

NATO Narrowband Waveform (NBWF)

Interoperable Tactical Communications for Coalition Operations

Standards-Based Interoperability for NATO and Allied Forces

Etherstack's platform-independent implementation of the NATO Narrowband Waveform (NATO NBWF) enables secure, interoperable tactical communications across NATO nations and coalition partners.

Designed for radio manufacturers, defence organisations, and government agencies in NATO nations, Etherstack's NATO NBWF software accelerates the deployment of standards-compliant VHF/UHF narrowband voice and data MANET communications, reducing integration risk while supporting coalition and joint-force interoperability. Information on the software package is provided on the next page.

Resilient, Spectrum-Efficient Tactical Communications

Etherstack's implementation enables organisations to:

- Achieve NATO-standard interoperability without developing a waveform in-house
- Support joint, combined, and coalition operations
- Strengthen C4ISR capability and PACE plan resilience
- Meet NATO Federated Mission Networking (FMN) objectives

Functional Scope of NATO NBWF Standards

The NATO NBWF standards define **25 kHz and 50 kHz VHF/UHF narrowband MANET communications** optimised for tactical mobility, redundancy, and quality of service across diverse operational environments.

Operational Environments

- Ground-to-ground (land)
- Littoral and coastal operations
- Mounted, dismounted, and autonomous nodes

Key Capabilities

- Narrowband MANET with dynamic ad-hoc relay for tactical mobility, redundancy, and quality of service.
- Bespoke real-time narrowband protocols (not IP or generic mesh).
- Extended range via multi-hop communications.
- Provides task and mission flexibility via pre-defined configuration profiles. Suited to low and high density and small and large missions.

Network Features

- 1-hop and 2-hop multicast voice
- 1-hop, 2-hop, and multi-hop multicast data
- 1-hop and 2-hop unicast data

User Services

NATO NBWF enables simultaneous voice and data, without explicit mode selection:

- Combat voice (MELPe 2400 bps)
- Position Location Information (PLI)
- Free text tactical chat and short messages
- Email
- Fire control data

Interoperable with other NATO standards, including MELPe, SCIP, TSVCIS and TACOMS/IP gateway STANAGs. These are a key enabler for Multi-Domain Operations (MDO), creating a shared information domain across coalition forces.

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Portable Waveform Software Implementation

Etherstack NATO NBWF Software Implementation

Etherstack has implemented the NATO NBWF STANAGs as vendor and platform agnostic waveform software, suitable for rapid integration on a wide range of radio platforms. The software scope includes:

- STANAG 5630 (AComP-5630) – Overall Architecture
- STANAG 5631 (AComP-5631) – Physical Layer
- STANAG 5632 (AComP-5632) – Link Layer
- STANAG 5633 (AComP-5633) – Network Layer

Edition 1 is available with Edition 2 currently in development.

Designed for Portability and Field Worthiness The Etherstack NATO NBWF implementation is highly modular and optimised for portability without compromising operational performance.

- Operating system independent
- Multiple processor architectures
- SWaP-constrained and battery-powered radio platforms
- Handheld, vehicular, and fixed installations

Etherstack waveform software has been ported to over twenty radio platforms and is used operationally in field.

Delivered with a Complete Integration Package Etherstack's NATO NBWF software is accompanied by:

- Automated test and simulation environment (ELITE)
- Extensive functional and unit test suites covering the STANAGs
- Interface documentation and header files
- Functional and conformance specifications
- Hardware and platform integration guidance
- Commercial warranty options

Flexible Engagement Models Developing a field-worthy NATO waveform is complex and resource-intensive. Etherstack offers flexible options to suit manufacturers and government programs, including:

- Off-the-shelf waveform licensing
- Platform porting and integration services
- Architecture and design support
- Test, validation, and conformance assistance
- Long-term sustainment and support

These options reduce development risk, shorten time-to-field, and enable interoperability by design.

About Etherstack

Etherstack delivers the technology that underpins **secure, resilient, and interoperable wireless communications**, including:

- Tactical waveforms
- Software-defined networking
- Cryptography and key management systems
- Cross-domain and radio-to-radio gateways

Etherstack solutions are based on **open international standards** (NATO, ETSI, 3GPP, US TIA) and are used in live operations globally by defence, public safety, and mission-critical organisations.

Engage with Etherstack

If your organisation is based in a NATO or NATO partner nation and is:

- Developing or upgrading tactical radios
- Seeking coalition interoperability
- Planning joint or allied operation
- Evaluating NATO NBWF adoption

Etherstack welcomes discussions on how its NATO NBWF products and services can support your program.

etherstack

Etherstack Pty Ltd
64 Rose Street
Chippendale NSW 2008
Australia

+61 2 8399 7500
info-au@etherstack.com
www.etherstack.com