ECHODYNE

MESA® Radar Solutions for Government

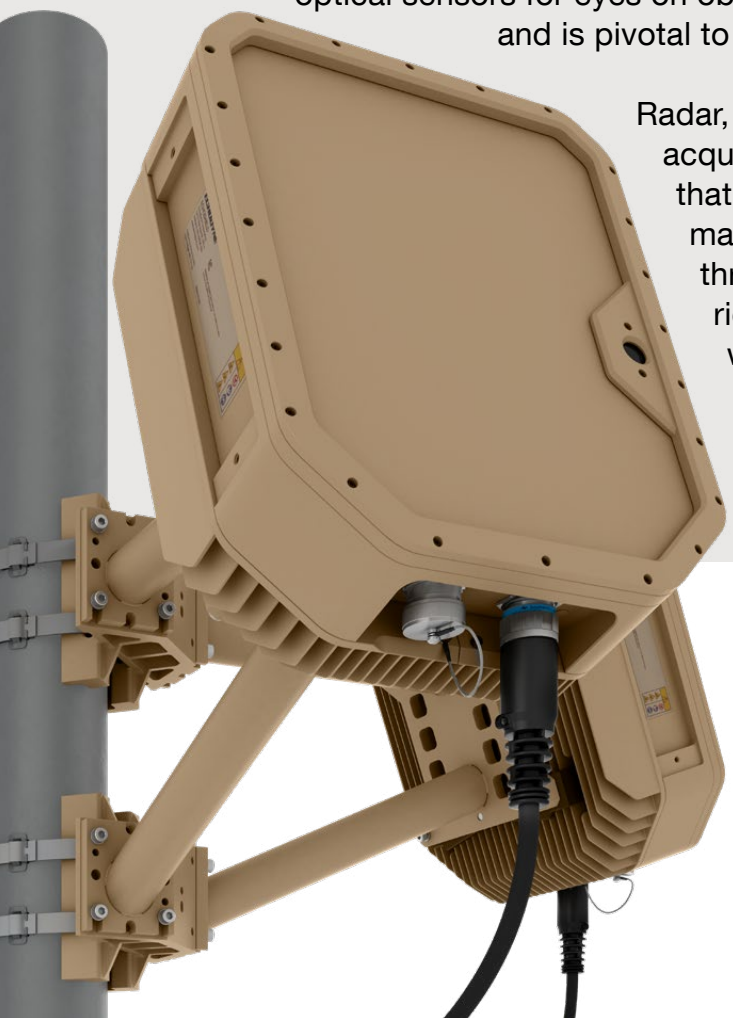
INFORMATION LEADS TO ADVANTAGE. THE BETTER THE INFORMATION, THE GREATER THE ADVANTAGE.

COUNTER-DRONE + ADVANCED BORDER SECURITY + PUBLIC SAFETY + VIP PROTECTION + ASSET SECURITY + SENSITIVE SITES

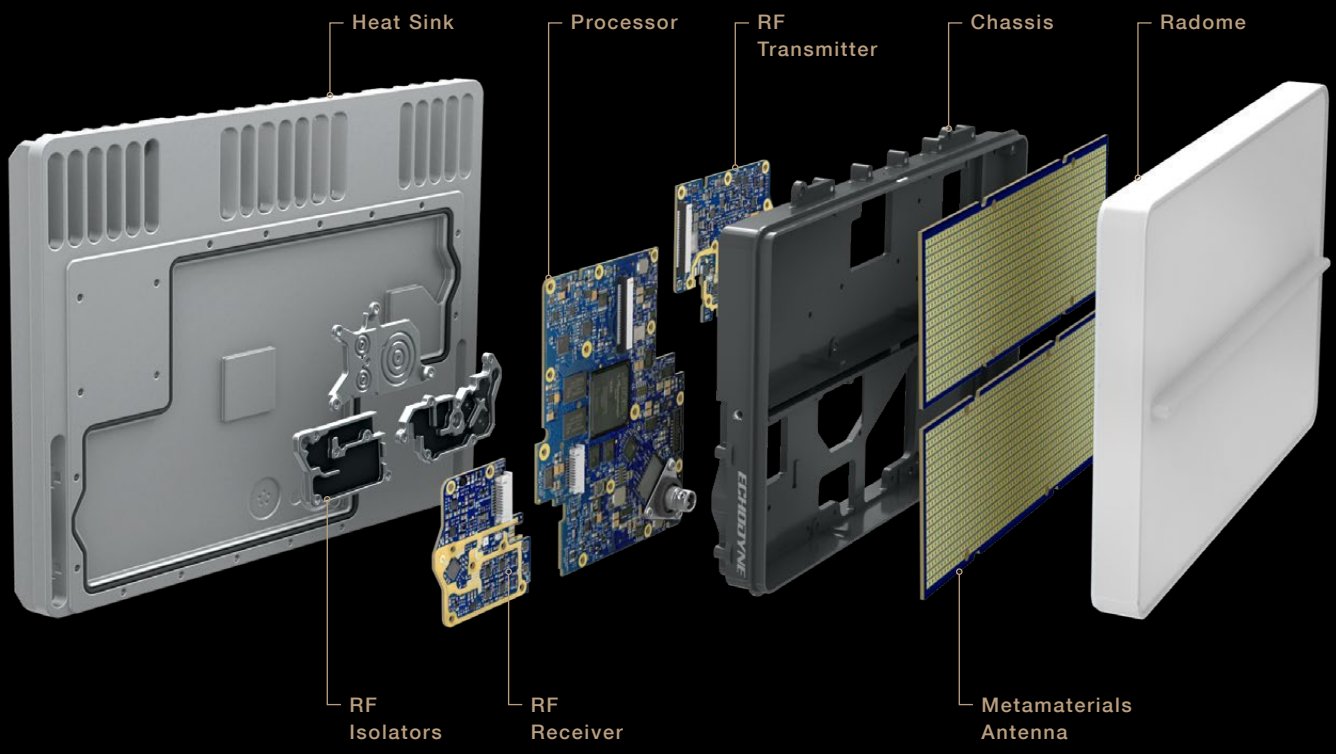
Accuracy is the New Range. Data Fidelity Matters Most to National Security.

What we see on the battlefields today can be sourced in the Homeland tomorrow. Drones level the field for bad actors intent on chaos and harm. Border transgressions are enabled by drones maintaining watch on facilities and agents. VIPs, important assets and facilities, critical infrastructure, and communities at large all face new threats from the air.

Radar is the only sensor that detects and tracks all movement in the ground and air domains, regardless of lighting or weather conditions. Radar is also required if “dark” drones, ones that emit no detectable RF signature, are part of the risk assessment. As the foundational sensor, radar detects and tracks objects of interest, directs optical sensors for eyes on object and identification of the intruding aircraft, and is pivotal to directing mitigation options.



Radar, like every sensor in the array, is a means of data acquisition. Today’s threats require data precision that improves sensors, effectors, and solutions and maintains cost symmetry with inexpensive drone threats. The object metadata from MESA radar is richer, faster, more accurate, and more reliable, with the precision and data rates for robust comprehensive situational awareness. Data fidelity distinguishes great sensors and systems.



MESA is a Rare Breakthrough in ESA Radar.

Active ESA radars have long been the gold standard for range and performance, with today's fielded ESA radars offering extraordinary performance but at an equally extraordinary acquisition and operational capital cost. The primary obstacle to broader use of ESA is directly related to the system architecture, which is built using complex Tx/Rx modules with high lifecycle costs. Simply, traditional ESA requires significant upfront investment in equipment, maintenance, and staffing.

Echodyne has taken a different approach, employing the physics design concept called metamaterials to create a breakthrough in ESA radar. Using standard materials and processes, a metamaterials design creates counter-intuitive results when assembled in a very specific way. In the case of Echodyne radar, the MESA design allows electromagnetic energy to be shaped and steered without moving parts – a true "phased array" radar with no phase shifters. This approach unlocks other elements in radar design that produce a compact, solid-state radar with the range and, importantly, the accuracy to detect and track objects of interest across a large field of view.

Combined with powerful on-radar and off-radar software, Echodyne's patented MESA design creates a commercially priced radar with ultra-low SWaP and unrivaled performance.

Radar reinvented.

Why are Echodyne Radars the Choice for More Missions?

Data Fidelity. Radar is a means to acquire data, gain information, and achieve superior situational awareness. Echodyne radars generate the most accurate data in their class. More accurate data, better fusion, smarter systems.

Systems Integration. Built for data fusion and systems integration, Echodyne radars utilize TCP/IP over Gigabit Ethernet and offer multiple rich-data options that can be individually or simultaneously ingested.

Networking. Designed for deployment in cooperative networks, Echodyne can mix radar products to provide a single integration point for all radar data.

SWaP. MESA design creates true commercial ESA radar with no moving parts and results in an unbeatable size, weight, and power format.

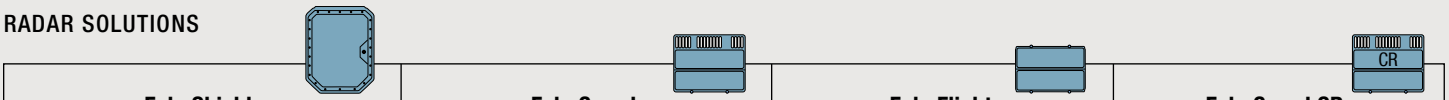
Engineering Breakthrough. Advanced ESA beamforming performance at commercial radar prices. Designed and built in the USA.

Key Applications

COUNTER-DRONE

Drones challenge existing security deployments and compliance regimes. All national security risk assessments now include drones as threats to critical infrastructure and community continuity. High performance radar is your counter-drone advantage. Integrated with dozens of CUAS solutions and platforms, Echodyne radar delivers the best price-performance of any radar in its class.

RADAR SOLUTIONS

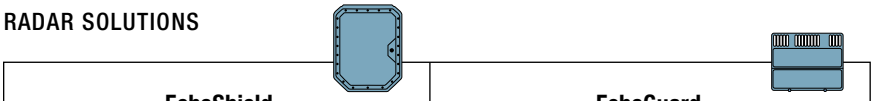


EchoShield	**EchoGuard**	**EchoFlight**	**EchoGuard CR**
Medium-range, best-in-class accuracy, and on-the-move capable.	Proven short-range counter-drone detection, tracking, and targeting.	For tethered drones and airborne interceptor requirements.	Reduced power levels for urban and dense CUAS environments.

BORDER SECURITY

The open spaces between authorized border crossings are too vast for human surveillance alone, requiring situational awareness technologies that provide early warning for agents and offices. With solutions for fixed, portable, and on-the-move requirements, Echodyne radars are a critical sensor in every border technology solution.

RADAR SOLUTIONS

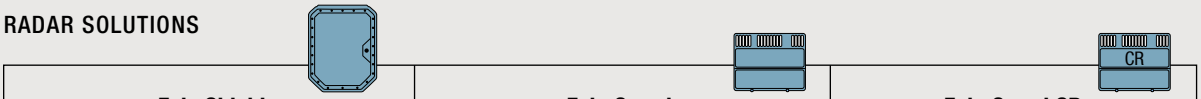


EchoShield	**EchoGuard**
Medium-range, best accuracy, ideal for Surveillance Towers or OTM.	Proven performance across domains and technology deployments.

PERIMETER SURVEILLANCE

Information is an advantage. Security processes are built on data that disambiguates scenes and informs actions and responses. Whether permanently installed or deployed in response to unexpected or temporary circumstances, radars are the backbone for informed 3D security operations. With native industry-standard data interfaces and data-rich options, Echodyne radars raise the bar for perimeter surveillance.

RADAR SOLUTIONS

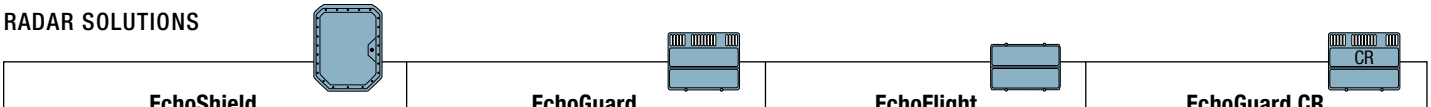


EchoShield	**EchoGuard**	**EchoGuard CR**
For facilities and assets with significant acreage or OTM needs.	Proven ground + air perimeter surveillance performance.	Reduce power levels for dense environment requirements.

PUBLIC SAFETY

Agencies overseeing VIP events, securing airspace around stadiums and other public spaces, and extending perimeter surveillance into the sky around facilities and assets require radar in the solution. Echodyne radar detects non-RF emitting drones (aka “dark drones”) and provides the tracking accuracy to keep optical sensors trained on the intruder.

RADAR SOLUTIONS



EchoShield	**EchoGuard**	**EchoFlight**	**EchoGuard CR**
OTM capable for mobile VIPs and Assets.	Portable ESA radar for temporary needs.	Tethered drones as CUAS platforms.	Lower power levels for urban environments.

EchoShield®

Multi-Mission 4D Radar

Next-Gen ESA

Intelligent Search

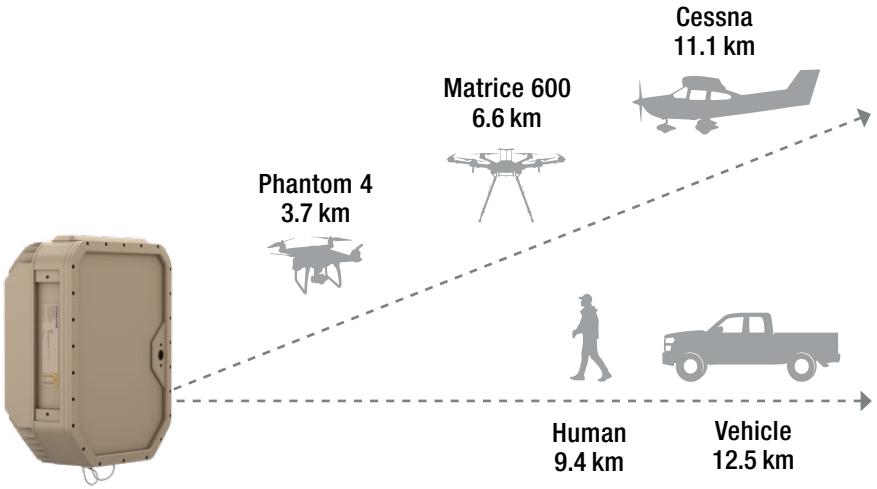
Multi-Domain, Multi-Mode

Mid-Range Superiority

EchoShield is a medium-range, software-defined, pulse-Doppler, cognitive 4D metamaterials ESA (MESA) radar. With the equivalent of more than 500 Tx/Rx modules, EchoShield intelligently searches a large, customizable field of view and tracks ~1,000 objects of interest with industry-leading angular accuracy. High-fidelity data is delivered in a proprietary format over a standard TCP/IP Gigabit Ethernet connection with multiple data-rich output options available via API. EchoShield utilizes cognitive radar concepts to combine different waveforms, beam schedules, and other resources into quick “Mission Sets” that tailor radar performance to need. A steady cadence of software updates offers new capabilities and extend Mission Sets. Highly precise object metadata enriches fusion and decision-making, while quick setup and on-the-move (OTM) capabilities bring value to multiple mission types.

MISSION SETS: CUAS + Dismount + [OTM + Coastal + more]

TRACKING RANGE (not maximum)



RADAR SPECS

Frequency
Ku-band 15.4 – 16.6 GHz

Field of View
130° Azimuth x 90° Elevation

Track Accuracy
< 0.5° Azimuth x < 0.5° Elevation

Track Update Rate
10 Hz

Size
42.5 cm x 33 cm x 18 cm

Weight
17.8 kg

Power
+ 21.5 to + 33 VDC

Learn More About EchoShield →

EchoGuard®

4D Surveillance Radar

Superior Drone Detection

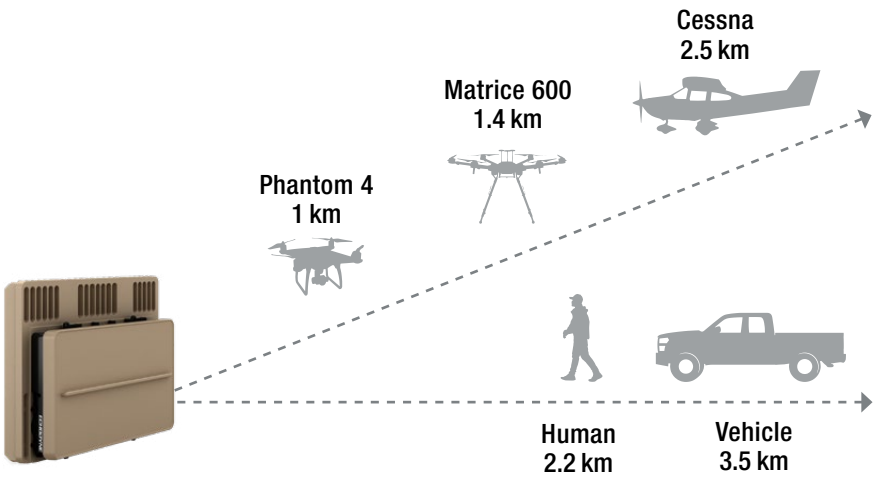
Enhanced Perimeter Security

Market-Leading Performance

Multi-Mission Superiority

Echodyne combines patented MESA technology with powerful software to deliver ESA performance in a compact solid-state format that detects, tracks, and classifies objects of interest on the ground or in the air, regardless of weather or lighting conditions. Exclusive to Echodyne, concentrated Tx/Rx modules direct thousands of pencil-thin beams across the 120° azimuth x 80° elevation field of view (FoV) in milliseconds. EchoGuard rapidly detects and precisely tracks up to 20 objects of interest, delivering high-fidelity data in a proprietary format over a standard TCP/IP Gigabit Ethernet connection. With multiple data-rich output options available by API, including raw data, EchoGuard's superior spatial accuracy creates a robust data foundation for protecting assets critical to national security and governmental operation.

TRACKING RANGE (not maximum)



RADAR SPECS

Frequency
K-band 24.45 – 24.65 GHz (USA)
K-band 24.05 – 24.25 GHz (INTL)

Field of View
120° Azimuth x 80° Elevation

Track Accuracy
< 1° Azimuth x < 1.5° Elevation

Track Update Rate
10 Hz

Size
20.3 cm x 16.3 cm x 5.7 cm

Weight
1.25 kg

Power
+ 15 to + 28 VDC

Learn More About EchoGuard →

EchoFlight®

4D Airborne Radar

Ultra-Low SWaP
Un/tethered Drone Surveillance
Drone Interceptor Applications

Lightweight Airborne CUAS

As drones become an ever-greater threat to warfighters and assets, novel methods for counter-UAS are required. EchoFlight is designed for use on airborne platforms and is customizable to mission requirements. For temporary missions, EchoFlight's Field of View (FoV) can be shrunken for interceptor applications or kept broad for airspace surveillance. In either case, a low signals footprint on a mobile platform confuses enemy counterfire and maintains situational awareness.

RADAR SPECS

Frequency
K-band 24.45 – 24.65 GHz

Field of View
120° Azimuth x 80° Elevation

Track Accuracy
< 1° Azimuth x < 1.5° Elevation

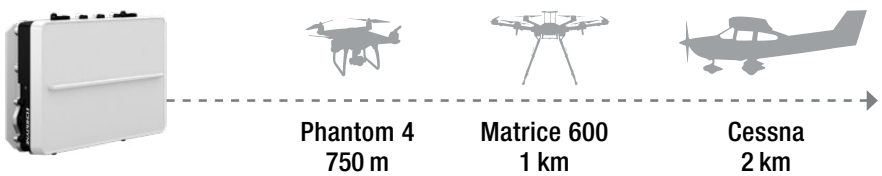
Track Update Rate
10 Hz

Size
18.7 cm x 12 cm x 4 cm

Weight
817 g (Natural Convection)

Power
+ 12 to + 28 VDC

TRACKING RANGE (not maximum)



Learn More About EchoFlight →

EchoGuard CR®

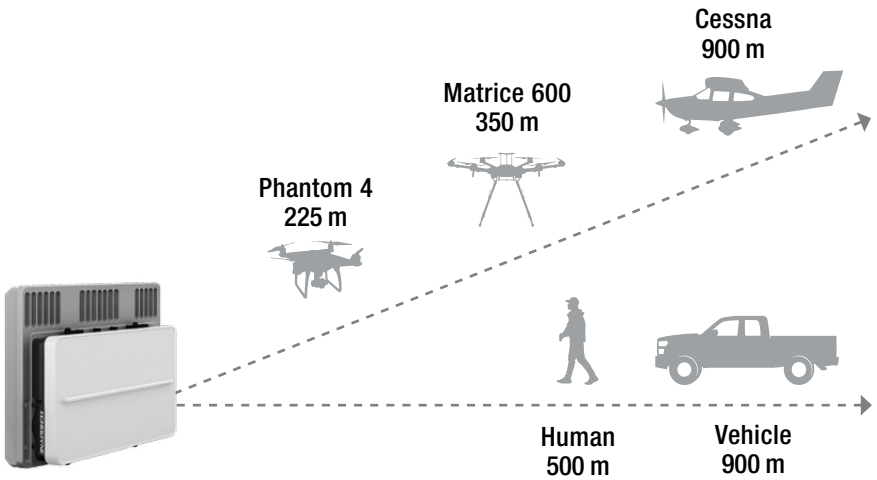
4D Surveillance Radar for Close Range

Guard Every Perimeter
Ground and Air
Accurate and Reliable

Close-Range Precision

Part of the EchoGuard family of 4D beamforming radars, EchoGuard CR is specifically built for performance in semi-urban, urban, and other close-range environments. EchoGuard CR's low-power signature maintains high performance by managing energy output to reduce signal clutter and reflection. EchoGuard CR rapidly and accurately detects and assesses multiple ground and air targets within the 120° azimuth and 80° elevation field of view. High-fidelity data for up to 20 simultaneous tracks includes latitude, longitude, range, velocity, bearing, closing time, and more. Standard TCP/IP Gigabit Ethernet connections and multiple data-rich output options available by API ease integration with other sensors and systems.

TRACKING RANGE (not maximum)



RADAR SPECS

Frequency
K-band 24.45 – 24.65 GHz

Field of View
120° Azimuth x 80° Elevation

Track Accuracy
< 1° Azimuth x < 1.5° Elevation

Track Update Rate
10 Hz

Size
20.3 cm x 16.3 cm x 5.7 cm

Weight
1.25 kg

Power
+ 12 to + 30 VDC

Learn More About
EchoGuard CR ➞

Software & Support

MAXIMIZE RADAR PERFORMANCE

SOFTWARE UPDATES

Continuous Improvement from Software-Defined Radar

- Includes All Major and Minor Releases
- Improve Radar Operations
- Enhanced Classification
- Radar Data Visualization Tools
- Radar Support Tools

TECHNICAL SUPPORT

Priority Access to Radar Support

- Review and Training Sessions
- Systems Integration
- Troubleshooting
- Performance Review
- Planning

PRIORITY TECHNICAL SUPPORT

Priority queuing via company match when using support@echodyne.com.

CUSTOMER PORTAL

24/7 access to all tools, manuals, and materials.

PERFORMANCE ENHANCEMENT

Continuous improvements through software development.

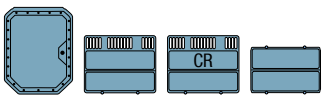
USER COMMUNITY

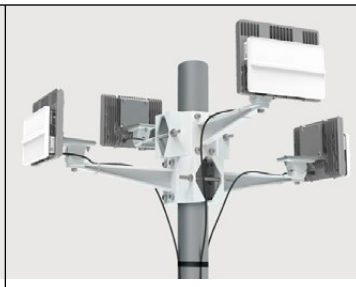
Submit requests for features and functionality.

Kits & Accessories

QUICK START KIT (QSK)

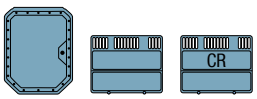
A ruggedized transport case with all the cables and accessories needed for typical integration and testing activities.

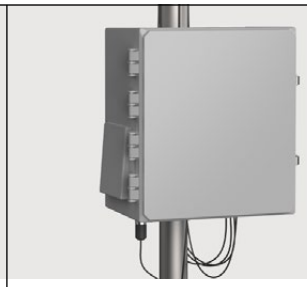




TOWER MOUNTING KIT

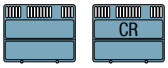
Radar mounting kit includes arms, brackets, and tools to configure and operate hemispherical ground and/or airspace surveillance for one to four radars.





RADAR HUB

Pre-engineered C2 solution for deployment, networking, and operations of multi-radar installations. Standardize every install and simplify support and maintenance.



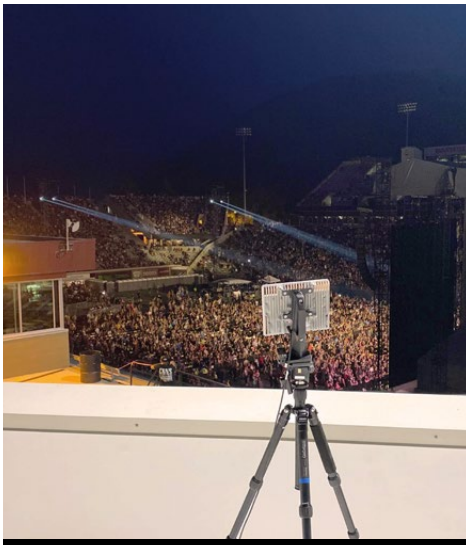
LIGHTWEIGHT DEPLOYMENT KIT (LDK)

A compact kit designed to carry all gear (radar, computer, tripod, batteries) in a backpack weighing less than 10 kg (25 lbs). LDK includes a rugged hard case for teams on the go.

Featured Applications

EchoGuard radars deployed for discrete surveillance.

EchoGuard radar on Anduril Surveillance Tower.



EchoGuard deployed for drone detection at mass gathering.

EchoGuard radar solution for urban situational awareness.

EchoFlight radar on Easy Aerial's airborne counter-UAS platform.

Border testing of EchoGuard radar.

Echodyne Corp.

Echodyne, the radar platform company, is a U.S. designer and manufacturer of advanced radar solutions for defense, government, and commercial market applications. The company's proprietary metamaterials electronically scanned array (MESA®) architecture is a rare breakthrough in advanced radar engineering, leveraging an innovative physics-design approach, Echodyne's MESA radars use standard materials and manufacturing processes to shatter unit cost barriers for high performance radar. The result is a solid-state, low-SWaP, exportable, commercial radar with advanced software capabilities that delivers superior performance, unparalleled data integrity, and exceptional situational awareness.

For more information, please visit: Echodyne.com.

U.S. Designed & Manufactured

AS9100D CERTIFIED ISO 9001

ECHODYNE
12112 115th Ave NE, Ste. A
Kirkland, WA 98034
info@echodyne.com
+1 425.454.3246
echodyne.com