NEWCASTLE AUTONOMOUS SYSTEMS
WHO WE ARE

NEWCASTLE IS A DESIGN AND MANUFACTURING FIRM THAT CREATES AUTONOMOUS VEHICLES AND SYSTEMS, SPECIALIZING IN U.S.-MADE MISSION-FLEXIBLE, RUGGEDIZED DRONES FOR BOTH THE PRIVATE AND GOVERNMENT SECTORS.
WHERE WE CAME FROM

• **Newcastle** began in 2003 as a supply chain and manufacturing consulting company.

• Our facility opened in 2015. In that time we have:
  - Achieved ISO 9001:2015 and AS9100D certification
  - Manufactured components for the aerospace industry including manned space vehicles, military and commercial aviation
  - Began internal UAS efforts in 2018
    - Created 3 drone models
    - Submitted for 2 patents (UAS operating system and structural design)
WHAT WE ARE DOING TODAY

• Through our R&D efforts we are creating drone systems that exceed the current capability of major overseas manufacturers in our size class
  • Smaller, more efficient, tough.

• Engaging with government and military organizations on UAS deployment and design

• Developing flight control systems for GPS-denied environments, including AI / neural network research

• Design and development of rotors

• Multi-team project with an out-of-state DoT to create a UAV for their public service sector, with state-wide deployment as a final objective.
OUR VISION AND DESIRE

**VISION:**

• **We will be the manufacturer that sets the standard for ruggedized, mission capable drones.**

**DESIRE:**

• **Team up with UAV and technology firms in Texas.**
• **Team with LE agencies (local, state and federal) in Texas.**
• **Assist other autonomous vehicle companies in building their components and platforms.**
• **Be an integral part of Making North Texas a hub for drone development and manufacturing.**
CONTACT INFO:

Website:
http://newcastleas.com/

POC:
Travis Kunkel
Travis.Kunkel@newcastlemfg.com

Arrive First.
Act First.
Always Be On Offense.
Never Quit.
V-BAT Innovative VTOL Technology

- **Equipment Independent**
  - No Launch & Recovery Equipment

- **Safety**
  - No exposed blades
  - Enclosed rotor system offers safe operating environment, especially in confined areas

- **Tactical / Expeditionary**
  - Assemble in less than 10 min
  - Launch in 15-20 min

Martin UAV Competition Sensitive and Business Proprietary, 2020
Public Release Information
V-BAT Advantages

• VTOL to Fixed Wing, not “hybrid quad”
• Ducted fan, no exposed propeller blades, safety
• No ground equipment for launch/recovery
• Launch/recover in 10 x 10 foot space
• Launch/recover on moving vehicle/boat
• Ship and Land-based, same configuration
• 3 Operators (total) for 24 hour operations
• Set Up/Fly 15 mins, Pack Up/Move 15 mins
• Simple Ops & Maintenance, shorter training time
• Forward Operations at remote locations
• No modifications needed to ships or vehicles
• Transport via minivan, helicopter, small boat or C-130
V-BAT Air Vehicle

Specifications
Wing Span: 2.75 m / 9 feet
Length: 2.4 m / 8 feet
Weight: 40 kg / 88 lbs
Propulsion: 182cc 2-cylinder EFI, Remote Start
On board electrical power: 500 watts
Fuel: Gas-Oil Mix or JP-4/5/8

Performance
Speed Range: 0–150 km/hour
Endurance: 8-10 hours at 75 km/hour
Max Altitude: 4500 m / 15,000 feet
BLOS Range: 130 km / 70 miles
Payload Weight: 4+ kg+ / 10 lbs (with full fuel)
Land CONOPS
Our People

Martin UAV team members come from a wide variety of backgrounds that include international organizations in Aerospace, Defense, Civil Govt & Police, Engineering, Finance, Business, etc.
- MUAV’s headquarters is located in Plano, Texas. Many of the firm’s corporate services are performed at this location, including executive management, business unit management, business development, accounting, administration, human resources and IT services.
- Most of MUAV’s research and development and all production activities are located in Prosper, Texas.
Thank You!

www.martinuav.com
Topics for Today

• Project Summary & Objectives
• Research Plan Review
• Collaboration & Partners
Areas of Expertise

ARCHITECTURE
ENGINEERING
GEOSPATIAL
Woolpert at a glance.

1911
Founded in Dayton, Ohio

30+
Offices Worldwide

900+
Global employees
Woolpert Office Locations

Arlington, VA
Atlanta, GA
Austin, TX
Calgary, Canada
Charleston, SC
Charlotte, NC
Chesapeake, VA
Chicago, IL
Cincinnati, OH
Cleveland, OH
Columbia, SC
Columbus, OH
Dayton, OH
Denver, CO
Fairview Heights, IL
Greenville, SC
Houston, TX
Indianapolis, IN
Johannesburg, RSA
Lexington, KY
Miami, FL
Orlando, FL
Pensacola, FL
Pittsburgh, PA
Portland, OR
Richmond, VA
San Francisco, CA
St. Louis, MO
Stennis, MS
Tampa, FL
Toledo, OH
Virginia Beach, VA
Our UAS Experience

- Operating since 2012
- Conducted hundreds of UAS missions
- Multiple full-scale implementations
- Flown in all classes of airspace (including on major Class B airfields)
- Expansive internal research and development group
- Crossed-trained field pilots and surveyors
- Evaluates multiple LiDAR and niche sensors
- Participants in higher education research projects
- Collaborates with regulators and technology partners
Private, Nonprofit Institution
...with a mission of national service
Transportation Research Board

- Division A
  - Technical Activities
  - Annual Meeting
  - TRB Committees

- Division B
  - Studies and Special Programs
  - FACA Policy Studies
  - Synthesis Program

- Division C
  - Administration and Finance

- Division D
  - Cooperative Research Programs
  - NCHRP
  - TCRP
  - ACRP
  - NCFRP
  - NCRRP
  - HMCRP

- Division E
  - Strategic Highway Research Program
Airport Cooperative Research Program

- Research ideas come from industry practitioners.
- Projects are selected by the ACRP Oversight Committee.
- Projects focus on applied research.
- Volunteer panels develop scope, select contractors, oversee research, and review results.
- Research contractors selected on a competitive proposal basis.
ACRP 07-18: Airport Design Standards from Large UAS Guidelines

The objective of this research is to develop guidelines for airfield design challenges, issues, and considerations for the unique operational needs of large UAS (currently greater than 55 lbs), considering safety and capacity at existing airfields of different types and sizes. The primary audience for this research consists of airport managers, planners, UAS operators, and other stakeholders.

The guidelines should address, but not be limited to the following:

- Integration vs. segregation of operational areas at airfields;
- Considerations for different UAS categories and capabilities;
- Integration of technology (e.g., command and control systems (C2), detect and avoid (DAA) systems, cybersecurity,
- infrastructure and utilities, etc.);
- Airport master planning, including economic and cost considerations;
- UAS support infrastructure (e.g., maintenance facilities, hangars, terminal, fueling, etc.);
- Environmental impacts (e.g., hazmat, noise, battery storage); and
- Approach surfaces and terminal airspace.
Boiled Down... Areas of Impact

- Airfield configuration
- Air traffic blind spots
- Pavement design
- Lighting, markings, and signage
- Surveillance technology
- Navigation aids
- Hangar and maintenance facilities
- Communications and data systems
- Energy/fuel requirements and cost
- Obstacles and airspace protection
- Airport facility and operational capacity
- Noise and environmental impacts
- Hazardous material and/or battery storage
- UAS operator facilities
- Airport systems and facility master planning
- Radio frequency concerns
- Emergency response and containment
- Public relations and education
1. Airfield Surface Infrastructure
2. Airfield Nav/Comm/Technology
3. Environmental (Noise/Fuel/Materials/etc.)
4. Support Facilities (Hangars/Utilities/etc.)
5. Airspace and Air Traffic
6. Emergency Response (Police/Fire/etc.)
# Group & Existing Criteria

## Airfield Surface Infrastructure

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Airport Design</td>
<td>AC 150/5300-13A</td>
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<tr>
<td>Airport Marking</td>
<td>AC 150/5340-1</td>
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<tr>
<td>Airport Signage</td>
<td>AC 150/5340-18</td>
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<td>Apron</td>
<td>AC 150/5300-13 (Appendix 5)</td>
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<td>Deicing Facilities</td>
<td>AC 150/5300-14</td>
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<tr>
<td>EMAS Arresting System</td>
<td>AC 150/5220-22</td>
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<td>Geospatial Data Submissions</td>
<td>AC 150/5300-18B</td>
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<td>Pavement Design</td>
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<td>Pavement Management System</td>
<td>AC 150/5380-7</td>
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<td>Runway Length Requirements</td>
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<td>Runway Thresholds</td>
<td>AC 150/5300-13 (Appendix 2)</td>
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<td>Wind Analysis</td>
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<td>Wind Cones</td>
<td>AC 150/5340-30</td>
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<tr>
<td>Windrose</td>
<td>AC 150/5300-13 (Appendices 1, 11)</td>
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# Group & Existing Criteria

## Airspace and Operations

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<tr>
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<td>Operational Safety – Construction</td>
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<td>Snow Removal Operations</td>
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<td>SMGCS</td>
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## Emergency Response/Operations

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<td>ARFF Building</td>
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<td>ARFF Equipment – DEVs</td>
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<tr>
<td>ARFF Equipment – Clothing</td>
<td>AC 150/5210-14</td>
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<tr>
<td>ARFF Vehicle – Small Dual Agent</td>
<td>AC 150/5220-10</td>
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<tr>
<td>ARFF Vehicle</td>
<td>AC 150/5220-10</td>
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## Airfield Navigation/Comm/Technology

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<td>ADS-B Squitters</td>
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<td>Airport Lighting - Runway/Taxiway</td>
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<td>Airport Lighting - Runway Centerline</td>
<td>AC 150/5340-30</td>
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<td>Airport Lighting - Radio Control</td>
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<td>AWOS</td>
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<td>Beacons</td>
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<td>Land and Hold Short Lighting</td>
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<td>PAPI</td>
<td>AC 150/5345-28</td>
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<td>REIL</td>
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<tr>
<td>Runway Surface Monitors</td>
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<td>VASI</td>
<td>AC 150/5340-30</td>
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Syracuse Hancock International Airport (SYR)
Approach Outline & Deliverables

Phase 1
• Task 1: Project Kick-off       +2 weeks / +1.5 months       June 2020
• Task 2: Data Collection and Research Reviews
  o Literature and Existing Research
  o Technology Studies
  o Stakeholder Engagements       +5 months       Sept 2020
• Task 3: Interim Report         +7 months       Nov 2020

Phase 2
• Task 4: Design Standard Comparison & Gap Analysis       +10 months       Feb 2021
• Task 5: Large UAS Airport Impacts Analysis       +10 months       Feb 2021
• Task 6a: Draft Final Deliverable       +13 months       May 2021
• Task 6b: Final Deliverable Development       +16 months       August 2021
Collaboration is Key
ARVIKA AERIAL TECH Inc.

Keeping Our Communities Safe

“Universal Aerial Solutions for Today and Tomorrow”
Today’s Situation

Health & Hygiene

- Rapidly evolving COVID 19 Pandemic
  - Create an increased emphasis on public healthy safety with impacts on employers as well as consumers to maintain a healthy space
  
- Large public areas will need to be regularly disinfected
  - Public parks and venues
  - High School athletic facilities
  - Office Buildings
  - Sports and Event Complexes
  - Hotels and Conference Centers
  - Construction Sites
  - Shopping Centers
Vision

Arvika proposes to make our communities safer by disinfecting and decontaminating large spaces in order for community to return to a sense of normalcy.

We are merging existing proven technologies in an innovative fashion to meet the problem of how to disinfect these large spaces.

Our team of pilots and scientists, who also are pilots, have an innate understanding of how flight and drone capabilities can be harnessed to deliver cutting-edge, green disinfectant that keeps our communities safe while providing the safest manner of delivery within all regulations.

We provide customized drone flight planning for each venue as well as determine the right disinfectant for each project.
Our Team

Experience Includes

- 2000+ hours in drone flight experience
- 6000+ hours of commercial aircraft flight experience
- 100 combined years of experience with FAA regulations and safety systems to ensure compliance with all operations and the highest level of safety to both our crews and the public
- Degrees from Rutgers in Microbiology and Chemistry and Embry Riddle Aeronautical University in Aeronautics and Unmanned Aircraft
Arvika Aerial’s Tools

sUAS - AGRAS MG-1P

Disinfectant

Hypochlorous Acid

Pre/Post Site Testing
The AGRAS MG-1P is a precision agriculture drone adapted to deliver our hypochlorous acid disinfectant.

With powerful hardware, an AI engine, and 3D-operation planning, the MG-1P brings operation efficiency to a whole new level.

The MG-1P spray tank can carry up to 10 L, and the spray width is 6.5 m. The spraying system has 4 delivery pumps and 4 sprinklers with a maximum spray rate of 4.8 L/min. The MG-1P can spray 6 hectares per hour.

The spraying system also has an all-new electromagnetic flow meter, providing higher precision and stability than conventional flow meters.
Hypochlorous Acid (HOCl)

- HOCl is a naturally occurring chemical that is produced by our white blood cells to fight bacteria and inflammation after an infection or trauma. HOCl provides a unique power to eradicate dangerous organisms while not causing harm to our cells.
- Used in hospitals, large office buildings, sports arenas and other spaces where large groups of people congregate.
- Kills Coronavirus (COVID-19), C. diff spores, MRSA, TB, Black Mold, and more in one minute.
- Fragrance-free, dye free, non-abrasive, and non-corrosive with exceptional surface compatibility.
- Arvika is also happy to use the disinfectant currently employed by the venue or any combination to treat the facility.

R-Water Unit makes on-demand hypochlorous acid

HOCl also comes in tablet form for easy transportation.
Arvika will perform pre-testing of surfaces to be disinfected to determine if additional disinfectant levels are required. Post-testing will be conducted to ensure all surfaces have been disinfected.

Arvika’s testing methods follow industry standards for hygiene management and environmental monitoring.

Testing results will be supplied to each customer for their records.
• FAA part 137 Letter of Intent Submitted
  • Waiting action on FAA and San Antonio FSDO
  • All required documentation is completed and ready for review.
  • Personnel and equipment is ready for required demonstrations.
• FAA part 107 Exemption Submitted
  • Waiting action on FAA and San Antonio FSDO
  • All required documentation is completed and ready for review.
• Once FAA approvals are achieved, Arvika can launch outdoor venue treatment by drone to meet the health and hygiene needs of the community.
Questions?
Paul Woessner - 830-584-7972 - Paul.Woessner@vt-aaa.com
Kyle Beebe - 830-584-7974 - Kyle.Beebe@vt-aaa.com
FUTURE OF JOBS
AFRICA

Baltimore - Lagos - London

United States
1400 Greenmount Avenue
Baltimore, MD

Nigeria
7 Ibiyinka Olorunbe
Victoria Island, Lagos

United Kingdom
12 Paxton Avenue
London-Slough

The Global Air Drone Academy is a 501(c) 3 Non-Profit Organization
Powered by Global Air Media

Questions? CONTACT US!
On the Web: gadacademy.org
E-mail: info@gadacademy.org
ABOUT US

- Based in Baltimore, USA
- Workshops in 9 countries (Nigeria, United Kingdom, UAE, Kyrgyzstan, Turkmenistan, Zambia, South Africa, Ethiopia, and Kenya)
- Recently won the 'African Drone Business Challenge' Award (Rwanda)
- Taught over 6,000 students worldwide
- OUR MISSION is to train the next generation of global drone professionals!
WHERE WE TEACH

UNITED KINGDOM
NIGERIA
ZAMBIA
KENYA
ETHIOPIA
SOUTH AFRICA
BANGLADESH
TURKMENISTAN
KYRGYZSTAN
UNITED ARAB EMIRATES
PUERTO RICO
UNITED STATES
OUR PARTNERS
GLOBAL AIR DRONE ACADEMY
PRODUCTS AND SERVICES

- Industry-Specific Drone Training
  - Agriculture
  - Mapping
  - Media
  - Security
- Online Learning
- Consultation
- Entrepreneurship and Business Coaching
- Youth Programming
ORDER YOUR DRONE CAMP IN-A-BOX AT GADACADEMY.ORG

SIGN UP FOR ONE OF OUR LIVE VIRTUAL CAMP SESSIONS

WE SHIP YOU A DRONE, ACTIVITY GUIDE, GADA 'SWAG BAG', AND MORE!

YOUR DRONE CAMP IN-A-BOX ARRIVES WITHIN 5–7 BUSINESS DAYS

QUESTIONS? CONTACT US AT INFO@GADACADEMY.ORG
DRONE ACADEMY
DRONE BUILDING

UNIVERSITY AND ADULT TRAINING

HANDS-ON STEAM ACTIVITIES

DRONE CODING/PROGRAMMING

PROFESSIONAL DEVELOPMENT

ENTREPRENEURSHIP WORKSHOPS
Licensed alumni become attractive candidates for high paying careers. Additionally they receive preference in our jobs placement initiative.

Organizations hiring drone pilots include Amazon, FedEx, Medical Systems, Police Departments.

Advanced students are trained in industry specific drone applications & Entrepreneurship. Students receive Part 107 Licensing prep & assistance in our internship & collegiate network.


Students learn the fundamentals of 3D printing drone components & build their own individual drones.

( Middle/ High School ) Courses: Drone Building 201/ Drone Programming 201.

Junior Drone Pilots learn to program in languages such as Python & Scratch. Each student builds their own drone while learning about aerodynamics and practical applications of robotics.

( Elementary/Middle School ) Courses: Drone Building 101/ Drone Programming 101.

Students are introduced to drones & robotics in fun engaging activities such as obstacle courses.

( All Ages ) Courses: Drone Zone/ Intro to Drones 100.
OUR CURRICULUM

- High-quality, age-appropriate workshops
- Basic understanding of drone technology
- Safety, Regulations, and Licensing
- Hands-on flight lessons
- Drone Building and troubleshooting
- Aerodynamic principles (the physics of flight)
- Programming and Coding with Drones
- Photography, Filming, Video Editing
- Career and entrepreneurial opportunities
- Fun and engaging group activities
- Train-the-Trainer model
- Fully customizable workshops
WORKSHOPS CONDUCTED

- NIGERIA*
- ZAMBIA*
- ETHIOPIA
- KENYA
- SOUTH AFRICA

NUMBER OF STUDENTS TRAINED
~2,000 since 2016

*Partnership with CAA to offer professional training
According to World Bank estimates, Africa needs to spend $38 billion more each year on transport infrastructure, plus a further $37 billion on operations and maintenance – just to sustain its current level of development. The continent’s infrastructure deficit is more than a mobility issue. Today, road accidents are Africa’s third-biggest killer.

Drones offer a starting point for a radically new model of low-cost, fast and futuristic transportation. Transforming mobility infrastructure can provide rural towns and villages with access to modern services such as emergency aid, commercial goods and medical supplies. This will benefit industries like agriculture, mining, construction, and livestock.