GETTING STARTED ON THE FUTABA 8FG & 8FGS

PROGRAMMING A TRAINER AEROPLANE

These notes are intended to provide an illustration of some of the basic setup procedures of the 8FG(S) transmitter. They cover the following features :-

Creation of a new model
Frequency selection
Naming a model
Connecting servos
Servo reversing
End point adjustment
Dual rate switches and exponential
Aileron differential
Aileron/rudder mix
Limit point adjustment
Throttle cut
Timer
Setting the failsafe

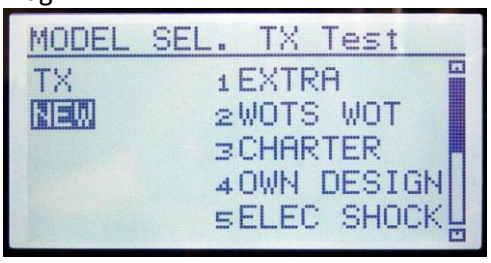
The following notes assume that you are familiar with the use of the Touch Sensor for navigating menus and entering values. If this is not the case, page 16 of the Futaba manual gives a clear explanation.

CREATING A NEW MODEL

In the LINKAGE MENU scroll to MODEL SELect and tap RTN (Diag 1). In the MODEL SELECT screen scroll to NEW and tap RTN and then hold it for one second (Diag 2).

Diag 1

Diag 2



The MODEL TYPE screen will appear. Set TYPE to AIRPLANE and WING to NORMAL. Beneath WING choose either 1AIL or 2AIL (see below). This refers to the number of receiver sockets (channels) you want to use for your ailerons and not to the number of ailerons themselves.

Many trainers and small models use a single servo in the middle of the wing to operate both the ailerons. In some models each aileron has its own servo but these are connected together by a Y-lead which plugs into a single socket in the receiver. In both these cases the 1AIL setting is used.

When a model has a separate servo for each aileron it is better to plug each into a different socket in the receiver if there is one to spare. This provides more programming options later and gives a greater margin of safety. Where two sockets will be used choose the 2AIL setting. This is the option shown in the example in Diagram 3.

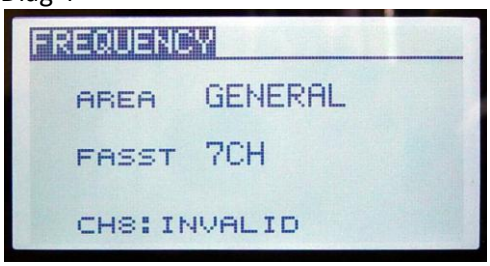
Diag 3

Set TAIL to NORMAL and then scroll to YES and confirm by holding RTN for a second.

FREQUENCY SELECTION

Depending on how you navigated away from the MODEL TYPE screen above the FREQUENCY screen may open automatically. If it does not you should open it by selecting FREQUENCY in the LINKAGE MENU.

Diag 4



If you are using a 7-channel receiver, which is more than adequate for this type of model, you should select 7CH. Otherwise select MULT and then return to the LINKAGE MENU. Diagram 4 shows the model set for a 7-channel receiver.

Note that the frequency chosen only applies to this particular model. It will not affect any other models on the transmitter which may operate on different frequencies with different types of receivers.

NAMING THE MODEL

The following example simply uses the name TRAINER but you can, of course, substitute any name you wish for your model.

In the LINKAGE MENU scroll to MODEL SELect and tap RTN. In the MODEL SELECT screen your new model should appear as NEW1 and be highlighted. Tap RTN and the screen shown in Diagram 5 should appear. Scroll to RENAME and tap RTN.

Diag 5

A new screen should open with a vertical cursor flashing to the left of NEW1. Scroll to DELETE (bottom left) and tap RETURN four times. You will see NEW1 disappear.

Now scroll so that the letter T in the alphabet on the right of the screen is highlighted (see Diag 6). Tap RTN and a letter T will appear behind the vertical flashing cursor. Scroll to the letter R and tap RTN. Continue entering letters until you have spelled TRAINER. Now scroll to ENTER (see Diag 7) and tap RTN.

Diag 6

Diag 7

CONNECTING THE SERVOS

When a new model is created the transmitter software automatically allocates appropriate functions (Aileron, Elevator, Rudder, Motor etc) and controls (sticks, switches, dials and levers) depending on the MODEL TYPE settings entered. Should you wish to change any of these it is very easy to do but, with a simple model such as this, there seems little point.

To see the allocations made by the transmitter and how to connect up the servos go to the LINKAGE MENU and then select FUNCTION. If a Mode 2 transmitter is used the screen should appear as in Diagram 8. In other modes the control sticks will be allocated differently.

Diag 8

The numbers down the left hand side show the channels through which the data for each function are transmitted. These correspond to the numbered sockets on the receiver. Accordingly you should plug one aileron servo into socket 1 on the receiver and it will be controlled by stick J1. Connect the elevator, throttle (or ESC in the case of an electric model) and rudder servos to sockets 2, 3 and 4 respectively.

Now scroll to the next page. It is unlikely that you will use retractable gear on a trainer but, if you did, you would plug it into socket 5 and operate it with switch SE.

If you selected a 2AIL wing on the MODEL TYPE screen you will see that the second aileron has been allocated to channel 6. Accordingly you should plug the second aileron servo into socket 6 on the receiver. Rather than plugging the servos directly into the

receiver each time you attach the wing you will probably find it easier to buy two short extension leads. Leave these permanently plugged into the receiver and plug the aileron servos into them.

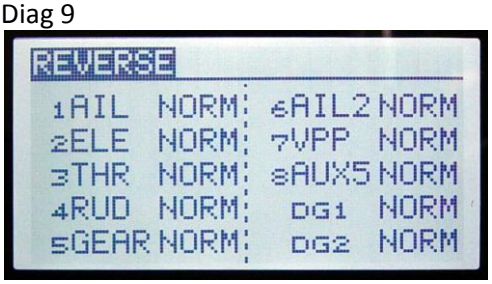
At this stage it does not matter which aileron servo is connected to which of the two sockets (1 and 6) but, once you have programmed the transmitter, it is important not to transpose them. To avoid this, label the right and left servos and their corresponding sockets with coloured tape.

SERVO REVERSING

Fit all the linkages from the servos to the controls of your model as described in its instructions. The direction that each control surface (aileron, rudder, elevator) moves will depend on how the servos and control horns have been installed.

Move each control stick on the transmitter and check that its corresponding control surface moves correctly. If any move in the wrong direction scroll to REVERSE in the LINKAGE MENU and tap RTN. The screen should appear as in Diagram 9 with each servo shown operating in the NORMal direction.

Diag 9



Diag 10

To change the direction in which any control moves simply scroll to the NORM next to its name, tap RTN, and scroll so that NORM changes to REVerse. At the prompt “Are you sure?” tap RTN to confirm. Diagram 10 illustrates the elevator servo being reversed. Note that if you are using two aileron servos on separate channels you may have to reverse both AIL and AIL2.

Before attempting to start the engine check very carefully that the throttle barrel in the carburettor is moving correctly in response to the transmitter’s throttle stick and, if necessary, reverse the servo.

If your model is electric follow the instructions for your Electronic Speed Controller. You will probably have to reverse the throttle channel to get the control stick to operate correctly.

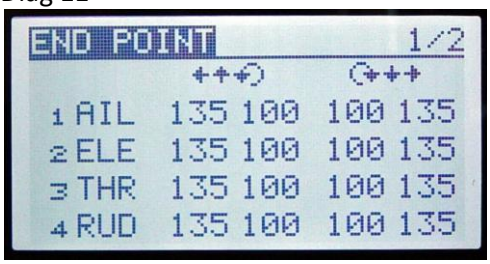
SETTING END POINTS

Now that the servos are connected and working in the correct direction it is important to adjust the control linkages so that each surface moves consistently and by the correct amount (often referred to as its “throw”).

When the transmitter control stick is in its central position the servo arm should usually be at right angles to its push rod. If the servo arm is not at right angles the control surface will move more in one direction than the other. Check each servo in turn and, if necessary, remove the servo arm and re-position it on the servo so that it is at as close to a right-angle as possible.

Now, for each control surface in turn, check with the model’s instructions to see the recommended amount of movement (throw). If necessary, disconnect a clevis on either the servo arm or the control horn and experiment by connecting it to different holes until the correct amount of movement is established.

Diag 11



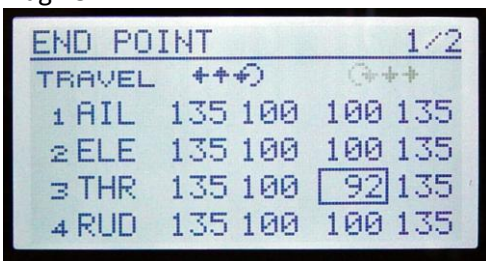
Scroll to END POINT in the LINKAGE MENU to see how you can alter the total amount that each servo, and therefore its connected control surface, will move in response to the transmitter’s controls (see Diagram 11). For the moment ignore the outer columns of figures (135) and look at the two inner columns of figures which show the end points in each direction for each servo. They are initially set at 100%. As explained below, this can be changed but it should only be used for making **very fine adjustments** once the mechanical adjustments described above have been completed. Reducing the servo travel by the transmitter’s end point adjustment prevents the power of the servo from being fully utilized. This places more strain on it, draws more current from the battery and makes it centre less accurately. On a trainer, where precise control throws are not critical, it should be possible to maintain the end points of the control surface servos at 100% by careful setting up of the mechanical linkages.

On the throttle of an I.C. engine, however, end point adjustment is very helpful for setting the idling speed. Connect the throttle servo to the arm on the carburettor so that, when the transmitter throttle stick is fully up, the throttle barrel is fully open. Next pull the transmitter throttle stick fully down. The throttle barrel should now be very nearly closed. If necessary move the clevis to a different hole, as before, to obtain the correct movement.

In the END POINT screen scroll to the left hand 100 value next to THRottle (see Diagram 12). With the throttle stick in the up position the arrows at the top of the screen will flash. This indicates that the left hand 100 is the end point for the high throttle position.

Diag 12

Diag 13



Move the throttle stick down and the arrows on the right of the screen will flash. Accordingly, in order to adjust the idling speed, scroll to the right hand 100 and tap RTN. Scrolling will now change the end point value in the box. Decreasing the value will decrease the amount of servo movement and so make the engine run faster (see Diagram 13). With the model restrained start the engine and let it warm up. Decrease the value in the END POINT screen and fully close the throttle (stick down). Now gradually scroll to increase the end point value again until the engine has slowed to a reliable idling speed. Tap RTN to store the end point value.

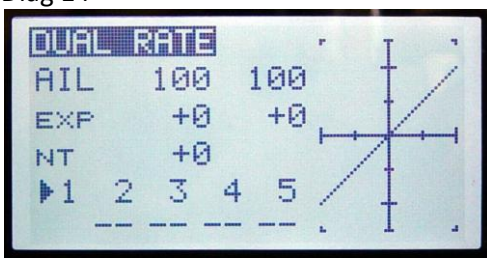
If necessary the end points in each direction for other servos can be changed by highlighting the appropriate value, tapping RTN and scrolling to adjust.

DUAL RATE SWITCHES

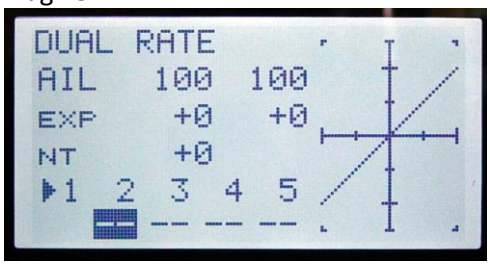
With these you can reduce the amount of movement of the control surfaces at the flick of a switch while flying. This will make the aircraft less sensitive to fly.

In the MODEL MENU select DUAL RATE. Diagram 14 shows that AILeron can be set on this screen. The two values of 100 show that the ailerons are currently set to give 100% movement in each direction. An arrow head points to the number 1 at the bottom of the screen indicating that the 100% values will apply when the rate switch is in position 1.

Diag 14



Diag 15



Scroll to the -- underneath the number 2 at the bottom of the screen (see Diagram 15). Tap RTN and a H/W (hardware) select screen will open. This lists all the control sticks, switches, levers and dials. Switch SD is used in this example for turning the

aileron dual rates on and off though you may use whichever control you find most convenient. Scroll to switch SD and tap RTN. ON/OFF will now become highlighted (see Diagram 16). Tap RTN.

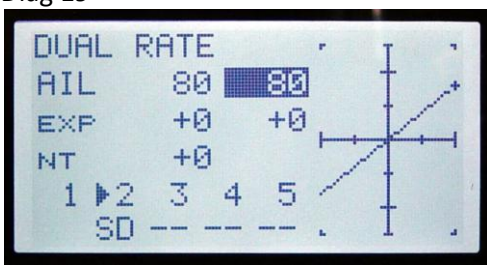
Diag 16

Diag 17

The ON/OFF screen will appear. When switch SD is fully up the screen will appear as in Diagram 17 with the arrow pointing at the top OFF. Move switch SD to its middle position and the arrow indicates that the switch is still OFF. Only by moving SD fully down will it switch ON. Scroll to the OFF in the middle position on the screen and tap RTN. Scroll again and you will be able to change the OFF to ON and save the setting by tapping RTN. As Diagram 18 shows, the switch now turns on as soon as you move it down to the middle position. Choose the setting which seems most convenient. You could, for example, set the switch to be OFF when in the down position and ON when up. The 8FG allows you total choice of which controls to use and how they operate.

Diag 18

Diag 19



Return to the DUAL RATE screen in MODEL MENU. Operate switch SD and, as you move it to its ON position, you will see the arrow at the bottom move to the number 2. Scroll to the first 100 next to AIL. Tap RTN, scroll to change the value to 80 and tap RTN again to save it. Similarly scroll to the second 100 value and change it to 80. (Diagram 19)

You now have Dual Rate settings for the ailerons. They will move fully when switch SD is off but will only move 80% of their normal travel in each direction when SD is ON. The values can, of course, be adjusted for comfortable flying once the model has been test flown.

Now scroll to AIL and tap RTN. Scroll again and select ELEvator. Follow the procedure described above to set up Dual Rates for the elevator and then the rudder. You may use the same switch for all three or assign different switches to the elevators and rudder.

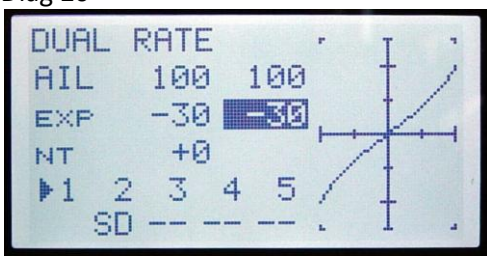
Choosing different rate switches for the ailerons, elevators and rudder gives more flexibility but more to think about when flying. Using a single switch allows you to make the model less sensitive as a whole very easily.

EXPONENTIAL

Another way in which the responsiveness of the model can be changed is by using exponential. Normally each control surface will move in direct proportion to the amount you move its control stick. Pull the elevator stick half way back and the elevator will rise half way to its end point. Exponential changes this so that the control surface only moves very gradually at first but then moves more quickly to its end point. This makes the model less sensitive when performing gentle manoeuvres but, unlike a reduced rate, still retains full control movement when the stick is pushed to its limit.

In the MODEL MENU select DUAL RATE and then the control for which you wish to set exponential. In the example AILeron is selected. Check that the Dual Rate switch is in the OFF position. The arrow at the bottom of the screen will be pointing at 1. Scroll to the first 0 value next to EXP, tap RTN, scroll to change it to minus 30 and tap RTN again to store it. Similarly change the second value to minus 30. Your screen should now appear as in Diagram 20.

Diag 20



The two values allow you to adjust the exponential in each direction. On Futaba radios you use a minus value to make the control less sensitive when its control stick is near the neutral (mid) position.

Now turn on your reduced rate with its switch. The arrow should move to the number 2 at the bottom of the screen. You will see that the exponential values here are still both on 0. Any values entered only apply to the rate number selected when they are entered. If you wish to set exponential values for when flying with reduced rates you can do so using the method described above.

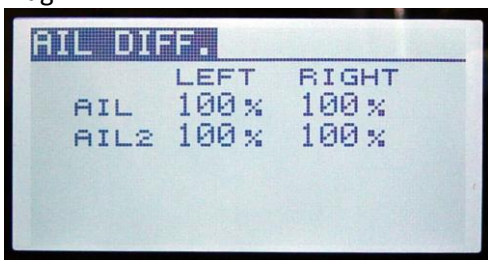
You are free to choose between using just different rates, just exponential or both in combination. You can, of course, ignore them altogether.

AILERON DIFFERENTIAL

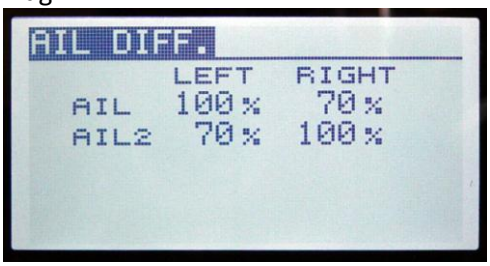
Some models will turn better (and perform aerobatics more accurately) if the ailerons are adjusted so that they rise more than they fall. This is known as aileron differential. It is particularly helpful on aeroplanes with long, slender wings.

The 8FG provides a quick way of adjusting differential though it will only work if the ailerons are operated from two separate channels. In the MODEL MENU select AIL DIFF. (If your model wing type is 1AIL this option will not be available). Diagram 21 shows the default screen with both ailerons set to move 100% of the way to their end points.

Diag 21



Diag 22



Each value can be adjusted in the usual way by scrolling to it, tapping RTN, scrolling to adjust and tapping RTN again to save. Which values you should adjust will depend on how your servos have been installed and are probably best determined by trial and error as follows.

Change the LEFT value for AIL to zero and then move the aileron stick. One of the ailerons will only move in one direction. If it moves up but not down you are adjusting the correct value. Change the value back from zero to 70. If it moves down but not up reset it to 100 and then change the RIGHT value to 70

Now do exactly the same for AIL2. Typically your screen will look something like Diagram 22. When you move the aileron control stick you will see that each aileron rises fully but only lowers 70% of the way down. You can adjust the 70 values after testing the model to achieve a comfortable turn.

AILERON/RUDDER MIX

A properly banked turn is achieved with the co-ordinated use of the ailerons and rudder. This can be quite difficult to achieve, particularly for a beginner. The 8FG helps overcome this by providing an aileron to rudder mix in which the aileron stick controls the ailerons in the usual way but also controls the rudder. The rudder can still be controlled by its own stick as well.

The amount that the rudder moves in response to the aileron stick can be adjusted. Usually only a small amount of rudder is required. The mix can also be programmed so that it always operates (is ACTIVE) or you can set a switch to turn it on and off as required.

From the MODEL MENU select AIL > RUD and the screen shown in Diagram 23 will open.

Diag 23

Scroll to the LEFT +0 value and change it to +50 in the usual way (RTN, scroll, RTN). Do the same for the RIGHT value.

Now scroll to INHibited. Tap RTN, scroll it to ACTive and confirm with RTN. It will now change to ON.

Move the aileron stick to the right while watching the model. The ailerons will move in the usual way but the rudder should also move 50% of its normal travel to the right. If the rudder moves left when the stick is pushed right then change both the +50 values to minus 50.

At the bottom of the screen is SW - -. SW indicates switch and - - shows that no switch has been allocated. Accordingly the mix will remain on permanently.

If you wish to set a switch scroll to the - - as shown in Diagram 24. Tap RTN and the H/W select screen will open. Scroll to your chosen switch and select it with RTN as you did when choosing rate switches.

Diag 24

You should now find that the aileron stick only operates the rudder when the switch is ON.

SETTING LIMIT POINTS

The amount of movement of the ailerons and rudder in response to their respective control sticks was adjusted mechanically and, if necessary, by means of the transmitter's end point adjustment.

The addition of the Aileron/Rudder mix with the settings described above creates a potential problem. When the aileron stick is applied the rudder can move up to 50% of its normal travel. If the rudder stick is applied at the same time the rudder will also move up to 100% of its normal travel. Thus, when both controls are operated together, the rudder could attempt to move 150% of its normal travel. This is probably more than the hinges will allow. The servo will stall, drain the battery very quickly and may be damaged. If it is sufficiently powerful it could damage the linkages and cause a crash. The Limit Point adjustment feature overcomes this by letting you control the maximum amount that any servo can move regardless of the number of mixes applied to it.

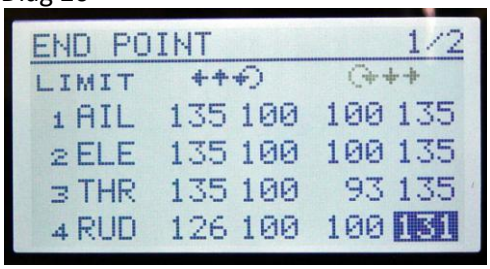
Scroll to END POINT in the LINKAGE MENU. The two outer columns of figures (135 by default) are the Limit Points for each servo in each direction and the two inner columns are the End Points as explained previously.

Diag 25

To set the Limit Points for the rudder first scroll to the Left Rudder **End Point** as shown in Diagram 25 and tap RTN. If you have previously changed it from its default 100 setting make a note of its value. With the receiver switched on, hold the rudder stick fully to the left and scroll to increase the value of the End Point. The rudder will slowly move further to the left and eventually its servo will start to buzz as it meets too much resistance. Reduce the value slightly to find the setting at which the control stick can be held fully to the left without the servo beginning to stall. Now scroll to the left rudder **Limit Point** and adjust it to this setting. Finally scroll back to the left rudder End Point and re-set it to its original value. Set the Limit Point for Right Rudder in a similar manner.

The left and right limit points are likely to be slightly different as they are influenced by friction in the linkages (See Diag 26). As the purpose is simply to ensure that the servo cannot stall this is unimportant.

Diag 26



Although the rudder is currently the only control affected by a mix it is sensible to set limit points for all the servos in a similar manner. You might want to experiment with additional mixes later.

THROTTLE CUT

If you are using an I.C. engine it will be set to tick over when the throttle stick is pulled back fully. To stop the engine you can move the throttle trim lever but must then remember to re-set it ready for the next flight. It is simpler to set a throttle cut switch.

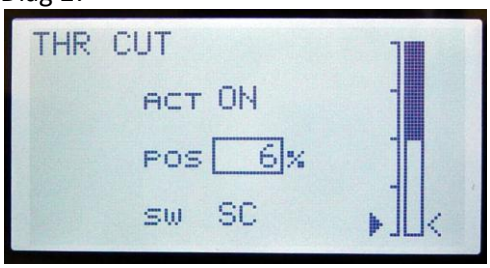
Select THRottle CUT in the LINKAGE MENU. Scroll to INHbited, tap RTN, scroll to change it to ACTive and save with RTN.

Scroll to - - next to SW. Tap RTN, scroll to select a switch and tap RTN to save it. Switch SC is used in the example. (If you wish to change the way in which the switch operates go to the ON/OFF screen). Return to the THR CUT screen.

Set the throttle stick to the fully closed position as throttle cut does not work at high throttle settings. Switch on the receiver.

Activate throttle cut with the switch you have just assigned. As shown in Diagram 27 ON will appear next to ACTive. Scroll to the 17% next to POS. Tap RTN and scroll to decrease this value to zero or until the throttle servo just begins to buzz. In the latter case increase the value slightly so that the servo is not stalled.

Diag 27



If this setting does not stop the engine when the switch is operated at low throttle you will need to adjust the linkage.

TIMER

It can be helpful to set a timer to warn you that the fuel or flight batteries may be running low. This can be achieved with a switch but you must, of course, remember to turn it on. The following notes explain how to set a timer which will start automatically as soon as the throttle stick is moved forward.

On the main screen scroll so that ST1 is highlighted (see Diagram 28) and tap RTN.

Diag 28

Diag 29

The TIMER screen will open as shown in Diagram 29. By default the timer will count up from zero but it can be set to count down from a specified time. To do this scroll to UP next to MODE. Tap RTN, scroll to DOWN and tap RTN to save.

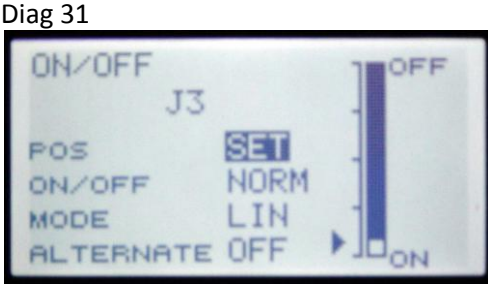
To set the amount of time before the alarm sounds and also the time from which a down timer will count scroll to the 10 next to ALARM. Tap RTN, scroll to change the number of minutes and tap RTN to save. The number of seconds can be set in the same way if required. In the example in Diagram 30 the timer is set to count down from 15 minutes.

Diag 30

To set an operating switch scroll to the - - next to START and tap RTN. On the H/W select screen which opens scroll to the throttle stick (J3 in Mode 2 transmitters) and tap RTN. Tap RTN again to open the ON/OFF screen.

Pull the throttle stick down to its fully closed position and then move it back up by one click of the ratchet. At the ON/OFF screen scroll to SET next to POSition. Tap RTN to make the throttle stick (J3) switch the timer on and off at its current position.

Diag 31



Diag 32

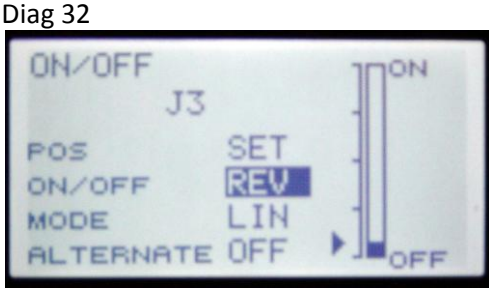


Diagram 31 shows that J3 is switching the timer ON when it is at its very lowest position but OFF for the rest of its travel. To change this scroll to NORM next to ON/OFF. Tap RTN, scroll to REVerse and tap return to save. You will see that the timer will now be switched on unless J3 is at the very lowest point of its travel (see Diagram 32).

The timer will reset each time the transmitter is turned off. It can also be reset by scrolling to RESET at the top of the Timer screen and tapping RTN. Alternatively you can scroll to the - - next to RESET at the bottom of the timer screen and set a separate reset switch.

SETTING THE FAILSAFE

The failsafe feature allows you to set the positions to which each control will move should the radio signal to the model fail or be corrupted. While this may prevent a fly-away or save the model from serious damage its main purpose is to minimise the risk to people on the ground.

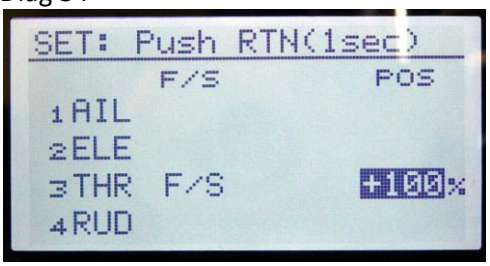
In 7-channel mode the failsafe is only available on the throttle channel. In the LINKAGE MENU scroll to FAIL SAFE and tap RTN. You will see that, by default, the throttle is set to HOLD (Diagram 33). This means that the receiver will hold the throttle at whatever setting it is on when the radio signal fails. It is strongly recommended that this should be changed.

Diag 33

Scroll to HOLD next to Throttle and tap RTN. Scroll to change HOLD to F/S and confirm with RTN. A % value will now appear which shows the POSition to which the throttle will move in the event of signal failure. Scroll to this value. Move the throttle stick to its fully

closed position and hold RTN for a second. The value will change to reflect the position of the stick (see Diagram 34).

Diag 34



Check the operation by switching on the receiver. Open the throttle by moving the throttle stick up. While watching the throttle servo switch off the transmitter. The throttle servo should move to its tick over position. Switch on the transmitter again and the throttle servo should return to its original position. On an electric model the motor should stop when the failsafe activates.

In MULT and MLT2 frequency modes failsafe positions can be set for every channel.

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August, 2011