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HOW TECHNOLOGY ENHANCES SEARCH TECHNIQUES

Modern search methodology can combine established physical-search expertise with Wi-Fi, Bluetooth, RF and other detection technologies to help identify and locate concealed digital devices.

Police Search Advisers (PoSA) and professionally trained search personnel possess highly developed skills in systematic searching, scene assessment and identifying potential concealment locations. Those skills remain fundamental. However, the nature of what police teams are being asked to find is changing.

Increasingly, the item of interest may be a smartphone, tracker, wearable, wireless camera, portable hotspot, IoT device or another piece of connected technology. Unlike many traditional search targets, a digital device may be hidden from view while still communicating through Wi-Fi, Bluetooth, cellular or other radio-frequency technologies.

SEARCHING FOR THE DIGITAL SIGNATURE

Traditional searching asks a vital question: where could the item have been concealed? When the target is a digital device, technology allows search teams to add another: is the device itself providing clues to its location?

Wi-Fi and Bluetooth scanning can help build a picture of the electronic environment around a search. Depending on the equipment and circumstances, investigators may observe SSIDs, BSSIDs, MAC addresses, manufacturer information, hostnames, Bluetooth or BLE devices and received signal strength. Received signal strength is not a precise measure of distance and can be affected by walls, reflections, interference and neighbouring devices. Used correctly, however, changes in signal strength while moving through a property, vehicle or other search area may help identify locations that merit closer physical examination.

The important point is that the technology does not replace a physical search. It provides an additional search indicator that can be considered alongside established search observations.



A BROADER TECHNOLOGICAL TOOLKIT

Technology-assisted searching is much wider than simply opening a Wi-Fi scanner. Depending on lawful authority, operational circumstances, equipment and the competence of the personnel involved, a search team may be able to draw upon several complementary technologies:

- **Wi-Fi scanners** - Identify wireless networks, access points, hotspots and broadcasting devices.
- **Bluetooth and BLE scanners** - Identify phones, watches, trackers, headphones, vehicle systems and IoT equipment.
- **RF detectors and spectrum analysers** - Identify radio-frequency activity across frequencies beyond conventional Wi-Fi and Bluetooth.
- **Directional antennas** - Assist trained operators in assessing the apparent direction or relative strength of a transmission.
- **Thermal imaging** - Potentially reveal heat generated by powered electronic equipment in suitable environments.
- **Non-linear junction detectors** - Assist in locating electronic components, including equipment that may not currently be transmitting.
- **Network scanning and router examination** - Reveal devices associated with accessible network infrastructure and, where available, useful network artefacts.
- **Inspection cameras and borescopes** - Support examination of cavities and difficult-to-access concealment areas.

THE ROUTER SHOULD ALSO BE PART OF THE SEARCH

Network infrastructure can provide another source of information. Where examination is lawful and operationally appropriate, a router or access point may show devices that are currently connected or have previously been associated with the network. Depending on the device, configuration and available retention, information may include hostnames, MAC addresses, local IP allocations, DHCP records and other connection information. Such data can help investigators understand what devices have formed part of the digital environment and may identify equipment that has not yet been physically located.



COMPLEMENTING - NOT REPLACING - SEARCH EXPERTISE

A scanner cannot understand why a void, structural feature or piece of furniture represents a strong concealment opportunity. An experienced search professional can. Equally, a search officer cannot see a radio transmission with the naked eye. Appropriate technology can provide visibility of that electronic environment. The opportunity lies in bringing the two together. Physical observations, search intelligence and electronic indicators can be considered collectively, rather than treating digital detection as a separate discipline.

WHY THE CAUTION?

There are legitimate reasons for caution. Equipment must be understood, personnel require appropriate training, and results need careful interpretation. Radio signals can travel through walls, originate from neighbouring premises and fluctuate significantly. A detected Bluetooth device or RF transmission does not, by itself, establish ownership, relevance or precise location.

There may also be legal, evidential, operational and information-security considerations depending on the technique being used. These limitations are important - but they are also reasons to develop training, procedures and informed operational use rather than to disregard the technology altogether.

DIGITAL DEVICES ARE BECOMING EASIER TO CONCEAL

The challenge is likely to increase as capable connected technology becomes smaller and cheaper. Search teams may encounter second or 'burner' phones, smartwatches, Bluetooth trackers, GPS devices, miniature cameras, portable hotspots, wireless storage, IoT devices, small single-board computers and concealed network equipment.

The obvious handset on a bedside table may not be the device that matters. Modern searching increasingly requires an understanding of both the physical environment and the electronic environment.

BRINGING SEARCH AND DIGITAL INVESTIGATION TOGETHER

Closer collaboration between Police Search Advisers, search-trained personnel, Digital Media Investigators, communications specialists and digital forensic practitioners could help embed these opportunities within operational search planning. A technology-informed search might consider what wireless networks are present, what Bluetooth devices can be detected, whether unusual RF activity exists, what equipment is associated with relevant network infrastructure and whether those electronic observations support what the physical search team is seeing.



“WHERE COULD THEY HAVE HIDDEN IT?”

Should increasingly be accompanied by:

“IS THE DEVICE TELLING US WHERE IT IS?”

Police search techniques have continually evolved in response to changing threats, concealment methods and investigative opportunities. Digital technology presents another stage in that evolution.

The aim is not to turn every search officer into an RF engineer or digital forensic examiner. It is to recognise that when the object being sought is capable of communicating wirelessly, there may be valuable information available before the device is ever physically found. Used alongside established professional search techniques, Wi-Fi, Bluetooth, RF and other detection technologies can help search teams see an additional layer of the environment - the digital signature created by the devices around them.

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