

The R/Cer's Partner

ECLIPSE 7



SYSTEM INSTRUCTION MANUAL

- FOR AIRCRAFT • GLIDERS • HELICOPTERS
- 7 CHANNELS
- 7 MEMORIES
- PROGRAMMABLE FM SHIFT

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Introduction to the Eclipse 7 System

Congratulations! You now own a Hitec® **Eclipse 7**, an extremely versatile R/C system that may be effectively used by both beginning and master pilots. The transmitter may be programmed for airplanes, gliders, or helicopters, all with special mixing functions, so it can accommodate virtually any model configuration. You can store programming for **seven** different models in this powerful system! The transmitter will remember all of your settings for each of your different models forever - no backup battery is ever needed. With programmable shift, it can be used with **all** PPM/FM receiver models, even other brands!

The system pushbuttons allow rapid data input into the easy-to-read LCD display. With its *electronic digital trims*, you'll never lose your trim positions again, because they stay at the same place you left them!

Standard programming features include servo reversing for all channels, end point adjust on all channels, dual rates, and exponential. Pre-programmed functions and programmable mixers allow you to use the system for any type of model you can imagine. For those learning to fly, the transmitter has "buddy-box" capability (a second transmitter may be connected for training by an instructor pilot with an optional trainer cord). The *Eclipse 7* menus even have the advanced "**flight condition**" settings found in other radios costing hundreds of dollars more in all its menus!!

The extensive preprogrammed mixing features for **aircraft** include flaperon (dual aileron servos), V-tail, elevon (for flying-wing models), landing settings, throttle cut, aileron → rudder mixing, and elevator → flap. Five programmable mixers for custom functions are also provided.

For **sailplanes**, you find the following custom programming for competition and sport models with two or four wing servos: crow mixing for spot landings, flap → aileron mixing, aileron → flap, elevator → flap, aileron → rudder, flap → elevator, two sets of switchable offsets for launching and speed, V-tail, aileron differential, and five programmable mixers. The second aileron is on channel 5, so you can use the system with ultralight five-channel receivers without any problems!

Helicopter features include five-point pitch and throttle curves, high and low revolution mixing, throttle cut, throttle hold, gyro settings, and rudder → throttle mixing. You may select a conventional swashplate, or if you have a more complex chopper, mixing is provided for two types of three-servo swashplates.

About this manual

This manual is *not* just a translation - it has been carefully written from scratch to be as helpful to you, the new owner, as possible. There are many pages of setup procedures, examples, explanations, and trimming instructions. In order for you to make the best use of your system and to fly safely, *please read this manual carefully*. If you don't have time to read it thoroughly, at least spend some time browsing through it to see all the features this fine system has to offer.

Eclipse 7 System Options:

1. Airplane Version, Item #171721. Includes four HS-422 deluxe servos, 8 channel Supreme receiver, 600 mAH airborne battery, standard switch harness, 12" (30 cm) servo extension cord and overnight wall charger.

2. Airplane Spectra Version, Item #171723. Includes four HS-425BB ball-bearing servos, **Spectra** programmable frequency module, 8 channel **Super Slim** receiver, 600 mAH receiver battery, heavy-duty switch, 12" (30 cm) servo extension cord and overnight wall charger.

3. Helicopter Version, Item #171725. Includes five HS-425BB ball-bearing servos, 8-channel Supreme receiver, 1000 mAH receiver battery, heavy-duty switch harness and overnight wall charger.

These versions come with the following accessories:

- Frequency number flag
- Hardware and mounting package for all the servos
- Additional "smooth click" throttle ratchet
- "Flight preserver" closed-cell foam wrap to protect the receiver from shock and vibration.
- Warranty card
- Manual

4. Eclipse Transmitter only, with Spectra module, Item #171724.

Eclipse transmitter with Spectra Synthesizer Module, manual, overnight wall charger, and warranty card.

This product is to be used for sport and recreational flying of radio-control models only. Hitec is not responsible for the results of use of this product by the customer or for any alteration of this product, including modification or incorporation into other devices by third parties. Modification will void any warranty and is done at owner's risk.

If you have any difficulties, please consult this manual, your hobby dealer, or Hitec (contact information is provided in the rear of this manual). Note the information contained in this manual is subject to change without notice due to possible changes in manufacturing procedures, system software programming, or updates.

"Hitec" is a registered trademark of the Hitec RCD, Inc.

Disclaimer: This information specific to North American versions of the Eclipse.

Flying Safety

To ensure your own safety and the safety of others, please observe the following precautions:

Charge the Batteries!

Be sure to recharge the batteries before each flying session. A battery low in charge will soon die, causing loss of control and a crash. Plug in the charger that comes in this system and hook up the transmitter and airborne batteries the day before a planned flying session. When you begin your flying session, reset the transmitter's timer to keep track of how long the system's been used, and monitor the transmitter's voltage display. Quit flying long before your batteries become low. Beware of on-field charging of your batteries with a field charger. A fast-charger may overcharge the Ni-Cd batteries, causing overheating and a premature failure. Never charge your transmitter or receiver battery at a rate higher than 2 amps.

Flying field

We recommend that you fly at a recognized model airplane flying field. You can find model clubs and fields by asking your nearest hobby dealer, or contacting the Academy of Model Aeronautics. Always pay particular attention to the flying field's rules, as well as the presence and location of spectators, the wind direction, and any obstacles on the field. Be very careful flying in areas near power lines, tall buildings, or communication facilities as there may be radio interference in their vicinity. If you must fly at a site that is not a club field, *be sure there are no other modelers flying within a two-mile range*, or you may lose control of your aircraft.

Once you arrive at the flying field....

Before flying, be sure that the frequency you intend to fly with is not in use, and secure any frequency control device(pin, tag, etc.) for that frequency before turning on your transmitter. Never believe that it's possible to fly two or more models on the same frequency at the same time. Even though there are different types of modulation (AM, PPM or FM, and PCM), *only one model may be flown on a single frequency*. When you are ready to fly your model, position the throttle stick to its low speed position, or do whatever is necessary to command your motor NOT to run. Then, you may turn on the transmitter power followed by the receiver power. When you have finished flying, begin by turning off the receiver power, then turn off the transmitter power. If you do not follow these procedures, you may damage your servos or control surfaces, flood your motor, or in the case of electric-powered models, the motor may unexpectedly turn on and cause a severe injury. Before starting the engine, fully retract the transmitter antenna, power up the transmitter and receiver, and check to be sure that the servos follow the movement of the sticks. If a servo operates abnormally, don't attempt to fly until you

determine the cause of the problem. We recommend that you range-check your system before each flying session. Have an observer verify that the system works with the transmitter about 30 paces away with the transmitter antenna collapsed. Finally, before starting the engine, be sure to check that the transmitter model memory is correct for the chosen model. While you're getting ready to fly, if you place your transmitter on the ground, be sure that the wind won't tip it over. If it is knocked over, the throttle stick may accidentally get moved causing the engine to race unexpectedly. Before taxiing, be sure to extend the transmitter antenna to its full length. A collapsed antenna will reduce your flying range and may cause a loss of control. It is a good idea to avoid pointing the transmitter antenna directly at the model at all times, since the signal is weakest in that direction. Finally, don't fly in the rain! Water or moisture may enter the transmitter through the antenna or stick openings and cause erratic operation or loss of control.

If you must fly in wet weather during a contest, be sure to protect your transmitter with a plastic bag or waterproof barrier.

Airplane Frequencies

The following frequencies and channel numbers may be used for flying aircraft in the U.S. (this information specific to North American versions of the *Eclipse*):

72 MHz band					
Ch.No.	MHz	Ch.No.	MHz	Ch.No.	MHz
11	72.010	24	72.270	37	72.530
12	72.030	25	72.290	38	72.550
13	72.050	26	72.310	39	72.570
14	72.070	27	72.330	40	72.590
15	72.090	28	72.350	41	72.610
16	72.110	29	72.370	42	72.630
17	72.130	30	72.390	43	72.650
18	72.150	31	72.410	44	72.670
19	72.170	32	72.430	45	72.690
20	72.190	33	72.450	46	72.710
21	72.210	34	72.470	47	72.730
22	72.230	35	72.490	48	72.750
23	72.250	36	72.510	49	72.770



Installing your frequency number indicator

It is very important to display your transmitter channel number at all times. To install your frequency flag device on your transmitter antenna, slide the appropriate paper numbers into the slots and slip the device onto the transmitter antenna.

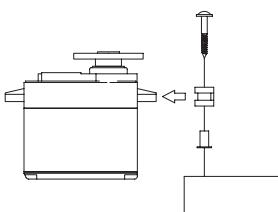
Radio Installation Notes

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

Notes on Servos

Mounting

When you mount each servo, use the supplied rubber grommets and insert an eyelet up through the bottom. Be sure not to overtighten the screws. If any portion of the servo case directly contacts the fuselage or the servo rails, the rubber grommets will not be able to attenuate vibration, which can lead to mechanical wear and servo failure.



Servo Throw

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

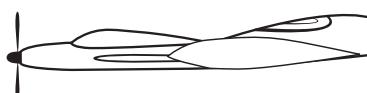
Switch Harness Installation

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

Receiver Notes

Antenna

DO NOT cut or coil the receiver antenna wire.



It is normal for the receiver antenna to be longer than the fuselage. DO NOT cut it or fold it back on itself - cutting or folding changes the electrical length of the antenna and may reduce range. Secure the antenna to the top of the vertical fin or the tailboom, and let the excess length trail behind the aircraft (be sure it cannot tangle with the tail rotor on a helicopter).

You may run the antenna inside of a *non-metallic* housing within the fuselage (a plastic outer pushrod housing works well for this), but range may suffer if the antenna is located near metal pushrods or cables. Be sure to perform a range check before flying. With the antenna collapsed, you should be able to walk 30 paces from the model without losing control or seeing "jitter" in the servos. The range check should be done with the motor

running and the model should be securely restrained in case of loss of control.

Connectors

Be sure the alignment of a servo or battery connector is correct before inserting it into the receiver. To remove a connector from the receiver, try to pull on the connector's plastic housing rather than pulling on the wires. Pulling the wires can ruin the connector pins and break wires.

Using The Aileron Extension

If any of your servos are located too far away to plug directly into the receiver (like the aileron servo), or you need to unplug the servo each time you disassemble the model, use a servo extension cord to extend the length of the servo lead. Additional Hitec extension cords of varying lengths are available from your hobby dealer.

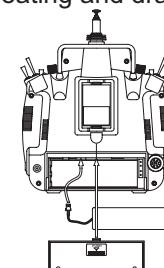
Vibration and Waterproofing

The receiver contains precision electronic parts. Be sure to avoid vibration, shock, and temperature extremes. For protection, wrap the receiver in the provided "Flight Preserver" foam rubber, or use some other vibration-absorbing materials. It's also a good idea to waterproof the receiver by placing it in a plastic bag and securing the open end of the bag with a rubber band before wrapping it with foam. If you accidentally get moisture inside the receiver, you may experience intermittent operation or a crash.

Charging the Eclipse 7 Ni-Cd Batteries

- ① Connect the transmitter charging cord into the charging socket (on the rear of the case, left side) and airborne Ni-Cd batteries to the receiver connector on the charger.
- ② Connect the receiver battery to the charging cord.
- ③ Plug the charger into a wall socket.
- ④ The charger's LEDs should light, indicating charging current is flowing. The batteries should be left on charge for about 15 hours.
- Try to charge the batteries with the charger supplied with your system exclusively. The use of a fast-charger may damage the batteries by overheating and dramatically reduce their lifetime.

NOTE: If you need to remove or replace the transmitter battery, do not pull on its wires to remove it. Instead, gently pull on the connector's plastic housing where it plugs in to the transmitter. The battery must be removed to charge it properly with a "peak" charger.

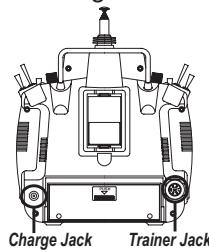


Operating With A Trainer Cord

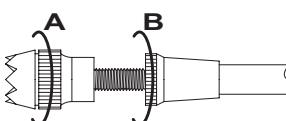
An optional training cord is available from your dealer. The cord may be used to help a beginning pilot learn to fly easily by allowing a second transmitter, operated by an experienced instructor, to be connected to this system. The instructor may override the beginning pilot at any time to bring the model back under safe control. For training, the transmitter may be connected to another Hitec FM system, as well as to any Futaba® FM transmitter (if Hitec cord #58310 is used).

To use the trainer cord:

- ❶ Set up both the student's and instructor's transmitters to have identical trim and control motions. If the instructor's transmitter is on a different frequency than the student's, use the student's transmitter as the master (held by the instructor) and the other transmitter should be held by the student.
- ❷ Collapse the student's antenna, and fully extend the instructor's antenna. If the student's transmitter has a removable RF module, remove it from the transmitter.
- ❸ The Hitec cord is specifically marked at one end as the "master" the other end as "student". Plug it accordingly into each transmitter, with power switched off. The trainer jack is on the back of the transmitter. Turn the connector until its notches line up and it fits without having to be forced.
- ❹ Turn on the instructor's transmitter. DO NOT turn on the student transmitter power. Move the controls on the instructor's transmitter, and verify each control moves the proper direction. Now verify that the student's trims and control travels match the instructor's by using the trainer switch (the momentary **Trainer** switch on the top left of the transmitter case) and switching back and forth while leaving the control sticks and trims alone, then moving the control sticks.
- ❺ The instructor's transmitter has normal control over the model unless the trainer switch is pulled, passing control to the student's transmitter. If the student loses control, the instructor can quickly "take over" by releasing the trainer switch and controlling the model.

**Other Adjustments****Adjustable length control sticks**

You may change the length of the control sticks to make your transmitter more comfortable to hold and operate.

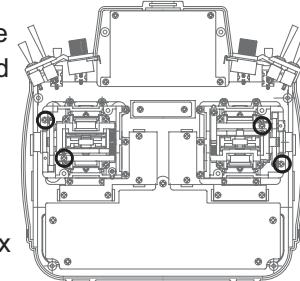


To lengthen or shorten your transmitter sticks, first unlock the stick tip by holding locking piece B and turning stick tip A counterclockwise. Next, move the locking piece B up or down (to lengthen or shorten). When the length feels comfortable, lock the position by turning locking piece B counterclockwise.

Stick lever tension adjustment

You may adjust the stick tension of your sticks to provide the "feel" that you like for flying. To adjust your springs, you'll have to remove the rear case of the transmitter. Using a screwdriver, remove the six screws that hold the transmitter rear cover into position, and put them in a safe place. Place some padding under the front of the transmitter and place it face-down on the pad. Gently ease off the transmitter rear cover and move it to the right side of the transmitter, carefully turning it as you would turn the page of a book. Now you'll see the

view shown. Using a small cross-point screwdriver, rotate the adjusting screw for each stick for the desired spring tension. The tension increases when the adjusting screw is turned clockwise, and decreases for counterclockwise motion. When you are satisfied with the spring tensions, you may close the transmitter. Very carefully reinstall the rear cover. When the cover is properly in place, tighten the six screws.

**Ratchet change**

Some pilots, especially those flying helicopters, prefer a "softer" or "smoother" ratchet action on the throttle stick. An alternate ratchet that provides a smoother ratcheting action is included as an accessory with your *Eclipse 7* system. To change the throttle ratchet, remove the back of the transmitter case as directed above in the "stick lever tension adjustment" section. Then, unscrew the ratchet retaining screw, remove the old ratchet, and replace with the new one. Tighten the retaining screw gently but firmly. Then, replace the transmitter rear cover.

Changing the Eclipse 7 transmitter's mode

If you wish to change the mode of the transmitter, say from Mode 2 to Mode 1, return the radio to Hitec for conversion. If you don't know what this means, you don't need to worry about it!

Factory Service Repair Information (for U.S. & Canada only)

Please read the warranty card supplied with your system, and return it so your system will be under warranty. Before you decide to have your system repaired, if there is no apparent physical damage, read this instruction manual again and check to be sure that you are operating the system as it is supposed to be operated. If you are still having trouble, pack up your system in its original shipping materials and send it to the factory or the nearest authorized Hitec R/C Service Center.

Be sure to include a note in your package that describes the trouble in as much detail as possible, including:

- Symptoms of the problem in as much detail as you can provide, including any unusual mounting conditions or equipment orientation
- A list of items you are sending, and what you want to be repaired.

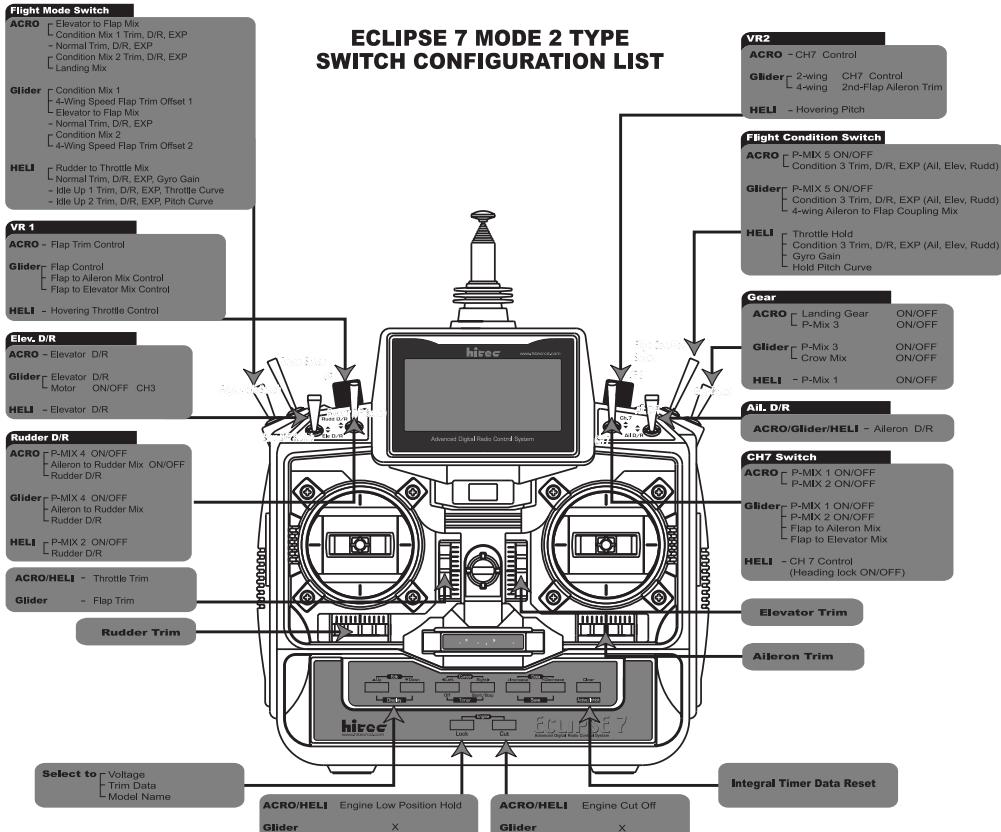
• Your name, address, and telephone number.

If you have any questions regarding this product, please consult with Hitec's service center. The address and telephone numbers of our service center is given below. Telephone inquiries are accepted from 8:00 AM to 4:30 PM weekdays (closed on holidays).

Hitec-RCD, Inc.
12115 Paine St.
Poway, CA 92064
TEL: 1-858-748-6948
FAX: 1-858-748-1767

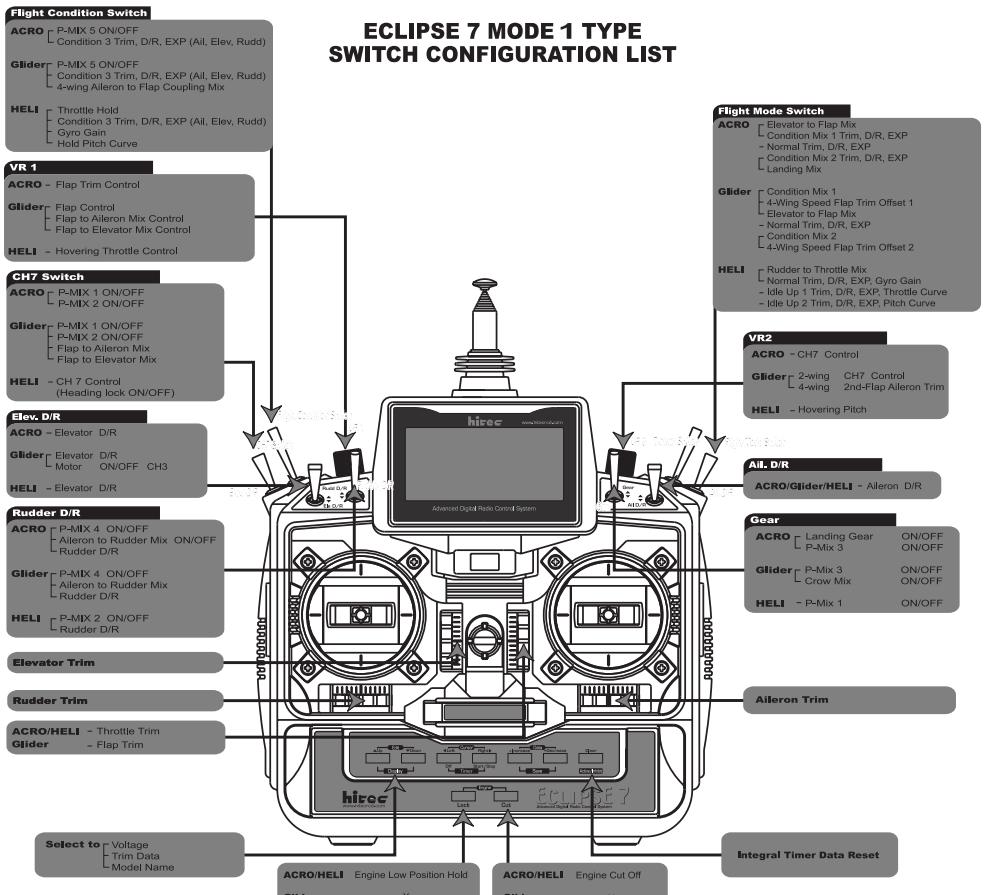
Web site: <http://www.hitecrcd.com>

Eclipse 7 "Mode 2" Controls and Switch Assignments



This figure shows the assignments for a Mode 2 system as supplied by the factory in North America. Note that some of the functions will not operate until activated in the mixing menus.

Eclipse 7 "Mode 1" Controls and Switch Assignments

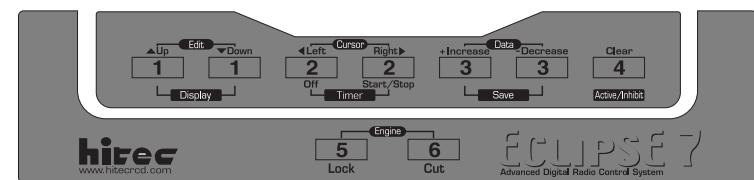


This figure shows the assignments for a Mode 1 system as supplied by the factory (not in North American versions). Note that some of the functions will not operate until activated in the mixing menus.

Transmitter Input Buttons

The buttons are used for different things as follows:

1. The **Edit/Display Up & Down** buttons (1) allow you to move up and down within the model menus, and move within the regular display.
2. The **Cursor Left/Right** buttons (2) allow you to select options within a particular function, and control the timer function.
3. The **Data +Increase & -Decrease** buttons (3) allow you to increase or decrease the numerical settings for a function.
4. The **Clear Active/Inhibit** button (4) resets numbers, and turns functions on and off.
5. The **Engine Lock** button (5) holds the throttle channel while other channels may respond to the transmitter.
6. The **Engine Cut** button (6) closes the throttle so that you can shut off the engine without touching the trim lever.



You'll learn how to use these buttons in the setup sections that follow.

Receiver - Servo Connection List

The table below shows the hookups that should be used for each of the model types. Note that some functions shown will not operate until they are activated in the transmitter.

Receiver channel	Aircraft (ACRO)	Glider (GLID)	Helicopter (HELI)
1	aileron or right aileron or right flaperon (FLPN) or right elevon (ELVN)	right aileron(or rudder for rudder-elevator models)	roll or swash servo 1 (120') or swash servo 1 (180')
2	Elevator or V-tail right side (VTAL) or left elevon (ELVN)	elevator or V-tail right side (VTAL)	pitch or swash servo 2 (180')
3	throttle	spoiler, throttle (on-off controlled by elevator D/R switch)	throttle
4	rudder or V-tail left side (VTAL)	rudder or V-tail left side (VTAL)	yaw
5	landing gear	left aileron	gyro sensitivity
6	flap (controlled by VR1) or left flaperon (FLPN) or left aileron	right flap (4WNG) or single flap (2WNG)	pitch or swash servo 3 (120') or swash servo 2 (180')
7	optional, controlled by VR2	left flap (4WNG) or proportional channel, controlled by VR2 (2WNG)	optional, controlled by Gear switch

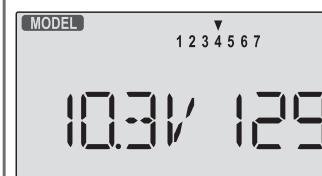
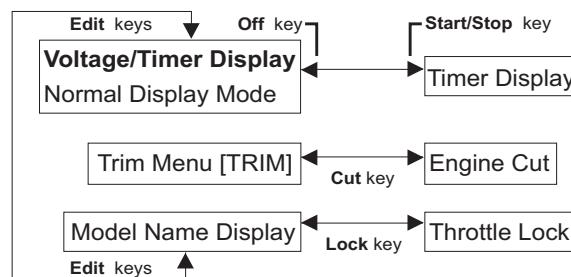
The servo response varies with the selected function. Standard options are shown first.

Transmitter Displays & Messages

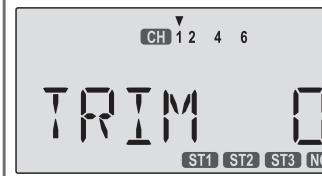
When you first turn on your transmitter, the first screen shown below appears on the LCD display. Before flying, or even starting the engine, **BE SURE that the model number appearing in the top center of the display matches the model that you are about to fly!**

If you don't, reversed servos and incorrect trims will lead to an immediate crash.

You can scroll up and down through the startup screen by pressing one of the two **Edit** keys (the two keys on the far left). If you press timer or engine cut or lock keys, you go directly to those functions regardless of the display.



This screen appears at startup. The model memory number is shown by the small down-arrow. Battery voltage is shown in the bottom left, and operating time is on the lower right. You can reset the operating time display by hitting the **Clear** button (the one on the farthest right). Do this after each charge to keep track of your operating time on a single charge.



Pressing the **Up** button gives the **Trim** display (different numbers may appear depending on the model type). To see where the trim for a certain channel is, you have to move it! Be sure to move it back to where it was. Note that the **CH3** trim only moves downward, so if you need more engine RPM, set up idle with the trim at -25% so you can increase it if needed.



Pressing the **Up** button again gives the **Model Name** display. If you've named your model, it will appear here so you can be

sure you have recalled the correct memory. If you do not name the model, you'll have to remember which model memory it's stored within by the memory number.



Pressing the **start/stop** button gives the **Timer** display, with a stopwatch display on the left, and operating time on the right.

This also starts the timer, so hit the **start/stop** key again to stop it. Hitting the **Cursor Left (Off)** button resets the timer and returns you to the display mode.



Pressing the **Lock** button locks the throttle servo and holds it where you last commanded it. This may be used as a safety

feature when you are carrying the model and transmitter to ensure you don't accidentally give throttle. It is shown by the **LOCK** indicator.

Warning Displays



The **LOW BATTERY** warning is displayed when the transmitter battery voltage drops below 9.3 volts, and a beeper will beep.

The operating time is still shown on the right. If you reset this each time you charge the system, you will have a good idea of how long you can safely operate.

WHEN THE BEEPER SOUNDS, LAND YOUR MODEL AS SOON AS POSSIBLE BEFORE LOSS OF CONTROL DUE TO A DEAD TRANSMITTER BATTERY.



The **IDLE ON** warning is displayed when the transmitter is powered up with the Idle-up switch on *in the helicopter mode only*.

You can turn this off by moving the **Flt. Mode** switch back. For your safety, the transmitter will not broadcast until this alarm is ended.



The **HOLD ON** warning is displayed when the transmitter is powered up with the Throttle hold switch on *in the helicopter mode only*

when throttle hold values are programmed.

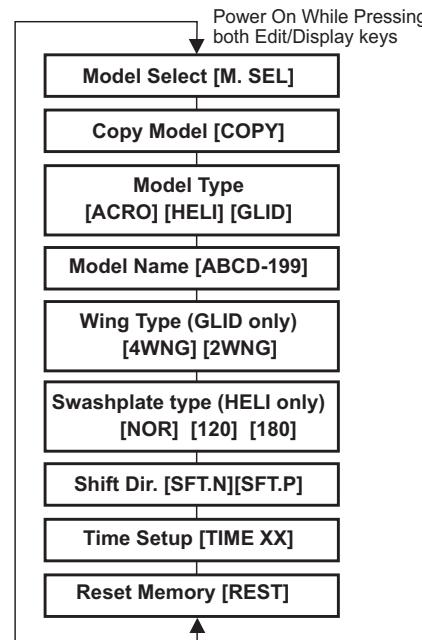
You can turn this off by moving the **Flt. Cond.** switch back. For your safety, the transmitter will not broadcast until this alarm is ended.

Model Setup Functions

This section describes the **model setup functions** that are used to choose all of the operating features of a particular model memory. These functions are used to select the model memory, the model type (from airplanes, gliders, and helicopters), set the stopwatch, and other useful functions. *These functions are used to set up a new model or a new model memory, to switch between memories, and to change transmit shift.*

Map of Basic Menu Functions (see right)

M.SEL	Model select	10
COPY	Data Copy	10
ACRO	Acrobatic model mode	10
HELI	Helicopter model mode	10
GLID	Glider model mode	10
2WNG	Two Servo Wing (GLID only)	10
4WNG	Four Servo Wing (GLID only)	10
NOR	Normal swashplate (HELI only)	10
120'	120'Swashplate (HELI only)	10
180'	180'Swashplate (HELI only)	10
****	Model Name (four letters + up to three numbers)	11
SFT.N	Transmit Shift	11
TIME	Timer setup	12
REST	Reset Memory	12



MODL - Model Select

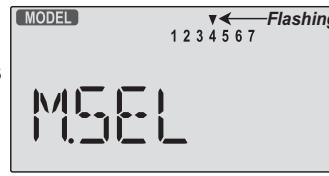
Your **Eclipse 7** system can store up to **seven** independent sets of model data in its memory. The Model Select (**MODL**) function allows you to choose from any of the seven sets of model data.

You can assign a four-character name to each model memory. The model names are not visible when you wish to switch memories. There are several ways to keep track of which model is in each memory. You may attach a small piece of white tape to the transmitter and write the model's name along with the model setup number (and its channel number), or you may use a notebook, or label the model with its memory number prominently near its on-off switch outside the fuselage.

Choosing a model memory to load

1. Start with the transmitter switched off.

2. Turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left). This gets you into the model select (**M.SEL**) menu.



3. Select the desired model number by pressing the **Cursor Right** or **Left** button. At this time, the small arrow above the selected model number will blink on and off.

4. Switch power off.

5. Switch power back on. The previously-selected model number is indicated by the arrow above the model numbers in the display.

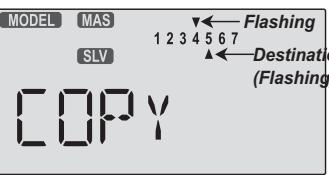
COPY - Copy Model

The **COPY** function is used to copy the model data stored in the current model memory into another model memory. This function is handy to use to start a new model that's similar to one you have already programmed, and is also handy for copying the current model data into another model memory as a backup.

Copying from one model memory to another

1. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left). The model select (**M.SEL**) menu will be displayed.

2. Press the **Up** arrow key. This gets you into the model copy (**COPY**) menu. (If you're already in the setup menus, you can just press the **UP** or **Down** arrow key to get here.)



3. The source model memory (the memory that will be duplicated) is the current one, indicated by the fixed upper arrow. To select your destination model number, press the **Left** or **Right Cursor** keys. The selected destination memory number is shown by the flashing triangle under it.

4. Press the **+Increase** and **-Decrease Data** keys at the same time. The transmitter beeps twice rapidly, indicating the copy has been completed. **THIS WILL ERASE ALL**

THE OLD SETTINGS IN THE SLAVE MODEL MEMORY, SO BE SURE YOU'RE IN THE CORRECT MODEL BEFORE YOU COPY MODEL!

5. Switch power off.

6. Switch power back on. If you wish to go to the newly-saved memory, repeat step 1.

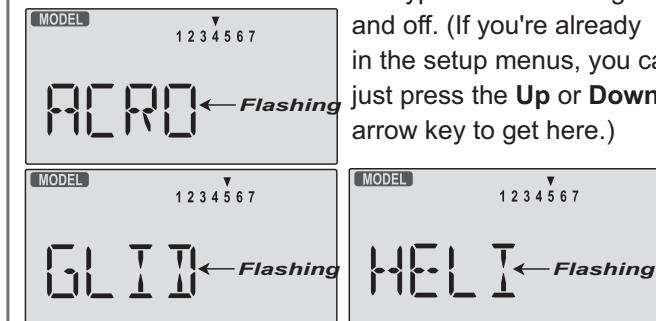
ACRO, HELI, GLID - Model Type Select

This function is used to select the **type of model** to be programmed in the current model memory. You may select from aircraft (**ACRO**), gliders (**GLID**), and helicopters (**HELI**). If you select glider or helicopter types, you will need to set the wing type (for a glider) or the swash type (for a helicopter). These settings are covered below.

Selecting the Model Type

1. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left). The model select (**M.SEL**) menu will be displayed.

2. Press the **Down** arrow key. This gets you into the type select menu. The current model type will be flashing on and off. (If you're already in the setup menus, you can just press the **Up** or **Down** arrow key to get here.)



3. If the model type you want is displayed, you're done.

[If you wish to change the wing type or swash type in the **GLID** and **HELI** model settings, see the sections below.]

4. If you wish to change the model type from that displayed, press on the **Left** or **Right Cursor** buttons until the model type you want, either **ACRO**, **GLID**, or **HELI**, appears.

5. To select your desired model type, press both the **+Increase** and **-Decrease Data** keys simultaneously.

Two beeps tell you that the new model type is now registered. **THIS WILL ERASE ALL THE OLD SETTINGS IN THE MODEL MEMORY, SO BE SURE YOU'RE IN THE CORRECT MODEL MEMORY BEFORE YOU CHANGE MODEL TYPE!**

6. Press the **Up** or **Down** arrow keys to get to another setup menu, or switch power off.

7. Switch power back on. You may now set up the details of your model in the **Edit** mode.

Wing & Swashplate Type Selection

If you are using the glider (**GLID**) or helicopter (**HELI**) setting menus, you must tell the Eclipse system what type of model you are using. In the case of a glider, you have to specify whether it has two (**2WNG**) or four (**4WNG**) wing servos (most slope gliders use two wing servos, and competition gliders use four wing servos, two each for outboard and inboard ailerons and flaps). Helicopters may have one servo each for blade angle, roll and pitch (**NOR**) or they may use three servos in concert on the swash to

provide these functions (120°, 180°). Note that these menus will not be available unless you have selected the **GLID** or **HELI** model types.

Selecting the Wing or Swashplate Type

1. Select the **GLID** or **HELI** model type in the Model Type

Select menus (see above).

2. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left).

The model select (**M.SEL**) menu will be displayed.

3. Press the **Up** or **Down** arrow keys: In the **GLID**

mode, you'll enter the wing setup menu, and **WING** will be highlighted:

If you're in **HELI** mode, **SWASH** will be highlighted and you can select from three swashplate types: **NOR**, **120°**, and **180°**:



If you're happy with the wing or swash type that is displayed, go on to the next step. If you wish to change the wing or swashplate type from that displayed, press on the **Left** or **Right Cursor** buttons until the wing/swash type you want appears. **CAUTION: if you change types, you may lose settings in the menus.**

4. Press the **Up** or **Down** arrow keys to get to another setup menu, or switch power off.

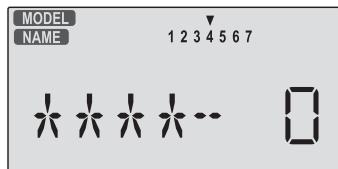
5. Switch power back on. You may now set up the details of your model in the **Edit** mode.

Model Name

The **Model Name** function is used to create an alpha-numeric name which is stored in the model memory along with the rest of the model settings. You will find it useful to help keep track of multiple models. The model name can be four alphabetic characters, along with up to three numbers following. The letters may be used to abbreviate the model's name, and the numbers may be used for the memory number, or you may wish to store that model's channel number so you can remember easier.

Inputting a Model Name

1. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left). The model select (**M.SEL**) menu will be displayed, with "stars" to represent letters to be chosen.



2. Press the **Up** or **Down** arrow key until you get into the model name menu. You'll see the display as shown to the right, with the MODEL and NAME indicators in the upper left on. The first character of the name will be flashing on and off. (If you're already in the setup menus, you can just press the **Up** or **Down** arrow key to get here.)

3. To change the first character, press the **+Increase** and **-Decrease Data** keys until you see the character you desire. You may select from the upper case letters A ~ Z, *, +, -, /, and the numbers 0 ~ 9.

4. Press the **Right Cursor** key to move to the next character.

5. Press the **+Increase** and **-Decrease Data** keys until you see the character you desire.

6. Repeat the previous two steps to input the third and fourth characters of the display.

7. Press the **Right Cursor** key to move to the number displays on the right.

8. Press the **+Increase** and **-Decrease Data** keys until you get to a number that you like. This can be

any number from 0 to 199. If you have lots of models with different frequencies, you may wish to input your channel number here.

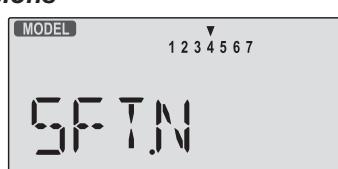
9. Press the **Up** or **Down** arrow keys to get to another setup menu, or switch power off.

10. Switch power back on. You may now set up the details of your model in the **Edit** mode.

Transmit Shift - SFT.N, SFT.P

For all 35 and 40MHz versions

The signal shift used with 35 and 40MHz is all the same. The transmit shift menu screen should look like this one, for all 35 and 40MHz Eclipse 7 versions.



For 72MHz North American Version.

The **Transmit Shift** function is used to change the *shift direction* of the Eclipse 7 system.

With this menu, you can change the way your transmitter broadcasts, so that it can address **all types** of PPM receivers. (PPM receivers are also referred to as "FM" receivers.) The **Eclipse 7 FM** is **not compatible with PCM receivers**, only with FM. Hitec/RCD and Futaba receivers use negative shift (**N**), and JR and Airtronics receivers use positive shift (**P**).

If you choose the wrong shift direction for your receiver,

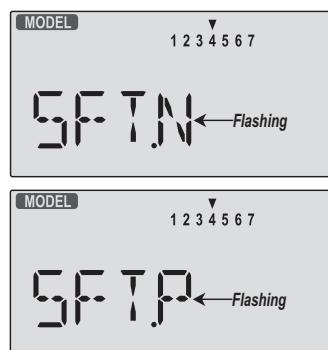
the servos will move erratically and will not respond to the transmitter, even if it is on the correct frequency. Turn off your receiver at once to preclude damage to your servos, and change the shift direction.

If you use a mixture of receiver brands, make sure that the transmitter is properly set for the brand of receiver you are using in the current memory.

Changing the Frequency Shift

1. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left). The model select (**M.SEL**) menu will be displayed.

2. Press the **Up** or **Down** **Edit** key until you get into the shift menu. You'll see either the word **SFT.N** or **SFT.P**, with the last character, **N** or **P**, flashing on and off. (If you're already in the setup menus, you can just press the **Up** or **Down** arrow key to get here.)



3. **N** represents negative shift and will work with Hitec and brand F. **P** represents positive shift and will work with brands A and J. *The Eclipse 7 will not work with any PCM receivers.*

4. To change the shift direction from what is shown, press either the **Left** or **Right Cursor** key one time.

This will change the display from **P** to **N** or **N** to **P**.

5. Press the **Up** or **Down** arrow keys to get to another setup menu, or switch power off.

TIME -Timer Function Setup

The timer function is helpful for keeping track of flight duration, engine run time, or other things that need to be monitored during flight. You can set up the timer to count down from 0 to 60 minutes. If you select a time from 1 to 60 minutes, the timer will count down the number of minutes selected when you first press the Start/Stop button. You may stop it at any time by pressing the Start/Stop button a second time. Beginning the last 14 seconds of the selected time, the system will beep every second to tell you the time has elapsed. If you wish to reset the timer, just press the **Off** button, it will then be changed to display mode. You may then press the **Start/Stop** button to reset it and count down again, whenever you like. If you select **0** minutes, the timer acts like a stopwatch and counts upwards.

Setting up the Eclipse Timer

1. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left). The model select (**M.SEL**) menu will be displayed.

2. Press the **Up** or **Down** arrow key until you get into the Timer (**TIME**) menu.

You'll see a display with the

word "TIME" flashing on and off. (If you're already in the set-up menus, you can just press the **Up** or **Down** arrow key to get here.)

3. To change the number of minutes shown, press the **+Increase** and **-Decrease Data** keys until you see the amount you desire. You may select from 0 to 60 minutes.

4. Press the **Up** or **Down** arrow keys to get to another setup menu, or switch power off.

5. Switch power back on. You may now set up the details of your model in the **Edit** mode.

REST - Data Reset

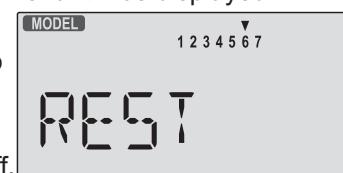
The Reset function is used to clear out an existing set of model data within a single model memory, the current one. This function resets all data to the factory default values, and may be used to get a "fresh start" so that you may begin with a clear memory before you input new model settings into a memory that had been used for another model.

Resetting the memory

1. With the transmitter switched off, turn on your transmitter while pressing both of the two **Edit** keys (the two keys on the far left).

The model select (**M.SEL**) menu will be displayed.

2. Press the **Up** or **Down** arrow key until you get into the Reset (**REST**) menu.



This display has the word "REST" flashing on and off. (If you're already in the setup menus, you can just press the **Up** or **Down** arrow key to get here.)

3. IF YOU ARE SURE YOU WANT TO RESET and clear out the current model memory, press both the **+Increase** and **-Decrease Data** keys at the same time. The transmitter will beep twice to indicate a successful reset.

4. Press the **Up** or **Down** arrow keys to get to another setup menu, or switch power off.

5. Switch power back on. You may now set up the details of your model in the **Edit** mode.

CAUTION: WHEN YOU COMMAND RESET, YOU'LL ERASE THE MEMORY YOU'RE IN AND LOSE ANY PROGRAMMING YOU HAVE ENTERED. DON'T DO THIS UNLESS YOU ARE POSITIVE YOU WANT TO FLUSH OUT THAT MEMORY AND START FROM SCRATCH WITH THE FACTORY DEFAULT SETTINGS.



AIRCRAFT (ACRO) MENU FUNCTIONS

This section describes the menu functions for fixed-wing aircraft, provides a detailed setup example, and then describes the functions individually. Functions relating specifically to gliders and helicopters may be found in the following sections.

ACRO Functions Map

(see right)

Simple Aerobatic Airplane Transmitter Setup 13

EPA	End Point Adjust (servo travels)	18
D/R	Dual Rates	18
EXP	Exponential Settings	20
FLT.C	Flight Condition Select	20
S.TRM	Subtrim	21
REV	Servo Reverse	22
T.CUT	Throttle Cut (engine shut off)	22
PMX1-5	Programmable Mixer #1 - #5 (five total)	22
LAND	Landing function settings	23
FLPT	Flap trim	23
E->F	Elevator → Flap mixing	23
A->R	Rudder Coupling	24
ELVN	Elevon mixing (tailless models)	24
VTAL	V-tail mixing	25
FLPN	Flaperon (combined flaps & ailerons)	26

Aircraft Trimming Chart 27

Voltage/Timer Display

Normal Display Mode



Simple Transmitter Setup - Aerobatic Airplane (ACRO)

The following pages will take you step-by-step through the setup process for a sport or aerobatic airplane in the ACRO menu. Going through this complete section will help you learn how to use your system quickly and easily. If you need to set up a helicopter or glider, please refer to the quick setup instructions in the helicopter and glider sections.

AIRCRAFT SETUP INSTRUCTIONS (AEROBATIC PLANE)

The aircraft setup procedure presented below uses an aerobatic model as an example and assumes that there are two aileron servos, one in each wing. You can use a similar procedure to set up your own model; your setting's numbers and percentages will probably be different. If your model only has one aileron servo, skip the instructions referring to flaperon.

1. Be sure that all of your servos are plugged into the proper receiver channels:

CH1 - Right aileron **CH4** - Rudder **CH7** - (optional)

CH2 - Elevator **CH5** - Gear

CH3 - Throttle **CH6** - Left aileron

2. We recommend that you do this programming exercise with the servos installed in the model and connected to the respective control surfaces. This will enable you to immediately see the effect of each programming step.

3. Turn on your transmitter while holding down the two **Edit** keys (the two keys on the far left). This gets you into the model select (**M.SEL**) menu. Press the Cursor **Right** button to move to a new model memory. The selected model memory you select is indicated by the little flashing arrow pointing down.

Memory #2 is shown here.

▼ 1 2 3 4 5 6 7

4. Press the **Up** arrow until the word **ACRO** appears, flashing on and off. If it does, you're ready to proceed on to the next step. If not, press the **Left** or **Right Cursor** keys until it appears. *You must press both Data keys to "Save" the setting, after which the radio will beep twice.* This is how you select the type of model you wish to use, either **ACRO**, **HELI**, or **GLID**.

5. ***WARNING: selecting a different model type will erase the settings in the model memory. BE SURE you're in the correct model memory before selecting a new model type, or you might accidentally erase a model you're using. (The other memories will not be affected.)***

6. Press the **Up** arrow once. This gets you into the model name mode (note the words "MODEL" and "NAME" in the upper left of the display).

7. Now you can select four letters to identify your model. With the first of the four letters flashing, press the **Data +Increase** or **-Decrease** key to change the letter that is displayed. Stop when the first letter is the one you want.

8. Press the **Right Cursor** key once to get to the second letter. Repeat the previous step to choose the second letter.

9. Repeat two more times to fill out the remaining two letters. If you like, you can hit the right cursor button one more time and select a number between **0** and **199** for further identification. It can be handy to use this to store the plane's channel number.

10. Press the **Up** arrow once. This gets you into the Timer menu (**TIME**). If you want, you can use the **Data +Increase** or **-Decrease** keys to select the amount of time you want the stopwatch to count down.

11. This completes the initial part of the setup.

Now, we'll go ahead and customize the **ACRO** settings for your model. Switch transmitter power **OFF**.



right is the elapsed time, which will vary depending on how long the transmitter has been left on.



arrow to get to the flaperon menu (**FLPN**).

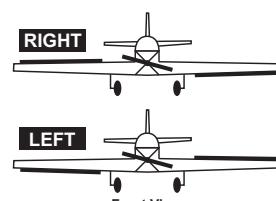
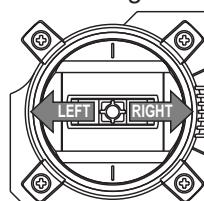
The display should show that it is inhibited (**INH**).



15. Be sure that you connect the right aileron servo to receiver **CH1** and the left aileron servo to receiver **CH6**.

16. Later, you can get differential by adjusting the up and down motion of the two servos in the **FLPN** menu. Now we'll set the servo throw directions. Now check that each servo moves the proper direction. We'll use the Reversing function if they don't. Go to the Reversing menu (**REV**) by hitting the **Down** arrow.

17. We'll start by setting the *right aileron* servo direction. This is channel 1, and the **1** should be flashing for this command. When you move the right-hand stick to the right, the aileron on the right wing should move upwards, and the aileron on the left should move downward. Check that the right aileron moves the correct way!



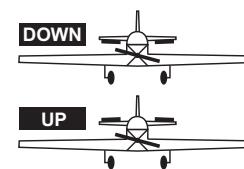
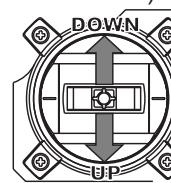
18. If it does not, activate the opposite direction for the CH1 aileron servo by pressing the **Active/Inhibit (Clear)**

key. Each press switches from Reversed to Normal and from Normal to Reverse. In the display, **N** for Normal is chosen when the little triangle is *above* the channel number, and **R** for Reverse is chosen when the little triangle is *below* the channel number. Move the right-hand stick again and verify the right aileron moves in the right directions.



The display shows Channel 1 reversed.

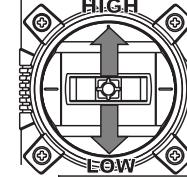
19. Next we'll set the direction of the *elevator* servo, channel 2. When you move the right-hand stick towards the **BOTTOM** of the transmitter, the elevator should move up. Check to make sure it moves in the proper direction! (More planes are crashed due to reversed controls than for any other reason.)



20. If the elevator control moves in the wrong direction, move over to Channel 2 by pressing the **Cursor Right** key. Now the **'2'** should be flashing in the display.

Activate the opposite direction for the elevator servo by pressing the **Active/Inhibit (Clear)** key. Move the right-hand stick up-and-down again and verify the elevator moves the right direction.

21. Now we'll set the direction of the *throttle* servo. When you move the left-hand stick towards the **BOTTOM** of the transmitter, the throttle should close, meaning that the hole in the carburetor should close. Check to make sure that the throttle lever on the engine moves in the proper direction!

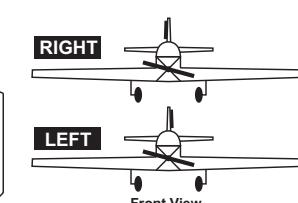
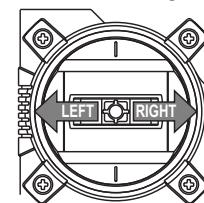


HIGH Throttle :
carburetor fully opened
LOW Throttle :
carburetor at idle position
(not fully closed)

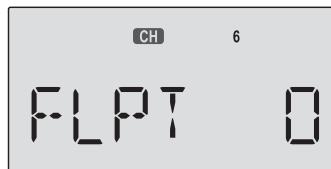
22. If the throttle servo moves in the wrong direction, move over to Channel 3 by pressing the **Cursor Right** key. Now the **'3'** should be flashing in the display.

Activate the opposite direction for the throttle servo by pressing the **Active/Inhibit (Clear)** key. Verify the throttle stick makes the servo move the carburetor opening in the correct direction.

23. Now we'll set the direction of the *rudder* servo. When you move the left-hand stick towards the **CENTER** of the transmitter (to the right), the trailing edge or rear rudder should move to the right. Check to make sure!



If the rudder moves in the wrong direction, move over to Channel 4 by pressing the **Cursor Right** key. Now the '4' should be flashing in the display. Activate the opposite direction for the rudder servo by pressing the **Active/Inhibit (Clear)** key. Move the left-hand stick left-and right again and verify the rudder moves the right direction. If your model has *retracts*, set the correct response direction when commanded by the **Gear** switch, using the same procedure. If you're using a second aileron servo, you'll now set the left aileron servo direction (otherwise skip this and the next step). This is channel 6, and the '6' should be flashing for this command. When you move the right-hand stick to the right, the aileron on the *left* wing should move downwards. Check that the *left* aileron moves the correct way! If it does not, activate the opposite direction for the left aileron servo using the above procedures. Move the right-hand stick again and verify the left aileron moves in the proper directions.

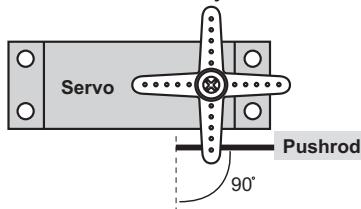


key. This temporarily disables the flap knob (VR1) so that you can set aileron neutrals without regard to the flap knob position. Later we'll turn it back on.

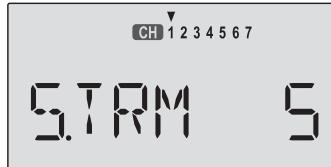
24. Before we set the servo neutrals, we need to be sure that all the trims are centered. Press both **Edit** keys to get to the main menu, where voltage and time are displayed. Press the Up arrow until the word **TRIM** appears.

By moving each of the four trim levers around, you can see their positions, and move them back to zero for the next step.

25. Once you have centered all the trims, unscrew the screws holding the servo arms onto the elevator, aileron, and rudder (we'll set the throttle travel later). You will want to place the servo arms on the output shaft so they are near neutral - that is, about 90° to the servo case sides or, if the servo is mounted sideways, 90° to the pushrod (sideways mounting is not recommended). This way you won't run out of subtrim authority. Remove all the arms that are in the way or interfere with your pushrods.



Adjust the clevises on each servo pushrod to get the position of each control to be as close as you can to neutral (lined up with the adjacent portion of wing or tail).



Setting Subtrims. Now we'll adjust all the subtrims to electronically set the desired neutral locations. To do so, go back to the

programming menu by pressing both **Edit** keys, then press the **Up** or **Down** arrow key repeatedly until **STRM** appears.

26. Set the right aileron subtrim first. If the little arrow is not pointing at channel 1, press one of the **Cursor Left** or **Right** buttons until it is (see figure). Then, adjust the subtrim amount by adding or subtracting with the **Data +Increase** or **-Decrease** keys. When you reach a place where the right aileron matches up with the fixed portion of the wing, you are done. If you can't get both to match up, then set the subtrim back to zero and mechanically adjust the clevis to get as close as you can, then readjust the subtrim if necessary.

27. Note 1: you should NOT use subtrims instead of mechanically adjusting the pushrods to be close. This is because you can reduce the travel of the servo, especially if you have to set the subtrim near 100%. As we stated before, get the pushrods close mechanically first, then use the subtrim adjustment to get it just right.

28. Note 2: if you mess up the number you've entered or find the percentage the wrong direction, you can get back to zero quickly by pressing the **Active/Inhibit (Clear)** button.

29. Repeat the subtrim adjustment with the elevator servo (**CH2**). First set the pushrod length mechanically to get as close to neutral as possible, then set the subtrim to get the elevator lined up to be parallel with the stabilizer portion. For full-flying surfaces, use an incidence meter or another method to get the incidence angle recommended by the kit manufacturer or model designer.

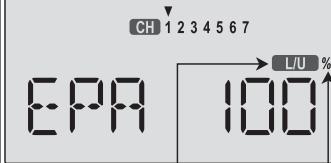
30. For the throttle, we recommend not setting a subtrim at this time. You will use the trim tab on the transmitter for setting your idle RPM. To shut off the motor you will use the Engine Cut function. In this way, you don't lose your carefully-set idle position.

31. Most people set up their engines to idle with the throttle trim near center, so that there is room for changes due to humidity and other factors.

32. The *Eclipse 7* provides a special throttle trim function which allows the throttle trim lever to work at low throttle levels, but disables it at high throttle.

33. Repeat the subtrim adjustment with the rudder (**CH4**), gear (**CH5**), 2nd aileron channel (**CH6**), and the **CH7** function if used. As before, first set them mechanically, then adjust the electronic settings. Be sure you have selected the appropriate channel number each time.

34. Servo EPA (End Point Adjustment). Now we'll go through and set the servo travels for each channel. This is both helpful and important, because you can set the throw of each servo, in each direction, so that there is no *binding*. Binding is important because it causes very high current drain, and can lead to a battery dying prematurely. Another use for the **EPA** function is to adjust the model's total throws to match the recommended



control motions specified on the plans or instructions by the model's designer.

35. To set travels, get to the **EPA** menu by pressing one of the **Up Down Edit** buttons repeatedly until **EPA** appears. In sequence, we'll set right aileron right travel, right aileron left travel, up and down elevator travels, right and left rudder travels, open and closed throttle positions, and left aileron travels.

36. When you reach the **EPA** menu, you'll see the screen as shown. The channel indicator is above numeral 1 for right aileron, the percent symbol will be flashing, and you'll notice that you can change the **L/U** indicator to **R/D** (or vice versa) by moving the aileron (right) stick. You are about to see that this is how you set the travel directions independently for each stick motion.

37. To set the **RIGHT** aileron motion, move the aileron stick all the way to the right and hold it. The letters "**R/D**" should appear next to the flashing percent sign, meaning you are setting either Right or Down travel (with ailerons it's right or left only, but the display is set up to use the same indicators for elevator and throttle, thus the dual meanings for the letters). Now if your servo is stalled or binding, you'll hear a buzzing sound. Hit the minus

-**Decrease Data** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100%. If you can, choose a location for the pushrod on the servo arm so that the throw is adjusted in the 90-100% range.

38. To set the right aileron's **LEFT** motion, move the aileron stick all the way to the left and hold it. The letters "**L/U**" should appear next to the flashing percent sign (as shown in the figure above). Again listen and hit the -**Decrease Data** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100%. (Remember, you're only setting the right aileron travel. You set the other aileron's travel in channel 6's EPA.)

39. To set the **UP** elevator motion, press on the **Right Cursor** key until the indicator moves over channel 2.

Now move the right stick all the way to the transmitter bottom and hold it.

The letters "**L/U**" should appear next to the flashing percent sign. Again listen for a buzzing sound to indicate the servo is stalling, and hit the -**Decrease Data** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100%.

40. Repeat the previous step for **DOWN** elevator by moving the stick all the way to the top of the transmitter, full "down" elevator. Check for binding and adjust the percentage as before.

41. To set the throttle position at **IDLE**, first return to the regular display and set the throttle trim to +25%. Then go back to the **EPA** menu and press the **Right Cursor** key until the arrow moves over channel number 3. Now

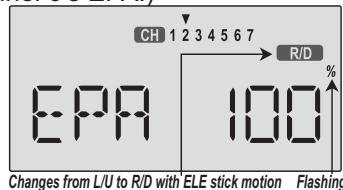
move the throttle stick all the way to the transmitter bottom and hold it. The letters "**L/U**" should appear next to the flashing percent sign. Listen for a buzzing sound to indicate servo stalling, and hit the -**Decrease Data** key until the buzzing stops. Change the setting to nearly-but not completely - close the throttle (engine idle).

Later you may increase or decrease this number so you can't accidentally shut off the engine using the trim tab.

42. To set the **FULL** throttle position, move the throttle stick all the way to the transmitter top and hold it. The letters "**R/D**" should appear next to the flashing percent sign. [Notice that the *Eclipse 7* transmitter thinks of throttle stick positions to the reverse of the way it seems, in that with the throttle stick fully forwards - "up" towards the transmitter top, is the Down position.] Listen for a buzzing sound to indicate the servo is stalling, and hit the -**Decrease Data** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100% or change your linkage as necessary to fully open the throttle.

43. To set the **RIGHT** rudder motion, press the **Right Cursor** key until the indicator moves over channel 4. Now move the left stick all the way to the transmitter right and hold it. The letters "**R/D**" should appear next to the flashing percent sign. Listen for a buzzing sound to indicate the rudder servo is stalling, and hit the **Data -Decrease** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100%. You may wish to increase or decrease this number depending on how strongly the model reacts when the rudder is deflected. Now move the stick to the left side, and repeat the setting procedure for left rudder.

44. In the same manner as described above, be sure to set **EPA** values for channels **5** (landing gear) and **6** (second aileron), if you have either.



Changes from L/U to R/D with ELE stick motion Flashing

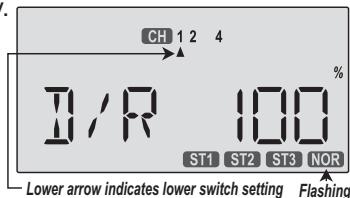
45. If you wish to have the flaps operate with the **CH6** knob, go back to the **FLPT** menu and input a number greater than zero. Adjust the number to get the desired amount of flap travel as you turn the knob.

46. If you wish to have differential aileron travel, this can be done in the flaperon menu. First, we'll reduce the down travel on the right aileron. Press the **Right Cursor** key until the little triangles are both above and below the numeral 1. Hold the aileron stick to the left and press the -**Decrease Data** key until the number is smaller. 50-75% is a good starting point. Watch to be sure you're setting the down travel on the right aileron.

47. Next, we'll reduce the down travel on the left aileron. Press the **Right Cursor** key until the little triangle moves below the numeral 6 (the second aileron; the upper triangle should stay over the number 1). This time, hold the aileron stick to the right and press the - **Decrease Data** key until the number is the same as you chose for the other side.

48. Aileron Dual Rate setting. You can use the dual rate function to reduce the aileron and elevator travel *in flight* by flipping switches. Dual rates are typically used to reduce a model's sensitivity.

49. Get to the D/R menu by pressing one of the **Up Down Edit** buttons repeatedly until **D/R** appears, as shown.



50. The aileron dual rate setting automatically affects both ailerons if the flaperon function is active. To set the aileron dual rate, move the arrow by pressing the **Right Cursor** key until the little arrow is under or over the numeral 1 (the arrow depends on the position of the **Ail D/R** switch above the right stick.) Now move the aileron D/R switch up or down, noticing the position of the arrow. You can set two dual rates, one for each switch position. If you set them, be sure to note which switch position turns them on.

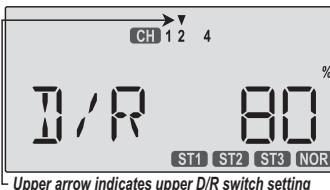
51. By pressing the **Data +Increase** or **-Decrease** keys, you can add or subtract from the numerical value displayed. Note that you may pick a value anywhere from 0% to 125% (125% is larger than the normal amount, so if you do this be careful not to exceed servo travel limits and cause stalling or excess current drain). If you quickly want to get back to the default 100%, press the **Clear** key. We suggest using an initial value of 75%.

52. NOTE: If you set any of the dual rates to 0%, you will have **ZERO CONTROL AUTHORITY** and **LOSE CONTROL OF YOUR AIRCRAFT** when the switch is in that position.

DON'T DO IT!

53. Also note that the flight mode indicator NOR may be flashing. This tells you that you have set the dual rates for the NOR mode, and if you activate other flight modes, you can set dual rates for them as well.

54. Elevator dual rate setting: press the **Right Cursor** key one time to get the little arrows above or below the numeral 2. Now set the elevator dual rates in the same way you set the ailerons in the previous step.



Upper arrow indicates upper D/R switch setting

55. Rudder dual rate setting: press the **Right Cursor** key one time to get the little arrows above or below the numeral 4. Now set the rudder dual rates in the same way you set the ailerons and elevator in the previous steps.

56. Note that you can have different dual rate values in each of the different flight conditions. When you activate flight conditions, be sure to set dual rates for each one if you desire.

57. Landing setup. You can get an airbrake effect by flipping a switch to raise or lower both flaperons and add elevator to keep it trimmed. This high-drag configuration makes the landing approach steeper to help make safe landings in small fields. *This is an on-off function, not proportional.*

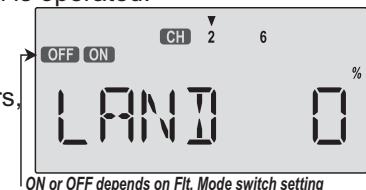
proportional.

58. With landing mode on, it is possible to lose some aileron effectiveness. Be sure to test the landing settings at altitude before trying it on a landing approach. You should spend some time fine-adjusting the elevator travel so that there is minimal trim change when the landing (**Fit. Mode**) switch is operated.

59. Press one of the Up

Down Edit buttons until

the **LAND** window appears, as shown. The landing mode is **OFF** unless the



ON or OFF depends on Fit. Mode switch setting

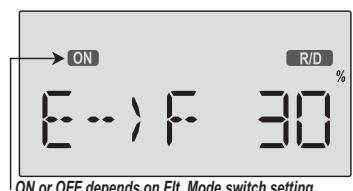
Fit. Mode switch is fully forward.

60. The arrow should be over the numeral 2. Now press the **Data +Increase** key to change the percentage shown. You may input the amount of offset for the elevator at this time. This should be set from -7% to -10%. Don't use too much or it could crash your model.

61. Press the **Cursor Right** key one more time, and you may now input the CH6 setting. The rates may vary considerably for different models, but for initial settings you might try the flap rate around 50-55%. You may want flaps to droop or rise, depending on the model type.

62. E->F Mixing: you may couple elevator to flaps for tighter corners in the elevator-to-flap mixer. Get to the **E->F** menu, then activate it by pressing the **Clear** key. Press the **Right Cursor** key to get the percent symbol to flash. Now you may input the percentage of mixing with the **Data +Increase** key. Start out with 10-20% and increase it until the corners in your loops are square enough. If the flaps don't drop when you pull up elevator, reverse the sign in front of the mix percentage (change the + to a - or vice versa).

63. Be sure to input a mixing percentage for each side of the elevator stick motion.



ON or OFF depends on Fit. Mode switch setting

64. Programmable mixers: now take advantage of your system's advanced custom programming capabilities. You may use up to five programmable mixers (**PMX1** through **PMX5**) to get rid of unwanted tendencies (for example, rolling or tucking during knife-edge flight).

65. For tucking during knife-edge, you want to apply a little up elevator when you are using full rudder to sustain knife-edge. Thus, we want the **master** channel to be rudder, and the **slave** to be elevator.

66. To program this mixing, first get to the **PMX1** window. Press one of the **Edit Up/Down** keys until you see **PMX1** displayed. Then press the **Active/Inhibit (Clear)** key to activate it (a flashing **ON** or **OFF** will appear, depending on the position of the **CH. 7** switch, which turns mixer #1 on and off).

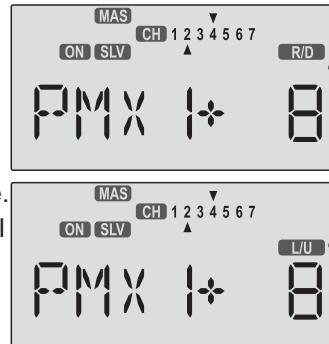
67. Next, press the **Cursor Right** key once to select the master channel (**MAS** flashes on and off), then press the **Data +Increase** key until the little arrow moves over the

numeral 4, indicating CH4 (rudder) is the *master* channel. Press the **Cursor Right** key once (**SLV** flashes on and off), then press the **Data +Increase** key until the little arrow is under the numeral 2, indicating **CH2** (elevator) is the *slave* channel.

68. Now, you'll define the mixing *percentage*. Notice that the mixer starts with 100% on both sides, which is WAY too much. Move the rudder stick to one side and press the **Clear** button, zeroing the percentage. Move it to the other side and repeat. Now both sides are set to zero percent.

69. If your model tucks during knife-edge, you'll want to input up elevator for rudder going both directions. Move the rudder stick to the right and press the **Data +Increase** until you can see which way the elevator moves; if incorrect, press the **Data -Decrease** key until the plus sign changes to a minus sign. Repeat this by moving the rudder stick to the other side. You'll end up with a plus sign for one rudder direction, and minus for the other direction. Start with only **5-10%** mixing on both sides until you know how much you need from actual test flying.

70. Be sure you understand how to use the **CH. 7** switch to turn **PMX1** on and off, since you won't want this mixing on during normal flight, only during knife-edge. Later, after you fly the model you may fine-tune the amount of elevator travel so that the pitching tendency is eliminated. You can define another mixer to handle adding aileron corrections during knife-edge. In this case, you'll have the same percentage sign on both sides of the rudder. This introduction just scratches the surface of the capabilities of your *Eclipse7* system. Please read the manual so you'll know what other features you can take advantage of. The sky's the limit - we know you'll enjoy using your **Eclipse 7** system!



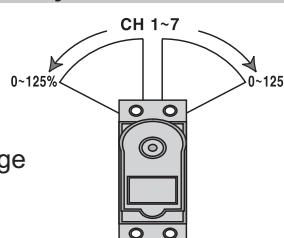
Airplane Model Function Descriptions

EPA - End Point Adjust

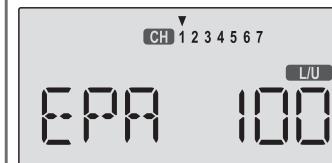
The **EPA** function is used to set (or limit) the travel of each servo, and may be set anywhere from 0% and 125% for each travel direction. Reducing the percentage settings reduces the total servo throw in that direction.

The **EPA** function is normally used to prevent any servos from binding at the ends of their travel.

If you change the EPA setting to 0%, you will not have any servo response in that direction, and will probably crash.



Setting EPA values on your system:



1. Enter the programming mode by pressing the two **Edit Up Down** keys (the two keys on the far left) at the same time. You should pop right into the **EPA** screen, but if you do not, press either **Edit Up Down** key until you see **EPA** displayed.

The channel indicator is above numeral 1 for ailerons, the percent symbol will be flashing, and you'll notice that you can change the **L/U** indicator to **R/D** (or vice versa) by moving the aileron (right) stick. In the next steps you will see how you set the travel directions independently for each stick (or knob or gear switch) motion.

2. To set the **RIGHT** aileron servo travel, move the aileron stick all the way to the right and hold it. The letters "**R/D**" should appear next to the flashing percent sign, meaning you are setting either Right or Up travel (with ailerons it's right or left only, but the display is set up to use the same indicators for elevator and throttle, thus the dual meanings for the letters). Now if your servo is stalled or binding, you'll hear a buzzing sound. Hit the **Data -Decrease** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100%. Later, depending on how rapidly the model rolls, you can use aileron dual rates to reduce the sensitivity.

3. To set the **LEFT** aileron motion, move the aileron stick all the way to the left and hold it. The letters "**L/U**" should appear next to the flashing percent sign. Again listen and hit the **Data -Decrease** key until the buzzing stops. If the servo is not buzzing, leave the setting at 100%.

4. To set travel volumes for other channels, press the **Cursor Right** key to select the channel you wish to change. The little triangle moves and indicates the active channel. Repeat these steps with each channel in sequence, taking care to set the travel for both directions. You may set each channel separately, anywhere in between 0% and 125%, and if you wish to rapidly return to the default 100% setting, press the **Active/Inhibit (Clear)** key.

5. Return to the regular operating mode by pressing the two **Edit Up Down** keys simultaneously.

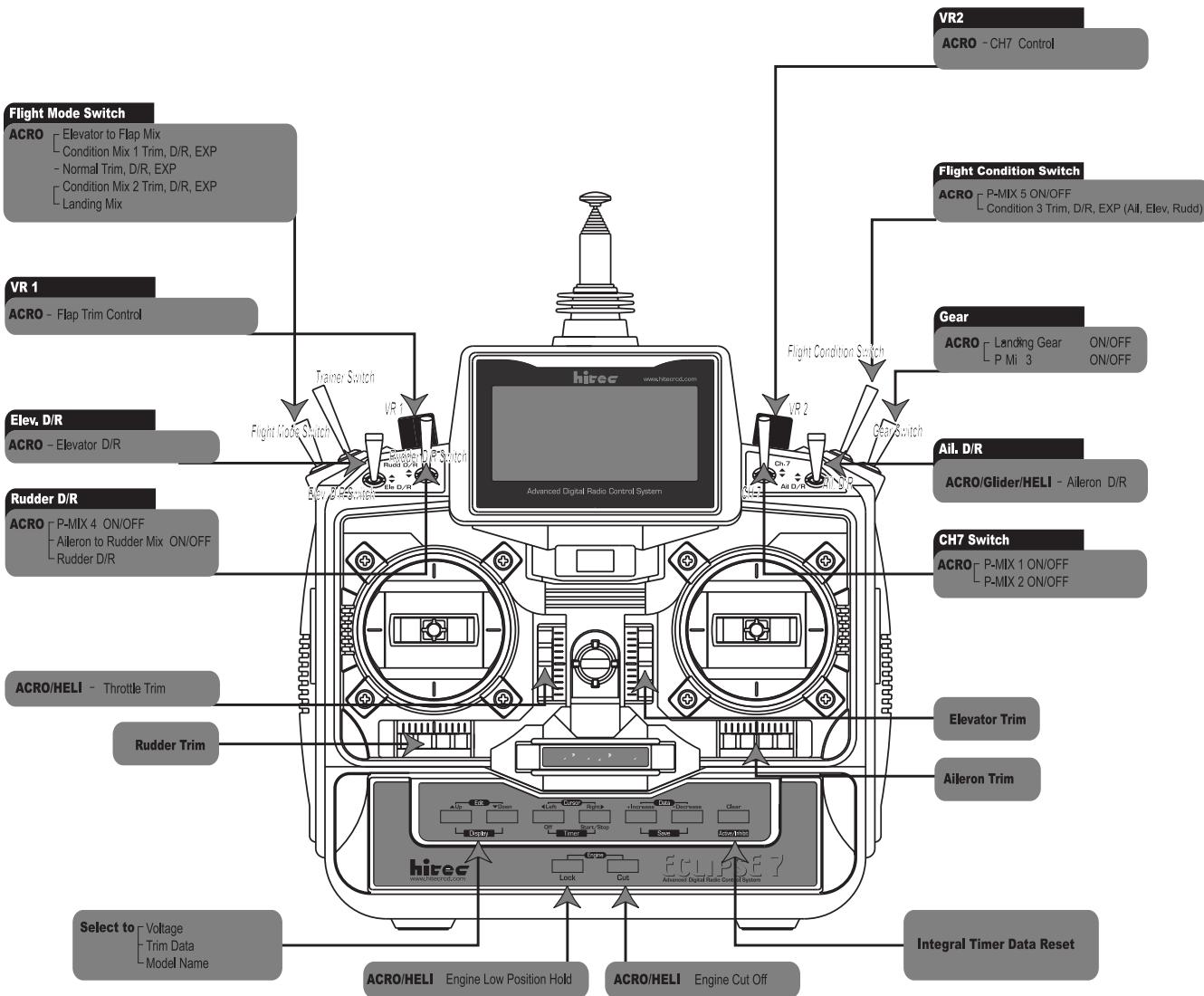
Congratulations! You've successfully programmed your system!

D/R - Dual Rates

If this is your first computer radio, you may have never been introduced to dual rates before. Dual rates are used because most models respond more rapidly to control inputs while they're flying at higher speeds, and it is possible to be really gentle with the controls and yet still over-control. Dual rates are used to adjust the transmitter so that a control actuated at high speed will not cause a radical response, so they are very useful for beginning pilots as well as experts. Dual rates are invoked by flipping the dual rate switches on the transmitter.

The **Eclipse 7** has three dual rate switches, one each for

Eclipse 7 Aircraft Controls and Switch Assignments



This figure shows the assignments for a **Mode 2** system as supplied by the factory for the North American version. Note that some of the functions will not operate until activated in the mixing menus.

ailerons, elevator, and rudder. The aileron dual rate switch is located over the right-hand stick; the elevator dual rate switch is located over the left-hand stick, and the rudder dual rate switch is to the right of the elevator switch. The amount of travel reduction or increase may be set anywhere between 0 and 125%.

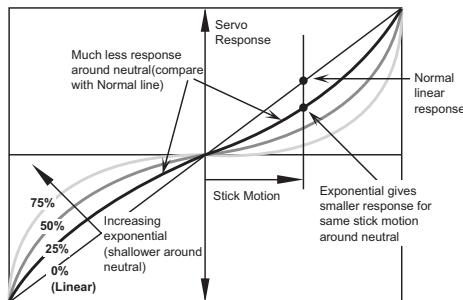
Note: If you set the dual rate amount to zero, you will get no response from that channel, which may cause a crash. If you have flight conditions active, you can select different amounts of dual rates for each flight condition.

Inputting Dual Rate Values

- Get to the **D/R** screen with the **Edit Up Down** keys.
- The active channel number is indicated by the arrow above or below the channel numbers. The arrow's position depends on the position of that channel's dual rate switch. In the figure, the aileron (CH1) dual rate setting at the D/R switch's lower position is being programmed.
- Use the **Data +Increase or -Decrease** key to choose the amount of dual rate for that switch position. You may set the travel for both sides of the switch simply by flipping the switch to the other position (the arrow will also switch sides). If you wish to return to the original 100% value, press the **Active/Inhibit (Clear)** key.
- Press the **Cursor Right** key to move to another channel you wish to input dual rate settings.
- Repeat the first three steps for the dual rate settings on the remaining channels. Note that you can leave one side of the dual rate switches alone. This can be used for exponential settings (see next function).
- Return to the regular operating mode by pressing the two **Edit Up Down** keys simultaneously.

EXP - Exponential

You may be new to exponential settings. "Exponential" refers to a mathematical function where the curve grows steeper the further away from center it gets. **Expo** is a way to get the effect of dual rates without having to flip a switch. The figure below will help explain this concept.

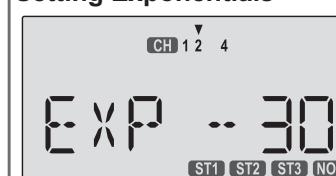


You will notice that exponential has a smooth curve. For this reason it is possible to have low sensitivity at low stick angles (like dual rates), and yet have full motion at full stick deflection. The *Eclipse 7* allows you to have two different values of exponential, chosen by the same dual rate toggle switches on the transmitter, described earlier. You might want to set a dual rate at one switch

position with zero exponential, and an exponential value with 100% dual rate at the other. Then you can switch between them in flight and decide which you like better. Later, you can combine both dual rate settings and exponential on a single switch setting. There are really two kinds of exponential, "positive" and "negative." Negative exponential is the one shown in the graph and the type most commonly used, where servo movement is softer around neutral. Positive exponential is where the servos are very sensitive around neutral and soft at extremes. It is sometimes used for helicopter tail rotors.

The *Eclipse 7* allows you to set exponential for ailerons, elevator, and rudder. If you have flight conditions active, you can select different amounts of expo for each flight condition.

Setting Exponentials



- Enter the programming mode by pressing the two **Edit Up Down** keys (the two keys on the far left) at the same time.

Press either **Edit Up Down** key until the **EXP** menu appears, as shown.

- To set exponential for channel 1, move the arrow by pressing the **Cursor Right** or **Left** keys repeatedly until the arrow is under or over the channel number you want. Now switch the appropriate switch up or down, noticing the position of the arrow. You can set two values of exponential, one for each switch position. By pressing the **Data +Increase or -Decrease** keys, you can add or subtract from the numerical value displayed. Note that you may pick a value anywhere from -100% to +100%. If you quickly want to get back to the default 0%, press the **Active/Inhibit (Clear)** key. You should understand that you won't see changes in your model's servo response unless you move the sticks. To get a feel for how exponential works, just hold partial stick and switch the Expo on and off (one side of the switch should be set to zero expo). You'll see how it affects the servo travel.
- The values you set for exponential are highly dependent on both the model and pilot's preference. We normally recommend a start value of about -10% to -20%, and many test flights, slowly increasing the number until things are "right". Obviously this depends on the pilot and model so go ahead and fly with Expo programmed on one of the flight condition switches so it can be turned on and off during flight. Or don't use it at all if you don't like it - it's not for everyone.

- Repeat this procedure for the expo settings on the other remaining channels.

- Return to the regular operating mode by pressing the two **Edit Up / Down** keys simultaneously.

FLT.C - Flight Condition Menu

Flight conditions are special functions which allow you to switch certain settings in the *Eclipse 7* transmitter in order to tailor it to different conditions of flight.

For example, you might have a scale model which is very sluggish at lower speeds (such as takeoff and landing) yet is very sensitive at higher speeds. Or, it may need lots of rudder trim at lower speeds, but not at higher speeds.

Flight conditions allow you to choose between up to three different individual sets of trims, dual rate settings, and exponential values. You make the change when either the **Flt. Mode** 3-position switch or **Flt. Cond.** switch is flipped. The *Eclipse 7* provides three flight conditions in addition to the normal one (**NOR**), denoted **ST1**, **ST2**, and **ST3** (you will see these indicators in the display). Flight conditions are a very unusual feature for a system in the class of the *Eclipse 7* and they are normally found only on systems costing far more. As you learn to use them, you will really appreciate them.

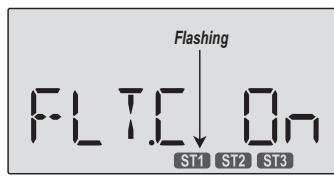
The priority of the conditions (when all three are activated) is as follows: **ST3 > (ST1, ST2) > NOR**. In other words, whenever **ST3** is turned on, it has priority over the other conditions. If **ST3** is not on, both **ST1** and **ST2** override **NOR**, which is only active if all the others are turned off. This is better understood if you look at the table below:

Fit. Mode Switch	Flt. Cond Switch	Active Flight Cond.	Comments
Any position	Forward	ST3	ST3 overrides all
Forward	Back	ST2	ST2 active if ST3 off. LAND also on.
Back	Back	ST1	ST1 active if ST3 off. (E->F on)
Center	Back	NOR	Default condition

Choosing Flight Conditions

1. Get to the **FLT.C** screen with the **Edit Up Down** keys.

The display will indicate "Inh" and, depending on the positions of the two controlling switches, one of the condition displays on the bottom (**ST1**, **ST2**, or **ST3**) may be flashing.



2. Select the desired flight condition from the *third* column of the table above, and move the two switches to the positions shown on the same row of the table. The active condition indicator on the bottom right of the display will flash.

3. Activate the selected flight condition by pressing the **Active/Inhibit (Clear)** key. The letters "Inh" will change to "On". Note that you cannot activate **ST1** or **ST2** if the **Flt. Cond** switch is **Forward**, even if **ST3** is currently inhibited.

4. Repeat this procedure to activate each desired flight condition. You can activate up to three conditions (besides the normal one, which is always on). In this display, you can tell if you are in the **NOR** mode if the display indicates "Inh" and **ST1**, **ST2**, and **ST3** are NOT flashing.

5. Verify that the desired flight conditions operate when the appropriate switch combination is selected by looking at the flashing displays.

6. Now that you have activated one or more flight conditions, you can have new sets of dual rates, exponential values, and trims. Trims are defined by the trim levers on the transmitter, but you can define the values of D/R and Expo using the programming menu. Use the **Edit Up Down** key to move to the **D/R** menu.

7. With **D/R** indicated in the display, be sure the flight condition switches are in the desired position by checking to see which is flashing. Then input the desired **D/R** value for the active condition. Note that you can only define one rate for each flight condition - the position of the Dual Rate switches does not matter.

8. Again use the **Edit Up Down** keys to get to the **Expo** menu, and set up a desired value of expo for each flight condition. Again, you can only select one exponential value for each flight condition.

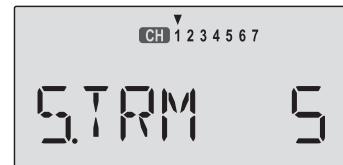
9. Return to the regular operating mode by pressing the two **Edit Up Down** keys simultaneously. If you move to the **TRIM** menu with the **Edit Up Down** key, the flight condition indicators are shown in the lower right of the screen, to tell you which is active. You can change the trims in one flight condition, and they are stored separately and called up when you switch between them. That's really cool!

STRM- Subtrim Settings

The Subtrim window is used to make small adjustments or corrections in the neutral position of each servo, independent of the trim levers. The recommended procedure is to zero out both the trims (see settings menu) and the subtrims (this menu). Then, one mounts the servo arms and sets up linkages so that the neutral position of each control surface is as close to where it should be as possible, with the arm 90° to the pushrod. Finally, small amounts of subtrim are used to make fine corrections. We recommend that you try to keep all of the subtrim values of as small as possible. Otherwise, when the subtrims are large values, the servo's full range of travel may be restricted.

Setting Subtrims

1. Use the **Edit Up Down** keys to call up the **STRM** window.



2. Press the **Cursor Right** or **Left** key until the small

arrow is above the channel you wish to adjust (the figure shows subtrim adjustment for **CH1**).

3. Adjust the neutral position using the **Data +Increase** or **-Decrease** keys. You may adjust between -100% and +100%. If you want to reset the value back to zero, press the **Active/Inhibit (Clear)** key.

4. Repeat steps 2 and 3 for each channel to be adjusted in turn.

5. Return to the regular operating mode by pressing the two **Edit Up Down** keys simultaneously.

REV - Servo Reversing

The servo reverse function may be used when you need to change the direction that a servo responds to a control stick motion. When you use this function, BE SURE THAT YOUR CONTROL IS MOVING THE CORRECT DIRECTION. If you are using any preprogrammed mixers such as flaperon, be sure to set correct travels in the REV menu setting up the preprogrammed function.

Reversing Servos

- Get to the REV screen with the **Edit Up Down** keys.
- Use the **Data +Increase** or **-Decrease** key to select the channel you wish to reverse. The active channel number will flash.
- Toggle between normal (**N**) and reverse (**R**) with the **Active/Inhibit (Clear)** key. The arrow above the number indicates normal travel, while the arrow below indicates reversed travel (the figure shows all channels normal, none reversed).
- Repeat this procedure for each channel needing to be reversed.
- Return to the regular operating mode by pressing the two **Edit Up Down** keys simultaneously.



T.CUT - Throttle Cut (Engine Shut off) Function

The **Throttle Cut** function provides you an easy way to stop the engine by simply pressing a button with the throttle stick at idle, which commands the throttle servo to move a prescribed amount. The throttle servo moves to the selected cut position when the **Cut** button is pressed and the throttle stick is below 50%. Above 50% throttle, the cut button has no effect. The activation direction may be chosen by the owner.

Setting up the Throttle Cut function

- Get to the T.CUT screen with the **Edit Up Down** keys.
- Place the throttle at its idle position (towards bottom of transmitter). Use the **Data -Decrease** key to select the amount of motion of the throttle servo you wish - normally you want to completely close the carburetor, but be careful not to choose too much travel which will stall the servo. You may see the servo move when you press the **Active/Inhibit (Clear)** button. A maximum of 72% may be chosen, but only use the amount you need to fully close the carburetor without stalling the servo.
- Return to the regular operating mode by pressing the two **Edit Up Down** keys simultaneously.



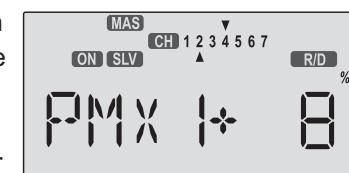
PMX1 to PMX5 - Programmable Mixes 1, 2, 3, 4, & 5

Your **Eclipse 7** system contains FIVE separate programmable mixers (**PMX1 - PMX5**) with unique capabilities. You may use mixing to correct unwanted tendencies of the aircraft during aerobatics. Each one of these mixers may be programmed to do things that are not built-in

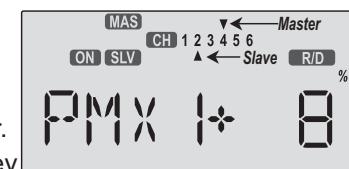
programs. This makes them useful for all sorts of different things. Note that the mixers must be turned on by flipping a switch - if you need them to be on all the time, you must not touch that switch. The elevator dual-rate switch in its down position turns on mixers (if they've been activated). The method to be used to program mixers is given for Mixer #1, but the other mixers may be programmed in an identical fashion. You can use both PMXs to create a custom dual elevator function, where you use two servos for your elevator control, one for each side, the second plugged into an unused receiver channel and mixed from elevator (if you do this, you must be careful to keep the mixer on at all times). Or you may also use the mixers for correcting unwanted flying tendencies, like automatically applying a bit of rudder with throttle to account for torque/P-factor effects, to a corrective elevator motion during knife-edge flight to correct for an undesired tucking tendency (the latter is described in the **ACRO** model setup section and below).

Using the Programmable mixers

- Call up the mixer screen by repeatedly pressing one of the **Edit Up Down** keys until a **PMX** window appears. The default is for the function to be inhibited. To activate, press the **Active/Inhibit (Clear)** key. This will cause the **INH** display to change to a display showing 100%, Master and Slave indicators, and a flashing **ON** or **OFF** depending on the position of the mixer's on-off switch.



- Now you'll select the **Master** channel for the mixing, the channel that causes the mixing to occur. Press the **Cursor Right** key to get the master channel indicator **MAS** flashing on and off, then press the **Data +Increase** or **-Decrease** keys to move the top arrow over the number of the desired master channel, 1 - 7.



- Next you'll put in the **Slave** channel, the one that is affected by motion of the master channel. Press the **Cursor Right** key to get slave channel indicator **SLV** flashing on and off, then press the **Data +Increase** or **-Decrease** keys to move the bottom arrow underneath the number of the desired slave channel.

- Now we'll input the mixing percentage, which tells how much the slave channel responds to the master channel. Press the **Cursor Right** key to cause the percent(%) sign to the right of the large number to flash on and off. Note that you can set the percentage for the mixer on each side of the master channel's control's motion by moving the master channel's control back and forth. The motion of the master channel's control is also indicated by the **R/D** (= Right/Down) or **L/U** (= Left/Up) indicator in the window.
- Hold the master channel's control to one side, and then

use the **Data +Increase or -Decrease** key to change the percentage for the mixer. Verify that you get the proper motion of the slave channel when you move the master. If you don't get a response to the master movement, check that the mixer is turned **on** with its on-off switch (either the **Ch. 7** switch, or the **Rudd D/R** switch). Change the percentage if the *amount* of travel is incorrect. If you want to set the percentage to **ZERO**, press the **Active/Inhibit (Clear)** key.

6. Move the master control to the other side of its travel and then repeat the actions in the previous step to set the amount of mixing on the other side. Use the **Data +Increase or -Decrease** key to change the percentage for the mixer until you get the response you want for the second side.

[Knife-Edge Example]:for a model that tucks under during knife-edge flight, set up a mixer with **Master = 4**(Rudder), and **Slave = 2** (elevator). You want to get **up** elevator mixed in for **either** direction of full rudder. Therefore, you'll set **plus** mixing on one side of the rudder stick, and **minus** mixing on the other side. Normally only 5% to 10% mixing is needed to solve this problem.

Mixer No.	Mixer On When...	Available menus
1	CH7 Switch Forward	ACRO, GLID
2	CH7 Switch Forward	ACRO, GLID
3	Gear Switch Forward	ACRO, GLID, HELI
4	Rudder Switch Forward	ACRO, GLID, HELI
5	Flt Condition Switch Forward	ACRO, GLID

LAND - Landing Function

The **LAND** function simultaneously moves the flaps and the elevator to defined positions to help make steep descents or limit airspeed in dives. The controls move to the defined positions by flipping the **Flt. Mode** switch fully forward. If your model has a single flap servo on CH6, the flap is dropped. If flaperons are active, you'll want to raise both to prevent tip-stalling with some up-elevator to compensate, but you may want to experiment with small values of down flaperons to slow the model down.

Use the elevator offset to maintain pitch trim when the landing function is turned on.

Setting up Landing function

1. Use the **Edit Up Down** arrow keys to select the **LAND** window.

Depending on the position of the landing switch, the display will show a flashing **OFF** or **ON**. The **Flt. Mode** switch turns on **LAND** when all the way forward.

2. First the amount of elevator offset is programmed. A small arrow is displayed over the numeral **2** (representing elevator). You may adjust the amount of travel with the **Data +Increase and -Decrease** keys. You may use anywhere between -100% and +100%, but a small value of ±10% or less is

the recommended starting value. Be careful as this has a very powerful effect on the model's trim. Press the **Active/Inhibit (Clear)** key if you wish to reset to 0%.

3. To get to the flap travel setting, press the **Cursor Right** key. The small triangle is now displayed above the numeral **6**, indicating the flap channel. You may input any desired flap travel with the **Data +Increase and -Decrease** keys. The default is 0%, and you may set this anywhere from -100 to +100% (check that there is no binding with large flap deflections and aileron commands). With flaperons, large motions should also be avoided because of reduced aileron effectiveness. You may return to the 0% settings by hitting the **Active/Inhibit (Clear)** key.

Note: At first, be very cautious using the **LAND** function when you are flying slowly, as there could be a loss of roll authority. Check out how it works at high altitude first.

FLPT - Flap Trim Function

The Flap Trim function is used to specify the amount of flap travel produced by motion of the flap control (the **CH6** knob). With flaperons active, it controls the motion of both ailerons.

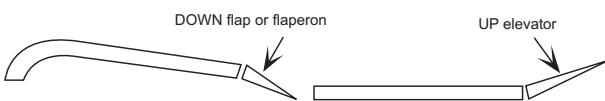
Setting Flap Trim function

1. Use the **Edit Up Down** arrow keys to select the **FLPT** window.

2. Pressing the **Data +Increase or -Decrease** key to input your desired flap motion setting. The 30% default value produces "reasonable" travel for many models, but you must try it out on your own model to be sure. A 100% setting causes extreme travel and is not recommended. You may want to set it to a smaller number, say 10% for starters. If you wish to return to the default 30% setting, press the **Active/Inhibit (Clear)** key. You can toggle through the settings 0%, 30%, and 100% by continuing to press this key. Setting it to 0% disables the flap knob, but the flaps will still respond to mixing functions such as **E->F** and to the **Landing** function.

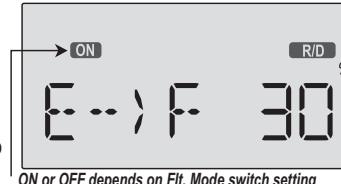
E->F - Elevator → Flap Mixing

Elevator-to-flap mixing makes the flaps drop or rise whenever you pull on the elevator stick. It is used to make tighter "pylon" turns or squarer corners in maneuvers. Elevator-to-flap mixing is set up so that the flaps droop (are lowered) when up elevator is commanded. Notice that this mixing function works with the flaperon setting. If flaperon mixing (**FLPN**) AND **E->F** mixing are activated, when you pull up elevator, BOTH ailerons will droop. This function is turned on with the **Flt. Mode** switch fully **Back**.



Setting Up E → F Mixing

1. Press one of the **Up** **Down** **Edit** buttons until the **E→F** window appears. The default is for the function to be inhibited. To activate, press the **Active/Inhibit (Clear)** key.



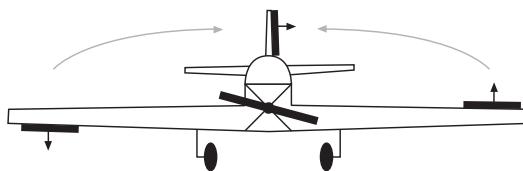
This will cause the **INH** display to change to a number display, and either **ON** or **OFF** will be flashing depending on the position of the **Flt. Mode** switch (fully aft turns it **ON**).

2. Press the **Cursor Right** key to get the percent sign flashing, then press the **Data +Increase and -Decrease** keys to increase or decrease the amount of mixing.

Check the direction the flaps move with elevator stick: with up elevator, the flaps should droop downwards, and for down elevator they should come up. In other words, they should move opposite the elevator motion. If they don't, use the **Data +Increase and -Decrease** keys to change the sign in front of the percentage number. You should probably start with a smaller number (say 20% or so) and slowly increase it to learn how the model reacts. Remember the position of the **Flt. Mode** switch turns this function on and off (fully back turns it **ON**).

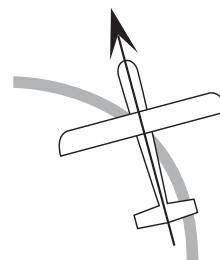
A→R - Aileron → Rudder Mixing

Aileron-to-rudder mixing is a function which causes the rudder to move automatically with the motion of the aileron stick. This is done because when ailerons are used to command a turn, the down-moving aileron has more drag than the up-moving one, so the plane's fuselage tries to yaw *against* the turn. Adding rudder mixing cures this problem by making the fuselage point straight into the oncoming air stream (this is also called "coordinating the turn").

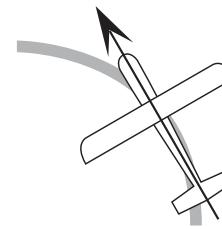


The slower the model flies, the more mixing is needed, and the faster it moves, the less is needed. It is ideal to make slow-flying scale models fly realistically. The amount of coupling is highly dependent on the model configuration. Usually only a small amount of rudder is needed. It will also help to set up some aileron differential using the **EPA** menus.

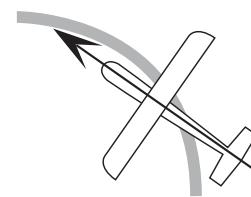
A good starting point is to limit the ailerons' down motion to 50% to 75% of the up-moving aileron's motion. The aileron-to-rudder mixing function is turned on and off by the **Rudder D/R** switch.



Nose Points outside Circle
increase coupling and/or differential



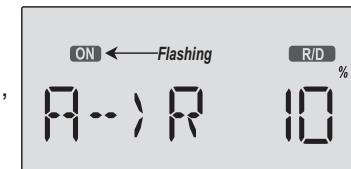
Coordinated turn
fuse lines up with turn direction
(don't change anything!)



Nose Points inside circle
too much coupling or differential.
Reduce one or both.

Setting Up A→R Mixing (Rudder Coupling)

1. Press one of the **Up** **Down** **Edit** buttons until the **A→R** window appears, as shown. The default is for the function to be inhibited, as shown. To activate, press the **Active/Inhibit (Clear)** key.

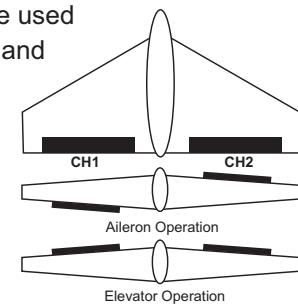


2. Press the **Cursor Right** key once, and the **Percent** sign will be flashing. Move the aileron stick all the way to the right, and adjust the **R/D** mixing amount by pressing the **Data +Increase or -Decrease** key. You may set any amount between 0 and 100% (an initial value of 10-20% is suggested). To return to the initial 0% value, press the **Active/Inhibit (Clear)** key.

3. Move the aileron stick all the way to the left, and adjust the **L/U** mixing amount in the same way. To return to the initial 0% value, press the **Active/Inhibit (Clear)** key.

ELVN - Elevon Mixing

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



The amount of aileron and elevator response can be adjusted independently. However, if you program in too much elevator or rudder travel, the servos may reach their travel limits before full stick motion has occurred. The default values for this mixer are 100%, but **you may want to keep the travel settings at 50% or below** because most elevon planes are very sensitive, and adjust the control linkages to get the travel you desire. Note that you cannot use either flaperon or V-tail mixing when elevon mixing is active.

Setting up elevon mixing

1. The right elevon should be plugged into **CH1**, and the left elevon should be plugged into **CH2**.

2. Press one of the **Up Down Edit** buttons repeatedly to select the **ELVN** window.

3. To activate, press the **Active/Inhibit (Clear)** key. The letters "INH" will turn to "On."

4. Press the **Cursor Right** key once, to get to the elevator travel setting menu. A small arrow is displayed over the numeral **2**

represents elevator master channel, and the percent indicator will blink on and off. The little arrow below the **2** indicates left elevon is being set.

5. Move the elevator stick all the way to the back (full up position): both elevons should move upwards like elevators. If the left (**CH2**) elevon moves down, change its travel direction by pressing the **Active/Inhibit (Clear)** key to get 0% quickly, then pressing the **Data -Decrease** key until you reach -50%.

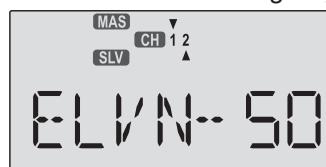
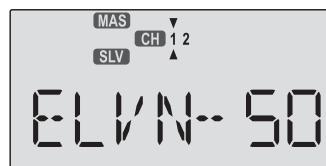
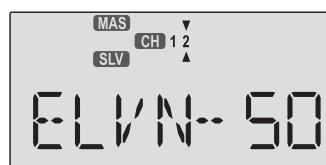
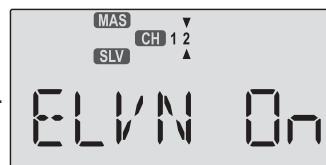
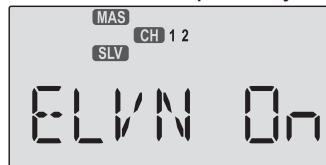
6. If the right (**CH1**) elevon moves down with up elevator stick, change its travel direction by pressing the **Cursor Right** key (the little arrow moves under the **1**), then press the **Data -Decrease** key until you reach -50%. Otherwise, continue.

7. Now you'll input the amount of aileron stick response on the right(**CH1**) elevon by pressing the

Cursor Right key once. Now the little arrows move both over and under the **1**, and you may adjust the amount of right elevon travel with the **Data +Increase** and **-Decrease** keys. 50% is a good starting point. As before, change the sign and use -50% if it travels the wrong way with aileron stick.

8. Now you'll input the amount of aileron stick response on the left (**CH2**) elevon by pressing the

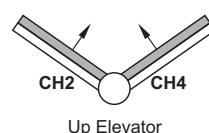
Cursor Right key once. Now the little arrow moves under the **2**, and you may adjust the amount of left elevon travel with the **Data +Increase** and **-Decrease** keys. 50% is a good starting point. Change the sign if travel needs to be reversed.



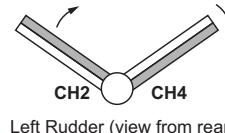
VTAL - V-Tail Mixing

V-tail mixing is used with V-tail aircraft so that both elevator and rudder functions are combined for the two tail surfaces, called "ruddervators." The response to both elevator and rudder inputs can be adjusted independently. However, if you program in too much elevator or rudder travel, when both rudder and elevator are commanded the servos may reach their travel limits before full stick

motion has occurred. Therefore, you should keep the travel settings at 50% or below and adjust the control linkages to get the travel you desire. Note that you can not have both V-tail and elevon mixing active at the same time.



Up Elevator



Left Rudder (view from rear)

Setting up V-Tail mixing

1. The right ruddervator should be plugged into **CH2**, and the left ruddervator should be plugged into **CH4**.

2. Press one of the **Up Down Edit** buttons repeatedly to select the **VTAL** window. The **INH** indicator will show.

3. Press the **Active/Inhibit (Clear)** key to activate the V-tail function. The display will show **On**.

4. Press the **Cursor Right** key once, to get to the elevator setting menu.

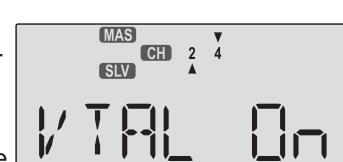
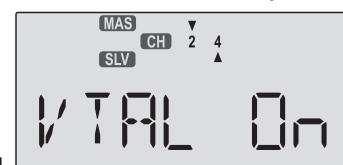
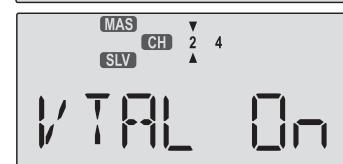
A small arrow is displayed over the numeral **2**, representing elevator master channel, and under the numeral **2**, indicating the right (**CH2**) ruddervator, and the percent indicator will blink on and off. Move the elevator stick all the way to the back (full up position): both ruddervators should move upwards. If the right (**CH2**) ruddervator moves down, change its travel direction by pressing the **Active/Inhibit (Clear)** key, then pressing the **Data -Decrease** key until you reach -50%.

5. If the left (**CH4**) ruddervator moves down with up elevator stick, change its travel direction by pressing the **Cursor Right** key (the bottom arrow moves under the **4**), the **Active/Inhibit (Clear)** key (sets 0%), then press the **Data -Decrease** key until you reach -50%. Otherwise, continue.

6. Now you'll input the amount of rudder stick response on the left (**CH4**) ruddervator by pressing the **Cursor Right** key once. Now the little arrows move both over and under the **4**, and you may adjust the amount of left ruddervator travel with the **Data +Increase** and **-Decrease** keys. 50% is a good starting point. Press **Active/Inhibit (Clear)** key if you wish to reset to 0%).

7. Now you'll input the amount of rudder stick response on the right (**CH2**) ruddervator by pressing the **Cursor Right** key once.

Now the little arrow moves under the **2**, and you may adjust the amount of right ruddervator travel with the **Data +Increase** and

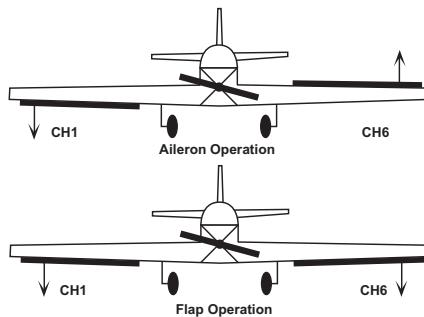


-Decrease keys. 50% is a good starting point. Press **Active/Inhibit (Clear)** key if you wish to reset to 0%.
8. Remember to be sure not to have so much travel as to cause binding when both elevator and rudder are commanded simultaneously.

FLPN - Flaperon Mixing

The Flaperon mixing function uses two servos to individually control two ailerons, combining the aileron function with the flap function. Both ailerons can be raised and lowered simultaneously for a flap effect. Of course, aileron function, where the two controls move in different directions, is also performed. The down travel of the left and right ailerons can be adjusted, so you can also get a differential effect. (Left and right flap travel are adjusted individually in the EPA menu.)

To take advantage of the flaperon mixing function, you'll need to connect the right aileron servo to CH1 (AIL) and the left aileron servo to CH6 (FLP).



You can combine the flaperon function with the landing function (**LAND**), to get steeper descents without building up airspeed. This is very convenient for making short approaches on small fields. Note that you cannot have both flaperon and elevon mixing active at the same time.

Setting up the Flaperon function

1. The right flaperon servo should be plugged into **CH1**, and the left flaperon servo should be plugged into **CH6**.
2. Press one of the **Up Down Edit** buttons repeatedly to select the **FLPN** window. The **INH** indicator will show.

3. Press the **Active/Inhibit (Clear)** key to activate the flaperon function. This will show the **On** indicator.

4. Press the **Cursor Right** key once. A small arrow is displayed over the numeral **1**, representing aileron master channel, and the percent indicator will blink

on and off. A small arrow is displayed under the numeral **1**, which tells us we're setting the right (**CH1**) flaperon servo. Move the aileron stick all the way to the right, and check that both flaperons move the right direction.

If the right (**CH1**) flaperon moves the wrong way, change its travel direction by holding the stick to the right, pressing the **Active/Inhibit (Clear)** key, then pressing the **Data -Decrease** key until you reach -100%.

This will also change the travel for the left stick motion.

5. If the left (**CH6**) flaperon moves correctly with aileron stick, go to the next step. Otherwise, change its travel direction by pressing the **Cursor Right** key (the little arrow moves under the **6**), press the **Active/Inhibit (Clear)** key (sets 0%), then press the **Data -Decrease** key until you reach -100%.

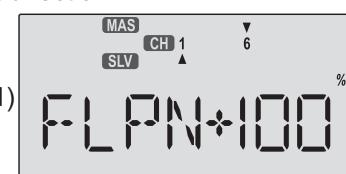
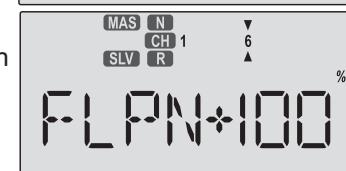
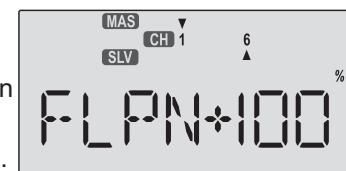
6. Now you'll input the amount of flap response on the flaperons. The flap motion is commanded by the **VR1** knob to the left of the antenna, and both flaperons should move the same direction when you move the knob. Press the **Cursor Right** key one time, so the little arrow moves over the **6** indicating flaps are now the master channel. Note the arrow under the **6** as well, indicating left (**CH6**) flaperon. Now you may adjust the amount of left flaperon travel with the **Data +Increase** and **-Decrease** keys. Press **Active/Inhibit (Clear)** key if you wish to reset to 0%. You may need to choose negative values to get the control to travel the correct direction.

7. Now you'll input the amount of flap knob response on the right (**CH1**) flaperon by pressing the **Cursor Right** key once.

Now the little arrow moves under the **1**, and you may adjust the amount of right flaperon travel with the **Data +Increase** and **-Decrease** keys.

8. You may wish to set aileron differential. Aileron differential means that each aileron has more travel in the 'up' direction than the 'down' direction. Normally the down travel is reduced to about half of the up travel, especially on slower-flying models. Press the **Cursor Right** key two times, so the little arrows move over and under the **1** indicating aileron stick is again the master channel. The arrow under the **1** indicates the right (**CH1**) flaperon. Move the stick to the LEFT and press the **Data -Decrease** key until you get to 50-75%. If you need even more differential, you can choose as low as 0% down, and the ailerons will move up only. This is preferred over reducing the up travel, which reduces the roll rate.

9. You must repeat this procedure for the left flaperon also. Press the **Cursor Right** key one time, so the little arrow moves under the **6** indicating the left (**CH6**) flaperon. Move the stick to the Right and as before, press the **Data -Decrease** key until you get to 50-75%.



Aircraft Flight Trimming Chart

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

To test for ...	Test Procedure	Observations	Adjustments
1. Control neutrals	Fly the model straight and level	Use the transmitter trims for hands-off straight & level flight.	Change electronic subtrims or adjust clevises to center transmitter trims.
2. Control throws	Fly the model and apply full deflection of each control in turn	Check the response of each control <ul style="list-style-type: none"> • Aileron high-rate: 3 rolls in 4 seconds; low-rate: 3 rolls/6 sec • Elevator high-rate: to give a smooth square corner; low-rate gives approx. 130 ft diameter loop • Rudder: high-rate 30-35° for stall turns; low rate maintains knife-edge 	Change EPA (for high rates), and Dual Rate settings (for low rates) to achieve desired responses.
3. Decalage	Power off vertical dive(crosswind if any). Release controls when model vertical (elevator trim must be neutral)	A. Model continues straight down B. Model starts to pull out (nose up)? C. Model starts to tuck in (nose down)?	A. No adjustment B. Reduce incidence C. Increase incidence
4. Center of Gravity	Method 1: Roll into near vertically-banked turn. Method 2: Roll model inverted	A1. Nose drops B1. Tail drops A2. Lots of forward stick (down elevator) required to maintain level flight B2. No forward stick (down elevator) required to maintain level flight, or model climbs	A. Add weight to tail B. Add weight to nose
5. Tip weight (coarse adjustment)	Fly model straight & level upright. Check aileron trim maintains level wings. Roll model inverted, wings level. Release aileron stick.	A. Model does not drop a wing. B. Left wing drops. C. Right wing drops.	A. No adjustment B. Add weight to right tip. C. Add weight to left tip.
6. Side Thrust & Warped Wing	Fly model away from you into any wind. Pull it into a vertical climb, watch for deviations as it slows down.	A. Model continues straight up. B. Model veers left C. Model veers right D. Model rolls right	A. No adjustment B. Add right thrust C. Reduce right thrust D. Put trim tab under left wing tip *
7. Up/Down Thrust	Fly the model on normal path into any wind, parallel to strip, at a distance of around 100 meters from you (elevator trim should be neutral as per Test 3). Pull it into a vertical climb & neutralize elevator	A. Model continues straight up B. Model pitches up (goes toward top of model) C. Model pitches down (goes toward bottom of model)	A. No adjustment B. Add down thrust C. Reduce down thrust
8. Tip weight (fine adjustment)	Method 1: fly the model as per Test 6 and pull into a reasonably small diameter loop (one loop only) Method 2: fly the model as per Test 6 and then push into an outside loop (one only, fairly tight)	A. Model comes out with wings level B. Model comes out right wing low C. Model comes out left wing low	A. No adjustment necessary B. Add weight to left tip C. Add weight to right tip
9. Aileron differential	Method 1: fly model toward you & pull into a vertical climb before it reaches you. Neutralize controls, then half-roll the model. Method 2: fly model on normal pass and do three or more rolls Method 3: fly the model straight and level and gently rock the aileron stick back and forth	A. No heading changes B. Heading change opposite to roll command (i.e. heading veers left after right roll) C. Heading change in direction of roll command A. Roll axis on model centerline B. Roll axis off to same side of model as roll command (i.e. right roll, roll axis off right wing tip) C. Roll axis off to opposite side of model as roll command A. Model flies straight ahead without yawing B. Model yaws away from roll command (i.e. right roll, yaw left) C. Model yaws towards roll command (i.e. right roll, yaw right)	A. Differential settings OK B. Increase differential C. Decrease differential A. Differential settings OK B. Increase differential C. Decrease differential A. Differential settings OK B. Increase differential C. Decrease differential

To test for ...	Test Procedure	Observations	Adjustments
10. Dihedral	Method 1: Fly the model on normal pass and roll into knife-edge flight; maintain flight with top rudder (do this test in both left & right knife-edge flight) Method 2: Apply rudder in level flight	A. Model has no tendency to roll B. Model rolls in direction of applied rudder C. Model rolls in opposite direction in both tests	A. Dihedral OK B1. Reduce dihedral B2. Use mixer to produce aileron opposing rudder travel (start with 10%) C1. Increase dihedral C2. Mix ailerons with rudder direction 10%
11. Elevator alignment (for models with independent elevator halves)	Fly the model as in Test 6 and pull up into an inside loop. Roll it inverted and repeat the above by pushing it up into an outside loop.	A. No rolling tendency when elevator applied B. Model rolls in same direction in both tests - halves misaligned. C. Model rolls opposite directions in both tests. One elevator half has more throw than the other (model rolls to side with most throw).	A. Elevators in correct alignment B. Either raise one half, or lower the other C. Reduce throw on one side, or increase throw on the other.
12. Pitching in knife-edge flight	Fly the model as in Test 10	A. There is no pitch up or down B. The nose pitches up (the model climbs to its top side) C. Nose pitches down (model dives to its bottom side)	A. No adjustment needed B. Alternate cures: 1) move CG back; 2) increase incidence; 3) droop ailerons; 4) mix down elevator with rudder C. Reverse 'B' above

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

Glider (GLID) Menu Functions

The following section describes how to use the glider-specific menu functions (model type **GLID**). Descriptions of the other functions are contained in the aircraft (**ACRO**) section. There are two different glider modes in the *Eclipse 7* system. You set them up in the Model Setup menus (see page 10). **4WNG** refers to a glider with four wing servos. **2WNG** refers to a model with two wing servos for flaperons, but this setup also applies to models with an additional flap or spoiler servo in **CH6**.

Glider Functions Map		(see right)
Glider Setup Example		30
EPA	End point adjust	18
D/R	Dual Rates	18
EXP	Exponential	20
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Useful Control & Switch Information

Gear Switch controls receiver **CH3**

VR1 controls **camber** (flap motions)

VR2 controls receiver **CH7** and sets **DFL.T**

CH7 switch Forward = **F->A On, F->E On**

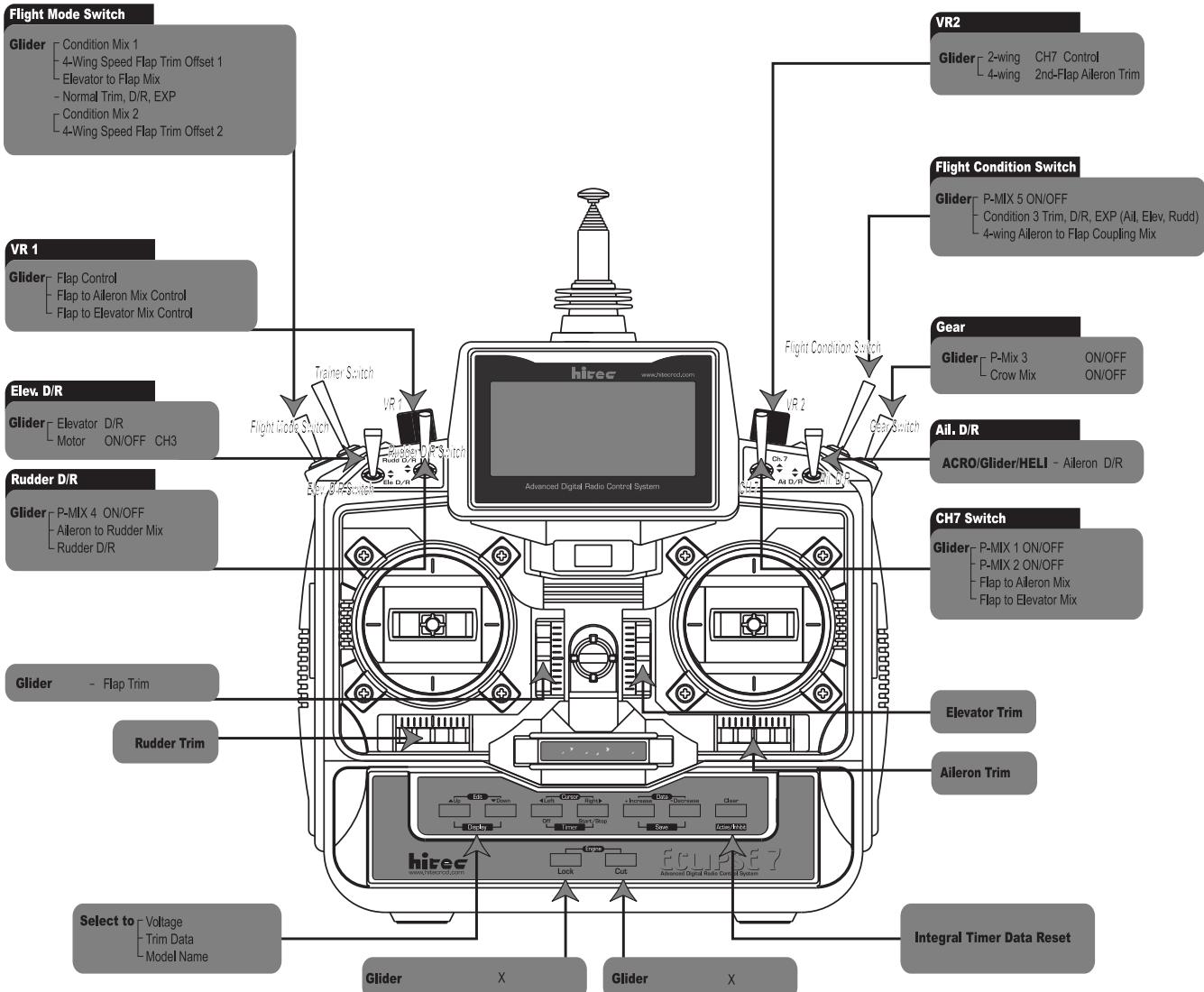
GEAR switch Back = **CROW Off**,

Flt. Condition switch Back= **A->F Off**

Flt. Mode switch Back ("speed")= **E->F On, S.TM1**

Flt. Mode switch Forward ("launch") = **S.TM2 On**

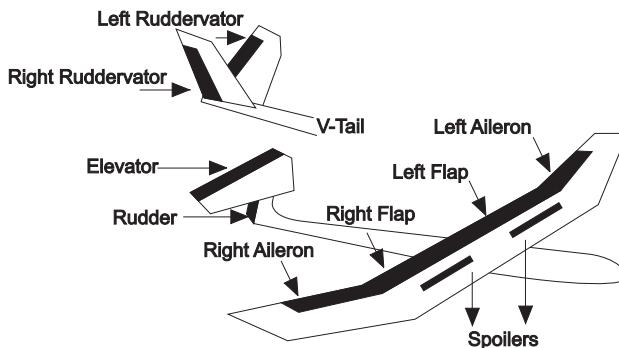
Eclipse 7 Glider Controls and Switch Assignments



This figure shows the assignments for a **Mode 2** system as supplied by the factory for the North American version. Note that some of the functions will not operate until activated in the mixing menus.

Competition Glider Quick Setup Instructions

The following example shows how the **Eclipse 7** may be programmed for the "typical" high-performance six-servo sailplane, shown below. Six servos are used for right and left ailerons, right and left flaps, elevator, and rudder. If the model happens to have a V-tail, all the functions are the same, except for the response of the two tail controls. The channel 3 output on the receiver toggles with Elevator D/R switch and may be used for motor on/off. If you are programming a model with two wing servos, skip the steps labeled "4WNG only." Your model's settings will be dependent on the setup and linkages. Ask an experienced pilot for assistance setting up.



- Before you begin, be sure that all of your aileron and flap servos are plugged into the proper receiver channels:

CH1 - Right aileron
CH2 - Elevator
CH3 - Motor on/off or spoiler
CH4 - Rudder
CH5 - Left Aileron
CH6 - Right Flap (4WNG only)
CH7 - Left Flap (4WNG only)

- Enter the **SETUP** mode by turning on the transmitter while pressing the two **Up Down Edit** buttons simultaneously. You will be in the model setup (**MSEL**) menu.
- Make sure you're in a clear memory. If necessary, use the Cursor **Right** button to move to a new model memory. The selected model memory is indicated by the little flashing arrow pointing down. Power down if you've chosen a new memory, then power up as in previous step.

- Press the **Up** arrow until the word **GLID** appears, flashing on and off. If it does, you're ready to proceed on to the next step.

If not, press the **Left** or **Right Cursor** keys until it appears. *You must press both Data keys to "Save" the setting; when you do this, there will be two beeps. This is how you select the type of model you wish to use.*

WARNING: selecting a different model type will erase the settings in the model memory. BE SURE you're in the correct model memory before selecting a new model type, or you might accidentally erase a model you're using! (The other memories will not be affected.)

- Now it's time to select the wing type. Select **2WNG** for models with two aileron servos, and **4WNG** for models

with two ailerons and two flaps. Press the **Up** arrow until you see the word **"WING"** in the upper right of the display. The wing type in the lower left will be flashing. *You must press both Data keys to save the wing type.*



- Press the **Up** arrow once. This gets you into the **model name** mode (note that the words "MODEL" and "NAME" appear in the upper left of the display).
- Now you can select four letters to identify your model. With the first of the four letters flashing, press the **Data +Increase** or **-Decrease** key to change the letter that is displayed. Stop when the first letter is the one you want.
- Press the **Right Cursor** key once to get to the second letter. Repeat the previous step to choose the second letter.

- Repeat two more times to fill out the remaining two letters. If you like, you can hit the right cursor button one more time and select a number between **0** and **199** for further identification. It can be handy to use this to store the plane's channel number.

- Press the Up arrow once. This gets you into the Timer menu (**TIME**). If you want, you can use the **Data +Increase** or **-Decrease** keys to select the amount of time you want the stopwatch to count down.

- This completes the initial part of the setup. Now, we'll go ahead and customize the **GLID** settings for your model. Switch transmitter power **OFF**.

- Turn the transmitter on. When you do, you will find that channels **1** and **5** act as ailerons. Channels **6** and **7** will only move when the flap knob (**VR1**) is moved.
- Now check that each servo moves the proper direction. Move the aileron, elevator, and rudder sticks. Be sure that the channels go the proper direction. If not, go to the Reversing menu (**REV**) by hitting the **Down** arrow. Follow the procedures in the ACRO setup example, for details.

- (4WNG only) Move to **A → F** by pressing the **Up Down Edit** buttons.

Activate it by pressing the **Active/Inhibit (Clear)** key ('On' or 'Off' will be flashing depending on the position of the **F1t condition** switch: forward is on).



- (4WNG only) Next, move the aileron stick and be sure that both flaps move the same directions as the ailerons. If they do, move on to the next step. If they don't, reverse them in the **REV** menu. Check again that the flaps now move with the ailerons.

- (4WNG only) Reduce the rate that the ailerons mix to the flaps by pressing the **Cursor Right** key until the percent sign flashes. You can independently set the up and down travel for each flap, which is handy for models

which have hinging that prevents motion in one direction. We suggest that you set the mixing rate to 50% on all four settings. You can increase this later if you find you need more maneuverability.

17. Now all the servos should function properly for different stick motions. When you move the right-hand stick to the right, the servos on the right wing should move the controls upwards, and the servos on the left should move the left wing controls downward. Rudder and elevator should also respond properly.

Spend some time getting the correct motions in this step. If you try to do it later within the different mixing functions, you will get all messed up!

18. Now we'll input values for aileron differential. Press one of the **Up Down Edit** buttons to get to **ADIF**. The function is already activated, but it's set to 100% on both sides, zero differential.

19. The display shows little triangles over and under the numeral 1. This means that we are programming the aileron stick input (the upper triangle) into the right aileron servo, CH1 (triangle under the 1). Normally, we want to have more up aileron travel than down travel. Hold the aileron

stick to the right but leave the percentage setting at 100%. Now move the aileron stick to the left and use the **Data -Decrease** key to drop it to 60-70%.

20. Now we'll repeat the previous step for the left aileron. Press the **Cursor Right** key once, so that the small triangle is under the number 5. Now we'll set the differential on the second aileron. Holding the aileron stick to the left, we leave the percentage setting at 100%. Now move the aileron stick to the right and use the **Data -Decrease** key to drop it to 70% or so. Now, when you move the aileron stick, each aileron will go up more than down.

21. Move to the full-wing camber control (**F->A**) menu, and activate by pressing the **Active/Inhibit (Clear)** key. For this function, we recommend using a setting of 100% so the motion of all four wing servos is the same. It is important to have flap and aileron horns that are the same length, but if they differ (hopefully in pairs) it is possible to make some corrections here. The camber-changing is done by turning the knob on the top left of the transmitter (**VR1** flap knob, on the top left of the transmitter). The default settings for Flap → Aileron mixing are such that you get equal motion above and below the neutral camber position. There is a neutral point setting command in this menu, which can be reached by pressing the **Cursor Right** key inside of the **F->A** menu. However, we recommend not using this command. It does move the flap neutral position relative to the aileron neutral. Note that the motion dictated by

the Camber knob (**VR1** knob) goes into both positive and negative camber from the neutral point, unless you set the F → A offset (see previous step).

22. Center the camber knob, also known as the **VR1** knob, on the top left of the transmitter. Be sure to center all of the trims, and get all of the servo arms to be near neutral. Use the clevises to get as close as you can. This way you won't run out of subtrim authority. You can make fine adjustments to the positions of the two outer ailerons using the aileron trim (**AIL.T**) function in the programming menu. Now, you can set the neutral position of the two inboard flaps (**CH6** and **CH7**) relative to each other

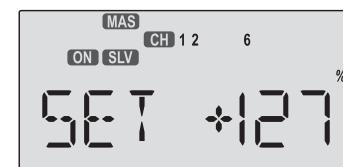


using the dual flap trim (**DFL.T**) knob (**VR2**). Then use the subtrims (**STRM**) to set all the remaining controls the desired neutral locations.

Note: you can set the neutrals for the ailerons and flaps by using the wing beds (if they're foam wings) or matching up with the rest of the wing. Don't use the fuselage airfoil as these are often far from parallel from one side to the other. Set the elevator incidence per the manufacturer or plans, and the rudder should be centered.

23. Set up the **CROW** (also referred to as "butterfly") function for precise spot landings. The ailerons reflex (go up), and the flaps drop with movement of the throttle stick. Turn on by locating the **CROW** menu with the **Up Down Edit** keys, then pressing the **Active/Inhibit (Clear)** key. The **On** or **Off** display will be flashing, depending on the **Gear** switch.

24. First set the **CROW** function activation point. Hit the **Cursor Left** key one time to get to the offset setting menu. Now move the throttle stick all the way up. Enter that position by pressing the **Clear Active/Inhibit** key.



25. Next, set up the throws for the ailerons. Hit the **Cursor Right** key two times to get to the aileron setting menu (a small triangle appears over the number 1). Use the **Data +Increase or -Decrease** keys to input some percentage of aileron motion. Move the throttle stick downwards and be sure the ailerons go UP with crow. If they don't, change the sign in front of the setting number. You'll probably want a fair amount, but not all, of aileron travel. Start with about 50%. Be sure not to use full travel, so you'll have roll authority while on approach in full crow command. Notice that you set the throw for both ailerons at the same time: this is the reason to have identical control arm lengths and neutral positions.



26. Now you may set up the throw for the elevator, but it usually doesn't take much, and too much will be uncontrollable. We suggest you set this amount after you've flown and know how much elevator motion is

needed to trim. Press the **Cursor Right** key once to get to the elevator setting menu (a small triangle appears over the number **2**). Set the desired number with the **Data +Increase or -Decrease** keys. For starters, use zero or very little elevator compensation until you fly and determine what is needed: if the model pitches up with crow, add down

elevator compensation and if it pitches downwards, add some up compensation. Make only small changes in compensation because it has a big effect on trim. Refer to the sailplane trimming chart for more details.

27. (4WNG only) Now set up the throws for the flaps as desired. Press the **Cursor Right** key once to get to the flap setting menu (a small triangle appears over the number **6**). Set the desired number with the **Data +Increase or -Decrease** keys.

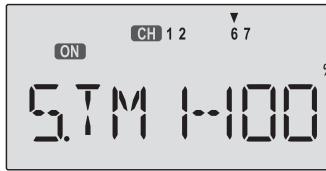
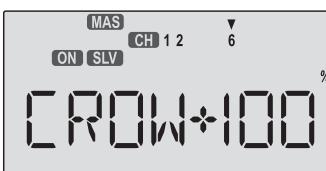
Move the throttle stick and be sure the flaps go DOWN with crow. If they don't, change the sign (this may depend on servo orientation). You'll probably want as much flap motion as possible - 90° is great if you can get it. Like the ailerons, you set both flap offsets at the same time.

28. (4WNG only) Then, using Subtrims, fine tune to get neutral flaps on both sides. Use **EPA**s to get 90° flap travel (or the amount of travel that you'd like) at full **crow**. It may be helpful to use long servo arms on the flap servos to increase their effective throw.

29. (4WNG only) You can use the **S.TM1** (launch) preset for high launches. You can set the two flaps (**CH6** and **CH7**) to drop for more lift, and trim with elevator (**CH2**). Increase the up-elevator preset in small increments until the plane launches as steeply as you like, or add down elevator if the model weaves back and forth or is hard to control (remember to use the rudder stick, or rudder coupling, during the launch). A well-trimmed model may actually have some *down* elevator mixed in for launching.

Remember that to get the **S.TM1** function to turn on, you have to flip the **Flt. Mode** switch Back.

30. (4WNG only) You may also set up the speed mode presets (**S.TM2**) for high-speed cruise between thermals. Reflex the entire trailing edge a very small amount -10% or even less all the way across is recommended for starters. The trailing edge should raise no more than 1/16" (1.5 mm), or you'll gain more drag than penetration ability.



31. If desired, add aileron-rudder coupling (A->R) for coordinated turns. This setting is highly dependent on the model configuration.

Usually only a small amount of rudder is needed, especially if a large amount of differential is present, so start out with 10-15%.

Carefully observe the direction of the fuselage relative to the thermal turn the model is making. If the nose points towards the inside of the circle, the coupling is too high, and if it points towards the outside of the circle, you need more coupling. When everything is set properly, the fuselage will be tangent to the thermal turn circle (see page 33 for more details). While you are flying, watch for trim changes during launch and crow control actions and set the compensations to cancel them out. You may wish to refer to the sailplane trimming chart presented earlier.



Glider Model Function Descriptions

EPA - End point adjust

See ACRO instructions on page 18.

D/R - Dual Rates

See ACRO instructions on page 18.

EXP - Exponential

See ACRO instructions on page 20.

FLT.C - Flight Conditions

See ACRO instructions on page 20. There are three **FLT.C** settings available in the **GLID** menus. Note that in addition to the **FLT.C** features described there, you can also use the **STM.1** and **STM.2** subtrim offset functions to program different controls move to new positions.

Together, these can be used to set up launch and speed control positions and offsets for sailplanes. The trim lever for the flap stick controls the neutral position of both flaps if 4WNG is on. In the **GLID** menus with the **4WNG** option on, the **flight condition** menus allow you to offset the trim positions inputted by the trim levers for channels 1, 2, 4, and 6. The **Speed Flap Trim offset** functions allow you to also offset the position of the elevator servo (**CH2**) and the dual flap servos (**CH6** and **CH7**). Speed Flap Trim offset functions are described later.

STRM - Subtrim

See ACRO instructions on page 21.

REV - Servo Reversing

See ACRO instructions on page 22.

PMX1 to PMX5 - Programmable Mixing Functions

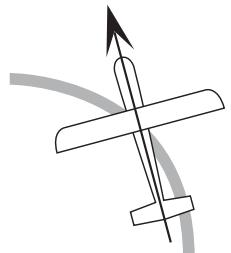
See ACRO instructions on page 22.

ADIF - Aileron Differential

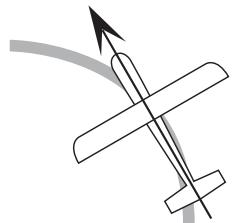
Ailerons are used to roll or bank the glider's wing, but making a roll or turn has a price. A wing that generates lift also generates a drag component called *induced* drag, meaning that drag is induced as a by-product of the lifting wing. This means that the wing that is lifting more is also dragging more, and the resulting drag difference

causes the fuselage of the model to yaw away from the desired turn direction, exactly the wrong thing to have happen. This causes even more drag, which can really hurt a glider's performance. There are two ways to reduce the yaw of the fuselage, differential (**ADIF**) and rudder coupling (**A->R**). Both should be used together, but you only find **ADIF** in the glider menus. Aileron differential causes the ailerons to automatically move with more UP than DOWN motion, which helps to reduce induced drag. It helps, along with rudder-coupling, to make the fuselage point straight into the oncoming air stream (this is also called "coordinating the turn").

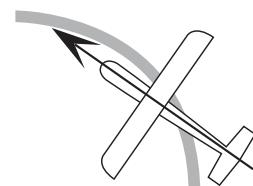
The amount of differential is highly dependent on the model configuration. A good starting point is for the down aileron to move 50% to 75% as much as the up-moving aileron.



Nose Points outside Circle
increase coupling and/or differential



Coordinated turn
fuseline up with turn direction
(don't change anything!)

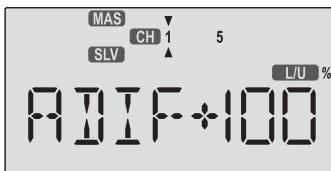


Nose Points inside circle
Too much coupling or differential.
Reduce one or both.

Setting Up Differential

1. Press one of the **Up Down Edit** buttons repeatedly to select the **ADIF** window.

To begin with, the function is already activated, but it's set to 100% on both sides so there is no differential.



2. A small arrow is displayed under the numeral **1**, showing that **CH1** is the affected channel. To set the differential for the right aileron (**CH1**) down travel, hold the aileron stick to the left side (display shows **L/U**), and press the **Data Decrease** key (the right aileron moves down when left aileron stick is commanded). Continue reducing the percentage until you reach about **60%** to **70%**.

3. Make sure that the up travel for the first aileron (**CH1**) stays at 100% by holding the aileron stick to the right side (display shows **R/D**) and verifying that the display shows **100%**.

4. Press the **Cursor Right** key once, to get to the left aileron (**CH5**) setting menu. A small arrow is displayed under the numeral **5**, showing that **CH5** is the affected channel.

5. Move the aileron stick to the right (display shows **R/D**), and press the **Data Decrease** key reducing the percentage until you reach about **60%** to **70%**.

6. Make sure that the up travel for the second aileron (**CH5**) stays at 100% by holding the aileron stick to the left side (display shows **L/U**) and verifying that the display shows **100%**.

7. If for some reason you want a **0%** setting, press the **Active/Inhibit (Clear)** key. This is the maximum amount of differential you can get, but will reduce the roll rate if selected.

VTAL - V-Tail Programming

See page 25

E->F - Elevator → Flap mixing

See **ACRO** instructions on page 23. The **GLID** mode **E->F** function is turned on with the **Flt. Mode** switch fully **Back**. Also, the **Elevator-Flap mixing** does not provide *full* trailing-edge motion on gliders even if the **F->A** mixing function is activated - only the center flaps are coupled.

A->R - Aileron → Rudder mixing

See page 24.

F->A - Flap → Aileron mixing

Flap → Aileron mixing (F->A) is used to make both ailerons move together as flaps when the camber-changing/flap knob **VR1** is rotated. This allows full-span camber changing on models with either two ailerons and one flap (**2WNG**) or two ailerons and two flaps (**4WNG**). It is **on** only if the **Ch. 7** switch is **forward**, and functions at the same time as flap->elevator mixing (see next menu).

Using Flap->Aileron Mixing

1. Locate the flap->aileron mixing function by scrolling to the **F->A** menu with the **Up Down Edit** keys. The default is for it to be inhibited (**Inh**). Press the **Active/Inhibit (Clear)** key so that the '**+100%**' display is shown, meaning the ailerons follow the flaps 100%. Depending on the position of the **Ch. 7** switch, either '**On**' or '**Off**' will be flashing.

2. Press the **Cursor Right** key once, to get to the percent setting menu. Press the **Data +Increase** or **-Decrease** keys to adjust the amount of mixing to suit.

3. Move the flap knob so the **R/D** display changes to **L/U**, or vice versa, and repeat the setting adjustment for that side of the travel. You can set an input on each side of the flap knob.

4. If you want to zero out the amount of mixing on one side of the knob's travel, press the **Active/Inhibit (Clear)** key.

5. You can observe the effect of flap->aileron mixing on the aileron servos when the function is turned **on** with the **Ch. 7** switch, and you move the flap knob (**VR1**) back and forth.

F->E - Flap → Elevator mixing

Flap → Elevator mixing (F->E) is used to make the elevator move to maintain trim when the camber-changing/flap knob **VR1** is rotated. It functions at the same time as flap->aileron mixing (see previous menu). **F->E** mixing is **on** only if the **Ch. 7** switch is **forward**.

Setting Up Flap->Elevator Mixing

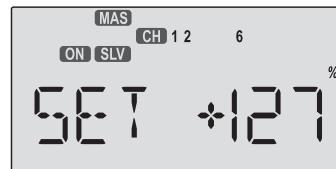
- Get to the flap->elevator mixing function by locating the **F->E** menu with the **Up Down Edit** keys. The default is for it to be inhibited (**Inh**). Press the **Active/Inhibit(Clear)** key so that the '+100%' display is shown, meaning the elevator follows the flaps 100%. Depending on the position of the **Ch. 7** switch, either '**On**' or '**Off**' will be flashing.
- Press the **Cursor Right** key once, to get to the percent setting menu. Press the **Data +Increase** or **-Decrease** keys to adjust the amount of mixing to suit. You probably want to select a number like 10% or less, since the elevator is very powerful as a trimming device.
- Move the flap knob so the **R/D** display changes to **L/U**, or vice versa, and repeat the setting adjustment for that side of the travel. You can set an input on each side of the flap knob.
- If you want to zero out the amount of mixing on one side of the knob's travel, press the **Active/Inhibit (Clear)** key.
- You can observe the effect of flap->elevator mixing on the elevator servo when the function is turned *on* with the **Ch. 7** switch, and you move the flap knob (**VR1**) back and forth.

CROW - Crow mixing (airbrakes)

The **Crow** mixing function is useful for increasing the drag of a model during landing approaches, which makes the approach steeper and slower, making landings shorter and easier. This is especially useful for sailplanes, where applying down elevator to steepen the glide also speeds things up and makes landings very difficult. Crow is activated by the flap (throttle) stick position. Ailerons, elevator, and flaps are the three controls that are commanded by crow function, which is also called "butterfly" in the sailplane world. The idea of the crow function is to simultaneously raise the ailerons (which reduces the wing's lift), and drop the flaps (to regain the lift lost by the up aileron movement). Elevator motion may also be also commanded if needed to prevent a trim change induced by the flap and aileron motion. Normally, crow is set up so that the maximum control movements (Maximum drag) occur at "low" throttle stick position (towards the bottom of the transmitter). The **Gear** switch must be **forward** for Crow to operate.

Setting Up Crow Mixing

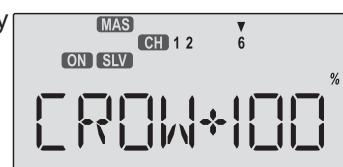
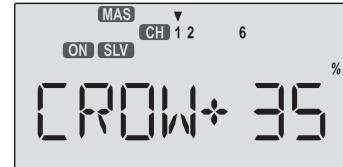
- Start by locating the **CROW** menu with the **Up Down Edit** keys. Either the **ON** or **OFF** display will be flashing, depending on the position of the Gear switch (forward is on).
- First set the **CROW** function activation point. Hit the **Cursor Left** key one time to get to the **SET** menu. Now move the throttle stick all the way up. Enter that position by pressing the **Clear Active/Inhibit** key. The display should read a number around **+125%**.



- Make sure CROW is **ON** by moving the Gear switch **forward**. Verify by looking at the flashing indicator.
- Next, set up the throws for the ailerons. Press the **Right** key two times to get to the aileron setting menu (a small arrow will appear over the number **1** in the display). Press the **Data +Increase** or **-Decrease** keys to adjust the amount of UP aileron motion. Move the throttle stick all the way down and be sure the ailerons go **UP**. If they don't go up, but go down instead, press the **Clear Active/Inhibit** key and then press the other **Data** key to achieve the desired up aileron travel (this may depend on servo orientation). You'll probably want a fair amount, but not all, of aileron travel. Be sure not to use full travel, so you'll have roll authority while on approach in full crow command. Notice that you set the throw for both ailerons at the same time: this is the reason to have identical control arm lengths and identical neutral positions.

- Now press the **Right** key to get to the elevator compensation menu (a small arrow will appear over the number **2** in the display). Press the **Data +Increase** or **-Decrease** keys to set up the throw for the elevator as desired. Move the throttle stick and be sure the elevator goes **UP** with crow. If it goes down, press the **Clear Active/Inhibit** key and then press the other **Data** key to achieve the desired up elevator travel (this may depend on servo orientation). For starters, use zero or very little up elevator compensation until you fly and determine what is needed: if the model pitches up with crow, add down elevator compensation and if it pitches downwards, add some up compensation. Make only small changes in compensation because it has a big effect on trim. Refer to the sailplane trimming chart on page 37 for more details.

- Now press the **Right** key to get to the flap setting menu (a small arrow will appear over the number **6** in the display). Press the **Data +Increase** or **-Decrease** keys to set up the throws for the flaps as desired. Move the throttle stick and be sure the flaps go **down** with crow. If they don't go down, but go up instead, press the **Clear Active/Inhibit** key and then press the other **Data** key to achieve the desired down flap travel (this may depend on servo orientation). You'll probably want as much flap motion as possible - 90° is great if you can get it. Like the ailerons, you set both flap offsets at the same time.
- If you can't get enough travel, go to the **EPA** menu and be sure CH6 and CH7 are set as high as possible to get 90° flap travel. Of course, you can reduce them to get



the amount of travel that you'd like at full crow, but this is better done in the Crow menu as given in the previous step. It may be helpful to use long servo arms on the flap servos to increase their effective throw.

Remember to try your crow setup out at higher altitudes to verify that the trim doesn't change rapidly. If you want to steepen the descent, increase the flap downward deflection while increasing the up aileron movement.

Caution: when setting up crow, do not call for too much aileron "up" travel, or you'll lose roll authority, and this occurs at a crucial time, when your model is flying relatively slowly on a landing approach. Always make changes in small increments, don't try to do it "all at once."

S.TM1, 2 - Speed Flap Trim offsets (Camber mix) 1, 2 (4WNG only)

Speed Flap Trim Offsets, together with flight conditions, are a way to set up gliders with four wing servos (**4WNG**). They do not appear in the two wing servo (**2WNG**) menu. Speed Flap Trim offsets are used to offset the positions of the elevator servo (**CH2**) and the inboard flaps (**CH6** and **CH7**) by flipping the Flt. Mode switch.

Together with the Flight Condition menus (**FLT.C**), you can command any position of the inboard flaps, ailerons, and elevator by flipping the **Flt. Mode** switch, and without using Speed Flap Trims. Speed Flap Trim offset #1 is **On** when the **Flt. Mode** switch is fully **back**, and is commonly used for the "speed" mode, where the trailing edge is reflexed. Speed Flap Trim offset #2 is **On** when the **Flt. Mode** switch is fully **forwards**, and is commonly used for setting up offsets needed for good launches.

Setting Up Speed Flap Trim Offsets

1. Start by locating the **S.TM1** menu with the **Up Down Edit** keys, then pressing the **Active/Inhibit (Clear)** key. Either the 'Off' or the 'On' display will be flashing, depending on the position of the **Flt. Mode** switch. Also, the indicators for **CH2**, **CH6**, and **CH7** will appear at the top of the display.
2. First, you'll set the elevator (**CH2**) function offset amount. Make sure **S.TM1** is **ON** by moving the **Flt. Mode** switch fully back. Verify it's on by looking at the flashing **On** indicator. Hit the **Cursor Right** key one time, and a small arrow will appear over the numeral **2**.
3. Next, set up the elevator (**CH2**) motion. Press the **Data +Increase** or **-Decrease** keys to adjust the amount of elevator offset. Use a small amount at first, as the elevator is very effective.
4. Now set up the throws for the **CH6** flap. Hit the **Cursor Right** key one time, and the small arrow will appear over the numeral **6**. Now use the **Data +Increase** or **-Decrease** keys to adjust the amount of **CH6** flap offset.
5. Next set up the throws for the **CH7** flap. Hit the **Cursor Right** key once, and the small arrow will move over the numeral **7**. Use the **Data +Increase** or **-Decrease** keys to adjust the amount of **CH7** flap offset.
6. Locate the **S.TM2** menu by pressing the **Up Edit** key,

and then press the **Active/Inhibit (Clear)** key to turn it on. Either the 'Off' or the 'On' display will be flashing, depending on the position of the **Flt. Mode** switch.

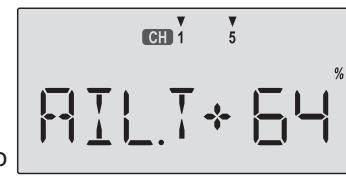
7. Repeat the previous instructions for the second set of inputs for elevator, **CH6**, and **CH7**.

AIL.T - Aileron trim

Aileron Trim is a special trimming function for gliders with either two or four wing servos. It provides a simple way to adjust the position of the outboard wing controls (**CH1** and **CH5**) without resorting to the Speed Flap Trim menu. When you adjust the Aileron Trim setting, you move the two outboard wing controls together - they go upwards or downwards together. In models with four wing servos, you can use Aileron Trim together with the Dual Flap Trim function (see below) to set any position of the wing controls without using subtrims.

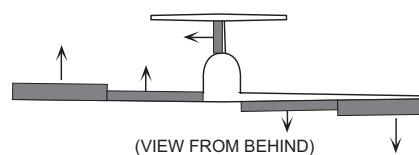
Using Aileron Trim

1. Turn on Dual Aileron Trim by locating the **AIL.T** menu with the **Up Down Edit** keys.
2. Adjust the percentage to neutralize them relative to each other with the **DATA** keys



A->F - Aileron → Flap mixing (4WNG only)

To roll a sailplane, we must increase the lift on one wing and reduce lift on the other. The model will of course roll towards the wing with reduced lift. For minimum drag when turning, we want to have the way the lifting is done vary smoothly along the span (i.e. zero at the root and maximum at the tips). Unfortunately, to do this requires a control surface that tapers from zero at the root to maximum at the tip. Since this is impractical, we mix from the ailerons to the flaps as shown below, so the inner ailerons don't move as far as the outer ones. This is an approximation of the ideal lift for rolling, and will reduce the drag created while banking the wings. It's more efficient to use both inboard and outboard wing controls to make a turn. For a left turn, the left ailerons go up, the right ones go down. The length of the arrows is proportional to the control movement (notice that inboard ailerons are programmed to move a smaller angle). Rudder coupling is also shown and may be programmed with the R->A mixing function.



Aileron->Flap mixing is turned on and off with the Flt. condition switch. You can adjust the amounts of up and down mixing independently, which is nice if your model's flaps are hinged on the bottom and they cannot move up past a certain point.

Using Aileron->Flap Mixing

1. Turn on Aileron->Flap mixing by locating the **A->F** menu with the **Up Down Edit** keys. The default is for it to be inhibited (**Inh**). Press the **Active/Inhibit (Clear)** key so that the 'On' display is shown.
2. First, you'll set the aileron (**CH1**)->**CH6** function mixing amount. Make sure **A->F** is **On** by moving the Flt. condition switch fully back. Verify it's on by looking at the flashing **On** indicator. Hit the **Cursor Right** key one time, and a small arrow will appear over the numeral **1** and under the numeral **6**.
3. To set the **UP** mix amount for the right flap, hold the aileron stick to the right side (display shows **R/D**), and press the **Data Decrease** key. Continue reducing the percentage until the servo stops buzzing. If there's no buzzing, you can start with about 50%. If your model has bottom-hinged flaps, you can get to 0% quickly by pressing the **Active/Inhibit (Clear)** key.
4. Now set the **Down** mix amount for the right flap (**CH6**). Holding the aileron stick to the left side (display shows **L/U**), use the **Data Decrease** key to reduce the percentage to about 50%.
5. Now we'll do the same for the second flap servo (**CH7**). Press the **Cursor Right** key once, to get to the left flap (**CH7**) setting menu. A small arrow is displayed under the numeral **7**, showing that **CH7** is the affected channel. Move the aileron stick to the right (display shows **R/D**), and press the **Data Decrease** key reducing the percentage until you reach about **50%**.
6. Set the **up** mix amount for the second flap (**CH7**) as you did for the first flap servo. Hold the aileron stick to the left side (display shows **L/U**) and press the **Data Decrease** key to reduce the percentage to about 50%. Again, if your model has bottom-hinged flaps, you can get to 0% quickly by pressing the **Active/Inhibit (Clear)** key.

DFL.T - Dual Flap Trim (4WNG only)

Dual Flap Trim is a trimming function for gliders with four wing servos, and does not appear in the two wing servo (2WNG) menu. It provides a simple way to adjust the position of the inboard flaps (**CH6** and **CH7**) without resorting to the subtrim menu. When you activate Dual Flap Trim, you can turn the right-hand knob (**VR2**) to move the two inboard flaps against each other - one goes upwards, the other goes downwards. Together with the Flap/Camber control knob (**VR1**), you can set any position of the inboard flaps without using subtrims.

Using Dual Flap Trim

1. Turn on Dual Flap Trim by locating the **DFL.T** menu with the **Up Down Edit** keys. The default is for it to be on. If you wish to disable the dual flap trim, press the **Active/Inhibit (Clear)** key so that the 'inh' display is shown.
2. Turn the **VR2** knob one way or the other and observe the response of both inboard flap servos. Adjust the knob



to neutralize them relative to each other. If you inhibit this function, they'll return to their original positions.

Sailplane Trimming and Adjusting

The following chart gives procedures that may be followed when trimming a new sailplane. The flights should be made in near-calm conditions, and repeat them several times before making adjustments. If any changes are made, go back over the previous steps and verify, or further adjust as necessary. One of the most critical steps is the center-of-gravity (CG)/decalage testing (Step 3). Decalage is a fancy term describing the relative angle difference between the wing and horizontal tail. Although the control neutrals have been set in Step 1, there are differing combinations of elevator trim and CG that produce stable flight. In general, by moving the CG back you get better performance and you reduce the stability, making the model more difficult to fly and requiring more attention from the pilot. Moving the CG back lessens the download on the model's tail, which means the wing and tail are working more together and less against each other as they do with a forward CG. Many contest flyers use a CG position located between 35 and 40% of the mean wing chord, which is near the back limits for stability (the mean chord is just about the same as the average chord, which is calculated by dividing the area by the wing span). How you set your model up really depends on your preferences. A nose-heavy model will be easier to fly but will lack the performance of the back-CG model. You should also set differential and/or rudder coupling carefully. Incorrect settings will result in needless increased drag, and may be checked fairly easily. If you practice keeping the fuselage straight while gently rocking the wings back and forth, you'll learn how to coordinate turns and won't need coupled rudder any more. You can also learn about the proper amount of differential or rudder coupling by studying the figures of the model circling in the "coordinating turns" section, Chapter 5. Too much differential can make the model sluggish when entering or exiting turns and banks. Setting up butterfly can be tricky. The reader is referred to the section earlier in this chapter which describes the instructions contained in the chart's line 4, 5, and 6. Whatever you do, be sure to spend a lot of time trimming your sailplane. If you have a nearby slope, practice flying on very light lift days, where you can just barely keep the model airborne. It is under these conditions that you learn whether your model is really trimmed properly.

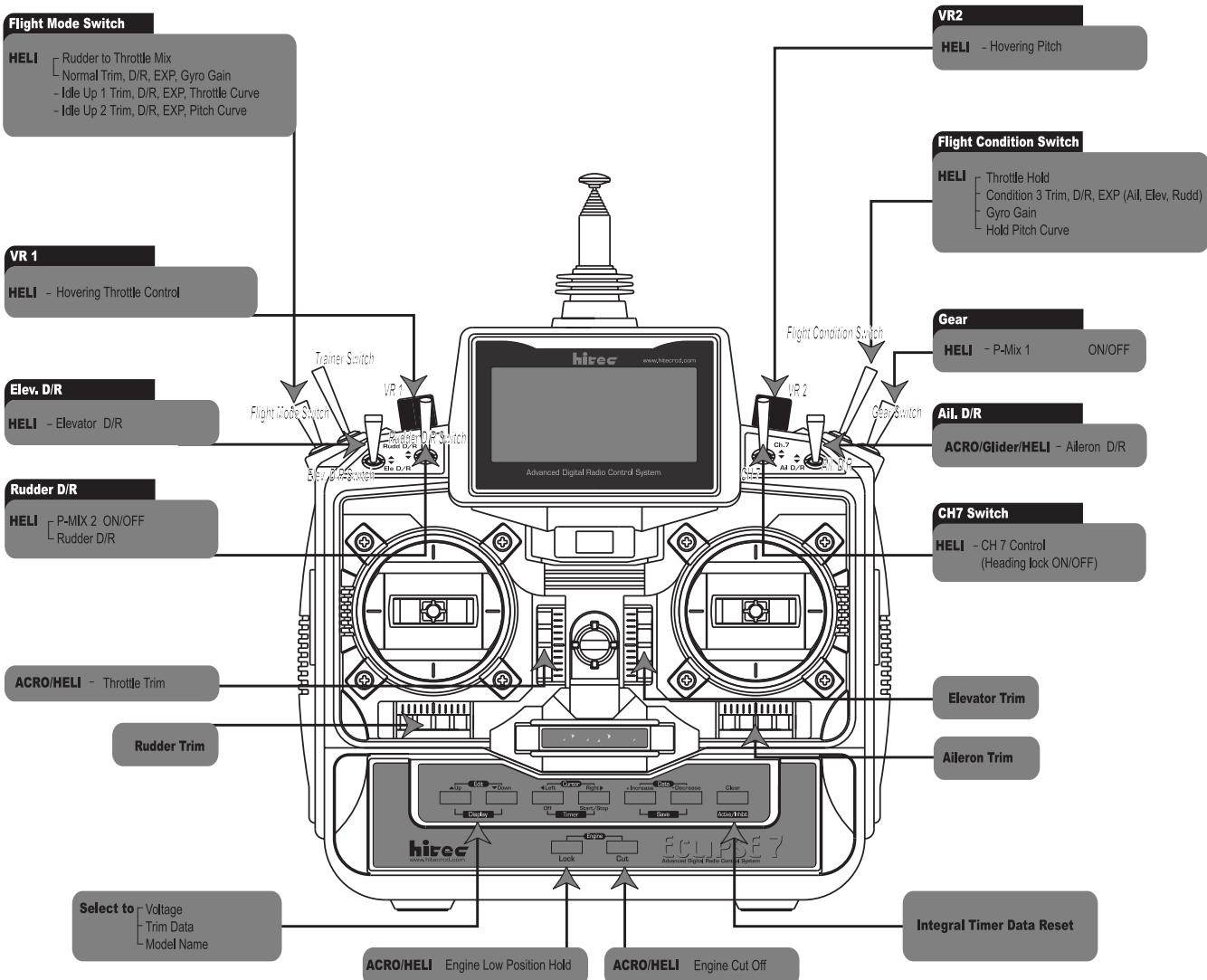
SAILPLANE TRIMMING CHART

To test for ...	Test Procedure	Observations	Adjustments
1. Model Control Neutrals	Fly the model straight and level	Adjust the transmitter trims for hands-off straight & level flight, no camber control.	Change electronic subtrims and/or adjust clevises to center transmitter trims.
2. Control Throws <i>Note: be sure all aileron & flap horn pairs have matching angles</i>	Fly the model and apply full deflection of each control in turn. Camber control in neutral (setup 6 & 9).	Check the model's response to each control input. Set flaps for as much down flap as possible in glide path control (90° is good) <5° reflex needed.	<ul style="list-style-type: none"> • Aileron & elevator rates: set for desired authority • Rudder: set for max. throw • Set flap motions in Steps 4, 5, & 9.
3. Decalage & Center of Gravity <i>(Note: this is a trial and error test procedure, depends on desired handling characteristics. Back CG = less stability but better performance)</i>	Trim for level glide. Enter 45° dive (across wind if any) and release controls. CAUTION: beware of airspeed & flutter.	<ul style="list-style-type: none"> A. Does the model continue its dive without pulling out or diving? B. Does the model start to pull out (nose up)? C. Does the model start to tuck (dive more nose down)? 	<ul style="list-style-type: none"> A. No adjustment B. Reduce incidence (add down elevator) and/or reduce nose weight C. Increase incidence (add up elevator or add nose weight)
4. Glide Path Control Settings - Pitch Trim <i>Note: be sure all aileron & flap horn pairs have matching angles.</i>	Fly the model and slowly apply full deflection of glide path control (airbrake stick). Observe any pitch changes.	<ul style="list-style-type: none"> A. Nose drops, up elevator required for level flight B. No pitch change C. Tail drops, down elevator required to maintain level flight 	<ul style="list-style-type: none"> A. Several options: <ul style="list-style-type: none"> 1) more up elevator mix; 2) reduce aileron reflex*; 3) increase flap motion* B. No adjustment C. Reverse of A
5. Glide Path Control Settings - Elevator Delays	Rapidly apply full glide path, observe initial pitching response	<ul style="list-style-type: none"> A. Nose drops B. No pitch change C. Nose rises 	<ul style="list-style-type: none"> A. Increase elevator delay % B. No adjustment C. Reverse of A
6. Glide Path Control Settings - Roll Response	Fly the model and apply full glide path control. Observe any roll motion.	<ul style="list-style-type: none"> A. Model rolls to right when glide path control (airbrake stick) activated B. No roll motion C. Model rolls to left 	<ul style="list-style-type: none"> A. Mix in less right & more left aileron reflex with airbrake motion B. No adjustment C. Reverse of A
7. Differential/Coupled Rudder setting	Fly the model and apply alternating left & right aileron commands. Observe path of fuselage line.	<ul style="list-style-type: none"> A. Model yaws to right with left aileron and vice versa B. Fuselage traces straight line C. Model yaws to left with left aileron and vice versa 	<ul style="list-style-type: none"> A. Increase differential and/or amount of rudder coupling B. No adjustment C. Reduce differential and/or amount of rudder coupling
8. Camber (full wing aileron & flap droop or reflex) setting	Put the model in a straight glide passing in front of you. Apply camber control.	<ul style="list-style-type: none"> A. Model slows down & stalls or sinks rapidly B. Model slows slightly C. Model speed unchanged 	<ul style="list-style-type: none"> A. Reduce amount of droop &/or add elevator compensation B. No change needed C. Reverse of A
9. Launch Settings (Part 1)	Switch to Launch mode. Launch the model & observe climb angle and required control inputs	<ul style="list-style-type: none"> A. Shallow climb angle; lots of up elevator required B. Model climbs steeply with little control input needed C. Too steep climb, weaves back & forth, down elev. required 	<ul style="list-style-type: none"> A. Move towhook rearwards small amount, increase up elevator preset a little, or add camber B. No adjustment C. Reverse of A
10. Launch Settings (Part 2)	Switch to Launch mode. Launch the model & observe climb angle and required control inputs	<ul style="list-style-type: none"> A. Model banks left on tow B. Model climbs straight ahead with no roll input needed C. Model banks right on tow D. Model tip stalls to one side 	<ul style="list-style-type: none"> A. Reduce left ail & flap droop or increase right ail / flap droop B. No adjustment C. Reverse of A above D. Check droop same on both sides. <i>Increase aileron or decrease flap droop</i>
11. Speed Settings	Switch to speed mode (entire TE reflexed <i>slightly</i> , <1/16"/1 mm)	<ul style="list-style-type: none"> A. Nose drops B. No pitch change C. Tail drops 	<ul style="list-style-type: none"> A. Increase up elevator preset B. No adjustment C. Reverse of A
12. Elevator-to-Camber Coupling Setting	Fly model at high speed, bank & pull up	<ul style="list-style-type: none"> A. Model keeps speed and comes about rapidly B. Model slows down 	<ul style="list-style-type: none"> A. Increase down flap or leave alone B. Reduce amount of down flap

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

Eclipse 7 Helicopter Controls and Switch Assignments

Helicopter(HELI) Section



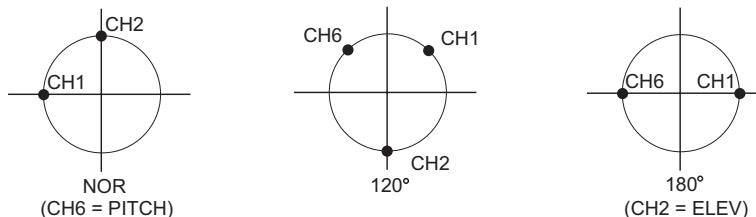
This figure shows the assignments for a **Mode 2** system as supplied by the factory for North America. Note that some of the functions will not operate until activated in the mixing menus.

Eclipse 7 Helicopter (HELI) Programming

This section describes how to use the **Eclipse 7** helicopter functions (model type **HELI**). Descriptions of the other functions, such as endpoints, dual rates, expo, etc., are contained in the aircraft (**ACRO**) section. The **HELI** menu provides three flight conditions in addition to the normal one (**NOR**). **ST1** may be used for forward flight and mild aerobatics, **ST2** may be used for inverted, and **ST3** is used for autorotations.

Helicopter Functions Map	see right	
Helicopter Setup Example	39	
R->T	Rudder->Throttle mixing	42
GYRO	Gyro Settings	42
HOLD	Throttle Hold	42
THCV	Throttle Curve	43
PTCV	Pitch Curve	43
RVMX	Revolution mixing	44
SWAH	Swashplate settings (120°, 180°)	44
Hovering	Pitch Adjusting knob	45
Hovering	Throttle Adjusting knob	45
Helicopter	Trimming Chart	45

The *Eclipse 7* system comes with three choices for the helicopter's swashplate arrangement, which may be found in the setup menu: normal (**NOR**), 120° (**120'**), and 180° (**180'**). **NOR** is the standard swashplate where one servo each performs the collective pitch, elevator, and aileron functions. **120°** and **180°** are intended for three-servo swashplates needing special mixing to get the servos to properly provide the required pitch, elevator, and aileron functions.



Helicopter Setup Instructions

The following example shows how the **Eclipse 7** may be programmed for a helicopter model. Your model's settings will be dependent on the setup and linkages. If you're not sure about the settings for your particular model, please ask an experienced pilot for assistance.

The helicopter setup procedure presented below uses a standard helicopter setup, one servo each for ailerons and elevator. You can use a similar procedure to set up your own model; your setting's numbers and percentages will probably be different.

1. In the helicopter, install each servo and hook up the aileron, elevator, throttle, rudder, and pitch pushrods to the servos in accordance with the model's instructions or plans. Be sure that all of your servos are plugged into the proper receiver channels:

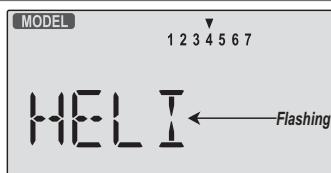
CH1 - Aileron	CH5 - Gyro
CH2 - Elevator	CH6 - Pitch
CH3 - Throttle	CH7 - Aux. or heading hold control
CH4 - Rudder	

If your model uses 120° or 180° swash programming, plug in the servos as indicated in the table on page 8.

We recommend that you do this programming exercise with the servos installed in the model and connected to the respective control surfaces. This will enable you to immediately see the effect of each programming step.

- 2. Model Memory.** Turn on your transmitter while holding the two **Edit Display** keys. This gets you into the model select (**M. SEL**) menu. Press the **Cursor Right** button to move to a new model memory. The model number of the model memory you select is indicated by the little arrow pointing down. The figure shows Memory #4. **SEL** M 1 2 3 4 5 6 7
- 3. Model Type.** Press the **UP** arrow two times. The word **ACRO** will appear, flashing on and off. Press the **Left** or **Right Cursor** keys until **HELI** appears. You must press

both **Data** keys to "Save" the setting. This is how you select the type of model you wish to use, either **ACRO**, **HELI**, or **GLID**.



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

4. Swash Type. Now it's time to select the swash type. Select **NOR** for helis with independent aileron, elevator, and pitch servos;

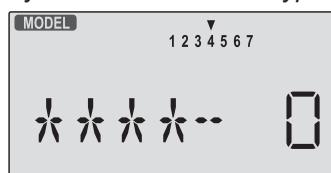
120' for models using 120° swashplates; and **180'** for models with 180° swashes. Press the **Up** arrow until you see the word "**SWASH**" in the upper right of the display. The swash type in the lower left will be flashing.

You must press both **Data** keys to save the swash type.

5. Name your model.

Press the **UP** arrow once.

This gets you into the model name mode (note the words **MODEL** and **NAME** in the upper left of the display).



6. Now you can select four letters to identify your model. With the first of the four letters flashing, press the **Data +Increase or -Decrease** keys to change the letter that is displayed. Stop when the first letter is the one you want.

7. Press the Right Cursor key once to get to the second letter. Repeat Step 5 to choose the second letter.

8. Repeat the previous steps two more times to fill out the remaining two letters. If you like, you can hit the right cursor button one more time and select a number between 0 and 199 for further identification.

9. Set the stopwatch.

Press the **UP** arrow once.

This gets you into the Timer menu (**TIME**). Use the Data Increase and Decrease keys to select the amount of time you want the stopwatch to count down. This is handy to keep track of engine running time so you don't run out of gas.

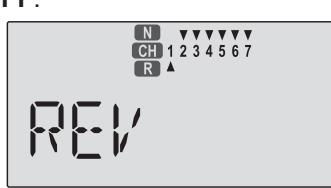


10. This completes the initial part of the setup. Now, we'll go ahead and customize the settings for your model.

Switch transmitter power **OFF**.

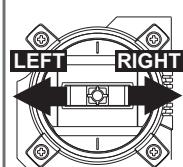
11. Servo Directions.

Switch transmitter power back **on** and check the proper direction of throw for each servo. Use the reversing function [**REV**] to reverse channels as necessary to get proper throw directions.



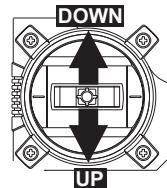
12. If you're using 120' or

180' swash types, please use the swashplate (**SWAH**) menu, page 44, to adjust these responses.



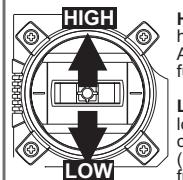
Right Aileron: swashplate tilted towards chopper's right side.

Left Aileron: swashplate tilted towards the left side.



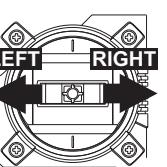
Down Elevator: swashplate tilted towards chopper's front.

Up Elevator: swashplate tilted towards the rear.



HIGH Position: high rotor pitch AND carburetor fully opened.

LOW Position: low rotor pitch, carburetor at idle (use trim tab to fully close)



LEFT **RIGHT** **LEFT**

13. Servo Neutrals. First, be sure the hovering pitch and hovering throttle knobs are centered. Set up all linkages so that all servos are as close to mechanical neutral as possible. Then, use the Subtrim (**STRM**) window to make fine adjustments on the servo neutrals.

14. Servo Travel. Use the **EPA** command to limit servo travels to prevent binding.



15. Collective Pitch. The collective pitch angle (controlled by **CH6** on a conventional helicopter) should vary from -2° to +10° with full stick motion, depending on the flight condition. We recommend setting the hovering pitch (pitch with throttle stick at center) to +4.5°. Adjust servo arms and **EPA** values to get the desired travel at the end points, measuring with a pitch meter.

16. Engine travel. On the regular display menu, enter a value of -25% for throttle trim. Use the **EPA** menu to set up the carburetor pushrod so that at full throttle there is no binding, and so the engine idles smoothly at low throttle.

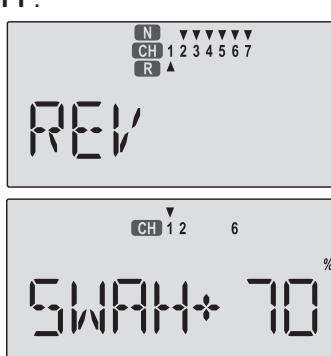
17. Throttle Cut. Enter the throttle cut (**T.CUT**) menu and enter a value of -25% or so. Press the **Cut** button



and be sure that the carburetor fully closes, which will shut off the engine. Don't pick too large a number, or binding may occur.

18. Throttle Curve. You can use the Throttle Curve (**THCV**) menu's five-point setting curves to fine-tune the engine servo's response. Adjust the throttle position for hover to get the desired head RPM. You can change the curve values to make a steeper curve near idle and shallower curve past hover. See the **THCV** menu description on page 43 for more details.

If your instructions don't give any suggested values,



you may start with the following settings:

Throttle Curve NOR

Point	1 (low)	2	3	4	5 (high)
%	0	26	45	72	100

19. Pitch Curve. You can use the Pitch Curve(PTCV) menu's five-point setting curves to make finer adjustments to the endpoints and the middle of travel of the pitch servo. Your model's instructions may provide suggested values for the blade pitch angles. If not, you may want to start with the following:

Pitch Curve NOR

Point	1 (low)	2	3	4	5 (high)
Pitch	0 deg.	+5	+6.5	+8.0	+10.0

After you've set the pitch at each of the five points, be sure to check that both aileron and elevator motions do not cause binding at extreme pitch settings. If they do, use EPA to reduce travels.

20. Revolution mixing

(RVMX) uses the tail rotor to suppress the torque reaction of the main rotor

due to changes in collective pitch. It is disabled whenever Idle-Up or Throttle Hold are activated. RVMX may be set on either side of the stick (note the letters R/D and L/U displayed). Adjust RVMX mixing for both travel directions as described in the trimming instructions on page 45.

21. Gyro settings.

You can select an independent value of gyro gain for each flight condition by using the GYRO menu. Select the desired



flight condition, then use the Data keys to choose the desired value. The gyro must be plugged into CH6. This function will only work with dual rate heading hold gyros.

22. Aerobic Setups and Flight Conditions. Your Eclipse 7 system has three built-in flight condition menus in addition to the normal (NOR) hovering mode.

Two -- **ST1** and **ST2** -- are typically used for aerobatics, including 540° stall turns, looping, and rolling stall turns.

ST3 is used for "throttle hold" so that the throttle servo is disengaged during autorotations. These functions are switched on as follows:

- **NOR:** ON when Flt. Mode Switch is back.
- **ST1:** ON, when Flt. Mode Switch centered
- **ST2:** ON when Flt. Mode Switch is forward.
- **ST3:** ON when Flt. Cond Switch is forward.

As these functions are switched on or off, **ST3** will override all the others, followed by **ST2** and **ST1**, which will override **NOR**. Regular settings (**NOR**) occur when the others are off. Dual rates, exponentials, throttle and pitch curves, revolution mixing, and gyro gain may be

independently selected for each condition. Here are some suggested starting settings if your instructions do not provide any:

Throttle Curve ST1

Point	1 (low)	2	3	4	5 (high)
%	50	38	50	75	100

Throttle Curve ST2

Point	1 (low)	2	3	4	5 (high)
%	100	50	38	50	100

Pitch Curve ST1

Point	1 (low)	2	3	4	5 (high)
Pitch	-4 deg.	+0.5	+6.0	+7.5	+9.0

Pitch Curve ST2

Point	1 (low)	2	3	4	5 (high)
Pitch	-9 deg.	-6.0	0	6.0	9 or 10.0

Pitch Curve ST3 (HOLD)

Point	1 (low)	2	3	4	5 (high)
Pitch	-4 deg.	--	+6.5	--	+12

23. Throttle Hold Setting.

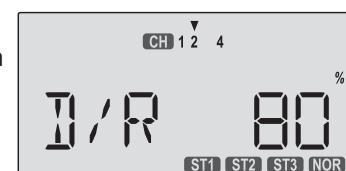
Throttle hold (HOLD) commands the throttle to a preset position near idle and disconnects it from



pitch when activated. Move to the HOLD menu and move the Flt. Cond. switch forward position. Set the hold position to maintain engine speed safely above idle without engaging the main rotor clutch.

24. Dual Rate Settings.

If you find that your aileron and elevator controls are too sensitive, you may set dual rates to reduce them.



Use the dual rate (D/R) window to adjust them to the desired amount of response when the switch is flipped. This is only a brief introduction to the setup procedure for helicopters. Be sure to browse through the pages following this example to see the details about the menus for helicopters.

Menu Descriptions - Helicopter

Flight Conditions

Your Eclipse 7 system's HELI menu provides three flight conditions in addition to the normal one (NOR). Within each condition, you may program an independent set of dual rates, exponentials, throttle and pitch curves, revolution mixing, and gyro gain. In the HELI menus, these are automatically called up whenever you switch to a new condition. (In ACRO and GLID, you have to activate them manually.) NOR is intended for hovering flight. ST1 may be used for forward flight and mild aerobatics, ST2 may be used for inverted, and ST3 is used for autorotations as it includes a throttle hold feature which disengages the throttle servo from collective commands.

These conditions are activated whenever the model memory is chosen to be **HELI** type.

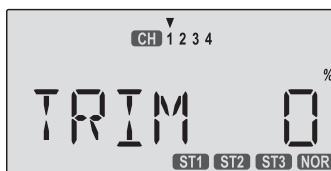
These flight conditions are switched on as follows:

- **NOR: ON** when **FIt. Mode** Switch is back.
- **ST1: ON**, when **FIt. Mode** Switch centered
- **ST2: ON** when **FIt. Mode** Switch is forward.
- **ST3: ON** when **FIt. Cond** Switch is forward.

As these functions are switched on or off, **ST3 = HOLD** has highest priority, followed by **ST2** and **ST1**.

Regular settings (**NOR**)

occur when all of the others are off. You can see which condition your transmitter is currently in by viewing the display. The current condition is the one flashing on and off in the lower right of the **TRIM** display.



EPA - End point adjust

See ACRO instructions on page 18.

D/R - Dual Rates

Refer to ACRO instructions on page 18.

EXP - Exponential

See the ACRO instructions on page 20.

STRM - Subtrim

Refer to the ACRO instructions on page 21.

REV - Servo Reverse

See ACRO instructions on page 22.

T.CUT - Throttle Cut

Described in the ACRO instructions on page 29.

PMX1, PMX2 - Programmable Mixing

See ACRO instructions on page 22. There are **two** programmable mixers in the helicopter menus. PMIX-1 is operated with the Gear switch and PMIX-2 is selected with the Rudder D/R switch.

R->T - Rudder → Throttle Mixing

Rudder → Throttle (R->T) mixing is used to maintain rotor speed so that altitude is kept constant when the rudder stick is operated in hover. The reason for this mixing is that when rudder is commanded, the tail rotor consumes a little more power, which reduces the power at the main rotor and the helicopter drops or climbs.

For helicopters with normal rotor rotation, commanding right rudder (which requires more power) should also increase throttle slightly, while using left rudder (requires less power) should decrease the throttle slightly. **R->T** mixing is handy for hovering but may also be used in 540° stall turns, hovering eights, nose-in circles, Top Hats, Pirouettes, and other aerobatics.

Setting Up Rudder-> Throttle Mixing

1. Press one of the **Up** **Down** **Edit** buttons repeatedly to select the **R->T** window. The function is activated by switching the **FIt. Mode** switch all the way back. It's set to 0% on both sides so there is no differential.
2. To set the mixing amount for the left rudder, hold the



rudder stick to the left side (display shows **L/U**), and press the **Data Decrease** key. Continue reducing the percentage until you reach about **10%**. If for some reason you want a **0%** setting, press the **Active/ Inhibit (Clear)** key.

3. Input the mixing amount for right rudder by moving the rudder stick to the right (display shows **R/D**), and press the **Data Increase or Decrease** key to reach about **10%**.

4. Note that **R->T** mixing may only be set up in the **NOR** menu.

GYRO - Gyro settings

Gyro settings are used to automatically control the gyro's gain in different flight modes. It may be set to different values in **NOR**, **ST1**, **ST2**, and **ST3** flight modes, allowing you to pick the gain you need for each circumstance.

The Gyro settings control the output at receiver **CH7**.

Note: *this function only works with dual rate heading hold gyros.*

Using Gyro Settings

1. Press one of the **Up** **Down** **Edit** buttons repeatedly to get to the **GYRO** menu.

To begin with, the function is already activated, but it's set to **50%** in all four flight modes.



2. To set the mixing amount for the normal (**NOR**) flight condition, flip the **FIt. Mode** switch all the way **back**.

NOR will be flashing on and off. Set the percentage to yield the desired gyro gain (this is usually a high-gain setting). If for some reason you want a **0%** setting, press the **Active/Inhibit (Clear)** key.

3. Flip the **FIt. Mode** switch to its **center** position. **ST1** will be flashing on and off. Set the percentage to yield the desired gyro gain in this flight condition (this will usually be a lower-gain setting for reduced damping in stunts).

4. Flip the **FIt. Mode** switch all the way **forward**. **ST2** will be flashing on and off. Set the percentage to yield the desired gyro gain.

5. Now flip the **FIt. Cond.** switch fully **forward**. You may now input a setting for **ST3**.

6. Make some test flights to try these settings out. Take note of when more gain is needed, and when less gain is needed. You can adjust all of the gyro settings in each flight condition to suit your machine.

HOLD - Throttle Hold

The Throttle Hold function moves the engine throttle servo to a selected position near idle, and disengages it from the throttle stick. It is commonly used during auto-rotation, and activated with the **FIt. Cond.** switch on the right rear of the transmitter. You can set the throttle position to be held over a -50 to +50% range centered about the throttle idle position. Activating throttle hold also disables revolution mixing (**RVMX**).

Setting Up Throttle Hold

1. Press one of the Up Down Edit buttons until the **HOLD**

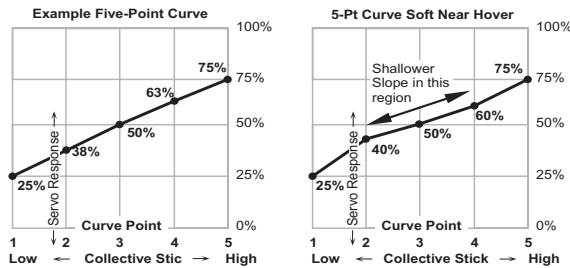
window appears. The default is for the function to be inhibited. To activate the throttle hold function, press the **Data -Decrease** key. This will cause the **INH** display to change to a -4% value with an **ON** or **OFF** display, depending on the **Flt. Cond.** switch's position.

2. Now you can adjust the throttle hold position with the **Data +Increase** or **-Decrease** keys, anywhere between -50 and +50% (To inhibit this feature, press the **Active/Inhibit (Clear)** key).

3. Check that your throttle goes to the desired hold position by flipping the **Flt. Cond.** switch one way and the other. Adjust the number as needed. Be sure to choose an engine speed that's fast enough to keep the engine from accidentally quitting but slow enough to not engage the main rotor clutch.



THCV - Throttle Curve
The throttle & pitch curves are tied to the position of the collective stick, and are specified at five points labeled 1 through 5 below. These "curves" are really straight lines connecting the settings at the five points, and are defined by assigning servo movement percentages to five positions of the left stick: lowest = Point 1, the 1/4-up stick position = Point 2, half-stick = Point 3, 3/4 position = Point 4, and top position = Point 5. With the numbers as input as shown, the servo would move 50% of full travel to one side at low collective stick position, and 50% of full travel to the other side at high stick position. You can get a linear response by making the five settings line up as shown above. But if you want another shape, you're free to do it. You can "flatten out" or "soften" the curve around hover as shown here. This is handy for making the control less sensitive around hover.



Setting Up The Throttle Curve

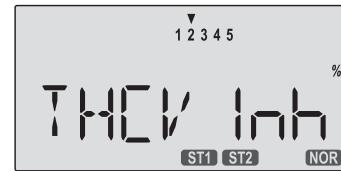
1. Press one of the **Up Down Edit** buttons until the **THCV** window appears. The default is for a linear curve, a straight line from 0 to 100% passing through 50% at hover (center, point 3).

2. Be sure you're in the desired flight condition by moving the **Flt. Mode** and **Flt. Cond** switches to their proper position. Remember, you can input separate, independent throttle curve settings for each flight condition (except for **ST3**, throttle hold)! Also, be sure to center the hovering throttle knob.

3. You begin at set point #1, idle. A small arrow should

appear over the number 1 in the display, and a value of **0%** should be shown. Press the **Data +Increase** or **-Decrease** key to change the setting to your desired value.

4. When you're finished with Point 1, move to the next point with the **Cursor Right** key. A small arrow over the number 2 indicates you are setting the value for Point 2. Note that the function is inhibited (**Inh**) to start with.



5. Repeat this procedure for Points 3, 4, and 5 by pressing the **Cursor Right** key, then adjusting as desired with the **Data +Increase** or **-Decrease** keys.

6. When you've completed the settings for the first flight condition (**NOR**), test fly your model. When you're satisfied with the settings, use them as a basis for the other flight conditions. Flip the switches as necessary to get into the new conditions, verify on the display that you are in the desired flight condition, then set all the five points in by going through the steps given previously.

PTCV - Pitch Curve

Like the throttle curve described above, **pitch curves** are tied to the position of the collective stick, and are specified at five points labeled 1 through 5 below. Setup instructions are the same as those for throttle curve, except that you may also input a curve for the throttle hold/**ST3** flight condition. You can get a linear response by making the five settings line up as shown above. But if you want another shape, you're free to do it. You can "flatten out" or "soften" the curve around hover, which is handy for making the control less sensitive there.

Inputting The Pitch Curve Values

1. Press one of the **Up Down Edit** buttons until the **PTCV** window appears. The default is for a linear curve, a straight line from 0 to 100% passing through 50% at hover (center).

2. Be sure you're in the desired flight condition by moving the **Flt. Mode** and **Flt. Cond** switches to their proper position. Remember, you can input separate, independent throttle curve settings for each flight condition!

3. You begin at set point #1, idle. A small arrow should appear over the number 1 in the display, and a value of **0%** should be shown. Press the **Data +Increase** or **-Decrease** key to



change the setting to your desired value.

4. When you're finished with Point 1, move to the next point with the **Cursor Right** key. A small arrow over the number 2 indicates you are setting the value for Point 2. Note that the function is inhibited (**Inh**) to start with.



If you leave it, you get a straight line from points 1 to 3. Otherwise, you can change this setting with the **Data +Increase** or



-Decrease keys. You can inhibit THCV point 2 and 4 by pressing the **clear** key.

5. Repeat this procedure for Points 3, 4, and 5 by pressing the **Cursor Right** key, then adjusting as desired with the **Data +Increase** or **-Decrease** keys.
6. When you've completed the settings for the first flight condition (**NOR**), **test** fly your model. When you're satisfied with the settings, use them as a basis for the other flight conditions. Flip the switches as necessary to get into the new conditions, verify on the display that you are in the desired flight condition, then set all the five points in by going through the steps given previously.

RVMX - Revolution mixing

The **revolution mixing** function mixes **pitch** commands into **rudder** (pitch → rudder) in order to suppress the torque generated by changes in the main rotor's pitch angle and rotational speed. You can input independent values for revolution mixing **above** and **below** one-half throttle for each of the **NOR**, **ST1**, and **ST2** flight conditions. Revolution mixing is disabled whenever throttle hold (**ST3**, operated by the **Flt. Cond.** switch) is on. For a clockwise-turning rotor, revolution mixing should apply right rudder when pitch is increased; for a counterclockwise-turning rotor, the opposite should occur. Remember to set the value for both the top and bottom of the throttle stick's motion.

Note: A procedure for adjusting revolution mixing is given in a table on page 45.

Revolution Mixing Programming

1. Call up the revolution mixing screen by repeatedly pressing one of the **Up Down Edit** buttons until the **RVMX** window appears. The function is active with 0% mixing turned on. Put the throttle stick to its idle position.
2. Now press the **Data +Increase** key. This will increase the percentage of **RVMX** mixing for the *low* side of throttle. You may set a value of 0% to 100% for this side. If you wish to return the mixing percentage to the default 0% value, press the **Active/Inhibit (Clear)** key.
3. Move the throttle stick to a position above half-throttle, and change the percentage number to suit.
4. Now verify that the rudder responds both the correct direction and amount for travel on both sides when throttle is commanded.
5. Set up the **RVMX** values for the other flight conditions (**ST1**, **ST2**) by flipping the **Flt. Mode** switch and repeating these procedures.



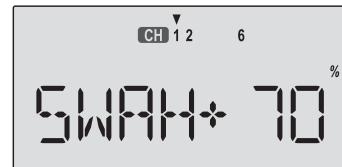
SWAH - Swashplate adjust (120°, 180° only)

The **swashplate** menu is intended only for helicopters whose collective pitch is controlled by more than a single servo at a time, and is sometimes referred to as CCPM (Collective & Cyclic Pitch Mixing). The *Eclipse 7* contains settings for 120° and 180° swashplates. Consult your model's setup instructions to find out which you need. When you move the collective stick, all swashplate servos should move in the same direction and the same amount to lift or drop the swashplate without tilting. If the swashplate should tilt to one side when you command collective, one or more servos is moving the wrong direction or the wrong amount, and must be adjusted in the **SWAH** menu. If the swashplate moves down when pitch should be increasing or vice versa, change the sign in front of all three servos from (+) to (-) or vice versa. For reference, there is no **SWAH** menu in the **NOR** menu, but the other two swash types do contain the **SWAH** menu. The swash default settings are shown below.

NOR	120°	180°
No SWAH menu	CH1 +70%, CH2 +70%, CH6 +70%	CH1 +70%, CH6 +70%

Swashplate Programming

1. Consult your model's setup instructions. If two or three servos are needed to move the swashplate, go to the model setup instructions (page 10) and select the appropriate swash type.
2. With all the servos hooked up, and the transmitter and receiver turned on, move the throttle/collective stick up and down. The swash should move up and down with no rotations. Move the aileron stick left and right. The swash should tilt left and right without pitching or rising. Move the elevator stick. The swash should tilt fore and back with no rotations. If there are rotations when collective is moved, or the swash moves up and down with aileron or elevator, you need to adjust the settings in the swash menu.
3. If the servos do not all respond in the same direction for collective or opposite directions for aileron and elevator, you will need to reverse one or more of them in the reversing menu (**REV**). It may take a little trial and error trying different combinations of normal and reverse rotation to get the servos to respond properly. Don't worry about the direction they respond, just that they all move the same for collective and tilt for aileron and elevator.
4. Call up the swash screen by repeatedly pressing one of the **Up Down Edit** buttons until the **SWAH** window appears. The function is automatically active when you select **120°** or **180°** mixing in the model setup menu.
5. If all the servos **raise** the swash with increasing collective, go to the next step. If they **lower** the swash, press the **Cursor Right** key twice to get to the collective setting menu (the arrow appears over the number **6**). Now press the **Data -Decrease** key until the sign is



reversed in front of the percentage value. Now the swash should properly respond to collective. If you've done the wrong thing, you can reset the percentage by pressing the **Active/Inhibit (Clear)** key.

6. If all the servos **tilt** the swash to the **right** with **right** aileron stick, go to the next step. If they **tilt** the swash to the **left**, press the **Cursor Right** key once to get to the aileron setting menu (the arrow appears over the number **1**). Reverse the sign in front of the percentage with the **Data -Decrease** key. Now the swash should properly respond to aileron.

7. (120' swash only) If all the servos **tilt** the swash **back** with up elevator stick, go to the next step. If they **tilt** the swash forwards, press the **Cursor Right** key once to get to the elevator setting menu (the arrow appears over the number **2**). Now press the **Data -Decrease** key until the sign is reversed in front of the percentage value. Now the swash should properly respond to elevator. (In the 180' swash menu, there is no elevator setting, and this step should be skipped.)

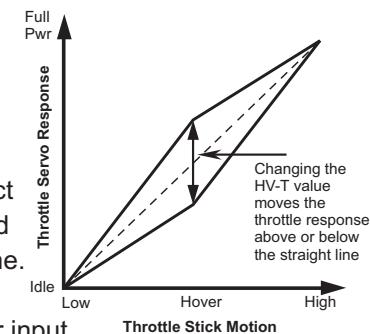
8. Double check that all three functions, collective, aileron, and elevator, produce the desired result on the swashplate.

Hovering Throttle Adjustment Knob

The **Hovering Throttle knob** may be used to "tweak" the throttle servo's position around hover without affecting main rotor pitch. It's handy to make up for changes in rotor speed caused by variations in temperature, humidity,

or other conditions.

To change the hovering throttle setting, simply turn the Hovering throttle knob **VR1**. As shown in the figure, turning the knob has the largest effect in the hovering region and leaves the endpoints alone. Please center this knob before you set neutrals or input throttle curves.

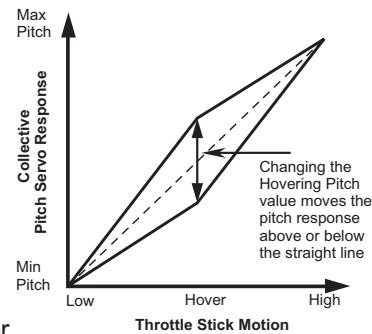


Hovering Pitch Adjustment Knob

The Hovering Pitch

knob may be used to trim the collective pitch near hover without affecting throttle. Like hovering throttle, it's handy to make up for changes in rotor speed caused by variations in temperature, humidity, or

other conditions. You can adjust the hovering pitch value simply by turning the Hovering pitch knob **VR2**. Like hovering throttle, this knob only works near hover and tapers off at either end of throttle. Please center this knob before you set neutrals or input throttle curves.



Helicopter Flight Trimming Chart

This procedure assumes helicopter is trimmed for hovering. Trimming must be done in near-calm conditions.

Repeat tests several times before making adjustments. If any changes are made, go back over the previous steps and verify, or further adjust as necessary.

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

Adjusting Hovering Pitch and Hovering Throttle

RPM	Stick	Primary Corrective Action	RPM	Stick	Primary Corrective Action
High	Below 1/2	Decrease hovering throttle	Low	Above 1/2	Increase hovering throttle
Low	Below 1/2	Decrease hovering pitch	Perfect	Above 1/2	Increase hovering pitch, increase hovering throttle
Perfect	Below 1/2	Decrease hovering throttle, decrease hovering pitch			
High	1/2 stick	Increase hovering pitch, decrease hovering throttle	Want more	Keep 1/2	Decrease hovering pitch, then increase hovering throttle
Low	1/2 stick	Decrease hovering pitch, increase hovering throttle	Want less	Keep 1/2	Increase hovering pitch, then decrease hovering throttle
Perfect	1/2 stick	Don't touch a thing!			
High	Above 1/2	Increase hovering pitch			

GLOSSARY

The abbreviations used with the Eclipse 7 are defined below alphabetically. Related pages are given in parenthesis following the definition.

A		F		P	
ACRO	Acrobatic aircraft menu (13)	FLPN	Flaperon function gives the ailerons a flap function. (26)	PMX	Programmable mixer. Mixing between arbitrary channels. (22)
ADIF	Aileron differential. Makes aileron move more to one side than the other (32)	FLTC	Flight condition function (20)	PTCV	Pitch curve function (43)
AIL.T	Dual aileron trim (35)	FLPT	Flap trim function; controls flap neutral position. (23)	R	
ATL	Adjustable Travel Limit. Limits throttle trims to only the throttle idle position. (built in to your system)	F->A	Flap → Aileron mixing (33)	R/D	Indicator showing Right or Down stick motion
A->F	Aileron → Flap mixing (35)	F->E	Flap → Elevator mixing (33)	REV	Reverse. Servo operating direction switching function. (22)
A->R	Aileron → Rudder mixing (24)	G		REST	Reset model memory (12)
C		Gear	Landing gear control switch. (7)	RVMX	Revolution mixing (44)
camber	A function which drops or raises the entire trailing edge of a glider wing.	GLID	Glider settings menu (28)	R->T	Rudder → Throttle mixing (42)
COPY	Data copy: command used to copy one memory to another (10)	GYRO	Gyro setting menu (42)	S	
CROW	Airbrake function for gliders	H		SLV	Slave channel in program mixer (22)
CURSOR	Button used to step through menus (8)	HELI	Helicopter settings menu. (10)	ST1, ST2, ST3	Flight condition 1, 2, & 3 indicators
D		HOLD	Throttle hold function holds the throttle in a near-idle position (used for autorotation). (42)	STM.1,2	Speed Flap Trim offsets 1 & 2 for gliders (launch presets, etc.) (35)
D/R	Dual rate: switch-controlled function reduces control travels. (18)	I		S.TRM	Subtrim function used to adjust servo neutrals. (21)
DATA	Editing keys change numbers (8)	INH	Inhibit. Function will not operate	SWAH	Swash type (10)
DFL.T	Dual Flap trim knob (36)	L		T	
E		L/U	Indicator showing Left or Up stick motion	T.CUT	Throttle cut function used to kill engine without moving trims (22)
ELVN	Elevon function combines ailerons & elevators for tailless models. (24)	LAND	Landing function (23)	THCV	Throttle curve function (43)
EPA	End Point Adjust. Function that adjusts the servo travel at the left and right sides. (24)	Lock	Lock throttle button (9)	TIME	Timer/Stopwatch function (12)
EXP	Exponential function, used to reduce sensitivity around neutral (20)	M		V	
E->F	Elevator → Flap mixing (23)	MAS	Master channel in mixer (22)	VTAL	V-tail function combines the elevators and rudder. (25)
		MSEL	Model select menu (10)	Numerical	
		N		120'	Helicopter swashplate, 120 deg. (10)
		NOR	Normal helicopter swashplate (1 servo each for elevator, aileron, pitch. (10)	180'	Helicopter swashplate, 180 deg. (10)
		O		2WNG	Glider with 2 wing servos (10)
		OFF	Function or Switch in OFF position.	4WNG	Glider with 4 wing servos (10)
		ON	Function or Switch in ON position.		

ACRO Model Data Recording Sheet

Make copies before using

Memory No. 1 . 2 . 3 . 4 . 5 . 6 . 7

Model Name _____ - _____							
MENU FUNCTION	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH7
REV Servo Rev (circle)	N . R	N . R	N . R	N . R	N . R	N . R	N . R
EPA End Point Adj. R/D	%	%	%	%	%	%	%
	L/U	%	%	%	%	%	%
SBTR Subtrims Value	%	%	%	%	%	%	%
D/R NOR	Up	%	%	%			
	Down	%	%	%			
D/R ST1	Up	%	%	%			
	Down	%	%	%			
D/R ST2	Up	%	%	%			
	Down	%	%	%			
D/R ST3	Up	%	%	%			
	Down	%	%	%			
EXP NOR	Up		%	%			
	Down		%	%			
EXP ST1	Up		%	%			
	Down		%	%			
EXP ST2	Up		%	%			
	Down		%	%			
EXP ST3	Up		%	%			
	Down		%	%			
T.CUT		%					
PMX1 Programmable Mixer 1	ON . INH	MAS CH ____	SLV CH ____	R/D + . - %	L/U + . - %		
PMX2 Programmable Mixer 2	ON . INH	MAS CH ____	SLV CH ____	R/D + . - %	L/U + . - %		
PMX3 Programmable Mixer 3	ON . INH	MAS CH ____	SLV CH ____	R/D + . - %	L/U + . - %		
PMX4 Programmable Mixer 4	ON . INH	MAS CH ____	SLV CH ____	R/D + . - %	L/U + . - %		
PMX5 Programmable Mixer 5	ON . INH	MAS CH ____	SLV CH ____	R/D + . - %	L/U + . - %		
LAND Landing Mixing	ON . INH	CH2 ____ %	CH6 ____ %				
FLPT Flap Trim	ON . INH	Amount ____ %					
E->F Elevator → Flap Mixing	ON . INH	Up ____ %	Down ____ %				
A->R Ail → Rud Mixing	ON . INH	Left ____ %	Right ____ %				
ELVN Elevon Mixing	ON . INH	2-2 ____ %	2-1 ____ %	1-1 ____ %	1-2 ____ %		
VTAL V-tail Mixing	ON . INH	2-2 ____ %	2-4 ____ %	4-4 ____ %	4-2 ____ %		
FLPN Flaperon Mixing	ON . INH	1-1 R ____ %	1-1 L ____ %	1-6 R ____ %	1-6 L ____ %	6-6 ____ %	6-1 ____ %

GLID Model Data Recording Sheet

Make copies before using

Memory No. 1 . 2 . 3 . 4 . 5 . 6 . 7

MENU FUNCTION	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH7
REV Servo Rev (circle)	N . R	N . R	N . R	N . R	N . R	N . R	N . R
EPA End Point Adj.	R/D	%	%	%	%	%	%
	L/U	%	%	%	%	%	%
SBTR Subtrims Value	%	%	%	%	%	%	%
D/R NOR	Up	%	%	%			
	Down	%	%	%			
D/R ST1	Up	%	%	%			
	Down	%	%	%			
D/R ST2	Up	%	%	%			
	Down	%	%	%			
D/R ST3	Up	%	%	%			
	Down	%	%	%			
EXP NOR	Up	%	%	%			
	Down	%	%	%			
EXP ST1	Up	%	%	%			
	Down	%	%	%			
EXP ST2	Up	%	%	%			
	Down	%	%	%			
EXP ST3	Up	%	%	%			
	Down	%	%	%			
PMX1 Programmable Mixer 1	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
PMX2 Programmable Mixer 2	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
PMX3 Programmable Mixer 3	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
PMX4 Programmable Mixer 4	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
PMX5 Programmable Mixer 5	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
ADIF Aileron Differential		1-1 R	%	1-1 L	%	1-5 R	%
VTAIL V-tail Mixing	ON-INH	CH2	+ - %	CH6	+ - %		
E->F Elevator → Flap Mixing	ON-INH	Up	%	Down	%		
A->R Ail → Rud Mixing	ON-INH	Left	%	Right	%		
F->A Flap → Ail Mixing		L/U	%	R/D	%	Set	%
F->E Flap → Elevator Mixing	ON-INH	L/U	%	R/D	%	Set	%
CROW Crow Mixing	ON-INH	CH1	%	CH2	%	CH6	%
SET Set of Trims 1	ON-INH	CH2	%	CH6	%	CH7	%
STM2 Set of Trims 2	ON-INH	CH2	%	CH6	%	CH7	%
AIL.T Ail Trim	ON-INH	Amount	%				
A->F Ail-Flap Mixing	ON-INH	1-6 R	%	1-6 L	%	1-7 R	%
DFL.T Dual Flap Trim	ON-INH						

HELI Model Data Recording Sheet

Make copies before using

Memory No. 1 . 2 . 3 . 4 . 5 . 6 . 7

MENU FUNCTION	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH7
REV Servo Rev (circle)	N . R	N . R	N . R	N . R	N . R	N . R	N . R
EPA End Point Adj.	R/D	%	%	%	%	%	%
	L/U	%	%	%	%	%	%
SBTR Subtrims Value	%	%	%	%	%	%	%
D/R NOR	Up	%	%	%			
	Down	%	%	%			
D/R ST1	Up	%	%	%			
	Down	%	%	%			
D/R ST2	Up	%	%	%			
	Down	%	%	%			
D/R ST3	Up	%	%	%			
	Down	%	%	%			
EXP NOR	Up	%	%	%			
	Down	%	%	%			
EXP ST1	Up	%	%	%			
	Down	%	%	%			
EXP ST2	Up	%	%	%			
	Down	%	%	%			
EXP ST3	Up	%	%	%			
	Down	%	%	%			
T.CUT	%						
PMX1 Programmable Mixer 1	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
PMX2 Programmable Mixer 2	ON . INH	MAS CH	SLV CH	R/D + . - %	L/U + . - %		
R->T Rud-Thr Mixing		Right Side (R/D)	+ . - %	Left Side (L/U)	+ . - %		
GYRO Gyro setting		NOR	%	ST1	%	ST2	%
HOLD Throttle Hold setting		%					
THCV Throttle Curve NOR	%	%	%	%	%		
THCV Throttle Curve ST1	%	%	%	%	%		
THCV Throttle Curve ST2	%	%	%	%	%		
PTCV Pitch Curve NOR	%	%	%	%	%		
PTCV Pitch Curve ST1	%	%	%	%	%		
PTCV Pitch Curve ST2	%	%	%	%	%		
PTCV Pitch Curve ST3	%	%	%	%	%		
RVMX Revolution Mixing NOR		High Side (R/D)	+ . - %	Low Side (L/U)	+ . - %		
RVMX Revolution Mixing ST1		High Side (R/D)	+ . - %	Low Side (L/U)	+ . - %		
RVMX Revolution Mixing ST2		High Side (R/D)	+ . - %	Low Side (L/U)	+ . - %		
SWAH Swash settings	%	%	%				

ECLIPSE 7



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