

Trim Control Selection Switch and Indication

Back in 2012 when I designed my all glass instrument panel, I thought I had covered every possible situation you could encounter while flying. I was proven wrong when I did my first flight with my wife. As we flew along she rested her hand on the co-pilot joystick, and since both joysticks have trim control, she accidentally changed the way the airplane was trimmed. Since I fly actual IMC, this was not part of an acceptable design to me. So I re-wired the trim circuit and installed a trim selector switch.



Trim Selector Switch

This way the trim can only be controlled by the pilot flying while the other trim inactive. This setup worked to perfection, until last month.

I was flying with a pilot friend who wanted to do some practice approaches. He flew the airplane for about 1hr then it was my turn to do some approaches. But no matter how hard I tried I was fighting the airplane and could not keep it where I wanted. After about 1/2hr I realized the trim switch was still set to co-pilot so no matter how much I moved the trim, nothing was happening. As soon as I turned the switch to pilot, I could properly trim the airplane and everything fell in to place. I realized that unless I was looking down at the selector switch I couldn't tell who had control of the trim. The last thing I want to do while flying actual IMC is to be looking down to check the trim selector switch position. Again this was not part of an acceptable design to me. So I went back to the drawing board to come up with an acceptable solution.

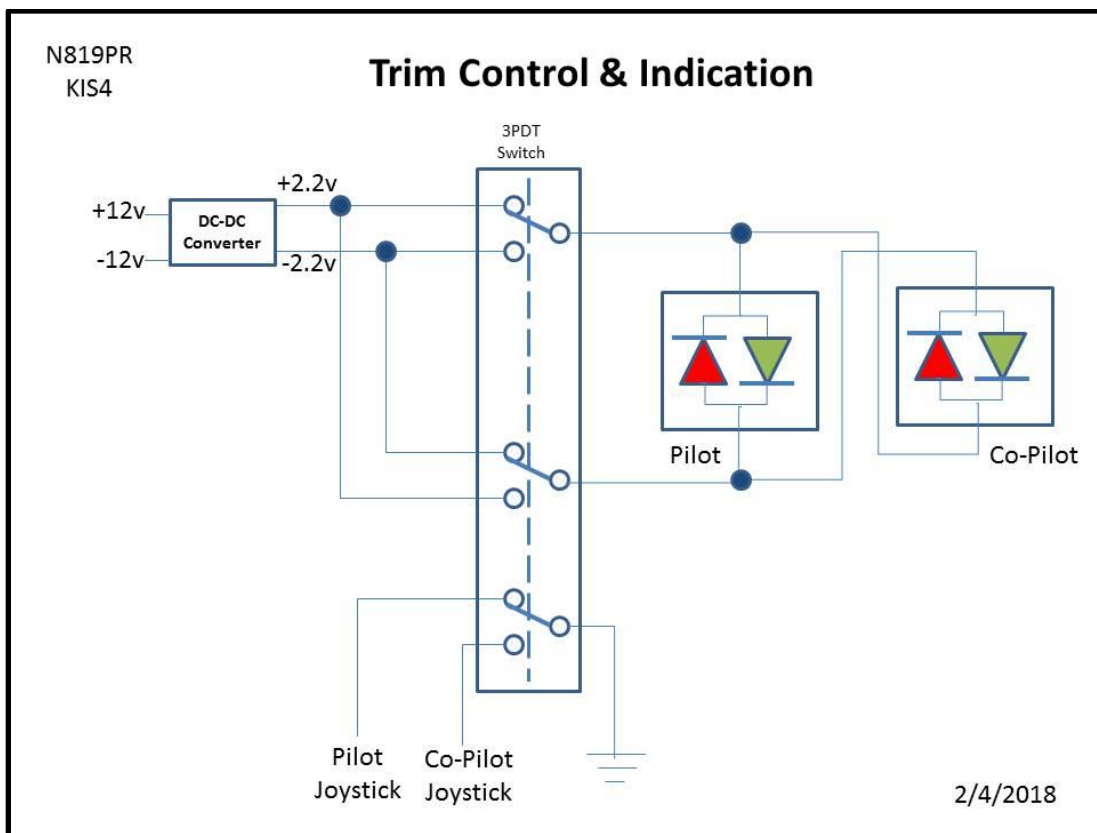
I decided to install some kind of trim selector position indication. At first I thought of putting a trim position indication widget on my DYNON SkyView. But this only works if I have the EMS display active which was not acceptable. So I decided to use a dedicated trim status light near the SkyView display. This is what I came up with.

Searching the INTERNET for an acceptable LED I came across a bi-color (RED/GREEN) two leg LED that only cost \$.50 each.



Bi-Color (RED/GREEN) LED

This LED glows RED or GREEN depending on the voltage polarity it gets. I figured if I used a triple pole double throw switch (3PDT, ON-ON) and wired it correctly when the pilot had the trim selected the LED on the pilot side would glow GREEN while the LED on the co-pilot side would glow RED. When the co-pilot had the trim selected the LED on the co-pilot side would glow GREEN while the LED on the pilot side would glow RED. This would be a very acceptable solution.



Trim Control Circuit Schematic Diagram

The problem was that, like most LED's, they use 2.2v not 12v like my airplane has. With some more INTERNET searching I found a tiny device that accepts between 8 – 22v input voltage, can be set to output any voltage between 1 – 15v and costs less than \$8.00 each. It is completely sealed in epoxy and is about 1-1/2" long by 1" wide. It has a maximum current capacity of 2A but two small LED's draw less than 0.25A so it has plenty of capacity. Additionally since it is a linear device, it should not create any RF interference. This was the perfect device to power the LED's.



DC – DC Converter

The 3PDT mini toggle switch was easy to find and they cost less than \$2.00 each.



Triple Pole Double Throw (3PDT) ON-ON Switch

I also needed some 22ga TEFZEL wires, a 3 pin connector, a 4 pin connector, two 2 pin connectors and 2 LED holders all of which I already had. So for less than \$11.00 I could buy all the parts needed for the circuit. But shipping and handling would cost \$8.00 so I bought 10 LED's, five 3PDT switches and two DC voltage converters. This was I have plenty of spare parts.

Building the circuit and adjusting the voltage converter took me about 4hrs. Actually installing it in the airplane took another 4hrs since it is so uncomfortable getting behind and under the instrument panel. The first test flight went off without a hitch and overall I am very pleased with how it came out.



Pilot LED is GREEN while Co-Pilot LED is RED indicating the Pilot controls the trim



Co-Pilot LED is GREEN while Pilot LED is RED indicating the Co-Pilot controls the trim

I hope this helps anybody that is faced with the same trim control situation.

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