TrueSignalDetect

BANC3

BANC3 has adapted our **TrueSignalDetect** software defined receiver (SDRX) for use in aerostat surveillance platforms to meet the demands of today's most challenging Electronic Intelligence (ELINT) missions. Our latest TSD-2000 system provides a lightweight front end optimized for integration into the size, weight, and power (SWaP) constrained environment of the aerostat. The RF signals are converted to digital in the payload with high-speed data transferred over 100G fiber optic interface to the processor at the ground station. Our SDRX processes the high-speed digital data using a Real Time Spectrum Analyzer (RTSA) and a Digital Instantaneous Frequency Measurement (DIFM) in parallel to create spectra and pulse descriptor word (PDW) data continuously in real-time.

The **TrueSignalDetect** real-time processing extracts, classifies, and locates signals of interest. Our unique processing leverages both spectrum and PDW data to create a detailed definition of critical signal parameters including frequency, bandwidth, pulse width, pulse repetition interval, modulation types, and scan patterns. User programmable alarms allow signals to be classified in real-time with audio/visual alerts issued upon threat signal recognition. Automated modulation recognition for AM, FM, and PM signals ensures today's complex waveforms can be correctly segregated. Detailed log files for signals and system diagnostic data are collected and stored continuously to support post mission analysis. The signal data from the TSD-2000 can be easily imported into a variety of user Command and Control (C2) systems. When multiple aerostat platforms are on station, the direction finding (DF) data from each can be merged to generate geolocation of the signals.

The **TrueSignalDetect** team at BANC3 works diligently to improve and expand our understanding of today's ELINT mission requirements and we are committed to working with defense agencies and platform integrators to provide high-quality and cost-effective solutions that exceed their expectations. Our modular architecture can be customized and configured to satisfy a wide variety of missions and scales to fit your budget. When high probability of intercept in complex RF environments is your mission, BANC3 has a system to meet your requirements.
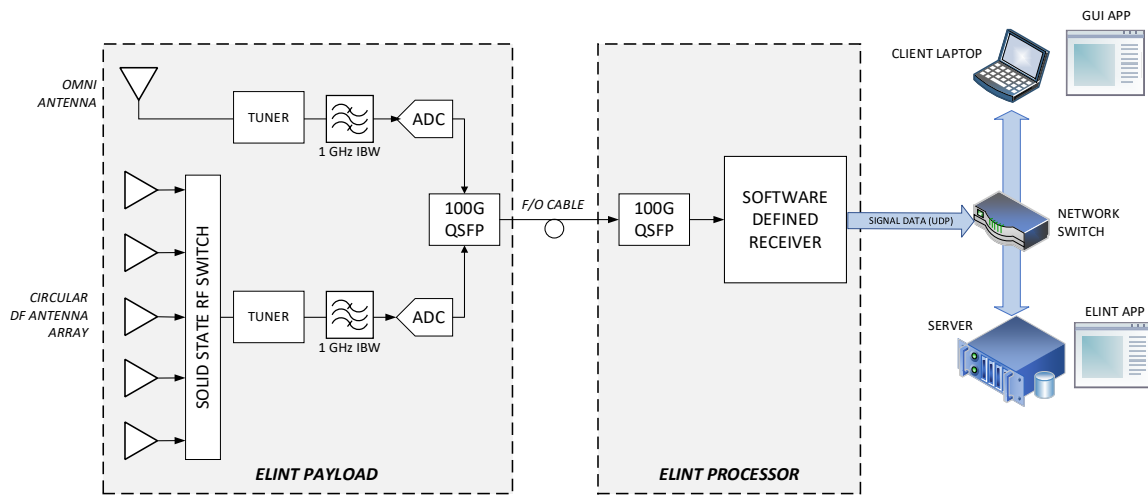
Specifications

Model No.	TSD-2000
Frequency Range	0.5-18 GHz
Sensitivity	-60 dBm
Dynamic Range	60 dB
Pulse Width Range	50 ns - CW
PRI Range	100 ns – 100 ms
Signal Modulation Flags	AMOP, FMOP, PMOP
Simultaneous Signal Flags	PoP, PoCW, SSD
RF Input	SMA(F), +20 dBm max
Ext 10 MHz Ref Input	SMA(F), +20 dBm max
Blanking (Own ship Radar)	SMA(F), 0-10VDC
Data Output	RJ45 Ethernet
ADC	14-bit, 3 GSPS
Receiver Types	RTSA/DIFM
Receiver Data	Max Spectrum
	Average Spectrum
	PDW Groups
Signal Analysis App	Signal Track List
	Spectrum Waterfall
	Spectrum Analyzer
	Spectrograph
	Programmable Alarms
	Diagnostics

TSD-2000 Optimized for Aerostat Payloads

TSD-2000 ELINT Analysis Software Application

TSD-2000 Aerostat ELINT System Block Diagram

ELINT Payload	
Omni Antenna	Persistent 360 coverage in azimuth to maximize probability of intercept
DF Antenna	Electrically commutated (10,000 RPM) uniform circular array using amplitude comparison DF
Tuner	Microwave downconverter covers 0.5-18 GHz providing IF with 1GHz bandwidth
ADC	High-speed analog-to-digital converter with 14-bit up to 3 GSPS
Fiber Optic Link	
Transceiver	100G fiber optic data link using QSFP28, OTU4/100GBASE-LR4
Fiber Type	Single Mode, 1310 nm, up to 10 km
ELINT Processor	
SDRX	Software defined receiver implemented in FPGA for real-time processing using RTSA/DIFM
RTSA	Real Time Spectrum Analyzer (RTSA) applies window function and FFT to ADC data with 50% buffer-to-buffer overlap to generate detected spectra
DIFM	Digital Instantaneous Frequency Measurement (DIFM) uses multiple digital delay line/phase correlator to measure frequency, amplitude, pulse width, time of arrival, modulation detection
Data Reduction	Intelligent data reduction is used to process and compress the spectra and PDW data over a fixed integration period into data products that can be transferred over 1G ethernet interface. This data includes max spectra, mean spectra, and PDW groups sorted and statistically analyzed.
Software	
ELINT App	Server (Linux) application receives signal data and system diagnostics over 1G ethernet from SDRX. Signal data analyzed to detect, classify, and track signals of interest. Diagnostic data analyzed to assess health of the system. All data continuously logged for post mission analysis.
GUI App	Client (Windows) web service application with multiple graphical display formats for detailed examination of signal parameters. All display formats adjustable by the user. System diagnostic data continuously presented to show system health. Multiple clients can be active during operations.
Geolocate	When multiple payloads are in operation, time-stamped signal data with DF solutions are exchanged over the network to triangulate and geolocate the signal of interest