



Reliable Wi-Fi and CBRS for Air Force Hangars, Bunkers and Flight Lines



Unreliable Wi-Fi in hangars and around flight lines prevents the Air Force from seeing the full mission value from electronic workflow. ID Technologies and CommScope have teamed up to deliver an end-to-end solution for reliable communications for Air Force base hangars, bunkers and flight lines.



Challenge:

- Reliable Wi-Fi in hangars, bunkers and flight line areas to support electronic workflow

Solution:

- Thorough site survey to discover coverage needs in challenging environments
- CommScope™ RUCKUS® wireless access points with optional CBRS/Private LTE module
- Implementation and tuning

Mission Value:

- Increases operational efficiency by eliminating the need to walk to the base station to download documentation
- Acts as force multiplier by saving many hours daily for operators and staff
- Enables video coaching for aircraft repairs and maintenance

Challenge: Delivering Wi-Fi in challenging base environments.

Unreliable Wi-Fi in hangars and around flight lines prevents the Air Force from seeing the full mission value from electronic workflow. Today, the Air Force deploys the same commercial-grade wireless access points everywhere on base, outdoors and indoors. While commercial access points generally perform well in an office environment, they perform poorly—if at all—in hangars, flight lines and warehouses. The coverage area is too vast, and metal hangars, concrete bunkers and moving aircraft block signals. What's more, commercial vendors for access points typically deploy them without first conducting the rigorous site surveys needed for optimal coverage in complex environments.

Knowing that Wi-Fi connections are likely to drop if they're available at all, operators work the same way they did in the 1990s. Imagine an operator who receives mid-day orders to replace an F-16 wiring harness or load medical supplies. Today that operator has to walk to the base station—potentially 10 minutes away—download instructions to a laptop and then walk back to the aircraft. An operator assigned six tasks a day can easily spend two hours simply retrieving documents.



Solution: Adapting as Planes Move with Wi-Fi and CBRS.

ID Technologies and CommScope have teamed up to deliver an end-to-end solution for reliable communications for Air Force base hangars, bunkers and flight lines. The solution includes detailed site surveys, advanced RUCKUS® access points and implementation services.

To test the solution, two Air Force bases deployed RUCKUS access points next to existing legacy wireless access points in various locations across the base. In tests, while the legacy access points often had no signal, RUCKUS access points in the same location consistently provided strong Wi-Fi signals in both directions, with 10-20 Mbps bandwidth.

Here's the difference: As aircraft and endpoints move, RUCKUS access points adapt dynamically using BeamFlex™ technology. Each access point has up to 21 high-gain, directional antennas. Unlike omnidirectional antennas that radiate signals in all directions, BeamFlex identifies the best path to the receiving device, constantly reconfiguring the antennas in the best of 4,200 potential patterns to increase signal gain. The antennas also focus RF energy away from the direction of interference.

The result is consistently good wireless performance, stable connections and interference mitigation.

On-Site Services.

Even the most advanced wireless solution will not work reliably on Air Force bases if not designed and architected for each base's unique environment. ID Technologies and CommScope provide end-to-end design and implementation services as part of the solution. To begin an engagement we dispatch wireless engineers to conduct a thorough site survey, measuring wireless coverage throughout the base, including runways, hangars and bunkers. The site survey takes 3-7 days. Using this data we build wireless coverage models that reflect actual conditions—not predictions. Engineers return to base to deploy and test access points and fine-tune placement if necessary.

Extending wireless range.

Large bases may need coverage beyond Wi-Fi limits. In these cases, we use two techniques: dynamic meshing and Citizens Broadband Radio Service (CBRS)/Private LTE.

Dynamic meshing. We supplement fixed access points with mobile access points deployed on trucks, golf carts, pushcarts, hand carried cases, etc. As operators move across base, access points seamlessly hand off the signal to neighboring access points without dropping the connection.

CBRS/Private LTE. For bases that need longer coverage or restrict the use of traditional Wi-Fi signals,



we can augment Wi-Fi with CBRS, which uses previously restricted lower frequency bands for private LTE. Unlike LTE services offered by carriers like AT&T and Verizon, private LTE keeps all Air Force data private: sensitive information such as aircraft fuel levels, repair status and cargo remain behind the Air Force firewall. In addition, the Air Force has complete control over which devices, applications and users have access to private LTE networks.

Fewer CBRS access points than Wi-Fi access points are needed to cover the same area, lowering capital expense. The Air Force can cut costs further by adding compact CBRS modules to RUCKUS Wi-Fi access points instead of deploying separate CBRS access points.

Mission Value: Improving Operator Effectiveness by Supporting Electronic Workflow Everywhere On Base.

With wireless communications solutions from ID Technologies and CommScope, operators can perform their mission critical tasks whenever and wherever they need to instead of returning to the base station throughout the day to download documentation. On a base with 1,800 operators, if each operator saves two hours a day, the Air Force gains 3,600 man-hours daily, the equivalent of 450 additional airmen. For 144 Air Force bases and runways, reliable Wi-Fi is a powerful force multiplier.

Another benefit of reliable Wi-Fi is that operators who needs coaching during a procedure can join a video session with a remote expert using Air Force collaboration applications.

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