Software Defined V/UHF Networking Radio Family
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The increased command, control and communication requirements of the 21st century make it necessary to assure a network based seamless communication. To achieve this end, ASELSAN Software Defined Networking Radios (SDNR) have been developed to enable multi-band, multi-purpose utilization in both strategic and tactical fields.

Today, the 30-88 MHz CNR which is the backbone of the tactical communication in combat area is not sufficient to meet military requirements as a stand alone system. The importance of interoperability among various defense counterparts such as security forces, public safety units and seamless voice and data communication among the users of tactical/strategic system networks is gradually increasing. ASELSAN Software Defined Networking Radios are developed to be used for Ground, Naval and Airborne Platforms within 30-512 MHz for V/UHF frequency band.
FEATURES

Based on its software configurable architecture, SDNR ensure clear or encrypted voice and data communications in VHF and UHF frequency bands (30-512 MHz) as well as full automatic integration with tactical and strategic or PSTN networks to provide "cellular phone" services to tactical users. The radio transceiver features a 96x64 graphical LCD display and a 3x6 keypad for easy man machine interface. The menu structure and controls are very similar to cellular phones for ease of use and training.

SDNR ensure increased survivability against Electronic Warfare threats by providing alternative communication functions compared to conventional radios.

Various radio waveforms operating in different frequencies and modulations (FM, AM) can be utilized by means of the software running on the radio. With this software, SDNR's support short and medium range tactical radio communication (CNR), Narrow Band Packet Radio (NBPR), Wide Band Packet Radio (WBPR) and Mobile Telephone (SCRA) functionalities and advanced Electronic Counter Counter Measure (ECCM) techniques on the same platform. Software Defined Networking Radio architecture which supports many waveforms and can be software upgraded for new waveforms or features.

ASELSAN RC-9661LA Tactical Remote Control System (RCS) is designed to control 3 Manpack/Vehicular Software Defined Networking Radios (SDNR) and to make voice and data communication with these radios up to 3 km distance from the operator through two-wire cable connection in the tactical field.

ASELSAN RCS 9661 IP Remote Control System Works on IP Networks and enables to control and provide audio and data communication on all kinds of Software Defined Radios, independent of the distance inbetween.

SDNR networks can be integrated into all kinds of Tactical and Strategic communication networks to enable simultaneous voice/data and IP communication.

Available Services:
- CNR Type Voice Communication Between Radios
- Selective Voice Communication between Radio Users
- Selective Voice Communication between Radio Users in different Nets
- Radio to phone selective voice communication (in WBNR)
- Phone to radio selective voice communication (in WBNR)
- IP data between Radio Users
- IP data between Radio Users in different Nets
- IP data between Radio Users and Internet Users
- IP data between Radio Users and Tactical Users

SDNR have Ethernet interfaces for IP communication to provide end-to-end encrypted communication between SDNR users and Tactical Digital Terminal users.

Near-real time data transfer capability for sensor to weapon applications.
WAVEFORMS

Software configurable architecture provides flexibility to add new radio waveforms/features to fulfill emerging requirements. Properties of the currently available waveforms are as follows:

VHF/FM LOW BAND (30-108 MHz) MODE

Communication Services:
- Fixed Frequency Analog Voice
- Fixed Frequency Encrypted CVSD (16 kbps) Voice
- Fixed Frequency Clear Data
- Fixed Frequency Encrypted Data
- Frequency Hopping Encrypted CVSD (16 kbps) Voice
- Frequency Hopping Encrypted Data
- Asynchronous Data Rates: 1200, 2400, 4800 bps
- Synchronous Data Rates: 1200, 2400, 4800, 16000 bps

Supplementary Services:
- Active and Passive Late Entry
- Hailing
- Operational Code Transmission
- Short Message Transmission
- Receive only operation
- Channel/Net Scan (up to 3 FF or FH nets are scanned)

Technical Performance:
- Frequency Band: 30 – 108 MHz
- Channel Spacing: 25 kHz
- Up to 300 preset channels
- Squelch Types:
  - Noise Squelch
  - Tone Squelch
- FEC: Majority Voting for rates 4800 bps and below.

ACNR (30-512 MHz) MODE

Communication Services:
- Fixed Frequency Analog Voice
- Fixed Frequency Encrypted MELP (2.4 kbps) Voice
- Fixed Frequency Encrypted Data
- Frequency Hopping Encrypted MELP (2.4 kbps) Voice
- Frequency Hopping Encrypted Data
- Asynchronous Data Rates: 1200, 2400, 4800 bps
- Synchronous Data Rates: 1200, 2400, 4800, 16 000 bps
- IP Data (Ethernet) Rate: 19200 bps

Supplementary Services:
- Active and Passive Late Entry
- Up to 300 preset channels (FF or FH channel) with 365 COMSEC/TRANSEC time periods
- Hailing
- Short Message Transmission
- Receive only operation
- Channel/Net Scan (up to 3 FF or FH nets are scanned)

Technical Performance:
- Frequency Band: 30 – 512 MHz
- Channel Spacing: 25 kHz
- Squelch Types:
  - Noise Squelch
  - Tone Squelch
- Forward Error Correction (FEC): Turbo Coding

VHF(146-174 MHz) & UHF (406 - 470 MHz) FM MODE

Communication Services:
- Fixed Frequency Analog Voice
- Fixed Frequency Encrypted CELP (4.8 kbps) Voice
- Fixed Frequency Clear Data
- Fixed Frequency Encrypted Data
- Asynchronous Data Rates: 1200, 2400, 4800 bps

Supplementary Services:
- Tone-Coded Squelch (CTSS)
- Up to 300 preset channels
- Channel/Net Scan
- Over-the-air re-keying
- Over-the-air disabling
- Emergency call

Technical Performance:
- Frequency Band: 146 - 174 MHz & 406 - 470 MHz
- Channel Spacing: 25 kHz
- Forward Error Correction (FEC):
  - ½ Convolutional for voice and data
- Squelch Types:
  - Noise Squelch
  - Tone Squelch
SOFTWARE DEFINED V/UHF NETWORKING RADIO FAMILY

**WBNR (225-400 MHz) MODE**
Wide Band Networking Radio (WBNR) mode operates in a TDMA Network. TDMA Networking is configured around a Net Master (VRC-9661 Vehicular Software Defined Radio or VRC-5110 Mobile Subscriber Terminal) or a Gateway Radio (VRC-5112). These radios serve as the base stations for all the networking radios to affiliate.

**Communication Services:**
- ECCM (DSSS) Encrypted CELP (4.8 kbps) Voice
- ECCM (DSSS) Encrypted Data
- TDMA Channel Access
- A user data throughput capacity of up to 112 kbps is available
- User Asynchronous Data Rates: 2400, 4800, 9600, 19200, 38400 bps full duplex
- User Synchronous Data Rates: 2400, 4800, 9600, 19200, 38400, 64000 bps full duplex
- User IP Packet Data (up to 112000 bps throughput)
- User X.25 Packet Data: 9600 bps full duplex
- Over-the-air re-keying

**Technical Performance:**
- Frequency Band: 225 - 400 MHz
- DQPSK Modulation
- Forward Error Correction (FEC): Reed Solomon

**NBNR (30-512 MHz) MODE**
- Advanced TDMA architecture
- Virtual Circuit Based Communication
- Simultaneous Voice and Data Communication
- Advanced Frequency Hopping
- Encrypted Voice/Data
- Inter-radio-net routing

**Technical Performance:**
- 25 kHz instantaneous channel bandwidth
- 15-37 Kbps Data Rate

**V/UHF-AM (108-400 MHz) MODE:**
**Communication Services:**
- Fixed Frequency Analog Voice

**Supplementary Services:**
- Up to 100 preset channels
- Receive only operation

**Technical Performance:**
- Frequency Band: 108 – 400 MHz
- Channel Spacing: 25/8.33 KHz (AM), 25/12.5 KHz (FM)

**APCO 25 (146-174MHz, 380-400 MHZ ve 406-470 MHz) MODE**
- Fixed Frequency Clear and Encrypted Voice and Data
- Digital; Compatible with TIA/EIA 102
- Analog; Compatible with TIA/EIA 603-A

**Technical Performance:**
- 12.5 KHz Channel spacing

**HAVE QUICK II (225-400 MHz) MODE**
- STANAG-4246 Compatible
HANDBHELD
MULTIBAND MULTIMODE RADIO

- Multiband Multimode
- AM/FM/QPSK
- 5W Power Output
- Software Programmable Architecture
- Easy Man Machine Interface
- Built-in-Test (BITE)
- Remote Control Interface
- Emergency Erase
- Full duplex voice and data
- Simultaneous voice and data
- Advanced Electronic Protection Measure (EPM) Techniques:
  - Frequency Hopping (full band 30-512 MHz)
  - Direct Sequence Spread Spectrum (DSSS)
- High data rate up to 64 kbps
- IP packet data service (variable 64 kbps full-duplex)
- ITU-T V24/V28 and Ethernet interface
- 14.4V Li-ion (Rechargeable) Battery
- 1300 preset channels

Microtelephone
Earphone/Microphone Set
Wideband Antenna / Long Antenna
Solar Battery Charger
MANPACK
MULTIBAND MULTIMODE RADIO

- Multiband Radio: 30-512 MHz Transceiver (V/UHF)
- AM/FM/QPSK
- Software Programmable Architecture
- Remote Control Interface
- Emergency Erase
- Full duplex voice and data
- Simultaneous voice and data
- Advanced Electronic Protection Measure (EPM) Techniques:
  - Frequency Hopping (full band 30-512 MHz)
  - Direct Sequence Spread Spectrum (DSSS)
- High data rate up to 64 kbps
- Easy Man Machine Interface
- 10W Power Output
- Supports 25 kHz, 12.5 kHz and 8.33 kHz Channel Spacing
- Reliable Ad-Hoc Radio Networking
- Frequency hopping net scan (Up to 3 nets)
- Built-in-Test (BITE)
- Tactical Internet
- Li-Ion rechargeable Battery
- External GPS Connection
- 1300 preset channels
VEHICULAR / BASE STATION
MULTIBAND MULTIMODE RADIO

- Multiband Radio: 30-512 MHz Transceiver (V/UHF)
- AM/FM/QPSK
- Software Programmable Architecture
- Remote Control Interface
- Emergency Erase
- Full duplex voice and data
- Simultaneous voice and data
- Adjustable 50W Power Output
- Co-site Filtering
- Reliable Ad-Hoc Radio Networking
- Frequency hopping net scan (Up to 3 nets)

- Supports 25 kHz, 12.5 kHz and 8.33 kHz Channel Spacing
- Advanced EPM Techniques:
  - Frequency Hopping (full band 30-512 MHz)
  - Direct Sequence Spread Spectrum
- High data rate up to 64 kbps
- Easy Man Machine Interface
- 10.5 – 32 V DC power supply
- Built-in-Test (BITE)
- Tactical Internet
- External GPS Connection
- 1300 preset channels

Mounting Table  50 Watt Power Amplifier  AC/DC Power Supply  Vehicular Wide Band Antenna
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