



## AM/FM V/UHF TRANSCEIVER

The RT-619/NV-IP is a new-generation, multi-band, multi-role, multi-function 30 W AM/100 W FM V/UHF Transceiver that provides reliable voice/data LOS and SATCOM radio communications over the 108 MHz to 400 MHz frequency range for shipboard and ground-based applications.

The RT-619/NV-IP is configured as a self-contained unit suitable for tabletop or 19" rack mounting. Keyboard, display and audio connectors are located on the front panel for local operation in a modular Control Panel unit that can also be remotely located respect to the radio equipment.

The human interface is supported by interactive menus which greatly simplify the operating procedures. The equipment allows connection to a single V/UHF antenna or two separate VHF and UHF antennas.

The RT-619/NV-IP is equipped with 2 x IEEE802.3 Ethernet interface, which provides the following capabilities:

- Automatic switchover in case of a failure over one Ethernet port
- VoIP operating mode according to EUROCAE ED137B Part 1

- Operating mode change can be directly managed from VCSS Operator's console
- Complete monitoring, settings and testing capability by a dedicated Network Management System in a concurrent mode respect to the VCS

The RT-619/NV-IP provides specific applications in the following areas:

- Ground-Air-Ground UHF (225 MHz - 400 MHz) LOS secure voice/data communications between Air Defense Sites and flying aircraft for mission control/monitoring
- Ship-to-ship/ship-to-shore/ship-to-air UHF (225 MHz - 400 MHz) LOS secure data communications supporting the Command and Control function (LINK-11, LINK-22), in association with external DTS equipment
- UHF SATCOM secure voice/data communication for exchange of tactical/non-tactical information over the satellite space segments.
- LOS voice communication with military/civil aircraft over the 108 MHz to 156 MHz band for Air Traffic Control (ATC)
- LOS voice communications over the 156 MHz to 174 MHz Maritime band with merchant ships and Port Authority stations

# RT-619/NV-IP

## MAIN FEATURES

- Digital Signal Processing (DSP) techniques used to implement IF/Audio filtering, modulation/demodulation, AGC functions; programmable to meet specific customer requirements
- Direct Digital Synthesis for channeling with increments of any size and frequency agility in the fast frequency hopping EPM mode
- Capability for extension of the upper band limit to 470 MHz
- 70 MHz interface for connection to external modems (UHF SATCOM, Spread Spectrum, etc.)
- Compatibility with NATO voice/data crypto equipment
- Bus architecture to simplify interconnections and to allow addition of new functions with minimum modification
- Compatibility with tunable high selectivity UHF filters for increased communication reliability
- Plain/secure voice and data communication (up to 16,000 bps) over V/UHF LOS and UHF SATCOM channels
- EPM frequency hopping facilities based on current NATO standards (HAVE QUICK, SATURN) or MSC proprietary fast frequency hopping schemes, either built-in or remoted for security (upon request).
- Remote control of the operating functions over an RS-422/RS485/RS-232 or by an optional Ethernet IP interface
- BITE system providing:
  - Indication of type and location of faulty module
  - continuous, automatic monitoring of Transceiver functions.
  - Interruptive, operator-activated tests
  - Transfer of BITE data for remote diagnostics

## TECHNICAL SPECIFICATION

GENERAL CHARACTERISTICS	
Frequency ranges	108MHz to 173.975MHz, 225MHz to 399.975MHz
Optional range extension	400MHz to 469.975MHz
Channel spacing	25kHz, 12.5kHz, 8.33kHz (VHF only), 5kHz
Preset channels	Up to 99 for LOS communication Up to 10 uplink/downlink for SATCOM
Link types	LOS (Line Of Sight), UHF SATCOM
Operation types	Fixed Frequency simplex/half duplex Frequency Hopping (optional): HAVEQUICK - SATURN - EASY IIN MSC proprietary EPM mode
Modulation types	AM - FM - CPFSK (Continuous Phase Frequency Shift Keying) - FSK

TYPES OF SERVICE	
Voice	Plain analogue Secure digital (VINSON compatible) by use of external crypto device
Data, by use of external DTS/modem LINK-11, LINK-22 (optional), LINK-Y	
Duty cycle	Continuous transmission
In/Out RF impedance	50 ohm unbalanced
Frequency stability	Long-term (1 yr): Better than 1 part in 10 <sup>-6</sup>
Short-term (20msec):	Better than 1 part in 10 <sup>-8</sup>
MTBF	greater than 10000 hr
MTTR	less than 30 minutes
Primary power	115/220VAC ±10%; 50/400Hz ±5%; 28VDC ±10%
Power consumption	100VA on Rx, 700VA on Tx, maximum

TEMPERATURE	
Operating	0°C or -20°C to 50°C
Storage	-40°C to 75°C
Relative humidity	Up to 95%
Dimensions (W x H x D)	420mm x 132mm x 544mm
Weight	27kg maximum

TRANSMITTER CHARACTERISTICS	
RF carrier output power	100W on FM, 30W on AM
Power levels	10dB range in 1dB steps
Harmonic attenuation	>80dBc
Spurious rejection	>80dBc at ±10MHz off tuned frequency
Broadband noise	>-160dBc/Hz ±10MHz off tuned frequency

MODULATION BANDWIDTH	
Narrowband	300Hz to 3500Hz
Wideband	20Hz to 10240Hz (baseband) 300Hz to 21300Hz (diphase)
Audio inputs	Microphone 100µV/150 ohm Line 0dBm/600 ohm balanced
VSWR protection	Underrated operation for VSWR up to 2:1, graceful degradation for VSWR > 2:1

RECEIVER CHARACTERISTICS		
Sensitivity	AM Narrowband 2.5µV/50 ohm for (S+N)/N = 10dB, m = 0.3 FM Narrowband 2.5µV/50 ohm for (S+N)/N = 16dB, frequency deviation 3kHz	
IF selectivity	Narrowband 22kHz min at -6dB, 50kHz max at -60dB Wideband 50kHz min at -6dB, 100kHz max at -60dB	
Spurious rejection	Better than 80 dB at 5% off the tuned frequency	
Image rejection	Better than 80dB	
Signal-to-Noise Squelch threshold	Adjustable in a 6 dB to 15 dB range of the (S+N)/N ratio	
Carrier level Squelch threshold	Adjustable in a 5 µV to 50 µV RF input level	
AGC response	AM	audio output variations of +/- 3dB max for RF input variations in the 5 µV to 500mV range
	FM	audio output variations of +/- 3dB max for RF input variations in the 5 µV to 500mV range
Audio distortion	AM	5% max.
	FM	5% max.
	RF	Input protection No permanent degradation for RF inputs up to 20V emf from a 50 ohm source