Equalizer II you will need to put a "Y" connector in the receiver channel you are using and run one side directly to a servo and the other side to the Equalizer II. On the Equalizer 3D there is a feed-thru connector (marked "F" that simple passes the receiver signal to that servo but allows the servo to be powered from the auxiliary power connectors. It is suggested you set the options with the servos disconnected.

1) Connect the servo you wish to match to the "Y" connector for the Equalizer II or the feed-thru connector on the Equalizer 3D. Turn the receiver power on and use the transmitter functions to set the centering and endpoints of this servo. These are the reference points you will match the other servos to.

2) Enter the **Option Menu**. First **Reset** the unit (6), and then **Calibrate** the unit (5,transmitter must be on). Next turn on **Servo Priority** (4) and lastly select your **Power Source** (1) and return the unit to **Run** (0).

3) Turn the power off and connect the servos. Turn the selector to **Adjust Servo A** (1) and power on. At this point the servo on output A is being driven while output B (and output C on Equalizer 3D) are turned off. Use the "Incr" and "Decr" buttons to adjust the center on servo A so that your current draw is at a minimum or the buzzing goes away. Turn the selector to **Adjust Servo B** (2) and use the "Incr" and "Decr" buttons to adjust the center on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos on an Equalizer 3D, now move the selector to **Adjust Servo C** (3) and adjust the center on servo C. Turn the selector back to **Adjust Servo A** (1).

4) Move the transmitter stick all the way over to one endpoint and hold it there firmly. Use the "Incr" and "Decr" buttons to adjust the endpoint on servo A so that your current draw is at a minimum or the buzzing goes away. Move the selector to **Adjust Servo B** (2) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos on an Equalizer 3D, now move the selector to **Adjust Servo C** (3) and adjust the endpoint on servo C so that your current draw is at a minimum or the buzzing goes away. Turn the selector back to **Adjust Servo A** (1).

5) Move the transmitter stick all the way over to the opposite endpoint. Use the "Incr" and "Decr" buttons to adjust the endpoint on servo A so that your current draw is at a minimum or the buzzing goes away. Move the selector to **Adjust Servo B** (2) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos on an Equalizer 3D, now move the selector to **Adjust Servo C** (3) and adjust the endpoint on servo C use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. . Turn the selector back to **Run** (0).

6) Setup is now complete.

Additional information, technical help, set-up hints and FAQs can also be found at www.Smart-Fly.com

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Smart-Fly

Equalizer II and Equalizer 3D *User Guide*

Please Read First

Thank you for purchasing the Smart-Fly Equalizer!

This manual walks you through typical setups using the features of the Equalizer II and Equalizer 3D to obtain optimal results. This manual should be used in conjunction with the Equalizer Reference Manual. For detailed instructions on how each function works please refer to the Equalizer Reference Manual.

A unique feature of the Smart-Fly Equalizer II and Equalizer 3D is the **Option Menu**. Use of **the Option Menu** makes the Equalizer II and Equalizer 3D more precise and faster to setup. Spending just a couple minutes in the **Option Menu** will save you more time in setup and make any subsequent tweaks faster to implement. The **Option Menu** is entered by turning the rotary switch to position "7"and holding both pushbuttons down while powering the unit on. The LED will start to flash slowly when the request is recognized. You can now reset, calibrate and set your options to make the servo alignment process easier.

Determining Optimal Servo Adjustment

There are several ways to determine when the servo is optimally adjusted. One method is to just listen to the servos' chatter and adjust it until this disappears or is minimized. A second, more accurate method is to monitor the current draw of the servos. You do not need to move your current monitor to each servo you adjust because when one servo is pulling against all the others they have to fight back and their current draw will increase. Using this little fact, all you need to do is monitor the current on the servo connected to output A. Minimizing this current will mean the servos are at their optimal positions. Lastly you can leave the screws out of the arms so they can be removed. When you think you have a servo at its optimal position you should be able to lift the arm off the spindle and replace it very easily. It should virtually drop onto the spindle. If you feel your servos are highly mismatched you may want to remove the arms from the servos and only put the arm back on when the spindle has been adjusted to a position where the arm drops on with little or no effort. Move down the chain of servos putting the arms on as you adjust each servo's optimal position. If you feel the endpoints are also highly mismatched repeat this procedure for each of the endpoint adjustments.

Operating Precautions

The Equalizer performs a self-check each time it is turned on. If it discovers a failure it will not operate. Always perform a check on all surfaces to make sure that all servos are operating normally before releasing the plane. The unit normally takes between one to three seconds to come alive. If it does not respond after this time something is probably wrong with the unit and it should be replaced.

The Equalizer can only do so much. A lot depends on the quality of the mechanics of your system. It is strongly suggested that you keep the servo rotation below 50 degrees even at high rates. Travel beyond this rotation results in reduced mechanical advantage and a higher susceptibility to mechanical interference. Use good servo arms and high quality mechanical linkage. The linkage should be very, very smooth before attempting to align it.

Always range check your plane. Moving wires and adding additional wiring can change the behavior of your plane's antenna and the strength of the signal the receiver is getting from the transmitter. Never fly if you have a question about your radio system performance.

Multiple Ganged Servos Using Endpoint Hold and Servo Priority
The following method sets up multiple servos on a single surface (servos are ganged to a single moving surface). Examples of this are rudders with two or three servos, ailerons with two or three servos or elevator halves with two servos on each half. The options chosen from the **Option Menu** for this example make it easy for a single person to do the setup unassisted. It is suggested you set the options with the servos disconnected the first time.

1) Enter the **Option Menu**. First **Reset** the unit (6), and then **Calibrate** the unit (5, transmitter must be on). Next turn on the **Servo Priority** (4) option and the **Endpoint Hold** (2) option. Lastly select your **Power Source** (1) and return the unit to **Run** (0).

2) Turn the power off and connect the servos. Turn the selector to **Adjust Servo A** (1) and power on. At this point the servo on output A is being driven while output B (and output C on an Equalizer 3D) is turned off. Use the "Incr" and "Decr" buttons to adjust your center. Now move the stick all the way over and wait about 1 second. The surface will move to the endpoint and you can release the transmitter stick. Now you can adjust the throw you want in that direction, again using the "Incr" and "Decr" buttons. Move the stick all the way in the opposite direction you did before and let the surface move through neutral and then to the opposite endpoint. You can release the transmitter stick and adjust the throw you want in that direction. Now move the transmitter stick to the opposite extreme as before to return the surface to neutral.

3) Turn the selector to **Adjust Servo B** (2) and use the "Incr" and "Decr" buttons to adjust the center on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos on and Equalizer 3D, now move the selector to **Adjust Servo C** (3) and use the "Incr" and "Decr" buttons to adjust the center on servo C. Turn the selector back to **Adjust Servo A** (1).

4) Move the transmitter stick all the way over and wait for the servos to move to an endpoint. Turn the selector to **Adjust Servo B** (2). Use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. If you are doing 3 servos on and Equalizer 3D, now move the selector to **Adjust Servo C** (3) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo C. Turn the selector back to **Adjust Servo A** (1).

5) Move the transmitter stick all the way over in the opposite direction and wait for the surface to go through neutral to the other endpoint. Turn the selector to **Adjust Servo B** (2). Use the "Incr" and "Decr" buttons to adjust the endpoint on servo B so that your current draw is at a minimum or the buzzing goes away. . If you are doing 3 servos on and Equalizer 3D, now move the selector to **Adjust Servo C** (3) and use the "Incr" and "Decr" buttons to adjust the endpoint on servo C. Turn the selector back to **Adjust Servo A** (1). Turn the selector back to **Run** (0).

6) Setup is now complete.

Multiple Servos On Multiple Surfaces Using Endpoint Hold
The following method sets up multiple servos on multiple surfaces. Examples of this are a split elevator with one servo per side or using separate servos for rudder and nose-wheel control. The options chosen from the **Option Menu** for this example make it easy for a single person to do the setup unassisted. It is suggested you set the options with the servos disconnected.

1) Enter the **Option Menu**. First **Reset** the unit (6), and then **Calibrate** the unit (5, transmitter must be on). Next turn on **Endpoint Hold** (2) and lastly select your **Power Source** (1) and return the unit to **Run** (0).

2) Now is the time to reverse any servos that need to be reversed. To reverse servo A turn the unit to position 4 and push the increment button for about 1 second. The LED will go from a slow flash to a fast flash when the servo is reversed. You can do servos B and C the same way using positions 5 and 6.

3) Turn the power off and connect the servos. Turn the selector to **Adjust Servo A** (1) and power on. Use the "Incr" and "Decr" buttons to adjust your center on servo A. Now move the stick all the way over and wait about 1 second. The surface will move to the endpoint and you can release the transmitter stick. Now you can adjust the throw you want on servo A in that direction, again using the "Incr" and "Decr" buttons. Move the stick all the way in the opposite direction you did before and let the surface move through neutral and then to the opposite endpoint. You can release the transmitter stick and adjust the throw you want in that direction on servo A. Now move the transmitter stick to the opposite extreme as before to return the surface to neutral.

4) Turn the selector to **Adjust Servo B** (2) and use the "Incr" and "Decr" buttons to adjust the center on servo B. Now move the stick all the way over and wait about 1 second. The surface will move to the endpoint and you can release the transmitter stick. Now you can adjust the throw you want on servo B in that direction, again using the "Incr" and "Decr" buttons. Move the stick all the way in the opposite direction you did before and let the surface move through neutral and then to the opposite endpoint. You can release the transmitter stick and adjust the throw you want on servo B in that direction. Now move the transmitter stick to the opposite extreme as before to return the surface to neutral.

5) If you are doing 3 servos on an Equalizer 3D, now move the selector to **Adjust Servo C** (3) and adjust the center and endpoints on servo C the same way you did for servos A and B.

6) Setup is now complete.

Matching 2 Servos to a 3rd (Eq II) or 3 Servos to a 4th (Eq 3D) Using Servo Priority
The following method shows how to align 2 servos (Equalizer II) to a 3rd servo or 3 servos (Equalizer 3D) to a 4th servo. This requires that the transmitter stick be held at its endpoints while adjustments on the Equalizer are being made. I may be easiest to have a second person helping you or you may want to rig up some way to hold the transmitter stick at its endpoints while you do the servo alignments. When matching 2 servos to a 3rd on the