

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC

Regulatory Docket No. _____

**IN THE MATTER OF THE PETITION FOR EXEMPTION OF:
WOOLPERT, INC.
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF
TITLE 14 OF THE CODE OF FEDERAL REGULATIONS
SECTIONS 91.9(b), 91.203(a), 91.203(b), 45.23(b) AND 21.185
CONCERNING OPERATION OF AN UNMANNED AIRCRAFT SYSTEM
OVER THE STATE OF OHIO
PURSUANT TO SECTION 333 OF THE
FAA MODERNIZATION AND REFORM ACT OF 2012**

Submitted on July 17, 2014

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GLOSSARY OF ABBREVIATIONS

AGL	Above Ground Level
ATC	Air Traffic Control
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
NAS	National Airspace System
Section 333	FAA Modernization and Reform Act of 2012, Section 333
SMS	Safety Management System
UAS	Unmanned Aircraft System
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

SUMMARY

Woolpert, Inc. seeks exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b) and 21.185. This exemption will permit Woolpert, Inc. to operate an Unmanned Aircraft System (“UAS”) over certain rural areas of the State of Ohio, while keeping the documents required by the regulations at the ground control station and immediately accessible to the pilot in command. Furthermore, the exemption will relieve Woolpert, Inc. from the airworthiness certificate standards and the requirement to have a certificate of airworthiness issued for its UAS. This exemption will also permit any required markings concerning the operational status of the UAS to be displayed on the fuselage of the unmanned aircraft.

INTRODUCTION AND INTERESTS OF THE PETITIONER

Woolpert, Inc. (hereinafter referred to as “Woolpert”) is a 103 year-old design, geospatial and infrastructure management firm with a long and well-recognized history in mapping and surveying. Woolpert excels in the collection of aerial imagery from manned, fixed-wing aircraft for the purpose of making highly accurate aerial maps for a range of clients and various applications. In addition to operating a fleet of conventional fixed-wing aircraft, Woolpert has recently acquired an Altavian Nova Block III Unmanned Aircraft System (hereinafter referred to as the “Nova Block III UAS”). As set forth in this Petition, Woolpert seeks to operate its Nova Block III UAS for the special purpose of aerial surveying, continuing an established legacy that has always sought the highest standards of operations and safety.

BACKGROUND

Unmanned Aircraft System: Altavian Nova Block III UAS

Woolpert seeks an exemption to operate an Altavian Nova Block III UAS, Serial No. 3001, registration number¹ N937RW, for compensation or hire within the national airspace system (“NAS”). The Nova Block III UAS is comprised of an amphibious unmanned aircraft and a transportable ground station. The Nova Block III UAS has a maximum gross weight of approximately fifteen (15) pounds, while having a wingspan of 108 inches and a length of 65 inches. The Nova Block III unmanned aircraft is equipped with a single propeller driven by a Lithium Polymer battery powered electric motor.



Figure 1: The Nova Block III UAS with registration number displayed in accordance with 14 C.F.R. Part 45.

¹ Woolpert has reserved registration number N937RW, and will submit an Aircraft Registration Application upon the grant of the exemptions sought by this Petition.

Proven Operational History of the Nova Block III UAS in the NAS

The Nova Block III UAS is currently operating safely within the NAS pursuant to approximately fourteen (14) Certificates of Authorization (“COA”) granted by the Federal Aviation Administration (“FAA”) to the Middle Tennessee State University; Sinclair Community College in Dayton, Ohio; the U.S. Army Corps of Engineers (Jacksonville District, for operations in South Florida); Mississippi State University for the Pearl River Basin; and the University of Florida. The U.S. Army Corps of Engineers will be operating the Nova Block III UAS pursuant to an additional five COAs in the foreseeable future, pending approval by the FAA.

BASIS FOR PETITION

Petitioner, Woolpert, Inc., by and through undersigned counsel, pursuant to the provisions of the Federal Aviation Regulations (14 C.F.R. § 11.61) and the FAA Modernization and Reform Act of 2012, Section 333, *Special Rules for Certain Unmanned Aircraft Systems*, hereby petitions the Administrator for an exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness as contemplated by 14 C.F.R. Part 21.

In the alternative, and in accordance with Federal Aviation Regulation (“FAR”) Section 21.16, entitled *Special Conditions* (14 C.F.R. § 21.16), Woolpert respectfully requests that the Administrator prescribe special conditions for the intended operation of the Altavian Nova Block III UAS that contain such safety standards as the Administrator finds necessary to establish a level of safety equivalent to that established by the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185. In the alternative, Woolpert seeks an exemption from

the requirement to have a certificate of airworthiness issued for its Nova Block III UAS, as otherwise contemplated by 14 C.F.R. Part 21.

In accordance with 14 C.F.R. § 11.81, Woolpert provides the following information in support of its petition for exemption:

A. Name And Address Of The Petitioner.

The name and address of the Petitioner is:

Woolpert, Inc.
4454 Idea Center Blvd.
Dayton, Ohio 45430

The point of contact for this Petition and specific contact information is as follows:

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B. The Specific Sections Of 14 C.F.R. From Which Woolpert Seeks Exemption.

1. Woolpert Seeks Exemption From The Requirement Of Section 91.9(b).

Woolpert seeks an exemption from **14 C.F.R. § 91.9(b)**. Section 91.9 entitled *Civil aircraft flight manual, marking, and placard requirements*, subsection (b) states the following:

(b) No person may operate a U.S.-registered civil aircraft--

(1) For which an Airplane or Rotorcraft Flight Manual is required by § 21.5 of this chapter unless there is available in the aircraft a current, approved Airplane or Rotorcraft Flight Manual or the manual provided for in § 121.141(b); and

(2) For which an Airplane or Rotorcraft Flight Manual is not required by § 21.5 of this chapter, unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

2. Woolpert Seeks Exemption From The Requirements Of Sections 91.203(a) and 91.203(b).

Woolpert seeks an exemption from **14 C.F.R. § 91.203(a) and (b)**. Section 91.203 entitled *Civil aircraft: Certifications required*, subsections (a) and (b) state the following:

(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:

(1) An appropriate and current airworthiness certificate. Each U.S. airworthiness certificate used to comply with this subparagraph (except a special flight permit, a copy of the applicable operations specifications issued under § 21.197(c) of this chapter, appropriate sections of the air carrier manual required by parts 121 and 135 of this chapter containing that portion of the operations specifications issued under § 21.197(c), or an authorization under § 91.611) must have on it the registration number assigned to the aircraft under part 47 of this chapter. However, the airworthiness certificate need not have on it an assigned special identification number before 10 days after that number is first affixed to the aircraft. A revised airworthiness certificate having on it an assigned special identification number, that has been affixed to an aircraft, may only be obtained upon application to an FAA Flight Standards district office.

(2) An effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft registration Application as provided for in § 47.31(c), or a registration certification issued under the laws of a foreign country.

(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

3. Woolpert Seeks Exemption From The Requirements Of Section 45.23(b).

Woolpert seeks an exemption from **14 C.F.R. § 45.23(b)**. Section 45.23 entitled *Display of marks; general*, subsection (b), states the following:

(b) When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

4. Woolpert Requests Relief To Exempt The Nova Block III UAS From The Restricted Category Airworthiness Certification Standards Specified In 14 C.F.R. §21.185.

In accordance with the FAA Modernization and Reform Act of 2012, Section 333, and 14 C.F.R. § 21.16 entitled *Special Conditions*, Woolpert seeks to exempt the Nova Block III UAS from the restricted category airworthiness certification specified in **14 C.F.R. § 21.185**, or the requirement to have a certificate of airworthiness issued, as contemplated by **14 C.F.R. Part 21**. Section 21.185 entitled *Issue of airworthiness certificates for restricted category aircraft*, states the following, in part:

(a) Aircraft manufactured under a production certificate or type certificate. An applicant for the original issue of a restricted category airworthiness certificate for an aircraft type certificated in the restricted category, that was not previously type certificated in any other category, must comply with the appropriate provisions of § 21.183.

C. The Extent Of Relief Woolpert Seeks And The Reason Woolpert Seeks The Relief.

1. Extent Of Relief Woolpert Seeks And The Reason Woolpert Seeks Relief From Section 91.9(b).

Relief is requested because the Nova Block III UAS weighs approximately fifteen (15) pounds at its maximum gross weight and cannot carry the approved Airplane Flight Manual onboard. Furthermore, since the Nova Block III UAS is unmanned, the aircrew member is located at a ground control station. As such, Woolpert proposes the following conditions and limitations to its request for exemption from Section 91.9(b):

The approved Airplane Flight Manual must be kept at the ground control station, where it is immediately available for reference by the aircrew member (pilot in command) of the Nova Block III UAS any time the unmanned aircraft is operating.

The approved Airplane Flight Manual must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.

2. The Extent Of Relief Woolpert Seeks And The Reason Woolpert Seeks Relief From Section 91.203(a) and (b).

Woolpert requests relief from the requirement of Section 91.203(a) (*i.e.*, that an appropriate and current airworthiness certificate and an effective U.S. registration certificate be carried within the aircraft), and further, requests relief from the requirement of Section 91.203(b) (*i.e.*, that the airworthiness certificate be displayed at the cabin or cockpit entrance so that it is legible to passengers or crew). As the Nova Block III UAS is unmanned, it has no cabin, cockpit, pilot station, or entrances thereto. Therefore, the aircrew member is located at a ground control station and no passengers are carried at any time. As such, Woolpert proposes the following conditions and limitations to its request for exemption from Sections 91.203(a) and (b):

The documents required by Sections 91.203(a) and (b) must be kept at the ground control station, where it is immediately available to the aircrew member (pilot in command) of the Nova Block III UAS any time the unmanned aircraft is operating.

The documents required by 91.203(a) and (b) must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.

3. The Extent Of Relief Woolpert Seeks And The Reason Woolpert Seeks Relief From 14 C.F.R. § 45.23(b).

Woolpert requests relief from the requirement of Section 45.23(b), if applicable, that the word “Restricted” be displayed on the Nova Block III UAS near each entrance to the cabin, cockpit, or pilot station. As the Nova Block III UAS is unmanned, it has no cabin, cockpit, pilot station, or entrances thereto. Therefore, Woolpert proposes that, if required, the word “Restricted” be displayed in letters two (2) inches high, horizontally on both sides of the fuselage between the leading edge of the wing and the nose section of the Nova Block III UAS.

4. The Extent Of Relief Woolpert Seeks And The Reason Woolpert Seeks Relief From 14 C.F.R. § 21.185.

Woolpert seeks relief from the airworthiness certificate requirements of the Federal Aviation Regulations and proposes to commercially operate the Nova Block III UAS, without an airworthiness certificate, for the special purpose of conducting aerial acquisition services over the State of Ohio, pursuant to specific operating limitations and a Safety Management System (“SMS”). Woolpert seeks relief from the airworthiness certificate requirements of 14 C.F.R. § 21.185 to the extent that the Nova Block III UAS, which has not yet been type certificated by the FAA, may be operated as if it were a restricted category aircraft for a single, defined, special purpose operation (*i.e.*, aerial surveying).

Pursuant to the FAA Modernization and Reform Act of 2012, Section 333 (“Section 333”), Woolpert seeks relief from the airworthiness certificate requirements of the FAR because operation of the Nova Block III UAS will not create a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public or pose a threat to national security. Further, Section 333 provides the authority for such UAS to operate without airworthiness certification.

Specifically, Section 333 states the following, in part:

(b) Assessment of Unmanned Aircraft Systems.--In making the determination under subsection (a), the Secretary shall determine, at a minimum--

(1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and

(2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

As set forth below, numerous factors, including the proven safe operational history of the Nova Block III UAS in the NAS, as well as the specific parameters of Woolpert's intended operation pursuant to this exemption, demonstrate that the Nova Block III UAS has in the past, and will continue in the future, to operate safely in the NAS without creating a hazard to other aircraft or people on the ground. Accordingly, the FAA may approve operation of the Nova Block III UAS, without an airworthiness certificate, by setting forth specific operating limitations to ensure a level of safety equivalent to what would be provided by airworthiness certification.

D. The Reasons Why Granting Woolpert's Request Would Be In The Public Interest; That Is, How It Would Benefit The Public As a Whole.

Granting the present Petition will further the public interest by allowing Woolpert to safely, efficiently, and economically perform aerial acquisition and research over the State of Ohio in support of government entities, agriculture, scientific studies, wildlife monitoring, and forestry, while also furthering the development of the state economy related to the oil and gas industries. Additionally, use of the Nova Block III UAS will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the economy. Notably, the benefits of the proposed operation of the Nova Block III UAS will be realized without implicating any privacy issues.

1. The Public Will Benefit From The Aerial Acquisition And Research Performed.

Woolpert submits this Petition to perform aerial acquisition and research throughout the State of Ohio, in support of government entities, agriculture, scientific studies, wildlife monitoring, forestry, and the oil and gas industries. The Nova Block III UAS will provide safe,

efficient, and economical aerial acquisition and research operations to further each of these fields, all of which are critical to the well-being of the general public.

The specific operations that Woolpert will perform with the Nova Block III UAS demonstrate how the requested exemption will directly benefit the above-referenced industries and the public. In agriculture, the aerial acquisition performed by the Nova Block III UAS will be used to predict crop yields, research and prevent crop disease, and increase crop yields. In the oil and gas industry, the Nova Block III UAS will be used to aid in facility inspections, surveying and planning new worksites, and performing right of way analysis. The Nova Block III UAS will also further environmental management by researching invasive species, mapping deforestation, and surveying point source pollution.

2. The Public Will Benefit From Decreased Congestion Of The NAS.

The Nova Block III UAS is a battery powered UAS that serves as a safe, efficient, and economical alternative to the manned aircraft traditionally utilized to obtain aerial imagery. By reducing the amount of manned aircraft needed to perform aerial acquisitions, an exemption allowing the use of a Nova Block III UAS would reduce the amount of manned aircraft in the NAS, reduce noise and air pollution, as well as increase the safety of life and property in the air and on the ground.

Furthermore, by reducing the number of manned aircraft operating in the NAS, congestion around airports caused by arriving and departing aircraft will be reduced. The Nova Block III UAS does not require an airport to takeoff or land. Likewise, a reduction of manned aircraft conducting aerial survey missions would result in fewer aircraft that must be handled by air traffic control during the ground, takeoff, departure, arrival, and landing phases of flight operations.

3. The Public Will Benefit From The Safety And Efficiency Of The Nova Block III UAS.

Conducting aerial acquisitions with the Nova Block III UAS, instead of manned aircraft, will greatly benefit the public by drastically reducing the levels of air and noise pollution generated during traditional aerial survey flight operations. By using battery power and an electric motor, the Nova Block III UAS produces no air pollution, and is the most viable environmentally conscious alternative to the cabin class, six cylinder internal combustion twin engine aircraft that are typically utilized for aerial acquisitions, while burning approximately 20-30 gallons per hour of leaded aviation fuel. The Nova Block III UAS, while reducing the carbon footprint of aerial acquisitions, also eliminates noise pollution as its battery powered electric motor is barely audible during the take-off phase, and cannot be heard when operating more than 100 feet above ground level.

By using the Nova Block III UAS to perform aerial acquisitions, the substantial risk to life and property in the air and on the ground, which is usually associated with traditional manned aircraft flight operations, will be substantially reduced or completely eliminated. Aside from the lack of aircrew members located onboard the aircraft, the Nova Block III UAS (weighing approximately fifteen (15) pounds at its maximum gross weight with a wingspan of 108 inches and a length of 65 inches, with no fuel on board), has less physical potential for collateral damage to life and property on the ground, and in the air, compared to the manned aircraft that typically conduct aerial acquisitions (weighing approximately 6,500 pounds with a wingspan of approximately 40 feet, a length of 34 feet, and a fuel capacity of 180 gallons).

4. Performing Aerial Acquisition Operations With The Nova Block III UAS Will Benefit The Economy.

In addition to being safe and efficient, the Nova Block III UAS is also an economical alternative to using manned aircraft to conduct aerial acquisitions. As such, operation of the Nova Block III UAS will allow United States based companies, like Woolpert, to remain competitive and contribute to growth of the U.S. economy. Specifically, with the rising cost of aviation fuel and the Environmental Protection Agency (“EPA”) regulatory actions phasing out leaded fuels, U.S. owned and operated companies must adopt new and alternative technology in order to remain competitive.

Operating the battery powered Nova Block III UAS is one such technology that not only allows companies greater operational flexibility compared to manned aircraft, but provides such flexibility without the high operational cost of a traditional manned aircraft.

By operating the Nova Block III UAS, companies such as Woolpert can remain competitive and profitable, and therefore provide greater job stability to employees and contractors, which will ultimately contribute to growth of the U.S. economy. Improved financial performance of U.S. companies, through commercial use of the Nova Block III UAS, provides a stable workforce that increases consumer spending; improves local, state, and federal tax revenues; and allows companies to invest in research and development in order to remain competitive both in the United States and abroad.

5. There Are No Privacy Issues.

Like the manned aerial acquisition flight operations that have been conducted for decades, the proposed operation of the Nova Block III UAS will not implicate any privacy issues. Specifically, the Nova Block III UAS will be operated only in rural areas, and in accordance with all Federal Aviation Regulations, including the minimum altitude requirements

of 14 C.F.R. § 91.119. Most significantly, the Nova Block III UAS will not be operated closer than 500 feet to any person, vessel, vehicle, or structure, except when necessary for takeoff or landing.

E. The Reasons Why Granting The Exemption Would Not Adversely Affect Safety, Or How The Exemption Would Provide A Level Of Safety At Least Equal To That Provided By The Rule From Which Woolpert Seeks Exemption.

1. Reasons Why An Exemption From The Requirements Of Section 91.9(b) Would Not Adversely Affect Safety.

This exemption would maintain the level of safety established by Section 91.9(b) because Woolpert will keep the approved Airplane Flight Manual at the ground control station where the pilot in command flying the Nova Block III UAS will have immediate access to the document.

Previous exemptions granted by the FAA concerning Section 91.9(b) establish that safety is not adversely affected when the approved Aircraft Flight Manual is kept at the ground control station of a UAS, where it can be immediately accessed by the pilot in command. Section 91.9(b) “requires aircraft to carry the flight manual so the pilot would have ready access to the aircraft limitations while in flight.” Exemption No. 8607. However, the FAA has also found that UAS will always be operated without any passengers or crew onboard, and that “requiring these special-use aircraft [UAS] to carry superfluous paper documents may present a safety hazard to the integrity of the [UAS].” *Id.*

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8607, 8737, 8738, 9299, 9430, 9554, 9564, 9565, 10167, 10602, 10673, 10835, 10869, 10968).

2. Reasons Why An Exemption From The Requirements Of Section 91.203(a) And (b) Would Not Adversely Affect Safety.

This exemption would maintain the level of safety established by Sections 91.203(a) and (b) because Woolpert will keep the required documents at the ground control station where the pilot in command flying the Nova Block III UAS will have immediate access.

Previous exemptions granted by the FAA concerning Sections 91.203(a) and (b) establish that safety is not adversely affected when the Airworthiness Certificate and U.S. registration certificate are kept at the ground control station of the UAS, where it can be immediately accessed by the pilot in command. Specifically, the FAA has held that the intent of Sections 91.203(a) and (b) is better served by having the required documents in the control of the UAS operator (pilot in command), reasoning as follows:

The original intent of the subject regulation was to display the airworthiness and registration documents so they would be easily available to FAA inspectors and passengers for inspection and verification of the airworthiness and registration of the aircraft . . . In this case, the aircraft will always be operated without any passengers or crew.

The missions for which UASs are intended will prevent the aircraft from being available for the inspections normally prescribed for civil aircraft. Further, it will be operated on strictly confined missions from a known departure and arrival point, under the constant control of a pilot-in-command. We also find that requiring these special-use aircraft to carry superfluous paper documents may present a safety hazard to the integrity of the [UAS].

FAA operating limitations and special arrangements with Air Traffic Control (ATC) for surveillance of [UAS] flights adequately compensate for the requirements for carrying airworthiness and registration documents. We find the intent of the regulation is better served by having the required documents in the control of the aircraft operator and available for inspection under the special conditions prescribed in this exemption.

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8607, 8737, 8738, 9299, 9564, 9565, 10167, 10602, 10673, 10835, 10869, 10968).

3. Reasons Why An Exemption From The Requirements Of 14 C.F.R. § 45.23(b) Would Not Adversely Affect Safety.

This exemption would maintain the level of safety established by Section 45.23(b) because if required, displaying the word “Restricted” with two (2) inch high letters, horizontally on both sides of the fuselage between the leading edge of the wing and the nose section of the Nova Block III UAS, will inform all parties of the unmanned aircraft’s overall operating status.

Significantly, Woolpert will display the word “Restricted” in two (2) inch high letters in compliance with size requirement of Section 45.23(b) (*i.e.*, “letters not less than 2 inches nor more than 6 inches high”). By placing the letters horizontally on both sides of the fuselage between the leading edge of the wing and the nose section of the Nova Block III UAS, will ensure that the word “Restricted” is the in most visible location, so that all parties will be informed of the unmanned aircraft’s overall operating status. *See* Figure 1, page 4.

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8737, 10167, 10167A, 10700, 10810).

4. Reasons Why An Exemption From The Requirements Of 14 C.F.R. § 21.185, Including The Requirement To Have A Certificate Of Airworthiness, Would Not Adversely Affect Safety.

In seeking this exemption, Woolpert submits that the Nova Block III UAS can operate safely in the NAS above the State of Ohio without creating a hazard to other aircraft or people on the ground. Accordingly, the FAA may approve its use without an airworthiness certificate as demonstrated by: (i) the safe operational history and current use of the Nova Block III UAS in the NAS; (ii) the characteristics of the Nova Block III UAS; (iii) the limited area of Woolpert’s intended operation; (iv) the Safety Management System Woolpert has developed for Nova Block III UAS operations and maintenance; (v) the commercial pilot requirement; (vi) the specific operating limitations; and (vii) any other conditions that the Administrator may prescribe.

i. The Nova Block III UAS Has A Proven History Of Operation In The NAS Pursuant To A Certificate Of Authorization (“COA”).

The Nova Block III UAS is currently operating safely in the NAS pursuant to approximately fourteen (14) Certificates of Authorization (“COA”) granted by the FAA to the Middle Tennessee State University; Sinclair Community College in Ohio; the U.S. Army Corps of Engineers (Jacksonville District, for operations in South Florida); Mississippi State University for the Pearl River Basin; and the University of Florida. The U.S. Army Corps of Engineers will be operating the Nova Block III UAS pursuant to an additional five COAs in the foreseeable future, pending approval by the FAA.

ii. The Specifications Of The Nova Block III UAS Demonstrate Its Safe Characteristics.

The Nova Block III UAS does not create a hazard to users of the NAS or the public, or otherwise pose a threat to national security considering its size, weight, speed, or operational capability. The specifications of the Nova Block III UAS are as follows:

Unmanned Aircraft System	The Nova Block III is an Unmanned Aircraft System that is comprised of an amphibious unmanned aircraft and a transportable ground station.
Serial No.	3001
Unmanned Aircraft Dimensions	Wingspan: 108 in. Length: 65 in.
Engine (Propulsive Unit)	<u>Engine (Propulsive Unit)</u> (1) Altavian Inc. P/N : 30027 (Electric) FAA Engine Type Cert: None Propulsive Unit Type: 25V, 11 Amp Hour capacity, Lithium ion battery powered, direct drive electric motor

	<p><u>Motor, Electric Sub-Assembly:</u> Manufacturer: NeuMotor Model: 1509 2.0 HP Peak Power Direct Drive 10 oz. Wt.</p> <p><u>Motor, Controller Sub-Assembly:</u> Manufacturer: Castle Creation Model: Phoenix Ice 100 Type: Speed Controller 100 Amps Maximum 4.6 oz. Wt.</p> <p><u>Motor, Battery:</u> Manufacturer: MaxAmps, Inc. Type: Lithium Ion 11 Amp hour 22.2V (nominal)</p>
<p>Fuel</p>	<p>Not Applicable. NOTE: The Nova Block III UAS is powered by a Lithium Polymer rechargeable battery, Altavian P/N 30142.</p>
<p>Engine (Propulsive Unit) Limits</p>	<p>Maximum Power Output: 2.0 HP Maximum RPM: 60,000 RPM (reduced to a propeller RPM of 7,200) Maximum Motor Temperature: 170 °F (77 °C) NOTE: The motor temperature is not displayed to the operator. Maximum motor, controller sub-assembly temperature: 194 °F (90 °C) Minimum voltage, motor battery during pre-flight engine run up after 3 sec. at max throttle: 22.6V</p>
<p>Propeller and Propeller Limits</p>	<p>(1) Altavian Inc. P/N 30360 FAA Propeller Type Certificate: None Propeller Type: 2-blade, hinged (folding), carbon fiber reinforced plastic, fixed pitch, tractor</p>

	<u>Propeller Sub-Assembly:</u> Manufacturer: Aeronaut Model: CAM 15x13 Diameter (Nominal): 15 in.
Battery Command & Control	Nova Air Vehicle Battery P/N 30142 powers the motor, and battery command and control.
Airspeed Limits	Vne (Never Exceed Speed) 58 knot (30 m/s) Vno (Maximum Structural Cruising Speed) 48 knots (25 m/s) Va (Maneuvering Speed) 48 knots (25 m/s) Landing Speed: 27 knots (14 m/s)
Empty Weight C.G. Range	20.2 – 21.7 inches aft of datum
Datum	Front of Motor Case
Mean Aerodynamic Chord (MAC)	13 in. long with leading edge 21.2 in. from nose
Leveling Means	Not Applicable.
Maximum Weights	Ramp 15 lbs. Takeoff 15 lbs. Landing 15 lbs.
Empty Weight	8.35 lbs. NOTE: Empty Weight Excludes weight of battery and payload modules.

Frequencies	902-928 MHz (ISM Band) 2.4 GHz (ISM Band) NOTE: FCC license is not required to utilize the above frequencies; uplink and downlink are on the 900Mhz band. If video is utilized, uplink, downlink, and video are all on 2.4 Ghz.																									
Computer Software	Avionics embedded processor, P/N 30138																									
Minimum Crew	(1) The Nova Block III UAS can be operated by a single operator.																									
Number of Seats	(0) Not Applicable.																									
Fuel Capacity	Not Applicable.																									
Oil Capacity	Not Applicable.																									
Max. Operating Altitude	1,000 ft. AGL (304 M)																									
Control Surface Movements	<table> <tr> <td>Wing Flaps</td> <td colspan="4">N/A</td> </tr> <tr> <td>Aileron</td> <td>Up</td> <td>30°</td> <td>Down</td> <td>30°</td> </tr> <tr> <td>“V” tail elevator action</td> <td>Up</td> <td>60°</td> <td>Down</td> <td>60°</td> </tr> <tr> <td>“V” tail rudder action</td> <td>Up</td> <td>60°</td> <td>Down</td> <td>60°</td> </tr> <tr> <td>“V” tail max. combination Rudder elevator action</td> <td>Up</td> <td>60°</td> <td>Down</td> <td>60°</td> </tr> </table>	Wing Flaps	N/A				Aileron	Up	30°	Down	30°	“V” tail elevator action	Up	60°	Down	60°	“V” tail rudder action	Up	60°	Down	60°	“V” tail max. combination Rudder elevator action	Up	60°	Down	60°
Wing Flaps	N/A																									
Aileron	Up	30°	Down	30°																						
“V” tail elevator action	Up	60°	Down	60°																						
“V” tail rudder action	Up	60°	Down	60°																						
“V” tail max. combination Rudder elevator action	Up	60°	Down	60°																						
Nominal Endurance	90 minutes above 32 °F (0 °C) 45 minutes below 32 °F (0 °C)																									

Ambient Outside Air Temperature (OAT)	Maximum OAT: 120 °F (49 °C) Minimum OAT At Altitude: -20 °F (-29 °C)
Wind Limitation	19 knots
Maintenance	This Nova Block III UAS must be maintained in accordance with the Altavian Nova Maintenance Operation Manual, or later FAA accepted revision.

iii. Flight Operations Pursuant To The Exemption Sought Would Be Limited To Areas Over The State Of Ohio That Are Not In The Proximity Of Airports Or Over Populated Areas.

Woolpert proposes to only conduct aerial acquisition flight operations over certain rural areas of the State of Ohio that are not near populated areas, airports, helipads, or state roads. Specifically, Woolpert’s proposed area of flight operations over the State of Ohio includes rural areas that are:

1. Not populated areas as depicted on VFR Sectional Aeronautical Charts;
2. Not within five (5) miles of any airport or helipad;
3. Not within one hundred (100) meters of state roads having more than two lanes; and
4. Not within fifty (50) meters of state roads having two lanes or less.

Furthermore, all flight operations will be conducted in accordance with 14 C.F.R. § 91.119, *Minimum safe altitudes: General*.

Woolpert submits that approximately 15,919 square miles, or approximately thirty-five percent (35%) of the total area of the State of Ohio would qualify as rural areas over which Woolpert could perform aerial acquisition flight operations pursuant to the requested exemption.

A digital map depicting the proposed area for flight operations over the State of Ohio, combined with the Cincinnati and Detroit VFR Sectional Aeronautical Charts, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).²

The green shaded area of Figure 2 also depicts the intended area of Woolpert's flight operations of the Nova Block III UAS, as defined by the criteria set forth above.



Figure 2: Green shade represents proposed area of operations for Nova Block III UAS aerial acquisitions over the State of Ohio.

Figure 3 depicts an enlarged view of an example of the five (5) mile exclusion zone or “buffer” for flight operations around airports and helipads. Because the features are

² Exhibits to this Petition are proprietary information, and in accordance with 14 C.F.R. 11.35(b), are not to be included in the Federal Docket Management System (FDMS).

geometrically represented as points, the resulting buffer is a circle. Where the buffers “mix” into one another, a new single shape is created. The unmanned aircraft will not operate within any of the areas depicted in white.

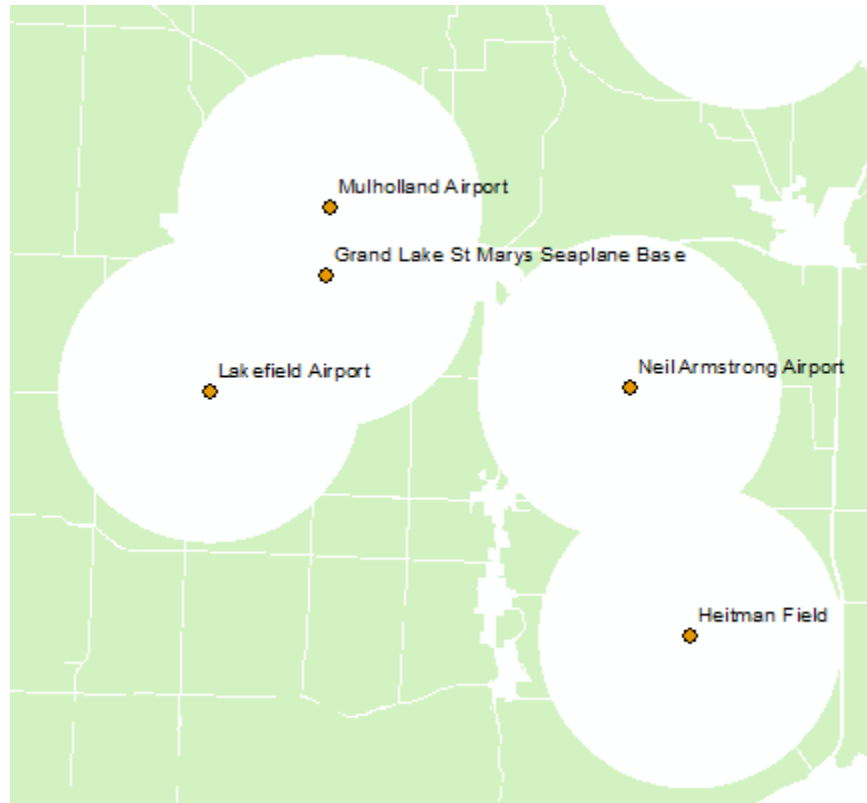


Figure 3: Example of 5 mile buffer around airports on VFR Sectional Aeronautical Charts.

A buffer or exclusion zone for flight operations will also be implemented around state roads. Since the roads are represented geometrically as lines, the buffer results in a corridor. Figure 4 depicts buffers of one hundred (100) meters around state roads with more than two lanes, and fifty (50) meters around state roads with two lanes or less.



Figure 4: Example of a flight exclusion zone of 100 meters around a state road with more than two lanes, and a 50 meter flight exclusion zone around a state road with two lanes or less.

Figure 5 depicts additional examples of state road buffers, as well as a small, rural town. Since the small, rural town shown in Figure 4 is not designated as a populated area on the VFR Sectional Aeronautical Chart, it is not included in the exclusion zone. As such, flight operations will be conducted pursuant to 14 C.F.R. § 91.119, *Minimum safe altitudes: General*.



Figure 5: Example of state road flight exclusion zones and a rural town. Since the rural town does not appear as a populated area on the VFR Sectional Aeronautical Chart, flight operations over the area will be conducted in accordance with 14 C.F.R. § 91.119.

In summary, Woolpert seeks to operate its Nova Block III UAS only over rural areas of Ohio, while maintaining safe distances from any populated areas, airports, helipads, or roadways.

iv. Operation Of The Nova Block III UAS Will Be Conducted Pursuant To A Safety Management System.

A Safety Management System (“SMS”) will control Woolpert’s operation of the Nova Block III UAS and will significantly contribute to maintaining the level of safety contemplated by the airworthiness certificate requirements from which Woolpert now seeks relief.

Pursuant to the SMS and 14 C.F.R. § 43.13, entitled *Performance Rules (general)*, each person performing maintenance, alteration, or preventive maintenance on the Nova Block III UAS, motor, propeller, or appliance shall use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator. Each person shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices.

A copy of the SMS, which is proprietary information, is attached hereto as Exhibit B, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).³

v. Flight Operations Of The Nova Block III UAS Are Limited To The Line Of Sight Of A Commercial Certificated Pilot in Command With A Safety Observer.

Woolpert will only utilize Commercial Pilots with a valid First or Second Class Airman Medical certificate to act as pilot in command of the Nova Block III UAS. Additionally, all pilots will be assisted by a safety observer. The pilot in command and safety observer must meet the requirements as set forth by the SMS and Standard Operating Procedures adopted by

³ Exhibits to this Petition are proprietary information, and in accordance with 14 C.F.R. 11.35(b), are not to be included in the Federal Docket Management System (FDMS).

Woolpert for flight operations of the Nova Block III UAS. A copy of the Standard Operating Procedures, which is proprietary information, is attached hereto as Exhibit C, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).⁴

vi. Flights Will Be Conducted Pursuant To Specific Operating Limitations.

In seeking this exemption, Woolpert proposes to commercially operate the Nova Block III UAS without satisfying the restricted category airworthiness certification process specified in 14 C.F.R. § 21.185, or otherwise having a certificate of airworthiness issued by the FAA, as contemplated by 14 C.F.R. Part 21. Woolpert proposes to operate the Nova Block III UAS, for the special purpose of conducting aerial acquisitions over the State of Ohio, pursuant to the following specific operating limitations:

1. Flight operations are permitted only in the defined areas over the State of Ohio.
2. The Nova Block III UAS will be operated at or below 400 ft. above ground level (AGL), except as necessary to comply with the requirements of 14 C.F.R. § 91.119.
3. The Nova Block III UAS shall be operated within one mile, and within line of sight, of the pilot in command and safety observer.
4. The Nova Block III UAS shall be operated pursuant to Day Visual Flight Rules (VFR) in visual meteorological conditions (VMC). The Nova Block III UAS shall be operated only during daylight hours (*i.e.* between the end of morning civil twilight and the beginning of evening civil twilight, as published in the American Air Almanac, converted to local time).
5. The duration of each flight shall not exceed 1.5 hours.

⁴ Exhibits to this Petition are proprietary information, and in accordance with 14 C.F.R. 11.35(b), are not to be included in the Federal Docket Management System (FDMS).

6. The Nova Block III UAS shall operate from on-site takeoff/landing locations directly next to the pilot in command and co-located safety observer. If the operation is from a watercraft, the pilot in command and safety observer shall remain co-located on the same watercraft.
7. Operations shall be conducted by commercially certificated airmen who have completed training, checking, currency, and recency of experience requirements as approved by the FAA Administrator.
8. Operation of the Nova Block III UAS with any inoperative instruments or equipment shall be prohibited.
9. The Nova Block III UAS shall be maintained in accordance with the Manufacturer's Maintenance Manual.
10. The Nova Block III UAS shall be operated pursuant to 14 C.F.R. Part 91, operating requirements.
11. For the proposed flight operation, only one Nova Block III UAS shall be airborne at any given time.
12. Prior to flight operations, Woolpert shall coordinate and establish two way communications with the nearest Air Traffic Control facility.
13. For any flight operations over U.S. Government or state managed lands, Woolpert shall coordinate with the appropriate authority and ensure that the property owners have at least twelve (12) hours of advance notice prior to the proposed flight operations. Coordination shall include anticipated periods of operation, purpose of the flights, and contact information for the operator should questions or issues arise.

vii. Any Other Conditions The FAA May Prescribe For Safe Operation.

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. § 21.16 entitled *Special Conditions*, Woolpert requests that the FAA prescribe special conditions for the intended operation of the Nova Block III UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by Section 21.185, and which will permit safe operation of the Nova Block III UAS for the special purpose of conducting aerial acquisitions over the State of Ohio. Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification in accordance with any requirements that must be established for the safe operation of the aircraft systems in the NAS.

Likewise, the Administrator may prescribe special conditions pursuant to 14 C.F.R. § 21.16, for operation of the Nova Block III UAS, since the airworthiness regulations of 14 C.F.R. Part 21 do not contain adequate or appropriate safety standards, due to the novel or unusual design features of the aircraft. Section 21.16, entitled *Special Conditions*, states the following:

If the FAA finds that the airworthiness regulations of this subchapter do not contain adequate or appropriate safety standards for an aircraft, aircraft engine, or propeller because of a novel or unusual design feature of the aircraft, aircraft engine or propeller, he prescribes special conditions and amendments thereto for the product. The special conditions are issued in accordance with Part 11 of this chapter and contain such safety standards for the aircraft, aircraft engine or propeller as the FAA finds necessary to establish a level of safety equivalent to that established in the regulations.

See 14 C.F.R. § 21.16

Therefore, in accordance with Section 333 and 14 C.F.R. § 21.16, the FAA may prescribe special conditions for Woolpert's intended operation of the Nova Block III UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety

equivalent to that established by Section 21.185, and which will permit safe operation of the Nova Block III UAS for the special purpose of conducting aerial acquisitions over the State of Ohio.

F. A Summary That Can Be Published In The *Federal Register*, stating:

The Rules From Which Woolpert Seeks Exemption:

Woolpert, Inc. seeks exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b) and 21.185.

A Brief Description Of The Nature Of The Exemption Woolpert Seeks:

This exemption will permit Woolpert, Inc. to operate an Unmanned Aircraft System over certain rural areas of the State of Ohio, while keeping the documents required by the regulations at the ground control station and immediately accessible to the pilot in command. Furthermore, the exemption will relieve Woolpert, Inc. from the airworthiness certificate standards and the requirement to have a certificate of airworthiness for its Unmanned Aircraft System. This exemption will also permit any required markings concerning the operational status of the UAS to be displayed on the fuselage of the unmanned aircraft.

G. Any Additional Information, Views, Or Arguments Available To Support Woolpert's Request.

This Petition is made pursuant to the FAA Modernization and Reform Act of 2012, Section 333, which directs the Secretary of Transportation to determine if certain UAS may operate safely in the NAS. As such, Woolpert's request for exemption may be granted pursuant to the authority of Section 333 and 14 C.F.R. Part 11, as set forth above.

Sec. 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public or pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification. Section 333 states the following:

(a) In General.--Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national

airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act.

(b) Assessment of Unmanned Aircraft Systems.--In making the determination under subsection (a), the Secretary shall determine, at a minimum--

(1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and

(2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

(c) Requirements for Safe Operation.--If the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system.

As discussed in detail above, the Nova Block III UAS has in the past, and will continue in the future, to operate safely in the NAS without creating a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

CONCLUSION

As set forth above, Woolpert seeks an exemption pursuant to 14 C.F.R. § 11.61 and Section 333 of the FAA Modernization and Reform Act of 2012, which will permit safe operation of the Nova Block III UAS commercially, without an airworthiness certificate, for the special purpose of conducting aerial acquisitions over certain rural areas in the State of Ohio. By granting this Petition, the FAA Administrator will be fulfilling the Congressional mandate of the FAA Modernization and Reform Act of 2012, while also advancing the interests of the public, by allowing Woolpert to safely, efficiently, and economically operate the Nova Block III UAS commercially within the NAS.

WHEREFORE, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, Woolpert respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness issued for the Nova Block III UAS, as contemplated by 14 C.F.R. Part 21.

Dated: July 17, 2014

Respectfully submitted,

The Aviation Law Firm

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