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.

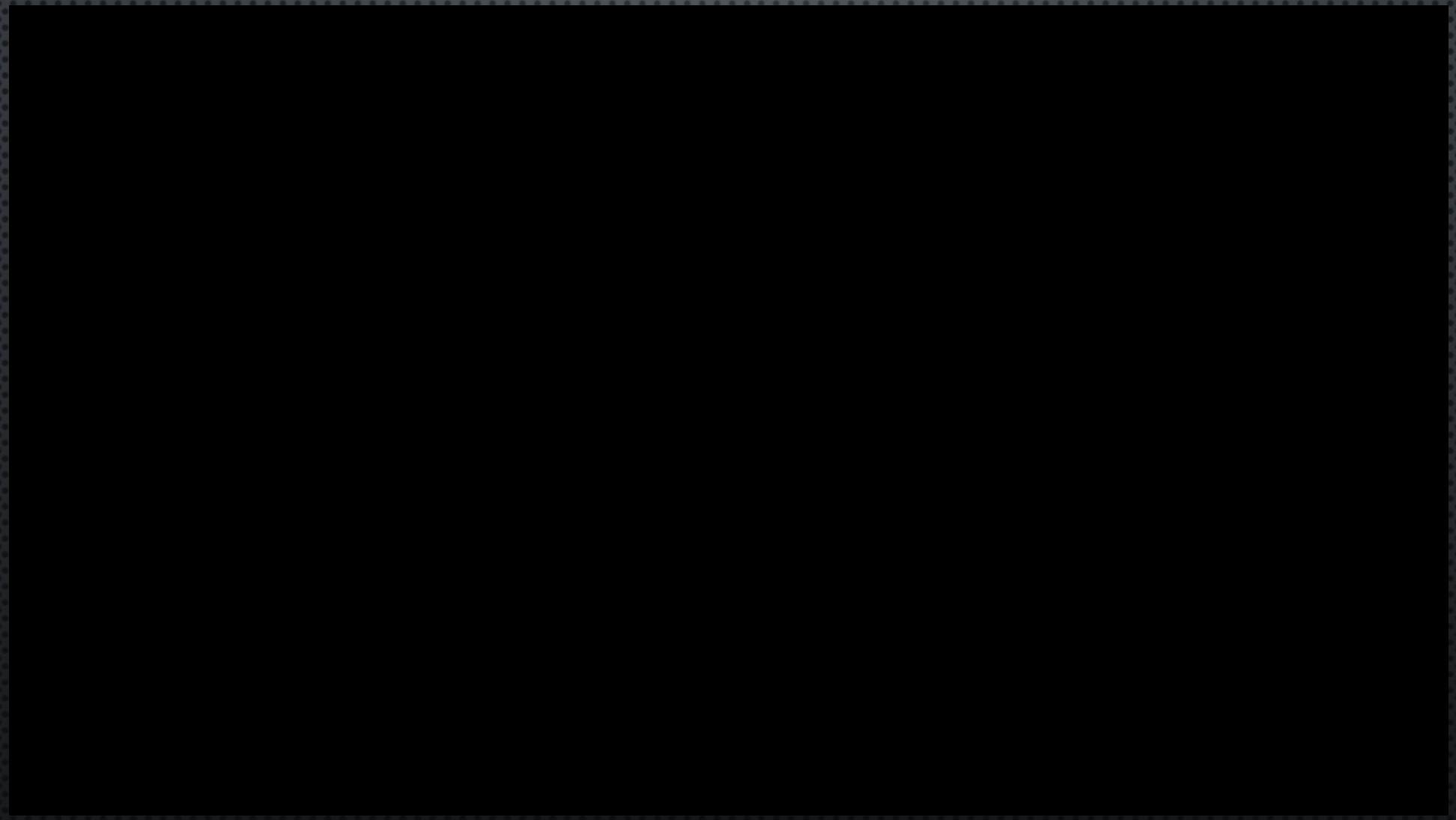
WHERE WE CAME FROM

- Newcastle began in 2003 as a supply chain and manufacturing consulting company.
- Our facility opened in 2015. In that time we have:
  - achieved ISO9001:2015 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.

LATEST RELEASE



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.

Mark Russell
Director, Int'l Business Development

Ester Peres
Marketing & Business Development

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***

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

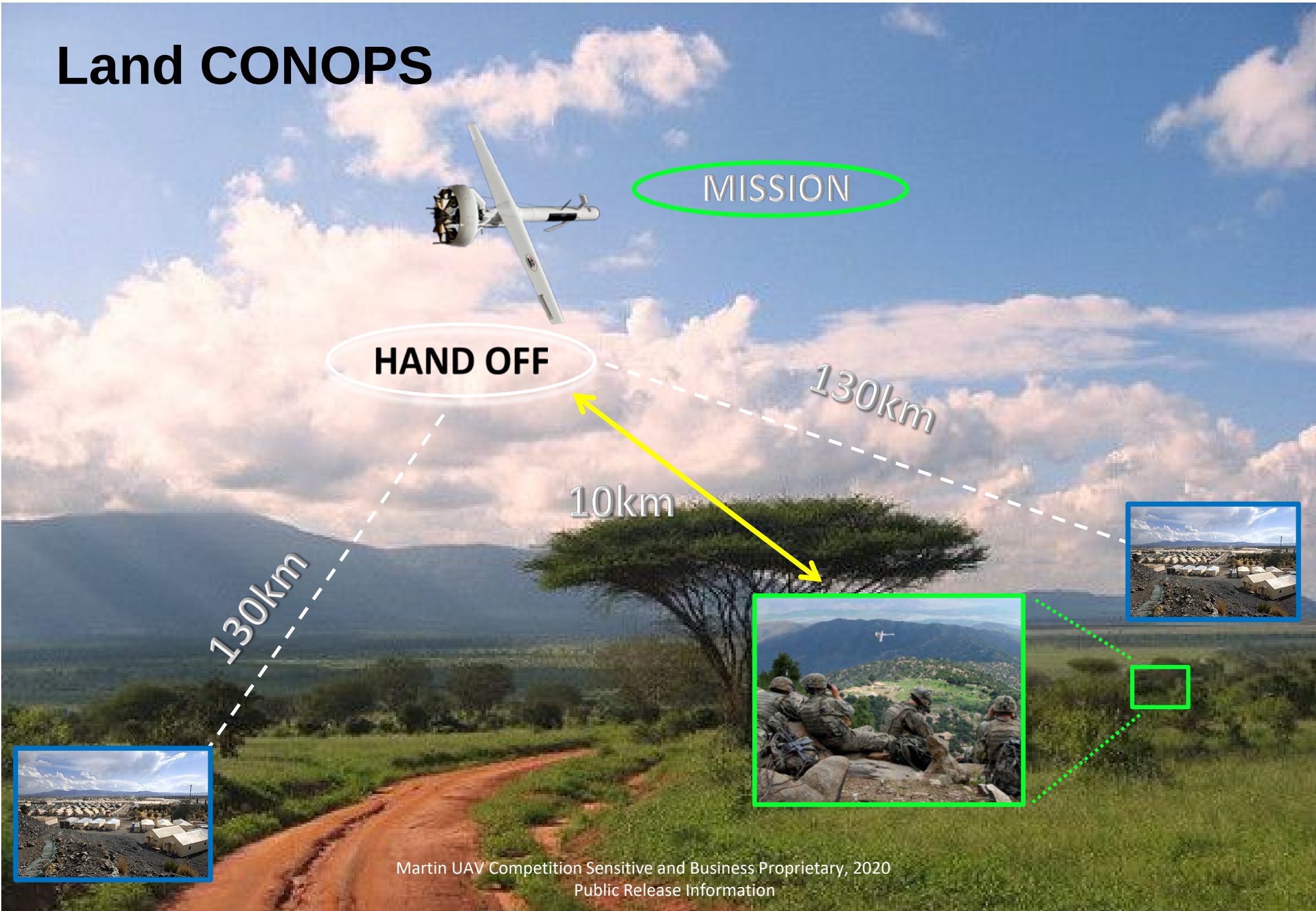
V-BAT Operational Equipment

V-BAT Air Vehicle

<u>Specifications</u>
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

<u>Performance</u>
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 wide variety of backgrounds that include international organizations in Aerospace, Defense, Civil Govt & Police, Engineering, Finance, Business, etc.

GENERAL ATOMICS
BOEING
LOCKHEED MARTIN
TEXTRON
Raytheon
NIGHT STALKERS
INSITU
MARTIN MIDSTREAM PARTNERS
L3
THE SPACESHIP COMPANY
AAI
constellis
KAMAN Aerospace
SCHIEBEL
TELEPHONICS A Griffon Company
Goldman Sachs
DynCorp INTERNATIONAL

Facilities

- 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.

Corporate Headquarters
Plano, Texas
Production, R&D Facility
Prosper, Texas

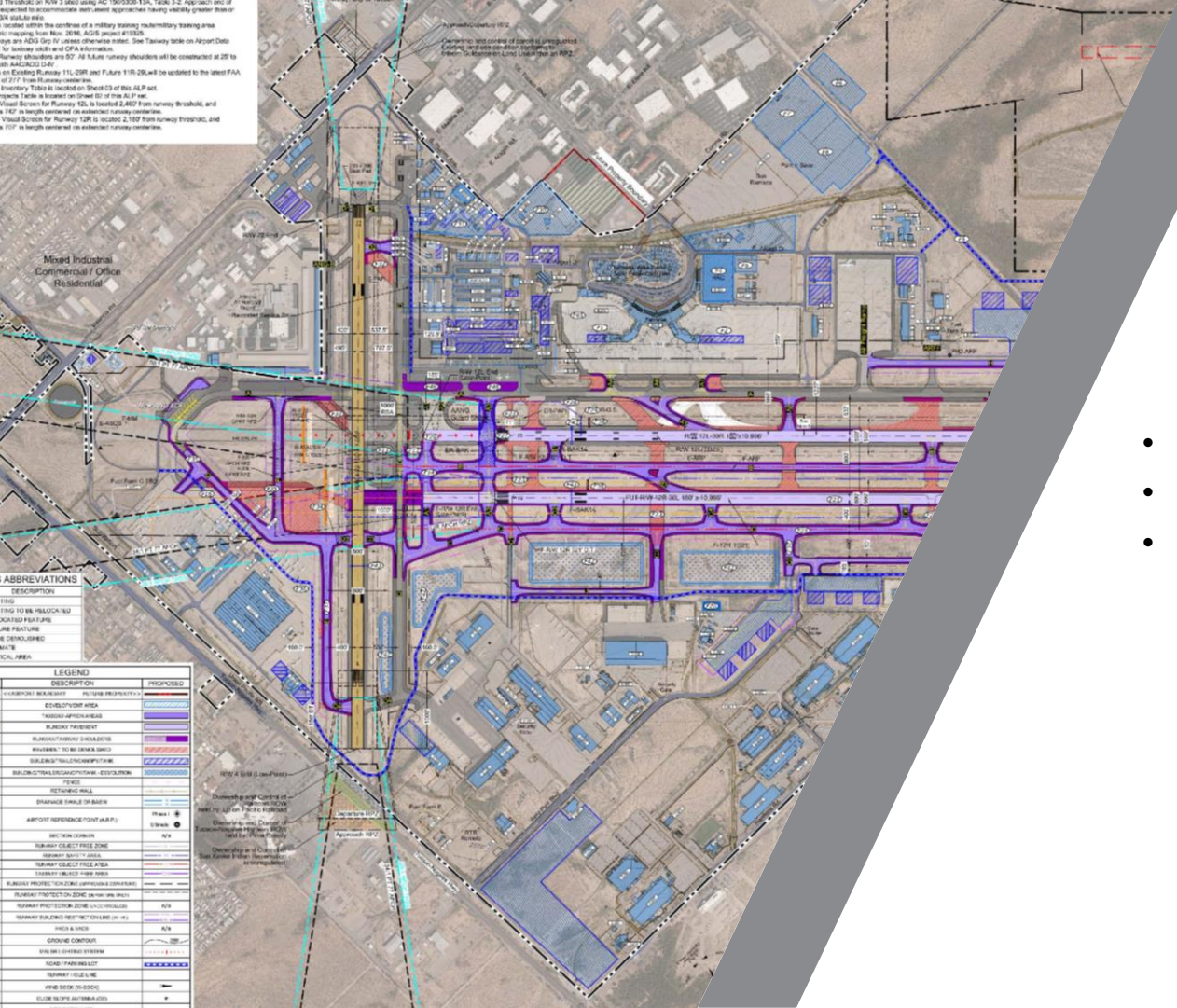
Thank You!

www.martinuav.com

WOOLPERT
ARCHITECTURE | ENGINEERING | GEOSPATIAL

ACRP 07-18: Airfield Design Guidelines for Large UAS

September 3, 2020



Topics for Today

- Project Summary & Objectives
- Research Plan Review
- Collaboration & Partners

ACRP
AIRPORT COOPERATIVE RESEARCH PROGRAM

Areas of Expertise

ARCHITECTURE

ENGINEERING

GEOSPATIAL

Woolpert at a glance.

1911

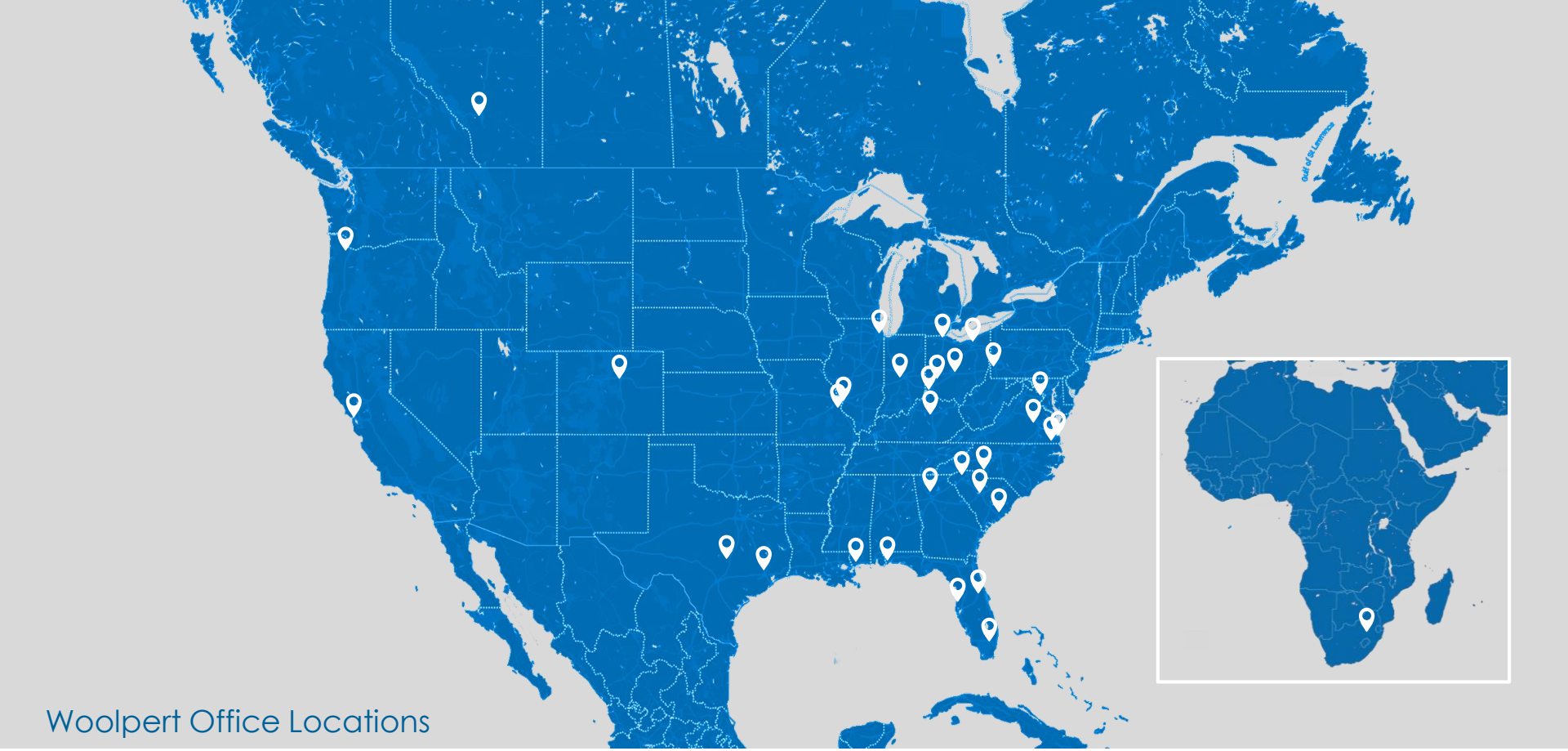
Founded in Dayton, Ohio

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

NAVFAC
Naval Facilities Engineering Command
EXWC Engineering & Expeditionary Warfare Center

SAFE SKIES

SAVANNAH HILTON HEAD INTERNATIONAL

DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

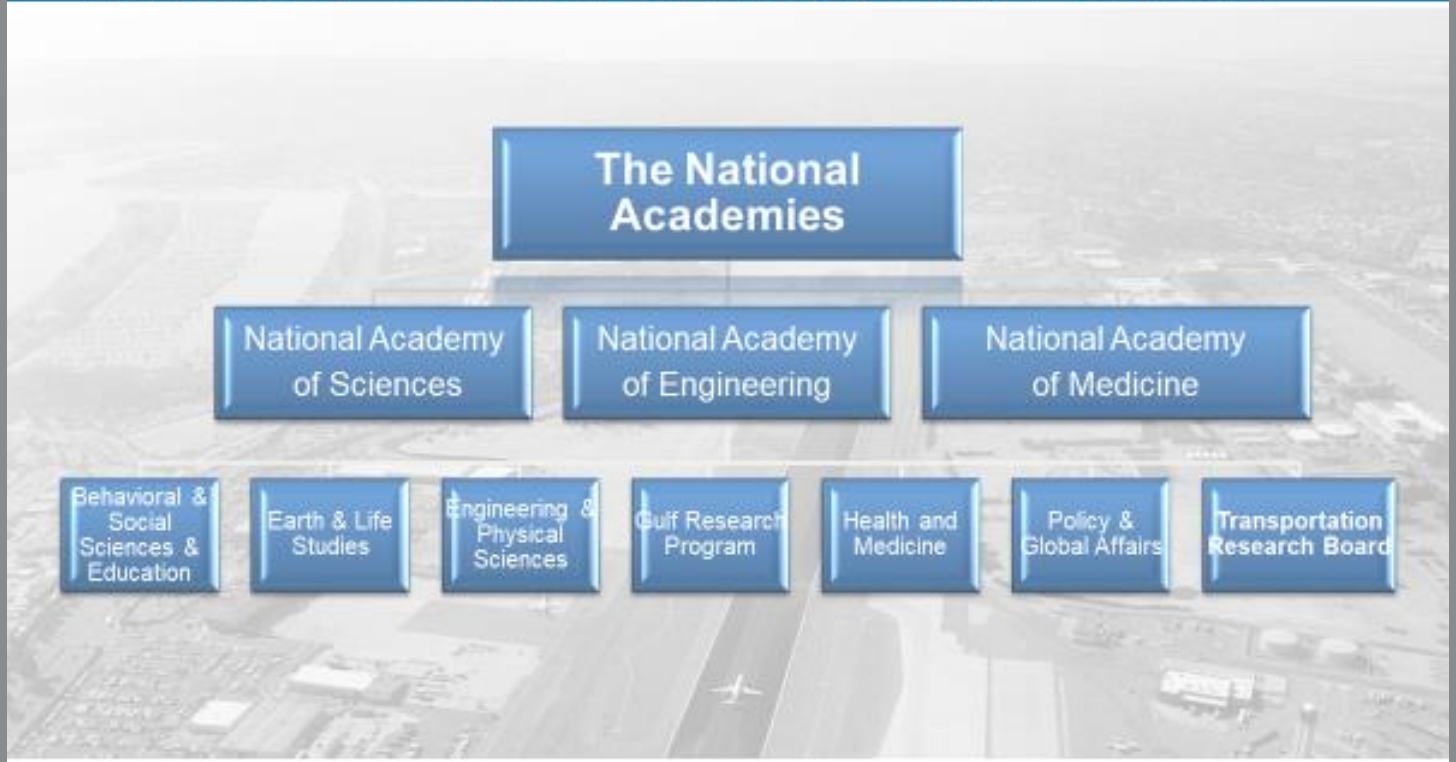
FEDERAL AVIATION ADMINISTRATION

The National Academies

The National Academies of
SCIENCES · ENGINEERING · MEDICINE
TRANSPORTATION RESEARCH BOARD

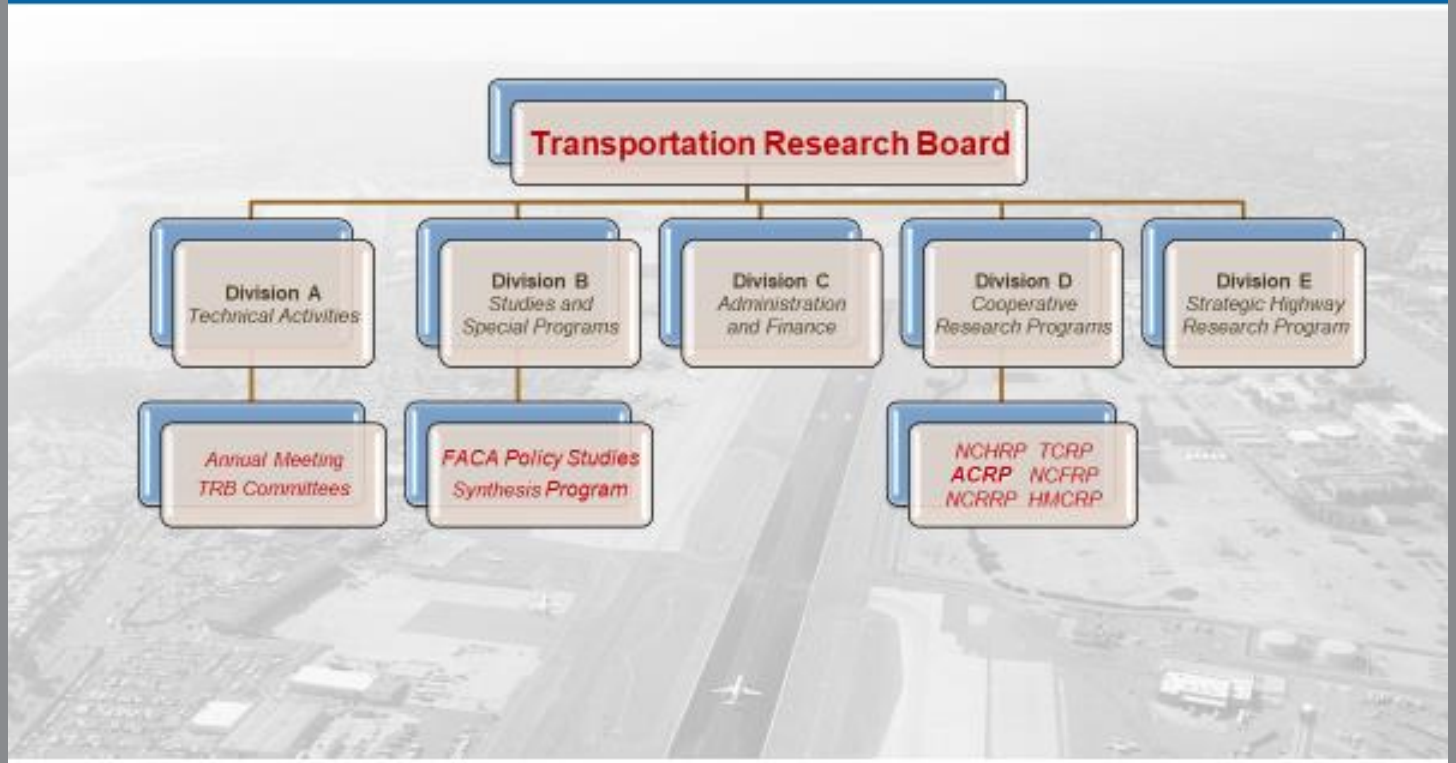
ACRP AIRPORT COOPERATIVE RESEARCH PROGRAM

Private, Nonprofit Institution
…with a mission of national service



The National Academies of
SCIENCES · ENGINEERING · MEDICINE
TRANSPORTATION RESEARCH BOARD

ACRP AIRPORT COOPERATIVE RESEARCH PROGRAM



The National Academies of
SCIENCES · ENGINEERING · MEDICINE
TRANSPORTATION RESEARCH BOARD

ACRP AIRPORT COOPERATIVE 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

Group & Existing Criteria

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.)

Airspace and Operations	
Item	**Reference**
Airspace Protection	14 CFR Part 77
Operational Safety – Construction	AC 150/5370-2
Snow Removal Operations	AC 150/5200-30
SMGCS	AC 150/5340-30

Emergency Response/Operations	
Item	**Reference**
ARFF Building	AC 150/5210-15
ARFF Equipment – DEVS	AC 150/5220-10
ARFF Equipment – Clothing	AC 150/5210-14
ARFF Vehicle – Small Dual Agent	AC 150/5220-10
ARFF Vehicle	AC 150/5220-10

Group & Existing Criteria

Airfield Surface Infrastructure	
Item	**Reference**
Airport Design	AC 150/5300-13A
Airport Marking	AC 150/5340-1
Airport Signage	AC 150/5340-18
Apron	AC 150/5300-13 (Appendix 5)
Deicing Facilities	AC 150/5300-14
EMAS Arresting System	AC 150/5220-22
Geospatial Data Submissions	AC 150/5300-18B
Pavement Design	AC 150/5320-6
Pavement Management System	AC 150/5380-7
Runway Length Requirements	AC 150/5325-4
Runway Thresholds	AC 150/5300-13 (Appendix 2)
Wind Analysis	AC 150/5300-13 (Appendix 1)
Wind Cones	AC 150/5340-30
Windrose	AC 150/5300-13 (Appendices 1, 11)

Group & Existing Criteria

Airspace and Operations	
Item	**Reference**
Airspace Protection	14 CFR Part 77
Operational Safety – Construction	AC 150/5370-2
Snow Removal Operations	AC 150/5200-30
SMGCS	AC 150/5340-30

Emergency Response/Operations	
Item	**Reference**
ARFF Building	AC 150/5210-15
ARFF Equipment – DEVS	AC 150/5220-10
ARFF Equipment – Clothing	AC 150/5210-14
ARFF Vehicle – Small Dual Agent	AC 150/5220-10
ARFF Vehicle	AC 150/5220-10

Airfield Navigation/Comm/Technology	
Item	**Reference**
ADS-B Squitters	AC 150/5220-26
Airport Lighting - Runway/Taxiway	AC 150/5340-30
Airport Lighting - Runway Centerline	AC 150/5340-30
Airport Lighting - Radio Control	AC 150/5340-30
AWOS	AC 150/5220-16
Beacons	AC 150/5340-30
Land and Hold Short Lighting	AC 150/5340-30
PAPI	AC 150/5345-28
REIL	AC 150/5340-30
Runway Surface Monitors	AC 150/5200-30
VASI	AC 150/5340-30

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		
○ Literature and Existing Research		
○ Technology Studies		
○ Stakeholder Engagements	+5 months	Sept 2020
• Task 3: Interim Report	+7 months	Nov 2020

Phase2

• 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

Faith Group

Thomas Mackie, PS

Vice President

Aviation Program Director

thomas.mackie@woolpert.com

937.531.1877

ARVIKA

Universal Aerial Solutions

ARVIKA AERIAL TECH Inc.

Keeping Our Communities Safe

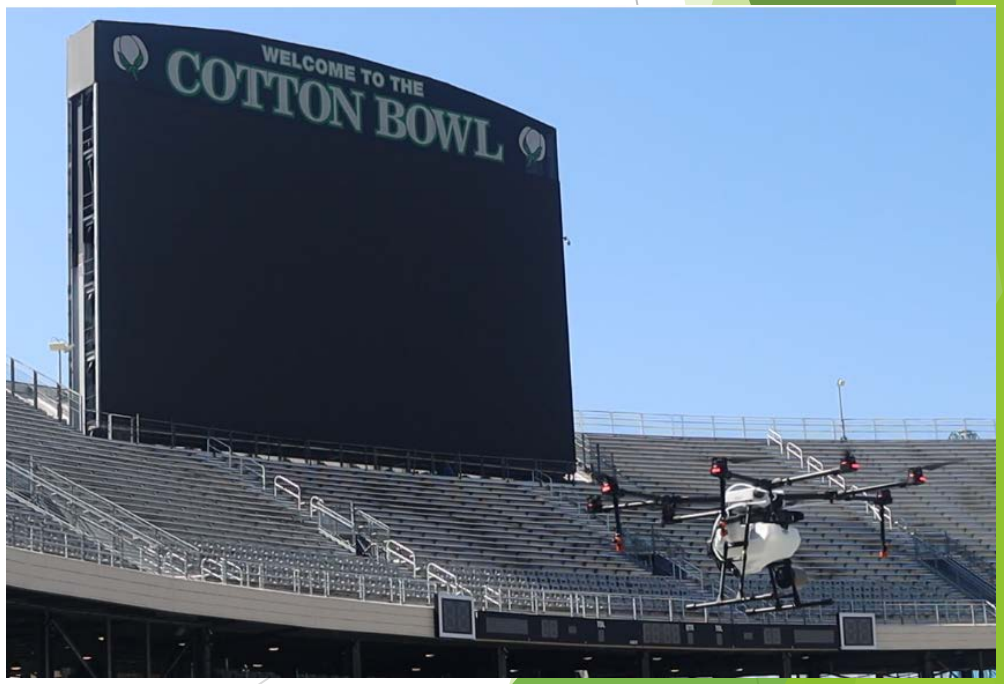
“Universal Aerial Solutions for Today and Tomorrow”

ARVIKA

Universal Aerial Solutions

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



ARVIKA

Universal Aerial Solutions

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.

ARVIKA

Universal Aerial Solutions

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

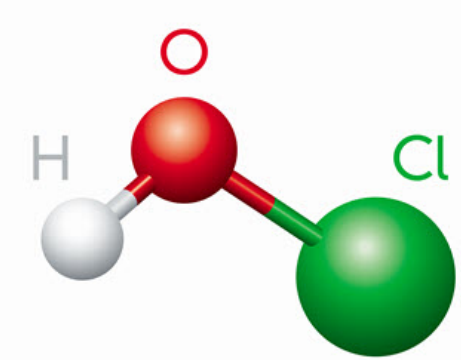
ARVIKA

Universal Aerial Solutions

Arvika Aerial's Tools

sUAS - AGRAS MG-1P

Disinfectant



Hypochlorous Acid

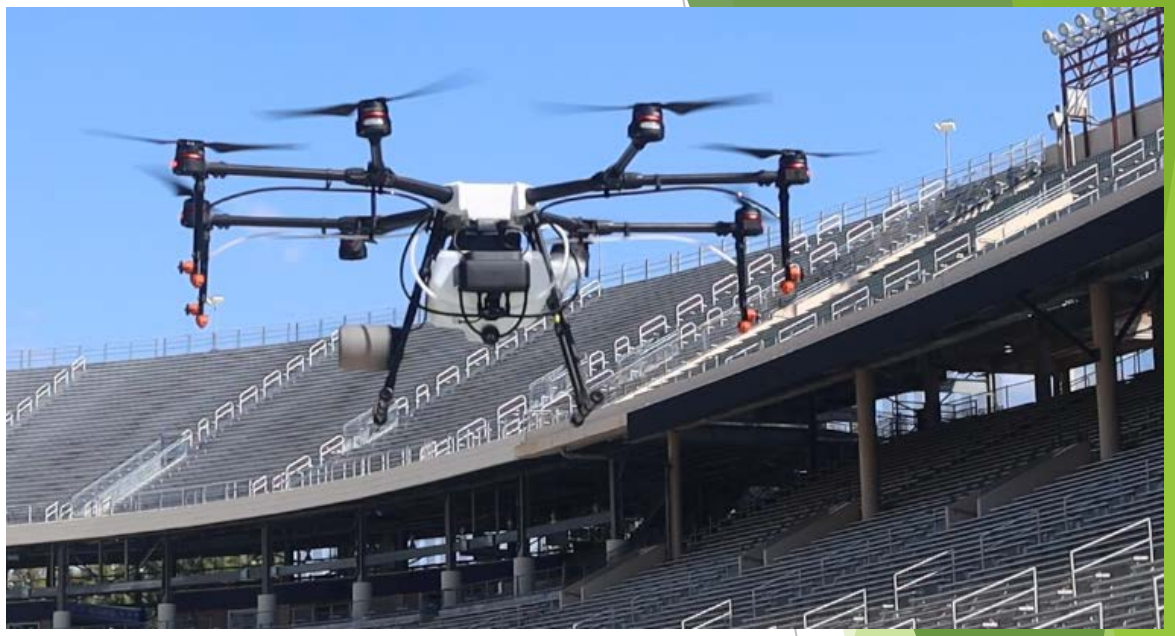
Pre/Post Site Testing

ARVIKA

Universal Aerial Solutions

AGRAS MG-1P

- 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.



ARVIKA

Universal Aerial Solutions

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

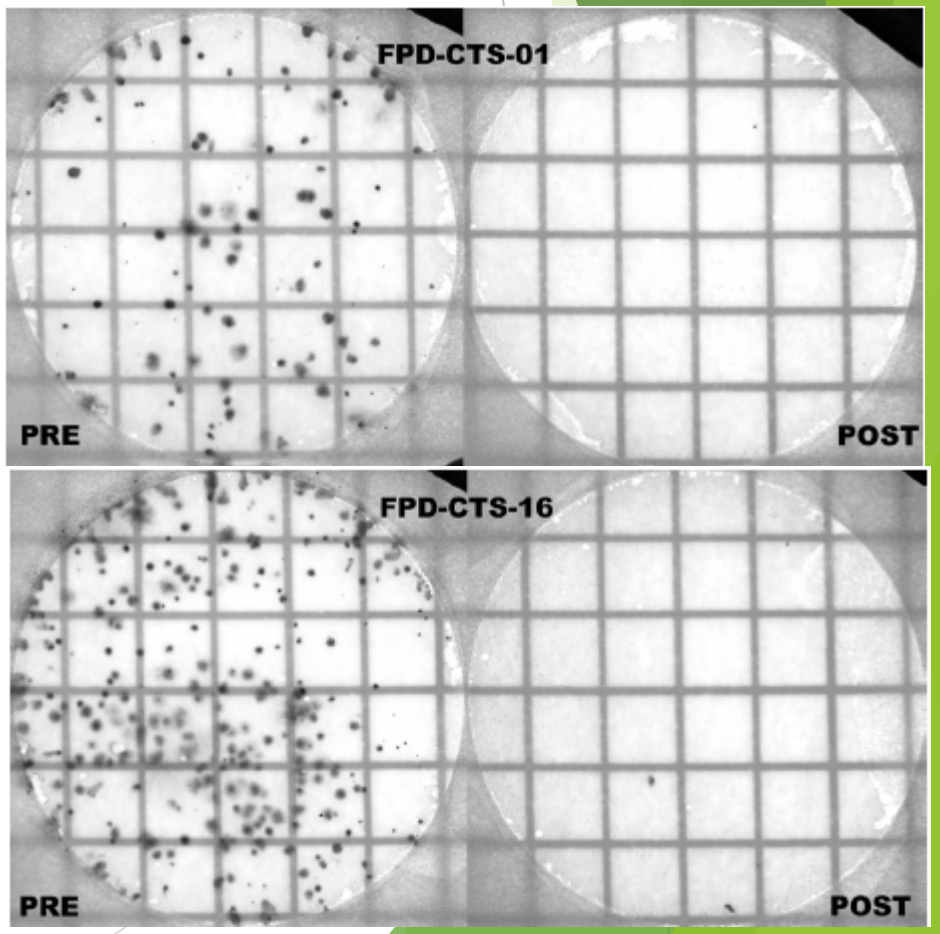
ARVIKA

Universal Aerial Solutions

Testing

- 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.

Samples from Cotton Bowl Testing



ARVIKA
Universal Aerial Solutions

Arvika Next Steps

- 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.

ARVIKA

Universal Aerial Solutions

Questions?

Paul Woessner – 830-584-7972 – Paul.Woessner@vt-aaa.com

Kyle Beebe – 830-584-7974 – Kyle.Beebe@vt-aaa.com

2020

global air media

GLOBAL AIR DRONE ACADEMY

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

IN COLLBORATION WITH

FEDERAL AVIATION ADMINISTRATION

NIGERIAN CIVIL AVIATION AUTHORITY NCAA

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


@GADRONEACADEMY
@WHEREISENO

OUTLINE

- Introduction
- History of GADA
- Our Curriculum
- GADA Africa


AFRICAN DRONE FORUM
RWANDA 2020
Date: 06/02/2020
For AFRICA DRONE BUSINESS CHALLENGE

ABOUT US

- Based in Baltimore, USA
- Workshops in 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!

UAE

COACH T

BALTIMORE

COACH JEB

LONDON

COACH VIC

WASHINGTON D.C.

COACH JESS

LAGOS

COACH TOBI

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

GLOBAL AIR
DRONE ACADEMY

DRONE CAMP IN-A-BOX

step 1

ORDER YOUR
DRONE CAMP IN-A-BOX
AT GADACADEMY.ORG

step 2

SIGN UP FOR ONE OF OUR
LIVE VIRTUAL CAMP SESSIONS

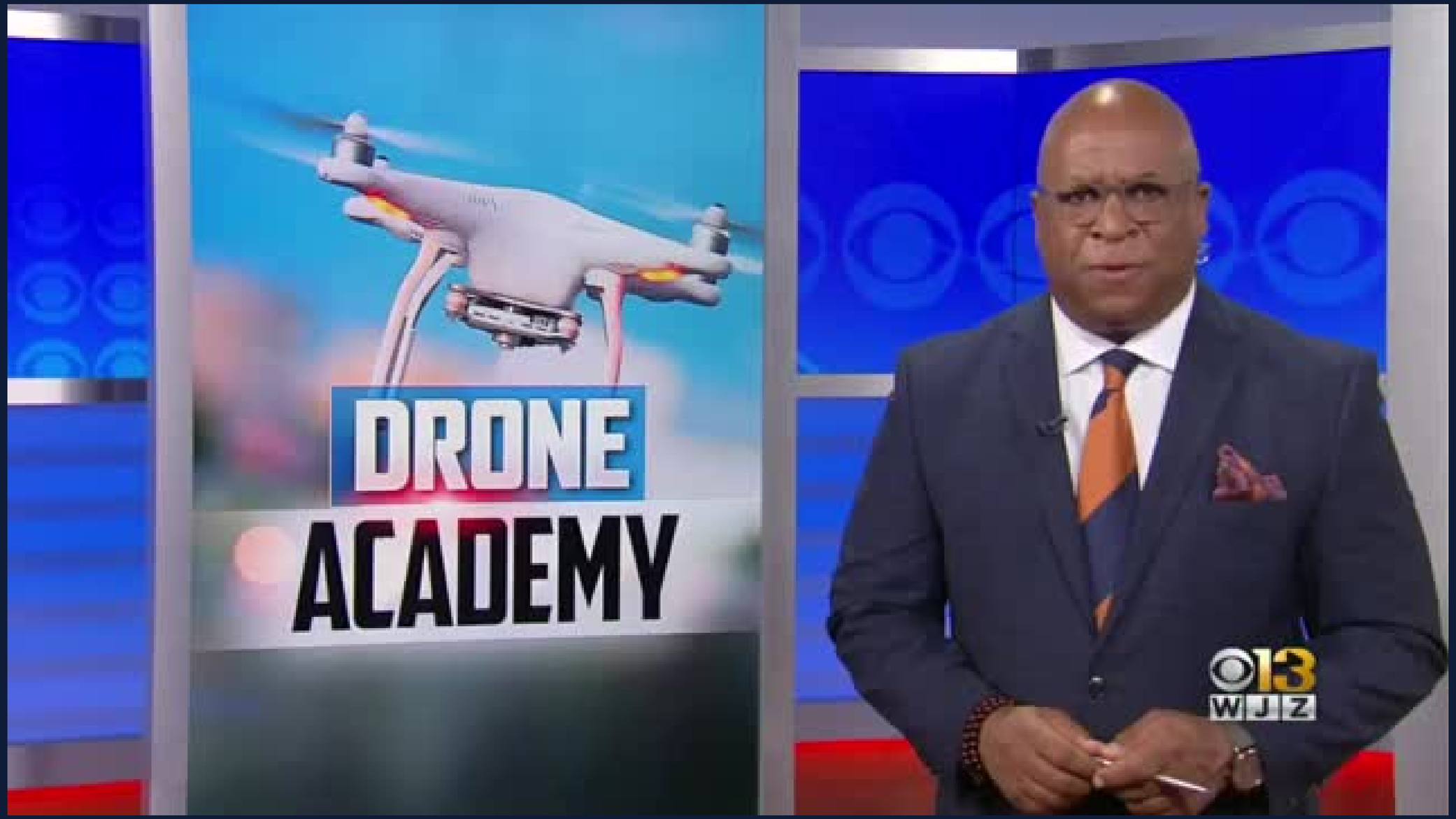
step 3

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

step 4

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

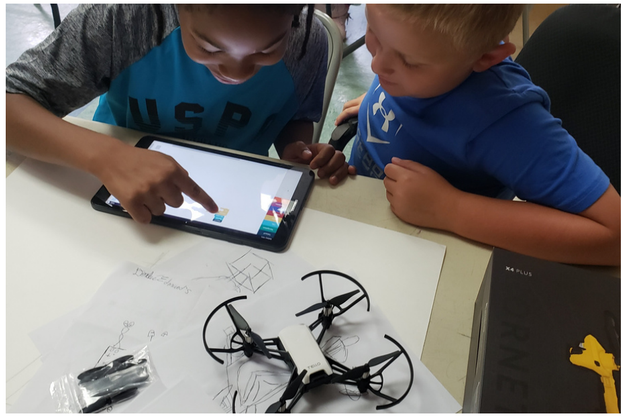
QUESTIONS? CONTACT US AT INFO@GADACADEMY.ORG


DRONE
ACADEMY
13
WJZ

DRONE BUILDING

UNVERSITY AND ADULT TRAINING

HANDS-ON STEAM ACTIVITIES

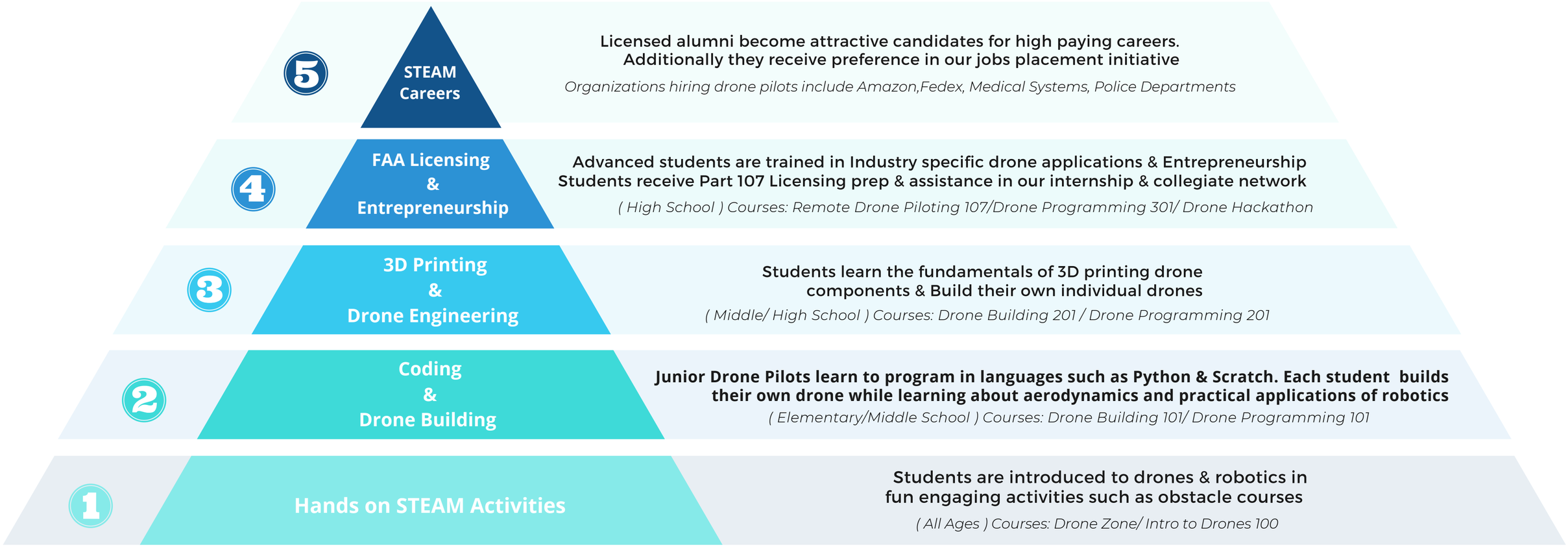


DRONE CODING/PROGRAMMING

PROFESSIONAL DEVELOPMENT

ENTREPRENEURSHIP WORKSHOPS

JUNIOR DRONE PILOT PIPELINE



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

*Parnership with CAA to offer professional training

AFRICAN DRONE FORUM
LAKE KIVU CHALLENGE

FEBRUARY 2020 | KIGALI, RWANDA

Accelerating new, clean and safe infrastructure models

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.

African Drone Business Challenge