

Designing a Transformable

How GDRS is helping the U.S. Navy and Navatek Ltd. to imagine initial T-CRAFT systems for Seabasing mission

By Jack Flanagan, GDRS

In late 2006, a Navatek Ltd. team, including General Dynamics Robotic Systems (GDRS), won a research and development contract to begin design work on the Transformable Craft or T-CRAFT.

GDRS' responsibility is to perform the concept and preliminary designs of T-CRAFT's Mission Management System and the Captive Air Amphibious Transport, or CAAT. The customer for this project is the Office of Naval Research (ONR). ONR is embarking on an effort to develop a "game changing" Innovative Naval Prototype solution to enable the U.S. Navy and Marine Corps to better perform the Seabasing mission.

In the U.S. Navy's Seabasing mission concept of operations (CONOPs), the T-CRAFT will deploy in an unloaded condition from an Intermediate Support Base (ISB) to the Seabase. To understand the scope of this mission, imagine Guam in the Pacific Ocean or Diego Garcia in the Indian Ocean as the ISB. The T-CRAFT is required to have a range of 2,500 nautical miles (nmi) for this open ocean transit with good sea keeping capabilities. After reaching the Seabase, located anywhere from 25 to 250

nmi offshore, the T-CRAFT will become a Seabase "connector" ship. It will then onload 300-750 long tons of M1A1 tanks, troops, tracked vehicles and other equipment at sea for the high speed (~40 knots), shallow water run towards the beach. Finally, when approaching the landing zone, T-CRAFT will



Artist's concept of the T-Craft with the Captive Air Amphibious Transport (CAAT at the bow).

Illustration by Mike Fridley

transform into an amphibious mode to transverse sand bars, mud flats and the surf to provide "feet dry on the beach" landing for its warfighting payload.

GDRS is helping to enable this design by providing automation technology and low manning designs for the Mission Management System to meet the requirement to operate the T-CRAFT with a crew of 2-3,

in total. Compare this to the Joint High Speed Vessel (JHSV) requirement for a crew of 37. JHSV is a near-term Seabasing transport ship program that will perform some portion of the T-CRAFT mission.

How can this be done? Does this not go against the basic laws of physics? The LCAC (current beachable Amphibious Craft - Air Cushioned) can only carry 75 tons, or a single tank, onto the beach. How can Navatek claim to be able to do that times 10?

Well the answer is “no problemo.” Navatek Ltd. has devised an innovative solution to the T-CRAFT problem by providing a Systems-oriented design that involves a High Speed Tilt Deck Catamaran and a smaller, Captive Air Amphibious Transport (CAAT) that can carry the payload the full distance onto the beach after being launched from the catamaran.

GDRS is providing propulsion designs for the unique Captive Air propulsion system that will propel the CAAT through the water and also over the mud flats, sandbars and beach.

Other companies on the Navatek Ltd. T-CRAFT team include AMSEC Naval Architects (Rosenblatt), Alion (MA&D), Oceaneering, SAIC, Materials Sciences and Atlantic Marine.

Phase 1 of T-CRAFT ends in mid-2007. Phase 2, a \$6 million effort, will begin in 2008 and run for 12 months. During Phase 2, competitive Preliminary Designs will be completed and model tests will be performed. Phase 3, for approximately \$150 million, involves the Detailed Design and Construction of the Prototype Demonstrator for a single contractor. Phase 3 will only occur if the U.S. Navy and Marine Corps fully support the system and want to transition T-CRAFT to the fleet. ■



The CAAT will provide “feet dry on the beach” landings for troops and equipment.

Illustration by Mike Fridley