

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

Regulatory Docket No. _____

**IN THE MATTER OF THE PETITION FOR EXEMPTION OF:
COMPASSDATA, INC.
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF
TITLE 14 OF THE CODE OF FEDERAL REGULATIONS,
SECTIONS, 61.113(a) and (b); 91.7(a); 91.119(c); 91.151(a); 91.405(a);
91.407(a)(1); 91.409(a) and 91.417(a)
CONCERNING OPERATION OF AN UNMANNED AIRCRAFT SYSTEM
OVER THE STATES OF ARIZONA (AZ), COLORADO (CO),
MINNESOTA (MN), MONTANA (MT), NORTH DAKOTA (ND),
NEBRASKA (NE), NEW MEXICO (NM), SOUTH DAKOTA (SD), TEXAS
(TX), UTAH (UT) AND WYOMING (WY) PURSUANT TO SECTION 333
OF THE
FAA MODERNIZATION AND REFORM ACT OF 2012**

Submitted
22 January 2015

Hayden Howard
Vice President
CompassData, Inc.
12353 E. Easter Ave.
Centennial, CO 80112

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(NOTE: Exhibits No. 2, 3, 4, and 5 contain CONFIDENTIAL INFORMATION and should not be made available to the PUBLIC)	

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

OVERVIEW

COMPASSDATA, INC. seeks exemption from the requirements of Title 14 C.F.R. Sections 61.113(a) and (b); 91.7(a); 91.119(c); 91.151(a); 91.405(a); 91.407(a)(1); 91.409(a) and 91.417(a) . This exemption will permit COMPASSDATA, INC. to operate an Unmanned Aircraft System (“UAS”) over certain rural areas in the States of AZ, CO, MN, MT, ND, NE, NM, SD, TX, UT and WY 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 COMPASSDATA, 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

COMPASSDATA, INC. (hereinafter referred to as “CompassData”) is a 20 year-old design, geospatial and infrastructure management firm with a long and well-recognized history in mapping and surveying. CompassData excels in the collection and processing of aerial imagery from airborne and satellite platforms for the purpose of making highly accurate aerial maps for a range of clients and various applications. CompassData has recently acquired a Trimble UX5 Unmanned Aircraft System (hereinafter referred to as the “UX5 UAS”). As set forth in this petition for exemption, CompassData seeks to operate its UX5 for the special purpose of aerial photography for use in mapping and land surveying applications. CompassData is a professional mapping surveying organization with licensed surveyors in numerous states; certified mapping professionals; and the company has earned AC20-153(a) & RTCA-DO200A and ISO-9001:2008 certifications.

BACKGROUND

The Unmanned Aircraft System UX5 for which CompassData seeks exemption is a UAS designed and built by Trimble Navigation Limited. Trimble has applied for and received a Special Airworthiness Certificate for this aircraft and, additionally Trimble has received a Grant of Exemption No. 11110 to commercially operate this aircraft. CompassData seeks an exemption to operate a UX5 UAS under the same terms and conditions as have been granted to Trimble. It is CompassData's intention to operate UX5 UAS serial number UX500415 with registration number¹ N501HH, for compensation or hire within the national airspace system ("NAS"). The UX5 UAS is classified as a small UAS weighing approximately six pounds and constructed primarily of EPP (expanded poly propylene). The complete system consists of the unmanned aircraft body with on-board camera, the Trimble Tablet Rugged PC Ground Control Station (GCS), portable ground launcher, and operating software. The UX5 UAS is equipped with a single motor and propeller powered by a lithium polymer battery.

¹ CompassData has reserved registration number N501HH, and has submitted an Aircraft Registration Application to: FAA Aircraft Registration Branch in Oklahoma City, OK.

**BASIS FOR
PETITION**

Petitioner, COMPASSDATA, INC., hereby petitions the Administrator for an exemption from:

Title 14 C.F.R. Sections 61.113(a) and (b); 91.7(a); 91.119(c); 91.151(a); 91.405(a); 91.407(a)(1); 91.409(a) and 91.417(a) .

The specific details regarding this request for exemption are included in the Trimble Navigation Limited Grant of Exemption No.11110 which is incorporated herewith as part of the CompassData exemption application as Exhibit 1.

The exemption would allow operation by CompassData of the UX5 UAS for the purpose of precision aerial photography for use in mapping and land survey applications.

Name and Address of the Petitioner

The name and address of the Petitioner is:

CompassData, Inc.

12353 E Easter Ave.

Centennial, CO 80112

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

Hayden Howard, Vice President

12353 E Easter Ave.

Centennial, CO 80112

Email: haydenh@compassdatainc.com

1-303-627-4058

**(1) EXEMPTION REQUEST AND EQUIVALENT LEVEL OF SAFETY SHOWINGS
UNDER APPLICABLE RULES SUBJECT TO EXEMPTION**

A. CompassData requests an exemption from the following regulations as well as any additional regulations that may technically apply to the operation of the UX5:

The following is a list of the exemptions with a discussion of the equivalent level of safety for each item for which exemption is being requested. CompassData is in full concurrence with Trimble's request and agrees to comply with the equivalent level of safety statements in the Trimble Grant of Exemption No.11110 (Exhibit 1).

14 C.F.R. § 61.113(a) & (b); Private Pilot Privileges and Limitations; Pilot in Command; Commercial Pilot Privileges and Limitations.

14 C.F.R. § 91.7(a): Civil aircraft airworthiness.

14 C.F.R. § 91.119(c): Minimum Safe Altitudes

14 C.F.R. § 91.151(a): Fuel Requirements for Flight in VFR Conditions

14 C.F.R. § 91.405(a); 407(a)(1); 409(a)(2); 417(a): Maintenance Inspections

B. The Reasons Why Granting CompassData'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 CompassData to safely, efficiently, and economically perform aerial acquisition and research over the States of AZ, CO, MN, MT, ND, NE, NM, SD, TX, UT and WY performing mapping and land survey applications in support of government entities, scientific studies, wildlife monitoring, and civil construction, while also furthering

the development of the nation's economy related to the oil and gas industries. Additionally, use of the UX5 UAS will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the economy and the environment. Notably, the benefits of the proposed operation of the UX5 will be realized without impacting any privacy issues.

C. The Public Will Benefit From Aerial Acquisition and Research Performed

CompassData submits this Petition to perform precision aerial photography throughout the states of AZ, CO, MN, MT, ND, NE, NM, SD, TX, UT and WY, in support of government entities, commercial enterprises, and research institutions, the oil and gas industries, mining and environmental compliance. The UX5 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 CompassData will perform using the UX5 UAS provide many advantages compared to traditional land survey and manned aerial photography operations. The use of the UX5 UAS will allow for timely, less costly and more site specific data capture than is possible with traditional methods. The types of work planned for the UX5 UAS include, but are not limited to, facility inspections, surveying and planning new worksites, performing right of way analysis, environmental monitoring, and remediation planning and monitoring.

D. The Public Will Benefit From Decreased Congestion of the NAS.

The UX5 UAS uses an electric motor propulsion system that is powered by a

battery. This serves as a safe, efficient, and economical, non-polluting alternative to the manned aircraft traditionally utilized to obtain aerial photography. Use of the UX5 for these planned applications will significantly reduce the number of manned aircraft used to perform aerial acquisitions in these regions. The requested exemptions allowing the use of a UX5 UAS will also have the added benefit of reducing noise and air pollution, as well as increasing the safety of life and property in the air and on the ground. The size, weight and mass of this small UAS as compared to manned aircraft will greatly enhance the safety of acquiring precision survey data. 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 UX5 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.

E. The Public Will Benefit From the Safety and Efficiency of the UX5 UAS.

Conducting aerial acquisitions with the UX5 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 UX5 UAS produces no air pollution, and is the most viable environmentally conscious alternative to the cabin class, internal combustion twin engine aircraft that are typically used for aerial photography today. The UX5 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 UX5 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.

F. Performing Aerial Acquisition Operations with the UX5 UAS Will Benefit the Economy

CompassData is Woman Owned Small Business encouraging business development and job growth with interest in utilizing the new UAS professional systems. Through its early entrance into the use of the UX5 UAS CompassData has found that the UX5 UAS to be safe, efficient and an economical alternative to using manned aircraft to conduct aerial acquisitions. As such, operation of the UX5 UAS will allow United States based companies, like CompassData, to remain competitive and contribute to growth of the U.S. economy. Specifically, increasing operational costs due to increasing aviation fuel prices and the costs of Environmental Protection Agency (“EPA”) regulatory actions, U.S. owned and operated companies must adopt new and alternative technology in order to remain competitive.

By operating the UX5 UAS, companies such as CompassData 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 UX5 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.

G. Privacy Issue Concerns

Like the manned aerial acquisition flight operations that have been conducted in the United States for more than 90 years, the proposed use of the UX5 UAS will not create privacy issues nor will it violate any privacy laws when being used for the purposes stated in this petition. Specifically, the UX5 UAS will be operated only in rural areas, and in accordance with all Federal Aviation Regulations, including the minimum and maximum altitude requirements of 14 C.F.R. § 91.119. Most significantly, the UX5 UAS will not be operated closer than 500 feet to any person, vessel, vehicle, or structure, except when necessary for takeoff or landing.

(2) EXEMPTION REQUEST AND EQUIVALENT LEVEL OF SAFETY SHOWINGS UNDER APPLICABLE RULES SUBJECT TO EXEMPTION

CompassData requests an exemption from the following regulations as well as any additional regulations that may technically apply to the operation of the UX5:

14 C.F.R. § 61.113(a): Private Pilot Privileges and Limitations; Pilot in Command; Commercial Pilot Privileges and Limitations.

Section 61.113(a) limits private pilots to non-commercial operations. Unlike a conventional aircraft that carries a pilot, passengers, and cargo, the UX5 UAS is remotely controlled carrying no pilot, no passengers or freight on board. CompassData respectfully proposes that operator requirements should take into account the characteristics of the particular UAS. The

UX5 UAS has a high degree of pre-programmed control and various built-in technical capabilities that strictly limit the potential for operation outside of the operating conditions set forth in the exemption application. The UX5 UAS has a semi-autonomous navigation and control system comprised of a Ground Control Station (GCS) and auto-pilot system. All flights are pre-programmed with precision GPS guidance and do not require human intervention. Flight mission area and routing cannot be changed after launch. Flights are not directed by positive manual control, nor are evasive maneuvers. In the case of unplanned events, the operator inputs pre-programmed evasive maneuvers from the control unit, and the control unit executes that maneuver. Pre-programmed operator interventions include diversion to the right; initiation of holding at present position; suspension of mission; fly back to launch point; fly to point and hold; abort mission and land; and emergency power cut off and land (Flight Termination System).

Additional automated safety functions and safety enhancing features of the UX5 UAS include the following:

- Auto-pilot detection of lost GPS or of insufficient satellites initiates an immediate spiral landing
- Low power on the aircraft triggers escalating alarms at GCS at 35% and 10% levels.
- If the auto-pilot detects a lost-link to the GCS for longer than 30 seconds, landing procedure begins.
- If the UX5 UAS auto-pilot fails the craft will immediately execute a very rapid exit from flight with a gentle downward spiral to the ground.
- Aircraft has an on-board failsafe that limits speed in the event of dive to approximately 14 m/s.

- The aircraft, weighing less than 6 lbs., fully loaded, is constructed of EPP foam, or similar material which is intended to absorb impact energy.
- The motor is driven by a pulse width modulated signal, not an analog signal.

Given these safety features, CompassData proposes that operators of the UX5 UAS should not be required to hold a commercial pilot certification.

CompassData notes that the FAA has found that safety factors permitted operation of UASs by operators with these qualifications in the case of operations pursuant to public COAs where the mandatory operating conditions specified above are present. *See* Federal Aviation Administration, Notice N-8900.227, Unmanned Aircraft Systems (UAS) Operational Approval, at 20-21 (July 30, 2013). The FAA has the statutory authority, granted at 49 U.S.C. § 44701(f) to waive the pilot requirements for commercial operations.

Given these conditions and restrictions, an equivalent level of safety will be provided by allowing operation of the UX5 UAS by individuals with a valid private pilot's certificate.

Under the conditions set forth herein, the risks associated with the operation of the UX5 UAS (given its size, speed, operational capabilities, and lack of combustible fuel) are so diminished from the level of risk associated with other commercial operations contemplated by Part 61 with conventional aircraft (fixed wing or rotorcraft), that allowing operations of the UAS as set forth above meets or exceeds the present level of safety provided under 14 C.F.R. § 61.113(a) & (b).

14 C.F.R. § 91.7(a): Civil aircraft airworthiness.

This regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. Should the exemption be granted allowing commercial operation of the UX5 UAS

without an airworthiness certificate, no standard will exist for airworthiness of the UX5 UAS. Given the size of the aircraft and the requirements that have presumably already been met in the SAC approval process for the UX5 UAS (for instance, the UX5's Maintenance & Inspection Manual and Safety Checklist), an equivalent level of safety will be achieved by insuring compliance with the Trimble UX5 UAS operations manuals (Exhibits 2, 3, 4 and 5) prior to each flight.

14 CFR § 91.119: Minimum Safe Altitudes

Section 91.119 establishes safe altitudes for operation of civil aircraft. Specifically, 91.119(c) limits aircraft flying over areas other than congested areas to an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

As set forth herein, the UX5 UAS will not be operated at higher than 400 feet AGL. It will, however, be operated to avoid congested or populated areas that are depicted in yellow on VFR sectional charts. Because aerial survey work must be accomplished at relatively low altitudes and at altitudes less than 500 feet AGL, an exemption from Section 91.119(c) is needed.

The equivalent level of safety will be achieved given the size, weight, speed, and material with which the UX5 UAS is built. Compared to aerial survey operations conducted with aircraft or rotorcraft weighing far more than 5.5 lbs. and carrying flammable fuel, any risk associated with these operations will be far less than those currently allowed with conventional aircraft operating at or below 500 feet AGL. Indeed, the low-altitude operations of the UAS will maintain separation between these small-UAS operations and the operations of conventional aircraft that must comply with Section 91.119.

14 C.F.R. § 91.151(a): Fuel Requirements for Flight in VFR Conditions

This regulation prohibits an individual from beginning “a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed – (1) During the day, to fly after that for at least 30 minutes; or (2) At night, to fly after that for at least 45 minutes.”

The UX5 UAS batteries provide approximately 50 minutes of powered flight. Without an exemption from § 14 CFR 91.151, the UAS’s flights would be limited to approximately 20 minutes in length.

Given the limitations on its proposed operations and the location of those proposed operations, a longer time frame for flight in daylight VFR conditions is reasonable.

CompassData believes that an exemption from 14 CFR § 91.151(a) is safe and within the scope of a prior exemption. *See* Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with 91.151(a)). Operating the small UAS, without 30 minutes of reserve battery power does not engender the type of risks that Section 91.151(a) was meant to prevent given the size and speed at which the UAS operates. The fact that it carries no pilot, passenger, or cargo also enhances its safety. Additionally, limiting UX5 UAS flights to 20 minutes would greatly reduce their utility. In the unlikely event that the UX5 UAS should run out of battery power, it would simply land using a gentle downward spiraling pattern. Given its weight and construction material, the risks are less than contemplated by the current regulation.

CompassData believes that an equivalent level of safety can be achieved by maintaining 10 minutes of reserve battery power, which, allowing 40 minutes of flight time, would be more than adequate to return the UAS to its planned landing zone from anywhere in its operating area.

Trimble Navigation Limited was granted an Exemption from this FAR, Exemption No. 10808 for its X-100 UAS and an exemption for commercial operation of the UX5 UAS, Exemption No. 11110. Similar exemptions have been granted to others, including Exemptions 2689F, 5745, and 10673.

14 C.F.R. § 91.405(a); 407(a)(1); 409(a)(2); 417(a): Maintenance Inspections

Section 91.405(a) requires that an aircraft operator or owner “shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter” Section 91.407 similarly makes reference to requirements in Part 43; Section 91.409(a)(2) requires an annual inspection for the issuance of an air worthiness certificate.

Section 91.417(a) requires the owner or operator to keep records showing certain maintenance work that has been accomplished by certificated mechanics, under Part 43, or licensed pilots and records of approval of the aircraft for return to service.

Maintenance of the UX5 UAS will be accomplished by the owner/operator pursuant to the manuals, included as Exhibits 2, 3, 4 and 5, provided as an attachment to the petition. An equivalent level of safety will be achieved because the UAS is small in size, will carry no external payload, will operate only in restricted predetermined areas and is not a complex mechanical devise. As provided in the attached

Maintenance Manual and the Safety Checklist, the operator of UX5 UAS will ensure that the UAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance that is performed. Moreover, the operator is the person most familiar with the aircraft and is best suited to maintain the aircraft in an airworthy condition and to ensure an equivalent level of safety. The UX5 UAS’s Maintenance Manual provides for

replacement of the airframe every 50 hours of flight. This will ensure an equivalent level of safety to the maintenance requirements in Part 91. In addition, between such air frame replacements, should a mechanical issue arise the aircraft will either return to its launch site or immediately land.

(3) Flight Operations Pursuant To The Exemption Sought Would Be Limited To Areas That Are Not In The Proximity Of Airports Or Over Populated Areas.

CompassData proposes to only conduct aerial acquisition flight operations over rural areas that are not near populated areas, airports, helipads, highways or state roads. Specifically, CompassData's proposed area of flight operations includes rural areas that are:

1. Non 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.

In summary, CompassData seeks to operate its UX5 UAS only over rural areas within the States defined above while maintaining safe distances from any populated areas, airports, helipads, or roadways.

Flight Operations of The UX5 UAS are Limited To The Line of Sight of A Certificated Pilot in Command and With A Safety Observer

CompassData will only utilize FAA Licensed Pilots to act as pilot in command of the UX5 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 UX5 Standard Operating Procedures, which is proprietary information, and is attached hereto as (Exhibits 2, 3, 4 and 5) and is to be held in a separate file pursuant to 14

C.F.R. § 11.35(b).

**Flights Will Be Conducted Pursuant To Specific Operating
Limitations**

In seeking this exemption, CompassData proposes to commercially operate the UX5 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. CompassData proposes to operate the UX5 UAS, for the special purpose of conducting aerial image acquisitions, pursuant to the following specific operating limitations as approved in the Trimble Grant of Exemption No. 11110. These operating limitations as stated in the Trimble Grant of Exemption include:

- 1) Operations authorized by this grant of exemption are limited to the following aircraft described in the operator's manual which is a fixed-wing aircraft weighing less than 6 pounds: Trimble Navigation Limited UX5 UAS. Proposed operations of any other aircraft will require a new petition or a petition to amend this grant.
- 2) The UA may not be flown at an indicated airspeed exceeding 74.5 knots.
- 3) The UA must be operated at an altitude of no more than 400 feet above ground level (AGL), as indicated by the procedures specified in the operator's manual. All altitudes reported to ATC must be in feet AGL.
- 4) The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate.
- 5) All operations must utilize a visual observer (VO). The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times. The PIC must be

designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the functions prescribed in the operator's manual.

6) Provided the additional requirements identified in these conditions and limitations are added or amended, the operator's manual is considered acceptable to the FAA. The operator's manual and this grant of exemption must be maintained and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operator's manual, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operator's manual.

The operator may update or revise its operator's manual. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator upon request. The operator must also present updated and revised documents if it petitions for an extension or amendment of this exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for amendment to its exemption. The FAA's UAS Integration Office (AFS-80) may be contacted if questions arise regarding updates or revisions to the operator's manual.

7) Prior to each flight the PIC must inspect the UAS to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight. The Ground Control Station must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.

8) Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g. replacement of a flight critical component, must undergo a functional test flight in accordance with the operator's manual. The PIC who

conducts the functional test flight must make an entry in the UAS aircraft records of the flight. The requirements and procedures for a functional test flight and aircraft record entry must be added to the operator's manual.

9) The preflight inspection section in the operator's manual must be amended to include the following requirement: The preflight inspection must account for all discrepancies, i.e. inoperable components, items, or equipment, not covered in the relevant preflight inspection sections of the operator's manual.

10) The operator must follow the manufacturer's UAS aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements, with particular attention to flight critical components that may not be addressed in the manufacturer's manuals.

11) CompassData must carry out its maintenance, inspections, and record keeping requirements in accordance with the operator's manual. Maintenance, inspection, and alterations must be noted in the aircraft logbook, including total flight hours, description of work accomplished, and the signature of the authorized UX5 technician returning the UX5 to service.

12) UX5 technicians must receive and document training referenced in the operator's manual.

13) Each UAS operated under this exemption must comply with all manufacturer System and Safety Bulletins.

14) CompassData UX5 maintenance personnel must make a record entry in the UAS logbook or equivalent document of the corrective action taken against discrepancies discovered between inspections.

15) The PIC must possess at least a private pilot certificate and a third-class airman medical certificate. The PIC must also meet the flight review requirements specified in

14 CFR 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

16) Prior to operating for hire, the PIC must have completed Trimble's five-day UX5 Training Syllabus as outlined in the Safety Checklist. The Training Manual must also be updated to reflect the specific five day Training Syllabus presented by Trimble. The Training Manual specifies the minimum flight and skill requirements for the Remote Pilot, Instructor Pilot and Examiner. Those Manuals and records of those requirements must be documented and made available upon request by the Administrator. Those minimum flight requirements are repeated here as conditions and limitations:

Remote pilot [PIC]

- Minimum 2 flights on the UX5 as a remote pilot during the Type Rating module
- Minimum 2 flights on the UX5 as visual observer during the Type Rating module
- When failed: Minimum 4 flights on the UX5 for the failed part

Instructor pilot

- A minimum of 25 flights and 4 hours where:
 - The flights occurred on 4 different calendar days.
 - Two long endurance flights that last near the maximum permissible endurance (40 min for operations conducted under this exemption) or have a minimum duration of 45 min for previously logged flights or flights not conducted under this exemption (per the Trimble operation's manual).
 - One flight with a minimum measured wind speed of 30 kph (18.64 mph). If the wind speed cannot be measured, you can provide proof from METAR as close as 25km from the weather station.

- One flight with a minimum programmed leg distance of 1 km (if possible by CAA regulations, otherwise as long as possible.)
- 11 flights with a different selected height where:
 - 2 flights are at the minimum height
 - 2 flights are at the maximum allowable height

Examiner

- 100 flights and 20 hours (regardless of aircraft type) or as approved by a team of examiners.

Prior documented flight experience that was obtained in compliance with applicable regulations may satisfy this requirement. Training, proficiency, and experience-building flights can also be conducted under this grant of exemption to accomplish the required flights and flight time.

17) If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property and land or be recovered in accordance with the operator's manual.

18) The PIC must abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operator's manual.

19) The PIC is prohibited from beginning a UX5 flight unless (considering wind and forecast weather conditions) there is enough power to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 10 minutes.

20) The operator is required to request a Notice to Airman (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation.

- 21) All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N- Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.
- 22) Before conducting operations, the radio frequency spectrum used for operation and control of the UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.
- 23) The documents required under 14 CFR 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
- 24) The UA must remain clear and yield the right of way to all other manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).
- 25) The UAS may not be operated by the PIC from any moving device or vehicle.
- 26) UAS operations may not be conducted during night, as defined in 14 CFR 1.1.
- 27) All operations shall be conducted in Class G airspace.
- 28) All operations must be conducted under visual meteorological conditions (VMC). The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.
- 29) During operations in Class G airspace, the UA may not operate within 5 nautical miles of the geographic center of an airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's

management is obtained, and the operation is conducted in accordance with a NOTAM. The letter of agreement with the airport management must be made available to the Administrator upon request.

30) The UA may not be operated over congested or densely populated areas. These areas include but are not limited to the yellow areas depicted on World Aeronautical Charts (WAC), Sectional Aeronautical Charts (Sectionals), or Terminal Area Charts (TAC). However, aeronautical charts may not reflect pertinent local information. Ultimately, it is the PIC's responsibility to maintain the minimum safe altitudes required by § 91.119.

31) Operation of the UA must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures.

32) Operations of the UA may be conducted at distances less than 500 feet from participating persons, vessels, vehicles or structures that perform an essential function in connection with these special purpose operations. Operations closer than 500 feet from the PIC, VO, operator trainees and essential persons, are permitted when operationally necessary; but never so close as to present an undue hazard, per § 91.119(a).

33) Operations of the UA may be conducted at distances less than 500 feet from unoccupied vessels, vehicles or structures owned by the land owner/controller when the land owner/controller grants such permission and the PIC makes a safety assessment of the risk from operations closer to these objects.

34) All operations shall be conducted over government owned, private or controlled-access property with permission from the land owner/controller or authorized representative. Permission from land owner/controller or authorized representative will be obtained for each flight to be conducted.

35) Any incident, accident, or flight operation that transgresses the lateral or vertical

boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.nts.gov.

SUMMARY

SUMMARY OF COMPASSDATA SECTION 333 EXEMPTION REQUESTS

CompassData hereby provides pursuant to Part 11 a summary of its exemption application to allow commercial operation of the UX5 UAS in precision aerial survey work. An exemption is requested from the following regulations:

14 C.F.R. 61.113(a) & (b);

14 C.F.R. 91.7(a);

14 C.F.R. 91.119;

14 C.F.R. 91.151(a);

14 C.F.R. 91.405(a);

14 C.F.R. 91.407(a)(1);

14 C.F.R. 91.409(a)(2);

14 C.F.R. 91.417(a).

CONCLUSION

As set forth above, CompassData 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 UX5 UAS commercially, without an airworthiness certificate, for the special purpose of conducting aerial acquisitions over certain rural areas within the States of AZ, CO, MN, MT, ND, NE, NM, SD, TX, UT and WY. 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 CompassData to safely, efficiently, and economically operate the UX5 UAS commercially within the NAS.

Dated: 22 January 2015

Respectfully submitted,

Hayden Howard
Vice President
CompassData, Inc.
12353 E Easter Ave.
Centennial, CO 80112
303-627-4058

cc: James H. Williams, AFS-80
Robert Pappas
Dean Griffith, Esq.