

# Handheld Explosives Detection

## The Hound™ and the MicroHound™



The Hound™ sample collection and preconcentration unit works with a commercial detector to detect trace explosives. The operator collects a swipe sample from a vehicle.

### The Solution

Sandia National Laboratories has developed two additions to the handheld explosives detection field: The Hound™ and the MicroHound™.

The underlying advantage for both of these units is Sandia's unique sample collection and preconcentration technology. By gathering the sample and concentrating it, the detector's task is easier. This patented sample collection and preconcentration technology was developed originally for an explosives detection personnel portal for the Federal Aviation Administration, now the Transportation Security Administration. The handheld units use a miniaturized version of the technology.

### The Need

The threat response community, including security forces, military personnel, state and local law enforcement, fire fighters, and anti-terrorist/anti-crime units, need a tool to alert them to the presence of explosives. Handheld units are extremely versatile, allowing screeners to check suspicious packages, vehicles, or even people for trace levels of chemicals, especially explosives. Responder community personnel need a device that provides high sensitivity at a low cost.

The Hound™'s front-end sniffer can be detached to allow easier vapor sample collection.



The MicroHound™ provides a fast, portable, lightweight, low-cost solution for trace detection of common high explosives.

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## Hound™ and MicroHound™: Comparing Features

	Hound	MicroHound
<b>Application</b>	Handheld explosives and drug detection system	Handheld explosives detection system (can be configured for drugs)
<b>Application Areas</b>	Military bases, sensitive facilities, embassies, airports, traffic stops, and border crossings.	
<b>Detector</b>	Commercial ion mobility spectrometer (IMS) detector	Sandia-developed microsensors—including a miniature IMS, micro gas chromatograph ( $\mu$ GC), and a micro surface acoustic wave ( $\mu$ SAW)
<b>Operation</b>	<p>Operates in two modes: <b>vapor</b> (inhale fumes or particles, contactless) or <b>swipe</b> (collect particles from surfaces, requires contact)</p> <p><b>Collecting the sample:</b> For <b>vapor collection</b>, a blower draws in a large volume of air and collects explosives and other chemicals from the airstream onto a metalized screen. For <b>swipe mode</b>, the operator wipes the sampling medium across the suspect surface and inserts it into the device.</p> <p><b>Preconcentrating the sample:</b> Next, the system vaporizes the collected compounds into a small parcel of air that is delivered to the detector.</p>	
<b>Sensitivity</b>	Can detect less than a fingerprint of explosives	
<b>Specificity</b>	Can identify the type of chemical detected, which canines cannot do.	
<b>Power Source</b>	Chargeable batteries	
<b>Stage of Development</b>	Field prototypes fabricated on a contractual basis for individual customers; Sandia is investigating licensing opportunities	R&D prototype in third phase of a three-phase development effort
<b>Cost</b>	~\$40K for one field unit (\$30K for commercial unit) \$35K in commercial production	~\$10K in commercial production



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