

How to replace the GS-10's battery

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This document describes how to replace the BOSS GS-10's battery, or at least how I did it...

When do you need to replace the GS-10's battery?

The GS-10 notifies you about its battery's declining voltage level in two stages:

1. **The warning stage:**

On startup, the GS-10's display says 'Battery Low !! Please Change' for several seconds, but then the GS-10 resumes normal operation.

At this stage the global settings and patches are still intact, but you should back them up as soon as possible if you haven't done so already. (You can use BOSS' GS-10 Editor/Librarian, GS-10 Manager from Mountain Utilities (i.e. yours truly) or any utility capable of receiving and saving MIDI System Exclusive messages.) After that, you should replace the battery as soon as possible.

WARNING:

Once you remove the battery, the GS-10's global settings and patches are irretrievably lost. So if you haven't backed up your data yet, you should do so before removing the battery.

2. **The data loss stage:**

On startup, the GS-10's display says 'Battery Low !! Please Change' *terminally* and you can't do anything with the unit, since all keys are dead.

At this stage the GS-10's global settings and patches have already been lost. All you can do is replace the battery.

Beware: the warning stage doesn't last long. In fact, if you haven't used your GS-10 for a few months, it may skip the warning stage and confront you with the data loss stage straight away — another reason to always maintain backups of your data.

TIP:

You can check the voltage of the GS-10's battery yourself by means of the GS-10's self-test (item 8); see my document on the GS-10's self-test for details.

In my experience the GS-10 didn't even produce a warning yet at 2.7 V, but then data loss suddenly occurred at 2.6 V.

What you need to replace the GS-10's battery

- A 3.0 mm hex key (a.k.a. Allen or Inbus key/wrench).
Size is critical here: a fraction too big and the key doesn't fit, a fraction too small and it has no grip.
See http://en.wikipedia.org/wiki/Hex_key for more information.
- A 'smallish' cruciform screw driver. (Its exact type and size are not very important.)
- A new CR2032 3V lithium battery. This type is also very popular on computer motherboards, so you may be able to pinch one from an old motherboard (provided of course that its voltage is 2.7 V or higher).

General construction of the GS-10

It helps to understand in broad terms how the GS-10 is constructed before you start taking it apart.

Overall, the GS-10 consists of four parts:

- The metal top/front/back plate. All knobs, sockets and internal electronics are connected (directly or indirectly) to this plate.
- The metal bottom/side plate. It is connected to the top/front/back plate by means of four hex screws (on the top) and eight cruciform screws (six on the bottom, two at the back).
- Two black plastic side panels. Each side panel is connected to the bottom/side plate by four hex screws.

Steps to replace the GS-10's battery

1. Switch off the GS-10 and remove all cables.
2. Remove the two black plastic side panels by unscrewing each panel's four hex screws counter-clockwise with the 3.0 mm hex key:



3. Remove the four hex screws indicated by red arrows from the top:



DON'T REMOVE THE EIGHT HEX SCREWS AROUND THE TWO SPEAKERS.

These screws are not connected to the bottom/side plate, but only (in vertical pairs) to metal strips underneath the two speakers: if you fully remove these screws, their metal strips fall off, and you need pretty long fingers to re-attach the middle ones without removing the whole motherboard...

4. Remove the six cruciform screws (indicated by red arrows) from the bottom with the cruciform screw driver (counter-clockwise of course):



(More about the two yellow arrows later.)

5. Similarly, remove the two cruciform screws indicated by red arrows from the back:



6. Separate the top/front/back and bottom/side plates, first making sure that the bottom plate's two tabs (indicated by yellow arrows in the photo under step 4) are freed.

This is what the separated bottom/side plate looks like:

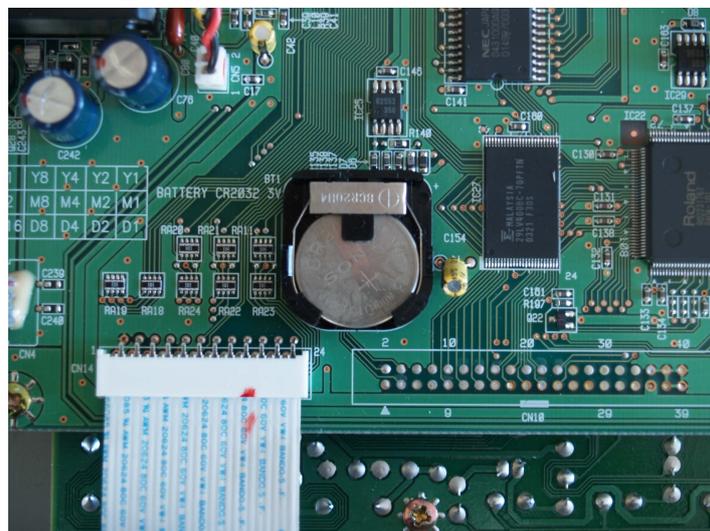


And this is the upside-down top/front/back plate:

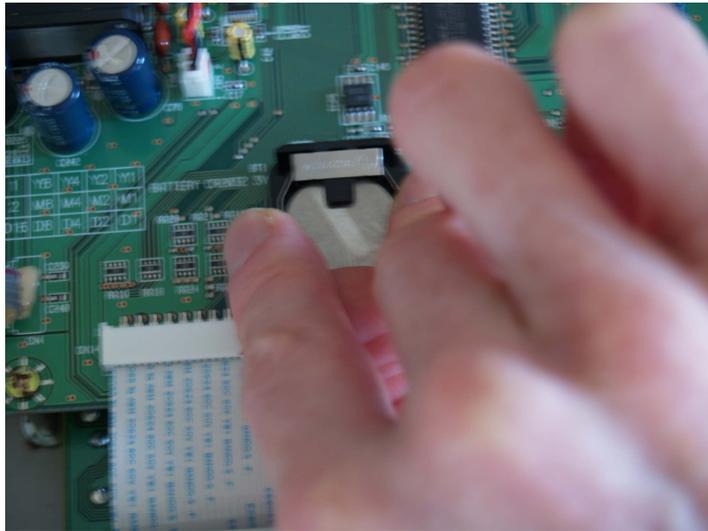


The battery is indicated by the red arrow.

Here is a close-up of the area with the battery (note the helpful text 'BATTERY CR2032 3V' on the motherboard!):



7. Remove the old battery from its socket on the motherboard. Basically you have to lift it at the side of the red arrow in the photo of the motherboard under step 6. My personal method: with the index and middle fingers of my right hand I keep the sides of the socket down and I gently push the battery up with my thumb(nail) at the side of the red arrow, until it snaps free from the two black tabs left and right of my thumb:



After the battery is removed, its socket is fully revealed:



8. Insert the new battery into the socket from the side of the red arrow, with the + side up.
9. Re-assemble the GS-10, basically reversing the actions in steps 6 down to 1. Most importantly, it's probably best to re-attach the two cruciform screws at the back *before* the four hex screws on the top and the six cruciform screws on the bottom, which can make re-attaching the top and bottom screws very hard — at least in my experience.
10. Connect the power cable to the GS-10. (If you're sure the new battery's voltage is sufficient, you may also connect any other cables.)
11. Perform a full factory reset (cf. the official GS-10 manual under 'Restoring the Factory Settings (Factory Reset)':
 - a. Hold down CHANNEL SELECT A and B, then press POWER.

- b. Release the CHANNEL SELECT A and B keys and wait until the display says
Factory Reset
System → U100
- c. Press WRITE (not the non-existent ENTER, as the official GS-10 manual
erroneously states!) and wait until the display says
POWER LEAD
U001

That's it: your GS-10 should now be fully functional again!

If you wish, you can of course check the voltage of the new battery (as reported by the GS-10) by performing the GS-10's self-test.

(In fact, you could perform this self-test *in place of* step 11 above, since the self-test ultimately gives you the opportunity to perform a factory reset as well. However, the self-test is rather complicated, so if you don't suspect any malfunctions, the full self-test is probably a bit over the top.)