TACTICAL RADIOS
AN ARMADA INTERNATIONAL SUPPLEMENT

2021/22

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SECURE AND TACTICAL COMMUNICATIONS
INTRODUCTION

The past 18 months saw an understandable dearth of defence exhibitions. Thus, it was with bated breath that the defence community awaited the 2021 Defence and Security Equipment International exhibition.

Held in London betwixt 14th and 17th September, the show had an abundance of tactical radio purveyors. Arriving in droves to exhibit their wares, several kindly updated Armada on product and programme developments.

US land tactical communications acquisitions continue to dominate the sector alongside evolutions of other leading programmes in Europe. Discussions focused on the US Army’s HMS (Handheld, Manpack, Small Form Factor) project. HMS procures handheld and backpack radios to equip the army’s manoeuvre force. These transceivers will carry the army’s legacy Single Channel Ground Airborne Radio System (SINCGARS). They will also carry TrellisWare’s TSM Mobile Ad-Hoc Networking (MANET) waveform. Several companies exhibiting at DSEI told Armada that TSM replaces the army’s abortive Soldier Radio Waveform (SRW). The SRW was intended to equip both the handheld and backpack radios. Shortcomings in performance sees the SRW being replaced by TSM. The Wideband Networking Waveform (WNW) also looks likely to be replaced, most probably by a TSM incarnation.

HMS

Three radios comprise the ‘H’ element of HMS; the Rifleman Radio (RR), Leader Radio (LR) and Single-Channel Data Radio (SCDR). As its name suggests, dismounted troops at the lowest echelon will use the single-channel RR. The two-channel LR will be used by squad, platoon and team leaders. One channel connects them with their troops, the second connects them with higher echelons. The backpack radio also has two channels. These latter radios also carry TSM alongside Satellite Communications (SATCOM) waveforms like the Mobile User Objective System (MUOS). Along with equipping dismounted troops, the backpack radio equips vehicles.

The HMS programme has procured a bewildering array of radios. General Dynamics was tasked with the Low Rate Initial Production (LRIP) of the first-generation AN/PRC-155 two-channel system. L3Harris and Collins Aerospace, meanwhile, performed the LRIP of the second-generation backpack radios. They are respectively providing their AN/PRC-158 and AN/PRC-162 transceivers. All three are outfitted with the TSM and SINCGARS waveforms in addition to SATCOM waveforms like MUOS.

The SCDR is being procured in support of the Integrated Visual Augmentation System (IVAS). This US Army programme will provide soldiers with headsets hosting several capabilities to improve their vision. This includes augmentations like three-dimensional maps, multi-spectral imaging and weapons sights. The SCDR will carry data between soldiers equipped with the Tactical Assault Kit (TAK). The TAK, in turn, is a map-based software application supporting collaborative combat. TrellisWare’s newly-launched TSM Spirit Very/Ultra High Frequency (V/UHF: 30 megahertz/MHz to three gigahertz) radio is one SCDR candidate. This is alongside offerings from Silvus and Domo Tactical Communications had a handsome display of its 4050 (left) and 4090 (right) high frequency radios on the company’s stand at this year’s DSEI exhibition.

Thomas Withington
Communications (DTC). The TSM Spirit is also being touted by the company as a single-channel squad radio. Tactical radio vendors in North America and beyond are now eagerly awaiting the release of HMS' Full Rate Production contracts.

Moving across the Atlantic, Europe is abuzz with tactical radio programmes as several nations roll out new capabilities across their armies. A bewildering assortment of programme monikers characterise this trend: The United Kingdom’s Project Morpheus joins France’s Contact. German’s SVFUA (Joint Combined Radio System) dances with the Netherlands’ Foxtrot. Belgium, meanwhile, moves ahead with its TLCP (Tactical Land Communications Programme) undertaking.

MORPHEUS

Morpheus is an overarching modernisation of the UK’s Bowman combined communications and battle management system. At the heart of the Morpheus architecture is the so-called ‘Evolve to Open’ (EVO) approach. EVO employs the existing Bowman Combat Infrastructure-5.6 (BCIP-5.6) standard. BCIP-5.6 was a modernisation of the Bowman architecture fielded with the British Army and Royal Marines from 2015.

At the core of EVO is evolving the BCIP-5.6 architecture into an open configuration. The goal is to ensure that new systems and capabilities can be easily added to the architecture over time. General Dynamics is leading the EVO undertaking following the award of a contract in 2017. This was scheduled for completion in 2021. Sources close to Morpheus speaking to Armada at DSEI revealed that delays have now forced an extension of EVO into 2022 at the earliest.

Outside Morpheus, but an equally important aspect of the British Army’s communications modernisation, is the Trinity programme. Trinity will replace the force’s Falcon trunk voice, data and imagery radio system. During DSEI officials from Ultra told Armada that the firm was proposing its Orion radio for the Trinity programme. They added that this radio is already providing trunk communications for the US Army. The company is currently halfway through providing around 700 Orion transceivers to the force.

CONTACT AND SYNAPS

Across La Manche (the Channel), Thales has commenced production of its Contact tactical radios for the French armed forces. The company was awarded the Contact contract by the French government in 2012. Official documents say that around 25,000 Contact radios will be supplied to all three French armed services. Armada was told by Thales officials that development of Contact land tactical radios is now complete. Development of the airborne Contact radios is ongoing.

Thales has spun out a version of the Contact radio family called Synaps. Armada understands that these radios are similar to the Contact radio sans French communications/transmission security protocols and waveforms. The Belgian government ordered Synaps in December 2019. Deliveries commenced just under one year later. Synaps-H V/UHF handheld radios and Synaps-T vehicular radios were delivered to the force and are now in service. Additional capabilities will be rolled out onto the Belgian Synaps radios as these are developed for their Contact brethren.

Beyond Synaps/Contact, Thales was also promoting new capabilities for its SquadNet UHF radio at DSEI. Thales’ Web Bridge is a software enhancement for SquadNet. This allows the radio to stream encrypted data onto a combat cloud. This data is carried across third-generation cellular, long-term evolution or Wi-Fi wireless networks. Smartphone, computer or tablet users who have downloaded the Web Bridge android software application can then receive this data from the cloud and vice versa.

FOXTROT

Further north, the Netherlands is moving forward on its Foxtrot programme. This effort is replacing erstwhile transceivers equipping over 200 of its combat vehicles no longer fit for purpose. Reports have stated that new Combat Net Radios will be acquired as replacements. There appears to be no information about the model of radio satisfying this requirement. It is known that the radio modernisation will occur via a series of Spirals. The first, Spiral 0, is worth up to $117 million and will occur between 2020 and 2026. Reports continued that delivery of the new radio will commence in 2023. These will initially be made to the Koninklijke Landmacht (Dutch Army) 43 Mechanised Infantry Brigade.

Sources close to Germany’s SVFUA programme have shared with Armada information regarding the Heer (German Army’s) uptake of new radios. This summer the roll out of Rohde and Schwarz’ Soveron-D multiband radio was authorised across the KMW/Rheinmetall Puma infantry fighting vehicle fleet. Importantly, these radios are compatible with legacy transceivers used by the Heer.

NEW PRODUCTS

DSEI also saw new radios promoted at the show. Codan launched its Sentry-H 6110-MP high frequency (three megahertz to 30MHz) backpack radio. This builds upon the company’s earlier first-generation 6110-MP product. The new radio includes several enhancements like simultaneous voice and data traffic, and frequency-hopping, open standard digital voice communications. The use of smaller and lighter rechargeable lithium-ion batteries gives the radio an all-up weight of four kilograms (eight pounds). This does not compromise the radio’s 23-hour battery life. A company press release states that the Sentry-H 6110-MP is “the smallest and lightest HF manpack radio available today.” An optional handset has improved readability in sunlight and is compatible with night vision goggles.

The Sentry-H 6110-MP was not the only new radio unveiled by the company. This May, Codan completed its acquisition of DTC. The two firms are preserving their identities but nevertheless shared a stand at DSEI. DTC showcased its new SOL8SDR2x1W-P radio specifically designed for uninhabited platforms. Embedded into the system is the company’s MeshUltra tactical MANET waveform. This offers channel bandwidths of between 1.25MHz to 20MHz. Data rates of up to 87 megabits-second are also achievable. DTC’s press release stated that the radio can handle voice, data, audio and imagery traffic.

Not to be outdone, Barrett Communications had one of its star performers on their stand namely their PRC-4090 HF radios. The PRC-4090 was launched in 2019 at the previous DSEI. Weighing 6.5lb (2.95kg), the firm claims the radio entered the market as “the lightest, military-grade HF transceiver.” The software-defined PRC-4090 has a 24-bit colour touchscreen display, along with an icon interface. This makes the radio so intuitive that even your correspondent could operate it. Other useful features include the option to use Arabic, English, French, Russian and Spanish language options. Security is also embedded into the PRC-4090 via the radio’s AES-256 and DES-56 encryption. A digital voice mode enhances clarity by reducing background noise.

RETURN TO FORM?

DSEI heralded the welcome return of large-scale defence exhibitions. While the ongoing COVID-19 pandemic will continue to cause disruption to some future events, similar big shows may still go ahead. These will no doubt witness new products and programme developments in the tactical communications domain. The next 12 months looks set to be energetic as acquisitions expand, and new products grace the market.
Spectrum Sensing Cognitive Radios
Enabling Soldiers & Unmanned Systems:

- Greatest Throughput & Channel Flexibility
- Ultra-Low Latency
- Longest Range per Output Power
- MANET MIMO MESH Networking
- Situational Awareness & PLI
- LPI & LPD
- Interference Avoidance System (IAS)
Offensively, data is the primary concern for the future digital radio space, notes Chris Barter, Datron World Communications’ vice president of sales and marketing. If there was one event which hallmarked how tactical communications have changed over the last three decades it is the demand for data, as well as voice traffic. During the Cold War, tactical radios were primarily used for voice communications. The digitisation of the battlefield, a process which started during the Persian Gulf War of 1991, shows no signs of abating. If anything the appetite for moving torrents of data around the battlefield at lightspeed will only increase.

Innovations like the Tactical Cloud, the Internet of Military Things (IOMT) and Multi-Domain Operations (MDO) are all data reliant. The Tactical Cloud will bring cloud computing to the battlefield. The cloud will act as a secure environment where troops access software applications and share relevant data. It mirrors the advent of cloud computing in the civilian world but will see higher levels of encryption and cyber security. Meanwhile, the IOMT will network sensors, weapons, personnel, vehicles, platforms and installations across the battlefield. These will share a raft of data between one another. From a soldier’s heart rate and temperature to a vehicle’s fuel state, this information will need to be accessed by those who need it quickly and easily.

MDO
MDO poses another challenge to tactical radio engineers. A 2021 report by the US Congressional Research Service defines MDO as providing “commanders numerous options for executing simultaneous and sequential operations using surprise and the rapid continuous integration of capabilities across all domains to present multiple dilemmas to an adversary”. This is “in order to gain physical and psychological advantages and influence and control over the operational environment”. In essence, sea, land, air, space and electromagnetic forces will be fully networked and synchronised to achieve tactical and operational success.

The Tactical Cloud, IOMT and MDO will all need wideband Radio Frequency (RF) communications to handle the sheer amount of data all three will bring. It is not enough for these wideband links to simply be present. They will need to be secure and robust in hotly contested electromagnetic environments. The links will need to be supported by agile, self-
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OUR PRODUCTS FACILITATE UNCOMPROMISED COMMUNICATIONS BETWEEN ALL FORCES IN FULL COMSEC, TRANSEC, AND LINKING MODES.

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forming networks continuously adapting to conditions in the electromagnetic spectrum. The answer to these challenges most probably lies in wideband RF links carried across cognitive radios. These radios will be able to sense and adjust their transmissions and networks to the prevailing spectrum.

These wideband links will have to be present at the Forward Edge of the Battle Area (FEBA) at the lowest echelons. Sensors, soldiers and weapons in the FEBA will need these links to send data up the chain of command and to receive all-important updates, intelligence and orders. It is no surprise that Personal Role Radios (PRRs) have for some time possessed waveforms to carry data as well as voice traffic. One can expect that the data capabilities of PRRs will continue to grow in the future. The rollout of wideband links at the FEBA, particularly for weapons and sensors, can only realistically occur via advances in Edge Computing. Edge Computing will see sensors, platforms and weapons processing as much of the data that it has received or is generating as it can. This will ensure that only the most relevant data is shared across the network, ensuring links do not become saturated.

Neither is the demand for data confined to US, North Atlantic Treaty Organisation (NATO) or allied militaries: “Even in developing world markets we are seeing demand for pretty high-speed data rates in the tactical space,” remarks Mr. Barter: “In other words, data is not relegated to the most sophisticated users anymore.”

**INTEROPERABILITY**

20 years of war in Afghanistan and eight years of war in Iraq underscored that even the US military still relies on allied contributions. For the West and its allies at least, coalition warfare will be the order of the day for the foreseeable future. This creates challenges for the tactical communications domain. Many armies have common waveforms. HAVEQUICK-I/II and SINCGARS (Single Channel Ground-Airborne Radio System) are two notable examples. However, encryption and communications/transmission security considerations mean it is not always easy for one army to talk to another using these, or other, waveforms.

Initiatives like the pan-European ESSOR (European Secure Software Defined Radio) high data rate waveform are a step in the right direction. Belgium, Finland, France, Germany, Italy, Spain and Sweden are all involved in ESSOR. The initiative will yield a common waveform which can be loaded into the transceivers of these nations’ armies permitting truly interoperable communications in the coming years. Mr. Barter stresses the importance of interoperability seeing it as the “key to success”. He believes that this can be assisted through common waveforms and open architectures.

Like cognitive radio which senses and adapts to its spectrum, open architecture will play a leading role in future tactical communications. Gone are the days when a radio was delivered with a set number and type of waveforms and encryption. Today’s and tomorrow’s transceivers will have to be ‘future proofed’ from the start: “We currently see innovative and more open architectures receiving attention, instead of a ‘one size fits all’ or single-source approach,” notes a written statement from Rohde and Schwarz. ESSOR is a good case in point. Many of the radios it will equip will not have been delivered with this waveform. Instead, they will receive the waveform as a software update.

**Tactical cloud computing will drive a strong demand for wideband RF links for troops to access software applications and mission data.**
Interoperability is a sine qua non for militaries around the world. New waveforms will greatly assist the ability of armies to work closely and securely with one another.

COTS
Open architectures will benefit from the strides taken in the civilian computing and telecommunications worlds. The use of Commercial Off-The-Shelf (COTS) technologies is now de rigueur in the military domain. Reliance on COTS will increase particularly as civilian telecommunications technology evolves. The attraction of these technologies to tactical radio engineers are obvious: Using civilian innovations where possible goes a long way to reducing development and procurement costs. We are already seeing the advent of civilian end user devices like smartphones and tablets on the battlefield. Initiatives like the US Army’s Integrated Tactical Network (ITN) provides a means by which these devices can securely access military networks.

Beyond civilian hardware, civilian networks have a role to play. We have already discussed the appetite for RF wideband links as the demand for data expands. Rhode and Schwarz’ statement posits an argument for using non-military networks where appropriate to carry some of this burden. It states that networks like the ubiquitous Terrestrial Trunked Radio (TETRA) standard used by European first responders could provide such a utility. Likewise civilian wireless protocols like Long Term Evolution, and forth/fifth generation cellphone standards and the networks they underpin offer similar potential. Military communications systems could be routed “through a trusted, integrated architecture” to access these networks “for routine or mission needs.” Routine data like vehicle fuel consumption or meteorological information could be carried securely across these networks. This would ensure that standard tactical communications networks are not deluged, and continue to support the manoeuvre force’s demand for voice and data traffic.

Finally, avantgarde technologies will make their presence felt in the tactical radio domain. DSEI was instructive as it featured emerging tactical communications technologies. For example, Blu Wireless exhibited its Millimetric Wave (MMW) communications technology. MMW radio uses frequencies above 30 gigahertz/GHz. These wavebands are attractive as they provide wideband communications with a very narrow beam. This means they can be used for line-of-sight communications with a physically small antenna. Small antennas are comparatively easy to install on vehicles, and to move around a battlefield for use at static locations. The narrow beams widths characteristic of MMW radio are also difficult to detect and jam. Blu Wireless’ technology uses frequencies of 57GHz to 71GHz. It boasts data rates of one gigabit-per-second/gbps at a one-kilometre (0.6-mile) range. Data rates of 100 megabits-per-second at four kilometres (2.5 miles) are also achievable. Company officials say that the US Army has shown great interest in MMW radio.

Drivers
Battlefield digitisation and the appetite for data are driving innovation and acquisition in the tactical communications domain. The advent of MDO, the IOMT, the Tactical Cloud and deepening interoperability means that the desire for innovative military communications hardware and software is unlikely to diminish. Fortunately, the continued embrace of COTS and open architecture, alongside the innovations like edge computing, MMW communications and cognitive radio will help meet this demand.
Standardized radio test for legacy SINCGARS and future waveforms

When it comes to preparation, your fleet comes first. The ATS-3100 RTS helps maximize your operational readiness by ensuring your radios perform when most needed, whether legacy, modern, or a future technology. With powerful, synthetic instrumentation and the ability to maintain your investment in legacy cable sets for SINCGARS radios, the ATS-3100 RTS is the ideal replacement solution for aging and unsupportable radio test systems.

Learn more about our airborne and ground electronic systems maintenance solutions for radio test and wire integrity at astronics.com/defense.
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<th>Model</th>
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| PRC-9651 V/UHF Handheld | Aselsan               | **Power:** Up to 5W in CNR, A-CNR, NBNR modes, 4W in SK2 mode, 25W in air-to-ground mode  
**Frequencies/waveforms:** 30MHz to 512MHz in 1.300 preset channels, software architecture supports Aselsan’s CNR, SK2 VHF, S100, SK2 UHF, A-CNR, NBNR waveforms and V/UHF-AM.  
**Security:** Built-in national crypto, frequency hopping, burst data transmission  
**Weight:** 1.4kg  
**Notes:** SDR designed to provide continuous audio, data and video communications for the tactical at up to 64kbps in full duplex IP packet data switching service mode. |
| PRC-5712 Soldier Radio | Aselsan               | **Power:** 125mW  
**Frequencies/waveforms:** 380MHz to 400MHz, 99 pre-set channels  
**Security:** Encryption optional, whisper function  
**Weight:** less than 370g with antenna, NiMH battery  
**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. |
| PRC-5433 V/UHF Handheld | Aselsan               | **Power:** 5W max  
**Frequencies/waveforms:** 30MHz to 512 MHz, 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. |
| PRR 1M              | AT Electronic and Communication International | **Power:** 100mW EIRP max  
**Frequencies/waveforms:** 2.4GHz, spread spectrum, 240 operating channels, eight selectable nets  
**Security:** Time hopping, frequency hopping and OFDM resists interception, jamming.  
**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-2090 HF manpack transceiver | Barrett Communications | **Power:** 30W/10W PEP (Select able) output power  
**Frequencies/waveforms:** 1.6MHz to 30MHz/ Modes: 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 3.90kg (5.2kg with Barrett high performance Li-ion Battery with built in charge controller)  
**Weight:** 2G 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. |
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TACTICAL RADIOS LISTINGS

PRC-2080+ Tactical VHF radio

Barrett Communications

- Power: 5W hand portable, 25W manpack, 50W mobile, base station & rebroadcast
- Frequencies/waveforms: 30MHz to 88MHz, 25kHz channel resolution, 10 channels
- Security: Multiple levels of encryption and frequency hopping security available: Analogue Voice - Fixed Frequency, Digital Unencrypted Data - Fixed Frequency, Digital Encrypted Voice - Fixed Frequency (DEFF), Digital Encrypted Voice - Frequency Hopping (DEFH), Digital Encrypted Voice - Free Channel Search (DEFCS), Digital Encrypted Data - Fixed Frequency, Digital Encrypted Data - Frequency Hopping
- Weight: 1.3kg with battery pack
- Notes: 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.

PRC-2081+ – 25 W VHF Manpack

Barrett Communications

- Power: 25W
- Frequencies/waveforms: 30MHz to 88MHz, 25kHz channel resolution, 10 channels
- Security: Multiple levels of encryption and frequency hopping security available: Analogue Voice - Fixed Frequency, Digital Unencrypted Data - Fixed Frequency, Digital Encrypted Voice - Fixed Frequency (DEFF), Digital Encrypted Voice - Frequency Hopping (DEFH), Digital Encrypted Voice - Free Channel Search (DEFCS), Digital Encrypted Data - Fixed Frequency, Digital Encrypted Data - Frequency Hopping
- Weight: 7.7kg with backpack frame and 16.8V 10 Ah Li-Ion battery pack
- Notes: PRC-2081+ 25 Watt Man-pack upgrades the PRC-2080+ transceiver with increased power and communication range. Standard package includes: man-pack dock, battery pack, AC/DC charger, collapsible section whip, tape whip antenna, handset, framed backpack.

PRC-4090 HF Tactical Manpack Transceiver

Barrett Communications

- Power: Tx 30W/10W PEP (Selective), Rx current consumption 250mA
- Frequencies/waveforms: 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)
- Security: Encryption Standards: AES256 & DES56. Frequency Hopping: 5 or 25 hops per second
- Weight: 2.95kg (4.55kg with BB2590 Battery / 5.00kg with Barrett high performance Li-ion Battery with built in charge controller)
- Notes: 2G and 3G ALE options, MIL110, 3G (STANAG) & CLOVER data options. Released September 2019.

4090 HF Manpack Transceiver

Barrett Communications

- Power: Tx 30W/10W PEP (Selective), Rx current consumption 250mA
- Frequencies/waveforms: 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)
- Security: Encryption Standards: AES256 & DES56. Frequency Hopping: 5 or 25 hops per second
- Weight: 2.95kg (4.55kg with BB2590 Battery / 5.00kg with Barrett high performance Li-ion Battery with built in charge controller)
- Notes: 2G and 3G ALE options, MIL110, 3G (STANAG) & CLOVER data options. Released September 2019.

4050 HF SDR Transceiver

Barrett Communications

- Power: Tx 150W PEP (with 24V supply), current consumption 350mA standby (muted)
- Frequencies/waveforms: 1.6MHz to 30MHz, J3E (USB, LSB), H2B (AM), J2A (CW), CF (Custom Filter) and ISB (data option).
- Security: 5 or 25 hops per second frequency hopping
- Weight: Undisclosed
- Notes: Provides secure telephone, data and email services, uses 2G and 3G ALE standards, can operate in temperatures of -30°C to +70°C.

BLD100 Tactical Radio

Benelec

- Power: 1W to 3W
- Frequencies/waveforms: VHF 30MHz to 88MHz, full civilian CTSS squelch, standard military 150Hz sub-audio tone
- Security: external encryption modules
- Weight: 0.295kg including battery & antenna
- Notes: Designed for platoon communications, BLD100 is a fixed frequency handheld radio family in IP67 housing, complies with Mil Std 810C, D, E & F. Features built-in data modem.
**TACTICAL RADIOS LISTINGS**

**BL350U UHF FM tactical radio**

- **Power:** 2W to 4W selectable
- **Frequencies/waveforms:** 380MHz to 420 MHz, up to 128 channels with 12.5Hz or 25Hz spacing
- **Security:** AES 256bit encryption optional
- **Weight:** 0.285kg inc 1700mAH Li-ion battery
- **Notes:** Up to 14 hour battery life, IP54 water & dust protection, priority channel & talkback scanning, 1,200/2,400 baud modem, programming via USB, voice operated transmission (VOX).

**Tough SDR Handheld**

- **Power:** 5W (PEP)
- **Frequencies/waveforms:** 30MHz to 2500MHz, Bittium Narrowband Waveform, Bittium TAC WIN Waveform with data throughput up to 25Mbps, ESSOR High Data Rate Waveform, supports porting of legacy and national waveforms
- **Security:** Red/black separation, secured boot, tampering detection & response, emergency erase, COMSEC and TRANSEC allowing implementation of national algorithms, Application Sandbox for customer applications
- **Weight:** 950g with battery
- **Notes:** 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 GNSS, camera, transflective TFT LCD (320 x 426) display.

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**CMALD**

- **CMALD**
- Push-Pull connector with high contact density configuration up to 36 contacts

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- **CMSD**
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- **MMC**
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Tough SDR Vehicular

**Power:**
12V DC to 32V DC according to MIL-STD-1275

**Frequencies/waveforms:**
30MHz to 2.5GHz. Bittium Narrowband Waveform, Bittium TAC WIN Waveform, ESSOR High Data Rate Waveform. Supports also porting of legacy and national proprietary waveforms.

**Security:**
Red/Black separation, secured boot, tampering detection and response, emergency erase, COMSEC and TRANSEC allowing implementation of national algorithms, application sandbox for customer applications.

**Weight:**
15kg

**Notes:**
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.

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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.

---

2110/2110M Man-pack (Military)

**Power:**
5W or 25W selectable, 50 percent duty cycle with over-temp protection.

**Frequencies/waveforms:**
1.5MHz to 30MHz Tx, 250kHz to 30MHz Rx, all in 10Hz steps

**Security:**
GES-128 & AES-256 voice encryption & internal frequency hopping options.

**Weight:**
2.9kg or 5kg with 8Ah NiMH battery, 0.3kg smart handset

**Notes:**
Features 2nd Gen digital voice technology, integrated GPS receiver, over 60 hours battery life, 3G ALE (STANAG 4538) including FLSU, HDL, LDL, CAST (Codan Adaptive Signalling Technology), MIL-STD-188-141B ALE, MIL-STD-198-110A/B, STANAG 4539, 75bit/s to 9600 bit/s.

---

Sentry-H 6110-MP

**Power:**
30 W PEP ± 1dB (two-tone or voice), user programmable in 1W steps (low/medium/high)

**Frequencies/waveforms:**
Transmit: 1.6 to 30 MHz (optional: 1.5 to 30MHz) Receive: 250 kHz to 30 MHz with up to 1,000 channels AES-256 digital voice and data (256 keys, direct entry and programmable via Codan KMS/KFS & USB memory stick), GES-128 voice (97 x 16-digit keys, 4-digit PIN). AES-256, 256 x programmable 256-bit keys.

**Weight:**
3.95 kg

**Notes:**
Codan’s Sentry-H 6110-MP delivers a rugged man-portable Software Defined Radio (SDR) solution for military organisations that demand uncompromised, secure voice and data communications, while on the move. The 6110-MP forms an integral part of the Sentry-H product family that meets the demands of the modern battlefield whilst offering full backwards compatibility with legacy products. The 6110-MP is one of the smallest, lightest form factor manpack HF radios available, delivering a powerful 30W RF power in a unit weighing less than 4 kg without compromise on any capabilities.

---

Sentry-V Handheld VHF Radio

**Power:**
up to 5W

**Frequencies/waveforms:**
Optional bands: 30MHz to 88MHz or 136MHz to 176MHz with 1,024 channels. Supports 12.5kHz / 25kHz channel spacing, analog FM, DVOA, P25 conventional/trunking & DMR

**Security:**
Optional AES 256 encryption, over-the-air zeroise to disable compromised radios

**Weight:**
0.58kg with Li-ion battery

**Notes:**
Features built-in radio repeater, GPS positioning & report, shows group member positions on screen, text & image transmission, voice recording, Bluetooth smartphone link. Canned or open text messages can be sent between radios, up to 128 characters.

---

Sentry-H 6120-BM

**Power:**
150 W PEP ± 1dB (two-tone or voice), user-programmable in 1 W steps (low/medium/high)

**Frequencies/waveforms:**
Transmit: 1.6 to 30 MHz (optional: 1.5 to 30MHz) Receive: 250 kHz to 30 MHz with up to 1,000 channels AES-256 digital voice and data (256 keys, direct entry and programmable via Codan KMS/KFS & USB memory stick), GES-128 voice (97 x 16-digit keys, 4-digit PIN). AES-256, 256 x programmable 256-bit keys.

**Weight:**
2.82 kg; Handset: 280 g (no cable)

**Notes:**
Codan’s Sentry-H 6120-BM delivers a rugged Software Defined Radio (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. In close consultation with military customers, the 6120-BM has been optimised for ease-of-use and features an ergonomic smart handset with a colour, high-resolution multi-language interface and a variety of other capabilities.
<table>
<thead>
<tr>
<th><strong>SENTRY-V 6150</strong></th>
<th>Codan Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>Handheld: 0.1W, 1W, 5W, Base/Mobile: 5W, 20W, 50W</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>30 to 87.975 MHz</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>AES-256 (COMSEC) Frequency Hopping (TRANSEC)</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>940g</td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td>Available in Handheld, Base and Mobile configurations, Codan’s Sentry-V 6150 military band VHF radio provides a rugged solution for users who require communications with a tactical edge: designed and tested to all the environments faced on the modern day battlefield, offering users the ability to pass critical information across the area of operation in real time. The Sentry-V 6150 increases operational efficiency and awareness over VHF radio networks between forward deployed elements and operational command centres for those in the immediate area and back to command elements.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SENTRY-U 6160-PR</strong></th>
<th>Codan Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>100mW, 400mW, 650mW</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>2405 to 2480 MHz (unlicensed ISM band)</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>AES-128 (COMSEC)</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>With battery and antenna &lt;345g</td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td>Codan’s Sentry-U 6160-PR 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. The 6160-PR includes auto re-transmission and integration with other Sentry products for added connectivity and mission control. Improved waveform technology reduces the risk of interception and detection.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SENTRY-M 6170</strong></th>
<th>Codan Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>Handheld: 0.1W, 1W, 5W, Base/Mobile: 5W, 20W, 50W</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>30 to 87.975 MHz</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>AES-256 (COMSEC) Frequency Hopping (TRANSEC) and NETSEC.</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>9.5 kg</td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td>Codan’s Sentry-M 6170-HH is an advanced, secure and easy to operate handheld multiband military Software-Defined Radio (SDR) designed for use in the harshest environments worldwide. With continuous spectrum coverage from 20 MHz through to 520 MHz, the 6170 provides simultaneous voice, data and situational awareness (APP-6 NATO standard for tactical BMS).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PRC7700H manpack</strong></th>
<th>Datron</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>100W</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>1.6MHz to 30MHz, 10Hz Steps, RX: 100kHz to 30MHz/ waveforms, modulation types, wide &amp; narrow bands, and communications security can be updated via software</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>Integrated high-level encryption option with front panel quick-connect key fill port and zeroize button</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>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>Notes:</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PRC1099A HF tactical manpack</strong></th>
<th>Datron</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>5W to 20W, PEP or average, man-pack; 5/20/100/400W in mobile configuration. Capable of continuous duty service at 5W.</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>1.6MHz to 30MHz, 10Hz Steps, 100 programmable channels optional add-on</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>4.4kg plus 2.4kg battery pack</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>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>Notes:</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PRC2100V</strong></th>
<th>Datron</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power:</strong></td>
<td>500mW to 10W (Manpack) &amp; 500mW to 75W (mobile or base station)</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>30MHz to 88MHz, 100 programmable channels Embedded ECCM, COMSEC for voice and data. Full- or partial-band frequency hopping, digital encryption, and internal GPS receiver with external TNC antenna connector</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>4.2kg plus 1.8kg battery pack</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>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>Notes:</strong></td>
<td></td>
</tr>
</tbody>
</table>
**PRC1077 VHF tactical manpack**

**Datron**

**Power:** 500mW, 2W and 5W selectable  
**Frequencies/waveforms:** 30MHz to 88MHz in 25kHz steps, 10 programmable channel presets  
**Security:** encryption module, KRC1077, high-security voice scrambler optional  
**Notes:** 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

---

**HH2100V Spectre-V tactical VHF handheld**

**Datron**

**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

---

**HH7700**

**Datron**

**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 VDX for hands free operation and whisper mode, interoperable in FM clear-voice mode with Datron Squad Radio family

---

**HH3100 Spectre M multiband tactical transceiver**

**Datron**

**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

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**SOL8SDR-H2**

**Domo Tactical Communications (DTC)**

**Power:** 1W (30dBm) per output, 2W (33dBm) total  
**Frequencies/waveforms:** 320-470MHz, 1.14-1.50GHz, 1.67-2.35GHz, 1.98-2.70GHz, 4.40-5.00GHz  
**Security:** AES 256-Bit and AES 128-Bit Encryption  
**Weight:** 950g  
**Notes:** The SOL8SDR-H2 is the enhanced next generation Special Role Radio designed to meet a diverse range of applications. With the same bulletproof soldier radio form factor, the SOL8SDR-H2 offers enhanced GPS performance with on-board magnetics for a simplified Ethernet interface and future support for dual push-to-talk (PTT) communications.

---

**SOL8SDR2x1 W-P**

**Domo Tactical Communications (DTC)**

**Power:** 1W (+30dBm) max per output, 2W total  
**Frequencies/waveforms:** 1.14-1.55GHz, 1.67-2.35GHz, 1.98-2.70GHz, 4.40-5.05GHz  
**Security:** AES 256-Bit and AES 128-Bit Encryption  
**Weight:** 456g approx.  
**Notes:** The SOL8SDR2x1 W-P is a compact software defined radio transceiver with 2x1W RF output power. Leveraging DTC’s industry-leading MeshUltra Mesh waveform and also capable of operating as a unidirectional COFDM Transmitter or Receiver, the SOL8SDR2x1 W-P is ideally suited for LVW and commercial applications.
**TACTICAL RADIOS LISTINGS**

**SOL8SDR-R**

**Domo Tactical Communications (DTC)**

**Power:** 100mW (+20dBm) per output, 200mW total

**Frequencies/waveforms:**
- 320-470MHz + 902-928MHz tel
- 1.14-1.5GHz + 863-870MHz tel
- 1.67-2.35GHz + 902-928MHz tel
- 1.67-2.35GHz + 863-870MHz tel
- 1.98-2.7GHz + 902-928MHz tel
- 1.98-2.7GHz + 863-870MHz tel
- 4.40-5.0GHz + 902-928MHz tel
- 4.40-5.0GHz + 863-870MHz tel
- 5.50-6.0GHz + 902-928MHz tel

**Security:**
- AES 256-Bit and 128-Bit Encryption

**Notes:**
- The SOL8 Software Defined Radio is a COFDM digital video transceiver from Domo Tactical Communications (DTC), designed specifically for Point of View (PoV), body worn and concealment applications.
- The SOL8SDR Robust provides a passively cooled IP67 rated enclosure ideal for outdoor, or body worn applications. Dependent on the applications loaded the platform can operate as a Transmitter, Receiver, Dual Encoder and IP Mesh Radio node.

**NETNode2x2W-5RM**

**Domo Tactical Communications (DTC)**

**Power:** 25W (40W pk) approx.

**Frequencies/waveforms:**
- 320-470MHz, 1.20-1.70GHz, 1.65-2.40GHz, 1.98-2.55GHz, 3.00-3.70GHz, 4.40-5.00GHz

**Security:**
- AES NETNode 256 and 128 bit decryption

**Notes:**
- Phase 5 is the latest generation of DTC’s NETNode IP Mesh Radio family offering built-in dual HD video encoders and MIMO capability for our highest ever data capacities. The NETNode 5RM is a Robust Mobile variant which offers an alternative form factor to its sister, the NETNode Phase 5 Robust, but being smaller allows a wider variety of applications. The 5RM is ideal for extended outdoor deployment and feature rich with new additions including built-in GPS receiver and both composite and SDI video inputs.

**NETNode2x5W-5RM**

**Domo Tactical Communications (DTC)**

**Power:** 60W (max data rate)

**Frequencies/waveforms:**
- 1.20-1.70GHz, 1.65-2.30GHz, 1.98-2.55GHz, 4.40-5.00GHz

**Security:**
- AES NETNode 256 and 128 bit decryption

**Notes:**
- Phase 5 is the latest generation of DTC’s NETNode IP Mesh Radio family offering built-in dual HD video encoders and MIMO capability for our highest ever data capacities. NETNode IP radios can be combined in a fluid self-forming, self-healing mesh network containing up to 80 nodes. The NETNode 5RM 5W variant provides up to 10W total RF power output over two transmit ports. The 5RM is ideal for extended outdoor deployment and feature rich with built-in GPS receiver and both composite and SDI video inputs.

**NETNode2x5W-5**

**Domo Tactical Communications (DTC)**

**Power:** 25W (40W pk) approx.

**Frequencies/waveforms:**
- 320-470MHz, 1.20-1.70GHz, 1.65-2.40GHz, 1.98-2.55GHz, 3.00-3.70GHz, 4.40-5.00GHz

**Security:**
- AES NETNode 256 and 128 bit decryption

**Notes:**
- NETNode IP radios can be combined in a fluid self-forming, self-healing mesh network containing up to 20 nodes. The radios exchange bidirectional IP data in a single RF channel, simplifying frequency management. The entire mesh can operate in a bandwidth between 1.25MHz and 20MHz and employs DTC’s unique COFDM modulation scheme offering excellent RF penetration and performance in the presence of multipath. Multiple Input Multiple Output (MIMO) technology transmits two signals in the same channel almost doubling the available data capacity.

---

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**60 W GaN HEMT**

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- Small plastic package 4.4 mm x 6.5 mm
- Free large signal simulation model
- Multiple reference designs
- Samples and stock available

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**TACTICAL RADIOS LISTINGS**

**NETNode2x2W-5P**

- **Power:** 25W (40W pk) approx.
- **Frequencies/waveforms:** 320-470MHz, 1.20-1.70GHz, 2.20-2.50GHz, 1.98-2.55GHz, 3.00-3.70GHz, 4.40-5.00GHz
- **Security:** AES NETNode 256 and 128 bit decryption
- **Weight:** 1kg
- **Notes:** NETNode IP radios can be combined in a fluid self-forming, self-healing mesh network containing up to 20 nodes. The radios exchange bidirectional IP data in a single RF channel, simplifying frequency management. The entire mesh can operate in a bandwidth between 1.25MHz and 20MHz and employs DTC’s unique OFDM modulation scheme offering excellent RF penetration and performance in the presence of multipath. Multiple Input Multiple Output (MIMO) technology transmits two signals in the same channel almost doubling the available data capacity.

**NETNode2x2W-5PT-175500T**

- **Power:** 25W (40W pk) approx.
- **Frequencies/waveforms:** L-band (1.70-1.85GHz), S-band (2.20-2.50GHz), C-band (4.40-4.90GHz)
- **Security:** AES NETNode 256 and 128 bit decryption
- **Weight:** 550g
- **Notes:** Phase 5 is the latest generation of DTC’s NETNode IP Mesh Radio family, offering built-in dual HD video encoders and MIMO capability, providing our highest ever data capacities and maximum frequency flexibility. The latest tri-band product offers increased frequency agility with support for high L-band, S-band and C-band, provided by one physical unit.

**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-104GI and TWH-104G3 Portable Gateways**

- **Power:** 400mW
- **Frequencies/waveforms:** AES encryption
- **Range:** 2km line of sight
- **Maximum data rate:** 115.2kbps
- **Weight:** 0.225kg inc batteries: 9VDC to 33VDC in TWH-104G1, 3VDC from 2x LR6 cells or 2x NiMH LR6 rechargeable batteries.
- **Notes:** Creates a gateway between a TWH network and external equipment such as CNR, legacy radios etc.

**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.
## TACTICAL RADIOS LISTINGS

### Cordis array radio system
- Phased array technology
- Narrow antenna beams
- Point to multipoint
- IP network connectivity
- Tactical Ad hoc system
- Long range (>200km)
- High data rate (15 Mbps)
- High mobility
- Military grade TRANSEC/COMSEC

---

### PNR-1000A Personal Network Radio

| Power:   | 0.5W, 1W, 2W adjustable |
| Frequencies/waveforms: | 225MHz to 512MHz, AES 256 encryption based on FIPS 197 standards |
| Security: | < 0.36kg |
| Weight:   | 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

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

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### CNR-710MB multiband radio

| Power:   | 5W handheld & man-pack, 20W high-power man-pack, vehicular & airborne |
| Frequencies/waveforms: | 30MHz to 512MHz, 25kHz channel spacing, 20 preset channels |
| Security: Digital COMSEC, orthogonal frequency hopping ECCM |
| Notes:    | Multi-band radio providing ground, sea, and air units with wide frequency coverage and waveforms. Dynamic network synchronisation eliminates the need for a central control station. Uses Tadiran’s synchronous-orthogonal frequency hopping technology, and is fully compatible with legacy Tadiran frequency hopping systems like the CNR-710, CNR-900, CNR-9000 and CNR-9000HDR. |

---

### Cordis Array II

- When you demand long range and high bandwidth

Drone control and video signal by only one datalink. The small size system does not require a servo-controlled ground station antenna or any moving parts. An excellent choice for ground stations on-board ships.

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[Images and contact information for Radionor]
<table>
<thead>
<tr>
<th>TACTICAL RADIOS LISTINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MTCR-7200 V/UHF man-pack</strong></td>
</tr>
<tr>
<td><strong>Power:</strong></td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
</tr>
<tr>
<td><strong>Security:</strong></td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
</tr>
</tbody>
</table>

| **PRC-434G/CS survival radio** | Elbit Systems |
| **Power:** | approx 1W UHF & 121.5MHz |
| **Frequencies/waveforms:** | 225MHz to 299.975MHz + 121.5MHz, 3,000 channels in 25kHz steps |
| **Security:** | Encrypted individual identification code assigned to each user; LPI/LPD |
| **Weight:** | less than 0.85kg |
| **Notes:** | 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 |

| **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-COI) |
| **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-COI) |
| **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 comms 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, emergency beacon. 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 |
# TACTICAL RADIOS LISTINGS

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<thead>
<tr>
<th>Radio Model</th>
<th>Manufacturer</th>
<th>Power</th>
<th>Frequencies/waveforms</th>
<th>Security</th>
<th>Weight</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td><strong>SR600 UHF Soldier Radio</strong></td>
<td>Kongsberg Defence Systems</td>
<td>10mW to 1W</td>
<td>225MHz to 400MHz, to 5MHz bandwidth</td>
<td>Embedded AES256 encryption</td>
<td>0.7kg</td>
<td>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.</td>
</tr>
<tr>
<td><strong>MH300 Handheld Multi-Role Radio (MRR)</strong></td>
<td>Kongsberg Defence Systems</td>
<td>15mW, 1W</td>
<td>30MHz to 87.975MHz, 2,320 channels</td>
<td>Built in encryption, up to level secret, comprehensive crypto and key management provided</td>
<td>1.05kg</td>
<td>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), &quot;grab and run&quot; from vehicle installation.</td>
</tr>
<tr>
<td><strong>MP300</strong></td>
<td>Kongsberg Defence Systems</td>
<td>10mW, 0.5W, 5W, 50W/A MRR special waveform</td>
<td>30MHz to 87.975MHz, 2,320 channels</td>
<td>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. 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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AN/PRC-150(C) HF Manpack Radio</strong></td>
<td>L3Harris Tactical Communications</td>
<td>1W, 5W, 20W PEP, -1/+2dB</td>
<td>1.6MHz to 60MHz, HF features: encrypted data, ALE, frequency hopping, vocoder, data link layer protocol, VHF features: vocoder, encrypted data</td>
<td>US Type-1 and coalition encryption, enhanced frequency hopping</td>
<td>4.7kg without batteries</td>
<td>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.</td>
</tr>
<tr>
<td><strong>AN/PRC-152A Wideband Networking Radio</strong></td>
<td>L3Harris Tactical Communications</td>
<td>10mW to 1W</td>
<td>30MHz to 87.975MHz, 2,320 channels</td>
<td>Built-in encryption, up to level secret, comprehensive crypto and key management provided</td>
<td>1.055kg</td>
<td>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.</td>
</tr>
<tr>
<td><strong>AN/PRC-117G Wideband Multi-band Multi-mission Radio</strong></td>
<td>L3Harris Tactical Communications</td>
<td>15mW, 1W</td>
<td>30MHz to 87.975MHz, 2,320 channels</td>
<td>Built-in encryption, up to level secret, comprehensive crypto and key management provided</td>
<td>1.2kg max with GPS, battery and antenna</td>
<td>Handheld networking SDR for simultaneous voice and data, including video.</td>
</tr>
</tbody>
</table>

---

**Connectivity Across the Battlefield**

Bittium Tough SDR Handheld™
Bittium Tough SDR Vehicular™

Outstanding situational awareness and interoperability for combat vehicles and dismounted soldiers with the widest range of frequency bands and flexibility to use different waveforms, such as ESSOR.

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www.bittium.com
TACTICAL RADIOS LISTINGS

RF-330-E-HH wideband networking handheld | L3Harris Tactical Communications
---
**Power:** 3.2W max, user selectable
**Frequencies/waveforms:** UHF: 225MHz to 450MHz, 99 channel presets (L-Band: 1250MHz to 1390MHz and 1755MHz to 1850MHz, extension to 2.5GHz optional)/ ANW2C, others available.
**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 a leave-behind device.

Falcon III AN/PRC-158 Multi-Channel Manpack | L3Harris Tactical Communications
---
**Power:** Narrowband: 10W, SATCOM: 20W; Wideband: 20W peak, 10W average (max)
**Frequencies/waveforms:** 30MHz to 2.5GHz NB; VHF: 30MHz to 25MHz, UHF 225MHz to 520MHz & 762MHz to 2.5GHz; 874 MHz; NB waveforms: AM/FM, VHF/UHF LOS, SINCGARS, Havequick, (SATURN, APCO P25 capable), SATCOM: Rx 245MHz to 270MHz, Tx 235MHz to 281MHz, MUX: Rx 360MHz to 390MHz, Tx 300MHz to 320MHz, WB: 225MHz to 520MHz, UHF, 762MHz to 2.5GHz L-band. WB waveforms: SRW, ANW2C.
**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 MUGS-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-7800M-P-MP wideband HF/VHF radio | L3Harris Tactical Communications
---
**Power:** HF: 1W, 5W, 20W PEP, VHF: 1W, 5W, 10W FM
**Frequencies/waveforms:** 1.5MHz to 59.999MHz/ Fixed frequency, 2G ALE, 3G ALE, Serial Tone ECCM Falcon II interoperable, VHF FM, 75 channel presets
**Security:** Citadel encryption, CAM (Customer Algorithm Modification), AES, AVS (Analog Voice Security)
**Weight:** 3.9kg without batteries
**Notes:** RF-7800M-P 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.

RF-7850S Advanced Wideband Secure Personal Radio | L3Harris Tactical Communications
---
**Power:** 3.2W
**Frequencies/waveforms:** 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 & data
**Security:** 256bit Citadel, 256bit AES
**Weight:** 0.775kg with standard battery
**Notes:** 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.

RF-8000V-HH VHF Handheld Radio | L3Harris Tactical Communications
---
**Power:** Selectable 0.25W, 1W, 2W, 5W and up to 10W
**Frequencies/waveforms:** 30MHz to 108MHz/ Quicklook 1A, Quicklook 2, Quicklook 3, Free Channel Search, Quicklook Wide, TNW, Export SINCGARS with Pavilion encryption (optional)
**Security:** 128bit & 256bit Harris proprietary (Citadel) and AES Customer Algorithm
**Weight:** 1.09kg with battery
**Notes:** Designed for traditional CNR missions, ground-to-air and company, and below, provides high-speed narrowband networking, manpack performance in a handheld, can be used with 50W amplifier for mid-tier networking.

RF-7800H-MP Wideband HF/VHF set | L3Harris Tactical Communications
---
**Power:** HF: 1W, 5W, 20W PEP; VHF: 1W, 5W, 10W FM
**Frequencies/waveforms:** 1.5MHz to 59.999MHz/ Fixed frequency, 2G ALE, 3G ALE, Serial Tone ECCM Falcon II interoperable, VHF FM, 75 channel presets
**Security:** Citadel encryption, CAM (Customer Algorithm Modification), AES, AVS (Analog Voice Security)
**Weight:** 3.9kg without batteries
**Notes:** 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.
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🌐 www.aoc-europe.org
### Tactical Rover e (TACe) video receiver

**L3 Harris Communications Systems West**

**Frequencies/waveforms:**
- L, S, C & Ku bands / DDL, DVB-T, Tactical, CDL, legacy digital (455), 466ER, VNW, FM analogue

**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.

### 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

**Security:**
- AES & triple DES supported.

**Weight:**
- 0.8kg

**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.

### Personal Role Radio (PRR)

**Leonardo**

**Power:**
- 50mW

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

**Security:**
- Encryption optional

**Weight:**
- under 8kg inc battery

**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.

### Enhanced Personal Role Radio (EZPRR)

**Leonardo**

**Power:**
- 100mW

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

**Security:**
- Encrypted

**Weight:**
- 0.63kg with standard battery

**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, gooseneck antenna, data capabilities, rebroadcast, C2 base station, special purpose ancillaries.

### SWave Enhanced Handheld (HH-E)

**Leonardo**

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

**Frequencies/waveforms:**
- 30MHz to 512MHz V-UHF / NB VuLOS V/U AM/FM (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 programmable COMSEC up to national restricted and TRANSEC, embedded AES 256 crypto engine, support for custom crypto algorithms.

**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.

### Swave MBI manpack/vehicle radio

**Leonardo**

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

**Frequencies/waveforms:**

**Security:**
- Embedded customisable COMSEC, TRANSEC

**Weight:**
- 8.5kg 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.
### RF-7850M-HH Multiband Networking Handheld

**Manufacturer:** L3Harris Tactical Communications

**Power:** Selectable 0.25W, 1W, 2W, 5W and up to 10W

**Frequencies/waveforms:**
- 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, ANW2 C (optional)

**Security:**
- Quicklook 1A, 2, 3 and Quicklook-Wide ECCM, 1128bit & 256bit Harris proprietary Citadel AES 128 & 256
- Customer Algorithm Modification encryption

**Weight:** 0.510kg without antenna

**Notes:**
- 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.

### RO Tactical Radio

**Manufacturer:** L3Harris Tactical Communications

**Frequencies/waveforms:**
- NIST certified AES 256 voice and data encryption (can be used by coalition troops).

**Weight:** 0.510kg without antenna

**Notes:**
- 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.

### SINCGARS RT-1523 VHF Radio

**Manufacturer:** L3Harris Tactical Communications

**Power:**
- 1mW, 100mW, 5W, 50W (with power amplifier)

**Frequencies/waveforms:**
- NB: STANAG 4204 compliant (SC); WB: SINCGARS (FH)

**Weight:** 3.5kg including BB-2590 battery

**Notes:**
- Country unique Pavilion SINCGARS
- 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.

### SINCGARS RT-1702 VHF Combat Net Radio

**Manufacturer:** L3Harris Tactical Communications

**Power:**
- 1mW (LO), 100mW (MED), 5W (HI), 50W (PA with RFPA power amplifier)

**Frequencies/waveforms:**
- NB: STANAG 4234 compliant (SC); WB: SINCGARS (FH)

**Weight:** 3.5kg including BB-2590 battery

**Notes:**
- Country unique Pavilion SINCGARS
- 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)

**Manufacturer:** 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

**Manufacturer:** 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 RADIO ENCRYPTION & ACCESSORY

RT1 Voice & Position Encryptor

- **Interface:** Connects to radio handset or AUX/DATA port
- **Waveforms:** STANAG 4538 (3G) FLSU LDL, HF-2T Secure Digital Voice
- **Security:** COMSEC, LINKSEC, AES-256. Zeroize function.
- **Weight:** 170g (excludes handset & cables), 117 x 52 x 20 mm
- **Notes:** Soldier-worn digital voice encryption 600, 1200 & 2400bps. GPS/GLONASS position transfer capability: automatic push or pull. Dedicated MEDIVAC and ATTACK Alert Buttons. Powered from the connected radio. Blue Force Tracking supported via RapidM CommandPoint.

RT3 Tactical Voice & Data Encryptor

- **Interface:** Connects to radio handset or AUX/DATA port
- **Waveforms:** STANAG 4538 (3G) ALE FLSU LDL RDL, HF-2T Secure Digital Voice
- **Security:** COMSEC, LINKSEC, AES-256. Zeroize function. Tamper detect.
- **Weight:** 490g including 2xAA batteries, 148 x 82 x 28 mm
- **Notes:** Multi-role use. Digital voice encryption 300, 600, 1200 & 2400bps. GPS/GLONASS position transfer capability: automatic push or pull. Messaging, Chat, File Transfer and Email. Full QWERTY interface with 2.4" OLED display. Ethernet interface. MIL-STD-1275 power.

RT5 Tactical Voice & Data Terminal

- **Interface:** Connects to radio handset or AUX/DATA port
- **Waveforms:** STANAG 4538 (3G) ALE FLSU LDL RDL, HF-2T Secure Digital Voice
- **Security:** COMSEC, LINKSEC, AES-256. Zeroize function.
- **Weight:** 800g, 163 x 96 x 41 mm

RM5 Rugged High-Speed Modem

- **Interface:** Connects to radio handset or AUX/DATA port
- **Waveforms:** MIL-STD-188-110A & MIL-STD-188-110B, STANAG 4539 (QAM), STANAG 4285 (PSK), STANAG 4529 (NB PSK), STANAG 4415 (robust), Optional 2G ALE (MIL-STD-188-141B)
- **Security:** N/A
- **Weight:** 800g, 163 x 96 x 41 mm
- **Notes:** Multi-role HF data modem. MIL-STD-1275 power. Ethernet interface for RapidM STANAG 5066 software support.

RV2 Radio Voice Bridge

- **Interface:** Connects to radio handset or AUX/DATA port
- **Waveforms:** Voice Activity Detect (VAD)
- **Security:** N/A
- **Weight:** 800g, 163 x 96 x 41 mm

RW3 Radio Remote Control

- **Interface:** Connects to radio handset or AUX/DATA ports. 5km remote capability via Field-Wire D-10, P-274 or similar line.
- **Standards:** EN 55022, EN 55024, MIL-STD-461E, MIL-STD-810G, MIL-STD-1275
- **Security:** N/A
- **Weight:** 800g, 163 x 96 x 41 mm per unit
- **Notes:** Radio remote control set of devices for voice service. Radio Interface Unit (RIU) and Remote Control Unit (RCU). Supports up to 3 different radios. Built-in Loudspeaker. U-183 / H-250 handset connector. Continuous field wire integrity checking.
<table>
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<tr>
<th>Model</th>
<th>Description</th>
<th>Power</th>
<th>Frequencies/Waveforms</th>
<th>Security</th>
<th>Weight</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRE2-189</td>
<td>GCS RADIO TRANSEIVER AND ANTENNA</td>
<td>19-55 VDC/250W</td>
<td>4.900 - 5.900 GHz</td>
<td>COMSEC and TRANSEC provided by digital beam-forming and AES-256 encryption embedded in hardware</td>
<td>2 kg</td>
<td>Phased array wireless data-link. Maximum data capacity 15 Mbps. IP based. Long range. Vertically mounted panel with radio transceiver and antennas ideal for vessels and semi-mobile installations. The unit is fully compliant with the very most demanding class of electromagnetic compatibility and immunity according to MIL-STD-461F. Water ingress protection is IP67 (Submergible).</td>
</tr>
<tr>
<td>CRE2-179-UAV</td>
<td>UAV RADIO TRANSEIVER AND ANTENNA</td>
<td>19-55 VDC/250W</td>
<td>4.900 - 5.900 GHz</td>
<td>COMSEC and TRANSEC provided by digital beam-forming and AES-256 encryption embedded in hardware</td>
<td>2 kg</td>
<td>Phased array wireless data-link. Maximum data capacity 15 Mbps. IP based. Long range. Horizontally mounted panel with radio transceiver and antennas ideal for UAV applications. The antenna panel has the same properties as CRE2-179, but with significantly lower weight adapted for UAV applications. The unit is fully compliant with the very most demanding class of electromagnetic compatibility and immunity according to MIL-STD-461F. Water ingress protection is IP67 (Submergible).</td>
</tr>
<tr>
<td>CRE2-144-M2</td>
<td>HELMET MOUNTED RADIO</td>
<td>9-36 VDC</td>
<td>4.900 - 5.900 GHz</td>
<td>COMSEC and TRANSEC provided by digital beam-forming and AES-256 encryption embedded in hardware</td>
<td>295g</td>
<td>C-band phased array tactical wireless radio. IP centric/ad hoc network operations. Compact radio transceiver and antennas ideal for portable or man-carried applications. The radio/antennas have very low weight and are to be mounted on top of a helmet. The radio has two Ethernet connections and military grade rugged for harsh environments with a special easy-to-clean connector for dust and mud. The unit is waterproof including full submerging in water (IP68). The unit also has built-in GPS and options for insertion of short range wireless interfaces to connect to user terminal equipment such as PCs, pads, and mobile terminals.</td>
</tr>
<tr>
<td>COMP@N H07</td>
<td>VHF/UHF handheld</td>
<td>Max 5W (FM, programmable), max 6W (PEP)</td>
<td>20MHz to 520 MHz and 30MHz to 137 MHz</td>
<td>Programmable FM, max 5W, programmable AM max 4 W-PEP, CPM (W2FH): 0.1W, 1W, 5W</td>
<td>1kg</td>
<td>Handheld SDR radio, 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>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 137 MHz</td>
<td>Programmable FM max 5W, programmable AM max 4 W-PEP, CPM (W2FH): 0.1W, 1W, 5W</td>
<td>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 / 35MHz to 137 MHz/BMS IP WF – narrowband MANET waveform that can operate in frequency hopping mode or at fixed frequency, STANAG 4204 - fixed frequency VHF FM, STANAG 4205 - frequency VHF FM/AM.</td>
<td>Programmable FM max 5W, programmable AM max 4 W-PEP, CPM (BMS IP WF): 0.1W, 1W, 5W</td>
<td>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>
</tbody>
</table>
### BNET-MPS/V
**Rafael Advanced Defense Systems**

| Power: | 5W/20W (BNET-MPS), 50W per channel (BNET-V) |
| Security: | Networking ECCM capabilities, frequency hopping spread spectrum techniques. |
| Weight: | 6kg (BNET-MPS), 13kg (BNET-V) |
| Notes: | The BNET-MPS is the manpack member of the overall BNET family with the BNET-V being its vehicular counterpart. |

---

### Microlight DH500
**Raytheon**

| Power: | 0.1W to 4W |
| Frequencies/waveforms: | 225MHz to 2GHz/ Eight-hop relay, CPSM with DSSS, TDMA, CDMA and FDMA |
| Security: | supports commercial Advanced Encryption Standard (AES) for Secure But Unclassified (SBU) transmission |
| Weight: | 0.76kg |
| Notes: | 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. |

---

### EPLRS-XF-I
**Raytheon**

| Power: | 10W max |
| Frequencies/waveforms: | 30MHz to 512MHz, 142 channel pre-sets/ SINCGARS, SATCOM, DAMA, HAVEQUICK I/II, AM, FM, FSK, B/SB/DESB/SOQ PSK |
| Security: | embedded encryption engine, embedded CDMSEC for voice and data |
| Weight: | 5.2kg |
| Notes: | Provides lightweight, secure, network-capable, multi-band/multi-mission, anti-jam, voice/imagery/data communications capability in a single package. |

---

### EPLRS-XF-I (lightweight)
**Raytheon**

| Power: | 10W to 20W |
| Frequencies/waveforms: | 30MHz to 88MHz |
| Security: | User definable tamper proof QCM-R module for full INFOSEC and TRANSEC autonomy. |
| Weight: | LANDSEC HMI features integrated texting from front panel. Has CNIS Link-ZA compliant tactical data link, Bluetooth for peripherals, automatic GPS position reporting, local/networked remote control, Li-ion battery with gauge. |

---

### MTR3005 Manpack
**Reutech**

| Power: | 10W max |
| Frequencies/waveforms: | 118MHz to 400MHz V/UHF |
| Security: | User definable tamper proof QCM-R module for full INFOSEC and TRANSEC autonomy. |
| Notes: | LANDSEC HMI features integrated texting from front panel. Has CNIS Link-ZA compliant tactical data link, Bluetooth for peripherals, automatic GPS position reporting, local/networked remote control, Li-ion battery with gauge. |

---

### MTR2005 Manpack
**Reutech**

<p>| Power: | 10W max |
| Frequencies/waveforms: | 30MHz to 88MHz |
| Security: | User definable tamper proof QCM-R module for full INFOSEC and TRANSEC autonomy. |
| Notes: | LANDSEC HMI features integrated texting from front panel. Has CNIS Link-ZA compliant tactical data link, Bluetooth for peripherals, automatic GPS position reporting, local/networked RC, built-in antenna tuning, Li-ion battery with gauge. |</p>
<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| MTR1025 Manpack | **Power:** 30W  
**Frequencies/waveforms:** 1.6MHz to 30MHz, HF  
**Security:** User definable tamper proof INFOSEC, TRANSEC module  
**Notes:** Features integrated texting from front panel, CNIS 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. |
| TR2400 Manpack/Vehicle set | **Power:** 25W on internal battery or 100W on 26V vehicle battery  
**Frequencies/waveforms:** HF with Automatic Link Establishment waveform.  
**Security:** ECCM for voice and data  
**Notes:** Configurable as man-pack, vehicle and fixed-installation HF radio. External co-location filter enables multi-transceiver operation. Features ALE to MIL-STD-188-110A, built-in GPS, Bluetooth connectivity for peripherals. Micro DSP technology allows configuration flexibility and provides upgrade path. |
| TR6000 Manpack/Vehicle set | **Power:** 10W on man-portable battery, 40W on 27V vehicle battery typical  
**Frequencies/waveforms:** Low band VHF ground-to-ground, ATC band ground-to-air  
**Security:** 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. |

**Other models:**

### PWH4001

**Security:** Anti-jamming, LPD waveform  
**Notes:** 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.

### TR620

**Security:** Analogue voice scrambling compatible with the TR610 and TR6000 in FM mode; provides AES 256 encryption for secure FH voice.  
**Notes:** Handheld transceiver based on flexible DSP/SDR technology that allows configuration flexibility and an upgrade path; qualified to MIL-STD-810F.
### MR300xH/U multiband HF/VHF/UHF tactical radio

**Rohde & Schwarz**

**Power:**
Several output power classes up to 50W (VHF/UHF) ad 500W (HF) with external amplifiers.

**Frequencies/waveforms:**
Multiband capability (1.5-512MHz with external devices). R&S MR300xH for HF/VHF (1.5MHz to 146MHz). R&S MR300xH for VHF/UHF (25MHz to 512MHz). Multi-Waveform capability (HF House, VHF/UHF tactical and G-A-G waveforms).

**Security:**
Embedded EPM (ECM) in line with R&S SECOM and R&S SECOS, HAVE QUICK II. Secure digital voice and data (AES 256).

**Notes:**
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&S IPoA) and SIP based remote voice operation.

### HR5000 handheld tactical radio

**Rohde & Schwarz**

**Power:**
5W RF output power

**Frequencies/waveforms:**
Multiband capability (25MHz to 146MHz)

**Security:**
Embedded EPM (ECM) in line with R&S®SECOM-P

**Notes:**
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.

### MR3000P handheld VHF transceiver

**Rohde & Schwarz**

**Power:**
Transmit output power: up to 5W

**Frequencies/waveforms:**
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.

**Security:**
Frequency hopping (TRANSEC), AES encryption (COMSEC)

**Notes:**
A member of the SOVERON HR family, the HR5000 provides two parallel voice channels and IP-based data transmission.

### Afracal 1k High Power HF Amplifier

**Sat-Com Secure and Tactical Communications**

**Power:**
100W PEP @ (1.6-30MHz)
100W PEP @ (30-88MHz)
90W PEP @ (30-512MHz)

**Frequencies/waveforms:**
1.6-30MHz

**Features:**
Extremely compact 3U Linear HF, Automatic output filter selection, Liquid cooled, Silent operation, Forward and Reflected power indication

**Automatic Antenna Tuner:**
Radio control is passed through to ATU via a connector on the rear.

**Mounting:**
19” Rack, desk top

**Weight:**
25kg

**Note:**
110-230VAC (48VDC optional)

### Afracal2 HU Dual Power Multiband (HF/VHF/UHF) Amplifier

**Sat-Com Secure and Tactical Communications**

**Power:**
175W PEP @ (1.6-30MHz)
100W PEP @ (30-88MHz)
50W PEP @ (30-512MHz)

**Frequencies/waveforms:**
1.6-512MHz

**Features:**
Linear HF/VHF/UHF, Automatic output filter selection, Convection cooled, No moving parts, Forward and Reflected power indication

**Automatic Antenna Tuner:**
Radio control is passed through to ATU via a connector on the rear.

**Mounting:**
Mobile Racks, Base Racks, Custom Solutions

**Weight:**
11kg

**Note:**
DUAL amplifier, Automatic RF input routing, Automatic antenna output routing, Ideal for high-power and compact REBRO and REPEATER systems.

### Badger HU Combat Net Multiband (HF/VHF/UHF)

**Sat-Com Secure and Tactical Communications**

**Power:**
30W PEP @ (1.6-30MHz), 16W PEP @ (30-88MHz), 10W PEP @ (88-512MHz)

**Frequencies/waveforms:**
1.6-512MHz

**Modulation:**
AM, PSK, QPSK, QAM

**Security:**
COMSEC, Encrypted AES256 Digital Voice
TRANSEC, OTP, AES128, 1-600 hops per second.

**Enhanced Features:**
Advanced Modem: BPSK, QPSK, PSK, QAM, DSSS*

**Mounting:**
Panel, 19” Rack, 5.8kg (including Battery)

**Weight:**
5.8kg (including Battery)

**Note:**
The Badger has been specifically designed to be rack or panel mounted, an extension kit facilitates mounting in standard 19” rack. Perfect for Naval or Mobile installations. COMSEC (SDV) and TRANSEC(FFH) Modes on Scanning or ALE. All HF/VHF/UHF Features are interoperable with the Satcom suite of radios.
Cheetah 3 VU Combat Net Multiband (VHF/UHF)

**Power:** 10W

**Frequencies/waveforms:** 30-512MHz

**Modulation:** USB/LSB, AM, FM, FSK, MSK, Advanced Modem: BPSK, QPSK, QAM, DSSS

**Security:** COMSEC, Encrypted AES/256 Digital Voice

**TRANSEC:** OTP / AES128, 1-600 hops per second, NETS: 8-digit decimal Mission Key

**LINKING:** Ad hoc channel scan / ALE

**Mounting:** Backpack, Docking Station

**Weight:** 2.9kg (including Battery)

**COMSEC (SDV) and TRANSEC(FFH) Modes on Scanning or ALE. All VHF/UHF Features are interoperable with the Satcom suite of radios.

Cheetah 3+ Combat Net Multiband (HF/VHF)

**Power:** 20W

**Frequencies/waveforms:** 30-170MHz (1.6-30 MHz capable)

**Modulation:** USB/LSB, AM, FM, FSK, MSK, Advanced Modem: BPSK, QPSK, QAM, DSSS

**Security:** COMSEC, Encrypted AES/256 Digital Voice

**TRANSEC:** OTP / AES128, 1-600 hops per second, NETS: 8-digit decimal Mission Key

**LINKING:** Ad hoc channel scan / ALE

**Mounting:** Backpack, Docking Station, Mobile Racks, Base Racks

**Weight:** 3.25kg (including Battery)

**COMSEC (SDV) and TRANSEC(FFH) Modes on Scanning or ALE. All HF/VHF Features are interoperable with the Satcom suite of radios.

Leopard HU Combat Net Multiband (HF/VHF)

**Power:** 30W/B01: 6-30MHz, 10W/B08: 512MHz

**Frequencies/waveforms:** 1-512MHz

**Modulation:** USB/LSB, AM, FM, FSK, MSK, Advanced Modem: BPSK, QPSK, QAM, DSSS

**Security:** COMSEC, Encrypted AES/256 Digital Voice

**TRANSEC:** OTP / AES128, 1-600 hops per second, NETS: 8-digit decimal Mission Key

**LINKING:** Ad hoc channel scan / ALE

**Mounting:** Backpack, Docking Station, Mobile Racks, Base Racks, Custom Solutions

**Weight:** 4.9kg (including Battery)

**COMSEC (SDV) and TRANSEC(FFH) Modes on Scanning or ALE. All HF/VHF Features are interoperable with the Satcom suite of radios.

AN/PRC-148 MBITR/JEM

**Power:** 0.1, 0.5, 1.0, 3.0 and 5.0W user selectable (waveform dependent)

**Frequencies/waveforms:** 30MHz to 512MHz contiguous. Implemented and planned waveforms and modes include: AM/FM, Havequick I/II, MIL-STD-188-241-1/-2 (SINCGARS), MIL-STD-188-181B (56kbps), MIL-STD-188-181C, -182B, -183B (SATCOM IW), ANDVT, Project 25, Over The Air Cloning (OTAC), retransmission

**Security:** Programmable encryption engine supports NSA crypto modernisation requirements, certified by NSA.

**Weight:** 0.867kg with battery

**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.

AN/PRC-148B MBITR2

**Power:** 5 W in all frequencies

**Frequencies/waveforms:** 30MHz to 512MHz, Soldier Radio Waveform (SRW), MIL-STD-188-241-1/-2 (SINCGARS - Standard/ FHZ EGM), MIL-STD-188-181B, -182B, -183B (SATCOM IW), HAVEQUICK I and II, ANDVT (LPC-10, MELP), AM/FM, Project 25. 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.

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 DES (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.
## TACTICAL RADIOS LISTINGS

### 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 1,860MHz (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. |

### AN/PRC-154B Rifleman Radio

| Power: | User selectable up to 5W |
| Frequencies/waveforms: | UHF band 225MHz to 450MHz, L-Band 1,250MHz to 1,390 MHz, 1,750MHz to 1,850MHz/ 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 |

### 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 |

### St@r Mille Handheld

| Power: | 2 W |
| Frequencies/waveforms: | UHF 310MHz to 470MHz, supports squad, platoon and weapon system waveforms |
| Security: | Embedded AES-256 encryption |
| Weight: | 0.38kg without battery |
| Notes: | 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 |

### SYNAPS-H

| Frequencies/waveforms: | VHF & UHF/ Waveform library provides NATO, coalition & advanced networking waveforms. Manoeuvre waveforms provide collaborative combat capabilities over wideband networks |
| Notes: | 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. |

### TC9210 PR4G VHF Manpack Radio

| Power: | Selectable up to 10W |
| Frequencies/waveforms: | 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) |
| Security: | High grade built-in encryption and advanced protection schemes including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes |
| Weight: | 3.4kg without battery |
| Notes: | An advanced combat net radio with simultaneous voice and IP capabilities. |
TRC 3700 HF Manpack Radio

**Frequencies/waveforms:** 30MHz to 88MHz
**Security:** High grade built-in encryption, and advanced protection schemes including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes
**Notes:** 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.

TRC 9110 PR4G VHF Handheld Radio

**Frequencies/waveforms:** 1.5MHz to 30MHz
**Security:** High grade built-in encryption, and advanced protection schemes including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes
**Notes:** 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.

TRC 9105 VHF Handheld Radio

**Power:** 2 W
**Frequencies/waveforms:** 30MHz to 88MHz
**Security:** High grade built-in programmable encryption, advanced EPM including Fast Frequency Hopping (FFH), Free Channel Search (FCS) and mixed FH and FCS modes
**Weight:** 1 kg without battery
**Notes:** 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.

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/
**Security:** Programmable encryption with red/black architecture
**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 comms 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.
<table>
<thead>
<tr>
<th>TACTICAL RADIOS LISTINGS</th>
<th>Yaroslavl Radioworks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R-168-1KE (Kvartz-N) handheld HF radio</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Power:</strong></td>
<td>4W</td>
</tr>
<tr>
<td><strong>Frequencies/waveforms:</strong></td>
<td>1.5MHz to 9.999MHz</td>
</tr>
<tr>
<td><strong>Security:</strong></td>
<td>Offers clear and secure communications</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>0.85kg</td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td>Designed by the Sozvezdie JSC for both urban conditions and broken terrain with limited signal propagation plus long-range communications of up to 300km. Offers USB/LSB operation, compatibility with older radio types.</td>
</tr>
</tbody>
</table>

| **R-168-5KNE HF manpack**                       |                      |
| **Power:**                                       | 8W max, 1W reduced   |
| **Frequencies/waveforms:**                       | 1.5MHz to 29.999MHz  |
| **Security:**                                    | Built-in encryption, 256hop frequencies, 20hops/sec hop rate |
| **Weight:**                                      | 3kg plus battery     |
| **Notes:**                                       | Operates in simplex, dual-frequency simplex, FH, adaptive communication and listening watch modes. Also employs frequency telegraphy for automatic reception. |

| **R-168-0.1UME VHF handheld**                   |                      |
| **Power:**                                       | 0.15W 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. |

| **R-168-0.1UME VHF handheld**                   |                      |
| **Power:**                                       | 2W min               |
| **Frequencies/waveforms:**                       | 44MHz to 56MHz       |
| **Security:**                                    | built-in encryption for analogue data; digital data from external data terminal. |
| **Weight:**                                      | 1.5kg                |
| **Notes:**                                       | 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-168-0.1UME VHF monoblock handheld**         |                      |
| **Power:**                                       | 1W min               |
| **Frequencies/waveforms:**                       | 30MHz to 80MHz       |
| **Security:**                                    | Built-in encryption of voice and data, frequency hopping. |
| **Weight:**                                      | 0.3kg                |
| **Notes:**                                       | Monoblock radio connects company and platoon commanders, squad leaders, soldiers. Provides FM voice or 16kb/s secure voice, data rates of 2.4kb/s or 16 kb/s via RS-232 interface. |

| **R-168-0.5MKME VHF handheld**                  |                      |
| **Power:**                                       | 1W min               |
| **Frequencies/waveforms:**                       | 33MHz to 56MHz       |
| **Security:**                                    | Built-in encryption for voice and data; with encryption, voice range falls from at least 3km to 2.5km, data transmission range 2km. |
| **Weight:**                                      | 0.3kg                |
| **Notes:**                                       | Provides single- and multi-channel clear and secure tactical communications. Features rechargeable battery, two antenna types, microphone headset. Range for simplex and double-frequency simplex operation 3km with ASP-1.5 antenna, 1.5km with ASP-1.0 antenna or 2 and 1 km with FH. |
TACTICAL RADIOS LISTINGS

R-168-0.5UDE VHF

<table>
<thead>
<tr>
<th>Power:</th>
<th>1W nominal, 5W max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>146 MHz to 174MHz</td>
</tr>
<tr>
<td>Security:</td>
<td>Encrypted voice and data, whisper mode</td>
</tr>
<tr>
<td>Weight:</td>
<td>0.3kg</td>
</tr>
<tr>
<td>Notes:</td>
<td>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.</td>
</tr>
</tbody>
</table>

Yaroslavl Radioworks

R-168-5UN-1E VHF manpack with digital display

<table>
<thead>
<tr>
<th>Power:</th>
<th>1W low, 8W high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>30MHz to 87.975MHz</td>
</tr>
<tr>
<td>Security:</td>
<td>Clear and secure analogue via built-in ciphering unit; digital data from external data terminal</td>
</tr>
<tr>
<td>Weight:</td>
<td>11.1kg with battery</td>
</tr>
<tr>
<td>Notes:</td>
<td>Provides platoon, company, battalion coms. Offers simplex or two-frequency simplex at any of 6 preset frequencies, remote control at up to 500 m, emergency data erasure. Replaces heavier R-159, R-159M, R-1603, 16/F, Island Place Tower, 510 King’s Road, Hong Kong</td>
</tr>
</tbody>
</table>

Yaroslavl Radioworks

R-168-0.5UDE UHF monoblock radio

<table>
<thead>
<tr>
<th>Power:</th>
<th>1W nominal, 5W max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>146MHz to 174MHz</td>
</tr>
<tr>
<td>Security:</td>
<td>1 kb/s secure voice, built-in encryption for analogue data, digital data from external terminal</td>
</tr>
<tr>
<td>Weight:</td>
<td>0.3kg</td>
</tr>
<tr>
<td>Notes:</td>
<td>Connects company and platoon commanders, squad leaders, soldiers through tactical command link allows them to communicate with aircraft, warships. Range is up to 5km.</td>
</tr>
</tbody>
</table>

Yaroslavl Radioworks

R-168-0.5UDE UHF portable radio set

<table>
<thead>
<tr>
<th>Power:</th>
<th>1W nominal, 4W max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies/waveforms:</td>
<td>390MHz to 440MHz</td>
</tr>
<tr>
<td>Security:</td>
<td>Analogue secure data protected with built-in encryption unit; digital data delivered from external data terminal, encrypted whisper mode</td>
</tr>
<tr>
<td>Weight:</td>
<td>1.5kg</td>
</tr>
<tr>
<td>Notes:</td>
<td>Connects company and platoon commanders, squad leaders, soldiers, allows coms with aircraft, warships. Input of modes, frequencies, keys automated. Offers 10 hours continuous operation.</td>
</tr>
</tbody>
</table>

Yaroslavl Radioworks