Tactical Targeting Network Technology (TTNT) is a secure and robust IP-based waveform that delivers the fastest ad hoc mesh network to the tactical edge. TTNT compliments Link 16 increasing the warfighter’s networking capability to address the growing threats from peer advisories. TTNT is a proven and mature system that instantly and accurately shares secure voice, video and data across a dynamic battlespace, meeting the rapidly changing networking needs of today’s warfighter.

**TTNT NETWORKING OVERVIEW**

- Robust, high-speed, high-capacity, low latency, Ad Hoc network
  - Greater than 14Mbps instantaneous network bandwidth
  - Up to 2 Mbps single user Tx data rate
  - Up to 8 Mbps single user Rx data rate
  - Multiple Data Rates (250k, 500k, 1M, 2M) & Special Modes
  - Ranges up to 300 NM without relay (dependent on power)
  - Multi-hop Relay (up to 16 hops)
  - Very low latency from sender to receiver
  - Self forming & self-healing with fast join time
  - Aircraft relative velocities up to Mach 8
- Standard Internet Protocol (IP) with autonomous adaptive networking
  - Automatic routing between originating and destination nodes for resilient communications
  - Self Mitigates intentional jamming “Quality of Service” Prioritized Communications
- Transmit on demand – no waiting for time slots
- Nodes receive while transmitting
  - Receive up to four simultaneous streams

**MIDS JTRS TTNT KEY FEATURES**

- Multi-Waveform operation w/ isolated security
  - TTNT Waveform
    - 3 channel IP-based tactical network capable of running at different security levels
    - Information is transmitted on demand
    - Adaptable power output levels
  - Link 16 Waveform
    - Full access to situational awareness & Command and Control (C2)
    - Increased receive capacity w/ CMN-4/CCR
  - TACAN Waveform
    - Option for additional growth waveform
  - NSA Certified Equipment

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The Collins Aerospace TTNT-1000 allows SWaP-constrained platforms to integrate into the Tactical Targeting Network Technology (TTNT) network. The small form factor of the TTNT-1000 terminal enables smaller disadvantaged platforms to participate in the TTNT network, increasing the dissemination of operational relevant, actionable data to the warfighter at the speed of battle. The TTNT-1000 uses Dynamic Spectrum Access (DSA) capability to enable authorization of generally restricted RF spectrum frequencies by allowing the radio to select and deselect frequencies based on geo-spatial and temporal policies, and communicating those adjustments over the TTNT network improving network performance.

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**TTNT-1000 Key Features**

- Small form factor software defined radio (8 pounds, 125 in³)
- Single TTNT waveform operation at defined security level
  - (U) IP-based tactical network
  - (U) Information is transmitted on demand
  - (U) Adaptable power output levels
  - (U) fast automatic joining & leaving of network nodes
  - (U) Interoperable with MIDS JTRS TTNT
- Internal Cryptographic Subsystem (CSS) for full COMSEC / TRANSEC operations (NSA Type 1)
- Miniaturized Terminal for disadvantaged SWaP platforms
- “Hooks” to additional capabilities
  - (U) Special Modes (classified)
  - (U) External 80 Watt Dual Power Amplifier (DPA)
  - (U) Precision Navigation Time (PNT)
When mission success is critical, TacNet WDL enables warfighters to engage stationary and moving targets at greater ranges and in all-weather, high threat environments. TacNet makes any guided weapon a Network Enabled Weapon (NEW) providing the warfighter with joint weapon tracking and fire control, as well as high-confidence situational awareness data.

**TACNET KEY FEATURES**

- Multi-channel Link 16 and UHF
- NSA Type-1 certified
- Moving target engagement
- In-flight target update
- In-flight retargeting
- In-flight controller hand-off
- In-flight abort
- Bomb Hit Indication (BHI)
- Increased standoff range
- Increased weapon accuracy
- Real-time situational awareness
- Collaborative weapon engagement

**TACNET 2.0 FUTURE CAPABILITY**

- Requirements
  - 2-Channel Link-16 and Advanced Tactical Data Link (ATDL)
  - Beyond Line of Sight
  - LPI/LPD/AJ
  - Long Range/High Altitude
- Collins IR&D investment in small form factor Software Defined Radio (SDR) that is waveform agnostic (TRL-6) to host multiple ATDL networking waveforms
- 2 Channel conceptual framework initiated through Advanced Weapon Agnostic Radio Enhancement (AWARE) program
Datalink and communication waveform technology is being outpaced by adversary offensive electronic warfare capability, which reduces critical connectivity between warfighters and between platforms. Traditional radios are designed with highly integrated software and hardware which result in cumbersome, expensive and lengthy upgrade cycles to field new capability. To counter adversary capability in an affordable manner, the upgrade cycle must be significantly reduced by deploying radios with open architectures based on government owned open standards using general purpose processors.

**SPOC Key Features**

- **SPOC** is a 3-channel multi-functional processor radio that is capable of simultaneous operation of 3 disparate waveforms.
- **SPOC** is field programmable so that it can accept additional waveforms or waveform upgrades, increasing versatility and utility.
- Launching platform for future waveforms:
  - Mobile ADHOC IP-Based Networks
  - Increased anti-jam performance
  - LPI/LPD signals in space
- **SPOC** will enable ground and airborne platforms to replace multiple existing legacy systems with a single unit having the added flexibility of reprogram ability.
Collins Aerospace system-of-systems view of battlespace awareness and management directly aligns with the ABMS "many as ONE" approach. ABMS is challenged with making sure the right data is transmitted to the right user at the right time to shorten the "kill chain". Collins Aerospace delivers products now and is innovating solutions addressing the six different ABMS Product Categories to connect, safeguard, process, fuse, and apply multi-domain effects in the highly dynamic battlespace.

Collins is part of the ABMS IDIQ Contract in 6 categories

**Digital Architecture Standards**
- Building on Collins high fidelity Modeling and Simulation (M&S) environment for development, integration, test and training

**Sensor Integration**
- Building on fielded Collins sensors as ABMS test bed, and evolving to Smart Sensors

**Secure Processing**
- Using SecureOne™ product family to prototype and maturing ABMS Multi-level Security (MLS) products

**Connectivity**
- Demonstrating new tactically resilient capabilities with existing communication and Data Links products and emerging Open Architecture Systems

**Applications**
- Demonstrating existing Machine Learning (ML) framework and functions and evolving capabilities into ABMS Apps

**Effects Integration**
- Virtually demonstrating multi-domain, multi-platform collaborative effects with robust Modeling and Simulation (M&S) and then demonstrating live capabilities