

THE AERO-TRIKE: A UNIQUE VEHICLE DEDICATED TO THE MEMORY OF DON NELSON

A pictorial history of a very weird design concept by
Niels Nielsen, Jeff Munsey and their like-minded friends

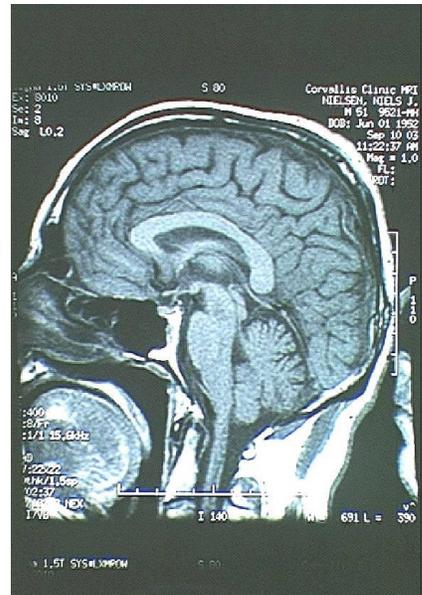
NOTE: A project this unusual never follows a linear path. In summarizing it here we have taken the liberty of omitting the dead ends and rearranging the chronology of events to make it a little more comprehensible, if such a thing is possible...But it is important to remember that while we were actually doing this, we had very little idea where things would lead, which is one reason it was so much fun.

Our story starts in the spring of 2003, when Niels decided that it was time for his belated mid-life crisis. "I purchased a nice big motorcycle to ride south on for this purpose: a beautiful old Yamaha XV-920 in almost perfect condition with less than 4000 miles on it, shown on the right. I added the Krauser hard bags and as the weather got warmer, I prepared to hit the road and face my fate. There was only one minor problem standing in my way: I couldn't keep the bike stable in turns, especially if the horizon was not visible. Not a good thing if you are hanging onto something that weighs 500 lbs and goes 90 MPH."



After a lengthy series of tests, his doctors determined that the part of his right ear that does balance and equilibrium tasks was not working, and that he has been running on a half system (left ear only) for who-knows-how-long. "My friends and co-workers had been telling me for years that I was unbalanced, but now it was medically verified..." A vitamin B12 deficiency did not help things either. A series of shots cured that but there was no cure for the problem in his right ear. So he went home with one of the MRI headscans that they did on him during the testing, which he used to prove to his co-workers that he does in fact have a brain. We reproduce it for you here.

After this, Niels sold the motorcycle. When he told his co-worker Jeff Munsey why, Jeff suggested that what he really needed was not to abandon motorcycling, but instead to get another wheel under him so his impaired balance system would not be required to navigate turns. What Jeff was telling him was that he needed a TRIKE. And Jeff knew how to build it.



The important point here was the idea of BUILDING a trike. A person could of course buy a three-wheeled motorcycle; they have been on the market for years as kits, in both two-wheels-in-back form and two-wheels-in-front form. Some are quite jazzy, as the photo here shows, but they cost as much as a car. Jeff and Niels, being cheap, do-it-yourself guys, knew this was not what they wanted.



Niels and Jeff entered into a pact to construct a trike, under the following terms. Jeff's wife needed a vehicle of some sort to run about their neighborhood in, to keep tabs on her folks who live nearby. By sheer coincidence, Niels had in his garage a derelict electric car called a SEBRING CITICAR which he was planning on restoring, but which his teen-aged kids refused to be seen in. The photo of it on the right should give you some idea why. Niels offered it to Jeff in return for the design and construction of a subframe for the trike project. Jeff agreed, and soon showed up at Niels' place with his trailer and hauled the Citicar away.



At this point Niels started looking for ideas about how to design a three-wheeled motorcycle from scratch and discovered that Don Nelson, the husband of Carol Nelson (his daughter's piano teacher) had a wealth of documentation on the classic British three-wheeled sports car, the MORGAN. He loaned the whole lot to Niels to study and encouraged him to actually try building one. Not long afterwards, Don passed away very suddenly. Having resolved to follow his advice, Niels decided to go ahead with the trike project and to dedicate its construction to his memory.



Niels knew that he wanted the two wheels in front, like the Morgans shown above that Don had educated him about. Jeff recommended using a VW front end and started looking for a suitable example. Regarding the bodywork, Jeff and Niels knew it had to look as cool and radical as possible. One option was to do up the bodywork to look like an airplane of some sort. General Motors did this in 1954 with a show car modeled after a jet fighter, shown here. Note that the two pilots seem to be positively impressed with this idea!



Here is when the proverbial light bulb went on: Niels knew another friend of his, Tom Hammer, had in his barn the remains of a home built, ultrahigh-performance airplane which he constructed and then crashed many years ago. The fuselage was really the only part that was more or less intact, and Niels knew that the chances that Tom would ever get the thing back in the air were pretty low. It would serve as an extremely wild cockpit for the trike! After a moderate amount of arm-twisting, Tom agreed to donate it to the cause, and after he pulled everything off it that could be sold on Ebay, Jeff and Niels came over with Jeff's trailer and hauled the remains over to Niels' house.

Scrounging the fuselage from the barn it sat in for the last 20 years.



Fuselage builder and donor Tom Hammer (l) and chief mechanic Jeff Munsey (r) load it on Jeff's trailer.



Niels put some temporary wheels on it so it could be moved around easily and fabricated a foam plug to fit into the hole left when the canard wing came off. Here you see the fuselage on its "landing gear", with the foam plug in place before it was covered with fiberglass. Also visible are a rear-view mirror on the right side and a pair of Harley-Davidson turn signals, which Niels attached to the sides of the fuselage as a test.

Meanwhile, Stasi Valliancourt heard about the project and directed Niels to a website devoted to RATBIKES, which loosely defined are motorcycles that have been rescued from rust and oblivion and given a new lease on life with a fresh coat of camo paint and various types of skull-and-crossbone detailing, preferably at zero cost using salvaged and scrounged materials. This inspired Niels to come up with a MUCH cooler arrangement for the turn signals and a whole new vibe for the project in general. Jeff and Niels were now building a RAT TRIKE with a *specific mission*. But more on this later...



Here is another shot of the fuselage with the canopy open. You can see the firewall to which the engine of the plane was once mounted, facing backwards and turning a pusher prop. Note the skateboard borrowed from Niels' son Henrik to use as the nosewheel...



Lubomir Pospisil got wind of the budding trike project and allowed as to how he had a derelict Yamaha XV-1000 Virago motorcycle lying around his place. He had originally bought the bike for parts to restore another Virago and after pulling the carbs off it, he stashed it in his barn under a sheet of plastic where it sat for a couple of years. Lubik told Niels and Jeff that if they could get it out of the barn, it would be theirs to use on the trike project. They jumped at the chance: Jeff was confident that he would be able to get the thing running and Niels was sure that it would furnish a perfect power plant and drive train for the trike. So they drove over to Lubik's barn, muscled out the Virago carcass, scraped most of the mold off it and hauled it away on Jeff's trailer. Here it is in Jeff's shop, stripped of forks and all extraneous hardware.



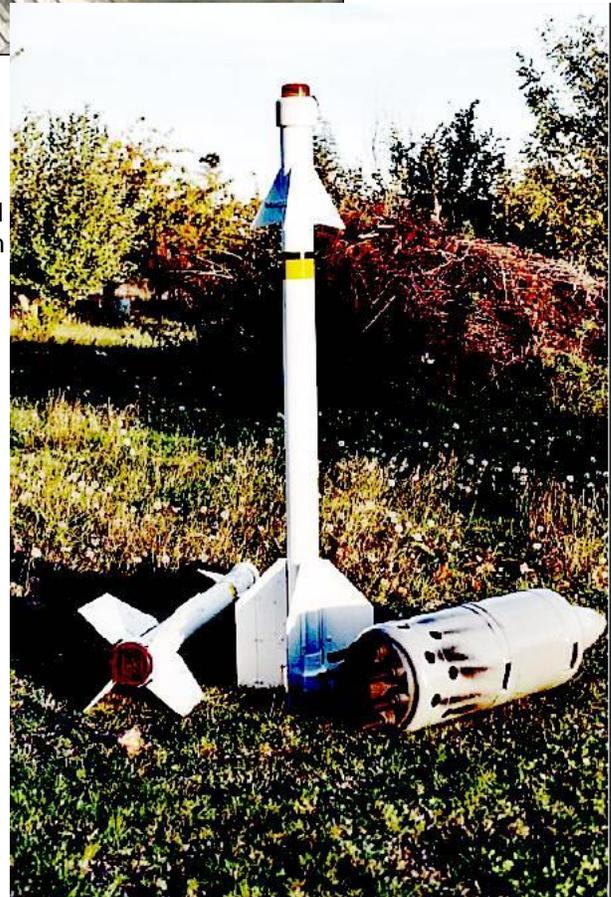
Jeff welded up a single-carb intake manifold for it in a jiffy. He left it over-long so it could be trimmed down for length after he located the right carb for it. Niels then bought a single S&S carb originally made for a Harley, that would be more or less suitable for the 1000cc Virago. At \$75, it was the single most expensive purchase they made for the project.



Inspired by the RATBIKE website, Niels got busy building two half-scale (5 feet long) Sidewinder air-to-air missile replicas to mount on the tips of the wing stubs, where the wing attach points were on the fuselage. In the nose of each (where the infrared sensor window would be) he put the front-facing turn signal. The rear-facing turn signal is mounted in the tail, where the rocket nozzle would have been.

For good measure, he also built a replica of an 8-barrel 20mm rotary cannon in an underwing pod mount, which is shown here lying on the grass of my back yard next to the Sidewinder replicas.

Why the heavy armaments? Because the mission of the Aero-Trike (as Jeff had dubbed the project) would be to clear the road of gas-sucking Winnebagos and Hummers, and you need pretty heavy stuff to take those mammoths out especially if they have the optional armor plating and bullet-proof glass.



With the fuselage in his garage instead of the Sebring Citicar, Niels started revising the cockpit. Here is a close-up of his first cockpit mockup with a new instrument panel and yoke. He replaced

the original side stick control with a military-style handle from a computer game joystick, to see if the switches in it would be useful. He also mounted a green transmission neutral light in the top of it. The rate-of-climb and altimeter gauges are functional but the ILS crosshairs, turn coordinator and gyro horizon are not. The RPM gauge will be splined to the speedo drive on the left wheel of the VW front end. The airspeed indicator between the pilot's knees will be driven by a wind-powered AC generator in the slipstream.



Here Niels tries out the cockpit for size. It will be a tight fit. In this layout, He is considering a telescoping steering column so the yoke can be pushed forward out of the way for entry and exit.



Another shot of the cockpit. Here, the side stick is being considered for use as the remote clutch and shifter control for the motorcycle transmission. Niels is testing it for clearance with the yoke in a comfortable driving position. These shots were taken by Warren Chism, who volunteered to help document the project with his digital camera.



With the motorcycle stripped down and ready, Jeff hauled the fuselage back to his shop for the first take on a cut and fit job. The basic idea was to cut the floor out of the passenger compartment and slide as much of the motorcycle in as possible with main box girder running across the firewall sitting down onto the bike frame just ahead of the rear wheel. Here's Jeff with his Sawz-All, getting ready to start carving up the "Thanksgiving Turkey".



Here Jeff has parted off the nose cone that contains a 35 pound lead counterweight which was used to get the proper weight distribution when this was still an airplane. Note that one of the rudder pedals, destined to become the gas pedal, is visible inside the fuselage. The opening that the Sawz-All is resting on is the attach pad for the canard wing, with the foam plug removed. The lead went to Lubik, for use in casting sinkers for deep sea fishing.



Jeff stood the fuselage on its tail and cut out the floor of the passenger compartment to clear the motorcycle, which by the way can be seen sitting in the background.



With the floor gone, the motorcycle now slips into the passenger compartment...



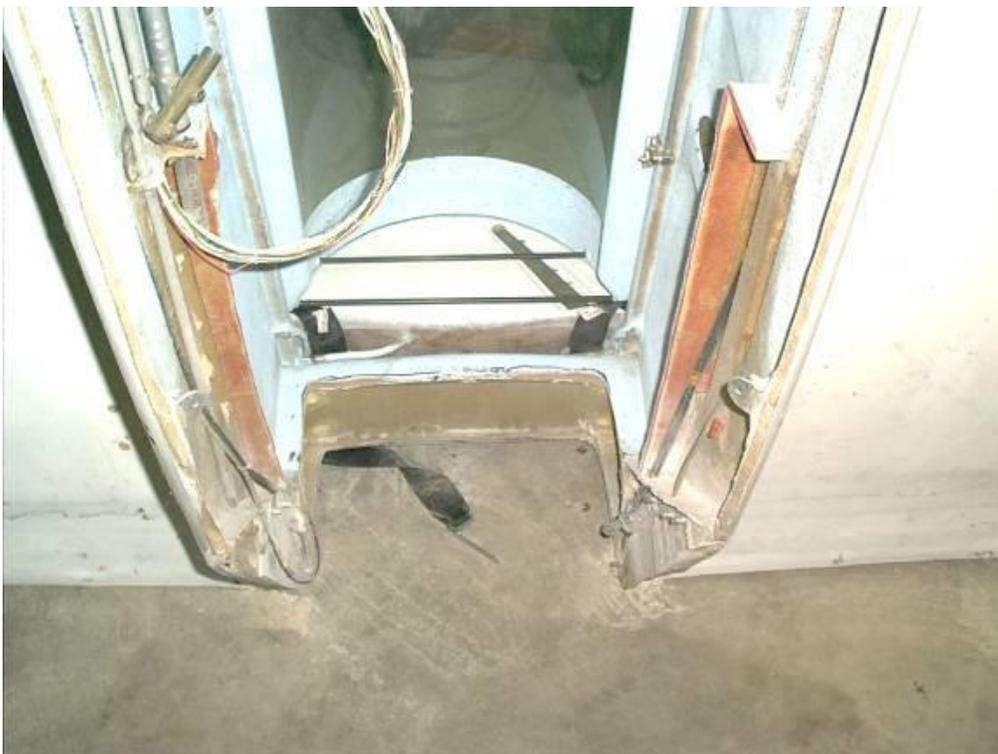
...with the fork bearing right behind the pilot's headrest...



and just the rear wheel of the Virago showing out the back. Note how much of the firewall Jeff has cut away, to get the proper ride height.



Here is a view looking up through the hole in the bottom of the fuselage where the floor of the passenger compartment used to be. This view is toward the firewall at the rear. You can see how deeply Jeff has cut away the firewall to fit the motorcycle. The wire bundle on the left is the original wiring harness from when this was an airplane.



Here is an unusual view of the fuselage in its carved-up condition. The nose cone is gone and Jeff has cleanly dressed away the rear of the opening at an angle under the stub wing to enhance airflow over the engine. The plan calls for F-14-style scoops just under the leading edge of the stub wing to convey ram air in sideways over the engine cylinders. Electric radiator fans will be mounted inside each scoop to force extra air over the engine when stopped and at low speeds. At this point the rear portion of the plexiglas canopy that will now cover the motorcycle is still clear. The plan is to paint the part of it aft of the pilot's headrest to match the fuselage.



Here is Niels with the “armaments” in Jeff’s shop, trying them out for size and fit. First, the rotary cannon...



...then the Sidewinder missile replica. Jeff and Niels are having a VERY GOOD TIME.



Here Jeff has mocked up the frame using the VW front end and some 2" heavy wall steel tube.



Here Jeff and Niels have hoisted the fuselage shell off the motorcycle and positioned it on top of the frame tubes to check out where the steering box would need to be located.



Jeff connected the VW front end and the Virago frame together with the steel tubes, and after getting the brake drums unstuck, he put the rolling frame back on his trailer and delivered it to Niels' garage for electrical work.

The next photo shows the project on display at the annual Ride Your Motorcycle To Work Day at the HP parking lot in Corvallis, where Niels and Jeff work.

