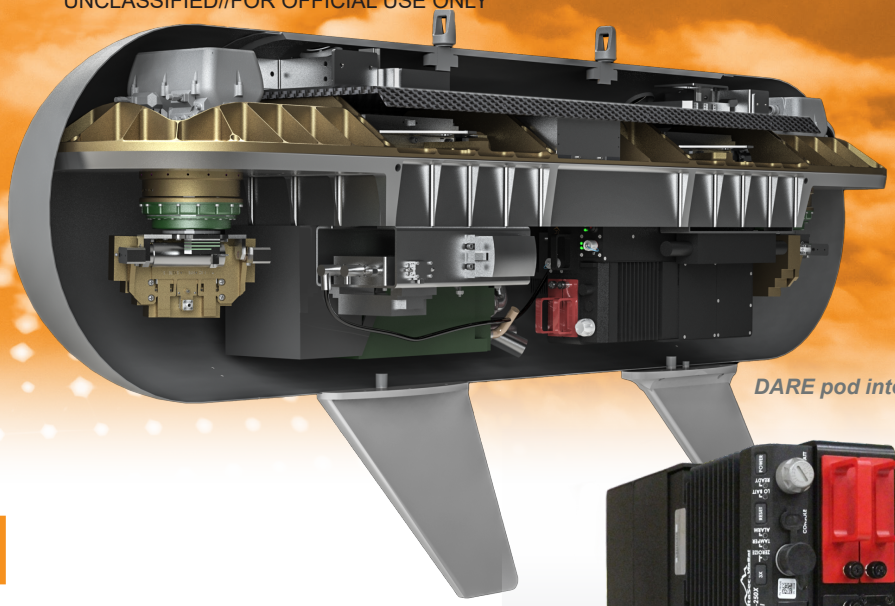

DARE pod interior

DARE Pod

The DARE* pod is an airborne networking gateway providing dynamic network connectivity to ground and airborne platforms. DARE integrates Link-16 with multibeam Common Data Link (CDL), and mesh networking IP links to extend ISR, C2 and target data through directional links in the contested environment. DARE provides an inexpensive quick reaction capability that has been successfully flight tested and is ready for use in forward deployed environments today.

DARE provides a distributed airborne networking solution in a wing-mounted pod airframe compatible with multiple aircraft and previously flown on MQ-1B. The DARE pod extends tactical edge networking to disadvantaged users, providing range extension of network connectivity for both airborne and ground based warfighters. DARE provides agility across the radio frequency spectrum with simultaneous use of multiple radios, and a TDL gateway able to push tracks and TDL data back to distributed command centers via JREAP-C. DARE connects sensors to shooters to C2 nodes with tactical edge networking architecture that cross-bands data between multiple links.

DARE is built to be compatible with a colorless core (or ciphertext core) architecture for the network using NSA-certified encryption for data transport. Advanced cybersecurity is implemented with embedded firewall/IPS/IDS in the virtualized CORE multifunction network controller. The backbone of the network is secure, flexible, and reliable.

CORE® 4.0

Enabled by CORE®

The CORE network system delivers a secure network through DARE with radio-aware networking protocols embedded in an agile software defined stack. CORE provides MUDLAN† compatibility along with backwards compatibility with the DISA, Navy and other networks.

Patent No. 10,177,914

Combined TDL and IP Networking

The DARE pod currently integrates:

- Link 16
- Dual Ku-band CDL
- ANW2 mesh
- TrellisWare
- TTNT
- and other options

The DARE shell can support different radio configurations depending on requirements. Mechanical and electrical redevelopment can support MIDS-JTRS‡ with TTNT, Silvus, W-band, 4G-LTE, or other adjustments to the system.

Contact

For more information about CORE or Fuse, please refer to the following points of contact:

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* Distributed Access/Range Extension (DARE).
† Mobile Unmanned/Manned Distributed Lethality Airborne Network (MUDLAN).
‡ Multifunctional Information Distribution System Joint Tactical Radio System (MIDS-JTRS).

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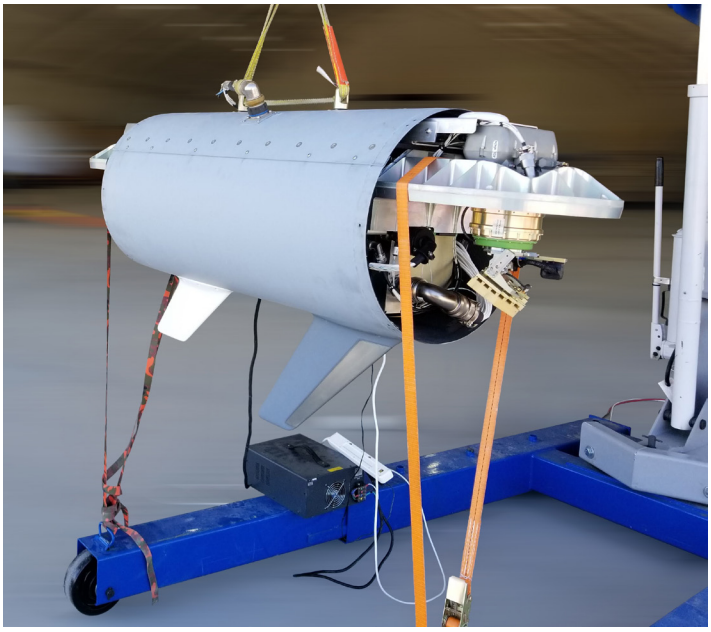
Enhanced Tactical Communication

The DARE pod leverages a standardized under-wing mounted pod airframe built to fit MIL-STD-8591 mounting brackets. DARE connects to the aircraft with MIL-STD-1760 power, MIL-STD-1553 serial data, and Ethernet.

DARE is able to connect aircraft systems, such as onboard sensors and processors or networked workstations in manned aircraft, over line-of-sight networks. DARE provides a PACE employment of multiple radio frequency links for network connectivity providing high throughput CDL with dual beams, both floppable to SCE and PCE, Link-16 connectivity with embedded gateway to JREAP, TrellisWare mesh networking for medium throughput to multiple users, and TTNT mesh network connectivity. DARE has been designed and built to accommodate STT Link-16 radio.

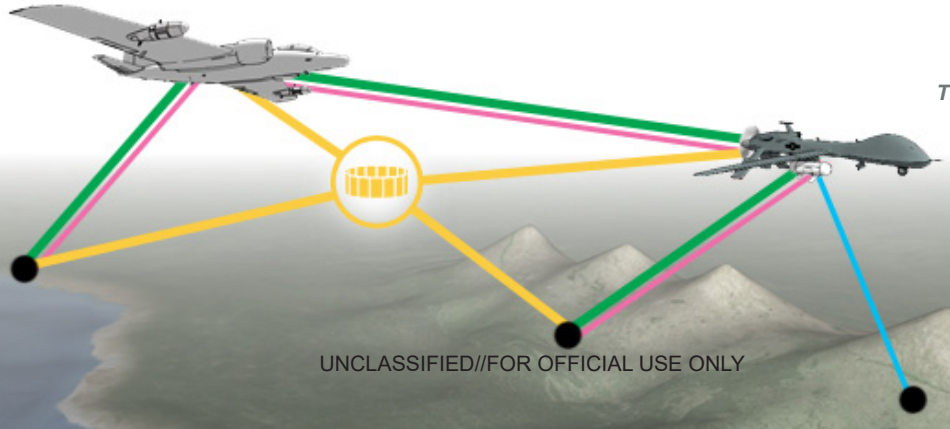


The DARE pod is designed and built to be MUDLAN compatible.

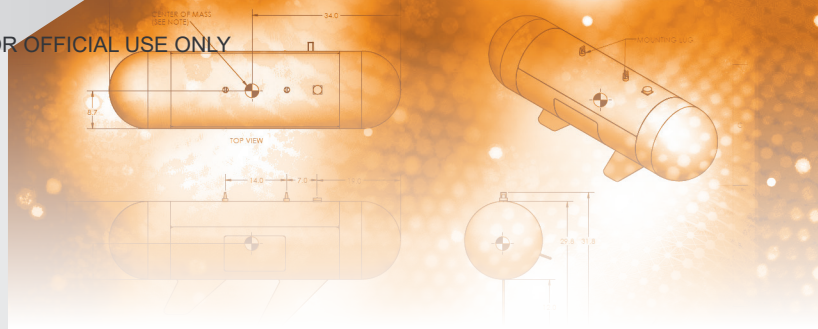
T3, CORE's network monitoring and troubleshooting software.

DARE employs an innovative control plane embedded in the CORE network controller that eliminates the need for an omnidirectional CDL antenna. By using location data passed over Link 16 and other links, the pod is able to discover other CDL nodes and establish a network connection without broadcasting high power Ku-band radio frequency. This approach to discovery enhances the ability of the pod to operate undetected.

CORE provides the control plane, as well as dynamic networking over multiple radio frequency paths including discovery, network join, failover, load sharing, and self healing. The CORE platform includes T3, which provides network visualization for the enterprise network with its ability to view performance metrics and manipulate remote system configurations in real time. T3 is an intuitive network management tool built for the warfighter.



The DARE pod connects aircraft systems over line-of-sight networks.



DARE Pod Specifications

Physical

Size (L × W × H):	66.5 × 18 × 18 in (pod only) 66.5 × 18 × 31.75 in (antenna and lugs included)
Volume:	8.9 ft³
Weight:	178 lbs

Electrical

Nominal Input Voltage:	28-V DC
Peak Load:	30 A

Primary Internal Components

CUSTOMIZATIONS BY REQUEST
Most pod components can be exchanged for other component types that better suit your needs, subject to testing and validation.

GPS/INS Options:
- SECHAN Dragonfly X200 MAPS device
- Collins Aerospace Athena 511 Integrated Flight Control System (optional)
- VectorNav (optional)

Radios:
- Viasat® Small Tactical Terminal (STT) KOR-24A
- TrellisWare® TSW-950 TSM Shadow® Radio
- Cubic™ Multiband Miniature Transceiver (MMT)
- Collins Aerospace QNT-200 Software-Defined Radio (SDR)
- Raytheon Microlight® RT-1922 SADL Radio (optional)

Antennas:
- Sensor Systems® UHF/L-Band Antenna
- TrellisWare® TW-1110 GPS Stub Antenna
- Antcom S-Band Antenna
- Dual Pacific Antenna Systems Model AD-200 Ku TCDL Airborne Antennas
- Pacific Antenna Systems Model AD-300 KU TCDL Airborne Antenna (optional)
- GPS Source L1L2-RA-1 GPS Active DAGR Antenna (optional)
- Sensor Systems® GPS L1/L2 Antenna (optional)
- Sensor Systems® VHF/UHF/AM/FM Antenna (optional)
- Mayflower MAGNA-I NavGuard® series Anti-Jam GPS Navigation Antennas (optional)

Amplifiers:
- Tricom TCR-MBA-50V2 50/75 Watt Multiband RF Amplifier
- Pacific Antenna Systems Solid State Power Amplifier (SSPA)
- Pacific Antenna Systems Low Noise Amplifier (LNA)

Other Components:
- Fuse CORE® 4.0
- Viasat® KG-250X
- Astronics CorePower® Systems Electronic Circuit Breaker Unit (ECBU)

Mounting Information

- Compatible with MAU-3A bomb rack with 14 in lug spacing
- Compatible with BRU two-lug 14 in systems (IAW MIL-STD-8591)

Certification and Compliance

- Certification: NSA Type I encryption
- Compliant: STANAG 7085
- Compatible: IAW MIL-STD-8591 mounting standards
- Capable: MIL-STD-1760 interconnection interface
- Manufactured in an ISO-9001 certified facility

Mechanical Integration

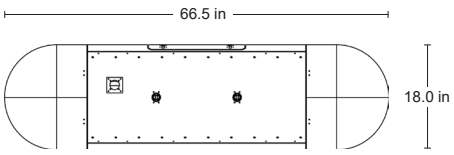
At under 6 feet in length and weighing less than 200 pounds, DARE provides a versatile, mobile, and easy-to-install platform for agile communications.

Utilizing a MIL-STD-8591 compatible mounting structure with 14-inch spacing ensures that DARE can be flown on multiple airborne platforms and requires minimal tooling and manpower for complete integration. Additionally, using MIL-STD-1760 power and standard communications interfaces in conjunction with standard D38999 connectors ensures a seamless integration into existing aircraft infrastructures.

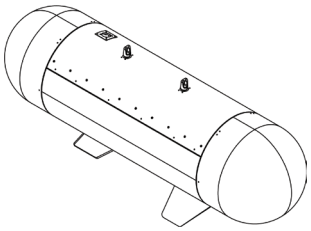
DARE is built with two gender floppable ISRFEs manufactured by Pacific Antenna Systems, allowing for dynamic switching between PCE and SCE modes in real time.

The DARE pod, dimensions of which are displayed below, is designed to be as lightweight and compact as possible for transport by manned and unmanned aircraft.

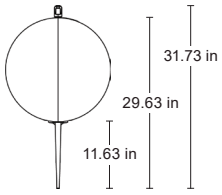
Top View



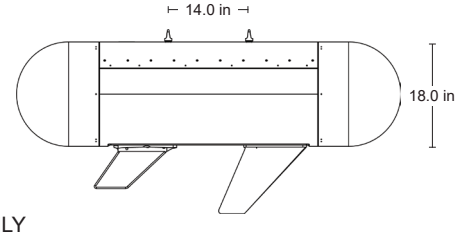
Three-Quarter View



Front View



Side View



Thoroughly Tested and Demonstrated

DARE pod has been thoroughly tested throughout lab and flight test and demonstration. Multiple flight events have proven combined TDL and IP connectivity with crossbanding between links, LPI/LPD discovery techniques for directional CDL connectivity, multibeam CDL, and remote network monitoring and management. DARE testing has been extensive and productive and has prepared the system to move into initial production.

Fuse Flight Test Squadron

The DARE pod has been flight tested on the Fuse Fuse Flight Test Squadron O-2A Skymaster aircraft based out of San Diego, CA. This organic Test Squadron asset enables Fuse to run rapid cycles of build-test-build in an operationally representative environment for UAV and light aircraft platforms. Test Squadron experience with US Navy, Marine Corps, and Air Force test requirements has allowed DARE to significantly increase performance over time with reduced risk and reduced timeline.

Palmdale DARE Pod Demo

June 2019 saw the first flight of DARE out of Plant 42 in California. This very limited demo included basic flight test and initial CDL discovery and antenna pointing during ground taxi testing. Despite greater network configuration issues with other aircraft participants, DARE successfully executed discovery and antenna pointing while on the ground, and basic control software connectivity from the air.

MUDLAN TD1 Demo

Tech Demo 1 flew DARE over San Diego with connectivity to dual ground stations plus a dismounted user on Trellisware. This first full flight test of out-of-band discovery provided the critical first step towards MUDLAN requirements of OOB discovery and CDL connectivity.

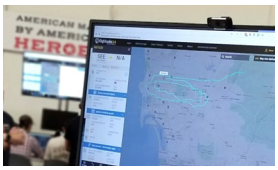
NAVAIR Link-16 Flight Testing

The Fuse Test Squadron flew DARE over San Diego in June 2020 and successfully demonstrated standards-based out-of-band discovery for BE-CDL using J28.2 messages over radio frequency Link-16. This major milestone for LPI/LPD discovery provide CORE discovery and pointing with enhanced network functionality and remote pod management system functioning over live links. Through DARE testing, Fuse has collected hours of network, radio, antenna, software, and system data that has shaped the system architecture and ensured a functional capability that will enable resilient networking on the battlefield.

CDL Antenna Pointing Demo
December 2018

Palmdale DARE Pod Demo
June 2019

MUDLAN TD1 Flight Testing
January 2020



NAVAIR Flight Testing
July 2020

MUDLAN TD2/OD1 Demo
December 2020

2019 2020 2021

Goldstone DARE Pod Testing
May 2019

Link 16 and CDL Flight Testing
November 2019

MUDLAN TD1 Demo
February 2020

MUDLAN TD2/OD1 Flight Testing
November 2020