REFORMING THE *KATZ* FOURTH AMENDMENT "REASONABLE EXPECTATION OF PRIVACY" TEST: THE CASE OF INFRARED SURVEILLANCE OF HOMES

> *It is the duty of courts to be watchful for the constitutional rights of the citizen, and against any stealthy encroachment thereon.*[1]

The Fourth Amendment to the United States Constitution provides:

> The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.[2]

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1. Boyd v. United States, 116 U.S. 616, 635 (1886).

2. U.S. CONST. amend. IV.

The Fourth Amendment applies to both searches and seizures. This Note will only discuss searches. Issues dealing with Fourth Amendment seizures are beyond the scope of this Note. For a discussion of seizure issues, see generally 1 WAYNE R. LAFAVE, SEARCH AND SEIZURE: A TREATISE ON THE FOURTH AMENDMENT (2d ed. 1987).

For general discussion of Fourth Amendment search issues, see Anthony G. Amsterdam, *Perspectives on the Fourth Amendment*, 58 MINN. L. REV. 349 (1974); Craig M. Bradley, *Two Models of the Fourth Amendment*, 83 MICH. L. REV. 1468 (1985); Lloyd L. Weinreb, *Generalities of the Fourth Amendment*, 42 U. CHI. L. REV. 47 (1974).

I. INTRODUCTION

The national illicit marijuana market persists despite large-scale coordinated efforts to destroy it.[3] As state and federal law enforcement authorities reduced the flow of illegal marijuana[4] into the United States from other countries,[5] domestic production of marijuana increased to meet the new demand.[6] In response, American law enforcement agencies attacked domestic marijuana farms.[7] This caused the marijuana cultivators to move their operations indoors and use hydroponic growth techniques.[8] To combat this trend, police began using high technology surveillance techniques, including infrared detection to locate illegal marijuana growth operations.[9] Although the use of infrared detection is highly effective,[10] some courts hold that it violates the Constitution.[11]

American Courts apply the "reasonable expectation of privacy" test

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3. Despite well funded and highly organized efforts to eradicate marijuana, production within the United States nearly tripled, growing from 2.6 million pounds in 1981 to 7.7 million pounds in 1987. Michael Isikoff, *U.S. Targets Domestic Crop of Marijuana; Critics Call Program Futile, Wasteful*, WASH. POST, July 3, 1988, at A1, A22.

4. For the purpose of this Note, the author is assuming that all marijuana is illegal.

5. Isikoff, *supra* note 3, at A22. In 1977, the United States began a campaign of spraying paraquat, an herbicide used to kill weeds, on the Mexican marijuana crop. This caused American marijuana consumers to abandon the use of Mexican marijuana for fear of its effect on their health. As a result, the Mexican marijuana market nearly collapsed and American producers filled the demand. *Id.*

6. *Id.* In 1980, domestically grown marijuana accounted for 10% of all American marijuana. DRUG ENFORCEMENT AGENCY, U.S. DEP'T OF JUSTICE, 1992 DOMESTIC CANNABIS ERADICATION/SUPPRESSION PROGRAM 1 (1992) [hereinafter CANNABIS ERADICATION]. By 1992, domestically grown marijuana accounted for 25% of American marijuana. *Id.*

7. In 1988, the Reagan administration instituted "Operation Stop Crop," an extensive effort to eradicate outdoor domestic marijuana production. The operation included the deployment of the National Guard to eradicate marijuana fields, a toll-free number for citizens to report marijuana to authorities, and expanded undercover surveillance. Isikoff, *supra* note 3, at A1.

8. Mark A. Stein, *Pot Growers Retreat Inside, Under Lights in High-Tech Battle*, L.A. TIMES, Oct. 3, 1988, at 3.

9. See *infra* part II.B. for a definition and discussion of infrared detection technology.

10. Since law enforcement agencies began using infrared detection technology, they have seized nearly 4,000 indoor marijuana growing operations. CANNABIS ERADICATION, *supra* note 6, at 29.

11. See *infra* part IV.B. for a discussion of the cases holding infrared detection unconstitutional.

developed in *Katz v. United States*[12] to determine the constitutionality of the surveillance techniques used by law enforcement agencies.[13] This test establishes whether a warrantless search violates the Fourth Amendment prohibition against unreasonable searches and seizures.[14] Courts apply this test to decide the constitutionality of infrared detection of homes.[15]

Part II of this Note describes the social trends that led to increased indoor production of marijuana. It discusses indoor marijuana cultivation and law enforcement use of infrared detection devices to locate marijuana production sites. Part III examines the development of Fourth Amendment search and seizure law. It discusses the more traditional rules used by American courts, and the reasons for their replacement by the current rule of Fourth Amendment analysis. Part IV considers recent court opinions on the constitutionality of warrantless infrared detection. Part V analyzes recent court applications of the "reasonable expectation of privacy" test established in *Katz* to decide the constitutionality of infrared detection. This section questions the use of technological analogies to subvert the *Katz* test and notes the misunderstanding of infrared detection technology by courts. Part VI presents a two-part proposal to cure the problems in current Fourth Amendment analysis of high technology surveillance methods without destroying the framework established in *Katz*. First, the proposal urges courts to rule that the use of infrared detection without a search warrant violates the Fourth Amendment. Second, the proposal outlines a number of refinements and clarifications that the courts should make to improve the *Katz* test.

II. THE BATTLE OVER MARIJUANA CULTIVATION

The phenomenon of indoor marijuana cultivation resulted from the interplay between marijuana growers and various law enforcement agencies.[16] A co-ordinated crackdown[17] on outdoor marijuana cultiva-

12. 389 U.S. 347 (1967).

13. *Id.* at 361 (Harlan, J., concurring).

14. *Id.*

15. *See infra* part IV.

16. *See infra* notes 18-26 and accompanying text.

17. The Domestic Cannabis Eradication/Suppression Program (DCE/SP) pools federal, state, and local law enforcement agencies to effectively combat domestic marijuana production. CANNABIS ERADICATION, *supra* note 6, at 1. This program, administered by the United States Drug Enforcement Agency (DEA), coordinates federal resources with

tion in the late 1980s and early 1990s forced many growers to forego outdoor production.[18] Instead of abandoning marijuana cultivation, however, many growers started cultivating marijuana indoors, utilizing hydroponic cultivation techniques.[19]

A. *Indoor Marijuana*

Marijuana cultivators grow and harvest marijuana indoors through the use of modern hydroponic techniques.[20] Hydroponics is a cultivation technique which simulates natural growing conditions indoors without soil or sunlight.[21] Cultivators place the marijuana plants into containers and circulate water and nutrients through them at regular intervals.[22] Growers use high-intensity lamps to provide light,[23] and

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101 state and local agencies and provides money for anti-marijuana efforts. *Id.*

18. David Foster, *War on Drugs is Driving Pot Growers Underground*, SEATTLE TIMES, Aug. 9, 1992, at A3. This crackdown utilized such techniques as aerial surveillance, herbicide spraying, and commando style "whack-and-stack" raids, in which law enforcement officials sweep into a marijuana field, harvest and burn the marijuana to deny the cultivators their crop. *Id.*

According to the chief of the DEA's marijuana eradication program, efforts to crackdown on marijuana production are worthwhile: "We feel, and the administration feels, that this is one of the drugs that we're really having a win with . . . . The success story is with marijuana." Joe Hallinan, *Home Grown*, SUN SENTINEL (Fort Lauderdale), Oct. 12, 1992, at 1D, 6D (quoting John Peoples).

19. Foster, *supra* note 18, at A3. *See also* Sebastian Rotella, *Pot Farms Show Drug Traffickers Going High Tech*, L.A. TIMES, Nov. 26, 1990, at A3. During the 1980s the market share of home-grown marijuana rose from under 10% to 25%. During this same period "domestic marijuana production grew from 2.6 million pounds to more than 10.1 million pounds," primarily due to stepped-up drug enforcement at United States borders. Increased border surveillance led to a reduction in Colombian and Mexican marijuana competition. Frank Greve, *DEA Cracks Down on Indoor Marijuana Growing*, CHARLOTTE OBSERVER, Oct. 29, 1989, at 20A.

Other factors also contributed to the movement of marijuana growing indoors, including the cultivators' frustration at thieves stealing outdoor crops and the unpredictability of the weather. Dennis McCafferty, *Authorities Trying to Weed Out Indoor Marijuana Growers*, ATLANTA J. & CONST., Oct. 24, 1993, at A1, A10.

20. David Noel, *Hydroponics Kits Fertilize Suspicions*, ATLANTA J. & CONST., June 8, 1992, at J4.

21. *Id.*

22. Greve, *supra* note 19, at 20A.

23. To grow marijuana indoors successfully, cultivators need to supply the plants with artificial light while keeping the air temperature within reasonable limits. High-intensity discharge lights, which use between 400 and 1000 watt bulbs, provide the necessary light for indoor marijuana cultivation. These bulbs generate temperatures of approximately 150

they pump a precise mixture of oxygen and carbon dioxide into the growth area.[24] By using these techniques, marijuana growers can produce harvestable plants up to three times faster than under outdoor conditions.[25] The recent proliferation of hydroponically grown marijuana demonstrates the success of these techniques.[26]

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degrees or more. United States v. Pinson, 24 F.3d 1056, 1057-58 (8th Cir. 1994), *cert. denied*, 115 S. Ct. 664 (1994).

These high intensity lights were originally developed to televise indoor sporting events. Because television cameras are calibrated for sunlight, these lights were developed to match the frequency of sunlight. *See* Ed Rosenthal, *Pot Moves Inside; Indoor Growing of Marijuana*, WHOLE EARTH REV., Mar. 22, 1987, at 62-63 (discussing a marijuana cultivation enthusiast who took the author to a Seattle SuperSonics basketball game to show him the "secret" of indoor marijuana cultivation).

24. A technical obstacle growers must overcome in order to grow plants hydroponically is the delivery of water, oxygen, and mineral nutrients to the plant roots. Seventeen chemical elements are necessary for normal plant growth. Nine elements are required in relatively large amounts: carbon, hydrogen, oxygen, sulfur, phosphorus, calcium, magnesium, potassium, and nitrogen. Eight others are required in trace amounts: iron, zinc, copper, manganese, boron, chlorine, cobalt, and molybdenum. Carbon, hydrogen, and oxygen are supplied from the air. 14 ENCYCLOPEDIA AMERICANA 662, 664 (1993); 6 ENCYCLOPEDIA BRITANNICA 195 (1993).

25. Noel, *supra* note 20, at J4. Hydroponic growth techniques, together with various genetic techniques, make marijuana cultivation more profitable now than it was in the past. Foster, *supra* note 18, at A3. Additionally, marijuana grown indoors contains up to 10 times the amount of Delta-9 tetrahydrocannabinol (THC), the psychoactive chemical in marijuana, than earlier varieties. *Id.* Due to careful breeding and high-technology horticulture, home-grown American marijuana today ranks as "the best in the world," according to DEA's Cannabis Investigations Section Chief, John Sutton. Greve, *supra* note 19, at 20A.

Hydroponic growth techniques require a substantial investment from illicit cultivators, both in time and money, compared to outdoor growth techniques. *See* McCafferty, *supra* note 19, at A10. *But see* Hallinan, *supra* note 18, at 1D (building a marijuana "grow" closet, complete with lights, fan and irrigation system costs about $300).

26. "Nationally, nearly 350,000 plants in 3,850 indoor sites were seized in 1992, up from an estimated 282,900 plants in 2,850 sites the year before." McCafferty, *supra* note 19, at A10. *See also* CANNABIS ERADICATION, *supra* note 6, at 29-30.

Hydroponic marijuana cultivation is so successful that Pyraponic Industries, Inc., a corporation that manufactures a popular hydroponic growth box, the Phototron II super-terrarium, earned gross profits in excess of $50 million as of 1989. The corporation sold over 90,000 units for approximately $400 per unit. Greve, *supra* note 19, at 20A. *See* Kim Kowsky, *Business Honor Goes to a Most Unusual High Tech Firm*, L.A. TIMES, Feb. 2, 1990, at D1. In fact, the corporation did so well that in 1990 the Greater San Diego Chamber of Commerce named it Business of the Year in Manufacturing. *Id.* It was also recognized in 1989 by *Inc.* magazine as one of the 500 fastest growing private corporations in the United States. *The 500 Index*, INC., Dec. 1989, at 83.

B. *Infrared Detection*

Infrared detection[27] refers to a number of closely related devices[28] that permit law enforcement officials[29] to monitor and visualize[30] otherwise hidden objects by utilizing infrared emissions.[31] More

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27. Infrared detection devices rely on technology developed in the 1950s for military applications. Dan Bernstein, *Marijuana Raiders Go High-Tech, Foes Say Infrared Sensors Invade Privacy*, SACRAMENTO BEE, June 2, 1991, at B1, B8.

Infrared detection devices range in price from inexpensive models costing between $15,000 and $25,000 to expensive models used in military applications costing $150,000 to $225,000. 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, 607 n.2, 4 (1994) (interviewing Col. Carlos Aniglioh, President, Thermal Technologies, Inc. regarding thermal imaging technology).

28. Infrared detection is also referred to as "thermal imaging," "thermal imaging scanning" (TIS), "thermal imaging devices" (TID), and "infrared tracking devices" (ITD). An infrared detector mounted on a helicopter or an airplane is called a "forward looking infrared" device or a "FLIR" or "FLID." This Note uses these terms interchangeably. *See* United States v. Myers, 46 F.3d 668, 669 (7th Cir. 1995) (discussing TIS); United States v. Casanova, 835 F. Supp. 702, 704-06 (N.D.N.Y. 1993) (referring to ITD); United States v. Penny-Feeney, 773 F. Supp. 220, 223-24 (D. Haw. 1991) (speaking of a FLIR); State v. Russell, 857 P.2d 220, 220 (Or. Ct. App. 1993) (discussing TID); Plaschke, *supra* note 27 (calling this technology "thermal imaging"); Lynne M. Pochurek, Comment, *From the Battlefront to the Homefront: Infrared Surveillance and the War on Drugs Place Privacy Under Siege*, 7 ST. THOMAS L. REV. 137 (1994) (using the terms "infrared surveillance" and FLID).

29. The DEA sponsors the Thermal Imagery Investigations Seminar, which is a ten-day thermal-imaging systems course for law enforcement agents. In addition to teaching agents how to use thermal imagers, "the course teaches theory, technology, legal, and practical applications." CANNABIS ERADICATION, *supra* note 6, at 4. This seminar culminates in DEA certification as a thermographer. United States v. Field, 855 F. Supp. 1518, 1521-22 (W.D. Wis. 1994). In 1992, the DEA trained 747 federal, state, and local law enforcement officers in marijuana related training courses like the Thermal Imagery Seminar. CANNABIS ERADICATION, *supra* note 6, at 4.

30. The term "visualize" used here denotes that the results of infrared detection are shown in a video mode and are recorded on a VHS video-tape. It should be emphasized that this technology is not an enhancement of human sight. The range of detection produced by this technology is well beyond human capabilities, both in terms of the infrared spectrum and its ability to discern differing energy levels. Thus, although the technology presents its results in a video form, it is not recording sight.

31. "Infrared emissions form part of the infrared spectrum, which includes radio waves, microwaves, heat, visible light, ultraviolet light, X-rays, and gamma rays. The difference between each of these forms of energy is the wavelength of the electric and magnetic fields." Lisa J. Steele, *Waste Heat and Garbage: The Legalization of Warrantless Infrared Searches*, 29 CRIM. L. BULL. 19, 24 (1993). The infrared device allows "police officers to sense a part of the spectrum that their eyes could not normally

specifically, this technology allows officials to detect temperature variations among and between objects within a structure.[32] Law enforcement officers use infrared detection to "surveil"[33] suspected "home-grown"[34] marijuana operations.

Hydroponic growth methods require marijuana growers to use extensive indoor lighting which produces substantial heat.[35] Infrared detection devices visualize the heat escaping from a structure,[36] and give law enforcement officers clues as to the source of the heat and its specific location within the structure.[37] By using infrared detection to surveil a home, police can often determine whether the residents are growing marijuana indoors.[38]

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perceive in the same way that a geiger counter would have allowed them to tell if radioactive material was located in the home." *Id.*

32. The device detects temperature variations of as little as 0.2 degrees Celsius (approximately 0.36 degrees Fahrenheit). *Id.* at 24.

33. Throughout this Note the word "surveil" is used to denote the use of infrared detection devices to investigate for illegal marijuana cultivation. The word "surveil" means "to subject to surveillance." WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY 1188 (1987).

The author chooses this term to avoid the implication that this technology represents merely an enhancement of the operator's visual faculties, as would be implied if one used words such as "see," "look," "view," or "observe." In addition, the author wishes to avoid the term "search," except as it relates to the *Katz* standard. For a discussion of *Katz*, see *infra* part III.B.

34. The term "home-grown" refers to the growing of marijuana indoors, for example, in houses, barns, and in underground caverns. *See, e.g.*, Stein, *supra* note 8, at 3.

35. *See supra* note 23 and accompanying text.

36. Law enforcement officials describe the infrared detection device as "a passive, non-intrusive instrument . . . that does not send any beams or rays into the area on which it is fixed or in any way penetrate the structures within that area." Steele, *supra* note 31, at 21 n.12.

37. After an infrared detector scans a structure, various shades of grey will appear on a screen. The shade of grey depends on the amount of heat the object is radiating and the "emissivity" of the object. A hot object, such as a high-intensity light bulb, will appear white. *Id.* at 24.

38. The determination made by police officers that the residents are growing marijuana, however, is sometimes false. *See, e.g.*, United States v. Ishmael, 843 F. Supp. 205, 214 (E.D. Tex. 1994) (noting that information gathered through thermal imaging is consistent with cultivating african violets and other legal activities); McCafferty, *supra* note 19, at A1, A10 (noting an instance where law enforcement agents mistakenly searched a house suspected of hiding a home-grown operation); Eric Schlosser, *Reefer Madness; Part I; Criminalization of Marijuana*, ATLANTIC MONTHLY, Aug. 1994, at 45 (stating that the heat sources detected by thermal imaging may indicate a pottery kiln or a jacuzzi).

III. FOURTH AMENDMENT SEARCH CASES AND INFRARED DETECTION

A. *Traditional Analysis*

The Supreme Court originally construed the Fourth Amendment liberally in order to emphasize the importance of preventing the government from interfering with the security of persons and property.[39] In *Boyd v. United States*,[40] the trial court heard a challenge to a law which provided that, in certain noncriminal proceedings, the government could compel a party to produce books or papers relating to the proceeding.[41] If the party refused, the court would hold that the party had confessed to the government's allegations.[42] The Supreme Court held that this law effected a search and seizure and violated the Fourth Amendment, even though no physical search or seizure took place.[43]

In *Olmstead v. United States*,[44] decided forty-two years after *Boyd*, the Court narrowed the scope of the Fourth Amendment, centering the protection against unreasonable searches and seizures on the concept of physical trespass.[45] In *Olmstead*, the Supreme Court ruled that a wiretap of a defendant's private telephone line by the government without a search warrant did not violate the Fourth Amendment.[46] The Court rationalized that because the police conducted the wiretap without physical trespass it did not violate an individual's right to be secure in

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39. Boyd v. United States, 116 U.S. 616, 635 (1886). The Court stated that a close and literal construction of the Fourth Amendment deprives it of its efficacy and "leads to gradual depreciation of the right. . . . It is the duty of courts to be watchful for the constitutional rights of the citizen, and against any stealthy encroachment thereon." *Id.* For a general discussion of the scope of privacy rights, see Ken Gormley, *One Hundred Years of Privacy*, 1992 WIS. L. REV. 1335 (1992).

40. 116 U.S. 616 (1886).

41. *Id.* at 619-20.

42. *Id.* at 620.

43. *Id.* at 622. The Court elaborated, stating that although the law's effect "is divested of many of the aggravating incidents of actual search and seizure . . . it contains their substance and essence, and effects their substantial purpose." *Id.* at 635.

The Court also held that the act violated the Fifth Amendment privilege from self-incrimination. *Id.* at 633-35.

44. 277 U.S. 438 (1928).

45. *Id.* at 464-66.

46. *Id.* at 466.

his person, house, papers, and effects.[47] *Olmstead* established that surveillance conducted without any physical trespass fell outside the ambit of the Fourth Amendment, while surveillance that involved physical trespass required a search warrant.[48]

Olmstead provided a clear standard both for law enforcement officers and for courts. The cases that followed *Olmstead* reinforced the requirement of physical intrusion to demonstrate a Fourth Amendment violation.[49] Commentators criticized the rule for being unresponsive to new technological developments.[50] However, in *Silverman v. United*

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47. *Id.* "Small wires were inserted along the ordinary telephone wires from the residences of four of the petitioners and those leading from the chief office. The insertions were made without trespass upon any property of the defendants." *Id.* at 456-57.

Chief Justice Taft held that a wiretap was neither a search nor a seizure because ears cannot trespass, nor were the "wires . . . part of [the defendant's] house or office any more than are the highways along which they are stretched." *Id.* at 465. *See also* Shirley M. Hufstedler, *Invisible Searches for Intangible Things: Regulation of Governmental Information Gathering*, 127 U. PA. L. REV. 1483, 1493-95 (1979) (arguing that the *Olmstead* decision was the result of an impermissibly literalist interpretation of the Fourth Amendment).

48. *Olmstead*, 277 U.S. at 464. "The [Fourth] Amendment does not forbid what was done here . . . . There was no entry of the house or offices of the defendant." *Id.* "[T]he doctrine derived from *Olmstead v. United States*, and *Goldman v. United States*, [was] that if police officers had not been guilty of a common-law trespass they were not prohibited by the Fourth Amendment from eavesdropping . . . ." Rakas v. Illinois, 439 U.S. 128, 143 (1978) (citations omitted).

Olmstead confined the Fourth Amendment to situations where the defendant was forced to endure "an official search and seizure of his person, or such a seizure of his papers or his tangible material effects, or an actual physical invasion of his house 'or curtilage' for the purpose of making a seizure." *Olmstead*, 277 U.S. at 466.

Justice Brandeis and Justice Stone strongly dissented from the *Olmstead* decision because they believed that the actions of the Government were an "unjustifiable intrusion by the Government upon the privacy of the individual," and thus a violation of the Fourth Amendment. *Olmstead*, 277 U.S. at 478 (Brandeis, J., dissenting). *See also* Gormley, *supra* note 39, at 1361-62 (discussing Justice Brandeis' dissent from *Olmstead*).

49. *See, e.g.*, On Lee v. United States, 343 U.S. 747 (1952) (finding no Fourth Amendment violation where the defendant, while at his place of business, voluntarily spoke with a narcotics officer wearing a concealed microphone because voluntarily allowing entry vitiates trespass); Goldman v. United States, 316 U.S. 129 (1942) (finding no Fourth Amendment violation where a dictaphone was used to listen to a defendant in a room adjoining the room being investigated). *See generally* Gormley, *supra* note 39, at 1357-74 (discussing Fourth Amendment privacy).

After *Olmstead*, judges and attorneys focused on issues of trespass, including ownership, custody, and control of the property at issue. Hufstedler, *supra* note 47, at 1494.

50. Scholars repeatedly voiced dissatisfaction with the *Olmstead* standard because its mechanical approach was too simplistic to cope with the emerging technology of law

States,[51] the Supreme Court began to hint that trespass was not the exclusive means by which courts could address Fourth Amendment concerns.[52] Yet, the Court refused to overrule *Olmstead* for another six years.[53]

B. *The* Katz *Doctrine*

In *Katz v. United States*,[54] the Supreme Court explicitly overruled the *Olmstead* standard.[55] *Katz* considered the constitutionality of law enforcement officers placing a wiretap in a telephone booth.[56] The Government charged Katz with using a telephone to place bets illegally in interstate commerce.[57] At trial the Government sought to introduce evidence of the defendant's telephone conversations.[58] Agents of the Federal Bureau of Investigation had intercepted Katz's conversations by using an electronic recording device which was attached to the outside of the telephone booth where he placed his calls.[59] The trial court admitted evidence of the conversations over Katz's objection.[60] When Katz appealed,[61] the Ninth Circuit Court of Appeals rejected his contention that the recordings of his telephone conversations violated the

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enforcement. Hufstedler, *supra* note 47, at 1495. The perfection and ready availability of new electronic surveillance devices allowed the government to pose a much greater threat to personal privacy. Gormley, *supra* note 39, at 1360-66. As Mr. Justice Brandeis pointed out in *Olmstead*, "[S]ubtler and more far-reaching means of invading privacy have become available to the Government." *Olmstead*, 277 U.S. at 473.

51. 365 U.S. 505 (1961).

52. *Id.* at 511. The Court stated that "Fourth Amendment rights are not inevitably measurable in terms of ancient niceties of tort or real property law." *Id. See also* Hufstedler, *supra* note 47, at 1495.

53. See *infra* notes 54-70 and accompanying text for a discussion of the Court's decision to overrule *Olmstead*.

54. 389 U.S. 347 (1967).

55. *Id.* at 353.

56. *Id.* at 348.

57. *Id.* The authorities convicted Katz under 18 U.S.C. § 1084 (1990). This statute provided in part: "Whoever . . . uses a wire communication facility for the transmission in interstate or foreign commerce of bets or wagers . . . shall be fined not more than $10,000 or imprisoned not more than two years, or both." *Id.*

58. *Katz*, 389 U.S. at 348.

59. *Id.*

60. *Id.*

61. Katz v. United States, 369 F.2d 130 (9th Cir. 1966).

Fourth Amendment, because "there was no physical entrance into the area occupied by [Katz]."[62]

The Supreme Court, however, reversed the Court of Appeals and held that subsequent decisions had weakened the "trespass" doctrine established in *Olmstead*, and thus it no longer controlled.[63] The Court placed no constitutional significance on the fact that the device used to record Katz's conversations did not penetrate the telephone booth.[64] Instead of relying on the "trespass" doctrine, the Court held that "what [a person] seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected."[65]

In the cases that followed, the Supreme Court adopted a new standard set forth in Justice Harlan's concurrence in *Katz*, as the Fourth Amendment rule.[66] Justice Harlan announced a two-fold test[67] for Fourth Amendment protection against unreasonable searches: "[F]irst that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as 'reasonable.'"[68] Justice Harlan's two-pronged test supported the majority's reasoning that "the Fourth Amendment protects people, not places."[69]

Despite spirited scholarly debate on the issue, the courts have continued to employ the "reasonable expectation of privacy" test to decide whether a warrantless search violates the Fourth Amendment

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62. *Id.* at 134.

63. *Katz*, 389 U.S. at 353.

64. *Id.* at 354.

65. *Id.* at 351-52.

66. *Id.* at 360-62. The Court formally adopted Justice Harlan's concurrence in Terry v. Ohio, 392 U.S. 1, 9 (1968).

67. This two-fold test became known as the "reasonable expectation of privacy test." *Terry*, 392 U.S. at 9.

68. *Katz*, 389 U.S. at 361. After applying the two-part test to the facts at issue in *Katz*, Justice Harlan concluded that the electronic surveillance of an individual in a telephone booth violates the Fourth Amendment. *Id.* In subsequent Fourth Amendment cases, Justice Harlan expressed doubts about the correctness of his two-pronged standard. Amsterdam, *supra* note 2, at 384 (citing United States v. White, 401 U.S. 745, 786 (1971)).

69. *Katz*, 389 U.S. at 361. Scholars interpret this to mean that Fourth Amendment protections no longer depend on physical trespass onto property ("places"), but instead depend on the actions and expectations of individuals ("people"). LAFAVE, *supra* note 2, § 2.1(b).

proscription against unreasonable searches.[70]

C. *The Warrant Requirement*

According to the language of the Fourth Amendment, a search is unreasonable unless a warrant is issued upon probable cause.[71] To obtain a search warrant, the police must present a "neutral and detached magistrate"[72] with information sufficient for the magistrate to determine that there is probable cause for the police to believe that they will find contraband or evidence of a crime in the area they propose to search.[73]

IV. THE *KATZ* DOCTRINE AND INFRARED SURVEILLANCE OF HOMES

The constitutionality of infrared surveillance of homes by law

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70. Numerous articles have considered the *Katz* standard and suggested ways in which Fourth Amendment analysis could be improved. *See* Ronald J. Bacigal, *Putting the People Back into the Fourth Amendment*, 62 GEO. WASH. L. REV. 359 (1994) (advocating the use of juries to make Fourth Amendment reasonableness determinations); Daniel J. Polatcek, *Thermal Imaging and the Fourth Amendment: Pushing the* Katz *Test Towards Terminal Velocity*, 13 J. MARSHALL J. COMPUTER & INFO. L. 453 (1995) (advocating a test based on the character of information revealed, and expectations of privacy); David E. Steinberg, *Making Sense of Sense-Enhanced Searches*, 74 MINN. L. REV. 563 (1990) (recognizing the inability of courts to apply the *Katz* standard and demonstrating the default standards they use); Michael Campbell, Comment, *Defining a Fourth Amendment Search: A Critique of the Supreme Court's Post-*Katz *Jurisprudence*, 61 WASH. L. REV. 191 (1986) (proposing a Fourth Amendment standard based on "social norms of privacy"); Note, *A Reconsideration of the* Katz *Expectation of Privacy Test*, 76 MICH. L. REV. 154 (1977) (concluding that courts should first apply a "constitutionally protected areas" standard before the *Katz* test); Peter Thornton, Note, *Police Use of Sense-Enhancing Devices and the Limits of the Fourth Amendment*, 1977 U. ILL. L. F. 1167 (1977) (advocating the expansion of the *Terry* limited search standard to sense-enhancing devices); Kenneth Troiano, Comment, *Law Enforcement Use of High Technology: Does Closing the Door Matter Anymore?*, 24 CAL. W. L. REV. 83 (1988) (suggesting a new definition of "search" to limit undue sensory augmentation).

71. U.S. CONST. amend. IV. The finding of "'probable cause' may rest upon evidence which is not legally competent in a criminal trial." United States v. Ventresca, 380 U.S. 102, 107 (1965).

72. Coolidge v. New Hampshire, 403 U.S. 443, 453 (1971). The Supreme Court prefers the use of search warrants because a neutral and detached magistrate can determine whether there is probable cause to search rather than the police acting without anyone to review the propriety of their actions. *Ventresca*, 380 U.S. at 105-07.

73. Illinois v. Gates, 462 U.S. 213, 238 (1983). The police generally provide the magistrate with an affidavit setting out information about the search. The magistrate, after considering all the circumstances listed in the affidavit, determines whether there is a "fair probability" of finding evidence. *Id.*

enforcement officers is a novel issue before American courts. The earliest reported case discussing this issue is the Ninth Circuit's 1989 decision in *United States v. Kerr*.[74] Since *Kerr*, twenty-six other courts have heard arguments concerning the constitutionality of infrared detection to discern indoor marijuana cultivation.[75] The Fifth,[76] Seventh,[77]

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74. 876 F.2d 1440 (9th Cir. 1989).

75. *See infra* notes 76-85 and accompanying text. In addition to the detection of home-grown marijuana, border agents also use infrared detection devices mounted on helicopters and airplanes (FLIR devices) to track and surveil small aircraft and boats entering the United States. When used by border agents to track suspected drug smugglers, the FLIR device operates in much the same way as radar. When used in this way, the FLIR does not provide information about the interior of the vehicle, and thus, does not implicate any Fourth Amendment concerns. *See, e.g.*, United States v. Nueva, 979 F.2d 880 (1st Cir. 1992) (using FLIR device on a United States Customs Service plane to track a speedboat illegally importing cocaine); United States v. Talavera-Negrete, No. 91-50453, 1992 U.S. App. LEXIS 7376 (9th Cir. Apr. 15, 1992) (tracking aliens smuggling marijuana across the United States-Mexico border); United States v. Mieres-Borges, 919 F.2d 652, 654 n.2 (11th Cir. 1990) (using FLIR to track a boat suspected of receiving cocaine via an airdrop); United States v. Nash, 910 F.2d 749 (11th Cir. 1990) (using FLIR to intercept a plane which was flying low to evade radar and was suspected of dropping bundles of cocaine); United States v. Sanchez, 829 F.2d 757 (9th Cir. 1987) (using FLIR to follow a small plane from Mexico to a rendezvous point in the United States); United States v. Porter, 701 F.2d 1158 (6th Cir. 1983) (using FLIR to identify and track a small plane entering the United States); United States v. Kilgus, 571 F.2d 508 (9th Cir. 1978) (holding that FLIR could not be used in court as a method to identify a specific plane suspected of smuggling drugs from other planes of the same type or size); State v. Strayer, 750 P.2d 390 (Kan. 1988) (using FLIR to follow and later identify a small plane smuggling marijuana from Texas to Kansas).

Courts recognize a heightened government interest in allowing law enforcement authorities to conduct searches at United States borders to prevent the importation of illegal narcotics. *See* United States v. Place, 462 U.S. 696, 704 (1983) (discussing the limits of search-and-seizure rights at international airports). The use of infrared detection to track alleged smugglers is beyond the scope of this Note.

Similar to infrared detection is the use of night-vision equipment and ultraviolet detection. Technologically, night-vision scopes are closely related to infrared detection. Unlike infrared detection, however, they enhance visible light rather than visualizing infrared radiation. They are also used almost exclusively outside and have no ability to provide information about the interior of a structure. They do not implicate any Fourth Amendment concerns. *See* United States v. Ward, 546 F. Supp. 300 (W.D. Ark. 1982) (using night-vision scopes in the open to surveil drug dealer held not a Fourth Amendment search). *But cf.* State v. Wacker, 826 P.2d 1019 (Or. Ct. App. 1992) (using nightscope to observe defendant's car violated Oregon Constitution).

Police use ultraviolet detection as an invisible marker on decoy contraband in sting operations to identify criminal suspects. Its use does not raise Fourth Amendment issues. *See* United States v. Williams, 902 F.2d 678 (8th Cir. 1990) (using ultraviolet marker to track illegal cocaine); Williams v. City of Lancaster, 639 F. Supp. 377 (E.D. Pa. 1986) (identifying person who pulled a false fire alarm using ultraviolet marker).

Eighth,[78] and Eleventh Circuits[79] have each ruled that, even absent a warrant, it is constitutional for police officers to investigate homes for indoor marijuana cultivation using infrared surveillance techniques. The Ninth Circuit, in contrast, has declined to resolve the issue on five separate occasions.[80] No other circuit courts have addressed the

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76. United States v. Ishmael, 48 F.3d 850 (5th Cir. 1995), *rev'g* 843 F. Supp. 205 (E.D. Tex. 1994), *cert. denied*, 116 S. Ct. 74 (1995).

77. United States v. Myers, 46 F.3d 668 (7th Cir. 1995), *cert. denied*, 116 S. Ct. 213 (1995). The *Myers* decision limited the precedential value of the *Field* decision. United States v. Field, 855 F. Supp. 1518 (W.D. Wis. 1994) (holding unconstitutional warrantless infrared detection of a house). See *infra* notes 148-70 and accompanying text for discussion of *Field*).

78. United States v. Robertson, 39 F.3d 891, 894 (8th Cir. 1994) (precedent dictated that *Robertson* follow *Pinson*), *cert. denied*, 115 S. Ct. 1812 (1995); United States v. Pinson, 24 F.3d 1056 (8th Cir. 1994), *cert. denied*, 115 S. Ct. 664 (1994).

Police have used infrared detection in other Eighth Circuit cases, but the respective defendants have failed to raise the issue of the constitutionality of infrared detection. *See, e.g.*, United States v. Sherrell, 979 F.2d 1315 (8th Cir. 1992) (seeking suppression of evidence because of lack of probable cause).

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

80. In *United States v. Kerr*, the Ninth Circuit became the first federal appellate court to hear arguments concerning the constitutionality of infrared detection. 876 F.2d 1440 (9th Cir. 1989). The defendant argued that the warrantless use of infrared detection violated the Fourth Amendment, and that evidence obtained from a subsequent valid search of defendant's property should be suppressed. *Id.* at 1443. The Ninth Circuit rejected the defendant's argument and held that the evidence obtained by using infrared detection was of such low probative value that it would not effect the later warrant. *Id.* at 1444-45. Consequently, the court did not resolve the larger constitutional question. *Id.*

In *United States v. Penny-Feeney*, the defendant alleged that the physical evidence obtained with a valid search warrant was based on information illegally obtained by an infrared device. 773 F. Supp. 220, 225 (D. Haw. 1991). The Ninth Circuit, however, determined that the government had probable cause to search regardless of the information obtained from the infrared device and decided not to resolve the constitutionality of infrared devices. United States v. Fenney, 984 F.2d 1053, 1056 (9th Cir. 1993). See *infra* notes 85-121 and accompanying text for a discussion of *Penny-Feeney*.

In *United States v. Leeson*, the Ninth Circuit again declined to rule on the constitutionality of infrared detection because it found sufficient probable cause for a warrant without considering the evidence obtained from the infrared device. No. 92-10236, 1993 U.S. App. LEXIS 8257, at *2-3 (9th Cir. Apr. 13, 1993).

In *United States v. Pugh*, the Ninth Circuit held that, even without evidence supplied by infrared detection, there was probable cause for the issuance of a search warrant, and therefore, there was no need to decide the constitutionality of infrared devices. No. 93-30443, 1994 U.S. App. LEXIS 25480, at *2 (9th Cir. Sept. 13, 1994).

Finally, in *United States v. Kyllo*, the Ninth Circuit again declined to rule on the constitutionality of infrared detection, and remanded the case to the district court for findings on the technological capabilities of thermal imaging. 37 F.3d 526, 531 (9th Cir.

constitutional issue.[81] Lower federal and state courts[82] have decided both in favor of[83] and against finding warrantless infrared detection a violation of the Fourth Amendment.[84]

1994), *modifying* 26 F.3d 134 (9th Cir. 1994), *aff'g in part and rev'g in part,* 809 F. Supp. 787 (D. Or. 1992). *See also The Heat is on Pot Growers, Man Caught with Plants in House Objects to Use of Infrared Device,* CHARLESTON DAILY MAIL, June 23, 1995 at D2 (discussing the remand stage of the *Kyllo* case).

81. The Fifth and Sixth Circuit Courts of Appeal have each heard cases alleging the use of infrared detection devices. However, the courts did not discuss the constitutionality of infrared detection, nor did the defendants raise it as an issue. *See, e.g.,* United States v. Zimmer, 14 F.3d 286, 287-88 (6th Cir. 1994); United States v. Broussard, 987 F.2d 215 (5th Cir. 1993).

82. The Fourth Amendment was made applicable to the states by incorporation into the Fourteenth Amendment. Ker v. California, 374 U.S. 23, 30-34 (1963); Wolf v. Colorado, 338 U.S. 25 (1949).

83. The following lower courts held that infrared detection of a house is constitutional: United States v. Porco, 842 F. Supp. 1393 (D. Wyo. 1994); United States v. Kyllo, 809 F. Supp. 787 (D. Or. 1993); United States v. Deaner, No. 1:CR-92-0090-01, 1992 U.S. Dist. LEXIS 13046 (M.D. Pa. July 27, 1992); United States v. Penny-Feeney, 773 F. Supp. 220 (D. Haw. 1991); State v. Cramer, 851 P.2d 147 (Ariz. Ct. App. 1992); State v. McKee, 510 N.W.2d 807 (Wis. Ct. App. 1993).

84. Several lower courts held that infrared detection of a house is unconstitutional unless conducted pursuant to a search warrant. United States v. Field, 855 F. Supp. 1518 (W.D. Wis. 1994); United States v. Ishmael, 843 F. Supp. 205 (E.D. Tex. 1994), *rev'd* 48 F.3d 850 (5th Cir. 1995); State v. Binner, 877 P.2d 642 (Or. Ct. App. 1994); State v. Young, 867 P.2d 593 (Wash. 1994).

A number of state and lower federal courts recognized the Fourth Amendment implications of infrared detection but failed to rule on its constitutionality. United States v. Casanova, 835 F. Supp. 702, 705 (N.D.N.Y. 1993) (noting that the constitutionality of infrared detection was an issue of first impression in the Second Circuit, and that "it would be interesting to address" the issue, but declining to do so); State v. Lewis, 527 N.W.2d 658, 661 (N.D. 1995) (concluding that the magistrate had insufficient evidence to find probable cause even with the evidence obtained from the infrared device); State v. Russell, 857 P.2d 220, 223 (Or. Ct. App. 1993) (refusing to rule on the constitutionality of the infrared device because the information obtained did not contribute to probable cause).

In several other state and lower federal court decisions the judges discussed infrared detection but did not acknowledge any constitutional issues arising from its use. United States v. Meadows, 881 F. Supp. 1219, 1226 (N.D. Ind. 1995) (allowing a police officer to testify as to the results of an infrared device); People v. Smith, 26 Cal. Rptr. 2d 580, 582 (Cal. Ct. App. 1994) (noting scanning of barn with thermal imager to detect illegal marijuana production, but not relying on this in its decision); State v. Niel, 640 So. 2d 588, 596 (La. Ct. App. 1994) (finding the DEA's use or reading of the thermal imager did not mislead the court); State v. Morrison, 812 P.2d 832, 834 (Or. Ct. App. 1991) (holding that failure to list all the high technology devices the authorities used to obtain a search warrant is not enough to show the authorities acted in bad faith); State v. Johnson, 879 P.2d 984, 987 (Wash. Ct. App. 1994) (mentioning, but not relying on, use of infrared detection to confirm strong suspicion of illegal marijuana); State v. Kelley, 762 P.2d 20, 22 (Wash. Ct.

A. *Cases Holding Infrared Detection Is Constitutional*

In *United States v. Penny-Feeney*,[85] the United States District Court for Hawaii ruled that the use of infrared detection devices by Hawaii County police officers, prior to seeking a search warrant, did not violate the Fourth Amendment prohibition against unreasonable searches.[86] Federal authorities indicted the defendants, Janice Penny-Feeney and Sean Feeney, on three counts of federal drug and firearms violations.[87] For two years the police investigated the defendants' possible drug trafficking.[88]

After receiving information from various informants, a police officer flew over the defendants' residence in a helicopter equipped with a Forward Looking Infrared Device (FLIR)[89] to corroborate the informants' information.[90] The defendants' residence was dark to the naked eye, but through the FLIR device the walls and certain areas of the garage were bright white.[91] This indicated to the officer that heat was escaping from the structure.[92] The officer then examined adjacent houses for comparison,[93] but these did not appear in the same color

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App. 1988) (mentioning that police twice surveilled garage with infrared detector).

85. 773 F. Supp. 220 (D. Haw. 1991), *aff'd on other grounds sub nom.* United States v. Feeney, 984 F.2d 1053 (9th Cir. 1993).

86. *Id.* at 230.

87. *Id.* at 224. The grand jury charged the defendants with "(1) . . . cultivating . . . more than 100 marijuana plants in violation of 21 U.S.C. § 841(a)(1); (2) possessing with intent to distribute more than 100 marijuana plants in violation of 21 U.S.C. § 841(a)(1); and (3) carrying . . . three firearms while committing the two drug offenses in violation of 18 U.S.C. § 924(c)(1)." *Id.*

88. *Id.* at 221-24.

89. The police leased the FLIR device from the helicopter pilot. *Id.* at 223.

90. *Penny-Feeney*, 773 F. Supp. at 223.

91. *Id.* at 223-24.

92. *Id.*

93. Using FLIR devices on houses not under investigation by law enforcement agents, as a control, or to compare results, may present a separate Fourth Amendment issue. United States v. Field, 855 F. Supp. 1518, 1532-33 (W.D. Wis. 1994). Assuming, *arguendo*, that drug manufacturers, by the nature of their illegal activity, have no reasonable expectation of privacy, the law-abiding persons residing on either side of the drug manufacturer should have an expectation of privacy that society would find reasonable. *See* Katz v. United States, 389 U.S. 347, 361 (1967) (detailing the reasonable expectation of privacy standard). This problem is compounded by the fact that the neighbor who is investigated with the FLIR device would have no idea that it occurred,

contrast as the defendants' house.[94] As a result of the information gained by the use of infrared detection, in addition to other evidence,[95] the police applied for, and received, a warrant to physically search the defendants' home.[96] After conducting a physical search, the police arrested the defendants and sought an indictment against them.[97]

At trial, the defendants sought to suppress the evidence gained from infrared detection alleging that it amounted to a search conducted without a warrant in violation of the Fourth Amendment.[98] The court denied the defendants' motion and held that the use of infrared detection did not constitute a search under the Fourth Amendment.[99]

The *Penny-Feeney* court began its opinion by stating the two-pronged *Katz* test.[100] First, the court considered the nature of infrared detection and concluded that the device merely measured the amount of heat emanating from the structure.[101] Second, the court examined the

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and thus no recourse at law. *Id.* Only if the investigation of the neighbor happened to indicate that they too had an illegal indoor marijuana farm would the neighbor find out about the examination. *See Field,* 855 F. Supp. at 1533.

94. *Penny-Feeney,* 773 F. Supp. at 224.

95. In the affidavit for the search warrant, the police also offered evidence gained from several informants that had been in the defendants' home. *Id.* at 221-23. This information detailed the marijuana operation, where the plants were kept, the equipment used, and how the defendants packaged and distributed the marijuana. *Id.*

96. *Id.* at 224. See *supra* part III.C. for a discussion of the warrant requirement.

97. *Id.* The police officers found "approximately 247 marijuana plants . . . 10 one-thousand watt light bulbs, electric transformers, air conditioning units," an altered electric meter, a drip irrigation system for the plants, books and papers showing drug transactions, two rifles, and a loaded handgun. *Id.*

98. *Id.* at 224-25. To prevail on a motion to suppress evidence, the defendants must establish that they had a reasonable expectation of privacy and that the search took place without a warrant. Katz v. United States, 389 U.S. 347, 361 (1967) (Harlan, J., concurring) (explaining the reasonable expectation of privacy standard). The burden of proof then shifts to the government to establish that an exception to the warrant requirement was applicable, and therefore, that the search was reasonable. United States v. Bachner, 706 F.2d 1121, 1126 (11th Cir. 1983).

In infrared detection cases, the Government generally argues that the use of infrared detection is not a search at all. *See, e.g.,* State v. McKee, 510 N.W.2d 807, 808 (Wis. Ct. App. 1993). *See also* United States v. Field, 855 F. Supp. 1518, 1532-33 (W.D. Wis. 1994) ("The government's legal argument . . . is that it does not need a reason to look at anyone's house with a thermal imager, because this is not a search.").

99. *Penny-Feeney,* 773 F. Supp. at 228.

100. *Id.* at 225-26.

101. *Id.* at 225.

nature of the heat itself, and characterized it as "heat waste," or "abandoned heat."[102] After determining that the police used the infrared device to measure "heat waste," the court asked whether the defendants had manifested a legitimate expectation of privacy regarding their heat waste and whether society viewed this expectation as reasonable.[103] The court concluded that the defendants did not show an actual expectation of privacy in their home's heat waste because the defendants vented it outside and they had not attempted to impede its escape.[104] The court further concluded that even if the defendants had demonstrated a subjective expectation of privacy, that expectation was not reasonable.[105]

The court analogized to *California v. Greenwood*,[106] where the Supreme Court held that the Fourth Amendment did not prohibit the warrantless search of garbage left for collection outside the curtilage[107] of the home.[108] The *Penny-Feeney* court said that, like garbage, the heat at issue here was waste matter exposed to the public.[109] The court further noted that the fact that one could only detect heat waste by using infrared technology did not diminish this analogy.[110]

The court declared that "time and again" the Supreme Court validated the use of extra-sensory, non-intrusive devices to investigate objects.[111] These devices include beepers,[112] drug detection

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102. *Id.* "[T]he heat was an incidental by-product of various energy sources used to help cultivate marijuana. Defendants in no way attempted to impede its escape . . . ." *Id.* The court further noted that defendants even used exhaust fans to vent the heat outside. *Id.*

103. *Id.* at 226.

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

105. *Id.*

106. 486 U.S. 35 (1988).

107. The curtilage is the area immediately surrounding a home that an individual may reasonably expect will remain private. *See* United States v. Van Dyke, 643 F.2d 992, 993 n.1 (4th Cir. 1981) (defining curtilage as "an area of domestic use immediately surrounding a dwelling and usually but not always fenced in with a dwelling").

108. *Greenwood,* 486 U.S. at 39-40.

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

110. *Id.*

111. *Id.*

112. *See, e.g.*, United States v. Knotts, 460 U.S. 276 (1983) (using beeper to track movements of a vehicle). *But cf.* United States v. Karo, 468 U.S. 705, 714 (1984) (using beeper to monitor activities inside a private residence not open to visual surveillance

dogs,[113] and pen registers.[114] The court further stated that the use of the FLIR device to visualize heat sources in this case was much like the use of a trained dog to sniff drugs,[115] and like a dog sniff, caused no embarrassment to or physical contact with the object investigated.[116] Furthermore, the defendants expected the heat to emanate from the structure because they vented it with fans.[117] Finally, the court stated that, like the Supreme Court cases that ratified the use of aerial surveillance,[118] the helicopter search using FLIR caused no physical invasion of the home, nor did it cause excessive noise, wind, dust or a threat of injury.[119] Therefore, in this case, society would not recognize the defendants' expectation of privacy as reasonable.[120]

Since *United States v. Penny-Feeney* was decided, the majority of courts confronting this issue have found that the use of infrared detection to surveil a home without a warrant is constitutional.[121] All of these courts closely follow the analysis of the *Penny-Feeney* decision.

In *United States v. Pinson*,[122] the Eighth Circuit effectively ratified the *Penny-Feeney* analysis, concluding that a warrantless use of thermal imaging was constitutional.[123] The circuit court added that thermal detection implicated none of the interests that create the need for

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violates the Fourth Amendment).

113. *See, e.g.*, United States v. Place, 462 U.S. 696, 706-07 (1983) (investigating luggage with a drug-sniffing dog at an airport not a search). *Contra* United States v. Thomas, 757 F.2d 1359, 1366-67 (2d Cir. 1985) (using a drug-sniffing dog outside a person's dwelling violates the Fourth Amendment).

114. *See, e.g.*, Smith v. Maryland, 442 U.S. 735, 745-46 (1979) (using a pen register to find what numbers were called by a private residence does not constitute a search).

115. *Penny-Feeney*, 773 F. Supp. at 226-27 (citing United States v. Solis, 536 F.2d 880 (9th Cir. 1976)). *But cf. Place*, 462 U.S. at 707 ("[T]he canine sniff is *sui generis*.").

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

117. *Id.*

118. *See* Florida v. Riley, 488 U.S. 445, 451-52 (1989) (ratifying aerial surveillance of an unattached greenhouse using a helicopter); California v. Ciraolo, 476 U.S. 207, 215 (1986) (allowing aerial surveillance of defendant's backyard using a small plane); Dow Chemical Co. v. United States, 476 U.S. 227, 239 (1986) (permitting aerial surveillance of defendant's extensive factory using a precision mapping camera).

119. *Penny-Feeney*, 773 F. Supp. at 228.

120. *Id.*

121. *See supra* notes 74-84 and accompanying text.

122. 24 F.3d 1056 (8th Cir. 1994), *cert. denied*, 115 S. Ct. 664 (1994).

123. *Id.* at 1058-59.

constitutional protection of a residence, namely intimacy, personal autonomy, and privacy.[124] In *United States v. Ford*,[125] the Eleventh Circuit also adopted much of the *Penny-Feeney* analysis and concluded that infrared detection did not reveal conversations or human activities[126] and that it was more analogous to a smoke plume rising above a factory.[127]

The Seventh Circuit became the third federal circuit to hold that infrared surveillance of a residence did not violate the Fourth Amendment when conducted without a warrant. In *United States v. Myers*,[128] the Seventh Circuit adopted the reasoning of the Eighth and Eleventh Circuits and denied the defendant's motion to suppress evidence obtained through infrared detection.[129] The court stated that infrared detection "does not intrude in any way into the privacy and sanctity of the home."[130]

Most recently, in *United States v. Ishmael*,[131] the Fifth Circuit ruled on the constitutionality of thermal imaging.[132] The *Ishmael* court

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124. *Id.* at 1059.

125. 34 F.3d 992 (11th Cir. 1994).

126. *Id.* at 996. In several other opinions, however, courts note that the opposite is true; with a thermal imager, law enforcement agents can observe some intimate details inside a home. In *United States v. Olson*, police using an infrared device could tell from the videotape that a divider split the mobile home into two rooms. 21 F.3d 847, 848 n.5 (8th Cir. 1994). In *State v. Young*, the court observed that an infrared imager "can detect a human form through an open window when the person is leaning against a curtain," and that "[t]he device can also detect the warmth generated by a person leaning against a relatively thin barrier such as a plywood door." 867 P.2d 593, 595 (Wash. 1994). *See also* United States v. Field, 855 F. Supp. 1518, 1531 (W.D. Wis. 1994) ("As for the notion that thermal imagers do not reveal activities that occur inside the home, if this is so, then why does the government use thermal imagers to try to detect indoor marijuana growing operations?").

127. United States v. Ford, 34 F.3d 992, 997 (11th Cir. 1994) (citing Air Pollution Variance Board of Colorado v. Western Alfalfa Corp., 416 U.S. 861, 865 (1974) (holding that it was not a violation of the Fourth Amendment when a state health inspector entered an outdoor premises and observed and tested a smoke plume)).

128. 46 F.3d 668 (7th Cir. 1995).

129. *Id.* at 669-70.

130. *Id.* at 670.

131. 48 F.3d 850 (5th Cir. 1995), *cert. denied*, 116 S. Ct. 74 (1995).

132. *Id.* at 857. In this case the court reviewed the use of thermal imaging to surveil a building outside the curtilage of the defendant's residence, *id.* at 851-53, and reasoned that the use of the device "in an open field" was "passive and nonintrusive," and did not disturb "[t]he sanctity of one's home or business." *Id.* at 857.

reversed the district court's decision which held that the use of thermal imaging was an unconstitutional search.[133] The court, however, criticized the other circuits for applying the first prong of the *Katz* analysis—whether the defendant exhibited a subjective expectation of privacy—in an overly restrictive manner.[134] The Fifth Circuit concluded, unlike the other courts,[135] that the Ishmaels did exhibit a subjective expectation of privacy.[136] In evaluating the second prong of the *Katz* analysis—whether the defendant's expectation of privacy was reasonable[137]—the court held that the use of thermal imaging was not unreasonable because other similar types of high technology surveillance equipment are constitutional, and the police did not physically invade the Ishmaels' curtilage.[138] Because the court found that the use of thermal imaging here was permissible, the court held the Ishmaels' expectation of privacy was not reasonable.[139]

B. *Cases Holding Infrared Detection is Unconstitutional*

Several courts have rejected the reasoning of *Penny-Feeney* and its progeny and instead have held that the warrantless use of infrared detection is an unconstitutional search.[140] In *United States v.*

Although the court's holding could be construed as more limited than prior cases, nearly all thermal imaging of a residence can be done from outside the curtilage, whether in an open field or from the air. Thus, the court's limitation is illusory.

133. *Id.* at 853. For a discussion of the district court's opinion, United States v. Ishmael, 843 F. Supp. 205 (E.D. Tex. 1994), see *infra* notes 173-85 and accompanying text.

134. *Ishmael*, 48 F.3d at 854. For a discussion of the *Katz* test, see *supra* notes 56-70 and accompanying text.

135. *See, e.g.*, United States v. Myers, 46 F.3d 668, 669 (7th Cir. 1995) (concluding the defendant did not try to prevent the heat from emanating from his home); United States v. Ford, 34 F.3d 992, 995 (11th Cir. 1994) (recognizing that defendant voluntarily punched holes in the floor of his mobile home to vent the heat).

136. *Ishmael*, 48 F.3d at 854-55. Ishmael built his lab in secrecy and it was located in the basement of a secluded, steel building. *Id.*

137. *Id.* at 855. For a discussion of the *Katz* test, see *supra* notes 56-70 and accompanying text.

138. *Ishmael*, 48 F.3d at 855-56.

139. *Id.* at 855-57. *But cf.* Katz v. United States, 389 U.S. 347, 353 (1967) (holding that the "reach of the [Fourth] Amendment cannot turn upon the presence or absence of a physical intrusion into any given enclosure").

140. In addition to the cases discussed in this section, the Oregon Court of Appeals held that infrared detection was unconstitutional absent a warrant. State v. Binner, 877

Field,[141] the District Court for the Western District of Wisconsin provided an exhaustive analysis of the infrared detection issue,[142] and concluded that the use of infrared detection was improper.[143] In *State v. Young*[144] the Washington Supreme Court also found that warrantless infrared detection violated the Fourth Amendment.[145] In *United States v. Ishmael*,[146] the District Court for the Eastern District of Texas found that the police violated the Fourth Amendment when they used infrared detection to surveil a business structure.[147]

In *Field*, the district court adopted the report and recommendation of the magistrate judge who found that the use of infrared detection absent a warrant was unconstitutional.[148] The court began its analysis by noting that individuals normally expect freedom from government intrusion while at home and that this freedom is clearly reasonable to society.[149] The Court refused to accept the Government's argument that police should be free from the Fourth Amendment warrant requirement when using an electronic device to determine whether persons are conducting illegal activities within their homes.[150]

The court reviewed and rejected the line of cases which hold that

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P.2d 642 (Or. Ct. App. 1994) (reserving judgment on the issue of FLID's constitutionality, but noting that the trial court found the use of such a device unconstitutional). The opinion, however, did not discuss the reasoning behind its holding.

141. 855 F. Supp. 1518 (W.D. Wis. 1994).

142. *Id.* at 1525-33. For the purposes of this Note the arguments in *Field* will be considered for their persuasive value.

143. *Id.* at 1533.

144. 867 P.2d 593 (Wash. 1994).

145. *Id.* at 601.

146. 843 F. Supp. 205 (E.D. Tex. 1994). The district court decision in *Ishmael* was overturned on appeal by United States v. Ishmael, 48 F.3d 850 (5th Cir. 1995), *cert. denied*, 116 S. Ct. 74 (1995). For the purposes of this Note, however, the arguments of the district court will be considered for their persuasive value.

147. *Id.* at 213.

148. United States v. Field, 855 F. Supp. 1518, 1520 (W.D. Wis. 1994). The district judge explicitly adopted all portions of the magistrate's opinion discussing the constitutionality of infrared detection. *Id.*

149. *Id.* at 1530.

150. *Id.* The *Field* court noted as an initial premise that: "Indiscriminate monitoring of property that has been withdrawn from public view would present far too serious a threat to privacy interests in the home to escape . . . Fourth Amendment oversight." *Id.* (quoting United States v. Karo, 468 U.S. 705, 716 (1984)).

the use of infrared detection is a legal search technique because it is passive and nonintrusive.[151] The *Field* court instead relied on *United States v. Taborda*,[152] where the Second Circuit Court of Appeals held that the use of a high powered telescope to peer into a residence was unconstitutional even though the telescope was "passive."[153] In addition, the *Field* court noted that even though wiretaps are deemed "passive," they are strictly proscribed absent a warrant.[154] Finally, the court concluded that because passive devices are capable of invading a person's reasonable expectation of privacy, the "passivity" of a device cannot be used to tell if a device violates the Fourth Amendment.[155]

The *Field* court next took up the contention of *Penny-Feeney* and later cases that thermal imaging does not reveal details within a residence.[156] The court noted that if thermal imaging did not reveal activities within a residence, then the government would not use thermal imaging to detect indoor marijuana growing operations.[157] Rather, the court found that the devices provide visual images of varying quality that permit the government to draw conclusions about what is happening within the residence.[158] The court noted that the government often can

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151. *Field*, 855 F. Supp. at 1530 ("That thermal imagers collect heat 'passively' is a red herring."). For a discussion of the cases that hold infrared detection is valid under the Constitution, see *supra* part IV.A.

152. 635 F.2d 131 (2d Cir. 1980).

153. *Id.* at 139. The court concluded that law enforcement officials may not use a telescope to peer into an apartment and gain information that is unavailable to the naked eye. *Id. See also* United States v. Kim, 415 F. Supp. 1252, 1256 (D. Haw. 1976) (noting that government agents have no right to peer into people's windows with a telescope).

154. *Field*, 855 F. Supp. at 1531. Wiretaps are considered passive because they simply collect processed sound waves pulsing through a wire located outside the home. *Id. See also* Katz v. United States, 389 U.S. 347, 353 (1967) (listening to the defendant's conversations violated the Fourth Amendment).

155. *See Field*, 855 F. Supp. at 1530-31.

156. *Id.* at 1531. *See also* United States v. Ford, 34 F.3d 992, 996 (11th Cir. 1994) (stating that thermal imagery cannot penetrate walls or windows and can only depict details within a structure in gross detail); United States v. Penny-Feeney, 773 F. Supp. 220, 228 (D. Haw. 1991) (finding that thermal imagery can only detect heat on the "exterior" of the house).

157. *Field*, 855 F. Supp. at 1531.

158. *Id.* The court noted that the police tried to downplay the efficacy of thermal imaging. The court considered this "coyness" "a two-edged sword" because if thermal imaging does not tell the police anything useful about what is occurring within the residence, "then it has no value in determining whether there is probable cause to issue a search warrant." *Id. See supra* note 126 (concerning whether an infrared imager can

gain very detailed information by using these devices.[159] Because the whole purpose of using a thermal imager is to learn what is happening inside the home, the use of thermal imaging constituted a search.[160]

The *Field* court then went on to address arguments that thermal imaging was analogous to the "garbage exception" held constitutional by the Supreme Court.[161] The *Field* court stated that this analogy, created in *Penny-Fenney*, was inappropriate for several reasons.[162] First, taking out the trash was a conscious and affirmative act that demonstrated that the resident abandoned the contents of trash. In contrast, the loss of heat from a home occurred without the resident making a conscious effort to abandon it.[163] Second, the person who put trash on a curb, according to the Supreme Court, had common knowledge that the trash was readily accessible to the public at large.[164] However, the resident whose heat was radiating from her house had no knowledge that the government was using thermal imaging to detect suspicious heat patterns.[165] The Court

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"see" inside a house).

159. *Id.* The court proposed the following hypothetical:

> Hypothesize a homeowner at 1:00 a.m. lying immobile on his bed in a first story bedroom smoking a cigarette, with a cup of coffee on the night stand, watching late night television. There are French doors out to a ten foot patio, leading to a forty foot backyard, beyond which is an alley that is public access. The doors are open to let in air, but lightweight curtains are drawn to ensure privacy. Could a properly trained operator with a currently available thermal imager scan the house from the alley . . . and discern the heat sources in the bedroom and draw accurate conclusions about what was happening inside that room? . . . I surmise that if other variables were accounted for, the answer would be yes.

Id.

160. *Id.* at 1531-32.

161. *Id.* at 1532. *See* California v. Greenwood, 486 U.S. 35 (1988) (searching garbage bags on the curb does not violate the Fourth Amendment).

162. *Field*, 855 F. Supp. at 1532. *Penny-Feeney* held that heat escaping from a home was a form of waste analogous to trash left on a curb for pickup. United States v. Penny-Feeney, 773 F. Supp. 220, 226 (D. Haw. 1991). *See supra* notes 106-10 and accompanying text.

163. *Field*, 855 F. Supp. at 1532.

164. "It is common knowledge that plastic garbage bags left on or at the side of a public street are readily accessible to animals, children, scavengers, snoops, and other members of the public." *Penny-Feeney*, 773 F. Supp. at 226 (quoting California v. Greenwood, 486 U.S. 35, 40 (1988)).

165. *Field*, 855 F. Supp. at 1532.

thus rejected the garbage analogy because it believed that if individuals had knowledge that the government used infrared devices to surveil their homes, they would develop subjective expectations of privacy regarding their escaped heat.[166] Furthermore, if society were aware that these searches took place, it would recognize an individual's expectation of privacy concerning the detection of heat sources within the home as reasonable.[167]

The *Field* court ended its analysis of infrared detection by discussing the analogy used by some courts that compares infrared detection to the use of a trained dog to detect drugs.[168] The court held that this analogy fell short because while infrared detection can detect marijuana cultivation from 200 meters away, the government is unable to use dogs from a remote location.[169] Additionally, a dog sniff is uniquely precise because the dogs are trained only in detecting specific contraband, while a thermal imager visualizes all heat radiation, no matter what its source.[170]

The *Field* court supported its conclusions by looking to two prior cases, *United States v. Ishmael*[171] and *State v. Young*.[172] In *Ishmael*, the United States District Court for the Eastern District of Texas discussed the issue of infrared detection in an analytically different fashion than previous courts.[173] The defendants in this case argued that

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166. *Id.* at 1533.

167. *Id.*

168. *Id. See, e.g., Penny-Feeney*, 773 F. Supp. at 226-27.

169. *Field*, 855 F. Supp. at 1533.

170. *Id.*

171. 843 F. Supp. 205 (E.D. Tex. 1994), *rev'd*, 48 F.3d 850 (5th Cir. 1995).

172. 867 P.2d 593 (Wash. 1994).

173. *Ishmael*, 843 F. Supp. at 209-13. The court began by writing:

> We must take care that the war on drugs not count as one of its victims fundamental rights. The benefits to our society of safeguarding the right to privacy is such that the courts must say that there is a limit to the use of technological weapons, even in the war on drugs.

Id. at 208.

This Note deals specifically with the issue of the constitutionality of infrared detection of residences. In *Ishmael*, the court addressed the related issue of infrared detection of businesses and business curtilage. *Id.* at 210-11. The Fourth Amendment affords protection against the warrantless search of businesses as well as residences. Marshall v. Barlow's, Inc., 436 U.S. 307, 311 (1978).

the building[174] the police had surveilled was within the curtilage of their home and was thus protected by the Fourth Amendment.[175] The government asserted that the building stood in an open field, making it susceptible to surveillance.[176] The court characterized the building as a business and concluded that it was protected under the "business curtilage" doctrine, rather than by the curtilage of the defendants' home.[177] Because a business owner may decide what areas of his business he will allow the public to view, the court concluded that Ishmael had a reasonable expectation that the building, and the area immediately surrounding it, would remain free from government and public intrusion.[178]

The Government argued that the use of infrared detection was constitutional because the heat escaping from the building was in "plain

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174. The building was a large steel building (40' x 80' x 15') that was located 200-300 yards behind the residence. *Ishmael*, 843 F. Supp. at 208.

175. *Id.* at 209. For a definition of "curtilage" see *supra* note 107. The Supreme Court created a four-factor standard to test the extent of the curtilage around a given residence: (1) the proximity of the area under scrutiny to the home; (2) whether the area under scrutiny is within an enclosure surrounding the home; (3) the nature and use of the area under review; and (4) the effort made by the homeowner to conceal the area under review. United States v. Dunn, 480 U.S. 294, 301 (1987).

176. *Ishmael*, 843 F. Supp. at 210. The "open fields" doctrine refers to the area outside of the curtilage that is unoccupied or undeveloped. *Id.* The doctrine holds that while a person has a Fourth Amendment right of protection from unlawful searches and seizures in his home and the area immediately surrounding his home, he has no right of privacy for activities conducted in the open, *e.g.*, in fields. Oliver v. United States, 466 U.S. 170, 178 (1984).

177. *Ishmael*, 843 F. Supp. at 210. The court found that Ishmael used the building for his business, known as R&M Equipment Rental, which was registered with the Texas State comptroller's office; that the defendant had made purchases of commercial equipment; and that the building contained both office and warehouse space. *Id.* Although the building was not within the home's curtilage, the court was not willing to accept the Government's argument that the building was in an open field. *Id.* "[T]o say that the government could intrude up to the very windows of the building on the basis of the 'open fields' doctrine simply because it was outside the curtilage of a home, would eviscerate the Fourth Amendment." *Id.*

178. *Id.* at 210-11. The court wrote that the expectation of privacy "logically includes the water and air systems connected to the building." *Id.* at 211. Implicit in the court's opinion that the expectation of privacy includes both the building and the area surrounding it, is the idea that this privacy includes protection from the detection of things escaping from the building.

view"[179] and thus subject to aerial surveillance.[180] The Government additionally made use of the two popular analogies that infrared detection was comparable to looking at garbage or using a drug-sniffing dog.[181] Although the Supreme Court had previously ratified the use of a high-precision camera to photograph a factory, the *Ishmael* court denied the Government's asserted right to use infrared devices because the devices recorded images which were not in plain view.[182] The court also held that heat escaping from a building was not comparable to garbage.[183] The court concluded that the Ishmaels had not abandoned the heat escaping from their building like trash on a sidewalk, but instead they had tried to conceal their activity from "human sensory detection."[184] The court further held that infrared detection was unlike a dog sniff for two reasons. First, infrared detection was far more sophisticated than a dog sniff, and second, a dog can distinguish between contraband and noncontraband items.[185]

In *State v. Young*,[186] the Washington Supreme Court ruled that the

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179. *Id.* at 212. The "plain view" doctrine says that the police may view what may be seen "from a public vantage point where [they have] a right to be." United States v. Penny-Feeney, 773 F. Supp. 220, 227 (D. Haw. 1991) (quoting California v. Ciraolo, 476 U.S. 207, 213 (1986)).

180. *Ishmael*, 843 F. Supp. at 212. In *Dow Chemical Co. v. United States*, the Supreme Court held that it was not an unlawful search for the Environmental Protection Agency to observe a large industrial site using a precision mapping camera in order to establish evidence of violations of environmental laws. 476 U.S. 227, 234-39 (1986).

181. *Ishmael*, 843 F. Supp. at 213. *See supra* notes 106-10 and 160-64 and accompanying text (discussing the garbage analogy).

182. *Id.* at 212. The *Dow* Court noted, "that surveillance of private property by using highly sophisticated surveillance equipment not generally available to the public . . . might be constitutionally proscribed absent a warrant." *Dow*, 476 U.S. at 238.

183. *Ishmael*, 843 F. Supp. at 213. The court did say, however, that "[i]f a law enforcement agent had alleged in an affidavit that while conducting surveillance he felt an inordinate amount of heat being vented from the building, the waste heat analogy may have validity." *Id.*

184. *Id.*

185. *Id.* The court wrote that "a dog's sense of smell, while more acute than a human's, does not compare to a technology that can turn minute gradations in temperature into video tapes from 1500 feet away." *Id.*

186. 867 P.2d 593 (Wash. 1994). The defendant alleged that the infrared surveillance of his residence violated the Fourth Amendment of the United States Constitution and article I, section 7 of the Washington State Constitution. *Id.* at 595. Because greater protection may be available under a state constitution, the court examined the defendant's second allegation first. *Id.* at 595-96. After concluding that the infrared surveillance

warrantless use of infrared detection on a residence violated the Fourth Amendment.[187] In addition to discussing many of the points covered in *Field*,[188] the court noted that, with regard to electronic tracking devices, the Supreme Court has differentiated between the use of such devices in the home and their use in other areas.[189] The court pointed out that the United States Supreme Court found a Fourth Amendment violation when law enforcement authorities allowed a beeper to operate within a home, but did not find a Fourth Amendment violation when the authorities used a beeper outside the home.[190] In the same way, the *Young* court continued, the use of infrared surveillance on residences impermissibly allows the police to gain otherwise unobtainable information concerning heat sources within a home.[191] Because it provides information about the activities within a residence, the court concluded that the use of infrared technology, without a warrant, is a search and thus violates the Fourth Amendment.[192]

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violated the Washington State Constitution, the court proceeded to analyze whether infrared surveillance violated the Fourth Amendment. *Id.* at 601. Although it was not necessary for the court to discuss the Fourth Amendment issue, it chose to do so "for the purpose of providing guidance to other courts." *Id.*

187. *Id.* at 601.

188. *See supra* notes 148-70 and accompanying text.

189. *Young*, 867 P.2d at 601.

190. *Id.* at 601-02. The court contrasted two Supreme Court decisions, United States v. Karo, 468 U.S. 705 (1984), and United States v. Knotts, 460 U.S. 276 (1983). In *Knotts*, police placed a beeper inside an object commonly used in illegal drug activity. *Knotts*, 460 U.S. at 277-79. When the object was placed within the defendant's car the authorities traced the movement of the car with the beeper. *Id.* However, when the object was taken inside the house the agents did not use the beeper. *Id.* at 278-79. The Court held that this activity was constitutional because the information received by using the beeper could have been discovered by following the car. *Id.* at 285.

In *Karo*, the police placed a similar beeper in a can of ether, which the defendant moved from place to place. *Karo*, 468 U.S. at 708-11. When the defendant moved the can from one place to another, the police used the beeper to locate the can. *Id.* The Court held that using the beeper to determine whether the can was inside a house was a search because the beeper revealed information about the interior of the home that the agents could not have attained through visual surveillance of the home's exterior. *Id.* at 715. *See also supra* note 112 (discussing the use of beepers).

191. *Young*, 867 P.2d at 602. The court noted that while "an electronic device . . . [is] less intrusive than a full-scale search, . . . it does reveal a critical fact about the interior of a premises that the Government is extremely interested in knowing and that it could not have otherwise obtained without a warrant." *Id.* (quoting *Karo*, 468 U.S. at 715).

192. *Id.* at 604.

V. ANALYZING THE INFRARED DETECTION CASES

A. *The Application of the* Katz *Test*

To put the current infrared detection cases into perspective it is necessary to discuss them with reference to the original basis for the *Katz* test—the increasing ability of law enforcement authorities to pry into people's private lives without physically trespassing.[193] The *Katz* decision greatly limited the freedom afforded to law enforcement agents to conduct searches.[194] Under *Katz*, a warrantless search is unconstitutional if the individual has an actual expectation of privacy and society recognizes this expectation of privacy as reasonable.[195] This test balances personal privacy needs with society's need to enforce the laws.[196] The application of *Katz* to novel technology, however, shows the limitation of the doctrine. *Katz* poorly applies to situations involving remote surveillance technology, especially given the willingness of judges to fall back to concepts of trespass when challenged with new technology.[197]

There are a number of reasons behind the poor application of the *Katz* test to infrared detection. Perhaps the greatest reason for this problem is the lack of information a court has when determining whether the two prongs have been met.[198] With regard to the defendant's subjective expectation of privacy, in most cases the defendant has little knowledge of the capabilities of law enforcement surveillance. Thus, the defendant has done little to prevent the detection of infrared sources in

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193. *See* Katz v. United States, 389 U.S. 347, 353 (1967) ("[T]he reach of [the Fourth] Amendment cannot turn upon the presence or absence of a physical intrusion into any given enclosure.").

194. *See id.* at 352 (mentioning that prior to this case the absence of physical trespass foreclosed any Fourth Amendment scrutiny).

195. *Id.* at 361.

196. One commentator stated that *Katz* "marks a watershed in fourth amendment jurisprudence" and has "extraordinary character and implications." Amsterdam, *supra* note 2, at 382-83.

197. A number of courts have allowed concepts of "trespass" to enter their discussions. *See, e.g.*, United States v. Pinson, 24 F.3d 1056, 1058 (8th Cir. 1994) ("[T]he heat-sensing device did not invade Pinson's home nor its curtilage, nor did it emit rays into his home . . . ."), *cert. denied*, 115 S. Ct. 664 (1994). A faithful application of *Katz* would prohibit such considerations.

198. *See supra* notes 66-70 and accompanying text.

his home.[199] Because the defendant generally has no knowledge of infrared detection the question of whether he has a subjective expectation of privacy is unanswerable.

With respect to the question of whether society would find the defendant's expectation of privacy reasonable, the courts agree that society has little or no knowledge of infrared detection techniques.[200] This is important because the *Katz* test requires the judge to gauge the beliefs of "society" in some objective manner.[201] In the context of a surveillance technique that the defendant, society, and the judge know nothing about until the case is tried, the ability of the judge to make a reasonable determination of the values of a free and open society concerning that technology must be viewed with skepticism.

Another problem with the way the *Katz* test is applied in infrared detection cases is the tendency of courts to construe the scope of the *Katz* analysis as broadly or as narrowly as necessary to fit the conclusion at which they will arrive. For example, implicit in the *Katz* framework is the initial task of characterizing to what the expectation of privacy refers.[202] In *Penny-Feeney*, the court considered whether there was an expectation of privacy in "heat waste."[203] The court in that case looked only at whether or not the defendant tried to conceal his sources

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199. This is a common-sense assumption in marijuana production cases, given the great lengths defendants typically go to in order to conceal their operations from visual or aural detection. *See also* United States v. Field, 855 F. Supp. 1518, 1532 (W.D. Wis. 1994) ("It is hardly common knowledge that government officials cruise the public streets after dark scanning houses with thermal imagers, seeking to interpret heat patterns.").

200. *Field*, 855 F. Supp. at 1533 ("[I]t is not clear that the public is aware either of the capabilities of thermal scanners or the use to which they are being put, or could be put."). *But cf.* United States v. Deaner, No 1:CR-92-0090-01, 1992 U.S. Dist. LEXIS 13046, at *6 (M.D. Pa. July 27, 1992) (writing with regard to FLIR that "[t]he technology employed is 'off the shelf,' having been in general use for fifteen years").

201. The ultimate question, plainly, is a value judgment. It is whether, if the particular form of surveillance practiced by the police is permitted to go unregulated by constitutional restraints, the amount of privacy and freedom remaining to citizens would be diminished to a compass inconsistent with the aims of a free and open society.

Amsterdam, *supra* note 2, at 403.

202. The issue in *Katz* was whether a person's expectation of privacy in a public telephone is reasonable. Justice Harlan opined that, "a man's *home* is . . . a place where he expects privacy. . . . On the other hand, conversations in the *open* would not be protected . . . for the expectation of privacy . . . [is] unreasonable." Katz v. United States, 389 U.S. 347, 361 (1967) (Harlan, J. concurring) (emphasis added).

203. *See supra* notes 100-20 and accompanying text.

of heat from detection.[204] In *Field*, a case factually similar to *Penny-Feeney*, the court characterized the expectation of privacy as being freedom from government intrusion while at home.[205] The *Field* court looked for a manifestation of a desire to prevent surveillance generally.[206]

If a court determines that the expectation of privacy refers to "heat waste," then the individual has no expectation of privacy from surveillance and the search is constitutional. On the other hand, if the court determines that the expectation of privacy refers to the sanctity of the home, then the search is unconstitutional.[207] In the former cases the courts invariably find a lack of subjective expectation of privacy because the defendant could not hide the heat waste from detection.[208] In the latter cases, however, the courts find a subjective expectation of privacy, even though the defendant had no knowledge of infrared radiation, because defendants generally have an expectation of privacy in their homes.[209]

Another criticism of the infrared detection cases is that they have raised the ghost of the "physical trespass" doctrine,[210] repudiated by *Katz*,[211] in the form of considerations of "intrusiveness."[212] "Intrusiveness" refers to the amount of inconvenience or disruption a given surveillance method causes. But a surveillance method can be more violative of Fourth Amendment privacy precisely because it is

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204. United States v. Penny-Feeney, 773 F. Supp. 220, 226 (D. Haw. 1991). In *State v. McKee*, the defendant argued that he had sought to conceal the heat sources, thus establishing a subjective expectation of privacy. 510 N.W.2d 807, 809 (Wis. Ct. App. 1993). However, notwithstanding that fact, the court held that the defendant did not establish a subjective expectation of privacy because the infrared surveillance device did not invade the home or the curtilage, nor did it reveal the defendant's activities within. *Id.* at 810.

205. United States v. Field, 855 F. Supp. 1518, 1530 (W.D. Wis. 1994).

206. *Id.* at 1524.

207. *See supra* part IV.

208. *See, e.g., Penny-Feeney*, 773 F. Supp. at 226.

209. *See, e.g., Field*, 855 F. Supp. at 1527-29.

210. For a discussion of the "physical trespass" doctrine, see *supra* notes 44-53 and accompanying text. *See, e.g. Penny-Feeney*, 773 F. Supp. at 228 ("Use of the FLIR in this case caused absolutely no physical invasion of the home or curtilage.").

211. *See supra* section III.B.

212. *See, e.g., Penny-Feeney*, 773 F. Supp. at 223 (describing the FLIR as nonintrusive, passive).

unintrusive, allowing a person to be investigated in their home without knowing it.[213] Even if a particular method of surveillance is found to be very intrusive, this finding does nothing to advance the *Katz* analysis, which concentrates on expectations of privacy.

One final criticism of the way courts have decided infrared detection cases concerns the use of other Fourth Amendment precedent. Search and seizure cases often have limited holdings, made with specific reference to location, the characteristics of the search, and a number of other factual circumstances.[214] Courts reviewing Fourth Amendment search cases, however, tend to make broad statements concerning the constitutionality of whole categories of technology, which confuse, if not totally misstate, the law.[215] This tendency toward overstatement of precedent necessarily results in confusion among courts and should be consciously avoided.

The *Katz* test has been ineffective in its application to infrared detection. The ineffectiveness of the test has led litigants and judges to rely on analogies to other surveillance methods to discuss the constitutionality of infrared detection.

B. *Argument By Analogy*

Because the *Katz* doctrine provides no clear direction to courts in deciding whether infrared surveillance of residences is constitutional, litigants and courts rely on analogies to resolve this issue.[216] For example, the prosecution in these types of cases often argues that because infrared technology shares characteristics with a certain

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213. *See supra* notes 151-55 and accompanying text.

214. For example, in the leading case discussing the constitutionality of narcotic dog sniffs, the Supreme Court held that it was constitutional for a law enforcement official to use a narcotics dog to sniff a passenger's luggage in an airport, as the passenger is leaving a plane, if the passenger is not detained for an unreasonable period of time. United States v. Place, 462 U.S. 696, 706 (1983). This holding is specific concerning the place of the investigation (an airport), the thing to be investigated (luggage), and the method of investigation (a brief dog sniff). Courts in infrared detection cases, however, have characterized this precedent as holding that dog sniffs are always constitutional. This is not the case. In fact, a dog sniff of a residence, which is the location where thermal imaging often takes place, has been held to be an unconstitutional search. United States v. Thomas, 757 F.2d 1359 (2d Cir. 1985).

215. *See supra* notes 111-20 and accompanying text.

216. *See, e.g.*, United States v. Penny-Feeney, 773 F. Supp. 220, 226-28 (D. Haw. 1994).

technology that may constitutionally be used absent a search warrant, then, *a fortiori*, the use of infrared technology is constitutional without a search warrant. Prosecutors have effectively used this technique to argue that heat radiating from a house is just like garbage,[217] and the use of infrared technology is just like a narcotics dog, aerial surveillance, or smoke.[218]

While argument by analogy is a time-honored method of legal reasoning, its unlimited use in this area results in confusion concerning the capabilities of infrared detection[219] and leads to irrational results. One problem with analogy is that it tends to cause attorneys and judges to overstate and misapply prior case law concerning related surveillance methods.[220] In addition, the use of analogy in this context forces each side of the issue to adopt strained arguments that are unrealistic. Courts confronted with infrared detection cases may assert any of the following: (1) radiation visualized by infrared detection is like abandoned garbage;[221] (2) radiation is as easily detected as a plume of smoke;[222] and (3) infrared technology is as simple and effective as the use of a narcotics dog,[223] and as permissible as aerial surveillance.[224] However, these analogies fail to assert, although equally true, that humans cannot directly sense infrared radiation through sight, touch, hearing, smell, or taste. In addition, these analogies overlook that infrared technology goes much further than simply amplifying human sensory capabilities and can actually provide information about activities within a building. Furthermore, they fail to consider that most people have little or no knowledge of the existence of this technology.[225] These concerns lead to the final criticism of the cases that have decided the constitutionality

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217. The author would like to note his disagreement with this prosecutorial theory because, unlike garbage left on the curb, the heat detected through thermal imaging cannot be seen, touched, or smelled, nor is it outside the curtilage of the home.

218. *See supra* notes 111-20 and accompanying text.

219. *See infra* part V.C.

220. *See supra* part IV.A. (concerning misapplication of precedents).

221. United States v. Penny-Feeney, 733 F. Supp. 220, 226 (D. Haw. 1994). *Contra* United States v. Field, 855 F. Supp. 1518, 1532 (W.D. Wis. 1994).

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

223. *Penny-Feeney*, 773 F. Supp. at 227. *Contra Field*, 855 F. Supp. at 1533.

224. *Penny-Feeney*, 773 F. Supp. at 227-28. *Contra* United States v. Ishmael, 843 F. Supp. 205, 212 (E.D. Tex. 1994).

225. *See supra* notes 199-200 and accompanying text.

of infrared imaging—that the courts have failed to consider the actual capabilities of infrared technology in their opinions.

C. *The Capabilities of Infrared Detection*

Courts have failed to reach a consensus regarding the capabilities of infrared detection. In each case the parties debate over whether infrared detection equipment "sees" into houses and whether the equipment detects the surface of the object visualized or the interior of the object.[226] Courts discuss the technology in hyperbolic terms, accentuating qualities they favor and down-playing qualities they do not.[227] Few, if any, courts have attempted to evaluate the technology on its own. Instead, they choose to coin the analogies used by the defense or prosecution. Unless the courts become familiar with the scientific facts of infrared detection, and in turn develop a regular standard to evaluate its use, the debate will remain mired in confusion and inconsistencies.

VI. RESTORING THE *KATZ* DOCTRINE: A PROPOSAL FOR THE SUPREME COURT

This Note proposes two cumulative solutions to the question of how courts should proceed in evaluating the constitutionality of infrared surveillance of homes—a minimal solution and a more substantial solution. This effort is grounded in realism with regard to both the courts' political will concerning fundamental rights that inhibit law enforcement's ability to enforce the laws, and the resolve of the Supreme Court.

A. *Protection from Unconstitutional Invasions*

Courts must continue to give careful consideration to the Fourth Amendment before deciding to allow infrared surveillance without a search warrant. This is especially true given the increasing ability of law enforcement authorities to gain access into people's private lives without physically trespassing. The cases that have ruled on the constitutionality of infrared detection demonstrate how easily the courts can erode constitutional rights. The analysis provided by the courts that follow *Penny-Feeney* is not persuasive. These courts rely on strained logic to

226. *See, e.g.*, State v. Young, 867 P.2d 593, 598-99 (Wash. 1994).

227. *Compare* discussion of *Penny-Feeney*, *supra* notes 100-20 *with* discussion of *Field*, *supra* notes 161-70 and accompanying text.

decide this issue and fail to balance the societal need for privacy with the need to enforce the laws.[228] A faithful reading of the *Katz* decision compels the conclusion that the infrared detection of a home is unconstitutional absent a search warrant.[229] The essence of the *Katz* decision is that individuals deserve protection from searches where they have a reasonable expectation of privacy. An expectation of privacy at home is clearly reasonable. Thus, courts should require law enforcement agents to obtain a search warrant before conducting infrared surveillance of a residence.[230] The Supreme Court traditionally has afforded the utmost protection from governmental scrutiny to the home.[231] To prevent the

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228. *See, e.g.*, United States v. Albarado, 495 F.2d 799, 805 (2d Cir. 1974) ("In determining the reasonableness of a search, one must . . . balance the need for the search against the invasion of privacy involved.").

229. *See supra* notes 54-69 and accompanying text. A number of other articles have discussed the constitutionality of infrared detection. *See* Melinda Foster, Note, State v. Young: *A Cool View Toward Infrared Thermal-Detection Devices*, 30 GONZ. L. REV. 135 (1994) (arguing that although the use of thermal imaging was found unconstitutional by the Washington Supreme Court, the United States Supreme Court would find it constitutional); Steele, *supra* note 31 (providing a history of infrared detection cases and suggesting that the use of infrared detection requires a warrant); Plaschke, supra note 27, at 615 (concluding that the *Deaner* court erroneously held that infrared detection did not violate the Fourth Amendment); Pochurek, *supra* note 28, at 165-67 (finding use of infrared detection, absent a search warrant, unconstitutional).

230. The Fourth Amendment should be construed liberally for the security of persons and property. Boyd v. United States, 116 U.S. 616, 635 (1886).

The author acknowledges that there are two drawbacks to the recommended action. First, more people will grow marijuana at home, and second, law enforcement agents will have to work harder to collect sufficient evidence to obtain a search warrant before they can conduct infrared detection. While these are not minor concerns, the author believes their importance is less than the dangers associated with the loss of constitutional protections of privacy in the home.

231. "[T]he Court since the enactment of the Fourth Amendment has stressed 'the overriding respect for the sanctity of the home that has been embedded in our traditions since the origins of the Republic.'" Oliver v. United States, 466 U.S. 170, 178 (1984) (quoting Payton v. New York, 445 U.S. 573, 601 (1980)).

"[E]very unjustifiable intrusion by the Government upon the privacy of the individual, whatever the means employed, must be deemed a violation of the Fourth Amendment." Olmstead v. United States, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting).

The genesis of our traditional notion of the sanctity of the home embedded in the Fourth Amendment has long been thought to be Pitt's address in the House of Commons in March 1763: "The poorest man may in his cottage bid defiance to all the forces of the Crown. It may be frail; its roof may shake; the wind may blow through it; the storm may enter; the rain may enter; but the King of England cannot enter—all his force dares not cross the threshold of the ruined tenement!" Payton v. New York, 445 U.S. 573, 601 n.54 (1980) (quoting Miller v. United States, 357 U.S. 301, 307 (1958)).

erosion of Fourth Amendment principles, courts should scrupulously maintain this protection.[232]

Additionally, obtaining a warrant to search a home is a simple procedure.[233] The search warrant remains an effective way to balance the needs of law enforcement officers with the constitutional rights of citizens. A warrant is essential because police officers can conduct infrared surveillance with no preparation, as long as it is nighttime.[234] Thus, court approval of the warrantless use of infrared detection may lead to indiscriminate use of this technology by law enforcement officers "fishing" for violations of law.

A minimal solution to the Fourth Amendment infrared detection problem would require the Supreme Court to declare the use of such devices unconstitutional without a warrant. If the Court is willing to so hold, then it may also choose to tackle the greater problem of the irrelevance of the *Katz* test in remote surveillance technology cases.

B. *Curing the Ills of* Katz

The Supreme Court should undertake an effort to clarify and revalidate the operation of the *Katz* doctrine. This may involve a number of related tasks, each of which may require substantial analytical work. Potential routes include: (1) defining in hierarchical terms the different levels of privacy protected by the Fourth Amendment and assigning a rough level of protection to each of them;[235] (2) detailing in more

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232. "At the very core [of the Fourth Amendment] stands the right of a man to retreat into his own home and there be free from unreasonable governmental intrusion." Silverman v. United States, 365 U.S. 505, 511 (1961).

It is unnecessary, however, for the Supreme Court to rule that infrared detection is unconstitutional in all situations. When police want to use it to surveil a residence the Court should require a warrant. But, under other circumstances the Fourth Amendment considerations may not be sufficiently serious to require a warrant. *See* State v. Slowikowski, 743 P.2d 1126, 1130 (Or. Ct. App. 1987) (presenting the idea that given surveillance methods could be constitutionally proscribed in some situations and not in others).

233. *See supra* part III.C. and accompanying notes.

234. *See supra* notes 89-96 and accompanying text.

235. The hierarchy could look like this (starting with the greatest protection): (1) bodily autonomy (freedom from physical violation); (2) protection of personal papers and effects from physical search; (3) protection of the privacy of the home; (4) protection of business privacy; (5) protection of personal real property (open fields); (6) protection of real business property; (7) protection within a car; (8) protection in public (generally); and (9) protection at United States borders.

definite and concrete terms the scope of the two *Katz* standards, the subjective expectation of privacy and the societal reasonableness standard;[236] (3) limiting each holding of the court to the specific technology involved;[237] and (4) creating a standard with regard to novel technologies, whereby a new technology would be presumed to require a search warrant until either the Supreme Court rules on it, or one party can prove that a sufficient cross-section of society knows about its existence and implications.

VII. CONCLUSION

The analytical problems associated with the application of the Fourth Amendment to the police use of infrared technology are indicative of difficulties that will recur as law enforcement officers continue to bring scientific advances to bear on criminal activity.[238] While these advances are certainly favorable in their ability to monitor and apprehend criminals, the courts must take care that these advances do not wipe out fundamental protections as they wipe out crime. A ruling by the Supreme Court that requires officers to obtain a warrant before engaging in the infrared surveillance of a home should be the first step in dealing with these technological developments.

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For each hierarchical level the Court would give a rough guide as to the level of privacy violation that it finds unacceptable. The Court has done this in a rudimentary fashion in some respect, by holding that the home deserves heightened protection. *See supra* note 231.

236. *But cf.* Amsterdam, *supra* note 2, at 383-84 (arguing that the *Katz* opinion left the Fourth Amendment inquiry purposefully vague).

237. Any holding concerning a Fourth Amendment issue which involves the novel use of technology should state: (1) whether it is constitutional absent a search warrant; (2) what location was searched using this technology; (3) whether the person being observed or listened to had manifested a desire for privacy; and (4) how intrusive the search was. This last category should not be confused with actual trespass, but instead should consider to what extent the search entered comparatively secret areas or privacies.

238. New law enforcement devices being tested and developed include electromagnetic wave imagers and passive millimeter wave imagers which can detect objects through clothing and walls at a distance of fifty feet. *See* Bob Dart, *The Battle for Techno-Tools; The Thin Blue Line Between Law Enforcement and Rights*, HOUS. CHRON., Dec. 25, 1994, at 46-47. *See also* Laurent Belsie, *New Era of Electronic Snooping Draws Static*, CHRISTIAN SCI. MONITOR, May 9, 1995, at 1 (criticizing the Clinton administrations' proposal to loosen restrictions on covert electronic eavesdropping).

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