ONE "SMALL STEP" TOWARDS MARS?

In the June issue of our sister publication — *Power Transmission Engineering* — the Power Play feature (Destination Mars! — pg. 64) was devoted to NASA's Mars-oriented LDSD (Low Density Supersonic Decelerator) project. The mission: "Advance the technology of decelerating large payloads traveling at supersonic speeds in thin atmospheres (read *Mars*) to a new level of performance" for Mars landings.

(A brief re-cap of the Power Play article: To colonize Mars — indeed, we're — some of us — going — ships bearing much heavier payloads will be needed, making landing in the Red Planet's extremely thin atmosphere a dicey proposition. The LDSD project is being developed to solve that problem.)

Unfortunately, the test flight scheduled for mid-June was scrubbed. "NASA did not conduct the flight test of the agency's Low-Density Supersonic Decelerator (LDSD) during its designated launch" window, which closed June 14 due to continuing, "unfavorable weather conditions," said a NASA press release.

But Addendum is here to bring you the rest of the space saga — *and* a happy — if not perfect — ending to this early installment in achieving manned flights to Mars. This is much more ambitious than the Moon Walks, circa 1969. Different how, you wonder? Well, there are people — maybe you know some — who actually *want to live and stay on Mars* — and they don't even belong to a cult. Why the Red Planet? Scientists say after Earth, Mars is the most habitable planet in our solar system (*marsone.com*).

So having another go at it, NASA on June 28 launched the LDSD craft from Hawaii. Reports say the first part of the test went well, but the LDSD's mammoth parachute did not deploy properly.

Nevertheless, NASA and the LDSD team are satisfied with their progress. "Progress" in this project includes reaching goals such as developing and testing the biggest supersonic chute ever flown — and two saucer-like devices called Supersonic Inflatable Aerodynamic Decelerators (SIADs).

"We are thrilled about yesterday's test," said Mark Adler, LDSD project manager at NASA's Jet Propulsion Laboratory (JPLP) in Pasadena, California. "The test vehicle worked beautifully, and we met all of our flight objectives. We have recovered all the vehicle hardware and data recorders."

Both SIADS (due to their shape, the press can't resist referring to them as "flying saucers") are built to fit around the rim of atmospheric entry vehicles like the one that carried NASA's Mars Rover Curiosity in 2012, slowing them down by increasing their drag.

During Saturday's test a huge helium balloon carried the 7,000 lb. test vehicle — equipped with the big chute and the 20-foot SIAD — up to an altitude of 23 miles.

After the balloon and its load soared to roughly 23 miles high, the balloon released the vehicle and dropped to Earth, the cue for a rocket attached to the saucer to fire. The rocket propelled the saucer to four times the speed of sound, duplicating the rapid clip of a spacecraft bound for Mars. The saucer's inflatable ring, made of Kevlar, popped up, expanding to some three feet high in a fraction of a second; the ring is designed to brake the vehicle as it speeds through the atmosphere.

The balloon was to drop the craft at that point, and its onboard rocket motor to kick in — boosting it to Mach 4 (four times the speed of sound) and 34 miles up (55 km) — if all went as planned.

If the test had gone perfectly, the SIAD was to have inflated and thus slowed the test vehicle down to Mach 2.5, at which point the chute would deploy and take the craft down to a soft splashdown in the Pacific Ocean.

Instead, it's back to the drawing board

As the balloon released the test vehicle, the rocket appeared to fire properly. The SIAD seemed to inflate on cue, but the collected data later indicated that the parachute didn't deploy as planned; more information will be made available later.

Existing technology like the sky crane (used to deliver the Mars Rover to the planet's surface) can (and probably will) be used again to let payloads down on Mars. But new gear such as bigger chutes and SIADs will be used to slow down extreme payloads enough for the sky crane to finish the job.

"With the science and the technologies that we're testing here, we think we could double the (payload) that we land on Mars (up to two tons)," said principal investigator Ian Clark of JPLP, adding that the gear could also help put payloads down more accurately and at higher elevations on the Red Planet than is currently possible.

What's more, with the new technology now being tested, the successful use of multiple parachutes could mean even spacecraft of 20 to 30 tons could make a soft Mars landing, Clark said.

So if you're thinking of signing up, you'd best hurry as spots are filling up fast if internet reports are any indication. There are various for-profit outfits more than willing to take your money in return for planting your rear-end on Mars.

Then what?

(*Source: June 28 article, space.com, by senior writer* Mike Wall.)

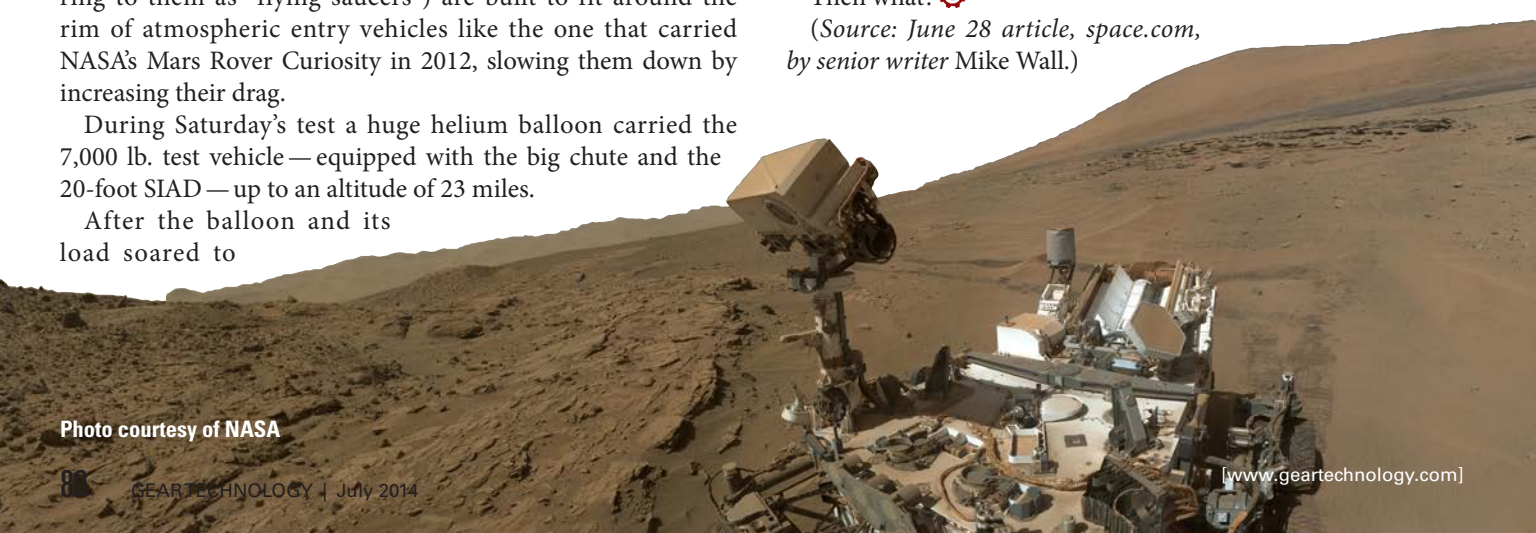

Photo courtesy of NASA