SPEDIS L C

C-band radar altimeter fixed-range echo simulator

SPEDIS L C creates the RF environment a C-band radar altimeter expects to see. It receives the altimeter's transmission at its input and returns a single echo at a fixed range at its output. Inputs and outputs connect directly through RF connectors (direct injection) or through receive and transmit antenna coupling units adapted to the platform's fuselage and altimeter antennas. The system consists of the echo simulator unit in a 1U 19-inch rack enclosure, the two antenna coupling units and the test and control software with a graphical interface and an API for automatic test equipment.



Figure 1. SPEDIS L C echo simulator unit with control software on a laptop

AT A GLANCE

OPERATING FREQUENCY
4.0 GHz – 4.5 GHz (C band)

TARGET MODEL
Fixed range, 1 echo

SIMULATED RANGE
5 m – 1500 m

RANGE RESOLUTION
≤ 1 m

INSTANTANEOUS BANDWIDTH
500 MHz

APPLICATIONS

- Functional testing of C-band radar altimeters on the aircraft or on the bench
- Radar altimeter checks in automatic test equipment

Key Features

- Fixed-range echo
- FMCW altimeter signals
- Direct injection or antenna coupling
- Graphical interface and test automation

Capabilities

Fixed-range echo

One echo at a fixed range from 5 m to 1500 m with a resolution of 1 m or better, across 4.0 to 4.5 GHz.

FMCW altimeter signals

Sawtooth up, sawtooth down, triangular up/down and triangular down/up FMCW waveforms, with sweeps up to 500 MHz and sweep times from 1 µs.

Direct injection or antenna coupling

SMA inputs and outputs for direct injection, or receive and transmit antenna coupling units sized to the platform's fuselage and altimeter antennas. Output attenuation is adjustable over 60 dB in 1 dB steps.

Graphical interface and test automation

Windows and Linux software for manual control shows test parameters in real time and handles scenario management, FMCW waveform selection and signal levels. C#, Python and C++ APIs and a documented messaging interface integrate the simulator into automatic test equipment.



Figure 2. SPEDIS L C front panel with RF status indicator, debug port and power switch

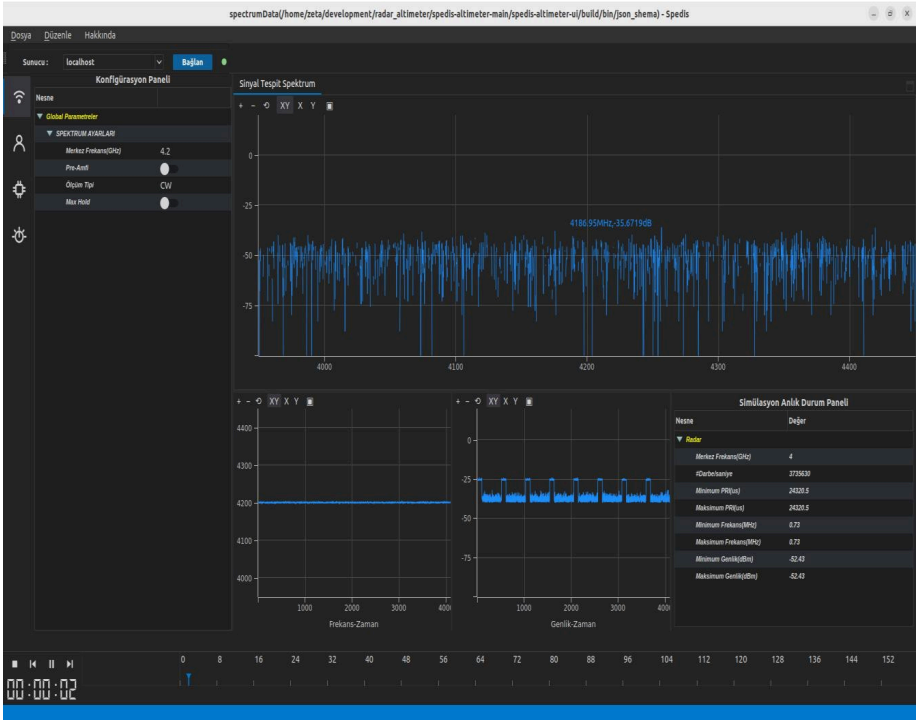


Figure 3. Control software: spectrum of the detected altimeter signal at 4.2 GHz with frequency–time and amplitude–time graphs and measured parameters

Specifications

General	
Operating frequency	4.0 GHz – 4.5 GHz (C band)
Target model	Fixed range, 1 echo
Simulated range	5 m – 1500 m
Range resolution	≤ 1 m
Instantaneous bandwidth	500 MHz

General	
FMCW waveforms	Sawtooth up, sawtooth down, triangular up/down, triangular down/up
FMCW sweep	Up to 500 MHz, sweep time ≥ 1 µs
Maximum operating input level	0 dBm
Maximum safe input level	+10 dBm
Maximum output power	−30 dBm
Output attenuation	60 dB in 1 dB steps
RF connectors	SMA, 50 Ω
Form factor	19-inch rack, 1U
Power supply	220 V AC, 50 Hz
Software	Windows/Linux GUI; C#, Python and C++ APIs

Warranty

All hardware and software procured from Zeta is under warranty against manufacturing or design failures for 2 years. Customer-specific warranty terms may be arranged.

Disclaimer

Due to ongoing research and development, Zeta reserves the right to change product specifications without notice.

About Zeta

Zeta Defence develops electronic intelligence (ELINT) and communication intelligence (COMINT) equipment and radar / electronic warfare simulators. Its capabilities include RF transceiver system design, digital design and large-scale software development.

Contact

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