

# DRONES AND PRIVACY

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### ABSTRACT

The Los Angeles Times recently reported the first instance in which military “drone” aircraft participated in the arrest of United States citizens on United States soil. A Customs and Border Protection Predator B drone played a key role in the arrest of Rodney Brossart and his three sons at their North Dakota ranch. With the conclusion of the Second Gulf War, pressures mount to utilize surplus drones and other quasi-military drone technology on the home front. This monograph summarizes the known facts of the Brossart case, describes the capabilities of military surveillance “drone” aircraft, and discusses whether a case similar to Brossart could serve as a catalyst for Supreme Court action. If a case like Brossart were appealed, the Supreme Court could issue a judgment articulating a new standard controlling how the Fourth Amendment governs robotic surveillance.

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*Dramatic technological change may lead to periods in which popular expectations are in flux and may ultimately produce ... changes in ... attitudes [towards privacy].*<sup>2</sup>

## INTRODUCTION

On June 23, 2011, Sheriff Kelly Janke and his deputies arrived at the Brossart family ranch in Nelson County, North Dakota with a search warrant authorizing him to look for six missing cows.<sup>3</sup> According to court records, when the deputies served Rodney Brossart with a search warrant, he “refused to give the cattle back and said if they came onto his property they wouldn't be coming back.”<sup>4</sup> When Sheriff Janke arrested Rodney Brossart later that day, Brossart “allegedly resisted and had to be tazed.”<sup>5</sup>

At 6:15pm that evening, Sheriff Janke returned to the Brossart ranch.<sup>6</sup> The officers were met “by the three [Brossart] brothers carrying high-powered rifles.”<sup>7</sup> The brothers “allegedly pointed the rifles at the officers.”<sup>8</sup> The criminal complaint filed against the brothers says that they “ran toward the officers, who then retreated to a safe distance.”<sup>9</sup> The officers “called in reinforcements,” including members of “the state Highway Patrol, a regional SWAT team, ... deputy

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<sup>2</sup> *United States v. Jones*, 132 S. Ct. 945, 962 (2012) (Alito, J., concurring in the judgment).

<sup>3</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times, Dec. 10, 2011, at Nation; see also *Brossart Family Appears in Court After Standoff Arrests* Wday 6 News (Feb. 19, 2012), [http://www.wday.com/event/article/id/11101/publisher\\_ID/30/](http://www.wday.com/event/article/id/11101/publisher_ID/30/) (After the incident involving the Predator, Rodney Brossart was again arrested by Sheriff Janke for failure to appear in court to answer the cattle rustling charges that led to the Predator incident) See also *ND Family Involved in Standoff Wants Charges Dismissed, Trial Venue Moved* WDAZ 8 Television (1 Apr. 19, 2012), <http://www.wdaz.com/event/article/id/13182> (This report describes a slightly different sequence of events, but asserts that a valid warrant was obtained before the situation escalated).

<sup>4</sup> *Rodney Brossart Speaks for First Time Since Standoff*, WDAZ 8 Television (Oct. 21, 2011, 2:17 AM), [http://www.wdaz.com/event/article/id/10923/publisher\\_ID/30/](http://www.wdaz.com/event/article/id/10923/publisher_ID/30/).

<sup>5</sup> *Id.*

<sup>6</sup> *Arrested in Armed Standoff Near Lakota, ND* Wday 6 News (Feb. 19, 2012), [http://www.wday.com/event/article/id/9251/publisher\\_ID/30/](http://www.wday.com/event/article/id/9251/publisher_ID/30/).

<sup>7</sup> *Warrant Issued After Man Accused In Standoff Near Lakota, ND Fails To Appear In Court*, WDAZ-TV (Feb. 19, 2012), [http://www.wdaz.com/event/article/id/10488/publisher\\_ID/30/](http://www.wdaz.com/event/article/id/10488/publisher_ID/30/).

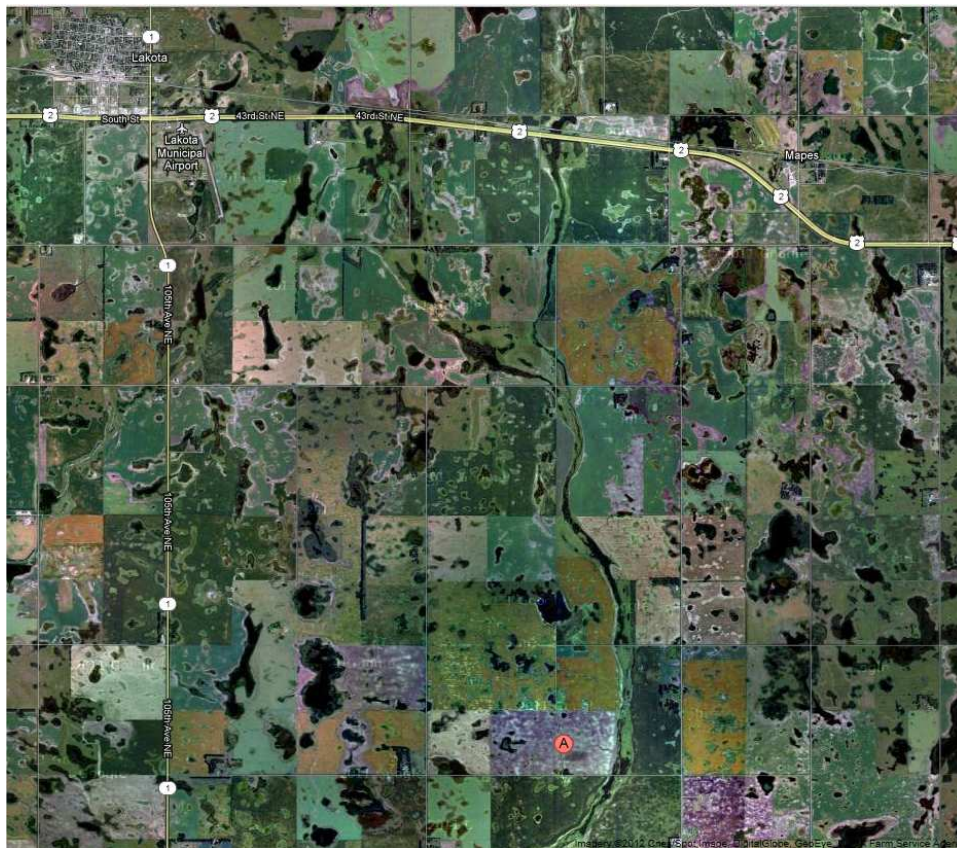
<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

sheriffs from three other counties ... [and] a Predator B drone.”<sup>10</sup>

“Janke requested help from the drone unit, explaining that an armed standoff was underway.”<sup>11</sup> A U.S. Customs and Border Protection Predator B, operated out of Grand Forks Air Force Base, happened to be flying in the vicinity and operators diverted the surveillance drone to fly over the ranch (see Figure 1).<sup>12</sup>

Fig. 1 – The Brossart family ranch, near Lakota, ND as observed from space using Google Maps<sup>13</sup>



<sup>10</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times, Dec. 10, 2011, at Nation.

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> Satellite View of Brossart Property, Google Maps, <http://maps.google.com> (search coordinates 47.965905, -98.268771; then follow hyperlink to “Satellite” view option) (retrieved Apr. 5, 2012).

“For four hours, the Predator circled 10,000 feet above the farm.”<sup>14</sup> Janke and other civilian law enforcement officers watched live video and, after nightfall, thermal imaging broadcast by the drone.<sup>15</sup> The thermal images showed people “carrying what appeared to be long rifles.”<sup>16</sup> At 10:45pm, the sheriff decided to withdraw forces until morning.<sup>17</sup>

The next morning, the Predator returned to reconnoiter the ranch.<sup>18</sup> Its sensors pinpointed the location of three unarmed suspects.<sup>19</sup> “Police rushed in and made the first known arrests of U.S. citizens [on U.S. soil] with help from a Predator, the spy drone that has helped revolutionize modern warfare.”<sup>20</sup>

According to news reports, Rodney Brossart “is charged with one count of ‘terrorizing, . . .,’ one count of theft of property, one count of criminal mischief, one count of failure to comply with an estray order (for the cattle) and one count of preventing arrest.”<sup>21</sup> His three sons, whom the Predator also located, are each charged with one count of “terrorizing.”<sup>22</sup>

Congress authorized the purchase of Predators for the U.S. Customs and Border Protection in 2005.<sup>23</sup> These drones currently patrol the southern and northern boundaries of the continental United States.<sup>24</sup> The border patrol hopes for a fleet

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<sup>14</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times, Dec. 10, 2011, at Nation.

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *Warrant Issued After Man Accused in Standoff Near Lakota, ND, Fails to Appear in Court*, WDAZ 8 Television (Feb. 19, 2012), [http://www.wdaz.com/event/article/id/10488/publisher\\_ID/30/](http://www.wdaz.com/event/article/id/10488/publisher_ID/30/).

<sup>18</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. TIMES, Dec. 10, 2011, at Nation.

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Rodney Brossart Speaks for First Time Since Standoff*, WDAZ 8 Television (Oct. 21, 2011, 2:17 AM), [http://www.wdaz.com/event/article/id/10923/publisher\\_ID/30/](http://www.wdaz.com/event/article/id/10923/publisher_ID/30/).

<sup>22</sup> *Id.*

<sup>23</sup> *US Customs and Border Protection Agency Plans 24 Predators by 2016*, UAS Vision (Dec. 29, 2011), <http://www.uasvision.com/2011/12/29/us-customs-and-border-protection-agency-plans-24-predators-by-2016>.

<sup>24</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times, Dec. 10, 2011, at Nation; see also Tim Gaynor, *U.S. drones to watch entire Mexico border from September 1*, Reuters, Aug. 30, 2010.

of twenty four to be in place by 2016.<sup>25</sup>

The use of this surveillance technology to assist local law enforcement has drawn criticism.<sup>26</sup> Former U.S. House Representative Jane Harman (D-CA36) told the Los Angeles Times that during her tenure on the House Homeland Security Intelligence Subcommittee, there was no discussion about using Predators to assist local police on routine matters.<sup>27</sup> She asserts that the use of these drones without public debate or clear legal authority is a “mistake.”<sup>28</sup>

Rodney Brossart’s attorney, Bruce Quick, says the use of the drone was unlawful.<sup>29</sup> The motions he filed in court raise the argument that “even in an instance where a search is warranted, if the warrant is executed in an ‘unreasonable’ manner,” the resulting evidence should be suppressed.<sup>30</sup> Mr. Quick asserted that the use of Predators for surveillance of civilians on private property “is a bad idea, regardless of whether I’m a defense attorney in this case or any other .... [i]t’s a bad idea.”<sup>31</sup>

Both Representative Harman’s and Mr. Quick’s voiced concerns generate many questions. Some have clear-cut answers; others may only be resolved by the Supreme Court.

First, was this action by the police lawful unto itself? Although the police had a search warrant for the missing cows, the Predator was not used to locate the wayward ungulates but instead to track citizens on private property. What facts of the case render the sheriff’s call for a Predator drone a lawful response to a developing situation?

Second, beyond the facts of the instant case, can the

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<sup>25</sup> William Booth, *More Predator drones fly U.S.-Mexico border*, Washington Post, (Dec. 21, 2011), [http://www.washingtonpost.com/world/more-predator-drones-fly-us-mexico-border/2011/12/01/gIQANSZz8O\\_story.html](http://www.washingtonpost.com/world/more-predator-drones-fly-us-mexico-border/2011/12/01/gIQANSZz8O_story.html). See also *US Customs and Border Protection Agency Plans 24 Predators by 2016*, UAS Vision (Dec. 29, 2011), <http://www.uasvision.com/2011/12/29/us-customs-and-border-protection-agency-plans-24-predators-by-2016>.

<sup>26</sup> *Id.* See also Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times, Dec. 10, 2011, at Nation. (Former Rep. Jane Harman says that “There is no question that this could become something that people will regret.”)

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

<sup>29</sup> *ND Family Involved in Standoff Wants Charges Dismissed, Trial Venue Moved*, WDAZ 8 Television (Apr. 19, 2012), <http://www.wdaz.com/event/article/id/13182>.

<sup>30</sup> *Id.*

<sup>31</sup> *Delay in Pleas For Lakota Family in Standoff*, WDAZ 8 Television (Dec. 30, 2011), [http://www.wdaz.com/event/article/id/11711/publisher\\_ID/30/](http://www.wdaz.com/event/article/id/11711/publisher_ID/30/).

advanced imaging technology on board the Predator be used to develop legally admissible evidence for prosecution? Must the police obtain a court-issued particularized warrant? May police use a Predator for surveillance in the absence of a warrant?

This monograph reviews how the Supreme Court has matured in its understanding of the constitutional limitations of a “reasonable” search performed with or without a warrant. Here, the sheriff used the Predator’s “multi-spectral targeting system,” comprised of visible light and infrared thermal imaging telemetry, to reveal whether the suspects were armed, by day and by night.<sup>32</sup> And yet, Predators do not represent a *sine qua non* for robotic surveillance. Radically smaller and less conspicuous robotic aircraft are being developed that carry an even broader range of remote sensing equipment.<sup>33</sup>

Finally, this monograph speculates as to what scenario involving police use of robotic surveillance equipment, if appealed to the Supreme Court, might trigger a holding in which the Court defines a new privacy paradigm.

## I. WAS THE POLICE ACT OF CALLING IN A PREDATOR DRONE TO ASSIST IN AN ARREST LAWFUL?

The state of North Dakota began a criminal prosecution of the Brossarts for the events of June 23, 2011.<sup>34</sup> Although these cases appear to have been settled without a trial, the charges most relevant to the use of the Predator drone will be those made against the three Brossart sons who were arrested on “terrorizing” charges.<sup>35</sup> A recent article in *The Los Angeles*

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<sup>32</sup> *MQ-1B Predator*, U.S. Air Force, (Jan. 5, 2012) <http://www.af.mil/information/factsheets/factsheet.asp?id=122>; Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times (Dec. 10, 2011) <http://articles.latimes.com/2011/dec/10/nation/la-na-drone-arrest-20111211>.

<sup>33</sup> See Michael Hoffman, *The Plan for Smaller, Faster, Deadlier UAV's*, Air Force Times, Jun. 10, 2009, [http://www.airforcetimes.com/news/2009/06/airforce\\_uas\\_automation\\_061009w/](http://www.airforcetimes.com/news/2009/06/airforce_uas_automation_061009w/).

<sup>34</sup> *Delay in Pleas For Lakota Family in Standoff*, WDAZ 8 Television (Dec. 30, 2011), [http://www.wdaz.com/event/article/id/11711/publisher\\_ID/30/](http://www.wdaz.com/event/article/id/11711/publisher_ID/30/) (confirmed by a telephone call to Nelson County, N.D. Courthouse, Feb. 15, 2012).

<sup>35</sup> Stephen J. Lee, *Brossart family reaches plea deal with prosecutors over stand-off charges*, Grand Forks Herald, (Jan. 24, 2013) (“Janke criticized the plea deal: ‘This case needs to go to trial’”) See generally N.D. Cent. Code § 12.1-17-04 (2011) (defining terrorizing as a felony charge that applies when one person intentionally places “another human being in fear for that human

*Times* suggests that the use of drones for state law enforcement may raise both Posse Comitatus and privacy concerns.<sup>36</sup> This monograph will address both issues.

A. *Was Posse Comitatus violated when the sheriff called in a Predator drone to help with the search of the Brossart ranch?*

The Posse Comitatus Act, codified as 18 U.S.C. § 1385, states:

Whoever, except in cases and under circumstances expressly authorized by the Constitution or Act of Congress, willfully uses any part of the Army or the Air Force as a posse comitatus or otherwise to execute the laws [of the United States] shall be fined . . . or imprisoned . . . .<sup>37</sup>

The doctrine of Posse Comitatus is invoked only when domestic law enforcement directly employs federal troops. In *United States vs. Jaramillo*, the United States District Court in the State of Nebraska held that Posse Comitatus was not violated when local law enforcement used “substantial amounts of materiel furnished by the Army” to suppress civil unrest of Lakota tribe members at Wounded Knee, South Dakota.<sup>38</sup> According to its legislative history, 18 U.S.C. § 1385 was intended “to eliminate the use of federal troops to execute the laws of the United States.”<sup>39</sup> “The prevention of the use of military supplies and equipment was never mentioned in the debates, nor can it reasonably be read into the words of the Act.”<sup>40</sup> Conversely, “the use of troops to execute the laws was forbidden, unless expressly authorized by the Constitution or

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being's or another's safety.”); *State v. Carlson*, 559 N.W.2d 802, 811 (N.D. 1997) (affirming the trial court's view of defendant's statement, “I'm going to kill you,” as a threat to commit “any crime of violence or act dangerous to human life,” which satisfied the charge of “terrorizing”).

<sup>36</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times (Dec. 10, 2011), <http://articles.latimes.com/2011/dec/10/nation/la-na-drone-arrest-20111211>.

<sup>37</sup> 18 U.S.C. § 1385 (2011).

<sup>38</sup> *United States v. Jaramillo*, 380 F. Supp. 1375, 1379 (D. Nebraska 1974) (Posse Comitatus Act was not violated when the Army supplies local law enforcement with materiel including rifles, ammunition and personnel carriers; and local law enforcement coordinates with the National Guard to obtain aerial surveillance).

<sup>39</sup> *Id.* See also 7 Cong.Rec. 3845-3852, 4240-4248, 4295-4304, and 4688 (1878).

<sup>40</sup> *Id.*

an Act of Congress.”<sup>41</sup> During the Wounded Knee intervention “at least one aerial reconnaissance was made by the Nebraska National Guard, using National Guard personnel for the flight, at the request of the Federal Bureau of Investigation and the United States Marshal Service.”<sup>42</sup> At Wounded Knee, courts found the use of federal troops, not the use of military reconnaissance, the fact that triggered a violation of the Posse Comitatus Act.<sup>43</sup>

While the Predator was designed as a military surveillance aircraft, United States Customs and Border Protection holds title to the unit used in the Brossart arrests.<sup>44</sup> Although it is operated out of the Grand Forks Air Force Base, it is maintained in a separate hangar designated for Customs and Border Protection.<sup>45</sup>

Therefore, a Posse Comitatus violation arises only if a court determines that “military personnel directly participated in the interdiction of defendants ... or in their arrest.”<sup>46</sup> Courts have given United States Customs and Border Control latitude in using military equipment to execute its arrests. In addition to *Jaramillo*, supra, the Fifth Circuit found that the Posse Comitatus Act was not violated when a U.S. Customs Service Agent aboard a United States Air Force Airborne Warning and Control System (AWACS) training flight used Air Force technology to observe drug smuggling.<sup>47</sup> Therefore, it is unlikely that a court could rule against the use of the Predator in the Brossart arrests. However, even if Sherriff Janke committed a Posse Comitatus violation, the Brossart brothers would still be liable for criminal penalties because Posse Comitatus violations do not permit “the criminal . . . to go free because the constable has blundered.”<sup>48</sup>

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<sup>41</sup> *Id.*

<sup>42</sup> *Id.* at 1379.

<sup>43</sup> *United States v. Red Feather*, 392 F. Supp. 916, 923 (D.S.D. 1975) (determining that direct involvement of U.S. Military personnel in the occupation of Wounded Knee constitutes unlawful conduct under the Posse Comitatus Act).

<sup>44</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times (Dec. 10, 2011), <http://articles.latimes.com/2011/dec/10/nation/la-na-drone-arrest-20111211>.

<sup>45</sup> Personal communication with Brian Bennett LA TIMES correspondent (Feb. 15, 2012).

<sup>46</sup> *Id.*

<sup>47</sup> *United States v. Hartley*, 796 F.2d 112, 115 (5th Cir. 1986). See also *United States v. Jaramillo*, 380 F. Supp. 1375, 1379 (D. Nebraska 1974)

<sup>48</sup> *United States v. Walden*, 490 F.2d 372, 376 (4th Cir. 1974) (quoting *People v. Defore*, 242 N.Y. 13, 21 (1926)).

*B. Was the Fourth Amendment violated when the Sheriff used a Predator to track the suspects?*

The privacy ramifications of the Brossart brothers' arrest rise and fall "on whether the Fourth Amendment was violated - i.e., whether the governmental intrusion was reasonable."<sup>49</sup> The Fourth Amendment protects citizens against law enforcement serving general warrants.<sup>50</sup> General warrants are open ended search warrants, lacking a description of specific places to be searched or specific persons or things for the police to seize.<sup>51</sup>

There is widespread understanding that fugitives with outstanding warrants have no reasonable expectation of privacy.<sup>52</sup> If the facts described in the news are accurate, the Predator was called out to locate the three Brossart brothers only after the police obtained valid arrest warrants.<sup>53</sup> Because the Predator was not involved in the collection of evidence used to charge the Brossart brothers with "terrorizing," its use is incidental to their criminal prosecution. There are no allegations that the Predator was used either for open-ended surveillance under a warrant or for warrantless reconnoitering of the Brossart property. Instead, the Predator tracked the brothers, out doors, at a time when they were considered

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<sup>49</sup> *O'Connor v. Ortega*, 480 U.S. 709, 732 (1987) (Scalia, J., concurring) (noting that there exist exceptions to the warrant requirement when "'special needs, beyond the normal need for law enforcement, make the warrant and probable-cause requirement impracticable . . .'" (citing *New Jersey v. T.L.O.*, 469 U.S. 325, 351 (1985) (Blackmun, J., concurring))). See also *California v. Ciraolo*, 476 U.S. 207, 211 (1986) ("The touchstone of Fourth Amendment analysis is whether a person has a "constitutionally protected reasonable expectation of privacy." (reaffirming J. Harlan's concurrence in *Katz vs. United States*).

<sup>50</sup> U.S. Const. amend. IV, cl. 2 (requiring that warrants "particularly describe the place to be searched, and the persons or things to be seized").

<sup>51</sup> *Marron v. United States*, 275 U.S. 192, 196 (1927) (noting that the Fourth Amendment requirement "that warrants shall particularly describe the things to be seized makes general searches under them impossible and prevents the seizure of one thing under a warrant describing another").

<sup>52</sup> *Warden, Md. Penitentiary v. Hayden*, 387 U.S. 294, 313 (1967) (Douglas, J., dissent) (discussing the Exigent Circumstances exception for police in "hot pursuit" of a fugitive notes that "the right of privacy protected by the Fourth Amendment . . . does not make [the home or office] sanctuaries where the law can never reach. . . . A policeman in 'hot pursuit' or an officer with a search warrant can enter any house, any room, any building, any office. The privacy of those places is of course protected against invasion except in limited situations.)

<sup>53</sup> 5 *Arrested in Armed Standoff Near Lakota, ND*, WDAY 6 News (Jun. 24, 2011, 11:19 AM), [http://www.wday.com/event/article/id/9251/publisher\\_ID/30/](http://www.wday.com/event/article/id/9251/publisher_ID/30/).

fugitives from the law.<sup>54</sup> It is unlikely that a violation-of-privacy counterclaim will prove successful.<sup>55</sup>

Although the Brossart case appears to have been settled without trial, had this case gone to trial it seems unlikely that the defense could have successfully attacked the legality of police use of the Predator on either Posse Comitatus or Fourth Amendment grounds.<sup>56</sup> Because the government's use of the Predator was incidental to the filing of criminal charges, it seems improbable that any trial record could have preserved the drone related controversy in a manner suitable for appellate review.

## II. WHAT ARE DRONES?

The media uses the word "drone" to refer to a wide variety of unmanned flying machines. Before building the Flyer, Orville and Wilbur Wright worked out their ideas by testing unmanned, albeit cable-controlled, gliders.<sup>57</sup> "As early as 1914, the British military" experimented with unpiloted aircraft, reaching some level of success by the late 1920's.<sup>58</sup> During the Second World War, Nazi Germany deployed large numbers of V-1 "buzz bombs."<sup>59</sup> These early cruise missiles were bomb-laden aircraft pre-programmed for automatic flight from launch to a specific target destination.<sup>60</sup>

After the Second World War, hobbyists popularized home built, radio-controlled (R/C) airplanes. In the United States,

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<sup>54</sup> Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. Times (Dec. 10, 2011), <http://articles.latimes.com/2011/dec/10/nation/la-na-drone-arrest-20111211>.

<sup>55</sup> *Payton v. New York*, 445 U.S. 573, 576 (1980) (determining that the "reasons for upholding warrantless arrests in a public place do not apply to warrantless invasions of the privacy of the home.") (The reported circumstances involving the Brossart sons involved warrantless surveillance outside of the home as a prelude to an outside the home arrest; the Payton counterargument cannot control.).

<sup>56</sup> Stephen J. Lee, *Brossart family reaches plea deal with prosecutors over stand-off charges*, Grand Forks Herald, (Jan. 24, 2013). ("The Lakota, N.D., farmer involved in a months-long stand-off with law enforcement in 2011 has struck a plea deal that would keep him and four of his children from serving any time behind bars or having a felony on their record.")

<sup>57</sup> Russell Freedman, *The Wright Brothers: How They Invented the Airplane*, 31, 36-37 (Holiday House, 1991).

<sup>58</sup> Kenneth P. Werrell, *The Cruise Missile: Precursors and Problems*, Air U. Rev., Jan.-Feb. 1981, <http://www.airpower.maxwell.af.mil/airchronicles/aureview/1981/jan-feb/werrell.htm>.

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

these operators were largely unregulated<sup>61</sup> and voluntarily complied with rules set up by the Academy of Model Aeronautics.<sup>62</sup> The Government expressly encouraged hobbyist use: the FCC allocated RF spectrum for radio control,<sup>63</sup> while the FAA issued guidelines regarding the permissible conditions for flight of R/C aircraft.<sup>64</sup>

Federal law permits the Government to regulate the development and sale of technology under International Traffic -in -Arms Regulations (ITAR).<sup>65</sup> These regulations grant the Government the ability to restrict domestic commercial, as well as export, sales of “defense articles.”<sup>66</sup> Items may be defined as “defense articles” if they have “significant military or intelligence applicability.”<sup>67</sup> Both the inherent flight capability of a drone and its surveillance payload may cause it to be considered a *de facto* defense article, even if it was assembled from a collection of unregulated parts.

The word “drone” initially referred to large, radio-controlled, remotely piloted military aircraft. Unmanned aerial vehicles (UAV’s), such as the Global Hawk or Predator and Reaper, have seen considerable use overseas in the run-up to—and the aftermath of—the Second Gulf War.<sup>68</sup> First generation drones carried only surveillance electronics; they

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<sup>61</sup> Federal Aeronautics regulations are found in Title 14 of the Code of Federal Regulations. FAA guidelines for model aircraft were found in the form of an advisory circular, AC 91-57. These guidelines were never formally part of a Federal Statute or promulgated into a regulation compiled as part of the Code of Federal Regulations. AC 91-57 purports to clarify 14 C.F.R. § 91 “Air Traffic and General Operating Rules” for Aircraft but does not expressly trace its reasoning to any specific subsection of 14 C.F.R. § 91.103. *See generally*: TIMOTHY T. TAKAHASHI, DRONES IN THE NATIONAL AIRSPACE (J. AIR L. & COM. FORTHCOMING 2013). *See also*: FAA Advisory Circular 91-57, June 9, 1981. *See generally*: 14 C.F.R. § 91.103 (2012).

<sup>62</sup> *See Academy of Model Aeronautics National Model Aircraft Safety Code*, Academy of Model Aeronautics (Jan. 1, 2011), (<http://www.modelaircraft.org/files/105.pdf>.)

<sup>63</sup> See 47 C.F.R. § 95.201 *et seq.* (2011), for current regulations.

<sup>64</sup> Dep’t of Transp., Fed. Aviation Admin., Advisory Circular 91-57 (1981).

<sup>65</sup> 22 C.F.R. §§ 120.1 – 130.17 *et seq.* (2011).

<sup>66</sup> 22 C.F.R. § 121.1 (2011) (enumerated defense articles include “guns over .50 caliber,” the ammunition for the articles listed in Sections I and II of the regulation, and aircraft “which are specifically designed, modified, or equipped for military purposes,” including for “electronic and other surveillance”).

<sup>67</sup> 22 C.F.R. § 120.3(b) (2011).

<sup>68</sup> *See generally* *RQ-4 Global Hawk*, U.S. Air Force (Jan. 27, 2012), <http://www.af.mil/information/factsheets/factsheet.asp?fsID=13225>; *MQ-1B Predator*, U.S. Air Force (Jan. 5, 2012), <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122>; *MQ-9 Reaper*, U.S. Air Force (Jan. 5, 2012), <http://www.af.mil/information/factsheets/factsheet.asp?fsID=6405>.

were used expressly (solely?) for reconnaissance missions.<sup>69</sup> Later generation drones were adapted to perform “hunter/killer” missions; they carry both surveillance electronics and weapons.<sup>70</sup>

Today, media reports use the word “drone” to refer to all sorts and sizes of radio-controlled, remotely-piloted, semi-autonomous or fully autonomous aircraft, including hobbyist, radio controlled airplanes.<sup>71</sup>

Advances in the miniaturization of electronic equipment permit a small hobbyist R/C aircraft to carry a wide range of sensors.<sup>72</sup> Commercial entities have arisen to exploit this marketing opportunity; they sell ready-to-fly R/C aircraft equipped with various remote sensing instruments.<sup>73</sup> Considerable military development funding has been directed to design both very large and very small UAVs for surveillance and strike missions.<sup>74</sup>

The press marvels at the degree of automation found in military “drone” aircraft.<sup>75</sup> The Predator “drone” of *Brossart* fame can be hand flown by its remote, ground-based pilot as well as flown hands off on a course programmed to overfly

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<sup>69</sup> See generally *RQ-4 Global Hawk*, U.S. Air Force (Jan. 27, 2012), <http://www.af.mil/information/factsheets/factsheet.asp?fsID=13225> (last visited Jan. 31, 2012).

<sup>70</sup> See *MQ-1B Predator*, U.S. Air Force (Jan. 5, 2012), <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122> (“A change in designation from RQ-1 to MQ-1 occurred in 2002 with the addition of the AGM-114 Hellfire missiles, enabling reaction against ISR, CAS and interdiction targets”).

<sup>71</sup> Jason Ukman, *Privacy Group Seeks to Lift Veil on Domestic Drones*, Wash. Post (Jan. 13, 2012), [http://www.washingtonpost.com/blogs/checkpoint-washington/post/privacy-group-seeks-to-lift-veil-on-domestic-drones/2012/01/12/gIQABH6OuP\\_blog.html](http://www.washingtonpost.com/blogs/checkpoint-washington/post/privacy-group-seeks-to-lift-veil-on-domestic-drones/2012/01/12/gIQABH6OuP_blog.html). See also Glenn Greenwald, *The Growing Menace of Domestic Drones*, Salon (Dec. 12, 2011), [http://www.salon.com/2011/12/12/the\\_growing\\_menace\\_of\\_domestic\\_drones](http://www.salon.com/2011/12/12/the_growing_menace_of_domestic_drones).

<sup>72</sup> Nick Wingfield and Somini Sengupta, *Drones Set Sights on U.S. Skies*, N.Y. Times, Feb. 18, 2012, at A1.

<sup>73</sup> *Id.*

<sup>74</sup> See generally Michael Hoffman, *The Plan for Smaller, Faster, Deadlier UAV's*, Air Force Times (June 10, 2009), [http://www.airforcetimes.com/news/2009/06/airforce\\_uas\\_automation\\_061009w/](http://www.airforcetimes.com/news/2009/06/airforce_uas_automation_061009w/). See also *AFRL Cuts Ribbon on New Micro Air Vehicle Research Facility*, U.S. Air Force Research Laboratory Newsletter: Air Vehicle News and Accomplishments (U.S. Air Force Research Laboratory, Wright-Patterson Air Force Base, OH), July 2010.

<sup>75</sup> See, e.g., Joseph Nevins, *Robocop: Drones at Home*, Boston Review, January/February 2011, available at <http://www.bostonreview.net/BR36.1/nevins.php> (retrieved Jan 16, 2012); Yochi J. Dreazen, *From Pakistan, With Love: The Technology Used to Monitor the Skies Over Waziristan Is Coming to Your Hometown*, National Journal (Mar. 13, 2011), <http://www.nationaljournal.com/magazine/drones-may-be-coming-to-your-hometown-20110313>.

specific waypoints.<sup>76</sup> While technology is expanding the boundaries of aircraft autonomy, “sentient” autonomous drones remain creations of science fiction.<sup>77</sup>

*A. Drones are flying machines which carry a variety of remote sensing instruments*

This discussion bases the distinction between various hobbyist, commercial, military and quasi-military “drones” on their inherent performance capabilities as a flying machine.

The General Atomics Predator (see Figure 2) and the Northrop Grumman Global Hawks represent a class of unmanned aircraft that operationally resemble conventional aircraft.<sup>78</sup> They fly from conventional runways.<sup>79</sup> Nothing

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<sup>76</sup> *MQ-1B Predator*, U.S. Air Force (Jan. 5, 2012),

<http://www.af.mil/information/factsheets/factsheet.asp?fsID=122>.

<sup>77</sup> Press reports marveling at the autonomy of robotic aircraft do not tend to differentiate the subtleties in terms of what is “new” in contrast to legacy autonomous systems such as the V-1 or Tomahawk. None of the systems described are “sentient” in either a cyborg RoboCop or droid ED-209 sense as depicted in the 1987 film, *Robocop*.

(<http://www.imdb.com/title/tt0093870/plotsummary>). The reader should consider the differing

levels of autonomy represented by various unmanned aircraft: 1) an aircraft that is human controlled in “real-time” from a remote location (analogous to a traditional, hobbyist R/C aircraft – 1940’s technology), 2) an aircraft that is human programmed to fly to specific waypoints (represented by the 1940’s technology V-1, as well as the current generation of cruise missiles represented by Raytheon’s Tomahawk), 3) an aircraft that has limited, autonomous behavior (such as a heat-seeking air-to-air missile – represented by 1950’s technology AIM-9 Sidewinder Missile), and 4) an aircraft that contains significant “sentient activity” (which must be represented by a hypothetical flying machine that acts without human intervention to acquire, track and/or destroy a target of interest). See also *U.S. Navy Fact Sheet: Tomahawk Cruise Missile*, U.S. Navy (Apr. 23, 2010),

[http://www.navy.mil/navydata/fact\\_print.asp?cid=2200&tid=1300&ct=2&page=1](http://www.navy.mil/navydata/fact_print.asp?cid=2200&tid=1300&ct=2&page=1) (detailing the features and level of autonomy of a Tomahawk Land Attack Missile). U.S. Navy Fact Sheet:

*AIM-9 Sidewinder Missile*, U.S. Navy

[http://www.navy.mil/navydata/fact\\_display.asp?cid=2200&tid=1000&ct=2](http://www.navy.mil/navydata/fact_display.asp?cid=2200&tid=1000&ct=2) (detailing the features and level of autonomy of a Sidewinder Missile).

<sup>78</sup> See generally U.S. Air Force, *Factsheet: MQ-1B Predator*,

<http://www.af.mil/information/factsheets/factsheet.asp?fsID=122> (last visited Jan. 31, 2012);

U.S. Air Force, *Factsheet: RQ-4 Global Hawk*,

<http://www.af.mil/information/factsheets/factsheet.asp?fsID=13225> (last visited Jan. 31, 2012).

<sup>79</sup> *Id.*

Fig. 2: General Atomics Predator B Drone<sup>80</sup>

inherent to their mission profile, speed, altitude, endurance or agility is extraordinary; they basically replace manned surveillance aircraft.<sup>81</sup> While automation extends their endurance and enhances their utility, these UAVs operate in a world dominated by the rules and customs of manned aircraft.<sup>82</sup>

The second category of unmanned aircraft may be broadly considered the progeny of R/C model aircraft. They include production drones such as the US Air Force's RQ-11B Raven and the Wasp III  $\mu$ UAS (see Figure 3).<sup>83</sup> They are much smaller than manned aircraft; they do not operate from conventional runways.<sup>84</sup> These unmanned flying robots are so small that they perform missions flying to locations

<sup>80</sup> See U.S. Air Force, *Factsheet: MQ-1B Predator*, <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122> (last visited Jan. 31, 2012).

<sup>81</sup> *Id.* (The record duration for flight of a U.S. military surveillance aircraft was set in 1961 with the U.S. Navy ZPG-2W blimp, flying a 264-hour mission that covered 8216 miles. See *U. S. Navy Lighter Than Air (LTA) Blimps, and Dirigibles*, Blue Jacket, [http://bluejacket.com/usn\\_avi\\_lta.html](http://bluejacket.com/usn_avi_lta.html) (last visited Feb. 24, 2012).

<sup>82</sup> See FAA Modernization and Reform Act of 2012, Pub. L. no. 112-95, 126 Stat 11 (2012). Print. (Subtitle B "Safety – Unmanned Aircraft Systems" instructing the FAA to perform rulemaking to regulate the operation of large, unmanned aircraft in the national airspace.).

<sup>83</sup> See U.S. Air Force, *Factsheet: RQ-11B Raven*, <http://www.af.mil/information/factsheets/factsheet.asp?fsID=10446> (last visited Jan. 31, 2012). See *U.S. Air Force, Factsheet: WASP III*, <http://www.af.mil/information/factsheets/factsheet.asp?fsID=10469> (last visited November 11, 2012)

<sup>84</sup> *Id.*

Fig. 3: AeroVironment RQ-11 Raven Drone<sup>86</sup>

unreachable by manned aircraft.<sup>87</sup> Their existence and utility entirely depend upon the capabilities of miniaturized electronics.

In an attempt to decouple mission endurance from flight time, some prototype designs incorporate “perch-and-stare” capability. Such a capability would permit the drone to avoid energy-intensive moving or hovering flight by securing itself to a vantage point and turning off its propulsion mechanism.<sup>88</sup> Because operation of the propulsion system consumes significant amounts of energy, battery life may be greatly extended.<sup>89</sup> The more speculative research includes bio-mimetic configurations, such as the DARPA/AeroVironment robotic Hummingbird (see Figure 4).<sup>90</sup> More conventional designs include quad-rotor configurations (see Figure 5) as well as airplanes that double as helicopters.<sup>91</sup> The best way to envision “perch-and-stare”

<sup>86</sup> *Id.*

<sup>87</sup> *Id.* (The WASP III has a 28.5 inch wingspan, it is 10 inches long, much smaller than any manned aircraft)

<sup>88</sup> AeroVironment Unveils Shrike: A VTOL UAV With Perch-And-Stare Capabilities, UAV Business Review, (Sept. 4, 2011), <http://uavbusinessreview.com/2011/09/04/aerovironment-unveils-shrike-a-vtol-uav-with-perch-and-stare-capabilities/>.

<sup>89</sup> *Id.* (The Shrike can send surveillance video while moving, hovering or “perch”ing. Flight endurance while hovering is limited to 40 minutes. In perch and stare mode battery life is sufficient to transmit “several hours of live video”).

<sup>90</sup> DARPA Defense Sciences Office, *Nano Air Vehicle (NAV)*, [http://www.darpa.mil/Our\\_Work/DSO/Programs/Nano\\_Air\\_Vehicle\\_\(NAV\).aspx](http://www.darpa.mil/Our_Work/DSO/Programs/Nano_Air_Vehicle_(NAV).aspx) (last visited Jan. 31, 2012). See also W.J. Hennigan, *It's a Bird! It's a Spy! It's Both*, L. A. Times., Feb. 17, 2011 at Business. B1.

<sup>91</sup> DARPA Tactical Technology Office, *Shrike*, [http://www.darpa.mil/Our\\_Work/TTO/Programs/Shrike.aspx](http://www.darpa.mil/Our_Work/TTO/Programs/Shrike.aspx) (last visited Jan. 31, 2012). See also David Hambling, *Aussie Hovering Drone Straight Outta Avatar*, Wired (Dec. 17, 2009), <http://www.wired.com/dangerroom/2009/12/australian-drone-perches-stares/>.

drones is to consider them unattended, ground-based, remote sensing devices that have an ability to relocate at the command of a remote operator.

Fig. 4: DARPA/Aerovironment nanoUAV<sup>92</sup>



Fig. 5: DARPA Shrike QuadRotor<sup>93</sup>



“Perch-and-stare” capability in a small surveillance UAV offers great tactical advantage. The ability to fly below navigable airspace allows sensors to operate from vantage points inaccessible by humans and conventional aircraft. By powering down the propulsion system, the persistence of surveillance can be extended greatly. Biomimetic designs, such as a robotic pigeon or hummingbird, provide an inherent camouflage advantage. While these features certainly provide transformative military capability, their potential use in domestic law enforcement is unsettling.

<sup>92</sup> DARPA Defense Sciences Office, *Nano Air Vehicle (NAV)*.  
[http://www.darpa.mil/Our\\_Work/DSO/Programs/Nano\\_Air\\_Vehicle\\_\(NAV\).aspx](http://www.darpa.mil/Our_Work/DSO/Programs/Nano_Air_Vehicle_(NAV).aspx) (last visited Jan. 31, 2012).

<sup>93</sup> DARPA Tactical Technology Office, *Shrike*,  
[http://www.darpa.mil/Our\\_Work/TTO/Programs/Shrike.aspx](http://www.darpa.mil/Our_Work/TTO/Programs/Shrike.aspx) (last visited Jan. 31, 2012).

*B. Drone sensors may incorporate newly-developed or restricted-access military technology*

The surveillance mission payload of a UAV may contain a wide variety of sensors and detectors. First, surveillance UAVs are equipped with radio transmitters and receivers; they communicate with their master throughout the mission. Second, almost every UAV has some sort of position tracking system used for navigation. Together, these elements cause the drone to inherently relay situational location information back to their operators. By reporting their own location history, they infer the time history of the activities that they observe.<sup>94</sup>

*Optical – Visible Light Imaging*

Almost all surveillance UAVs are equipped with some form of visible light imaging system. Modern high resolution digital video cameras have a wide dynamic range, providing high quality imaging even in dim light.<sup>95</sup> This level of imaging capability can exist on almost any UAV, small or large. The Predator UAV described in the *Brossart* case is equipped with high-resolution daylight video imaging capability.<sup>96</sup>

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<sup>94</sup> If a “drone” is visually tailing a suspect, it is essentially providing its operator with information akin to the information provided by a GPS transponder on the suspect’s person. See United States v. Jones, 132 S. Ct. 945, 956 (2012). (Sotomayor, J., observing that merely knowing the location of a suspect over a long period of time reveals significant details about that person’s private life.)

<sup>95</sup> Whereas analogue film speeds are typically limited to a maximum sensitivity of ISO 3200, modern digital cameras can capture light with “barely any detectable noise at ISO of 3200 or higher. The prosumer Canon EOS-1DX camera features a sensitivity equivalent to ISO 51200 film. An ISO 51200 speed 18.1 MP sensor produces a high-resolution image in extremely dim light. See generally: [http://www.usa.canon.com/cusa/consumer/products/cameras/slr\\_cameras/eos\\_1d\\_x](http://www.usa.canon.com/cusa/consumer/products/cameras/slr_cameras/eos_1d_x) (last visited Oct. 7, 2012).

<sup>96</sup> U.S. Air Force, Factsheet: MQ-1B Predator, <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122> (last visited Jan. 31, 2012) (The Predator B carries a “Multi-spectral Targeting System ... which integrates an infrared sensor, a color/monochrome daylight TV camera, an image-intensified TV camera, a laser designator and a laser illuminator into a single package. The full motion video from each of the imaging sensors can be viewed as separate video streams or fused together.)

*Optically Enhanced Imaging – Night Vision / FLIR*

Image intensification technology is widely employed in “night vision goggles;” this system amplifies visible wavelength light using a solid-state photocathode device.<sup>97</sup> In addition, digital imaging sensors may be constructed that are sensitive to non-visible wavelengths such as ultra-violet or infra-red light.<sup>98</sup> These technologies permit detailed observations to be made under adverse weather and lighting conditions.

Although “night vision goggles” are commercially available in the United States, technology that incorporates infra-red focal plane arrays remain inaccessible to citizens because the government has designated such sensors as export-controlled “defense articles.”<sup>99</sup> The Predator UAV described in the *Brossart* case is equipped with night-vision “image intensifier” video imaging capability as well as an infra-red thermal imaging camera.<sup>100</sup>

*Acoustical – “Listening In”*

Although rarely discussed by the media, acoustical eavesdropping capability can be effectively implemented on perch-and-stare drones. Either direct acoustical reception using a conventional microphone or a laser optical microphone may be used to surreptitiously record conversations.<sup>101</sup> Acoustical systems function by day and by

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<sup>97</sup> See Night Vision Goggles (NVG), GlobalSecurity.org, (Jul. 7, 2011), <http://www.globalsecurity.org/military/systems/ground/nvg.htm>.

<sup>98</sup> Improved infrared and ultraviolet sensitive focal-plane arrays are the subject of current government-sponsored university research. See *Digital Focal-Plane Arrays*, Massachusetts Institute of Technology Tech Notes, [http://www.ll.mit.edu/publications/technotes/TechNote\\_DFPA.pdf](http://www.ll.mit.edu/publications/technotes/TechNote_DFPA.pdf) (last visited Oct. 7, 2012).

<sup>99</sup> 22 C.F.R. § 121.1 Category XII(c) (2011); see FLIR, *Tau Uncooled Cores*, <http://www.flir.com/cvs/cores/view/?id=51374> (last visited Oct. 14, 2012). (The FLIR company produces thermal imaging systems based upon infra-red sensitive focal plane arrays such as the Tau Uncooled Thermal Imaging Camera Core.).

<sup>100</sup> U.S. Air Force, *Factsheet: MQ-1B Predator*, <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122> (last visited Jan. 31, 2012). (The Predator B carries a “Multi-spectral Targeting System ... which integrates an infrared sensor, a color/monochrome daylight TV camera, an image-intensified TV camera, a laser designator and a laser illuminator into a single package. The full motion video from each of the imaging sensors can be viewed as separate video streams or fused together.)

<sup>101</sup> See *Our Product*, BestLaserMicrophones.com,

night while laser systems function on wavelengths not easily visible to humans.<sup>102</sup> No physical trespass is necessary in order to record the sounds from inside a structure.<sup>103</sup> The usable range of these devices may approach 1000 feet, allowing the UAV to remain “off-premises” while recording.<sup>104</sup> National Public Radio reports that laser microphones (separate from UAVs) were used in the surveillance leading to the apprehension and death of noted terrorist Osama Bin Laden.<sup>105</sup>

Some commercial laser microphone surveillance system vendors restrict sales to law enforcement and other government-approved users.<sup>106</sup> This behavior implicitly concedes the government’s designation of laser microphones as controlled “defense articles.”<sup>107</sup> But, instructions exist for the hobbyist to construct such a system from off-the-shelf parts.<sup>108</sup> Local law enforcement officers are not prevented from using this technology. 109

### *Olfaction – Airborne Dilute Chemical Detection*

Press reports describe the inherent synergy between

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<http://www.bestlasermicrophones.com/ourproduct.html> (last visited Oct. 14, 2012).

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> Melissa Block, host. *All Things Considered*, National Public Radio, (May 4, 2011), <http://www.npr.org/2011/05/04/135995089/cia-used-satellites-to-prep-for-bin-laden-raid>. (John Pike, the director of GlobalSecurity.org, asserted that laser microphones were used by the CIA in finding Osama Bin Laden.).

<sup>106</sup> *Id.*; see also 22 C.F.R. § 120.3 (2011). (The language of 22 C.F.R. §120.3 implies that it is likely that such a laser-microphone surveillance systems are defense articles; consequently vendors voluntarily chose to not risk selling it to regular U.S. civilians.).

<sup>107</sup> See 22 C.F.R. § 120.3 (2011) (technologies with specific military or intelligence applicability are controlled by the ITAR); see also: 22 C.F.R. § 121.1. Category IXXI (b) (2011) (ITAR regulates sales of electronics designed for “intelligence, security, or military purposes for use in ... reconnaissance, collection, [and] monitoring.”).

<sup>108</sup> DIY plans to build a laser microphone in *Build the Long Range Laser Spy System*, Lucid Science, <http://www.lucidscience.com/pro-laser%20spy%20device-1.aspx> (last visited Oct 14, 2012).

<sup>109</sup> See 22 C.F.R. § 120.1(c) (2011) (“Only U.S. persons ... and foreign governmental entities in the United States **may** be granted licenses or other approvals” only a “U.S. person” or “a foreign governmental entity in the United States may receive an export license or other export approval.” While ITAR restricts sales of enumerated articles to the general public, this regulation permits sales of ITAR restricted to clients vetted by the Federal Government. ITAR does not restrict state and local law enforcement agencies from accessing regulated technology.).

drones and electronic noses.<sup>110</sup> Solid-state devices, fabricated from advanced conducting polymers, can detect trace quantities of specific long-chain molecules.<sup>111</sup> These detectors can differentiate among many odors. They can monitor basic air quality and detect explosives.<sup>112</sup> They can also differentiate between a variety of acids, alcohols, amines, and thiols.<sup>113</sup> Law enforcement has successfully employed scent detection for centuries by relying on dogs. Press reports note the field-testing of a sophisticated olfactory sensor on an AeroVironment RQ-11B Raven drone.<sup>114</sup> With an “electronic nose,” a law enforcement drone could conceivably confirm the presence of explosives, detect the aroma of smoldering cannabis or follow the perfumed scent of a suspect.

### *Sense-Through-The-Walls – Imaging Radar*

The press has reported on what is colloquially known as Sense-Through-The-Wall (STTW) technology.<sup>115</sup> Imaging radar uses microwave RF transmission and reception technology to produce detailed images at great distances through smoke, haze and other opaque media.<sup>116</sup> Recent advances have miniaturized this technology; other advances allow radar to create three-dimensional renderings of optically hidden objects.<sup>117</sup>

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<sup>110</sup> See Noah Schactman, *Drones See, Smell Evil from Above*, Wired.com ( Mar. 24, 2003), <http://www.wired.com/politics/law/news/2003/03/58173> (describing the ACR Silver Fox drone that was fitted with nerve gas sensors that can detect various toxins in the air).

<sup>111</sup> Josephine B. Chang and Vivek Subramanian, *Electronic Noses Sniff Success*, IEEE Spectrum, March, 2008., available at <http://spectrum.ieee.org/biomedical/devices/electronic-noses-sniff-success>.

<sup>112</sup> *Id.*

<sup>113</sup> *Id.*

<sup>114</sup> *Smiths Detection, AeroVironment Show Chemical Sensing* show chemical sensing UAV, . HOMELAND SECURITY NEWSWIRE, . Oct 5, [www.homelandsecuritynewswire.com/smiths-detection-aerovironment-show-chemical-sensing-uav](http://www.homelandsecuritynewswire.com/smiths-detection-aerovironment-show-chemical-sensing-uav) (Oct. 5, 2009) . (The basic RQ-11B is a military drone; this article describes the inclusion of a new “smell” sensor into its electronics package.).

<sup>115</sup> William Saletan, *Nowhere to Hide: Killer Drones That Can See Through Walls*, Slate (Sept. 17, 2008), [http://www.slate.com/articles/health\\_and\\_science/human\\_nature/2008/09/nowhere\\_to\\_hide.html](http://www.slate.com/articles/health_and_science/human_nature/2008/09/nowhere_to_hide.html)

<sup>116</sup> See Melissa Healy, *New Radar Plane Rushed Into Duty: Military Field Tests for the JSTARS Aircraft Are Cut Short. It Will Help Plot Movement of Iraqi Ground Forces*, L.A. Times, (Jan. 15, 1991), available at [http://articles.latimes.com/1991-01-15/news/mn-341\\_1\\_ground-forces](http://articles.latimes.com/1991-01-15/news/mn-341_1_ground-forces).

<sup>117</sup> U.S. Patent Application No. 13/105,096, Publication No. US 2011/0285577 A1 (published Nov.

Imaging radar can look “through multiple walls and even penetrate whole buildings.”<sup>118</sup> A cooperative system involving a single transmitter and distributed receivers can provide “intelligence on the configuration, content, and human presence inside enclosed areas [buildings].”<sup>119</sup> The press reports recent military acquisition proposals seeking this capability in a lightweight (less than 30 lbs.) and portable (less than 4 cubic feet) form factor.<sup>120</sup> While the power requirements of imaging radar render it improbable for inclusion on a covert robotic pigeon, the systems are clearly becoming small enough to be used in urban law enforcement. It is unclear from press reports what form of imaging radar capability exists on production drone aircraft.<sup>121</sup> Imaging radar is an enumerated export-controlled technology not commercially available to citizens.<sup>122</sup>

### *Multi-Sensor Data Fusion*

Data fusion methods can combine inputs from multiple sources to enhance surveillance capability. The press describes the military as actively funding the development of drones that “won’t just be able to look at what you do. They’ll ... they’ll be able to recognize your face -- ... and track you, based on how you look.”<sup>123</sup> Time will tell if “soft biometrics” algorithms that assemble a mix of inputs from optical and other sources to “keep track of targets . . . . 750 feet away or more” remain the subject of research grants or become practical products.<sup>124</sup>

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24, 2011) (Sun Gu Sun, Churl Park, Byung Lae Cho, Jong Soo Ha, applicants).

<sup>118</sup> William Saletan, *Nowhere to Hide: Killer Drones That Can See Through Walls*, Slate (Sept. 17, 2008),

[http://www.slate.com/articles/health\\_and\\_science/human\\_nature/2008/09/nowhere\\_to\\_hide.html](http://www.slate.com/articles/health_and_science/human_nature/2008/09/nowhere_to_hide.html)

<sup>119</sup> *Id.*

<sup>120</sup> *Id.*

<sup>121</sup> *Id.* (The article describes contracts awarded to Boeing to put STTW radar into a UAV, but does not reference a production drone featuring STTW radar). A Google search has not revealed any press reports documenting the existence of a production Boeing STTW equipped UAV.

<sup>122</sup> 22 C.F.R. § 121.1 Category XI (a)(5) (2011) (expressly enumerates imaging radar systems as a restricted technology).

<sup>123</sup> Noah Schachtman, *Army Tracking Plan: Drones that Never Forget a Face*, Wired.com (Sept. 28, 2011), <http://www.wired.com/dangerroom/2011/09/drones-never-forget-a-face/>.

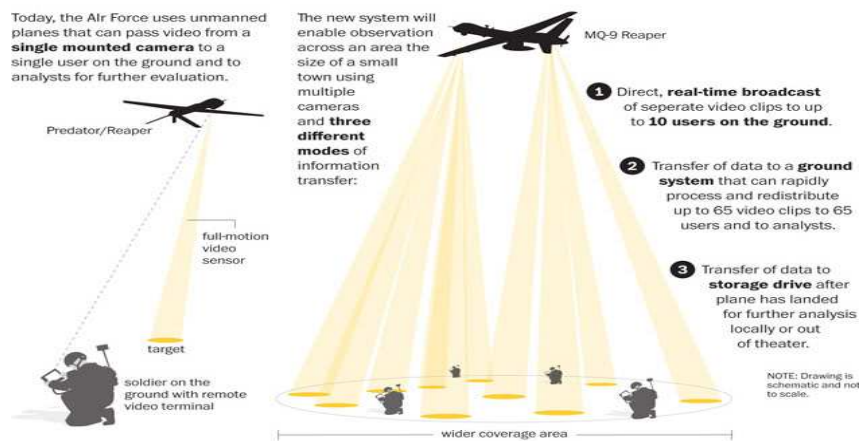
<sup>124</sup> *Id.*

### C. Drone Surveillance Telemetry is amenable to post-hoc data-mining

Traditional police eavesdropping and surveillance required humans to personally investigate and observe other humans in action. Advances in digital storage technology enable permanent storage of extraordinarily detailed data. Law enforcement need no longer prospectively observe behavior to take action; they may retrospectively review archived surveillance data.<sup>125</sup>

Recent military projects, such as project *Gorgon Stare* (see Figure 6), aim to create a dragnet environment of multi-sensor data with real-time access and archival storage and replay.<sup>126</sup> *Gorgon Stare* comprises a drone mounted multi-camera imaging system designed to observe “a whole city, so there will be no way for the adversary to know what we're looking at, and we can see everything.”<sup>127</sup>

Fig. 6 – *Gorgon Stare* Concept of Operations<sup>128</sup>



<sup>125</sup> Eric Lichtblau, *Police Are Using Phone Tracking as a Routine Tool*, N.Y. Times (Mar. 31, 2012), <http://www.nytimes.com/2012/04/01/us/police-tracking-of-cellphones-raises-privacy-fears.html?pagewanted=all>.

<sup>126</sup> Ellen Nakashima and Craig Whitlock, *With Air Force's Gorgon Drone 'We Can See Everything,'* Washington Post, (Jan. 2, 2011), <http://www.washingtonpost.com/wp-dyn/content/article/2011/01/01/AR2011010102690.html>.

<sup>127</sup> *Id.* (The article describes the Gorgon Stare technology as a real-time data fusion technique that “stitches together views from multiple cameras shooting two frames per second at half-meter resolution.”).

<sup>128</sup> *Gorgon Stare: Watching Everyone – Anywhere – Whenever They Want*, Adopt Resistance (Jan. 2, 2011), <http://adoptresistance.blogspot.com/2011/01/gorgon-stare-watching-everyone-anywhere.html>, (retrieved Apr. 5, 2012).

The military developed *Gorgon Stare* to grant foot soldiers access to electronically steered, real-time airborne situational awareness video through portable devices.<sup>129</sup> In addition, the raw imaging feed can be archived.<sup>130</sup> Analysts can study the video retrospectively “to determine, for instance, the identity of a culprit who planted an improvised bomb.”<sup>131</sup>

### III. THE COVERAGE OF THE FOURTH AMENDMENT HAS EVOLVED SINCE ITS RATIFICATION

Before the states ratified the Fourth and Fifth Amendments, “force and violence were ... the only means ... by which a government could directly affect self-incrimination.”<sup>132</sup> The Government could “compel the individual to testify ... by torture.”<sup>133</sup> Police could “secure possession of (a citizen’s) papers and other articles incident to his private life ... by breaking and entry.”<sup>134</sup> These two amendments protect citizens “against such invasion of ‘the sanctities of a man’s home and the privacies of life’ ... by specific language.”<sup>135</sup>

The Fourth Amendment states that

the right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.<sup>136</sup>

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<sup>129</sup> Ellen Nakashima and Craig Whitlock, *With Air Force’s Gorgon Drone ‘We Can See Everything,’* Washington Post (Jan. 2, 2011), <http://washingtonpost.com/wp-dyn/content/article/2011/01/01/AR2011010102690.html>.

<sup>130</sup> *Id.*

<sup>131</sup> *Id.*

<sup>132</sup> *Olmstead v. United States*, 277 U.S. 438, 471 (1971)

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> *Id.*

<sup>136</sup> U.S. Const. amend. IV.

At present, legal scholars interpret the Fourth Amendment as having two separate clauses.<sup>137</sup> The first clause states that the people are protected against “unreasonable searches and seizures.”<sup>138</sup> The second clause states that warrants may only be issued where they describe with particularity, “the place to be searched, and the persons or things to be seized.”<sup>139</sup> The boundary between the “Amendment’s Warrant Clause and Unreasonableness Clause is unclear.”<sup>140</sup> Justice Scalia has observed that “neither Clause explicitly requires a warrant.”<sup>141</sup>

The history of the Fourth Amendment’s interpretation remains important because Justice Scalia’s “originalist” viewpoint may provide the swing vote in a future privacy case.<sup>142</sup> He wrote the majority opinion in *U.S. v. Jones*, a landmark case regarding electronic surveillance.<sup>143</sup> His reasoning derives strongly from historical cases from which he ties the Fourth Amendment back to property law.<sup>144</sup> In a prior Fourth Amendment case, he grouses, “the Court has vacillated between imposing a categorical warrant requirement and applying a general reasonableness [of privacy expectation] standard.”<sup>145</sup> It seems probable that Justice Scalia wishes to resolve this issue to his satisfaction.

#### A. *The Fourth Amendment has roots in Property Law*

The Fourth Amendment’s text “reflects its close connection to property, since otherwise it would have referred simply to ‘the right of the people to be secure against unreasonable searches and seizures’; the phrase ‘in their persons, houses,

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<sup>137</sup> See generally Thomas Y. Davies, *Recovering the Original Fourth Amendment*, 98 Mich. L. Rev., 547, 550-51 (1999).547. See also U.S. Const. amend. IV (for the text of both clauses).

<sup>138</sup> U.S. Const. amend. IV, cl 1.

<sup>139</sup> U.S. Const. amend. IV, cl. 2.

<sup>140</sup> *Groh v. Ramirez*, 540 U.S. 551, 571 (2004) (Scalia, J. dissenting).

<sup>141</sup> *Id.*

<sup>142</sup> See *Arizona v. Gant*, 556 U.S. 332, 351 (2009) (Scalia, J. concurring) (“To determine what is an “unreasonable” search within the meaning of the Fourth Amendment, we look first to the historical practices the Framers sought to preserve; if those provide inadequate guidance, we apply traditional standards of reasonableness.”).

<sup>143</sup> See *United States v. Jones*, 132 U.S. 945 (2012) (This recent case has already attracted some negative treatment: see *U.S. v. Graham* 846 F.Supp.2d 384 (2012).)

<sup>144</sup> *Id.* at 949 (citing the English Case *Entick v. Carrington*, 95 Eng. Rep. 807 (C.P. 1765) which stresses the importance of private property rights in a search and seizure analysis).

<sup>145</sup> *Groh v. Ramirez*, 540 U.S. 551, 572 (2004) (Scalia, J. writing in dissent).

papers, and effects' would have been superfluous."<sup>146</sup> Traditionally, Fourth Amendment jurisprudence was "tied to common-law trespass."<sup>147</sup> Nevertheless, the Fourth Amendment does more than protect "the Lord of the Manor who holds his estate in fee simple."<sup>148</sup>

The founding fathers designed the first clause of the Fourth Amendment in light of perceived abuses by law enforcement when officers conducted discretionary searches of property and arrests.<sup>149</sup> In response to the Townshend Act of 1767, judges refused to issue writs on the basis that arming officers with a "power ... to be exercised totally at their own discretion would be ... dangerous ... and was not warranted by law."<sup>150</sup> Given this "deep-rooted distrust ... for the judgment of ordinary officers ... it is wholly implausible that the Framers would have approved of [the] broad use of warrantless intrusions[;] ... such intrusions would ... have rested solely on the officers' own judgment."<sup>151</sup> This reasoning permits little opportunity for unsupervised law enforcement to perform warrantless searches.

The founding fathers designed the second clause of the Fourth Amendment in light of a 1763 British case, *Wilkes v. Wood*.<sup>152</sup> Wilkes, a critic of the King, was charged upon evidence acquired during a search of his business premises under a general warrant.<sup>153</sup> A general warrant is a warrant "where no inventory is made of the things thus taken away, and where no offender's names are specified in the warrant, and therefore a discretionary power given to messengers to search wherever their suspicions may chance to fall."<sup>154</sup> The Crown Court ruled the evidence inadmissible, holding that if the Court were to allow the Crown to issue general warrants "such a power ... [would] affect the person and property of

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<sup>146</sup> *Jones*, at 949 (quoting U.S. Const. amend. IV, cl. 1).

<sup>147</sup> *Id.* at 949.

<sup>148</sup> *Minnesota v. Carter*, 525 U.S. 83, 95 (1998) (Scalia, J. concurring).

<sup>149</sup> Thomas Y. Davies, *Recovering the Original Fourth Amendment*, 98 Mich. L. Rev. 547, at 576-77, 580-81 (1999).

<sup>150</sup> *Id.* at 581.

<sup>151</sup> *Id.* at 582.

<sup>152</sup> Samantha Trepel, *Digital Searches, General Warrants and Case for the Courts*, 10 Yale J. L. & Tech., 120, 123 (2007).

<sup>153</sup> *Wilkes v. Wood*, 98 Eng. Rep. 489, 498-99 (C.P. 1763).

<sup>154</sup> *Id.*

every man in this kingdom, and is totally subversive of the liberty of the subject.”<sup>155</sup>

The Supreme Court affirmed these principles in the 1886 landmark case of *Boyd v. United States*. In *Boyd*, the Supreme Court considered the threshold question of when “a search and seizure . . . of a man's private papers, to be used in evidence against him, ... [is] an ‘unreasonable search and seizure’ within the meaning of the Fourth amendment.”<sup>156</sup> To answer that question, “the Court asked whether the papers sought by the Government were subject to seizure at all, no matter how specifically identified, and no matter how supported by evidence of probable cause.”<sup>157</sup>

In *Boyd*, the Supreme Court held that “the first freedom of the Fourth Amendment protects the people from any search for or seizure of any private property to which Government could not affirmatively demonstrate that it had a superior right.”<sup>158</sup> This interpretation of the Fourth Amendment limited the reach of the Government, even if it “could meet the warrant, probable cause, and particularity requirements of the Amendment, it could not search for [evidence] ... unless that property was shown to be the fruit of a crime, an instrumentality of a crime, or contraband.”<sup>159</sup>

The Supreme Court upheld this viewpoint throughout the 1920's. For example, in *Gouled v. United States* the Court held that search warrants “may not be used as a means of gaining access to a man's house or office and papers solely for the purpose of making search to secure evidence to be used against him.”<sup>160</sup> The penumbra of the Fourth Amendment protected citizens so that articles on their property could not be used to subvert their Fifth Amendment privilege against self-incrimination.<sup>161</sup> *Gouled* marked the beginning of a shift

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<sup>155</sup> *Id.*

<sup>156</sup> *Boyd v. United States*, 116 U.S. 616, 622 (1886) (abrogated by *Warden, Md. Penitentiary v. Hayden*, 387 U.S. 294 (1967)).

<sup>157</sup> Brief for Gun Owners of America, Inc. et al. as Amici Curiae Supporting Respondent at 19, *United States v. Jones*, 132 S. Ct. 945 (2012) (No. 10-1259), 2011 WL 4590837 [hereinafter Amicus Brief] (paraphrasing *Boyd v. United States*, 116 U.S. 616 (1886)).

<sup>158</sup> Amicus Brief for Gun Owners of America, Inc. et al. as Amici Curiae Supporting Respondent at 3, *United States v. Jones*, 132 S. Ct. 945 (2012) (No. 10-1259), 2011 WL 4590837, 3 (U.S., 2011). [hereinafter Amicus Brief]; see generally *Boyd*, 116 U.S. at 622.

<sup>159</sup> *Id.* Amicus Brief at 3.

<sup>160</sup> *Gouled v. United States*, 255 U.S. 298, 309 (1921).

<sup>161</sup> Amicus Brief at 21. See generally *Gouled*, 225 U.S. at 309.

where the court contemplated the existence of an implied constitutional right of privacy.

*A. Beginning with Olmstead, the Supreme Court granted the police a right to conduct warrantless wiretaps*

In 1928, the Supreme Court refused to apply the Fourth Amendment to a wiretap on a person's telephone line. It held that a warrantless wiretap was a constitutional use of police discretion.<sup>162</sup> The *Olmstead v. United States* majority found that the Fourth Amendment protected only real property “material things” from search and seizure.<sup>163</sup> When the Supreme Court later overruled the *Olmstead* holding, it found the earlier holding inconsistent with the implied Fourth Amendment privacy doctrine. “The *Olmstead* ruling was an egregious violation of the Fourth Amendment's property principles” because it considered only the protection of tangible property, rather than real, personal and intellectual property from search.<sup>164</sup>

*B. Justice Brandeis' dissent in Olmstead articulated the modern view that the Fourth Amendment protects more than real property from warrantless search and seizure*

In his dissent in *Olmstead*, Justice Brandeis stated that the Constitution is not an “ephemeral enactment”<sup>165</sup> He predicted that “[s]ubtler and more far-reaching means of invading privacy [will] become available to the Government.”<sup>166</sup> He believed that technological “invention[s] have made it possible for the Government, by means far more effective than stretching upon the rack, to obtain disclosure in court of what is whispered in the closet.”<sup>167</sup> Brandeis’ concerns for privacy

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<sup>162</sup> See generally *Olmstead v. United States*, 277 U.S. 438, 467 (1928).

<sup>163</sup> *Id.* at 464 (determining that “the person, the house, his papers, or his effects” are all “material things”).

<sup>164</sup> Amicus Brief at 22-23, 2011 WL 4590837.

<sup>165</sup> *Olmstead*, 277 U.S. at 472-73 (Brandeis, J., dissenting).

<sup>166</sup> *Id.*

<sup>167</sup> *Id.*

would become evident in *Warden, Md. Penitentiary v. Hayden* and *Katz v. United States*, judged 39 years later.

*C. In Hayden and Katz, the Court interpreted the Fourth Amendment to include invasions of privacy*

In *Hayden*, the Supreme Court formally abandoned the property-based interpretation of the Fourth Amendment of *Boyd* for one rooted in the emerging right of privacy.<sup>168</sup> Writing for the majority, Justice Brennan claimed that distinctions between mere evidence, instrumentalities of crime, fruits of crime, and contraband were “based on premises no longer accepted as rules governing the application of the Fourth Amendment.”<sup>169</sup> Justice Brennan rejected *Boyd’s* requirement that the Government demonstrate its property interest in the thing to be seized, reasoning that “searches and seizures may be ‘unreasonable’ within the Fourth Amendment even though the Government asserts a superior property interest at common law.”<sup>170</sup>

Under the new policy, the “Government may seize evidence simply for purpose of proving [a] crime.”<sup>171</sup> This enlarged “the area of permissible searches ... made after fulfilling the probable cause and particularity requirements of the Fourth Amendment and after the intervention of ‘a neutral and detached magistrate’.”<sup>172</sup> Under these circumstances, “the Fourth Amendment allows intrusions upon privacy .... [T]here is no viable reason to distinguish intrusions to secure ‘mere evidence’ from intrusions to secure fruits, instrumentalities, or contraband.”<sup>173</sup>

In *Katz*, the Supreme Court overturned *Olmstead*; warrantless wiretapping became unconstitutional.<sup>174</sup> In this case, the police obtained evidence using a microphone hidden on the exterior of a public telephone booth; they eavesdropped upon the suspect without physically intruding upon the

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<sup>168</sup> See *Warden, Md. Penitentiary v. Hayden*, 387 U.S. 294 (1967); see also Amicus Brief at 8, 2011 WL 4590837.

<sup>169</sup> *Hayden* 387 U.S. at 300-01.

<sup>170</sup> *Id.* at 304.

<sup>171</sup> *Id.* at 306.

<sup>172</sup> *Id.* at 309.

<sup>173</sup> *Id.* at 310.

<sup>174</sup> See *Katz v. United States*, 389 U.S. 347, 352-53 (1967).

interior of the booth.<sup>175</sup> The court reasoned that its reversal of the *Olmstead* standard was justified because the “premise that property interests control the right of the Government to search and seize has been discredited” by *Hayden*.<sup>176</sup>

Although the *Katz* majority enshrined a privacy basis for Fourth Amendment protection, the court held that “the Fourth Amendment cannot be translated into a general constitutional ‘right to privacy.’”<sup>177</sup> Instead, the Court articulated that the Fourth Amendment “protects individual privacy against certain kinds of governmental intrusion, but its protections go further, and often have nothing to do with privacy at all.”<sup>178</sup>

*D. Justice Scalia’s majority opinion in Jones indicates that the Court may revisit Katz*

Following *Hayden* and *Katz*, the courts have largely shorn the Fourth Amendment of its basis in property law. Modern *Katz*-derived analysis is used to decide what is within the bounds of a “reasonable search” absent a valid warrant.<sup>179</sup> The two-part test comes not from the majority holding, but from Justice Harlan’s concurrence.<sup>180</sup> Step one, the court must consider “whether the individual has exhibited an actual (a subjective) expectation of privacy” in the object of the challenged search?<sup>181</sup> Step two, the court must then ask, is society “prepared to recognize [that expectation] as ‘reasonable’?”<sup>182</sup> Invoking Justice Harlan’s test, the Supreme Court has permitted warrantless searches of privately owned “open fields,” curbside trash, private residences and factories of closely regulated industries.<sup>183</sup>

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<sup>175</sup> *Id.* at 352-53. (Under *Olmstead*, the absence of such trespass upheld the constitutionality of the policeman’s action. See *Olmstead v. United States*, 277 U.S. at 457, 464, 466 (1928)).

<sup>176</sup> *Hayden*, 387 U.S. at 304. See *Katz*, 389 U.S. at 352-53.

<sup>177</sup> *Katz*, 389 U.S. at 350.

<sup>178</sup> *Katz*, 389 U.S. at 350.

<sup>179</sup> See *Smith v. Maryland*, 442 U.S. 735, 740 (1979) (*aff’d* by *California v. Ciraolo*, 476 U.S. 207, 211 (1986)).

<sup>180</sup> *Id.*

<sup>181</sup> *Id.* (quoting *Katz v. United States*, 388 U.S. 347, 361 (1967) (Harlan, J., concurring)).

<sup>182</sup> *Id.*

<sup>183</sup> See generally *Oliver v. United States*, 466 U.S. 170 (1984) (person does not have a legitimate expectation of privacy in an open field); *California v. Greenwood*, 486 U.S. 35 (1988) (person does not have a legitimate expectation of privacy with respect to curbside trash); *Minnesota v.*

While Justice Harlan’s test is a permissible interpretation of the *Katz* majority holding, these words are found in a concurrence.<sup>184</sup> It cannot stand as an exclusive interpretation of the majority holding that which articulated that the strict property viewpoint was superseded “to ensure that the Fourth Amendment continues to protect privacy in an era when official surveillance can be accomplished without any physical penetration of or proximity to the area under inspection.”<sup>185</sup>

Justice Scalia’s majority holding in *Jones* reiterates that “Fourth Amendment rights do not rise or fall with... [Justice Harlan’s] *Katz* formulation.”<sup>186</sup> The court must always “assur[e] preservation of that degree of privacy against [the] Government that existed when the Fourth Amendment was adopted.”<sup>187</sup> Justice Scalia insists that “*Katz* did not repudiate” the nineteenth century property theory basis of the Fourth Amendment.<sup>188</sup> He expresses frustration at his colleagues whose “insistence on the exclusivity of [Justice Harlan’s] *Katz* test ... needlessly leads us [to] ‘particularly vexing problems.’”<sup>189</sup>

A further examination of the *Jones* majority and concurrence holdings will be presented in Section V, below.

#### IV. THE FOURTH AMENDMENT LIMITS THE SCOPE OF TECHNOLOGY USABLE BY LAW ENFORCEMENT

“Applying the Fourth Amendment to new technologies may sometimes be difficult, but when it is necessary to decide a

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Olson, 495 U.S. 91, 98 (1990) (posing the hypothetical situation where exigent circumstances could allow police to have a warrantless search of a home); (*New York v. Burger*, 482 U.S. 691, 712 (1987) (holding a New York statute that authorizes warrantless inspections of automobile junkyards constitutional because of the “well-established exception to the warrant requirement for inspections of ‘closely regulated’ businesses” bypassing the second prong of the *Katz* test).

<sup>184</sup> *Katz*, 389 U.S. at 360-362.

<sup>185</sup> *Dow Chem. Co. v. United States*, 476 U.S. 227, 247 (1986).

<sup>186</sup> *United States v. Jones*, 132 S. Ct. 945, 950 (2012).

<sup>187</sup> *Kyllo v. United States*, 533 U.S. 27, 34 (2001).

<sup>188</sup> *Jones*, 132 S. Ct. at 950.

<sup>189</sup> *Id.* at 953 (quoting *Jones*, 132 S. Ct. at 962 (Alito, J. concurring)) (The “vexing problem” that Justice Scalia alludes concerns where the *Katz* formulation would draw the line between an impermissible and a permissible warrantless search in a case involving long-term surveillance but lacking physical trespass.) *See also Kyllo*, 533 U.S. at 34 (“The *Katz* test—whether the individual has an expectation of privacy that society is prepared to recognize as reasonable—has often been criticized as circular, and hence subjective and unpredictable.”).

case we have no choice.”<sup>190</sup> A Fourth Amendment case presents “two separate questions: whether the search was conducted pursuant to a warrant issued in accordance with the second clause, and, if not, whether it was nevertheless ‘reasonable’ within the meaning of the first.”<sup>191</sup> The Court is also steadfast reiterating that “the Fourth Amendment protects people, not places” and holding that this is the basis for all further analysis.<sup>192</sup>

*A. Police may not employ sophisticated surveillance equipment without a warrant*

The Fourth Amendment specifically states that people have the right “to be secure ... against unreasonable searches and seizures.”<sup>193</sup> Typically, “warrantless searches are presumptively unreasonable, though the Supreme Court has recognized a few limited exceptions to this general rule.”<sup>194</sup> For example, the Court has held that the Constitution grants police the “authority to make warrantless seizures in public places of such objects as weapons and contraband.”<sup>195</sup>

Police also have governmental authority to patrol public areas, where neither a trespass of private real estate nor a search of private property is necessary to enforce the law.”<sup>196</sup>

Implicitly, a public patrol cannot violate the Fourth Amendment because an inspection “that involves merely looking at what is already exposed to view - ... is not a ‘search’ for Fourth Amendment principles, and therefore does not even require [the police to have] reasonable suspicion.”<sup>197</sup> Broadly

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<sup>190</sup> *City of Ontario, Cal. v. Quon*, 130 S. Ct. 2619, 2635 (2010) (Scalia, J., concurring).

<sup>191</sup> *United States v. Leon*, 468 U.S. 897, 961 (1984) (*superseded by statute*, Rule 41(e) Fed. R. Crim. Pro.)

<sup>192</sup> *Katz v. United States*, 389 U.S. 347, 351 (1967).

<sup>193</sup> U.S. Const. Amend. IV, cl. 1.

<sup>194</sup> *United States v. Karo*, 468 U.S. 705, 717 (1984) (The exceptions require the police to have some form of “probable cause.”).

<sup>195</sup> *Arizona v. Hicks*, 480 U.S. 321, at 327 (explaining that it is impermissible for police to physically handle and inspect suspicious goods they visually happened upon in the regular course of business. However, as long as their actions are “minimally intrusive and operational necessities render it the only practicable means of detecting certain types of crime,” police are allowed to physically seize weapons and other contraband goods found in the regular course of business.).

<sup>196</sup> *California v. Ciraolo*, 476 U.S. 207 (1986) (The court holding that the Fourth Amendment “does not preclude an officer’s observation from a public vantage point where he has a right to be and which renders the [illegal] activities clearly visible.”).

<sup>197</sup> *Arizona v. Hicks*, 480 U.S. at 328.

speaking, “What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection.”<sup>198</sup>

“At the very core [of the Fourth Amendment] stands the right of a man to retreat into his own home and there be free from unreasonable governmental intrusion.”<sup>199</sup> With few exceptions, the Fourth Amendment prohibits warrantless searches inside a home.<sup>200</sup> The “Fourth Amendment’s protection of the home has never been tied to [a] measurement of the quality or quantity of information obtained.”<sup>201</sup> “[A]ny physical invasion of the structure of the home, ‘by even a fraction of an inch,’ was too much.”<sup>202</sup> Thus, the Fourth Amendment should protect the home from warrantless police patrol.

Outside of narrowly defined exceptions, the Fourth Amendment protects citizens against all forms of warrantless police trespass. The principal exception is controlled by the “open fields doctrine;” police are allowed to physically trespass upon a privately owned “open field” without a warrant.<sup>203</sup> In such a circumstance, a police officer could conduct binocular surveillance from a vantage point on private property provided that he only observes and reports on items that are within his “plain view.”<sup>204</sup>

In *United States v. Karo*, Justice Stevens stated that “absent exigent circumstances Government agents have a constitutional duty to obtain a warrant before they install an electronic device on a private citizen’s property.”<sup>205</sup> The court reiterated this in *Jones*, stating that the Government’s installation of a device on a target’s vehicle constituted a

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<sup>198</sup> *Katz v. United States*, 389 U.S. 347, 351 (1967).

<sup>199</sup> *Silverman v. United States*, 365 U.S. 505, 511 (1961) (citing *Entick v. Carrington*, 19 Howell’s State Trials 1029, 1066 (1765); *Boyd v. United States*, 116 U.S. 616, 626-30 (1886)).

<sup>200</sup> *Kyllo v. United States*, 533 U.S. 27, 31 (2001).

<sup>201</sup> *Id.* at 37.

<sup>202</sup> *Id.* (quoting *Silverman v. United States*, 365 U.S. at 512).

<sup>203</sup> *Hester v. United States*, 265 U.S. 57, 59 (1924), reaffirmed in *Oliver v. United States*, 466 U.S. 170, 178 (1984) (holding that “the special protection accorded by the Fourth Amendment to people in their ‘persons, houses, papers and effects,’ is not extended to the open fields.”).

<sup>204</sup> See *Coolidge v. New Hampshire*, 403 U.S. 443, 465 (1971) (“Where the initial intrusion that brings the police within plain view of such an article is supported, not by a warrant, but by one of the recognized exceptions to the warrant requirement, the seizure is also legitimate.”).

<sup>205</sup> *United States v. Karo*, 468 U.S. 705, 736 (1984) (Stevens, J., concurring in part and dissenting in part).

Fourth Amendment “search,” which was impermissible absent a valid warrant.<sup>206</sup> Thus, the Fourth Amendment should protect both home and vehicles from warrantless police trespass.

Following *Katz*, the Court decided many cases concerning the amount of technological assistance law enforcement can employ when conducting warrantless surveillance.<sup>207</sup> The Court generally applies Justice Harlan’s “reasonable expectation of privacy” test either explicitly or implicitly.<sup>208</sup>

Previously, in *Dow Chem. Co. v. United States*, Justice Burger speculated that “surveillance of private property by using highly sophisticated surveillance equipment ... might be constitutionally proscribed absent a warrant.”<sup>209</sup> While he was not troubled by the possibility of enhanced human vision, he forewarned that use of “[a]n electronic device to penetrate walls or windows so as to hear and record confidential discussions ... would raise very different and far more serious questions.”<sup>210</sup>

In *Jones*, the court held that “situations involving merely the transmission of electronic signals without trespass would remain subject to a *Katz* analysis.”<sup>211</sup> This is consistent with its position on the warrantless use of “beepers” in *United States v. Knotts* and *Karo*.<sup>212</sup>

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<sup>206</sup> See *United States v. Jones*, 132 S. Ct. 945, 949 (2012).

<sup>207</sup> See generally *United States v. Jones*, 132 S. Ct. 945, 945 (2012) (warrantless physical attachment of a GPS device impermissible); *Illinois v. Caballes*, 543 U.S. 405, 409 (2005) (warrantless use of police drug detection dogs without reasonable suspicion during a traffic stop permissible); *Kyllo v. United States*, 533 U.S. 27, 40 (2001) (warrantless thermal imaging of a suspect’s home impermissible); *Florida v. Riley*, 488 U.S. 445, 451 (1989) (warrantless observation from low altitude helicopter overflight permissible); *California v. Ciraolo*, 476 U.S. 207, 215 (1986) (warrantless observation from aircraft permissible); *Dow Chem. Co. v. United States*, 476 U.S. 227, 239 (1986) (warrantless photography of commercial property by a Federal regulatory agency from an aircraft permissible); *United States v. Knotts*, 460 U.S. 276, 285 (1983) (warrantless use of a transmitting “beeper” placed in goods, with consent by the seller, permissible to track a potential suspect to his final destination).

<sup>208</sup> *Katz v. United States*, 389 U.S. 347, 360-362 (1967) (applying Justice Harlan’s *Katz* test will find that the more revealing the technology renders the surveillance, the more likely the court will consider its warrantless use unreasonable. The *Katz* test will find warrantless use of widely available surveillance technology less likely to be qualified as unreasonable. Finally, *Katz* analysis applied to warrantless surveillance that reveals “intimate details” about a person’s life is more likely to be qualified as unreasonable.).

<sup>209</sup> *Dow Chem. Co. v. United States*, 476 U.S. 227, 238 (1986).

<sup>210</sup> *Id.* at 238-39.

<sup>211</sup> *United States v. Jones*, 132 S. Ct. 945, 953 (2012).

<sup>212</sup> See *United States v. Knotts*, 460 U.S. 276, 285 (1983) (holding that the warrantless use of a transmitting “beeper” placed in goods, with consent by the seller, could be used by the police to

The Court holds warrantless reception—as opposed to transmission—to a more rigorous standard. *Katz* held warrantless acoustical reception of the suspect’s conversations unconstitutional.<sup>213</sup> In *Kyllo* the Court found the warrantless police surveillance of a home using a thermal imaging system unconstitutional.<sup>214</sup> The fact that the police did not trespass onto *Kyllo*’s property was immaterial (they operated the thermal imager from a public street).<sup>215</sup> When “the Government uses a device that is not in general public use, to explore details of the home that would previously have been unknowable without physical intrusion, the surveillance is a ‘search’ and is presumptively unreasonable without a warrant.”<sup>216</sup>

In contrast, warrantless reception of chemical signals that reveal the contents of a protected area has not troubled the Court. In *Illinois v. Caballes*, the court found no trouble with police using “a well-trained narcotics-detection dog.”<sup>217</sup> It held that a dog sniff performed on the exterior of a lawfully stopped car did not “implicate legitimate privacy interests.”<sup>218</sup> The Court distinguished a search that can only reveal the possible presence of contraband from one that detects lawful as well as unlawful activity as one that does not qualify for full Fourth Amendment protection.<sup>219</sup>

So long as a policeman can lawfully obtain a vantage point for direct observation, no warrant is required. In *California v. Ciraolo*, the Supreme Court upheld warrantless aerial surveillance from an altitude greater than 500 feet.<sup>220</sup> In

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track a potential suspect to his final destination); *see also United States v. Karo*, 468 U.S. 705, 714 (1984) ( holding that the warrantless use of a transmitting “beeper” placed in goods was impermissible when used by the police to reveal things it could not discover from a legal vantage point outside the suspect’s house).

<sup>213</sup> *Katz v. United States*, 389 U.S. 347, 359 (1967).

<sup>214</sup> *Kyllo v. United States*, 533 U.S. 27, 40 (2001).

<sup>215</sup> *Id.*

<sup>216</sup> *Id.*

<sup>217</sup> *Illinois v. Caballes*, 543 U.S. 405, 409 (2005).

<sup>218</sup> *Id.*

<sup>219</sup> *Id.* at 409-410 (J. Stevens holding that “[t]he legitimate expectation that information about perfectly lawful activity will remain private is categorically distinguishable from respondent’s hopes or expectations concerning the nondetection of contraband in the trunk of his car.” He summarizes: “[a] dog sniff . . . that reveals no information other than the location of a substance that no individual has any right to possess does not violate the Fourth Amendment.”).

<sup>220</sup> *California v. Ciraolo*, 476 U.S. 207, 213-15 (1986) (Surveillance of even the curtilage of a home from publicly navigable airspace, at an altitude generally used by the public and conducted with

*Florida v. Riley*, the Court applied the *Katz* test to hold that a police officer's warrantless visual observation of the interior of a partially open greenhouse from the vantage point of a helicopter circling 400 feet above did not violate the Fourth Amendment.<sup>221</sup> A plurality believed that a warrant would be required if the surveillance occurred at a lower altitude, one where the aircraft would have been flying "contrary to law or regulation."<sup>222</sup>

The United States District Court for the District of Hawaii frowned upon warrantless telescopic surveillance of a home, holding that when no lawful vantage point exists from which naked-eye surveillance of the inside of a premises could be conducted, use of binoculars should be considered a search.<sup>223</sup> The district court applied the *Katz* test to hold that "not all surveillances with visual aids . . . constitute invasions of privacy."<sup>224</sup> Absent a warrant, it is impermissible for police to use artificial aids to observe activities within an individual's home because that act intrudes upon an individual's privacy, triggering a Fourth Amendment 'search.'<sup>225</sup> Thus, the Constitution limits the amount of technological assistance the police may use without a warrant.

The courts may use the Fourth Amendment to place limits on the duration of warrantless police surveillance. Under certain circumstances, warrantless short-term surveillance is reasonable absent a warrant.<sup>226</sup> For example, "A person travelling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another."<sup>227</sup> While the Supreme Court has yet to rule

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the naked eye, is not a 'search' within the meaning of the Fourth Amendment, because there is no reasonable expectation of privacy in areas visible to the public.).

<sup>221</sup> *Florida v. Riley*, 488 U.S. 445, 447-448, 452 (1989).

<sup>222</sup> *Id.* at 451.

<sup>223</sup> *United States v. Kim*, 415 F. Supp. 1252, 1256 (D. Haw. 1976) ("It is inconceivable that the government can intrude so far into an individual's home that it can detect the material he is reading and still not be considered to have engaged in a search. . . . If government agents have probable cause to suspect criminal activity and feel the need for telescopic surveillance, they may apply for a warrant; otherwise, they have no right to peer into people's windows with special equipment not generally in use.")

<sup>224</sup> *Id.* at 1254-55 ("police surveillance with telescopes or binoculars of non-private places" is not a Fourth Amendment search).

<sup>225</sup> *Id.* at 1256-57.

<sup>226</sup> *United States v. Knotts*, 460 U.S. 276, 281 (1983).

<sup>227</sup> *Id.*

on the limits of warrantless long-term surveillance, lower courts have split on the matter. In *United States v. Vankesteren*, the Fourth Circuit held that while “[t]he idea of a video camera constantly recording activities on one’s property is undoubtedly unsettling to some . . . the protection of the Fourth Amendment is not predicated upon these subjective beliefs.”<sup>228</sup> Whereas in *Commonwealth v. Williams*, the Pennsylvania Supreme Court found that a nine-day warrantless police stakeout, observing “an apartment to determine who was in it and what they were doing,” was impermissible.<sup>229</sup> That court was outraged by the police use of night vision goggles, “which permitted the officers to see what went on in the apartment when the lights were out and the television off” especially since the police observed “two acts of sexual intercourse not involving the person . . . for whom the surveillance was established.”<sup>230</sup>

To conclude, the *Katz* “reasonable expectation of privacy” standard has already reached its breaking point when applied to emergent surveillance technology; strict use of the *Katz* test has led to inconsistent holdings by lower courts.<sup>231</sup> When confronted with facts stemming from the warrantless use of multi-modal drone surveillance technology, it is likely that the Supreme Court would find *Katz* ripe for re-evaluation.

*B. Even with a valid warrant, the spectre of a “general warrant” limits police technology*

The Warrant Clause of the Fourth Amendment limits the power of a police search performed under a warrant. In *Hicks*, the Supreme Court held that when police take “action, unrelated to the objectives of the authorized intrusion . . .

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<sup>228</sup> *United States v. Vankesteren*, 553 F.3d 286, 291 (4th Cir. 2009). See also: *Vankesteren v. United States*, 129 S.Ct. 2743 (2010). (Cert. denied).

<sup>229</sup> *Commonwealth v. Williams*, 431 A.2d 964, 966 (Pa. 1981)

<sup>230</sup> *Id.*

<sup>231</sup> Compare *United States v. Vankesteren*, 553 F.3d 286, 291 (4th Cir. 2009) (warrantless continuous surveillance of an open field did not violate the Fourth Amendment - duration of surveillance not dispositive), with *Commonwealth v. Williams*, 431 A.2d 964, 966 (Pa. 1981) (warrantless continuous surveillance of an apartment with night vision goggles did violate the Fourth Amendment - duration of surveillance dispositive), and *United States v. Kim*, 415 F. Supp. 1252, 1256 (D. Haw. 1976) (warrantless continuous surveillance of an apartment with a telescope did violate the Fourth Amendment – duration of surveillance dispositive)..

[they] produce a new invasion of [a citizen's] privacy unjustified by the exigent circumstance that validated the entry."<sup>232</sup>

Although police officers “may seize evidence in plain view without a warrant,” the Court limits their scope when performing a search under a warrant.<sup>233</sup> The *Hicks* majority reaffirmed that “the plain view doctrine may not be used to extend a general exploratory search from one object to another until something incriminating at last emerges.”<sup>234</sup> Justice White wrote in his concurrence that the “so-called ‘inadvertent discovery’ prong of the plain-view exception to the Warrant Clause ... has never been ... supported by a majority of this Court.”<sup>235</sup> Therefore, the Court invokes the specter of the general warrant and limits a search performed under a valid warrant to the specifics of the particularized warrant.

Warrants must be granted by a magistrate based upon “probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.”<sup>236</sup> The Supreme Court has not been persuaded by arguments that “a warrant should not be required because of the difficulty in satisfying the particularity requirement of the Fourth Amendment.”<sup>237</sup> It is no excuse if the Government finds itself incapable of describing “the ‘place’ to be searched, because the location of the place is precisely what is sought to be discovered through the search.”<sup>238</sup>

When highly sophisticated remote sensing technology is applied to a warrantless search, it becomes inevitable that the

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<sup>232</sup> *Arizona v. Hicks*, 480 U.S. 321, 325 (1987) (police came to investigate a domestic disturbance at Hicks’ apartment and noted a suspicious quantity of stereophonic equipment in living room. One officer physically inspected the equipment, lifting up a turntable and recording its serial number. Upon return to the station, the police determined that the goods were stolen in an armed robbery. Police then indicted Hicks for the robbery.).<sup>233</sup> *Coolidge v. New Hampshire*, 403 U.S. 443, 465 (1971) (plurality opinion); see also *Horton v. California*, 496 U.S. 128, 141-42 (1990) (affirming that inadvertence is not a necessary condition of a permissible, warrantless “plain view” seizure).

<sup>233</sup> *Coolidge v. New Hampshire*, 403 U.S. 443, 465 (1971) (plurality opinion); see also *Horton v. California*, 496 U.S. 128, 141-42 (1990) (affirming that inadvertence is not a necessary condition of a permissible, warrantless “plain view” seizure).

<sup>234</sup> *Arizona v. Hicks*, 480 U.S. at 328 (quoting *Coolidge*, 403 U.S. at 466).

<sup>235</sup> *Id.* at 329-330 (White, J., concurring).

<sup>236</sup> U.S. Const. amend. IV, cl. 2.

<sup>237</sup> *United States v. Karo*, 468 U.S. 705, 718 (1984).

<sup>238</sup> *Id.*

police will overstep the *Hicks* boundary. If police use technology that can “see through walls,” it blurs the boundary between the formerly permissible act of “looking at a suspicious object in plain view” and the impermissible act of “moving it” for the purposes of inspecting it.<sup>239</sup> The temptation for dragnet enforcement is great.

Turning *Kyllo* on end, could police operating under an exigent circumstances exception to the need for a warrant use STTW to frisk citizens and discover evidence which is obviously incriminating?<sup>240</sup> Because the standard of suspicion needed for a police officer to detain and question citizens is based only on an articulable “reasonable suspicion that criminal activity is afoot” and imaging radar technology is ideal to find concealed weapons; there is a compelling reason for police to use regularly employ these devices.<sup>241</sup> While the Court has articulated positions on plain-view<sup>242</sup> and plain-touch,<sup>243</sup> there is no such thing as a plainly-visible-using-advanced-technology doctrine. It is unclear what rule lower courts would favor when faced with this confluence of crime, technology and police procedure.

When confronted with the facts arising from advanced surveillance technology, it is likely that the Supreme Court will find *Hicks* ripe for re-evaluation.

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<sup>239</sup> *Arizona v. Hicks*, 480 U.S. 321, 325 (1987).

<sup>240</sup> Contrast *Kyllo v. United States*, 533 U.S. 27, 40 (2001) (warrantless search of a home is upheld to the highest standards of privacy; warrantless use of enhanced technology was impermissible) with *Terry v. Ohio*, 392 U.S. 1, 30 (1968) (exigent circumstances related to public safety allow police to search citizens for concealed weapons in absence of a probable cause to arrest).

<sup>241</sup> *U.S. v. Sokolow*, 490 U.S. 1, 2 (1989). (Rehnquist, J., reiterating the holding of *Terry* being that “police can stop and briefly detain a person for investigative purposes if the officer has a reasonable suspicion supported by articulable facts that criminal activity ‘may be afoot,’ even if the officer lacks probable cause.”)

<sup>242</sup> See *Horton v. California*, 496 U.S. 128, 142 (1990) (Stevens, J.) (items seized in ‘plain view’ during warrantless police searches may be used as evidence so long as its immediately apparent that the item to be seized). See also *Coolidge v. New Hampshire*, 403 U.S. at 465 (“It is well established that under certain circumstances the police may seize evidence in plain view without a warrant”). See also *Arizona v. Hicks*, 480 U.S. 321, 328 (1987) (noting that while probable cause is needed for police to search the premises for items unrelated to exigent circumstances, “a truly cursory inspection—one that involves merely looking at what is already exposed to view, without disturbing it—is not a “search” for Fourth Amendment purposes, and therefore does not even require reasonable suspicion.”).

<sup>243</sup> *Minnesota v. Dickerson*, 508 U.S. 366, 375 (1993) (White, J.) (if the officer is lawfully positioned and performing a *Terry* frisk, and the officer’s sense of touch indicates probable contraband, that contraband may be seized without a warrant despite an absence of initial probable cause).

## V. HOW DRONES MAY SERVE AS A CATALYST THAT LEADS TO A NEW CONSTITUTIONAL PARADIGM FOR PRIVACY

Justice Scalia has stated that “[a]pplying the Fourth Amendment to new technologies may sometimes be difficult, but when it is necessary to decide a case we have no choice.”<sup>244</sup> He argues that it is indefensible for the Supreme Court to “concoct[] case-specific standards or issu[e] opaque opinions.”<sup>245</sup>

If the Supreme Court follows Justice Scalia’s advice, it may address the constitutional implications of all forms of technologically enhanced surveillance in a single holding. The ultimate question controlling the outcome concerns “whether” and “when” a specific technology renders a search “unreasonable” as defined by the Fourth Amendment.

### *A. Drones are part of a technology system that acquires the sort of evidence which formerly required a trespass*

Although the Government’s warrantless trespass was an essential element of its Fourth Amendment violation in *Jones*, the majority holding seemed to resist passing broad judgment. In Justice Alito’s four-vote concurrence in the judgment, he stated that the majority’s “reliance on the law of trespass will present particularly vexing problems in cases involving surveillance that is carried out by making electronic, as opposed to physical, contact with the item to be tracked.”<sup>246</sup> While the facts of *Jones* limited the scope of its holding, it seems possible that a future five-vote majority will develop to curtail the freedom of the police to evade obtaining a warrant through the use of advanced technology drones.<sup>247</sup>

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<sup>244</sup> *City of Ontario v. Quon*, 130 S. Ct. 2619, 2635 (Scalia, J., concurring in the judgment).

<sup>245</sup> *Id.*

<sup>246</sup> *United States v. Jones*, 132 S. Ct. 945, 962 (U.S. 2012) (Alito, J., concurring in the judgment).

<sup>247</sup> *Id.* (The fact that the court ruled 9:0 against the police but that it split with Justice Alito writing a broad four vote minority concurrence and Justice Sotomayor both joining Scalia’s narrow holding majority and writing her own separate concurrence indicates the presence of a disagreement internal to the court).

*B. Drones represent an emergence of a new kind of military technology that Police can deploy against the general public*

The right for citizens to be free from military intrusions into their affairs is a right that is deeply rooted in our nation's laws, history and tradition.<sup>248</sup> Beyond the Posse Comitatus Act, this view is broadly expressed in the "Third Amendment's explicit prohibition against quartering soldiers ... [and] in the constitutional provisions for civilian control of the military."<sup>249</sup> Even the most expansive interpretation of the Second Amendment, which holds the "the right of the people to keep and bear Arms," restricts its breadth to control light arms, and admits that it is not a grant for private parties to acquire military materiel.<sup>250</sup>

The Government, through its commerce power, regulates the development, possession and sale of military materiel. Government regulations presently declare that "drones" specifically designed for military purposes, "infrared focal plane arrays," imaging radar systems, "electronic systems or equipment specifically designed .... . . for intelligence, security, or military purposes" are restricted "munitions."<sup>251</sup> ITAR (International Traffic-In-Arms Regulations) designated technology appears to be, *per se*, technology that is restricted so that it is "not in general public use."<sup>252</sup> Following *Kyllo*, police use of such technology is "presumptively unreasonable without a warrant."<sup>253</sup>

The Predator drone used in the *Brossart* case indisputably qualifies as military materiel.<sup>254</sup> Other drones, ostensibly designed for civilian law enforcement use, embody military technology. Depending on their capabilities, they too may be

<sup>248</sup> *United States v. Walden*, 490 F.2d 372, 375 (4th Cir. 1974).

<sup>249</sup> *Id.*

<sup>250</sup> *Dist. of Columbia v. Heller*, 554 U.S. 570, 626 (2008) . (J. Scalia wrote in the majority: "Like most rights, the right (to bear arms) secured by the Second Amendment is not unlimited ... the right was not a right to keep and carry any weapon whatsoever in any manner whatsoever and for whatever purpose. ... Nothing in our opinion should be taken to cast doubt on longstanding prohibitions on the ... qualifications on the commercial sale of arms.").

<sup>251</sup> 22 C.F.R. § 121.1 (2011).

<sup>252</sup> *Kyllo v. United States*, 533 U.S. 27, 40 (2001).

<sup>253</sup> *Id.*

<sup>254</sup> See 22 C.F.R. § 121.1 Category VIII(a) (2011). (The Predator is a military drone designed for military surveillance and light-attack missions. The fact that it can be used for civilian humanitarian as well as military missions does not shield it from ITAR).

regulated under the catch-all “[a]ny article ... which has substantial military applicability” clause in the ITAR.<sup>255</sup> It seems that the Court need only take a small step to formally declare that warrantless information gleaned using any designated “defense article” is inherently forbidden as it arises from technology that is “not in general public use.”<sup>256</sup>

*C. Drones enable covert police surveillance of extraordinary duration*

The *Jones* majority left unanswered the question of the permissible duration limits of a warrantless search. Moreover, the *Jones* holding did not address the potential duration limits of a search under a valid warrant. Justice Alito speculated in his concurrence that “if long-term monitoring can be accomplished without committing a technical trespass[,]...the [*Jones* holding] would provide no protection.”<sup>257</sup> Justice Alito hints that a future majority decision may extend *Katz* to hold that while the “relatively short-term monitoring of a person's movements on public streets accords with expectations of privacy that our society has recognized as reasonable ... [but that] longer term ... monitoring ... impinges on expectations of privacy.”<sup>258</sup> Because “society's expectation has been that law enforcement agents and others ... could not ... secretly monitor and catalogue every single movement ... for a very long period,” these searches would be inherently unreasonable absent a warrant.<sup>259</sup>

Alternatively, Justice Scalia could lead the court in abandoning Justice Harlan's “reasonable expectation” test. The principal holding of *Katz* would remain: that warrantless eavesdropping absent a physical trespass is unconstitutional.<sup>260</sup> It is difficult to speculate what holding could overrule Justice Harlan's because the court rarely enumerates fundamental rights. Certainly omnipresent

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<sup>255</sup> 22 C.F.R. § 121.1 Category XXI(a) (2011).

<sup>256</sup> *Kyllo*, 533 U.S. at 40.

<sup>257</sup> *United States v. Jones*, 132 S. Ct. 945, 961 (2012). (Alito, J. concurring in the judgment).

<sup>258</sup> *Id.* at 964.

<sup>259</sup> *Id.*

<sup>260</sup> *Katz v. United States*, 389 U.S. 347, 352-53 (1967).

internet, cellular phones, Twitter and Facebook connectivity are causing seismic shifts in the amount of formerly private information that citizens voluntarily reveal.

Several types of warrantless drone use would give rise to this challenge. The clearest overreach of privacy boundaries would involve the deployment of a “perch-and-stare” robotic aircraft that would alight on some public property to conduct long-term covert, warrantless surveillance of a suspect. A more sophisticated case might involve a “perch-and-stare” robotic aircraft that follows a suspect in his car, tracking his motion and recording his actions. Because it can wait for him at each stop, and conserve (or even recharge) power, continuous surveillance can be acquired over a period of many days. No trespass like the one in *Jones* would be required for the police to obtain the desired information about the suspect.

*D. Multi-Modal surveillance does not discriminate; its use may be unreasonable with or without a warrant*

The *Jones* majority held narrowly to the facts of the case, ruling on warrantless use of surveillance technology. A future holding will need to address the broader question of the permissible limits of surveillance under a particularized warrant.

Presently, wiretapping pursuant to a warrant is subject to strict statutory “minimization requirements.” 18 U.S.C. § 2518(5) requires that wiretapping “shall be conducted in such a way as to minimize the interception of communications not otherwise subject to interception.”<sup>261</sup> When agents realize that the participants in an overheard conversation do not include the suspect and/or the topic of the conversation does not involve the suspected illegal activity, they must take steps to ensure the privacy of such communications.<sup>262</sup>

In her concurrence in *Jones*, Justice Sotomayor raised an objection to the inherent dragnet nature of automated

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<sup>261</sup> 18 U.S.C. § 2518(5) (2012).

<sup>262</sup> *Id.*

surveillance.<sup>263</sup> “Physical intrusion is now unnecessary to many forms of surveillance. ... With increasing regularity, the Government will be capable of duplicating the monitoring undertaken in this case” without the need to install a physical tracking device on the suspects’ car.<sup>264</sup> This capability for continuous, warrantless remote observation gives law enforcement a “comprehensive record of a person’s public movements that reflects a wealth of detail about [their] familial, political, professional, religious, and sexual associations.”<sup>265</sup> Such information is both “highly personal information [and] unrelated to any investigation.”<sup>266</sup>

Justice Sotomayor applied the *Katz* standard for warrantless searches. She opined on the evils of long term warrantless surveillance, inquiring whether “people reasonably expect that their movements will be recorded and aggregated in a manner that enables the Government to ascertain, more or less at will, their political and religious beliefs, sexual habits, and so on.”<sup>267</sup> She doubted that society truly places “no reasonable expectation of privacy in information voluntarily disclosed to third parties [in] the digital age.”<sup>268</sup> She implies that information learned by warrantless surveillance and data aggregation is implicitly self-incriminating and could provide the sort of probable cause that would lead a magistrate to issue a warrant absent any other evidence. She concluded by reiterating Justice Marshall’s dissent in *Smith v. Maryland*: “privacy is not a discrete commodity, possessed absolutely or not at all.”<sup>269</sup>

The court must rule on the legality of advanced technology capable of performing a “general search.” Justice Sotomayor did not find it comforting that “the Government might obtain the fruits of [long-term position] monitoring through lawful conventional surveillance techniques.”<sup>270</sup> In the Ninth Circuit,

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<sup>263</sup> *United States v. Jones*, 132 S. Ct. 945, 955-56 (2012) (Sotomayor, J., concurring).

<sup>264</sup> *Id.* at 955 (Sotomayor, J., concurring).

<sup>265</sup> *Id.* (Sotomayor, J., concurring).

<sup>266</sup> Brief for Gun Owners of America, Inc. et al. as Amici Curiae Supporting Respondents at 33-34, *United States v. Jones*, 132 S. Ct. 945 (2012), (No. 10-1259), 2011 WL 4590837.

<sup>267</sup> *Jones*, 132 S. Ct. at 956 (Sotomayor, J., concurring).

<sup>268</sup> *Id.* at 957 (Sotomayor, J., concurring).

<sup>269</sup> *Id.* (Sotomayor, J., concurring) quoting *Smith v. Maryland*, 442 U.S. 735, 749 (1979) (Marshall, J., dissenting)

<sup>270</sup> *Id.*

Chief Justice Kozinski expressed a similar concern when police used emerging technology to conduct a dragnet sweep.<sup>271</sup> In his dissent he expressed the concern that when law enforcement can create “a permanent electronic record that can be compared, contrasted and coordinated to deduce all manner of private information about individuals, ... the government can use computers to detect patterns and develop suspicions.”<sup>272</sup>

Drone technology will serve as a catalyst for these future holdings. Multi-modal sensory data obtained by drones will be archived and fused with data from other public and private sources. Drones flying on authorized missions will observe and record, in their regular course of business, all sorts of collateral information. Law enforcement could find this information interesting. It is probable that the archived information will clearly exceed what is permissible for police to obtain under the plain view doctrine. Any law enforcement action that draws upon archived data obtained by legitimate drone flights could trigger a Fourth Amendment challenge.

## CONCLUSION

Because drones represent the technological frontier of remote sensing and data acquisition, interest in them will only increase. In the 2012 budget, Congress directed the Federal Aviation Administration to set formal standards for domestic operation of unmanned flying machines.<sup>273</sup> With burgeoning use, it is possible “that drones will further erode our individual and collective privacy. Yet the opposite may happen ... Drones may help restore our mental model of a privacy violation [by being] the visceral jolt society needs to drag privacy law into the twenty-first century.”<sup>274</sup>

Eighty-four years ago, Justice Brandeis wrote that “[d]ecency, security, and liberty alike demand that

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<sup>271</sup> *United States v. Pineda-Moreno*, 617 F.3d 1120, 1124-25 (9th Cir. 2010) (Kozinski, J. dissenting) cert. granted and judgment vacated, 132 S. Ct. 1533 (2012), *aff'd on remand* 688 F.3d 1087 (9th Cir. 2012).

<sup>272</sup> *Id.*

<sup>273</sup> FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, §332(a)(1), 126 Stat 11 (2012).

<sup>274</sup> M. Ryan Calo, *The Drone as Privacy Catalyst*, 64 *Stan. L. Rev.* Online 29, Dec. 12, 2011, available at <http://www.stanfordlawreview.org/online/drone-privacy-catalyst>

government officials shall be subjected to the same rules of conduct [as are ordinary] citizen[s].”<sup>275</sup> He warned that “the greatest dangers to liberty lurk in insidious encroachment by men of zeal, well-meaning but without understanding.”<sup>276</sup>

The darkest hour is just before the dawn. Overzealous law enforcement use of intrusive technology will eventually force the Supreme Court to reevaluate key cases such as *Katz* and *Hicks* in light of technological advances. Until the Supreme Court weighs in definitively, advances in miniaturized remote sensing technology will blur the boundaries between reasonable observation and unreasonable eavesdropping.

Drones can eavesdrop in many ways. If they visually tail a suspect while reporting their own time-and-location history, they may provide the sort of long-term positional evidence that *Jones* ruled inadmissible, effectively performing the tracking without the need for physical trespass. If drones are small, they may be able to provide simple visual information from vantage points inaccessible to a human law enforcement officer. This would stretch the reasoning in *Ciraolo* and *Riley* beyond the breaking point. If drones are large, and equipped with enhanced, multi-modal sensors (night-vision, imaging thermal) they are likely to offend the court on *Kyllo* grounds. If drones are equipped with electronic noses, the smells they sense may trigger a reevaluation of the reasoning behind *Cabellas*. If drones of any size have ultra-intrusive see-through-the-wall imaging radar capabilities, even their use under a warrant might raise unresolvable plain view issues previously settled by *Hicks*. Finally, if police undertake dragnet surveillance using drones of any shape or size, the courts may find them liable for performing an unreasonable general search.

We must pray that the Court rules in the spirit of our founding fathers. As these cases reach the Court, it may choose to move boldly or incrementally, resolving these issues *in toto* or piecemeal. Ideally, the Court will articulate the bounds of a broad, constitutionally derived implied right of privacy. Most assuredly, they will reaffirm the evil inherent in

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<sup>275</sup> *Olmstead v. United States*, 277 U.S. 438, 485 (1928) (Brandeis, J., dissenting), overruled in part by *Katz v. United States*, 389 U.S. 347 (1967), overruled in part by *Berger v. N.Y.*, 388 U.S. 41 (1967).

<sup>276</sup> *Id.* at 479.

general warrants and rein in otherwise well-meaning law enforcement when they go looking for trouble.<sup>277</sup> We must always remember that the law of the land provides a right “of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures;”<sup>278</sup> and that “no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.”<sup>279</sup>

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<sup>277</sup> *Id.*

<sup>278</sup> U.S. Const. amend IV, cl. 1.

<sup>279</sup> U.S. Const. amend. IV. cl. 2.