TOTAL IMPULSE

JACKSON MODEL ROCKET CLUB
JMRC
HUVARS
HURON VALLEY ROCKET SOCIETY
TOTAL IMPULSE VOLUME 26, NO. 3
MAY - JUNE 2026

CRAFTING NIKE STANDARD FINS

DEPENDABLE IGNITERS FOR CONTEST USE
PERCHERON SOFT/DOT SCALE DATA
MAY SPORT & NRC LAUNCHES
ROMAN SPACE TELESCOPE

CLUB OFFICERS

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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:
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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 TBA (Horning 3)
- September TBA (Horning)
- October TBA (Horning)
- November 8 (Horning)

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.

John Brohm	Tony Haga
Dale Hodgson	Al de la Iglesia
Steve Kristal	Scott Miller
Buzz Nau	Roger Sadowsky
Chris Timm	Andy Tomasch

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EDITOR'S RANGE BOX

Many of us have recently returned from what it probably one of the hottest NARAMs in recent memory, Even hotter than Springfield, MO. Despite the heat and short schedule, the event went smoothly with only a couple small issues (which NARAM hasn't had an issue or two?).

The writeup for NARAM will appear in the July/August issue of the newsletter as there just isn't time to pull it togther for this issue. I do want to take a moment though to thank everyone for the awesome support throughout the year that resulted in *Total Impulse* winning the LAC Rockwell Trophy for best newsletter once again. I couldn't put this together without all the wonderful submissions, proofreaders, and moral support.

It was a great year and I have article submissions already queud up for this year. That said, we're always looking for more material; articles, photos, and ideas are all welcome! If you have an idea or question on how to submit, shoot me an email and lets talk!

On the Cover:
A Terrier-Improved Malemute sounding rocket containing student experiments including those from Saginaw Valley State Univeristy, led by club member John Potts. The launch took place on 24 June at Wallops Flight Facility.

LAUNCH REPORT MAY 16 SPORT AND NRC LAUNCH

Buzz Nau

There are times when you must will something to happen and that was pretty much the case for our monthly sport and NRC launch on 16 May. Weather forecasts couldn't decide with any certainty what would happen even the day before the launch. We pressed on with our normal schedule and managed to dodge most of the rain. We did get a shower around 10 am that suspended flying for a short period of time, but it eventually cleared out completely with nice skies and light winds. Furthermore, we have cancelled launches in the past based on a forecast, only to see the actual weather would have been fine for a launch, so we persevere and do the best we can.

Thirteen fliers attended the launch who made 48 sport and 11 competition flights. Not bad for what was forecast to be a poor flying day at best.

Randy Gilbert's 3d printed Moon Go on a B6-4

Steve Lindeman's Spartacus on a D12-5

Sport Flights

Top number of flights this month went to Steve Lindeman with 9. Most of Steve's rockets are scratch builds with interesting themes like his Spartacus, Crayonic Probe, and Autism Awareness. All of Steve's flights went well, though KOA had a couple of problems coming off the rod.

Jon Demick made his first visit to one of our launches with 8 flights for the day. His models, mostly scratch built, included the Goblin Imposter on a C11-5, Ugly But Trackable on a C6-5, and four flights with his Skittles 55. He pushed the Skittles 55 hard with flights using a B14-5, C18-6, D22-7, and E26-7 that CATO'd. All were successful recoveries and the CATO didn't cause any damage.

Randy Gilbert recently got a 3D printer, and he's been busy with it. Three of his seven flights were 3D printed, the Moon Go, Raider, and Quasar clone. Randy also had a large Moon

Jon Demick's Skittles on a D22-7

Go upscale though it didn't fly this time around. He did fly an Estes Nell on an A10-3 for a nice flight.

Buzz Nau made 6 flights including his scratch built Little John on an F15-4, Big Bertha on a C12-4, and Estes Flying Saucer on a B4-4. He flew an upscale Screamer twice on D12-5s. The second flight managed to hook a tree just past the flying field. He also flew his Estes Skywinder on a C5-3. One of the rotor hinges snapped on deployment and was lost.

Another prolific 3D printed flier is Mark Chrumka who launched a 3D printed Estes Ram-jet clone on an E12-4. It failed to deploy the chute was a total loss. Mark got in great flights with his Centuri Evel Knievel Sky Cycle and Estes Crusader Swing-wing. His plastic model conversion (PMC) SR-71 on two C5-3s was entertaining but harmful to all except itself.

We hadn't seen Art Upton in over a year, so it was great to see him make it out and doing well. We'll let Art describe his own flights as only he can,

It was a great day with Good Friends I had not seen since November 2024. It was great to see all again. Black Brant II up on a 29mm Black Powder E16-6. Tony helped set up the pad electronics with me for the first flight of the day, thank you, and thanks Buzz for the recovery help when I found it.

After a short rain delay, I sent up my Hi-Tech H45 on a test of the new 'Sans-Switch Band' AV-bay I built. It uses a pull pin, "Remove before flight" roller switch. With a PerfectFlite Strato Logger CF, it did apogee deploy to about 850 feet on a Very Smoky Sam G88. It stopped at the arc and deployed just like Perfect Flite Strato loggers do...and then deployed main close to call at 400 feet on a Jolly Rancher Chute Release. *Credit Roger for the new nickname*

Next, I flew a 'Star-Sport'...which is a Star-Orbiter that pranged at this field in 2024 and bent the tubes. I cut out the tube bends and joined them together with a friction fit coupler, no glue... just in case of future emergencies. I flew it on an Estes E9-6 (I found a 'Stash of them), and we expected an "Earth Shattering KaBoom" that only Roger could say in the Prefect Voice... It deployed at the arc, a 9" chute, and floated away about 500 feet or more northeast over the hill. As I walked to and fro, a redwing black bird kept landing to my sides and making noise. First to my right and over to my left when I walked that way and then back to my right... I said a prayer and kept moving about and then followed to where

Steve Kristal's Boyce Nike Hercules ptototype *the bird was before he took off. Before I got to that spot I saw the rocket.*

I launched a Cherokee-E on a C6-5 off a micro rail next to the LPR rack and someone asked, "that is a C motor?" as it climbed high.

I then flew my Short Partizon (only two of the three tubes) on an F67W-6. It also had a great flight, moved well, arced over, stopped and then deployed. Jolly Logic Chute Release at 400 feet. I need to re-calibrate my eyeballs. I kept thinking it should have deployed sooner and kept saying 'now' but it didn't. Roger had it correct and called it when it deployed to my answered prayers. I need to get more flight time in again to get back in the saddle to call 'em.

Cooper Wintz made it out for the second month in a row with two flights. His Estes Crossfire nicknamed "Fred" flew on a C6-5 and the first flight of "Ted" flew on an A8-3.

In addition to his competition flights, Steve Kristal put in two excellent sport flights. His Revell PMC Gemini Capsule went up on a D12-3 and flew straight and true. Next up was a prototype Boyce Aerospace Nike Hercules gap-staged 3d printed kit. The booster had 3 B6-2s plus 1 B6-0 and the sustainer flew on a B6-2. The gap-staging worked perfectly and both staged were recovered successfully. This will make for a nice highly detailed Nike Hercules that is easy to fly.

Art Upton's Short Partizon on an F67-6

Richard Buckley's successful Level 1 Cert flight

We had one cert attempt, with Richard Buckley successfully achieving his level 1 flying his Zephyr on an H238. Great flight and his Jolly Logic Chute Release made for a short recovery. Congratulations Richard! He also flew his Super Big Bertha on an F15 with a successful JLCR recovery.

Jeff Jerzy wanted to make a cert flight, but a proper motor case wasn't available, so he opted to fly "I Love Grapes" on a Loki G70. It was the rocket's first flight and flew well using a JLCR for recovery.

When he wasn't busy taking care of the range, helping others recover models, and troubleshooting a finicky controller, Tony Haga snuck in one flight with his Big Bertha on a B6-4. Nice flight as Big Bertha's always are.

Competition Flights

Steve Kristal and Al de la Iglesia (Escape Velocity team) put in 10 comp flights between them.

Al tested an airframe with new mods for FAI 1/2A Streamer Duration and it paid off well on the first flight of 57 seconds.

The next two flights weren't bad as well with 35 and 40 seconds for a 132 second total. He made 2 parachute duration flights, but only one did well at two minutes. Al's last flight was a test of a new helo design using two rotors. If he can dial it in it could be competitive.

Steve's flights were all 1/2A Parachute Duration. He nailed it on his second flight as we lost sight of it after 205 seconds. It was returned to my house the following day after spending the night in the lake.

Future launches this summer will be at the Horning 3 field until crops are harvested allowing us back on Horning 1. Horning 2 is converting over to all alfalfa this year and will be our primary launch site starting next year.

Tony Haga's Big Bertha

Steve Kristal's Revell Gemini capsule PMC

Jeff Jerzy's I Love Grapes on a G70

VIEW FROM THE FLIGHT LINE

Revisiting the Basics

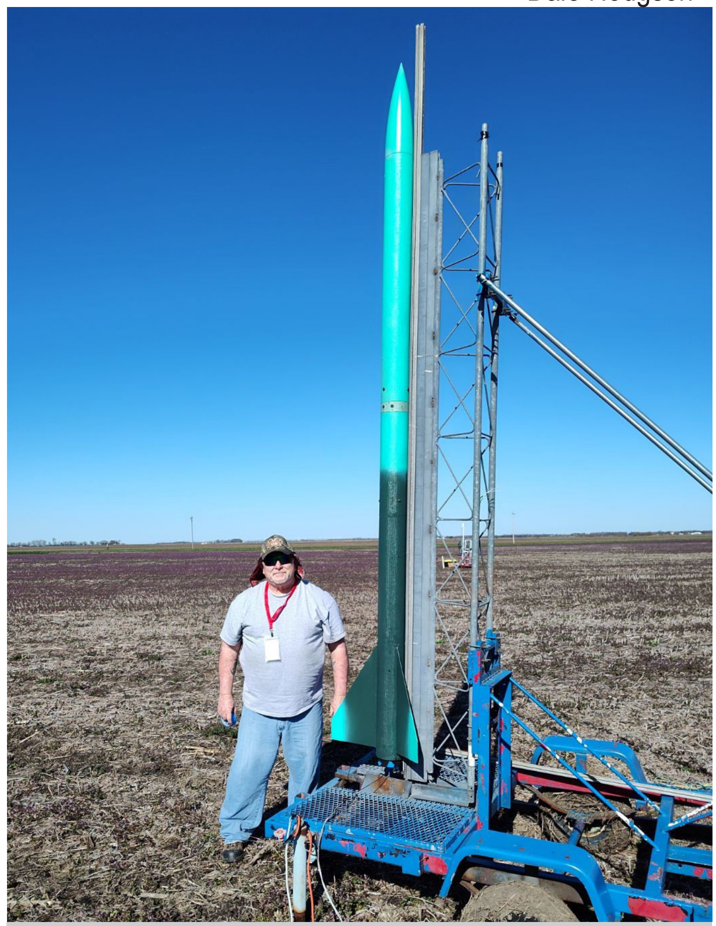
Dale Hodgson

This article will take a different track than what most folks are used to, such as designing, testing, experimenting, evaluations, and lessons learned. This is much more simplified than that. It has to do with the one thing, the singular purpose that we all got into this hobby to begin with…. flying rockets.

I remember the feeling I first got back into the hobby way back when was the same as when I was a grade schooler learning to build rockets. Incidentally, I flew my very first rocket at 8 years old; I'm 68 now so the math is easy. And yes, it was an Estes Alpha. My favorite motor at the time was a B4-4. Small enough to fly the field (either a nearby farm or schoolyard) and big enough to really send the thing high. Even today, like those many decades earlier I get that same excitement when I launch a rocket "what a cool flight!"

Sure, most of us started when we were younger, but this even holds true with those that didn't become involved until a bit later in life. It's all the same. There are a lot of factors to be considered when planning for the flying day. There is the weather, field considerations, and even how we are feeling on a given day.

None of that has changed. What HAS changed though is time. I'm much older now and although the excitement level remains the same, that energy level just isn't the same as it once was. Back when I was even a little younger and started flying with JMRC in 2000, I wanted to fly the snot out of everything I owned (which wasn't too much at the time). For a long time, I was always near the very top of the Newton-seconds burned for the day list that was put out right after a launch. Now, and especially this year, I have to keep reminding myself to have a plan and not just grab a bunch of birds and go.



Dale and his Unleashed at Thunderstruck 2024

Dale and his upscale Alpha

This was never more apparent than when I went to LDRS and then Crapshoot this year. I didn't fly much at those two launches, although I took plenty with me. What happened was that I suffered a severe case of "go fever". Everything I brought was designed to do one thing, go high and get within a stone's throw from the waiver limit. Of course, I didn't take weather into consideration, or more truthfully, I simply ignored it and hoped for the best. Both launches were a bit hampered with wind and rain, the two very things that spell disaster for us at a launch. As I'm older now, planning is essential.

Details must be considered like the weather, are we flying a big or smaller field, do I have to assemble motors, configure altimeters and all those other things that will either make… or break… a launch day. How I'm feeling especially comes into play. I may be ready mentally, but simply tired from the previous week's activities that tend to make me want to watch rather than participate.

So, after giving this a lot of thought I've come up with a more concrete game plan. First of all, watch the weather and watch it closely. No point bringing something going really high when the winds are strong enough to ruin a flight. Coupled with that, what motors will I need to build? Next of course are the motors…do I build some or simply bring smaller ready to use motors to be able to even fly when the breeze is up.

Composite motors are far more expensive than they used to be so careful planning must be done to ensure a smooth, successful flight with a decent recovery. For me personally nothing ruins a day more than losing a rocket, motor case, and electronics. And that feeling of supreme failure doesn't help much either. I've taken that walk of shame to where I thought I last saw my rocket many times.

Just a word of advice here, build your motors at home before coming. It will make things all that much smoother at the field. The same goes with recovery. Have your altimeters done, set, and ready to go. Put the charges on at the field. It's the safe thing to do. I've heard of folks putting on charges at home which is not a safe practice as far as I'm concerned, but that's me.

If flying smaller rockets most of this stuff is easily done. Motors are selected and require little prep, recovery setup is pretty easy…. 'chute or streamer. Mostly just a matter of getting a rocket ready and walking it out to the pad. Recovery is a bit simpler as well. Not as far of a walk but sometimes things do not go as planned so be prepared for that too. Since I have a good cross-section of rockets to fly, I have to consider type; single or multi-stage, rocket or glider. I still think it might be a better idea to have a couple on hand just in case the weather fails to cooperate, or you will at least be able to adapt should the weather happen to change. I'm thinking the proper plan is to simply get a small mix together of smaller rockets along with the larger birds with altimeters and dual deployment. Having a few of each pretty much guarantees you'll get at least something in the air. And by planning a bit ahead of time you may find out you'll get a few more flights in for the day.

Last cautionary tale here, plan and prep yourself as well. Insect repellant, sunscreen, comfortable shoes and dressing in such a manner as to remain at the right temperature throughout the day is an important thing to remember. Sometimes it is cool in the morning but pretty warm later in the day so it's always a good thing to be able to adapt to what is thrown at you. Lastly, keep hydrated! I notice the younger crowd either doesn't need water or forgets about it entirely. Either way can lead to issues. I've been sun scorched a few times over the years, and it's no picnic. Plus, that only leads to quicker fatigue which really interferes with a good state of mind. Nothing worse than ruining a good day of flying simply because you weren't hydrated enough to be willing to go retrieve your rocket once it has landed.

There you have it, just a few random (and not so random) thoughts of things to consider before launch day. It pays dividends to have a thought-out plan rather than grabbing a handful of whatever, throwing it into the car then driving to the field. Who knows, doing this may help you have a better rocket day and get you all pumped up for the next launch.

Go Blue 2

Dale's 4" Super Big Bertha

LAUNCH REPORT MAY 30 SPORT AND NRC LAUNCH

Buzz Nau

Due to the crop rotation, we had to make the switch to the Horning 3 field early this year. While the weather was good for the most part with nice skies and comfortable temps, the wind however was blowing towards the Consumer's Energy plant. This made for some careful aiming and motor selection. Regardless, 12 fliers made 61 flights for a successful day.

Sport Flights

Andy Tomasch put in the most flights for the day with a total of 10. A couple of his models were clones of the classic Astron Mark and Streak which featured a rear ejection streamer. He also flew an Estes Show Stopper on a C11-5, scratch built Black Max Q on a C11-3.

Our newest member, Jon Demick had 8 flights, most with scratch-built designs. His Skittles made two flights on C6-5s and a third with a D12-5. Jon also flew his AIM-120 AMRAAM

Andy Tomasch's Show Stopper on a C11-5

Jon Demick's RSO Seeking Missile misses on a D12-5

then with a D12-5. Both were great flights and one of the straightest flying AMRAAMs I've seen.

With 7 flights, John Potts flew mainly 3d printed models like Scott's Club Model and Mars Lander. The Mars Lander flew great on the first flight with a D12-5, but the second flight went a little squirrelly. John also had a couple of great flights with his Centuri Super Kit, S.S.V. Scorpion on a D12-5 and upscale Estes Trident on an E9-4.

Richard Buckley put up 6 flights, three of which were scale models. His Estes Patriot, Nike Smoke, and GBU-24 Paveway all flew on B6-4s. He also flew a Der Red Max on a B6-4 and Estes Crossfire ISX and Quest Big Betty on A8-3s All were good flights. Randy Gilbert also put in 6 flights. His 3d printed Quasar flew on an A8-3 and A-20 Demon clone on a C11-5. His Ogre went up on an E16-4 for a great flight. He put in two flights on his Estes Optima Pro using an F15-6 and F67-6. Unfortunately, the second flight took the model to south end of the Consumers property and as of this writing is still MIA.

Jeff Jerzy made 5 flight attempts. His LOC “I Love Grapes unfortunately CATO’d on a G70, but he got in a couple of great flights with his Estes Mercury Redstone Liberty Bell 7 on a C6-5 and C5-3. He also sent up an Estes Astrocam and Alpha III on B4-4s. Dan Weimer also put in 5 flights making good use of a Jolly Logic Chute Release to accommodate the field and wind. His scratch-built Procyon flew twice on a C11-5 and D12-5. His scratch built Nuclear Explorer flew on a C5-3 and EAC Viper upscale went up on a C6-3. Also with 5 flights, Buzz Nau mainly tested some competition models, but got in a couple sport flights with his Der Red Max on a B6-4 and Barclone Mini-Loader on an A3-4T.

With 3 very memorable flights, Dan Ball flew all scratch-built designs, two of which were 3d printed. His Dra-gow flew well on an E9-4 especially with the nose mounted fins. His 3d printed X-15 unfortunately CATO’d on a D20-4. His main event was the 100th flight of his scratch-built Skywolf on a CTI F240. As expected, it screamed off the pad and was then caught in the winds aloft.

Steve Kristal made one sport flight with his Boyce Aerospace

Randy Gilbert’s Orgre (Great Goblin) on an E16-4

Richard Buckley’s Patriot on a B6-4

Nike Hercules prototype using four B6s in the booster to a single A8-3 in the sustainer. It boosted and staged perfectly, but I believe the booster suffered some damage on landing. Steve also made a couple of FAI S1 altitude test flights.

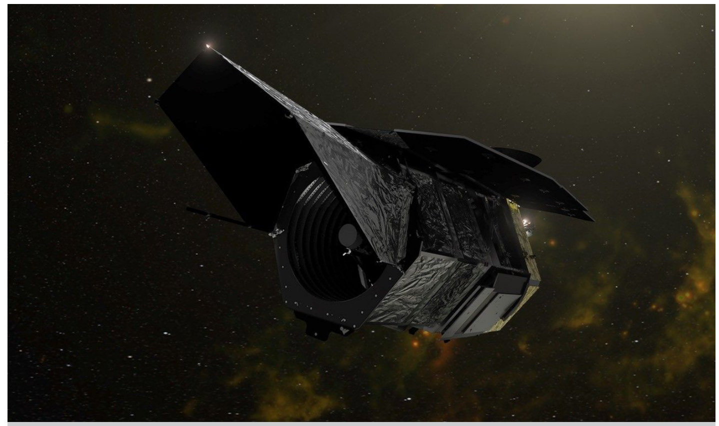
Tony Haga made one flight sending up his Big Bertha on a C6-5. It was a great day for Big Bertha models.

Competition Flights
In addition to Steve and Buzz’s test flights, Al de la Iglesia made a single 1/2A FAI Helicopter Duration flight. It hooked good air that shouldn’t have been there for an 87 second flight. Unfortunately, it landed in the south end of the Consumer’s plant.

Roman's Ready to Roll:

NASA's Wide-Field Wonder Heads to L2 on a Falcon Heavy

Tony Haga


Roman illustration at LagrangePoint 2 - NASA

If you love big telescopes and even bigger rockets, mark your calendars. NASA's Nancy Grace Roman Space Telescope (Roman for short) is fully integrated, tested, and prepped for launch — targeting August 30, 2026 (with early September as a strong backup) aboard a SpaceX Falcon Heavy from historic LC-39A at Kennedy Space Center. This flagship mission is coming in eight months ahead of schedule and under budget — a win for everyone who geeks out over deep-space astronomy and heavy-lift rocketry.

Named after Nancy Grace Roman, NASA's first chief astronomer and the "mother of Hubble," this observatory is designed to tackle cosmic heavy hitters: mapping dark energy, hunting exoplanets via gravitational microlensing, and delivering stunning wide-field infrared views of the universe. With a 2.4-meter mirror (same as Hubble) but a field of view ~100 times wider, its 300-megapixel Wide Field Instrument will survey vast swaths of sky in a single shot. The Coronagraph Instrument adds next-gen tech for directly imaging exoplanets by blocking starlight. Weighing in at around 10,500 kg (with ~4,200 kg for the spacecraft itself in some references), it's no lightweight payload.

Not every telescope needs a heavy lifter like the Falcon Heavy, but Roman does. Its destination is the Sun-Earth Lagrange Point 2 (L2), a gravitationally stable spot about 1.5 million kilometers (roughly 930,000 miles) from Earth — the same neighborhood as the James Webb Space Telescope. Getting there requires serious energy: a fast, direct trajectory with enough delta-v to insert into a halo orbit around L2 without relying on excessive spacecraft propulsion.

Roman ST at Goddard Space Flight Center - NASA photo

Falcon Heavy delivers exactly that muscle. Built from three Falcon 9 cores strapped together, it features 27 Merlin engines producing over 5 million pounds of thrust at liftoff. In fully expendable mode, it can haul up to ~63,800 kg to LEO, but for demanding deep-space missions like this, its per-formance to L2 is ideal. The contract with NASA came in at about $255 million, reflecting the complexity of a flagship science payload on a precise interplanetary path.

A lighter rocket simply wouldn't cut it for the mass and the required C3 (characteristic energy) needed for efficient L2 insertion. Falcon Heavy gives Roman the push for a relatively quick journey to its operational halo orbit, where it can keep its instruments pointed at deep space with minimal disturbances from Earth or the Moon.

Roman was built and assembled primarily at NASA's Goddard Space Flight Center. It recently completed final integration and testing, then shipped to Kennedy for the home stretch. At the Payload Hazardous Servicing Facility (PHSF), teams handled critical steps: thermal protection closeouts, solar array work, cleaning for contamination control, and loading hydrazine propellant for the spacecraft's attitude control and orbit maintenance systems.

Encapsulation into the Falcon Heavy's 5.2-meter fairing happens in the clean room environment. The telescope's sensitive optics and instruments demand meticulous handling — vibration isolation, precise balancing, and thermal management during the ride to orbit. Falcon Heavy's payload adapter and separation system are engineered for reliable deployment of large, delicate payloads like this.

Launch from LC-39A will send the stack southeast over the Atlantic. After booster separation (with side boosters likely returning for landings on drone ships or the Cape, depending on the exact profile), the center core's second stage will handle the bulk of the work. For an L2 mission, expect a high-energy injection burn, possibly with a trajectory that includes Earth escape and a transfer orbit optimized for L2 arrival.

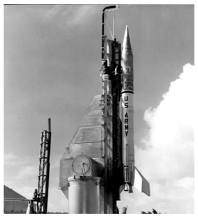
Roman will then coast toward L2, performing trajectory correction maneuvers using its onboard propulsion. Once there, it settles into a halo orbit around the point — providing a stable vantage with constant solar power and an unobstructed view of the sky. Communication will flow through NASA's Deep Space Network.

This profile mirrors JWST's successful journey but benefits from Falcon Heavy's proven capabilities and Roman's somewhat different mass and design.

Roman will complement Hubble and Webb by cranking out massive survey data — think billions of galaxies, free-floating planets, and insights into whether dark energy is constant or evolving. Pairing it with Falcon Heavy shows how commercial super heavy-lift rockets are unlocking these ambitious science missions affordably and reliably.

Keep your eyes peeled for launch updates — Florida summer weather can be tricky, but momentum is strong. Whether you're tracking boosters splashing down or dreaming about the science returns, this is rocketry at its finest: big iron delivering big answers from the edge of our solar system.

The Roman Space Telescope will launch aboard a Falcon Heavy tentively on 30 August 2026 - SpaceX photo



Aerolab Development Corporation

Percheron A SOFT/DOT

Chris Timm & Buzz Nau

The Percheron SOFT/DOT was a solid-propellant sounding rocket adapted for use as a suborbital sensor platform for the U.S. Army's Ballistic Missile Defense (BMD) programs from 1975 to 1982. It boosted a large Long-Wave Infrared (LWIR) sensor payload into the exoatmosphere (>300 nautical miles altitude) for realistic testing against ballistic missile targets, including debris clouds and penetration aids.

Directed by the U.S. Army Ballistic Missile Defense Advanced Technology Center (BMDATC) Optics Directorate, the program developed and demonstrated LWIR optical sensor technology for ballistic missile defense. It evaluated sensor performance in realistic exoatmospheric environments against Minuteman or Titan II targets, including tracking, discrimination of reentry vehicles from debris/fragmented tanks, stellar viewing, zodiacal light scans, and earth-limb observations. Sounding rockets offered a low-cost, recoverable platform for this testing.

Percheron SOFT/DOT was built on the earlier Percheron/Argo A-1 (1950s–1960s NASA sounding rocket using a modified Sergeant plus 2 Recruits side boosters) and directly evolved from the mid-1970s SOFT (Signature of Fragmented Tanks) program, which used similar motor combinations for initial debris-cloud signature tests.

Boeing Aerospace Company served as prime integrating contractor for both SOFT and DOT. The SOFT program established the need for coordinat-

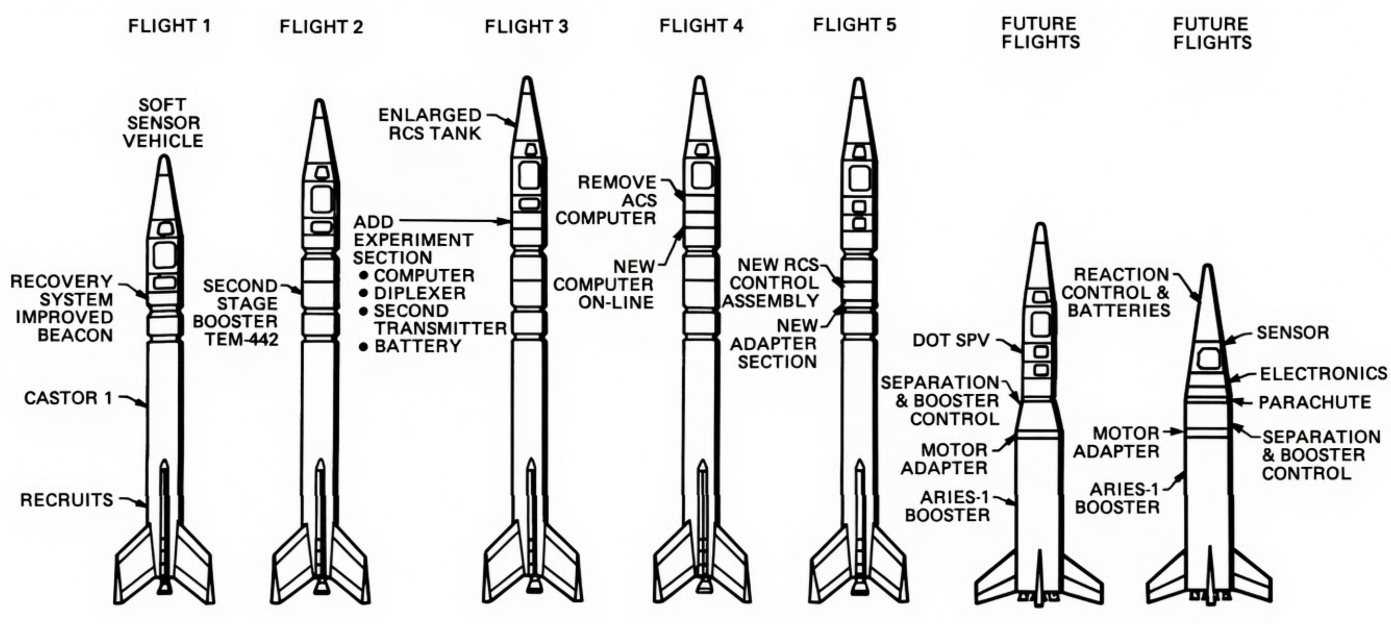
Percheron SOFT/DOT on a launcher - US Army photo ed launches (sounding rockets from Roi-Namur, Kwajalein Atoll; targets from Vandenberg AFB). DOT expanded this with a structured five-flight test matrix. Remaining Government Furnished Equipment (GFE) hardware from SOFT (Castor motors, Recruits, sensor vehicles) were heavily reused for cost efficiency.

The single-stage vehicle length was 439 inches while the two-stage variant was approximately 458 inches, with a liftoff weight of about 12,260 lbs. The sensor payload weighed between 1,035 to 1,240+ lbs. (up to ~1,300 lbs. with growth), including attitude control, computer, telemetry, and recovery systems. Configurations featured Castor motors (~31-inch diameter) with Recruit strap-ons (9-inch diameter) and optional TE-M-442-2 second stages (26-inch diameter).

Configurations
Flight 1: Single-stage (Castor I + 2 Recruits), duplicating SOFT.
Flights 2–4: Two-stage (Castor I + 2 Recruits + TE-M-442-2).
Flight 5: Single-stage for heavier payload.

The vehicles reached apogees of 771,847 to 1,062,830 ft and experiment times (payload separation to reentry at 50 nm) of 361 to 431 seconds across DOT flights, consistently exceeding predictions due to higher-than-expected propellant tem-

Percheron SOFT/DOT on a launcher - US Army photo



DOT Flight Configuration

peratures. Impact ranges were extremely close to predictions (maximum 9 nm deviation). 100% of booster objectives were met.

SOFT/DOT emphasized heavy recoverable LWIR payloads, precise ICBM coordination, advanced attitude control, onboard computing, contamination control for cryogenics, and upgraded recovery systems, far beyond the primarily scientific focus of 1960s Percheron/Argo rockets. Early SOFT required dual-rocket redundancy; this was eliminated as reliability was proven.

Typical Percheron SOFT/DOT test flight

A target Minuteman or Titan II ICBM was launched from Vandenberg Air Force Base on a ballistic trajectory towards the Kwajalein Atoll impact area. The single or two-stage Percheron is launched from Roi-Namur in the Kwajalein Atoll under precise timing to intercept the target complex in the exoatmosphere.

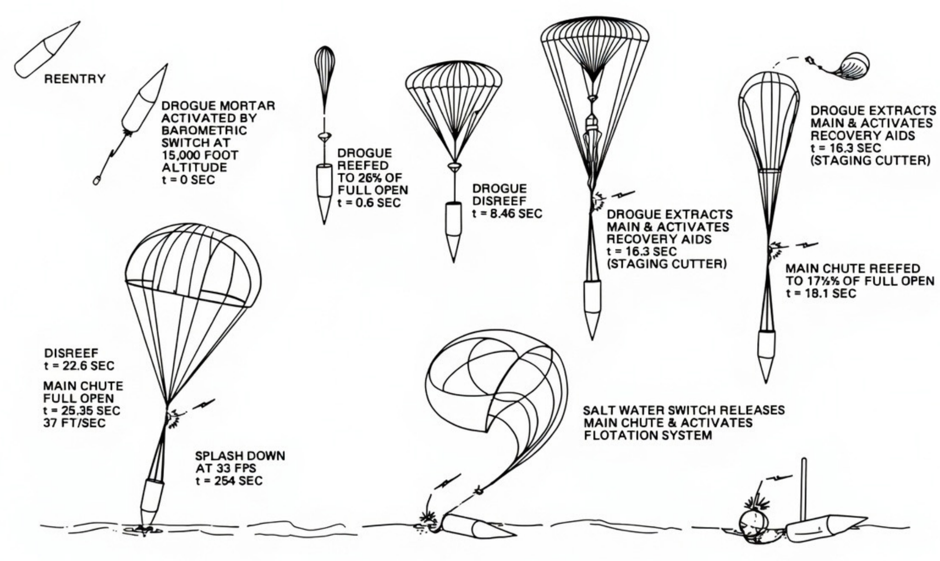
After boost and coast, the payload separated ~1-2 minutes after launch and a yo-yo despin system, would reduce the spin-rate. The Attitude Control System (ACS) would then be activated. It used gyros, thrusters, and an onboard computer to stabilize the vehicle, cage the roll-stabilized platform, and acquire the target using radar-updated pointing commands from the ground (Ennylabegan station).

The LWIR sensor would then spend several minutes tracking the target complex (reentry vehicles, debris, or penetration aids). It would also conduct additional scans (stellar viewing, zodiacal light, earth limb). Real-time telemetry from the LWIR and vehicle data was streamed to the ground station. Ground controllers would send commands (based on radar tracking) to update pointing and timing. The Macro-Micro Computer System (MMCS) handled sequencing, attitude control, sensor gimbal commands, and data processing autonomously.

After the viewing window, the sensor would stow and the vehicle was spun back up to reduce heating loads during reentry. The recovery sequence began at 15,000 feet triggered by a barometric switch deploying the drogue chute. The main chute followed resulting in a ~30 ft/s water landing. Sensors were recovered and refurbished for reuse.

As payload requirements grew, the program transitioned to the larger Aries sounding rocket (Minuteman I Stage 2-based) while retaining the proven sensor vehicle and recovery approach.

SOFT/DOT exemplified the utility of sounding rockets for advanced defense technology development; reliable, flexible, and economical. They advanced LWIR sensor technology, attitude control, onboard computing, and recoverable payload techniques that influenced later suborbital and hy-



DOT Recovery Sequence

personic test programs. The reuse of military surplus hardware remains a model for cost-effective high-altitude testing.

The Percheron SOFT/DOT program stands as a prime example of resourceful defense engineering. By adapting proven solid rocket motors and 1960s sounding rocket heritage to 1970s–1980s BMD needs, these vehicles delivered critical LWIR sensor data in realistic exoatmospheric conditions at minimal cost. Through innovative integration by Boeing Aerospace, detailed subsystem development (ACS, MMCS, advanced recovery), and consistent mission success, the program laid foundational data for ballistic missile defense sensors. Its legacy underscores the enduring value of sounding rockets: bridging laboratory concepts to operational realities without the expense of orbital systems, a principle that continues to guide modern suborbital experimentation.

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Cooper, E. R., and D. F. Seaton. *Sounding Rockets Utilized to Support Department of Defense Programs*, AIAA 82-1706, American Institute of Aeronautics and Astronautics, 1982

Corliss, William R. *NASA Sounding Rockets, 1958-1968: A Historical Summary*, NASA SP-4401, National Aeronautics and Space Administration, 1971

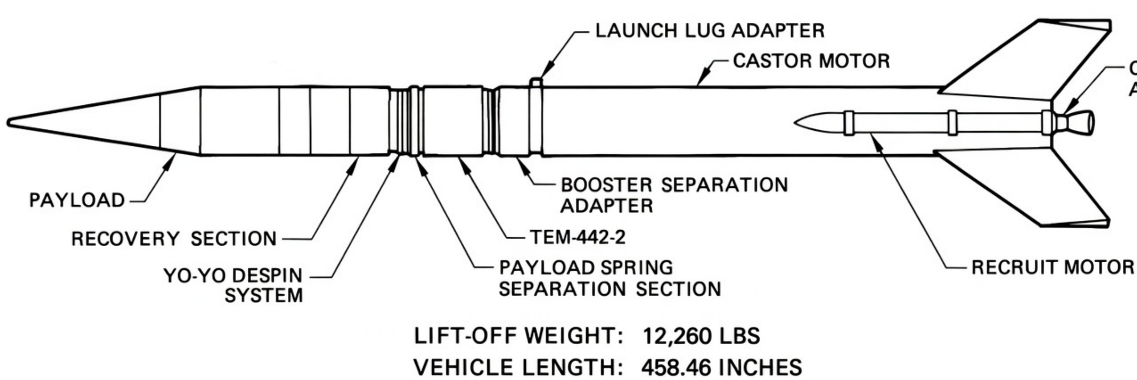
Special thanks to Mark Johnson who provided the majority of data used to create this article.

SOFT/DOT

The SOFT is a single stage (Castor I) launch vehicle developed under contract to Boeing that carries a 1000 lb. payload to 800,000 feet. First flight in January 1975 was successful. DOT is a two-stage (Castor I - TEM-442) version for attaining 1,400,000 ft. altitude. Both are for optical payload testing.

SOFT/DOT vehicles represent present technology standard launch systems for universal experiment and test programs.

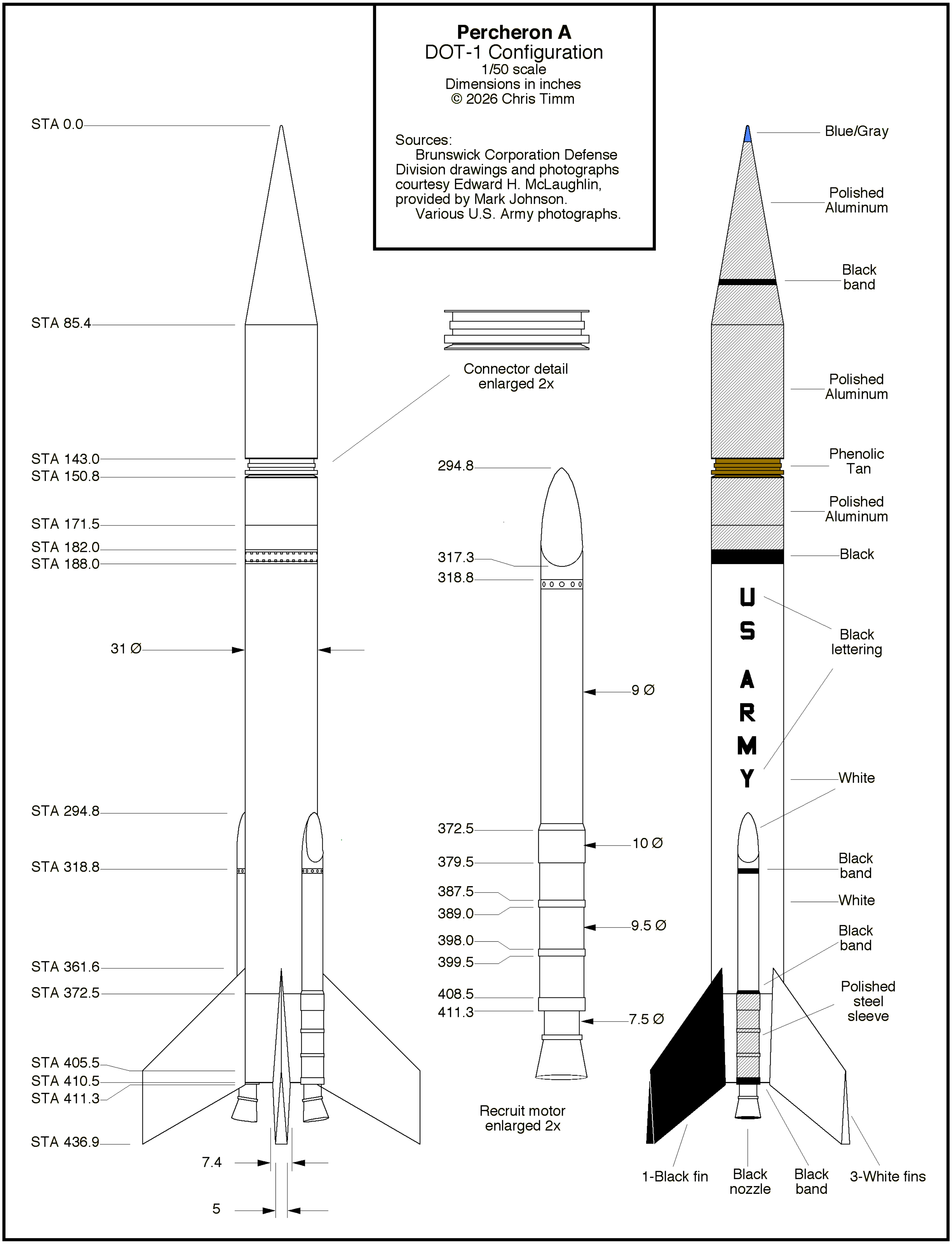
Excerpt from Brunswick pamphlet



DOT Two-Stage Configuration

Twin Percheron SOFT/DOT vehicles at Kwajalein Atoll - US Army photo

Percheron SOFT/DOT vehicle at Kwajalein Atoll - US Army photo


Percheron A
DOT-1 Configuration
1/50 scale
Dimensions in inches
© 2026 Chris Timm
Sources:
Brunswick Corporation Defense Division drawings and photographs courtesy Edward H. McLaughlin, provided by Mark Johnson.
Various U.S. Army photographs.
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Phenolic Tan
Polished Aluminum
Black
US ARMY
Black lettering
White
Black band
White
Black band
Polished steel sleeve
1-Black fin
Black nozzle
Black band
3-White fins

COMPETITION CORNER

Dependable Igniters for Contest Use

Al de la Iglesia

You're holding your launch controller, waiting for just the right moment to push the button. The wind dies down, and you feel what may be a thermal rolling in. 5, 4, 3, 2, 1 launch! But nothing happens. Your model sits there as the igniter burns through without lighting the motor. The dreaded misfire and you missed the thermal. Any competitor can relate to this scenario and endeavors to prevent it from happening again. The problem with most commercially available igniters is reliability as they are made to be low cost and high volume. In competition flights, igniter reliability is more important, so I set out to make my own, highly dependable igniters.

Design

My goal was to make an igniter that would light black powder motors with 100% reliability. I wanted them to be strong enough to handle without breaking and be able to hold up to the weight of any competition model. They also had to be simple to use and easy to store while being low cost. I drew inspiration from the old Estes igniters and Centuri Sure Shot igniters, but I didn't want to deal with a pyrogen coating. I decided to go with the age-old bare nichrome wire, but I needed a way to make it easier to handle and insert into a motor. Furthermore, I took the idea of using SIP (single inline pin) connectors from an article by Jay Marsh where he soldered Estes solar igniters into SIP connectors for use in FAI competition. I liked his general idea but disliked the use of Estes igniters as they seem to be quite fragile. I decided to use SIP connectors and bare nichrome wire. Now all I had to do was figure out what size nichrome wire and how to solder them together.

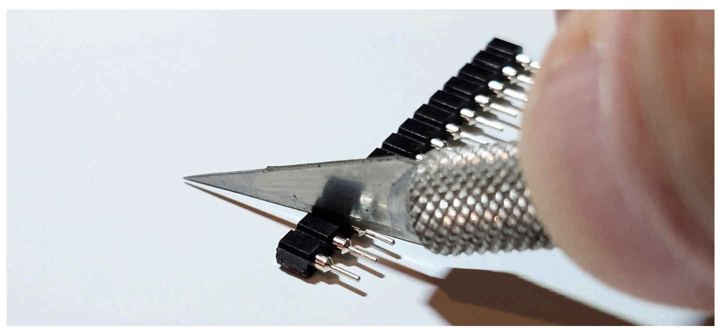
Construction & Testing

I first had to figure out what size nichrome wire to use, so I purchased a pack of various gauge spools of nichrome 80 wire. I cut sample lengths of 20, 22, 24, 26, 28 and 30 gauge and proceeded to test each by connecting them to the micro clips of my Aerotech launch controller and then pushing the launch button to see what happened.

A strip of SIP connectors and 24-gauge nichrome wire

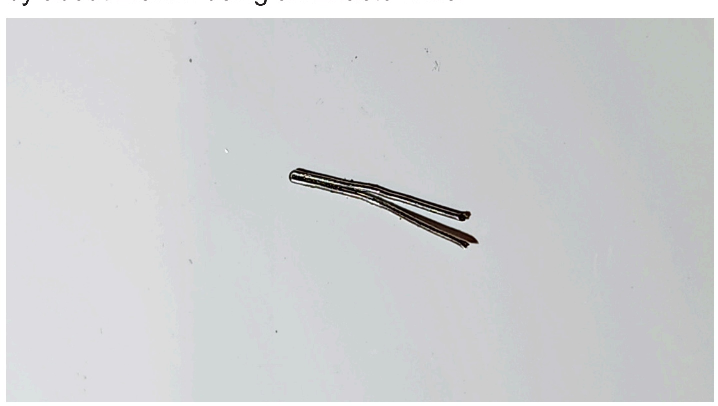
The larger diameter wires did heat up a little bit, but never enough to get red-hot. The small diameter wires got red-hot quickly but would quickly melt and fall apart. The 26-gauge wire got hot very quickly but tended to easily melt apart if I held the launch button too long. I finally tried the 24-gauge wire and discovered that it was a little slower to glow red-hot, but it would stay intact and not fall apart even if I held the launch button for a couple seconds. All this testing was done with a lead acid battery at a voltage of about 12.8 volts. If your launch controller has a significantly higher or lower voltage, then you will need to use a different gauge nichrome wire.

I then purchased a pack of 400 SIP connectors from Amazon and began learning how to solder them without melting them since they are so small. I first cut the strip of connectors into 2 pin connectors using a sharp Exacto knife by placing the connector strip on a flat surface and applying constant pressure with the blade until the pin pair pops off cleanly. Furthermore, I also found that using a Zona saw and a small right angle miter block works well but is a bit slower.



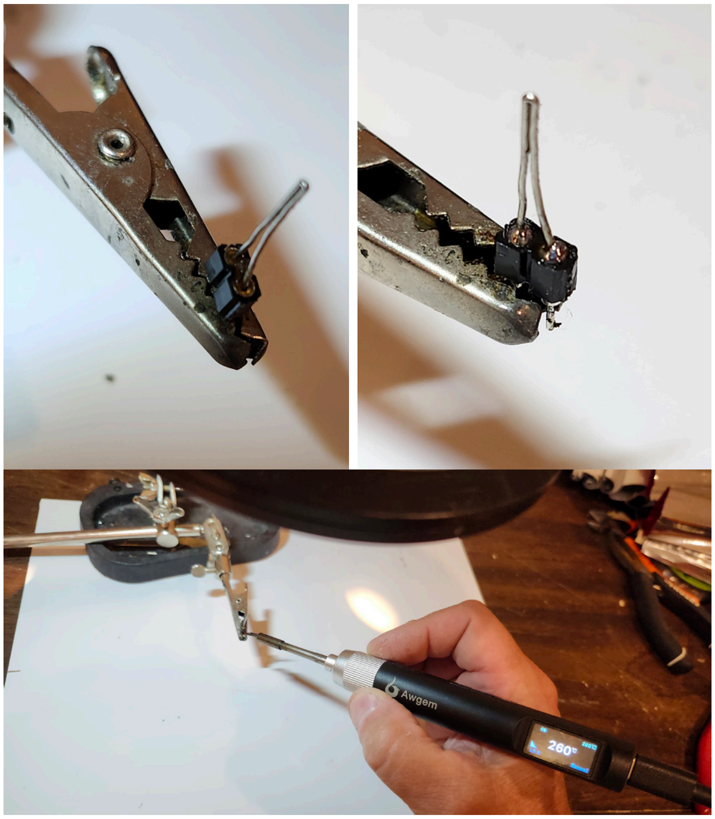
Cutting a pair of SIP connectors with a hobby knife

I snip the 24-gauge nichrome wire into 1.5-inch lengths using a sharp wire cutter and then bend them in half with an electrician's plier. Then the folded tip of the wire is crimped with a strong flat plier so that it will hold its shape better and heat up at the sharp bent tip. Next, I spread the wire leads apart by about 2.5mm using an Exacto knife.



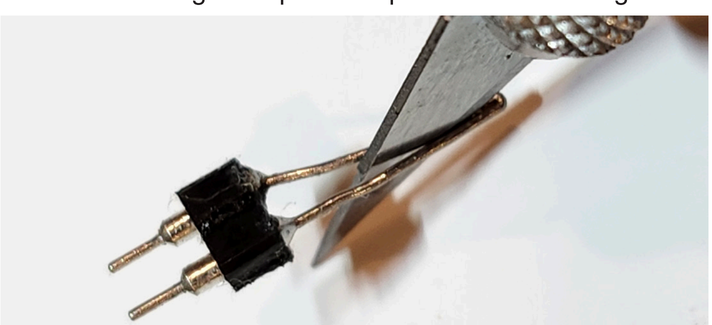
Nichrome wire cut and bent to shape before soldering

To make it easier to solder the tiny SIP connector, I secure the connector pins into the alligator clip of my helping hands magnifying tool. Then I dipped the ends of the wire into flux and inserted them into the SIP. I use a small handheld USB soldering iron set to 260 C with a fine angled tip. The solder used is fine (1/32” diameter) electrical solder. With a little practice you can solder the nichrome to the connector in a second or two without melting the plastic connector base. The magnifier really helps so that you can apply heat to the joint quickly and accurately.



Soldering the nichrome wire into the SIP connectors

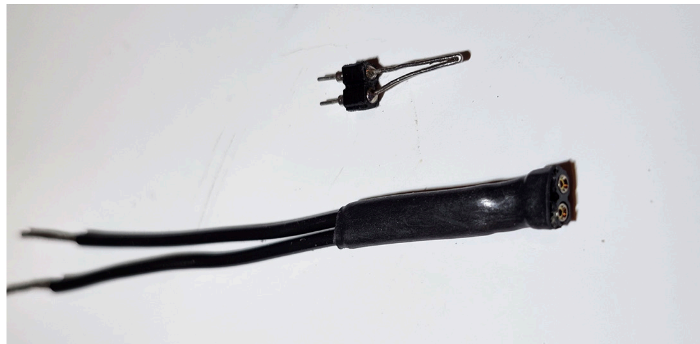
After allowing the igniter to cool for a few seconds, I toss it into a small bottle of 90% isopropyl alcohol to remove any excess flux. Lastly, I spread the leads with an Exacto knife to ensure that the igniter tip heats up instead of shorting.



Spreading the nichrome tip with a hobby knife

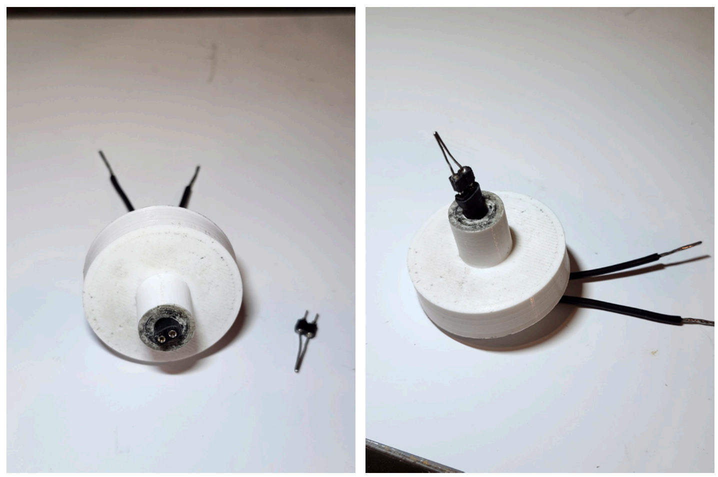
Use

Due to its small size, you need a connector to hold the igniter in place and provide an easy way to attach the micro clips from your launch controller. The simple solution is to make a connector from another SIP that you solder a couple wires to make a pigtail. A few inches of 16-gauge wire are plenty, but you can make the leads as long as you like. I have made leads that are over 1m long for use in pistons that use the same igniters.



SIP igniter with pigtail connector harness

I also designed in CAD and 3D printed an igniter holder that fits into the base of my 40mm tower which keeps the igniter upright and centered in the tower. The big advantage to these igniters is that the model rests on top of the igniter with the nichrome touching the motor grain. This ensures that the motor will light 100% of the time. It also eliminates the need for a plug or tape to keep the igniter from falling out. The 24-gauge nichrome wire used gives plenty of strength so that the weight of your model will not cause the igniter to bend or deform thus causing a short or other misfire like other igniters.



3D printed igniter holder for the base of a tower

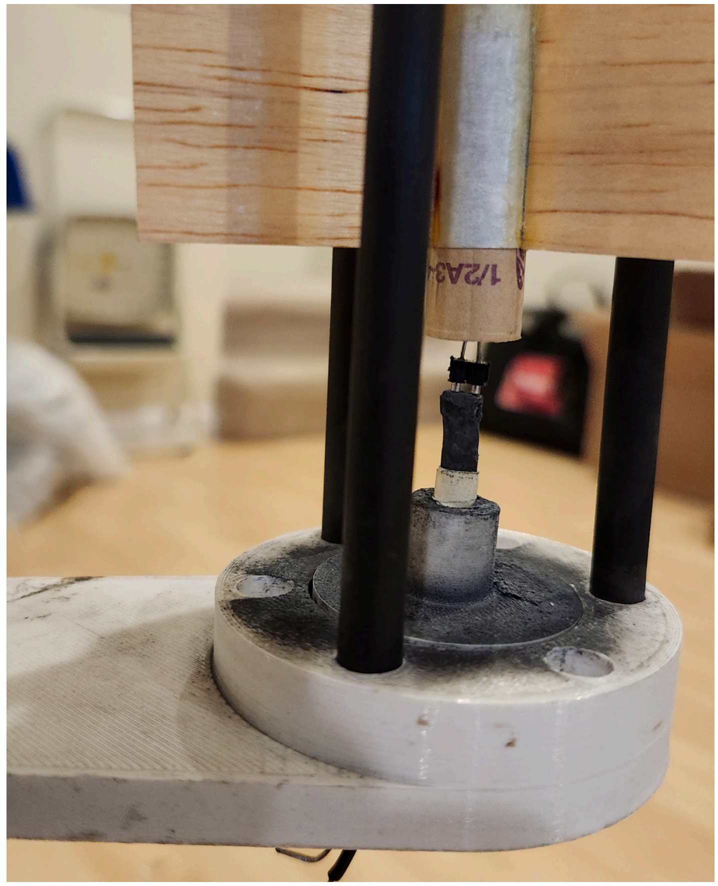
When used to fly my 40mm FAI models on ½ A motors, the igniter takes about a half second to light the motor and often the igniter can be reused many times. All it takes is a little wipe to remove the exhaust residue or a gentle scrape with a knife, and you can place the next model on it and still get 100% reliability. When used in pistons, I have found that the model lifts off so quickly that I could get 3 to 6 flights before needing to change the igniter. If your model is heavy, such as an egglofter, or you hold the launch button too long, the nichrome wire can melt and get blown apart by the rocket motor exhaust. These igniters are so cheap and easy to build that you can make 100 and not worry about reusing them if you like.

SIP Nichrome igniter in a 10mm piston

Summary

If you are dissatisfied with the currently available black powder motor igniters, then making your own nichrome igniters can increase your reliability and save money. Although I mainly use these igniters in competition models, I have also tested them in sport models with 18mm motors. They work, but they become one use only as the larger, heavy models are slow to take off thus exposing the igniter to a large amount of engine exhaust. I have also used these igniters successfully in 10mm European motors and will be developing an igniter for micro maxx motors as well.

Please email me if you have any questions or comments



Entire igniter setup including tower and model

Estes promotional photo - Jonathan Dunbar Collection

Musings From The Shop:
Crafting Scale Nike Standard Fins

John Brohm

Introduction

Most scale modelers have likely encountered a Nike based prototype at some point in their building career. The Nike M5 motor became one of the most widely used boosters in America's sounding rocket program, serving as the prime mover in the single stage Nike Smoke and appearing in multi stage vehicles such as the Nike Apache, Nike Orion, Black Brant VIII, Argo D 4 Javelin, and many others.

Project Nike began in the mid 1940s under the U.S. Army Ordnance Corps, with Hercules Aerospace contracted to develop the M5 motor for the Nike Ajax surface to air missile system. Initial test firings took place by late 1946. By the early 1950s, motor production outpaced Army requirements, and surplus units became available to emerging sounding rocket programs. The first use of a Nike motor in this role occurred in 1953 with the Nike Deacon.

As the motor proved its versatility, Atlantic Research Corporation developed a family of fin types, fin can assemblies, and interstage adapters to support its integration with ARC's upper stage vehicles. Among the fin type choices was the Nike Standard Fin — the focus of this article.

The Nike Standard Fin was a lightweight, foam filled, trapezoidal structure paneled in sheet aluminum and built around a simple diamond airfoil. With an aerodynamic area of only 2.5 square feet, it could be adapted to a variety of mounting configurations. The component saw broad use, appearing on the Nike Cajun, Nike Apache, Black Brant VIII, and numerous other prototypes.

Recently, I began work on a 1/5.489 size Nike Apache, making the Nike Standard Fin a key component of the build. In this article, I'll share the method I used to create accurate scale reproductions of this iconic fin type.

Nike Apache at Wallops Flight Facility, 1966 - NASA photo

The Nike Standard Fin

As mentioned, the Nike Apache deployed a Nike M5 motor as its booster. The motor was fitted with four Atlantic Research #16151 Nike Standard Fins, as shown in Figure 1.

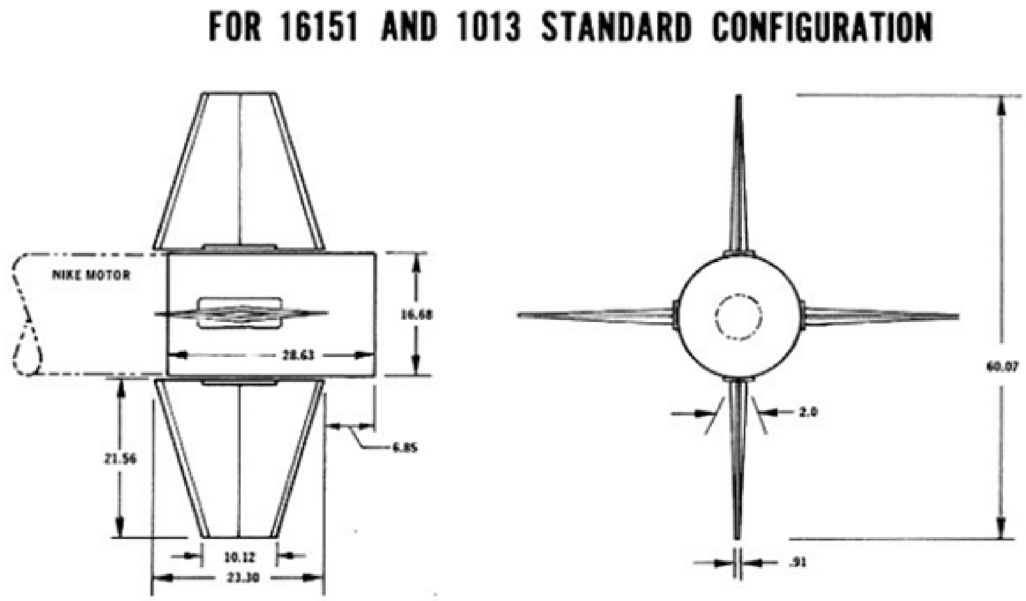


Figure 1: Nike Standard Fin #16151
https://meatballrocketry.com/wp-content/gallery/scale_data/nike_data/nikefins.pdf

As Figure 1 shows, the Nike Standard Fin was fabricated with a simple diamond airfoil, tapered from root to tip. For our model, we'll base the booster's fins on 1/16" aircraft plywood cores and we'll face the cores with shaped balsa segments to realize the diamond airfoil. Consideration was given for traditional built-up fin construction, but because the fins are relatively thin at this scale factor, a solid core seemed the better approach.

Figure 1 also shows how the leading and trailing edges converge to a knife-like edge. Actualizing that sharp edge requires a bit of math. Our 1/16" fin cores are much too thick to represent that knife edge; the prototype had a leading/trailing edge width of about 0.20"[1], not counting the protective cuff. At our scale factor, that reduces to 0.036". And, since we want a nice smooth convergence of the skins at the edges, we'll need to size our fin cores to something less than the full fin plan. Ideally, the fin core edges would sit just tangent to the inside face of the fin skins. Figure 2 highlights the point.

1 "Nike Apache Sounding Rocket", Sht2, drawing by Mike Dorffler, 1996

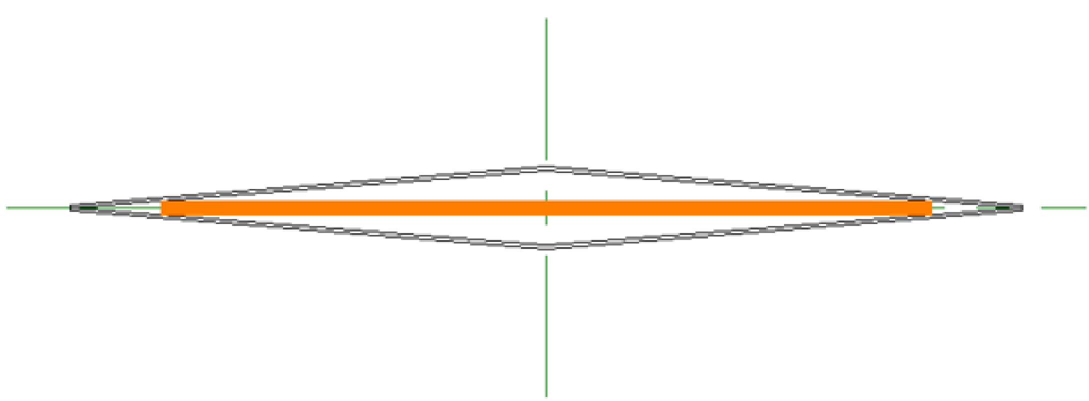


Figure 2: Nike Fin Root Section

Figure 2 illustrates the fin section right at the root. The fin skins are shown at scale thickness, while the orange bar illustrates the tangent fin core. As one can see, to get a knife edge based on the skins alone (just like the prototype), our fin core edges must be placed further back to the tangent point, based on the core's 1/16" thickness.

Finally, the fin skins. Mike Dorffler's Nike Apache drawing indicates the Standard Fin's leading and trailing edges were 0.20" wide. While we don't presently have access to the specification for the aluminum sheeting used to empanel the Standard Fin, the sheeting used on other sounding rocket fins (e.g.: the Aerobee 350 Sustainer fins) was typically 0.090" thick. Two such skins meeting at the edge would yield a width of 2 × 0.090" = 0.180", which is consistent with Mike's 0.20" edge-width callout.

If we take that single skin thickness of 0.090" into our scale factor paradigm, it returns a value of 0.016", so the skins on our model's fins will be fashioned from 0.015" thick Styrene sheet. As we'll see in the following construction section, we'll take some steps to strengthen those plastic leading and trailing edges.

With our build strategy set, let's start with those 1/16" plywood cores.

Fin Construction

A fin core template was drawn in TurboCAD and was used to cut the cores. Our usual practice is to make our own ply core blanks to mitigate warpage, but in this case, a serious shop search turned up an old sheet of 1/16" ply suitably flat for our purposes.

Photo 1: 1/16" Plywood Cores

Now for the tapered diamond airfoil. Since I'm not proficient at freehand sanding a consistent airfoil, I decided to fashion the airfoil faces from individual balsa segments, each segment to be precisely shaped on a segment shaping and sanding fixture. The fixture is based on a piece of 3/16" aircraft plywood, its width cut to the precise length of the fin span. The fixture uses 1/16" plywood fences, cut to match the airfoil tapers, which are used as the sanding block guides. The fences are glued in place, mirroring the exact shape of the tapered segments that make up a diamond airfoiled fin face.

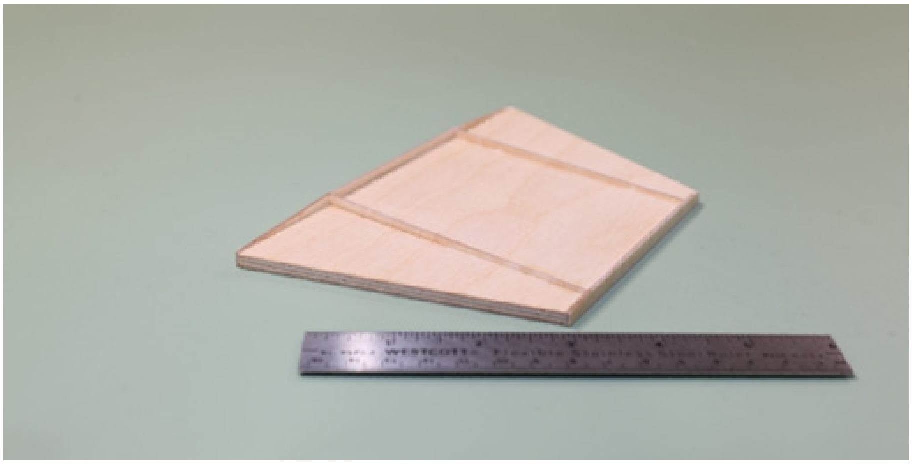


Photo 2: Sanding Fixture

Next, a set of airfoil segments was cut from a sheet of 3/16” thick balsa. Note that a top and bottom segment is required for each fin face.

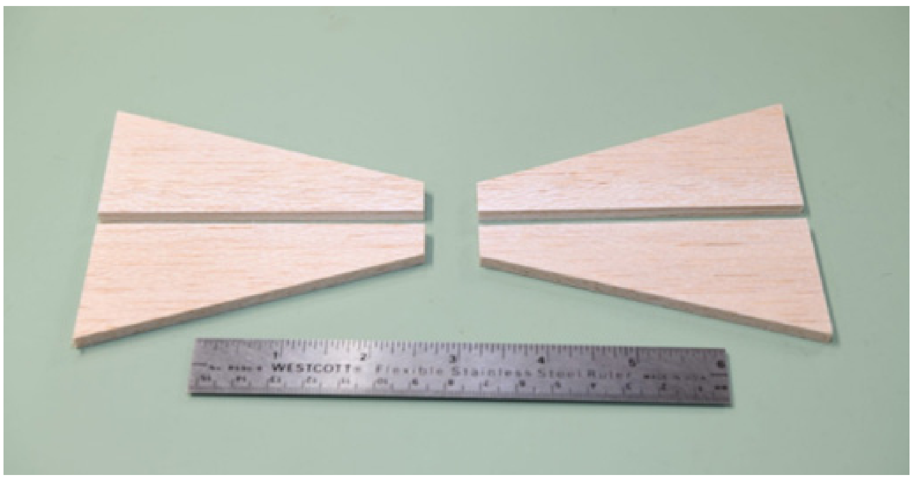


Photo 3: Balsa Segments

To shape a segment, a balsa blank is set into the fixture (held in place with a small piece of 3M double-sided tape) and is then carefully shaped with a miniature plane and sanded with a progression of grits until the blank is profiled flush to the tapered fences.

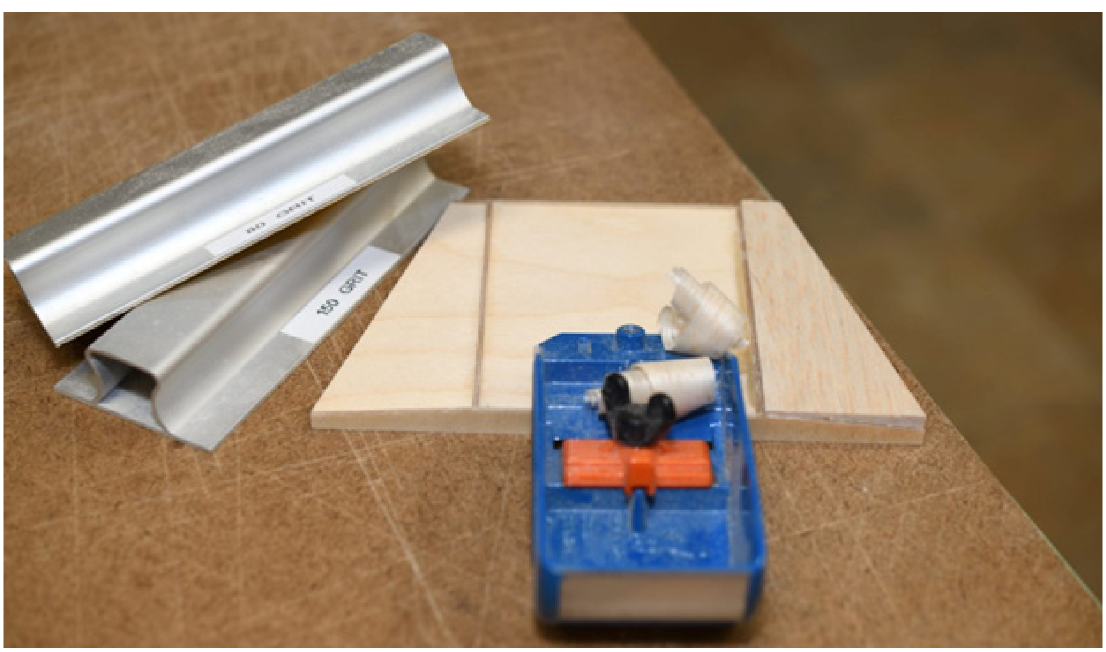


Photo 4: Segment Shaping

We'll repeat this process for the other three segments, and with a bit of elbow grease, we end up with a set of four precise, consistent fin segments, ready to be applied to the plywood fin cores.

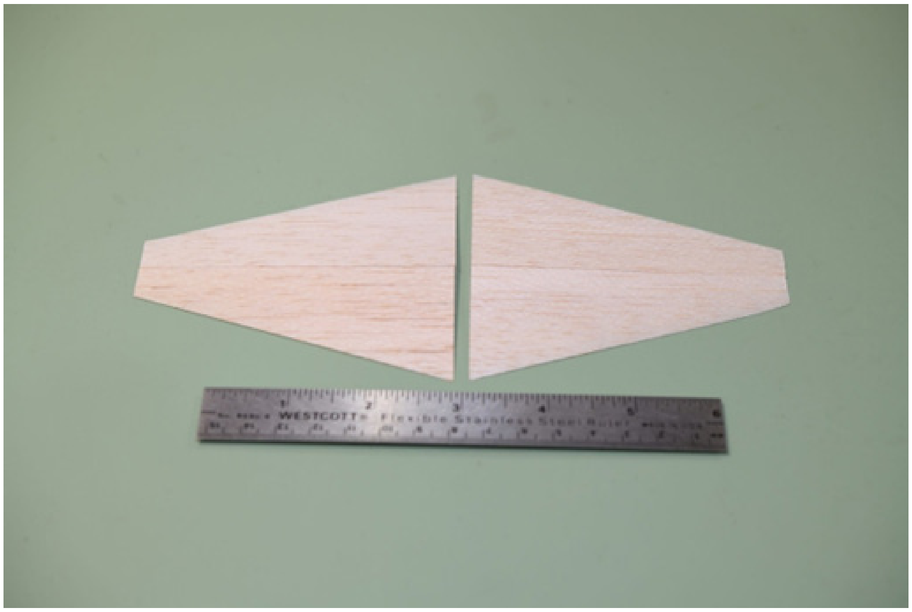


Photo 5: Ready for Application

Each segment is applied to the fin core with a very thin layer of epoxy, providing working time to align and adjust the segment on the core.

Photo 6: Segment Glued in

One will notice that the balsa segment is slightly longer than the plywood core. The reason for that goes to the finishing stage. If the core is also cut to the precise length of the fin span, then the hard plywood center presents a pivot point to the sanding block. This makes it more difficult to sand the tip face flush and perpendicular, as the surrounding material is softer. Since we need that tip face flush, square and perpendicular, the fin core is slightly shortened to facilitate the finishing process.

Once the epoxy cures, we have a native fin, ready for skinning.

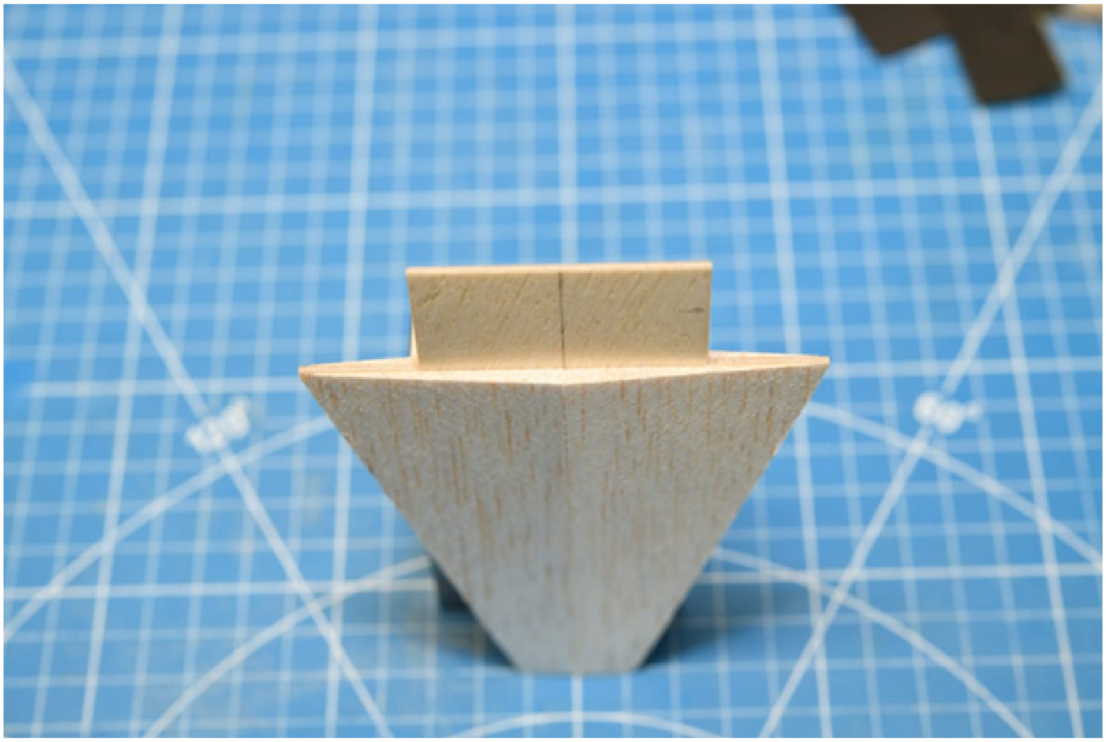


Photo 7: Native Fin, Ready for Skinning

The fin skins are cut from 0.015" thick sheet Styrene but before they're applied, they must first be detailed with the fin's rivet pattern. Some Nike Orion photos give us a good view of the Standard Fin rivet pattern.

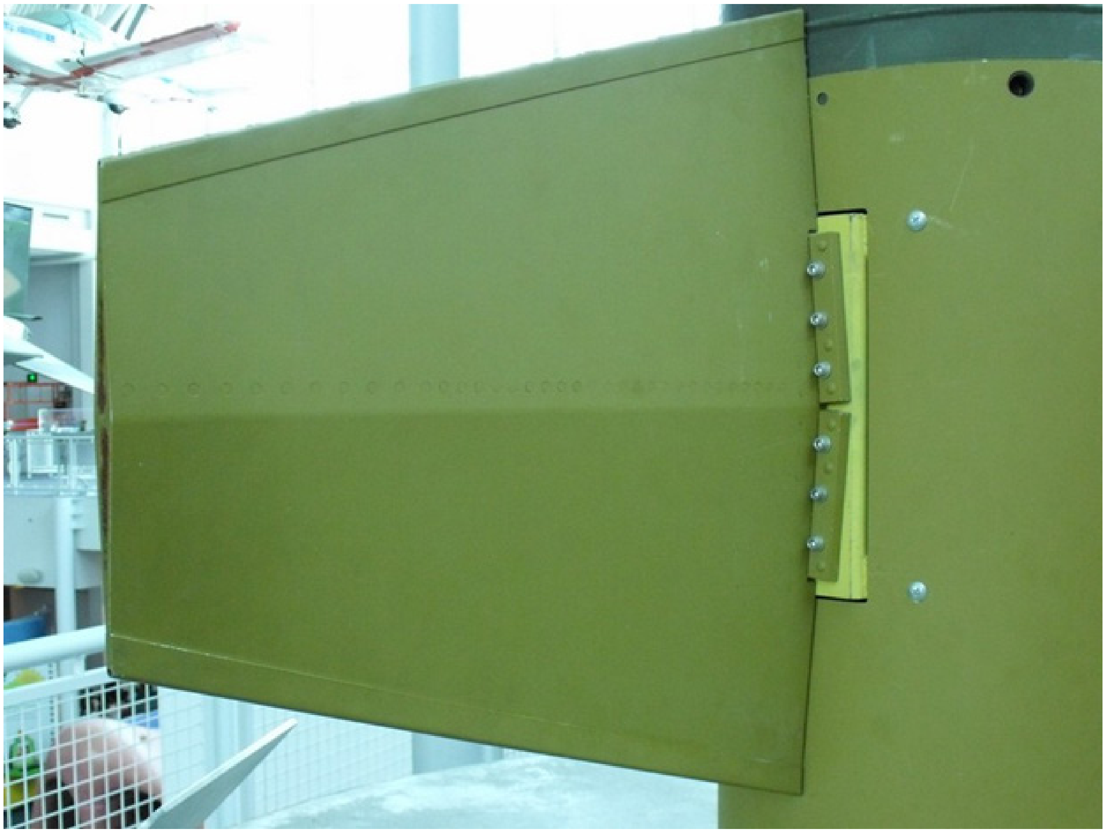


Photo 8: Standard Nike Fin Span Rivets
Photo provided by Josh Tschirhart

Photo 9: Nike Fin Root Rivet Detail
Photo provided by Josh Tschirhart

We'll replicate that rivet scheme on a piece of 0.020" thick Styrene sheet to create a rivet template.

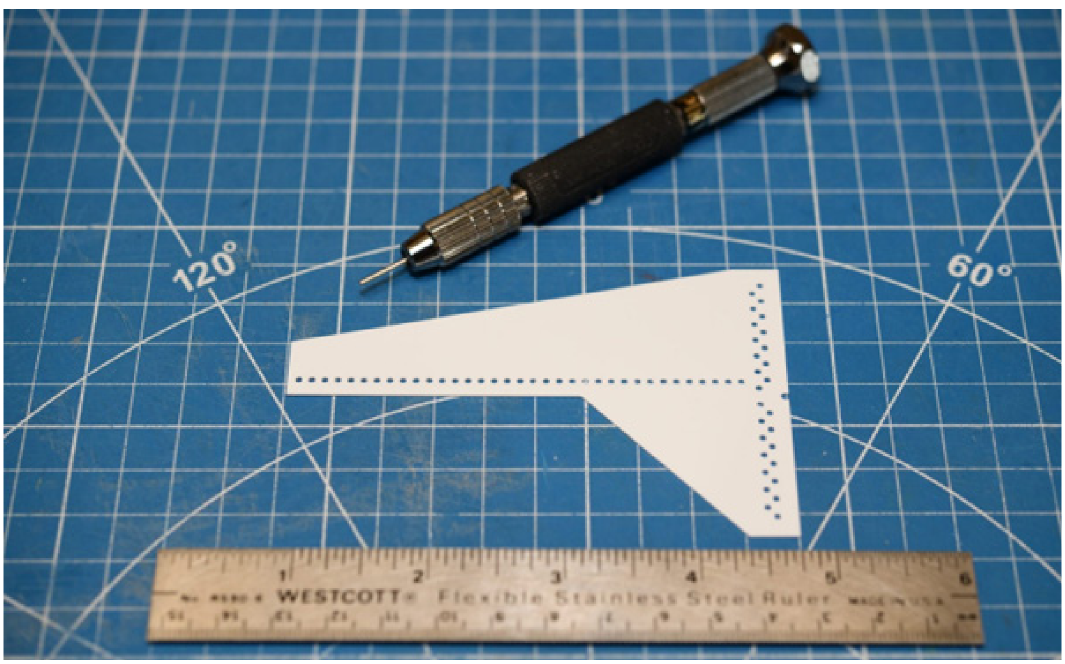


Photo 10: Fin Rivet Template

The rivets scale out to a 0.25” diameter on the prototype, which at our scale factor is 0.046”. An 18-gauge glue syringe needle provides an OD of 0.05”, and when pressed into the Styrene fin skin it produces a reasonable facsimile of the flush rivets we see on the prototype fin.

So, the needle is chucked into a pin vise, and with the rivet template taped in place, hole by hole, we arrive at a fully riveted fin skin. The skin is scored down the middle on the backside, is then bent along the score, and then tested with a dry fit. Satisfied with the fit, we can glue the skin in place with thin CA, taking care to check alignment along the way. The process is repeated for the other side, and once applied, we have a fully skinned fin, ready for leading and trailing edge finishing.

Photo 11: Skinned Fin

If our math and construction efforts converge as planned, then so too should the leading and trailing edges of the Styrene fin skins. With some thin Styrene cement, we can carefully close those edges. A sharp, scale-like knife’s edge greets us.

Photo 12: A Knife’s Edge

Our earlier Figure 2 makes it apparent that there's an airgap between the internal fin core edges and the outer leading and trailing edges of the fin. Without reinforcement, landing loads could damage the fin tips and edges, so we'll add some reinforcement by borrowing a tip from our friend and noted scale modeler, Marc McReynolds.

The following photo shows the process underway. A length of 0.030" diameter carbon fiber rod is inserted into the airgap and is allowed to settle naturally between the two fin skins. CA is then dribbled down the CF rod, cementing it in place.

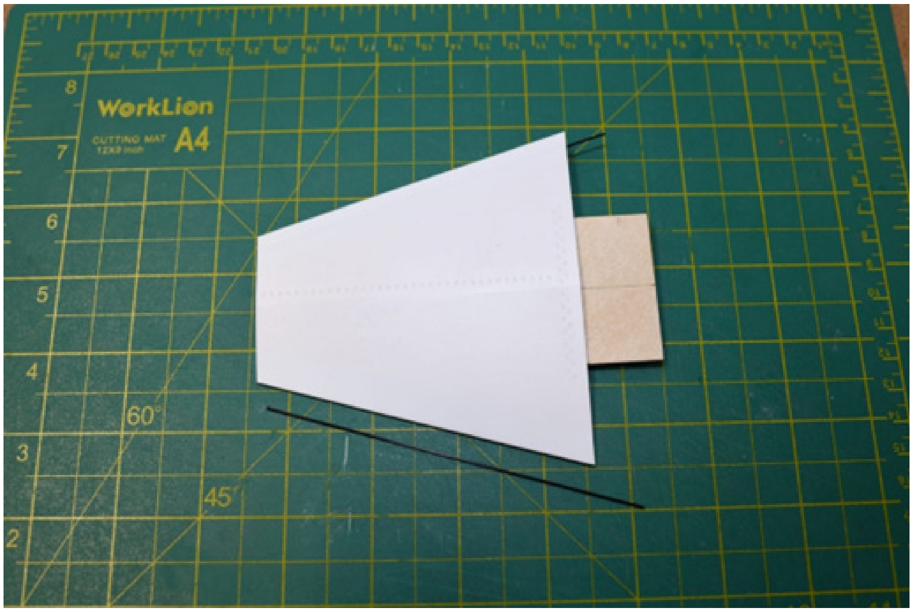


Photo 13: Carbon Fiber Reinforcing Rods

Once the CA has cured, the aft end of each rod is cut flush with the Styrene fin skin. Fin construction is completed by filling the tip face with a mix of epoxy and micro-balloons.

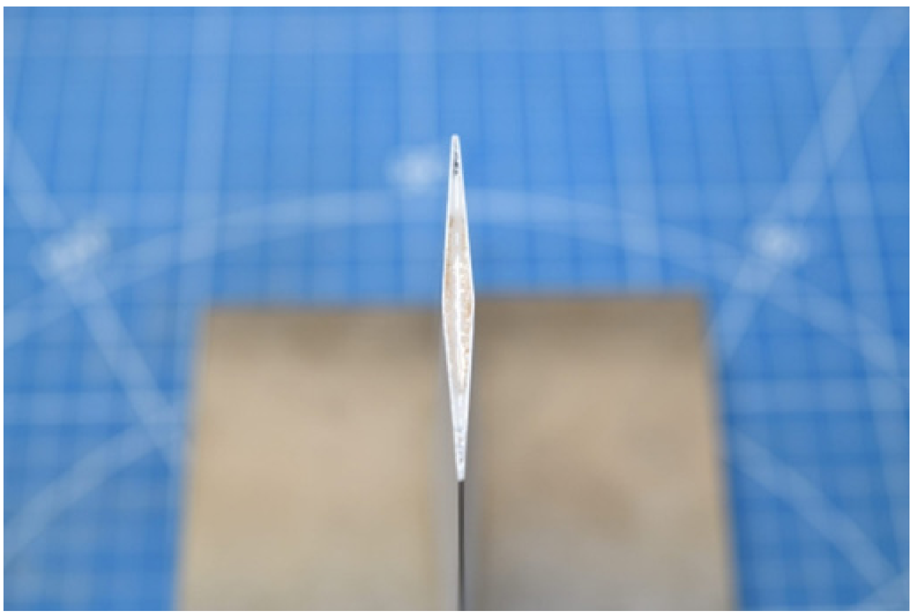


Photo 14: Fin Tip Filled

This process is repeated for the remaining fins, leaving us with just the leading and trailing edge protective cuffs to add. But before we do that, we must first detail and cut them.

The Leading and Trailing Edge Cuffs

The prototype fins had their leading and trailing edges covered with an Inconel cuff[2], riveted in place, intended to protect the edges from the aerodynamic heating effects that occur at high rates of speed. For our model, we'll add 0.010" thick strips of Styrene, cut to scale width, to represent the sides of these cuffs. We can get a clear view of the cuff rivet pattern from the following Nike photo.

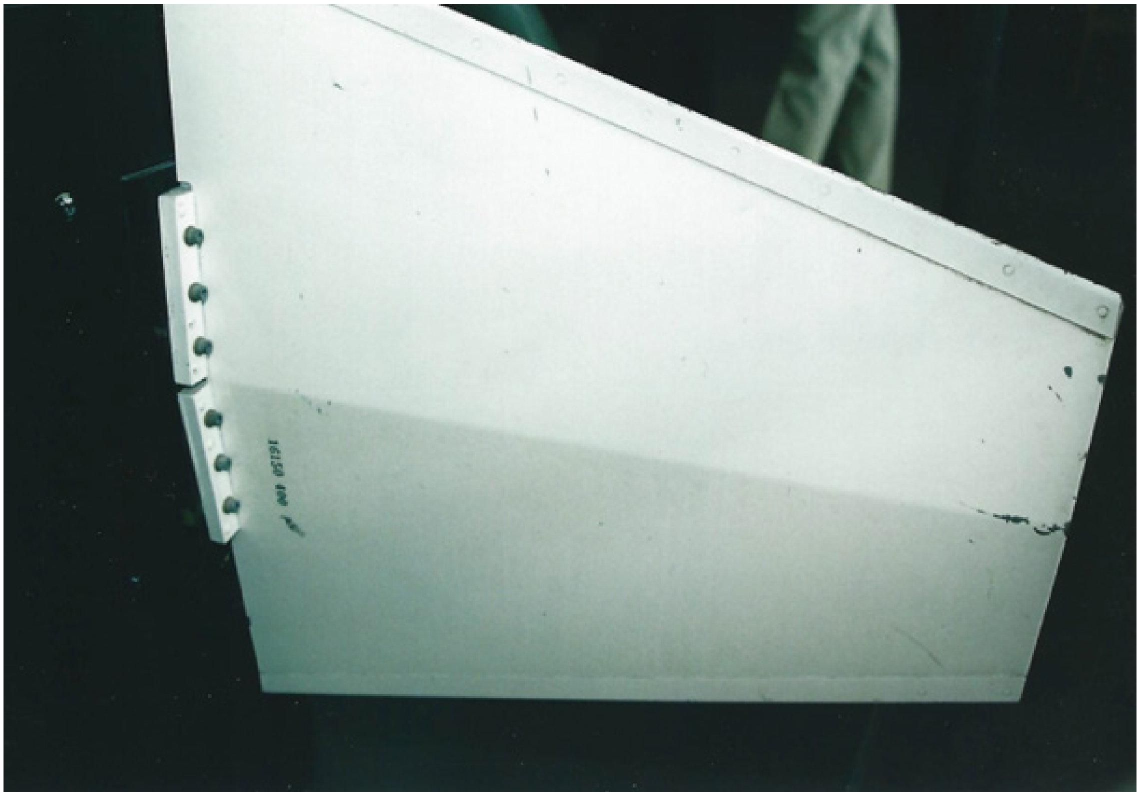


Photo 15: Nike Standard Fin Leading Edge Cuff

Photo provided by Taras Tataryn

To realize the rivet pattern, we'll fashion another rivet template from a strip of 0.020" Styrene sheet. The rivet template is secured to a sheet of 0.010" Styrene and then as we did for the fin skins, the rivet tool is pressed hole by hole into the rivet template.

2 "Standard Fins – Nike Rocket Motor", Pg 3, Atlantic Research Corporation

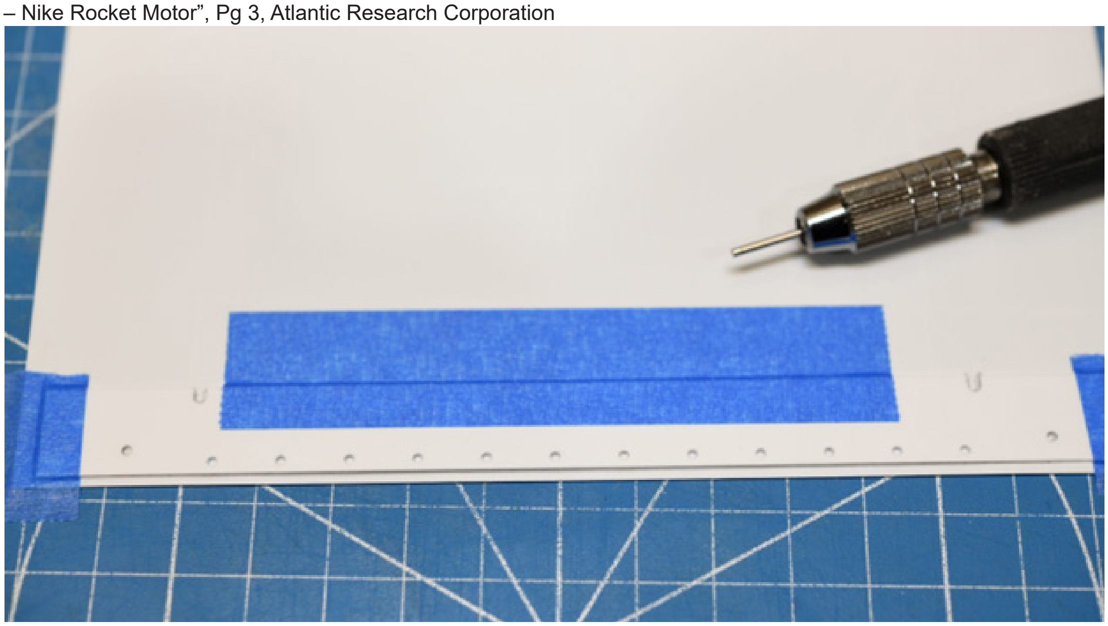


Photo 16: Cuff Rivet Template

The resulting cuff rivet strip is cut from the sheet and then applied to a fin edge with careful dashes of thin Styrene cement. Placing and trimming the remaining cuff strips completes the fin.

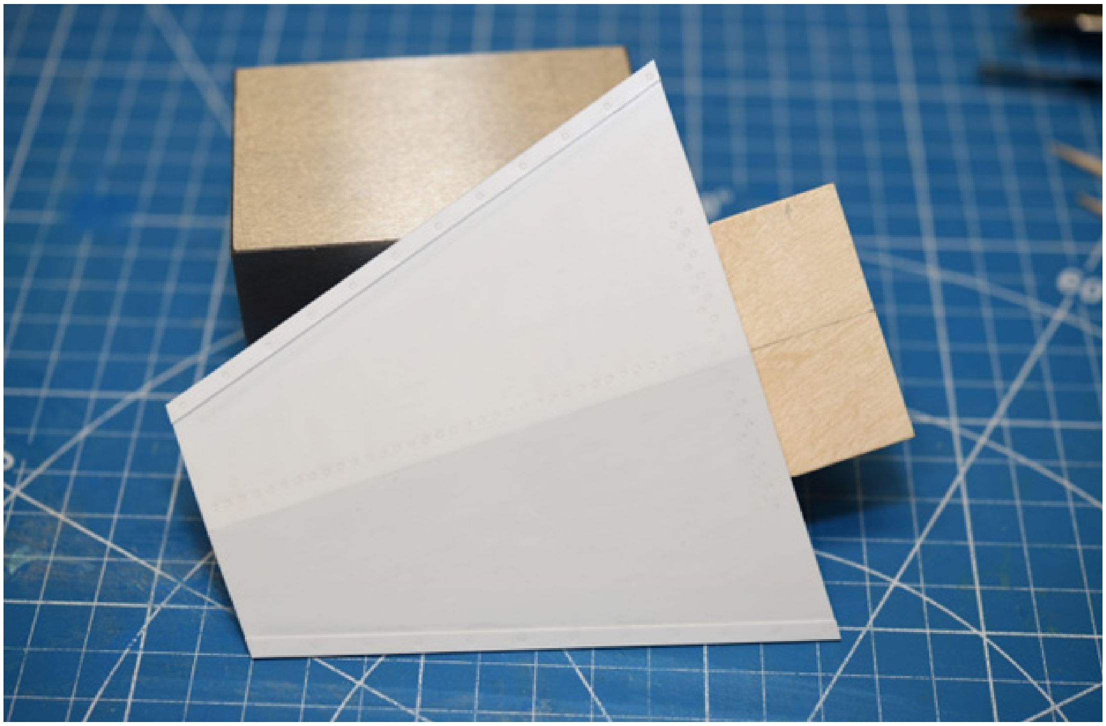


Photo 17: Finished Fin

All that remains is to lightly run a high grit sanding block along the edges to round them. And with that our scale Nike Standard Fin is ready for a visit to the Paint Shop.

Crafting accurate scale fins is always a challenge, but the fabrication method outlined here — from shaping the airfoil segments to closing the knife-edge skins — can produce a component that faithfully captures the shape and detail of the prototype. I hope these techniques prove useful in your own work, and as always, I wish you every success with your scale modeling projects.

Nike Apache at Wallops Flight Facility, 1974 - NASA photo

JMRC HUVARS Club News

Horning Farms 2026 Craft Show Community Outreach
May 9th marked our third time attending the Horning Farms Craft Show with an information booth representing JMRC/ HUVARS. The day was spent passing out club fliers, answering questions about model rocketry and the various displays we bring, and supporting the Hornings who have been so generous to us over the years allowing access to their fields.

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. Our random number genterator used a low altitude range to better fit the Horning 3 field we are flying on for most of the year.

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

New Members
Please welcome our newest members
Jon Demick

PRESIDENT'S CORNER

As the Summer continues onward with fluctuating storms and high temps we have not had the greatest luck with our launches. While we all would prefer to be on the field enjoying models battling gravity with the aid of pressure generation often coupled with a touch of flame… keeping everyone safe and the field protected from damage always take precedence. Alas, we will continue to try, and mother nature will one day soon smile upon us so we can enjoy the flight portion of our hobby.

Our current field available is on a ~28 day harvest schedule which allows us to fly the weekend after. Our next prediction is flying on August 1st, of course this is still contingent on weather. Either way we will do our best to be nimble and flexible so we can offer the membership as many opportunities as possible. Keep the birds flight ready, and we'll get them airborne as soon as possible!

Junior trophy for the 2026 Altitude Contest

CURRENT EVENTS IN SPACE EXPLORATION

Except for the highly anticipated SpaceX Starship Integrated Test Flight 12, the May–June 2026 period for space flight was rather subdued. SpaceX continues to lead other launch providers with a total of twenty-five space vehicle launches. Of those, eighteen were Falcon 9 flights in support of the Starlink telecommunication constellation, one Starship test flight, and six Falcon 9 flights supporting other missions.

Rocket Lab made three flights, 2 Electrons and one HASTE mission using a suborbital version of Electron.

United Launch Alliance (ULA) made a single launch of an Atlas V 551 in support of the Amazon Leo telecommunications constellation.

NASA flew an Improved-Terrier Malemute for a RockOn! Hands-on educational workshop and student flight program mission.

Blue Origin suffered a major setback with the explosion of a New Glenn vehicle on the pad during a static fire test. The root cause is still under investigation but appeared to have originated in the aft section of the first stage. It has been labeled as one of the largest rocket explosions in decades and caused significant damage to the launch pad and towers while destroying the vehicle. Blue Origin is dedicated to making repairs and resolving the root cause in hopes of a new flight before years end.

SPACEX

On 3 May, a Falcon 9 supporting the CAS500-2 rideshare mission lifted off from Vandenberg Space Force Base to a sun-synchronous orbit. The Compact Advanced Satellite 500-2 (CAS500-2) is an earth imaging satellite for the Korean Aerospace Research Institute. The mission deployed a total of 45 payloads for KAI, S.r.L, Exolaunch, Impulso. Space, Loft-EarthDaily, Lynk, True Anomaly, and Planet Labs.

The NROL-172 mission was launched from Vandenberg Space Force Base on 11 May aboard a Falcon 9 for the U.S. National Reconnaissance Office (NRO). NROL missions typically do not disclose payload information, however, NROL-172 likely deployed SpaceX/Northrop Grumman Starshield communications satellites to the NRO's proliferated reconnaissance constellation.

NASA's 34th Commercial Resupply Mission (CRS-2 SpX-24) to the International Space Station (ISS) lifted off on 15 May from SLC-40 at Cape Canaveral Space Force Station. The Falcon 9 vehicle carried the Cargo Dragon C209 for its 6th mission, delivering approximately 6,500 lbs. of supplies and experiments to the ISS.

The much-awaited Starship IFT-12 mission launched on 22 May from Starbase Texas. The 66 minute flight was the first for Starship version 3 and first launch from Pad 2 featuring a flame diverter. Super Heavy Booster 19 and Ship 39 were also the first stack to feature Raptor 3 engines. Successful aspects included the liftoff with all 33 Raptor 3 engines, though one shut down early, hot-staging, Starship ascent and payload (Starlink simulators), reentry and targeted splashdown in the Indian Ocean. The main issue involved the booster boostback/flip maneuver which failed and resulted in a high-speed impact with no landing burn attempted. Overall, the mission was considered a successful validation of block hardware.

The BlueBird Block 2 #3-5 (aka BlueBird 8-10) mission launched on 17 June from SLC-40 at Cape Canaveral Space Force Station atop a Falcon 9 booster. The 3 Block 2 BlueBirds were deployed successfully to AST SpaceMobile's constellation and will provide direct-to-smartphone cellular broadband service from low earth orbit. The Block 2 design features a massive 2,400 sq ft phased array antenna.

NROL-179 was launched on 19 June from Vandenberg Space Force Base for the U.S. National Reconnaissance Office. The classified mission was probably similar to the NROL-172 launched in May.

On 23 June, the Project Starfall Demonstration mission flew aboard a Falcon 9 from SLC-40 at Cape Canaveral Space Force Station. The mission's purpose was to demonstrate controlled re-entry, atmospheric flight, and recovery of a low-profile, disk-shaped capsule designed for affordable return of payloads from orbit (e.g., microgravity-manufactured goods, experiments, or samples). The mission was successful and paves the way for routine, cost-effective microgravity research and in-orbit manufacturing by providing a dedicated, recoverable platform smaller and cheaper than Dragon.

ROCKET LAB

Viva La StriX was an Electron launch from Launch Complex 1B in New Zealand for the Japanese company Synspective on 22 May. The payload was a StriX synthetic aperture radar (SAR) earth observation satellite. This was Rocket Lab's 9th launch for Synspective to build out their SAR constellation.
Curveball was a suborbital flight as part of the HASTE program flown on 11 June from Launch Complex 2 at Wallops Flight Facility. Hypersonic Accelerator Suborbital Test Electron (HASTE) flights are classified tests of hypersonic vehicle technology in a suborbital trajectory, this flight however did reach low earth orbit fitting the name, "Curveball".

The Ten Owl Of Ten mission launched on 27 June from Launch Complex 1b in New Zealand. This was the 10th StriX synthetic aperture radar satellite deployment for Synspective and similar to the Viva La StriX in May.

ULA

The Amazon Leo LA-07 mission launch on 29 May from SLC-41 at Cape Canaveral Space Force Station. The Atlas V 551 lofted 29 Amazon Leo telecommunications satellites to the Project Kuiper broadband constellation.

NASA WFF

On 24 June an Improved-Terrier Malemute launched from Wallops Flight Facility supporting a RockOn! and RockSat mission, the first time payloads from both groups flew together on one sounding rocket. Nearly 250 students from 38 universities and community colleges participated. This flight included experiments assembled by a team from Saginaw Valley State University led by JMRC/HUVARS member, John Potts.

One of the last Atlas V 551 variants to fly - ULA photo

Lift-off of Starship IFT 12 - SpaceX photo

University teams involved in the 24 June RockOn! / RockSat flight - NASA photo

LIVONIA LAUNCH FIELD

26 MAY 2026

Steve Kristal photos

Pete Alway and his Mercury Redstone

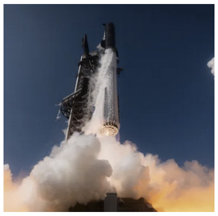

Mercury Redstone launch


Marck Chrumka's Sky Cycle


Pete Alway and his Goddard Rocket


Goddard rocket CATO


Savit launch



LAUNCH WINDOWS

July 14, 2026
ROSCOSMOS, Soyuz MS-29, Soyuz 2.1a
Launch site: 31/6, Baikonur Cosmodrome
Soyuz MS-29 will carry three cosmonauts and one astronaut to the International Space Station aboard the Soyuz spacecraft from the Baikonur Cosmodrome. The crew consists of Roscosmos cosmonauts Pyotr Dubrov and Anna Kikina, as well as NASA astronaut Anil Menon.

July 17, 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.

July 2026
StriX Launch 10, Electron, Rocket Lab
Launch site: Rocket Lab LC 1, Mahia Peninsula
Synthetic aperture radar satellite for Japanese Earth imaging company Synspective.

July 2026
SpaceX, Transporter 17, Falcon 9 Block 5
Launch site: SLC 4E, Vandenberg SFB
Dedicated rideshare flight to a sun-synchronous orbit with dozens of small microsatellites and nanosatellites for commercial and government customers.

July 2026
Mitsubishi Heavy Industries, HTV-X2, H3-24
Launch site: Yoshinobu LC LP-2, Tanegashima Space Center
Second flight of the upgraded Japanese HTV-X spacecraft designed to resupply the International Space Station.

July 2026
SpaceX, BlueBird Block 2 #6-8, Falcon 9 Block 5
Launch site: SLC 40, 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, delivering 24/7 continuous cellular broadband service coverage in the United States. 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.

July 2026
ULA, Amazon Leo (LA-08), Atlas V 551
Launch site: SLC 41, Cape Canaveral SFS
Amazon Leo, formerly known as Project Kuiper, is a mega constellation of satellites in Low Earth Orbit that will offer broadband internet access. This constellation will be managed by Kuiper Systems LLC, a subsidiary of Amazon. This constellation is planned to be composed of 3,276 satellites. The satellites are projected to be placed in 98 orbital planes in three orbital layers, one at 590 km, 610 km and 630 km altitude. 29 satellites are carried on this launch.

August 15, 2026
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.

August 27, 2026
Arianespace, MTG-I2, Ariane 62
Launch site: Ariane LA 4, Guiana Space Centre
Third of EUMETSAT's third generation of weather satellites.

August 30, 2026
SpaceX, Nancy Grace Roman Space Telescope, Falcon Heavy
Launch site: LC 39A, Kennedy Space Center
The Nancy Grace Roman Space Telescope is a NASA infrared space telescope with a 2.4 m (7.9 ft) wide field of view primary mirror and two scientific instruments. The Wide-Field Instrument (WFI) is a 300.8-megapixel multiband visible and near-infrared camera, providing a sharpness of images comparable to that achieved by the Hubble Space Telescope over a 0.28 square degree field of view, 100 times larger than imaging cameras on the Hubble. The Coronagraphic Instrument (CGI) is a high-contrast, small field of view camera and spectrometer covering visible and near-infrared wavelengths using novel starlight-suppression technology. Roman objectives include a search for extra-solar planets using gravitational microlensing and probing the expansion history of the Universe and the growth of cosmic structure, with the goal of measuring the effects of dark energy, the consistency of general relativity, and the curvature of spacetime.

August 2026
CASC, Chang'e 7, Long March 5
Launch site: Wenchang SLS
Chang'e 7/CE-7 is scheduled to launch in 2026, including an

orbiter, a lander, a mini-hopping probe, and a rover. The mission will land in the South Pole regions of the Moon to study lunar surface environment around the South Pole, especially in looking for water ice in lunar soil.

August 2026
SpaceX, Dragon CRS-2 SpX-35, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
35th commercial resupply services mission to the International Space Station operated by SpaceX. The flight will be conducted under the second Commercial Resupply Services contract with NASA. Cargo Dragon 2 brings supplies and payloads, including critical materials to directly support science and research investigations that occur onboard the orbiting laboratory.

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

August 2026
Rocket Lab, StriX Launch 11, Electron
Launch site: Rocket Lab LC 1, Mahia Peninsula
Synthetic aperture radar satellite for Japanese Earth imaging company Synspective.

September 9, 2026
Avio S.p.A, Sentinel-3C & FLEX, Vega-C
Launch site: Ariane LA 1 (ELV), Guiana Space Centre
Sentinel-3C is the third satellite in the Sentinel-3 constellation, which provides high-accuracy optical, radar and altimetry data for marine and land services. The Fluorescence Explorer (FLEX) satellite is a part of ESA's Earth Explorer program. The satellite will map vegetation fluorescence to quantify photosynthetic activity.

September 9, 2026
ROSCOSMOS, Progress MS-35 (96P), Soyuz 2.1b
Launch site: 31/6, Baikonur Cosmodrome
Progress resupply mission to the International Space Station.

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

September 2026
Innospace, InnoSat-0, HANBIT-Nano
Launch site: Alcântara Space Center, Brazil
Innospace's first in-house test satellite, 'InnoSat-0', will test various technologies for future development of satellites by Innospace themselves. The satellite will be deployed using Korean company SpaceBey's specialized deployer.

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

September 2026
Firefly Aerospace, QuickSounder, Firefly Alpha Block 2
Launch site: SLC 2W, Vandenberg SFB
QuickSounder is the first satellite mission of the Near Earth Orbit Network (NEON) program of the National Oceanic and Atmospheric Administration (NOAA), which aims to replace the current Joint Polar Satellite System (JPSS) series of polar orbit weather satellites. This pathfinder mission will demonstrate NOAA's ability to launch a small satellite within 3 years, flying a refurbished Advanced Technology Microwave Sounder (ATMS) instrument to polar orbit.

September 2026
Korea Aerospace Research Institute, NeonSat-2 to 6, Nuri
Launch site: Naro Space Center
NeonSat-2 to 6 are part of the South Korean government's Earth observation micro-satellite constellation NeonSat (New-space Earth Observation Satellite).

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

September 2026
Innospace, Flight 2, HANBIT-Nano
Launch site: Alcântara Space Center, Brazil
Second orbital launch attempt for the South Korean start-up Innospace and its HANBIT-Nano small launch vehicle.

September 2026
Firefly Aerospace, VICTUS HAZE Jackal, Firefly Alpha Bk 2
Launch site: SLC 2W, Vandenberg SFB
True Anomaly's Jackal Autonomous Orbital Vehicle (AOV) will support U.S. Space Force Space Systems Command's VICTUS HAZE Tactically Responsive Space (TacRS) mission with operations in orbit proximity with another spacecraft built by Rocket Lab National Security. The spacecraft, once completed, will remain on call until the U.S. Space Force provides the notice to launch. The Firefly team will then have 24 hours to transport the payload fairing to the pad, mate the fairing to the Alpha rocket, fuel the rocket, and launch within the first available window.

September 2026
SpaceX, MRV-1, Falcon 9 Block 5
Launch site: Cape Canaveral SFS
The SpaceLogistics MRV-1 is a mission extension payload including a mission robotic vehicle (MRV) and multiple mission extension pods (MEPs).

OUR MEMBERS IN THE FIELD

Al de la Iglesia preps his FAI model

Steve Lindeman preps his Spartacus

Randy Gilbert with a handful of his kits

Dan Weimer and Richard Buckley

Jon Demick and his Skittles 55

Mark Chrumka and his 3d printed Ram-Jet