

SNR-2031 TADIL-A / Link 11-Link 22  
HF ISB Transceiver System  
Product Information Sheet



- **T-9410 and R-9210 HF ISB Transceiver System**
- **Compliance with MIL-STD-188-203-1A Interoperability and Performance Standard for Tactical Digital Information Links and STANAG 5511 Tactical Data Exchange**
- **TADIL-A / Link 11-Link 22**
- **Interoperable with all Data Terminal Systems (DTS) meeting MIL and STANAG requirements for TADIL / NATO links**
- **Independent sideband (ISB) diversity (DIV) capability included as standard**
- **Sidetone monitoring included as standard**

The SNR-2031 ISB Diversity 125 Watt TADIL A/Link 11-Link 22 HF Transceiver system provides the high frequency radio component of a Tactical Digital Information Link A system. It consists of an R-9210 HF/ISB Receiver, T-9410 HF/ISB Transmitter, F-9800 Pre/Postselector and all necessary interconnect control and RF signal cables. An R-9210 HF/ISB Receiver Data Terminal Set (DTS) interface cable, without DTS connector, is also supplied.

The R-9210 HF/ISB Receiver and T-9410 HF/ISB Transmitter are customized versions of the R-9200 and T-9400. Each unit is equipped with special hardware components and software to meet the performance requirements for HF radio equipment in TADIL A systems as specified in MIL-STD-188-203-1A.

The R-9210 HF/ISB Receiver and T-9410 HF/ISB Transmitter are configured with LSB and USB high-speed data filters designed to meet the TADIL A bandwidth and group delay requirements. Each unit is also supplied with a High Stability Reference Oscillator to maintain the required frequency stability over the specified operating temperature range.

The simplex transmit/receive relay function is supplied by the R-9210 HF/ISB Receiver. Receiver TADIL A software allows the receiver to monitor the transmit ISB signal (sidetone), and control the transmitter, RF power amplifier and antenna coupler functions.

The SNR-2031 can be operated locally from the front panel of the R-9210 HF/ISB Receiver. It can be also be remote controlled over metallic-pairs or telephone lines using the optional R-9310R Remote Control Head and KY-9110() FSK remote control modems.

Transmitter RF output power may be increased from 125 Watts to 500 Watts or 1 kW with the LPA-9500 or LPA-9600 RF Linear Power Amplifiers. These amplifiers are designed to operate continuously into a broadband antenna system with a VSWR up to 2:1. Graceful degradation is employed for a VSWR above 2:1. In non-resonant systems such as a vertical monopole or end-feed wire, the CU-9125 or CU-9150 Automatic Antenna Coupler is required.

The SNR-2031 system does not provide the Tactical Data System (TDS) computer, encryption equipment or Data Terminal Set (DTS).



# SNR-2031 TADIL-A / Link 11-Link 22

## HF ISB Transceiver System Product Specifications

SNR-2031 TADIL-A (100W) System:

**Sunair P/N:** 8109506496

SNR-2031 with Remote Control TADIL-A (100W) System:

**Sunair P/N:** 8109506399

The specifications listed below are specific to MIL-STD-188-203-1A and apply to 125 W, 500 W, and 1 kW systems. Please refer to Sunair Engineering Report 8109080006 for additional detail on specification compliance.

General equipment performance specifications not directly related to the TADIL A specification may be found in the respective equipment Product Information Sheets.

- 5.3.1.1 Audio Output and Input Impedances:** 600 ohms balanced.
- 5.3.1.1.2 Audio Input Level:** 0 dBm (nominal).
- 5.3.1.1.3 Audio Output Level:** 0 dBm (nominal), adjustable +3 / -3 dBm.
- 5.3.1.2 Radio Keyline:**
  - Simplex Method:** 6 VDC transmit state/0 VDC receive state on the centertap of either DTS audio output.
  - Unbalanced to Ground Method:** 0 VDC (ground) transmit state on an unbalanced to ground keyline. Open Circuit receive state.
- 5.3.1.3 Switching Time:** 90% of rated output power within 7.0 milliseconds after application of the composite audio and radio set keyline.
- 5.3.1.4 RMS Phase Jitter (Stability):** Will not exceed 2.5 degrees.
- 5.3.1.5 Sidetone:** USB and/or LSB audio output.
- 5.3.1.6 Frequency Selection Time:** 10 milliseconds (external Antenna Coupler 30 milliseconds).
- 5.3.1.7 Duty Cycle:** 100% transmit duty cycle.
- 5.3.1.8.1 Maximum Time Delay:** Less than 3.5 milliseconds (range of 500 Hz to 3050 Hz).
- 5.3.1.9 RF Terminations:** 50 ohms, unbalanced to ground. Protected against failures induced by a VSWR greater than 4:1.
- 5.3.2 HF Radio Requirements:** TADIL A data transmission and/or reception: LSB only, USB only,
- 5.3.2.1 Frequency Coverage:** Capable of being tuned to any integral multiple of 100 Hz or 10 Hz in the frequency range of 2.0000 MHz through 29.9999 MHz. Note: Optional extended frequency coverage to 1.6 MHz is available.
  - 5.3.2.1.2 HF Accuracy and Stability:** Periodic calibration or alignment within 1 part in  $10^9$  of any designated frequency. Initial frequency stability 1 part in  $10^8$  per day, 5 parts in  $10^8$  during the first 30 days after calibration, no more than 4 parts in  $10^8$  per each 30-day period thereafter.
  - 5.3.2.2.1 HF Audio Outputs to the DTS:** Separate USB and LSB audio outputs.
  - 5.3.2.2.2 Audio Balance:** The difference between USB and LSB audio outputs does not exceed 0.5 dB in the ISB mode with equal USB and LSB input RF signals.
  - 5.3.2.2.3 HF Receiver Sensitivity:** -113 dBm for a minimum (S+N)/N ratio of 10 dB.
  - 5.3.2.2.4 HF Receiver Selectivity:**
    - USB:
      - < 2.0 dB down at fc +450 Hz to fc +3050 Hz
      - < 3.0 dB down at fc +300 Hz
      - > 60.0 dB down at fc -400 Hz and fc +4400Hz
    - LSB:
      - < 2.0 dB down at fc -450 Hz to fc -3050 Hz
      - < 3.0 dB down at fc -300 Hz
      - > 60.0 dB down at fc +400 and fc -4400 Hz
    - ISB: Same as USB and LSB.

The peak-to-valley ratio is < 2.0 dB from 450 Hz to 3050 Hz and the slope of the response between the 2.0 dB and 60.0 dB points is a monotonic transition (free from regeneration).
  - 5.3.2.2.5 HF Input Signal Protection:** No damage for signals up to +53 dBm (open circuit peak value).
  - 5.3.2.2.6 HF In-Band Intermodulation:** In band (450 Hz to 3,050 Hz) IMD products are at least 45 dB below the output level of either -53 dBm input audio tones.
  - 5.3.2.2.7 HF Receiver AGC:** Developed for each sideband. Sideband of greater magnitude controls the gain of the RF stages. In SSB mode the unused sideband is prevented from controlling the gain of the RF stages.
  - 5.3.2.2.7.1 Level Control:** Audio output level will not change more than 6 dB over an RF input range of -100 dBm to -6 dBm. The audio output is 0 dBm nominal.



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- 5.3.2.2.7.2 AGC Attack Time:** Less than 13 milliseconds for an RF signal level increase of 10 dB or more occurring within the range from -93 dBm to +7 dBm.
- 5.3.2.2.7.3 AGC Release Time:** Total release time does not exceed 23 milliseconds within the RF signal amplitude upper level of -87 dBm to +7 dBm, to a lower level of -107 dBm.
- 5.3.2.2.7.4 Recycle Period:** AGC system provides the specified attack and release characteristics during repetitive attack and release cycles of 100 milliseconds or greater with equal large and small signal intervals.
- 5.3.2.3 HF Transmitter Audio Inputs:** Separate USB and LSB 600 ohm balanced inputs.
- 5.3.2.3.2 HF Overall Frequency Response:** Maximum attenuation does not exceed 2 dB in respect to the peak response between 450 Hz and 3050 Hz.
- 5.3.2.3.3 HF Transmitter Peak Envelope Power-to-Average Power Ratio:** Designed to maximize the average power output.
- 5.3.2.3.4 HF Intermodulation:** Intermodulation distortion products produced by any two equal level audio tones of 440 Hz spacing within the bandpass will be a minimum of 30 dB below the output of either audio tone.
- 5.3.2.3.5 HF In-Band Noise:** Will not exceed 45 dB below PEP in the transmit state and 0.1 microvolt or less in a 6 kHz bandwidth in the receive state.

### Remote Control Rack

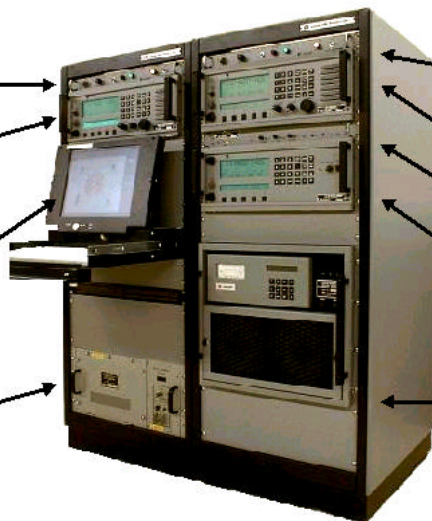
KY-9110C (not req'd if DTS is installed locally)

RCU-9310

Or

PATHFINDER II NT Workstation

DRS Communications Data Terminal Set with TADIL Modem



### Local Rack

KY-9110 R/T (not req'd if DTS is installed locally)

R-9210 Receiver

F-9800 Pre/Post Selector

T-9410 Transmitter

LPA-9600 1kW Power Amplifier

### SYSTEM OPTIONS

**500 W POWER AMPLIFIER:** LPA-9500

**1kW POWER AMPLIFIER:** LPA-9600

**ANTENNA COUPLERS:** 1KW/CU-9150 or 125W/CU-9125

**REMOTE CONTROL:** RCU-9310R Control Unit or PATHFINDER II Remote Terminal

**EQUIPMENT CABINET**



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