Thermal Surveillance: Do Infrared Eyes in the Sky Violate the Fourth Amendment?

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Table of Contents

I. Introduction ............................................. 1772

II. The Debate .............................................. 1776

A. Cases Holding That a Warrantless Infrared Scan Is Not a Prohibited Search .................................. 1776
   1. United States v. Penny-Feeney ........................... 1776
      a. The Katz Reasonable Expectation of Privacy Test ......................... 1778
      b. Analogy of Waste Heat to Garbage ........................................ 1781
      c. Analogy of FLIR to Canine Sniff ...................................... 1782
      d. Analogy to Aerial "Plain View" Cases .................................. 1786
   2. United States v. Pinson .................................. 1787

B. Cases Holding That a Warrantless Infrared Scan Is a Prohibited Search .................................. 1788
   1. United States v. Ishmael ...................................... 1788
   2. State v. Young ............................................ 1790

III. The Solution ............................................. 1792

A. A Critique of the Application of the Katz Test by Cases That Follow Penny-Feeney ........................... 1792

B. A Critique of the Analogies Used by the Cases That Follow Penny-Feeney .................................. 1796
   1. Garbage Cases ............................................ 1796
   2. Drug-Sniffing Dog Cases ..................................... 1798
   3. Aerial "Plain View" Cases .................................. 1802

C. Suggestions for Alternate Analogies .......................... 1803

IV. Suggested Approach ...................................... 1804

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1771
The black-mustachio'd face gazed down from every commanding comer. BIG BROTHER IS WATCHING YOU, the caption said. In the far distance a helicopter skimmed down between the roofs, hovered for an instant like a bluebottle, and darted away again with a curving flight. It was the Police Patrol, snooping into people's windows.\footnote{George Orwell, Nineteen Eighty-Four 4 (1949), quoted in Florida v Riley, 488 U.S. 445, 466 (1989) (Brennan, J., dissenting).}

I. Introduction

As society's concern about the crime rate has risen, police have used increasingly sophisticated technology to combat criminals.\footnote{See David E. Steinberg, Sense-Enhanced Searches: The Limitations of Warrant Clause Analysis and a Proposal for Change, 17 Search & Seizure L. Rep 41, 41 (1990) (discussing increasing police use of sense-enhancing technological devices).} At the same time, the United States Supreme Court has expanded the types of technology that the government may use without a warrant.\footnote{See Lisa J. Steele, Waste Heat and Garbage: The Legalization of Warrantless Infrared Searches, 29 Crim. L. Bull. 19, 19 (1993) (noting that Supreme Court has allowed use of increasing numbers of technological tools).} Thus, citizens of the United States are torn between their need to keep their neighborhoods safe and the erosion of their privacy rights.\footnote{See id. (explaining that average citizens must "watch their rights slowly eroding in the name of law and order"); see also United States v Ishmael, 843 F Supp. 205, 207-08 (E.D. Tex. 1994) (explaining tension between right to privacy and increasing technological sophistication and stating that "war on drugs" should not erode fundamental rights), cert. denied, 116 S. Ct. 75 (1995); Ellen Alperstein, Aerial Protection or Just High-Flying Harassment?, L.A. Times, July 26, 1987, Magazine, at 27 (noting ambivalence of one citizen, who stated in reference to patrol by police helicopters, "they are helpful, but sometimes it feels like a police state"). One zealous police officer evoked the potential abuses of the Forward Looking Infrared Device (FLIR) in the name of law and order when he said "It's a very neat tool for us. We can survey all kinds of things without letting people know we're surveying them." Lynn O'Shaughnessy, Heat Image on Infrared Scope Led to Hiker's Body, L.A. Times, Sept. 7, 1987, at 6; see State v Young, 867 P.2d 593, 600 (Wash. 1994) (en banc) (noting that unrestricted, sense-enhanced observations provide dangerous amount of police discretion); see also U.S. Const. amend. IV (stating that "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, 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").}

The technology of remote sensing devices exemplifies this tension between the desire for safety and the right to privacy.\footnote{Ishmael, 843 F Supp. at 207-08 (noting tension between right to privacy and increasing technological sophistication used in "war on drugs").} Police departments across the country commonly employ the infrared scanner, or Forward
Looking Infrared Device (FLIR).\textsuperscript{6} Originally developed by the military, the FLIR detects and tracks targets through infrared light rays.\textsuperscript{7} Users generally mount the device on a helicopter or plane.\textsuperscript{8} The FLIR transforms the differences in the surface temperature of the scanned area electronically into a black and white visual image: Hotter objects appear white in contrast to cool areas, which are dark.\textsuperscript{9} Some versions of the FLIR that the police use are sensitive enough to pick up temperature differentials of as little as 0.02 degrees Celsius\textsuperscript{10} and produce an image in various shades of grey.\textsuperscript{11} The FLIR can produce a remarkably clear image, at times having great definition\textsuperscript{12} and revealing exact details.\textsuperscript{13} However, atmospheric conditions\textsuperscript{14} or ambient temperature can affect the image’s quality.\textsuperscript{15} For these reasons, among others, courts have not accepted the FLIR image as definitive in the unique identification of remote objects, such as distinguishing one DC-3 airplane from another,\textsuperscript{16} although courts have accepted the device for the

\begin{itemize}
  \item \textsuperscript{6} See Alperstein, supra note 4, at 27 (noting that police helicopter patrols are major civilian consumer of military surveillance hardware).
  \item \textsuperscript{7} See United States v. Kilgus, 571 F.2d 508, 509 (9th Cir. 1978) (discussing use and technology of FLIR device).
  \item \textsuperscript{8} See United States v Penny-Feeney, 773 F Supp. 220, 223 (D. Haw. 1991) (discussing use of FLIR), aff’d sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993).
  \item \textsuperscript{9} See Kilgus, 571 F.2d at 509 (discussing use and technology of FLIR device).
  \item \textsuperscript{11} See Kilgus, 571 F.2d at 509 (discussing use and technology of FLIR device).
  \item \textsuperscript{12} See Bill Bleyer, \textit{On the Water Chopper’s Special Set of Eyes}, NEWSDAY, Jan. 2, 1994, at 23 (noting that FLIR can provide definition of "videotape shot in daylight").
  \item \textsuperscript{13} See Charles Stanley, \textit{Infrared Tool Helps Cops Stay Out of Dark}, CHI. TRIB., July 26, 1994, at 3 (noting infrared scanning device revealed detail such as "eyeglasses and facial hair"); see also William P Coughlin, \textit{Fisherman Falls Into Rough Seas; Search Halted}, BOSTON GLOBE, Feb. 21, 1987, at 19 (stating infrared device revealed "seagull heads"); Greg Johnson, \textit{Defense Firms Jockey to Build Pilotless Aircraft}, L.A TIMES, Sept. 8, 1992, at D2, D12 (quoting awed observer stating that FLIR images were so detailed they were spectacular).
  \item \textsuperscript{14} See United States v. Kilgus, 571 F.2d 508, 510 (9th Cir. 1978) (discussing use and technology of FLIR device).
  \item \textsuperscript{15} See O’Shaughnessy, supra note 4, at 6 (stating that daytime heat interferes with image because entire background emits heat).
  \item \textsuperscript{16} See Kilgus, 571 F.2d at 509-10 (discussing limitations of evidentiary value of FLIR reading). The \textit{Kilgus} court noted, however, that the FLIR could readily distinguish differing types of airplanes. \textit{Id.} at 509
\end{itemize}
generic identification of objects. In addition, the FLIR cannot create a precise image when a solid object that conducts very little heat blocks the infrared rays. However, the walls and roof of a structure often will transmit enough heat to show grey or white on the FLIR image, thereby indicating that a heat source exists inside the structure. The FLIR can also detect body heat through a curtain or a thin partition.

Despite its limitations, the FLIR has proven to be a very useful tool. The government and the private sector have already used the FLIR to spot hunters using illegal spotlights, to find bodies hidden under rubble or missing in the wilderness, to find defective equipment on power transmission lines, to track down illegal immigrants, to assist in routine police sur-

17 See United States v Sanchez, 829 F.2d 757, 758-759 (9th Cir. 1987) (citing Kilgus opinion for proposition that, with proper foundation, one can use FLIR for generic identification).

18 See Valentine, supra note 10, at 4 (noting that FLIR camera "can't see through things").


20 See State v Young, 867 P.2d 593, 595 (Wash. 1994) (en banc) (discussing capabilities of FLIR device).

21 Penny-Feeney, 773 F Supp. at 223 n.4 (noting that government and private sector have used infrared devices for various purposes including finding missing persons, identifying inefficient building insulation, detecting hot, overloaded power lines, and detecting forest fire lines through smoke). The FLIR may one day provide such novel amenities as night vision and accident avoidance systems in cars. See Monique P Yazigi, Group Working on Car Features to Prevent Accidents, STAR TRIBUNE, Sept. 26, 1992, at 03M (discussing advances in car safety and comfort); David Kushma, Hughes Acquisition Proves High-Tech Coup, DETROIT FREE PRESS, June 14, 1987, at 1A (discussing advances in technology at Hughes Aircraft Co.).


23 See Malcolm Gladwell, Police Say Blast Had to Be Bomb, WASH. POST, Feb. 28, 1993, at A1, A12 (stating government used thermal imaging cameras to look for bodies in rubble after World Trade Center bombing).

24 See Bleyer, supra note 12, at 23 (discussing use of FLIR to find missing boater); Coughlin, supra note 13, at 19 (discussing use of FLIR to find lost fisherman); O'Shaughnessy, supra note 4, at 6 (discussing successful search for body of stray hiker).


THERMAL SURVEILLANCE AND THE FOURTH AMENDMENT

Surveillance,\textsuperscript{27} to discover suspects in hiding,\textsuperscript{28} and to find structures that emit excess heat, possibly housing marijuana-growing operations.\textsuperscript{29} This Note addresses the Fourth Amendment problems raised by use of the FLIR to find marijuana-growing operations.

Part II.A reviews cases that have held that the warrantless use of an infrared scanning device to determine whether a house emits excessive heat does not constitute an unreasonable search in violation of the Fourth Amendment.\textsuperscript{30} Part II.B addresses two cases that have held that the warrantless use of a thermal scanning device does violate the Fourth Amendment.\textsuperscript{31} Part III examines the law underlying the analysis of what constitutes an impermissible search and considers whether warrantless thermal surveillance violates the

\textsuperscript{27} See Stanley, supra note 13, at 3 (discussing police department's use of car-mounted infrared devices in routine surveillance by patrol car).

\textsuperscript{28} See O'Shaughnessy, supra note 4, at 6 (discussing sheriff department's use of FLIR to detect suspects "lurking in doorways or hiding in trees").

\textsuperscript{29} See, e.g., United States v Ford, 34 F.3d 992, 993 (11th Cir. 1994) (involving agents' use of FLIR to reveal excessively hot floor and walls of mobile home that they later found contained marijuana-growing operation); United States v Pinson, 24 F.3d 1056, 1057 (8th Cir.) (involving government's use of FLIR to reveal excessively hot roof, skylight, and window of residence that government later found contained marijuana-growing operation), cert denied, 115 S. Ct. 664 (1994); United States v Ishmael, 843 F. Supp. 205, 208 (E.D. Tex. 1994) (involving officers' use of FLIR to reveal excessively hot brush pile and metal building that they later found contained marijuana-growing operation), cert. denied, 116 S. Ct. 75 (1995); United States v Penny-Feeney, 773 F. Supp. 220, 223-24 (D. Haw. 1991) (involving police’s use of FLIR to reveal excessively hot garage that they later found contained extensive marijuana-growing operation), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993); State v. Young, 867 P.2d 593, 595 (Wash. 1994) (en banc) (involving detective’s use of FLIR to reveal excessively hot foundation of residence that they later found contained quantity of marijuana).

\textsuperscript{30} See United States v Pinson, 24 F.3d 1056, 1059 (8th Cir.) (holding that police’s warrantless use of FLIR device was not search in violation of Fourth Amendment because defendant failed to show that subjective expectation of privacy was one society would find objectively reasonable), cert. denied, 115 S. Ct. 664 (1994); United States v Penny-Feeney, 773 F. Supp. 220, 226-28 (D. Haw. 1991) (holding that officers’ warrantless use of FLIR device was not search in violation of Fourth Amendment because defendants did not show subjective expectation of privacy, and if defendants did show subjective expectation of privacy, society would not find expectation reasonable), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993).

\textsuperscript{31} See United States v Ishmael, 843 F. Supp. 205, 212-13 (E.D. Tex. 1994) (holding that defendants had reasonable expectation of privacy in building and that officers' use of FLIR without warrant was search in violation of Fourth Amendment), cert. denied, 116 S. Ct. 75 (1995); State v. Young, 867 P.2d 593, 604 (Wash. 1994) (en banc) (holding that officers' warrantless scan with FLIR device was search in violation of Fourth Amendment because device obtained information about interior of defendant's home that police could not obtain by unaided observation of exterior of home).
Fourth Amendment. Finally, Part IV reviews some options for legislatures and courts in dealing with this problem and proposes a practical approach for states to take in addressing the FLIR problems.

II. The Debate

A. Cases Holding That a Warrantless Infrared Scan Is Not a Prohibited Search

1. United States v Penny-Feeney

The earliest and most influential case holding that warrantless thermal scanning for marijuana-growing operations does not violate the Fourth Amendment's ban on unreasonable searches is United States v Penny-Feeney, which courts have followed in a substantial number of cases. Penny-Feeney involved two defendants indicted on three counts of federal drug and firearm violations. The investigation leading to the indictment began in 1988, when the police received a tip that one defendant, Jan Penny, had sold drugs in California and continued to sell drugs in Hawaii. In 1989, the police obtained a search warrant to open a package mailed to


33. See United States v Penny-Feeney, 773 F Supp. 220, 228 (D. Haw. 1991) (holding that officers' warrantless use of FLIR device was not search in violation of Fourth Amendment), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993); see, e.g., United States v Ford, 34 F.3d 992, 995-97 (11th Cir. 1994) (holding that warrantless thermal scanning did not violate Fourth Amendment); United States v Pinson, 24 F.3d 1056, 1058-59 (8th Cir.) (holding that warrantless thermal scanning did not violate Fourth Amendment), cert. denied, 115 S. Ct 664 (1994); United States v Domitrovich, 852 F Supp 1460, 1472-75 (E.D. Wash. 1994) (finding that warrantless thermal scanning did not violate Fourth Amendment), aff'd, 57 F.3d 1078 (9th Cir. 1995); United States v Porco, 842 F Supp 1393, 1396-98 (D. Wyo. 1994) (same), aff'd sub nom. United States v Cusumano, 67 F.3d 1497 (10th Cir. 1995); United States v Deaner, No. 1:CR-92-0090-01 and -02, 1992 WL 209966, at *2-4 (M.D. Pa. July 27, 1992) (same), aff'd on other grounds, 1 F.3d 192 (3d Cir. 1993); United States v Kylo, 809 F Supp. 787, 791-92 (D. Or. 1992) (same), aff'd in part, vacated and remanded in part, 37 F.3d 526, 530-31 (9th Cir. 1994) (remanding Fourth Amendment issue); State v Cramer, 851 P.2d 147, 150 (Ariz. Ct. App. 1992) (finding that warrantless thermal scanning did not violate Fourth Amendment); State v McKee, 510 N.W.2d 807, 808-10 (Wis. Ct. App. 1993) (same), review denied, 515 N.W.2d 715 (Wis. 1994). Ford and Pinson are the only cases in which federal courts of appeals have decided the issue. Ford, 34 F.3d at 995-97; Pinson, 24 F.3d at 1058-59. In Ford, the United States Court of Appeals for the Eleventh Circuit followed the reasoning of the court in Penny-Feeney, Ford, 34 F.3d at 995-97, as did the United States Court of Appeals for the Eighth Circuit in Pinson. Pinson, 24 F.3d at 1058-59.

34. Penny-Feeney, 773 F Supp. at 221.

35. Id.
The package contained $2,700 in cash. A trained dog detected traces of narcotics on the money. Another anonymous informant called the police department approximately eight months later and stated that Penny was operating a large-scale, marijuana-growing operation in Penny’s house. An informant corroborated this information. The informant described the layout of the growing area inside the garage, the powerful, continuously running grow lights, the ventilation of the area by means of an air conditioner at the back of the garage, and the drainage of water out the back of the garage that made the grass greener behind the garage than elsewhere on the property. The informant stated that Penny recently had married Sean Feeney, and the informant presumed that the couple lived on profits from the marijuana-growing operation.

Police then attempted to corroborate the informant’s testimony. An officer drove by the suspects’ house and confirmed the informant’s description of the house and cars, the green grass behind the garage, the location of a shed that seemed to conceal the air conditioning unit, and the presence of cars registered to people that the informant described as accomplices. To obtain further confirmation, the officer arranged to fly over the house in a FLIR-equipped helicopter at a height between 300 and 600 feet above the ground. When viewed with the naked eye — without the FLIR — the house appeared dark. With the aid of the FLIR, however, the walls and other areas of the garage registered as bright white, indicating a strong artificial heat source within the garage. The officer later testified that this type of reading was consistent with the use of grow lamps for, among other things, marijuana production. Based on the results of the previous search

36. Id. at 222.
37. Id.
38. Id.
39. Id.
40. Id.
41. Id. at 222 & n.3.
42. Id. at 222-23.
43. Id. at 223-24.
44. Id. at 223.
45. See id. at 223 & n.5. The Penny-Feeney court characterized the FLIR as a "passive, non-intrusive instrument" that sends no "beams or rays into the area on which it is fixed" and does not in any way "penetrate" the area. Id. at 223.
46. Id. at 223.
47. Id. at 223-24.
48. Id. at 224.
of the package mailed to Penny, the informants' testimony, the officer's visual observation, and the FLIR reading, a judge issued a warrant to search the house. The police carried out the search and found evidence of an extensive marijuana-growing operation.

At trial, the defendants made a motion to suppress the physical evidence seized pursuant to the 1989 warrant to search Penny's package and the 1990 warrant to search the defendants' house. The defendants argued that the judge based the 1990 warrant on the FLIR scan, the judge based the warrant on illegally obtained information. The defendants contended specifically that a warrantless scan with an infrared device was a search in violation of the Fourth Amendment.

a. The Katz Reasonable Expectation of Privacy Test

The district court rejected the defendants' argument and held that the use of an infrared device in airspace above the defendants' residence was not a "search" within the meaning of the Fourth Amendment. To reach this conclusion, the district court applied the test that the Supreme Court set forth in Katz v United States. Katz supplanted the "trespass" doctrine that the

49. Id. To avoid confusion, this Note will follow the lead of the court and refer to the earlier warrant as the "1989 warrant" and to the later warrant as the "1990 warrant." Id. at 222 n.2.

50. Id. at 224.

51. See id. at 224-25 (noting that defendants sought suppression of evidence seized pursuant to both warrants, but because bulk of motion pertained to 1990 warrant, court addressed that issue first). This Note will address only the arguments and analysis that concern the 1990 warrant, because the 1989 warrant did not involve the use of a FLIR device. See id. at 221-22 (describing grounds for 1989 search warrant). However, the Penny-Feeney court considered the admissibility of evidence seized pursuant to the 1989 warrant as well. See id. at 229-30 (finding that issuing judge had substantial basis for concluding probable cause existed for limited search of parcel addressed to Jan Penny and alternatively that evidence was admissible under "good faith exception" to exclusionary rule).

52. Id. at 225.

53. Id.

54. Id. at 228. The Penny-Feeney court also held that there was probable cause to support the warrant independent of the FLIR evidence. Id. at 229.


56. Katz v United States, 389 U.S. 347 (1967). In Katz, the Supreme Court of the United States considered Katz's contention that recordings of telephone conversations obtained by attaching an electronic listening and recording device to the outside of a phone booth were inadmissible in court because they were obtained in violation of the Fourth Amendment. Id. at 348-49. The Court rejected the parties' formulation of the issue, which relied on whether the phone booth was a "constitutionally protected area," and stated that the
Court had established in *Olmstead v United States*, a doctrine stating that searches during which the government committed an actual physical invasion violated the Fourth Amendment. The *Katz* test, explained in Justice Har-
lan's concurring opinion, requires, first, that the person involved exhibit an actual, subjective expectation of privacy under the circumstances. Second, the expectation of privacy must be one society will recognize as reasonable. If these conditions are met, the Fourth Amendment protects against the warrantless search.

In applying the Katz test, the Penny-Feeney court characterized the FLIR's target as waste heat, because the device only detected heat that emanated from the house and the defendants made no attempt to contain the heat, attempting instead to vent it. The Penny-Feeney court thus characterized the first issue under the Katz test as whether the defendants had manifested a subjective expectation of privacy in this waste heat. The Penny-Feeney court concluded that the defendants had no actual expectation of privacy in this waste heat because they voluntarily exposed the heat to the public and did not try to prevent it from escaping. The Penny-Feeney court then addressed the next prong of the Katz test and concluded that even if the defendants had manifested an actual expectation of privacy in

Justice Brandeis, dissenting, argued that technical advances in the government's ability to view the secrets of the public made it necessary to expand the literal language of the Constitution to protect the public from unanticipated invasions of individual security. See Katz, 389 U.S. at 360-61 (Harlan, J., concurring) (explaining test that determines when action of government violates Fourth Amendment). Justice Brandeis also stated that essentially no difference existed between sealed mail and the telephone and noted that the Supreme Court had often refused to adhere strictly to the literal language of the Constitution. See id., see also Penny-Feeney, 773 F Supp. at 225 (citing Olmstead for proposition that violation of Fourth Amendment required physical invasion).

50. 1 WAYNE R. LAFAVE, SEARCH AND SEIZURE: A TREATISE ON THE FOURTH AMENDMENT § 2.1(b), at 306 (2d ed. 1987) (noting that courts, including Supreme Court, have come to rely on Justice Harlan's explanation of Katz test in his concurring opinion).

51. See id., see also Penny-Feeney, 773 F Supp. at 225 (stating Katz test).

52. See United States v Penny-Feeney, 773 F Supp. 220, 225 (D. Haw. 1991) (explaining that, under Katz, when person establishes subjective and reasonable expectation of privacy, that person has legitimate expectation of privacy in item or space, and Fourth Amendment protects item or space from warrantless search), aff'd on other grounds, 984 F.2d 1053 (9th Cir. 1993).

53. Id.

54. Id. at 226.

55. See id. (stating that defendants "voluntarily vented [the heat] outside the garage where it could be exposed to the public and in no way attempted to impede its escape or exercise dominion over it").
the heat, society was not prepared to find that expectation of privacy reasonable. 66

b. Analogy of Waste Heat to Garbage

The Penny-Feeney court analogized the waste heat that the FLIR detected to garbage left on the curb outside of a residence. 67 The Penny-Feeney court noted that the Supreme Court, in California v Greenwood, 68 had found that, because the general public had knowledge that anyone had access to garbage left on the side of a public street, society would not accept as reasonable a privacy interest in garbage left for collection. 69 The court in

66. Id. at 226-28.
67. Id. at 226.
69. See United States v Penny-Feeney, 773 F. Supp. 220, 226 (D. Haw. 1991) (citing Greenwood for proposition that society will not accept as objectively reasonable expectation of privacy in plastic garbage bags left outside home), aff'd on other grounds, 984 F.2d 1053 (9th Cir. 1993); see also California v Greenwood, 486 U.S. 37, 40-41 (1987) (stating that defendant sufficiently exposed garbage to public so that defendant had no reasonable expectation of privacy in items discarded because garbage on public street was readily accessible to "animals, children, scavengers, snoops, and other members of the public"). In Greenwood, the United States Supreme Court considered whether the warrantless search and seizure of the garbage bags left outside the defendant’s home violated the Fourth Amendment. Greenwood, 486 U.S. at 39. To determine whether the search of the garbage bags violated the Fourth Amendment, the Court applied the Katz test. Id. The Court concluded that the defendant might have had a subjective expectation of privacy in his garbage but that society was not prepared to accept that expectation as reasonable. Id. at 39-41. The Court rejected the defendant’s argument that an expectation of privacy in garbage should be deemed reasonable because the warrantless search and seizure of the defendant’s garbage was impermissible under California law. Id. at 43. The Court reasoned that whether or not a search is reasonable depends not on state law but on the broad societal understanding. Id. at 43-44. The Court also rejected the defendant’s argument that California’s elimination of an exclusionary rule for evidence seized in violation of state, but not federal, law violated the Due Process Clause of the Fourteenth Amendment. Id. at 44-45.

The dissent, written by Justice Brennan, concluded that the defendant did have a reasonable expectation of privacy in the defendant’s garbage, or at least a reasonable expectation that the government would not search the garbage. Id. at 46-49 (Brennan, J., dissenting). Brennan reasoned that the Fourth Amendment protects all containers used for transport and that it made no difference that the defendant used these containers for disposal. Id. Brennan also noted that most people would be revolted to find someone going through trash that would reveal intimate details of their daily lives. Id. at 50-52. Brennan further stated that the possibility that dogs or scavengers might tear open trash bags did not make the expectation of privacy in their contents less reasonable. Id. at 53-54. Finally, the fact that the defendant relinquished control over the trash did not mean he relinquished his expectation of privacy Id. at 54-55.
Penny-Feeney stated that waste heat also involved the disposal of waste matter in public areas. The court concluded that it was irrelevant that police could inspect garbage visually but had to use a heat-sensing device like the FLIR to detect waste heat.

c. Analogy of FLIR to Canine Sniff

The Penny-Feeney court also analogized the FLIR to several other devices that police may use without first obtaining a warrant. Police have used devices to record numbers that a private residence called, beepers

70. See Penny-Feeney, 773 F. Supp. at 226 (noting that disposal of waste heat involved homeowner's disposing of waste in public areas and reasoning that because defendants attempted to vent heat from garage, waste heat was exactly like garbage in Greenwood).

71. See id. (dismissing without explanation argument that because naked eye could not detect heat it was not "exposed" in same way that garbage is "exposed" when placed on curb for collection).

72. See id. at 226-27 (noting that "[t]ime and again, the United States Supreme Court has held that police utilization of extra-sensory, non-intrusive equipment, such as the FLIR, to investigate people and objects does not constitute a search for purposes of the Fourth Amendment").

73. See id. at 226 (citing Smith v. Maryland for proposition that government's placing device with telephone company to determine what phone numbers were called by private residence was not search within meaning of Fourth Amendment); see also Smith v. Maryland, 442 U.S. 735, 745-46 (1979) (holding that petitioner probably had no actual expectation of privacy in phone numbers dialed, and if petitioner did, expectation was not legitimate; consequently, use of pen registers to record numbers was not "search"). In Smith, the United States Supreme Court considered whether the warrantless installation and use of a "pen register" to record numbers dialed from a private home was a search within the meaning of the Fourth Amendment. Id. at 736. The telephone company, at police request, installed a pen register at its offices to record numbers called from the defendant's home because the police suspected the defendant of placing obscene phone calls to the victim of a robbery Id. at 737 The defendant argued that the trial court should have suppressed evidence seized pursuant to the warrantless installation of the pen register. Id. The Smith Court defined the challenged state activity as the installation of the pen register and explained that the Katz test determined whether the installation violated the Fourth Amendment. Id. at 739-41. The Court noted that the defendant's argument amounted to a claim that he had a legitimate expectation of privacy in the numbers he dialed and that therefore he met the second prong of the Katz test. Id. at 742. The Court rejected his argument and instead found that the defendant probably had no actual expectation of privacy in the numbers he dialed, because everyone must furnish numbers to the telephone company to place calls. Id. at 742-43. Furthermore, even if the defendant had some subjective expectation of privacy, the Court held that society would not recognize the expectation as reasonable, because the defendant voluntarily turned the information over to the telephone company and assumed the risk that the numbers would be turned over to someone else. Id. at 743-45. The defendant further argued that because the telephone company usually does not elect to record local numbers,
he had a legitimate expectation of privacy. \textit{Id.} at 745. The Court declined to make Fourth Amendment protection dependent on the "billing practices of a private corporation." \textit{Id.} at 745-46.

Justice Stewart dissented and stated that the defendant had a legitimate expectation of privacy in the numbers dialed because they arose from private conduct in a person's home and were an integral part of an otherwise protected communication. \textit{Id.} at 746-48 (Stewart, J., dissenting). Justice Marshall also dissented and stated that people do not as a rule expect that the numbers they call will be recorded. \textit{Id.} at 748-49 (Marshall, J., dissenting). Marshall further stated that the majority's conclusion that the defendant assumed the risk was flawed because the defendant had no choice but to turn over the numbers, and a risk analysis would allow the government to define Fourth Amendment analysis by putting the public on notice of the risks of disclosure. \textit{Id.} at 749-51.

74. \textit{See United States v Penny-Feeney, 773 F Supp. 220, 226 (D. Haw. 1991)} (citing \textit{United States v. Knotts}, 460 U.S. 276, 285 (1983) (holding that monitoring of beeper signals from container in car did not invade legitimate expectation of privacy and thus was not search or seizure within scope of Fourth Amendment). In \textit{Knotts}, the United States Supreme Court considered whether the use of a beeper to monitor the location and final destination of a five gallon drum of chloroform being transported in a car was a search in violation of the Fourth Amendment. \textit{Id.} at 277 The government used visual surveillance and the beeper to trace the drum of chloroform to a secluded cabin, but police did not use the beeper after determining the drum's location in or near the cabin. \textit{Id.} at 278-79. The Court applied the \textit{Katz} test to determine whether the use of the beeper violated the Fourth Amendment. \textit{Id.} at 280-85. The \textit{Knotts} Court noted that the driver of the car had a lesser expectation of privacy than the owner of the cabin, so the beeper did not violate the driver's legitimate expectation of privacy when used to track the car. \textit{Id.} at 281-82. The Court concluded that the use of the beeper did not transform what would otherwise be pure visual surveillance into a Fourth Amendment violation. \textit{Id.} at 282-84. However, the defendant argued that the use of the beeper to determine the location of the chloroform at the cabin violated the defendant's expectation of privacy in his residence. \textit{Id.} at 284. The Court found that the beeper was not used in any way to determine any movement of the can of chloroform that could not have been observed visually, as allowed by the "open fields" doctrine. \textit{Id.} at 284-85.

Three justices concurred. \textit{Id.} at 285-88. Justice Brennan noted that the case would be more difficult if the defendant had challenged the installation rather than the monitoring of the beeper. \textit{Id.} at 285-87 (Brennan, J., concurring). Justice Blackmun commented that the Court unnecessarily invoked the open fields doctrine. \textit{Id.} at 287 (Blackmun, J., concurring). Justice Stevens disagreed with two dicta in the Court's opinion: First, that the case involved the open fields doctrine; second, that the Fourth Amendment does not prevent the police from augmenting the police's senses with technological devices. \textit{Id.} at 288 (Stevens, J., concurring).

\textit{But cf. United States v Karo, 468 U.S. 705, 711-18 (1984)} (holding that installation of beeper did not violate Fourth Amendment but that monitoring of beeper inside private residence did). In \textit{Karo}, the United States Supreme Court considered whether the installation of a beeper or the monitoring of it within a private residence constituted a search in violation of the Fourth Amendment. \textit{Id.} at 711, 714. First, the Court concluded that the installation
of the beeper posed no Fourth Amendment concerns. *Id.* at 711-13. Second, the Court found that monitoring the beeper without a warrant did violate the Fourth Amendment as it revealed to the government crucial information about the interior of the house that the government could not have obtained by visual surveillance. *Id.* at 713-15. Even the limited information that the container with the beeper remained on the premises was enough to trigger the Fourth Amendment. *See id.* at 715. The Court distinguished *Knotts* on the ground that in that case, the monitoring of the beeper told the government nothing about the interior of the cabin. *Id.* The Court rejected the government’s argument that the Court should allow the government to use an electronic device to determine whether a particular article is in an individual’s home at a particular time. *Id.* at 716. The Court also rejected the government’s contention that the Court should deem warrantless beeper searches reasonable if justification exists to believe a crime is being or will be committed. *Id.* at 717-18. The Court was also unpersuaded by arguments that a warrant would be difficult to obtain. *Id.* at 718. Finally, the Court concluded that the warrant the government did obtain for a physical search of the residence was valid, because sufficient untainted evidence supported the warrant. *Id.* at 719-21.

Justice O’Connor, in a concurring opinion, stated that a defendant would have a legitimate expectation of privacy only in those containers that were monitored when visual surveillance was not possible and only in those containers the defendant owned or controlled sufficiently to have standing to consent to or challenge a search. *Id.* at 724-28 (O’Connor, J., concurring). Justice Stevens also dissented in part and concurred in part. Stevens concluded that the surreptitious use of a beeper on another’s private property was both a search and a seizure within the meaning of the Fourth Amendment. *Id.* at 728-36 (Stevens, J., concurring in part and dissenting in part).

75. *See Penny-Feeney,* 773 F Supp. at 226 (citing United States v Place for proposition that using drug-detection dog to sniff luggage at airport was not search); see also United States v Place, 462 U.S. 696, 707 (1983) (holding that exposure of defendant’s luggage, which was in public place, to trained canine was not search within meaning of Fourth Amendment). In *Place,* the United States Supreme Court considered whether narcotics officers can temporarily detain personal luggage for exposure to a trained narcotics dog on suspicion that the luggage contains narcotics. *Id.* at 697-98. Police seized the defendant’s bags and retained them for approximately 90 minutes while presenting them to a trained dog who reacted positively to one bag. *Id.* at 698-99 As it was late on Friday, the police retained the luggage until Monday morning. *Id.* at 699. After obtaining a warrant, police opened the bag and found cocaine. *Id.* The *Place* Court held that the warrantless seizure of personal luggage for the purposes of a limited investigation was reasonable under the Fourth Amendment and was an exception to the probable cause requirement. *Id.* at 699-702. The Court required only that the government have a reasonable suspicion of illegal activity *Id.* at 706. The Court reasoned that the substantial government interest in discovering narcotics in the bags of travelers outweighed the limited intrusion upon the individual’s Fourth Amendment rights. *Id.* at 703-06. The Court rejected the defendant’s argument that though a limited stop of the person is less intrusive than full arrest, no degrees of intrusion exist in the context of seizure of property. *Id.* at 705-06.

The Court concluded that the exposure of the bags to a narcotics dog was not a search within the meaning of the Fourth Amendment. *Id.* at 706-07 The Court reasoned that the "search" was limited in the scope of information that police obtained and was nonintrusive. *Id.* at 707 Furthermore, the Court noted that it was "aware of no other investigative procedure that is so limited both in the manner in which the information is obtained and in the
these devices that police may already use without a warrant, the court found the drug-sniffing-dog analogy the most compelling. The *Penny-Feeney* court discussed the case of *United States v Solis*, in which the police, reacting to an informant’s tip, went to the defendant’s trailer to look for marijuana. The police found talcum powder on the doors of the trailer and brought in a trained dog that sniffed at the doors and detected marijuana. The *Solis* court concluded that the sniff was not a prohibited search. The court reasoned that the method did not embarrass anyone, the defendants expected that the drug would give off an odor (as shown by their attempt to conceal the odor with talcum powder), and the specific physical evidence that the police looked for and found clearly indicated a possible crime. The *Penny-Feeney* court reasoned that the use of the FLIR in the circumstances of the case was much like the use of the trained dog in *Solis* because the *Penny-Feeney* defendants knew that the heat the marijuana-growing operation produced would exit the garage. Moreover, the use of

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76. See United States v. Penny-Feeney, 773 F Supp. 220, 226 (D. Haw. 1991) (stating that use of dog sniff is most analogous to use of FLIR), aff’d sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993).

77. 536 F.2d 880 (9th Cir. 1976).

78. United States v Solis, 536 F.2d 880, 881 (9th Cir. 1976). In *Solis*, the United States Court of Appeals for the Ninth Circuit considered whether the use of drug-sniffing dogs was a prohibited search within the meaning of the Fourth Amendment. In *Solis*, police used drug-sniffing dogs to detect marijuana in the defendant’s semi-trailer parked behind a public gas station. Reasoning that the government’s use of the dogs was inoffensive, did not embarrass the person, and revealed only a physical fact indicating a crime, the Court held that the dog’s intrusion was reasonable and therefore not a search. *Id.* at 881-83.

79. *Solis*, 536 F.2d at 881. Drug offenders commonly use talcum powder to mask the smell of marijuana. See *Penny-Feeney*, 773 F Supp. at 226 (discussing use of talcum powder in *Solis*).

80. *Solis*, 536 F.2d at 881.

81. See *Solis*, 536 F.2d at 882 (holding that use of dogs was not prohibited search because defendants expected odor would emanate from trailer, search method was inoffensive, officers did not search or embarrass person, and target was physical fact that indicated crime); see also *Penny-Feeney*, 773 F Supp. at 227 (quoting *Solis* for proposition that use of dogs was not prohibited search).

82. *Solis*, 536 F.2d at 882-83.

83. See United States v *Penny-Feeney*, 773 F Supp. 220, 227 (D. Haw. 1991) (concluding that government’s use of FLIR to detect waste heat was in every way like govern-
the FLIR did not embarrass the defendants or involve a bodily search, and the heat physically indicated a possible crime.  

**d. Analogy to Aerial "Plain View" Cases**

Finally, the *Penny-Feeney* court concluded that the fact that the police mounted the FLIR to a helicopter flying above the defendants’ residence did not make the defendants’ expectation of privacy in the heat emanations reasonable. The *Penny-Feeney* court noted that, in *Florida v Riley* and *California v Ciraolo*, the United States Supreme Court had upheld the observation of the area near a home from an airplane or helicopter flying in public airspace. In both cases, the Court relied on the fact that the ob-

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84. Id.
85. Id.
87 476 U.S. 207 (1986).
88. *See* United States v Penny-Feeney, 773 F Supp. 220, 227 (D. Haw. 1991) (discussing Court’s holdings in *Riley* and *Ciraolo*), aff’d sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993).

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In *Riley*, the Supreme Court of the United States considered whether surveillance of the interior of a partly covered greenhouse in a residential backyard from a helicopter at 400 feet constituted a search within the meaning of the Fourth Amendment. *Riley*, 488 U.S. at 447-48. Relying on *Ciraolo*, the Court concluded that the police’s nonintrusive observation of the backyard from a helicopter flying where the helicopter had a right to be, according to FAA regulations, did not invade a reasonable privacy expectation of the defendant. *Id.* at 449-52. Justice O’Connor, concurring, commented that the plurality rested too heavily on compliance with FAA regulations when the plurality should have relied on the routine nature of public flights in the area and at the altitude in question. *Id.* at 452-55 (O’Connor, J., concurring). Justice Brennan dissented and stated that a police overflight at 400 feet was not a sufficiently common public vantage point to render the defendant’s reasonable expectation of privacy in his backyard unreasonable. *Id.* at 456-61, 464-66 (Brennan, J., dissenting). Justice Brennan also noted that the plurality’s opinion placed few and illogical limits on the scope of permissible vantage points. *Id.* at 461-64, 466-67 Justice Blackmun also dissented and noted that whether the defendant had a reasonable expectation of privacy did not depend on the scope of FAA regulations. *Id.* at 467-68 (Blackmun, J., dissenting). He concluded that the Court should remand the case to determine whether public helicopter flights in the area at 400 feet were routine. *Id.*

In *Ciraolo*, the United States Supreme Court considered whether the warrantless aerial surveillance of a fenced-in backyard of a home violated the Fourth Amendment. *Ciraolo*, 476
observation involved no physical intrusion. In Riley, the Court also noted that the police have a right to see whatever is visible from a public vantage point. In Penny-Feeney, the court found that the police viewed the defendants' house from a public vantage point and that the FLIR did not physically invade the defendants' home. Consequently, the Penny-Feeney court concluded that an overflight using a FLIR resembled the flights that the Supreme Court found permissible in Riley and Ciraolo.

2. United States v Pinson

In United States v Pinson, the United States Court of Appeals for the Eighth Circuit held that a warrantless infrared scan of the defendant's house did not violate the Fourth Amendment. In Pinson, police suspected that the defendant grew marijuana because the police received notice that suppliers of hydroponics equipment had mailed packages to the defendant. Based on the packages and the defendant's abnormally high electrical usage, the police decided to perform aerial thermal surveillance of the defendant's home. The thermal scan detected excessive amounts of heat emanating from a covered window, the roof, and a skylight. Based in part on the thermal scan, the police obtained a search warrant and arrested the defendant for U.S. at 209. Applying the Katz test, the Court first concluded that the defendant had manifested a subjective expectation of privacy from most observations of his yard. Id. at 211-12. Reasoning that the yard was visible with the naked eye from public airspace, the Court next concluded that the defendant's expectation of privacy was not one society was prepared to recognize as reasonable. Id. at 212-14. The dissent argued that the Court's implication that the defendant knowingly exposed himself to observation from the air was flawed in that the actual risk of such observation by an average citizen is slight. Id. at 222-24 (Powell, J., dissenting).

89. Riley, 488 U.S. at 449. See Ciraolo, 476 U.S. at 212-14 (explaining that officers saw only what could be seen from public vantage point outside defendant's property).

90. See Riley, 488 U.S. at 449 (noting "police may see what may be seen 'from a public vantage point where [they have] a right to be'") (quoting Ciraolo, 476 U.S. at 213).

91. See Penny-Feeney, 773 F. Supp at 227-28 (comparing overflight in instant case to flights in Ciraolo and Riley and placing great emphasis on fact that beams of FLIR did not physically invade defendants' home).

92. Id.

93. 24 F.3d 1056 (8th Cir. 1994).

94. See United States v Pinson, 24 F.3d 1056, 1059 (8th Cir.) (holding that because defendant's subjective expectation of privacy is not one that society finds objectively reasonable, search did not violate Fourth Amendment), cert. denied, 115 S. Ct. 664 (1994).

95. Id. at 1057

96. Id.

97. Id.
growing and processing over 100 marijuana plants, a charge of which the jury found the defendant guilty. On appeal, the defendant claimed that the warrantless FLIR scan violated the Fourth Amendment.

The Pinson court followed the reasoning of the court in Penny-Feeney. First, the Pinson court concluded that because the FLIR detected only surface heat and did not invade the defendant's residence, it did not constitute a search. Second, the court stated that there was no reasonable expectation of privacy in voluntarily vented heat. Finally, the court concluded that the FLIR resembled a drug-sniffing dog because police use each sense-enhancing device to detect something otherwise invisible.

B. Cases Holding That a Warrantless Infrared Scan Is a Prohibited Search

1 United States v Ishmael

In United States v Ishmael, the United States District Court for the Eastern District of Texas addressed the issue of whether the warrantless scan of the defendants' buildings with a thermal imaging device was a search in violation of the Fourth Amendment. The Ishmael defendants had purchased a large amount of concrete and had begun a construction project on a secluded area of property. After concluding that the defendants had built a basement under the mobile home on the property, the police scanned the property with an aerial FLIR device and found that a metal building and a nearby brush pile were considerably hotter than their surroundings. The

98. Id.
99. Id.
100. See id. at 1058-59 (discussing court's reasoning in Penny-Feeney and explicitly following that reasoning). First, the Pinson court very briefly summarized two analogies the Penny-Feeney court used. Id. at 1058. Next, the Pinson court concluded in one paragraph that the defendant did not meet the Katz expectation of privacy test. Id. at 1058-59. The Pinson court based its conclusion that society would not recognize the defendant's expectation of privacy as reasonable on the analogy of waste heat to garbage and to a canine sniff. Id.
101. See id. at 1058-59 (concluding that use of FLIR is not "search").
102. Id. (stating that there is no reasonable expectation of privacy in heat that defendant voluntarily vented).
103. Id. at 1058.
106. Id. at 208.
107 Id.
police obtained a search warrant based in part on the scan and arrested the defendants for the marijuana-growing operation that the police found on the premises. The defendants claimed that the warrantless FLIR scan violated the Fourth Amendment.

In addressing whether the scan violated the Fourth Amendment, the Ishmael court applied the Katz test and found that the defendants had manifested a subjective expectation of privacy in the heat vented from their building. Next, the Ishmael court found that society recognized the defendants' expectation of privacy in the heat as reasonable. The Ishmael court noted that, in Ciraolo and Riley, the United States Supreme Court had held that observations made with the naked eye from airplanes in normal airspace were not searches within the meaning of the Fourth Amendment. The Ishmael court also noted that in Dow Chemical Co. v United States, the Supreme Court held that an overflight using a mapmaking camera did not violate the Fourth Amendment. The Ishmael court recognized the Government.
ment's contention that the Dow Court's holding expanded permissible surveillance beyond that visible to the naked eye. The Ishmael court stated, however, that the holdings of Ciraolo, Riley, and Dow applied only to naked eye observations or observations with technology that merely enhanced the naked eye's vision slightly. Therefore the district court held that the Fourth Amendment did not sanction observations made with the FLIR, which enables the naked eye to see otherwise invisible heat. The court also rejected the Government's contention, based on Penny-Feeney, that the heat detected was waste heat and thus analogous to garbage because the Government had to use high-technology devices to detect the heat. In addition, the court rejected the Government's analogy of the FLIR to a trained dog sniff because the FLIR detects a broader range of information at a greater distance. Therefore, the court held that the warrantless scan with the FLIR device was a search that the Fourth Amendment barred.

2. State v Young

In State v Young, the Supreme Court of Washington considered whether a warrantless infrared surveillance of the defendant's home consti-camera did not reveal too much intimate detail, the Court concluded that Dow did not have a reasonable expectation of privacy in protecting the plant area from aerial photographs of this type. See id. at 235-39 (noting that Court has not recognized expectation of privacy in activities conducted in "open fields" as reasonable and noting that camera did not reveal intimate detail).

Justice Powell, joined by three other justices, concurred in part and dissented in part. Id. at 240-252 (Powell, J., concurring in part and dissenting in part). Justice Powell noted that the majority did not explicitly follow the Katz analysis. Id. at 244, 247. Justice Powell then applied the Katz test. Id. at 247-52. Justice Powell first concluded that trade secret laws indicated that society will accept as reasonable Dow's privacy interest in its open air plant area. Id. at 248-49. Justice Powell rejected as irrelevant the majority's reliance on the "open fields" doctrine and the nature of the technology the EPA used to photograph Dow's plant. Id. at 249-51. Justice Powell also criticized the majority's opinion for relying on the "trespass" doctrine repudiated in Katz. Id. at 252. Because the photographs infringed on Dow's expectation of privacy which society has recognized as legitimate, and because the photographs captured sensitive information that Dow tried to conceal, the EPA's taking the photographs without a warrant violated the Fourth Amendment. Id.

116. See id. at 211-12 (discussing "Fourth Amendment flyover cases").
117  Id.
118.  Id. at 212-13.
119.  Id. at 213.
120.  Id.
121.  867 P.2d 593 (Wash. 1994).
tuted a search in violation of the Fourth Amendment. The police began investigating the defendant when the police received an anonymous note that stated that the defendant operated a large marijuana-growing operation. After observing the defendant’s house and noting that the defendant’s power consumption records were abnormally high, the police scanned the defendant’s house with a thermal device. The device indicated that the basement and other portions of the defendant’s house were excessively hot. The police obtained a warrant to search the house, discovered a marijuana-growing operation, and arrested the defendant for possession of marijuana with intent to manufacture or deliver. The defendant claimed that the police’s use of the thermal device constituted a search in violation of both the state constitution and the Fourth Amendment.

First, the court noted an individual’s enhanced expectation of privacy in her home. Second, the court addressed the government’s contention that represented the correct Fourth Amendment analysis. The court examined but found the court’s reasoning unpersuasive. The court noted that heat does not resemble garbage because people do not voluntarily vent heat like they dispose of garbage and because heat reveals information about the interior of the home. Finally, the court concluded that the FLIR device did not resemble a dog sniff because the dog sniff is distinct from other investigative methods in the manner the evidence is obtained and in the information revealed.

122. See State v Young, 867 P.2d 593, 594 (Wash. 1994) (en banc) (holding that warrantless FLIR search of defendant’s home violated Fourth Amendment).
123. Id. at 595.
124. Id.
125. Id.
126. Id.
127 Id. at 594.
128. Id. at 601. The court compared Karo, see supra note 74 (discussing United States v Karo, 468 U.S. 705 (1984)), and Knotts, see supra note 74 (discussing United States v Knotts, 460 U.S. 276 (1983)) and noted that the difference in the two cases hinged on the enhanced expectation of privacy in the home. The court stated that the FLIR device was at least as intrusive as the beeper in Karo. Young, 867 P.2d at 601-02.
129. State v Young, 867 P.2d 593, 601-04 (Wash. 1994) (en banc).
130. Id. at 602-04.
131. Id. at 602-03.
132. See id. at 603-04 (noting that canine sniff differed from other investigative procedures in manner of obtaining evidence and content of information revealed). The court found the reasoning of United States v Thomas, 757 F.2d 1359 (2d Cir. 1985), more persuasive than that of Solis. Id. at 603-04 (discussing Thomas court’s holding and comparing it to
fore, the *Young* court held that the police's warrantless use of the FLIR constituted an unreasonable search in violation of the Fourth Amendment.133

**III. The Solution**

**A. A Critique of the Application of the Katz Test by Cases That Follow Penny-Feeney**

The *Penny-Feeney* line of cases relies heavily on Justice Harlan's test in *Katz*.134 However, the facts of *Katz* indicate that the *Penny-Feeney* court came to the wrong conclusion. In *Katz*, the United States Supreme Court considered whether the attachment of a listening device to a telephone booth constituted a prohibited search under the Fourth Amendment.135 The Court noted that the Government claimed that it based the search on probable cause of illegal activity and that it narrowly tailored the search to gather only information that would further the investigation of the illegal activity 136 The Court accepted these contentions, yet held that *Katz* had an actual and reasonable expectation of privacy in his phone conversations in the telephone booth and that the Constitution required that the government obtain a warrant.137

Solis); see supra notes 77-82 and accompanying text (discussing facts and holding of Solis); In *Thomas*, the United States Court of Appeals for the Second Circuit addressed whether the police's use of a drug-sniffing dog to investigate defendant Wheelings's apartment violated the Fourth Amendment. *Thomas*, 757 F.2d at 1365-67 The police used a trained dog to sniff the doors of the defendant's apartment. *Id.* at 1367 The court held that the defendant had a legitimate expectation of privacy that the contents of his closed apartment would remain private. *Id.* The court limited United States v *Place*, 462 U.S. 696 (1983), which held that a search by a drug-sniffing dog did not violate the Fourth Amendment, to airports or other situations that did not involve a heightened expectation of privacy, unlike apartments. *Thomas*, 757 F.2d at 1367; see also supra note 75 (discussing *Place*).

133. *Young*, 867 P.2d at 601. The court's decision rested on the grounds that the scan violated the Washington State Constitution but analyzed the Fourth Amendment issue as well. *Id.*


135. See *Katz* v United States, 389 U.S. 347, 349-54 (1967) (rejecting government’s definition of issues in case and defining issue as whether search complied with constitutional standards); see also supra note 56 (discussing facts and holding of *Katz*).

136. See *Katz*, 389 U.S. at 354 (noting government’s argument).

137 See *id.* at 354-59 (noting acceptance of government contentions and holding wiretap...
Penny-Feeney and its progeny fail to recognize that the facts of Katz provide a better analogy to the police's use of the FLIR than garbage, dog-sniff, or "plain view" cases.\(^{138}\) Admittedly, the Katz Court did not provide much guidance to lower courts that must determine when society will recognize an expectation of privacy as reasonable.\(^{139}\) However, in both Penny-Feeney and Katz, police used a nonintrusive device that made otherwise undetectable information detectable.\(^{140}\) The police use of the FLIR looks slightly more suspect than the government's use of the listening device in Katz. First, a FLIR search, which indiscriminately picks up any heat emissions and by necessity must scan neighboring houses, gathers a broader range of information than the listening device in Katz.\(^{141}\) Second, the FLIR searches the home,
a place in which courts have commonly found that a person has the highest expectation of privacy.\footnote{142}

The distinction that the \textit{Penny-Feeney} line of cases has drawn between the FLIR cases and \textit{Katz} depends on the characterization of the object searched.\footnote{143} In the FLIR cases, the \textit{Penny-Feeney} court and those courts that followed \textit{Penny-Feeney} have characterized the item searched as "waste heat," rather than as the heat patterns in the house.\footnote{144} However, \textit{Katz} was not concerned with the expectation of privacy in the technical item intercepted but with the expectation of privacy in the basic activity in which the defendant was engaged.\footnote{145} Characterizing the object searched in \textit{Penny-Feeney} as "waste heat" is equivalent to characterizing the item in which Katz had an expectation of privacy as sound waves, rather than as Katz's conversation.\footnote{146}

The \textit{Katz} Court did not separate the conversation that the police recorded from government surveyed similar nearby structures for comparison with defendants' residence; \textit{see also} \textit{Katz}, 389 U.S. at 354-55 & nn.14-15 (accepting government's contention that government's use of listening device was very narrowly tailored and stating that magistrate could have constitutionally authorized very limited search and seizure that government conducted).

\footnote{142. See} \textit{Katz} v United States, 389 U.S. 347, 360 (1967) (Harlan, J., concurring) (noting that home is area where person has constitutionally protected reasonable expectation of privacy); \textit{id.} at 351 n.8 (stating that courts commonly agree that private home is constitutionally protected area); \textit{see also} \textit{State v Young}, 867 P.2d 593, 601 (Wash. 1994) (en banc) (discussing status of homes in federal constitutional jurisprudence); \textit{1 LAFAYE}, supra note 59, § 2.3, at 378 (discussing protected nature of residential premises and stating courts have viewed dwelling as area "most resolutely protected" by Fourth Amendment). \textit{But see} \textit{Katz}, 389 U.S. at 350-52 & n.9 (noting that defendant's attempt to characterize phone booth as constitutionally protected area diverted attention from real issue and stating that whether area was constitutionally protected was not solution to every Fourth Amendment problem).


\footnote{144. See}, e.g., United States v \textit{Ford}, 34 F.3d 992, 995 (11th Cir. 1994) (stating that FLIR scan targeted heat from home and that defendant treated heat as waste); United States v \textit{Pinson}, 24 F.3d 1056, 1058-59 (8th Cir.) (stating that FLIR device detected heat being cast off or thrown away from defendant's home), \textit{cert. denied}, 115 S. Ct. 664 (1994); \textit{Penny-Feeney}, 773 F Supp. at 225 (characterizing heat detected by FLIR as waste heat).

\footnote{145. See} \textit{Katz} v United States, 389 U.S. 347, 351-52 (1967) (stating that defendant sought to preserve privacy of words defendant spoke into telephone and that defendant had reasonable expectation that those words would remain private). The \textit{Katz} Court did not analyze whether the defendant had a reasonable expectation of privacy in the sound waves that the defendant's conversation generated. \textit{Id.}

\footnote{146. See} \textit{State v Young}, 867 P.2d 593, 602-03 (Wash. 1994) (en banc) (noting that police sought information about interior of defendant's home and valued information about waste heat only because heat revealed information about interior of defendant's home critical to government but not available otherwise).
the sound waves that the conversation produced. Therefore, the Penny-Feeney line of cases incorrectly separated the information that the police gained about the activity inside of the home from the heat that the activity generated. When the artificial "waste heat" distinction breaks down, the defendants in the FLIR cases have at least as much of an expectation that the government will not detect information about the interior of the defendants' house or place of business as the Katz defendant had for his telephone conversation.

Even if courts should define the defendants' expectation of privacy in relation to the heat rather than the home, the defendants may still have a subjective expectation of privacy in that heat. The Penny-Feeney line of cases found that the defendants did not have a subjective expectation of privacy in "waste heat" because the defendants tried to vent the heat. However, any building will inevitably vent some heat. Therefore, the Penny-Feeney court

147 See Katz, 389 U.S. at 351-52 (discussing nature of police's target, namely defendant's telephone conversation).

148. See Young, 867 P.2d at 602-03 (suggesting Penny-Feeney court was incorrect in stating that government sought information about heat rather than information about interior of home).

149. See id. at 603-04 (stating that defendant had reasonable expectation that police would not "use sense-enhancing devices to obtain information from [defendant's] home that could not be obtained by unaided observation of the exterior"); see also 1 LAFAVE, supra note 59, § 2.3(a), at 378 (noting that residential premises are places especially protected against unreasonable government intrusion). Courts are likely to find a defendant's expectation of privacy in the home more reasonable than a defendant's expectation of privacy in other places. Supra note 142 (citing cases in which courts recognized residences as most constitutionally protected areas); see also Katz, 389 U.S. at 361 (Harlan, J., concurring) (noting that though Fourth Amendment protects persons, place is relevant to whether expectation of privacy is reasonable). Admittedly, courts might be more likely to find reasonable the defendant's expectation of privacy in Katz because the listening device delivered more detailed information about Katz than the FLIR did about the lives of those searched. Compare Katz, 389 U.S. at 348 (noting that police recorded defendant's conversation) and Penny-Feeney, 773 F.2d at 223 (noting that FLIR revealed heat patterns on structure's surface) with United States v. Ford, 34 F.3d 992, 996 (11th Cir. 1994) (noting that "the intimacy of detail and activity that a surveillance technique reveals in a particular case" is "a significant factor in the Court's Fourth Amendment analysis") and supra notes 10-13, 20 and accompanying text (discussing detail FLIR can reveal).

150. See Ford, 34 F.3d at 995 (stating that defendant actively expelled excess heat from his mobile home); United States v. Penny-Feeney, 773 F.2d 220, 226 (D. Haw. 1991) (stating 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 and in no way attempted to impede its escape or exercise dominion over it"), aff'd sub nom. United States v. Feeney, 984 F.2d 1053 (9th Cir. 1993).

151. See Young, 867 P.2d at 602-03 (noting that heat automatically leaves home without
wrongly applied *Katz* when it determined that a defendant's subjective expectation of privacy should turn on whether a defendant attempted to direct that heat or to regulate the heat in some areas and not in others. \(^{152}\)

**B. A Critique of the Analogies Used by the Cases That Follow Penny-Feeney**

1. Garbage Cases

Even if one accepts the *Penny-Feeney* court's contention that the defendants in FLIR cases must prove a reasonable expectation of privacy in waste heat rather than in the defendants' homes to satisfy the *Katz* test, the *Penny-Feeney* court still reached the wrong conclusion. \(^{153}\) The *Penny-Feeney* court relied on inappropriate analogies to prove that society will find unreasonable any subjective expectation of privacy that the defendants might have. \(^{154}\) The *Penny-Feeney* court argued that waste heat is similar to garbage placed on the curb for collection. \(^{155}\) That argument fails for two reasons. \(^{155}\) First, the heat any deliberate participation by homeowner).

152. See *Katz*, 389 U.S. at 361 (Harlan, J., concurring) (assuming that defendant exhibited actual, subjective expectation of privacy in conversation in phone booth). The fact that Justice Harlan placed little emphasis on the first prong of the *Katz* test indicates that courts should not use the first prong to bar Fourth Amendment protection. See 1 LAFAYE, *supra* note 59, § 2.1(c), at 308-10 (noting that excessive reliance on subjective prong would unduly limit *Katz* rule and stating that majority of Court has cautioned that reliance on subjective expectation of privacy prong would in some situations provide inadequate Fourth Amendment protection).


154. See *United States v. Ishmael*, 843 F. Supp. 205, 212-13 (E.D. Tex. 1994) (rejecting government's contentions that waste heat was in plain view, that waste heat was just like garbage, and that FLIR device was like sniff by trained dog), *cert. denied*, 116 S. Ct. 75 (1995); *Young*, 867 P.2d at 601-04 (rejecting *Penny-Feeney* court's analogies of waste heat to garbage and FLIR device to sniff by trained dog); see also *Steele*, *supra* note 3, at 28-32, 35 (examining and rejecting *Penny-Feeney* court's analogies of waste heat to garbage and FLIR device to sniff by trained dog and noting that *Penny-Feeney* court could not find valid analogy to FLIR search).

155. See *United States v Penny-Feeney*, 773 F. Supp. 220, 226 (D. Haw. 1991) (comparing waste heat to garbage), *aff'd sub nom.* United States v *Feeney*, 984 F.2d 1053 (9th Cir. 1993); see also *United States v Ford*, 34 F.3d 992, 997 (11th Cir. 1994) (citing *Penny-Feeney* and comparing heat that defendant vented from house to garbage that defendant placed on curb in *Greenwood*); *United States v Pinson*, 24 F.3d 1056, 1058-59 (8th Cir.) (following *Penny-Feeney* and comparing waste heat to garbage), *cert. denied*, 115 S. Ct. 664 (1994); *supra* notes 67-71 and accompanying text (discussing *Penny-Feeney* court's analogy of garbage to waste heat and discussing facts and holding of *Greenwood*).

156. See *Young*, 867 P.2d at 602-03 (identifying two reasons why *Penny-Feeney* court's
would have escaped anyway; the defendants did not place the heat outside with the same conscious effort required to take garbage to the curb.\textsuperscript{157} In contrast, the \textit{Greenwood} Court relied on the fact that the defendants had deliberately placed their garbage on the curb for a third party to retrieve.\textsuperscript{158} Second, even if the defendants did deliberately "place" the heat outside and thereby "exposed" the heat to the FLIR, the defendants still had a reasonable expectation of privacy in the heat.\textsuperscript{159} The \textit{Greenwood} Court stated that everyone is aware that all members of the public have ready access to garbage bags left for collection outside the home.\textsuperscript{160} In addition, anyone placing garbage on the curb knows that workers will collect the garbage, throw it into a truck, and probably take it to the public dump.\textsuperscript{161} The FLIR situations are distinguishable because the government uses a highly technological device to detect the waste heat.\textsuperscript{162} Until the government routinely uses FLIR devices to scan private homes, people will not expect that anyone will detect and analyze heat

\textsuperscript{157} See \textit{id.} (noting that heat escapes house without any deliberate participation by defendant); Steele, \textit{supra} note 3, at 30 (stating that Penny-Feeney defendants did not voluntarily expose heat with same conscious effort of person taking garbage to curb).

\textsuperscript{158} See \textit{United States v. Greenwood}, 486 U.S. 35, 40-41 (1988) (stating that defendants put garbage on curb for express purpose of conveying garbage to third party and that defendants did not have reasonable expectation of privacy in garbage because defendants put garbage in area "particularly suited for public inspection and public consumption") (quoting \textit{United States v Riecherter}, 647 F.2d 397, 399 (3d Cir. 1981)); see also \textit{supra} note 69 (discussing \textit{Greenwood}).

\textsuperscript{159} See \textit{United States v Ishmael}, 843 F Supp. 205, 213 (E.D. Tex. 1994) (noting that vented heat detected by high tech devices was not analogous to abandoned garbage), \textit{cert. denied}, 116 S. Ct. 75 (1995); \textit{State v Young}, 867 P.2d 593, 603 (Wash. 1994) (en banc) (noting that one does not expect others to detect heat escaping from one's home with sophisticated infrared instruments); Steele, \textit{supra} note 3, at 29 (noting that defendants in Penny-Feeney might reasonably expect police would not use specialized commercial equipment to detect infrared emissions that defendants vented).

\textsuperscript{160} See \textit{Greenwood}, 486 U.S. at 40-41 (stating that "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") (citations omitted); see also \textit{supra} note 69 (discussing facts and holding of \textit{Greenwood}).

\textsuperscript{161} See \textit{Greenwood}, 486 U.S. at 40-41 (noting defendants expected that trash collector would pick up garbage when defendants placed garbage on curb).

\textsuperscript{162} See \textit{Ishmael}, 843 F Supp. at 213 (noting that government’s use of high tech sensory devices distinguished FLIR cases from garbage cases); \textit{Young}, 867 P.2d at 602-03 (noting relevance of government’s use of sophisticated infrared instruments to view heat to determine reasonableness of defendant’s expectation of privacy); Steele, \textit{supra} note 3, at 29 (noting that government’s use of specialized commercial equipment to detect infrared emissions distinguished venting waste heat from placing garbage on curb).
that might vent from their house. That heat is only accessible to those who hire a helicopter and a FLIR operator to fly over the house and analyze the house's heat emissions.

2. Drug-Sniffing Dog Cases

The Penny-Feeney court compared the government's use of the FLIR device to the government's warrantless use of several other sense-enhancing devices that the Supreme Court has held permissible under the Fourth Amendment. However, the searches at issue in each of these cases differed from the government's use of the FLIR in Penny-Feeney. In United States v Knotts, the Supreme Court held that the government's monitoring of a beeper in order to track a car did not violate the Fourth Amendment. However, the Knotts Court specifically noted that the gov-

163. See Young, 867 P.2d at 602-03 (stating public did not expect government's use of sophisticated instruments on home to detect heat); Steele, supra note 3, at 29 (suggesting that general public did not expect government would detect heat with sophisticated device and therefore Penny-Feeney defendants' expectation of privacy in heat was reasonable); see also 1 LAFAVE, supra note 59, § 2.1(d), at 312-13 (noting importance of "customs and sensibilities of the populace" in determining reasonableness of expectation of privacy under second prong of Katz test) (quoting Note, 60 Mich. J.L. 154, 179-80 (1972)). Unfortunately, the fact that courts determine the reasonableness of an expectation of privacy with reference to the customs of the populace raises the possibility that the use of technology will become so commonplace that people will no longer have a reasonable expectation of privacy in their homes. Cf. California v Ciraolo, 476 U.S. 207, 226 (Powell, J., dissenting) (noting with alarm that majority's holding eroded defendant's reasonable expectation of privacy in home and that rapidly increasing technology allowed increasing police surveillance in homes).

164. See Steele, supra note 3, at 29 (noting that "[f]or a curious passerby to see what Officer Char discovered [with the FLIR in Penny-Feeney], he would need to rent a helicopter and spend at least $200 in addition to the normal rental fee").

165. See United States v Penny-Feeney, 773 F Supp. 220, 226-27 (D. Haw. 1991) (comparing government's use of FLIR to government's use of beeper in Knotts, trained dog sniff in Place and Soils, and pen register in Smith), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993); see also United States v Ford, 34 F.3d 992, 997 (11th Cir. 1994) (stating that Supreme Court has held that fact that surveillance device allowed for super- or extra-sensory perception was not fatal to Katz analysis and citing Dow, Knotts, and Place for proposition that use of surveillance device with super- or extra-sensory capability is not fatal to Katz analysis); supra notes 72-75 and accompanying text (discussing Penny-Feeney court's use of analogies and discussing facts and holdings of Smith, Knotts, and Place).

166. See Steele, supra note 3, at 32-34 (discussing invalidity of Knotts, Place, and Smith as analogies to Penny-Feeney).


ernment had only used the beeper to track the defendant's vehicle on open roads, had not monitored the beeper once the vehicle came to rest on the defendant's premises, and had only gained information that would have been available using visual surveillance. In contrast, the government's use of the FLIR in Penny-Feeney obtained information about the interior of the defendants' home that the government could not have obtained through visual surveillance. The Supreme Court then decided another case involving a beeper, United States v Karo. In Karo, the United States Supreme Court found the government's monitoring of a beeper in a private residence to be unconstitutional. The Penny-Feeney court did not acknowledge Karo, which provides a much better analogy than does Knotts.

The Penny-Feeney court also compared the FLIR device to the pen register that the government had used in Smith v Maryland, which the Supreme Court found did not violate the Fourth Amendment. However, the Smith Court relied on the fact that the defendant knew that he had to "convey" the telephone numbers that he dialed to the telephone company to

169. See Knotts, 460 U.S. at 282-85 (noting that beeper was not used in any way to reveal information about movement of drum within cabin or to reveal any information not visible to naked eye from outside cabin).

170. See State v. Young, 867 P.2d 593, 603 (Wash. 1994) (en banc) (stating that infrared device produces image of inside of home that otherwise is protected by home's walls); see also Penny-Feeney, 773 F Supp. at 223.


172. See United States v Karo, 468 U.S. 705, 714, 718 (1984) (holding that government's monitoring of beeper, when beeper revealed information that government could not have obtained through visual surveillance, violated defendant's legitimate expectation of privacy in residence); see also supra note 74 (discussing facts and holding of Karo).

173. See United States v Penny-Feeney, 773 F Supp. 220, 226 (D. Haw. 1991) (citing Knotts for proposition that government's use of beeper was not a search but not acknowledging Karo), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993); Young, 867 P.2d at 601-02 (comparing government's use of beeper in Karo with government's use of FLIR device); see also United States v Ford, 34 F.3d 992, 997 (11th Cir. 1994) (citing Knotts for proposition that fact that device allowed "super- or extra-sensory perception" did not defeat Katz analysis, but not acknowledging Karo); infra notes 202-07 and accompanying text (discussing analogy of Karo to FLIR situation).


175. See Smith v Maryland, 442 U.S. 735, 745-46 (1979) (holding government's use of pen register to record numbers defendant dialed from his home did not violate Fourth Amendment); Penny-Feeney, 773 F Supp. at 226 (comparing government's use of FLIR to government's use of pen register in Smith); see also supra note 73 (discussing facts and holding of Smith).
place a call.\textsuperscript{176} Therefore, the \textit{Smith} Court concluded that the defendant manifested no actual or legitimate expectation of privacy in the numbers.\textsuperscript{177} In contrast, the defendants in \textit{Penny-Feeney} did not deliberately expose to the public the heat that the defendants had generated inside the defendants' house.\textsuperscript{178}

The \textit{Penny-Feeney} court also argued that the government's use of the FLIR device was analogous to the government's use of a trained drug-sniffing dog.\textsuperscript{179} This analogy is inappropriate.\textsuperscript{180} The cases that hold that a sniff by a trained canine is not a search rely heavily on the fact that the only possible information that the sniff can reveal is the presence of a narcotic.\textsuperscript{181}

\textsuperscript{176} \textit{See Smith}, 442 U.S. at 742-43 (stating that telephone users know they must transmit telephone company to complete calls).

\textsuperscript{177} \textit{See id.} at 742-46 (stating that defendant had no actual expectation of privacy in numbers because of public's knowledge that telephone users must "convey" numbers to telephone company and stating that if defendant did have actual expectation of privacy that expectation was not reasonable because defendant voluntarily "exposed" numbers to public).

\textsuperscript{178} \textit{See State v. Young}, 867 P.2d 593, 602-03 (Wash. 1994) (en banc) (noting that heat escapes house without any deliberate participation by defendant); \textit{Steele}, supra note 3, at 30 (stating that \textit{Penny-Feeney} defendants did not voluntarily expose heat with same conscious effort of person putting garbage on curb). The same issues arose in the context of the analogy between waste heat and garbage. \textit{See supra} notes 153-64 and accompanying text (discussing analogy between waste heat and garbage and noting that defendants did not voluntarily expose heat, but even if they did, defendants did not have reason to expect third party would collect and analyze heat).

\textsuperscript{179} \textit{See Penny-Feeney}, 773 F Supp. at 226-27 (comparing government's use of FLIR to government's use of trained dog sniff in \textit{Solis}); \textit{see also} United States \textit{v Ford}, 34 F.3d 992, 997 (11th Cir. 1994) (stating that Supreme Court has held that fact that surveillance device permitted "super- or extra-sensory perception" is not fatal to \textit{Katz} analysis and citing \textit{Place}, canine-snoof case); United States \textit{v Pinson}, 24 F.3d 1056, 1058-59 (8th Cir.) (finding FLIR use was analogous to warrantless use of trained drug-sniffing dogs and citing \textit{Place}), cert. denied, 115 S. Ct. 664 (1994); \textit{supra} notes 75-83 and accompanying text (discussing \textit{Penny-Feeney} court's use of canine-snoof analogy and discussing holdings and facts of \textit{Solis} and \textit{Place}).

\textsuperscript{180} \textit{See United States v. Ishmael}, 843 F Supp. 205, 213 (E.D. Tex. 1994) (identifying two reasons for failure of analogy of dog sniff to FLIR), \textit{cert. denined}, 116 S. Ct. 75 (1995); \textit{Young}, 867 P.2d at 603-04 (stating that canine sniff is unique investigative procedure and that \textit{Penny-Feeney} court incorrectly compared FLIR to canine sniff in \textit{Solis}); \textit{Steele}, \textit{supra} note 3, at 30-32 (stating that \textit{Penny-Feeney} court incorrectly relied on \textit{Solis} and \textit{Place} and that "[t]he greater possibility of intrusion, the difference in training, and the relative novelty of FLIR devices invalidates the [Penny-Feeney] court's analogy to the canine sniff").

\textsuperscript{181} \textit{See United States v Place}, 462 U.S. 696, 707 (1983) (noting that dog sniff reveals only presence or absence of narcotics); United States \textit{v Solis}, 536 F.2d 880, 882 (9th Cir. 1976) (noting that government did not investigate indiscriminately using dog sniffs but directed investigation solely to particular illegal substance); \textit{see also} \textit{Steele}, \textit{supra} note 3, at
In the FLIR situation, the FLIR scan also can reveal information about the house and its occupants that is not illegal.\textsuperscript{182} Furthermore, the Penny-Feeney line of cases relies on United States v Place,\textsuperscript{183} in which the Supreme Court emphasized that the canine sniff is a unique investigative device.\textsuperscript{184} As such, courts should not compare the dog sniff to the FLIR device.\textsuperscript{185} The Penny-Feeney court also inappropriately relied on United States v Solis,\textsuperscript{186} in which the United States Court of Appeals for the Ninth Circuit held that the government's use of a trained dog to sniff the defendant's semi-trailer parked at a gas station was not a search in violation of the Fourth Amendment.\textsuperscript{187} The government's use of the FLIR in the Penny-Feeney line of cases differs from the government's use of the dog sniff in Solis because the government used the FLIR to scan residences.\textsuperscript{188} Courts could craft a better analogy by using United States v Thomas,\textsuperscript{189} in which the United States Court of Appeals for the Second Circuit held that a dog sniff at the door of the defendant's residence constituted a search under the Fourth Amendment.\textsuperscript{190} The court based

\textsuperscript{182} See Steele, supra note 3, at 31 (noting that trained drug-sniffing dog detects only odor of drugs, while FLIR device reveals any source of heat, legal or illegal).

\textsuperscript{183} 462 U.S. 696 (1983).

\textsuperscript{184} See Place, 462 U.S. at 707 (noting that "canine sniff is sui generis" and stating that Court was "aware 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"); see also supra note 75 (discussing Place).

\textsuperscript{185} See State v. Young, 867 P.2d 593, 603-04 (Wash. 1994) (en banc) (finding Penny-Feeney court's analogy of FLIR to dog sniff inappropriate, partly because Supreme Court declared dog sniffs unique in Place).

\textsuperscript{186} 536 F.2d 880 (9th Cir. 1976).

\textsuperscript{187} See Solis, 536 F.2d at 882-83 (holding government's use of trained, drug-sniffing dogs was not prohibited search under Fourth Amendment); supra notes 77-82 and accompanying text (discussing Solis); see also United States v Penny-Feeney, 773 F Supp. 220, 226-27 (D. Haw. 1991) (comparing dog sniff in Solis to FLIR device), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993); Young, 867 P.2d at 603-04 (stating that Penny-Feeney court mistakenly compared dog sniff in Solis to FLIR device); see also supra notes 76-83 and accompanying text (discussing Penny-Feeney court's comparison of FLIR device to dog sniff in Solis).

\textsuperscript{188} See Young, 867 P.2d at 601 (noting that Supreme Court has drawn distinction between use of sensory-enhancement devices in homes from their use in other places); see also supra text accompanying notes 34-53 (discussing Penny-Feeney); supra note 78 (discussing Solis).

\textsuperscript{189} 757 F.2d 1359 (2d Cir. 1985).

\textsuperscript{190} See United States v Thomas, 757 F.2d 1359, 1367 (2d Cir. 1985) (holding that
its holding on the fact that the defendant had a heightened expectation of privacy within his dwelling.  

3. Aerial "Plain View" Cases

The aerial "plain view" cases have held that if an item can be seen from plain view with the naked eye, then viewing from the air does not constitute a search. Cases have extended this doctrine to include the use of telescopic lenses and high-technology cameras — items that enhance the vision of the naked eye. United States v Dow Chemical Co., which involved a high-technology camera, may be the Penny-Feeney court's best analogy, although the court did not stress the analogy. Both the mapping camera and the FLIR device enhance visibility but do not reveal intimate detail. In both cases, the device was available for public rental. However, courts might distinguish Dow on the basis that FLIR devices are not as common as cameras, even mapping cameras. Also, courts could distinguish Dow by

canine sniff at defendant's door constituted search under Fourth Amendment; supra note 132 (discussing Thomas); see also State v Young, 867 P.2d 593, 603-04 (Wash. 1994) (en banc) (arguing that government's use of dog sniff in Thomas is better analogy to government's use of FLIR than dog sniff in Solis).

191. See Thomas, 757 F.2d at 1367 (holding canine sniff at defendant's door constituted search under Fourth Amendment because of defendant's heightened expectation of privacy within his home).

192. See United States v Ciraolo, 476 U.S. 207, 215 (1986) (holding that Fourth Amendment does not prohibit police traveling in public airways from seeing what was visible with naked eye within curtilage of home); see also United States v Ishmael, 843 F Supp. 205, 211 (E.D. Tex. 1994) (stating that naked-eye aerial observations of property do not violate Fourth Amendment, even if property is within curtilage of home), cert. denied, 116 S. Ct. 75 (1995).

193. See Dow Chemical Co. v United States, 476 U.S. 227, 239 (1986) (holding that government's taking aerial photographs of industrial plant complex with high-magnification mapping camera from navigable airspace did not violate Fourth Amendment); see also supra note 114 (discussing facts and holding of Dow).


195. See Steele, supra note 3, at 38 (noting that Dow was best authority by which Penny-Feeney court could have supported its position); see also United States v Penny-Feeney, 773 F Supp. 220, 227-28 (D. Haw. 1991) (discussing Ciraolo and Riley but not citing Dow), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993).

196. See Dow, 476 U.S. at 229-30 (discussing facts of case); Penny-Feeney, 773 F Supp. at 223-24 (discussing facts of case).

197 See Steele, supra note 3, at 38 (noting that devices government used in Dow and in Penny-Feeney were available to public).

198. See id. (stating that "it might be hoped that the Court would hold that although
noting that the FLIR makes heat — which the naked eye cannot see at all — visible.199 Making the invisible visible goes far beyond simply enhancing the ability of the naked eye.200 Courts should be careful in further expanding the "plain view" doctrine to include items that make visible things that are normally invisible to the naked eye, because each expansion erodes Fourth Amendment protection.201

C. Suggestions for Alternate Analogies

United States v Karo202 offers perhaps the best analogy to the government’s use of the FLIR device.203 In both Karo and Penny-Feeney, the government obtained information about the interior of a home that the government would not have been able to obtain without the device.204 The beeper in Karo provided no more information than the FLIR device; in fact, the FLIR device provided more information than the beeper.205 Also, both situations involved a private residence, which generates the highest expectation of privacy.206 The Penny-Feeney court should have followed the Karo

infra detectors are publicly available, they are not as ubiquitous as cameras and thus may not be used for warrantless searches").

199. See Penny-Feeney, 773 F. Supp. at 223-24 (noting that defendants’ residence appeared dark without FLIR but that FLIR revealed bright white areas of escaping heat).

200. See Dow Chemical Co. v. United States, 476 U.S. 227, 238 (1986) (noting that fact that human vision was enhanced somewhat did not give rise to Fourth Amendment problems).

201. See id. (stating that "it may well be that surveillance of private property by using highly sophisticated surveillance equipment not generally available to the public, such as satellite technology, might be constitutionally proscribed absent a warrant"); State v Young, 867 P.2d 593, 598 (Wash. 1994) (en banc) (warning that "as technology races ahead with ever increasing speed" public’s right to privacy may erode without public’s awareness and therefore courts should safeguard Fourth Amendment rights).

202. 486 U.S. 705 (1984); see supra note 74 (discussing Karo’s facts and holding).

203. See Young, 867 P.2d at 601-02 (comparing government’s use of beeper in Karo to government’s use of FLIR device); see also supra text accompanying note 173 (commenting that Karo was better analogy). For further suggestions of analogies to the FLIR device, see Steele, supra note 3, at 35-38.

204. See Young, 867 P.2d at 602 (analogizing FLIR situation to situation in Karo).

205. See id. (stating that FLIR was at least as intrusive as beeper in Karo).

206. See Katz v United States, 389 U.S. 347, 360 (1967) (Harlan, J., concurring) (noting that home is area where person has constitutionally protected reasonable expectation of privacy); id. at 351 n.8 (stating that courts have appeared to agree that private home is constitutionally protected area); see also State v Young, 867 P.2d 593, 601 (Wash. 1994) (en banc) (discussing status of homes in federal constitutional jurisprudence); 1 LAFAVE, supra note 59, § 2.3, at 378 (discussing protected nature of residential premises and stating "one’s dwelling has generally been viewed as the area most resolutely protected by the Fourth
Court and held that the warrantless FLIR scan was a search that violated the Fourth Amendment.

IV Suggested Approach

The government's use of the FLIR device, if abused, could pose serious risks to citizens' Fourth Amendment rights. However, the FLIR is helpful in tracking down indoor marijuana-growing operations, among other uses. Therefore, the government should find a way to use the FLIR device without creating constitutional problems. The government can use the FLIR effectively without weakening the Fourth Amendment protection provided to citizens. In many of the cases involving the FLIR, previous information existed that led the police to suspect that the defendant was conducting an indoor marijuana-growing operation. Furthermore, use of the FLIR device requires planning; the police must rent a helicopter and the device and find a FLIR operator. To ensure that the government does not use the FLIR for random surveillance, courts or legislatures should require the police to obtain a warrant before using the FLIR.

207 See supra note 4 and accompanying text (stating that citizens may face erosion of privacy rights as result of increasing technology).

208 See supra notes 21-29 and accompanying text (discussing usefulness of FLIR device).

209 See supra notes 21-29 and accompanying text (suggesting ways government can use FLIR device to help citizens outside law enforcement context).

210 See infra notes 214-20 and accompanying text (suggesting that courts could require standard lower than probable cause for prior authorization or that legislature could enact statute prescribing procedures government should follow).

211 See, e.g., United States v Ford, 34 F. 3d 992, 993 (11th Cir. 1994) (noting that police received informant's tip and that government based warrant on information from thermal imager and "other sources"); United States v Pinson, 24 F.3d 1056, 1057 (8th Cir.) (noting that police had information about packages defendant received and records of unusually high electrical usage), cert. denied, 115 S. Ct. 664 (1994); United States v Ishmael, 843 F Supp. 205, 213-14 (E.D. Tex. 1994) (summarizing information police gathered other than thermal scan), cert. denied, 116 S. Ct. 75 (1995); United States v Penny-Feeney, 773 F. Supp. 220, 221-23, 228-29 (D. Haw. 1991) (describing extensive evidence other than information police gained from FLIR scan and finding probable cause for warrant absent information police gained from FLIR scan), aff'd sub nom. United States v Feeney, 984 F.2d 1053 (9th Cir. 1993); State v Young, 867 P.2d 593, 595 (Wash. 1994) (en banc) (summarizing information police gathered other than thermal scan).

212 See Penny-Feeney, 773 F. Supp. at 223 (noting that police officer contracted with outside company to arrange FLIR overflight).

213 See supra note 4 (noting danger of erosion of Fourth Amendment rights).
that the government satisfy some lower standard of evidence — such as reasonable suspicion, rather than probable cause — before courts can authorize a FLIR scan.\textsuperscript{214} The government should be able to meet this lower burden because in most situations justifying FLIR use there has been prior evidence of illegal activity.\textsuperscript{215} Moreover, ample time will exist to secure a warrant.\textsuperscript{216} If courts are unwilling to act, as they seem to be, given the holding in \textit{Penny-Feeney}, legislatures should enact statutes requiring the government to comply with certain procedures before using the FLIR.\textsuperscript{217} The Omnibus Crime Control and Safe Streets Act of 1968\textsuperscript{218} (the Act) prohibits wiretapping and electronic eavesdropping except pursuant to certain procedures.\textsuperscript{219} Section 2516 of the Act specifies that a judge may authorize wiretapping when the requested wiretapping may provide evidence of, among other things, any offense involving the manufacture of marijuana.\textsuperscript{220} Legislatures could specify the same authorization procedures for FLIR use. If the courts or legislatures required a lower evidentiary standard for a warrant for FLIR use, any FLIR scan would have at least some form of prior authorization, which is vital to safeguard citizens’ Fourth Amendment rights.\textsuperscript{221}

\textsuperscript{214} See United States v Karo, 468 U.S. 705, 718-19 n.5 (1984) (noting possibility of court’s requiring that government show only reasonable suspicion rather than probable cause before execution of beeper monitoring search); see also 1 LAFAVE, \textit{supra} note 59, § 2.1(e), at 318 (noting that Court in \textit{Camara v. Municipal Court}, 387 U.S. 523 (1967), allowed search upon showing of less than probable cause, but required that magistrate determine standard had been met). For a general discussion of whether courts should require a warrant based on full probable cause before every search, see 1 LAFAVE, \textit{supra} note 59, § 2.1(e), at 317-20.

\textsuperscript{215} See \textit{supra} note 211 and accompanying text (noting that government usually has evidence of illegal activity absent information from thermal scan).

\textsuperscript{216} See \textit{supra} text accompanying note 212 (noting that FLIR scans require planning).

\textsuperscript{217} See 1 LAFAVE, \textit{supra} note 59, § 2.1(b), at 306 (noting that Congress enacted Omnibus Crime Control and Safe Streets Act of 1968, which prohibits wiretapping and electronic surveillance except in accordance with specified procedures).


\textsuperscript{219} See \textit{id.} (specifying procedures and standards for authorization and use of wiretapping devices and for disclosure of information obtained).

\textsuperscript{220} Id. at § 2516(1)(e).

\textsuperscript{221} See \textit{Katz v United States}, 389 U.S. 347, 356-57 (1967) (stating that courts must impose prior restraint on government, not trust government to limit searches itself).