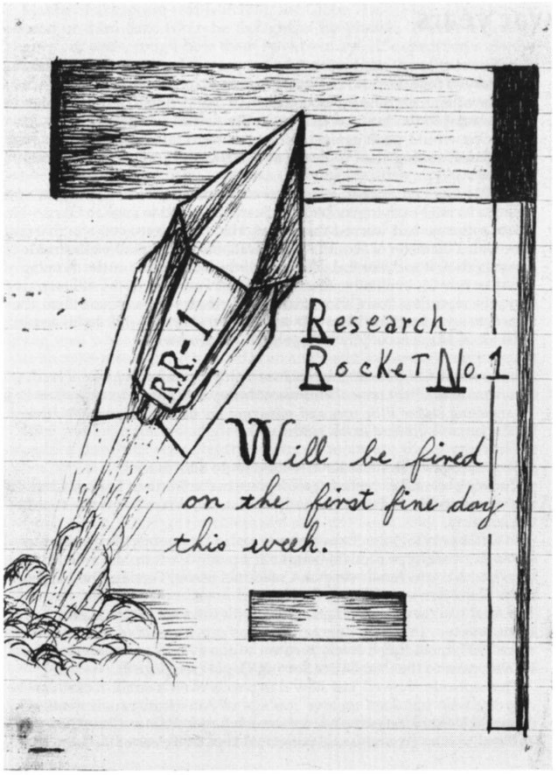
90 years of Paisley's rocketeers

On a chilly November evening exactly 90 years ago, a bunch of schoolkids living in Underwood Road in Paisley launched their first cargo-carrying rocket; from their back garden!

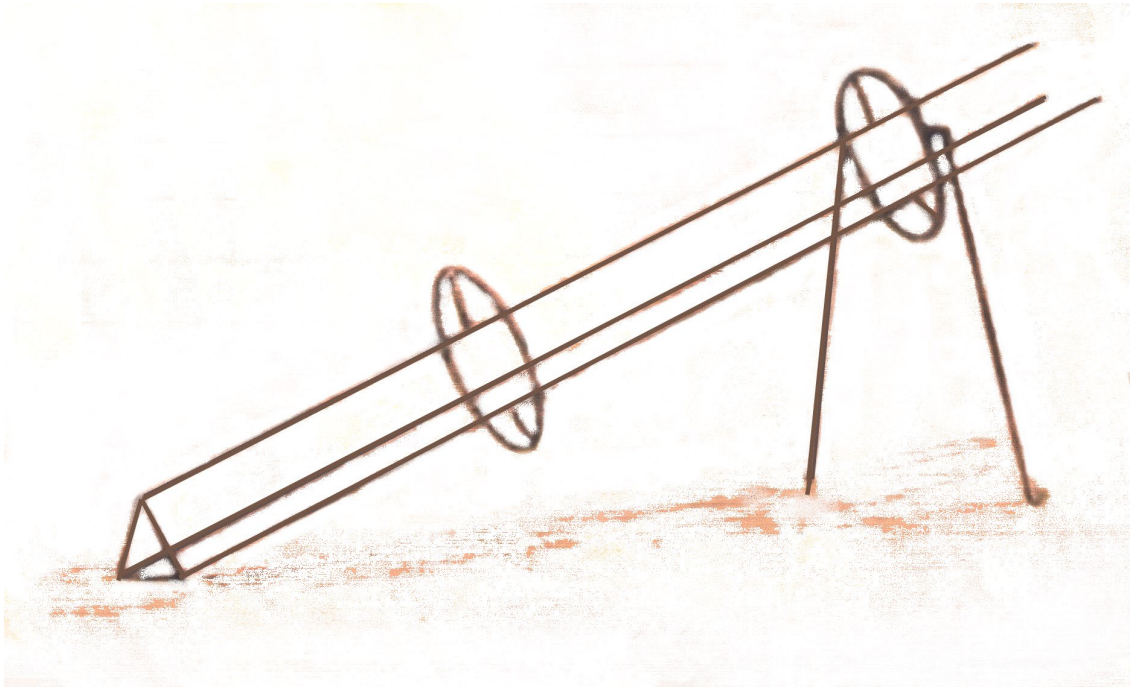


Research Rocket number One looked a modest affair, made from cardboard and sticky-tape, and smaller than a fizzy drinks can.

Looks were deceptive. Its designer John Stewart had filled R.R.-1's hexagonal fuselage almost to capacity with a battery of seven solid-propellant rocket motors. Only the spire-like nosecone was rocketry-free; what we rocket engineers refer to as a respectable 'mass ratio'.

So, it could have reached quite the altitude; sufficient to worry Glasgow airport today, but back in 1935 the airport was yet to exist. There was nothing out there but bog on Linwood Moss, having been underwater in ancient times and soon to be again.

But contrary to modern rocketry, R.R.-1 wasn't designed for altitude. Our young rocketeers had sensibly built a launching rack - the rocketry equivalent of an aircraft's runway - to keep the take-off straight until the tailfins were up to flying speed. This launching rack was angled a mere 30° or so above the horizontal as R.R.-1 was designed as a test-model for a high-speed cargo transporter.



The R.R.-1 launching rack (from John Stewart's notebook).

Back in 1935, the world's fastest aircraft had barely exceeded *half* the speed of sound, so a lot of research was being conducted on behalf of Royal Mail and others toward the practicality of rocket airmail, and even rocket transatlantic passenger flights (a faster Concorde). Our rocketeers were attracted by rocket-airmail, which is why R.R.-1 carried some in its nosecone.

We've learnt the hard way over the years always to divorce our rocketry from our own creations for the sake of life and limb; someone uninvolved has to press the red button, or to tell us to go away and come back when our rocket is less of a shed. Our 1935 nascent rocketeers had no such 3rd party…

They discovered, come launch-day, that R.R.-1 didn't quite fit in their launch-rack. So with typical 'launch-itis' they decided just to stick R.R.-1 on the ground resting on its little fin tips and light the fuse anyway. Mistake number 1.

To be honest, the launch rack was immaterial because R.R.-1 was fatally tail-heavy. Just as an arrow or dart needs sufficient nose-weight to fly straight, so do unguided rockets. And the flights need to be right at the back, whereas R.R.-1's fins ran right up its length to act more as supersonic wings than fins: two of its three fins had deliberately been made wider to see if R.R.-1 could glide somewhat.

We now know that a properly-balanced R.R.-1 would have made a fine 'lifting body' re-entry capsule. Elon Musk's and Geoff Bezos' rival flying circuses now launch enormous rockets with a resemblance to R.R.-1; multiple engines and the same slender lifting fins to help bring it home.

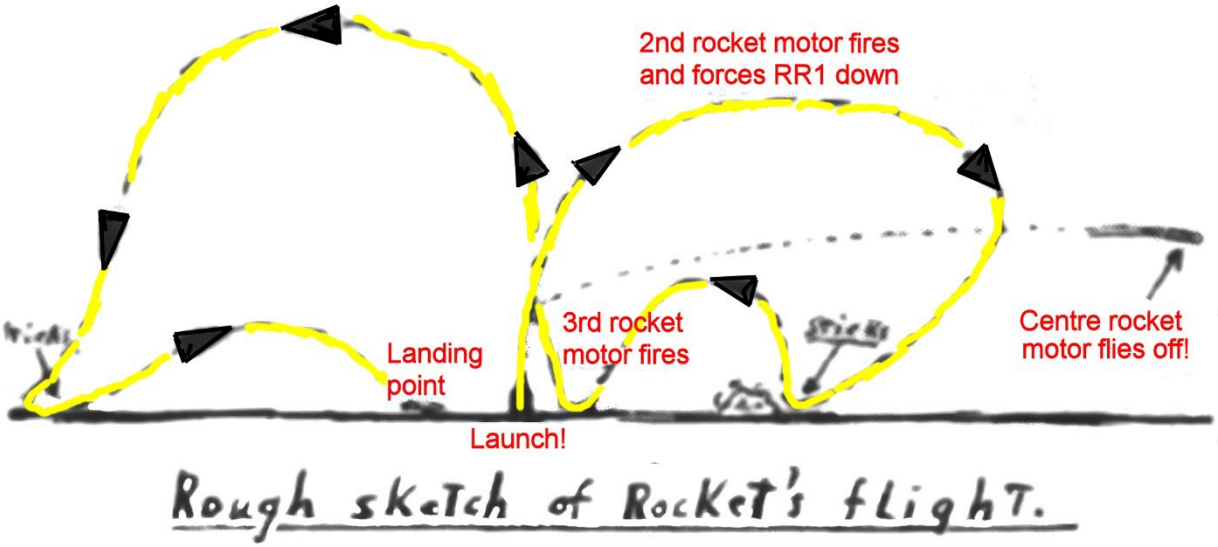
But they have the benefit of powerful computers to ensure split-second synchronicity in the ignition of their multiple engines.

Our schoolboys didn't: each of the seven rocket motors had its own individual stringlike fuse; each taking its own sweet time to burn.

Nowadays, we'd use ultra-quick-burning fuse but our lads couldn't source any, so lit the slow fuses anyway. "It'll be fine." Mistake number 2, and pyrotechnic mayhem ensued!

Inevitably, each rocket motor lit at a different time to the others, causing R.R.-1 to leapfrog back-and-forth across the back green; taking off and landing several times (nine decades pre-Elon) whilst pursuing screaming kids.

When the smoke finally cleared, R.R.-1 was mostly intact (we still have it) but the close call remained seared in the mind; John Stewart sketched the flight thusly:



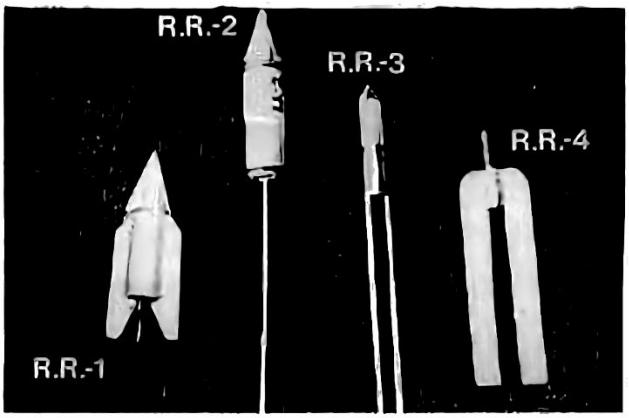
The flight of R.R.-1 from John Stewart's notebook (colourised and annotated).

The original R.R.-1 today. If Paisley Museum is ever finished, it'll reside there.

Many youngsters - and to be sure modern parents - would have called it quits then and there, but John and his friends didn't; they had the tenacity to work through the problems. John confided in me many years later that if R.R.-1 had worked properly, they'd have got bored and moved onto some other hobby.

By the time they officially formed the Paisley Rocketeer's Society just eight weeks later, they were up to R.R.-9 and most of them had worked reliably enough that the Rocketeers then developed their own rocket airmail service; launching letters into each other's back gardens in the nosecones of their rockets, and firing thank-you letters right back! Naughty perhaps, but did Santa bring *your* kids little drones last Christmas?

THE PAISLEY ROCKETEERS



The first four experimental rockets
of the Paisley Rocketeers

Research Rocket No. 1 Seven "Standard" motors, mail in the nose. Unstable. Problem of igniting motors simultaneously.

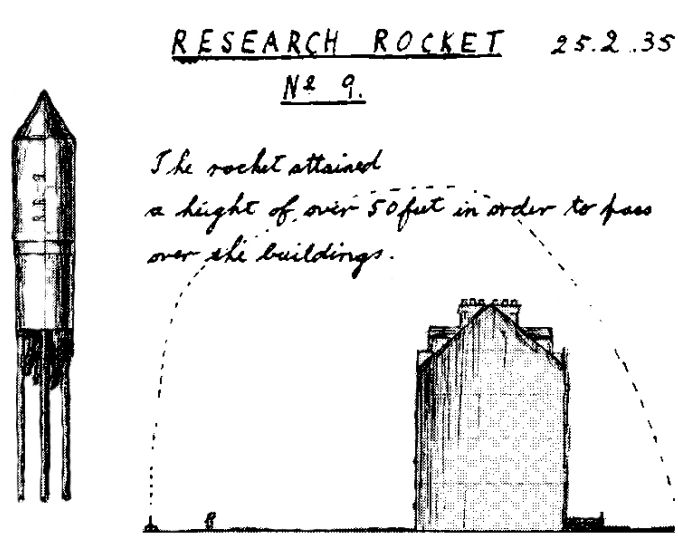
Research Rocket No. 2 Three "Standard" motors. Central stick. Parachute. Partial success, but bulky, heavy construction.

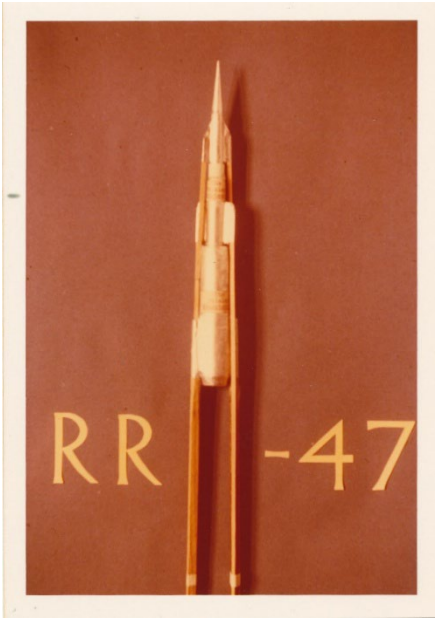
Research Rocket No. 3 One "Standard" motor. Two stabilising sticks. Successful flight.

Research Rocket No. 4 One "Standard" motor. Card fins rather flexible, but successful flight.

John Stewart (top), his brother Peter (bottom left), and the other Rocketeers of 1935

R.R.-5 and R.R.-8 were launched where Ferguslie cricket ground is now; Rocket airmail R.R.-9 launched from the same garden as R.R.-1, soaring over the tenements to land, ironically, where the Underwood Road Royal Mail sorting office is now.



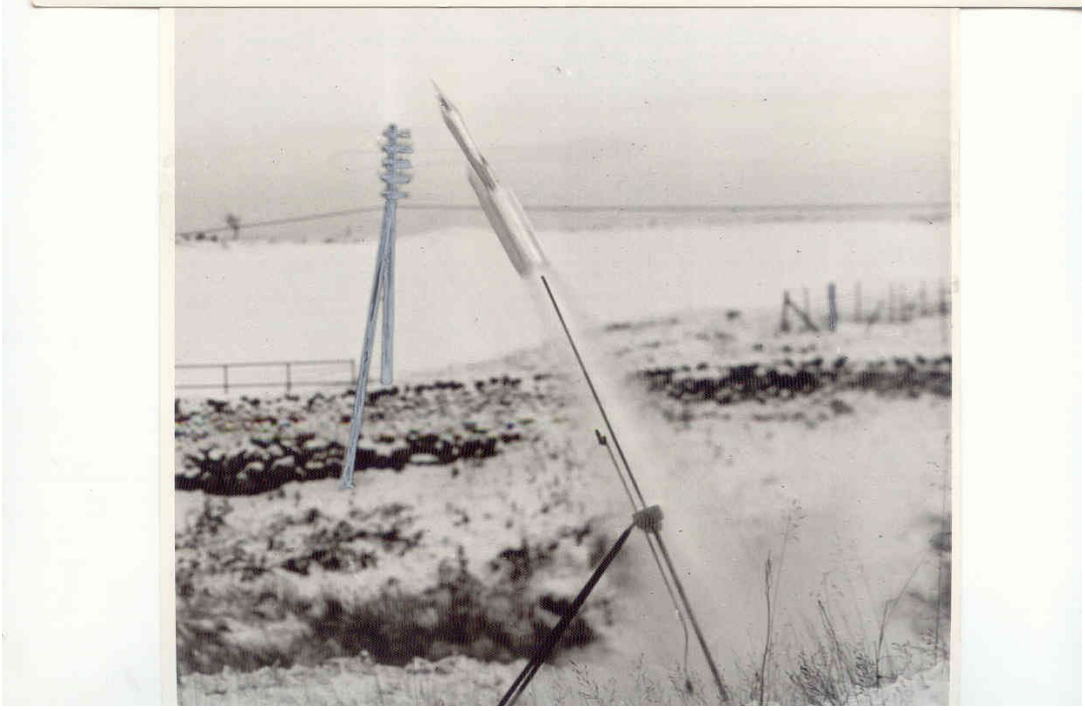


R.R.-47 was launched at St. James's Park on Hogmanay 1937. A successful launch of one of the world's first 3-stage rockets, its 3rd stage shot off way to the North.

Back then, there was no M8 motorway, no flyover, and no ‘Glasgow’ airport. Stages 1 and 2 were recovered, but stage 3 is still out there to perplex future archaeologists.

Encroaching adult life began to retard the rocketry, and then WW2 stopped pacifistic rocketry altogether.

Come November 1965, the Paisley Rocketeers Society was resurrected, launching R.R.-69 beside the Gleniffer Braes carpark (in the sky) to celebrate the 40th anniversary of R.R.-1’s infamous flight.



I joined the Paisley Rocketeers as a kid in 1984, and now I'm a rocketry consultant. R.R.-1 has outlived the original rocketeers (who were hale and hearty well into their 90's) but Scottish rocketry goes ever onward and upwards.

Increasingly-busier airspace has forced rocketry out of Paisley and we now fly near Largs courtesy of the Scottish Aeronautics and Rocketry Association (https://sara.rocketry.org.uk)

We Paisley Rocketeers still have a wont to commemorate the launch of R.R.-1 with a bit of pyrotechnic reenactment. In November 1985, we aided and abetted the now elderly John Stewart to fire a water rocket from his old back garden to demonstrate the flightpath that R.R.-1 was supposed to, but didn't. Where it landed there's now an allotment with lots of fragile glassware so we won't be doing that again!

Back at the back garden, 1985 with John Stewart (right)

In November 2015 we decanted back to the Gleniffer Braes, firing a variety of rockets including John Bonsor's water rocket version of R.R.-1.

John Bonsor of SARA with Peter Stewart (right).

Your humble scribe getting a cold shower

For this year's 90th anniversary, I 3D-printed an exact scale replica of R.R.-1 (how the original Rocketeers would have absolutely loved a 3D printer!)

Its first test flight last Sunday was as ignominious as the original, because its single supposedly-reliable modern rocket motor exploded on takeoff, blowing the nosecone off-course into a freezing stream. We'd scattered John Stewart's ashes at this launch site years ago (by rocket, naturally) and I swear I could hear him chuckling.

Definitively burning the candle at both ends:

As I write this on the 90th anniversary, it's absolutely persisting it down outside, and blowing a hoolie; the typical Paisley November weather that delayed the launch of the original.

I'll try again tomorrow if there's a break in the gloom.

The Paisley Rocketeers were not the first Scottish rocketry group – there was one in Glasgow that vanished to history and is another story. But the Paisley Rocketeers' legacy was the creation of an unbroken fellowship of Scottish rocketeers, some of whom are now heavily involved in commercial satellite launching around the world including one day - with a bit of luck – Scotland.

Rick Newlands.