

# Entrepreneur giving shuttle truss new uses

May 15 2013, by Steven Siceloff

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Jim Fletcher packs the prototype solar power generator inside the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida. Credit: NASA

(Phys.org) —A truss design devised to help workers process space shuttles continues to find new uses as a space shuttle engineer-turned-entrepreneur adapts it to everything from a solar-powered electric generator to a mobile cellphone tower.

The structure, which is constantly being redesigned into smaller packages that unfold to larger sizes, is also envisioned for Mars or other

space destinations where it could be deployed to connect modules for astronauts.

Jim Fletcher, who worked for United Space Alliance during the [space shuttle](#) era, began working on the truss 10 years ago and started a company two years ago called CPI Technologies dedicated to produce them. The design began life as an extendable work platform that would reach over the shuttle's cargo bay.

"We were trying to come up with a way to reach out and retrieve something while the shuttle was out at the pad so we wouldn't have to roll it back to the [Vehicle Assembly Building \(VAB\)](#)," Fletcher said.

Engineers built a truss that ultimately was put to use in the Orbiter Processing Facility spanning the cargo bay.

From there, Fletcher built a portable solar-powered electric generator that stretched two pair of 21-foot-long trusses out from the center, complete with solar panels that locked into the top. He demonstrated the concept by deploying the prototype in the VAB parking lot where it generated enough electricity to power a house, except the air conditioning.

Fletcher returned to the VAB recently, where the truss has been stored, to collect NASA's prototype for demonstrations at the Florida Solar Energy Center's building in Cocoa. The FSEC and Space Coast Energy Consortium have been working closely with Fletcher since the prototype is a [power generator](#) using a clean and [renewable resource](#). The prototype will be made into a fully operational model and returned to NASA.

Since the first model was made, Fletcher has built a few more advanced versions that open longer and wider and produce more electricity while

taking up no more folded space than the original.



The solar power generator prototype was unfolded in the Vehicle Assembly Building parking lot in 2011. Since then, the design has been modified to make a larger array set that folds up into the same amount of space. Credit: NASA

"You'd have a 16-foot array on a trailer the same size as this," Fletcher said. "It can produce 10 kilowatts of peak power."

Part of Fletcher's adjustments to the design include making the individual sections, or bays, of the truss able to unfold independent of the other sections so the truss can be varied in its size. The original design, in which all the truss sections had to be unfolded before any could lock in, met a standard requirement for space.

"In space, it's a good thing because you can use one mechanism to

deploy the whole thing. On the ground, it's not necessarily an advantage," Fletcher said. "The new design makes it easier to deploy in a rough environment."

Thanks to interest from India and South Africa, Fletcher is looking to take the truss vertical. Extending 100 feet up from a six-foot-high box, the truss is strong enough to hold cell phone equipment and the solar panels to power them.

As the Earth-bound business takes shape, Fletcher has not given up on putting the concept to work in orbit or on other worlds.

"We had in mind all along deploying this thing in space, or at least a one-sixth or one-third gravity environment," Fletcher said.

With robust connections, a strong frame and the flexibility to deploy it in different ways, Fletcher said the truss is a good fit for NASA's exploration plans. The mechanism could serve as the basis for an unfolding crew module in [space](#), for example, or a frame for a small base on Mars.

At the moment, though, Fletcher and the consortium are working the business through the early stages of growth.

"It's been a good experience, it's really challenging," Fletcher said. "We're doing pretty good."

Provided by NASA

Citation: Entrepreneur giving shuttle truss new uses (2013, May 15) retrieved 23 April 2024 from <https://phys.org/news/2013-05-entrepreneur-shuttle-truss.html>

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