ChopperAddicts FULL guide to the Spektrum DX6i Radio

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In case you are looking for any other of the tutorials in my series, you can download or read any of them by going to http://www.chopperaddict.co.uk and selecting the menu link to my Tutorials

The full set of tutorials (as at July 2009) include :-
1 - Setting up a collective pitch helicopter
2 - Learning to hover a collective pitch helicopter
3 - Moving on from the Hover to forward flight -
4 – Learning to fly basic aerobatics with a helicopter –
5 - How to correctly assemble and fit a Trex 450 style rotor head to a Belt CP
6 – How to fit TowerPro SG90 servos to a Belt CP – and dodge the pitfalls
7 – Setting up a DX6i & heli for the first time – A step by step guide
8 – ChopperAddicts guide to the DTS mod for Belt CP helicopters
9 – ChopperAddicts detailed guide to the Spektrum DX6i

Hi there, and welcome to what is now my 8th tutorial in an ever growing list of documents that are all targeted at helping the Radio controlled helicopter pilot to fly and setup their helicopters and radio systems correctly.

This one will hopefully fill a hole missed by the manufacturers of the Spektrum DX6i 2.4GHZ radio system, whose documentation while certainly lengthy, does not tell you what all the settings are for, or what effect they will have, or even how to change many of the correctly.

So my aim here is to go through each and every setting that is applicable to radio controlled helicopter flying, and describe them in as much detail as possible, explaining what each one of them do, how to change them, and even what effects they may have on other settings provided by the radio.

IMPORTANT – The Legal bit

Because I make suggestions here as to setting some individual values, I must make it clear that you use any of the information in this documentation entirely at your own risk. You use this in the full understanding that the author is not responsible for liability resulting from any damage or injury to you or to any third party or property due to the use of this document.

So lets start with the Setup menu

MODEL TYPE

Only two choice here, and as we are talking about helicopters, we have to go with the heli option here. NB – if you save it as ACRO and then reset to HELI, all other settings are cleared automatically.

Changing this setting makes the DX6i expose the right settings for helicopters rather than planks.

MODEL NAME

Simply let's you put in a short name for that particular configuration. You can change it at any time later if required.

MONITOR

Useful visual guide to the direction of movement and the extent of movement of all the channels. Very useful to check this if you cannot get the servos working the correct way around, as it shows the Aileron and Aux channels separately.

REVERSE

An essential screen that lets you reverse the direction of operation of all the servos. This is necessary as some servos operate in CW direction, others in an ACW direction, plus the direction of mounting of a servo can effect the direction you need it to rotate.

One slightly confusing aspect on this screen is what the DX6i calls the Pitch setting, but this is actually the AUX channel used by one of the two aileron servos on CCPM setups.

SWASH TYPE

A very important setting. It offers only two options of 90 degrees or 120 degrees. Most helicopters today use 120 degree swash plates, and these need to use CCPM mixing. Examples of such helicopters are the Esky Range, the Trex 450 range, the Blade 400 and many others. Some larger helicopters however do use the 90 swash plate, and these do not use CCPM, but rather they have mechanical mixing designed into the swash plate design. Examples of such helicopters are the Hirobo Scale helicopters such as the Schweizer 300, the large Trex range, and many others.

It is easy enough to decide which one you want, just look at the swash plate and see what the angle is between the elevator and aileron balls. If more than 90 degrees, you need to select the 120 degree setting.

This also changes some of the other selections that are made available in the DX6i, so it is good idea to set this up very early on in your setup procedure.

THROTTLE CUT

An essential setting, it should ALWAYS be set to ACT(ivated). This will enable the throttle cut switch to kill all power to the motor whenever it is switched on. We cover how to configure this later on

DR/COMBI

This screen is only used to let you select the switch that you want to use to switch between NORMAL and STUNT modes. It is therefore most commonly known as the Idle Up switch or “Devils Switch”

The setting most pilots use is FM. Which stands for F Mode (Flight Mode).

If you absolutely and definitely do not want to use STUNT MODE at all, you can select INH here, and then the Idle Up switch will not do anything.

Once you have selected F MODE here, you will no longer be able to access or configure any of the Aileron, Elevator or Rudder Dual Rate switches, so they will have no effect for you when flying.

TIMER

Useful little electronic timer that can warn you when the LIPO is about to get too low when flying. You can select it to be a count up or a count down timer, set the timer period of course, and finally select the switch that starts/stops the timer. Most people choose the trainer switch, so flicking it once starts the timer, flicking it again stops the timer.

When the timer expires, the X6i gives 5 or 6 short beeps to warn you. It repeats this every 5 seconds or so until you turn the timer off again.

RANGE CHECK

This is used to let you verify that the TX and the RX are able to communicate successfully at a decent distance. How to do this is covered in detail in the DX6i manual.

POWER SETTING

This is a slightly unusual setting, but basically there are only two ranges available.

If you are flying in the UK and Europe, you should set it to the A-EU-328 setting, and if you are in the USA and Canada, you should select the A-US-247 setting.

CONTRAST

Use this to adjust the back lighting of the screen to make it clearer to see.

TIP – When new, the DX6i comes with a film of clear material over the screen to protect it. Removing this film makes the screen a lot easier to see, especially in bright sunshine.

COPY/RESET

As it’s name implies, this option lets you copy the entire current configuration to a different configuration in the DX6i. Useful if you want to experiment with one setup, but don’t want to loose the current settings so that you can revert to it again if it all goes wrong !!

You can also use this to completely RESET all settings in the current configuration to the manufacturers default settings.

ADJUST LIST

Takes you to the other (ADJUST) menu in the DX6i.

The Adjust menu

Select Model

Obvious really, but for completeness we will discuss it here. This lets you select anyone of the up to 10 model configurations that you may have setup in your TX. A word of caution here however, check that you have the selection right after selecting it, as it is quite easy to somehow roll over to another selection as you are pressing the roller control down to select the one you actually want.

HINT - Typically, if you power up a heli and it sits there beeping slowly and constantly, it means it cannot find the TX, and this may be the cause of that.

DR/EXPO

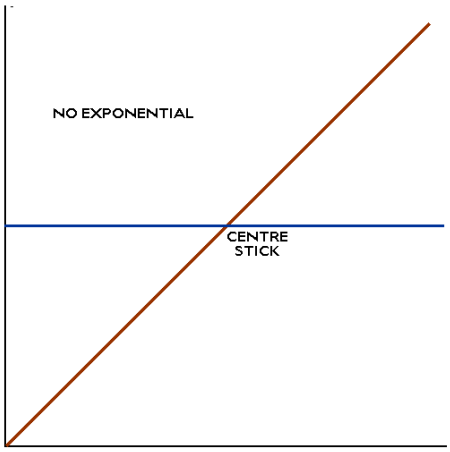
These are something that it seems many people do not understand very well, although it is really quite simple.

Basically the DR stands for Dual Rate, and EXPO stands for exponential control. These are the same settings per se, but the left hand column is ONLY used for setting the extent of overall movement for use with the DR switch, while the right hand column is the settings you need to use to adjust the expo for normal flight.

What does Expo do – Well, it is mainly used to soften the movement of the servos on the aileron and/or elevator and/or rudder around the centre stick position. To do this you have to think of a graph line showing what happens as you increase let's say the aileron.

With no Expo on the aileron cyclic, the correlation between the cyclic control and the aileron servo is a on a one to one basis, so the more you move the stick, the more the servo horn moves at the same speed.

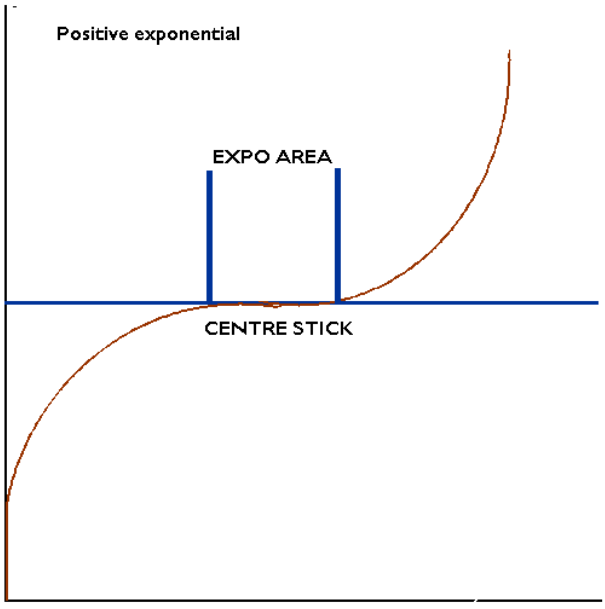
Therefore the graph line would be a straight line at 45 degrees from bottom left to top right, as shown in the image below. The movement of the servo horn is shown by the red line and shows just how much movement the servo will make in either direction as you move the control stick. The stick movement is along the blue line, the servo movement follows the red line.



As you can see, whichever way you move the aileron stick, it is going to move the same distance along the red line, making the servo horn do exactly the same thing, moving at the same speed throughout its movement.

If you then provide some positive expo to make it less responsive around the centre stick position, what happens is that the servo does not move so far as previously for a given amount of aileron cyclic input. However, once it reaches the end of the Expo range, it then speeds up, or in other words moves further than previously, so that you still get the full servo travel with full cyclic input.

The graph for this looks rather different, as it looks more like an ‘S’ that is flattened out. Where the line is more horizontal is where the Expo effect is going to occur.

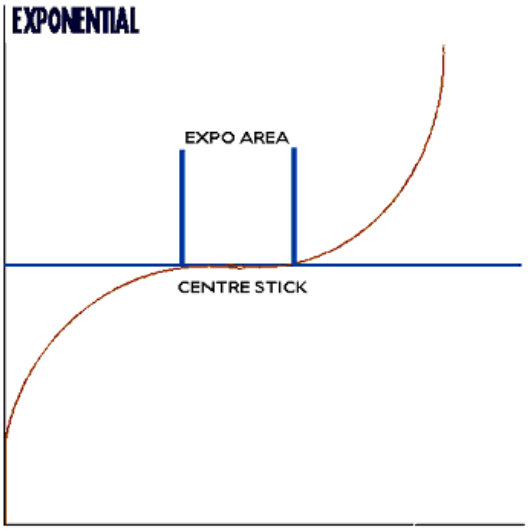


In our example above we have emphasised the curve far more than it would be in real life to make the point more clearly. Normally of course, you would not set up an Expo that gave you almost vertical movement at either end and almost no movement around the centre stick position, although it is possible to do so if their really was any need for it.

You can see that we have marked the area of stick movement where we are going to have expo effect around the centre stick point. It is now easy to see that as we move the stick left or right, initially there is very little movement away from the centre line, which means our servo horn is not moving much at all either. As the amount of aileron input is increased, the movement of the servo horn starts to accelerate, and therefore it moves further.

The DX6i apparently seems to let you set up two entirely different sets of expo settings, but as stated above, it is the RIGHT HAND COLUMN ONLY that you use to set expo.

You can set the expo for each axis up to be either a positive or a negative value. A negative value will make the control softer around the centre stick position, and vice versa.



For completeness, the graph above shows what will happen if you use a positive value of around +20% for aileron expo. We have exaggerated the curve for illustration purposes only. As you can see, this shows that as you move the stick from the centre position, you will get a slow and short movement at the servo, but this movement speeds up and the distance travelled by the servo horn increases as you apply more aileron input.

Exactly the same things happen for the elevator and rudder expo settings, so you can set all three up independently to suit your own personal taste.

As a good guide, to soften a helicopter around the centre stick position for the aileron and elevator, which are the two most commonly used expo settings, a positive value of around +15% to +20% is usually about right.

As stated before, it can be a little confusing to set the expo in the DX6i, as it shows a setting of 100% in the left column and INH in the right. As stated above, the left hand column should normally be ignored, as this only changes the Dual Rate travel extent, which most helicopter pilots do not use.

Before setting these, you should check that all the Dual Rate switches are in the NORMAL (0) position, and that the value shown at the left of the expo screen say's "100".

To set these to a positive expo of +20%, to soften the response, you need to change the change the INH to +20. Repeat for the Elevator setting. If you also want the rudder quietened down, you can use the same settings. As you can probably see, the larger number the wider the expo band is going to be.

IMPORTANT – Don't forget that when you first fly with some positive expo, both cyclic axis and possibly the rudder as well will NOT REACT AS QUICKLY as you are used to, so take off gently and feel the cyclic responses before trying to do anything exotic.

If it is still not soft enough, land the helicopter, put the THROTTLE HOLD SWITCH ON FOR SAFETY and then change the settings by decreasing the value on the left and increasing the value on the right. If it is too soft, reverse this by increasing the left value and decreasing the right value.

TRAVEL ADJUST

This is also often called ENDPOINT adjustment by many pilots.

As it's name implies, this set of adjustments let's you fix the maximum range of movement each servo will be able to move. This is an important area, for as you probably already know, if you have a servo that is being thrown too far, causing it to bind at either end, this will most likely result in a burnt out servo pretty rapidly.

The travel adjustment can also be used to limit the maximum throw a servo will make intentionally. A good example of this is on the Belt CP collective pitch helicopter, where the total amount of tail movement is really pretty limited, and rather than having to move the ball on the servo horn too far in to limit it's effect on the tail, you can simply limit the servos throw in both directions to match the range needed.

To set the endpoints of each servo is the same process, no matter which channel you are doing it for. There is one thing that has confused quite a few people initially, and that is how you set it up differently for either end, as there appears to only be one single changeable value provided.

The answer to this conundrum is very simple,

Let's take the aileron servo again as our example. Select it and change it's value to say 80%. What you have in fact done is only set the left hand throw of the servo. Move the aileron stick left and you will see that it will remain at 80%. Now move it to the right, and you will see it will revert to the original 100% setting as it reaches the centre point again.

Now hold the aileron stick to the right and while doing so set a new value (say 90%) in the DX6i. Now you will see that as you move the stick left and right, the value will switch between 80% and 90%.

An excellent use for endpoint settings is to ensure that when full pitch is selected, the mixer arm hub is not being forced up against the base of the rotor head hub. This can apply equally to the bottom limit, where the swash plate may bottom out on the mainshaft locking collar.

Another time it quite often used is to bias the movement of rudder servo as mentioned previously, for as we know most helicopters require a lot more rudder input in one direction than the other due to the fact that it is always counteracting the spin of the head. You can use the endpoint adjustment to force the servo to only move say 80% in one direction, but up to 125% in the other direction. If you do this, it is a good idea to equal the bias out, so if you set one side to 80%, set the opposite direction to 120%, etc……

SUB TRIM

As it's name implies, this is to allow you to make MINOR ADJUSTMENTS ONLY to the position of the servo horns.

CAUTION – Sub trims should really only be used to adjust the servo horns so that they are perfectly perpendicular to the servo body when doing the original mechanical setup.

If you are not familiar with what is involved with the mechanical setup, I suggest you read one of the many tutorials that are around that cover this in great detail, as it really is a crucial part of setting up any helicopter. (The URL of my own tutorial on mechanical setup is shown at the top of this tutorial)

The only other time that you might want or need to use them is to make VERY SMALL adjustments to the swash plate servos to get it absolutely and perfectly parallel and horizontal.

A final note on sub trims. They provide a range of settings from -100 to +100, but if you have any one of them set to a value greater than say -35 to +35 or so, you really need to try a different servo horn on the servo concerned to get it more central BEFORE using the Sub Trim. Don't forget that servo horns have offset splines, so turning them around, or even switching them between servos can achieve the required aim.

GYRO

Another bit of black magic really, but not too difficult to understand.

The screen shows that there are three general settings, INH, F-Mode and GYRO.

For most people, the required selection is GYRO. You can also use the F-Mode setting, but you are more likely to want to save that to handle switching between normal and stunt mode so I suggest you stick with the GYRO selection. This setting simply selects which switch on your DX6i is to be used to toggle the gyro between rate mode and Heading Hold mode. So you will quite logically be using the Gyro switch at the top left of your DX6i.

The settings that need to be in here can vary quite a bit according to what gyro you have, so I strongly recommend that you read the documentation that came with your own gyro to find out what is needed.

Basically, at least for most gyros, the two settings need to be different, and again typically, one needs to be a value less than 50%, while the other a value greater than 50%. The change in values above and below the 50% mark tells the gyro to switch into the appropriate mode (Rate or HH)

If you do not have any documentation on your gyro, try setting the first value to 40% and the second to 60% and then see what happens to your gyro.

Also, don't forget that for this to work at all, your gyro must have a single wire connection to the receiver in addition to the main rudder connector that simply signals the value required to the gyro, which then switches the gyro's operating mode. If your gyro does not have this single wire connector, you cannot use this setting in the DX6i and should select INH.

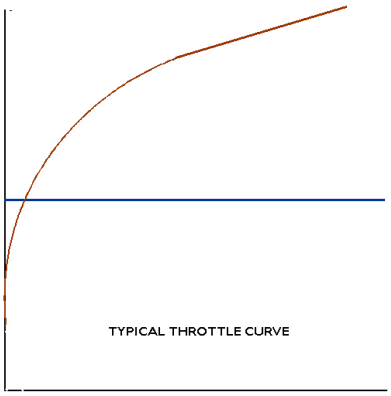
Finally on the subject of Gyros, when you want to set up the gyro for Stunt mode, you need to switch it from showing mode '0' to mode '1'. To do so you simply flick the gyro switch on the TX and the mode number will change for you.

THROTTLE CURVE

Obvious really, it sets the way the throttle reacts to increases and decreases of the throttle stick.

Now you might think that a nice straight diagonal line from bottom left to top right would just fine, as this would provide a steadily increasing head speed as the pitch increases. Although you could do this, you will find it will not work very well with most helicopters.

In fact the throttle curve is usually a far more curved line, bringing head speed up rapidly at first, and then slowing that rate of increase higher up the throttle range. This is illustrated below, although it is slightly exaggerated to make the point clearer.



As you can see, we start of at the lower left with ZERO THROTTLE, and by the time we reach mid throttle (half way along our blue line), which is where the helicopter will be getting light on it's skids, our throttle, and therefore head speed, is already at around 80% in this illustration.

A more likely real world setting would be around 65%-70% of max rpm at mid throttle setting

There are many discussions in the forums on both throttle and pitch curves, but the most common consensus is that these curves are a very personal setting, and depend on your flying style, your helicopters power and it's lifting ability.

The DX6i lets you specify 5 points in the curve. Some TX's offer even more, but 5 points is just fine.

When you are first setting up the DX6i, you need to ensure that you select the NORMAL curve, NOT THE STUNT CURVE. Then scroll the next field through it's range, which is L, 25, 50, 75, H (Low, 25%, 50%, 75%, High)

First off, ensure that you have the L setting to ZERO - of course, we DO NOT WANT ANY THROTTLE AT ALL when the throttle stick is fully down. Then work your way through each of the other settings, entering the values required to achieve the curve you want.

A commonly quoted throttle curve for those learning to hover is a range of 5 point settings looking something like 0, 35, 65, 95, 100

This will give you a curve very similar in appearance to that shown above.

Why these particular numbers you may be asking ?

Well, let's look at them shall we.

Zero – throttle OFF – obvious…

35% throttle at 25% stick – spooling up the head speed, and probably still have a negative pitch value at this time

65% throttle at 50% stick - Going light on our skids, pitch will be increasing through 3 degrees or so.

95% throttle at 75% stick – This is the critical one really. We have now lifted off, and will be working with a positive pitch range of around +5 to +9. This is where if the pitch is too much for the motor, or the head speed is too slow, the motor can get BOGGED down by the load, and to correct this you typically change the 50% and 75% throttle settings as well as those same pitch settings.

100% throttle at 100% stick – obvious again, but not necessarily, for you may choose not to use the maximum speed of the motor at all if you want to do so.

Another reason for using high motor rpm as soon as possible is because for most electric helicopters, the faster the motor is running, the easier it is for it to drive the main gear and the head efficiently.

The secondary effect of this is to provide more airflow over the electronics, especially the ESC, to help keep them cool. If you find that the head speed is too high for your comfort when you do this, get yourself a new motor pinion with LESS teeth to reduce the head speed.

If you are in to flying 3D, then you are going to want to do something very different with the throttle curve for the STUNT setup. So let's look at that for completeness.

The first question to ask ourselves is what do we need from the throttle to fly 3D routines. Well the answer is simple really, you will need FULL THROTTLE at both maximum throttle and also at minimum throttle. This is so that when the helicopter is inverted you will switch from full throttle to minimum throttle, which will then mean the throttle is working normally, but in the opposite direction to normal.

Why do you need that ? Well, when we get to look at the pitch curves it should become a lot clearer

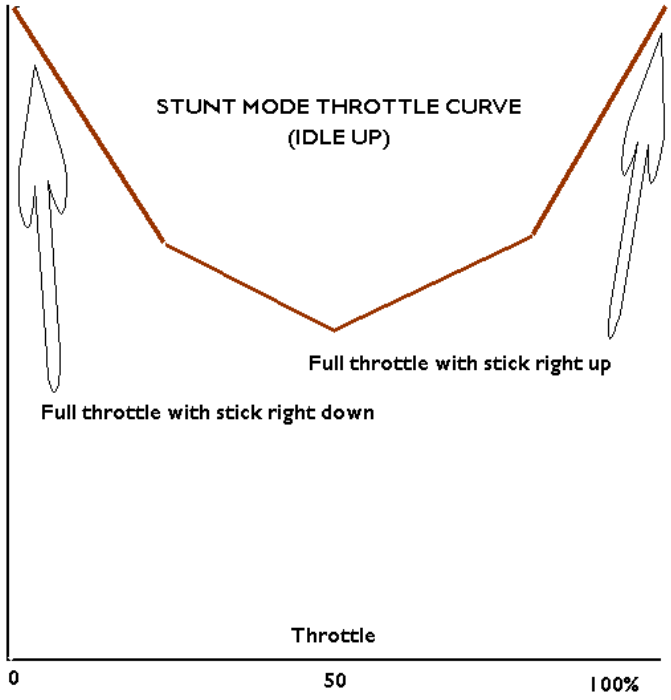
A fairly typical STUNT mode (Idle up) throttle curve is shown below.

An important point to take note of is the fact that the centre stick point drops to around 50% throttle. It doesn't need to do so, but you need to remember that at some point you are going to flick the "devils switch" (Idle Up) and the one thing you do not want is to have the head to suddenly start to accelerate like mad.

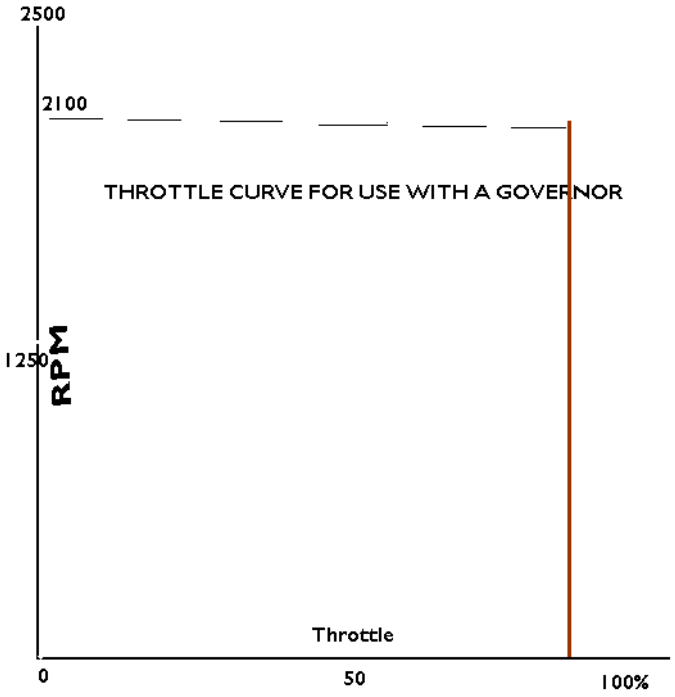
The trick here is to pick a suitable point in the NORMAL curve and match the centre point of the STUNT curve to the same point in the NORMAL curve. The point most often chosen for this is around 50% throttle. The reason for choosing this is quite simple. With around 50% throttle, most helicopters will just be going light on their skids. By flicking the Idle Up switch at that point, the rotor head speed will remain the same, but almost certainly the pitch will change, usually to a more negative value.

It is an equally good idea to try to match the 75% and 100% throttle settings ion both Normal and STUNT modes, so that you can switch between them at any time you have 50%+ throttle without the head speed changing. (Thanks to Dusty1000 again for this point)

You will see how this all works when we talk about STUNT settings for the Pitch curve.



There is also one more variation we need to cover, and that is if your ESC provides a governor mode, and you want to use that in STUNT mode.



As you can see from the above graph this is a very strange setup, as all that most governors want is a perfectly straight, horizontal line that will represent the percentage of throttle, or head rpm that you want the governor to maintain.

By looking at our graph you can see that our throttle line is dead straight and vertical, which shows that we have selected a value for the head rpm of about 85-90% throttle, which will give us around 2100 rpm.

WARNING – When switching to STUNT mode and using the governor, the head is going to start to spool up quite rapidly. Most governors cover this by ensuring the initial build up of rpm is nice and smooth. One of the most common methods is that the ESC controls the head speed build up initially, and thereafter, as long as the throttle stick is not left unused for more than 5 seconds, it responds instantly to inputs. If no throttle movement is made in that period, it will revert to assuming that a slow start up is required again. This is fine, as don't forget that basically now the throttle stick is only controlling pitch changes, as the governor is handling the head speed and therefore the motor revs.

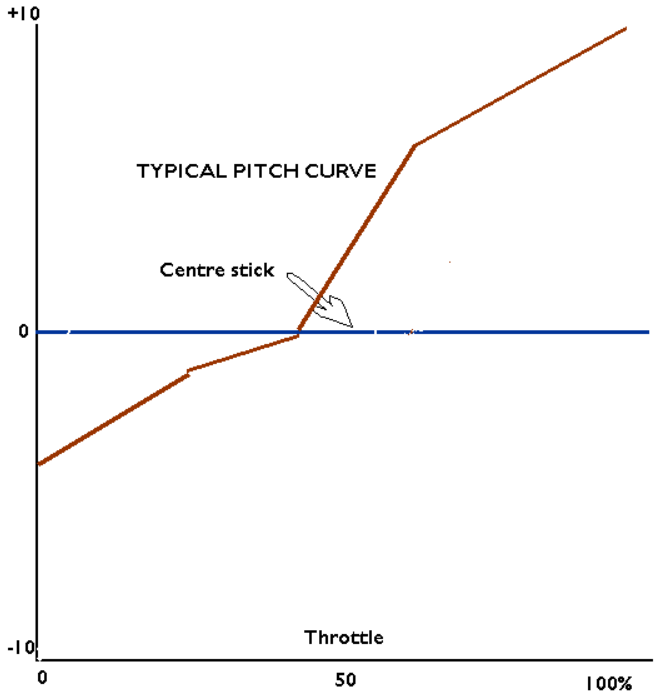
If you are not going to use the STUNT mode for 3D flying or under the governor, then once you have set the NORMAL curve, select the STUNT (Idle up) settings and use the same settings in STUNT MODE as well. This will protect you from any nasty shocks if you hit the Idle Up switch accidently, as both are identical.

Finally, and VERY IMPORTANTLY, select the HOLD option and set this to either ZERO, or even a small negative value. This is used by the throttle hold switch at the top right of your DX6i, and is the most important switch on your TX.

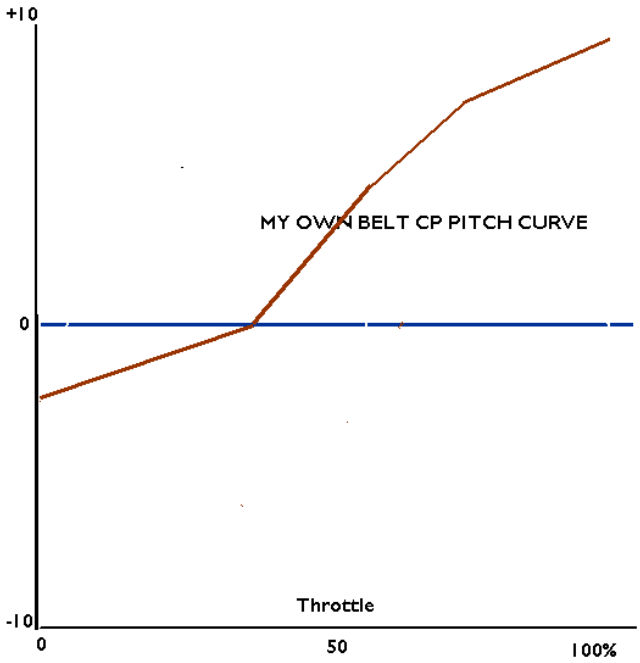
PITCH CURVE

As with the previous throttle curve, the way the settings are used are basically identical, but the shape of the curve we want is totally different again. As can be seen in the diagram below, the pitch curve is quite different to the throttle curve, starting the pitch at about -5 degrees, and increasing slowly to about the 40% throttle setting. As we reach 50% throttle, the pitch increases more rapidly so that at 65% throttle, we have around 6 degrees pitch, and then the pitch increases a little more slowly to 10 degrees at full throttle.

This is because we don't want too much pitch until the head speed is correct. After that it is a question of balancing the amount of pitch the head can take without bogging the motor down as you increase the throttle setting.



However, different helicopters will end up with very different pitch curves for many reasons. It also depends on how you want to fly, 3D, scale, hovering, FFF and normal aerobatics etc.



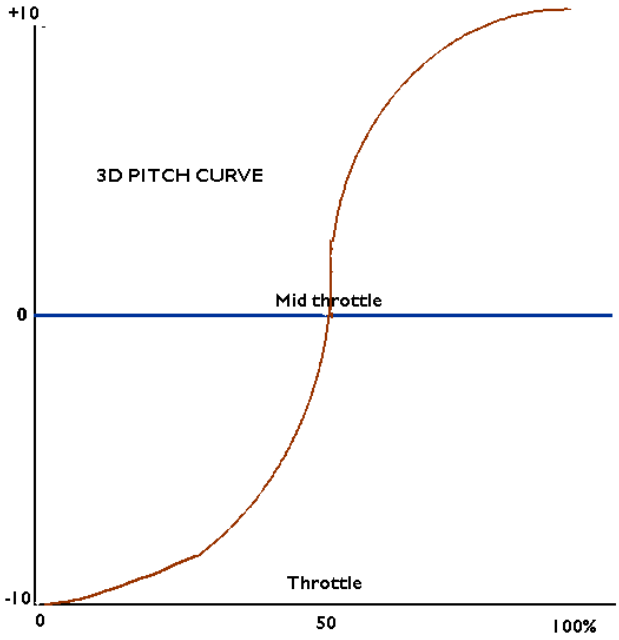
This is perhaps best illustrated by the curve I personally use on collective pitch Esky Belt CP that I use mostly as a test bed for hovering and FFF with all sorts of modifications being made to it all the time. As you can see from the curve, it has literally VERY LITTLE NEGATIVE PITCH AT bottom throttle, and starts off at about 40% throttle with zero pitch, and then the pitch increases more rapidly to about the 70% throttle setting, and then smoothes off again between 75% and 100% throttle.

This curve gives me a very nice smooth lift off, with a good initial climb out response to the hover, and then an almost linear increase in lift the rest of the way from a steady hover upwards.

So you can see how many options there can be between these two curves.

As an initial setting, try out the straight diagonal line and see what happens, then adjust the curve points in conjunction with those of the throttle curve to achieve the result you want and prefer.

If you are going to fly 3D aerobatics, you will need to set the pitch curve in STUNT mode to be very different from your NORMAL curve.



As you can see from our graph, (which is not one to be followed slavishly, it is just an illustration) this is pretty different to the previous pitch curves. What is happening is that we need the pitch to be about zero at mid throttle, but we are going to want ABSOLUTE FULL NEGATIVE AND POSITIVE PITCH RANGES AVAILBLE to us to let us have the same control when inverted as when flying the right way up.

You can soon see that this curve will give us just that, for at zero throttle, our curve is way down at the bottom of the negative range, it moves up to zero at mid throttle, and finally gives us full positive pitch at 100% throttle.

If you are not going to use the STUNT mode for 3D flying, then once you have set the NORMAL curve, select the STUNT (Idle up) settings and use the same settings in STUNT MODE as well. This will protect you from any nasty shocks if you hit the Idle Up switch accidently, as both are now identical.

SWASH MIX

This is also a relatively straightforward setting, but one that is misunderstood by many people.

Basically, it is right at the heart of the CCPM mixing system (assuming you are using CCPM). It also lets you calm down both aileron and elevator responses in much the same way as the Exponential Settings can be used to do this, but it works in a different way.

You will see that there are three settings available in the Swash Mix menu, AILERON, ELEVATOR and PITCH.

The almost de-facto initial settings used for all three of these is typically 60%. What this means is that the aileron and elevator servos will only be allowed to move through approximately 60% of the total movement possible for the swash plate servos when being used by the cyclic stick. NB – Different Servos will give you quite different amounts of throw, so check your own setup carefully.

This means that applying cyclic in any direction will be less abrupt as you can not move the swash plate too far. The PITCH Setting is however rather different, as this controls how far the CCPM will move all three swash plate servos together to change the main blade pitch. Any setting made to the PITCH value here DOES NOT EFFECT the range of the INDIVIDUAL Aileron or Elevator movements.

So if you leave the first two at 60%, the helicopter will not be able to perform wild snap rolls, or flips, but it will be much softer to fly. If you set them to 100%, then full back elevator will almost certainly result in an instant flip onto it's back, and full aileron will execute a very rapid roll.

However, be very careful to check that high settings for the aileron and elevator do NOT CAUSE BINDING anywhere in the head, such as the flybar cage hitting the blade grips etc. (Thanks go to Dusty1000 for raising this very valid point)

To check for binding, a good way is to place the main blades over the nose and tail, and then move the elevator cyclic to full in either direction and then check for any binding, as this is the most likely place that binding will occur.

But if you change the PITCH setting, this will limit the range of movement of the swash plate range up and down, and will therefore have some effect on your PITCH CURVE AS WELL…

Think about it and you will understand why. ☺

The most likely Swash Mix settings for a reasonably gentle helicopter would be 60%, 60% and 80% respectively.

HINT– A problem that occurs relatively frequently is that when first setting up a helicopter in the DX6i, you find that the servos are not operating in the correct direction. You natural response is to go to the RVERSE menu and switch them over, but this is quite often not the right answer.

The reason for this is that the Swash Mix also allows you to reverse servo operation, because the range of values available go from -100% to +100%, which of course reverses the direction.

So, if you manage to get the aileron and elevator cyclic servos to work together correctly, but find the swash plate is not moving up and down smoothly and levelly, you might need to use the opposite "sign" value on any one or all of these Swash Mix settings, and after doing so you might then need to change the REVERSE setting for these servos again. This might mean reiterating through the process a few times, but you will usually soon spot what is needed and get everything working in the correct direction.

MIX 1 & MIX 2

Most helicopter pilots are unlikely to use these at all, especially as that would mean loosing the use of the throttle hold switch. I suggest you ignore these

REVO MIX

This option CAN be useful, but **must only be used if you only have a rate gyro**.

What it does is to allow you to mix the rudder with the throttle so that as the throttle is increased or decreased, the rudder will be applied more or less to stop the automatic rotation of the helicopter against the head movement. Naturally a decent HH gyro will do this for you anyway, so please do not confuse it by adding REVO MIX
The DX6i provides two separate settings here, one for NORMAL mode, the other for STUNT. It also lets you set different rates of rudder for the throttle, one for when the throttle is above 50%, the other for when it is below 50%. This is very useful as typically you will need more rudder offset in the initial 50% of the throttle movement than you do once it is airborne above 50% throttle.

To set this really is a question of trial and error, but try setting the lower band to around 10% and the upper to around 5% and then experiment from there.

Also, these values can be positive or negative, which will of course effect the direction to the tail rotors will work.

Therefore check that you have yours working in the CORRECT DIRECTION before trying to fly the helicopter

If you are not using the STUNT MODE, set the STUNT values to the same as the NORMAL settings.

The Transmitter itself

You obviously have had a good look at your DX6i already, and probably played around with it a bit as well. So let's take a look at all those pesky switches, apart from the sticks, which I am going to assume you understand the functionality of already. ☺

So starting at the top left…

At the very back we have the TRAINER switch. By it's name, it is there to allow an experienced pilot to connect to your DX6i with a cable from their own DX6i and then buddy with you while you are learning to fly your helicopter. However, it does have one other IMPORTANT use, and that is to BIND a helicopter to a model configuration in the DX6i.

What is a BIND ?

Well, in the simplest terms, it means that the transmitter and the receiver work together intelligently, and recognize each other because each TX and each model configuration create a totally unique ID called a GUID. When you bind a model to a TX, the receiver remembers this GUID, and it will not communicate with any other TX until it is bound to it. You can only bind to one TX at a time as it is the RX that does the memory trick, so this rules out having multiple configurations for a single helicopter on the same TX, which might have been a nice feature if you think about it.

BINDING to the RX is pretty easy to do. Take the BIND plug and insert it into the Battery connection on the receiver in the Helicopter. For once, you arm the helicopter FIRST, and then quickly switch the DX6i ON WHILE HIOLDING THE TRAINER SWITCH

FORWARD FOR AT LEAST 2 OR 3 SECONDS. The helicopter should beep and then the LED's will typically come on permanently, showing the BIND was successful. Disarm the helicopter, and then turn off the DX6i. Now restart it all as normal, and the systems should communicate. If your helicopter sits there beeping slowly, check that you have selected the correct model in the DX6i, it is quite easy to get the wrong one…..

Forward of the trainer switch on the top left is what is marked as the GEAR switch (and F MODE in red). This is the dreaded IDLE UP switch, often called the "Devils Switch". If you are going to use Idle Up at all, you should have set this to FM in the DR/COMBO setting screen. This is shown in red in our diagram above.

I have red tape around my IDLE UP switch to remind me what it is, and to ensure it is OFF unless I really mean it not to be. It switches the mode the DX6i is running between NORMAL and STUNT, and therefore if switched ON it will use the STUNT curves for the Throttle and Pitch, and indeed for all other settings that have the option of using NORMAL or STUNT settings. It is essential that you do not have this turned ON when arming your helicopter.

Moving over to the top right, we have at the back the VERY IMPORTANT THROTTLE HOLD SWITCH. As its name implies, when held ON (forward), and assuming you have set the throttle hold to ZERO (YOU DID DO THIS - DIDN'T YOU?), it will instantly kill power to the motor, but will NOT interfere with the pitch on the rotors, which can still be controlled by the throttle stick.

The other times to use this POWERFUL switch is whenever you have the helicopter armed and it is not actually flying, to make sure it cannot accidently spool up and cause damage or worse to you or others around you.

Next to the Throttle hold switch is the Rudder Dual Rate switch. Most helicopter pilots do not use this facility.

Just below that on the front right of the DX6i is the equivalent switch for Aileron Dual Rates. Most helicopter pilots do not use this facility.

To the left of this switch is another very useful control, the THROTTLE CUT button. This does what it says, and cuts power to the motor as soon as it is pressed. It is another good way to ensure the helicopter is not likely to spool up, and although it could also be used rather than the Throttle hold switch if a crash is inevitable, to avoid the helicopter thrashing itself to bits on the ground, using the Throttle Hold switch is a far better choice as you will then still have your fingers free to try to attempt an auto rotation to a safe landing, or at last one with minimal damage.

On the front left of the DX6i is the RUDDER Dual rate switch, and next to this is the GYRO switch. If you have a switchable gyro this is the switch to use to switch it between Rate and HH modes. When you switch this switch, the mode value in the gyro setup screen switches between '0' and '1' for NORMAL and STUNT modes.

Finally we come to the control stick trimmers. Unless you are at the main front menu, you cannot see the trimmer position indicators. However if you slide any one of them across and wait you will hear it beep as it moves. At the end it will give a longer beep and stop. If you then reverse the trimmer direction it will beep just the same, but when it

is back at the centre position it will stop and emit a long beep. If you continue to hold it, it will start to move the other way after about 2 seconds.

And that concludes our walk through the two DX6i Menu systems and the physical TX itself.

If you are setting up you DX6i for the first time, you might want to complete your reading by downloading my DX6i follow up tutorial that tells you in detail how to work through the initial setup of the DX6i, which settings to change first, etc. Links to this tutorial are at the top of this tutorial ☺

I hope that this tutorial has helped you to understand what the DX6i is all about, and how to use it to best advantage to get your heli under control exactly as you want it.

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