# FIRES AS A SERVICE (FaaS):

## A Globally Available Fire Direction Capability

*By COL Andrew Knight, LTC Elizabeth Womble and MAJ Aaron Gilbert*

The United States Army is advancing its modernization efforts to prepare for Large-Scale Combat Operations (LSCO) and global deterrence. Central to this modernization are field artillery systems, known for their battlefield effectiveness. However, their utility depends on timely deployment and responsiveness to dynamic combat scenarios. The 17th Field Artillery Brigade (17FAB) is pioneering advancements in fire direction capabilities to address these challenges, leveraging technology to enhance speed, range and battlefield survivability.

Operational requirements across the United States Indo-Pacific Command (USINDOPACOM) area of responsibility (AOR) necessitate a portable modular fire direction capability that can be employed in land, air and sea domains. The vast geography of the Pacific dictates greater dispersion of firing units, possibly with a single battalion fighting from three different islands simultaneously. To address this need, 17FAB developed a portable fire direction center (pFDC) suite that integrates with the existing Fires as a Service (FaaS) capability. FaaS is a capability provisioning virtual Advanced Field Artillery Tactical Data System (AFATDS) machines remotely to develop a pFDC package with redundant network transport capabilities able to process fire missions in any location. This provides commanders the ability to achieve effects from thousands of miles away in a matter of seconds.

FaaS allows sending firing package data using the upper tactical internet from a cloud-based instance of AFATDS through a commercial internet provider or cellular network to the pFDC for tactical fire direction anywhere in the world. This in conjunction with the pFDC capability allows units at the battery and platoon levels to receive fire missions from across the Pacific. It also provides timely fire mission processing beyond the range and speed that traditional frequency modulation (FM) and high frequency (HF) radio suites allow.

The brigade tested the FaaS and pFDC capabilities during Warfighter exercises with the 18th Field Artillery Brigade, a 62nd Air Wing Agile Combat Employment to Australia and most recently as part of an exercise at the Joint Pacific Multinational Readiness Center (JPMRC) in Hawaii. Our goals were to validate the pFDC in the digital kill chain while being geographically dispersed from higher headquarters, validate that cloud-based AFATDS can be used effectively in lieu of the physical AFATDS and identify pFDC and network transport computing limitations.

### Technological Advancements with pFDC

The pFDC leverages a suite of computer networking and radio systems that support rapid and secure global data transmission crucial for dynamic targeting. It operates on a hardware-agnostic and transport-agnostic platform, integrating FaaS cloud-hosted AFATDS through a VMware Horizon server hosted at Joint Base Lewis-McChord (JBLM).

### Components of the pFDC Suite

Key components include:

- **Network and Communication Systems**: The Cisco 3850 Switch, Cisco 4300 routers and KGV-175D TACLANE support encrypted data transmission.
- **Data Transport Options**: The pFDC is designed to operate with multiple data transport options to ensure reliable connectivity in diverse, and often austere, electromagnetic spectrum contested

environments. Key transport methods include:

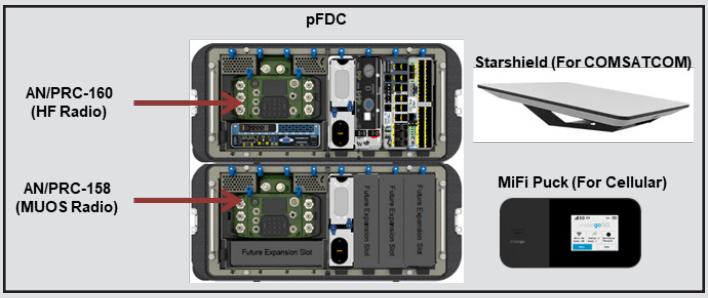
- ◊ **Commercial Satellite Systems**: The Starshield satellite system offers exceptional speeds up to 400 Mbps, providing data transport approximately 40,000 times faster than FM, 4,000 times faster than HF and 80,000 times faster than traditional tactical satellite (TACSAT). This enables real-time targeting and mission updates critical to modern operations.

- ◊ **Cellular Infrastructure**: When available, the pFDC can leverage existing cellular networks using a WiFi puck, which provides reliable, redundant connectivity via cellular towers. This option allows rapid data transmission, offering flexibility and resilience in areas where cellular service is accessible and thereby supporting mission continuity even outside satellite coverage.

- ◊ **Radio Systems**: The PRC-160 and PRC-158 radios offer HF and Mobile User Objective System (MUOS) capabilities for beyond line of sight (BLOS) communication. These radios support a range of transmission methods, ensuring that the pFDC remains operable in environments where commercial options are limited.

- **Power Resilience**: The pFDC includes a KLAS Voyager 8 TRIK-M chassis, a Honda 3kW generator and an uninterruptible power supply (UPS), ensuring stable power in austere environments.

- **Platform Agnostic**: The components of the pFDC can be assembled in various locations and mounted on any platform including MRZR, HMMWV, pick-up truck, etc.




## Operational Testing and Performance Metrics

Testing of the pFDC during the 62nd Air Wing Agile Combat Employment in Australia demonstrated the system's capability for trans-Pacific data transmission, achieving rapid response times that enable accurate, real-time targeting.

Specific metrics include:

- **Free Text, Geometries and Meteorological Data**: Transmission of geometries averaged 18 seconds, while meteorological data transmission occurred almost instantaneously.

- **Fire Mission Processing**: The pFDC processed digital fire missions 10 times faster than traditional FDC systems, demonstrating substantial efficiency gains critical to LSCO.

- **Cross-platform Interoperability**: The pFDC supports both physical and cloud-based AFATDS, allowing flexibility and continuity in various combat scenarios.

*Soldiers from Bravo Battery, 1-3 FAR operating a pFDC mounted on a Polaris MRZR platform during JPMRC, October 2024.*

Soldiers from Bravo Battery, 1-3 FAR operating a pFDC mounted on a Polaris MRZR platform during JPMRC, October 2024.

## Enhancing Coalition Capabilities

The pFDC's interoperability was validated through joint exercises with the Australian Defense Force (ADF), where it facilitated digital fire mission processing across lower and upper tactical internets. This interoperability fosters deeper coalition integration, particularly valuable for LSCO in the Indo-Pacific. 17FAB tested the capability in coordination with the ADF and looks forward to future experimentation during the Talisman Sabre Exercise in Australia in July 2025.

Soldiers from Alpha Battery, 1-3 FAR employing pFDC in Australia. One of 17FAB's core tasks in the Indo-Pacific Area of Responsibility is HIMARS Rapid Infiltration (HIRAIN). This mission involves deploying HIMARS launchers, and a Fire Direction Center (FDC) to remote airfields within striking range.

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## Conclusion and Future Implications

17FAB's development and deployment of the pFDC is an example of grass roots innovation and transforming in contact, aligned with the Army's LSCO readiness goals. The brigade received approval to procure a second pFDC kit in Fiscal Year 2024. Mission requirements paired with legacy fire direction center equipment make a pFDC kit in each firing battery the ideal issue plan. By integrating robust and resilient communication technologies, the brigade sets a benchmark for rapid, global fire mission capabilities that align with a lean, mobile force structure.

The brigade continues to look for opportunities to utilize and test operational use of the portable fire direction center across the Pacific and at home station training events. The modular construction of the pFDC enables inclusion of other capabilities based on network speeds. For instance, it is possible to pair the pFDC with a call manager and make secure voice over internet protocol (SVOIP) phone calls or even secure internet protocol router (SIPR) Teams video calls. The pFDC provides a warfighting advantage, and the brigade will continue to innovate this capability at the speed of relevance.

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