Kyllo v. United States: Something Old, Nothing New; Mostly Borrowed, What To Do?

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“Recent inventions and business methods call attention to the next step which must be taken for the protection of the person, and for securing to the individual what Judge Cooley calls the right ‘to be let alone.’” Sounds like the lament of a twenty-first century citizen, concerned over the many modern technological marvels used, for better or worse, by Big Brother² to cast a watchful eye. The contemporary tone of this sentiment, however, belies its origins in a Harvard Law Review article written in 1890 by Samuel D. Warren and the future Supreme Court Justice Louis D. Brandeis. The Industrial Revolution and the technological advances of the late nineteenth century were changing society in generally positive ways, but with a dark side that threatened the tranquility of life. Now, more than one hundred years later, advances in electronics and miniaturization are once again changing our daily lives. The current information revolution rivals the Industrial Revolution’s impact on society. Once more, change threatens the tranquility of life. However today, the threats are more insidious, with magical marvels of technology making walls transparent,³ penetrating clothing to expose the nude body,⁴ and turning darkness into daylight⁵. One of these new abilities used to enhance human sensory

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2. George Orwell, 1984 (1949). “Big Brother” was used by Orwell to refer to the government in his prescient novel about the threat of potential totalitarianism.
3. See Millivision, L.L.C., Surveillance and Monitoring, http://millivision.com:8071/survmon.html (last visited Oct. 30, 2001). Millivision, L.L.C. is a major developer of advanced surveillance equipment, including a millimeter-wave radar system that is capable of creating three dimensional renderings of objects hidden behind a brick wall. This device emits low energy microwave radiation that penetrates the wall and is partly reflected back by surfaces that it encounters. The reflected energy is interpreted by a computer and converted to an image.
4. See Millivision, L.L.C., Gateway Scanner, http://millivision.com:8071/gscanner.html (last visited Oct. 30, 2001). Millivision also makes a line of contraband detection equipment that is passive in that it does not emit any radiation, only sensing naturally occurring radiation from various objects. This technology is capable of rendering a fairly detailed image of the bare body underneath clothing. These devices are not generally available to the public.
5. Two types of technology are generally used for the purposes of “seeing in the dark,” the older and inferior technology is light amplification, still the military workhorse, issued to infantry forces as the AN/PVS-7D Night Vision Goggles (NVG’s). See ITT Industries, http://www.ittnv.com/military/gnvg/anpvs7bg3.pdf (last visited Oct. 30, 2001). The more advanced technology used for night aviation in special forces helicopters is the Forward Looking Infrared system (FLIR) that
capacity was tested by the Supreme Court in _Kyllo v. United States_ and found to be a search because law enforcement officers were deemed to "look" inside a home to find drug cultivation activity.

In _Kyllo_, law enforcement officers used a thermal imaging device, without a warrant, to view the amount of heat radiating from the surface of a house. The equipment made the pattern of heat radiation from the roof visible in the form of a video picture showing a hot spot. Officers inferred that grow lights were being used for cultivation of marijuana from that information. The thermal pictures and electrical utility statements showing above normal power consumption at that house provided probable cause for issuance of a search warrant. When the warrant was executed, officers performed a physical search of the premises and found a marijuana cultivation operation.

The Supreme Court's decision in _Kyllo_ is fully consistent with existing Fourth Amendment jurisprudence regarding searches using enhanced surveillance techniques, relying on an established line of Fourth Amendment cases. Essentially every element of the decision appears in one of the cases that traces its roots back to _Katz v. United States_, a turning point in Fourth Amendment electronic search law. _Kyllo_ clarified that a home enjoys an increased level of protection from government intrusion and that governmental use of tools that disclose information about the inside of a home is considered to be a search under the Fourth Amendment. However, the Court's reference to the fact that the device used was not in "general public use," a distinction drawn from dicta in _California v. Ciraolo_ and _Dow Chemical Company v. United States_, raises some interesting questions about the surveillance tools themselves, and how they are critical to the determination of whether a search has occurred.

The ten years between Danny Kyllo's arrest and the Court's decision have seen the thermal imaging technology become more widely available and possibly fitting within the meaning of the "general public use" referenced in _Kyllo_'s holding. Thus, the _Kyllo_ decision leaves an

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7.  Id. at 30, 121 S. Ct. at 2041.
12.  The phrase "general public use" appears in _Kyllo_'s holding, derived from dicta in _Dow_ and _Ciraolo_. The term is not defined, but we must infer that at the time of Mr. Kyllo's arrest, the thermal imaging device was not in "general public use."
impression that when a thermal scanner is in “general public use,” its use by law enforcement to observe a house might not constitute a search.13

Is there a message in that aspect of the holding that should prompt us to ask whether the Constitution provides adequate protections to the public, or should legislative measures be taken to ensure that the Fourth Amendment protections of individual privacy are not continually eroded by technological advances? Will the Constitution allow the Legislature to restrict one individual liberty (First Amendment speech) in order to protect another (privacy)?14

Part I of this case note presents the history of Kyllo. The line of enhanced “looking” jurisprudence is traced in Part II along with the Court’s parallel development of eavesdropping and wiretap law. Part III examines the Kyllo decision to determine whether it advanced the protections of the Fourth Amendment with respect to modern surveillance techniques and what the privacy implications of the decision are. In Part IV the federal wiretap statutes are analyzed to see if they might be construed to include enhanced “looking”15 and addresses the need to extend these statutes expressly to include restrictions on enhanced looking as well as listening techniques. Finally, Part V briefly notes a recent Supreme Court decision that may be an impediment to statutory protection.

I. KYLLO

In 1991, an agent of the U.S. Department of the Interior became suspicious that Danny Lee Kyllo was growing marijuana in his home. Knowing that indoor cultivation of marijuana required high intensity grow lights that produce significant amounts of heat, the officer used a thermal imaging device6 to observe Kyllo’s home, one unit of a triplex in Florence, Oregon. The scans confirmed that the attic area of Kyllo’s unit was emitting much more heat than similar adjacent units and the agent inferred that grow lights were probably in use in

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13. Since 1991, when the events occurred that led to Danny Kyllo’s arrest, thermal imaging devices are being used by the public, raising the issue of whether this somewhat limited use would rise to the level of “general public use” intended by the Court in Kyllo. This issue and examples of current public use will be discussed in this note.

14. The clash between First Amendment Freedom of the Press and governmental protection of individual privacy was addressed in Bartnicki v. Vopper, 532 U.S. 514, 121 S. Ct. 1753 (2001), and will be discussed briefly in this casenote.


16. The device, an Agema Thermavision 210, is like a video camera, except that it records images of the infrared radiation patterns emitted by objects rather than visible light. See infra note 114.
the attic. Based on tips from informants, Kyllo’s larger than normal electric bill, and the thermal imaging results, the agent obtained a search warrant and confirmed that Kyllo was growing marijuana in his attic.

At trial, Kyllo moved to suppress the evidence seized from his home as being obtained in violation of the Fourth Amendment. The motion was denied. He then entered a conditional guilty plea and appealed the court’s decision to allow the thermal imaging evidence. The Ninth Circuit Court of Appeals remanded the case to the district court for an evidentiary hearing. The district court found that since the thermal imager “is a non-intrusive device,” “did not show any people or activity within the wall of the structure,” and “no intimate details of the home were observed,” its use did not constitute a search. The district court upheld the validity of the warrant and reaffirmed its denial of the motion to suppress the thermal imager evidence. The court of appeals then held that Kyllo showed no expectation of privacy because he made no effort to conceal the heat radiating from his house. Even if Mr. Kyllo had taken measures to conceal the heat emissions, the court continued, he could have no objectively reasonable expectation of privacy because the thermal imaging device “did not expose any intimate details of Kyllo’s life.”

On application by Kyllo, the Supreme Court granted certiorari to review the question of whether the use of a thermal imaging device to examine a home was a search within the meaning of the Fourth Amendment.

II. FOURTH AMENDMENT SEARCH JURISPRUDENCE

A. The Fourth Amendment

The Fourth Amendment to the Constitution is uniquely American in its statement of a right based on the experience of the colonists. While it does have an English heritage regarding a man’s home as being his castle, the real impetus came from the colonists’ disdain for writs of assistance that empowered agents of the King to enter anyone’s home in search of contraband at any time. Acting on those

18. Kyllo v. United States, 190 F.3d 1041, 1046 (9th Cir. 1999).
19. Id. at 1047.
concerns, the framers worded the Fourth Amendment to require a warrant that specifically identified the place to be searched, the items to be seized, and justification by a showing of probable cause that the objects of the search would be located in the place to be searched.

The Fourth Amendment is only applicable when the government executes a search. A warrant based upon a showing of probable cause to believe that particular things will be found is generally required for the search to be valid. When the Bill of Rights was adopted, a search required physical entry into the place to be searched, a physical reality until the advent of technologies that made it possible to virtually breach the walls of a structure such as a home. The Supreme Court first considered this new phenomenon in Olmstead v. United States, a wiretap case.

B. Setting the Stage: Olmstead v. United States

Olmstead was a 1928 case concerned with the tapping of telephone wires exiting a private residence occupied by bootleggers. The Court found that the tapping of the telephone wires in no way intruded into the sanctity of the home, and that the wires themselves could not be considered an extension of the home. The Court also refused to draw an analogy to the protection afforded to mail because mail plainly qualified as papers under the Fourth Amendment, and the more abstract electric impulses that carried the conversation were certainly not papers. However, it was noted that “Congress may, of course, protect the secrecy of telephone messages by making them, when intercepted, inadmissible in evidence in federal criminal trials, by direct legislation.”

22. U.S. Const. amend. IV states in part: “[N]o 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.”
24. See Burdeau v. McDowell, 256 U.S. 465, 475, 41 S. Ct. 574, 576 (1921) where the Court made clear that the Fourth Amendment is “a restraint upon the activities of sovereign authority, and [is] not intended to be a limitation upon other than governmental agencies.”
25. Searches may also be executed under exigent circumstances without a warrant, but those situations are not within the scope of this note.
27. Bootlegger is a term used to describe the practice of selling illegal liquor, especially during the prohibition era. The word is derived from the practice of concealing the contraband in the upper portion of high top boots.
29. Id. at 465-66, 48 S. Ct. at 568.
30. Id., 48 S. Ct. at 568.
Justice Brandeis' dissent in *Olmstead* recognized that government eavesdropping on telephone communications was a Fourth Amendment concern. While the majority found that no search had occurred since no physical intrusion had taken place, Justice Brandeis realized that technology was fundamentally changing an individual's ability to seek solitude and "[t]he progress of science in furnishing the government with means of espionage [was] not likely to stop with wire tapping." He also noted that "[t]here is no difference between the sealed letter and the private telephone message" and would have afforded the same degree of protection to both. Thus was the concept of privacy first interjected into Fourth Amendment jurisprudence.

Acting on the Court's suggestion, Congress then enacted legislation protecting the privacy of telephone conversations in Section 605 of the Communications Act of 1934. The statute stated, in part, "no person not being authorized by the sender shall intercept any communication and divulge or publish the existence, contents, substance, purport, effect, or meaning of such intercepted communication to any person." The Court applied the statute in *Nardone v. United States*, holding that the government was a "person" in the meaning of the statute, and that the statute required the exclusion of evidence acquired by wiretap without a warrant even though *Olmstead* would have permitted its use.

**C. Katz Overrules Olmstead**

Statutory protections kept the eavesdropping issue out of the courts for a while, but once again, technological advances surpassed the limits of statutory protection in 1967. In *Katz v. United States*, the Supreme Court decided that law enforcement use of a microphone mounted on the outside of a public phone booth to capture one end of a telephone conversation was a search under the Fourth Amendment. Charles Katz had entered a public phone booth to place several illegal bets. FBI agents recorded his conversation without a warrant and he was prosecuted. A majority of the Court found that even though there was no intrusion into the interior of the phone booth, Katz was justified in expecting that no one was listening to his conversation because he took reasonable steps to prevent anyone

31. Id. at 474, 48 S. Ct. at 571.
32. Id. at 475, 48 S. Ct. at 571.
35. Id. at 381-84, 58 S. Ct. at 276-78.
from doing so. Justice Harlan's concurring opinion has become widely cited as the de facto two-pronged Katz test, i.e., in order to receive protection under the Fourth Amendment a person must exhibit a subjective expectation of privacy, and that expectation must be one that society is prepared to recognize as reasonable.  

As before, Congress passed legislation regulating both private and governmental eavesdropping, enacting Title III of the Omnibus Crime Control and Safe Streets Act of 1968. Thus, further development of electronic eavesdropping jurisprudence was somewhat limited by the statutory protections that exceeded those afforded by the Fourth Amendment.

While the legislation inhibited full development of Katz with regard to technologically enhanced listening, Katz evolved through its application to other forms of search and surveillance. As the Court pointed out in Katz, the Fourth Amendment protects people, not places, and no trespass is necessary for a search to violate its provisions. Justice Harlan's two-pronged Katz test established that the protections of the Fourth Amendment are not spatially dependant, but are more properly related to a person's reasonable expectation of privacy as manifested in his behavior. Conceptually, the right is personal and it must relate to an interest protected by the Fourth Amendment.

D. Post-Katz Search Jurisprudence

Oliver v. United States confirmed that a person must not only have a subjective expectation of privacy, but that society must be prepared to recognize the reasonableness of that expectation. In Oliver, law enforcement officers entered private property that was marked with no trespassing signs and was enclosed by fences and gates. The officers found a cultivated field of marijuana over a mile from the defendant's home. The Court found that the marijuana

37. Id. at 361, 88 S. Ct. at 516.
39. The statutes were also amended significantly in subsequent years to expand protections as technologies emerged that created new risks. Cellular telephones and cordless phones are two examples of those new devices that required new protections from eavesdropping.
41. In Rakas v. Illinois, 439 U.S. 128, 99 S. Ct. 421 (1978), the Court addressed the applicability of the Fourth Amendment to defendants who failed to claim any interest in the place searched or the items seized. The nature of the place searched and the degree of control over the place asserted by the party claiming Constitutional protection are factors to be considered.
43. Id. at 173, 104 S. Ct. at 1738.
patch was in an open field as it was understood at common law and not entitled to the same degree of protection as a house and its curtilage. The existence of fences and trespass signs might provide a subjective sense of privacy, but not one that "society recognizes as reasonable." Oliver had the effect of tying the Katz test back to traditional notions that certain circumstances never justify an objectively reasonable expectation of privacy, such as open fields. By contrast, certain places such as a home and its curtilage, enjoy a much elevated expectation of privacy at common law and under the text of the Fourth Amendment.

The protections of the wiretap statutes were tested in 1979 when, in Smith v. Maryland, the Supreme Court addressed the question of whether a "pen register" could be used, without a warrant, to record phone numbers dialed from a residential telephone. Applying the Katz test, the majority found there was no reasonable expectation of privacy because all phone customers know that the phone company uses this information for billing and rate information and that a list of toll calls appears on the monthly statement. Justice Stewart argued against the majority's opinion that the phone number was not like a conversation. He wrote that a list of numbers "could reveal the identities of the persons and the places called, and thus reveal the most intimate details of a person's life." Thus, in his view, it was not a question of the quality of information that was obtained, but that any information in which a telephone user had "a legitimate expectation of privacy" was indeed obtained.

The Court addressed a unique electronic search question in United States v. Karo. There, an electronic transmitter was attached to the inside of a container of chemicals used in the manufacture of illegal drugs. The transmitter was capable of emitting only a tone or "beep," but no other information. This beep made it possible for someone a short distance away to trace the location of the container, but it could not give precise location information. When the suspects in Karo picked up the containers, DEA agents in unmarked cars used the beepers to follow the suspects' vehicle to a residence and later

44. Curtilage is the immediate area surrounding a dwelling place, usually enclosed. See Black's Law Dictionary 389 (7th ed. 1999).
45. Id. at 179, 104 S. Ct. at 1742 (citing Katz v. United States, 389 U.S. 347, 88 S. Ct. 507 (1967)).
46. Id. at 180, 104 S. Ct. at 1742.
47. Smith v. Maryland, 442 U.S. 735, 736 n.1, 99 S. Ct. 2577, 2578 n.1 (1979) ("A pen register is a mechanical device that records the numbers dialed on a telephone by monitoring the electrical impulses caused when the dial on the telephone is released. It does not record any part of the conversation.").
48. Id. at 748, 99 S. Ct. at 2584 (Stewart, J., dissenting).
49. Id. at 747-48, 99 S. Ct. at 2583-84.
followed the containers when they were relocated to other intermediate storage locations.\footnote{Id. at 708-11, 104 S. Ct. at 3300-01.} The Court ruled that when an electronic device "reveal[s] a critical fact about the interior of [a] premises that the Government is extremely interested in knowing and that it could not have otherwise obtained without a warrant,\footnote{Id. at 715, 104 S. Ct. at 3303.} a warrantless search had occurred. The Court noted that the use of a beeper for following a vehicle to the cabin that was later searched with a warrant was permitted by the Fourth Amendment, as was held in a similar prior case.\footnote{See United States v. Knotts, 460 U.S. 276, 103 S. Ct. 1081 (1983).} The problem arose when the signal from the beeper was relied upon to ensure that the container remained in the cabin for a prolonged period of time. That information could not have been acquired with certainty by visual surveillance, a method permissible under the Fourth Amendment.

In 1986, the Court decided two aerial surveillance cases that would provide important insights into the application of the objective prong of the \textit{Katz} test. The first, \textit{California v. Ciraolo},\footnote{476 U.S. 207, 106 S. Ct. 1809 (1986).} was a marijuana cultivation case where the police received an anonymous tip that the activity was taking place in a residential yard adjacent to a home.\footnote{Id., 106 S. Ct. at 1809.} A police officer secured a private airplane and flew over the residence at an altitude of 1000 feet, within legally navigable airspace. With unassisted eyesight, the officer was able to identify and photograph a number of marijuana plants growing in the yard.

Unlike \textit{Oliver}, \textit{Ciraolo} involved the curtilage of a home, a place where a greater expectation of privacy is considered reasonable.\footnote{Oliver, 466 U.S. at 180, 104 S. Ct. at 1742.} Applying the two part \textit{Katz} test, the Court noted that the respondent had manifested a subjective expectation of privacy with multiple tall fences enclosing the yard, although that question was not before the Court on appeal. The question on appeal was whether Ciraolo's expectation of privacy was reasonable. The Court observed that "[t]he Fourth Amendment... has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares... [n]or does the mere fact that an individual has taken measures to restrict some views of his activities preclude an officer's observations from a public vantage point where he has a right to be and which renders the activities clearly visible."\footnote{Ciraolo, 476 U.S. at 213, 106 S. Ct. at 1812.}

The Court continued, "[w]hat a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth
Amendment protection.” The Court concluded that any expectation of the respondent that his garden was protected from aerial observation was unreasonable and not an expectation that society would honor since private and commercial aviation overflight by the general public had become common.59

Justice Powell, writing the dissenting opinion in Ciraolo, cautioned the majority that they were overlooking Justice Harlan’s concurring opinion in Katz where he stated that any construction of the Fourth Amendment that limited protection to instances of physical intrusion “is, in the present day, bad physics as well as bad law, for reasonable expectations of privacy may be defeated by electronic as well as physical invasion.”60 The Ciraolo majority distinguished Justice Harlan’s remarks as inapplicable to aerial photography because he was referring to “future electronic developments and the potential for electronic interference with . . . private communications,” and the remarks were “not aimed at simple visual observations from a public place.”61 The majority pointed out that after Katz, any form of electronic surveillance “aimed at intercepting private conversations” required the issuance of a warrant upon showing of probable cause.62 The majority did not explicitly mention that this protection was not the result of the Katz jurisprudence per se, but rather the legislative response to Katz in enacting Title III of the Omnibus Crime Control and Safe Streets Act of 1968.

The other aerial surveillance case, Dow Chemical Company v. United States,63 was decided the same day as Ciraolo. In Dow, the U.S. Environmental Protection Agency (EPA) used a commercial aerial mapping service to photograph a 2000 acre chemical plant from high altitudes. The aircraft made passes at 12,000, 3,000, and 1,200 feet, all within legally navigable airspace. Dow Chemical Company had taken extensive security measures to shield the facility from observation, primarily to thwart efforts by competitors to steal trade secrets.64

Dow Chemical Company claimed that the surveillance of their facility by the EPA was a violation of the Fourth Amendment, asserting that the plant was a form of “industrial curtilage” subject to

59. Id. at 214, 106 S. Ct. at 1813.
60. Id. at 216, 106 S. Ct. at 1814 (Powell, J., dissenting) (citing Katz).
61. Ciraolo, 476 U.S. at 214, 106 S. Ct. at 1813.
62. Id., 106 S. Ct. at 1813 (emphasis added).
64. Id. at 229, 106 S. Ct. at 1822.
an elevated level of protection, that trade secret laws protected the complex from aerial observation, and that the taking of pictures using sophisticated mapping cameras was a search requiring a warrant under the Fourth Amendment. The claim of protection under the trade secrets laws was quickly dismissed because the EPA had no intention to compete with Dow. The claim that the industrial complex should be considered as an "industrial curtilage" received some attention, but was found to fit more closely to the common law concept of an open field. The Court’s analysis focused on the defendant’s contention that the EPA’s action amounted to a search.

The Court identified the critical question to be whether the high-resolution aerial photographs revealed any intimate detail. The government conceded that the use of “highly sophisticated surveillance equipment not generally available to the public, such as satellite technology, might be constitutionally proscribed absent a warrant,” but that the photographs in question were “not so revealing of intimate details as to raise constitutional concerns.” The Court accepted this reasoning and noted that just because a greater degree of detail than the naked eye could reveal was present, that was not enough to make the EPA’s photography a search. However, the Court went on to say that “[a]n electronic device to penetrate walls or windows so as to hear and record confidential discussions of chemical formulae or other trade secrets would raise very different and far more serious questions.” The Court concluded that the plant complex was not a curtilage and that the EPA’s high resolution aerial photography from navigable airspace was not a search.

The Dow dissent countered that while the majority cited Katz, it completely ignored the Katz standard and its shifting of the question away from physical trespass. The dissent pointed out that if the analysis of the majority were to replace the Katz rule, privacy rights would be at risk of erosion as technological advances became “generally available in society.”

E. Contemporary Thermal Imaging Cases

Prior to the Kyllo decision, there were a number of cases heard in the federal circuit courts involving the use of thermal imaging.
devices by law enforcement. These cases are a rag bag of fact patterns, many not close enough to *Kyllo* to be directly analogous, but with important analytical elements similar to those used by the Court in *Kyllo*. In *United States v. Ishmael*, the facts were very similar to *Kyllo*, except the structure in question was not a house, but an outbuilding with a very sophisticated marijuana cultivation operation in the basement. The Fifth Circuit held that a thermal imaging device "when used in an 'open field' does not offend the Fourth Amendment because it is passive and non-intrusive" and "[t]he sanctity of one's home or business is undisturbed." Other cases, however, involved homes being the subject of thermal imaging surveillance. Those cases generally fell into two analytically similar groups, one in which the courts focused on the question of whether a subjective expectation of privacy existed with respect to thermal emissions (the 'waste heat cases'), the other group focusing on the objective expectation of privacy in that phenomenon (the intimate detail cases). Some of the cases combined the two analytical paths and found neither element of the *Katz* test was met.

The courts in the "waste heat" cases have reasoned that the first prong of the *Katz* test must fail where someone knowingly exposes the heat generated in the marijuana cultivation process because there is no subjective expectation of privacy. Courts drew an analogy between the knowing venting of heat and the discarding of garbage bags containing incriminating evidence as was the case in *California v. Greenwood*. In *Greenwood*, police found incriminating evidence in garbage bags set by the curb for collection and the Court relied on *Katz* in holding that "[w]hat a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection." The argument drawn from *Greenwood* by the courts in these "waste heat" cases is that even when some measures are taken to mask or disguise the heat, it is subjectively unreasonable to believe that it will not be detected.

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74. 48 F.3d 850 (5th Cir. 1995).
75. Id. at 857.
76. The term "waste heat" was used by courts in those cases to characterize thermal emissions as a by-product of normal existence, analogous to garbage set out for collection.
78. Id. at 41, 108 S. Ct. at 1629 (quoting *Katz v. United States*, 389 U.S. 347, 88 S. Ct. 507 (1967)).
The other line of thermal imaging cases fall in the "intimate detail" category, where the objective prong of the *Katz* test failed. The courts in those cases found that even where someone takes adequate measures to demonstrate a subjective expectation of privacy, that expectation is not reasonable because the thermal imaging device does not disclose intimate details of any activity inside the house. The reasoning was that since the information discernible by the thermal imager was not particularly revealing of "intimate" activity, it was not something that society is willing to recognize as a privacy issue. All of these cases rely heavily on *Ciraolo* and *Dow* where the amount of detail revealed was the key issue.

Oddly, one theory that always appears in the background of these cases is that because thermal imaging does not physically intrude into a protected space, its use does not constitute a search in the meaning of the Fourth Amendment. This return to the traditional trespass theory of privacy ignores that *Katz* expressly overruled *Olmstead*. Whether or not an intrusion in the form of a microphone, an officer, sound waves, or other forms of radiation occurs is not germane to the search issue after *Katz* where the Court held that "[t]he fact that the electronic device employed . . . did not happen to penetrate the wall of the booth could have no constitutional significance."

Among the federal appeals cases examining the thermal imaging issue, one stands out in applying the *Katz* test in a manner faithful to the original reasoning the *Katz* Court followed in developing that test. In *United States v. Cusumano*, the Tenth Circuit Court of Appeals looked beyond the means used to gather information and asked instead whether the actions of the person being monitored manifested an intent to maintain privacy. *Cusumano* involved facts very similar to *Kyllo*, with the petitioner growing marijuana in a home, and law enforcement officers using an infrared imager to detect the heat of grow lights therein. The *Cusumano* court, in examining the second element of *Katz* (an objective expectation of privacy), realized that earlier courts had focused their analysis on the deficiencies of the thermal imaging device and how it did not reveal great detail about the activities inside a house. In using that approach, prior decisions completely overlooked the fact that such technologies have a

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80. See generally *United States v. Pinson*, 24 F.3d 1056 (8th Cir. 1994); *United States v. Robinson*, 62 F.3d 1325 (11th Cir. 1995); *United States v. Myers*, 46 F.3d 668 (7th Cir. 1995); *United States v. Ford*, 34 F.3d 992 (11th Cir. 1994).
81. Recall that the court in *Ciraolo* and *Dow* discussed above, found the lack of intimate detail to be an important factor in determining that the objective prong of the *Katz* test had failed.
tendency to improve. A narrow holding that a particular device did not show enough detail to offend the Fourth Amendment would inevitably lead to ongoing judicial review of each new and improved version of the device. 84

Concluding that thermal imaging is permissible under the Fourth Amendment based on the limited capabilities of existing devices would “allow the privacy of the home to hinge upon the outcome of a technological race of measure/counter-measure between the average citizen and the government—a race, we expect, that the people will surely lose.” 85 A particularly astute observation of the court was made in a footnote, commenting on the alleged inability of the thermal imaging device to discern any intimate detail of the activities of the home. The Tenth Circuit commented that “[i]t is somewhat disingenuous for the government to plead so forcefully the deficiencies of its machine while simultaneously averring that the output of that device is sufficiently reliable to support the warrant that issued.” 86 It seems questionable that a valid warrant could be issued if the evidence offered to show probable cause does not reveal anything of significance.

III. THE KYLLO DECISION

A. The Majority’s Analysis

The Fourth Amendment guarantees people a right to be secure in their homes, free from unreasonable governmental intrusions. 87 However, the Fourth Amendment only applies when an agent of the government actually conducts a search. 88 Mere visual observation is not a search. 89 Whether the conduct of government agents constituted a search was the question decided in Kyllo, just as it was in Katz. 90 As the Kyllo Court pointed out, “[t]he Fourth Amendment protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares.” 91 The Court had previously applied the Katz test to determine if a search had occurred, even with respect to a

84. Id. at 1504.
85. Id.
86. Id. at 1505 n.12.
87. U.S. Const. amend. IV provides 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.”
91. Kyllo, 533 U.S. at 32, 121 S. Ct. at 2042 (citing California v. Cirillo, 476 U.S. 207, 106 S. Ct. 1809 (1986)).
house, by inquiring whether a person “manifested a subjective expectation of privacy in the object of the challenged search” and whether “society [is] willing to recognize that expectation as reasonable.”

The *Kyllo* Court acknowledged that the *Katz* test is problematic and somewhat circular. But with respect to a house, a place expressly recognized in the text of the Fourth Amendment, a minimum expectation of privacy exists and is acknowledged to be reasonable, and that “obtaining by sense enhancing technology any information regarding the interior of the home that could not otherwise have been obtained without physical intrusion constitutes a search—at least where (as here) the technology in question is not in general public use.” The Court applied the *Katz* test in a very particular way, stating that by confining an activity to the home, an individual is expressing a subjective expectation of privacy, and that the protection of a house in the text of the Fourth Amendment makes that expectation reasonable as long as there is no other way the information could have been obtained. Thus, the *Katz* test was applied in *Kyllo*, but was narrowed to the circumstance where a house is the object of an alleged search. The objective component of the test with respect to houses is reduced to the question of whether the tool used to enhance sensory perception is “in general public use.” By implication, it would seem that when one’s neighbors can buy a piece of equipment that can reveal information about the inside of a house, it is no longer objectively reasonable to expect that they will not buy it and use it.

The Court found the quality and quantity of information obtained by the sensory enhancement to be irrelevant to the question of whether a search occurred. The fact that any information about the interior of a house “that could not otherwise have been obtained without physical intrusion” is collected makes the surveillance a search. This is similar to the *Ciraolo* Court’s observation in dicta that “aerial observation of curtilage may become invasive . . . [if] modern technology . . . discloses to the senses those intimate associations, objects or activities otherwise imperceptible to police

92. *Id.* at 33, 121 S. Ct. at 2042-43 (quoting *Ciraolo*, 476 U.S. at 211, 106 S. Ct. at 1811).
93. Perhaps the best example is the comment in *Smith v. Maryland*, 442 U.S. 735, 99 S. Ct. 2577 (1979), where the Court noted that the subjective expectation prong could be defeated by the government broadcasting notices on television for a number of days that all houses would be searched without warrants. It would be difficult then to claim that people had a subjective expectation of privacy.
94. *Kyllo*, 533 U.S. at 34, 121 S. Ct. at 2043.
95. *Id.*, 121 S. Ct. at 2043.
96. *Id.*, 121 S. Ct. at 2043.
97. *Id.*, 121 S. Ct. at 2403.
944  LOUISIANA LAW REVIEW  Vol. 62

or fellow citizens." The Court in *Kyllo* interpreted that passage to mean that the invasion resulted from observation of things "otherwise imperceptible" and that "intimate associations" were just an example of the kind of thing that might thus be observed. Inquiry into whether a particular technology provides intimate detail is not the appropriate question. In the home, "all details are intimate details, because the entire area is held safe from prying government eyes."

The holding in *Kyllo* is an adaptation of *Katz* to situations involving houses, with text from *Ciraolo*, *Karo*, and *Dow Chemical* interwoven. *Kyllo* held that "where... 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." The phrase “device that is not in general public use” has origins in *Ciraolo*, where the Court said that "[i]n an age where private and commercial flight in the public airways is routine, it is unreasonable... to expect... constitutional[] protect[ion] from being observed... from an altitude of 1,000 feet" and hence, that the second *Katz* element was not met.

Similar language also appeared in *Dow Chemical* where the government conceded that "using highly sophisticated surveillance equipment not generally available to the public... might be constitutionally proscribed absent a warrant." However, the government asserted that the mapping cameras used to photograph the Dow plant were nothing out of the ordinary and available to anyone who could afford to hire an aerial mapping contractor.

The language "explore details of the home that would previously have been unknowable without physical intrusion" is derived from *Karo* where the Court found that "a beeper... does reveal a critical fact about the interior of the premises that the Government is extremely interested in knowing and that it could not have otherwise obtained without a warrant." Thus, *Kyllo* did not reveal anything new, but rather clarified the application of *Katz* to a house, followed *Karo* with respect to the quantity and quality of information that a device must reveal about the inside of a house for a search to exist, and distinguished *Dow Chemical* and *Ciraolo* using dicta that qualified the holdings of those two cases where a surveillance operation was found not to be a search.

99.  *Kyllo*, 533 U.S. at 38 n.5, 121 S. Ct. at 2045 n.5.
100.  *Id.*, 121 S. Ct. at 2045 n.5.
101.  *Id.* at 40, 121 S. Ct. at 2046.
Finally, the phrase "not in general public use" was criticized by the Kyllo dissent as introducing a whole new level of uncertainty. The Court responded that the credit for the phrase belonged not with Kyllo, but with Ciraolo. While that may be true, one thing is striking about the incorporation of that phrase into the holding. Given that the Constitution protects only against governmental action, restrictions on private conduct must come from state legislatures and Congress. If the Court restricts governmental use only of enhanced surveillance technologies not in "general public use," it would seem that privacy is continually eroded as the general public has access to more sophisticated technologies. When one's neighbor can perform a thermal scan of a house and inform law enforcement of suspicious activity, probable cause to issue a warrant may be shown without the government having directly acted.\footnote{While it has always been true that private individuals are free to observe their neighbors public activities, it is the recent availability of sophisticated reconnaissance equipment that limits the individual's ability to readily retreat from the public's eye.}

General public use is a function of cost, availability, and the lack of statutory restrictions on possession. Given the cost trends in consumer electronic devices, it can be expected that Radio Shack\textsuperscript{\textregistered} will one day sell such devices absent any government restriction. In fact, the 2000 and later model Cadillac DeVille had available as an option a Raytheon FLIR NightVision\footnote{See Raytheon, Products: NightVision, at http://www.raytheoninfrared.com/html/prod3a/summary.htm (last visited Nov. 5, 2001).} system fully the equal of the equipment used by the agents in 1991 to scan Danny Kyllo's house.\footnote{Respondent's Brief at n.18, Kyllo v. United States, 533 U.S. 27, 35, 121 S. Ct. 2038, 2044 (No. 99-8508).} Might this fact be construed to mean that thermal imaging technology is now "in general use by the public?" If so, a fact pattern identical to Kyllo's occurring today might be found not to be a search.

B. The Kyllo Dissent

Justice Stevens, writing for the dissent in Kyllo, made much of the fact that the thermal imager was not actually getting information from the inside of the house, but rather reading with some precision the temperature of the exterior walls and roof. This reasoning completely ignores the fact that the directly analogous condition existed in Katz.\footnote{Kyllo, 533 U.S. at 43-44, 121 S. Ct. at 2048 (Stevens, J., dissenting).} There, a microphone outside of a
Today, even more advanced eavesdropping devices are available, such as the "laser microphone"\textsuperscript{109} that uses a laser beam bounced off of a window to read the minute vibrations of the glass induced by the sound waves inside a structure. The vibrations create a modulating component of the reflected laser light that is then converted to an electrical signal back at the laser microphone transmitter/receiver located hundreds of yards away. The signal is then amplified and played through a speaker, reproducing sound that duplicates the sound waves inside the distant structure. As with the thermal imager, the device is not directly reading or monitoring anything "inside" the house, but measuring an exterior manifestation, the movement of a window pane.

The same phenomenon is what makes the thermal imaging technique work as a surveillance tool. Several sources of energy affect the temperature of the walls and roof of a house. Heat sources inside the house cause the exterior surface temperature to radiate unevenly, producing a pattern from which certain information about what is inside the house may be inferred. Those patterns of heat radiation on the outside are a manifestation of what is happening inside the house in much the same way as the vibrating glass outside the Katz phone booth reflect the sound emanations on the inside. The dissent's contention that a search does not occur when temperature is measured "off the wall"\textsuperscript{110} of a house is, as Justice Harlan said in Katz, "bad physics as well as bad law."\textsuperscript{111}

The dissent also talked about the "waste heat" theory, drawing an analogy to the intentional leaving of garbage at the curbside for collection as in California v. Greenwood.\textsuperscript{112} The dissipation of heat is readily distinguished from the setting out of trash, however, because a resident does so with full knowledge that any passerby, be it the garbage man or a police officer, can readily open the bag and snoop to their heart's delight. To "observe" heat energy emanating from a building requires sophisticated equipment that a trash picker probably does not have.

\textsuperscript{110} The dissent in Kyllo used the term "off the wall" to distinguish observation of the exterior of the dwelling from observations of activity inside the dwelling ("through-the-wall"). Kyllo, 533 U.S. at 41, 121 S. Ct. at 2047.
IV. WHAT TO DO? THE LEGISLATIVE APPROACH

A. Possible Application of Existing Statutes

Title 18, Section 2510 of The United States Code provides definitions of terms with specific meanings under the Electronic Communications Privacy Act of 1986. It defines "electronic communications" as follows:

[A]ny transfer of signs, signals, writing, images, sounds, data, or intelligence of any nature transmitted in whole or in part by a wire, radio, electromagnetic, photoelectronic or photooptical system that affects interstate or foreign commerce.\(^{113}\)

Reducing the text to terms pertinent to the *Kyllo* facts results in "electronic communication" means any transfer of images transmitted by a[n] electromagnetic system that affects interstate or foreign commerce." Infrared radiation is the form of energy that a thermal imaging device senses. Like light and radio waves, it is an electromagnetic form of radiation.\(^{114}\) The infrared energy is emitted or "transmitted" by any mass at a temperature above absolute zero.\(^{115}\) The source of the emission is inherently an electromagnetic system in that it conveys information about itself in the form of electromagnetic energy generated internally. So it could be said that a wall of a house that is emitting an infrared image of itself produces an "electronic communication" that cannot be legally intercepted under Section 2511(1)(a). An interesting aside is the exemption in Section 2511(2)(g)(I) that allows interception of electronic communications "made readily accessible to the general public."\(^{116}\) This language is surprisingly close to the *Kyllo* holding and might readily yield similar results since both criteria allow interception of


\(^{114}\) See Electromagnetic Radiation, 18 The New Encyclopedia Britannica 292, 293 (1989). Electromagnetic radiation is the propagation of energy through space by means of electric and magnetic fields that vary in time. One property of electromagnetic radiation is its wavelength. Familiar classifications of electromagnetic radiation include radio and television signals, visible light and X-rays, with the distinguishing characteristic between the classes being wavelength. Infrared radiation falls between visible light and microwave radio signals in wavelength.

\(^{115}\) See Absolute Zero, 1 The New Encyclopedia Britannica 40 (1989). Absolute zero is the lowest temperature theoretically attainable, inferred from the behavior of matter. At absolute zero, molecular motion essentially ceases.

an image when the device used is made "accessible to the general public."\textsuperscript{117}

While finding the use of thermal imaging to fit under the provisions of the existing Title III statutes requires a stretch of interpretation, consider the case of a device that is capable of recording every keystroke of a computer keyboard or computer display from outside of the building in which the computer is located. The device is completely passive and detects the modulated electromagnetic emissions from the keyboard or display. Devices such as this exist and are the subject of a U.S. Government National Security Agency (NSA) specification for computer equipment that is immune to such monitoring.\textsuperscript{118} This form of surveillance would likely be prohibited under the statutes, and the physical science behind it is virtually identical to thermal imaging. These obvious analogies between the physical science of thermal imaging and other surveillance methods that are statutorily prohibited could be argued, but would be susceptible to an overbreadth defense. All human activity is susceptible to observation in the form of energy reflection or emanation that is readily captured and converted to "data." When those data are pervasively captured, stored, and integrated with other data, individual privacy becomes a physical impossibility.

\textbf{B. Legislative Amendment to Title III}

As the section above shows, the existing statutory provisions of Title III of the Electronic Communications Privacy Act provide some protections from both governmental and private eavesdropping. However, the text is an adaptation of the original legislation intended to limit wiretaps of telephone and telegraph era technology. Since the nature, both materially and technically, of the threat to privacy in the home is similar whether it involves thermal imaging, keystroke monitoring, or other passive monitoring technologies, redrafting the statutes should follow a single generalized approach. Without such revisions, as noted above, the Fourth Amendment protections against government overreaching become moot once the general public has ready access to sophisticated monitoring devices.

\textsuperscript{117} Note the similarity to the language from \textit{Kyllo} that using a device "not in general public use" to monitor activity in a house would violate Fourth Amendment protections.

A redrafting of the statutes should be based on a core objective of providing information security that is not particular to any existing technology. Rather than relying on nebulous metrics like "reasonable expectations of privacy," the statutes should define times, places, and modes of communications that are intended to be secure. Then, a person will not have to guess whether a particular channel of communications is secure; they will expect it to be secure because of its protected status. Exceptions would create intentional gaps allowing permissible uses, similar to the current exceptions permitting reception of certain broadcast types of communications. Possession of devices capable of unlawful use, but also having lawful applications should be permitted with penalties applying to any use that is prohibited.

By providing well defined protected contexts, the subjective expectation of privacy will be the defining issue. If people expect privacy, they will make the conscious effort to conform to the context provided by the statute. The old "objective" component of the *Katz* test will be provided by the Legislature, generally the appropriate forum for that kind of determination.

V. THE CONUNDRUM

The Fourth Amendment stands as a limitation against the exercise of government power. In no way does it restrict the conduct of individuals acting in a private capacity. Restriction of individual conduct is effected through legislative action that is, in turn, subject to Constitutional limits. In the case of telephone and electronic communications, the need to restrict both governmental and individual interference has been recognized for most of the twentieth century in the form of state and federal laws. Use of

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119. Examples are commercial radio and television, Ham radio and CB radio. Many devices have legitimate uses and should not be outlawed. The unlawful use is the activity that should be restricted and penalized. The Cadillac NightVision system is one such example.

121. See *Minnesota v. Carter*, 525 U.S. 83, 91, 119 S. Ct. 469, 474 (1998) (Scalia, J., concurring) (pointing out that the *Katz* criteria that calls for the expectation of privacy be one "that society is prepared to recognize as reasonable" ends up bearing "an uncanny resemblance to those expectations of privacy that this Court considers reasonable"). This is Justice Scalia's inimitable way of saying that legislatures tend to be the government body in the best position to make such determinations.


other electronic devices, such as the thermal imager in Kyllo, has not been subject to the same kind of regulation and is becoming more common as the cost of manufacture drops. It is logical to suggest extension of existing state and federal statutory strictures to protect individual privacy against government and private intrusion.

There is one problem with this solution. Any time the government acts in the interest of protecting its citizens from some form of individual conduct, that action necessarily interferes with the freedoms of some part of the population. When that government restriction implicates an interest subject to express constitutional protection, the courts must resolve the conflict. Three weeks before the Court decided Kyllo, it declared in Bartnicki v. Vopper124 part of the federal wiretap statute125 a violation of the First Amendment insofar as it bars publication by the media126 of illegally obtained conversations. Bartnicki finds a questionable First Amendment protection allowing disclosure “of lawfully obtained information of public interest by one not involved in the initial illegality.”127

While Bartnicki warrants a separate casenote, it is worthy of mention in the context of Kyllo because it stands to completely undermine any effort to statutorily protect individual privacy. If the disclosure of truthful information of public interest, legally acquired, despite its initial illegal acquisition, is constitutionally protected, there can be no guarantee of privacy. The Court in Bartnicki found the right of a radio station to play an illicitly obtained recording of a private telephone conversation to be protected under the First Amendment, and that criminal penalties for such actions provided under federal wiretap laws were unconstitutional.128 As a result of Bartnicki, new technologically advanced devices will inevitably be used to provide interesting content for the tabloid publications found at the grocery checkout line. Judging from the existing materials on the front pages of those publications, there are a wide range of things, truthful or otherwise, that are “of public interest.” If a person’s best efforts to keep information secret are trumped by the interest of others to disclose that information, legislatively provided protections of privacy can eventually be defeated by technology.

125. Specifically, Section 2511(1)(c) prohibits “any person intentionally disclosing . . . the contents of any . . . electronic communication, knowing or having reason to know that the information was obtained . . . in violation of this subsection.” 18 U.S.C. § 2511(1)(c)) (2000).
126. The “medium” in Bartnicki was a radio station that broadcast an illegally taped intercept of a cellphone conversation and newspapers that published transcripts thereof.
127. Bartnicki, 532 U.S. at 529, 121 S. Ct. at 1762.
128. Id. at 534, 121 S. Ct. at 1765.
It must be recognized, that while the First Amendment assures the right to speak, "[t]here is necessarily, and within suitably defined areas, a concomitant freedom not to speak publicly, one which serves the same ultimate end as freedom of speech in its affirmative aspect."129 The Court has previously found the right to not speak contained in the First Amendment, holding that a public school cannot compel students to recite the pledge of allegiance,130 and that New Hampshire drivers cannot be forced to adorn their vehicles with the slogan "live free or die" on their license plates.131 Thus, it is clear that the right to "not speak" is protected by the First Amendment under certain circumstances. That raises an interesting question at to whether that First Amendment right is superior to the First Amendment right of another to disclose that information to the public. Bartnicki, applying a standard of strict scrutiny in favor of disclosure, did not appear to give appropriate weight to the chilling effect that the spectre of potential disclosure must inevitably have on individual free speech. Hopefully, Bartnicki will not be expanded beyond the narrow scope of its facts.

VI. CONCLUSION

Kyllo did not expand or contract the Fourth Amendment protections as interpreted in Katz, but the decision did clarify how the rule of Katz is applied to activities occurring inside a home. The Court noted that the specific reference to houses in the text of the Fourth Amendment means that expectations of privacy in a home are de facto objectively reasonable, as long as the general public does not possess the ability to defeat the privacy shield of the home.

The language stating that an expectation of privacy in the home would cease to be objectively reasonable when members of the general public have access to sophisticated surveillance equipment sets the limit to which the Fourth Amendment can effectively protect privacy. Protection from government searches is a less valuable right when the "general public" can do the same thing with impunity. The only way to sustain an expectation of privacy in the home is to pass legislation that limits the use of sophisticated surveillance technologies by the public. Finally, existing statutory protections must be revised to encompass technological

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enhancement of all senses, not just "listening." The Constitution can only go so far in protecting privacy, and legislation is the appropriate mechanism to balance the conflicting public interests in a democratic republic.

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