



U.S. Department
of Transportation

**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave
Washington, DC 20591

In the matter of the petition of

AMERICAN ROBOTICS, INC.

For an exemption from
§§ 61.3(a)(1)(i); 91.9(b)(2);
91.119(c); 91.121; 91.151(b); and
91.203(a) and (b) of Title 14, Code
of Federal Regulations

Exemption No 18693

Regulatory Docket No. FAA-2019-0775

PARTIAL GRANT OF EXEMPTION

By letter dated September 20, 2019, and additional information submitted on October 15, 2019, October 13, 2020, and January 7, 2021,¹ Ms. Lisa Ellman, Counsel, Hogan Lovells US LLP, 555 13th Street, NW, Washington, DC 20004, petitioned the Federal Aviation Administration (FAA) on behalf of American Robotics, Inc. (American Robotics) for an exemption from Title 14, Code of Federal Regulations (14 CFR) 61.3(a)(1)(i); 91.9(b)(2); 91.119(c); 91.121; 91.151(b); and 91.203(a) and (b).² This grant of exemption allows American Robotics to operate its proprietary Scout quadcopter unmanned aircraft (UA), with a maximum gross takeoff weight of 20 pounds (lbs.), in rural settings for the purposes of: research and development and crew training, and market surveys in accordance with the operating conditions and limitations of waiver number 107W-2020-01574A.

¹ All information on which the FAA bases this decision is available in the public docket for this exemption or is described in this document. As used in this decision, the term “operational documents” refers to documents containing such information.

² The petition contains a discrepancy with respect to § 91.203: in the list of regulations from which American Robotics sought relief, the petitioner requested relief from § 91.203(b). However, in the text of the petition American Robotics asked for relief from both (a) and (b). This discrepancy is moot, as the FAA does not evaluate this petition under part 14 CFR 91.

American Robotics proposed to station the Scout UA in fields at pre-surveyed sites for extended durations, performing flight operations without the need to have a pilot co-located on site with the small UA. Operations under the requested exemption would only occur in Class G airspace in areas having light air traffic, in daylight visual meteorological conditions (VMC), and would be limited to 400 feet above ground level (AGL). Individual missions would occur within the boundaries of controlled access farmland (or similar rural, controlled-access environments) owned or controlled by American Robotics' customers.

American Robotics applied for a waiver under part 107 to allow American Robotics to operate the Scout UAS beyond visual line of sight (BVLOS) of the remote pilot in command (PIC). The FAA issued two waivers 107W-2019-05256 and 107W-2020-01574, both of which permit operations BVLOS but require a remote PIC on site. Neither waiver excused the remote PIC from being on site with the aircraft for the purpose of conducting a preflight assessment. As a result, American Robotics submitted a petition for exemption, as described herein.

Because American Robotics will operate a small UAS, as defined at § 107.3, and given the provision codified at § 91.1(f), the FAA construes American Robotics' petition as: (1) a request for a waiver to operate the small UAS BVLOS of sight of the remote PIC or visual observer (VO), and (2) a petition to exempt compliance with § 107.15, *Condition for safe operation* and §107.49, *Preflight familiarization, inspection, and actions for aircraft operation*. In conjunction with this exemption, which grants limited relief from §§ 107.15 and 107.49, the FAA also issues waiver number 107W-2020-01574A, which grants relief from § 107.31 pursuant to § 107.200. The combination of these two decisions will permit American Robotics to conduct its operations under part 107 in the manner described in its petition.

All provisions of part 107 from which waiver number 107W-2020-01574A, or its successor, and this exemption do not provide relief will apply to all operations American Robotics will conduct pursuant to this exemption.

The petitioner requests relief from the following regulations:

Section 61.3(a)(1)(i), which requires, in part, that a person who operates a civil aircraft as a required flight crewmember to hold a pilot certificate issued under part 61 and in accordance with 61.19.

Section 91.9(b)(2), which prohibits a person from operating a U.S. registered aircraft for which a flight manual is required unless the manual is available in the aircraft.

Section 91.119(c), which prescribes that, except when necessary for takeoff or landing, no person may operate an aircraft below 500 feet above the surface or closer than 500 feet of any person, vessel, vehicle, or structure.

Section 91.121, which requires maintaining certain altitudes.

Section 91.151(b), which prohibits any person from beginning a flight in a rotorcraft under VFR (visual flight rules) without a certain amount of fuel.

Section 91.203, which prohibits, in part, any person from operating a civil aircraft unless the aircraft has within it an appropriate and current airworthiness certificate and an effective U.S. registration certificate.

While American Robotics did not petition for relief from §§ 107.15 and 107.49, such relief is necessary. These regulations provide as follows:

Section 107.15, Condition for safe operation, states -

- (a) No person may operate a civil small unmanned aircraft system (UAS) unless it is in a condition for safe operation. Prior to each flight, the remote pilot in command must check the small unmanned aircraft system to determine whether it is in a condition for safe operation.
- (b) No person may continue flight of the small unmanned aircraft when he or she knows or has reason to know that the small unmanned aircraft system is no longer in a condition for safe operation.

Section 107.49, Preflight familiarization, inspection, and actions for aircraft operation, states -

Prior to flight, the remote pilot in command must:

- (a) Assess the operating environment, considering risks to persons and property in the immediate vicinity both on the surface and in the air. This assessment must include:
 - (1) Local weather conditions;
 - (2) Local airspace and any flight restrictions;
 - (3) The location of persons and property on the surface; and
 - (4) Other ground hazards.
- (b) Ensure that all persons directly participating in the small unmanned aircraft operation are informed about the operating conditions, emergency procedures, contingency procedures, roles and responsibilities, and potential hazards;
- (c) Ensure that all control links between ground control station and the small unmanned aircraft are working properly;
- (d) If the small unmanned aircraft is powered, ensure that there is enough available power for the small unmanned aircraft system to operate for the intended operational time; and
- (e) Ensure that any object attached or carried by the small unmanned aircraft is secure and does not adversely affect the flight characteristics or controllability of the aircraft.

The petitioner supports its request with the following information:

As part of its safety risk analysis, the FAA relied on materials marked as “proprietary” by the petitioner to make determinations about the petitioner’s capabilities. Accordingly, while these materials have not been released in their entirety, they have been identified in the docket for this exemption. See Attachment 1.

The petition for exemption describing the proposed operation and the regulations from which the petitioner seeks exemption are posted to the docket. To view the petition, visit <http://www.regulations.gov>, enter the regulatory docket number FAA-2019-0775 into the search box and click “Search,” then click on the “Open Docket Folder” link next to a result associated with the docket number.

The petitioner asserts it will only use remote pilots who hold a Remote Pilot Certificate with a Small UAS rating to conduct operations. The petitioner will designate a remote PIC for each flight.

The petitioner describes the Scout UAS as a highly automated industrial vertical takeoff and landing (VTOL) electric multirotor that has been custom designed and built by American Robotics for use in applications such as agriculture, mining, and energy, where the small UA would conduct aerial surveys. The Scout has four motors configured in a quadcopter formation and has a maximum gross takeoff weight of 20 lbs. The petitioner asserts that, because the Scout UAS is highly automated, it is capable of completing safe missions while its remote PIC monitors the operation from an off-site location. See Pet. at 4.

The flight operations proposed by the petitioner would only be conducted in Class G airspace with areas having light air traffic, in daylight visual meteorological conditions (VMC) and would be limited to 400 feet above ground level (AGL). The operations would only occur over controlled access environments that are owned and controlled by American Robotics’ customers. Additionally, survey (data collection) operations that occur under this exemption are limited to within 400 feet vertically and 20 feet horizontally of the boundaries of controlled access areas.

The petitioner states the Scout UAS was designed to be capable of BVLOS operations with a remote PIC monitoring the operation from an off-site location. Ultimately, American Robotics intends to operate the aircraft with an employee or a customer seeing the aircraft only with electronic visual aids. American Robotics proposes to use a pilot who holds a Remote Pilot Certificate with a small UAS rating for monitoring the operation and maintaining responsibility for it.

The Scout UAS is composed of six primary subsystems, namely the Scout UA, ScoutBase, ScoutOps, ScoutView, ScoutChronicle, and TASA (a ground-based detect and avoid (GBDAA)) system that work in concert with each other to execute preplanned flights in a pre-defined, constrained operating area. The ScoutBase acts as the hangar, charging station, data

processing station, command and control infrastructure and diagnostic center for the Scout UAS. The Scout UAS is equipped with a GBDA system, which the petitioner asserts will provide a means for detecting and avoiding non-cooperative aircraft that may enter into the area of operation.

According to the petitioner, once installed in a particular operating area, the ScoutBase and TASA allows for the monitored and safe operation of the Scout UA to a fixed, 2.0-mile radius from the TASA unit. When any non-cooperative aircraft is detected ('sensed') at ranges well exceeding 2 miles and determined ('declared') to be a threat to breach the 2.0-mile radius limit, the Scout UA is commanded to 'avoid' and descend immediately. The Scout UA uses a proprietary method of descent to avoid oncoming traffic at speeds greater than 2.5 meters per second.

The petitioner will use three supporting software subsystems, ScoutOps, ScoutView, and ScoutChronicle, for the operation. The petitioner asserts that, together, these systems assure every flight-critical component is continuously monitored and checked for degradation, all flight plans exist within expected operating boundaries away from populated and restricted areas, and all system data is continuously logged.

According to the petitioner, all areas over which the small UAS will operate are geo-fenced by their boundaries, as well as distance from the base station to ensure that the small UAS is not able to operate outside the areas that are explicitly designated for the operation. Similarly, all regions where people would be present or congregate and where vehicles would park or be present (barns, grain silos, power substations, etc.) will be designated as zones over which the small UAS will not operate.

Discussion of Public Comments:

A summary of the petition was published in the Federal Register on April 28, 2020 (85 FR 23592). The FAA received one comment, from the Commercial Drone Alliance (CDA), in support of the petition. The CDA states that current aviation regulatory framework in the United States is designed to regulate manned aviation operations, not UAS agricultural operations. Accordingly, an exemption from certain regulations is necessary to enable UAS agricultural operations, and open the U.S. skies to today's technology, including American Robotics' Scout UAS research, development and training operations. The CDA believes granting the American Robotics petition will also significantly advance the integration of UAS into the National Airspace System (NAS) in a controlled, safe environment, consistent with the objectives of the Administration and Congress. American Robotics' efforts will benefit the UAS industry as a whole, as the industry seeks broad regulatory authority to expand operations to include flights BVLOS and over people in a way that is safe and secure. The FAA agrees with the CDA to the extent that the public is served by safe and secure BVLOS operations, but notes that the subject operations are not agricultural operations as

prescribed by 14 CFR part 137; rather, the petitioner describes aerial survey operations in rural agricultural environments.

The FAA’s analysis is as follows:

In its petition, American Robotics proposed to conduct operations under the provisions of part 91 using a small UAS as defined at § 107.3, *Definitions*. However, § 91.1(f) states, “except as provided in §§ 107.13, 107.27, 107.47, 107.57, and 107.59 of this chapter, this part does not apply to any aircraft governed by part 107 of this chapter.”

Based on the applicability of part 107 and the language of § 91.1(f), part 91 does not apply to the petitioner’s proposed operations. Therefore, relief from §§ 91.9(b)(2); 91.119(c); 91.121; 91.151(b); and 91.203(a) and (b) is denied. Similarly, part 61 does not apply to the proposed operations. Therefore, the petition for relief from § 61.3(a)(1)(i) is denied.

Title 49 U.S.C. 44807 provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate or authorization, or a certificate under § 44703 or § 44704 is required for the operation of certain UAS. Section 44807(b) instructs the Secretary to base this determination on which types of UAS do not create a hazard to users of the NAS or the public. In making this determination, the Secretary must consider the size, weight, speed, operational capability of the UAS, and other aspects of the proposed operation.

By seeking to operate under 14 CFR part 91, American Robotics essentially seeks relief from the applicability provisions of part 107. American Robotics does not dispute that the Scout UAS weighs less than 55 lbs. As the FAA determined in Exemption No. 18279, the Department of Transportation and the FAA explained in promulgating part 107 that the statutory authority for part 107 is based on the Secretary’s determination that *small* UAS may operate safely in the NAS, pursuant to certain restrictions. 81 FR 42064, 42073-74, 42076 (June 28, 2016). This determination applies to the proposed operations, as the operations will be civil operations not subject to any exception codified at § 107.1(b) and will occur with the Scout UAS, which weighs less than 55 pounds. American Robotics did not articulate a basis for not applying part 107, or the statutory determination upon which it is based, to the proposed operations.

While the provisions of part 107 contain operational restrictions to ensure safety, the FAA has acknowledged that (1) the rulemaking process for small UAS operations may lag behind new and emerging technologies; and (2) certain individual operating environments may provide unique mitigations for some of the safety concerns underlying part 107. As a result, the FAA included a framework for issuing waivers from certain restrictions codified in part 107 in order to accommodate new technologies and unique operational circumstances. A certificate of waiver under § 107.200 allows a small UAS operation to deviate from certain provisions of part 107 if the Administrator finds that the proposed operation can occur safely under the terms of that certificate of waiver. Section 107.205 lists these specific provisions.

American Robotics has presented the FAA with both new technology and a unique operational circumstance envisioned in the preamble to part 107; however, § 107.15, *Condition for safe operation*, or § 107.49, *Preflight familiarization, inspection, and actions for aircraft operation*, are not subject to waiver. The FAA has not considered granting relief via waiver from to the extent necessary for these activities to be conducted by a remote PIC who is not co-located with the aircraft. To conduct the operations that American Robotics describes in its petition, American Robotics must receive relief by obtaining a limited exemption from certain requirements codified in §§ 107.15 and 107.49.

According to American Robotics' operational documents, the remote PIC for each flight under this exemption and its associated waiver will be solely responsible for determining whether the aircraft is in a safe condition for flight and confirming that the planned flight operations are within the operating limitations of the small UAS. Specifically, American Robotics must designate a remote PIC for each flight. Prior to each flight, the remote PIC will log into ScoutOps™ and ScoutBase™, proprietary software that allows the remote PIC to ensure the small UAS is in a safe condition for flight and the preflight familiarization, inspection, and actions for aircraft operation are completed.

- First, the remote PIC confirms a Return-to-Service Inspection Check has been completed within past 7 calendar days.
- Second, the remote PIC conducts the Aircraft Pre-Dispatch Checks to detect systemic degradations or non-ideal flight conditions, as described in the operational documents.
- Third, the remote PIC conducts the Base Pre-Dispatch Checks, to detect all components critical to operation are active and running, as described in the operational documents.
Any failures in the Pre-Dispatch Checks will result in a delayed flight. The flight cannot be approved until all issues have been resolved. The remote PIC will determine whether to postpone or cancel the flight in order to resolve the issues.
- Fourth, the remote PIC uses the procedures and tools described in the documents that accompanied the petition to inspect the UA, its base, and necessary components, as described in the operational documents.
- Fifth, the remote PIC verifies completion of pre-dispatch checks that include weather, notice to airmen (NOTAMs), and flight path, as described in the operational documents.
- Sixth, the remote PIC approves the mission.
- Seventh, the ScoutBase™ roof opens and platform deck rises to takeoff position.
- Eighth, the remote PIC uses the ScoutOps™ to conduct the Pre-Takeoff Checks, to ensure the sensors on board the aircraft are functional, within calibration, and are working properly, as described in the operational documents.

Once the Pre-Dispatch Checks are complete, the remote PIC who is responsible for the operation will verify the functionality of the automated system via ScoutOps™ and the ScoutBase™ camera system prior to each flight. The inspection will be consistent with the pre-dispatch checks that will occur.

The FAA has determined that successful completion of the checks, preflight familiarization, inspection, and actions for aircraft operation proposed by American Robotics will ensure the proposed operation will not adversely affect safety. Therefore, this exemption provides relief from §§ 107.15 and 107.49, but only to the extent that permits the remote PIC to perform these activities from an off-site location.

Public interest

The FAA will learn more about automated operations by allowing the operations American Robotics petitions to conduct. Specifically, American Robotics' proposed operations will provide the FAA with critical data for use in evaluating BVLOS operations from offsite locations. Once adopted on a wider scale, such a scheme could lend efficiencies to many of the industries that fuel our economy such as agriculture, transportation, mining, technology, and non-durable manufacturing. Moreover, the operations will achieve a reduction in environmental impact, as they will involve a small aircraft carrying no passengers or crew, rather than a manned aircraft of significantly greater size. Given these considerations, the small UAS operation the petitioner will conduct under this exemption is in the public interest.

Summary

The following table summarizes the FAA's determinations regarding the relief sought by American Robotics for its operations and granted by the FAA:

Relief considered (14 CFR)	FAA determination (14 CFR)
61.3(a)(1)(i)	Relief not necessary
91.9(b)(2)	Relief not granted
91.119(c)	Relief not granted
91.121	Relief not granted
91.151(b)	Relief not granted
91.203(a) and (b)	Relief not granted
107.15	Relief granted with conditions and limitations
107.49	Relief granted with conditions and limitations

The FAA's Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, 44701, and 44807, delegated to me by the Administrator, American Robotics, Inc. is granted an exemption from 14 CFR §§ 107.15 and 107.49 to the extent necessary to allow American Robotics to operate

the Scout UAS in rural settings in accordance with waiver number 107W-2020-01574A, or its successor, for the purposes of research and development, crew training and market surveys and subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, American Robotics, Inc. is herein referred to as the operator. Failure to comply with any of the conditions and limitations of this grant of exemption or its companion waiver number 107W-2020-01574A, or its successor, will be grounds for the immediate suspension or revocation of this exemption.

Operational Conditions and Limitations

1. Operations authorized by this grant of exemption are limited to the Scout UAS. Proposed operations of any other unmanned aircraft system (UAS) requires a new petition or a petition to amend this decision.
2. All operations conducted in accordance with this exemption must also be conducted in compliance with waiver number 107W-2020-01574A or succeeding version of waiver number 107W-2020-01574A.
3. This exemption is only applicable to small UAS operations for research and development, crew training, and market survey. As such, operations may also include training, currency or proficiency flights associated with the operator's operations.
4. The operator must comply with all applicable manuals and procedures provided in support of the requested relief. Where discrepancies exist between the conditions and limitations of this exemption, the associated waiver, and other operating documents, the most restrictive terms apply.
5. The operator must petition for an amendment to this decision if the operator or Federal Aviation Administration (FAA) makes any update or revision to the operating documents, training program, aircraft systems, operating parameters, or other supporting documents that would affect the basis upon which the FAA granted this exemption. The documents on which the FAA relied for granting this petition for exemption are listed above, within the section titled, "Petitioner supports its request with the following information." The petitioner must track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The petitioner must submit such updates by contacting the FAA's Flight Standards Service, General Aviation and Commercial Division (AFS-800), 55 M Street, SE, 8th Floor, Zone 1, Washington, DC 20003. Telephone number: 202-267-1100, Email: 9-AFS-800-Correspondence@faa.gov.

6. This exemption, a copy of waiver number 107W-2020-01574A or its successor, and all operating documents must be accessible during all operations that occur under this exemption and must be made available to the Administrator upon request.
7. The operator must designate a remote pilot in command (PIC) for each flight and retain the information in accordance with waiver number 107W-2020-01574A or its successor. This person has the ultimate responsibility for the entire flight and must ensure its safety.
8. Prior to each flight, the remote PIC must check the small UAS to determine that it is in a condition for safe operation. If the remote PIC cannot make the determination, he or she must not fly the aircraft until the situation has been resolved.
9. Once in the air, the remote PIC may not continue flight of the small UAS when he or she knows or has reason to know that the small UAS is no longer in a condition for safe operation.
10. Prior to each flight, the remote PIC must conduct a preflight inspection in accordance with the procedures outlined in the operator's manual and determine the small UAS is in a condition for safe flight. The preflight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the small UAS, the remote PIC is prohibited from operating until the issue has been remedied and the remote PIC determines the small UAS is in a condition for safe flight.
11. Prior to each flight, the remote PIC must effectively assess the operating environment, considering risks to persons and property in the immediate vicinity both on the surface and in the air according to procedures described in the Scout Pilot Operating Handbook. This assessment must include local weather conditions; local airspace and any flight restrictions; the location of persons and property on the surface; and all other ground hazards.
12. Prior to each flight, the remote PIC must ensure that all persons directly participating in the small UAS operation are informed about the operating conditions, emergency procedures, contingency procedures, roles and responsibilities, and potential hazards.
13. The remote PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the small unmanned aircraft (UA) to conduct the intended operation and to operate after that for at least five minutes, or with the reserve power recommended by the manufacturer if greater.
14. This exemption is not valid for operations outside of the United States.

If you request an extension to this exemption, please submit your request by using the Regulatory Docket No. FAA-2019-0775 (<http://www.regulations.gov>). In addition, you should submit your request no later than 120 days prior to the exemption's expiration date listed below.

If you require an amendment to this exemption, please submit your request no later than 120 days prior to the date you need the amendment using the process described above.

Any extension or amendment request must meet the requirements of § 11.81 of 14 CFR.

This exemption terminates on January 31, 2023, unless sooner superseded or rescinded.

Issued in Washington, D.C., on January 14, 2021.

Sincerely,

/s/

Robert C. Carty
Deputy Executive Director, Flight Standards Service

Enclosure:
Waiver Number: 107W-2020-01574A

Attachment 1

Supplemental documents:	Information received:
Operational Risk Assessment (ORA)	The ORA contains detailed information describing the operation's operational risks and correlated mitigations to those risks.
General Operations Manual (GOM) 1 August 2019; Original Document ID No. ARDO-00-GOM	This manual constitutes "base line" requirements that American Robotics will apply in structuring the organization and the staffing, as well as planning and conducting UAS flight operations.
Unmanned Flight Manual (UFM) 1 August 2019; Original	This manual describes the processes for complete operation of the Scout™ UAS
Maintenance and Inspection Program (MIP) Scout1801, Scout 1802, Scout 1803, Scout 1904, Scout 1905, 1 August 2019; Original	The manual contains detailed information describing the operation's maintenance and inspection program
Scout System Summary American Robotics Scout updated October 8, 2020	This document summarizes key concepts from the American Robotics Scout
AR Scout UAS + Ground-Based Detect and Avoid (GBDAA) Testing Document Report Date: 8/15/2019	The GBDAA system was integrated with the Scout UAS and tested against low-flying manned aircraft in Searchlight, Nevada. This document summarizes the results of that test.
American Robotics Inspection System, dated October 15, 2020, VO.3	This document describes the technical design details and functionality of the Inspection System with the objective of documenting the milestone stages of the design process: design objectives, system architecture, realized design.
GBDAA Additional Information	This document contains additional technical information and details related to GBDAA sensor, as well as the integration with the American Robotics Scout UAS to form a complete end-to-end DAA system. This document is an adjunct to the American Robotics Scout UAS + GBDAA Testing Summary document.
Three documents with maps and location information	The three documents contain maps and identify the boundaries of the three operational areas.
Scout UAS Reliability Data – Transient Crossing of Rural Roads	This document describes the number of flights, flight hours number of road crossings and reportable incidents in 2018 and 2019.

