

How-to for button pushers

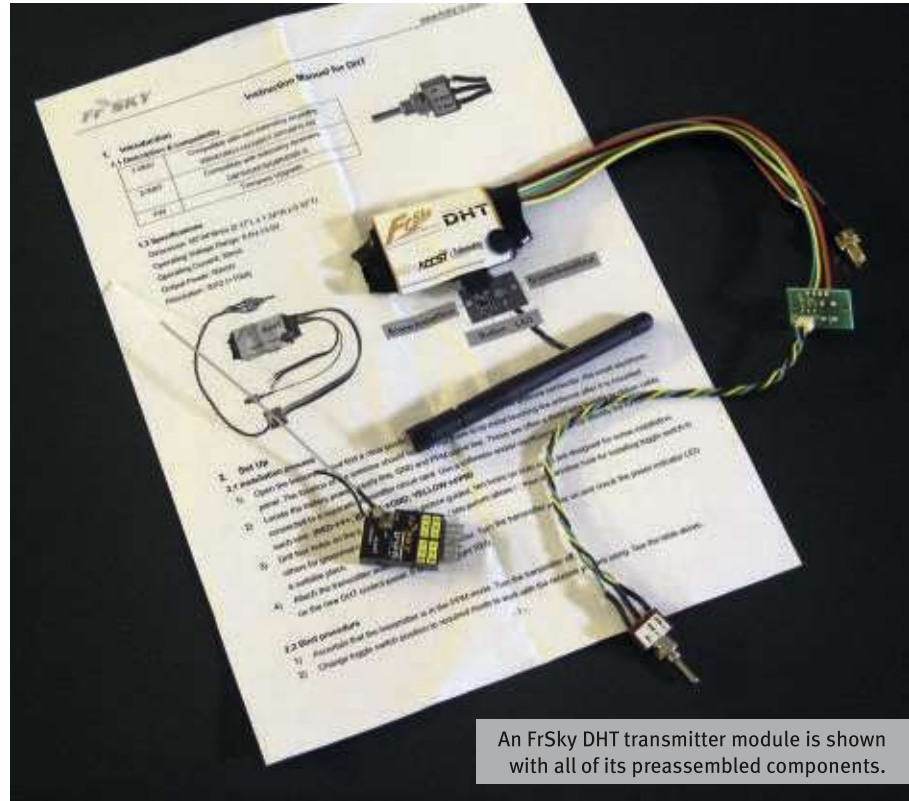
Some of you will remember when we flew single-channel radios and only controlled the rudder on our airplanes. Our transmitters either had a button on the end of a cable or, as the transmitters got smaller and could be handheld, the button was on the transmitter. The introduction of transistors allowed RC manufacturers to build smaller and smaller single-channel transmitters, but the button still existed. As I wrote in the past, there were many gadgets designed to replace the button to actuate the escapement or servo.

I have enjoyed reading about the "button-pushers" gathering in the United Kingdom, which has been going on for several years. A trip to Phil & Shaun's Single Channel & Vintage R/C Page website is an enjoyable one, and you can see and read about what Phil Green and Shaun Garrity have been doing in the United Kingdom.

Although some choose to restore old, single-channel radios, there is another way to obtain reliable operation while using your single-channel, handheld transmitter. Why not convert it to 2.4 GHz? With the help of some FrSky electronics and Phil Green, I will explain to you how I converted a popular Controilaire Mule transmitter.

I converted an FM single-channel transmitter to 2.4 GHz several years ago and I use it to fly a Mini Mambo. For this how-to column, I decided to convert a Controilaire Mule—a single-channel transmitter that was sold by the thousands. To emulate the action of a compound escapement using modern servos, I am using the single-channel emulation encoder produced by Phil Green.

The first thing to do is discard all of the inner workings of the transmitter except the switch, including the button. While flying my Mini Mambo, I found that the button on that transmitter did not allow me to fly well, so I decided to purchase a button with a micro switch,



An FrSky DHT transmitter module is shown with all of its preassembled components.

which provides a crisp click when I push it. I found mine online, although I don't remember where I bought it. It was inexpensive, so I bought several.

The primary item for this conversion is an FrSky DHT module that is available from several sources. The module uses Advanced Continuous Channel Shifting Technology and has telemetry capability, which is not used in this application. There is also a cable with an attached three-position switch that can be unplugged and discarded. The DHT module comes with an antenna and a small circuit board with an LED and a button.

Because the Mule does not have any internal mounting brackets, I mounted the DHT module at the top of the case using servo tape. I made a mount for the button/LED board and the single-channel encoder from hard balsa wood. I attached both items with servo screws, which can be seen in one of the photos.



The DHT module and antenna are installed in the Controilaire Mule transmitter. A balsa block is also attached with servo tape to mount the single-channel emulator and LED/button circuit board.



The compound escapement emulator (center) is attached to the balsa block with servo screws.



Two 4.8-volt receiver packs are wired to provide 9.6 volts for the system.



The two receiver packs are taped together with electrical tape and attached to the bottom of the transmitter with servo tape.

Wiring is quite simple using servo leads that plug into the emulator board.

Power for the DHT module and the single-channel encoder is supplied by two four-cell NiCd battery packs. The two packs are wired to provide 9.6 volts. I tried to use a 9.6-volt transmitter pack I had on hand, but it would not fit into the case. The battery pack is mounted in the transmitter using servo tape, as can be seen in the photo.

Phil Green's encoder provides compound escapement action and a third position for up-elevator if you are so inclined to put an elevator on a single-channel airplane. It also provides a "quick-blip" feature for three-position throttle control. The mid-throttle position is programmable in order to match your particular engine throttle and personal preference.

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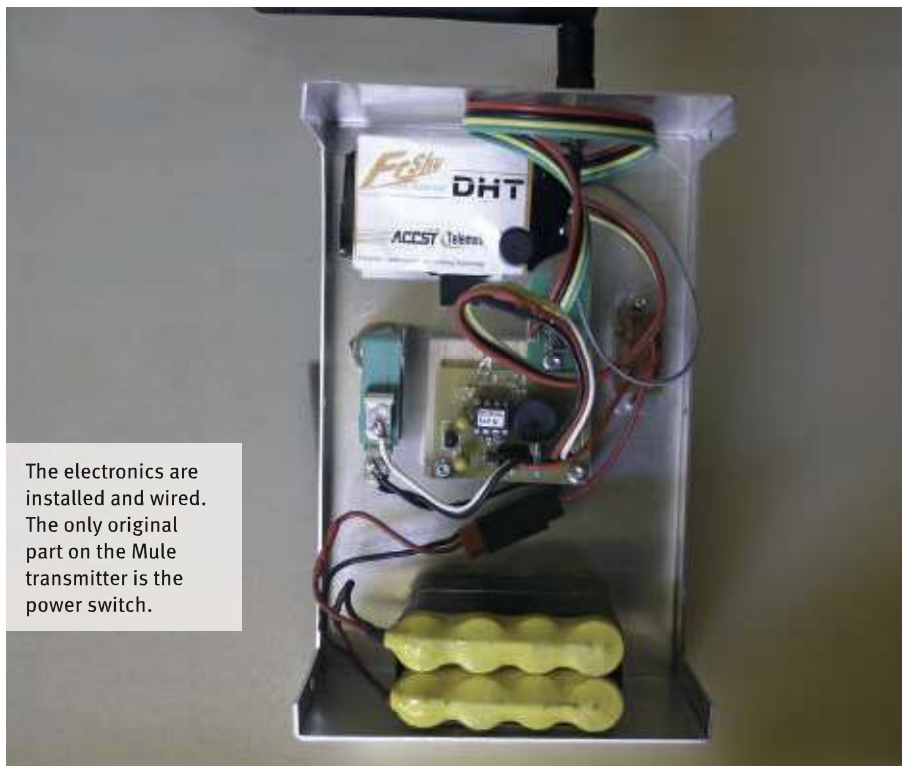
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The electronics are installed and wired. The only original part on the Mule transmitter is the power switch.

exhaust throttle in my Mini Mambo, and I used an FrSky TFR4 receiver with this conversion. Binding the system is straightforward.

With this transmitter conversion, you can enjoy all of the fun of 1960s single-channel flying, without the reliability problems that frequently happened

at that time. Now you will have no interference, no waiting for your turn to fly, and no running out of turns on that escapement rubber. 🛩️

SOURCES:

Phil & Shaun's Single Channel & Vintage R/C Page
www.singlechannel.co.uk

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