

XM-7

Terrain normally impassable to wheeled and heavy tracked vehicles soon may be traversed by the XM759 Marginal Terrain Vehicle (MTV). U.S. Army Materiel Command (USAMC) and U.S. Army Combat Developments Command (USACDC) evaluations to date indicate that the new MTV could prove most effective in Vietnam where tidal mud flats, rice paddies, heavily vegetated waters, and swamp areas with underwater obstructions abound. Additional adaptations would permit operation in deep snow and muskeg vegetated bogs characteristic of arctic and subarctic environmental terrains. Pilot models are amphibious



759

CONQUERS THE SWAMP

and employ the air-roll principle for both land and water locomotion. They can accommodate 14 fully equipped combat troops or 1½-ton rated payload.

The logistical troop carrier's suspension system consists of two individually driven tracks composed of 24-inch diameter, 21-inch wide tires mounted on individual axles attached at both ends to drive chains. Pneumatic action of the tires provides the only spring response to rough terrain since the XM759's sponsons either rest or ride on top of the tires, with no mechanical connection in between.

Large drive sprockets engage the track chains to

propel the MTV. When traveling on firm ground or terrains possessing varying degrees of softness, the MTV's sponsons roll over the tires as though on a roller conveyor. When its operation is required in a marine environment, the carrier's wheels, serving as paddles, propel the vehicle through the water.

Technical resources and engineering skills of three major testing organizations of the U.S. Army Test and Evaluation Command (USATECOM), operating in conjunction with the U.S. Army Engineer Waterways Experiment Station (USAEWES), are involved in evaluating the XM759 prototypes.

MTV undergoes mobility tests in terrain simulating the swamps of Southeast Asia.



Aberdeen Proving Ground, Maryland is responsible for land engineering testing. Yuma Proving Ground, Arizona is evaluating the MTV's operational characteristics under desert conditions.

The U.S. Army General Equipment Test Activity (USAGETA), Fort Lee, Virginia, has been assigned responsibility for conducting water engineering, reliability, and the tire comparison phases of the engineering tests to determine the XM759's overall technical operation and safety characteristics.

Of the 15 mobility courses used initially, the XM759 completed 14 both with and without a rated payload. The test vehicle proved capable of traveling over 44 different terrain types in the testing complex. The standard M116 full-tracked carrier, used for comparison of capability, traversed only 24 of the varied terrains.

Water engineering tests were conducted on the Chickahominy River and in the harbor at Fort Eustis, Virginia. Engineering evaluations performed on the test and control vehicles included static flotation and watertight integrity, maximum static roll and pitch angles, water towing resistance, water drawbar pull, water speed, swimming fuel consumption, and water turning tests. During the water turning tests a water stabilizer kit as well as various sizes of flag rudders were tested to determine which provided the best turning control of the vehicle in water.

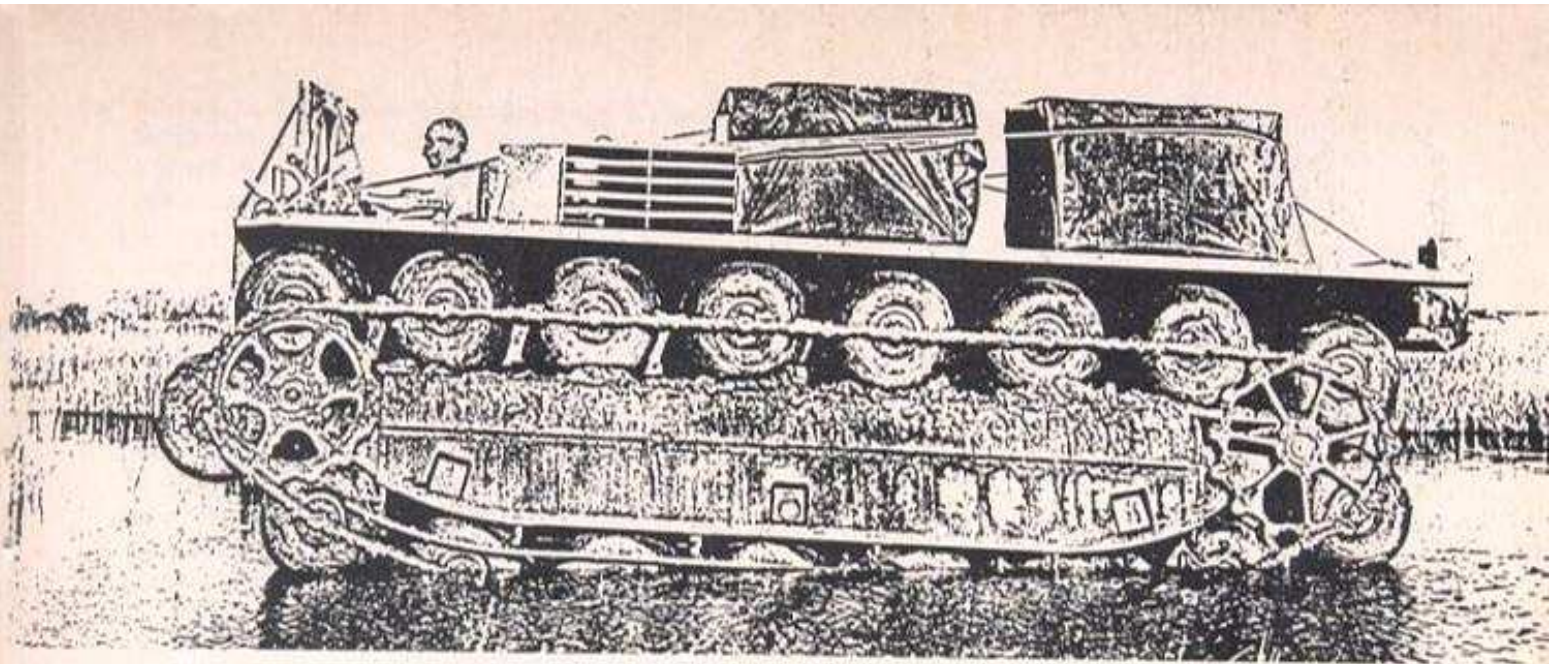
Four hundred hour durability testing, conducted in 100-hour cycles on Pilot Model No. 1, was performed to ascertain the XM759's endurance. The test called for operation 20 hours in mud, 24 in swamp areas, 8 on smooth surface highways, 8 under secondary road conditions, 8 cross-country, 12 on hilly terrains, and 20 for swimming evaluations. During these durability tests the XM759 was equipped with smooth-treaded tires.

Laboratory tests conducted by USAEWES revealed that the use of tread patterns on the tires would increase their tractive effort performance by a factor of seven in relation to the use of smooth tires. At a USAMC Research and Development meeting in June 1968, the attendees agreed that comparison tests between patterned and smooth treaded tires should be effected.

Specific tests established as a result of this meeting consisted of an operational performance comparison and evaluation of the XM759 when equipped with smooth, chevron, and bar-treaded tires. Drawbar pull, water exiting, and slippery clay slopes tests were then conducted on the XM759 in a high clay-soil area near Richmond, Virginia. Grass covered slope tests were performed at Fort Eustis, Virginia. Determinations were made as to whether aggressive pattern treaded tires could effectively eliminate any problems which might be encountered when the XM759 was traversing slippery slopes, climbing steep river banks, and engaging in drawbar pull operations.

On completion of additional swimming and mobility phases of the engineering tests scheduled soon for Camp Peary and Fort Story, Virginia, and provided the MTV has been recommended as suitable for service tests, the experimental amphibian will undergo this type of testing in a typical marine environment. Factors relating to the MTV's overall operational characteristics and maintainability under both simulated and actual field conditions will be tested by experienced Army test personnel.

Operated by a two-man crew, the prototype weighs approximately 11,500 pounds and has a top speed of about 35 miles an hour. USACDC has proposed inclusion of the MTV in the Army's inventory. ☺



During LOTS testing the MTV disembarks over-the-ramp of an LCM-8.



The MTV climbs a steep canal bank after completing swimming trials.

