CarouselUSA
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# MILITARY-GRADE TURNTABLE SYSTEM

## Case Study

*Aerosonde UAS approaching the Launch & Recovery system aboard a U.S. Navy vessel*

**Deployment:** U.S. Navy Littoral Combat Ships & U.S. Army Ground Platforms

**Product:** Custom Military-Grade Rotating Platform

**Application:** Unmanned Aircraft System (UAS) Launch & Recovery Integration

**Client:** Textron Systems Corporation

## TURNTABLE – PROJECT OVERVIEW:

Textron Systems Corporation — a global leader in unmanned aircraft systems — required a rotating platform to serve as the structural and electrical foundation for the launch and recovery of its Aerosonde Small Unmanned Aircraft System (SUAS). The turntable needed to orient the Launch &

Recovery (L&R) system into the wind for each takeoff, deliver uninterrupted power and controls to the rotating deck, and physically catch the returning aircraft during recovery.

Deployed aboard U.S. Navy vessels in open-ocean environments, the turntable also had to withstand continuous saltwater and UV exposure across a 10+ year service life with minimal maintenance access.

Carousel-USA engineered and delivered a fully customized turntable system designed to meet structural, electrical, environmental, and service-life demands — on time and built to military standards.

*Aerosonde UAS launching from the L&R system aboard a U.S. Navy ship*

## THE CHALLENGE: CONTINUOUS POWER & CONTROL THROUGH ROTATION

The turntable needed to carry power and control signals from a fixed command station to a rotating deck — without interruption across nearly 360° of travel. Traditional slip rings and drag chains introduce wear points, signal dropouts, or rotation limits that were not acceptable for this application.

The system required:

- **Uninterrupted power delivery** to the L&R system across full rotation
- **Clean control signals** with no electrical noise or intermittent contact
- **Zero rotation limits** that would require operator re-indexing mid-mission

This demanded precise cable routing engineering and a rotating-joint design capable of handling continuous electrical transfer over thousands of operational cycles.

## OPEN-OCEAN ENVIRONMENTAL DURABILITY

Because the turntable is deployed at sea, saltwater spray, humidity, and UV exposure posed a significant risk:

- Accelerated corrosion of structural and mechanical surfaces
- UV degradation of coatings and sealants
- Long-term exposure with very limited maintenance access

A conventional industrial finish would not provide adequate protection. Military-specification coatings and components were required throughout.

## TURNTABLE – STRUCTURAL INTEGRITY FOR AIRCRAFT RECOVERY:

Although the turntable is rotating equipment, it also functions as the foundation for the aircraft recovery process. The platform must support the full L&R assembly while physically arresting a returning Aerosonde UAS — transmitting dynamic capture loads into the deck structure without flex, fatigue, or loss of alignment. Engineering, fabrication, and certification had to align with U.S. military standards from the first drawing through final delivery.

## THE SOLUTION: ENGINEERED ROTATING PLATFORM & CABLE MANAGEMENT

Carousel-USA engineers utilized computer load modeling to properly size the structural framework and validate performance under launch vibration and recovery capture events.

The system includes:

- ~360° continuous rotation
- Structural framework sized for launch and recovery dynamic loads
- Proprietary continuous-rotation cable management system
- Precision drive integration for smooth, controlled rotation
- MIL-SPEC coatings on all exposed surfaces
- Military-grade components from structural members to fasteners

The result is a platform that rotates cleanly through nearly a full circle, holds alignment over thousands of cycles, and delivers uninterrupted power and control to the rotating deck.

*The Carousel-USA military-grade turntable — designed, fabricated, and certified at our Fontana, CA facility*

## PROPRIETARY CABLE MANAGEMENT SYSTEM

To eliminate the wear points and signal-loss risks of conventional slip rings, Carousel-USA designed and fabricated a custom continuous-rotation cable management system consisting of:

- A purpose-built rotating cable routing assembly
- Integrated power and control signal paths through the rotating joint
- Uninterrupted electrical continuity across the full range of motion

This engineered solution delivers reliable power and controls to the L&R system without the failure modes associated with traditional slip-ring designs — a critical feature for long-deployment operations at sea.

## STREAMLINED FABRICATION & MILITARY CERTIFICATION

Carousel-USA met the full scope of military fabrication requirements by:

- Designing and engineering the platform entirely in-house
- Fabricating all structural and mechanical components at our Fontana, CA facility

- Meeting U.S. military specifications for materials, coatings, and components
- Certifying the completed system prior to shipment

The turntable was delivered ready for integration with the Aerosonde L&R system and deployment aboard naval and Army platforms.

*The Aerosonde L&R system in operation aboard a U.S. Navy ship — the Carousel-USA turntable rotates the entire assembly to face into the wind*

## TURNTABLE DESIGN FEATURES

- ~360° continuous rotation
- Proprietary cable management system for uninterrupted power and control
- 10+ year engineered service life in open-ocean environments
- MIL-SPEC protective coatings throughout
- Military-grade components from structural steel to fasteners
- Structural capacity to support and arrest the Aerosonde L&R system
- Very low maintenance design for remote deployments
- Direct integration with the Aerosonde Launch & Recovery system
- Fabricated to U.S. military standards
- Designed and built in the USA

## PROJECT OUTCOME

The Textron Systems turntable is deployed aboard U.S. Navy Littoral Combat Ships and U.S. Army ground support platforms, serving as the rotating foundation for Aerosonde UAS operations. The Aerosonde fleet supported by this turntable has since expanded to more than 10 U.S. Navy ships, and Textron Systems was awarded a follow-on NAVAIR contract valued at up to $47 million in late 2024. The aircraft this turntable supports has accumulated over 700,000 cumulative flight hours.

The Textron Systems turntable installation demonstrates Carousel-USA's ability to:

1. Engineer rotating platforms for demanding, mission-sensitive applications
2. Solve complex electrical continuity challenges across rotating joints
3. Deliver equipment built for long-term service in the harshest environments
4. Meet rigorous fabrication, certification, and delivery requirements

*Deployed & proven at sea — Aerosonde UAS supported by Carousel-USA's rotating platform*

This project reflects Carousel USA's commitment to precision engineering, durability, and American-built quality.

## SEE THE AEROSONDE IN ACTION

Watch Textron Systems' Aerosonde Small Unmanned Aircraft System take its first flight from a U.S. Navy guided missile destroyer — supported by the Carousel-USA rotating platform.

**Watch on YouTube — Aerosonde SUAS First Flight from U.S. Navy Destroyer**

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