

## ABSTRACT

Search, rescue, and firefighting: these three tasks are expected to be done quickly and effectively. Normally, it can be expected that an aircraft can complete missions such as these. Some aircraft can be fast, others can land quickly, but not many can do both. Helicopters are efficient at VTOL (Vertical Take Off and Landing), but inefficient in fast transport. Conventional aircraft, such as the C-130, can travel fast but has no VTOL capabilities. The Bell Boeing V-22 Osprey was the first successful attempt at creating a military aircraft that could take-off and land quickly, as well as fly like a conventional aircraft – a tiltrotor. The challenge of landing a fast aircraft in tight areas was overcome, and rescue and personnel retrieval became a quick task to complete. However, the V-22 has encountered some challenges through the years; challenges such as stability and aquatic landing. In order to adapt to the presented difficulties, the Geryon was developed.

The Geryon is an innovative aircraft that can easily transition from search and rescue missions to fire fighting. It is a quad tiltrotor aircraft that maximizes STOL (Short Take Off and Landing), VTOL, and fast transport to reach targeted areas quickly. This tiltrotor aircraft is built to meet design goals of traveling a range of 800 nautical miles and reach a top cruising speed of 320 knots. Another goal was to make the Geryon amphibious; its quad tiltrotor design allows for aquatic landing and safe rescue. The quad tiltrotor design also increases stability while in vertical flight, and the tandem wing helps with stability in conventional flight. Not only does this innovative design improve landing and stability, it also allows the aircraft to carry approximately twice that of the V-22 GTOW (Gross Take Off Weight). However, the intense loading from the engines creates a problem of structural stress, which could cause the wings to shear off. To help address this issue, the wing design is structurally reinforced to help reduce the stress. Aerodynamically, the Geryon has been designed to reduce drag and maximize lift, which is crucial for fast flight and quick rescue. The Geryon is the aircraft that will be able to aid with all missions, and do it in a short amount of time.