



# Optim

300 CP

## Instruction Manual



## Specifications

Length:	20.25 in (514 mm)
Height:	7.25 in (184 mm)
Main Rotor Diameter:	22 in (588.8 mm)
Weight with Battery:	4.8 oz (135g)
Main Motor:	4200 KV brushless motor (installed)
Battery:	3S 11.1V 1350 mAh 30c LiPo battery (included)
Transmitter:	8-channel 2.4GHz (included)
On-Board Electronics:	25A brushless ESC , Flybarless unit w/Aegis Natural Flight Progression (NFP) software and 6-axis Flight Stabilization System (FSS), 2.4GHz receiver, 7.5 gram digital servos

# Table of Contents

Specifications .....	1
Introduction .....	3
Safety Precautions .....	4
General Precautions .....	4
FCC Information .....	5
Optim 300 CP Contents .....	5
Needed to Complete .....	6
LiPo Battery Warnings .....	6
Charging LiPo Battery.....	8
Flight Battery Installation .....	9
Binding Procedure RTF .....	10
Alternate Radio Installation .....	10
Transmitter Details .....	13
Natural Flight Progression .....	14
Dual Rate Switch .....	14
Stability Control Switch .....	15
Idle Up Switch (Stunt) .....	15
Throttle Hold Switch .....	15
Throttle Curve Knob .....	16
Invert Switch .....	16
Tail Gain Knob .....	16
Flight Controls .....	17
Set Up Menu.....	18
Manual Trim Locks .....	19
Trimming for 3-Axis Mode .....	19
Setting Pitch .....	19
Vibration and 6-Axis Drift .....	20
Parameter Menu .....	20
Tuning Cyclic in 3-Axis .....	22
Fine Tuning Rudder.....	23
Flight Progression .....	24
Post Crash Inspection .....	26
Trouble Shooting Guide .....	27
Exploded View .....	28
Parts Legend .....	29
Upgrade Parts List .....	31
Warranty Information .....	32

# Introduction

The Ares Advantage Optim 300 CP is the first RC helicopter in its size and class to assist pilots looking to progress from sport flying to 3D. The Aegis Natural Flight Progression (NFP) technology in the Optim 300 CP combines a state-of-the-art 6-axis sensor system with groundbreaking control software to create a RC heli training tool unlike any other. If you're new to CP flight, your first step is to fly using the advanced 6-axis Flight Stabilization System (FSS) on the Optim 300 CP that allows you to fly basic sport maneuvers. All you have to do if you happen to get into trouble is let go of the sticks and the 300 CP will right itself and assist you in avoiding any potential crashes. When you're ready to test your skills with 3D flight, the flip of a switch puts you in 3-axis agility mode. Pair this with the high-performance capabilities of the 300 CP heli, and you will be able to execute just about any 3D flight maneuver you can imagine. Better yet, if you lose control, flipping the switch back to the 6-axis Flight Stabilization System (FSS) automatically stabilizes the heli and helps you regain control and avoid a crash!

Learning to fly inverted is the first big step to 3D flight and the Optim 300 CP makes taking the step to inverted flight easier than ever. The transmitter features a switch that, when turned on while in 6-axis FSS mode, automatically flips the Optim to stable inverted flight. While in stable inverted flight, you can familiarize yourself with how the heli responds differently to your controls with the assurance of knowing that all you need to do if you lose control is let go of the sticks and the Natural Flight Progression (NFP) technology assists you in going back to a stable inverted hover. And when you want to return to flying right side up again, it's as easy as another flip of the switch!

The Ares Advantage Optim 300 CP RTF comes with a 100% pre-assembled airframe, an 8-channel 2.4GHz transmitter, an 11.1V 1350mAh 30c LiPo battery, an 800mA DC charger with an AC adapter, and even the AA batteries to power up your transmitter. With nothing extra to buy to get in the air, you'll be on your way to advancing your flying skills with the Ares Advantage Optim 300 CP within minutes of opening the box!

# Safety Precautions

Failure to use this product in the intended manner as described in the following instruction can result in damage and/or personal injury. A Radio Controlled (RC) airplane/helicopter/quadcopter is not a toy! If misused it can cause serious bodily harm and damage to property.

Keep items that could become entangled in the rotor blades away from the rotor blades, including loose clothing, tools, etc. Be especially sure to keep your hands, face and other parts of your body away from the rotor blades. As the user of this product you are solely and wholly responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

This model is controlled by a radio signal that is subject to possible interference from a variety of sources outside your control. This interference can cause momentary loss of control so it is advisable to always keep a safe distance from objects and people in all directions around your model as this will help to avoid collisions and/or injury.

## General Precautions

- Never operate your model if the voltage of the batteries in the transmitter is too low.
- Always operate your model in an open area away from obstacles, people, vehicles, buildings, etc.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable batteries, etc.).
- Keep all chemicals, small parts and all electronic components out of the reach of children.
- Moisture causes damage to electronic components. Avoid water exposure to all electronic components, parts, etc. not specifically designed and protected for use in water.
- Never lick or place any portion of the model in your mouth as it could cause serious injury or even death.

## FCC Information

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

The associated regulatory agencies of the following countries recognize the noted certifications for this product as authorized for sale and use: USA

## Optim 300 CP Contents

Item	Description
Not Available Separately .....	Optim 300 CP RTF Airframe
AZSZ2302.....	Optim 300 CP RFR (Ready-For-Receiver) Heli
AZSZ2381 .....	MP8H 8-Channel Helicopter Transmitter, Mode 2
Not Available Separately .....	AA Batteries (4pcs)
AZSZ2384 .....	800mA,3S,11.1V, DC Charger w/ AC adaptor
AZSZ2373.....	1350mah, 30C,3S,11.1V LiPo Battery
AZSZ2329 .....	Main Rotor Blade Set
AZSZ2339 .....	Tail Blade Set



## **Needed to Complete**

***The Optima 300 CP RTF includes everything needed to fly right out of the box. There's nothing extra to buy or provide!***

## **LiPo Battery Warnings**

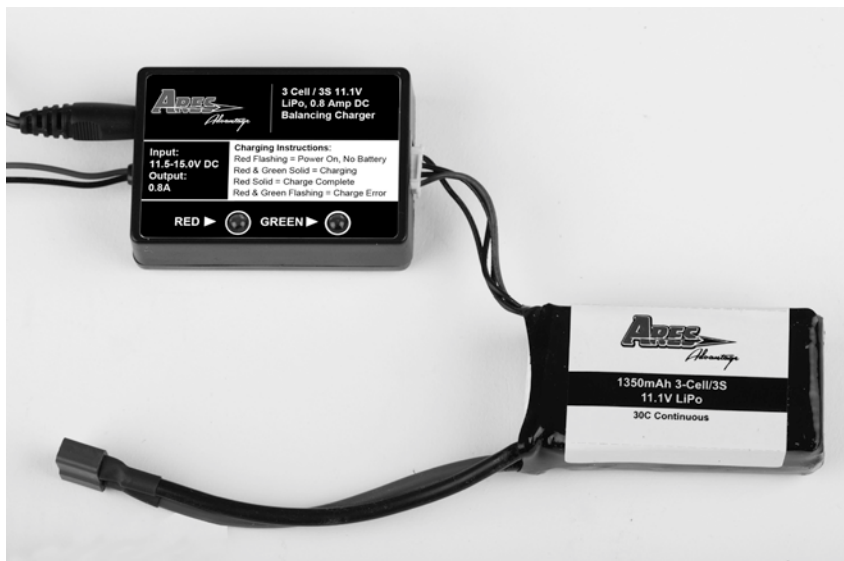
**IMPORTANT NOTE:** Lithium Polymer batteries are significantly more volatile than the alkaline, NiCd or NiMH batteries also used in RC applications. All instructions and warnings must be followed exactly to prevent property damage and/or personal injury as mishandling of LiPo batteries can result in fire. By handling, charging or using the included LiPo battery you assume all risks associated with LiPo batteries. If you do not agree with these conditions please return the complete product in new, unused condition to the place of purchase immediately.

- You **MUST** charge the LiPo battery in a safe area away from flammable materials.
- **NEVER** charge the LiPo battery unattended at any time. When charging the battery you should **ALWAYS** remain in constant observation to monitor the charging process and react immediately to any potential problems that may occur.
- After flying/discharging the battery you must allow it to cool to ambient/room temperature before recharging.
- To charge the LiPo battery you **MUST** use only the included LiPo balance charger. Failure to do so may result in a fire causing property damage and/or personal injury. **DO NOT use a NiCd or NiMH charger.**
- If at any time during the charge or discharge process the battery begins to balloon or swell, discontinue charging or discharging immediately. Quickly and safely disconnect the battery, then place it in a safe, open area away from flammable materials to observe for at least 15 minutes. Continuing to charge or discharge a battery that has begun to balloon or swell can result in a fire. A battery that has ballooned or swollen even a small amount must be removed from service completely.
- Store the battery at room temperature, approximately 68–77° Fahrenheit (F), and in a dry area for best results.
- When transporting or temporarily storing the battery, the temperature range should be from approximately 40–100°F. Do not store the battery or model in a hot garage, car or direct sunlight whenever possible. **If stored in a hot garage or car the battery can be damaged or even catch fire!**
- Do not over-discharge the LiPo battery. Discharging the LiPo battery too low can cause damage to the battery resulting in reduced power, flight duration or failure of the battery entirely. LiPo cells should not be discharged to below 3.0V each under load.

- In the case of the 3-Cell/1S 11.1V LiPo battery used to power the Optim 300 CP, you will not want to allow the battery to fall below 9.0V during flight.
- The ESC unit has low voltage cutoff (LVC) protection. However it is not recommended to run the batteries down to this level on a regular basis.

## Charging LiPo Battery

You **MUST** charge the included 1350mAh 3-Cell/3S 11.1V 30C LiPo Battery (AZSZ2373) using the included 800mA Charger w/AC adapter (AZSZ2384) or a suitably compatible LiPo battery charger. Charging the LiPo battery using a non-LiPo battery compatible charger (such as a NiCd or NiMH battery charger), or even a different LiPo battery charger with the incorrect settings, may result in damage to the battery or even fire resulting in property damage and/or personal injury.



To charge the flight battery, first plug the AC charge adapter into an AC outlet and then plug in the 800mA DC Balance Charger to the adapter. Plug the flight battery balance adapter into the balance charger. With the battery connected to the charger, both the red and green LED will light up. When the green LED goes out, leaving only the red LED lit, the charging is complete.



# Flight Battery Installation



Attach the battery to the airframe using the included hook and loop tape. Secure the battery with the the hook and loop strap. Once the battery is in place it can now be connected to the ESC battery plug.

After plugging the battery in, set the helicopter on a level surface and allow the control system to initialize. Do not move the helicopter during this time. This typically takes a 5-10 seconds, when complete the servos will do a series of movements and control from the transmitter is established.



# Binding Procedure RTF

*\*Please note, for your safety, we recommend unplugging two of the motor wires anytime you will be working on the helicopter.*

1. Press and hold the button on the FBL unit while plugging in the flight battery. At this point you should see the LED on the receiver start to blink rapidly.
2. With all the control switches set away from you turn on the transmitter and you should notice the LED on the receiver switch from blinking to solid.
3. After the LED on the receiver is solid your helicopter is bound. To check this, you must first unplug the flight battery, then plug it back in. After the flight battery is plugged back in, wait for the helicopter to initialize and move the cyclic stick insuring you have movement on the swash plate.

*\* If using a radio system other than the one included with the Optim 300CP RTF, Please refer to your radio systems manual for binding/linking instructions. The INP port on the FBL unit can be utilized to bind/link certain radio systems.*

## Alternate Radio Installation

You can fly your Optim 300 CP with radio systems from several manufacturers. These instructions will give you an overview of the steps required.

### **Instructions for use with Spektrum™ DSM2® or DSMX® Transmitter and Satellite Receiver**

To fly your Optim 300CP using a Spektrum compatible radio system, you will need a DSM2 or DSM-X compatible receiver and a Spektrum compatible transmitter in Helicopter mode with 6 channels or more. Connect the Spektrum DSM2 or DSMX receiver to the receiver port on the NFP control unit and secure it in an appropriate location on the airframe using double-sided adhesive.

Assign the channels on the transmitter as follows:

Channel 1: Throttle

Channel 2: Aileron

Channel 3: Elevator

Channel 4: Rudder

Channel 5: 6-axis stability ON/OFF switch

Channel 6: Pitch

Channel 7 (if available on transmitter): Norm/Inverted 6-axis switch

Channel 8 (if available on transmitter): Tail gain

If Channel 8 is not available, tail gain must be adjusted from Pot 3 on the FBL unit. If Channel 7 is not available, inverted 6-axis flight is not enabled.

If the transmitter has programmable pitch/throttle curves available, we recommend a linear throttle curve and a linear pitch curve in Normal mode and 100% throttle with a linear pitch curve in Idle up Mode.

The 6-axis stability On/Off switch should be set such that it outputs 100% when stability is turned on and -100% when stability is turned off.

The Norm/Inverted 6-axis switch should be set such that it outputs -100% when non-inverted flight is selected and 100% when inverted flight is selected.

Channel 8 should be set such that turning the knob from full counterclockwise to full clockwise (increasing gain) moves the output from -100% to 100%. If no knob/dial is available, the channel should be assigned a value of 0.

## **BINDING**

If you are using the DSM2 protocol, you will need to place a Spektrum Bind Plug on the Input connector on the flybarless control unit before binding. If you are using the DSM-X protocol, this is not necessary. To enter bind mode, with the transmitter powered off, press and hold the button on the FBL unit while plugging in the battery. The receiver will start to blink rapidly to indicate that it is in bind mode. Then, power

on the transmitter in bind mode. The LED indicator on the receiver should become solid to indicate a solid link. You can now remove the Bind Plug (if connected). You will need to unplug the battery and plug it back in to re-initialize the system.

You can also use another system to bind the receiver and transmitter and then install the already bound receiver into the helicopter.

## **Instructions for use with Futaba® Transmitter and S.BUS Receiver**

To fly your Optim 300CP with a Futaba radio system, you will need a programmable Futaba compatible transmitter in helicopter mode with 6 channels or more and a Futaba compatible S.BUS receiver with 6 channels or more. The Optim 300CP supports both S-FHSS and FASST radio protocols. You will also need an adapter to connect the receiver to the S.BUS receiver (**AZSZ2607**).

Connect the S.BUS adapter to the FBL unit using the AZSZ2607 S.BUS adapter cable. Make sure to use the correct polarity such that the brown GROUND wire on the adapter connects to the GROUND pin on the S.BUS adapter. **DO NOT connect the servo outputs on the S.BUS receiver to the FBL unit**, as doing so may damage the devices and will cause the helicopter to function incorrectly.

Channel 1: Aileron

Channel 2: Elevator

Channel 3: Throttle

Channel 4: Rudder

Channel 5: 6-axis stability ON/OFF switch

Channel 6: Pitch

Channel 7 (if available on transmitter): Norm/Inverted 6-axis switch

Channel 8 (if available on transmitter): Tail gain

Channels 1-7 should be normal and channel 8 should be reversed.

We recommend a -100 to 100 setting for channels 5, 7 and 8.

If channel 8 is not available, tail gain will be set to default. If channel 7 is not available, inverted 6-axis flight is not enabled.

If the transmitter has programmable pitch/throttle curves available, we

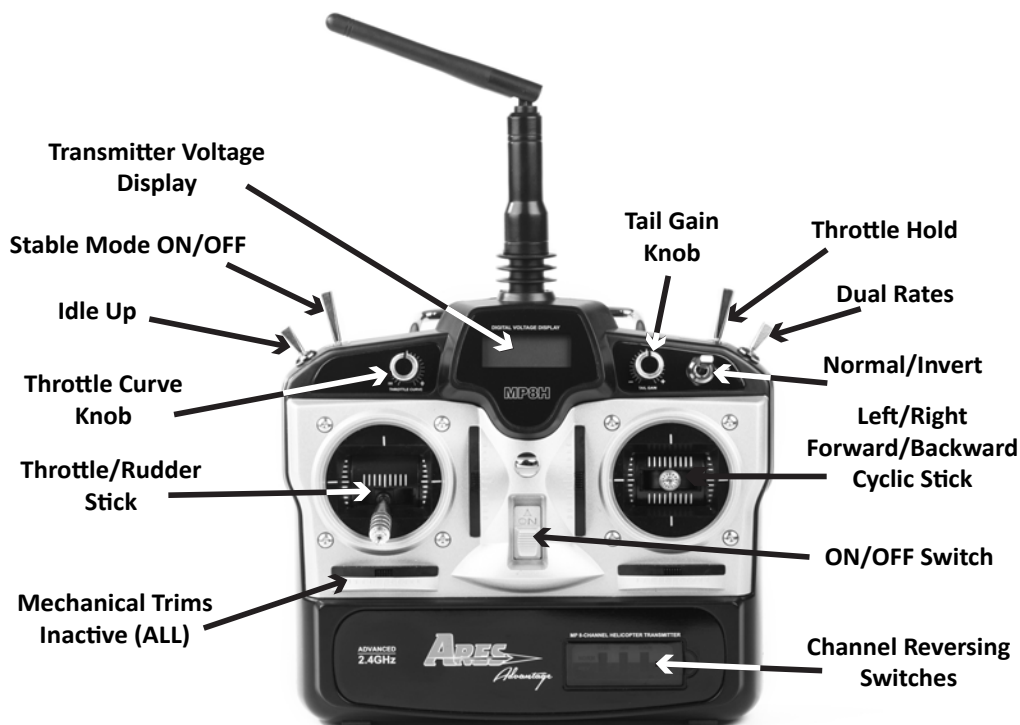
recommend a linear throttle curve in Normal mode and 100% throttle with a linear pitch curve in Idle up Mode.

The 6-axis stability On/Off switch should be set such that it outputs 100% when stability is turned on, and -100% when stability is turned off.

The Norm/Inverted 6-axis switch should be set such that it outputs 100% when non-inverted flight is selected and -100% when inverted flight is selected.

Channel 8 should be set such that turning the knob from full counterclockwise to full clockwise moves the output from -100% to 100%. If no knob/dial is available, the channel should be assigned a value of 0.

## Transmitter Details



# Natural Flight Progression

The Optim 300 CP offers two flight modes that enable pilots with varying degrees of experience to enjoy CP helicopter flight. The first mode is Stable Mode, which the pilot can turn on by setting the switch on the transmitter labeled “Stable Mode” to the “ON” position.

In Stable Mode (6-Axis), the helicopter flies like a high performance traditional CP helicopter, except that there is a stabilizing force which pulls it toward a neutral hover. As the helicopter moves further from neutral, this restoring or stabilizing force increases. Thus the helicopter can not become inverted when Stable Mode is active. When the cyclic stick is released, the helicopter quickly returns to neutral, making stable mode excellent for low-time pilots who are not entirely comfortable with traditional CP flight. The helicopter flies and feels like a CP, but it returns to a stable configuration when the sticks are released, thus making it easier to avoid crashes.

Stable Mode functions in both normal and inverted flight. It is turned off by moving the switch on the transmitter to the back, or “OFF” position. When in “OFF”, the stabilization software is disabled and the helicopter responds quickly and nimbly to the pilot’s input. In this mode the helicopter does NOT return to neutral when the cyclic stick is released. If the pilot loses control in this mode, they can simply flip the Stable Mode switch on the transmitter back to the “ON” position, to help regain control of the helicopter.

If stability mode is activated when the helicopter is inverted, the helicopter will return to upright stabilized flight.

## Dual Rate Switch

The DUAL RATE switch adjusts the control sensitivity of the aileron/elevator channels. We recommend that you start in low rates for your initial flights in stabilized mode and progress to high rates for 3D stunt flying.



# Stability Control Switch

To put the helicopter into stable mode (6-axis), locate the Stable Mode Switch on the top left of the transmitter and flip it to the ON position. In this mode, the pilot will experience stable yet agile flight with the helicopter returning to level flight when the cyclic stick is returned to neutral.



# Idle Up Switch (Stunt)

The Idle Up switch (Stunt/Normal) is used to set the throttle to full power independent of the position of the throttle stick. When in idle up any throttle stick movement above mid point engages positive pitch on the main rotor, any stick movement below mid stick produces negative pitch on the main rotor allowing you to fly inverted. For 3D flight, Idle Up should be engaged once you have taken off in Normal mode and established a stable hover. **Use caution, engaging Idle Up brings the main rotor to full power!**



# Throttle Hold Switch

The Throttle Hold switch will shut the motor off in either normal or idle up mode and should be engaged if a crash is anticipated to minimize damage. It can also be used if you are working on the helicopter while it is powered up to prevent possible injury from the rotor.





## Throttle Curve Knob

The throttle curve can be adjusted when the helicopter is in normal mode. As the throttle curve is increased the throttle input will be more responsive and the head speed will be raised. We recommend that low time pilots keep the throttle curve near the middle until they become familiar with the helicopter.



## Invert Switch



The Invert Switch must only be used in Idle Up (Stunt) mode when in 6-axis stability mode. When switched ON the helicopter will automatically flip to inverted stabilized flight allowing the pilot to gain experience in learning the flight controls when in inverted flight. Please note that when the helicopter flips to inverted the pilot will need to apply some additional negative pitch to maintain the inverted hover. A flip of the switch to OFF will flip the helicopter back into stabilized normal flight.

## Tail Gain Knob

Tail gain is pre-set at the factory. It may need slight adjustment to suit your flying style. To set the gain, put the helicopter into a stable hover and increase the gain until a slight wag in the tail is evident. Back the gain down until the wag is gone.

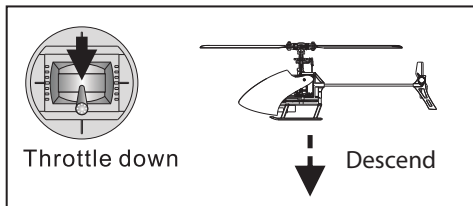
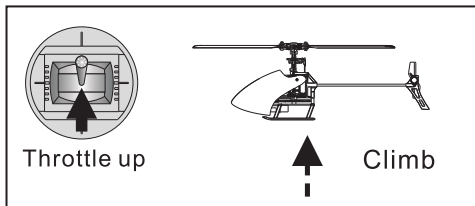




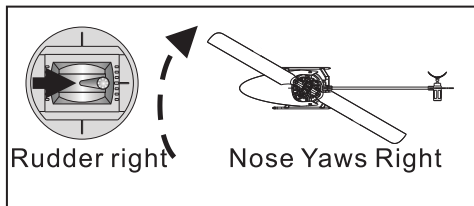
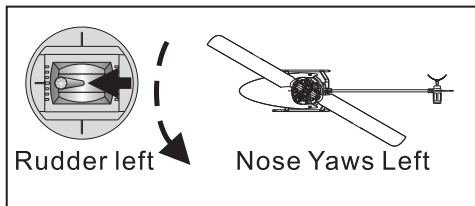
# Flight Controls

If you are unfamiliar with the flight controls on you Optim 300 CP please review them in the illustrations below.

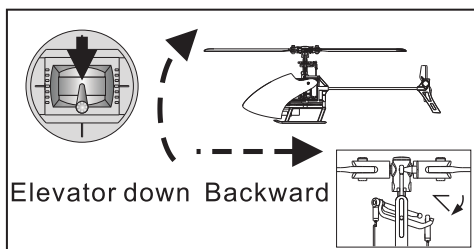
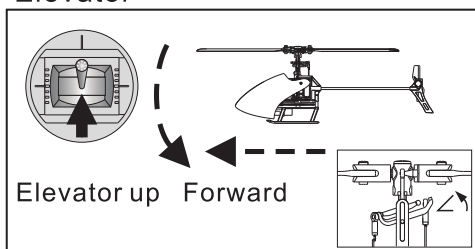
## Throttle



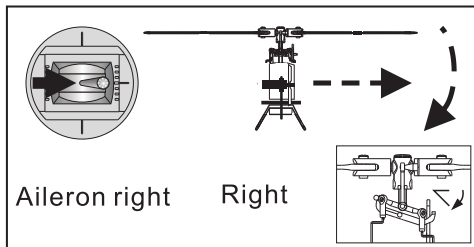
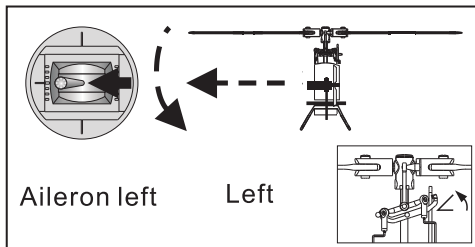
## Rudder



## Elevator



## Aileron



# Set Up Menu

Your Optim 300CP FBL unit has set up configuration utility to make servicing your helicopter and getting it back in the air faster. Anytime you service your helicopter you should verify that the swashplate is perfectly level when the transmitter is in 3-axis mode and the helicopter is not moving. If this is not the case you can use the setup menu to set the helicopter up correctly. Enter the setup configuration menu by powering on the transmitter, plugging in the battery and rapidly pressing and holding the button on the top of the FBL unit. Release the button, and you will be in the first step of the configuration menu.

## 1. Servo Centering

At this point, you will be able to move one of the cyclic servos up and down using the elevator stick. Once the elevator is centered such that the arm is horizontal, you can move to the next servo using the rudder stick. You will see a servo twitch to indicate which servo is currently being adjusted. Once again, you can adjust the servo center using the elevator stick until the servo arm is horizontal. Repeat for all servos and then press the button on the FBL unit to save your settings and move to the next configuration step.

## 2. Swashplate Leveling

To level the swashplate, use the elevator and aileron input to move the swashplate to a perfectly level position. Then, press the button on the FBL unit to save your setting and advance to the next step.

## 3. Tail Servo Centering

The third stage in the configuration menu is tail servo centering. In this stage, the tail servo will be set to a neutral position. Adjust the servo horn so that the tail pushrod ball is directly above the servo. Then, adjust the tail pushrod until the tail slider is in the middle of the tail shaft, with equal amounts of shaft visible on each side of the slider. When ready, press the FBL unit button to advance to the next step.

## 4. 6-Axis Calibration

During 6-axis calibration mode, place the helicopter on a flat level surface. Then, leave the helicopter still for 15 seconds. The LEDs will illuminate to show progress. If the helicopter is disturbed during this process, calibration will start over. Once calibration is complete, the LEDs will all blink simultaneously, and configuration will be complete. Unplug the battery and plug it back in to begin flying.

# Manual Trim Locks

Your transmitter comes with trim locks installed to disable trimming. For high performance CP helicopters like the Optim 300 CP, if any trimming is required in 3-axis flight, it should be performed mechanically by adjusting the swashplate. For stabilized flight, trimming is performed using the FBL unit's user interface. Therefore, the trim locks should not be removed from the transmitter for any reason.

## Trimming for 3-Axis Mode

In 3-axis mode, the swashplate should be perfectly level when the cyclic controls are neutral and the helicopter is not moving. If the swashplate for some reason is far away from this setting, then the FBL system's configuration menu (see appropriate section of the manual) can be used to reset the swashplate position. Minor adjustments can be made by adjusting the lengths of the swashplate pushrods.

- If the helicopter tends to move forward in 3-axis flight, the front pushrods should be lengthened and the back pushrod should be shortened equal amounts to adjust the swashplate backward.
- If the helicopter tends to move backward in 3-axis flight, the front pushrods should be shortened and the back pushrod should be extended equal amounts to adjust the swashplate forward.
- If the helicopter tends to move left in 3-axis flight, the left servo pushrod should be extended and the right pushrod should be shortened an equal amount to adjust the swashplate right.
- If the helicopter tends to move right in 3-axis flight, the right servo pushrod should be extended and the left pushrod should be shortened an equal amount to adjust the swashplate left.

## Setting Pitch

It is important to have the pitch of the blades set to neutral when the throttle stick on the transmitter is at 50%. To adjust this setting, first flip the **Throttle Hold** switch on the transmitter to **ON**, then flip the **Idle Up** switch to **Stunt**. Then, raise the **Throttle Stick** to **50%** and measure blade pitch. If the blade pitch is not 0 at this point, extend or shorten the pitch adjust push rods as necessary to achieve 0 degree pitch on both blades.

# Vibration and 6-Axis Drift

In any helicopter, it is critical to reduce vibration as much as possible. The 6-axis NFP flybarless unit is attached to the helicopter using a revolutionary vibration isolation pad, which significantly reduces the vibration of the control unit. The NFP flybarless unit also features sophisticated vibration suppression software that reduces the effect of vibration to improve performance.

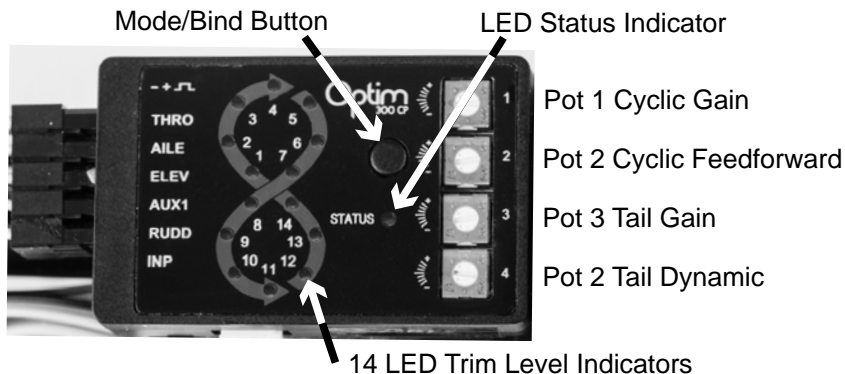
If the helicopter is damaged in any way, vibrations may increase enough to degrade helicopter performance. In 3-axis mode, this is typically characterized by visible shakes in the helicopter. In 6-axis mode, the helicopter may become unable to correctly detect its orientation and begin to drift very fast or may even become impossible to fly. Therefore, it is absolutely critical to carefully inspect your helicopter after even a minor crash. Damage such as scuffed main blades or tail blades, bent feathering, main, or tail shafts, chipped gears are anything similar can be sufficient to degrade 6-axis performance. Improper blade tracking, wherein the two main blades are misaligned and do not rotate through the same plane, can cause degradation in 6-axis performance. Therefore, care must be taken to precisely track blades before flight.

## Parameter Menu

The 300CP comes set up and ready for flight. If after your initial flight you want to make any trim or gain adjustments, follow these steps. With the helicopter on the ground and initialized, the throttle stick lowered all the way, and throttle hold activated, you can press and hold the button on the flybarless unit to enter the trim/gain menu. The trim/gain menu allows you to make changes and adjustments to improve your flight experience and includes the following features:

- |    |                      |    |                          |
|----|----------------------|----|--------------------------|
| 1. | 6-axis aileron trim  | 3. | 6-axis gain              |
| 2. | 6-axis elevator trim | 4. | Rudder heading lock gain |

You can progress through the modes by pressing the button on the face of the flybarless unit. The status LED will blink to indicate which menu item is currently active. There will be a series of blinks followed by a pause, after which the pattern will repeat. The number of blinks indicates the menu item.



## 1. 6-axis Aileron Trim

The Optim 300CP stabilized mode is designed to give the pilot maximum stability and minimize drift in wind-free conditions with cyclic inputs neutral. While there will always be some drift, if the helicopter tends to consistently move in one direction, a 6-axis trim mode is provided to reduce this drift. To adjust this trim, navigate the trim/gain menu until you are in aileron gain trim mode. Trim can be added by moving the aileron stick left or right in aileron trim mode. You will notice the number of illuminated LEDs decrease (left trim added) or increase (right trim added). A blinking LED indicates a half trim step. At the neutral trim setting, there will be 7 fully lit LEDs. Once you have made the desired change in aileron trim, press the button on the FBL unit again to save your settings and proceed to elevator trim mode.

## 2. 6-Axis Elevator Trim

When you enter the 6-axis elevator trim mode, you will see the status LED begin to blink to indicate that you have successfully advanced to this mode. You can now use the elevator stick to trim the helicopter. You will notice the number of illuminated LEDs decrease (back trim added) or increase (forward trim added). At the neutral trim setting, there will be 7 fully lit LEDs. When you have made your desired elevator trim adjustments, press the button on the FBL unit to save your settings and advance to 6-axis gain adjustment.

## 3. 6-Axis Gain Adjustment

You will see the status LED blinking pattern change to indicate that you have proceeded into 6-axis gain adjustment mode. You can increase 6-axis gain by moving the elevator stick forward or decrease it by moving it backward. You will see the LED display adjust accordingly. Adjustments in this mode are rarely necessary, as the neutral setting indicated by 7 fully lit LEDs performs well in nearly all cases. When you have made your desired

changes, press the button on the flybarless unit to progress to the heading lock gain mode.

#### **4. Heading-Lock Gain Mode**

When you enter the heading lock gain mode, you will see the status LED blinking pattern change to indicate that you have moved into this mode. Here, you will be able to adjust the heading lock gain. Moving the elevator stick upward will increase the gain, while moving it downward will decrease the gain. The LED display will reflect this change. When you have made the desired change, press the button on the flybarless unit again to save your settings and return to normal operation.

Heading lock affects how strongly the rudder will act to maintain the commanded position. This includes the scenario where the rudder stick is neutral, and the commanded speed is 0. With low heading lock gain, the tail may incur unwanted drift. With excessive heading lock gain, the tail will move back and forth or “hunt/wag”, and the tail will not stop crisply when commanded to do so. We recommend that the user sets this gain as high as possible without hunting or wagging.

Please note that heading lock is turned completely off when the heading lock gain is set to 0. We do not recommend flying in this mode, as the rudder will drift constantly. However, this mode can be used to correct the length of the tail servo pushrod.

To make this correction, set the heading lock gain to zero and hover the helicopter. Observe which direction the rudder drifts. Then, land the helicopter and shorten or lengthen the tail pushrod accordingly. Repeat this process until rudder drift is minimized. Once this is done, make sure to increase the heading lock gain before resuming normal flight.

## **Tuning Cyclic in 3-Axis**

### **Tuning Cyclic response for 3-Axis mode**

For a positive first flight experience in 3-axis mode, the Optim 300CP is shipped with conservative gain settings to ensure a stable and enjoyable hover. However, pilots may wish to adjust gains to suit their flying needs. There are two potentiometers provided for adjusting the performance of the elevator and aileron. First, Pot 1 on the FBL unit adjusts cyclic gain. Increasing this setting by turning the pot clockwise will make the helicopter respond more firmly to disturbances. If it is set too high, the helicopter may begin to shake or oscillate in flight. If this setting is too low, the helicopter

may respond slowly to disturbances and may not hold its orientation very stably. The pilot may feel that the helicopter is “loose” in this situation. The second potentiometer, Pot 2, is for adjusting the elevator and aileron for forward flight (feedforward). Increasing this setting by turning Pot 2 clockwise will increase the response of the helicopter to aileron and elevator inputs. If this setting is set too high, the helicopter might feel jumpy, and, if it is set too low, the helicopter may feel sluggish in its cyclic response.

## Fine Tuning Rudder

### Tuning Rudder for Optimal Performance

There are three adjustments possible for the rudder or tail. The first is tail gain, which can be adjusted either on the transmitter for radios with 8 or more channels or using Pot 3 when using transmitters with 7 or fewer channels. For example, on the provided 8-channel transmitter, tail gain can be increased by turning the tail gain knob clockwise. Increasing this gain will make the tail control stiffer. However, increasing the gain too much may cause the tail to oscillate or “hunt.”

The second tail adjustment is Tail Dynamic, which is changed using Pot 4. Turning this pot clockwise will increase tail dynamic. Increasing tail dynamic may improve tail acceleration and deceleration, helping the tail respond more rapidly to your input. However, increasing tail dynamic too much may cause a rapid vibration in the tail, which may damage the tail servo. In general, it is beneficial to use the lowest tail dynamic setting for which good tail performance can be achieved.

The third tail adjustment is heading lock gain, which is available in the parameter menu. See description on page 22 of this manual.

The flybarless unit should fly well out of the box, but additional fine-tuning may be desirable to achieve optimal performance. We recommend that the pilot increases tail gain until the tail starts to oscillate and then decreases it until the tail is steady. Then, tail dynamic can be added to make stops sharper. If the tail starts to oscillate quickly after a sharp stop, the tail dynamic is too high. Finally, the pilot can increase the heading lock gain until the tail starts to “hunt” back and forth, and then decrease it slightly. Oscillations caused by excessive tail dynamic are typically very fast, whereas oscillations caused by excessive gain are a little slower. Oscillations caused by excessive heading lock gain are typically more gentle. Note that these are only guidelines and are not always the same for each helicopter.

**Flying the Optim 300CP with incorrect gain settings may cause the helicopter to vibrate or oscillate, which may damage the servos and cause a crash. If your helicopter vibrates or oscillates, immediately land it and adjust gain settings to avoid servo failure.**

## Flight Progression

The Ares Optim 300 CP with NFP (Natural Flight Progression) technology is designed to assist you in progressing through and mastering the skills required to fly a 3D capable helicopter. By following these steps you will make the quickest progress with the least amount of down time and repair.

### **IMPORTANT NOTE:**

**The 4 initial flight steps are all flown with the Idle Up switch and the Invert switch in their NORMAL positions**

### **INITIAL UPRIGHT FLIGHT PROGRESSION**

1. We recommend that you begin in **Stabilized 6-axis Mode** and **LOW** rates. Fly in this mode until you are completely familiar with the helicopter and its handling and you are confident in your mastery of this level.
2. While remaining in **Stabilized 6-axis Mode**, switch the rates to **HIGH**. Continue flying in this mode until you are comfortable controlling the helicopter in this new more dynamic setting while still having the benefit of 6-axis stability.
3. Switch OFF **Stabilized 6-axis Mode** and return to **LOW** rates, you are now in **3-axis** (non-stabilized) flight. Continue to practice flying and learning to control the helicopter without the aid of stabilization but remember if you get in trouble just switch the stable mode back on to help avoid a crash. Fly in this configuration until you become comfortable flying the helicopter smoothly and under control.
4. Finally switch the rates to **HIGH** and leave the **Stabilized 6-axis Mode OFF**. You now have the maximum amount of performance that the helicopter is capable of in normal mode. Continue flying until you are perfectly comfortable controlling the helicopter. You are now ready to graduate to aerobatic helicopter flying in Idle Up mode.



### IMPORTANT NOTE:

During the aerobatic and inverted flight steps you will be turning the Idle Up switch to the STUNT position.

### WARNING!

Switching the Idle Up to STUNT brings the main rotor to full throttle independent of the throttle stick position.

### WARNING!

Always make sure that the INVERT switch is in normal mode before switching to Stable Mode  
**FAILURE TO DO THIS WILL LEAD TO THE HELICOPTER AUTOMATICALLY FLIPPING INVERTED AS SOON AS THE STABILITY MODE IS ENGAGED!**

## INITIAL INVERTED FLIGHT PROGRESSION

1. With the Invert switch in **NORMAL, Stabilized 6-axis Mode ON** and rates set to **LOW**, establish a stable hover. Once established, turn **Idle Up** to **STUNT**. Throttle will go to 100% and the throttle stick will now control the pitch of the main blades. Above half stick will be positive pitch and below half stick will be negative pitch. Practice flying in this mode until you are completely comfortable before proceeding.
2. The next step is to proceed as in step 1 but change the rates to **HIGH** while remaining in **Stabilized 6-axis Mode**. Continue flying in this mode until you are comfortable controlling the helicopter in this new more dynamic setting while still having the benefit of 6-axis stability.
3. For your first inverted flight establish a stable hover at least 30 feet above the ground with the Invert switch in **NORMAL, Stabilized 6-axis Mode ON** and rates set to **LOW**. When ready, flip the Invert switch to **INVERT** the helicopter will automatically rotate to a stabilized inverted configuration. ( **Please note that at this point negative collective must be applied to maintain altitude**) While inverted in this mode you still have the benefit

of 6-axis stabilization. You can now begin to learn the controls while inverted. If you become disoriented just flip the Invert switch back to **NORMAL** to return to stabilized upright flight. Continue to practice until you are totally comfortable with the controls of the helicopter while inverted.

4. Continue on to the final stabilized flight mode. Everything is the same as step 3 with the exception of switching to **HIGH** rates. Practice with the added level of control until you are comfortable.
5. Once you have mastered these flying modes you are ready to fly without the aid of 6-axis stability. As before, if you lose orientation or control you can switch the **Stability Mode** back **ON** to help avoid a crash.

## Post Crash Inspection

During the learning process some crashes are inevitable. It is critical to the flight performance of the helicopter that a thorough post crash inspection is carried out. Look for any broken or damaged parts. Not inspecting the helicopter after a crash will result in poor flight characteristics and possibly further damage to the helicopter. Although the whole helicopter should be examined, some of the more common parts to sustain damage in a crash are as follows:

- Main shaft
- Feathering shaft
- Servo
- Tail shaft
- Main gear
- Main Blades
- Landing gear
- Tail boom

***Please check out our videos!***

***Flying videos***

***Product set-up videos***

***Maintenance and Repair videos***

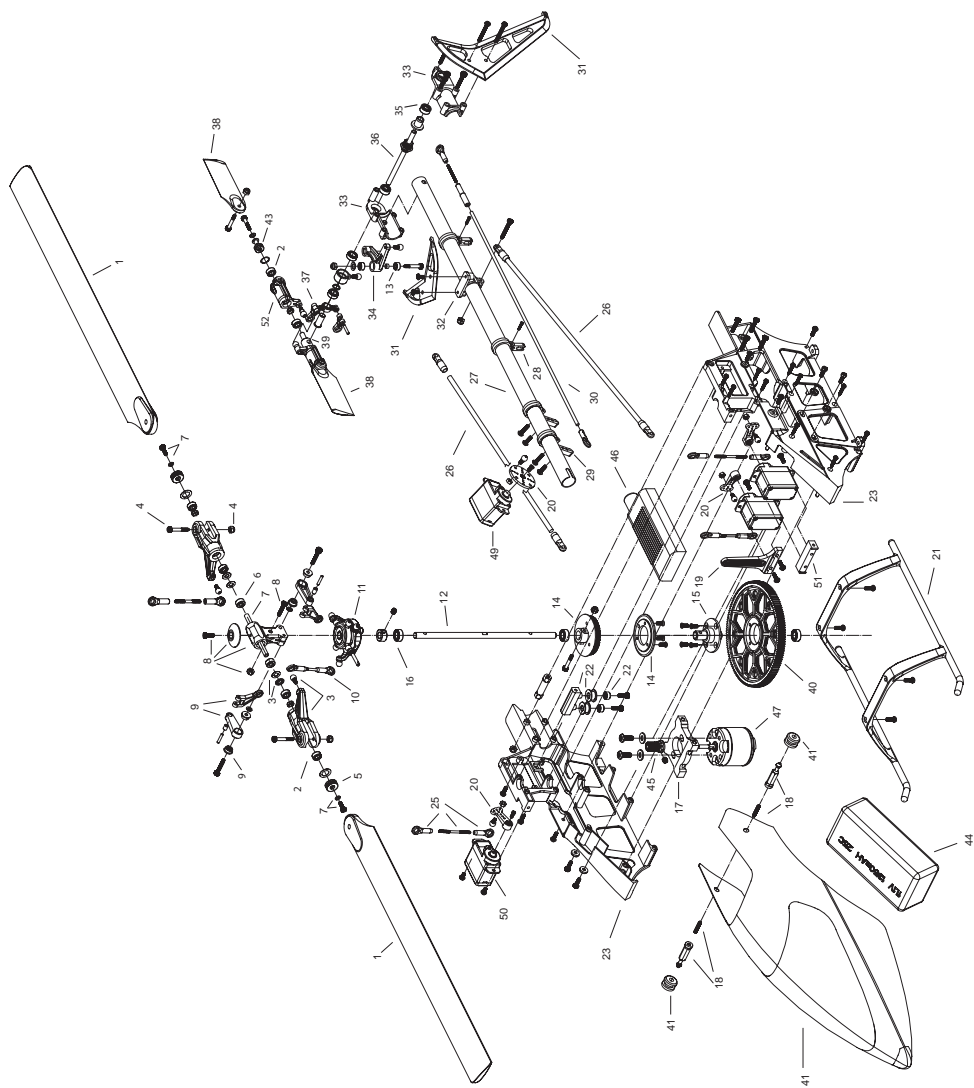
***[www.ares-rc.com](http://www.ares-rc.com)***

# Trouble Shooting Guide

## Optim 300 Troubleshooting Guide

Problem	Possible Cause	Solution
Helicopter not Responding to Transmitter	Helicopter not bound to transmitter	Bind helicopter to transmitter (see manual for instructions)
	Helicopter not initialized	The helicopter must not be moved for 7 seconds to initialize
Tail Wagging	Tail gain set too high	Reduce gain using tail gain control knob
Helicopter Vibration	Bent main shaft	Replace main shaft
	Bent feathering shaft	Replace feathering shaft
	Blades out of track	Track blades
	Bent tail shaft	Replace tail shaft
	Damaged tail hub	Replace tail hub
	Damaged blades	Replace blades
No Throttle Response	Throttle hold on	Turn throttle hold off
	Battery voltage too low	Charge battery
	Motor wires unplugged	Plug in motor wires
	Helicopter not initialized	Initialize helicopter
Helicopter Spins out of Control	Tail gain too low	Increase tail gain
	Tail drive belt too loose	Tighten tail drive belt
	Tail drive belt installed incorrectly	Check tail belt for proper installation
	Blades out of track	Track blades
Helicopter Shakes in Flight	Cyclic gain set too high	Reduce cyclic gain
	Head dampers worn out	Replace head dampers
	Bent main shaft	Replace main shaft
	Bent feathering shaft	Replace feathering shaft

# Exploded View



# Parts Legend

1	Main Blade Set	AZSZ2329
2	Bearing Set 3x6x2.2 (2)	AZSZ2340
3	Main Rotor Grip Set	AZSZ2327
4	Main Rotor Blade Screw/Nut Set	AZSZ2341
5	Main Grip Bearing Set (2)	AZSZ2342
6	Dampers (4)	AZSZ2343
7	Feathering Shaft (2)	AZSZ2344
8	Head Block	AZSZ2345
9	Follower Arms	AZSZ2346
10	Linkage Set	AZSZ2347
11	Swashplate	AZSZ2323
12	Main Shaft (2)	AZSZ2348
13	Bearing Set 2x5x2.5 (2)	AZSZ2349
14	Tail Drive gear (2)	AZSZ2350
15	Gear Hub	AZSZ2351
16	Bearing Set 4x8x3	AZSZ2352
17	Motor Mount Set	AZSZ2353
18	Canopy Mounts (2)	AZSZ2354
19	Anti-Rotation Bracket	AZSZ2355
20	Servo Arm Set	AZSZ2356
21	Landing Gear Set	AZSZ2334
22	Belt Guide Set	AZSZ2357
23	Main Frame Set	AZSZ2330
24	Tail drive Belt	AZSZ2358
25	Servo Push rod Set	AZSZ2359
26	Tail Boom Support Set	AZSZ2360
27	Tail Boom (2)	AZSZ2361

28	Tail push rod Guide Set	AZSZ2362
29	Tail Servo Mount	AZSZ2363
30	Tail pushrod (2)	AZSZ2364
31	Tail Stabilizer/fin set	AZSZ2338
32	Horizontal Fin Mount	AZSZ2365
33	Tail Case	AZSZ2366
34	Tail Rotor Pitch Arm Set	AZSZ2387
35	Bearing Set 3x7x3 (2)	AZSZ2367
36	Tail Rotor Shaft/Pulley (2)	AZSZ2368
37	Tail Pitch Control Slider	AZSZ2369
38	Tail Blade Set	AZSZ2339
39	Tail Hub	AZSZ2370
40	Main Gear (2)	AZSZ2319
41	Canopy	AZSZ2371
42	Complete Hardware set	AZSZ2331
43	Tail Thrust bearing Set 3x6x2.5(2)	AZSZ2388
44	1350,mah,30c,3s,11.1 Battery	AZSZ2373
45	Pinion Gear	AZSZ2374
46	25A Speed control	AZSZ2375
47	4200KV Brushless motor	AZSZ2376
48	Blade Holder	AZSZ2377
49	7.5g Digital Tail Servo	AZSZ2379T
50	7.5g Digital Cyclic Servo	AZSZ2378c
51	Servo Mount	AZSZ2380
52	Tail Blade Grip Set	AZSZ2337
	MP8H 8-Channel Helicopter Transmitter, Mode2	AZSZ2381
	Aegis FBL Unit	AZSZ2382
	800mA, 3S, 11.1V, DC Charger W/AC Adapter	AZSZ2384

# Upgrade Parts List

6 Channel, 2.4G, FHSS Receiver	AZSZ2386
Servo Gears/Cyclic	AZSZ2383C
Servo Gears/Tail	AZSZ2383T
Vibration Isolation Pad	AZSZ2385
Aluminum Swash Plate	AZSZ2323AL
Aluminum Main Rotor Blade Grip Set	AZSZ2327AL
Wood Main Blade Set	AZSZ2329W
Carbon Fiber Main Blade Set	AZSZ2329CF
Carbon Fiber Tail Stabilizer/Fin Set	AZSZ2338CF
Carbon Fiber Tail Blade Set	AZSZ2339CF
Aluminum Head Block	AZSZ2345AL
Aluminum Follower Arms	AZSZ2346AL
Aluminum Anti-Rotation Bracket	AZSZ2355AL
Aluminum tail Boom Support Set	AZSZ2360AL
Carbon Fiber Tail Boom	AZSZ2361CF
Aluminum Tail Rotor Pitch Arm Set	AZSZ2387AL
Aluminum Tail Servo Mount	AZSZ2363AL
Aluminum Horizontal Fin Mount	AZSZ2365AL
Aluminum Tail Case	AZSZ2366AL
Aluminum Tail Rotor Shaft/Pulley	AZSZ2368AL
Aluminum Tail Pitch Control Slider	AZSZ2369AL

Canopy/Black	AZSZ2371B
Canopy/Yellow	AZSZ2371Y
Futaba SBUS Adapter	AZSZ2389
Aluminum Tail Blade Grip	AZSZ2337AL
Mounting Access, Screwdriver & Wrench	AZSZ2399

## Warranty Information

### 30-Day Limited Warranty Term Period:

We warranty that the Product(s) purchased (the "Product") will be free from defects in materials and workmanship when the product is new (before being used) for the limited warranty term period, 30 days, from the date of purchase by the Purchaser.

If you believe a defect in material, workmanship, etc. was not apparent when the Product was new and only became evident after the Product was used, take the following steps. If you purchased the Product at a HobbyTown store, please contact your local HobbyTown store for warranty support and/or service. If you purchased the Product from the Firelands website, use the contact information found under the Support heading to contact Firelands directly.

If you contact Firelands, you may be asked to send the product to Firelands, at your cost, for inspection. Provided the warranty conditions have been met within the warranty term period, the components that are found to be defective, incorrectly manufactured or assembled may be repaired or replaced, at the sole discretion of Firelands. Your warranty item will be returned to you at Firelands' expense. In the event your product needs repair or a replacement part that is not covered by this warranty, your local HobbyTown store or Firelands can assist you with support and in obtaining the genuine replacement parts to repair your Product. Firelands will charge \$40.00 per hour plus the cost of replacement parts to service your vehicle if after contacting you, you so authorize such repairs. Your product will be returned to you at your expense.

If you purchased your Product from a HobbyTown Internet site not affiliated with a local store, please consult that site for its support and service policies. You can also find more information at:

[www.Hobbytown.com](http://www.Hobbytown.com)  
or by emailing [customerservice@firelandsgroup.com](mailto:customerservice@firelandsgroup.com)  
or call [800-205-6773](tel:800-205-6773)



## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

FCC ID: XUNSSTC-0002

Item Number:005734

SHEN zhen shen's TONGCHUANG Aeronautic Model CO., LTD

statement:This device complies with Part 15 of the FCC Rules. Operation is subject to the following twoconditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesiredoperation.

Warning: Changes or modifications to this unit not expressly approved by theparty responsible for compliance could void the user s authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radiofrequency energy and, if not installed and used in accordance with theinstructions, may cause harmful interference to radio communications.However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ☐ Reorient or relocate the receiving antenna.
- ☐ Increase the separation between the equipment and receiver.
- ☐ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ☐ Consult the dealer or an experienced radio/TV technician for help.

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

To comply with FCC's RF radiation exposure limits for general population/uncontrolled exposure, this device must be operated only in hands with a separation distance of at least 20 cm from its antenna to the body. In add-ition it must not be collocated or operating in conjunction with any other antenna or transmitter.



Correct Disposal of this product. This marking indicates that this product should not be disposed with

other household wastes throughout the EU. To prevent possible harm to the environment or human health from

uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To

return your used device, please use the return and collection systems or contact the retailer where the product

was purchased. They can take this product for environmental safe recycling.

**CAUTION**

**RISK OF EXPLOSION IF BATTERY IS REPLACED**

**BY AN INCORRECT TYPE.**

**DISPOSE OF USED BATTERIES ACCORDING**

**TO THE INSTRUCTIONS**

Hereby, SHEN zhen shen's TONGCHUANG Aeronautic Model CO., LTD, declares that this 005734 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC



[www.Ares-RC.com](http://www.Ares-RC.com)

© 2014