

Detecting Contraband:

Current and Emerging Technologies and Limitations

By Ariel Whitworth

Author's Note: Findings and conclusions reported in this article are those of the author and do not necessarily represent the official position or policies of the U.S. Department of Justice. This article was adapted from *Keeping Contraband on the Outside*, published in the summer 2009 issue of *TechBeat*.¹

A plastic bottle of cough syrup, a bundle of bills outside a wallet, a pornographic magazine — all of these items are contraband in a correctional facility. None, of course, would be caught by a metal detector.

Today, detection devices have become more advanced. Recent models can detect many objects located on, and in some cases even within, a person's body. In a correctional facility, checks for contraband typically occur at a perimeter gate house, the lobby or other entrances in an institution. Generally, all staff, inmates, contractors and visitors must move through these checkpoints before they are allowed entrance.

Using the older radio frequency (RF) metal detectors to screen for contraband can be a tedious process. For instance, if a correctional officer sets off the metal detector, the officer must remove items such as belts, restraining devices (like handcuffs), shoes with metal toes, and any other metal objects the officer may be wearing. If the alarm continues to trigger, the officer must wait in a separate line and be searched with a handheld device. This kind of process is inefficient and can cause staff to feel like they are not trusted.

New and Developing Devices

Although still cost-prohibitive for many agencies, an array of new devices that use alternative technological approaches are becoming available. These devices may detect a broader spectrum of contraband with greater ease and efficiency. New devices currently available or being developed include:

- **Backscatter X-ray contraband detection.** Uses high-energy, low-dose X-ray beams to detect contraband objects on a person's body or within a vehicle. The device is available as a walk-through portal or as an enclosure for scanning vehicles. It may be used in

airport security for passengers as an alternative to manual searches when they set off a metal detector. However, it cannot detect objects in body cavities, such as the mouth or digestive system.

- **Electric field tomography.** Sends weak electric energy into a person's body and provides an operator with a graphic view, as though the operator was looking through the person's body. This technology has the potential to detect all objects on and within a human body. NIJ is funding a grant to create a working prototype.
- **Person detection in vehicles.** Listens to vehicles within an enclosure to find a human heartbeat. The technology uses geophone sensors (electronic sensors that pick up seismic vibrations) and corresponding interpretive software that can be used to detect hidden persons (e.g., in situations involving smuggling or trafficking).
- **Ion scan technology.** Detects the ion profile of an air sample around a person's body, in a vehicle, or in a living space. This device may be portable and handheld, and can be used to detect drugs or explosives.
- **Millimeter wave detection devices.** Interprets high-frequency radio waves to determine if contraband exists on a person's body (e.g., next to the skin, in a pocket.) These devices cannot detect objects inside the body, including objects located in the mouth or hidden in skin folds.

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Continued on page 107

- **Passive magnetic field metal detection.** Senses the earth's magnetic field within a portal and compares the reading with a measurement of the same space when a human is in the portal. This software can be installed in archways or doors. It does not detect objects inside body cavities or nonmetallic objects.

As discussed above, active millimeter wave technologies use high-frequency radio waves at low power levels to determine if contraband objects exist on a person's body, close to the skin. Unlike standard metal detectors, which are only able to identify metal objects, such as guns or knives, millimeter-wave detection devices may identify drugs, pornography or other contraband.

Millimeter Wave Evaluation — Graterford Correctional Institution

Recent evaluations of active millimeter wave scanning technology in an operational setting have had positive results. The National Law Enforcement and Corrections Technology Center (NLECTC) performed an evaluation of the use of active millimeter wave scanning technology in detecting contraband at the Pennsylvania Department of Corrections State Correctional Institution at Graterford. Equipment was installed at the facility in October 2007, and personnel were trained to use it. The evaluation was observed during a site visit to the facility in 2008.

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At Graterford, a person entering the building walks into the portal and raises both arms. Transmitters rotate around the person and project a holographic image of the individual onto a computer monitor. A trained operator can analyze the image and look for areas where contraband may be hidden. If any parts of the image look suspicious, the individual will be searched in the general areas where an operator thinks contraband may be located.

The NLECTC evaluation found that the millimeter wave device detected a wide variety of nonmetallic contraband, and officers felt that it acted as a deterrent, preventing many more illegal items from entering the facility than standard detection technologies. Graterford employees said they have found decreasing amounts of contraband, as regular visitors realize they will be caught.

ENDNOTE

¹ National Law Enforcement and Corrections Technology Center. 2009. *Keeping Contraband on the Outside*. Washington, D.C.: U.S. Department of Justice, National Law Enforcement and Corrections Technology Center. NCJ 228120. Available at: <http://www.justnet.org/TechBeat%20Files/Keeping%20Contraband.pdf>.

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