GigaTronic Control Manual

Introduction

The GigaTronic system is a completely new approach in controlling the complex system of a model helicopter. Up to now, using programmable remote control transmitters has taken care of combined, collective and cyclic control curve functions. Governor systems for tail stabilization have been added between the tail control signal and tail control (servo or tail motor). They can be activated via a control channel. In the GigaTronic system, utilizes only the transmitter information about the position of the control stick and trim as well as the positions of the switches and rotary/slider controls to the model. The receiver (RF module) sends the information from all of the channels to a central microcontroller. All of the necessary functions are carried out by the GigaTronic system in the model itself. These functions are: matching channels to functions with function-dependent digital signal processing, cyclic control curve functions, mixed and collective control curve functions, operational mode and flight phase switching, model trim, collective swash plate mixing, and, thanks to the integrated gyro element, a gyro system for stabilizing the vertical axis (yaw) of the model in Standard or Heading Hold Mode. A speed governor for the main rotor speed is optional.

Since all of the model-specific data are stored in the GigaTronic, there must also be a possibility of altering the data or creating new data records for various models or pilot preferences. GigaTronic has a special PC interface for this purpose. All of the settings and options such as functions, times, regulation parameters and so on can be set in the “GigaTronic Control” program. The records thus created are archived on the PC. These data records are then transferred to GigaTronic with a special cable and saved using the “save” command. This way, a copy of all data archived on the PC has been created in the model. It possible to transfer these parameters and settings from the PC to another user to benefit from.

In the following, we will describe the individual options and features in the sequence generating the settings for a new model or user. However, before you carry out any settings for your model, you will need thorough knowledge of the system involved. Both beginners and experts can always fall back on the tested default settings, which will work in any case. You can order these from the manufacturer or download them from the Web.

In this description, you will find a block circuit diagram illustrating the functions of the GigaTronic and the model. The exact functions will be described in more detail in the following.

Model and User Settings

Safety Warning

GigaTronic is equipped with many safety mechanisms. These ensure, for example, that the motors will not switch off during flight if there is interruption in signal transmission. However, there is no way that any safety mechanism can intervene in actual operating errors or bad settings such as operating in the wrong operating mode with the wrong system settings or control commands. Always act in such a way that inadvertently switching on the motors will not cause any danger, especially when adjusting the settings of your model. In many of the setting steps, you can remove the main rotor blades to enable access to the model while complying with the safety instructions.

Adjustments on the Transmitter
If you are using computer transmitters, switch off all collective and special functions. Reducing the deflections may result in channel allocation not working properly. Only the PPM coding process is supported for up to nine channels. You will need to use a two-position switch for switching flight phase (hover/acro), and a switch with three positions for operating mode (motor off/standard gyro/heading lock gyro). You can use channel reverse at any time.

For some user and model adaptations, there is also a direct programming option (programming via the transmitter) in addition to the “GigaTronic Control” PC program.

Direct Programming the GigaTronic

As a kind of quick-reference manual in this chapter, you will find out more about which programming steps you can carry out from your transmitter. Any references to the word “CONF” (for confirmation) means the tail motor briefly starts up or the tail servo giving a brief twitch. In both cases, this means that GigaTronic has understood your command and that you can continue.

Learning Channel Allocation
One of the major differences in transmitters used in model flight is the number of channels to be transferred. GigaTronic can receive and evaluate up to nine such channels. Depending on transmitter mode and pilot preferences, functions allocated to certain channels are transmitted differently. This means that GigaTronic has to learn which channel of your transmitter is transmitting which function.

Preparation on the transmitter:
- Switch off all servo reverse settings
- Switch off all mixed functions
- Set all trim levers to the center
- Set flight phase switch to “Hover” (optional)
- Set three-position switch to “Motors Off” (optional)
- Set additional switches and channels to “Off” position (optional)
- Switch transmitter off

Programming:
- Connect receiver battery (flight battery). LED flashes red
- Push both transmitter control sticks into any corner and hold them there
- Switch on the transmitter, wait for CONF
- Release the control sticks and bring Collective Pitch to minimum value; CONF
- Tail control stick full right; CONF, release tail control stick
- Forward Pitch control stick full forward; CONF; release pitch
- Cyclic Roll control stick full right; CONF; release roll

Optional:
- Switch flight phase to “Acro”; CONF, switch back to “Normal” position
- Three-position switch to “Heading Lock Mode”; CONF, switch back to “Off” position.
- Switch additional switches in sequence; CONF, back.
- Forward Pitch to full forward and then back to previous position, long CONF.

Programming finished. LED flashes green

Take-off preparation after channel allocation
- Flight phase to “Hover”, Mode to off (optional)

- Collective Pitch to medium
- Switch transmitter on
- Connect receiver battery; LED flashes green
- Put helicopter down
- Set pitch to minimum; system initializes
- System is ready; LED flashes green
- Check function and direction of effect of Collective Pitch and swash plate
- Mode switch to “Heading Lock”, LED lights up green (optional)

System is ready for take-off.

Gyro Drift Correction

You should always carry out this adjustment if you find that the helicopter is constantly turning on its vertical axis even if the tail control stick is centered. This may happen due to temperature changes around the gyro element during flight.

Preparation:

- Place model on the ground. Motors off
- Tail control stick full left. CONF after about one second

The gyro is now recalibrated, and the yawing is minimized

Model Trimming

This function is advisable if the changes in the mechanics or servo have been made and the helicopter has to be retrimmed.

Preparation

- After take off, trim while hovering. Land model
- With the model on the ground, switch motors off and switch Mode to off (optional)
- Push the tail control stick full left for about six seconds
- After one second, CONF for gyro correction, keep holding rear stick to full left
- After six seconds, CONF after saving trim
- Swash plate moves by the amount of trim correction
- Set Pitch and Cyclic Roll controls to the center

The trim values are now saved in the model memory.

Deleting Model Trim

This function is advisable if changes have to be made to the mechanics or servos of the helicopter. The trim values are set to zero in the model.

Preparation:

- Place model on the ground. Motors off, Mode to off (optional)
- Tail control stick full left for around 10 seconds
- After one second, CONF (gyro correction), keep holding tail control stick to full left
- After six seconds, CONF for model trim
- After another four seconds, CONF for deleting trim memory
- Swash plate moves back by the amount of trim correction

The trim values in the model memory are now deleted.

Adjusting the Swash plate
This function is advisable if the servos have been changed or repaired. The servo is selected by cyclic roll control (right, center, left), and the zero position is changed by the forward pitch cyclic control.

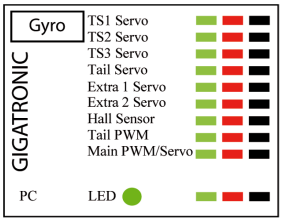
Preparation:
- Center all transmitter trim controls
- Switch off the transmitter

Adjustment procedure:
- Connect the receiver battery. LED flashes red
- Move Forward Pitch and Cyclic Roll sticks to any position and hold that position.
- Switch on the transmitter; wait for CONF
- Release Forward Pitch and Cyclic Roll control
- Move Collective Pitch to maximum; wait for CONF
- Preselect with roll servo (right, center, left)
- With Forward Pitch at full deflection, change servo center position until the swash plate is horizontal and at the correct height

The center of the adjustment range is acknowledged by CONF.
- Setting Collective Pitch to minimum ends adjustment and saves the new settings.

After this adjustment, the model will have to be retrimmed. First delete the model trim settings.

The connections on the GigaTronic and the meaning on the LED display



Servo swash plate 1 TS1 (front left)
Servo swash plate 2 TS2 (front right)
Servo swash plate 3 TS3 (rear center)
Tail Servo (only with tail pitch control)
Servo extra 1 (undercarriage, lights,…)
Servo extra 2 (as extra 1)
Hall sensor (optional)
Rear Power board GT/controller (according to option selected in GigaTronic Control)
Main Power board GT/servo (according to option selected in GigaTronic Control)
PC connection or optional navigation lights

In the last chapter you learned about the meaning of some of the LED signals. Here is a complete list.

LED display signal:	What it means:
Off	GigaTronic is without power or is defective.

Flashing red	No transmitter recognized, or the channel values sent prevent initialization. Pitch/Throttle not at minimum setting (possibly because the pitch/throttle trim controls are not centered); Mode not set to off, flight phase not set to hover (optional)
Red	General fatal error—e.g. defective gyro element
Flashing green	System initialized, motors off, soft take-off activated
Green	Motors are activated, normal operation
Flashing yellow	Ready to allocate channels or adjust swash plate. Or: The system has been switched off due to insufficient voltage supply.

The GigaTronic Control PC Program

As mentioned above, all that is needed to operate the model helicopter with the GigaTronic system is a simple R/C transmitter. All of the model-specific parameters, mixers and control curves are stored in the model, or to be more exact, in the GigaTronic. Each helicopter has a factory default program, developed by expert pilots for optimized trouble-free flight performance. However, many pilots may prefer to individualize their model helicopter or to adapt their GigaTronic to another helicopter system. This is where the GigaTronic Control PC program comes into the picture.

Using the GigaTronic Control Software (GTC) on your PC

After starting the GigaTronic control program, the first thing you will see is the “General Settings” menu, the menu you will need most often. In general after opening the program, the last data file used will be loaded (a *.GTC file). After a new installation, DEFAULT.GTC will be loaded. You can copy this file and use it as a starting point for customizing it. However, if you wish to make changes to the factory default settings for an Eco7 model, go to the “File” and “Open” to select the file “Eco7_Factory Default.GTC”. You can later save the changes you have made going to “File” and “Save”. At this point, you should select a new name for the record. The “Eco7_Factory Default GTC” file is write-protected. However, if you should lose this file, you can download it from the Web pages at Ikarus or from your installation CD at any time. The “GTC” file suffix stands for “GigaTronic Control.”

Most of the operating options are self-explanatory, or as you would expect in the Windows operating system. You can set the slider bars with the mouse cursor holding the left-hand mouse key down and/or by mouse click. The current setting is shown as a number in the colored field next to the slider. Double-clicking on this field will return you to the original value, the value that was read out when the file was loaded. This makes it easy to undo any attempts you have made that have gone wrong. The checkboxes can each be checked on or off. A box with a check shows an activated function. Functions with small white circular buttons show are options—only offering this one option by mouse click. A dot in the circle indicates that this option has been selected. The only exceptions are channel allocation of options for navigational lights, Extra1 and Extra2 functions. These can be activated with the Phase or Mode options. See multiple allocation of channels below.

Curve Selection

The colors of the curve points have a particular meaning. Red points cannot be changed, blue points cannot be deleted, and green points are points that have been added by the user, and can be changed or deleted as required. By clicking the mouse on a vertical line, you can also add an extra point to the curve. Right-clicking on the green point will delete that point. Points can either be moved by mouse with the left-hand mouse key down, or with the up/down cursor keys on your keyboard. The mouse cursor will indicate the vertical line of the point you are changing. The position of the point will be shown as a curve value above the curve.

Data Transfer to GigaTronic

Connect the special interface cable supplied to a free serial port on your PC and to the PC connection port on your GigaTronic. First activate your transmitter, then your GigaTronic. The GigaTronic LED operating display should now flash green. Start the GigaTronic Control program on your PC.

Note: the transmitter should not be positioned too close to the interface cable, as this may affect the data transfer.

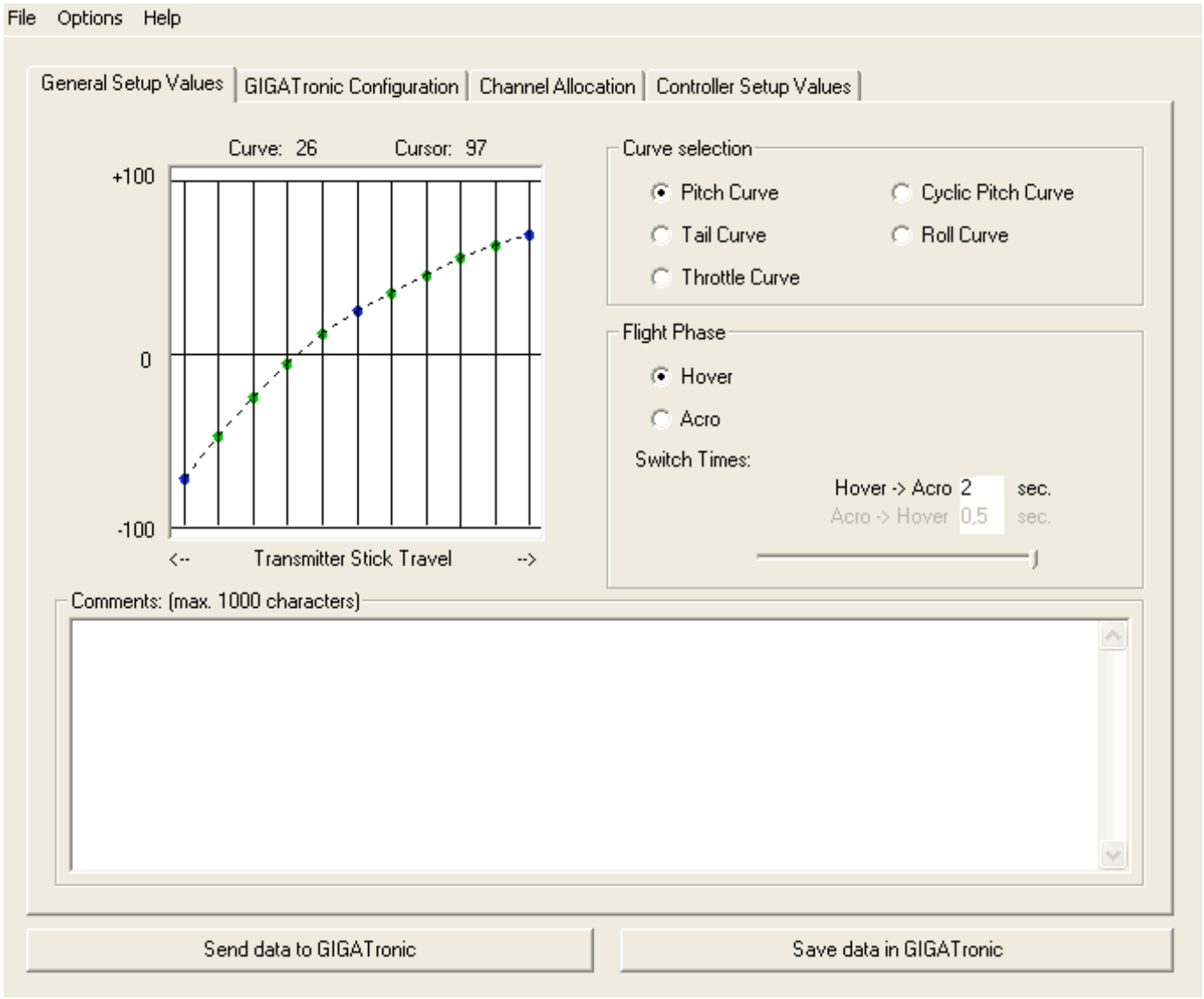
Data Transfer to GigaTronic

You are now ready to transfer data, which you can start by pressing the corresponding button for transferring data to GigaTronic. During the transfer, the mouse cursor will turn into an hourglass.
Helicopters with a rear motor will acknowledge the end of the transfer with a brief movement by the rear motor. Before transfer, check that the tail motor can move freely and that it's turning motion will not endanger anyone. In models with a rear servo, the servo will briefly twitch to signalize the end of the transfer.

Saving Data in GigaTronic

Simply transferring the data to GigaTronic does not save the data permanently. After switching the GigaTronic off and on again, the data will be lost and the GigaTronic will initialize with the last data you have saved. This makes sense, as you may want to transfer data for testing only. As soon as you want to keep the data, click the corresponding button for saving the data transferred to GigaTronic to ensure that the data transferred is permanent. Once the saving procedure has been successfully carried out, the LED display will light up in orange. The GigaTronic is now in secured mode, and can only be operated after you switch it off and on again.

General Settings



Control Curve Selection
Use the option button “Curve Selection” to select the curve you want displayed. The available curves are determined by the current configuration. If necessary this means that you may have to change settings in the Configuration Menu first.
Flight-Phase switching is only available in pitch controlled helicopters. This allows switching between the two modes, Acro and Hover. All curves are separately available for each flight phase. Only pitch-controlled systems have a pitch curve. Using a revolution speed governor eliminates the Throttle Control Curve.

Control Curves
Curves generally determine how the corresponding function in the model follows the transmitter control stick. You can set the curve function as well as the max. and min. limits.

Tail, Forward Pitch and Roll Curve

The tail, forward pitch and roll curves allow you to determine the control characteristics of the model. For example, you can compensate different left and right turning speeds for the tail rotor or set an exponential curve. The settings for basic tail sensitivity are selectable in “Controller Adjustments” under “Tail Control Sensitivity”

Note: In order to ensure that the GigaTronic will recognize the center position of the control stick signal under any circumstances, it is important “informing” the GigaTronic about the position using “Save Trim Settings” after possible setting changes, especially if you are using exponential curves. You might otherwise find that the servos’ end setting cannot be reached at full stick deflection, especially in curves that only steepen at the end of the stick movement.

Collective Pitch and Throttle Control Curves
The pitch curve determines how the angular change of the rotor blades follows the control signal. The throttle curve attempts to set the required rotational speed for any blade angle and keep it constant as much as possible.

Note: to avoid giving the model completely different settings when switching from hover to acro, the throttle curves should only be essentially different in the negative pitch range. The differences should allow changed control behavior and/or different rotor speed.

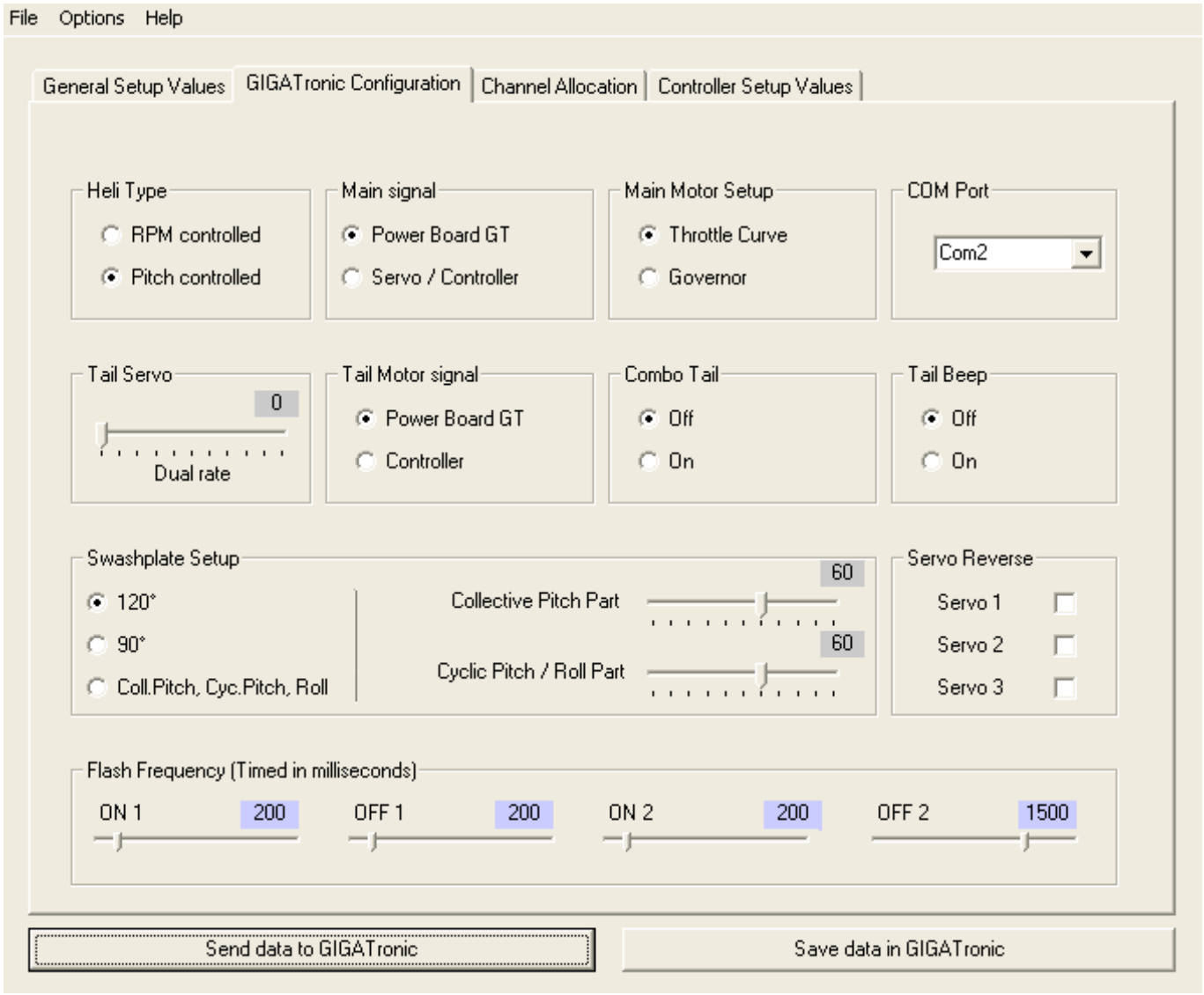
Flight phase
The names for the hover and acro flight phases have been selected as normally used. The Hover mode is used for take-off, landing and simple hovering and round-flight. Acro makes sure that the motors do not switch off when the cyclic control stick is below center (towards negative pitch for aerobatics), but that throttle is increased wherever necessary according to the Acro/Throttle Control Curve.

When changing the flight phases, the control curves are smoothly transformed from one to the other. The transition time can be set separately from zero to two seconds for each transition.

Notes
The “Notes” field gives you the opportunity to record additional text information for the file you have created. The type of information to be entered may be model type, type of power, components used, special equipment, particular objectives such as flight characteristics, and information on the origins of the data. This is the only sensible way of exchanging “expert knowledge” embedded in the data.

Flash Frequency
The GigaTronic can control a navigational light or a headlight. You can select two on and off times in the flash frequency field. By selecting the corresponding on and off times, you can set the navigational light to two consecutive flashes. The fields may be set for up to two seconds per field.

GigaTronic Configuration



Helicopter Type
Speed-controlled (fixed pitch) systems such as Eco Piccolo/Fun Piccolo do not have any collective pitch setting, therefore there is no collective pitch curve applicable. Pitch-controlled (collective pitch) systems have an adjustable rotor blade angle (pitch). Select your model type according to the model you are using.

Main Motor Signal
Using a Power Board GT means transmitting special signals. If you use another motor controller or brushless controller for the main motor, select Servo. A normal servo control signal is then sent for main motor control, and standard off-the-shelf motor controllers can be used. Note that the Power Board GT in the GigaTronic system also includes the BEC function. If using other controllers for the main motor, a separate 5V voltage supply will have to be provided. The GigaTronic requires a stabilized 5.0 V supply. Temporary voltage fluctuations and failures will lead to interferences during flight, especially in governor function. If the controller has no BEC, you will have to provide a separate power supply.

Main Motor Control

The main motor is usually controlled by the pitch/throttle control function. Adjust the throttle control curve to adapt the performance to the flight phase. The aim of this setting is to keep the rotor head speed constant for all pitch settings—ascent, descent, and hover. As an alternative, the GigaTronic also offers the possibility of governing the rotor head speed. The model will have to be outfitted with a corresponding governor (see Head Speed Governor).

Tail Servo Dual Rate

This allows the ideal setting for tail rotor blade pitch angle. You can adjust the turning rate of the motor best matching the angle of the tail rotor blades on systems with directly driven tail rotors. The zero value corresponds to approximately 90° servo setting range, while 100 corresponds to the maximum servo setting range.

Tail Motor Signal

If a conventional motor controller is used instead of the Power Board GT for controlling the tail motor, select the “Servo/Controller” option.

Tail Rotor Beep

Models with a tail motor can have the Tail Rotor Beep function activated if desired. System readiness is signalized by an interval signal (beep-beep-beep), and take-off readiness with a long beeeeep. The optional Tail Flasher Module will support this signal visually.

Swash plate Control

Select the swash plate control that matches the mechanics of your model, e.g. Pitch, Forward Pitch and Roll on the PRO Piccolo, since each function is allocated to a separate servo in this model. The Eco7 has a 120° swash plate control (CCPM), and requires the corresponding mixed signals. GigaTronic will always assume that 90° and 120° servo arrangements have one pitch forward and two roll servos.

The sliders can be used to set the mixing portion for the collective pitch as well as forward pitch and roll cyclic control for the swash plate. Note that not every control combination can be realized if the mixing portions are too high as the servo, mechanics and/or electronics may limit the control path. This may lead to non-linear control behavior. Therefore, check all possible control paths for pitch, roll and forward pitch with the motors off or operation without rotor blades. For individual control of pitch/forward pitch and roll, both sliders should first be placed to 100%. The forward pitch/roll portion (cyclic) slider can be used to reduce the servo range for forward pitch/roll and the servo range for collective pitch can be reduced via the collective pitch slider.

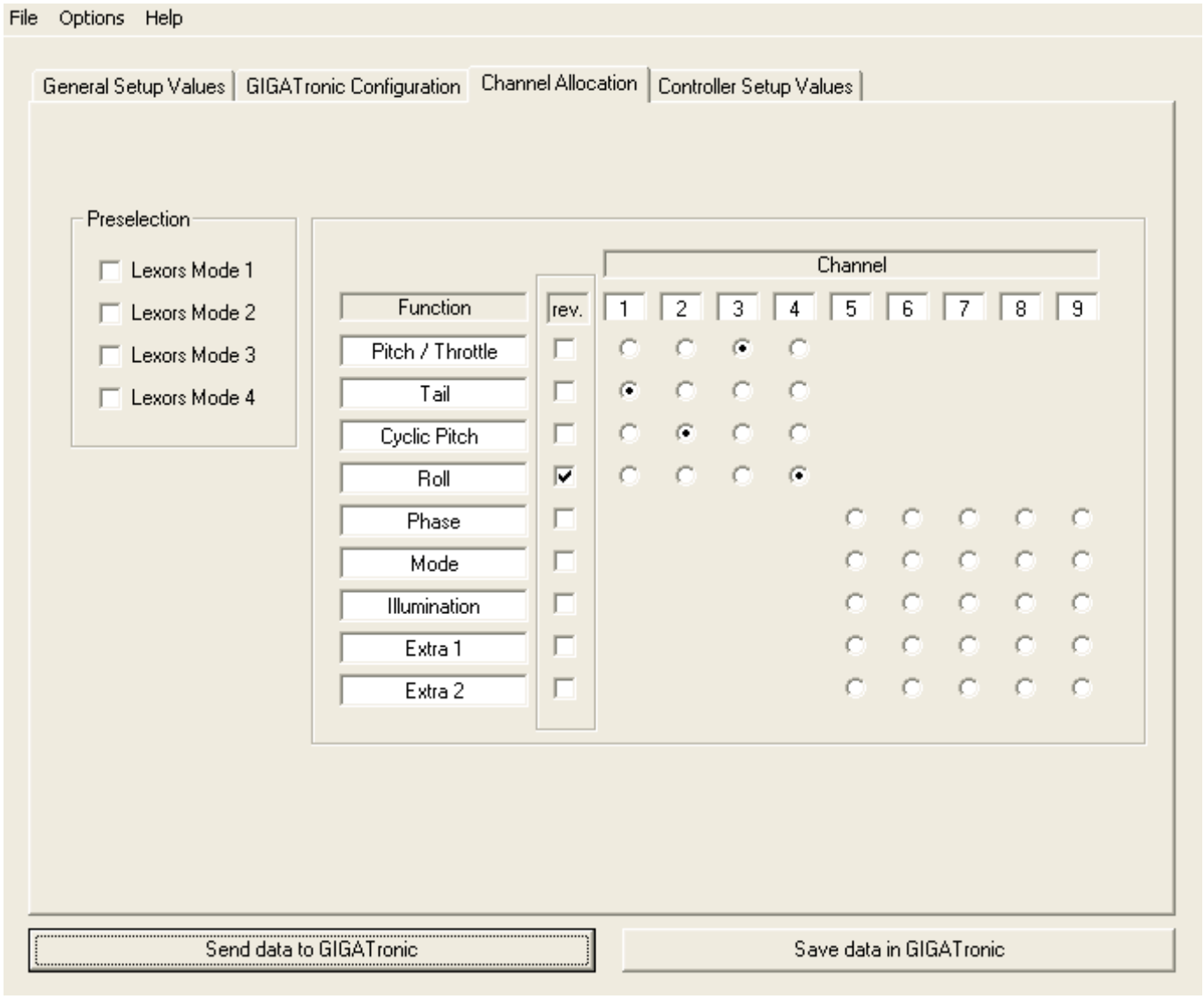
Servo Reverse

Here you can select the operating direction of the servo to match the mechanics.

Interface

In this menu, you can set the serial interface to be used with your PC.

Channel Allocation

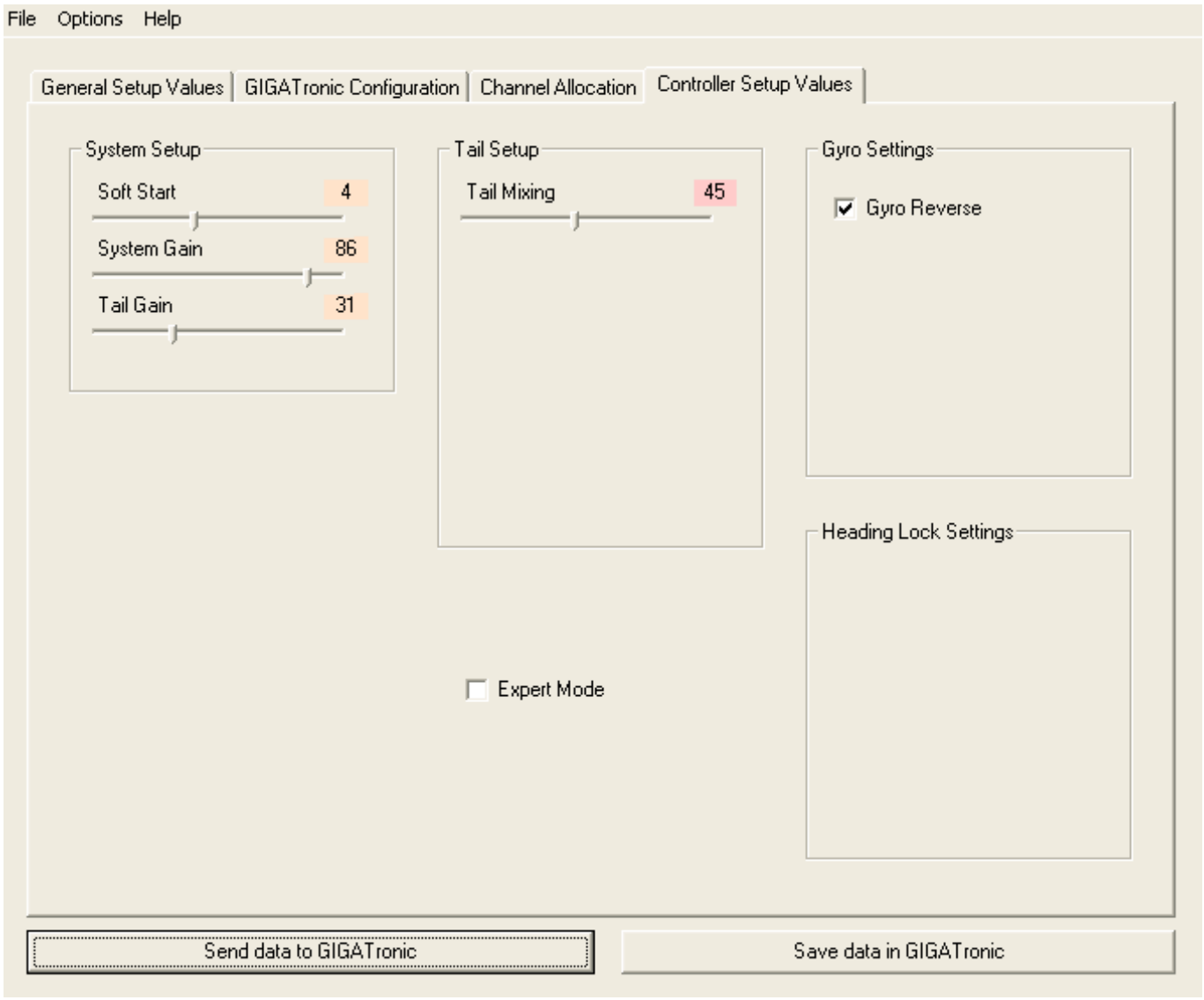


This window is used to allocate the control functions of the model to the channels transferred from the transmitter. If you select in the previous window the “Fixed Pitch” helicopter type, flight-phase switching would not make any sense. In this case, the flight phase function is blocked. For Lexor transmitters, the different Modes can be selected directly. In this menu the operating direction of each individual channel can be selected clicking on the reverse switch function. The primary functions can only be transmitted via channels one to four, and special functions via channels five to nine. In general one channel can only control one function. Exceptions are Lighting, Extra1 and Extra2. These three special functions allow for multiple allocations to one channel. If there are only six channels available on your transmitter, or if the pilot prefers it this way, the flight-phase switch can also operate the landing light and a landing gear servo. In the hover flight phase, the headlight can be switched on and the landing gear extended, while acro flight phase selection would switch the headlight off and retract the landing gear. Here too, the reverse switch allows the change of operating direction if required.

Note that as an alternative to the GigaTronic Control program, channel allocation can also be carried out according to the Direct Programming Manual. However, multiple allocations to one channel are not possible via direct programming.

When transferring data to GigaTronic, you can decide whether the allocations saved in the model should be replaced or kept.
This way, you can transfer system settings from other users to your model without changing your own personal channel allocation.

Gyro Settings



This window is used to easily modify the settings for a certain model. If you only want to make modifications to a system that is already up and running, we recommend that you leave expert mode switched off.

Soft Start

Soft Start prevents system overload and/or collision between the main rotor blades on fast throttle increase during take-off phase. The values range between 0 and 10. The take-off phase ends around five seconds after switching on the main motor. Thereafter the throttle will react to every incoming control signal directly. After about three seconds without activating the throttle or if the operation mode switch is in the “OFF” position, Soft Start will be reactivated automatically. An accidental idling back during flight will not result in Soft Start being activated!

Tail Settings

Tail control stick effect determines how effectively the pilot can influence the gyro system and therefore the helicopter’s yaw movement via the tail rotor control function.

Tail Mixing

Changing the main rotor pitch angle and main rotor speed will result in varying levels of torque. These torque changes can be compensated by the tail rotor by varying the pitch angle on a pitch controlled tail rotor, or by varying the tail rotor speed if the tail is rpm-controlled.
There is no rigid connection by shaft or built between the main and rear motor in helicopters that have a turning rate-controlled rear rotor. Rear combination signal has the effect of transferring a part of the control of the main rotor to the rear in all situations, thus replacing a rigid connection, and is set such that the model will not turn around the vertical axis in standard mode at hover pitch or hover turning rate. Depending on the model, this setting will have a medium-range value between 40 and 85.

Gyro Settings

The gyro effect describes the effectiveness of the gyro system on the yaw movement of the helicopter. It can be used to make the gyro system calmer or more agile. The gyro can also be switched off completely if you want to work on the settings.

Gyro Reverse

It may be necessary to reverse the gyro depending upon the installation position of the GigaTronic, and therefore the gyro. This function reverses the direction of effect of the gyro.

Standard Mode Sensitivity, Heading Sensitivity

Standard mode sensitivity determines how much the gyro will counteract unwanted yaw in the model. If value is set too high, the system will start to oscillate. The same applies to Heading Lock Mode for heading sensitivity and heading intensity.

Expert Mode

First, acquaint yourself with the system image that illustrates the function principle of the adjustment sliders and control options in GigaTronic. Function blocks are those channels controlled by the pilot displayed in the white boxes. The components of the model are in gray, the control curves for “Hover” and “Acro” in light and dark blue. The speed controller settings for “Hover” and “Acro” are in red and orange. System settings are in pink, slider settings in yellow for heading mode and green for standard mode. The circles mean that all of the control values are added and transferred to the next blocks. The gray frame surrounds the actual control system for the tail rotor system. The main entry control system is tail rotor control according to the rear control curves and adjustable rear stick control effect. Apart from that, the tail rotor is also influenced by the collective pitch and throttle settings for the system. This resulting load is mixed directly into the tail control (orange box), thus relieving the governor system.
In the next part the operation will be explained in an example as well as the settings for a new model. This task assumes thorough knowledge of the functional principles of a helicopter, and is not recommended for beginners. Test flights for optimizing the settings should only be carried out by experienced pilots.

Approach:

1. Go to System and User Settings
2. First, find out the static parameters for combining throttle and collective pitch without tail control. Make rough settings for the dynamic parameters.
3. Add the standard mode
4. Add heading mode
5. Set fine tuning and flight characteristics
6. If necessary, add governor (optional)

1. System and User Settings

Preparation: first, complete all of the settings to be made in the windows for configuration, channel allocation, and general settings. Expert mode must be activated.

2. **Without Tail Control** (Adjustment of tail settings)

The aim here is to make the model free of yaw as far as possible in both static (hovering) and dynamic (under throttle and load changes) operation without necessary tail control.

First, switch off the gyro and heading lock by setting the gyro effect to 0. Standard mode sensitivity and heading sensitivity remain at medium values and dynamic compensation at 0 (no reaction to throttle changes).

Start with the tail control mixing at 70 and throttle curve compensation (only in collective pitch systems) at 30.
Weaker tail motors or small tail rotor blades may require a higher mixer setting.

Bring the model into a hover. Depending on whether the tail shows too much or too little effect the mixing will have to be altered

Usually the throttle control curve will reach 100% in the upper range fairly soon. At this stage, you may still increase pitch and therefore increase the tail load. The throttle control curve compensation function ensures that the tail will remain largely stable even in this range. Change the setting to keep the tail from turning as much as possible even if the climbing helicopter operates in the range, where the throttle control curve has already reached 100%.
Generally, the tail will still swerve out during pitch and throttle changes. This can be compensated by dynamic compensation. The holding time parameter sets that time period in which pitch or throttle changes have an additional effect on the tail rotor. You should start with values of around 10 for smaller models and 20 for larger ones. Ideally, the model will no longer yaw even if there are powerful pitch or throttle changes.
At this point, the model will be capable of flying without tail rotor control or gyro function. In the following the tail stability will still be improved by a control system.

3. Gyro Operation

In general remember that in a gyro system the parameters influence each other, therefore changing the behavior of the gyro. In Standard Mode, all of the parameters influence each other; in Heading Lock Mode, standard mode parameters, dynamic compensation and holding time as well as heading sensitivity and mixing influence each other.

Select the following basic settings: standard mode sensitivity 50, dynamic compensation 30, dynamic holding time depending of model size around 5, gyro effect 70. If necessary, check without the rotor blades or rotor head mounted, whether the effective gyro direction has to be reversed.
Eventually, the settings will have to be optimized during flight. If the sensitivity values are too high, the tail will start to oscillate. Without dynamic compensation, the system cannot be set very "hard". Find the point just before the tail starts to oscillate, than reduce sensitivity by about 20%.

4. Adding Heading Hold Mode

The GigaTronic will recognize a directional change of the helicopter. The aim of heading lock mode is to ensure that the helicopter only changes direction if the pilot is giving the corresponding control signal. For example, if the tail of the helicopter is deflected by a wind gust, the helicopter should maintain its original course automatically. Even if there is a strong cross wind or the helicopter flies sideways, heading lock mode will maintain the helicopter's heading. Of course, this will also eliminate the weather-vane effect, and the model will have to be flown through turns.

Holding Angle
Thanks to heading lock mode you can set the angle of deflection up to which the tail returns to its original position simply by changing the holding angle. We recommend a setting around 30.

Fading out Heading Hold
If the model is to be moved through fast pirouettes, heading lock mode should be faded out, otherwise the model will turn back by size of the holding angle. With Heading Fade Out, you can set the value of tail control stick deflection on the transmitter above which the heading lock function is eliminated.

Heading Hold Mixing
This is the actual setting used for keeping direction. If this value is set to "0", Heading Lock Mode corresponds to Standard Mode. Higher values will make the system more agile, but too high values will also lead to oscillation of the tail. For most models a value between 20 and 50 should be just about right.

Heading Sensitivity
The Heading Hold sensitivity corresponds to the Standard Mode sensitivity. But because of the additional holding function a lower sensitivity has to be set. Start at 80% of the value you have determined in Standard Mode.

Mean Value of the Combination Tail rotor
In a pitch-controlled tail rotor with motor drive (combination tail rotor with motor and pitch servo), the tail motor is controlled by a V-curve to ensure that virtually the same control power is

available at any collective tail rotor pitch value. First, set the tail rotor combination value to “0”, and then move the mean value until the tail motor has the lowest rpm at 0° pitch.

5. Speed Governor

Speed governor operation is only possible with the optional sped governor sensor. Only when this sensor has been installed you can switch the main motor control to Speed Governor Mode. In the Control Settings window you will find than the sliders for the speed governor. Refer to the separate manual for the necessary settings.

This concludes the basic settings procedure. Thanks to the diverse range of setting possibilities, you may continue with the optimization, giving you a statically and dynamically perfect regulation system with balanced control behavior. Never forget to save your setting values in a new file (*.GTC file). The files are very compact and can easily be sent to other GigaTronic users by email or via the internet. We would welcome a lively exchange of ideas, as this will help pilots without sound knowledge of the application to optimize their model starting out from a comparable model. Please fill out the “Notes” field in the general settings dialog with complete and meaningful information. After file transfer these notes will be available to every other user, and are supposed to ensure that the parameters are only used on the system intended.