



Shifting data speeds into high gear

CASE STUDY: SONOMA RACEWAY

JMA Wireless drives powerful cellular connectivity at Sonoma Raceway

OVERVIEW

Delivers robust mobile communications

Sonoma Raceway, located in northern California's Sonoma wine country, is an expansive motor-sports facility spread across 1,600 acres. In addition to the road course, it also boasts a quarter-mile long drag strip. It hosts many sporting events including world class races such as NASCAR, IndyCar, and NHRA drag racing. Besides hosting major race events, the complex is home to more than 70 motorsports shops in its motor-sports industrial park. These local businesses provide services such as car restoration, vintage car storage, and materials fabrication.

To ensure the ultimate in mobile communications, cellular coverage and capacity had to be robust across every area

of this expansive motor-sports venue. This level of Shifting Data Speeds into High Gear connectivity was achieved thanks to a combination of innovative offerings from JMA Wireless, a global leader of wireless communications solutions. Its leading edge JMA DAS (distributed antenna system) along with its digital electricity offering and various antennas made powerful wireless connectivity a reality.

SITUATION

Cellular connectivity near and far

A large outdoor venue like Sonoma Raceway brings with it a multitude of cellular coverage challenges. Powerful mobile communications must be available in the far reaches of the race track, the enormous parking lots, the many onsite





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businesses, the grandstand, and the concession area. However, providing wireless coverage from the head-end locations to antennas in remote areas is not always easy or cost efficient.

During a major event many spectators, participants and corporate guests gather at Sonoma Raceway, which leads to the issue of densification. Cellular operators define densification as a highly concentrated area of cell phone subscribers with a great demand for wireless connectivity. Fans require cellular connectivity so they can share that special finish line moment via a video, photo, text or tweet. During an IndyCar or NASCAR event, terabytes of data can be transported over the wireless network in just a few short hours.

The wireless network must not only be able to provide robust cellular coverage for one operator, but it must be a multi-carrier, multi-band solution. People from all over the world enjoy the events at Sonoma Raceway. These spectators subscribe to a variety of operators and bands.

In addition, it needs to be future-proof so it can quickly and easily support the latest technologies. The motor-sports complex is one of the world's busiest racing facilities with activities scheduled on average 340 days per year; therefore, not much downtime is available to upgrade the wireless network.

Outdoor wireless systems in locations such as Sonoma Raceway can experience performance issues and signal degradation due to a number of factors. First, climates with extreme temperature changes may result in wireless performance issues. Since Sonoma Raceway is in the mountains, it often experiences large daily temperature fluctuations. Next, the excessive vibrations caused by the racing negatively impacts the structural integrity of wireless components. Finally, outdoor equipment is more susceptible to signal disruptions

due to its exposure to polluted air, dirt and the development of corrosion or rust. In the industry, these signal performance issues are classified as PIM (passive intermodulation). PIM is a form of intermodulation distortion that occurs in passive components such as antennas, cables, connectors, or duplexers with two or more high-power input signals. The outdoor wireless system must be built to guarantee high performance even under difficult conditions.

Finally, Sonoma Raceway hosts many large events each year; therefore, public safety is a major concern. The wireless network must be able to support thousands of fans as well as the drivers, media, employees and first responders.

SOLUTION

A triumphant combination of technologies

The network is comprised of several innovative solutions from JMA Wireless. Its multi-band, multi-carrier JMA DAS provides cellular coverage and capacity for the 700, 1900 and 2100 bands currently. Furthermore, this future-proof offering includes remote units (RUs) and head-end equipment that are AWS-3 ready.

This 15-sector system is comprised of 76 low-power, five-band remote units and four high-power, five-band remote units. In addition, 88 ODAS (outdoor DAS) antennas were deployed throughout this massive motor-sports complex. These antennas include a combination of directional and omni-directional solutions providing either 1X2 or 2X2 MIMO (multiple input, multiple output). However, in the main grandstand XGU-FRO-230 antennas were deployed to ensure mobile communications for the thousands of spectators often just seated in this area. These antennas

with Fast Roll-Off (FRO) technology ensure increased data throughput without compromising coverage. The horizontal beam produced by FRO technology increases the Signal to Interference and Noise Ratio (SINR) by eliminating overlap between sectors. The enhanced SINR results in higher throughput, which is particularly critical during major racing events. Furthermore, the horizontal beam produced by Fast Roll-Off technology reduces harmful interference between adjacent cells, making them especially useful in dense environments. These antennas do not only provide a small unobtrusive footprint, but also are quite durable and can withstand winds up to 120 mph. Finally, the deployment at Sonoma Raceway features the latest technology from JMA Wireless, which effectively eliminates PIM from the wireless network.

JMA Wireless solutions are effective and cost efficient too. Each remote unit only requires a single fiber to deliver multiple bands as well as connect it to the master unit (MU). The master unit provides a single administrative interface for configuring and upgrading remote units with new firmware.

The JMA Wireless FUZE™ technology was deployed to provide further cost savings. Its digital electricity feature allowed power to be centralized in three different locations – the head-end room and two outdoor cabinets. It powers various remote units and antennas a quarter mile away. However, this offering can provide electricity up to over one mile away. Digital electricity also resulted in tremendous time savings. If AC power had to be available at each pole the local electric company would have had to become involved in this project. The process of providing AC power to each pole would have added many more months to the timeline beyond the three months it took to deploy the wireless network. Besides the distance and time savings benefits, digital electricity also enabled the team to utilize composite cable (fiber and copper in one sheath), which consolidated everything onto a single “pull” cable. Finally, digital electricity meets IEC and UL safety requirements; therefore, the deployment team did not have to run metal conduits, which is not only tedious, but expensive as well.

RESULT

The winning wireless experience

Whether standing at the finish line, tail gating in the parking lot, working onsite in one of the 70 motor-based shops, or just driving on the roads leading to the motorway, robust mobile communications can be experienced thanks to JMA Wireless' leading-edge solutions. These innovative offerings are providing



FUZE provides digital electricity to antennas and remote units deployed in the far reaches of the raceway.



coverage and capacity for multiple carriers and numerous bands. As capacity needs increase in the future, they will be handled readily and cost effectively thanks to JMA Wireless.

About JMA Wireless

JMA Wireless is the leading global innovator in mobile wireless connectivity solutions that ensure infrastructure reliability, streamline service operations, and maximize wireless performance. Employing powerful, patented innovations their solutions portfolio is proven to lower the cost of operations while ensuring lifetime quality levels in equipment and unrivaled performance for coverage and high-speed mobile data.

JMA Wireless solutions cover macro infrastructure, outdoor and indoor distributed antenna systems and small cell solutions. JMA Wireless corporate headquarters are located in Liverpool, NY, with manufacturing, R&D, and sales operations in over 20 locations worldwide.

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