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HOWTO: Korg DW-8000 Battery Replacement

Here's a tutorial on how to change the battery on a Korg DW-8000 synthesizer. (There's also a similar HOWTO for the Korg Poly-800 II.) The process is complicated by the fact that the battery is soldered onto one of the (many) PC boards inside the machine. This HOWTO will have you install a battery holder, so in 5 years when you have to do this again, it will be easier.

WARNING and DISCLAIMER

This procedure is not for the technically faint of heart. It requires some basic electronics skills such as soldering. If you blow it, you could kill your synth, or worse, yourself. So if you're not completely comfortable with the procedure described here, please refer this work to a professional. *I am not responsible* if you mess up your DW-8000 or suddenly feel drawn to a great white light (remember: run *away* from the light).

What You'll Need

- Phillips screwdriver
- Low-wattage soldering iron and some electronics solder
- Desoldering tool such as a Soldu-Vac
- A low-profile 20mm single-cell (CR2032) battery holder, like Digi-Key part BH32T-C-ND
- A few inches of 22-gauge wire, preferably solid-conductor
- An inch of small-diameter head-shrink tubing
- A lighter or heatgun to shrink the tubing
- A new CR2032 3V battery

Procedure

1. Back Removal

Turn the DW-8000 over, being sure not to put pressure on the joystick. **Make sure the unit is unplugged.**

Remove all 17 the screws around the periphery, and the five big machine screws in the middle section of the bottom. Don't remove the rubber feet or any of the small screws on the middle section of the bottom.

Tilt the bottom of the keyboard back, "hinging" it at the back edge of the unit. Here's what you'll see:

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2. Board Removal

Board KLM-661-3 has the battery right in the middle of it (see the red circle in the picture to the left). Unforunately, it's soldered on. Hey, Korg technicians gotta eat too.

Label all the cable bundles with the name of the connector they connect to then remove them. **Do not** try to remove CN12A or CN13A - they're soldered on. You have to unplug them at the other end where're they're plugged into connectors on the board to the right.

Cut the wire ties that bind the CN13A cable bundle to the board to the right (see the red circles in the picture to the right). This will allow you to

completely remove the KLM-661-3 board from the chassis.

Remove the five machine screws that hold the KLM-661-3 board to the chassis. They may have locktite on them, so they might be hard to get off.

Remove the KLM-661-3 board and place it on a big stat bag or other nonstatic surface.
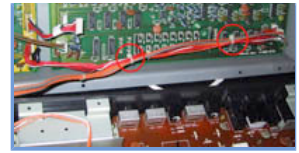
3. Battery Removal

On the back of the board, locate the three points at which the battery is soldered to the board. (Click the picture to see the whole back of the board.)

Use a solder vacuum or wick to desolder the old battery at its three solder points. Remove the old battery from the board and carefully clean the holes.

Here's the old battery. Ever seen one like that with leads spot-welded onto the battery? Me either. You can't even buy these babies from Digi-Key. Anyawy, never again shall you have to gaze upon this ugly little part. Ceremoniously toss the old battery in the trash can. If you're feeling confident, try a half-court shot.

4. Building the Battery Holder Assembly

Reader **Tommy B** noted that you can get an exact replacement for the soldered-in CR-2032 battery, but better (Lithium) here and elsewhere. Using this type of replacement battery saves you the hassle of building and installing the battery holder, but you'll have to do the same procedure again later when *this* battery dies.

Get a low-profile CR2032 battery holder like this one. The clip on the top is the positive side of the battery. The holes on the circuit board naturally do not coincide with the pinouts of any known battery holder, so you're going to have to build what's affectionately known in the business as a *wart*.

Pallium

Solder two 2" lengths of (preferably) solid-conductor 22-guage to the two PCB lugs on the bottom of the battery holder. Once they're soldered on, put two small lengths of heat shrink around the solder joints and warm them up with the heat gun. You'll end up with this:

Cut and strip the leads so they look like what you see in the picture. Use the board to help you bend the wires such that they fit the holes on the board. The whole assembly needs to be very low profile, because when the back of the synth is reinstalled this battery holder assembly will be just above the keyboard's keys.

5. Installing the Battery Holder Assembly

Pay attention to which lead is positive (+). The lead attached to the clip at the top of the battery holder is the positive lead, and the positive holes are clearly marked on the front of the circuit board.

After ensuring proper polarity, mount the battery holder assembly on the front of the circuit board and solder it from the back.

Clip the leads down and clean the board.

Make sure the assembly is riding as low on the circuit board as possible. It doesn't have to be directly over the holes—you can shove it down to one side or the other.

Insert a new CR2032 battery, then put a piece of electrical tape over the top of the assembly, to keep the battery from grounding onto any part of the keyboard assembly that it will be sitting over. *Oh yeah, tape it Plasmatics style.*

6. Board Reinstallation

Carefully put the circuit board back against its mounting lugs. Replace the five machine screws that hold the board in place.

Reattach all the cable bundles (you labelled them, right?). Reattach the wire bundles that come from CN12A and CN13A to their respective places on the filter/VCA board to the right.
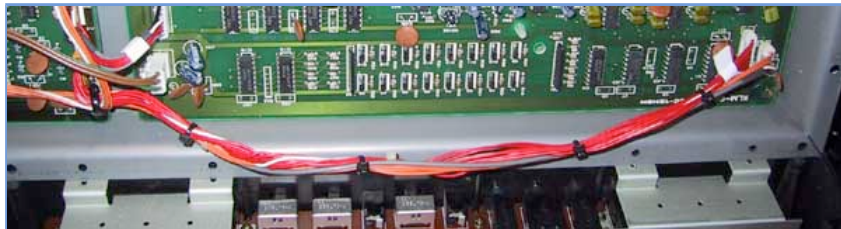
Replace the wire ties that you cut off before with new ones.

(Shown here without the electrical tape atop the battery holder assembly.)

7. Testing

Lower the back of the keyboard back down onto the front. Replace only the five big machine screws that go into the back of the keyboard assembly. Leave the screws that go into the periphery of the keyboard back out for now.

Without all the screws in it, the keyboard as a unit is not that strong, so you need to be careful here. Turn the keyboard over and place it back on its rubber feet. Plug in the keyboard's AC cord and turn the unit on.

Don't be immediately alarmed if when you switch the DW-8000 on nothing happens (i.e. no lights, no digit LEDs, nothing). Mine took maybe 1-2 minutes before all the lights came on and it was acting itself again, and there was a lot of weird random flashing of LEDs during that time. This is probalby due to the fact that the keyboard's memory is full of garbage.

After the patch/parameter lights come back on, reset parameters 84-87 to reasonable values. When you dial in those parameters, you may see weird patterns on the green value LEDs - this is because the parameter's stored value is out of range. Just use the data slider to put in a new value. The data slider will only give you valid values.

Your DW-8000 still doesn't have any patches in memory. It might make sound when you play the keyboard, but it's not likely to be anything pretty. But at this point you can be reasonably sure all is well.

8. Buttonup

Switch the unit off and **DISCONNECT THE AC POWER**. Turn the unit over (again, carefully, since not all the screws are in yet). Now replace the other 17 screws around the periphery of the keyboard's back.

Congratulations!

Now it's time to put some patches in your DW-8000. You can either do this by loading from tape, or by sending some MIDI SysEx. If you don't have any patches, you can get some from me.

Enjoy your improved DW-8000!