HUBBELL
Premise Wiring

CASE STUDY

Fiber optics deployment takes Air Force to new heights

Our top priority is security.

Security is a top priority for the United States Air Force, which manages a complex communication network across more than 90 separate bases. A military branch with such an expansive reach needs accessible, adaptable communication infrastructure that supports fast and private data transmission. While copper cabling had served the Air Force well in the past, it was beginning to present significant challenges, including distance restrictions and pathway limitations.

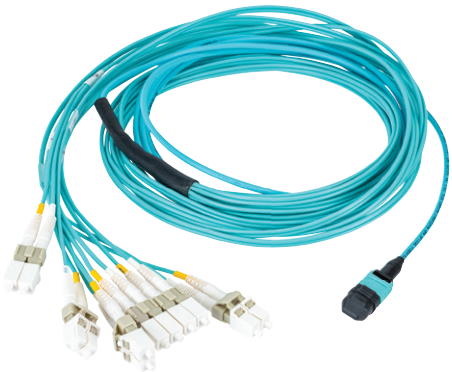
In late 2022, the Air Force finished construction on a new facility. The branch used this new build as an opportunity to upgrade their outdated copper wiring to fiber optic cabling. Fiber optic cabling sends light pulses through optical fiber to transmit data faster and safer than copper wiring. Hubbell collaborated with full-service network infrastructure consultant Capitol Cable Communications to design, source, and implement custom fiber infrastructure for this facility.

The Challenge

There's no room for error or downtime for essential military branches like the Air Force. It needs networks with redundancy, reliability, and security to maintain operations in all circumstances—from a simple system update to a natural disaster and everything in between. Networks must be able to manage real-time data from aircraft sensors, facilitate rapid decision-making in critical situations, coordinate complex operations across distance, and maintain private communication during combat.

Unfortunately, copper wiring can compromise security, weaken communications, and impede operations. Copper cables have low bandwidth, are susceptible to electromagnetic interference (EMI), and lose up to 94% of signal at distances greater than 100 meters. Furthermore, copper wiring requires labor and time-intensive installation to meet Telecommunications Electronics Materials

MPO Cords
FPCPMPOB50G4M10FN



MPO Breakout Assemblies
FHPMPLCM4L10FN

Protected from Emanating Spurious Transmissions (TEMPEST) requirements for data theft protection. The Air Force had encountered its share of challenges with copper wiring, including electromagnetic radiation, interference, and TEMPEST threats.

Collaboration Leads to Solution

In search of upgraded cabling for its new facility, the Air Force enlisted Capitol Cable Communications to design and build out a custom fiber infrastructure. Capitol Cable designs, installs, and tests state-of-the-art network connectivity solutions for both government and commercial customers. Hubbell's partnership with Capitol Cable makes it easy for large organizations like the Air Force to implement a fiber network. The two companies designed everything from pathways to rack and cabinet elevations to meet stringent government security standards.

Hubbell and Capitol Cable also developed a color-coded network system to help the Air Force identify the appropriate classification of fibers, cables, and connectors during and after installation. Hubbell then built out Capitol Cable's designs with products that met the Air Force's unique needs. Together, the two companies developed a comprehensive, ready-to-install fiber optic infrastructure for the new facility.

Customized Fiber Optic Deployment

The Air Force used Capitol Cable's designs and Hubbell's end-to-end fiber infrastructure to install a secure zone cabling approach in ceilings, floors, and cable tray pathways. Customizable fiber optic cables were used to connect central telecommunications rooms to designated zone enclosures within specific areas of the building. This shortened fiber runs to individual workstations, allowing for faster network maintenance.

Capitol Cable designed nine distinctly color-coded networks with over 8.3 million linear strands of Hubbell fiber. Color-coordinated cable jackets, network outlet port adaptors, and network fiber panel adapters made it easy for Air Force staff to immediately identify cable classification level and perform necessary work. Separate ceiling mounted zone boxes for each network were positioned in small footprint workspace areas to minimize disruption of daily operations.

Fiber cables and patch cords

Our FiberHUBB Universal Fiber Cable is plenum I/O rated and available in any jacket color. Fiber optic patch cords are also available in any jacket color to color code your network run.

FiberHUBB Universal Fiber Cable
HFCB14012P4

Fiber Optic Patch Cords
FDLC1MM

> ***A connectivity product solution that exceeded the optimum design criteria, delivering the finished installation on time and within budget***

Hubbell's MPO Plus Premium Mini Connectors were used in all fiber trunk assemblies. Built for tight, high-density applications, these adaptable assemblies allow technicians to change cable gender and polarity without having to open connector housing. The connectors even accommodate migration to 40G, 100G, 200G, and higher speeds, so the Air Force won't have to recable for future upgrades.

"With help from the Hubbell Premise Wiring team, Capitol Cable Communications was able to install a connectivity product solution that exceeded the optimum design criteria requested, delivering the finished installation on time and within budget," shared Sean Foley, RCDD and Vice President of Capitol Cable.

Zone Boxes
ZCB5UP

Fiber Optics Provide Scalable Security

Fiber optic cables from Hubbell provided significant cost and labor savings for the Air Force while also improving network security. Upgrading to an all-fiber network and centralized architecture saved the Air Force money and space, as they didn't have to install expensive wiring closets. Pre-terminated assemblies with connectors were shipped directly to the Air Force facility. These assemblies require minimal skilled labor and can be installed by simply plugging cables into existing network hardware. Field-terminated cables, on the other hand, must be installed on-site by professionals with appropriate tools.

MPO fiber assemblies and individual one-side, pre-terminated drop cable assemblies were installed quicker than traditional cabling. These assemblies transmit signals using light pulses instead of electrical currents so electrical noise and magnetic interference cannot affect signal integrity within the cables. The MPO fiber assemblies arrived pre-terminated on site, saving time and money

that the Air Force would have spent preparing cable terminations, connectors, and tool kits. Thanks to this pre-termination, the Air Force was able to complete their installation much faster than a traditional deployment.

Capitol Cable and Hubbell provided a complete zone cabling approach in ceilings, floors, and cable tray pathways. Not only does this approach minimize downtime and reduce costs, it is also highly scalable. The Air Force can easily add new connections without having to undergo a major network reconfiguration. When the time comes to build another facility, the Air Force will have the tools it needs to create a safe, redundant fiber network across both existing and new constructions.

Learn More About Fiber Optics

Capitol Cable and Hubbell designed, built, and implemented an end-to-end fiber infrastructure that enhanced security and connectivity at the Air Force facility. Reflecting on the deployment, Foley noted how "the Hubbell team worked closely with [Capitol Cable] through all phases of design and installation, assisted with delivery logistics, and supported project close-out. This exemplifies a true manufacturer and installer partnership."

The success of the initial build has encouraged the branch to use fiber trunk assemblies and mini connectors in future projects, including a new facility that will begin construction in 2025.

Critical organizations like the Air Force need flexible networks that can adapt and grow without disrupting operations. Customized fiber alleviates immediate and long-term security concerns and lays the groundwork for a safer and more dependable communication network.

To learn more about how fiber optics can help fortify and secure your organization's network, contact Hubbell Premise Wiring today at (860) 535-8326.

You can also check out fiber optic network solutions or other data and communications products on the official Hubbell Premise Wiring website at www.hubbell.com/hubbellpremisewiring/en.

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Hubbell Premise Wiring is committed to maintaining a tradition of excellence and delivering unmatched quality, innovation and reliability. Our solutions offer a fully integrated system of copper and fiber network cabling and components that are designed to exceed all applicable standards for performance and reliability.

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EP-WDK-WP-EN-02902 | 05/2025

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