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CELEBRATING 40 YEARS

KOSMOonaut's ENJOY DAY IN HUTCHINSON

by Duane Lanterman



Amid the almost daily changes in scheduled events in this weird year of 2020, KOSMO'S August launch at the State Fair grounds parking lot took place and for August the weather was quite nice and the infamous Kansas winds kept a low profile. The parking lot will remain strangely empty come September as the Kansas State Fair has been canceled for the first time in its over 100 year history. We had 76 flights and to say there was a wide variety of models that took to the air would be an understatement. So much for writing about the event as the next 3 pages will be given over to photos from John Palmer and Duane Lanterman.

Top Left: The gang poses for a group photo. Top Right: A bit of the variety on hand. Bottom Left: Dustin Wyant hooks up a helicopter model. Middle: Ka'lon Kirk and Bill Lindsay with their covid models. Bottom Middle: Steve Hamous and grandson Silas Bottom Right: Tina Lindsay prepares to sky write.

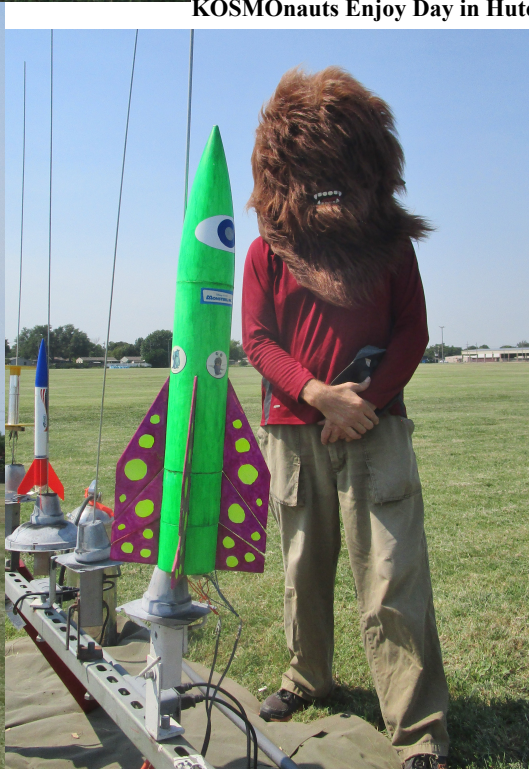
KOSMONaut's Enjoy Day in Hutch - and they took to the skies !



An assortment of models flown by Duane Lanterman, John Palmer, Silas Dunn, Keith Ravenstein and Steve Saner proxy flying several models built by the late Ron Snow.



KOSMONauts Enjoy Day in Hutch



TOP LEFT: FRED SMITH HAD A VERY SUCCESSFUL DAY OF FLYING TOP RIGHT : DUSTIN AND KIERA WYANT AT THE CONTROLS MIDDLE LEFT: BILL LINDSAY'S SUPER BIG BERTHA ON AN F36 MIDDLE CENTER: KEIIH RAVENSTEIN WITH HIS 3 STAGE MONSTAR MIDDLE RIGHT: 2ND STAGE IGNITION ON THE MONSTAR BOTTOM ROW: JOHN PALMER AND SOME OF HIS SPORT SCALE MODELS.

Reflections on 40 Years of Kansas Rocketry

Part 4

Mark Johnson, NAR 14025 L1
KOSMO Charter Member/Current Historian

In this issue I will recall some of the advances we've all see in model rocket motors over the past 40 years – and even a few years longer. I had the privilege of being 'on the ground' at the development of some of the advances in motor technology, some years before I moved to Kansas. I'll have more on that in a bit.

When I started flying rockets, the only propulsion maker I knew was Estes. I had heard about some other companies, but the now-standard 0.69" diameter x 2.75" long 1/4A – C motors were far and away the most common. The Estes motors of 1966 had very thick paper casings, made of relatively soft paper, with an inside diameter of 0.4 inches. This didn't leave a lot of room for propellant, so the biggest single stage motor you could buy was a B.8-6. There were C engines, but only zero-delay boosters; Mabel couldn't pack C power and 5 seconds of delay into that tiny tube. Also, you'll notice that the average thrust value was 0.8 – measured in pounds.

In 1968, two things happened: First, model rocket motors went metric, with average thrust measured in Newtons, not pounds. A B.8-4 suddenly became a B4-4. The second, and in a way much bigger change was that Estes put together a new motor machine (Mabel II) that used a much thinner-walled, denser paper casing with an inside diameter of over a half-inch. All of a sudden, the standard size casing would hold a full C motor with a delay and ejection charge – the old C.8-0 boosters were only about ¾ of the maximum impulse allowed for a C. We could send our BT-20 models twice as high! A cynic would say that it was a huge boost to sales of rocket kits – at twice the peak altitude, the chances you would lose your rocket and have to buy a new kit were much greater. To be honest, I have never asked Vern about that. Perhaps someday soon I will...

Sidebar: Where did the 'standard' motor size come from, anyway? This recollection comes from some old articles in the 1960's Model Rocketry magazine, written by NAR founder G. Harry Stine. It seems that Orville Carlisle's original hand-loaded motors were ½ inch diameter and about 2.5 inches long. When Harry founded Model Missiles, Inc. in 1956 or thereabouts, MMI first sold motors that were hand-loaded by Mr. Carlisle and his brother Robert, and shipped from Nebraska to Colorado in bulk. Very quickly, MMI's motor demands exceeded Carlisle's ability to produce, and he contracted with Brown Fireworks Co. in Missouri to produce motors to his specifications. He reached an agreement with Brown, who informed him "Yes, we can make your rockets in that size, but we can make them much cheaper if we use the casing from our 'Buzz Bomb' firework. This was a cylindrical firework piece with a small aluminum wing at one end, and a nozzle in the side of the case at the opposite end. It was – you guessed it – 0.69" diameter and 2.75" long. These became the standard, and when Vern Estes entered the picture a couple of years later, offering Stine and MMI equivalent rocket motors for even less than they were paying Brown, it stuck.

But wait, there's much more to come. A year or so after model rocketry went metric, Estes announced a larger-diameter motor, its first D. This was originally the D13, but it became the D12, with a

significantly lower maximum thrust, within a couple of years. It seemed that the 9-pound thrust spike of the D13 tended to cause nozzles to blow out. Oddly, though, I never had a CATO on a D13 – suffered my first one on a D12, a couple of years after they were introduced. The D motors were conveniently sized to fit in an Estes BT-50. There had been D motors before, but they were 1.125 inch diameter, heavy monsters produced by Coaster and later as Centuri Mini-Max. These motors were notoriously unreliable – it was rumored that as many as half of the batches of Mini-Max E & F motors failed QA and were dumped in the desert. Many of the problems were later traced to the instructions on igniter placement.

In 1968, when I was still in Indiana, another rocket company got my attention – Rocket Development Corporation, 50 miles down the road from me, near Seymour, Indiana. They announced the first composite model rocket motor, the Enerjet 8, which was fairly close to a full sized E motor. The Enerjets were something brand new – durable spun-fiberglass casings and graphite nozzles. They produced a bright flame and almost no smoke, and our local club members shredded more than one rocket learning to handle the power. A friend of mine, Art Hirsch, actually worked for RDC for one summer, helping develop both model rocket and larger, professional versions of the Enerjets – in sizes up to what we would now call a K motor. Around 1970, RDC was acquired by Centuri, and the Enerjet line was significantly expanded, with the introduction of the F67 – the first full-impulse F motor. These were available until about 1975.

There were some other motor manufacturers, less well remembered. Uni-Jet built E and F motors that were never widely distributed, and Propulsion Dynamics (Prodyne) sold some unique motors in the late 60's and early 70's. Prodyne motors were unique in that they had a very predictable shelf life...if they were fired less than 6 months from date of manufacture, they worked great. At 6 months to 1 year, most of them blew out their nozzles. A year-old Prodyne was a guaranteed KABOOM with a split casing. Much later, someone figured out that Prodyne's propellant recipe tended to shrink as it aged, breaking the bond between propellant and casing, with the resulting cracks causing uncontrolled burning. Prodyne owner John Rahkonen was said to have static tested his motors in his home fireplace, directing the nozzle upward.

A bit later on (around 1980), several companies started to produce composite-propellant motors. The first two were Composite Dynamics (founded by Gary Rosenfield, now owner of AeroTech) and Small Sounding Rocket Systems (SSRS) from Seattle, founded by Mark Mayhle, who later became a medical doctor. Each company produced 24 mm and 29 mm E and F motors for several years. SSRS faded away, and Composite Dynamics morphed into AeroTech. I still have several collected motors from each company. The Composite Dynamics motors were low-cost, with ceramic nozzles that eroded badly, and occasional reliability problems. The SSRS motors looked a lot like the Centuri Enerjets, with graphite nozzles and phenolic casings.

The final big changes, which came at about the same time, were the coming of high power motors and reloadable motors. I'm sure everyone is familiar with these...but there's a story you probably don't know – RDC had experimented with reloadable motors as early as 1969-1970. I interviewed RDC founder Irv Wait a few years back, and he showed me his prototypes, of E and F size. Apparently, he submitted them to NAR Standards and Testing, and got a big, fat NO because of the use of metal casings. Too bad; we might have had reloadable motors 15 years sooner.

So that's the story, as I remember it. I am sure I have left out many details; the story of model rocket propulsion is much more extensive than I have time to recall here.

KOSMO

2020 LAUNCH CALENDAR

Events are subject to revision depending
on Covid-19 status



LATEST UPDATES ON OUR CLUB'S EMAIL LIST,
WEBSITE www.kosmo427.org AND FACEBOOK PAGE
(Kansas Organization for SpaceModeling)

SEPTEMBER 12 – FINAL FRONTIER FUN FLY – Ellinwood, Ks. - Lanterman Family Farm – 10am-5pm - BBQ @ noon. 10,000' FAA Waiver – *Alternate weather date September 19*
Please note the launch area is about ½ mile north of our normal launch area.
No sparky motors. Please consider a chute release or other dual deploy for high altitude flights.

OCTOBER 3 – ROCKET-TOBER – Ellinwood, Ks. - Lanterman Family Farm – 10am-5pm
10,000' FAA Waiver – Bring your own lunch – *Alternate weather date October 10*

NOVEMBER 14 – KOSMO SPORT LAUNCH – Hutchinson, Ks. State Fair Grounds
Parking Lot – Presently scheduled for Noon to 4pm.



KOSMO Vice-President Bill Lindsay presents Kaden Eskins with his Jr. Level 1 pin. Kaden was the captain of his TARC team that went to DC in 2019. Congratulations.



Two young men received “fly it and take it” models at our launch in August . Bill made up a batch of models early in the year and these are the latest recipients. Bill does a great job of explaining to the kids how to prep the models and fly safely. On the left is Jaxon Swim, on the right Xander Thomas. They had a great time!