

# FLUKE®

## The little gray box that started a revolution

More than 25 years of  
Fluke Digital Multimeters

### Technology at Work



**It wasn't as big as the  
space shuttle Enterprise.**

**It wasn't as flashy as  
Star Wars.**

For electronic technicians, that didn't matter. The Fluke 8020A digital multimeter made big news in 1977.

Traveling in hip pockets and tool bags to the most inaccessible job sites, it proved to be accurate, reliable, easy to use and tough as a rock. And it made the technicians who used it look good.

The Fluke 8020A — the world's first successful handheld DMM — gave field technicians the troubleshooting capabilities once reserved for lab specialists.

It changed Fluke's focus from a maker of bench test instruments into the world leader in handheld electrical test tools. In the decades that followed, the 8020 and its successors would earn their keep in the world's most challenging workplaces and build incredible loyalty among some of the world's most demanding technicians.

"It's still my favorite, just because I've had it so long," says Jack Nugent, FlukePlus member and president of Specialty Engineering, Inc. in Vancouver, WA, USA. Traveling across the Northwestern United States to maintain control circuits for small power utilities, Nugent and his team can choose from an arsenal of Fluke DMMs. And his 8020A, purchased in June of 1978, still resides in his personal toolbox. Imagine still using other 1977 technology, like the Apple II computer, Atari 2600 video game or a first-year VHS video player!

### Secret: The newest and best technology

Born into an era of remarkable technological advances (the first fiber optic phone circuits began service in 1977), the Fluke 8020A used the newest and best electronics technology. That was its secret.

Existing components couldn't deliver the required combination of high performance and low cost, so Fluke designers created a custom complementary metal oxide semiconductor (CMOS) analog-to-digital converter chip to drive its liquid crystal display. The electronics packaged into that little gray case proved to be

highly accurate (within 0.25 percent of reading  $\pm 1$  digit), light on battery use, reliable and durable.

Visiting trade magazines to show off the new product, Chuck Newcombe, now product planner at Fluke, would "accidentally" let it slip from his hand to show off its toughness.

"One editor nearly broke his neck trying to keep it from hitting the floor," Newcombe laughs. "He missed it, but I just picked it up and continued with the demonstration. I knew it would still work, and it did."

If the 8020 impressed the editors (*Electronics* magazine ran a six-page technical analysis), it made an even bigger splash



Jack Nugent, president of Specialty Engineering, Inc., and his 8020A.



Fredrick Gantzer II of Minot, ND, and his well-used DMM.

where it really counts: in the field. After just a day of use, competing meters with an LED display required an overnight recharge; the nine-volt battery in the 8020 lasted through 200 hours of testing. Its LCD display was designed to optimize visibility and response, even at low temperatures. To protect against high-voltage transients, the 8020 used metal-oxide varistor clamps in combination with input resistors designed to fail as an open circuit to protect the meter and its operator. The little gray meter delivered a mix of performance and price (US\$169) that made it an instant hit.

Before the 8020A was retired in 1984, more than 250,000 were sold. And, the 8020B, with five additional models based on the same technology, brought the total to 1 million units by the end of the decade. Combine that with over 2 million 70 Series meters (a new design introduced in 1983), and Fluke was in the handheld test tool business big time.

## Building a worldwide reputation

In 1999, while working as plant electrician at a mill that processed durum wheat flour for pasta, FlukePlus member Fredrick Gantzer II of Minot, ND USA spent a month in Uzwil, Switzerland, learning about the factory's food processing equipment, manufactured by Swiss giant Buhler AG.

"Everybody knows that the Swiss are great engineers and manufacturers," Gantzer says. "One day they took us to their electronics factory. As I was walking around, I noticed that everybody had at least one Fluke meter."

"To me, that really said something," Gantzer continues. "The best craftsmen in the world were using an American-made meter. That really says something about the quality of Fluke instruments."

## Millennium meters

Today's Fluke multimeters are safer and more capable than ever before. For instance, the new Fluke 189 DMM delivers more than 20 features not available in the 8020A. They include:

- The ability to record and time-stamp events to identify intermittents.
- Safety rated for 1000 V CAT III, 600 V CAT IV environments.
- Designed to withstand 8,000-volt peak transients and protect against arc flash.
- Fused to safely measure five times more in-line current.
- Built-in thermometer eliminates the need to carry a separate tool.
- 'Display hold' freezes display while measuring.
- Min/Max/Average readings capture intermittents, sags and swells.
- Peak capture function helps find glitches and transients without a scope.
- Faster auto ranging and integral holster.

## Planning the meters of tomorrow

**Improved safety and ruggedness** — The concern for safety among employers, unions and technicians is only going to increase. Today's Fluke tools meet or exceed the toughest relevant safety standards and bear the marks of U.S. and international testing labs to prove it. As standards become more rigorous, so will Fluke DMMs.

**Ergonomics to fit the environment** — A tool that's hard to use soon slips to the bottom of the toolbox. But techs keep their "Flukes" on top, thanks to new features like larger, back-lighted displays and the ToolPak™ hanging magnetic strap that lets technicians hang their Fluke DMMs practically anywhere.



### **Simplified user interface —**

DMM designers are constantly incorporating new features without adding extra complications. In the new 87V DMM, Fluke reassigned an existing button to include both temperature and an adjustable speed motor drive feature.

### **Non-contact measurement —**

Newcombe says Fluke designers have their eyes on wireless technologies that could reliably transmit readings directly to a computer or data recorder. Another possibility: instruments capable of making readings without touching conductors. Current clamps are a step in that direction, as is the Fluke 1AC voltage detector.

### **Greater reliability —**

Technicians can be confident that reliability will remain a defining Fluke advantage. FlukePlus member U.S. Army Chief Warrant Officer Ron Cingle depended on his Fluke 80 Series DMM to keep Hummers and other military vehicles operating during his seven-month deployment eight miles outside Nasiriyah, Iraq. "The black Fluke hard case helped protect it from the damaging daily sand storms," recalls Cingle, now an instructor at the Army proving ground in Aberdeen, MD, USA. "After seven months of use, in temperatures sometimes over 145°F, it still performs without problems. It served me well."

### **Expanded capabilities —**

New Fluke tools do more. It's that simple. In addition to the ToolPak and larger display, the new Fluke 87V DMM adds a thermometer and a push button low-pass filter that can accurately measure adjustable speed motor drives — something other DMMs can't do.

In just over 25 years, the Fluke digital multimeter has made a journey long enough to test even the Space Shuttle (and yes, Fluke meters have flown on the shuttle). The little gray meter has grown into a family of precision tools that are "must haves" for professionals. The DMM has changed Fluke's business, and made life easier and more productive for millions of engineers and technicians worldwide.

And that's a pretty good start.

## **25 Years of Progress with Fluke Digital Multimeters**

- 1977** – The Fluke 8020A becomes the first successful handheld digital multimeter
- 1988** – Fluke introduces the 80 Series DMM with integrated frequency and capacitance
- 1990** – Fluke introduces the 88, the first handheld meter designed for automotive technicians
- 1996** – Fluke DMMs maintain Fluke's safety advantage. Several models are now certified under new measurement category ratings (CAT III and CAT IV) set by the International Electrotechnical Commission (IEC)
- 2000** – Fluke introduces the 180 series of enhanced multifunctional digital multimeters with data logging capability. Companion FlukeView Forms software turns the data into valuable graphical reports
- 2004** – Fluke's new industrial DMM, the model 87V, adds a thermometer function and the ability to accurately measure frequency and voltage on adjustable-speed motor drives

## What do you mean, my meter's obsolete?

Electronics have come a long way since Fluke introduced its first DMM in 1977. The only way for Fluke to stay on top in its highly competitive market is to keep changing, adapting and improving. That means that inevitably, some Fluke models with a loyal following will give way to new models with new features.

Flukes are tough and long lasting, so it may come as a shock when parts for that prized old-time Fluke are no longer available.

How can this be?

It's a matter of balance between the needs of yesterday and tomorrow, says Chuck Newcombe, Fluke product planner.

Fluke meters are built to meet or exceed the most stringent current safety standards, using the best contemporary technology, Newcombe says. But over time, safety standards get tighter, and what was once the latest technology becomes obsolescent, then obsolete. The companies that supply Fluke with electronic components move on to build new components, and stop manufacturing the old parts.

So Fluke must look ahead when designing a test tool, Newcombe says, estimate how long that tool will remain in service, and make a "lifetime buy" of repair parts to keep users supplied through the tool's anticipated service life. In time, that inventory will run out.

In theory, Fluke could maintain a huge parts inventory sufficient to keep that last ancient meter running for a century. But that's where the idea of balance comes in.

Fluke customers benefit from the long service life of their tools, but they also benefit from the increased safety, capabilities and performance of new generations of Fluke tools. Fluke must balance the cost of holding an oversize parts inventory against the need to invest in developing new and better tools.

**Fluke.** *Keeping your world  
up and running.*

### **Fluke Corporation**

PO Box 9090, Everett, WA USA 98206

Fluke Europe B.V.  
PO Box 1186, 5602 BD  
Eindhoven, The Netherlands

For more information call:  
In the U.S.A. (800) 443-5853 or  
Fax (425) 446-5116  
In Europe/M-East/Africa (31 40) 2 675 200 or  
Fax (31 40) 2 675 222  
In Canada (800) 36-FLUKE or  
Fax (905) 890-6866  
From other countries +1 (425) 446-5500 or  
Fax +1 (425) 446-5116  
Web access: <http://www.fluke.com>

©2004 Fluke Corporation. All rights reserved.  
Printed in U.S.A. 8/2004 2386856 A-US-N Rev A