Workshop of 2021-02-09

UAS Direct Remote Identification

Questions & Answers

1	Is the draft standard "prEN 4709-02" available somewhere? Google did not help me here.	Draft standards are not freely available, but this link gives you more information already about prEN 4709-02: https://standards.cen.eu/dyn/www/f?p=204:110:0::::FSP_PROJECT,FSP_ORG_ID:72429,6378&cs=1CE12293FC0503061603281BB9AF6E697
2	Does this indeed track user (drone pilot) location in addition to drone location?	Yes, it does. It will be detailed further.
3	Having the position of the pilot being "public" to anyone interested is no privacy anymore. Having that information available to law enforcement should be good enough.	Privacy is a fundamental right for all citizens; however, members of the public have the priority over the drone pilot as they are not responsible for the drone operation. Due the technology used, the DRI provides a balanced solution as the pilot position will only be accessible to those citizens potentially affected by the operation of the drone (need to have the drone in line of sight at a relatively limited distance). Enforcement authorities may not always be available to enforce privacy and studies have demonstrated that privacy issues can often be solved without an intervention of law enforcement authorities.
4	Will there be second workshop regarding NID?	This is not yet defined, but as soon as the NRI standard will be available, it would probably happen.
5	The problem with most Broadcast Drone IDs is that those are easily spoofable. IETF is developing a secure id protocol in DRIP working group https://datatracker.ietf.org/wg/drip/about/. Will those extensions be supported in EU standards?	Contrary to the NRI, DRI is not a safety critical item. Its main purpose is to support security and privacy. Simplicity and low cost is an important characteristic of the function to enable its application on most of the drones. The exact specification needed for DRIP support are not yet clear (as the DRIP work is still ongoing). Hence, support for DRIP is currently not included, just as it is not yet included in the ASTM Remote ID standard.

6	What does DRI stand for?	Some commonly used abbreviations in the presentation are: UA = Unmanned Aircraft UAS = Unmanned Aircraft System DRI = Direct Remote ID (Broadcast Remote ID) NRI = Network Remote ID (over an internet connection) GDPR = General Data Protection Regulation OPRN = Operator Registration Number
7	Remote ID. What is the regulation's requirement for "Broadcast" vs possible network solutions?	The main difference between the DRI requirement defined in Regulation 2019/945 and a network solution is that DRI “ensures the direct periodic broadcast from the UA in a way that it can be received directly by existing mobile devices within the broadcasting range” while the NRI ensures “the transmission from the UA in a way that it can be received through a network”.
8	@ Mr. Lentz - what was the exact reasoning to keep DRI and NRI separate? It would seem there are practical benefits to using ONE ID?	The reason is that we need different solutions to answer different needs. Security and privacy request the possibility to receive the identification data directly from the drone without the need to rely on an intermediary like a U-Space service provider. This requires that the drone broadcasts directly the information to a receiver. On the contrary the purpose of the NRI is to connect in a secure way the drone to the U-Space.
9	Does the DRI broadcast the pilot data, how the pilot private information (name, address etc) are protected by data security?	Only the operator registration number and the pilot location (or the take-of position of the drone) are broadcasted. Operator’s registration data are kept by the authority in a database not accessible to the public.
10	For Jean-Pierre Lentz: Is there any concern from the EC about private DRI receive networks, like flightradar24, being used to track all drone flight data and collect sensitive business or personal data about where and when UAS operate?	It is expected that the limited range of the broadcast will strongly limit the possibility to aggregate data. In case this however happens, the situation will have to be assessed (and appropriate action taken, if deemed necessary - for instance faces and car number plates are blurred on street view).

11	DRI with a range of 2KM can allow for Operator ID and location harvesting. Privacy is possible for this data, but not provided in the standard.	Drones operation present a privacy risk for citizens that need to be addressed. It is on purpose that the data transmitted by the DRI are broadly accessible to the public. As explained above, the DRI is considered to be a way to protect citizen's privacy in a balanced way, minimizing the impact on the drone operator.
12	How long before FlightAware publishes worldwide the identities of UAVs and pilots in each single location in the world? By not defining any actual security, you have made this more open and widely available than NRI, amplifying the impact ...	Due to short range of the technology used for the DRI, data integration over a large area will be difficult and costly. In addition, only an operator registration number can be associated to a drone/pilot position. No other data
13	Is it considered that all public could capture the DRI unique number, but only security forces could link this number with specific personal data through databases?	Yes that's correct.
14	Our company is operating in Specific category. Article 40 - Requirements for UAS operated in the 'certified' and 'specific' categories except when conducted under a declaration, point 5 requires us to be equipped with Remote Identification. In slides you mentioned that specific category requires NRI. Where to find additional info for NRI and are you going to make workshop for NRI?	Drones operating under U-Space will be required to connect to a U-Space service provider using the NRI function. As the U-Space regulation is still under preparation the NRI function is not fully defined yet. Article 40(5) of regulation (EU) 2020/1058 introduces the requirement for the drone operating under the specific category to be equipped with at least one remote identification system. This might however be subject to revision.
15	The proposed secret content of the Operator ID does NOT protect from spoofing information by bad parties. Is there concern about theft of Operator ID by parties that have 'evil' intent?	The purpose is not to protect against spoofing, but only to protect from the steel of the OPRN (as this number is openly broadcasted) Without the three secret characters, it is not possible to load the OPRN in the DRI (so you cannot load your neighbour's OPRN instead of yours).
16	Will there be a uniformity/norm of operator registration numbers (length)? Currently appears to be of varying lengths dependent on country.	The unique UAS operator registration number issued by the Member States should consist of 16 alphanumeric characters, (see the presentation)
17	Is this 2019/945 & 2019/975 applicable in Switzerland? The last information known was	You are right. The addition of regulations 2019/945 and 2019/947 to the Annex of the

	that FOCA (Swiss NAA) has not yet made their arrangement for the EU acceptance?, do you have any update?	EU-CH air transport agreement will not take place before June.
18	Question for Antonio: What is the purpose of the secret characters? Can't someone just guess them until the checksum matches and observed DRI if trying to spoof someone else?	The upload system in the drone will fail if the secret characters do not match.
19	Where can we get prEN 4709-002 and how do we submit comments?	Draft standards are not freely available, for commenting, please contact your national standardization organization. You can find these here: https://standards.cen.eu/dyn/www/f?p=CENWEB:5" . This link gives you more information on prEN 4709-002 already: https://standards.cen.eu/dyn/www/f?p=204:110:0::::FSP_PROJECT,FSP_ORG_ID:72429,6378&cs=1CE12293FC0503061603281BB9AF6E697
20	Will this standard be using worldwide? Or is prepared just for EASA states?	The standards being developed are European Harmonized standards.
21	Will notified bodies use also 4709 to control the conformity?	Yes, the notified bodies will use the EN4709 series.
22	Where is the evaluation that the secret protects against undetected spoofing? And please define "undetected spoofing".	As you will see, to setup the operator ID, you need the three secret characters. So without those characters you cannot use the OPRN captured when listening to others. And a forged OPRN can be detected by authorities.
23	The (EU) 2020/1058 doesn't differentiate between NRI or DRI for specific category. Which legislation regulates or will regulate the need to use either one in the case of specific category?	Starting December 2021 operations in the specific will have to be equipped either with DRI or with NRI
24	For Jean-Pierre: Article 5 of Delegated Regulation (EU) 2019/945 Article 40 (Requirements for UAS operated in the 'certified' and 'specific' categories except when conducted under a declaration) requires each UA intended to be operated in the 'specific' category and at a height below 120 meters to be equipped with a remote identification system. Could you clarify where	As explained above Article 40(5) may be subject to further revision in line with the progress of the definition of the NRI in the framework of the elaboration of the U-Space Regulation

	do the exemption/option of using NRI come from? (Regulation (EU) 2019/945 Article 40 (b) requires that ""it can be received by existing mobile devices"")	
25	(EU) 2020/1058 mentions the option of using networked remote id. In one of the answers to the questions above it is mentioned that you have the choice of using networked or direct remote id. In my opinion this is not correct, since direct remote id is mandatory, networked remote id is optional. Am I correct in assuming they can be used together, but not networked without direct remote id?	No, it is not mandatory in the specific (remote identification is mandatory)
26	What about the role of the airspace observer? Is the AO considered as another pilot or general public?	If airspace observer refers to a third party looking at the UA flying in the airspace, they should be considered as general public. Alternatively, if they belong to Aviation Authorities, they may have access to registration database. This will depend on Member States decision.
27	In a dedicated area where let say there would be 10 UAVs located, how will it be possible to identify each drone with DRI (with the with the lack of accuracy) for each UAV?	Each UA broadcasts both their own unique ID and their location.
28	What are the most common technologies or radio interfaces used in the UAS? In the presentation appear Bluetooth and WIFI, is there other technology in use at this moment?	As the requirement from regulation EU 2019/945 has been established that DRI needs to be able to be received by commonly available smartphones there is only Wi-Fi or Bluetooth left as options
29	How can you certify that the operator use real personal data for registration	The operator ID uses 3 'secret chars' that are used to calculate the checksum. Upon entry of the OperatorID, the checksum needs to correct, else the drone/add-on will not save the operator ID.
30	Shall all drone support both WIFI (2.4 & 5.4) and Bluetooth? Why not only one type of broadcast instead of 3?	You can use one of the types. Not all.

31	WIFI/Bluetooth (2.4GHz) are compulsory? are there any current plans in order to designate a no ISM band for this purpose?	The requirement is to allow anyone to easily receive the DRI on his standard personal device. So no intention to go to dedicated frequency bands and receiver devices.
32	Today in France we already have the digital signalling imposed by civil aviation. This system will have to be in addition?"	We're currently working / exchanging with the French authorities in order to have a common approach between the EU DRI and the FR DRI when the standard will be published and reach the stage of Harmonized European Norm. Before this stage, the EU DRI has to be considered different (in addition with FR requirement).
33	Accessing the raw WIFI frames in Android requires ROOT access. Any thoughts on this?	Remote ID data contained in WIFI beacon frames can be accessed on Android without root access, the Dedrone DroneScanner app demonstrates that.
34	Changing the WIFI Beacon scanning rate WILL have detrimental impact on phones for other use. Has this been carefully analysed and has there been interaction with IEEE 802.11 on this use case?	The impact of changing the scanning rate to improve the Wi-Fi beacon rate is that the phone battery will be flat sooner. During experimental test, it was not an issue observed.
35	Just to clarify, the "Android receive" is by far the more interesting technology?	Unfortunately, Apple has not yet provided support for receiving Bluetooth Long Range PHY S=8 + Extended Advertising nor for receiving WIFI NAN. We can only hope that they will add this support in future SW releases since their HW do support it.
36	Is there a minimum transmit power that is required for certification? Otherwise long-range detection cannot be assured?	There is a requirement to broadcast with a power close to the legal maximum. The achieved range strongly depends on the environment
37	The issue I see is that the technology chosen is operating in the same frequency band (2.4GHz) that the widely used remote control on drones. This will mean the DRI system will most probably disturb remote control signal reception on the drone. Has this been taken into account when making the decision for BT and WIFI?	The way the standard is written allows UAS manufacturers to choose which of the 4 solutions shall be used to allow a safe operation and a stable C2 Link. That's the reason why DJI and Parrot decided to use Wi-Fi and Intel on the other hand BT.

38	Does it not make sense to have one form of Electronic conspicuity that enables both air traffic deconfliction and could also address the privacy issues concerning who is operating a drone overhead? ADS-B transmitted on the UAT 97.8 MHz can be received by many mobile apps and hence available to both the general public and more importantly other aircraft using ADS-B traffic systems. It's a one stop system and easy to mandate and implement.	Air risk is addressed in other way in the open category.
39	Putting the addon module on top of the drone will greatly impact the downward range of the signal. We have already seen some test results on the complexity of antenna requirements that will be very challenging for addons.	You are right. EU regulation in general required documentation with the products. I expect add-on manufacturers to provide recommendations on installation of their products.
40	And has been already communicated with rest of the world and manufactures? Will this standard work in rest of the world after all?	The ASD-STAN DRI specification is compliant with the ASTM Remote ID specification (and vice-versa). ASD STAN prEN4709-002 is harmonized to the ASTM F38 remote ID work (At least on the DRI part) and as well there are ongoing discussions in ISO TC20/SC16 to harmonize this piece of technology globally
41	For the "demonstration of compliance" who will be able to validate the results?	You'll probably have to work with a Notified body. Alternatively, the manufacturer may declare the conformity under its sole responsibility, following an internal production control process.
42	'@Lionel: Thank you for the interesting presentation. Are there any requirements regarding the accuracy of the positioning solution to be broadcast by the DRI? You mentioned GNSS receiver and barometer on your slides, are they part of an expected minimum set of sensors to be used to compute the position?	All the mandatory sensor data that is required for the DRI broadcast can be acquired from a GNSS receiver is the mandatory receiver. Pressure-based altitude data is possible to broadcast as well but is not mandatory.
43	It is not clear how the remote Id system could be de-activated when the system is operating in UGV mode in order to enter into certain areas without leading to possible false emergency alerts of the authorities in the case of UAS-UGV hybrid unmanned system	This is an interesting use case, not covered by the current standard which addresses only UAV. My personal answer to this would be to equip the hybrid with add-on featuring manual activation or develop an ad-hoc function that

		would power on only when leaving the UGV mode.
44	Isn't it an error to distinguish between U-space, Open, Specific - everything that flies uses the same airspace an may collide.	Open and specific have different ways to mitigate/address air risk. VLOS is a strong mitigation for air risk in the open. usually N/A for the specific. U-space services will be tactical mitigation means for the specific.
45	Regarding drone position accuracy, also, don't forget the drone can lie.	True. The regulation and standard take this into account by specifying that: the serial number is programmed in factory and not modifiable afterwards and the operator ID number is verified with the secure characters to avoid any invalid OPRN. There is no requirement on position integrity.
46	Where can any further requirements for the NRI be found? Will it be covered in this webinar?	Sorry, we'll not cover NRI topic in this webinar but please refer to EASA publication for this (e.g. ref. Specific cat. class 6)
47	For the "demonstration of compliance" working with "notified bodies" in order to validate the results is not conceivable for a small company making small series, it is economically impossible to pass on the cost of such bodies. This type of regulation both eliminates SMEs that meet customised needs, unfortunately it also kills creativity.	Three conformity assessment methods are offered in (EU) 2019/845 : - Internal production control (manufacturer declaration ion their sole responsibility) - EU type examination (product assessment by a notified body) - full quality assurance (quality system approved by a notified body)
48	In terms of DRI data harvesting, please see: datatracker.ietf.org/doc/draft.moskowitz-drip-crowd-sourced-rid. This would allow for the sort of harvesting that FlightAware does. It could be used to protect the space around an airport, or sports arena. It could be used to track activities of competing delivery services. Good and bad..."	Thanks for sharing this. For sure, data harvesting and database construction by crowdsourcing is always possible. Then we can question the amount and validity of information gathered in such databases. In any case, personal information such as name or address can only be provided by the drone owner, since this information is not broadcasted.
49	What about to put an external device into the drone. Should We have trouble with the insurance in case of any incident, due to is not and standard part of the drone?	The operator is responsible for the drone operation and shall comply with the recommendations of the manufacturers.

50	How do you technically achieve that the system software will be secure and hacking work resistant?	This is left at manufacturer discretion to achieve this and to make the demonstration, based on their design files. Secure memory is recommended.
51	Is there a technical reason why in the app the altitude pressure and alt geod is shown as "unknown"?	Let's say this was some preliminary testing. Some manufacturers haven't implemented all the fields yet. For example, in our case (Dronetag), you can see the height missing because we did some last-minute changes and sent a wrong update to Thomas
52	Yes, but how would someone looking at a number of UAV´s close-by know, which one (in physical airspace) is one? The DRI technology used is not that accurate	You would be able to identify a specific drone within the limits of the accuracy of the GNSS location that it is broadcasting. A typical receiver app will show both the location of the receiver and the drone(s) e.g. as dots on a map and since it updates live there should be a reasonable chance to pair what is visually observed with what is shown on the map.
53	Can I get the dedrone scanner app to try it out?	I don't believe the dedrone scanner app is available publicly, but the full source codes for an Android receiver app can be found on Github: https://github.com/opendroneid/receiver-android. Unfortunately, it has not been possible to publish there a ready compiled apk file for installation so you would need to use Android Studio to compile and install the application on your phone.
54	It’s possible to give for example a phone number as an operator... to make the flight easily communication capable ?	No, but you could put a note inside one of the messages and it will be broadcasted to other. There is a special field for this in OpenDroneID lib There is an optional free-form text field in the broadcasted data that can be used to broadcast a short message. If the operator chooses to broadcast a phone number there, that is possible.
55	Could we have a "Stop flight" option ever for other UAVs? Or could we, as an example, contact the owner of the other UAV via the app?	This is not planned for now.

56	The impact of the WIFI Beacon change comes up when the phone is then in a urban environment. It is why this option was developed.	You refer to impact on battery life? I didn't notice any impact in our office and around where there are many WIFI networks present.
57	Please, about my question to put some device that is not an original part of the drone. I have an Inpire 2. Is it visible ? Can Ronald answer the question about it?	As I tried to explain in the panel, once the standard is finalized and the processes to demonstrate compliance is clear we will publish a list of DJI products which will receive DRI through Firmware Upgrade and which will need to rely on Add on solutions by trusted Add on manufacturers
58	Performance question: as seen in the video, the drone was connected and flew away up to 4km. Is there any experience when the devices detect an approaching UAS that has not been connected before and needs to start handshake process first? How long will a handshake need in general? Is it possible to pass and fly out of range before the devices can connect? What is the maximum speed the DRI connects to a device?	There is no hand-shake process. The broadcasts are one directional from the UA to the receiver. Similar to the ADS-B squirts. Whenever a receiver picks up all the data from a "squirt", it is able to decode and display that data.
59	Will there be performance requirements for manufacturers? if we put a DRI device in our privately built drone and the device does not reach more than a short distance, 100m as an example, or is unstable, will we be unable to comply with norm?	There are requirements to broadcast with a power close to the legal maximum and have a transmitter antenna that is able to transmit omnidirectionally. Having strict requirements on the broadcasting distance is very difficult since there are many different things influencing that (the environment, the receiver and other things outside the control of the person implementing the transmitter).
60	Is DJI developing its own app to detect the DRI ?	The DJI receiver app has only being developed for the testing that the DRI functionality on the Drone works properly.
61	Is there a common ontology defined for storing and exchanging drone data? Format for id, owner, speed etc. Something like XML template for semantic web. For interoperability	Not to that extent, but we have a common data dictionary between EU / ASD-STAN and ASTM

62	Are there any publicly available DRI scanner apps available today, e.g. in Android Google Play Store or Apple iOS AppStore?	As far as I am aware, currently there isn't any publicly available receiver application in the app stores, but the full source codes for an Android receiver app can be found on Github: https://github.com/opendroneid/receiver-android. Unfortunately, it has not been possible to publish there a ready compiled apk file for installation so you would need to use Android Studio to compile and install the application on your phone.
63	Do scanners have to constantly scan different WIFI channels and does it have an effect on update rate?	The WIFI scanner in Android anyway scans all Wifi channels, we didn't restrict that in opur app and achieved more than sufficient performance.
64	Why do we talk only about wi-fi and Bluetooth way of data transmission? Aren´t there other ways of broadcast? For example, radio communication or others used in civil aviation?	It was a requirement that the broadcasted signals can be received by commonly available hand-held devices. That strongly drove the decision to use BT and WIFI.
65	@85 : Because this is the only technologies on typical smartphones?	You are right. It was a requirement from the EU Regulation that the DRI can be received with a commonly available device (e.g. smartphone)
66	Dear attendees, for more in depth and practical information on ASD-STAN's work on DRI and prEN 4709-002. Please read the white paper drafted by the experts and contributors of ASD-STAN D05/WG08: https://asd-stan.org/wp-content/uploads/ASD-STAN_DRI_Introduction_to_the_European_digital_RID_UAS_Standard.pdf	Thank you, Paul-Alexander!
67	Has anyone analysed if Wifi DRI can be used for edge collision avoidance? Interesting secondary use for the technology, but depends on latency and update rate.	DRI is not intended for detect and avoid but for identification only.
68	Dear, I have to left this workshop now because I have an important meeting, but I would like to receive the presentation and the record of it, could be it possible? raul.conde@altertechnology.com	Dear Raul, you and all other attendees will receive the presentation and the recording of the workshop in the inbox later on. Have a good meeting :)

69	in what stage of development is this tool?	which tool do you mean? the Dedrone DroneScanner is a prototype still
70	It is not a workshop; it is a set of commercial presentations.	Hello Stephane, what exactly was too commercial for you? I think we did our best to balance between the standard and its implementation from manufacturers (commercialization).
71	It appears there are not mobile devices capable of receiving all 3 of these of these DRI methods (Bluetooth, Wifi NAN, Wifi Beacon). Is that a concern for the use of DRI by the public and law enforcement? Is there any effort in Europe to standardize on a technology that can be used by a single receiver?	Please have a look at the DeDrone Presentation which successfully demonstrated DRI receiver capabilities on one single mobile phone. For law enforcement purposes a dedicated receiver development can be used to receive all signals on one device as well Some devices capable of receiving all three transmission methods have been identified. However, it has been difficult to test this on a broader scale since you need physical access to the device and must be able to install various applications on it in order to check with a compliant transmitter whether it picks up the signals or not. If you have a device that is not yet fully covered on this list, additional details are greatly welcomed: https://github.com/opendroneid/receiver-android/blob/master/supported-smartphones.md. It is expected that over time, more and more devices will be able to pick up all transmission methods and as people step-by-step replace their phones with newer models this situation will improve.
72	How standard is the E-ID standard? Can e.g. Parrot FreeFlight receive and display the Electronic ID data from other manufacturers like BLIP of DJI transmissions?	I am not familiar with the Parrot FreeFlight. However, the standard is interoperable which means that if you implement it on the drone side, any receiver app could be able to catch the messages and they won't distinguish between manufacturers Parrot FreeFlight app is used to control Parrot Drones only. With it, you will be able to set-up the DRI option of Parrot Anafi drones, not to detect and display DRI information. In another hand, several applications as DeDrone for example are able to receive and display DRI

		signal from different manufacturers and different broadcast technologies.
73	Is the Dedrone DroneScanner app available somewhere?	No yet, it is still a prototype.
74	It is possible to provide privacy of Operator broadcast information and still give authorized observers the needed information. Work in the IETF has shown one such approach.	Yes, it is an interesting debate. The issue is not just technical but organisational. The regulation restricts broadcast information to ID and location. No private information is transmitted. Authorities may have access to detailed and private information from the National registration databases.
75	And if you want info about the IETF work, everything is freely available online https://datatracker.ietf.org/wg/drip/	Thank you