

Converting G5 fans for original look and native PC control

A lot of people have tried using the original G5 fans by re-wiring the connector. Many have tried varying the voltages to the fans in different ways to try and make them quieter. And a few have tried to make special control circuitry to replicate the way a G5 would control the fans.

Each of these approaches has met with issues and, mostly, people (myself included) decide that it is more sensible in the end just to sacrifice the original look and buy new fans.

However, as I have quite a few original fans around I thought why not experiment and see if I can succeed in taking apart the original fans and looking at how they might run if I put in a new motor board (stator) from a modern PC fan.

My logic was that if there really is something unique about the way the G5 controls the original fans, then the stator must be the thing with different control circuitry. So how will the G5 fans run if I switch the G5 stator circuit board for a PC stator board?



The experiment started with some cheap (£3 or so) but quiet Zalman 92mm fans.

I got 4 of these from Quiet PC. 36dBA is not silent (2,800 rpm at 12v) but the reduced voltage settings of 20dBA @1500rpm was a reasonable starting point.

These fans were chosen for a couple of reasons:

1. No point in trying a Noctua expensive fan when much of the technology is in the fan blade shape and the frame or in special bearings that would not be used in the G5 fans;
2. With a cheap fan I can afford to wreck one or two figuring out how to take them apart (yes I did wreck some);
3. Maybe the parts will not be interchangeable/compatible with the Mac fan rotors etc. so a big investment not a great idea.



Taking apart the G5 fans

I made mistakes here on my first time around, so you don't have to!

Here is how to take the exhaust fans apart with minimal risk.



1. Remove grill and clip off the wiring.



2. Using a flat blade remove the grey sticker from the back. Be careful and it can be re-used.



3. Here is a close look. You can see the rotor spindle, that is held on by a little white plastic circular clip and underneath that is a bearing.

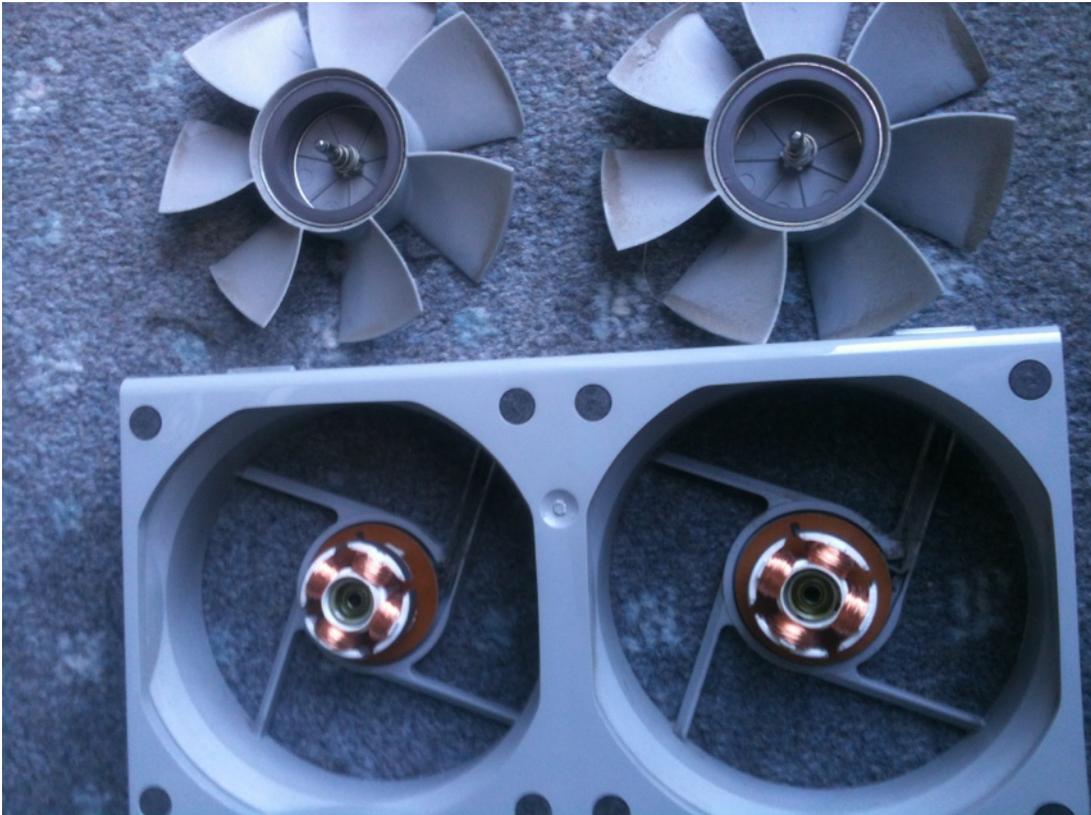
4. Hold the fan rotor still with one hand from underneath and with the other hand use a sharp knife to prise the white circular clip off the end of the rotor shaft.



5. Shown below - clip removed. Don't worry if it looks a little damaged. They are surprisingly hard to destroy and, if you do manage to break it, you get a second chance later to keep the Zalman one undamaged.



6. The rotors now just can fall off. Basically all fans have a the same inner rotor construction, it is a circular permanent magnet. They rotate when current is passed in the coils of the stator. Notice the springs on the rotor shaft. Don't lose them.



7. Be VERY careful here. The stator removal is where everything can go wrong. It doesn't matter if you damage the circuit board, but the frame and the plastic shaft on which the rotor sits is vital to keep intact. The best way I found to remove the stator board is to support the fragile frame of the fan centre with one hand and using the other poke a small screw driver in each of the holes labelled 1, 2, 3 (3 is under my finger!) one after the other in turn and pushing gently.



8. When the stator board starts to move you can use your fingers from the other side to pull it off the plastic shaft.



You now have this. The stators removed from the frame and you can see the top bearing in the shafts (don't worry if they fall out - just place them back in they are a loose fit) and there are also separate bearings underneath.



Taking apart the Zalman's



9. Remove the sticker and then carefully pull the wiring from the retaining clips in the frame.



10. Remove the rubber cap (keep it you can re-use it) and in the same way as with the G5 fans prise off the little circular white plastic clip.



11. Rotor now comes off and can be thrown away. Notice though the bearing here is a solid brass sleeve. Your next job is to remove it without damaging the stator board.



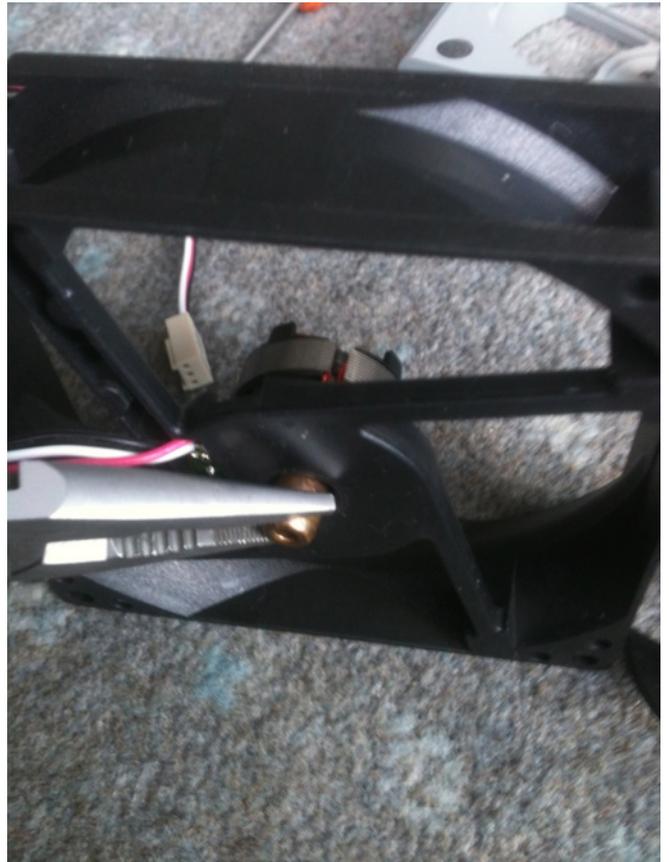
12. Find something blunt and larger than the brass sleeve bearing (like a cross head screwdriver) and with the fan on a flat surface push the bearing down hard.



13. The idea is to push the sleeve out through the bottom of the fan frame as shown.



14. When the bearing has slipped through you can pull it out from underneath.



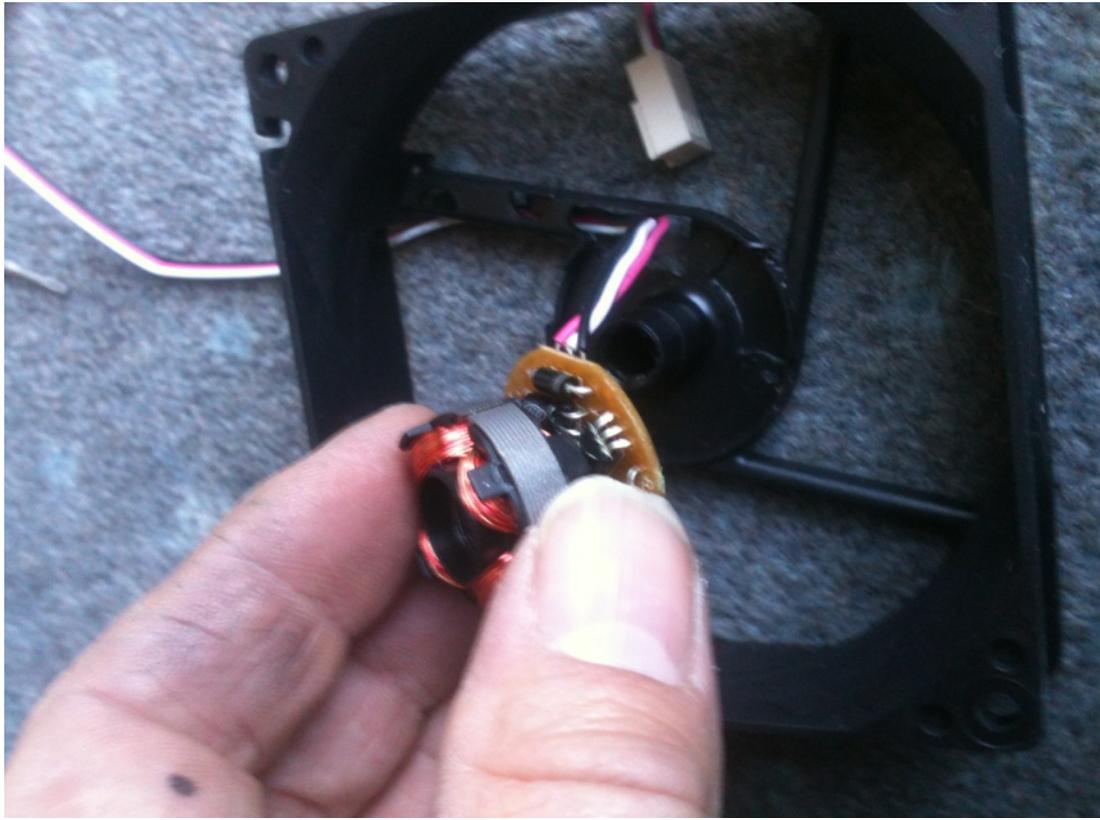
15. With the bearing removed the fan bottom looks like this. VERY gently insert a screw driver in as shown between board and frame and wiggle gently to loosen the board from the plastic shaft of the frame.



16. Alternate step 15 with gently working the board loose from the front as shown. Do NOT try to pull the top coil part of the stator as you can easily break it....just be patient until the board starts to move up the shaft.



17. Once the board is freely moving off the shaft you can pull it clear and then pull the wiring from the frame.

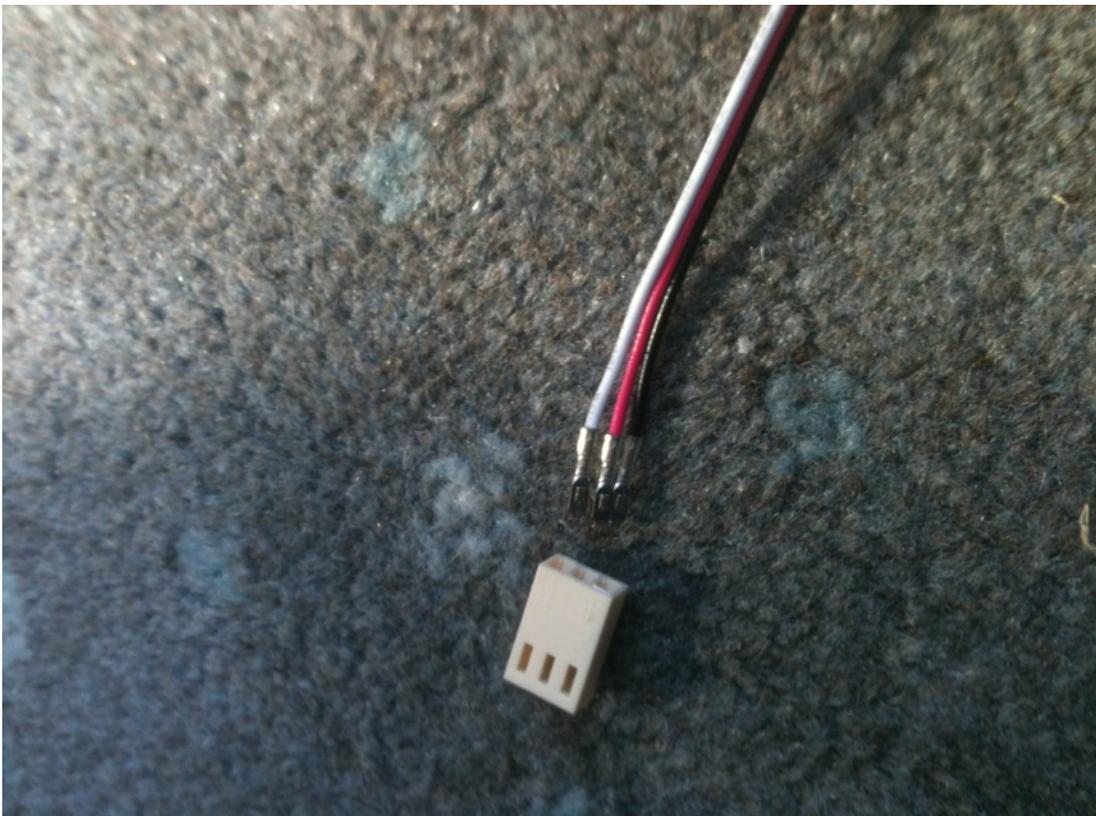


18. Here is a comparison between the Zalman board (left) and the much more complicated G5 original board (right).



Putting the parts together

19. For the rear G5 fans the wiring has to fit through a small hole in the fan frames so make a note of where wires fit in the fan connector and using your blade depress the little “tongue” holding each of the wires in the connector and then pull the wires out.



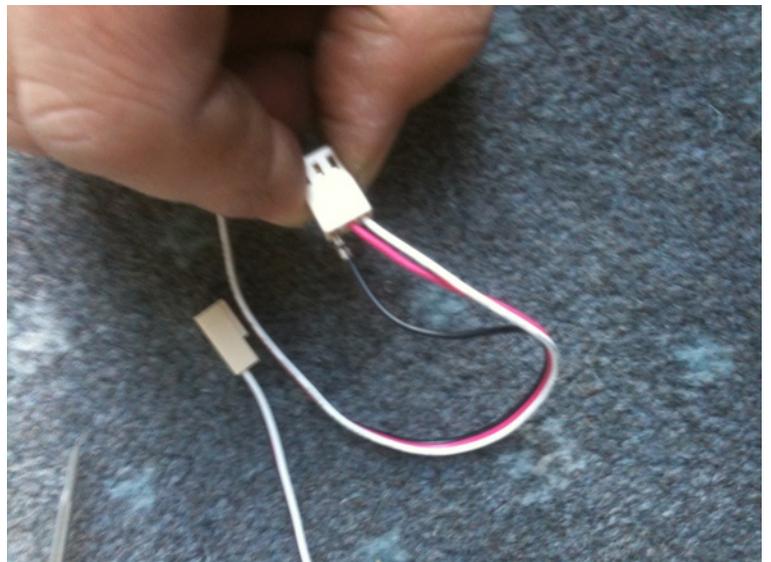
20. Now feed the wires through the frame one by one as shown:



21. Place the rotors on the plastic shaft and wiggle them down. They should be a snug fit.



22. You can now re-attach the fan connectors.



23. Nearly done:



24. Before re-assembling completely though take time to clean the grill and the rotors.



25. I used a wet wipe cloth.



26. Fit the rotors back in place and then re-fit the white plastic clips. The original ones or the Zalman ones will fit. You can use your multitool to push it back onto the rotor shaft.



27. I re-used the rubber bungs and then put back the grey stickers.



28. Route the wiring neatly. Then put back the clean grills.



Job done!



See and hear the results:

<http://youtu.be/61nXo7H0ZJs>