

## Mary Lou Jepsen: Laptops for All

By **Sandra Upson**

### Dream Jobs 2007

A little over two years ago, [Mary Lou Jepsen](#) flew to Boston to interview for a professorship at MIT Media Lab. A week later, she got a job in Cambridge—not the professorship, but something even better: chief technology officer of the One Laptop per Child (OLPC) project, which is working on an ultracheap but versatile laptop for children in developing countries.

If you're an engineer and a job interview turns into a brainstorming session, that's probably a good sign. It certainly was for Jepsen, who spent 2 hours of her "interview" kicking around ideas for the laptop with Nicholas Negroponte, the Media Lab's cofounder. Negroponte had just launched OLPC, a nonprofit organization independent of MIT, and when he asked Jepsen to be its chief technology officer, she immediately agreed. Little did Jepsen, then a Californian, realize she had just signed up for a seemingly permanent seat on a globe-hopping flight.



PHOTO: JOSHUA DALSIMER

**A PC PC::** Mary Lou Jepsen designs cheap and hardy laptops.

Negroponte's offer came on the heels of what Jepsen characterizes as an unpleasant year at Intel, where she was the chief technology officer of the company's now-defunct display division. Looking for a change of pace, at OLPC she soon found herself at the happy center of a whirlwind. "The whole first year I couldn't sleep past two or three in the morning, I was just so excited to wake up and enjoy what I did again," Jepsen says. "There were no boundaries; we were just running as fast as we could."

Jepsen, now 41, spent her childhood on a family farm in Connecticut. She first dove into technology during the summer after her junior year of college, test-driving nuclear submarines for the U.S. Naval Underwater Systems Center in New London, Conn. She graduated from Brown University, in Providence, R.I., with degrees in art and electrical engineering, and subsequently earned a master's degree from the Media Lab. After brief forays into teaching computer science and creating large-scale holographic art installations, Jepsen returned, somewhat reluctantly, to Brown for a Ph.D. in optics. "All the advice I'd gotten was that, as a woman, it's a lot easier [with a Ph.D.], because people will let you through the door," she says. "It's a union card; that's all it is. Just get the stupid union card. So that's what I did."

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### **8 to 30 w** power consumption of a typical laptop

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Her ambivalent return to academia coincided with a precipitous decline in health. At age 29, Jepsen found herself suffering from blistering headaches, confined to a wheelchair, and sleeping 20 hours a day. She was just about to drop out of school when an MRI revealed a tumor on her pituitary, a small gland at the base of the brain central to hormone production. She underwent surgery to have the tumor removed and emerged from the ordeal ready to move on with her life. "There's a stigma when you undergo brain surgery: are you still smart or not? So afterwards I tried to challenge myself to find out." She finished her Ph.D. in the next six months and then cofounded MicroDisplay, a Fremont, Calif.-based company that manufactures liquid-crystal-on-silicon chips for high-definition TV displays. She left MicroDisplay in 2003, citing "creative differences" with its chief executive, but within days Intel was recruiting her.

Her health problems weren't quite over, though. As a result of the operation, Jepsen's body now makes no hormones, requiring a rigid schedule of twice-daily hormone supplements to keep her alive. Now that she's a globe-trotting

computer executive for the OLPC venture, the regimen can be tough to follow; last March she went into adrenal shock on board a plane, forcing it to make an emergency landing. (On the bright side, Jepsen reports that as a result of her hormone deficiency, she is unaffected by jet lag.)

The bold technical challenge of designing a US \$100 laptop and the chance to work on global problems are what made the project irresistible to her. Her first big assignment was to reinvent the computer's display—by far the most expensive and most battery-draining component of a laptop. According to Jepsen, the display her team eventually marshaled into existence requires, depending on the mode, only between 2 percent and 14 percent of a typical laptop display's power consumption. The power needed is low enough to be provided easily by a pull cord or other manual means, charging a nickel-metal-hydride battery pack; 1 minute of charging suffices for 10 minutes of use. To save watts, the display can switch between color with the backlight on, in low light, and black-and-white with the backlight off, in sunlight. OLPC's engineers trimmed battery usage further by, among other things, adding memory to the timing-controller chip, which decides how often a display refreshes. That trick enables the display to update itself continually without using the CPU if nothing changes on the screen.

In June 2005, the OLPC team hadn't even finished its design when it found itself pitching the \$100 laptop concept to the Brazilian government. Brazil immediately committed to 2 million units. "The cacophony it created!" Jepsen marvels. "Every other head of state in Latin America contacted us by the end of the week." From there, her transcontinental commuting intensified. Jepsen began efforts to line up manufacturing partners. By December of that year, Taiwan-based Quanta Computer, the largest laptop manufacturer in the world, had agreed to build the computers.

Since then, the pace hasn't slowed a bit. Jepsen still lives one week a month at her home on a peninsula outside Boston, from which she commutes to OLPC's Cambridge offices by ferry. The rest of the month is devoted to shuttling to various places in Asia and meeting with manufacturers. She spends so much time in southern Taiwan, near display maker Chimei Corp., that she now has an apartment there overlooking a canal, where in her few spare hours she likes to explore the bustling city streets by bicycle. "Constantly orbiting the earth is a hard thing to do, but you get a lot done that way," Jepsen says. For those fortunate engineers with boundless enthusiasm, that is indeed so.