Issue 669 / January 13th, 2026

PEAK OF FLIGHT NEWSLETTER

Apogee Components, Inc. / ApogeeRockets.com / Colorado Springs, CO

Build a Low Cost - "One Carry" Launch Pad



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COVER PHOTO



Gyro Chaser Rocket gets an Overhaul

The Gyro Chaser rocket was redesigned to make it simpler and easier to assemble thanks to a 3D printed rotor hub. And it performs even better! Check it out today!

FEATURED ARTICLES



Low Cost - "One Carry" Launch Pad

WLooking for a cheap launch pad that has the capability to swap between rods and rails? This article shows plans for a converted bicycle repair stand.

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About this Newsletter

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The Apogee Gyro Chaser lifts off on January 3, 2026 from Pueblo, Colorado



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Low Cost - "One Carry" Launch Pad

Repurposing a Bicycle Repair Stand

By Dave Newill, NAR 6139

Over my many years (60 and counting!) of model, mid, and high-power rocketry, the topic of Ground Support Equipment (GSE)—specifically launchers—has always been a point of contention. We all know the struggle: you arrive at the field, and suddenly you are hauling a separate launcher, a heavy battery, a launch controller, a bundle of rails and rods, and your rocket box. It usually takes two or three trips back to the car before you are ready to fly.

My goal has always been the "One Carry." I want to walk from my car to the launch point with everything I need in a single trip.



Figure 1. Bike Repair Stand with rail / blast deflector



Furthermore, as I've gotten older, I have developed a strong aversion to bending over or kneeling in the dirt to hook up igniters.

I have built special carry boxes with adjustable launch heads, tripods of various styles, and other designs that were, frankly, less than perfect. But then, I saw a bicycle repair stand with a clamp. BINGO! It was so obvious. These stands are designed to hold heavy bikes at adjustable angles and heights—exactly what a rocketeer needs.

While the setup is intuitive, I've refined the design into two distinct configurations: a single-rail launcher for personal use, and a multi-rocket rack for youth groups. Here is how you can build the ultimate GSE.

The Foundation: The Stand

There are a number of four-legged bicycle repair stands available from various online retailers. Mine cost right around $50.00, though most seem to hover near the $75 mark these days. They are robust, foldable, and designed to take a beating.

The premise is simple: open the legs, lock them, and clamp your rail into the grip. However, as an engineer, I couldn't just leave it at that. We must complicate things to perfect them, of course.

Configuration 1: The Adjustable Rail & Rod Launcher

I am a stickler for alignment. One issue with the standard bike clamp is that the rail tends to fit into the soft blue jaws at a 45-degree angle rather than sitting square. I wanted the rail and blast



Figure 2. Bike Stand as it arrived and the legs spread.



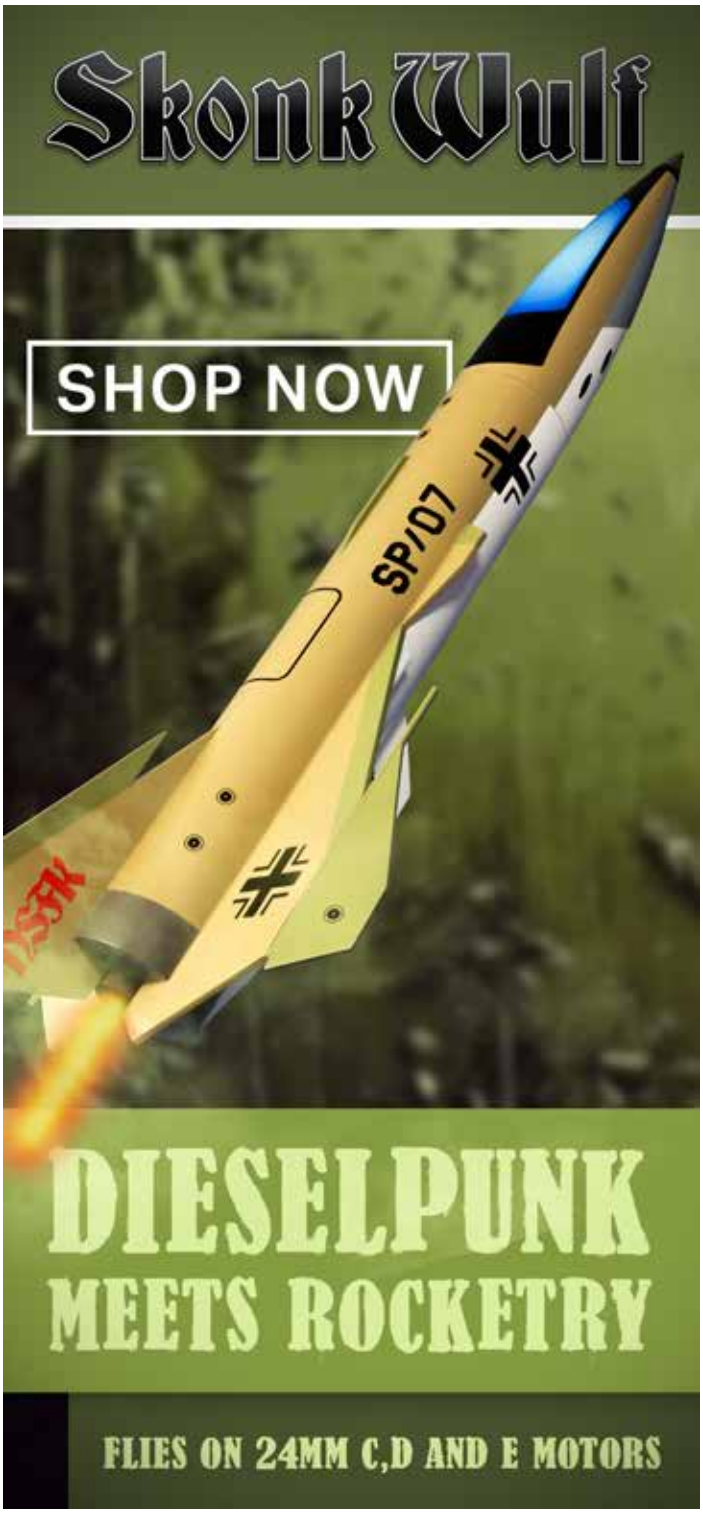




Figure 3: Attach the pivot head.

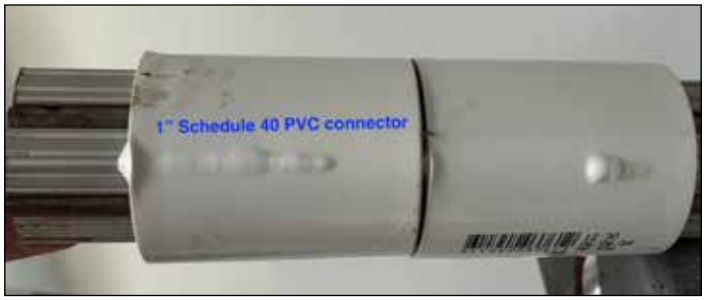


Figure 4: Schedule 40 PVC 1" Connnectors on base end of 10X10 rail.

plate to be perfectly square to the main cross tube.

To solve this, I used two 1 ½" diameter Schedule 40 PVC pipe connectors. By heating them slightly, I drove them onto the base end of my 1010 rail. These PVC connectors act as a round bush-



Figure 5 - PVC connectors in the blue clamp hold the 10X10 launch rail.



Figure 6 - Blast Plate holder after MANY uses.

ing, allowing the rail to sit securely in the clamp while being rotated to any position I desire.

The "Forever" Blast Plate

Next came the blast plate. I shaped a piece of sheet metal in a vice to provide the proper deflection angle. However, metal plates get dirty and conductive. My solution? I put a lip edge on the metal plate and inserted a piece of scrap ceramic tile.

I drilled a ¼" hole through the plate and used a ¼-20 thread, 2" carriage bolt to connect it to the rail. With a small amount of filing, the carriage bolt head slides perfectly into the "tee" slot of the rail. The ceramic shield lasts nearly forever, cleans up easily, and is usually free if you ask nicely at a carpet and tile shop. Most importantly, ceramic does not conduct electricity, preventing short circuits between your clips.

Adding Launch Rod Capability

But what about standard model rockets that need a rod? I realized the tube holding the blue rail clamp had an open end opposite the clamp. I took a 12" piece of 1" dowel and sanded it to fit tightly into that open tube.

After careful drilling, I installed ports for various-sized rods. I added threaded inserts at 90 degrees to those holes, allowing me to use a locking bolt to clamp the rods securely in place. Now, the launcher is dual-purpose.

To achieve the "One Carry" goal, I needed storage. I attached two "quivers" made of scrap aluminum tubing, zip-tied to one of the fold-down legs. This provides instant storage for my 1/8" and 3/16" rods.

The Launch Experience

With the center rotation clamp loose, I can tip the rail or rod



Figure 7 - Note igniter connection at eye level.



Figure 8 - Drill for launch rods. Install threaded studs for the knob/bolt. The Bold secures rods - here rotated 90 degrees (right).



Figure 9 - "quiver" on folded leg with rods of various sizes. Right: The bike repair rack rail and rod holder launcher in position.

into a near-horizontal position for loading. I can make my igniter connections easily at eye level—no squatting required—and then simply tilt it up to launch position.

My battery, launch controller, and cable travel in a heavy-duty canvas sack slung over one arm. The range box is in one hand, and the folded stand is in the other. One trip!



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Configuration 2: The Group Launch Rack

But wait, there's more! Eventually, the day came when I needed to support a youth program. Launching one rocket at a time



Figure 10 - The Bicycle repair stand mounted launch rack with six rockets

wasn't going to cut it; I needed a rack.

Since there was no need for a rail in this configuration, I grabbed a piece of 2x4 lumber, a 1 ½" dowel, and some scrap wood. The result was a highly adjustable, six-station rack that fits right onto the same bicycle stand.

Building the Rack

The length of the 2x4 was determined by the width of the rear hatch on my small SUV. For my vehicle, 44" was the magic number. A little sanding and bright paint yielded a part that kids could safely handle without getting splinters.

To mount the 2x4 securely to the bike stand, you need to cut two clearance pockets: one for the center pivot and one for the main blue clamp. These pockets allow the 2x4 to rest flush along the length of the stand's horizontal tubes (see Figure 11).

The Attachment Mechanism

To allow the blue clamp to grab the square 2x4, I cut a 6" piece of 1 ½" dowel. I removed a 3" section along the centerline of the dowel to create a flat area. This flat side is glued and screwed to the 2x4, while the remaining round section provides a grip surface for the blue clamp.

I also added two "saddle" strips—1" wide, 6" long scrap wood—to keep the 2x4 aligned with the horizontal tube and prevent twisting (see figures.14 and 15).



Figure 11 - 2X4 rack sitting on horizontal tubes of the bike repair stand. Pockets were cut out of the wood for clearance in the stand.



Figure 12 - A 1-1/2" wood dowl was notched and attached to the surface of the wood. This is the handle that attaches to the blue clamps of the bike stand.

Figure 13 - (below) Base view of the dowel on the 2x4.

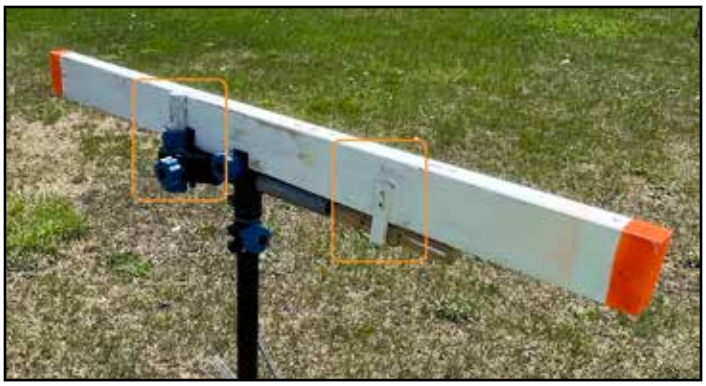






Figure 14. Dowel for Blue Clamp and saddle strips (one side shown)

Figure 15 (below) - Saddle strips – one side shown (same side as above).



Use in the Field

I drilled the top of the 2x4 to accept both 1/8th and 3/16th launch rods—six in total. I also added ceramic tile blast deflectors to this setup as well.

The beauty of this design for youth groups is the tilt. The rack tilts down to 90 degrees or less, allowing several rocketeers to load their rockets simultaneously. It puts the igniter clips at eye lev-

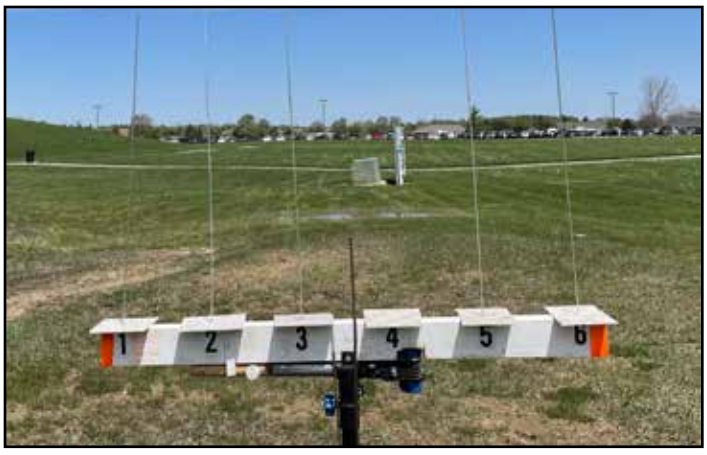


Figure 16: Bike repair stand holding six station rack — note the ceramic tile blast deflectors



Figure 17 - Kids sliding their rockets onto the rods – nice that it tilts over

el for smaller flyers, which is a massive help in ensuring successful hookups and fewer misfires.

For older teens or adults, the center fitting of the stand allows the entire rack to be adjusted upwards by 20 inches, keeping the business end of the rockets at a comfortable height. The whole rack rotates and tilts to adjust for local wind conditions instantly.

Conclusion

Whether you are flying high-power rails solo or managing a



Figure 18 - The rack can be clamped in place for easy carry out to the launch site. Remove the rockets from quiver tubes, then spread the legs and lock into place.





chaotic group of Cub Scouts, the bicycle repair stand is the secret weapon of ground support. It locks in place, provides a robust set-up, and packs away neatly.

Best of all, it meets the "One Carry" rule. Save your back, save your time, and spend more of your day launching rather than setting up.

About the Author

David Newill NAR 6139 - an OLD rocketeer - NAR since 1964





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Article Submission Guidelines

SUBMITTING ARTICLES TO APOGEE

We are always looking for quality articles to publish in the *Peak-of-Flight* newsletter. Please submit the "idea" first before you write your article. It will need to be approved first.

When you have an idea for an article you'd like to submit, please use our contact form at **https://www.apogeerockets.com/Contact**. After review, we will be able to tell you if your article idea will be appropriate for our publication.

Always include your name, address, and contact information with all submissions. Including best contact information allows us to conduct correspondence faster. If you have questions about the current disposition of a submission, contact the editor via email or phone.

CONTENT WE ARE LOOKING FOR

We prefer articles that have at least one photo or diagram for every 500 words of text. Total article length should be between 2000-4000 words and no shorter than 1750 words. Articles of a "how-to" nature are preferred (though other types of articles will be considered) and can be on any rocketry topic: design, construction, manufacture, decoration, contest organization, etc. Both model rocket and high-power rocket articles are accepted.

CONTENT WE ARE NOT LOOKING FOR

We don't publish articles like "launch reports." They are nice to read, but if you don't learn anything new from them, then they can get boring pretty quick... Example: "Bob flew a blue rocket on a H120 motor for his certification flight." As mentioned above, we're looking for articles that have an educational component to them, which is why we like "how-to" articles.

You can see what articles and topics we've published before at: **https://www.apogeerockets.com/Peak-of-Flight?pof_list=archives&m=education**. You might use this list to give you an idea or two for your topic.

Here are some of the common articles that we reject all the time, because we've published on these topics before:

- How to get a L1, L2, or L3 Cert
- Building cheap rockets and equipment (pads & controllers)
- How to 3D print parts, or a Rocket Kit
- How to Build a cheap Rocket Kit
- Getting Back Into Rocketry After a Long Hiatus

ARTICLE & IMAGES SUBMISSION

Articles may be submitted by emailing them to the editor. Article text can be provided in any standard word processor format, or as plain-text. Graphics should be sent in either a vector format (Adobe Illustrator, SVG, etc.) or a raster format (such as jpg or png) with a width of at least 600 pixels for single column images or 1200 pixels for two-column images. It is preferable for images to be simple enough to be readable in a two-column layout, but special layouts can be used.

Send the images separately via email as well as show where they go by placing them in the word processor document.

ACCEPTANCE

Submitted articles will be evaluated against a rubric (available here on our website). All articles will be evaluated and the results will be sent to the author. In the evaluation process, our goal is to ensure the quality of the content in *Peak-of-Flight*, but we want to publish your article! Resubmission of articles that do not meet the required standard are heavily encouraged.

ORIGINALITY

All articles submitted to Peak-of-Flight must not run in another publication before inclusion in the *POF* newsletter, but it may be based on another work such as a prior article, R&D report, etc. After we have published and paid for an article, you are free to submit them to other publications.

RATES

Apogee Components offers **$300** for a quality-written article over 2,000 words in length. Payment is pro-rated for shorter articles.

WHERE WILL IT APPEAR?

These articles will mainly be published in our free newsletter, *Peak-of-Flight*. Occasionally some of the higher-quality articles could potentially appear in one of Tim Van Milligan's books that he publishes from time to time.





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