

Several Important Things Contractors Should Know About Public Safety DAS



#### **Everything Contractors Need To Know About DAS**



#### **Distributed Antenna Systems for ERCES**

While responding to RFPs, it's likely that from time to time, contractors will come across requirements for Emergency Responder Communications Enhancement Systems (ERCES) that require a Distributed Antenna System (DAS) for public safety radios. In these instances, contractors must work with DAS integrators - like the In-Building Wireless Solutions (IWS) team at MCA - who not only understand all of the project requirements but also can meet the necessary budget and service-level requirements.

## What Is Public Safety DAS?

Similar to a cellular distributed antenna system, public safety DAS strengthens and extends coverage throughout a building. However, while cellular DAS is typically for use by the general public, public safety DAS is specifically designed for use by first responders. When firefighters, police officers, and EMTs respond to an incident, public safety DAS ensures that their communications devices have strong, reliable coverage throughout the vicinity.

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## **Design Requirements**

Before any installation, the IWS team at MCA will design a system that meets the various requirements of the property owners and those set forth by the Authority Having Jurisdiction (AHJ). One of the hallmarks of our IWS team is our expertise with iBwave RF design software. This software, which requires training and issues a certification to use, is the industry standard design software for DAS.

#### **Estimated Cost**

Utilizing iBwave also allows contractors to provide the most accurate estimate for the job rather than making estimates based on square footage alone. Once the MCA team has completed the design, a quote that includes materials, equipment, and labor costs can be provided to the customer.

#### **Coverage Testing**

In addition to using the appropriate design software, coverage testing (or pretesting) is an excellent way to ensure the quotes accuracy, as the preliminary designs will be much more accurate as they will be based on firm knowledge of the varying signal strength in the building. In buildings under construction, coverage testing ideally happens when the construction is approximately 80% complete after walls and windows are installed.

Coverage testing is done by physically going floor by floor throughout the building and utilizing frequency testers to measure signal strength. Depending on local requirements, each floor is divided into 20 or 40 grids. It may need to be remedied if there are more than two signal failures per floor. Additionally, if there are any below-ground structures, such as basements or parking garages, or LEED high-efficiency glass, then it's highly likely that a DAS will be required.

# **Authority Having Jurisdiction**

The Authority Having Jurisdiction (AHJ) is the agency, office, or individual - such as the fire marshal - responsible for enforcing the various IFC and NFPA codes for compliance. While most jurisdictions base their requirements on IFC and NFPA codes, they may vary on the city, county, and/or state level.

#### Some examples of discrepancies between city, country, or state include:

- **First Responder Frequencies:** In some municipalities, first responders operate on entirely different frequencies from each other, which means that the DAS must be configured to amplify multiple frequency bands.
- **Backup Battery Life:** The requirement for how long the backup battery must last varies between 12 hours and 24 hours, and whether they're needed at all in the event there is a 24-hour generator already in place.
- Amplifiers and Cable: Equipment must be housed within NEMA 4-rated cabinets to withstand damage from various sources, including liquids and corrosive chemicals, while vertical cables must be run in a two-hour fire-resistant space. In some areas, horizontal cables must also be run in two-hour fire-resistant spaces, which would add considerable costs to the installation

To ensure that your system will meet the requirements set forth by the AHJ and prevent future renovations and remediations, the MCA IWS team will adhere to the entire fire code, not just the local fire marshal's interpretation.

#### **Radio System Owner**

When implementing DAS, authorization is required from Radio System Owners (RSO) so that they are aware of any DAS rebroadcasting of their signals. In the event that there is a need to remediate signal interference, they will need to know where every system in the building is located.





# **Backbone Infrastructure**

When it comes to DAS installations, cabling is not just cabling. DAS installations require half-inch coaxial cable, which is rigid and must be handled differently than the types of cables - such as electrical cables or Wi-Fi coax - that most electrical contractors or technicians are used to dealing with.

Slight oversights - such as a bend or kink in the cable - can majorly degrade the performance of the DAS and require additional labor to remediate the issue. Even worse, these seemingly minor issues could cause the system to fail during an emergency, rendering it useless and potentially putting lives at risk.



# **Design for Specific Building Needs**

To meet the First Responders' needs and ensure that all IFC and NFPA codes are met, the right type of DAS must be deployed, depending on the type of structure and its size.

#### **Bi-Directional Amplifiers (BDA)**

The BDAs feed signals in and out of the DAS, and while they can accommodate different frequencies, not all BDAs can handle all of the requirements. Our IWS team understands the needs and requirements that the system must meet and then selects the appropriate equipment to fulfill those requirements.

#### **Channelized System**

Typically the ideal choice for public safety DAS, channelized systems are designed to amplify only the necessary channels. Since they're only amplifying a limited number of channels, they can provide a stronger and more reliable signal with superior sound quality and less interference. While this may be a more expensive option, it's also the more reliable one.

#### **Fiber DAS and Active Systems**

Buildings over 250,000 square feet (or campus environments) have a better experience using fiber optic cable rather than coaxial cable, as coax cable has higher signal loss than fiber optics. Considering that, fiber backbones must be used throughout the DAS to ensure efficient signal strength. At the end of the run, the signal is converted back into a radio frequency and out through the antenna network via the fiber remote unit.

#### Separate Cellular DAS

Suppose a building must maintain both a cellular DAS and a public safety DAS. In that case, the two systems must be kept separate, as most of the time the AHJ wants to avoid inviting the risk of competing or interfering signal sources on the first responder system. This will help ensure that in an emergency, the first responder system is working as it should.



# Post Installation: Submittal Package and Testing

Depending on the preference of the AHJ, you may be required to submit a post-installation package. This package will consist of documentation showing:

- Where installations were made
- The products/equipment used
- The assembly
- Final coverage test results

This documentation will be helpful to the AHJ in understanding the design specifications of the system and verifying that it is working properly. In most cases, a building owner can only receive their certificate of occupancy once post-tests are complete.



# **BDA/DAS Recertification**

Once the initial system is deployed, the job isn't done. ICC and NFPA require that emergency coverage radio systems be reinspected each year or when any renovations or modifications are made to the building that may change the results of the original field performance tests.

Whether a local government adheres to the "every year" requirement is their decision, but the vast majority require recertification at least every five years, if not more frequently, and annual recertification is becoming more prevalent.

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# **Not A Simple Application**

While it may seem like a simple addition to your portfolio of contractor service offerings, DAS integration takes work. The main takeaways of this piece, and the minimum considerations for contractors, should be:

- **iBwave Software is non-negotiable.** As the industry standard for designing DAS, credible system designers like MCA will have the appropriate training, certifications, and software licenses.
- A comprehensive technical understanding is a must. The IWS team at MCA understands the various types of radio frequencies and which public safety entities will use each, as well as the different types of equipment that are available for the job and be able to determine which one is the right one.
- Proper testing sets the stage and finishes the job. If the proper testing equipment and protocols aren't used then the system won't be designed or function properly. MCA employs licensed FCC technicians who can perform the tests according to code to ensure its accuracy.
- Take your time choosing the right integration partner. With so many facets of the project to examine, you must take your time choosing a DAS integrator who is up to the task and a consummate professional.



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## **About MCA**

MCA is one of the largest and most trusted integration partners in the United States, offering world-class voice, data, and security solutions that enhance the quality, safety, and productivity of customers, operations, and lives.

More than 65,000 customers trust MCA to provide carefully researched solutions for a safe, secure, and more efficient workplace. As your trusted advisor, we reduce the time and effort needed to research, install, and maintain the right solutions to improve your workplace.

Our team of certified professionals across the United States delivers a full suite of reliable technologies with a service-first approach. The MCA advantage is our extensive service portfolio to support the solution life-cycle from start to finish.

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