

HERMES

Hardened Edge Relay & Machine-intelligent Encrypted Speech

FEATURES

SIP RFC 3261 Registrar Server

SRTP AES-256-CM Encryption

7 Audio Codecs incl. MELPe

STANAG 4591 Voice Encoding

Conference Bridges (8 Groups)

AI Voice Agent (Offline LLM)

Push-to-Talk (USB HID/evdev)

GVA Display Extension (COM F7)

GeoChat via SIP MESSAGE

Gateway Plugin Architecture

DDS Land Data Model v10

Systemd Service Integration

TLS Certificate Authentication

Multi-Codec Transcoding

Linux x86_64 & aarch64

Zero Cloud Dependency



**MADE IN
AUSTRALIA**

HERMES is a secure, military-grade VoIP communications suite providing encrypted tactical voice, conferencing and AI-assisted voice capabilities for GVA (Generic Vehicle Architecture) platforms. Supporting seven audio codecs — including MELPe at 600, 1200 and 2400 bps for ultra-low-bandwidth tactical links, G.729 for compressed speech, and Opus for high-fidelity voice — HERMES adapts automatically to available network conditions. Real-time codec transcoding enables seamless communication between endpoints running different codecs.

Built on a modular four-component architecture — SIP registrar server, push-to-talk client, AI voice agent and GVA display extension — HERMES delivers end-to-end encrypted speech across tactical networks with zero reliance on internet connectivity or cloud infrastructure. Eight pre-configured conference bridges support simultaneous multi-party voice channels for platoon, company and battalion nets, while the gateway plugin architecture enables bridging to PSTN, analogue radio and custom systems.

Military-Grade Encryption: All voice traffic is secured with SRTP AES-256-

CM encryption and HMAC-SHA1-80 authentication, ensuring compliance with defence communication security requirements. TLS 1.3 secures all SIP signalling with certificate-based mutual authentication, preventing eavesdropping and man-in-the-middle attacks. Per-session encryption keys are negotiated independently with no unencrypted fallback permitted. STANAG 4591 compliance guarantees interoperability with allied nation voice systems over HF and VHF radio links.

AI-Powered Voice Agent: HERMES integrates a fully offline AI voice assistant powered by Ollama (LLM), Piper (neural text-to-speech) and Vosk (speech recognition). Operators can query battlespace information, request status updates, or issue commands by voice — all processed locally with no data leaving the platform. The AI agent participates as a standard SIP endpoint, meaning it can be dialled from any handset, conferenced into group calls, or triggered via configurable response handlers. Voice activity detection and comfort noise generation ensure clean audio on noisy vehicle intercom circuits.



ENCRYPTED TACTICAL COMMUNICATIONS



FIND OUT MORE

Commercial Off The Shelf (COTS) and Modified Off The Shelf (MOTS) solutions for defence and aerospace.

Astute Systems is a global leader in rugged AI computing and software for autonomous military systems. Our GVA toolchain provides complete compliance with UK and Australian defence standards, delivering real-time battlespace management across land, sea, air and cyber domains.

AUDIO CODECS

- MELPe 2400 bps (STANAG 4591)
- MELPe 1200 bps (narrowband tactical)
- MELPe 600 bps (ultra-low bandwidth)
- G.729 (8 kbps compressed)
- G.711 A-law (64 kbps PCM)
- G.711 μ-law (64 kbps PCM)
- Opus (variable 6–510 kbps)

ENCRYPTION & SECURITY

- SRTP AES-256-CM media encryption
- HMAC-SHA1-80 authentication
- TLS 1.3 SIP signalling
- Certificate-based mutual auth
- Per-session encryption keys
- No unencrypted fallback

SIP PROTOCOL

- RFC 3261 SIP Registrar
- RFC 3265 SUBSCRIBE/NOTIFY
- RFC 3428 SIP MESSAGE (GeoChat)
- UDP & TCP transport
- Digest authentication
- Multi-realm registration
- Configurable expiry timers

VOICE FEATURES

- Full-duplex voice calls
- Half-duplex PTT mode
- Conference bridges (8 groups)
- Auto-answer for priority calls
- Call hold, transfer, forward
- DTMF tone generation
- RTP jitter buffer
- Silence detection (VAD)
- Comfort noise generation

AI VOICE AGENT

- Ollama LLM (offline inference)
- Piper TTS (neural text-to-speech)
- Vosk STT (speech recognition)
- Battlespace query by voice
- Status reporting & alerts
- Fully offline — no cloud
- Configurable AI personality
- Plugin response handlers

GATEWAY PLUGINS

- Twilio PSTN gateway
- Analogue radio bridge
- Custom plugin API (C++)
- Multi-gateway routing
- Codec transcoding bridge

GVA INTEGRATION

- Display Extension Spec v1.1
- COM screen (Function Key F7)
- Contact list management
- Call controls overlay
- Status line indicators
- DDS LDM v10 pub/sub

PLATFORM REQUIREMENTS

- Linux (Desktop / Embedded)
- x86_64 and aarch64
- Qt6 (Core, Widgets, Network)
- C++20 compiler, CMake 3.16+
- GVA LDM v10 (DDS pub/sub)
- PortAudio (audio I/O)
- Optional: ALSA / PulseAudio
- Systemd service integration

PUSH-TO-TALK

- USB HID device support
- Linux evdev input events
- Configurable key mapping
- LED status feedback
- Multi-device support

DEPLOYMENT

- Debian .deb packages
- Systemd unit files
- JSON configuration
- Log rotation & audit trail
- Zero-configuration discovery

Specifications subject to change without notice.
GVA compliance requires land platform integration.

CONTACT YOUR LOCAL REPRESENTATIVE

FOR MORE INFORMATION ON HOW WE CAN ADAPT OUR SOLUTIONS TO MEET YOUR IO REQUIREMENTS

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