

**At New Jersey's Rhythm and Blues Stables, riders and trainers view their performance on the arena's big screen, with the optimum camera angle displayed at all times.**

By Claire Swedberg

Aug. 28, 2007—Typically, horse trainers and riders use mirrors situated around an arena to visually check the performance of their horses and themselves during practices. Trainers and riders often bring a friend to the arena to capture video footage, which they can later watch and analyze. However, at [Rhythm and Blues Stables](#), in Allentown, N.J., riders can observe themselves without ever dismounting.

The stable is currently testing an RFID-based system that allows equestrians to watch themselves practice in arenas via cameras integrated with sensors. Developed by startup company [Integrated Equine Technologies](#), the system consists of Integrated Equine software for controlling camera coverage and recordings, as well as RFID hardware and real-time location system (RTLS) software from [Ubisense](#). The stable's owner, Jason Beck, is also president of Integrated Equine Technologies.



*Joshua Horton*

The arena is equipped with two analog video cameras, four Series 7000 Ubisensor RFID interrogators for capturing transmissions from active ultra-wide band (UWB) RFID tags attached to horses or riders, a computer running the Ubisense and Integrated Equine software and a large LCD screen.

Currently, Beck says, the tags—the size and shape of a flattened golf ball—are being attached to a horse's bridle or bit, or to a rider's garments. According to Joshua Horton, Integrated Equine Technologies' managing partner and CTO, the company is testing the application of several tags attached simultaneously to different parts of the horse. With multiple tags attached to a horse, the system can choose the best recording angle—for example, one facing the horse's head, rather than its rear.

Each tag uses the 6 to 8 GHz UWB frequency band to transmit a signal encoded with its unique ID number. The tag can transmit its signal continually, Horton says, or be set to be turned on or off automatically by a built-in motion sensor. Equine Technologies is testing both methods. The Ubisensors receive the tag data and, via a cabled link, forward it to a server running the Ubisense software. The software calculates the tag's location at that instant via the signal's angle of transmission and time of arrival, as recorded by each sensor.

The four RFID interrogators capture data from all tags in the 210-by-80-foot arena, Beck says, adding, "It's just incredible the way it works. It's extremely accurate." If a rider wears the RFID tag on a helmet and leans forward, he says, the sensors will capture that movement.

Each video camera is attached to a motorized mount designed to pan and tilt to get the best picture. Ubisense software allows the system to direct cameras regarding how far to move, and when to stop. "This is the primary role Ubisense plays in our system," Horton explains, "to provide us the X-Y coordinate of our subject."

The cameras route their data to a recorder, where the frames are digitalized. Based on the tag data, Integrated Equine Technologies' software directs the digital video images from the best-angled cameras for display on a large screen. The system allows a trainer to replay specific segments of the video or freeze a specific frame. "For people who know the sport, it's very important to have every frame as clear as possible," Horton says. This makes it vital to use the correct camera angle at any given moment. Typically, horses canter at a rate of 1,066 feet (325 meters) per minute.

According to Beck, the company intends to continue testing hardware and software at the Rhythm and Blues location for at least two more weeks, after which the solution will be made commercially available to other equine facilities. He says he hopes to make the system easy to use. "This is not going to be used by technophiles; it's going to be used by people who ride horses," Beck explains. "We want it to be very simple for operators."

Although the Rhythm and Blues arena is using only two cameras, the system is being built to accommodate up to 12. The number of cameras typically required is expected to be four to six, Horton says. A smaller arena—approximately 100 feet in length—would require only two Ubisensor RFID interrogators. The system for such an arena would cost about \$25,000, including two sensors, several tags, four to six cameras attached to motorized mounts, software, a PC to receive the data and run the software, and a plasma or LCD screen. A stable could also opt to connect the readers via a LAN cable to its back-end operation management system, Beck notes, so that recordings could be saved for stable employees or clients to view at a later date.

Eventually, Integrated Equine Technologies hopes to host a password-protected Web site to which video footage could be uploaded, enabling users to watch recordings of themselves or other riders online. Another potential online application might be the real-time viewing of horses or riders during practice or competitions. No timetable, however, has yet been established for the deployment of such services.