

RFID and the Arts

Arts organizations are turning to RFID as a flexible and cost-effective way to track and safeguard precious objects.

By John Edwards

Feb. 26, 2007—On New Year's Day morning 2000, a smoke canister crashed through a skylight at the [Ashmolean Museum](#) in Oxford, England. Fire alarms sounded at the world's oldest public museum, and as security guards rushed from the building, a thief dropped a rope ladder through the skylight, lowered himself into a gallery and helped himself to a Cezanne painting entitled "Auvers-sur-Oise". The thief—and the £3 million (\$5.9 million) artwork—were gone well before police and firefighters arrived.

The theft—one of the largest art heists in recent U.K. history—delivered a wake-up call to the [National Gallery](#), a London-based institution maintaining one of the world's greatest collections of European paintings. "After the theft of the Cezanne, we decided we needed to reinforce our security," says Jon Campbell, the gallery's head of visitor services and security. Pondering its options, the museum decided that RFID technology, which helps eliminate the need for costly and intrusive wiring, should play a key role in its overall security strategy.



London's National Gallery

As RFID matures, the technology is quickly expanding its presence beyond warehouses and factories, and into the genteel world of museums, galleries and theaters. "Yet the goals are really the same," says Ellen Daley, enterprise mobility research director for [Forrester Research](#), a technology research firm in Cambridge, Mass. "It's all about identification and tracking"

But a museum isn't a warehouse, and a theater isn't a factory, so as RFID moves into the art world to protect masterpieces of all shapes and sizes, the technology is also creating challenges for both vendors and adopters. Hurdles include adapting freight-oriented tags to small and delicate objects, funding the addition of new technology and training staff members in RFID's operation and quirks. "It's all of the issues that are associated with addressing a new market," Daley says.

National Gallery

To help it develop an RFID-based security system, the National Gallery contacted [ISIS](#), a London-based developer of RFID asset-tracking technologies. ISIS has installed systems at several historic royal palaces, as well as the [Victoria and Albert Museum](#), [The Royal Academy](#) and many other U.K. and global venues. The company recommended using its Aspects ARTS active tag system, which enables artworks to continuously signal their presence to interrogators covertly placed on the museum's ceilings.

Over the past several years, credit-card-sized tags have been installed on the artworks in the National Gallery's main exhibit areas and reserve collection. Every tag includes a unique ID, as well as a sensing feature able to detect both vibration and tilting. "Each tag has a lifetime of over six years," says Rob Green, ISIS's managing director. Interrogators receive a signal from each tag every 15 seconds. If a reader misses a signal, or if the system is compromised in any way, the Aspects ARTS software sounds an alarm. A computer and display system kicks into action, showing the endangered artwork's exact location and displaying and recording nearby CCTV video streams for visual identification and evidence. "The system also sends a message to the guards' pagers," says Green, "telling them what's being touched and activating a sounder."

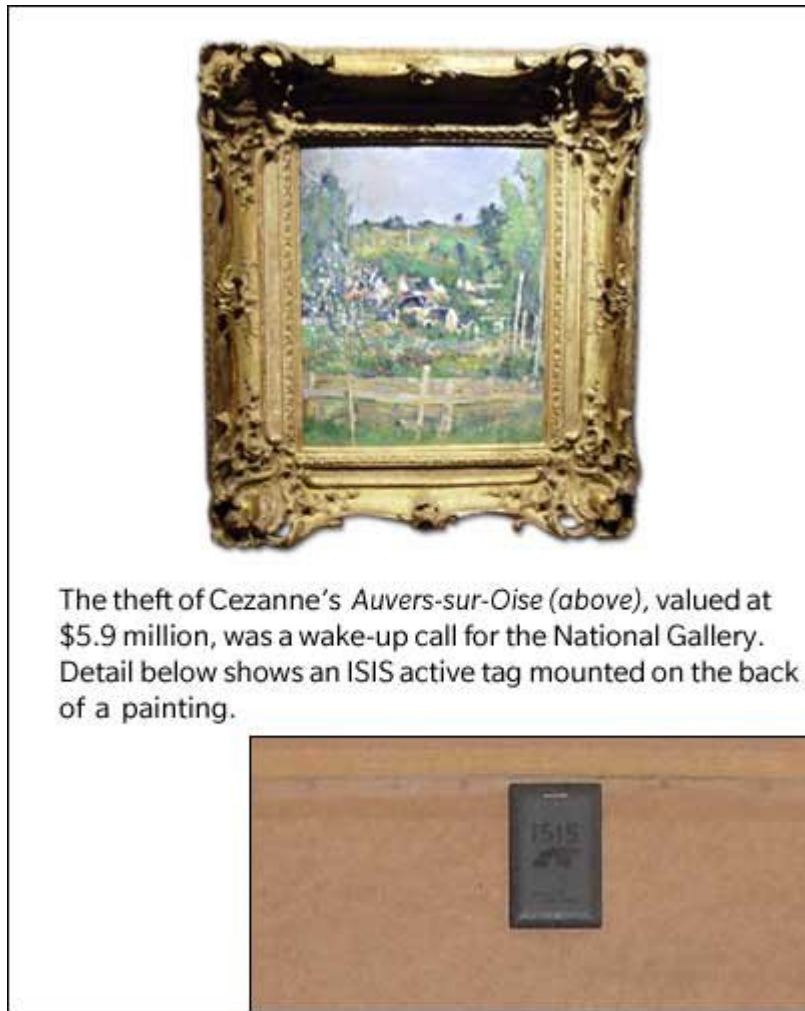
Campbell says the security system presented a substantial learning curve to the museum's staff. Workers had to figure out, for example, how to mount the tags onto artworks without causing any damage. Employees also had to be educated about the technology's operation. "Early on, we did see a pretty high level of false alarms," he says. "If you start moving works of art around in the galleries without telling anybody, people will start assuming that something is perhaps in the process of being stolen."

Still, Campbell is pleased with the technology overall. "What we got is very much what we asked for," he says. "I would say that it has worked well for us."

Exhibiting Doubts

Virtually all arts institutions appreciate RFID's ability to track and safeguard collections, but many organizations simply can't afford to switch to a technology still viewed by many directors and boards as new and untested. "The promise of the technology is exactly what we need," says Stephen Topfer, collections manager at the [Art Gallery of Greater Victoria](#), located in Victoria, B.C., Canada. "But we're not a big enough organization that we can afford to devote \$50,000 or \$100,000 to an experiment."

Many institution officials considering an RFID implementation wonder if the technology is ready to make the jarring transition from pallets, containers and crates to a world of paintings, sculptures and various *objets d'art*. "I understand how RFID would work in a warehouse or factory environment, but what I need is something that can work with fragile and delicate objects that are often stacked quite close together," Topfer says. "For example, our works on paper are generally stored matted and interwoven with acid-free tissue in shelves, so there might be 20 or 30 works in a drawer."



The theft of Cezanne's *Auvers-sur-Oise* (above), valued at \$5.9 million, was a wake-up call for the National Gallery. Detail below shows an ISIS active tag mounted on the back of a painting.

Vendors are responding with smaller tags, some as tiny as a grain of rice. ISIS's Green notes, "Passive tags can be extremely small. Active devices, however, may still be too large for many objects."

Environmental factors can also be a problem. Unlike modern, open-floor warehouses and factory floors, many museums and galleries are a maze of rooms, often built with thick, RF-absorbing masonry walls. As a result, providing premises-wide RFID coverage often necessitates the use of large numbers of interrogators, which drives up costs.

Despite the drawbacks, most experts believe RFID is still far more flexible and easier to manage and maintain than most competing technologies, including room-wide motion detectors and manual bar-code scanners. Wireless also offers an advantage over hard-wired sensors. "As I see it, with ever-changing exhibitions and re-hangings in public institutions, the wireless solution is far better than a fixed wire security system," says Charley Hill, former detective chief inspector of Scotland Yard's art theft squad, and currently a private investigator in London.

RFID in Performance

RFID is also beginning to gain traction in music and the performing arts. In an effort to combat theft and fraud, instrument makers, concert organizers, performers and collectors are all now using the technology to track both instruments and people.

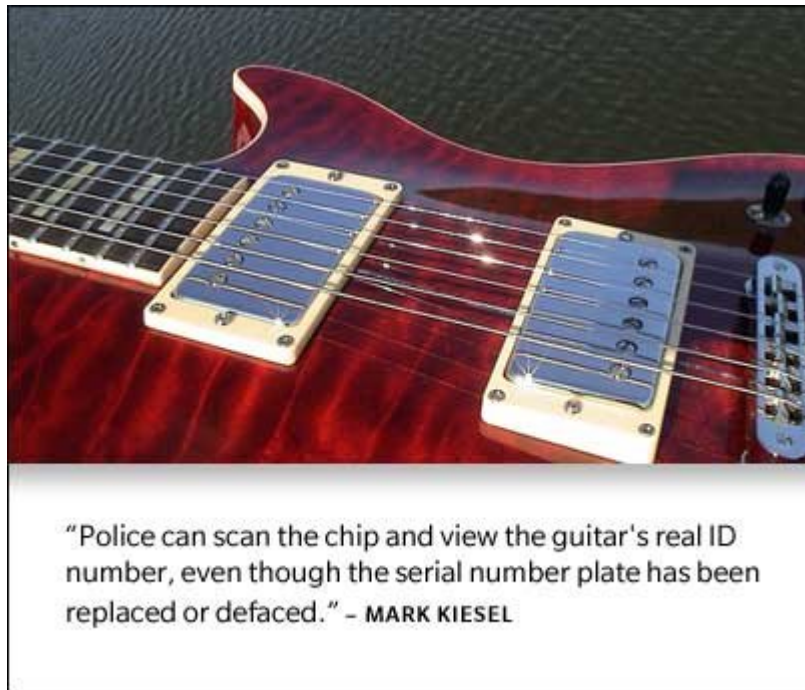
San Diego-based custom guitar manufacturer [Carvin](#) places an RFID chip into each of its guitars at the start of the manufacturing process. This enables customers to track their instruments throughout their construction. "We've set up stations at key areas of the factory, where all guitars are scanned and [their] location gets recorded in our database," says Mark Kiesel, Carvin's vice president of guitar design and production. Customers can follow their guitar's progress via Carvin's Web-based [GuitarTraQ](#) service, which provides details on the instrument's progress, from initial assembly through finishing, testing and shipping.

Once the guitar is in its owner's hands, the RFID chip begins working as a security device, allowing the system to

scan and identify the instrument in case it is ever lost or stolen. Like most high-end guitars, Carvin models feature an external serial number plate. "Many times, when someone steals a guitar, that plate will be replaced with a counterfeit copy," Kiesel says. But the RFID chip cannot be easily duplicated. "Police can scan the chip and view the guitar's real ID number, even though the serial number plate has been replaced or defaced," Kiesel says.

Number plates aren't the only items counterfeiters produce. Some create entire instruments with the goal of passing them off as rare or collectible objects. "There is a lot of fraud when it comes to the provenance of instruments," says Sanford Forte, executive vice president of marketing and business development for [SNAGG](#), the company that developed Carvin's tracking system.

Provenance—the physical record of an item's ownership history—is highly important to collectors of noteworthy or historical musical instruments. The pedigree of a Stradivarius violin, for example, can often be traced back hundreds of years through sales receipts, auction records and other documents. But that's the exception. Less-notable instruments often come with little or no historical documentation, leaving both sellers and buyers in the dark about an object's manufacturer, construction date and past owners. "If I'm a collector of rare guitars, violins or whatever, and I want to sell a part of my collection on the market, there's nothing other than occasional papers to prove the provenance of that instrument," Forte says.



While a new RFID tag cannot generate a history for an existing instrument, it can launch the provenance chain, attesting to its current owner and condition, and potentially raising the object's value. In addition to marketing RFID tools to instrument manufacturers, SNAGG sells a \$25 retrofit kit enabling owners to add an RFID chip to a current instrument. Whether installed at the factory or by an owner, the tag serves as a silent witness, ready to attest to its host's origin whenever pinged.

SNAGG's RFID chips are about the size of a grain of rice. They require no power source and have an estimated shelf life of more than 80 years. The chips are functional between 25 and 125 degrees Fahrenheit and are impossible to remove without destroying the instrument—a substantial disincentive and deterrent to thieves.

Besides Carvin, SNAGG's customers include guitar maker [Fender](#), piano distributor [Chicago Pianos](#) and [Josephus Harps](#). The company has also partnered with [MusicPro Insurance](#), which offers a discount to clients that own RFID-equipped instruments. According to Forte, his company is committed to helping manufacturers and owners identify and authenticate their instruments. "We have a large database of instruments," he says, "and we have been working very closely with organizations like the [National Association of Property Recovery Investigators](#) and the [FBI's Art Frauds group](#)."

Wrist Action

As more arts organizations embed RFID devices into their collections, many groups are looking to begin tagging another highly mobile commodity commonly found on their premises—namely, people. At [South By Southwest](#) (SXSW), a music and media festival held annually in Austin, Texas, selected attendees receive an RFID wristband upon entrance to the event. "We're essentially using RFID at our venues so that we can make sure that the people who are trying to get in have legitimate credentials," says Scott Wilcox, chief technology officer of SXSW, the Austin-based company producing the event.

Douglas Bourque, RFID manager at [Precision Dynamics](#)—an RFID wristband manufacturer in San Fernando, Calif.—says a growing number of concert organizers are turning to RFID as a way to reduce ticket counterfeiting, improve crowd control and achieve more accurate attendance counts. "A vendor can download the reader's data and balance the books right on the spot," he says.

SXSW's RFID adoption arose out of necessity: With more than 1,500 bands and some 70 venues, crowd control was getting out of hand. "A few years ago, we had a big counterfeiting problem," says Wilcox. People who were only entitled to enter music events were sneaking into other areas, such as conferences and trade exhibits. "We started looking at RFID as a way to prevent that," Wilcox says.



For assistance, SXSW turned to Precision Dynamics. The company suggested its Smart Band Wristband, which features a tiny, flat RFID chip sealed inside a nontransferable plastic strap. Each chip contains a unique serial number that, when pinged by an interrogator, verifies the wristband's authenticity.

The wristbands cost approximately \$1 apiece. For Wilcox, the wristbands ensure that only properly credentialed individuals get into each venue. "We use it as an authentication technology," he says. The organization has gradually expanded the technology's use over the past few years, adding more wristbands and more interrogators. "Our first year, we started with maybe 20 readers. Last year, we had 40," Wilcox says. "This year, I'm expecting we will have at least 60. It's a technology that has proven its worth."

Encore

RELATED ARTICLES

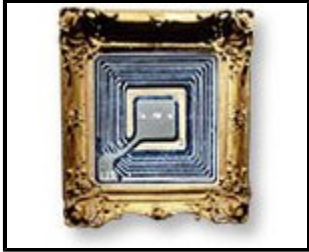
- › [Northstar Ski Resort RFID-Enables Guest Locker Rooms](#)
- › [Ford World Rally Team Uses RFID-Enabled DVDs for VIP Tickets](#)
- › [Payter Expands Its Electronic Wallet](#)
- › [RFID Journal LIVE! 2007 Report](#) 🌟

As RFID's cost continues dropping, and as both tags and interrogators get smaller and more convenient to use, the technology will undoubtedly be adopted by a greater number of arts organizations, says private investigator Hill. "RFID is so much better and more cost-effective than big systems that essentially cover rooms at night," he says. As thieves become more brazen, staging daylight robberies of museums and galleries, arts organizations need a system

able to provide 24-7 monitoring. "A wireless system can protect an object wherever it is and whenever it is moved," he says. "I think it's the wave of the future."

SNAGG's Forte agrees. "The theft market is currently a nascent opportunity," he says. "RFID will eventually be ubiquitous."

"What we're looking at is embryonic," adds Forrester's Daley. "There's no doubt that it's only going to continue to grow."



| [Back to normal page view](#) | [Send this article to a friend](#) |

Copyright © 2002 - 2007 RFID Journal, Inc. All Rights Reserved