



TOWER HOBBIES®

SYSTEM 2.4

224 2.4GHz 2-Channel
SPREAD SPECTRUM RADIO

INSTRUCTION MANUAL

Thank you for making the Tower Hobbies 2.4GHz system your choice for radio control! This system uses modern 2.4GHz Spread Spectrum technology – an innovation that allows for automatic channel selection and interference-free control of R/C models.



It is strongly recommended to completely read this manual before use! Damage resulting from misuse or modification will void your warranty.



FEATURES

- 2.4GHz Spread Spectrum Technology
- Transmitter can bind to multiple receivers
- Tiny, lightweight receiver with internal antenna
- Built-in fail-safe
- Steering and throttle trim dials
- Steering and throttle servo reversing
- Steering rate adjustment
- Power LED with low battery warning indication



TRANSMITTER

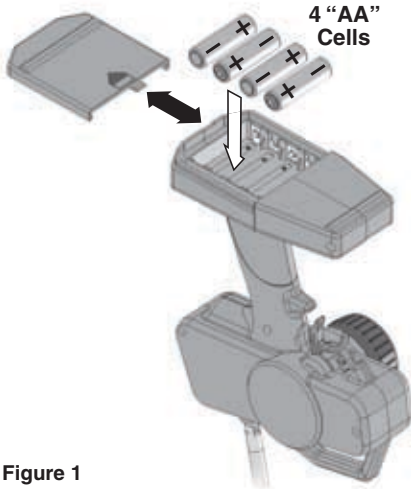


Figure 1

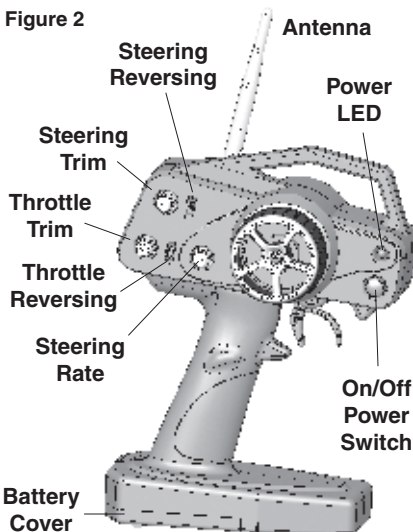
The transmitter (Tx) requires 4 “AA” batteries. Non-rechargeable alkaline or rechargeable nickel-cadmium (NiCd) or nickel-metal hydride (NiMH) cells can be used. Do not mix old and new cells, or mix non-rechargeable alkaline cells with rechargeable NiCd or NiMH cells, etc. See the SERVOS AND ACCESSORIES section at the end of this manual for optional rechargeable NiCd and NiMH batteries and chargers. Note the 224 transmitter does not include a charge jack for rechargeable cells. A separate AA cell charger will be necessary.

To install the batteries, slide open the battery door on the bottom of the Tx (see figure 1). Install the batteries in the holder as shown in the diagram (see marks molded inside the case). Make sure to note the proper polarities on each cell. Close the battery door.



IMPORTANT: Do not operate an R/C model with weak batteries as it could result in reduced range and/or possible loss of control!

Figure 2



Press the power switch to turn the Tx on (see figure 2). The “POWER” LED should illuminate. If not, turn off the Tx and check the batteries to make sure each cell is firmly in place and in the proper direction. If the Tx LED blinks, the batteries are low on power and should be replaced.

When operating the model, carefully rotate the Tx antenna so that it's always locked in the full upright position.



BIND THE RECEIVER TO THE TRANSMITTER

For proper installation and operation of the 2.4GHz transmitter and receiver system, it is necessary to “bind” them together electronically. This ensures sole communication between the two and prevents other transmitters from being able to control the receiver. To bind the Tx and Rx:

1. Turn on the transmitter.
2. Apply power to the receiver (see the INSTALLATION section that follows for how to do this).
3. If the receiver’s LED flashes once and then stays on, the Rx is already bound to the Tx and you can skip to the next section. Otherwise, push and hold the receiver’s “BIND” button until its LED glows red and then turns off after about one second.
4. Release the bind button.
5. If the binding is successful, the LED will flash once and then remain ON.
6. Test for proper Tx / Rx functionality by completing the next section. If it doesn’t seem the radio has bound properly, repeat steps 1-6 above.



INSTALLATION

Receiver: Mount the receiver as specified in your model’s instructions. As a guideline, mount in a secure location using double-sided tape. Route the servo wires so they do not interfere with any moving parts. For boat applications, it’s highly recommended to wrap the receiver in a balloon or enclose it in a water tight box.

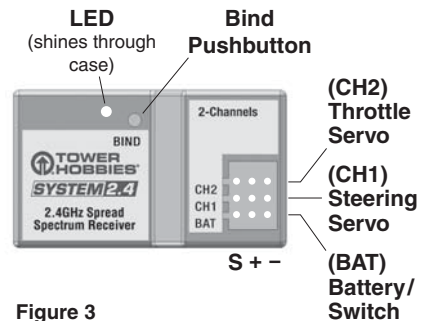


Figure 3

Servos: See the SERVOS AND ACCESSORIES section at the end of this manual for a full list of optional servos. CENTER THE TRIM DIALS on the Tx. Mount the servos inside the model and connect the linkages to the servo using an appropriate length servo arm. Make sure all mechanical linkages are free of obstructions and can move smoothly. Connect the servos to the receiver as shown in Figure 3. Turn the transmitter’s trim dials to finely adjust the servo’s center point as needed to match the installation.

Electronic Speed Control (ESC): If using an electronic speed control, connect it to channel 2 of the receiver (throttle). Center the transmitter’s throttle trim and follow the ESC instructions for programming.

Switch / Battery: It may not be necessary to use the included switch harness and 4-cell battery holder if using an optional electronic speed control (ESC). Check the instructions with your ESC for further information. Otherwise, mount the included switch harness into the model as instructed in the model's manual, and insert the switch harness's proper mating plug into the receiver's "BAT" slot (bottom). For off-road environments, it's a good idea to wrap or enclose the switch harness to prevent dirt from entering the switch and causing poor operation. Insert four "AA" alkaline, NiCd, or NiMH batteries in the included 4-cell battery holder (note proper polarity). Connect the battery holder to the switch harness and the switch harness to the BAT slot.



SYSTEM CHECK

Turn on the Tx, then the Rx. Make sure all servos operate according to the movement of the Tx controls (refer to figure 4).

Steering: Turn the steering wheel left and right. Make sure there are no obstructions with the steering servo's movements, and the servo moves in the proper direction. If the steering wheel is turned to the right but the model turns left, reverse the position of the Steering Reversing switch.

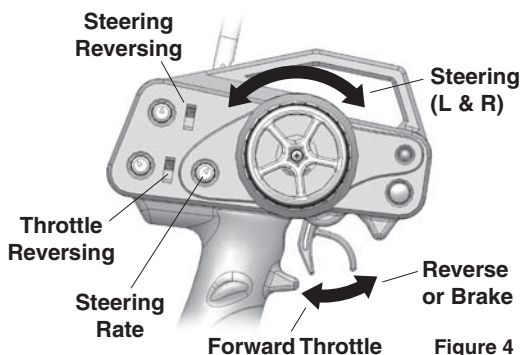


Figure 4

Steering rate: This dial adjusts the limits that the steering servo can travel on each side. Turning the dial will widen or narrow the steering end points. Adjusting this dial to your preference can help to customize control of steering in different applications.

Throttle: Squeeze the throttle trigger to make the car move forward. If the car moves backwards, reverse the position of the Throttle Reversing switch. (See the model's instruction manual for specific set-up instructions.) Push the trigger forward for reverse or brake function.

Fail-safe: This radio system includes a "fail-safe" function, which will automatically center (bring to neutral) all servos if the receiver loses signal communications from the transmitter. When the receiver regains signal it will automatically resume normal function.

Range check: The "range" or safe operating distance from the Tx to the Rx is typically as far as you can clearly see the model. Before operating the model, perform a simple range check to make sure the transmitter maintains good radio contact with the receiver within your operating area.



SERVOS AND ACCESSORIES

Stock #	Description
TOWM4505	TS10 Micro Servo
TOWM4510	TS5 Hi-speed Nano Servo
TOWM4515	TS6 Nano Servo
TOWM4520	TS11 Micro Servo
TOWM4525	TS53 Standard Servo
TOWM4545	TS69 Std Ball-Bearing Servo
TOWM5214	TS70MG Std Super-Torque 2BB Servo
TOWM5220	TS67 Std 2BB Servo
TOWM5227	TS64 Std Hi-Torque 2BB Servo
TOWM5240	TS35 Mini Hi-Power BB Servo
TOWM5241	TS35MG Mini Hi-Power BB MG Servo
TOWM4590	TS110 Digital Micro BB MG Servo
TOWM4595	TS115 Digital Micro Hi-Torque BB MG Servo
TOWM4600	TS126 Digital Std 2BB Servo
TOWM4604	TS140 Digital Std Hi-Speed 2BB MG Servo
TOWM4608	TS150 Digital Std Hi-Torque 2BB MG Servo
TOWM4612	TS160 Digital Std Hi-Torque Hi-Speed 2BB MG Servo
TOWM4616	TS170 Digital Std Ultra-Torque 2BB Titanium Gear Servo
TOWM6025	4 Cell Battery Box w/BEC Plug
TOWM6065	Mini Switch Harness w/BEC Plug
TOWG0115	Tower Hobbies .15 Car Glow Engine
DTXC 2193	7.2V NiMH 1600mAh 2/3A Pk Vendetta, M-Quake, CliffClimber
TOWC1030	7.2V NiCd 1500mAh Stick Pack Std Connector
TOWC1050	7.2V NiMH 2000mAh Stick Pack Std Connector
TOWP0150	Tower 420 AC/DC 6-7 Cell Charger
TOWP0170	Tower AC/DC Digital Peak Charger
FUGP6688	4 AA Rechargeable NiMH Cells w/1 Hr Wall Charger
SANP3500	Sanyo AA Alkaline Batteries (4)
SANP3501	Sanyo AA Alkaline Batteries (8)
SANP1100	N-700AAC 1.2V AA NiCd Rechargeable Cells

For current price and availability, enter the stock numbers shown into the search box of our web site at www.towerhobbies.com.



224 SPECIFICATIONS

TRANSMITTER

Channels: 2

Frequencies: 2.403 – 2.480GHz

Modulation: spread spectrum

Input power: four “AA” alkaline, NiCd, or NiMH cells

Output power: < 0.1W

Power on indicator: red LED

Antenna: non-removable, folding

RECEIVER

Channels: 2

Receiving freqs: 2.403 – 2.480GHz

Modulation: spread spectrum

Input power: four “AA” alkaline, NiCd or NiMH cells

Dimensions: 1.77 x 0.98 x 0.5” (45 x 25 x 13mm)

Weight: 0.25 oz (7g)



TROUBLESHOOTING

RANGE IS SHORT: Interference – check Rx installation and servo connections. Low Tx or Rx battery – replace the batteries. Crash damage – send the radio to Hobby Services for repair.

RUNTIME IS SHORT: Low Tx or Rx batteries – replace the batteries. Obstructed servo linkages causing excess battery drain – free the linkages / pushrods.

Tx LED ON BUT SERVOS DO NOT FUNCTION: Rx batteries are low – replace the batteries. Rx switch is in the off position – turn on the ESC or switch harness. Switch harness or ESC is connected incorrectly – check all connections and the ESC instruction manual. Rx is not binded to the Tx properly – perform binding process again.

INTERFERENCE OR SERVOS GLITCHING: Out of range – operate the model more closely to the transmitter. Outside radio interference (paggers, strong industrial or other commercial transmitters in the area) – check your local R/C club for confirmation of dangerous / interfering frequencies in your area.

ONLY ONE SERVO GLITCHES: Servo is bad – replace the servo or send to Hobby Services for repair.



FCC STATEMENT

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.

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.



WARRANTY AND REPAIR

1-YEAR LIMITED WARRANTY

Tower Hobbies warrants this product to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. During that period, Tower Hobbies will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt). This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Tower Hobbies will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number or e-mail address in case we need to contact you about your repair. This warranty gives you specific rights. You may have other rights, which vary from state to state.

For service on your Tower Hobbies product, send it post paid and insured to:

HOBBY SERVICES

3002 N. Apollo Dr., Suite 1
Champaign, IL 61822

Tel: (217) 398-0007

(9:00am - 5:00pm CST, M-F)

E-mail: hobbyservices@hobbico.com



CONTACTING TOWER HOBBIES

Via Phone:	Toll-free in the U.S. and Canada:	800-637-6050
	Outside the U.S. and Canada:	217-398-3636
	Toll-free FAX in the U.S. and Canada:	800-637-7303
	FAX outside the U.S. and Canada:	217-356-6608

Via the Internet: e-mail at info@towerhobbies.com
<http://www.towerhobbies.com>

Via mail: Tower Hobbies
P.O. Box 9078
Champaign, IL 61826-9078



FCC ID: IYFTTX240

