

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AXON ENTERPRISE, INC. AND DEDRONE HOLDINGS, INC.

Petitioners

v.

AIRSPACE DEFENSE, INC.

Patent Owner

Case No. IPR2025-00530

Patent 10,249,199

**PETITIONERS' SUR-REPLY TO PATENT OWNER'S REPLY TO
OPPOSITION TO NON-CONTINGENT REVISED MOTION TO AMEND**

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LIST OF EXHIBITS

Ex. No. ¹	Description
1001	U.S. Patent No. 10,249,199 to Banga, “System and Method for Aerial System Discrimination and Action” (the “199 Patent”)
1002	File History for U.S. Patent No. 10,249,199
1003	Declaration of Dr. Girish Chowdhary
1004	Complaint for Patent Infringement, <i>Airspace Systems, Inc. v. Dedrone Holdings, Inc.</i> , Case No. 1-24-cv-01625 (E.D. VA), September 16, 2024
1005	U.S. Patent Application Publication No. 2019/0003807 to Whitmarsh <i>et al.</i> , “UAV Defense System,” (“ <i>Whitmarsh</i> ”) filed December 8, 2016 and published January 3, 2019
1006	U.S. Provisional Application No. 62/267,393 to Whitmarsh <i>et al.</i> , “UAV Defense System,” (“ <i>Whitmarsh Provisional</i> ”), filed December 15, 2015
1007	U.S. Patent Application Publication No. 2007/0239986 to Viggiano <i>et al.</i> , “Secure ADS-B Authentication System and Method,” (“ <i>Viggiano</i> ”) filed April 7, 2006 and published October 11, 2007
1008	U.S. Patent Application Publication No. 2016/0023760 to Goodrich, “Systems and Methods Countering an Unmanned Aerial Vehicle,” (“ <i>Goodrich</i> ”) filed July 16, 2015 and published January 28, 2016
1009	U.S. Patent No. 10,733,894 to Beard <i>et al.</i> , “Direct-broadcast Remote Identification (RID) Device for Unmanned Aircraft Systems (UAS),” filed February 26, 2018 and issued August 4, 2020
1010	U.S. Provisional Application No. 62/209/221 to Beard, “Automatic Dependent Surveillance Broadcast Transmission within Whitespace,” filed August 24, 2015

¹ Citations to patents are made by column and line cite; citations to patent publications are made by paragraph number; citations to Exhibit 1002 are made with reference to the Bates-stamped pagination; citations to other exhibits are made to the page number of the document itself.

1011	U.S. Patent No. 9,805,238 to Falk <i>et al.</i> , “System for Identifying and Controlling Unmanned Aerial Vehicles,” (“ <i>Falk</i> ”) filed July 11, 2016 and issued October 31, 2017
1012	U.S. Provisional Application No. 62/301,858 to <i>Falk</i> , “System for Identifying and Controlling Unmanned Aerial Vehicles,” (“ <i>Falk Provisional</i> ”), filed March 1, 2016
1013	Claim Listing of Challenged Claims
1014	Kayton, Myron and Fried, Walter, <i>Avionics Navigation Systems</i> , John Wiley and Sons, 1997.
1015	International Publication No. WO2016/154949 A1 to Gong <i>et al.</i> , “Authentication Systems and Methods for Generating Flight Regulations,” filed March 31, 2015 and published October 6, 2016
1016	International Publication No. WO2015/043123 A1 to Wang <i>et al.</i> , “Data Communication Systems and Methods,” filed January 14, 2014 and published April 2, 2015
1017	Burnside, Joseph E., “ADS-B Out: 978 UAT Or 1090ES?,” AviationSafety Magazine, published March 15, 2016.
1018	Nichols, Randall et al., <i>Counter Unmanned Aircraft Systems Technology and Operations</i> , New Prairie Press, 2020
1019	Austin, Reg, <i>Unmanned Aircraft Systems, UAVS Design, Development and Deployment</i> , Wiley, John Wiley and Sons, 2010
1020	Stipulation email on May 29, 2025
1021	Second Declaration of Dr. Girish Chowdhary
1022	International Publication No. WO2016/161637 to Gong et al., “Method, Apparatus and System of Providing Communication Coverage to an Unmanned Aerial Vehicle,” filed April 10, 2015 and published October 13, 2016 (“Gong637”)
1023	Transcript of Deposition of Dr. Nikolaos Papanikolopoulos
1024	Third Declaration of Dr. Girish Chowdhary
1025	U.S. Patent 9,087,451 to Jarrell, “Unmanned Aerial Vehicle Communication, Monitoring, and Traffic Management,” filed July 28, 2014, issued July 21, 2015 (“Jarrell”)
1026	U.S. Patent Application Publication No. 2016/0125740 to Pasko et al., “Unmanned Aerial Vehicle Identity and Capability Verification,” filed May 20, 2014, published May 5, 2016 (“Pasko”)
1027	Transcript of Second Deposition of Dr. Nikolaos Papanikolopoulos

I. PO HAS NOT MET ITS WRITTEN DESCRIPTION BURDEN

[10.d] Lacks Written Description Support: Petitioners demonstrated a *second identifier* received from a *computing system that is remote relative to the discrimination system* is unsupported. Opposition (Paper 32, “Oppo.”), 1-3. PO hinges its hopes on two arguments (Reply, 1-2), but both fail and impermissibly rely on obviousness.

PO’s first argument tries to combine four disparate specification passages to argue that, when “[r]ead . . . in context with each other,” they demonstrate “that one or two identifiers may be used, and either may be remote or local to the UAV. Reply, 1 (citing EX2002 at 2:18-22, 4:15-22, 14:16-5:2, and 39:6-9). This fails for three reasons. **First**, PO points to “aerial system identifier 310 [that] is preferably dynamic” and can be “generated remotely (e.g., at a remote computing system),” but PO is conflating the claimed *first identifier* and the *second identifier*. *Id.* Identifier 310, whether dynamic or static, is never disclosed as being a *second identifier* and at best relates to the *first identifier* instead. EX2002, 14:23-15:7; *see also id.*, 6:1-3, 9:13-17, 14:6-17; Oppo., 2. Additionally, the specification does not say the remote computing system is *remote relative to the discrimination system* as claimed; instead, the remote computing system is contrasted with generation “on-board” the aerial system and is simply “remote” **from aerial system 100 (i.e., the aircraft)**. EX2002, 14:23-15:2 (“The dynamic aerial system identifier can be **generated on-**

board the aerial system 100, generated remotely (e.g., at a remote computing system, etc.; updated in-flight or when connected to a predetermined communication connection type, etc.), or generated by any other suitable system.”), EX1027, 20:21-21:16. The remote computing system is never described as remote from the *discrimination system*; and, in context, this dynamic identifier is only disclosed as transmitted in identifier signal 300—as part of the discrimination system, not remote from it. EX2002, 14:6-8. PO then points to the specification at 4:15-22, but this also fails to support [10.d] and introduces an architectural contradiction to SC 10. Reply, 1. Here, the specification discloses an aircraft (aerial system 100) includes an “identifier transmission system” that transmits “a first and second identifier.” *Id.*; EX2002, 4:15-22. But PO has taken the position that transmissions from the UAV are not “remote” from the discrimination system and thus this portion cannot be relied upon to supply written description. RMTA at 20 (arguing that a second identifier received “from the UAV” is not “remote relative to the discrimination system”). PO also cites to the specification’s boilerplate language—that “preferred embodiments include every combination and permutation of the various system components”—but that is insufficient as a matter of law. *D Three Enters., LLC v. SunModo Corp.*, 890 F.3d 1042, 1051 (Fed. Cir. 2018). **Second**, PO’s conclusion that “either [identifier] may be remote or local to the UAV” is beside the point. Reply, 1. [10.d] does not merely require an identifier “remote to the UAV”—it

requires the second identifier to be received from a computing system *remote relative to the discrimination system*. Showing that an identifier might be remote from the UAV does not support the actual claim language. **Third**, PO's attempt to combine and vary these disclosures reveals it is relying on obviousness to supply written description. EX2005, ¶¶72-79 (PO's expert alleging specification embodiments can be "*varied*" based on each other). This is impermissible as a matter of law. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) (obvious "does not satisfy" written description); *Novozymes A/S v. DuPont Nutrition Biosciences APS*, 723 F.3d 1336, 1349 (Fed. Cir. 2013) (cannot work backward using hindsight to derive written description support from "an amalgam of [specification] disclosures plucked selectively").

PO's second argument points to disclosure stating that a "dynamic aerial system identifier can be ... generated remotely (e.g., at a remote computing system...)" to conclude that a remote computing system "outside of the discrimination system" transmits identifiers to the receiver. Reply, 2 (referring to content at EX2002, 14:23-15:2, 8:16-17).² This is pure attorney argument that relies on multiple impermissible leaps of obviousness to gap-fill and fails for four reasons. **First**, PO again is confusing identifiers in relying on the "dynamic identifier;" the remotely generated "dynamic identifier" (element 310) is the first identifier, not the

² The Reply incorrectly cites to EX2002, 8:5-10 and 4:57-59.

claimed second identifier functioning as a separate second factor. *Id.*; *see supra*.

Second, the passages fail to define what the computing system is remote *from*. EX2002, 14:23-15:2, 8:16-17. As explained, the specification does not say that the computing system is “outside of the discrimination system.” *See supra*. PO, through attorney argument, leaps to this conclusion, but that is an impermissible use of obviousness for written description support. **Third**, the specification never states that this remote system “transmit[s] identifiers” to the identification receiver as claimed. This, too, uses obviousness. Reply, 2. **Fourth**, PO’s unbacked assertion that a POSITA would understand the claim to encompass identifiers routed “indirectly (e.g., *through the UAV*)” is a fatal architectural admission that is unsupported by the intrinsic record. Reply, 2. That a dynamic identifier can be “generated remotely” from an aircraft at a “remote computing system,” “updated in flight,” or “connected to a predetermined communication connection type” does not support a specific arrangement of indirect communication in which a *second identifier* is transmitted from a computing system *remote relative to the discrimination system* to a UAV, and then from the UAV to a receiver. *Id.*; EX2002, 14:23-15:2. The specification contains no support for this concept. Moreover, by conceding that the identifier must pass “through the UAV,” (and thus its identifier transmission system), PO has itself established a lack of support. Reply, 2. As noted above, PO has argued that an identifier “received from the UAV” is not received

from a “computing system that is remote relative to the discrimination system,” so a transmission passing “through the UAV” under PO’s own logic cannot provide written description support as PO said it is not within the claim scope. RMTA at 20.

[10.e2] Lacks Written Description Support: PO again impermissibly relies on obviousness, stitching together disconnected passages. Reply, 2-3. PO first cites EX2002 at 9:14–17, which merely states a chipset “*interprets*” the signal. *Id.* PO’s expert then impermissibly uses obviousness to conclude that the chipset “*determines*” the identifier, solely to bridge this passage to an entirely different section (EX2002 at 30:17–18) stating that *determining* an identifier optionally includes verifying its authenticity. *Id.* But the specification itself never links the chipset’s *interpretation* of a signal (on page 9) to the optional authentication (on page 30). PO relies on obviousness to bridge this gap, but that cannot satisfy § 112. PO next cites EX2002 at 9:20–22, which notes the chipset sends a “raw or processed signal” to the permissions module. Reply, 3. PO asserts a POSITA would understand the “processed” signal to mean an “authenticated” identifier. *Id.* This is a quintessential, impermissible use of obviousness. The specification describes “processing” a signal in the context of interpretation (*e.g.*, decrypting a broadcast); it never equates a “processed” signal with an “authenticated” first identifier verified using a second identifier.

II. SCS 10-18 ARE INDEFINITE

[10.d]: PO's own conflicting arguments demonstrate that the scope of element [10.d] is not reasonably certain. To manufacture written description support, PO argues the claim encompasses identifiers routed "through the UAV." Reply, 1-2. Yet, PO took the opposite position in its RMTA, asserting that an identifier received "from the UAV" is not from "a computing system that is remote relative to the discrimination system." RMTA, 20. These contradictory positions highlight the fatal architectural paradox at the heart of the claim. If, as PO says, an identifier passes through the UAV from another computing system, then the scope of the claim is unclear since PO broadly argued that an identifier received from the UAV is not within the scope of the claim. RMTA, 20. Because PO's own shifting positions prove that the claim scope is unclear, element [10.d] is indefinite.

[10.g]: The Oppo. demonstrated SC 10 is indefinite, because the intrinsic record does not provide any insight into the meaning of "*preemptively enabled*," making SC 10's scope ambiguous and unclear. Oppo., 4-6. The specification does not differentiate between the meaning of "*preemptively enabled*" and "enabled," which sows uncertainty into SC 10 and suggests the claim could have different meanings. *Id.*; *Interval Licensing v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014). Figure 5 shows the three "conditions" 500, 501, and 502 that the specification says can cause disruption system 105 to be "*preemptively enabled*." EX1001, 19:14-25, Fig. 5;

EX2002, 36:20-37:3, Fig. 5; EX1027, 16:6-10. But for condition 502 (“identifier is valid but is not permissioned”), Figure 5 shows that the disruption system is directly “enable[d]” at step 503 and does not show anything that could be “*preemptively enabled*.” EX1001, Fig. 5; EX1024, ¶¶55-56. This contradiction demonstrates uncertainty given “*preemptively enabled*” and “enabled” are different terms with different meanings, as PO’s expert agrees. EX1027, 14:9-19. PO never confronts this. Reply, 4-6. Instead, PO says that the term “preemptively” means “to ‘forestall’ or to ‘preclude’” and that this definition is “consistent” with aggressively taking a disruptive action to the exclusion of other less aggressive options. Reply, 4-5. But PO fails to address how condition 502, which the specification says causes disruption system 105 to be *preemptively enabled*, is not shown by Figure 5 or otherwise explained as “forestal[ling]” or “preclude[ing]” any “less aggressive option,” including “contacting the aerial system pilot.” *Id.*; EX1001, 19:14-25, Fig. 5; EX2002, 36:20-37:3, Fig. 5. Condition 502 is instead shown as being a condition for directly enabling the disruption system. *Id.* PO’s avoidance is further demonstrated by the analysis of Figure 5 it is does provide, in which PO only discusses meeting conditions 500 and 501; it never addresses what happens if condition 502 is met, and never identifies what steps are “short-circuited” if condition 502 is met. Reply, 5-6 (Figure 5’s flow can be “short-circuited” as “the check for the condition 502 can be omitted, if condition 501 is met” and “[i]f

condition 500” is “met,” the “checks for conditions 501 and 502 can be omitted”). Finally, PO additionally argues that “the plain and ordinary meaning of ‘preemptive’ and the disclosures of the specification, clearly delineates a non-preemptive enablement of a disruption system (e.g., based on a UAV being deemed not permitted, and after the exercise of one or more less aggressive option [sic]), and a preemptive enablement of the disruption system (e.g., without exercising the less aggressive options).” *Id.* (parentheticals in original). PO cannot get its story straight. Rather than causing “non-preemptive enablement,” a “UAV being deemed not permitted” is **explicitly disclosed by the specification as being a condition for preemptive enablement: it is condition 502** (“identifier is valid but is not permissioned 502”). *Id.*; EX2002, 36:21-24; EX1027, 15:20-16:10. Moreover, as discussed, condition 502 for preemptive enablement has not been shown to have any “less aggressive options” associated with it, and there are no Figure 5 steps that can be “short-circuited” when 502 is met. EX2002, 36:21-24, Fig. 5; Reply, 5-6.

SC 18: SC 18 is indefinite as *the control system* lacks antecedent basis. Oppo., 6. PO does not address this argument and it is unrebutted.

III. SCS 10-18 ARE OBVIOUS

The Jarrell Grounds (7B, 8B, 9B, and 10B): PO mischaracterizes Petitioners’ arguments, uses an improper construction in SC 10, and ignores the combinations. Reply, 6-8. **First**, PO asserts that Jarrell’s list itself is the claimed *second identifier*.

Reply, 6-7. This is wrong and not what Petitioners argued. The Oppo. demonstrated that in the combinations, Jarrell teaches a valid MAC address identifier relevant to the UAV, which is located on a list, forms the claimed *second identifier*. Oppo., 13-17. Such a valid MAC address does identify and is specific to a particular UAV—*i.e.*, the UAV the MAC address is relevant to. *Id.* PO’s argument is unresponsive and does not address Petitioners’ position. **Second**, PO argues for an improper construction of the term *second identifier functioning as a second factor identifier*. Reply, 7-8. PO asserts the *first identifier* and *second identifier functioning as a second factor identifier* must each be a different one of “something you know” (“SYK”), “something you have” (“SYH”) or “something you are” (“SYA”). Reply, 7. PO then alleges the Jarrell combinations describe a “first identifier [that] is a MAC address” that is SYH, but a matching MAC address on Jarrell’s list is “not a different factor,” *i.e.* SYK or SYA. *Id.*, 7-8. But PO’s construction is wrong and improperly relies exclusively on extrinsic evidence to vary claim meaning. *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1332 (Fed. Cir. 2003); *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369 (Fed. Cir. 2003). The Reply does not demonstrate that the intrinsic record supports PO’s construction and instead solely cites the expert’s declaration (EX2005), which itself cites several additional extrinsic sources. Reply, 7 (citing EX2005, ¶¶46-52, which cites EX2008-EX2014). And the declaration does not explain how these extrinsic sources relate to the intrinsic record

except to baldly assert “the ’199 patent uses the term ‘second factor’ in the same manner as discussed,” quote EX1001 at 2:57-67 (EX2002, 4:15-20), and then comment, without support, how a “second factor” would “prevent identifier reproduction.” EX2005, ¶¶46-52. Such attenuated analysis, not even in the Reply, cannot be used to vary claim meaning. Properly analyzing the intrinsic record, neither SC 10 nor the specification require the *first identifier* and *second identifier functioning as a second factor identifier* must each be a different one of SYK, SYH, or SYA. The specification does not describe this concept, and its only disclosure of a “second factor identifier” is as a “secondary authenticator for the aerial system to prevent tampering and/or identifier reproduction,” which says nothing about SYK, SYH, or SYA. EX2002, 4:17-20. PO’s argument is also incompatible with SC 10, because both the *first identifier* and the *second identifier functioning as a second factor identifier* are **identifiers**; PO does not resolve how two identifiers must be a different one of SYK, SYH, or SYA. *Id.* And the Jarrell combinations clearly teach to *verify an authenticity of the first identifier using the second identifier*, where the *second identifier [is] functioning as a second factor identifier*, because a match between the MAC address of the UAV (*first identifier*) and the valid MAC address identifier relevant to the UAV (the *second identifier*) located on a list “authenticate[s]” the MAC address of the UAV. *Oppo.*, 15-17; Reply, 8. PO fails to address Jarrell’s explicit “authentica[tion]” teachings, or that such addresses are

“different” (to the extent this is even required) because one is transmitted by the UAV and unauthenticated at that time, and the other is located on the list and known by the system as being valid. *Oppo.*, 15-17; EX1025, 10:53-59, 11:49-55, 12:12-17, 12:47-65, 13:23-14:15, 18:31-35, 25:13-47. Jarrell’s use of the valid MAC address identifier relevant to the UAV (*the second identifier functioning as a second factor identifier*) on a list also “prevent[s] tampering” just like the ’199 Patent. *Id.* If a UAV had a tampered MAC address, this tampered address would not be authenticated as it would not match the UAV’s proper, valid MAC address (*second identifier*) on Jarrell’s list. *Id.*

The Jarrell-Pasko Grounds (7C, 8C, 9C, and 10C): PO says “verifying that a UAV’s identifier is registered to fly does not verify whether the identifier a UAV provides is authenticated,” but this argues the references individually and does not address the combinations. Reply, 9-10. In combination, the UAV’s MAC address is determined as associated with a properly government-registered UAV and good standing account through authentication comparisons; this further verifies an authenticity of the UAV’s MAC address as the MAC address is associated with a UAV that is properly registered with a government authority. *Oppo.*, 9-17. PO further argues that the *second factor* must be SYK, SYH, or SYA, but, for the same reasons discussed above, this construction is wrong; and Pasko’s account information including “identification numbers of UAVs,” “public and/or private

keys of UAVs,” and “account status” of UAVs, as well as a government registration number, collectively form a *second identifier* as claimed. Oppo., 9-17; EX1026, ¶¶0037-0038. PO finally argues that the combinations are not based on disclosure “rooted in Pasko.” Reply, 10-11. But they are rooted in Pasko’s authentication teachings that involve comparisons using multiple pieces of information, and further verifies an authenticity of the UAV’s MAC address as discussed. Oppo., 9-17.

The Viggiano-Gong637 Grounds (11, 12, 13, and 14): PO alleges the “message AC” (*second identifier*) would be transmitted by an identifier transmission system that is a “component of the claimed ‘discrimination system.’” Reply, 11-12. But PO ignores that in the combinations, the communication system transmitting message AC is not part of the identifier transmission system and is a separate computing device of the UAV. Oppo., 19-24. The message AC (*second identifier*) is thus transmitted from a computing device that is *remote relative to the discrimination system. Id.* For the same reasons as above, PO’s argument that the *second factor* should be construed as SYK, SYH, and SYA is wrong; moreover, the *second factor* is properly formed from identification information and a unique secret key of the UAV and used to authenticate the UAV aircraft’s identity. *Id.*

Respectfully submitted,

BAKER BOTTS L.L.P.

A handwritten signature in black ink, appearing to read "Chad C. Walters". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Chad C. Walters (Reg. No. 48,022)

Lead Counsel for Petitioners

Date: July 13, 2026

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I certify that on this 13th day of July, 2026,
**PETITIONERS' SUR-REPLY TO PATENT OWNER'S REPLY TO
OPPOSITION TO NON-CONTINGENT REVISED MOTION TO AMEND**
and **EX1027** were served by email on the following counsel for Patent Owner:

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