THE UNOFFICIAL
YUNEEC TYPHOON H
MANUAL

Initiated by WesBur13
Made by the people for the people!

WORK IN PROGRESS!

IT'S NOT FULLY FEATURED YET, BUT WILL BE

DISCLAIMER

This manual does not supercede the official Yuneec Typhoon H manuals and documentation. It is for informational purposes ONLY. Should the reader decide to use information contained in this document, they do so at their own risk and assume all responsibility for any outcome.

Contents

The Typhoon H is property of Yuneec. I am in no way shape or form affiliated with Yuneec. Plz dont sue me

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INTRODUCTION

Typhoon H is an advanced aerial photography and videography platform, perfect for skilled pilots and photographers alike. It offers up to 25 minutes of flight time while filming with the CGO3+ 4K-resolution camera. Settings can be freely and remotely adjusted through the ST16 Personal Ground Station, an easy and intuitive remote controller which features a 7-inch Android touchscreen that displays live footage of your flight. To meet different needs for function and portability, Typhoon H has two configurations: the professional version with Intel RealSense, equipped with a portable backpack, and the advanced version with Sonar Collision Avoidance, which features an upgrade path to the professional version with the purchase of a RealSense module, sold separately

This is from the official manual. Let's set a few things straight!

DO NOT EXPECT 25 min flights, it ain't happening. 15-19 min is a better number.
The Typhoon H now comes in 3 flavors (more on that in the Typhoon H section)

Why does this manual exist?

Over at Yuneecpilots.com people complained up a storm that the Typhoon H has a craptacular manual. Lots of information is spread around the site so I decided to compile it into a book. End of story.

SPECS

TYPHOON H SPECIFICATIONS			
Flight Time	Up to 25 min	Maximum Rotation Rate	85°/s
Size	20.5x18x12.2 in (520x457x310mm)	Maximum Roll Angle	35°
Takeoff Weight	68.8oz (1950g)	Maximum Climbing Speed	5m/s
Battery	4S 14.8V LiPo Battery (POWER 4)	Maximum Speed In Follow Me Mode	70km/h
Battery Capacity/Voltage	5400mAh 4S/14.8V (79.9Wh)	Maximum Descending Speed	3m/s
Charger	SC4000-4	Diagonal Wheelbase	18.9 in (480mm)
Transmitter	ST16 Personal Ground Station	Frame Arm Length	7.4 in (187mm)
Maximum Flying Height	122m (400ft)(Restricted by FAA)	Landing Gear Size	10.4x7.3 in (265x185mm)

CGO3+ (CGO3 PLUS) SPECIFICATIONS			
Weight	9.0oz (255g)	Electronic Shutter	1/30--------1/8000s
Effective Pixels	12.4 Megapixels	Video Transmission Range	Up to 1 Mile (1.6km)
Camera Lens	14mm/F2.8	Transmission System	5.2GHz – 5.8GHz
Number of Axis	3	Video UHD	4K 30fps

ST16 GROUND STATION			
Operating System:	Android™	Video Transmission Distance/Range	FCC Compliance: Up to 1 Mile (1.6km)
Number of Channels:	16	(Optimum Conditions):	CE Compliance: Up to 1 Mile (1.6km)
Control Transmission Distance/Range:	Up to 1 Mile (1.6km) (Optimum Conditions)	LCD Screen Size:	7"
Video Link Frequency Band:	5.8GHz WiFi	Built-In Li-ion Battery Voltage / Capacity:	3.6V 8700mAh 31.32Wh Li-ion

Rumor has it that the flight battery is larger than 5400mAh. It's highly debated because an aftermarket charger will put 6400mAh of power into the battery, but specs say 5400mAh. (Yuneec did this before with the Blade Chroma, same numbers even)
The 1 Mile range is optimistic, upgrade the antennas or have the ST16 Pro and you may be able to hit it better.(I own the pro and have taken it 1.2 Miles with video and good signal)

CGO3+ secret specs
The sensor used in the CGO3+ is a Sony IMX177
The processor is the Ambarella S2

ST16 secret specs
The tablet in the radio is running an android system based off of the

Charging

There are a few ways to charge your flight batteries,

1. Charger that came with the H
2. Modified charger that came with the H
3. The breakout cables

The charger included with the H is rather slow, 2 hours slow. But it does have a USB port for charging the ST16…..Slowly

People have modded the charger to accept power from an outside charger. This is not as common because of the next option.

Some retailers have released a nice charger cable that works with all* lipo chargers that support 4 cells. It breaks the battery out to the 2 main power leads and a balance lead. All you need is a charger like the Hitec x1 or x2 if you want to do two at once!
For those of you in the UK or europe you can purchase a balance charging lead from Yuneec UK straight from their web page.

The ST16 charges using USB. Let's do some inaccurate math!
Let's say you charge the ST16 at 5v 2a (common with usb) charging a 8700mAh or 8.7Ah battery would take over 4.5 hours in a perfect world. That's really slow. If you bought one of the chargers mentioned above you are in luck! Just get a banana to EC2 charging lead and charge that battery in no time at all (about 1.5 hours) but **remember this is a Li-ion not a Li-Po!**
Recommended setting: 1s Li-ion, <8.7A

Battery Life: Battery life will vary. Expect 15-19 minutes of normal use the maximum.
Battery life may decrease with improper charging, storage and care.
Battery life will decrease after multiple charges.
It may be wise to keep a logbook for each battery, noting the number of charging cycles it has gone through. Additional data should be logged to improve awareness of battery state and health.

Data to record:

- Charging cycles
- Date, time used for each flight
- Number of minutes flown for each flight
- Battery voltage observed at beginning and end of each flight

Battery Exhaustion: The aircraft will land when the system detects a critical state. However, this should not be relied on. The system may misinterpret battery status data. Battery failure may result in damage to the aircraft, damage to property, loss of the aircraft, or injury to personnel.

Calibration

Your Typhoon H will need a compass calibration if the status light on the rear of the H flashes Orange or the ST16 requests it.
It is also a good measure to recalibrate every update!

Typhoon H calibration goes as follows:

Compass

Open CALIBRATION from the mode screen
Press COMPASS
Hold the H facing north
When the front LEDs come on flip it forwards 360 degrees
2 more LEDs will come on
Rotate the H so they face north
Flip 360 degrees forward again
Do the same thing for all LEDs

It is recommended to remove the camera from the H when performing the Compass Calibration, to minimize damage to the gimbal from centrifugal forces, caused by the action of spinning the arms during the procedure.

BABY'S FIRST FLIGHT

Your first flight can be as good or bad as you want it to be! Just take it easy and make small movements, the H can get out of hand quick! If you get disoriented, let go of the sticks it should hover in place. I personally do all of my first flights without a camera, no risk of breaking it.
A good tip is to make sure you move the slider on the right hand side of the ST16 so that it reflects the "turtle mode". This mode slows all your stick movements down.

FIRST FLIGHT should always be done in a large open field with no trees or people around. Avoid the temptation to fly out of your driveway. Use of SMART MODE on takeoff may cause to aircraft to quickly fly up and away from you if you're within the 26ft safe circle.

Prior to the first flight, become familiar with the ST-16 functionality. understand what each switch and slider does before putting the H into flight. Set up your ST-16 as you find it best for you. Add labels at locations where you may mind something confusing. Install the glare shield. Understand how and why the antennas need to be positioned differently for some flights. Do not leave them laying down at the top of the ST-16. Understand the long omnidirectional antenna will not perform best when pointing directly at the H. Maintaining a slight angle will function better because of the radiation pattern of this type of antenna.

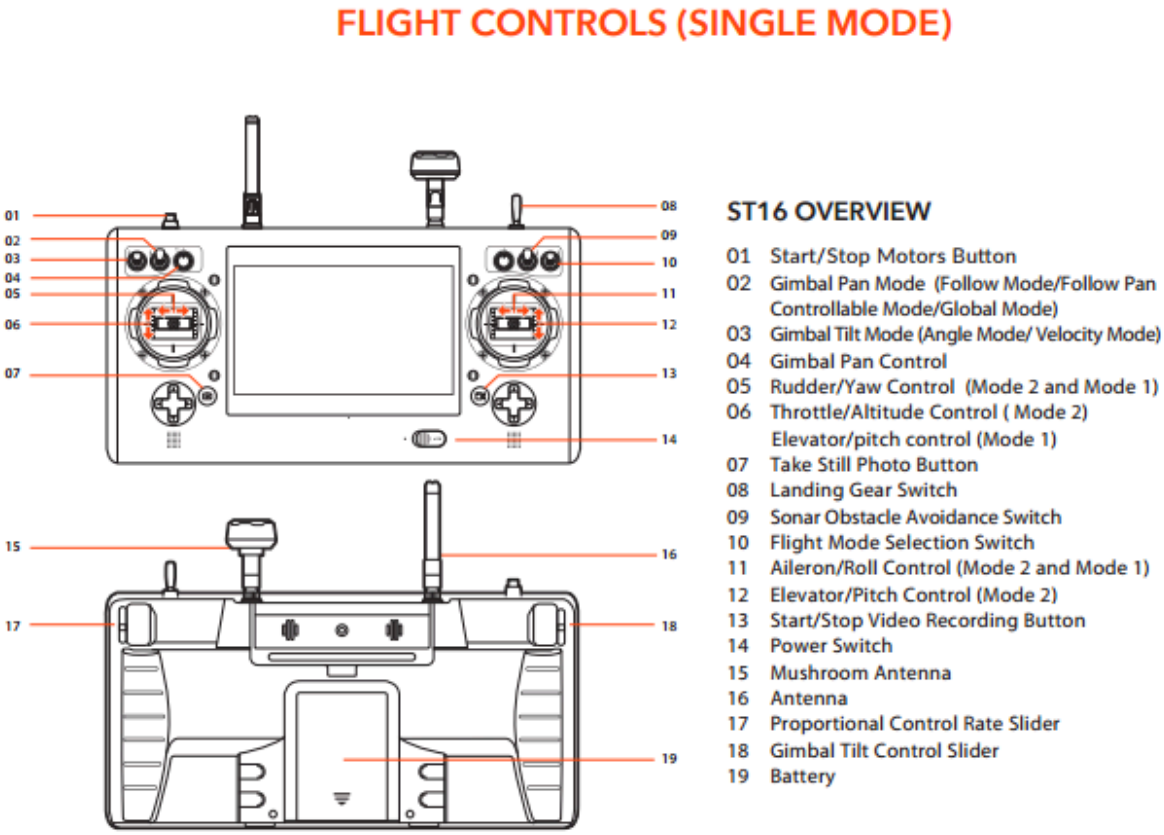
Your H is designed around LOS, or line of sight operations. This means the ST-16 and the H must at all times be able to "see" each other while in operation. The frequencies used for command and control (C2) and video are short wave length and, due to legal requirements, low power. Neither frequency is capable of penetrating obstructions so once the radio wave is interrupted control will be lost. Obstructions can include buildings, vehicles, trees and other foliage, or any other object that can block radio signal. Loss of signal can occur when the H is being flown a considerable distance from the operator when the distance causes the H to lose "sight" of the ST-16 because of it's position relative to a false angular horizon due to trees and buildings interfering with signal connectivity. LOS is also applicable to the operator's ability to, at all times, use their unaided vision to see the H, it's orientation, and to effectively control the aircraft. This is a legal requirement in the United States, imposed by the Federal Aviation Administration.

Learn how to fly the H taking one step at a time. Thoroughly explore each flight mode before moving to another one. Understand the differences between Smart and Angle Modes and how

each can help or hinder the operator when used incorrectly. Learn the functionality of each stick control, yaw, roll, throttle, pitch, and how they relate to aircraft control and orientation.

ST16

The ST16 is a 16 channel ground station for Yuneec aircraft. It is a combination of a radio and an Android tablet. Just as a warning, just because it's Android and you can install apps does not mean you should. Any issue with third party apps can lead to crashed radios and aircraft. Yuneec will most likely not warranty these crashes.



Main Screen

This is the place where you fly from, it's the first screen to appear when the radio boots.On this screen you are given telemetry(flight information) and you see the view finder for the camera. This is also the screen in which you toggle SMART flight modes(see Typhoon H section)

On the bottom you will find 4 buttons,
PAD, SYSTEM SETTINGS, CHANNEL SETTINGS, MODEL SELECT

Pad is the normal android launcher, use this to get to the flight log app.

System settings is for changing system setting(surprise!)
You will find BIND screen for connecting to the H and the CGO3+ camera.
Other Settings allows you to change measurement units(meters or feet), Language, toggle advanced mode, and if you have Realsense installed.

Hardware monitor allows you to quickly test hardware such as sticks, knobs and switches

Mode select allows you to change modes which allow the sticks to have different functions, in America we use Mode 2. But others may like another mode better, its all preference.

Camera Select lets you choose your camera, The standard for the Typhoon H is C-GO3-Pro. This is the same as C-GO3 but has settings for the picture(Auto settings are not that good)

About Controller is where updates take place on V03 of the ST16 software. You can also see all the versions of firmware of connected devices.

Channel Settings allows you to change channel settings. Playing on this screen is not recommended, as it can get out of hand quick. (If this button is greyed out then toggle Advanced Settings in the System Settings menu)

Model Select is where you tell the radio what you are flying. Of course this will be the H. The other option is the Tornado H920, and New Model

Here's a video going over the basic navigation of the ST16:

https://www.youtube.com/lajiZEvoCJQ

THINGS TO NEVER DO! ST16 Edition

Do not mess with channel settings unless you know what you are doing!
Refrain from installing apps on the ST16 that are unnecessary to the H.
Do NOT run the ST16 with the antennas removed.
The ST16 is not water resistant.
Only open the ST16 if you understand that:
A. Doing so will void your warranty.
B. Doing so, may result in damage to the unit or catastrophic failure of the unit.

Do not install Custom Firmware on the ST16

The ST16+(3 antennas) should have the flat patch antenna pointing at the craft as much as possible to get better video reception.

The long stick antennas on both types of ST16 should have the sides facing the craft, not the tips.

The Mushroom looking antenna on the regular ST16 has the worst reception from the top, try to keep the sides facing the craft.

CGO3+

The CGO3+ is the camera included with the current Typhoon H. It supports 4K at 30FPS all the way to 1080p at 120FPS(for slow mo). Many people recommend against using the auto settings as they can be wonky and not work well. Take time to learn the manual settings and you can be shooting like a pro!
The newest feature is the gimbal's 360 degrees of movement around, allowing for the H to face a different direction than the camera. Other than that the CGO3 and CGO3+ are almost the same.

General rule of thumb is to set the shutter to 2x your fps. eg. 4K 30FPS set the shutter to 1/60. This gives you smoother video but can over expose and make video too bright. To solve this, buy a set of neutral density filters. CGO3 and CGO3+ use the same filters.

The camera uses slice recording. It will slice the video into smaller files. Each slice is about 5 minutes. No video is lost between slices, and they can be seamlessly re-joined with editing software.

If your camera says CGO-ET on the side then you're lucky it's a thermal camera that's a direct replacement for the CGO3+

What's the CGO3 Pro?

Either you read the ST16 section or are exploring the menus! The camera is the same, the difference is the Pro has settings for shutter, white balance, etc. Use this setting for a better picture, or better yet just use this mode as there is no reason not to.

NOTE: Failure to stop the recording function prior to powering down the aircraft will result in corrupted files.

WIZARD WAND

If you bought the H Pro or certain other packages then you found a little remote inside the box! This is the Wizard Wand. It is a secondary controller for the Typhoon H. It can be used to fly the aircraft as a stand alone control, or in combination with the ST-16 Ground station in team mode. When in team mode, the wand controls the flight of the aircraft, while the ST-16 only controls the camera. As a stand alone controller, the Wizard Wand in smart mode can engage follow me and watch me functions. This will allow action sports enthusiast to carry the wand while the Typhoon H follows the wand. It will also keep the camera centered on the wand location. The Wizard Wand contains a barometric sensor allowing the Typhoon H to adjust altitude as the wand increases or decreases in elevation. The aircraft speed limitation is increased when in this mode. Enabling obstacle avoidance in this mode decreases aircraft speed to 11 MPH. . Controls are odd to get used to but it works great for Follow Me (Typhoon H section for info). The hardest thing to learn is the LED status codes. I keep a copy of the codes on me when I fly along with the button combinations which can be found below.

NOTE: The Wizard Wand does not display telemetry and other flight data.
NOTE: When landing the aircraft, continue to hold the down arrow until the motors go to idle.Failure to do so may result in inadvertent flight or a tip over resulting in damage to the aircraft.

Wizard™ LED STATUS

Aircraft Mode LED

- Smart Mode: LED solid green
- Watch Me Function: LED solid green
- Follow Me Function: LED solid yellow
- Angle Mode: LED solid purple
- Home Mode: LED solid red
- 'Point To Fly' Function Activated: LED solid blue
- Obs. Avoidance On: LED blink white
  Altitude follow function turned off: LED blinking slowly

Wizard™ GPS LED

- GPS Locked: LED solid green.
- Recording video: LED blinking green once every second (with the Wizard GPS locked)

Aircraft Status LED

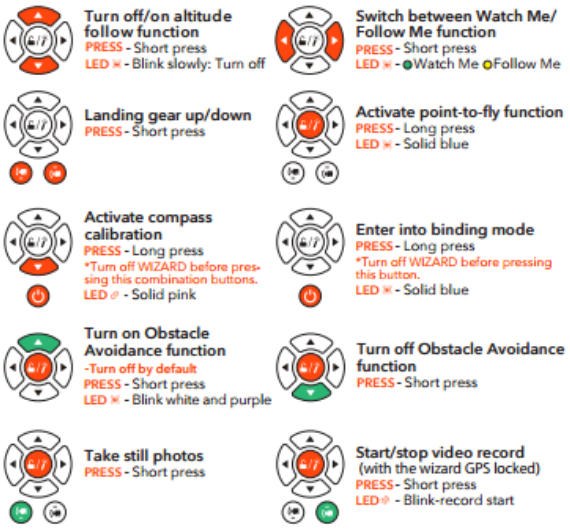
- The Communication Mal-function Between the Wizard™ and the Aircraft : LED solid red
- GPS Loss of Aircraft: LED off
- Aircraft in No-Fly Zone: LED blinking red, green and blue alternately
- Battery full: LED solid green
- Battery 50%: LED blinking green twice every 2 seconds
- Battery 25%: LED blinking green once every 2 seconds
- Low Voltage Warning of the Aircraft:
  LED blinking red quickly, the Wizard™ vibrating for 2 seconds once continuously

Wizard™ Power LED:

- Powered On: LED solid green
- During Charging: LED solid red
- Charging Completed: Red LED off
  Low Voltage Warning of the Wizard™:
- Battery 50%--- LED blinking green twice every 2 seconds
- Battery 25%--- LED blinking green once every 2 seconds
- Power Cut-off---LED blinking red quickly, the Wizard™ vibrating for 2 seconds once continuously.

WIZARD BUTTON COMBINATION FUNCTIONS

*All vibrate once when any of the combination function is activated (rthe Wizard will vibrate twice when turning on the altitude follow function) .
*For the last four functions, press the orange marked button first, and then the green one. Release both buttons at the same time after the function is activated.



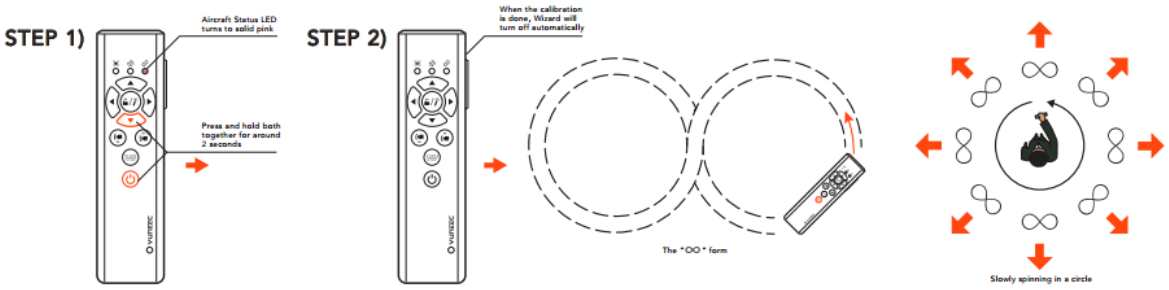
Wizard Button Combination

Note: If two buttons are shown in orange then you press both at the same time.

Calibration

My first attempt at calibrating the Wizard was sad, I was standing in front of the hobby store I work at and did a silly dance only to find I did it wrong. The Instructions included were confusing. Here's how to do it:

Hold the Wizard in front of you with the top(says GPS) straight up, and buttons facing you.
Press and hold the **Power and Down** buttons until the led turns pink.
Start moving the Wizard in a figure 8 pattern with the top always facing the direction it's moving, do this and turn a little bit.
If the power LED blinks red fast then calibration failed.



TIPS: Keep distance from magnetic interference during the calibration. We recommend calibrating Wizard outdoors. You can find the TYPHOON Wizard calibration tutorial video at www.yuneec.com/wiz-info.html

TEAM MODE

Team Mode allows two people to pilot one Typhoon H at once.

Requirements are to have any combination of of these radios:
Wizard Wand* (Included with Pro packages)
ST12 (rarest radio)
ST16
ST16 Pro
ST24 (sold with Tornado H920)

*you can only use the Wizard Wand for flying the H, not for camera controls

TYPHOON H

The Typhoon H is a Hexacopter meaning you have 6 rotors unlike a quadcopters 4 rotors. The props provided look the same but they are different. By looking at the middle of the prop you will see one is just black while another might have a silver circle, this is to differentiate the clockwise from the counter clockwise. Props with the silver rings go on the motors with the white top, props with black rings go to the motors with the black tops.

Obstacle Avoidance

Two versions of OA exist: Standard and Intel Realsense. To tell which you have look at the nose of the craft, you will see 2 circles these are the sonar sensors included with every Typhoon H. If you see a thin black bar possibly with an Intel sticker then you also have Realsense!
OA limits you to 12 MPH, Could change in the future.
OA cannot be activated until the craft is:
at least 10ft off the ground
landing legs are up.

NOTE: The realsense module may react to dirt and debris on the realsense module lenses as well as debris in the air. Clean the lenses before each flight and avoid flight in areas high in dust, smoke, or other debris. If the aircraft is behaving erratically with obstacle avoidance on, it may be a sign of interference with the realsense module.

5 rotor mode

If your H gets a little too close to a tree or other object you may break a prop from impact. Most multicopters would then crash causing the operator to cry. The H is different by having 6 rotors instead of 4. Your H also has a “5 rotor” mode. If one prop is damaged, that motor will be disabled and the motor directly opposite will switch directions as needed to keep the craft in the air. This is a great feature that can help reduce accidents. But as with any feature **don't rely on 5 rotor mode!** In rare cases the craft can get stuck in a spin and be unable to stop. Some people recommend grabbing a landing leg if this happens. I personally don't as the rotors are now spinning faster to compensate and they can hurt. I'd rather bring it low and see if it can stop first. Just my preference.

One more note: 5 rotor mode requires one prop to switch directions constantly. This is very bad for both the ESC and motor. If 5 rotor mode activates, **LAND AS SOON AS SAFELY POSSIBLE!**

What if I lose connection?!

If the ST16 becomes disconnected from just the camera(5.8), you can Initiate Return to Home(More info further in this section) until connection is restored, but be wary of anything in the way of the craft.
If the ST16 becomes disconnected from just the control link(2.4) then it should switch to control over the camera link(5.8). Bring it home now! the camera link is not suitable for control but is better than nothing.(note control over the camera link is only on newer versions of the firmware)
If all signals are lost(eg. Radio crash) then the Typhoon H will go back to within 26 feet of the last known location of the radio and land(stay away from water)

Flight Modes

SMART mode is the first position on the mode select switch. It has great features including:

Stick relativity, you say go right and it will go right from your perspective no matter the orientation of the craft. With Obstacle Avoidance on it will turn to face that direction and then proceed to move. This allows it to see where it's going, eliminates the need for 360 OA.

This also is the mode for the special modes(section New Fun Modes for more info)

When flying in SMART mode always remember to have about 30 ft distance between you and the craft when taking off to prevent the “SMART circle of Death”. This is caused by launching the craft within your “SMART circle” a 27ft circle around the pilot in which the craft will not fly. If it is within the circle it will do everything in its power to leave the circle, this includes running into trees and other objects.

Angle mode is the most used mode on the Typhoon H. It allows the H to fly like any other multicopter. When you say go forward it will go forward in the direction of the nose

of the aircraft. You can also strafe left and right, plus fly backwards. This is the recommended mode to learn in and fly in. There is also no SMART circle, so be warned you can hit yourself with the craft!

Obstacle avoidance is available in this mode!

Return to Home or RTH for short brings the craft back to where it started. Great for lazy landings and looks cool.
If you turn Obstacle Avoidance on before going to RTH it will avoid objects, albeit slower
You can set the Return to Home height from you radio(see ST16 for more info)

Cool New Modes

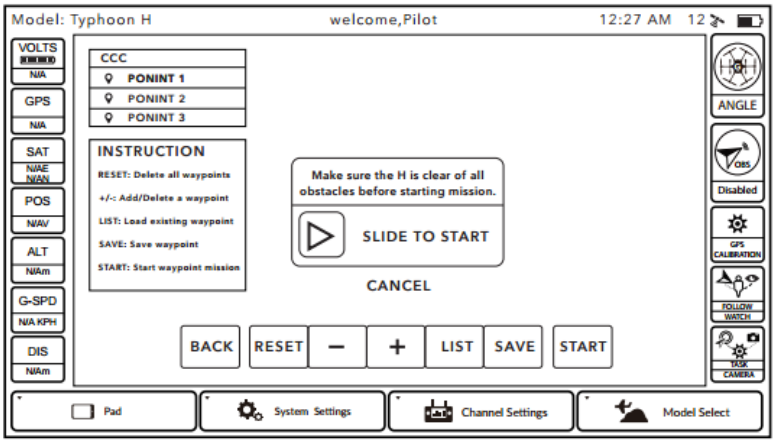
Follow Me allows the craft to follow the ST16 or Wizard controllers and keep them inframe of the camera. Be wary of trees and other objects if not using OA

Top speed of around 43 MPH (I've seen higher) with no OA, or 12 MPH with OA

OA is available in this mode(and is great!)

Curved Cable Cam Allows you to set a path for the Typhoon H to follow and you then point the camera while the path is followed.

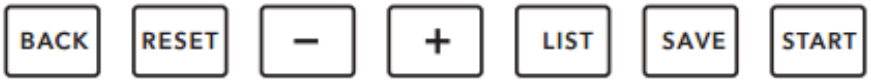
OA is currently not available in these modes!



If the PAN mode of the gimbal camera is switched to Follow and Follow Pan Controllable modes, the gimbal PAN and TILT angle will be adjusted as the same as the angle what the gimbal camera is at each waypoint automatically and continuously. When the PAN mode is switched to the Global Mode, the PAN and TILT angle can be controlled by aileron and elevator stick.

NOTICE: The direct distance between every two waypoint should be more than 5 meters.

Tap the CCC to enter the Curve Cable Cam function.



BACK: Tap BACK and you can return to the previous interface.

RESET: Tap RESET to delete all the points created during the flight.

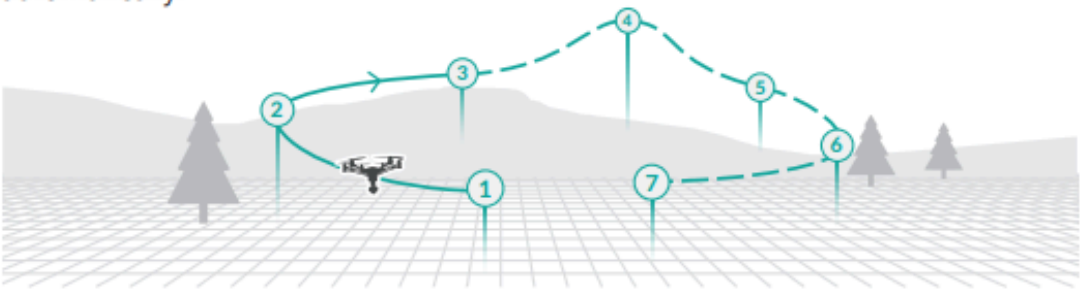
−: Tap '-' to delete the last point created during the flight.

+: Tap '+' to create a new point recording the current flying position.

LIST: Tap LIST and all previous routes will be shown on a list. You can delete any saved route by sliding the chosen one to the left.

SAVE: Tap SAVE and the current route will be saved.

START: Tap START, and slide the icon. Typhoon H will fly back to waypoint 1 automatically.

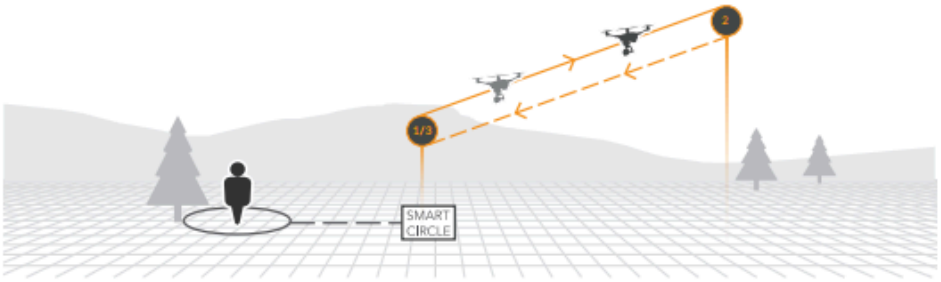


If the pilot set 7 waypoints as shown, when the copter arrives at the Waypoint 1, slowly raise the throttle stick, the copter will fly along the waypoints from 1 to 7 in order. If the pilot slowly lower the throttle stick, the copter will fly along the waypoints from 7 to 1 in order.

Journey Mode also known as selfie mode. The Typhoon H will fly out take a picture and come back.

Tap JOUR to enter the journey function.

START: Press START, and slide the icon. Typhoon H will fly up and out and then take a selfie.
BACK: Tap BACK to return to the previous interface.



After sliding the icon, the remote control interface will display EXIT and [⏸]. When the pilot tap the [⏸], the icon will become [▶]. Then the journey function is paused. When the pilot taps it again, the [▶] will become [⏸], the copter will continue the journey function. The pilot can exit the function by tapping EXIT icon or switching flight mode.

NOTICE: When the Journey function is activated, the Journey distance can be set by the pilot.

NOTICE: The gimbal camera can't be controlled when journey function is activated and will remain the previous angle set before. Depending on the camera tilt, the aircraft will go up and out to take the perfect selfie.

Orbit Me mode make the Typhoon fly around you in a circle. You move, it moves.

ORBIT ME: When Orbit Me is enabled, Typhoon H flies a circular path around the pilot.
Press ORBIT to enter the ORBIT ME function.

START: Press START, and slide the icon, push the aileron stick to the right or left, then Typhoon H will fly around the pilot with the distance between the start point and the pilot as the radius.

BACK: Tap BACK to return to the previous interface.

NOTICE: You can increase/decrease radius by apply forward/back on right stick. You also can trim the gimbal pan position by adjusting pan control knob on ST16.

Point of Interest is like orbit me but orbits a spot you specify

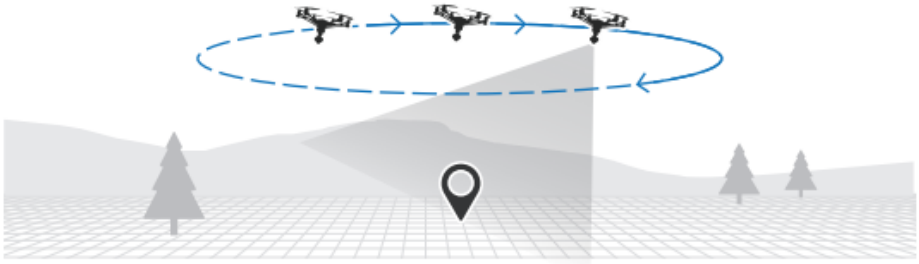
POI: Point of Interest allows the pilot to select a subject they would like to orbit and have Typhoon H orbit that subject autonomously.

CENTER: Press CENTER to set the current flight position of Typhoon H as the center of a circle.

START: Press START, and slide the icon, push the aileron stick to the right or left, Typhoon H will fly around the circle center with distance between the Start point and the center point as the radius.

BACK: Tap BACK to return to the previous interface.

NOTICE: You can increase/decrease radius by apply forward/back on right stick. You also can trim the gimbal pan position by adjusting pan control knob on ST16.



INTEL REALSENSE

This was the big feature of the H when announced. Yet it is the least documented and was left to the community to discover. (Thanks Yuneec/Intel)

What is Realsense?

Realsense is based off of the Intel R200 camera system. This is a 3D scanner that uses a laser grid to measure distances, kind of like the Xbox Kinect. It is built into a module that contains an Intel Atom processor like the ST16. This processor handles all calculations and is the brain, and the R200 is the eyes. Also on the bottom of the module is an Indoor Position Sensor or IPS for short. This allows for indoor flight (if you're that brave). It contains a sonar distance sensor for measuring altitude, and an Optical Flow Sensor(pinhole camera) that watches the ground and acts like indoor GPS. IPS only works at lower heights and is only needed when indoors where you don't have GPS.

How do I use Realsense?

Make sure Realsense Module Installed is toggled to on in the ST16 settings(See ST16 section for more info)
Get the Typhoon H at least 10ft off the ground and have the landing gear in the up position. Flip the switch and Realsense should be active.
If you get the message "OBS.Avoidance Not Available!" then you are either not meeting the requirements for activating Realsense or there was an object in front of the sensor during start up. if this is the case reboot and make sure the sensor is clear.

In SMART mode you can use Realsense just like normal OA(see Typhoon H section for more info) the H will turn to face the requested direction to watch for obstacles.

In Angle mode the Typhoon H will not let you hit objects head on. You can still rise/fall into them and strafe and fly backwards into them, this is why in smart mode it changes the direction it faces. You also get a cool rounded shape at the top of the screen that tells you how far away an object is. When flying too close it makes a pinging sound. The faster the sound the closer you are!

In Return to Home mode the Typhoon H will fly back to home but watch for objects, if an object is in the way it will stop and work its way around it.

In Follow Me the Typhoon will keep the camera locked onto you but attempt to fly around objects. It will get very, very close to objects but I have not heard yet of it crashing into one.

How do I use IPS?

With the Typhoon H on the ground and GPS on and in Angle mode, If it cannot find a GPS signal it will beep like it's ready and the SAT readout will say 0 and POS will say 0.000 and 0.000. You can now take off and fly, when you get in the air, MODE will now say IPS. Welcome to IPS mode

PS mode the H will not go below a certain height without the legs down.
Make sure you are in a well lit room.
The more shapes on the floor the better it can hold its position. It uses three downward facing sensors; two sonar sensors, and a pinhole optical sensor/camera to watch for any ground movement.

Flying Indoors

Flying indoors presents a lot of challenges. Do not attempt to fly indoors unless you are comfortable enough with your Typhoon H and your control of it to attempt this. The IPS available with RealSense makes flying indoors possible.

Indoor Setup for ST16

Verify in “settings” that RealSense box is checked as ‘Installed”.
Verify on the ST16 that OBS is off.
Verify on the ST16 that you are in “Angle Mode”
Verify on the ST16 that you are in “Turtle Mode”
Verify in “Calibration” that you have turned off GPS
Verify on your ST16 Flight Screen that IPS is showing as “Active”

Once you have verified these settings, and your Typhoon H shows it is “Ready” and you are Initialized for flight, start the rotors, be cognizant of your surroundings and obstacles, and proceed slowly at first. Indoor flight gives you far less reaction time to correct judgement errors by the pilot, and OBS is not available to save you from your mistakes.

TIPS AND TRICKS

1. If you lose sight of the H, don't panic. First gain altitude perhaps 200' and then switch to RTH. Wait until you can see it before switching back to Angle mode.
2. If the H loses control signal it will initiate RTH. If that happens always flip the switch to RTH. Why??? Because when it regains the control signal it will go into hover and wait for a command. If you can't see it and don't realize it's in hover the battery will deplete and the H will land wherever it is. By changing to RTH it will continue flying back to you.
3. Always set the RTH altitude during your first flight. Set it to an altitude that you are sure is high enough to clear everything you might fly over. 200' is usually good. You can do this on the ST16 under the calibration menu.
4. If you plan to fly over water always stay back 50' from the shoreline. Why?? Because if something happens to the ST16 and you lose control signal, the H will initiate RTH and will land about 26' from the controller's last known position *in the line of flight*. If you are standing on the shore or a pier, guess where it's going to land. (Yep you got it….. in the water.)

Hidden menus/tips:

Tap ST16 screen during charging to monitor charge status.
Tap the Battery voltage repeatedly to see channel info.
Tap the About Controller in the settings many times and open the hidden test menu (Don't mess with this unless you know what you are doing)

EVERYONE WHO HELPED

Changes
Doc - Added Page numbers, changed contents listing.
Sorry left a chair edge on keyboard while I got a coffee … bad move for the footer, lots of the letter e added by mistake. I did remove them…. sheesh.

Drone PreFlight Checklist

1. Drone Transportation and Environmental Notes:

When transporting a drone from one location to another many environmental factors can affect the controls, sensors, air frame structure, CPUs, memory, and batteries of the drone and controller. Air Pressure/Density/Temperature/Humidity, bumps, hard drops, high power electricity transmission lines, magnetic anomalies in buildings, rocks or mountains, and even the vehicle electronics can cause issues with flight controls.
For these reasons, it is recommended that you recalibrate the compass, accelerometer, and camera gimbal systems often to prevent loss/damage to your drone or other property. Also, verify as many preflight controls as your drone allows before powering up the propellers.

2. Site Check:

Flight Region Survey: (Mobile Apps)

– Check FAA Mobile Apps for Flight Space Restrictions and NOTAMs Information

– Check FAA METAR Apps for Aviation Weather Alerts or http://www.aviationweather.gov

– Check NOAA for Local Ground Weather Radar and Predictions- http://www.weather.gov/

– Check Air Density – Temperature, Pressure, Humidity – For Flight Performance Characteristics

Flight Area Survey: (Visual)

– No Power Lines, Tree or obstacles that may impede flight path or drone operations

– No People in drone flight path

– Wind Gust Speed Less Than 10mph (This can change quickly. Be aware of the weather)

– Look for area obstacles that may affect wind speed and direction.

– Look for flight areas that may obstruct drone view from operator. (Line of Site Required)

Takeoff/Landing Area Survey: (Visual)

– Level Position

– 100 Feet Clearance on all sides minimum.

– Clean Area (Don't want debris to fly around and get in propellers or camera lens)

– Be aware of any Overhead/Underground utilities that may affect drone or controller.

3. Drone Check:

Drone Labeled:

Readable FAA ID on Drone

FAA Drone Maintenance and Inspection Guidelines:

Section 5.5 and Chapter 7:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_107-2.pdf

3. Drone Check (continued):

Drone Preparations:
– Propellers Securely Attached
– Battery Fully Charged, No Visible Damage and good service history
BE SURE BATTERY IS FULLY SEATED - There should be
2 distinct clicks. The second click is the battery locking in.
– No loose/worn components on air frame
– Camera Securely Attached, Travel Shield Removed, Lens Cleaned
– Camera SD Card inserted and space available– Don't want to lose pictures or video recordings
– Accelerometer and Compass Calibration – Bi-Weekly or if traveling more than 50 miles from location where last calibration was performed.
– Camera Gimbal Calibration – Weekly for best results depending on usage

4. Controller Check and Power UP:

Check All Switch Setting for Preferences and Flight Requirements (Before Power Up)
– Collision Avoidance, Pilot/Angle Mode, Landing Gear Down…
– Gimbal Controls Centered, Turtle Mode…
– Switches may have moved with unpacking and transit…
Power Up Controller
Check Battery – Don't start flying under 60% Battery on Controller
Hardware Monitor – Check Switches and Flight Controls for Response
Check GPS Link (14+ is good for Controller)
Check Storage Space Available – Remove Old Telemetry Data if needed

5. Power Up Drone: (Controller should be pointed at Drone)

Controller: 10-20 Foot Minimum away from drone
Wait for Drone Telemetry Connection to Controller
Wait for Drone Camera Connection to Controller
Wait for 18+ GPS Satellite Locks on Drone – GPS Ready Indicator on Controller
Check Drone Battery: 17.6+ for Take Off – Don't Start Flying Under 16.7
Check space on drone camera SD card – Don't want to lose pictures or video

6. Fly Safe!!!!

Update Drone Flight and Battery Usage Logs