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# Markets

ITALY'S  
PUPPET  
MASTER

SUN MICRO-  
SYSTEMS  
IN CRISIS

THE BAD  
BOY OF  
RUSSIAN OIL

A close-up portrait of Richard Fuld, CEO of Lehman Brothers, looking directly at the camera with a neutral expression. He is wearing a dark blue suit jacket, a white shirt, and a red patterned tie.

## Last Man Standing

Lehman Brothers  
CEO Richard Fuld  
survived two decades  
of internal warfare.

Now, he wants  
Wall Street's respect.

**STRATEGIES**

Convertible Bonds

## PERSONAL BUSINESS

## Tech Tools

# Different Strokes

**New computer keyboards are blurring the lines between virtual and reality.**

By Robert S. Anthony

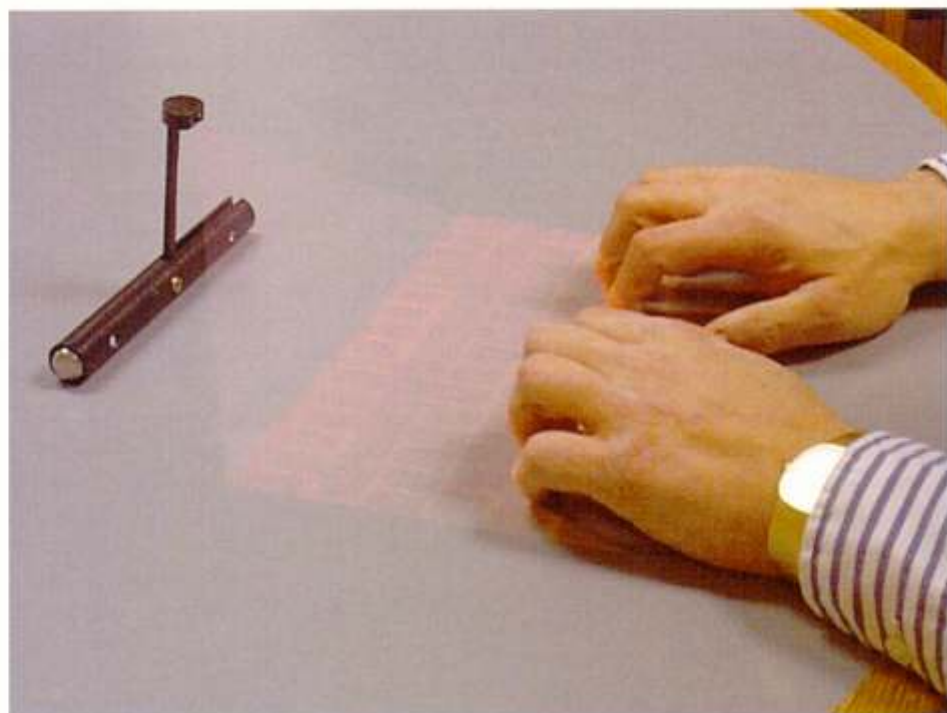
◀ Have you ever caught yourself tapping a tune as if you were Elton John at a grand piano or strumming an air guitar to an Eric Clapton classic? Don't be embarrassed. You may need those skills someday to type your business reports.

When you think of a keyboard, you probably think of the one computer accessory that hasn't changed much since International Business Machines Corp. introduced its first PC in 1981. Sure, today's keyboards are quieter and lighter and have extra keys for special functions. At the end of the day, though, a keyboard is just a keyboard, right? Not anymore.

We're already seeing keyboards that fold into vest-pocket-size cases and others that roll up like kitchen place mats. What's next? How about keyboards that don't exist?

Virtual Devices Inc. of Allison Park, Pennsylvania (412-492-8500, [www.virtualdevices.net](http://www.virtualdevices.net)), is making VKey, a virtual keyboard that you use by tapping your fingers on the image of a keyboard. You can see the keyboard, but don't try to pick it up or blow dust out of it because it isn't really there.

VKey projects a holographic likeness of a



The VKey projects a holographic image of a keyboard onto any flat surface and lets you type away.

keyboard onto any flat surface. As you touch the virtual keys, tiny cameras sense where your fingers are falling and send the corresponding keystrokes to the computer to which you've connected the VKey.

Virtual Devices plans a cigar-size VKey unit that will connect to most handhelds and may also work with a desktop PC. It also aims to put the same laser-projected keyboard technology into mobile phones and handheld organizers. You may soon be able to walk into a tavern, prop up your

cell phone and start exchanging e-mail by tapping messages right on the bar. Virtual Devices says VKey will cost \$100-\$150 when it becomes available later this year.

Another virtual keyboard comes from Senseboard Technologies AB of Stockholm (+46-8-477-98-61, [www.senseboard.com](http://www.senseboard.com)). Senseboard's product figures out what you're typing by measuring the movements of the muscles and bones in your hand. Here again, no keyboard is present, although you can cheat

and use a paper mock-up if you need it.

The Senseboard Virtual Keyboard comes with two small sensors that strap to the palm of each hand, leaving the fingers free to wiggle. As you type on a table, in your lap—or in thin air if you like—the sensors detect your finger movements and calculate which keys you would be hitting if you were using a real keyboard.

Since hands come in different sizes, you need to calibrate the Senseboard for each user. By typing a uniform document on

a standard keyboard, the unit senses a person's typing style and adjusts for the person's unique movements. Calibration takes about 15 minutes, the company says.

The keystrokes travel to the computer or handheld device via a wire or a Bluetooth wireless connection. The Bluetooth wireless standard makes quick, short-distance connections between devices such as cell phones, handhelds, computers and headsets.

Each Senseboard hand sensor weighs 50 grams (less than two ounces), and the system uses rechargeable batteries that last 8–10 hours per charge, according to the company. Senseboard's keyboard is expected to sell for \$200 when it hits stores in the last quarter of this year.

If you're not ready to take the virtual plunge, you'll find enhancements in keyboards you can touch.

For example, Think Outside Inc.'s (760-431-9090, [www.thinkoutside.com](http://www.thinkoutside.com)) \$99 Stowaway keyboard offers full-size keys. Once you're through typing, it folds into a self-contained case that can fit in a shirt pocket. Think Outside makes Stowaway versions for handhelds from Palm Inc., Handspring Inc. and Hewlett-Packard Co. (including products from the former Compaq Computer Corp.) and for certain phones from Motorola Inc. and Kyocera Corp.

I got hold of a Stowaway and found it easy to set up. A latch unlocks the unit, which has four hinged sections that unfold like an accordion. You lock the keyboard by pushing the outer two sections of keys toward the center. Once you insert the cell phone or handheld into the keyboard's connector, a small stand props up the device so you can see its screen.

In most cases, you'll need to install driver software.

The Stowaway isn't meant to be used unsupported; it requires a hard, flat surface. Even after I locked the keyboard into typing position, it wasn't rigid enough to sit directly on my lap. However, when I put it on a tabletop or slid a book or notepad under it, the keyboard was responsive and didn't feel like something that could be folded so easily.

A number of manufacturers—including Flexboards LLC of Fort Lauderdale, Florida (209-755-5556, [www.flexboards.com](http://www.flexboards.com))—make flexible keyboards that can be rolled up like newspapers. The rubbery, \$100 Flexboard comes in five colors and works with both Windows and Macintosh computers.

Flexboard says its keyboard is waterproof and dustproof, which gives it

an advantage over standard models in potentially messy places like a kitchen—or even the desk of a coffee-drinking executive. The unit has no moving parts, making it silent. And because the characters are burned

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**Make sure you turn your virtual keyboard off the next time you imitate Little Richard playing 'Good Golly, Miss Molly.'**

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into the rubbery material, they can't be rubbed off.

If you're all thumbs, a thumb keyboard might be the right prescription. Devices such as the Palm Mini Keyboard (800-881-7256, [www.palm.com](http://www.palm.com)) or Hong Kong-based TT Tech Ltd.'s SnapNType line (+852-2947-7031, [www.tt-tec.com](http://www.tt-tec.com)) clap onto the bottom of handheld computers and provide a small, full-featured keyboard that you manipulate with your thumbs. The Palm Mini Keyboard, \$60, can be used only with the Palm i705. TT Tech makes several SnapNTypes for Palms and Handsprings. One version for Handspring's Visor organizers sells for \$40.

New keyboards may eliminate some of the hassles of traditional models. Just the same, make sure your virtual keyboard is off the next time you do your Little Richard imitation. That last "Good golly, Miss Molly!" might end up mangling your tax return. ▶



Senseboard's Virtual Keyboard uses sensors to detect the keys you would be typing on a real keyboard.

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