

9CP / 9CAP / 9CHP

PCM/FM SYSTEM, 9CHANNELS



INSTRUCTION MANUAL

1M23N09607



Futaba®

Digital Proportional R/C System

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Introduction to the 9C System

TRANSMITTER

The versatile T9C PCM1024 multi-function 9-channel transmitter may be used with any Futaba PCM1024 receiver! In addition, your system will work with Futaba FM/PPM receivers when you select the FM transmission option. The large graphic liquid-crystal display panel allows rapid data input into its easy-to-read LCD display. To allow efficient programming, all of the transmitter's functions have been separated into Basic Menu and Advanced Menu functions.

The 9C transmitter has electronic trims so that rapid yet precise trim adjustment is possible while flying. These exclusive trims are designed to that when the trim lever is activated, trim movement accelerates, and in addition, each trim's sensitivity may be programmed to match the model or control. For convenience, the location of the trim is constantly displayed on the LCD panel.

The 9C system comes complete with programming for ACRO (aircraft), HELISWH1/SWH2/SWH4/SR-3/SN-3 (helicopter), or GLIDIFLP/2FLP (sailplane) mixing and can accommodate virtually any model configuration. The compact, ergonomically-designed transmitter holds completely independent memories for eight different models. [For modelers requiring additional storage, memory for another six models can be added using the DP16K CAMPac (available separately). You may also easily copy and transfer your model data to another T9C transmitter by plugging your CAMPac into the other transmitter. The data pack does not require any battery backup and can be stored indefinitely.]

The 9C features a new stick design which provides an improved feel. The sticks' length and tension may be adjusted. Switches are provided for dual rate (D/R), programmable mixers (PROG.MIX), and other functions. And the location of the switches can be changed electronically to suit your own preferences. For those learning to fly, the transmitter has "buddy-box" capability and the individual training channels can be selected by the instructor. [The trainer cord is sold separately.]

Standard programming features include servo reversing for all channels, end point adjustment on all channels, dual rates, exponential, throttle cut, electronic subtrim on all channels, and fail safe on all channels (PCM transmission only). An alphabetic name may be used for each model stored in the eight model memories.

The 9C features a number of special mixing features applicable to all types of flying models. For aircraft, there are extensive preprogrammed mixing features: aileron differential, flaperon, V-tail, elevon, airbrake (with delayed elevator), elevator→flap, snap roll in 4 directions, throttle→needle (with acceleration), idle-down, and second aileron switching. Helicopter features include throttle and pitch curve settings, hovering pitch and throttle, revolution mixing, delay, offset, throttle needle, gyro mixing, and governor mixing. Special sailplane features for single and dual flap servos include flap→aileron, aileron→flap, elevator→flap, aileron differential, butterfly mixing, camber control, and start (launch) and speed presets.

R149DP/R138DF RECEIVERS

The R149DP nine-channel or R138DF eight-channel receiver included with your system is a high-sensitivity narrow-band, dual conversion receiver.

SERVOS

The S3001 servo includes a ball bearing and provides 60° of travel in a rapid 0.22 of a second, along with a rated torque of 3kg-cm (41.7 oz-in). The S9252 servo includes a coreless motor and provides 60° of travel in a rapid 0.14 second (at 4.8V), along with a rated torque of 6.6kg-cm (91.7 oz-in) (at 4.8V).

CONTENTS AND TECHNICAL SPECIFICATIONS (9CP / 9CAP / 9CHP)

Specifications and ratings are subject to change without notice.

Your 9C (PCM or FM) system includes the following components:

- 9C Transmitter, including RF module
- R149DP or R138DF Receiver
- Servos: S3001 or S9252, with mounting hardware and servo arm assortment
- Switch harness
- Extension cord

Transmitter T9CP / T9CAP / T9CHP

Operating system: 2-stick, 9 channels, PCM1024 system

Transmitting frequency: 29, 35, 36, 40, 41, 50, or 72 MHz bands

Modulation: FM/PPM or PCM, switchable

Power supply: 9.6V NiT8S700B Ni-Cd battery

Current drain: 280 mA

Receiver R149DP (PCM Dual conversion)

Receiving frequency: 29, 35, 36, 40, 41, 50, or 72 MHz bands

Intermediate freq.: 10.7 MHz and 455 kHz

Power requirement: 4.8V Ni-Cd battery

Current drain: 14 mA

Size: 1.28 x 2.17 x 0.82" (32.6x55.0x20.8mm)

Weight: 34.5 g (1.22 oz)

Receiver R138DF (FM Dual conversion)

Receiving frequency: 35, 40, 41 MHz bands

Intermediate freq.: 10.7 MHz and 455 kHz

Power requirement: 4.8V Ni-Cd battery

Current drain: 18 mA

Size: 2.56 x 1.42 x 0.85" (65x36x21.5mm)

Weight: 41 g (1.45 oz)

Servo S3001 (Standard, ball-bearing)

Control system: Pulse width control,

1.52 ms neutral

Power requirement: 4.8V (from receiver)

Output torque: 3.0 kg-cm (41.7 oz-in)

Operating speed: 0.22 sec/60°

Size: 1.59 x 0.78 x 1.41" (40.4 x 19.8 x 36 mm)

Weight: 45.1g (1.59 oz)

Servo S9252 (Coreless motor)

Control system: Pulse width control,

1.52 ms neutral

Power requirement: 4.8V (from receiver)

Output torque: 6.6 kg-cm (91.7oz-in) at 4.8V

Operating speed: 0.14 sec/60° at 4.8V

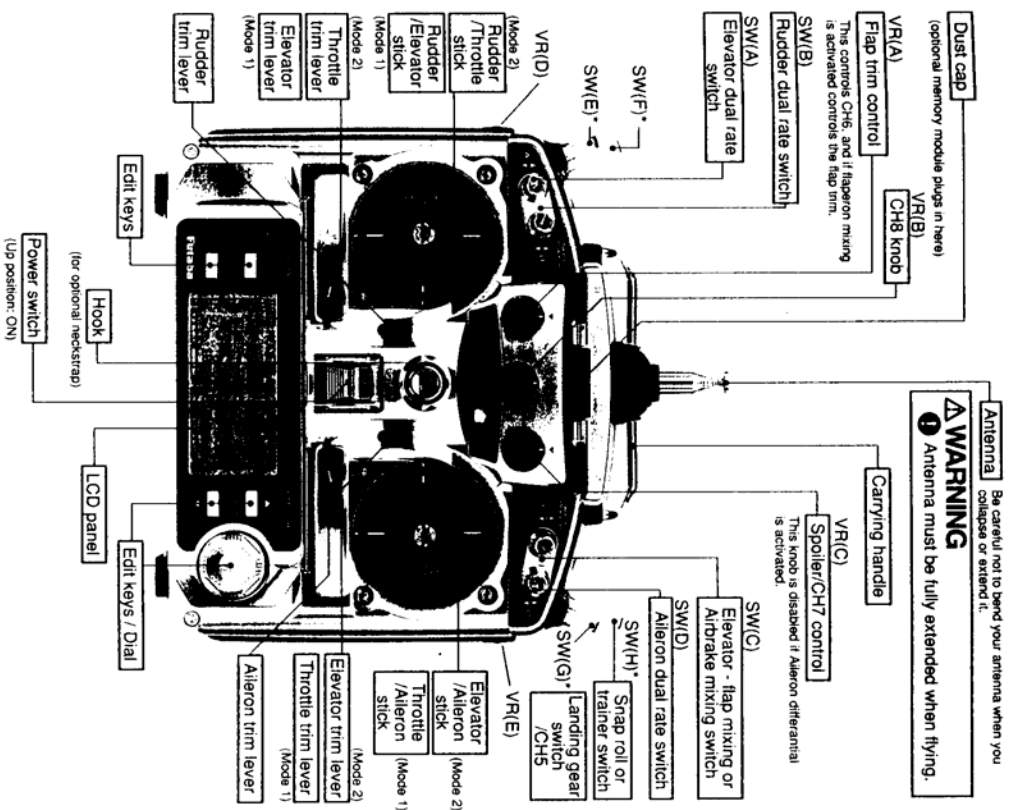
Size: 1.57 x 0.79 x 1.44" (40 x 20 x 36.6 mm)

Weight: 50 g (1.76 oz)

The following additional accessories are available from your dealer. Refer to a Futaba catalog for more information:

- Memory module – the optional DP-16K CAMPac adds your model storage capability (to 14 models from 8) and allows you to transfer programs to another 9C transmitter.
- Transmitter battery pack – the NT8S700B transmitter Ni-Cd battery pack may be easily exchanged with a fresh one to provide enough capacity for extended flying sessions
- Trainer cord – the optional training cord may be used to help a beginning pilot learn to fly easily by placing the instructor on a separate transmitter. Note that the 9C transmitter may be connected to another 9C system, as well as to any FF5, Skysport, Super 7, Super 8 or 9Z series transmitter.
- Neckstrap – a neckstrap may be connected to your T9CA system to make it easier to handle and improve your flying precision, since your hands won't need to support the transmitter's weight.

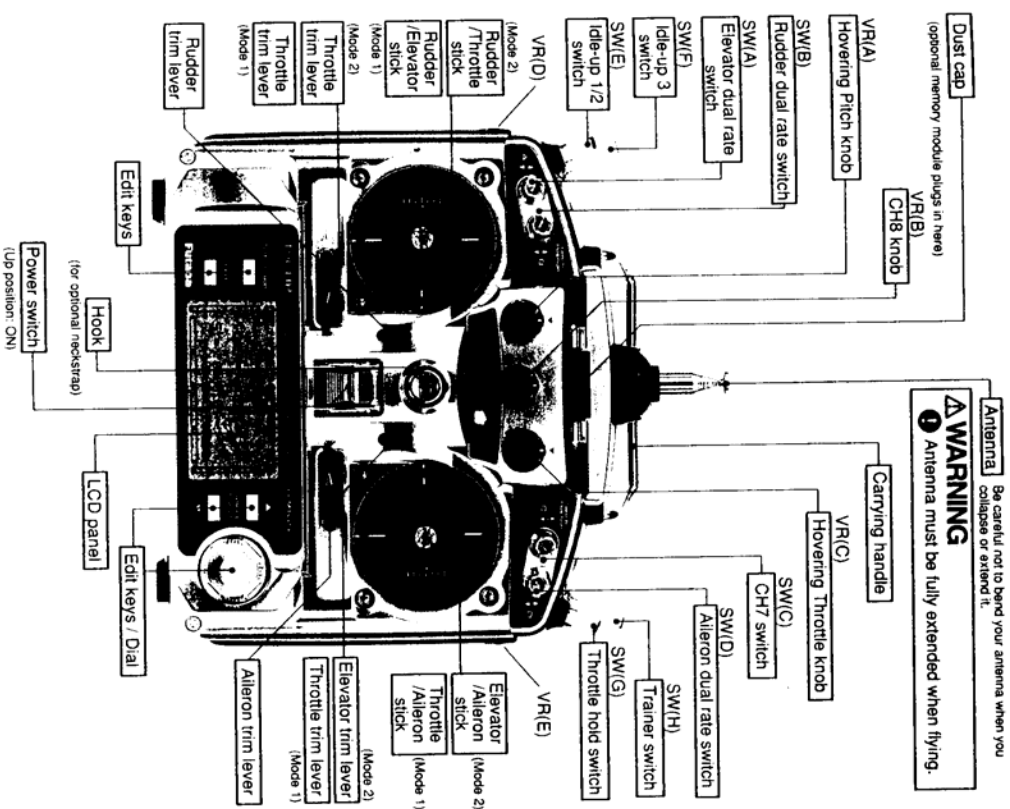
TRANSMITTER CONTROLS – AIRCRAFT



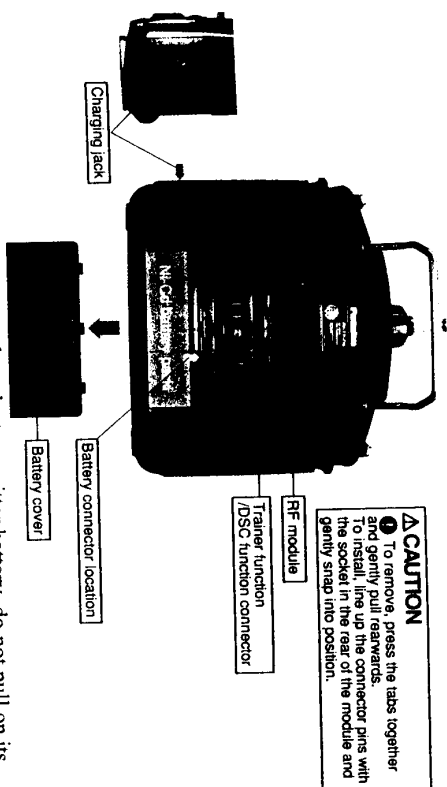
This figure shows the default assignments for a 9C aircraft system as supplied by the factory. You can change many of the switch positions or functions by selecting a new position within the setting menu for the function you wish to move.

The functions for 9CAP mode 2 transmitter reverse the E and G switches (F and H switches).

TRANSMITTER CONTROLS – HELICOPTER



This figure shows the default assignments for a 9C system as supplied by the factory. You can change many of the switch positions or functions by selecting a new position within the setting menu for the function you wish to move.



CAUTION
 1 To remove, press the tabs together and gently pull rearwards.
 To install, line up the connector pins with the socket in the rear of the module and gently snap into position.

NOTE: If you need to remove or replace the transmitter battery, do not pull on its wires to remove it. Instead, gently pull on the plastic connector housing where it plugs in to the transmitter.

SWITCH ASSIGNMENT TABLE

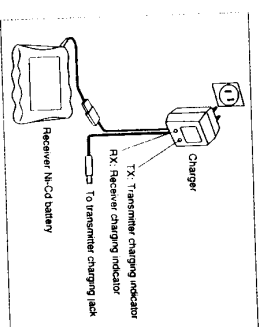
The factory default functions activated by the switches and knobs for a 9C transmitter are shown below. Note that some of the functions will not operate until activated in the mixing menus. The functions for 9CAP mode 2 transmitter reverse the E and G switches (F and H switches).

Switch / Knob	ACRO	GLID	HELI
Switch A	Elevator Dual Rate	Elevator Dual Rate ↓ = Butterfly on	Elevator Dual Rate
Switch B	Rudder Dual Rate / CH9 ↑ = ELE → FLP on center ↓ = Idle-down	Rudder Dual Rate / CH9 ↑ = ELE → FLP on center ↓ = Idle-down	Rudder Dual Rate / CH9
Switch C	↑ = Aileron on center ↓ = Aileron on	Aileron Dual Rate back = Speed forward = Start (Launch)	Aileron Dual Rate
Switch D	Aileron Dual Rate	Idle-up 1/2	Idle-up 1/2
Switch E		Idle-up 3/CH5	Idle-up 3/CH5
Switch F		Idle-up 3/CH5	Idle-up 3/CH5
Switch G	Landing Gear / CH5	Trainer GLID2FLP: Flap (Flap trim if FLP on)	Trainer GLID2FLP: Flap (Flap trim if FLP on)
Switch H	Snap Roll/Trainer	Trainer GLID2FLP: Flap (Flap trim if FLP on)	Trainer GLID2FLP: Flap (Flap trim if FLP on)
Knob A	Flap (Flap trim if FLP on) / CH6	Trainer GLID2FLP: Flap (Flap trim if FLP on)	Trainer GLID2FLP: Flap (Flap trim if FLP on)
Knob B	CH8	CH8	CH8
Knob C	Spoiler (disabled if AI-DIF on) / CH7	Spoiler (disabled if AI-DIF on)	Spoiler (disabled if AI-DIF on)
Knob D			
Knob E			

CHARGING THE Ni-Cd BATTERIES

Charging Your System's Batteries

1. Connect the transmitter charging jack and airborne Ni-Cd batteries to the transmitter and receiver connectors of the charger.
2. Plug the charger into a wall socket.
3. Check that the charger LED lights. The batteries should be left on charge for about 15 hours when recharging the standard NR-4J, NR-4RB, NR4F1500 and NT8S700B Ni-Cd batteries.



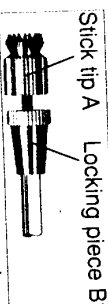
CAUTION

Only charge the batteries with the charger supplied with your system. The use of a fast charger may damage the batteries by overheating and dramatically reduce their lifetime.

You should fully discharge your system's batteries periodically to prevent a condition called "memory." For example, if you only make two flights each session, or you regularly use only a small amount of the batteries' capacity, the memory effect can reduce the actual capacity even if the battery is fully charged. You can cycle your batteries with a commercial cycling unit, or by leaving the system on and exercising the servos by moving the transmitter sticks. Cycling should be done every four to eight weeks, even during the winter or periods of long storage. Keep track of the batteries' capacity during cycling; if there is a noticeable change, you may need to replace the batteries.

Adjusting the length of the non-slip control sticks

You can change the length of the control sticks to make your transmitter more comfortable to hold and operate. To lengthen or shorten your transmitter's sticks, first unlock the stick tip A counterclockwise. Next, rotate the locking piece B up or down (to lengthen or shorten). When the length feels comfortable, lock the position by turning locking piece B counterclockwise.

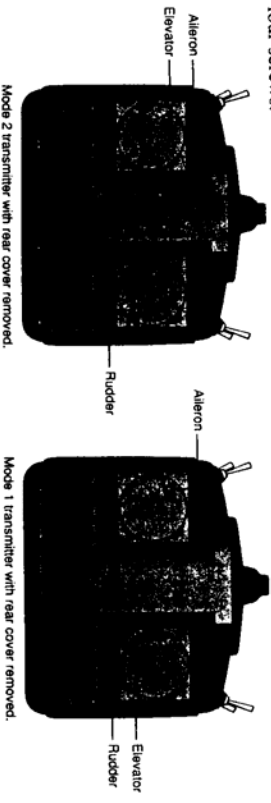


Stick lever tension adjustment

You may adjust the stick tension of your sticks to provide the "feel" that you like for flying. To adjust your springs, you'll have to remove the rear case of the transmitter. First, pop off the battery cover on the rear of the transmitter. Next, unplug the battery wire, and remove the battery and RF module from the transmitter. While you're removing the RF module, pay attention to the location of the pins that plug into the back of the module. Next, using a screwdriver, remove the four screws that hold the transmitter's rear cover into position, and put them in a safe place. Gently ease off the transmitter's rear cover. Now you'll see the view shown in the figure below.

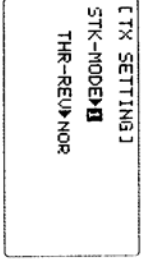
Using a small screwdriver, rotate the adjusting screw for each stick for the desired spring tension. The tension increases when the adjusting screw is turned clockwise, and decreases for counterclockwise rotation.

When you are satisfied with the spring tensions, you may close the transmitter. Check that the upper printed circuit board is on its locating pins, then very carefully reinstall the rear cover being careful thread the RF module connector pins through the hole in the case and not to bend them. When the cover is properly in place, tighten the four screws.



Changing the 9C transmitter's mode

If you wish to change the mode of the transmitter, say from mode 1 to mode 2, turn on the transmitter holding the Mode button and End button down simultaneously. You'll see a display "STK-MODE X," where X is a number representing the current transmitter mode. Turn the Dial clockwise or counterclockwise to change the mode number as desired. You'll see the effect of you changes when you next turn on your transmitter. When changing mode the throttle detent mechanism and elevator centering mechanism have to be swapped over. Remove the rear case as above. Unscrew metal throttle detent and move to other side. Release spring from tension adjuster. Remove tension adjuster (it is not necessary to unscrew) and move to other stick unit. With spring removed carefully release the cam arm. Move the cam arm to the other side and reconnect spring between the arm and tension adjuster.

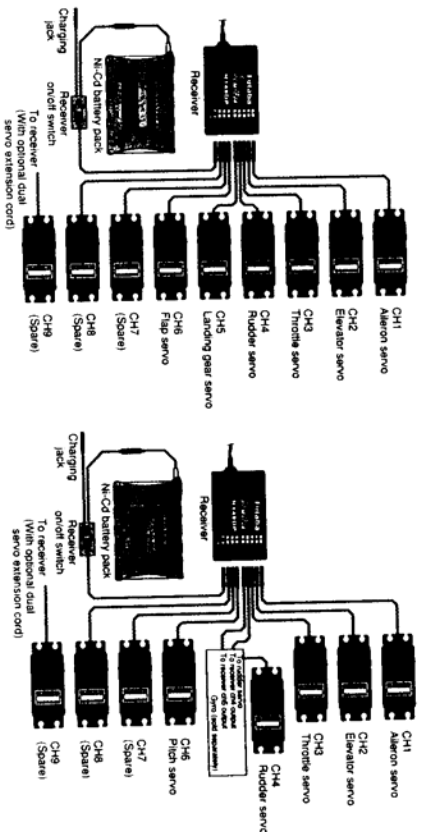


RECEIVER AND SERVO CONNECTIONS

Receiver output channel	Aircraft (ACRO)	Glider		Helicopter (HEL)
		(GLID1FLP)	(GLID2FLP)	
1	Aileron	R.flap-aileron	R. aileron	Aileron
2	(combined R. flap - aileron*)	Elevator	Motor/Speed Control	Elevator
3	Throttle	Rudder	R. flap	Throttle
4	Landing Gear	L.flap-aileron	L. flap	Rudder
5	Flap	(combined L. flap - aileron*)		Gyro sensitivity
6				Pitch
7	Spare	Spare	L. aileron	Spare
8	Spare	Spare		Spare
9	Spare	Spare		Spare

Multiple entries indicate that the servo function varies with the selected programming (*=FLPRON mode). Outputs with no mixing functions are shown first.

The diagram below shows the default connections in the ACRO / HELI mode.



Receiver Notes

- ⚠CAUTION DO NOT cut or coil the receiver antenna wire. Secure to the top of the vertical fin, and let the excess length trail behind the aircraft.
- ➊ When you insert servo or battery connectors into the receiver, note that each plastic housing has an alignment tab. Be sure the alignment tab is oriented correctly before inserting the connector. To remove a connector from the receiver, pull on the connector housing rather than the wires.
- ➋ If a servo is too far away to plug into the receiver, use an extension cord to extend the length of the servo lead. Additional Futaba extension cords of varying lengths are available from your hobby dealer.

RADIO INSTALLATION

⚠ CAUTION While you are installing the battery, receiver, and servos into your model's fuselage, please pay attention to the following guidelines:

Servo Mounting

❶ Use the supplied rubber grommets when you mount each servo. Be sure not to over-tighten the screws. If any portion of the servo case is in direct contact with the fuselage or servo rails, the rubber grommets will not attenuate vibration, which can cause mechanical wear and servo failure.



Servo Throw

❷ Once you have installed the servos, operate each one over its full travel and check that the pushrod and output arms do not bind or collide with each other, even at extreme trim settings. Check to see that each control linkage does not require undue force to move (if you hear a servo buzzing when there is no transmitter control motion, most likely there is too much friction in the control or pushrod). Even though the servo will tolerate loads, any unnecessary load applied to the servo arm will drain the battery pack quickly.

Switch Harness Installation

❸ When you are ready to install the switch harness, remove the switch cover and use it as a template to cut screw holes and a rectangular hole slightly larger than the full stroke of the switch. Choose a switch location on the opposite side of the fuselage from the engine exhaust pipe, and pick a location so that it can't be inadvertently turned on or off during handling or storage. Install the switch so that it moves without restriction and "snaps" from ON to OFF and vice versa.

Receiver Antenna

It is normal for the receiver antenna to be longer than the fuselage.

❹ DO NOT cut it or fold it back on itself – cutting or folding changes the electrical length of the antenna and will reduce the range. Secure the antenna to the top of the vertical fin, and let the excess wire trail behind. You may run the antenna inside of a non-metallic housing within the fuselage, but range may be reduced if the antenna is located near metal pushrods or cables. Be sure to perform a range check before flying.

Receiver Vibration and Waterproofing

The receiver contains precision electronic parts. Be sure to avoid vibration, shock, and temperature extremes.

❺ For protection, wrap the receiver in foam rubber or other vibration-absorbing materials. It's also a good idea to waterproof the receiver by placing it in a plastic bag and securing the open end of the bag with a rubber band before wrapping it with

foam. If you accidentally get moisture inside the receiver, you may experience intermittent operation and crash.

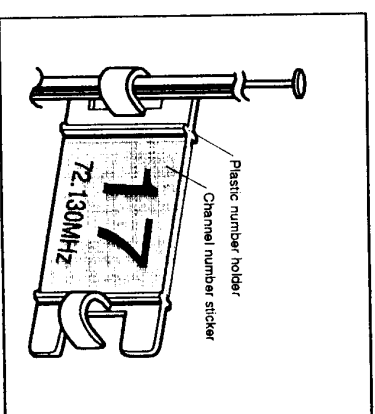
Airplane Frequencies

Each country has specific allocated frequencies for aircraft, helicopters, cars, boats and other types of model. Before operation check with your local hobby shop or model association for the correct frequency to use for the type of model you are operating.

NEVER operate a model on an incorrect frequency as it may interfere with other users and cause a crash or malfunction.

⚠ CAUTION

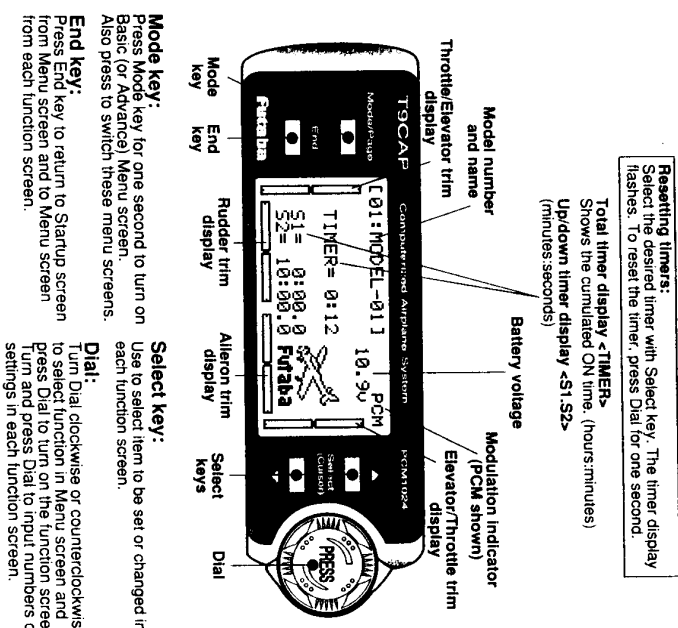
❶ It's very important that you display your transmitting channel number at all times. Purchase a suitable frequency flag or identification tag at your model shop.



TRANSMITTER DISPLAYS & BUTTONS

When you first turn on your transmitter, a confirmation beep sounds, and the screen shown below appears. Before flying, or even starting the engine, BE SURE that the model name appearing on the display matches the model that you are about to fly! If you don't, servos may be reversed, or travels and trims could be wrong, leading to an immediate crash.

Edit keys and Startup Screen (appears when system is first turned on)



WARNING & ERROR DISPLAYS

An alarm or error indication may appear on the display of your transmitter for several reasons, including when the transmitter power switch is turned on, when the battery voltage is low, and several others. Each display has a unique sound associated with it, as described below.

BACKUP ERROR

BACK-UP MEMORY ERROR
NOW INITIALIZING...
MODEL No. x AREH

The BACKUP ERROR warning occurs when the transmitter memory is lost for any reason. If this occurs, all of the data will be reset when the power is turned on again.

WARNING
DO NOT FLY when this message is displayed – all programming has been erased and is not available. Return your transmitter to Futaba for service.

MODEL SELECTION ERROR

MODEL SELECT ERROR !
CURRENT MODEL No. 01

The MODEL SELECTION warning is displayed when the transmitter attempts to load a model memory from a memory module that is not currently plugged into the transmitter. When this occurs, model No. 01 is automatically loaded.

WARNING
Do not fly until the proper model is loaded into memory! Reinsert the memory module, and recall the desired setup using the model select function.

LOW BATTERY ERROR

LBAT51C(ACRO) 10 <1/2>
MODEL

The LOW BATTERY warning is displayed when the transmitter battery voltage drops below 8.5V.

WARNING
LAND YOUR MODEL AS SOON AS POSSIBLE BEFORE LOSS OF CONTROL DUE TO A DEAD BATTERY.

MIXER ALERT WARNING

***** WARNING ! *****
SNAP-ROLL
AIR-BRAKE
IDLE-DOWN
THR-CUT

The MIXER ALERT warning is displayed to alert you whenever you turn ON the transmitter with any of the mixing switches active. This warning will disappear when the offending switch or control is deactivated. Switches for which warnings will be issued at power-up are listed below:
ACRO: Throttle cut, idle-down, snap roll, airbrake
GLID: Butterfly, Start and Speed mixing
HELL: Throttle cut, throttle hold, idle-up

Warning sound: beep beep beep beep space (repeated)

(Operation when switching OFF does not stop the mixing warning)
When the warning does not stop even when the mixing switch, indicated by the warning display on the screen, is turned off, the functions described above probably use the same switch and the OFF direction setting is reversed. In short, one of the mixes described above is not in the OFF state.

In this case, reset the warning display by pressing both Select keys simultaneously. Then change one of the switch settings of the mixes duplicated at one switch.

MEMORY MODULE INITIALIZE DISPLAY

[EXT-**MEM**]
INITIALIZE ?
<Yes:Mode> No:End>
TYPE 16< 6models>

This warning appears when a CAMFrac memory module [optional] is used in the transmitter for the first time. When the Mode key is pressed, initialization of the module begins, after which the memory module can be used. Once the module is initialized, the display will not appear again.

RF MODULE WARNING

Warning sound: A single beep

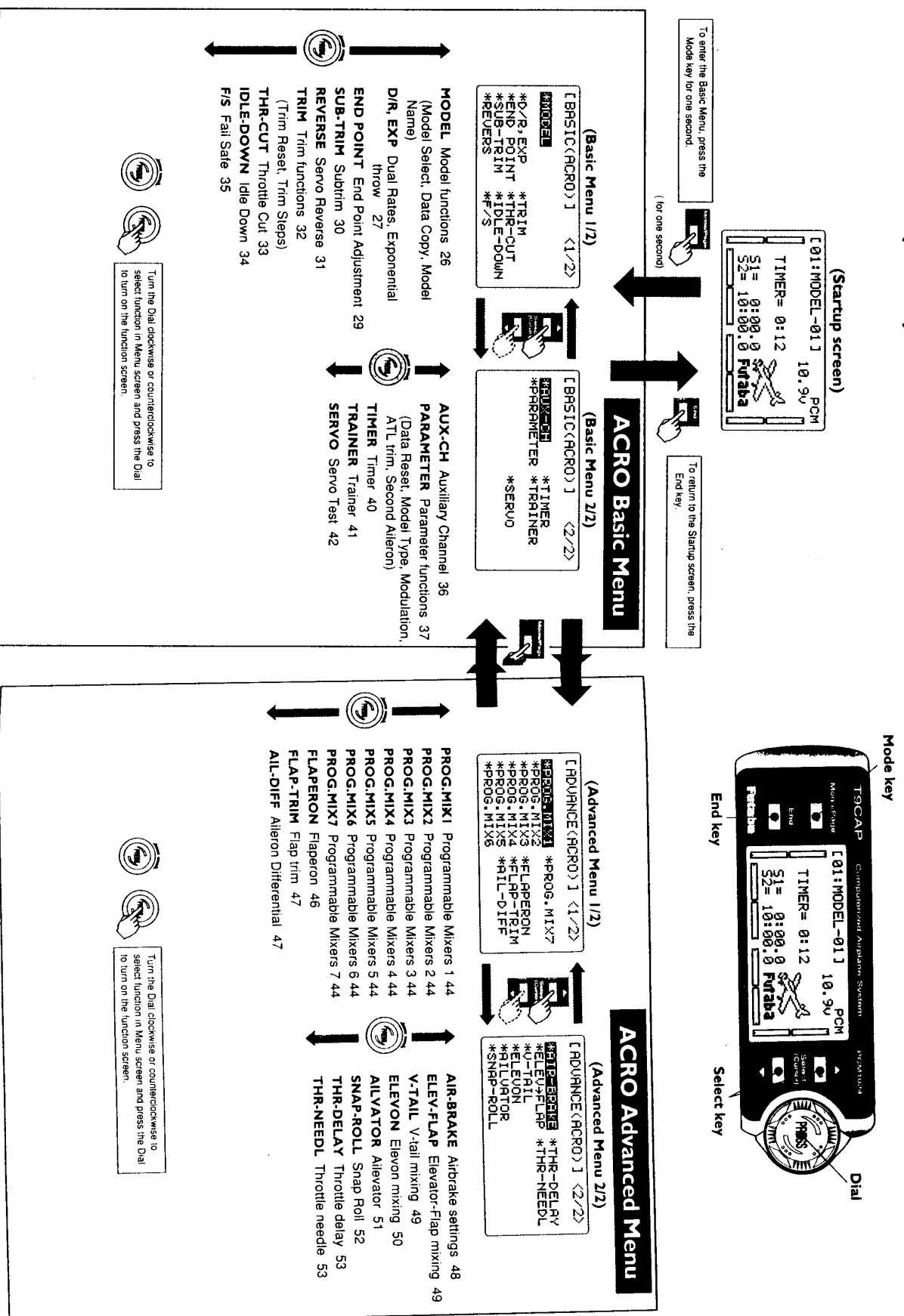
This single beep lets you know that the RF module is not in contact with the transmitter.

AIRCRAFT (ACRO) MENU FUNCTIONS

*Pages 26 to 42 describe the Basic Menu. Please note that all of these Basic Menu functions are the same for aircraft (ACRO setup), sailplanes (GLIDIFLP/ZFLP setups), and helicopter (HELISWH1/SWH2/SWH4/SR-3/SN-3) setups as well.

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AIRCRAFT (ACRO) FUNCTIONS MAP



AIRCRAFT SETUP INSTRUCTIONS (GENERAL 120 CLASS STUNT PLANE)

The aircraft setup procedure presented below uses an F3A-class model as an example. You may use a similar procedure to set up your own model, but your settings' numbers and percentages will probably be different.

1. Enter the BASIC menu by pressing the Mode key for one second. Select "MODEL" by turning the Dial clockwise or counterclockwise, then enter the MODEL function by pressing the Dial. Press the upper or lower Select key to get to the model select function (SELECT). Choose a vacant model memory by turning the Dial, then press the Dial for one second. The confirmation message "sure?" is displayed. Select it by pressing the Dial. The following instructions refer to memory #1.

```
[MODEL]
SELECT [MODEL-01]
COPY 1-1 [MODEL-01]
NAME MODEL-01
```

2. Press the lower Select key twice to get to the model name function (NAME, p. 26). Use the Select key and the Dial to spell out the name that you wish to appear on the screen, one letter at a time.

3. Select "PARAMETER" by turning the Dial clockwise or counterclockwise in the BASIC menu, then enter the PARAMETER function by pressing the Dial. Verify that ACROBATIC (aircraft) is selected (TYPE, p. 37). (If it isn't, press the lower Select key once to get to the model type select function and select ACROBATIC by turning the Dial until it appears, then press the Dial for one second. The confirmation message "sure?" is displayed. Select it by pressing the Dial.)

```
[PARAMETER]
RESET [ACROBATIC]
TYPE ACROBATIC
MODEL-01
AL-3-Chief-7
```

WARNING: selecting a different model type will erase the settings in the model memory. BE SURE you're in the correct model memory before selecting a new model type.

If necessary, select the proper mode of transmission (MODUL, p. 37) (PPM is for FM/PPM transmission, and PCM is for PCM). This should be set to match your receiver. If

you make a change, it won't take effect until you cycle the power off and on again.

4. Next, turn on the Flaperon function (FLAPERON, p. 46) in the Advance Menu. To do this, enter the ADVANCE menu by pressing the Mode key once in the Basic menu screen. Select "FLAPERON" by turning the Dial clockwise or counterclockwise, then enter the FLAPERON function by pressing the Dial.

```
[FLAPERON]
MODEL-01
RATE: FL-12+100% FL-13+100%
FL-12+100%
FL-13+100%
```

Connect the right aileron servo to receiver CH1 and the left aileron servo to receiver CH6.

Note that you can get differential by adjusting the up and down motion of the two servos in the FLAPERON menu. If you don't need the flap effect, you can use the ALL-DIFF menu and plug the servo into the receiver CH7 output.

5. Check that each servo moves the proper direction. The aileron servos should move in opposite directions for aileron stick motion, and the same direction for flap control. If not, use the REVERSE function (REVERSE, p. 31) in the Basic Menu to set the proper throw directions for each servo. Also check elevator, rudder, throttle, gear, and any other servos.

6. Set the basic travels with the end point adjustment function in the Basic Menu (END POINT, p. 29).

```
[END POINT]
CH1: RLE 21:EL-100/100
CH6: RLE 21:EL-100/100
RLE 21:EL-100/100
RLE 21:EL-100/100
RLE 21:EL-100/100
RLE 21:EL-100/100
```

Aileron settings: the left and right aileron travel should be limited to roughly 9/16" (14-15 mm). If necessary, adjust CH1 and CH6 location on the servo arm so that the throw is adjusted in the 90-100% range.

Elevator setting: adjust the elevator travel to roughly 9/16" (15 mm) with the END POINT function.

Rudder setting: adjust the rudder travel to roughly 45 degrees in the left and right directions with the END POINT function.

7. Dual Rate setting (DR, p. 27). Adjust the servo movements with the DR function (in the Basic menu).

```
[DR: EXP]
RLE 21:EL-100/100
RLE 21:EL-100/100
RLE 21:EL-100/100
RLE 21:EL-100/100
```

Aileron Dual Rates: adjust the aileron travel to roughly 7/16" (11 mm). You may also wish to adjust EXP so that its rate is -20 to -30% to soften the stick inputs around neutral.

Elevator DR: adjust the up side to 15/32" (12 mm) and the down side to 17/32" (13 mm). EXP should be -15 to -20%.

Rudder adjust the left and right travel to 40 to 45 degrees. EXP should be about -20%.

8. Airbrake (AIR-BRAKE, Advance menu, p. 48): an airbrake effect is obtained by raising both ailerons and adding elevator to trim. This high-drag configuration assists landings at small fields. It is possible to loose some aileron effectiveness so test the airbrake effect at altitude before trying it on a landing approach. You should spend some time fine adjusting elevator travel so that there is no trim change with the application of airbrakes.

The rates may vary considerably for different models, but for initial settings choose the flap rate to be (+)50-55% for both CH1 and CH6. The ELE rate should be set to -7% ~ -10%.

We recommend that you select the Manual mode. The airbrake switch is SW(C), lower position ON. Move SW(C) to the lower position and verify its operation.

```
[AIR-BRAKE]
MODEL-01
RATE: AIR-100/100
AIR-100/100
AIR-100/100
AIR-100/100
```

9. Snap Roll (SNAP-ROLL, p. 52, Advance Menu)

Set the deflection rate for each switch position. Be sure that the direction of motion of each control is correct.

Aileron: 80 ~ 100%

Elevator: 90 ~ 110%

Rudder: 60 ~ 70%

```
[SNAP-ROLL]
MODEL-01
RATE: AIR-100/100
AIR-100/100
AIR-100/100
AIR-100/100
```

We recommend that you activate the safety switch. This stops your model from snap rolling if the landing gear is not retracted, so you don't accidentally snap while taking off or landing.

If your aircraft snaps poorly, increase the elevator and rudder deflection. Note that some models don't snap even when the control deflections are increased. This may be caused by the center of gravity being too far forward, or by the characteristics of the airplane.

10. Failsafe settings we recommend that you set the Fail Safe function (F/S, p. 35) to move the throttle to idle if interference is experienced. Note that the failsafe function only operates in the PCM transmission mode.

```
[F/S]
MODEL-01
RATE: F/S-100/100
F/S-100/100
F/S-100/100
F/S-100/100
```

11. Now take advantage of your system's other great programming capabilities. You may set such functions as Throttle-Needle and Throttle delay to improve engine response, and couple elevator to flaps in the elevator-to-flap mixer (EL-FLAP, p. 49) for tighter turns. You may want to use programmable mixers to get rid of unwanted tendencies (for example, pitching up during knife-edge flight). Finally, if you have dual elevator servos, you can turn on the Ailerator function (AILVATOR, p. 51) to increase roll authority in low-speed maneuvers. The sky's the limit --- enjoy!

Pattern Aircraft Flight Trimming Chart

The following chart may be used to systematically set up and trim a model for straight flight and aerobatic maneuvers. Please note that for best results, trimming should be done in near-calm conditions. Before you decide to make a change, be sure to test the change several times before making adjustments. If any changes are made, go back through the previous steps and verify that they have not been affected. If they have, make further adjustments as necessary.

To test for	Test Procedure	Observations	Adjustments
1. Control neutrals	Fly the model straight and level	Use the transmitter trims for hands-off straight & level flight.	Change electronic subtrims or adjust elevators to center transmitter trims.
2. Control throws	Fly the model and apply full deflection of each control one at a time	Check the response of each control • Aileron high-rate: 3 rolls in 4 seconds; low-rate: 3 rolls in 6 sec • Elevator high-rate: to give a smooth square corner; low-rate gives approx. 130 ft diameter loop • Rudder: high-rate 30-35° for stall turns; low rate maintains knife-edge	(for high rates), and Dual Rate settings (for low rates) to achieve desired responses.
3. Decalage	Power off vertical dive (crosswind if any). Release controls when model vertical (elevator trim must be neutral)	A. Model continues straight down B. Model starts to pull out (nose up)? C. Model starts to tuck in (nose down)?	A. No adjustment B. Reduce incidence C. Increase incidence
4. Center of Gravity	Method 1: Roll into near vertically-banked turn. Method 2: Roll model inverted	A1. Nose drops B1. Tail drops A2. Lots of forward stick (down elevator) required to maintain level flight B2. No forward stick (down elevator) required to maintain level flight, or model climbs	A. Add weight to tail B. Add weight to nose C. Increase incidence
5. Tip weight (coarse adjustment)	Fly model straight & level upright. Check aileron trim maintains level wings. Roll model inverted, wings level. Release aileron stick.	A. Model does not drop a wing. B. Left wing drops. C. Right wing drops.	A. No adjustment B. Add weight to right tip. C. Add weight to left tip.
6. Side Thrust & Warped Wing	Fly model away from you into any wind. Pull it into a vertical climb, watch for deviations as it slows down.	A. Model continues straight up. B. Model veers left C. Model veers right D. Model rolls right	A. No adjustment B. Add right thrust C. Reduce right thrust D. Put trim tab under left wing tip *
7. Up/Down Thrust	Fly the model on normal path into any wind, parallel to strip, at a distance of around 100 meters from you (elevator trim should be neutral as per Test 3). Pull it into a vertical climb & neutralize elevator	A. Model continues straight up B. Model pitches up (goes toward top of model) C. Model pitches down (goes toward bottom of model)	A. No adjustment B. Add down thrust C. Reduce down thrust
8. Tip weight (fine adjustment)	Method 1: fly the model as per reasonably small diameter loop (one loop only) Method 2: fly the model as per Test 6 and then push into an outside loop (one only, fairly tight)	A. Model comes out with wings level B. Model comes out right wing low C. Model comes out left wing low	A. No adjustment necessary B. Add weight to left tip C. Add weight to right tip

Pattern Aircraft Flight Trimming Chart (continued)

To test for	Test Procedure	Observations	Adjustments
9. Aileron differential	Method 1: fly model toward you & pull into a vertical climb before it reaches you. Neutralize controls, then half-roll the model. Method 2: fly model on normal pass and do three or more rolls Method 3: fly the model straight and level and gently rock the aileron stick back and forth	A. No heading changes B. Heading change opposite to roll command (i.e. heading veers left after right roll) C. Heading change in direction of roll command A. Roll axis on model centerline B. Roll axis off to same side of model as roll command (i.e. right roll, roll axis off right wing tip) C. Roll axis off to opposite side of model as roll command A. Model flies straight ahead without yawing B. Model yaws away from roll command (i.e. right roll, yaw left) C. Model yaws towards roll command (i.e. right roll, yaw right)	A. Differential settings OK B. Increase differential C. Decrease differential A. Differential settings OK B. Increase differential C. Decrease differential A. Differential settings OK B. Increase differential C. Decrease differential
10. Dihedral	Method 1: Fly the model on a normal pass and roll into knife-edge flight; maintain flight with top rudder (do this test in both left & right knife-edge flight) Method 2: Apply rudder in level flight	A. Model has no tendency to roll B. Model rolls in direction of applied rudder C. Model rolls in opposite direction in both tests	A. Dihedral OK B1. Reduce dihedral B2. Use mixer to produce opposing rudder travel (start with 10%) C1. Increase dihedral C2. Mix ailerons with rudder direction 10%
11. Elevator alignment	Fly the model as in Test 6 and pull up into an inside loop. Roll it inverted and repeat the above by pushing up into an outside loop.	A. No rolling tendency when elevator applied B. Model rolls in same direction in both tests — halves misaligned. C. Model rolls opposite directions in both tests. One elevator half has more throw than the other (model rolls to side with the most throw).	A. Elevators in correct alignment B. Either raise one half, or lower the other C. Reduce throw on one side, or increase throw on the other.
12. Pitching in knife-edge flight	Fly the model as in Test 10	A. There is no pitch up or down B. The nose pitches up (the model climbs laterally) C. Nose pitches down (model dives laterally)	A. No adjustment needed B. Alternate cures: 1) move CG aft; 2) increase incidence; 3) droop ailerons; 4) mix down elevator with rudder C. Reverse *B. above

*Trim tab is 3/16" x 3/4" x 4" trailing edge stock, placed just in front of aileron on bottom, pointed end forward.

The Model function includes a number of functions that are used to manage the model memory.

The Model Select function allows you to choose from all of the different sets of model data stored in the transmitter (eight models can be stored within the transmitter, and data for six additional models may be selected from the optional DP-16K CAMPA memory module, which is sold separately). The SELECT function is used to select the model memory set to be loaded.

The `COPY` function is used to copy the current model data into another model memory, which may either be inside the transmitter, or in the optional DP-16K **CAMPac** memory module. This function is handy to use to start a new model that's similar to one you have already programmed, and is also handy for copying the current model data into another model memory as a backup. If data is stored in the memory module, you can easily transfer the settings to friend's transmitter, which will save a lot of programming time.

The `NAME` function may be used to assign the current model memory a name. The model name makes it a lot less confusing since you can easily tell your model memories apart. The name of the model that you assign is displayed at the top left corner of the startup screen. The name can be up to eight characters long, and each of the characters may be alphanumeric, or symbols (see list below). The default names assigned by the factory are in the "MODEL-xx" form.

```

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789
!@#$%^&*~.-/_:;{}|'";<=>?`

```

Dual Rates

Dual rates
You can use D/R dual rate settings to reduce (or increase) the servo travels by flipping a switch, or (in case of ACRO/GLID type) they can be engaged by any stick position. The travel reduction or increase for the ailerons, elevator, and rudder may be controlled by this menu.

The default locations of the Dual rate switches (factory settings) are as follows:

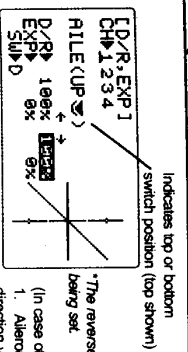
Switch	Function
Switch A	rudder
Switch B	aileron
Switch C	flaps
Switch D	elevator

You may select your own positions for the switches. In case of ACRO/GLID type, you may also program your system so that the dial rates are automatically activated when you move any stick past a certain position.

Exponential settings may be used to change the response curve of the servos to make flying more pleasant. You can make the servo movement less or more sensitive around neutral for aileron, elevator, throttle (except HELI type), and rudder. It can also be set for each side of the dual rate switches. Negative exponential (–) makes the servo movement around the stick neutral less sensitive and positive (+) makes the servo movement more sensitive.

For throttle, exponential is applied from the end of travel rather than for neutral like the other controls. When the "+" side is increased, the idle sensitivity decreases and the high throttle sensitivity increases. This is best understood by experimenting with a servo.

Setting Dual Rates and Exponential Values



Indicates top or bottom switch position (top shown).
To return to the Basic menu.
The Select keys are used to move through setting items in this menu.
*The reversed item is what is being set.

(In case of ACRO/GLIDE type)

Dual Rate Values
Range: 0 - 140%
Initial value=100%
Channel display:
ALE = Aileron, ELE = Elevator.
RUDD = Rudder

1. Aileron adjustment: place the aileron D/R switch and stick in the direction you want to adjust and set the rate with the Dial.
2. Elevator: place the elevator D/R switch and stick in the direction you want to set and adjust with the Dial
3. Rudder: put the rudder D/R switch and stick in the direction you want to adjust and set with the Dial.

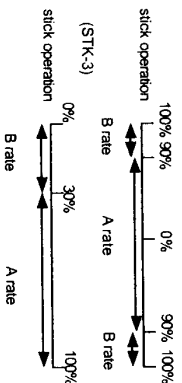
• If you're unhappy with your set value, you may return to the default value by pressing the Dial for one second.

- (In case of HELI type)
1. Aileron UP side adjustment:
Set the rate with the Dial.
 2. Aileron DOWN side adjustment:
Set the rate with the Dial.

Repeat above procedure to set channels 2/4 as necessary.

4. Select Aileron D/R switch with the Dial.
6. Select the Rudder D/R switch with the Dial.

You can put all three rates on a single switch.
See notes to right about stick switch setting.



You may wish to select "stick sw" when you want to have the dual rate turn on and off according to the position of the stick. This is effective during stall turns and other maneuvers.
After you have selected the "stick sw", hold the stick at the position you wish to switch dual rates.
Next, store the position by pressing the Dial for one second.
This will change the stick position numbers. Check that the dual rate is switching by moving the stick.

(In case of ACRO/GLIDE type)

Exponential Values
Range: -100 - +100%
Initial value = 0%

1. Aileron EXP adjustment: place the aileron D/R switch and stick in the direction you want to adjust and set the EXP value with the Dial.
2. Elevator: place the ELEV D/R switch and stick in the desired direction and adjust EXP with the Dial.

Repeat above procedure with Throttle and Rudder.

• If you're unhappy with your set value, you may reset to the default value by pressing the Dial for one second.

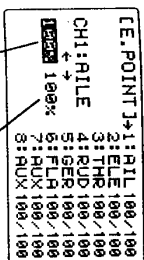
- (In case of HELI type)
1. Aileron UP side adjustment:
Set the rate with the Dial.
 2. Aileron DOWN side adjustment:
Set the rate with the Dial.

Repeat above procedure to set channels 2/4 as necessary.

END POINT - End Point Adjustment

The END POINT function is used to set the travel of each servo in both directions. At a 100% setting, the throw of the servo is approximately 40° for channels 1-4 and approximately 55° for channels 5-8. Reducing the percentage settings reduces the total servo throw in that direction. The END POINT menus should be set to prevent any servo binding at extreme travel.

Setting END POINT on your system:



Servo Throw
Range: 0 - 140%
Initial value = 100%
To return to the Basic menu.
To move through channels 1-8 in this menu.

You can reset to the initial values by pressing the Dial for one second.

*The reversed out figures are what is being set.

Aileron travel setting: push the aileron stick to the right and set the amount of servo throw with the Dial.
Move to the left side and repeat.

Elevator adjustment: push the elevator stick down and set the amount of servo throw with the Dial. Repeat with up elevator.

Adjust the following channels (if used) in a similar fashion (don't forget to set both directions): Throttle, Rudder, Landing gear, Flap, CH7, CH8

Channel display *

No.	Channel Name	No.	Channel Name
CH1	AIL = Aileron	CH5	GEA = Landing gear, GYR = Gyro, FLP = Flap
CH2	ELE = Elevator	CH6	FLA, FLP = Flap, PTT = Pitch
CH3	THR = Throttle, ARB. Air brake	CH7	AUX = Auxiliary
CH4	RUD = Rudder	CH8	AUX = Auxiliary

SUB-TRIM — Subtrim Settings

The Subtrim menu is used to make small changes or corrections at the neutral position of each servo. We recommend that you center the digital trims before making subtrim changes, and that you try to keep all of the subtrim values of as small as possible. Otherwise, when the subtrims values are large, the servo's range of travel is restricted.

The recommended procedure is as follows: zero out both the trims (TRIM RESET menu) and the subtrims (this menu). Next, mount the servo arms and set up your linkages so that the neutral position of the control surface is as close to where it should be as possible. Finally, use a small amount of subtrim to make fine adjustments.

Setting Subtrims

[SUB-TRIM] → 1: AILE

2: ELE

3: THR

4: RUD

5: GER

6: FLA

7: RUJ

8: RUX

0

0

0

0

0

0

0

0


CH1: AILE

0


This number is the subtrim value being set (Aileron) (Default value = 0)

to +120

(Default value = 0)



To return to the Basic menu.



Choose channels 1-8 with the Select keys.

SETTING SUBTRIMS.

- Begin with the Aileron subtrim. Use the Dial to neutralize the control surface.

- Adjust the remaining controls (when used) in a similar fashion: Elevator, Throttle, Rudder, Landing gear, Flap, CH7, CH8

If you're unhappy with a subtrim value, you can reset it to zero by pressing the Dial for one second.

REVERSE — Servo Reversing

The servo reverse function is used when you need to change the direction that a servo responds to a control stick motion. When you use this function, BE SURE THAT YOUR CONTROL IS MOVING IN THE CORRECT DIRECTION. If you are using Advance Menu functions, set the correct travels in the REVERSE menu first, before setting up the Advance Menu.

Reversing Servos

[REVERSE] → 1: AILE

2: ELE

3: THR

4: RUD

5: GER

6: FLA

7: RUJ

8: RUX

NOR

NOR

NOR

NOR

NOR

NOR


NOR

NOR


CH1: AILE

REV NOR

*The blinking item is the one being set.



To return to the Basic menu.



The Select keys are used to reverse channels 1-8 in this menu as needed.

1. Aileron setting. Select "NOR" or "REV" with the Dial.

Repeat above procedure to reverse channels 2-8 as necessary:

2 = Elevator

3 = Throttle

4 = Rudder

5 = Landing gear

6 = Flap

7 = CH7

8 = CH8

TRIM — Trim Settings

The 9C has digital trims which are different from conventional mechanical trim sliders. Each trim control is actually a two-direction switch. Each time the trim switch is pressed, the trim is changed a selected amount. When you hold the trim lever, the trim speed increases. The current trim position is graphically displayed on the screen. The Trim function includes two submenus that are used to manage the trim options.

Trim Reset (RESET)

The Trim Reset function electronically centers the trims to their default values. Note that the subtrim settings and the trim step rate are not reset by this command.

Trim Step (STEP)

The Trim Step menu is used to change the rate at which the trim moves when the trim lever is activated. It may be set to a value ranging from 1 to 40 units, depending on the characteristics of the aircraft. Most ordinary aircraft do well with their trim step rate set to about 2 to 10 units. The lower the unit value the finer the trim movement.

[TRIM]

RESET **TRIM**

STEP **4** 4 < 8 >

TRIM **4** 4 < 8 >

RUDO **4** 4 < 8 >

Select the desired function in the TRIM submenu with the upper and lower Select keys.

TRIM functions:

- Trim Reset
- Trim Step Rate

Step rate
Range: 1 - 40
Factory setting: 4

RESETTING TRIM

To Reset Trim, press the Dial for one second.

SETTING TRIM STEP RATE

Use the Dial to set the aileron trim step rate. When done, select elevator trim with the Select key. Again use the Dial to set the elevator trim step rate. You can set the throttle and rudder trims in the same way. If you're unhappy with your settings, you can return to the default value by pressing the Dial for one second.

To return to the Basic menu.

THR-CUT — Throttle Cut Function

The Throttle Cut function provides an easy way to stop the engine by simply flicking a switch, with the throttle stick at idle, which commands the throttle servo to move a prescribed amount. The amount of movement is largest at idle and disappears at high throttle. Both the switch's location and activation direction can be selected by the user.

Setting up Throttle Cut Operations

[THR-CUT]

THR **THR**

RATE **8%**

SWITCH **UP**

POST **NULL**

Throttle Offset Movement Value
(Range: 0 - 40%)
(Initial value: 0%)

• If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

2. THROTTLE CUT MOVEMENT SETTING

Adjust the amount of throttle motion with the Dial. —

3. THROTTLE OFFSET ACTIVATION SWITCH

Select the desired switch location with the Dial.

You may change any of switches A-H. When you choose switches, the chosen on/off directions are reset to NULL. If this is the case be sure to reset the direction.

To return to the Basic menu.

The Select keys are used to move around in the THR-CUT menu.

4. SWITCH DIRECTION

Select the on and off switch directions with the Dial.

"UP": Switch's upper position turns on throttle-cut

"DOWN": Switch's lower position turns on the function.

"NULL": THR-CUT is deactivated regardless of the switch direction.

To return to the Basic menu.


IDLE-DOWN — Idle Down Function

The Idle Down function lowers the engine idling speed when either the airbrake switch (SW C) or landing gear switch (SW E) is activated. This function may be used whenever you wish to raise the engine idling speed to prevent the engine from stalling, and to lower the engine idling speed for landing.

Setting the IDLE-DOWN function

1. Activate the IDLE-DOWN function by turning the Dial clockwise ("ON" or "OFF" will be displayed). You may turn the function off by turning the Dial counterclockwise (INH will be displayed).

[IDLE-DOWN]

MIX  100%

RATE 0%

SW C

Pos: 10 Cnt: 8 Cn

**The reversed item is the one being set.*

2. Idle-Down throttle position

Adjust the idle-down position with the Dial.

If you're unhappy with your setting, you may return to the default value by pressing the Dial for one second.


Normally, a value of about 10-20% is suitable. Secure the fuselage, and while running the engine, set the throttle stick to idle. Adjust the idle-down rate while flipping the switch ON and OFF.

3. Select the desired Idle-Down switch with the Dial.

The "C" and "Cnt & Dn" display indicates that both the switch C CENTER and DOWN positions activate the IDLE-DOWN function to lower the idling speed.

To return to the Basic menu.

The Select keys are used to move through items 1-3 in this menu.



F/S — Fail Safe Function (PCM mode only)

The Fail Safe function is used to prescribe what the PCM receiver will do in the event radio interference is received. In this menu, you may select from one of two options of operation for each channel. The "NORM" (normal) setting holds the servo in its last commanded position, while the "F/S" (Fail Safe) function moves each servo to a predetermined position.

A WARNING The use of the fail safe function is recommended from the standpoint of safety. You may wish to set the throttle channel so that the engine idles when there's interference. This may give enough time to fly away from and recover from the radio interference.

If you choose to specify a failsafe setting, the fail safe data are automatically transmitted once each two minutes.

Battery Failsafe

Your system provides a second safety function called Battery Failsafe. When the airborne battery voltage drops below approximately 3.8V, the battery fail safe function moves the throttle to a predetermined position.

When the battery failsafe function is activated, your engine will move to idle (if you haven't set a position) or a preset position. You should immediately land. You may temporarily reset the failsafe function by moving the throttle stick to idle, at which time you'll have about 30 seconds of throttle control before the battery function reactivates.

Setting the Failsafe Function

1. Aileron fail safe setting

Select the Failsafe function for CH1 by turning the Dial counterclockwise.

Next, hold the aileron stick in the position you want to memorize and set the position by pressing the Dial for one second.


(If you wish, you may return to the NOR position by turning the Dial clockwise.

2. Set the following channels in the same manner:

The initial setting for all channels except Throttle is "NOR". When failsafe mode is turned on, the initial position settings are 0%.

To return to the Basic menu.

The Select keys are used to set failsafe for channels 1-8 in this menu.



Channel display

No.	Channel Name	No.	Channel Name
CH1	AIL = Aileron	CH5	GEA = Landing gear, GYR = Gyro, FLP = Flap
CH2	ELE = Elevator	CH6	FLA.FLP = Flap, PTT = Pitch
CH3	THR = Throttle, ARB, Air brake	CH7	AUX = Auxiliary
CH4	RUD = Rudder	CH8	AUX = Auxiliary

When you choose the failsafe mode, check that your settings are correct by turning off the transmitter power switch and verifying that the servos move to the settings that you chose. Be sure to wait at least two minutes after turning on the transmitter and receiver power before turning off the transmitter.

AUX-CH — Auxiliary Channel Function

The auxiliary channel function is used to define the relationship between the transmitter controls and the receiver output auxiliary channels.

Also the CH9 servo reverse function can be used when you need to change the CH9 servo direction

Auxiliary Channel Function

CH9 SW-B

CH6 UP-A

CH7 UP-C

CH8 UP-B

CH9 SW-B

NDRM

[AUX-CH SELECT]

1. CH5 function selection

Select the desired function with the Dial.

2. Repeat above procedure with channels 6-9 as required.

3. CH9 servo reverse setting

Select "NORM" or "REV" with the Dial.

To return to the Basic menu.

The Select keys are used to move up and down this menu as required.

PARAMETER — Parameter Functions

The parameter function includes a number of submenus that are used to input basic model data settings.

Data Reset (RESET)

The Date Reset function is used to delete an existing set of model data. This may be used to input new model settings into a memory used for another model. It resets all data to initial values. (except Modulation and Model Type functions)

Model Type (TYPE)

This function is used to select the type of model to be programmed in the current model memory. You can select from aircraft (ACRO), gliders with one or two flap servos (GLID1FLP, GLID2FLP), and helicopters with five swashplate types (HELISWH1/SWH2/SWH4/SR-3/SN-3).

Swashplate Type Setting Procedure

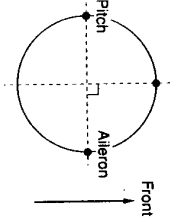
HELISWH1 Type

This type of helicopter has independent aileron and elevator servos linked to the swashplate. Most kits are HELISWH1 type.

HELI SWH2 Type

Use SWH2 mixing when the pushrods are positioned as shown in the diagram. Elevator operates with a mechanical linkage.

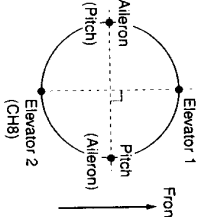
With Aileron inputs, the aileron and pitch servos tilt the swashplate left and right; With Pitch inputs, the aileron and pitch servos move the swashplate up and down.



HELI SWH4 Type

If the servo inputs are located as shown in the diagram, use SWH4 Mixing.

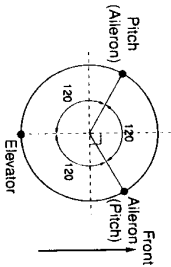
With Aileron inputs, the aileron and pitch servos tilt the swashplate left and right; With Elevator inputs, the servos tilt the swashplate fore and aft; With Pitch inputs, all four servos move the swashplate up and down.



HELI SR-3 Type

If the servo inputs match the diagram, use SR-3 Mixing.

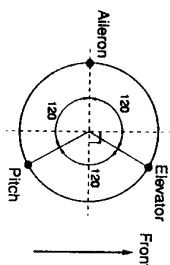
With Aileron inputs, the aileron and pitch servos tilt the swashplate left and right; With Elevator inputs, the three servos tilt the swashplate fore and aft; With Pitch inputs, all three servos move the swashplate up and down.



HELI SN-3 Type

Use SN-3 Mixing if the servo inputs match the diagram.

With Aileron inputs, the three servos tilt the swashplate left and right.
With Elevator inputs, the elevator and pitch servos tilt the swashplate fore and aft.
With Pitch inputs, all three servos move the swashplate up and down.



Use the reversing function (REVERSE) as necessary to get the proper aileron, elevator, and pitch operations.

Modulation Select (MODUL)

The Modulation menu is used to select the PCM or PPM mode of transmission, to match the receiver being used (PCM = Pulse Code Modulation, and PPM = Pulse Position Modulation). When using an FM receiver, you should select the PPM mode. Note that you have to turn your transmitter on and off before a modulation change becomes effective.

Adjustable Travel Limit (ATL)

The ATL trim function enables the trim to function only at the throttle stick idle position and disables trim at high throttle, which prevents pushrod jamming due to trim changes made at idle.

Second Aileron (AIL-2)

AIL-2 outputs the second aileron to channel 5. (In the "ACRO" and "GLID/FLP" modes.) Modes that output the second aileron to channels 6 or 7 ("6or7"), the same as normal, or output the second aileron to channels 5 and 6 ("5&6") can be selected. When using the Flaperon or aileron differential function with a 5-channel receiver, select the "5&6" mode.

[PARAMETER]
RESET [ENTER]
TYPE: ACROBATIC
MODUL: PCM
AIL-2: ON
AIL-2: Ch6 or 7

PARAMETER includes five functions:
· Data Reset
· Model Type
· Modulation
· ATL Trim
· 2nd Aileron

To return to the Basic menu, use the Select keys to move to the other submenus within the PARAMETER function.

MODEL DATA RESET

Press the Dial for one second.

The confirmation message "sure?" is displayed at the top right corner of the screen.

When the Dial is pressed again, the reset process is started.

A beep, beep, beep tone sounds during reset, followed by a continuous beep tone indicating that the reset is complete.

To protect against inadvertently resetting a model's memory, a double setting system is used. If the Select key is pressed after the confirmation message is displayed, resetting is halted and no changes are made.

NOTE: The existing modulation and model type are not reset. If the power switch is turned off during a reset is underway, the data may not be reset.

MODEL TYPE CHANGE

Select Model Type with the Dial. Next, press the Dial for one second.

At this point, a "sure?" confirmation message is displayed.

If you press the Dial, the model type change is started.

A continuous beep indicates completion.

Type display: ACROBATIC, GLID(FLP), GLID(FLP), HEL(SWH1), HEL(SWH2), HEL(SWH4), HEL(SR-3), or HEL(SN-3)

NOTE: If you change the model type, you'll lose the contents of the memory.

To halt model type change after the confirmation message is displayed, press the Select key.

NOTE: If the power switch is turned off while a TYPE change is underway, the data may not be reset.

MODULATION CHANGE

Select the modulation mode with the Dial. Verify that you changed the modulation mode in the PCW/PPM display.

IMPORTANT: After selecting the required modulation, you'll need to turn the transmitter power off and on to reset the modulation mode.

AIL ON/OFF SETTING

Select ON or OFF with the Dial.

Initial value: ON.

AIL-2 OUTPUT CHANNEL SETTING

Select the output channel with the Dial.

The default setting is "6or7".

TIMER — Timer (Stopwatch Function)

The Timer Menu controls two electronic clocks that may be used to keep track of time remaining in a competition task window, flying time on a full tank of fuel or amount of time on a battery, etc. The timer's settings may be set independently for each model, and is automatically updated each time the model is changed. The timer can be set to count up to 99 minutes 59 seconds.

You can choose either a count-down or count-up timer mode. When the timer switch is turned on, the down timer starts from the chosen time and displays the amount of time remaining. If the timer exceeds the time setting, it continues to count and displays a minus sign (-) in front of the numbers. The count up timer starts at 0 and displays the elapsed time. In either timer mode, the timer beeps once each minute. During the last twenty seconds, there's a beep each two seconds. And during the last ten seconds, there's a beep each second.

The timer is started and stopped by the pre-selected switch. When the Dial is pressed for one second after selecting the timer with the Select key in the startup screen, the timer is reset.

Activation can be selected from any Switch A ~ H, by using the throttle stick (STK-THR) or by the power switch (PWRSW). The ON and OFF directions can also be selected with the exception of the power switch. Using the throttle stick is very convenient if you're keeping track of fuel consumption, or for in electric aircraft for remaining battery life.

Using the 9CA Timer Function

[TIMER]

TIME: 00:00

MODE: UP

SW: A

POS: 1 NULL

<2>

10:00


DOWN

A


NULL

Timer Type display:

UP or DOWN



To return to the Basic menu.



The Select keys are used to move around the TIMER menu.

1. Timer Minutes Setting

Set the minute display with the Dial.

2. Timer Seconds Setting

Press lower the Select key, then use the Dial to set the seconds.

3. Count Up or Down Selection

Again press lower the Select key, then select the type of timer with the Dial.

4. Timer Switch Selection

Select the desired switch location with the Dial.

You may choose any of switches A~H, throttle stick (STK-THR), or power switch (PWRSW). When you change switches, the chosen on/off directions are reset to NULL. If this is the case, be sure to re-select the required directions.

5. Switch Direction Selection

Select the switch on and off positions with the Dial.

UP = Switch's upper position turns on the function.

DOWN = Switch's lower position turns on the function.

CNTR = Switch's center position (if any) turns on the function.

NULL = Switch not used

If you want the throttle stick movement to activate the timer (STK-THR), you'll need to set the ON-OFF stick position and direction for the stick to turn the timer on and off as follows:

1. First, position the throttle stick so that it's in the position where you want to have the timer switch on and off.
 2. Next, press the Dial for one second to make the transmitter memorize the location.
- Move the throttle stick back and forth to confirm that the timer starts and stops as desired.

TRAINER — Trainer Functions

The Trainer function (also known as 'Buddy Box') is used to train novice pilots using an optional trainer cord connecting two transmitters. The instructor can choose if all the channels are controlled by the student, or if only certain designated channels are operated by the student and the remainder by the instructor. Pulling on Switch F allows the student to control the selected channels on the model. You may use your 9C transmitter with any transmitter of the SKYSPORT, Super 7, Super 8, or 1024Z series of transmitters. Simply plug the optional trainer cord (for 9C series, sold separately) into the trainer socket on each transmitter. Note that when the trainer function is active, the snap roll function is automatically deactivated.

Trainer function operation modes:

"FUNC": When the trainer switch is ON, a channel set to this mode is controlled by the student using the mixing set in the instructor's transmitter. "OFF": A channel set to this mode cannot be controlled by the student even when the trainer switch is ON. The set channel can only be controlled by the instructor. "NORM": When the trainer switch is ON, a channel set to this mode can be controlled by the student. The set channel is controlled using the student transmitter's settings.

Examples:

When the stick channel is set to the "FUNC" mode, it is possible to practice helicopter stick operation even with a 4Vf transmitter (4 channel for aircraft). The practice channel matched to the student level can be set to the "NORM" mode and the other channels can be set to the "OFF" mode and controlled by the instructor.

A few important precautions:

- NEVER turn on the student transmitter power. Collapse the student's antenna.
- ALWAYS set the student transmitter modulation mode to PPM.
- BE SURE that the student and instructor transmitters have identical trim and control motions. Verify by switching back and forth while moving the control sticks.
- FULLY extend the instructor's antenna.
- ALWAYS remove the student transmitter RF module (if it is a module-type transmitter).

Setting up Trainer mode

[TRAINER]

1: RLE FUNC

2: ELE FUNC

3: THR FUNC

4: RUD FUNC


5: SER OFF

6: FLX OFF


7: RUX OFF

8: RUX OFF

The Select keys are used to move through channels.



To return to the Basic menu.



1. Activate the TRAINER function by turning the Dial counterclockwise.

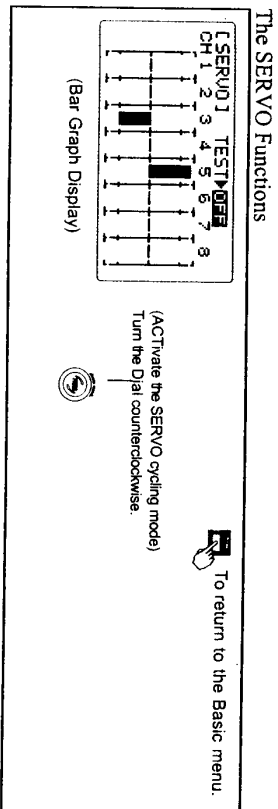
2. Aileron setting

Select "FUNC", "OFF", or "NORM" by turning the Dial.

3. Elevator - Channel 8 are set similarly. (INH=clockwise)

SERVO — Servo Cycle & Bar Graph Display

This function has two different functions: a servo cycling mode, which slowly moves each servo the full extent of its travel, and a servo bar graph indication, which pictorially shows the position to which each servo is being commanded. The servo test function is useful for finding unevenness in servos, and the bar graph function may be used for roughly setting up models without using a receiver or servos. This can be particularly handy in setting up models with complicated mixing functions, because the result of each stick, lever, knob, switch input and delay circuit can be seen immediately.



AIRCRAFT (ACRO) ADVANCE MENU FUNCTIONS

The next section of this manual, pages 43 to 53, describe how to use the functions in the ADVANCE MENU with the aircraft (ACRO) model mode. Some of these functions are also used with glider model modes (GLID1FLP, GLID2FLP).

PROG.MIX Programmable mixers 1-7	44
FLAPERON Flaperon (combined flaps & ailerons)	46
FLAP-TRIM Flap trim (camber adjustment)	47
AIL-DIFF Aileron differential	47
AIR-BRAKE Airbrake	48
ELEV→FLAP Elevator→Flap mixing	49
V-TAIL V-tail mixing	49
ELEVON Elevon mixing (for tailless models)	50
AILVATOR Ailvator (differential elevator control) ..	51
SNAP-ROLL Snap roll	52
THR-DELAY Throttle delay	53
THR→NEEDL Throttle needle	53

PROG.MIX 1-7 — Programmable Mixers 1-7


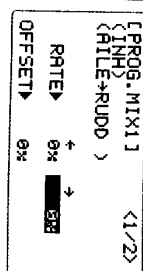
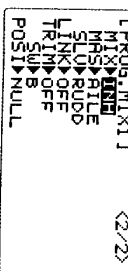
Your 9C system contains seven separate programmable mixers with unique mixing capabilities. You may use mixing to correct bad flight tendencies of the aircraft during aerobatics, and to ease operation. Besides mixing between arbitrary channels, the mixers may be linked with the Advance menus in the 9C. They can also be set to provide fixed offsets. You may select which switch activates your mixers. The method to be used to program mixers is given for Mixer #1, but Mixer #2-5 may be programmed in an identical fashion. Mixer #6-7's mixing rate can be set with a 5-point curve.

The Link function is used to 'link' programmable mixers with other mixing menus. For example, you might wish to use a PMIX to provide rudder→aileron mixing for better knife-edge flight in a model with flaperons using the Flaperon (FLAPERON) mixing function. With two aileron servos plugged into receiver channels CH1 and CH6, mixing only appears at the CH1 aileron when rudder is commanded. When the Link function is turned on, this situation is easily corrected, and mixing is applied to both CH1 and CH6.

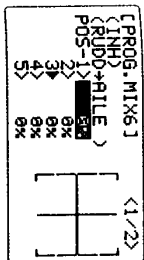
The trim selection option allows you to choose whether the trim from the master also affects the slave channel. The offset function lets you offset the mixing curve for the slave channel relative to the master channel, a feature which is handy for mixing with non-centering functions such as throttle or dials as the master channel.

Switch selection: you can choose an ON/OFF switch for each of the programmable mixers from the eight switches A ~ H. In addition, the throttle stick (STK-THR) may be used to turn the programmable mixers ON and OFF.

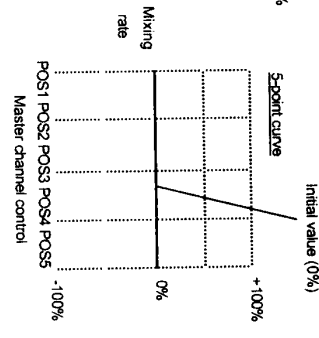
Using the Programmable mixers

1. **Activate the Programmable Mixer**
Turn the Dial to activate the PMIX-1 function ('ON' or 'OFF'—will be displayed, depending on the switch's ON/OFF position).
 To return to the Advance menu, the Select keys are used to move around in the PMIX-1 menu.

2. **Master channel setting**
Select the master channel with the Dial. (the master is the one that sends the mixing).
If you select 'OFF' for the master channel, the numerical mixing rate setting affects the slave side only, providing a fixed offset.

3. **Slave channel setting**
Select the slave channel (the one that receives the mixing) with the Dial.
(Mixer# 1-5 only)
4. **Mixing rate setting**
Move the master control in the direction you want to adjust, and one of the mixing rate displays will be reversed. Set the mixing amount with the Dial. Note that you can set the mixing rate individually for each side of the mix (left/right or up/down).
You may reset the rate to zero by pressing the Dial for one second. If the amount of mixing is set to 0%, no mixing will occur.
(See following page for input 5-point curve values. (Mixer#6-7))

(Continued from preceding page)

4. **Input 5-point curve values**
Select the curve position 'POS-1' with the Select keys and set the rate by turning the Dial.
If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

5. **Link function setting**
Turn the Link function ON or OFF with the Dial.
(Mixer# 1-5 only)
6. **Trim setting**
This couples the master channels trim with the slave function.
Select ON/OFF with the Dial.
(Mixer# 1-5 only)
7. **Offsetting neutral mix point**
If you want the mix to occur somewhere besides master neutral, hold the master channel control in the desired position, and store the offset position by pressing the Dial for one second.
(Mixer# 1-5 only)
8. **Switch selection**
Choose the desired mixer ON/OFF switch with the Dial.
9. **ON/OFF Direction**
Set the ON/OFF directions with the Dial.
NULL = Normal operation regardless of switch setting
UP = Switch upper or rear position turns on the function
CENTER = Center position of 3-position switch turns on the function
DOWN = Switch lower or forward position turns on the function
UP&Cntr = Upper and center position of 3-position switch turn on the function.
Cntr&Dn = Center and lower position of 3-position switch turn on the function.

Set rate:
Range: -100 to +100%
(Initial value: 0%)



Initial value (0%)

5-point curve

Master channel control

POS1 POS2 POS3 POS4 POS5

-100% 0% +100%

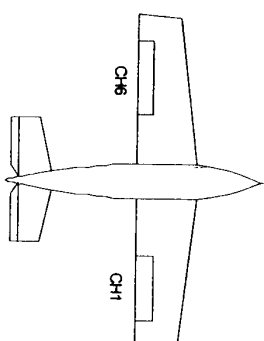
• If you select 'STK-THR' to turn mixer on and off, you'll need to set the switching position and direction. To do this, first position the throttle stick where you want switching to occur. Next, enter the stick position into memory by pressing the Dial for one second. (a percentage will be displayed on the screen).

When you think you're done, move the throttle stick and check if programmable mixing switches go on and off as per your settings.

FLAPERON — Flaperon Mixing

The Flaperon mixing function uses two servos to individually control two ailerons, combining the aileron function with the flap function. For a flap effect, the ailerons can be raised and lowered simultaneously. Of course, aileron function, where the two controls move in different directions, is also performed. The up and down travel of the left and right ailerons can be adjusted independently, so you can also get a differential effect. Left and right flap travel can be adjusted individually. You can combine the Flaperon function with the airbrake function, to get steep descents without building up airspeed, which is very convenient for small or narrow fields. To take advantage of the flaperon mixing function, you'll need to connect the right aileron servo to CH1 (AIL) and the left aileron servo to CH6 (FLP).

NOTE: Only one of the three functions flaperon, aileron differential, or elevator can be used at a time. All three functions cannot be activated simultaneously. The last function activated overrides the others.



Setting up the Flaperon function

1. Turn the FLAPERON function ON by turning the Dial. ("ON" is displayed).

[FLAPERON]
 MIX> 1NH
 RATE> RIL1>+100% +100%
 RIL2>+100% +100%
 FLP1>+100%
 FLP2>-100%

Servo travel rate
(Range: -120 to +120%)
(Initial setting +100%)

You must have a Flap trim that is not zero to adjust flap travels.
2. Right aileron adjustment.
 Move the aileron stick in the direction you want to adjust and set the value with the Dial.
3. Left aileron adjustment.
 Again move the aileron stick in the direction you want to adjust and set the value as before.
 - If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
4. Flap 2 adjustment.
 Adjust flap 2 with the Dial.
5. Flap 1 adjustment.
 Adjust flap 1 with the Dial.

Note: use the FLP1 and FLP2 settings to match flap travels on both sides. Then use FLAPTRIM to set the total throw you want.

Aileron stick	CH1 servo functions as	CH6 servo functions as
Flap control knob	Right aileron	Left aileron
	Flap 2	Flap 1

To return to the Advance menu. The Select keys are used to move around in the FLAPERON menu.

FLAP-TRIM — Flap Trim (Camber)

The Flap Trim function is used to specify the amount of flap travel (or camber, if on a sailplane setup). If flaperon (FLAPERON) mixing is active, FLAP-TRIM is automatically turned on. You should match the travel of both flaps before using this function to set the total amount of flap throw. The amount depends on the model, but for sailplanes a small amount (less than 10%) is preferred, since too much camber produces excessive drag. Don't use more than about 1/16" travel up or down (some airfoils, such as the RC-15, should be flown with NO reflex).

Setting Flap Trim function

1. Turn the FLAP-TRIM function ON or OFF by turning the Dial. ("ON" displayed).

[FLAP-TRIM]
 MIX> 1NH
 RATE> 0%

Trim range of values
Range: -100 to +100%
Initially set to 0%

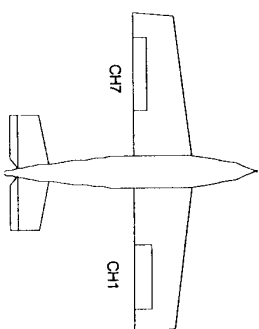
Press the Dial for one second to return to 0%.
2. Flap travel adjustment.
 Adjust the flap travel with the Dial.

To return to the Advance menu. The Select keys are used to move around the FLAP-TRIM function.

AIL-DIFF — Aileron Differential

The differential function allows you to program the amount of "up" aileron travel independently from the amount of down travel when you have two servos plugged into the receiver (right aileron = CH1/AIL and left aileron = CH7).

NOTE: Only one of the three functions aileron differential, flaperon, or elevator can be used at a time. The last function activated overrides the others. If you need both flaperons and differential, activate the FLAPERON function and in its menu set different up and down aileron travels to provide differential.



Setting up aileron differential in AIL-DIFF

1. Turn the AIL-DIFF function ON by turning the Dial. ("ON" displayed).

[AIL-DIFF]
 MIX> 1NH
 RATE> RIL1>+100% +100%
 RIL2>+100% +100%

Amount of servo travel:
Travel Range: -120 to +120%
Initially settings are +100%

Press the Dial for one second to return to +100%.
2. Right aileron servo (CH1) travel.
 Move the aileron stick in both directions and set the travel in each direction with the Dial.
3. Left aileron servo (CH7) travel.
 Press lower the Select key and repeat travel adjustment as done for CH1.

To return to the Advance menu. The Select keys are used to move around the AIL-DIFF function.

AIR-BRAKE — Airbrake Function

The AIR-BRAKE function simultaneously drops the flaps and moves the elevator, and is used to make steep descents or limit airspeed in dives. Airbrakes can be activated in a proportional manner by moving the throttle stick, or you may choose to move all the controls to the defined positions by flipping switch C. If you choose to operate it by throttle stick movement, you'll need to set the stick activation position. You can suppress sudden changes in your model's attitude when airbrake is activated by setting the delay ("DELAY-ELE") function, which slows down the elevator response.

When the FLAPERON function has been selected, the travel of the ailerons when the airbrake is operated can be independently adjusted for the servos plugged into CH1 and CH6. When AIL-DIFF function is used, the travel for CH1 and CH7 can be adjusted. Normally both ailerons are raised in the airbrake mode, and the elevator motion is selected to maintain trim when the ailerons rise.

Setting up Airbrake function

1. Turn the AIR-BRAKE function ON by turning the Dial ("ON" displayed).

[AIR-BRAKE]

MIX INH

RATE-ELE1 50%

FLAP 50%

AIL2 50%

DELAY-ELE 0%

MODE Manual 1

Servo travel Range:

-100 to +100%

Initial values:

AIL, FLAP = +50%

Elevator = -10%

Elevator delay value

Range: 0 ~ 100%

Initial setting = 0%

To return to the Advance menu.

The Select keys are used to move through the items 1-7 in the AIR-BRAKE function.

2. Set Aileron travel setting input the travel you'd like with the Dial.
3. Set Flap travel input travel with the Dial.
4. Set Elevator travel input travel with the Dial.

Press the Dial for one second to return to the initial value for the control.

5. Set Elevator delay rate
- Adjust the elevator delay with the Dial.
- A 100% delay produces full elevator throw in about one second.
- Press the Dial for one second to return to 0%.

6. Airbrake control selection. Using the Dial select the control whose movement you want to use to turn the airbrake mixing on and off.
- Set Elevator travel. If you choose MANUAL, you'll need to continue as shown to the right.

Switch type display

Manual = Controlled by manually-actuated switch

Linear = Controlled linearly by throttle stick

Set Throttle position (a throttle on/off position must be set if you use the linear (Linear) airbrake mode).

7. Enter Throttle position. The throttle position you set becomes the starting point for air brake operation. The servo motions increase linearly when the throttle stick passes this position.

Move the throttle stick to the desired airbrake on/off position. Enter the position into memory by pressing the Dial for one second.

You can disable the airbrake mixing with Switch C during Linear mixing.

ELEV-FLAP — Elevator-to-Flap Mixing

Elevator-to-flap mixing makes the flaps drop or rise whenever the elevator stick is moved. It is most commonly used to make tighter "pylon" turns or squarer corners in maneuvers. In most cases, the flaps droop (are lowered) when up elevator is commanded.

Setting Elevator-to-Flap Mixing

1. Turn the ELEV-FLAP function ON or OFF by turning the Dial. ("ON" or "OFF" displayed).

[ELEV-FLAP]

MIX INH

RATE 50%

FLAP 50%

POS1 Up

Allowed flap travel

Range: -100 to +100%

Initially set to +50%

To return to the Advance menu.

The Select keys are used to move around the ELEV-FLAP function.

2. Flap UP and DOWN travel input. Push the elevator stick in the direction you want to adjust and set the desired travel with the Dial. Press the Dial for one second to reset to 50%.

V-TAIL — V-Tail Mixing

V-tail mixing is used with V-tail aircraft so that both elevator and rudder functions are combined for the two tail surfaces. Both elevator and rudder travel can be adjusted independently on each surface. Because they share receiver outputs, Elevon and V-Tail mixing cannot be activated simultaneously.

Setting up V-Tail mixing

1. Turn the V-TAIL function ON by turning the Dial ("ON" displayed).

[V-TAIL]

MIX INH

RATE-ELE1 50%

RUD2 50%

RUD1 50%

Servo travel Range:

-100 to +100%

Initial values:

RUD1, RUD2, ELE1 = +50%

ELE2 = -50%

To return to the Advance menu.

The Select keys are used to move through the item 1-5 in the V-TAIL function.

2. Set elevator travel for CH2. Repeat for:
- CH4 servo elevator travel (ELE2)
- CH2 servo rudder travel (RUD2)
- CH4 servo rudder travel (RUD1)

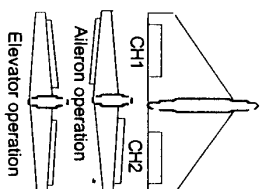
Stick Command	Receiver Output
ELEV	CH2
ELEV	ELE1
RUD	RUD2
RUD	RUD1

Be sure to move the elevator and rudder sticks continually while checking the servo motions. If a large value of travel is specified, when the rudder and elevator sticks are moved at the same time, the servo travel may be large, and controls may bind or run out of travel.

ELEVON — Elevon Mixing

The Elevon function should be used with delta wings, flying wings, and other tailless aircraft whose layouts combine the aileron and elevator functions, and requires one servo for each elevon. The aileron and elevator response of each servo can be adjusted independently. Connect the right aileron to receiver CH1/AIL and the left aileron to CH2/ELE.

NOTE: The elevon, flaperon, aileron differential, and ailerator functions cannot be activated simultaneously. The function activated last has priority.



Setting up elevon mixing

1. Turn the ELEVON function ON by turning the Dial ("ON" displayed).

ELEVON 1
MIX INH
RATE-AIL1+100% ELE2+100%
AIL2+100% ELE1+100%
ELE2+100% ELE1-100%

Servo travel rate
Range: -120 to +120%
Initial value: +100%
(ELE1: -100%)

To return to the Advance menu.

The Select keys are used to move through the items 1-4 in the ELEVON function.

2. Right aileron adjustment
Move the aileron stick in the direction you want to adjust and set the value with the Dial.
3. Left aileron adjustment
Again move the aileron stick in the direction you want to adjust and set the value as before.
- If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
4. CH1 servo elevator rate adjustment (ELE2). Adjust ELE2 with the Dial.
5. CH2 servo elevator rate adjustment (ELE1). Adjust ELE1 with the Dial.
- Return to the default value by pressing the Dial for one second.

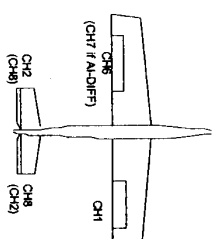
When you move the control below	CH1 servo functions as	CH2 servo functions as
Aileron stick	Right aileron	Left aileron
Elevator stick	ELE 2	ELE 1

Be sure to move the elevator and aileron sticks continually while checking the servo motions. If a large value of travel is specified, when the aileron and elevator sticks are moved at the same time, the servo travel may be large, and controls may bind or run out of travel.

AILVATOR — Ailerator Mixing

The Ailerator mixing function allows you to connect two servos to the receiver that operate two independent elevator control surfaces together as elevators and differentially as ailerons. This can be used to get more realistic flying properties with jet fighters and similar aircraft. You can also use this mixing to drive dual elevator servos without differential. The elevator and aileron travel can be adjusted independently. The two elevator servos must be plugged into the receiver CH2 and CH8 outputs.

NOTE: Ailerator mixing cannot be activated simultaneously with the throttle→needle mixing function, because they use the same receiver channels.



Setting up dual elevator servos

1. Turn the AILVATOR function ON by turning the Dial. ("ON" displayed).

AILVATOR 1
MIX INH
RATE-AIL3+50% ELE2+100%
AIL4+50% ELE1+100%

Servo travel
Range: -100 to +100%
(Initial values set to AIL3, 4 = -50%
ELE2 = -100%, ELE1 = +100%)

To return to the Advance menu.

The Select keys are used to move through the items 1-5 in the AILVATOR function.

2. CH2 tail servo aileron travel adjustment (AIL3): enter the desired value with the Dial.
3. CH8 tail servo aileron travel adjustment (AIL4): adjust and set the value as before.
4. CH8 tail servo elevator rate adjustment (ELE2). Adjust the rate with the Dial.
5. CH2 tail servo elevator rate adjustment (ELE1). Return to the default by pressing the Dial for one second.

When you move the control below	CH2 servo functions as	CH8 servo functions as
Aileron stick*	AIL3	AIL4
Elevator stick	ELE1	ELE2

*If you want elevator function only, set the "AIL3" and "AIL4" travel rates to 0.

Be sure to move the elevator and aileron sticks continually while checking the servo motions. If a large value of travel is specified, when the aileron and elevator sticks are moved at the same time, the servo travel may be too large, and controls may bind or run out of travel.

S NAP-ROLL — Snap Roll

This function can be programmed so that you can execute snap rolls by flicking a switch. You may select any of four roll directions using preset switches, and can set up a safety switch to prevent accidental snap rolls while the landing gear is down, even if you accidentally activate the snap roll switch. You cannot do snaps while using the trainer function.

SETTING METHOD

1. Turn the SNAP-ROLL function ON by turning the Dial.
 2. Select the snap roll direction switches by turning the Dial. (SW1, SW2)
- [SNAP-ROLL]
MIX INH
RATE 100%
RUD +100%
MOD FREE
SW1 NULL
SW2 NULL
- Servo travel
(Range: -120% to +120%)
- The Selected keys are used to move through the items 1-6 in the SNAP-ROLL function.
- Snap roll direction switch
RU = Right + up snap roll
RD = Right + down snap roll
LU = Left + up snap roll
LD = Left + down snap roll
3. Aileron travel setting.
Set the travel with the Dial.
 4. Elevator travel setting.
Set the travel with the Dial.
 5. Rudder travel setting.
Set the travel with the Dial.
- If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
6. Select safety switch.
Select the safety switch with the Dial.
- The safety switch is turned on and off with the landing gear switch. When "ON" is chosen, the safety mechanism is activated for the direction the landing gear switch is set at that time. Snap rolls can not be actored even if the snap roll switch is turned on. When the landing gear switch is moved to the opposite position, the display will change to "OFF" and snap rolls may be actored.
When the safety switch is set to "OFF", the safety mechanism operates in the direction opposite that when the switch was set to "ON". If it is set to "FREE", the safety mechanism does not operate regardless of the switch direction, and snaps can be actored regardless of the gear position.

THR-DELAY — Throttle Delay

The Throttle Delay function is used to delay the response of the throttle servo to simulate the slow response of a turbine engine to throttle control. A 40% delay setting corresponds to about a one second delay, while a 100% delay takes about eight seconds to respond.

Setting Throttle delays

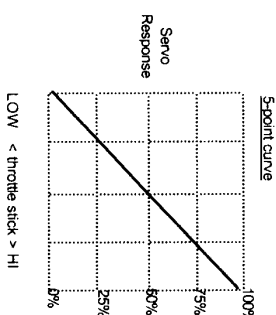
1. Turn the THR-DELAY function ON by turning the Dial. (ON displayed).
- [THR-DELAY]
MIX INH
RATE 40%
RUD 0%
- Delay range: 0 to +100%
Initially set to 0%
2. Delay rate setting.
Set the amount of delay with the Dial. A 40% value delays the response by 1 second. (You may reset to zero by pressing the Dial for one second.)
- The Selected keys are used to move through the items 1-2 in the THR-DELAY function.

THR-NEEDL — Throttle Needle Mixing

The throttle needle mixing function is used to control the motion of a second servo connected to the mixture control system of an engine (needle valve or other mixture adjustment) relative to throttle stick movement. The throttle needle servo connects to receiver CH8, and the CH8 control knob adjusts the high throttle mixture. An acceleration function moves the engine mixture control when the throttle is moved. This function cannot be used simultaneously with the Ailevator function.

SETTING METHOD

1. Turn the THR-NEEDL function ON by turning the Dial. (ON displayed).
- [THR-NEEDL]
MIX INH
POINT 1 0%
2 50%
3 75%
4 100%
5 100%
RUD 0%
- Travel rate
Range: 0 to +100%
(Initial setting = 0%)
- Initial values:
POS1 = 0%
POS2 = 25%
POS3 = 50%
POS4 = 75%
POS5 = 100%
- If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
2. Input 5-point curve values.
Move the throttle stick to the position you want to set (the adjustment point is displayed at the screen) and set the rate with the Dial.
 3. Acceleration function setting.
Input the desired acceleration level with the Dial. You can reset it to the initial value by pressing the Dial for one second.

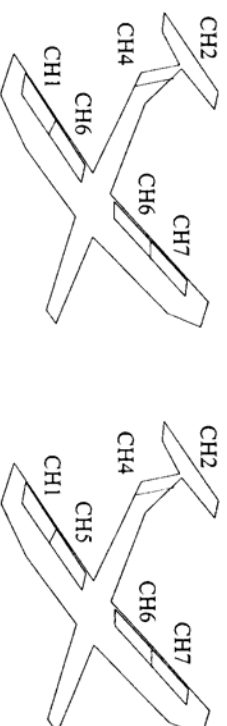


GLIDER (GLID1FLP/2FLP) ADVANCE MENU FUNCTIONS

The pages in the glider Advance Menu section describe the additional special mixing functions that only are available when the two glider (GLID1FLP, GLID2FLP) model types are selected. The GLID1FLP menu is intended for sailplanes with one or two aileron servos, and a single flap servo (or two connected with a Y-connector), while the -2FLP configuration is for dual flap servos that can act oppositely as ailerons. Note that for some aerobatic and slope gliders, the ACRO menus may be more appropriate to use, as they provide snap rolls.

For an explanation of the other Advance Menu functions available in the GLID menus, refer to the aircraft (ACRO) Advance Menu section, p. 43 to 53.

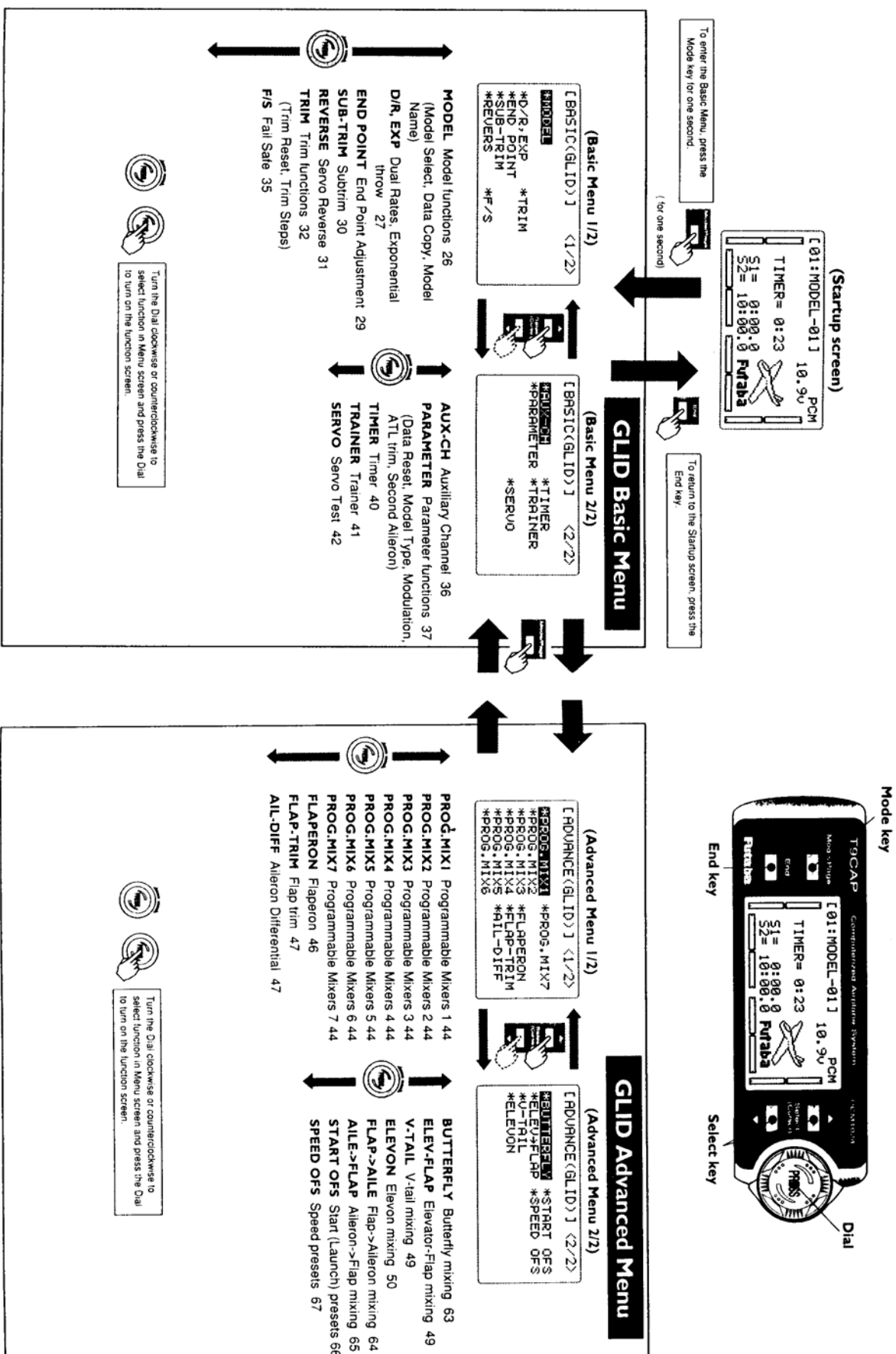
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Glider 1FLP Configuration

Glider 2FLP Configuration

GLIDER (GLID) FUNCTIONS MAP



GLID-2FLAP SETUP INSTRUCTIONS (TWO ALERON & TWO FLAP SERVOS)

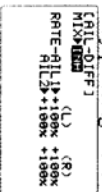
- Before you begin, be sure that all of your aileron and flap servos are plugged into the proper receiver channels. This example assumes that you are using model memory #3.

CH1 — Right Aileron
CH2 — Elevator (or first half of V-tail)
CH3 — (not used)
CH4 — Rudder (or second half of V-tail)
CH5 — Right Flap
CH6 — Left Flap
CH7 — Left Aileron

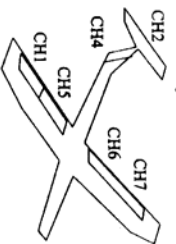
- Enter the BASIC menu by pressing the Mode key for one second. Select "PARAMETER" by turning the Dial clockwise or counterclockwise, then enter the PARAMETER menu by pressing the Dial.



- Press the lower Select key to get to the TYPE setup, which should display GLID(2FLP). If it doesn't, then turn the Dial until the words GLID(2FLP) are displayed. Press the Dial for one second to activate the mode. "sure?" will appear flashing in the upper right of the display. Pressing the Dial again will lock in the selected mode. **CAUTION: AS SOON AS YOU SWITCH THE MODEL MODE, SOME OR ALL OF THE DATA EXISTING IN THE CURRENT MODEL MEMORY WILL BE ERASED!** (The other seven memories will not be affected.) To return to the BASIC menu press the End key.

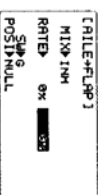


- Do not worry that the servos may not be moving the proper direction now. We will first activate all the special mixes necessary, and later go to the reverse menu to correct any reversed servo responses (if necessary). Press the Mode key to get to the ADVANCE menu. This is where are the sailplane-specific mixes are located. Select "ALL-DIFF" by turning the Dial, then enter the ALL-DIFF settings menu by pressing the Dial.



- "MIX" setup should be "ACT". This makes the second aileron servo (CH7) operate. Ignore the number settings for now.

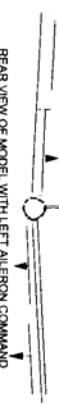
- Move to Aileron → Flap menu (ALL-FL, p. 65).



- Press the upper Select key to get to the MIX setup, then activate it by turning the Dial (ON should be displayed). Press the lower Select key to get to the RATE setup. Hold the aileron stick left or right, then use the Dial to set a value of 50%. Move the aileron stick to get the other number reversing, and set to the same number. You can increase this setting later if you need more maneuverability, such as for a slope racer or F3B model. Now you may choose whether you want this mix always on or switchable. NULL means always on, UP means on when Switch G is up, and DOWN means on when Switch G is down. We recommend leaving it in the NULL position; you can change the switch setting.

- If your model has a V-tail, go to the V-TAIL menu (p. 49) and activate it. This will make the elevator and rudder commands mix to the two tail surfaces. Leave the settings as is for now.

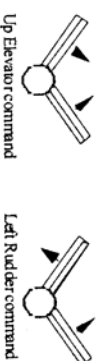
- Now move the aileron stick to the left. You should see your model's servos deflect as shown in the rear view below. The Right aileron and flap should move down, and the Left aileron and flap should go up. If the wing servos move as specified, you can continue.



Reverse any of CH1, 5, 6, and 7 by moving to the appropriate channel number with the upper or lower Select keys, then turning the Dial to reverse or un-reverse the channel. Be sure you get the aileron response in the picture.

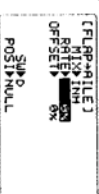


Next, move the elevator stick and be sure that the elevator moves the correct directions. Reverse CH2 if necessary. Similarly check the response of the rudder (CH4). If you have a V-tail, you should get the following response for rudder and elevator commands.

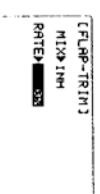


- Double-check to make sure all the servos move the correct way! Then, go to the END POINT menu and specify the maximum servo throws while moving all the controls. Spend some time getting the correct movements at this stage.

- Move to the flap → aileron (FLP → AL, p. 64) menu and activate by turning the Dial. Use a setting of 100% so the movement of all four wing servos is the same with flap and aileron horns that are the same length. If the horn lengths differ (hopefully in pairs) you can use a number either greater or less than 100% depending on the length ratio. The camber changing is done by turning the left most knob on the top center of the transmitter (CH, 6 Flap trim knob).



- To set the amount of camber-changing across the wing, go to the flap trim menu (FLAP-TRIM, p. 47) and activate it by turning the Dial.



Set it to a small number (about 5%), or set it to zero if you want no camber-changing (this may be changed later for more travel). For cruising, you'll want no droop at all, but for slow-speed thermalling, you may want to drop the trailing edge a bit. Use the flap trim setting to get the desired amount of camber. No more than about 1/8" (3 mm) is all that is needed for most models.

Note that the motion dictated by the Camber knob (CH, 6 flap trim knob) goes into both positive and negative camber from the neutral point, unless you set the F → A offset (see previous step). Also, note that if you don't set a small number or leave it inhibited (its default condition), you get a huge movement of the trailing edge. You can set the approximate neutral point by matching the notch on the front of the knob with the slot in the knob holder.

- Put the camber knob (CH, 6 flap trim knob, on the top left of the transmitter) where you want it to be for normal flight, and make sure that the travel you desire is the right direction from that point. Be sure to center all of the trims, and get all of the servo arms to be near neutral. Use the devices to get as close as you can. This way you won't run out of trim authority. Now set all the subtrims (SUB-TRIM, p. 30) to the desired neutral locations.



You can set the neutrals for the ailerons and flaps by using the foam wing beds or matching up with the rest of the wing. Don't use the fuselage airfoil (if any) as these are often not correctly aligned. Set the elevator incidence per the plans/instructions, and center the rudder.

- Go back to differential tail (ALL-DIFF) and set to get more 'up' throw than 'down' on the ailerons. For starters use a down travel of about 50% of the up travel. Your model may have different plus and minus signs depending on the servo orientations. Note that you set the right aileron's travel in both directions (move stick to change reversing display), then go to the left aileron's menu and repeat inputting values.

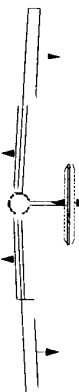

```
[R1-DIFF]
(1)
RATE-AL+100%
(2)
RATE-AL+100%
RATE-AL+100%
RATE-AL+100%
```

- Set up the butterfly (also referred to as "crow") function for glide path control and precise spot landings. The ailerons go up and the flaps drop with movement of the throttle stick.

```
[BUTTERFLY]
(1)
RATE-FL+100%
(2)
RATE-FL+100%
RATE-FL+100%
RATE-FL+100%
```

Press the upper Select key to get to the MIX setup, then activate it by turning the Dial (BUTTERFLY function p. 63).

First set the Butterfly function activation point. Hit the lower Select key to get to "RESET" setup. Now move the throttle stick to where you want the function to begin. (we recommend having the throttle stick all the way up for normal flight, and have the BUTTERFLY function "kick in" about 3 clicks from top. This way, if you accidentally jog the throttle stick a bit, you won't activate the butterfly function.) Enter your position by pressing the Dial for one second. Next, input a 25% value for the ailerons. Move the throttle stick and be sure the ailerons go UP with butterfly (see figure below). If they don't, change the sign of the number you've chosen (this may depend on servo orientation). You'll probably want 1/4 to 1/3 of aileron travel so you'll have plenty of roll authority while on approach in full butterfly command.



Input the throw for the flaps. Move the throttle stick and be sure the flaps DROP with butterfly. If they don't, change the sign (this again may depend on servo orientation). You want as much flap motion as possible — 90° is great if you can get it.

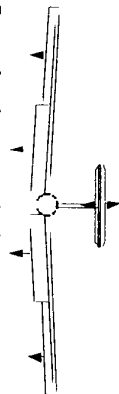
Use zero or very little elevator compensation until you fly and determine what is needed: if the model pitches up with butterfly, add down

elevator compensation and vice versa. Make only small changes in compensation because it has a big effect on trim. Refer to the sailplane trimming chart for more details.

- Set up the START OFS (launch, p. 66) preset for high launches so that the flaps drop slightly lower than the ailerons to reduce tip-stalling tendencies.

```
[START OFS]
(1)
RATE-FL+100%
(2)
RATE-FL+100%
RATE-FL+100%
RATE-FL+100%
```

Recommended settings are 30%, 0%, 40%, 40%, 30%. Increase the up-elevator preset in small increments until the plane launches as steeply as you like; add down elevator if the model weaves back and forth or is hard to control (remember to use the rudder stick, or rudder coupling during the launch). A well-trimmed model may actually have some down elevator mixed in for launching.



Remember that to get the START function to turn on, you have to flip the START/SPEED switch (Switch E) to its forward position.

14. You may also set up the speed mode presets (SPEED OFS, p. 67) for high-speed cruise between thermals. Reflex (raise) the entire trailing edge no more than 1/16" (1.5 mm), or you'll gain more drag than penetration ability. Use no more than 5 or 10% for initial setup.

- You can add aileron-rudder coupling (1-4 mixing is set up in PROG.MIX, p. 44) for coordinated turns.

```
[PROG.MIX]
(1/2)
RATE-FL+100%
(2)
RATE-FL+100%
RATE-FL+100%
RATE-FL+100%
```

This setting is highly dependent on the model configuration. Usually only a small amount of rudder is needed especially if a large amount of differential is present, so start out with 10-15%. Carefully observe the direction of the fuselage relative to the thermal turn the model is making. If the nose points towards the inside of the

circle, the coupling is too high, and if it points towards the outside of the circle, you need more coupling. When everything is set properly, the fuselage will be tangent to the thermal turn circle.



Sailplane Trimming Chart

The chart on the next page describes the procedures that may be followed when trimming a new sailplane. The flights for trimming must be made in near-calm conditions, and should be repeated several times before making adjustments.

One of the most critical steps is the center-of-gravity (CG)/decalage testing (Step 3). Decalage is a fancy way of describing the relative positions of the wing and horizontal tail. Although the control neutrals have been set in Step 1, there are differing combinations of elevator trim and CG that produce stable flight. In general, you get better performance by moving the CG aft, but at the same time you reduce the stability and make the model more difficult to fly, or make it so that constant attention is required. Moving the CG aft lessens the download on the model's tail and in some cases produces an *uplift*, which means the wing and tail are working together and not against each other as they do with a forward CG. Many contest flyers use a CG position located between 35 and 40% of the *mean* wing chord, which is near the aft limits for stability. A nose-heavy model will be easier to fly but will lack the performance of the aft-CG model.

You should also set differential and/or rudder coupling carefully. Incorrect settings will result in needless increased drag, and may be checked fairly easily. If you practice keeping the fuselage straight while gently rocking the wings back and forth, you'll learn how to coordinate turns and won't need coupled rudder any more. You can also learn about the proper amount of differential or rudder coupling by studying the figures of the model circling.

Whatever you do, be sure to spend a lot of time trimming your sailplane. If you have a nearby slope, practice flying on very light days, where you can just barely keep the model airborne. It is under these conditions that you learn if your model is really trimmed properly.

While you are flying, watch for trim changes during launch and butterfly control actions and set the compensations to cancel them out.

You can also add other mixing types such as elevator-to-flap mixing (ELEV-FLAP, p. 49) to make better pylon turns. You may wish to refer to the sailplane trimming chart following. Whatever you do, Enjoy!

SAILPLANE TRIMMING CHART

To test for	Test Procedure	Observations	Adjustments
1. Model Control Neutrals	Fly the model straight and level	Adjust the transmitter trims for hands-off straight & level flight, no camber control.	Change electronic subtrims and/or adjust clevises to center transmitter trims.
2. Control Throws Note: be sure all aileron & flap horn pairs have matching angles	Fly the model and apply full deflection of each control in turn. Camber control in neutral (setup 6 & 9).	Check the model's response to each control input. Set flaps for as much down flap as possible in glide path control (90° is good) <5° reflex needed.	* Aileron & elevator rates: set for desired authority * Rudder: set for max throw * Set flap motions in Steps 4, 5, & 9.
3. Decalage & Center of Gravity (Note: this is an iterative procedure, depends on desired handling characteristics. Air CG = less stability but better performance)	Trim for level glide. Enter 45° dive (across wind if any). Release controls when model on desired handling characteristics. Air CG = less stability but better performance	Does the model continue its dive without pulling out or diving? B. Does the model start to pull out (nose up)? C. Does the model start to tuck in (nose down)?	A. No adjustment B. Reduce incidence (add down elevator) and/or reduce nose weight C. Increase incidence (add up elevator) or add nose weight
4. Buttery Glide Path Control Settings (Part 1) Note: be sure all aileron & flap horn pairs have matching angles.	Fly the model and apply full deflection of glide path control (usually throttle stick). Observe any pitch changes.	A. Nose drops, up elevator required for level flight B. No pitch change C. Tail drops, down elevator required to maintain level flight	A. Several options: 1) more up elevator mixing; 2) reduce aileron reflex *; 3) increase flap motion* B. No adjustment C. Reverse of A
5. Differential/Coupled Rudder setting	Fly the model and apply alternating left & right aileron commands. Observe path of fuselage line	A. Model rolls to right when glide path control (throttle stick) activated B. No roll motion C. Model rolls to left	A. Increase differential and/or amount of rudder coupling B. No adjustment C. Reverse of A
6. Camber (full wing aileron & flap droop or reflex) setting	Put the model in a straight glide passing in front of you. Apply camber control.	A. Model yaws to right with left aileron and vice versa B. Fuselage traces straight line C. Model yaws to left with left aileron and vice versa	A. Increase differential and/or amount of rudder coupling B. No adjustment C. Reduce differential and/or amount of rudder coupling
7. Launch Settings (Part 1)	Launch the model & observe climb angle and required control inputs	A. Model slows down & stalls or sinks rapidly B. Model slows slightly C. Model speed unchanged	A. Reduce amount of droop B. No change needed C. Increase droop amount
8. Launch Settings (Part 2)	Switch to Launch mode. Launch the model & observe climb angle and required control inputs	A. Shallow climb angle; loss of up elevator required B. Model climbs steeply with little control input needed C. Too steep climb, weaves back & forth, down elevator required	A. Move tow hook rearwards small amount, increase up elevator preset a little B. No adjustment C. Move tow hook forward, increase down elevator preset
9. Speed Settings	Switch to speed mode (centre TE reflexed slightly, no more than 1.16° or 1.5 mm)	A. Model banks left on tow B. Model climbs straight ahead with no roll input needed C. Model banks right on tow D. Model tip stalls to one side	A. Reduce left aileron flap droop or increase right aileron flap droop B. No adjustment C. Reverse of A above D. Be sure droop same on both sides. Increase aileron droop or decrease flap droop (no typo)
10. Elevator-to-Flap Coupling Setting	Fly model at high speed. bank & pull up	A. Model keeps speed B. Model slows down	A. Increase down flap B. Decrease down flap

*Note: Swept wing planform may cause opposite reactions, so experiment until proper behavior is attained.

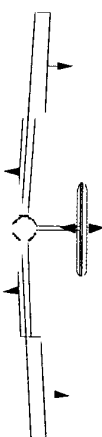
BUTTERFLY — Butterfly Mixing ("Crow")

The Butterfly mixing function – sometimes called "crow" – is used for glide path control for landing or for limiting speed when in a dive. Butterfly mixing is controlled with the throttle stick and raises the ailerons and lowers the flaps (two aileron servos are required, using CH1 and CH7, and the same setting applies to both, so the horns must be identical). Butterfly will work with either one or two flap servos. All of the servos move linearly with throttle stick motion.

Butterfly mixing can generate a change in pitch, so the elevator may need to be adjusted to compensate. Sudden changes in pitch can be suppressed by setting the elevator delay ("DELAY-ELE"): a 100% delay means that the elevator takes about two seconds to go to full travel.

Butterfly mixing is manually turned on and off with Switch A. If you turn on the transmitter, and there's a beeping sound, it could be your butterfly activation switch is in the ON position.

At the throttle stick "idle" position, butterfly mixing has maximum throws. [If you wish to move the ATL to the high throttle end, turn on the transmitter holding the Mode and End buttons down. You'll see a display "TX-SETTING". Press the lower Select key to get to the "THR-REV" display. Now turn the Dial to reverse the throttle function. You may need to reverse the signs on some mixers after you perform this operation, which applies to all model memories.]

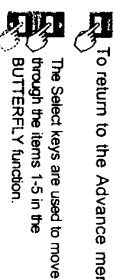


Butterfly mixing programming

1. Turn the BUTTERFLY function ON by turning the Dial ("ON" or "OFF" displayed depending on SW-A position).
2. Set Aileron travel setting Input the travel you'd like with the Dial.
3. Set Flap travel Input travel with the Dial.
4. Set Elevator travel Input travel with the Dial.
5. Set Elevator delay rate - Adjust the elevator delay with the Dial. A 100% delay produces full elevator throw in about one second.
6. Enter Throttle position The throttle position you set becomes the starting point for butterfly mixing. The servo motions increase linearly when the throttle stick passes this position towards "low throttle."



Servo travel
Range: -100 to +100%
Initial value: 0%



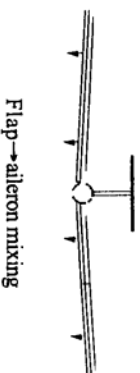
To return to the Advance menu.
The Select keys are used to move through the items 1-5 in the BUTTERFLY function.

Set Throttle position
Throttle stick position for BFLY begin.
Range: 0 - 100%
(Initial value: 0%)
The throttle position you set becomes the starting point for butterfly mixing. The servo motions increase linearly when the throttle stick passes this position towards "low throttle."

Move the throttle stick to the desired butterfly on/off position. Enter the position into memory by pressing the Dial for one second.

FLAP→AIL: Flap→Aileron Mixing

Flap→aileron mixing is used to change the camber (the angle of the ailerons and flaps) over the entire wing, which produces less drag than just dropping the flaps by themselves. When you have Elevator→Flap mixing activated along with Flap→Aileron mixing, the entire trailing edge droops or reflexes with elevator stick motion.





Flap→aileron mixing

You can program an offset of the flaps as described in step 3 below, but we suggest leaving this at zero initially.

Switch "D" is programmed to turn this function on and off, but you can have the function always on if you like by selecting the NULL direction.

Setting up Flap→Aileron mixing

1. Turn the FLAP-AIL function ON or OFF by turning the Dial. ("ON" or "OFF" displayed depending on switch D's position).
 To return to the Advance menu.
 The Select keys are used to move through the items 1-4 in the FLAP-AIL function.

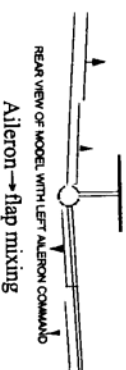
[FLAP→AIL]
 MIX INH
 RATE 8%
 OFFSET
 POS NULL

 Range: -100 to +100%
 (Initial value: 0%)
2. Aileron travel rate setting
 Adjust the amount of aileron travel compared to flap motion with the Dial.
 - if you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
3. Flap neutral position offset
 Turn the CH6 knob in the desired offset direction. Memorize the amount of offset by pressing the Dial for one second.
 (Suggest leaving 0% initially)
4. Activation Switch Direction/Disabling
 Select the desired direction for Switch D to turn the function on and off with the Dial.
 "UP" = Upper position turns on FLAP-AIL mixing
 "DOWN" = Lower position turns on FLAP-AIL mixing
 "NULL" = FLAP-AIL mixing is always on; switch disabled.

AIL→FLAP — Aileron→Flap Mixing



Aileron-to-flap mixing is used to improve the roll rate and to reduce the wing's induced drag during rolls and banking maneuvers by operating the flaps differentially as ailerons. The function may be turned on and off by switch "G", or it may be permanently on.

For normal flying, a value of about 50% is often used. But for slope racing or F3B models in speed runs, you may wish to use a larger value approaching 100%.



Aileron→flap mixing

Setting up aileron-to-flap mixing

1. Turn the AILE-FLAP function ON or OFF by turning the Dial. ("ON" or "OFF" displayed depending on switch G's position).
 To return to the Advance menu.
 The Select keys are used to move through the items 1-3 in the AILE-FLAP function.

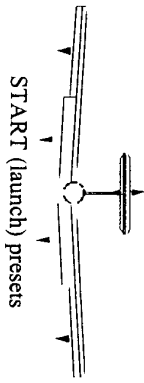
[AILE→FLAP]
 MIX INH
 RATE 8%
 POS NULL

 Range: -100 to +100%
 (Initial value: 0%)
2. Flap travel setting
 Push the aileron stick in the direction you want to adjust and adjust the flap amount with the Dial. Repeat for other aileron stick position.
 - if you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
3. Activation Switch Direction/Disabling
 Select the desired direction for Switch G to turn the function on and off with the Dial.
 "UP" = Upper position turns on AILE-FLAP mixing
 "DOWN" = Lower position turns on AILE-FLAP mixing
 "NULL" = AILE-FLAP mixing is always on; switch disabled.


START OFS — Start (Launch) Presets

The Start function is used to offset the aileron, elevator, and flap servos to the position that provides maximum lift during launch. Normally the ailerons and flaps are drooped about 20~30°, with the flaps drooped slightly more to prevent tip-stalling on tow. The elevator neutral can also be offset in order to trim out any pitch changes caused by the flap and aileron presets. This function is activated by flipping switch G to the aft position.


If you wish to have the three-position switch above the left-hand stick (position E), you should purchase the 9CH system.





Inputting the Start (Launch) presets for your model


1. Turn the START function ON by turning the Dial:  ("ON" or "OFF" displayed depending on Switch G position).

[START OFS]

MIX INH 


RATE-AILEV 


ELEV 

FLAP 

UR NULL

Servo offset
Range: -100 to +100%
Initially set to 0%

 To return to the Advance menu.

 The Select keys are used to move through the items 1-4 in the START function.

2. Aileron offset
Input the desired Aileron offset with the Dial.

3. Elevator offset
Input the desired Elevator offset with the Dial.

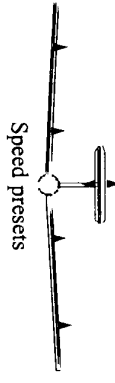
4. Flap offset
Input the desired Flap offset with the Dial.

-The GLID 2FLP menu for START has separate Flap 1 and Flap 2 offsets.
(You may reset to zero by pressing the Dial for one second.)


SPEED OFS — Speed presets

The Speed function is used to offset the aileron, elevator, and flap servos to the position that provides maximum drag for cruise and high-speed flight. Normally the ailerons and flaps are raised about 3~5°. Some airfoils, notably the RG-15, actually have higher drag with reflex, so Speed function should not be used with this section and other similar ones. The elevator neutral can also be offset in order to trim out any pitch changes caused by the trailing edge reflex. This function is activated by flipping switch G to the forward position.


If you wish to have the three-position switch above the left-hand stick (position E), you should purchase the 9CH system.





Inputting the Speed presets for your model


1. Turn the SPEED function ON by turning the Dial:  ("ON" or "OFF" displayed depending on Switch G position).

[SPEED OFS]

MIX INH 


RATE-AILEV 


ELEV 

FLAP 

UR NULL

Servo offset
Range: -100 to +100%
Initially set to 0%

 To return to the Advance menu.

 The Select keys are used to move through the items 1-4 in the SPEED function.

2. Aileron offset
Input the desired Aileron offset with the Dial.

3. Elevator offset
Input the desired Elevator offset with the Dial.

4. Flap offset
Input the desired Flap offset with the Dial.

-The GLID 2FLP menu for SPEED has separate Flap 1 and Flap 2 offsets.
(You may reset to zero by pressing the Dial for one second.)

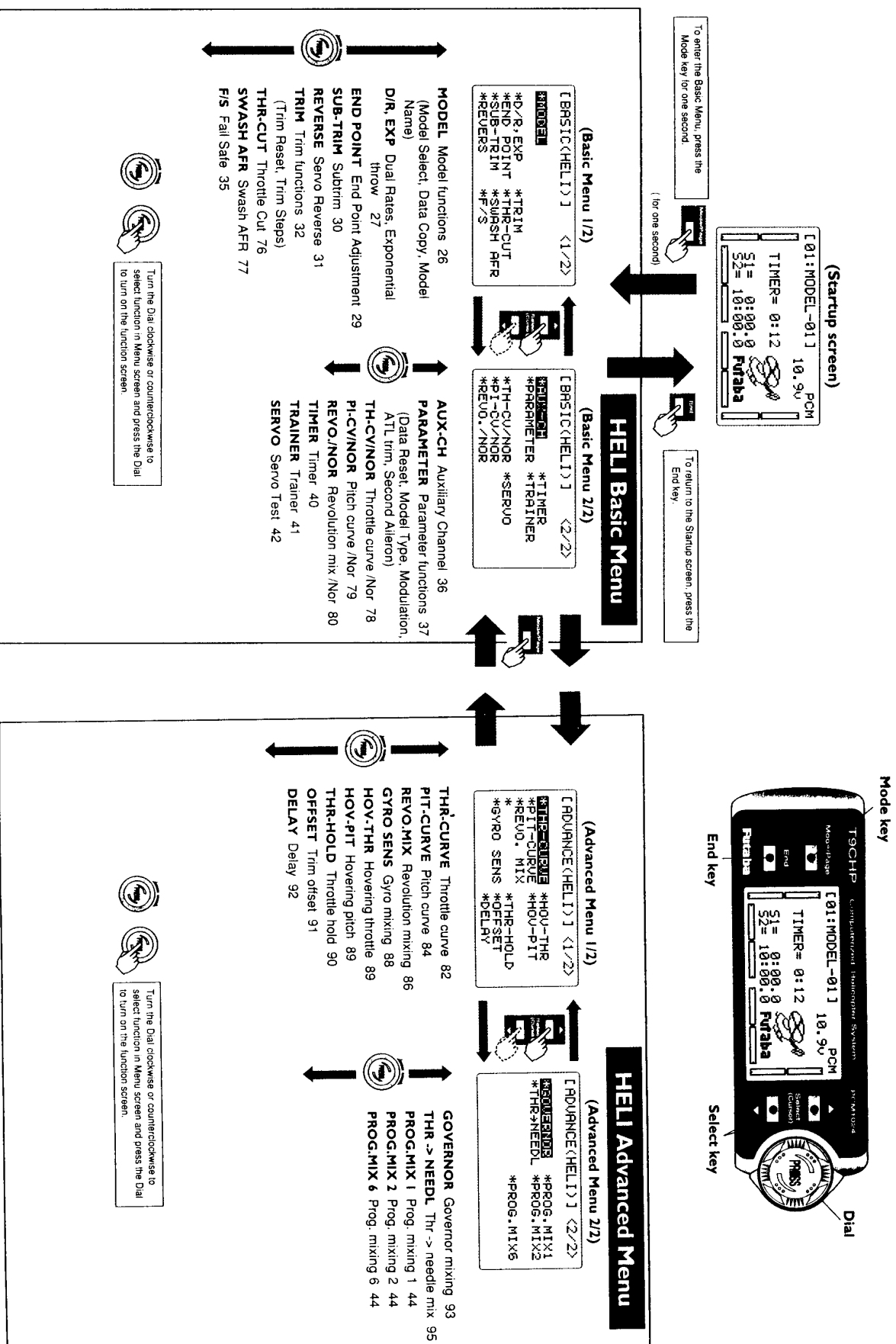
HELICOPTER BASIC MENU FUNCTIONS

The following section (pages 76 – 80) describes how to use the helicopter-specific Basic Menu functions for helicopters (model types HELISWH1, HELISWH2, HELISWH4, HELISR-3, HELISN-3). The functions of the other Basic Menu items are contained in the aircraft (ACRO) section, pages 26 – 42.

The helicopter Advance Function section begins on page 81.

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TH-CV/NOR ... Throttle curve (Normal)	78
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REVO./NOR.Revolution mixing (Normal)	80

HELICOPTER (HELI) FUNCTIONS MAP



HELICOPTER SETUP INSTRUCTIONS

The following example shows how the T9C may be programmed for a contest helicopter model. The settings presented here are for a typical model. Your model's settings are likely to vary from these, but the procedures given will still be applicable.

1. Memory Selection
Use the model select function [SELECT] in the model menu to select a model memory.



CAUTION: if you select a new type of model, you'll lose all the data already in the model memory. This example assumes you're using model memory 1.

2. Name your model using the model name [NAME] function in the model menu
3. Hook up controls In the helicopter, hook up the aileron, elevator, throttle, and rudder servos in accordance with the model's instructions or plans.

4. Plug Servos Into Receiver.
CH1.....Aileron
CH2.....Elevator
CH3.....Throttle
CH4.....Rudder
CH5.....Gyro Sensitivity
CH6.....Pitch
CH7.....(spare)
CH8.....(spare)

5. Set Servo Throw Direction
Check the proper direction of throw for each servo. Use the Reversing Function [REVERSE] in the Basic menu to set proper throw directions.



Reverse channels as necessary to correct throws. Set up the carburetor pushrod so that the carb may be fully closed to shut off the engine.

6. Servo Travel
Use the END POINT command to limit servo travel to prevent binding.



7. Throttle Cut Setting
After a flight, use the Throttle Cut function to kill your engine with the trainer switch.



There is no need to fumble with trim, and the idle trim position will never be lost.

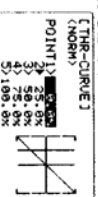
Enter the THR-CUT settings in the Basic menu and set the desired switch (we recommend using the trainer switch H, in the down or momentary position). Press the lower Select key to get to the "THR" setup. Move the throttle stick a few clicks above idle, then press the Dial for one second to memorize the position. This makes it so the engine cut function will only operate when the throttle is below the set point, so the engine can't inadvertently be shut off in flight.

Adjust the throttle servo motion so that when activated, the carburetor is fully closed and there is no binding in the throttle pushrod.

Normal Flight Programs

Continue within the Basic functions menu to set up the Normal flight settings (see the menu structure on p. 70 for more info).

8. Throttle Curve-Normal

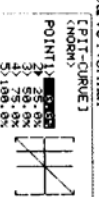


Go to the Throttle Curve [THR-CURVE <NORM>] function. Input the throttle curve to the values shown in the table below:

Point	1	2	3	4	5
Setting (%)	0	25	45	75	100

You'll want to set the throttle so it's about half open at Point 3. The throttle responds a bit slower than linear near center, and then the response rate approaches linear at both ends.

9. Pitch Curve-Normal



Move to the pitch curve function [PITCH-CURVE <NORM>]. For a semi-symmetrical

rotor blade with no twist, the pitch angle should vary from -4° to $+12^\circ$. We recommend setting the hovering pitch to $+4.5^\circ$.

Move the hovering pitch knob (CH6) and the hovering throttle knob (CH7) to the center positions (if these functions are activated in the Advance Menu, the knobs may be moved in flight to make adjustments). Next, input pitch curve data so that the normal pitch used in hovering varies between -2.5° and $+10^\circ$.

The pitch angle should be set so that the high throttle pitch rate is large. This provides high collective sensitivity to help cope with windy conditions.

The following values are recommended starting points for the pitch curve:

Point	1	2	3	4	5
Setting (%)	15	25	55	75	90
Blade pitch	-2.0°		$+4.5^\circ$		$+10^\circ$

10. Revolution Mix Setting



Revolution mixing uses the tail rotor to suppress the torque reaction of the main rotor due to changes in collective pitch. Call up the [REVO. MIX <NORM>] Menu. Input the values as follows:

Point	1	2	3	4	5
Setting (%)	-25	-12	0	+12	+25

FLIGHT CONDITION SWITCHING

Your system is already programmed to have settings for Idle-up 1 [IDL1], Idle-up 2 [IDL2], Idle-up 3 [IDL3], and Throttle Hold [HOLD] in addition to the normal flight condition [NORM]. The menus for these added flight conditions are contained in the Advance Menu. Refer to the menu structure on p. 70 for more info.

The position and ON direction of each flight condition call switch are set as follows:

- Normal [NORM] – for hovering. Operation when all switches OFF.
- Idle-up 1 [IDL1] – for 540° stall turns, looping, rolling stall turns. ON at Switch E center position
- Idle-up 2 [IDL2] – for rolling acrobatics. ON at Switch E forward position.

- Throttle Hold [HOLD] – for autorotation. ON at Switch G forward position.

We recommend that you fly the model and adjust trims and control responses to your liking in hover before setting up another flight condition.

To set the condition data for each flight condition, be sure that you call the appropriate condition by turning on the correct switch (as given above). Double-check to be sure that you are setting the menu you desire.

As mixes are switched on or off, HOLD has highest priority, followed by IDL3, IDL2, IDL1, and NORM.

Idle-Up 1 Settings

The settings for IDL1 conditions are among those contained in the Advance menus (see the menu structure on p. 70 for more info).

11. Throttle Curve Setting: move to the THR-CURVE <IDL1> menu and activate it. Change the Idle-up 1 throttle curve points to the values shown below:

Point	1	2	3	4	5
Setting (%)	57	55	57	75	100

12. Pitch Curve Setting: Move to the PITCH-CURVE <IDL1> menu and activate it. The Idle-up 1 pitch curve should use the same curve as the normal condition except with the maximum high throttle pitch angle between 8° to 10° , depending on the engine used.

Point	1	2	3	4	5
Setting (%)	10	25	50	65	80
Blade pitch	-2.5°		$+4.5^\circ$		$+8^\circ$

13. Idle-up 1 Revolution Setting:

These settings are used in 540° stall turns, looping, and rolling stall turns and are set to be straight ahead when the model is pointing directly into or away from the wind. Move to the REVO. MIX <IDL1> menu and input the following values:

Point	1	2	3	4	5
Setting (%)	-20	-10	0	+10	+20

Idle-Up 2 Settings

The settings for IDL2 conditions are also among those contained in the Advance menus (see the menu structure on p. 70).

14. Throttle Curve Setting: move to the THR-CURVE <IDL2> menu and activate with the

Dial Input the rnal throttle curve points as shown below:

Point	1	2	3	4	5
Setting (%)	60	60	60	75	100

15. Pitch Curve Setting 3ep through the menu to the PIT-CURVE <IDL> menu. Set the pitch curve as follows:

Point	1	2	3	4	5
Setting (%)	5	25	50	65	80
Blade pitch	-3°		+4.5°		+8°

16. Idle-up 2 Revolution Setting:

These settings are used in rolls. Move to the REVO.MIX <IDL> menu and try out the following values for the rudder mixing curve:

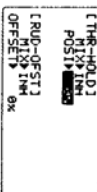
Point	1	2	3	4	5
Setting (%)	-20	-10	0	+10	+20

Throttle Hold Settings

The settings for HOLD conditions to be used for Autorotation, are also among those contained in the Advance menus (see the menu structure on p. 70).

17. Throttle Hold Setting

THR-HOLD sets throttle position near idle and keeps the model pointed straight ahead during autorotation.



Move to the Throttle Hold menu and activate, then set switch G to the forward position. Set the hold position (POS1) maintain engine idling. Next, move to the rudder offset setting and set OFF-SET to keep the tail rotor pitch angle to nearly 0°, since there is no torque. Your numerical value may vary from those shown.

18. Pitch Curve Setting Move to the PIT-CURVE <HOLD> menu and activate. During autorotation, high pitch is used at both the HIGH and LOW sides, so set the HIGH and LOW rates to their maximum values 0 and 100% respectively.

Point	1	2	3	4	5
Setting (%)	0	25	50	65	100
Blade pitch	-4°		+4.5°		+12°

19. Rudder→Throttle Mix Setting

Rudder→Throttle mixing is useful for hovering eight, nose-in circle, Top Hat, P-rocette, and other aerobatics. It is normally set up so that rotor speed is maintained to keep air rate constant when the rudder stick is operated at half-throttle.

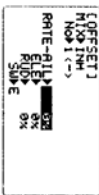
For helis with normal rotor rotation, commanding right rudder should increase throttle slightly, while using left rudder should decrease throttle slightly.

To set this feature, use one of the PROG.MIX mixers. Turn the Dial to activate it, and set master = Rudder, slave = Throttle. Input the value for left at -10% and the right value to +10%. Adjust values to suit.

Another use for a programmable mixer: The main rotor's RPM can decrease due to increased load whenever full cyclic control is used, like when doing a roll. To help keep the RPM up, you can use a mixer with Master = ALL, Slave = THR. About 10% mixing is a good starting point for both directions.

20. Trim Offset Setting

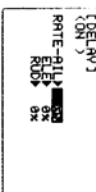
The Trim Offset menus may be adjusted for Idle-up 1 and Idle-up 2. Aileron, elevator, and rudder trims may be offset to different positions so that the model flies straight ahead during normal flight.



If you find you need some trim offsets in IDL 1 or IDL 2, call up the OFF-SET menus you need. Recommended settings for aileron and elevator offsets are small, from 6% to 10% or as needed.

21. Delay Settings

Delay settings are used to prevent sudden trim changes due to different settings in different flight conditions. You can set different delays for aileron, elevator, and rudder. The delays you set apply to all flight conditions. We recommend trying very small values for the initial settings, say 5 - 10%. A 2.5% delay is about a half-second transit time between neutral settings.



You may use the Hovering Pitch and Hovering Throttle functions for fine trimming changes due to humidity, etc.

This concludes the example setup procedure for helicopters. Be sure to browse through the pages following this example to see

what other menus are available for helicopters, such as Hovering Throttle and Pitch knobs, OFF-SET, and DELAY. You may use a mixer to adjust gyro sensitivity, or to enhance flight capabilities or to correct a response you don't like. Again, we recommend you set up and trim in the Normal flight condition before setting up the alternate flight modes.

Helicopter Flight Trimming Chart

This procedure assumes helicopter is trimmed for hovering. Trimming must be done in near-calm conditions. Repeat tests several times before making adjustments. If any changes are made, go back over the previous steps and verify, or further adjust as necessary.

To test	Test Procedure	Observations	Adjustments
1. Revo mixing --- Up settings (Part 1)	Fly the model straight and level into the wind at 100 ft altitude, lower pitch to 0°	A. No rotation B. Model rotates counterclockwise C. Model rotates clockwise	A. None B. Add right rudder trim C. Add left rudder trim
2. Revo mixing --- Up settings (Part 2)	Bring the copier into hover, add full pitch and ascend 75 ft	Observe rotation as copier ascends A. No rotation B. Model rotates counterclockwise C. Model rotates clockwise	A. None B. Increase UP revo mix C. Decrease UP revo mix
3. Revo Down mixing settings	Begin Down Revo mixing with same number as UP mix. From inverted flight (top of loop, or mid-point of roll, or inverted part of split-S), add full negative pitch	Observe rotation as copier ascends A. No rotation B. Model rotates clockwise C. Model rotates counterclockwise	A. No adjustment B. Increase Down revo mix C. Decrease Down revo mix

THR-CUT — Throttle Cut

The TH-CUT function is used to kill the engine at the end of a flight. The engine can be stopped with one touch with switch F (the momentary trainer switch is the initial setting, but you may select another). This function eliminates the need to move the trim to kill the engine and then move back to the idling position after each flight. When the throttle stick is lower than the function ON/OFF set point throttle position (normally a little above idle), the THR-CUT function responds to the operation of the switch, and the throttle servo moves to its defined position.



The THR-CUT function will protect you from accidentally shutting off the engine. When the throttle stick is above the set point, the THR-CUT function is not activated even if the throttle cut switch is operated. In addition, you must move the throttle stick back below the set point before the THR-CUT function can be reset, to avoid sudden engine acceleration.

THR-CUT setup

Hook up and adjust the throttle linkage so that full throttle fully opens the carburetor, and use the digital trim to make the engine idle at low throttle. Turn on the throttle cut switch (switch F) and select the amount of offset to be just large enough in the “-” direction (low throttle) to fully close the carburetor.

If you prefer, you may select another switch and ON-OFF direction. For safety, always activate the THR-CUT function and use it.

Setting up the Throttle Cut function

1. Turn the TH-CUT function ON or OFF by turning the Dial: (“ON” or “OFF” displayed depending on switch F’s position).
 To return to the Basic menu.
 The Select keys are used to move through the items 1-5 in the THR-CUT function.
2. Input throttle offset
 Adjust the throttle offset amount with the Dial.
 - if you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.
 Throttle Offset
 Range: -30 to +30%
 (Initial setting 0%)
 Throttle position
 Range: 0 - 100%
 (Initial setting 5%)
3. Throttle-Cut activation position
 Hold the throttle stick at the highest throttle position you want to be able to activate THR-CUT (normally set near idle). Memorize the position by pressing the Dial for one second.
 UP = Upper position turns on THR-CUT
 DOWN = Lower position turns on THR-CUT
 NULL = THR-CUT is deactivated
4. Activation Switch Selection
 Select the switch with the Dial.
 5. Switch direction selection
 Select the desired direction for the switch to turn the function on and off with the Dial.
 UP = Upper position turns on THR-CUT
 DOWN = Lower position turns on THR-CUT
 NULL = THR-CUT is deactivated

SWASH AFR - Swash AFR

You can use Swash AFR rate settings to reduce (or increase) the function rate when SWH2, SWH4, SR-3, or SN-3 is selected as the swash type. The function rate reduction or increase for the aileron, elevator, and pitch may be controlled by this menu.

Setting Swash AFR rate values

1. Aileron adjustment
 Set the rate with the Dial.
 2. Elevator (except SWH2 type)
 Set the rate with the Dial.
 3. Pitch:
 Set the rate with the Dial.
- Rate:
 RATE AFR 1
 RATE AFR 2
 RATE AFR 3
 RATE AFR 4
 RATE AFR 5
 RATE AFR 6
 RATE AFR 7
 RATE AFR 8
 RATE AFR 9
 RATE AFR 10
 RATE AFR 11
 RATE AFR 12
 RATE AFR 13
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TH-CV/NOR — Throttle Curve (Normal)

The throttle curve normal function is used to input the normal (NORM) throttle curve, which is usually not a linear response to throttle stick motion. The normal throttle curve is the basic throttle curve intended for flight around hover. Together with the pitch curve (normal), the throttle curve is adjusted for best climb at a fixed engine RPM. You can program a 5-point throttle curve to get the best engine response relative to throttle stick motion. Each point of the curve can be adjusted over a range of 0% to 100%.

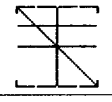
There are four throttle curves in your transmitter: normal (NORM), idle-up 1 (IDL1), idle-up 2 (IDL2) and idle-up 3 (IDL3), but only the basic normal throttle curve is displayed in the Basic Menu. The normal curve can be seen and programmed in either the Basic or Advance Menus, but the others are only accessible in the Advance menu.

Setting the Normal throttle curve

1. Turn the THR-CRV function ON by turning the Dial. ("ON" displayed).

[THR-CURVE]
[NORM<NORM>]

POINT1 25.0%
 2 50.0%
 3 75.0%
 4 100.0%
 5



Curve Point Value
(Range: 0 - +100%)

Initial values:
 POS1 = 0%
 POS2 = 25%
 POS3 = 50%
 POS4 = 75%
 POS5 = 100%

The reversed item on the setting screen is the current setting item.
2. Input 5-point curve values. Set the curve value with the Dial.
 - if you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

The Throttle Curve Normal function is normally on.

Example Throttle Curve
Norm Five-point Curve

The Selected keys are used to move through the points 1-5 in the curve.

To return to the Basic menu.

PI-CV/NOR — Pitch Curve (Normal)

The Normal pitch curve function contained in the Basic Menu sets the normal (NORM) curve. The Normal pitch curve is the basic pitch curve for flight near hover. Together with the normal throttle curve, the normal pitch curve is adjusted for best vertical performance at a constant engine speed. You can program the response over a 5-point curve so that you may choose the best rotor pitch angle relative to throttle stick movement. Each of the five points can be adjusted over a 0% to 100% range.

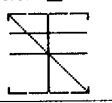
The T9C system helicopter programs contain five pitch curves: normal, idle-up 1 (IDL1), idle-up 2 (IDL2), idle-up 3 (IDL3), and hold (HOLD). The basic normal pitch curve is the only one displayed in the Basic Menu, but all of the pitch curves can be viewed in the Advanced menu. The Normal curve is the same in both the Advanced and Basic Menus.

Setting the Normal Pitch Curve

1. Turn the PI-CRV function ON by pressing the Dial. ("ON" displayed).

[PI-CURVE]
[NORM<NORM>]

POINT1 25.0%
 2 50.0%
 3 75.0%
 4 100.0%
 5



Curve Point Value
(Range: 0 - +100%)

Initial values:
 POS1 = 0%
 POS2 = 25%
 POS3 = 50%
 POS4 = 75%
 POS5 = 100%

The reversed item on the setting screen is the current setting item.
2. Input 5-point curve values. Enter the desired curve value with the Dial.
 - if you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

Example Pitch Curve-Norm
Five-point Curve

The Selected keys are used to move through the points 1-5 in the curve.

To return to the Basic menu.

REVO.MIX — Revolution Mixing (Normal)

The Normal revolution function mixes pitch commands into rudder in order to suppress the torque generated by changes in the main rotor's pitch angle. There are three different settings of revolution mixing available: normal (NORM), idle-up 1/2 (IDL1/2), and idle-up 3 (IDL3). Only normal revolution mixing is displayed on the Basic Menu.

The revolution mixing rate can be input on a 5-point curve. For a clockwise-turning rotor, the rudder is mixed in the clockwise direction when pitch is increased; for a counterclockwise-turning rotor, the opposite setting is made. The operating direction setting is changed by changing the signs of the numbers in the curve from plus (+) to minus (-) and vice versa:

Clockwise rotation: -50, -25, 0, +25, +50% from low throttle

Counterclockwise rotation: +50, +25, 0, -25, -50% from low throttle

These numbers are the default initial values. You should replace them with the actual values that work best for your model.


Procedure for adjusting revolution mixing

This procedure assumes that your model is trimmed, and no tail rotor command is needed in hover.

1. Throttle low-side adjustment (between idle and hovering)
Repeatedly takeoff and hover and return to land. Adjust the revolution mixing so that raising and lowering the throttle does not cause a sudden fuselage heading change. If the nose points left when landing from hover or when taking off, the low-side mixing rate is too high. If the nose points in the opposite direction, the mixing rate is too small. Note that the nose direction may not become stable when taking off if the helicopter is not steady before takeoff, or if the rotor speed does not rise.
2. Throttle high-side setting (between hovering to high-power climbing)
Apply throttle while hovering to climb and then descend back to hover. Adjust revolution mixing so that the nose does change heading when the throttle is raised and lowered as in the low-side adjustment given above.

Revolution Mixing Setting

1. Turn the REVO.MIX ON by turning the Dial.
(“ON” displayed)




Curve Point Value
(Range: 0 - +100%)


Initial values:
POS1 = -50%
POS2 = -25%
POS3 = 0%
POS4 = +25%
POS5 = +50%

The reverse item on the setting screen is the current setting item.

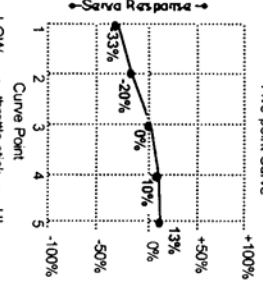
[REVO.MIX]
[NORM] < NORM >
MIX ON
POINT 1: -33%
2: -10%
3: 0%
4: +10%
5: +20%



To return to the Basic menu.
The Select keys are used to move through the points 1-5 in the curve.



Example Revolution-Norm
Five-point Curve



LOW ← throttle stick → HI

HELICOPTER ADVANCE MENU FUNCTIONS

Pages 81 to 95 describe the Advance menu functions for both helicopter model types (HELISWH1, HELISWH2, HELISWH4, HELISR-3, HELISN-3). Helicopter Basic Menus are in pages 76 to 80.

THR-CURVE... Throttle Curve (Normal, Idle-up 1/2/3).....	82
PIT-CURVE... Pitch Curve (Normal, Idle-up 1/2/3, Hold).....	84
REVO.MIX... Revolution Mixing (Normal, Idle-up 1/2/3).....	86
GYRO SENS... Gyro Mixing.....	88
HOV-THR... Hovering Throttle.....	89
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THR-HOLD... Throttle Hold.....	90
OFFSET... Trim Offset (Idle-up 1/2/3).....	91
DELAY... Delay.....	92
GOVERNOR... Governor Mixing.....	93
THR-NEEDL... Throttle Needle Mixing (Normal, Idle-up 1(2)/3).....	95
PROG.MIX... Programmable Mixing (1,2,6).....	44

THR-CURVE — Throttle Curve (Normal, Idle-Up 1/2/3)

You can use Throttle Curve menus to program a five-point curve so that the engine speed responds the way you like relative to movement of the throttle stick. You can set each of the five points over a 0% to 100% range.

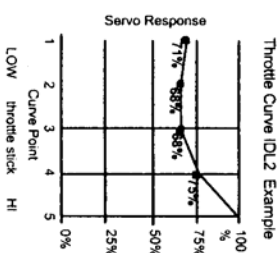
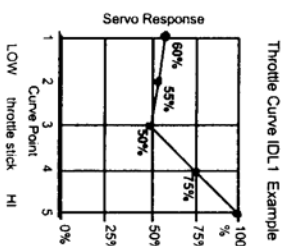
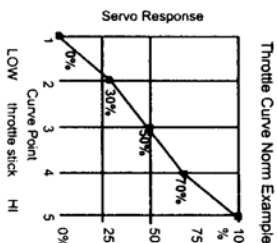
There are three throttle curves: normal (NORM), idle-up 1 (IDL1), idle-up 2 (IDL2) and idle-up 3 (IDL3). Only the basic normal throttle curve is displayed in the Basic Menu, but all the curves may be programmed in the Advance Menu. For your convenience, the normal curve can be programmed in either the Basic or Advance Menu, and it is automatically updated in both places. Switch G is programmed so that you may change between the normal (NORM), idle-up 1 (IDL1), and idle-up 2 (IDL2) curves.

Normal Curve Adjustment Method

The normal throttle curve (TH-CV/NOR) function is used to produce the basic throttle curve for flight near hover. It is used along with the normal pitch curve (PL-CV/NOR) so that the helicopter flies with constant rotor RPM. The normal throttle curve function is ON at startup.

Idle-up 1 and 2 Curve Adjustment Method

The idle-up curves should be programmed so that the engine maintains constant RPM even when the pitch is reduced during flight. The curves should be matched to loops, rolls, and other maneuvers, and are divided into idle-up curve 1 and idle-up curve 2.

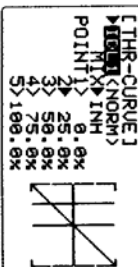


Inputting the Throttle Curve in Normal, Idle-up 1, and Idle-up 2

The Throttle Curve Normal function is on at startup.

To return to the Advance menu.

The Select keys are used to move around the THR-CURVE function.



The reverse item on the setting screen is the current setting item.

Curve Point Value
(Range: 0. - 100%)
Initial curve settings:
POSI = 0%
POSS = 25%
POSS = 50%
POSS = 75%
POSS = 100%

Input 5-point curve values
Enter the desired curve value
with the Dial.

If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

Idle-up 1 Curve Setting

Select the THR-CURVE IDL1 function with the Dial.

The curve setting procedure is the same as normal curve described above.

Idle-up 2 Curve Setting

Select the THR-CURVE IDL2 function with the Dial.

The curve setting procedure is the same as normal curve described above.

Idle-up 3 Curve Setting

Select the THR-CURVE IDL3 function with the Dial.

The curve setting procedure is the same as normal curve described above.

You can activate idle-up 1, 2, and 3 setups independently.

CAUTION

Before actually starting the engine, be sure that idle-up switches are off, and the throttle is set near engine idle.

PIT-CURVE — Pitch Curve (Normal, Idle-Up1, 2, & 3, Hold)

The pitch curve is defined by a 5-point curve so that you may set the best pitch motion relative to throttle stick movement. Each point on the curve can be adjusted over a 0% to 100% range.

The T9C system contains five pitch curves: normal (NORM), idle-up 1 (IDL1), idle-up 2 (IDL2), idle-up 3 (IDL3), and hold (HOLD). The basic normal pitch curve is the only one displayed in the Basic Menu, but all of the pitch curves can be viewed in the Advance menu. The Normal curve is exactly the same in both the Advance and Basic Menus.

Use the idle-up switch (switch G) to move between Normal, idle-up 1, and idle-up 2. Switching to the hold (HOLD) function is performed with switch E. Note that whenever the hold switch is turned on, it has priority regardless of the idle-up switch position.

Normal Curve Adjustment

The normal (NORM) pitch curve function produces the basic pitch curve for flight near hover. It is set up to provide up and down control at a constant engine speed along with the normal throttle curve.

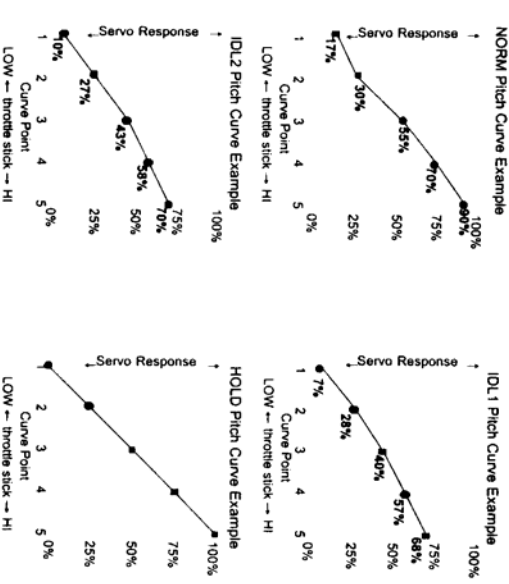
Idle-Up 1 & Idle-Up 2 Curve Adjustment

The HI-side pitch curve limits the maximum rotor pitch so that a large load is not applied to the engine. The LO-side pitch curve produces a curve with a minimum pitch of -4°. Idle-up 1 is used for 540° stall turns, looping, and rolling stall turns, while idle-up 2 is used for rolls.

Throttle-Hold Curve Adjustment

The throttle hold curve is used when performing autorotations, and should provide pitch from -4° to +12°. To get this pitch range, set the HI and LO rates to +100% and -100% respectively.

Examples of these four curves are shown below:



SETTING METHOD

The Pitch Curve Normal function is on at startup.

[PIT-CURVE]

[1/2/3] <NORM>

POINT 1

2

3

4

5

0. 0%

25. 0%

50. 0%

75. 0%

100. 0%

The reversed item on the setting screen is the current setting item.

Curve Point Value
(Range: 0 - +100%)
Initial curve settings:
POS1 = 0%
POS2 = 25%
POS3 = 50%
POS4 = 75%
POS5 = 100%

Input 5-point curve values
Enter the desired curve value with the Dial.



If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

Idle-Up 1/2/3, HOLD Pitch Curve Setting

Select the PIT-CURVE IDL1,2,3 or HOLD function with the Dial.

The curve setting procedure is the same as normal curve described above.

CAUTION

Before actually starting the engine, be sure that idle-up switches are off, and the throttle is set near engine idle.

To return to the Advance menu.
The Select keys are used to move around the PIT-CURVE function.



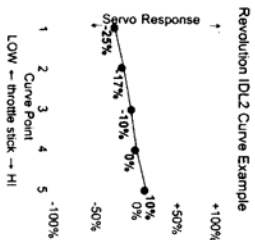
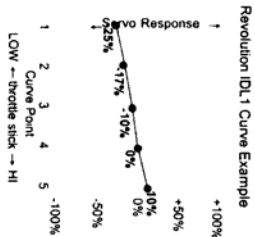
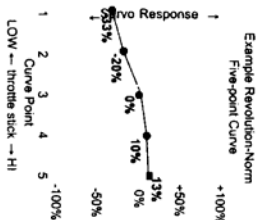
REVO.MIX — Revolution Mixing (Normal, Idle-Up 1/2, Idle-Up 3)

Revolution mixing is used to mix pitch→rudder to suppress the torque reaction generated by changes in the pitch and speed of the main rotor. The mixing ratio can be set by a five-point curve.

There are three kinds of revolution mixing: normal (NORM), idle-up 1/2 (IDL1/2), and idle-up 3 (IDL3). Only basic NORM revolution mixing is displayed in the Basic Menu, but all the revolution curves are visible in the Advance Menu. If you program the normal curve in the Basic Menu, the same curve is automatically reflected in the REVOLU NORM menu within the Advance Menu, and vice versa.

Revolution Mixing for Idle-Up 1/2

These two functions set the mixing rate so that the fuselage direction is straight ahead during high-speed flight. You can set either a curve or offset position to match the helicopter's tendencies. You may also program in reverse rudder mixing for 3D flight.



Inputting Revolution Five-Point Curves

The Revolution Normal function is on at startup. It can be turned ON/OFF with the Dial.

[REVO, MIX 1]
[REVOLU NORM] ON
POINT 1 2 3 4 5
0% 0% 0% 0% 0%

Curve Point Value
(Range: 0 - +100%)
Initial curve settings:
POSS1 = 0%
POSS2 = 25%
POSS3 = 50%
POSS4 = 75%
POSS5 = 100%

The reversed item on the setting screen is the current setting item.

Input 5-point curve values
Enter the desired curve value with the Dial.



- If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

Revolution Idle-Up 1/2 & Idle-Up 3 Curve Setting

You can activate idle-up 1/2 and idle-up 3 independently. The curve inputting procedure is the same as normal curve described above.

To return to the Advance menu.



The Select keys are used to move around the REVO.MIX function.

GYRO SENS — Gyro mixing

The gyro mixing function is used to adjust the gyro sensitivity from the transmitter.

Use this function by connecting the gyro sensitivity adjustment input connector to the channel 5 output of the receiver. Switch H or switch G (idle-up switch) can be selected, and each direction of the changeover switch can be adjusted.

Switch H: The UP and DOWN sides sensitivity can be adjusted.

Switch G: The NORM, IDL1, and IDL2 sensitivities can be adjusted.

Entering Gyro Sensitivity Values

1. Activate Gyro Mixing Function
Turn the Dial to activate the GYRO function.

[GYRO SENS] MODE ▶ STD
 MIX ▶ ON
 RATE-UP ▶ 50.8%
 DOWN ▶ 50.8%
 SM ▶ F

2. "UP" side setting
Enter your desired sensitivity value with the Dial.

3. "DOWN" side setting
Enter your desired sensitivity value with the Dial.

To return to the Advance menu.
The Select keys are used to move around the GYRO function.

Sensitivity amount (STD):
Range: 0 to 100%
(Initial value: 50%)

Sensitivity amount (GY):
Range: NORM 100 to 0 to AVC 100%
(Initial value: 0%)

4. Switch selection
Select the desired switch with the Dial.

HOV-THR — Hovering Throttle

The Hovering Throttle function may be used to trim the throttle near hover without affecting pitch. Its position can be memorized so that when the model memory is recalled, the original trim is repeated by rotating the knob to its center position.

When the hovering throttle knob is turned clockwise, the engine speed rises and when turned counterclockwise, the engine speed drops. Changes in rotor speed caused by temperature, humidity, or other conditions can be accommodated. When used with the hovering pitch function, more exact trimming is possible.

Working with Hovering Throttle

1. Activate Hovering Throttle Function
Turn the Dial to activate the HOV-THR function ("ON" or "OFF" will be displayed, depending on the IDL-UP switch's position).

[HOV-THR]
 MIX ▶ ON
 RATE ▶ 0%
 UR ▶ +URC

2. Trim memory setting
Press the Dial for one second to enter the current knob location. When the hovering throttle knob is returned to the center, the trim returns to its position before memorization. Note that when memorization is repeated with the knob offset from center, the trim value accumulates.

• If you wish to reset to the initial value, make the trim position 0% with the knob and memorize the trim, then return the knob to its center position.

To return to the Advance menu.
The Select keys are used to move around the HOV-THR function.

HOV-PIT — Hovering Pitch

The Hovering Pitch function may be used to trim the rotor pitch near hover without affecting throttle. Its position can be memorized so that when the model memory is recalled, the original trim is repeated by rotating the knob to its center position.

When the hovering pitch knob is turned clockwise, the rotor pitch increases, and when turned counterclockwise, the rotor pitch decreases. Changes in rotor speed caused by temperature, humidity, or other conditions can be accommodated. When used with the hovering throttle function, more exact trimming is possible.

Using the Hovering Pitch Function

1. Activate Hovering Pitch Function
Press the Dial to activate the HOV-PI function ("ON" or "OFF" will be displayed, depending on the IDL-UP switch's position).

[HOV-PIT]
 MIX ▶ ON
 RATE ▶ 0%
 UR ▶ +URR

2. Trim memory setting
Press the Dial for one second to enter the current knob location. When the hovering pitch knob is returned to the center, the trim returns to its position before memorization. Note that when memorization is repeated with the knob offset from center, the trim value accumulates.

• If you wish to reset to the initial value, make the trim position 0% with the knob and memorize the trim, then return the knob to its center position.

To return to the Advance menu.
The Select keys are used to move around the GYRO function.

THR-HOLD — Throttle Hold

The Throttle Hold function holds the engine throttle in the idling position and disengages it from the throttle stick, whenever switch E is activated. It is commonly used during autorotation. You can set the throttle position to be held over a -50 to +50% range centered about the throttle idle position. The throttle hold function also includes a rudder offset option.

Rudder offset at throttle hold

The rudder offset function contained in throttle hold is used to offset the tail rotor pitch neutral position during autorotation. It is set to keep the fuselage from rotating only when the throttle hold function is active.

You may also input a time delay for the offset to be implemented (to prevent sudden trim changes) in the DELAY menu within Advance menu (page 92).

Setting up Throttle Hold

1. Turn the THR-HOLD function ON by turning the Dial ("ON" or "OFF" displayed depending on SW-E position). The hovering pitch curve function is also activated.

[THR-HOLD]
 MIX INH
 POS 1
 OFFSET 0%

To return to the Advance menu.
 The Select keys are used to move around the GYRO function.
2. Enter Hold position
 Adjust the position with the Dial.
 - Press the Dial for one second to return to 0%.

Hook up the throttle linkage so that the carburetor is opened fully at high throttle, then use the digital trim to adjust the engine idle position. To have THR-HOLD maintain idle, move the throttle stick to the idle position, then cycle the hold switch on and off and keep changing the offset value until the servo does not move. When you want THR-HOLD to lower the engine idle speed, or you want to stop, input a more negative number.
3. Rudder offset function
 First activate by pressing the Dial ("ON" or "OFF" displayed).
 Rudder offset rate
 (Range: -100 - +100%)
 (Initial value: 0%)
4. Offset rate setting
 Enter the desired rudder offset amount with the Dial.

CAUTION

The throttle hold function has priority over the idle-up function. Be sure that the idle-up and throttle hold switch are off before trying to start the engine.

OFFSET — Trim Offset

The Offset is used to offset (change the neutral position) of the aileron, elevator, and rudder when switch G is used to switch to idle-up 1 (or 2). This function may be used to automatically change the trim of a helicopter flying at high speed. A clockwise-rotation rotor helicopter tends to drift to the right at high speed, so an aileron offset may be applied to offset the helicopter to the left. You can use the DELAY function to make a smooth transition between the differing neutral settings.

The necessary elevator offset varies with model geometry, so it must be determined by noting pitch changes at high speed. The rudder offset is affected by both revolution mixing (page ??), and trim (overall level movement) with the offset function. When the offset function is ON, also the electronic trim levers will operate, so the trim amount in these flight modes is automatically input to each offset amount.

The activating switches are initially set so that offset 1 and offset 2 are on at the same time as the idle-up 1 and idle-up 2 functions, switched by Switch G. If desired, the offset function ON/OFF operation can be changed to switch C.

Setting up Offset function

1. Turn the Offset function ON or OFF by turning the Dial ("ON" or "OFF" displayed depending on switch position).

[OFFSET]
 MIX INH
 NOB 1 <->
 RATE-RLT
 ELE 50%
 RUD 0%
 SWP E

To return to the Advance menu.
 The Select keys are used to move around the Offset function.
2. Aileron offset:
 Input the desired Aileron offset with the Dial.
 - If you're unhappy with what you've set, you may reset to zero by pressing the Dial for one second.
3. Elevator offset:
 Input the desired Elevator offset with the Dial.
4. Rudder offset:
 Input the desired Rudder offset with the Dial.
5. Switch selection:
 Select the desired switch with the Dial.

Offset rate
 Range: -120% to +120%
 (Initial setting = 0%)

DELAY — Delay Function

The Delay function provides a smooth transition between the trim positions whenever offset, revolution mixing, or throttle hold functions are turned on and off. You may set different delay times for aileron, elevator, and rudder. With a 50% delay setting, the servo takes about a half-second to move to its new position, quite a long time. Normally a 10-15% delay is used.

Setting Delays

The Delay function is automatically activated when either Offset, Revolution mixing, or Throttle hold are activated.

DELAY 1
(ON)

RATE-AIL 50%
ELEV 50%
RUDD 50%

Delay amount
Range: 0 - 100%
(Initial value: 0%)

To return to the Advance menu.

The Select keys are used to move around the Delay function.

1. Aileron delay
Input the desired Aileron delay with the Dial:

2. Elevator delay
Input the desired Elevator delay with the Dial:

3. Rudder delay
Input the desired Rudder delay with the Dial:

* If you're unhappy with what you've set, you may reset to zero by pressing the Dial for one second.

GOVERNOR— Governor mixing

The Governor mixing function is used to adjust the GV-1 (Governor) speed settings (rS1, rS2, rS3) from the transmitter. Whether speed switching and governor ON/OFF are switched using one switch or ON/OFF switching is performed using an independent switch can also be selected. When speed setting control uses CH7 and an ON/OFF switch is used, CH8 can also be used.

When speed and ON/OFF are switched using one switch

(Setting example)

Governor Speed	Switch Position (Switch C or G)	Rate (%)	Adjustment from Transmitter
rS1: OFF	UP or NORM	0	Use up to 0% (Governor speed display: "off")
rS2: 1400	CNTR or IDL1	50	Speed adjusted by raising and lowering "50%" rate.
rS3: 1700	DOWN or IDL2	100	Speed adjusted by lowering "100%" rate.

* For instance, rS3 is adjusted by setting the maximum speed used and lowering it from the transmitter.

* For the time being, use the initial rate setting above.

* Since speed adjustment from the transmitter is rate setting, for the actual speed, checking the governor side display and remembering its relationship with the actual speed is convenient.

When governor ON/OFF is controlled using switch B

When governor ON/OFF uses an independent switch, the speed can be adjusted and switched using each position (3 points) of switch C or G.

Caution:

The relationship of the governor speed setting rS1~rS3 and the switch positions conforms to the table above. Since the governor mixing function may not be used or the direction may be different, if this mixing was turned ON, first check the direction.

At throttle hold, always check that the governor is OFF. Conversely, when the speed value rises, reverse it as described in "Throttle hold OFF direction selection".

Setting the Governor Mixing Function

1. **Activate Governor Mixing Function**
Turn the Dial to activate the GOVERNOR function.

[GOVERNOR 1] <1/2>
(INH) **UP** **DOWN** **58.8%** **100.8%**
C.NTR: 58.8%
D.NTR: 100.8%
S.M.C

Speed setting
Range: 0 to 100%
(Initial value:
UP=0%
C.NTR=50%
DOWN=100%)

To return to the Advance menu.
The Select keys are used to move around the GOVERNOR function.

[GOVERNOR 1] <2/2>
MIX: **END**
CUT: CH7
DIR: Limit

2. **Switch Selection**
Choose the desired mixer switch with the Dial.

3. **ON/OFF Channel Selection**
Select the output channel with the Dial.

CH7: CH7 controls the speed and ON/OFF.
CH8: CH8 independently controls ON/OFF.

4. **"UP" Side Rate Setting:**
Enter your desired speed value with the Dial.

5. **"C.NTR":**
Enter your desired speed value with the Dial.

6. **"DOWN":**
Enter your desired speed value with the Dial.

Switch C: UP, C.NTR, DOWN
Switch G: NORM, IDL1, IDL2

7. **Selection of OFF Direction at Throttle Hold**
Operate the Dial in the direction that turns the Governor off at throttle hold operation.

THR→NEEDL — Throttle→Needle Mixing

The Throttle→Needle mixing function is used to control the engine's mixture using a 5-point curve relative to throttle stick movement. The engine must be equipped with a mixture control system, such as needle control or some other mixture adjustment, and the needle servo must be plugged into CH8. The CH8 knob may be used for High-side mixture adjustment when the idle-up (IDLE) function is ON.

You can have independent control of throttle→needle mixing in both the Normal (NORM) and idle-up (IDLE) conditions. The TH→NDL function includes an 'acceleration' function that precedes rapid throttle opening and provides the engine with the best mixture.

Setting Throttle→Needle Mixing

1. **Turn the THR-NEEDL function ON** by turning the Dial. ("ON" displayed)

[THR-NEEDL]
>NORM (NORM) >
MIX: **END**
POINT: 1 2 3 4 5
1 58.8% 2 58.8% 3 58.8% 4 58.8% 5 100.8%
Initial values:
POST = 0%
POSS = 25%
POSS = 50%
POSS = 75%
POSS = 100%

The reversed item on the setting screen is the current setting item.

Curve Point Value
(Range: 0 ~ +100%)

To return to the Advance menu.
The Select keys are used to move around the THR-NEEDL function.

2. **Input 5-point curve values**
Enter the desired curve value with the Dial.

If you're unhappy with what you've set, you may return to the default value by pressing the Dial for one second.

Handling the CAMPac

The setting data for 8 models can be saved in the T9C transmitter itself and the setting data for 6 more models can be saved in the DP-16K CAMPac (Option) removable memory module.

CAMPac initialization

To use the CAMPac with the T9C, the CAMPac must be initialized when the power is turned on for the first time. After the message "[EXT-MEM] INITIALIZE ?" appears on the screen when the power is turned on, press the "MODE" key. This automatically initializes the storage area for 6 models. Further operation is unnecessary.



DP-16K CAMPac (Option)

When using the DP-16K CAMPac, remove the transmitter dust cap and insert the data pack as far as it will go.

Always turn off the transmitter power before inserting or removing the data pack.

Back-up unnecessary

The setting data (transmitter body and CAMPac) are memorized in memory elements that do not require a back-up battery. Therefore, the data can be used while ignoring the back-up battery life. Of course, the setting data is not destroyed even when the transmitter battery is replaced.

9CP / 9CAP / 9CHP

PCM/FM SYSTEM, 9CHANNELS



Futaba®