RF Signal Generator power switch

I built the RF Signal Generator (June-July 2019; siliconchip.com.au/Series/336), and it generally works as expected. However, the power on/off only turned it on and not off. To make that part of the circuit work correctly, I had to increase the 1µF capacitor in series with the 270kΩ resistor to 10µF.

I'm also having problems with the frequency change control. Instead of stepping once for each rotational step, it jumps several steps in frequency, regardless of whether it is set for Hz, kHz or MHz. I changed the encoder to a different type (twice), but the results were the same.

I've discussed this with a few other people, and it appears this problem is not uncommon if the encoder programming has not been correctly debounced. Programming is an area I am not strong in so I can do little to prove one way or the other. I would appreciate any assistance you can provide. (P. M., Croydon, Vic.)

● The designer, Andrew Woodfield, responds: thank you for your observations. I've built four or five of these power switches now, and all have worked fine with the 1µF capacitor. However, I am likely using capacitors from the same batch, and your power source may be different from mine.

I'm glad that the 10µF capacitor solved your problem. But when I tried this value in one of my boards just now, it did not work well, and I had to change it back to 1µF to restore proper operation. I will ponder the circuit and see whether I can figure out why you need a different value to me. Perhaps switch contact resistance plays a part.

Regarding the rotary encoder, some low-cost encoders can produce significant contact bounce, extending beyond the time delays allowed for in my software. I have also encountered occasional problems when trying to turn the encoders very quickly (which is beyond the ability of the software to handle) or if a cheap encoder becomes worn.

I've used similar software to handle the rotary encoder in several designs, with many different (mostly cheap) encoders from different suppliers. I have generally found them to operate satisfactorily. My software is designed in such a way that debouncing should not be critical.

I will try to get my hands on some more different encoders to see if I can reproduce this problem you are having. I may be able to speed up the processing routines in the software to improve performance.

Editor's comment: see also the letter regarding a similar problem on page 13.

More Signal Generator encoder problems

I have built the RF Signal Generator which works well, apart from some erratic rotary encoder operation. I think it might be due to contact bounce.

Is this a common problem, and is there a hardware- or software-based solution? One manufacturer, Bournes, suggests a hardware-based solution. Would I need to disable the internal pull-up resistors to allow this? Am I missing something obvious? (P. R., Linden, NSW)

● Andrew Woodfield responds: some low-cost encoders can cause this. The internal programmed pull-ups are necessary for correct operation, so if these are disabled, the encoder won't work unless you replace them with external pull-ups.

Online forums have debated the use of external capacitors for debouncing, but conclusions are divided. Some are firmly in favour, others equally vehemently opposed.

I suspect a wide variety of encoders can produce considerable variation, which can also make determining a 'best solution' difficult.

My suggestion is to try a different encoder. Failing that, or while you wait

for delivery on a different encoder, you could experiment with debouncing timing networks.

However, after a dozen or more different designs and testing several dozen encoders of various makes, albeit almost all cheaper types, I've not found them useful.