FAA NPRM Response Regarding RID for UAS

Regarding the FAA’s proposed rule on RID (Remote Identification) of UAS (Unmanned Aircraft Systems). The following relates only to recreational UAS operations.

Executive Summary

These rules, as proposed, will not achieve the FAA’s goals, which are presumably to ensure public safety and promote commerce in the presence of all manner of UAS.

In the absence of a significant FAA police force, the FAA is dependent on the good will and cooperation of the recreational UAS community for self-enforcement. That cooperation can only be achieved if the rules are seen as reasonable and rational. These rules are seen by many as an ignorant attack on the hobby we love.

The FAA has failed to understand the diversity within the recreational UAS community and the different levels of risk they pose. This proposal saddles the entire community with rules that are only somewhat appropriate for a portion. As a result, many individuals will quietly ignore the rules and continue to operate as they have for many years.

I acknowledge that RID (Remote ID) is an important step towards UTM (Unmanned aircraft systems Traffic Management). Rules of this sort are needed and will be welcomed by the recreational UAS community if they are rational and properly targeted.

In general, it is not the concept of remote identification that I object to. It is the various flight restrictions imposed by some forms of RID and, ironically, the lack of a viable path to compliance. RID is, however, not reasonably necessary for some of the smallest and lowest risk UAS.

Ready-to-fly UAS in general, primarily consisting of ready-to-fly GPS enabled camera drones, of the type that are typically purchased and flown by unskilled operators, need some form of RID and owner registration. The FAA’s plan, however, needs significant modification.

Small directly piloted aircraft that are not GPS enabled, flown by either LOS (Line of Site) or FPV (First Person View with a camera), and flown within the range of LOS, have a long history of safe operation and do not require RID or additional rules beyond those that already exist. Their range is inherently limited, and small size limits their risk.

Larger directly piloted aircraft need a pathway to RID compliance. This includes existing aircraft, and aircraft that are not purchased as RID compliant even if they do not meet the 50% rule. The FAA must not block our attempts to become compliant with onerous rules that are meant to apply to manufacturers or are intended to prevent tampering.
The 0.55 pound threshold for RID is irrational and needs to be revisited. Many birds weigh much more than that and they do not require RID. Raising this threshold to 5 pounds would eliminate many objections to RID.

The FRIA (FAA Recognized Identification Area) is not a long-term or even a short-term solution for traditional RC (Remote Controlled) aircraft. The majority of RC flights take place in parks, school yards, back yards, and open fields, not at formal RC club fields. It is also clear that the FAA wants to kill the FRIA concept as evidenced by their refusal to allow their renewal. In a different form, the FRIA concept could be very helpful.

RID hardware, software, and services need to exist in some prototype form that we can examine and understand. The FAA’s estimates for cost, weight, etc. are not credible, especially since no published standard exists. The FAA’s proposed schedule is also unreasonable since industry cannot develop compliant products or services without a standard.

The requirement to store real time location data in the cloud amounts to government mandated self-surveillance of citizens who are not in the act of, or suspected of committing, any crime. It is gross over-reach and will certainly be challenged in the courts.

I have included proposals for alternate forms of Standard RID and Limited RID. They avoid the bulk of the privacy concerns and some of the cost while still providing the essential RID functionality.

The hatred you are hearing is real. The social media campaign is just getting started. You don’t want to be seen as the big bad FAA that is preventing parents and children from flying their toy planes in the park.

The NPRM is long, endlessly repetitive, confusing, and unclear on many points. A major rewrite is needed with a 2nd round of public comment.
Supporting Detail

1. The existing recreational UAS community is divided into 4 major groups with significant overlap and grey areas between the groups.
   a. Traditional RC (Radio Controlled) aircraft are directly piloted and flown LOS (Line of Sight). They include fixed wing, helicopters, and some multi-copters. They are typically flown to experience the joy of flight.
   b. RC FPV (First Person View) aircraft are directly piloted using a camera, RF (Radio Frequency) downlink, and video display. FPV aircraft include fixed wing, helicopters, and mostly quad-copters. Their mission is primarily to allow the pilot to experience the joy of flight with a secondary aerial camera role.
   c. GPS assisted and electronically stabilized “drones”, are primarily multi-copters with limited autonomous features such as “Position Hold” and “Return to Home”. They are primarily “Camera Drones” with minimal pilot skill required.
   d. GPS Enabled Fully autonomous UAS can be of any aircraft type and are relatively rare in the recreational community. They can be long range and are primarily camera drones. They are often used within the recreational community to explore the technology of autonomous flight.

2. The different types of UAS operations pose very different levels of risk:
   a. Traditional RC aircraft have been flown LOS for many years with no significant safety issues. There is no reason to believe that they now pose any significant risk to manned aircraft or commercial UAS with reasonable and minimal precautions.
   b. RC aircraft flown FPV have been flying in large numbers for a few years now with no significant safety issues. They generally prefer to fly at low altitudes in close proximity to race gates, trees, and even indoors. They are often flown within the same general airspace as traditional RC aircraft. While they can fly a little farther, they are usually limited by the range of the video downlink. There is no reason to believe that they now pose any significant risk to manned aircraft or commercial UAS with reasonable and minimal precautions.
   c. GPS assisted and electronically stabilized “drones”, are the reason we are having this discussion. They have proliferated broadly in the last several years, largely because they allow for amazing photography with little or no pilot skill. The physically larger aircraft of this type can fly at significant altitudes and cover significant distances. Many operators of this type have no prior experience with aviation. They purchased the aircraft as an interesting “toy” and will likely move on to other hobbies in time. This is the class of UAV where operators need to be educated and whose flight operations need to be limited to some degree.
   d. GPS enabled fully autonomous drones are currently operated by skilled individuals, however technology advances are quickly allowing this category of UAS to be operated by uneducated operators with minimal skill. While currently a very small class, flight operations need to be limited to some degree.

3. It is important to understand the physical structure of these different types of aircraft, both as it relates to the risk they pose in the event of a collision, and also in terms of the types of operators that would use them. The 50% amateur built
content rule as used by the EAA (Experimental Aircraft Association) does not make sense for any of these UAS.

a. Traditional RC airplanes are mostly sold as RTF (Ready To Fly) and ARF (Almost Ready to Fly), although there is a growing group of creative builders using foam-board. RTF and ARF planes are unboxed with minor assembly and possibly some radio gear installation. A few are built from kits, or from traditional raw materials, by the pilot. Most of these aircraft are less than 5 feet in length or span, weigh less than 5 pounds, and fly at speeds of 50 MPH or less. Most are electric powered with a small lithium-ion battery but some larger models use internal combustion engines. The most common materials are injection molded foam with internal spars, foamboard, or light weight balsa structures with plastic covering. Helicopters and multi-copters are sold as RTF or ARF, but are also sold as kits. These kits are mostly just bolted together though there can be a fair number of parts to assemble. The most common building materials are carbon fiber plates with metal hardware. Most helicopters weigh less than 5 pounds.

b. FPV aircraft are mostly quad-copters and simple foam fixed wing designs. Quad-copters are extremely simple and are bolted together from a few pieces of carbon fiber plate. Their greatest complexity is the need for some soldering and setting tuning parameters in the flight controller. Most FPV quad-copters are less than a foot in length and weigh less than 2 pounds. Airplanes are built much the same as traditional RC airplanes with the addition of a camera and video transmitter. FPV airplanes are often somewhat smaller and lighter in weight than LOS airplanes.

c. GPS assisted and electronically stabilized drones are usually just purchased and unboxed. Most owners have little or no ability to repair them. They are usually constructed of a carbon fiber frame with some plastic covers. Some of the larger ones can be expensive and the owners are often more skilled, but the skills required do not usually go beyond basic assembly and some soldering.

d. Fully autonomous drones can span a wide range of aircraft type. Except for a very few very expensive types that you can just buy, they are largely assembled from components. The airframes may be simple and are often traditional RC planes or multi-copters. The electronics, however, are cutting edge at the consumer level so the owners are often engineers and programmers. Most of these aircraft have an FPV or LOS backup mode.

4. The rules need to be seen as rational, and must reflect the risk posed by these various types of recreational UAS.

a. No new rules or Real ID (RID) equipment are required for traditional RC aircraft flown LOS. The existing rules developed in cooperation with the AMA (Academy of Model Aeronautics) have proven safe and effective for many years.
   i. There is no need for RID for aircraft below 10 pounds.
   ii. Aircraft from 10 to 55 pounds could require RID, but only if there is a viable pathway to compliance. A pathway to RID compliance is actively desired for these aircraft.
   iii. This includes a 400 ft. altitude limit in many locations.
iv. There is no need for a horizontal distance limit as LOS automatically limits the safe operating distance.

v. There is no need to register each individual aircraft. Registering of pilots and external labeling of aircraft is sufficient.

vi. There is no need to designate specific flying sites where RID is not required because smaller aircraft should not require RID and larger aircraft should have RID.

vii. There is no need to regulate or serialize the components that the aircraft is made of except for the specific RID module.

viii. There is no need for any sort of “50% home built” rule.

b. No new rules or RID equipment are required for directly piloted FPV aircraft with little or no GPS enabled functionality. The existing rules developed in cooperation with the AMA (Academy of Model Aeronautics) have proven safe and effective for a few years now. The video downlink technology automatically limits their horizontal range in a manner similar to LOS limits.

i. There is no need for RID for aircraft below 10 pounds.

ii. Aircraft from 10 to 55 pounds could require RID, but only if there is a viable pathway to compliance. A pathway for RID compliance is actively desired for these aircraft.

iii. A 400 ft. altitude limit and other common-sense operational rules are sufficient for safe operation.

iv. There is no need for a horizontal distance limit as the RF video link automatically provides a distance limit similar to the LOS limit.

v. There is no need to register each individual aircraft. Registering of pilots and external labeling of aircraft is sufficient.

vi. There is no need to designate specific flying sites where RID is not required because smaller aircraft should not require RID and larger aircraft should have RID.

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c. Some form of RID and flight operation limits area are generally a good idea for GPS assisted and electronically stabilized camera drones as well as GPS enabled fully autonomous drones. The FAA should, however, logically justify the specific limitations and relax those limitations wherever the data and logic allows.

i. The 250 gram (0.55 pounds) limit is arbitrary and irrational. Pigeons weigh up to 5 pounds and geese weigh up to 14 pounds, and no one is registering or putting RID on them. The weight limit should be raised to at least 5 pounds.

ii. The horizontal flight limit of 400 ft. is unreasonable and makes LRID (Limited Remote ID) unusable for many faster UAS. Golf balls and baseballs regularly fly over 400 ft. The horizontal limit without RID should be increased to at least a ¼ mile radius.
iii. When operated within altitude, distance, and weight limits, it should not be necessary to burden the aircraft or the airspace management system with RID. This is especially true if the altitude and distance limits, along with other geographic operational limits are enforced by the aircraft's internal operating system as installed by the manufacturer.

iv. No form of RID should require storing real time location information in the cloud. Historical UAS and operator location information can be stored in the UAS and obtained by law enforcement through existing legal processes.

v. A broadcast RID solution can be created that broadcasts from either the UAS or the operators location.

vi. Operators and aircraft who comply with RID, registration, and all the rest should enjoy the associated additional privileges. This includes the ability to fly at higher altitudes, greater distances, at night, over people, and so on.

5. The FAA clearly stacked the ARC (Aviation Rulemaking Committee) with regulation advocates. The representatives of the community being regulated were simply drowned out or ignored. The burden of proof should be on the FAA to demonstrate with data and reasonable logic that specific regulations and limits are required for public safety or for the promotion of commerce. It should not be up to individual citizens or even community based organizations to defend their right to continue to operate safely as they have for many years.

6. There are many actions that could be taken by any recreational UAV, which are and should be illegal. This includes things like flying into fire zones, spying on people over private property, flying in controlled airspace without proper authorization, etc. While it may be difficult to find the perpetrators in some cases, the threat of prosecution, stiff fines, and jail time should be sufficient to deter most bad-actors. We should not unduly curtail the personal freedoms of law-abiding citizens in a failed attempt to avoid these problems.

7. In order to comment on the technology behind RID, we need specifics on size, weight, input power, output power, frequency, and most of all cost. We need to see a working prototype, not only for RTF (Ready to Fly) aircraft, but also as a retrofit to existing aircraft. We need to understand the compatibility with existing control systems and the upgrade path. We need a realistic estimate of the upgrade cost which includes the scrapping of hundreds or even thousands of dollars worth of existing equipment which RID will make obsolete.

Where specific and needed technologies do not currently exist, the FAA should indicate their intention that they will be required by some target date. As the date approaches the FAA should review the efficacy, cost and availability of the technology before actually making it a requirement or even threatening to make it a requirement. UAS manufacturers will welcome these technologies to the extent that their customers welcome them and are willing to pay for them.
The FAA strategy should be to promote these technologies for the additional privileges that they provide to the operators, not to threaten operators with a loss of privileges if they fail to spend unknown amounts of money on technologies that aren’t defined.

8. The AMA, EAA, and other responsible parties are unable to be brutally honest about the impact of these proposed rules. They need to maintain good relations with the FAA in order to preserve what influence and credibility they have. Unfortunately, that could leave the FAA with the mistaken impression that these rules will work, or that the upset will die down over time. These rules will not work. They are aggressively antagonistic to most recreational UAS operators.

9. If the FAA insists on these burdensome rules for many classes of UAS where they don’t logically apply, many individuals will simply ignore them. This does nothing to increase the safe operation of UAS and only fosters the idea that all rules are to be ignored. Such rules are also subject to selective and unfair enforcement which only serves to create distrust of the FAA’s motivations. Please do not criminalize harmless or even beneficial behavior.

10. Despite what some people may think, the FAA has no power to make these rules work. The only real power the FAA has is over businesses, including the manufacturers who sell these aircraft, or the various pieces that they are made from. It is conceivably possible for the FAA to impose regulations on major producers like DJI, but it is not possible to regulate the thousands of producers of components that may or may not be used in UAS, not to mention the vast store of components that are already available and owned by countless UAS owners.

The FAA, and authorities in general, need to think about this in terms of how they can best accomplish their goal. The FAA is ultimately reliant upon the recreational UAS community to police itself. If the FAA wishes to maintain a productive relationship with the recreational UAS community then they need to listen and understand what that community is about. Rational rules will be welcomed because they increase safety and enable legal operation in a broader range of conditions. Irrational and unenforceable rules will be largely ignored.

11. If the FAA insists on these burdensome rules there will be long term consequences to the aviation industry, our economy, and to many youth whose first exposure to aviation is via UAS. The cost and complexity of the unnecessary systems being proposed are largely beyond the means of children, and may well deter educators from using aviation as a part of their STEM (Science Technology, Engineering, and Math) curriculum.

12. The proposed rule related to a FRIA (FAA-Recognized Identification Area) is particularly antagonizing. The idea that FRIs can only be designated for one year indicates a clear intention to retire those sites as they go out of existence for other reasons. A closely related issue is the lack of a mechanism to have a special event like a flight festival.
In a different form the concept of a FRIA could be very useful. The permanent and temporary establishment of FRIAs could provide the FAA with valuable information and help deconflict the airspace. This assumes that the process for establishing a FRIA is reasonable and timely.

13. If the FAA insists on these burdensome rules, there will be political repercussions. Our representatives will be lobbied repeatedly, not only by recreational flyers, but also by the owners and shareholders of the many businesses the FAA is threatening to destroy. Do not assume that recreational pilots are not passionate about their hobby. Beyond the traditional means of political influence, the social media campaign is just getting started. Thus far, many responsible parties are asking for a calm and reasoned response. If this NPRM becomes law in its current form the FAA will be ridiculed and portrayed as a typical big government bureaucracy answerable to no one but big money. The FAA does not want to be seen as preventing parents and their children from playing with toy airplanes in the park. The FAA has a much bigger and more important mission to pursue. Don’t let toy airplanes become a distraction.

14. No form of RID should involve forcing the user to create a permanent record of their flight operations in the cloud. It might be reasonable for commercial UAS operations, but not for recreational operations. An argument can and will be made that it violates the 5th amendment as a form of self-incrimination, and that it also amounts to unreasonable search and seizure of this private data.

Whether you realize it or not, you are attempting to legislate a government surveillance program. You are compelling people to surveil themselves, to create a permanent record of their real-time location, and to place that personal data in the hands of private service providers as well as the government. There is no possible way to ensure the privacy of that data as anything can be hacked. More importantly, there is no compelling reason that justifies that level of Orwellian intrusion into so many people’s lives.

The real outrage will come when people realize the precedent you are attempting to set, and what potentially comes next. The FAA can easily use a bot to search this data for violations and issue thousands of automated fines. The next step is to require similar real-time tracking of cars and drivers, followed by automatic traffic fines. That is an angle we can and will use on social media to kill this idea, so be prepared for the fallout.

We have no problem with the concept of an RF (Radio Frequency) license plate. UAS need to be identifiable and traceable back to their owners. We accept that anyone who receives that RF signal can track the UAS and the real-time location of the operator. We even accept that anyone, including the government, can receive that signal and store the information in a permanent data base. The FAA can place RID receivers wherever they want, around airports, on government buildings, at sporting events, in fire-fighting equipment, in police cars, even in public parks. We have no expectation of privacy in public spaces.
What we do not accept is that the FAA can compel us to create a permanent record of our personal real time location and then give that data to the FAA without a search warrant. The internet or cloud option for RID is not acceptable on that basis alone, not to mention the galling cost and inconvenience.

An option that better balances the needs of law enforcement with the public's privacy rights is available. You could require that UAS keep an on-board record of their flight track, and operator location, in a manner similar to a black box. The data would be overwritten beyond some time limit, and the user would have no option to delete it. In practice this could involve inexpensive flash memory with the data stored in a defined format.

There are existing laws and procedures for obtaining evidence related to a crime. That is very different from collecting detailed surveillance data on a large number of citizens for whom you have no probable cause and who are not in the act of committing a crime. Flying a UAS, by itself, is not probable cause for the unreasonable search and seizure of stored real time tracking data.

For example, if a UAS was improperly flying over a sporting event, law enforcement could easily identify the aircraft and its operator from the RF broadcast data. They could easily find and arrest the operator and confiscate the UAS, and they could easily download the black box data for use in a court of law. If the operator and UAS were to somehow escape immediate apprehension then law enforcement can still track them down and apprehend them by normal means. They can also get a search warrant to confiscate the UAS and legally use it as evidence.

Do not set yourself up for a series of lawsuits that you can’t win.

15. If RID data storage in the cloud is not an option, then LRID as defined cannot exist. In almost all cases, SRID is a fine option for all aircraft above a defined weight limit, however there is a form of LRID that can be useful for GPS enabled UAS. This would allow these aircraft to fly within the 400 ft. (or similar) limit.

This form of LRID can be implemented with a cell phone app. Using the app, the operator would effectively state, “I am at this location and intend to fly within the next half hour”. The app would automatically confirm or deny that LRID operations are allowed from that location over that time period. The app would also “unlock” the UAS and allow it to fly within that time frame. The unlocking process would also establish the boundaries of UAS operations for that session. The app would also inform the FAA of LRID based UAS operations at that location.

If law enforcement should need to find the operator they can easily visually find the operator within 400 feet (or similar) of the UAS. They can also consult a version of the app designed for their purposes.
While this form of LRID does involve the internet and permanent storage of the operators location, it does not involve real time tracking of the operator. There is also no potential for the FAA to use the data against the operator as the FAA has effectively given the operator permission to fly via the app.

This form of LRID does not require the UAS to transmit RID information or any sort of flight-enabling information. All of the necessary flight enabling information comes from the base station, and is transmitted to the UAS.

This form of LRID could be retrofitted into many existing GPS enabled camera drones with a simple firmware upgrade. It would cost operators almost nothing.

16. I understand that the FAA wants virtually all UAS to comply with RID, but that is literally impossible depending on how you define UAS. The scope of this regulation is incredibly important. The FAA needs to define some exemptions, meaning types of aircraft, or types of flight operations that are not in scope. The FAA has already done this to some degree, but now you need to examine the exact thresholds and definitions to see if they are rational and supportive of your overall goals. Exemptions are hugely important in terms of who you help, and who you hurt, which in turn defines your supporters and your detractors. In general, exemptions should be as large as possible, because you don’t want to make enemies for no good reason.

A. The most important threshold you should consider is for weight. You currently have an exemption for UAS under 250 grams or 0.55 pounds. The exemption is good but the threshold is not supportable. Geese weight up to 14 pounds or more, and have taken down airliners. It is irrational that you should require RID on a 0.56 pound UAS but not on a 14 pound goose. The fact that you have no authority to regulate geese doesn’t make it any more reasonable.

I realize that weight is a factor in terms of how much damage a UAS can do, not only by air to air impact, but also by falling on people or even in terms of explosives or contraband delivery. You have to balance the benefit against the risk, bearing in mind the long history of safe operations for certain UAS types, and also the fact that truly nefarious actors are unlikely to use RID anyway. You also need to consider all of the various mitigating factors like the benefits of having CBOs on your side, helping to educate their members and the public. If you set this exemption at 5 pounds then you will seriously blunt your detractors. This is especially true because UAS above 5 pounds are better able to carry the RID equipment. They are also more expensive to begin with, and better able to support the added cost which I estimate at $40 per aircraft once RID solutions are widely available. This assumes that you create a path to compliance for all UAS over 5 pounds.

Go ahead and require the owners to register, but don’t cause yourself endless grief by trying to register and maintain a database of these aircraft. There are just too
many of them, and they come and go too quickly. You would be hard pressed to achieve even 50% accuracy in such a database.

**Don’t make enemies of your natural allies. Raise this threshold to 5 pounds.**

B. We need an exemption for directly piloted aircraft up to a certain weight like 10 pounds. These aircraft are flown by “pilots” not controlled by “operators”. They require extensive training and skill to fly. They are not the kind of people who will buy an off-the-shelf camera drone and immediately crash it into their neighbors house. The aircraft are specifically identifiable by the lack of GPS. These are also the types of aircraft and pilots who have been flying safely for years.

Aircraft of this type are most commonly flown LOS (Line of Sight) but they are also flown FPV (First Person View). LOS operations are inherently limited by the distance the pilot can see to control the aircraft. FPV aircraft are limited by the range of the RF (Radio Frequency) video link which is generally similar. The range of these aircraft is not precisely defined in feet, but it is limited, and more importantly there is a degree of situational awareness involved that is inherent in the way they are flown. Pilot attention is constantly required, usually within a second or less.

Go ahead and place appropriate limits on the flight envelope of these aircraft. 400 feet AGL (Above Ground Level) is already assumed. Lacking GPS, these limits cannot be enforced by internal aircraft hardware but rely on the good judgment of the pilot. This is no different than for countless manned aircraft.

Go ahead and require the pilots to register, but don’t cause yourself endless grief by trying to register and maintain a database of these aircraft. There are just too many of them, and they come and go too quickly. You would be hard pressed to achieve even 50% accuracy in such a database.

**Don’t make enemies of your natural allies. Raise the weight limit for directly piloted aircraft to fly without RID to 10 pounds.**

C. An exemption is recommended for ready-to-fly UAS below a certain weight threshold, like 5 pounds. These aircraft are typically sold with RID capability installed, but it needs to be enabled through the registration process. The idea is that these aircraft can fly out-of-the-box, but only in a very limited way. Their internal flight controller would limit them to something like 100 feet from the controller or ground station in any direction.

This exemption is only really practical for GPS enabled camera drones of the type that are most popular. Many users would be happy to live within the 100 foot limitation as it entirely meets their needs. Manufacturers would be happy to offer a product that is very capable but does not subject their customers to the hassle of
registration. The FAA benefits because this huge class of “drones” does not clog up their database or require “customer service”. The owners are also encouraged to unlock their drones full capability by registering and enabling the RID functionality.

Don’t make enemies of your natural allies, but do make friends when it costs you less than nothing.

D. Summary Table of Exemptions

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* This assumes a registration pathway is made available.
# Standard RID is assumed acceptable whenever Limited RID is acceptable.

17. I have heard from multiple sources that the FAA has received a large number of angry and emotional responses. I have also heard that you are unable to process those responses in a meaningful way because they often contain little more than hatred. I submit to you that those responses do contain useful data. You can assume that for every one of those there are 100 more who didn’t bother to respond because they assume you will not listen. There are many more who didn’t register as UAS pilots because they feared you would do something like this, and they didn’t want to be on your radar. These are all people you have lost. From their point of view, you are attacking them with your ignorance. As far as they are concerned, you started this fight, and they have correctly calculated that you can’t win. All you have done is damage your credibility.

I would encourage you to look at this in terms of how you can best accomplish your goals. You will never get everyone to follow the rules, but it is within your power to bring many of them willingly into the fold. You are going to have to trust that the vast majority of recreational UAS users are not criminals, terrorists, or grossly negligent. You
are going to have to give them some space to enjoy their harmless, and sometimes beneficial, hobby.

18. If you want people to comply with these rules, you have got to give them a viable path to compliance. FRIAs are not a path to compliance, they are a temporary bone you have thrown to the AMA in order to placate them. For every pilot who flies at an AMA sanctioned field, there are many more who fly in parks, school yards, their back yard, or in open fields. This happens today, and has been happening for years, with no serious safety issues. You have got to give these people a path to compliance. This applies to their existing aircraft, and aircraft that they might buy which don’t include factory installed RID. It also applies to aircraft that they did not build by your understanding of the 50% rule, including ones they will buy in the future. It also applies to aircraft flown both LOS (Line of Sight) and aircraft flown FPV (First Person View). I am speaking of directly piloted aircraft without GPS capability, not the GPS enabled camera drones that you are mostly worried about. These are not RTF (Ready to Fly) out-of-the-box aircraft. They require some assembly, though the assembly may be well below 50%.

These pilots want to comply. They are willing to go out of their way and spend hundreds, or very likely over $1,000 to comply, and they know they don’t really have to. They know they can just continue flying without RID and there is nothing you can do about it. These pilots deserve your trust. You can’t be overly concerned with issues related to tampering or attempts to bypass the system. If they wanted to bypass the system they would simply not buy an RID system and continue to fly. Why would they spend good money to buy an RID system and then disable it? They would not.

These systems are inherently “tamperable”. The manufacturers can put in a fair amount of self-test and fail-safe functionality, they can even meet the spirit of your intent, but they cannot guarantee that the systems are installed or set-up correctly. This is where you must have a reasonable amount of faith in our good intent. We are literally adding cost and an unnecessary component to our aircraft that could very easily cause it to crash. Per the current NPRM, RID is an integral part of the control system not just a simple RF beacon.

I won’t define the system in every technical detail. I will give you a sense of what such a system would look like and how it would work.

LRID (Limited Remote ID) is not suitable for UAS of any significant size or speed. This is true for fast multi-copters and especially true for fixed wing aircraft. An unusually fast RC model can travel 100 MPH or more. Such an aircraft can travel 400 ft. in just 2.7 seconds. If the RID system were to turn such an airplane around, it would have to temporarily take full control, briefly making it a fully autonomous UAS. Without sophisticated sensors and software, such an aircraft would be actively dangerous and possibly hit other aircraft, or more likely a tree. All of this implies that the RID upgrade path for most RC models is (SRID) Standard Remote ID. This also simplifies the RID upgrade module as it does not need gyros, accelerometers, an IMU (Inertial Measurement Unit) and does not need to be tuned to match the control response of the aircraft.
The SRID functionality would probably be integrated into the RC Receiver creating an RRX (Remote ID enabled Receiver) or SRRX (Standard Remote ID enabled Receiver) to be more specific. The entire RRX would be about 1 cubic inch in volume, plus antenna, and weigh just a few grams. Internally it would contain a DC to DC converter, microprocessor, Bluetooth RID transmitter, GPS Receiver, and barometric Altimeter, as well as the standard RC Receiver Functionality. The RRX would receive the GPS location and altitude, as well as the emergency signal, from the RID base station. The RRX would transmit the required SRID data whenever it is moving, or above the initial altitude when power was applied.

The SRID base station could exist as an application in a cell phone, however, not all cell phones have a barometric altimeter, so it would be helpful if the altitude of the base station could be GPS based. The SRID base station could also be integrated into the RC transmitter, either as a module that plugs into the back of many existing transmitters, or more likely fully integrated into the Transmitter, creating a RTX (Remote ID enabled Transmitter) or more specifically a SRTX (Standard Remote ID enabled Transmitter).

The RTX would contain a GPS receiver, barometric altimeter, and Bluetooth receiver for receiving the RID transmission from the aircraft. The RID would not need WiFi, Bluetooth or a direct connection the cellular network because, as I have explained previously, real time cloud storage of RID data in inappropriate.

The RID requirement would trigger an upgrade cycle for both RC transmitters and receivers which would typically cost between $200 and $1,000. Existing RC gear would be limited to operation of aircraft below the weight limit, or in a FRIA under the existing proposed rules.

You might ask why all new aircraft can’t be purchased with RID, and everything else, pre-installed. In some cases they can, but RC aircraft tend to crash, and when they do it is often only the airframe that gets destroyed. Modelers of any significant experience will save all of the “gear” including receivers, servos, batteries and motors, and install them in new airframes. It is unreasonably expensive and wasteful to throw all that gear away since it is usually perfectly good.

If you don’t formally give RC modelers an upgrade path of this sort, they may make one of their own. It is very likely possible to remove the RID gear from a damaged UAS and install it in a new UAS, which in this case happens to be a traditional RC aircraft of some sort. It would be nonsensical if the FAA forced pilots to do something you consider illegal in an attempt to comply with your rules.

As important as this path to compliance is, it is not a complete solution. It is still too onerous for the smallest, safest, and least dangerous aircraft. This is why you have got to provide some relief on the 0.55 pound rule.
19. I get it. There was no evil intent here. Somewhere, several levels up in the FAA, someone realized we need to get this UAS thing under control. The need was valid and their intent was honorable. It passed down, layer by layer, and became a project with a schedule and expectations. More importantly the people charged with doing the actual work were held responsible to deliver results. Still with honorable intent they made some assumptions, went through a process, and began documenting a plan. It was only with time that some of those assumptions were found to be, not so much false, as incomplete. The situation gradually became more and more complex until it became hard to see all the angles. The results began to jell, and it became ever more difficult to change course. New data and new complexity was not so easy to accommodate. Schedules had to be kept as reputations and careers were potentially impacted.

The people involved were genuinely dismayed when their work was not well received. Their intent was, and still is, honorable, but there is no time to deal with these unexpected problems. The people who created these rules began to think, “The people who are complaining will surely get over it. Their issues can’t possibly compare to the greater good. We have a mandate, and we must deliver.” And so, the NPRM was born, flawed, and already difficult to change. But it must change…

If you continue down this path, in 5 years your work will be reviled and under constant attack in the courts. In 10 years it will be shredded and replaced with something very different.

This is perhaps the first time that the FAA has been broadly seen as anything other than a protector of the public interest. You are entering the role of a traffic cop. Your relations with the general public are about to take a nose dive if you don’t recognize this new reality. You don’t want to be seen as arrogant, dictatorial, and ignorant. The general public may not have lots of money to spend on lobbyists, but we do have a voice and we do vote. We also have social media, including YouTube and all the rest. If you are ever measured by the degree of compliance then careers are potentially at stake.