The Lurio Report

News and Analysis of the 'New Space' Enterprise

Message From Rick Homans, More "Flight School," "NewSpace 2007"
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A Special Note From Rick Homans of New Mexico: - On a 'Spaceport America' Permanent Executive Director & On This Newsletter

Noted in "Quick Updates" below is an item on Rick Homans leaving the New Mexico Spaceport Authority for the private sector. In response to a note wishing him well, he sent me the following (all emphases mine),

"Kelly O'Donnell will become chair of the authority and Mike Holston is the project coordinator ....

"Thanks for all YOU do for the industry -- you cover it all, very well and very thoughtfully.

"Might be good if you can get word out about the search for the permanent executive director of Spaceport America -- you probably have the best mailing list of all."

>My thanks to Mr. Homans, and please spread the word about the Spaceport job.**<**

Quick Updates

"NewSpace 2007" and "A NACA for Space": One of the high points of the Space Frontier Foundation's "NewSpace 2007" conference to be held in Washington next week is **Thursday's "Commercial-Military Spaceplane Day." Questions on this particular topic should be sent to spacepolicy@yahoo.com.**

Also: See the full schedule for "NewSpace 2007" at <http://www.space-

frontier.org/Events/NewSpace2007/>.

Both government and private aviation gained enormously from the sharply focussed, low cost cooperation and research efforts pursued by NASA's predecessor, NACA. In a statement published in January 2006 (yours truly contributed to the document and was a cosigner), the emerging commercial spaceflight industry recognized the potential for analogous cooperative actions today between the government and 'New Space.'

As previously noted here, present privately funded projects in regular, low cost and safe commercial spaceflight greatly overlap with government military (and civilian) mission needs. **Both could be assisted at little additional cost by a "NACA for Space." This entity has been notionally designated the "Advisory Council on Entrepreneurial Space Access (ACESA)." A very active effort is proceeding at this time that aims at creating such an entity.**

Wyle Labs Supporting Virgin Galactic's First Passenger Flights: Wyle Labs has long provided medical screening, qualification, support, data gathering and analysis for NASA human spaceflight. **A press release dated July 6th states that they've been awarded a contract from Virgin Galactic to,** "...provide [a] chief medical officer, medical data analysis, and program management services to advise and guide the preparation of [Virgin's] first passengers for spaceflight" (<http://www.wylelabs.com/news/2007/07-06.html>). The press release notes that Wyle has, "...recently published a report entitled 'Commercial Human Spaceflight Participant Biomedical Data Collection'" for the FAA's Office of Commercial Space Transportation.

(I believe this reference is to
< http://www.faa.gov/about/office_org/headquarters_offices/ast/industry/advisory_committee/meeting_news/media/COMSTAC%20brief%20TO%206%20May07.ppt.>.)

Wyle and Paragon Space Development Corporation had recently announced an effort to develop "...comprehensive human support services for the growing commercial human spaceflight industry" (<http://www.paragonsdc.com/pr-wyle.php>). Among other accomplishments, Paragon (which has been around since 1993) has developed thermal analysis tools and unique test facilities. They have designed and flown in space a host of successful biological test systems. (Full disclosure: I got a tour of Paragon from CEO Taber MacCallum last March.) Their present work includes environmental control and life support systems and human factors for both COTS winners and for commercial suborbital vehicles.

Homans Leaves for NM Private Sector: Rick Homans - who'd taken over the New Mexico Spaceport Authority a couple of months ago after the untimely death of former director Lonnie Sumpter - **is leaving for a private sector job with a New Mexico environmental technology company.** As secretary of the state's Economic Development Department, he'd been a widely applauded point man under Gov. Richardson for the development of a spaceport and associated industries.

He brought a 'down to earth' attitude and political savvy to pushing an idea with real risk, but with equally real potential benefits. From a larger perspective, New Mexico's efforts have also helped underscore at state and Congressional levels that 'New Space' is a plus for both political parties.

A New Mexico political blog noted that, "[Homans's departure] comes as state officials are working to finalize several aspects of spaceport approval, funding and design before construction begins early next year**[, but] even after he starts his new job, Homans has offered to volunteer his time, in an official or unofficial capacity, to help the spaceport** secure approval of a license from the Federal Aviation Administration, push for tax increases in Sierra and Otero counties to help fund the project, and see construction begin. That could include an appointment to the board of the spaceport authority." (My emphases; see the original at <http://haussamen.blogspot.com/2007/07/homans-leaving-spaceport-job-for.html>.)

Genesis II Performing Well: Following up my note in Vol. 1, No. 12 (June 28th), Genesis II looks like another big step forward for Bigelow Aerospace. Interior and exterior photos of the

inflated module are posted at <http://www.bigelowaerospace.com/out_there/genesis_II_first_pics.php>. **Keep tracking the company's home page for new data.**

Speaking of tracking, the site notes that some folks have already seen the vehicle in the night sky and provides realtime look-down positions for both Bigelow modules at <http://www.bigelowaerospace.com/out_there/real_time_tracking.php>.

Changes between Genesis I and II were discussed in a March 5th article at the Bigelow site, <http://www.bigelowaerospace.com/out_there/genesis_II_difference.php>. Prominent among these:

-- **Distributed multitank system** to improve reliability and control of the inflation process;

-- **Augmentation of measurement systems and new reaction control wheels** to have better pointing control and dampening of residual launch effects;

-- **More outer shield** layers for micrometeoroid protection, thermal control and experimentation for future module needs;

-- **Higher data flow rates** due to more ground stations and enhanced onboard systems This assists the increased number of cameras (which include new types such as wireless and articulated devices) as well as improved pressure, temperature and radiation detection sensors.

-- **Payloads: Improved habitat** for microorganisms and insects; the **'Fly Your Stuff' program materials**, contributed by anybody who wanted to pay to see their 'stuff' floating in zero - g; and the colorful, mechanical **Space Bingo' box** intended for online play - but not for gambling! (<http://www.bigelowaerospace.com/galaxy_games/bingo_in_space.php>.

Masten and Real Rocket Engineering Experience: Also in the June 28th note I stated an alternative to my oft-used phrase about "Rocket Science not being 'Rocket Science,'" namely that, **"Rocket Science isn't 'Rocket Science' - it's just underused engineering."**

Masten Space is getting some of that needed engineering experience, the real nitty-gritty of, "try, trace problems, think about it, make changes, try again," with the work on their XA - 0.1 testbed. See in particular the discussion at the company blog dated June 30th, laying out progress, problems and a path forward resulting from their tethered testing, <http://masten-space.com/blog/?p=118>. There's a further short Masten note dated July 5th at <http://masten-space.com/blog/?p=119>.

>Another instructive record of the reality of rocket engineering has long been appearing in John Carmack's updates at the Armadillo Aerospace site.<

Dear Acquaintances

Flight School 2007, 'The [Air &] Space Experience' and 'ZERO-G'

One of the unifying themes for air and space flight from 'Flight School 2007' was expressed by the phrase, "It's all about the experience!" This applied to remedies for the increasing trials faced by air travelers from the 'legacy' air system and TSA procedures. It equally applied to entrepreneurial space tourism efforts, where creating an attractive experience (and one as safe as possible) from 'day one' will be crucial for success.

The new options presented for air travel included 'air taxis' and registered traveler services. Many attendees had already used or were entrepreneurs developing such options. Their feasibility has been boosted by new technologies, manufacturing techniques and air control protocols for small capacity jets and other small aircraft. **I hope that these 'early adopters' and innovators will multiply, leading to price reductions and opportunities for an ever enlarging sector of the public to 'disrupt' the 'mainframe' air travel industry with *_positive_* effect.**

The 'New Space' entrepreneurs are the positive disruption that the even more critically ill 'Old Space mainframe' so desperately needs. One spearhead for heightening the 'reality potential' of space tourism for the public (and proving it something whose promise extends beyond the very wealthy) is a relatively low cost air flight offering tens of seconds of zero - g on each leg of a repeated parabolic trajectory. Such flights are offered by Peter Diamandis's Zero Gravity Corporation, or 'ZERO-G.'

It still may not be pocket change for most of us, but a few thousand dollars for flying a parabola on a slightly modified airplane is a whole heck of a lot less costly (and less daunting) than the estimated $100-200,000 for the first suborbital tourist flights. The ZERO-G flights are offered from home bases at Kennedy Space Center and Las Vegas and less frequently at some other major airports (see <http://www.gozerog.com/>). As of the 22nd of June the company had made 114 flights with some 3000 passengers flown. Peter asserted that only about one in a hundred passengers gets substantially motion-sick.

One of the continuing obstacles for ZERO-G is overcoming the negative PR about parabolic flights from the last forty-plus years of NASA experience. For over 25 years I've known folks who've flown on the NASA zero -g plane and I've heard the stories of overwhelmingly common nausea on that ride. Leading into Flight School, I had an open mind - but some skepticism - about ZERO-G's claim that its flights have largely 'beaten' the nausea problem for its customers.

Maybe it's the combination of hearing Peter discuss the matter in person and the enthusiasm of Ms. Dyson and others who've flown, but as a result of 'Flight School' much of that skepticism has melted away. As I heard and read of people's experiences and the protocols being used by ZERO-G, I had to ask myself: Had I (of all people!) been letting myself fall into the implicit attitude that I bitterly complain of in others - that "NASA is the perpetual, all circumstances, space-related authority for all time?"

>The fundamental difference between ZERO-G and NASA is that the former's parabolic flights - when they carry paying passengers - have the objective of pleasing those passengers, while NASA's aim is to maximize cumulative zero - g time per flight on essentially all flights. While those on the NASA jet can take the same anti-nausea medication as ZERO-G's and protocols are present to reduce frequency of nausea, *_passenger comfort is way down the list of NASA's priorities_.* <

Some of the following notes and comments use information derived from Peter Diamandis's comments at Flight School; others are extracted from the preflight briefing to ZERO-G customers that he kindly sent me (much if not all of that data is available in the FAQ section of the company's site).

-- NASA does many tens of parabolas per flight, while ZERO-G passengers experience a maximum of 15;

-- The ZERO-G parabolas work *_gradually_* towards zero-g, starting with two at simulated Martian (actually about 1/3g) gravity and one at Lunar (1/6g) gravity;

-- The peak 'pull-up' gravity force in the ZERO-G parabolas is restricted to 1.8g. The company briefing asserts that the 'pull-up' has the [most] influence on causing 'motion discomfort.' It also tells passengers to keep on one's back and not to move one's head much at that time;

-- In addition to 'common sense' suggestions to avoid slamming into things when going from zero-g to 'pull-up,' the briefing recommends "slow, graceful, gentle movements." I think it self-

evident that this reduces the chances of getting nauseated - ever get sick spinning rapidly on a chair?;

-- ZERO-G provides a "*_light_* meal low in protein and dairy products" (emphasis theirs);

-- Assistants on the ZERO-G flights actively help people avoid those things that would cause illness. There's also a person dedicated to helping out folks who do get motion-sick.

True to the notion of *_personally_* testing, "...the experience," 'Flight School' had offered a prearranged chance at a flight on a chartered ZERO-G plane at the end of the meeting (for those with the inclination and the additional dollars). Sorry to say, this flight didn't occur due to a cascade of delays in getting approved the paperwork for some recent modifications in the aircraft and for the charter to be flown from the Aspen area.

But this was primarily bad luck. As Peter noted, there had been frustrating years of bureaucratic slow motion before ZERO-G could fly passengers at all. However, a lot of that has been overcome due to the help of FAA Administrator Marion Blakey in finding a usable regulatory framework.

Here's my bottom line: The translation of NASA's attitude towards people flying zero-g parabolas is: "Buck up and take it, you're doing it for the Agency." ZERO-G's attitude is: "Have fun so that you can tell others about us and we can make more money!"

So, as in other aspects of 'New Space,' let's let the market and the facts decide, instead of preconceptions based on NASA as an 'omniscient Oz.'

Yours very truly,

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