

fmc progress

VOLUME 14 NUMBER 1

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CYPRESS 5-1111



PROGRESS

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VOLUME 14, NUMBER 1—1964

Published by FMC Corporation, Executive Offices, San Jose, California, to create a broader understanding of the contributions made by FMC's diversified and integrated activities in the many fields using FMC's products and services. George Lajeunesse, FMC Corporation, EDITOR; Roger Sheridan, Landphere Associates, ART DIRECTOR.

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ABOUT THE COVER

A landing craft of the future "flies" over the windblown waters of San Francisco Bay near the San Francisco-Oakland Bay Bridge. She's the LVHX2 (landing vehicle, hydrofoil), designed and built by FMC Corporation's Ordnance Division for the U. S. Marine Corps. A boat with wheels, the hydrofoil vehicle can carry heavy cargo from ship-to-shore and inland at high speeds. See "Over Water and Over Land," pages 4-6.

Vehicle contracts awarded

SAN JOSE, CALIF.—Two new contracts totaling \$80,868,318 were awarded FMC Corporation by the U. S. Army this year for a large quantity of tracked vehicles.

Ordnance Division plants at San Jose and South Charleston, West Virginia will manufacture the vehicles, including 1,682 M113A1 aluminum armored personnel carriers, 640 XM106E1 mortar carriers, 1,225 M577E1 command post carriers and 265 M132E1 flame thrower vehicles.

All vehicles will be powered by diesel engines. The new diesels will extend the range of the vehicles to 300 miles from the 200 mile range of those now equipped with gasoline engines.

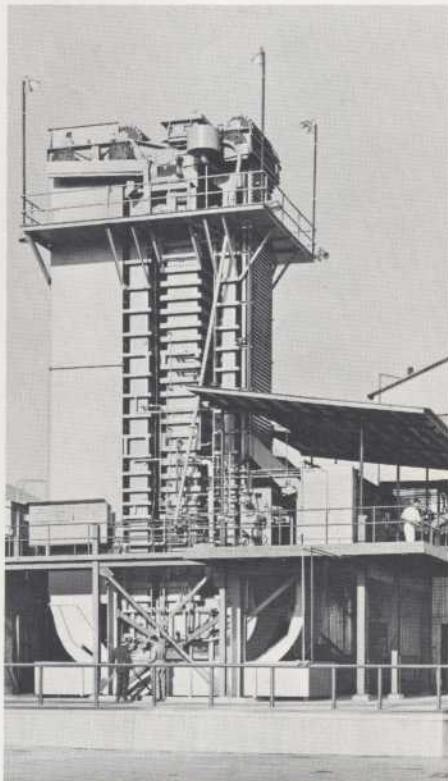


FMC wins 2nd "E" award

SAN JOSE, CALIF.—FMC International, overseas division of FMC, has been awarded an "E" flag for excellence in exporting by the U. S. Department of Commerce.

Displaying the coveted banner at recent ceremonies are (above) left to right, Dr. Eugene Braderman, Bureau of International Commerce; Mrs. Roberta Horn, secretary to A. Wayne Elwood, FMC senior vice president in charge of international operations; John D. Crummey, honorary board chairman of FMC and Hubert L. Byrd, FMC executive vice president.

Last year Dr. Braderman made a similar presentation to FMC's Peerless Pump in Los Angeles, in behalf of Secretary of Commerce Luther Hodges. Both awards are for outstanding records in furthering sales of U. S. products in world markets.



First "hydrostatic" installed

STOCKTON, CALIF.—First hydrostatic sterilizer built and installed in the United States is now in operation at Tillie Lewis Foods, Inc. Designed and built by FMC's Canning Machinery Division, the six-story sterilizer is one of the most advanced types of equipment for preservation of food known to the food processing industry.

High capacity, fast output and unusual versatility are the principal advantages of the combination sterilizer-cooker. It is capable of handling up to eight different sizes of cans for a wide range of products, including fruits, vegetables, soups and meats.

Virginia welcomes FMC

FREDERICKSBURG, VA.—A bound volume of letters welcoming FMC Corporation to Virginia's industrial family was presented to the company recently.

William N. Williams, FMC executive vice president, accepted the gift at the annual meeting of the Fredericksburg Chamber of Commerce. The book includes letters from Governor A. S. Harrison and state and local officials. FMC plants in Virginia, operated by the American Viscose Division, include manufacture of cellophane at Fredericksburg and production of rayon staple and rayon tire yarn at Front Royal.

Hydrostatic sterilizers manufactured by FMC have been in use in Europe in recent years. FMC, a pioneer in food processing equipment, first introduced the continuous pressure cooker-cooler, a mainstay of the U. S. food preservation industry, in this country in 1920.



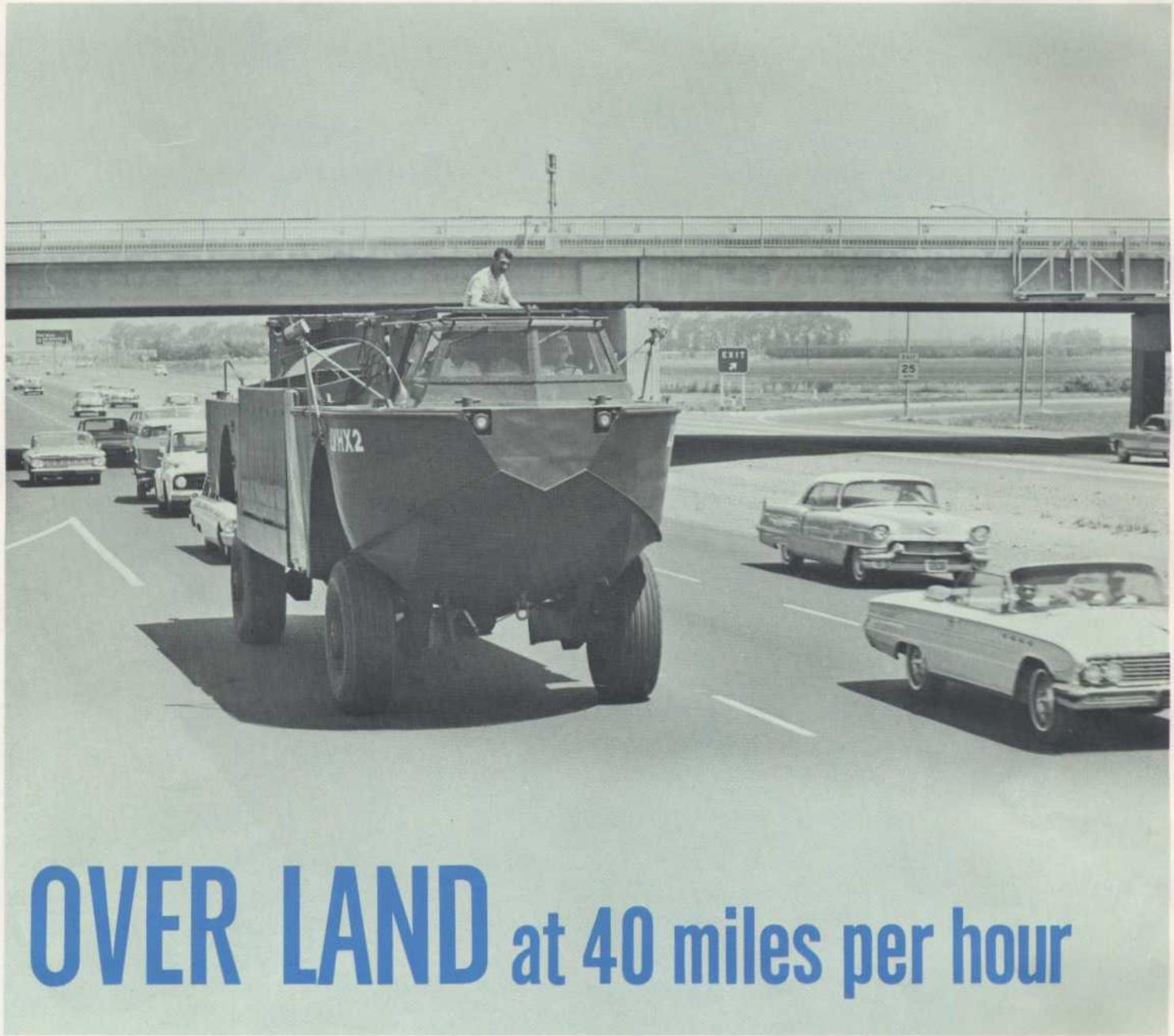
OVER WATER AND

Foilborne, FMC-built amphibious hydrofoil vehicle skims effortlessly over the choppy waters of San Francisco Bay during speed tests for the U. S. Navy. In background is the San Francisco-Oakland Bay Bridge.

On wheels, the amphibian shows its versatility in heavy traffic along Bayshore Freeway, between San Jose and Redwood City, California. Sand-type tires which retract into the LVHX2's hull during water operations, can carry the vehicle across rough, hilly beach terrain.

One-third scale models of the hydrofoil system had to be exhaustively tested before final design for the LVHX2 was selected. Test boat, piloted by FMC's Dave Wray, is powered by a small automobile engine.





OVER LAND at 40 miles per hour

FMC's hydrofoil vehicle does both—carrying five tons of military cargo

Motorists crossing the San Francisco-Oakland Bay Bridge recently were startled by the sight of a wheeled, boat-like vehicle "flying" over the surface of the water on hydrofoils.

Some time later, beach strollers in the vicinity of Oceanside in southern California saw a similar vehicle performing even more astounding maneuvers: Such as a fast flight on foils over the waves toward shore, then settling down easily into a "boat" mode to ride through the surf; emerging on the beach as a wheeled vehicle, and rolling inland with speed and agility.

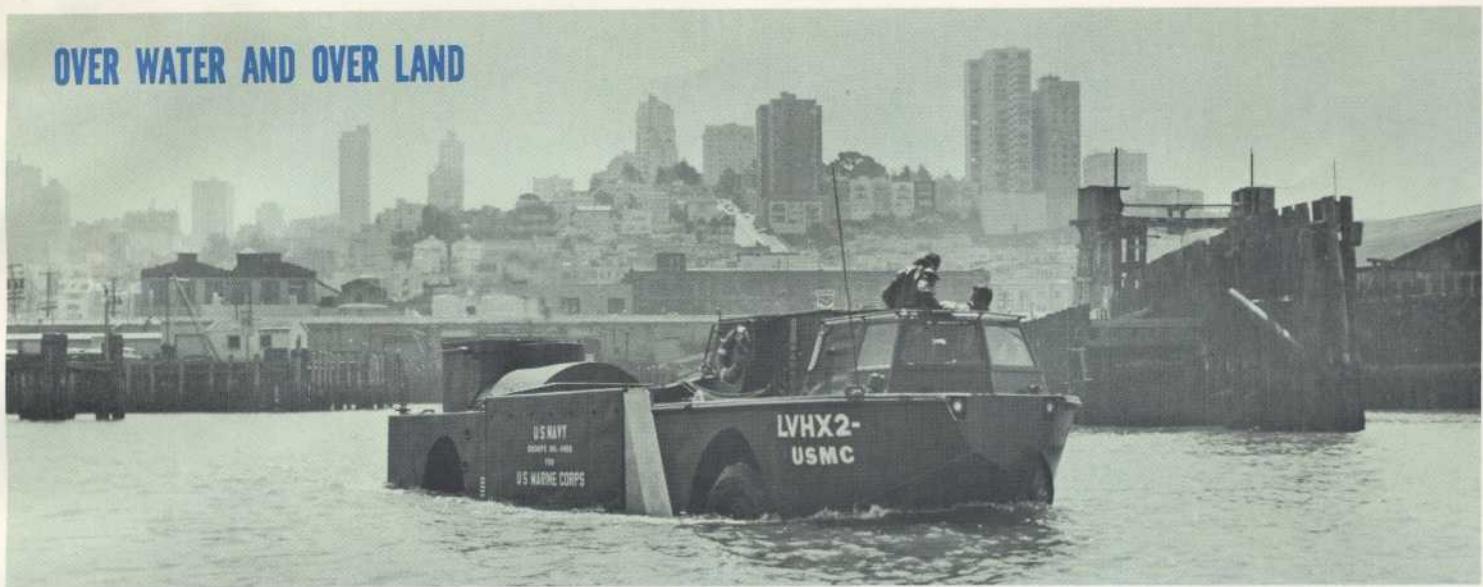
What the Californians watched were tests of two vehicles,

both prototypes of the LVHX2 (landing vehicle, hydrofoil), designed and built by FMC Corporation's Ordnance Division, San Jose, California, for the U. S. Marine Corps. These were the first amphibious landing vehicles to make use of hydrofoils for high speed ship-to-shore operation.

The story of the two LVHX2's began in 1961 when the U. S. Navy's Bureau of Ships issued bids for a vehicle with performance characteristics which, if not impossible, were extremely difficult to attain. Specifications called for a high-speed amphibious ship-to-shore cargo carrier capable of moving over water at 35 knots (approximately 40 land miles per hour) and over ground at the same speed. It had to carry five tons of cargo across water, through the surf, across the beach and inland. The vehicle also had to be quickly loaded and unloaded under combat conditions.

(continued on next page)

OVER WATER AND OVER LAND



San Francisco's skyline looms up behind the hydrofoil vehicle as it operates in boat mode with wheels and foils in retracted position.



FMC Ordnance Division engineers refuel the LVHX2 at S. F.'s Fisherman's Wharf, readying the vehicle for another test trial on the bay.

FMC engineers went to work and the LVHX2 took shape on the drawing board, in mockup and test model form and then in special aluminum alloy as a finished vehicle. Ordnance Division engineers designed an efficient hydrofoil system utilizing surface-piercing forward foils. For a power plant they chose a 1,040-horsepower gas turbine engine of advanced design.

When the LVHX2 is ready to fly, the foils are extended and the hull lifts free of the water until the 38-foot amphibian is completely foilborne and "flying" at 35 knots. The hydrofoil system is inherently self-stabilizing because it seeks a level of flight at which the foil area is just sufficient to support the vehicle. An autopilot system is used to insure steady, level flight even in a sea with waves approximately five feet high.

Equally impressive is the manner in which the LVHX2 is able to negotiate the transition from sea to land. Approaching shore, the foils are folded neatly into the hull. As the craft moves in toward shallow water as a boat the wheels are lowered and power is applied to the wheels and propeller at the same time. As the vehicle comes out of the surf, the propeller is retracted and a fast, maneuverable sea vehicle becomes a fast, maneuverable land vehicle.

It took the versatility that FMC engineered into the LVHX2 to meet the needs of the Marine Corps. The two hydrofoil vehicles designed by FMC are now assisting the Marines in their continuous research and development program to develop better equipment for amphibious assault operations.