

Hydrofoil Pioneers...

The *CIGAR*

by Bob Johnston and Jean Buhler

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CIGAR - Miami Shipbuilding Corp. Hull 493

Official Trials with John D. Gill, Project Engineer, as pilot and Marine Colonel Stafford, who accepted the trials, as passenger

(Note the absence of spray or wake from the struts, 10 HP Mercury engine, speed 30 knots)



CIGAR at Virginia Beach VA with "[Beach Jumpers](#)"



CIGAR at Virginia Beach VA with "[Beach Jumpers](#)"

During the late 1950s, the use of hydrofoils in clandestine naval operations was evaluated. Some of these operations used hydrofoils purely for rapid sea transportation. For example the old "[Beach Jumper](#)" units tested a Supramar design as a personnel mover. This design was a small patrol boat that initially had been designed for the border patrol forces of the French Navy. These boats carried 6 to 7 personnel at speeds in the 30 to 40 knot range. Embarkation at speed was an interesting problem that the "Beach Jumpers" evaluated.

Out of this background a requirement was developed for a device that could be launched from the

torpedo tube of a submarine. Such a craft was to be capable of being assembled by two individuals after ejection. The craft was then to travel to a beachhead at a maximum distance of 15 nautical miles at a speed of at least 30 knots, while transporting the two individuals. Near the beach area the craft was to be submerged and its position marked while the swimmers proceeded to shore. Upon completion of the shore operation, which might be as long as two days, the craft was to be retrieved and proceed a maximum distance of 15 miles for a rendezvous with the submarine.

Upon these requirements the basis for a contractual arrangement was established. [Miami Shipbuilding Corporation](#) was selected as the designer and producer of the craft and foil system. The outboard marine industry undertook the task to develop a suitable, reliable propulsion unit of 20 to 25 horsepower. Their major task was to produce an outboard capable of lengthy submergence which would then be floated and restarted to transport the swimmers back to the submarine. Also, because of the nature of the intended operation, silencing of the motor, while still producing the required power, was specified.

The preliminary design established the power requirements and the basic configuration. The major task of Miami Shipbuilding was to configure a hull, foil and propulsion system that could be placed within a 21 inch diameter torpedo tube. The resulting configuration was a three submerged foil arrangement—two incidence controlled 18 inch span, tapered, swept back foils mounted forward on four-foot long splayed struts and a similar fixed foil aft attached to the bottom of a four-foot long extension of a steerable outboard motor strut. The foil incidence control system was basically by an aircraft type joystick to provide both differential foil movement for lateral control and collective movement of the foils for elevation. Unlike aircraft, fully submerged foil craft cannot be "flown" very far, particularly at night, without some altitude sensing input. To provide this intelligence the craft was provided with a mechanical single forward reaching surface feeler, the motion of which modifies the pilot joystick command.

Steering of the outboard motor/rear strut was controlled by foot pedals, which when used together with the joystick would provide a fully coordinated turn, just as in an aircraft. The only other control device was the throttle.

The hull was primarily a monocoque construction of 1/8-inch aircraft grade mahogany faced plywood. Several laminated spruce hoop web frames were installed in strategic places. A five-gallon fuel tank of FRP (fiberglass reinforced plastic) was molded in as an integral part of the hull. The mahogany surface of the hull was varnished making it look like a giant cigar, hence the name. Also, since this project was for a Cloak & Dagger (C & D) type operation, *CIGAR* seemed to take the emphasis away from the Navy "Confidential" classification. In flight the craft looked more like a praying mantis.

It should be noted that the name *CIGAR* was not officially approved or used but during the building process, [Jean Buhler](#), the Naval Architect on the project, called it the *CIGAR* and everyone at Miami Shipbuilding used that name through the entire life of the project. The name stuck as the craft went through evaluation by the Navy and Marine Corps. While never officially adopted or assigned, that name became the one by which all participants in the program called the vehicle.

An interesting side note relates to the Project Engineer and principal designer of the *CIGAR*, Professor John Dallas Gill. John was a graduate of Carnegie Tech in Aeronautical Engineering and later obtained his Master's Degree from Stevens Institute of Technology. He worked at Bell Aircraft and later at the Kellogg Co. in rocket design and testing after which he became a Professor of Mechanical Engineering at the University of Miami. John became a consultant for Miami Shipbuilding Corp. on the *HALOBATES* (See IHS Winter 1992 Newsletter) project during the school year and a full time engineer during the summer months. The schedule for the *CIGAR* fitted John's full time employment time so he became the Project Engineer.

In a first review of the control set up for the *CIGAR* it was noted that the throttle was on the left hand side. When asked "Why this arrangement?" Professor Gill responded by saying that he was going to be the test pilot as well as the Project Engineer. You see, John had a hunting accident at the age of 14 and lost his left arm at the elbow. In the interim he had trained himself well in overcoming this handicap. Try tying a necktie or shoe laces, or cutting a steak with one hand. John accomplished these feats as rapidly as most two arm persons. When John got his private pilot's license the FAA inspector made him wear a socket-like attachment to his left stub to hold the joystick while he adjusted the throttle, mixture control and pitch control with his right hand but John used the socket only when the inspector was present.

In the photo of the *CIGAR* in flight, John is at the controls. Colonel Stafford of the U.S. Marine Corp. is the passenger. John had started the engine by reaching his right arm over his left shoulder to pull the engine starter cord, then bumped the throttle ahead with his left stub while grabbing the joystick in his now free right hand. John has been gone for a few years now but he was a delightful, fun loving, talented individual with whom to work, fly, sail or drink.

Another interesting side light is that at the time the craft was being built under wraps the Navy had a contract with Miami Shipbuilding to supply space and assistance to [George Meinas](#) in constructing a hydrofoil for demonstration purposes. See IHS Newsletter issue of Winter 1993. George was not to be permitted to see the *CIGAR* but he sure tried hard. When the craft was completed it was moved at night to Commodore Munroe's boat house in Coconut Grove out of George's sight and knowledge.

An equally challenging part of the design was the stowage problem. All the hydrofoil appendages had to be folded into the confinement of the 21 inch diameter of the hull. At the same time to ease assembly of the vehicle by swimmers, effort was made to not detach the appendages but to hinge them so that they would only require positioning for flight after being secured. Looking at the photograph, the forward feeler swung back and over to the location where the prone passenger rode. The forward foils and struts also swung aft to store in the pilots location along with the joy-stick.

The outboard engine, rear strut and foil were stowed by having the motor hinge at the transom to fit inside a hull cut-out with the strut and foil extending but within the 21 inch circle limitation.

The photograph was taken during the acceptance trials of the vehicle. All performance requirements were met or exceeded and Phil Eisenberg, who was head of ONR at the time, came for the trials, said the performance was amazing and accepted the craft for delivery. The craft was shipped to Little Creek, Va. for Navy and Marine Corp. evaluation. The outboard used for these efforts was not the one that had been contracted for with submersible capabilities.

During the evaluation, as everyone waited for the new outboard, some interest was shown in the concept. A number of Navy and Marine Corps personnel qualified as pilots. Features of the design were evaluated including the in water assembly of the foil system and the storage of the vehicle in a torpedo tube. The launching of the vehicle and the shore side submergence and retrieval demonstration were held in abeyance pending the arrival of a suitable outboard engine. Such an engine never arrived. The reliability of an outboard, submerged for lengthy periods was not established. With the lack of a suitable engine, interest in the project waned and finally the concept was abandoned. No craft other than the *CIGAR* were produced.

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[Back To Hydrofoil Pioneers Table of Contents](#)

[Go To Main Page](#)
