

Big League Crew Communications

Arizona's NFL and MLB franchise operations crews overcome wireless intercom challenges.

By E. Victor Brown

NFL and MLB stadiums often rank among the harshest RF interference environments in the country. This is due primarily to the thousands of patron cellular transmissions, in-stadium Wi-Fi access and the wireless transmissions from microphones, fire/safety, broadcast and support services that fill the air waves.

Game operations crews must navigate this environment via wireless intercom in order to create an immersive environment for tens of thousands of fans. Finding a reliable, versatile and high quality system has only become more difficult as the available frequency bandwidth shifts and grows more crowded by the day. In late 2008, crews for Arizona's Cardinals and [Diamondbacks](#) were looking for [intercom solutions](#) that would take them well into the next decade.

Blocking Cardinals Communication

Mark Tenkely, a member of the [Arizona Cardinals](#) scoreboard operations team has weathered the storm of hundreds of complex games like the Super Bowl and other world class events. The stadium's massive size, metal-clad construction and plethora of wireless signals made crew communications a daily challenge.

The battle for coverage and clarity was compounded by versatility limitations of the existing wireless intercom system. "I had insufficient quantities of belt packs for the 13 members of the operations crew, which required me to rent eight additional packs," said Tenkely. "On top of that, battery packs had to be duct taped to belt packs and I was going through sixty AA's a day just for the intercom system."

Tenkely and scoreboard director Michael Conner discussed new wireless system options and first tried a solution from their existing system's manufacturer. A demonstration was scheduled utilizing the company's latest generation wireless intercom system. The demo system consisted of a 2.4 GHz band Wi-Fi base station and four belt packs.

Tenkely positioned the base station outside the control booth window as he would do with rental units on a typical game day. Drop outs and interference disrupted the signal to and from the belt packs within the first 20 feet of walking the field to test the system. It was clear to the product representative and Tenkely that this solution would not work in their environment. Consequently, Conner and Tenkely began looking for better options.

Into the End Zone

As a freelance audio engineer, Jamie Gillespie had been working with the stadium since its inception. He also had a long track record in audio production for major festivals, broadcasts, the NHL's Phoenix Coyotes and audio at Arizona's Jobing.com Arena. Since 2007, Gillespie has worked as a systems

engineer for Phoenix-based [AVDB Group](#), an audio, video and control system integration design/build firm with offices in San Diego and Las Vegas.

Gillespie had intimate knowledge of the [wireless intercom](#) challenges the stadium crew faced. Subsequent conversations with Tenkely kept returning to the HME line of [wireless intercom](#) solutions. "I had a lot of experience working with the HME systems as both an engineer and installer," said Gillespie. "I knew it had the necessary frequency agility in the UHF band, superior fidelity over distance and the ability to run as many as 16 belt packs from one base station, addressing all of Mark's problems."

Gillespie and AVDB president Marty Waverley contacted HME Pro Audio Product Manager Rick Molina and together settled on the HME PRO850™ wireless intercom system as the best solution. Molina flew out from the company's San Diego headquarters with an [HME PRO850 base station](#), four belt packs and headsets for a demonstration at the stadium with Tenkely and Gillespie.

Molina provided a 30-minute tutorial on the software and then did a scan for the best frequencies during setup. The team then utilized the RF power adjustment capability of the belt packs for fine tuning. After walking the entire stadium without issue, Tenkely hooked the base station into the existing antenna in the booth rack and walked the stadium again. "We made some minor frequency adjustments to eliminate a couple of RF interference spots and things worked well from that point," said Tenkely.

The Touchdown

With a strong signal and intuitive layout/operation of the system verified, the initial purchase decision was made on the spot. As a final check, Molina arranged for the Cardinals crew to keep the demo system for two subsequent game weekends for a trial by fire. Tenkely distributed the four belt packs to specific crew members for feedback on the system, getting rave reviews.

With the system proving itself under real-world conditions, Tenkely awaited final funding approval over the next month. The final system included a single [HME PRO850 base station](#) and eight belt packs with HME single muff/noise canceling headsets. Two Sennheiser A5000-CP antennas were added to the order to boost reception for the wireless camera operator throughout the structure.

According to Tenkely, the software setup via laptop to base station interface was tremendously easy. Programming the belt packs took just several minutes versus nearly an hour for the former system. "We run a pre-game check for interference problems and make adjustments if necessary, but once the game begins, I never have to make any adjustments," said Tenkely. "Programming is simple, belt pack button changes are quick and I've never had battery packs die at any event."

In addition to all home Cardinals games, the multipurpose stadium is host to concerts, monster truck rallies, large trade shows and conventions for an average total of 50 events a year where the HME PRO850 comes into service. Although the previous wireless system is still in existence, Tenkely hopes to replace it with additional HME belt packs and headsets for the 2010 season. "The HME PRO 850 is the cleanest wireless intercom system that I have ever used with great communication up to and beyond 500 feet by my estimate," said Tenkely.

Chasing Diamondback Communications

Eric Hanson has been audio manager for the Arizona Diamondbacks since 1999, and in that time, he's seen a lot of changes. As an integral part of Game Operations, he and the rest of the department make sure all of the pre-game elements from the national anthem to other presentations go off without a hitch. The team's Chase Field home in Phoenix Arizona is big, busy and complex with RF interference challenges from a myriad of sources typically encountered in major league ballparks. "In 2001, our game operations director used a hard wired belt pack and headset with 100-foot cable from our two-wire intercom system," said Hanson. "By the following year we had purchased a wireless alternative that worked adequately but the belt packs were quite heavy."

As interference became more of a problem late in the decade, Hanson consulted with the existing system's manufacturer about better alternatives. The manufacturer presented a solution requiring permanent antennas several hundred feet apart. "The cost of cable pulls and conduit was prohibitive and the wireless system's own antennas would be unable to provide clear and uninterrupted communication without the additional antenna system," said Hanson.

In 2008, Hanson attended the NAB show with an eye to replacing the existing system. He met with all of the familiar players in wireless with some ignoring him and others unsure if their wireless intercom systems would work in the Chase Field environment. A quick check of the floor show map showed the HME booth, a wireless player that Hanson was unfamiliar with. "I was pleasantly surprised that they were able to answer all of my questions and in addition were asking me all of the right questions to find the right solution to my needs," said Hanson.

Communications Home Run

A short time after the NAB show, AVDB president Marty Waverley and HME Pro Audio Product Manager Rick Molina brought an HME DX200 wireless system out to the ballpark for a demonstration. "The unit didn't work as well as we'd hoped in our environment, but Rick and Marty were determined to help us find the right solution," said Hanson. "They suggested the HME PRO850, which they subsequently brought out for a successful demo" said Hanson.

Hanson was able to obtain funding for a single HME PRO850 base station as well as four belt packs with single muff/noise canceling headsets. "It's great that the HME system interfaces with our previous system and other major intercom systems," says Hanson. "The two channel flexibility of the PRO850 allows the RF camera operator to talk to the camera director and other operators without interfering with the three crew members on the production channel."

In order to boost the signal as a safeguard for the most extreme distance, Hanson purchased non-powered telescoping antennas from a local supplier. This allowed him to pick the length of the antenna to match the wavelength of the frequency, thereby improving reception even more. "With the addition of the antennas mounted outside of the booth, we easily reach distances of 400 feet with clear and uninterrupted communication," said Hanson. "Also, the belt packs and headsets are very light for our long days."

Chase Field and the HME system see action in more than 100 events a year with 83 of those being regular and pre season games. With the awarding of the 2011 All-Star Game to Chase, Hanson plans to expand the four-up system in the interim to accommodate additional crew.

The world of wireless will continue to change as spectrum availability and growing congestion leads to evolving interference hurdles. Both engineers at the respective Arizona stadiums agree that this makes the manufacturer just as important as the technology they provide. "Every environment and its challenges are different, so the manufacturer's dedication to problem solving is equally important to the technology they provide, and HME gave us the best of both," said Hanson. ■

For more info on HME's PRO850, please call (800) 848-4468 or visit <http://www.hme.com/pro850.cfm>.

About HME

Founded in 1971, HME is an innovative technology company focused on enhancing productivity and customer service for the pro audio and sports markets. HME has a 36-year reputation as a quality provider of innovative wireless intercom systems used in a wide variety of sports and other entertainment venues. For information on other HME pro audio products, log on to www.hme.com.

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Photos will be provided upon request.

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