

Switchmode supply hash affects Micromite Garage Parking Assistant

Having seen the July issue and feedback in Ask SILICON CHIP (on page 99) on the Garage Parking Assistant, here is my experience with the kit.

The construction and configuration of the unit was straightforward and proceeded without any issues. I was able to program and test the operation without any errors while plugged into the USB port of my computer. I then tested it using a 5V USB battery pack on the dining room table and it performed correctly.

When I subsequently powered up the Garage Parking Assistant using a 5V USB plugpack after installing it in the garage, the distance measurement was very unstable and flicked across the entire range from 0-200mm and also read "device not found". I replaced the mains powered plugpack with the battery-powered USB supply and the distance measurement stabilised.

I removed the unit from the garage and took it back to the dining room table where I built it. When using the battery bank, the display was still completely stable.

Changing to the mains-powered USB supply caused the display to resume flicking across the range again. I tried all the mains-powered USB plugpacks I have and none worked. The plugpacks were either pur-

chased separately or supplied with a device as the charger.

In all, I tried eight different plugpacks, all rated at either 1A or 2A, and all gave problems

While not testing with a CRO, I did notice that the output voltage of the battery-powered USB supply was exactly 5V whereas the plugpacks were 5.2V. I don't know if this was the problem.

I added a 1000 μ F capacitor across the supply to see if it would help but there was no change. I therefore decided to try a 7805 and built a 5V supply and powered it from 9-12V. I left the capacitor across the regulated 5V output.

This appeared to fix the problem on the dining table. The distance display was again stable and accurate.

I returned the Micromite Ultrasonic Parking Assistant to the garage and powered it up again. The distance measurement was much more stable but still jumping up and down by 5cm; still not good enough.

I thought RFI might be getting into the signal to and from the ultrasonic sensor. I replaced the lead to the ultrasonic sensor with a shielded and Earthed lead and the problem was finally solved. The Micromite Ultrasonic Parking Assistant has been running for about three weeks now and it is still stable and accurate.

**Ian Hayes,
Helensburgh, NSW.**

Parking Assistant problem solved

I have now resolved the problem with my Garage Parking Assistant, as mentioned in the Ask SILICON CHIP section of the July issue (page 99). I can confirm that the issue was the power supply. I have sourced a variety of 5V plugpacks from Australian suppliers but every one of them exhibited the same characteristics as the original unit and the Parking Assistant behaved the same way when using them. I tried inductors, ferrite cores and a variety of capacitors across the plugpack output as per your suggestions, with only minor improvements in all cases.

Ultimately, I constructed a small linear power supply with a transformer and one of the universal regulator PCBs that you designed, since I had it to hand. Using this source of 5V DC, the unit is completely stable and works very well.

This experience has confirmed my longstanding uncertainty about switchmode power supplies, especially in plugpacks. While it is undoubtedly possible to manufacture such a supply to give a clean DC out-

put, the sad truth seems to be that no plugpack version of such a supply is adequate for sensitive usage. In reality, a linear supply is not a great deal more expensive but is greatly superior in performance and has the added bonus of being repairable in the event of failure.

None of the plugpack supplies that I tested had a clean DC output. All of them had varying levels of ripple and random spikes on the output and three of the five units were inaccurate in their output voltage. One plugpack which came with a Nokia phone actually produced 6V instead of the 5V claimed on the unit, both loaded and unloaded.

Thank you once again for your assistance with this project.

**Barrie Davis,
Hope Valley, SA.**

Comment: we have answered another letter on this topic in the Ask SILICON CHIP pages of this issue. It appears that the Micromite Parking Assistant is quite prone to switching noise in the supply rail and the only solution to is use a conventional (ie, non-switchmode) regulated 5V supply, as you have found.