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Maker Faire 2009: Cupcake and Snail Art Cars, Solar-Electric Chariots, Recliner-Chair Runabouts and Steampunk Vehicles

Steve Leibson, Contributing Editor -- Design News, June 1, 2009

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The 2009 Maker Fair attracted a big crowd to the San Mateo County Fairgrounds in the San Francisco Bay area. Billed by its creator *Make* magazine as the world's largest DIY event, the Maker Faire is an engineer's dream venue. Tens of thousands of people listened to speakers discuss constructive creativity from huge stages or watched from bleachers as robotic model warships trundled around a manmade pond and fired at each other with deadly intent. But many people were very busy creating ... something.

In one building, young children assembled foot-long model rockets, decorated them and then took turns firing off their new creations from a large launch complex set up in an adjacent parking lot. Next door, parents helped their young children reduce mountains of discarded electronic equipment into component parts, which they then reassembled into fanciful creations using glue, bolts and screws. In a third building, robots competed for prizes. In a fourth, crowds of people from all age groups labored over sewing machines to create new clothes from old. In short, the 2009 Maker Faire was a heavily attended, chaotic mashup of unbridled creativity.

Rampant creativity was abundantly apparent in the oddball collection of strange and unusual vehicles that either toiled around the fairgrounds or sat on display. The diverse set of vehicles ranged from electric-powered cupcake/muffin art cars and a mobile recliner chair that silently scooted amongst the Faire goes to an exquisitely executed fire-snorting Snail Car with a beautifully hand-crafted body on a 1967 VW bug chassis. Throughout the day, a solar-powered electric chariot pulled by a roller skating robot wearing a rubber mask of Barack Obama silently sailed through the thick crowds. Finally, there were otherworldly steampunk vehicles to look at and to ride.

With a Blueberry on Top

The **cupcake and muffin cars** are the brainchildren of Lisa Pongrace and Greg Solberg, who originally developed the concept for the Burning Man event in 2004. The electric vehicles employ 24V motors and deep-cycle marine batteries. They can go as fast as 15 mph. Each car is just large enough to hold one person, with the person's head sticking up through the cupcake or muffin top. The wheels are not apparent on the low-slung vehicles so they look more like air-cushion or anti-gravity vehicles. The cars' cupcake-tin body is formed from accordion-folded 26-gauge galvanized sheet steel and the cupcake or muffin top is made from chicken wire, batting and fabric. The cars cost \$500 to \$1500 to make and there are currently about 16 of them. Many are stored at a "secret" facility in Berkeley, CA. Pongrace's car is styled as a blueberry muffin and she scoots around in it wearing a large fabric blueberry for a hat.

Meanwhile, mechanical engineer Lyn Gomes piloted her electric recliner chair through the crowd using the tail of a stuffed-toy lap cat as a joystick. Gomes built the mobile recliner around an electric wheelchair and she looked quite relaxed as she glided through the crowd. When she's not running about in her roaming recliner, Gomes is an HVAC engineer and lives in Walnut Creek, CA.

Ess-Car-Go?

Oakland blacksmith, metal fabricator and sculptor Jon Sarriguarte took an inexperienced team of metal workers and built the **Snail Art Car** but the concept didn't originate with Sarriguarte. It was his wife's idea. "We were driving in the desert," he said, "and she said she wanted a snail car." The original idea was to create the car's body in fiberglass but one morning at breakfast, the project suddenly gelled in Sarriguarte's mind and he quickly drew the concept for a riveted and welded metal snail body on a napkin. Then he bought a partially restored 1967 VW bug from a seller on Craigslist for \$400; he sold the body for \$200 and he ended up with a low-priced, fully functional chassis and drive train for the Snail Art Car.

Sarriguarte assembled a team of eager students who wanted to learn about metal working but had little experience. To train them, "I had to make rules for them," he says. For example, there was a rivet rule that allowed a student to figure out where to place a rivet without needing to ask the teacher. There was a "golden mean rule" that governed the symmetry of the project. In all, it took the team three months to complete the Snail Art Car, which is street legal and sports an official California license plate. Like the cupcake/muffin cars, the Snail Art Car has also made the pilgrimage to the Burning Man event.

Machinist Bob Schneeweis developed the idea for a solar-powered electric chariot pulled by an anthropomorphic roller-skating robot a few years ago. An electric motor drives the chariot's robotic legs through cams. The robot smoothly skates from one foot to the other and the movement silently

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propels the chariot forward. At last year's Maker Faire, the robot sported a rubber face mask of California Governor Arnold Schwarzenegger and the robot held a globe of the world in its arms. A [YouTube video](#) shows the robot dressed as former President George W. Bush in a Roman Legionnaire's costume. This year, the robot wears a President Barack Obama mask and holds an American flag. Schneeveis lives in Palo Alto, CA and has been building electric vehicles for 30 years.

Four friends in Santa Rosa, CA – David Farish, Dan Kirby, Skye Barnett and Clifford Hill – built the Hennepin Crawler, a human-powered, four-person steampunk vehicle. Two of the four people involved with the Hennepin Crawler appeared at this year's Maker Faire in steampunk attire. Haven't heard of steampunk? Steampunkers are fascinated with Victorian dress, steam power, gears and ornate brass trim.

Steampunk traces its roots to the stories of Jules Verne, Mark Twain and Mary Shelly but the subgenre exploded in 1990 after the publication of *The Difference Engine*, which describes a world with an alternate history where coal-fired steam power and elaborate geared mechanical transmissions run everything from communications to computers and hackers are called "clackers." Essentially, the book asks "What if Babbage had succeeded in creating all-mechanical computers and electronics had never evolved?" (Watch the 1999 movie remake of the TV series *Wild Wild West* for a fun, fast look at steampunk.)

Built for Burning Man

The **Hennepin Crawler** was purpose-built for the Burning Man event. "We went to Burning Man," says Hill, "and saw people with big, cool things. We wanted one but couldn't afford to buy one, so we built one." A carport served as the assembly area and the project team used nothing more than a bucket of hand tools, two grinders and an MIG welder to assemble the vehicle. "It's surprisingly easy to MIG weld," says Hill. It took the quartet about 250 person-hours to fabricate the Crawler using discarded or recycled parts from various pieces of lawn furniture, a free-standing hammock frame and a porch swing. Each of the four seated riders provides motive power to the Crawler's rear axle through an independently geared bicycle pedal crank and chain.

One of the most prominent features of the Hennepin Crawler is its unique wheel design. Each of the Crawler's wheels consists of a central metal hub made from a conventional "Hyundai or Ford Escort" steel rim. "We stole those from somebody," quips Hill. The outer wheel was made from a short section of 48-inch plastic culvert pipe. Roughly 200 steel aviation cables plus eye bolts, washers and crimp rings link each wheel's inner and outer rims for a total of about 900 parts per wheel. The wheel treads consist of mountain-bike tires that have been filleted and riveted to the culvert pipe sections. "Each wheel [assembly] took about a case of beer," says Hill. "They're not exactly true, but they're close enough." The fabrication exercise was obviously worth the effort because the Hennepin Crawler drew large, admiring crowds wherever it went throughout this year's Maker Faire.

While waiting on the Caltrain platform for my return to San Jose, I spied a dad with two kids: a brother and sister who looked like they were perhaps 9 and 8 years old respectively. Each child held a foot-long purple rocket with an expended rocket engine still in place. The girl's rocket had lost one of its four stabilizer fins, probably from a bad landing in the parking lot after its inaugural flight. It didn't matter. She wasn't letting it out of her tight grasp. She'd made something herself. She'd launched it herself. It streaked into the sky and returned to earth. Now she was taking it home. In just a few short hours, that little girl learned about the power and thrill of making something spectacular and then using it. She'd touched the exquisite creative joy that sits at the core of engineering just as the vehicle developers at the Maker Faire surely have. You could see it in the way she held her rocket. She now had bragging rights. I suspect that the family I saw on the train platform will return to the 2010 Maker Faire. Let's hope there's a cupcake car or an electric reclining-chair runabout or a fire-snorting snail car in that young lady's future.



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