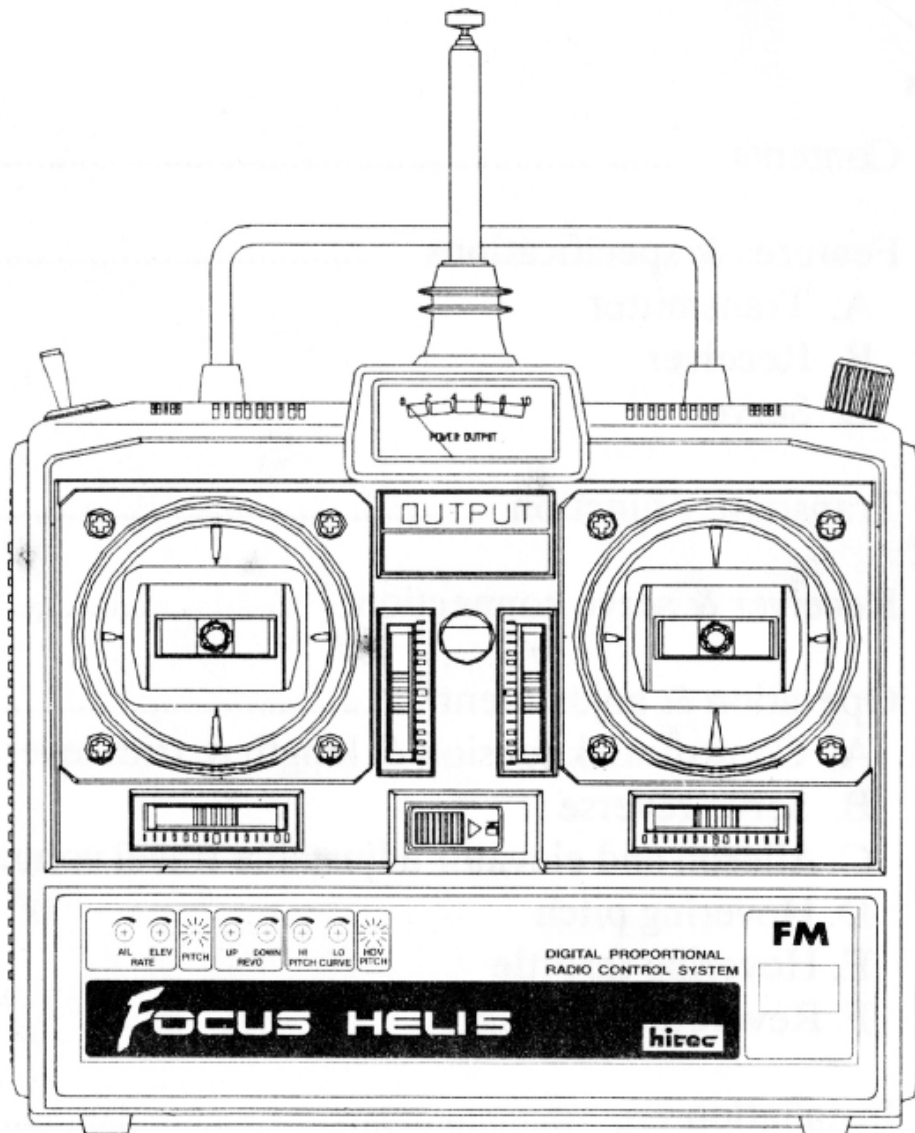


FOCUS HELI 5

5 CHANNEL F.M. SYSTEM HELICOPTER

OPERATIONAL MANUAL



The Hitec Focus digital proportional radio control system is a highly sophisticated system that features modern solid state circuit design and components of unsurpassed reliability. The time you spend learning about your Focus from this manual will ensure that you will enjoy many years of dependable control.

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2. Features & specifications

A. Transmitter

- 5 channel P.P.M/F.M. transmitter
- AMA listed 1991 F.M. system and RCMA gold stickered transmitters
- High Quality precision gimbal stick with adjustable length & tension
- Accurate smooth-operating electronic control sticks
- All channel servo reversing
- ATV for aileron, elevator
- Channel 5 for gear switch
- Hovering pitch control
- Hovering throttle control
- Pitch curve high/low rate control
- Revolution up/down rate control

Operating system	: 2 stick system
Module change system	:Internal module system
Power supply	:9.6V (8 Ni-Cad batteries)
Current drain	:150mA (13.5) -130mA (10.8)

B. Receiver (Ultra series)

- X-TAL interchangeable
- Ultra narrow band width for maximum adjacent channel rejection
- Minimized 2nd & 3rd order intermodulation
- Metallic noise proof

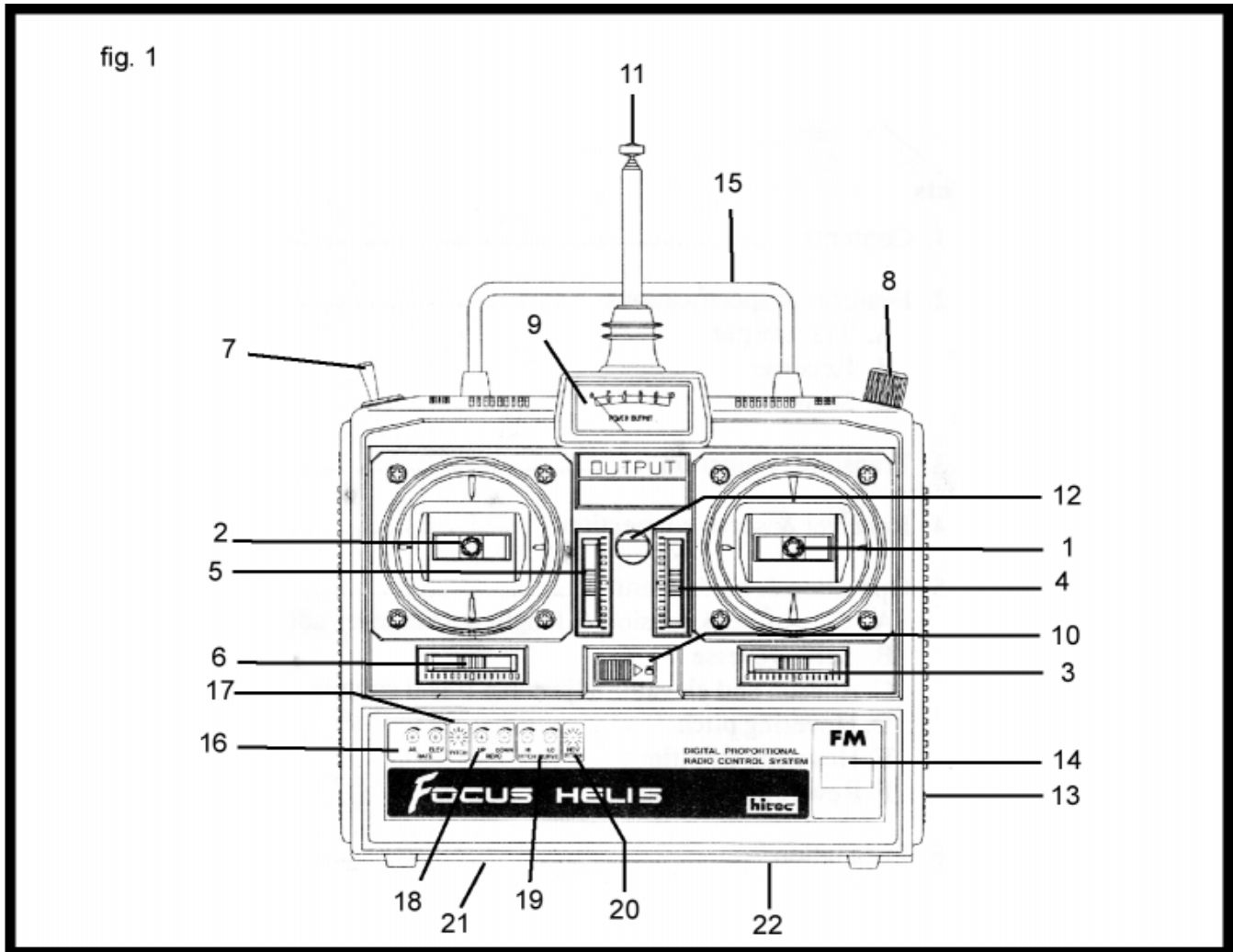
Intermediate frequency	:455KHz, 10.7MHz
Power supply	:4.8V (4 Ni-Cad battery) AA size
Current drain	:22mA
Dimensions	:37x61x22mm (1.5"x2.4"x0.9")
Receiving range	:3000 ft or greater in the air
Working voltage	:3.7 - 7.0V

C. Servo

- Top oilite bearing prevents wearing out of the top plastic case
- Indirect drive for gear train protection
- Hitec custom designed I.C. with narrow dead band & high trackability
- SMT (Surface Mount Technology) circuitry adopted

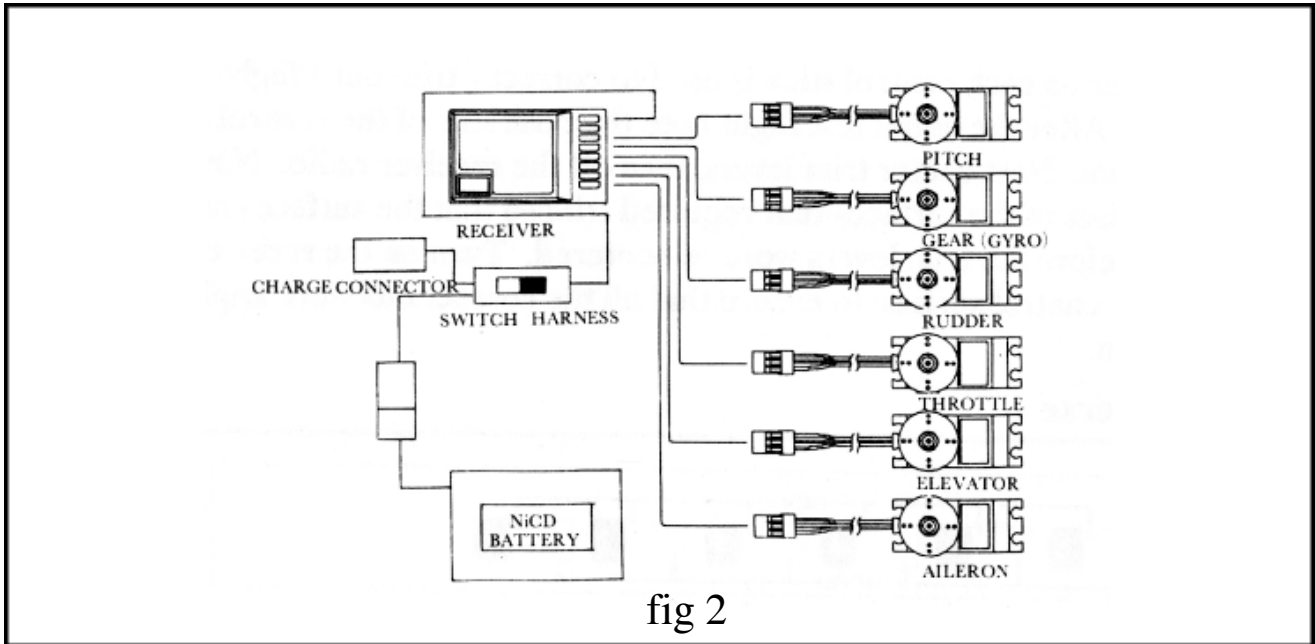
Control system	:+ pulse width control (1550 uS/N)
Operating angle	:One side 45deg or more (including trim)
Power supply	:4.8V (4 Ni-Cad) or 6V (4 Alkaline battery) AA size
Current drain	:8mA at 6.0V (stopped)
Output torque	:3.0kg/cm (41 oz/in)
Operating speed	:0.21 sec/60deg
Dimensions	:41x20x36mm (1.6"x0.8"x1.4")
Weight	1.51oz (43g)

3. Transmitter function



- | | | | |
|----|--|----|---|
| 1 | Aileron/Elevator stick in MODE II | 4 | Crystal |
| 2 | Throttle/Rudder stick in MODE II | 5 | Handle |
| 3 | Aileron trim | 6 | Aileron & elevator adjustable travel volume (A.T.V.) |
| 4 | Elevator trim | 7 | Pitch trim |
| 5 | Throttle trim | 8 | Revolution up/down rate control |
| 6 | Rudder trim | 9 | Pitch curve high/low rate control |
| 7 | Landing gear switch (5CH) | 10 | Hovering pitch trim |
| 8 | Hovering throttle trim (MODE II) | 11 | Servo reversing switches |
| 9 | Level meter | 12 | (note: leaving the reverse switches in the middle will cause the radio to act erratically). |
| 10 | Power switch | 13 | Ni-Cad battery (back panel) |
| 11 | Rod antenna | | |
| 12 | Neck-strap connector | | |
| 13 | Recharge jack | | |
| 14 | “Power switch should be off when charging” | | |

4. Receiver & servo connections



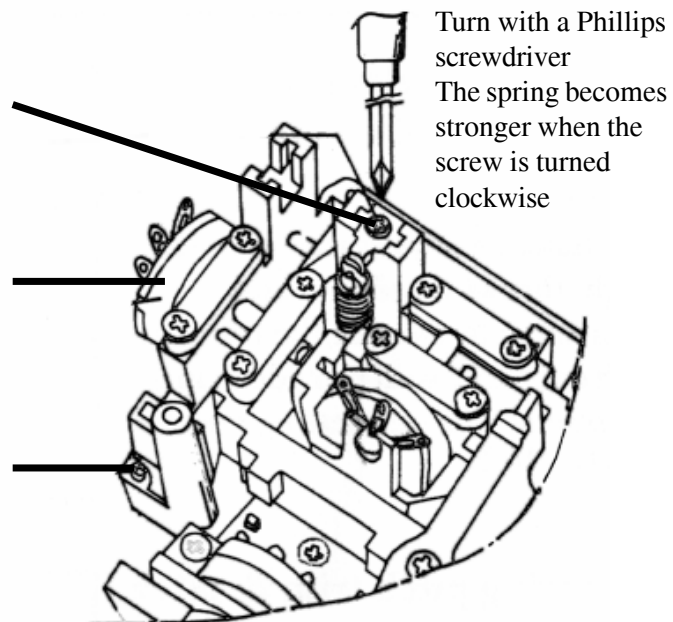
5. Operation & adjustment

A. Control stick length & tension & trim lever adjustment

The unique open-stick assembly provides fully adjustable stick tension “feel”. Turning the tension adjustment screw counter clockwise will soften (decrease the tension) the feel of the Control stick (fig 3)

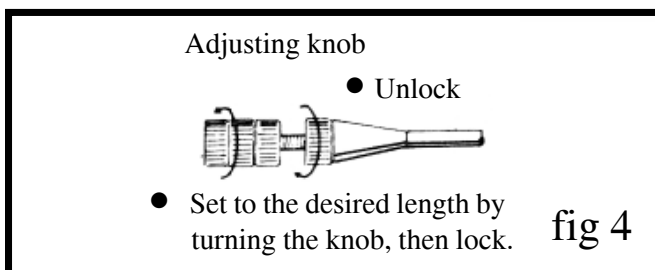
CP- variable resistors improve the neutral characteristics and resolution of the servo positioning.

All of the molded parts are fabricated from high-grade polycarbonate that is unaffected by temperature and humidity.



Remove the transmitter rear cover and open the P.C. Board.

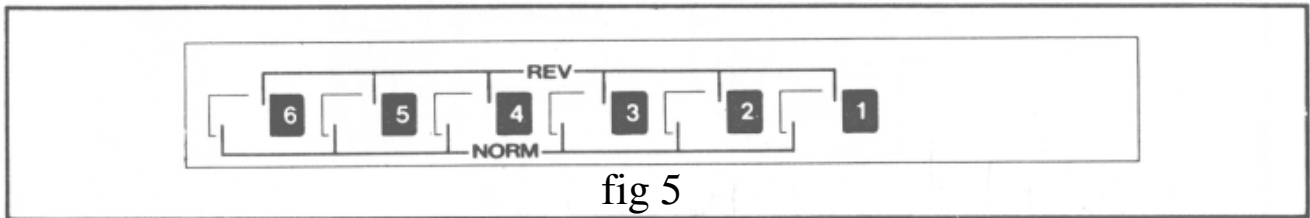
fig 3



The length of the nonslip control sticks can be adjusted to suit the requirements of the operator. (fig 4)

The trim lever on each control stick is used to correct (trim out) flight characteristics. After the initial test flight note the positions of the control surfaces that required trim. Next center trim levers, turn off the receiver radio. Now adjust the control clevises of the surfaces that required trim so that the surfaces are in the same position before the trim levers were re-centered. Turn on the receiver radio and recheck the control surface to ensure that all the corrections were applied in the correct direction.

B. Servo reverse

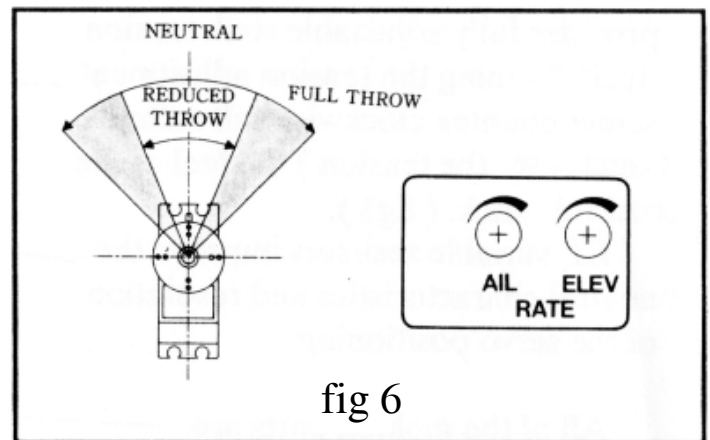


The Focus Heli-5 F.M. transmitter is equipped with servo reversing on all 6 channels (including Pitch servo).

(Note: Leaving the reverse switch in the middle will cause the radio to work erratically so please make sure that the switches are all pushed to the furthest end.)

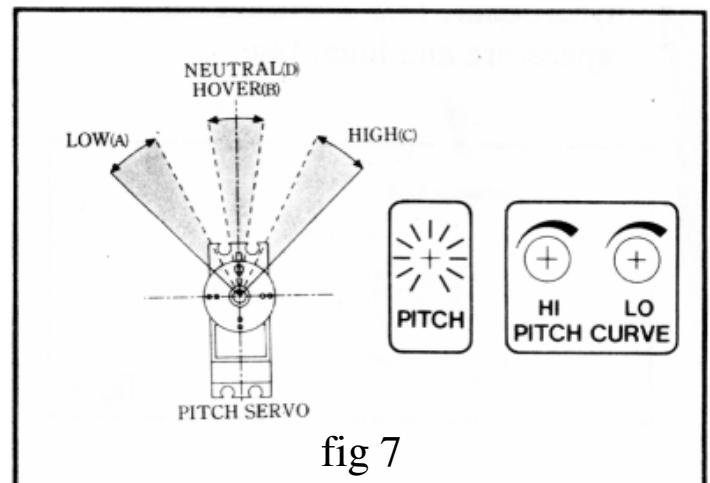
C. Aileron and elevator adjustable travel volume (A.T.V.)

This function adjusts the servo left and right throws on aileron and elevator servo by twisting the trimmer in the front panel with the provided small screwdriver. The rate setting range is 30% to 110%



D. Hovering pitch trim & pitch trim & pitch curve high & low

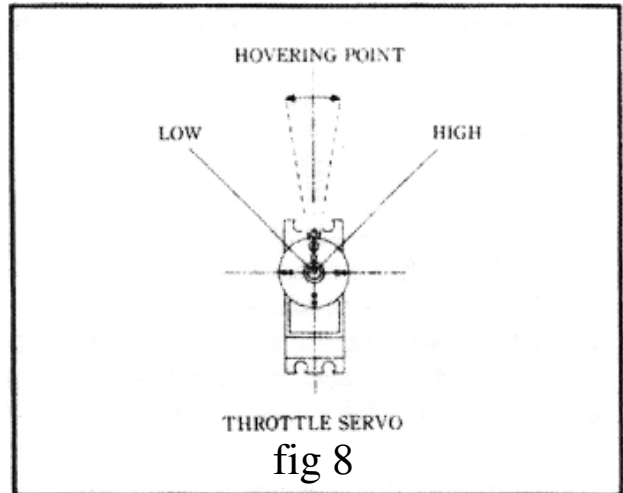
The Focus Heli-5 transmitter provides adjustment of pitch trim & high & low collective points.



- a. Low travel end point of pitch servo: Adjusted by “PITCH LOW TRIMMER”.
- b. High travel end point of pitch servo: Adjusted by “PITCH HIGH TRIMMER”.
- c. Hovering point of pitch servo: Adjusted by “HOVERING PITCH TRIMMER”.
- d. Neutral point of pitch servo: Adjusted by “PITCH TRIM”.

E. Hovering throttle

The Focus heli-5 transmitter has a hovering throttle function designed to adjust the hovering point of the engine speed. It is operated by “HOVERING THROTTLE TRIM KNOB” on the top of the transmitter. This function controls the “HOVERING POINT” of the throttle servo as below.



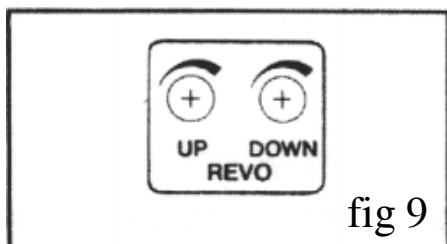
F. Revolution mixing

Revolution of main rotor generates a reverse torque which causes the helicopter to rotate in the opposite direction of the main rotor rotation. To compensate for this torque, a certain amount of opposite rudder control must be applied according to the power and pitch of the main rotor. The Focus Heli-5 performs this function automatically which is “REVOLUTION MIXING”.

To adjust the Rev-mixing you must first get the heli into a stable hover. Advance the throttle and note if the nose of the heli turns left or right. By increasing or decreasing the “Up mix” you will be able to add power without the nose turning. The “Down mix” will be adjusted in the same way only from a high hover and will be done by reducing power.

There are two trimmer settings, “UP” for ascending and “DOWN” for descending flight. “UP” trimmer adjusts the amount of revolution mixing when the throttle stick is in the high position and “DOWN” trimmer adjusts the amount of revolution mixing when the throttle stick is in low position.

(Note) The amount of “Revolution mixing” is related on “Pitch Curve High & Low” setting.



6. Installation

- Connect the servos, batteries and switch harness in accordance with fig 2. Carefully check to ensure that all connectors are properly seated.
- Turn the power switches “ON” and operate the transmitter. Observe the direction of travel of the control surfaces to see if they correspond to the control stick movement. Improper servo direction is corrected with the servo reverse switches (fig 5).
- Operate each servo over its entire range and check for binding of the push rods. Correct as necessary. Hold each control stick at its extreme position and listen for servo hum. The hum indicates that the control linkage is too tight for the amount of servo travel. This is corrected with the end point adjustment or by lengthening the push rods.
- Applying unreasonable force to a servo output arm will adversely affect the servo and quickly drain the flight batteries. Therefore, all control linkages should operate as smoothly and as frictionless as possible. Use Hitec “Jam Check’r” to assure smooth, safe control setups.
- When installing the switch, cut a rectangular somewhat larger than the full stroke of the switch, then install the switch so it moves smoothly from ON to OFF.
- The length of the receiver antenna is critical to the reception of signals transmitted, therefore DO NOT cut or bundle the antenna wire, make every effort to keep the antenna wire fully extended. Keep receiver antenna away from power & servo wires. Keep off the metal frames.
- Protect the receiver from excessive vibration by wrapping it in sponge rubber (note: Use Hitec “Flight Preserver: #58480”). Next place the receiver in a plastic bag. Secure the plastic bag with rubber bands to keep out moisture and dust.
- Collapse the transmitter antenna fully and operate the system from a distance of 60 to 90 feet. The system should function flawlessly. If it does not, check to see that the receiver and transmitter batteries are at maximum capacity.

7. Charging Instruction

- Before first use of Focus Heli-5 F.M. system, connect appropriate charge connectors from charger to transmitter and receiver switch harness with battery connected.
- With transmitter and receiver switched OFF, plug charger into AC plug and be sure the RED & GREEN charge lights are ON. If either charger light is OFF, recheck connections to charger and be sure switches on transmitter and receiver are OFF.
- Charge for 24 hours first before further use of system. This conditions the batteries for full-charge capacity.
- Re-charge 16-20 hours immediately before flying day.
- In normal use (with Hitec Gyro) aircraft battery should provide 20-30 minutes of safe operation. Transmitter battery will operate for one hour or as indicated by battery voltage meter.

