NASA 'e-mails' a wrench to space for the first time

By Rachel Feltman | WASHINGTON POST DECEMBER 23, 2014

WASHINGTON — Now that the International Space Station has a 3-D printer, engineers can design tools on the ground and then beam them up to space.

NASA made a tool in space last week in response to a request by space station commander Barry Wilmore for a ratcheting socket wrench.

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Made in Space Inc. shipped a 3-D printer to the astronauts at the space station in September. Two months later, the printer turned out its first object — a replacement part for itself.

But this is the first time it has printed a specially designed tool on-demand, which is exactly the kind of work its designers hoped it would do.

"The socket wrench we just manufactured is the first object we designed on the ground and sent digitally to space, on the fly," Made in Space founder Mike Chen wrote on Medium. "This is the first time we've ever 'e-mailed' hardware to space."

Until now, the kind of request made by Wilmore would take months to fulfill because he would have had to wait for the next mission to the space station to carry the tool up.

Instead, Chen and his team designed the wrench for printing, then sent the design up to the space station by way of NASA.

"Because it's a lot faster to send digital data to space than it is to send physical objects, it makes more sense to 3D-print things in space, when we can," Chen wrote.

The technology could also be a lifesaver: During the infamous Apollo 13 mission, astronauts were forced to build carbon dioxide scrubbers from materials they had on hand.

With the lunar module's clean oxygen running out, engineers on the ground raced to design a makeshift solution and relay building instructions to the astronauts on board. With the 3-D printer, the astronauts could create custom-designed pieces to serve the purpose.

This quick and cheap delivery will become more useful when astronauts venture beyond the planet's orbit.

"When we do set up the first human colonies on the moon, Mars and beyond, we won't use rockets to bring along everything we need," Chen wrote. "We'll build what we need there, when we need it."