C2 for Allied Interoperability

EXECUTIVE SUMMARY

NATO's militaries are being designed for interoperability. The Federated Mission Networking framework, updated doctrine, and Spiral 6's new tactical-level requirements reflect a firm commitment to connected C2. But thirty-two nations means thirty-two budgets and thirty-two different inventories of fielded equipment. Not every nation moves at the same pace. Smaller nations face funding and capacity constraints that slow implementation, even when the standards are sound. The gap between where the Alliance is headed and where it operates today is not a question of intent. It's a question of time.

The threat environment has made that gap more dangerous. Near-peer adversaries have spent years studying how Allied forces communicate and building systems to stop it. Jamming, GPS spoofing, SATCOM suppression, and cyber intrusion are not contingencies in a NATO operational scenario. They are the scenario. A C2 architecture that cannot bridge Allied radio systems in peacetime will not survive the first hour of a contested operation.

REDCOM Sigma was built for this environment. Sigma connects radios that were never designed to work together, sustains C2 when the primary network is denied, and gives every element one interface for all communications, without replacing a single piece of equipment Allied forces already carry.

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FOUR CHALLENGES EVERY ALLIED COMMUNICATOR KNOWS

1. THE TACTICAL INTEROPERABILITY GAP PERSISTS

NATO's Federated Mission Networking (FMN) framework is working hard to close the interoperability gap. The recently approved Spiral 6 extended interoperability requirements to the tactical level for the first time. But a standard and its field implementation are not the same thing. Adoption across 32 nations is asymmetric: budgets, timelines, and capacity vary widely from country to country. Some nations are tracking the current spiral. Others are taking their time and holding onto their legacy equipment a bit longer. The gap between them is measured in years, but it is being contested by the enemy today. Every formation in that gap needs a bridging solution now.

2. DDIL IS NOT A SCENARIO. IT IS THE BASELINE.

Ukraine validated what NATO planners already knew: near-peer adversaries built their EW capability to do one thing: sever Allied communications at the moment they matter most. Jamming is pervasive. SATCOM links are targeted. GPS is spoofed. Communications infrastructure is a kinetic priority. In any contested NATO operational environment, the question is not whether communications will be degraded. It is when, for how long, and whether the C2 architecture can outlast it.

3. LIAISON OFFICERS ARE NOT A COMMUNICATIONS ARCHITECTURE

When Allied radios cannot communicate directly, the traditional solution is a liaison officer or relay station: a human in the gap between two systems that should already work together. This approach has a ceiling. It is slow, personnel-intensive, and fails completely under comms pressure. An LNO cannot be in six places simultaneously. A relay station does not survive in a contested environment. These are workarounds, not solutions.

4. THE SOLUTION THAT EXISTS TODAY WINS THE MISSION TOMORROW

The path from standardization to operational capability takes years. The threat environment moves in days. Allied forces in a contested environment cannot wait for the next procurement cycle or the next interoperability spiral. The solution that is available, proven, and deployable without a program of record is the one that matters when the mission is live and the network is not.

HOW REDCOM SIGMA SOLVES IT

Sigma is a software-defined C2 platform that runs on hardware Allied forces already have and connects the radios they already carry. Every element gets one interface for all comms, regardless of what radios are in the field. Sigma was selected by U.S. Army PEO C3N and the U.S. Air Force for TOC-L, and is available today for immediate procurement.

ONE INTERFACE, INFINITE INTEROPERABILITY

Sigma bridges IP and RF networks in real time. Analog radios, MANET nodes, SATCOM terminals, SIP phones, and ATAK devices all connect through the same platform and can be joined on the fly. Coalition interoperability becomes a configuration, not a negotiation. If a partner's radio can connect to a port, Sigma puts it on the network.

- Connects any combination of IP and RF endpoints in real time
- Supports SIP, VHF, UHF, HF, SATCOM, and MANET simultaneously
- Agnostic to radio make, model, waveform, and encryption

FMN Spiral specifications will continue to evolve. Sigma's architecture does not depend on which one a nation has implemented.

RESILIENT BY DESIGN

Sigma is built to operate when the network does not. It runs fully standalone: no cloud dependency, no higher-echelon infrastructure, no sustained SATCOM link required. When the primary transport fails, Sigma routes to the next available path with limited operator intervention. IP fails, move to SATCOM. SATCOM gets jammed, move to MANET. Communications continue.

- Standalone operation at the lowest tactical echelon
- Session persistence across hard shutdowns and battery swaps
- Works out of the box with an Auto-PACE network

DAY ZERO INTEROPERABILITY

Sigma's interface was built for communicators running a mission, not administrators managing a network. The interface runs in a standard web browser. New partner connections are added in seconds without taking the system offline. When the command post is established, Sigma is ready to go.

BUILT FOR EVERY ALLIED DEPLOYMENT SCENARIO

Sigma runs on REDCOM's own purpose-built hardware, on third-party hardware, in a cloud environment, or on a hypervisor. From battalion headquarters to the forward deployed element, one platform covers every scenario:

REDCOM STRIKE. An 8 kg ruggedized laptop running Sigma with a built-in 4- or 8-port radio gateway. Supports SATCOM, 4G/5G, MANET, IP phones, and ATAK clients from a single device. MIL-STD-810H and MIL-STD-461G certified. Hot-swappable batteries keep STRIKE running for hours. STRIKE is an entire joint command post in one kit.

Sigma XRI. Purpose-built for radio bridging, with four analog radio ports and unlimited IP radio connections. Fits in a pack. Mounts in a vehicle. Connects disparate Allied nets in minutes. Available as a standalone MIL-SPEC C2 box (XRI-400), as a module for Anduril Voyager and Curtiss-Wright PacStar systems, or in any computer with a PCIe slot.

Sigma Client for Windows. Full C2 voice, video, chat, and PTT on any Windows laptop or tablet. Monitor channels, verify cipher state (CT or PT), transmit to one or many simultaneously, and push radio changes including frequency and waveform from a single interface.

Sigma Client for ATAK. Full C2 voice and PTT on the Android device Allied operators already carry. Supports preconfigured and ad hoc talk groups, live video streaming from UAVs and external cameras, encrypted chat, and spatial audio across separate nets.

Sigma C2 Console. A single screen displaying every active Allied connection. Patching a radio net to a satellite link is drag-and-drop. No configuration menus. No scripting. No calling back to a network operations center.

WHAT SIGMA LOOKS LIKE FOR ALLIED FORCES

MULTINATIONAL BATTLE GROUP

Three Allied nations arrive with three different radio systems on two different frequency bands. REDCOM Sigma XRI bridges all three networks. Every element communicates directly, without liaison officers or relay stations. From the first moment of contact, every force is connected.

FORWARD JOINT TASK FORCE COMMAND POST

A JTF is establishing a forward command element with limited infrastructure and no fixed SATCOM terminal. One REDCOM STRIKE handles it: voice C2 for subordinate elements, SATCOM integration when windows are available, 4G/5G as the backup transport. All on one device that's fully mobile and operational in minutes.

CONTESTED OPERATIONS: EASTERN FLANK

Electronic warfare is active. SATCOM links are being suppressed. The only available path is a short-range MANET. Sigma continues operating on the available transport, maintaining C2 across the element without operator reconfiguration. When the SATCOM window reopens, Sigma rejoins the wider network and C2 never breaks.

ALLIED SOF INTEGRATION

Allied SOF elements operating alongside conventional forces need common C2 without a dedicated signal section. Sigma Client for ATAK and Sigma Client for Windows put full PTT, voice, and video on the devices operators already carry: the same network as the joint headquarters, with no additional hardware required.

GETTING SIGMA TO ALLIED FORCES

REDCOM Sigma is available now. No developmental programs and no waiting on a program of record.

- **JITC tested.** Cybersecurity and interoperability tested at JITC and listed on the DoDIN APL.
- **Proven.** Selected by U.S. Army PEO C3N and the U.S. Air Force for tactical edge network modernization.
- **CWIX demonstrated**. Field-proven at NATO's premier interoperability exercise. Returning for CWIX27 to ensure Spiral 6 alignment.
- **No rip and replace.** Sigma connects to the radios and systems Allied forces already carry. Nothing is discarded. Everything connects.

THE BOTTOM LINE

REDCOM has been solving the tactical interoperability problem for the U.S. Army, Air Force, Marine Corps, Navy, and international partners for years. The Alliance's strength comes from its unity, and at the tactical edge, that unity requires communications that work. For years, the gap between Allied radio systems has been managed with liaison officers, relay stations, and stovepiped systems. REDCOM Sigma closes those gap today.

One platform. Every radio. Every net. Every Allied force, connected.