Introduction

Thank you for purchasing the Hitec Laser digital proportional radio control system. The Laser is loaded with features, easy to use and utilizes the latest in solid-state components for unsurpassed reliability and performance. It is important that you read and understand this manual before you attempt to operate your system.

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System Specifications

1. Transmitter

A. Features

- Ergonomically designed 4 or 6 channel FM transmitter.
- High quality precision gimbals with adjustable stick length and tension.
- Servo reversing on all channels.
- ATV (Adjustable Travel Volume) CH 1 and CH 2.
- V-tail and Elevon mixing.
- Trainer system. (Hitec/Futaba compatible)
- Premium 9.6v 600mah Nicad rechargeable battery pack.
- Neck strap attachment.
- Carrying handle.
- Easy to read LED battery indicators. (***Laser 4***)
- Transmitter battery voltage meter. (***Laser 6***)
- EPA (End Point Adjustment) CH 3. (***Laser 6)***
- Dual rates on CH 1 Ailerons and CH 2 Elevator (***Laser 6***)

B. Layout

- **(Show drawing and point to features)**

C. Specifications

- Power supply: 9.6V (8 cell) Nicad battery
- Current drain: 150mA
- Output power: 500mw
- Modulation: PPM (FM)

D. Servo Reversing

- The Laser 4/6 FM transmitter is equipped with servo reversing on all channels.
- Leaving the 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.

(Show Illustration of switches)

E. Adjustable Travel Volume (A.T.V.)

- CH 1 & CH 2 only.
- This function adjusts the servos overall travel on CH 1 and CH 2.
- The rate setting is adjustable from 30% to 110%.

(Show Illustration of pots)

F. Mixing

- The Laser series transmitters are equipped with a switch that will mix ch.2 & ch.4 for V-tail vehicle or ch.1 and ch.2 for Elevon.

(Show illustration of the switch and the nice illustration used in the Eclipse manual on pages 25 for v-tail and pg. 24 elevon function)

G. Control Stick Adjustment

- The length of the non-slip control sticks can be adjusted to suit the requirements of the user.

(Show Illustration of stick like on pg. 6 of the Eclipse manual)

H. Gimble Tension Adjustment

- The unique open-stick assembly provides fully adjustable stick tension to adjust the "feel" of the sticks in your hands.

- 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's rear cover into position, and put them in a safe place. Gently ease off the transmitter's 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 in the illustration. Using a small Phillips 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.

(Show Illustration)

I. Trim Levers

- The trim levers associated with each control stick are used to correct or (trim-out) the tracking of the vehicle.
- (Caution) Make sure the trims will move the surface past neutral when moved to their extremes. This will assure you have adequate trim control.
- After your vehicles first test run, note the positions of the control surfaces that required trim. Next, center the trims and turn the receiver off. Now adjust the control linkage on the vehicle so the surfaces are in the same position before the trim levers were re-centered.
- Turn on the radio and receiver and recheck the control surfaces to ensure that all the corrections were applied in the proper direction.

J. Dual Rates ***Available on Laser 6 only***

- The Laser 6 offers the user a choice of 2 rates on CH 1 and CH 2. Dual rates are used to lessen and increase the servo "throw" or movement of the control surface . For example a vehicle traveling very fast will require small servo or stick movements and should be driven on "low rates". While the same vehicle, driven slower might require more servo throw and could be driven on higher rates.

Adjusting for Aileron Dual Rates

- With the dual rate switch in the high position, you will have full, or 100% throw. When adjusting for a lower rate, move the CH. 1 dual rate switch down to the lower position. Fully deflect the control surface with the transmitter stick to the left or right and hold it there. Then adjust the "pot" located on the lower left corner of the transmitter case with a small Phillips head screwdriver. You will see the control surface move when you turn the pot, adjust it accordingly. Repeat this process to adjust the CH. 2 dual rate setting.

K. Landing Gear Switch ***Available on Laser 6 only***

- The landing gear switch will operate a servo in the CH 5 slot of the receiver. This is typically used for air or mechanically operated landing gear, it is not proportional.

L. End Point Adjustment (E.P.A) ***Available on Laser 6 only***

- CH 3. (Throttle)
- This function allows for individual adjustment of the high and low throttle servo end points. Adjust the pots on the face of the radio with a small Phillips screwdriver to position the throttle servo so it does not bind or "buzz" when at high or low stick.

2. Receiver

Most Laser systems will be sold with the Hitec Supreme 8 channel dual conversion receiver, these are the specifications of the Supreme receiver.

A. Features

- Dual conversion
- Narrow Band
- Crystal Interchangeable

B. Layout

(Show picture)

- Channel #1: (If vehicle does not have ailerons)
- Channel #2: Elevator
- Channel #3: Throttle or Electronic speed controller
- Channel #4: Rudder (If vehicle has ailerons)
- Channel #5: Gear **(Laser 6 only)**
- Channel #6: Flaps **(Laser 6 only)**
- Channel #7: Not used
- Channel #8/Batt: Battery or switch harness

C. Specifications

- Power supply: 4.8 – 6 volts
- Current drain: 22mA
- Dimensions: 2.3”x 1.4”x 0.8”
- Weight: 1.34 oz (34 grams)
- Range: Line of sight to 3,500 ft.
- Operating voltage: 3.7 – 7.0 volts

D. Installation

- Always wrap receiver in the supplied protective foam padding.
- Do not coil the antenna.
- When turning on the system always turn the transmitter on first and off last.
- See vehicle manufacturers instructions for proper radio system location.

3. Servos

Your Laser 4 system will contain the HS-300 standard servo while the Laser 6 systems will have the HS-422 servo.

A. Features

- Indirect drive
- Custom IC
- SMT (Surface Mount Technology) construction
- Precision gear train

B. Layout

- (Show illustration)
- Black wire: Negative
- Red wire: Positive
- Yellow wire: Signal

C. Specifications:

- Control system: + Pulse width control (1550uS/N)
- Operation angle: 45 degree (one side) 90 degree total throw
- Power Supply: 4.8V – 6.0V
- Current drain: 8mA (Idle)

HS-300 Specifications

- Output torque: 42 in/oz (4.8V) 49 in/oz (6V)
- Operating speed: .19sec/60deg. (4.8V) .16sec (6V)
- Dimensions: 1.6”x 0.8”x 1.4”
- Weight: 1.6oz (47grams)

HS-422 Specifications

- Output torque: 43in/oz (4.8V) 52 in/oz (6V)
- Operating speed: .20sec/60deg. (4.8V) .17sec (6V)
- Dimensions: 1.6”x 0.8”x 1.4”
- Weight: 1.7oz (49grams)

D. Installation

(Show illustration)

- Connect the servos, battery and switch harness.
- See vehicle manufacturers instructions for proper servo installation positions within your specific vehicle.

4. Charging Specifications

A. Transmitter/Receiver battery

- The initial charge on your system should be at least 24 hours to insure a full charge.
- Subsequent charges should be at least 12 - 20 hour.
- It is best to put your system (TX and RX) on charge the night before you plan to use it.
- To charge your batteries first make sure your transmitter and receiver are off; then connect the wall chargers outputs to the charging jack on the transmitter and the charge receptacle on the switch harness or directly to the battery. Make sure the green (TX) and red (RX) lights come on. If it does not, check for proper connection and/or power to the outlet.
- Be careful not to leave your transmitter or receiver battery on charge for more than 24 hours to prevent any damage to the battery or charger.
- Always charge your system before you go out to fly.

5. Operation

A. Trainer system

- The Laser 4/6 is equipped with a training system that allows for master, student control
- Use trainer cord, part# 58301
- When setting up the training system, make sure the student radio is set up properly so the trims and servo reversing are the same as the master.
- To activate the trainer system and transfer control to the student pull and hold the trainer switch located on the top let of the transmitter. Releasing the switch to restore immediate control back to the master.

B. Range checking

- Always perform a range check before each operation.
- Range checks are performed by walking away from the vehicle with the transmitter antenna collapsed.
- You should have complete control from a distance of 60’– 90’.
- If the controls are erratic before the minimum distance is reached, do not drive until the problem is resolved.

6. Replacement Parts & Accessories

The following is a listing of replacement parts and accessories available for the Laser radio series from your hobby dealer.

- TX Battery (#58207)
- RX Battery 600mah (#57401)
- Overnight Charger (#43025)
- Neck strap (#58311)
- Trainer cord (#58310)
- Switch harness (#57215S)
- Stick extensions (#56381)
- Flight Preserver (#58480)

7. Product Warranty and Service Information

All Hitec product is warranted for two years from the date of purchase against manufacturers defects. In the event of component failure send the parts to:

Hitec Service Department
12115 Paine St.
Poway, CA 92064

Please include your name address and telephone number along with a brief description of the failure or the work that you are requesting be done.

8. Precautions

- Always turn your transmitter on first and off last.
- Never operate your system without first performing a proper range check.
- Never change the crystal in your transmitter. For channel changes send your system to an authorized service/repair center.
- It's a good idea to check your receiver batteries with a tester like the Hitec Power Mate II (part# 44110) This will verify the charge level in your receiver batteries.
- Make sure your frequency is clear before turning on your system.