FAA Remote ID NPRM Comments

Contacts:

Dave Messina  
President & CEO, FPV Freedom Coalition  
dmessina@fpvfc.org

Josh Cook  
VP, FPV Freedom Coalition  
josh@fpvfc.org

The FPV Freedom Coalition (FPVFC), LLC is a 501(c)(3) which aspires to be an FAA Community Based Organization. The FPVFC has been educating the FPV community including the creation and distribution of a set of safety guidelines tailored to FPV fliers. The FPVFC is active in the 2019 - 2020 FAA Drone Advisory Committee Tasking Groups on Remote ID, UAS Facility Maps and Spectrum/C2 and hopes to participate in future DAC Tasking Groups. A recent YouTube video produced by FPVFC was viewed over 121,000 times in the first three weeks of release.

The FPVFC believes the Remote ID Notice of Proposed Rulemaking (NPRM) if put in place as written, will be interpreted as unreasonable regulation. We judge that many of the over 1.3 million recreational UAS operators in the U.S. will not comply because they view the regulations as unreasonable. Further, the provision of Remote ID NPRM as written does not materially mitigate safety or security issues, however it will penalize law-abiding citizens of the United States, while those who would commit crimes using a UAS would simply not comply with the proposed requirements.

The Federal Aviation Administration (FAA) will be seen by millions of recreational hobbyists, STEM instructors, engineers, educators and individuals as responsible for destroying an industry which employs thousands of people in the US. And, this industry will be destroyed without merit because recreational UAS operators have a proven record of safety with near-zero confirmed incident records going back decades.

FPVFC cautions the FAA from implementing the proposed rule. As evidenced by Section 349, Exception for Limited Recreational Operations of Unmanned Aircraft of H.R. 302 (P.L. 155-254) (the FAA Reauthorization Act of 2018), congress had no intention of regulating the recreational operation of UAS operation out of existence. In fact, congress expressly demonstrated an intention of protecting recreational UAS operation, going so far as to include a (or, more precisely reiterate) a statutory framework for lawful operation which has seen the safe operation of 1.3 million UAS aircraft. To
implement the proposed rule would be to exceed the authority granted the FAA in the 2018
Reauthorization Act.

In that context, the FAA must consider that the regulations, as presented in the Remote ID NPRM will likely stall innovation and dissuade the general public from attempting to enter the hobby or industry. As recreational operators are the future pilots, software programmers, engineers, astronauts, explorers and entrepreneurs, restricting amateur-built drones as well as restricting hobbyist flight of Unmanned Aerial Systems (UAS) will discourage young people from pursuing technical careers. It is not hyperbole to say that a safe, secure airspace is a national security asset, but so is maintaining the U.S.’s lead in UAS development, innovation and education. The FAA’s stifling of innovation will have the direct effect of surrendering the U.S.’s lead in UAS innovation to foreign actors. A balance must be struck.

Evidence of this chilling effect can be seen anecdotally. The Remote ID NPRM has caused a negative response among UAS hobbyists and is now causing once passionate participants to hesitate investing money or development time in the hobby; others have left or have considered leaving the hobby altogether. One metric of this is a YouTube video where two of us from FPVFC were interviewed about the Remote ID NPRM by Joshua Bardwell, an industry leader. Within three weeks of airing, the video was viewed 121,000 times, several times higher than Joshua’s normal videos. We are concerned the FAA’s release of the NPRM has damaged the recreational UAS industry and a long period of uncertainty between March 2, 2020 and the first communication of Final Rules will further damage what was a growing industry.

The FPV Freedom Coalition believes the current FAA NPRM is improper and overreaching, although the concept of some form of remote ID has merit as it would allow recreational operators to engage in BVLOS operations. The FAA should reject its own proposed rule and instead adopt FPVFC’s recommendations because (a) the FPVFC’s proposed amended rules would accomplish the same goals of UAS tracking, safety and accountability; (b) it is more appropriate because it is not unduly burdensome in terms of cost and impact to affected persons and systems; and (c) it would permit other types of lawful UAS operation, further development, experimentation and education, all of which would be curtailed or eliminated under the proposed regulations. FPVFC’s vision for a better Remote ID looks like this:
High Level Summary of FPVFC’s Comments:

1. Elimination of Internet Broadcast requirements for Remote ID.
   a. RF Broadcast Remote ID is sufficient to satisfy Standard Remote ID
2. Elimination of Limited Remote ID Category.
   a. With the elimination of Internet Broadcast requirements, this category becomes obsolete. Categories would be “Standard Remote ID” and “Non-Equipped Remote ID”.
3. Remote ID information can not be available to the general public as this creates a privacy and safety issue for the operator.
   a. Information can only be available to the FAA and Law Enforcement on an as needed and warranted basis.
4. Non-Equipped Remote ID UAS are able to fly in Class G airspace freely, and within Controlled Airspace via Low Altitude Authorization and Notification Capability (LAANC).
5. Recreational registration will continue to be pilot only.
6. Elimination of build restrictions for Amateur-Built UAS. UAS are not required to come from an FAA Approved Producer to adhere to Remote ID.
   a. Standard Remote ID can easily be satisfied with an add on component or module that can come from an FAA Approved Producer with it’s own burned in serial number that can be registered and RF Broadcasts the required information.
   b. Amateur-Built UAS are able to add that component to their UAS to comply with Standard Remote ID and component is able to be transferred from one UAS to another.
7. Elimination of FAA-Recognized Identification Area (FRIA) provisions.
   a. When Non-Equipped Remote ID UAS are able to fly freely, there is no need for the FAA to identify FRIA’s as the concept will be obsolete.
8. Add a provision for shielded operations.
9. Increase the FAA Registration weight limit from 250 grams to 1 kilogram.
The FPV Freedom Coalition encourages the FAA consider these changes to the Remote ID NPRM:

**Connectivity, RID Data:**

**References:**
- X. Operating Requirements for Remote Identification; C. Internet Availability and Transmission to a Remote ID USS
- XII. Means of Compliance D. Minimum Performance Requirements 2. Automatic Remote ID USS Connection

1. **Paraphrased Requirements and Proposed Rules:**
   
   a. For Standard Remote ID UAS to effect connectivity to a Remote ID USS, the FAA is requiring both an Internet Network Connection as well as a Radio Frequency Broadcast.
   
   b. For Limited Remote ID UAS to effect connectivity to a Remote ID USS, the FAA is requiring an Internet network connection from the control station.

2. **FPVFC Comment:**
   
   a. This requirement does not solve safety or security issues and does create excessive cost for operators as well as overly restrictive flight operation limits. In addition, an Internet connection from a control station providing ID as well as control station location creates privacy issues as well as raises the risk of personal safety of the operator. We have spoken to UAS operators who have been shot at, been the victim of assault or battery and have encountered safety concerns while flying a UAS due to inability to detect and avoid other aircraft due to loud and aggressive bystanders.

   b. The FAA asserts 93% of the existing UAS fleet in the U.S. could be firmware upgraded to compliance. The FPVFC asserts the number is 0%. There are no UAS in the U.S. fleet operating either as recreational or under part 107 which could be firmware upgraded to compliance. Further the FAA estimates the average cost of a UAS is $114. Based on a survey across the FPVFC membership, the average cost is closer to $500. In addition, the FAA estimates a Remote ID USS monthly service fee would be $2.50/month. The FAA does not attempt to estimate a cellular service cost per month; however, an additional $20/month would be a very low and conservative estimate.

   c. FPVFC recommends that the FAA eliminate proposed rules relating to Network Based Operations (Internet Based) for both Standard and Limited Remote ID UAS.

   d. FPVFC recommends that the FAA eliminate the Limited Remote ID UAS category, keeping Standard Remote ID category with RF Broadcast ONLY. The accessibility of
Remote Identification data shall require a warrant. Restrict categories to Standard Remote ID and Non-Equipped Remote ID.


1. Background:
   a. The FAA invites comments on whether the parameters for the message elements performance requirements proposed in section 89.310(j) and section 89.320(j) are appropriate and requests commenters submit specifics, supported by data, to sustain their position.
      i. Verbatim from Section 89.310 requires the following data elements for Standard Remote ID UAS:
         1. §89.310(a) - Control Station and UAS location
         2. §89.310(b) - Automatic RID USS connection
         3. §89.310(c) - Time mark
         4. §89.310(d) - Self-testing and monitoring
         5. §89.310(e) - Tamper resistance
         6. §89.310(f) - Connectivity
         7. §89.310(g) - Error correction
         8. §89.310(h) - Interference considerations
         9. §89.310(i) - Message transmission requirements for broadcast and Remote ID USS
        10. §89.310(j) - Message elements for performance requirements for broadcast and Remote ID USS transmission
        11. §89.310(k) - Cybersecurity
      ii. Verbatim from Section 89.320 for Limited Remote ID requires the following remote ID message elements:
         1. §89.320(a) - Control station location
         2. §89.320(b) - Automatic Remote ID USS connection
         3. §89.320(c) - Time mark
         4. §89.320(d) - Self-testing and monitoring
         5. §89.320(e) - Tamper resistance
         6. §89.320(f) - Connectivity
2. **FPVFC Comment:**
   
a. Section 89.310 is overly vague with respect to self-testing and monitoring, error correction, interference considerations, message element performance requirements and cybersecurity. These requirements, if established too rigidly, could ground the entire UAS forever. As described elsewhere, the FPVFC considers just broadcast and not broadcast plus network connection as sufficient for a Standard Remote ID UAS which will be intended for BVLOS operations. This recommendation is consistent with the UAS Identification and Tracking Aviation Rulemaking Committee (ARC) final report dated September 30, 2017, the ASTM WK65041 and the FAA DAC submission on Remote ID equipage approved by the DAC on October 17, 2019.

   i. **§89.310(a) - Control Station and UAS location** – The FPVFC concludes that UAS location supplied by an RF Broadcast Remote ID solution should be adequate to satisfy Remote ID requirements. This can be achieved by a supplemental add-on module from an FAA approved vendor or from an open-source implementation using a FAA approved capabilities. Control Station location is not necessary as this has the potential to put the operator’s safety and security at risk.

   ii. **§89.310(b) - Automatic RID USS connection** – FPVFC concludes that by eliminating the need for an internet broadcast solution, Automatic RID USS connection becomes a non-issue and should be removed from any final rule. An RF Broadcast Remote ID solution would not need to connect to a RID USS.
iii. §89.310(c) - Time mark – This could be supplied by an RF Broadcast Remote ID add-on module.

iv. §89.310(d) - Self-testing and monitoring – The RF Broadcast Remote ID module could have simple LED (Light Emitting Diode) indicator lights that would show the result of the Self-Test upon start up. If the self-test fails, the UAS would only be able to be flown as a Non-Equipped UAS. If equipped, the failed POST could also be configured to trigger an audible alarm on the UAS, as well as a visual alert or warning in any downlink video feed. There is no need to restrict takeoff of the UAS. The monitoring could be transmitted as part of the telemetry package of the UAS, and supplied to the operator constantly.

v. §89.310(e) - Tamper resistance – No issue with this.

vi. §89.310(f) – Connectivity – Again as stated above, there is no need for this with an RF Broadcast Remote ID solution. Internet connectivity should not be required, and should not be implemented due to the privacy violations, as well as the safety and security of the operator.

vii. §89.310(g) - Error correction – No issue with this.

viii. §89.310(h) - Interference considerations – No issue with this.

ix. §89.310(i) - Message transmission requirements for broadcast and Remote ID USS – Eliminate the need to transmit via an Internet connection. RF Broadcast Remote ID solution must not be accessible by the general public, but open to the Administrator and his delegates, as well as law enforcement. The technology to protect the operator’s location information is insufficiently mature to be effective and should therefore not be part of this rule.

x. §89.310(j) - Message elements for performance requirements for broadcast and Remote ID USS transmission – Eliminate the need to transmit via an Internet connection. Eliminate the need for the Control Station location message.

xi. §89.310(k) – Cybersecurity – With RF Broadcast Remote ID, there is no need for a cybersecurity solution. RF Broadcasts should be encrypted or digitally encoded to prevent or dissuade the deciphering of contents so as to protect the
identity and location of the operator. Eliminate the need for Internet Connectivity Remote ID.

b. Section 89.320 is overly vague with respect to self-testing and monitoring, error correction, interference considerations, message element performance requirements and cybersecurity. These requirements, if established too rigidly, could ground the entire UAS forever. As described elsewhere, the FPVFC considers just broadcast and not broadcast plus network connection as sufficient for a Standard Remote ID UAS which will be intended for BVLOS operations. This recommendation is consistent with the UAS Identification and Tracking Aviation Rulemaking Committee (ARC) final report dated September 30, 2017, the ASTM WK65041 and the FAA DAC submission on Remote ID equipage approved by the DAC on October 17, 2019. In addition, Range limitation should be eliminated from the Limited Remote ID UAS message elements. This restriction creates unforeseen consequences including having a Limited Remote ID UAS limited to flying in a 400’ dome at a FRIA and also being incapable of flight indoors, which is beyond the authority of the FAA. **Furthermore, the entire Limited Remote ID category should be eliminated as Standard Remote ID would deal with all Remote ID solutions through an RF Broadcast solution. There is no need to further segment Remote ID beyond Standard Remote ID and Non-Equipped Remote ID.**

References: XII. Means of Compliance E. Other Performance Requirements Considered  
1. Background:  
   a. Paraphrased: The FAA believes that the current proposal reflects the minimum requirements necessary to achieve the intent of the proposed rules. The FAA welcomes comments on whether the final rule should incorporate additional performance requirements including but not limited to:  
      i. Additional UAS operator contact information or other aircraft or control station information such as velocity, direction, route or AGL  
      ii. Equipment interface requirements  
      iii. Flight data recording features to store RID information on the aircraft  
      iv. Requirements for connection indication of whether the UAS is connected to the Internet and connection to a specific RID USS.  
      v. Transmission broadcast requirements during C2 lost link event
2. Response:
   a. First, because a UAS must always yield right of way to any other aircraft, any flight data recording risks the privacy rights of the UAS operator and puts the UAS operator in the position of proving innocence in any infraction. No flight data recording should be required to exist on the UAS, but in the event flight data recording is captured and retained, it should be protected from access or review by law enforcement unless granted by a duly approved search warrant. Next, information including velocity, direction, route or AGL may be calculated from current requirements of position, time marks and barometric altitude. Equipment interfaces should be left to industry at this time. As subsystems in a UAS are being consolidated and redesigned, requiring interfaces between subsystems will inhibit innovation at this time. An example of this is the PC industry where graphics and I/O standards slowed the introduction of new technology. FPVFC and the community we represent steadfastly maintains that no connectivity monitor should be required for a fleet of aircraft with an extremely safe record. Given that the average cost of a recreational UAS aircraft exceeds $500, an operator is already incentivized to ensure continuous connectivity, and most operators ensure connectivity proactively by selecting the appropriate frequency band, connection protocols, antenna selection and operation distance. Requirement for a connection monitor would be a distracting hindrance of little value to the operator and would do nothing to improve safety of operations.

   b. In response to the FAA’s request to for additional data to be collected, any additional performance requirements should be linked to mission operations. For example, for BVLOS, additional sensors and communication of that sensor data to the control station would improve safety such as ADS-B in to alert the operator at the control station of manned aircraft. In all cases, no operator contact information should be available; this creates privacy and physical safety risks for the operator. With respect to velocity, direction, route and AGL, with the required lat/lon and requirement to submit a flight plan, this data can be calculated at the control station and would be a redundant (and therefore unnecessary) requirement to transmit this information. None of this data needs to be transmitted to the Remote USS.
Manufacturer:

 CFR 89.510 - Design and Production Requirements.

  1. **Background:** This section of the proposed rule asserts Producers of UAS would have to:

     a. Allow the Administrator to inspect their facilities, technical data, and any standard remote identification UAS or limited remote identification UAS the person produces, and to witness any tests necessary to determine compliance with subpart F.

     b. Perform independent audits on a recurring basis, and whenever the FAA provides notice of noncompliance or potential noncompliance, to demonstrate the UAS listed under a declaration of compliance meet the requirements of subpart F. The person responsible for the production of standard remote identification UAS or limited remote identification UAS must provide the results of all such audits to the FAA upon request.

     c. Maintain product support and notification procedures to notify the public and the FAA of any defect or condition that causes a UAS to no longer meet the requirements of subpart F, within 15 calendar days of the date the person becomes aware of the defect or condition.

  2. **Response:** The FPVFC asserts CFR 89.510 describes rules and requirements of UAS designers and producers which are beyond the authority of the FAA. The FAA’s authority is restricted to the National Airspace. This rule specifies inspections and testing on the ground. In addition, at the end of 2019, the UAS amateur-built fleet in the United States is approximately 200,000 quad-copters, approximately 15% of the 1.3 million recreational drones. This rule would ground all of these UAS and the required inspection processes would be unenforceable as the FAA would be required to inspect the households of some 200,000 US citizens on an ad hoc schedule. In addition, this rule stipulates it would be unlawful for individuals to produce amateur-built UAS. This is explicitly beyond the FAA’s authority, and raises the spectre of 4th Amendment constitutional challenges, thus detracting from the FAA’s goals of regulating the national airspace. FPVFC challenges the FAA to articulate any other lawful recreational activity that would permit the inspection by the government of a participant’s home or his places, papers or effects without a warrant, even if the activity were otherwise federally regulated. FPVFC proposes that 90.510 allow recreational UAS fliers to fly in uncontrolled airspace as they do today, with registration for the pilot. For controlled airspace, recreational fliers would be required to request approval to fly via a LAANC application. ADS-B 2020 is projected to cover
approximately 50% of manned aircraft in 2020. In other words, approximately 50% of manned aircraft have transponders alerting other aircraft to their existence and location. When this percentage reaches a higher number, it would then be appropriate to require all UAS recreational fliers to use LAANC if their UAS is unequipped. With respect to Subpart F, the FPVFC proposes only an electronic module for use with a Standard Remote ID UAS with a serial number and transponder be required to retrofit existing and new amateur-built UAS to achieve compliance.

References: XIII. A. through C. - Design and Production Requirements

1. Reference Sections:
   a. §89.501(c), §89.505, §89.501(a)(1), §89.5010(b), §89.515, §89.520, §89.1, §89.501(c)(1), §89.105, §89.120, §89.501(c), §89.310, §89.505, §89.510(a)(1), §89.405, §89.510(a)(2), §89.520, §89.520(b), §89.320, §89.510(b), §89.520(b)

2. FPVFC Comment:
   a. Recreational UAS should not be required to be separately registered. Per NPRM section XIII.A, recreational UAS do not require subpart F or ANSI/CTA-2063-A., but amateur-built UAS are restricted to fly only in FRIAs. We request the concept of a FRIA be eliminated and in addition, we request amateur-built UAS be allowed to fly Line-of-Sight (LOS) in uncontrolled airspace and also LOS with approval via LAANC in controlled airspace as permitted today. UAS operators have consistently demonstrated the ability to safely operate outside of FRIA’s presently, and with the additional controls, such as LAANC and broadcast Remote ID without internet connectivity would meet the FAA’s goals.

3. Rationale:
   a. This is a critically important topic to the recreational UAS industry and operators. The rules as proposed would effectively halt amateur-built UAS from flying outside of FRIAs, which are designed to become obsolete within a small number of years. The FRIA requirement would be unduly burdensome to lawful UAS operation, would hinder development of UAS technology, and prohibit participation of many new operators after the FRIA designation process closes. At the end of the year 2019, the United States fleet of recreational UAS exceeds 200,000 aircraft.
i. From a survey taken from FPVFC members, the average cost to the owner of a recreational drone exceeds $880 and the average lifespan of a drone is 6 years. The average number of drones owned by each operator is 15. This data supports a difference from that stated in the Assumptions and Data section of the Remote ID NPRM and is discussed below. The conclusions drawn from this size and lifespan of UAS means the cost to register the current fleet is prohibitively high, particularly when a less restrictive solution is available that would accomplish the same regulatory goals.

ii. FPVFC concludes that in nearly all cases, no software upgrade is possible that would bring the UAS into compliance with the proposed rule; as such a hardware upgrade would be required. Under the proposed rule, any hardware upgrade would dictate that the UAS now fall into the amateur-built category and therefore be restricted to fly in a FRIA. While it may be in its regulatory authority to require certain Remote ID technology, the proposed contradictory rules are mean spirited at best, and overreaching and are void as illegally impossible at worst. The FAA must permit a path for compliance for all existing UAS aircraft so as to foster cooperation from the regulated community, ensure greater compliance with the FAA’s stated goals, and reduce the cost of investigation and enforcement in cases of alleged non-compliance.

b. For Standard and Limited Remote ID UAS, the FPVFC proposes:

i. Amateur-built should be allowed to fly as Standard Remote ID UAS, provided they meet all requirements at time of flight. This could be achieved with excellent safety results by requiring only specific add-on components or add-on subassemblies manufactured to perform in a manner consistent with the requirements and capabilities set forth in any final rule. Further, these subassemblies or modules could contain the ANSI/CTA-2063-A serial numbers. And, for Standard Remote ID UAS, a single module should be allowed to be plugged into all of the owner’s UAS. This would achieve the safety requirements of associating individual serial numbers with operators.

ii. Again, the FPVFC proposes the elimination of the Limited Remote ID category. When combined with the removal of Internet Broadcast requirements, as well
as allowing for the flight of Non-Equipped Remote ID UAS in Class G airspace and within Controlled Airspace through the LAANC approval process, the Limited Remote ID category becomes obsolete.

Mission / Airspace:

References: X. Operating Requirements for Remote Identification:

1. FPVFC Proposal:
   a. The FPVFC requests the FAA add, “Shielded Operations” to recreational UAS operation. The FPVFC proposes that the FAA create a provision for shielded operations. This would exempt any UAS, commercial or recreational, from any and all RID requirements when the following criteria are met:
      i. Operation takes place in any airspace except over air traffic-controlled airports.
      ii. Operation does not exceed an altitude of 50 feet over the tallest object within 1000 lateral yards of the location of the operator’s ground station.
      iii. Low Altitude Authorization and Notification Capability (LAANC) approval would be required in controlled airspace.

2. Rationale:
   a. The FPVFC references FOIA Request # 2019-007539F6 which states, “A search of Accident Incident Data Systems (AIDS) on June 3, 2019 revealed 14 records identifying UAS, UAV or drone accidents or incidents for the past five years.” The five years referenced were 2013 through 2018. This data shows UAS are extremely safe and allowing recreational UAS to fly below the top of a structure or obstacle would continue to allow safe operation. New Zealand has established Shielded Operations through 2019 and the result is positive.
   b. If this is an unacceptable proposal to the FAA, an alternative is offered: When the manned aircraft coverage of ADS-B transponders, which is currently at 50%, reaches a higher number, closer to 100%, then all recreational UAS could be required to utilize LAANC, even in uncontrolled airspace. This would permit law enforcement and Federal agencies to be aware of all UAS flying and their location.

References: X, Operating Requirements for Remote Identification:

1. Background:
   a. The rationale for Remote ID as stated in section I. Executive Summary states, “...the ability to identify and locate UAS operating in the airspace of the United States provides
additional situational awareness to manned and unmanned aircraft.” and, “The ability to identify and locate UAS provides critical information to law enforcement and other officials charged with ensuring public safety.”

2. **FPVFC Request:**
   
a. Add a provision for recreational UAS operations in Class G without requesting flight approval and gain flight approval within controlled airspace via LAANC.

3. **Rationale:**
   
a. As described above, FOIA Request # 2019-007539F6 which states, “A search of Accident Incident Data Systems (AIDS) on June 3, 2019 revealed 14 records identifying UAS, UAV or drone accidents or incidents for the past five years.” The FPVFC asserts recreational UAS have proven to be extremely safe and the U.S. recreational fleet is estimated to be 1.3 million UAS. Put another way, the UAS fleet is at a fleet size seven times larger than traditional RC aircraft and continues with a safe record. From a security perspective, recreational UAS, in particular, First Person View 5” propeller driven quad-copters (FPV drones) are not a security threat because they cannot carry a meaningful payload and the duration of normal flights is approximately 3 minutes, insufficient to carry out a threat.

**References:** XV. Eliminate FRIA and Permitting Operation Generally

1. **Referencing:**
   
a. §89.21, §89.205, §89.210, §89.215, §89.220, §89.225, §89.230

2. **Background:**
   
a. As described in section XV. FAA-Recognized Identification Areas, these areas are intended by the FAA to be short-lived, must be nominated by a Community Based Organization and may only be nominated for a period of 12 months. After this period, no further applications will be accepted. All UAS which are unequipped or amateur-built will be required to fly in FRIAs. Existing AMA flying fields which have recently gone through a MOA approval process for any flying fields in controlled airspace must re-apply for FRIA approval.

3. **Request:**
   
a. At a minimum, non-equipped amateur-built UAS should be able to fly anywhere in uncontrolled airspace as they may today under current recreational rules. For
controlled airspace, amateur-built UAS should be able to fly with LAANC approval. Restricting UAS to FRIA’s, which the FAA expects will diminish in number quickly means small UAS may not be flown over landowners’ property, public areas or aeronautical club permanent flying sites unless these locations are approved by the FAA through an application submitted by a Community Based Organization. These restrictions create a barrier to the hobby that seeks to create a monopolistic system through which a CBO can mandate both membership fees and club fees to be extorted from UAS operators in order to fly recreationally. Further, since the FAA has failed to identify exactly what CBO’s are, there is no current way to comply with this requirement. Since realistically, there is only one viable CBO that currently possess flying locations across the US, this creates an unfair business practice. These restrictions do not solve any safety or security issues but will have a negative impact on the youth of the United States by inhibiting participation in aviation hobbies. By way of example, a sophomore level mechanical engineering class at Michigan State University, assigned teams to use Computer Aided Design to model and then 3D print and build an FPV racing drone. One team proudly posted their design in school colors! This type of team projects where a mechanical design team faces challenges of making parts that fit and don’t break, assembling electronics, programming the FPV racing drone and then figuring out how to fly it all combine to stimulate young minds and motivate them to consider hiring into the aviation industry. With the proposed FRIA rules, this same class would need to gain FAA approval to operate under a Research program and would be legally impossible to launch a similar program after the conclusion of the FRIA nomination process. They would not be able to test fly their FPV racing drone at public parks, school grounds or on their own private property unless the flying areas were approved as FRIA’s. In another example of either FAA mean-spiritedness or illegal impossibility, these students would further be prohibited from testing the results of their educational endeavors indoors due to the onerous proposed requirements pertaining to inoperability in the absence of, for example, GPS signal in an indoor location.
Reference XVII. Proposed Effective and Compliance Dates

1. **The FAA Request for Comments:** on whether certain operations currently conducted under waiver, such as operations over people or nighttime operations, should be required to comply with remote identification prior to being authorized under a waiver or regulation.

2. **Response:**
   a. Consistent with the October 2019 DAC Remote equipage submission and approved input to the FAA on October 17, 2019, no waiver should be required for an operator to fly a Standard or Limited Remote ID UAS over people or at night. This would provide an important incentive for UAS operators to comply early with Remote ID. Night flight and flight over people should require LAANC approval but should not require the equipage of a Standard Remote ID UAS. An unequipped UAS with LAANC approval should provide sufficient communication to RID USS of the existence, authorization and location of a UAS during night or over-people flight operations.

References: XVII. Proposed Effective and Compliance Dates

1. **FAA Request for comments:**
   a. Paraphrasing: The FAA is interested in comments related to how an early compliance framework would work and how it would fit into the overarching remote identification network. The FAA would consider providing incentives to parties that adopt remote identification as early as possible.

2. **FPVFC Response:**
   a. As proposed in the DAC Remote ID equipage proposal which was approved by the DAC and submitted to the FAA on October 17, 2019, incentives could include:
      i. Contract Preference for Federal contracts
      ii. Part 107 waiver application prioritization
      iii. FAA publicly accessible database of FAA approved producers of Standard and Limited Remote ID UAS
      iv. Airspace access which would otherwise be a restricted area (e.g. National Parks on established dates)
      v. Insurance incentives - reduced cost to operators
      vi. State and local government incentives to provide additional takeoff and landing locations and relief from other restrictions
      vii. Industry Recognition - common logos, certifications, etc.
UAS Registration:
References: IX. Changes to Registration Requirements E. Request Comments Regarding Serial Number Requirements
1. Background:
   a. Paraphrased: ...the proposed rule required their [UAS] operation be restricted to FAA Recognized Identification Areas (FRIAs). The FAA welcomes detailed comments on whether and why it should require the owners of UAS without remote identification to have to obtain an ANSI/CTA-2063-A compliance serial number and to list it in the Certificate of Identification and whether there would be any costs associated with obtaining a compliant serial number. The FAA also welcomes comments on whether the Agency should issue ANSI/CTA-2063-A compliant serial numbers to such aircraft when registered or re-registered by their owners.

2. FPVFC Response:
   a. The FPVFC reiterates its recommendation that operation without remote ID should not be limited to FRIA sites. With that in mind, FPVFC further proposes the FAA eliminate proposed rule for serial number requirement and any requirement for FAA on recreational UAS flying VLOS. For any recreational aircraft flying BVLOS, the FPVFC supports serial numbers for UAS. However, the FPVFC recommends existing fleet and amateur-built UAS be capable of upgrading existing UAS to compliant Standard Remote Identification UAS by the retrofit of an electronic module which would include a tamper resistant broadcast transponder and burned in (permanent) electronic serial number. This module could be moved from UAS to UAS of the owners and would provide all the necessary identification and squawking required for BVLOS operations.

References IX. Changes to Registration Requirements, introduction
1. Background:
   a. The FAA is providing an exception to registration for UAS under 250 grams. However, these UAS would be restricted to FRIA operations. The FAA also requires registration of all recreational UAS greater than 250 grams.

2. FPVFC Response:
   a. The FPVFC reiterates its recommendation that operation without remote ID for aircraft under 250 grams should not be limited to FRIA sites. With that in mind, the FPVFC further proposes the FAA eliminate the proposed rule to register all UAS greater than
250 grams and retain current Recreational UAS pilot registration. In addition, the FPVFC proposes the 250-gram clip level be raised to 1 kilogram. Even at this mass, the UAS do not create an excess kinetic energy safety issue as described in the Final Report for the FAA UAS Center of Excellence Task A4: UAS Ground Collision Severity Evaluation dated 27 October 2016. With respect to having to register each UAS above a set mass, the FAA estimates the average number of UAS in the United States recreational fleet is 2 with a lifespan of 3 years. We have conducted a survey across the FPVFC membership which we believe to be representative lifespan is approximately 6 years.

References IX. C. Issues with the Current Registration Requirements and Proposed Changes

1. **References**:

2. **Background**:
   a. The FAA is proposing that all individual recreational UAS be registered at a fee of $5 per UAS.

3. **FPVFC Response**:
   a. The FPVFC proposes that the FAA eliminate this provision as it will incur a cost burden to current and future UAS hobbyists with no perceivable benefit to safety and security within the NAS. The current provision where the operator themselves is registered and that registration number is applied to the aircraft is sufficient to identify any UAS from that operator.
   b. The FPVFC challenges the FAA to identify any singular case where any investigation or regulatory action was hindered by the registration of an operator, and not the registration of an aircraft. The FPVFC proposes that, should the FAA adopt our recommendations for a transferrable serial number Remote ID module, the FAA may require the registration of the individual modules, but not individual aircraft.

**Assumptions & Data Sources:**

**References:** I. Executive Summary:

1. **Background**:
   a. Paraphrased: This section includes the statement, “The remote identification of UAS is necessary to ensure public safety and the safety and efficiency of the airspace of the United States.”
2. **FPVFC Response:**

   a. The FAA has not demonstrated any need to restrict otherwise lawful UAS operation, and the proposed rule is unduly burdensome in its advancement of a regulatory purpose. Data acquired from a Freedom of Information Act request from the FAA shows there were 14 confirmed drone (UAS) related incidents in the period of 2013 through 2018. Within these 14 confirmed incidents there were no deaths and no crashes of manned aircraft. Using FAA data, there are currently over 1.3 million recreational UAS in the United States, resulting in an approximate incident rate of 0.001%. Recreational UAS use is proven to be an extremely safe endeavor, especially when compared to the incident rate of manned recreational aircraft. We challenge the FAA to demonstrate why remote identification of UAS is required to ensure public safety and the safety and efficiency of the airspace of the United States.

**References:** XIX. Regulatory Notices and Analyses A.Regulatory Evaluation 1.Key Assumptions and Data Sources

1. **Background:**

   a. XIX.1.A. Retrofits. pp72489, “Based on industry information and market research, the FAA estimates at least 93% of the current part 107 fleet and at least 20% of the current recreational fleet would be eligible for retrofits, thus minimizing the costs for operators and producers.”

   i. **FPVFC Response:**

      1. Our view is 0% of the current part 107 and 0% of the recreational fleet could be software upgraded or retrofit to comply with the standard or limited Remote ID UAS rules proposed in the Remote ID NPRM. The First Person View community flies almost all amateur built UAS (quad copters with 5 inch to 7 inch propellers are the most popular) and therefore we all procure the variety of components including frames, motors, Electronic Speed Controllers, Video Transmitters, C2 receivers, flight controllers and cameras and then solder all these components together and then flash the ESC and Flight Controller firmware and tune the configuration to optimize flight. We are a community of enthusiasts numbering approximately 200,000 amateur-built drones in the U.S. and it is our informed judgement that zero percent of DJI drones could be
software updated to comply with the proposed rules and zero percent of the recreational could be retrofitted.

2. The FPVFC proposes elimination of the Limited Remote ID UAS as well as the requirement for Internet connectivity. For the Standard Remote ID UAS, the FPVFC proposes a broadcast-only requirement. For recreational flight, the FPVFC proposes extending the existing rules where flight in uncontrolled airspace requires no RID. Manned flight in the U.S. with the requirements of ADS-B 2020 coverage is just over 50%. When this number gets nearer to 100%, it would be appropriate to require non-equipped recreational UAS to use LAANC in all the NAS.

b. **FAA Requested Comment:** As a producer of UAS affected by this proposal, would you be able to retrofit your current UAS models to comply with the proposed rule given the availability of FAA-accepted means of compliance?

   i. **FPVFC Response:**

   1. While the FPVFC is not a manufacturer, our staff and members have either worked in design or manufacturing companies or work closely with people who do. From our informed perspective, the only way the commercial and recreational fleet could be retrofit to comply with the proposed RID rules would be a hardware upgrade. As part of this hardware upgrade process, the FPVFC proposes amateur-built UAS be allowed to have a hardware transponder or electronic serial number module (tamper resistant printed circuit boards) be added to the UAS and be able to be compliant as a Standard or Limited Remote ID UAS.

c. **FAA Requested Comment:**

   i. Do you have information that would assist in the early development of means of compliance that would be available for retrofits for the following scenarios: a) before the effective date of the final rule, which is 60 days after the publication date of the final rule, and b) within one year after the effective date of the final rule?

d. **FPVFC Response:**
i. Our proposal would be to encourage manufacturers to design and manufacture a Serial number and transponder which could be retrofit to existing amateur-built and professionally built recreational and commercial UAS to be compliant as Standard and Limited Remote ID UAS. The FPVC estimates there 200,000 of the 1.3 million recreational UAS in the US. This means, a high percentage of these UAS would be motivated to purchase this serial number-transponder module to ensure their compliance and ability to fly in uncontrolled and controlled airspace under VLOS provisions of recreational rules. Given that similar technology already exists in the marketplace, the timeline for implementation of remote ID using this technology could be drastically reduced, and the FAA could see a high degree of voluntary compliance with any final rule.

e. FAA Requested Comment:
   i. Would it be possible to retrofit by a software or firmware update through an Internet download?

f. FPVC Response:
   i. The answer to this is an unequivocal no. This has been a topic of discussions we have had with operators, manufacturers and fellow engineers. There is no hesitation or qualification of this response.

g. FAA Requested Comment:
   i. How would a retrofit solution meet the proposed tamper resistance and labeling requirements? Would a software push be able to meet requirements for tamper resistance or would it require hardware? How would you meet labeling requirements under a retrofit scenario (e.g. would you mail the label)?

h. FPVFC Response:
   i. Our recommendation for tamper resistance is for the serial number/Transponder discussed above to be burned permanently onto chips. This technique is used in aircraft, automobiles and computer systems.

i. FAA Requested Comments:
   i. Would retrofits meet the limited or standard remote identification requirements?

j. FPVFC Response:
i. As stated above, in the NPRM, a “retrofit” is described as a software or firmware upgrade. As described above this type of retrofit could not upgrade the existing fleet to compliance to either Standard or Limited Remote ID UAS. In a broader definition of retrofit which would include hardware, retrofits could be created that would enable compliance. Of course, the rule would need to be changed to allow retrofit hardware to be added to a UAS and then comply with Standard or Limited Remote ID UAS rules.

k. FAA Requested Comments:
   i. What are the costs of retrofits to the producer and the owner/operator?

l. FPVC Response:
   i. The FPVFC proposes a Serial Number/Transponder module which could be used on a variety of UAS owned by an individual operator. As recreational operators/owners in the US own on average 15 UAS (not 2 as described in the NPRM), this would significantly lower the cost burden on the recreational operator. Elsewhere in these comments, the FPVFC requests the FAA continue the registration requirements for recreational operators to register themselves and not each UAS. Having a module which carries the operator’s registration number and may be moved from one recreational UAS to another reduces costs and satisfies the requirement of location and identification of the UAS when in the air.

m. FAA Requested Comments:
   i. In lieu of a software push through the Internet, what other methods could producers use to facilitate retrofits (e.g. mail-in programs or physical retrofit drop-off locations)?

n. FPVFC Response:
   i. As described above, the FPVFC advocates the use of a Serial Number/Transponder module which could be sold as a small hardware module and used to enable compliance of the recreational UAS.

o. FAA Requested Comments:
i. If retrofits are not an option for certain makes and models, would you offer operators “buy-back” or “trade-in” incentives to replace UAS without remote identification equipment? If so, please describe the incentive and the process.

p. FPVFC Response:

i. Buy-Backs or Trade-ins must comply with antitrust legislation and they are normally a money losing proposition for the producer or manufacturer. They are frequently used to motivate buyer loyalty to a specific brand or to resolve customer satisfaction issues with a defective or tainted product. Manufacturers would therefore have little motivation to offer buy-backs unless they were compensated for the incremental costs and time required to design, manufacture and release the replacement offering.

2. FPVFC Response:

a. The FPVFC estimates there are approximately 200,000 recreational UAS flying FPV in the U.S. This number is based on a calculation of the total number of motors sold by the leading retailers and assuming a lifespan of 3 years, half the actual lifespan to account for UAS aging out of the fleet. Virtually all of these owners/operators build their own equipment. From anecdotal experience the FPVFC operators do not know any FPV operator with fewer than 10 FPV UAS. None of this fleet or the remaining recreational and commercial UAS fleet of approximately 1.5 million UAS are capable of a firmware upgrade to become Standard or Limited Remote ID UAS compliant. IF, the proposed rule would allow for additional hardware, which would include a serial number as well as the required communication device (transponder for Standard Remote ID UAS) to be added to existing, non-equipped UAS, a high percentage of the existing FPV UAS fleet, estimated above at 1.5 million units could be retrofitted.

Reference: XIX.C. Affected UAS Fleet/Characteristics

1. Background:

a. Page 72491. “Based on the FAA fleet forecast for small unmanned aircraft, the FAA estimates the average number of aircraft owned by each part 107 operator to be 2.4 and the average number owned by each recreational flyer to be 1.4 aircraft. The FAA assumes the average lifespan for for unmanned aircraft operated by these two groups is three years based on FAA research related to its annual aerospace forecast, UAS
registration information, information from recreational and model unmanned aircraft owners, and a review of literature.” “The FAA assumes members of a nationwide community based organization own, on average two aircraft which may have an average lifespan which may exceed ten years.”

2. **FPVFC Response:**
   
a. Based on surveys within the FPV UAS community, the average number of UAS owned by each of us is 10, not the 2.4 or 1.4 discussed in the NPRM. In addition, the average lifespan is 6 years. The average cost per an FPV is $890, not the $114 in the NPRM.