

Jetdrives are the future, predicts company

Northwest firm claims its microcontroller overcomes two drawbacks of conventional models

By Michael Hauenstein / Staff Writer

A new jetdrive from a Redmond, Wash., company uses a microcontroller to simultaneously regulate its intake, jet nozzle and variable-pitch impeller pump.

Marine Jet Technology Corp. says the system should counter the shortcomings of conventional jetdrives which, it claims, don't react well to changes in load and require too much power to operate at low and mid-range speeds.

"The problem with jets in the past is that they've been for one load and one speed," says MJT president Jeff Jordan.

The microcontroller on the Variable Marine Jet has three main functions: It regulates the pump to maintain engine efficiency by following the curve of the engine's power band, adjusts the area of the nozzle to maintain pump efficiency by controlling pressure on the impeller, and adjusts the inlet duct to ensure the impeller receives the most efficient water speed. This means the system runs efficiently at all speeds, and under all loads and accelerations, according to MJT.

Multiple uses

Jordan says his jetdrive will have many applications — from fast cargo ships and fishing vessels to security boats with divers and recreational boats.

"The uses keep getting wider," he says, pointing out that MJT's earlier technology was designed to replace sterndrives for safety and dependability.

The variable-pitch impeller eliminates both gear-mashing and the need for the reversing bucket common to jetdrives, Jordan says. The impeller sits in a spherical housing where the blades change pitch from forward, to "true neutral," as Jordan



Jeff Jordan

puts it, to reverse. The continuous maneuvering range runs from 45 degrees forward thrust to -25 degrees reverse thrust.

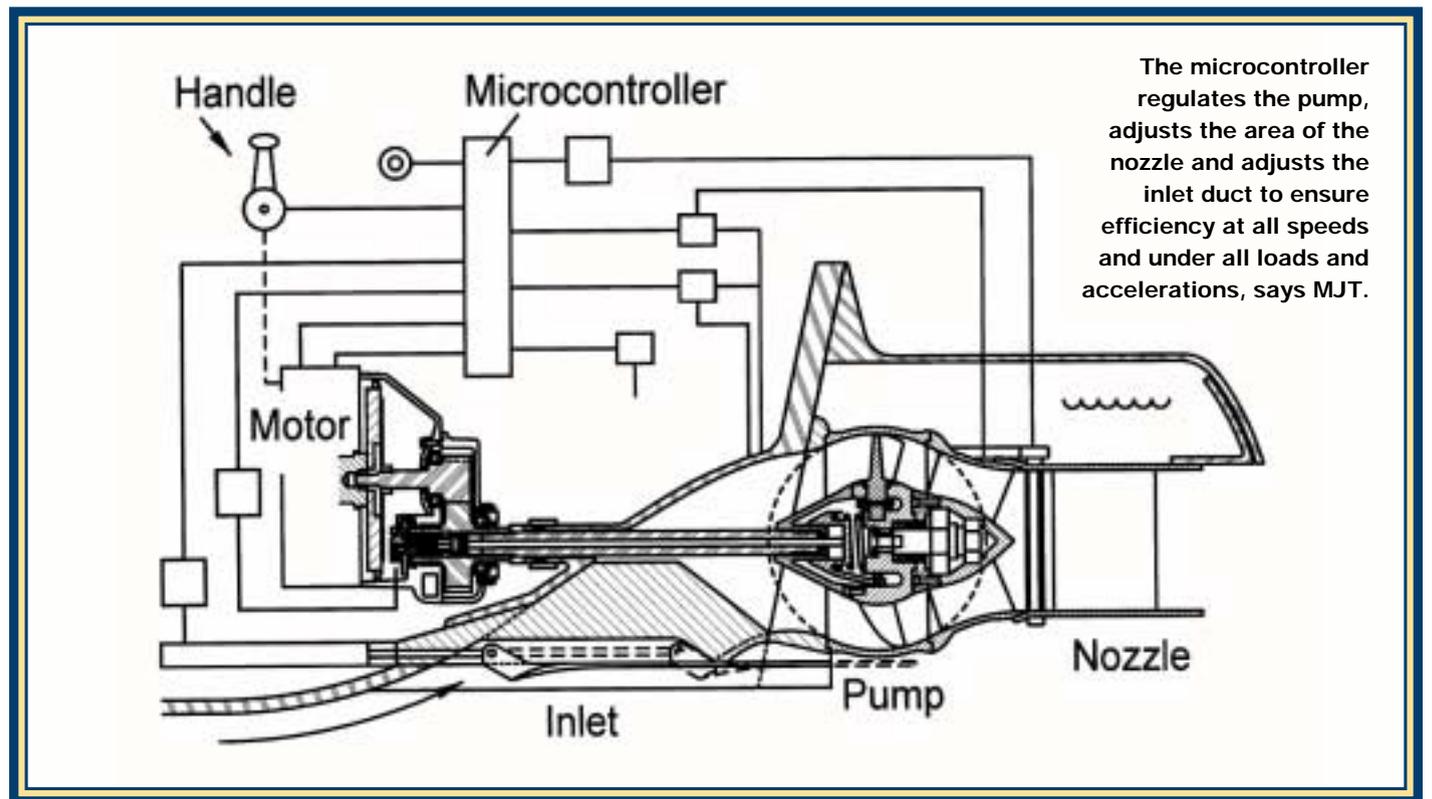
When in reverse the nozzle and inlet duct exchange roles, although the rectangular nozzle continues to control steering, according to MJT.

Jordan says the microcontroller, which reads rpm, speed and duct pressures, is the key to the Variable Marine Jet. It controls the pitch of the impeller instantaneously, he says, like a variable-pitch propeller on a sterndrive.

The drive has a larger pump than most conventional jets, and its variable inlet duct is an actuated slide that opens and closes to determine how much water is delivered to the variable-pitch pump, according to MJT.

A balancing act

The Variable Marine Jet can be de-



scribed as a high-volume, low-pressure system. "That gives it a better power transfer in the water at low speeds, but it means you have to monitor it pretty carefully at high speeds," says Jordan.

At high speeds, he says, the inlet duct has to be adjusted constantly to ensure the system doesn't waste the pressure it receives from the water as it moves through it. The jet nozzle opens to increase water flow for acceleration; at high speeds it becomes smaller for better performance.

Another component that plays a part in this balancing act is the jetdrive's

continuously variable power transmission, or CVT. As the impeller pitch increases through the engine's power band, more shaft power is needed. In addition, the CVT plays a big role in low-speed operation — slower than 20 knots, Jordan says — in which adjusting the variable inlet duct is less important.

Let's see it work

The Variable Marine Jet is MJT's second generation of jetdrive technology. The first generation, which underwent on-water testing, didn't include the variable-pitch impeller pump and had a

different inlet-duct design. So far the company has built a 16-inch scale model of the Variable Marine Jet for a 300-hp engine. It plans to rely on partnerships for both manufacturing and marketing, Jordan says.

"The general feeling in the industry has been that they want to see it working in the water before they do anything," says Jordan. He says MJT didn't want to market the jetdrive before the company had improved on its earlier designs.

"The future is going to be jet," Jordan says, although he admits, "It's been a long time getting there."