

Code 58

Model Type

Selection of Model Type

m	c	-	1	8	E		M	O	D	E	L			1
H	e													

The PROFI-ULTRASOFT-Module recognises a total of 9 different model types. The selection has to be performed when beginning to program a model, as it determines which codes may be called. A code number which is incompatible with the model type concerned, will be rejected by a message "INH (WRONG TYPE)".

The following model types can be selected via buttons **1**...**9** on activation of code 58, with the selected type indicated in the lower line of the display.

Key	Display	Meaning
1	NORMAL	Conventional model
2	NORMAL/DIFF	Same as 1, but with 2 aileron servos and differential
3	DELTA/DIFF	Deltas and flying wings with aileron/elevator mix
4	UNIFLY/DIFF	Models with plain flaps operated by a single channel
5	QUADRO-FLAP	Same as 4, but flaps operated by 2 channels
6	F3B (3 wing sv)	F3B model with 3 wing-mounted servos (1 channel for flaps)
7	F3B (4 wing sv)	F3B model with 4 wing-mounted servos (2 channels for flaps)
8	Heli	Universal helicopter program including models with RPM control
9	Heli (sp.ctl)	Helicopter with RPM control only

When changing model type via code 58, you must be aware of the fact that some of the already programmed adjustments will be deleted and reset to their basic values, even if immediately switched back to the initial model type.

Code 21

Throttle/Pitch Reversal

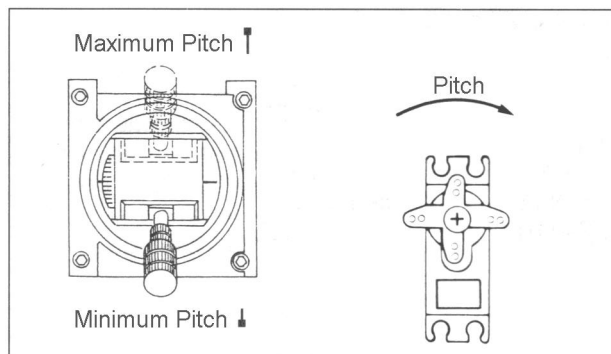
Set-up the Throttle/Pitch Control Direction

m	c	-	1	8	E		M	O	D	E	L			1
L	O	W		P	I	T	C	H						

Code 21 enables the pilot to adapt throttle/pitch stick motion to the direction of operation he prefers.

After calling the code, the direction of operation (pitch push or pull) can be reversed by pressing the **INC** and **DEC** keys. The currently active adjustment is shown on the display in a stylised control stick which indicates idle stick position.

This setting affects all the other control functions using the throttle/pitch stick, e.g. Idle Up, Idle Trim, DMA-Mixer, Pitch Trim, etc.



Code 32

Model Name

Entering Model Names

N	A	M	E	:										
L	O	C	K	H	E	E	D	2	8	6				

Due to the variety of model programs which can be stored in the transmitter at the same time, it will not be easy to remember the number of a model, the data of which have been stored in memory. For this reason the name of a model can be additionally stored. The relevant test, which must not exceed 11 symbols, is indicated in the multi-data terminals display.

On selecting code 32 the earlier input text will appear or, when programming for the first time, an empty line. Using the **INC** and **DEC** keys the letters of the alphabet and numbers 0 through 9 may be selected. Use of the **TURN** key permits switching from capital letters to lowercase. When the desired character appears it is accepted by pressing **STORE** and the next character can be selected. When finished, press the **ENTER** key.

Deletion of data input is performed by pressing the **CLEAR** key.

If analogue input is used, via a proportional rotary module connected to the AUX socket, for selection of the characters, special symbols will be available in addition to capital letters and numbers, for dressing up a names.

Code 29 Throttle Trim

Selection and Deletion of Models

T	H	R	O	T	T	L	E		T	R	I	M			
N	O	R	M	A	L										

Code 29 determines which flight phase the idle trim is effective under. It is therefore possible during Autorotation to determine, with the idle trimmer position, whether the motor remains running or not.

After calling the code, the flight mode can be selected using the **INC** and **DEC** keys.

Display	Idle Trim Effective During
NORMAL	Normal Flight
AUTOR.	Autorotation
NORMAL+AUTOR.	Normal & Autorotation
OFF	Idle Trim Inactive

Code 23 Switch Function

Allocation of External Switches to Model Types 1 – 5

→	C	L	K		G	Y	R		A	R			A	R	P
		N				9				9				9	

External switches installed and connected to plug stations 1 – 8 are allocated to specific functions via code 23. Some of these functions can be activated and de-activated in the process. Allocation can be performed either as per the mechanical mode of operation of the switch (open = OFF, closed = ON) or by pole reversal (open = ON, closed = OFF).

In addition to physically existing switches a logical “phantom switch” is available, designated numeral 9. By allocation of this switch one of the functions can be permanently switched on or off, respectively.

As any number of functions can be allocated to any of the switches, linkages can be realised. Without this mixers would have to be used, which remain available for other purposes.

So it is through the corresponding assignment and use of the freely programmable mixers (code 33), for example possible for a competition helicopter to switch, with only one external switch, from a perfect hovering flight adjustment to a special aerobatics adjustment: Gas pre-selection 2 instead of gas pre-selection 1, dual rate, exponential control, alternative adjustments for pitch and gas in the hovering flight and for minimum and maximum pitch, modification of the gyroscope effect, modification of the trim and correction of the throttle adjustment.

Allocation and pole reversal of external switches

After calling code 23, the functions available for the active model will appear on the upper line of the display, with the allocated switches appearing on the line below. Numerals indicate the switches wired to the corresponding plug stations.

N means that the function in question is de-activated. Flashing numerals indicate that the switch concerned has been allocated with reverse polarity. The small arrow (upper line) indicates the function to which the switch can be allocated at the present time. It can be moved to the right or left by pressing the **INC** and **DEC** key, respectively.

As not all of the available functions can be shown at the same time on the display, the latter can be moved – window style – over the two lines, showing the allocations. When the arrow points to the outermost right function, the next function will appear in the display when the **INC** key is pressed. They can be scrolled left by pressing the **DEC** key. In this manner any of the functions can be displayed.

To allocate the selected functions press the **CLEAR** key. As a result a question mark symbol will appear on the lower line. To switch be may allocated by pressing keys **1**...**9**. If the switch is to be reversed, the **DEC** key has to be pressed first.

If a de-activatable, currently active function is selected, pressing the **CLEAR** key will first deactivate the function, pressing the **CLEAR** key a second time will display the question mark symbol.

Code 34 DR/EX Switch

Dual Rate / Exponential Switch Allocation

→	D	R	2	3	4			E	X	2	3	4		
	S	W	I	9	9	9				9	9	9		

The switches for the dual-rate and exponential functions are allocated using code 34. In doing so it is possible to trigger several control functions simultaneously without using multi-function switches.

Due to the possibility of reversing switch functions via the **DEC** key, dual-rate and exponential can be coupled with any other function switch.

Allocation and reversing of external switches

After calling the designations of the control functions will appear in the upper line of the display for dual-rate and exponential, with the allocated switches concerned in the lower line. The small arrow in the upper line indicates whether the allocation for dual-rate or exponential is being performed, and its position can be changed using the **INC** and **DEC** keys.

Allocation of the switches is performed by pressing the key for the input function (**2...4**) followed by the switch number, if necessary pressing **DEC** first to reverse the switch polarity.

After all allocations have been made, press **ENTER** to store the settings.

Using code 73, switch position, the number and orientation of the switches can be found quickly and reliably.

Available Functions:

- CLK Stopwatch, runs as long as the switch is closed
- GYR Switches the Gyro mixer on/off
- AR Autorotation Switch
- ARP Automatic Autorotation Switch
- IU1 Idle Up 1 selection switch
- IU2 Idle Up 2 selection switch
- FL2 Activation of the alternative pitch and throttle adjustments for hovering flight.
- PRT Disconnection of PROFITRIM-Module
- INV Inverted Flight Switch
- CH7 Operation of Channel 7
- CH8 Operation of Channel 8
- CH9 Operation of Channel 9

Thus external operating elements can be used as switches for control channels, whereby the two switching positions are processed in such a way as if the end positions of a 2 channel switch attached at this channel (Part No. 4151).
If a normal control is already attached for this channel at the appropriate card location, then it is deactivated by the switch allocation. It can be assigned, however, using Code 37 to another function. In this way channel 9 is available to the helicopter programs, for which no connection is available.

Selection of the individual functions:

→	C	L	K		G	Y	R		A	R			A	R	P
		N			9				9				9		

4 x **INC**

4 x **DEC**

→	I	U	1		I	U	2		F	L	2		P	R	T
		9			9				9				N		

4 x **INC**

4 x **DEC**

→	I	N	V		C	H	7		C	H	8		C	H	9
		9			N				N				N		

Selection of individual functions - Stopwatch

→	C	L	K		G	Y	R		A	R			A	R	P
		N			9				9				9		

CLEAR

→	C	L	K		G	Y	R		A	R			A	R	P
		?			9				9				9		

4

→	C	L	K		G	Y	R		A	R			A	R	P
		4			9				9				9		

ENTER

Code 68

Swashplate Type

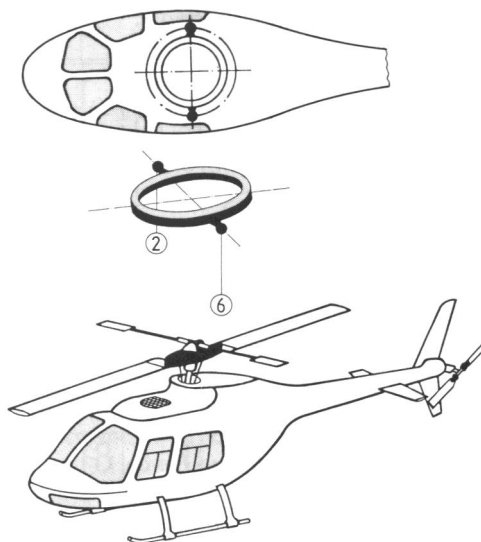
Swashplate Type

m	c	-	1	8	E		M	O	D	E	L			1	
S	W	A	S	H		3	S	v	(2	R	o	l	l)

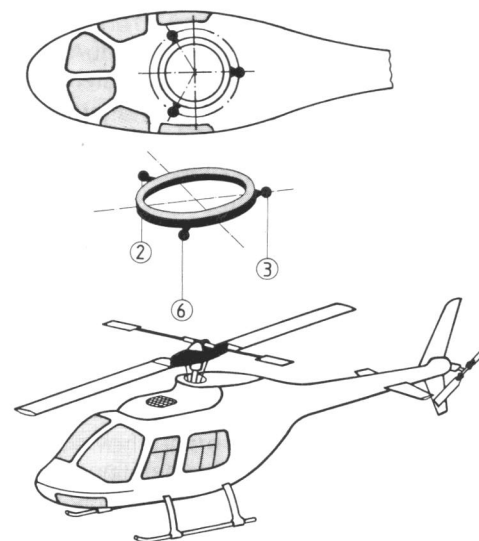
For the swash plate control five different programs exist:

- 1** The swash plate has servos for roll and pitch, it is not however not axially adjustable. Collective pitch change is achieved by a separate servo.
- 2** The swashplate is axially shifted for the pitch control by two Roll servos; the collective pitch control is decoupled by a mechanical output.
- 3** Symmetrical three point control of the swashplate by three points at 120° spacing, for which one pitch servo (front or rear) and two Roll servos (laterally on the left and on the right) are connected. For collective pitch control all three servos shift the swashplate.
- 4** Symmetrical three point control as above, however, turned 90° with a roll servo laterally and two pitch servos front and rear.
- 5** A four servo swashplate with two roll and two pitch servos.

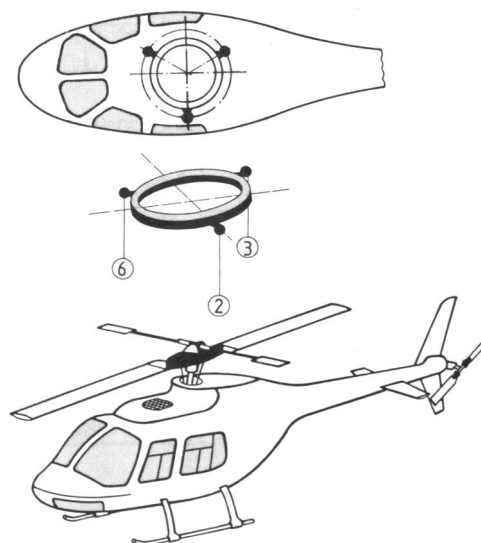
After selecting code 58, the desired type of swashplate can be selected through pressing of the appropriate key **1**...**5**, accepted by pressing the **ENTER** key.



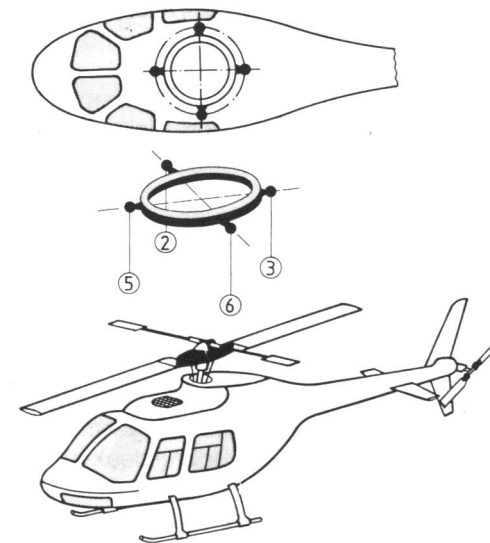
Code-Nr. 68/2
Heli 2 Servo



Code-Nr. 68/3
Heli 3 Servo (2 Roll)



Code-Nr. 68/4
Heli 3 Servo (2 Pitch)



Code-Nr. 68/5
Heli 4 Servo (2 Pitch / 2 Roll)

Code 69

Swashplate Adjustment

Adjustment of Swashplate Mixers

S	W	S	H	-	P		M	I	X		A	D	J	.
p	u	s	h		k	e	y		2	,	3	o	R	6

After activating a swash plate mixer (code 68), the mixing proportions are effective for the functions roll, pitch and collective pitch, preset to standard values, which can now be adjusted using code 69 to suit the practical requirements.

After calling Code 69, the request appears, on the display, to input the code number for the function to be adjusted, as follows:

- 2** = Roll
- 3** = Pitch
- 6** = Collective Pitch

In the case of swashplate type 1 (no mixing) these adjustment options are, of course, not provided.

In the case of type 2 (standard HEIM mechanics) only the mix quota for roll and pitch functions are adjustable.

A reversal of the mix quota in each case can be performed by pressing the **TURN** key, with the prefix changing between + and - accordingly.

Important:

For safety reasons, reversal of the mix quota, using the **TURN** key, is only possible when the throttle / pitch control stick is moved to the full throttle / full pitch position.

Code 11

Servo Reversal

Reversing Direction of Servo Rotation

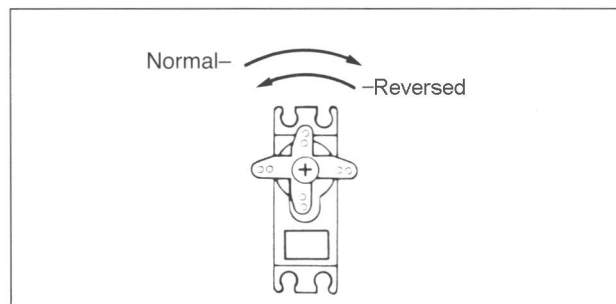
R	E	V	.	S	W		2	3		6					
		N	O	R	M		1			4	5		7	8	9

Code 11 permits changing the direction of rotation of servo to those required in a model, so the linkages etc., can be installed without paying attention to the initial direction of rotation of the servos in question.

After calling code 11, the direction of rotation of all servos will be simultaneously indicated on the display by their numbers 1...9 with the numbers appearing in the bottom line indicating normal rotation, and those appearing in the upper line indicating reversed rotation.

Important:

The numerals of the servo designation always refer to the receiver outlet to which the servo is connected. Any conformity with the numbering of the control function inputs of the transmitter would be purely coincidental. They won't occur normally because of the complex special programs of these hi-tech models. For that reason a change of allocation of control functions (code 57) won't affect the numbering and direction of rotation of the servos.



Code 37

Signal Generator Allocation

Allocation of Operating Elements Channels 5 – 9

P	O	R	T			5	6	7	8	9				
I	N	P	U	T			5	6	7	8	9			

In some cases, for individual models, it may be desirable to have certain operating elements, such as slider-type potentiometers or channel switches affect other function outputs than those to which they have been allocated by the internal connection.

Code 37 permits free choice of allocation of the operating elements to the function outlets without changing the internal connections. In addition it is possible to have one operating element affect several function outputs.

After selecting, the function inputs (operating elements) appear in the upper line of the display identified by the socket 5...9, and the output to which they have been allocated appears in the lower line. Signal generator 7 is, for example, the slider -type potentiometer is connected to plug station 7.

To allocate one of the function inputs to another operating element, select the function concerned by one of the keys ...**9**, whereupon a question mark symbol appears in the lower line below the selected function. Pressing key **5** ...**9** allocates this function to the desired operating element, which may have also been allocated to another function, affecting both functions in that case.

Normal allocation will be restored by pressing the **CLEAR** key.

In the case that a signal generator action should be undesirable, in special case such as a dummy mixer, the signal generator concerned can be turned off via code 72.

Code 67 Direction of ATS

Input of Main Rotor Direction of Rotation

m	c	-	1	8	E	M	O	D	E	L			1
A	T	S		L	E	F	T						

The direction of rotation of the main rotor is input using code 67, indicating whether the rotor is rotating to the right or the left. To the right means that it is rotating clockwise when viewed from above, and to the left that it is rotating anti-clockwise.

This information is required so that the torque and load compensation mixers will be able to work properly.

Code 81 Static Torque Compensation

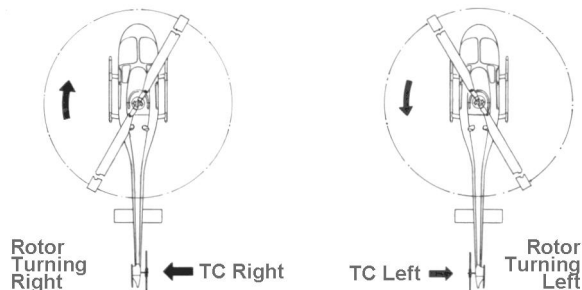
Code 82 Dynamic Torque Compensation

Code 87 Mixer Tail Rotor → Throttle

Code 75 Mixer Swashplate → Tail Rotor

After entering Code 67, the direction of rotation of the Main Rotor can be input, using the **INC** for anti-clockwise systems and **DEC** for clockwise rotating Main Rotors.

The entire torque and load compensation system can be turned via the **CLEAR** key, e.g. for conducting tests and adjustments. For normal flying operation the direction of rotation of the model concerned must be correctly set using this code.



Code 24 Autorotation

Change-over to Autorotation

A	U	T	O	R	O	T		p	o	s			4	0	←
O	F	F					S	T	I	C	K			5	0

To permit the use of autorotation change-over and autorotation switch has to be installed and allocated using Code 23. When in an active state the functions of throttle and pitch will be separated, with the throttle servo occupying a fixed pre-set position, whilst the pitch control is still performed by the control stick. In addition:

- The torque compensation mixer is turned off.
- The tail rotor is moved into the position set by Code 83.
- Switch over to autorotation settings for maximum and minimum pitch are made.

In addition to a manual activation of autorotation mode, the PROFITRIM-Module provides for automatic switch over, via the pitch control stick, on falling below a certain pitch value after the automatic mode has been prepared by a separate autorotation pre-select switch. This switch has also to be allocated by Code 23.

After entering the adjustment menu the display will read "AUTOROT. INH" meaning inhibited. After actuation of the **INC** or **DEC** key the function will be active. Throttle servo position in autorotation is adjusted by the **INC** and **DEC** keys. After pressing the **TURN** key the arrow at the right hand end of the display moves to the pitch setting. The control stick position can be input, where automatic autorotation switching will occur. This position is again set using the **INC** and **DEC** keys, with a value of 100% corresponding to neutral position of the pitch stick and a value of 50% reflecting the stick travel stop for minimum pitch.

Code 25 Inverted Flight

Switching to Inverted Flight

m	c	-	1	8	E	M	O	D	E	L			1
F	L	Y	-	I	N	V	T	r	m	+		1	2

Switch over to inverted flight can be activated by Code 25.

To achieve this a switch (such as Part No 4160) must be installed in the transmitter at a convenient, readily accessible, position and allocated to the inverted flight switch using Code 23.

Flipping this switch instantly reverses the various functions, allowing the pilot to perform inverted flight without having to reverse the control inputs. In this manner inverted flight will be simplified somewhat, as the model can be controlled in the manner the pilot is accustomed to.

After entering Code 25, activation is performed using the **INC** and **DEC** keys, or to deactivate by pressing the **CLEAR** key.

After activation, only approximately 50% of the normal servo throw will be available for collective pitch control in upright and inverted flight. Separate hover pitch trim for inverted flight can be adjusted with the adjustment range here being $\pm 100\%$.

The following changes result from activating the inverted flight switch:

- Collective Pitch function is reversed.
- The torque compensation mixer is adapted to the reverse collective pitch function.
- Pitch control is reversed.
- Tail rotor function is reversed.
- The appropriate inverted flight settings for maximum and minimum pitch become effective.

Code 26

Maximum Pitch

Adjustment of Swashplate Mixers

H	i	P	i	t	c	h	C	u	r	v	e		
		N	o	r	m	a	l			1	0	0	%

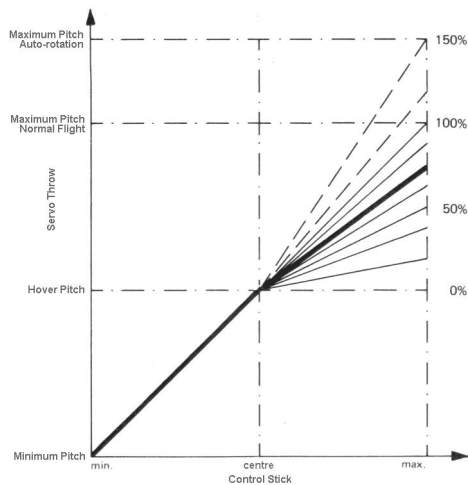
Maximum pitch (collective) data for 4 different flight phases can be stored using Code 26:

- Normal Flight (Normal)
- Autorotation (AT-rot)
- Inverted Flight (FLY-INV)
- Alternative Adjustment (FI2)

Adjustment of the percentage values is performed by the **INC** and **DEC** keys, with the values for Normal, Inverted and Alternative Adjustment being adjustable between 0 – 100%, and Autorotation up to 150%.

Values for inverted flight, FI2 and autorotation can be adjusted only after the corresponding options (Codes 24 and 25, if required) have been activated and the switch concerned, after being installed and allocated by Code 23, operated.

Additional analogue adjustments are possible with the PROFITRIM-Module (Part No. 4109).



Code 27

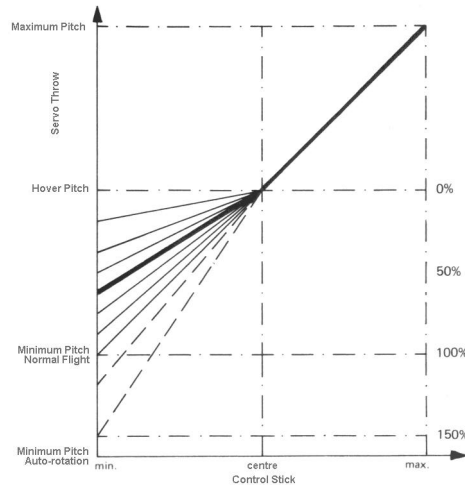
Minimum Pitch

Reversing Direction of Servo Rotation

L	O	P	i	t	c	h	C	u	r	v	e	1	
		N	o	r	m	a	l			1	0	0	%

Code 27 permits setting the minimum (collective) pitch data for Normal, FI2, autorotation and inverted flight modes. These adjustments are made as described for the maximum pitch adjustments.

Additional analogue adjustments are possible with the PROFITRIM-Module (Part No. 4109).



Code 28

Hover Pitch

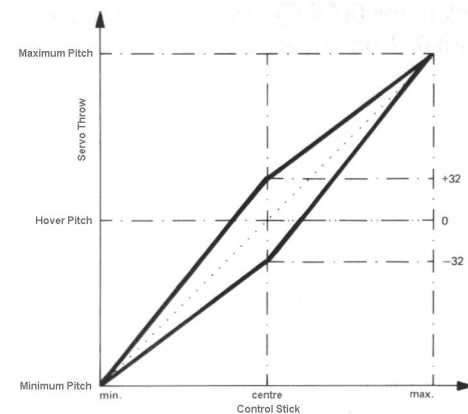
Allocation of Operating Elements Channels 5 – 9

H	O	V	.	P	I	T	C	H					
		N	o	r	m	a	l					0	

With this code, the collective pitch values for hovering flight can be adjusted, in such a way that the model will hover with the pitch control stick in the neutral position, without affecting the maximum and minimum pitch adjustments.

Additional analogue adjustments are possible with the PROFITRIM-Module (Part No. 4109).

For adjustment of the alternative flight mode (FI2), a separate value can be entered provided the switch, that has been allocated by Code 23, is actuated.



Code 93

Swashplate Rotation

Virtual Swashplate Rotation

M	c	-	1	8	E	M	O	D	E	L			1	
S	w	a	s	h	R	o	t	.		1	3	°	R	i

In certain circumstances, when applying cyclic control, tilting the swashplate in a direction other than that the planned tilt of the Main Rotor plane may be required. In the case of the four bladed HEIM system the swashplate control system needs to be rotated through 45° to the right so that the control linkages connecting swashplate and rotor head can be set-up truly vertical. In this way ensuring the correct blade control without any undesirable differential effects.

Code 93 permits establishing the described rotation, without changing the mechanical control by the servos. The latter operation is performed as usual with the swashplate being tilted the corresponding direction for cyclic control.

After activation of Code 93, the swashplate linkage can be virtually rotated in anti-clockwise or clockwise direction using the **INC** and **DEC** keys respectively, with the number of degrees and the direction of rotation being indicated in the display. The **CLEAR** key cancels the rotation (reset to 0°).

Code 81

Static ATS

Static Torque Compensation

S	T	A	T	I	C		m	a	x		3	0	%	←
							m	i	n		3	0	%	

Static torque compensation (ATS, mixer collective pitch → tail rotor) is adjusted using Code 81, with separate settings for collective pitch above and below the stick neutral position (hover point).

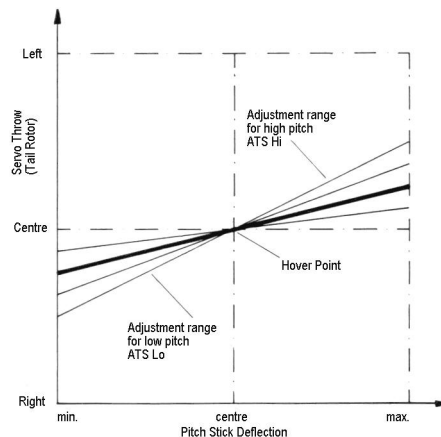
The small arrow on the display indicates the option that can currently be changed:

- “max” for climb data
- “min” for descent data.

Adjustments are made using the **INC** and **DEC** keys, with the **TURN** key changing the current setting selection.

To permit performing these adjustments the main rotor direction of rotation must be input using Code 67 beforehand, and autorotation change-over must be inactive.

Analogue adjustments of the values are possible with the PROFITRIM-Module (Part No. 4109) and one proportional rotary module (Part No. 4111) for each of the “UP” and “DOWN” settings.



Code 82

Dynamic ATS

Dynamic Torque Compensation

D	Y	N	A	M	I	C		V	o	I			0	%	←
								T	i	m			1		

Dynamic torque compensation is used to compensate for momentary torque fluctuations caused by drive system induced acceleration processes (RPM increase or decrease).

This option is provided mainly for helicopters using speed control (and lacking collective pitch). It may also be used for helicopters which, although equipped with collective pitch control, do not sustain constant system RPM, but change RPM simultaneously with collective pitch control. This holds true for the older types of model helicopters, e.g. the Graupner Bell 212 Twin Jet.

Adjustment:

With this code referring to momentary torque fluctuations, this mixer provides temporary adjustment to the tail rotor (for over swing). To allow this, the magnitude of the deflection () and the duration () can be adjusted separately in this menu.

The small arrow indicates which setting is selected and can be moved by pressing the **TURN** key.

For modern helicopters flying at constant RPM, throughout the entire pitch range, this mixer is not required and therefore should not be activated.

Code 83

AR – Tail Position

Tail Rotor Position for Autorotation

A	u	t	o	r	o	t	a	t	i	o	n			
R	u	d	d		o	f	f	s	e	t		+	1	5

Under normal flight conditions the tail rotor of a helicopter generates a constant thrust which serves to compensate for the torque of the main rotor acting on the fuselage.

During autorotation, this torque is not encountered as the rotor is being rotated by the airflow passing through it, and not being powered by the engine. Therefore torque compensation by the tail rotor will not be required.

Though the tail rotor blades are stopped during autorotation, in the majority of currently used model helicopters it will still produce a certain amount of thrust during the shut down phase, causing the tail of the model to swing over and presenting a poor image. The same also holds true during practise landing approaches where the idle speed of the engine is too high, causing the tail rotor to keep running.

The adjustments performed by Code 83, which are activated on switching to autorotation, permit setting the angle of incidence of the tail rotor blades to 0° thus preventing the tail rotor from generating thrust. In the case of tail rotors which are kept running during the autorotation phase, adjustments can be made to generate a slight negative thrust (acting against the normal direction of Main Rotor rotation) to compensate for gearbox and bearing friction which try to rotate the fuselage in the opposite direction of the tail rotor.

These adjustments, performed using Code 83, determine the tail rotor neutral position in autorotation. Normal tail rotor trim, including the trim data stored in the trim memory, is turned off as are the mixes affecting the tail rotor.

Code 84

Hover Throttle

Throttle Settings for the Hover

H	O	V	.		T	H	R	O	T	T	L	E		
					N	o	r	m	a	l		+	1	3

Code 84 permits adjusting the carburettor setting for hovering flight (neutral position of the throttle / pitch stick) without affecting the high and low speed regimes, in such a way that the desired engine speed will result. The adjustment range comprises of 32 steps, with the value 0 corresponding to normal, linear control. Negative values result in advanced throttle characteristics, positive ones result in retarded throttle actuation.

Adjustments are made using the **INC** and **DEC** keys, with the **CLEAR** key resetting to linear (0).

In conjunction with options 26 (maximum pitch) and 28 (hover pitch) it is now no problem to obtain constant system RPM from hovering flight to maximum climb, with the helicopter hovering with the throttle / pitch control stick in the neutral position.

Proceed as follows:

Start by having the helicopter climb vertically for some time, with the collective pitch control stick in the end position – the engine should then operate at the desired RPM. This depends on the engine output and the weight of the model. In the case of the engine speed being too low, reduce the maximum blade angle using code 26. If the engine RPM in climbing flight is too high, increase the maximum pitch accordingly.

When satisfied with adjustments, transition the model to hovering flight. This should be achieved at the neutral throttle / pitch stick position. If the latter has to be shifted in the direction of full throttle / pitch to achieve hovering flight, this should be compensated by increasing the setting using Code 28 until the model hovers with the stick at neutral.

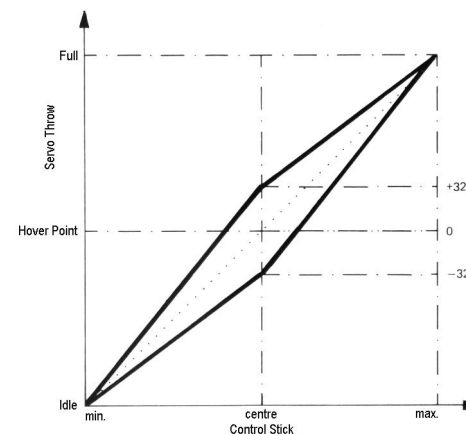
In the alternative case that the model hovers with the stick below the neutral position, the value in Code 28 has to be reduced.

Hover point engine speed is now adjusted using Code 84 to the same engine speed as established during the earlier case of maximum climb.

These adjustments may possibly have to be repeated alternately with Code 28 (hover pitch) until a perfectly constant engine speed in hover and climb has been achieved.

BE SURE TO NOTE:

These adjustments are of vital importance for the entire tuning of the model helicopter and for that reason must be executed with the greatest care. All other adjustments depend on a correctly matched throttle / pitch relationship!



Code 85

Throttle Pre-Sets

Throttle Pre-sets

I	d	l	e		u	p	(1)	G		5	0	%	←
				P	o	i	n	t					0		

Throttle pre-set mainly serves to prevent a reduction of system RPM when pitch is reduced below the hover point. Throttle pre-set is thus only effective below the hover position of the throttle / pitch control stick, which is normally the stick neutral point.

In rare cases, throttle pre-set is used to increase system RPM for certain manoeuvres, generally for model helicopters where the construction of the rotor does not permit constant hover and aerobatic RPM. In such cases a pre-set must remain active beyond the hover region.

In order to accommodate all requirements the PROFI - ULTRAOSFT-Module provides two pre-sets which can be switched on separately and which can also be adjusted independently of each other, in both magnitude (G) and take-over point. The take-over point is that point along the throttle / collective pitch control stick up to which the pre-set will be effective. When pitch is increased still further, only the earlier set-up throttle / pitch relationship will remain effective.

Adjustments:

On entering Code 85 (and possibly activating the switch concerned) adjustments can be made for throttle pre-set (1) and (2) for values of (G) between 0 - 100% and for the take-over point with ± 64 steps about control stick neutral position.

The small arrow on the right side of the display indicates which setting can be adjusted and is moved by pressing the **TURN** key.

Adjustment 0 for take-over point corresponds to stick neutral, negative values displacing the point downwards and positive values moving it up the pitch control region.

The adjustments are made by getting the model to fly forwards at a higher altitude and descending by pulling back on the collective pitch stick, then adjusting the pre-set value (G) until the RPM does not increase or decrease. This point adjustment should correspond to the hover point, that is near 0. Normally the throttle pre-set (1) will be adjusted in this way so that throttle pre-set (2), which can be adjusted differently can be used for special applications.

It is possible, for example, to adjust the pre-set value to 100% resulting in the marginal case of "power-on approach" adjustment. In this case the throttle will not be affected by pitch control below the take-over point, but it holds a constant value which corresponds to the stick position at the take-over point set. Above the take-over point the throttle will follow the collective pitch in the normal way.

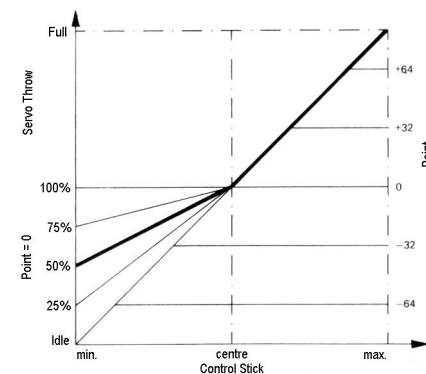
For some model helicopters such an adjustment might prove advantageous for aerobatic flight. They should be avoided though for models equipped with HEIM mechanics.

Another option for the application of the 2nd throttle pre-set are the manoeuvres of the FAI competition

programmes. In order to reach the maximum RPM in the lift-off phase the pre-set value of 100% should be selected and the take-over point should be positioned slightly below the hover point. This kind of adjustment can not be recommended for normal flight operation and aerobatics as the RPM in steep descent will increase dramatically, which will disturb the equilibrium of the adjustments of the model. After termination of the hover manoeuvres, one switches back to normal throttle pre-set (1).

If an additional slider control has been installed for throttle pre-set (1), the pre-set value (G) can be adjusted varied infinitely between 0 and the programmed value. After starting the engine, when the engine is still idling, this permits increasing the throttle pre-set slowly and smoothly instead of the normal abrupt change. The display indicates the currently pre-set value, including the effect exerted by the slider.

Running up throttle pre-set can be programmed using Code 92 after actuating the switch.



The diagram illustrates the relationship between the two adjustment options: Point adjustment displaces the take-over point along the control stick curve by ± 64 steps, while (G) adjustment determines the slope of the curve below that point.

A (G) value of 100% always results in constant carburettor setting below the take-over point. How wide the carburettor is open depends is, however, determined by the point adjustment.