</tr>
<tr>
<td>MR3000P handheld VHF transceiver</td>
<td>5W RF output power</td>
<td>Multiband capability (25MHz to 146MHz)</td>
<td>Embedded EPM (ECCM) in line with R&amp;S®SECOM-P</td>
<td>A member of the SOVERON software defined radio family, the MR3000P provides secure transmission of voice, data and short messages, selective calling with sender authentication, GPS position reporting.</td>
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<tr>
<td>TACTICAL RADIOS LISTINGS</td>
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<tr>
<td><strong>LEOPARD1 Combat Net Multiband (HF/UHF/VHF)</strong></td>
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<tr>
<td><strong>Sat-Com - Secure and Tactical Communications</strong></td>
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</tr>
<tr>
<td><strong>Power:</strong></td>
<td>HF SSB 200W / VHF FM 18W/10W AM 7W</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>Frequency Range: 1.6 - 170 MHz / 512 MHz</td>
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</tr>
<tr>
<td><strong>Security:</strong></td>
<td>COMSEC: Encrypted AES256 Digital Voice</td>
<td></td>
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<tr>
<td><strong>Enhanced Features:</strong></td>
<td>TacTalk - Messaging, Chat, E-mail, File Transfer.</td>
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<tr>
<td><strong>Weight:</strong></td>
<td>3.2 kg (excluding Battery)</td>
<td></td>
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<tr>
<td><strong>Notes:</strong></td>
<td>COMSEC (SDV) and TRANSEC (FFH) Modes on Scanning or ALE. All VHF/UHF Features are interoperable with the LEOPARD1 and BADGER Radios.</td>
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</tbody>
</table>

| **BADGER 19" Multiband SDR (New Product)** |
| **Sat-Com - Secure and Tactical Communications** |
| **Power:** | HF SSB 125W / VHF FM 200W UHF 100W AM 50W |
| **Frequencies/waveforms:** | Frequency Range: 1.6 - 170 MHz / 512 MHz |
| **Security:** | COMSEC: Encrypted AES256 Digital Voice |
| **Enhanced Features:** | TacTalk - Messaging, Chat, E-mail, File Transfer. |
| **Weight:** | 11 kg (typical) |
| **Notes:** | DUAL Power Amplifier for single or dual radio deployment. RF Output/s of Radio/s are automatically switched through to the correct band antenna by the internal antenna switch based on a priority selection with two radios connected. Radio control is passed through to ATU is connected on the rear for control. |

| **Afracal2 Linear Dual POWER AMPLIFIER 125W/50W (HF/UHF/VHF)** |
| **Sat-Com - Secure and Tactical Communications** |
| **Power:** | HF SSB 125W / VHF FM 100W / UHF 75W |
| **Frequencies/waveforms:** | Exact Same as Exciter - Leopard1 Manpack. |
| **Security:** | Exact Same as Exciter - Leopard1 Manpack. |
| **Enhanced Features:** | Automatic Antenna Tuner: |
| **Mounting:** | Purpose Rack or desk Top |
| **Weight:** | 11 kg (typical) |
| **Notes:** | DUAL Power Amplifier for single or dual radio deployment. RF Output/s of Radio/s are automatically switched through to the correct band antenna by the internal antenna switch based on a priority selection with two radios connected. Radio control is passed through to ATU is connected on the rear for control. |

| **Afracal-1000 HF High POWER AMPLIFIER** |
| **Sat-Com - Secure and Tactical Communications** |
| **Power:** | 1000W Linear PEP (Liquid Cooled) |
| **Frequencies/waveforms:** | Exact Same as Exciter - Leopard1 Manpack/19" Badger |
| **Security:** | Exact Same as Exciter - Leopard1 Manpack/19" Badger |
| **Enhanced Features:** | 19" Rack or desk Top |
| **Mounting:** | High Power Amplifier for single radio deployment if used with 19" Exciter delivering 1KW onto a Wide Band Dipole or Vertical Whip. The VHF/UHF outputs are connected to the appropriate antennas. |
| **Weight:** | 25 kg (typical) |
| **Notes:** | 100W Linear PEP (Liquid Cooled) |

| **Streamcaster 4200E** |
| **Silvus Technologies** |
| **Power:** | 1mW to 4W variable, up to 8W effective with Tx beamforming 480MHz to 6GHz including UHF-1, UHF-2, 900 MHz ISM, Lower, Extended, Middle and upper L-bands, Broadcast B, Federal S, S-band, 2.4 GHz ISM, Low and Federal and High C-bands, 5.2GHz and 5.8GHz ISM bands /Mobile Networked MIMO (MN-MIMO) using techniques including spatial multiplexing, space-time coding, Tx/Rx eigen beamforming. DES56 (Standard) AES256 (Optional) IPS1 40-2 Level2 (Suite B) encryption, MANET Interference Avoidance (MANA) |
| **Frequencies/waveforms:** | 0.116kg |
| **Security:** | 2x2 hand handheld or embedded MIMO radio. Enhancements include user-customizable multiposition switch for loading presets and zeroizing crypto, improved connectors and tie-down points for weather caps, RoIP tethering and dual PTT, IP68 enclosure (submersible to 20 meters), Smart battery percent monitoring (for SC4200E). |
| **Weight:** | 0.116kg |
| **Notes:** | All VHF/UHF Features are interoperable with the CHEETAH3 and BADGER Radios. |
## TACTICAL RADIOS LISTINGS

### AN/PRC-148 MBITR/JEM

| Power: | 0.1, 0.5, 1.0, 3.0 and 5.0W user selectable (waveform dependent) |
| Security: | Programmable encryption engine supports NSA crypto modernisation requirements, certified by NSA. |
| Weight: | 0.867kg |
| Notes: | An evolution of the combat-proven AN/PRC-148 MBITR, the JEM is a JTRS-approved production radio, is part of a complete communications system for mounted and dismounted operations. |

**Thales**

### AN/PRC-148B MBITR2

| Power: | 5 W in all frequencies |
| Security: | Programmable encryption engine supports NSA crypto modernisation requirements, certified by NSA. |
| Weight: | 1.225kg |
| Notes: | Combines AN/PRC-148 and AN/PRC-154 wideband tactical handheld radio capabilities to integrate dismounts into the wideband tactical IP and voice network via the SRW, simultaneously connecting with older nets via narrowband. |

**Thales**

### AN/PRC-6809 Multi-Band Inter/Intra Team Radio

| Power: | 0.1W to 5.0W |
| Frequencies/waveforms: | 30MHz to 512 MHz contiguous, Havequick II frequency hopping ECCM waveform, country-specific ECCM waveforms |
| Security: | Type 3 BES (optional), 256-bit AES (optional) |
| Weight: | 0.867kg |
| Notes: | Non-Type 1 version (without NSA approved cryptographic algorithms) of the AN/PRC-148 compatible with all MBITR family products and available to US, allied and coalition forces. |

**Thales**

### AN/PRC-154A Rifleman Radio

| Power: | User selectable up to 5W |
| Frequencies/waveforms: | 225MHz to 450 MHz (UHF band), 1,250MHz to 1,390MHz and 1,750MHz to 1,850MHz (L-band); supports SRW |
| Security: | Programmable COMSEC and TRANSEC NSA certified for Type 1 secret and below, non-CCI. |
| Weight: | 0.771kg with battery |
| Notes: | Low-cost, body-worn radio that transmits voice and data simultaneously using the SRW, bringing secure secret and below squad-level communications to the soldier at the tactical edge, enables situational awareness and blue force tracking. |

**Thales**

### AN/PRC-154B Rifleman Radio

| Power: | User selectable up to 5W or 20W boosted mode in vehicle configuration |
| Frequencies/waveforms: | UHF band 225MHz to 450MHz, L-Band 1250MHz to 1390 MHz, 1750MHz to 1850 MHz/ Soldier Radio Waveform (SRW) |
| Security: | Embedded encryption, COMSEC, TRANSEC |
| Weight: | 0.771kg with battery |
| Notes: | Increased RF range, battery life, and added visual HMI display built on the successful and field proven AN/PRC-154A Program of Record Rifleman Radio |

**Thales**

### BCC 67 Panther VHF Manpack Radio

| Power: | Selectable up to 5W or 20W boosted mode in vehicle configuration |
| Frequencies/waveforms: | 30MHz to 108MHz |
| Security: | Secured voice and data 16kbps digital encryption, high EPM protection including frequency hopping, free channel search and mixed mode |
| Weight: | 5.9kg with battery |
| Notes: | Interoperable with Jaguar radios. Battery life: 32 hours with rechargeable Li-Ion battery pack. Advanced CNR services including group selective call, alert, authentication, passive late entry, over-the-air rekeying. |

**Thales**
## TACTICAL RADIOS LISTINGS

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<tr>
<th>Model</th>
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<th>Weight</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>St@r Mille Handheld</strong></td>
<td>2 W</td>
<td>30MHz to 88MHz, supports squad, platoon and weapon system waveforms</td>
<td>High grade built-in encryption, and advanced protection schemes including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes</td>
<td>1 kg without battery</td>
<td>Light and compact, the software-defined ST@R Mille enables simultaneous voice and data communications featuring automatic position reporting. Features standard V24, USB and Ethernet interfaces. Range greater than 1.5km in open terrain</td>
</tr>
<tr>
<td><strong>SYNAPS-H</strong></td>
<td></td>
<td>VHF &amp; UHF/ Waveform library provides NATO, coalition &amp; advanced networking waveforms. Manoeuvre waveforms provide collaborative combat capabilities over wideband networks</td>
<td></td>
<td></td>
<td>Handheld terminal of new SYNAPS networking SDR family designed to provide an easy and adaptable radio solution for network centric transformation of all forces. RF module performance extends communication range.</td>
</tr>
<tr>
<td><strong>TC9210 PR4G VHF Manpack Radio</strong></td>
<td></td>
<td>30MHz to 88MHz/ CNR mode (voice or data), iMux mode (simultaneous voice and data), SuperMux mode (data at 21.6 kbps), GeoMux mode: voice + data + BFT, SuperMux HD (60 kbps), Single Radio Relay (3 bounces voice or data), FireMux mode (Weapon System Triggering)</td>
<td>High grade built-in encryption and advanced protection schemes including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes</td>
<td>3.4kg without battery</td>
<td>An advanced combat net radio with simultaneous voice and IP capabilities.</td>
</tr>
<tr>
<td><strong>TRC 3700 HF Manpack Radio</strong></td>
<td></td>
<td>1.5MHz to 30MHz, supports squad, platoon and weapon system waveforms</td>
<td>Built-in digital encryption for voice and data and wide band hopping on the move, automatic hop band selection, intelligent frequency hopping with spectrum cleaning.</td>
<td></td>
<td>This digital HF software defined radio handles digital ciphered voice and high speed data based on multiple waveforms; features fast 2G and 3G automatic link establishment.</td>
</tr>
<tr>
<td><strong>TRC 9110 PR4G VHF Handheld Radio</strong></td>
<td></td>
<td>30MHz to 88MHz, supports squad, platoon and weapon system waveforms</td>
<td>High grade built-in encryption, and advanced protection schemes including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes</td>
<td></td>
<td>Handles simultaneous voice and data and features a built-in IP router. Capabilities include automatic data relay, dynamic voice/data allocation to boost data rate.</td>
</tr>
<tr>
<td><strong>TRC 9105 VHF Handheld Radio</strong></td>
<td>2 W</td>
<td>30MHz to 88MHz, supports squad, platoon and weapon system waveforms</td>
<td>High grade built-in programmable encryption, advanced EPM including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes</td>
<td>1 kg without battery</td>
<td>Handles simultaneous voice and data with, for example, a SuperMux mode with a throughput of 21.6 kbps and features a built-in IP router. Capabilities include automatic data relay, dynamic voice/data allocation to boost data rate. GPS built in.</td>
</tr>
</tbody>
</table>
## TACTICAL RADIOS LISTINGS

### F@stnet Twin

**Frequencies/waveforms:**
- VHF and UHF

**Notes:**
- F@stnet Twin keeps infantry leader in touch with soldiers through the embedded UHF soldier channel while being continuously in touch with the commanding level thanks to the embedded VHF channel. Designed for interoperability with legacy waveforms; handles simultaneous voice and data.

### SquadNet soldier radio

**Frequencies/waveforms:**
- 865MHz to 880MHz, 100 talk groups over 50 channels with up to 50 users per channel/
- Programmable encryption with red/black architecture

**Security:**
- Built-in encryption for voice and data; with encryption, range falls from at least 1.2km to 1km

**Weight:**
- 250 including battery

**Notes:**
- "Unique" waveform ensures communication is maintained across urban, wooded and mountainous terrain. In open terrain SquadNet gives a 2.5km range point-to-point, extending to 6km with automatic network relaying, maintaining secure comm's over IP networks with an Android app.

### BATS-D AN/PRC-161 Handheld Link 16 Radio

**Power:**
- 8W or 8mW transmit power

**Frequencies/waveforms:**
- Link 16 Voice/Data waveform enables 26.8kbps through 1102 kbps TADIL J coded, free text variable format for enhanced throughput

**Weight:**
- 1kg including battery

**Notes:**
- Radio fuses air and ground Situational Awareness (SA) in a handheld package designed for use at the tactical edge. Designed to be used vest-worn, handheld, or mounted by special operations and expeditionary forces, including Joint Terminal Attack Controllers (JTACs), Forward Air Controllers (FACs), Tactical Air Control Party (TACPs), as well as size, weight, and power constrained platforms.

### R-168-0.1UME VHF handheld

**Power:**
- 0.19W min

**Frequencies/waveforms:**
- 44MHz to 56MHz

**Security:**
- Built-in encryption for voice and data; with encryption, range falls from at least 1.2km to 1km

**Weight:**
- 1.5 kg

**Notes:**
- Connects company and platoon commanders, squad leaders, soldiers. Voice prompt reports channel number, encryption operation and operating modes in darkness. Replaces R-168-0.1U and Barmitsa-RS.
<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-168-0.1UME</td>
<td>VHF handheld</td>
<td>Yaroslavl Radioworks</td>
</tr>
<tr>
<td>R-168-0.5MKME</td>
<td>VHF handheld</td>
<td>Yaroslavl Radioworks</td>
</tr>
<tr>
<td>R-168-0.0.5UDE</td>
<td>VHF monoblock radio</td>
<td>Yaroslavl Radioworks</td>
</tr>
</tbody>
</table>

**Frequencies/waveforms:**
- R-168-0.1UME: 44MHz to 56 MHz
- R-168-0.5MKME: 30MHz to 80MHz
- R-168-0.5UDE: 146MHz to 174MHz
- R-168-0.1UME, R-168-0.5UDE: 1603, 16/F, Island Place Tower, 510 King's Road, Hong Kong

**Power:**
- R-168-0.1UME: 2W min
- R-168-0.5MKME: 1W min
- R-168-0.5UDE: 1W nominal, 5W max

**Security:**
- R-168-0.1UME: built-in encryption for analogue data, digital data from external data terminal.
- R-168-0.5MKME: built-in encryption for voice and data; with encryption, voice range falls from at least 3km to 2.5km, data transmission range 2km.
- R-168-0.5UDE: encrypted voice and data, whisper mode

**Weight:**
- R-168-0.1UME: 1.5kg
- R-168-0.5MKME: 0.3kg
- R-168-0.5UDE: 1.5kg

**Notes:**
- R-168-0.1UME: Connects company and platoon commanders, squad leaders, soldiers. Covert voice prompting, modular for ease of repair, automated fill, sealed alloy case. Replaces: R-147, -162-0.1B, R-163-0.5R, R-163-1U, R-168-0.1U, R-168-0.5U, Barmitsa-RS.
- R-168-0.5MKME: Connects company and platoon commanders, squad leaders, soldiers. Provides FM voice or 16kHz/s secure voice, data rates of 2.4kb/s or 16kb/s via RS-232 interface.
- R-168-0.5UDE: Provides single- and multi-channel clear and secure tactical comms. Features rechargeable battery, two antenna types, microphone headset. Range for simplex-frequency operation 3km with ASP-1.5 antenna, 1.9km with ASP-1.0 antenna or 2 and 1 km with HH.

**TACTICAL RADIOS LISTINGS**

**Frequencies/waveforms:**
- R-168-0.1UME: 44MHz to 56 MHz
- R-168-0.5MKME: 30MHz to 80MHz
- R-168-0.5UDE: 146MHz to 174MHz
- R-168-0.1UME, R-168-0.5UDE: 310MHz to 380MHz

**Security:**
- R-168-0.1UME: Built-in encryption for voice and data; with encryption, voice range falls from at least 3km to 2.5km, data transmission range 2km.
- R-168-0.5MKME: Built-in encryption of voice and data, frequency hopping.
- R-168-0.5UDE: Encrypted voice and data, whisper mode

**Weight:**
- R-168-0.1UME: 1W nominal, 5W max
- R-168-0.5MKME: 1W nominal, 5W max
- R-168-0.5UDE: 1W nominal, 5W max

**Notes:**
- R-168-0.1UME: Provides platoon and company commanders, squad leaders, soldiers. Provides FM voice or 16kHz/s secure voice, data rates of 2.4kb/s or 16kHz/s via RS-232 interface.
- R-168-0.5MKME: Provides single-channel clear and secure tactical comms. Features rechargeable battery, two antenna types, microphone headset. Range for simplex-frequency operation 3km with ASP-1.5 antenna, 1.9km with ASP-1.0 antenna or 2 and 1 km with HH.
- R-168-0.5UDE: Enables open and secure comms with R-168 system on coincident frequencies, connects company and platoon commanders, squad leaders, soldiers, allows them to communicate with aircraft, warships. Range up to 5km.

**Power:**
- R-168-0.1UME: 2W min
- R-168-0.5MKME: 1W min
- R-168-0.5UDE: 1W nominal, 5W max
- R-168-0.1UME, R-168-0.5UDE: 1W nominal, 5W max

**Notes:**
- R-168-0.1UME: Connects company and platoon commanders, squad leaders, soldiers, allows coms with aircraft, warships. Input of modes, frequencies, keys automated. Offers 10 hours continuous operation.
- R-168-0.5MKME: Connects company and platoon commanders, squad leaders, soldiers. Provides FM voice or 16kHz/s secure voice, data rates of 2.4kb/s or 16kHz/s via RS-232 interface.
- R-168-0.5UDE: Provides single- and multi-channel clear and secure tactical comms. Features rechargeable battery, two antenna types, microphone headset. Range for simplex-frequency operation 3km with ASP-1.5 antenna, 1.9km with ASP-1.0 antenna or 2 and 1 km with HH.

**Weight:**
- R-168-0.1UME: 1.5kg
- R-168-0.5MKME: 0.3kg
- R-168-0.5UDE: 1.5kg

**Security:**
- R-168-0.1UME: Built-in encryption for voice and data; with encryption, voice range falls from at least 3km to 2.5km, data transmission range 2km.
- R-168-0.5MKME: Built-in encryption of voice and data, frequency hopping.
- R-168-0.5UDE: Encrypted voice and data, whisper mode

**Frequencies/waveforms:**
- R-168-0.1UME: 44MHz to 56 MHz
- R-168-0.5MKME: 30MHz to 80MHz
- R-168-0.5UDE: 146MHz to 174MHz
- R-168-0.1UME, R-168-0.5UDE: 310MHz to 380MHz

**Power:**
- R-168-0.1UME: 2W min
- R-168-0.5MKME: 1W min
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- R-168-0.5UDE: Provides single- and multi-channel clear and secure tactical comms. Features rechargeable battery, two antenna types, microphone headset. Range for simplex-frequency operation 3km with ASP-1.5 antenna, 1.9km with ASP-1.0 antenna or 2 and 1 km with HH.
A complete systems and solutions communications provider at the tactical edge. Enabling interoperability, scale and reliability for multinational coalition operations and soldier modernisation.

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