

Charge it!

Technology and market forces are increasing the

DENNIS WOLFE PHOTO



number of electric-powered boats on the water.

*We look at three examples;
a home-built wooden launch,
a modern fiberglass production model
and an experimental aluminum prototype.*



Wolfe drew inspiration from a boat in Weston Farmer's book From My Old Boat Shop. This hundred year-old boat design actually has four computers; controller, energy meter, GPS and iPod.

Dennis Wolfe is a newly retired mechanical engineer who has built 13 boats of his own over the past thirty years. Prior to building the beautiful wooden launch on the preceding page, he and his wife Sue had enjoyed cruising the St. Clair river north of Detroit onboard a V8-powered stern drive runabout of his own construction. Dennis and Sue found that most of their time was spent at idle, rendering the big V8 underutilized.

“An electric motor boat would score a trifecta of very low noise, very low fuel cost and zero local emissions (50% better than the gas engine even if you consider the coal fired power plant). Fuel for the runabout costs about a dollar per mile. Fuel for the electric boat costs about a nickel a mile if recharged from the grid and fifteen cents if recharged from the little Honda generator stored in the lazarette. Practical electric boats are limited to displacement speeds but we hardly ever drove the runabout above displacement speed anyway.”

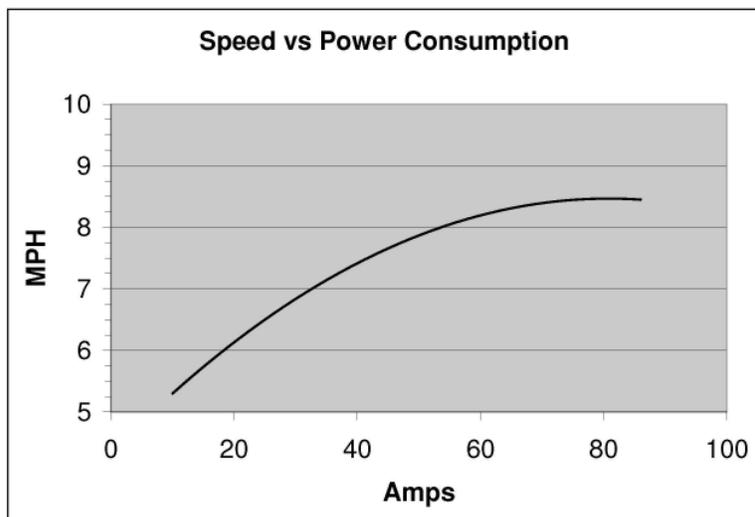
Wolfe drew inspiration from a boat in Weston Farmer's book *From My Old Boat Shop* (Boathouse Publishing, 1979). A narrative, lines plan and offsets for the

"Coyote II" power launch appeared in the book, based on a design named "Coyote" by Edson Schock, Sr done in 1907. Farmer estimated the 1907 engine weighed about 450 lbs. (205kg). The *Rudder* reported her speed as 12.5 statute mph (20kph) at the time with a 10hp (7.5kW) motor.

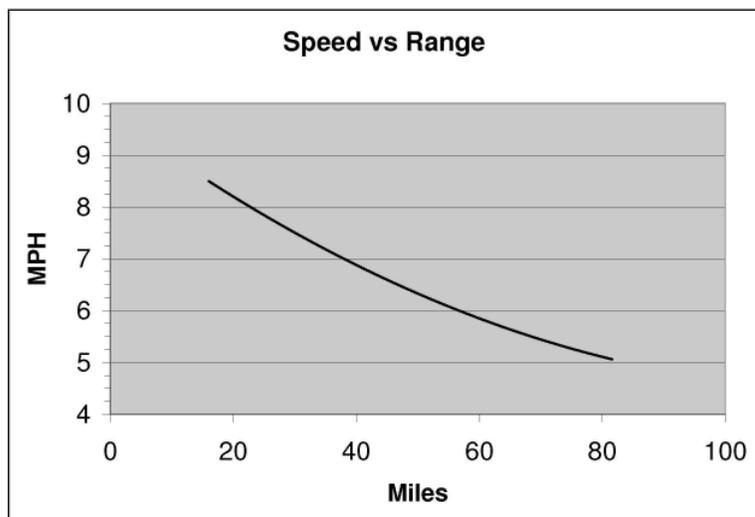
In 1974, the *National Fisherman* republished her lines which led to correspondence between Weston Farmer and Edson Schock, Jr. He built a copy in 1946 for use as a coaching launch at Rutgers University and suggested the boat was fast, threw little wake, but awfully tender. She would benefit from expanding her half-breadths about 25%. This wider design is the "Coyote II" in Farmer's book. It's still quite slender at 25' (7.6m) LOA and a 5'11" (1.8m) beam.

Eight automotive size batteries weigh about 500 lbs. (227kg), just about matching the 1907 gas engine's weight. The 24' 6" (7.5m) waterline gives a theoretical hull speed of 7.6 statute mph (12.2kph) at a S/L ratio of 1.34. Dave Gerr's *Propeller Handbook* suggests 13.5mph (21.7kph) should be possible with 20hp (15kW) due to the boat's very low displacement-to-length ratio of 54 at 1,800 lbs. (816kg) weight.

The motor is a 6.0 hp MARS brushless DC unit made for the golf cart industry.



Builder's data from initial sea trials



The launch's tidy motor and PMAC unit

Even the relatively puny continuous output of a common 6hp (4.5kW) electric motor should achieve 9mph (14.5kph).

Wolfe's boat is built from 3/4" (19mm) square cedar strips sandwiched between layers of 10oz fiberglass cloth set in epoxy. Bright finished wood is Sapele and 3/16" (5mm) Garapa was used as an unfinished veneer for the seats and sole. Construction time was 14 months working nearly full time. The motor is a 6.0 hp MARS brushless DC unit made for the golf cart industry. Power comes from a Sevcon PMAC controller. There are eight 6 volt 220AH Concorde AGM batteries wired in series for 48 volts. Power consumption is monitored by a Link 10 energy meter. This hundred year-old boat design actually has four computers - controller, energy meter, GPS and iPod. A quiet Honda EU2000i generator onboard will run four hours on one gallon of gas, according to Wolfe, and drive the boat at a bit more than 5 mph (8kph) with no battery drain.

Wolfe plans to build and sell one launch per year. The boat pictured is for sale as well. Contact Dennis Wolfe at 810.580.9404 or dwolfe@dropsheet.com