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THERMAL IMAGING AND THE FOURTH AMENDMENT: THE ROLE OF THE KATZ TEST IN THE AFTERMATH OF KYLLO V. UNITED STATES

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COMMENT: THERMAL IMAGING AND THE FOURTH
AMENDMENT: THE ROLE OF THE *KATZ* TEST IN THE
AFTERMATH OF *KYLLO V. UNITED STATES*

*“Wherever he may be, asleep or awake, working or resting, in his bath or in bed, he can be inspected without warning and without knowing that he is being inspected.”*¹

I. INTRODUCTION

Ever since the War on Drugs was first declared in the early 1970's,² the technologies used by the government to fight it have developed at an alarming rate.³ Although these technological advancements have successfully suppressed the amount of drugs within the country, their use is seriously infringing on American citizens' right to privacy.⁴ For example, law enforcement is utilizing “Carnivore,” a computer program that scans the contents of e-mail, and “Millivision,” a device that can detect guns through people's clothing by measuring electromagnetic radiation and producing an image of the body of the person being viewed.⁵ As new advancements in technology are developed, several questions are raised. Are there any limits that can be placed on the power of technology so it will not shrink the realm of guaranteed privacy? Will the Supreme Court protect the individual's interest in being free from unreasonable searches by the government over the government's interest in ending the drug trade?

In *Kyllo v. United States*⁶ (hereinafter “*Kyllo*”), the Supreme Court answered “Yes” to both questions.⁷ The case involved the highly controversial police procedure of thermal imaging.⁸ Throughout the

1. GEORGE ORWELL, 1984 173-74 (Signet Classic 1983) (1949).

2. Richard Nixon was the first President to officially announce a war on drugs. See James M. Naughton, *President Gives Highest Priority to Drug Problem*, N.Y. TIMES, June 2, 1971, at A1.

3. See, e.g., John Larrabee, *Surveillance Zooming in with High-Tech but Critics Fear for Privacy*, USA TODAY, Dec. 26, 1995, at A3.

4. See *id.*

5. See Millivision Home Page at <http://www.millivision.com>; *How Far Will Computer Monitoring Go?*, N.Y. LAW JOURNAL, Dec. 28, 2001 at 1.

6. 533 U.S. 27 (2001).

7. See *id.*

8. See *id.* at 29.

1990's, thermal imaging was one of the most widely used technological tools utilized by governmental agencies to identify and eliminate the indoor cultivation of marijuana.⁹ This was due to the hydroponic farming techniques required to grow viable marijuana plants indoors.¹⁰ In particular, the cultivation process requires the extensive use of artificial lighting.¹¹ These lights generate enormous amounts of heat that is emanated outdoors either naturally or through a ventilation system installed by the cultivator.¹² A thermal imager, placed outside the residence, can be used to measure and record the magnitude of these heat emissions.¹³ This data generally provided the probable cause necessary for law enforcement to obtain the search warrant needed to discover and eradicate the indoor growing operations.¹⁴

In *Kyllo*, the Supreme Court held that the use of a thermal imager to detect heat emissions from a home is a "search" under the Fourth Amendment and is therefore presumptively unreasonable without a warrant.¹⁵ Although civil libertarians and privacy rights activists applauded the result,¹⁶ upon closer inspection, the case raises some interesting questions.

What determines a "search" under the Fourth Amendment was established in *Katz v. United States*.¹⁷ Known as the "reasonable expectation of privacy" test, the Court has developed a wide range of case law applying and discussing the test.¹⁸ In *Kyllo*, the Court cited *Katz* as

9. See Daniel J. Polatsek, *Thermal Imaging and the Fourth Amendment: Pushing the Katz Test Towards Terminal Velocity*, 13 J. MARSHALL J. COMPUTER & INFO. L. 453, 453 (1995).

10. See Nation Narcotics Intelligence Consumer Comm. Report, the NNICC REPORT 66 (1996).

11. See *id.*

12. See Bradley J. Plaschke, *United States v. Deaner: Thermal Imagery, the Latest Assault on the Fourth Amendment Right to Privacy*, 12 J. MARSHALL J. COMPUTER & INFO L. 607, 608 n.5 (1994) (citing a telephone interview with Col. Carlos Aniglioh, President, Thermal Technologies, Inc. (Feb. 12, 1993)).

13. See Mindy G. Wilson, *The Prewarrant Use of Thermal Imagery: Has This Technological Advance in the War Against Drugs Come at the Expense of Fourth Amendment Protections Against Unreasonable Searches?*, 83 Ky. L.J. 891, 893 (1994-95).

14. See *id.*

15. See *Kyllo*, 533 at 40.

16. See Adam Miller, *Not Quite Up in Smoke Florida Cops Will be Slowed, Not Stymied, by Ruling that Bans Using Heat Sensors to Detect Pot Crops*, BROWARD DAILY BUSINESS REVIEW, June 20, 2001 at A1.

17. 389 U.S. 347 (1967).

18. See *e.g.*, *California v. Greenwood*, 486 U.S. 35 (1988); *Florida v. Riley*, 488 U.S. 445. (1989).

precedent, yet the Court did not appear to actually conduct a proper *Katz* inquiry.¹⁹ Moreover, essential to the Court's holding was the fact that the thermal imager was a device "not in general public use,"²⁰ a fact never before emphasized by the Court. As a result, the case will likely cause disorder in the lower courts as they attempt to determine whether a particular surveillance technology has entered the domain of "general public use."

In addition, the Court's opinion failed to address certain Fourth Amendment implications that arose in the lower courts when these courts were faced with the issue of thermal imaging. In holding that the use of a thermal imager was a "search," the Supreme Court reversed the Ninth Circuit.²¹ Relying on decisions from other Circuit Courts, in *United States v. Kyllo*²² (hereinafter "*Kyllo III*"), a panel of the Ninth Circuit held that the government's warrantless use of a thermal imager was not an unreasonable search and thus did not violate the Fourth Amendment.²³ The court reasoned that because the technology merely measured "waste heat" and did not reveal any "intimate details" inside Kyllo's home, it was constitutionally legitimate.²⁴ Accordingly, the court concluded that one's home is not safeguarded from such outside, non-intrusive government observation.²⁵ While briefly discussing the "waste heat" and "intimate details" doctrine, the Supreme Court did not flatly reject them outright.²⁶ As such, lower courts are left without complete guidance and will be even more confused in the future.

This comment examines and criticizes the Supreme Court's reasoning in *Kyllo*.²⁷ In doing so, it demonstrates that, under a *Katz* framework, the use of the thermal imager in *Kyllo* violated the defendant's legitimate expectation of privacy and thus amounted to an unconstitutional search, rendering the "waste heat" doctrine and "intimate details" analysis inappropriate.²⁸ In addition, this comment will examine the future effect of the "not in general use" language

19. See *infra* Part IV.

20. *Kyllo*, 533 U.S. at 40.

21. See *id.* at 41.

22. 190 F.3d 1041 (9th Cir. 1999) (*Kyllo III*).

23. See *Kyllo III*, 190 F.3d at 1047.

24. See *id.*

25. See *id.*

26. See *Kyllo*, 533 U.S. at 36-37.

27. See *infra* Parts II-V.

28. See *infra* Part IV.

used by the Court.²⁹ Part II of this comment first summarizes the indoor marijuana growing process and then explores the technology of thermal imaging.³⁰ Part III then presents the case law that generally defines searches under the Fourth Amendment.³¹ The remainder of Part III explores a variety of cases that specifically deal with thermal imaging, and discusses the tests utilized and the outcomes reached by these decisions.³² Part IV analyzes the *Kyllo* case in depth, focusing on its facts, holding, and problems in its reasoning.³³ Part V concludes that the Court in *Kyllo*, although reaching the correct result, fell short of fully protecting the citizen from unreasonable governmental intrusions.³⁴

II. MARIJUANA GROWING AND THE TECHNOLOGY OF THERMAL IMAGING

In the United States, more people consume marijuana than any other illegal drug.³⁵ Dried marijuana traditionally entered the United States through smugglers,³⁶ but, because of the effective suppression of the smuggling trade by law enforcement, marijuana is ever increasingly being produced in this country through indoor cultivation.³⁷ This transition to indoor growing has additionally been encouraged by its lucrative results; as many as four crops per year can be harvested from nominal investment in seeds, water, and lighting.³⁸

However, despite the cultivators' attempt to avoid detection by moving indoors, their need for great amounts of artificial lighting has been their undoing.³⁹ In order to provide sufficient lighting to grow viable plants, four hundred-watt to one thousand-watt light bulbs are necessary.⁴⁰ These light bulbs are typically capable of operating at 150 degrees Fahrenheit, but their optimal temperature for cultivating ma-

29. See *infra* Part IV.

30. See *infra* notes 35-70.

31. See *infra* notes 71-96.

32. See *infra* notes 97-151.

33. See *infra* notes 152-254.

34. See *infra* Part V.

35. See National Household Survey on Drug Abuse, 200, at <http://www.samhsa.gov/oas/NHSDA/2kNHSDA/chapter2.html>.

36. See The NNICC REPORT, *supra* note 10, at 66.

37. See *id.*; see also Wilson, *supra* note 13, at 892.

38. See Wilson, *supra* note 13, at 892.

39. See, e.g., *Kyllo III*, 190 F.3d at 1047.

40. See *United States v. Pinson*, 24 F.3d 1056, 1057; *United States v. Penny-Feeney*, 773 F. Supp 220 at 222 n.3 (D. Hawaii 1991), *affirmed on other grounds sub nom*, *United States v. Feeney*, 984 F.2d 1053 (9th Cir. 1993).

marijuana is sixty-eight to seventy-two degrees Fahrenheit.⁴¹ As a result, their use generates tremendous amounts of heat, which is expelled outside.⁴² Such thermal energy can then be detected and measured by any thermal energy detection instrument.⁴³ Up until *Kyllo*, law enforcement officials were using this technology to trace heat patterns from private residences and thus infer that an individual may have been growing marijuana plants inside.⁴⁴

Thermal imaging, despite its relatively straightforward application, is a highly advanced technology.⁴⁵ It works in the following manner. All objects give off heat in the form of infrared radiation.⁴⁶ This radiation is detected by the thermal imager and then converted by it to create images of the energy that can be observed and recorded.⁴⁷ In particular, these devices perceive the energy radiated from the outside of surface objects and the internal heat that has been transmitted to the outside of the surface object.⁴⁸ Acting much like a camera,⁴⁹ the device does not send out beams or rays but rather merely records thermal emissions.⁵⁰ A viewfinder then translates these emissions and displays the results in patterns visible to the human eye.⁵¹ These results typically shade the area around an object darker or lighter.⁵² The shading is dependent on a baseline measurement that is set by the operator.⁵³

In addition, the device is passive, *i.e.*, it does not project beams or otherwise physically penetrate the targeted objects.⁵⁴ Thermal imagers do not “see through walls” or produce distinct images of people, objects, or activities within a building, unless, for instance, one has

41. See *Pinson*, 24 F.3d at 1057-58.

42. See Plaschke, *supra* note 12, at 608 n.5.

43. See Polatsek, *supra* note 9, at 453.

44. See *United States v. Robinson*, 62 F.3d 1325, 1328 n.2 (11th Cir. 1995).

45. See Mark J. Kwasowski, Note & Comment: *Thermal Imaging Technology: Should Its Warrantless Use by Police be Allowed in Residential Searches?*, 3 TEX. WESLEYAN L. REV. 393, 403 (1997).

46. See *Kyllo III*, 190 F.3d at 1044.

47. See *id.*; see also *United States v. Field*, 855 F. Supp. 1518, 1522 (W.D. Wis. 1994).

48. See *Kyllo III*, 190 F.3d at 1044.

49. See Kwasowski, *supra* note 45, at 403.

50. See *Kyllo III*, 190 F.3d at 1044.

51. See *id.*

52. See *id.*

53. See *United States v. Field*, 855 F. Supp. 1518, 1522.

54. See *id.*

pressed his body up against a window.⁵⁵ Rather, the device merely reveals “that an enclosed structure contains a source of heat and the relative quantity of heat being produced.”⁵⁶

Thermal imaging was first used by the military.⁵⁷ The technology still is extensively used by the military to aid in such tasks as detecting warm objects, like engines, in relatively cool environments⁵⁸ and in weapon targeting.⁵⁹ Recently, the use of the thermal imager has expanded to other areas.⁶⁰ Thermal imaging presently has a number of commercial applications.⁶¹ These include detecting overloaded power lines, faulty building insulation, and excessive moisture in roofs.⁶² The most significant use of thermal scanners, however, has been their application by law enforcement personnel.⁶³ While law enforcement utilizes the device to aid in the tasks of search and rescue,⁶⁴ to investigate the causes of fires,⁶⁵ to locate fugitives,⁶⁶ to track covert, illegal waste discharges,⁶⁷ and for perimeter security,⁶⁸ it is primarily used for uncovering indoor marijuana growing facilities.⁶⁹ It is this final and principal use that raised substantial constitutional concerns.⁷⁰

55. See *State v. Siegal*, 281 Mont. 250, 259.

56. *Id.*

57. See *Kyllo III*, 190 F.3d at 1044.

58. See Leonard E. Ravich, *Thermal Imaging: A Review*, LASER FOCUS, Feb. 1986, at 108.

59. See Janice Fioravante, *Night Sight*, INVESTOR'S BUS. DAILY, Feb. 26, 1995, at A6; see also *United States v. Raytheon*, 1997 WL 669646, at *3 (D.C. Cir. 1997).

60. See Fioravante, *supra* note 59, at A6.

61. See *Kyllo III*, 190 F.3d at 1044 n.4.

62. See *id.*

63. See *id.* at 1044.

64. See *id.* at 1044 n.4. For an example of law enforcement using thermal imaging to locate bodies in a natural disaster see, e.g., Teilo Colley, *Fifth Body Found in Head-On Train Crash Wreckage*, PRESS ASS'N NEWSFILE, Oct. 15, 1994.

65. See, e.g., *Fire Crews Seek Smoke Cause at World Trade Center*, Reuters World Service, Aug. 12, 1994.

66. See *Kyllo III*, 190 F.3d at 1044 n.4.

67. See *id.*

68. See *id.*

69. See Lynne M. Pochurek, *From the Battlefield to the Homefront: Infrared Surveillance and the War on Drugs Place Privacy Under Siege*, 7 ST. THOMAS L. REV. 137, 149 (1995).

70. See Michael D. O'Mara, Comment, *Thermal Surveillance and the Fourth Amendment: Heating Up the War on Drugs*, 100 DICK. L. REV. 415, 417 (1996).

III. THERMAL IMAGING AND THE FOURTH AMENDMENT

A. *Supreme Court Fourth Amendment Precedent*

The Fourth Amendment to the United States Constitution provides 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.”⁷¹ The Fourth Amendment’s limitations on searches are invoked when the government invades an individual’s privacy.⁷² Under normal circumstances, law enforcement officials must obtain a warrant before searching a home.⁷³ In most cases involving thermal imaging, however, law enforcement officials conducted the scan before obtaining a warrant.⁷⁴ Therefore, if a thermal imaging scan was adjudged to be a “search” under the Fourth Amendment, it presumptively violated constitutional privacy protections.⁷⁵ In *Katz v. United States*, the Supreme Court developed a two-part test to determine whether the government has in fact conducted a Fourth Amendment “search.”⁷⁶ As such, most courts that have addressed the issue of thermal imaging have tried to fit it under the test developed in *Katz*.⁷⁷

Under this test, in order to demonstrate that a police activity amounts to a “search” under the Fourth Amendment, an individual must establish the following: (1) that he exhibits an actual, subjective expectation of privacy and (2) that this expectation is one that society recognizes as reasonable.⁷⁸ This assessment of the subjective and objective expectations of privacy in terms of reasonableness under the Fourth Amendment has become known as the *Katz* inquiry, or the “reasonable expectation of privacy” test.⁷⁹

71. U.S. CONST. amend. IV.

72. See *Oliver v. United States*, 466 U.S. 170, 177-78 (1984).

73. See *Katz v. United States*, 389 U.S. 347, 357 (1967).

74. See, e.g., *Myers*, 46 F.3d 668; *Ishmael*, 48 F.3d 850; *Pinson*, 24 F.3d 1056; *Cusumano*, 67 F.3d 1497.

75. The Supreme Court of Montana has characterized the issue as the following: “may law enforcement utilize warrantless thermal imaging of a structure to gather information for probable cause for the later issuance of a search warrant, or does the use of thermal imaging technology to gather information about the activities inside a structure itself constitute a search which can be accomplished only with judicial oversight and following the issuance of a search warrant?” See *Siegel*, 281 Mont. at 257.

76. See *id.* at 361 (Harlan, J., concurring).

77. See, e.g., *Myers*, 46 F.3d 668; *Ishmael*, 48 F.3d 850; *Pinson*, 24 F.3d 1056; *Cusumano*, 67 F.3d 1497.

78. See *Katz*, 389 U.S. at 361 (Harlan, J., concurring).

79. See *California v. Ciraolo*, 476 U.S. 207, 211 (1986).

After *Katz*, the Supreme Court has developed a long, and somewhat confusing, Fourth Amendment “search” jurisprudence.⁸⁰ Lower courts, when faced with the issue of thermal imaging, analogized to these decisions to reach their conclusion regarding the constitutionality of the device.⁸¹

One such Supreme Court development is the so-called “public access therefore police access” doctrine.⁸² This doctrine states that, “if an aspect of a person’s life is subject to scrutiny by society, then that person has no legitimate expectation in denying equivalent access to the public.”⁸³

Further cases have refined this principle. For example, in *Air Pollution Variance Board of Colorado v. Western Alfalfa Corp.*, the Court held that an unreasonable search was not conducted when a state inspector stood in an open field and observed smoke fumes flowing from a chimney.⁸⁴ In addition, in *United States v. Place*, the Court found that the use of a drug-sniffing dog to smell unopened luggage at an airport was not a search by virtue of the fact that the sniff revealed nothing more than the odor and thus the presence of narcotics.⁸⁵ Soon thereafter, in *United States v. Karo*, the Court held that the warrantless detection of a suspect’s electric beeper to locate him within a residence did not violate the Fourth Amendment.⁸⁶

Two years later, in *California v. Ciraolo*, the Court found that it was constitutionally permissible for law enforcement officials to conduct warrantless, visual observations from an airplane.⁸⁷ The Court applied *Ciraolo* in *Florida v. Riley*, and held that surveillance of a backyard from a helicopter hovering 400 feet above ground was not a search.⁸⁸ Justice O’Connor concurred in the judgment but wrote separately to argue that the “public access therefore police access” doctrine should be

80. For examples of the Court’s post-*Katz* history see STEPHEN A. SALTZBURG & DANIEL J. CAPRA, *AMERICAN CRIMINAL PROCEDURE* 42-77 (6th ed. 2000).

81. See *United States v. Penny-Feeney*, 773 F. Supp. 220, 226-28 (D. Haw. 1991), *aff’d on other grounds sub nom*, *United States v. Feeney*, 984 F.2d 1053, 1056 (9th Cir. 1993).

82. STEPHEN A. SALTZBURG & DANIEL J. CAPRA, *AMERICAN CRIMINAL PROCEDURE* 48 (6th ed. 2000).

83. See *id.*

84. See 416 U.S. 861, 865 (1974).

85. See 462 U.S. 696, 699, 707 (1983).

86. See 468 U.S. 705, 714-15 (1984). Law enforcement followed the detection and found narcotics-related substances inside. See *id.*

87. See 476 U.S. at 215.

88. See 488 U.S. 445, 449-52 (1989).

determined by whether the public ordinarily had access to the information, not whether it was legally possible for a member of the public to acquire it.⁸⁹ Later, in *Dow Chemical v. United States*, aerial photography of an industrial complex with a mapping camera was held not to be a search under the Fourth Amendment.⁹⁰

Further, in *United States v. Dunn*, the Court held that it was reasonable for the police to use a flashlight to aid in the visual inspection of the inside of a barn.⁹¹ Finally, in *California v. Greenwood*, the Court found that law enforcement was free to search one's trash when it was left on the curb for routine garbage pickup.⁹²

These cases stand for the proposition that an objective reasonable expectation of privacy is not afforded to things whose typical exposure is out in the open and that are ordinarily detectable, even when the particular observation might utilize techniques that are more acute than normal human sensory capacities.⁹³ Thus, lower courts drew a line to distinguish those observations that are not too far beyond human capabilities.⁹⁴ With respect to thermal imaging, federal courts relied on the above cases and attempted to draw such a line corresponding to this rule.⁹⁵ Specifically, as discussed below, courts developed the "waste heat" doctrine and the "intimate details" analysis to address the problem.⁹⁶

B. Judicial Treatment of Thermal Imaging

The first case to thoroughly examine the constitutionality of thermal imaging devices was *United States v. Penny-Feeney*, a decision from

89. *See id.* at 452-56.

90. *See* 476 U.S. at 239.

91. *See* 480 U.S. 294, 305 (1987).

92. *See* 486 U.S. 35, 40-42 (1988).

93. *See* *United States v. Solis*, 536 F.2d 880, 881, 883 (9th Cir. 1976) (holding that a dog sniff of the open air is constitutionally valid even though expert testimony demonstrated that a dog's sense of smell is eight times more sensitive than a human's); *Katz*, 389 U.S. at 352-53 (pointing out that words spoken into a telephone mouth piece are ordinarily not emanated outside a phone booth); *Karo*, 468 U.S. at 715-18 (noting that beeper signals are not ordinarily radiated from a house).

94. *See Katz*, 389 U.S. at 348-52 (noting that acoustic vibrations that were ascertained using electronic surveillance equipment were not humanly perceptible); *Dow Chem. Co. v. United States*, 476 U.S. 227, 238 (noting that pictures taken with a mapping camera, even though not enlarged, were not too far beyond human capabilities).

95. *See infra* Part III-B.

96. *See infra* Part III-B.

the United States District Court for the District of Hawaii.⁹⁷ In this case, a thermal imaging survey of the defendant's property was conducted from a helicopter.⁹⁸ The survey revealed unusually high amounts of heat emanating from the walls of the residence and from areas of the garage.⁹⁹ After a warrant was obtained, a raid uncovered the presence of an extensive indoor, marijuana growing facility.¹⁰⁰

The court began its analysis by asserting the "waste heat" doctrine.¹⁰¹ This doctrine states that one's privacy cannot be violated under the Fourth Amendment when the government merely measures discarded heat emanating from one's home.¹⁰² Utilizing the *Katz* inquiry, the court first found that the defendants did not demonstrate a subjective expectation of privacy for waste because, by intentionally venting the heat outside with exhaust fans, they deliberately exposed the heat to public areas.¹⁰³ Second, by analogizing to the dog sniff of drugs in *Place* and the search of the garbage in *Greenwood*, the court held that there was no objective expectation of privacy for waste heat.¹⁰⁴ In addition, the *Penny-Feeney* court noted that thermal imaging was valid because it did not reveal any protected areas of privacy within the home.¹⁰⁵

Shortly after this decision, the Eighth Circuit addressed the issue of thermal imaging under the *Katz* inquiry in *United States v. Pinson*.¹⁰⁶ There, the Drug Enforcement Administration mounted a thermal imager to a helicopter and, before obtaining a warrant, performed an aerial scan of the defendant's property.¹⁰⁷ The court relied on the decision in *Penny-Feeney* and utilized the "waste heat" doctrine.¹⁰⁸ The court thus found that the first prong of the *Katz* test was not satisfied because the heat given off from the grow lamps was waste that the defendant could not expect to remain private.¹⁰⁹ Additionally, the court

97. See 773 F. Supp. 220, 228 (D. Haw. 1991), *aff'd on other grounds sub nom*, *United States v. Feeney*, 984 F.2d 1053, 1056 (9th Cir. 1993).

98. See *Penny-Feeney*, 773 F. Supp. at 223.

99. See *id.* at 223-24.

100. See *id.* at 224.

101. See *id.*

102. See *id.* at 226.

103. See *Penny-Feeney*, 773 F. Supp. at 226.

104. See *id.*

105. See *id.* at 228.

106. See 24 F.3d 1056 (8th Cir. 1994).

107. See *id.* at 1057.

108. See *id.* at 1058.

109. See *id.*

held that even if the defendant could establish any subjective expectation of privacy, the second prong of the *Katz* inquiry was not met.¹¹⁰ After reaffirming that the objective prong of the test asks whether the individual's privacy expectation is one that society would recognize as reasonable,¹¹¹ the court once again applied the "waste heat" approach and drew a comparison between abandoned heat and garbage left on a curb and odors emanating from luggage.¹¹² The court also focused on the technical capacity of thermal imagers, and noted 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 the home, are threatened by thermal imagery."¹¹³ According to the court, because the technology did not reveal any "intimate details" of the home,¹¹⁴ the defendant's Fourth Amendment rights were not violated.¹¹⁵

The Eleventh Circuit next addressed the issue in *United States v. Ford*.¹¹⁶ There, a search was made pursuant to a warrant partly based on results of a thermal scan conducted by police.¹¹⁷ The scan revealed that the defendant's home was emitting an "inordinate amount of heat."¹¹⁸ Law enforcement then obtained a search warrant, executed it, and discovered a highly sophisticated hydroponic laboratory inside.¹¹⁹ The defendant then moved to suppress the evidence.¹²⁰ The court held that the defendant failed to meet the subjective prong of *Katz* because he had taken intentional steps to vent the heat detected

110. *See id.* at 1059.

111. *See id.* at 1058.

112. *See Pinson*, 24 F.3d at 1058. Like the court in *Penny-Feeney*, the *Pinson* court analogized to *Place* and *Greenwood*. *See id.* The court first stated that just as one cannot have a reasonable expectation of privacy for discarded items like bagged garbage, so too should they not expect that heat voluntarily vented outside will remain private. *See id.* The court additionally found that "[j]ust as odor escapes a compartment or building and is detected by the sense-enhancing instrument of a canine sniff, so also does heat escape a home and is detected by sense-enhancing infrared camera." *Id.* Thus, the court held the use of the infrared surveillance technology to be constitutionally permissible. *See id.*

113. *Id.* at 1059.

114. *See Pinson*, 24 F.3d at 1059.

115. *See id.*

116. 34 F.3d 992 (11th Cir. 1994).

117. *See Ford*, 34 F.3d at 993.

118. *See id.*

119. *See id.*

120. *See id.*

by the imager.¹²¹ The court additionally found that the objective test was not met.¹²² The court noted that this prong is to be analyzed by referring to the fundamental values of the Fourth Amendment, and stated that “[o]ne such value. . . is the intimacy of detail. . . that a surveillance technique reveals in a particular case.”¹²³ Citing *Dow*, the court held that no violation of the Fourth Amendment can occur without the disclosure of “intimate details,”¹²⁴ and, since no such details were observed here, no constitutional violation occurred.¹²⁵

The next case to hold that a warrantless thermal scan was not a “search” under the Fourth Amendment was the Seventh Circuit’s decision in *United States v. Myers*.¹²⁶ The court relied on the “persuasive” reasoning of the Eighth and Eleventh Circuits to reach its conclusion.¹²⁷ After the court said that the defendant failed to meet the first prong of *Katz*,¹²⁸ the court, citing *Pinson*, found that any subjective expectation of privacy that Myers might have is one that society is not ready to accept as reasonable because no “intimate details” were detected.¹²⁹ The court also heavily emphasized the “waste heat” doctrine, stating that society is “not willing to protect as reasonable an expectation of privacy in the wasted heat emitted from a home.”¹³⁰

121. *See id.* at 995.

122. *See id.*

123. *Ford*, 34 F.3d at 996.

124. *See id.* (citing *Dow Chem. Co.*, 476 U.S. 227 at 238).

125. *See id.* at 996-97 (quoting *Florida v. Riley*, 488 U.S. 445, 452 (1989)). In a subsequent case, *United States v. Robinson*, the Eleventh Circuit once again held that the use of thermal imaging was not an unreasonable search under the Fourth Amendment. *See* 62 F.3d 1325 (11th Cir. 1995). The court’s reasoning was nearly identical to its reasoning in *Ford*. *See id.* Not only did the defendant in *Robinson* fail to meet both prongs of the *Katz* inquiry, but the court also noted that a thermal imaging device is not unreasonable because it does not reveal “intimate details.” *See id.* at 1328-30.

126. 46 F.3d 668 (7th Cir. 1995).

127. *See id.* at 669.

128. *See id.*

129. *See id.* at 670.

130. *Id.* In a recent case, the Seventh Circuit reaffirmed its stance on the permissibility of thermal imaging. *See United States v. Real Property Located at 15324 County Highway E*, 219 F.3d 602 (7th Cir. 2000). The court utilized its holding in *Myers* in reaching its conclusion. *See id.* at 603-04. However, the opinion did note that if the defendant could have produced evidence that suggested that the capability of the thermal imager used here was superior to the one used in *Myers*, *i.e.*, if it could “create a precise video image of every living thing in the house, revealing facial features, body positions, who is walking through a kitchen, and who is in the bedroom engaged in sexual activity,” then perhaps the outcome would have been different. *See id.* at 604.

Finally, in *United States v. Ishmael*, the Fifth Circuit added to the majority position by upholding a warrantless thermal imaging scan of the defendant's property.¹³¹ The court concluded that "the crucial inquiry. . . is whether the technology reveals 'intimate details.'"¹³² Here, because the thermal imager did not reveal such intimate details within the scanned structure, the Fourth Amendment was not violated.¹³³

The only circuit that held that a warrantless thermal imager scan violated the Fourth Amendment was the Tenth Circuit in *United States v. Cusumano*.¹³⁴ The court refused to apply the "waste heat" doctrine.¹³⁵ The opinion noted that the imager itself does not detect "waste heat," but rather heat differentials, thus creating a heat signature.¹³⁶ That is, the scan measures heat gradients across the exterior surface of the scanned object.¹³⁷ The device can detect "signatures" of activities that generate a significant amount of heat inside one's home.¹³⁸ To the court, "waste heat" was of no relevance.¹³⁹

The court then stated that other circuits upholding the use of thermal imagers had misframed the question.¹⁴⁰ The Tenth Circuit suggested that, rather than focusing on the tools that the government employs to obtain the information, a court should concentrate on the object of the government's inquiry.¹⁴¹ Thus, to the court, the key question is not whether the defendants have a reasonable expectation of privacy into the waste heat emanated from their homes, but whether they have an expectation of privacy in activities within their homes, which could be revealed by their heat signatures.¹⁴²

The court reasoned that the true value of the thermal imager was what it revealed about the inside of the defendant's home, not merely

131. See 48 F.3d 850 (5th Cir. 1995).

132. *Id.* at 855 (citing *Dow Chem. Co.*, 476 U.S. at 238).

133. See *id.* at 856 ("The device assesses only heat differentials in objects and therefore poses no threat to the privacy concerns that the Fourth Amendment is intended to protect.").

134. 67 F.3d 1497 (10th Cir. 1995), *vacated on other grounds*, 83 F.3d 1247 (10th Cir. 1996) (en banc).

135. See *id.* at 1501.

136. See *id.* at 1501-02.

137. See *id.* at 1501.

138. See *id.*

139. See *id.*

140. See *Cusumano*, 67 F.3d at 1502.

141. See *id.* at 1502.

142. See *id.*

that it could measure the heat emitted from it.¹⁴³ Thus, under the first prong of *Katz*, the defendant demonstrated a subjective expectation of privacy for the heat signatures of domestic activity by concealing the grow operation inside his house.¹⁴⁴ With regards to the second prong, the court dismissed the government's "intimate details" argument and concluded that the device intruded on the privacy of one's home, "not because it records white spots on a dark background, but rather because the interpretation of that data allows the government to monitor those domestic activities that generate a significant amount of heat."¹⁴⁵ The court further added that the imager invaded the sanctity of one's home because it stripped the inhabitants of "the right to be left alone from the arbitrary and discretionary monitoring of our actions by government officials."¹⁴⁶

Although the Tenth Circuit is the only federal court to have concluded that the warrantless use of a thermal imager violated one's privacy protections, the highest courts in several states have done so as well.¹⁴⁷ For example, in *Montana v. Siegel*, the Supreme Court of Montana, utilizing the reasoning of *Cusumano*, found that the defendants met both prongs of the *Katz* inquiry.¹⁴⁸ Likewise, in *Commonwealth v. Gindlesperger*, the Supreme Court of Pennsylvania, also relying on the Tenth Circuit's reasoning, rejected a "waste heat" approach, and found the practice repugnant to the Constitution.¹⁴⁹ The Pennsylvania Supreme Court refused to extend the reasoning in *Greenwood* and *Place*

143. *See id.* The court concluded that the defendant manifested an expectation of privacy because he located his activities within the sanctity of his home. *See id.* The interior of one's home has traditionally been given the greatest Fourth Amendment protection. *See, e.g., Florida v. Riley*, 488 U.S. 445, 452-55 (1989) (O'Connor, J., concurring), *Karo*, 468 U.S. at 714; *Payton v. New York*, 445 U.S. 573, 590 (1980).

144. *See Cusumano*, 67 F.3d at 1502.

145. *Id.* at 1504.

146. *Id.* The court also recognized that this technology is stagnant, but will surely improve with time. *See id.* Therefore, the court thought it imperative to limit the use of thermal imagers now, before they are able to reveal any more about the inside of one's home. *See id.* (noting that the reasonableness of privacy expectation should not "hinge upon the outcome of a technological race of measure/counter-measure between the average citizen and the government" because such a race is one the court felt the people would undoubtedly lose).

147. *See, e.g., Young*, 867 P.2d 593 (Wash. 1994); *Gindlesperger*, 560 Pa. 202 (Pa. 1999); *Siegel*, 281 Mont. 250 (Mont. 1997).

148. *See Siegal*, 281 Mont. at 273-74.

149. *See Gindlesperger*, 560 Pa. at 232-33.

to thermal imaging devices.¹⁵⁰ As a result, the court found that both prongs of *Katz* were met and consequently, that the Fourth Amendment was violated.¹⁵¹

IV. THE KYLLO CASE

A. *Facts and Procedural History*

In July of 1991, Danny Kylo's next-door neighbor, Tova Shook, became the focus of an Oregonian drug task force.¹⁵² At that time, Kylo was living in the center of a triplex in Florence, Oregon.¹⁵³ During the investigation of Tova, William Elliot, an agent of the United States Bureau of Land Management, an agency that was participating in the task force, became suspicious of Kylo.¹⁵⁴

Elliot's suspicions were aroused by additional information provided to him by Oregon state law enforcement.¹⁵⁵ First, Elliot was informed that Kylo and Luanne, his wife, resided in one unit of the triplex and Tova occupied another.¹⁵⁶ Secondly, he was told that a car parked at the triplex was jointly registered to Luanne and Kylo and that Luanne had been arrested one month earlier for delivery and possession of a controlled substance.¹⁵⁷ Lastly, Elliot was informed that Kylo had once stated to a police informant that Luanne and he could supply the informant marijuana.¹⁵⁸ Soon thereafter, Elliot subpoenaed the utility records of Kylo and his neighbors.¹⁵⁹ Elliot deter-

150. The court distinguished garbage left at the side of a curb from waste heat emissions, because "waste heat, unlike garbage, can only be detected by means of a technologically advanced device" *Id.* at 234. Furthermore, because it is inevitable that heat will dissipate from heat production, any heat-producing activity "does not require a deliberate act nor is it preventable in the same way that one can conceal incriminating garbage." *Id.* The court distinguished *Place* by noting that a "thermal imaging device, unlike the trained drug dog, does not have the ability to distinguish between legal and illegal activities occurring within the home based upon the amount of extraneous heat detected." *Id.*

151. *See id.* at 237.

152. *See* United States v. Kylo, 37 F.3d 526, 528 (9th Cir.1994) (*Kylo I*). Tova was the daughter of the task force's original target. *See id.*

153. *See* United States v. Kylo, 809 F. Supp. 787, 789 (1992). Kylo's address was 878 Rhododendron Drive and Tova lived next door at 890 Rhododendron Drive. *See id.*

154. *See Kylo III*, 190 F.3d at 1043.

155. *See id.*

156. *See id.*

157. *See id.*

158. *See id.*

159. *See id.*

mined that Kylo's electrical usage was abnormally high compared to other residents in the area.¹⁶⁰ From this, Elliot inferred that Kylo might be concealing an indoor marijuana growing facility within his unit.¹⁶¹

Without securing a warrant, between 3:30 and 4:00 in the morning in mid-January of 1992, a thermal image survey of Kylo's triplex was conducted.¹⁶² Sergeant Daniel Hass of the Oregon National Guard performed this scan.¹⁶³ From the passenger seat of a parked car, Hass examined the triplex.¹⁶⁴ Hass concluded that high heat was being emanated from Kylo's roof above the garage and from one wall.¹⁶⁵ Moreover, Hass determined that Kylo's unit "showed much warmer" than the other two units in the triplex.¹⁶⁶ Due to Elliot's belief that high levels of heat emission are usually associated with the intense lighting needed to grow marijuana, he thought these results established further evidence of marijuana cultivation.¹⁶⁷ Elliot then presented this information in an affidavit to a magistrate judge, and a warrant was issued.¹⁶⁸ Elliot then searched Kylo's home and, as he suspected, found an indoor growing operation.¹⁶⁹ In addition, more than one hundred marijuana plants were discovered, along with weapons and drug paraphernalia.¹⁷⁰

After an indictment and the district court's denial of his motion to suppress the evidence, Kylo was convicted of drug manufacturing and sentenced to 63 months in prison.¹⁷¹ Kylo then appealed the denial of his suppression motion, challenging, *inter alia*, the warrantless use of the thermal imager as unconstitutional.¹⁷² A panel of the Ninth Cir-

160. See *Kyllo III*, 190 F.3d at 1043. Kylo's maximum power use was 1.3 times the usage of his neighbor. See *Kyllo*, 809 F. Supp. at 790.

161. See *id.*

162. See *Kyllo I*, 37 F.3d at 531.

163. See *Kyllo III*, 190 F.3d at 1044.

164. See *id.*

165. See *id.*

166. See *id.*

167. See *id.*

168. See *id.*

169. *Kyllo III*, 190 F.3d at 1044.

170. See *id.*

171. See *id.* at 1043. Specifically, Kylo was convicted on one count of manufacturing marijuana in violation of 21 U.S.C. §841(a)(1).

172. See *id.*

cuit remanded for an evidentiary hearing on the character and intrusiveness of the thermal imager.¹⁷³

On remand, the District Court made factual findings regarding the device, and concluded that a thermal scan may be conducted without first obtaining a warrant.¹⁷⁴ It therefore denied Kylo's motion to suppress.¹⁷⁵ The judge also resentenced Kylo to one month of imprisonment, followed by a period of supervised release.¹⁷⁶

Kylo once again appealed, and a divided Court of Appeals reversed and remanded the case to the district court (hereinafter "*Kylo II*").¹⁷⁷ The *Kylo II* court held that the warrantless thermal image scan conducted by Sergeant Hass was an unreasonable "search" and, consequently, the information acquired by the imager could not be considered in evaluating the validity of the warrant to search Kylo's residence.¹⁷⁸ The government petitioned the Ninth Circuit for a rehearing, and a panel of the court granted the petition.¹⁷⁹ The stage was set for the Ninth Circuit to once again decide whether Danny Lee Kylo's Fourth Amendment rights were violated by Sergeant Hass's warrantless use of the thermal imager.

Without oral argument, the panel withdrew the opinion in *Kylo II* and issued another opinion holding, by a two to one vote, that the use of the thermal imager to detect heat emissions from Kylo's home "did not constitute a search under contemporary Fourth Amendment standards."¹⁸⁰ Therefore, the Constitution did not prohibit the use of such a device.¹⁸¹

The court began by noting that, to determine whether the government has unconstitutionally invaded one's privacy, the two-part *Katz* inquiry is the appropriate test.¹⁸² Under the first prong, the court applied the "waste heat" doctrine and found that Kylo did not manifest a subjective expectation of privacy.¹⁸³ The court rejected Kylo's contention that the thermal imager was not merely measuring "waste heat"

173. See *Kylo I*, 37 F.3d at 531.

174. See *Kylo III*, 190 F.3d at 1045.

175. See *id.*

176. See *Kylo I*, 37 F.3d at 531.

177. See *United States v. Kylo*, 140 F.3d 1249 (9th Cir. 1998) (*Kylo II*).

178. See *id.*

179. See *Kylo III*, 190 F.3d at 1047.

180. *Id.*

181. See *id.*

182. See *id.* at 1045.

183. See *id.* at 1046.

emitted from the home, but rather was intruding into activities within his home that he expected to remain private.¹⁸⁴ Even though Kylo's decision to move his growing operation indoors indicated some expectation of privacy, the court placed heavy emphasis on the fact that he never did anything to conceal the "waste heat" emissions created by the heat lamps.¹⁸⁵ According to the court, this inaction on Kylo's part "demonstrat[ed] a lack of concern with the heat emitted and a lack of subjective privacy expectation in the heat."¹⁸⁶ In sum, because the thermal imager did not peer into Kylo's home but merely measured "waste heat" emissions that Kylo neglected to conceal, Kylo did not exhibit a subjective expectation of privacy.¹⁸⁷

Second, the court held that even if Kylo could illustrate a subjective expectation of privacy in the heat emissions, he could not establish that such a privacy expectation would be found objectively reasonable to society.¹⁸⁸ The court first stated that even though one's home is afforded greater privacy expectations, activities within one's home are not afforded protection from "outside, non-intrusive" government surveillance.¹⁸⁹ The court then noted that the use of technology that amplifies government observation does not itself make non-intrusive observation unconstitutional.¹⁹⁰ Instead, to the court, the key inquiry under the second prong of *Katz* is whether the technology reveals any "intimate details" within one's residence.¹⁹¹

After adopting the "intimate details" standard, the court found that no such details were revealed in this case.¹⁹² In doing so, the court placed heavy emphasis on the district court's finding regarding thermal imaging's capabilities.¹⁹³ Specifically, the court noted that the technology is a "non-intrusive device which emits no rays or beams and shows crude visual images of the *heat* being radiated from the *outside* of the house" and that "the device cannot and did not show any people or activity within the walls of the structure. . . , record[ing] only the heat

184. *See id.*

185. *See Kylo III*, 190 F.3d at 1046.

186. *Id.* The Ninth Circuit, relying on *Place*, analogized waste heat radiating from the surface of a home to the odor of illicit drugs emitted from an object.

187. *See id.*

188. *See id.*

189. *See id.* at 1046-47. (citing *Riley*, 488 U.S. at 449; *Ciraolo*, 476 at 1047).

190. *See Kylo III*, 190 F.3d at 1047.

191. *See id.* (citing *Ishmael*, 48 F.3d at 855 (quoting *Dow Chem. Co.*, 476 U.S. at 238)).

192. *See id.* at 1047.

193. *See id.* at 1045-47.

being emitted from the home.”¹⁹⁴ As such, according to the court, the thermal scan did not reveal any “intimate details,” but rather only “amorphous ‘hot spots’ on the roof and exterior wall,” which are neither “sensitive nor personal.”¹⁹⁵ Accordingly, no constitutional concerns were implicated.¹⁹⁶

B. The Supreme Court’s Holding and Reasoning

Due to the varying results regarding thermal imaging in the lower courts, the Supreme Court granted *certiorari*.¹⁹⁷ In a 5-4 decision, Justice Scalia writing for the majority held that “the information obtained by the thermal imager in this case was the product of a search.”¹⁹⁸ As such, the warrantless scan of Danny Lee Kyllo’s home was presumptively invalid.¹⁹⁹

The Court began its opinion by noting that, in any Fourth Amendment analysis, the home is given special protection.²⁰⁰ The Court then reiterated that the appropriate test to determine whether a “search” has occurred is the *Katz* test, specifically whether “the government violates a subjective expectation of privacy that society recognizes as reasonable.”²⁰¹ The Court emphasized that this test is used even when one’s house is implicated.²⁰²

The Court then stated that “[t]he question we confront today is what limits there are upon [the] power of technology to shrink the realm of guaranteed privacy.”²⁰³ Thereafter, the Court noted that, while the *Katz* inquiry may be difficult to refine in certain areas, no such difficulty exists when a search involves the interior of a home.²⁰⁴ Purporting to apply the test, the Court stated that, in searches of the interior of a home, “there is a ready criterion, with deep roots in common law, of the minimal expectation of privacy that *exists*, and that is

194. *Id.* at 1045 (emphasis in original).

195. *See id.* at 1047.

196. *See Kyllo III*, 190 F.3d at 1047.

197. *See* 530 U.S. 1305 (2000).

198. *See Kyllo*, 533 U.S. at 33.

199. *See id.* at 2046.

200. *See id.* at 2041-42. Justice Scalia, quoting *Silverman v. United States*, 365 U.S. 505, 511, (1961) wrote, “[a]t the very core” of the Fourth Amendment “stands the right of a man to retreat into his own home and there be free from unreasonable governmental intrusion.” *See Kyllo*, 533 U.S. at 34.

201. *See Kyllo*, 533 U.S. at 32.

202. *See id.*

203. *Id.* at 33.

204. *See id.*

acknowledged to be *reasonable*.²⁰⁵ According to the Court, to remove this minimum expectation would allow law enforcement technology to diminish the privacy guaranteed by the Fourth Amendment.²⁰⁶ Concluding, the Court stated that any information about the interior of a home obtained by sense-enhancing technology amounts to a search, “at least where (as here) the technology in question is not in *general public use*.”²⁰⁷

The Court then turned its discussion towards the “waste heat” doctrine and the “intimate details” standard. As to the former, the Court did not address the issue specifically as a “waste heat” inquiry.²⁰⁸ Instead, it addressed the question by rejecting the government’s argument that thermal imaging is not a “search” because it “detected ‘only heat radiating from the external surface of the house.’”²⁰⁹ With reference to *Katz*, the Court “rejected such a mechanical interpretation of the Fourth Amendment” because adopting such a standard would leave the “homeowner at the mercy of advancing technology.”²¹⁰ The Court’s conclusion was forward looking, taking account of surveillance technologies more advanced than a thermal imager in use or in development.²¹¹

The Court then addressed and rejected the “intimate details” analysis.²¹² The Court stated that analogizing the *Kyllo* case to *Dow*, the decision in which the Court first used the term “intimate details”, was inappropriate because it involved aerial photography of an industrial factory, a complex that “does not share the sanctity of the home.”²¹³ To the Court, the protection afforded to one’s home has never been dependent on the quality or quantity of the information secured from a search.²¹⁴ In fact, in one’s house, “*all* details are intimate, because the entire area is held safe from prying government eyes.”²¹⁵ There-

205. *See id.* (emphasis in original).

206. *See id.*

207. *See id.* (emphasis added).

208. *Kyllo*, 533 U.S. at 35.

209. *Id.* (citing Brief for the United States 26).

210. *Id.* at 37.

211. *See id.*

212. *See id.* at 37.

213. *Id.*

214. *See id.*

215. *Id.* (emphasis in original).

fore, the heat emissions detected by Officer Hass “were intimate details because they were details of the home.”²¹⁶

Justice Scalia continued by noting that limiting the use of a thermal imager to those searches that did not obtain “intimate details” would be wrong in both principle and practicality.²¹⁷ As such, it would fail to provide “a workable accommodation between the needs of law enforcement and the interests protected by the Fourth Amendment.”²¹⁸ Scalia reasoned that, because there is no necessary nexus between the complexity of a surveillance technology and the intimacy of the details it detects, every use of a thermal imager, a “relatively crude” device, will not be lawful.²¹⁹ For example, a thermal imager may detect when “the lady of the house” takes her sauna and bath, an “intimate” activity, whereas a highly sophisticated device may detect nothing more than whether one has left the closet light on.²²⁰ As such, the Court would have to develop a jurisprudence that could determine what activities were intimate.²²¹ Further, law enforcement, who would not know in advance whether its scan would detect something intimate, would not know whether its behavior was constitutional.²²²

In summation, the Court stated that where law enforcement “uses a device that is not in general public use to explore the details of the home that would previously have been unknowable without physical intrusion, the surveillance is a ‘search’ and is presumptively unreasonable without a warrant.”²²³

C. *The Issues Raised by Kyllo*

The Supreme Court’s decision in *Kyllo* is problematic for two reasons. First, even though the Court agreed that the *Katz* framework was the appropriate test to determine whether the use of the thermal imager was a “search,” it did not fully apply the test. In particular, the Court failed to analyze each prong of the test with reference to the specific facts of this case. Instead, the Court found that, with any

216. *See id.*

217. *See id.*

218. *See Id.* at 38 (citing *Oliver v. United States*, 466 U.S. 170, 181).

219. *See id.* at 36.

220. *Id.* at 38.

221. *Id.*

222. *Id.* at 38-39.

223. *Id.* at 40.

search of a home, a minimum expectation of privacy exists and this expectation is one that society believes is reasonable. Such reasoning was inappropriate and unnecessary. Under a routine *Katz* inquiry, the Court could have concluded that Danny Lee Kyllo manifested a subjective and reasonable expectation of privacy in the heat producing activities within his home. In doing so, the Court would have rendered the “waste heat” doctrine and “intimate details” analysis irrelevant.

Second, the Court’s decision to limit its holding to only those sense-enhancing technologies “not in general public use” was improper. Never before has Fourth Amendment jurisprudence depended on whether the public ordinarily had access to the information sought by the police. Instead, to determine whether a “search” occurred under the “public-access-therefore-police-access” doctrine, the Court has asked whether it was legally possible for a member of the public to obtain the sought out information. This language likely will cause confusion in the lower courts as they step away from the two-prong *Katz* analysis and attempt to determine whether particular surveillance technology has entered the realm of “general use.”

1. The Appropriate *Katz* Inquiry

a. The Subjective Prong

Even though the Court was correct in utilizing the *Katz* inquiry, its analysis was incorrect. The Court should have criticized the Ninth Circuit for incorrectly identifying the issue and displaying an utter misunderstanding of the law. By focusing on the “waste heat” doctrine to hold that Kyllo did not have a subjective expectation of privacy, the Ninth Circuit erred, and the high Court should have more fully addressed this.

The Supreme Court has stated that it is “obvious” that “private residences are places in which the individual normally expects privacy free of governmental intrusion not authorized by a warrant, and that expectation is plainly one that society is prepared to recognize as justifiable.”²²⁴ The Ninth Circuit evaded this principle by characterizing Kyllo’s relevant privacy expectation as a privacy expectation in the “waste heat [emissions]. . . radiating from the outside surface of [his] home.”²²⁵ The Ninth Circuit’s reliance on the “waste heat” doctrine

224. See *Karo*, 468 U.S. at 714.

225. See *Kyllo III*, 190 F.3d at 1046.

was overly narrow and unduly restricted the Fourth Amendment's protections against intrusions into privacy.

A thermal imager does not merely inform law enforcement officials that heat is radiating from a home. It provides them with a basis to infer that the occupants are engaging in heat-generating conduct inside the home. In fact, it is this inference that makes the technology so useful to the government. As a result, the issue should not be whether the occupant has an expectation of privacy in the heat radiating from his home. Rather, it should be whether he has an expectation of privacy in the information that can be revealed by thermal imaging, *i.e.*, whether he is engaging in heat-producing activities in particular parts of his home. Clearly, one has an expectation in keeping such concealed, in-home activities private. The Ninth Circuit, by relying so heavily on the "waste heat" analysis, did not properly focus its inquiry. When analyzing one's expectation of privacy, the inquiry should focus on the homeowner's expectation regarding the interior of his home, not on the heat emissions that might escape his home.

Moreover, by not clearly analyzing the first prong of the *Katz* test, the Court displayed a profound misconception of Fourth Amendment law. It is well established that one exhibits a constitutionally cognizable, actual expectation of privacy whenever "he seeks to preserve [his actions] as private."²²⁶ *Kyllo* clearly behaved in such a manner. He chose to move his growing operation inside his residence.²²⁷ Further, he did not decide to conduct his operation in an area visible through a window by someone standing outside.²²⁸ *Kyllo* had sought to prevent observation and to keep his operation private, and, but for the thermal scan, the government would have lacked sufficient information to obtain a search warrant.²²⁹ Therefore, Danny Lee *Kyllo* manifested an actual expectation of privacy. Any reasoning based solely on the fact that the search involved one's home, although relevant, should not be dispositive.

In addition, according to the Supreme Court, one does *not* exhibit an actual, subjective expectation in only two situations: (1) when one either "knowingly exposes [something] to the public"²³⁰ or (2) when one engages in acts that he knows will reveal information to an-

226. *Smith v. Maryland*, 442 U.S. 735, 740 (1979).

227. *See Kyllo III*, 190 F.3d at 1046.

228. *See id.*

229. *See id.*

230. *Katz*, 389 U.S. at 351.

other.²³¹ In this case, *Kyllo* did neither of these. As to the first prong, heat emissions are not detectable without the aid of sense-enhancing technology like a thermal imager. The ordinary human being, therefore, cannot sense or observe heat emanations. Thus, such heat is not “exposed” to anyone.²³² As to the second factor, occupants of a home generally will not be aware that their in-home conduct will produce infrared radiation, that such radiation travels through walls, or that others can detect this radiation with the aid of a technological device. Even assuming *Kyllo* did know these factors, he took steps to conceal his operation inside and keep it out of public view. Therefore, *Kyllo* did not knowingly expose nor willingly reveal what he was doing to anyone outside his home. Consequently, he had an actual expectation of privacy, and any reference to “waste heat” was improper.²³³

b. The Objective Prong

The Court should further have held that the Ninth Circuit also erred when it held that *Kyllo*'s expectation of privacy is one that society would not recognize as reasonable. Although the Court was correct in affording special protection to the home, it failed by not disposing of the “intimate details” analysis in its entirety when dealing with this prong of the *Katz* inquiry.

In analyzing the second prong of the *Katz* inquiry, one extremely relevant factor is whether the privacy expectation involves activities within one's home.²³⁴ In fact, the protection of privacy within one's residence was one of the principal purposes of the Fourth Amendment.²³⁵ Furthermore, a home is “the center of the private lives of our people” and should therefore be accorded “special protection.”²³⁶ Moreover, because the “assurance of personal security in one's home” is crucial to “our constitutional tradition,”²³⁷ any government action

231. See *Smith*, 442 U.S. at 743-44.

232. For a similar argument see Brief Amicus Curiae of the National Association of Criminal Defense Lawyers and the American Civil Liberties Union, in support of Petitioner at 10, *Kyllo v. United States*, 2000 U.S. LEXIS 4863 (No. 99-8508).

233. See *id.*

234. See, e.g., *Karo*, 468 U.S. at 714 (noting that the expectation that one's home will remain free of government surveillance is “plainly one that society is prepared to recognize as justifiable.”).

235. See *Payton v. New York*, 445 U.S. 573, 585 (1980).

236. See *Minnesota v. Carter*, 525 U.S. 83, 99 (1998) (Kennedy, J., concurring).

237. See *Carter*, 525 U.S. at 100 (Kennedy, J., concurring).

that intrudes on the privacy interests inside a home is presumably a Fourth Amendment violation.²³⁸

By focusing on whether the imager reveals “intimate details” within the home rather than whether the imager merely intrudes on the sanctity of the home, the Ninth Circuit erroneously ignored these established principles of Fourth Amendment jurisprudence. Justice Scalia obviously recognized this when he ruled that the “intimate details” analysis was wrong in principle. Yet, the Court seemed to contradict itself by noting that, in one’s household, drawing a line between details that are intimate and those that are not would be difficult because “[i]n the home, . . . all details are intimate.”²³⁹ This assertion implies that intimacy is given special constitutional protection. But this is not the case.

The intimacy of the activity being surveyed may be considered when determining whether society would be prepared to acknowledge an expectation of privacy in the activity as reasonable. However, whether an activity is intimate is not dispositive. Any inquiry into intimacy is just plain inappropriate in any Fourth Amendment analysis.

Furthermore, the Ninth Circuit adopted the “intimate details” approach by relying on *Dow* and *Riley*.²⁴⁰ However, neither of these cases support the proposition that this standard is a constitutional requirement. In *Dow*, to illustrate what expectations are reasonable in open fields, the Court noted that “open fields do not provide the setting for those *intimate activities* that the Fourth Amendment is intended to shelter from government interference or surveillance.”²⁴¹ The Court’s “intimate activities” language was meant to cover any activity within one’s home in which a person would legitimately have an expectation of privacy. Nowhere in the opinion of *Dow* is it suggested that the word “intimate” was used to cover only those activities that are considered sensitive or personal.

In *Riley*, the crucial fact was that the partial enclosure of a greenhouse left it open to aerial view, which “any member of the public” flying over could have also observed.²⁴² The Court was not concerned with matters of particularly private or sensitive significance, only those that were openly visible to the public. Even though the plurality in

238. See *Karo*, 468 U.S. at 715.

239. See *Kyllo*, 533 U.S. at 37 (emphasis in original).

240. See *Kyllo III*, 190 F.3d at 1047.

241. See *Dow Chem. Co.*, 476 U.S. at 235 (emphasis added).

242. See *Riley*, 488 U.S. at 450-52.

Riley used the term “intimate details,” the Court did not propose that this standard is an indispensable factor in Fourth Amendment analysis. In fact, a majority of the Court either did not address the search’s detection of “intimate details” or expressly rejected the significance of such an inquiry.²⁴³ The Ninth Circuit, however, through its misinterpretation of case law, unnecessarily raised this phrase to constitutional significance.²⁴⁴ The *Kyllo* Court should have addressed this point more forcefully so lower courts would be better equipped to handle other Fourth Amendment cases and to prevent such improper standards from being adopted in the future.

The Court could have dealt with the second prong of the *Katz* test in the following manner, and thereby made irrelevant any reference to intimacy. A thermal imager detects heat-producing objects and activities. Thermal imagers may not disclose precise details about the character of in-home activities.²⁴⁵ Nevertheless, they can detect whether there are extraordinarily high or low levels of heat-generating conduct within the home.²⁴⁶ More precisely, these devices can indicate particular areas of a home where such heat-producing conduct occurs.²⁴⁷

In addition, most of the activities that are capable of being revealed are innocent and are those that society would normally deem as reasonable (*e.g.*, the use of a sauna, the making of ceramics in a kiln, or the household cultivation of plants or herbs in a domestic greenhouse).²⁴⁸ Thermal imagers, therefore, enable law enforcement officials to observe “critical fact[s] about the interior of the premises that the government is extremely interested in knowing.”²⁴⁹ As a result, this technology violates a privacy expectation that society is prepared to recognize as reasonable. Any inquiry into the intimacy of what is revealed is irrelevant when one is under surveillance.

Whether a search detects “waste heat” or reveals “intimate details” should not be dispositive in any Fourth Amendment question. If tests such as these are developed in the future, the *Katz* inquiry may be undermined and Fourth Amendment precedent may be turned on its

243. *See id.* at 463-64 (Brennan, J., dissenting).

244. For a similar argument see Brief Amicus Curiae of the Liberty Project in Support of Petitioner at 20-21, *Kyllo v. United States* 2000 U.S. LEXIS 4863 (No. 99-8508).

245. *See, e.g., Siegal*, 281 Mont. at 259.

246. *See Kyllo III*, 190 F.3d at 1044.

247. *See id.* (noting that the scan in this case discovered heat-producing activities “from the roof of *Kyllo*’s home above the garage, and from one wall.”).

248. *See Kyllo III*, 190 F.3d at 1050 (Noonan, J., dissenting).

249. *Karo*, 468 U.S. at 715.

head. As a result, the government may seriously threaten the rights of many people with an ever-increasing arsenal of technological weapons. Such a prospect is too frightening to ignore. Therefore, the Court, in its role as a teacher to the lower federal courts, should have addressed them and disposed of them more forcefully.

2. The “Not in General Public Use” Language

Prior to *Kyllo*, Supreme Court precedent held that, under the Fourth Amendment, if law enforcement obtained information in a manner that any member of the public could obtain it, then such police activity was not a “search.”²⁵⁰ Therefore, in *Florida v. Riley*, the Court held that the police did not “search” the defendant’s property when they flew 400 feet overhead to view an area of the property that was partially obscured by a greenhouse.²⁵¹ The Court reasoned that because the public could legally hover over the defendant’s property in a helicopter at a low level, so too could law enforcement.²⁵² In dissent, Justice O’Connor, uneasy with such a result, suggested that the “public-access-therefore-police-access” doctrine should be modified to ask whether the public *ordinarily* had access to the info sought by the police, not whether it was legally possible for a member of the public to obtain it.²⁵³ Her suggestion, however, has never persuaded a majority of the Court.

Nonetheless, in *Kyllo*, the Court held that the warrantless use of a thermal imager was a “search” based, in part, on the fact that the device was “not in general public use.” This limitation, by forcing any *Katz* inquiry to depend on reasonable foreseeability rather than expectations of possibilities, may be an adoption of the O’Connor test. The Court did not admit to this. But such a conclusion follows from the holding in *Kyllo*. Because the public ordinarily does not use thermal imaging, then a police officer may not utilize the device to gather evidence. Put another way, no-public-access-therefore-no-police-access.

Under a civil libertarian framework, this new limitation is a victory. By not allowing law enforcement to use surveillance technologies that are not in general use, the Court has, in essence, delayed any erosion of an individual’s guaranteed realm of privacy. Now, any new ad-

250. See STEPHEN A. SALTZBURG & DANIEL J. CAPRA, *AMERICAN CRIMINAL PROCEDURE* 48 (6th ed. 2000).

251. See *Florida v. Riley*, 488 U.S. at 449-52.

252. See *id.*

253. See *id.* at 452-56.

vancements in technology will be off limits to law enforcement until, if ever, they become widely available to the public. This is cause for celebration for privacy rights activists.

Not everyone, however, will be so happy. The losers after *Kyllo* are going to be the lower courts. When faced with deciding whether the use of newly advanced surveillance technologies constitutes a “search” under the Constitution, courts will now have to focus their judicial attention to whether the technology is “not in general public use” rather than simply follow the case-by-case *Katz* framework.

Although *Katz* has been criticized as circular and thus subjective,²⁵⁴ its two-prong inquiry is straight-forward and allows for judicial discretion. The new limitation announced in *Kyllo*, however, is much more unworkable. It will be difficult for a court draw the line between whether something is within the realm of “general public use.” As discussed previously, at the time of *Kyllo*, thermal imagers were used in a variety of commercial settings. Yet the Court found the device not to be in “general public use.” How many commercial or private applications must a device have in order not to fall within this limitation?

The *Katz* test provides the courts with a more reliable guide than any new test dependent on whether something is in “general public use.” The Supreme Court has a duty to provide lower courts with manageable and predictable legal tests. The “not in general public use” limitation is far from one. Therefore, havoc will likely run throughout the lower courts when dealing with new advancements in surveillance technologies.

V. CONCLUSION

The Supreme Court’s holding in *Kyllo* that the warrantless use of thermal imaging of one’s home is not constitutionally permissible was the correct result. Under the *Katz* inquiry, the use of the technology violated *Kyllo*’s legitimate expectation of privacy and amounted to an unconstitutional search. By focusing on terms such as “waste heat” and “intimate details” the Ninth Circuit engaged in word play and ignored well-established Fourth Amendment law. The Court recognized this, but should have done more to fully dispose of such irrelevant doctrines so as to add more clarity and order to Fourth Amendment law.

The Court’s conclusion did remember to protect the special expectations of privacy in the home. Thermal imagers reveal too much

254. See, e.g., W. LAFAVE, SEARCH AND SEIZURE § 2.1(d) (3d ed. 1996).

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about one's in-home activities and their prohibition was necessary in order to maintain a society free of unnecessary, governmental intrusion. But, by limiting its holding to only those surveillance technologies that are "not in general public use," lower courts will be faced with a very difficult task and the law thereby will be less predictable.

For these reasons, when the Supreme Court is faced with deciding the constitutionality of surveillance technologies in the future, it should utilize a legal framework that focuses not on the aspects of the technology, but rather on what the technology will potentially reveal. Moreover, the Court should abandon any inquiry into whether a particular law enforcement activity is one that is generally used by the public. Such a standard is unworkable and unnecessary.

The Court has a duty to put American citizens' constitutional rights before any interest in combating the War on Drugs. In the future, the Court must hold that the warrantless use of surveillance technologies to explore details of a home that previously would not have been uncovered without physical intrusion constitutes an unreasonable search under the Constitution, regardless of whether the technology is or is not in general public use. Otherwise, we may be one step closer to living in an Orwellian nightmare.

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