**This Document is meant to educate how a Spektrum DX9 owner can upgrade their transmitter to provide a serial data port for use with the Team Black Sheep Crossfire Module.**

**Currently there are 2 methods.**

**Please read this disclaimer before using a Spektrum DX9 with the TBS Crossfire Module.**

## - - DX9 Crossfire Disclaimer - -

Using the Crossfire firmware

By downloading this firmware, you acknowledge that you understand the use and liability of long range radio systems, such as the Team Black Sheep Crossfire long range system, and that flying beyond line of sight can be hazardous and potentially illegal. Horizon Hobby in no way endorses hazardous and/or illegal activities, and it is the user's responsibility to understand and follow all local laws and regulations. Furthermore, Horizon is not responsible for any loss of control that may result in damages or loss of property when using external RF modules with Spektrum Equipment.

Modification for use of the Team Black Sheep Crossfire System

The TBS Crossfire long range system is intended to provide less latency and greater range than standard systems in the DX9 radio. However, installing the Crossfire system requires soldering a new serial port onto the transmitter circuit board. We have provided a comprehensive tutorial to perform this modification on a Spektrum DX9 Transmitter correctly. Please be aware that any self-modification of the transmitter will void your transmitter warranty. Future service on a self-modified transmitter will not be denied, but any future service performed will not be covered under warranty, and repairs will be billed accordingly.  As a result, Horizon strongly recommends sending your Spektrum radio in for service and allowing our professional service technicians to perform the Crossfire system installation and preserve your warranty. Click here to start the service request process. Please include a note in the service request asking for this modification.

Once we receive your Transmitter, an authorized Spektrum Service Technician will perform the modification and confirm that the Transmitter functions properly post upgrade. Once the modification is completed, your radio will have a common servo connector leading out the back of the radio that offers serial port signal and ground. Use this plug to connect and communicate with your serial input module.

The cost for this modification is $75 plus shipping and is currently only offered for the Spektrum DX9 and DX9 Black Edition transmitters.

**\* PLEASE NOTE THAT THIS SERVICE IS CURRENTLY AVAILABLE ONLY FOR US AND CANADA**

**\*\*\* PLEASE NOTE THAT HORIZON HOBBY DOES NOT SUPPORT OR WARRANTY TEAM BLACKSHEEP PRODUCTS. IF YOU HAVE QUESTIONS OR NEED SERVICE WITH A TBS CROSSFIRE OR OTHER TBS PRODUCTS, PLEASE CONTACT TEAM BLACKSHEEP DIRECTLY.**

**Method 1 – Self Modification – How to install a serial port on your Spektrum DX9**

These instructions are geared toward the Do it Yourself enthusiast, if you do not possess the knowledge and confidence to perform a minor modification to your RC equipment, or if your radio is still with in the 1 year warranty period, please continue to Method 2.

***Note there is a video going over this procedure found Here that is a great companion to these instructions.

*Step 1) Remove the back of the Transmitter*

There are 8 Screws. Use a #1 Phillips screw driver to remove. The antenna housing can be removed by pushing forward, toward the front of the transmitter, then pulling up to remove. Gently lift the rear case away from the front. Be careful not to tug on any wires going from the front to rear. None of the connections need to be removed but removing the Handle antenna wire from its anchor can make the inside easier to access.
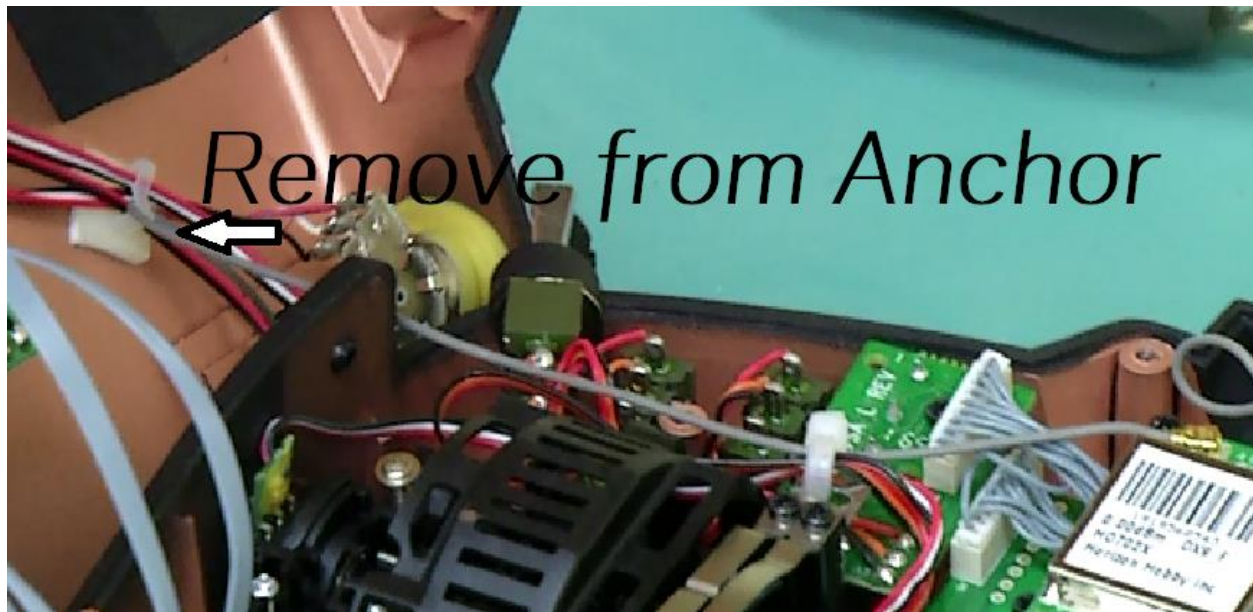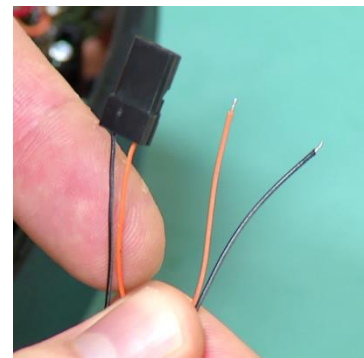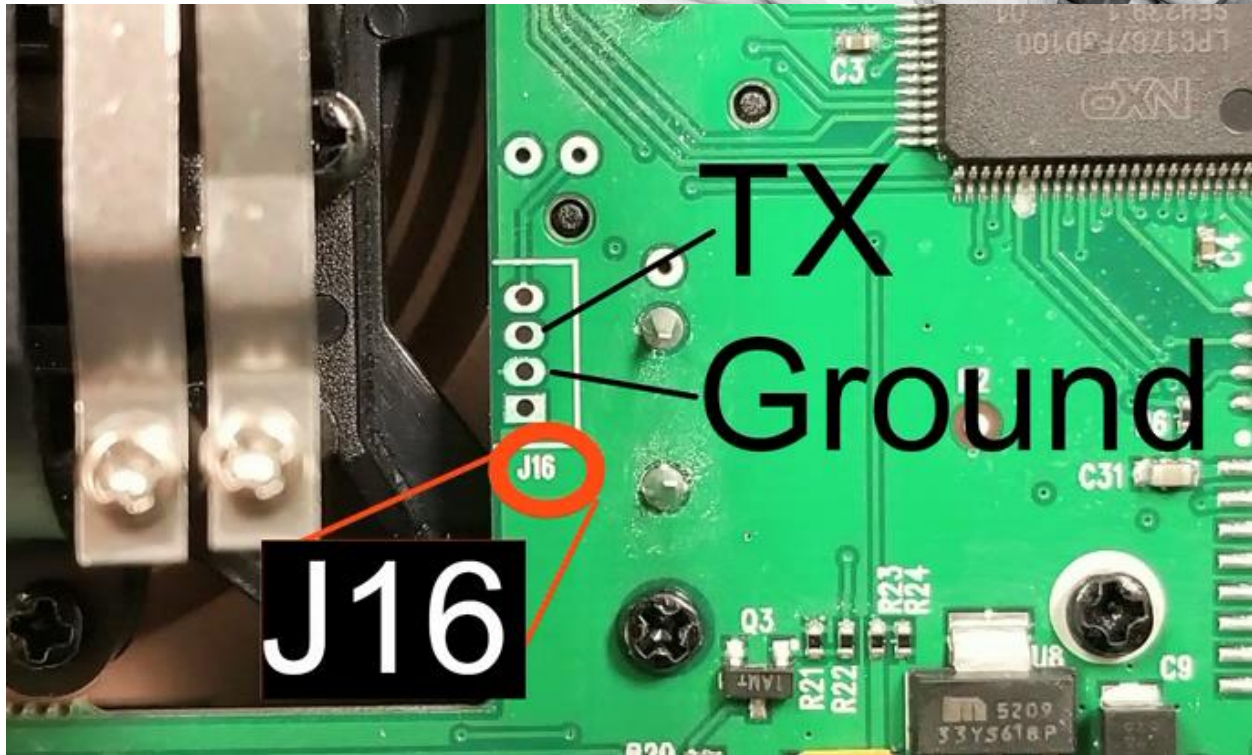


*Step 2) Install your serial output cable*

The cable used will need to have at least 2 wires. One for signal, another for ground.  In our example we will use the male end of a common 3 wire servo lead, and remove the middle lead.

Suggested Lead Part # EFLREX12L



Once you have that cable prepared we will "tin" the two pin holes used for the serial out port.

Find the pin holes labeled **J16**. We are using the 2$^{nd}$ and 3$^{rd}$ holes down for TX and Ground respectively.

Proceed to "tin" these two locations and solder the signal and ground leads to them, being careful not to bridge the gap. For extra precaution, use a multi-meter to check that you have no continuity between these points once soldering is complete.
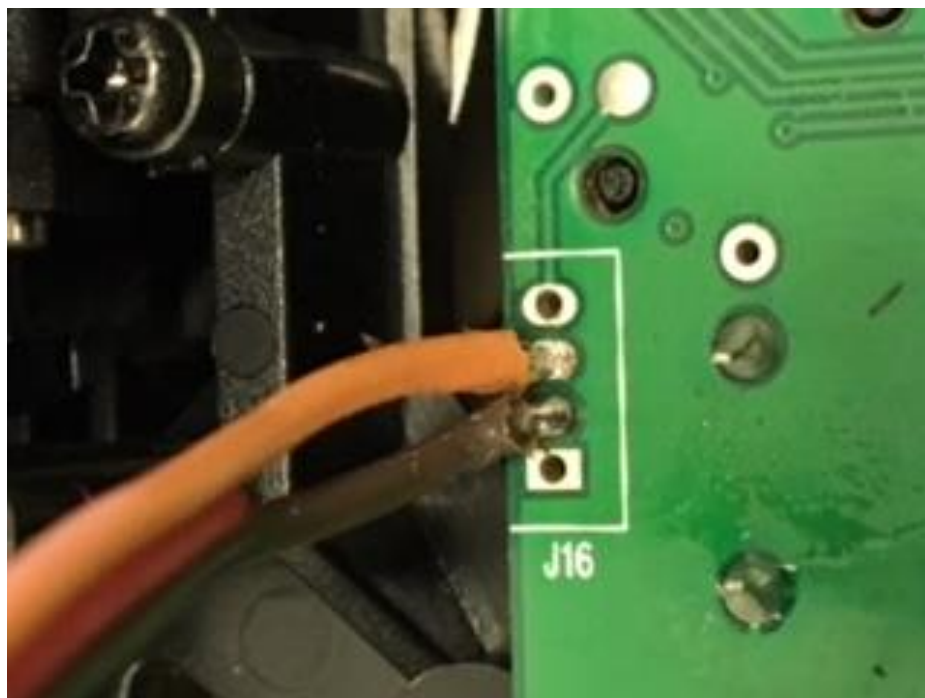
### Step 3) Secure your serial data out lead

It is important that the wire being installed has no chance of rubbing against sharp edges or getting into any moving parts. To prevent this, anchor the wire to one of the anchor points already available inside the DX9, such as this example.



### Step 4) Route the lead outside of the transmitter case

There are a number of ways to do this, but an easy route that does not require and modification to the back case is to take it thru one of the rubber grommets as shown here.



Once complete, replace the back case, being careful to reroute the antenna lead back in its anchor point and making sure no wires are pinched while re-attaching the rear case of the transmitter.

### Step 5) Create a interface cable

The DX9 will be interfacing this serial port with the EXP Port on the TBS Crossfire. This is the 6 Pin port. Here is a diagram for the cable and an example.
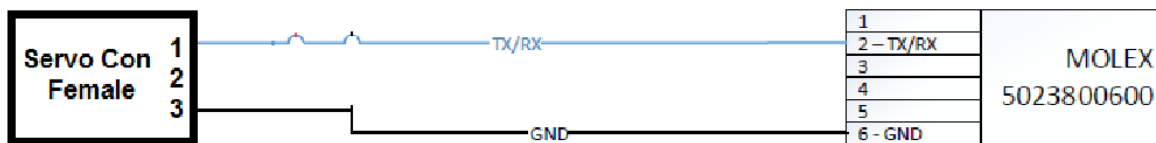


1 = Servo Signal Pin
2 = N/C
3 = Servo GND Pin

Either utilize a cable that comes off the TBS Crossfire module bay adapter or aquire the connector seperately. In our example we used the iX12 Crossfire adapter (SPMA3090) and attached a female servo lead to the blue (TX) and Black (GND) leads.

*Step 6) Update the DX9 Airware for Serial Port Access*

Proceed to Spektrumrc.com to download the firmware required to turn on this serial data port. Once logged in, find your registered DX9 (if you have not done so, do so now) and then find Update Firmware. Browse through until you locate the latest firmware that incorporates Crossfire/Serial data port. Please reference the change log readme file for the update download to find this information.

Once the DX9 is updated, the Serial Port Setup menu will be located in the system setup menu. Inside that menu change the settings as shown and the radio is ready to utilize the TBS Crossfire via the CRSF Protocol.

(Protocol = Crossfire , Spektrum RF = Inhibit)
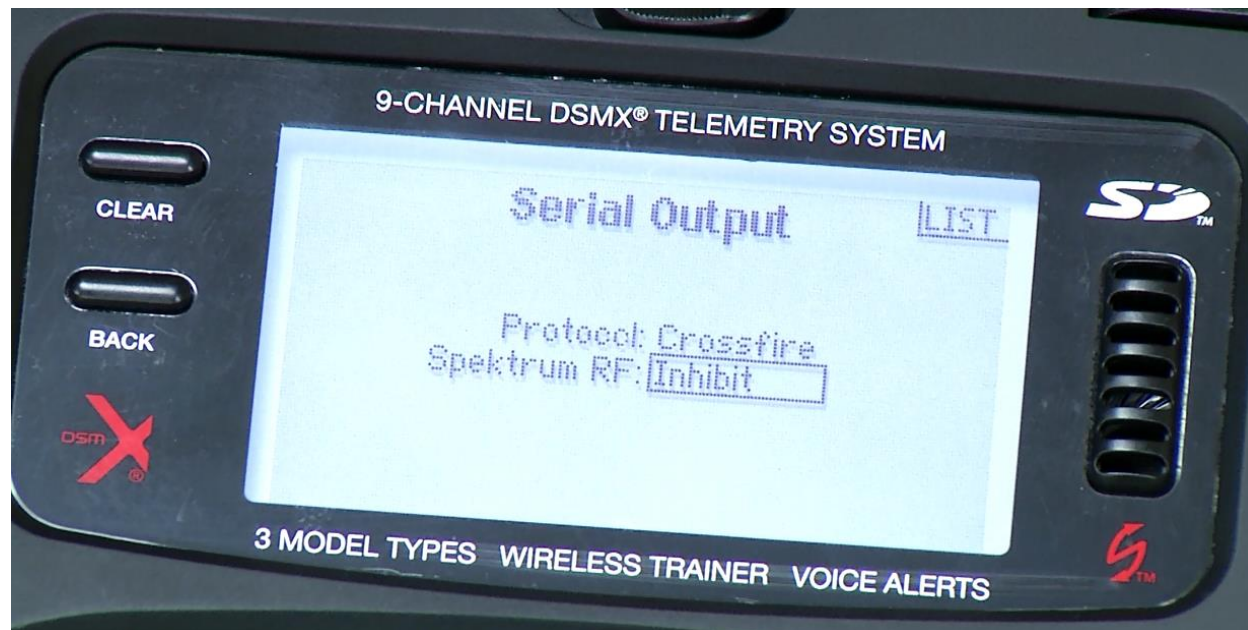
## Method 2 – Send in your Spektrum DX9 for Serial Port Upgrade

Horizon strongly recommends sending your Spektrum radio in for service and allowing our professional service technicians to perform the Crossfire system installation and preserve your warranty. Click here to start the service request process. Please include a note in the service request asking for this modification.

Simply state that you would like to have your DX9 to have the serial port added.

Once we receive your Transmitter, an authorized Spektrum Service Technician will perform the modification, install the latest DX9 firmware that uses the Serial Port Setup menu and confirm that the Transmitter functions properly post upgrade. Once the modification is completed, your radio will have a common servo connector leading out the back of the radio that offers serial port signal and ground. Use this plug to connect and communicate with your serial input module.

The cost for this modification is $75 plus shipping and is currently only offered for the Spektrum DX9 and DX9 Black Edition transmitters.  With this service your DX9 will have a male servo lead out of the back of the transmitter and we will include an adapter used for the EXP port on a TBS Crossfire to this lead.

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**Available Spektrum Crossfire Mount**

There is a STL file that can be used to 3D print the  Crossfire mount that can be attached to the back of a DX9 via Double sided tape. Makes attaching and removing the module easy and clean. The file can be found HERE.