

Proven Aiming and Stabilization Brings Maximum Effectiveness from Land to Sea

Challenge	Solution	Result
Unprecedented aiming and stabilization application	Highly engineered turret drive stabilization system	Successful first test firing with 100% accuracy
Unique behavioral and environmental conditions	Rugged components proven to perform reliably in harsh environments	Cost-effective solution that met delivery schedules
Modular configuration to support multiple weapon sizes	Modular system design for an easy path to upgrades or modifications	Further strengthened long-standing partnerships

Challenge

The X18 Armoured Troop Carrier (ATC) concept, also known as the “Antasena” tank boat, was first introduced in 2014 and proposed a new hybrid vehicle for militaries tasked with protecting coastal and smaller bodies of water. Navies responsible for securing smaller countries or countries with many smaller islands could see significant benefits from such a vessel. Outfitted with a turreted weapons system from John Cockerill Defense, the Antasena blurs the lines between boat and tank. The Cockerill® 3030 weapons system, primarily responsible for providing disembarking troops with protective firepower, can fire high explosive shells and anti-tank guided missiles, making it as lethal as a mortar or howitzer.

The weapons system needed an aiming and stabilization system that delivered maximum effectiveness while taking into account the behavioral and environmental conditions of this new landscape. In addition to the up and down motion typically experienced on land vehicles, the aiming and stabilization system would also need to account for the rolling motion experienced during operation on water. “Brown water” operation in coastal regions would also expose the system to saltwater, a more aggressive and corrosive environmental element.

John Cockerill Defense weapons systems are modular in their design, enabling customers to evolve their weapons systems cost-effectively over time. The need for an aiming and stabilization solution that could meet current program needs and be scaled up or down to accommodate future changes in the weapons system was a must. The company turned to a trusted partner to meet their aiming and stabilization needs for the X18 ATC program.

Solution

The Cockerill 3030 can provide heavy firepower, day or night, at targets as far away as 5000 meters (more than 16,000 feet). Outfitting the weapons system with Curtiss-Wright's Turret Drive Stabilization System (TDSS) would offer the control and stability needed to accurately locate a target and stabilize a shot, even while speeding over open waters. Motion control systems for defense applications often require high-speed movements and extreme precision, resulting in highly accurate and consistent load positioning while operating in conditions not often seen in industrial applications. The TDSS is a pre-engineered solution specifically designed to meet the control motion requirements unique to defense applications.

Available in three standard configurations or as a completely customized solution, each system configuration provides the option to gain functionality through upgrades as program requirements change incrementally. For example, a customer can quickly move from Configuration 2 to Configuration 3, a more stabilized system with the addition of gyroscopes, without the need to replace existing hardware. Despite its use on this hybrid platform, system integrators could install a standard TDSS configuration with minimal modifications. Only slight changes to the aiming and stabilization software were needed to meet the rotation requirements for the weapons system.

Experienced in the aiming and stabilization solutions from Curtiss-Wright, John Cockerill Defense was well-versed in the capabilities of the TDSS. Purpose-built for armored land vehicles traversing rugged, harsh terrain, the TDSS has a long history of performing accurately and reliably in extreme environmental conditions. To ensure performance requirements are met in a wide variety of conditions, including; extreme temperatures, continuous vibrations, and exposure to sand, dust, and water, every system component undergo extensive testing. As a result, the TDSS was an ideal candidate to provide the stabilization needed for successful open water operation.

Result

Every motion control solution from Curtiss-Wright results from a building-block approach to system design, and the TDSS is no exception. Each configuration consists of rugged, field-proven components that can be quickly adapted and configured to meet specific program requirements. The use of a standard configuration meant John Cockerill Defense could move on to the next development phase much quicker. At the same time, this modular approach to system design provided John Cockerill Defense with a cost-effective aiming and stabilization solution that could support the X18 ATC program and any changes to the weapons system without a negative impact on program schedules.

The prototype vessel completed production in April 2021 and was quickly followed by sea trials. In May 2021, John Cockerill Defense completed its first successful test firing at sea in Paiton, Indonesia. The Combat Boat, capable of traveling at speeds up to 45 knots, proved to be as accurate as it is fast, with a 100% target success rate.

Choosing a purpose-built drive system puts customers, like John Cockerill Defense, in a far better position to reduce program risk, accelerate time to market, and reduce costs.

System integrators could rest easy with an aiming and stabilization system engineered to meet the key properties needed to meet performance requirements. By partnering with Curtiss-Wright and leveraging our more than 70 years of experience in a wide variety of motion control applications, John Cockerill can further strengthen relationships with their partners to deliver on successful efforts like that of the X18 ATC.



Linear Gear Drive



John Cockerill's Combat Boat