



T-28D Trojan BNF Instruction Manual



ParkZone® products are distributed exclusively by
Horizon Hobby, Inc.
4105 Fieldstone Road
Champaign, IL 61822
USA
© 2009 Horizon Hobby, Inc.

Horizon Hobby UK
Units 1-4 Ployters Rd
Staple Tye
Harlow, Essex
CM18 7NS
United Kingdom

Horizon Hobby Deutschland GmbH
Hamburger Strasse 10
25335 Elmshorn
Germany

DSM and DSM2 are trademarks or registered trademarks of Horizon Hobby, Inc. The Spektrum trademark is used with permission of Bachmann Industries, Inc. Spektrum radios and accessories are exclusively available from Horizon Hobby, Inc.

www.parkzone.com

Printed 6/09 14589



BIND-N-FLY SPEKTRUM DSM2 TECHNOLOGY



Charge-and-Fly™ Park Flyer

Wingspan: 44.0 (1120mm)
Length: 36.0 (915mm)
Weight: 31.0 oz (880 g)
Battery : 3-cell 1800mAh Li-Po Battery (PKZ1031)
Motor: PKZ 480 960Kv outrunner brushless motor
ESC: E-flite 30A Switch-Mode BEC
Receiver: Spektrum AR500 Sport full range 2.4GHz DSM2



T-28D Trojan BNF Instruction Manual

Congratulations on your purchase of the ParkZone® T-28D Trojan Bind-N-Fly™ airplane (PKZ5080). We at ParkZone are committed to giving you the most enjoyable flight experience possible. In order to have a safe and successful flight, we ask that you do not fly until you have read these instructions thoroughly. This airplane comes almost fully assembled in order to allow you to get in the air quickly. Your T-28D Trojan BNF already has the 3-wire servos, a ParkZone 480 outrunner brushless motor, and an E-flite® 30A brushless ESC, 3-cell 1800mAh Li-Po battery pack and an AR500 receiver installed. The decals have already been applied, as well. You will only need to add your own full range DSM2™ transmitter. In as little as an hour, you can be ready for your first flight with the T-28D Trojan BNF. This means you can spend your time refining your flying skills, not your building skills.

Warning: Although your ParkZone T-28D Trojan BNF comes almost ready to fly, this aircraft is for experienced RC pilots only and is not a toy! Misuse of the plane can cause serious bodily harm and damage to property. Therefore, only an experienced RC pilot should fly it.

Note: A 4-channel or greater radio is required for the T-28D Trojan.

Age Recommendation: 14 years or over. This is not a toy. This product is not intended for use by children without direct adult supervision.

Step 1

Charging the Aircraft Battery

Your T-28D comes with a DC balancing charger and 3S Li-Po battery. You must charge the included Li-Po battery pack with a Li-Po specific charger only (such as the included charger). Never leave the battery and charger unattended during the charge process. Failure to follow the instructions properly could result in a fire. When charging, make certain the battery is on a heat-resistant surface. It is recommended to charge the battery pack while you are assembling the aircraft. The flight battery will be required to confirm proper aircraft operation in future steps.

DC Li-Po Balancing Charger Features

- Charges 2- to 3-cell lithium polymer battery packs
- Variable charge rates from 300mAh–2A
- Automatically detects incorrect cell count selection
- Simple single push-button operation
- LED charge status indicator
- LED cell balance indicator
- Audible beeper indicates power and charge status
- 12V accessory outlet input cord

Specifications

- Input power: 12V DC, 3A
- Charges 2- to 3-cell Li-Po packs with minimum capacity of 300mAh
- Variable charge rates from 300mAh to 2 amps

3S 11.1V 1800mAh Li-Po Battery Pack

The ParkZone 3S Li-Po battery pack features a balancing lead that allows you to safely charge your battery pack when used with the included ParkZone Li-Po balancing charger.

To Complete the Charging Process

1. Attach the input cord of the charger to the appropriate power supply (12V accessory outlet), or use the HBZ6513 (Alligator Clip input adapter for 12V) and attach to 12V DC power supply. Once your charger has been correctly powered up, there will be an approximate 3-second delay and then you will hear an audible “beep” and the green (ready) LED will flash.
2. Refer to the chart below to select the appropriate charge rates:

BATTERY CAPACITY	MAX. CHARGE RATE
300—400mAh	300mAh
500—1000mAh	500mAh
1000—1500mAh	1A
1500—2000mAh	1.5A
2000mAh +	2.0A

Warning: Selecting a charge rate higher than 1x battery capacity may cause a fire.

3. Select the proper number of cells that you will be charging, either 2 or 3 cells.
 4. Locate the safety charge lead on the battery pack. The charge lead of a 3-cell Li-Po battery will plug into the larger 4-pin port on the bottom right of the charger. A 2-cell pack will need to plug into the 3-pin port on the bottom left of the charger. Once the battery is properly plugged into the correct port, it will beep 3 times if it is a 3-cell, and twice if it is a 2-cell pack. Once this is done, you are ready to proceed to charge the battery pack.
 5. Push the start button to begin the charging process. Once this is done, the charger will make an audible beep that matches the cell count, and then the red (charge) LED will begin to flash. Do not adjust the current once the charger has begun to charge.
- Note:** At times, the green LED may also flash during the charging process, indicating that the charger is balancing one or more of the cells at the same time it is charging the battery pack. When this is occurring, the red and green LEDs will both be flashing. It will not always be necessary for the cells to be balanced.
6. When the battery pack is fully charged, you will hear an audible beep for about 3 seconds, and the green LED will be solid. Always unplug the battery from the charger immediately upon completion. Failure to do so could cause a fire.

Warning: Failure to use the proper charger for a Li-Po battery can result in serious damage, and if left charging long enough, will cause a fire. ALWAYS use caution when charging Li-Po batteries.



Step 2

Transmitter and Receiver Binding

Binding is the process of programming the receiver of the control unit to recognize the GUID (Globally Unique Identifier) code of a single specific transmitter. It will be necessary for you to 'bind' your chosen Spektrum DSM2 technology equipped transmitter to the receiver for proper operation.

The transmitter you select must be a DSM2 full range (high power) Tx. The following is a list of some of the Spektrum DSM2 equipped full range transmitters and modules that will bind to the receiver of the T-28D Trojan:

Spektrum DX5e	JR X9303 2.4
Spektrum DX6i	JR 12X 2.4
Spektrum DX7/DX7SE	EFLH1056
All SPM Module systems	

The following steps outline the binding process:

- Confirm the process of entering the bind mode for your chosen transmitter by reviewing the instruction manual included with the transmitter.
 - Make sure the flight battery is disconnected from the receiver unit and the transmitter is turned off.
 - Plug the bind plug into the Batt/Bind port on the AR500 receiver.
 - Plug the flight battery into the battery lead of the ESC. The LED on the receiver unit will begin flashing.
- Note:** NEVER plug the balance lead of the battery directly into the receiver. This will cause damage to the receiver and battery.
- After verifying the LED is flashing on the receiver, follow the steps that allow your chosen transmitter to enter bind mode.
 - If you entered bind mode correctly, you will see a solid LED approximately 5–10 seconds later on the receiver. You should now be bound to the transmitter, and have full control and function.
 - Remove and store bind plug in a safe place.

If you encounter any problems, repeat the binding process again, see the troubleshooting guide or call the Horizon Support Team at 1-877-504-0233.

Transmitter-Specific Binding Instructions

DX5e:

- To bind your T-28D Trojan to the DX5e, plug the bind plug into the Batt/Bind port on the AR500 receiver.
- Plug the battery into the ESC of the airplane. The LED on the receiver will begin flashing.
- Move the sticks and switches on the transmitter to the desired failsafe positions (low throttle and neutral control positions).
- Pull and hold the Trainer Switch on the transmitter while turning the transmitter on. Release the trainer switch once the LEDs on the front of the transmitter flash.
- The LED on the receiver will go solid amber and the system will connect after several seconds.
- Remove and store bind plug in a safe place.

DX6i:

- To bind your T-28D Trojan to the DX6i, plug the bind plug into the Batt/Bind port on the AR500 receiver.
- Plug the battery into the ESC of the airplane. The LED on the receiver will begin flashing.
- Move the sticks and switches on the transmitter to the desired failsafe positions (low throttle and neutral control positions).
- Pull and hold the Trainer Switch on the transmitter while turning the transmitter on. Release the trainer switch once the word BIND flashes on the LCD screen on the front of the transmitter.
- The LED on the receiver will go solid amber and the system will connect after several seconds.
- Remove and store bind plug in a safe place.

DX7 (includes DX7se):

- To bind your T-28D Trojan to the DX7, plug the bind plug into the Batt/Bind port on the AR500 receiver.
- Plug the battery into the ESC of the airplane. The LED on the receiver will begin flashing.
- Move the sticks and switches on the transmitter to the desired failsafe positions (low throttle and neutral control positions).
- Press the bind button on the back of the transmitter while turning the transmitter on. The bind button on the back of the transmitter will flash. Release the button after 2–3 seconds.
- The LED on the receiver will go solid amber and the system will connect after several seconds.
- Remove and store bind plug in a safe place.

X9303:

- To bind your T-28D Trojan to the X9303, plug the bind plug into the Batt/Bind port on the AR500 receiver.
- Plug the battery into the ESC of the airplane. The LED on the receiver will begin flashing.
- Move the sticks and switches on the transmitter to the desired failsafe positions (low throttle and neutral control positions).
- Press the bind button on the back of the transmitter while turning the transmitter on. The bind button on the back of the transmitter will flash. Release the button after 2–3 seconds.
- The LED on the receiver will go solid amber and the system will connect after several seconds.
- Remove and store bind plug in a safe place.

12X:

- To bind your T-28D Trojan to the 12X, plug the bind plug into the Batt/Bind port on the AR500 receiver.
- Plug the battery into the ESC of the airplane. The LED on the receiver will begin flashing.
- Move the sticks and switches on the transmitter to the desired failsafe positions (low throttle and neutral control positions).
- Press the black bind button on the back of the transmitter while turning the transmitter on. Release the button after 2–3 seconds.
- The LED on the receiver will go solid amber and the system will connect after several seconds.
- Remove and store bind plug in a safe place.

Transmitter Control Identification

Note: Each time before you fly you should ALWAYS turn the transmitter on before connecting the flight battery to the receiver unit. After each flight, be sure that you always disconnect the flight battery from the receiver unit before powering the transmitter off.

Additional Binding Information

Prior to each flight, you should ensure that you power on your transmitter and wait about five seconds before you plug the flight battery into the receiver. Doing this allows time for the transmitter to scan and secure two open frequencies. If the flight battery is plugged in too quickly and the link is missed, it may not allow the receiver to connect to the transmitter. If this occurs, simply leave the transmitter on and then disconnect and reconnect the flight battery.

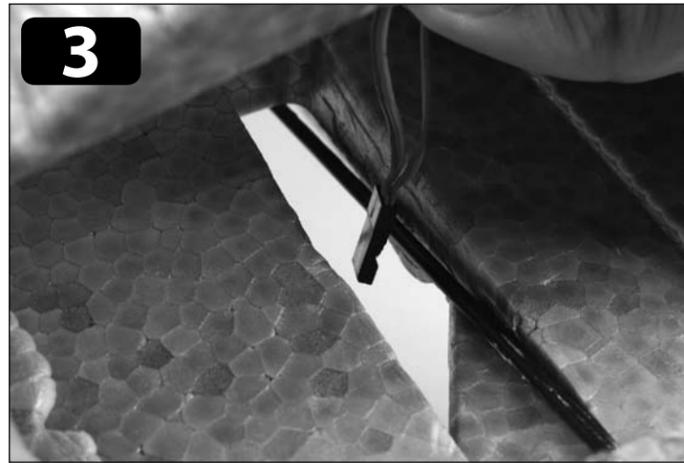
Note: If using a Futaba transmitter with a module, it may be necessary to reverse the throttle channel.

Step 3

Attaching the Wing

In order to attach the wing of your T-28D, please follow these simple instructions:

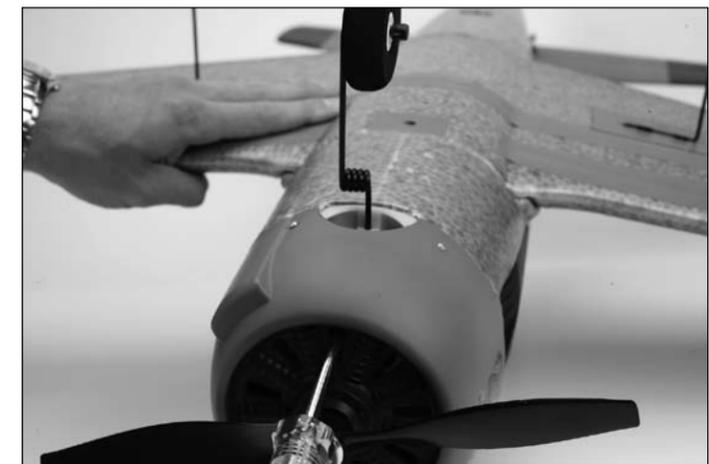
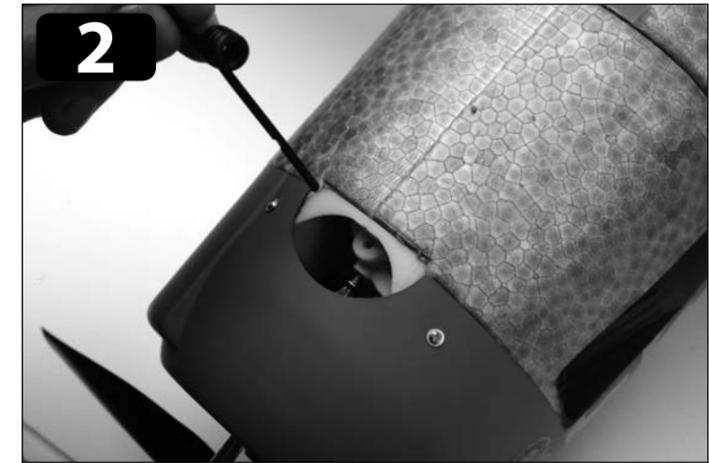
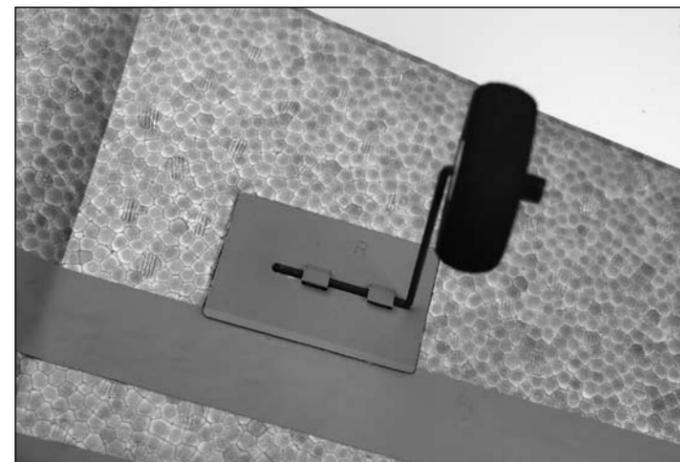
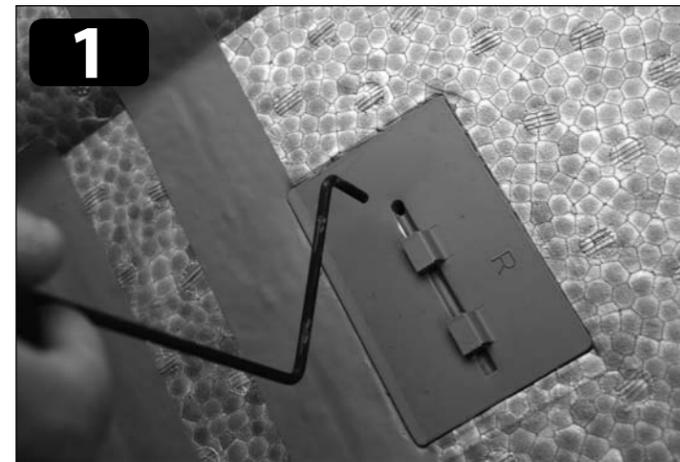
1. Locate the included wing-securing screw.
2. Turn over the fuselage so you are looking at the bottom. Do the same with the wing.
3. Connect the aileron leads to the pre-installed Y-harness, noting proper orientation. Route the Y-harness lead through the access hole in the bottom of the fuselage.
4. Carefully align the two locator pins on the front of the wing into the two small holes in the front of the fuselage.
5. Slide the aileron leads inside the fuselage so that they will not become pinched in between the wing and the fuselage when securing the wing.
6. Slide the bottom of the leading edge of the wing into the fuselage as shown, making certain it is perfectly centered. This must be done correctly in order to allow the screw to thread into the fuselage. Once you are certain the wing is centered, tighten the screw to secure the wing.
7. The wing is correctly installed when no gap exists between the wing and fillet.
8. Gently pull up on the rear of the canopy hatch to remove and set aside.
9. Plug the Y-harness lead into one of the AIL ports of the Spektrum AR500 receiver.



Step 4

Installing the Landing Gear

1. Install the main landing gear by inserting it into the locator hole in the wing. Swivel the landing gear toward the retaining clips and gently snap into place.
2. Insert the nose gear into the steering assembly on the underside of the cowl with the flat spot facing forward.
3. Align the retaining screw with the flat spot on the cowl. The retaining screw should be visible through the front of the cowl.
4. Using a Phillips screwdriver, tighten the retaining screw. The retaining screw should be accessible through the front of the cowl, however, you may choose to remove the cowl for easier access.
5. Reposition the T-28D so that it is resting on the landing gear.



Step 5

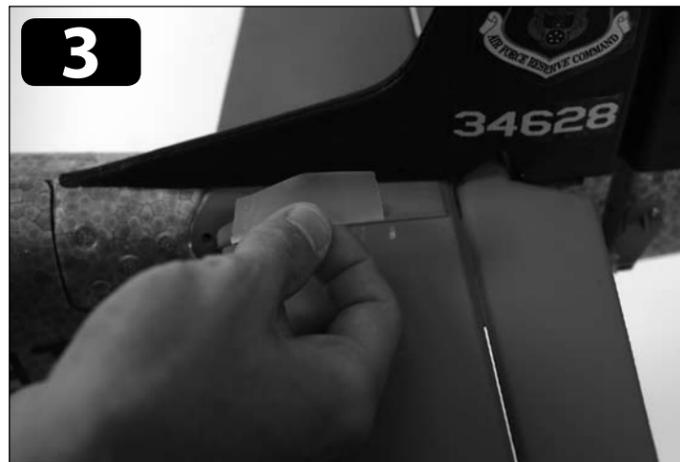
Attaching the Horizontal Stabilizer

1. Locate the horizontal stab of the tail.
2. Slide tail in allotted space of fuse, making sure the control horn installed into the horizontal tail will properly align with pushrod and clevis exiting the back of the fuse.
3. When you are certain the tail is centered correctly and in the right place, use the tape provided to properly secure the tail to the fuselage as shown. Use the tape on the top and bottom of each side of the tail (total of 4 applications).
4. Turn on the transmitter and plug in the flight battery. Make sure the trim levers are centered and the left stick is in the full down position.
5. Locate the clevis and rod exiting the right side of the fuselage, and attach the clevis to the control surface as shown.
6. Make any trim adjustments as necessary prior to flight (see Step 10).

Note: To make trim adjustments to the horizontal stabilizer:

- a. Turn on radio transmitter.
- b. Plug in fully charged battery into fuse.
- c. Use the elevator trim of the radio by moving up or down to center the tail at neutral when the gimbal is also at neutral. If these changes are not sufficient, center the transmitter elevator trim lever, then remove the clevis from the control surface and turn clevis in or out as needed to move the control surface back to neutral.

Warning: Always keep hands and all objects away from the propeller in case the motor is engaged. A moving propeller can cause severe injury and/or damage.



Step 6

Replacing the Propeller

1. Loosen prop hub by inserting a hex driver through the prop hub. Remove the prop hub and propeller.
2. Slide the new propeller on. Make certain the numbers on the prop (9.5 x 7.5 for 2 blade) are visible from the front.
3. Replace the prop hub and tighten it securely.



Step 7

Range Checking your Radio System

After you have finished the final assembly, it is time to range check the radio system within the T-28D Trojan BNF.

Prior to each flying session

- Turn on the transmitter prior to plugging in the flight battery. With the airplane on the ground and motor running, you should walk away approximately 100 feet and still have full control of all functions while following the specific range test feature of your DSM2 transmitter. **If this is not the case, do not fly!** Call Product Support at 1-877-504-0233.

- Always make sure that all controls are functioning per the transmitter input that you are giving. This includes ailerons, rudder, elevator and throttle.
- Always make sure you have fully charged the transmitter batteries.
- **Always remove the flight battery from the airplane when you are done flying, or when you are on the way to the flying field.**

Step 8

Flying

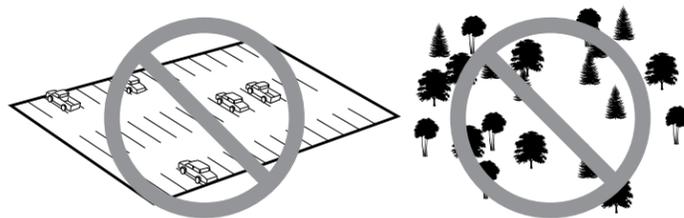
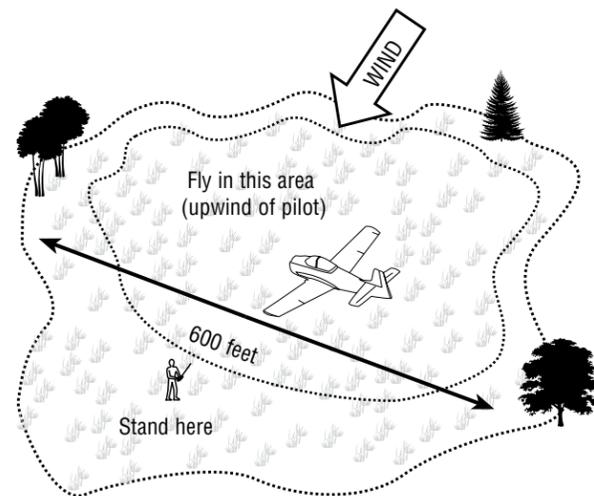
Always choose a wide-open space for flying your ParkZone T-28D Trojan BNF. It is ideal for you to fly at an AMA sanctioned flying field. If you are not flying at an AMA approved site, always avoid flying near houses, trees, wires and buildings. You should also be careful to avoid flying in areas where there are many people, such as busy parks or schoolyards. Always follow local ordinances. We recommend only flying your Trojan in light winds.

Prior to each flight

- Always make sure your T-28D Trojan BNF is properly trimmed.
- Always make sure the receiver, ESC, and battery are properly secured.
- Always verify the propeller is on securely.
- Always ensure the servo reversing switches on the transmitter are set correctly.
- Always verify the dual rates switch is set at where you plan on flying. We recommend LOW rates for your initial flying. The T-28D Trojan BNF is VERY maneuverable on high rates and requires a lot of experience to handle properly.

Center of Gravity Location

The center of gravity on your T-28D Trojan should be located approximately 2-1/2" behind the leading edge of the wing, when measured against the fuselage. This CG location has been determined with the ParkZone 1800mAh 11.1V Li-Po battery installed.



Control Surface Travel Information

	High Rate	Low Rate
Aileron:	1/2 inch (13mm)	3/8 inch (9.5mm)
Elevator:	5/8 inch (16mm)	1/2 inch (13mm)
Rudder:	7/8 inch (22mm)	5/8 inch (16mm)

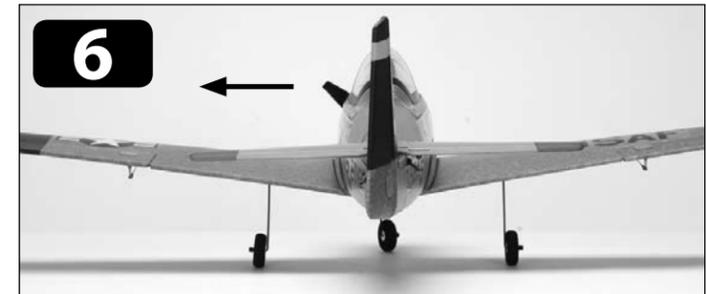
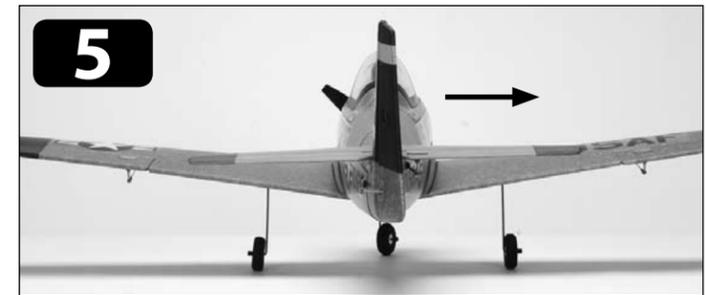
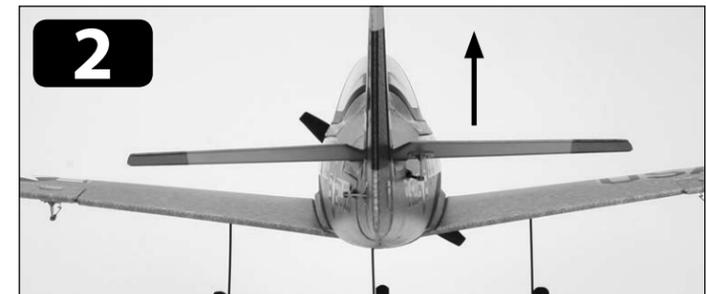
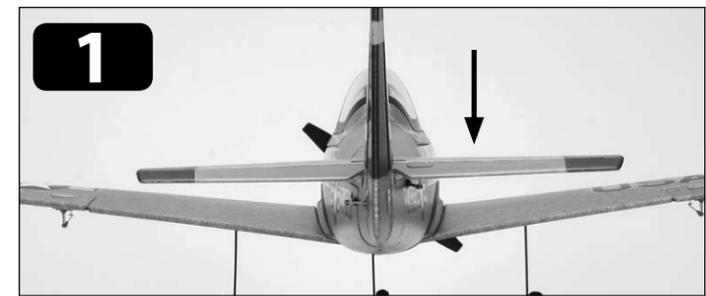
Step 9

Control Direction Test

1. Move the elevator stick on the transmitter forward and aft to check elevator pitch control. When the stick is pushed forward, the elevator should move down.
2. When the elevator stick is moved aft the elevator should move up.
3. Move the aileron stick left and right to check aileron roll control. When the stick is pushed to the left, the left aileron should move up and the right aileron should move down.
4. With the aileron stick pushed right, the right aileron should move up and the left aileron should move down.
5. Move the rudder stick left and right to check yaw control. When the stick is pushed to the right the rudder should also move to the right (if viewed from behind the airplane).
6. With the rudder stick pushed to the left, the rudder should move to the left (if viewed from behind the airplane).

If at any time during the test the controls respond in the opposite direction, it may be necessary to reverse/change the direction of operation of the flight controls.

Follow your transmitter instructions to change the direction of the various flight controls.



Step 10

30-Amp Pro Switch-Mode BEC Brushless Controller

Your T-28D Trojan BNF comes out of the box with the E-flite 30-Amp Pro Switch-Mode BEC Brushless Controller. This controller has been designed for use in radio control aircraft and is designed to support motor currents up to 30 amps continuous, and a 5-volt Switch-Mode BEC circuit capable of 700mAh continuous current on any recommended input voltage with a 3- to 4-cell Li-Po battery. It is suitable to use with most radio brands.

If you intend to fly your T-28D Trojan BNF stock, then there is no need to program your ESC. It comes installed with the default settings. If you intend to re-program the ESC, we strongly recommend removing the propeller first in order to keep it from spinning if the motor is accidentally engaged.

Note: ALWAYS assume the motor and the propeller are live. ALWAYS keep clear of the propeller at all times. The high rpm of the brushless motor can cause severe injury.

Features

- Up to 30-amp continuous current with proper airflow, 35-amp peak
- 5-volt Switch-Mode BEC circuit capable of 700mAh continuous current on any recommended input voltage
- Drives up to 5 analog or 4 digital sub-micro servos with the BEC
- 3S-4S Li-Po or 9- to 12-cell Ni-MH/Ni-Cd input voltage
- Programmable motor braking
- Safe power-arm mode prevents accidental starts
- Programmable low voltage cut-off with settings for 3S Li-Po (9.2V), 4S Li-Po (12V) or 74% of battery starting voltage
- Programmable soft start for helis and airplanes
- Auto motor shutdown if signal is lost or there is interference
- Programmable timing - 5 user-selectable ranges for use with a larger variety of brushless motors
- Heli mode for starting the motor with a low speed ratio
- Optional RS232 Serial Link available for programming (EFLARS232)
- Pre-wired connectors - E-flite EC3 connectors on battery input and 3.5mm female gold bullets on motor output leads

Using the 30-Amp Pro Switch-Mode BEC Brushless Controller

This controller is very simple to use, and for safety, will not arm the motor until the throttle stick has been held in the Idle/Off position for more than 1 second. The controller will indicate the soft cutoff voltage setting every time you plug the battery in by first emitting a low, long tone, to indicate startup. Depending on the selected cutoff voltage (default is 74%), you will then hear the respective number of medium length mid tones to indicate the cell count or a musical tone for the 74% cutoff, helping you to confirm the setting before every flight. Proper air cooling is required during flights so the ESC should be placed in an area where air flows over the controller.

Connecting the ESC to the Motor

The three wires from the motor connect to the three female gold bullet connectors on the ESC. The order of connection to the motor is not important; any motor wire can be plugged into any connector. If the motor runs backwards, you can simply unplug and switch any two of the motor wire plugs connected to the ESC.



Mounting the ESC

Choose a location that has good airflow and offers good protection. Do not cover the side with the flat heat shield with hook and loop or tape as this will greatly reduce its effectiveness. Mount the ESC with a combination of hook and loop, 2-sided foam tape and/or tie wraps.

Starting Your Power System

1. Turn on your transmitter and ensure the position of the throttle stick is set to Idle/Off.
2. Plug the battery pack into the controller. You will hear 1 low long tone to indicate startup, then the

respective number of medium-length mid tones to indicate the cell count or a musical tone for the 74% cutoff, followed by 3 rising tones to indicate the controller is armed.

3. When you move the throttle stick upward, the motor will run. Continue to move the throttle stick upward to the full throttle (high) position, and the motor will run faster. When the throttle stick goes below the start-up position, the motor will stop running.
4. Check servo motion as part of your preflight check. It is very important to make sure linkages are free-moving with no binding.

Remember, when in the programming mode:

Full Throttle = Stick Up
Idle = Stick Down

5. The default settings (from the package) for your E-flite 30-Amp Pro ESC are as follows:

- Voltage cutoff set at 74%
- Brake set to Off
- Timing set at 15 degrees
- Throttle Input Range set at 1.2ms to 1.8ms
- Start-up Rate (Acceleration Delay) set at 0.25 seconds
- PWM Frequency set at 8KHz
- Operating Mode set to normal (airplane)

Entering the Programming Mode

1. With the battery disconnected from the controller, and the transmitter turned on, first move the throttle stick to full throttle (>1.7ms) position. Leave it in this position and then connect the battery to the controller.
2. Wait for 5 seconds, and the ESC will give two sets of fast ringing tones to indicate you have successfully entered the programming mode.
3. Once you hear these tones, move the stick to center (between 1.4 and 1.7ms) for 5 seconds, and the controller will beep 1 time, indicating you are now in Menu 1.
4. The controller will now wait 5 seconds for you to make your selection; your programming options are either full throttle (>1.7ms) or idle (<1.3ms).
5. When you have made a valid selection, the control will beep once with a lower tone, and you can move the stick back to center for the next menu item (2 beeps, 3 beeps and so on). If you do not make a selection within 5 seconds, the controller will move to the next menu item.

6. If you want to make changes in the programming menus (see specific instructions below) move the throttle stick to full throttle (>1.7ms) position. You will have 5 seconds to make your selection.
7. If you want to advance to the next menu, allow the programming to skip to the next menu after the 5 seconds have expired.

Programming Menu 1 – Voltage Cutoff

Use this option to set the voltage at which the controller will shut down the motor to prevent damage to your battery when it reaches the cutoff voltage. You will know your battery pack has reached auto cutoff when you hear the motor “pulse” repeatedly.

1. Move the throttle stick to full throttle (>1.7ms) position to make changes to the voltage cutoff programming.
 - a. To select 3-cell low voltage cutoff – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select 4-cell low voltage cutoff – You will hear 4 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - c. To select 5-cell low voltage cutoff – You will hear 5 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - d. To select 6-cell low voltage cutoff – You will hear 6 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - e. To select 74% cutoff – You will hear 7 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

IMPORTANT NOTE ABOUT 74% CUTOFF: This option will activate the soft cutoff at 74% of startup voltage or 9.2V, whichever is higher. For example, if your pack measures 16.8 volts at startup, then the soft cut will occur at 12.4 volts. The 74% cutoff option will check the startup voltage every time you plug the battery into the controller, so beware of using partially charged packs, as the system cannot protect your Li-Po batteries if you are using the 74% cutoff and connect a partially charged pack. You will know your battery pack has reached soft auto cutoff when you hear the motor “pulse” repeatedly. We recommend you land your model as soon as you hear the motor pulse (indicating the pack voltage has dropped to the cutoff voltage level) to prevent over-discharge of the Li-Po battery pack, and to prevent sudden power loss.

Programming Menu 2 – Brake Type

The default setting is Brake Off. This option gives you the choice to have the ESC stop the propeller during flight (Brake On) or allow it to windmill (Brake Off). Use the Brake On options for folding propellers.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 2 times, indicating you are now in Menu 2.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Brake Type programming.
 - a. To select No Brake/Brake Off – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select Soft Brake – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - c. To select Medium Brake – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - d. To select Hard Brake – You will hear 4 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

Programming Menu 3 – Timing

The default setting is 15 degrees. As a general rule, lower pole count motors use lower timing and higher pole count motors use higher timing. Please refer to your motor instructions and specifications for an indication of the number of poles.

LowTimingAdvance

Timing Degrees – 5 & 10
 Motor Poles – 2 to 4
 Expected Performance – Good balance of power and efficiency
 Motor Poles – 6 or more
 Expected Performance – Best efficiency and run time (lowest power)

StandardTimingAdvance

Timing Degrees – 15 & 20
 Motor Poles – 6 to 12
 Expected Performance – Good balance of power and efficiency
 Motor Poles – 14 or more
 Expected Performance – Best efficiency and run time (lowest power)

HighTimingAdvance

Timing Degrees – 25
 Motor Poles – 12
 Expected Performance – Highest power, less efficiency
 Motor Poles – 14 or more
 Expected Performance – Good balance of power and efficiency

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 3 times, indicating you are now in Menu 3.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Timing programming.
 - a. To select 5 Degrees – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select 10 Degrees – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.

- c. To select 15 Degrees – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
- d. To select 20 Degrees – You will hear 4 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
- e. To select 25 Degrees – You will hear 5 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

Programming Menu 4 – Throttle Input Range (PWM)

The default setting is 1.2ms to 1.8ms and should work with most radio systems. This option allows for proper throttle input with many different radio systems. However, some radios have a wider output range, and may give a more linear response with the 1.1ms to 1.9ms range. If you feel there is too much “dead” area in the stick movement near full throttle, try adjusting the end points in your radio, or change to the wider input range. Be aware that if these settings are not correct, it may be impossible to arm the controller.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 4 times, indicating you are now in Menu 4.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Throttle Input Range programming.
 - a. To select 1.2ms to 1.8ms – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select 1.1ms to 1.9ms – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

Programming Menu 5 – Start-Up Rate

The default setting is 0.25 seconds. The start-up rate is the time it takes to reach maximum motor speed. Changing the setting to 1 second can be useful with power-fragile gear boxes.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 5 times, indicating you are now in Menu 3.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Start-up Rate programming.
 - a. To select .25 second – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select 1 second – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

Programming Menu 6 – PWM Switching Frequency

The default setting is 8KHz, which should be acceptable for most motors. If you have a low or very low inductance motor and know you need to use a higher PWM Frequency (refer to the manual included with the motor), then you can change the setting. Otherwise, we recommend leaving the default setting.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 6 times, indicating you are now in Menu 6.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the PWM Switching Frequency programming.
 - a. To select 8KHz PWM Frequency – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select 16KHz PWM Frequency – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program

selection or leave in full throttle for 5 seconds to advance to the next selection.

- c. To select 32KHz PWM Frequency – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

Programming Menu 7 – Operating Mode

The default setting is set to Normal (airplane) Mode, which is limited to a start-up rate of 0.25 or 1 second. Alternatively, the Heli Mode can be selected which reduces the start-up rate to 5 seconds for the first start-up and any start-up after the motor/ESC has been stopped for more than 5 seconds. This helps to prevent damaging the motor, gears or any other components from an abrupt start-up when none of the parts are moving. Any time the motor/ESC has been stopped for less than 5 seconds in Heli Mode, the start-up will be immediate. This allows power to be applied immediately, such as when aborting an auto-rotation attempt or for any other reason, to help prevent a crash. Remember, you must wait more than 5 seconds after stopping the motor/ESC in order for the 5-second start-up to occur again.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 7 times, indicating you are now in Menu 7.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Operating Mode programming.
 - a. To select Normal Mode – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
 - b. To select Heli Mode – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

Troubleshooting

The controller will beep more quietly than normal if the input voltage is below the cutoff voltage when the battery is connected. Check the voltage of the battery pack to see if it is correct (charged), or the programmed cutoff setting if the input voltage is set incorrectly for the voltage of the pack being used.

If you have trouble arming the controller (and the throttle trim has been set to minimum), enter the programming mode and try changing the setting to 1.1ms–1.9ms in Programming Menu 4 to see if it helps correct the problem. If it is a computer radio, you may alternatively increase high and low throttle ATV (endpoint) percentages.

Note: *Increasing the high ATV will not have a consequence on arming issues, only low ATV.*

Some transmitters, including all Futaba transmitters, will require the throttle channel to be “reversed” for proper operation.

Replacement Parts

Make sure that you keep your T-28D Trojan BNF flying. Replacement parts are available at your local hobby shop or from Horizon Hobby (www.horizonhobby.com). Please try your local hobby shop first. By supporting them, they will be there when you need them.

Item #:	Description:
PKZ1011	Prop Adapter: T-28D
PKZ1012	Propeller: T-28D
PKZ1031	11.1V 1800mAh Li-Po Battery
PKZ1040	Variable Rate 2- to 3-cell DC Powered Balancing Li-Po Charger
PKZ1060	SV120 Servo (short lead): T-28D Elevator
PKZ1063	Servo Y-Harness: T-28D/3D2
PKZ1064	Metal Gear Set: DSV130M
PKZ1081	SV80 Servo (long lead): T-28D Ailerons
PKZ1090	DSV130M Servo (short lead): T-28D Rudder
PKZ4406	Main Landing Gear: T-28D
PKZ4407	Nose Gear Set: T-28D
PKZ4416	480 Outrunner Brushless Motor: T-28D
PKZ4418	Motor Mount
PKZ4422	Pushrods w/Clevis: T-28D
PKZ5003	Decal Sheet: T-28D
PKZ5013	Clear Canopy & Painted Pilot w/Pedestal: T-28D
PKZ5020	Painted Wing (No Servo): T-28D
PKZ5025	Horizontal Tail w/Accessories: T-28D
PKZ5026	Cowl: T-28D
PKZ5067	Painted Bare Fuselage: T-28D
EFLA1030	30-Amp Pro Switch-Mode BEC Brushless ESC

Optional Parts

Item #:	Description:
PKZ1030	11.1V 2200mAh Li-Po Battery
SPMR5500	DX5e Mode 2 Full Range Transmitter
SPMR6600	DX6i Mode 2 Full Range Transmitter

Warranty Period

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warranties that the Products purchased (the “Product”) will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

Limited Warranty

(a) This warranty is limited to the original Purchaser (“Purchaser”) and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER’S INTENDED USE.

(c) Purchaser Remedy- Horizon’s sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser’s exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

Damage Limits

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

Safety Precautions

This is a sophisticated hobby Product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the Product or other property. This Product is not intended for use by children without direct adult supervision. The Product manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or injury.

Questions, Assistance, and Repairs

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please direct your email to productsupport@horizonhobby.com, or call 877.504.0233 toll free to speak to a service technician.

Inspection or Repairs

If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. A Service Repair Request is available at www.horizonhobby.com on the “Support” tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

Warranty Inspection and Repairs

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

Non-Warranty Repairs

Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly. Please note: non-warranty repair is only available on electronics and model engines.

United States

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822
USA

All other Products requiring warranty inspection or repair should be shipped to the following address:

Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822
USA

Please call 877-504-0233 or e-mail us at productsupport@horizonhobby.com with any questions or concerns regarding this product or warranty.

United Kingdom

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Hobby UK
Units 1-4 Ployters Rd
Staple Tye
Harlow, Essex
CM18 7NS
United Kingdom

Please call +44 (0) 1279 641 097 or e-mail us at sales@horizonhobby.co.uk with any questions or concerns regarding this product or warranty.

Germany

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Technischer Service
Hamburger Strasse 10
25335 Elmshorn
Germany

Please call +49 4121 46199 66 or e-mail us at service@horizonhobby.de with any questions or concerns regarding this product or warranty.

Compliance Information for the European Union

Instructions for Disposal of WEEE by Users in the European Union



This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



Declaration of Conformity

(in accordance with ISO/IEC 17050-1)

No. HH20090520

Product(s): PKZ T-28D BL BNF

Item Number(s): PKZ5000

Equipment class: 1

The object of declaration described above is in conformity with the requirements of the specifications listed below, following the provisions of the European R&TTE directive 1999/5/EC:

EN 301 489-1, 301 489-17

General EMC requirements for Radio equipment

Signed for and on behalf of:
Horizon Hobby, Inc.
Champaign, IL USA
May 20, 2009

Steven A. Hall
Vice President International Operations
and Risk Management
Horizon Hobby, Inc. Warranty Inspection and Repairs

