

# TOWER HOBBIES® **SYSTEM 3000™**

## 4-TH 4-CHANNEL FM RADIO CONTROL SYSTEM INSTRUCTION MANUAL FOR R/C AIRPLANE USE

First of all, let me just say "Thank You!" for choosing the Tower Hobbies® System 3000™ 4-TH! All of us here at Tower Hobbies are very pleased with the 4-TH, because we feel it offers you, the Tower Hobbies customer, one of the very best values available in an airplane system.

The 4-TH offers 4-channel control, enough for trainer and many sport models. As an FM narrow-band system, it's far less vulnerable to interference than AM radios. The narrow-band transmitter and dual-conversion receiver enhance strong control by filtering and boosting the signal. Combined, they'll provide you with smooth, glitch-free operation even in today's "noisiest" radio environments.

Those are big pluses, but we went even further to make the 4-TH the most complete 4-channel radio we've ever offered. The case has been ergonomically designed to ensure a more comfortable fit for your hands, allowing you many hours of flying enjoyment. You also receive such advantages as a full set of NiCd batteries with charger, reversing switches for all channels, improved trainer jack and more.

Packed with easy-to-use features and complete with a 1-year limited warranty, the 4-TH is a valuable investment toward superior model control. Congratulations on your purchase and happy flying!



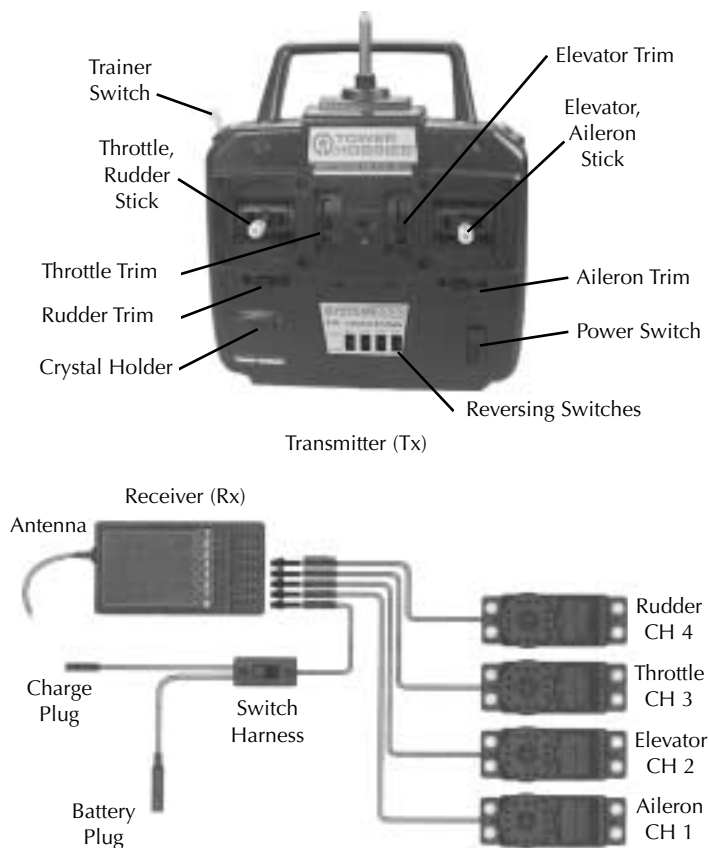
Sincerely,

Bruce R. Holecek  
Founder and Chief Executive Officer,  
Tower Hobbies

### QUICK REFERENCE GUIDE

**NOTE: This Quick Reference Guide is a condensed version of all information given in this manual. We strongly recommend you first read this entire manual before operating your 4-TH system or your model.**

1. Charge the transmitter and receiver batteries for 15 hours with the included charger.
2. Connect servos, 4-cell battery pack and switch harness to the receiver as shown at right.
3. Turn on the transmitter and then turn on the receiver switch harness.
4. Center all four transmitter trim levers. Make sure all servos operate according to transmitter stick movements.
5. Turn off the system, receiver first, then transmitter.
6. Wrap the receiver and receiver battery in foam rubber (HCAQ1000 or HCAQ1050) for protection from vibration and hard landings.
7. Install the entire radio system into your model as shown in the model's instruction manual (see receiver picture to the right for proper channel usage).
8. If you need to reverse the direction in which a servo rotates, locate the reversing switch for the desired channel on the bottom front of the transmitter and slide it to the "REVERSE" position.
9. Range test the radio system prior to flight. With the transmitter antenna collapsed, you should be able to smoothly control movement of all control surfaces on your model from at least 100ft on the ground.



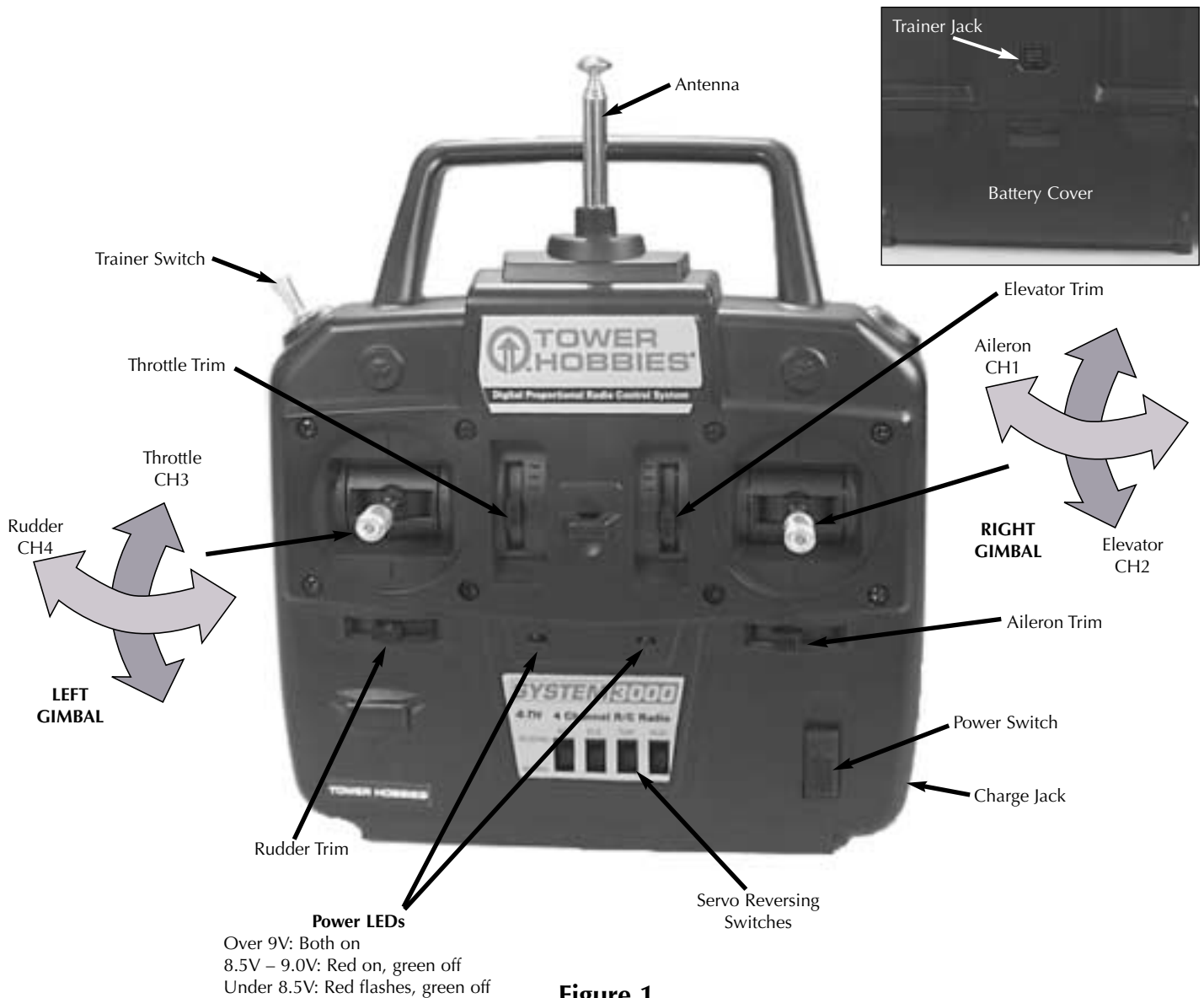
*Please read this entire manual carefully and use your radio system safely.  
Pay special attention to all precautions and warnings to ensure the safest operation.*

## WARNINGS

- Do not fly simultaneously on a frequency that is already being used in your area. Doing so could cause unwanted interference, a crash and possibly bodily harm.
- Always attach the proper frequency flag to the transmitter's (Tx's) antenna when flying. This alerts others at the flying field as to which frequency you are using.
- Do not fly in the rain or at night. Water can permanently damage many of the components in the radio system, possibly causing loss of control and a crash.
- Only fly at designated R/C flying fields. Fly at safe distances away from other people, objects in the air, buildings, electrical lines, or any other object which could possibly impede safe flying. Failure to do so could cause a crash and possibly bodily harm and physical damage to other property.
- Extend the Tx and receiver (Rx) antennas to maximum length when flying. Make sure the Tx antenna is threaded into the Tx tightly. Always test the radio system before use. Make sure the operation of each channel in the radio is in the proper direction. If a channel does not accurately respond according to Tx stick input, do NOT fly the plane. Check for and correct improperly functioning equipment before use. Failure to ensure proper radio operation before flight could result in a crash.
- During flight preparations, be certain to place the Tx on its back when on the ground, to prevent it from accidentally falling over and inadvertently moving the throttle stick to high speed.
- Do not allow fuel or oil on the plastic parts. Some plastics may melt when exposed to such materials.
- BEFORE turning the Tx's power switch "ON", adjust the throttle stick to minimum speed position. After stopping the engine turn "OFF" the Rx's power switch, then turn "OFF" the Tx power switch. Failure to follow this order could cause the engine to go to full throttle and cause an injury.
- Do not make adjustments to the radio system while the engine is running unless absolutely necessary. Failure to do so could cause the engine to accidentally go to high speed and cause an injury.
- Always fully charge the Tx and Rx NiCd batteries before each flight. Failure to do so could cause an inadvertent power failure and a crash. Use the charger supplied with this system. If using another charger, do not overcharge the battery, as it could cause burns, fire, injury or other equipment damage. Do not short circuit the NiCd battery terminals, as arcing, overheating or fire could result.
- Do not leave the radio system, batteries, model airplane or other modeling equipment within the reach of children.
- Do not overheat or throw the NiCd batteries into a fire. Leaking electrolyte from the battery could cause injury, such as burns or blindness. **IN CASE OF EMERGENCY, IMMEDIATELY FLUSH YOUR EYES, SKIN OR CLOTHES WITH PLENTY OF WATER AND SEE A DOCTOR.** Recycle the battery when no longer in usable condition.
- Store the radio with all NiCd batteries in the discharged state and be certain to fully charge the batteries just prior to use.
- Do not store the radio system in extreme heat (exceeding 104°F) or cold (below -14°F), in direct sunlight, in high humidity, in high vibration environments or in dusty areas.

## BEFORE INSTALLATION

The rechargeable batteries inside of the Tx and the Rx pack must be fully charged prior to use. Plug the supplied charger into a 110V AC wall outlet. Connect the charger's output leads to the Rx pack and the charge jack located on the side of the Tx (make sure the power switch is OFF). The corresponding LEDs will illuminate on the charger when a good electrical connection is made with each battery. When charging is complete, disconnect the charge leads from the batteries and disconnect the charger from the wall.



**Figure 1**

The 4-TH transmitter (Tx) is designed for mode-II operation. Mode-II is commonly used throughout the U.S., where the aileron and the elevator are controlled with the right stick and the throttle and rudder are controlled with the left stick. Operation of controls and their assigned channel numbers are as follows:

**Aileron Control (CH1):** When the aileron stick is moved to the right, the right aileron is raised and the left aileron is lowered and the plane banks to the right. When the aileron stick is moved to the left, the ailerons move in the opposite direction and the airplane banks left. To level the plane, the aileron stick must be moved in the opposite direction and back to center.

**Elevator Control (CH2):** When the elevator stick is pulled back, the tail elevator is raised and the tail of the plane is forced down, thus causing the plane to climb (UP operation). When the elevator stick is pushed forward, the elevator is lowered; the tail of the plane is forced up, thus causing the plane to descend (DOWN operation).

**Throttle Control (CH3):** When the throttle stick is pulled back, the engine throttle lever arm moves to the SLOW (low speed) side. When the throttle stick is pushed forward, the throttle lever arm moves to the HIGH (high speed) side.

**Rudder Control (CH4):** When the rudder stick is moved to the right, the rudder moves to the right and the nose points to the right, thus causing the plane to turn right. When the rudder stick is moved to the left, the rudder moves to the left and the nose points to the left, thus causing the plane to turn left.

During normal conditions, the **range**, or safe operating distance from the Tx to the Rx is “line of sight”. This means the 4-TH should maintain complete control any time you can see your model. The 4-TH operates on the 72MHz frequency band. There are 50 different channels available for this system ranging from 72.010MHz (Ch11) through 72.990MHz (Ch60). For safety reasons, you must always be aware of what channel you are using so that no two radios in the same area are EVER operating on the same frequency simultaneously.

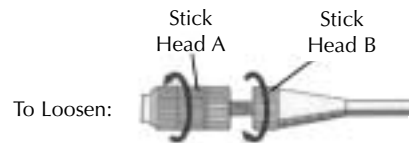
The rechargeable batteries inside the transmitter and the receiver pack must be fully charged prior to use. Plug the charger into a 110V AC wall outlet. Next, connect the charger's output leads to the Rx battery pack or switch harness and Tx charge jack. The respective charger LEDs will illuminate as you connect the charger to the batteries. Charge each battery for 15 hours. The batteries may become warm as they charge. This is normal and a good indication that the batteries are becoming fully charged.

**NOTE:** The Tx and Rx batteries should be charged the night before each use. If the batteries have not been used for several

months, you may need to **cycle** them prior to use. Cycling is the process of fully charging, then discharging, rechargeable batteries to help maximize their charge capacity and run time. To cycle a battery, charge it for 15 hours and then discharge it by turning on the transmitter. The Tx's voltage indicator should not drop into the red zone (with the antenna extended) for 90 to 120 minutes. If it does, cycle the batteries again. If the batteries still cause the voltage indicator to drop in less than 90 minutes after repeated cycles, battery replacement is recommended. The old batteries should be disposed of at a recycling center.

## STICK LEVER LENGTH ADJUSTMENTS

The stick lengths can be adjusted to match different preferences (see figure 2). Turn the stick head (A) counter-clockwise and stick head (B) clockwise to unlock. Adjust the length to your preference and lock in reverse order.



**Figure 2**

## TRAINER FUNCTIONS

The trainer function is a very effective way to teach others how to fly. To use it, the special trainer cord (sold separately) is necessary. The trainer cord comes in 2 configurations, based on what transmitter is being used as a "Buddy Box".

Configuration 1 can be connected to Tower 6FM, 4FM and Futaba® SKYSPORT4, FF5, SKYSPORT6, 7U series, 8U series and PCM1024Z series transmitters. The Tower trainer cord TOWM6081 or the Futaba FUTM4420 may be used in this configuration.

Configuration 2 can be connected to another Tower 4-TH and the new Futaba 9C series transmitters. The Tower trainer cord TOWM6082 or the Futaba FUTM4415 may be used in this configuration.

### OPERATING INSTRUCTIONS

Connect the student and instructor transmitters with the trainer cord.

#### Instructor side:

Turn on the power switch and extend the antenna to its full length. When the trainer switch is not pressed, the instructor has control. When the spring-loaded trainer switch is pressed and held, control of the airplane is transferred to the student.

#### Student side:

**WARNING:** 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 controls to the same settings. For example, if the direction of operation of any channel is reversed, control will be incorrect and the plane will crash. All trim settings on the student Tx should match that of the instructor Tx. The instructor's Tx can only be an FM (PPM) type transmitter. If the modulation method is different, control is impossible.

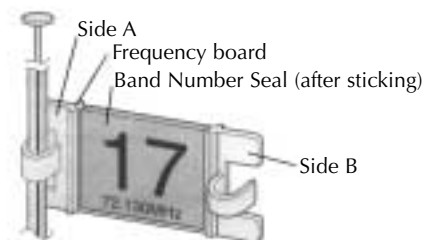
**Before training, it is important to follow these preflight checks:**

1. Connect the appropriate trainer cord to the appropriate trainer cord jack; they are located on the rear of the transmitters.
2. Turn off the instructor's Tx and Rx switch harness in the model. **Caution: Do not turn on the student's Tx or damage to the instructor's Tx will occur.** The student's Tx will receive its power from the instructor's Tx.
3. Set the trims and reversing switches on the student's Tx to match the instructor's Tx.
4. Press and hold the trainer switch on the instructor's Tx. The student should now be able to control the aircraft. **Caution: Make sure the student's Tx is properly controlling the aircraft. Any difference in operation could cause loss of control during flight.**
5. Release the trainer switch in order to confirm that the instructor's Tx has regained control of the model.
6. You are now ready to begin flight training.

**Caution:** Training should only begin if an experienced pilot is controlling the instructor's transmitter. Failure to do so could put yourself and others in the area at risk of injury or property damage. To make your R/C modeling experience more enjoyable, it is recommended that you get an experienced instructor for your first flights. Experienced instructors can be located at your local R/C club; some even offer training programs and insured newcomer training. To locate a club in your area, you can contact the national Academy of Model Aeronautics (AMA), which has more than 2,500 chartered clubs across the country. Please contact the AMA at:

Academy of Model Aeronautics  
5151 East Memorial Drive  
Muncie, IN 47302-9252  
Tel: (800) 435-9262 Fax: (765) 741-0057  
<http://www.modelaircraft.org/>

Use the frequency flags that are supplied with your R/C system so that other modelers at the flying field can identify your channel number. Attach the flags to the base of the Tx antenna as shown in figure 3.



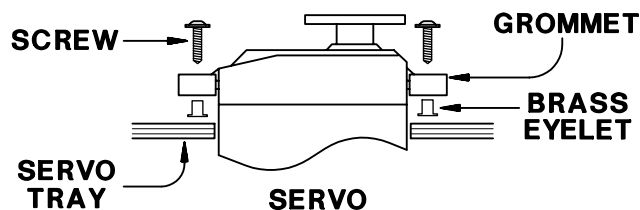
**Figure 3**

## SERVO INSTALLATION

All servos should be mounted as shown in the model's instructions. Use the rubber grommets, screws and brass eyelets supplied when mounting your servos (see figure 4).

Do **NOT** over-tighten the mounting screws. The servos should be able to move slightly to compensate for engine vibration. For each servo, use a servo horn long enough to accommodate the entire range of movement for that particular control.

When mounting the servos, make sure the pushrods are not too loose or bind in anyway. Pushrods should be capable of operating the full range of the servo. This can be tested by moving the Tx sticks to maximum positions several times while observing the movement of the control services. If a servo is binding or sticks in flight, a greater current drain on the battery is applied, thus shortening the flight time of the



**Figure 4**

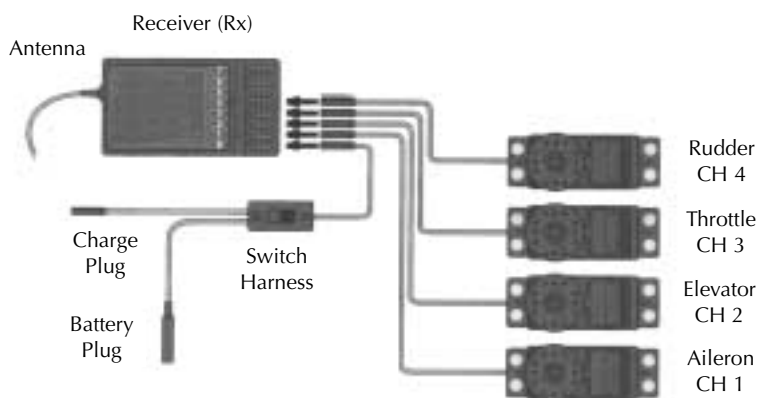
model. Binding can also cause damage to the servo and loose linkages could result in poor control of the aircraft.

Because there are a variety of specific applications for servos in R/C modeling, different servos are designed for different applications. Tower Hobbies offers a large line-up of servos which you can choose from.

## RECEIVER, SWITCH HARNESS & RECEIVER BATTERY INSTALLATION

After the receiver and servos are mounted in your model, connect the Rx to the servos and switch harness per the diagram in figure 5. Always insert the servo and battery or switch harness connector into the Rx firmly, to ensure solid physical and electrical connections are made.

Turn on the Tx, then the Rx switch harness. Make sure all servos operate according to the movement of the Tx sticks. Center all trim levers, turn off the Rx switch harness, then the transmitter and be careful not to move the servo arms from their centered position during installation. The servo connectors are keyed to prevent improper connection, but do pay close attention when connecting them to the receiver. The black wire goes toward the outside edge of the receiver case. Mount the switch harness to the side of the fuselage away from the engine exhaust (refer to your model's instruction manual). Connect the red plug to the receptacle on the Rx marked "B" for battery. Connect the 4.8V Rx battery to the female plug on the switch harness. Wrap the receiver and battery in 1/4"-1/2" foam rubber (HCAQ1000, HCAQ1050) to reduce vibration. Route the receiver antenna according to the model's instructions. Do **NOT** cut or coil the antenna or you may lose adequate operational range.



**Figure 5**

**NOTE:** You may mount the battery fore or aft of the location shown to better balance the aircraft. Range test the radio system prior to flight. With the Tx antenna collapsed, you should be able to smoothly control movement of all control surfaces on your model from at least 100 ft. on the ground. If not, refer to the 4-TH's Troubleshooting Guide on page 7 before proceeding.

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.

The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **RECYCLING OF NICKEL-CADMIUM BATTERIES**

The Tower Hobbies 4-TH Radio system contains nickel-cadmium (NiCd) batteries in the Tx as well as a separate pack to power the receiver. The RBRC® Battery Cycling Seal on the NiCd batteries indicate that Tower Hobbies 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 and Canada. The RBRC program provides a convenient alternative to placing used NiCd batteries into the trash or the municipal waste system, which may be illegal in your area.

Please call 1-800-8-BATTERY™ for information on NiCd battery recycling and disposal bans/restrictions in your area.



## **4-TH SPECIFICATIONS**

### **Transmitter**

Channels: 4-channel  
Transmitting frequencies: 72MHz band  
Modulation type: FM Narrow-band  
Nominal current drain: approx. 180mA  
Input power: 9.6V NiCd battery  
Output power: <0.75W

### **Receiver**

Channels: 7-channel  
Receiving frequencies: 72MHz band  
Crystal type: FM Dual-Conversion Narrow-band  
Current drain: 10mA, approx. 250mA w/4 standard servos  
Input power: 4.8V or 6.0V NiCd battery  
Receiving Range: 500 yards ground, 1000 yards air  
Dimensions: 2.5 x 1.38 x 0.88"  
Weight: 1.4 oz

## **SAFETY GUIDE**

Read and abide by the following Academy of Model Aeronautics Official Safety Code (Model Flying **MUST** be in accordance with this Code in order for AMA Liability Protection to apply):

### **GENERAL**

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.
2. I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.
3. Where established, I will abide by the safety rules for the flying site I use and I will not willfully and deliberately fly my models in a careless, reckless and /or dangerous manner.
4. At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only those persons essential to the flight operations are to be permitted on the flying side of the line; all others must be on the spectator side. Flying over the spectator side of the line is prohibited, unless beyond the control of the pilot(s). In any case, the maximum permissible takeoff weight of the models is 55 pounds.
5. At air shows or model flying demonstrations a single straight line must be established, one side of which is for flying, with the other side for

spectators. Only those persons accredited by the contest director or other appropriate official as necessary for the flight operations or as having duties or functions relating to the conduct of the show or demonstration are to be permitted on the flying side of the line. The only exceptions which may be permitted to the single straight line requirements, under special circumstances involving consideration of site conditions and model size, weight, speed and power, must be jointly approved by the AMA President and the Executive Director.

6. Under all circumstances, if my model weighs over 20 pounds, I will fly it in accordance with paragraph 5 of this section of the AMA Safety Code.
7. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. NOTE: This does not apply to models flown indoors.
8. I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.
9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document

available from AMA HQ). In any case, models using rocket motors as a primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. NOTE: A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.

**10.** I will not operate any turbo jet engine (axial or centrifugal flow) unless I have obtained a special waiver for such specific operations from the AMA President and Executive Director and I will abide by any restriction(s) imposed for such operation by them. (NOTE: This does not apply to ducted fan models using piston engines or electric motors.)

**11.** I will not consume alcoholic beverages prior to, nor during, participation in any model operations.

#### RADIO CONTROL

**1.** I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.

**2.** I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

**3.** I will perform my initial turn after takeoff away from the pit or spectator areas and I will not thereafter fly over pit or spectator areas, unless beyond my control.

**4.** I will operate my model using radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band Frequencies.)

**5.** I will not knowingly operate an R/C system within 3 miles of a pre-existing model club flying site without a frequency sharing agreement with that club.

**6.** I will not fly my model aircraft in any racing competition which allows models over 20 pounds unless that competition event is AMA sanctioned. (For the purposes of this paragraph, competition is defined as any situation where a winner is determined.)

### TROUBLESHOOTING GUIDE

Problem	Possible causes	Solution
<b>Short range</b>	Collapsed Tx antenna.....	Fully extend the Tx antenna
	Interference .....	Check frequencies in area, check Rx installation
	Rx antenna poorly routed.....	Re-route Rx antenna
	Low Tx or Rx battery .....	Charge batteries for 15 hours prior to use
	Rx or Tx out of tune .....	Send radio to Hobby Services for tuning
	Severed Rx antenna.....	Send radio to Hobby Services for repair
	Crash damage .....	Send radio to Hobby Services for repair
<b>Short run-time</b>	Low Tx or Rx batteries.....	Charge batteries for 15 hours prior to use
	Batteries need to be cycled .....	See before Installation on page 3
	Binding servos causing excess battery drain.....	Free binding components in pushrods or moving surfaces. See model's manual.
	Too many servos for the Rx pack used .....	Additional servos cause quicker battery drain. Use a Rx battery pack with a higher mAh rating.
<b>Tx meter low</b>	Tx batteries need charged .....	Charge Tx batteries for 15 hours
<b>Tx meter beyond red zone but servos do not function</b>	Rx batteries need charged .....	Charge Rx batteries for 15 hours
	Rx switch in off position .....	Turn on switch harness
	Switch harness connected incorrectly .....	See quick reference guide on page 4
<b>Interference or servos glitching</b>	Another Tx is on your channel .....	Do not operate your system until other system is not in use
	Outside interference .....	Check your local R/C club for confirmation (Pagers, transmission towers) of dangerous frequencies in your area
	Engine or motor noise .....	Reroute the antenna or servo leads as far away from the engine as possible. When using an electric motor, make sure that the proper capacitors (see motor installation instruction for details) have been mounted and that there is a good electrical connection
<b>One glitching servo</b>	Bad servo .....	Send servo to Hobby Services for repair

**1-YEAR LIMITED WARRANTY  
(U.S.A. and Canada Only)**

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 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, warranty or non-warranty, send it post paid and insured to:***

HOBBY SERVICES  
1610 Interstate Drive  
Champaign, IL 61821  
Phone: (217) 398-0007

**CONTACTING TOWER HOBBIES**

Via phone:

Toll-Free in the US and Canada: 800-637-6050

Outside the US and Canada: 217-398-3636

Toll-Free FAX in the US and Canada: 800-637-7303

FAX Outside the US and Canada: 217-356-6608

Via the Internet:

World Wide Web: <http://www.towerhobbies.com>

Via mail:

Tower Hobbies

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