

Casio PG380/310/300 and MG510/500 Capacitor Replacement guide - Part 2

By Graham Meredith 24/7/2007

This document is an **add-on** document to the already published “**Casio PG380 capacitor replacement.pdf**” guide in the **FILES** section of the **Yahoo MIDI Guitar Forum**:

<http://launch.groups.yahoo.com/group/midiguitar/>

It **completes** the repairs required to get the **MIDI tracking and triggering** of the **MG/PG guitars** back to brand new.

The MG/PG guitars contain **2 circuit boards** that are part of the **MIDI tracking/triggering circuit** – a top board (double sided) and a bottom board (single sided). The top board plugs into the bottom board with a mounted connector. The previous guide mentioned above only shows how to repair the top board.

When I began repairing my PG380, according to that guide, the guitar tracked well after replacing the capacitors mentioned for about 2 days, then the **problem returned**. Also, what occurred was that the sounds sounded distorted and crackly. I examined the untouched **bottom board** and noticed that the capacitors on the board also were leaking. After replacing them, the guitar again played and tracked perfectly and the problem has not come back.

I recommend anyone wishing to get their Casio PG/MG guitar working again to replace the capacitors on **BOTH boards**, and although some people may get their guitars to work after only replacing the top board capacitors, it will only be a matter of time before the bottom board capacitors fail and create problems.

Parts required

Magnifying glass

Soldering iron

Low power soldering iron, no greater than 12W power, with a very fine point tip

Capacitors

To completely replace ALL of the capacitors in the PG guitars, you will need 39 small **surface mount (SMD) electrolytic capacitors** like these. They will only cost about \$15 for the lot:



They can be found at Jameco Electronics, in packs of 10:

<http://www.jameco.com/webapp/wcs/stores/servlet/ProductDisplay?langId=-1&storeId=10001&catalogId=10001&productId=192997&pa=192997PS>

You will need them in values and quantities of:

1uF, 50V ----- 9 of
47uF, 16V ----- 2 of
10uF, 16V ----- 23 of
100uF, 16V ----- 5 of

Procedure

Follow and complete the instructions in the first guide and remove the top board. The top board plugs into the bottom board with a connector. Take note that the clearance between the 2 boards is fairly small.

Examine the photo below of the bottom board showing the capacitors already replaced; noting the **values and orientation** of the capacitors (they have a black semi-circle marking the negative capacitor leg).

Use a low power soldering iron, no greater than 12W power, with a very fine point tip. Using anything bigger than this will melt the circuit tracks.

Remove the bad capacitors by putting the soldering iron tip on one of the capacitor's partly-covered solder pads on the board of a until the solder melts, then **gently tilt** or push the capacitor sideways until it's leg breaks free of the board. You will notice that the original capacitors use a **square black plastic mount** at their base, which partly covers the legs and the circuit board pads. You may have to really push the soldering iron tip under this black mount to reach the pad and melt the solder.

Do this to the other leg until the capacitor breaks free, and remove it. You may find that the legs completely snap off because of corrosion. The **circuit board pad** may also be corroded as well. Gently scrape off as much as you can with a razor blade or hobby knife, then melt some solder on the iron and wet the pad with the solder until it is nicely covered again. You may have to scrape it a couple of times to clean it.

Now take the **new capacitor** that replaces it. Remove and **discard** the black square plastic mount attached to it; it is too hard to replace the capacitor with it attached, and is only there for the automated factory production line robot to set it properly. Bend the legs out wide enough to match the pad distances for each leg, and using tweezers to stop your fingers getting burnt, hold the capacitor on the pads, noting the **correct polarity orientation**. Solder each leg to each pad. You will notice in the photo that the capacitors are **leaning over**. This is necessary because you have to get them as low as possible, otherwise the top board **will not plug into** the bottom board properly because the capacitors are too high, and you might not get the guitar to work.

Replace each capacitor in turn. I reassembled the boards and tested the guitar after installing each new capacitor, to see which capacitor was the problem, just for my own interest. If you do this, you will suddenly come upon one replacement that the guitar suddenly starts working. Yaaaayyyy!!!.

Continue replacing the rest, don't be tempted to stop here, otherwise the other un-replaced ones **WILL** fail (I promise!!).

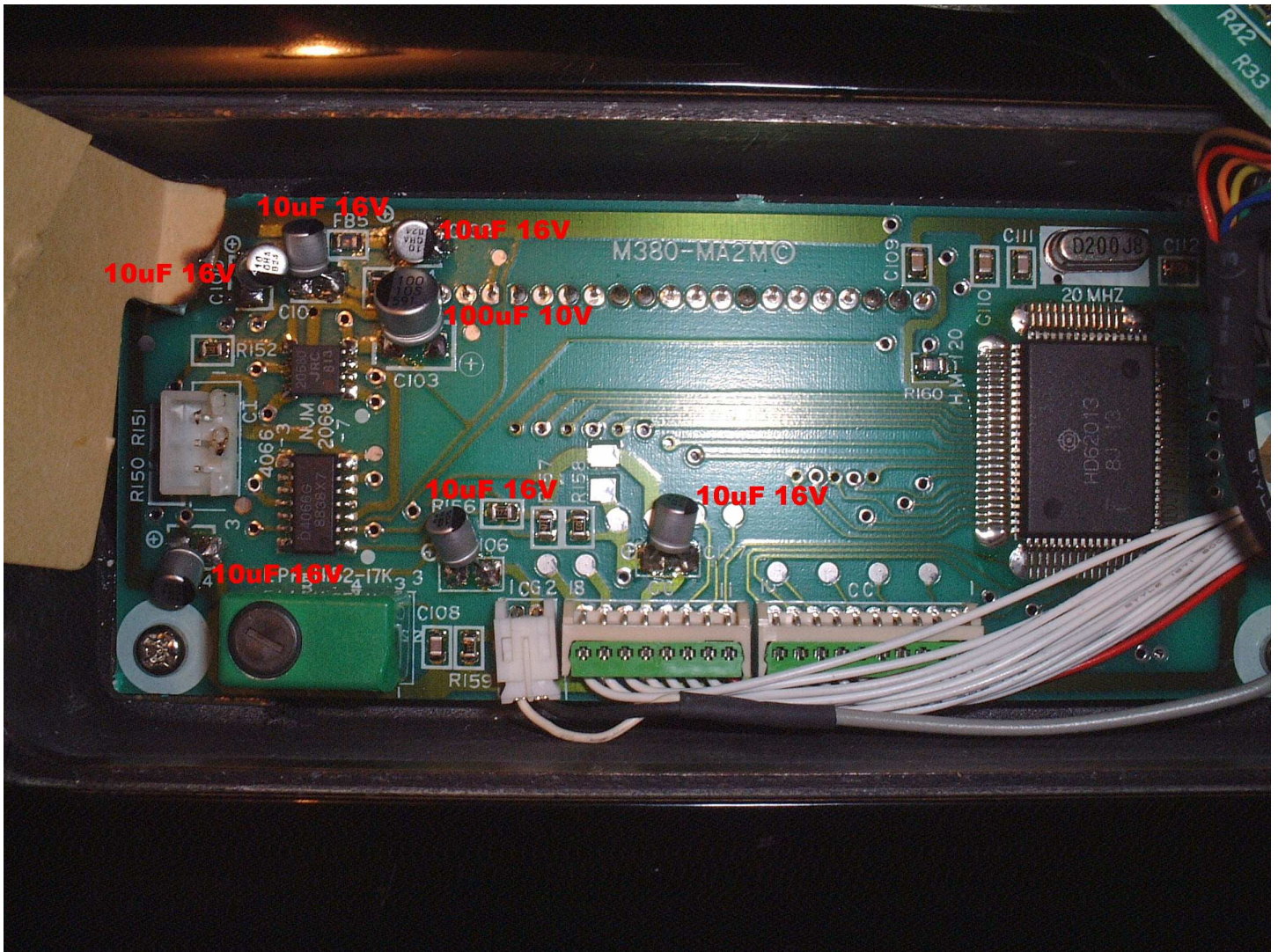
When you have finished, check all of your soldering work for neatness, put the boards back together, and reinstall the boards into the guitar, Switch it on and check each triggering of each string carefully. If they are all working, well done!

You may have to readjust the **triggering sensitivity control adjusters** on the top board for each string again, now that it is working properly. They may now be working too well, and need to not be as sensitive.

If one string is still not triggering properly, one of the new capacitors may be still not connecting properly, or is in backwards. Recheck your work, paying close attention to the orientation, and also the solder pads on the board. They may have not have been cleaned well enough, and the solder joint is poor. Re-solder any suspicious joints if necessary.

Bottom Board Capacitor Layout, showing the new capacitors installed.

Notice that the new ones have had their small black plastic bases removed. This is to make mounting and soldering easier, and they are not needed. Remove them from the capacitors before installing them.



PG380/310/300 synthesizer board capacitor replacement (not applicable to the MG series)

The PG series guitars have a **built-in synthesizer module** inside the guitar. This board also has the **same small capacitors** in it as the triggering boards, which also go bad after a while. These **do not affect** the string triggering at all. If they go bad, the guitar will still trigger normally and output to MIDI normally.

The synth will probably still work OK (nearly all of mine were bad, but it still sounded OK), but the synth sounds may seem a little staticy or hissy, or not crisp and clean. Replacing all of the capacitors on the synth board will fix this.

Parts required

Magnifying glass

Soldering iron

Low power soldering iron, no greater than 12W power, with a very fine point tip

Capacitors

The same type of capacitors are used in the synth board as in the triggering boards:



They can be found at Jameco Electronics:

<http://www.jameco.com/webapp/wcs/stores/servlet/ProductDisplay?langId=-1&storeId=10001&catalogId=10001&productId=192997&pa=192997PS>

You will need them in values and quantities of:

1uF, 50V ----- 3 of

10uF, 16V ----- 8 of

If you bought the amount listed above in the parts list on the previous page, you will already have these.

Procedure

Examine the photo below of the synthesizer board showing the capacitors; noting the **values and orientations** of the capacitors (they have a black semi-circle marking the negative capacitor leg). The photo is a composite of 3 photos joined together (which is why there are photo join lines in it which don't quite match)

Remove the screws from the large hatch plate that mounts the **output sockets**, and move the plate out of the way. The **synth board** is large and **U-shaped**. You will also need to unscrew and remove the **ROM card compartment**. You do not need to remove the synth board to replace the capacitors, however, if you feel it is easier to work on it removed, first undo the clear LED display **trim cover** screws on the front of the guitar before undoing any synth board screws. The display is **attached** to the synth board and will come out with it from inside.

You **don't need** to remove the display from the board to change the capacitors, and in fact, if you leave it attached, you will stop all of the buttons spilling out all over the place and having to replace them (an annoying job). You will notice 4 or 5 slightly smaller screws in the synth board, up the display end. **These are the display screws**. Leave them in. You don't need to undo them to get the board out, just undo all the larger screws on the synth board.

Capacitor replacement procedure is the same as for the trigger board capacitor replacement.

