

## **Article I**

Huttunen, Mikko (2017) *Unmanned, Remotely Piloted, or Something Else? Analysing the Terminological Dogfight.*

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# Unmanned, Remotely Piloted, or Something Else? Analysing the Terminological Dogfight

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*Throughout their existence, several attempts have been made at naming and categorizing aircraft which are flown without a pilot on board. Regulatory documents by the International Civil Aviation Organization (ICAO), European Aviation Safety Agency (EASA), and Federal Aviation Administration (FAA) have called them unmanned and remotely piloted aircraft (systems), drones, and other less popular names. This has resulted in a risk of gaps and incoherence being introduced into the system of international aviation law. The growing field of unmanned aviation has proved difficult to encapsulate in a single term which would serve as a regulatory basis.*

*This article seeks to analyse the terminological dogfight between the most established terms used to regulate the aircraft in question. It presents the legal basis, meaning, implications, and relevance of each term and their mutual relationship.*

*The article recommends doing away with the concept of model aircraft, as it has become difficult to distinguish recreational from non-recreational use of the aircraft in question. A critical angle is taken at the concept of pilotless aircraft, employed in the Chicago Convention. The article acknowledges that both unmanned and remotely piloted aircraft are viable regulatory concepts, but preference is given to the former due to its simplicity and wide scope. The concept of a system is seen as necessary due to the distributed nature of the aircraft.*

## 1 INTRODUCTION

When it comes to manned aircraft, the official legal terminology is quite established. This has been the case for decades now, if not for a century. Manned aircraft are simply aircraft: machines ‘that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface’, including the many subcategories thereof, pursuant to the generally accepted categorization by the International Civil Aviation Organization (ICAO).<sup>1</sup>

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<sup>1</sup> E.g. *Annex 7 to the Convention on International Civil Aviation: Aircraft Nationality and Registration Marks* 1–2 (6th ed., ICAO 2012).

However, the same has not been the case for heavier-than-air<sup>2</sup> aircraft flying without a pilot on board (unmanned aircraft, UA).<sup>3</sup> Over the brief history of aviation, we have seen numerous attempts to name and categorize such aircraft: model aircraft, pilotless aircraft, autonomous aircraft (AA), unmanned vehicle (UV), unmanned aerial vehicle (UAV), remotely piloted aircraft (RPA), remotely operated aircraft (ROA), remotely piloted vehicle (RPV), remotely operated vehicle (ROV), remotely controlled vehicle (RCV), pilotless aerial vehicle (PAV), and drone. Lately, they have also been called unmanned aircraft or remotely piloted aircraft *systems* (UAS, RPAS).<sup>4</sup> But none of these terms has seemingly prevailed. Instead, official documents and literature<sup>5</sup> as well as everyday communication<sup>6</sup> have shown disoriented support for many of them.

The issue, which to date has not been tackled in a detailed manner, is seemingly unimportant. After all, the aircraft in question have thus far played quite a minor role in comparison with their manned counterparts. Additionally, whether they should be called unmanned or remotely piloted, or aerial vehicles or aircraft, appears of little relevance to their actual operation and the regulation thereof.

But, from a legal point of view, such a position is prone to danger. This is because each term carries with it a certain meaning, according to legal documents, dictionaries, and everyday use, which differs from those of other terms. The use of improper terms or definitions can easily introduce legal gaps into regulations, while adopting too many concepts can lead to excessive complexity and incoherence. Both strategies are sure to leave the door open for disputes along the road. Conversely, following an appropriate and unanimous terminology would eliminate such risks and facilitate communication amongst international, regional, and national authorities as well as private parties. Even rhetoric

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<sup>2</sup> Lighter-than-air unmanned aircraft (unmanned free balloons, etc.) are excluded from this article.

<sup>3</sup> This article uses 'unmanned aircraft' as an interim concept, instead of trying to circumvent the terminological issue at hand. As a side note, it is common in aviation law to distinguish civil aircraft from state aircraft: '[a]ircraft used in military, customs and police services'. This distinction stems from the Convention on International Civil Aviation (Chicago Convention), Art. 3, para. b (7 Dec. 1944), 15 U.N.T.S. 295. See also LC/29-WP/2/1: Secretariat Study on 'Civil/State Aircraft' (ICAO 1994). However, here this distinction is not emphasized. Rather, it is assumed that similar legal implications of terminology concern both types of unmanned aircraft, although the regulation thereof differs to a varying extent.

<sup>4</sup> See Kristian Bernauw, *Drones: The Emerging Era of Unmanned Civil Aviation*, 66 *Zbornik PFZ* 223, 225–226 (2016). To be precise, the letters in the abbreviations may also stand for numerous other words; for instance, 'UAV' may be read as 'unmanned air vehicle'.

<sup>5</sup> See the following chapters for details.

<sup>6</sup> Consider e.g. the Google search term and Twitter hashtag popularity of the various terms. See Google Trends, <https://www.google.com/trends> (accessed 10 Jan. 2017); Keyhole, <http://keyhole.co/> (accessed 10 Jan. 2017).

arguments – the ability of each term to convey information – have certain merit in the discussion.<sup>7</sup>

The issue is buttressed by the escalating developments within the field of UA themselves. Their use has increased significantly over the past few years and will continue to increase: a fact testified to by many market surveys.<sup>8</sup> Besides everyday use by consumers, sophisticated equipment has given rise to a vast amount of novel professional applications.<sup>9</sup> So far, we have caught but a minor glimpse of the future of such aircraft, both in terms of quantity and quality. To not address the most preliminary issues, such as the terminology as the basis of regulation, is to ignore the ways in which the rise of UA is challenging the status quo of aviation and technology.

The object and purpose of this article are quite simple. It aims to explore the most established terms and the current definitions thereof used to regulate UA, providing arguments to the ongoing debate. This terminological exploration consists of two things: presenting the legal basis, meaning, implications, and relevance of each term as well as their mutual relationship. How does an ‘unmanned’ aircraft differ from a ‘remotely piloted’ one? Is it accurate to speak simply of ‘drones’? What can be gained by speaking of ‘systems’? Does a single term suffice, or is there a need for several?

## 2 CHILD’S PLAY?

One of the earliest terms used for the aircraft in question is ‘model aircraft’. While there is no universal definition, ICAO has pointed out that it is ‘generally recognized’ that the phrase refers to aircraft ‘intended for recreational purposes only’.<sup>10</sup> This is also the way regional and national authorities, especially the European Aviation Safety Agency (EASA) and the United States Federal Aviation Administration (FAA), have defined the concept.<sup>11</sup> In simple terms, it stands only for hobby aircraft.

The concept of ‘model aircraft’ encompasses both stationary and flying models, regardless of their structure, or means of propulsion or control, including most

<sup>7</sup> See Robin Shoaps & Sarah Stanley, ‘Don’t Say Drone’: *Hits and Misses in a Rhetorical Project of Naming* (2015). Also published in *Rhetorics of Names and Naming* (Star Medzerian Vanguri ed., Routledge 2016).

<sup>8</sup> See e.g. Commercial Drone Market Analysis by Product (Fixed Wing, Rotary Blade, Nano, Hybrid), by Application (Agriculture, Energy, Government, Media & Entertainment) and Segment Forecasts to 2022 (Grand View Research 2016).

<sup>9</sup> See e.g. *40 Uses for Drones: Practical Applications for Unmanned Aerial Vehicles* (Euroskycam 2014).

<sup>10</sup> Cir 328 – AN/190: Unmanned Aircraft Systems (UAS), para. 2.4 (ICAO 2011). See also Doc 10019 – AN/507: Manual on Remotely Piloted Aircraft Systems (RPAS), para. 1.5.2, subpara. d (ICAO 2015).

<sup>11</sup> See e.g. Australian Civil Aviation Safety Regulations 1998 (CASR), Dictionary; 14 C.F.R. § 1.1 (2017); Notice of Proposed Amendment (NPA) 2014-09: Transposition of Amendment 43 to Annex 2 to the Chicago Convention on Remotely Piloted Aircraft Systems (RPAS) into Common Rules of the Air, para. 2.4.5.4.1 (EASA 2014).

notably ‘radio controlled aircraft’ (RC aircraft) of various types. Model aircraft are commonly built or assembled and maintained by the hobbyists themselves and used either simply for fun or competitive sports.<sup>12</sup> This activity, sometimes known as aeromodelling, revolves around model flying clubs and associations, of which there are quite a number around the world.<sup>13</sup>

A related term is ‘toy aircraft’, though this concept has not been used in as many legal documents as the previous one. It is rather a namesake adopted by EASA to describe ‘products designed or intended, whether or not exclusively, for use in play by children under 14 years of age’<sup>14</sup> and ‘capable of flight’.<sup>15</sup> The concept excludes vehicles that are ‘equipped with combustion engines’.<sup>16</sup>

It is obvious that such concepts do not include all UA and thus cannot be used universally. They only concern UA used for recreational purposes, leaving out those used for aerial work and commercial air transport operations.<sup>17</sup> Furthermore, the reference to ‘model’ is quite outdated and misleading when it comes to the whole field of UA, and to call them ‘toys’ is outright mistaken. The aircraft we see in use today appear increasingly less like models or toys; rather, they are a species *sui generis*.<sup>18</sup> They are usually intended neither as prototypes nor mimicry, but have distinctive features.<sup>19</sup>

One may even argue that we should give up the concepts of ‘model’ and ‘toy’ aircraft altogether, as far as flying models are concerned. This is not simply because the concepts are limited and outdated, although such are viable arguments. Rather, the core issue lies within the legal implications of using distinct terms for models and toys.

Until recent years, the idea has been that we should not burden law-abiding model enthusiasts (or children) with rules that otherwise apply to other UA<sup>20</sup> – a sensible goal in itself. To this end, ICAO, while handing out recommendations

<sup>12</sup> See generally e.g. David Boddington, *Radio-Controlled Model Aircraft* (Crowood Press 2004). Of the early history of model aircraft, see Claude Evelyn Bowden, *The History and Technical Development of Model Aircraft* (Harborough 1946).

<sup>13</sup> See e.g. the British Model Flying Association, <https://bmfa.org/> (accessed 10 Jan. 2017).

<sup>14</sup> Directive 2009/48/EC of the European Parliament and of the Council of 18 June 2009 on the safety of toys, Art. 2, para. 1.

<sup>15</sup> Notice of Proposed Amendment 2014-09, *supra* n. 11, para. 2.4.5.4.2 et seq.

<sup>16</sup> Directive 2009/48/EC, *supra* n. 14, Art. 2, para. 2, subpara. c.

<sup>17</sup> Commercial air transport and aerial work have been defined in, e.g. Annex 6 to the Convention on International Civil Aviation: Operation of Aircraft – Part I: International Commercial Air Transport – Aeroplanes, Ch. 1 (9th ed., ICAO 2010).

<sup>18</sup> See Milan A. Plücken, *The Regulatory Approach of ICAO, the United States and Canada to Civil Unmanned Aircraft Systems, in Particular to Certification and Licensing* 20, Master’s Thesis (McGill University 2011) [unpublished].

<sup>19</sup> See e.g. Jay Gundlach, *Designing Unmanned Aircraft Systems: A Comprehensive Approach* 25–56 (American Institute of Aeronautics and Astronautics 2012).

<sup>20</sup> Cf. Plücken, *supra* n. 18, at 20.

concerning UA in general, has seen ‘model aircraft’ as falling outside the 1944 Chicago Convention. It has viewed them as ‘being exclusively the subject of relevant national regulations, if any’.<sup>21</sup> ‘[G]lobally harmonized standards’ have not been ‘considered necessary’ for such aircraft.<sup>22</sup> Regional and national authorities have shared this aspiration.<sup>23</sup>

But lately, the same regulatory bodies have come to realize the issues with such an approach. ICAO has depicted the categories of RPA and model aircraft as overlapping, suggesting that the former can be used for recreational purposes and the latter for non-recreational purposes.<sup>24</sup> EASA has noted that upholding the distinct notion of ‘model aircraft’ allows operators to circumvent rules by labelling their aircraft as models, and that it makes no sense in terms of risk management either since ‘a significant number of incidents are caused by UA operated non-commercially’. Thus, the Agency has set out to abolish the distinctions, adopted in the product legislation of the European Union (EU) and its Member States.<sup>25</sup>

In the present author’s view, such realizations are necessary, even at the cost of exacerbating the struggle between established model enthusiasts and aviation authorities.<sup>26</sup> It is becoming extremely difficult to assign aircraft into categories defined loosely as ‘model’ or ‘toy’. How can one draw and, moreover, enforce the line between UA used for recreational and non-recreational purposes? How can one distinguish a UA intended for play from one that is not?

These distinctions, which can more easily be maintained in manned aviation due to the size and supervision of the aircraft, are fickle when it comes to unmanned aviation. UA are small and cannot be monitored in a similar manner, and their purpose and nature can easily be altered. One person can operate such an aircraft for fun and another professionally, and the nature of the operation can change from one day to the next.<sup>27</sup> In many applications, like aerial photography, the line between recreational and professional is not clear in the first place. For these reasons, applying similar rules across the board appears the only option.

However, this does not mean that the aforementioned goal of protecting established activities cannot be maintained. EASA, for one, has set out to grant special privileges to the associations and clubs where aeromodelling takes place.

<sup>21</sup> Cir 328, *supra* n. 10, para. 2.4.

<sup>22</sup> Doc 10019, *supra* n. 10, para. 1.5.2, subpara. d. *See also* paras 2.3.6 and 8.1.4 and fig. 1-1.

<sup>23</sup> As early as 2004, European authorities asserted that ‘[l]ight UAVs do not contain model aircraft. Model aircraft are defined and regulated nationally’. *See* UAV Task-Force Final Report: A Concept for European Regulations for Civil Unmanned Aerial Vehicles (UAVs), 9 (Joint Aviation Authorities (JAA) of Europe and Eurocontrol 2004).

<sup>24</sup> Doc 10019, *supra* n. 10, fig. 1-1.

<sup>25</sup> ‘Prototype’ Commission Regulation on Unmanned Aircraft Operations, Explanatory Note, 8 (EASA 2016).

<sup>26</sup> *See* Shoaps & Stanley, *supra* n. 7, at 11–15.

<sup>27</sup> *Cf.* Plücker, *supra* n. 18, at 20–21.

Additionally, the Agency has decided to include UA with a very light take-off mass (the ones currently known as ‘toys’) in the lowest of new, purpose-neutral subcategories.<sup>28</sup> This approach may manage to abolish the artificial divide between recreational and non-recreational, while at the same time ensuring the interests of fringe groups and the toy industry. Of course, the granting of special privileges may cause operators to establish clubs in order to circumvent regulations.

### 3 FLYING WITHOUT A PILOT?

Another old, albeit less popular term used for the aircraft in question is ‘pilotless aircraft’. The roots of this term go back to Article 15 of the 1919 Paris Convention<sup>29</sup> – as amended by the 1929 Protocol<sup>30</sup> – which speaks of ‘aircraft ... capable of being flown without a pilot’. This phrase was adopted nearly verbatim in Article 8 of the 1944 Chicago Convention, in whose title the exact term ‘pilotless’ was first mentioned. Since its adoption, the term has seen little use beyond the context of the latter Convention.

To assess whether ‘pilotless aircraft’, defined as an ‘aircraft capable of being flown without a pilot’, is an appropriate term to employ for the aircraft in question requires looking into the meaning of the phrases. Such an exploration is a matter of treaty interpretation, the rules of which are commonly accepted as being set forth in the Vienna Convention on the Law of Treaties.<sup>31</sup> What type of aircraft do the phrases include exactly? While the phrase ‘aircraft capable of being flown’ seems self-explanatory enough, the phrase ‘without a pilot’ appears less so. It allows for at least three interpretations, depending on how ‘pilot’ is defined.

First, one may suggest that ‘pilot’ only refers to personnel who operate the aircraft on board the aircraft (pilots of manned aircraft). Second, it is possible to assert that the term also includes personnel who operate the aircraft from outside

<sup>28</sup> See COM(2015) 613 final – 2015/0277 (COD): Proposal for a Regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and repealing Regulation (EC) No 216/2008 of the European Parliament and of the Council, Art. 45 (containing no distinction); ‘Prototype’ Commission Regulation, *supra* n. 25, Art. 1 (containing no distinction), UAS.OPEN.50, Appendix I.2 and Explanatory Note, 4 and 8.

<sup>29</sup> Convention Relating to the Regulation of Aerial Navigation (13 Oct. 1919), 11 L.N.T.S. 173.

<sup>30</sup> Protocol relating to Amendments to Arts 3, 5, 7, 15, 34, 37, 41, 42 and Final Clauses of the Aerial Navigation Convention of 13 Oct. 1919 (15 June 1929), 138 L.N.T.S. 418.

<sup>31</sup> Vienna Convention on the Law of Treaties, Arts 31–33 (23 May 1969), 1155 U.N.T.S. 331. Of treaty interpretation in detail, see especially Richard Gardiner, *Treaty Interpretation* (2d ed., Oxford University Press 2015); Ulf Linderfalk, *On the Interpretation of Treaties: The Modern International Law as Expressed in the 1969 Vienna Convention on the Law of Treaties* (Springer 2007). Regarding the general acceptance of the rules, see e.g. *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro)*, Judgment, I.C.J. Rep 2007 (Feb. 26), 43, para. 160 (‘propositions, reflected in [the given articles] are well recognized as part of customary international law’).

throughout the flight (remote pilots).<sup>32</sup> And third, one can claim that the term also includes personnel who set the flight in motion without having further control over the aircraft ('launchers', for lack of a better word – the very minimum threshold at which a person could be considered a pilot).

These suggestions represent which types of UA may fall within the ambit of the Chicago Convention. Pursuant to the first suggestion, the Convention concerns all types of UA, since they are all 'capable of being flown without a pilot on board'. According to the second suggestion, the Convention only concerns such UA that are launched without further control over the flight: they are 'capable of being flown without a remote pilot'. Utilizing the terminology of ICAO, this would be a reference to 'autonomous aircraft': UA that do 'not allow pilot intervention in the management of the flight'.<sup>33</sup> Its opposite, as envisioned by the Organization, is RPA.

Meanwhile, the third suggestion leaves all types of (unmanned) aircraft outside the scope of the Convention. There are no such (unmanned) aircraft which are 'capable of being flown without a launcher'. It is necessary to at least have one person to initiate the flight at some point: aircraft are not sentient beings which can begin operating all by themselves.<sup>34</sup>

The third suggestion is obviously an oxymoron which must be rejected. It would lead to Article 8 of the Convention having no meaning, since no aircraft would fall within its scope.<sup>35</sup> Thus, the real question is whether the term 'pilot' should encompass only pilots on board the aircraft or also remote pilots: whether the Convention concerns all UA or only autonomous ones.

From a textual, literal point of view, 'pilot' should include both pilots on board and remote pilots. In common parlance, the term simply refers to any 'person who flies an aircraft'<sup>36</sup>; and according to a definition espoused by ICAO, pilot-in-command means the 'pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight'.<sup>37</sup> These definitions can include remote pilots, too.<sup>38</sup> As a

<sup>32</sup> Cf. Plücker, *supra* n. 18, at 42.

<sup>33</sup> Doc 10019, *supra* n. 10, at xiv and fig. 1-1.

<sup>34</sup> Some unmanned aircraft can surely be programmed to begin an operation at a certain time, or even in certain conditions, such as rain, but even in such cases the programming results from human interaction.

<sup>35</sup> The article must be interpreted enabling 'the treaty to have appropriate effects'. See Draft Articles on the Law of Treaties with Commentaries, 219 (in *Yearbook of the International Law Commission, 1966*, vol. II, 187-274. UN 1966).

<sup>36</sup> Oxford English Dictionary Online, 'pilot, *n.* and *adj.*', A.I.3.a.

<sup>37</sup> Annex 6 to the Convention on International Civil Aviation: Personnel Licensing, 1-4 (11th ed., ICAO 2011). The Organization has not defined 'pilot' (person) as a separate concept.

<sup>38</sup> To elaborate, 'remote pilot' itself has been defined as a 'person charged by the operator with duties essential to the operation of a remotely piloted aircraft and who manipulates the flight controls, as



matter of fact, it has been claimed that precisely the requirement of a remote pilot has led ICAO to adopt the concept of RPA.<sup>39</sup> According to this interpretation, ‘without a pilot’ would only refer to AA.

However, ICAO has taken a different stance. It has asserted that the phrase “aircraft capable of being flown without a pilot” ... refers to the situation where there is no pilot on board the aircraft’. According to the Organization, ‘pilotless aircraft’ is the same as ‘unmanned aircraft’<sup>40</sup>: the terms are interchangeable. The argument rests on ‘the intent of the drafters’ as well as the circumstances of the conclusion of the Chicago Convention: ‘[r]emotely controlled and uncontrolled (autonomous) aircraft were already in existence at the time of the First World War’.<sup>41</sup> This would expand the scope of the Convention to its maximum extent. The implication is that the drafters were aware of all types of UA and wanted to regulate them equally through Article 8.

From the viewpoint of practical application of law, the inclusive reading by ICAO makes certain sense. Article 8 of the Convention *should* include all UA, not just autonomous ones: otherwise, ones that are remotely piloted might be subject to the same provisions as manned aircraft.<sup>42</sup> This would, inter alia, grant civil RPA the right of non-scheduled flight pursuant to Article 5 of the Convention, which seems somewhat of a safety hazard given the current state of technology.

ICAO’s interpretation gains some support from legal literature. For instance, it has been noted that ‘the text of the Article’ is insufficient in determining ‘which interpretation prevails’. ‘[A] literal interpretation’ would result in RPA being excluded from the scope of Article 8, but ‘a teleological interpretation which would look at the object and purpose of the [Chicago Convention] may be more appropriate’.<sup>43</sup> It has also been noted that the context of the terms, including especially the requirement set forth later in the article to control the flight of UA, suggests including both remotely piloted and AA.<sup>44</sup>

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appropriate, during flight time’. See Cir 328, *supra* n. 10, at x; Doc 10019, *supra* n. 10, at xviii; Prototype Regulation, *supra* n. 25, Art. 2, para. 2, subpara. p.

<sup>39</sup> Ronald Bartsch, *Unmanned and Uncontrolled: The Commingling Theory and the Legality of Unmanned Aircraft System Operations*, 4(1) *J. Aeronaut Aerospace Eng’g* 3 (2015).

<sup>40</sup> See *infra* for details.

<sup>41</sup> Doc 10019, *supra* n. 10, paras 1.2.4–1.2.7. See also Cir 328, *supra* n. 10, paras 2.1–2.3 and 4.3; Doc 9854 – AN/458: Global Air Traffic Management Operational Concept, appendix B, 6 (1st ed., ICAO 2005); Vienna Convention *supra* n. 31, Art. 32. This view was also presented by Plücken, *supra* n. 18, at 42.

<sup>42</sup> Rather than falling out of the scope of the Convention altogether, as hinted by Pablo Mendes de Leon & Benjamyn Ian Scott, *An Analysis of Unmanned Aircraft Systems Under Air Law*, in *Drones and Unmanned Aerial Systems: Legal and Social Implications for Security and Surveillance* 192 (Aleš Završnik ed., Springer 2016).

<sup>43</sup> Mendes de Leon & Scott, *supra* n. 42, at 192–193. The writers do not, however, elaborate on the ‘object and purpose’ of the Convention that would support an inclusive reading.

<sup>44</sup> Plücken, *supra* n. 18, at 42.

But these legal viewpoints only hold good as means of coping with a poor wording to avoid practical issues. Their foundations are otherwise contestable. To refer to ‘the intent of the drafters’ is shaky, if we accept the rules of interpretation as laid down in the Vienna Convention on the Law of Treaties which, according to its preparatory work, reject ‘an investigation *ab initio* into the intentions of the parties’.<sup>45</sup> The intention should, of course, be taken into account for instance if it suggested that a special meaning was intended<sup>46</sup> for the term ‘pilot’, the special meaning being of course ‘pilot on board’. But one is hard-pressed to find any clear proof that the parties to the Chicago Convention had such an intention.

The context of the phrase is not very conclusive, either. The phrase ‘the flight of such aircraft without a pilot ... shall be so controlled’, as the provision continues, indeed implies that ‘flying without a pilot’ refers to aircraft whose flight is controlled. But even the flight of such aircraft which are launched without further piloting is always controlled to an extent: their flight parameters must be determined, whatever they are. Thus, the implied requirement of ‘control’ lends support to neither an exclusive nor an inclusive reading.

Recourse to the circumstances of the conclusion of the Chicago Convention, as put forward by ICAO, is also quite a futile argument. Although RPA such as Denny drones were used in the 1930s in military drills and flying bombs such as the V-1 (resembling aircraft) were employed in the Second World War,<sup>47</sup> the drafters of the 1944 Convention seem to have given very little thought to such developments. They simply copied almost word-for-word the provision of the 1929 Protocol to the Paris Convention, as also hinted by the preparatory work of the Chicago Convention.<sup>48</sup> This makes any reference to the circumstances of the conclusion rather inconclusive.<sup>49</sup>

The object and purpose of the Chicago Convention are perhaps the only element lending some support to including all UA in the ambit of ‘pilotless aircraft’. This is because the preamble of the Convention mentions the development of ‘international civil aviation ... in a safe and orderly manner’, and because allowing RPA the same (albeit limited) liberties as manned aircraft might be a

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<sup>45</sup> Draft Articles, *supra* n. 35, at 220.

<sup>46</sup> Vienna Convention, *supra* n. 31, Art. 31, para. 4.

<sup>47</sup> Matthew T. DeGarmo, *Issues Concerning Integration of Unmanned Aerial Vehicles in Civil Airspace* 1–3 (MITRE 2004).

<sup>48</sup> Proceedings of the International Civil Aviation Conference Chicago, vol. II, 1382 (United States Department of State 1948).

<sup>49</sup> Including references presented contrary to the ICAO’s position by, e.g. Douglas Marshall, *Unmanned Aerial Systems and International Civil Aviation Organization Regulations*, 85 N.D. L. Rev. 693, 699 (2009); Mendes de Leon & Scott, *supra* n. 42, at 192.

safety hazard with current technology.<sup>50</sup> But even such an argument is based on a multitude of assumptions, such as determining the object and purpose on the basis of the preamble and assessing the safety of RPA.

Is this incoherence enough to suggest a convention of the States parties to amend the Chicago Convention in accordance with its Article 94? Perhaps not. But it is enough to warrant caution in the use of its lingo. The idea of a ‘pilotless aircraft’, defined as it is, should only be used in the context of the Chicago Convention, if even there. Elsewhere, a more representative concept and definition thereof should be adopted to regulate the aircraft in question. To regulate them as aircraft ‘flying without a pilot’ breeds legal uncertainty. Aircraft flying without a pilot on board are, in most cases, piloted in the most direct sense of the word. Indeed, the approach of international, regional, and national bodies has been to regulate the very pilots to a varying degree.<sup>51</sup>

#### 4 VEHICLES OR AIRCRAFT?

‘Unmanned aerial vehicle’ (UAV) and ‘unmanned aircraft’ (UA) have for some time been common terms for the aircraft in question. According to an early and contestable characterization by the ICAO, the former means ‘a pilotless aircraft, in the sense of Article 8 of the [Chicago Convention], which is flown without a pilot-in-command on-board’. Such vehicles are ‘either remotely and fully controlled from another place (ground, another aircraft, space) or programmed and fully autonomous’.<sup>52</sup> Meanwhile, EASA has defined UAV as an ‘aircraft which is designed to operate with no human pilot onboard’.<sup>53</sup>

The concept of ‘unmanned aircraft’ has been defined in a rather similar manner. ICAO has called it an ‘aircraft which is intended to operate with no pilot on board’,<sup>54</sup> while EASA has concluded that it ‘means any aircraft operated or designed to be operated without a pilot on board’.<sup>55</sup> The FAA has defined it as ‘an aircraft operated without the possibility of direct human intervention from within or on the aircraft’.<sup>56</sup>

<sup>50</sup> Chicago Convention, *supra* n. 3, preamble, para. 3.

<sup>51</sup> See e.g. Doc 10019, *supra* n. 10, Ch. 8.

<sup>52</sup> Doc 9854, *supra* n. 41, appendix B, at 6.

<sup>53</sup> Advance Notice of Proposed Amendment (NPA) 16-2005: Policy for Unmanned Aerial Vehicle (UAV) Certification, 25 (EASA 2005).

<sup>54</sup> Cir 328, *supra* n. 10, at x.

<sup>55</sup> Prototype Regulation, *supra* n. 25, Art. 2, para. 2, subpara. t. This definition has also been endorsed by the European Commission. See COM(2015) 613, *supra* n. 28, Art. 3, para. 29.

<sup>56</sup> 14 C.F.R. § 1.1 (2017). The Administration also uses the concept of *small* unmanned aircraft, defining it as a UA weighing less than 55 pounds on take-off. See *ibid.*

Other national authorities have almost *verbatim* repeated these characterizations in their own documents.<sup>57</sup>

The term ‘unmanned’ could, of course, be objected to. Its ordinary meaning, to apply the criteria already established, might suggest that there is no human at all involved in the operation of the aircraft.<sup>58</sup> This has especially been rejected in the context of the military, where it has been viewed as erasing the identity of the pilot.<sup>59</sup> But such a reading would actually be even more limited than a literal reading of ‘pilotless aircraft’: not only could the aircraft have no pilot to guide it, but no crew to set it up nor any passengers on board. While the transport of passengers aboard such aircraft is currently unfeasible, one need not look far to see that this is already being envisioned by the industry.<sup>60</sup> And, as pointed out above, at least one human is required to initiate the flight.

The actual definitions of ‘unmanned aircraft’ employed in the documents where the term is used, however, seem to rectify this semiotic ambiguity. The definitions do not exclude humans, including a crew and passengers, being involved in the operation of such aircraft – just that the pilot is not *on board* the aircraft.<sup>61</sup> In fact, the ‘intention’ or ‘design’ to be operated, or actual ‘operation’ without a pilot on board is stated as the sole qualification of a UA. The definitions cover all such aircraft, regardless of their automation or autonomy or the lack thereof,<sup>62</sup> and regardless of their purpose.

Of the two unmanned concepts, ‘UA’ appears more suitable. Both ICAO and EASA have given up using the concept of ‘UAV’, the former explicitly referring to it as an obsolete term. Within ICAO, the change occurred in 2007, as the second informal meeting on the regulation of such aircraft concluded that ‘the subject should be referred to as unmanned aircraft systems (UAS), in line with [Radio Technical Commission for Aeronautics (RTCA)] and [European Organisation for Civil Aviation Equipment (EUROCAE)] agreements’.<sup>63</sup> The change within EASA took place in a similar manner.<sup>64</sup>

But the objection to ‘UAV’ is not simply a matter of authority or popularity. The main issue rather lies with the phrase ‘aerial vehicle’. This is at odds with the

<sup>57</sup> See e.g. CAP 722: *Unmanned Aircraft System Operations in UK Airspace – Guidance 19–20* (6th ed., United Kingdom Civil Aviation Authority 2015).

<sup>58</sup> The present author, however, rejects the ludicrous notion that ‘unmanned ... may actually be a euphemism for an aircraft piloted completely by women’. See Mark Edward Peterson, *The UAV and the Current and Future Regulatory Construct for Integration into the National Airspace System*, 71 J. Air L. & Com. 521, 531, fn. 38 (2006).

<sup>59</sup> See Shoaps & Stanley, *supra* n. 7, at 5–11.

<sup>60</sup> See e.g. Thom Patterson, *Remote-Controlled Passenger Flights 5 Years Away, CEO Says*, <http://edition.cnn.com/2015/06/26/travel/remote-controlled-passenger-airplane/> (accessed 27 Apr. 2017).

<sup>61</sup> See Plücken, *supra* n. 18, at 16–17.

<sup>62</sup> *Contra* Bartsch, *supra* n. 39, at 2; Peterson, *supra* n. 58, at 530.

<sup>63</sup> Cir 328, *supra* n. 10, at vii and paras 1.3–1.4; Doc 10019, *supra* n. 10, at xii and paras 1.2.10–1.2.11.

<sup>64</sup> See Comment Response Document to Advance Notice of Proposed Amendment (NPA) 16–2005: Policy for Unmanned Aerial Vehicle (UAV) Certification, 5 (EASA 2007).

term ‘aircraft’, which serves as a basis for most, if not all, international, regional, and national legal documents regarding aviation.<sup>65</sup> What one calls UAVs are, in reality, no less aircraft than manned aircraft: they are, pursuant to the ICAO definition, machines ‘that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface’.<sup>66</sup> They are simply aircraft of the kind that operates without a pilot on board. Using a separate term, even if that term is defined with reference to ‘aircraft’, reinforces a separation between manned and unmanned aviation – a separation that is becoming less and less valid each year.<sup>67</sup> Meanwhile, adopting a common ground establishes a link between the regulation of manned and UA.<sup>68</sup>

## 5 PILOTED OR AUTONOMOUS?

Perhaps the newest addition to the cavalcade of terms is ‘remotely piloted aircraft’ (RPA).<sup>69</sup> In the words of ICAO, this phrase refers to an ‘unmanned aircraft which is piloted from a remote pilot station’.<sup>70</sup> Thus, according to the Organization, ‘[r]emotely piloted aircraft are one type of unmanned aircraft’.<sup>71</sup> EASA has also pointed to the concept, utilizing the ICAO definition word-for-word<sup>72</sup> and recognizing it as a subcategory of UA.<sup>73</sup>

The legal significance of the categorization lies in how the given regulatory bodies are planning to regulate the aircraft. ICAO, for one, has virtually ceased

<sup>65</sup> See e.g. CASR, *supra* n. 11; Chicago Convention, *supra* n. 3; Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 Feb. 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC.

<sup>66</sup> E.g. Annex 7, *supra* n. 1, at 1. See also Cir 328, *supra* n. 10, para. 1.7. Regarding other definitions, see Marshall, *supra* n. 49, at 700–701; Plücken, *supra* n. 18, at 18–19.

<sup>67</sup> Consider e.g. the developments in unmanned technology and how ICAO has set forth as its goal ‘to provide an international regulatory framework ... to underpin routine operation of RPAS throughout the world in a safe, harmonized and seamless manner *comparable to that of manned operations*’. See Doc 10019, *supra* n. 10, at v (emphasis added).

<sup>68</sup> See Peterson, *supra* n. 58, at 528–530; Plücken, *supra* n. 18, at 17. The authors note, however, that some parties would benefit from their equipment *not* categorized as aircraft, enabling them to circumvent regular rules. See the discussion above regarding ‘model aircraft’.

<sup>69</sup> Historically, FAA used the term ‘remotely operated aircraft’ (ROA). This was defined as ‘a powered, aerodynamic aircraft with an integral recovery/landing system which is operated without a pilot onboard’. See e.g. Airspace Integration Plan for Unmanned Aviation, 3 (United States Department of Defense 2004). As since, however, the FAA has opted to use the term ‘UAS’, the concept of ROA is not discussed any further in this article.

<sup>70</sup> Annex 7, *supra* n. 1, at 1; Doc 10019, *supra* n. 10, at xviii.

<sup>71</sup> Doc 10019, *supra* n. 10, para. 1.1.1 (referring to Annex 7, *supra* n. 1).

<sup>72</sup> Notice of Proposed Amendment (NPA) 2012–10: Transposition of Amendment 43 to Annex 2 to the Chicago Convention on Remotely Piloted Aircraft Systems (RPAS) into Common Rules of the Air, 32 (EASA 2012).

<sup>73</sup> Technical Opinion to Advance Notice of Proposed Amendment (A-NPA) 2015–10: Introduction of a Regulatory Framework for the Operation of Unmanned Aircraft, 4 (EASA 2015).

reference to all UA and only begun to tackle remotely piloted ones. It has put these in contrast with what it has called ‘autonomous aircraft’ (AA): UA that do ‘not allow pilot intervention in the management of the flight’.<sup>74</sup> The rationale of this course of action is that only RPA ‘could be integrated alongside manned aircraft in non-segregated airspace and at aerodromes’.<sup>75</sup> Meanwhile, EASA has gone the opposite way, as it has chosen to use ‘the term “unmanned aircraft” ... for regulatory proposals’. Conversely, it has done so because the concept is wide, allowing ‘to establish rules for ... autonomous aircraft’, too.<sup>76</sup>

But what is, exactly, the difference between ‘RPA’ and ‘AA’? And what should be their role as regulatory concepts?

For a start, the definition of RPA consists of several core components. First, RPA are UA, as already established above. Second, they are ‘piloted’ UA. In accordance with an ICAO definition, this means that RPA are UA whose flight controls are manipulated during the flight.<sup>77</sup> Third, RPA are piloted from a ‘remote pilot station’, which refers to the ‘component of the remotely piloted aircraft system containing the equipment used to pilot the remotely piloted aircraft’.<sup>78</sup>

AA are also UA which have a pilot, a ‘person who flies [the] aircraft’.<sup>79</sup> But they are such that do not allow the pilot to intervene in the management of the flight. In other words, once an AA is in flight nothing can be done to alter its flight parameters: not the manipulation of flight controls nor any other activity amounting to intervention in the management of the flight.

These definitions seem clear enough. However, upon closer inspection, the distinction is not without its issues. The immediately notable one is that the categories of RPA and AA do not correspond with each other. The antithesis of RPA is ‘not piloted’, rather than ‘not allowing intervention’. There are thus, supposedly, UA which do not fall in either category. This is exacerbated by the fact that the standard of ‘piloting’, which is the basis for the definition of RPA, has not been defined precisely. Nowhere has it been determined how much manipulating of flight controls and at what interval is necessary to meet the standard of ‘piloting’: for an aircraft to be recognized as an RPA.

The described issues translate directly into practice. In extreme cases, it is clear when a UA is an RPA and when it is an AA. For example, when the UA cannot remain airborne without input from a pilot, its controls are constantly manipulated, and thus it should clearly be regarded as an RPA. If, instead, the UA takes off from

<sup>74</sup> Doc 10019, *supra* n. 10, para. 1.2.14, at xiv and fig. 1-1. *See also* Cir 328, *supra* n. 10, para. 2.2.

<sup>75</sup> Doc 10019, *supra* n. 10, para. 1.2.14.

<sup>76</sup> Technical Opinion to A-NPA 2015-10, *supra* n. 73, at 4-5 and 35.

<sup>77</sup> E.g. Annex 1, *supra* n. 1, at 1-4.

<sup>78</sup> E.g. Annex 2 to the Convention on International Civil Aviation: Rules of the Air, Ch. 1, 7 (10th ed. as amended, ICAO 2005).

<sup>79</sup> Oxford English Dictionary Online, ‘pilot, *n.* and *adj.*’, A.I.3.a.

the ground after which it no longer allows anyone to change its course, it is autonomous.<sup>80</sup>

But the issue is with UA which operate with only some autonomy or automation, utilizing sensors and/or programming to guide their flight. There are numerous such aircraft nowadays, ranging from consumer grade products to professional equipment,<sup>81</sup> and the future must also be considered.<sup>82</sup> To buttress the issue, the same UA can be under direct control at one point in time, whereas at another it may operate in a highly autonomous manner. ‘Semi-autonomous’ is likely to become the most common type of UA rather than fully autonomous, as many writers assume that at least one person must monitor and, if necessary, control the flight throughout its execution.<sup>83</sup>

The given problems with the categorization cannot be solved in a definitive manner. They necessarily leave a grey area of aircraft and operations overlapping the categories of RPA and AA. To be sure, this is something ICAO has recognized, too. The Organization has referred to ‘RPA conducting autonomous flights/segments’ and vice versa, and defined autonomous operation as an ‘operation during which a remotely piloted aircraft is operating without pilot intervention in the management of the flight’.<sup>84</sup> This, however, seems a rather confounding solution to the matter, since it implies that the categories are misconstrued in the first place.

The second question, as presented above, concerns the role of RPA and AA as regulatory concepts. To this issue, there are three possible solutions. One, that both concepts should be abandoned in favour of UA; two, that they should actually substitute UA altogether; and three, that they should be employed as subcategories of UA.

Abandoning RPA and AA as regulatory concepts, as seems to be suggested by EASA, is the simplest option. Instead of regulating subsections of UA, regulations are targeted towards all of them. It eliminates the aforementioned problem of distinction: ‘UA’ encompasses all types of aircraft that are operated without a pilot on board. Rules are established purely on the basis of the properties and/or use of the UA, without terminologically splitting them into subcategories.

<sup>80</sup> Cf. Bartsch, *supra* n. 39, at 3; Plücken, *supra* n. 18, at 21. As a side note, there are very few of the latter type of aircraft. In civil aviation, only recreational balsawood gliders are operated in such a manner. In military aviation, uncontrollable aircraft are no longer used.

<sup>81</sup> Consider e.g. the ‘intelligent flight modes’ of DJI unmanned aircraft, <http://www.dji.com/intelligent-flight-modes> (accessed 10 Jan. 2017).

<sup>82</sup> Cf. Bartsch, *supra* n. 39, at 3 and *passim*. Consider e.g. the Perdix drone swarm developed by the United States Defense Department’s Strategic Capabilities Office, <http://www.cbsnews.com/news/60-minutes-autonomous-drones-set-to-revolutionize-military-technology/> (accessed 9 Jan. 2017).

<sup>83</sup> See Bartsch, *supra* n. 39, at 3; Peterson, *supra* n. 58, at 530–531; Plücken, *supra* n. 18, at 21.

<sup>84</sup> See Doc 10019, *supra* n. 10, at xv and fig. 1–1.



Using the two concepts to substitute UA altogether is the solution promoted by ICAO. Unlike the first option, this requires making a terminological distinction between RPA and AA. As stated, the distinction currently presented by the Organization is somewhat problematic, since it seems to leave some UA outside both categories and because it fails to properly tackle UA with varying degrees of autonomy. And regardless, using two concepts can be cumbersome in comparison with one.

Utilizing RPA and AA as subcategories of UA is not something that has been widely suggested by regulatory bodies, if at all. It appears that if the former concepts are adopted, there is no reason to maintain reference to UA as an overarching category. Establishing general regulations for all UA while also creating rules for RPA and AA seems too daunting a task to undertake.

## 6 SYSTEM OR NO SYSTEM?

The concepts of UA and RPA are often supplemented by the term ‘system’. ICAO has defined UAS as the ‘aircraft and its associated elements which are operated with no pilot on board’<sup>85</sup>; RPAS has been defined as the ‘aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design’.<sup>86</sup> According to EASA, UAS should be defined as ‘the UA and any equipment, apparatus, appurtenance, software or accessory that is necessary for the safe operation of the UA’.<sup>87</sup> Curiously, the FAA has only adopted the concept of *small* UAS, defined quite similarly to the other regulatory bodies but with reference to UA with less take-off mass.<sup>88</sup>

To elaborate, ICAO has provided information on the components which, in addition to the aircraft itself, may be part of the RPAS. These include, first and foremost, the remote pilot station (RPS) and the command and control (C2) link, which connects the station to the aircraft. Additionally, the system may include equipment for communication with the air traffic control (ATC) and for surveillance purposes, including for instance voice radio and transponders; equipment for navigation, take-off, and recovery; a flight control computer, flight management system, autopilot, and so forth.<sup>89</sup>

There are certain reasons to question the usefulness of adopting UAS or RPAS as a regulatory concept. For one, the systems are distributed. They consist of numerous components which can be located in different places, perhaps even in

<sup>85</sup> Cir 328, *supra* n. 10, at x.

<sup>86</sup> Doc 10019, *supra* n. 10, at xviii. *See also Ibid.*

<sup>87</sup> Prototype Regulation, *supra* n. 25, Art. 2, para. 2, subpara. v.

<sup>88</sup> 14 C.F.R. § 1.1 (2017).

<sup>89</sup> Doc 10019, *supra* n. 10, paras 2.2.2–2.2.6.



different countries.<sup>90</sup> Which requirements exactly should concern the system, as opposed to only the aircraft, the RPS, or other components? It is possible, of course, to set forth certain general standards which should be applied on the system as a whole. But when it comes to specifications, the requirements (such as airworthiness standards) regarding the aircraft and the control station will have to be separate simply because the components are completely different.

This is not only an issue of targeting requirements, but also of their implementation. It is difficult to determine, in the first place, which state and authority should have competence over the system. Is it feasible to simply apply the solution adopted in manned aviation, giving competence to the state where the aircraft component is registered?<sup>91</sup> And what if the chosen state were to fail to meet its responsibilities in terms of oversight? How should disputes between authorities and states be resolved?

Another reason to question the idea of overarching systems is the interchangeability of the components thereof. UA and the equipment used to control them are, in comparison with traditional aviation equipment, easily modifiable and replaceable without much expertise.<sup>92</sup> If the whole system is, for example, issued a type certificate, changing just one component may require re-doing the process of certification all over again. And if the components are issued type certificates separately, what is the function of using the concept of a system?

ICAO has already hinted at some of these issues, noting that the distribution of components presents very complex oversight situations. But on the basis of its recommendations, the Organization appears not yet to have dealt with them in a definitive manner. Regarding type certification and continuing airworthiness, for example, there is clearly a struggle as to how to target requirements to the various parts of the system. On one hand, the importance of the aircraft component has been recognized; on the other, it is the design of the system with all its parts that should be scrutinized.<sup>93</sup> This struggle is of course understandable, as the technology is in a constant shift.

Despite these unsolved issues, it seems necessary to maintain a legal distinction between the UA or RPA and the whole system. Regulating only the aircraft component would leave no rules applicable to the other components which are necessary to the operation – a regulatory gap. This has been implied, though not explicitly noted, in various regulatory documents by ICAO and EASA.<sup>94</sup> It would seem confusing, too, to regulate the systems by referring to them as UA or RPA:

<sup>90</sup> *Ibid.*, e.g. paras 4.2.1–4.2.2.

<sup>91</sup> See Chicago Convention, *supra* n. 3, Art. 17.

<sup>92</sup> See e.g. UavMods, <http://www.uavmods.co.uk/> (accessed 10 Jan. 2017).

<sup>93</sup> See Doc 10019, *supra* n. 10, Ch. 4.

<sup>94</sup> See e.g. Cir 328, *supra* n. 10, paras 1.4 and 3.8–3.9; Doc 10019, *supra* n. 10, paras 1.2.11 and 2.2.1–2.2.6; Prototype Regulation, *supra* n. 25, Explanatory Note, at 3.

this would make it impossible to target rules solely on the aircraft component. Thus, any regulatory solution must embrace the concept of UAS or RPAS.

## 7 THE 'D' WORD

In common parlance, the term 'drone' has often been employed for UA. It is, as a matter of fact, one of the oldest terms, having already been introduced in the 1930s.<sup>95</sup> While ICAO has not utilized the term in its official documents at all, EASA, in 2015, even suggested adopting it universally. Pursuant to a description issued in that year, drone is 'the flying component' of a UAS. More specifically, according to the Agency, drone means 'an aircraft without a human pilot on board, whose flight is controlled either autonomously or under the remote control of a pilot on the ground or in another vehicle'.<sup>96</sup> It was thus defined rather similarly to UA.

The idea of 'drone' as an official concept did not, however, take off. After its suggestion, EASA quickly reverted back to using the concepts of UA and UAS. 'Drone' was reserved for 'communications addressing the general public'.<sup>97</sup>

While the reasons for the change were not stated explicitly, it is not hard to fill in the blanks. First of all, the critique issued above concerning the term 'UAV' also applies here: to regulate 'drones' may suggest that they do not qualify as aircraft, which upholds, in a somewhat artificial manner, a divide between manned and unmanned aviation. The devices which are often dubbed as drones are aircraft like manned aircraft, machines deriving 'support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface'.<sup>98</sup>

Curiously enough, the term may easily be misunderstood as also referring to non-aircraft unmanned vehicles. Such include, at least, UVs which are operated underwater.<sup>99</sup> 'Drone' has thus seemingly become a common name for all vehicles which can be piloted remotely – to whatever extent, depending on the automation and autonomy of the system. This makes it a fickle term to use officially in the context of aviation, risking issues later on as regulating other drone-type vehicles may be necessary.<sup>100</sup>

<sup>95</sup> DeGarmo, *supra* n. 47, at 1–3. See in detail Laurence R. Newcome, *Unmanned Aviation: A Brief History of Unmanned Aerial Vehicles* (American Institute of Aeronautics and Astronautics 2004); Bill Yenne, *Attack of the Drones: A History of Unmanned Aerial Combat* (Zenith Press 2004).

<sup>96</sup> Advance Notice of Proposed Amendment (A-NPA) 2015-10: Introduction of a Regulatory Framework for the Operation of Unmanned Aircraft, 4 (EASA 2015).

<sup>97</sup> Technical Opinion to A-NPA 2015-10, *supra* n. 73, at 5.

<sup>98</sup> E.g. Annex 7, *supra* n. 1, at 1.

<sup>99</sup> See e.g. OpenROV Trident, <http://www.openrov.com/> (accessed 10 Jan. 2017); Fathom One, <http://fathomdrone.com/> (accessed 10 Jan. 2017). Sometimes these are also called 'unmanned underwater vehicles' (UUV) or 'unmanned marine vehicles' (UMV).

<sup>100</sup> This objection could also be levied upon the term 'remotely piloted vehicle' (RPV), a curious amalgamation of UAV and RPA, which makes no reference to aerial activities.

From a rhetorical point of view, many stakeholders have viewed ‘drone’ as a negative and unprofessional concept. Military personnel have criticized it as misleading the general public to believe that unmanned aerial warfare lacks human agency and/or control over the technology, belittling the role of pilots in such operations. Some actors within the industry have made attempts at getting rid of the term due to its perceived connotations. Meanwhile, model aircraft hobbyists have used the term ‘as a signifier of new technology’ which does not refer to their activities: an attempt at circumventing rules that have been established or are being developed regarding unmanned activities.<sup>101</sup>

But as has been noted, the rhetorical strategies adopted to reject the use of the concept have failed. As the argument goes, “‘drone’ is tethered to too many diverse rhetorical contexts and its metaphoric source domain is too productive of new ideas and potential meanings for it to die’. The concept offers manufacturers, marketers, and ultimately journalists visibility, whereas activists prefer it for its history which ‘indexes military aggression’.<sup>102</sup> Thus, while its imprecision disfavours its use as a regulatory concept, it is to be expected that ‘drone’ will continue to be used in everyday discussion. In this sense, EASA’s latter approach to utilize it when addressing the public appears wise.

## 8 CONCLUSIONS

As the discussion above depicts, the terminology surrounding UA – the intermediate term chosen here – is still far from established. On one hand, it is laden with a lot of historical weight, and on the other, we have thus far not yet witnessed the full scale of unmanned operations. The technology is developing at a pace that is difficult to capture with a single word or phrase. There is curious tension between various monikers which all approach the subject matter from a different angle.

The first and strongest conclusion of this article is that the regulatory concepts of ‘model’ and ‘toy’ aircraft should be done away with. These concepts cannot be used to describe all UA, and neither should they be reserved for certain kinds of UA. Upholding a separation between UA used for recreational and professional purposes is downright impossible, and trying to do so detrimentally affects the development as well as implementation of regulatory solutions. The same rules must be applied across the board, although established associations can be assigned certain privileges to the extent they are proven to supervise the activities occurring

<sup>101</sup> See Shoaps & Stanley, *supra* n. 7, at 5–17.

<sup>102</sup> *Ibid.*, at 19–23.

within their sphere. Additionally, exclusions can be established on the basis of, for instance, take-off mass.

Second, this article takes a critical position towards the consensus that all types of UA fall within the scope of Article 8 of the Chicago Convention. Although such an understanding has sensible practical implications, it is based on a rather frivolous reading that may go beyond the ordinary meaning of the provision. As concluded, the uncertainty is perhaps not significant enough to warrant an amendment, but it suggests that the idea of ‘pilotless aircraft’ as a regulatory concept should be rejected.

This article also reaffirms the conclusion that UA should be precisely called ‘aircraft’ instead of ‘aerial vehicles’. This allows for the establishment of a more unified set of rules, negates legal uncertainty, and future-proofs instruments by taking into account how the gap between manned and unmanned aviation is closing year by year. To acknowledge that we are concerned with aircraft also suggests rejecting legally ambiguous concepts such as ‘remotely piloted vehicle’. Still, the legal profession is forced to accept that ‘drone’ has become the prevalent pet name in public discourse. It can be utilized while communicating with the general public, per the suggestion of EASA.

The final argument presented in this article is an ambiguous one, concerning the legal division between unmanned, remotely piloted, and AA. As noted above, the concepts of RPA and AA do not correspond with each other perfectly, leaving a regulatory blind spot and creating an unclear threshold for RPA. This issue also translates into practice, since technological developments are expanding a grey area of aircraft which have *certain* automation and autonomy, falling into neither category clearly.

There are several possible approaches to the issue. From a terminological point of view, the simplest option would be to establish ‘unmanned aircraft’ as the sole regulatory concept and abandon its subcategories. ‘UA’ encompasses all types of aircraft that are operated without a pilot on board, which suggests establishing rules on the basis of the properties of the aircraft and operation. This is the route taken currently by EASA.

The entirely opposite and a more precise approach would be to target regulations at ‘RPA’ and ‘AA’, doing away with the umbrella term. In order to avoid regulatory blind spots, this would require maintaining a sensible terminological distinction between the two categories. Furthermore, separate rules would have to be issued for both types of UA. This seems to be the way the regulatory project of ICAO is heading.

From a practical point of view, EASA’s way of thinking seems more sensible. With all the confusion amongst regulatory bodies, academia and the general public stemming from the colourful nomenclature, the last thing one needs is more terms

and distinctions. This is especially the case with categories such as RPA and AA, whose definitions only seem to create more confusion and uncertainty in representing the reality of unmanned aviation.

The core problem is that the line between full control and autonomy is not rigid, as many – if not the most – UA fall somewhere in between the two extremes. The move from the so-called RPA to AA is not a giant ledge, but more of a staircase or even a slope. This is something which ICAO's categorization may ultimately fail to grasp, taking into account how swiftly the technological developments are occurring. Meanwhile, EASA's lack of categorization is open-ended and thus may prove to be future-proof. Instead of trying to divide the whole scope of unmanned aviation on a conceptual level, it directs the attention toward the actual rules which can be established on the basis of a more fine-grained division.

Regardless of the route taken, it appears inevitable that regulations must be targeted at both the system and its aircraft component. Establishing and implementing such rules can be challenging, taking into account the problems already acknowledged by regulatory bodies and the ones presented in this article, but without doing so a legal blind spot will be created. Whereas in manned aviation the aircraft component contains all parts necessary for flight – though the role of ATC is absolutely vital – in unmanned aviation the system is distributed by default. This requires maintaining the concept of UAS or RPAS for rules that target the system as a whole.