# Tech-Tip 021

## ***Launch Rails & Rail Buttons:***

Dedicated to the dissemination of detailed model building methods and techniques.
Materials and methods presented here are not intended as the best or only solutions to the modeling challenge(s) discussed, rather as methods and procedures which have a proven record of success in actual use. Please keep experimenting with new materials, techniques and procedures as this is the only way to expand the fields of knowledge. Written by: John E. McCoy Sr. NAR-15731 - March 25, 2016 – rev. April 09, 2016.

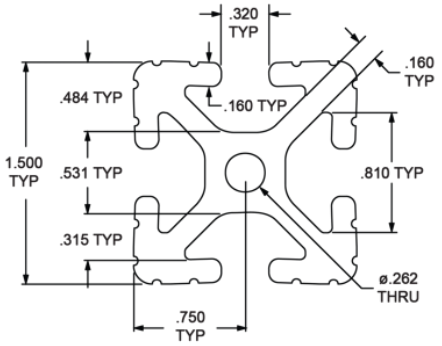
***Launch Rails:*** Much has been written over the past year or so about the joys of launching from various size and length rails eliminating the dreaded *Launch Rod Whip* seen so often at many sport launches. The internet is buzzing with all kinds of stuff pertaining to what rail, how long for what size and weight rockets. This Tech-tip will be a brief look at the various size ***Rails*** available, the ***Rail Buttons*** and lugs used with each rail and some general suggestions for mounting these Launch Rails to personal or club equipment. I'm sure I'll miss something along the way as I do not fly HPR, so the largest Rail I'll be reviewing is the 1515 rail.

Because this rail is larger than anything we at Narhams will likely ever need I'll start with it and proceed downward through MPR, LPR to the smallest launch rail useable with Micro Maxx models.

Launch Rails have been in use by HPR folks for a good long time now. ***80/20 inc***. at http://8020.net has supplied most of the larger Launch rails along with Catalog number 1515 and 1010 for years.

**Please Note: Prices quoted in this article will likely change without notice and do not include shipping fees or sales tax.**

***The 1515 Rail:*** 80/20 Inc. Part no. 1515 is 1-1/2" square aluminum with slots on all 4 sides and a center core .262" hole. These hefty 6105-T5 aluminum extrusions are available in just about any length one might want with 72", 96", or 120" being the most common. Currently from 80/20 inc. 1515 Rails are priced at .53/inch. Mated with Rail buttons from any number of sources, I've found the most cost efficient vendor to be ***www.rail-buttons.com*** which carry a complete line of buttons in 1515, 1010, Mini and now Micro sizes. Currently 1515, 1piece Delrin rail buttons will support rockets between 15 – 20lbs. These buttons are attached to the model airframe with metal screws and epoxy. I'm told these screw are Flat Head Phillips ¼-20" Steel or Stainless Steel Machine Screws.
1515 Rail extrusion are generally machine screw mounted to heavy fabricated steel HPR launch pads.





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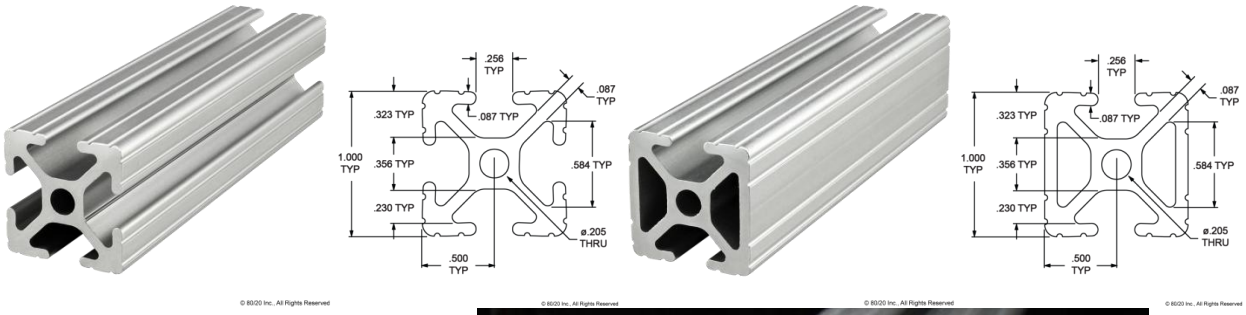
***The 1010 Rail:*** Also from 80/20 inc., Part no. 1010 is 1.0" x 1.0" Square 6105-T5 Aluminum extrusion with slots on all 4 sides with a .205" center hole that can easily be tapped for ¼-20 threaded studs. This seems to be the most common MPR/HPR Rail purchased currently at .23/inch. But Wait! There is another profile that is a bit stronger yet.

***The 1004 Rail:*** Also from 80/20 inc. or McMaster-Carr this profile is only 2 Slot on opposite sides of the 6105-T5 extrusion making this profile considerable stronger along the solid sides, and has the same .205" core hole. Best of all, is exactly the same price .23/ inch as the 1010 rail. This is the Rail profile purchased for our two major club systems. For those who might want to purchase their own, McMaster-Carr #47065T95 for the 2 slot 72", or 47065T101 for the slightly weaker 4-slot 72" either at 19.79 each.

Rail-Buttons.com has a wide variety of 1-piece delrin or 3piece Nylon buttons in a number of colors. All attach to the Airframe with 8-32 x ½" binder head Phillips machine screws & epoxy. Currently the 3-pc nylon button 10pk for 2.50.

Either of these rail profiles can be mounted with through bolts or retainer sockets in many of the larger MPR Pads or with 1/4" stud pins tapped into the center core hole.



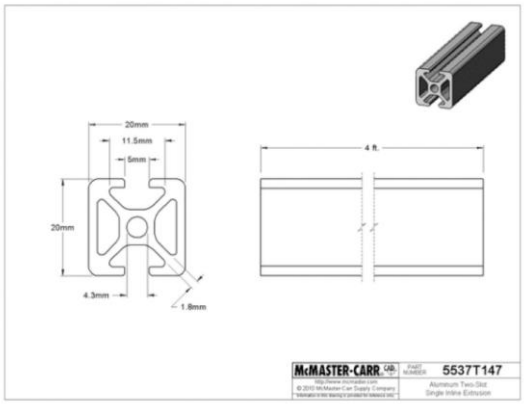


***The 20mm Rail:*** These 20mm x 20mm square rails are actually .787" square with a smaller core hole that can be tapped for 10-24 threaded studs. I threaded an old 3/16" diameter 316 stainless steel launch rod to make the studs for our 48" long club 20mm rails. These will easily mount on our 3/16" rack launcher heads.

These 6105-T5 Aluminum extrusions can also be purchased in 72" @ 17.19, and have the same two slot profiles as the 1010 rails. Currently 20mm 4-slot Rail x 48" McMaster-Carr #5537T101 @ 13.09each, or stronger 2-slot 20mm Rail x 48" McMaster-Carr # 5537T43, (which I recommend). These rails are mated with the relatively new Mini Rail Buttons from www.rail-buttons.com Mini buttons are 4-piece nylon with 4-40 x 3/8" binder head Phillips machine screws in 10pks for about 1.50. During testing last summer these Mini buttons & Rails were used on models from BT-50 to 3" with motors C6 to G with no trouble at all. Models up to 3.3lbs plus should not be a problem though the heaviest I have seen flown was a 2.5lb Big Daddy.
Like the 1010 rails these shorter rails can be mounted with through bolts or 3/16" threaded studs to standard rack launchers.







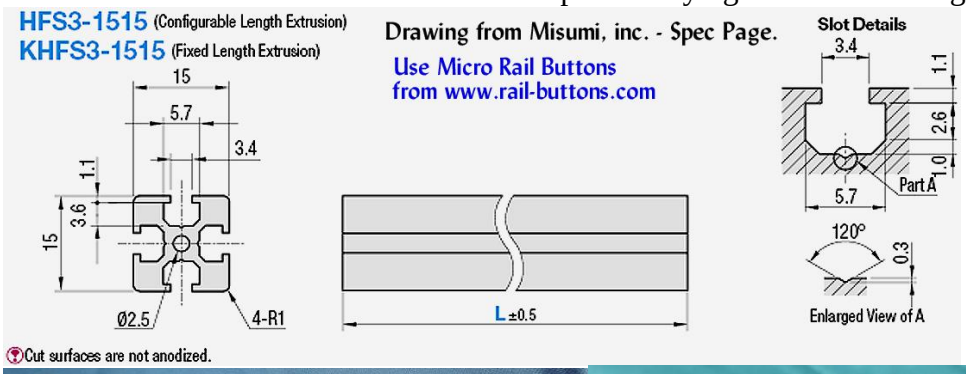
***The 15mm Rail:*** A Larger & Longer Micro Rail can be had from Misumi USA. us.misumi.ec.com, ordering from this company is a little tricky as you have to set up an account first. It's a World wide Industrial Supply with thousands of products sometimes making finding the correct area on the vast website a bit frustrating. It is essential not to loose the catalog number listed below which will make your search must less of a chore. The extrusion itself is pretty cheap currently at $7.40 each but the shipping is $12.98 so the total cost for a single 15mm x 15mm x 2000mm rail comes to $20.38.

This 15mm (.5901") Square x 2000mm (78.75") A6N01SS-T5 alloy Alum clear surface anodized extrusion is their Catalog **#KHFS3-1515-2000.** While this 4-slot extrusion has a larger footprint then the 10mm MakerBeam extrusion, the Misumi rail slots also fit the Micro Rail Buttons produced by www.rail-buttons.com.

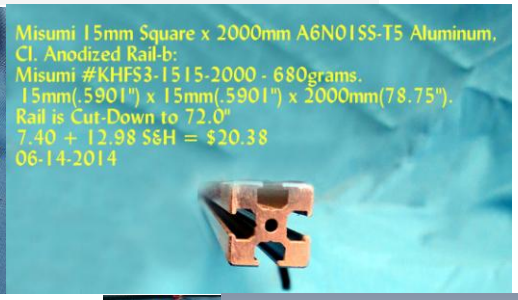
Since this beam comes in 2000mm (78.75") lengths and is a much heavier extruded section (680grams) it is possible to cut this rail down to 72" to fit our storage tubes.

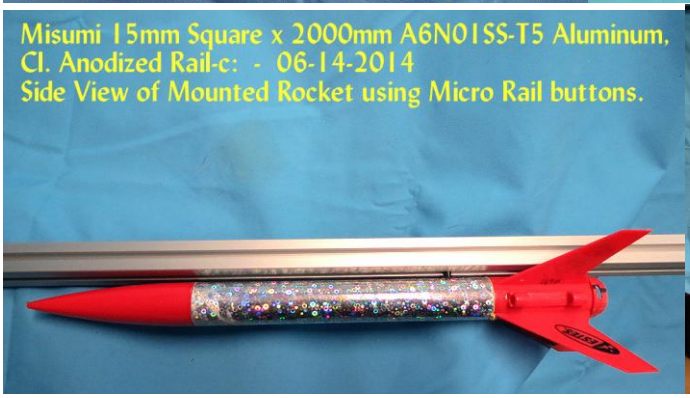
This heavier beam can be used with much heavier models (at least 3.3lbs) while using the smaller profile Micro Rail Buttons. Several testers last summer flew models on motors up to APCP E, F, & G powered motors without a single mishap or button failure during the testing. The Author was not a part of these tests but as one of the Beta Testers involved did get data feed back for other testing partners. The author has one of these 72" 15mm rails in his storage tube set up for use on most heavy launcher bases with a 3/16" epoxy set Stainless Steel pin or clamped into square launcher brackets.

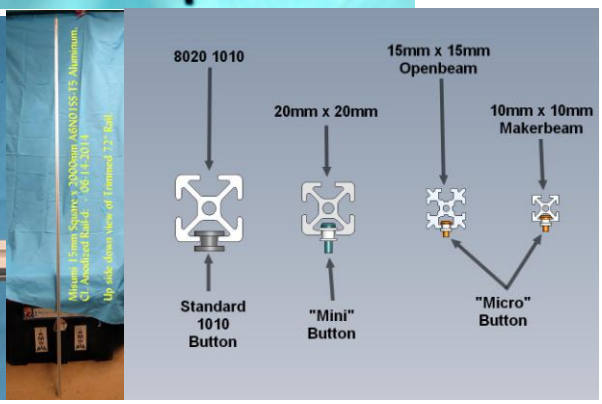
To date I have not used this rail but plan on trying it with a few larger diameter models in the future.







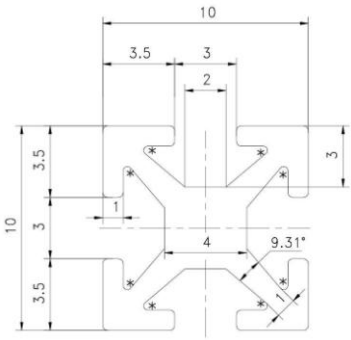



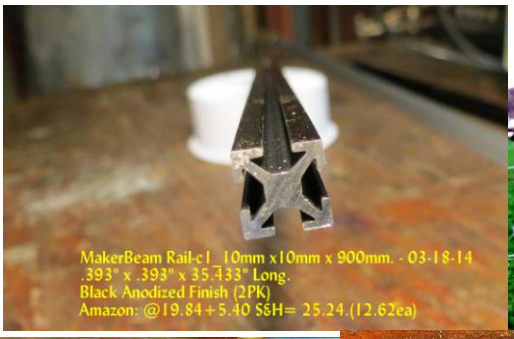
***The 10mm MakerBeam Rails:*** Originally believed to be only suitable for Micro Maxx Models, these little 10mm x 10mm 4-slot solid core, black anodized 6063-T5 rails come in a number of lengths 300mm(11.81”), 900mm (38.43”) and 1500mm(59.05”). Sold through Amazon.com these little rails have proven to be great little launch rails for models from Micro Maxx .T2+ (.281”) to BT-80 (2.6”) F20 powered motor rockets. During last year’s testing 10mm MakerBeam rails in 900mm and 1500mm rails proved very stable, eliminating Rod Whip on rockets powered by BP and APCP motors to F20’s. Testing with G-40 and G-80s were planned but didn’t get flown during the test dates due to high windy weather.

Through Amazon MakerBeam 900mm and 1500mm rails are sold in 2-pks currently at 19.84 and 27.00 respectively.

While the club does not own one of these 10mm MakerBeam Rails the author has several different lengths in his Rail Tube Storage carrier and MMX Range box. All are ready for mounting in any launcher that will accept 1/8” launch rods.

Rail Buttons for 10mm MakerBeam Rails are only available from [www.rail-buttons.com](http://www.rail-buttons.com) in black or white. 10pk -2pc buttons @ 1.35/pk. Supplied with 2-56 x 3/8” Nylon binder head screws.



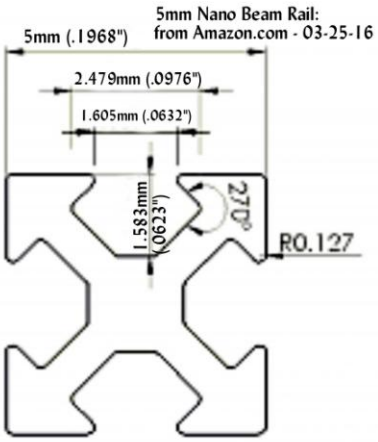




***The 5mm NanoBeam Rails:*** Quite New to the mix these 5mm(.1968") x 5mm(.1968") x 30cm(11.81") Silver anodized 6063-T5 Aluminum rails come in minimum order 10 packs at 24.18 from Amazon.com.

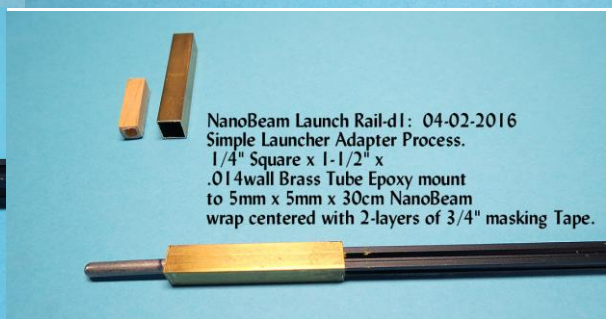
This week I've been experimenting with this tiny extrusion. Finding a button size to fit the 1/16" open slot with a head close to the 3/32" max opening was a small challenge. After a few unsuccessful attempts with bare 00-90 Stainless Button Head (BH) machine screws and several different head diameter tacks, brads and wire nail heads I've come to the conclusion it will take either a 00-90 machine screw or an altered (flattened two sides) nail head with some form of 1/16" x 1/16"long shaft sleeve and 1/8" x 1/32"thick polycarbonate washer to keep the model centered in the rail slot. Without the sleeve and washer the model has a tendency to rock side to side allowing either screw or nail head to pop out of the rail.

As the maximum length offered at this time is 30cm (11.81") they are certain to be used ONLY for Micro Maxx models. I am excited by the 5mm profile offering a much smaller and hopefully lighter rail button option. I have fitted one of the NanoBeams with a ¼" x 1-1/2" square brass sleeve and 1/8" diameter x ¾" stainless steel mounting stud to fit any of our Launcher heads that will accept 1/8" Launch rods. Hope to test fly a couple minimum diameter .281" Micro Maxx powered models in the next day or two.

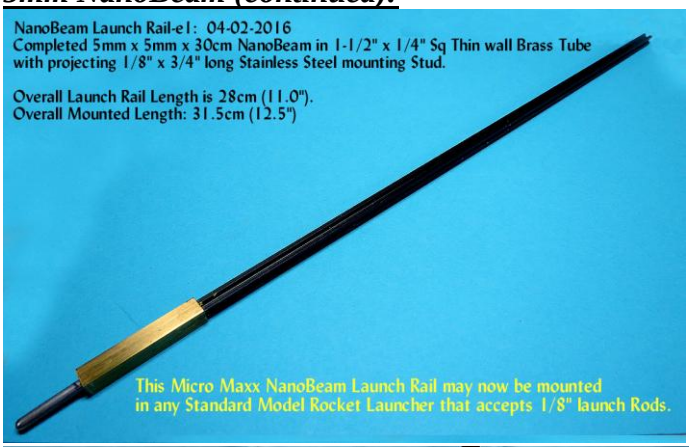






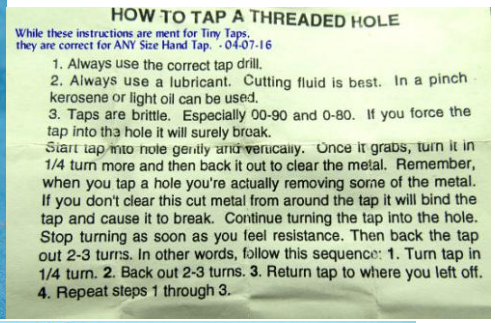
## ***5mm NanoBeam (continued):***







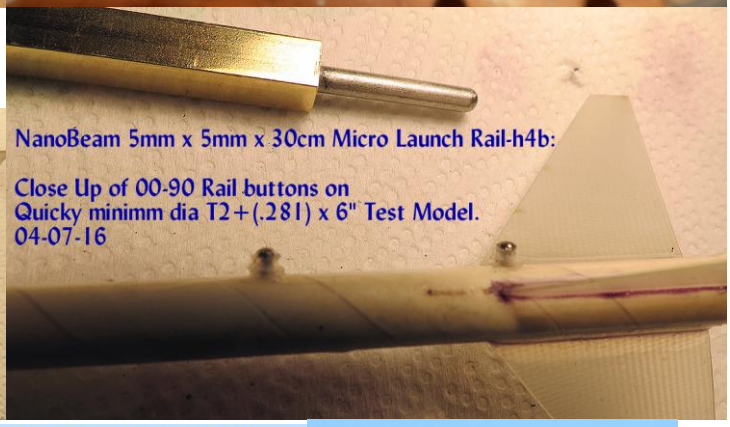


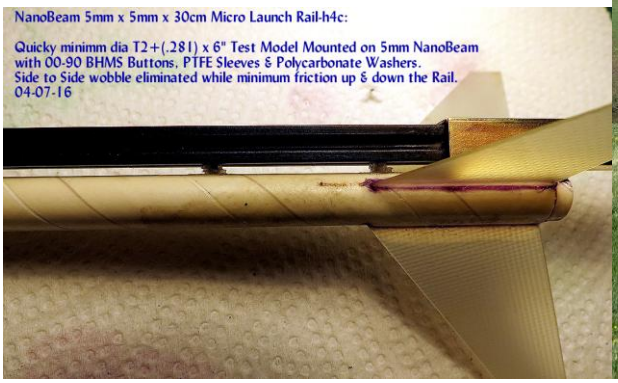




***5mm NanoBeam Buttons:*** Installing 00-90 x ¼" St. Stl. BHMS, Hand cut 1/16" PTFE sleeves & 1/8" OD Lexan flat washers.





***Speaking about Options:*** Rather than using traditional Rail Buttons, many of the above rails can be fitted with several size plastic extrusions as Launch Lugs. Both "I" and "H" beam sections can work depending on the width & depth of the rail slot. These small "H" sections would be surface mounted with either epoxy or glue to the airframes instead of Rail Buttons. These options would be especially useful on Scale and Semi-Scale model launch lugs.

***Rail button Sources:*** Below are a few of the many rail button sources researched for this article. With the exception of www.rail-buttons.com all other vendors supply ONLY 1515 and/or 1010 rail buttons.









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| www.apogeerockets.com | - | doghouse.blastzone.org |
| prolinerocketry.com | - | coastrocketry.com (Canada) |
| cdimodelrocketry.com | - | www.discountrocketry.com |
| alwaysreadyrocketry.com | - | www.madcowrocketry.com |