

1. Channel Allocation (Code 51)

To program a mixer first call code 51, via which the channels to be linked are determined.

On the display then appears "MIX ?", asking the operator to input the number of the mixer to be used. After the number has been input, the display changes to:

M	I	X	1																
<u>I</u>	N	H																	

With INH meaning Inhibited.

This indicates that the mixer is not yet active, otherwise the numbers of the already allocated control channels will be displayed instead of INH.

Start by entering the control functions by keys **1...9**, which are to act as input signal of the mixer. If the dummy mixer indicated by "0" is to be used press **INC**, or if the preceding mixer is to be used as the input press the **DEC** key before the input function number, which will be indicated by an arrow in front of the input channel. Then input the control channel (=servo output) into which the signal will be mixed.

M	I	X	1																
	4	→	8																

If, as in the example above, the input is one of the control functions 1–4, it can be decided whether trim is also to affect the mixer input or not. Pressing the **INC** or **DEC** key will enable the trim, whilst pressing the **CLEAR** key will disable it.

M	I	X	1																
	4	→	8																

Channel allocation of the mixers is confirmed by the **ENTER** key. Programming can be continued by entering the next mixer number, or terminated by pressing the **ENTER** key again.

2. Allocation and Polarity Reversal of External Switches (Code 33)

A switch which allows the mixer to be turned on and off is allocated to the mixer by code 33.

M	I	X	E	R															
S	W	I	T	C	H														

The upper line indicates the mixer numbers, with the allocated switches shown on the bottom line. Switches are allocated by entering the number of the mixer, whereupon a "?" appears in the lower line, and then entering the desired switch number, the polarity of which can be reversed by pressing the **DEC** key first. The phantom switch "9" can be used, in which case the mixer remains permanently on (basic setting of all mixers). When in doubt, switch number and switch position can be established quickly and reliably using code 73.

3. Adjusting the Symmetrical Mix Quota (Code 61)

If a symmetrical (common) mixer (in relation to the neutral point) is required, the mix quota and direction is set using code 61.

M	I	X	1																

Mix quota is adjusted using the **INC** and **DEC** keys, the process can be speeded up by pressing the **6** or **8** key, which increases or decreases the value in steps of 10 respectively. The direction of mixing is determined by the + or – prefix to the mix quota and can be changed by pressing the **TURN** key.

To alter the neutral point of the mixer, shift the corresponding operating element (stick, etc.) into the required position and press the **STORE** key. The offset from the normal neutral point captured in this way is transferred to the display.

Adjustment is confirmed by pressing the **ENTER** key. Afterwards, further mixes can be adjusted by entering their number, or the adjustment process terminated by pressing the **ENTER** key again.

4. Adjusting the Symmetrical Mix Quota (Code 71)

Code 71 permits adjusting separate mix quota and mix directions for the two sides of the control function at the mixer inlet.

M	I	X	1																

The setting of the mix quota is performed in the same way as for code 61 using the **6**, **8**, **INC** and **DEC** keys. In this case the operating element has to be set to the side requiring adjustment (displayed with the prefix + or – ahead of "s"). The direction of mixing can be adjusted separately for either side using the **TURN** key. Neutral point offset is achieved by moving the operating element of the control function to the required position and capturing the value using the **STORE** key.

Code 72 MIX-only Channel

Mix-only Channel Setup

M	I	X		O	N	L	Y		C	H					
			n	o											

Code 72 permits interrupting the normal direct signal flow between the control function inlets and the associated control channels at the outlet side. The signal generators connected to the control function inlets concerned will then affect the mixer inputs of the channel in question, but not the allocated servo. The latter can then be reached by mixers programmed for their specific control channels. Using this arrangement, it is possible to utilise the signal generator and servo of one or more channels independently of each other for optional special functions.

It permits, for example in F3B model types to use channel 1 via the dummy function of a special functions mixer to operate "butterfly mode", controlled by the throttle/spoiler stick, provided spoilers have not been installed.

In the case where spoilers have been installed and "butterfly mode" with or without spoilers is to be provided for experimentation purposes, a mixer can be operated in normal mode. With the aid of code 33, this connection can be turned on and off. The same applies to other applications.

Any channel can be switched between normal and mix-only mode by keys **1...9**. All channels can be switch back to normal by pressing the **CLEAR** key.

ALARM TIMER and Stopwatch

The PROFULTRASOFT-Module offers two stopwatch functions.

1. Stopwatch with normal display (hours, minutes and seconds).
2. Timer alert, with seconds display.

One of these options can be selected for each model program.

A stopwatch, once programmed, will appear on the lower line of the display each time the transmitter is turned on, it does not need to be called over and over again. Once triggered the stopwatch will continue to run even when inputs are made during its operation via the keyboard.

Stopwatch with normal display.

The stopwatch with normal display may be programmed by allocating a switch to function "CLK" using code 23. A prerequisite is that the alarm timer (code 97) is not activated. The clock will then run as long as the allocated switch is closed. Using the **CLEAR** key it can be reset to 0.00.00 when not running (if running the transmitter switches to list of codes mode of operation). By this programmable switch allocation, the stopwatch function may be coupled with the tow hook, permitting the exact duration of flight (starting from release of the towline) to be recorded.

Code 97 Stopwatch

Stopwatch

T	I	M	E	R		6	0	0	s	e	c		←		
A	L	A	R	M			3	0	s	e	c				

After calling code 97, the message "TIMER OFF" will appear on the display. The timer is activated by the **INC** or **DEC** key, whereby the stopwatch, possibly programmed by code 23, will be turned off. The alarm timer can be deactivated by the **CLEAR** key. Timer run can be adjusted on the upper line of the display in 10 second increments using the **INC** and **DEC** keys. In the lower line a point of time can be set when, prior to the expiration of the return time, an acoustic signal alerts the flyer. The arrow at the right hand end of the display indicates which time can currently be adjusted, and is moved by pressing the **TURN** key.

After the set time has run down to 0, it is indicated by a longer acoustic signal. The timer continues to run, so that the time beyond 0 can be read.

Start/Stop instructions can be given by keys **2** and **3** respectively, or via an intermediate switch (order No. 4160/11) connected to plug station CLK, or a kick button (order No. 4144).

If a switch for the timer has been allocated by code 23, operation of the alarm timer will be performed exclusively by that switch.

Acoustic Signal Sequence:

100s before zero: every 5 seconds
 20s before zero: every 2 seconds
 10s before zero: every second
 0s Extended Signal

A + symbol on the display indicates that the time shown is that beyond zero. The maximum timer capacity is 900 seconds beyond zero.

Code 98 Operating Timer

Transmitter Operating Timer

m	c	-	1	8	E		M	O	D	E	L			1
I	N	T	E	G	.	T	4	:	2	7	:	5	4	

The operating timer displays the time the transmitter has been switched on and monitors the transmitter power supply.

After the batteries have been charged, code 98 should therefore be called and indicated time reset to 0 by pressing the **CLEAR** key.

The operating time is then measured whilst the transmitter power switch is on. This permits the cumulative operating time to be displayed at any moment by calling code 98.

Code 77 FAIL SAFE

Programming the Fail Safe

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

This is possible only in PCM mode with m=18 receivers.

The inherently higher operational reliability of Pulse Code Modulation (PCM) as compared to the simpler Pulse Position Modulation (PPM) results from the ability of the micro-processor installed in the receiver to recognise when a received signal has been corrupted or stopped by outside interference.

In such cases, the receiver automatically replaces the false signal with the last correctly received one stored in the receiver. In this manner interference of short duration will be eliminated.

In the case of longer lasting disturbance of the transmissions, the operator may choose between two options:

1. HOLD

The servos hold that position which corresponds to the last correctly received signal, until the receiver manages to receive a new intact signal again.

2. FAILSAFE

The servos move a preset position until an acceptable signal is again received by the receiver. The delay, determining the time from loss of signal to the triggering of the failsafe program, can be adjusted in three steps (1.0s, 0.5s and 0.25s), to allow for different model speeds.

After calling code 77, switching can be performed by the **INC** key between HOLD, FS1.0s, FS 0.5s and FS 0.25s. To record the positions for the servos the control functions have to be moved to the required positions at the transmitter, then press the **STORE** key. This step stores the current adjustments as the fail-safe settings, which are transferred at regular intervals to the receiver. The receiver stores these fail-safe values for use in the case of signal loss.

Fail-safe adjustments can be overwritten at any time, even in flight, by calling code 77 and changing the current transmitter failsafe data by pressing the **STORE** key.

Code 78 FAIL SAFE BAT

Activating Battery FailSafe

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

The automatic battery fail-safe serves to warn the pilot of dropping receiver battery voltage and to give him a chance to avoid an impending crash caused by depleted receiver batteries.

As soon as the voltage at the receiver battery drops below a predetermined value, a servo permanently allocated to the battery failsafe function and acting as an indicator of the imminent depletion of the receiver power supply will be actuated. In the case of a fixed wing model program, this will be the servo wired to channel 1 (throttle). For helicopter programs it will be channel 8, which could for example be used for switching on the lights, etc.

For the position, to which the servo will be shifted, three different values may be programmed:

- +75% Three-quarter deflection in one direction
- 0% Servo neutral position
- 75% Three-quarter deflection in the opposite direction

When checking adjustments, the servo position display (code 74) will prove helpful.

The fail-safe display can be cleared again by actuating the operating element concerned for a moment (e.g. throttle stick for fixedwing) and the servo can then be controlled in the normal manner. A model should be landed straight away after the battery fail-safe has been indicated. After code 78 has been called the display will read "BATT F.SOFF". Pressing the **INC** key activates the battery failsafe and permits selecting the display position of the servo in sequential order -75%, 0%, +75%, OFF. Pressing clear will switch off the battery failsafe immediately.

Code 88 Input Lock

Code Lock for Keyboard Input

K	E	Y	B	O	A	R	D	L	O	C	K		
p	u	s	h		k	e	y	1	-	9			

The input lock prevents changes of transmitter settings by unauthorised persons or accidental pressing of the input keys. The lock does not prevent unimpaired use of the transmitter when flying models using the elements activated, but no inputs will be possible via the keyboard, hence a change of models is not possible.

Activation of the keyboard lock is performed using code 88 and entering an optional 3 figure combination using keys **1**...**9**, followed by the **ENTER** key.

The lock becomes effective by turning the transmitter off and on again. After pressing the **ENTER** key, the request "push key word" appears. Only after entering the correct combination of numbers will the lock be released. The lock remains released until the transmitter is turned off, after which it will be active and it has to be unlocked again.

The combination of numbers can be changed at any time, after releasing the lock, by calling code 88 again and entering the new combination.

To clear the input lock completely, the **CLEAR** key has to be pressed instead of entering a combination. The input has to be terminated by pressing the **ENTER** key.

Please ensure you remember the combination you set, or you will have to return the transmitter to Graupner Service for decoding.

Code 99 Transmitter Lock

Numerical Transmitter Lock

A	L	L		C	L	O	S	E					
p	u	s	h		k	e	y	1	-	9			

As a precaution against theft an electronic transmitter lock can be enabled using code 99. It prevents the putting the transmitter into operation unless the correct combination of figures is input after turning the transmitter on.

Activation of the transmitter lock is achieved by calling code 99 and entering an optional 3 figure combination using keys **1**...**9**, followed by the **ENTER** key.

The lock becomes effective after the transmitter has been turned off. On activation of the transmitter, the request "push key word" will be displayed and it is only after entering the correct combination of digits that the lock will be released, permitting the transmitter to be used. The keyboard, however, remains locked as in the case of code 88. After pressing the **ENTER** key, the request "push key word" appears again and the correct combination must be entered to obtain access to the settings.

The lock remains released until the transmitter is turned off, after which it will be active and it has to be unlocked again.

In the case where the combination entered for the input lock (code 88) differs from the combination of the transmitter lock (code 99), the combination of numbers for code 99 will also apply to the input lock and replace the figures previously entered into code 88.

Code 76 Servo Test

Testing Servos 1– 9

When the lock has been released the combination of digits can be changed at any time by calling code 99 and entering a new combination. To remove the lock completely instead of entering a new combination, the **CLEAR** key has to be pressed instead of entering a combination. The input has to be terminated by pressing the **ENTER** key.

For safety's sake the lock has to be removed prior to starting with flight operations! To this end, proceed as follows:

Turn on the transmitter

Input the correct combination of digits

Press the **ENTER** key

Input the correct combination of digits again

Call code 99

Press keys **ENTER CLEAR ENTER**

Please ensure you remember the combination you set, or you will have to return the transmitter to Graupner Service for decoding.

m	c	-	1	8	E		M	O	D	E	L			1	
E	N	T	E	R	=	S	E	R	V	O	T	E	S	T	

To check all servos for proper function, check them one after another by executing full deflections in both directions, starting from the neutral position. After calling code 76, the test program will be executed in an endless loop until interrupted by pressing the **ENTER** key. In this way, the receiver can be checked over a longer period.

Code 74 Servo Position

Display of Servo Position

S	E	R	V	O		P	O	S	.						
p	u	s	h		c	h		k	e	y		1	-	10	

The actual position of each servo can be shown exactly with the aid of code 74. In this manner, the interaction of different mixers on a specific servo can be determined with accuracy, and the operation of throw reduction can be controlled. Battery failsafe (code 78) can also be checked.

For the simulation of battery failsafe position relying on the menu. The operating element for channel 1 or channel 8 is adjusted to the percentage value set using code 78, and the control surfacethrow checked at the servo after calling code 74.

After calling the request for the selection of the control channel to be checked will appear in the display. To select the channel, use keys **1...9** and **INC** (for channel 10). After entering the channel number, the lower line of the display will indicate after the channel number, the exact servo position within a range of $\pm 150\%$ of the servo throw in either direction, with 0% corresponding to the neutral position. Using key **1...9** and **INC**, other control channels can be displayed. To terminate the display of servo position, press the **ENTER** key.

The sole exception is the adjustable servo speed of code 79 can not be displayed.

Code 73 Switch Position

Display of Switch Positions

S	w	i	t	c	h	1	2	3	4	5	6	7	8	9
						⏏	⏏	⏏	⏏	⏏	⏏	⏏	⏏	⏏

For checking the installation of switches and their connections to plug stations 1...8, the switch positions of all external switched are indicated by code 73, with an automatic channel 1 switch, possibly programmed by code 63, being taken into account.

The display always refersto the actual mechanical switch position of the switch concerned, independent of its having possible been reversed by code 23, 33, or 34.

Please Note:

In the case of mixers a closed switch will normally turn off the mixer concerned, not on!

F3B Programs (Model Types 6 and 7)

Universal ProfiPrograms for competition flyers, and also for other models such as large sailplanes featuring least 2 wing-mounted servos

The F3B model programs (code 58, types 6 and 7) have been developed for F3B class contest models in close cooperation with renowned experts. The competition program requires a model with three different flight tasks, with only its ready to fly weight, being permitted to be changed by adding or removing ballast weights. Any other adjustments can only be performed by remote control.

To be able to comply with these requirements, the models of this contest normally feature plain flaps so they can be adapted to the flight tasks of duration, distance and speed, as well as the launch phase. In addition they also servo as a landing aid. As a rule, the flaps are lowered for takeoff to generate as much lift as possible, with the resulting drag being of little importance as it is overcome by the towline winch anyway. For hi-speed flight a slightly negative deflection (meaning an upward one) may be advantageous depending on the airfoil section, while for distance flying the optimum angle of glide should be found somewhere about the neutral setting of the flaps.

For duration flying the lowest sinking rate will be achieved by setting the flaps to a slightly positive angle. That setting may have to be reduced a bit for tight circling flight in thermals and increased when searching for thermals by flying wide circles to ensure the optimum glide. On landing, the flaps are fully deflected (positive) causing the airflow on the upper surface to separate and increase drag, without affecting the lift. This effect can be supplemented by spoilers, if installed (in some cases spoilers are dispensed with). Drag can be increased still more by deflecting both ailerons upward in addition to the extreme downward deflection of the flaps, this combination results in a most effective control of glide angle.

The latter set-up is also called “butterfly” or “crow” function. In some cases separate ailerons and plain flaps are replaced by one-piece full-span flaps, which are simultaneously operated as ailerons and plain flaps (called flapèrons). Performance flying means flying at very low drag, in any flight situation and attitude, including turns and circling flight.

Lowest drag is achieved only when the airflow hits the model head-on, that is when sideslipping (with the flow having a component along the lateral axis) is avoided. This condition is simplified by differential ailerons used in conjunction with the aileron– rudder mix, whereby the negative yawing moment is compensated for. Additional mixers increase the effect of the control surfaces (plain flaps– ailerons), ensure uniform lift distribution (aileron– plain flaps), increase manoeuvrability (plain flaps– elevator) and adjust elevator trim for deflection of the flaps.

In addition to the normal actuation of the plain flaps, via slider-type potentiometer or a step switch, the F3B programs offer storable presets for plain flaps and elevator adjustments for any flight task and for take off, all of which can be called via a switch. Which of the operating elements is to be used for in-flight fine tuning of the flaps settings can be determined separately for any of the presets.

The change of the flap and elevator settings when switching from one preset to another one is not made abruptly, but achieved using separately adjustable time constants. Other sensible options, such as reduction of aileron differential (for butterfly function), co-switchable PROFITRIM module with optional storing of adjustment data, etc., simplify handling of a model for the demanding contest flyer and assist him in his endeavour to achieve optimum performance.

The two F3B programs differ only in that model type 6 is meant for flaps which are operated by a common servo, while each aileron is operated by a separate servo (in all 3 wing-mounted servos), while type 7 refers to a set-up where each flap and aileron is operated by its own servo (4 wing-mounted servos).

In the case of type 6, the flaps can be moved only in unison, so the aileron→ flap mixer is omitted. All other options are alike for type 6 and type 7 so the two programs may be described together.

Model types 6 and 7 provide nearly all of the options of types 1...5, with the sole difference that those functions which are needed for power models only are omitted, such as throttle reduction (code 7) and automatic manoeuvre (code 66). As opposed to types 1...5, seven freely programmable mixers are available for type 6 and 7. Code 23 (switch allocation) takes the expansion of the F3B program into account when compared to normal types.

In addition types 6 and 7 provide the following functions (listed in sequential order of their descriptions):

Code	Display	Meaning	Page
23	SWITCH FUNCT.	External Switch Allocation	38
52	STRT-SPD-DIST	Flight Trim: Start, Speed, Distance	39
53	FLAP TRIM ASS	Flap Trim Assignment	39
92	SMOOTH SWITCH	Servo Transit Time Set-up	39
41	AILE→RUDD	Aileron to Rudder Mix	40
42	AILE→FLAP	Aileron to Flap Mix	40
49	FLAP→AILERON	Flap to Aileron Mix	40
91	AN. TRIM SW	Set-up for PROFITRIM	42
48	FLAP→ELEV	Flap to Elevator Mix	42
47	ELEV→FLAP	Elevator to Flap Mix	42
44	BRK→ELEV	Spoiler to Elevator Mix	43
45	BRK→FLAP	Spoiler to Flap Mix	43
46	BRK→AILERON	Spoiler to Aileron Mix	43
54	DIFF REDUCT	Reduction of Aileron Differential	43

Code 23

Switch Function

Allocation of External Switch in F3B Models

External switches installed and connected to the plug connections 1...8 are allocated to specific functions by code 23. Some of these functions can be activated and de-activated. The allocation can be performed to suit the mechanical mode of operation of the switch (open = ON, closed = OFF) or by reversing (open = OFF, closed = ON).

In addition to physically existing switches a logical "phantom switch" is also available, designated switch number 9. By allocating this switch to a function, it can be permanently switched on or off.

As any number of functions may be allocated to any of the switches, linkages can be achieved for which otherwise, mixers would have to be used, which in this way remain available for other purposes.

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 deactivated. 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.

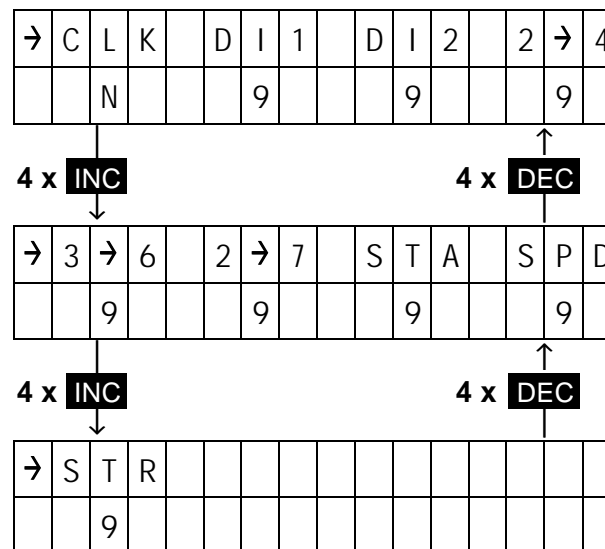
If a de-activatable, currently active function is selected, pressing the **CLEAR** key will first deactivate the function, pressing the **CLEAR** key a second time will display the question mark symbol.

The type and number of functions, to which switches can be allocated via code 23, depends on the activated model type (code 58).

Available functions for model types 6 and 7

- CLK Stopwatch in standard mode, runs as long as switch is closed.
- DI1 Differentiation switch 1 (see code 22)
- DI2 Differentiation switch 2 (see code 22)
- 2→4 Mixer Ailerons → Rudder
- 3→6 Mixer Elevator → Flaps
- 2→7 Mixer Ailerons → Flaps
- STA Pre-set for Start
- SPD Pre-set for Speed task
- STR Pre-set for Distance task

Selection of individual functions:



Using code 73 the switch position, number and direction of operation of the desired switch can be found quickly and reliably.

Code 52 TAKE-OFF, SPD, DIST

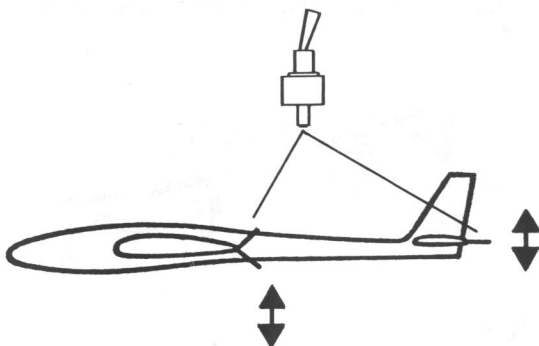
Pre-sets for the Flight Tasks

S	T	A	R	T		F	L	A	P	+	5	8	←
						E	L	E	V	+		7	

Code 52 permits storing the flap and elevator settings for Speed, Distance and for the TakeOff phases. However, the allocation of the corresponding external switches has to be performed first using code 23.

A possibly active aileron → rudder mixer (code 41) will automatically be switched off when the Speed flight task is selected on.

For these adjustments the corresponding external switch has to be actuated after calling code 52, whereupon the values for elevator and flaps will be displayed. Adjustments are made using the **INC** and **DEC** keys, by pressing the **TURN** key the elevator and flap adjustments can be changed and the value set directly to 0 by the **CLEAR** key.



Code 53 Flap Trim Arrangement

Signal Generator Selection for the Flap Function

N	O	R	M	A	L		I	N	P	6	=	O	N	←
							I	N	P	7	=	O	F	F

The operating elements for actuating the flaps can be selected separately from the preset flight tasks duration (normal), distance, speed and the start phase. Operating elements can be slider type, rotary potentiometers or step switches, which are wired to the plug stations for channel 6 and 7. Between the two inlets a fundamental difference exists.

While the signal generator wired to channel input 6 also affects mixer code 48 (flap → elevator), inlet 7 may be used for elevator independent flap trim. For any of these four phases of flight you can select whether the flaps function is to be performed by the signal generator of channel 6 or 7, or by neither of these. For example, you may actuate the flaps for the duration phase by slider type control 6, for distance flight by a switch module providing three switch positions, and for the start and speed phases exclusively by the preset values without any further adjustment being possible.

Adjustment

After calling code 53, a selection menu appears on the display for the active flight phase concerned, selected by actuating the external switch in question. Using the **INC** and **DEC** keys you can switch the values between ON and OFF, or the **CLEAR** key for OFF. Using the **TURN** key permits swapping between adjustment of channel 6 or 7. For selection of another flight phase the corresponding switch has to be actuated, whereupon the display will change accordingly.

Code 92 Switch Slow-Down

Elevator / Flap Transit Time SlowDown

S	m	o	o	t	h		E	L	E	=	O	F	F	←
							F	L	A	=	3	.	3	s

In order to avoid abrupt elevator and flap deflection when switching between the pre-sets for the various flight phases, the transit time of the servos for elevator and flap can be adjusted separately, by code 92, within the range 0.5s to 30s for full servo throw. In the case of the elevator this slowing down is effective only when switching from one flight phase to another one, not in the course of normal control. In the case of flaps it is permanently effective, so the flaps can be operated smoothly with a 3 position switch without jerking.

After calling code 92, the transit time can be adjusted by the **INC** and **DEC** keys. For smaller delay values the steps are very small and not every change will show on the display. Steps increase in size as the delay value increases. By pressing the **CLEAR** key the slow-down is cancelled while pressing the **TURN** key swaps between adjusting the elevator and flaps setting.

PROFITRIM-Module

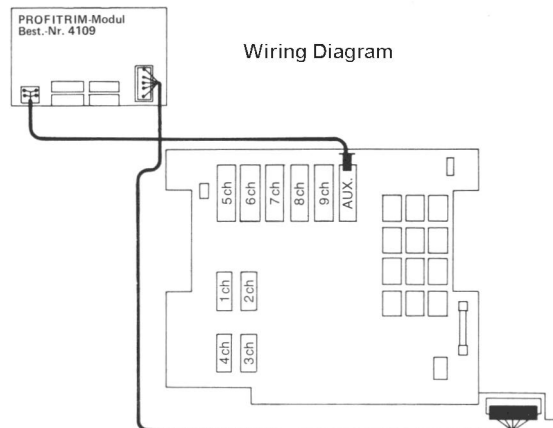
The PROFITRIM external module (order No. 4109) permits additional trimming of all flap and aileron functions by four rotary trimmers. The latter are allocated to the following functions:

- 1 = Aileron Trim (aileron function)
- 2 = Aileron Trim (flap function)
- 3 = Flap Trim (aileron function)
- 4 = Flap Trim (flap function)

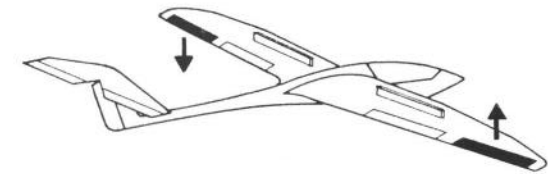
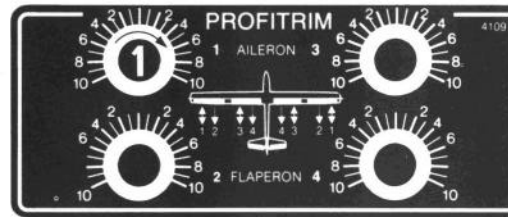
The trimmers can be turned on and off singly or in any desired combination, with their neutral positions corresponding to the programmed settings.

On deactivation of the trimmers, the adjusted value will be stored. It is thus possible to establish optimum settings in flight with the trimmers turned on, and to protect them against being accidentally changed when turned off. These data values will only be stored up to the next time the trimmer is turned on, whereupon the initial reference point, set in the course of programming will be reestablished.

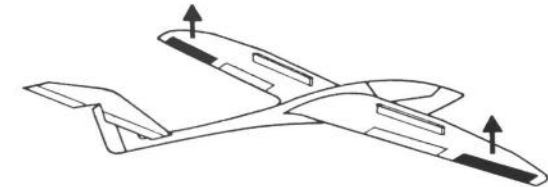
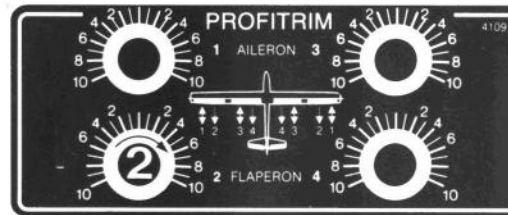
Trimmer 3 cannot be used in the case of type 6 models, since the flaps can only be driven in the same direction.



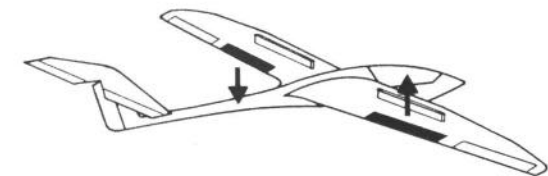
1 = Trimming Ailerons (aileron function)



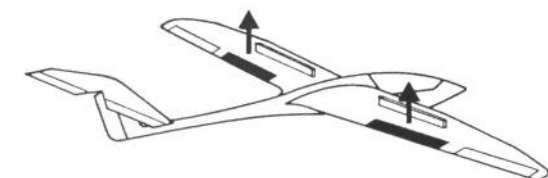
2 = Trimming Ailerons (flap function)



3 = Trimming Flaps (aileron function)



4 = Trimming Flaps (flap function)



Code 91 Activating PROFITRIM

Activating PROFITRIM

A	N	.	T	R	I	M			3	4				
			A	C	T				1	2				

Works only with (code58) model types 6 and 9.

The adjustment controls of the PROFITRIM are turned on and off using code91.

The upper line of the display shows the inactive controls, the lower line showing the active ones. The regulators are switched between on and off by entering the control number **1**...**4**), whereupon the display will update accordingly.

In the case of type 6models, control 3 (aileron trim of flaps) can not be used, since they are moved by a common servo and in the same direction only.

Actual setting can be stored by turning the control off, but only until the next trim the regulator is turned on again, whereupon the initial reference point, set in the course of programming, will be reestablished.

Code 48 Flap → Elevator

Trim Correction on activation of Flap

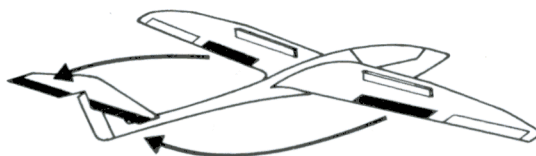
F	L	A	P	→	E	L	E	V							
o	f	s	-		7	3		+	s		+		3	3	%

Code 48 permits programming automatic correction of elevator trim on response to actuation of the flaps, so the attitude of the model won't be affected by the position of the flaps.

After calling code48, only the offset value can initially be performed, which is to say that the mixer has to be told which position the operating element for the flaps (normally a slider-type control) will occupy in the normal flight (with flaps at neutral position). To this end the operating element concerned is set accordingly and then the **STORE** key is pressed. The offset from the neutral position is shown on the lower line of the display).

The mix quota can be adjusted using the **INC** and **DEC** keys (in 1% steps) and the **6** or **8** key (in 10% steps), and set to 0 by pressing the **CLEAR** key, with direction of the mix being changed by pressing the **TURN** key.

Code 48 permits adjusting unequal mix quota and directions. In the course of programming the operating element for the flaps has to be set to the end required to be adjusted.



Code 47 Elevator → Flap

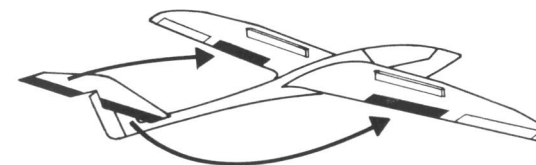
Mixer Elevator → Flap

E	L	E	V	→	F	L	A	P								
									-	s		+		2	0	%

To assist the elevator when the model is circling tightly or when performing aerobatics, the flap function can be slaved to the elevator control using mixer code47. The flaps being deflected downwards when up elevator is applied, and deflected upwards with down elevator. Thanks to this arrangement it is possible to have the flaps drop when circling and up elevator is applied, yet leave them inactive in the case of down elevator.

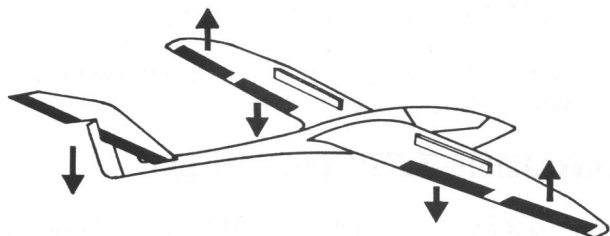
The mixer can be turned on and off by an external switch allocated bycode 23.

After calling code 47, the mix quota for up and down elevator can be adjusted separately using the **INC** and **DEC** keys (in 1% steps) and the **6** or **8** key (in 10% steps). To achieve this, the elevator control has to be moved into the corresponding position indicated by the prefix + or- on lower line of the display. Using the **CLEAR** key the value can be set to 0, and the direction of the mix can be changed by pressing the **TURN** key.



Codes 44, 45, 46 and 54

Butterfly Function as Landing Aid



The "butterfly" function serves as a landing aid by controlling the glide slope. It may be used alone or in conjunction with spoilers which are possibly in use already.

On operation of the spoiler channel control, the flaps will be deflected downward, while the ailerons are moved upwards. The elevator is also retrimmed by the mixers so as to maintain the longitudinal attitude of the model in normal flight. All of the three mixers can be adjusted individually and, of course, they can be used alone. For example, code 44 (spoiler → elevator) can be used in conjunction with normal spoilers to retain the glide path angle on extension of the spoilers, while the two other mixers have been set inoperative. In the case of full span ailerons, which are also used as flaps (flaperons), mixers 45 (spoiler → ailerons) and 44 (spoilers → elevator) may be used in unison to deflect the flaperons to the upper limit and to re-trim the elevator to suit.

When using aileron differential (code 22), aileron effectiveness will be considerably impaired by the extreme deflection of the ailerons via the butterfly function, aileron downward deflection being reduced or even suppressed entirely as a result of the differential. Deflections in the upward direction cannot be increased any more as the ailerons are already at their limits.

A remedy is provided by code 54 (reduction of differential), whereby the degree of differential is continuously, and adjustably, reduced or entirely cancelled on actuation of the butterfly function.

Adjustments:

Mixers 44, 45 and 46 are already allocated as per their functions, with mix quota having been set to 0, they are effectively inactive.

Code 44 Spoilers → Elevator
 Code 45 Spoilers → Flaps
 Code 46 Spoilers → Ailerons

To activate them, input the corresponding code number, whereupon the associated adjustment menu will be shown on the display. The first adjustment to be made is the offset, which is to say the mixer has to be told which position the operating element for the spoilers (throttle/spoiler control stick) normally occupies (spoilers retracted, and the no butterfly position of ailerons and flaps). To this end the operating element concerned is set accordingly and then the **STORE** key is pressed. The offset from the neutral position is shown on the lower line of the display). The mix quota can be adjusted using the **INC** and **DEC** keys (in 1% steps) and the **6** or **8** key (in 10% steps), and set to 0 by pressing the **CLEAR** key, with direction of the mix being changed by pressing the **TURN** key.

To deactivate the butterfly function, the mix quota of mixers 44, 45 and 46 have to be set to 0.

If spoilers are not provided, control channel 1 in code 72 (mix-only channel) can be decoupled from the stick and, with the aid of a mixer, used for other purposes.

B	R	K	→	E	L	E	V							
o	f	s	-	7	3					-	2	5	%	

B	R	K	→	F	L	A	P							
o	f	s	-	7	3					+	1	0	0	%

B	R	K	→	A	I	L	E	R	O	N				
o	f	s	-	7	3					-	9	0	%	

Code 54 Adjusting the Reduction of Differential

After calling code 54, the magnitude of the reduction of differential can be adjusted using the **INC** and **DEC** keys, with 0% meaning that the differential remains unchanged on activation of the spoiler/butterfly control, while a value of 100% indicates that differential is completely removed in the case of maximum butterfly function. The transition from normal to reduced differential is linear to spoiler actuation. The **CLEAR** key permits resetting the reduction to 0% and completely cancelling differential reduction.

D	I	F	F	R	E	D	U	C	T	I	O	N		
				8	5	%								

Programming Examples for Fixed-Wing Models

In case you have become slightly confused by the unusually large number of functions offered in the preceding chapters of these instructions, the following pages show you by way of example, how a practical adjustment of a model can be programmed in a minimum of time. In doing so, the essential functions will be activated, while the “deluxe” options meant for the competition pilot will not, initially, be taken into consideration. In the following chapters this basic program will be expanded by additional options, followed by a few examples for the Profi’s bag of tricks. Here the basic principles of computer R/C will become clear.

From the extensive range of functions you select only those which are actually required and forget the rest of them. If, in the course of time, you need more all you have to do is activate additional functions.

Be sure to duplicate the following examples step by step, so you won’t forget or overlook anything. In this manner you’ll actually get automatically familiar with your R/C equipment and won’t consider it nearly as complicated as it may have appeared at first glance.

1.) Preparations

You have installed the module into the transmitter as per the instructions. Close the case of the transmitter again and turned the transmitter on. The display will read:

m	c	-	1	8	E		M	O	D	E	L			1	
	9	.	6	V			P	C	M						

Depending on what kind of module had been installed previously in your transmitter the display may show another model number or another modulation mode.

2.) Executing RESET (Important)

Call model memory 1 and clear it completely. To do this input:

ENTER 5 6 ENTER 1 CLEAR ENTER

If the transmitter had previously been switched to PCM you now have the basic position of the display again. If not, the request will appear to turn the transmitter off. This is because it has been switched to the default position of PCM modulation. Comply with the request and then turn it on again a moment later, thereafter you will be in the basic position.

For safety’s sake, so you won’t forget it later, execute a reset (right now) on all the remainder of the model memories. To do this, input:

ENTER 5 6 ENTER 2 CLEAR ENTER

ENTER 5 6 ENTER 3 CLEAR ENTER

...

ENTER 5 6 ENTER 7 CLEAR ENTER

...

(ENTER 5 6 ENTER 3 0 CLEAR ENTER)

This procedure needs only to be performed once in order to positively delete any programming parts and data which may have been stored in the transmitter memory by an earlier used module, and could still be stored. These program fragments may cause a malfunction if not deleted.

m	c	-	1	8	E	M	O	D	E	L		1
	9	.	6	V		P	C	M				

ENTER 5 6 ENTER

s	e	l	e	c	t	M	O	D	E	L		
K	E	Y	1	-	7	O	R	+	/	-		

1

s	e	l	e	c	t	M	O	D	E	L		
N	O	N	A	M	E					:	1	

CLEAR

E	N	T	E	R	=	R	E	S	E	T	A	L	L
N	O	N	A	M	E					:	1		

ENTER

m	c	-	1	8	E	M	O	D	E	L		1
	9	.	6	V		P	C	M				

3.) Selection of Model Memory

In order to file the following adjustments under model No, 1, input the following

ENTER 5 6 ENTER 1 ENTER

4.) Entering Model Name

So you'll be able to locate it correctly later on, input the name of your model, by inputting:

ENTER 3 2 ENTER

The transmitter now asks for the name, with the cursor being located in the first position of the lower line. Using the **INC** and **DEC** keys you select the first letter of the name of the model. This is stored by pressing the **STORE** key, whereupon the cursor moves to the 2nd position. In this manner, store the complete name of the model (the length of the name must no exceed 11 characters). Using the **TURN** key changes between uppercase and lowercase letters. If you have entered an incorrect letter, you can backspace using the **CLEAR** key and the correct it. Having entered the complete name, input is terminated by a press of the **ENTER** key.

NOTE:

The transmitter is now back in the command mode, indicated on the lower line of the display by "FUNCTION ?", which is to say it is waiting for a code number to be input. During adjustment it will remain in this mode, which can be left by pressing the **ENTER** key. From normal mode you can switch to the command mode by the **ENTER** key.

For the ensuing inputs it is assumed that the transmitter is in the command mode, that is "FUNCTION?" will be showing on the lower line of the display.

In case you had switched off your transmitter or had accidentally switched to normal mode via the **ENTER** key, just press the **ENTER** key again to get back to command mode.

m	c	-	1	8	E	M	O	D	E	L		1
	9	.	6	V		P	C	M				

ENTER 3 2 ENTER

N	A	M	E	:								
_												

INC...DEC

N	A	M	E	:								
T												

STORE

N	A	M	E	:								
T	_											

INC...DEC...STORE...

N	A	M	E	:								
T	A	X	I	C	U	P						

ENTER

T	A	X	I	C	U	P			:	1		
F	U	N	C	T	I	O	N	?	_			

Programming Examples for Fixed-Wing Models

5.) Defining Stick Allocation

Set the control stick allocation you are accustomed to by entering:

5 7 ENTER

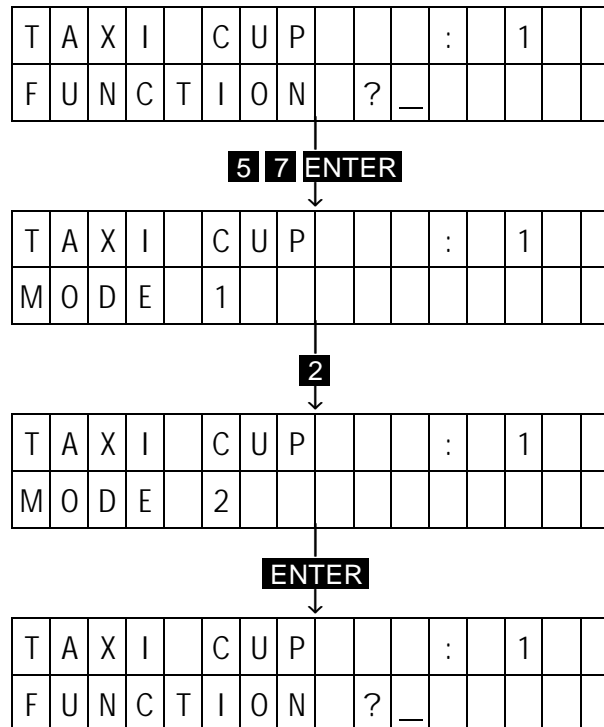
Thereupon the lower line of the display will read:

MODE 1

Now press one of the keys **1... 4**, to suit your normal control mode:

- 1** = Throttle and Ailerons on the right
Elevator and Rudder on the left
- 2** = Throttle and Rudder on the left
Ailerons and Elevator on the right
- 3** = Throttle and Rudder on the right
Ailerons and Elevator on the left
- 4** = Throttle and Ailerons on the left
Elevator and Rudder on the right

The figure on the display will change accordingly.
Terminate the input by pressing the **ENTER** key and you are once again back in command mode.



6.) Defining the Model Type

The previous inputs were universally applicable to all types of

model. Now you select the type of model to which your actual model corresponds. For this example it is assumed that you own a perfectly normal power model, the ailerons of which as well as elevator and rudder are operated by a single servo each. Input:

5 8 ENTER

In the lower line of the display now appears the actual model type. At the moment it will read "NORMAL". As you do not intend to switch to another model, leave type selection by pressing the **ENTER** key.

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

5 8 ENTER

T	A	X	I		C	U	P			:	1		
N	O	R	M	A	L								

ENTER

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

7.) Determining Idle Trim

Define the idle trim to the manner you are used to, e.g. pulling or pushing the throttle stick to increase engine power. To this end, input:

1 8 ENTER

The display then reads: IDLE R. TRIM OFF

Using the **INC** and **DEC** keys you may now switch to and fro between I and T. I means pushing for full throttle, and T means pulling. Terminate the selection with the **ENTER** key.

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

1 8 ENTER

T	A	X	I		C	U	P			:	1				
I	D	L	E		R	.		T	R	I	M		O	F	F

ENTER

T	A	X	I		C	U	P			:	1			
I	D	L	E		R	.		T	R	I	M		<u>I</u>	

ENTER

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

Programming Examples for Fixed-Wing Models

8.) Copying Adjustments

All that's been input so far may be considered as "pilot specific" programming, as these inputs depend on the habits of the pilot and are alike for all models (excepting the name of the model). In order not to have to input these settings for each model memory, you can now copy them first into the other model memories. To this end input:

9 4 ENTER 1 ENTER 2 ENTER ENTER

You have now copied the essential settings of model 1 onto model 2. Repeat the same procedure for the remaining models by:

9 4 ENTER 1 ENTER 3 ENTER ENTER

9 4 ENTER 1 ENTER 4 ENTER ENTER

...

9 4 ENTER 1 ENTER 7 ENTER ENTER

...

(9 4 ENTER 1 ENTER 3 0 ENTER ENTER)

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

9 4 ENTER

C	O	P	Y		:	F	R	O	M		M	O	D	E	L
K	E	Y		1	-	7		O	R		+	/	-		

1

C	O	P	Y		:	F	R	O	M		M	O	D	E	L
T	A	X	I		C	U	P			:	1				

ENTER

C	O	P	Y		:	T	O		M	O	D	E	L		
K	E	Y		1	-	7		O	R		+	/	-		

2

C	O	P	Y		:	T	O		M	O	D	E	L		
N	O		N	A	M	E				:	2				

ENTER

C	O	P	Y		:	1	→		3						
E	N	T	E	R		K	E	Y		e	x	e	c		

ENTER

9.) Modulation Mode

If a PCM receiver has been installed in your model you may skip this step. In the case of a PPM receiver just input:

9 5 ENTER INC ENTER

Doing this you have switched to PPM mode, The transmitter now requests you to turn it off so it can change over to PPM.

A reversion to PCM mode is performed in the same way.

T	A	X	I	C	U	P		:	1	
F	U	N	C	T	I	O	N	?	_	

9 5 ENTER

T	A	X	I	C	U	P		:	1	
M	O	D	U	L	A	T	I	O	N	P C M

INC

T	A	X	I	C	U	P		:	1	
M	O	D	U	L	A	T	I	O	N	P P M

ENTER

T	A	X	I	C	U	P		:	1	
p	o	w	e	r	s	w	o	f	f	

Switch the power off, and then on again

T	A	X	I	C	U	P		:	1	
9	.	6	V		P	P	M			

ENTER

T	A	X	I	C	U	P		:	1	
F	U	N	C	T	I	O	N	?	_	

10.) Adjusting the Direction of Servo Rotation

For the ensuing adjustments you now require a model with a ready to operate installed radio set. The servos should be wired to the receiver as follows:

- Channel 1 = Engine Throttle
- Channel 2 = Ailerons
- Channel 3 = Elevator
- Channel 4 = Rudder

Turn the transmitter and receiver on now and check the function of the control surfaces. Most likely one or other of the servos will be found to rotate in the wrong direction (it would be matter of sheer luck if not). To correct the direction of rotation of a servo moving in the wrong direction, call servo reversing code 1:

ENTER 1 1 ENTER

The display now indicates the direction of rotation of all servos. Correct the direction of rotation by entering the corresponding channel number so all control surfaces and the throttle move in the right direction. Terminate all input using the **ENTER** key.

T	A	X	I	C	U	P		:	1	
F	U	N	C	T	I	O	N	?	_	

1 1 ENTER

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

2

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

3

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

ENTER

T	A	X	I	C	U	P		:	1	
F	U	N	C	T	I	O	N	?	_	

Programming Examples for Fixed-Wing Models

11.) Adjusting Servo Throw

Normally one should choose the size of the control horn and servo arms so they provide approximately the required control surface throw. In this context you should remember: the relative size of the arm of a servo and the lever of a control horn determines the magnitude of the throw of the control surface. All control linkages introduce a certain amount of play, which can not be completely eliminated even when using top quality servos and working with ultimate precision, with the slop increasing with time. Everything should be done to reduce slop as much as possible. Here are some basic rules.

1. Keep control horns as large as possible as this helps minimise slop.
2. Slop will be greater the more acute or obtuse the angle formed by the linkage and control horn. Slop will be smallest when the linkage and horn form a right angle (90°).
3. Servo slop will make itself felt more the smaller the angular range the servo operates over.

When applying these fundamental rules the conclusion must be drawn that full servo throw should be used for the controls of a model, using the largest possible control horns, and that the required control throw should be achieved by adjusting the servo arm.

In practical operation, however, smaller and larger deviations from these ideal conditions have to be accepted, such as the selection of smaller control horns for visual reasons, the control surface linkages will have to be concealed in the gaps between surfaces, or the accommodation of large servo arms is not possible in the fuselage.

For such cases the PROFULTRASOFT-Module provides the ability to adjust servo throw, with all the servos and each direction of operation being separately adjustable. To make this point perfectly clear: this possibility should be utilised only after you have mechanically optimised the linkages as far as possible in every case. At first glance, taking the easiest and simplest way of linking the control surfaces and performing adjustments via the transmitter options may appear to be a good solution, but in that case a lot of obtainable control precision will be lost. This, of course, is not limited to the control surfaces, but also applies to the throttle as well. Here again the linkage should be attached to the outermost hole of the carburettor lever and a servo arm chosen which will open the carburettor fully when the throttle stick is in the full throttle position, and will close the carburettor fully with the stick and trim fully pulled back. It is important that the servo is not mechanically restricted in its motion. If this can not be achieved mechanically the adjustments may then be optimised using the throw adjust (code 12). To achieve this, input:

1 2 ENTER

The select the control channel to be used for throw adjustments:

- 1** = Throttle
- 2** = Ailerons
- 3** = Elevator
- 4** = Rudder

Let us assume you wish to adjust servo throw for the throttle operation, press in this **1** case.

The display now indicates normal servo throw (100%). Shift the throttle stick to the full throttle position and adjust the carburettor with the aid of the **INC** and **DEC** keys so it will be fully open, but is not

hitting the mechanical stops. The display now shows the servo throw in % of normal servo throw.

Move the throttle to the idle position and set the trim slider for throttle all the way back against its stop, where the carburettor will be as closed as possible. The display now shows 100% again, since for this side of the servo throw (viewed from the centre) the normal value is still effective.

Throw is now adjusted using the **INC** and **DEC** keys so the carburettor is fully closed without hitting the mechanical stop. It is possible that an idle stop screw on the carburettor will have to be adjusted to permit the carburettor to fully close. You should now be able to adjust the RPM of the engine with the idle trim, and also stop the engine with the trim fully back.

In the same manner you'll be able to adjust the throw of the control surfaces, if necessary asymmetrically, for example if the elevator at "full up" deflection blocks the rudder, and downward deflection must not be reduced. Call the elevator position and adjust deflection using the **INC** and **DEC** keys so that the rudder remains freely movable. Remember to take changes in elevator trim into account to ensure that fowling does not occur. Terminate the input by pressing the **ENTER** key.

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

1 2 ENTER

T	H	R	O	W		A	D	J	U	S	T		
p	u	s	h		c	h		k	e	y		1	- 9

1

T	H	R	O	W		A	D	J	U	S	T		
		1	c	h		+	E	N	D		1	0	0 %

Stick in full Throttle position.. **INC / DEC**

T	H	R	O	W		A	D	J	U	S	T		
		1	c	h		+	E	N	D			9	2 %

Stick and Trim in idle Throttle position

T	H	R	O	W		A	D	J	U	S	T		
		1	c	h		-	E	N	D		1	0	0 %

INC / DEC

T	H	R	O	W		A	D	J	U	S	T		
		1	c	h		+	E	N	D		1	1	5 %

3

T	H	R	O	W		A	D	J	U	S	T		
		3	c	h		+	E	N	D		1	0	0 %

INC... DEC... ENTER

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

The model may be considered as now being essentially ready for flight, the vital adjustments having been performed. If you are a beginner you ought to be content with these adjustments and collect practical experience by nowflying your model. Although it would not do any harm to try the other examples, you should keep in mind that the latter are “deluxe” options with the aid of which problems encountered when flying certain models can be solved. Flying certain manoeuvres can be made easier and/or advantages can be gained over other contestants in competition flying due to the simplified operation of the transmitter.

Bearing this in mind:

II. Further Examples

Let's return to the last example in the preceding chapter. The full-span elevator of the tailplane when deflected upwards blocks the rudder mounted above it.

This had been avoided by reducing the upward servo throw correspondingly, also allowing for the possible upward trim movement. The reaction to elevator will be smoother now the down-elevator for the reduced throw is evenly distributed over the entire control range from neutral to hard over up. The different control reaction to “up” and “down” may be acceptable in some cases, but might not necessarily be so. The PROFULTRASOFT-Module offers another option for such cases, namely throw reduction.

Programming Examples for Fixed-Wing Models

12.) Throw Reduction

Unlike throw adjust, servo reaction to a control stick deflection remains unchanged, provided the preset threshold value is not exceeded. On reaching the threshold value, the servo will simply stop there, even when the stick concerned (or some other signal generator) is moved beyond that point. It does not matter by which of the means the servo reaches the threshold value (by control stick alone or by interaction of mixers). The only importance is that the threshold can not be exceeded by the servo. In our example we wish to adjust the threshold for the elevator in such a way that jamming of the rudder can not occur, while the elevator action remains normal and no concern is needed over the upward deflection of the control surface. Throw reduction is accessed by code 19:

1 9 ENTER

Select the elevator channel by entering number and hold the elevator in the "full up" position. By pressing the **DEC** key you may now reduce the threshold (normally at 150% of normal servo throw) to a value which prevents the elevator hitting the rudder.

When pulling the elevator stick slowly you'll notice that the servo follows the stick in a normal manner, until it stops at the threshold value, resulting in a "dead" range having been created at the end of the stick travel. It will become larger, if up trim has been added.

This example permits recognising the action of throw reduction, although its normal field of application is in the interaction of several mixers on a specific servo, used for example in the case of plain flaps and flaperons of large sailplane models. Here the threshold action can be set just short of a point where otherwise linkages or hinges would flex or deform.

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	-			

1 9 ENTER

T	H	R	O	W		L	I	M	I	T				
p	u	s	h		c	h		k	e	y		1	-	9

3

T	H	R	O	W		L	I	M	I	T				
	3	c	h		-	E	N	D			1	5	0	%

DEC

T	H	R	O	W		A	D	J	U	S	T		
	3	c	h		-	E	N	D			9	4	%

ENTER

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	-			

13.) Adapting Throttle Characteristics

If you have flown your power model in the meantime, you may have noticed that while engine speed can be adjusted between idle and full throttle via the throttle stick, the RPM adjustments are not uniformly distributed along the stick throw. In most cases engine speed adjustments for idle to 80% of full throttle will occupy the lower half of the control stick movement, while the upper half of the stick travel has little effect. This depends on the carburettor used of course, but it is typical nevertheless for nearly all engines. The desirable carburettor characteristics would be for the RPM to follow the stick travel in a linear manner.

The PROFULTRASOFT-Module also provides an adjustment option to allow compensation of the above mentioned non-linearity – neutral point offset can be called up for channel 1:

3 1 ENTER

The indicated value 0% mean linear operation of the carburettor control lever by the servo. In the case described above the actuation has to be a progressive one compared to the regressive behaviour of the carburettor. The servo position for the stick neutral point needs to be offset in the direction towards idle, which can be accomplished by press the **INC** key. Adjustments should preferably be made with the engine running until a continuous rate of engine RPM change has been achieved. Terminate adjustments using the **ENTER** key.

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

3 1 ENTER

T	H	R	/	B	R	K		M	I	D	P	N	T
+				0	%								

TURN

T	H	R	/	B	R	K		M	I	D	P	N	T
-				0	%								

INC

T	H	R	/	B	R	K		M	I	D	P	N	T
-				4	0	%							

ENTER

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

14.) Trim Storage

By now you have test flown your model and though you built and trimmed it correctly, now that the model flies perfectly straight, the trim levers are no longer in the neutral position. This is unsatisfactory in that the levers may be accidentally displaced and you may not remember their correct positions afterwards. Also when you fly another model it will be difficult to reproduce the correct trim lever positions if they are not at the neutral position.

The mc-18 transmitter therefore provides for storage of trim data, so the trim levers can be reset to the neutral position. In this manner you can always reproduce the correct trim adjustment even after a change of models.

To store the in-flight established trim data input:

5 9 ENTER STORE

The display now indicates, in its lower line, the trim lever offset you had set from the neutral position (in the sequence from left to right: throttle, ailerons, elevator, rudder). The corresponding electronic values are now retained and you can return the trim levers to their neutral positions. While you do this you will notice that the display readings will return to zero.

The idle trim lever, through should not be reset as a rule, this being a random position not an in-flight established setting. Terminate the adjustment by pressing the **ENTER** key. The in-flight established trim will now correspond to the neutral position of the trim levers.

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

5 9 ENTER

T	R	I	M		O	F	F	S	E	T			
S	T	O	R	E		O	R		C	L	E	A	R

STORE

S	E	T		T	R	I	M		&		E	N	T	E	R
+	3	9		+	0	6		-	4	4		-	0	1	

Set the trim levers to neutral

S	E	T		T	R	I	M		&		E	N	T	E	R
+	3	9			0				0				0		

ENTER

T	A	X	I		C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_			

ENTER

T	A	X	I		C	U	P			:	1		
	9	.	6	V		P	P	M					

Copying Example – Single Model Memory

Between two mc18 transmitters
With Programming Interface (Order No. 4180)

T	A	X	I	C	U	P		:	1		
F	U	N	C	T	I	O	N	?	_		

9 4 ENTER

C	O	P	Y	:	F	R	O	M	M	O	D	E	L
K	E	Y	1	-	7	O	R	+	/	-			

1

C	O	P	Y	:	F	R	O	M	M	O	D	E	L
T	A	X	I	C	U	P		:	1				

ENTER

C	O	P	Y	:	T	O	M	O	D	E	L		
K	E	Y	1	-	7	O	R	+	/	-			

DEC

C	O	P	Y	:	T	O	M	O	D	E	L		
E	X	T	E	R	N	A	L	I	N	T	F	.	

ENTER

C	O	P	Y	:		1	→	E	X	T			
E	N	T	E	R	K	E	Y	e	x	e	c		

ENTER

C	O	P	Y	:		1	→	E	X	T			
S	E	N	D	I	N	G							

C	O	M	P	L	E	T	E	D					
S	W	I	T	C	H	O	F	F					

Transmitting Unit

Call the copy function

Call the model to be copied, such as model 1, using the keys **1**...**9** or **INC** and **DEC**.

If the model is to be copied externally, call the external interface using the **DEC** key.

Terminate the copy program selection using the **ENTER** key.

Unit ready to transmit copy.

Trigger copying process with the **ENTER** key.

Important

Always trigger the copy process by the **ENTER** key on the receiving unit first.

m	c	-	1	8	E	M	O	D	E	L			6
F	U	N	C	T	I	O	N	?	_				

9 4 ENTER

C	O	P	Y	:	F	R	O	M	M	O	D	E	L
K	E	Y	1	-	7	O	R	+	/	-			

DEC

C	O	P	Y	:	F	R	O	M	M	O	D	E	L
E	X	T	E	R	N	A	L	I	N	T	F	.	

ENTER

C	O	P	Y	:	T	O	M	O	D	E	L		
K	E	Y	1	-	7	O	R	+	/	-			

4

C	O	P	Y	:	T	O	M	O	D	E	L		
N	O	N	A	M	E			:	4				

ENTER

C	O	P	Y	:	E	X	T	→		4			
E	N	T	E	R	K	E	Y	e	x	e	c		

ENTER

C	O	P	Y	:	E	X	T	→		4			
W	A	I	T										

C	O	M	P	L	E	T	E	D					
S	W	I	T	C	H	O	F	F					

Receiving Unit

Call the copy function

If the model is to be copied from the external interface call the interface using the **DEC** key.

Call the model memory into which it is to be copied, using the keys **1**...**9** or **INC** and **DEC**.

As a safety precaution copying into the currently active memory is not permitted, in this example memory 6.

Terminate the copy program selection using the **ENTER** key.

Unit ready to receive copy.

Trigger copying process with the **ENTER** key.

Important

Always trigger the copy process by the **ENTER** key on the receiving unit first.

Copying Example – All Model Memory

Between two mc18 transmitters

With Programming Interface (Order No. 4180)

T	A	X	I	C	U	P			:	1		
F	U	N	C	T	I	O	N		?	_		

9 4 ENTER

C	O	P	Y		:	F	R	O	M	M	O	D	E	L
K	E	Y	1	-	7	O	R		+	/	-			

DEC DEC

C	O	P	Y		:	F	R	O	M	M	O	D	E	L
T	O	T	A	L	S	T	O	R	A	G	E			

ENTER

C	O	P	Y		:	T	O	M	O	D	E	L		
K	E	Y	1	-	7	O	R		+	/	-			

DEC

C	O	P	Y		:	T	O	M	O	D	E	L		
E	X	T	E	R	N	A	L	I	N	T	F	.		

ENTER

C	O	P	Y		:	A	L	L	→	E	X	T		
E	N	T	E	R	K	E	Y	e	x	e	c			

ENTER

C	O	P	Y		:	A	L	L	→	E	X	T		
S	E	N	D	I	N	G								

C	O	M	P	L	E	T	E	D						
S	W	I	T	C	H	O	F	F						

Transmitting Unit

Call the copy function

Call all model memories by pressing the **DEC** key twice.

If the model is to be copied externally, call the external interface using the **DEC** key.

Terminate the copy program selection using the **ENTER** key.

Unit ready to transmit copy.

Trigger copying process with the **ENTER** key.

Important

Always trigger the copy process by the **ENTER** key on the receiving unit first.

m	c	-	1	8	E	M	O	D	E	L		6		
F	U	N	C	T	I	O	N		?	_				

9 4 ENTER

C	O	P	Y		:	F	R	O	M	M	O	D	E	L
K	E	Y	1	-	7	O	R		+	/	-			

DEC

C	O	P	Y		:	F	R	O	M	M	O	D	E	L
E	X	T	E	R	N	A	L	I	N	T	F	.		

ENTER

C	O	P	Y		:	T	O	M	O	D	E	L		
K	E	Y	1	-	7	O	R		+	/	-			

DEC DEC

C	O	P	Y		:	T	O	M	O	D	E	L		
N	O	N	A	M	E				:	4				

ENTER

C	O	P	Y		:	E	X	T	→	A	L	L		
E	N	T	E	R	K	E	Y	e	x	e	c			

ENTER

C	O	P	Y		:	E	X	T	→	A	L	L		
W	A	I	T											

C	O	M	P	L	E	T	E	D						
S	W	I	T	C	H	O	F	F						

Receiving Unit

Call the copy function

If the model is to be copied from the external interface call the interface using the **DEC** key.

Call all model memories by pressing the **DEC** key twice.

Terminate the copy program selection using the **ENTER** key.

Unit ready to receive copy.

Trigger copying process with the **ENTER** key.

Important

Always trigger the copy process by the **ENTER** key on the receiving unit first.

Copying Example – Single Model Memory

Model Memory to Model Memory
In the same Transmitter

T	A	X	I	C	U	P			:	1		
F	U	N	C	T	I	O	N	?	_			

9 4 ENTER

C	O	P	Y	:	F	R	O	M	M	O	D	E	L
K	E	Y	1	-	7	O	R	+	/	-			

1

C	O	P	Y	:	F	R	O	M	M	O	D	E	L
T	A	X	I	C	U	P			:	1			

ENTER

C	O	P	Y	:	T	O	M	O	D	E	L		
K	E	Y	1	-	7	O	R	+	/	-			

3

C	O	P	Y	:	T	O	M	O	D	E	L		
N	O	N	A	M	E				:	3			

ENTER

C	O	P	Y	:		1	→			3			
E	N	T	E	R	K	E	Y	e	x	e	c		

ENTER

Call the copy function

Call the model to be copied, such as model 1, using the keys **1...9** or **INC** and **DEC**.

Call the model memory to be copied, into using the keys **1...9** or **INC** and **DEC** such as memory 3.

Terminate the copy program selection using the **ENTER** key.

Transmitter ready to copy.

Trigger copying process with the **ENTER** key.

As a safety precaution copying into the currently active memory is not permitted.

C	O	P	Y	:		1	→			4			
I	N	V	A	L	I	D							

Indicates that copying into the currently active memory is not permitted.

E	R	R	O	R	S								
S	W	I	T	C	H	O	F	F					

Indicates faulty input while programming, renew the input.

I	N	C	O	M	P	A	T	I	B	L	E		
S	W	I	T	C	H	O	F	F					

Appears when trying to copy from a 30 memory transmitter to a 7 memory unit.