



STANAG/MIL WAVEFORMS COMMUNICATING ON SDR RADIOS

'HF, VHF, UHF STANAG and MIL WaveForm' is a suite of communications waveform software products delivered for all the SWave Radios in land, naval and air domains. The large-scale support of HF/VHF/UHF STANAG/MIL WaveForms in our Swave Software-Defined-Radios successfully coped with the commitment to deliver continued interoperability with fielded radios and C4I systems and is also paving the way for a large-scale replacement of the former radios in the marketplace.

HF STANAG/MIL WaveForms Suite delivers long distance tactical BLOS HF communications by supporting the manifold services of the HF band. VHF/UHF STANAG/MIL WaveForms Suite Product encompasses the more common communications WFs for Ground, Satellite and Ground-Air-Ground domains many of them also applicable in Maritime Domain, ship aboard or ashore.

Our SDR Waveform portfolio is commonly delivered as a Software Suite package composed by executable files, support kit software and user manuals.

The company also delivers off-the-shelf product solutions as all the waveforms are natively provided as 'mission-ready' on our SWAVE® native SDR Platforms family.

WAVEFORMS PRODUCT

- HF/VHF/UHF LOS (STANAG 4203/ 4204/4205)
- Protocol-based MIL-STD 188-220, MIL-STD-188-184
- VHF G-A-G HAVEQUICK I/II STANAG 4246, SINGARS, SATURN STANAG 4372
- SATCOM Dedicated or DAMA
- HF House Suite
 - MIL-STD-188-110B
 - ALE 2G MIL-STD 188-141B
 - STANAG 4285
 - ALE 3G STANAG 4538
 - STANAG 5066
- Wideband HF MIL-STD 188-110 C
- Natively based on US JTNEC/ESSOR SCA Software Defined Radio Architecture.

HF VHF UHF WAVEFORMS

HF SUITE SDR WAVEFORM

Data Modem WF

Frequency Band	2-30 MHz
Modulation	PSK, QAM
Operative Scenario	BLOS (Ground & Sky wave)
Domain	National / Export / Joint Coalition
Provided Services	Data Modem [75 .. 9600 bps]
	App. C [3200 .. 12800 bps]
Standard	MIL 188-110 B

MIL-STD-188-110B waveform provides rapid, reliable, and accurate data transmissions up to 9600 bps by incorporating the Automatic Repeat Request and Forward Error Correction protocols to ensure error free data communications.

ALE 2G WF

Frequency Band	2-30 MHz
Modulation	8FSK
Operative Scenario	BLOS (Ground & Sky wave)
Domain	National / Export / Joint Coalition
Provided Services	HF Link Management
Standard	MIL 188-141B

Automatic Link Establishment, 2G ALE is the current standardized method of establishing connections between radio operators ALE 2G WF employs adaptive techniques automatic selection of HF channels to accommodate user communication requirements.

HF Modem WF

Frequency Band	2-30 MHz with 25 KHz bandwidth
Modulation	PSKs
Operative Scenario	BLOS (Ground & Sky wave)
Domain	National / Export / Joint Coalition
Provided Services	Data Modem [70 .. 3600 bps]
Standard	STANAG 4285

HF MODEM WF provides various Bit/S Single Tone Modulators / Demodulators for HF Radio Links. BPSK, QPSK, and 8PSK are used with STANAG 4285 for specific speeds.

ALE 3G WF

Frequency Band	2-30 MHz
Modulation	FLSU/FTM (or RLSU), BW0, BW1, BW2, BW3, Single-tone, 8PSK
Operative Scenario	BLOS (Ground & Sky wave)
Domain	National / Export / Joint Coalition
Provided Services	HF Link Management
Standard	STANAG 4538

3G ALE has been the new generation of ALE that has evolved from ALE 2G WF for increased reliability and significantly enhanced channel-time efficiency. ALE 3G WF is an alternate set of data link services and ARQ to STANAG 5066, providing reliable point to point data services.

IP Over HF WF

Frequency Band	Relay on Suite HF Data Modes
	Data Link Layer
Operative Scenario	BLOS (Ground & Sky wave)
Domain	National / Export / Joint Coalition
Provided Services	IP Services over HF
Standard	STANAG 5066

STANAG 5066 provides peer protocols that operate above an HF modem and below the application level. These protocols support Data Link Layer capability for TCP/IP applications enabling applications to directly connect the HF modem through a STANAG 5066 server over TCP/IP.

ALE 4G WB-HF WF

Frequency Band	2-30 MHz
Modulation	App. C compliant
Operative Scenarios	BLOS (Ground & Sky wave)
Domain	National / Export / Joint Coalition
Provided Services	WB Data Modem
Standard	MIL-STD 188-110C

A new family of wideband HF data waveforms supporting bandwidths from 3 kHz to 24 kHz in increments of 3 kHz has been recently defined. Wideband HF WF increases the data-rate throughput allowing the support of new IP-based services in wider band channels under the prevailing HF channel characteristics.

VHF-UHF STANDARD SDR WAVEFORM

VULOS

Frequency Band	VHF 30-88 MHz with 25 KHz bandwidth; UHF 30-400 MHz
Modulation	AM, FM, ASK, FSK
Operative Scenario	Ground Communications; Ground-to-Air-to-Ground Interoperability
Domain	National / Export / Joint Coalition
Security	NATO/National Restricted
Provided Services	Voice and Data Communications
Standard	STANAG 4204 / 4205

VULOS is a VHF-UHF Line Of Sight WF capable to provide initial standard analogue voice and data communications to ensure interoperability of land, air and maritime single channel VHF radio equipment.

SINGGARS

Frequency Band	VHF 30-88 MHz with 25 KHz bandwidth
Modulation	FM, FSK
Operative Scenario	Ground Communications; Ground-to-Air-to-Ground Interoperability
Domain	National / Joint Coalition
Security	Up to NATO Secret TRANSEC, LPI/LPD
Provided Services	Voice and Data Communications
Standard	MIL-STD-188-242, MIL-STD-188-220, MIL-STD-188-241

The SINGGARS (Single Channel Ground and Airborne Radio System) is a VHF Combat Net Radio (CNR) WF providing secure voice and data communications. SINGGARS is currently used by U.S. and several allied military forces. Vehicle-mount, backpack, airborne, and handheld form factors are available.

HAVEQUICK I/II

Frequency Band	UHF 225-400 MHz with 25 KHz bandwidth
Modulation	AM
Operative Scenario	Ground-to-Air-to-Ground Interoperability
Domain	National / Export / Joint Coalition
Security	Up to NATO Secret; TRANSEC
Provided Services	Voice and Data Communications
Standard	STANAG 4246

HAVE QUICK (also HAVEQUICK, short HQ) is a ECM resistant / frequency-hopping system used to protect Ground-Air-Ground radio traffic. HQ WF is COMSEC VINSON interoperable.

SATURN

Frequency Band	UHF 225-400 MHz with 25 KHz bandwidth
Modulation	MSK
Operative Scenario	Ground-to-Air-to-Ground Interoperability
Domain	National / Joint Coalition
Security	Up to NATO Secret TRANSEC, LPI/LPD
Provided Services	Voice and Data Communications
Standard	STANAG 4372

Second generation Anti-jam UHF Radio for NATO (SATURN) is a UHF EPM WF providing plain and secure Voice and Data communications, as it further improves the jamming resistance of the Have Quick II, by means of Fast Frequency Hopping and Digital Modulation Techniques.

SATCOM DAMA

Frequency Band	VHF, 225-400 MHz with 5 o 25 KHz bandwidth
Modulation	TDMA DAMA PSK, CMP, FSK
Operative Scenario	Satellite Communication for BLOS link
Domain	National / Joint Coalition
Security	Up to NATO Secret
Provided Services	Voice and Data Communications
Standard	MIL-STD-188-181A MIL-STD-188-182A MIL-STD-188-183

SATCOM DAMA is a VHF/UHF WF providing Beyond Line of Sight (BLOS) satellite access for voice and data communications. DAMA mode can function in a bent-pipe environment, thus requiring no special security or coordination hardware on the satellite.




MIL-STD 188-220 WF

Frequency Band	VHF, UHF, with 25 KHz bandwidth or more
Operative Scenario	Ground-to-Air-to-Ground Interoperability
Domain	National / Export / Joint Coalition
Security	Up to NATO Secret
Provided Services	IP Data Link Layer establishment for IP services

MIL-STD 188-220C WF provides any PHY-based WF with IP data capability and increases radio transmission reliability.

HF VHF UHF WAVEFORMS

READY ON SWAVE® RADIO SET

WAVEFORM	 <p>SWAVE® VQ1</p> <p>SWAVE® Naval Radios</p>	 <p>SWAVE® MB1</p>	 <p>SWAVE® HH-E</p> <p>PRR Radio</p>
SelfNET SBW Soldier Broadband Waveform	✓	✓	✓
SelfNET NBAW NarrowBand Adaptive Waveform	✓	✓	✓
STANAG 4204/05 VHF-UHF Line of Sight Waveform	✓	✓	✓
SelfNET EASY II Anti-Jam System II Waveform	✓	✓	✓
SelfNET PRR WF Individual Soldier Waveform			✓
MIL 188-220 C VHF/UHF IP Data Link Layer Waveform	✓	✓	✓
HaveQuick I/I NATO ECCM G-A-G Waveform	✓	✓	
SINCGARS MIL-STD G-G/G-A-G Combat Net Radio WF	✓	✓	
SATCOM DAMA MIL-STD Narrowband UHF C41 SAT WF	✓	✓	
SATURN NATO 2 nd Generation Anti-Jam UHF Radio	✓		
MIL 188-110B Suite HF - Data Modem Waveform	✓		
MIL-STD-188-141-B Suite HF - Data Modem Waveform	✓		
STANAG 4285 Suite HF - HF Modem Waveform	✓		
STANAG 4538 Suite HF - ALE 3G Waveform	✓		
STANAG 5066 Suite HF - IP over HF Waveform	✓		
MIL 188-110 C Wideband HF - ALE 4G WB Waveform	✓		
ESSOR HDR Essor Coalition High Data Rate Waveform	✓		
S_HCDR WF High Capacity Data Rate	✓		