

Unmanned Aerial Solution

for Firefighting

- Runway independent
- Certified for civilian airspace
- Long Endurance
- High Resolution Sensors with advanced Analytics



Mission Sensors & Analytics

Operational Environment



The Pain



The Cost of Wildfires in the United States is estimated between \$394 billion to \$893 billion each year*



^{*} The range was calculated by combining estimates from the costs related to property damage, direct and indirect deaths and injuries, health impacts from wildfire smoke, income loss, watershed pollution etc.



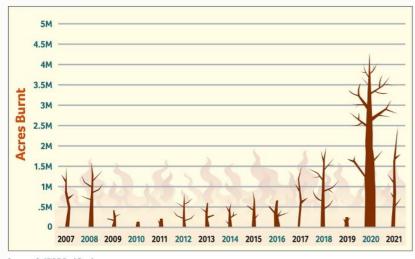
In California



California's cumulative spending on firefighting efforts and disaster relief over the past decade is estimated to be around \$35 billion.

Total cost of wildfires in California between 2017 and 2021 was \$117.4 billion.

Acres Burned Annually In California (2007-2021)



Source: CalFIRE Red Books





The Camp Fire (California)





- Approx. 153,336 acres of burned area
- 89 people perished
- Damage of 16.5b\$
- More than 18,800 destroyed structures
- Heavy air pollution
- Long-term **natural damage**



In California in 2024





INCIDENTS

PREVENT

PREPARE

OUR IMPACT

WHAT WE DO 💙

JOIN US

Search incidents and safety information

SEARCH

Home > Incidents > 2024

2024 Incident Archive

421,412

Total Emergency
Responses

6,045

Wildfires

906,013

Acres Burned

1

Fatalities:

1 Civilian / 0 Firefighter

1,248

Structures:

145 Damaged / 1,103 Destroyed



The Smokehouse Creek Fire (Texas)





- Approx. 1,058,482 acres of burned area
- 2 people perished
- Damage of 4,600,570\$
- At least 11,000 people were left without power
- More than 130 houses were destroyed
- Heavy air pollution
- Long-term **natural damage**



Firefighting Operational Challenges



24/7 Monitoring during
Hot Seasons

Early Detection

Availability of Advanced Detection Systems

Climate and Weather Conditions

Coordination Between Agencies

Real-time Aerial Support

Fast Aerial Response

Access to Remote Areas

Essential Supplies Delivery



Our Solution







ROC VTOL UAS



- A Certified 150 kg / 330 lbs. VTOL UAV for flight in Civilian airspace
- Up to 40 kg / 90 lbs. of Payload, above 20 hrs. of endurance
- End to end operation by a 2-man crew

- Fast response and availability 24/7
- Integration to existing eco-systems
- Early fire detection, during Day and Night
- Ability to direct forces





Integration of an Unmanned Array

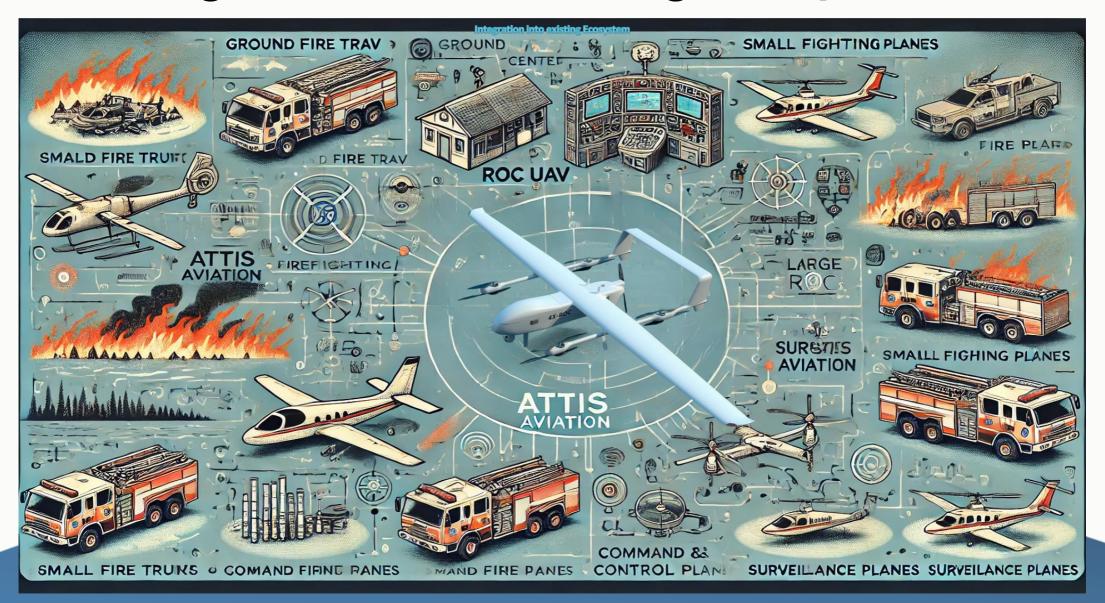






Integration into existing Ecosystem







ROC VTOL UAS





https://www.youtube.com/watch?v=IuPBvVLzndY





Project Background

Grant Award

Department of Energy Vehicle Technologies Office Program-Wide Funding Opportunity

- Open topic for project demonstration and deployment
- \$708,182 awarded to City of Arlington

Activities

- Pilot program testing and documenting the efficiency and scalability of using drones to serve food to residents in need
- Public education and outreach on the implementation autonomous vehicles and aerial drones
- Reduce greenhouse gas emissions by using autonomous, electric vehicles

Partners



















Demonstration #1

September 9th - 13th

Completed 139 scheduled deliveries

Average 27 packages per day

Received 40+ service feedback surveys











Project Timeline Update

FY2024 Q4

Project Cost Model

FY2025 Q1

Analysis of Demonstration #1 Real-World Demonstration #2 FY2025 Q2/Q3

Analysis of
Demonstration #2
Develop Scalability
Outline







Contact Us



Ernest Huffman Program Manager ehuffman@nctcog.org



Lori Clark
Senior Program Manager
& DFWCC Director
Iclark@nctcog.org



Bradley LeCureux Air Quality Planner blecureux@nctcog.org





dfwcleancities.org



cleancities@nctcog.org









SOLUTIONS

FOR THE UAS WORKFORCE





Eliminating Barriers in Aerospace with Drones (20 Min)



ABOUT USI

THE LEADERS IN UAS WORKFORCE DEVELOPMENT SINCE 2014

USI exists to define, promote and support the best practices for UAS operations starting with the industry's current and future workforce through complex applications of UAS operations in any market sector around the globe.

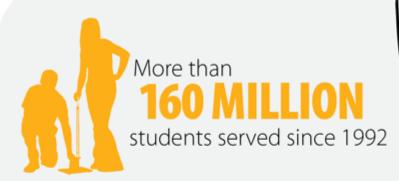




ABOUT PITSCO

POSITIVELY AFFECTING LEARNERS SINCE 1971





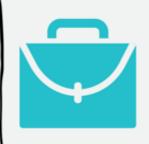


Since 2005, we have provided curriculum professional development for **7,800+** educators.





44% of our customers have been customers since **2000** or **before!**



1,016

different careers to explore within our curriculum





TRADITIONAL AEROSPACE CAREER FIELDS

"Transportation and Logistics" CTE Cluster

Pilot	Technic

- Part 141
- Part 61

cian

- Part 147
- AET

Engineering

• 2 & 4 Yr Degrees

Business and Management

• 2 & 4 Yr Degrees

Air Traffic Control

- FAA CTI
- 2 & 4 Yr Degrees

Weather

• 4 Yr Degrees

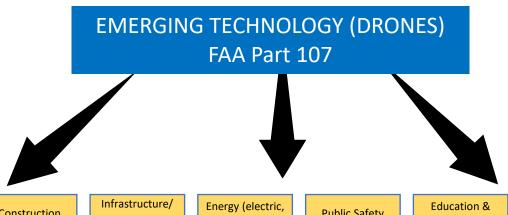
Dispatch

FAA Dispatch



AEROSPACE CAREER FIELD ACCESS

EXPANDED USE OF AEROSPACE ASSETS IN ALL CTE CLUSTERS



Agriculture

Arts, A/V Technology

Marketing

Construction

Telecomm

water, gas)

Public Safety

Training

Transportation & Logistics

STEM

Manufacturing

Tourism

Pilot

- Part 141
- Part 61

Technician

- Part 147
- AET

Engineering

• 2 & 4 Yr Degrees

Business and Management

• 2 & 4 Yr Degrees

Air Traffic Control

- FAA CTI
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Weather

• 4 Yr Degrees

Dispatch

• FAA Dispatch



AEROSPACE CONTINUUM

ENGAGE STUDENTS EARLIER, WHERE THEIR INTERESTS ARE

USI/PITSCO Partnered Curriculum Offering (Articulation, Dual Enrollment, Concurrent Enrollment Options)

Technical/Community **High School Employment & Career** Elementary Middle School University College •Part 107 Prep Third party proctored •USI Part 107 Prep Part 107 Prep •Design, Build, and Fly •Fly and Code out of the Box certification-based Optional Primary Primary Certification Track Primary Certification Track standardization Certification Track Optional Advanced Track Advanced Certification Track USI/PITSCO Partnered Hardware/Software Based Engagement Offering Technical/Community **High School** Elementary Middle School University **Employment & Career** College

Drone Maker Kit

- Drone Maker Kit
- •Echo Drone

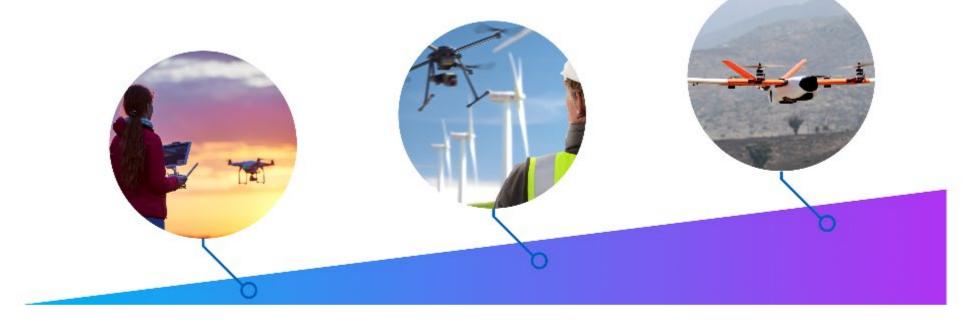
- Echo Drone
- •Tetrix®
- Arduino Student Kit
- Zephyr Simulation

- •Echo Drone
- •Tetrix®
- Arduino Student Kit
- Zephyr Simulation
- Commercial Grade Drones

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BUILDING A WORKFORCEFOR A COMPLEX INDUSTRY



BASIC OPERATIONS

Consumer electronics, Lowest air and ground risk, Requires some skills, Independent operators

PRIMARY OPERATIONS

Visual Line-of-Sight, Lower air and ground risk, Requires psychomotor skills, Companies operating under 14 CFR Part 107

ADVANCED OPERATIONS

Beyond Visual Line-of-Sight, Higher ground and air risk, Programmed flight paths, 14 CFR Part 135 operations



PROFESSIONAL CERTIFICATION

STANDARDS BASED WORKFORCE DEVELOPMENT











Meets ASTM International standard for training Remote Pilot in Command of Unmanned Aircraft Systems



From the beginning, USI has partnered with aviation insurance underwriters to promote best practices in safety. Currently, USI is a proud member of USAIG's Performance Vector program.



PRIMARY PATHWAY THIRD PARTY VALIDATED COMPETENCY

Entry Level Certification

Knowledge-Based Industry Certifications

Skill-Based Certification

Professional Designation



REMOTE PILOT CERTIFICATE

Aeronautics

- > Aviation Regulations
- > Weather
- Airspace
- > Airport Operations
- ▶ Reliability
- ▷ Performance



Systems Architecture

- D Air Vehicles
- > Aerodynamics
- > Performance
- Data Links
- ▶ Payloads



sUAS Maintenance

- Cycles & Checklists
- ⊳Inventory &Tools
- ⇒ General MX Actions
- ▷ Electronics & Firmware
- Calibration & Testing



Mission Planning

- > Area Assessments
- Site Surveys
- > Transportation
- Decision Making
- > Professionalism
- > Record Keeping



Flight Training

- > System Orientation
- >Planning
- >Servicing
- > Procedures
- > Flight Path Management
- > Emergencies







ADVANCED PATHWAY

FLYING BEYOND LINE OF SIGHT

Entry Level Certification

Primary Knowledge-Based Industry Certifications



REMOTE PILOT CERTIFICATE

iusir

CERTIFIED

LEVEL 1

ADVANCED UNMANNED SAFETY

Aeronautics

- > Aviation Regulations
- > Weather
- > Airspace
- ▶ Airport Operations
- ▶ Reliability
- ▶ Performance



Systems Architecture

- > Air Vehicles
- ▶ Aerodynamics
- > Performance
- Data Links
- Control Stations ▶ Payloads



Maintenance

- MX Programs
- ▷ Cycles & Checklists
- ▷ Inventory & Tools
- ▶ General MX Actions
- ⊳ Electronics & Firmware
- Calibration & Testing



Mission Planning

- > Area Assessments
- Site Surveys
- ⊳Transportation
- Decision Making
- > Professionalism
- ▶ Record Keeping

Advanced Knowledge-Based Industry Certifications



Skill-Based Certification



Human Factors

- > Crew Functions
- ▶ Training
- > Human Factors
- D Machine Interaction
- I> CRM & TEM
- Decision Making



Safety Management

- > Accident Causation
- D Safety Policy
- ⇒ Risk Management
- Diguality & Assurance
- ▷ Promotion
- Safety Culture



Advanced Planning

- Data Link Planning
- ▶ Risk Mitigation
- ⇒Waypoint Navigation
- ▷ Guidance & Control
- □ Ground Safety
- D System Performance



Advanced Operations

- > Advanced Systems
- Diata Links
- Detect & Avoid
- □ Guidance & Control
- Ground Safety
- □ Traffic Awareness

Professional Designation







ADDENDUMS

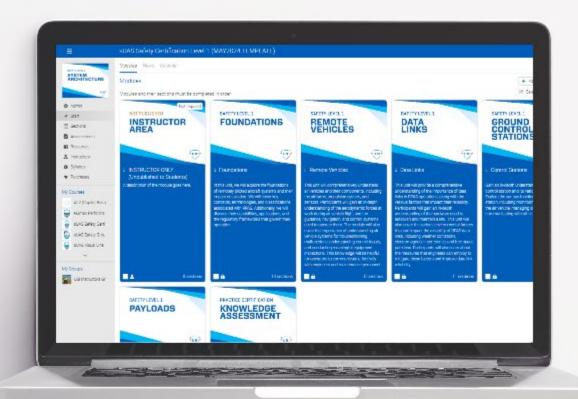
Product Alignment Detail and Delivery

- USI Delivery Options
 - Authorized Training Provider through Train the Trainer
 - UAS Center of Excellence with USI Staff Member Onsite
 - USI Virtual Instruction
- USI/Pitsco Program Packages
- USI Train the Trainer
 - Primary Instructor
 - Advanced Instructor
- Pitsco Drone Products



MULTIPLE DELIVERY OPTIONS

TO SERVE YOUR NEEDS









LF DIRECTED (

CUSTOMER LED

TAUGHT BY USI

OUR COURSES

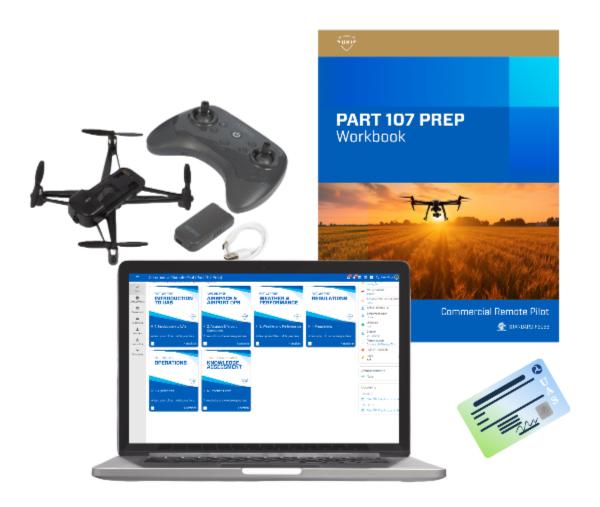
- > ORIGINAL BODY OF KNOWLEDGE
- > WORKBOOKS (PHYSICAL OR DIGITAL)
- > PRESENTATIONS COVERING KEY CONCEPTS
- > ELABORATION EXERCISES TO ENGAGE LEARNERS
- > MULTIPLE ASSESSMENTS
- DEDICATED CUSTOMER SUCCESS TEAM



PACKAGE A

REMOTE PILOT PREPARATION

- Option 1: Digital access to the online course with videos, elaboration exercises, and practice questions.
- Option 2: Physical workbook for each student and digital access to the online course with videos, elaboration exercises, and practice questions. This option includes Zephyr Simulation with a physical handheld controller and simulation exercises.
- Option 3 (depicted): PITSCO Echo Indoor Drones with curriculum guide, physical workbooks for each student, and digital access to the online course with videos, elaboration exercises, and practice questions.

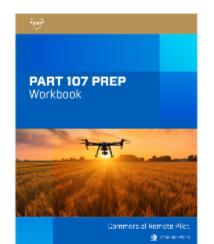


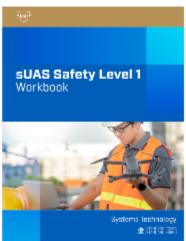


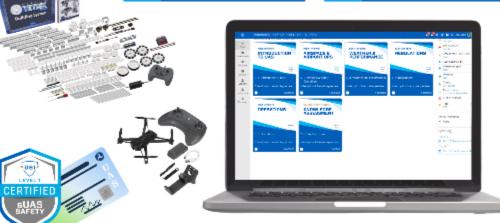
PACKAGE B

SYSTEMS & TECHNOLOGY

- Option 1: Online course with videos, elaboration exercises, practice questions, and a third-party proctored certification exam.
- Option 2: Course with a physical workbook and digital access to the online course with videos, elaboration exercises, practice questions, and a third-party proctored certification exam. This option includes Zephyr Simulation with a physical handheld controller and simulation exercises.
- Option 3 (depicted): Curriculum guide, PITSCO Tetrix®
 Robotics Kit with curriculum guide, two physical workbooks
 for each student, and digital access to the online course
 with videos, elaboration exercises, assessments, and a
 third-party proctored certification exam.









PACKAGE C

MAINTENANCE TECHNICIAN

- Option 1: Three online courses with videos, elaboration exercises, practice questions, and third-party proctored certification exams.
- Option 2: Three courses with physical workbooks and digital access to the online courses with videos, elaboration exercises, practice questions, and third-party proctored certification exams. This option includes Zephyr Simulation with a physical handheld controller and simulation exercises.
- Option 3 (depicted): PITSCO Echo Indoor Drones with curriculum guide, PITSCO Tetrix® Robotics Kit with curriculum guide, Arduino Student Kit for each student, three physical workbooks for each student, and digital access to the online courses with videos, elaboration exercises, assessments, and third-party proctored certification exams.





PACKAGE D

PROFESSIONAL REMOTE OPERATOR

- Option 1: Four online courses with videos, elaboration exercises, practice questions, and third-party proctored certification exams, as well as a digital flight record for each student. Instructors will receive training and a Training Course Outline to enable quality training at their school. Schools must also purchase outdoor UAS that meet the training requirements and the supplies to run a flight line safely.
- Option 2: Four online courses with physical workbooks and digital access to the content with videos, elaboration exercises, practice questions, and third-party proctored certification exams. This option includes Zephyr Simulation with a physical handheld controller and simulation exercises. Instructors will receive training and a Training Course Outline to enable quality training at their school. Schools must also purchase outdoor UAS that meet the training requirements and the supplies to run a flight line safely.
- Option 3 (depicted): Outdoor Drones, NIST Buckets, Safety Kit, PITSCO Echo Indoor Drones with curriculum guide, PITSCO Tetrix® Robotics Kit with curriculum guide, Arduino Student Kits for each student, four physical workbooks for each student, and digital access to the online courses with videos, elaboration exercises, assessments, and third-party proctored certification exams.





TEACHER PROFESSIONAL DEVELOPMENT

PACKAGE D

Teachers will be enrolled in the Online **Professional Remote Operator Pathway**, A USI virtual instructor presents on difficult topics weekly and is available to answer all questions.

Once teachers have completed the online content and passed the proctored exams, they will move to the **in-person flight line**. Teachers can expect to spend 3 days learning to fly and administer the training course outline.

Upon completing the entire pathway, the teacher will be designated as a USI Certified Flight Instructor.

The USI Flight Instructor Certification requires standardization, which occurs on a biennial basis at USI.













TEACHER PROFESSIONAL DEVELOPMENT

ALL OTHER PACKAGES

Teachers will be enrolled in online versions of the classes they will teach.

Upon completing each course, the teacher will be required to pass a proctored certification exam (not required for Package A).

Teachers will also be enrolled in **USI's educator course**, which is designed to familiarize them with our Learning Management System and provides access to **quarterly live educator info sessions**.

Both sUAS Safety Level 1 Certification and sUAS Safety Level 2 Certification requires re-certification every two years, which is completed online via the USI Learning Management System.







Industry Accepted Qualifications

QUALIFIERS: Operational & System Complexity	BASIC Civil Aviation Authority Minimum	PRIMARY VLOS OPERATIONS Aircraft <20 lbs Lower Risk Operations Some Manual Control	ADVANCED BVLOS OPERATIONS Aircraft >20 lbs Higher Risk Operations Higher Levels of Automation
AVAILABLE CERTIFICATION PREP COURSES	Commercial Remote Pilot Course	UAS Technology Course UAS Maintenance Course UAS Mission Planning Course UAS Flight Operations Course	Human Factors in UAS Course UAS Safety Management Course Advanced Mission Planning Course Advanced UAS Flight Operations Course
INDUSTRY SAFETY CERTIFICATIONS (DIGITAL BADGES)	None	LEVEL 1 SUAS SAFETY LEVEL 2 SUAS SAFETY LEVEL 2 SUAS SAFETY SUAS	LEVEL 1 ADVANCED ORACIE ORA
PROFESSIONAL DESIGNATIONS (DIGITAL BADGES)	CHANGE OF REMOTE OF	REMOTE OPERATOR	REMOTE OPERATOR



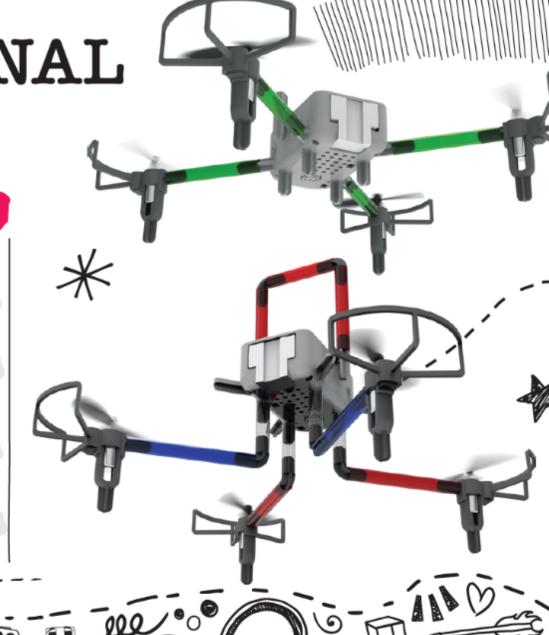




DRONES AND NATIONAL CAREER CLUSTERS

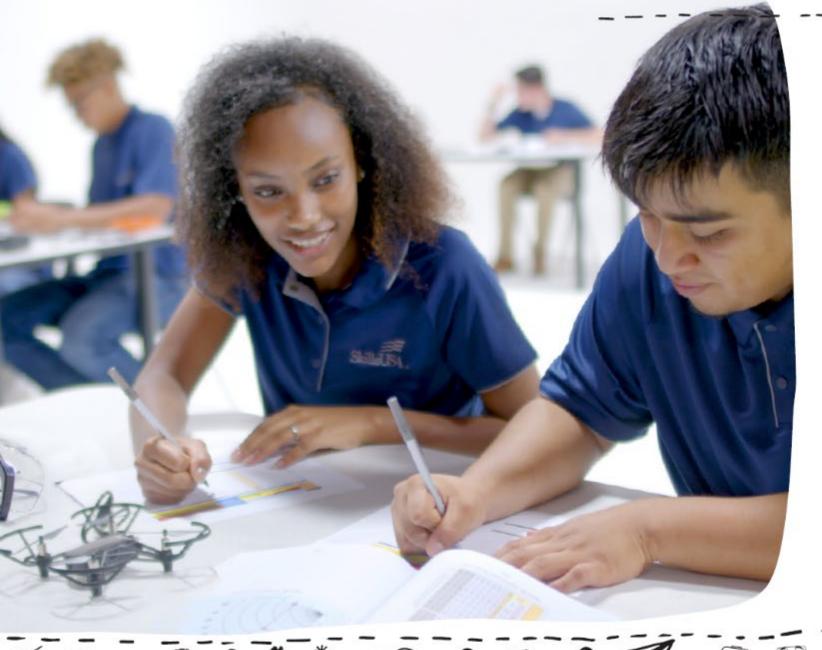
National Career Clusters

Agriculture		Hospitality & Tourism	~
Architecture & Construction		Human Services	
Arts, A/V Tech, & Communication		Information Technology	~
Business Management & Admin		Law, Public Safety, & Security	V
Education & Training		Manufacturing	~
Finance		Marketing	V
Government & Public Admin		Science, Tech, Engineering, & Math	V
Health Science		Transportation, Distribution, & Logistics	V
	1		l









OUR GOAL

To make it easy for teachers to bring hands-on STEM into the classroom and to arm students with the transferable, future-ready skills that will last a lifetime. The result: Learners who are college, career, and citizen ready.









DESIGN, BUILD, AND FLY





- Work through the engineering design process to customize your own drone using the Drone Maker Kit.
- Teach the basics of engineering and aviation through drone flight.
- Great for classrooms, clubs, after school, STEAM nights, at home, or just for fun!



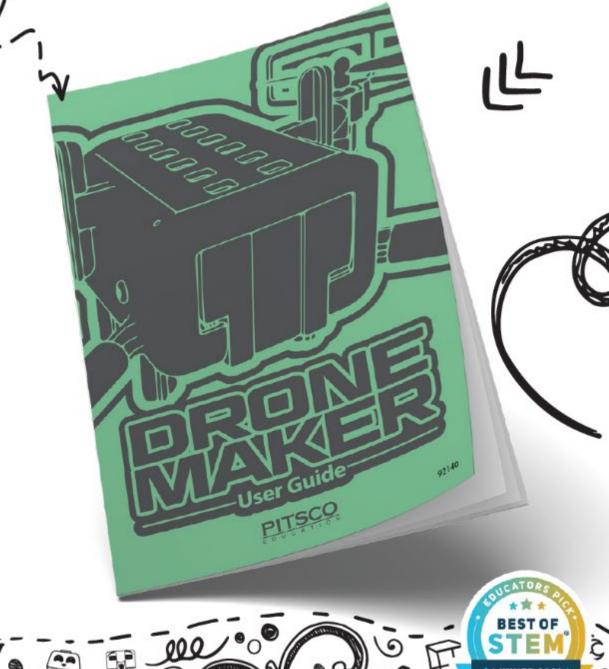




THE CURRICULUM

Drone Maker User Guide

- Walks through assembly methods
- Teaches basics of drone flight
- Introduces essential aviation vocabulary
- Provides beginner flight activity and engineering extensions
- Is included in kit and available for free download

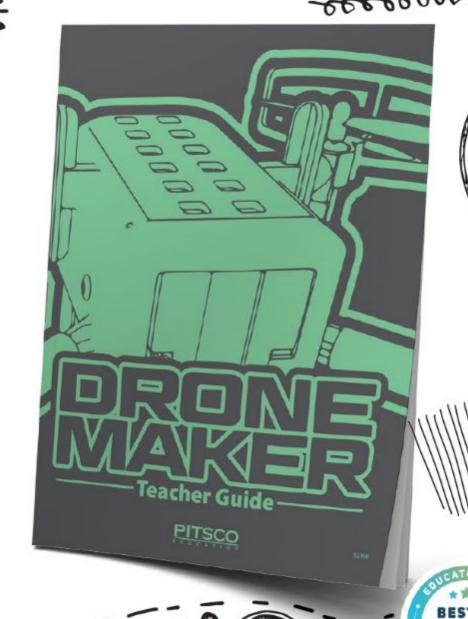




THE CURRICULUM

Drone Maker Teacher Guide

- Aligned to NGSS engineering design standards
- Contains:
 - Teacher-friendly introduction to drones
 - Troubleshooting and getting started tips
 - Reproducible student pages
- Teaches FAA Part 107 regulations
- Implements principles and vocabulary of flight
- Offers career connections
- Provides flight activities and challenges







GRADES 6+

- Echo Drone
- 10-minute flight time
- Weight: 85 g
- Requires 2 AAA batteries for controller
- App not required for flight

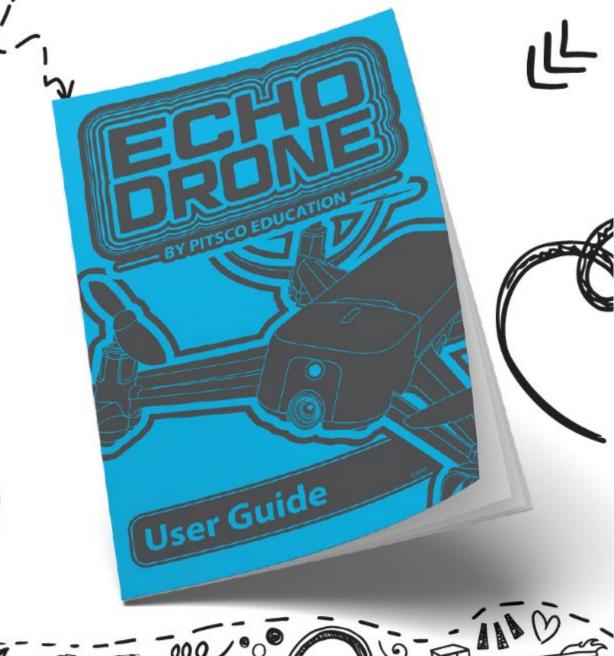






THE USER GUIDE

- Read the guide online: Pitsco.com/Echo-Drone
- QR code on box and quick-start card
- Contains:
 - Safety info
 - How to fly
 - How to code
 - Troubleshooting notes

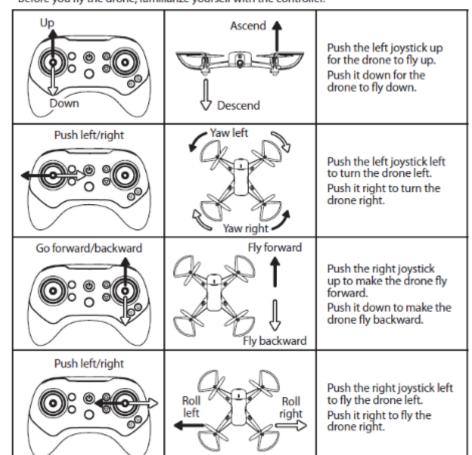


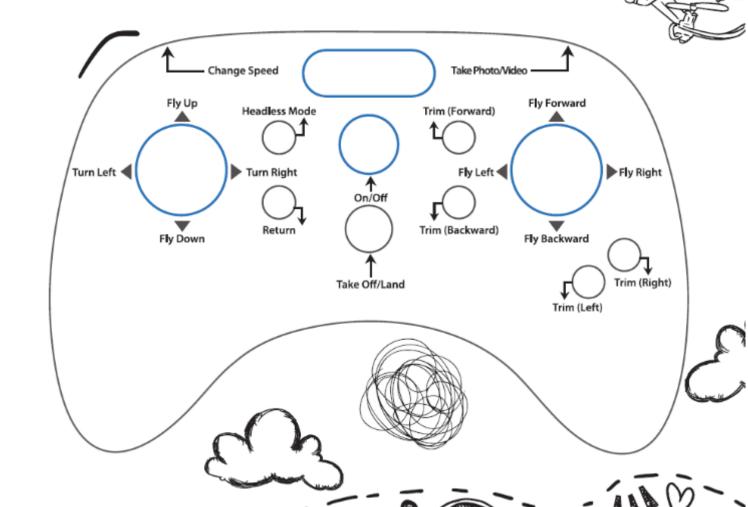


OPERATING THE CONTROLLER

DRONE FLIGHT AT A GLANCE

Before you fly the drone, familiarize yourself with the controller.







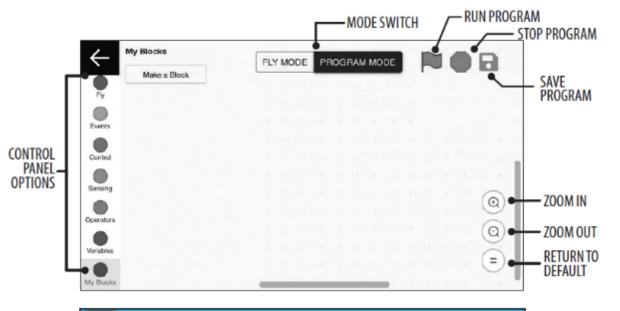
USING THE APP

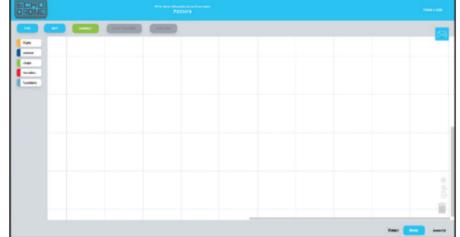
Smartphone options for download

- Access via Pitsco.com/Echo-Drone
- Block-based coding

Browser option

- · No download required
- Block-based or Javascript views









BACKGROUND

As one of the authors of the FAA
Reauthorization Act of 2024, Senator Ted
Cruz championed a provision authorizing the
creation of a Center for Advanced Aviation
Technologies

Center for Advanced Aviation Technologies
Legislation Sec. 961 of the FAA
Reauthorization Act of 2024



ESTABLISHMENT PLAN

08 / 14 / 2024 dates 90 days after enactment to when the FAA Administrator is required to develop a plan to establish the center

Goal to support new and emerging aviation technologies, including:

- Advanced Air Mobility (AAM) and
- Powered-lift Aircraft

CONSULT

Advanced Air Mobility Working Group



Interagency Working Groups



ROLES & RESPONSIBLITIES

The center will develop airspace laboratories and flight demonstration zones to facilitate the safe integration of AAM aircraft into the national airspace system

Establishment of testing corridors to validate air traffic requirements for AAM operations

Partnerships will be promoted between industry, academia, and government for technology development.

Identifying and supporting the advancement of new aviation technologies, including powered-lift aircraft



LOCATION CRITERIA

a large commercial airport or large air logistics center

5 proximity to both rural and urban communities

- 2 aviation manufacturing with expertise in advanced aviation technologies
- State, local, or Tribal governments

3 existing FAA facilities or offices

7 programs to support public-private partnerships

airspace utilized for advanced aviation technology testing

8 academic institutions that offer programs relating to advanced aviation technologies engineering



FUNDING/TIMELINE

\$35
million
per year
until 2028

September 30, 2026

INTERACTION WITH OTHER AGENGIES

Leverage the research and testing capacity and capabilities of the Center of Excellence for Unmanned Aircraft Systems and, the unmanned aircraft test ranges



WHY DALLAS-FORT WORTH?

Senator Cruz hosted an Advanced Aviation Roundtable on 08/30/2024 to discuss why the Center should be in the Dallas-Fort Worth region

PARTCIPANTS INCLUDED:

- Wisk Aero
- Lilium
- Archer Aviation
- Joby Aviation
- DroneUp
- Amazon
- Southwest
 Airlines

- Venus Aerospace
- Vertical Aviation Intl.
- Wing Aviation
- Ferrovial Vertiports
- Autonomy Research
 Institute at Texas A&M
 University-Corpus
 Christi

- DFW Airport, Dallas Love Field, and Perot Field- Fort Worth Alliance Airport
- Bell / Airbus / Lockheed Martin / L3Harris
- FAA Southwest Regional Office
- DFW Airport / Arlington Municipal Airport partnerships with eVTOL manufacturer
- FAA UTM Key Site
- Controlled and uncontrolled airspace
- Ease of access/corridor planning to Choctaw Nation
- NCTCOG UAS Safety and Integration Task Force
- NCTCOG Air Transportation Advisory Committee
- NCTCOG Public Safety Unmanned Response Team
- North Texas Aerial Robotics Initiative
- University of North Texas, University of Texas at Arlington, Dallas College, Tarrant County College
- AllianceTexas Mobility Innovation Zone
- Dallas Inland Port
- Mineral Wells Innovation Zone
- City of Fort Worth Autonomous Vehicle Weather DOT SMART Grant
- NASA National Campaign #2 AAM Flight Testing Corridor

