

ORAL ARGUMENT SCHEDULED FOR DECEMBER 15, 2021

No. 21-1087

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

TYLER BRENNAN and
RACEDAYQUADS LLC,

Petitioners,

v.

STEVE DICKSON, Administrator,
Federal Aviation Administration,

Respondent.

ON PETITION FOR REVIEW OF A FINAL RULE OF THE
FEDERAL AVIATION ADMINISTRATION

REPLY BRIEF OF PETITIONERS

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GLOSSARY

APA	Administrative Procedure Act
ATC	Air Traffic Control
DOT	Department of Transportation
FAA	Federal Aviation Administration
NPRM	Notice of Proposed Rulemaking

STATUTES AND REGULATIONS

Pertinent statutes and regulations not already set forth in Addendum A, filed with Brief of Petitioners, are set forth in Addendum D bound with this brief.

SUMMARY OF THE ARGUMENT

FAA and Amicus attempt to paint a picture of airspace that does not exist. Precedent applicable to aircraft flying at least 500ft. in the sky, an area subject to extensive regulation, does not negate privacy interests in airspace low to the ground in private backyards, an area specifically reserved for landowner control. Similarly, cases finding no Fourth Amendment concerns with installing a tracking device on property not owned by the individual do not justify installation of tracking devices on privately owned drones and controllers.

Remote ID provides otherwise impossible surveillance without any of the physiological, economic, or time restraints inherent in the methods of surveillance cited by FAA. Precedent dictates finding Remote ID implements a warrantless search. FAA has not established a special needs exception. The final rule cannot survive Constitutional scrutiny.

Nor can the rule withstand arbitrary and capricious review. None of FAA's proffered explanations alter the fact that FAA considered ex parte communications and withheld key information

from the record, or that FAA implemented significant changes – with significant flaws – without providing an opportunity for public input. FAA still has not shown it properly considered or responded to material comments or satisfied the statutory requirement to consult with specific entities.

ARGUMENT

Nothing argued by Respondent is sufficient to overcome the plethora of problems with this rulemaking. Petitioner does not dispute Congress ordered FAA to adopt regulations or guidance on remote ID, or that a properly promulgated Remote ID rule could serve as a beneficial stepping-stone to pave the way for expanded capabilities of drones. But as everyone acknowledges, this rulemaking is a *crucial* step in the trajectory of drone operations. It is vitally important it be done properly, with openness, transparency, and full public participation as well as respect for Constitutional guarantees. FAA cannot trample the rights of private individuals, withhold relevant and relied upon information from public scrutiny and comment, fail to address meaningful comments and concerns, or ignore statutory prerequisites to rulemaking under the guise of safety and security as a matter of expediency. No matter how necessary some form of regulation or guidance to govern drone operations may be, FAA must be held accountable to the requirements of the Administrative Procedure Act and the United States Constitution.

I. INACCURACIES

It is imperative to correct FAA's false claim that "all airplanes must provide their location information while traveling in the national airspace." Resp. Br. 23. There are thousands of airports where pilots do not need to use a 2-way radio, a transponder, or an Automatic Dependent Surveillance-Broadcast (ADS-B out) transmitter to transmit location information. See 14 C.F.R. §§ 126-31 (Generally, only Class B, C, & D airports have equipment requirements). Regulations permit flying in Class G airspace without a transponder or ADS-B out, i.e. without providing any location data. See 14 C.F.R. §§ 91.215 and 91.225. In South Florida, for example, approximately 73% of the airspace has no requirement to reveal identification or location below 700 feet. See Rupperecht, Jonathan, *Airspace & Fourth Amendment Expectations of Privacy*, <https://jrupprechtlaw.com/airspace-fourth-amendment-expectations-of-privacy/>.

Furthermore, many General Aviation aircraft utilize a mode allowing Air Traffic Control to track their aircraft without identifying it. See, e.g., Automatic Dependent Surveillance – Broadcast (ADS-B) Out Performance Requirements to Support Air Traffic Control (ATC) Service Final Rule, 75 Fed. Reg. 30160, 30183 (May 28, 2010) (explaining General Aviation aircraft can use an anonymity feature in broadcasting location information).

Remote ID does not have an equivalent option. For FAA to suggest this rule extends existing requirements for airplanes to drones is misleading and untrue.

II. REMOTE ID *DOES* VIOLATE THE FOURTH AMENDMENT

A. Reasonable Expectation of Privacy

FAA's arguments against a reasonable expectation of privacy are outdated and ineffective to contradict the clearly articulated basis of privacy set forth in Petitioner's opening brief.

1. **Special Privacy Considerations for Aircraft in the Sky do Not Apply to Drones Low to the Ground.**

FAA claims there is no reasonable expectation of privacy in the movement of aircraft in the sky while citing **non-binding cases** which were all adjudicated **before** the digital age. Resp. Br. at 23-24 (citing *United States v. Alonso*, 790 F.2d 1489, 1494 (10th Cir. 1986); *United States v. Butts*, 729 F.2d 1514, 1517 (5th Cir. 1984); *United States v. Hewitt*, 724 F.2d 117, 118-19 (11th Cir. 1984); *United States v. Bruneau*, 594 F.2d 1190, 1197 (8th Cir. 1979)). The meanings of "aircraft" and "sky" in the 1970s and 1980s were very different from the "aircraft" and "airspace" at issue in this rule. The cases relied upon by FAA and by Amicus apply to manned aircraft regulatorily required to fly higher than 500ft. above the ground, in "navigable airspace." See 14 C.F.R. §91.119 (prescribing minimum safe

altitudes for aircraft, except when necessary for takeoff and landing, at 500ft. or 1,000ft. above the surface). These regulations date back to 1941. See 14 C.F.R. §91.79 prior to 1989; 29 Fed. Reg. 9894 (July 23, 1964); Civil Air Regulations § 60.35(1941).

Drones, in contrast, are required to almost always fly below 400ft. and often do so low to the ground on private property, including within the curtilage of the operator's home. 14 C.F.R. §107.51; 49 U.S.C. 44809. Privacy considerations for large airplanes that can be seen miles away flying in airspace that is indisputably navigable, and thus subject to extensive FAA regulation, are far different from the privacy considerations at issue for small drones flown close to the ground and hidden from view by vegetation and fences in a private backyard. The quotes cited by FAA are from cases that did not anticipate the current state of aircraft or location of airspace at issue in this case.

Similarly, FAA inaptly claims drone operators have limited privacy expectations because aviation safety is a highly regulated federal concern. Brief For Respondents (Resp. Br.) 24. *Northwest Airlines*, relied upon by FAA for this proposition, recognized federal control over air commerce and likened its development to the evolution of federal control over navigable waterways. 322 U.S. 292, 302 (1944) (Jackson, J., concurring).

While navigable airspace is subject to extensive regulation, as are navigable waterways, there is no such justification for regulation of airspace in a private backyard. FAA's logic is akin to requiring a rowboat in a small private pond to broadcast its GPS coordinates along with the identity of the person rowing it. There are limits to the reach of government control over the air outside our back doors just as there are limits to government control over non-navigable water on private property.

Amicus, however, argues the exact opposite position. Amicus exceeds FAA's arguments and claims property owners have no rights whatsoever in any adjacent airspace, thus there can be no privacy interests anywhere while operating a drone. Amicus Br. 20-21; 26-27. In so arguing, Amicus asks the Court to extend the logic of *United States v. Causby*, 328 U.S. 256 (1946), a case that limited the common law doctrine of land ownership extending to the periphery of the universe in recognition of federal control over navigable airspace as a public highway. See 328 U.S. at 260-61. But *Causby* distinguished the highway in the sky from airspace low to the ground, specifically noting "if the landowner is to have full enjoyment of the land, he must have exclusive control of the immediate reaches of the enveloping atmosphere." 328 U.S. at 264. "Otherwise," the Court explained, "buildings could not be erected, trees could not be planted, and even fences could not

be run". *Id.* Accordingly, and as remains true today, "[t]he landowner owns at least as much of the space above the ground as he can occupy or use in connection with the land." *Id.*

Amicus' argument implies homeowners have no right to prevent drones from flying through their backyard barbeques or kids' swing sets; only FAA has any say in what happens within the airspace in private backyards. Surely, FAA does not have such unfettered control over *all* airspace at any height in any location as Amicus suggests.

Tellingly, DOT has explicitly *disagreed* with Amicus' interpretation of FAA authority. A report from the Government Accountability Office (GAO) notes in the preamble of the proposed rule, FAA refers to the "regulation of UAS operations in the '*airspace of the United States*,'" a term used by Congress in 49 USC 10403(a)(1) to declare "that the United States Government has exclusive sovereignty of '*airspace of the United States*.'" GAO explained, "DOT officials told us, however, that it is not the Department's position that this 'sovereignty statute provides additional authority to regulate UAS operations down to ground level.'" US GAO report: *Unmanned Aircraft Systems: Current Jurisdictional, Property, and Privacy Legal Issues Regarding the Commercial and Recreational Use of Drones*, Appendices I-VI, p.27 (September 2020).

This disagreement makes its way into FAA's brief with use of the made-up term "national airspace," a phrase undefined and unused in code or regulation, and which cannot serve as any basis for additional authority. Nor does FAA's authority to regulate "air commerce" serve to support the position of FAA or Amicus. "Air Commerce" is defined as "the operation of aircraft within the limits of a Federal airway, or the operation of aircraft that directly affects, or may endanger safety in, foreign or interstate air commerce." 49 U.S.C. §40102(3). "Federal airway," in turn, is defined to mean "a part of the navigable airspace that the Administrator designates as a Federal Airway." *Id.* at (20). "Navigable airspace" means "airspace above the minimum altitudes of flight prescribed by regulations," *Id.* at (32), which, as explained above, is defined as at least 500ft. above ground level or as necessary for takeoff or landing. No grant of statutory authority supports the extreme position taken by Amicus or FAA's claim that its authority over navigable airspace and air commerce minimizes the privacy expectations at stake here.¹

¹Even if drones wanted to fly in Navigable Airspace, Remote ID conditions the exercise of the statutory right to fly in navigable airspace upon giving up Fourth Amendment protections in violation of the constitutional conditions doctrine.

2. Mandatory Installation of GPS is a Search

FAA next misleadingly claims "installing a device that broadcasts its location does not violate any reasonable expectation of privacy," Resp. Br. 18 (citing *United States v. Karo*, 468 U.S. 705, 711 (1984)), while leaving out the primary basis for the Court's conclusion: lack of ownership. The Supreme Court's holding in *Karo* rested on DEA's owning the can into which the device was placed. Thus, defendants could not have any legitimate expectation of privacy in something they did not own or possess. *Karo*, 468 U.S. at 711. Similarly, in *United States v. Knotts*, 460 U.S. 276, 278 (1983), officers installed a beeper inside a container *with consent from the container's owner*.

The same is true of the aircraft tracking cases relied upon by FAA; installation of a tracking device did not implicate privacy concerns *because the individual did not own the aircraft*. See, e.g., *Alonso*, 790 F.2d at 1495 (defendant did not show lawful possession of the plane and therefore had no legitimate expectation of privacy in the plane); *Bruneau*, 594 F.2d at 1194 (finding no Fourth Amendment violation because the transponder was installed with the express consent of the aircraft's owner). The Court in *Bruneau* expressly noted "installation or attachment of a beeper **could** potentially violate the fourth amendment." *Id.*

Additionally, this Court has recognized while “open fields” may be beyond the enumerated scope of “places and things” protected by the Fourth Amendment, whether continuous monitoring in an open field violates a reasonable expectation of privacy is a distinct Fourth Amendment claim for consideration. See *N.Am. Butterfly Ass’n v. Wolf*, 911 F.3d 1244 (D.C.Cir. 2019) (citing *Oliver v. United States*, 466 U.S. 170, 176–77 (1984)).

FAA’s attempts to distinguish the privacy interests at stake here from *Carpenter v. United States*, 138 S.Ct 2206 (2018), which involved an unavoidable trail of data created any time a phone is turned on, also fail. See Resp. Br. 28. FAA claims drones must only broadcast when the operator has “opted to pilot the aircraft in the national airspace.” *Id.* But where can one fly a drone other than in the air? Other than flying indoors or within a recognized area, there is no meaningful choice to “opt” in or out of broadcasting except to disable the drone. Just as with the cell phone in *Carpenter*, any time a drone is turned on for purposes of using it, it creates an unavoidable trail of location data. See 138 S.Ct at 2220.

FAA’s claim “there is no evidence in the record contemplating such pervasive and far-reaching surveillance” to enable tracking the whole of one’s movements is also insufficient to counter the clear facts. Although FAA improperly refused to disclose the Cohort Documents, Remote ID

test site information, and evidence of demonstrations for law enforcement on the record, *c.f. Lee Mem'l Hosp. v. Burwell*, 109 F.Supp.3d 40, 43 (D.D.C. 2015)(an agency may not skew the record by excluding unfavorable information), these items clearly illustrate the intended surveillance and security-centric nature of the final rule. See Brief of Petitioners (Pet. Br.) 9-11, 35-36.

Furthermore, FAA's arguments never addressed tracking the drone controller held by the person on the ground. The proposition that a person has no reasonable expectation of privacy in the location of aircraft says nothing to limit the privacy interests in the location of the *person*. See Resp. Br. 32-33. FAA said nothing to explain its authority to track and store the location of a person, including without time or location limits and especially within the curtilage. This is particularly concerning as there is no limit on the age of the operator – Remote ID requires even children to broadcast detailed location data publicly.

Remote ID constitutes a search because of the technological enhancement providing otherwise impossible surveillance. The cases cited by FAA rely upon *physiological* constraints inherent in what one can "see" "look" at or "view," and the same restraints existent in the technology at issue. See Resp. Br. 32 (citing *U.S. v. Tuggle*, 4 F.4th 505 (7th Cir. 2021); *U.S.*

v. Trice, 966 F.3d 506 (6th Cir. 2020)). Thus, pole camera surveillance of a house may not violate a reasonable expectation in privacy but positioning the camera to look over a 10-foot fence and capture images unviewable to passerby does. *Tuggle*, 4 F.4th at 522 (citing *U.S. v. Cuevas-Sanchez*, 821 F.2d 248, 251 (1987)).

People may reasonably expect their drone to be visible in the surrounding area but would never anticipate their drone or their person to be “seen” a mile away. Remote ID can broadcast radio waves beyond “distances where the [drone] was difficult to visibly detect, up to 3,000 feet.” *Uncrewed Aircraft Systems (UAS) Traffic Management (UTM) UTM Pilot Program (UPP) Phase 2 Final Report (July 2021)*, <https://go.usa.gov/xFmyU> p.71; see also Pet. Br. At 26 (explaining remote ID can transmit information **more than a mile**). The distance from which Remote ID information can be gleaned far exceeds any reasonable expectation in being observed.

These concerns are heightened when drones are operated in private yards. While some “technological enhancement of ordinary perception” has been found Constitutional, the analysis is different when such technology is applied to “an area immediately adjacent to a private home, where privacy expectations are most heightened” and any details are intimate.

Kyllo v. United States, 533 U.S. 27, 33 (2001)(quoting *Dow Chem. Co. v. United States*, 476 U.S. 227, 237 n.4 (1986)).

Remote ID also lacks budget and personnel constraints inherent in other technologies. With pole cameras, construction and monitoring costs naturally limit law enforcement in their usage. Here, the cost of installing Remote ID equipment is born by the drone pilots; there is no economic limitation to the number of GPS trackers installed. While it is within the capabilities of a police department to watch an individual for a full day, it is extremely improbable for it to watch many people for an indefinite period. Pole cameras require the government to “decide ex ante to collect the video footage by installing the cameras,” whereas Remote ID allows the government to travel back in time and “tap into an expansive, pre-existing database” of location information that runs afoul of *Carpenter*. See *Tuggle*, 4 F.4th at 525. Remote ID presents the type of dragnet surveillance which *Knotts* recognized as needing “different constitutional principles” than those used by *Knotts* or *Katz* and their progeny cited by FAA.

3. Intended Law Enforcement Use

FAA next claims there is no search because the rule merely requires detailed location information to be broadcast, “but does not address how various government agencies may subsequently use that information.” Resp. Br. 26. In other

words, FAA acknowledges the rule mandates installation of a tracking device but claims privacy interests are not at stake because FAA has not defined or limited the extent of government monitoring, tracking, and querying of the broadcast data in the rule itself.

FAA's argument is misplaced. The Court in *Bruneau* established the Constitutionality of *installing* a device as a separate consideration from the Fourth Amendment implications of *monitoring* the signals. 594 F.2d at 1194 (quoting *United States v. Miroyan*, 577 F.2d 489, 492 (9th Cir 1978)). Simply because most Fourth Amendment cases involve law enforcement use of illicitly obtained information does not mean a search does not infringe upon the Fourth Amendment until such point. Remote ID's mandatory installation of a GPS tracking device *and* the clearly outlined use of Remote ID data by law enforcement, see Pet. Br. 34-36, constitute unreasonable searches.

FAA's claim that privacy is not a concern because the information is anonymous is likewise untrue. Resp. Br. 23. FAA is developing a System of Records Notice that will provide law enforcement with the ability to identify drone owners based on the publicly broadcast data required by this rule. See Resp. Br. 12-13. Furthermore, the rule requires unique and static identification, which allows aggregation with home property records to easily identify the operator.

B. No Special Needs Exception Applies

Warrantless searches “are per se unreasonable under the Fourth Amendment – subject only to a few specifically established and well-delineated exceptions.” *Katz v. United States*, 389 U.S. 347, 357 (1967). FAA claims if the GPS tracking required by remote ID is a search, it is not unreasonable because it falls within the special needs exception. This applies when “special needs, beyond the normal need for law enforcement, make the warrant and probable-cause requirement impracticable.” *Griffin v. Wisconsin*, 483 U.S. 868, 873 (1987) (internal quotation marks omitted).

Even where the government claims “special needs,” a warrantless search is generally unreasonable unless based on “some quantum of individualized suspicion.” *Skinner v. Ry. Labor Execs.’ Ass’n*, 489 U.S. 602, 624, (1989). “[A] search may be reasonable despite the absence of such suspicion,” however, “where the privacy interests implicated by the search are minimal, and where an important governmental interest furthered by the intrusion would be placed in jeopardy by a requirement of individualized suspicion.” *Id.* Accordingly, a court must “balance the individual’s privacy expectations against the government’s interests to determine whether it is impractical to require a warrant or some level of individualized suspicion in

the particular context." *Nat'l Treasury Employees Union v. Von Raab*, 489 U.S. 656, 665–66 (1989).

In contrast to FAA's claims on appeal, the Record is devoid of any reference to "special need," despite commenters alleging 4th Amendment violations. Arguments of counsel on appeal cannot justify FAA's failures during the rulemaking. *See Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto Ins. Co.*, 463 U.S. 29, 50 (1983).

Even so, the exception does not apply. FAA claims any search constitutes only a minimal intrusion into privacy and tries to minimize the true nature of GPS tracking by insisting Remote ID is nothing more than a "digital license plate." Br. at 34–36. But law enforcement recipients of the "license plate" broadcast are able to open an app on their cell phones and see the ID of the drone; a description of the type of drone; its status (e.g. "airborne"); the drone's location, latitudinal / longitudinal coordinates, altitude, height, direction of travel, and speed; the ID of the operator, the latitudinal / longitudinal coordinates and location of the operator; and the timestamp for all of this data. *See* Addendum E (from a video posted by FAA, demonstrating what the app displaying Remote ID data will look like for a law enforcement officer). This is not a "minimal intrusion."

FAA's citation to cases finding certain pat-downs by TSA at airport security checkpoints or requiring DNA samples from certain *convicted felons* are exempt from the warrant requirement is irrelevant here. Resp. Br. 36. Remote ID does not provide for a search of *certain* individuals in *certain* locations or limited circumstances, but of *all* individuals in *all* locations outside a FAA Recognized Identification Area.

FAA claims the invasion of privacy is justified because "the final rule articulates at length the safety imperative" and need to locate drones "that populate the national airspace and that are used in or may potentially interfere with air commerce." Resp. Br. 35-36. But FAA has not pointed to any such at length articulation of safety imperatives. Rather, lack of safety justification was specifically challenged and raised by commenters. See Pet. Br. 60-62. The rule is also devoid of any rationale for how small, non-commercial drones pose a risk to air commerce, particularly as airplanes are regulatorily required to stay 500ft away from houses. 14 C.F.R. §91.119. Likewise, the claim that the airspace awareness is "increasingly important as the number of unmanned aircraft operations increases," is unsupported because total drone registrations are significantly decreasing. See Rupperecht, Jonathan, *Drone Registration Statistics*, <https://jrupperechtlaw.com/drone-registration-statistics/>.

C. The Argument is Ripe for Consideration

Amicus inappropriately and impermissible raised a new issue not asserted by either party and thus not appropriately within the scope of this Court's review. See *Eldred v. Ashcroft*, 255 F.3d 849, 378 (D.C.Cir. 2001); *Michel v. Anderson*, 14 F.3d 623, 625 (D.C.Cir. 1994) (court will not entertain an amicus argument if not presented by a party).

However, to the extent the Court finds it necessary to address ripeness *sua sponte*, this situation is entirely distinct from the "mountain of conjecture and speculation" at issue in the cases cited by Amicus. *United Transp. Union v. Foster*, 205 F.3d 851, 858 (5th Cir. 2000) involved an allegation that required a four-step series of events before any Fourth Amendment violation could occur, including that the statute's standard would actually need be interpreted to mean less than "probable cause." Employees also had the right to refuse the test at issue. Similarly, the Court in *Ass'n of Am. Physicians & Surgeons, Inc. v. U.S. Dep't of Health and Hum. Servs.*, found no Fourth Amendment violation because "a number of unlikely events must occur in order for plaintiff's to sustain an injury" and the rule would not directly impact the plaintiffs. 224 F.Supp.2d 1123, 1125 (S.D. Tex. 2002), *aff'd* 67 F.App'x 253 (5th Cir. 2003).

Petitioners here are not arguing the Fourth Amendment could potentially be violated if some series of events occurs enabled by Remote ID. The immediate impact of the rule, the requirement to install a device to broadcast detailed location data at all times in all locations outside a recognized area, with no option to refuse, constitutes a search in violation of Fourth Amendment rights.

FAA's final rule implements unreasonable searches of persons, houses, and effects, implicating Fourth Amendment protections. The matter is ripe for this Court's consideration.

III. THE RULE IS ARBITRARY AND CAPRICIOUS

A. Ex parte communications were considered

Information from the Remote ID Cohort was considered by the FAA rulemaking team. The same individuals were involved in Remote ID rulemaking and the Remote ID Cohort, rendering such information subject to at least indirect consideration by Remote ID decision-makers. *Trump v. United States Dist. Of N. Cal.*, 875 F.3d 1200, 1207 (9th Cir. 2017), *vacated on other grounds* 138 S.Ct. 443 (2017) (*quoting Thompson v. U.S. Dep't of Labor*, 885 F.2d 551, 555 (9th Cir. 1989); U.S. Dep't of Justice, Env't and Nat. Res. Div., Guidance to Federal Agencies on Compiling the Administrative Record 3 (Jan. 1999)) (finding the Administrative Record for agency rulemaking "properly includes 'all documents and materials directly or *indirectly* considered by agency

decision-makers," and referencing DOJ guidance as directing inclusion of "all documents and materials prepared, reviewed or received by agency personnel and used or available to the decision-maker, even though the final decision-maker did not actually review or know about the documents and materials."); *Lee Mem'l Hosp. v. Burwell*, 109 F.Supp.3d 40, 43 (D.D.C. 2015) ("the record must include all materials that might have influenced the agency's decision, not merely those on which the agency relied in its final decision."). The lead Senior Attorney responsible for advising on rulemaking related to unmanned aircraft is also the liaison to stakeholders and industry advisory groups, including Aviation Rulemaking Committees. See <https://www.linkedin.com/in/jeambrose/>. A member of the rulemaking team publicly expressed concern based on personal knowledge that two FAA officials who attended rulemaking meetings and provided substantive feedback to the rulemaking team were members of the Cohort and "proposed it to the rulemaking team as a way to develop network ID while sidestepping APA rules on ex parte communications." *Remote ID Intrigue*, sUAS News (October 14, 2021) <https://www.suasnews.com/2021/10/remote-id-intrigue/>; see also https://www.suasnews.com/wp-content/uploads/2021/07/Redacted_Egan-2020-005150-RID_Rulemaking_Team.pdf (FOIA document showing two attorneys

from the Office of Chief Counsel were on the rulemaking team); https://www.suasnews.com/wp-content/uploads/2021/07/FOIA-2021-001076-Egan-Responsive-Records-Combined-AUS-400-and-AGC-200-Cleared_Redacted.pdf at p.64 (listing Jennifer Ambrose as the Office of Chief Counsel point of contact for the Remote ID rule); FAA's Data Exchange for Remote Identification Cohort Documents, https://www.faa.gov/foia/electronic_reading_room/media/remote_id_decohort_foia_documents_RFS.pdf at 112 (showing at least one person from Office of Chief Counsel was present at the Cohort meeting); *Remote ID FOIA #2012-004978*, sUAS News (July 22, 2021) <https://www.suasnews.com/2021/07/remote-id-foia-2012-004978/> (showing Jennifer Ambrose was involved in editing and reviewing the final rule). The same individuals being involved in both the rulemaking and the Cohort contradicts the assertions in FAA's brief.

FAA's attempt to spin the final rule's clear reliance on the Cohort as a "passing reference" and claim instead FAA relied on thousands of comments to justify abandoning network ID also fails. The final rule stated:

The cohort identified several challenges with implementing the network requirements.... For example, **the cohort raised the challenge** of developing and issuing technical specifications to govern remote identification interoperability when producers of UAS have not yet designed UAS with remote identification. Based on the above, the FAA decided to take a

simplified approach ... by only adopting the broadcast requirements in this rule.

JA 20. There is no reference to *comments* identifying the challenges. While six of the eight Cohort members submitted comments on the rulemaking record, *nowhere* did we find a direct discussion on the specific challenge referenced in the rule. FAA's own explanation in the final rule, along with no alternative explanation in the public record submissions from the Cohort, prove FAA relied upon *ex parte* information from the Cohort in changing the rule.

As to the arguments of Amicus, they have no knowledge of what was or was not considered by relevant FAA individuals and exceed propriety by making any claim in that regard.

B. Lack of Transparency is Material and Standing is Not an Issue

FAA then seems to concede the language of the final rule in fact exists but claims that FAA's consideration of materials from the Cohort is immune from review because Petitioner lacks standing to challenge it. Resp. Br. 25. But FAA misstates the standard for review. Generally, a petitioner must show harm from the final order under review. *If* a petitioner is barred from raising substantive claims in a proceeding because no injury in fact is caused by the order under review, courts will "apply a modified standing analysis to procedural claims" pursuant to *Wisconsin Public Power, Inc. v. Ferc*, 493 F.3d 239,

269 (D.C. Cir. 2007). That case does not set forth an *additional* showing to be made for each individual challenge to the rule.

Even if there was a requirement for Petitioners to show harm by FAA's failure to disclose all information from the Cohort on the record, Petitioners have already done so. See Pet. Br. 42-45. Just because Petitioners were against network ID does not mean the broadcast module is less problematic or that Petitioners were not entitled to comment on it and are not harmed by its abandonment; network ID at least allowed privacy by using one time use session IDs, while there is no such option under Broadcasts' unique and static IDs.

The issue is also not whether Petitioners were harmed by FAA considering the Cohort materials, FAA *should* have contemplated them and worked with the Remote ID Cohort in refining the Remote ID rule. The problem is Petitioners, along with the rest of the public, were precluded from considering or commenting on that information, and from having FAA consider and account for those comments that should have been on the record. *Everyone* is harmed by FAA's failure to develop a more refined concept of remote ID based upon rebuttals of *all* the information. FAA does not know what it does not know and, in the interest of safety and security, FAA must elucidate their unknowns. FAA cannot willfully withhold information from the public under the guise

of a "separate process" then, when caught, brush it off as immaterial.

Additionally, FAA claims information from Phase Two of the Pilot Program was not relevant to rulemaking because the feedback from Phase Two was not released until after the final rule had been promulgated. Resp. Br. 47. But the collaboration and demonstration of technology all occurred during the rulemaking. Only the *final report* from Phase Two came out after the final rule. Addendum B p.8-13.

C. FAA Has Not Shown Changes in the Final Rule Were a Logical Outgrowth

1. Barometric to Geometric Altitude

FAA's arguments in defense of its change to geometric altitude accuracy requirements miss the point of Petitioners' objection. The primary concern here is over the *significant increase* in accuracy requirements. Even assuming, *arguendo*, that FAA requesting comments on use of geometric *in addition* to barometric attitude constituted adequate notice to entirely *replace* barometric altitude, requesting comments on accuracy requirements for measures by barometric altitude does not mean "FAA would have similarly adopted an accuracy requirement for measurement by geometric altitude." Resp. Br. 52 (citing JA 164). These are technically different pieces of equipment with different datum reference points and sources and magnitudes of

error, requirements for one cannot “naturally flow” from comments on requirements for the other.

The accuracy requirements adopted in the final rule are vastly different than those proposed, see Pet. Br. 41-42, and beyond what anyone anticipated, illustrated by the serious problems pointed out to the FAA only after the final rule was published. As the Chair of the American Society for Testing and Materials Remote ID Working Group recently explained in an email to FAA, the final rule’s required accuracy within 15 feet (95% of the time) is unworkable because 50 feet is the “lowest practical requirement for vertical accuracy.” *ASTM wrote to the FAA Complaining about RID GPS requirements in June 2021*, sUAS News (Oct. 15, 2021), <https://www.suasnews.com/2021/10/astm-wrote-to-the-faa-complaining-about-rid-gps-requirements-in-june-2021/>.

The newly implemented use of e911 levels of accuracy for the controller were not only unexpected but problematic because “[u]se of this enhanced location information is highly restricted” by the FCC. *Id.* As a matter of National Security, FCC is trying to add DJI, the Chinese drone company that makes up more than 50% of the U.S. drone market, to its Covered List over concerns that DJI is “operating as a Huawei on Wings.” See *Citing National Security Risks, Carr Calls For Starting Process of Adding DJI – A Chinese Drone Company – To FCC’s Covered List*,

News Release (Oct. 19, 2021) <https://www.fcc.gov/document/carr-calls-review-dji-citing-national-security-risks>. FCC "found that DJI's software applications collect large quantities of personal information from the operator's smartphone that could be exploited by Beijing," and "U.S. intelligence services have warned that DJI poses a security threat due to the level of sensitive information it collects and the risk of that data being accessed by Chinese state actors." *Id.*

In direct contravention of these restrictions and national security concerns, the final rule envisions drone pilots granting drone apps on phones access to this FCC protected z-axis data. See JA 45 (anticipating most standard remote ID drones "will be designed to be paired with an existing smart phone or smart device to provide the control station location information.")

There was nothing logical about the change from the proposed barometric accuracy requirements to the significantly increased GPS accuracy requirements of the final rule. FAA clearly did not solicit public input before implementing these impracticable requirements.

2. Limited Remote ID to Broadcast Module ID

FAA claims the change from the NPRM's limited remote ID, relying solely on transmission over the internet, to the final rule's Broadcast Module ID, requiring the information be

broadcast over unlicensed radio frequencies, was implemented after receiving comments in opposition to using the internet and in no way in reliance on information provided by the Remote ID Cohort. But the post hoc rationalizations of counsel cannot serve to justify agency action. *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 50. As explained above, the final rule states the change was made because of challenges identified by the Remote ID Cohort, JA 20, and none of those technical changes were raised by commenters. Nor could they have been, the comment period was closed before the Cohort discovered them. That is the point; the public was not informed of or given an opportunity to comment on the technical challenges or FAA's new way of addressing them, adopted and stated for the first time in the final rule.

But even as to the comments that were made on the record, comments do not satisfy the requirement that an agency give the public notice of its intent to adopt a new approach and an opportunity to comment. *International Union, UMW v. MSHA*, 407 F.3d 1250, 1261 (D.C.Cir. 2005); *Fertilizer Inst. v. EPA*, 935 F.2d 1303, 1312 (D.C.Cir. 1991) (an agency "cannot bootstrap notice from comments."). FAA cannot "use the rulemaking process to pull a surprise switcheroo on the regulated entities" *Env'tl. Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C.Cir. 2005).

FAA's arguments the change was anticipated, and thus a logical outgrowth, because "commenters were 'generally supportive' of the standards the FAA had proposed with respect to broadcasting Remote ID over radio frequencies," Resp. Br. 54, is unpersuasive. Commenters were supportive of doing broadcast **OR** network, but not the complete abandonment of network ID. The final rule's Broadcast Module ID requirement is not a "logical outgrowth" of the NPRM because the public had no reason to anticipate the agency's course in completely abandoning network, in light of the clear NPRM language that *only* internet transmission of information would be required and the comments requesting an "or" approach.

The change from network ID to broadcast-only was "such a detour from the course of the rulemaking that in fairness to the public and interested parties the agency should be required to retrace its steps, give notice of its new focus, and reopen the comment period." *Sierra Club v. Costle*, 657 F.2d 298, 353 (D.C.Cir. 1981).

D. FAA Has Not Shown it Properly Considered or Responded to Material Comments

FAA does not claim it responded to commenters' challenges to its Constitutional and statutory authority. Rather, FAA asserts that no response was necessary because it "would mainly restate 'what had already been set forth in its published

notice.'" Resp. Br. 71 (quoting *Texas Mun. Power Agency v. EPA*, 89 F.3d 858, 870 (D.C.Cir. 1996)). But the published notice, the NPRM, did not explain the basis of FAA authority to regulate non-commercial drones that are flown below established navigable airspace, as challenged by commenters. See, Pet. Br. 49-52.

As previously explained, FAA has no statutory authority to regulate "airspace of the United States" as used in the NPRM and final rule. See Pet. Br. 51. Nor, does FAA has statutory authority over "national airspace" as used in FAA's arguments to this Court. FAA's statutory authority over "navigable airspace," by itself, does not give FAA authority to regulate down to the ground. FAA has *not* addressed these concerns or clearly set out the basis of its claimed authority to regulate all airspace.

FAA has done nothing more than cite to statutory provisions that are subject to heated debate, evidenced by Amicus' arguments. The authority cited in the NPRM does not give FAA clear or pervasive regulatory authority over the airspace in a private back yard just above ground level.

Furthermore, FAA has not expressly stated that it takes the position of Amicus, i.e. interprets existing statutory authority as extending down to the ground and into private property and backyards. FAA sidesteps the issue, claiming Petitioners "misunderstand" the rule as it "simply requires unmanned aircraft systems to broadcast location and identification

information while in use," without responding to challenges about *where* that use occurs and *how* FAA has authority to regulate use in those locations. *See, e.g.,* Resp. Br. 32-33. As explained in Petitioner's opening brief, these are material concerns that, if true, necessitate a change in the scope of FAA's rulemaking and mandate consideration by and response from FAA.

IV. FAA DID NOT SATISFY THE STATUTORY REQUIREMENT OF CONSULTATION

FAA's claim that the National Institute of Standards and Technology observed the Aviation Rulemaking Committee, even if true, is insufficient to satisfy the statutory mandate to develop standards in consultation with the Director of the National Institute as set forth in the FAA Extension, Safety, and Security Act of 2016, §2202, 130 Stat 629 (codified at 49 U.S.C. §44802 note "UAS Safety"). The only evidence of any involvement by the National Institute is a letter from FAA to Congress claiming that representatives from the National Institute were among several "government observers" to the Committee. *See* Resp. Br. 63 (citing <https://go.usa.gov/xFpkS>). Notably, the administrative record itself is seemingly devoid of any evidence of involvement by the National Institute, and the charter for the Aviation Committee lacks any reference to the National Institute. <https://go.usa.gov/xFpx5>. Even if a representative from the Institute "observed" the Committee,

there is absolutely nothing to suggest the Director was involved in developing the standards for the rulemaking as mandated by Congress.

Congress unequivocally directed FAA to consult with specific knowledgeable entities prior to adopting rules or guidance on remote identification. FAA failed to do so. The minimal involvement by the Radio Technical Commission for Aeronautics and mere "observation" by representatives from the National Institute is insufficient. There is no issue of judicial enforceability, as FAA oddly suggests. The facts in the record – and even in external documents cited by FAA now – establish FAA arbitrarily and capriciously failed engage in a statutory prerequisite to its rulemaking authority.

Respectfully submitted,

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Dated: November 2, 2021

Certificate of Compliance

I hereby certify that this brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B) because, excluding parts of the documented exempted by Rule 32(f) and Circuit Rule 32(e)(1), it contains 6,491 words.

I further certify that this document complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type-style requirements of Fed. R. App. P. 32(a)(6) because this document has been prepared using a monospaced typeface using Microsoft Word with 10 characters per inch and Courier.

/s/ Elizabeth Candelario

Dated: November 2, 2021

Certificate of Service

I hereby certify that I have served a copy of the foregoing brief by electronic filing through the CM/ECF system.

/s/ Elizabeth Candelario

Dated: November 2, 2021

ORAL ARGUMENT SCHEDULED FOR DECEMBER 15, 2021

No. 21-1087

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

TYLER BRENNAN and
RACEDAYQUADS LLC,
Petitioners,

v.

STEVE DICKSON, Administrator,
Federal Aviation Administration,
Respondent.

ON PETITION FOR REVIEW OF A FINAL RULE OF THE
FEDERAL AVIATION ADMINISTRATION

ADDENDA TO REPLY BRIEF OF PETITIONERS

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ADDENDUM D

49 U.S.C. § 40102 - Definitions

(a) General Definitions.—In this part—

(3) "air commerce" means foreign air commerce, interstate air commerce, the transportation of mail by aircraft, the operation of aircraft within the limits of a Federal airway, or the operation of aircraft that directly affects, or may endanger safety in, foreign or interstate air commerce.

(20) "Federal airway" means a part of the navigable airspace that the Administrator designates as a Federal airway.

(32) "navigable airspace" means airspace above the minimum altitudes of flight prescribed by regulations under this subpart and subpart III of this part, including airspace needed to ensure safety in the takeoff and landing of aircraft.

Regulation During 1941

Civil Air Regulations §§ 60.350- 60.3505 Minimum and maximum safe altitudes of flight. (1941)

§ 60.350 Minimum safe altitudes.

Exclusive of taking off from or landing upon an airport or other landing area aircraft shall not be flown below the following minimum safe altitudes of flight:

§ 60.3501 An altitude over the congested parts of cities, towns, or settle § 60.3501 An altitude over an area certified by the Administrator as a danger area sufficient to permit at all times an emergency landing outside of such danger area in the event of complete power failure but on no case less than 1,000 feet above the ground: Provided, That the restrictions of this paragraph shall not apply to public aircraft previously authorized by the appropriate governmental agency to make specific flights below such minimums in the public interest. NOTE: § 60.3501 was revoked by Amdt. 60-46, CAR, Nov. 21, 1941, effective Dec. 1, 1941; 6 F.R. 6015.

§ 60.3502 1,000 feet above the ground over any Federal penal institution or any open air assembly of persons.

§ 60.3503 500 feet above the ground or water elsewhere than as specified in §§ 60.3500, 60.3501, and 60.3502, or within 500 feet from any mountain, hill, or other obstruction Addendum D 14 except as may be specifically approved by the Administrator: Provided, however, That seaplanes and amphibians may be flown below 500 feet, but not below 300 feet, if making a contact flight during daylight hours over open water and where an emergency landing may, at all times, be made, without the aid of power, into the wind and without danger of collision with craft on the surface or other obstructions: And provided, further, That the restrictions of this paragraph shall not apply to public aircraft, previously authorized by the appropriate governmental agency, to make specific flights below such minimums in the public Interest.

§ 60.3504 1,000 feet above the ground or water, or within 1,000 feet of any mountain, hill or other obstruction to flight, if an aircraft is making an instrument flight as defined in § 60.131.

§ 60.3505 Any maneuver required in student instruction or solo practice under the supervision of a certificated flight instructor, the Army, Navy, Marine Corps, or Coast Guard, or in flight tests given by an inspector of the Administrator, may be conducted at the altitude above the ground or water necessary

for the proper execution of such maneuver in places other than as specified in §§ 60.3500, 60.3501, and 60.3502.

Regulation Prior to 1989

14 C.F.R. § 91.79 Minimum safe altitudes; general.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) *Anywhere.* An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) *Over congested areas.* Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) *Over other than congested areas.* An altitude of 500 feet above the surface except over open water or sparsely populated areas. In that case, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) *Helicopters.* Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with routes or altitudes specifically prescribed for helicopters by the Administrator.

Current Regulation

14 C.F.R. § 91.119 Minimum safe altitudes: General.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) **Anywhere.** An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) **Over congested areas.** Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) **Over other than congested areas.** An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) **Helicopters, powered parachutes, and weight-shift-control aircraft.** If the operation is conducted without hazard to persons or property on the surface -

(1) A helicopter may be operated at less than the minimums prescribed in [paragraph \(b\)](#) or [\(c\)](#) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in [paragraph \(c\)](#) of this section.

[Doc. No. 18334, 54 FR 34294, Aug. 18, 1989, as amended by Amdt. 91-311, 75 FR 5223, Feb. 1, 2010]

14 C.F.R. § 91.126 Operating on or in the vicinity of an airport in Class G airspace.

(a) **General.** Unless otherwise authorized or required, each person operating an aircraft on or in the vicinity of an airport in a Class G airspace area must comply with the requirements of this section.

(b) **Direction of turns.** When approaching to land at an airport without an operating control tower in Class G airspace -

(1) Each pilot of an airplane must make all turns of that airplane to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right, in which case the pilot must make all turns to the right; and

(2) Each pilot of a helicopter or a powered parachute must avoid the flow of fixed-wing aircraft.

(c) **Flap settings.** Except when necessary for training or certification, the pilot in command of a civil turbojet-powered aircraft must use, as a final flap setting, the minimum certificated landing flap setting set forth in the approved performance information in the Airplane Flight Manual for the applicable conditions. However, each pilot in command has the final authority and responsibility for the safe operation of the pilot's airplane, and may use a different flap setting for that airplane if the pilot determines that it is necessary in the interest of safety.

(d) **Communications with control towers.** Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established prior to 4 nautical miles from the airport, up to and including 2,500 feet AGL. However, if the aircraft radio fails in flight, the pilot in command may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received. If the aircraft radio fails while in flight under IFR, the pilot must comply with [§ 91.185](#).

[Doc. No. 24458, [56 FR 65658](#), Dec. 17, 1991, as amended by Amdt. 91-239, [59 FR 11693](#), Mar. 11, 1994; Amdt. 91-282, [69 FR 44880](#), July 27, 2004]

14 C.F.R. § 91.127 Operating on or in the vicinity of an airport in Class E airspace.

(a) Unless otherwise required by [part 93 of this chapter](#) or unless otherwise authorized or required by the ATC facility having jurisdiction over the Class E airspace area, each person operating an aircraft on or in the vicinity of an airport in a Class E airspace area must comply with the requirements of [§ 91.126](#).

(b) **Departures.** Each pilot of an aircraft must comply with any traffic patterns established for that airport in [part 93 of this chapter](#).

(c) **Communications with control towers.** Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established prior to 4 nautical miles from the airport, up to and including 2,500 feet AGL. However, if the aircraft radio fails in flight, the pilot in command may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received. If the aircraft radio fails while in flight under IFR, the pilot must comply with [§ 91.185](#).

[Doc. No. 24458, [56 FR 65658](#), Dec. 17, 1991, as amended by Amdt. 91-239, [59 FR 11693](#), Mar. 11, 1994]

14 C.F.R. § 91.129 Operations in Class D airspace.

(c) **Communications.** Each person operating an aircraft in Class D airspace must meet the following two-way radio communications requirements:

(1) **Arrival or through flight.** Each person must establish two-way radio communications with the ATC facility (including foreign ATC in the case of foreign airspace designated in the United States) providing air traffic services prior to entering that airspace and thereafter maintain those communications while within that airspace.

(2) **Departing flight.** Each person -

(i) From the primary airport or satellite airport with an operating control tower must establish and maintain two-way radio communications with the control tower, and thereafter as instructed by ATC while operating in the Class D airspace area; or

(ii) From a satellite airport without an operating control tower, must establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class D airspace area as soon as practicable after departing.

14 C.F.R. § 91.130 Operations in Class C airspace.

(c) **Communications.** Each person operating an aircraft in Class C airspace must meet the following two-way radio communications requirements:

(1) **Arrival or through flight.** Each person must establish two-way radio communications with the ATC facility (including foreign ATC in the case of foreign airspace designated in the United States) providing air traffic services prior to entering that airspace and thereafter maintain those communications while within that airspace.

(2) **Departing flight.** Each person -

(i) From the primary airport or satellite airport with an operating control tower must establish and maintain two-way radio communications with the control tower, and thereafter as instructed by ATC while operating in the Class C airspace area; or

(ii) From a satellite airport without an operating control tower, must establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class C airspace area as soon as practicable after departing.

(d) **Equipment requirements.** Unless otherwise authorized by the ATC having jurisdiction over the Class C airspace area, no person may operate an aircraft within a Class C airspace area designated for an airport unless that aircraft is equipped with the applicable equipment specified in § 91.215, and after January 1, 2020, § 91.225.

14 C.F.R. § 91.131 Operations in Class B airspace

(c) Communications and navigation equipment requirements. Unless otherwise authorized by ATC, no person may operate an aircraft within a Class B airspace area unless that aircraft is equipped with -

. . . .

(2) For all operations. An operable two-way radio capable of communications with ATC on appropriate frequencies for that Class B airspace area.

(d) Other equipment requirements. No person may operate an aircraft in a Class B airspace area unless the aircraft is equipped with -

(1) The applicable operating transponder and automatic altitude reporting equipment specified in § 91.215 (a), except as provided in § 91.215 (e), and

(2) After January 1, 2020, the applicable Automatic Dependent Surveillance-Broadcast Out equipment specified in § 91.225.

14 C.F.R. § 91.215 ATC transponder and altitude reporting equipment and use.

(b) All airspace. Unless otherwise authorized or directed by ATC, and except as provided in [paragraph \(e\) \(1\)](#) of this section, no person may operate an aircraft in the airspace described in [paragraphs \(b\) \(1\)](#) through [\(5\)](#) of this section, unless that aircraft is equipped with an operable coded radar beacon transponder having either Mode 3/A 4096 code capability, replying to Mode 3/A interrogations with the code specified by ATC, or a Mode S capability, replying to Mode 3/A interrogations with the code specified by ATC and intermode and Mode S interrogations in accordance with the applicable provisions specified in TSO C-112, and that aircraft is equipped with automatic pressure altitude reporting equipment having a Mode C capability that automatically replies to Mode C interrogations by transmitting pressure altitude information in 100-foot increments. The requirements of this [paragraph \(b\)](#) apply to -

(1) All aircraft. In Class A, Class B, and Class C airspace areas;

(2) All aircraft. In all airspace within 30 nautical miles of an airport listed in appendix D, section 1 of this part from the surface upward to 10,000 feet MSL;

(3) Notwithstanding [paragraph \(b\) \(2\)](#) of this section, any aircraft which was not originally certificated with an engine-driven electrical system or which has not subsequently been certified with such a system installed, balloon or glider may conduct operations in the airspace within 30 nautical miles of an airport listed in appendix D, section 1 of this part provided such operations are conducted -

(i) Outside any Class A, Class B, or Class C airspace area; and

(ii) Below the altitude of the ceiling of a Class B or Class C airspace area designated for an airport or 10,000 feet MSL, whichever is lower; and

(4) All aircraft in all airspace above the ceiling and within the lateral boundaries of a Class B or Class C airspace area designated for an airport upward to 10,000 feet MSL; and

(5) All aircraft except any aircraft which was not originally certificated with an engine-driven electrical system or which has not subsequently been certified with such a system installed, balloon, or glider -

(i) In all airspace of the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL, excluding the airspace at and below 2,500 feet above the surface; and

(ii) In the airspace from the surface to 10,000 feet MSL within a 10-nautical-mile radius of any airport listed in appendix D, section 2 of this part, excluding the airspace below 1,200 feet outside of the lateral boundaries of the surface area of the airspace designated for that airport.

(c) *Transponder-on operation.* Except as provided in [paragraph \(e\) \(2\)](#) of this section, while in the airspace as specified in [paragraph \(b\)](#) of this section or in all controlled airspace, each person operating an aircraft equipped with an operable ATC transponder maintained in accordance with [§ 91.413](#) shall operate the transponder, including Mode C equipment if installed, and shall reply on the appropriate code or as assigned by ATC, unless otherwise directed by ATC when transmitting would jeopardize the safe execution of air traffic control functions.

. . . .

(e) *Unmanned aircraft.*

(1) The requirements of [paragraph \(b\)](#) of this section do not apply to a person operating an unmanned aircraft under this part unless the operation is conducted under a flight plan and the person operating the unmanned aircraft maintains two-way communication with ATC.

(2) No person may operate an unmanned aircraft under this part with a transponder on unless:

(i) The operation is conducted under a flight plan and the person operating the unmanned aircraft maintains two-way communication with ATC; or

(ii) The use of a transponder is otherwise authorized by the Administrator.

**14 C.F.R. § 91.225 Automatic Dependent Surveillance-Broadcast
(ADS-B) Out equipment and use.**

(b) After January 1, 2020, except as prohibited in [paragraph \(i\) \(2\)](#) of this section or unless otherwise authorized by ATC, no person may operate an aircraft below 18,000 feet MSL and in airspace described in [paragraph \(d\)](#) of this section unless the aircraft has equipment installed that -

(1) Meets the performance requirements in -

(i) TSO-C166b; or

(ii) TSO-C154c, Universal Access Transceiver (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment Operating on the Frequency of 978 MHz;

(2) Meets the requirements of [§ 91.227](#).

. . . .

(d) After January 1, 2020, except as prohibited in [paragraph \(i\) \(2\)](#) of this section or unless otherwise authorized by ATC, no person may operate an aircraft in the following airspace unless the aircraft has equipment installed that meets the requirements in [paragraph \(b\)](#) of this section:

(1) Class B and Class C airspace areas;

(2) Except as provided for in [paragraph \(e\)](#) of this section, within 30 nautical miles of an airport listed in appendix D, section 1 to this part from the surface upward to 10,000 feet MSL;

(3) Above the ceiling and within the lateral boundaries of a Class B or Class C airspace area designated for an airport upward to 10,000 feet MSL;

(4) Except as provided in [paragraph \(e\)](#) of this section, Class E airspace within the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL, excluding the airspace at and below 2,500 feet above the surface; and

(5) Class E airspace at and above 3,000 feet MSL over the Gulf of Mexico from the coastline of the United States out to 12 nautical miles.

(e) The requirements of [paragraph \(b\)](#) of this section do not apply to any aircraft that was not originally certificated with

an electrical system, or that has not subsequently been certified with such a system installed, including balloons and gliders. These aircraft may conduct operations without ADS-B Out in the airspace specified in [paragraphs \(d\) \(2\)](#) and [\(d\) \(4\)](#) of this section. Operations authorized by this section must be conducted -

(1) Outside any Class B or Class C airspace area; and

(2) Below the altitude of the ceiling of a Class B or Class C airspace area designated for an airport, or 10,000 feet MSL, whichever is lower.

(f) Except as prohibited in [paragraph \(i\) \(2\)](#) of this section, each person operating an aircraft equipped with ADS-B Out must operate this equipment in the transmit mode at all times unless -

(1) Otherwise authorized by the FAA when the aircraft is performing a sensitive government mission for national defense, homeland security, intelligence or law enforcement purposes and transmitting would compromise the operations security of the mission or pose a safety risk to the aircraft, crew, or people and property in the air or on the ground; or

(2) Otherwise directed by ATC when transmitting would jeopardize the safe execution of air traffic control functions.

. . . .

(i) For unmanned aircraft:

(1) No person may operate an unmanned aircraft under a flight plan and in two way communication with ATC unless:

(i) That aircraft has equipment installed that meets the performance requirements in TSO-C166b or TSO-C154c; and

(ii) The equipment meets the requirements of [§ 91.227](#).

(2) No person may operate an unmanned aircraft under this part with Automatic Dependent Surveillance-Broadcast Out equipment in transmit mode unless:

(i) The operation is conducted under a flight plan and the person operating that unmanned aircraft maintains two-way communication with ATC; or

(ii) The use of ADS-B Out is otherwise authorized by the Administrator.

ADDENDUM E

<https://youtu.be/S0S2D8Sp8Do?t=256>





