

# ***StratoLauncher<sup>®</sup> IV Standard***

## **Instruction Manual**



Black clamp-on cable stop



Hose Q-Release



Aluminum manifold  
w/black cable stop



1/4" NPT plug



1/4" NPT plug



Schrader tank valve



125 PSI safety relief valve

If black cable stop hole is facing up, then use 2 mm hex key to loosen screw, flip cable stop around with slit facing up, and re-tighten screw.

Step by step video instruction links:

[Assembly Instructions](#)

[Select & Prepare a Bottle](#)

[Launch Procedure](#)

[Parachute Deployment Techniques](#)

[How to Mount an Altimeter](#)

[Rail System Upgrade Kit](#)

[Cable Is Too Short or Too Long](#)

[StratoJig: Homemade Fin Mounting Adapter](#)



# LAUNCH TIPS



Weighted fall away nosecone required (made from 2nd bottle)

Test launch with air only at 40 - 80 PSI for 2 or 3 times before adding any water

Fill funnel to the brim rapidly and stop (about 200 ml)

Score mark on center tube indicates max optimal fill level

\*Rocket will not fly straight and/or crash if procedures above are ignored





## STABLE 2-LITER ROCKET REQUIREMENTS

Aside from the angle a launcher has no effect on rocket flight. Rocket stability or lack thereof determines the flight path (straight, arc, flipping, veers off)

1. Aerodynamic nosecone
2. Add weight (0.5 – 1.5 oz) in the nose to prevent flipping during launch
3. Nosecone must fall away at apogee to deploy chute or prevent nosediving
4. Straight walled soda bottles work best (use fancy bottles only for nosecones)
5. Longer and/or narrow rockets are more stable
6. Mount fins as far back as possible
7. Use <200ml of water unless employing a guiderail system
8. Counterbalance weight if adding an altimeter or chute release or camera, etc.



## IMPORTANT TIPS:

Launch Video: [StratoLauncher IV Standard](#)

Nozzle water rockets function differently than full bore water rockets. Forget most everything you might know about water rockets and follow our assembly and launch instructions for the best performance (i.e. straight flights, high altitudes, no broken parts, and gentle recovery).

Do NOT wrap Teflon tape around any plastic threads. Teflon tape should only be used on metal to metal connections. In most cases if the fitting already has red sealant on the threads, Teflon tape is not needed.

Do NOT use Teflon tape where there is already a rubber washer to seal that connection (i.e. hose connector/top of manifold or nozzle/StratoFins attachment ring). StratoFins and the soda bottle threads do NOT need Teflon tape.

Do NOT hand tighten the fittings especially the air pressure gauge, but rather use the appropriate sized wrench to tighten them into the manifold.

Do NOT overtighten the black clamp-on cable stop over the hose connector. There should be a gap where the screw is. These ends should not be touching. There may be a small washer(s) in this area on recent models to limit tightening too much. The clamp-on cable stop only needs to be snug enough to not slip on the outside sleeve of the hose connector.

Do NOT attach the nose cone to the top of the rocket. It should merely be placed on top before launching so that it can fall away at apogee. Air flow will keep it in place on liftoff. To aid in falling away, 2 or 3 pennies can be added inside the screw-on cap and held in place with glue or use a pink flagging tape streamer to hold them in place when the cap is screwed on to the nose cone.

Do NOT launch or land on hard surfaces like concrete, asphalt, or rocks. If you are, do NOT expect the StratoFins to survive the landing especially if you are NOT using a fall away nose cone.

Do NOT overfill your rocket with water. Optimum water fill is only about 1 cup of water. If using the funnel, fill the funnel rapidly to the top with water and stop pouring when it reaches the brim. This will yield about 1 cup of water inside the bottle after the funnel has emptied and ought to be close to the score mark on the stainless steel tube when placed on the launcher. If using the Ultimate water fill system with the tank sprayer, cease adding water when the score mark on the stainless steel tube is reached. You are welcome to experiment with a little more or less water, but 1 cup is optimum and makes for efficient launching without requiring a lot of water being carried into the field. A 2 gal. tank sprayer will yield about 30 launches. Adding more water will not result in higher altitudes. If you are filling the bottle up 1/3 to 1/2 full than you will not obtain straight flights, since this extra water swirls around inside before exiting and throws the rocket out of balance on liftoff.

Generic brand (Walmart/ Target) straight walled 2 liter soda bottles work the best and they have the thickest walls for longevity. Pepsi drink bottles work fine, but have thinner walls and wear out quicker under high PSI. Coke style bottles work, but not very well and their steep necks reduce the amount of water in the bottle even though the level might be touching the score mark on the stainless steel tube.

If leaking and positioning issues continue to plague you when using Teflon tape for the air pressure gauge or the mini ball valve or any fitting that screws into the side of the manifold, you can use a removable thread lock sealant like Loctite 242 Blue [Threadlocker](#) or similar:

Plan ahead since this takes 24 hrs. to cure. Be sure you only use the removable version sealant in case you need to replace, reconfigure, or upgrade any of these fittings in the future. It will require a wrench to loosen once set, but it will still be removable. Only about 4 to 5 drops around the threads of the fitting is all that is needed.

Replacement parts such as black nozzles, StratoFins, upgrade kits, etc. can all be purchased on our website: <https://www.stratofins.com>



# StratoLauncher® IV Assembly Instructions

## Tools required for assembly and items needed to launch rocket:

An adjustable wrench (or a 14mm wrench), 4mm & 5mm hex wrench, and Phillips head screwdriver. A plastic (PET\*) soda bottle, nose cone, water, and air source (bicycle pump, foot pump, scuba tank, or an air compressor).

1



### Take Inventory of 17 parts

1 - Aluminum manifold w/black cable stop  
2 - 1/4" NPT male plugs  
1 - 125 PSI safety relief valve  
1 - Schrader tank valve  
1 - Hose Q-Release  
1 - Black clamp-on cable stop  
1 - 1/4" stainless steel tube  
1 - ABS plastic base | 1 - SS Phillips screw  
1 - Brake cable | 1 - lever | 1 - PVC handle  
1 - StratoFins® Set | 1 - black nozzle  
1 - Red water fill funnel | 1 - black reducer

2



### Assemble Launcher

With the black cable stop facing you screw brass parts into the manifold beginning at the upper left & work clockwise. Apply 4 drops of blue thread locker before screwing in. Screw in black plastic hose connector on top. Attach clamp-on cable stop over hose connector & align. **Do not over tighten clamp as connector will bind / break.** Apply thread locker around threads of 1/4" SS tube to keep water out of the air chamber below before screwing it in place.

3



Mount assembled launcher onto the ABS base with the SS Phillips screw. Stretch out brake cable & place fat barrel nipple into the brake lever slot, thread through, and secure with silver slack adjustment ring. Insert other end of cable housing into manifold cable stop, push hose connector down & place nipple into clamp-on cable stop. Remove excess brake cable slack by ring or screwing in Phillips screw on lever. Increase or decrease brake cable slack by raising or lowering clamp-on cable stop.

**Disclaimer:** Relationshipware LLC and its members are **NOT RESPONSIBLE** for any injury or loss of property to any person suffered while operating this water rocket launcher.

Copyright © 2018 by Relationshipware LLC

## Launch video: [Assembly Instructions](#)

### Soda bottle nose cone is required or rocket will not fly straight:

Create the nose cone by starting a cut with a razor blade or box cutter about 4" down from the cap and just above the label of a plastic (PET\*) soda bottle. Finish cutting around the bottle with scissors in a straight line.

4



### Check for Leaks

Before heading to the launch field, check that all seals do not leak. Add a cup of water to the bottle. Place bottle onto the launcher & press down until it locks with a loud click. Pressurize to 80 PSI with pump & see if any water is escaping around the threaded holes of the manifold. If so, pull the ring on the relief valve to release pressure, then redo leaking fitting(s). **Relief valve slits should face sideways to avoid spraying into eyes when it releases.**

5



### Upgrade Part Tips

Wrap 3 to 4 layers of Teflon tape clockwise around threads with threads facing you; insures that tape won't come off while threading into hole. Air pressure gauge & mini ball valve need to be aligned to face toward the top or angled slightly to the front. More wraps of Teflon tape may be needed for these 2 parts to properly align on the manifold. Water will run off better when gauge is installed at an angle and will read better when launcher is tilted.

6



### Assemble Accessories

Attach brake lever to PVC handle if separate. Insert black reducer into collapsible funnel. See next page for assembling the StratoFins and creating a nose cone from a 2 liter soda bottle. Screw black nozzle on to StratoFins or your homemade rocket.

### Replacement Parts

Replacement parts, upgrade kits, videos, and future accessories can be found at: [www.stratofins.com](http://www.stratofins.com)

\* Polyethylene terephthalate (aka PET) is a thermoplastic polymer resin of the polyester family that is used in soda pop bottles. Serious bodily injury could result from using any other type of bottle.

### **Tips & Troubleshooting:**

Be sure to use wrenches when screwing in the gauge, valves, and fittings. Do not attempt to screw them in by hand other than getting them started. This is particularly true for the pressure gauge as the housing will provide good leverage, but you will break the gauge in the process. Use the appropriate size wrench (14 mm ideal or adjustable or 9/16 inch will work okay) on the hex portion of these items.

If your kit comes with the ball head, but you do not want a user to be able to angle the launcher, you do not need to install the ball head.

### **Positioning gauge, valves, & fittings:**

With threads facing you, wrap Teflon tape clockwise around threads to insure that it won't come off while threading into a hole.

Wrap at least 4 layers of Teflon tape clockwise around threads of the air pressure gauge and the mini ball valve before screwing them into the top holes. This will keep these from leaking and help with alignment of these two units. The other fittings one can keep screwing in, but due to proper positioning of the gauge and valve you will not be able to keep screwing them in all the way.

Screw in air pressure gauge first on the upper left side hole if your kit comes with this part.

Next screw in mini ball valve on the upper right side hole if your kit comes with this part.

Air pressure gauge and mini ball valve need to be aligned to face toward the top or angled slightly to the front. More wraps of Teflon tape may be needed for these 2 parts to properly align on the manifold. Water will run off better when gauge is installed at an angle and will read better when launcher is tilted at an angle.

Air pressure safety relief valve slits should face sideways to avoid spraying into one's eyes should it open during pressurizing.

Do not over tighten clamp-on cable stop over hose Q-Release connector, since it might bind (reduce up and down movement from internal spring action) or possibly even crack the plastic hose Q-Release connector sleeve.

### **Ball Head Adjustments:**

Ball head will NOT lock in place if the attachment plate inside at the bottom is unscrewed too far. One can rotate the ball head from the base; however, if it is rotated too far it will not make contact with the ball and therefore will not lock in place. Solution: you may need to loosen Phillips head screw in ABS base to allow the ball head plate to screw back up inside to make contact with the ball head.

When adjusting the angle of the launcher lean it toward the left of the lever, since this has the slot enabling it to move a greater distance. Also, when launching at an angle release the rocket when you are positioned on the side of the lever. If you are behind the rocket on an angled launch you will get sprayed with water when it takes off.

### **Brake Cable and Lever Adjustments:**

The remaining cable outside the black housing will shorten when the brake cable is coiled up; therefore, do not leave it attached to the launcher when you coil it up since it will compress the springs inside the Q-Release hose connector. If you look closely at our pictures with this coiled arrangement you will see that the other end is not attached to the brake lever, but laying underneath of it. This arrangement was for picture taking purposes and it is better to keep the cable attached to the brake lever and remove the cable from the launcher when being stored.

When taking up slack in the brake cable, start with the slack adjustment barrel and back it out several revolutions and lock with the outer ring. If more slack needs to be removed turn the Phillips screw beside it in and this will adjust the throw distance of the brake lever. Do not remove all the travel out of the lever throw or you won't be able to pull the Q-Release hose connector down to release the rocket. If even more cable slack needs to be removed than raise the clamp-on cable stop on the Q-Release hose connector. Between these 3 adjustments you should be able to take up any extra slack in the cable length.

If the cable is not long enough make sure the Phillips screw is mostly turned out on the lever throw. Make sure the adjustment barrel is turned all the way inside so no slack is being taken up. Thirdly lower the position of the clamp-on cable stop on the Q-Release hose connector, which will require less cable to reach the clamp-on cable stop.

Spray WD-40 or similar lubricate inside the brake cable housing on the side closest to the launcher will help the cable move easily inside and keeps moisture out for longevity.

These troubleshooting tips should solve any issues you might have. If you encounter additional problems, please let us know [info@stratofins.com](mailto:info@stratofins.com) and we will update these troubleshooting tips with additional solutions.

Thank you for your purchase and we hope you enjoy your new StratoLauncher IV for many years to come.

# StratoFins® Instructions & Information

Please read through the *StratoFins*® instructions carefully to optimize flight performance with your specific style launcher. Launch rocket with extreme care and only under adult supervision.

## Launch video: [How to Make a Water Rocket Nose Cone](#)

### Launching rocket with a nose cone improves performance:

A nose cone makes a rocket aerodynamic for straighter flights. *StratoFins* will work on most launchers with air pressures of 10 to 120 PSI, but best results occur between 40 to 80 PSI with a nose cone resting atop the rocket.

**1**



**StratoFins®\* Kit Includes:**  
Attachment ring (1)  
Fins (3)

\* *StratoFins*®: are compatible with 95% of all available launchers either homemade or commercially available in the marketplace including those employing a rubber stopper, an expanding tube, nozzle, O-ring, or cable ties because it replicates the threaded portion of the bottle beyond the fins.


**2**



**Assemble StratoFins:**  
Assemble *StratoFins* by sliding each fin down a separate slot on the attachment ring beginning from the top. With all fins in place screw the attachment ring onto a soda bottle until snug. Works ideally with a 2 liter soda bottle, but smaller sizes can be used. This water rocket can be launched with or without a parachute attached since this configuration does not nose dive, but instead tumbles gently back to the ground.


\* *Stratofins*® require no tools or glue for assembly.

**3**



**Construct Nose Cone:**  
Create a nose cone from the top of a 2 liter bottle by starting a cut with a razor blade or box cutter about 4" down from the cap and just above the label of a plastic (PET\*\*) soda bottle. Finish cutting around the bottle with scissors in a straight line. Cut around the nose cone again if necessary to smooth and straighten the bottom edge of your new nose cone.

**4**



**Place Nose Cone:**  
Right before launch place the nose cone on top of the water rocket. Do NOT secure it in any manner. Notice the gap (notice arrow) between it and the bottle. During lift off the air pressure holds the cone in place. When the rocket reaches apogee and begins to turn, the cone falls off thus preventing the rocket from nose diving into the ground and causing potential damage to the rocket and public or private property.

**5**



**Assorted Rockets:**  
Various rockets and launchers can be used with the *StratoFins* from different size soda bottles to FTC (Fluorescent Tube Cover) rockets and more. A truly versatile product for many applications.

**6**



**Replacement Parts**  
Replacement parts, upgrade kits, videos, and future accessories can be found at: [www.stratofins.com](http://www.stratofins.com)

\* An optional flagging tap streamer about 2 ft. long can be attached inside the nose cone with the cap screwed over one end as shown above to help locate the cone after launching.

**Disclaimer:** Relationshipware LLC and its members are **NOT RESPONSIBLE** for any injury or loss of property to any person suffered while operating this water rocket launcher.

Copyright © 2018 by Relationshipware LLC

\*\* Polyethylene terephthalate (aka PET) is a thermoplastic polymer resin of the polyester family that is used in soda pop bottles. Serious bodily injury could result from using any other type of bottle.



# StratoLauncher® IV Launch Instructions

Please read operating instructions carefully before launching any plastic bottles. Designed for ages 10 and over. Operate launcher with extreme care and only under adult supervision.

1



## Safe & Secure

Choose a safe area such as a huge field or park away from people, trees, and residences to launch plastic bottles (rockets). Although no pulling action against the launcher is required to release the rocket, securing the base with 1 or 2 tent pegs (not included) may help avoid accidental tip over during use.

Launcher supports most .5L, 1L, 1.25L and 2 liter plastic (PET\*) bottles.

2



## Prepare Trigger

Fully stretch out the brake cable on the left side of the launcher parallel with the tank valve. Insert the black cable housing into the manifold cable stop, push Q-Release hose connector down & place nipple into clamp-on cable stop. Remove any excess cable slack with brake lever adjustments.

\* Polyethylene terephthalate (aka PET) is a thermo-plastic polymer resin of the polyester family that is used in soda pop bottles. Serious bodily injury could result from using any other type of bottle.

3



## Funnel Fill

Inspect your PET\* bottle for any damage or potential problems. If in doubt discard the bottle and employ another.

### Use only water and/or air for fuel.

Insert the red funnel into the bottle & fill the funnel to the brim quickly and stop pouring. This will yield the ideal amount of 1 cup (notice the water level near the score mark on the 1/4" SS tube when the bottle is mounted on the launcher).

4



## Mount Rocket

Tilt the entire launcher to the side, parallel with the ground, and slide the bottle over the 1/4" SS tube. Press the bottle against the Q-Release hose connector until it locks with a loud click. Place the launcher on the ground and secure with tent pegs if desired. Alternate method: hold your finger over the nozzle and place the bottle above the 1/4" SS tube, then rapidly remove your finger and push the bottle over and down the tube and lock in the hose connector.

5



## Water Fill Upgrade Kit

StratoLauncher IV Ultimate kit contains an upgrade kit that can be purchased separately, which enables the use of a tank sprayer (available at local hardware stores) as your water fill source. A 2 gal. tank will yield about 30 launches. Pressurize the tank by pumping 10 or more times. Open the mini ball valve on the launcher until the water level touches the score mark on the 1/4" SS tube, and then close for efficient and spill free fueling.

6



## Pump & Launch

Attach the air source\*\* to the Schrader valve on the launcher. Be sure all persons are at least 10 feet away from the launcher, then begin pumping. Launcher supports air pressures between 10 PSI up to 120 PSI\*\*\*. Stop pumping once you achieve the PSI that you desire. **Place nose cone on rocket.** Squeeze the brake lever from a safe distance and out of the splash zone to launch the rocket. Enjoy!

\*\* Sources for compressed air include a bicycle pump, a foot pump for a car, scuba tank, or air compressor.

**Disclaimer:** Relationshipware LLC and its members are **NOT RESPONSIBLE** for any injury or loss of property to any person suffered while operating this water rocket launcher.

Copyright © 2018 by Relationshipware LLC

\*\*\* If the bottle fails to release from the launcher or it is aimed in an unsafe direction and you are exceeding 120 PSI, then **ABORT** your launch. Carefully pull the safety valve ring to release the air pressure within the bottle; than one can remove the bottle from the launcher.

Launch video: [Launch Procedure](#)