

SAMPLE AIRPLANE SETUP INSTRUCTIONS

The following example shows how the PCM 1024Z may be programmed for a pattern airplane. 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. Model Selection

Use the Model Select function MSL to select a vacant model memory (or one you don't mind erasing) and choose the AIRPLANE Setup using the Type TYP function from Model menu.

2. Name The New Model

Rename the model using the Model Name MNA function in the model menu. Switch to the Condition menu CND and name the default flight condition (we recommend NORM L). Later you may add other flight conditions, which may also be named to make them easier to identify.

3. Activate Special Mixing

Activate Flaperon FPN or Aileron Differential ADF if you desire these functions (you may only choose one; both require two aileron servos). FPN is suggested since it can accommodate differential through end point adjustments, and has Flap mixing. The Flap mixing is used to have the ailerons behave as flaps as well, which can be used to make tighter loops and squarer corners in maneuvers. Use ALV to get elevators that act as ailerons (two servos are required for ALV function). You need not adjust the throws and mixing ratios at this time.

4. Reset Control Order

If necessary, reset the Control Order using the Function Control FNC in the model menu. Here you may choose what sticks and sliders control the different functions. If you use the ALV function, move the retract operation to another switch, perhaps CH7 or CH8.

5. Connect Servos

Plug Servos into Correct Channel Numbers

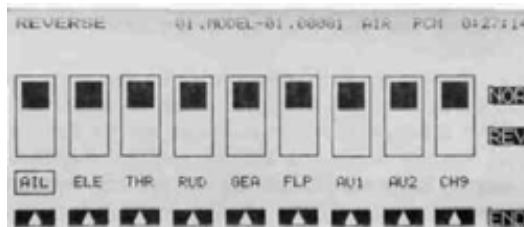
1. AIL Aileron (Ail 1 if FPN or ADF on)
2. ELE Elevator
3. THR Throttle
4. RUD Rudder
5. GEA Landing Gear (Elev 2 if ALV on)
6. FLP Flap (Ail 2 if FPN activated)
7. AU1 Spoiler (Ail 2 if ADF is used)
8. AU2 Collective Pitch
9. CH9 Channel 9

6. Set Neutral Points

Use the Subtrim function STM to move each servo to its neutral position. If the amount of subtrim is large, you should reset the subtrim to zero and move the splined servo arm to a position that is as close to the desired neutral as possible. Then use the subtrim to get the neutral position "right on." Repeat with the remaining channels.

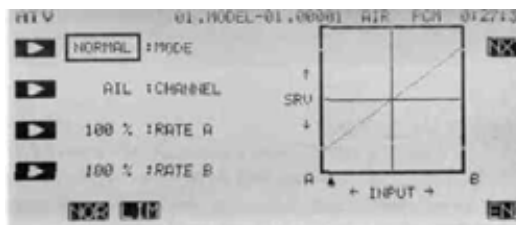
7. Adjust Servo Throws

Check the proper direction of throw for each servo. Use Reversing Function REV in the Model menu to set proper throw directions for each servo. Double check that each servo moves the proper direction.



8. Limit Servo Throws

Now use the ATV function to limit servo throws. The travel of the ailerons should be limited to roughly 10—12° maximum in both directions with the ATV function. Repeat for elevator. Adjust rudder lateral motion to about $\pm 45^\circ$. Be sure that no servo "bottoms out" at maximum control throw. After setting maximum throws, ATV is rarely used. Instead use AFR in the different flight modes.

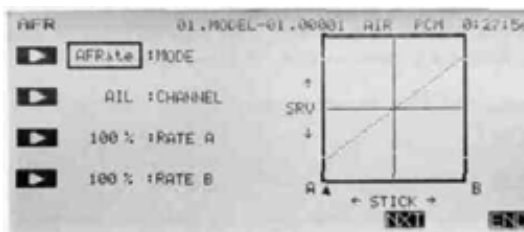


9. Changing The Control Feel

If you would like to soften the control feel for ailerons, use the AFR menu. Press the NXT key, then the EX1 key to get exponential curve. Set a rate of -15% to -25%. EX2 is used for throttle only.

Change to Elevator using the Channel key. Use the AFR to get slightly more up than down travel, and use EX1 with a -10% setting.

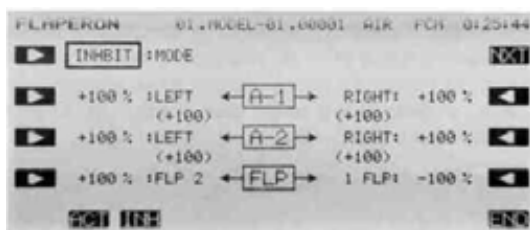
Change to Rudder with the Channel key, and set EX1 for -10%.



10. Set Flaperon Throws

Now go back to the FPN (Flaperon) menu. Set differential by limiting the down aileron throws on both sides. The down throw should be set between 70% and 95% of the up throw. This setting depends on the individual model and its particular flight characteristics, so make changes after flight testing. Be sure that the flap mixing settings are the same (default is $\pm 100\%$).

Move to the E->F menu to set up how much the ailerons move due to elevator. Approximately 10-30% up and down mixing should be used (be sure that up elevator causes the ailerons to drop, and down elevator raises the ailerons up). The amount of aileron droop at neutral elevator may be set with the A knob. You may adjust this travel by adjusting the trim rate — it can be set to zero to prevent accidental changes (be sure this knob is zeroed before resetting subtrims). Using the SWT button, you can also define a switch to turn the elevator-flaperon mixing on and off.



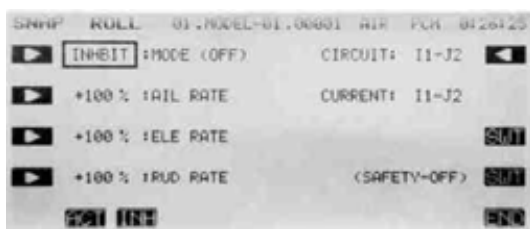
11. Setting Up Airbrakes

To make landings easier, you may set a switch to move both the elevators and flaps to a preset position for an airbrake effect. Normally, the ailerons are raised 5—10° and the elevator is offset to cancel any trim change.

Call the Airbrake ABK function from the condition menu. Select the Manual mode by pressing the MAN key. Auto is available.

This system should normally be used in manual mode. To select the operating switch, press the SWT key. The display shows that the default airbrake control switch is the C switch, ON in the lower position. You may choose another switch or direction at this time. Verify proper operation of the switch by activating it and watching the servos move.

Press the PRE key to get back to the preceding key. If you have spoilers, they may be actuated also. Read the section on ABK for more details.

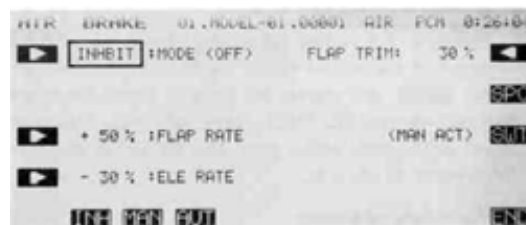


12. Snap Roll Setup

You may have any switch activate the Snap Roll function (the spring-loaded switch is strongly recommended!). Call the Snap Roll function SNP from the Condition menu. Activate it with the ACT key.

Set the deflection for each switch position: ailerons $\pm 100-110\%$, elevator $\pm 80-100\%$, rudder $\pm 70-80\%$. Be sure to choose the correct directions with the

For safety, you may also turn on the safety switch using the O button. This safety inhibits the activation of snap roll if the landing gear are down. Check to make sure the switch is set for the correct direction.



13. Setting Up Differential Elevator

Your PCM 1024Z system has a unique function called ALV for "Ailevators," or differential elevators. This function provides roll control whenever the propeller slipstream is acting on the tail, and is effective at low airspeeds.

Press the ALV key to enter the menu. Activate with the ACT key, then adjust the rates given by the A-3 and A-4 settings. We recommend starting out with small deflections at first. Be sure that the settings for ELE are 100% to get full elevator authority.

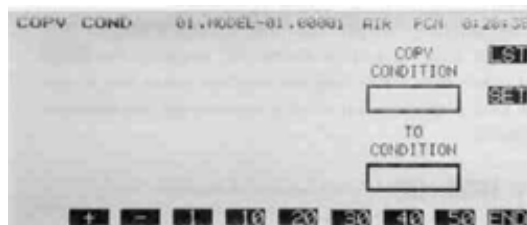
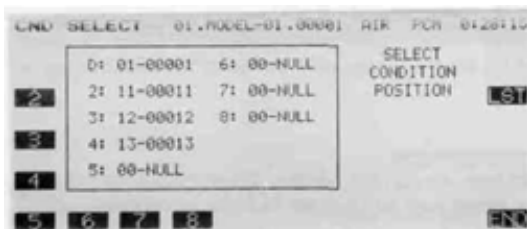
14. Flight Conditions Switching

If you like, you may set up the system to call up more than one function or switch to a new set of trims or control settings simultaneously by moving a single switch. You can have different subtrims, coupling, differential, exponentials, and throw volumes. In fact you may change EVERY parameter between flight modes.

We recommend that you fly the model and adjust trims and control responses to your liking before defining another flight condition. Any bad tendencies may be corrected with custom programmable mix settings PMX. Then, copy the set of adjustments to a new flight condition, where they may be modified for the new desired conditions. After copying you may add new functions as necessary.

Use the Condition Select CSL button in the Model Menu. This function allocates the necessary number of flight conditions to the model memory. Note the condition number next to the D (default) in the display. This is the set of conditions that will be copied into a new condition and modified. Also note the number after the next display. You will copy to this condition.

Use the Copy Condition CPC from the System menu. This function copies the contents of one condition into another. Choose the default flight condition number, press the SET button, then choose the second condition number in the lower box "TO CONDITION." Give the command to copy.



The switch that calls the flight conditions should be selected. Return to the Condition Select CSL function, press the desired flight condition number, and use the SWT button to choose the desired switch location. Once you have selected a condition, use the CNA (Condition NAME) button to label the new condition (you may have to flip the chosen switch to the correct position to get the desired condition). Now, you may go through the Condition menu items to get the desired settings in the new mode. Read the condition name after the model name to be sure you are changing the condition you want.

15. Volume Setting

Some functions can have their mixing ratio vary with the motion of another slider or knob: use the VOL key O to get to this choice (for example, see ADF). Move the selected control to determine how it affects the mix. You can also add a time delay on many of the menus: look for a DELAY setting.

16. Programmable Mixers

Up to five mixers are available in all flight conditions. These may be used to enhance flight capabilities or to correct bad tendencies by adjusting mixing from one control to another. For example, you may use Elevator->Flap coupling to tighten up the corners on square loops, Throttle->Rudder coupling to correct for torque tendencies, etc. There is no limit to the number of corrections that can be made.

Your PCM 1024Z system is filled with powerful, predefined mixing functions. Be sure to browse through the various function menus in the Aircraft section following this example.


AILERON DIFFERENTIAL (ADF)

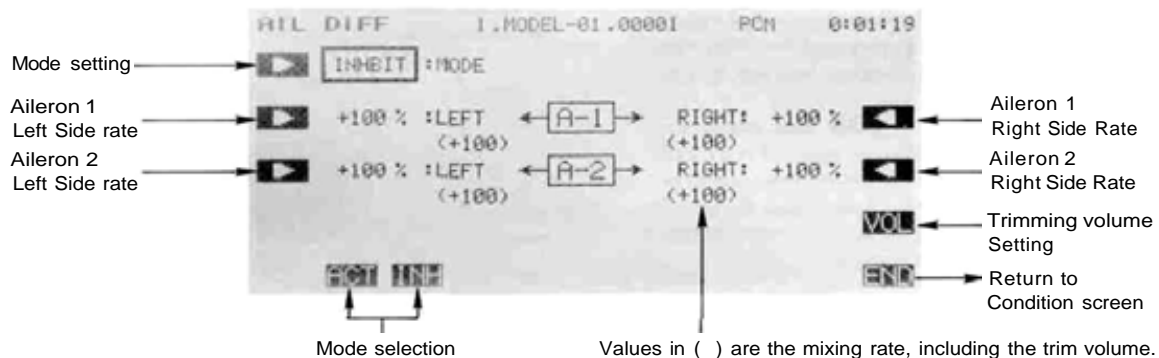
This function uses two separate aileron servos to independently correct yaw tendencies during rolls. It is possible to adjust each aileron's positive and negative deflection angles. When this function is activated, receiver outputs CH1 and CH7 are used for the two aileron channels. This function may not be used if Flaperon (FPN) is chosen. If desired, the amount of down aileron deflection may be trimmed in flight with a knob or trimmer.



Setting Up Aileron Differential

Activation of command

In the Condition Menu, press the ADF key to get the AIL DIFF menu shown below. Use the A () key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the aileron differential function.



Aileron 1 Travel Setting

You now set the amount of servo throw for Aileron 1. Press the B key to activate travel setting for the Left direction and set the throw with the numeric keys. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from -120 to +120%, the initial value is +100%.

Now set the travel for the Right throw on Aileron 1. Press the Q key to activate travel setting for the Right direction and set the throw with the numeric keys as before.

Aileron 2 Travel Setting

The setting process given above is repeated for Aileron 2. Press the C key to activate travel setting for the Left direction and set the throw with the numeric keys.

Finally, set the travel for the Right throw on Aileron 2. Press the P key to activate travel setting for the Right direction and set the throw with the numeric keys as before.

Trim volume setting

You may set up the Aileron Differential function so that its effect may be changed in flight by moving a trim control. The trim control adjusts the volume within $\pm 25\%$ of the set differential rate. This option is not activated at initial setup.

Call the volume setting screen by pressing the VOL O key, and select the desired control using the screen menus (for a description of the volume setting method, see page 37).

Use the END (N) key to leave this menu.

RUDDER COUPLING (A->R)

This function is used to mix rudder operation with aileron operation automatically, to make realistic, coordinated turns. It is especially effective when turning and banking scale models or large models that resemble full-sized aircraft. This mixing keeps the fuselage aligned into the wind and helps to make what is called "coordinated turns."

The function allows you to set up the left and right mixing rates independently. Furthermore, mixing can be turned on and off during flight by setting a switch, or it may be set to stay on all the

time if the function is activated (ACT) without setting an ON/OFF switch. Also, it is possible to adjust the amount of rudder coupling in-flight, by setting a volume control.



Setting Up Rudder Coupling

Activation of command

In the Condition Menu, press the A->R key to get the AIL TO RUD menu, as shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit rudder coupling.

Mode setting →

Mixing i — Left side →

rate →

setting l — Right side →

Mode Selection →

Values in () are the mixing rate, including the trim volume.

ON/OFF switch setting →

Trimming volume setting →

Return to Conditionscreen →

Setting the Mixing Ratio — Left and Right

You now set the amount of mixing for left aileron command. Press the C key to activate mixing ratio for the Left direction and set the value with the numeric keys F to M . The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from -100 to +100%. the initial value is +50%.

Now set the amount of mixing for the Right aileron command. Press the D key to activate mixing ratio for the Right direction and set the throw with the numeric keys as before.

On/Off Switch Setting

On initial setting, an activation switch for rudder coupling is not set. meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

Trim Volume setting

You may set up the Rudder coupling function so that its effect may be changed in flight by moving a trim control. The trim control adjusts the volume within $\pm 25\%$ of the set mixing rate. This option is not activated at initial setup.

Call the volume setting screen by pressing the VOL O key, and select the desired control using the screen menus (for a description of the volume setting method, see page 37).

Use the **END (N)** key to leave this menu.

V-TAIL (VTL)

This function automatically sets up the PCM 1024Z to control a V-tail airplane with combined elevator and rudder functions. It requires two servos, one hooked up to receiver output CH2

(elevator 2/rudder) and the second plugged into CH4 (elevator 2/rudder 1). The elevator and rudder deflection can be adjusted independently.

Setting Up V-Tail Mixing

Activation of command

In the Condition Menu, press the VTL key to get the V-TAIL Mixing menu shown below. Use the A key to activate mode setting, then press the *ACT* or *INH* keys (F and G) to activate or inhibit V-Tail Mixing.



Setting the Elevator Rates - 1 and 2

You now set the rate for Elevator 1. Press the B key to activate rate setting for Elevator 1 and set the rate with the numeric keys E to M . The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the elevator stick to the other side and continue. Your setting may vary from —100 to +100%, the initial value is +50%.

Now set the rate for Elevator 2. Press the Q key to activate Elevator 2 rate setting and set the rate with the numeric keys as before.

Setting the Rudder Rates - 1 and 2

You now set the rate for Rudder 1. Press the C key to activate rate setting for Rudder 1 and set the rate with the numeric keys E to M as before.

If you are not sure what you are changing, hold the rudder stick to one side and press different keys — if there is no effect, move the rudder stick to the other side and continue. The initial value is +50%, but your setting may vary from -100 to +100%.

Now set the rate for Rudder 2. Press the P key to activate Rudder 2 rate setting and set the rate with the numeric keys as before.

Checking Your Work

After you have set up the V-Tail rates, be sure that they move the correct directions. For up elevator command, both V-tails should move upward. For right rudder command, the trailing edge of both surfaces should move to the right. If they do not, use the +/- to reverse the direction as needed.

Use the **END** (N) key to leave this menu.

RUDDER—AILERON (R->A)

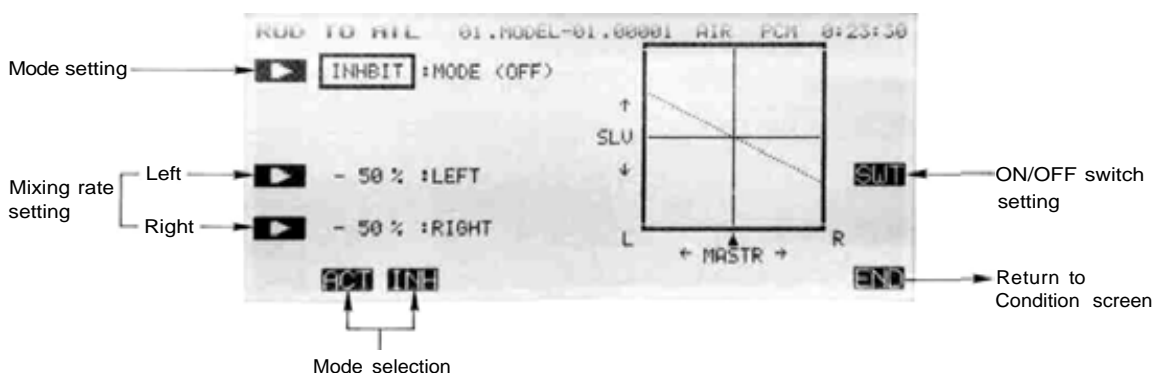
Rudder to aileron coupling may be used for correcting unwanted tendencies with aerobatic planes. For example, this mixing can be used to cancel out any rolling that occurs during knife edge flight. The rates for left and right rudder travel can be set independently. Mixing can be set to be turned on and off during flight by setting a switch (if no ON/OFF switch is set, mixing remains on all the time).



Setting Up Rudder-Aileron Mixing

Activation of command

In the Condition Menu, press the A->R key to get the RUD TO AIL mixing menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit rudder-to-aileron coupling.



Setting the Mixing Ratio - Left and Right

You now set the amount of mixing for Left rudder command. Press the C key to activate mixing ratio for the Left direction and set the value with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the rudder stick to the other side and continue. Your setting may vary from -100 to +100%, the initial value is -50%.

Now set the amount of mixing for the Right rudder command. Press the D key to activate mixing ratio for the Right direction and set the throw with the numeric keys as before.

On/Off Switch Setting

On initial setting, an activation switch for rudder to aileron coupling is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

Use the END (N) key to leave this menu.

ELEVONS (EVN)

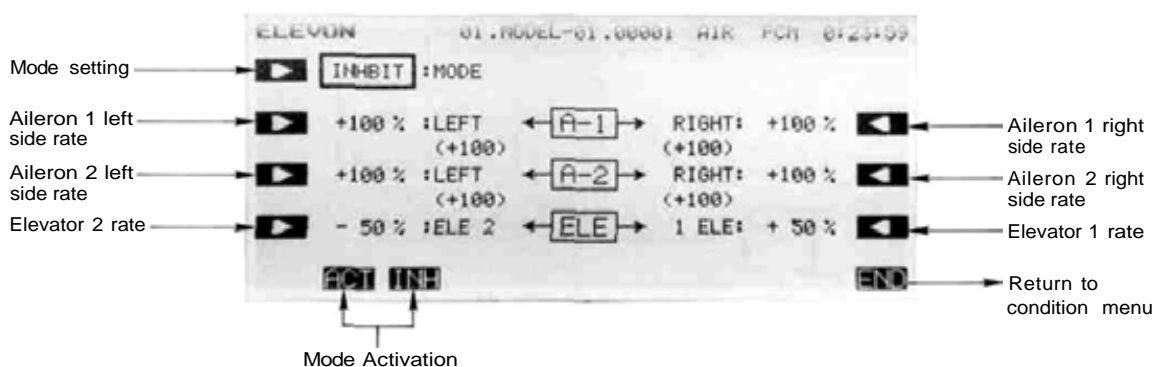
This function may be used to set up the controls for delta wings, flying wings, and other tailless aircraft which need combined aileron and elevator functions. Receiver CH1 and CH2 are made the operating channels for the two elevons, and differential operation is possible.

The elevator deflection angle and operating direction can be set for each servo. For convenience, the elevon deflection angles can be trimmed in flight when a volume-setting lever is activated (this setting is performed by the aileron differential ADF function on page 125).

Setting Up Elevon Mixing

Activation of command

In the Condition Menu, press the EVN key to get the ELEVON Mixing menu as shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit Elevon Mixing.



Setting the Aileron 1 Rates

You now set the left-side rate for Aileron 1. Press the B key to activate left rate setting for Aileron 1 and set the rate with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from —120 to +120%, the initial value is +100%.

Now set the right-side rate for Aileron 1. Press the Q key to activate Aileron 1 right rate setting and set the rate with the numeric keys as before.

Setting the Aileron 2 Rates

This procedure is repeated for Aileron 2. Press the C key to activate left rate setting for Aileron 2 and set the rate with the numeric keys E to M as before.

Now set the right-side rate for Aileron 2. Press the P key to activate Aileron 2 right rate setting and set the rate as before.

Setting the Elevator Rates — 1 and 2

You now set the rate for Elevator 2. Press the D key to activate rate setting for Elevator 2 and set the rate with the numeric keys E to M.

Now set the rate for Elevator 1. Press the O key to activate Elevator 1 rate setting and set its rate with the numeric keys.

Checking Your Work

After you have set up the Elevon rates, be sure that they move the correct directions. For up elevator command, both elevons should move upward. For right aileron command, the trailing edge of the right-hand surface should move up, and the trailing edge of the left-hand surface should move down. If they do not, use the +/- to reverse the direction as needed.

Use the END (N) key to leave this menu.

ELEVATOR-FLAP (E-F)

This mixing is used to droop the flaps whenever an up elevator command is given (and may be set up for down elevator as well, helpful during 'outside' maneuvers). It helps to eliminate 'bucking,' and makes tight, square corners in maneuvers for acrobatic aircraft.

Elevator-to-flap mixing can be set up to be turned on and off during flight by a switch (if no switch is activated, this mixing remains on all the time). You can also set the flap trim rate in this

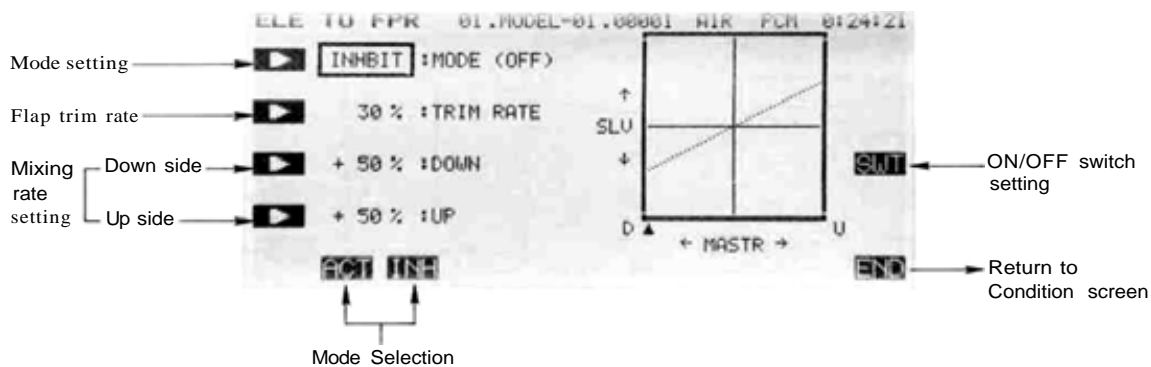
function. If the flaperon function is activated, the elevators are mixed with the ailerons, otherwise, the mixing is with the flaps only.



Setting Up Elevator-to-Flap Mixing

Activation of command

In the Condition Menu, press the E->F key to get the ELE TO FPR menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit Elevator-to-Flap.



Setting the Mixing Ratio — Down and Up Side

You now set the amount of mixing for down elevator command. Press the C key to activate mixing ratio for the Down direction and set the value with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction. Your setting may vary from -100 to +100%, the initial value is set to +50%.

Now set the amount of mixing for the up elevator command. Press the D key to activate mixing ratio for the Up direction and set the throw with the numeric keys as before.

Flap Trim Rate Setting

You may choose any value for the Flap Trim Rate. Knob (A) is used to trim the position of the flap servo, and the trim value controls the authority of the knob. The authority may be set anywhere from 0% to 100%, and the initial setting is 30%.

Call the flap trim setting screen by pressing the TRIM RATE B key, and select the desired trim rate using the screen menus. You may want a small number for this rate, so that an accidental movement of the knob doesn't give a large flap deflection.

On/Off Switch Setting

On initial setting, the activation switch for Elevator-to-Flap mixing is set as SW (C) on at the upper position. If you would like to change the switch or turn mixing on all the time, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

Use the END (N) key to leave this menu.

FLAP-ELEVATOR Mix (F-E)

This function is used to compensate for trim changes when flaps are deployed for show flight or landing by mixing in a small movement of elevator. The elevator should be adjusted to move only a small deflection amount: too much elevator can make the model difficult to control.

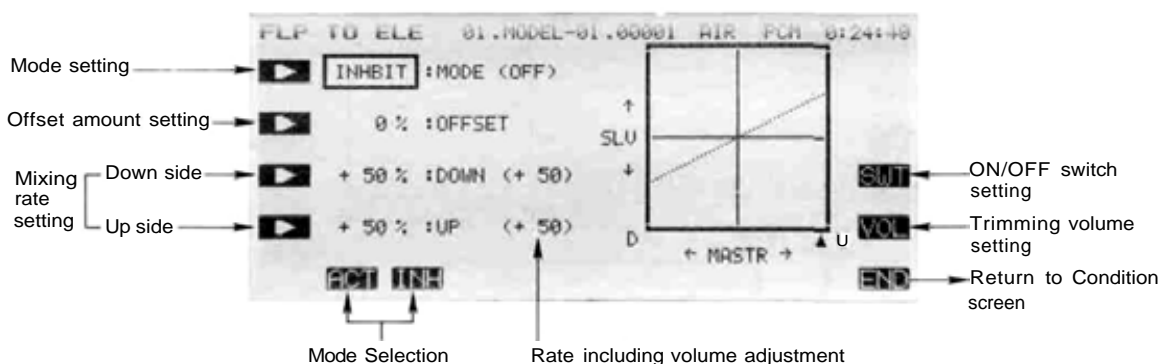
The amount of correction can be adjusted separately for both positive and negative flap inputs, and the neutral mixing position can be offset from the flap neutral position. Flap-to-elevator mixing can be turned on and off during flight by setting a switch, but if an ON/OFF switch is not set, it remains on all the time. The amount of mixing can be changed by setting a volume control.



Setting Up Flap-to-Elevator Mixing

Activation of command

In the Condition Menu, press the F-E key to get the FLP TO ELE menu shown below.



Use the A () key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit flap-to-elevator coupling.

Offset Position Setting

Use the B key to activate offset setting mode. Then set the flap control to the offset position, and press the SET key F to store the desired position in memory.

Setting the Mixing Ratio — Down and Up Side

You now set the amount of mixing for down flap command. Press the C key to activate mixing ratio for the down direction and set the value with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction. Your setting may vary from -100 to +100%, the initial value is set to +50%.

Now set the amount of mixing for the up elevator command. Press the D key to activate mixing ratio for the Up direction and set the throw with the numeric keys as before.

On/Off Switch Setting

Initially an activation switch for is not set, meaning that once activated, this function is on all the time. If you would like to set a switch to turn it on and off, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37.

Trim volume setting

You may set up the Flap-to-Elevator mixing so that its effect may be changed in flight by moving a trim control. The trim control allows you to adjust the volume within $\pm 25\%$ of the set mixing rate, which can be handy for getting the best value while flying the model. This option is not activated at initial setup.

Call the volume setting screen by pressing the VOL O key, and select the desired control using the screen menus (for a description of the volume setting method, see page 37).

Use the END N key to leave this menu.

COLLECTIVE PITCH FUNCTION (CPT)

Airplane Section

(DIVING AIR BRAKE, HIGH PITCH TRIM)

This function allows diving airbrake ("minus pitch") adjustment at low throttle and high pitch adjustment at high throttle for consistent model speed during vertical aerobatics. This mixing can be turned on and off during flight with a switch.

Air brake, engine idle-up trim, and the high-side pitch control trim can be set independently. The

mixing switching point (minus pitch/high pitch switching point) can be set at a selected throttle stick position, and each trim rate can be adjusted. The throttle delay when switching from minus pitch to high pitch and the pitch delay when switching from high pitch to minus pitch can also be adjusted independently.

Setting Up Collective Pitch Function

Activation of command

In the Condition Menu, press the CPT key to get the COL PITCH menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function.



Switch Point Setting

Press the B key to enter the throttle position setting function. Then set the throttle stick to the desired switch point, and press the SET (F) key.

Idle-up Trim and Delay Setting

Press the C key to enter the Idle-Up Trim rate setting function, and set the rate with the numeric keys F to M. The range may be set from 0 to 100%, and the initial value is set to 0%.

Next, press the P key to enter the Throttle delay setting function, and set the delay with the numeric keys. The setting range is 0 to 100%, and the initial value is set to 0%.

Pitch Control Trim Rate and Delay Setting

Press the D key to enter the Pitch Trim Rate setting function. Set the desired rate with the numeric keys F to M. The range may be set from 0 to 100%, and the initial value is set to 50%.

Press the O key to activate the Pitch Delay setting menu, and set the delay with the numeric keys F to M. The range may be set from 0 to 100% (initial setting is 0%).

On/Off Switch Setting

On initial setting, the activation switch for the Collective Pitch function is set as SW (E) ON at the lower position. If you would like to change the switch or turn mixing on all the time, call the Switch Setting screen by pressing the SWT (R) key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

Idle-Up Trim/Pitch Control Trim Setting

You may set up the Collective Pitch function so that its effect may be changed in flight by moving a trim control. The trim control allows you to adjust the volume by moving a slider. At initial setting, the left-side lever is set for idle-up trim and the right-side lever is set for pitch control trim.

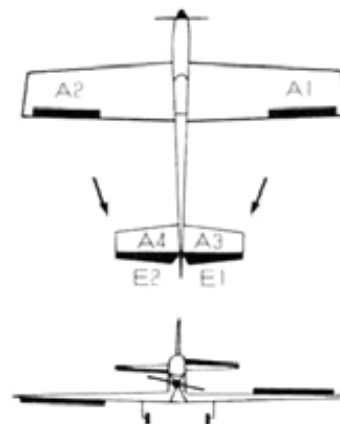
Call the volume setting screen by pressing the VOL O key, and select the desired control using the screen menus (for a description of the volume setting method, see page 37).

Use the END (N) key to leave this menu.

AILEVATORS/COMBINED AILERONS & ELEVATORS (ALV)

This function allows you to hook up the elevator surface on each side of the airplane independently, so that they operate together (elevator mode) and differentially (aileron mode). This function, sometimes called "ailevators" (ALV) will give aileron control even at low speeds, because the propeller wash is always passing over the tail surfaces and may be used for rolling commands.

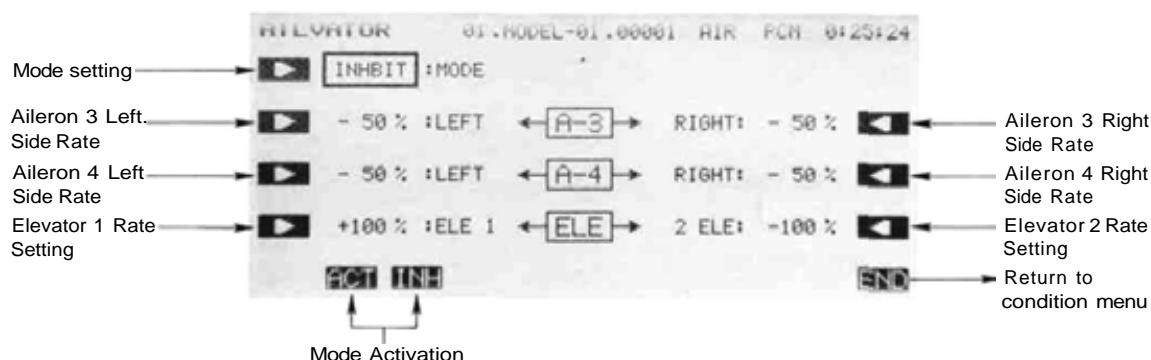
This function requires two elevator servos connected to receiver output channels 2 and 5. In this manual (see diagram), the rear control surfaces are referred to as Aileron 3 and Aileron 4. With this function, all control deflections — left and right ailerons, and elevator on both sides — can be adjusted. You may even add differential to the rear ailerons.



Setting Up Differential Elevators

Activation of command

In the Condition Menu, press the ALV key to get the AILEVATOR menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function.



Setting the Aileron 3 Rates

You now set the left-side travel for Aileron 3. Press the B key to activate left rate setting for Aileron 3 and set the rate with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

Your setting may vary from -100 to +100%, the initial value is -50%.

Now set the right-side rate for Aileron 3. Press the Q key to activate Aileron 3 right rate setting and set the rate with the numeric keys as before.

Setting the Aileron 4 Rates

This procedure is repeated for Aileron 4. Press the C key to activate left rate setting for Aileron 4 and set the rate with the numeric keys E to M as before. The max values and initial setting are the same as for Aileron 3.

Now set the right-side rate for Aileron 4. Press the 13 key to activate Aileron 4 right rate setting and set the rate as before.

Setting the Elevator Rates - 1 and 2

You now set the rate for Elevator 1. Press the D key to activate rate setting for Elevator 1 and set the rate with the numeric keys E to M. The initial rate is 100%, but you may vary your setting between -100 and +100%.

Now set the rate for Elevator 2. Press the O key to activate Elevator 2 rate setting and set its rate with the numeric keys. Settings have the same range as Elevator 1.

Checking Your Work

After you have set up the Ailevator rates, be sure that they move the correct directions. For up elevator command, both elevators should move upward. For right aileron command, the trailing edge of the right-hand surface should move up, and the trailing edge of the left-hand surface should move down. If they do not, use the +/- to reverse the direction as needed. Adjust the travels on either side to get the differential effect, if you wish.

Exiting

Use the END (N) key to leave this menu.

FLAPERONS (FPN)

This function allows you to program the ailerons to work in the same direction, giving a flap response as well as aileron control (see figure). For good square maneuvers, and landing, both ailerons can be raised and lowered simultaneously. While this function is on, regular aileron operation is always present.

The Flaperon function requires two separate channels: Receiver CH1 (aileron 1/flap 2) and CH6 (aileron 2/flap 1) are the operating channels. The Aileron 1 and Aileron 2 left and right deflection angles can be adjusted independently, making it easy to apply differential to the ailerons. With differential, the up side travel is set to around 5% larger than the down travel.

You may also adjust the Flap 1 and Flap 2 throws independently, and you can set the flap trim rate as large or small as you like. Also, the flap trim offset can be adjusted, allowing you to freely change the flap neutral angle.

Aileron operation



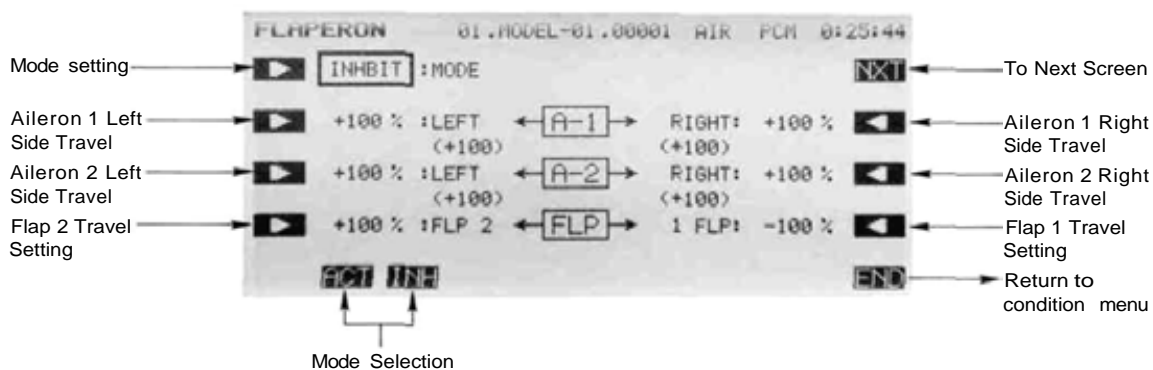
Flap operation



Setting Up Flaperons

Activation of command

In the Condition Menu, press the FLP key to get the FLAPERON menu as shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function.



Setting the Aileron 1 Travel

You now set the left-side travel for Aileron 1. Press the B key to activate left travel setting for Aileron 1 and set the travel with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from —120 to +120%, with an initial value of +100%.

Now set the right-side travel for Aileron 1. Press the Q key to activate Aileron 1 right travel setting and set the travel with the numeric keys as before.

Setting the Aileron 2 Travels

This procedure is repeated for Aileron 2. Press the C key to activate left travel setting for Aileron 2 and set the travel with the numeric keys E to M as before.

Now set the right-side travel for Aileron 2. Press the P key to activate Aileron 2 right travel setting and set the travel as before.

Setting the Flap Travels — 1 and 2

You now set the travel for Flap 2. Press the D key to activate travel setting for Flap 2 and set the travel with the numeric keys E to M. Your setting may vary from -100 to +100%, with an initial value of +100%.

Now set the travel for Flap 1. Press the O key to activate Flap 1 travel setting and set its travel with the numeric keys. Its initial value is -100%.

Flap Trim Authority Setting

In the Flaperon mode. Flap Trim moves both ailerons upwards or downwards together. To input the Flap Trim Authority, move to the next screen by pressing the NXT R key. Then press the D key and set the rate with the numeric keys F to M. You may choose any value from 0% to 100% for the Flap Trim Authority. The initial setting is 30%, but a smaller number is recommended.

Flap Trim Offset Setting

Flap trim offset sets the flap position from which motion occurs. To input the flap trim offset amount setting, press the B key, then set the flap trimmer to the position to be set and press the SET F key. The offset can be anywhere between \pm (trim authority setting).

Checking Your Work

After you have set up everything, be sure the controls move the correct directions. If they do not, use the +/- to reverse the direction as needed.

Use the END (N) key to leave this menu, or hit PRE to get to the previous menu.

AIRBRAKE (ABK)

Airbrake presets are used to set up preset deflections of the elevators, flaps, and (optionally) spoilers for landing precision or for constant speed during vertical flight maneuvers. Airbrake presets can be turned on and off during flight by ON/OFF switch, or you may define an AUTO mode where mixing is turned on and off automatically by throttle stick position.

The AUTO mode, if used, may be turned on and off with a switch. However, a command on

the air brake has priority and is followed regardless of the position of the AUTO mode ON/OFF switch.

Suggested settings for the Airbrake function are a flap deflection of +50%. The elevators will need to be set to about -20 to 23%. Of course, the elevators should be adjusted so that the model maintains level flight when the Airbrake function is operated.

Setting Up The Airbrake Presets

Activation of command

In the Condition Menu, press the ABK key to get the AIR BRAKE menu as shown below.



Use the A key to activate mode setting, and press the ACT F key to activate the function. Now you must decide on Manual or Auto operation. Select the manual mode by pressing the MAN (G) key. Select the auto mode by pressing the AUT H key.

Throttle Position Setting (Auto Mode Only)

For the Auto mode, you need to input the position at which the function will take effect. Press the B key, then move the throttle stick to the desired position, and press the SET (F) key to memorize the position.

Flap Preset Position Setting

To set the position that the flaps will move to, press the C key and use the rate setting keys E to M . This setting may vary from -100 to 100%, and is initially set to 50%.

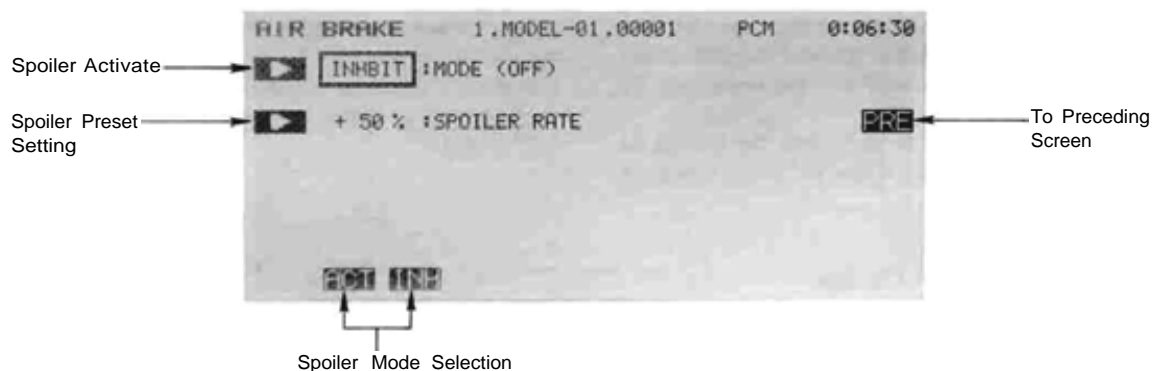
Elevator Preset Position Setting

To set the position that the elevators will move to, press the D key and use the rate setting keys E to M . This setting may vary from -100 to 100%, and is initially set to -30% by the system.

Flap Trim Authority Setting

Flap Trim moves both ailerons upwards or downwards together. To input the Flap Trim Authority, press the NXT R key. Then set the rate with the numeric keys E to M. You may choose any value from 0% to 100% for the Flap Trim Authority. The initial setting is 30%, but a smaller number is recommended. If you input a number here, it will override whatever value was input in the Flaperon menu.

Spoiler setting: Press the SPO Q key to get to the menu below.



Use the A () key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function. Press the B key and set the rate with the numeric keys E to M . The initial spoiler preset is 50%, but you may set it between -100 and +100%. Return to preceding screen by pressing the Q key.

Airbrake ON/OFF Switch Definition

SW (C) is turned ON at the lower position at initial setting. If you'd like another switch, call the switch setting menu by pressing the SWT P key. For a description of the switch setting method, see page 37. Caution: if the ON/OFF switch is disabled with NUL, the Airbrake function remains on all the time.

Auto ON/OFF Airbrake Switch Definition (AUTO mode only)

At first setting, the automatic airbrake control switch is defined as SW (E), ON at the lower position. To change this, call the switch setting menu by pressing the SWT O key. For a description of the switch setting method, see page 37.

Use the END N key to exit this menu.

SNAP ROLL (SIMP)

Your PCM 1024Z system may be programmed to perform snap rolls by flipping a switch. Four snap roll directions can be defined, and the preset positions of the aileron, elevator, and rudder servos can be set for each one.

You may activate a safety switch to ensure that snap rolls are not accidentally commanded while the landing gear is down, even if the snap roll switch is turned on accidentally.



Setting Up The Snap Roll Presets

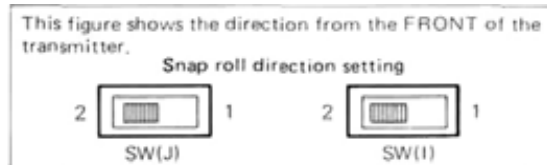
Activation of command

In the Condition Menu, press the **SNP** key to get the SNAP ROLL menu as shown below.

Snap Roll Directions



Direction Switches



(Note: These snap roll direction setting switches are only present on the T9ZAP systems, not on the T9ZHP)



Use the **A** key to activate mode setting, then press the **ACT** or **INH** keys (**F** and **G**) to activate or inhibit the function.

Inputting the Snap Roll Preset Control Positions

We'll start with the 1-2 direction (Right/Up) snap roll setting. Press the **R** key to get to the setting menu, then press the 1-2 **F** key.

To set the Aileron servo throw setting, press the **B** key. Use the numeric keys **E** to **M** to input the desired preset condition. The default is +100%, but you may use anything between -110 and +110%.

Now we'll set the Elevator servo preset. Press the **C** key, and set the preset with the numeric keys **E** to **M**. This also has a default of +100%, but you may use anything between -110 and +110%.

The last part of the setting is for the rudder position. Press the **D** key, and enter the rate that you want the rudder to move with the numeric keys **E** to **M**. This setting also has a default of +100%, and may be set anywhere between -110 and +110%.

This procedure should be repeated for the 1-1 direction (Right/Down) snap roll setting, 2-2 direction

(Left/Up) snap roll setting, and 2-1 direction (Left/Down) snap roll setting.

Snap Roll Switch ON/OFF Definition

SW (H) is defined to be the Snap Roll switch, and is turned ON at the forward position at initial setting. If you'd like another switch, call the switch setting menu by pressing the **SWT P** key. For a description of the switch setting method, see page 37. Caution: if you define a switch that doesn't have a spring return, the Snap Roll function will remain on all the time!

Snap Roll Safety switch setting

A safety switch should be used to prevent accidental operation of the snap roll function. To examine the snap roll safety switch settings, call up the switch setting screen by pressing the **SWT O** key. The function initially defines **SW (F)** for Mode I, (**G**) for Mode II to be the safety switch. You should set the ON direction of the safety switch to match the landing gear switch position when the landing gear is down. When this switch is ON, the snap roll function is inhibited.

Use the **END N** key to exit this menu.

THROTTLE CURVE ADJ. (TCV)

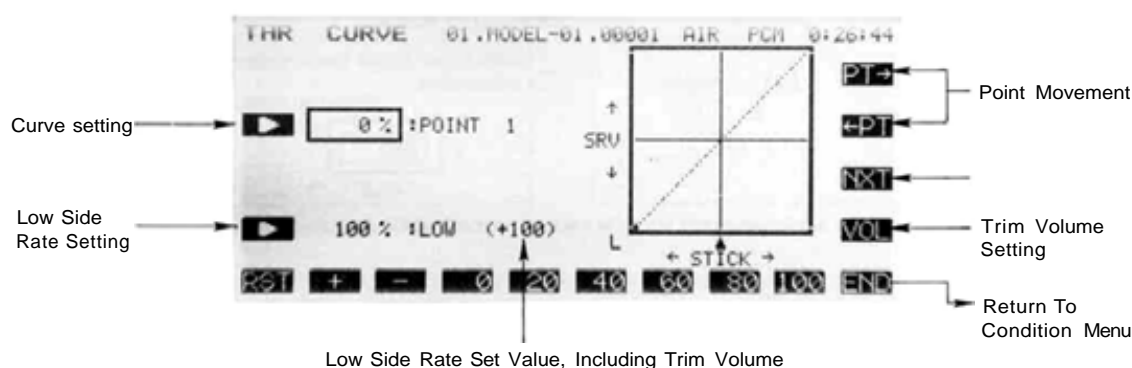
This function programs throttle curves for different flight modes. The throttle curve sets the servo response over full stroke of the throttle stick by a 13-point curve. The low side rate can be adjusted with a volume control (point 7 is the refer-

ence). The servo delay at flight condition switching can also be programmed. You need to activate the Model menu throttle curve [THR] function (page 53) to allow the Throttle curve function to work properly.

Setting Up The Throttle Curve Function

Throttle Curve Inputting

In the Condition Menu, press the TCV key to get the THR CURVE menu shown in the figure below.



Setting Point Selection (Points 1 to 13)

Press the Bkey to turn on the curve inputting function. Use the movement keys Q and R to select the point whose value is to be set. The PT-> key increases the point number by one, and the <-PT key reduces the point number by one. The active point on the curve is shown as a black dot.

Once you have selected the desired point on the curve, you may input the rate with the rate setting keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 0.5 with each button pressing (so it takes two hits to see a number change because of numeric rounding).

You may set or reset each point on the curve by repeating these steps for each point.

Low-Side Rate Adjustment

Press the D key and you may input the rate with the numeric keys E to M. You may set anywhere in the range from 0 to 110% (initially the rate is set to 100%).

Low-Side Volume Control Assignment

No volume controller is defined when TCV is first activated. To set the control and direction of the volume adjuster, call the volume setting screen by pressing the VOL O key. Use the buttons to select the control and direction you desire. For a description of the volume setting method, see page 37.

Use the PRE N key to return to the previous menu, or use the END N key to leave this menu and return to the Condition menu.

Curve Setting Note

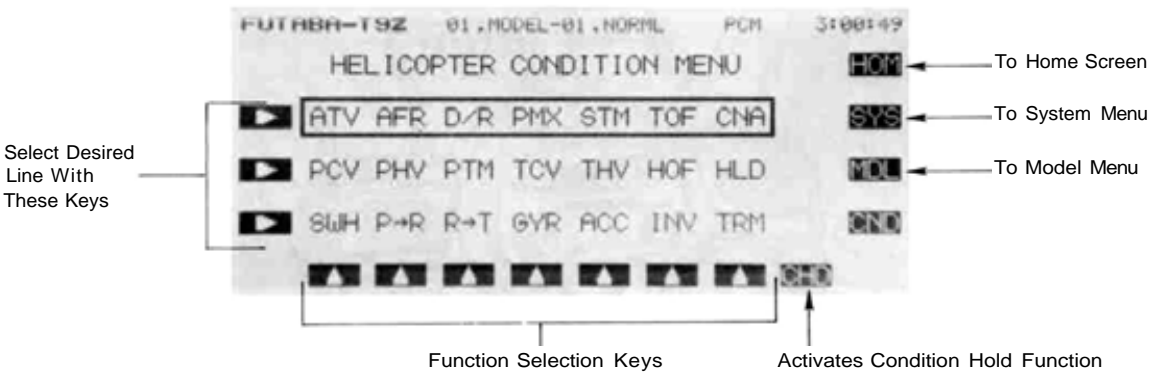
If you change Point 7 after setting the low side rate, other points in the throttle curve also change, because Point 7 is the reference point for the curve.

HELICOPTER SECTION

This section contains information on the commands that apply to helicopters only. Each of these functions can be set independently for different flight conditions.

To get to these settings, press the MDL key from any menu in a Helicopter setup. To select one, first select the line containing the desired function with the B , C, or D keys. Then use the F to L keys to select the function to be entered.

For conditions that apply to all models (ATV, AFR, D/R, PMX, STM, TOF, CNA, and TRM functions), refer to the Common Conditions section. For instructions on Airplanes and Sailplanes, refer to the sections pertaining to those aircraft.

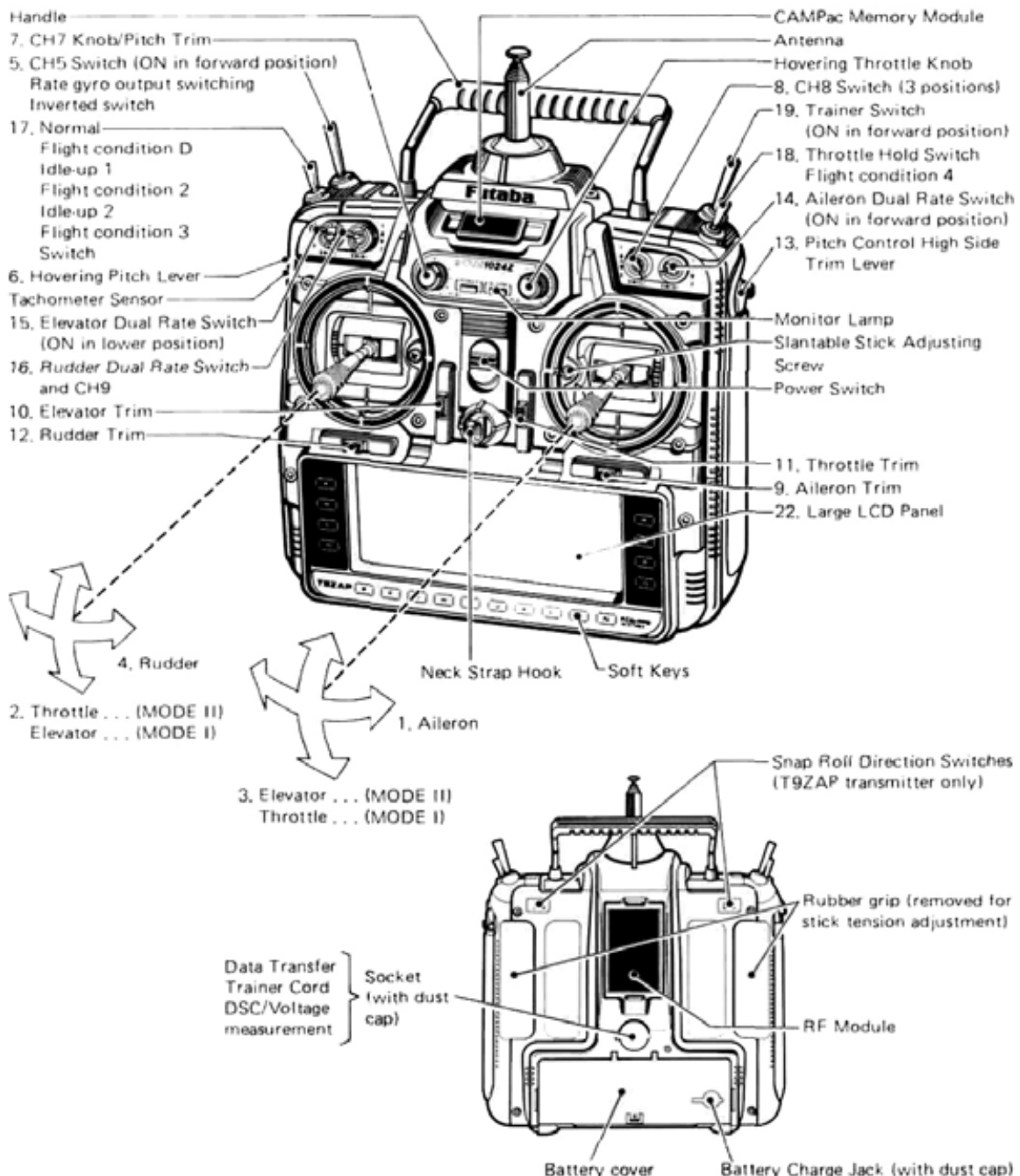


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THV . . .Hovering Throttle.Can adjust throttle response. . . 108 around hover
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HLD . . .Throttle HoldMoves the throttle to idle 110 during autorotation
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HELICOPTER TRANSMITTER CONTROLS AND FUNCTIONS

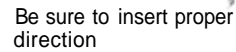
Functions and locations given in this drawing are the factory default positions, which occur upon startup. Each setting can be easily changed as the owner desires. The Function Change menu [FNC] may be used for this purpose.



Note that all stick & switch positions may be changed

1. Aileron control
2. Throttle control . . . (MODE II)
Elevator control . . . (MODE I)
3. Elevator control . . . (MODE II)
Throttle control . . . (MODE I)
4. Rudder control
5. CH5 switch
Rate gyro output switching/inverted switch.
6. Hovering rate lever (CH6)
Adjusts the hovering point pitch independently from the throttle. Used in pitch trimming when hovering. When the throttle stick is at the SLOW or HIGH side, the pitch servo does not operate even if this lever is moved.
7. CH7/pitch trim knob
Used as a spare channel, or as the pitch trimmer.
8. CH8 switch
Used as a spare channel (3 positions).
9. Aileron trim lever trims the ailerons.
10. Elevator trim lever trims the elevators.
11. Throttle trim lever (with ATL) Adjustable throttle limiter type trim lever. Operates at the throttle stick SLOW side. Movement is maximum at maximum slow. Since the HIGH side does not change even if the SLOW side is adjusted, it is very convenient when connecting the linkage, etc.
12. Rudder trim lever trims the rudder.
13. Pitch control HIGH side trim lever.
Pitch control servo HIGH pitch trimmer.
Adjusted for optimum pitch during flight.
14. Aileron dual rate switch.
Aileron deflection angle switch.
15. Elevator dual rate switch.
Elevator deflection angle switch.
16. Rudder dual rate switch.
Rudder deflection angle switch.
Can also be used as the CH9 switch.
17. Normal/idle-up 1/idle-up 2 switch.
Idle-up ON/OFF switch.
The On direction is set by condition select (CSL) function (page 40).
(Flight condition switch.)
18. Throttle hold switch.
This switch is used during auto rotation.
The ON direction is set by condition select (CSL) function (page 40).
(Flight condition switch)
19. Trainer switch.
This switch is turned on in the forward position. It is spring loaded and is turned off when released. It can also be changed to an alternate switch (page 29).

1. **AIL** Aileron
2. **ELE** Elevator
3. **THR** Throttle
4. **RUD** Rudder
5. **GYR** Rate Gyro Sensitivity Switching
6. **PIT** Pitch
7. **AU1** (Spare)
8. **AU2** (Spare)
9. **CH9** Channel 9



Receiver Crystal

Dual Conversion Crystal Required

Antenna Wire

Dual Conversion Receiver R129DP

Power Switch

NR-4RB

Frequency Synthesized Receiver R309DPS

Use of CH9

CH9 Servo

1. Aileron Servo

2. Elevator Servo

3. Throttle Servo

4. Rudder Servo (when a rate gyro is used, connect to the receiver through the gyro)

5. Pitch Control Servo

6. Tail Rotor Servo

Rate Gyro FP-G153/G153BB

Gyro Output

Polarity Switch

Gyro Control Amplifier

Gyro Control Box

Jumper connector

Special 5-Cell (6V) Battery Pack Connector (When separate battery not used, plug in jumper connector)

Gyro Output Trimmer

Gyro

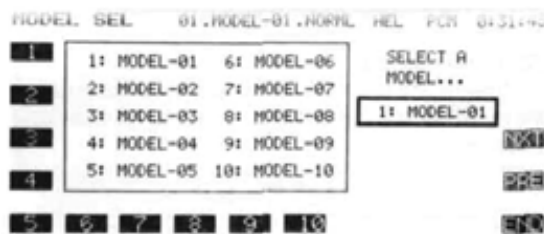
Tail Rotor Servo Connection to Gyro

SAMPLE HELICOPTER SETUP INSTRUCTION

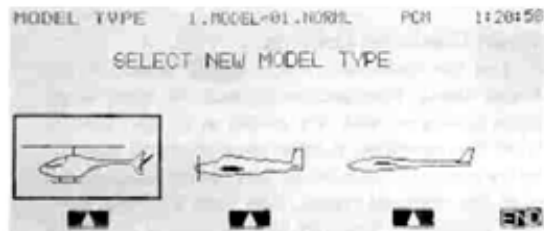
The following example shows how the PCM 1024ZH may be programmed for a contest helicopter model, although for completeness we have added other functions (these will be marked by a "t" sign). The settings presented here are for a typical model. Your model's settings are likely to vary from these, but the procedures given will still be applicable.

1 Memory Selection

Use the Model Select function MSL to select a model memory.



Choose the Helicopter Setup using the Type TYP function from Model menu.



2 Model Naming

Name the model using the Model Name MNA function in the model menu. Note that the default flight condition is named "NORML" (the condition name is located next to the model name). The system automatically adds and names three other flight conditions, which you will program later in this example.

3t Set Control Order

If desired, reset the Control Order using the Function Control FNC in the model menu. Here you may choose what sticks, sliders, and trims control the different functions.

4 Hook Up Controls

Hookup the aileron, elevator, throttle, and rudder servos in accordance with the model's instructions or plans.

5 Plug Servos Into Receiver

Plug Servos into Correct Channel Numbers

- 1AIL.Aileron
- 2E LE.Elevator
- 3THRThrottle
- 4RUDRudder
- 5GYRRate Gyro Sensitivity
- 6PITPitch
- 7AU1(Spare)
- 8AU2(Spare)
- 9CH9.Channel 9

6 Set Servo Throw Direction

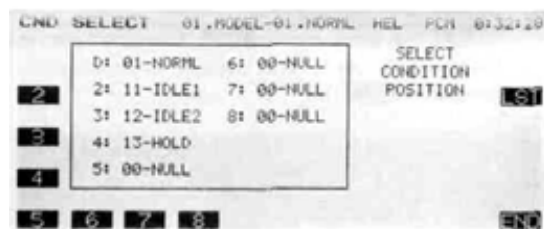
Check the proper direction of throw for each servo. Use Reversing Function REV in the Model menu to set proper throw directions. Reverse channels as necessary to correct throws. Link the carburetor to the throttle servo so that the carb may be fully closed to shut off engine.

7 Flight Conditions Switching

You may set up the system to call up more than one function or switch to a new set of trims or control settings simultaneously by moving a single switch. This is very convenient for loading different flight conditions such as Idle-up 1 IDL1, Idle-up 2 IDL2, and Throttle Hold HOLD in addition to the normal flight condition. You may change EVERY parameter between flight modes.

We recommend that you fly the model and adjust trims and control responses to your liking before defining another flight condition. Then, as described below, you will copy the set of adjustments to a new flight condition (this will maintain all trim settings between the different conditions), and define the condition switches that activate them. Each may be modified for the new desired conditions, and you may add new functions as necessary.

Use the Condition Select CSL button in the Model Menu. The four flight conditions listed above have already been allocated. The position and ON direction of each flight condition call switch are set as follows:



- 1. Normal.Operation when.Used in hovering, all switches OFF etc.
- 2. Idle-up 1ON at SW (E)For 540° stall Center position turns, looping, rolling stall turns

3. Idle-up 2ON at SW (E) Used for rolling
Forward position aerobatics.
4. ThrottleON at SW (G) Activate for
Hold Forward position autorotation.

In the case above, the flight condition priority is 4>3>2>D, with 4 having the highest priority. This means that if the Idle-Up 1 switch is on, and Throttle hold is turned on, the system will use the Throttle hold settings.

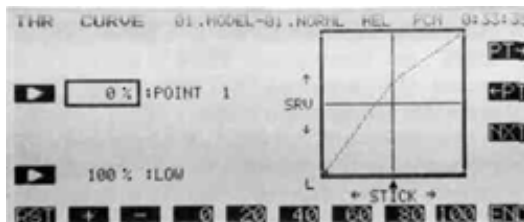
To set the condition data for each flight condition, be sure that you call the appropriate condition by turning on the correct switch (as given above). Read the condition name after the model name to be sure you are changing the condition you want.

8 Normal Flight Programs

Select the Normal flight settings by turning off all the flight condition switches.

9 Throttle Curve Setting

Call the Throttle Curve THA function from the Model Menu. Check to see that it is activated ACT .



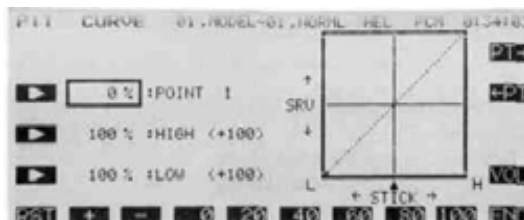
Next, move to the condition menu and press TCV to get the setting menu. Set the throttle curve to the values shown in the table below:

Point	1	2	3	4	5	6	7	8	9	10	11	12	13
Setting (%)	0	9	15	22	28	35	43	51	59	70	80	91	100

The throttle responds slowly at first and then the response rate increases at the top end.

10 Pitch Curve Setting

Call the pitch curve PIT function from the model menu. Verify that the PIT curve function is activated (ACT).



The following settings assume a semi-symmetrical rotor blade with no twist. For the pitch curve, the initial LOW rate is 100% and the HIGH rate is 100%. Set the maximum pitch angle in advance. The pitch angle is -4° to +12°.

When setting the pitch angle, set the hovering pitch lever and the HIGH side pitch lever to the center positions. These levers may be activated in flight to make adjustments. Next, input the data so that the normal pitch used in hovering becomes -2.5° to +10° by LOW/HIGH side rate setting.

Although unimportant in calm conditions, the pitch angle should be set so that the High side pitch rate is large. This provides high collective sensitivity to help cope with windy conditions.

Pitch Curve Setting.

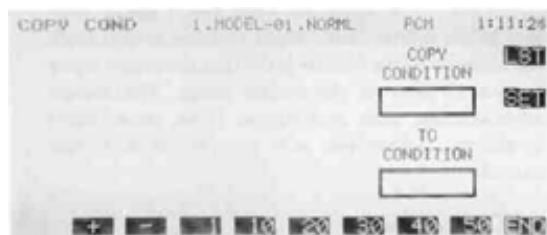
Move to the Condition menu, and select the pitch curve PCV key. Set the pitch curve to the following values:

Point	1	2	3	4	5	6	7	8	9	10	11	12	13
Setting (%)	9	18	27	35	43	52	59	67	73	78	82	86	88

The rise at the low end is fast, and then the rise rate is reduced at the high end. We recommend setting the hovering pitch to +4.5°.

11 Flight Condition Copying

Use the Condition Select CSL button in the Model Menu. This function displays the flight conditions associated with the model in active memory. Note the condition number next to the D (default) in the display. This is the set of conditions associated with the trimmed model. Also note the three numbers following: these are the conditions associated with Idle-up 1&2 and Throttle Hold, that will be copied into and modified.



Use the Copy Condition CPC from the System menu. This function may be used to copy the contents of one condition into another. Choose the default flight condition number (next to the D), press the SET button, then choose the Idle-up 1 condition number in the lower box "TO CONDITION." Give the command to copy. Repeat for Idle-up 2 and Throttle-hold conditions.

Normal->Idle-up 1
Normal->Idle-up 1
Normal->Throttle Hold

12 Idle-Up 1 Setting

The switch that calls the Idle-up 1 conditions (SW-E, center position) is not yet activated. In the Model menu, press the Condition Select CSL key, then select the condition position. Press the Switch button SWT, select SW-E (if it is not already selected), and press the center position button (Q). Hit the previous key PRE and END to finish.

Move the Idle-up 1 switch to its ON position and verify that the condition name after the model name refers to Idle-up 1. Then you may go through the Condition menu items to revise the desired settings in the new mode.

Throttle Curve Setting: move to the condition menu and press TCV to get the setting menu. Change the first seven Idle-up 1 throttle curve points to the values shown in the table below:

Point	1	2	3	4	5	6	7
Setting (%)	30	32	34	36	38	42	46

Pitch Curve Setting: Select the pitch curve PCV key. The Normal curve copied already appears on the screen. The Idle-up 1 pitch curve uses the same curve as the normal condition, but the maximum HIGH side pitch angle should be 8° to 10°, depending on the engine used. Set the pitch angle by curve or rate.

13 Idle-Up 2 Setting

Call up the Idle-up 2 conditions by setting SW-E to the 1 (forward) position. Be sure that the switch is defined using CSL as in the previous case. Now, you may go through the menu items to revise the desired settings in the new mode (be sure that the condition name after the model name refers to Idle-up 2).

Throttle Curve Setting: move to the condition menu and press TCV to get the setting menu. Change the first seven Idle-up 2 throttle curve points to the values shown in the table below:

Point	1	2	3	4	5	6	7
Setting (%)	58	52	47	44	40	39	44

Pitch Curve Setting: Select the pitch curve PCV key. The Normal curve copied already appears on the screen. Set the HIGH side pitch the same as Idle-up 1. Values may be easily compared by switching between Idle-up 1 & 2 with the condition switch, so settings may be easily matched. Set the LOW side pitch curve to the following values:

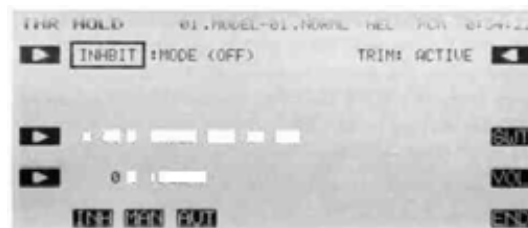
Point	1	2	3	4	5	6	7
Setting (%)	0	8	16	24	33	43	56

Adjust the pitch curve low side to -4°

14 Throttle Hold Setting

Now the Throttle Hold conditions are set for use in autorotation. Call up the Throttle Hold conditions by setting SW-G to the 1 (forward) position. Now you will set the Throttle Hold ON/OFF switch so that SW (G) is turned on in the 1 (forward) position, the same as the flight condition call switch:

Call the Throttle Hold HLD function from the condition menu. Set the condition switch SW (G) to the 1 (forward) position. Select the Manual mode MAN and activate the throttle hold function. Press the SWT button to get to the Switch menu, and activate the SW (G)-1 position. Hit PRE and END to exit.



When SW (G) is in the 1 (forward) position, the throttle hold function is turned on and when SW (G) is in the 2 (rear) position, the function is turned off. In throttle hold, set the throttle to move the servo to engine idle (approximately 15%).

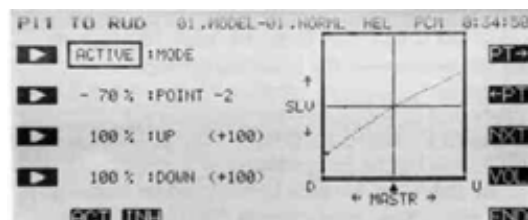
Pitch Curve Setting: Select the pitch curve PVC key. The Normal curve copied already appears on the screen. During autorotation, maximum pitch is used at both the HIGH and LOW sides. Therefore, normally set the HIGH and LOW rates to 100% each. The curve must be set so that the rise matches the rotor near points 2 to 6. The rotor blade pitch angle is -4° to +12°.

The pitch angle for each flight condition is shown below:

Normal -2.5° ~ 4.5° ~ 10°
 Idle-up 1 -2.5° ~ 4.5° ~ 8°
 Idle-up 2 -4° ~ 4.5° ~ 8°
 Throttle Hold -4° ~ 4.5° ~ 12°

15 Pitch-rudder Mix Setting

Pitch->Rudder P->R mixing uses the tail rotor to suppress the torque reaction of the main rotor due to changes in collective pitch. The shape of the mixing curve may be set independently for each flight condition.



To set this feature, call the Pitch->Rudder P->R from the Condition Menu. The Normal setting is used during hover, so it should be set to match take-off, landing, and constant speed vertical climbing.

Normal Setting:

Select the normal flight conditions by turning off all the flight condition switches. Set the rudder mixing curve to the following values (initial settings):

Point	-2	-1	0	+1	+2
Setting (%)	-70	-35	0	+25	+50

Idle-up 1 Setting:

These settings are used in 540° stall turns, looping, and rolling stall turns and is set to be straight ahead when the model is pointing directly into or away from the wind. Call the Idle-up 1 flight conditions by moving switch E to the 0 (center) position. Set the rudder mixing curve to the following values:

Point	-2	-1	0	+1	+2
Setting (%)	-15	-15	-15	-15	-15

When these values are input, the rudder is offset at the half-throttle position.

Idle-up 2 Setting:

These settings are used in rolls. Activate the Idle-up 2 flight conditions by moving switch E to the 1 (forward) position. Set the rudder mixing curve to the following values:

Point	-2	-1	0	+1	+2
Setting (%)	-30	-22	-15	-15	-15

The rudder is offset at the half-throttle position.

Throttle Hold Setting:

Throttle Hold settings are intended to keep the model pointed straight ahead during linear autorotation. The tail rotor pitch angle is nearly 0°. Set the Throttle Hold flight conditions by moving switch G to the 1 (forward) position. Set the rudder mixing curve to the following values:

Point	-2	-1	0	+1	+2
Setting (%)	-45	-45	-45	-45	-45

Delay Settings

Set the amount of delay for each flight condition. We recommend the following settings:

Normal 20%
 Idle-up 1 20%
 Idle-up 2 20%
 Throttle Hold 60%

The delay for Throttle hold should be large, because the rudder angle changes significantly during flight condition changes.

17 Rudder->Throttle Mix Setting

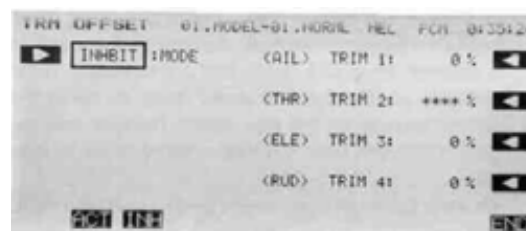
Rudder->Throttle R->T mixing is effective in hovering eight, nose in circle, top hat, pirouette, and other aerobatics. It should be set so that at half-throttle, if the rudder stick is operated, the rotor speed is maintained to keep altitude constant.

For normal models, commanding right rudder should increase throttle slightly, while using left rudder should decrease throttle slightly.

To set this feature, return to the Normal flight condition. Press the Rudder->Throttle R->T from the Condition Menu. Press the ACT button to activate it, and set the Left value to -10%, and the Right value to +10%.

18 Trim Offset Setting

The Trim Offset TOF setting should be adjusted for Idle-up 1 and Idle-up 2. Aileron, elevator, and rudder are offset so that the model flies straight ahead during normal flight.

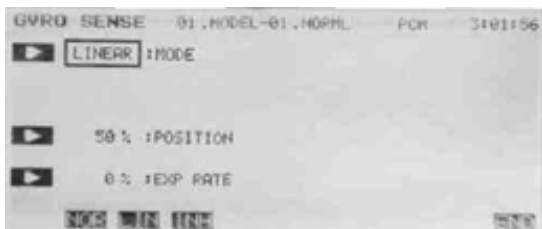


Call the Idle-up 1 or 2 flight condition by setting Switch E to the 0 (center) position. Press the TOF button from the Condition menu. Recommended settings for aileron and elevator offsets are 6% to 10%. A delay can be set with the digital trim TRM function.

Rudder offset is set by the Pitch->Rudder function set previously, so is not set here.

19 Gyro Sensitivity Switching

Gyro Sensitivity switching may be set for each flight condition. To set sensitivity, call the Gyro Sensitivity Function GYR from the condition menu.



Assuming that the sensitivity of the gyro is set so that the 1 side was made low sensitivity, and the 2 side was defined as high sensitivity, set the type at each flight condition as follows:

Normal	.....	Type 2
Idle-up 1	.....	Type 1
Idle-up 2	.....	Type 1
Autorotation	....	Type 1 (if the tail rotor is driven during autorotation, high gyro sensitivity (type 2) may be more effective.)

20 Engine Cut Setting

At the conclusion of a flight, you may use the Engine Cut function to kill your engine by one touch with a special switch. Because it is performed by stick lever, there is no need to fumble for the trim position, and the idle trim position need never be lost.

Press the Engine Cut CUT button from the model menu, activate it, and set the desired switch. Set the throttle a bit above the lowest throttle position, then press the SET button to memorize the position. This makes it so the engine cut function will only operate when the throttle is at the idle position, so the engine can't inadvertently be shut off.

Adjust the throttle servo motion so that there is no binding or excess travel.

21 Condition Hold Setting

If you want to set condition data while the engine is running, always use the Condition Hold function CHD to limit the throttle operation range. Press the CHD button on the Model menu. Set the maximum throttle position to be a bit above the idle position, and press the SET key. This should produce a maximum throttle setting of about 13%. Be sure not to set the maximum too high.

You may activate the Condition Hold menu from the Home menu (use the G key), from the Model menu (2nd line, G key), or from the Condition menu (use the M key). When Condition Hold is activated, a double beep repeats every few seconds to remind you that it is engaged, so that you do not attempt to fly with it on. This setting allows you to control the throttle between 0% and 13% with the throttle stick when the function is activated.

This concludes the setup procedure example. Be sure to browse through the pages following this example to see what other menus are available for helicopters, such as HOF, GYR, ACC, and INV. Many may be used to enhance flight capabilities or to correct bad tendencies. All of these menus may have different settings in different flight modes. For this reason, we recommend you set them up and use them in the Normal flight condition and trim the model before setting up the alternate flight modes.

PITCH CURVE (PCV)

This function may be used to set different pitch response curves for each flight condition (normal, idle-up 1, idle-up 2, throttle hold, etc.). This function is activated when the respective flight condition is selected.

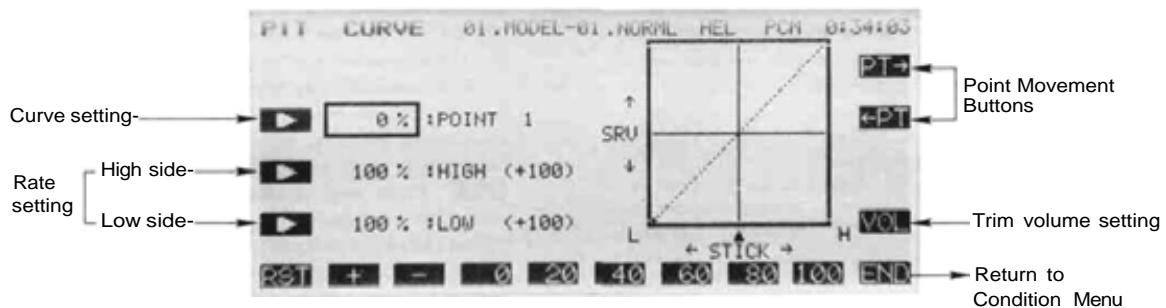
A 13-point curve can be input, and Point 7 can

be defined as the pitch curve reference point. You may also define High and low side rate trim volumes (the high-side pitch trim volume control is defined as the right side lever at initial setting). Pitch curve activation should be done with the model menu pitch curve (PIT) function (page 58).

Setting Up Pitch Mixing

Pitch Curve Inputting

In the Condition Menu, press the *PCV* key to get the PIT CURVE menu shown below.



Setting Point Selection (Points 1 to 13)

Press the *B* key to turn on the curve inputting function. Use the movement keys *Q* and *R* to select the point whose value is to be set. The *PT->* key increases the point number by one, and the *<-PT* key reduces the point number by one. The active point on the curve is shown as a black dot.

Curve Point Rate Setting

Once you have selected the desired point on the curve, you may input the rate with the rate setting keys *E* to *M*. The number keys *0* through *100* input the value directly. The *+* and *-* keys increase or decrease the value by 0.5 with each button pressing (so it takes two hits to see a number change because of numeric rounding).

You may set or reset each point on the curve by repeating these steps for each point.

High-Side Rate Adjustment

Press the *C* key to adjust the High-Side rates. The numeric keys *E* to *M* are used to directly set the rate, which may vary from 0 to 110%. The default value is 100%.

Low-Side Rate Adjustment

You may set the Low-Side rates by pressing the *D* key. As before, the rate may be set with the numeric keys *E* to *M*. This rate may vary from 0 to 110%, and its default value is 100%.

Trim Volume Setting

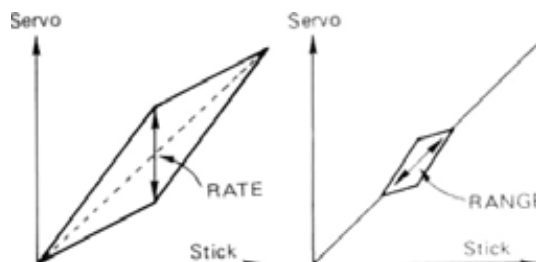
If you'd like to be able to change the pitch curve while in flight, you can set up this feature in the volume setting screen. Press the *O* key to get into this screen, and choose the control you'd like to use for this feature. For a description of the volume setting method, see page 37). The right slider is set as the high side trim volume when Pitch Curve is activated.

Note: when Point 7 of the pitch curve is changed after setting the HIGH/LOW side rates, the other points change also. This is because Point 7 is used as the rate setting reference point.

HOVERING PITCH (PHV)

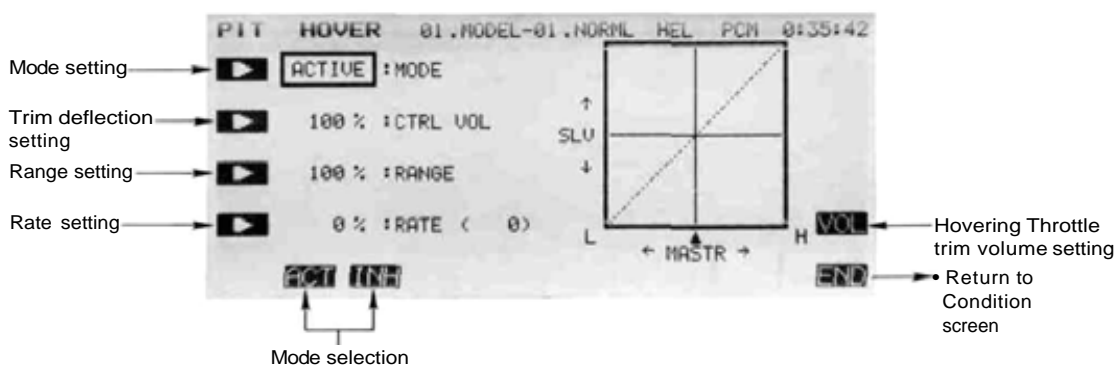
This function trims the pitch near the hovering point. By setting a range, adjustment is possible without changing the high and low points. This Hovering pitch setting can be made for each flight condition, but is commonly used for Normal flight condition.

At initial definition, the left sliding lever controls hovering pitch volume.



Activation of command

In the Condition Menu, press the PHV key to get the PIT HOVER menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function.



Hovering Pitch Trim Deflection Setting

Press the B key to allow input to this setting, and input the rate with the numeric keys F to M. The deflection may be set from 0 to 100% (the initial value of this parameter is defined to be 100%).

Setting of Range

Now you will set the Range of travel over which HIGH/LOW sides do not change. Press the C key and set the rate with the numeric keys F to M. The Range may be set from 0 to 100% (when activated, the initial value of this parameter is defined to be 100%).

Offset Rate Setting

The offset amount is entered by pressing the D key, and input with the numeric keys E to M. This may be input from -100 to +100%, and the initial value is programmed to 0%.

Hovering Pitch Trim Selection and Operation Direction Setting

Call up the volume setting screen by pressing the VOL O key. Set the volume control as desired (the left-side slider is set as the pitch trim volume control initially). For a description of the volume setting method, see page 37).

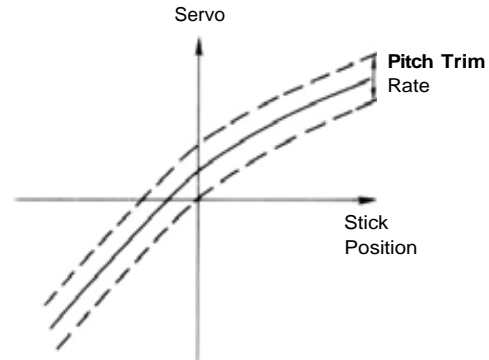
Precautions

When the range is set to 100%, the rate changes between points 1 and 13. When the range is set to 0%, the rate changes only between points 6 and 8. When you use this function, set up the numbers so that when the range is small, the trim deflection is also small, and make sure that the preceding and following points are not exceeded when the range is moved to its maximum position.

PITCH TRIM (PTM)

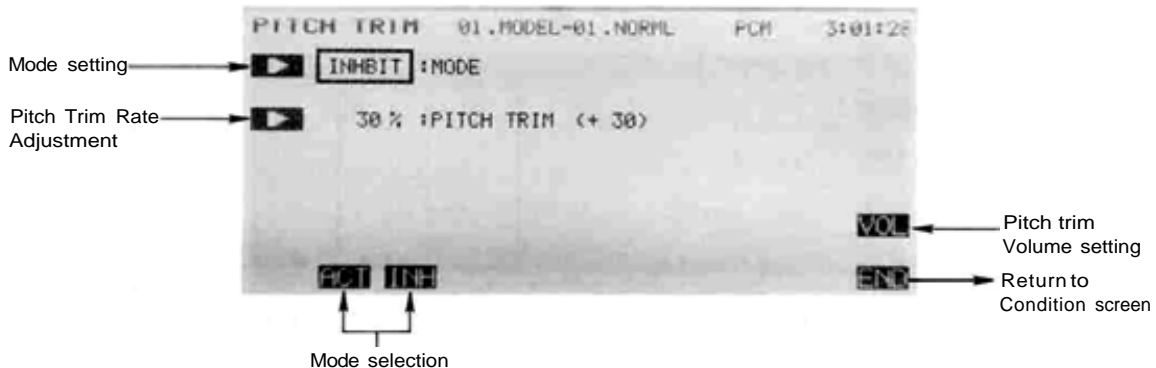
This function enables you to move the pitch trim (offset the trim) without changing the pitch curve. The amount of pitch trim can be adjusted, and may change for each condition.

At initial setting, the left side knob VR(A) is defined as the pitch trim volume control. However, the knob is not activated at initial setting.



Activation of command

In the Condition Menu, press the PTM key to get the PITCH TRIM menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function.



Rate setting

Press the B to input the rate to be set with the numeric keys F to M . The rate setting may range from 0 to 100%. and is initially programmed as 30%.

Volume selection

Enter the volume setting screen by pressing the O key. For a description of the volume setting method, see page 37. The left side knob is set as the volume control at initial setting, but is not activated. Be sure that you are setting for the desired condition by first turning on the condition switch and verifying the condition name.



THROTTLE CURVE (TCV)

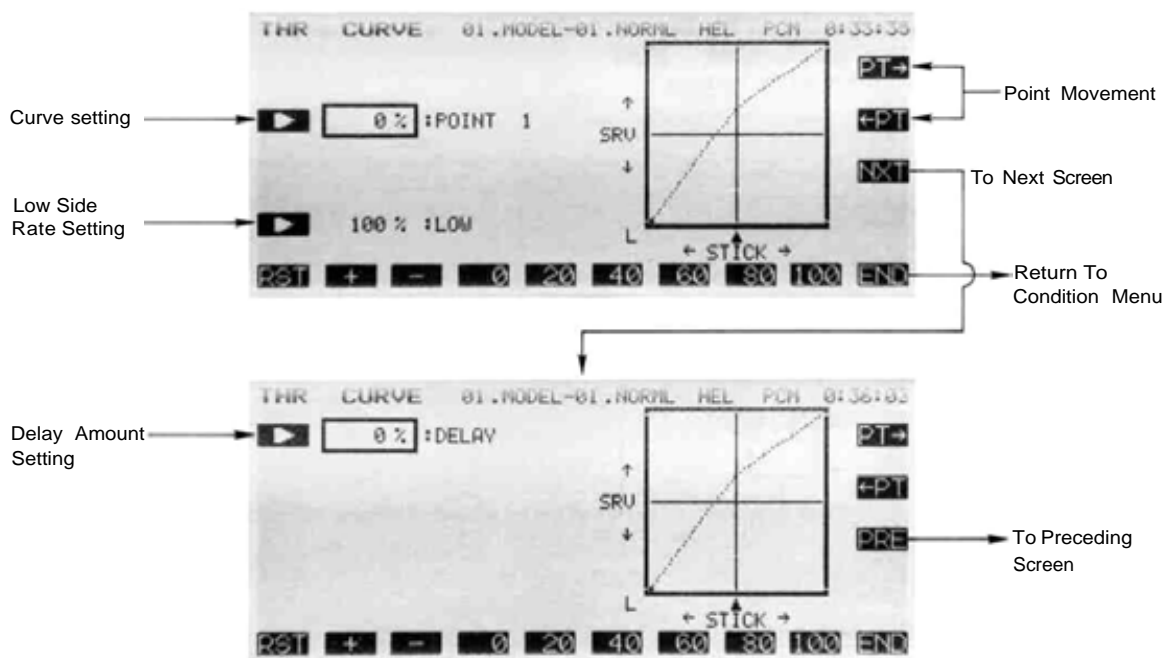
This function programs throttle curves to perform hovering, loops, rolls, and other aerobatics in the different flight modes. The throttle curve sets the servo response over the full stroke of the

throttle stick by a 13-point curve. The low side rate can be input (point 7 is the reference). The servo delay at idle-up and other flight condition switching can be programmed.

Setting Up The Throttle Curve Function

Throttle Curve Inputting

In the Condition Menu, press the •TCV key to get the THR CURVE menu shown in the upper portion of the figure below.



Setting Point Selection (Points 1 to 13)

Press the B key to turn on the curve inputting function. Use the movement keys Q and R to select the point whose value is to be set. The PT-> key increases the point number by one, and the <-PT key reduces the point number by one. The active point on the curve is shown as a black dot.

Once you have selected the desired point on the curve, you may input the rate with the rate setting keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 0.5 with each button pressing (so it takes two hits to see a number change because of numeric rounding).

You may set or reset each point on the curve by repeating these steps for each point.

Low-Side Rate Adjustment

Press the D key and you may input the rate with the numeric keys E to M. You may set anywhere in the range from 0 to 110% (initially the rate is set to 100%).

Delay setting

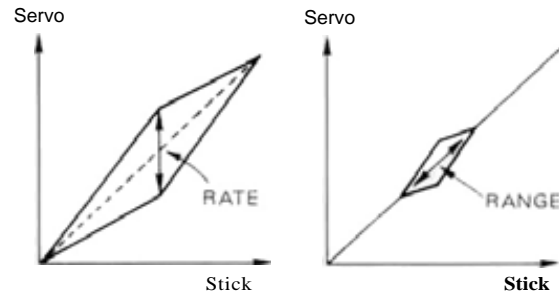
Shift to the next screen (the lower one in the figure) by pressing the NXT (P) key. Enter the delay with the rate setting keys E to M. The delay may be set from 0 to 100%, and is initially set to 0%.

Use the END (N) key to leave this menu.

HOVERING THROTTLE (THV)

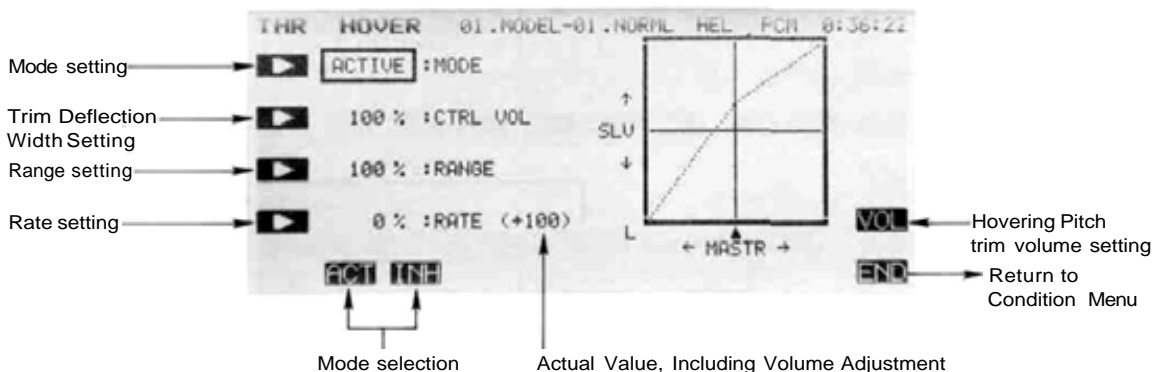
This function is used to trim the throttle around is hovering position. By setting a range, adjustment is possible without changing the high and low points. This Hovering throttle setting can be changed between the flight conditions, and ACT/INH may be set separately for each.

At initial definition, the right knob VR(B) controls hovering throttle trim.



Activation of command

In the Condition Menu, press the THV key to get the THR HOVER menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys F and G) to activate or inhibit the function.



Hovering Throttle Trim Deflection Setting

Press the B key to allow input to this setting, and input the rate with the numeric keys F to M. The deflection may be set from 0 to 100% (when activated, the initial value if this parameter is defined at 100%).

Setting of Range

Now you will set the Range of travel over which HIGH/LOW sides do not change. Press the C key and set the rate with the numeric keys F to M. The range may be set from 0 to 100% (when activated, the initial value if this parameter is defined at 100%).

Offset Rate Setting

The offset amount is entered by pressing the D key, and input with the numeric keys E to M. This may be input from -100 to +100%, and the initial value is programmed to 0%.

Hovering Throttle Trim Selection and Operation Direction Setting

Call up the volume setting screen by pressing the VOL O key. Set the volume control as desired (the right-side knob VR(B) is set as the pitch trim volume control initially). For a description of the volume setting method, see page 37).

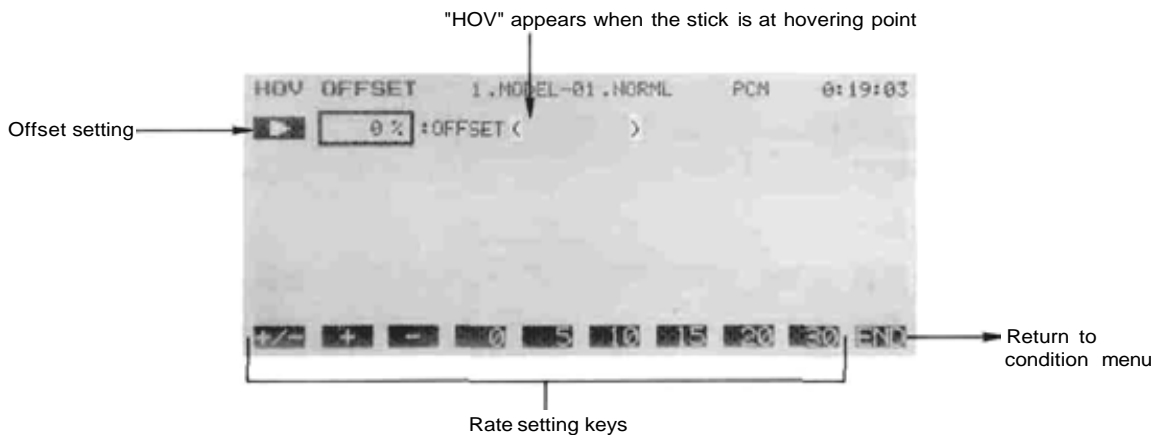
HOVERING OFFSET (HOF)

This function is used to program the pitch mixing hovering point. It is used to set the HIGH/LOW side switching point to the pitch hovering point when the pitch hovering point has drifted

above or below the stick neutral position. The model should be adjusted so that hovering is performed around the mid-throttle position.

Activation of command

In the Condition Menu, press the HOF key to get the HOV OFFSET menu shown below.



Setting Method

Offset setting

During flight, make a note of where the throttle stick is positioned during hover. Set the throttle stick to the hovering position and adjust the offset with the F and G keys until "HOV" is displayed on the screen. This function has a range of -30 to +30%, and its initial value is 0%.

THROTTLE HOLD (HLD)

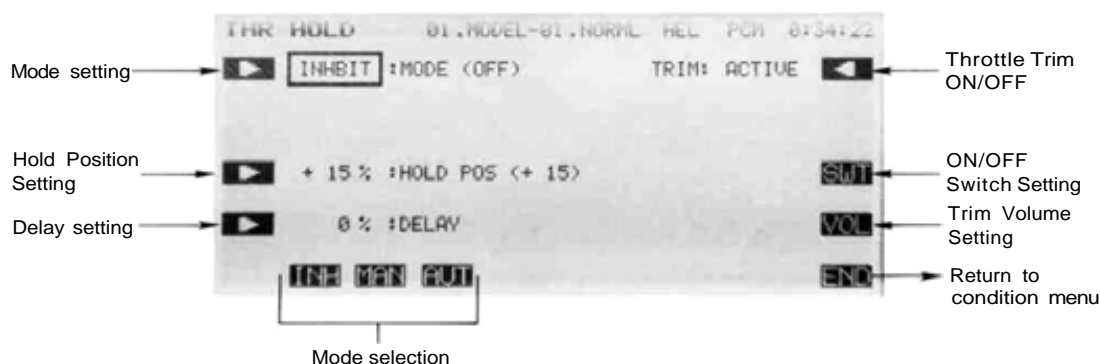
This function moves the throttle servo to idle during auto rotation. Either a Manual mode or an Auto mode can be selected. In the manual mode, the throttle servo is held by turning on the throttle hold switch. In the auto mode, the throttle servo is held when the throttle stick is moved past the set

position on the low throttle side after the throttle hold switch is turned on.

A delay up to the servo hold position can be set. Throttle trim can be turned on and off during throttle hold, but it is usually turned on.

Activation of command

In the Condition Menu, press the HLD key to get the THR HOLD menu shown below.



Select Operation Mode

Use the A key to activate mode setting. Now you must decide on Manual or Auto operation.

Select the manual mode by pressing the MAN (G) key. Select the auto mode by pressing the AUT (H) key. You may deactivate the function by pressing the F (INH) key.

Throttle hold ON/OFF switch setting

Call the switch setting screen by pressing the SWT (P) key. At initial setting, SW (G) is defined as the control switch. You may choose another switch with this menu. For a description of the switch setting method, see page 37.

Stick Position Setting (Auto Mode Only)

For the Auto mode, you need to input the position at which the function will take effect. Press the B key, then move the throttle stick to the desired position, and press the SET (F) key to memorize the position. If the throttle stick is near half-throttle position for hovering, this should be around 20% throttle position.

Servo Hold Position Setting

Press the C key and set the Idling position with the rate setting keys F to M. This setting may vary from 0 to 100%, and is initially set to 15% by the system. At the set position, the carburetor should be fully closed.

Delay setting

Press the D key and set the delay with the rate setting keys F to M. The setting range is 0 to 100%, and the initial value loaded is 0%.

Throttle trim ON/OFF at throttle hold

Press the R key to enter the throttle trim activation menu. The function may be activated by pressing the ACT (F) key, and deactivated by pressing the INH (G) key.

Servo Hold Position Trim Volume Selection and Operating Direction Setting

You may set a control to adjust the trim volume during flight. For a description of the volume setting method, see page 37. This volume is not loaded at initial setting, but may be adjusted $\pm 10\%$ by the volume control.

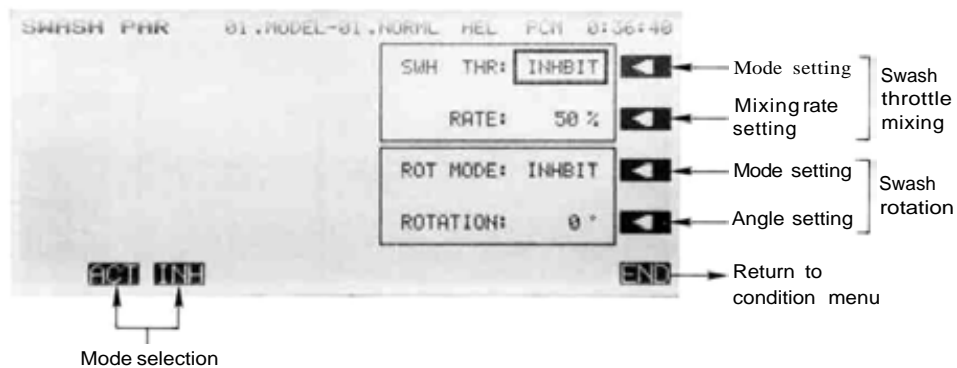
SWASHPLATE TYPE (SWP)

The SWP function has two built-in functions: Swash--Throttle mixing, and Swash rotation. These functions can be set for each flight condition. Swash->Throttle mixing is used to correct the tendency of the model to change altitude when

the rotor is tilted by aileron, elevator, and other controls. The Swash Rotation function is used when the swash plate connections are shifted a fixed angle from the reference position.

Using the Swashplate Menu

In the Condition Menu, press the SWP key to get the SWASH PAR menu shown below.



Activation of Swash-Throttle Mixing command

Use the R key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the aileron differential function.

Swash-Throttle Mixing Rate Setting

Press the Q key and enter the desired mixing rate with the rate setting numeric keys F to M. Mixing may be set from 0 to 100%; the system enters an initial value of 50%.

Swash Rotation Setting

Press the P to turn the swash rotation setting menu on. You may activate the offset mixing by pressing the ACT (F) key, and deactivate by pressing the INH (G) key.

Swash Rotation Angle Inputting

Press the O key and set the angle with the angle setting numeric keys E to M . This value may be set anywhere between -30° to +30°, and its initial value is set to 0°.

PITCH-RuDDER (P-R)

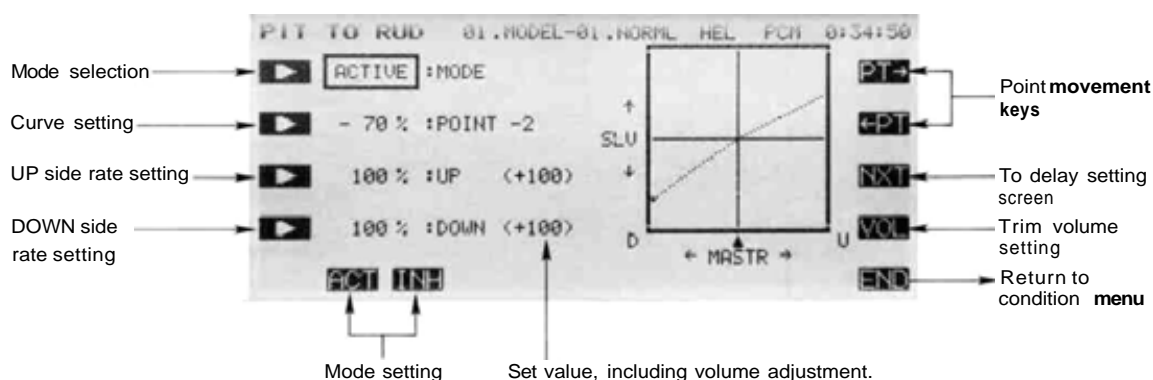
This mixing, also called Revolution Mix, mixes pitch commands into rudder in order to suppress the torque generated by changes in the main rotor's pitch angle. A five-point curve can be used to control the shape of the mixing curve for each

flight condition. The up-side and down-side mixing rates can be set, using Point 0 as the reference. A trim volume can be input for each direction, and a time delay to transition smoothly between flight conditions may also be set.

Setting Up Pitch->Rudder Mixing

Pitch Mixing Activation

In the Condition Menu, press the P-R key to get the PIT TO RUD menu shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the function.

Setting Points -2, -1, 0, +1, +2

Press the B key to turn on the curve inputting function. Use the movement keys Q and R to select the point whose value is to be set. The PT-> key increases the point number by one, and the <-PT key reduces the point number by one. The active point on the curve is shown as a black dot.

Once you have selected the desired point on the curve, you may input the rate with the rate setting keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 0.5 with each button pressing (so it takes two hits to see a number change because of numeric rounding). The +/- key changes the sign of the entered number.

You may set or reset each point on the curve by repeating these steps for each point.

Up-Side Rate Adjustment

Press the C key and you may input the rate with the numeric keys E to M. You may set anywhere in the range from 0 to 100% (initially the rate is set to 100%).

Down-Side Rate Adjustment

Press the D key and you may input the rate with the numeric keys E to M. You may set anywhere in the range from 0 to 100% (initially the rate is set to 100%).

Up & Down Sides Trim Volume selection

Enter the volume setting screen by pressing the O key. For a description of the volume setting method, see page 37. The volume control has an adjustment range of $\pm 25\%$ of the rates input above. No control is set as the volume control at initial setting. Be sure that you are setting the desired condition by verifying the condition name.

Delay setting

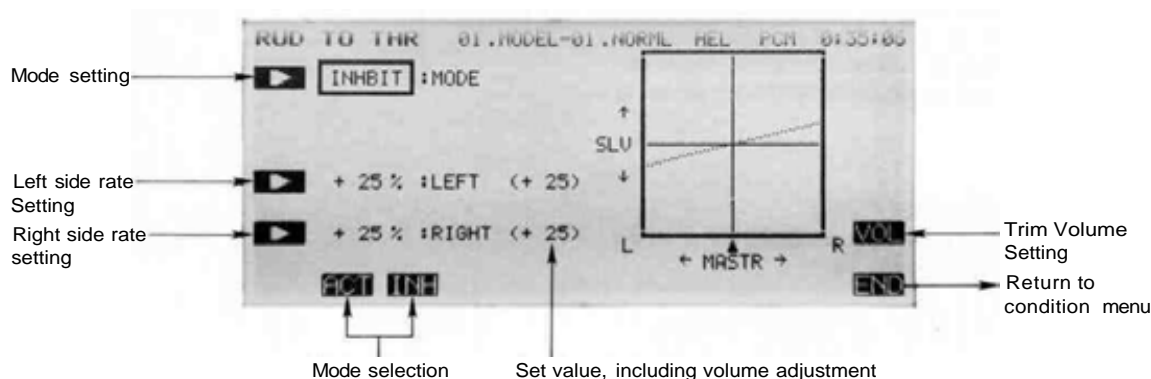
Call the delay setting screen by pressing the NXT (P) key. Now press the key and set the delay with the rate setting keys E to M. The setting range is 0 to 100%, and the initial value loaded is 0%.

RUDDER->THROTTLE (R->T)

This mixing adjusts the throttle setting to account for the changes in power required when rudder commands are made. The amount of mixing can be set for each condition, and the left and right rates may be set separately. Trim volumes may also be set.

Setting Up Rudders-Throttle Mixing

In the Condition Menu, press the R->T key to get the RUD TO THR menu shown below.



Activation of Rudder-Throttle Mixing command

Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the Rudder-Throttle function.

Left-Side Rate Adjustment

Press the C key and you may input the rate with the numeric keys E to M . You may set anywhere in the range from -50 to +50% (initially the rate is set to +25%, but a rate between 0 and 20% is recommended). Use the +/- key to change the sign if necessary.

Right-Side Rate Adjustment

Press the D key and you may input the rate with the numeric keys E to M . You may set anywhere in the range from -50 to +50% (initially the rate is set to +25%; again a rate from 0-20% is recommended).

Trim Volume Selection and Operating Direction Setting

You may set a control to adjust the trim volume during flight. Call the volume setting screen by pressing VOL (O) key. For a description of the volume adjusting method, see page 37. This volume may be adjusted by the volume control.

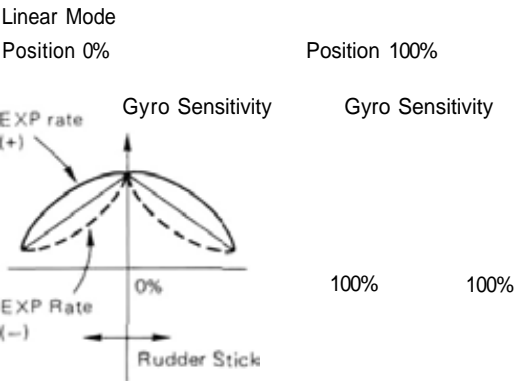
GYRO SENSITIVITY (GYR)

This function switches the gyro sensitivity. The mode depends on the gyro used. Usually, sensitivity 1 or 2 is switched in the normal mode.

The Normal mode is used with gyros having two-step switching. The sensitivity is pre-adjusted at two values and is selected by means of this function.

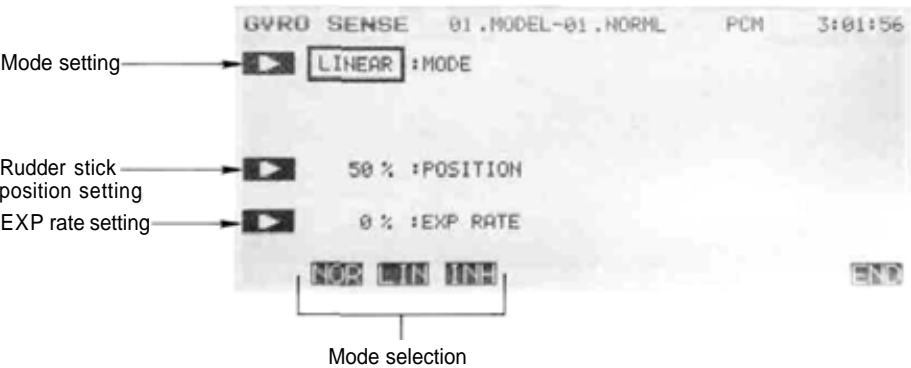
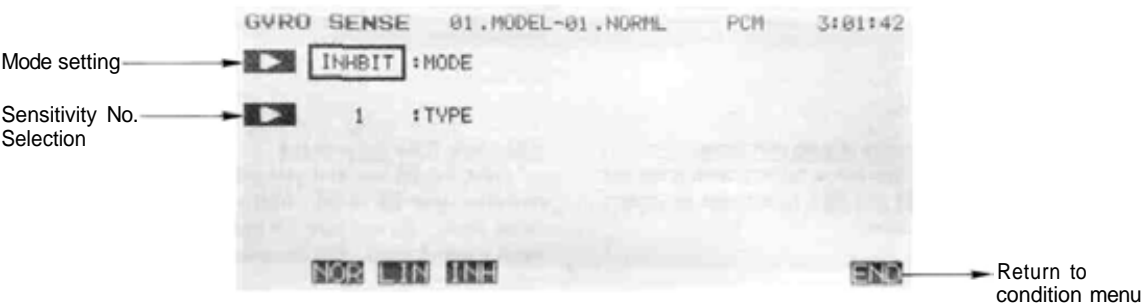
The Linear mode is used with gyros whose sensitivity can be switched linearly. The sensitivity can be lowered according to the rudder travel by means of this function.

An EXP mixing curve may also be input. The sensitivity remains constant (maximum sensitivity) up to the point at which gyro sensitivity is suppressed according to rudder operation. However, the maximum and minimum sensitivities are set at the gyro.



Using the Gyro Sensitivity Menu

In the Condition Menu, press the GYR key to get the GYRO SENSE menu shown below.



Select the Gyro Mode

Press the A key to enter the mode selection menu.
Select the normal mode by pressing the NOR (F) key.
Select the linear mode by pressing the LIN (G) key.
Deactivate the function by pressing the INH (H) key.

Normal mode	Linear mode
Select the sensitivity number by pressing the F (1) or G (2) key.	<p>Set Rudder Stick Position</p> <p>Press the C key and set the rudder stick position with the numeric keys F to M. You may input from 0 to 100% (initially 50% is entered). The numeric keys input the number; (+) and (-) change the inputted value by +/- 1, and the +/- key changes the sign.</p> <p>Set EXP rate</p> <p>Press the D key and set the curve rate with the numeric keys F to M. The numeric keys work the same as given in the previous paragraph.</p>

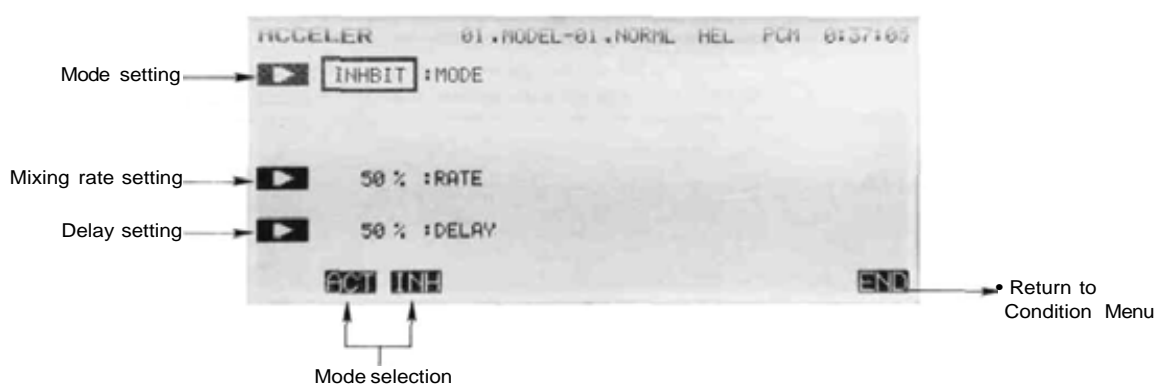
Press the END(N)key to exit this menu.

ACCELERATION (ACC)

This mixing function is used to cancel the reaction torque generated by sudden throttle changes. The amount of mixing and the rudder servo return delay can both be programmed.

Using the Acceleration Function

In the Condition Menu, press the ACC key to get the ACCELER menu shown below.



Activation of Acceleration Command

Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit the Acceleration function.

Mixing rate setting

To input the mixing rate, press the C key and set the mixing rate with the rate setting keys F to M. The mixing rate is initially set to a value of 50%, but may be set from 0 to 100% using the numeric keys.

Delay setting

Call the delay setting screen by pressing the 0 key. Now set the delay with the rate setting keys F to M. The setting range is 0 to 100%, and the initial value loaded is 50%.

Exiting

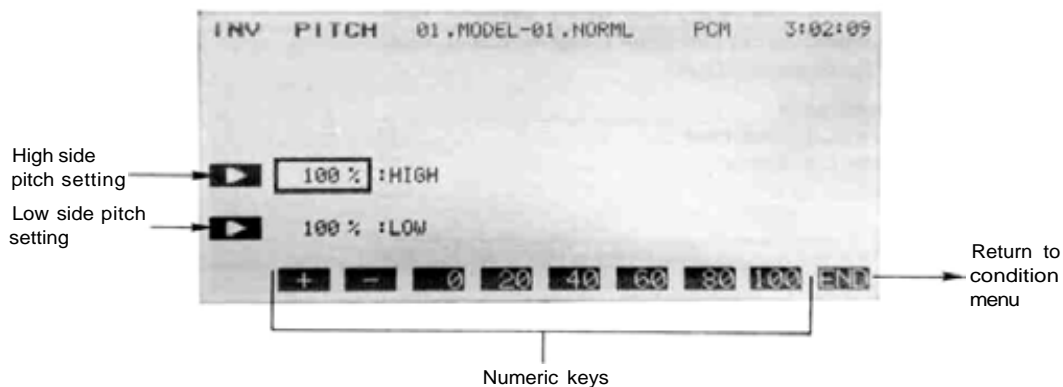
To exit the Acceleration Mix function, use the END N key.

INVERTED PITCH (INV)

This function sets the inverted pitch high-side and low-side rates during inverted flight. All linkages should be set up for inverted flight. Inverted flight function activation and cross position setting are performed with the Inverted Pitch (INV) function in the model menu (page 57).

Setting Up The Inverted Pitch Function

In the Condition Menu, press the INH key to get the INV PITCH menu shown below.



Inverted Flight High Pitch Rate Setting

Press the C key and you may input the rate with the numeric keys F to M. You may set anywhere in the range from 0 to 110% (initially the rate is set to 100%).

Inverted Flight Low Pitch Rate Adjustment

Press the D key and you may input the rate with the numeric keys F to M. You may set anywhere in the range from 0 to 100% (initially the rate is set to 100%).

Exiting

To exit the Acceleration Mix function, use the END key.

SAILPLANE SECTION

This section contains information on the commands that apply to sailplanes only. Each of these functions can be set independently for different flight conditions. The sailplane model types are grouped into 2-S type, 4-S type, and 5-S type by number of servos in the wing. The Condition menus for these three sailplane types are shown on the next page.

In this manual, speed flaps are controls that can move together (as flaps) or differentially (as ailerons), and are commonly found on most high-performance models. Brake flaps move together only, and are used for landing. Brake flaps are sometimes found on scale models. Butterfly is a high drag configuration used for landings, referred to as "Crow" elsewhere.

If you plan to use the PCM 1024Z system primarily for sailplanes and would like to have a three position switch on the left-hand side, we recommend you purchase a Mode I airplane radio (and convert to Mode II) or a Mode II helicopter radio.

For conditions that apply to all models (ATV, AFR, D/R, PMX, STM, TOF, CNA, and TRM functions), refer to the Common Conditions section. For instructions on Helicopters and Airplanes, refer to the sections pertaining to those aircraft.

Sailplane Section Table of Contents

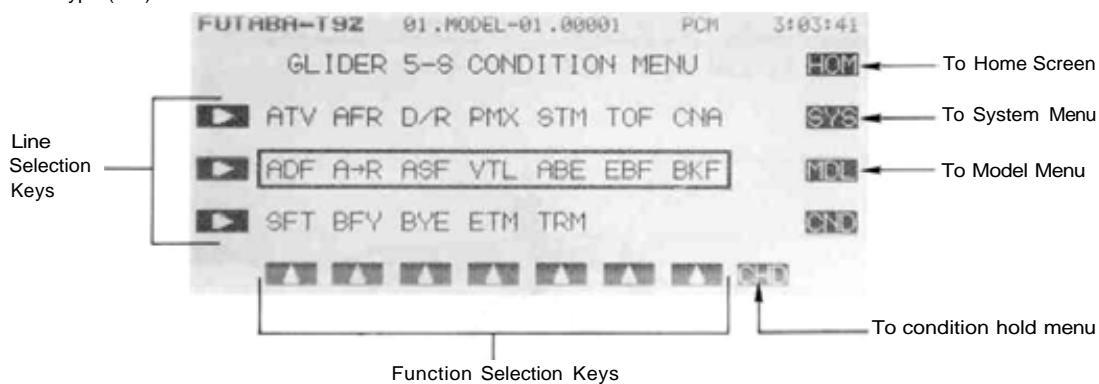
Sailplane Transmitter Controls and Functions.	120
Sailplane Receiver and Servo Connections.	121
Sailplane Setup Example.	122

Control Setup Definitions

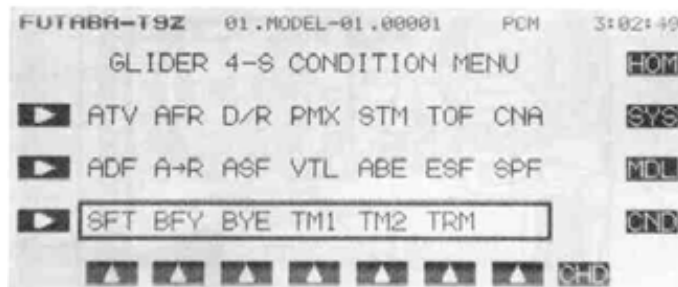
ADF . . . . .	.Aileron Differential. . . . .	.Sets different aileron up & down throws	125
A-R . . . . .	.Aileron-> Rudder. . . . .	.Mixing for low-drag, coordinated turns	126
ASF . . . . .	.Aileron-> Speed flap . . . . .	.Increased roll authority for 4-S & 5-S	127
VTL . . . . .	.V-Tail. . . . .	.Mixes rudder & elevator for V tail	128
ABE . . . . .	.Air Brake-> Elevator. . . . .	.Trims pitch change due to airbrakes	129
EBF . . . . .	.Elevator-< Brake Flap . . . . .	.High lift for better turning capability, 5-S	130
ESP . . . . .	.Elevator-- Speed Flap . . . . .	.High lift for better turning capability, 4-S	131
BKF . . . . .	.Brake Flap (5-S). . . . .	.Special flap mixing functions, 5-S	132
SPF . . . . .	.Speed Flap (4-S) . . . . .	.Special flap mixing functions, 4-S	135
SFT . . . . .	.Speed Flap Trim . . . . .	.Use to change wing camber on 4-S & 5-S	139
BFY . . . . .	.Butterfly (4-S/5-S) . . . . .	.High drag for predictable landings	140
BYE . . . . .	.Butterfly-> Elevator . . . . .	.Compensates for butterfly trim change	142
ETM . . . . .	.Elevator Trim (2-S/5-S) . . . . .	.Elevator Presets for flight conditions	143
TM1&2 . . . . .	.Trim Mix 1 & 2 (4-S) . . . . .	.Two presets for different flight conditions	145
P->E . . . . .	.Flap-> Elevator (2-S). . . . .	.Corrects trim change due to flap motion	147
E->F . . . . .	.Elevator-> Flap (2-S). . . . .	.High lift for better turning, 2-S	148
PPN . . . . .	.Flaperon (2-S). . . . .	.Combined flap & aileron functions, 2-S	149

SAILPLANE CONDITION MENUS

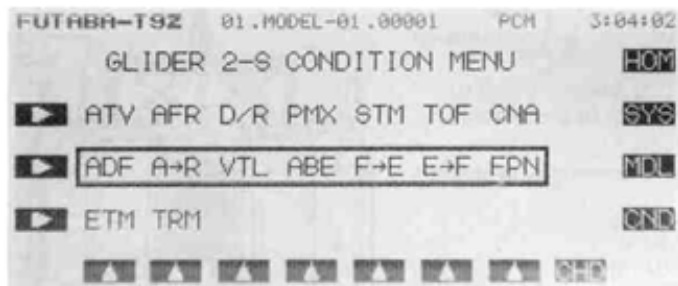
Five Servo Type (5-S)



Four Servo Type (4-S)



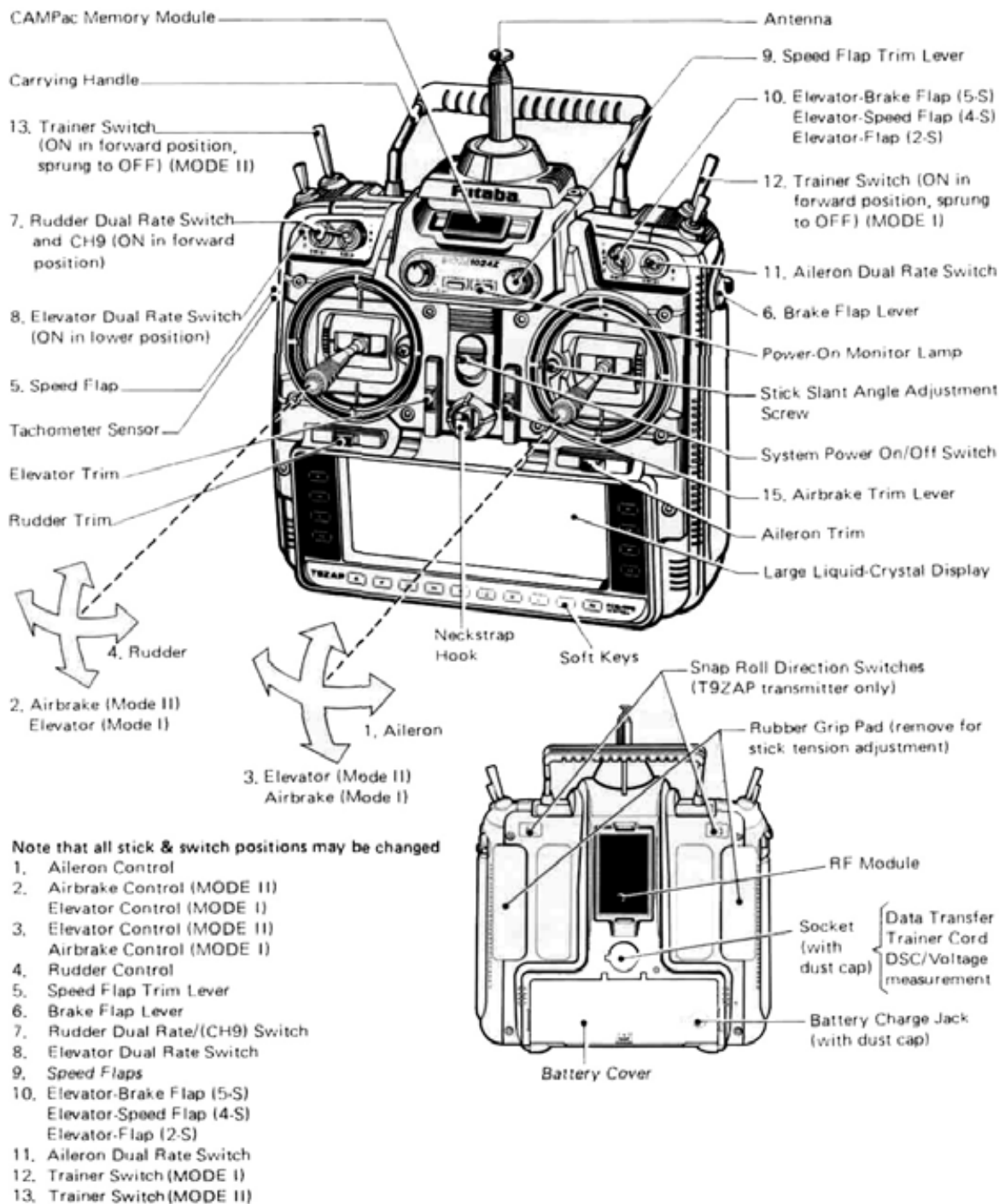
Two Servo Type (2-S)



To get to these settings, press the MDL key from any menu in an Sailplane setup. To select one, first select the line containing the desired function with the B, C, or D keys. Then use the F to L keys to select the function to be entered.

SAILPLANE TRANSMITTER CONTROLS AND FUNCTIONS

Functions and locations given in this drawing are the factory default positions. Each setting can be easily changed as the owner desires. The Function Change menu [FNC] may be used for this purpose.

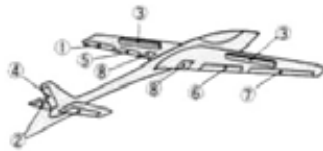


SAILPLANE RECEIVER AND SERVO CONNECTIONS

The order for connecting the servos depends on the selected number of wing servos (two, four, or five wing servos). When dual aileron or flap servos

are not required, the receiver output channels are available for other uses. V-tail connections = * The receiver output order is shown below:

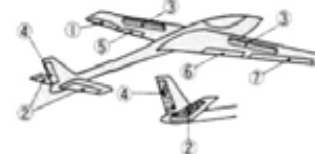
GLIDER 5-S



Glider 5-S

Ch 1 = Ail 1
Ch 2 = Elevator*
Ch 3 = Airbrake
Ch 4 = Rudder*
Ch 5 = Flap 1
Ch 6 = Flap 2
Ch 7 = Ail 2
Ch 8 = Brake flap

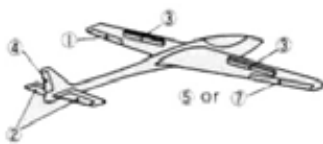
GLIDER 4-S



Glider 4-S

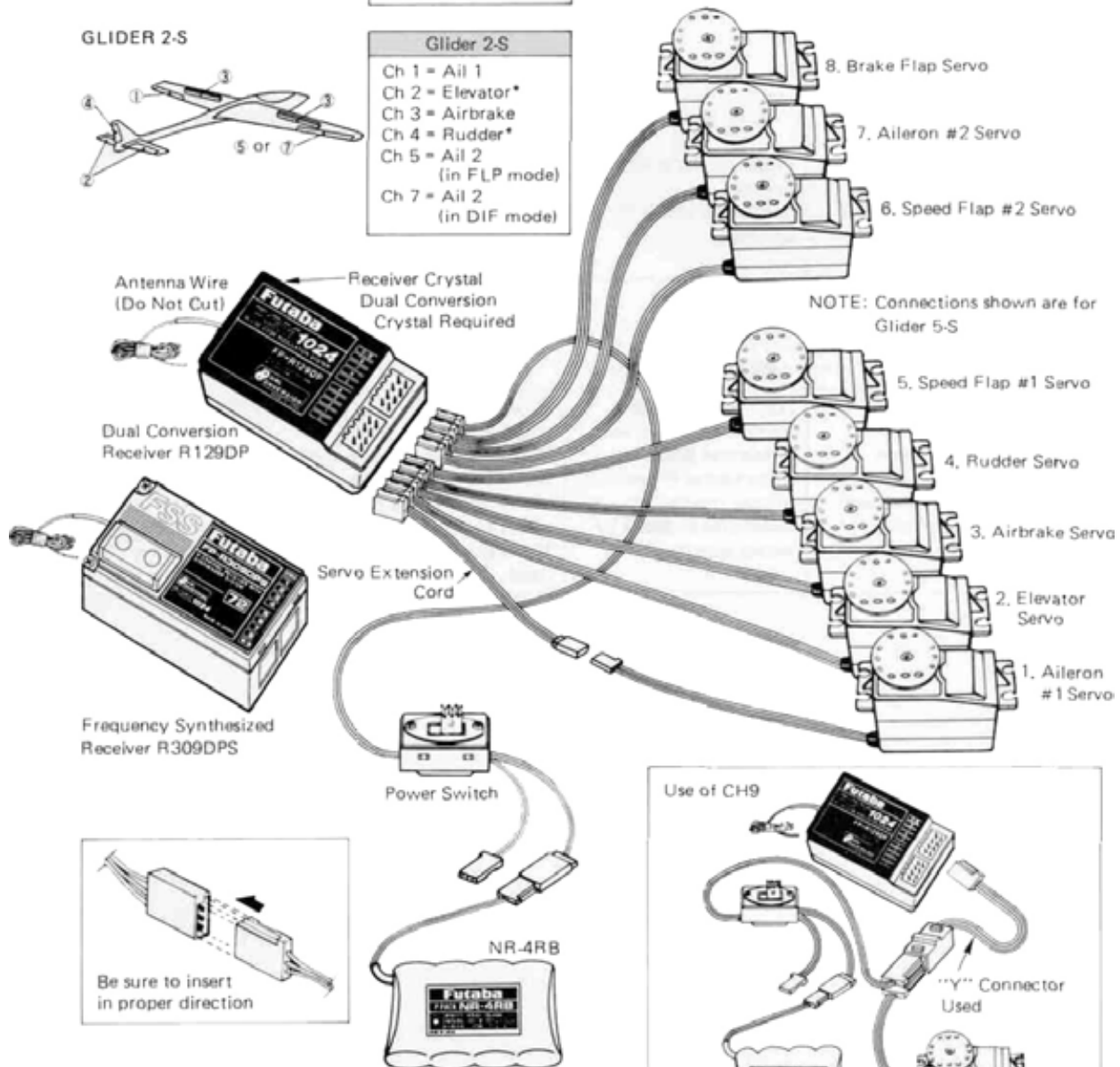
Ch 1 = Ail 1
Ch 2 = Elevator*
Ch 3 = Airbrake
Ch 4 = Rudder*
Ch 5 = Flap 1
Ch 6 = Flap 2
Ch 7 = Ail 2

GLIDER 2-S



Glider 2-S

Ch 1 = Ail 1
Ch 2 = Elevator*
Ch 3 = Airbrake
Ch 4 = Rudder*
Ch 5 = Ail 2
(in FLP mode)
Ch 7 = Ail 2
(in DIF mode)



EXAMPLE SAILPLANE SETUP INSTRUCTIONS

The following example shows how the PCM 1024Z may be programmed for a sailplanes with two, four, or five wing servos. The settings presented here are for typical models of the three types. Your model's settings are likely to vary somewhat from these, but the procedures given will still be applicable. To make things easier, be sure that the horns and linkages are all at the same angles and of the same length. This will make it so identical servo motion produces identical control surface movement on both sides.

This manual refers to ailerons, speed flaps, and brake flaps. Here are the definitions of each: Ailerons are control surfaces located nearest the tips of the sailplane's wings. Speed flaps are controls that can move together (as flaps) or differentially (as ailerons), and are commonly found on most high-performance models. Brake flaps move together only, and are used for landing. Brake flaps are sometimes found on scale models. Additionally, any sailplane can have airbrakes or spoilers, and electrics will of course have a motor control.

1	Use the Model Select function <i>MSL</i> to select a vacant model memory, and choose desired sailplane type using the Type <i>TYP</i> function from Model menu.	Two Wing Servos [2-S] Flaperons, Delta Wing, Electrics. Optional airbrakes or spoilers	Four Wing Servos [4-S] F3B, multitask, scale. Optional airbrakes or spoilers	Five Wing Servos [5-S] Multitask or Scale with Optional Airbrakes and/or spoilers
2	Be sure to select a vacant memory. Choose the desired sailplane type. RENAME model now using the Model Name <i>MNA</i> function in the model menu. Switch to the Condition menu <i>CND</i> and name the	default flight condition (we recommend <i>NORML</i>). Later you may add Launch, Speed, Distance, Landing, etc. (Step 16).		
3	Set Control Order using the Function Control <i>FNC</i> in the model menu. Here you may choose what sticks and sliders control the different functions.	Set Flaperon <i>FPN</i> (recommended). Aileron differential <i>ADF</i> doesn't allow Flaperon mixing. You can get differential in <i>FPN</i> by setting endpoints.	To get Butterfly control on the throttle stick, change the SF2 control to J3. If you will want full-span camber changing, assign SF1 to LS (for left slider control) or whatever device you want (LS is the default). Be sure to cut its authority down in all flight modes using AFR; around 10% is plenty for most models. Check direction of travel.	

	Instruction	2-S	4-S	5-S
4	Set V-Tail (if needed). Choose motor control channel from spares (if used).			
5	Plug Servos into Correct Channel Numbers * = V-Tail outputs Unnumbered receiver outputs are spares.	Ch 1 = Ail 1 Ch 2 = Elevator* Ch 3 = Airbrake Ch 4 = Rudder* Ch 5 = Ail 2 (in FLP mode) Ch 7 = Ail 2 (in DIF mode)	Ch 1 = Ail 1 Ch 2 = Elevator* Ch 3 = Airbrake Ch 4 = Rudder* Ch 5 = Flap 1 Ch 6 = Flap 2 Ch 7 = Ail 2	Ch 1 = Ail 1 Ch 2 = Elevator* Ch 3 = Airbrake Ch 4 = Rudder* Ch 5 = Flap 1 Ch 6 = Flap 2 Ch 7 = Ail 2 Ch 8 = Brake flap
6	Use Reversing Function REV in the Model menu to set proper throw directions. Reverse channels as		necessary to correct throws.	
7	If you will use multiple flight modes, choose and set switch for default flight mode. We recommend using the center position of the 3-position switch E.		Typically down is used for launch presets, and up is used for speed presets. These conditions are set in step 16.	
8	Set Aileron Differential ADF . More up (reflex) than down helps make coordinated low-drag turns,		Approximately 2:1 up:down ratio is a good starting point. At high speeds less or none is needed.	
9	Set Aileron->Rudder coupling A->R if desired. Only a small percentage is needed, around 10—15%. This reduces drag of fuselage yawing to make low-drag turns. Be sure that rudder moves in correct direction.		Little or no coupling is needed for high speeds. Use the switch SWT command to define the ON position of SW-E.	
10	Glide path control activation. Set these up for steeper descent and more precise landings.	Set flap travel (usually as much as you can get and still have roll control). Spoilers will help steepen approach.	Set Butterfly BFY . Be sure Aileron go up equal amounts, speed flaps go down equal amounts. Lots of flap (90°) is better.	Set Butterfly BFY . Be sure Ailerons go up equal amounts. Brake Flaps may be coupled to speed flaps BKF for more drag.
11	Couple Flaps to elevator for tighter pylon turns ("Nobler" mixing). Most models don't need much (1/16"-1/8" at wing trailing edge)	Set Elev->Flap E->F	Set Elev->Speed Flap ESF mixing. Add Speed Flap->Aileron Mixing SPF at 100% for uniform wing camber change.	Set Elev->Brake Flap EBF mixing. Brake Flaps may be coupled to speed flaps using BKF for more lift capability if desired.
12	Faster roll rate mixing (have the speed flaps move as ailerons)		Aileron->Speed Flap mixing ASF. Suggest 50% for thermalling, 80-100% for speed.	Aileron->Speed Flap mixing ASF . Suggest 50% for thermalling, 80-100% for speed.
13	Trim inboard flaps	—	Set speed flap trim SFT— . This might be used for landing or cruise preset positions.	
14	Switchable elevator trim (makes small changes)	Set Elev trim offset ETM for different flight conditions.	~	Set Elev trim offset ETM for different flight conditions.
15	Set Throw Volumes ATV to prevent binding. Check each servo at each extreme of motion in all flight modes.			

	Instruction	2-S	4-S	5-S
16	<p>After a few flights to trim the model, you may set different flight modes. You may trim for launch flap/ aileron droop, speed camber reflex, or other desired flight modes. You can have different subtrims, rudder coupling, differential, aileron/speed flap mixing. In fact you may change EVERY parameter between flight modes,</p> <p>Use the Condition Select CSL button in the Model Menu. This function allocates the necessary number of flight conditions to the model memory. Note the condition number next to the D (default) in the display. This is the set of conditions that will be copied into a new condition and modified. Also note the number after the next display. You will copy to this condition,</p> <p>Now use the Copy Condition CPC from the System menu to copy the contents of the default condition into another. Choose the default flight condition number, press the SET button, then choose the second condition number in the lower box "TO CONDITION." Give the command to copy.</p> <p>The switch that calls the flight conditions should be selected. Return to the Condition Select CSL function, press the desired flight condition number, and use the SWT button to choose the desired switch location,</p> <p>Once you have selected a condition, use the CNA (Condition Name) button to label the new condition (you may have to flip the chosen switch to the correct position to get the desired condition). Now,</p>		<p>you may go through the Condition menu items to get the desired settings in the new mode. Read the condition name after the model name to be sure you are changing the condition you want.</p> <p>Now, you may go through the Condition menu items (i.e. ADF, A->R, etc.) to get the desired settings in the new mode. Read the condition name after the model name to be sure you are changing the condition you want.</p> <p>As an example, for NORML we use approximately 50% ASF mixing, 50% differential, and 10% A->R coupling. In the speed mode, we use 100% ASF for better roll rate, 0% differential, and turn A->R down to zero because adverse yaw is very small at high speeds. Subtrims and Trim Mixes 1 & 2 may be used to offset controls for different conditions, like flap droop for launch.</p> <p>You can modify all of the settings and adjust each as you like. You can add a time delay on many of the menus: look for a DELAY setting. You can also have the mixing ratio vary with the motion of another slider or knob: look for the VOL key on the EI button in some menus.</p> <p>(Note: In the 4-servo model, if you don't mind having the same differential, mixing, etc. settings for all modes, you can easily set Trim Mix 1 & Trim Mix 2 TM1 , TM2 to droop flaps and ailerons, and trim elevator for both launching and speed. Then you do not have to use any other flight condition settings.)</p>	

After test flying, change compensation for glide path commands reacting & changing trim:

	Instruction	2-S	4-S	5-S
17	Set elevator presets for launch and speed, or other flight conditions as desired. Make small changes.			
18	Reduce rudder coupling A->R if fuselage points inward to center of turns, and increase if the fuse points outwards during turns. Turn it off for speed.			
19	Glidepath trim correction (Caution: make only small changes in elevator mixing)	For flap actuation trim change: Set Flap->Elev F->E	For Butterfly trim change: Set Butterfly-Elev BYE	Set Butterfly-Elev BYE . Brake Flap->Elev BKF
20	Airbrake or spoiler trim correction	Use Airbrake->Elevator ABE mixing to correct trim change due to airbrake/ spoiler. Make small changes as trim is very sensitive to this.		

AILERON DIFFERENTIAL (ADF)

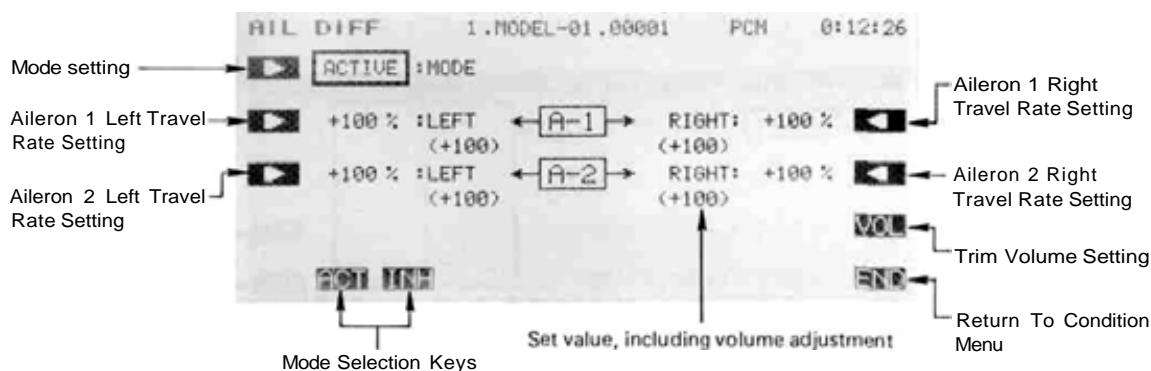
This applies to all three sailplane types, 5-S, 4-S, and 2-S. The aileron differential function is used to provide more deflection for the up aileron than for the down aileron. Depending on the model design, anywhere from 5 to 30% more up deflection is used. The up and down travel of each servo may be set separately. If desired, the amount of down aileron deflection may be trimmed in flight with a knob or trimmer.

When this function is defined, the required two servos plug into receiver output channels CH1 (aileron 1) and CH7 (aileron 2).

Setting Up Aileron Differential

Activation of command

In the Condition Menu, press the ADF key to get the AIL DIFF menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) activate or inhibit the aileron differential function.



Aileron 1 Travel Setting

You now set the amount of servo throw for Aileron 1. Press the B key to activate travel setting for the Left direction and set the throw with the numeric keys. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from -120 to +120%, the initial value is +100%.

Now set the travel for the Right throw on Aileron 1. Press the Q key to activate travel setting for the Right direction and set the throw with the numeric keys as before.

Aileron 2 Travel Setting

The setting process given above is repeated for Aileron 2. Press the C key to activate travel setting for the Left direction and set the throw with the numeric keys.

Finally, set the travel for the Right throw on Aileron 2. Press the P key to activate travel setting for the Right direction and set the throw with the numeric keys as before.

Trim volume setting

You may set up the Aileron Differential function so that its effect may be changed in flight by moving a trim control. The trim control adjusts the volume within $\pm 25\%$ of the set differential rate. This option is not activated at initial setup.

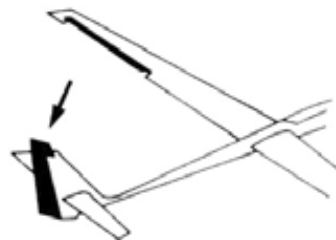
Call the volume setting screen by pressing the VOL O key, and select the desired control using the screen menus (for a description of the volume setting method, see page 37).

Use the END (N) key to leave this menu.

ALLERON-RUDDER MIXING (A-R)

This function is used to mix rudder operation with aileron operation automatically, to make realistic, coordinated turns. It is especially effective when turning and banking scale models or large models that resemble full-sized aircraft. This mixing keeps the fuselage aligned into the wind, reducing drag, and helps to make what are called "coordinated turns."

The function allows you to set up the left and right mixing rates independently. Furthermore, mixing can be turned on and off during flight by setting a switch, or it may be set to stay on all the time if the function is activated (ACT) without



setting an ON/OFF switch. Also, it is possible to adjust the amount of rudder coupling in-flight, by setting a volume control.

Setting Up Rudder Coupling

Activation of command

In the Condition Menu, press the A->R key to get the AIL TO RUD menu, as shown below. Use the A (D) key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit rudder coupling.

Mode setting → **INHBIT** :MODE (OFF)

Mixing —Leftside— → **+ 50 %** :LEFT (+ 50)

setting I—Right side → **+ 50 %** :RIGHT (+ 50)

Mode Selection → **ACT** **INH**

Values in () are the mixing rate, including the trim volume.

ON/OFF switch setting → **SWT**

Trimming volume setting → **VOL**

Return to Condition screen → **END**

Setting the Mixing Ratio — Left and Right

First set the amount of mixing for left aileron command. Press the C key to activate mixing ratio for the Left direction and set the value with the numeric keys E to M . The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from —100 to +100%, the initial value is +50%.

Now set the amount of mixing for the Right aileron command. Press the D key to activate mixing ratio for the Right direction and set the throw with the numeric keys as before.

On/Off Switch Setting

On initial setting, an activation switch for rudder coupling is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

Trim Volume setting

You may set up the Rudder coupling function so that its effect may be changed in flight by moving a trim control. The trim control adjusts the volume within $\pm 25\%$ of the set mixing rate. This option is not activated at initial setup.

Call the volume setting screen by pressing the VOL O key, and select the desired control using the screen menus (see page 37 for a description of the volume setting method).

Use the END (N) key to leave this menu.

AILERON-SPEED FLAP COUPLING (ASF)

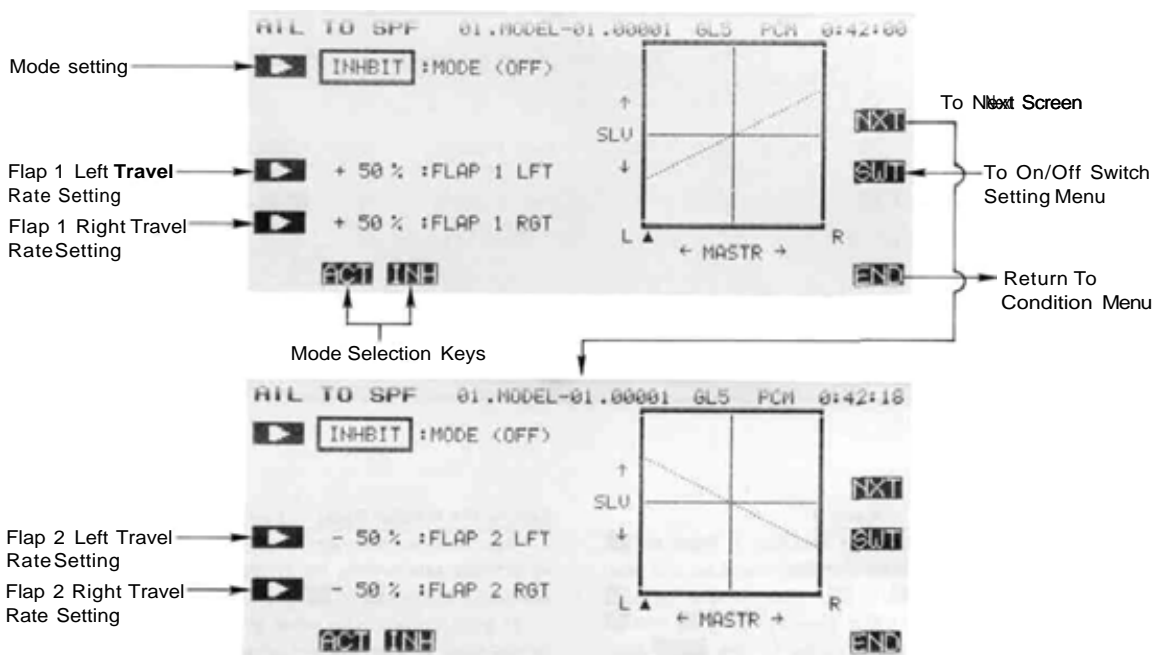
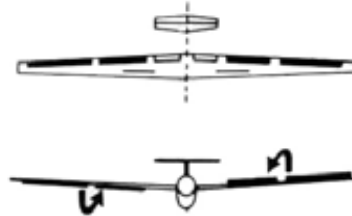
This function may be used to control mixing from the ailerons to the speed flaps, making the entire wing act as ailerons. When the aileron stick is moved, the aileron and speed flap servos operate simultaneously, which improves the model's roll rate.

Setting Up Speed Flap Coupling

Activation of command

In the Condition Menu, press the ASF key to get the AIL TO SPF menu, as shown below. Use the A (D) key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit speed flap coupling.

The left and right deflection angles of the speed flap servos can be adjusted. Speed Flap mixing can be made to turn on and off during flight by setting a switch. Initially, an ON/OFF switch is not defined, so mixing remains on all the time.



Flap 1 Left Travel Setting

First set the amount of mixing throw for Flap 1. Press the C key to activate travel setting for the Left direction and set the throw with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from -100 to +100%, the initial value is +50%.

Now set the travel for the Right throw on Flap 1. Press the D key to activate travel setting, and set the throw with the numeric keys as before.

Flap 2 Left Travel Setting

You now set the amount of mixing throw for Flap 2. Press the NXT Q key to get to the flap 2 menu, then press the C key to activate travel setting for the Left direction and set the throw with the numeric keys E to M as you did for Flap 1.

Now set the travel for the Right throw on Flap 2. Press the D key to activate travel setting, and set the throw with the numeric keys as before.

On/Off Switch Setting

On initial setting, an activation switch for speed flap mixing is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

V-TAIL (VTL)

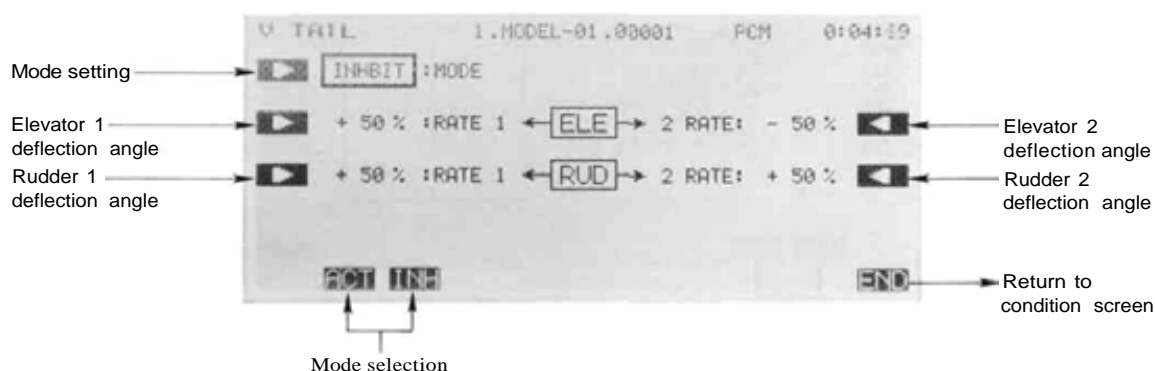
This function automatically sets up the PCM 1024Z to control a V-tail sailplane with combined elevator and rudder functions. It requires two servos, one hooked up to receiver output CH2 (elevator 1/rudder 2) and the second plugged into CH4 (elevator 2/rudder 1). The elevator and rudder deflections can be adjusted independently.



Setting Up V-Tail Mixing

Activation of command

In the Condition Menu, press the VTL key to get the V-TAIL Mixing menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit V-Tail Mixing.



Setting the Elevator Rates - 1 and 2

Begin by setting the rate for Elevator 1. Press the B key to activate rate setting for Elevator 1 and set the rate with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the elevator stick to the other side and continue. Your setting may vary from -100 to +100%. the initial value is set to +50%.

Now set the rate for Elevator 2. Press the Q key to activate Elevator 2 rate setting and set the rate with the numeric keys as before.

Setting the Rudder Rates - 1 and 2

You now set the rate for Rudder 1. Press the C key to activate rate setting for Rudder 1 and set the rate with the numeric keys E to M as before.

If you are not sure what you are changing, hold the rudder stick to one side and press different keys — if there is no effect, move the rudder stick to the other side and continue. The initial value is +50%, but your setting may vary from -100 to +100%.

Now set the rate for Rudder 2. Press the P key to activate Rudder 2 rate setting and set the rate with the numeric keys as before.

Checking Your Work

After you have set up the V-Tail rates, be sure that they move the correct directions. For up elevator command, both V-tails should move upward. For right rudder command, the trailing edge of both surfaces should move to the right. If they do not, use the +/- to reverse the direction as needed.

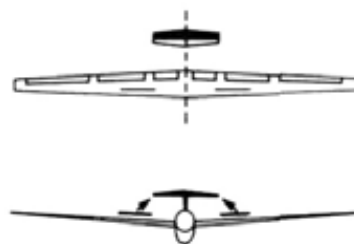
Use the END (N) key to leave this menu.

AIRBRAKE/SPOILER/GEAR TRIM COMPENSATION (ABE)

This mixing is used to compensate for trim changes when airbrakes, spoilers, or landing gear are operated. It may be used to correct dropping or raising of the nose by adding suitable elevator compensation.

The mixing rate to elevator can be adjusted independently at the high and low sides of the stick operation. If desired, the mixing neutral position can be offset from the air brake neutral position.

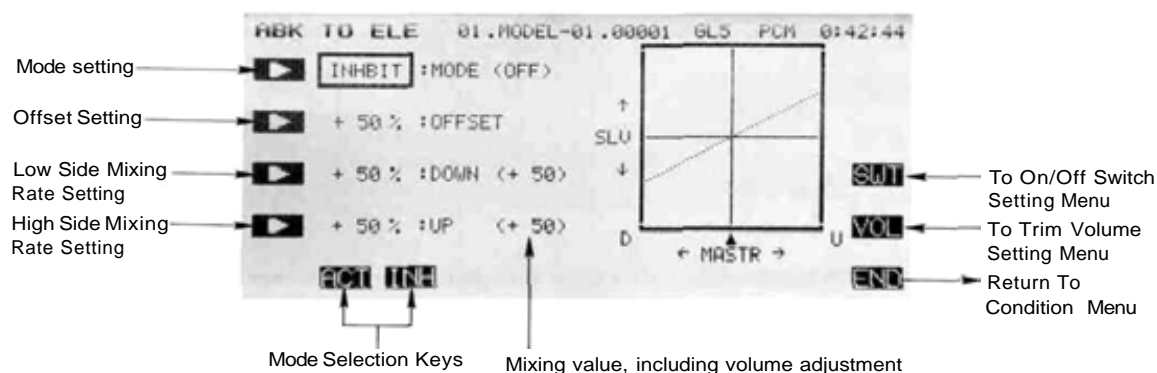
Airbrake compensation mixing can be turned on and off during flight if a switch is defined, otherwise, if activated it remains on always. The amount of mixing can also be trimmed by setting a volume control.



Setting Up Airbrake Mixing

Activation of command

In the Condition Menu, press the ABE key to get the ABK TO ELE menu as shown below.



Mode Setting

Use the A key to activate mode setting, then press ACT or INH keys (F and G) to activate or inhibit airbrake mixing.

Offsetting the Mixing Neutral Location

Press the B key. Then set the airbrake control to the desired offset position and press the SET F key.

Setting the Low-Side Mixing Rate

Press the C key, and then set the low-side mixing rate with the numeric keys 1 to 100 . The setting range may vary from -100 to +100% and the initial value is +50%.

High Side Mixing Rate Setting

Press the D key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%.

ON/OFF Switch Setting

An ON/OFF switch is not defined initially. To define one, display the switch setting screen by pressing the SWT P key. Use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

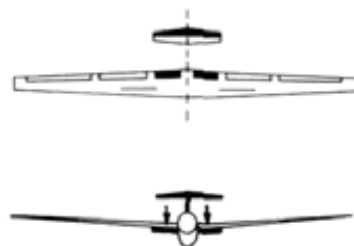
Mixing Rate Trim Volume Selection and Operating Direction

A mixing rate volume control is not defined initially. To define one, display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

ELEVATOR-BRAKE FLAP MIXING (EBF)—5-S

This mixing is used to command the lowering of the brake flaps when up elevator is given. This coupling increases the lift that the wing can deliver, resulting in tighter turns and better maneuverability.

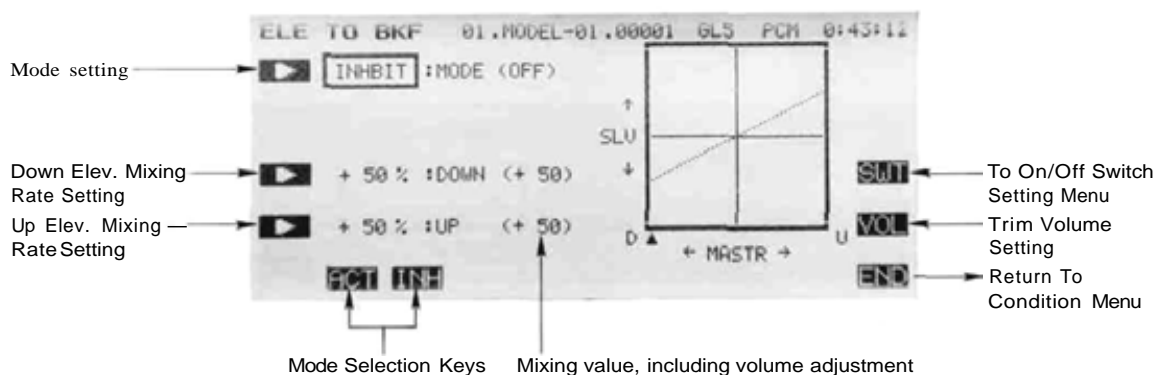
The mixing rates for elevator up and down deflections can be set independently (for many airfoils, down elevator to up flap mixing is not recommended because of a large drag increase). Mixing can be turned on and off during flight by setting a switch, and the amount of mixing may also be trimmed in flight by moving a volume control.



Setting Up Elevator-Brake Flap Coupling

Activation of command

In the Condition Menu, press the EBF key to get the ELE TO BKF menu, as shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit brake flap coupling.

Setting the Down Elevator Mixing Rate

Press the C key, and then set the down elevator mixing rate with the numeric keys E to M. The setting range may vary from -100 to +100% and the initial value is +50%.

Up Elevator Mixing Rate Setting

Press the D key and set the up elevator mixing rate with the numeric keys E to M. The setting range may vary from -100 to +100% and the initial value is +50%.

ON/OFF Switch Setting

Display the switch setting screen by pressing the SWT P key. Initially, SW (C) is set to be ON at 1 position, but you may use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

Mixing Rate Trim Volume Selection and Operating Direction

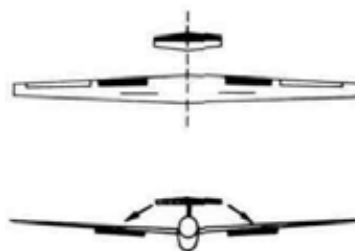
A mixing rate volume control is not defined initially. To define one, display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

Use the END (N) key to leave this menu.

ELEVATOR-SPEED FLAP COUPLING (ESF)—4-S

This mixing is used to command the lowering of the speed flaps when up elevator is given. This coupling increases the lift that the wing can deliver, resulting in tighter turns and better maneuverability.

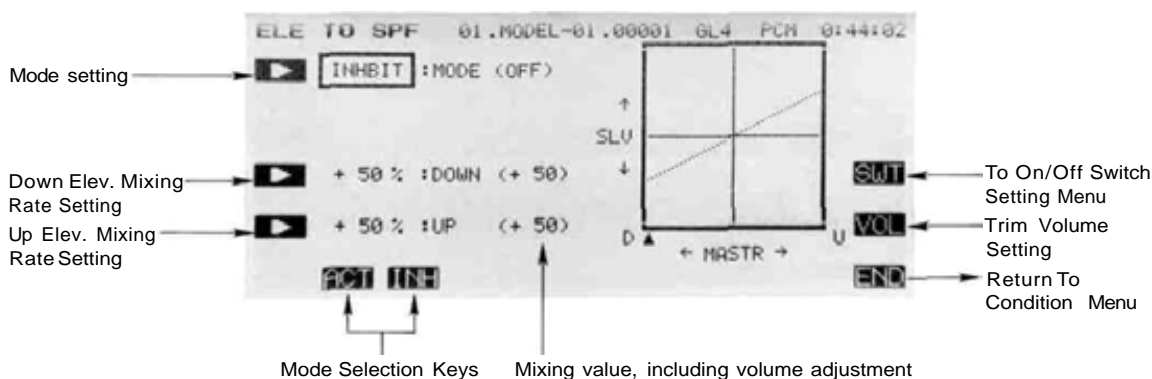
The mixing rates for elevator up and down deflections can be set independently (for many airfoils, down elevator to up flap mixing is not recommended because of a large drag increase). Mixing can be turned on and off during flight by setting a switch, and the amount of mixing may also be trimmed in flight by moving a volume control.



Setting Up Elevator-Speed Flap Coupling

Activation of command

In the Condition Menu, press the ESF key to get the ELE TO SPF menu, as shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit speed flap coupling.

Setting the Down Elevator Mixing Rate

Press the C key, and then set the down elevator mixing rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%.

Up Elevator Mixing Rate Setting

Press the D key and set the up elevator mixing rate with the numeric keys E to M . The setting range may vary from -100 to +100% and the initial value is +50%.

Choosing An ON/OFF Switch

Display the switch setting screen by pressing the SWT P key. Initially, SW (C) is set to be ON at 1 position, but you may use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

Mixing Rate Trim Volume Selection and Operating Direction

A mixing rate volume control is not defined initially. To define one, display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

Use the END (N) key to leave this menu.

BRAKE FLAP MIXING (BKF)—5-S

This function is used to define the following types of brake flap mixing:

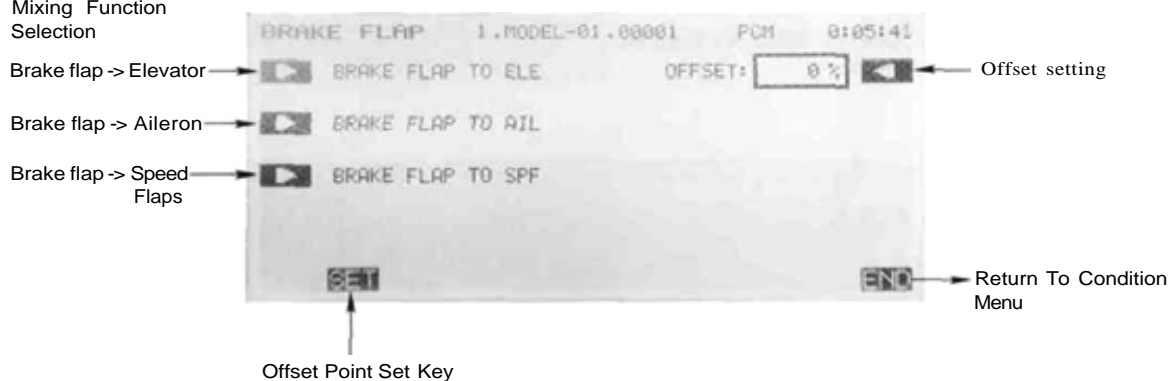
- Brake flap -> elevator mixing
- Brake flap -> aileron mixing
- Brake flap -> speed flaps mixing

These mixing functions are useful for compensating for flap actuation trim changes, increasing the lift capability of the wing, making tighter turns, and increasing maneuverability. The mixing neutral position can be offset from the brake flaps neutral position.

Activation of Brake Flap Mixing

In the Condition Menu, press the BKF key to get the BRAKE FLAP menu, as shown below.

Mixing Function Selection



Offsetting the Mixing Neutral Location

Press the R key. Then set the brake control to the desired offset position and press the SET F key.

Mixing Selection

Brake Flap -> Elevator Mixing may be set up by pressing the A key. For a description of the setting method, see page 133 following.

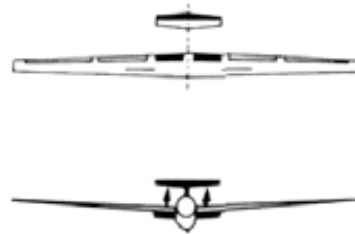
Brake Flap -> Aileron Mixing: use the B key to call the setting screen. For a description of the setting method, see page 134.

Brake Flap -> Speed Flaps Mixing: call the setting screen by pressing the C key. A description of the setting method may be found on page 135.

BRAKE FLAP-ELEVATOR MIXING —5-S

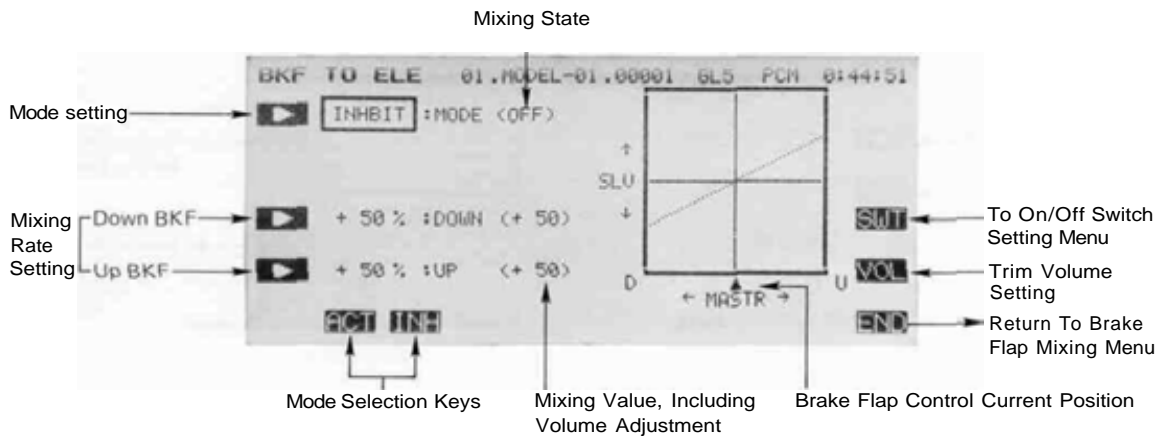
This function is used to correct the trim change that occurs when the brake flaps are moved by applying a small amount of elevator. For example, if the fuselage pitches up when the brake flaps are actuated, the elevator is commanded down simultaneously.

The mixing rates for up and down brake flap commands can be set independently. Mixing can be turned on and off during flight by setting a switch, and you may also define a volume control to change the mixing rate in flight. Brake flap mixing remains on all the time unless an ON/OFF switch is defined.



Activation of Brake Flap-Elevator Mixing

In the Condition Menu, press the BKF key to get the BRAKE FLAP menu. Press the A key to get the BKF TO ELE menu shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit brake flap coupling.

Setting the Down Brake Flap Mixing Rate

Press the C key, and then set the down elevator mixing rate with the numeric keys E to M. The setting range may vary from —100 to +100% and the initial value is +50%.

Up Brake Flap Mixing Rate Setting

Press the D key and set the up elevator mixing rate with the numeric keys E to M. The setting range may vary from -100 to +100% and the initial value is +50%.

ON/OFF Switch Setting

On initial setting, an activation switch for brake flap-elevator mixing is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, display the switch setting screen by pressing the SWT P key, and use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

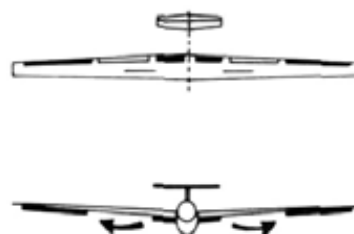
Mixing Rate Trim Volume Selection and Operating Direction

Display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

BRAKE FLAP-AILERON MIXING—5-S

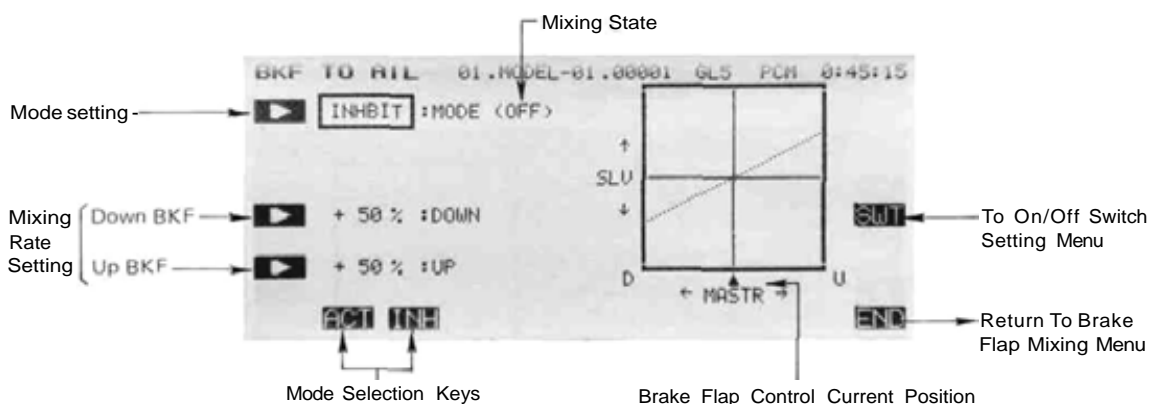
This mixing is used to make the ailerons operate together as brake flaps. When the brake flaps are deployed, the brake flaps and ailerons all perform the brake flap operation simultaneously.

The mixing rates for up and down brake flap movement can be set independently. You may also set up a switch for switching this mixing on and off during flight. If this mixing is activated without defining an ON/OFF switch, mixing remains on all the time.



Activation of Brake Flap-Aileron Mixing

In the Condition Menu, press the BKF key to get the BRAKE FLAP menu. Press the B key to get the BKF TO AIL menu shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit brake flap coupling.

Setting the Down Brake Flap Mixing Rate

Press the C key, and then set the down aileron mixing rate with the numeric keys E to M. The initial value is +50% and the setting range may vary from -100 to +100%.

Up Brake Flap Mixing Rate Setting

Press the D key and set the up aileron mixing rate with the numeric keys E to M. The setting range may vary from -100 to +100% and the initial value is +50%.

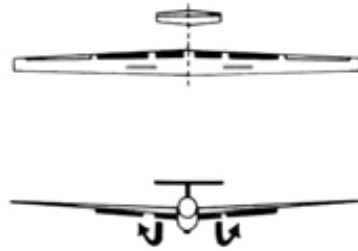
ON/OFF Switch Setting

On initial setting, an activation switch for brake flap-aileron mixing is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, display the switch setting screen by pressing the SWT P key, and use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

BRAKE FLAP-SPEED FLAP MIXING—5-S

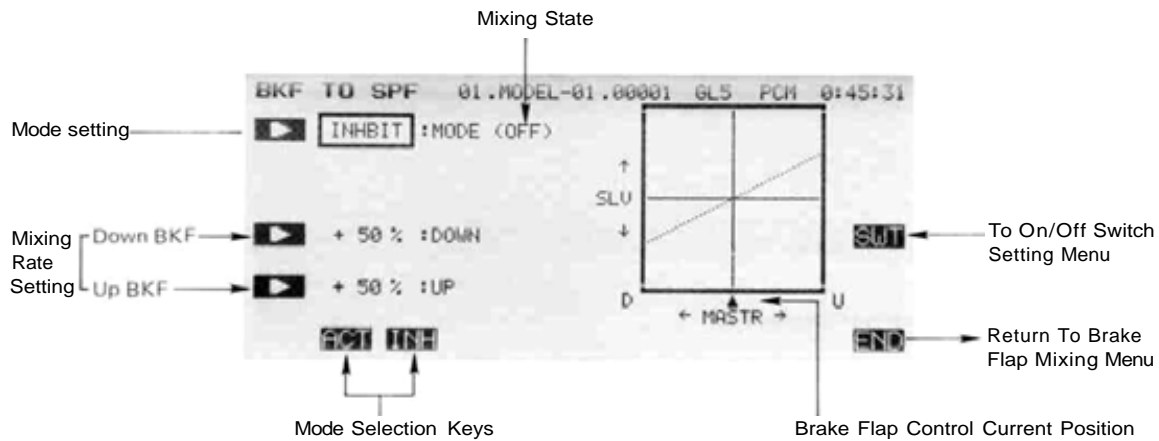
This mixing is used to make the speed flaps operate together as brake flaps. When the brake flaps are deployed, the brake flaps and speed flaps all perform the brake flap operation simultaneously.

The mixing rates for up and down brake flap movement can be set independently. You may also set up a switch for switching this mixing on and off during flight. If this mixing is activated without defining an ON/OFF switch, mixing remains on all the time.



Activation of Brake Flap->Speed Flap Mixing

In the Condition Menu, press the BKF key to get the BRAKE FLAP menu. Press the C key to get the BKF TO SPF menu shown below.



Use the A () key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit brake flap coupling.

Setting the Down Brake Flap Mixing Rate

Press the C key, and then set the down speed flap mixing rate with the numeric keys E to M . The initial value is +50% and the setting range may vary from -100 to+100%.

Up Brake Flap Mixing Rate Setting

Press the D key and set the up speed flap mixing rate with the numeric keys E to M. The setting range may vary from -100 to+100% and the initial value is+50%.

ON/OFF Switch Setting

On initial setting, an activation switch for brake flap-speed flap mixing is not set, meaning that once activated, is on all the time. If you would like to set a switch to turn it on and off. display the switch setting screen by pressing the SWT P key, and use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

SPEED FLAP MIXING (SPF)—4-S

This function is used to define the following types of speed flap mixing:

Speed flap - elevator mixing

Speed flap - aileron mixing

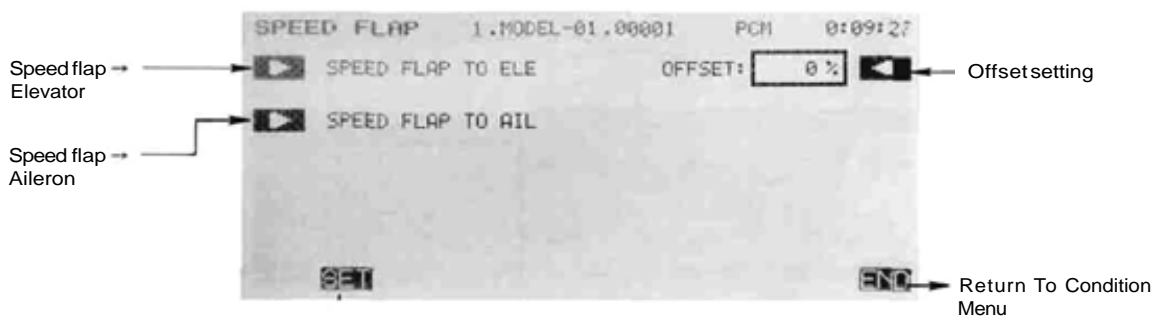
These mixing functions are useful for com-

pensating for flap actuation trim changes, increasing the lift capability of the wing, making tighter turns, and increasing maneuverability. The mixing neutral position can be offset from the speed flaps neutral position.

Activation of Speed Flap Mixing

In the Condition Menu, press the SPF key to get the SPEED FLAP menu, as shown below.

Mixing Function Selection



Offsetting the Mixing Neutral Location

Press the R key. Then set the speed flap control to the desired offset position and press the SET F key.

Mixing Selection

Choose from the two types of mixing as given below.

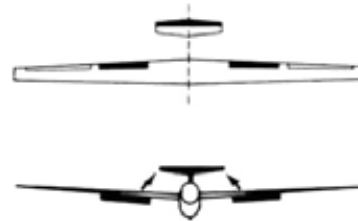
To set Speed Flap - Elevator Mixing, call up the setting screen by pressing the A key. For a description of the setting method, see page 137 following.

Speed Flap -> Aileron Mixing: use the B key to call the setting screen. For a description of the setting method, see page 138.

SPEED FLAP-ELEVATOR MIXING—4-S

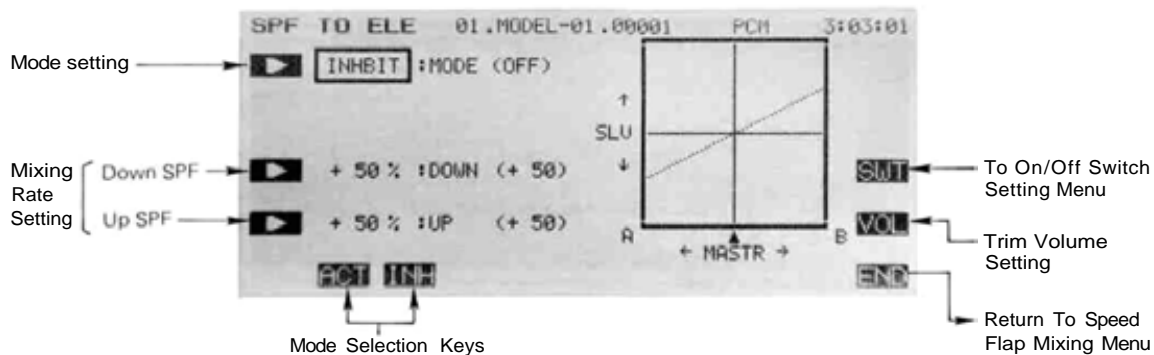
This function is used to correct the trim change that occurs when the speed flaps are moved by applying a small amount of elevator. For example, if the fuselage pitches up when the speed flaps are actuated, the elevator is commanded down simultaneously.

The mixing rates for up and down speed flap commands can be set independently. Mixing can be turned on and off during flight by setting a switch, and you may also define a volume control to change the mixing rate in flight. Speed flap mixing remains on all the time unless an ON/OFF switch is defined.



Activation of Speed Flap-Elevator Mixing

In the Condition Menu, press the SPF key to get the SPEED FLAP menu. Press the A key to set the SPF TO ELE menu shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit speed flap coupling.

Setting the Down Speed Flap Mixing Rate

Press the C key, and then set the down elevator mixing rate with the numeric keys E to M . The setting range may vary from -100 to +100% and the initial value is +50%.

Up Speed Flap Mixing Rate Setting

Press the D key and set the up elevator mixing rate with the numeric keys E to M . The setting range may vary from -100 to +100% and the initial value is +50%.

ON/OFF Switch Setting

On initial setting, an activation switch for speed flap-elevator mixing is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, display the switch setting screen by pressing the SWT P key, and use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

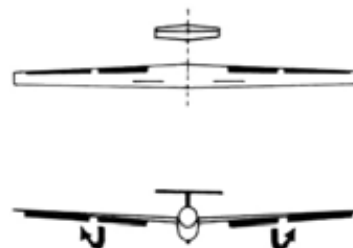
Mixing Rate Trim Volume Selection and Operating Direction

Display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

SPEED FLAP-AILERON MIXING—4-S

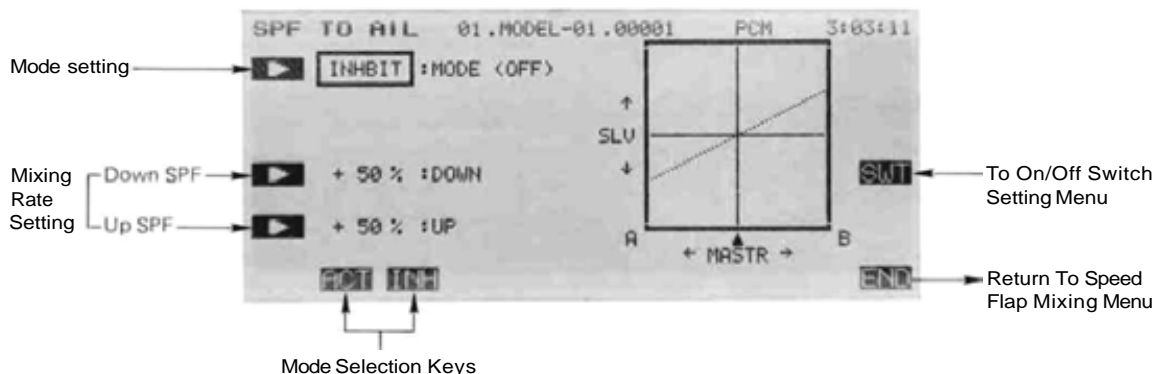
This mixing is used to make the ailerons operate together as speed flaps. When the speed flaps are deployed, the speed flaps and ailerons all perform the speed flap operation simultaneously.

The mixing rates for up and down speed flap movement can be set independently. You may also set up a switch for switching this mixing on and off during flight. If this mixing is activated without defining an ON/OFF switch, mixing remains on all the time.



Activation of Speed Flap-Aileron Mixing

In the Condition Menu, press the SPF key to get the SPEED FLAP menu. Press the B key to get the SPF TO AIL menu shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit speed flap coupling.

Setting the Down Speed Flap Mixing Rate

Press the C key, and then set the down aileron mixing rate with the numeric keys E to M. The initial value is +50% and the setting range may vary from -100 to +100%.

Up Speed Flap Mixing Rate Setting

Press the D key and set the up aileron mixing rate with the numeric keys E to M. The setting range may vary from -100 to +100% and the initial value is +50%.

ON/OFF Switch Setting

On initial setting, an activation switch for speed flap-aileron mixing is not set, meaning that once activated, it is on all the time. If you would like to set a switch to turn it on and off, display the switch setting screen by pressing the SWT P key, and use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

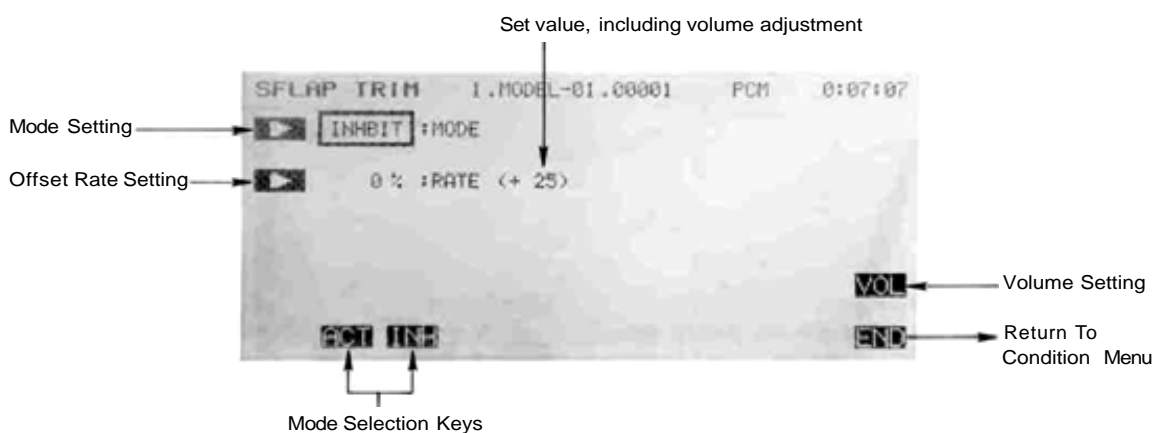
SPEED FLAP TRIM SETTING (SFT)—4-S/5-S

The Speed Flap Trim Setting function may be used to adjust the speed flap neutral position. The offset can be trimmed by setting a volume. However, the right knob RD is set at initial setting.



Activation of Speed Flap Trim

In the Condition Menu, press the SFT key to get the SFLAP TRIM menu.



Mode Setting

Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit speed flap trim setting.

Offsetting the Mixing Neutral Location

Press the B key, then set the rate with the numeric keys E to M . The initial value is 0%, but the setting may vary from -100 to +100%.

Offset Rate Trim Volume Selection and Operating Direction Setting

At initial setup, the right knob RD is defined as the trim volume control, and the adjustment rate is $\pm 25\%$. To change this, call the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37.

BUTTERFLY MIXING (BFY)—4-S/5-S

Butterfly mixing, sometimes called "crow" mixing, is a way to get effective glide path control without using spoilers. The butterfly action simultaneously raises the left and right ailerons and lowers the speed flaps (brake flaps for 5-S).

The total travel can be adjusted by CH6 volume. The butterfly neutral position can be offset from the center position. Butterfly mixing can be turned on and off during flight by setting a switch. If a switch is not set, mixing remains on all the time.

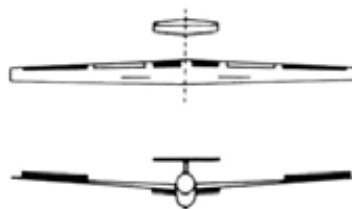
Setting Up Butterfly Mixing

Butterfly is often controlled with the throttle stick, but at initiation the control is assigned to the left knob VR(A). The FNC command in the Model menu may be used to change the assignment. In that menu, select SF2 with the J key, then press CTR. Select the throttle stick by choosing J3 with the K key (null the CTR for airbrake ABK if you want). At this time, be sure that both ailerons and speed flaps (or brake flaps for 5-S) move the proper directions. The default speed flap control is the left slider. If you use speed flap-aileron mixing, this will become the camber control.

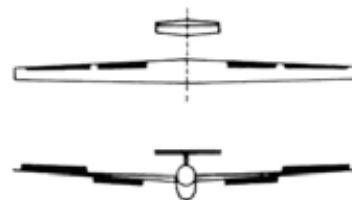
Activation of command

In the Condition Menu, press the BFY key to get the BUTTERFLY menu, as shown in the figure.

5-S BUTTERFLY OPERATION



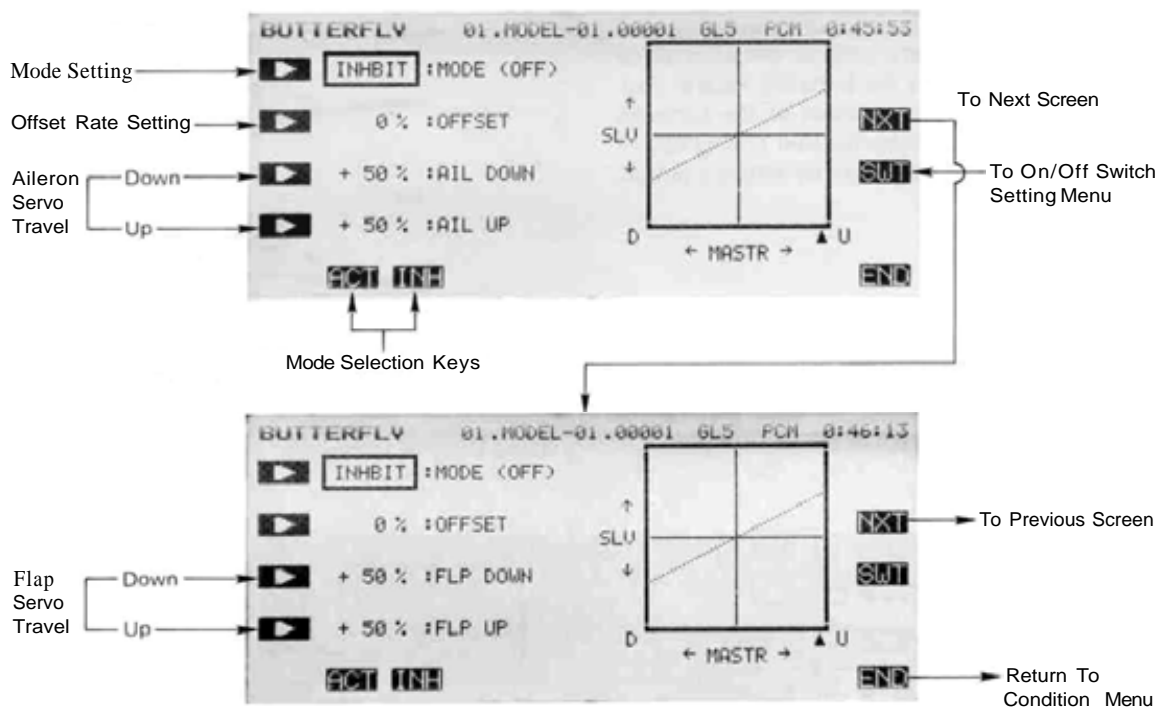
4-S BUTTERFLY OPERATION



Mode Setting

Press the A key to activate mixing, then press the ACT or INH key (F or G) to activate or inhibit the butterfly function. When you activate, you will notice two things: first, all four wing servos move, unless the throttle stick happens to be at center. Second, the Alarm light begins flashing. The alarm light is on whenever BFY is active. This is OK, except the transmitter will beep if it is on when first powered up. This is annoying, because you can't stop it!

In just a moment, you will set the offset position for the butterfly stick. The alarm light and beeping at startup may be taken care of two ways: either an activation switch may be defined, or the on position may be set slightly away from the zero-butterfly position. In the latter case, the function is off until the stick is moved slightly.



Offset Position Setting

This sets the position where butterfly begins working. Press the B key, then set the butterfly control (throttle stick or left side knob) to the position to be set and press the F (SET) key. We recommend one or two clicks down from the high throttle position.

Aileron Servo Down Side Travel Setting

Press the C key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%. If you set the BFY to be activated with the throttle stick moving down from the top (full throttle) position, this setting has no effect because motion is all on the Up side.

Aileron Servo Up Side Travel Setting

Press the D key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%. If you set the BFY with the throttle stick, this setting is the important one.

Flaps Servo Down Side Travel Setting

Press the NXT Q key to get to the flap setting menu. Then press the C key and set the rate with the numeric keys E to M . The setting range may vary from -100 to +100% and the initial value is +50%. If you set up with throttle stick, this setting has no effect.

Flaps Servo Up Side Travel Setting

Press the D key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%. This is the effective setting to make if throttle stick is used as mentioned before.

ON/OFF Switch Setting

An ON/OFF switch is not defined initially. To define one, display the switch setting screen by pressing the SWT P key. Use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 40.

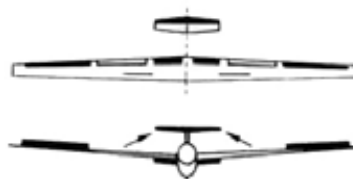
If you want BFY on all the time but don't like the alarm, press the SWT P key, then press the STK O key, to get to the stick setting menu. Choose the throttle stick J3 and set it just above the offset position. Press the SET Q button to input the On position, then move the throttle stick to be sure. You may need to switch direction with the +/- P key.

BUTTERFLY TRIM Mix (BYE)-4-S/5-S

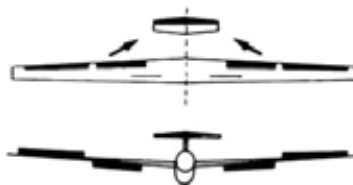
Butterfly trim mixing uses elevator motion to correct any change in model attitude when butterfly is activated. The CH6 volume up side and down side correction rates can be set independently.

The correction neutral position can be offset to a point different from the butterfly neutral position, but it should be matched to the butterfly mixing offset point. Butterfly trim mixing can be turned on and off during flight by setting a switch.

5-S



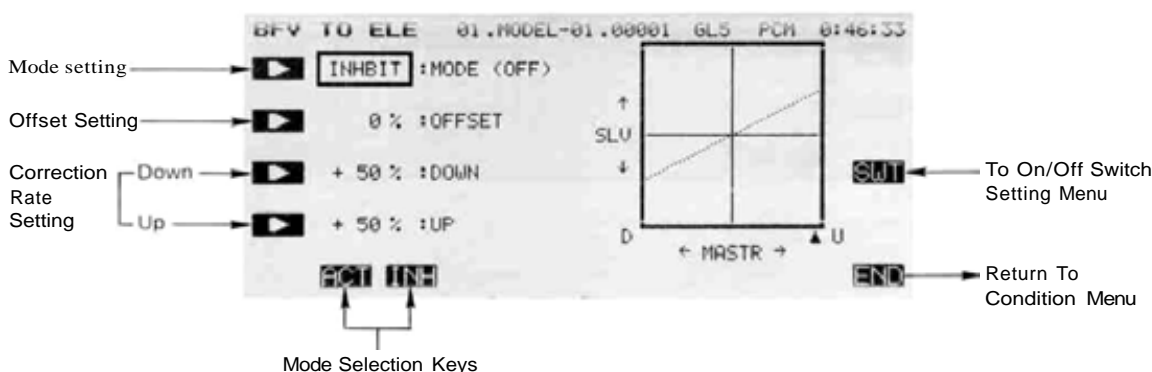
4-S



Setting Up Butterfly Trim Mixing

Activation of command

In the Condition Menu, press the BYE key to get the BFY TO ELE menu as shown below.



Mode Setting

Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit butterfly trim mixing.

Offsetting the Mixing Neutral Location

Press the B key. Then set the butterfly control to the desired offset position (usually where it begins working) and press the SFT F key.

Down Side Correction Rate Setting

Press the C key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%. If you use BFY on throttle as described previously, this may not do anything.

Up Side Correction Rate Setting

Press the D key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is +50%.

ON/OFF Switch Setting

An ON/OFF switch is not defined initially, so the mixing will be on all the time. To define one, display the switch setting screen by pressing the SWT P key. Use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

ELEVATOR TRIM (ETM)—2-S/5-S

The two Elevator Trim functions program an elevator offset position which may be called by a switch, for example to set the elevator position for thermalling or cruising. The two offsets may be set independently. Elevator trim 2 has priority.

To prevent a sudden trim change when the elevator trim is switched, a delay time can be entered. The amount of offset may be changed in flight by moving a volume control.



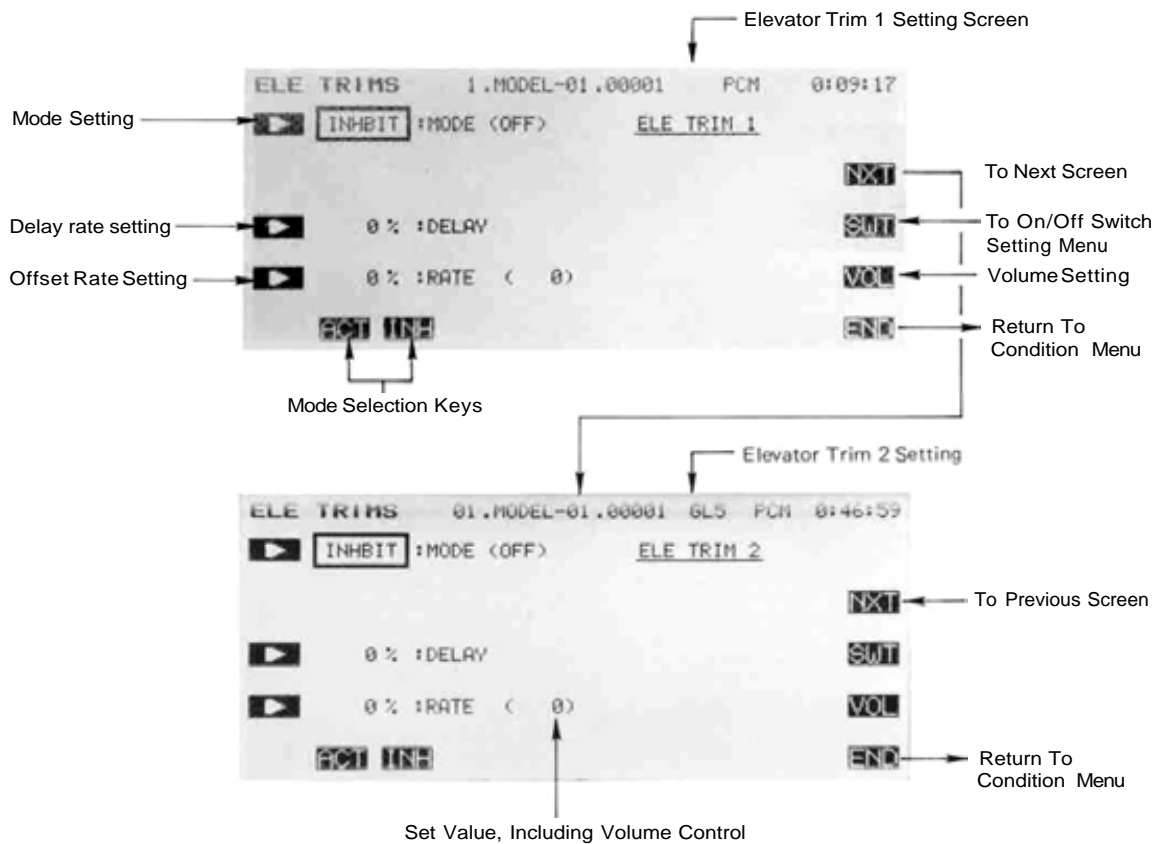
Activation of command

In the Condition Menu, press the ETM key to get the ELE TRIMS menu, as shown in the figure.

Mode Setting

The same procedure is used to program both Trim 1 and Trim 2 settings. To switch between the elevator trim 1 and 2 setting screens, press the NXT Q key.

Press the A key to activate mixing, then press the ACT or INH key (F or G) to activate or inhibit the elevator trim function.



Delay Rate Setting

Press the C key and enter the rate with the numeric keys F to M . The delay may vary from 0 to 100% (the initial value is 0%). A 100% delay takes about five seconds to move full travel.

Entering the Preset Position

Press the D key and set the rate with the numeric keys E to M . The setting range may vary from —100 to +100% and the initial value is 0%. Press the number you want. Caution: use small numbers as elevator trim changes are very effective!

ON/OFF Switch Setting

An ON/OFF switch is not defined initially. To define one, display the switch setting screen by pressing the SWT P key. Use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

Mixing Rate Trim Volume Selection and Operating Direction

A mixing rate volume control is not defined initially. To define one, display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

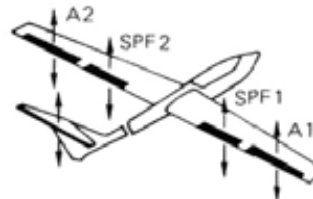
TRIM Mix 1 (TM1) & TRIM Mix 2 (TM2) - 4-S

TRIM PRESETS CALLED BY A SWITCH

Sailplane Section

The Trim Mix 1 & 2 function are used to program a preset position of the ailerons, elevator, and speed flaps with the use of a switch. They can be used to program setting for different flight conditions. For example. Trim mix 1 could be set up for launching, with speed flaps and ailerons drooped, and a slight amount of up elevator. Trim mix 2 might be used for high speed flying, with both ailerons and speed flaps reflexed slightly, and a bit of down elevator.

The Trim Mix functions can be activated during flight by setting a switch (trim mix 2 has priority). To prevent sudden trim changes when switching flight conditions, a delay can be set to provide a smooth transition between the two. This might be used during launch, so the flaps don't suddenly come back to neutral position and dump the lift all at once.

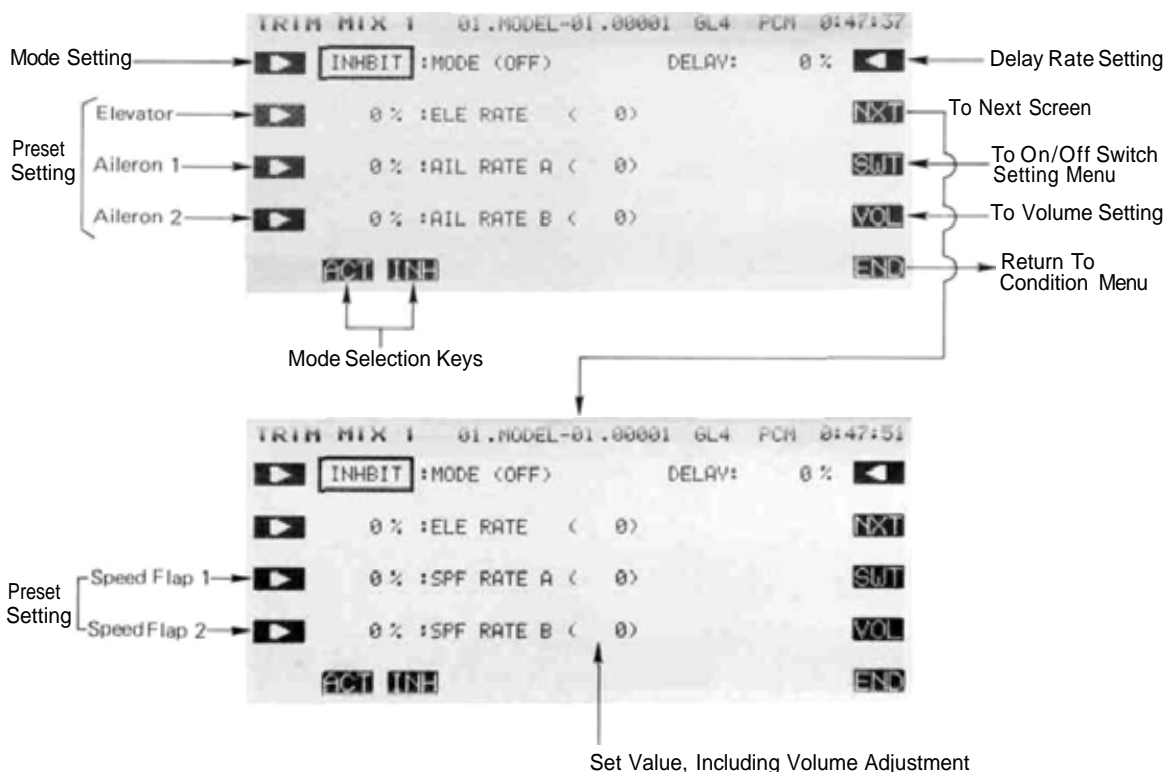


The presets as a group can be adjusted by moving a volume control. When this is done, each servo is adjusted at the same rate.

Setting Up Trim Mixing

Activation of command

In the Condition Menu, press the *TM1* (or *TM2*) key to get the TRIM MIX 1 (or 2) menu (Trim Mix 1 is shown in the figure).



Mode Setting

Press the A key to activate mixing, then press the ACT or INH key (F or G) to activate or inhibit the trim mix 1 (or 2) function. Now you will input the desired presets for the elevator, ailerons, and speed flaps.

Setting the Elevator Preset Amount

Press the B key and set the rate with the numeric keys E to M. The initial preset value is set to 0%, but may vary from -100 to +100%.

Entering the Aileron 1 Servo Preset Amount

Press the C key and set the rate with the numeric keys E to M. The setting range may vary from -100 to +100% and the initial value is 0%.

Aileron 2 Servo Preset Inputting

Press the D key and set the rate with the numeric keys E to M, as before. If your linkages and horns are identical, this setting should be the same as for Aileron 1.

Speed Flap 1 Preset

To get to the Flap preset inputting menu, press the NXT Q key. Then press the C key and set the rate with the numeric keys E to M. As with the ailerons, the initial value is set to 0%, but may vary from -100 to +100%.

Speed Flap 2 Preset

Press the D key and set the rate with the numeric keys E to M, as before. If your linkages and horns are identical, this setting should be the same as for Speed Flap 1.

Delay Rate Setting

Press the R key and set the rate with the numeric keys F to M. The initial delay is set to 0%, but may vary from 0 to 100%. A 100% delay takes about five seconds to complete changing.

ON/OFF Switch Setting

An ON/OFF switch is not defined initially. To define one, display the switch setting screen by pressing the SWT P key. Use the keys to choose the switch and ON direction you want. For a description of the switch setting method, see page 37.

We recommend using the three-position switch for Trim Mix activation. The lower position is usually defined to be the launch mode (use TM1), middle position is normal, and the upper position is used for the speed settings (use TM2).

If you use the three position switch, you will want to activate Trim mix on the middle position also. This will give the delay in switching both to and From the trim mix.

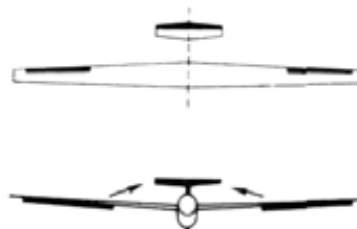
Trim Volume Control and Direction Setting

You may adjust all the presets as a group, but a volume control is not defined initially. Call the volume setting screen by pressing the VOL O key. The volume setting method is described on page 37. The volume control adds or subtracts $\pm 25\%$ from all the preset positions.

FLAP-ELEVATOR Mix (F-E)—2-S

This function is used to compensate for trim changes when flaps are deployed for slow flight or landing by mixing in a small movement of elevator. The elevator should be adjusted to move only a small deflection amount: too much elevator can make the model difficult to control.

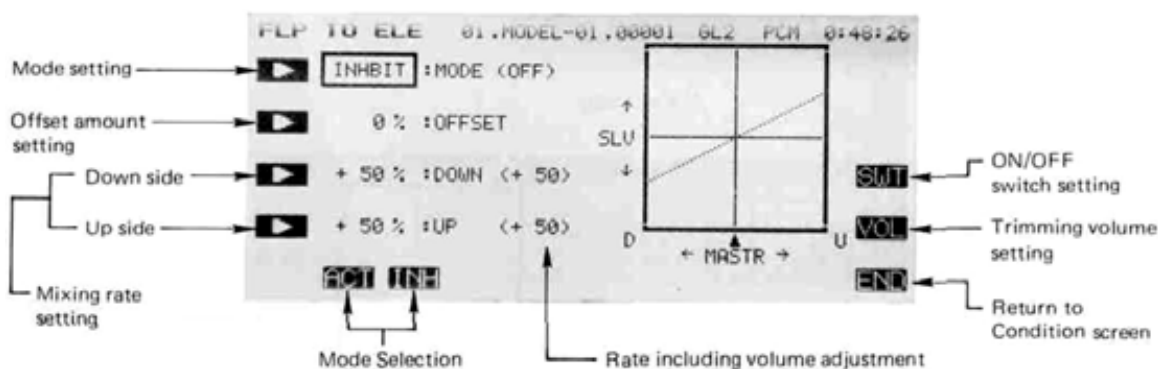
The amount of correction can be adjusted separately for both positive and negative flap inputs, and the neutral mixing position can be offset from the flap neutral position. Flap-to-elevator mixing can be turned on and off during flight by setting a switch, but if an ON/OFF switch is not set, it remains on all the time. The amount of mixing can be changed by setting a volume control.



Setting Up Flap-to-Elevator Mixing

Activation of command

In the Condition Menu, press the F->E key to get the FLP TO ELE menu shown below.



Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit flap-to-elevator coupling.

Offset Position Setting

Use the B key to activate offset setting mode. Then set the flap control to the offset position, and press the SET key F to store the desired position in memory.

Setting the Mixing Ratio — Down and Up Side

You now set the amount of mixing for down flap command. Press the C key to activate mixing ratio for the down direction and set the value with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction. Your setting may vary from -100 to +100%, the initial value is set to +50%.

Now set the amount of mixing for the up flap command. Press the D key to activate mixing ratio for the Up direction and set the throw with the numeric keys as before.

On/Off Switch Setting

Initially an activation switch for is not set, meaning that once activated, this function is on all the time. If you would like to set a switch to turn it on and off, call the Switch Setting screen by pressing the VOL O key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37.

Trim volume setting

You may set up the Flap-to-Elevator mixing so that its effect may be changed in flight by moving a trim control. The trim control allows you to adjust the volume within $\pm 25\%$ of the set mixing rate, which can be handy for getting the best value while flying the model. This option is not activated at initial setup.

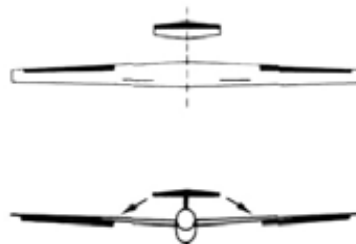
Call the volume setting screen by pressing the key, and select the desired control using the screen menus (for a description of the volume setting method, see page 37).

Use the END (N) key to leave this menu.

ELEVATOR-FLAP Mix (E-F)—2-S

This mixing is used to droop the flaps whenever an up elevator command is given (and may be set up for down elevator as well, helpful during 'outside' maneuvers). It helps aerobatic aircraft to make tight, square corners in maneuvers.

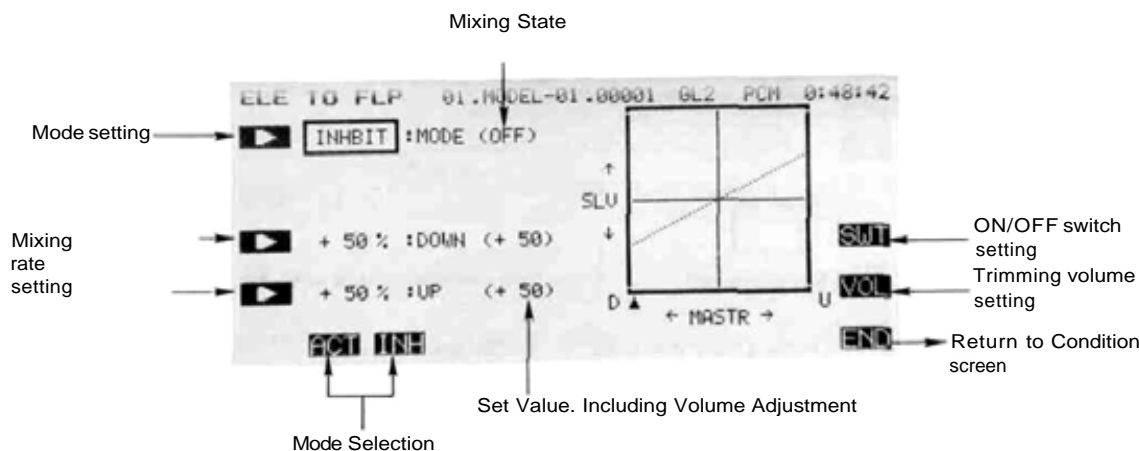
Elevator-to-flap mixing can be set up to be turned on and off during flight by a switch (if no switch is activated, this mixing remains on all the time). You can also set the flap trim rate in this function. If the flaperon function is activated, the elevators are mixed with the ailerons, otherwise, the mixing is with the flaps only.



Setting Up Elevator-to-Flap Mixing

Activation of command

In the Condition Menu, press the E->F key to get the ELE TO FLP menu shown below. Use the A key to activate mode setting, then press the ACT or INH keys (F and G) to activate or inhibit Elevator-to-Flap.



Setting the Mixing Ratio - Down and Up Side

You now set the amount of mixing for down elevator command. Press the C key to activate mixing ratio for the Down direction and set the value with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- key may be used to reverse the throw direction. Your setting may vary from -100 to +100%, the initial value is set to +50%.

Now set the amount of mixing for the up elevator command. Press the D key to activate mixing ratio for the Up direction and set the throw with the numeric keys as before.

On/Off Switch Setting

On initial setting, the activation switch for Elevator-to-

Flap mixing is set as SW C on at the upper position. If you would like to change the switch or turn mixing on all the time, call the Switch Setting screen by pressing the SWT P key. Then use the keys to choose the desired switch location and on direction. For more information on the switch setting method, see page 37).

Mixing Rate Trim Volume Selection and Operating Direction

A mixing rate volume control is not defined initially. To define one, display the volume setting screen by pressing the VOL O key. For a description of the volume setting method, see page 37. The volume control adjusts $\pm 25\%$ of the set mixing rate.

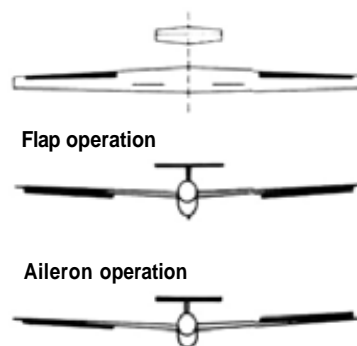
Use the END (N) key to leave this menu.

FLAPERON MIXING (FPN)—2-S

This function allows you to program the ailerons to work in the same direction, giving a flap response as well as aileron control (see figure). For good square maneuvers, and landing, both ailerons can be raised and lowered simultaneously. While this function is on, regular aileron operation is always present.

The Flaperon function requires two separate channels: Receiver CH1 (aileron 1/flap 2) and CH5 (aileron 2/flap 1) are the operating channels. The Aileron 1 and Aileron 2 left and right deflection angles can be adjusted independently making it easy to apply differential to the ailerons. With differential, the up side travel is set to around 5% larger than the down travel.

You may also adjust the Flap 1 and Flap 2 throws independently, and you can set the flap trim rate as large or small as you like. Also, the flap trim offset can be adjusted, allowing you to



freely change the flap neutral angle.

When setting aileron differential with this function, set the trim volume at the aileron differential (ADF) function setting screen.

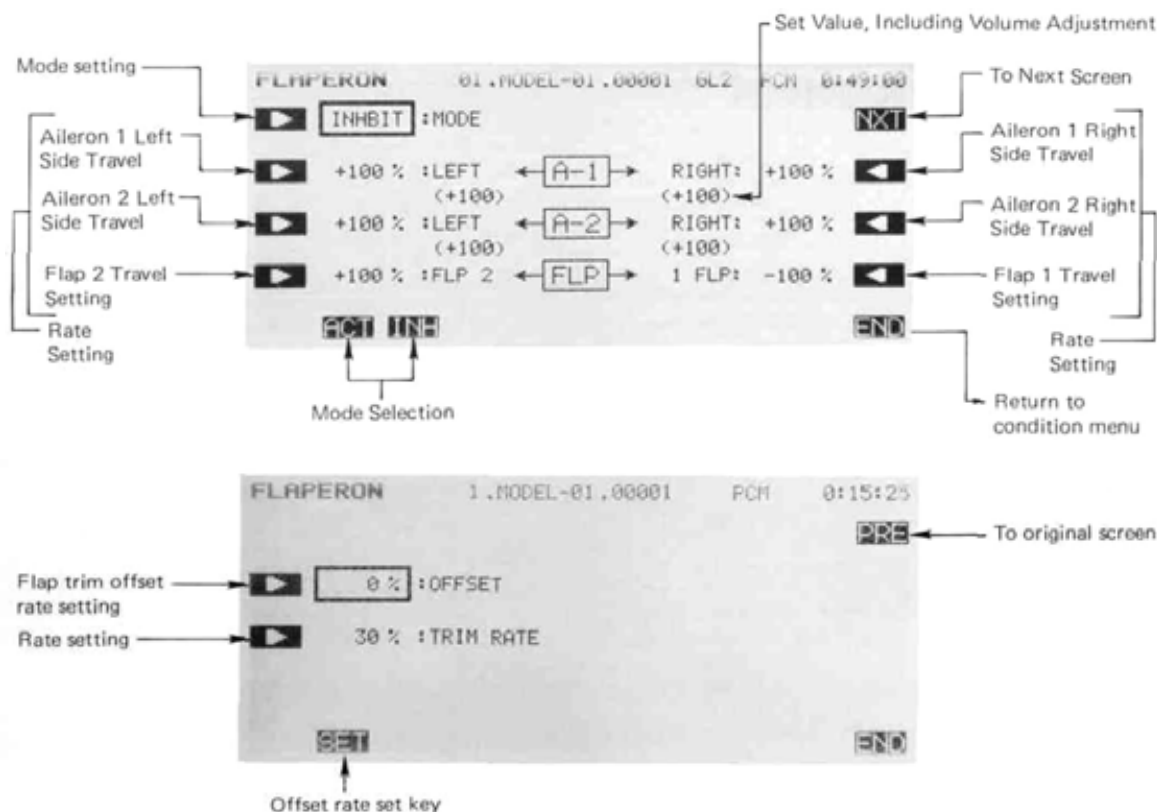
Setting Up Flaperons

Activation of command

In the Condition Menu, press the FLP key to get the FLAPERON menu as shown below. Use the A key to activate mode setting, then press the ACT F key to

activate. Next, press the E (YES) key. This automatically deactivates (INH) the aileron differential (ADF) function.

Deactivate mixing by pressing the INH key G to inhibit the function.



Setting the Aileron 1 Travel

You now set the left-side travel for Aileron 1. Press the B key to activate left travel setting for Aileron 1 and set the travel with the numeric keys E to M. The number keys 0 through 100 input the value directly. The + and - keys increase or decrease the value by 1. The +/- keys may be used to reverse the throw direction.

If you are not sure what you are changing, hold the stick to one side and press different keys — if there is no effect, move the aileron stick to the other side and continue. Your setting may vary from —120 to +120%, with an initial value of +100%.

Now set the right-side travel for Aileron 1. Press the Q key to activate Aileron 1 right travel setting and set the travel with the numeric keys as before.

Setting the Aileron 2 Travels

This procedure is repeated for Aileron 2. Press the C key to activate left travel setting for Aileron 2 and set the travel with the numeric keys E to M as before.

Now set the right-side travel for Aileron 2. Press the 13 key to activate Aileron 2 right travel setting and set the travel as before.

Setting the Flap Travels — 1 and 2

You now set the travel for Flap 2. Press the D key to activate travel setting for Flap 2 and set the travel with the numeric keys E to M. Your setting may vary from -100 to +100%, with an initial value of +100%.

Now set the travel for Flap 1. Press the O key to activate Flap 1 travel setting and set its travel with the numeric keys. Its initial value is —100%.

Flap Trim Offset Setting

Flap trim offset sets the flap position from which motion occurs. To input the flap trim offset amount setting, move to the next screen by pressing the NXT R key. Next, press the B key, then set the flap trim (left-side lever, LS) to the position to be set and press the F (SET) key.

Flap Trim Authority Setting

In the Flaperon mode, Flap Trim moves both ailerons upwards or downwards together. To input the Flap Trim Authority. Press the C key and set the rate with the numeric keys F to M. You may choose any value from 0% to 100% for the Flap Trim Authority. The initial setting is 30%, but a smaller number is recommended.

FUTABA PCM1024ZA/ZH MENU GLOSSARY

Home Screen [HOM]

S/S.Start/Stop Timer
RSTReset timer
TRM.Show trim menu
CHD.Condition Hold
TIMTo timer menu
VLTTo voltmeter menu
TACTo tach menu
T/R.Timer reset
SYSTo system menu
MDL.To model menu
CNDTo condition menu

Other Commands

ACTActivate
AUT.Auto
ENDReturn to prev. menu
INHInhibit
LINLinear
LSTLast part of list
MAN.Manual
N X TNext menu
PREPrevious menu
PT->Next point to right
<PTNext point to left
RSTReset menu
SELSelect
SETYes, command is ok
SRVServo
SWTTo switch set menu
VOLTo volume set menu
[+/-].Change sign
[+]Add 1
[-]Subtract 1
[nnn].Inputs number 'nnn'

Transmitter Abbreviations

J1.Right stick horizontal
J2.Right stick vertical
J3.Left stick vertical
J4.Left stick horizontal
RSRight slider
LSLeft slider
RD.Right dial VR(A)
LDLeft dial VR(B)
SW(n)Switch No. (n)

System Menu [SYS]

MSLModel Selection
VLTVoltmeter
OFFNo load
250.250 mA load

500.500 mA load
TACTachometer
DSPDisplay on/off
SRVServo Test & Bar Graph Display
ONActivate function
OFFswitch off
TRNTrainer System/Cmd.
MIXMix trainer commands
DTNData Transfer
TRNTransmit model data
RCVReceive model data
CPMCopy Model
CPCCopy Condition
PARParameters
UNA.User Name Def.
ENTEnter letter at cursor
FRQ.Transmitter Frequency Setting
 (Syn. only)
ABTAbort setting

Model Menu [MDL]

CSLCondition Select
TIMTimer Function
UPSet timer count up
DWN.Set timer countdown
S/S.Start/Stop timer
RSTReset timer
F/SFailsafe Function
BFSBattery Failsafe
NOR.Hold last command
PMDPulse Mode
PCMPulse code modulation
PPMPulse position modulation (FM)
REV.Servo Reversing
 Rev. selected servo
FNCFunction Change
TRM.Trim tab
CTRControl stick/knob
RSTData Reset
CUTEngine Cut
CHD.Condition Hold
TYPModel Type Selection
CH9Channel 9 Switch
MNA.Model Name Def.
ALTAlternate Switch
THRThrottle Curve
SWHSwashplate Type
 S-1Normal swash
 S-2,4.Mixed swash type 2,4
 SN3Swash type SN3
 SR3Swash type SR3

RDR Rotor Direction
CW Clockwise
CCW Counterclockwise
INV Inverted Pitch
PIT Pitch Curve

Common Conditions [CND]

CSL Condition Select
ATV Adjustable travel volume/Chanel delay
NOR Normal
LIM Limited
AFR Adjustable function rate
D/R Dual rate
P M X Programmable mixing
STM Sub trim
TOF Trim offset
CNA Condition naming
TRM Digital trim
 T1-4 Trims 1-4
 C-M Current to memory
 M-C Memory into current
 ATL Trim at low end only
 CMB Combined all conds.
 SEP Trim this cond. only

Model Type Labels

AIR Airplane type
HEL Helicopter type
GL2 Sailplane 2 wing servos
GL4 Sailplane, 4 wing servos
GL5 Sailplane, 5 wing servo

Airplane Menu

ADF Aileron Differential
A->R Aileron->Rudder Mixing
VTL V-Tail
R->A Rudder->Aileron Mixing
EVN Elevon
E->F Elevator->Flap Mixing
F->E Flap->Elevator Mixing
CPT Collective Pitch
ALV Ailevator
FPN Flaperon
ABK Air brake
SPO Spoiler control
 AUT Automatic mode
 MAN Manual mode
SNP Snap Roll
TCV Throttle curve

Sailplane Menu

ADF Ail. Differential
A->R Rudder Coupling

ASF Ail.-Speed Flap Mixing
VTL V-tail Mixing
ABE Airbrake
EBF Elevators-Brake Flap Mixing
ESF Elevator-Speed Flap Mixing
BKF Brake flap
SPF Speed Flap
SFT Flap Trim Setting
BFY Butterfly
BYE Butterfly Trim Mix
ETM Elevator Trim Sets
TM1 Trim set 1
TM2 Trim Set 2
F->E Flap-Elevator mixing
E->F Elevator-Flap Mixing
FPN Flaperon Mixing

Helicopter Menu

PCV Pitch Mixing
PHV Hovering Pitch
PTM Pitch Trim
TCV Throttle Curve
THV Hovering Throttle
HOF Hovering Offset
HLD Throttle Hold
SWP Swashplate Type
P->R Pitch-Rudder
R->T Rudder-Throttle
GYR Gyro Sensitivity
ACC Acceleration
INV Inverted Pitch

Model Control Abbrevs.

AIL Aileron
AU1 Aux Channel 1
AU2 Aux Channel 2
BKF Brake flap
CH9 Channel 9
ELE Elevator
FLP Flap
GEA Gear
GYR Gyro
PIT Pitch
RUD Rudder
SF1 Speed flap 1
SF2 Speed flap 2
SPO Spoiler
THR Throttle

Misc. Abbreviations

Syn Synthesized
Indented listings are subcommands

Futaba

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This Limited Warranty applies only to the Radio Control Equipment purchased and used in the United States of America (excluding its possessions and territories) and/or Canada.

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If you need service for your product under this Limited Warranty, you must deliver the product to FUTABA at the address noted below at your expense before the end of the warranty period. All transportation, postage and other charges to ship the product to FUTABA must be prepaid by you. FUTABA will not accept collect or postage due shipments. FUTABA will also not be responsible for any damages occurring during delivery to FUTABA so you should safely and securely pack the product, preferably in its original carton. Of equivalent, and purchase insurance for the shipment. You should also include in the package a legible copy of the bill of sale and a written note which gives your name, return address and contact telephone number. A description of the product returned (model number, frequency, and serial number) and a full explanation of the problem. FUTABA pays the cost of returning products serviced under this Limited Warranty.

Warranty returns should be sent to the following address:

SERVICE DEPARTMENT OF HOBBY R/C
FUTABA CORPORATION OF AMERICA
4 STUDEBAKER
IRVINE, CA 92718



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