TOTAL IMPULSE

JACKSON MODEL ROCKET CLUB
JMRC
HUVARS
HURON VALLEY ROCKET SOCIETY
TRIPOLI ROCKETRY ASSOCIATION, INC.

TOTAL IMPULSE VOLUME 26, NO. 5
SEPTEMBER - OCTOBER 2026

MOSFET RELAY BOX
AFFORDABLE 244Mhz/FM TRACKER
OMEGA CENTAURI INTERCEPTOR
OCTOBER SPORT & NRC LAUNCH
AGM-12B BULLPUP



CLUB OFFICERS

President: Scott Miller
Vice President: Roger Sadowsky
Treasurer: Tony Haga
Secretary: Buzz Nau
Editor: Buzz Nau
Board of Director: Al de la Iglesia
Board of Director: Dale Hodgson
Board of Director: Michael Lewandowski
Board of Director: Mark Chrumka

MEMBERSHIP

To be a part of the Jackson Model Rocketry Club and Huron Valley Rocket Society means joining our family. We have monthly launches and take part in various educational events. We encourage our members to actively participate in our club projects, run for office in our annual elections, contribute to our monthly newsletter with articles or tips, and offer their expertise to the club. Members also enjoy no launch fees!

Applications are available at a launch or request one from bod@jmrconline.com. Mail the completed form along with a check for the annual membership dues ($30.00 individual or $40.00 family) to our mailing address:

JMRC/HUVARS
C/O Tony Haga
711 Wilwood Rd
Rochester Hills, MI 48309

COMM CHANNELS

There are several ways to keep in touch with JMRC/HUVARS and its members.

Website: http://www.jmrconline.org. Information includes directions to launch sites, schedule, range procedures, and instructions on how to join the club.

Groups.io: The JMRC groups.io site is a place to share files and serves as our primary e-mail listserv. Follow this link to join, https://groups.io/g/jmrc

YouTube: Check out our launch videos on YouTube. Search for "JMRCtv" and don't forgot to Like the videos you watch and Subscribe to the channel.

Facebook: If you are on FaceBook, search for "Jackson Model Rocket Club JMRC" and request to be added.

Discord: Our new chat channel for broadcasting notifications and interacting with members instantly. Discord is an instant messaging social platform that also supports VoIP (voice over IP). It allows us an opportunity for members to socialize, meet virtually with voice and webcams, ask questions, and more. Click on the invite link to join the server, https://discord.gg/pq88zUKMF9

About Total Impulse

Total Impulse is the official newsletter of the Jackson Model Rocket Club (JMRC), Tripoli Prefecture 96, NAR Section 620 and Huron Valley Rocket Society (HUVARS), NAR Section 463. Published Bi-Monthly, ***Total Impulse*** is a space-modeling newsletter devoted to representing the diversity of interests in today's hobby of model rocketry.

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The editor of Total Impulse accepts material for inclusion from anyone.

Send correspondence to:
Total Impulse
Buzz Nau, Editor
E-mail: USSMidway@gmail.com

Launch/Event Calendar - 2026

- Holiday Party - Feb 7 (Manchester)
- vNARCON 2026 - Feb 21
- March TBA (Horning 1) - Cancelled
- April 11 (Horning 1)
- LDRS 44 - April 16 - 19 (Pence, IN)
- Crapshoot XI - April 25-26 (Muskegon)
- May 16 (Horning 1)
- May 30 (Horning 3)
- NARAM 66 - June 23 - 29 (Muncie, IN)
- July 5 (Horning 3)
- August 1 & 29 (Horning 3)
- October 24 (Horning1)
- November 7 (Horning1)
- November 14 (Horning1)

NOTE: Launch dates are subject to change without notice. Be sure to check the website or Discord for the latest weather and field information.

OUR CONTRIBUTORS

The following members contributed articles or photos for this issue. Photos by Buzz Nau unless otherwise noted.

Peter Alway
Tony Haga
Al de la Iglesia
Buzz Nau
Chris Timm
Randy Gilbert
Dale Hodgson
Scott Miller
Roger Sadowsky
Art Upton

Table of Contents

Article	Page
October 24 Sport & NRC Launch	3
MOSFET Relay Box	10
View From the Flight Line	12
Omega Centauri Interceptor	13
Affordable 440Mhz/FM Tracker	19
AGM-12B Bullpup A	20
Competition Corner	24
Club News	27
Current Events In Space Exploration	28
Launch Windows	32
Our Members in the Field	36

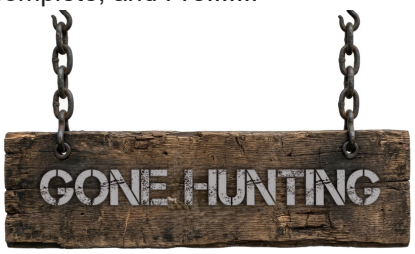
EDITOR'S RANGE BOX

Welcome and thanks for reading the September-October 2026 issue of *Total Impulse*.

CATOS (CATastrOphic failure) have always been an issue with model rocket motors. It happens to all manufacturers and all motor classes. If you feel like there has been an increase in the number of CATOS in recent years, you're not alone. It's heartbreaking to spend money on motors and kits, spend time to build and put on a nice finish, just to see them destroyed by something seemingly out of your control. One of the best things you can do is report your motor failures online at https://www.motorcato.org/. In addition to reporting your CATOS you can search the database for motor lots with issues that you may have in your range box.

Our flying for 2026 is nearly over. Wet field conditions prevented the clearing of our primary field, Horning 1 all through September and most of October. These things happen from time to time and as much as they are an inconvenience to us, they are bigger issue for the farm. Thankfully we can still get in our events. They may be a little late, but that's better than the alternative.

We have scheduled two November launches on the 7th and 14th, in an effort to get in as much flying as we can before we shut down for the year. These dates won't conflict with the Thanksgiving holiday or the upcoming opening of deer season on November 15th. Speaking of which, it's still bow season, this issue is finally complete, and I've.....



I'll see you back in December!

On the Cover:
Roger Wilfong's Estes Laser X 2 lifts off at the 24 October club launch at the Horning 1 Field in Manchester, MI.

LAUNCH REPORT OCTOBER 24 SPORT & NRC LAUNCH

Buzz Nau

Nearly two months would pass before we could hold another launch after holding two in August. Heavy rains prevented timely crop harvesting on the Horning 1 field. This was obvious on 24 October when we reached the field and saw the ruts from the farm equipment. The weather was well worth the wait as we enjoyed a sunny day in the low 70's with light and variable wind. We had 18 rocketeers attend the monthly sport & NRC launch who sent up a total of 114 flights. Of these 7 were competition flights and 19 were Alpha Streamer Duration entries.

Michael Rangitsch set the high launch count mark at 15 flights using 1/4A through E impulse motors as well as a couple of two-stagers. All of his flights were good except for a couple of separations and one that landed in the trees. Notable flights included his scratch-built Macho Mosquito on an E31-6, Estes Sandhawk on a C11-5, "Better" Bertha on a C11-5, and Estes Dark Energy on a D20-4.

Next with 10 flights, Buzz Nau, flew several recently finished models. His scratch-built Super Screamer flew well on a C6-5, Estes Odyssey clone on a B6-4, Estes A-20 Demon clone on a C6-5, and scratch-built USSF Hawk on an A8-3. He had two CATOs where each motor had no ejection charge (the clay caps were intact after recovery). His Omega Centauri Interceptor flew great on the way up, but made a lawn dart recovery. This was followed by Buzz's Hostile Projectiles X-15D on a D12-3, again, no ejection charge after a good flight up. Damage was confined to the resin nosecone.



Michael Rangitsch's Better Bertha



Buzz Nau's Super Screamer

Kinsley Wilson and her dad made the trip out where Kinsley sent up 9 flights. She flew her Estes Lil Spite twice on an E24-4 and E12-6, the Estes Vapor twice on an E12-8 and D12-5, and Estes Patriot twice on a C12-6 and D16-6, thought the D16 was a CATO. Kinsley also flew her Estes Solo with gliding Solo cup.

Many of Mark Chrumka's 8 flight cards were prophetic in stating, "expect a CATO" as he used up motors that have been failing for him regularly over the past couple of years. Several were flown in saucer type models that he deemed were expendable. Nostradamus was correct most of the time with various CATOs most notably a D20-4 spit grain with his HUVARS Scimitar and D22-4 forward closure failure with his 3D printed Estes RamJet clone. The RamJet remained on the pad burning at both ends like a roman candle and was a total loss. Not all of Mark's flight were chaotic as he put up great flights with his Odd Roc Scream "Ghost" on an F50-4, Estes SpaceShipOne on an E9-4, and Estes Vampire clone on an A10-3.

Richard Buckley also flew an Estes Lil Spite, one of his 6 flights for the day, on an E12-4. Richard also flew a Dyna Star Flame Thrower on a pair of D12-5s, a LOC Blaster on a D12-5, and Big Bertha on a C6-5. All were good flights.



Mark Chrumka's SpaceShipOne

One of the two successful Level 1 cert flights for the day was made by Jon Demick. Jon flew his LOC Goblin on an H135-7 with a Jolly Logic Chute Release set for 600 feet. It was a text book flight and easy recovery. Jon's Dad was in attendance to witness the flight that was dedicated to him and Jon's Mom. Jon also made several flights with his scratch-built Skittles II though it and his Estes Heatseeker were both lost.

New member, Jim Dulbs, sent five rockets up including his Quest Cobalt on a B6-4, Estes Vapor on a D12-5, and Estes Olympus twice on D12-5s. He also flew a nice scratch-built Mercury Redstone on a D12-5, that went unstable, but recovered fine. Art Upton also made 5 flights and many included tracking electronics. See Art's article on page 19 for more details on an affordable FM tracking setup. His Nike Ram flight on a G131 included a GPS tracker and FM beacon. His Estes "Arreaux" Ascender flew on a new F115-10 motor with a Jolly Logic Chute Release, tracker, and computer. Check out Art's launch write up at the end of this article.

Our second successful level 1 cert flight was made by Jeff Jerzy. He flew his LOC "I Love Grapes" first on a G80-5 test run and then again with a H125-8 for his level 1 certification. The Jolly Logic Chute Release was set for 300 feet and made for an easy recovery. Jeff also made a flight with his repaired Thomas the Rocket, this time with a shorter delay, F42-4 for a good flight. Finally, Jeff made another good flight with his Semroc Belly Flopper on a D12-0.

Dan Weimer had a bit of mixed luck for the day with his 3 flights. His scratch-built, rear ejection Arcturus flew great on a C5-3. He also flew his Apogee Zypher on an H123-8 which went up great, but the chute fouled at ejection. I believe is was recovered fine though. Dan's Quest Proteus suffered a CATO at motor burnout on a C6-5. Also with 3 flights, Dale Hodgson flew his new Apogee Shamrocket tube fin rocket on a D12-5, his Estes Liberty on a D12-5, and scratch-built 4" diameter upscale Alpha 4 on a H126. All were good flights. Steve Kristal flew a pair of Custom kits and Carlisle RockA-Chute clone for his 3 flights. The Custom Nomad flew on a B6-4 and the Pong on an A3-4T. The RockAChute Mark II is one of the first model rocket kits developed by Orville Carlisle and Vern Estes. The nose cone was a repurposed pencil sharpener. The last flier with 3 flights, Roger Wilfong, flew an Estes Orange Bullet on a 1/2A3-2T, an Estes Red Nova on a C11-3, and Estes Laser X2 on a C5-3. All were great flights.



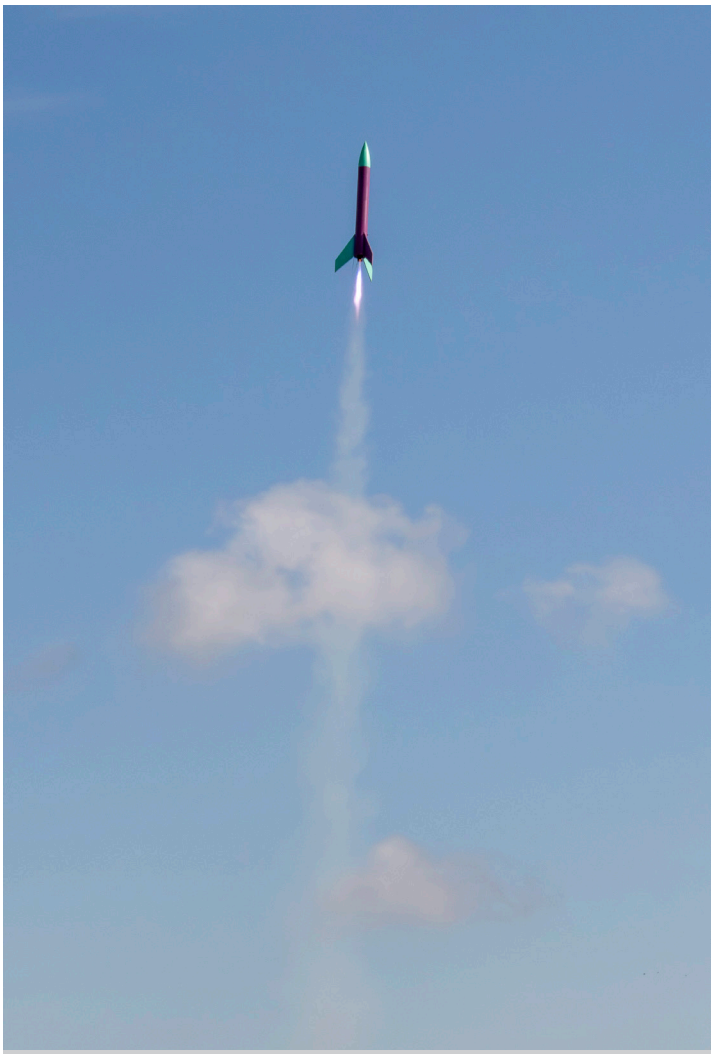
Kinsley Wilson's Lil Spite

The last of the sport flights were flown by Andy Tomasch with his BT-60 Sport Model on a B6-4, Ken Vepper flying an Estes Ascender on an E35, Christian Devier flying an Estes Hi Flyer on a D12-5 (CATO), and Tony Haga flying his PML Expanding Gas on an H350.

Alpha Streamer Duration Contest Flights
We are allowing flights for the Alpha contest to be flown at the October and November launches. Several members took advantage of the great weather for flying their Alphas. Al de la Iglesia has a comfortable lead with 283 seconds over four flights. Andy Tomasch is in second place with 235 seconds, Roger Wilfong has 172 seconds for third followed by Jeff Jerzy's 57 seconds and Tony Haga's 41 seconds. Jeff and Tony have one flight each remaining. It's not too late to enter the contest as it will continue to be flown at our November launches.

NRC Flights
There was one record attempt flight. Steve Kristal flew B Payload Altitude using a Qjet B14-7 which successfully piston launched. The piston worked well and the flight looked great, but the recorded altitude was well short of the record.

Buzz Nau of the Escape Velocity team made 2 1/2A Boost Glider Duration flights, for 45 and 46 seconds. The power-pod hung up on the first flight wasting half the altitude before finally falling off. Team member Al de la Iglesia flew a single B Egglofter Duration flight for 69 seconds, a single A Helicopter Duration flight for 73 seconds, and 2 1/4A Parachute Duration for combined total of 149 seconds.



Dale Hodgson's Alpha 4



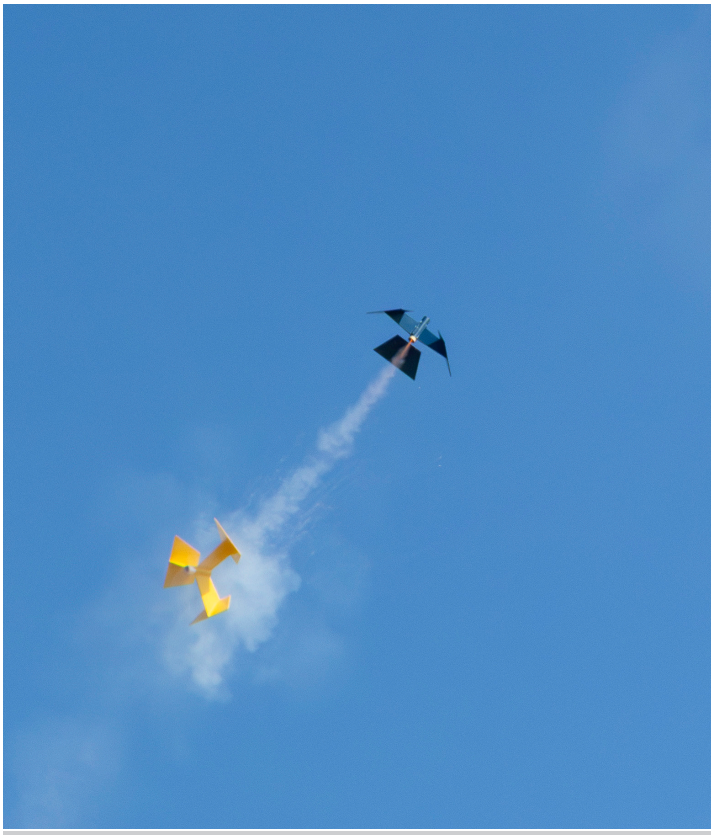
Tony Haga's Expanding Gas



Jon Demick's L1 Goblin



Jeff Jerzy's L1 I Love Grapes



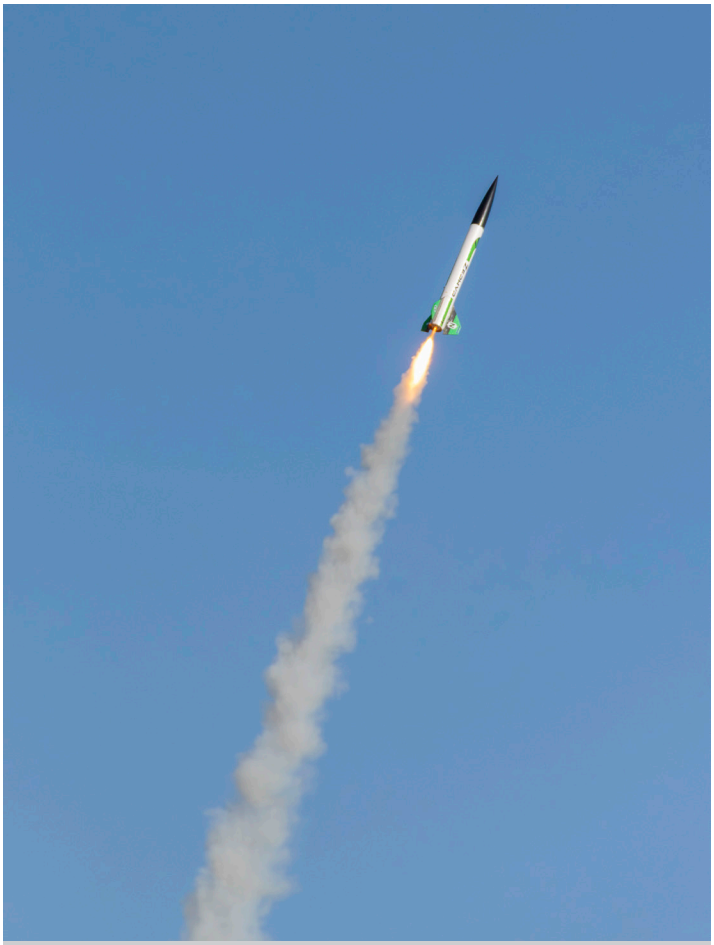
Buzz Nau's Frik N Frak



Steve Kristal's Carlisle RockAChute s



Richard Buckley's Blaster



Dan Weimer's Zypher



Jon Demick's Skittles II



Dale Hodgson's Shamrock

Art Upton's Flight Log for the 24 October Sport Launch

I started the day with one of my Pro Series II E2X Ascenders, this one painted in AeroTech Arreaux colors (yellow and black). I launched it on a freshly cut corn-stalk field where the rocket could easily blend in, even with its bright yellow fluorescent Top Flight parachute. Because of that, I installed one of the new $45 "Comspec Clone" RDF beacon trackers made by Brainstormz123 (available on the Rocketry Forum). More about those later.

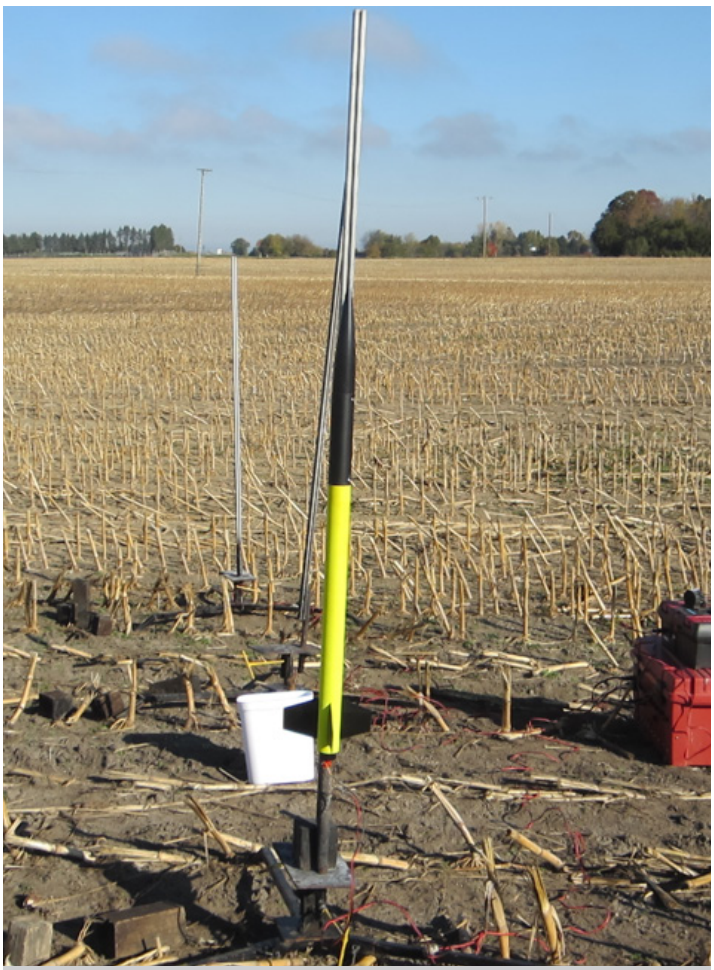
The 2-inch diameter rocket, weighing only 15 ounces, was making its first flight on one of the new AeroTech F115SN Warp motors. This is a high-power rocket (HPR) motor because its average thrust is over 80 Ns. These motors do not require a waiver, but you must be certified to use them.

For this flight I installed an Altimeter Cloud Mercury Plus recording flight computer (WiFi), a Jolly Logic Altimeter 3 (Bluetooth), and a Jolly Logic Chute Release for the main parachute. The setup used motor ejection for dual deployment. It was a quick liftoff.

According to the Mercury Plus on AltimeterCloud.com, the flight reached 1,835 feet at under 300 mph, with a peak of 38 g and a total flight time of just over one minute.

The Jolly Logic Altimeter 3 was attached to the nose cone, while the Mercury Plus sat on a wooden sled pushed into the coupler bulkhead in the payload section. The payload bay was properly vented.

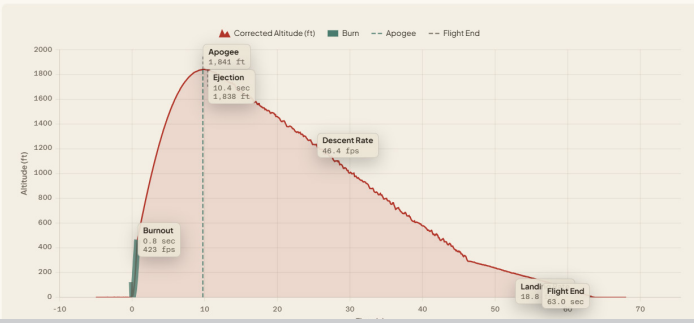
Jolly Logic's new Flight Lab web app (for the upcoming Altimeter 3 v2) also works with the original Altimeter 3 I used.



Pro Series II Ascender



It recorded 1,841 feet, a 46 fps drogue-less descent, and a 19 fps landing rate after the Jolly Logic Chute Release opened the main.



Because the Altimeter 3 was mounted on the nose cone rather than a sled, it only registered 24 g.

The rocket landed behind a hill out of sight. I used my handheld ham radio to track the increasing beep rate from the RDF beacon as I closed in (more on these trackers on page 19).

Ken Vedder arrived and helped me prep my Nike Ram a converted Mad Cow Nike Smoke booster with a payload section and ogive nose cone which we flew on a CTI Pro29 G131 Smokey Sam. It carries a Featherweight Blue Jay altimeter, which is armed by waving one end of the included magnet over the marked side of the av-bay and disarmed with the other end. I couldn't hear the tones clearly, but Ken could. I confirmed it was armed on the Featherweight phone app.

The payload section also held an Egg Timer Tiny GPS tracker (900 MHz to its receiver). A Bluetooth dongle streams the NMEA data to my Android phone running the beta Rocket Tracker app.

With a Jolly Logic Chute Release on the parachute, Roger Sadowsky gave the countdown. The rocket reached just over 1,000 feet—the 2.6-inch fiberglass Mad Cow booster is heavy. Ken and I followed the app after realizing my phone's compass was confused by the Blue Jay magnet in my shirt pocket. Once I moved the magnet, the app's navigation led us straight to the rocket over the hill.

Next, Ken flew his white Pro Series II E2X Ascender (last flown at MIS Speedway Gate 14 with JMRC) on a Quest E35-8 with a Procast-boosted igniter for a clean start. The ejection pushed the nose and some shock cord out, but the parachute stayed in. It came in flat and landed undamaged. I then flew the other E35-8 (also with a Procast-boosted igniter) in my Estes Star-Short, a shortened Star Orbiter that

had crashed hard at this field in 2024. I cut out the damaged tube sections; it flies better short and did so again. Ken had suggested putting my Comspec tracker on the shock cord, I should have listened. It reached about 1,600 feet. Ken and I walked to the expected landing area but didn't find it. Mark and another member in the Mule farther south recovered it and returned it. Thank you!

Finally, Ken helped me prep my LOC Semper Fi (built over the winter; tube and fin can painted in early spring). It carries a Perfectflite StrattoLogger CF and an Altus Metrum TeleGPS that transmits APRS position data to any APRS-capable ham radio, such as my Kenwood TH-D74 with its compass pointer.

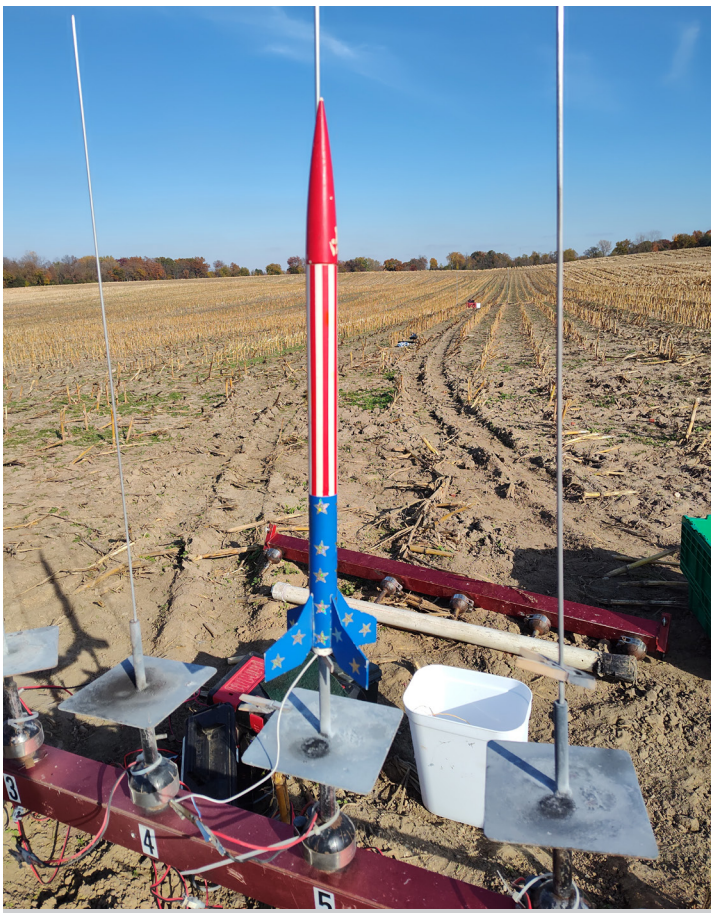
We launched it on a 22-year-old CTI H90 classic flame motor. I handed Ken the radio with the compass display and asked him to track it. The rocket landed over yet another hill in the corn stalks.



Art's Semper Fi



Art's Star Short



Art's Jaguar

BUILD IT: MOSFET RELAY BOX FOR POSITIVE IGNITION AND CLUSTERS

Randy Gilbert

Back further in memory than I care to remember (read: probably around 1978), there was an article in a rocketry magazine about transistor relay ignition. It had exactly one electronic part, a switching transistor. The rest was how you wired it into your existing launch pad (in my case, a Centuri Powr-pad). That circuit would shunt all the amperage you could get from that 6-volt lantern battery through the igniter when you pressed the launch button on the controller. The advantage was the current didn't have to flow the full distance (15 feet by wire) between the controller and the launch pad before hitting the igniter. The transistor would take the signal from the controller and close the relay (in the transistor) shunting all the power that battery could provide directly through the igniter in a circuit measured in inches.

Fast-forward 48 years. Artificial Intelligence, AI, is now something not just in Terminator movies, but a useful tool in accomplishing real solutions to problems. The circuit presented in this article was designed by AI. I won't say which one here, but if you ask me when you see me I'll tell you. I asked the AI to design a relay circuit suitable for launching model rockets with a 12 volt battery. What you'll see here is something that works with either 6 or 12 volt power sources. And, true to form, this circuit has two commonalities with the 1978 version: 1) They both use a transistor (present day, MOSFET), and 2) They both require you remove the continuity light from your commercial (Estes, Quest) launch controller. ←← **This is not optional! If you don't remove the continuity light from the controller, the rocket will launch when you insert the Safety Key.**

The new, AI inspired version is really quite an improvement over the 1978 version. Granted, it is not as minimalist as the old circuit with its single transistor and an SPST switch, but it's safer and includes an LED to prove continuity after connecting the igniter and flipping the safety switch at the pad (relay box).

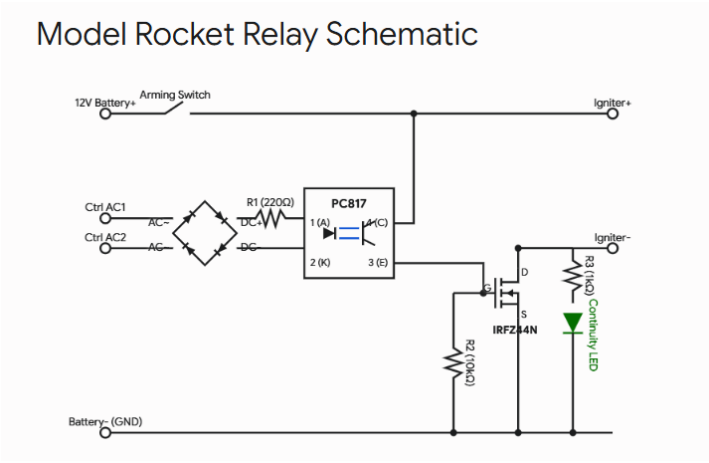
If you're lazy (like I am) you can order all the parts you need from Amazon and you'll have enough to build 8-10 relay boxes. My hope is that you are lucky enough to still have an electronics shop nearby where you can buy onesies of the parts list. Ahh, wishing Radio Shack was still around. Here's the parts list:

The Components:

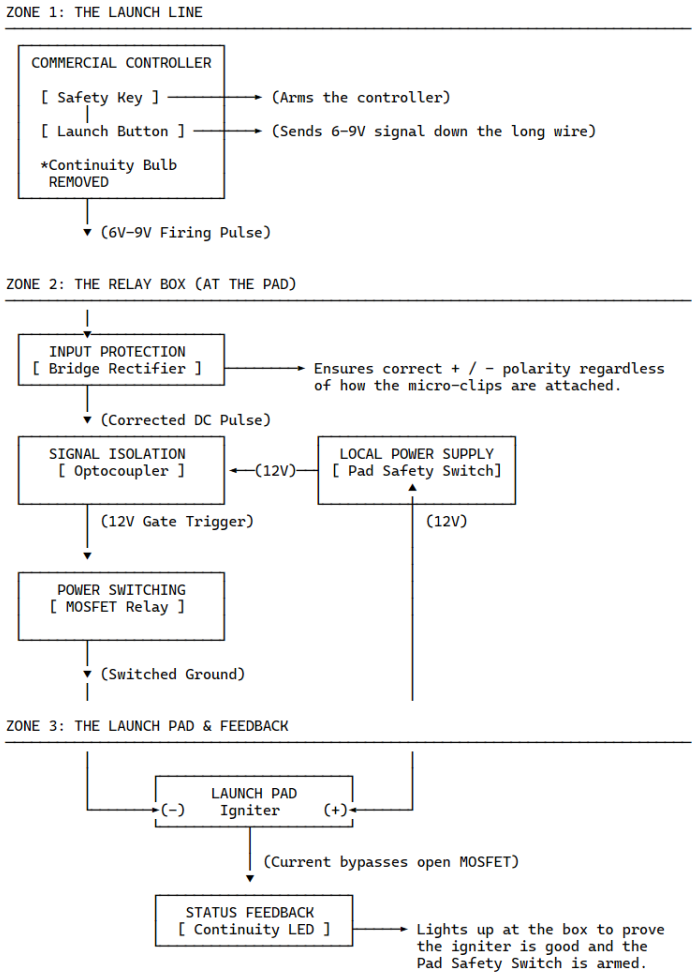
- 1x KBP206 BRIDGE (Sorts out polarity from the controller).
- 1x PC817 Optocoupler (To safely isolate the commercial controller from the 12V system).
- 1x IRFZ44N MOSFET (The main 12V relay).
- 1x 10kΩ Resistor (Gate pull-down).
- 1x 220Ω Resistor (Input voltage reducer).
- 1x 1kΩ Resistor (LED safety).
- 1x LED (Any color).
- 1x Heavy-Duty Toggle Switch (Pad Safety Switch).
- 1x Project Box (approximately 85 L, 50 W, 35 D; in mm)

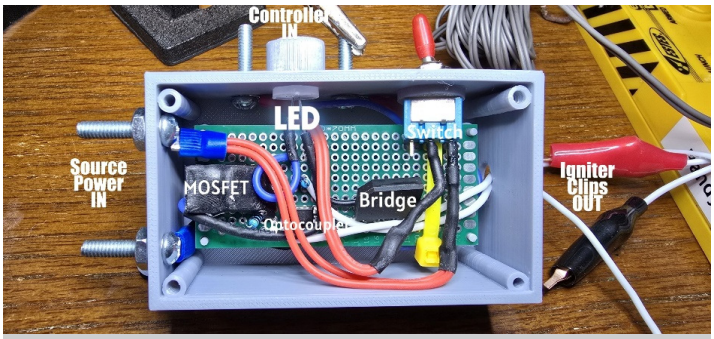
This components list does not include wire, breadboard (if desired), project box, clips, and hardware. It is assumed the reader can solder electronics or knows someone who can.

Following is the schematic:



How it works:





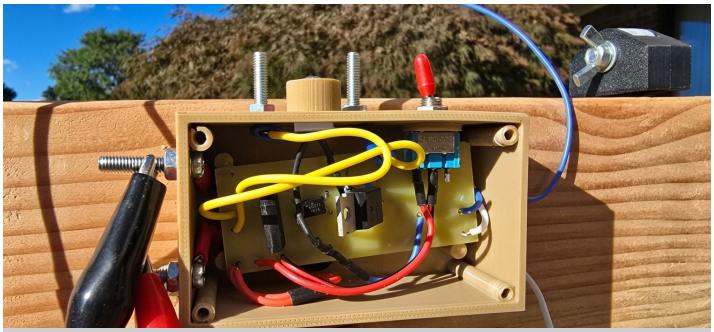
Here is the functional circuit, bread-boarded and mounted in a custom (3D) printed PETG box:

How to Operate It Safely

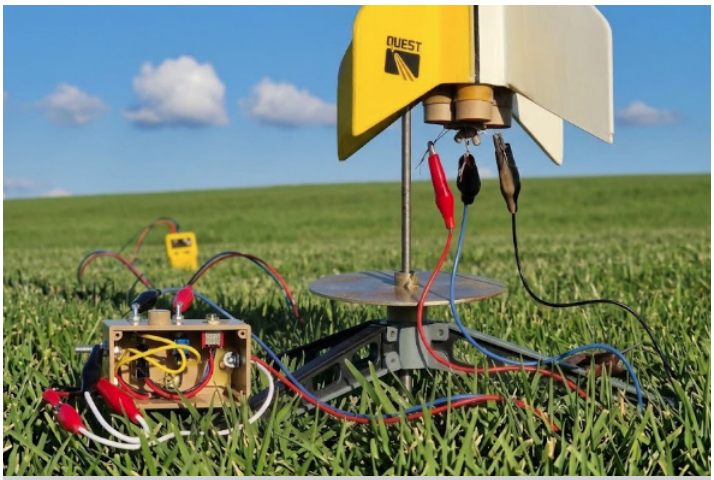
1. **Standby:** Ensure the commercial controller's safety key is out. Ensure the new Pad Safety Switch on your relay box is turned OFF.
2. **Hookup:** Connect the commercial controller's micro-clips to the input wires on your relay box. Connect the relay box's output micro-clips to the igniter on your rocket.
3. **Pad Continuity Check:** Flip the Pad Safety Switch to ON. 12V power flows through the igniter, into the MOSFET Drain, and out through the LED. The LED on the box lights up, confirming a good igniter.
4. **Arming:** Walk back to a safe distance. Insert the safety key into your commercial controller.
5. **Launch:** Press the launch button on the commercial controller. It sends a 6V-9V pulse to the optocoupler. The optocoupler instantly connects the 12V battery directly to the MOSFET Gate. The MOSFET opens, dumping 12V straight into the igniter. The LED winks out, and the rocket flies.

In tests, the relay instantly ignites up to four Estes igniters without breaking a sweat. Three Estes igniters were also attempted in both serial and parallel, and again, the igniters vaporized immediately.

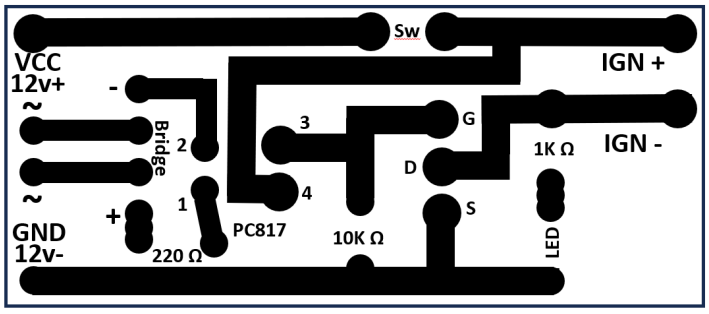
The author makes no guarantee of suitability for purpose and is not responsible for any misuse, abuse, or incorrect construction of the circuit. The circuit is for experimental purposes only.



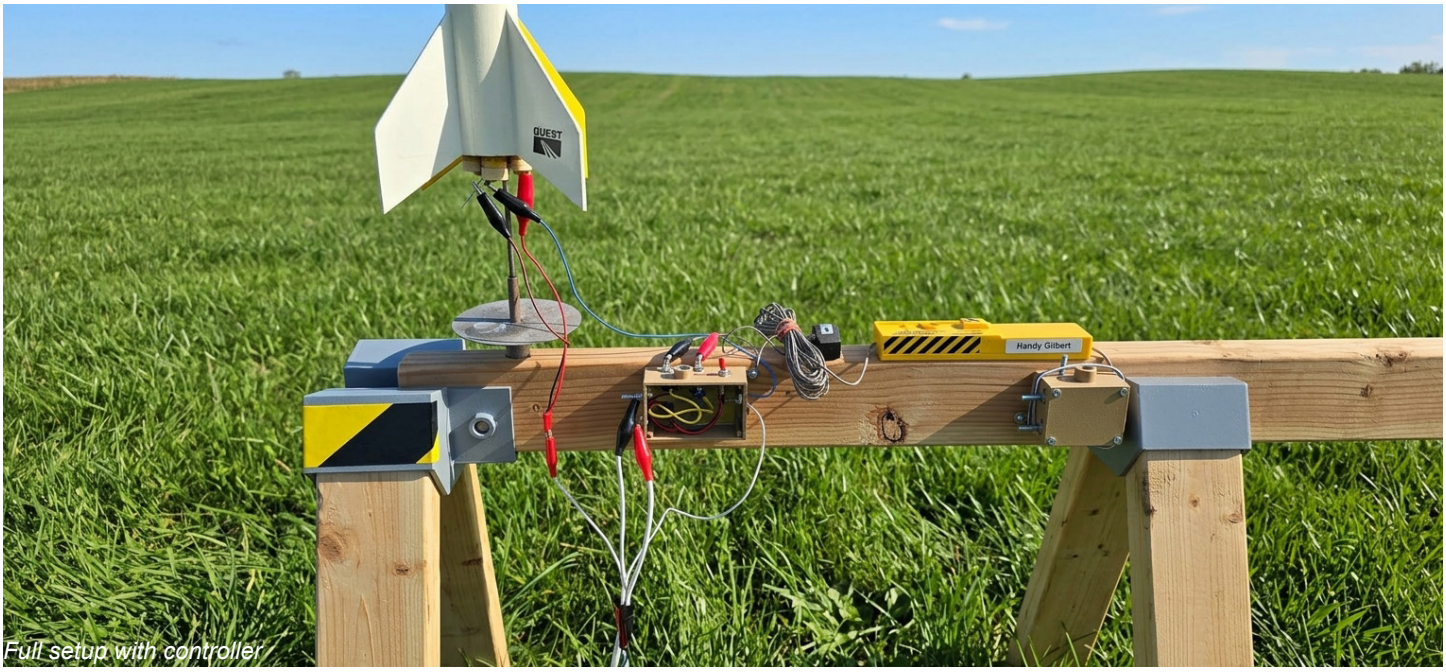
Relay box mounted on launcher



Full setup with controller



Printed circuit board layout



Full setup with controller

VIEW FROM THE FLIGHT LINE

Rocket Boys

Dale Hodgson

As I recall, I built (actually watched my dad build) my very first rocket in 1967. I was all of 8 years old but had a fascination with all things that flew, especially rockets going into space. In those days project Mercury was completed, Gemini was done, and Apollo was on deck but postponed 18 months because of the fire in the command module that killed Gus Grissom, Edward White and Roger Chaffee. Despite that setback, I couldn't get enough of it. I spent many hours trying to draw various rockets and satellites although not very well. Dad figured I'd fly a rocket a couple of times and like any other kids, lose interest, and move on to something else. Quite the opposite happened. It obsessed me and I couldn't wait for the next space shot or heading out to my uncle's farm to fly some more of my own. It got so bad that in fourth grade my teacher said that he had almost given up on me paying attention in class. So, what he did was take advantage of the obsession. He told me since the classes bored me he would allow me to be the class "space reporter" and follow all the space shots I could and report to class. He even allowed me to turn on an old (by our standards now) AM radio to the news station and listen during class when events were broadcasting. I took that sketch book of drawings for a show-and-tell report. I was thrilled and so was he since all of a sudden class became very interesting to me again as long as I could stay on top of our space missions. I've never forgotten that and except for a brief period during my college years, never quit building and flying, even (quite obviously) to this day.



Dale and the kids setting up Cape Hodgson

It all came back around not too long ago. My middle great-grandson Lincoln mentioned that he was studying rockets in school and would love to build one and fly it. He said he wanted Papa in on the deal and I quickly obliged. I didn't want to leave out his two brothers either. Carter is a little older and Brayden a little younger. So, I ended up getting (what else) an Estes Launcher and 3 beginner rockets. They are easy to build and fun to fly. I ended up getting Carter an Orbitron, Lincoln a Riptide, and Brayden an Alpha Make It Take It kit. I "helped" build everything and just yesterday was launch day. The weather was gorgeous but borderline too windy. I wasn't going to disappoint those boys, so we had to modify our "missions" just a little bit. I cinched up all of the parachutes by wrapping blue tape around the shroud lines



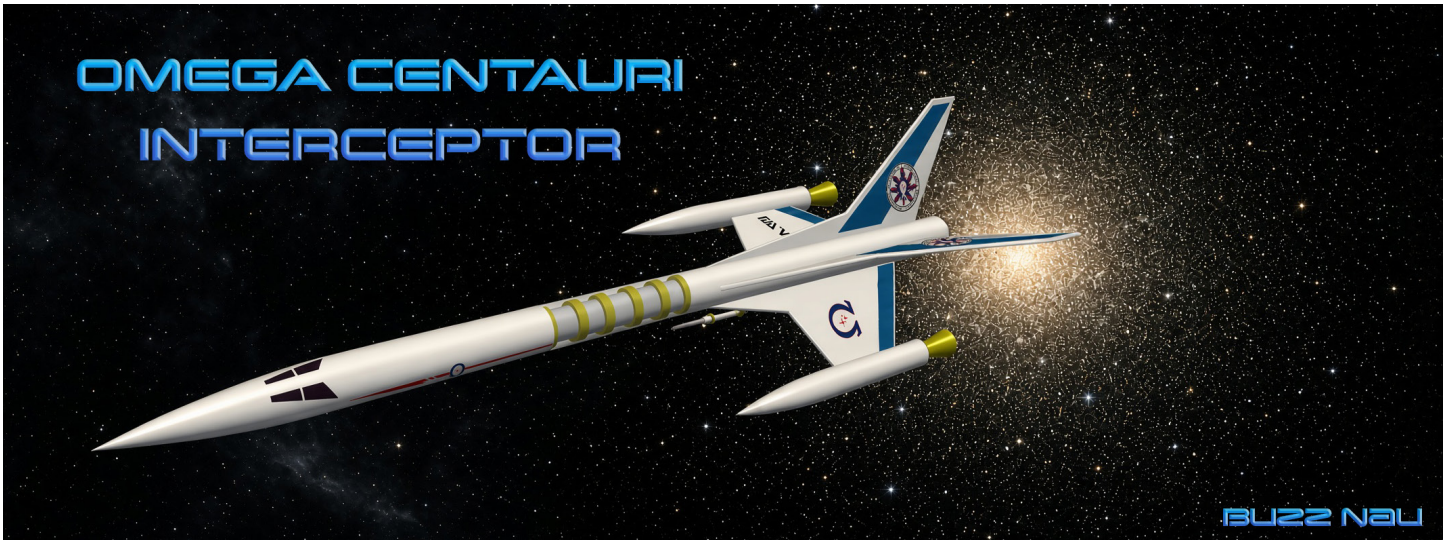
Carter, Lincoln, Dale, and Braydon ready to fly

so they wouldn't open as much, but unfurl enough to provide plenty of drag for a soft recovery. I helped them choose an appropriate motor for each model; an A8-3 for the Alpha, a B4-4 for the Riptide, and a C6-3 for the Orbitron. Originally the Orbitron had a 24mm motor mount to fly C11's or D12's but I adapted it to 18mm with one of the Estes plastic adapters which worked perfectly.

The wind really played with the rockets (and us) while on the field, so we had to angle the launch rod to fly over a soybean field then drift back into the yard. Fortunately, all that flying I've done over the years paid off. We only flew each rocket once, but with each flight I won't forget the expression on their faces. Even the youngest, Brayden, was thrilled. The rockets all went about the same height because of their weight and motor choice. All were recovered with no damage except for a separation of the Alpha which was my fault. An easy repair and I'll go ahead and replace all of the shock cords with Kevlar. Personally, I never liked elastic; good thing I had all that high power experience so I could modify accordingly.

The result of all this? The kids were happy…very happy and asked when we were going to fly again. I have plenty of motors and I'm sure that there will be a nice, calm day or two ahead. If I can coordinate schedules (kids seem to be very busy these days) we'll get out there again soon. I got my kids into rocketry when they were young but as they grew, neither got into the hobby, but they remember those days fondly. My grand-kids never caught the bug either and all are doing separate things. The great grand-kids though? I think they will be back at least for a while. It really doesn't matter to me if they take this up as a hobby or not. That's not the point, the point is that they were exposed to some real science, something they will be discussing in school and will be a leg up on most of the other kids since their old dude Papa had this obsession that never went away.

Continued on page 26



The third design in the Omega Centauri series is the Omega Centauri Interceptor. It shares several features with the earlier OC Probe and OC Courier, including asymmetrical fins or stabilizers and external pods. The standout characteristic of the series remains the reactor core section. The clear plastic body tube with a central core tube and centering rings is a design idea first published in the 1972 Centuri catalog and serves as the chief visual element throughout the Omega Centauri series.

In addition to the reactor section, the OC Interceptor features wings with wingtip pods, a pair of split vertical stabilizers, and a pylon-mounted plasma cannon underneath. The model is not a difficult build, but it has a large number of parts. It is based on Centuri/Semroc ST-10 body tube and can be converted to Estes BT-50 with little effort.

Construction

Assemble the reactor section first. If you do not have a 5-inch section of clear tubing, a shorter section can be substituted. Space the rings equally and leave a 0.9-inch section at each end with two centering rings so the upper and lower body tubes can be attached (see the reactor section drawing). The visible ST-7 core tube is silver and the centering rings are gold. I wrapped the core tube with adhesive chrome trim Monokote and 3D-printed the rings in gold filament. Attach the Kevlar recovery harness to the top centering ring of the reactor section.

Once the reactor section is complete, slide the clear body tube over it. You should have 0.9 inches of core tube with two centering rings exposed at each end. Glue the upper (5-inch) and lower (10-inch) ST-10 body tubes to these ends. I used 30-minute epoxy for this step. Make sure the ST-10 tubes are flush against the clear tube. Before the epoxy sets, roll the entire assembly on a flat surface to ensure it is straight.

Cut the pylon, wings, and stabilizers from 1/8-inch balsa. The wings and stabilizers are each made from two pieces (refer to the fin patterns for the direction of the wood grain). I tissue-covered the wings and stabilizers for added strength. If you tissue or paper the balsa parts, leave a 0.25-inch strip bare along the wingtip chord so you can glue through the wall of the wing pods.

Assemble the motor mount and install it in the lower (10-inch) ST-10 body tube so that 0.25 inch of the motor mount extends from the rear of the tube. Wrap the fin guide around the lower ST-10 body tube and mark the locations for the wings, stabilizers, and lower pylon.

Refer to the rear-view diagram for the location and angle of the wings, stabilizers, and lower pylon. Mount the pylon 1.4 inches from the bottom of the 10-inch ST-10 body tube. Mount the wings 2.2 inches from the end and the stabilizers 1 inch from the end.

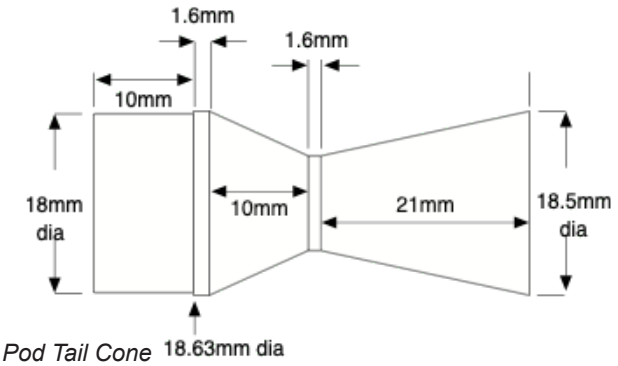
Cut a 1/8-inch-wide slot that is 2.25 inches long in each wingtip ST-7 pod tube. Start the slot 0.8 inches from one end (this end will be the bottom of the pod). Sand the slot as needed so it fits over the wingtip edge, then glue the pod to the wing with 0.25 inch of the wing inserted into the tube. When dry, glue the pod nose and tail cones in place. I 3D-printed the tail cones (STL file linked here).

Glue the 4.8-inch plasma cannon launch lug to the tip edge of the lower pylon so it is flush at both ends. Sand a rounded point on one end of the 6.2-inch plasma cannon dowel. Glue the dowel inside the launch lug so that 1.1 inches extends from the rear. The rounded end should face forward.

Glue a launch lug for 3/32-inch rods under the right wing and against the body tube, 3 inches from the bottom. Attach the recovery harness to the nose cone and install the parachute. I 3D-printed the nose cone, which weighs 21 grams. The center of gravity without a motor is 14.75 inches from the nose cone tip. The model was stable on a C6-3.

Flying

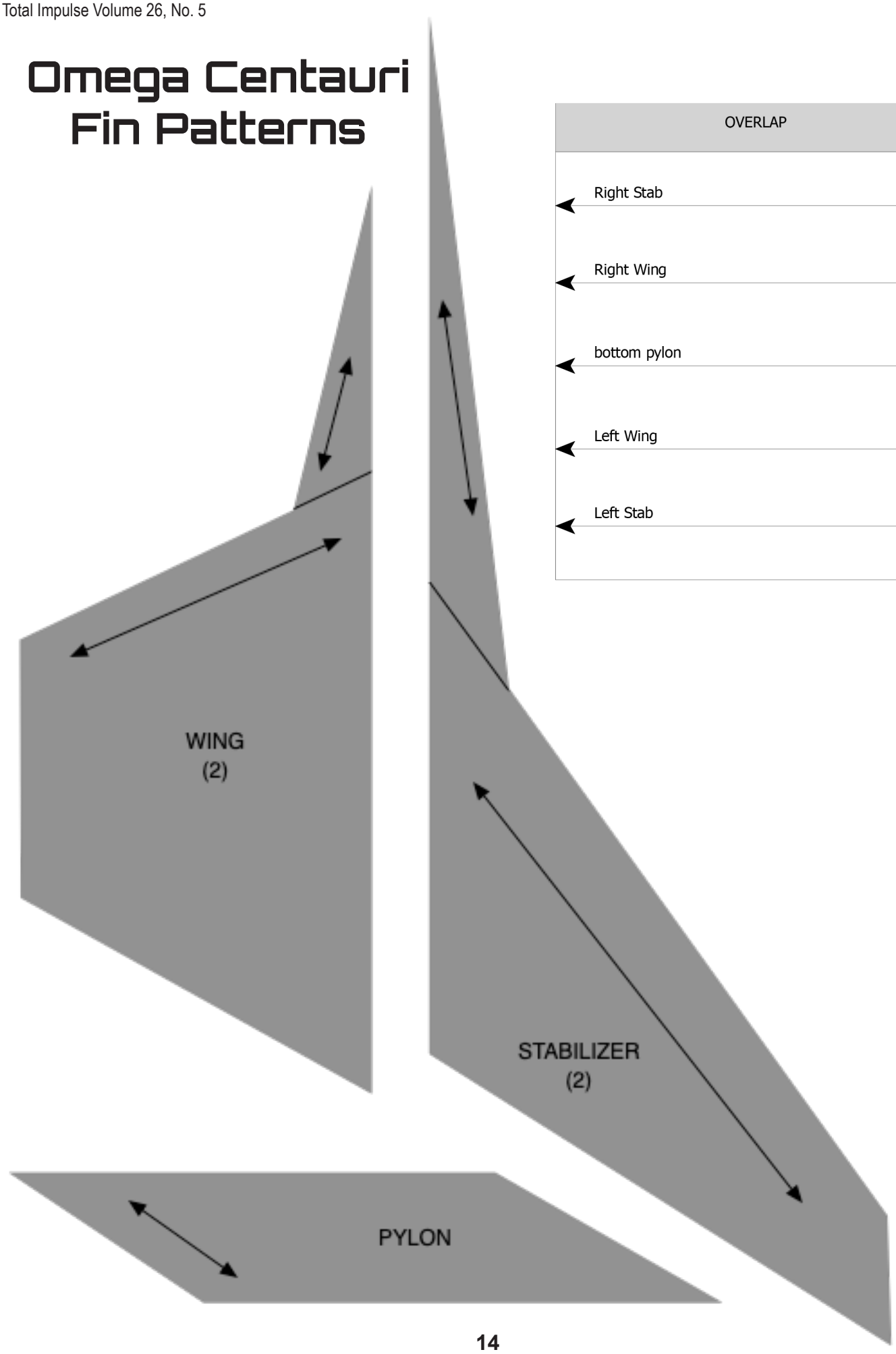
The OC Interceptor has flown once, at the JMRC/HUVARS October launch. The boost was nearly straight up with less than a single roll to apogee. The C6-3 had no ejection charge, so the model came in ballistic and lawn-darted. Fortunately the field was still soft from recent rain and only the forward body tube was damaged. The model is currently in dry dock being fitted with a new tube.



Pod Tail Cone
Apoligies for the mixed measuring units

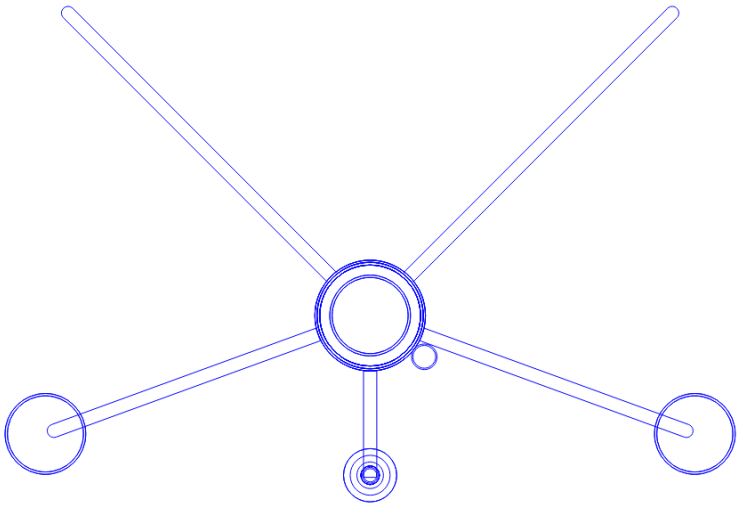
Omega Centauri Fin Patterns

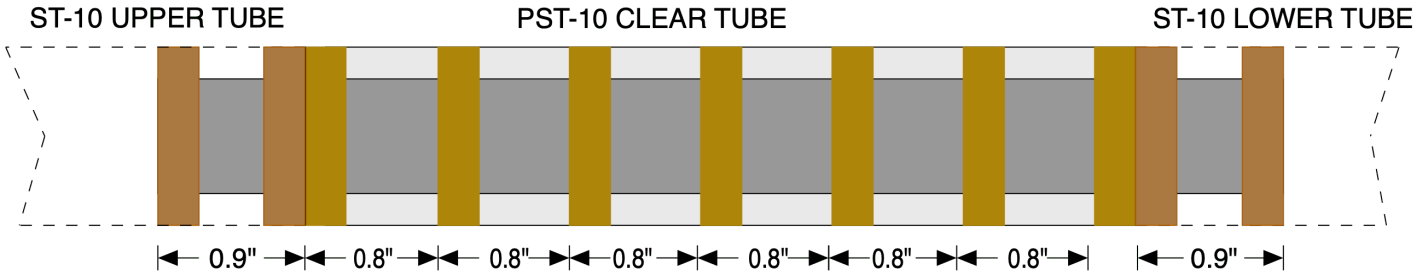
OVERLAP
Right Stab
Right Wing
bottom pylon
Left Wing
Left Stab



Parts List

1 – PNC-10 Nose Cone (4.75”)
2 – PNC-7 Pod Nose Cones (2.75”)
2 – PNC-7 Pod Tail Cones (1.35”)
1 – ST-10 Upper Body Tube (5”)
1 – PST-10 Reactor Clear Body Tube (5”)
1 – ST-10 Lower Body Tube (10”)
2 – ST-7 Pod Body Tubes (4”)
11 – CR-710 Reactor Section Centering Rings
1 – ST-7 Reactor Section Core Tube (6.8”)
1 – ST-7 Motor Mount Tube (3”)
2 – CR-710 Motor Mount Centering Rings
1 – Motor Hook for 18mm Motors
2 – Balsa Wings (1/8”)
2 – Balsa Stabilizers (1/8”)
1 – Balsa Lower Plasma Cannon Pylon (1/8”)
1 – 1/8” Plasma Cannon Launch Lug (4.8”)
1 – 1/8” Plasma Cannon Dowel (6.2”)
1 – 3/32” Launch Lug (3.5”)
1 – Parachute 16”
1 – Recovery Harness

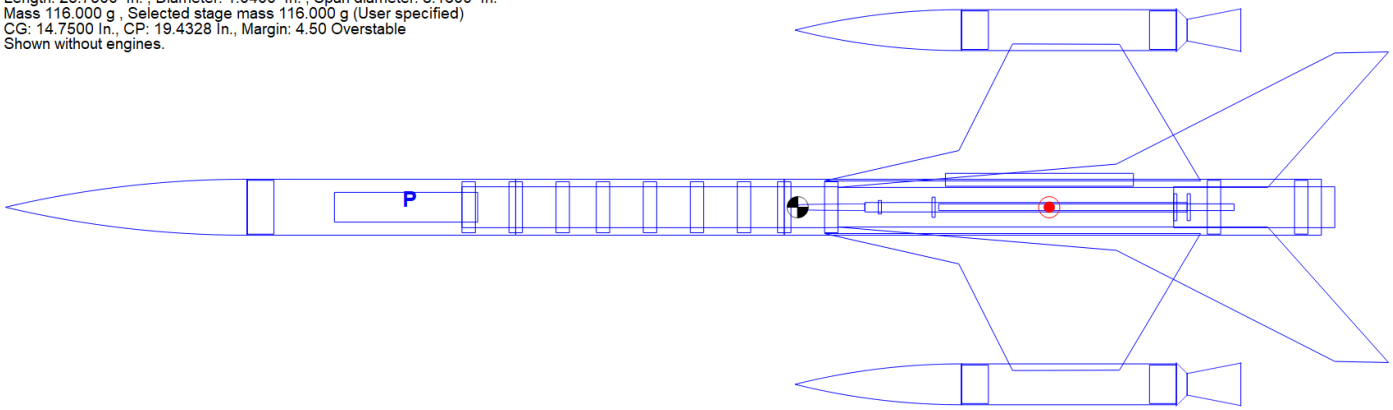


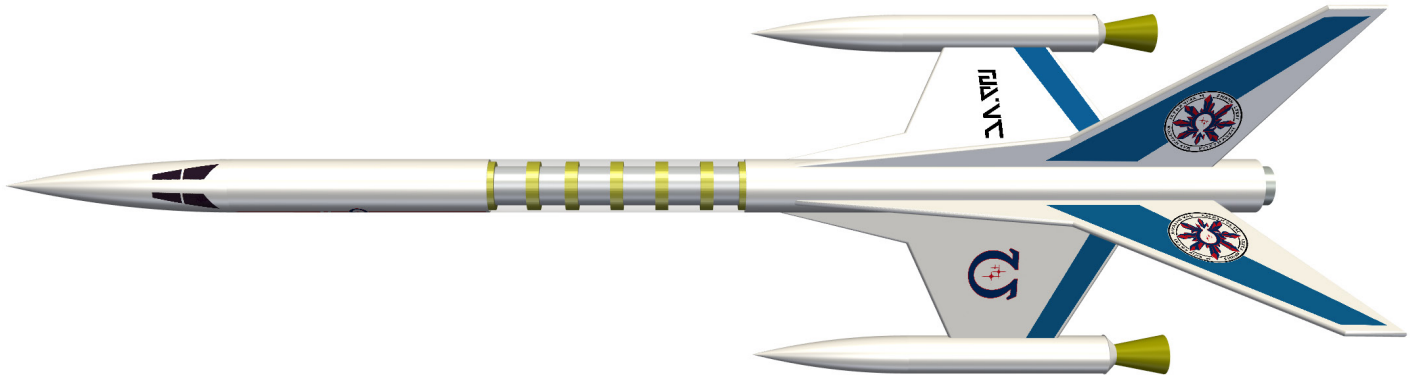


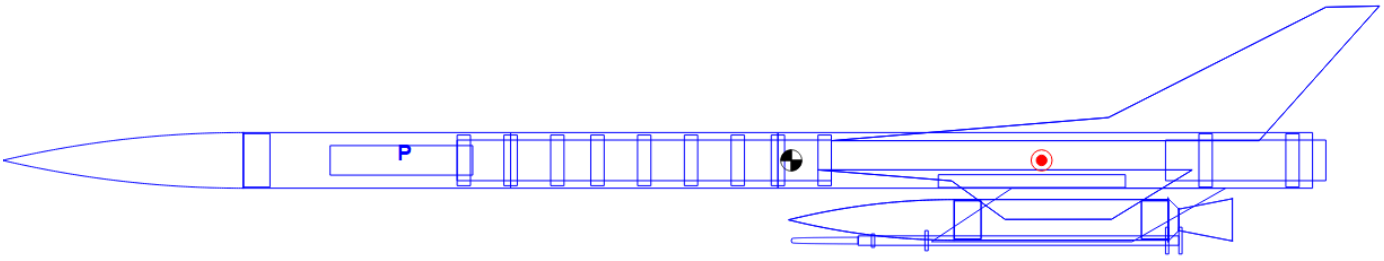


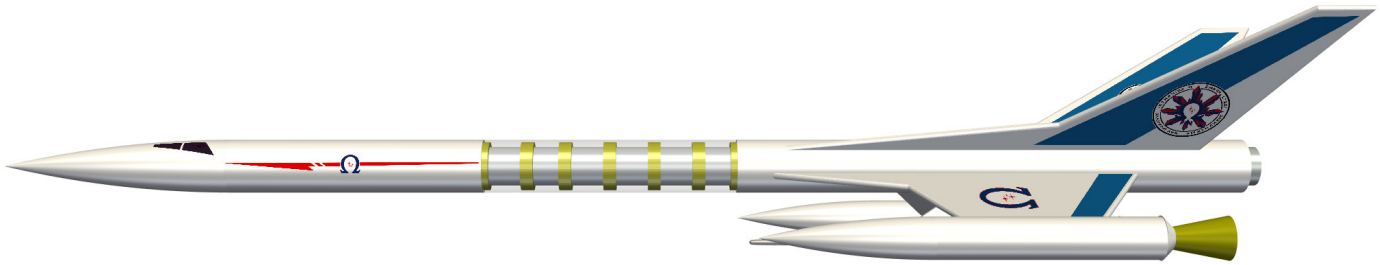


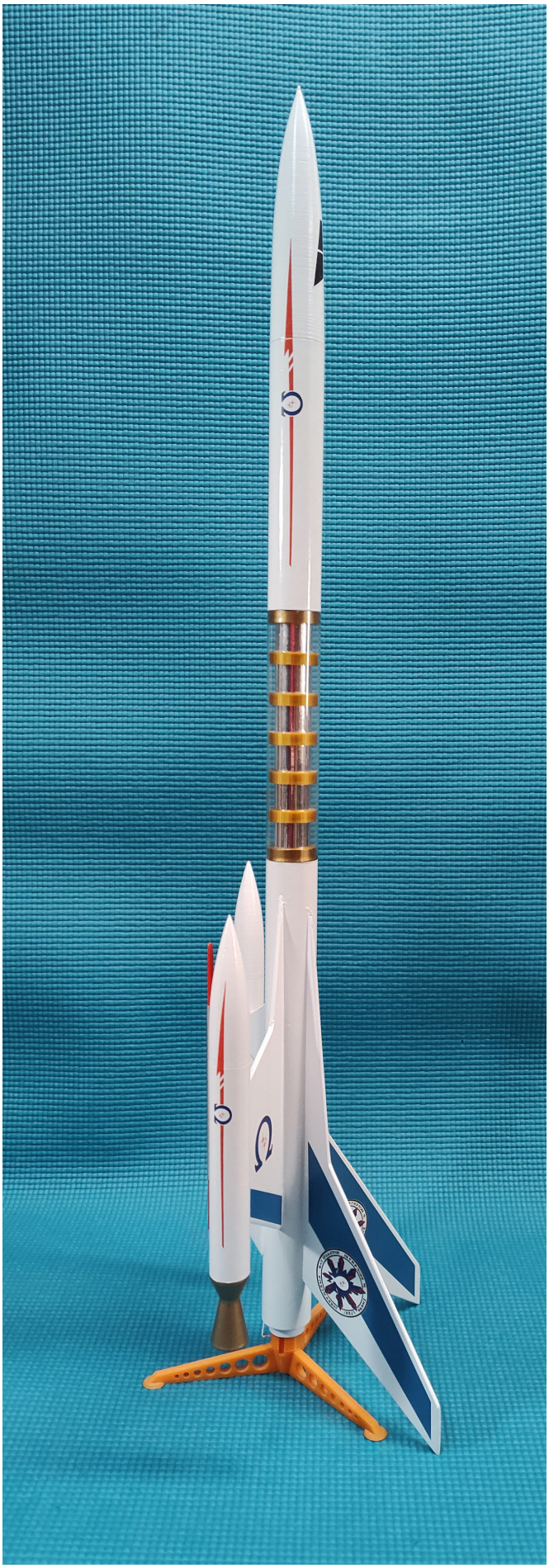
Omega Centauri Interceptor
Length: 25.7500 In. , Diameter: 1.0400 In. , Span diameter: 8.1600 In.
Mass 116.000 g , Selected stage mass 116.000 g (User specified)
CG: 14.7500 In., CP: 19.4328 In., Margin: 4.50 Overstable
Shown without engines.

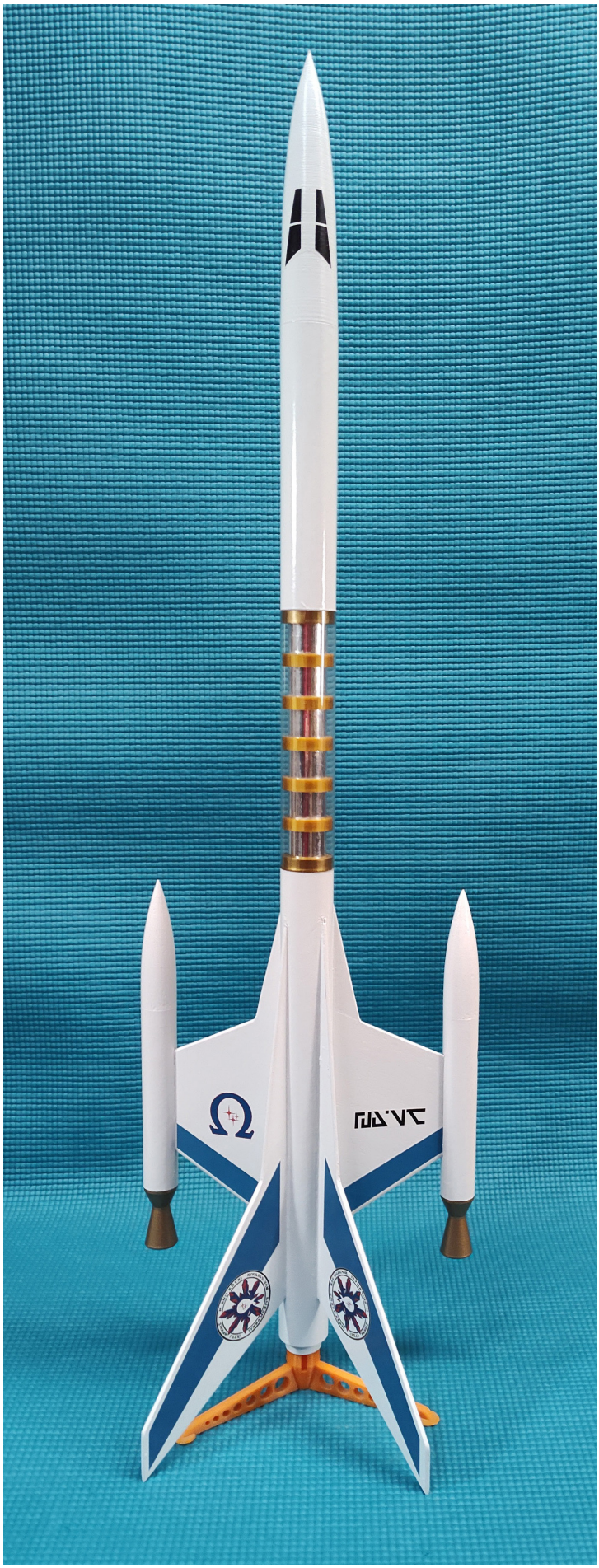




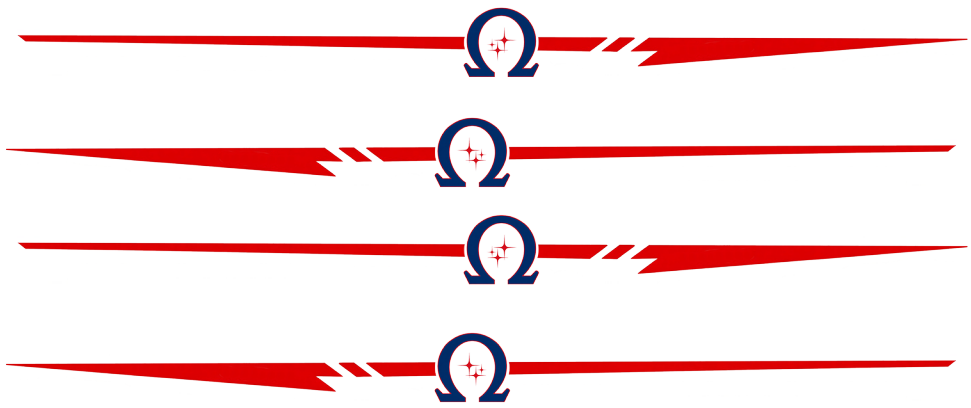


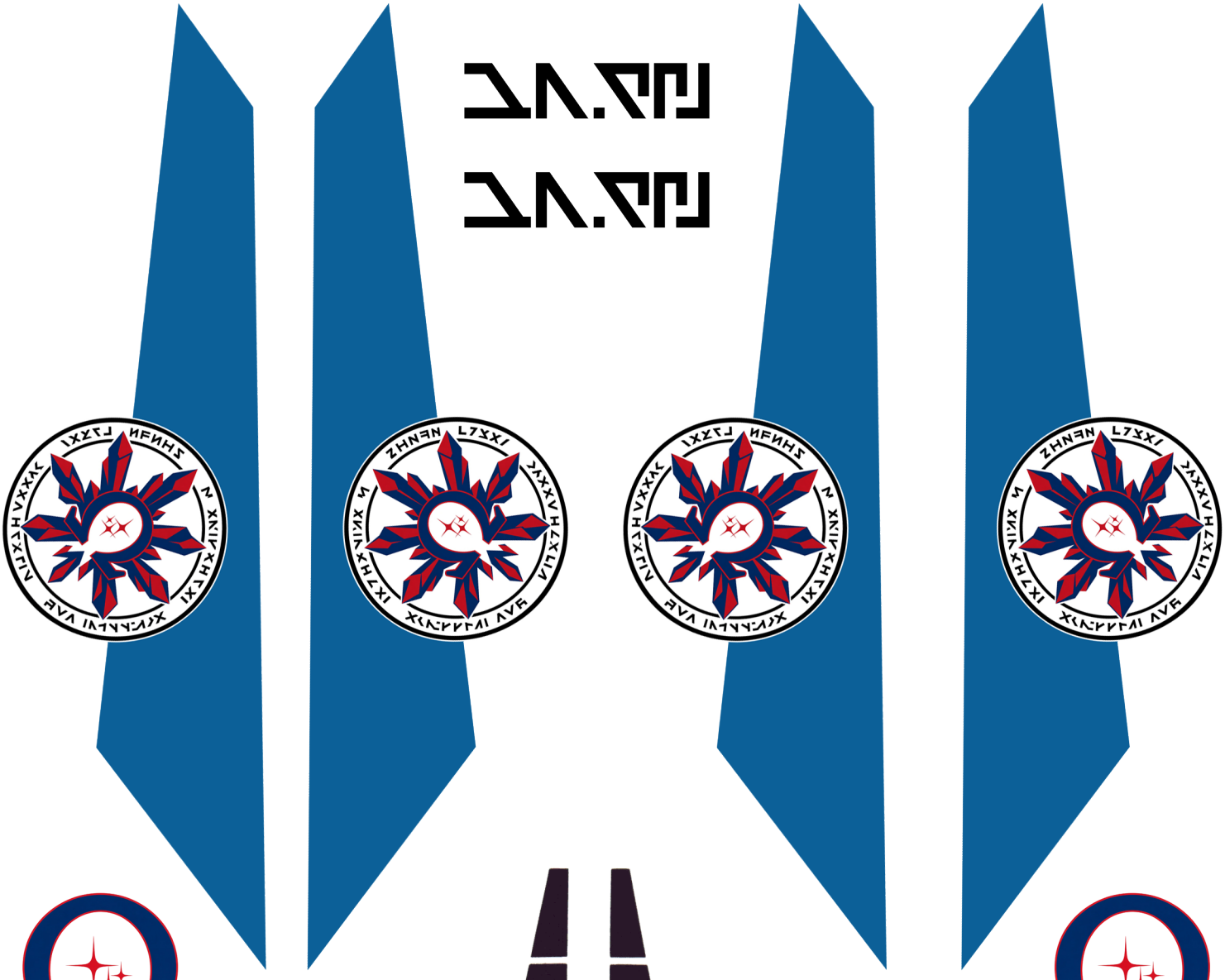






Omega Centauri Decals





Rocket 'Tronics
ELECTRONICS COLUMN

AFFORDABLE 440MHZ/FM TRACKERS

Art Upton

Back in the days before GPS, many JMRC members used 'Rocket Hunter' tracker beacons that could receive beacon tones on Scott Miller's expensive Walston 220mhz Falcon wildlife receiver. The beacons were low cost, and the shared use of the expensive receiver by the club made it affordable.

Comspec sold the beacon transmitters to Rocket Hunter and others that used them on R/C planes and wild life. They are no longer selling 220mhz beacons, but many clubs have their receivers.

A gentleman on The Rocketry Forum [TRF], @Brainstormz123 has been selling 220mhz beacons and now offers them in 440mhz/FM that can be used with low cost receiver Handheld Transceiver (HT) radios like the Mini Baofeng on Amazon. While I have the 220s as well, I will focus on the 440mhz one I recently bought and tested as others can use these with the $25 HT radios to receive data on.

I ordered mine without the coin cell holder attached so I could solder a small battery to it and mount it in the 3D printed BT-20 nose cone of a Femto-Magg rocket as well as on shock cords and other places on just about any rocket I can think of...



Shown above left with my $25 Mini Baofeng radio and on the right with my Kenwood TH-D74. I don't cry when I drop a $25 radio on the ground :)

You don't need a Yagi directional antenna to find these, especially in the last 100 feet hiding in the tall grass, alfalfa, or behind a corn stalk, even when the rocket is 3" diameter. You can use your body to block the signal and get an idea of its location. You can also move the frequency up 5 (e.g., to 434.455 instead of the 450 shown) to reduce the gain, or up to 460. When you are close, perhaps on top of it but still cannot see it in tall grass, take the antenna off and wave it over the grass to reduce signal overloading.

When farther away like at the range head, these trackers give off 4 beeps of different tones and signal strength. When you are far away you might only hear 2 beeps or even 1 beep until you start your trek to get closer to the rocket in the general direction you saw it go, generally…

In this YouTube video, you can hear the 4 beeps tones and signal strength bar graph. RDF Tracker Transmitter.

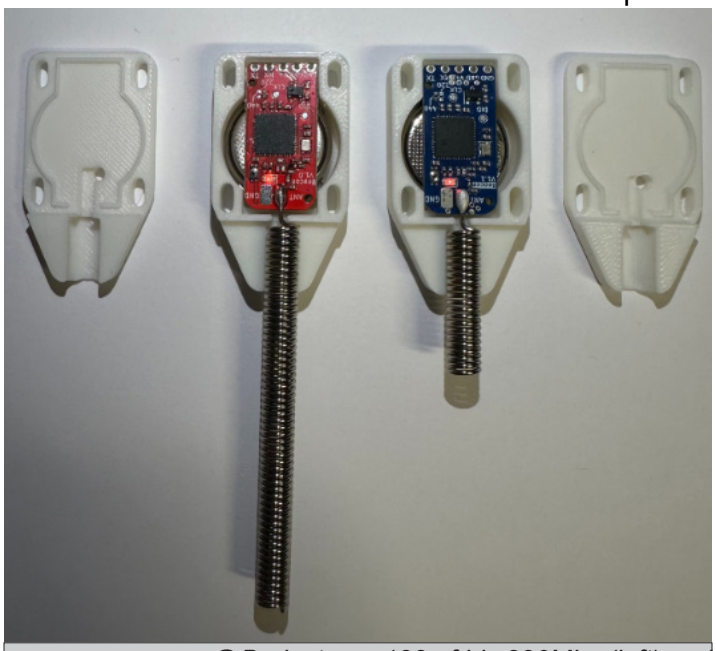


Photo from TRF by @Brainstormz123 of his 220Mhz (left) and 440Mhz (right) beacons with coil antennas. They can be used in or out of the 3D printed cases.

The tones are matched from low to high signal strength. For Example my Yellow Arreaux Ascender landed in the corn field behind the hill on October 24th. The signal went down to two beeps, the last two at the higher pitch. As I knew the general direction it landed, I began working that way and I could start hearing 3 beeps at the crest of the hill. Moving closer and closer, I got 4 beeps. Then I moved the frequency off by 5 dropping the signal back down to 2 beeps. Closing in more brought the return back up to 4 beeps on top of the rocket.

You can increase the range dramatically if you plan to hit a high altitude at a large launch field with a Yagi antenna. Arrow makes this one for handheld use, Arrow II Hand Held Portable Antenna.

You can build your own low-cost tape-measure Yagi antenna, just like many ham radio transmitter hunters do.The first link below has step-by-step instructions for building one for the 2-meter band.To use it on 440 MHz (and make it easier to carry around), you can fold the tape-measure elements over on themselves to cut their length in half. If you only plan to use the antenna on 440 MHz, simply make each element half as long as the 2-meter version.
Links:
2-meter tape-measure Yagi instructions (PDF)
Search for 440 MHz tape-measure Yagi designs
If you would like to get such a tracker, contact @Brainstormz123 on TRF with a PM and ask for the FM 440mhz version on the 440 frequency you wish. You can also order your own custom frequency. If you need suggestions on what frequency to use at the JMRC range, ask on the JMRC email list or Discord server and we can give you a list of what is being used and what could be good open frequencies for you to use.

SCALE DATA

MARTIN AGM-12B BULLPUP A

Peter Alway

From “Selected US Navy Missiles of the Cold War” by Peter Alway

During World War II and the Korean War, dive bombing was the most accurate way to hit a specific target from the air, but it exposed planes to dangerous ground fire. In 1951, in the heat of the conflict in Korea, the Navy’s Task Force 77 took a close look at the costs and benefits of dive bombing, and called for a guided, rocket-propelled bomb. In 1953, the Navy put out a call to industry for just such a weapon, and in May of 1954 selected the Martin company to create the ASM-N-7 missile—the Bullpup. “Bullpup” was both archaic British English for a bulldog puppy and a term for various compact firearms. Either way, the name meant something small but dangerous.

Martin designed the missile around a 250-lb (113 kg) conventional bomb. Martin’s engineers added a guidance section to the nose, with four small steering vanes. An Aerojet solid propellant rocket, burning WW II-style double base propellant (mostly nitrocellulose and nitroglycerine) propelled the missile for 2 1/2 seconds. The motor section carried four wings (not called fins in the literature). Two flares in the tail allowed the pilot of the launching aircraft to watch the missile as he steered it with a joystick in the cockpit.



AGM-12 Bullpup at the USAF Museum in Dayton, OH - Peter Alway



AGM-12 Bullpups loaded on a VX-4 F4J Fury - USN photo



AGM-12 Bullpup at the USAF Museum in Dayton, OH - Peter Alway

The original ASM-N-7 Bullpup reached Navy planes in 1959, equipping carrier-based FJ-4B Furies and A4D-2 Skyhawks. Within a year, Martin brought out an improved version, the ASM-N-7A, or Bullpup A.

The improved Bullpup A carried a more powerful liquid fueled engine built by Reaction Motors, by then a division of Thiokol. The whole liquid propulsion system was shipped as a self-contained, pre-fueled package, with the same length, diameter, and weight as the original solid motor, but with 15% greater total impulse. The combustion chamber nested inside the fuel tank in the rear half of the package. A gas generator fit in the center of the oxidizer tank in the front half. At launch, the gas generator burned a propellant whose pressure forced fuel (mixed amines) and oxidizer (inhibited red fuming nitric acid) into the combustion chamber, where they ignited on contact.

Many different Navy and Air Force aircraft would carry the Bulpup A and later versions.
In 1962, when the Defense Department redesignated rockets and missiles, the Bullpup became the AGM-12. To make things more confusing, the version letters of the new system were out of step with the old system. The original Bullpup (no letter) became the AGM-12A, while the Bullpup A became the AGM-12B. Externally these two versions looked nearly identical.



AGM-12 Bullpup at the USAF Museum in Dayton, OH - Peter Alway



AGM-12 Bullpup on a P-3 Orion wing pylon - USN photo

The Air Force commissioned its own version for the AGM-12 B Bullpup from Martin, with modifications to the radio control system. The AGM-12C (Bullpup B) version carried a bulging 1000 pound (454 kg) warhead and looked quite different from the first two versions, with wings of a completely different shape. There was also a nuclear-armed AGM-12D version.

The conventionally-armed AGM-12B and AGM-12C versions saw service in the Vietnam War. In spite of the glowing official descriptions of the Bullpup, it had some serious flaws as a weapon. The purpose of the missile was to keep attacking aircraft out of harm's way, but because the pilot was busy controlling the missile after launch, he couldn't take evasive action until it hit its target. North Vietnamese ground forces learned that by directing fire at the smoke trail of the Bullpup they would soon hit the launching aircraft itself. In one frustrating case, pilots were able to score direct hits on a bridge with Bullpups, but the 250-pound warhead lacked the explosive power to bring it down.

In the end the US military replaced the Bullpup with the Walleye television-guided bomb. The American military removed the last Bullpups from its inventory in the 1980's.

Bullpup A AGM-12B Specifications:

Length	10 ft, 6 in (3.20 m)
Diameter	12.07 in (30.7 cm)
Weight (loaded)	571 lb (259 kg)
Range	7 mi (11 km)
Thrust	12,000 lb (53,000 N)
Duration	2.04 sec
Total Impulse	24,480 lb-s (109,000 N-s)
NAR designation	Q 53,000

USN photos courtesy of Craig Bucklin, Chris Timm, and Buzz Nau



AGM-12 Bullpup on a A-1 Skyraider wing pylon - USN photo



AGM-12 Bullpup on a transport loader. Note the canards are not yet installed - USN photo



AGM-12 Bullpup loading on a VX-4 F4J Fury - USN photo



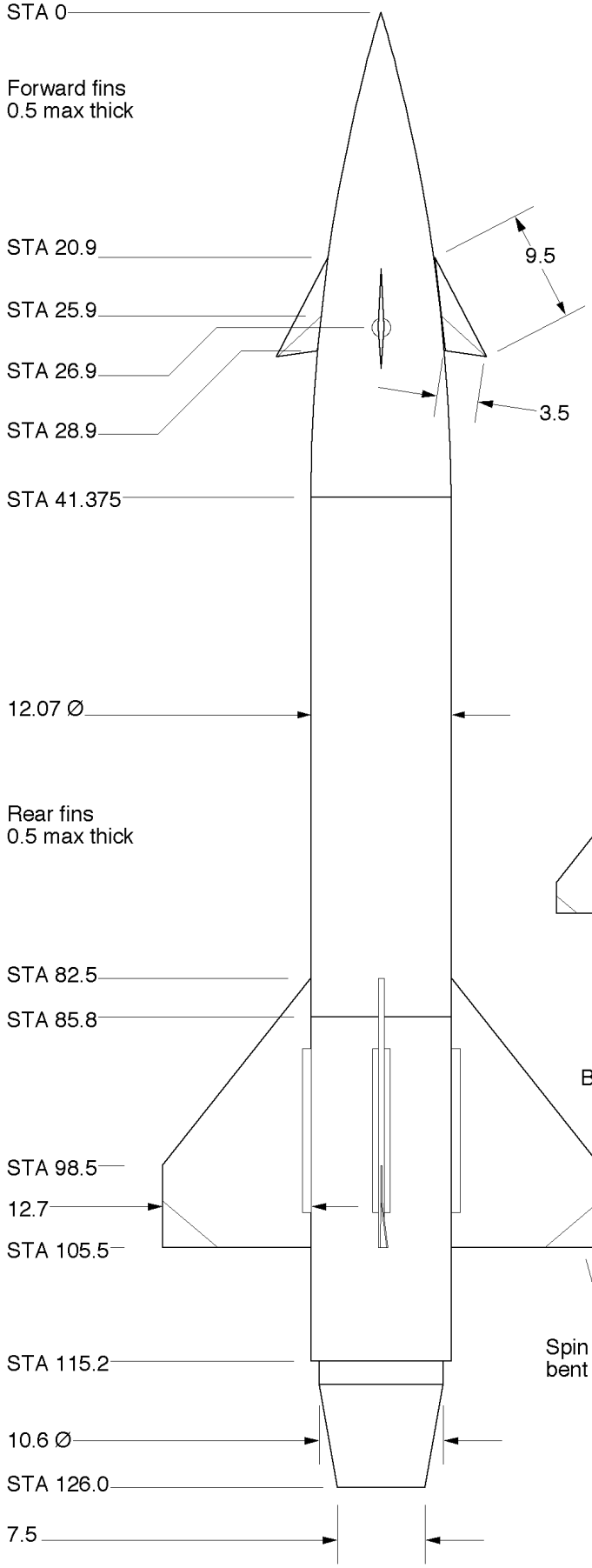
VX-4 F4J Fury carrying multiple AGM-12 Bullpups - USN photos



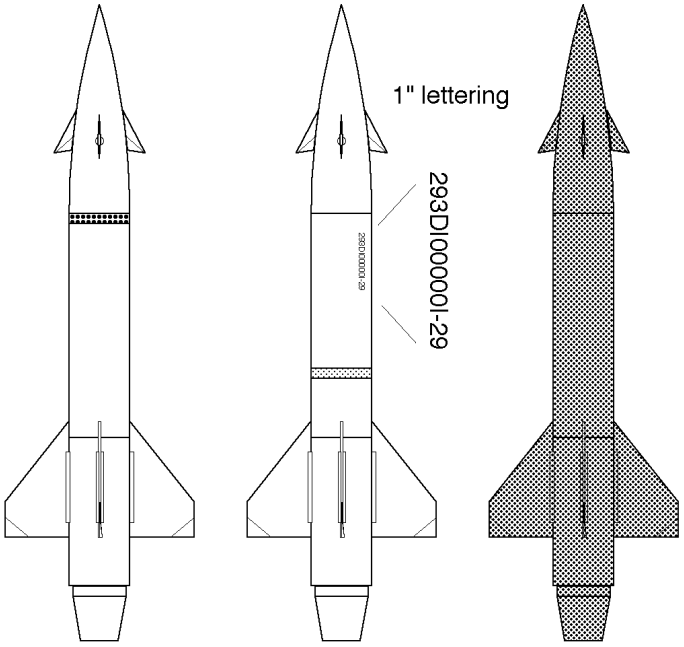
Bullpup A
AGM-12B

1/15 scale
Dimensions in inches
© 2022 Peter Alway

Source:
"The AGM-12B Bullpup A," Fred Williams, *Apogee*, February 1991.
Photographs of missile at the National Museum of the US Air Force, Dayton, Ohio.
1960's Missiles from the US Navy, YouTube video, Periscope Film.



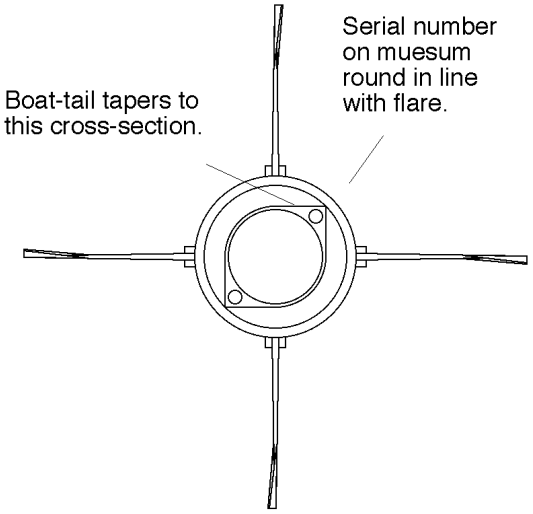
White
Yellow
Brown
Red



USAF
F-100:
Brown stripe

USAF Museum,
Dayton, Ohio
Yellow stripe

Missile fired from
A4D in YouTube
video.



COMPETITION CORNER

Alpha Streamer Duration Contest Hints & Tips

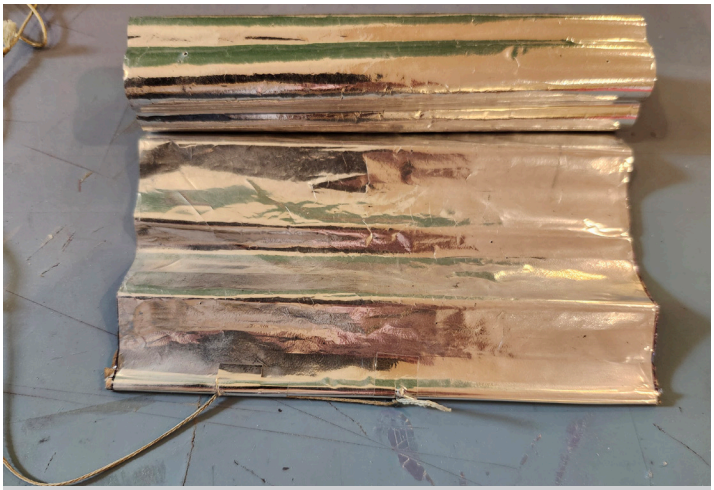
Al de la Iglesia

At a recent club launch I had an individual ask me how to make their Alpha perform better for the current club contest. I will outline several methods for improving the performance of your Alpha or for any competition model using some simple strategies and advanced construction techniques.

The Streamer

The first and foremost way to improve the performance of your Alpha in a contest for streamer duration is to simply use a streamer that is designed for competition. In a previous article I discussed some of the ways of making streamers but the most important point is the type of material used and how to fold it. The most competitive types of streamers currently used are typically made of aluminized Mylar. Avoid using space blanket or emergency blanket types of Mylar as these are too thin for the weight of the model to be effective. A better type of Mylar can be found in some types of wrapping material but the thickness of that type of material varies upon the brand you find. Some of these are found in dollar stores as happy birthday or congratulations streamers and the material is thick enough to be effective but you'll have to do some hunting to find good stuff. It should be relatively cheap and may be able to do the job. For best results in a competition streamer, the standard is 1 mil (0.001") aluminized Mylar. It will work for a slightly heavier model such as an Alpha, but if you continue to improve your Alpha and make it lighter then you will really see what duration your model is capable of.

In terms of the size of a streamer, you can easily fit a 5" X 50" long streamer into an Alpha if you are careful about how you build your model and with some modifications you could even fit a 6" X 60" long streamer. Be careful not to use too large of a heavy streamer as your streamer could outweigh your Alpha resulting in reduced performance. Just make sure the streamer you use weighs less than your model.



Streamer showing accordion fold and attachment point

Once you have sourced an appropriate material, the key is to put accordion folds in the streamer for its entire length. You can put folds in Mylar fairly easily by rolling it around a small diameter tube such as a 10 mm paper tube and then crushing it in a vise or clamp and then heating the Mylar in a toaster oven at 200 F for about 40 minutes. Use caution with this method as the Mylar can stick to itself if it's not clean and dry. I typically wipe down the surface of the Mylar with isopropyl alcohol, allow it to completely dry and then I dust the Mylar with baby powder before rolling on the tube and baking in the oven. I have had to throw away a streamer or two that had contaminants that caused the material to stick and not come apart.

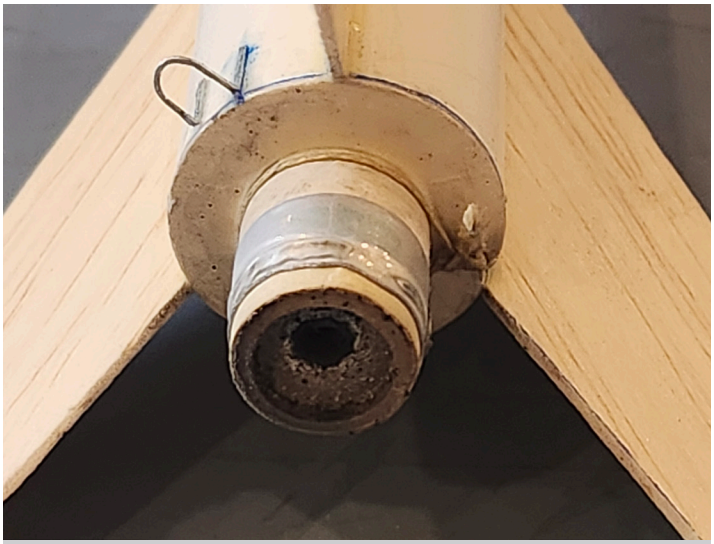


Lightweight Alpha for optimal performance

To attach the streamer to your model, I add a 1 mm carbon rod at the bottom of the streamer and tape it in place using Mylar tape. I also use 30 lb Kevlar line that is attached to the carbon rod somewhere between 20% and 30% of the width of the streamer.

Model Construction Modifications

The next major steps to improving the performance of an Alpha for competition is to modify the model itself to reduce weight. A lighter model will generally achieve a higher altitude, descend slower and thermal more easily due to the much lower mass. There is an optimum mass depending on the model dimensions and motor but for the model and motors we are using you cannot make your Alpha light enough.



Alpha with a 13mm motor mount and Kevlar attachment

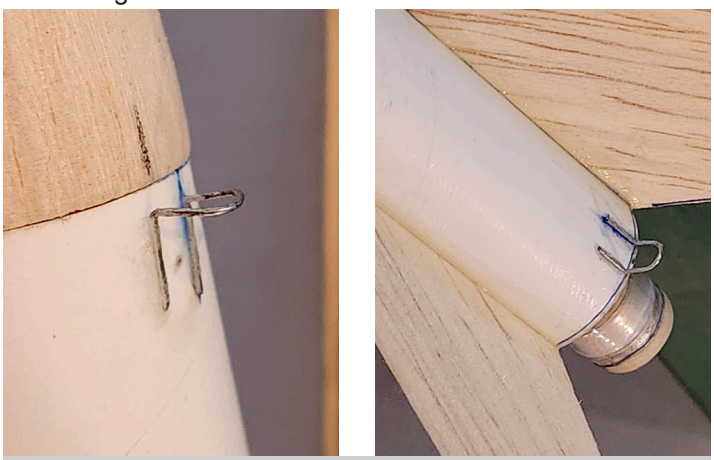
The first big change is to modify your Alpha to use 13mm motors instead of the standard 18mm motor. A 13mm motor and its mount are much lighter due to the smaller diameter and shorter length of the motor casing and motor tube. To do this you will need to build an entirely new motor mount. The motor mount from the original kit Alpha is too large and heavy. I made a new motor mount using a very short section of BT-5, about 2 inches long. You will also need to use different centering rings to mount the motor tube into the body tube. You can use Estes centering rings (RA-550, Estes SKU 003179) or you can make your own from scratch. I made centering rings from 3" X 5" index cards that are quite light and easily strong enough to withstand the thrust of an A3-4T motor. Do not put a thrust ring inside the motor tube as it is not needed and just adds to the mass of your model. If you really want to make your Alpha as light as possible, don't use an Estes BT-5 for the motor tube, but instead use Totally Tubular tubing from eRockets. There is not a lot of weight difference in switching from an Estes body BT-5 motor tube to a Totally Tubular BT-5, but several reductions in mass add up. You could also roll your own small section of motor tube by using parchment/resume paper that I discussed in my other competition articles that I use for building FAI models.

Next comes the body tube. If you are really looking to lose a lot of mass then roll your own body tube out of parchment/resume paper or Vellum. If you are going to use this method, then be sure to add a little heat resistant Kapton tape at the bottom of the body tube above where the motor mount is located. I use at least 1 inch of Kapton tape to reduce the risk of burn through as the ejection charge from Estes motors are quite powerful and will burn through Vellum after a few flights or even one flight if not protected.

The nose cone on an Alpha is another easy way to lose a lot of mass. The current plastic Alpha nose cone is quite heavy and can be substituted with a solid balsa nose cone which reduces the mass by almost 2 grams. I also have used a hollowed out balsa cone to lose a little more weight. If you are really looking to lose the most mass possible then substitute a vacuum formed nose cone.

You can also lose weight in your Alpha by using thinner fins. I have found that balsa is still the overall lightest and strongest material to use, but you need to use a thinner fin that you can finish and is still strong enough to do the job. I have successfully flown my competition Alpha with 1/16 inch thick fins, but if you really want to push the envelope then you can make your fins from 1/32 inch thick balsa but you should strengthen them by hardening the balsa with thin CA glue or Varathane wood hardener. In either case you should finish your fins with at least 600 grit sandpaper to reduce skin drag. The other benefit of thinner fins is lower frontal area which will result in higher altitude.

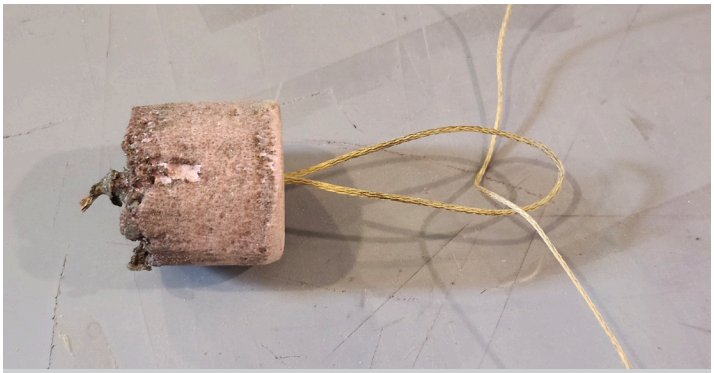
In our rules for the Alpha event you have to fly your model from a rail or launch rod so I chose to lose some weight and drag by not using the standard Estes launch lug. Instead I chose to make very thin lightweight wire lugs from staples. It is not the easiest to do but using fine pliers you can easily bend a staple around a launch rod into a nice round shape with two flat ends to glue on your model. I made two of them and placed one near the top of the model and one at the base by the motor mount. Make sure you align them properly for a straight launch.



Wire lugs mounted at the base and top of the body tube

Do not use the Estes elastic cord and mount from the kit. It is way too heavy and unreliable. The best shock line method I have found for this model is to use approximately 2 ft of 30lb Kevlar. I simply made a loop on one end that I can lasso around the motor tube and then tape over it when the motor is taped in place. Run the Kevlar externally up the side of your model. You do not have to worry about how tight the nose cone is when you have the Kevlar inserted in there. The Kevlar is very thin and offers minimal resistance plus the Estes motor ejection charges are so powerful they easily pop the nose cone even with a little extra friction.

To make flying my Alpha a little easier, instead of shoving an unknown amount of Estes wadding that may or may not protect the Mylar streamer, I chose to make a foam plug that is reusable for each flight. I have already gotten six flights out of the single foam plug. I added a 30 lb Kevlar loop in the foam plug so that it can run along the shock line keeping the plug with the model so it can be reused over and over. With our rules you don't have to keep the foam plug, so you could eject it and lose a little bit of mass for that little extra competitive edge, just make enough foam plugs for the number of flights you need to fly.



Foam plug replaces wadding and is good for several flights

When building your model I recommend tacking all parts in place with a small amount of medium CA to make sure they are aligned and in place properly and then using wood glue to seal and strengthen all joints. I use wood glue to make fillets on my fin joints, but I make the fillets as small as possible to add strength and minimize weight. Don't worry about the drag of having small fillets on these models as the drag is not nearly as important as the weight.

Another general hint for competition models is to not bother painting your model. If you want to decorate or color your model for easier visibility, then you are better off using Sharpie or other magic markers to color your model. Spray paint is heavy compared to magic marker, so I avoid using it on any competition models.

If you want to build a super light Alpha with all modifications, you could lose another 4 grams or so according to the data table. The model I flew did not use a parchment body or motor tube, nor did I use the hollow balsa nose cone. I built my model for a wee bit more reliability rather than risk any part failures.

Part	Description	Mass (g)
PNC-50KA	standard Alpha blow molded cone	4.32
PNC-50K	standard Alpha III injection molded cone	7.71
BNC-50K	solid Alpha balsa cone	2.28
BNC-50K	hollow Alpha balsa cone	1.56
BT-5 x 1.5"	13mm motor tube x 1.5"	0.50
	13mm parchment motor tube x 1.5"	0.16
BT-50 x 7.75	24mm body tube x 7.75"	4.77
	24mm parchment body tube x 7.75"	1.53
	index card centering 5 50 rings (2)	0.20
	3/32" balsa Alpha fins (3)	1.50
	1/16" balsa Alpha fins (3)	1.00
	complete Estes Alpha	22.70
	complete competition Alpha as flown	10.21



View From the Flight Line continued from page 12

It was a good experience for me to see the world again through the eyes of the kids. It brought back the feeling that I'm sure my dad had, that I had with my kids, and grand-kids. Now it's a step further; the great grand-kids are getting involved. How cool is that?

Postscript:

Since getting the grand-kids involved, I was approached by one of the kids from my church. There are four boys, the oldest is off to college while the other three are still at home. The next oldest asked if I could help him with his STEM (Science, Technology, Engineering and Math) project; he had chosen rocketry. I of course was thrilled and accepted readily. The two other boys looked a little left out so I went ahead and offered that they could also be involved. The STEM kit and the other rockets were delivered, so here we go again!

These projects will be built over the winter by the boys, who are a little older and will be able to understand a bit of the physics involved. It will be a teachable moment all winter long with flights in the spring. I did give the oldest a copy of G Harry Stine's, Handbook of Model Rocketry, to read and contemplate since his STEM requirement is a basic understanding of the physics involved. I can't wait to see who has the most fun with it all, but I have a pretty good idea who it will be….and it ain't the kids, I guarantee you!



Dale Hodgson paying it forward

JMRC HUVARS Club News

Final Call For Club Contests

Our November launches will be the last chance to compete in the Alpha Streamer Contest and the 2026 Precision Altitude event.

2026 Precision Altitude Contest

This year's target altitude is 518 feet. The object of the contest is come as close as possible without going over.

Precision Altitude Rules:

• At the end of the flying season, have the closest recorded altitude to the target altitude (518 feet) without going over
• Any commercial altimeter may be used
• The cost of entry is $5 and must be paid before the flight
• You must state on your flight card that the flight is participating in the Precision Altitude contest
• You may enter as many times as you like
• We must have at least 10 adult entries during the flying season, or the contest will be extended to 2027

Awards:
Adults (18 and older)
First place is 50% of the money collected
Runner-up is 25% of the money collected
Club fund receives the final 25%
Juniors (Under 18 years old) A trophy and prize kit

Alpha Streamer Duration

Goal:

Using an Estes Alpha or Alpha III (Including replica clones or scratchbuilds), make up to four flights using A impulse motors, and attain the highest score which will be the duration sum of all flights using a streamer for recovery.

Allowable changes:

The Alpha or Alpha III must be identical to a stock kit except for;

• The recovery device must be a streamer
• The shock line may be swapped out for Kevlar
• Launch lugs may be swapped out for rail buttons
• It may have a 13mm or 18mm motor mount (13mm adapters may also be used)
• Must use a rod or rail for launching. Towers and pistons are not allowed.

Awards:

• Trophy for overall winner
• Prizes for top three finishers

Entry cost is $5, which will go towards the club's operation costs. You may enter a second model for an additonal fee.



(R-L) Tony Haga, Mark Chrumka, and Roger Wilfong at the October 24 Sport Launch



CURRENT EVENTS IN SPACE EXPLORATION

The past two months have seen a down-tick in launch activity. This is due in large part, to SpaceX shutting down Falcon9 Starlink launches from the Cape as they focus on bring the Starship facilities online. There were a total of 19 SpaceX launches during September and October, down from 27 flights during the prior two months. Of the 19, only 7 were Starlink missions. The rest comprised of 10 Falcon 9 missions, one Falcon Heavy flight, and Starship Test Flight 14.

In other SpaceX news, the Commercial Crew Transportation contract with NASA was extended to include an additional three crew rotations, Crew 15 through 17. Orbital Launch Pad 1, the original Starship launch pad at StarBase Texas, is in the middle of its major refit to support Block 3 Starship launches. It is expected to be back in operation some time in 2027. LC-39A at Cape Canaveral is much further along in its conversion from supporting Falcon 9 to Starship. The pad is nearly complete and has undergone chop stick and flame trench testing. Tank farm work is wrapping up as well as some cladding installation on the tower. The current timeline includes the Starship Flight 16 launch attempt from LC-39A in December that would likely comprise of Ship 43 and Booster 23.

Most other launch providers were quiet over the past two months, though Blue Origin has made rapid progress in rebuilding LC-36A at the Cape since the New Glenn static fire explosion on in May destroyed the pad. They have a planned activation for mid-December 2026 with hopes of a launch before the end of the year.

Rocket Lab performed 5 launches, all successful from their New Zealand launch complex and NASA launched two Black Brant IX sounding rockets from the Poker Flats Research Range (PFRR) in Alaska over a three day period.

SPACEX

On 10 September, SpaceX successfully launched the classified USSF-153 mission for the U.S. Space Force on a Falcon 9 from SLC-4E at Vandenberg Space Force Base, deploying an undisclosed number of satellites to low Earth orbit. The first-stage booster (B1081, its 27th flight) landed on the *Of Course I Still Love You* droneship. The payload is widely speculated to be a batch of Starshield-based national-security satellites (possibly ~23), based on the trajectory matching prior Starlink Group 15 missions.

O3b mPOWER 11-13 was a Falcon 9 launch carrying the final three Boeing-built medium Earth orbit communications satellites for SES's O3b mPOWER constellation on 13 September from SLC-40 at Cape Canaveral Space Force Station. The satellites were deployed successfully and are expected to enter service by mid-2027, completing the 13-satellite network. It was the 29th flight for the Falcon 9 booster.

USSF-259 and USSF-385 were classified Falcon 9 missions for the U.S. Space Force from SLC-4E at Vandenberg Space Force Base. USSF-259 launched on 16 September into polar low Earth orbit, carrying what is suspected to be a batch of Starshield-based satellites for the Space Based Sensing and Targeting program. USSF-385 followed on 26 September into low Earth orbit, also suspected to be another Starshield deployment (possibly for the same portfolio). Both first stages landed on the Of Course I Still Love You droneship.

Starlink Group 31-1 (Starship Flight 14) was the first orbital flight of Starship and the first to deploy operational satellites, launching on 28 September from Orbital Launch Pad 2 at Starbase, Texas. The vehicle (Booster 21 and Ship 41) reached low Earth orbit and successfully deployed 26 Starlink V3 satellites, all of which were confirmed operational. One Raptor engine shut down early, shortening the planned multi-orbit flight; the ship splashed down in the northern Pacific after about three hours while the booster ditched in the Gulf.

Crew-13 was a NASA Commercial Crew Program mission to the International Space Station that launched on 1 October from SLC-40 at Cape Canaveral Space Force Station. A Falcon 9 lofted the Crew Dragon Grace (on its second flight) carrying NASA astronauts Jessica Watkins and Luke Delaney, CSA astronaut Joshua Kutryk, and ROSCOSMOS cosmonaut Sergey Teteryatnikov. The spacecraft docked about eight hours later. This was the third flight for the Falcon 9 booster, which landed at Landing Zone 40.

Transporter 18 was a dedicated rideshare mission to a sun-synchronous orbit launched on 1 October from SLC-4E at Vandenberg Space Force Base. It deployed 130 payloads, including cubesats, microsats, hosted payloads, reentry vehicles, and orbital transfer vehicles. This was the 25th flight for the Falcon 9 booster, which landed at Landing Zone 4.

NROL-97 was the National Reconnaissance Office's first Falcon Heavy mission, launching on 1 October from LC-39A at Kennedy Space Center. The classified payload, suspected to be a high-energy or medium Earth orbit reconnaissance satellite, was successfully delivered. The two side boosters (previously flown on the Roman Space Telescope and other missions) landed at Landing Zones 1 and 2, while the center core was expended.

SDA Tranche 1 Transport Layer A was the fourth launch for the Space Development Agency's Proliferated Warfighter Space Architecture, lifting off on 10 October from SLC-4E at Vandenberg Space Force Base. The Falcon 9 deployed 21 Northrop Grumman-built data transport satellites into polar low Earth orbit, bringing the total Tranche 1 satellites on orbit to 84. This was the sixth flight for the booster, which landed at Landing Zone 4.

Dragon CRS-2 SpX-35 was SpaceX's 35th Commercial Resupply Services mission to the International Space Station, launching on 13 October from SLC-40 at Cape Canaveral Space Force Station. The Cargo Dragon carried more than 6,300 pounds of supplies, science experiments, and the final pair of iROSA solar arrays. This was the eighth flight for the Falcon 9 booster, which landed at Landing Zone 40.

USSF-481 was a classified mission for the U.S. Space Force, launching on 15 October from SLC-4E at Vandenberg Space Force Base. The payload was not announced, but it is suspected to be related to the Space Development Agency's proliferated architecture or Starshield satellites in polar low

Earth orbit. This was the 28th flight for the Falcon 9 booster, which landed on the Of Course I Still Love You droneship.

Bandwagon 5 was a dedicated mid-inclination rideshare mission launched on 20 October from SLC-40 at Cape Canaveral Space Force Station. It deployed 32 payloads, including cubesats, microsats, and the second Starfall reentry capsule. This was the 19th flight for the Falcon 9 booster, which landed on the A Shortfall of Gravitas droneship.

ROCKET LAB

Owl Around The World, the 11th mission launched for the Japanese Earth imaging company Synspective, lifted off on 2 September from Rocket Lab's LC-1 on New Zealand's Māhia Peninsula. The Electron vehicle deployed a StriX synthetic aperture radar (SAR) satellite to a 575 km low Earth orbit. The goal is to expand Synspective's constellation for all-weather Earth observation.

Happily Ever Faster, the fifth mission for BlackSky's Gen-3 high-resolution Earth-imaging satellites, lifted off on 11 September from Rocket Lab's LC-1 on New Zealand's Māhia Peninsula. The Electron vehicle deployed a single Gen-3 satellite to a 500 km low Earth orbit for the confidential customer. The goal is to expand BlackSky's constellation for high-resolution optical imagery.

Owl By The Dozen, the 12th mission launched for the Japanese Earth imaging company Synspective, lifted off on 19 September from Rocket Lab's LC-1 on New Zealand's Māhia Peninsula. The Electron vehicle deployed a StriX synthetic aperture radar (SAR) satellite to a 572 km low Earth orbit. The goal is to expand Synspective's constellation for all-weather Earth observation.

Owlright, Owlright, Owlright, the 13th mission launched for the Japanese Earth imaging company Synspective, lifted off on 26 September from Rocket Lab's LC-1 on New Zealand's Māhia Peninsula. The Electron vehicle deployed a StriX synthetic aperture radar (SAR) satellite to a 559 km low Earth orbit. The goal is to expand Synspective's constellation for all-weather Earth observation.

We're Not Hawking Around, the third dedicated mission for HawkEye 360, lifted off on 23 October from Rocket Lab's LC-1 on New Zealand's Māhia Peninsula. The Electron vehicle deployed three HAWK satellites (Cluster 16) to a 520 km low Earth orbit. The satellites detect and geolocate radio-frequency signals for maritime tracking, GNSS jamming detection, and signals intelligence.

POKER FLATS RESEARCH RANGE

NASA launched two Black Brant IX sounding rockets from Poker Flat Research Range in Alaska in October. INFUSE-2 lifted off on 19 October carrying an integral field ultraviolet spectrograph to map the Dumbbell Nebula in far-ultraviolet light. DUST III followed on 21 October with a microgravity experiment to study the formation and growth of silicate cosmic dust grains. Both were successful suborbital flights above the atmosphere.

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INFUSE-2 Black Brant IX lifts off from Poker Flats

Sources:

SpaceX
NASASpaceflight
Space.com
NextSpaceflight
Flight Atlas
LASP / University of Colorado
Via Satellite
Next Spaceflight
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NASA Wallops
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Starship Flight 14 hot staging - SpaceX



Rocket Lab Electron Owlright Owlright Owlright - Rocket Lab



NROL-97 Falcon Heavy Lift Off - SpaceX



Rocket Lab Electron Owlright Owlright Owlright lifts off - Rocket Lab

Starship Flight 14 deploys Starlink V3 satellites - SpaceX





LAUNCH WINDOWS

November 24, 2026
ROSCOSMOS, Soyuz 2.1b
Launch site: 31/6, Baikonur Cosmodrome
Progress resupply mission to the International Space Station.

November, 2026
ISRO, TDS-01, PSLV-XL
Launch site: Satish Dhawan Space Centre
TDS-01 (Technology Demonstration Satellite-01) is an Indian geostationary orbit technology demonstration satellite carrying payloads for the Indian Space Research Organisation (ISRO)'s Institute of Plasma Research, Gandhinagar and the CSIR-CEERI, Pilani.

November, 2026
SpaceX, Cygnus CRS-2 NG-25, Falcon 9 Block 5
Launch site: Space LC 40, Cape Canaveral SFS
This is the 25th flight of the Orbital ATK's uncrewed resupply spacecraft Cygnus and its 24th flight to the International Space Station under the Commercial Resupply Services contract with NASA.

November, 2026
Arianespace, Metop-SG B1, Ariane 62
Launch site: Ariane Launch Area 4, Guiana Space Centre
Second of EUMETSAT's second generation of Metop weather satellites.

November, 2026
ISRO, Gaganyaan-1, LVM-3
Launch site: Satish Dhawan Space Centre
First uncrewed orbital test flight of the Gaganyaan capsule.

December, 2026
Isar Aerospace, ΣYNDEO-3, Spectrum
Launch site: Orbital Launch Pad, Andøya Spaceport
ΣYNDEO-3 is a satellite built by Redwire Corporation for the European Union/European Space Agency (ESA)'s In-Orbit Demonstration and In-Orbit Validation Programme (IOD/IOV), which will carry 10 different technological demonstration payloads from institutions of Spain, France, Germany, Italy, Luxembourg and the European Commission. The satellite is built on Redwire's Hammerhead spacecraft platform.

December, 2026
Rocket Lab, Leidos-5, HASTE
Launch site: Rocket Lab LC 2, Wallops Flight Facility
HASTE (Hypersonic Accelerator Suborbital Test Electron) is a suborbital test bed launch vehicle developed by Rocket Lab for high-cadence hypersonic and suborbital technology testing.

December, 2026
ISRO, GSAT-32 (GSAT-N3), LVM-3
Launch site: Satish Dhawan Space Centre
GSAT-32 is a geostationary communications satellite for the Indian Space Research Organization (ISRO). The spacecraft is a replacement for GSAT-6A that failed before reaching geostationary orbit after launch in 2018.

December, 2026
SpaceX, Telesat Lightspeed 5, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
Up to 18 satellites manufactured by MDA for Canadian satellite operator Telesat's Lightspeed constellation.

December, 2026
ULA, USSF-114, Vulcan
Launch site: SLC 3E, Vandenberg SFB
Classified payload for the US Space Force.

December, 2026
Isar Aerospace, 1 x Pelican satellite, Spectrum
Launch site: Orbital Launch Pad, Andøya Spaceport
Payload consists of a single Pelican high-resolution imaging satellite for Planet Labs Germany.

December, 2026
SpaceX, Inmarsat-7 F1 (GX-7), Falcon 9 Block 5
Launch site: Cape Canaveral SFS
Inmarsat-7 is the seventh generation of satellites for the London-based global mobile satellite communications operator Inmarsat. The three satellites of the series - GX-7, 8 & 9 - will have an improved fully reconfigurable Ka-band payload for Inmarsat's Global Xpress services. They are optimized for real-time mobility and feature thousands of dynamically-formed beams that direct capacity with laser-like precision over high-demand areas, to provide HTS (High Throughput) broadband connectivity for the mobility market.

December, 2026
Rocket Lab, Leidos-4, HASTE
Launch site: Rocket Lab LC 2, Wallops Flight Facility
HASTE (Hypersonic Accelerator Suborbital Test Electron) is a suborbital testbed launch vehicle developed by Rocket Lab for high-cadence hypersonic and suborbital technology testing.

December, 2026
SpaceX, SDA Tranche 1 Tracking Layer E, Falcon 9 Blk 5
Launch site: SLC 3E, Vandenberg SFB
Tranche 1 Tracking Layer E is one of five missions by the United States Space Force Space Development Agency (SDA) for the Proliferated Warfighter Space Architecture (PWSA) Tranche 1 Tracking Layer constellation, which will provide global indications, warning, tracking, and targeting of advanced missile threats, including hypersonic missile systems.

December, 2026
SpaceX, Cygnus CRS-2 NG-22, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
This is the 25th flight of the Orbital ATK's uncrewed resupply spacecraft Cygnus and its 24th flight to the International Space Station under the Commercial Resupply Services contract with NASA.

December, 2026
SpaceX, Rivada 10, Falcon 9 Block 5
Launch site: Space LC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
SpaceX, Telesat Lightspeed 6, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
Up to 18 satellites manufactured by MDA for Canadian satellite operator Telesat's Lightspeed constellation.

December, 2026
ULA, USSF-16, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Classified payload for the US Space Force.

December, 2026
SpaceX, SDA Tranche 1 Tracking Layer D, Falcon 9 Blk 5
Launch site: SLC 4E, Vandenberg SFB
Tranche 1 Tracking Layer D is one of five missions by the United States Space Force Space Development Agency (SDA) for the Proliferated Warfighter Space Architecture (PWSA) Tranche 1 Tracking Layer constellation, which will provide global indications, warning, tracking, and targeting of advanced missile threats, including hypersonic missile systems.

December, 2026
SpaceX, Rivada 1, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
Avio S.p.A, IRIDE 1, Vega-C
Launch site: Ariane LA 1 (ELV), Guiana Space Centre
First dedicated launch for the European Space Agency's IRIDE Earth observation constellation.

December, 2026
SpaceX, Rivada 11, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
SpaceX, Telesat Lightspeed 7, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
Up to 18 satellites manufactured by MDA for Canadian satellite operator Telesat's Lightspeed constellation.

December, 2026
Avio S.p.A, IRIDE 2, Vega-C
Launch site: Ariane LA 1 (ELV), Guiana Space Centre
Second dedicated launch for the European Space Agency's IRIDE Earth observation constellation.

December, 2026
SpaceX, Rivada 12, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
ULA, USSF-31, Vulcan
Launch site: SLC 3E, Vandenberg SFB
Classified payload for the US Space Force.

December, 2026
ULA, USSF-25, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Payload is the Defense Advanced Research Projects Agency's (DARPA) Demonstration Rocket for Agile Cislunar Operations (DRACO) nuclear thermal spacecraft.



December, 2026
SpaceX, SDA Tranche 2 Tracking Layer B, Falcon 9 Blk 5
Launch site: Vandenberg SFB
Classified mission launched by the Space Development Agency (SDA) for Tranche 2 Tracking Layer.

December, 2026
CASC, Shenzhou 24, Long March 2F/G
Launch site: Jiuquan Satellite Launch Center
Shenzhou 24 will be the 24th flight of the Shenzhou program. The Shenzhou program is China's crewed spaceflight initiative.

December, 2026
CASC, Demo Flight, Long March 10A
Launch site: Wenchang Space Launch Site
First test launch of CASC/CALT's Long March 10A rocket. Payload is expected to be a prototype of the Low Earth Orbit mission version of the Mengzhou crew spacecraft.

December, 2026
ULA, NROL-64, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Classified payload for the US National Reconnaissance Office.

December, 2026
Agency for Defense Development, Demo Flight, Mir
Launch site: ADD Offshore launch platform, Sea Launch
First orbital full version launch of the South Korean military small satellite launch vehicle, after 2 sub-orbital tests of individual stages on 30 March and 30 December 2022, and 1 orbital test flight without the 2nd stage on 4 December 2023.

December, 2026
SpaceX, Rivada 3, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
ULA, NROL-100, Vulcan
Launch site: SLC 3E, Vandenberg SFB
Classified payload for the US National Reconnaissance Office.

December, 2026
SpaceX, Rivada 7, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
SpaceX, VICTUS SURGO, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
A new Tactically Responsive Space (TacRS) mission by the United States Space Force Space Systems Command to deliver responsive space delivery. The mission consists of an Impulse Space Mira orbital transfer vehicle that will operate in Geosynchronous Transfer Orbit (GTO), which would be transferred from Low Earth Orbit (LEO) on an Impulse Space Helios kick stage. A Helios rideshare payload will also be delivered to GEO.

December, 2026
ULA, USSF-43, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Classified payload for the US Space Force.

December, 2026
SpaceX, SDA Tranche 2 Tracking Layer A, Falcon 9 Blk 5
Launch site: SLC 4E, Vandenberg SFB
Classified mission launched by the Space Development Agency (SDA) for Tranche 2 Transport Layer.

December, 2026
Payload Aerospace S.L. Maiden Flight, Miura 5
Launch site: Diamant LA, Guiana Space Centre
First flight of the Miura 5 launch vehicle.

December, 2026
ULA, SDA Tranche 1 Tracking Layer B, Vulcan
Launch site: SLC 3E, Vandenberg SFB
Tranche 1 Tracking Layer E is one of five missions by the United States Space Force Space Development Agency (SDA) for the Proliferated Warfighter Space Architecture (PWSA) Tranche 1 Tracking Layer constellation, which will provide global indications, warning, tracking, and targeting of advanced missile threats, including hypersonic missile systems.

December, 2026
SpaceX, Rivada 4, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
ULA, NROL-109, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Classified payload for the US National Reconnaissance Office.

December, 2026
SpaceX, Rivada 8, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
24 satellites for Rivada's internet constellation.

December, 2026
Blue Origin, Blue Ring-1, New Glenn
Launch site: LC 36A, Cape Canaveral SFS
The first mission of Blue Ring, Blue Origin's all-in-one, high-powered hybrid solar electric and chemical propelled spacecraft, will test the spacecraft's operations in Geostationary Transfer Orbit (GTO), as well as subsequent operations after reaching Geostationary Orbit (GEO).

December, 2026
SpaceX, SDA Tranche 2 Tracking Layer D, Falcon 9 Blk 5
Launch site: Cape Canaveral SFS
Classified mission launched by the Space Development Agency (SDA) for Tranche 2 Tracking Layer.

December, 2026
SpaceX, USSF-75, Falcon Heavy
Launch site: LC 39A, Kennedy Space Center
Classified payload for the United States Space Force

December, 2026
ULA, WGS-11, Vulcan
Launch site: LC 41, Cape Canaveral SFS
Last mission of the Wideband Global SatCom (WGS) series.

December, 2026
Rocket Factory Augsburg, Maiden Flight, RFA One
Launch site: Launch Pad Fredo, SaxaVord Spaceport
First flight of the RFA One launch vehicle. Will carry 7 satellites for various companies and organizations coordinated by the German Aerospace Center (DLR).

December, 2026
Arianespace, GO-1, Ariane 64
Launch site: Ariane Launch Area 4, Guiana Space Centre
Arianespace's GO-1 mission is a dedicated rideshare service designed to provide small satellites with direct access to Geostationary Orbit (GEO).

December, 2026
Blue Origin, BlueBird Block 2, New Glenn
Launch site: LC 36A, Cape Canaveral SFS
AST SpaceMobile's Block 2 BlueBird satellites are designed to deliver up to 10 times the bandwidth capacity of the BlueBird Block 1 satellites, required to achieve 24/7 continuous cellular broadband service coverage in the United States, with beams designed to support a capacity of up to 40 MHz, enabling peak data transmission speeds up to 120 Mbps, supporting voice, full data and video applications. The Block 2 BlueBirds, featuring as large as 2400 square foot communications arrays, will be the largest satellites ever commercially deployed in Low Earth orbit once launched.

December, 2026
SpaceX, Telesat Lightspeed 3, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
Up to 18 satellites manufactured by MDA for Canadian satellite operator Telesat's Lightspeed constellation.

December, 2026
ULA, SILENTBARKER 2/NROL-118, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Space domain awareness mission for the US Department of War.

December, 2026
Isar Aerospace, AT-Astra and Others (Spectrum Flight 3), Spectrum
Launch site: Orbital Launch Pad, Andøya Spaceport
Third test flight of the Isar Spectrum launch vehicle. This launch will carry various satellites including R-Space's AT-Astra/IOD-01, which will perform in-orbit demonstrations for ENPULSION, SUNBOOSTER GmbH, and Synopsis Planet.

December, 2026
Galileo L15 (FOC FM28 & FM31), Ariane 62
Launch site: Ariane Launch Area 4, Guiana Space Centre
Payload consists of two satellites for Europe's Galileo navigation system.

December, 2026
Mitsubishi Heavy Industries, Lunar Polar Exploration Mission (LUPEX), H3-24
Launch site: Yoshinobu LC LP-2, Tanegashima Space Center
The Lunar Polar Exploration mission (LUPEX) is a robotic lunar mission jointly developed by the Indian Space Research Organisation (ISRO) and Japan Aerospace Exploration Agency (JAXA), deploying a lunar rover and lander to explore the south pole region of the Moon.

December, 2026
Rocket Lab, BlackSky Gen-3 8, Electron
Launch site: Rocket Lab L C 1, Mahia Peninsula
BlackSky Gen-3 Earth-imaging satellites.

December, 2026
SpaceX, SDA Tranche 1 Tracking Layer A, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
Classified mission launched by the Space Development Agency (SDA) for Tranche 1 Transport Layer.

December, 2026
Japan Aerospace Exploration Agency, JV-LOTUSat-1, Epsilon S
Launch site: Mu Center, Uchinoura Space Center
Vietnamese Synthetic Aperture Radar Earth observation satellite build by NEC Corporation of Japan, based on Japan's ASNARO 2 satellite and the NEXTAR NX-300L satellite bus. The satellite will contribute to measures against natural disasters and climate change in Vietnam.

December, 2026
Relativity Space, Mars Lander, Terran R
Launch site: LC 16, Cape Canaveral SFS
Impulse Space's Mars Lander is designed to support research and development needed for human exploration of Mars.

December, 2026
SpaceX, Griffin Mission One, Falcon Heavy
Launch site: LC 39A, Kennedy Space Center
Demonstration flight of the Astrobotic Griffin lander and its engines, initially contracted for the cancelled NASA VIPER (Volatiles Investigating Polar Exploration Rover) mission. The vacated payload spot will now host the FLIP (FLEX Lunar Innovation Platform) lunar rover from Astrolab.

December, 2026
Rocket Lab, LOXSAT 1, Electron
Launch site: Rocket Lab LC 1, Mahia Peninsula
LOXSAT 1 is a demonstration satellite of a complete cryogenic oxygen fluid management system in orbit, developed by Eta Space and sponsored by NASA's Tipping Point program. The system will be integrated on a Rocket Lab Photon-LEO satellite bus and collect critical cryogenic fluid management data in orbit for 9 months, demonstrating capabilities of in-space cryogenic storage and transferal. Eta Space plans to use technology developed for this mission to develop a truly commercial depot intended to serve multiple customers in the future.

December, 2026
SpaceX, Telesat Lightspeed 4, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
Up to 18 satellites manufactured by MDA for Canadian satellite operator Telesat's Lightspeed constellation.

December, 2026
ULA, USSF-112, Vulcan
Launch site: SLC 41, Cape Canaveral SFS
Classified payload for the US Space Force.

December, 2026
Deep Blue Aerospace, Demo Flight, Nebula-1
Launch site: Land LP 1, Haiyang Oriental Spaceport
First test launch of Deep Blue Aerospace's Nebula-1 rocket.

December, 2026
SpaceX, CHORUS, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
CHORUS is MDA's next generation Earth observation constellation, consisting of 2 radar satellites (C-band SAR and X-band SAR), in a 53.5 degree 600 km altitude LEO, with the X-band trailing the C-band by 60 minutes. A collaborative multi-sensor constellation, CHORUS will bring together diverse and unique imagery and data sources and provide a new level of near real-time insight and innovative Earth observation services. Operating in a unique mid-inclination orbit, CHORUS will be able to image day or night, regardless of weather conditions, with daily access of up to 95% of the coverage area. From an industry-leading 700km-wide imaging swath down to sub-metre high resolution, CHORUS will provide the most extensive and unrivalled Earth observation radar imaging capacity available on the market in a single mission.

December, 2026
Rocket Lab, Leidos-3, HASTE
Launch site: Rocket Lab LC 2, Wallops Flight Facility
HASTE (Hypersonic Accelerator Suborbital Test Electron) is a suborbital testbed launch vehicle developed by Rocket Lab for high-cadence hypersonic and suborbital technology testing.

December, 2026
Rocket Lab, BlackSky Gen-3 9, Electron
Launch site: Rocket Lab LC 1, Mahia Peninsula
BlackSky Gen-3 Earth-imaging satellites.

December, 2026
SpaceX, SDA Tranche 1 Tracking Layer C, Falcon 9 Blk 5
Launch site: SLC 3E, Vandenberg SFB
Tranche 1 Tracking Layer C is one of five missions by the United States Space Force Space Development Agency (SDA) for the Proliferated Warfighter Space Architecture (PWSA) Tranche 1 Tracking Layer constellation, which will provide global indications, warning, tracking, and targeting of advanced missile threats, including hypersonic missile systems.

December, 2026
SpaceX, Globalstar 2-R Mission 2 (x 9), Falcon 9 Block 5
Launch site: SLC 40, Cape Canaveral SFS
The Globalstar global mobile communications network offers global, digital real time voice, data and fax services via its Low Earth Orbit satellite constellation. The constellation operates in a 1410 km orbit inclined at 52 degrees.

January 14, 2027
ULA, Starliner-1, Atlas V N22
Launch site: SLC 41, Cape Canaveral SFS
Starliner-1 is the first operational flight of a Starliner spacecraft to the International Space Station as part of NASA's Commercial Crew Program. Due to problems with the Starliner spacecraft's RCS attitude control system during the Crew Flight Test mission in 2024, this mission has been rescoped to not carry a crew by NASA. It will instead deliver necessary cargo to the orbital laboratory and allow in-flight validation of the system upgrades implemented following the Crew Flight Test mission.

January 29, 2027
Rocket Lab, Aspera, Electron
Launch site: Rocket Lab LC 1, Mahia Peninsula
Aspera houses an ultraviolet telescope and will examine hot gas in the intergalactic medium, thought to be contributing to the birth of stars and planets. Aspera will be the first NASA astrophysics mission to gather and map these ultraviolet light signatures, potentially unlocking a deeper understanding of the origins of stars, planets, and life in the universe.

January, 2027
SpaceX, Axiom Space Mission 5, Falcon 9 Block 5
Launch site: SLC 40, Cape Canaveral SFS
This is a Crew Dragon flight for a private company Axiom Space. The mission will carry a professionally trained commander alongside three private astronauts to and from the International Space Station for a month.

January, 2026
Astra Space, Maiden Flight, Astra Rocket 4
Launch site: Wallops Flight Facility
First flight of Astra Space's second generation small satellite launch vehicle.



OUR MEMBERS IN THE FIELD



Jeff Jerzy and his Level 1 "I Love Grapes"



Jon Demick and his Level 1 LOC Goblin



Art Upton with his Estes Ascender



Dale Hodgson and his ShamRocket



Steve Kristal and his Custom Rockets kits



Mark Chrumka and his ghost Scream rocket