

Organizers of Six Fest added tags to their tickets, thereby improving traffic flow for 14,000 concert-goers and saving thousands of dollars by discouraging counterfeiters.

By Claire Swedberg

June 18, 2009—Audience members at [Six Fest](#) music festival held this spring in Athens, Ohio, may have gotten soaked in a rainstorm, but their RFID-enabled tickets got them in the door, often without being taken out of their owners' bags or pockets. The system, installed by supply chain technology startup [InstaTrax Solutions](#), moved nearly 14,000 ticket holders through the gate, with no instances of counterfeit tickets. That feature alone, says Ryan Jones, the event's co-organizer, was worth the cost of the technology. In fact, he adds, by eliminating counterfeit tickets, as well as the practice of reusing legitimate tickets, Jones estimates the group saved approximately \$10,000. The system cost \$12,000, while the elimination of fraud saved the company an estimated \$22,000 or more.

Since 2004, the annual Fest concert has been a local event similar to a smaller version of Woodstock, with numerous bands performing in an open outdoor field from 11 a.m. into the night. Teenagers and college students primarily attend the event, paying \$15 for a ticket or \$25 at the door. But in previous years, Jones says, the concert lost thousands of dollars to counterfeit tickets—as many as 10 to 12 percent of the tickets were, in fact, fakes. In addition, some of those holding legitimate tickets would enter the concert, collect a handful of tickets from friends, carry them out of the gate and hand them off to others waiting outside, enabling them to enter without paying. To thwart such activities, Six Fest's organizers employed a fleet of staff members—college students, for the most part—who examined tickets carefully and tried to keep a watch out for ticket theft, which was time-consuming and only partially effective.



Six Fest's Ryan Jones

This year, however, each ticket included a passive ultrahigh-frequency (UHF) RFID tag encoded with a unique ID number. Each tag was read by interrogators at the concert gate, verifying that the ticket was not counterfeit or being reused. The tags were supplied by [InstaTrax](#), an Ohio company that provides RFID, data-management and e-commerce technology solutions. InstaTrax's president, Neco Can, knew someone who worked for the industrial engineering department at [Ohio University's](#) Athens campus, and that person volunteered to supply a six-foot-wide metal gate and a 17-inch computer screen for the application. InstaTrax then designed the system that was used this year.

The RFID tag was attached to the back of the ticket in a sticker format. InstaTrax chose to use the X-1030 dual dipole RFID tag, an EPC Gen 0 inlay made several years ago by [Matrics](#) (now part of [Motorola's](#) RFID division). According to Can, these 2-by-2-inch EPC Class 0 tags were utilized instead of EPC Gen 2 tags because the size fit well on the ticket, and because InstaTrax had a number of the tags in its inventory. The team tested the tags in-house, Can says, to ensure they could be read properly by two RFID portals that would be installed

on the metal entrance gate. The tags were found to have a read range of 7 feet or more, even when carried in a purse, wallet or pocket.

Each portal, consisting of a Motorola AR400 reader and two antennas, was designed to read the tags of ticket-holders within a range of 3 feet or less. The readers were cabled to a Linksys router that was then cabled to a laptop computer that ran InstaTrax software. The software interpreted the ID number read by the interrogators, then determined whether the read was valid. If the portal read anything other than a Class 0 tag, or if there was no read at all, the software then enabled the screen to display a red light indicating the individual lacked a valid ticket. If the ticket was read properly, a green light was illuminated. Of the 14,000 tickets sold, Can says, only six or seven did not read properly because their tags were defective and had to be visually examined to verify their validity.

Concert-goers first passed through a security checkpoint to have their bags checked for glass bottles and other forbidden items. However, Jones says, they then approached the entrance gate and moved through quickly because they were using the RFID-enabled tickets, thereby keeping the traffic flow steady.

What the organizers and InstaTrax had not expected was the amount of rain that soaked the concert area that day. The interrogators and computer were under a canvas tent, but because of the heavy rain and their proximity near the edge of the tent, the hardware got wet. What's more, the interrogator antennas and gate were uncovered and open to the rain. As the rain continued, concert employees moved the readers and computer farther from the edge of the tent to keep them dry. By this time, however, the interrogators were very wet, Can says, as were many of the tickets, though the system still functioned properly. In many cases, he notes, concert-goers—having just passed through the security line in which their bags were searched—began rummaging through their belongings, trying to find their tickets as they approached the gate. "I told them 'Don't search—just walk,'" Can says. They then passed through the portal, and their tickets were read despite the fact that they weren't in their hands.

Before the concert was held, organizers made a point of disclosing that the tickets were RFID-enabled. It was that effort, by posting information regarding the RFID tags on the event's Web site, for instance, that may have discouraged counterfeiters from attempting to create their own tickets. For future events, however, Jones says Fest's organizers intend to enter and store the unique ID numbers for all of the tickets on a database (there not insufficient time to accomplish that for this year's concert, Can explains). In that way, no one could try to create a counterfeit ticket using different RFID tags.