



SOUTHWEST OHIO ROCKETRY ASSOCIATION (SORA)

LAUNCH REPORT JULY 06, 2025

1:00PM TO 5:00PM NAR SECTION #624

Launch Conditions: partial clouds, temps in 80's

Total Number of Launches: 41 **Rockets Recovered:** 39 **Lost:** 2 **Found Rocket (not launched):** 0

Number of First-Time flyers: 1

Total Number of 100% Fully Successful Flights: 31 **Success Rate:** 76%

Failures: 10, 4 Chute tangles, 2 Chute separations, 1 shock cord broke, 1 lost due to chute size too big, 1 lost due to separation of rocket from chute, 1 CATO (bad motor)

Number of Individuals Who Launched Their Rockets: 11 **Number of Family/Friends/Observers:** 8

Teams and Competitions: 0 **NARTREK:** 0 **Scouts/Home School/4-H:** 1 (prep for 4-H contest 2 days later)

Types and Number of Motors: 42 total

1/4A: 0 1/2A: 0 A: 2 : 16 C: 17 D: 3 E: 3 F: 1 G: 0 H: 0 I: 0 Higher: 0

Estes Sasha used D12-0 going to C6-3

Total Newtons: 515

Ground Fires: 0 **Damage to vehicles/facilities:** 0 **Medical Incidents:** 0

Donations and drink/food sale, sale of merchandise:

straight out donations: \$50

mugs: 1 at \$10 = \$10

food/drinks: 21 at \$1ea = \$21

hats: 0 at \$10 = \$0

t-shirts: 0 at \$20 = \$0

stickers: 4 at \$0.25 = \$1

new memberships 1 @\$5 = \$5.0

Total: \$87.00 (\$21 returned to Rick for supplying snacks and drinks that sold)

Total Deposited to account (\$66)

Rocket Topics and Issues:

1. It was a great day for flying with scattered clouds and warm temperatures. A dragonfly landed on the launch rod just prior to our first launch, and this was a good sign of a successful day!
2. We had the same number of flights as June's launch (41) with the same success rate of 76%.

3. Paxton introduced us to the modern era of communication by giving us a QR code which we could use to access the camera footage from his on-board camera for the rocket he launched earlier in the day. Impressive. Yes, you can teach an old dog new tricks!
4. Loren launched her first rocket ever. Good job! Welcome to the world of model rocketry!
5. Rick volunteered to make his entry into the CATO Chronicles by having his Estes two-stage rocket CATO (Catastrophe on Take Off) on the pad. Luckily, he did not have a RUD (Rapid Unscheduled Disassembly) and the rocket was unharmed by the mishap. Motors were the infamous D12-0 which then ignited a C6-3.
6. The "Closest to the pad" was won by Dave who landed his rocket within a few feet of the Launch Control. That event made for some entertainment!
7. Rick's Semroc Mars Lander descended gracefully for a perfectly successful, soft touchdown on the planet. (This time, planet Earth!)
8. The rocketeers worked hard at trying to lose rockets with two rockets being lost to the Green Monster hill to the east. I hope to find them in winter when all the leaves are off the trees. Jon proved his worth (again) as Master Rocket Retriever (we should design a pin for that!) by finding Elijah's rocket with its altimeter out in the west high weeds. Thanks, Jon!
9. Thanks to Robb for running Range Safety and Launch Control.

Next meeting: Tuesday, August 5th at the Lebanon Library at 6:30PM.

Next Launch: Sunday, August 10, 2025. Meet me at Hisey Park. Setup 11:30, launch 1:00PM

The Club's Motto....."Sapientia ducet ad astra" – "Wisdom leads to the stars!"



Setting up for a fun day of rocketeering



Loren and her first rocket launch ever. Congrats!



Igniters ready to launch a beautifully crafted rocket.



Keeping cool in the shade



Um, angle?



Away we go!!!!



Rick's two stage Sasha (prior to CATO)



A family that rockets together, stays together!



Dragonfly fortelling good luck for the day by landing on the launch rod



Helping the next generation of scientists



Rick's Mars Lander



Rick's new license plate

FUN FACTS: What is RP1 and LOX? (Note: most of the following info comes from “Headed For Space” website)

You may have heard the terms RP1 and LOX as they refer to rocket fuel.

LOX is simply Liquid Oxygen, which is an oxidizer that promotes burning. When gaseous oxygen is chilled down to negative 297 degrees Fahrenheit, it liquifies and becomes a pale, blue liquid. Liquid oxygen is stored/used in rocket engines rather than gaseous oxygen because its density is almost a thousand times greater than gas. The tank on a rocket would contain 1140 grams per liter of space for liquid oxygen (LOX) but will only hold 1.42 grams of gaseous oxygen in the same space. This is a huge difference.

RP1 is Refined Petroleum #1. When later adopted into rocketry, it became known as Rocket Propellant #1. RP1 is a highly refined form of kerosene obtained from crude oil, is denser than kerosene, and is more energy efficient. Composed of molecules containing only carbon and hydrogen atoms (hydrocarbons), RP1 is a mixture of dozens of chains-like hydrocarbons like hexane (has 6 carbons in a chain), octane (eight carbons), heptane (seven), decane (ten), etc. More carbons mean more energy. Kerosene is used as the starting material and then a variety of compounds (like sulfur) are removed that weaken engine components, create corrosion, create coking(carbon) and the buildup of other residues in the critical engine parts. Also, heavier crude oil compounds are removed that will keep the fuel from polymerizing/gelling) under storage or high temperatures.

Some of the advantages of RP1 as a fuel include: it is cheap to produce, stores well at room temperature, has high energy density, low toxicity, has a low vapor pressure(low evaporation rate) which helps with the safety of ground crews, and has a high flashpoint(hard to ignite) so the risk of catching fire at lower temperatures is reduced.

Some disadvantages are that its high molecular mass makes it more difficult to accelerate through the rocket nozzle (low specific impulse), can build up coke/residue inside the engine, is more polluting than hydrogen or methane fuels, and engines that use LOX/RP1 must have the two tanks separated and insulated from each other as LOX must be kept extremely cold while RP1 is at ambient temperature.

Most orbital rockets use RP1/LOX in the main stage (or as additional boosters) such as the Falcon 9, Saturn, Atlas, Soyuz, Antares, and the popular Rocket Lab Electron (commercial small satellite rocket).