bytes and boats

Boat designer touts software as cutting edge

By Martin R. Drummond
of the News staff

STUART — Boat designer Steve French is convinced the best yachts are built first by mice.

In fact, French is so sure his mouse-driven computer program helps custom boat builders make vessels become more successful that he will soon mail a $20,000 demonstration video to boat builders across the country.

And the star of the video will be a new system for making the boat skeletons — known as jigs — used to produce the hulls of custom boats ranging up to 74 feet. French says the jig-making process he and his staff developed — basically an interlocking system based on a 3D computer model — shaves hundreds of man-hours from each vessel's production.

Blending bytes and the puzzle-like jigs and a bucket of screws, customers of French's Applied Concepts are finding labor savings amounting to as much as $100,000.

Even from the wealthy, that kind of money gets attention.

Helping customers build cheaper boats is not French's objective, though. Instead, the idea is to build them more quickly and with more precision, he said.

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"If a yacht is done as well or better in less time, even if for the same amount of money, it makes sense for the boat buyer. People in the custom boat market are looking for something unique to them that is of the highest quality," French said.

"Because we are three-dimensional modeling these interlocking jigs, there is more orientation to tighter geometry and tighter production schedules," he said.

His goal is to help boat builders eventually cut the production times on large yachts by up to 25 percent.

Based on comments from his customers, French is right on course.

The pieces — called jigs — designed in the computer and cut by specialty routers have traditionally been designed with ruler and paper and cut by saws.

Those jigs are assembled to create a skeletal form on which a boat hull is fashioned from plywood or synthetic boards, then covered with fiberglass. When the hull is completed, it is turned over and the jigs are removed.

Jigs are usually cut with electric handsaws that rarely cut perfect lines, even in the hands of an experienced craftsman.

The slight imperfections that result later require expensive, time-consuming "fairing" efforts, which involve filling notches in the batten — or skeletal rib — with wood shims to get the correct hull shape before the hull boards are attached.

In recent years, though, some boat designers have been using computer-aided drafting programs to draw the jig outlines. French said some designers have even sent the outlines to high-tech router shops that cut the jigs from sheets of cabinet-grade plywood.

Those computer-guided cuts have significantly reduced the amount of fairing required, which

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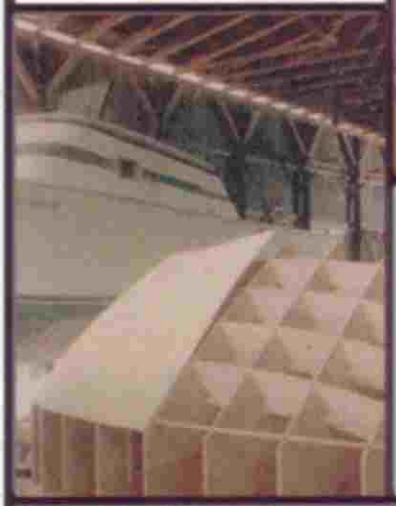
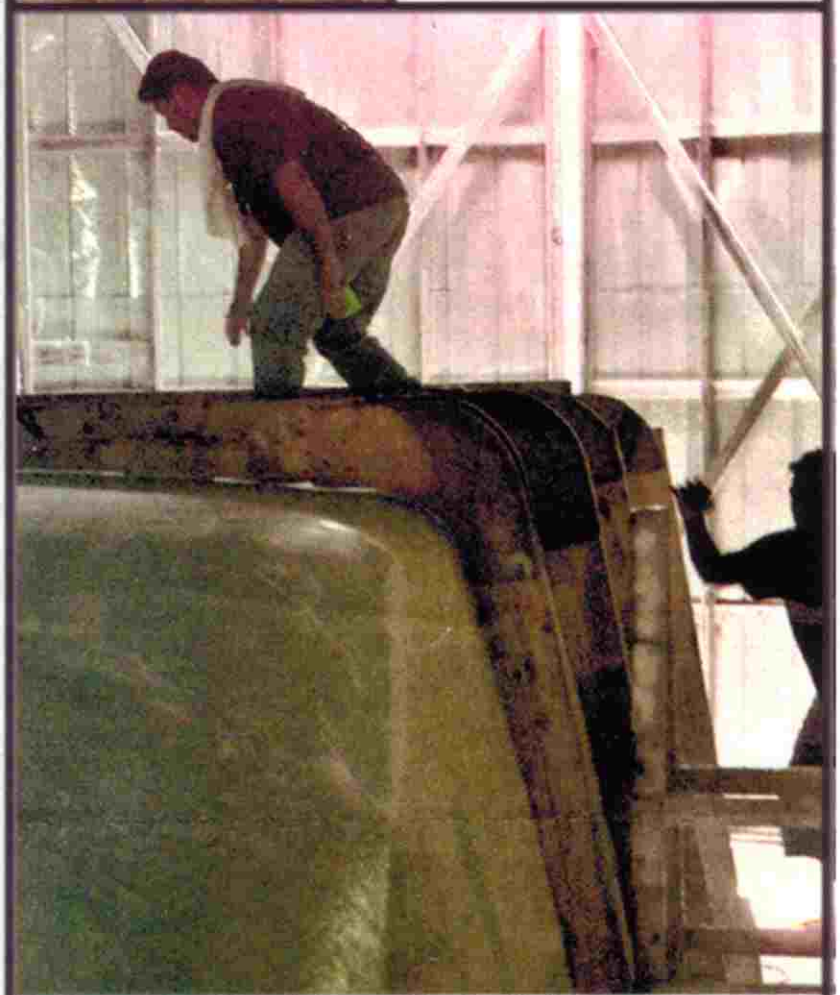
In a Palm City warehouse, Custom Boat Refits assembles the computer-cut wooden jigs.



Joel Vega uses the precision cut boat jigs to cut down on waste, wood and time. Vega's company builds custom-ordered yachts.



Joel Vega and George Madre climb on top of the cabin of the 57-foot yacht they are building to take some measurements. The frame was shaped by the wooden jigs and then the shell was molded with foam core before they strengthened the cabin with a fiberglass covering.

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saves money for the boat builder.

What sets Applied Concepts' jigs apart, French said, is unique interlocking cutouts that were developed to allow boat builders to assemble the jigs as if they were puzzle pieces.

Instead of four weeks to cut and assemble the jig structure for a sport-fishing yacht using the traditional approach, French said, the "tri-axis interlocking" jigs can be assembled in a matter of days.

Sunny Briggs, a sport-fishing yacht builder in North Carolina, said he has changed his custom boat production to work exclusively off router-cut jigs.

"Today's computer technology has really advanced jig building," Briggs said in *The 2001 Official Guide to Billfishing*.

In 1995, he said, three workers would take a month to build the jigs for a custom boat. The process now takes a fraction of that time, he said.

Another boat builder, Mike Sabatic of Wanchese Boat Builders in Wanchese, N.C., said his workers recently assembled the jig components for a 55-foot yacht in less than two days.

"The technology is pretty fantastic. We get six sets of drawings showing the boat from all angles and as soon as the jig is up, we begin building her," he said.

Joel Vega, owner of Custom Boat Refits in Palm City, is building the cabin house and fly bridge for a 58-foot custom yacht now under production for Spencer Yachts in Wanchese. He said the numbered jigs from Applied Concepts are so accurate that he doesn't have to use a tape measure to assemble them, a process called "lofting."

"I just follow the drawings and put them together. Normally, it would take three weeks to loft a 58-footer. But this one was done in less than a week," Vega said.

The 18-year veteran of boat-building said more than 40 percent of a large boat's price can be attributed to labor. On a $2 million yacht, that would mean $800,000. Based on Vega's estimate that the router-cut — that interlocking jigs save up to 15 percent of the labor cost — more than $100,000 could be cut from the boat's production cost.

Vega said boat builders would probably pass on a major chunk of that savings to the boat buyer.

"The industry is so competitive anymore. To stay on the cutting edge of price and quality, you have to stay up with the new technology," Vega said. "It just brings so much accuracy to the job."

Rich Scheffer, owner of Tribute Performance Boats in Jupiter, recently used an $18,000 set of nesting jigs to build the hull of a 74-foot sport-fishing yacht. The process of getting ready for hull planking went so quickly he was "shocked," Scheffer said.

"I am guessing that in total elapsed time, it probably took only 25 percent of the time to be ready for planking as it would have taken by lofting and fairing ourselves," Scheffer said.

"We are just bewildered by how accurate this thing is. In the weeks we would have been fairing this, we were starting to plank," he said. "It will cut at least six weeks out of the total project."

The cost of the jigs was saved just in not having to pay the labor involved in the design and cutting of jigs. Add the time saved in jig assembly and not having to fill in hull variations because of imperfect jig cuts, and the savings are significant, Scheffer said.

"For every week the boat is not in the shop, it is about a $10,000 to $15,000 savings," he said. For six weeks, that could mean up to $90,000 in savings for the boat buyer.

"I couldn't imagine not doing this in the future. This is the only way to go," Scheffer said.

Applied Concepts does not cut the jigs, but instead finds a computer-based routing shop in the general vicinity of the boat builder using the company's design, French said. Once a deal is reached on the price for materials and cutting, the computer codes needed to guide the router are e-mailed to the shop, which then cuts the boards and ships the jigs to the builder, he said.

By using routing companies near the boat builder, he said, up to $2,000 can be saved in shipping costs.

Before the boat builder receives the jigs, Applied Concepts presents the design in three-dimensional animation so last-minute changes can be suggested, if necessary.

Once approved, the cutting formula is transmitted. Within a few weeks, the jigs arrive at the boat builder with cutting accuracy within three-hundredths of an inch.

The jigs are then assembled like puzzle pieces, then screwed together with small wood plates.

Because the software has the potential to revolutionize boat design, and even design contracts for all sorts of products, French said his company will file for a patent on the software. In addition to hulls, cabins and fly bridges, French said the interlocking jigs are also being produced for boat cabinets, interior walls, doors and even furnishings.

French said the success of his idea has been 17 years in the making.

"In 1984, I had a vision to start Applied Concepts to serve the marine industry to create forms and jigs and stuff. The market for big boats was terrible then, though. I was 19 years old and nobody was going to loan me money," he said.

French said he started to refine his idea while working for area boat builders. When he started his own company more than a decade ago, he worked to refine the idea of computer-designed jigs and produced the first versions in 1991.

"For the old ones, we simply cut the frames. Now, in this second generation of jigs we launched earlier this year, we have it down to where they interlock," French said.

"Being an expert loftsman, I can tell you that you still end up with some tweaking of the jigs. But it's not much, and you can put your carpenters to work setting up your bulkheads and getting your (boat) house ready to set up," French said.

He said the current roster of computer design programs used by his office — EMS, Mechanical Desktop and Rhino — have been effective, but will not compare with software now being written exclusively for Applied Concepts.

"This proprietary software will speed up this process significantly by filling in a visual communication gap that now exists between the boat builder, boat buyer and us," French said.

"Our product will make it easier for people who need to see their boat visual 3D in order to make changes on their own computer and then send it back to us," he said.