

"Flir"ting With Danger: A Fourth Amendment Analysis of Infrared Imaging

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“FLIR”TING WITH DANGER: A FOURTH AMENDMENT ANALYSIS OF INFRARED IMAGING

The Fourth Amendment to the United States Constitution stands as a safeguard of every individual's right of privacy.¹ Specifically, the Fourth Amendment serves to protect people from unwarranted governmental intrusion.² Government access to ever-advancing technology³ for purposes of surveillance, however, nec-

¹ See *Schmerber v. California*, 384 U.S. 757, 767 (1966). “The overriding function of the Fourth Amendment is to protect personal privacy and dignity against unwarranted intrusion by the State.” *Id.*; *Olmstead v. United States*, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting). “[The Framers of the Constitution] conferred, as against the Government, the right to be let alone—the most comprehensive of rights, and the right most valued by civilized Men.” *Id.*; 1 JOSEPH G. COOK, *CONSTITUTIONAL RIGHTS OF THE ACCUSED* 291-92 (2d ed. 1985) (quoting *Flagg v. United States*, 233 F. 481, 482 (2d Cir. 1916)). “The Fourth Amendment was ‘intended to safeguard the rights of the people of the United States against the encroachment of unlawful and arbitrary powers and to preserve the rights of the humblest as well as the most powerful citizen.’” *Id.*; see also Anthony Amsterdam, *Perspectives on the Fourth Amendment*, 58 MINN. L. REV. 349, 357-58 (1974) (discussing Fourth Amendment protection of individual privacy); Ken Gormley, *One Hundred Years of Privacy*, 1992 Wis. L. Rev. 1335, 1357-74 (discussing Fourth Amendment as one of several constitutional sources of privacy).

² See, e.g., *Oliver v. United States*, 466 U.S. 170, 186 (1984) (Marshall, J., dissenting). “The Fourth Amendment . . . was designed, not to prescribe with ‘precision’ permissible and impermissible activities, but to identify a fundamental human liberty that should be shielded forever from government intrusion.” *Id.*; *United States v. Place*, 462 U.S. 696, 703 (1983). “We must balance the nature and quality of the intrusion on the individual's Fourth Amendment interests against the importance of the governmental interests alleged to justify the intrusion.” *Id.*

³ See Shannon Brownlee, *Science Takes the Stand*, U.S. NEWS & WORLD REPORT, July 11, 1994, at 29. The article examines the controversy over the use of DNA profiling both as evidence generally and specifically with regard to the O.J. Simpson trial. *Id.* The author states that “[t]here is no argument that DNA patterns from a crime scene that do not match a suspect's can lead to speedy exoneration.” *Id.* Furthermore, “DNA profiling gets controversial only when a match is made.” *Id.* Critics of the use of DNA evidence argue that “prosecutors have exaggerated the rarity of various DNA profiles” and that “labs performing the delicate analysis are not subject to adequate quality controls.” *Id.* at 29-30; see also Gordon Witkin & Katia Hetter, *High-Tech Crime Solving*, U.S. NEWS & WORLD REPORT, July 11, 1994, at 30. The automated fingerprint identification process allows “computerized storage and rapid matching of new prints against a police department's or a state's entire inventory—perhaps millions of fingerprint records.” *Id.* The “Bulletproof” computer system “takes a 360-degree picture of a bullet's ballistic characteristics, then compares it with others stored in a database to isolate a small universe of potential matches.” *Id.* A voice spectrograph “generate[s] pictures of recorded voices that graphically display fluctuations in pitch and tone, and then compares them with others . . .” *Id.* A hand-held wand disperses a fluorescent dye vapor which “reacts with the moisture and oil of the fingerprint, freezing the print so it cannot be harmed.” *Id.* See generally PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, *SCIENTIFIC EVIDENCE* § 1-8 (2d ed. 1993) (examining reliability of evidence derived by various scientific techniques); EDWARD J. IMWINKELRIED, *THE METHODS OF*

essarily implicates this privacy interest.⁴ New technological devices are extremely valuable to law enforcement because they provide more efficient and effective means for police departments to combat crime.⁵ Areas once beyond the reach of conventional surveillance are now readily accessible as a result of more sophisticated devices.⁶ Increasingly, these devices are utilized in efforts to curb drug infestation⁷ in the United States.⁸ Though such devices are helpful to the police, their use has sparked constitutional de-

ATTACKING SCIENTIFIC EVIDENCE 415-17 (2d ed. 1992) (discussing role of various types of scientific evidence at trial).

⁴ See *United States v. White*, 401 U.S. 745, 756 (1971) (Douglas, J., dissenting).

"[T]he concepts of privacy which the Founders enshrined in the Fourth Amendment vanish completely when we slavishly allow an all-powerful government, proclaiming law and order, efficiency, and other benign purposes, to penetrate all the walls and doors which men need to shield them from the pressures of a turbulent life around them and give them the health and strength to carry on . . ."

Id.; *United States v. Ishmael*, 843 F. Supp. 205, 207-08 (E.D. Tex. 1994), *rev'd*, 48 F.3d 850 (5th Cir.), *cert. denied*, 116 S. Ct. 74 (1995). The court recognized the "tension created between the right to privacy on the one hand and our society's rapidly evolving technological sophistication on the other." *Id.*; *State v. McKee*, 510 N.W.2d 807, 810 (Wis. Ct. App. 1993) (quoting *State v. Lange*, 463 N.W.2d 390, 395 (Wis. Ct. App. 1990)). "[T]here must be a limit to the degree the government can intrude upon a person's home and curtilage with 'high-tech' equipment." *Id.*; see also *Amsterdam*, *supra* note 1, at 386 (quoting *Silverman v. United States*, 365 U.S. 505, 509 (1961)). "In recent years . . . rapid technological advances and the consequent recognition of the 'frightening paraphernalia' . . . have underlined the possibility of worse horrors yet to come." *Id.*

⁵ See Jeff Frank, *Out of the Darkness*, SECURITY MGMT, Aug. 1991, at 45 (discussing frustrated security and law enforcement communities' continued struggle against darkness that has always shielded nighttime crime); see also W. Conard Holton, *Shedding New Light on Crime*, PHOTONICS SPECTRA, Dec. 1992, at 52. "A market for photonic technologies exists in law enforcement." *Id.*; Witkin & Hetter, *supra* note 3, at 30. According to a Bureau of Alcohol, Tobacco and Firearms spokesman, law enforcement officials are "literally able through automation to do the grunt work of a small army of forensic examiners . . ." *Id.* The Automated Fingerprint Identification System ("AFIS") "can whiz through 1,200 prints per second and in a few hours kick out possible matches, yielding suspects the cops never knew about." *Id.*

⁶ See *Olmstead v. United States*, 277 U.S. 438, 473 (1928) (Brandeis, J., dissenting). As long ago as 1928, Justice Louis Brandeis perceived that "[d]iscovery and invention have made it possible for the Government, by means far more effective than stretching upon the rack, to obtain disclosure in court of what is whispered in the closet." *Id.*

⁷ See, e.g., Mary H. Cooper, *War on Drugs*, CONG. Q. RESEARCHER, Mar. 19, 1993, at 243. The author notes that "[f]ederal spending to combat drugs has increased from \$1.5 billion in 1981 to almost \$12 billion in 1992" and yet the United States is "the world's leading market for illegal drugs." *Id.*; Derek T. Dingle, *Managing the War on Drugs*, BLACK ENTERPRISE, July 1990, at 43. "As of March [1990], [National Institute of Drug Abuse] research indicated that two-thirds of Americans, between the ages of 20 and 40, have used an illicit drug in the past year while 12% have done so within a 30-day period." *Id.*; Kitty Dumas, *War on Drugs Is a Standoff In the Partisan Trenches*, CONG. Q. WKLY. REP., Apr. 6, 1991, at 858 (reporting estimated cocaine use by 1.7 million Americans more than once per week); *Risky Business*, NEWSWEEK, July 16, 1990, at 16 (discussing military involvement in war on drugs).

⁸ See *Marijuana Retains Popularity Despite Anti-Drug Attitudes*, DALLAS TIMES HERALD, Nov. 18, 1990, at A6 (noting that "[p]olice departments that once paid little attention to marijuana have changed as attitudes harden toward all illegal drugs").

bate.⁹ One recent advent is use of the Forward Looking Infrared Device ("FLIR") in an attempt to detect indoor marijuana¹⁰ growing operations.¹¹

This Note evaluates FLIR use in light of the Fourth Amendment's protection of individual privacy. Part One examines the Fourth Amendment, primarily in the context of the standard for police searches which courts currently apply. Part Two discusses the scientific principles underlying thermal imaging technology. Part Three argues that warrantless FLIR use for detection of indoor marijuana growing operations is unconstitutional. Part Four proposes a new approach, consistent with the principles underlying the Fourth Amendment, to determine whether use of the FLIR or other new technological devices is within constitutional boundaries.

⁹ See, e.g., *United States v. Karo*, 468 U.S. 705, 714 (1984). The Supreme Court held that warrantless monitoring of an electronic beeper inside a private home violated the Fourth Amendment because the container containing the beeper was withdrawn from public view. *Id.*; *United States v. Ishmael*, 843 F. Supp. 205, 208 (E.D. Tex. 1994), *rev'd*, 48 F.3d 850 (5th Cir.), *cert. denied*, 116 S. Ct. 74 (1995). "We must take care that the war on drugs does not count as one of its victims fundamental rights." *Id.*; *State v. Young*, 867 P.2d 593, 601 (Wash. 1994). "The Supreme Court has differentiated between the use of sensory enhancement devices in homes from their use on other objects." *Id.*; *Hearings on Surveillance Technology Before the Subcommittee on Constitutional Rights of the Senate Committee on the Judiciary*, 94th Cong., 1st Sess. 1 (1975) (statement of Sen. Tunney). "Control over the technology of surveillance conveys effective control over our privacy, our freedom and our dignity—in short, control over the most meaningful aspects of our lives as free human beings." *Id.*; Gormley, *supra* note 1, at 1370. "What is most telling about the recent Fourth Amendment privacy cases, however, is that the Court seems to be especially heavy-handed in discounting the 'reasonableness' of the citizen's expectation of privacy where the individual's claim to secrecy or solitude collides with the government's war on drugs and alcohol." *Id.* "Particularly where drug and alcohol crack-downs motivate the search, individual 'expectations' become quickly minimized in the name of society's massive stake in eradicating drug traffic and drunk driving . . . Fourth Amendment privacy deals exclusively with government conduct, constantly pitting the individual against society, often (as in the drug and alcohol cases) with massive odds stacked in favor of the states." *Id.* at 1372. See generally Matthew Lippman, *The Drug War and the Vanishing Fourth Amendment*, 14 CRIM. JUST. J. 229, 308 (1992) (examining several recent Supreme Court decisions involving narcotics and concluding Court clearly demonstrated narrow Fourth Amendment interpretation and consequently sacrificed individual privacy).

¹⁰ Various sources have referred to "marijuana" by any one of the following terms: cannabis, dope, ganja, grass, hash, hashish, hemp, herb, Mary Jane, pot, reefer, smoke, and weed. See MERRIAM-WEBSTER'S COLLEGIATE THESAURUS 468 (Maire Weir Kay ed. 1988) (noting alternative terms for "marijuana").

¹¹ See, e.g., THERMAL DETECTION TECHNOLOGY: AN ASSESSMENT FOR DRUG LAW ENFORCEMENT [hereinafter *DEA Manual*] at 4. The indoor cultivation of marijuana "result[s] in detectable amounts of thermal energy." *Id.* "Recent design advancements making thermal detection equipment more portable coupled with the increasing need for specialized drug investigative surveillance capability has resulted in a renewed interest in the technology by law enforcement." *Id.* at 3.

I. FOURTH AMENDMENT ANALYSIS PURSUANT TO *KATZ v. UNITED STATES*

The Fourth Amendment to the United States Constitution states:

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 person or things to be seized.¹²

The history of the Fourth Amendment evinces that the Framers of the Constitution intended to limit the scope of governmental power over citizens.¹³ The Framers, all too familiar with the rampant abuses of general warrants by British soldiers,¹⁴ sought to establish a minimum threshold for police intrusion into citizens' privacy.¹⁵

¹² U.S. CONST. amend. IV.

¹³ See, e.g., Gormley, *supra* note 1, at 1358-59. "A requirement of particularized warrants to guard against unreasonable searches and seizures was embodied in the Fourth Amendment, largely in response to the use of general warrants and writs of assistance by the British, by which . . . soldiers conducted wide-roaming searches of colonists' homes and private affairs for contraband." *Id.*

¹⁴ See, e.g., M.H. SMITH, THE WRITS OF ASSISTANCE CASE 344 (1978) (quoting John Adams in the Massachusetts Spy of Apr. 29, 1773). "Custom-house officers may enter our houses when they please—we are commanded to permit their entry—their menial servants may enter—may break locks, bars and every thing in their way—and whether they break through malice or revenge, no man, no court can inquire—bare suspicion without oath is sufficient." *Id.* John Adams further stated:

It appears to me . . . [the writ of assistance is] the worst instrument of arbitrary power, the most distrustive [sic] of English liberty, and the fundamental principles of the constitution, that ever was found in an English law-book . . . Every man prompted by revenge, ill humor or wantonness to inspect the inside of his neighbor's house, may get a writ of assistance; others will ask it from self defense. One arbitrary exertion will provoke another until society will be involved in tumult and in blood.

Id. at 552-54; see also 1 WAYNE R. LAFAYE, SEARCH AND SEIZURE: A TREATISE ON THE FOURTH AMENDMENT § 1.1 (1978). "One of the points emphasized in the ratification debates was the need for a provision dealing with searches." *Id.* See generally JACOB W. LANDYNSKI, SEARCH AND SEIZURE AND THE SUPREME COURT; A STUDY IN CONSTITUTIONAL INTERPRETATION 19-48 (photo. reprint 1991) (1966) (examining in detail development of Fourth Amendment); NELSON B. LASSON, THE HISTORY AND DEVELOPMENT OF THE FOURTH AMENDMENT TO THE UNITED STATES CONSTITUTION 51-78 (1937) (discussing history surrounding adoption of Fourth Amendment).

¹⁵ See, e.g., Wong Sun v. United States, 371 U.S. 471, 481-82 (1963). "[The Constitution requires] that the deliberate, impartial judgment of a judicial officer . . . be interposed between the citizen and the police . . ." *Id.*; RICHARD B. McNAMARA, CONSTITUTIONAL LIMITATIONS ON CRIMINAL PROCEDURE 28 (1982). "[T]he framers sought to safeguard the privacy and security of citizens' homes by requiring that the decision to invade that privacy be made by a neutral and detached magistrate, and not by a police officer engaged in the often competitive business of ferreting out crime." *Id.*; Amsterdam, *supra* note 1, at 403.

Pursuant to the Fourth Amendment, a police officer must make a showing of probable cause to obtain a warrant to search an individual's home.¹⁶ In applying for a search warrant, an officer must establish that evidence of a crime is presently to be found at the location to be searched.¹⁷ Nevertheless, prior to determining whether probable cause exists, one must first ascertain whether the Fourth Amendment is invoked at all.¹⁸

The Fourth Amendment, by its own terms, extends only to "searches" and "seizures."¹⁹ Thus, the starting point for analysis of the constitutionality of a government action is a determination of whether the particular action at issue constitutes a "search" or "seizure" within the meaning of the Fourth Amendment.²⁰ This discussion will consider only the "search" aspect of the Fourth Amendment.²¹ If the activity in question does not constitute a "search," then it does not fall within the ambit of the Fourth Amendment.²² An action that constitutes a "search," however,

"[W]hether, 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." *Id.*

¹⁶ See *Agnello v. United States*, 269 U.S. 20, 33 (1925). "Belief, however well founded, that an article sought is concealed in a dwelling house furnishes no justification for a search of that place without a warrant. And such searches are held unlawful notwithstanding facts unquestionably showing probable cause." *Id.*

¹⁷ See WAYNE R. LAFAVE & JEROLD H. ISRAEL, *CRIMINAL PROCEDURE* § 3.3(a) (2d ed. 1992). "In search cases, two conclusions must be supported by substantial evidence: that the items sought are in fact seizable by virtue of being connected with criminal activity, and that the items will be found in the place to be searched." *Id.*

¹⁸ See *infra* note 20 (noting starting point in Fourth Amendment analysis is determination of whether amendment is applicable).

¹⁹ See *United States v. Jacobsen*, 466 U.S. 109, 113 (1984). A seizure occurs "when there is some meaningful interference with an individual's possessory interests in the property seized." *Id.*

²⁰ See, e.g., CHARLES H. WHITEBREAD, *CRIMINAL PROCEDURE* § 4.01 (1980). "The first step one must take in examining a search and seizure case is to determine whether the Fourth Amendment is implicated at all." *Id.*

²¹ See *Jacobsen*, 466 U.S. at 113. The Court noted that the Fourth Amendment "protects two types of expectations, one involving 'searches,' the other 'seizures.'" *Id.* A "search" occurs when an expectation of privacy that society is prepared to consider reasonable is infringed. *Id.* A "seizure" of property occurs when there is some meaningful interference with an individual's possessory interests in that property." *Id.*

The author's inquiry is limited to the "search" aspect of the Fourth Amendment because use of the FLIR in no way "seizes" anything within the meaning of the Fourth Amendment; *State v. Young*, 867 P.2d 593, 601-04 (Wash. 1994). The scanning of a home to detect the amount of heat it is emitting may, however, constitute a "search" within the meaning of the Fourth Amendment. *Id.*

²² See, e.g., Amsterdam, *supra* note 1, at 388. "[I]f [a police activity] is not labeled a 'search' or 'seizure,' it is subject to no significant restrictions of any kind." *Id.* "It is only 'searches' or 'seizures' that the fourth amendment requires to be reasonable: police activities of any other sort may be as unreasonable as the police please to make them." *Id.*; see

triggers the Fourth Amendment and is subject to all its provisions.²³

In determining whether a "search" has taken place, the Supreme Court, since the seminal 1967 case of *Katz v. United States*,²⁴ has focused on the individual's expectation of privacy.²⁵ In *Katz*, the petitioner appealed from a conviction for transmitting wagering information by telephone across state lines in violation of a federal statute.²⁶ At trial, the government introduced recordings of the petitioner's telephone conversations, obtained by an electronic recording device attached to the outside of the public telephone booth which he had used.²⁷ In reversing the conviction, the Supreme Court held that the Fourth Amendment entitled the petitioner to believe that his conversation would remain private.²⁸ In reaching this conclusion, the Court dismissed the notion that physical intrusion is a prerequisite to the occurrence of a search.²⁹ Though agreeing that the conviction should be reversed, Justice Harlan chose to concur in order to solidify the expectation of privacy inquiry used by courts.³⁰

Justice Harlan's concurrence proposed a twofold requirement,³¹ under which a court must first determine whether the individual

also Horton v. Goose Creek Indep. Sch. Dist., 690 F.2d 470, 476 (5th Cir. 1982), *cert. denied*, 463 U.S. 1207 (1983). "If an activity is not a search or seizure . . . then the government enjoys a virtual *carte blanche* to do as it pleases." *Id.*; RONALD J. ALLEN & RICHARD B. KUHN, CONSTITUTIONAL CRIMINAL PROCEDURE 499 n.1 (2d ed. 1991) (noting that "deciding that government activity is not a search or seizure" is one way of "insulating the activity from Fourth Amendment restrictions.").

²³ See, e.g., *Amsterdam*, *supra* note 1, at 388. "[W]herever [the Fourth Amendment] restricts police activities at all, it subjects them to the same extensive restrictions that it imposes upon physical entries into dwellings." *Id.* Therefore, "[t]o label any police activity a 'search' or 'seizure' within the ambit of the amendment is to impose those restrictions upon it." *Id.*; see also *Horton*, 690 F.2d at 476. "The decision to characterize an action as a search is in essence a conclusion about whether the Fourth Amendment applies at all." *Id.*

²⁴ 389 U.S. 347 (1967).

²⁵ See, e.g., *United States v. Mohan Mankani*, 738 F.2d 538, 542 (2d Cir. 1984). "Whether overhearing this conversation constituted an unlawful search or seizure in violation of Fourth Amendment rights depends on whether these defendants under the circumstances had a reasonable expectation of privacy." *Id.*

²⁶ See *Katz v. United States*, 389 U.S. 347, 348 (1967).

²⁷ *Id.*

²⁸ *Id.* at 353.

²⁹ *Id.*

³⁰ *Id.* at 360 (Harlan, J., concurring).

³¹ See *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring). "My understanding of the rule that has emerged from prior decisions is that there is a twofold requirement, first 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.'" *Id.*; see also *United States v. Mohan Mankani*, 738 F.2d 538, 542 (2d Cir. 1984) (citation omitted). "Analysis must begin with *Katz v. United States*, which established the

challenging the alleged "search" manifested a subjective expectation of privacy.³² If the individual displayed such an expectation, the court must then determine whether that expectation is one which society is prepared to recognize as objectively reasonable.³³ If both conditions are satisfied, then a search, within the meaning of the Fourth Amendment, has occurred.³⁴ As a result, the acting arm of the government must have had a search warrant, based upon probable cause, at the time the state obtained the evidence in order for the search to have been constitutional.³⁵ In the absence of such a warrant, the evidence obtained would ordinarily be inadmissible pursuant to the exclusionary rule.³⁶

Courts have applied Justice Harlan's two fold test in numerous cases involving the utilization of sense-enhancing devices.³⁷ Due

expectation of privacy rationale as the touchstone governing the scope of Fourth Amendment protection." *Id.*

³² See, e.g., *California v. Greenwood*, 486 U.S. 35, 39 (1988) (reversing dismissal of conviction based on evidence obtained from warrantless search of defendant's garbage). The Supreme Court first analyzed respondents' assertion that they had manifested an expectation of privacy as to their trash. *Id.* The Court considered the fact that the trash was contained in an opaque plastic bag, left at curbside and was expected to be commingled with other trash. *Id.*

³³ See, e.g., *Oliver v. United States*, 466 U.S. 170, 177 (1984) (determining there was no reasonable expectation of privacy in open field of marijuana). "The [Fourth] Amendment does not protect the merely subjective expectation of privacy, but only those [expectations] that society is prepared to recognize as reasonable." *Id.* (second alteration in original); *Smith v. Maryland*, 442 U.S. 735, 741 (1979) (quoting *Katz*, 389 U.S. at 361). "The second question is whether the individual's subjective expectation of privacy is 'one that society is prepared to recognize as 'reasonable'—whether, in the words of the *Katz* majority, the individual's expectation, viewed objectively, is 'justifiable' under the circumstances." *Id.*

³⁴ See *Greenwood*, 486 U.S. at 39. "The warrantless search and seizure of the garbage bags left at the curb outside the Greenwood house would violate the Fourth Amendment only if respondents manifested a subjective expectation of privacy in their garbage that society accepts as objectively reasonable." *Id.*

³⁵ See, e.g., *Katz*, 389 U.S. at 357. "[S]earches conducted outside the judicial process, without prior approval of judge or magistrate, are *per se* unreasonable under the Fourth Amendment—subject only to a few specifically established and well-delineated exceptions." *Id.*; see also *United States v. Leon*, 468 U.S. 897, 905 (1984). The Supreme Court created a "good-faith" exception which allows the evidence to be used if a police officer reasonably relies on an apparently valid warrant which is later determined to be defective. *Id.*

³⁶ See *LAWRENCE C. WADDINGTON, ARREST, SEARCH AND SEIZURE 3* (1974). "The exclusionary rule was a judicially created rule of evidence barring judges and juries from considering any evidence seized in violation of the Fourth Amendment—no matter how relevant and material to the issue on trial—in determining guilt or innocence." *Id.*; see also *Mapp v. Ohio*, 367 U.S. 643, 659-60 (1961) (extending exclusionary rule to states). See generally Thomas F. LaMacchia, *The Exclusionary Rule*, 81 GEO. L.J. 1013, 1016-27 (1993) (tracing development of exclusionary rule); Potter Stewart, *The Road to Mapp v. Ohio and Beyond: The Origins, Development and Future of the Exclusionary Rule in Search-and-Seizure Cases*, 83 COLUM. L. REV. 1365, 1372-77 (1983) (examining adoption of exclusionary rule).

³⁷ See *Dow Chemical Co. v. United States*, 476 U.S. 227, 239 n.5 (1986) (noting photographs taken of Dow's plant do not infringe on any reasonable expectations of privacy); *United States v. Place*, 462 U.S. 696, 706-07 (1983) (recognizing individuals' privacy interest in contents of personal luggage); *United States v. Knotts*, 460 U.S. 276, 281 (1983)

to technological advances, investigating officers are now able to detect activity and objects otherwise undetectable by the human senses alone.³⁸ Generally, courts have been willing to permit the use of devices which merely served to enhance the basic human senses.³⁹ Courts have been reluctant, however, to grant complete freedom in this area and have thus held the use of some devices to be a "search."⁴⁰ The FLIR is an example of such a device which has left courts divided as to the constitutionality of its use.⁴¹

II. INFRARED IMAGING TECHNOLOGY

The FLIR is capable of portraying visual images of heat radiating from a target source.⁴² Infrared radiation is that part of the electromagnetic spectrum which is just beyond visible light, and thus undetectable by the naked eye.⁴³ Any object with a temperature above absolute zero will emit infrared radiation.⁴⁴ The

(noting person traveling in automobile on public road has no reasonable expectation of privacy).

³⁸ See *United States v. Karo*, 468 U.S. 705, 715 (1984) (noting monitoring of beeper revealed presence of container within home, a fact not visually verifiable); *Place*, 462 U.S. at 707 (noting ability to detect presence of contraband within luggage without exposing remaining contents).

³⁹ See *Dow Chemical*, 476 U.S. at 239 (holding use of sophisticated camera from public airspace to take pictures of industrial complex does not constitute search); *Place*, 462 U.S. at 707 (holding use of trained narcotics detection dog on temporarily seized luggage at airport does not constitute search); *Knotts*, 460 U.S. at 285 (holding tracking of beeper located within suspect's automobile does not constitute search).

⁴⁰ See *Karo*, 468 U.S. at 715 (holding monitoring of beeper while in home constitutes search because it reveals information otherwise undetectable by visual surveillance).

⁴¹ See *infra* note 62 (noting split in authority on constitutionality of FLIR use).

⁴² See, e.g., *United States v. Field*, 855 F. Supp. 1518, 1522 (W.D. Wis. 1994). The report and recommendation of the magistrate stated:

To use the Stinger, [a thermal imaging device,] the operator first warms up the imager and adjusts the controls so that the view screen shows actual objects with somewhat less detail than a television picture. Then the operator adjusts the brightness and gain so that there is a neutral starting position that will allow hotter and cooler objects to be visualized. The Stinger uses a "gray" scale, with white being the visual representation of the hot end of the scale and black being the visual representation of the cold end of the scale. "Hot" and "cold" are relative terms because the [device] does not quantify temperature; it simply provides a visual image showing which objects are radiating more or less heat than the baseline set by the operator during warmup. Often, but not always, the baseline will be the air temperature, the normal temperature of the structure being viewed, or both, since they tend to be the same at the time the [device] is used.

Id.

⁴³ See LAURENCE PRINGLE, *RADIATION: WAVES AND PARTICLES/BENEFITS AND RISKS* 7 (1983). In approximately 1800, Sir William Herschel, an English astronomer, discovered infrared energy. *Id.* The name of this radiation derives from "infra," which means "below," because the radiation has a lower frequency than visible light. *Id.*; MICHAEL I. SOBEL, *LIGHT* 19 (1987). Infrared radiation, although invisible, is reflected and refracted in a similar manner to light. *Id.*

⁴⁴ See SOBEL, *supra* note 43, at 19 (discussing sensation of heat produced by radiation).

greater the temperature of an object, the greater the amount of infrared radiation it emits.⁴⁵ The FLIR does not quantify temperature, but rather displays on a view screen the relative amounts of heat being emitted from all objects scanned.⁴⁶ The device is used either aerially, as when mounted to a helicopter,⁴⁷ or from ground-level.⁴⁸

While private industry recently started using thermal imaging for a variety of purposes,⁴⁹ the government has been using it since the 1950s.⁵⁰ Law enforcement agencies⁵¹ are increasingly using

⁴⁵ *Id.* at 75. "The hotter the object is, the greater will be the total amount of radiation coming from a given surface area." *Id.*

⁴⁶ *See, e.g., Field*, 855 F. Supp. at 1522 (discussing capabilities of FLIR in distinguishing relative amounts of heat between objects scanned); *see also* Transcript of Evidentiary Hearing at 51, *United States v. Field*, 855 F. Supp. 1518, 1531-32 (1994) (noting supersensitive FLIR capability indicating different images based upon differences of merely one degree Fahrenheit); DEA Manual, *supra* note 11, at 4 (confirming system sensitivity as accurate as one degree and noting object's temperature is not measured).

⁴⁷ *See* Holton, *supra* note 5, at 52 (noting FLIR can be installed in gimbals on light planes or helicopters); *see also* Paul Proctor, *Police Unit Expands Capabilities With Flir-Equipped Helicopters*, AVIATION WEEK & SPACE TECH., Dec. 15, 1986, at 90 (noting FLIR use on single-engine helicopters).

⁴⁸ *See, e.g., United States v. Porco*, 842 F. Supp. 1393, 1396 (D. Wyo. 1994) (noting FLIR can be "hand held unit"), *aff'd sub nom. United States v. Cusumano*, 67 F.3d 1497 (10th Cir. 1995); *State v. McKee*, 510 N.W.2d 807, 808 (Wis. Ct. App. 1993) (stating officer examined defendant's home with thermal imager from parked vehicle).

⁴⁹ *See, e.g., United States v. Penny-Feeney*, 773 F. Supp. 220, 223 n.4 (D. Haw. 1991), *aff'd sub nom. United States v. Feeney* 984 F.2d 1053 (9th Cir. 1993). Uses of FLIRs include the "identification of inefficient building insulation, the detection of hot, overloaded power lines, and the detection of forest fire lines through smoke." *Id.*; DEA Manual, *supra* note 11, at 3. "Civilian application of the technology has been lacking, but this trend is changing as the technology has become less expensive, more mobile, and easier to operate and maintain." *Id.* "Some of today's common, nonmilitary applications are: moisture detection in roofs, building energy loss surveys, and electrical-mechanical preventative maintenance evaluations." *Id.*; Arthur Stout, *IR Images Aid Environmental Sleuths*, PHOTONICS SPECTRA, Dec. 1991, at 117 (noting use of infrared thermography to locate underground objects due to heating and cooling rate differences between objects and surrounding soil).

⁵⁰ *See, e.g., DEA Manual, supra* note 11, at 3 (reporting military use of thermal detection technology since 1950s); *see also* Frank, *supra* note 5, at 45. "IR [Infrared Radiation] cameras can even detect whether a vehicle has been moved from an area by sensing the thermal energy left by the vehicle at its previous location." *Id.* "IR images can also help ascertain whether guns or explosives have been fired or detonated recently." *Id.*; Stuart W. Greenwood, *The Application of Imaging Sensors to Aircraft Landings in Adverse Weather*, MICROWAVE J., Sept. 1992, at 80. FLIRs are also used to aid in aircraft landing under conditions of reduced visibility. *Id.*; Proctor, *supra* note 47, at 90. FLIRs are used by police departments to conduct searches for lost children and the searches are faster and more cost-effective than conventional manpower searches. *Id.* In addition, the FLIR is "capable of picking out abandoned getaway cars from crowded parking areas by the heat generated by their tires, engine and exhaust system." *Id.* at 93; Arthur Stout, *IR Images Track Heat Sources To Make Things Smarter*, R & D MAG., Feb. 1992, at 46. "[Infrared thermography] was . . . largely responsible for the [Persian Gulf] war's brevity, as IR-equipped aircraft and tanks found their Iraqi targets with unerring accuracy." *Id.*

⁵¹ *See, e.g., United States v. Ishmael*, 843 F. Supp. 205, 208 (E.D. Tex. 1994) (noting surveillance is sometimes conducted by Drug Enforcement Administration Task Force Officers), *rev'd*, 48 F.3d 850 (5th Cir.), *cert. denied*, 116 S. Ct. 74 (1995).

the FLIR in an attempt to uncover indoor marijuana growing⁵² operations.⁵³ Such operations require light sources⁵⁴ which generate large amounts of heat;⁵⁵ it is this heat that is susceptible to detection by the FLIR.⁵⁶ Police officers use high heat readings to support an application for a warrant to search the premises from which the reading was obtained.⁵⁷ A number of defendants who have been prosecuted on the evidence obtained from these searches have challenged FLIR use as a violation of their Fourth Amendment rights.⁵⁸

⁵² See *Penny-Feeney*, 773 F. Supp. at 224 (noting marijuana growers' preference for indoor cultivation since it is not dependent on weather conditions and cannot be detected by naked eye); Terry Glavin, *Growing Their Own Way*, VANCOUVER SUN, Jan. 11, 1992, at A1 (estimating earnings can reach as much as \$3,000 per plant per year); *Marijuana Retains Popularity Despite Anti-Drug Attitudes*, DALLAS TIMES HERALD, Nov. 18, 1990, at A6 (noting marijuana as most popular illegal drug as of 1990); Joseph B. Treaster, *Urban Grow-It-Yourselfers Cash In on Marijuana*, N.Y. TIMES, Aug. 5, 1994, at B3 (discussing extensive practice of indoor marijuana growing in New York City); Gordon Witkin, *Inside the High-Flying Pot Industry*, U.S. NEWS & WORLD REPORT, Nov. 6, 1989, at 27, 28 (noting government crackdowns on foreign marijuana and domestic outdoor growing have led to increase in indoor growing operations).

⁵³ See Transcript of Evidentiary Hearing at 30, *United States v. Field*, 855 F. Supp. 1518, 1521-22 (W.D. Wis. 1994). During direct examination, Captain Russell, the officer who took the FLIR readings, discussed his training for FLIR operation as 10 days in a Drug Enforcement Agency thermal imagery system course. *Id.* "[T]he majority of the course was designed for the indoor marijuana growing operation portion of it." *Id.*

⁵⁴ See, e.g., *Penny-Feeney*, 773 F. Supp. at 222 (noting lights used in marijuana growing operation were "of the thousand watt variety"); Ed Rosenthal, *Pot Moves Inside*, WHOLE EARTH REV., Spring 1987, at 62, 64 (stating single marijuana growing light "burns about as much electricity as two twenty-one inch color televisions").

⁵⁵ See, e.g., *United States v. Pinson*, 24 F.3d 1056, 1057 (8th Cir. 1994) (noting bulbs needed to grow marijuana indoors can result in temperatures in excess of 150 degrees), *cert. denied*, 115 S. Ct. 664 (1994).

⁵⁶ See, e.g., *id.* at 1057. "[T]he FLIR observation revealed that the covered window on the third floor displayed an excessive amount of heat as did the roof and a skylight of the residence." *Id.*; *United States v. Ishmael*, 843 F. Supp. 205, 208 (E.D. Tex. 1994), *rev'd*, 48 F.3d 850 (5th Cir.), *cert. denied*, 116 S. Ct. 74 (1995). The court noted that the "video tape made during the fly-over show[ed] that the metal building and a nearby brush pile were considerably hotter than the surrounding land and woods." *Id.*; *United States v. Porco*, 842 F. Supp. 1393, 1396 (D. Wyo. 1994), *aff'd sub nom. United States v. Cusumano*, 67 F.3d 1497 (10th Cir. 1995). "[T]he reading of the front side of the house showed several hot spots emanating from the front door and the roof of the residence." *Id.*; *State v. Young*, 867 P.2d 593, 595 (Wash. 1994). "The foundation of the home was shown to be warm in certain spots, indicating the downstairs was warmer than the upstairs." *Id.*

⁵⁷ See *United States v. Domitrovich*, 852 F. Supp. 1460, 1472 (E.D. Wash. 1994), *aff'd*, 57 F.3d 1078 (9th Cir. 1995). "Probable cause was predicated—in part—upon the heat emissions disclosed by the thermal imaging device." *Id.*

⁵⁸ See *Pinson*, 24 F.3d at 1058 (discussing defendant's assertion that FLIR monitoring without warrant constituted unreasonable search and seizure in violation of Fourth Amendment); see also *United States v. Olson*, 21 F.3d 847, 849 (8th Cir. 1994), *cert. denied*, 115 S. Ct. 230 (1994); *United States v. Deaner*, 1 F.3d 192, 195 (3d Cir. 1993); *United States v. Feeney*, 984 F.2d 1053, 1054 (9th Cir. 1993); *United States v. Field*, 855 F. Supp. 1518, 1518 (W.D. Wis. 1994); *Domitrovich*, 852 F. Supp. at 1472; *Ishmael*, 843 F. Supp. at 209; *Porco*, 842 F. Supp. at 1396; *United States v. Casanova*, 835 F. Supp. 702, 705 (N.D.N.Y. 1993); *United States v. Kylo*, 809 F. Supp. 787, 791 (D. Or. 1992), *aff'd in part*

III. WHETHER USE OF THE FLIR CONSTITUTES A "SEARCH" WITHIN THE MEANING OF THE FOURTH AMENDMENT?

A. *FLIR Analysis Under the Expectation of Privacy Test*

The threshold question in determining the constitutionality of FLIR use for detection of indoor marijuana cultivation is whether such detection constitutes a "search" within the meaning of the Fourth Amendment.⁵⁹ If this application of infrared technology is not a "search," then the Fourth Amendment is simply not applicable and consequently, the government need not show probable cause for its use.⁶⁰ On the other hand, if such utilization of the FLIR is interpreted to be a "search," the Fourth Amendment applies and the government is required to make a showing of probable cause.⁶¹

Courts that have addressed the constitutionality of FLIR use for detection of indoor marijuana cultivation thus far have all applied the "expectation of privacy" test to determine whether a "search" occurred. The courts have varied the focus of the inquiry, however, and thus have divided on the issue of what constitutes a search.⁶²

and vacated in part, 37 F.3d 526 (9th Cir. 1994); *United States v. Penny-Feeney*, 773 F. Supp. 220, 225 (D. Haw. 1991), *aff'd sub nom. United States v. Feeney*, 984 F.2d 1053 (9th Cir. 1993); *Young*, 867 P.2d at 594; *State v. McKee*, 510 N.W.2d 807, 808 (Wis. Ct. App. 1993).

⁵⁹ See *WHITEBREAD*, *supra* note 20, § 4.01 (noting preliminary question to be asked in Fourth Amendment analysis).

⁶⁰ See *supra* note 22 (noting Fourth Amendment limitations apply only to "searches" or "seizures").

⁶¹ See *supra* note 23 (noting "search" or "seizure" triggers application of Fourth Amendment).

⁶² A number of courts have held that FLIR use to detect indoor marijuana growing does not constitute a search. See *United States v. Pinson*, 24 F.3d 1056, 1059 (8th Cir.), *cert. denied*, 115 S. Ct. 664 (1994); *United States v. Domitrovich*, 852 F. Supp. 1460, 1475 (E.D. Wash. 1994), *aff'd*, 57 F.3d 1078 (9th Cir. 1995); *United States v. Porco*, 842 F. Supp. 1393, 1400 (D. Wyo. 1994), *aff'd sub nom. United States v. Cusumano*, 67 F.3d 1947 (10th Cir. 1995); *United States v. Kyllo*, 809 F. Supp. 787, 792 (D. Or. 1992), *aff'd in part and vacated in part*, 37 F.3d 526 (9th Cir. 1994); *United States v. Deaner*, Nos. 1:CR-92-0090-01 & 1:CR-92-0090-02, 1992 U.S. Dist. LEXIS 13046, at *11 (M.D. Pa. July 27, 1992); *United States v. Penny-Feeney*, 773 F. Supp. 220, 228 (D. Haw. 1991), *aff'd sub nom. United States v. Feeney*, 984 F.2d 1053 (9th Cir. 1993); *State v. McKee*, 510 N.W.2d 807, 810 (Wis. Ct. App. 1993).

For courts holding that FLIR use to detect indoor marijuana growing does constitute a search, see *United States v. Field*, 855 F. Supp. 1518, 1519 (W.D. Wis. 1994); *State v. Young*, 867 P.2d 593, 601 (Wash. 1994).

Some courts have chosen not to decide the issue at all, primarily because they found that probable cause existed independent of the FLIR evidence. See *United States v. Olson*, 21 F.3d 847, 849 (8th Cir. 1994), *cert. denied*, 115 S. Ct. 230 (1994); *United States v. Deaner*, 1 F.3d 192, 196 (3d Cir. 1993); *United States v. Feeney*, 984 F.2d 1053, 1055 (9th Cir. 1993); *United States v. Casanova*, 835 F. Supp. 702, 708 (N.D.N.Y. 1993).

In finding that infrared detection of indoor marijuana growing constitutes a "search," courts have channelled the expectation of privacy inquiry to the activity in question, specifically, the actual cultivating of marijuana.⁶³ These courts, having held that the individuals in question manifested a reasonable expectation of privacy in the growing of marijuana, thus found the actions of law enforcement officers to constitute a search.⁶⁴

For instance, in *State v. Young*,⁶⁵ the defendant sought to suppress evidence of a marijuana growth operation seized from his home pursuant to a search warrant.⁶⁶ FLIR heat readings of the defendant's home were utilized to establish probable cause for a search warrant.⁶⁷ The defendant contended that as FLIR use in and of itself required a warrant, any evidence obtained pursuant to its warrantless use was inadmissible.⁶⁸ In holding that use of the FLIR constituted a search, the Supreme Court of the state of Washington reasoned that the defendant had a reasonable expectation of privacy in his *conduct* while in his home.⁶⁹

In contrast, the courts which have held that FLIR detection of indoor marijuana growing does not constitute a search have evaluated the defendants' expectation of privacy in the *heat emanations*.⁷⁰ These courts have consistently and heavily relied on the reasoning of the United States District Court of Hawaii in *United States v. Penny-Feeney*.⁷¹ As in *Young*, the defendants in *Penny-*

⁶³ See *State v. Young*, 867 P.2d 593, 601 (Wash. 1994) (noting individual has reasonable expectation of privacy in conduct occurring in home).

⁶⁴ *Id.* at 604.

⁶⁵ 867 P.2d 593 (Wash. 1994).

⁶⁶ *Id.* at 595.

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ See *id.* at 603. "[T]he infrared thermal device allows the government to intrude into the defendant's home and gather information about what occurs there. A resident has a reasonable expectation of privacy in what occurs within the home." *Id.*

⁷⁰ See, e.g., *United States v. Pinson*, 24 F.3d 1056, 1058 (8th Cir.), *cert. denied*, 115 S. Ct. 664 (1994). "[I]n this case there is no reasonable expectation of privacy in heat which Pinson voluntarily vented outside." *Id.*; *United States v. Domitrovich*, 852 F. Supp. 1460, 1472-73 (E.D. Wash. 1994), *aff'd*, 57 F.3d 1078 (9th Cir. 1995). "The question, then, is whether the defendant's conduct reflected an expectation that the heat escaping from his marijuana growing would remain private." *Id.*; *United States v. Porco*, 842 F. Supp. 1393, 1397 (D. Wyo. 1994) (analyzing reasonableness of defendants' "expectation of privacy in the heat emanating from their residence"), *aff'd sub nom. United States v. Cusumano*, 67 F.3d 1947 (10th Cir. 1995); *United States v. Deaner*, Nos. 1:CR-92-0090-01 & 1:CR-92-0090-02, U.S. Dist. LEXIS 13046, *9 (M.D. Pa. July 27, 1992). "[T]here is no expectation of privacy as to heat emanating from one's home." *Id.*; *State v. McKee*, 510 N.W.2d 807, 809 (Wis. Ct. App. 1993) (examining "expectation of privacy with respect to any heat emanating from the basement").

⁷¹ 773 F. Supp. 220 (D. Haw. 1991), *aff'd*, 984 F.2d 1053 (9th Cir. 1993).

Feeney sought to exclude evidence of marijuana growth obtained pursuant to a search warrant partially based on heat readings obtained by a FLIR.⁷² In applying the expectation of privacy test to the *heat emissions*,⁷³ the court held that the warrantless use of a FLIR does not constitute a "search" within the meaning of the Fourth Amendment.⁷⁴

In order to determine which of these approaches represents the proper application of the expectation of privacy standard, one must carefully examine the reasoning used by the Supreme Court in *Katz* itself. There, the Supreme Court held that the "[g]overnment's activities in electronically listening to and recording the petitioner's words violated the privacy upon which he justifiably relied."⁷⁵ The Court acknowledged petitioner's expectation of privacy in the "words" he spoke⁷⁶ or, more precisely, in the message he was attempting to convey.⁷⁷ *Katz* intended and expected the ideas he imparted to remain private.⁷⁸ The individual words themselves merely provided the vehicle for expressing those ideas. The heart of *Katz's* communication was the meaning of the words in their entirety to an officer of the law. For instance, if a passerby who understood no English had overheard *Katz's* words, it would not have constituted an invasion of *Katz's* privacy because the passerby would have been unable to decipher the underlying meaning of the words spoken.

Just as *Katz's* words only served to express his underlying message, the defendants' use of heat only served to grow marijuana; thus, it is the actual growing which lies at the heart of their expectation of privacy.⁷⁹ Therefore, the focus of the expectation of privacy inquiry should be on the actual production of marijuana and not the heat used to implement the growth. In these cases,

⁷² *Id.* at 225.

⁷³ *See id.* at 226. "The question under *Katz* thus becomes whether movants had a legitimate expectation of privacy in this 'heat waste.'" *Id.*

⁷⁴ *Id.* at 228.

⁷⁵ *Katz v. United States*, 389 U.S. 347, 353 (1967).

⁷⁶ *See id.* at 352. "[*Katz* is] surely entitled to assume that the words he utters into the mouthpiece will not be broadcast to the world." *Id.*

⁷⁷ *See id.* at 352-61 (evidenced by repeated use of words "communication" and "conversation" in majority and concurring opinions); *see also* Cheryl K. Corrada, Comment, *Dow Chemical and Ciruolo: For Government Investigators the Sky's No Limit*, 36 CATH. U. L. REV. 667, 678 (1987) (noting *Katz's* reasonable expectation of privacy in "convey[ing] his message").

⁷⁸ *Katz*, 389 U.S. at 352-61.

⁷⁹ *See supra* notes 63-69 and accompanying text (noting expectation of privacy was in activity).

the individuals' expectation of privacy in the growing of marijuana is evidenced by their willingness to spend substantial sums of money to grow it indoors, hidden from easy detection.⁸⁰ Although the application of *Katz's* two-prong test to the marijuana growing is troublesome because it allows for recognition of a reasonable expectation of privacy while conducting an illegal activity, the application of the expectation of privacy test to the heat emissions seriously misconstrues the underpinnings of the test as set forth in *Katz*.⁸¹

Penny-Feeney and its adherents have also disregarded another indispensable aspect of the *Katz* opinion. In characterizing the FLIR as a "passive, non-intrusive instrument"⁸² which "does not send any beams or rays into the area on which it is fixed or in any way penetrate structures within that area,"⁸³ *Penny-Feeney* retreats to the very notion abandoned by the Supreme Court in *Katz*. *Katz* clearly withdrew Fourth Amendment analysis from property law in holding that "the Fourth Amendment protects people and not simply 'areas' . . . [and] that the reach of that Amendment cannot turn upon the presence or absence of a physical intrusion" ⁸⁴

B. *The FLIR's Unique Capabilities Require an Analysis Without Resort to Analogies*

The courts that have held that FLIR use for marijuana detection is not a search have repeatedly struggled to fit FLIR analysis into existing analytical frameworks.⁸⁵ Like the infamous square peg in the round hole, however, the fit is not a natural one. The multiple problems with these analogies arise as a result of the uniqueness of the FLIR. The capabilities of the FLIR, like those of

⁸⁰ See Rosenthal, *supra* note 54, at 66 (noting cost of electricity for indoor growing operations is about \$300 per month); see also Witkin, *supra* note 52, at 28 (noting indoor marijuana growing requires "high-intensity lamps, conveyors, timers, fans, sprinklers and automatic fertilizing systems").

⁸¹ Cf. H. Paul Honsinger, *Katz and Dogs: Canine Sniff Inspections and the Fourth Amendment*, 44 LA. L. REV. 1093, 1103 (1984) (noting theory that dog sniff is of air space around object rather than of object itself misconstrues reasonable expectation of privacy test).

⁸² *United States v. Penny-Feeney*, 773 F. Supp. 220, 223 (D. Haw. 1991), *aff'd sub nom. United States v. Feeney*, 984 F.2d 1053 (9th Cir. 1993).

⁸³ *Id.*

⁸⁴ *Katz v. United States*, 389 U.S. 347, 351 (1967). "[T]he Fourth Amendment protects people, not places." *Id.*

⁸⁵ See *infra* notes 86, 102.

any new technological device, virtually demand that courts approach the analysis from a new and innovative perspective.

Courts have likened the heat emissions from a home to waste or garbage placed on the street for collection.⁸⁶ In *California v. Greenwood*,⁸⁷ the Supreme Court held that police searches of sealed bags of garbage placed at curbside for collection are not "searches" within the meaning of the Fourth Amendment.⁸⁸ The *Greenwood* Court found that the defendants had "placed their refuse at the curb for the express purpose of conveying it to a third party, the trash collector, who might himself have sorted through respondent's trash or permitted others, such as the police, to do so."⁸⁹ Consequently, the Court determined that the defendants' expectation of privacy in the contents of their garbage bags was not objectively reasonable.⁹⁰

Greenwood's reasoning is inapplicable to FLIR detection of marijuana growing for several reasons.⁹¹ First, there is an inherent difference between heat, which escapes naturally and automatically, regardless of the wishes of the owner, and garbage, which the owner must physically remove from the premises.⁹² In addition, even persons who vent heat from their homes clearly do not do so in an effort to convey it to a third party.⁹³

Furthermore, because garbage bags are commonly left at curbside, a person can rummage through another's trash without the

⁸⁶ See, e.g., *United States v. Pinson*, 24 F.3d 1056, 1058 (8th Cir.), cert. denied, 115 S. Ct. 664 (1994); *United States v. Domitrovich*, 852 F. Supp. 1460, 1474 (E.D. Wash. 1994), aff'd, 57 F.3d 1078 (9th Cir. 1995); *United States v. Porco*, 842 F. Supp. 1393, 1396-97 (D. Wyo. 1994), aff'd sub nom. *United States v. Cusumano*, 67 F.3d 1947 (10th Cir. 1995); *United States v. Deaner*, Nos. 1:CR-92-0090-01 & 1:CR-92-0090-02, 1992 U.S. Dist. LEXIS 13046, *7-9 (M.D. Pa. July 27, 1992); *Penny-Feeney*, 773 F. Supp. at 226; *State v. McKee*, 510 N.W.2d 807, 810 (Wis. Ct. App. 1993).

⁸⁷ 486 U.S. 35 (1988).

⁸⁸ *Id.* at 37.

⁸⁹ *Id.* at 40.

⁹⁰ *Id.* at 40-41.

⁹¹ See, e.g., *State v. Young*, 867 P.2d 593, 602-03 (Wash. 1994) (rejecting rationales of *Greenwood* as inapplicable to FLIR detection of heat produced by marijuana growing).

⁹² See *Young*, 867 P.2d at 602. "Heat, unlike garbage, automatically leaves a person's home without any deliberate participation by the homeowner." *Id.*

⁹³ See *id.* at 602-03. "Even if some heat is vented to the outside . . . the device detects all heat leaving the home, not just the heat directed out through the vent." *Id.* But see *United States v. Penny-Feeney*, 773 F. Supp. 220, 225 (D. Haw. 1991), aff'd sub nom. *United States v. Feeney*, 984 F.2d 1053 (9th Cir. 1993). "Here, the record reveals that defendants did not manifest an actual expectation of privacy in the heat waste since they voluntarily vented it outside the garage where it could be exposed to the public . . ." *Id.* In such cases, although the emanation of heat is somewhat more analogous to the removal of garbage, the existence of a pure conveyance to a third party is still absent. *Id.*

need to trespass on the premises.⁹⁴ It seems, however, that the human senses could only detect heat emissions of the levels at issue here from immediately next to a house, if at all. In most cases, the police would be required to get a warrant in order to lawfully be this close to the home.⁹⁵ Thus, unlike the contents of a garbage bag, the heat may be detected *only* through the use of a sophisticated sense-enhancing device.⁹⁶ Indeed, law enforcement officials would not resort to such an expensive, technologically advanced method of detection if there were an easier alternative.⁹⁷

The need for a high-tech device to detect heat obviates the fact that ordinary citizens do not possess this capability.⁹⁸ While trash on the street is easily accessible,⁹⁹ the high cost of the FLIR renders it virtually unavailable to the general public.¹⁰⁰ Consequently, a member of the public at large simply does not have the means to evaluate heat emissions from another person's house as easily as he could rummage through that person's trash.

A second analogy drawn by those courts holding that FLIR use does not constitute a search is to compare the activity to the use of dogs specially trained¹⁰¹ to sniff for narcotics.¹⁰² Some courts

⁹⁴ See, e.g., *California v. Greenwood*, 486 U.S. 35, 37 (1988) (noting garbage bags were collected from street in front of defendant's house).

⁹⁵ See, e.g., *United States v. Field*, 855 F. Supp. 1518, 1533 (W.D. Wis. 1994) (alluding to distance from which FLIR can detect heat emissions).

⁹⁶ See Lisa J. Steele, *Waste Heat and Garbage: The Legalization of Warrantless Infrared Searches*, 29 CRIM. L. BULLETIN, 19, 29 (1993). "It takes no special senses or equipment for an animal, child, scavenger, or snoop to examine a garbage container, other than perhaps a strong stomach. However, the infrared emissions from the *Peeney-Feeney* home could only have been detected with specialized commercial equipment." *Id.*

⁹⁷ Cf. Honsinger, *supra* note 81, at 1104. "If there were no difference between [a dog's and an officer's nose], no rational law enforcement agency would invest the substantial resources necessary to acquire, train, and maintain the animals." *Id.*

⁹⁸ See *State v. Young*, 867 P.2d 593, 603 (Wash. 1994). "[I]t is difficult to say one should expect other people to use sophisticated infrared instruments on one's home to view so-called heat waste." *Id.*

⁹⁹ *California v. Greenwood*, 486 U.S. 35, 40 (1988). "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." *Id.*

¹⁰⁰ See *Holton*, *supra* note 5, at 52. The author states: "Some of the major defense contractors have sought to move into law enforcement, but their FLIR systems can start at about \$750,000; commercial-grade FLIRs mounted in a gimbal start at closer to \$125,000 . . ." *Id.*; cf. *Florida v. Riley*, 488 U.S. 445, 460 (1989) (Brennan, J., dissenting) (noting police officer's use of helicopter made his "ability to see over [defendant's] fence depend[ent] on his use of very expensive and sophisticated piece of machinery to which few ordinary citizens have access").

¹⁰¹ See, e.g., *United States v. Solis*, 536 F.2d 880, 882 (9th Cir. 1976) (noting "because of their keen olfactory sense," dogs are commonly used to detect contraband).

¹⁰² See, e.g., *United States v. Pinson*, 24 F.3d 1056, 1058 (8th Cir.), *cert. denied*, 115 S. Ct. 664 (1994); *United States v. Penny-Feeney*, 773 F. Supp. 220, 226 (D. Haw. 1991), *aff'd*

which have drawn this analogy have relied on *United States v. Place*.¹⁰³ There, the Supreme Court held that a dog sniffing luggage, not in the owner's possession does not constitute a search requiring a warrant.¹⁰⁴ The Court characterized such a dog sniff as non-intrusive because it "discloses only the presence or absence of narcotics [and] the information obtained is limited."¹⁰⁵ The Court noted its "aware[ness] of no other investigative procedure that is so limited both in the manner in which the information is obtained and in the content of the information revealed by the procedure."¹⁰⁶

Other courts that have likened FLIR use to dog sniffs have relied heavily on *United States v. Solis*.¹⁰⁷ *Solis* involved the use of a trained dog to detect the presence of marijuana odor emanating from a publicly parked trailer.¹⁰⁸ In holding that this method of detection did not constitute a search, the court reasoned that the defendants should have expected the odor to emanate from the trailer and, furthermore, that the dog search was neither offensive nor embarrassing.¹⁰⁹

Comparing FLIR use to a dog sniff is flawed in several respects. First, a drug sniffing dog can only detect the presence of narcotics from a relatively short distance away.¹¹⁰ The FLIR's range of detection, however, stems beyond the perimeter of the target property, and thus can be used without the prior consent of the property owner.¹¹¹

sub nom. *United States v. Feeney* 984 F.2d 1053 (9th Cir. 1993); *State v. McKee*, 510 N.W.2d 807, 810 (Wis. Ct. App. 1993).

¹⁰³ 462 U.S. 696 (1983).

¹⁰⁴ *See id.* at 697-98. "[T]emporarily detaining personal luggage for exposure to a trained narcotics detection dog on the basis of reasonable suspicion that the luggage contains narcotics" does not constitute a search. *Id.* However, the Supreme Court affirmed the reversal of the conviction, on the ground that the DEA agents' detention of the luggage was for too long a period of time. *Id.* at 710.

¹⁰⁵ *Id.* at 707.

¹⁰⁶ *Id.*; *see also* *State v. Young*, 867 P.2d 593, 603 (Wash. 1994). "The canine sniff is distinct from other investigative procedures, both in the manner in which the evidence is obtained and the content of the information revealed." *Id.*

¹⁰⁷ 536 F.2d 880 (9th Cir. 1976).

¹⁰⁸ *Id.* at 881.

¹⁰⁹ *Id.* at 882-83.

¹¹⁰ *See United States v. Field*, 855 F. Supp. 1518, 1533 (W.D. Wis. 1994). "[T]his court is aware of no such canine capable of detecting and pinpointing the location of contraband at a constant distance of 20 meters, let alone 200 meters." *Id.*; *Solis*, 536 F.2d at 881 (noting dog's detection of marijuana from 25 yards away).

¹¹¹ *See Field*, 855 F. Supp. at 1533. "Thus, a homeowner has some protection from the random use of a drug sniffing dog: unless the homeowner invites the police onto his prop-

The second major distinction between dog sniffs and FLIR use regards the intrusive nature of the latter.¹¹² When sniffing a given container, the dogs are trained to respond to the presence of a specific narcotic.¹¹³ Subsequently, the dog will either signal, indicating the presence of narcotics, or not signal at all. In either instance, the dog reveals no information regarding the remaining contents of the container.¹¹⁴ FLIRs, however, in detecting relative amounts of heat radiating, reveal heat emanations from legal as well as illegal sources within the home.¹¹⁵ Thus, FLIR is a more intrusive detection technique than a dog sniff.¹¹⁶

The final distinction involves the inability of a FLIR operator to draw any well-grounded conclusion from a heat reading. An officer using a drug sniffing dog may assuredly conclude whether the target of the sniff contains contraband based on the presence or absence of the dog's signal.¹¹⁷ Conversely, the strongest conclusion that a FLIR operator may draw is that the target house is emitting a relatively greater amount of heat than a neighboring home. Otherwise, the FLIR fails to provide any concrete information as to the actual presence or absence of a growth operation since the heat could be generated by any one of a number of sources.¹¹⁸ Even assuming the heat is being generated by a heat lamp, use of such a lamp is not *per se* illegal.

erty (or they have some other legal right to be present), the dog must operate outside the limits of the curtilage, which typically would prevent an unconsented search." *Id.*

¹¹² See *United States v. Deane*, Nos. 1:CR-92-0090-01 & 1:CR-92-0090-02, 1992 U.S. Dist. LEXIS 13046 at *11 (M.D. Pa. July 27, 1992). "[T]he FLIR is incapable of providing definitive information as to what is happening behind closed doors other than the generation of heat. A marijuana-sniffing dog, on the other hand, gives a decisive indication as to the presence of an illegal substance behind closed doors." *Id.*

¹¹³ See, e.g., *United States v. Place*, 462 U.S. 696, 699 (1983) (indicating dog reacted positively to presence of cocaine in luggage).

¹¹⁴ See *Place*, 462 U.S. at 707. "[T]he sniff only discloses the presence or absence of narcotics, a contraband item." *Id.*; *United States v. Solis*, 536 F.2d 880, 881 (9th Cir. 1976) (noting testimony indicated marijuana-sniffing dogs were "extremely reliable").

¹¹⁵ See *United States v. Field*, 855 F. Supp. 1518, 1525 (W.D. Wis. 1994) (noting dehumidifier within closet was mistaken for marijuana growth operation). "[T]he thermal imager picks up information of lawful activities as well as unlawful." *Id.* at 1519.

¹¹⁶ See *id.* at 1533. "[A] properly trained drug sniffing dog is more precise than a heat imager because the dog is trained to alert only to contraband. A thermal imager visualizes all the heat it registers, regardless of the source of the radiation." *Id.*

¹¹⁷ See *supra* note 114 and accompanying text (discussing accuracy and reliability of trained narcotics dogs).

¹¹⁸ See, e.g., *Field*, 855 F. Supp. at 1520 n.7. "[T]here is no doubt that a properly trained operator using a thermal imager could, under appropriate conditions, detect if a guest room was radiating heat, indicating that a visitor was present, or could detect heat radiating from a bathroom as a result of the prolonged presence of hot water from a bath or shower and/or heat lamps, or could detect heat from a television near the window of the living

IV. A NEW PROPOSED TEST

The problematic nature of the "expectation of privacy" test,¹¹⁹ as applied to the constitutionality of police use of new technology,¹²⁰ demonstrates the need for a new and more appropriate threshold to be met by government agencies prior to the use of surveillance or investigative devices.¹²¹ To determine whether use of a given technological device constitutes a "search" within the meaning of the Fourth Amendment, courts should engage in a two-part inquiry. Courts should first examine whether the device or method used reveals *only* the presence or absence of illegal activity. If so, secondly, courts should determine whether the information obtained from the device is *conclusive* as to the presence of illegal activity.

The following hypothetical illustrates the operation of such an inquiry. Assume there exists a device capable of detecting cocaine within any structure. The device would only reveal whether cocaine is present without providing any other information as to the container's contents. Furthermore, a positive reading would mean that cocaine is definitely present. With this instrument, a police officer could readily ascertain whether a given house contained cocaine without interfering with the resident's use of the premises, and without revealing any other information regarding the contents of the home. Such a device, by providing conclusive information solely as to illegal activity within the home, would satisfy both prongs of our proposed standard.

Presently, no device exists which satisfies this test. However, as technology progresses and assuming such a device is created, it

room, indicating which room in the house was in use by the occupants." *Id.*; *State v. Young*, 867 P.2d 593, 595 (Wash. 1994). "The device can detect a human form through an open window when the person is leaning against a curtain, and pressing the curtain between the window screen and his or her body." *Id.* "The device can also detect the warmth generated by a person leaning against a relatively thin barrier such as a plywood door." *Id.*

¹¹⁹ See, e.g., Edmund W. Kitch, *Katz v. United States: The Limits of the Fourth Amendment*, 1968 SUP. CT. REV. 133, 152 (finding *Katz* test "satisfactory in the context of *Katz*" but providing little help in resolving how to apply Fourth Amendment to more difficult situations); Note, *Tracking Katz: Beepers, Privacy and the Fourth Amendment*, 86 YALE L.J. 1461, 1473-74 (1977). "This use of the Harlan [two-prong expectation of privacy] test produces confused and unprincipled judicial decisions." *Id.*

¹²⁰ See John R. Dixon, *Warrantless Aerial Surveillance and the Open View Doctrine: Florida v. Riley*, 17 FLA. ST. U. L. REV. 157, 162 (1989) (recognizing difficulty in applying reasonable expectation of privacy test to advancing technology such as aerial surveillance).

¹²¹ See *supra* note 25 and accompanying text (indicating that courts currently apply the expectation of privacy test).

should be used without Fourth Amendment limitation¹²² in the interest of stemming the unbridled flow of crime.¹²³ A police officer could constitutionally use such an instrument without a search warrant or probable cause to scan a home for the presence or absence of illegal activity.¹²⁴ If, on the other hand, the device also detects legal activity, the risk of intrusion on fundamental constitutional rights dictates that law enforcement officials could not constitutionally use it without first obtaining a search warrant.

Our proposed threshold is based upon the principles which the Framers of the Fourth Amendment intended the provision to encompass.¹²⁵ Courts have repeatedly emphasized the Framers' intent to protect the innocent, which may incidentally result in the protection of the guilty as well.¹²⁶ The Framers thus protected the rights of all persons, law-abiding or not, as a "necessary evil."¹²⁷ Therefore, the use of a device capable only of conclusively detecting a particular illegal activity should pass constitutional muster, since it would ensnare only those persons who violate the law.

Many people are likely to disagree with this proposal because it would allow use of such a device on the home. Although the home and the activities conducted therein have traditionally received greater protection from governmental intrusion,¹²⁸ the notion that

¹²² Cf. Arnold H. Loewy, *The Fourth Amendment as a Device for Protecting the Innocent*, 81 MICH. L. REV. 1229, 1246 (1983). "[I]f a device could be invented that accurately detected weapons and did not disrupt the normal movement of people, there could be no Fourth Amendment objection to its use." *Id.*

¹²³ See Cooper, *supra* note 7, at 243 (noting rise in federal spending from \$1.5 billion in 1981 to almost \$12 billion in 1992 to combat drugs).

¹²⁴ *United States v. Poller*, 43 F.2d 911, 914 (2d Cir. 1930). "If the search is permitted at all, perhaps it does not make so much difference what is taken away, since the officers will ordinarily not be interested in what does not incriminate, and there can be no sound policy in protecting what does." *Id.*

¹²⁵ See LANDYNSKI, *supra* note 14, at 176. "The general object of the search and seizure provision is to protect the right of privacy as exercised by law abiding citizens, and to whatever degree and in whatever connection the right of privacy is unlawfully used for criminal activity, to that extent the protection of the Constitution should not apply." *Id.*; Loewy, *supra* note 122, at 1230. "[A] guilty person, lacking the right to secrete evidence, is essentially an incidental beneficiary of a rule designed to benefit somebody else—an innocent person who is not before the court." *Id.*

¹²⁶ See, e.g., *United States v. Rabinowitz*, 339 U.S. 56, 82 (1950) (Frankfurter, J., dissenting). Justice Frankfurter noted that "[b]y the Bill of Rights the founders of this country subordinated police action to legal restraints, not in order to convenience the guilty but to protect the innocent." *Id.*

¹²⁷ See *supra* notes 125-126 and accompanying text (noting Framers' intent to protect only innocent persons).

¹²⁸ See *Payton v. New York*, 445 U.S. 573, 601 (1980) (emphasizing "overriding respect for the sanctity of the home that has been embedded in our traditions since the origins of

"a man's home is his castle" is certainly not absolute.¹²⁹ Moreover, this notion evolved at a time when the only method of police investigation was *actual physical entry* of the premises to be searched.¹³⁰ It was the continuous breaking into and ransacking of dwellings that gave rise to the establishment of such a strict doctrine in the protection of the home.¹³¹ Although courts have correctly recognized that a search may occur absent physical intrusion,¹³² the underpinnings of the "home as castle" view are far less applicable in today's world of infinitely more sophisticated investigatory tools, where a scanning that reveals no illegal activity does not disturb the individual.

This approach strikes a better balance between our dire societal need for effective law enforcement on the one hand, and individual privacy on the other.¹³³ The inability of the government to use a device of this nature would serve to protect only the lawless, at the expense of the law-abiding—a result the Founders certainly never intended. It seems that with the advent of such devices as we hypothesize, the "necessary evils" our forefathers were forced to bear would remain "evil" but would no longer be "necessary."

the Republic"); *Frank v. Maryland*, 359 U.S. 360, 378-79 (1959) (Douglas, J., dissenting). In 1766, William Pitt spoke these now-classic words: "The poorest man may in his cottage bid defiance to all the force of the Crown. It may be frail—its roof may shake—the wind may blow through it—the storm may enter—but the King of England cannot enter—all his force dares not cross the threshold of the ruined tenement!" *Id.*; see also *State v. Young*, 867 P.2d 593, 603 (Wash. 1994) (quoting *United States v. Karo*, 468 U.S. 705, 714 (1984)). "A resident has a reasonable expectation of privacy in what occurs within the home, 'a location not open to visual surveillance.'" *Id.*

¹²⁹ See *Illinois v. Rodriguez*, 497 U.S. 177, 191 (1990). "Absent some grave emergency, the Fourth Amendment has interposed a magistrate between the citizen and the police. This was done not to shield criminals nor to make the home a safe haven for illegal activities." *Id.*; *California v. Ciraolo*, 476 U.S. 207, 226 (1986). "Of course, the right of privacy in the home and its curtilage includes no right to engage in unlawful conduct there." *Id.*; *Warden, Maryland Penitentiary v. Hayden*, 387 U.S. 294, 321 (1967) (Douglas, J., dissenting). "The right of privacy protected by the Fourth Amendment relates in part of course to the precincts of the home or the office. But it does not make them sanctuaries where the law can never reach." *Id.*

¹³⁰ See LANDYNSKI, *supra* note 14, at 200. "The men who wrote the Fourth Amendment knew of only one type of search, that involving physical entry into a dwelling." *Id.*

¹³¹ See *Hayden*, 387 U.S. at 315 (Douglas, J., dissenting) (quoting R. RUTLAND, *THE BIRTH OF THE BILL OF RIGHTS, 1776-1791* 25 (1955)). "The Bostonians complained that 'our houses and even our bed chambers are exposed to be ransacked, our boxes, chests, and trunks broke open, ravaged and plundered by wretches . . .'" *Id.*; *United States v. Poller*, 43 F.2d 911, 914 (2d Cir. 1930). "[I]t is only fair to observe that the real evil aimed at by the Fourth Amendment is the search itself, that invasion of a man's privacy which consists in rummaging about his effects to secure evidence against him." *Id.*

¹³² See *supra* note 84 and accompanying text (noting physical intrusion is no longer decisive factor in determining existence of search).

¹³³ Loewy, *supra* note 122, at 1234. "[T]he government's interest in seizing evidence of crime is nothing short of compelling." *Id.*

CONCLUSION

The Fourth Amendment prevents the government from abusing its police power. The advent of new technology and its subsequent employment by law enforcement agencies result in a constant judicial struggle with the scope of the Fourth Amendment. Most recently, its limits have been tested by use of the FLIR in detecting indoor marijuana cultivation, resulting in varied reasoning and thus differing holdings. The difficulties stem, at least in part, from confusion surrounding the proper application of *Katz's* two-prong test.

The problematic application of the *Katz* test, coupled with the ever-growing danger to privacy resulting from use of sophisticated technology, dictates the need for a new approach. A focus on the intrusiveness and conclusiveness of the investigative device or method will yield more consistent results. Devices like the FLIR, which are capable of detecting perfectly legal activities and thus fail to definitively indicate the presence of contraband put privacy rights in grave jeopardy. In contrast, the use of an instrument or method which, by its very nature, cannot disclose any more than an illegal pursuit in which the individual is engaging, is not only tolerable but desirable in light of the alarming incidence of crime in our society.

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