

RECEIVERS



SI-8614

SUBMINIATURE VHF/UHF Nanoceptor™ RECEIVER

The Nanoceptor™ is a high performance, subminiature general-purpose surveillance receiver which consists of a tuner that covers the 20 to 3000 MHz frequency range. Low noise synthesizers provide high dynamic range and fine tuning resolution of 100 Hz. The Nanoceptor™ features a combination of tracking preselectors and sub-octave filters designed to reject undesired out-of-band signals. Up to six IF bandwidths may be installed in the receiver, ranging from 10 kHz to 25 MHz.

The Nanoceptor™ utilizes the latest industry standard surface mount components. All control and RF interconnections are available on the front of the unit along the 3.0" x 1.1" face. RF signals are passed in and out of the unit via SMA-type connectors. All control and power supplies are available on a micro-miniature D-type connector.

The Nanoceptor™ supports the high-level interface and automatic scanning functions of its predecessor, the WJ-8654 Microceptor™. The extremely small size and low power consumption make the unit ideal for portable surveillance applications where weight and power consumption are crucial.

- Frequency coverage from 20 to 3000 MHz with 100 Hz resolution
- Six IF bandwidths from 10 kHz to 25 MHz
- 12 dB noise figure
- Extremely compact size: 3.0" x 5.0" x 1.1"
- Low power: less than 2.5 Watts
- AM and FM detection modes
- Windows™-based control software (WJ-RCS) compatible

VHF/UHF RECEIVER

The WJ-8633 is a general-purpose high-performance VXI VHF/UHF receiver covering a 20 to 2700 MHz frequency range. It utilizes a 160-MHz IF frequency to provide IF bandwidths of 250 kHz to 80 MHz. The unit is contained in a single-slot C-size VXI module. Combining receiver control directly onto a standard instrumentation and computing bus adds significant system capabilities while reducing the complexity of system integration.

The WJ-8633 receiver features low-phase noise frequency synthesizers, a sub-octave filter preselector, 100 Hz tuning resolution and high dynamic range. The WJ-8633 provides a 160 MHz IF output and selectable AM, FM, and LOG video outputs.

- Frequency coverage of 20 to 2700 MHz with 100 Hz resolution
- Up to 9 IF bandwidths from 250 kHz to 80 MHz
- +5 dBm 3rd-order input intercept point, typical
- 12 dB noise figure, typical
- Switchable RF preamplifier
- Configurable for multichannel phase-coherent operation
 - LO inputs/outputs
 - Two WJ-8633s can form a 2-channel coherent system
- VXI message based control
- Built-in reference oscillator
- Windows™-based control software (WJ-RCS) compatible

RECEIVERS



WJ-8633

RECEIVERS



WJ-8655A

MINIATURE VHF/UHF RECEIVER

The WJ-8655A is a high performance, subminiature, general-purpose surveillance receiver covering a 20 to 2700 MHz frequency range. The extremely small size and low power consumption make the unit ideal for portable, surveillance applications where weight and power reduction are crucial.

Low noise synthesizers provide high dynamic range and fine tuning resolution of 100 Hz. The receiver features a combination of tracking preselectors and sub-octave filters designed to reject undesired out-of-band signals. Up to six IF bandwidths may be installed in the receiver, ranging from 10 kHz to 25 MHz. The receiver demodulates AM and FM signals and may be used as a high performance tuner to drive an external digital processor.

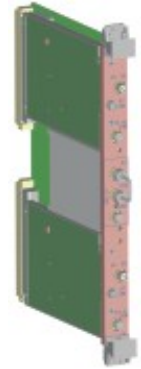
The WJ-8655A receiver supports the high-level interface and automatic scanning functions of its predecessor, the WJ-8654 Microceptor™.

- Frequency coverage from 20 to 3000 MHz
- Six IF bandwidths from 10 kHz to 25 MHz
- Low phase noise: -96 dBc/Hz at 20 kHz offset
- 12 dB noise figure
- Extremely compact size: 1.7" x 3.0" x 7.75"
- Low Power: Less than 3.0 Watts
- Sub-octave and tracking preselectors
- Windows™-based control software (WJ-RCS) compatible

DIRECT HF TUNER

The SI-9111 is a two-channel direct HF tuner with frequency coverage from 10 kHz to 31.5 MHz packaged in a single-slot 6U VME form factor. A direct HF approach utilizes wideband baseband circuitry to process the HF spectrum instead of the traditional frequency conversion approach. The RF input is first routed to a five-band preselector that divides the HF spectrum into five segments. These filters can be specified to include a selection of multi-octave and sub-octave filters. A low-pass anti-alias filter is included to reject spurious responses due to the sampling process. This filter is designed to provide a minimum of 100 dB of alias rejection for an external A/D sampling at 80 Msps. The tuner provides 45 dB of front-end gain control in one (1) dB steps. In addition, post-amplifier gain control is provided for A/D converter optimization. A dither circuit is included that can be turned on or off by software command.

- Frequency coverage from 10 kHz to 31.5 MHz
- 10 dB noise figure
- +90 dB output IP2
- +45 dB output IP3
- 64 dB RF gain control
- 2 channels in a single 6U VME slot
- Windows™-based control software (WJ-RCS) compatible

TUNERS**SI-9111**

TUNERS



SI-9137

DUAL VME TUNER

The SI-9137 is a dual-channel Wideband Tuner Converter packaged in a single-slot 6U VME (160 x 233 mm) form factor. Each tuner independently provides conversion of RF signals in the frequency range of 20 to 3000 MHz to two IF outputs centered at 16.25 MHz and 70 MHz, with an instantaneous bandwidth of 25 MHz. A high-stability, 10 MHz reference oscillator with front-mounted SMA outputs provides precise frequency control.

Each tuner is completely shielded and protected from the harsh EMI/RFI environment within the VME chassis. The onboard microprocessor provides the control interface between the VME backplane and the various digital signals required to tune, set the attenuation and monitor the status of the tuner module .



- Frequency coverage from 20 MHz to 3000 MHz
- 25 MHz IF bandwidth
- Each tuner provides two IF outputs centered at 16.25 MHz and 70 MHz
- VME bus register-based control
- Output passband group delay within ± 70 nanoseconds
- Output passband flatness within ± 1 dB
- Gain adjustable in 1 dB steps from 20 to 50 dB
- Two RF tuners on a single 6U VME card
- Windows™ -based control software (WJ-RCS) compatible

2 – 18 GHz SHF TUNER

The SI-9250 tuner extends the frequency coverage of any VHF/UHF-based receiving system. The single slot, 6U, VME SI-9250 accepts input signals from 0.5 to 18.0 GHz. Signals below 2 GHz are routed directly to the IF output. Signals above 2 GHz are filtered with suboctave preselection before being converted to an output IF centered at 1.6 GHz.

The converter's front-end utilizes five suboctave preselector filters spanning 2.0 to 3.2 GHz, 3.2 to 4.8 GHz, 4.8 to 8.0 GHz, 8.0 to 12.0 GHz and 12.0 to 18.0 GHz to limit the number of unwanted out-of-band signals. These bands are easily selected via register commands from the VME bus. The SI-9250 has a tuning range of 2.0 GHz to 18.0 GHz with a tuning resolution of 800 MHz. The IF output is centered at 1.6 GHz and has a 2 dB bandwidth of 880 MHz.

The 1st and 2nd LO's can be referenced to the internal 100 MHz crystal oscillator or referenced to an external 100 MHz oscillator to offer phase-coherent operation.

- Frequency coverage from .5 GHz to 18 GHz
- 880 MHz IF bandwidth
- Single-slot 6U VME form factor
- Compatible with most V/UHF receivers
- Configurable for multichannel phase-coherent operation
- Windows™-based control software (WJ-RCS) compatible

TUNERS



SI-9250

SIGNAL PROCESSING



SI-9460

PROGRAMMABLE DIGITAL SIGNAL PROCESSOR

The SI-9460 is a complete, self-contained programmable digital signal processor module. It consists of an 8 Msps digitizer, programmable digital down converter and 32-bits floating point TI TMS320C6701 processor. It provides both audio/video reconstruction outputs and digital data outputs. The SI-9460 can be tightly coupled to the BAE SYSTEMS Minicaptor™ family of receivers or used with other receivers .

WHAT IS SUNRISE?
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- Programmable DSP platform for user's custom algorithms such as:
 - Spectral analysis
 - Private voice systems
 - Digital modulations
 - Modulation recognition
 - Double demodulation
- Standard surveillance receiver functionality is built-in:
 - 22 bandwidths 200 Hz to 1.23 MHz
 - demodulators AM, FM, FSK, CW, SSB, ISB
- Digital data outputs (audio, video, I/Q, Magnitude/Phase or custom-algorithm data)
- Supports 21.4 MHz IF input
- Operates seamlessly with BAE SYSTEMS Minicaptor™ family surveillance receivers such as the WJ-8607A:
 - Demodulator control is automatic when handled through the host receiver
 - Minicaptor™ family scan functions are fully integrated with the host receiver
 - Binary command set for efficient, high-speed communication at 230.4 kBAUD
- Sunrise™ DSP Software Developer's Kit compatible and code compatible with other BAE SYSTEMS Sunrise receivers (WJ-8629A)

SUNRISE DSP SOFTWARE DEVELOPER'S KIT

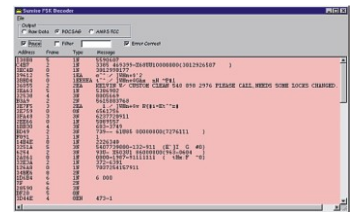
The WJ-SDK is a Sunrise Digital Signal Processor (DSP) Software Developer's Kit for the WJ-8629A Software-Definable VXI VHF/UHF Receiver and the SI-9460 Programmable Digital Signal Processor. The WJ-SDK consists of Microsoft Windows™-based application software, documents to help with the new DSP algorithm code developments and downloading into the WJ-8629A or SI-9460, and 100 hours of engineering phone support. The WJ-SDK also contains a Sunrise Programmer's Guide, Sunrise Programmer's Reference and Sunrise Utilities Setup disk(s).

- Sunrise Programmer's Guide
 - General Description (Overview, Developer's Kit Components, Document Organization and Contact Information)
 - Sunrise Architecture
 - Sunrise Utilities
 - Custom Filter Development
 - Custom Processing Module Development
 - Tutorials
- Sunrise Programmer's Reference
 - General Description
 - DSP Hardware Reference
 - DSP Operating System
 - Advanced Programming Techniques
- Sunrise Utilities Setup Disk(s)
 - Code Wizard
 - Control/Download Utility
 - Debugger
 - Filter Design
 - WMCS32 receiver control (same as WJ-RCS but with 32-bit VXI driver)

ACCESSORIES



Sample Video Application created with WJ-SDK



Sample Pager Application created with WJ-SDK

WHAT IS SUNRISE?

Sunrise is a receiver technology concept designed to enhance and help create a new generation of surveillance receivers. The Sunrise receiver architecture offers tight integration between receiver technologies and general-purpose, high-speed Digital Signal Processing (DSP) platforms. The results produce not only a completely autonomous, general-purpose surveillance receiver but also a digital receiver platform that allows many users to create and download their specific DSP algorithms to solve specific missions. The Sunrise receiver is capable of being dynamically reconfigured in the field to intercept, analyze, demodulate and/or decode various types of signals. This is accomplished by using DSP algorithms for BAE SYSTEMS surveillance receiver DSP libraries or from the user's own proprietary libraries.