X-tail MIXer

General layout

Servo 1 Output Connector (Pins)

(C)

(A) **Pitch Cmd Signal Lead**

Multifunction Status LED

(E)

Setup Button

(B) **Rudder Cmd Signal Lead**

(D)

Servo 2 Output Connector (Pins)

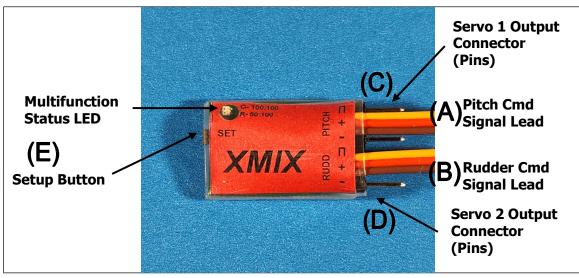## Quick Setup Guide

1. Plug the **Pitch Command Signal Lead (A)** into the output of your AD2 pitch controller.
2. Plug the **Rudder Command Signal Lead (B)** into the rudder channel of your receiver.
3. Plug stern plane servos in to each of **Servo 1 (C)** and **Servo 2 (D)** output pins taking note of the correct polarity.
4. If necessary, adjust the setup parameters of the XMIX using the **Setup Button (E)** to change the pitch:rudder mix ratio, mix reverse, and/or pulse read order.

Features

- No setup required – most users will find the default settings are appropriate for use out of the package.
- User selectable mix ratio between 100:100 or 50:100.
- User selectable electronic mix reverse to save from having mechanically reverse one servo to achieve proper pitch and steering control.
- User selectable read order on the input signals, and input leads do not need to be plugged in to adjacent channels on your receiver.

Multifunction Status LED

When power is initially switched on both red and green lights will turn on while waiting for receiver initialization. The XMIX will then indicate its signal read order configuration using the LEDs:

3 blinks GREEN	Read Rudder before Pitch (default)
3 blinks RED	Read Pitch before Rudder

After initialization (and during normal operation) the function of the Multifunction Status LED changes to indicate:

GREEN	100:100 mix between Pitch and Rudder (default)
RED	50:100 mix between Pitch and Rudder

During setup the function of the Multifunction Status LED changes. Setup steps are indicated with a GREEN flash of two, three, or four blinks, followed by a solid GREEN or RED light to indicate the saved setting for the current step as follows:

2 blinks: Set mix ratio between Pitch and Rudder	GREEN = 100:100, RED = 50:100
3 blinks: Set mix reverse	GREEN = NORMAL, RED = REVERSE
4 blinks: Set signal read order	GREEN = Rudder before Pitch, RED = Pitch before Rudder

Setup Mode

Although XMIX has been designed to operate without needing any configuration changes, some users may prefer to further customize some of the XMIX's features. The XMIX's user adjustable features are:

1) Desensitize the pitch command compared to the rudder command by altering the mix ratio on pitch and rudder inputs to from 100:100 to 50:100,

2) Reverse one of the output servos by changing the mix equation used to blend the two channels together. Set this to REVERSE in case one of output servos works correctly but the other is backwards. (This can also be done mechanically by rotating the output arm of one of the servos by 180 deg.)

3) Change the order that the XMIX will read the two input signals. Most setups will use "Rudder before Pitch". An AD2 will add roughly a one servo channel of delay from input read to output pulse generation. Most 75 MHz receivers create their servo signals one at a time in the order of their channel number. Commonly, models are set up with the rudder connected to channel 1 and the pitch servo connected to channel 2. (With an AD2 connected between the receiver and the XMIX, this would make the pitch signal show up with roughly equivalent to the timing of channel 3.) In this situation "Rudder before Pitch" is the appropriate setting. In the situation where rudder is connected to receiver channel 4 instead of 1, then "Pitch before Rudder" would be the correct setting. Most 900 MHz and 2.4 GHz receivers create all their servo signals simultaneously, but the delay created by the AD2 on the pitch input channel makes pulse timing behave more like a 75 MHz set so "Rudder before Pitch" is again typically the correct setting.

When Setup Mode is initiated you must choose the desired setting for each of the above parameters, but at each step the XMIX will remember the previous setting for each parameter so you can make "no change" by accepting the setting at each step. At each step the *step number* is indicated by number of blinks, and the *value* for the current step is indicated by the colour of the LED. (GREEN blinks are always used to indicate the "default" value for each of the three parameters.) Parameter values at each step are changed by moving and holding the rudder stick to the left or right until the colour changes. Parameters are saved by pressing the Setup button.

To enter setup mode first turn on your transmitter, then press and hold the Setup button on the XMIX, then turn on your receiver. The GREEN and RED status LEDs will both turn on for several seconds, then show a solid green to indicate you're ready to enter Setup mode. (You may now release the Setup button.)

1. Upon release of the setup button the LED will flash a 2-blink pattern to indicate you're at the Set Mix Ratio step. The LED will blink GREEN when the mix ratio is 100:100, or RED for a mix ratio of 50:100. If you wish to change the mix ratio from its current value move the rudder stick to the extreme left or right and hold until the LED colour changes, then return the stick to center. When the LED is blinking in the right colour for the setting you want press and hold the SETUP button until the LED glows solid green, then release to move to the next step.

2. The status LED will now flash a 3-blink pattern for the Set Mix Reverse change step, blinking in either GREEN or RED light to indicate the current value of the parameter. (GREEN for NORMAL, RED for REVERSE.) To change the parameter from the NORMAL to REVERSE (or REVERSE to NORMAL) move the rudder stick to the extreme left or right and hold until the colour changes, then return to center. Press, hold and release the setup button to accept the desired value.

3. The status LED will now flash a 4-blink pattern to indicate the Signal Read Order, blinking when the setting is "Rudder before Pitch", or RED for "Pitch before Rudder". Once again, to change the parameter move the rudder stick left or right and hold until the LED blinking changes colour, then return the stick to center. To save the Read Order value press and hold the Setup button until the LED turns solid GREEN.

The XMIX will now automatically exit from setup mode and return to normal operation.

Change Signal Read Order in Normal Mode

The Signal Read Order can also be altered in normal running mode by pressing and holding the SETUP button for at least one second, then release.

General Notes

- Please test the full range of travel for both pitch and rudder (at the same time!) to ensure that servos and control surfaces cannot bind at the "corners" of travel.
- This manual describes setup and features found in XMIX with **XMIX1b** software.

Questions?

- If you have questions or concerns about your X-tail MIXer please contact Kevin McLeod by email at KevinMc.Electronics@gmail.com