The BAE Systems CW Doppler Radar is an advanced tracking radar that provides accurate TSPI data on a variety of non-cooperative targets. While primarily intended for tracking ballistic targets, it is also capable of providing highly accurate track data on other types of targets including rockets, missiles and aircraft at long ranges. With the addition of the Multi-Frequency Ranging option (MFR), the radar can make direct range measurements on moving targets, adding another dimension to the capabilities of Doppler radar.

The CW Doppler Radar provides a direct measurement of target radial velocity and precise time, space, position information (TSPI) in ‘real time’:

- Performs active tracking in real time of airborne targets, rockets, mortars, bombs, and conventional munitions.
- The 320-watt version tracks 155mm projectiles in excess of 40km in true operational conditions with a 10dB signal-to-noise.
- Available in various outputs ranging from 20W to more than 1200W.
- Provides automatic calibration.
- Detects, separates and measures both positive and negative Doppler frequencies to permit measurement of incoming and outgoing targets.

**KEY FEATURES**

- Manufactured in the USA
- No annual software subscription or dongle cost
- Ambient cooling with continuous operation up to 50 degrees Celsius
- Quick-Look data available immediately after mission
- Real-time tracking of single objects and data collection on multiple objects
- Optional direct range measurement using multi-frequency technique. Maximum ranging distance >100 km (unambiguous)
- 4 deg to 1 deg beam width
- All solid-state components
- Rugged, weatherproof enclosures
- The system is gun rugged
- Modular construction for easier repairs
- System withstands shock, dust, sand, humidity, rain, salty air
- Highly mobile configuration (1hr set up/break down)
- Highly stable operating frequency derived from Phase-Locked Dielectric Resonator Oscillator (DRO)
- Automatic correction for pedestal mislevel
- PC-based processing architecture eliminates obsolescence issues and simplifies addition of custom post-mission processing software
- Processing software for 3-D analysis on multiple objects
- Projectile spin analysis
- External ballistic analysis using MPM trajectory model
- Warranty with proven sustainment support

**ANTENNA (320 WATT)**

- Type: Microstrip Array
- Polarization: Linear
- Transmitter Power, Variable (Max): 55 dBm
- Antenna Gain (Max): 41 dBi
- Beamwidth: 4.4 x 4.4 to 1.1 x 1.1 deg.
- Transmit Type: Solid State
- Transmitter Source: Phase-looked DRO (PLDRO)
- Transmitter Frequency: 10.250 - 10.450 GHz
- Transmitter Frequency Stability: ±5 PPM (better stability optional)
- Receiver Configuration: Coherent (Q)
- Noise Figure: < 3 dB
- Receiver Bandwidth: 0.7 – 250 kHz (10 – 3000 m/s)
- Receiver Option: Multi-Frequency Target Ranging
- Dimension: Variable, depending on power and beamwidth
- Designed for continuous operation (100% duty) at elevated temperatures

**ANTENNA PEDESTAL**

- Motion: Angular Velocity 30 Deg/s
- Elevation Angular Velocity: 30 Deg/s
- Azimuth Angular Acceleration: 30 Deg/s
- Elevation Angular Acceleration: 30 Deg/s
- Azimuth Range: ± 240 Deg - Continuous Azimuth Movement Available
- Elevation Range: ± 90 Deg
- Azimuth Angular Accuracy: < 0.05 mrad 1 SIGMA
- Elevation Angular Accuracy: < 0.05 mrad 1 SIGMA
- Timing & Synchronization: IRIG-B/GPS

**OPTIONS**

- C-Band or X-Band Capability
- Mobile or Fixed Configuration
- IA Compliance

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**Doppler processor and data recording**

Processing hardware integrated with the radar antenna and pedestal

- 16-channel Analog/Digital Converter (ADC) with integral anti-aliasing filter: 8/16 channel pairs sampled simultaneously
- 92 dB dynamic range (16-bit digitizer)
- IRIG-B or GPS time synchronization
- Power PC-based Digital Signal Processor (DSP)
- Available memory for the signal: 1.5 GByte
- IRIG-B or GPS time synchronization
- Power PC architecture allows the addition of DSP hardware to increase FFT size and speed of the returned Doppler signal (Doppler frequency) and for the calculation of the Power Spectral Density (PSD)
- Open PC architecture allows the addition of DSP hardware to increase FFT size and speed of the returned Doppler signal (Doppler frequency) and for the calculation of the Power Spectral Density (PSD)

**Operator interface (GUI) for the Doppler processor**

- High-speed optical link
- Networked with the Doppler processor using a Pentium-based PC computer running Windows 7.

**Data processing and report generation**

Direct measurement in real time:
- Radial velocity as function of time
- Distance as function of time
- Azimuth angles and elevation of the target as function of time
- Range vs time

**Real time data output**

Measured parameters - computed data:
- Velocity, azimuth and elevation
- Radial acceleration as a function of time and distance
- Signal-to-noise ratio as a function of time and distance

**Analysis Models:**

- Real-time tracking: Modified Point Mass Model
- Ballistic coefficients analysis: MPM (4 DOF) ballistic model calibration using tracking data
- Trajectory prediction: MPM (4 DOF) ballistic model

**Real-time display**

- Primary data output
  - Velocity, azimuth and elevation
- Secondary output
  - Time scale: Relative and/or absolute time
  - Computed acceleration and position
  - Radial velocity (both negative and positive velocities)
  - Radial distance (integrated velocity, multi-frequency ranging)

**Software Features**

- Monopulse azimuth and elevation angles
- Target azimuth and elevation angles
- Signal-to-noise ratio (SNR)
- Doppler frequency (velocity) spectrum

**Post-mission products:**

- Advanced report generation using MS Excel (default or user defined templates)
- Integrated journal for logging all parameters and results for each round
- The system will supply the following data:
  - Post analysis results
  - Velocity measurements
  - Repetitive fire (burst mode) data
  - Trajectory analysis

**BAE Systems is the** Range Instrumentation Market Leader. **The CW Doppler** is the newest product added to our American Made product line.