



# Innovative Multiple-Object Tracking Radar (iMOTR)

Adaptable and scalable radar system for rapidly changing operational environments

BAE Systems, a worldwide leader in test range solutions for more than 40 years, has advanced the multiple-object tracking radar concept with an innovative application to meet today's tactical and strategic radar needs.

Innovative Multiple - Object Tracking Radar (iMOTR) is a modular, scalable compact multi-static radar that provides enhanced tracking accuracy, improved clutter rejection and lower cost radar performance.

iMOTR delivers highly accurate real-time tracking of multiple unmanned aerial systems (UAS) with improved surface clutter rejection for low flying objects, sea skimming weapons, and surface craft.

The iMOTR features enhanced clutter suppression, improved accuracy, and lower cost capabilities to deliver clearer, more accurate assessments of launch trajectory flight path data on airborne objects, including small commercial grade UAS and orbital debris. This tracking information can then be handed-off to other radars or data collection sensors in real-time.

The system is also better equipped to provide precision time, space, and position information (TSPI) data of multiple objects in flight over a wider field of regard (FOR) than radars currently in service.

## Key Features

- Scalable multi-static radar
- Electronically scanned array with +/- 30 degree FOR
- Accurate TSPI data on multiple targets
- Real-time tracking and detection of UAS and space objects
- Skin and transponder tracking
- Improved clutter rejection
- C-, X- or Ku-Band operation
- Designed for reliability and sustainability using COTS components



### Cost-Effective

Designed to be a more cost-effective alternative to other systems, the iMOTR solution is inexpensive compared to the legacy multiple-object tracking radar systems currently in use. iMOTR delivers the enhanced radar performance capabilities necessary to meet today's requirements against small targets and reduces operation and sustainment costs.

### Interoperable

For greater compatibility and ready integration with existing infrastructure, the iMOTR is designed to operate in C-Band (NATO G-Band), X-Band (NATO I-Band), or Ku Band (NATO J-Band). This continues a long line of precision products from BAE Systems and allows operation with RCC-262-14 transponders together with the performance advantages of C-Band.

### Modular Design

The iMOTR is modular and scalable and is designed with sustainment and reliability in mind. Taking advantage of recent trends in RF component availability, the iMOTR features an all-COTS high performance array. It includes coherent processing to derive velocity based measurement as well as multiple-object tracking algorithms to provide real-time TSPI on all tracked objects.

### Steering

The iMOTR array is electronically steered with a nominal field of regard of +/- 30 degrees off boresight in azimuth and elevation.

### Mobility

The iMOTR is mounted on a commercial trailer with hydraulic jacks to lay it down for stowed transport or lift it for deployment for enhanced mobility. It is also designed to be weather-proof and to resist shock, dust, sand, humidity, and rain for improved performance, reliability, and sustainability.

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## iMOTR Key Performance Parameters:

- >100 km tracking range
- >20 targets in real time
- +/- 30 degree field of regard
- $1\sigma$  tracking accuracy (-17.4 dBsm target) of 300 rad
- $1\sigma$  range accuracy of 1 m
- Acquisition within 0.5 seconds of detection for a nonfluctuating radar cross section of -15 dBsm
- 99% probability of track initiation
- $10e^{-5}$  probability of false track initiation
- Compatible with RCC 262-14 transponders