Warranty

The US Futaba Service Center will warranty this radio for one year after the purchase date from defects in materials or workmanship. Please read the enclosed Futaba Warranty Card for full details of this radio's warranty.

Make sure you save the receipt or invoice you were given when you bought your radio! It is your proof of purchase and we must see it before we can honor the warranty.

To return your radio for repairs covered under the warranty, or for non-warranty service, please ship it with a detailed explanation of your concerns to the address listed below. Please include as many means of contact as possible. Daytime fax number and email address will allow us to provide you automated information updates, and will assist the service team in contacting you as quickly as possible.

Futaba Service Center
1610 Interstate Drive
Champaign IL 61822

www.futaba-rc.com
phone: 217-398-0007
8:00am - 5:00 pm Central Time M-F
fax: 217-398-7721
email: support@futaba-rc.com

Futaba®
6DA Radio System

Instruction Manual

Thank you for purchasing the Futaba 6DA 6-channel with Flight Set radio system. Whether this is your first R/C radio system, or you're moving up or replacing a trusted old friend, we believe you'll be pleased with your 6DA. Futaba is the leader in R/C radio technology.
Please read this instruction manual carefully and use the 6DA radio system safely. If you are unfamiliar with some of the terms in this instruction manual, take a few minutes to read the glossary. It contains useful information about terms that will help you understand the functions and features of this radio. Save this manual for future reference and, most of all, have fun!

•No part of this manual may be reproduced in any form without prior permission.
•The contents of this manual are subject to change without prior notice.
•This manual has been carefully written. Please write to Futaba if you feel that any corrections or clarifications should be made.
•Futaba is not responsible for the misuse of this product.

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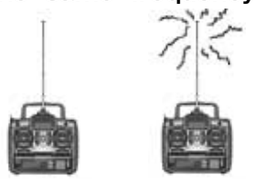
FUTZ8570 V1.0

SAFETY INFORMATION

To ensure safe use, observe the following precautions.

Precautions During Flight

- **Do not fly or turn on simultaneously with another radio on the same frequency.** Interference will cause a crash. Use of the same frequency will cause interference even if the modulation method (AM, FM, PCM) is different.



- **Do not fly on rainy or windy days, or at night.** Water will penetrate into the transmitter (Tx) and cause faulty operation, or loss of control, and cause a crash.

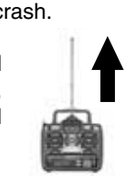
Do not fly in the following places:

- **Near other R/C flying fields (within about 2.5 miles [4km]).**
- **Near people on the ground, or objects in the air.**
- **Near homes, schools, hospitals, or other places where there are a lot of people.**
- **Near high tension lines, high structures, or communication facilities.** Radiowave interference and obstructions may cause a crash. A crash caused by trouble in the R/C set, or the model itself, may cause death or property damage.

Other Precautions

- **Do not fly when you are tired, sick, or intoxicated.** Fatigue, illness, or intoxication will cause a loss of concentration or normal judgment and result in operation errors and a crash.

- **Extend the antenna to its full length.** If the antenna is shortened, the effective range of the radio signal will be shorter.



- **Check that the transmitter (Tx) antenna is not loose.** If the transmitter antenna comes off during use, control will be lost and the model will crash.

- **Always test the R/C set before use.** Any abnormality in the R/C set, or model, may cause a crash. Before starting the engine, check that the direction of operation of each servo matches the operation of its control stick. If a servo does not move in the proper direction, or operation is abnormal, do not fly the plane.
- **When placing the transmitter (Tx) on the ground during flight preparations, be sure that the wind cannot knock it over.** If it is knocked over, the throttle stick may be pushed to full throttle, the engine will speed up and may create a very dangerous situation.
- **When adjusting the R/C set, always stop the engine.** If the engine suddenly goes to full throttle, it may cause an injury.
- **Do not get fuel, oil, etc. on plastic parts.** The plastic may melt, discolor, become brittle and fail to function.
- **Always use Genuine Futaba transmitters, receivers, servos, ESCs, NiCd batteries, and other optional parts.** Futaba is not responsible for damage, etc. caused by the use of parts other than Genuine Futaba parts. Use the parts described in the instruction manual and catalogs.

NiCd Battery Charging Precautions

Always charge the NiCd batteries before each flight. If the battery goes dead during flight, the plane may crash or fly away.

Charge the R/C NiCd battery with the standard charger, or fast field charger (sold separately). Overcharging may cause burns, fire, injury, blindness, etc. due to overheating, breakage, electrolyte leakage, etc.

Do not short the NiCd battery connector terminals. Shorting the terminals will cause sparking and overheating and result in burns or fire.

Do not drop or apply strong shock to NiCd battery. The battery may short out and cause overheating or breakage and electrolyte leakage, resulting in burns or damage from chemical contents.

TROUBLESHOOTING GUIDE

Problem	Possible causes	Solution
Short range	Collapsed or loose Tx antenna	Fully extend the antenna and make sure it is securely attached
	Interference	Check frequencies in area and check Rx installation
	Rx antenna poorly routed	Reroute antenna away from other wiring
	Severed Rx antenna	Send to Futaba service center for new antenna
	Tx or Rx battery not fully charged	Fully charge batteries prior to use
	Rx or Tx out of tune	Send to Futaba service center for retuning
	Crash damage	Send to Futaba service center for inspection and repair
	Faulty Rx or Tx crystal	Install new crystal and perform range check
Sluggish servo response	Low Tx or Rx batteries	Fully charge batteries prior to use, may need cycling (you must remove the batteries from the TX to cycle, and this requires opening the Tx case.)
	Binding servos causing excess battery drain	Check pushrods and free binding
	Too many servos	Use fewer servos if possible, or use a higher capacity battery pack
Tx meter low	Tx batteries are discharged	Fully charge batteries prior to use
Tx meter above red zone but servos do not function	Rx batteries are discharged	Fully charge batteries prior to use
	No power to receiver	Move Rx switch harness to “ON” position
	Switch harness incorrect	Make sure all leads are in the proper positions
	Reversing switch stuck in-between positions	Move switch fully to one side or the other
Interference or servos glitching	Another Tx is on your channel	Turn off immediately and do not operate your system until other user is finished
	Outside interference	Check local R/C club to learn of dangerous frequencies in your area
	Engine or motor electrical noise	Reroute antenna or servo leads as far away from engine or motor as possible
One glitching servo	Malfunctioning servo	Replace servo
	Other interference	Check quality and installation of servo lead or extension
Servo movement not as expected	Mix accidentally activated	Check all mix dip switches
	Servos connected incorrectly	Check all servo connections
	Interference	See above
	Too much/Too little throw	Check AST and D/R settings and switches

Retractable Gear - Landing gear which can be drawn up into the aircraft during flight.

Retract Servo - A specialized servo which only travels to full deflection and is not proportional. When input is given, the servo moves from one extreme to the other, which, when installed properly, will either bring the retractable gear all the way up and hold it in place, or lower it completely and hold it down.

Rudder (RUD) - Tail control surface, attached to the vertical fin, that controls the direction of the aircraft.

Reverse (REV) - For the servo reversing function, this refers to the reverse side. The opposite side of reverse is the normal side.

Roll - The rotation of the aircraft's wing tips up or down.

Servo Horn - A plastic part installed to the shaft of a servo which changes the rotating motion of the servo to linear motion. A linkage is hooked to this to transmit motion to the surface.

Servo Reversing - Changes the direction in which the servo travels.

Stick - A Control providing input to the transmitter.

Throttle (THR) - Controls the fuel/air mixture of the engine. When opened (throttle high position), a large fuel/air mixture is sucked in and the engine speed increases. When closed (throttle low position), the engine speed decreases.

Throw - The distance a control surface moves in response to movement of the transmitter stick.

Trainer Function - An electronic feature which allows two transmitters to be connected by an optional cord. Allows instructor to give and regain control from the student.

Trim - A device that adjusts the neutral point of each servo. In the case of the throttle, the trim adjusts only the low end of the travel.

Up - ("up" elevator) The direction in which the trailing edge of the control surface moves.

Yaw - The rotation of the aircraft's nose to the left or right.

Storage and Disposal Precautions

Do not leave the R/C set, battery, model airplane, etc. within the reach of small children. Touching and operating the R/C set, or licking the battery, may cause injury or damage due to chemical content.

Do not throw the NiCd battery into a fire or heat the NiCd battery. Also, do not disassemble or rebuild the NiCd battery. Breakage, overheating, and electrolyte leakage may cause injury, burns, or blindness.

NiCd Battery Electrolyte

The electrolyte in a NiCd battery is a strong alkali and can cause blindness if it gets in the eyes. If you get the electrolyte in your eyes, immediately wash your eyes with water and see a doctor. If you get the electrolyte on your skin or clothes, it may cause a burn. Immediately wash it off with water.

Do not store the R/C set in the following places:

- **Where it is very hot (75°F [40C] or more) or very cold (18°F [-10C] or less).**
- **Where the set will be exposed to direct sunlight.**
- **Where the humidity is high.**
- **Where there is strong vibration.**
- **Where it is dusty.**
- **Where there is steam and heat.**

Storing the R/C set in the places listed above may cause distortion, corrosion and product failure.

If the R/C set will not be used for a long time, remove the NiCd batteries from the transmitter and the model and store them in a dry place.

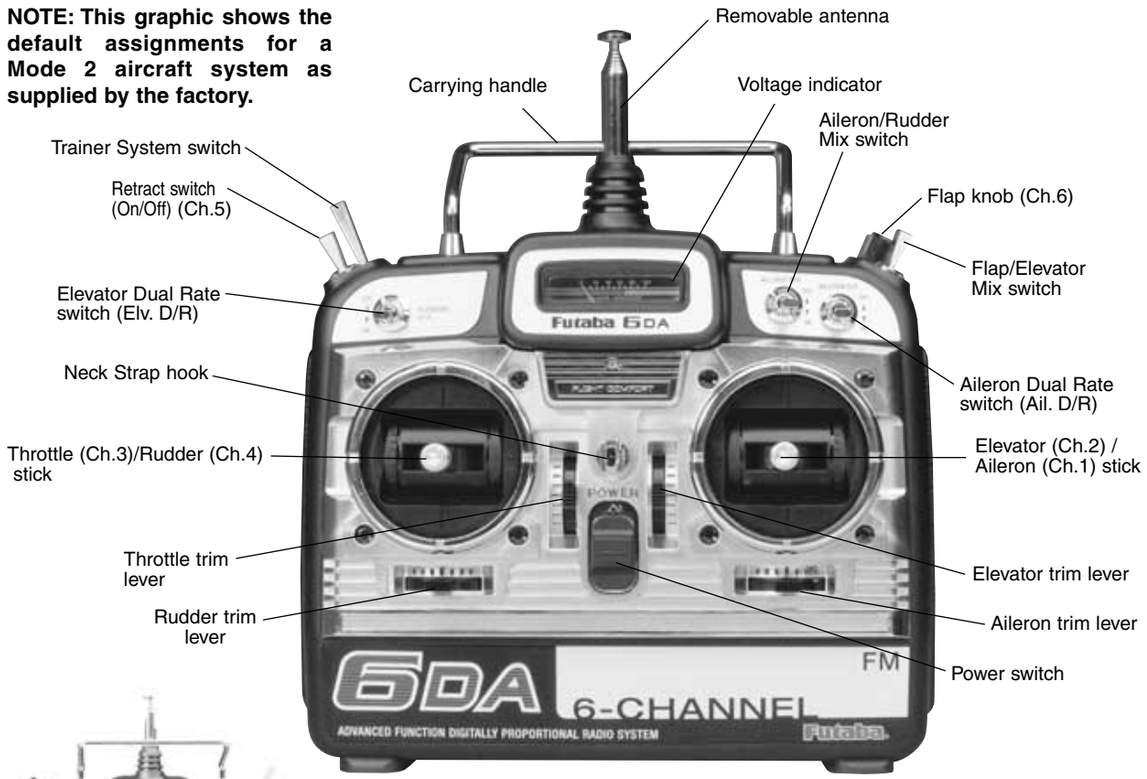
If the batteries are left in the transmitter and model, the battery electrolyte may leak out and damage the system, degrade the performance and shorten the life of the transmitter and model.

NiCd Battery Recycling (for North America only)

Used NiCd batteries are an important resource. Stick tape over the terminals and take the used batteries to a NiCd battery recycling center.

The RBRC Battery Recycling Seal on the nickel-cadmium (NiCd) battery that should be used in our product indicates Futaba is voluntarily participating in an industry program to collect and recycle these batteries at the end of their useful life, when taken out of service in the United States or Canada. The RBRC program provides a convenient alternative to placing used NiCd batteries into the trash or the municipal waste system, which is illegal in some areas. Please call 1-800-822-8837 for information on NiCd battery recycling in your area. Futaba's involvement in this program is part of our commitment to preserving our environment and conserving our natural resources.

NOTE: This graphic shows the default assignments for a Mode 2 aircraft system as supplied by the factory.



Crystal: Determines operating frequency. (please see page 6.)

NiCd Charging port: Charging jack used when charging the transmitter NiCd battery.

Back cover: Cover for Flight Set Control Center and Tx NiCd.

Trainer port: Connects the trainer cord when using the trainer function. The trainer cord is sold separately. See page 20 for the trainer function operation instructions.

Power switch: Turns the transmitter "On" or "Off." In the upper position, the power is "On".

Voltage indicator: This is an expanded scale voltmeter. It is not calibrated in volts. When the needle deflects to the boundary between the silver and red zones or lower, recharge or replace the battery. Do not operate the transmitter if the needle descends into the red area.

Removable Antenna: Radiates signal to the receiver. Never operate the transmitter without extending this antenna or you may create interference to other modelers and decrease your control of your model.

Aileron, Elevator, Throttle and Rudder sticks: Controls designated function. See page 10 for the transmitter operation instructions.

Aileron, Elevator, Throttle and Rudder trim levers: Used to shift the neutral or idle position of each servo. (As the throttle stick is moved up towards the high throttle position, the throttle trim will have less effect.)

Carrying handle: Provides an easy means of transporting the transmitter.

Neck strap hook: Secures the transmitter to the neck strap (optional).

GLOSSARY

Adjustable Servo Travel (AST) - An electronic adjustment of how far a servo moves when full inputs are given. Allows fine-tuning of the deflection provided to the control surface after adjusting the linkages as closely as possible. Sometimes called ATV. **Note**: AST has only one pot which adjusts both ends of travel simultaneously.

Aileron (AIL) - Control surfaces on the left and right sides of the main wing. These surfaces control banking (rolling) of the aircraft.

Aileron Differential (AIL/DIFF)- An electronic or mechanical setup which results in less down travel than up travel on each aileron servo to correct for unwanted yawing or "barrel rolling" effects when aileron input is given.

Binding - A problem with control linkages where the surface does not move freely or where the servo is attempting to push the surface farther than it can physically go. This problem is frequently noticeable due to a loud humming or "buzzing" of the servo.

Channel -

- The frequency on which an aircraft's radio equipment is transmitting. (ex. Ch. 11 is 72.010MHz)
- The number of servos the radio can independently control. The 6DA is a 6-channel radio, so it can independently operate 6 servos in a model.
- The receiver slot into which a servo is plugged in a receiver to operate a particular function. For example, a single aileron servo is plugged into channel 1, also called slot 1. Its counterpart in a dual aileron servo setup is plugged into channel 6, also called slot 6.

Control Surface - A moveable portion of the Fin, Stabilizer or Wing that produces changes in the aircraft's path of flight.

Down - ("down" elevator) The direction in which the trailing edge of the elevator moves.

Dual Rate (D/R) - An electronic adjustment which reduces servo travel when activated.

Elevator (ELE) - Control surface that moves up and down on the horizontal stabilizer of an aircraft and controls pitch.

End Point Adjustment (EPA) - An electronic function which allows for independent adjustment at each end of servo travel. Sometimes called ATV.

Flaperon - Twin aileron servo function, with one servo operating each aileron, which provides normal aileron function when aileron input is given and also moves both ailerons in unison to operate as flaps when flap input is given.

Flap (FLP)- A single control surface across the center or a pair of matched control surfaces, one on each side of the wing which, when lowered, slows the aircraft down, increases lift and allows the aircraft to fly at slower speeds.

Linkage - Mechanism that connects the servos to the control surfaces. Includes pushrods, clevises, control horns and servo arms.

Mix - An electronic action within a transmitter which commands a second servo to operate in direct proportion to the control movement of the primary servo.

Normal (NOR) - For the servo reversing function, it is the normal side. The opposite side is the reverse side.

Pitch - The rotation of the aircraft's nose up or down.

TRAINER FUNCTION

The trainer function is a very effective way to train students. To use it, the optional trainer cord TC-FM is necessary. The special trainer cord can be connected to all Futaba FM and PCM transmitters manufactured after 1991.

- **Never** turn on the student transmitter power switch. Turning on the power switch will cause interference and a crash.
- Set the student and instructor transmitter functions and trims to the same settings. For example, if the direction of operation is reversed, control may be lost and the plane may crash.
- The student Tx can only be an FM (PPM) type transmitter.

Trainer Jack (Trainer Cord TC-FM sold separately)

Operating Instructions

- With both transmitters off, plug the trainer cord into the instructor's Tx, then the student's.
- Turn on instructor's Tx. **DO NOT** turn on the student Tx.
- Check proper operation of all controls.
- Hold the trainer switch "on" and check the operation of all controls of the student Tx.
- Alternating from instructor to student, set throws and trims to be identical.

PREPARE TO FLY

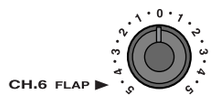
BEFORE EACH FLIGHT

- Confirm that you have exclusive use of your frequency.
- Check your Tx and Rx battery voltage.
- Turn on Tx first, then Rx.
- Check direction and smooth movement of every control surface.
- Range check the radio by having another person hold the model. With the antenna fully collapsed, walk at least 50 feet from the model. Ensure all control surfaces function properly.
- Have fun!!

Retract switch (Ch.5): Controls the raising and lowering of retractable landing gear or other feature. Not all models will use this function. (see page 18)

Retract switch (Ch.5)

Flap knob: Controls the flap servo(Ch.6). Turning clockwise lowers flaps. Turning counter-clockwise raises flaps. (see page 19)



Flap Control lever: Sets fixed position for flap movement to ease use in flight.

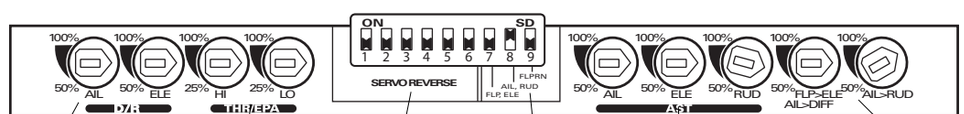
See page 19 for use of Flap Control lever.

Dual Rate switch (Ail. D/R and Elv. D/R):
Used to set and reduce the servo travel by flipping each Dual Rate switch. (see page 14)

Trainer switch: Controls the link between the instructor and student transmitters when using the trainer function. The student transmitter can only be operated when this switch is being held "on". (see page 20)

FLIGHT SET CONTROL CENTER

FLIGHT SET CONTROL CENTER



Dual Rate pots (Ail./Elv.): Used to reduce the servo travel when flipping each Dual Rate switch. The travel reduction for the aileron and elevator may be set independently. (see page 14)

Throttle EPA (End Point Adjustment) pots (Low/High)

Used to adjust throttle servo travel limits.Servo travel at both end points can be adjusted independently in each direction. (see page 12)

Servo Reversing dip switches: Switches that reverse the direction of operation of a servo. The numbers correspond to the channel number of each control function.

The lower position is the normal side and the upper position is the reverse side.

(see page 11)

AST (Adjustable Servo Travel) (AIL, ELE, RUD): Used to adjust total servo travel. Adjusts both ends of the servo travel at one time. (see page 13)

Mixing Activation dip switches: switches that activate the electronic mixes and features.

(see pages 15&19)

MIX adjustments (AIL to RUD, FLAP to ELE, AIL Differential): Used to adjust the amount of movement of second servo. (see pages 15,17&19)

FEATURES & SPECIFICATIONS

Transmitter (Tx)

- Digital Proportional 6CH FM Two-Stick 72MHz* Transmitter
- Flight Set Adjustment Control Center
- Narrow-band Transmission Technology
- Fully Proportional Flap Control
- Flaperon with Adjustable Aileron Differential Capability
- Separate Elevator and Aileron Dual Rate Switches and Adjustments
- Flap-to-Elevator (not available simultaneously with flaperon) and Aileron-to-Rudder Separate Mix Switches and Adjustments
- Two-Position Retract Switch for Gear Operation
- Momentary-on Trainer Switch
- Analog Battery Voltage Indicator
- Electronic Analog Trim Adjustments on All Four Primary Control Surfaces
- All-Channel Servo Reversing Switches
- Throttle Hi and Low EPA Adjustments
- Elevator, Aileron and Rudder AST Adjustments
- 9.6v NiCd Rechargeable Battery and Dual Charger Included

***6DA systems sold outside the USA include:**

- R138DF Receiver (Rx) on either 35 or 40MHz.
- 6DA Transmitter (Tx) on either 35 or 40MHz.

Receiver (Rx) FP-R127DF* **

- Interchangeable Crystal, 72MHz* Freq.**
- Size: .82" x 1.39" x .82" [20.8mm x 35.3mm x 20.8mm]
- Weight: 1.50 oz. [42g]
- Dual Conversion Narrow Band Technology
- 4.8v NiCd Rechargeable Battery Included

Servos (Sx) S3004

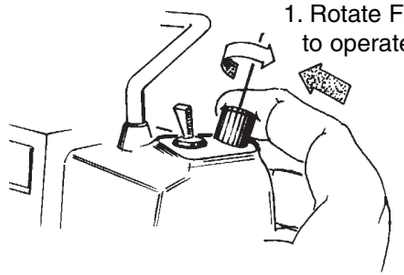
- Torque: 42 oz.-in. at 4.8V [2.99 Kg*cm]
- Size: .77" 1.59" x 1.41" [19.6mm x 40.4mm x 35.8mm]
- Speed: .22 sec/60 degrees
- Weight: 1.50 oz. [42g]

*This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions.
1) This device may not cause harmful interference.
2) This device must accept any interference received including interference that may cause undesired operation.

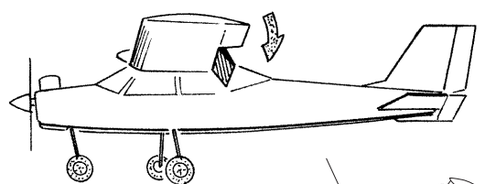
**For proper operation and the safety of all concerned, please be sure that if you choose to change your receiver's frequency to stay with in the proper band. If your receiver was originally on channels 11-35, then it is 'low band'. If it was on 36-60, then it is 'high band'. Do not change frequencies outside of the band of your receiver.
It is against FCC regulation for anyone but a licensed technician to change your transmitter's frequency. You may replace a damaged crystal of the same channel, but the radio must be properly retuned after transmitter channel change.

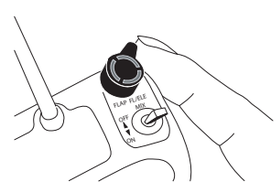
FLAPS

- If the model has separate flaps (not flaperons, as covered on page 16) plug the flap servo into channel 6 on the Rx.



1. Rotate Flap knob to operate flaps.





Flap Control lever:

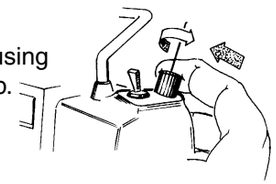
By using the flap control lever, you can set the maximum up deflection of the flaps. This way, you can keep from accidentally applying flaps as spoilers during flight, and do not need to look for center on the knob while in flight.

To use, simply turn the flap dial until the flaps are at the upmost position you desire. Now slide the flap control lever over the splines of the flap knob so that the long arm is touching the side of the radio. Now the flap knob can not be rotated counterclockwise any further, and you have the large lever available to easily deploy flaps!

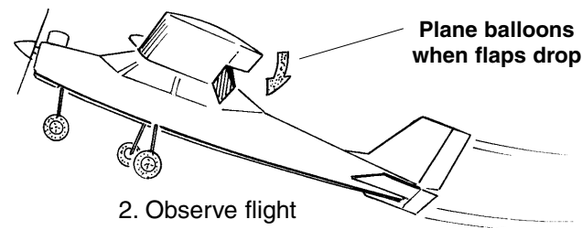
FLAP-TO-ELEVATOR MIXING

- Most models will change pitch upon deploying flaps (some will climb; others dive). Test fly the model and determine the direction and amount of elevator throw required to correct for this change.

1. Deploy flaps using the Flap knob.

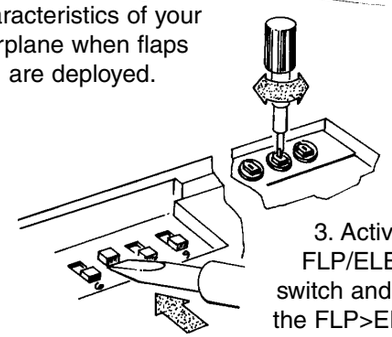


BEFORE



Plane balloons when flaps drop

2. Observe flight characteristics of your airplane when flaps are deployed.

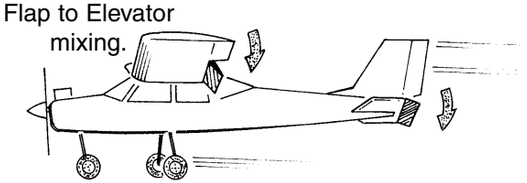


3. Activate FLP/ELE dip switch and adjust the FLP>ELE pot.

- Activate this feature with dip switch #7 and then turn it on with the mix switch. Adjust the amount as required to match the amount of elevator required in flight.

4. Level flight with Flap to Elevator mixing.

AFTER

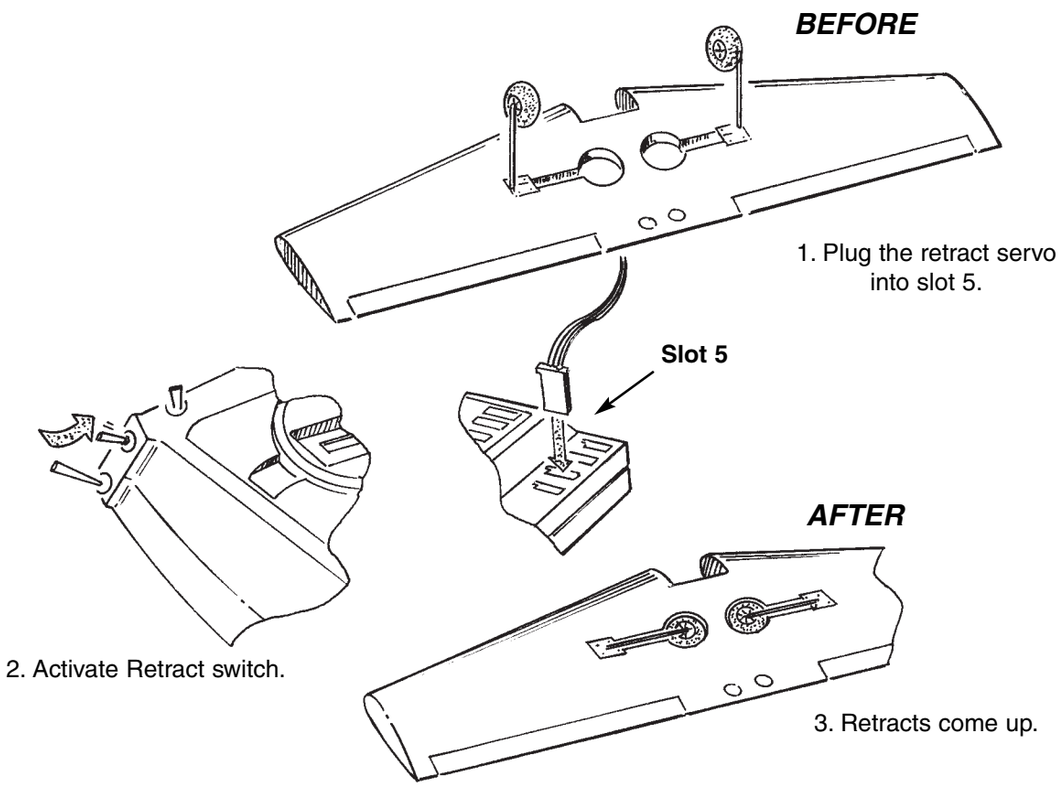


RETRACTABLE LANDING GEAR

- First, follow your model's instructions carefully for proper installation and fitting of the retract mechanisms. [**If you are using mechanical retracts**, the most secure means of operation is with a true "retract servo" such as Futaba's S136G (not included). See "Retract Servo" in the glossary on page 21.]

- The retract channel has no AST (Adjustable Servo Travel). Therefore, you MUST properly set it up mechanically to ensure "lock" on the gear and to avoid binding or buzzing of the servo.

- When everything is operating properly by hand, plug the retract servo into slot 5 on the Rx. Test the gear's movement. Reverse the servo, if required, per the instructions on page 11.

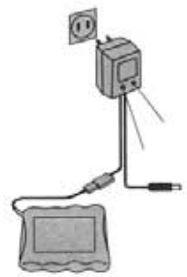


BATTERY CARE

- The transmitter includes a genuine Futaba 8-cell NiCd battery pack, NT8S, already installed. Please see page 3 regarding information on proper disposal of these batteries.

- **Do NOT attempt to use your radio prior to properly charging both your transmitter and receiver battery packs**. Using the included wall charger, plug your transmitter charge lead into the charge jack on your transmitter, and plug the receiver charge lead into the receiver pack's lead and allow the batteries to charge for 16-20 hours prior to use. (Be sure both LED charger lights are lit.)

- **Always charge your radio system overnight with the wall charger or otherwise peak the batteries prior to use**. Although the wall charger's average charge rate is approximately 50mAh, because of the resistance of the batteries it is always best to use the wall charger for at least 8 hours prior to flying. Use a loading voltmeter to check the voltage of the receiver pack between each use, charging the receiver battery to its peak voltage prior to using it any time the voltage indicator reads less than 5.0 volts for the receiver pack.



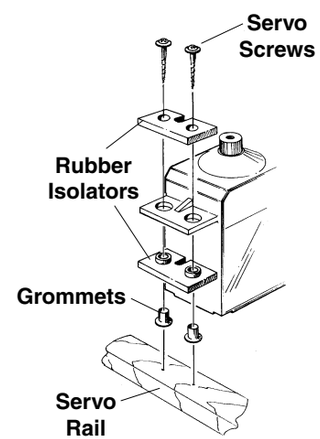
- You may use an optional 5-cell, 6-volt receiver battery pack (NR5F) with your new radio system. Note, however, that while 6 volts provides more torque and speed from the servos, it also provides a significantly shorter run time for the same capacity and may shorten the life of the servos proportionally.

  This can be confusing, so it may help to compare the current in the battery to water in a bucket. If you have four small holes in the bucket, the water will come out at a certain rate. Add a fifth hole the same size, and you're supplying more water (increasing the current and therefore making the servos stronger AND faster); however, the bucket empties 20% sooner than when it only had four holes.

- NiCd batteries discharge, or lose power, on a gradual curve. However, this curve is not a flat line; that is to say, if the pack uses 100mA in the first 10 minutes it will not continue to provide 100mA every 10 minutes until it is fully discharged. Rather, it starts out providing at a certain rate, then its output drops off in a curve which becomes very steep as the pack approaches discharge. Because of this discharge curve, it is imperative that you check battery voltage immediately prior to each use.

INSTALLING SERVOS

Assemble and mount your servos.
Note: the grommets must be installed as shown (large end against the aircraft) to provide proper isolation. A small drop of medium CA on each isolator prior to installation will secure it to the servo and ease installation.



SETTING UP YOUR RADIO GEAR

- Connector Connection:
  Insert the receiver, servo, and battery connectors fully and firmly.

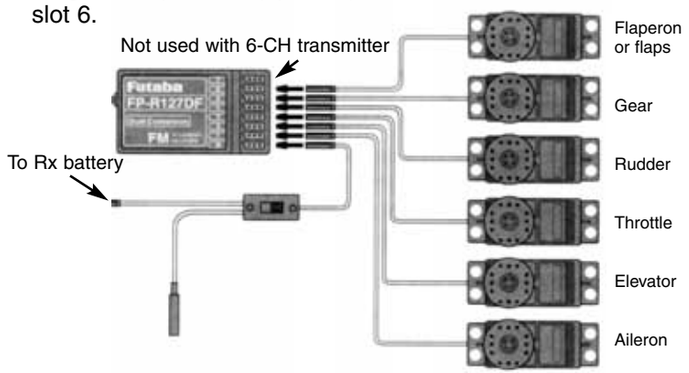
- Receiver Vibration-proofing:
  Vibration proof the receiver and battery by wrapping them in sponge rubber or similar material. If the receiver may get wet, waterproof it separately by placing it in a plastic bag or balloon. If the receiver is subjected to strong vibration and shock or gets wet, it may operate erratically and cause a crash.

- Receiver Antenna:
  Do not cut or bundle the receiver antenna. Also, do not bundle the antenna together with the servo lead wires. Cutting or bundling the receiver antenna will lower the receiver sensitivity and shorten the flight range and cause a crash. Attach the antenna to the top of the tail.

- Power Switch Installation:
  When installing a receiver power switch to the fuselage, cut a rectangular hole somewhat larger than the full stroke of the switch knob and install the switch so it moves smoothly from ON to OFF. Always install the switch so it will not come into direct contact with engine oil, dust, etc. Generally, install the switch to the fuselage on the side opposite the muffler exhaust. Plug the receiver battery into the black battery lead on the switch harness. Be sure the power switch is “OFF.” Plug the red switch harness lead into the “B” battery slot on the receiver.

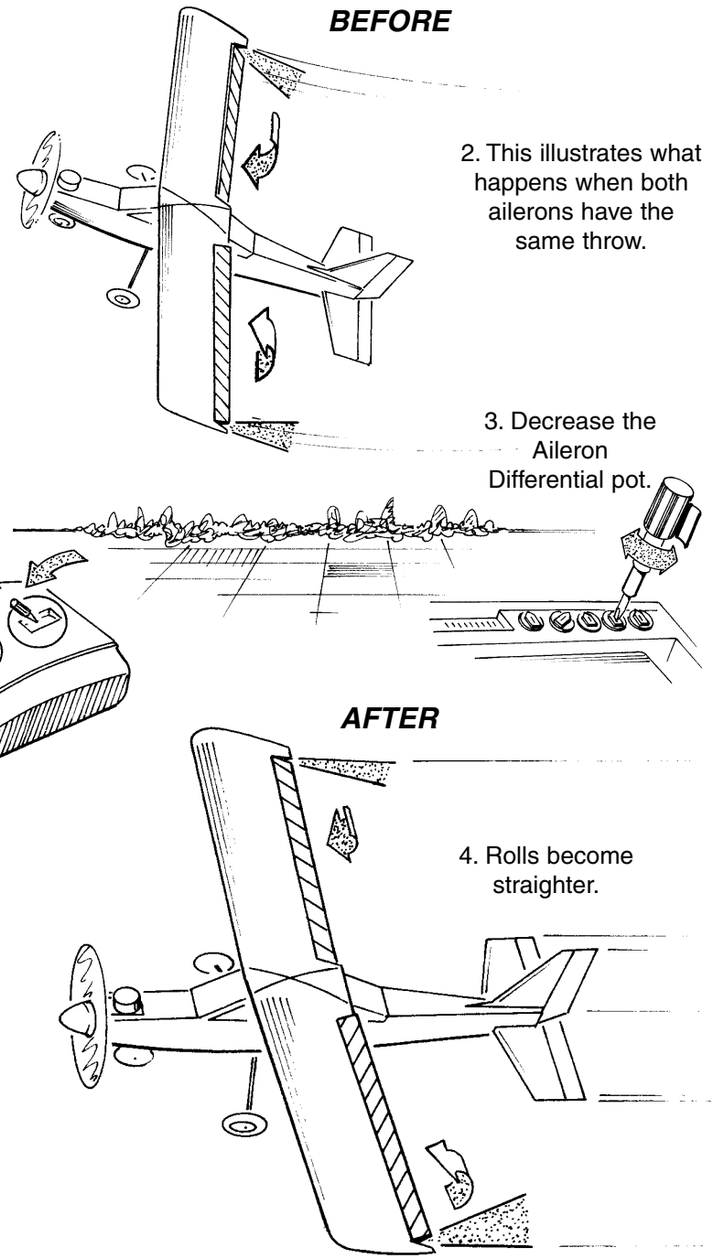
Servo Connection

- Plug the aileron servo into slot 1.
- Plug the elevator servo into slot 2.
- Plug the throttle servo into slot 3.
- Plug the rudder servo into slot 4.
- Plug the gear servo (optional) into slot 5.
- Plug the flap servo (optional) into slot 6.



AILERON DIFFERENTIAL

- For aerodynamic reasons, if a model’s two ailerons move the same amount, some models will yaw, or pull, toward the dropped aileron. For example, if the modeler gives left aileron inputs, the right aileron drops and the left aileron rises. If they move the same amount, besides rolling to the left, the model will also yaw to the right. Aileron differential decreases the amount of down travel for each aileron without affecting the up travel. By test flying and adjusting this feature, the model can be made to track straighter.



- Decrease the downward travel of the twin aileron servos by adjusting the aileron differential pot. Doing so will help your model to roll axially and not “barrel roll,” turning toward the lowered aileron, as shown in the sketch.

- If using the flaperons as flaps **AND** differential, be sure to check that you have sufficient aileron controls even when you have full flap throw. Decrease differential until safe control is available.

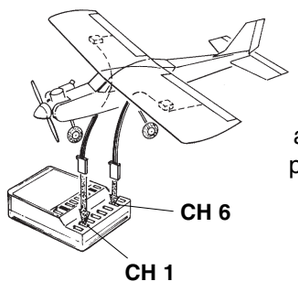
DUAL AILERON SERVOS/FLAPERONS

- Twin aileron servos are a very beneficial set up which allows the modeler more precise control and adjustment of the aileron response of the model, as well as providing “flaperons” — the movement of both aileron servos in the same direction at the same time to act as flaps.

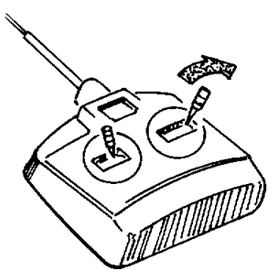
- Plug the right aileron servo into channel 1 and the left aileron servo into channel 6. Notice that moving the aileron stick moves only the right aileron servo.

- Activate the flaperon feature with dip switch #9. Note that both aileron servos now move with the aileron stick. Check the servo direction for both servos and adjust as required.

- The two aileron servos now operate in unison, creating flap action when the flap knob is turned. This feature is always active, so take care not to move this knob accidentally in flight. See page 19 for instructions on using the flap control lever.

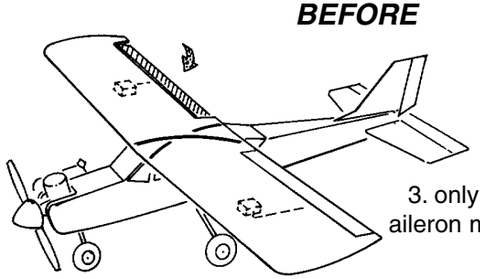


1. Plug each aileron into the proper channel.



2. Deflect aileron stick.

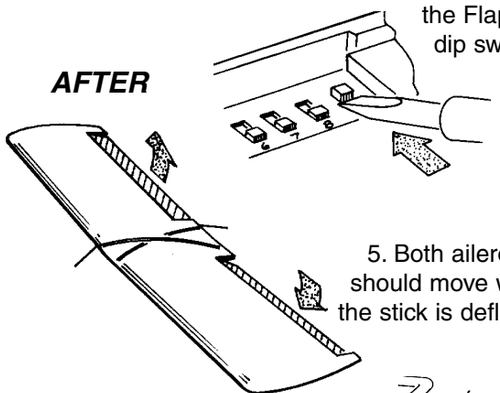
BEFORE



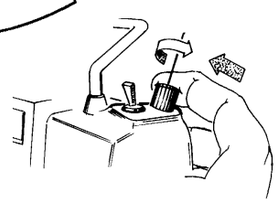
3. only one aileron moves.

4. Activate the Flaperon dip switch.

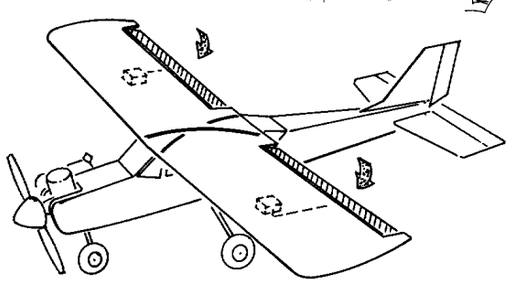
AFTER



5. Both ailerons should move when the stick is deflected.



6. Move flap knob when flap is desired.



7. When the flap knob is moved, both ailerons move down.

- This radio **cannot** support two aileron servos on separate receiver channels AND a separate flap servo at the same time. If your model requires both twin aileron servos and flaps, you must use a y-harness to drive the two aileron servos. Also note that this radio **cannot** support a flaperon-to-elevator mix. If you have flaperons active, the flap-to-elevator pot sets up aileron differential, not a mix.

USING THE FREQUENCY BOARD

1. Stick the band number seal to the frequency board.

2. Install the frequency board to the antenna.

3. Pass the frequency board over the small part of the antenna and slide it to the large part.

4. Cut off the unused side along the slot with cutters, etc.

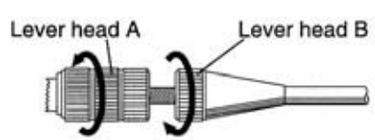
NON-SLIP ADJUSTABLE STICK LEVER

The length of the stick can be adjusted.

1. Unlock, the two heads, A and B, by turning them in the arrow directions.

2. Adjust the stick to the most comfortable length.

3. Lock the heads by turning them in the opposite direction of the arrows.



TRANSMITTER OPERATION & SERVO MOVEMENT

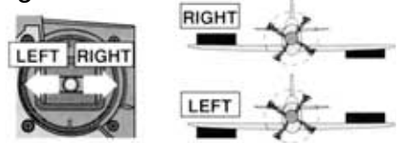
Turning on the power:	Turning off the power:
Set the transmitter (Tx) throttle stick to idle.	Stop the engine.
1. Turn “On” the transmitter (Tx) power switch.	1. Turn “Off” the receiver (Rx) power switch.
2. Turn “On” the receiver (Rx) power switch.	2. Turn “Off” the transmitter (Tx) power switch.

- **Safety Tip**: Remember to **ALWAYS** turn on the transmitter first, then the receiver, to be sure you never lose control of the model. Likewise, **ALWAYS** turn off the receiver first, then the transmitter. If the Tx power switch is turned off first, the engine may go to full throttle unexpectedly and cause an injury.

Aileron Operation

When the aileron stick is moved to the right, the right aileron is raised and the left aileron is lowered, relative to the direction of flight, and the plane rotates right. When the aileron stick is moved left, the ailerons move in the opposite direction. If the plane has rolled, the aileron stick must be moved in the opposite direction to correct.

Right Stick

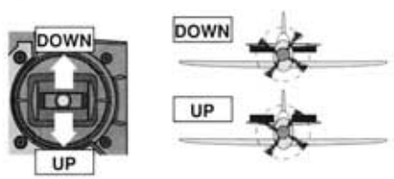


This controls the roll of the airplane.

Elevator Operation

When the elevator stick is pulled back, the elevator is raised, the tail of the plane is forced down and the plane climbs (UP operation). When the elevator stick is pushed forward, the elevator is lowered, the tail of the plane is forced up and the plane dives (DOWN operation).

Right Stick



This controls the pitch of the airplane.

Throttle Operation

When the throttle stick is pulled back (low throttle), the engine throttle lever arm moves to the SLOW (idle) side. When the throttle stick is pushed forward (full throttle), the throttle lever arm moves to the HIGH (high speed) side.

Left Stick

Full Throttle: carburetor fully opened

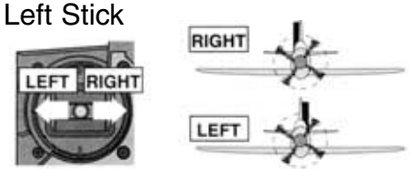
Low Throttle: carburetor at idle position(not fully closed)

This controls the speed of the airplane.

Rudder Operation

When the rudder stick is moved to the right, the rudder moves to the right and the nose moves to the right, relative to the direction of flight. When the rudder stick is moved to the left, the rudder moves to the left and the nose moves to the left.

Left Stick



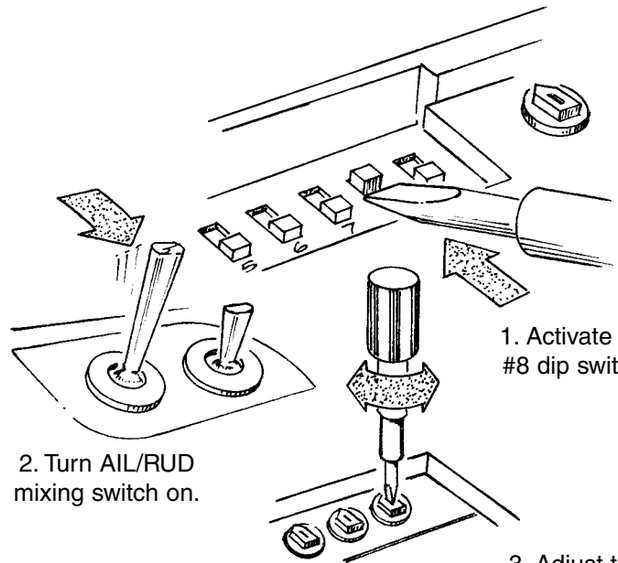
This controls the yaw of the airplane.

AILERON-TO-RUDDER MIXING

- When a model is rolled, it loses some lift and so the model slides nose down in the turn. An aileron-to-rudder mix gives opposite rudder, keeping the nose up and the turn level. This is called a "coordinated turn."

- To set up aileron-to-rudder mixing, first activate the function with dip switch #8, then turn it on with the mix switch. Next adjust the pot to set the desired amount of rudder response.

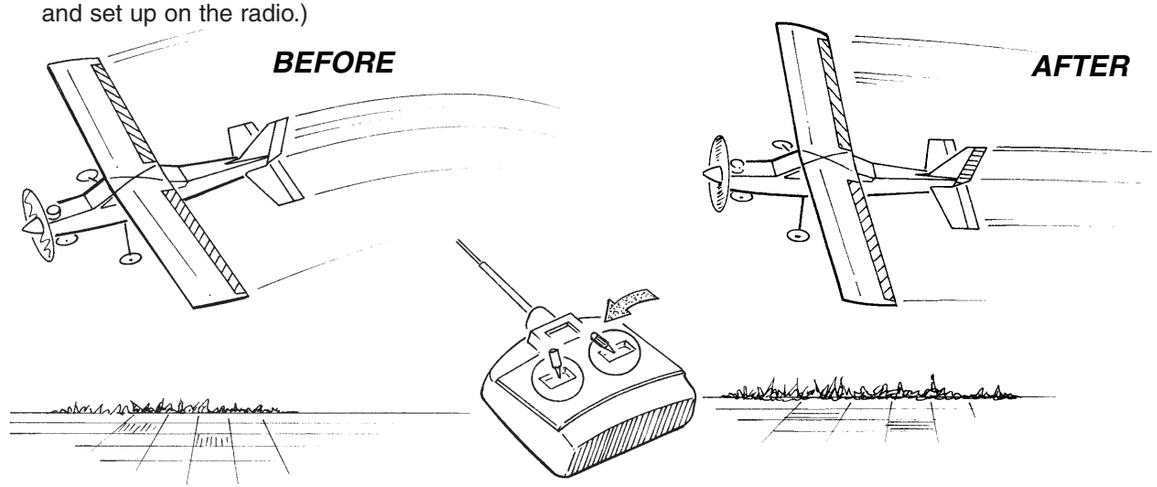
- This mix is turned on and off by a switch, allowing you to safely experiment with this feature in flight. Each model will require a different amount of mix to perform up to its potential, so start with a small amount and adjust accordingly to suit your needs. (If you are still flying under the guidance of an instructor, be sure the instructor knows this feature is available and set up on the radio.)



1. Activate the #8 dip switch.

2. Turn AIL/RUD mixing switch on.

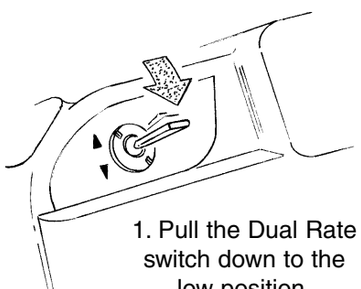
3. Adjust the AIL/RUD pot.



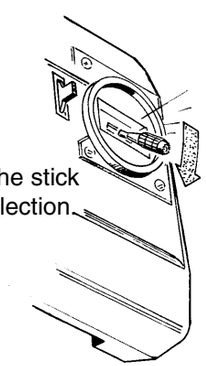
ELEVATOR AND AILERON DUAL RATES

- A "dual rate," or second, lower rate, on the model's ailerons or elevators can make the model easier to handle at higher speeds, while keeping plenty of responsiveness available on the high rate when flying at slow speeds such as landing.

- Check the model's instructions, and determine if the manufacturer has provided desired low rate settings for aileron and elevator. Pull the elevator rate switch to the down position and adjust the elevator dual rate pot to reach this desired throw. Repeat for aileron.

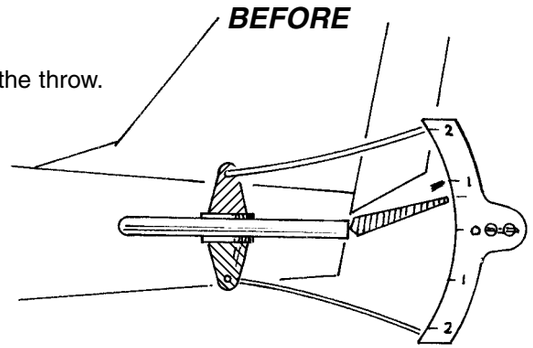


1. Pull the Dual Rate switch down to the low position.

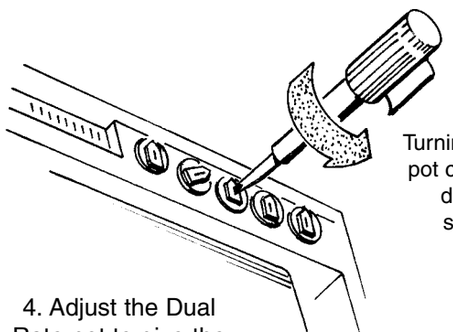


2. Move the stick to full deflection.

3. Check the throw.

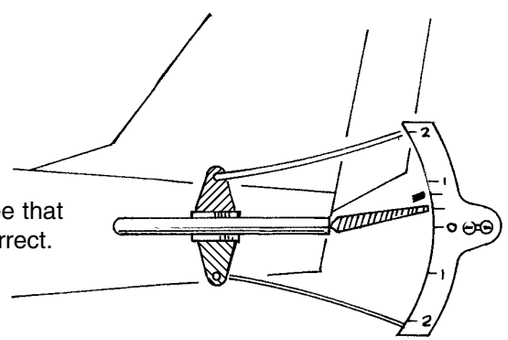


Low Rate same as High Rate



Turning the Dual Rate pot counterclockwise decreases the servo's travel.

4. Adjust the Dual Rate pot to give the correct throw.



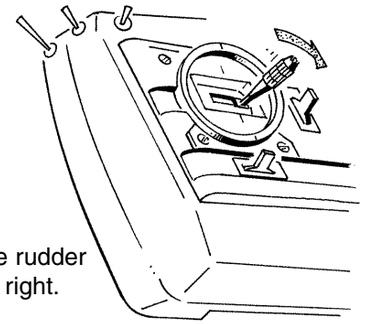
5. Check to see that the rate is correct.

Correct Low Rate Throw

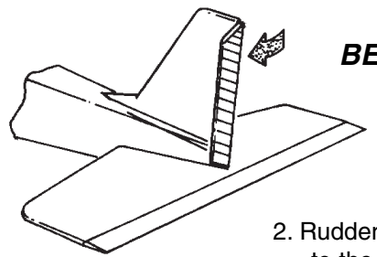
SERVO REVERSING

- Servo Reversing is a feature that allows you to correct the direction a servo travels without mechanically changing the linkage in your model. You simply flip a dip switch on your Flight Set Adjustment Control Center and the polarity of the servo control reverses.

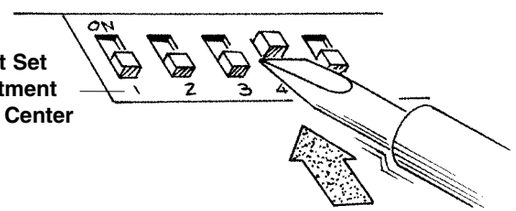
- Check the direction of all servo operation and reverse any servo as needed. For example, if the rudder moves left when right rudder command is given, then move the servo reversing switch for channel 4 from NOR to REV. Check that the rudder now operates properly.



1. Move rudder stick right.

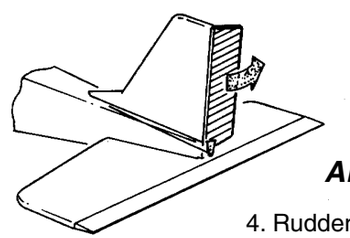


2. Rudder moves to the left.



Flight Set Adjustment Control Center

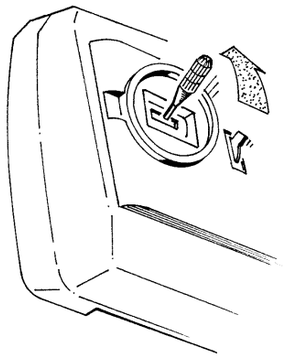
3. Move the servo reverse dip switch.



4. Rudder moves to the right.

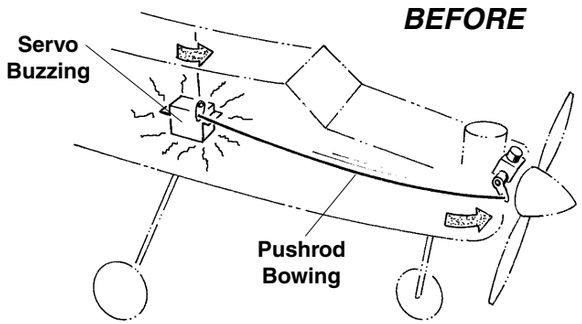
THROTTLE END POINT ADJUSTMENTS (EPA)

- Move the throttle stick to full throttle. Does the barrel of the engine's carburetor open completely? Does it open completely before the servo has moved its full distance, so the servo is pushing against the barrel at full throttle causing the servo to "buzz" or the pushrod to flex? Always correct the throw as closely as possible by adjusting the linkage. Then use the Throttle High EPA pot to fine-tune the full throttle setting.

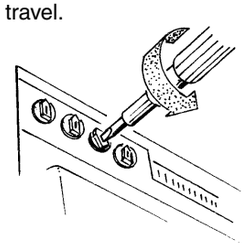


1. Move the throttle stick to full up.

BEFORE

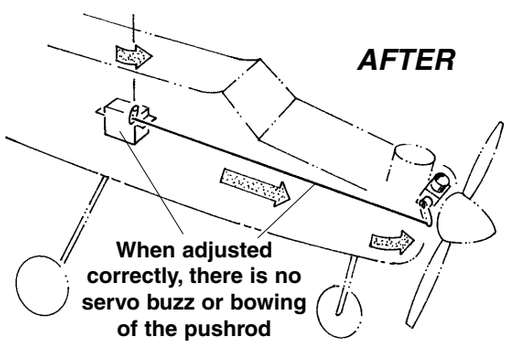


Turning the Throttle High EPA pot counterclockwise decreases the throttle servo travel.



2. Adjust the servo's end point.

AFTER

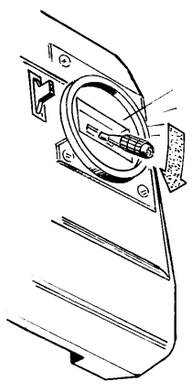


- Now close the throttle completely, including pulling the throttle trim closed. Does the barrel just close completely on your engine as the trim hits bottom? If not, adjust the Throttle Low EPA pot until it does, so the engine can be shut off safely from the radio.

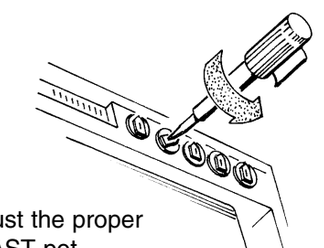
ADJUSTABLE SERVO TRAVEL (AST)

- Read your model's instructions to determine the proper distance each control surface should move. This is called "throw." If the model's instructions specify a "High" and "Low" rate, use the High rate here. With the dual rate switches in the "off" positions, move each control its full distance and measure the throw. Note that it is very common for your initial installation/set up to provide you more or less movement of the control surface than is desirable to fly the aircraft.
- Always adjust the throw as closely as possible first by moving the clevises in or out on the model's control horns and servo arms. (Using AST settings below 80% will significantly affect the precision of the servos' response to your commands.) If needed, adjust the AST pots for each surface until the proper throw is set.

1. Move the stick to full deflection.

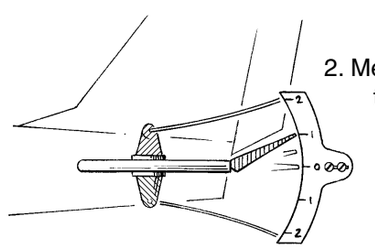


Turning the AST pot counterclockwise decreases the servo's travel at full stick deflection.



3. Adjust the proper AST pot.

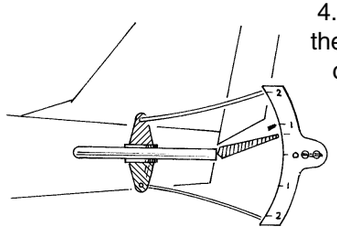
BEFORE



2. Measure the throw.

Too Much Throw

AFTER



4. Confirm the throw is correct.

Correct Throw