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[TekScopes] NEW SUBJECT: Exact Replacement for Tek Pushbutton Switch. WAS: Push-push switch repair (need some theory of operation)

Dennis Tillman W7PF <dennis@ridesoft.com>

Sat, Jan 11, 2020 at 5:05 PM

Reply-To: TekScopes@groups.io

To: TekScopes@groups.io

I admire the effort Ke-Fong has gone to repair a very common type of switch Tek used in the 7000 and 5000 series of scopes, and in the TM500 and TM5000 series of instruments. But I am baffled that he would do all of this when there is a completely compatible line of inexpensive exact replacements readily available from all major electronics distributors. I first discovered these switches when I realized it was possible to upgrade a PS-501-2 power supply, which uses an analog meter to display voltage, to a more modern digital readout that displayed voltage and current simultaneously.

I put a picture of the new switch in the photo section of TekScopes alongside the only old Tek switch I happen to have. The photo is at:

<https://groups.io/g/TekScopes/album?id=238160>

The old switch was a 2-pole DT. The new switch is a 6-pole DT. So the picture is intended to show that the pin spacing is the same and the plastic shaft extenders used on many of the Tek switches fit perfectly on the new switches. The version of the switch I happened to use had PCB pins on the bottom AND solder lugs on the top (another optional choice for these switches). So the photo I took shows both the bottom PCB pins and the top solder lugs. The switches also come with just the PCB pins which makes them identical replacements for the Tek switches.

These C&K F-Series Pushbutton Switches are available in many, many configurations such as:

- * Latching (push-push) and non-latching (momentary);
- * 2-pole, 4-pole, 6-pole, 8-pole, and 10-pole;
- * Solder Lugs (along the top of the switch) and PCB pins (along the bottom of the switch), only solder lugs, or PCB pins only;

The datasheet can be found at:

<https://dznh3ojzb2azq.cloudfront.net/products/Pushbutton/F/documents/datasheet.pdf>

These switches are very inexpensive. The 6-pole switch cost \$4.07 at Mouser in single quantities.

Dennis Tillman W7PF

-----Original Message-----

From: TekScopes@groups.io [mailto:TekScopes@groups.io] On Behalf Of Ke-Fong Lin

Sent: Saturday, January 11, 2020 11:52 AM

To: TekScopes@groups.io

Subject: Re: [TekScopes] Push-push switch repair (need some theory of operation)

Hi everyone,

So I've done the dis-assembly, clean-up, and re-assembly. It works! The x1000 switch had bad contact. However, the fix is not complete as both BJT/FET and x1000 switches need to be pressed several time to lock in either IN or OUT position. The plastic shaft needs to be replaced. I've made a small drawing and included in the photos. Hope my handwriting is not too bad.

The front (removable) metal pin is in some sort of triangular groove circuit in the plastic shaft.

In the OUT position, the not fully compressed spring still has enough pull tension to lock the back molded pin of the shaft in the notch of switch assembly.

The metal pin is at the back (top of triangle), even if not needed, this help the back plastic pin in locking things.

In the IN position, it entirely the job of the front metal pin to do the locking. The triangle circuit groove has some plastic in the middle, the metal pin rests at the front of it and lock the shaft.

The triangular groove circuit is not level, so as to only allow a counter-clock wise movement of the metal pin around it. It's difficult to explain it but by looking at the molding it is quite obvious.

This is the only dodgy part of an otherwise reliable/bombproof system. In particular, due to the movement of the metal pin, and the tension of the spring, this part can worn out.

However, if that system is very common, it must still be very reliable. In particular, I suspect that the BJT/FET switch suffered premature worn-out because there was a cable in contact (putting pressure) on the extender shaft of the button.

The BJT in the photo is a 2SC945 and the FET a 2SK30. I now need to double check everything on the 5CT1N and maybe do some calibration.

Best regards,

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Dennis Tillman W7PF
TekScopes Moderator

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