SCARAB™ Stealth Carbon Armour

Build guide

and Noobs guide to their first Scarab
Warnings & Alerts

This manual is a building guide and is not a substitute for common sense or technical competencies or skill sets required for safe operation of radio controlled aircraft. Skipping past any one step is not permitted. You must first read the manual entirely - then start. Separate assumptions from facts.

You - the pilot in command is responsible at all times for everything that you do in the setup and the operation of your aircraft. If you see something unusual or if you don’t completely understand something - Do Not Fly.

For full details regarding safety warnings and alerts, consult the relevant section on the MultiWiiCopter.com website.

For example, to set up your engines consult the setup and maintenance steps on the products page for the engines you have in your kit.

Throughout this instruction manual you will see the following warnings, alerts and notes. Please take particular note, as they are very important for your safety and also a successful build of your Scarab™ Airframe.

- **Extreme danger without warning - risk of fire, extreme heat and serious damage if misunderstood or used incorrectly.**

- **Irreversible electrical danger - permanent CPU damage outside of your warranty. Misuse will smoke and blow your electronics.**

- **Single redundancy critical - failure of this item to function will result in the uncontrolled crash of your Multicopter.**

- **Health and safety - if you remove the risk, you remove the danger. e.g. remove props = no risk of fingers & eyes being cut by prop.**

- **Watershed decision - choose wisely, not always possible to change your mind afterwards without replacement parts.**

**NB:** Points to take particular note of during construction.
Bolt Reference Guide

dark items are included in this kit.
ghosted items are not included in this kit

Check the product page on the website for what is included and what is excluded in this kit. This manual to be in conjunction with the website.
What you will need:

Phillips Screwdriver - size 1
for: Nylon Phillips M3*10

5mm socket spanner
for: tightening M3 standoffs hex metal (landing gear)

loctite® 241 (blue)
for: M2, M3 bolts and grub screws

SCARAB frame tool - deluxe -
1/16th 1.5875mm hex
can use supplied hex key instead
for: M2 stainless steel frame bolts

curved diamond file
for: smoothing and deburring plates and booms

2mm hex tool
for: M3 stainless steel bolts

1.5 mm hex tool
for: Motor grub screws, M3 grub screws

DU-BRO prop balancer
for: balancing props

good quality scalpel
(snap off blade cutter)
for: balancing props

fine sandpaper - 240 wet & dry
for: smoothing props

additional 5 zip ties
for: wiring, additional motor balancing

Nitto brand electrical insulation tape
for: attaching Rx to boom
also additive prop balancing method.
(adding weight)
Preparing the Scarab™ Airframe plates

**Base Plate**
1. Sand rough edges with curved diamond file
   Use diamond file to smooth curved edges of the frame, including the beetle wings to prevent wires being cut by sharp edges.
   Only light scraping is required. Do both sides and outside edges.

   **NB:** Take care not to slip and scratch the plates.

   carbon conducts electricity

2. Attach landing gear (30mm chrome plated brass standoffs) with M3*8 bolts.
   Attach by hand tighten with socket spanner.

**Top Plate**
Attach 6mm standoffs and secure with nylon nuts. Use your hands, no tools required.

**Attaching Delrin® Boomholders**
Insert M2*8 boomholder bolts into the Scarab™ Airframe plate from the bottom.
Place a small amount of loctite® onto bolt then screw on the 2.1mm Stainless Steel Shaft.

**NB:** Ensure no loctite® is on the outside of the shaft as it will lock boomholders. Wipe clean.

Repeat until all shafts are done on base.
Push Delrin® boomholder bases onto shafts. Tighten the M2*8 boomholder bolts in base of Scarab™ frame now using ⅛ Pro Tool (hex key can alternatively be used).

**Push Pro Tool in straight, otherwise bolt with strip.**

Screw heads are stainless steel which is soft. Pro Tool is hardened steel which is very hard.

If M2 heads are stripping out, this is a technique fault. You are not pushing the Pro Tool firmly in the first instance. A bolt with correct alignment require almost zero force to turn - a cross-thread bolt will be very stiff after one or two turns - STOP

Place boomholder tops on.

**Screw M2*8 bolts into top of shafts finger tight to test / check tolerances on all shafts and the threads on the M2 bolts**

**NB:** *DO NOT SKIP THIS STEP,* or you will regret it later when you are pulling your whole frame apart to replace once shaft.

Remove bolts, but leave the corner one in for each boomholder. This will hold the boomholders and booms during construction. This bolt will be removed later; just before enclosing the 2 halves.

**NB:** Bolt does not bottom out because boomholder pair has a gap when boom is in for a tight fit.

**NB:** Never apply loctite® to the top screws.

---

**Fitting the Carbonbird™ ESCs**

Install one Electronic Speed Controller as per photo to the right.

Points to note:
- blue Engine wires slot through boom holder.
- JST wire to remain in centre
- RC White Red Black wire to feed out the back of copter.
- Use zip-tie to attach speed controller to base plate.
Fit remaining ESCs as per photograph above.

**Connect Loom**

Trim thin wire on loom, so that no wire is exposed - it all must be insulated.

OR

if you intend to use with Andromeda™ add a quick-connector

Feed XT60 > JST5m (loom) through right hand side of frame and connect JSTm to the JSTf of the ESCs.

**NB:** Push JST connectors all the way in. Double click is required.

Leave one ESC red wire connected for 5v power out.
Use the ESC with best airflow for this.

**NB:** Keep your wires neat to avoid confusion and crushing.
Speed controllers need cooling - don’t smoother them.

Attach velcro strap for battery to Scarab™ Airframe base plate.
Feed furry side (female) down through beetle wings.

Cut and stick male adhesive velcro to base plate as shown in photo.
Insert M3*6 Grub screws into the outer holes on the boom holders on upper side. Do not tighten yet.

**NB:** Do not cross thread. When inserting threaded bolts or screws - the screw should feed.

**Debur booms**

Boom openings must be smoothed, inside and out prior to installing heatsinks.

Use diamond file to debur inside edge.
Use sand paper to debur outside edge.

**Assembling Booms and Heatsinks**

Debur heatsinks by pushing the screw through.

Screw M3*12 through engine holder into saddle clamp a small amount.

**NB:** There must be a gap for heatsink to fit around boom (see photo below).

Push red lock/heatsink onto boom.
Tighten screws.

Repeat for remaining booms.
Trim engine wires to suit booms.  
**pro:** reducing weight and keeping tidy  
**con:** cannot ever be lengthened for longer booms in future.  
requires advanced soldering skills. solder paste amech 223

---

**Carbonbird™ Engine Maintenance & Setup**

**Engine maintenance is YOUR responsibility.**  
Failure to follow engine care and maintenance will void your warranty. Refer to the MultiWiiCopter.com page for your engine for full instructions on engine maintenance.

**RISK**  
Engines contain magnets. Keep your work bench clean.  
When working with engines, keep work space clinically clean to avoid particles getting in and jamming engine; voiding your warranty.

**Apply 1 small drop of oil 20W50 - to Carbonbird™ engine bearings.**

**NB:** **NO MORE THAN ONE DROP**  
Overflowing oil will attract dirt and cause extra wear.

Spin oil in.  spin the motor by hand the oil will enter.  
Wipe with a cloth to remove all excess oil.

loctite® the Grub screw on side of engine.

**Keep loctite® away from bearings!**  
If loctite® goes in bearing, engine will seize.

wipe any excess loctite® away with a cloth.
Attaching Carbonbird™ engines to booms

1. Insert engine wires into boom.

2. Put loctite® into engine screw holes. Wipe any excess away.

**NB:** You will be using the holes that are 19mm apart (see image).

- Keep loctite® away from bearings!
- If loctite® goes in bearing, engine will seize.

3. Line up engine screw holes with corresponding heatsink holes. You will want the engine wires to be as close to the boom opening as possible.

4. Attach engine to heatsink with M3*5 bolts.
   - Do not cross thread.
   - Keep bolt straight - apply light pressure with screwdriver.
   - Put both bolts in halfway before tightening.

**NB:** Use correct length bolt to mount engine.
- If bolt goes too far into engine it will cut wires and short engine.

Labelling engine #s

Work out which ESC / engine pair belongs to each boom using below diagram.
Label each wire with engine # - 3, 10, 11, 9.
Tx Calibration

You must calibrate your transmitter. Once, for MultiWii
See wiki for a detailed explanation on how to calibrate your
transmitter. To calibrate Tx, you will need:

- Paris with USB FTDi drivers installed & connected
- Your Tx with clean model memory
- Your computer running WINGUI or JAVA GUI

Orientation of Ch/Rev - Orientation - the light blue bars (in
GUI 2.1 on your PC/Mac) MUST move in the same direction as
the stick you are moving - If they do not then REVERSE that Ch
in your Tx. So if you move the throttle stick up - then the blue
Throttle bar should move up. If you move your rudder right then
the YAW bar should move right.

Getting the engine direction correct

1. Connect learning curve 4 way Y lead to engine wires.
2. Connect 1 engine - any three engine wires plug into any
   three blue ESC GBC connectors.
   Engine collet (which hold the prop later) must be off.
3. Ensure your Rx is bound to your Tx. (see Radio Manual for
   futaba/JR/Spektrum
4. Connect 4 way Y lead to Rx Throttle Ch.
   Futaba = channel 3 | All other brands Spektrum = channel 1
5. Tx on (throttle off), all stick trims neutral on Tx.
6. Connect Lipo
7. You will hear 3 beeps (for a 3 cell battery - for a 4S = 4
   beeps) followed by 1 long beep from engine.
8. Move thro - Throttle up to 25% up position. Engine truns.
9. Is engine in correct orientation? CW / CCW?
   (As per diagram on previous page).
10. Disconnect Lipo.
11. If engine is not in correct orientation, swap any two blue GBC
   connections over
   If 2mm GBC connections are stiff to do up or take apart, heat
   up with hair dryer. Never force.
   You can also debur female entry lip GBC with a scalpel.
12. Retest.
   Ensure ESC / engine connection is fully insulated (no gold can be
   visible - all part are insulated by heatshrink).

Push connecting wires into boom. Twisting wires slightly helps
move them in.
Push boom into boomholder. Ensure not to crush or cut wires.

Repeat for remaining engines.
**Learning Curve**
This process by-passes PARIS - see photo at right
1. Tx on - full throttle (mode 2 - left stick)
2. Connect lipo
3. You will hear 2 beeps from engines
4. Throttle down immediately after this
5. You will hear 3 beeps, 1 long beep, this means **the ESCs have learnt the Multiwii throttle range** which is 1095 → 1905
6. Disconnect lipo

**Test of ESC learning**
1. Throttle off
2. Connect Lipo
3. Move throttle slowly forward 1 or 2 notches.
4. **All engines must start a the same time**
5. Throttle down
6. Disconnect Lipo
7. Tx off

**Program the Carbonbird™ ESC parameters**

**NB:** Ensure props are off and Lipo is disconnected at start.

1. Disconnect **4 way Y lead** used for learning curve process
2. Connect 1 engine to ESC card at a time
   White to White, Red to Red, Black to Black on BEC input.
3. Connect Lipo
   There will be a short delay, then lights on card will appear.
4. Change “#4 cut off voltage” to “low”
5. Make sure lights reflect After photo shown on right.
6. Disconnect Lipo
7. Disconnect ESC card

Repeat for remaining engines
Close Up

Feed Carbonbird™ ESC wires through rear of Scarab™ Airframe top plate (back left hole). (previous page photo)

**Insert a M2*5mm screw into the inside right position of each of the 6 positions** - see green circles.
Remove any other boomholder screws previously put in to hold booms in place during construction. These screws keep the booms in place whilst positioning the lid - or during maintenance.

Place top plate on top of boom holders (Nylon standoffs facing out)
Ensure nothing will be crushed.
Hold plates together like a sandwich.

Look inside to ensure that no wires are being squashed or pinched.
Move anything out of the way if it is being squashed.
Use a round ended stick - ie. a chopstick - so not to cut any wires.

If you crush, pinch, cut or screw into wires, you will short your Copter and create a hazard.

Put 2 M2*8 bolts in halfway, by hand - finger tight - Choose screws on opposite side of frame.

Check again for pinched or crushed wires.
Put in all remaining M2*8 bolts. **Screw in halfway.**

If you feel **any resistance in first half turn, STOP - back out** - you are cross-threading. M2 bolts should go in with no resistance. re-check the M2 bolt alignment - never force it.

In a boom holder group of 4, never tighten any one M2 until all 4 bolts are in or you will make alignment impossible.

Before tightening M2 bolts:
1. Check depth of booms in boomholders
2. Rotate booms approximately 5° as per diagram to the right.

**MOTOR tilt** - we designed the SCARAB™ system to use motor tilt. In a Quad X the engine 3 & 9 are tilted 5° clockwise (viewed from the end of the boom looking inward) and engines 11 & 10 are rotated 5° CCW - this gives positive YAW control for Aerial photo Ops with very little RPM change required.
It also allows the pilot to trim the neutral yaw position in the hardware - not on the Tx.

Now tighten all M2 bolts, top and bottom.

**NB:**
Never use loctite® on the topside boomholder M2 bolts.
Attach M3 grub screws to boom holders in outer holes on top side. Tighten, but not so much as to damage the booms.

After maiden flight and tuning, apply loctite® to these grub screws.

**Attach Paris™ Board & Andromeda™**

Attach Paris™ board to top plate of Scarab™ Airframe using 15mm Nylon Standoffs - screwing them into the 6mm standoffs attached previously.

NB: Ensure props are off and Lipo is not connected.

Connect Carbonbird™ ESC wires to Paris™ board.

- POWER OFF - Connect all three pins correctly (see photo), orientation - otherwise board will short later
- Neaten wires by tucking gently into frame.

1. Connect the +ve red wire from loom (150mm 32AWG thin red wire) to back of Andromeda +ve pin
2. Connect the black wire from Andromeda -ve directly to Paris LED strip GND 850ma -ve ground pin.

Attach Andromeda™ board to frame using Nylon Phillips M3*10. Finger tighten Nylon Screws halfway then lightly use Screw driver. Nylon is very soft and can cross thread easily.

Attached Rx to boom - opposite side to FPV antenna. Use adhesive velcro and Nitto electrical tape. Must not be able to get caught in prop.

Antenna need to sit at different angles - see image to right.

**NB:** Set your receiver fail-safe to AUTO LEVEL and 50% power - if Rx signal is blocked - craft will automatically flick level.
Prop Balancing

For detailed instructions of prop balancing, refer to video link on MultiWiiCopter.com website

NB: Ensure there is no wind, breeze or air moving through environment when doing prop balancing.

1. Lightly sandpaper edges to get rid of factory mould lines

2. Attach prop to prop balancing device. Observe where prop stops on balancer; mark the blade on the side that is lowest - heaviest - with a silver pen or white out pen. This is where you will scrape from.

3. With a scalpel remove shavings off the blade, testing on balancer after each shaving. Repeat until blade is balanced.

4. Sandpaper again to smooth surfaces.

5. Cut holographic blade tape provided in half long ways (see photo) and apply to blade matching tip edge angle. Wrap on both sides of blade and trim any excess.

6. Repeat with remaining blades. You will need two CW and two CCW blades. The rest of the blades are spares.

NB: 3D Holographic blade tape is for safety, not for balancing.

Nitto electrical insulation tape can be used for additive balancing - an alternate prop balancing method to scraping. Additive method is inferior to scrapping method as added tape can fly off during flight (without pilot knowing). See photo at right.

Note the amount of scraping required to balance one prop - this prop was out of balance on one side - so the leading edge of one blade and the trailing edge of the opposite blade were carefully...
Props on

Ensure to apply props in the correct orientation for your copter. Refer to diagram to right.

Never add props to the copter until you are confident in your understanding of the electronics.

No Props = No Risk

Squash engine collet leaves with your fingers.

Do not use a tool to squash collet. Collet will be damaged and prop will be out of balance.

Attach prop in between collet and washer, with the spinner holding everything onto the collet.

NB: Collets are soft and can be bent easily if forced.

Push collet onto engine firmly.
There should be a gap of approximately 3mm between collet and engine where shaft is visible.

Prop Tightening

1. Push nail through spinner
   If nail doesn’t go through, sand it smoother.

2. Hold base of Carbonbird™ engine with your lower hand ...

3. ... and hold top of spinner and prop with your thumb and index finger.

4. with your other hand, tighten spinner using the nail as grip.

5. Once tightened, test for tightness. Pull whilst holding exactly as shown in photo to right.

6. Spin to test collet.
   If prop spins true, collet is fine.
   If prop wobbles, collet is bent - replace it.
**Battery**

Attach female velcro to battery.

Attach Lipo to base plate of Scarab™ Airframe with velcro. Battery should be oriented slightly toward the front of the copter.

Adhesive velcro stops Lipo from slipping. Velcro strap holds Lipo in place.

Check Scarab™ Copter is correctly weighted with Lipo on board by balancing on index fingers. Copter should tilt slightly toward the front. ALWAYS check CoG.

**Pre-flight inspection**

Below - get used to doing a full pre-flight inspection every time. It’s a full aircraft and requires methodical checking. A combination of eyeball - visual inspection and manual checking - physical tightness checks - your quad does not glide - if something goes wrong it will exit the flight envelope.

Always do a Pre-flight and Post flight check - don’t become complacent. Be systematic and ALWAYS check prop attachment - wiring and Temps.
Flight Modes
MultiWiicopter ACRO vs Auto LEVEL

Some Noobs want to use their wallet to buy their way to a full auto-pilot - like buying a Wookong M for their first copter - or get GPS so that GPS somehow controls the aircraft for them - that's a myth and unsafe - but don't worry - the real JOY of the multiwiicopter ACRO mode system is the amazing combination of smooth 100% control with full stability - hard to explain - it's just amazing how the basic flight mode - called ACRO - handles really well - its far more satisfying than MikroKopter or DJI autopilot level modes - in these other platforms you feel like a cab passenger in New York - you can basically direct the Cab to go where you want but your in no doubt that your NOT the driver. Well with Multiwiicopter hardware/software it's the opposite - in ACRO mode (ACRO = stupid name - should be called AWESOME mode or HERO mode) you have absolute and complete control - Smooth and even response to stick inputs - yet its smooth predictable and stable. ALL the filmmakers at MultiWiicopter.com fly in ACRO mode - almost all the time.

First off I fly Mode 2 (throttle and Yaw on left stick - I am a real Helicopter pilot/instructor - so the other RC modes are like weird to me - sorry.

Transmitter set-up
I set on 2 posn switch above throttle (right stick) this switch controls ACRO/LEVEL - down is ACRO - up is LEVEL on on 3 position stitch on right side - up off/mid MAGon/ down/ MAG & BARO on

I fly 95% in ACRO - I use LEVEL mode only for High hover parking while looking at something (my ground station LCD)
I use LEVEL mode for Take-off on goggles - FPV - when in sloping or patterned area with no obvious level horizon line - first 10m climb out - then switch back to ACRO
Landing on Goggles - FPV - last 10m to touch down Crash recovery - if lost orientation - crash recovery panic is a) power up 70% b)hit switch above LEVEL on c)release right stick to centre it

I use MAG for level hover heading lock - MAG does not work when tilted more than 20° - erratic readings - don't go flying around at high bank angles in MAG locked mode.

I use BARO - for high hover parking at 100 feet up above my head (in calm wind - otherwise it will go downwind) - its not ultra sonic - use your eyes/brain/hands to hover the aircraft - you don't need an auto pilot for this - get more stick time and get your skills developed.
**Scarab™ Hand Maiden - hand held test**

**NB:** First test PROPS OFF - then if safe add props for Hand Maiden

1. Always turn the Tx on first - then turn it off last - reason is Failsafe - make sure you understand failsafe and have programmed the failsafe condition!

2. Hold the craft securely by the core body - either above your head - or away at arms length - secure all loose wires - no loose clothing!
   Use proper Eye protection - set ACRO mode only.

   **DANGER** - props can cut ! Use common sense and take safety precautions to suit your experience

3. Wear eye protection ! - do a test run to check the PARIS™/Carbonbird™ ESC / Carbonbird™ Engines - if an engine stutters or hesitates - cut power - STOP - re-check all wiring - or you will smoke your ESCs and the engines if you continue - so STOP - investigate the wiring!
   At 1/3 throttle all Gyro responses are normal - resists tipping in all directions - stick orientation is correct - yaw stick input is correct - low power systems response check.

4. Learn the switch position for Auto LEVEL - ON/OFF . MAG on/off and BARO on/off

5. All engines MUST start together to show all ESCs are programmed with THROTTLE LEARNING - see wiki - see Carbonbird™ Engines page on MultiWiiCopter.com website

6. All run smoothly up to full power - Same programming - timing setting - this is the time to check all motors and power systems are good. Should feel balanced. Make sure all modes are OFF - ACRO mode only.

7. ZERO vibration in the frame and props

8. Does not want to rotate - yaw - feels balanced in your hand - smooth

**NB:** If anything seems wrong, - then DON'T FLY. Aviation works on 100% perfect - not 98%

If you never tried RC before, use a Flight simulator first - AEROSIM RC - with Scarab™ Copters.
Scarab™ Maiden - first flight

Only do after a successful hand maiden (above)

1. Choose a field with thick, lush and soft 12” grass - for the first flight. Place down a piece of hard material to act as a level Helipad - 1 meter diameter approx - if you land in grass you will get a rotor strike - Choose a calm day and get well away, 100m - from spectators and by standers - NEVER maiden in front of a crowd of people - Use a hat-cam to record the flight incase you need to study your performance later. Stand behind the SCARAB and take off directly to 2m. Most crashes come from impulsive manouevres carried out before the pilot is orientated. Take your tools with you.

2. set it to ACRO mode - AUTO LEVEL OFF - MAG OFF - BARO OFF - GPS OFF

3. The objective of a maiden is to tune it and confirm PIDs are good - its a short flight - the objective is to -
   • Trim the craft yaw - setting all engine tilt angles start at 5° - then alter so there is no yaw in the hover
   • Check the craft hovers at 50% throttle - not overloaded with extra gear
   • Check the handling is smooth - PIDS not set too high - no oscillations -
   • Check the ESCs run cool
   • Check the motors run cool
   • Check the LiPo runs cool

4. After takeoff - when your nerves have settled down - check to make sure its not YAWING - rotating - if it does then alter the twist of the motors - in pairs - to hold true.

NB: DO NOT TRIM on your Tx! Transmitter trims are NEVER recommended for Multicopters with an IMU - this will shift the centre point away from 1500

5. On the second flight you can do the AUTO LEVEL trimming

6. On the third flight you can test the MAG - Only set the MAG to active after you place the craft on the ground - otherwise it will immediately rotate to the heading it was at when you powered up the CPU and Sirius IMU.

Pilots often get over confident and crash on their 2nd battery - small steps!

Use the Scarab Forums and become part of the online community - make some friends who have the same passion as you do - Scarab™ Pilots are some of the nicest people you will ever meet because they understand the power of the Scarab™

Fly safe.
Quinton - AlouetteIII
Safety in your Skies

Your Multicopter PARIS is controlled 100% by software - NEVER load Dev or hacked software. Use only the fully approved MultiWii software - full versions - approved by the master coder AlexinParis. All Dev or hacked software is potentially dangerous and will void your warranty. When making any changes to the Config section you assume FULL RESPONSIBILITY - never alter code unless you fully understand the code - and the consequences of your actions.

Never attempt a maiden flight until first completing a successful hand-held maiden - take safety steps - eye protection - gloves - See Guide to maiden Document.

Keep more than 30m from persons, choose an empty sports field for your first flights with soft grass

Do not fly near pets, houses or cars

Never fly within 3nm of an airfield or above 400ft

Never install your props until after the Multicopter is fully tested and 100% correct without props. Engines can start suddenly and without warning IF YOU FAIL to understand how they work or skip any steps.

Conduct full pre-flight and post-flight inspections and ground your Multicopter if you notice anything as a risk hazard, such as hot components or unusual operation.

Set your Tx/Rx binding FAILSAFE to low throttle 1/3 position so that if the link is lost the copter will descend slowly. Do a full range check and use RSSi

Always keep your Copter visual in line of sight LOS for one pilot ops - FPV is only legal in AU with a buddy on a buddybox - 2 person FPV is 100% legal using the buddybox system below 400’. See CASA Part 101 Regs

RC flying is a privilege - please enjoy it. Don’t show off and don’t get over confident

Home movies are fine, but in Australia professional paid photography or videos from an RC aircraft requires CASA Part 101 compliance, including exams and approved ops manuals and pilot competency tests by CASA official which will cost several thousand up front.

Disconnect the centre red wire if using a separate switching uBEC - Pay attention to polarity! Never plug or unplug live wires!

Warranty

90 day repair/replacement warranty - All products are covered by a 90-day replacement/repair warranty for normal use. Warranty excludes :- - fusion, reverse polarity, over-voltage damage, short-circuit, damage by static charge, connection of live servo or ESC wires, flood, crash damage, impact damage, incorrect tools, refashing the CPU comms or boot files, software hacks, moisture ingress, trauma damage and misuse. Where a product is considered to be defective in hardware, buyers are required to send a photograph/video showing the hardware problem in detail, accompanied by an accurate description of the fault in the video and photos - multiwiiocopter.com will issue an RMA authority number which must be displayed on the returned package/item. Buyer is responsible for the cost of shipping returned items. Where a buyer reloads any software - they assume full responsibility for the software alteration and any subsequent damage/corruption to the hardware - whether caused directly or indirectly by the software. Only full versions of the software are approved and any hacked or dev software is expressly forbidden and will void any and all warranty.

Returns

7 day refund - Where an item arrives DOA due to shipping damage or manufacturing fault, buyer has 5 working days (7 calendar days) to request a refund. Refund procedure requires that the item is returned in original condition, un-used, un-modified with supporting photographs of any defect/damage and an RMA number issued as above prior. The refund will only be processed on inspection at multiwiiocopter.com of the returned item for normal use. Normal use includes following of all guidelines and safety-related instructions in the user documentation.