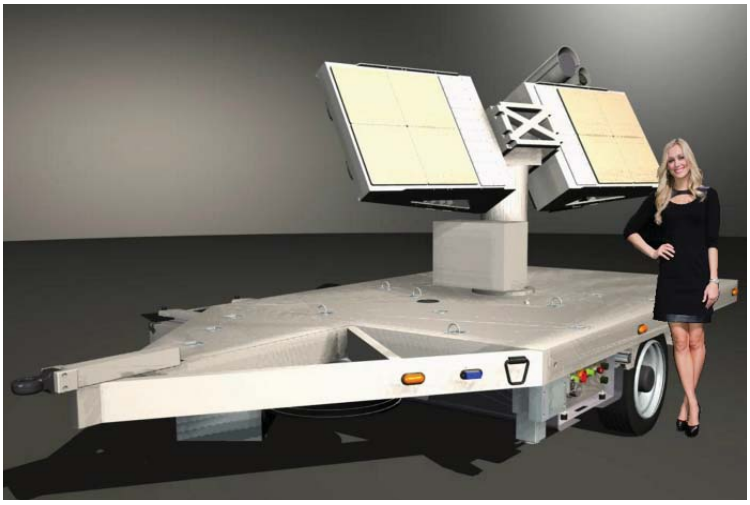
XSTAR
DSR Series Doppler Scoring Radar

STAR DYNAMICS CORPORATION

The XSTAR DSR is an advanced, medium-power, highly-mobile, continuous-wave (CW) Doppler Scoring Radar series from STAR Dynamics offering functions and capabilities designed for today's test-range requirements.

- 100% Duty-cycle operation at full power.
- Real-time time space position information (TSPI) on targets within selectable beam width.
- Remotely-controllable, MIL rugged computer.
- CW, FMCW, and MFR Doppler waverform modes.
- Highly-mobile, compact, lightweight, and rugged single-axle trailer.
- Real-time and quick-look post-mission data products.
- Ethernet or removable-disk data retrieval.
- Triple-screen, HD display and "live" camera video.



The XSTAR DSR Series advanced, CW-Doppler tracking radar offers Research, Development, Test, and Evaluation (RDT&E) users the ability to acquire and track multiple, energetic, in-flight objects and provides precision TSPI and Doppler data products during tests of a large variety of weapons. These tests include gun and projectile tests, missile/rocket firings, ejection-seat tests, gun-systems tests against air-to-ground weapons, air-to-air engagements, drone launches, bomb/small-missile flight-trajectory TSPI, and impact-scoring, UAV tests. CW Doppler TSPI radars are ideally-suited for these tests, and the XSTAR DSR is designed to offer maximum flexibility with the highest performance in these RDT&E scenarios. The DSR design provides up to 80 Watts per panel of continuous radiated RF power, yet it can be operated continuously in hot desert environments with ambient air cooling.

This high-power design provides a significant performance capability in a small, mobile configuration that is easily positioned to exploit any test scenario and provide high-quality TSPI and Doppler (I/Q) data for post-mission analysis and real-time TSPI for designating other sensor systems and/or for real-time data presentation to users, customers, and other observers at an operations center. The XSTAR DSR is available in a number of models and power levels to meet any operational requirement. With 40 to 80 Watts per transmit-antenna panel, the DSR illumination power is based on the number of panels activated and can be configured from 80 to 1280 Watts total radiated power. The transmitter output is phase-adjustable providing a variable control of transmitter beam width without loss of transmitter power from the minimum beam width shown in the table on the reverse side to a maximum of 10 degrees. The array panels can be configured from 2x1 to 4x4 as shown in the table. Reference performance values for RF loop gain and 12-dB SNR range on a 6-inch sphere are also provided.

XSTAR DSR SERIES

Model	Panels HxW	Antenna Gain (dBi)	TX Power (W)	Min. Beam Width (Deg Az and El)	Max Range (km) 6-in. Sphere at 12-dB SNR	RF Loop Gain (dBm) 1-second Integration
DSR-32080	2x1	32	80	4.4 and 2.2*	14	215
DSR-32160	2x1	32	160	4.4 and 2.2*	17	218
DSR-35160	2x2	35	160	2.2 and 2.2	24	224
DSR-35320	2x2	35	320	2.2 and 2.2	28	227
DSR-37240	3x2	36.8	240	2.2 and 1.5*	32	230
DSR-37480	3x2	36.8	480	2.2 and 1.5*	38	233
DSR-39360	3x3	38.5	360	1.5 and 1.5	43	235
DSR-39720	3x3	38.5	720	1.5 and 1.5	52	238
DSR-40480	4x3	39.8	480	1.5 and 1.1*	54	239
DSR-40960	4x3	39.8	960	1.5 and 1.1*	64	242
DSR-41640	4x4	41	640	1.1 and 1.1	67	242
DSR-411280	4x4	41	1,280	1.1 and 1.1	80	245

*Can be configured to provide wider beam in elevation if desired

DSR SERIES SYSTEM SPECIFICATIONS

Architecture

- Remotely-controllable Mobile CW Doppler Radar
- Doppler Modes: CW, FMCW, and MFR
- Selectable Beam Width, Transmit and Receive
- MIL Rugged Computer, Solid-state Drives, Linux OS with R/T Kernel
- Elevation Plunge (System Calibration)
- Significant Use of COTS Materials
- 100% Duty Cycle Operation at Full Power Over –20 to +50°C
- Multi-segment Flat-panel Patch Antenna Arrays (Transmit and Receive)
- Air-cooled, Solid-state RF Amplifier
- Continuous Azimuth Rotation
- Lightweight, Rugged, Single-axle Trailer
- No Specialized Towing Vehicle Required

Performance

- Operating Frequency Tuning: 10.1 to 10.55 GHz
- Instantaneous Bandwidth: 400 MHz
- Precision RAE Time Space Position Information (TSPI)
  - Angular Accuracy: < 1 mrad
  - Slant Range Accuracy: < 5 m
- High-performance Positioner
  - Zero Backlash
  - Elevation Travel: –8° to +188°
  - Slew Rates: 30° s^{-1} and 30° s^{-2} minimum
  - 17-bit Encoder

Operational Benefits

- Compact, Highly-mobile System
- Quick Set-up, < 1 hour (Single Operator)
- "Real-time" Remote Operation via Ethernet (Control, Status, Camera Video) < 100 Mbit/sec
- Rugged, Luggable, Triple-screen, HD Display Console and Multi-function Joystick
- Single Input 208-VAC/30-A 3PH Power Connection
- Data Retrieval via Ethernet or Removable Disk
- VIP Viewing "Live" H.264 Camera Video
- Real-time and Rapid Post Mission Data Products
- High Reliability and Availability Equals Low Cost of Ownership
- Built-in Diagnostic Tests

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