

solid state

Rescuing Fluke's Top Digital Meter Cheaply

By Charles Hansen

Replacing the battery packs in this digital multimeter puts a \$400 tool on your bench for about \$100.

The Fluke 8050A provides superior performance and measurement capabilities in a low-cost, benchtop instrument. These 4½ digit DMMs (digital multimeters) have the following measurement functions: DC volts, true RMS AC volts, DC amps, true RMS AC amps, ohms, dBm, conductance, and diode test. They also have a relative-reference feature that works with all measurement functions.

These units feature 0.3% basic DC accuracy and 0.5% true RMS accuracy from 20Hz to 20kHz. The -3dB bandwidth extends to 200kHz, with 5% accuracy from 20kHz to 50kHz. They also have overload protection and selectable impedance correction to reference a 0dBm, 1mW level into 50Ω, 75Ω, 93Ω, 110Ω, 125Ω, 135Ω, 150Ω, 250Ω, 300Ω, 500Ω, 600Ω, 800Ω, 900Ω, 1kΩ, and 1.2kΩ. This DMM is ideal for audio work, unlike many “true RMS” meters whose accuracy is limited to the 50–60Hz power line frequency.

The 8050A basic AC powered DMM cost \$389 when new. The 8050A-01 (\$439 new, *Photo 1*) is AC powered and also has a rechargeable battery pack that allows portable measurements. Nice 8050A-01 meters are available on eBay for well under \$100 these days. The battery packs used proprietary GE nicad batteries that are no longer available.

If the BT indicator in the LCD display is always on, even after having had the batteries on extended charge, one or more cells are bad. Once the batteries go, the DMM will not be as accurate as its specifications—even if powered from the AC line—due to the interopera-

tion of the battery charger and internal DC supply. There is also the danger of eventual battery leakage and damage to the meter.

However, it is quite easy to replace the four internal cells with standard C-size 1.2V nicads or NiMH cells. This article will show you how.

PHOTO 1: FLUKE 8050A DMM.

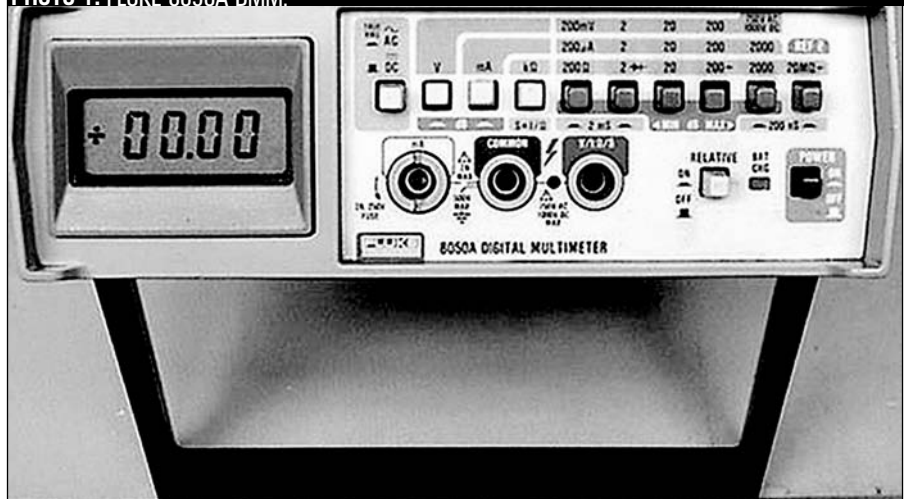
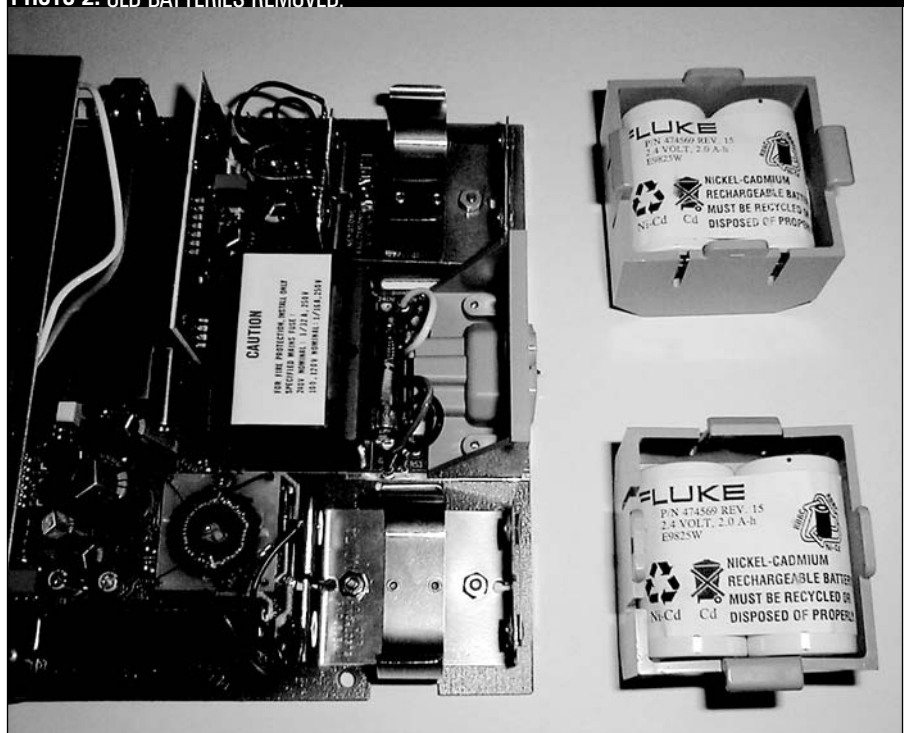


PHOTO 2: OLD BATTERIES REMOVED.



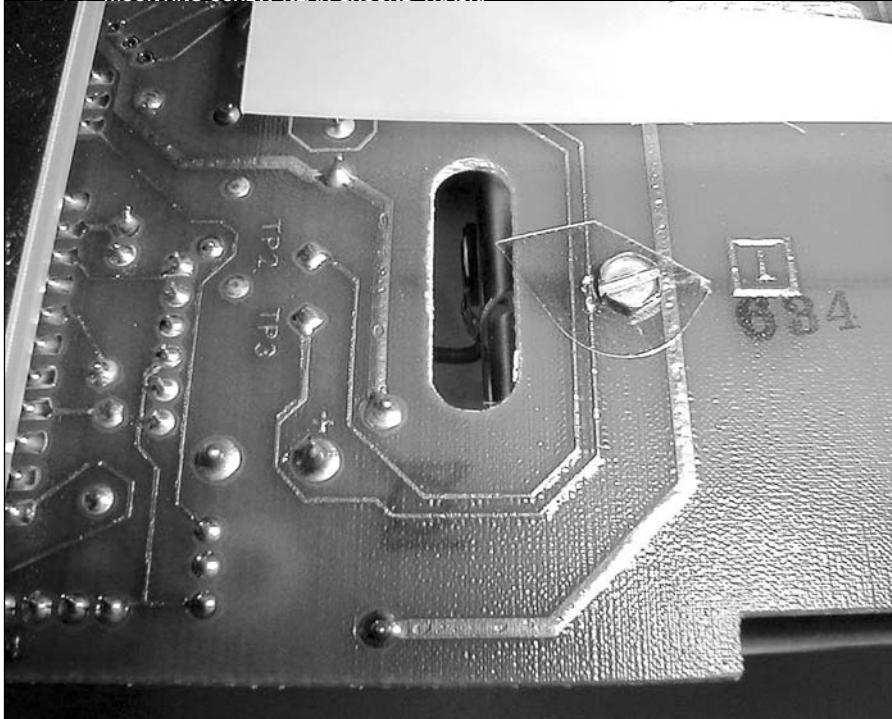
MODIFICATION

You remove the meter cover with one screw on the rear just below the AC receptacle. Place the meter with its display side down, remove the screw, and slide the cover off the meter. The batteries are mounted under two plastic covers on each side of the AC receptacle.

Press the slotted tab on each cover and remove them from the rear of the PC board. Snip the red and black wire from each battery pack, since you will re-use them later (*Photo 2*). The new aluminum battery holders are mounted with 4-40 hardware in holes you drill through the PC board. The right side holder has no PC tracks underneath, so just mark the location of the two holes in the battery holder on the board and drill with a 1/8" twist drill.

The left rear side of the PC board has three tracks on the bottom of the board. If you are careful, you can drill between the larger track and the closer of the two thinner tracks. It is actually OK to let the screw head touch the wider track (ground), but it must not come close to the thin track (*Photo 3*). You can add a piece of mica insulator from a TO-66

PHOTO 3: MOUNTING SCREW NEAR GROUND TRACK.



transistor mounting kit. Alternatively, you could use nylon hardware in this location.

The other approach is to drill a hole in the left side of the PC board outside

all three tracks, then drill a matching hole in the aluminum battery holder. This is a bit more work, but ensures that none of the mounting hardware comes near any of the PC tracks. Make

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sure the battery holder terminal lugs are facing forward in either case. Mark one lug “+” and the other “-.”

Once you have mounted both battery holders, solder the red and black wires to the “+” and “-” lugs, respectively

TABLE1

Parts List

QTY DESCRIPTION

2	Keystone 2C series aluminum battery holders, Mouser P/N 534-149
4	NiMH or nicad rechargeable batteries, size C
4	4-40 × 1/4" machine screws, Mouser P/N 561-P440.25
4	#4 internal tooth lock washers, Mouser P/N 5721-LW1-04
4	4-40 hex nuts, Mouser P/N 561-G440

SOURCES

Mouser Electronics

958 N. Main
Mansfield, TX 76063-4827
1-800-346-6873
www.mouser.com

Local Electronics Store

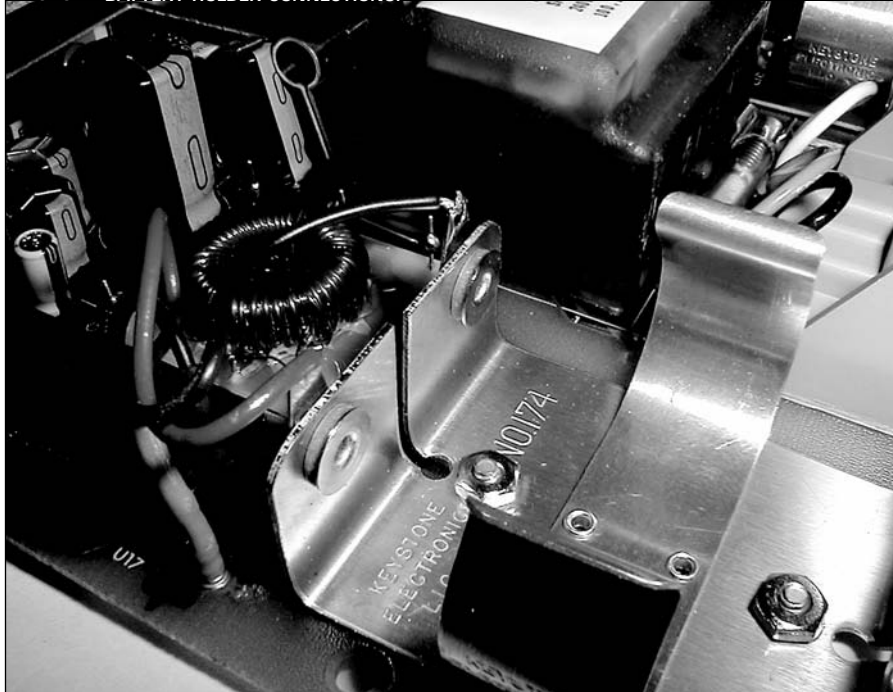
Note: Surplus vendors often have rechargeable batteries and holders.
All Electronics, www.allelectronics.com, 800-826-5432.—Ed.

(Photo 4). If the wires come loose from the PC board pins, note that the positive pin is marked “+” on the PC board.

Double-check your wiring, and insert four C-size rechargeable cells in the holders. Replace the cover and install

the cover screw. Make sure that the power switch is off, then plug the meter into an AC outlet and verify that the red BAT CHG light is lit. Charge the batteries for 24 hours before placing the meter into service. **ax**

PHOTO 4: BATTERY HOLDER CONNECTIONS.



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