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Passive, Sensory-Enhanced Searches: Shifting the Fourth Amendment "Reasonableness" Burden

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I. INTRODUCTION

Prior to the American Revolution, writs of assistance gave English soldiers and customs agents unlimited authority to enter the private residences and storehouses of American colonists to conduct arbitrary searches for smuggled goods.[1] In 1761, these writs and similar "general" warrants sparked a famous debate in Boston which arguably marked the beginning of the American Revolution.[2] In this debate, James Otis asserted that writs of assistance were "the worst instrument of arbitrary power, the most destructive of English liberty and the fundamental principles of law, that ever was found in an English law-book."[3]

With this oppression still fresh in the memories of many of its members, the First Congress adopted the Fourth Amendment[4] which provides in part that "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated."[5] The language of the Amendment demonstrates that Congress "only intended to restrain the abuse, . . . [but] not abolish the power. Hence it is only *unreasonable* searches and seizures that are forbidden."[6] Congress did not, however, define the terms "search" and "unreasonable." This task has been left to the courts.

Part II of this comment briefly reviews some of the principal cases in which the United States Supreme Court has analyzed Fourth Amendment search and seizure issues. In addition to demonstrating how the Court's definition of "search" has evolved, these cases illustrate the tests used by the Court in evaluating whether a particular search is "reasonable."

Part III discusses problems encountered when these tests of "reasonableness" are applied to the passive, sensory-enhanced technology[7] used by law enforce-

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1. *See* Black's Law Dictionary 1609 (6th ed. 1990) ("writs of assistance").

2. John Adams called this debate "the first scene of the first act of opposition to the arbitrary claims of Great Britain. Then and there the child Independence was born." Boyd v. United States, 116 U.S. 616, 625, 6 S. Ct. 524, 529 (1886).

3. James Otis' Speech Against the Writs of Assistance (Feb. 24, 1761), *in* 2 The Works of John Adams, app. A. 521, 523 (Charles Francis Adams ed., 1850). (There is no known formal record of James Otis' arguments. *See* 1 Documents of American History, to 1898, at 45 (Henry Steele Commager & Milton Cantor eds., 1988). However, John Adams made notes of the speech. The quoted material is from John Adams' account of this historic debate.).

4. "The well-known historical purpose of the Fourth Amendment, directed against general warrants and writs of assistance, was to prevent the use of governmental force to search a man's house, his person, his papers, and his effects, and to prevent their seizure against his will.". Olmstead v. United States, 277 U.S. 438, 463, 48 S. Ct. 564, 567 (1928).

5. U.S. Const. amend. IV.

6. Boyd v. United States, 116 U.S. 616, 641, 6 S. Ct. 524, 538 (1886) (Miller, J., concurring) (emphasis added).

7. The term "sensory-enhancement," as used in this comment, refers to the use of any object

ment for surveillance. To illustrate these problems, this part focuses on a relatively new method of passive, sensory-enhanced surveillance, thermal imagery, and explains how its use has been inconsistently and improperly analyzed by the federal courts of appeals.

Part IV proposes a new standard for the evaluation of passive, sensory-enhanced searches under the Fourth Amendment. The analysis currently used by the courts when evaluating the constitutionality of these searches places the burden of proof on the citizen. This comment proposes that the courts abandon their current rationales and shift the burden back to the government to prove that its actions are reasonable. In addition, this part discusses practical applications of the proposed standard when applied to more advanced surveillance technology such as hand-held millimeter wave cameras.

II. THE EVOLUTION OF FOURTH AMENDMENT DOCTRINE

A. Pre-1967 Search and Seizure Doctrine

Early jurisprudence interpreted the Fourth Amendment Search and Seizure Clause literally and placed primary focus on individual property rights. From this interpretation, a trespass-based analysis evolved under which there was no violation of the Fourth Amendment unless there had been an official warrantless search and seizure of the person, his papers, "his *tangible* material effects or an actual *physical* invasion of his house or 'curtilage.'"[8] For example, in *Olmstead v. United States* the Court stated that "[t]he amendment itself shows that the

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to extend the natural sensory perception of the normal human. This includes enhancement both within and beyond normal ranges. For example, natural human eyesight is limited to certain bandwidths within the electromagnetic spectrum. Amplification of those bandwidths with a device such as a telescope is an example of enhancement *within* normal ranges. In contrast, use of a device that detects infrared radiation, which is not within the bandwidths of visible light, is an example of enhancement *beyond* natural ranges. Although acknowledging that a distinction between the two types of enhancement exists, this author does not find that the differences are sufficient to compel different results with respect to "reasonableness" under the Fourth Amendment. (For an argument that sensory-enhancement should be allowed to amplify senses only within the normal human range of sensory perception, *see* Mark J. Kwasowski, *Thermal Imaging Technology: Should Its Warrantless Use by Police be Allowed in Residential Searches?*, 3 Tex. Wesleyan L. Rev. 393, 409 (1997).).

The term "passive," as used in this comment, refers to the fact that there has been no physical intrusion. Surveillance using a beeper or bug is an example of an "active" search because the device is planted within the area under surveillance and transmits information out to officers who cannot locate themselves within that area. Another example is when a device such as an X-ray machine is used to project a beam or ray into the area thus allowing the officers to gather information by measuring the characteristics of the reflected beam. On the other hand, no such intrusion occurs during "passive" searches. Surveillance using a parabolic microphone is an example of a "passive" search. The parabolic microphone does not emit any beams or rays; instead, it passively monitors the sounds that are emitted from that area.

8. Olmstead v. United States, 277 U.S. 438, 466, 48 S. Ct. 564, 568 (1928) (emphasis added).

search is to be of *material* things—the person, the house, his papers, or his effects."[9]

Considering the unsophisticated surveillance equipment available to government officials in the late 1700s,[10] even this limited textual interpretation was sufficient to provide adequate protection against government invasion into the individual's privacy because, once a citizen retreated into his home, he could be relatively certain the activities conducted there would be shielded from government scrutiny. However, by the mid 1800s, many cities began forming police forces[11] and scientists were making significant technological advances in the field of electronics.[12] Naturally, law enforcement officers took advantage of this technology to enhance their methods of surveillance. By 1928, the Supreme Court faced its first "wiretap" case, *Olmstead v. United States*,[13] and, by 1942, its first "bugging" case, *Goldman v. United States*.[14]

When first confronted with these electronic surveillance methods, the Supreme Court maintained a textual method of interpretation and refused to apply the concepts of search and seizure to intangibles such as communications.[15] For example, although the Court found that there was a Fourth Amendment violation in *Silverman v. United States* when officers inserted a "spike mike" into a wall to record a suspect's conversations in another room, it specifically stated that its decision was "based upon the reality of an *actual intrusion* into a constitutionally protected area" and not upon a search or seizure of the communication itself.[16]

However, as technology advanced, the Court's adherence to this trespass-based concept of "search" met frequent opposition. Some Justices recognized that such a limited application was no longer adequate to provide protection against governmental intrusion. In *Lopez v. United States*, Justice Brennan, dissenting, reflected that the Court's "course of decisions, it now seems, has been outflanked by the technological advances of the very recent past."[17] Also, in

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9. *Id.* at 464, 48 S. Ct. at 568 (emphasis added).

10. During this time, telescopes and field glasses were commonly available and were used by government officials for surveillance.

11. In the United States, the first full-time organized police department was formed in New York City in 1845. Wilbur R. Miller, Cops and Bobbies at x (1977).

12. In 1877, Emile Berliner developed the first loose-contact transmitter, or microphone, capable of transmitting voice by wire over long distances. Frederic W. Wile, Emile Berliner: Maker of the Microphone 79-87 (1926).

13. "The Court was faced with its first wiretap case in 1928, *Olmstead v. United States*, 277 U.S. 438, 48 S.Ct. 564." Berger v. New York, 388 U.S. 41, 50, 87 S. Ct. 1873, 1879 (1967).

14. "The first bugging case reached the Court in 1942 in *Goldman v. United States*, 316 U.S. 129, 62 S.Ct. 993." *Berger*, 388 U.S. at 51, 87 S. Ct. at 1879.

15. *See* Goldman v. United States 316 U.S. 129, 62 S. Ct. 993 (1942); Olmstead v. United States, 277 U.S. 438, 48 S. Ct. 564 (1928).

16. Silverman v. United States, 365 U.S. 505, 512, 81 S. Ct. 679, 683 (1961) (emphasis added).

17. Lopez v. United States, 373 U.S. 427, 471, 83 S. Ct. 1381, 1405 (1963) (Brennan, J., dissenting).

Berger v. New York, the Court acknowledged that "[f]ew threats to liberty exist which are greater than that posed by the use of eavesdropping devices"[18] and "[t]he law, though jealous of individual privacy, has not kept pace with these advances in scientific knowledge."[19] But, despite the recognized dangers of electronic surveillance, it wasn't until late 1967, when the Court heard *Katz v. United States*, that a majority finally agreed to abandon the trespass doctrine.[20]

B. The Katz *Decision*

In *Katz v. United States*, FBI agents attached an electronic listening device to the outside of a public phone booth frequented by their suspect, Charles Katz. The product of their surveillance, a recording of Katz's voice as he discussed illegal wagering, was introduced at trial and resulted in Katz's conviction.[21] Katz argued on appeal that the telephone booth was a "constitutionally protected area" and therefore the recording obtained via the warrantless search was a violation of his right to privacy.[22] Thus, he asserted that the illegally obtained information should be inadmissible as evidence against him.[23]

The Court objected to Katz's formulation of the issue and stated that "the correct solution of Fourth Amendment problems is not necessarily promoted by incantation of the phrase 'constitutionally protected area.'"[24] The Court declared that such a view "deflect[ed] attention from the problem presented . . . . For the Fourth Amendment protects people, not places."[25] This decision expressly overruled *Olmstead* and *Goldman* with respect to their trespass doctrines[26] and expanded the Court's definition of "search." It interpreted the Fourth Amendment to provide protection in circumstances where an individual has a protected privacy interest—even if outside one's home.[27] Therefore, *Katz* established as a general rule that "[w]hat a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment

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18. *Berger*, 388 U.S. at 63, 87 S. Ct. at 1885.

19. *Id.* at 49, 87 S. Ct. at 1878.

20. "The 'trespass' doctrine . . . can no longer be regarded as controlling." Katz v. United States, 389 U.S. 347, 353, 88 S. Ct. 507, 512 (1967).

21. *Katz*, 389 U.S. at 348-49, 88 S. Ct. at 509.

22. *Id.* at 349-50, 88 S. Ct. at 510.

23. *Weeks v. United States*, 232 U.S. 383, 34 S. Ct. 341 (1914) established the "exclusionary rule" which made unconstitutionally obtained evidence inadmissible in federal prosecutions. *Mapp v. Ohio*, 367 U.S. 643, 81 S. Ct. 1684 (1961) incorporated the Fourth Amendment through the Fourteenth Amendment thus making the "exclusionary rule" applicable in state prosecutions as well.

24. *Katz*, 389 U.S. at 350, 88 S. Ct. at 510.

25. *Id.* at 351, 88 S. Ct. at 511.

26. "The 'trespass' doctrine . . . can no longer be regarded as controlling." *Id.* at 353, 88 S. Ct. at 512.

27. "Wherever a man may be, he is entitled to know that he will remain free from unreasonable searches and seizures." *Id.* at 359, 88 S. Ct. at 515.

protection. But what he seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected."[28]

In Justice Harlan's oft-quoted concurrence, a two-part test was proposed to determine whether a protected privacy interest exists. First, an individual must exhibit an actual expectation of privacy (subjective). Second, that expectation must be one that society is willing to recognize as reasonable (objective).[29] To illustrate the application of the subjective prong of this test, Justice Harlan explained that "a man's home is, for most purposes, a place where he expects privacy, but objects, activities, or statements that he exposes to the 'plain view' of outsiders are not 'protected' because no intention to keep them to himself has been exhibited."[30] On the other hand, under the objective prong of the test, "conversations in the open would not be protected against being overheard, for the expectation of privacy under the circumstances would be unreasonable."[31]

C. Katz's *Progeny*

The two-part test proposed by Justice Harlan has been the starting point for analysis of Fourth Amendment issues for over 30 years.[32] The discussion below briefly reviews a few pertinent Supreme Court cases that have utilized the *Katz* two-part test and summarizes the doctrines that have developed from these decisions.

In *United States v. Place*,[33] the Court addressed whether a canine-sniff of luggage in a public place was a search. The Court affirmed that an individual has a protected privacy interest in the contents of personal luggage. However, a canine sniff "does not require opening the luggage. It does not expose noncontraband items that otherwise would remain hidden from public view. . . . Thus, the manner in which [this] information is obtained . . . is much less intrusive than a typical search."[34] The Court continued to emphasize the non-intrusive and limited nature of this type of sensory-enhanced search by pointing out that "the sniff discloses only the presence or absence of narcotics, a contraband item. Thus, despite the fact that the sniff tells the authorities something about the contents of the luggage, the information obtained is limited."[35] Also, as a result of this limited disclosure, "the owner of the

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28. *Id.* at 351, 88 S. Ct. at 511 (citations omitted).
29. *Id.* at 361, 88 S. Ct. at 516 (Harlan, J., concurring).
30. *Id.*
31. *Id.*
32. The 1967 *Katz* decision "marks a watershed in fourth amendment jurisprudence." Anthony G. Amsterdam, *Perspectives on the Fourth Amendment*, 58 Minn. L. Rev. 349, 382 (1974). *Katz* "is, of course, now generally recognized as seminal and has rapidly become the basis of a new formula of fourth amendment coverage." *Id.* at 383.
33. United States v. Place, 462 U.S. 696, 103 S. Ct. 2637 (1983).
34. *Id.* at 707, 103 S. Ct. at 2644.
35. *Id.*

property is not subjected to the embarrassment and inconvenience entailed in less discriminate and more intrusive investigative methods."[36] The Court knew of no other investigative procedure that was "so limited both in the manner in which the information [was] obtained and in the content of the information revealed. . . ."[37] Thus, the Court concluded that the use of the trained canine to detect the presence of narcotics in luggage "did not constitute a 'search' within the meaning of the Fourth Amendment."[38]

In *Dow Chemical Co. v. United States*,[39] the Environmental Protection Agency ("EPA") took aerial photographs of Dow Chemical's plant. In this case, the "EPA was not employing some unique sensory device that, for example, could penetrate the walls of buildings . . . but rather a conventional, albeit precise, commercial camera commonly used in mapmaking."[40] The Court commented that it may well be "that surveillance of private property by using highly sophisticated surveillance equipment not generally available to the public, such as satellite technology, might be constitutionally proscribed absent a warrant. But the photographs here are not so revealing of intimate details as to raise constitutional concerns."[41]

California v. Greenwood[42] involved the warrantless search and seizure of garbage bags left at the curb outside the Greenwood home. Applying the *Katz* test, the Court stated that the search "would violate the Fourth Amendment only if respondents manifested a subjective expectation of privacy in their garbage that society accepts as objectively reasonable."[43] The Court then held that the defendants, "having deposited their garbage in an area particularly suited for public inspection . . . for the express purpose of having strangers take it, . . . could have had no reasonable expectation of privacy in the inculpatory items that they discarded."[44] Furthermore, the Court stated that "the police cannot reasonably be expected to avert their eyes from evidence of criminal activity that could have been observed by any member of the public"[45] because, "what a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection."[46]

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36. *Id.*
37. *Id.*, 103 S. Ct. at 2644-45.
38. *Id.*, 103 S. Ct. at 2645.
39. Dow Chem. Co. v. United States, 476 U.S. 227, 106 S. Ct. 1819 (1986).
40. *Id.* at 238, 106 S. Ct. at 1826-27.
41. *Id.*, 106 S. Ct. at 1827.
42. California v. Greenwood, 486 U.S. 35, 108 S. Ct. 1625 (1988).
43. *Id.* at 39, 108 S. Ct. at 1628.
44. *Id.* at 40-41, 108 S. Ct. at 1629 (internal citations omitted).
45. *Id.* at 41, 108 S. Ct. at 1629.
46. *Id.* (quoting Katz v. United States, 389 U.S. 347, 351, 88 S. Ct. 507, 511 (1967)).

III. APPLICATION OF THESE DOCTRINES TO PASSIVE, SENSORY-ENHANCED SURVEILLANCE

Courts are now being asked to apply the principles of *Katz* to a new class of technology: passive, sensory-enhancing electronic surveillance devices.[47] These devices allow law enforcement to collect otherwise unavailable information by enhancing the officer's senses. This type of surveillance involves no physical intrusion. The suspect is normally not even aware that the surveillance has occurred because the device "passively" measures the natural emissions from the target such as sound and electromagnetic radiation (visible light, infrared, millimeter waves, radio waves, etc.). One such device, the thermal imager, has recently received significant attention in the courts. The focus of this part is on how the thermal imager is used and how this use has been analyzed under the two-pronged *Katz* test.

A. What Is a Thermal Imager and How Is It Used?

A thermal imaging device, often called a "FLIR" (forward-looking infrared radar), is used to detect differences in temperature on the surface of a selected target. Once the operator sets a baseline temperature, the device provides a visual image of objects that are warmer or cooler than the baseline. The cooler areas are displayed in shades of black and the warmer areas in shades of white.[48] Current thermal imagers are capable of detecting temperature differences as small as .018° Celsius[49] and can locate a human in the dark from over seven kilometers away.[50] While the FLIR is not capable of seeing *through* an object, it is often able to detect heat sources that are hidden from view due to the heat that passes through the intermediate object. For example, some "thermal imagers are capable of revealing the presence of human forms near open windows or behind walls made of plywood or similar material."[51]

Thermal imagers have proven useful in many different applications. FLIR was originally developed for military surveillance and navigation.[52] But, since

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47. *See generally supra* note 7 (definitions of "sensory-enhancement" and "passive").

48. Many imagers now have color displays. With these systems, heat is displayed in shades of red and cold in shades of green. *See* FLIR Systems, Inc., Vision: New Breakthroughs in Imaging Systems (1998) (on file with author).

49. *See* Michael Smith, *Overcome Your Misconceptions About Thermal Imaging*, Test & Measurement World Magazine (Oct. 1997), reprinted at FLIR Systems, Inc., Articles (visited March 14, 1999) <http://www.flir.com/articles/testmeasure.htm>.

50. *See* FLIR Systems, Inc., Specifications for FLIR Agema 1000LR (visited Sept. 12, 1998) <http:/www.flir.com/products/military/1000lr.htm>. Seven kilometers is approximately 4.3 miles.

51. United States v. Field, 855 F. Supp. 1518, 1531 (W.D. Wis. 1994).

52. *See* Jonathan Todd Laba, *If You Can't Stand the Heat, Get Out of the Drug Business: Thermal Imagers, Emerging Technologies, and the Fourth Amendment*, 84 Cal. L. Rev. 1437, 1450 (1996).

becoming publicly available, it has been widely used in a variety of commercial applications such as detecting defects in manufacturing equipment.[53] In addition, FLIR is used to aid search-and-rescue operations and to locate fleeing suspects and escaped convicts.[54] Firefighters use it to see through smoke in burning buildings in order to locate people trapped inside.[55] The United States Border Patrol uses it to catch illegal immigrants.[56] Power companies take advantage of the FLIR's heat-detecting capabilities to locate overloaded wires and to monitor insulation efficiency.[57] Environmental agencies use it for activities such as forest fire detection, oil spill detection, and wildlife management.[58] And, the National Guard even used a thermal imager to locate a young Bengal tiger that had escaped from a circus.[59]

Law enforcement has also found thermal imagers to be useful in the fight against illegal drugs. Many commercial marijuana growers cultivate their crops in the garages or basements of their homes using hydroponics equipment.[60] These operations often require powerful 1000-watt halide lights which use large amounts of electricity and can produce temperatures over 150° Fahrenheit.[61] The heat generated by these lights either escapes naturally or is vented outside by the grower. Law enforcement officers have discovered that thermal imagers can detect the excess heat emanating from these homes. The officers view the suspect's home through the imager and record its heat signatures. If the heat readings are abnormally high compared to neighboring homes, the information is usually combined with other evidence (such as power consumption records and tips from confidential informants) to support an application for a warrant to search the premises.[62]

B. The Circuit Split

Many defendants have challenged the government's use of thermal imager readings as evidence to support a search warrant. These defendants claim the use

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53. *See* FLIR Systems, Inc., *supra* note 48.

54. *See* Laba, *supra* note 52, at 1450.

55. *See* Richard Boyd, *Firefighters to Use Thermal Camera*, New Orleans Times-Picayune, Feb. 5, 1998, at H4.

56. *See* Laba, *supra* note 52, at 1450.

57. *See* Scott J. Smith, Note, *Thermal Surveillance and the Extraordinary Device Exception: Redefining the Scope of the* Katz *Analysis*, 30 Val. U. L. Rev. 1071, 1081 n.68 (1996); FLIR Systems, Inc., *supra* note 48.

58. *See* Janice Fioravante, *Night Sight*, Investor's Bus. Daily, Feb. 26, 1995, at A6.

59. *See* Laba, *supra* note 52, at 1450.

60. Hydroponics is a method of cultivation in which plants are grown in nutrient-rich solutions rather than soil. *See* Merriam-Webster's Collegiate Dictionary 568 (10th ed. 1993).

61. *See* United States v. Pinson, 24 F.3d 1056, 1057 (8th Cir. 1994).

62. *See* United States v. Penny-Feeney, 773 F. Supp. 220, 221-24 (D. Haw. 1991).

of the imager itself is a search and should not be conducted without a warrant issued on independent probable cause. This question has not yet been addressed by the Supreme Court of the United States. However, several United States circuit courts of appeals have ruled on whether the pre-warrant use of a thermal imager constitutes an unreasonable search under the Fourth Amendment. Four circuits have approved the pre-warrant use of thermal imagers: the Fifth Circuit in *United States v. Ishmael*,[63] the Seventh Circuit in *United States v. Myers*,[64] the Eighth Circuit in *United States v. Pinson*[65] and the Eleventh Circuit in *United States v. Ford*[66] and *United States v. Robinson*.[67] However, two other circuits have issued opinions reaching different conclusions. The Tenth Circuit, in *United States v. Cusumano*, ruled that the pre-warrant use of thermal imagers was unconstitutional.[68] Then, on rehearing, the opinion was vacated because the court found independent probable cause.[69] Later, in *United States v. Kyllo*, the Ninth Circuit first ruled that the pre-warrant use of thermal imagery was an unreasonable search.[70] Then, on rehearing, the court withdrew its original opinion and, in a 2-1 decision, held that the thermal scan was not a "search" within the meaning of the Fourth Amendment.[71]

These opinions demonstrate the difficulty courts have had with this technology. Operating without the benefit of a direct ruling from the Supreme Court, courts have looked to other Fourth Amendment decisions, like *Katz*, for guidance. Unfortunately, these cases, and the rationales that have developed from them, have been inadequate. As explained below, the rationales of the federal circuit courts are flawed and the analogies made have been to cases with distinguishable facts.

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63. United States v. Ishmael, 48 F.3d 850 (5th Cir. 1995).

64. United States v. Myers, 46 F.3d 668 (7th Cir. 1995).

65. United States v. Pinson, 24 F.3d 1056 (8th Cir. 1994).

66. United States v. Ford, 34 F.3d 992 (11th Cir. 1994).

67. United States v. Robinson, 62 F.3d 1325 (11th Cir. 1995).

68. United States v. Cusumano, 67 F.3d 1497 (10th Cir. 1995), *vacated*, 83 F.3d 1247 (10th Cir. 1996).

69. The court stated on rehearing, "[w]e do not decide the constitutionality of the warrantless use of the thermal imager to scan Defendants' residence because any such decision is unnecessary to a resolution of Defendants' appeals." *Cusumano*, 83 F.3d at 1250. Despite the fact that the opinion was vacated, the arguments made in *Cusumano* are still cited by other courts. Also, Professor LaFave refers to this opinion as "the most exhaustive and compelling analysis of the use of a thermal imager." 4 Wayne R. LaFave, Search and Seizure: A Treatise on the Fourth Amendment § 2.2 (Supp. 1998). Thus, throughout the remainder of this comment, all references in the text to *Cusumano* are to the original opinion, 67 F.3d 1497 (10th Cir. 1995).

70. United States v. Kyllo, 140 F.3d 1249 (9th Cir. 1998) (withdrawn and superceded by United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999)).

71. United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

C. *The Flawed Rationales*

1. Failure of the Katz *Test*

The first prong of the two-part *Katz* test requires that a person must have "exhibited an actual (subjective) expectation of privacy."[72] But, when applied to thermal imagery cases, the courts have had trouble determining what actions are necessary to satisfy this requirement. To illustrate, several seemingly simple questions are posed below. The purpose of these questions is not necessarily to support one theory over another, but instead to demonstrate that the current rationales used by the courts have generated inconsistent answers.

Should *deliberate* ventilation of the heat from one's home preclude a finding of a subjective expectation of privacy? *Katz* holds that "[w]hat a person knowingly exposes to the public" is not protected by the Fourth Amendment.[73] Therefore, one can argue that an individual who deliberately vents heat from his home is exposing that heat to the public.[74] This reasoning weighed heavily in the decisions in *Pinson*,[75] *Ford*[76] and *Myers*.[77] In each of these cases, the homeowner deliberately vented the heat from his home or garage and the courts held that no subjective expectation of privacy existed. As a corollary to this theory, it could also be argued that one who does not vent the heat, but knows that it is escaping and does nothing to impede its escape, likewise "knowingly exposes" that heat. But, the practical result of this line of reasoning is that only two classes of defendants in these cases would have been afforded Fourth Amendment protection: those who were totally ignorant of the most fundamental principles of thermodynamics[78] and those who took affirmative actions to conceal the heat.

But, does *Katz* demand that a person take affirmative actions to contain the heat or conceal its escape? *Robinson* held that, even though the heat was not

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72. Katz v. United States, 389 U.S. 347, 361, 88 S. Ct. 507, 516 (1967) (Harlan, J., concurring).

73. *Id.* at 351, 88 S. Ct. at 511.

74. "The defendant installed an exhaust fan which vented warm air from his [marijuana growing operation]. By doing so, he knowingly exposed exhaust vapors and heat to public observation." United States v. Domitrovich, 852 F. Supp. 1460, 1473 (E.D. Wash. 1994).

75. "[T]here is no reasonable expectation of privacy in heat which Pinson voluntarily vented outside." United States v. Pinson, 24 F.3d 1056, 1058 (8th Cir. 1994).

76. "Ford punched holes in the floor of his mobile home and forced the warmer air out using an electric blower . . . . [W]e find that he did not seek to preserve the fact of that heat as private. Thus, we conclude that Ford did not exhibit a subjective expectation of privacy in the heat emitted by his mobile home." United States v. Ford, 34 F.3d 992, 995 (11th Cir. 1994).

77. "Myers did not have a subjective expectation of privacy in the heat emitted. Myers took no steps to conceal or contain the heat emissions from his home. In fact, Myers discharged the heat from his home through vents on his roof." United States v. Myers, 46 F.3d 668, 669 (7th Cir. 1995).

78. When you ask the question "How can you tell if a car has recently been driven?" a common response will be "Feel the hood to see if it is warm." Such a response indicates that the respondents understand the basic principles of thermodynamics—even if they are not able to explain them in scientific terms. *See also* Michael L. Huskins, Comment, *Marijuana Hot Spots: Infrared Imaging and the Fourth Amendment*, 63 U. Chi. L. Rev. 655, 669 (1996).

intentionally vented, no subjective expectation of privacy existed because Robinson had not taken affirmative steps to prevent the heat from escaping.[79] Also, in *Kyllo*, the court found that the defendant "made no attempt to conceal [the] emissions, demonstrating a lack of concern with the heat emitted and a lack of a subjective privacy expectation in the heat."[80] However, Charles Katz did not take every possible precaution to protect against eavesdropping. Katz conducted his conversation inside the phone booth, but took no steps to prevent the vibrations of the glass which were recorded by the "bug" on the exterior of the phone booth. Yet, the court still found that he had a subjective expectation of privacy and disallowed the warrantless recording.[81] *Robinson* and *Kyllo* seem to articulate a requirement that a citizen take some affirmative step in order to demonstrate a subjective expectation of privacy in the emissions. However, this affirmative action requirement was not intended by *Katz* and, in fact, would have commanded a different result in *Katz*.[82] Contrary to *Robinson* and *Kyllo*, and in line with *Katz*, two other cases, *Ishmael*[83] and *Cusumano*,[84] both held that a subjective expectation of privacy existed even though the defendants had deliberately vented the heat outside their homes.

Another question raised is whether an individual's subjective expectation of privacy should depend upon his knowledge of current surveillance technology. Could a defendant argue that, although he was aware the heat was escaping from his home, he was not aware of the government's monitoring capability and therefore was unaware that he was exposing the heat to the public? If so, will this, in effect, require law enforcement to publicize its new crime-fighting equipment before putting it to use?

These basic questions illustrate only a few of the complications encountered in thermal imagery cases when deciding whether an individual has satisfied the first prong of the *Katz* test. Interestingly, all of these questions ignore an even more fundamental issue: *Cusumano* maintains that the pertinent inquiry is not whether there is an expectation of privacy in the escaping heat, but whether there is an expectation of privacy in the activities within the home that generated the

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79. "The focal issue is whether Robinson had a subjective expectation of privacy in the *heat* generated by his indoor marijuana cultivation. We find none. While Robinson attempted to conceal his marijuana growing operation by conducting it inside his home, the record does not indicate that he *affirmatively took any action* to prevent the resulting heat from being emitted into the atmosphere above his house." United States v. Robinson, 62 F.3d 1325, 1328-29 (11th Cir. 1995) (emphasis added).

80. United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

81. Katz v. United States, 389 U.S. 347, 88 S. Ct. 507 (1967).

82. "[U]nless we intend to render Katz' first prong meaningless," we must reject the proposal that the Ishmaels take every necessary precaution to demonstrate a subjective expectation of privacy. United States v. Ishmael, 48 F.3d 850, 854 (5th Cir. 1995).

83. "We must conclude that the Ishmaels exhibited a subjective expectation that their hydroponic laboratory would remain private." *Ishmael*, 48 F.3d at 854.

84. "We think it plain under Katz and its progeny that the Defendants exhibited a subjective expectation of privacy." United States v. Cusumano, 67 F.3d 1497, 1502 (10th Cir. 1995).

heat.[85] In other words, this case points out that the true objective of the government surveillance is not to determine whether there is excess heat escaping from the home, but whether there is a marijuana growing operation located within the confines of the home. Under this approach, whether heat is vented becomes irrelevant and any marijuana grower who, for purposes of concealment, moves his operation indoors will normally satisfy *Katz*'s subjective requirement.

The varied conclusions reached in these cases demonstrate that the subjective prong of the *Katz* test has been ineffective as a guide for the courts when applied to issues involving the use of thermal imagery. To further complicate matters, those courts that did acknowledge the existence of a subjective expectation of privacy were then faced with the task of determining whether that expectation was one society would recognize as reasonable. This task was no easier because the courts also encountered significant problems in the application of the objective prong of *Katz*.

Myers, *Pinson*, *Robinson*, *Ford*, and *Kyllo* all frame the "objectiveness" issue in accordance with *Oliver v. United States*, which states that "the correct inquiry is whether the government's intrusion infringes upon the personal and societal values protected by the Fourth Amendment."[86] If these values will be infringed upon, then the defendant's expectation of privacy is reasonable. These cases all stressed the non-intrusive nature of the thermal imager and four of them specifically said that "[n]one of the interests which form the basis for the need for protection of a residence, namely the intimacy, personal autonomy and privacy associated with a home, are threatened by thermal imagery."[87] But, as *Cusumano* pointed out, these cases focus only on the heat emanating from the home, not the activities within the home that generated the heat. *Cusumano* and the dissent in *Kyllo* both focused on the fact that the activities generating the heat occurred within the intimacy of the home and, as a result, concluded that the expectation of privacy was reasonable.[88]

This brief analysis illustrates the inadequacies of the *Katz* test when applied to thermal imagery cases. As a result, the courts have been forced to make strained and unrealistic analogies to the facts of other post-*Katz* cases. The following discussion reviews the arguments used by the courts to support their decisions and demonstrates that the rationales developed from these cases are also flawed when applied to thermal imagery.

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85. *Cusumano*, 67 F.3d at 1502.

86. Oliver v. United States, 466 U.S. 170, 182-83, 104 S. Ct. 1735, 1743 (1984); United States v. Myers, 46 F.3d 668, 670 (7th Cir. 1995); United States v. Pinson, 24 F.3d 1056, 1059 (8th Cir. 1994); United States v. Robinson, 62 F.3d 1325, 1329 (11th Cir. 1995); United States v. Ford, 34 F.3d 992, 995 (11th Cir. 1994); United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

87. *Myers*, 46 F.3d at 670; *Robinson*, 62 F.3d at 1330; *Ford*, 34 F.3d at 997 (all quoting *Pinson*, 24 F.3d at 1059). *Kyllo* also cites *Pinson* stating, "Such information is neither sensitive nor personal, nor does it reveal the specific activities within the . . . home." United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999) (citing *Pinson*, 24 F.3d at 1059).

88. *Cusumano*, 67 F.3d 1497; United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999) (Noonan, J., dissenting).

2. The "Waste Heat" Theory

United States v. Penny-Feeney,[89] the first thermal imagery case addressed by a federal court, is the seminal case for the "waste heat" theory. This theory has been subsequently adopted by several of the circuit courts.[90] The *Penny-Feeney* court, after an in-depth examination of the FLIR's capabilities, found that the device was limited to detecting differences in temperature only on the *surface* of an object. Thus, it could detect the heat that was emanating from the exterior of the structure; but, it could not detect heat inside the home. The court then analogized the heat emanating from the defendant's home to the trash placed by the curb in *Greenwood*.[91] Therefore, applying the first prong of the *Katz* test, the court held that the "defendants did not manifest an actual expectation of privacy in the heat waste since they voluntarily vented [the heat] outside the garage . . . and [they] in no way attempted to impede its escape or exercise dominion over it."[92] Turning to the second prong of *Katz*, the court continued its analogy to trash placed by the curb. *Greenwood* held that no objective expectation of privacy existed because it is common knowledge that trash left on the curb is "readily accessible to animals, children, scavengers, snoops, and other members of the public."[93] Likewise, the *Penny-Feeney* court concluded that, since the defendants' heat waste was exposed to the public, even if they "were capable of demonstrating a subjective expectation of privacy in the heat waste, . . . such an expectation would not be one that society would be willing to accept as objectively reasonable."[94]

This analogy, however, ignores fundamental factual distinctions. First, taking out the trash requires affirmative action on behalf of the homeowner. If he chooses, the homeowner can refrain from taking out the trash until time for collection or he can arrange another method of disposal. On the other hand, a homeowner has no choice whether heat dissipates from his home. This happens without any action taken on his part and, in fact, will most likely occur despite his best efforts because "[h]eat loss and heat conduction (or radiation) obey the laws of physics and are not phenomena over which an individual customarily exerts control."[95] For example, in *Ishmael*, the defendant constructed a special concrete basement beneath a steel building and pumped in water from a nearby pond for irrigation and cooling. However, law enforcement officers were

89. United States v. Penny-Feeney, 773 F. Supp. 220 (D. Haw. 1991).

90. This theory has been adopted by the 7th Circuit (*Myers*, 46 F.3d at 670), the 8th Circuit (*Pinson*, 24 F.3d at 1058), and the 11th Circuit (*Ford*, 34 F.3d at 997).

91. *Penny-Feeney*, 773 F. Supp. at 226 (citing California v. Greenwood, 486 U.S. 35, 108 S. Ct. 1625 (1987)).

92. *Penny-Feeney*, 773 F. Supp. at 226.

93. *Greenwood*, 486 U.S. at 40, 108 S. Ct. at 1628-29.

94. *Penny-Feeney*, 773 F. Supp. at 226 (citing *Greenwood*, 486 U.S. 35, 108 S. Ct. 1625).

95. United States v. Cusumano, 67 F.3d 1497, 1508 (10th Cir. 1995).

still able to detect elevated temperatures in the ground surrounding the building.[96]

Second, this analogy assumes that the homeowner is aware of the risk that his heat will be monitored. While a homeowner may be aware of the risk that someone may rummage through his trash, it is unlikely he is equally aware that his home could be the subject of infrared surveillance. Without such recognition of the risks, it seems improper to say that the homeowner "knowingly exposed" his heat to the public.

Cusumano and the dissent in *Kyllo* both reject the waste heat theory because, as mentioned above, they find that the proper focus should be on the heat-generating activities that occur within the home, not the escaping heat, because the purpose and utility of the imager is to reveal the heat signatures of objects and activities occurring *inside* the structure.[97] In fact, the true worth of the device to the government is predicated upon translation of the heat readings into information about the activities within the home that generated the heat.[98] With this perspective, these courts concluded that the waste-heat analogy was totally inapplicable.

3. *The Canine-Sniff Analogy*

The *Penny-Feeney* court also compared thermal imagery to a canine-sniff as used by the DEA agents in *Place*.[99] Stressing the non-intrusive nature of the thermal imager, the *Penny-Feeney* court commented that the heat emanations, like odor emanations, could be detected in an inoffensive manner without embarrassment to the person.[100] In addition, of utmost importance was the fact that no physical invasion occurred and "[n]o intimate details connected with the use of the home or curtilage were observed."[101] This canine-sniff analogy was endorsed by *Myers*,[102] *Pinson*,[103] *Ford*,[104] *Robinson*,[105] *Ishmael*,[106] and *Kyllo*[107] and, consequently, all of these cases found that the second prong of

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96. United States v. Ishmael, 48 F.3d 850, 851-52 (5th Cir. 1995).

97. "To focus upon the 'waste heat' radiating from a structure is to ignore both the purpose of the device and the manner in which it operates." *Cusumano*, 67 F.3d at 1501. "It is strange to focus on the homeowner's non-existent expectation as to emissions." United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999) (Noonan, J., dissenting).

98. *See Cusumano*, 67 F.3d at 1501.

99. United States v. Penny-Feeney, 773 F. Supp. 220, 228 (D. Haw. 1991) (citing United States v. Solis, 536 F.2d 880 (1976), a Ninth Circuit case which, like United States v. Place, 462 U.S. 696, 103 S. Ct. 2637 (1983), approved the pre-warrant use of dog-sniffs to search for narcotics).

100. *Penny-Feeney*, 773 F. Supp. at 227.

101. *Id.* at 228.

102. United States v. Myers, 46 F.3d 668, 670 (7th Cir. 1995).

103. United States v. Pinson, 24 F.3d 1056, 1058 (8th Cir. 1994).

104. United States v. Ford, 34 F.3d 992, 997 (11th Cir. 1994).

105. United States v. Robinson, 62 F.3d 1325, 1330 (11th Cir. 1995).

106. United States v. Ishmael, 48 F.3d 850, 856 (5th Cir. 1995).

107. United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

Katz was not satisfied. The focus of the discussion in these cases often turned on the kind of information revealed by the search. For example, the *Pinson* court commented that "[t]he detection of the heat waste was not an intrusion into the home; no intimate details of the home were observed, and there was no intrusion upon the privacy of the individuals within."[108]

This analogy, however, ignores a key factor in the *Place* decision. The *Place* court emphasized the fact that a canine-sniff discloses only the presence or absence of contraband items. It does not reveal any other information to law enforcement. However, a thermal imager is not so limited. It can reveal other details of the interior of the home. For example, in a Wisconsin case, "the imager recorded the thermal energy emitted by a dehumidifier inside a closet within defendant's residence. The imager did not reveal that the heat emitting source was a dehumidifier, but it did reveal facts about activities within the house: the fact of the heat emission and its general location."[109] Some thermal imagers could just as easily reveal two commingled bodies through a bedroom window.[110] Due to this significant difference between thermal imagery and canine sniffs, the Wisconsin court (as well as other courts[111]) found that the canine-sniff analogy was inapplicable.

4. The Intimate Details Factor

The phrase "intimate details" was first used in a majority opinion in *Dow Chemical*[112] where the court commented that the photographs taken by the EPA were "not so revealing of *intimate details* as to raise constitutional concerns."[113] Subsequent courts have focused on this language as a factor in evaluating thermal imagery. However, the courts' use of this rationale has been inconsistent. Several courts declared that the use of a thermal imager was permitted because no intimate details were *actually* revealed when it was used.[114] *Cusumano*,

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108. *Pinson*, 24 F.3d at 1059.

109. United States v. Field, 855 F. Supp. 1518, 1519 (W.D. Wis. 1994).

110. It would not be extremely "difficult to identify (if not, strictly speaking, to watch) two people making love in the privacy of their darkened bedroom." United States v. Cusumano, 67 F.3d 1497, 1504 and n.11 (10th Cir. 1995).

111. United States v. Ishmael, 48 F.3d 850 (5th Cir. 1995); and United States v. Cusumano, 67 F.3d 1497 (10th Cir. 1995).

112. *See* Merrick D. Bernstein, *"Intimate Details": A Troubling New Fourth Amendment Standard For Government Surveillance Techniques*, 46 Duke L.J. 575, 583 (1996) (discussing Dow Chemical Co. v. United States, 476 U.S. 227, 106 S. Ct. 1819 (1986)).

113. *Dow Chemical*, 476 U.S. at 238, 106 S. Ct. at 1827 (emphasis added).

114. "No revelation of intimate, even definitive, detail within the house was detectable." United States v. Robinson, 62 F.3d 1325, 1330 (11th Cir. 1995); "No intimate details connected with the use of the home or curtilage were observed." United States v. Penny-Feeney, 773 F. Supp. 220, 228 (D. Haw. 1991). "While this technology may, in other circumstances, be or become advanced to the point that its use will step over the edge from permissible non-intrusive observation into impermissible warrantless search, we find no violation of the Fourth Amendment on these facts." United v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

however, found the use of thermal imagery unconstitutional simply because it was *capable* of revealing such details.[115]

The "intimate details" factor was critical to the Fifth Circuit's analysis in *Ishmael* and the Ninth Circuit's analysis in *Kyllo*. The Fifth Circuit, after rejecting both the waste-heat and canine-sniff analogies, concluded that Ishmael had exhibited a subjective expectation of privacy when he moved his marijuana growing operation to the basement of a steel building constructed in a secluded area.[116] Then, turning to the second prong of *Katz*, the court utilized the "intimate details" theory and ruled that Ishmael's expectation was not one that society would recognize as reasonable.[117] For guidance, the court relied upon *Dow Chemical* which stated that the government should not be "foreclosed from using technology to enhance its surveillances, *provided* that that technology does not reveal '*intimate details.*'"[118] When a search does not reveal intimate details of the home, it "does not intrude in any way into the privacy and sanctity of a home."[119] Thus, it does not infringe upon the personal and societal values protected by the Fourth Amendment.[120] The Ninth Circuit stated in *Kyllo*, "Much like the Fifth Circuit, we believe that, in evaluating whether technology has been used to aid in permissible observation or to perform an impermissible warrantless search, the 'crucial inquiry, as in any search and seizure analysis, is whether the technology reveals intimate details.'"[121] Since the scan "did not expose any intimate details of Kyllo's life," the court could not "conclude that this surveillance was so revealing of intimate details as to raise constitutional concerns."[122]

The problem lies in the fact that no cases have specifically attempted to define or establish any test to determine which details are "intimate" and which are not. In fact, Justice Brennan asked in *Florida v. Riley*, "What, one wonders, is meant by 'intimate details'?"[123] Where should the line be drawn? Must the thermal

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115. "[T]he thermal imager used here is quite plainly capable of revealing rather specific information regarding the internal activities of the home." United States v. Cusumano, 67 F.3d 1497, 1504 (10th Cir. 1995). Also, the *Kyllo* court in its original opinion concluded the details that can be "unveiled by a thermal imager are sufficiently 'intimate' to give rise to a Fourth Amendment violation" and pointed out, as an example, that "[i]t is not disputed whether the Agema 210 could reveal details such as intimate activities in a bedroom." United States v. Kyllo, 140 F.3d 1249, 1254 (9th Cir. 1998), *withdrawn and superceded by* United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

116. United States v. Ishmael, 48 F.3d 850, 854-55 (5th Cir. 1995).

117. *Id.* at 855-57.

118. *Ishmael*, 48 F.3d at 855 (second emphasis added) (citing Dow Chemical Co. v. United States, 476 U.S. 227, 238, 106 S. Ct. 1819, 1827 (1986)).

119. *Ishmael*, 48 F.3d at 856 (citing United States v. Myers, 46 F.3d 668, 669 (7th Cir. 1995)).

120. The court framed the issue as "whether the government's intrusion infringes upon the personal and societal values protected by the Fourth Amendment" and then held that the "use of a thermal imager in this case was not an unconstitutional search." *Ishmael*, 48 F.3d at 855, 857.

121. United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999).

122. *Id.*

123. Florida v. Riley, 488 U.S. 445, 463, 109 S. Ct. 693, 703 (1989) (Brennan, J., dissenting).

imager record human activity within the home? Or could lesser details be sufficient to implicate the Fourth Amendment? Without a bright-line standard, law enforcement has no way to know what conduct is proscribed before a search is conducted. The unacceptable result is that Fourth Amendment issues are being decided by an ex post facto review of whether the search turned up "alarmingly personal information"[124]—rather than whether the activity itself constitutes a search.[125] Also, it is questionable whether an "intimate details" inquiry is even appropriate. Justice Brennan asked in his dissent in *Florida v. Riley*: "[W]here in the Fourth Amendment or in our cases is there any warrant for imposing a requirement that the activity observed must be 'intimate' in order to be protected by the Constitution?"[126]

Judge Noonan, dissenting in *Kyllo*, was also critical of use of the "intimate details" dicta in *Dow Chemical* as a Fourth Amendment test. The focus should be on the activity itself and not on whether "sensitive or personal" information was revealed. To illustrate, he points out that, under the intimate details theory, "if your home was searched by a blind policeman you would have suffered no constitutional deprivation."[127]

5. The Publicly Available Factor

The "publicly available" factor also originated in *Dow Chemical*. In dicta, the court commented that "[i]t may well be . . . that surveillance of private property by using highly sophisticated surveillance equipment *not generally available to the public* . . . might be constitutionally proscribed absent a warrant."[128] The aerial mapping camera used by the EPA cost over $22,000 and was described as the

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124. United States v. Cusumano, 83 F.3d 1247, 1254 (10th Cir. 1996) (McKay, Circuit Judge, dissenting in part and concurring in part).

125. *See* Bernstein, *supra* note 112, at 577-78.

126. *Riley*, 488 U.S. at 463, 109 S. Ct. at 703-04 (Brennan, J., dissenting). "Intimate details" could be defined as any details that cannot be observed through visual surveillance. This definition could be supported by *United States v. Karo* because one interpretation of *Karo* is that it establishes the principle that "the revelation of a single detail about the interior of the home . . . suffice[s] to violate the Fourth Amendment." *Cusumano*, 67 F.3d at 1508 (interpreting United States v. Karo, 468 U.S. 705, 104 S. Ct. 3296 (1984)). This interpretation is based upon the statement in *Karo* that "[t]he monitoring of an electronic device such as a beeper is, of course, less intrusive than a full-scale search, but it does reveal a critical fact about the interior of the premises that the Government is extremely interested in knowing." *Karo*, 468 U.S. at 715, 104 S. Ct. at 3303. This narrow definition, in effect, renders the adjective "intimate" superfluous and relieves Justice Brennan's concerns. Also, if this definition succeeds in establishing a bright-line rule that is adequate to inform law enforcement ahead of time whether their conduct is proscribed, the problem of ex post facto review may also be resolved. For a more in-depth discussion of the intimate details factor, *see* Bernstein, *supra* note 112.

127. United States v. Kyllo, 1999 WL 694733 (9th Cir. 9/9/1999) (Noonan, J., dissenting).

128. Dow Chemical Co. v. United States, 476 U.S. 227, 238, 106 S. Ct. 1819, 1827 (1986) (emphasis added).

"finest precision aerial camera available."[129] Yet, the court implied that it was a "publicly available" device.[130] Comparatively, thermal imagers are now commonly used in a wide variety of applications and a new handheld thermal image camera/recorder can be purchased for $12,950.[131] Therefore, under *Dow Chemical*'s definition of the term, thermal imagers would certainly qualify as "equipment generally available to the public."

Literally, *Dow Chemical* only states that technology *not* commonly available might be proscribed. But, several courts seem to have reasoned *a contrario sensu* that searches using commonly available technology are not proscribed. As a result, some courts have cited *Dow Chemical* in support of their conclusions that pre-warrant thermal imagery is constitutional.[132]

The underlying premise of the "publicly available" theory is that once a technology becomes widely available, its use is no longer proscribed because an individual's expectation of privacy against that method of surveillance is no longer accepted by society. However, this theory seems to create a descending Orwellian spiral[133] in which the privacy of the home would "hinge upon the outcome of a technological race of measure/counter-measure between the average citizen and the government—a race . . . that the people will surely lose."[134] The *Cusumano* court stated that technological wizardry should neither obviate nor supplant a warrant and that the government's use of technology must be constantly evaluated in light of the Fourth Amendment "not because the Constitution constrains the government to employ antiquated surveillance techniques but because the march of science over the course of this century has time and again laid bare secrets that society had (erroneously) assumed to lie safely beyond the perception of the government."[135]

Consider, for example, parabolic microphones. They are widely used and can be seen on the sidelines of any televised football game. Additionally, anyone can purchase a parabolic microphone over the internet for less than $700.00.[136] Therefore, they meet the definition of "publicly available." Yet, should government officials who do not have the probable cause necessary to obtain a warrant for "bugging" or "wiretapping" of a home be able to utilize a parabolic

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129. *Id.* at 242 n.4, 106 S. Ct. at 1829 n.4 (1986) (Powell, J., concurring in part, dissenting in part).

130. *See id.* at 238, 106 S. Ct. at 1827.

131. *See* FLIR Systems, Inc., Agema 510 (visited March 14, 1999) <http://www.flir.com/products_apps/AGEMA_510.htm>.

132. "*Dow Chemical* provides useful guidance for search and seizure cases involving surveillance technology." United States v. Ishmael, 48 F.3d 850, 855 (5th Cir. 1995).

133. "One can imagine an Orwellian spiral in which increased surveillance causes diminished privacy expectations, which legitimize further surveillance, and on and on—until the entire Fourth Amendment unravels." Laba, *supra* note 52, at 1474.

134. United States v. Cusumano, 67 F.3d 1497, 1504 (10th Cir. 1995).

135. *Id.* at 1505.

136. *See* Spy Stuff, Inc., *Spy Stuff: Parabolic Microphone*, (visited March 14, 1999) <http://www.spystuff.com/audio/mic3.html>.

microphone to obtain the same information by sitting in a car on the street and pointing the microphone at an open window of the suspect's home? Under the "publicly available" theory, use of the parabolic microphone in this manner would be permissible. Yet, it is generally recognized that such use is proscribed.[137] It seems obvious that the ramifications of acceptance of the court's dicta in *Dow Chemical* as a valid Fourth Amendment standard are unacceptable. Clearly, this inquiry should not be part of the analysis of the constitutionality of government searches.

6. Summary

Analysis of the rationales used in these thermal imaging cases clearly illustrates that courts are straining to put a square peg in a round hole. Thermal imagery and other passive, sensory-enhancing technologies are different from anything previously addressed by the Supreme Court. As a result, lower courts have been unable to address the constitutional issues raised by this new surveillance method by analogy to prior Supreme Court cases. The following section, however, proposes a better method for analyzing these cases.

IV. PROPOSED STANDARDS FOR EVALUATING THE CONSTITUTIONALITY OF SEARCHES

A. Introduction

The *Katz* test, although difficult to apply because it is not a bright-line rule, has been favored by the courts because of its flexibility—it allows the law to change with time.[138] But, this flexibility has, in effect, made Fourth Amendment doctrine like a Rorschach inkblot—subject to each court's individual perceptions of what society accepts as reasonable. Ironically, the Supreme Court itself "repeatedly has acknowledged the difficulties created for courts, police, and citizens by an ad hoc, case-by-case definition of Fourth Amendment standards to be applied in differing factual circumstances."[139] The Supreme Court has also stated that the lawfulness of a search should not turn upon a "highly sophisticated set of rules, qualified by all sorts of ifs, ands, and buts and requiring the drawing of subtle nuances and hairline distinctions."[140] Yet, despite recognition of these problems, few guidelines have been provided. There is, however, a better solution that will adequately protect the citizens' privacy rights. This solution can be found in the majority opinion of *Katz* and in the text of the Fourth Amendment itself.

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137. "[A] government official may not replicate a trick of the wind with a parabolic microphone." *Cusumano*, 67 F.3d at 1505.

138. David H. Steinberg, *Constructing Homes for the Homeless? Searching for a Fourth Amendment Standard*, 41 Duke L.J. 1508, 1520 (1992).

139. Oliver v. United States, 466 U.S. 170, 181, 104 S. Ct. 1735, 1743 (1984).

140. *Id.* (quoting New York v. Belton, 453 U.S. 454, 458, 101 S. Ct. 2860, 2863 (1981)).

B. A Closer Look at Katz

Justice Harlan's concurrence in *Katz* declared that the Fourth Amendment protects only those subjective expectations of privacy that "society is willing to recognize as 'reasonable.'"[141] On first impression, Justice Harlan's two-part test seems to be a refinement of the original question left open by the text of the Fourth Amendment: "what is reasonable?" However, there is a subtle, but extremely significant, difference between the Fourth Amendment requirement of reasonableness and Justice Harlan's test. The Fourth Amendment protects against "unreasonable searches and seizures." Thus, the question to be asked is whether the government activity—the search or seizure—is reasonable. However, the second prong of Justice Harlan's test reverses the focus from whether the government's action is reasonable to whether the citizen's expectation of privacy is reasonable. In effect, this shifts the burden of proof from the government to the citizen to prove "reasonableness." Now, instead of the government having to justify its actions, the citizen is forced to prove that his expectation is one society recognizes as reasonable.

C. The Proposal

1. Shifting the Burden Back to the Government

The Supreme Court should abandon Justice Harlan's test and re-focus on the process used in the majority opinion of *Katz*. The majority opinion analyzed the issue by first deciding whether the government conducted a search and then by determining whether the search was reasonable. This is the proper method of analysis—a method the Court should re-adopt.

With respect to whether a search had occurred, the majority wrote that "the Fourth Amendment protects people, not places. What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection. But what he seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected."[142] This language is a specific rejection of the trespass doctrine and an expansion and redefinition of the concepts of search and seizure to include intangibles such as communications. There is no mention in the majority opinion of objective "reasonableness" with respect to the individual's expectation of privacy. Thus, the majority seems to characterize a "search" simply as any government activity that is calculated to reveal information which an individual sought to preserve as private (did not knowingly expose to the public).

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141. United States v. Katz, 389 U.S. 347, 361, 88 S. Ct. 507, 516 (1967) (Harlan, J., concurring).

142. *Id.* at 351, 88 S. Ct. at 511 (internal citations omitted).

Once the majority determined a search had occurred, the burden shifted to the government. The majority wrote that "searches conducted outside the judicial process, without prior approval by judge or magistrate, are per se unreasonable under the Fourth Amendment—subject only to a few specifically established and well-delineated exceptions."[143] Therefore, the burden was placed upon the government to prove that the search fell within an established exception. Since this could not be proven, the search was "unreasonable" and, therefore, unconstitutional.

Other commentators have also argued that, in lieu of Justice Harlan's two-part test, an approach like this one—where the focus is on the government activity rather than the individual's expectations—is more appropriate.[144] But, so far, the Court has refused to accept this argument. One reason for the Court's reluctance may be the fear that, by placing the burden of proof on the government, legitimate law enforcement efforts could be excessively hindered.

However, one must consider the serious potential for government abuse inherent in technology like thermal imagery. Passive, sensory-enhanced surveillance devices pose a unique threat to the public because there is no notice to the subject that surveillance has been conducted. Normally, a person suspected of criminal activity is presented with a search warrant at the time of the search—or, if not home at the time, he is made aware that a search occurred when he returns home and finds his possessions disturbed. However, with passive, sensory-enhanced surveillance, there is no notice that a search has been conducted.

Without this notice, warrantless searches could be conducted with practically no government accountability. Notice operates to restrict government activity because if the "community learns of too many mistakes or unjustified searches by the police, the community probably will find other police officers to handle its law enforcement duties."[145] Also, civil suits are normally available to those individuals who have been subjected to constitutional violations. However, no adequate remedy exists if the suspects never become aware that a search has occurred.[146] Without these remedies, the police will be "far less hesitant to engage in questionable, arbitrary, or inappropriate sense-enhanced searches."[147] Some commentators have even argued that "undisclosed searches may have a 'chilling effect' on first amendment rights" because they may reduce an individual's willingness to freely express himself due to constant fear of surveillance.[148] For these reasons, some type of notice, regardless of the form it takes, is needed in order to prevent arbitrary government searches.

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143. *Id.* at 357, 88 S. Ct. at 514.

144. *See* Bruce G. Berner, *The Supreme Court and the Fall of the Fourth Amendment*, 25 Val. U. L. Rev. 383 (1991).

145. David E. Steinberg, *Making Sense of Sense-Enhanced Searches*, 74 Minn. L. Rev. 563, 573 (1990).

146. *Id.*

147. *Id.*

148. *Id.* at 570-71.

Congress recognized this need when it passed the federal wiretap statute.[149] But, currently there is no such federal legislative requirement for thermal imaging and other similar technologies.[150] Therefore, the task of preventing the government from using this technology to conduct arbitrary searches is left solely to the courts.

The most effective method for protecting against abuse would be for the Supreme Court to totally abandon Justice Harlan's two-pronged test and return the burden of proof to the government to demonstrate the reasonableness of all searches. However, if the Court finds this step too drastic, it should at least recognize the unique potential for abuse that is inherent in passive, sensory-enhanced surveillance and implement a new standard solely applicable to the use of that technology. The Court should, as the majority in *Katz* demonstrated, declare such warrantless searches presumptively unreasonable and place the burden on the government to overcome this presumption. The government would then be required to prove that the activity falls within an established jurisprudential exception.

It is obviously necessary to find an acceptable balance between the quest for law and order and the protection of individual privacy. Therefore, any guidelines established by the court must be sufficiently flexible so that legitimate law enforcement efforts to combat crime are not unduly hindered. This goal can be accomplished under the proposed standard by evaluating whether some overwhelming governmental interest exists. To make this determination, a balancing test can be employed in which the privacy interest of the individual is weighed against the potential value to the public of the government activity. This type of balancing test is common throughout constitutional law and lower courts are familiar with its application. In many previous cases, courts have recognized that there are situations where an overwhelming governmental interest may justify intrusions into individual privacy that would not otherwise be acceptable. Described below are some of these established jurisprudential exceptions. Also outlined below are some additional exceptions that may be established by courts in the future. These examples demonstrate that this proposal does not excessively restrain legitimate government activity. Instead, this proposal merely shifts the burden of proof in order to protect citizens against developing technologies until such time as the government demonstrates that the use of those technologies, absent some prevailing government interest, is not violative of individual rights to privacy.

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149. 18 U.S.C. § 2518 (1993). Section 2518(8)(d) requires that, no later than ninety days after termination of the wiretap, the persons under surveillance shall receive notice of the surveillance, on what dates it occurred, and whether any communications were intercepted.

150. In fact, a similar statute is not practical with respect to technology such as thermal imagery. A wiretap requires a warrant based upon probable cause *before* the surveillance can be commenced. However, in the case of thermal imagery, if probable cause could be shown, the officers would simply request a warrant to physically search the home—not surveil its exterior with electronic devices.

2. Airport, Courthouse and Border Exceptions

Courts have acknowledged that the privacy rights of an individual in an airport may be diminished due to the public concern for preventing terrorism or air piracy.[151] The fact that one instance of air piracy can result in hundreds of deaths and the destruction of millions of dollars of property makes even minor intrusions, such as having one's luggage X-rayed, reasonable. Similarly, this type of exception has been recognized with respect to courthouse[152] and border[153] searches.

A new type of passive, sensory-enhancing device, called Millivision,[154] may be particularly attractive to law enforcement in these situations. The Millivision gun detectors register the millimeter waves naturally emitted from the human body. The millimeter waves easily pass through clothing, but not through denser objects like guns. Therefore, if a person carrying a gun passes in front of a millimeter wave camera, an outline of the gun will show up as an anomaly on the operator's display screen. The resolution of these devices is precise enough that trained operators are capable of distinguishing items such as guns from harmless things like coins or ink pens. One concern, however, is that Millivision also provides the operator with a fairly detailed outline of the person's body. As the resolution of millimeter wave devices continues to improve, a point may be reached where the information provided to the operator about the person's body is of such a personal character that the intrusion is no longer justified—even by the heightened governmental interest. For example, a new device known as a radar skin scanner is capable of producing images so precise that the operator is able to tell whether or not a male subject has been circumcised.[155] Such an extreme invasion into one's privacy cannot be justified except in the rarest of circumstances.

On the other hand, if the resolution is high enough that guns and other weapons can be automatically detected with an extremely high degree of accuracy by computer software then it would become unnecessary to generate detailed images of the subject's body. In such a case, the use of Millivision gun detectors may then fall into another exception discussed below, the exception for binary searches.

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151. 4 Wayne R. LaFave, Search and Seizure: A Treatise on the Fourth Amendment § 10.6 (3d ed. 1996).

152. "Detention and search procedures of varying proportions are now employed in courthouses throughout the country." Kenneth L. Jesmore, *The Courthouse Search*, 21 UCLA L. Rev. 797, 799 (1974).

153. United States v. Martinez-Fuerte, 428 U.S. 543, 96 S. Ct. 3074 (1976).

154. Millivision is a brand name for the millimeter wave technology developed by Millimetrix Corporation. *See* Laura B. Riley, *Concealed Weapon Detectors and the Fourth Amendment: The Constitutionality of Remote Sense-Enhanced Searches*, 45 UCLA L. Rev. 281, 283 (1997).

155. Mark Hansen, *No Place To Hide: If crime is everywhere, so, too, may be police surveillance cameras and contraband detection devices to combat it. But, who's looking out for privacy rights?*, 83 A.B.A. J. 45, 46 (Aug. 1997).

3. Exigency Exceptions

The potential uses of passive, sensory-enhancing devices in exigency situations are numerous. For example, in hostage situations, the exigency exception could be invoked to allow officials to use either thermal imagery or Millivision to pinpoint the exact location within a building of the person holding the hostages. In fact, FLIR proved useful to the FBI in Waco to determine which rooms in the Branch Davidian complex were occupied.[156] These technologies could also be used prior to execution of an arrest warrant where a no-knock entry is authorized. Police could use the technology to conduct a limited scan of the entire home prior to entry to determine the number and location of all individuals inside. This would dramatically reduce the risks to police officers and damage to the arrestee's property.

4. The Terry*-Stop Exception*

Some commentators have argued that there may also be *Terry*-type applications where passive, sensory-enhancing technology could be used under constraints of limited duration and scope. If this exception, based upon *Terry v. Ohio*,[157] is allowed, the devices could be used only for the purpose of confirming an observation already made by non-enhanced senses that gives one a reasonable suspicion that criminal activity is afoot or that the suspect may possess a weapon. Other commentators, in addition to this author, believe that the *Terry* doctrine, once applied to passive, sensory-enhanced surveillance, could be dangerously expansive and its ramifications should be thoroughly considered by the courts before adoption.[158]

5. The Binary Search Exception

A binary search[159] tells authorities only two things: "yes" or "no." A binary search exception would allow sensory-enhancement to be used if the information obtained from the device was limited strictly to the existence or non-

156. *FBI Kept Tabs On Cult With High-Tech Gear*, St. Louis Post-Dispatch, Apr. 21, 1993, at 12A.

157. *Terry v. Ohio*, 392 U.S. 1, 88 S. Ct. 1868 (1968) allows an officer to temporarily detain an individual for questioning when he has a reasonable suspicion that criminal activity is afoot. Also, if the officer has reason to believe that the individual is armed with a dangerous weapon, then he may conduct a limited physical search for weapons.

158. For a more thorough discussion of the pros and cons of allowing such an exception, *see* David A. Harris, *Superman's X-Ray Vision and the Fourth Amendment: The New Gun Detection Technology*, 69 Temp. L. Rev. 1, 51-55 (1996).

159. Term used in *United States v. Colyer*, 878 F.2d 469, 474 (D.C. Cir. 1989) to describe the nature of a canine-sniff search. The term means that the instrument gives only two responses, true/yes or false/no.

existence of illegal activity or contraband. However, if the device conveys to authorities any other information, its use should be prohibited. Therefore, to fall under this exception, any information conveyed by the device must lead to no other conclusion than that of illegal activity.

While this exception has not been officially recognized by any courts, it can be supported by the Supreme Court decision in *United States v. Place*.[160] In *Place*, the officer's senses were enhanced by the use of a canine which gave the officer limited information only as to the presence or absence of narcotics. The justification for establishing this exception and declaring all binary searches such as the canine sniff "reasonable" is based upon the fact that the intrusion is of such a limited nature that the individual's privacy interests are easily overcome by the governmental interest in preventing crime. The potential benefits to law enforcement outweigh this minimal intrusion to the individual.[161]

To further illustrate, consider a Millivision gun detector with a very high resolution. Due to the intimate personal information it may reveal to the operator about the subject's body, its use may be proscribed—even in airport situations. However, if the resolution was such that computer software could identify guns with an extremely high degree of accuracy, their use might be allowed. To qualify as a "binary search" the device's software would have to be designed to set off an alarm or display the image on the operator's screen only if it positively identified a gun.[162] A perfectly discriminating Millivision gun detector might even be used by police on city streets where it is illegal to carry a concealed weapon. However, gun detectors could not be used where concealed weapons permits are issued because the information obtained from the device must lead to no other conclusion other than that of illegal activity.

These are only a few of the potential applications under this exception. The hurdle for surveillance technology manufacturers, however, would be to design the devices so that they are perfectly discriminating. Current thermal imagers would not fall into this exception because they cannot discriminate between legal and illegal heat sources. However, as technology develops, this exception could become particularly useful to law enforcement. In addition, public opposition would be minimal because absolutely no private information would be revealed to law enforcement officers unless the individual was in fact breaking the law.

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160. United States v. Place, 462 U.S. 696, 103 S. Ct. 2637 (1983).

161. For arguments against this exception, *see* Harris, *supra* note 158, at 51-53 and United States v. Jacobsen, 466 U.S. 109, 133, 104 S. Ct. 1652, 1667 (1984) (Brennan, J., dissenting).

162. Prior to establishment of this exception the courts would have to resolve several serious questions: Is 95% accuracy in the machine acceptable? 80%? Would establishment of this exception result in a reduction of probable cause determinations to mathematical formulae? Such a result would seem contrary to the Court's assertion that the determination of probable cause must be a "totality of the circumstances" decision because it is a "fluid concept" that includes many unmeasurable factors such as the experience of the officer. Illinois v. Gates, 462 U.S. 213, 230-32, 103 S. Ct. 2317, 2328-29 (1983). *See also* George Dery III, *Remote Frisking Down To The Skin: Government Searching Technology Powerful Enough To Locate Holes In Fourth Amendment Fundamentals*, 30 Creighton L. Rev. 353, 371-72 (Feb. 1997).

V. CONCLUSION

Courts have had difficulty resolving the constitutional issues raised by passive, sensory-enhanced surveillance with any measure of consistency. To help remedy this problem, the Supreme Court should seize the opportunity presented by the recent thermal imagery cases and establish a new standard for evaluating this kind of technology. Ideally, the court should abandon Justice Harlan's subjective-objective test and return the burden of proof to the government to demonstrate the "reasonableness" of its actions. Alternatively, due to the inherent lack of notice and resulting potential for abuse, the Court should at least shift the burden of proof with respect to passive, sensory-enhanced surveillance.

Under this new standard, the courts should conduct a two-part inquiry. First, they should determine whether a search has occurred—that is, whether the government activity was designed to reveal information that the individual subjectively sought to preserve as private. Second, the courts should determine whether the government has met its burden of proving that the search falls within a jurisprudential exception to the presumption of unreasonableness. These exceptions are established when the courts, after balancing the interests of the individual against the interests of the government, determine that some overwhelming governmental interest exists.

This proposal does not purport to eliminate all controversies raised by this technology, but it does provide a more stable structure within which the courts can conduct their analyses. One benefit is that the established exceptions will operate to provide prior notice to officers as to what conduct is unacceptable. Also, this proposal eliminates the Orwellian results created by the objective prong of *Katz*. And finally, this proposal avoids the "intimate details" inquiry that requires an ex post facto review of whether the search revealed alarmingly personal information.

Surely, there will still be questions as to whether a certain activity falls within a specific exception. However, the courts are familiar with this type of balancing test and should be able to answer those questions in a consistent manner. Most importantly, under this proposal, any "close calls" go to the citizen—not the government—because the burden of proof has been returned to its proper place.

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