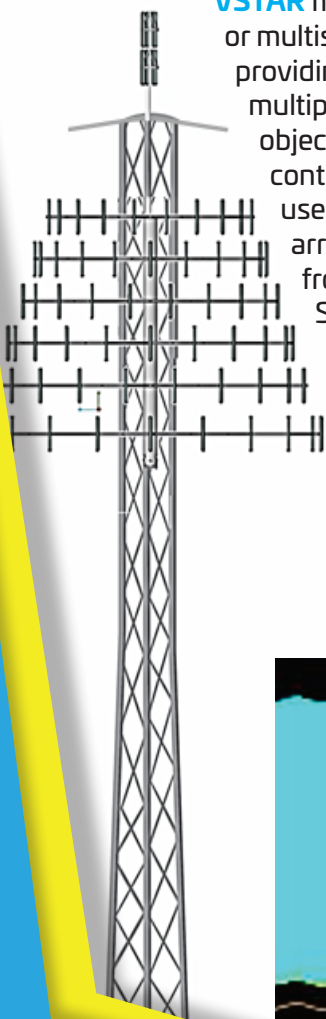


VHF Surveillance Tracking Array Radar

VSTAR is a fully-coherent, multi-frequency, VHF phased-array surveillance and tracking radar with **NO MOVING PARTS**

- Fixed site or mobile tower-based phased array transmit and receive apertures
- CW transmitter system incorporating solid state, high power amplifiers
- Provides multiple-object tracking slant ranges of several hundred kilometers with 1-second updates
- Unique track-to-track data association that enables track coasting
- Human-machine interface incorporating modern visualization graphics and displays
- Ruggedized, advanced, fully coherent, multi-element antenna array subsystems
- Digital signal generation of frequency modulated waveforms provides range disambiguation schemes
- Listen-only mode to identify jamming, interfering frequencies, and source directions
- Modern, object-oriented, distributed-computing environment with built-in system-status monitoring
- Expandable to multistatic network with central track association processing and command and control



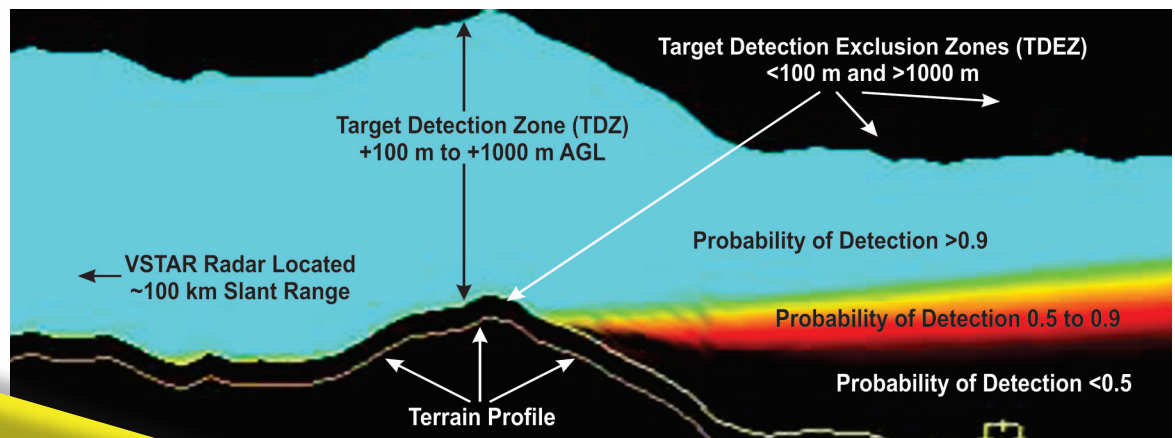
VSTAR may be deployed in monostatic or multistatic network configurations providing all-sky precision tracking of multiple airborne and surface-based objects simultaneously and continuously in real time. VSTAR uses interferometric covariance array signal processing derived from technology developed by STAR Dynamics for its X-band Space Time Adaptive Radar advanced-instrumentation radar system.

A track-while-scan radar, VSTAR continuously tracks targets at low or high altitude moving at slow

speeds for surface and low altitude targets, and at high velocity for rockets, missiles, and high performance aircraft.

A particularly-unique feature for VHF surveillance radars, VSTAR discriminates between very low altitude, slow moving airborne targets and surface targets using interferometric array processing for accurate target position referenced to an embedded terrain elevation database.

VSTAR provides a comprehensive, multiple-target tracking capability without complex mechanical or active digital control. The radar system uses relatively low gain array elements to create broad coverage areas that are then scanned during signal processing to establish detections, target locations and target dynamics.



VSTAR System Specifications

Range coverage (km)	500 km (270 nm)	Probability of detection	0.9
Elevation coverage	-10° to 70°	False alarm probability	10 ⁻⁶
Maximum height	300 km (1,000 kft)	Search load / track load	1,500 / 1,000
Minimum velocity	1 m/s (2 knots)	False track	<5 per hour
Maximum velocity	10 km/s (~19,500 knots)	Meantime b/t failures	>5,000 hours
Range accuracy	40 m	Transportability	Fixed site or mobile
Azimuth accuracy	0.2°	Local radar control	Yes
Elevation accuracy	0.3°	Remote radar control	Yes
Velocity accuracy	±0.5 m/s (±1 knots)	Plot update rate	1-10 Hz
Detection sensitivity	0 dBsm to >200 km	Track update rate	0.3-10 Hz

Key Functional Characteristics

- System sensitivity tracking ranges of 100s km and a center frequency of approximately 200 MHz
- Detects and tracks targets from each monostatic node of the overall system
- Accounts for clutter scatterers, including natural ground and sea scatterers, moving ground vehicles, weather, electromagnetic interference, lightning, and other standard environmental conditions
- Provides target location and velocity, and uncertainties in these quantities in a coordinate system specified by the current surveillance system
- Internal command and control handled by standard wireless-link communication protocols between sites
- Detects and tracks targets with Doppler velocities in ranges of 10-6,000 knots, approaching or receding
- Detects and processes hundreds of targets in all-sky search volume and Doppler range-of-interest while maintaining tracks on >500 objects
- Maintains track on maneuvering targets within:
 - 180° turns at 15°/s in any direction
 - 180° turns at 60 m/s² (6g) in any direction
 - Changing altitude at 100 m/s (20 kft/min) over an altitude change of 40 kft
 - Linear acceleration up to 20 m/s² (2g)
- Operates effectively in the presence of interference from broadcast RFI or narrow-band, fixed-frequency jammers
- Expandable to a network of radars with expanded coverage improving overall regional awareness

