

UNCREWED SYSTEMS & AUTONOMY

SECTOR OVERVIEW | OCTOBER 2023



KAL
Capital

UNCREWED SYSTEMS DEMAND DRIVERS & MOTIVATIONS

MOTIVATIONS FOR UNCREWED SYSTEMS

» Commercial



- ✓ Pilot Shortage
- ✓ Reliability Factors
- ✓ Capacity
- ✓ Unit Economics
- ✓ Operational Efficiencies

» Defense



- ✓ Manpower efficiencies (reduce human footprint & personnel costs)
- ✓ Rapid response & 24/7 presence (timely, persistent, enduring)
- ✓ Harsh environments (day, night, hot, cold, bad weather, rubble, barriers)
- ✓ New mission requirements (increasing competence enables new capabilities)
- ✓ Logistical support (reduce logistic burden: hold, transport, carry watch)

Autonomous Technology Focus Areas

Machine Perception,
Reasoning & Intelligence

Scalable Teaming of
Autonomous Systems

Human/Autonomous
System Interaction &
Collaboration

Test, Evaluation
Validation & Verification

SYSTEM-LEVEL VALUE PROPOSITION FOR UNCREWED SOLUTIONS

Enables Operational Risk-Taking

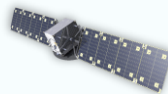
- » *Can afford risk of loss*
- » *Can afford probes and feints*



Standoff missiles are uncrewed vehicles that enable one-way missions

Unique Performance Characteristics

- » *Size, packaging*
- » *Endurance, speed*
- » *Precision station keeping*



Satellites are uncrewed vehicles enabling long-endurance, exo-atmospheric ops

Reduced Costs

- » *Operational cost savings from reduced training, platform usage*
- » *Procurement costs (sometimes) from reduced size or life support requirements*



Controllers are secure, low-cost, common control systems familiar to the warfighter



MARKET MOTIONS & TRENDS

RECENT HEADLINES IN UNCREWED & AUTONOMOUS SYSTEMS



Replicator

USD + DIU

BREAKING
DEFENSE

AIR WARFARE, LAND WARFARE, NAVAL WARFARE, NETWORKS / CYBER

DIU asks industry about affordable, mass-produced unmanned aerial systems

The request comes weeks after Secretary of Defense Kathleen Hicks announced the Replicator initiative to counter China's military mass.



Task Force 59

US Navy

Defense One

SCIENCE & TECH

Navy's 2-year-old robot task force eyes more AI

A 4th Fleet version of TF59 is in the works, and its lessons are headed to the Pacific as well.



Anduril's M&A Strategy Continues to Expand

Private Industry

Bloomberg

ANDURIL

Defense Startup Anduril Is in Talks to Raise More Than \$400 Million From Investors

- The financing is said to be structured as a convertible note
- Startup is likely to use cash influx to fund more acquisitions



MQ-9 Reapers as "Capital Drones"

USAF

AIR & SPACE FORCES MAGAZINE

AFSOC Wants MQ-9 Reapers to Act As 'Capital Ships' For Smaller Drones

The head of Air Force Special Operations Command envisions a future where MQ-9 Reaper drones act as 'capital ships' from which smaller uncrewed aerial systems (UASs) launch to establish a sensor grid or a communications pathway for the joint force.



MARKET MOTIONS & TRENDS

POLICY DEVELOPMENTS IN DOD DRONE SECTOR

Chinese state-subsidized drone dumping accounts for more than 90% of the consumer market, 70% of the enterprise market, and 92% of the first responder market. This has severely stagnated the development of a domestic drone manufacturing base in the United States

1

American Security Drone Act

- » Bans on the procurement/use of UAS developed by adversary entities
- » Department of Commerce has added DJI to named entity list

2

Executive Order 13981

- » Bans US tax dollars from being used on foreign drones and components

3

Florida Bill 44

- » Limits Florida government agencies to exclusively purchase drones from five "Blue UAS" companies
- » Similar bill proposed in Wisconsin

"Chinese drone dumping presents a challenge not only to U.S. competitiveness, but more importantly, to our national security." – Chad Wolf, Fmr. Secretary of Homeland Security

Private Sector Thought Leadership



**AUVSI
PARTNERSHIP
FOR DRONE
COMPETITIVENESS**



Source: [AUVSI Partnership for Drone Competitiveness White Paper](#)

- » ***"The Chinese government is likely using information acquired from DJI systems as a way to target assets"***
- » In 2019, Congress prohibited the DoD from purchasing drones made by companies based in China in Section 848 of the FY2020 National Defense Authorization Act (NDAA)
- » In Section 817 of the FY2023 NDAA, Congress expanded Section 848 to prohibit private companies working with the DoD from using insecure drones in the performance of federal contracts and directed the U.S. Coast Guard to transition their drone fleet to secure systems within 90 days

UNCREWED SYSTEMS MANUFACTURERS – NOTABLE M&A ACTIVITY

NOTABLE ACQUIRERS OF UNCREWED SYSTEMS MANUFACTURERS

AeroVironment



PROCEED
WITH
CERTAINTY

Sep-23

TOMAHAWK
ROBOTICS

May-21

TELEAIB

Feb-21

ARCTURUS UAV

Anduril Industries



ANDURIL

Sep-23

BLUE FORCE
TECHNOLOGIES

Feb-22

DIVE
TECHNOLOGIES

Apr-21

AREAL

Edge Autonomy / AE Industrial Partners



Industrial
Partners

Sep-21

JENNINGS AERONAUTICS

Jan-21

UAV FACTORY

Red Cat Holdings



RED CAT HOLDINGS
Investing in the future of drones

Sep-21

TEAL

May-21

SKYPERSONIC

OTHER NOTABLE TRANSACTIONS

Target	Buyer	Announced	Transaction Description
MILREM ROBOTICS	EDGE	Feb-23	» Robotics and autonomous systems
DZYNE	HIGHLANDER partners, L.P.	Jan-23	» Uncrewed Aircraft Systems OEM
skysapience	TITAN INNOVATIONS	Dec-22	» Tethered rotorcraft
HIGH POINT AEROTECHNOLOGIES	HIGHLANDER partners, L.P.	Nov-22	» Long-range VTOL drones OEM
VOLANS-I	SNC	Oct-22	» Uncrewed Aerial Vehicles OEM
AIROBOTICS	ONDAS	Aug-22	» UAV engineering & design
INNOCON	imco INDUSTRIES LTD.	Sep-21	» Develops micro, mini, tactical UAVs

AUTONOMY VALUE CHAIN – RECENT M&A ACTIVITY

Production

Operations

Mission Sets



Vehicle Design



Electrified Propulsion



Autonomous Behaviors



OEM/Integrator



Capital/Investment



Infrastructure Development



System Operations



Environmental Management



Fleet Management



Maintenance & Repair



Warfighter Interface



Data Collection & Processing

Notable Transactions

Target	Buyer	Announced	Value Chain Position
BLUE BEAR	SAAB	Sep-23	Autonomous Behaviors
BMS	VISLINK	Sep-23	System Operations
SightLine	ARTEMIS CAPITAL PARTNERS	Jul-23	Data Analysis
SkyScape	VOLATUS AEROSPACE	Apr-23	Infrastructure Dev.
VERUS TECHNOLOGY GROUP	ACP	Apr-23	Warfighter Interface
RAPID IMAGING	BLUESTONE INVESTMENT PARTNERS	Apr-23	Warfighter Interface/ Data Analysis
THE AIRO GROUP	Kernel	Mar-23	Autonomous Behaviors
Black Sage	HIGHLANDER PARTNERS, L.P.	Jan-23	OEM/ Integrator
XPilot	EMBRAER	Oct-22	OEM/ Integrator
planck AEROSYSTEMS	AV AeroVironment™	Aug-22	Autonomous Behaviors
uAvionix	DC CAPITAL PARTNERS <small>Davidson Capital Partners • Mission Focus • 30+ years of experience</small>	Mar-22	Fleet Management
ASSETT	VTG	Aug-21	Autonomous Behaviors
PANGEO SUBSEA <small>bounding out risk</small>	KRAKEN	Aug-21	Environmental Mgmt.
Ascendant Engineering Solutions	LEONARDO	Aug-21	Warfighter Interface
MARTINUAV	Shield AI	Jul-21	Autonomous Behaviors
Heron Systems Inc.	SIS	Jan-21	Infrastructure Dev.
MicaSense	AgEagle	Jan-21	Environmental Mgmt.

UNCREWED SYSTEMS – NOTABLE VC ACTIVITY

RECENT RELEVANT TRANSACTIONS

Target	Lead Investors	Announced	Funding Type	Amount Raised
 KOOP	 ALLEYROBOTICS VENTURES	Jul-23	Seed	\$4.0 million
 B GARAGE	 LB Investment	Jun-23	Series A	\$20.0 million
 STARFISH SPACE	 Munich Re Ventures  TOYOTA VENTURES	Mar-23	Series A	\$14.0 million
 ThayerMahan	 MC²	Feb-23	Series C	\$30.5 million
 PHANTOM AI	 INTERFEST	Feb-23	Series C	\$41.5 million
 SCYTHE	 ENERGY IMPACT PARTNERS	Jan-23	Series B	\$42.0 million
 exyn technologies	 Reliance Industries Limited	Dec-22	Series B	\$35.0 million
 seasats	 L3HARRIS	Oct-22	Seed	\$10.0 million
 Primordial Labs	 Logesone Group	Oct-22	Seed	\$4.0 million
 WONDER ROBOTICS LTD	 Elron Ventures	Jul-22	Seed	\$4.0 million
 CENSYS TECHNOLOGIES	 Kirenaga	Jul-22	Series A	\$8.3 million
 Flyby Robotics	 MaC VENTURE CAPITAL	Jul-22	Pre-Seed	\$4.0 million
 EXOSONIC	 ASYMMETRY VENTURES	May-22	Seed	\$4.0 million
 PYKA*	 PIVA	Apr-22	Series A	\$37.0 million
 OVERWATCH IMAGING	 SQUADRA SHIELD CAPITAL	Apr-22	Series A	\$11.2 million
 CESIUM	 AIRBUS VENTURES Forever Ventures	Mar-22	Series B	\$60.0 million
 SKYWAYS	 OPA	Dec-21	Series A	\$15.0 million
 SKYDWELLER	 Advection Growth Capital	Sep-21	Series A	\$40.0 million
 SHIELD AI	 POINT72 VENTURES	Feb-21	Series C	\$70.0 million
 IRIS AUTOMATION	 Bessemer Venture Partners	Dec-20	Series B	\$13.0 million

KAL'S EXPERIENCE IN THE UNCREWED SYSTEMS & AUTONOMY SECTOR



HAS BEEN ACQUIRED BY



SALE OF COMPANY

Hypergiant, a leader in AI-enabled, cloud-based command and control technologies and deployed solutions, has been acquired by Forward Slope

- » The company offers a world-class core geospatial data visualization and actions platform, Command Center, which makes AI-generated recommendations and delivers informs real-time decision-making ability and is shared instantly between multiple sources and across all domains



A PORTFOLIO COMPANY OF

TRIVE CAPITAL

HAS BEEN ACQUIRED BY



AND

MADISON DEARBORN
PARTNERS

SALE OF COMPANY

Aevex provides full-spectrum airborne intelligence services intended for the global intelligence community

- » The company's offerings include aviation, remote sensing and analysis solutions as well as custom design and engineering, prototyping, aircraft modification and certification, flight test instrumentation and support for the United States government and partner nations



FLORIDA TURBINE
TECHNOLOGIES

HAS BEEN ACQUIRED BY























SALE OF COMPANY

Florida Turbine Technologies ("FTT") designs and develops small engine development programs and facilitates integration of these engine solutions into next-generation Kratos tactical systems

- » As part of the Kratos Turbine Technologies ("KTT") Division, FTT is focused on the development and production of small, affordable, high-performance, jet engines for the next generation of tactical weapon systems and tactical jet uncrewed aerial systems (UAS)

RECENT TRANSACTIONS

 CYCLONE <small>SALES INC.</small> HAS BEEN ACQUIRED BY Mubea <small>SALE OF COMPANY</small>	 HYPER GIANT HAS BEEN ACQUIRED BY ESI <small>PERFORMANCE SYSTEMS</small> <small>SALE OF COMPANY</small>	 <small>Water Guard</small> HAS BEEN ACQUIRED BY ARCLINE <small>SALE OF COMPANY</small>	 FREGATA <small>SYSTEMS</small> HAS BEEN ACQUIRED BY ROTOR <small>CAPITAL</small> <small>SALE OF COMPANY</small>	 WALKER BROTHERS <small>SALES INC.</small> HAS BEEN ACQUIRED BY OMEGA MORGAN <small>SALE OF COMPANY</small>	 ESI <small>PERFORMANCE SYSTEMS</small> HAS BEEN ACQUIRED BY TRIVE CAPITAL <small>SALE OF COMPANY</small>	 HITEMCO HAS BEEN ACQUIRED BY Lincotek <small>SALE OF COMPANY</small>
 KITTYHAWK HAS BEEN ACQUIRED BY TRIVE CAPITAL <small>SALE OF COMPANY</small>	 VANGUARD ELECTRONICS <small>SALES INC.</small> HAS BEEN ACQUIRED BY INRCORE <small>A PORTFOLIO COMPANY OF THE JORDAN COMPANY</small> <small>SALE OF COMPANY</small>	 STROCO <small>SALES INC.</small> HAS BEEN ACQUIRED BY NOVARIA <small>GROUP</small> <small>A PORTFOLIO COMPANY OF KKR</small> <small>SALE OF COMPANY</small>	 CMI <small>SALES INC.</small> HAS BEEN ACQUIRED BY VITESSE <small>SYSTEMS</small> <small>SALE OF COMPANY</small>	 KEMCO <small>AEROSPACE MANUFACTURING</small> HAS BEEN ACQUIRED BY CRESTVIEW <small>AEROSPACE</small> <small>A PORTFOLIO COMPANY OF AMERICAN INDUSTRIAL PARTNERS</small> <small>SALE OF COMPANY</small>	 Systima <small>Technologies Inc.</small> HAS BEEN ACQUIRED BY KARMAN <small>GROUP</small> <small>A PORTFOLIO COMPANY OF TRIVE CAPITAL</small> <small>SALE OF COMPANY</small>	 SENTEK <small>GLOBAL</small> HAS BEEN ACQUIRED BY Deloitte. <small>SALE OF COMPANY</small>
 MINGO <small>AEROSPACE</small> HAS BEEN ACQUIRED BY SUNVAIR <small>AEROSPACE GROUP</small> <small>A PORTFOLIO COMPANY OF BLUE SEA CAPITAL</small> <small>SALE OF COMPANY</small>	 AAPT HAS BEEN ACQUIRED BY CHARGER <small>SALE OF COMPANY</small>	 ASE <small>A PORTFOLIO COMPANY OF GENCAP AMERICA</small> HAS BEEN ACQUIRED BY Calspan <small>SALE OF COMPANY</small>	 FLORIDA TURBINE <small>TECHNOLOGIES</small> HAS BEEN ACQUIRED BY KROTOS <small>SALE OF COMPANY</small>	 STS <small>Aerospace Group</small> HAS RECEIVED EQUITY INVESTMENT FROM GREENBRIAR <small>EQUITY GROUP LLC</small> <small>EQUITY INVESTMENT</small>	 Beaver <small>AEROSPACE & DEFENSE, INC.</small> HAS BEEN ACQUIRED BY HEROUX DEVTEK <small>SALE OF COMPANY</small>	 AEVEX <small>AEROSPACE</small> <small>A PORTFOLIO COMPANY OF TRIVE CAPITAL</small> HAS BEEN ACQUIRED BY MDP <small>SALE OF COMPANY</small>

KAL
Capital



Trevor Bohn
Partner
(949) 404-4203
trevor@kalcap.com



Ryan Murphy
Partner
(949) 404-4204
ryan@kalcap.com



Trevor McKinnon
Director
(949) 432-4724
trevor.mckinnon@kalcap.com

KAL Capital Markets LLC
3738 Bayer Ave. Suite 103
Long Beach, CA 90808
www.kalcap.com

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