Spectral Sieve for Puma™ LE (PU–4)

Airborne Platform with SS

UAS C2

UAS GCS

SS Work Station

Private LAN

PU–4 SS Kit

SS SEWSI GUI Display
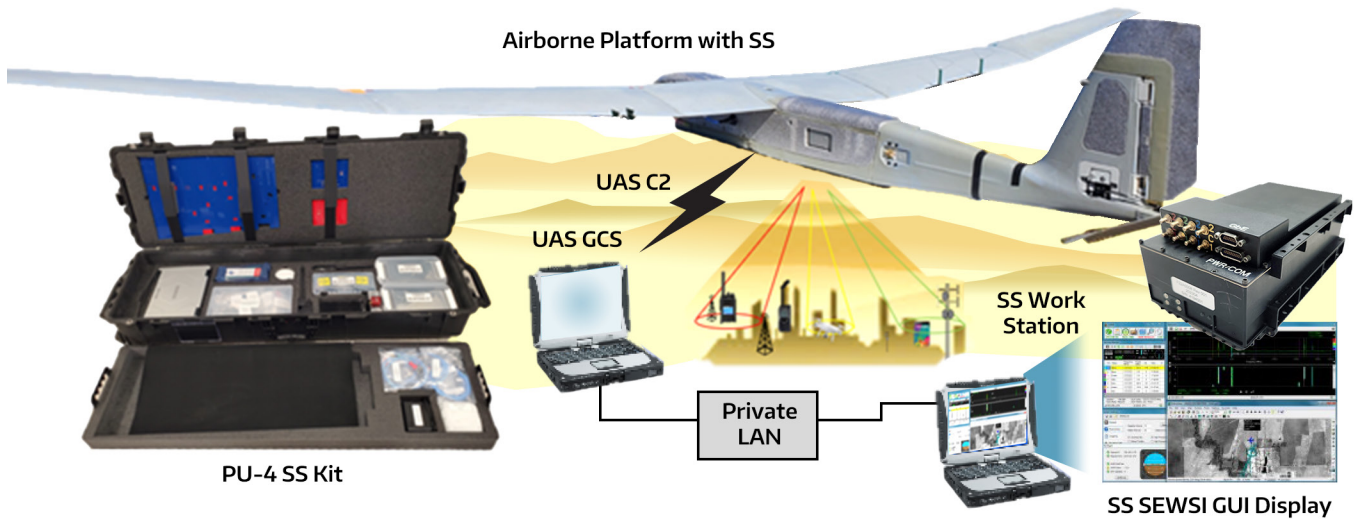
CACI's Spectral Sieve is the leading passive direction-finding/geolocation solution for tactical unmanned aircraft systems (UAS) and ground-based applications. Spectral Sieve for AeroVironment's Puma LE (Long Endurance) UAS platform provides a real-time, multi-function, multi-mission system that delivers precision intelligence, surveillance, and reconnaissance (ISR) capabilities, including situational awareness and targeting data. The PU-4 configuration of the Spectral Sieve system uses CACI's latest SS5.1 payload and is configured in field deployable kits for integration on AeroVironment's Puma LE.

With the PU-4 configuration, the Puma operations team can rapidly deploy Spectral Sieve to provide persistent identification of expanded signals of interest (SOIs) and radio frequency (RF) survey covering a broad frequency range. The PU-4 configuration fully integrates onto the Puma LE and uses the platform's organic peripherals via the Puma command and control (C2) link, to connect and operate the payload system using the simplified electronic warfare system interface (SEWSI) laptop.

Contained within the PU-4 system case is a payload/INS subsystem for the cargo bay and supporting antenna arrays to provide operations across a wide frequency spectrum that deliver real-time display of operationally relevant metadata for end users. CACI's SNARE functionality is also integrated with the payload system and performs advanced network characterization of the RF environment among higher frequencies (modern bands).

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For more on CACI's expertise and technology, visit:

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System Deployment Features

- Single deployed payload provides switchable inputs for two wing mounted arrays (QB and MB) for covering a broad RF environment.
- Payload C2 and data over the Puma GCS network.
- System packaged in one 1770 Pelican case with provided paring of antennas and coax cables.

Spectral Sieve Features

- Real-time SOI processing with metadata display.
- Spectral Sieve's SEWSI graphical user interface with integrated WinTAK/SIV mapping interface.
- Mission recording and playback.
- Compatible with ROVER and RaptorX software suites, and interfaces to Android team awareness kit and electronic warfare planning and management tool.
- Ruggedized field-ready receiver, storage, and signal analysis system.
- Flexible broadband RF data acquisition.
- Expanded tuning: 3 MHz to 6 GHz.
- 30 MHz instantaneous bandwidth (IBW).
- Integrated baseband software-defined radio.
- Four-channel coherent receiver for array processing. One single-channel receiver for survey.
- Pre-selector filters for higher dynamic range.
- Switchable inputs to allow two arrays with up to four elements each.
- Onboard data storage; signal and data processing.
- Waveform recording.
- US SOCOM modular payload compliant (2U size; custom packaging options available).

Notes: Puma™ is a registered trademark of AeroVironment, Inc.

*Additional development required for production release.

Spectral Sieve 5.1 Electronics

- Spectral Sieve 5.0 digital board
  - Increased operations processing for more efficient channelization, faster signal processing, and video co-processing.
- Spectral Sieve 4.0 radio board
  - Increased signal coverage and IBW by upgraded RFIC.
  - Architecture allows three arrayed inputs with two independent channels or four arrayed inputs with one independent channel.
- Extended band universal filter board
  - Factory configurable with customized fixed filters to address more challenging environments.

Spectral Sieve Applications

- Geolocation.
- Direction finding.
- Spectrum analyzer.
- Audio demodulation.
- Protocol processing.
- CACI SNARE survey.
- Tagging, tracking, locating mission support (special Waveform processing).
- Joint Interface Control Document 4.2 compatibility.
- National connectivity.
- Multi-channel processing.
- Decryption.
- Open Language Interface for Voice Exploitation compatibility (previously known as RATS)*.

General Specifications	
Standard Frequency Range	Key bands in UHF/VHF
Tuning Resolution Sensitivity	Varies with deployment
Application Specifications	
Operational Bands	Tactically relevant
Performance	Real-time, tactically relevant
Size, Weight, and Power Specifications (SWaP)	
Dimensions	7.0 x 4.3 x 3.0 in. (with heatsink)
Weight	SS Payload/INS Sub-system: ~2.64 lbs. Antennas, Mounts, Cables: ~0.74 lbs.
Power Consumption	18W
Environmental Specifications	
Operating Temperature Range	-32 to 49°C (-25 to 120°F)
Shock	21G half-sine shock pulse
Vibration	<5 kHz w/o isolation mounts 3.7 Grms random, 20 – 2000 Hz
Environmental Exposure	Dust and sand resistant, submersible in some configurations
Interface Specifications	
Payload Communication	10/100 ethernet
Payload Data Link	UAS data link/MANET radio networks
DC Voltage Input	11 – 32V (regulated)
Serial Interface	RS232
Puma LE Weight with SS System	~27.07 lbs

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