

Space Access Update #111 04/05/05 2nd try

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Space Access Update #111 04/05/05
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SA'05 Notes

First a few quick notes about our upcoming Space Access '05 conference, April 28–30 in Phoenix Arizona:

- The latest SA'05 info will be posted from now till the conference at <http://www.space-access.org/updates/sa05info.html>
- Our \$79 hotel room rate is guaranteed available through April 6th – we'll very likely be able to negotiate extensions as the conference approaches, but book by the 6th to be sure.
- If you have trouble getting our rate or booking the type of room that you want, try calling our hotel (Four Points by Sheraton Phoenix Metrocenter, 602 997–5900, mention "space access") between 8 am and 4 pm weekdays Mountain Standard Time (EDT–3) since outside those hours calls automatically get switched to the Sheraton national reservations center, which seems to have occasional problems with local hotel details.
- If you still have any difficulty booking a room at our rate for SA'05, drop us a note at sa05@xxxxxxxxxxxxxxxx ASAP. Thanks! And now back to our irregularly scheduled Update...

Low-Cost Launch: The Concept Is Spreading

It's a good thing this is America, where "may you live in interesting times" is still more blessing than curse. Kudos to the X-Prize, Scaled Composites and their subs, and Paul Allen – a lot of people are now aware that there are alternatives to the Government-Space Industrial Complex, paths off the planet that don't cost major slices of a national budget. The consequences have started arriving one after another.

One we should get out of the way immediately: Watch your wallet, the quick-buck artists are here. The email we saw about the Nigerian astronaut stranded on the Space Station until we take our 15% cut of an international funds transfer to pay for his return trip (please provide our account info) was actually pretty funny, but we suspect that the SEC wouldn't be at all amused by some of the outfits that have popped up peddling stock lately. Caveat investor... Not that every outfit around before the field got hot was a good place to put money either, but at least most actually meant well. Thomas Olson, Paul Contursi, and David Livingston have a short article in The Space Review with eight things to watch for when you're thinking of investing in a space startup, at <http://www.thespacereview.com/article/329/1>. Strongly recommended.

Another thing we've seen is multiple announcements of brand-new conferences and/or newsletters. Our rule of thumb is, if all the promoters seem to know is "X-Prize", "Scaled", and "SpaceDev", they probably have a way to go before they're worth much attention.

One new entrant in the conference field we are paying attention to is Esther Dyson, of computer journalism fame, with her "Flight School" one-day new-aviation/new-space event, debuting last month tagged onto the end of her long-time influential "PC Forum" IT industry conference. At \$1492 "Flight School" was a bit steep for our budget (though one way to look at that is that the price succeeded – it kept the riff-raff out!) but response we've heard has been positive – introducing her field to our field is generally seen as a good thing. Given Dyson's reputation as one of the sharper tools in the shed, her extensive information industry contacts, and her considerable resources, we expect we'll be hearing more from her.

One of the bigger space conferences around, the Space Foundation's National Space Symposium annual gettogether of everybody who's anybody in Big Aerospace (in Colorado Springs this week) this year features an "Entrepreneurial Spirit" panel with Courtney Stadd, Eric Anderson of Space Adventures, Jim Benson of SpaceDev, David Gump of T/Space, and George Nield of FAA AST, plus an appearance by SpaceX's Elon Musk on a New Directions In Launch panel. It's a good start. Also of interest on their schedule, a live broadcast on NASA TV of "The Vision For Space Exploration: Getting There From Here" (we wonder where that phrase

percolated up from...) set for 11 am to 12:15 pm mountain time on Wednesday April 6th. (As conference organizers ourselves, we'd advise allowing for a bit of schedule slop if you're setting up to tape it.)

Another major player that is starting to pay attention: NASA. We don't have much detail yet, but Explorations Systems Mission Directorate, ESMD, the large slice of NASA HQ tasked with making the Vision For Space Exploration happen, seems to be at least thinking about some sort of "non-traditional" Earth-To-Orbit development path in parallel with their main effort, the multi-billion dollar Crewed Exploration Vehicle (CEV) that is planned as the mainstay of post-Shuttle NASA manned spaceflight.

No further detail of what ESMD has in mind available yet, but we speculate this may have something to do with the schedule gap between Shuttle shutdown in 2010 and CEV operations start in 2014 – both SpaceX and Kistler (whose reorganization plan was just approved by the bankruptcy court) plan on having suitably-sized "non-traditional" boosters flying well before 2010, and there are a number of "non-traditional" parties who are more than willing (and quite possibly able) to put basic crewed ships on top. Add in Bigelow's "America's Space Prize" (\$50 million for just such a basic crewed ship) as extra development leverage, and a plausible picture begins to emerge. However speculative it is at the moment, of course.

One thing we do know for sure: Rick Tumlinson of the Space Frontier Foundation arranged for David Gump of T/Space, Tom Taylor of Lunar Transportation Systems, and Jim Muncy of PoliSpace to brief NASA's Lunar Exploration Roadmap Committee last Thursday, and by Friday the committee had a new Commercial Subcommittee, consisting of those four gentlemen plus Jeff Taylor of the University of Hawaii. Our congratulations to all concerned – we expect they'll bring in some fresh ideas.

What We Want From NASA:

Low Cost Hardware/Flight Demos – Pay For Results, Not Process

On a related subject, something we'd like to see happening at NASA (but don't really expect out of Exploration Systems) would be a whole series of low-cost (a few hundred thousand to a couple tens of millions max) hardware and/or flight demonstration projects, from non-traditional vendors, done under a reduced-paperwork pay-for-results-not-process regime. We think this could usefully expand the repertoire of known-to-work engineering solutions available and on the shelf, and usefully expand the space industrial base of experienced vendors ready to apply those solutions for NASA and for the US space industry in general.

Why don't we expect it out of Exploration Systems? To be frank, because ESMD already have their hands full developing CEV. Admiral Steidle, before he became ESMD's boss, did succeed in getting a flyable Joint Strike Fighter out of the established major aerospace contractors via

the established defense procurement process, but we expect he's very aware that he's at NASA now, where the procurement process and contractors makes DOD's equivalents look simple efficient and reliable.

Anything that doesn't contribute directly and immediately to meeting the transportation needs of NASA's new space exploration program is likely to be seen as a distraction and a drain on scarce funds – funds quite likely to get scarcer in future years, while future year costs all too likely climb. The natural inclination is going to be for ESMD to focus primarily on its major objectives at the expense of lesser projects.

We may already be seeing a symptom of this (necessary) focus: Cries of pain, public and private, over how thoroughly HQ is applying traditional NASA paperwork requirements to the smaller bidders. Whether ESMD actively wants the small outfits to just go away or merely lacks the time and attention to cut them the appreciable amount of slack available within the rules is moot – the effect is the same either way. Small companies end up taking NASA money to produce reports and viewgraphs, not testable hardware.

As for the viewpoint that if this level of paperwork is OK for the established majors, the startups should just suck it up and deal with it too, do we really want to foster new companies whose core expertise is dealing with NASA process, not delivering functional product quickly and affordably? Haven't we already got enough of those?

We suspect moving such minor industrial–base/engineering repertoire expansion efforts out of ESMD could be a good thing for all – less distraction for Exploration Systems, and steadier support for the small vendors involved. Looking around for a suitable home for such, we note that significant parts of NASA have considerable in–house design–support and engineering–test capabilities sitting around begging for customers – indeed, in danger of being shut down – and might well be suitable hosts for such work. We speak, of course, of the various NASA aeronautical centers – aeronautics is in fact a major element of the transit between ground and orbit we at SAS are primarily concerned with.

This arrangement could have a number of benefits, among them leveraging of existing underused NASA resources and a built–in Congressional constituency separate from the major NASA space operations centers. We think the greatest advantage of all would be the competitive aspects, however. Nothing gets the creative juices flowing like a little healthy competition, whether between companies or between NASA field centers.

But our bottom line is: NASA should be doing low–cost hardware and flight demonstration projects from non–traditional vendors under a reduced–paperwork pay–for–results–not–process regime, *somewhere*, if the agency is ever to break out of the high–overhead low–flight–rate high–cost cul de sac it's in now.

Industry News Roundup

Enough editorializing – on to a quick sampling of some things going on recently in the industry.

Armadillo has decided to pursue bipropellant liquid oxygen engines. They haven't been able to obtain commercially the high-concentration hydrogen peroxide they'd need for acceptable monopropellant performance, and their pursuit of "mixed monopropellant" – lower-concentration peroxide premixed with fuel just before flight – ran into problems with limited engine catalyst-pack life. They could make the engines perform reliably, but only by rebuilding them far more often than practical for the sort of routine operations they're pursuing. Armadillo has been developing liquid oxygen preburner technology in parallel with their peroxide work for a while, and now they've announced they're making their main propulsion development path engines based on that technology.

X-Prize has announced their planned X-Prize Cup rocket races and Personal Spaceflight Expo, to take place annually in early October at the Southwest Regional Spaceport in New Mexico. The first Personal Spaceflight Expo will take place over four days this year, with exhibition rocket flights added in 2006 and the first X-Prize Cup rocket races in 2007.

TGV Rockets remains reticent about announcing much publicly, but they have seen some government funding these last few years, and they will admit they'll be hitting some development milestones in the coming months.

Not directly related to our industry but an old friend of the family, Bill Stine, G. Harry Stine's son, is reviving Quest Aerospace, his educational model rocket company, shut down after a motor manufacturing accident several years ago. Kit manufacture will now be in China, motors in eastern Germany. The Stine family project to set up a scholarship program and a library to house Harry's extensive collection of space books and papers is still in the works.

Len Cormier's PanAero is bidding on an NRO BAA for an Operationally Responsive Launch Vehicle, and is proposing the Space Van '09 concept for it; he'll be telling us more at SA'05.

XCOR should have an interesting announcement sometime Tuesday – look for the press release at <http://www.xcor.com>.

There's a company in South Korea call C&Space working on an LNG-LOX engine for their Proteus suborbital ship – details are scant; we've had limited correspondence with them and their website (www.candspace.com) is in Korean. They tell us they've conducted ground firings of a water-cooled test chamber, and are working toward a ten-ton thrust LNG-cooled operational version. This does bear out something we've been saying for

a long time – rocketry may involve high–performance engineering but it's no longer ultra high–tech; the rest of the world is catching up, and may well leave us in the dust if we don't start doing the things we need to do to move ahead again.

Dr. Jordin Kare has spoken at our conference several times in recent years about his relatively low–tech approach to laser launch, using commercially available semiconductor lasers and heat–exchanger liquid propulsion. He tells us that the technology needed to do this is essentially available off–the–shelf now, and he'll be telling us about his plans at this year's conference. (We really are into the 21st century – we just typed the words "a relatively low–tech approach to laser launch" in complete seriousness!)

The Space Launch Amendments Act passed last winter with numerous mandates for how FAA AST should regulate commercial passenger–carrying space transports. That was the easy part – now the FAA needs to translate those broad mandates into detailed regulations. We're working with FAA AST to have someone at SA'05 to talk about how that process works, where it's gotten to so far, and what to expect down the line, plus we'll have feedback from various of the regulated parties about what they hope to see, and a talk from Tim Hughes, majority counsel to the House Science Committee and heavily involved in the drafting of the Amendments Act, on what the intentions behind various provisions are.

Rocketplane Ltd got full funding for their Rocketplane XP development last year and are currently moving ahead building a practical suborbital transport around various existing aircraft components – to oversimplify considerably, a Learjet fuselage, engines, and landing gear with new wings, thermal protection, and an Orbitec "Vortex" rocket engine in the tail. They're aiming at completing the flight test program in '07, and currently seeking funding for the passenger–carrying commercial operations phase to follow.

We spoke with David Gump, President of the T/Space consortium (Scaled Composites, Airlaunch LLC, CSI, USL, Delta Velocity, and Spaceport Associates among others) about the report in New Scientist the other week that due to the massive paperwork burden, T/Space would not bid on the next phase of NASA CEV. David told us that he had discussed the merits of a low–overhead rapid–prototyping approach versus the traditional NASA paperwork–intensive development process with New Scientist, but that T/Space has not yet made any final decision on whether they'll bid the next phase of CEV.

Scaled Composites is of course busy developing the suborbital passenger–carrying SpaceShip 2 for Richard Branson's Virgin Galactic, with passenger service schedule to commence in '07. Burt Rutan punctuates this routine by travelling to receive various (well–deserved) awards. Latest we hear is he'll be in DC to accept the prestigious Collier Trophy at the National Air & Space Museum April 19th. Rumor has it, by the way, that SpaceShip 2 may well use an all–EAC engine rather than the

mix of SpaceDev fuel casting and EAC plumbing SpaceShip 1 flew with.

Airlaunch LLC, Microcosm, SpaceX, and Lockheed–Martin are competing in the DARPA/Air Force FALCON small launch vehicle program and are not currently talking much. The next phase of the program, one or more contractors building flight prototypes, will be decided this summer.

Meanwhile the Air Force ARES program, to build a reusable rocket spacelift first–stage demonstrator, is getting underway. We'll have a briefing on FALCON and ARES at SA'05.

SpaceX meanwhile is still working toward first flight of their Falcon 1 launcher – they've completed all structural testing, but are still working on main engine qualification. The latest delay now is a matter of site scheduling at Vandenberg AFB – the final Titan 4 launch has pushed them back to Q3 '05 at earliest, longer if the Titan launch (as has happened before) is delayed. SpaceX says they may consider doing their first flight out of a site being developed on Kwajalein Atoll, if the VAFB delay goes on long enough.

Blue Horizon meanwhile continues to reveal their plans very slowly – the latest new info is from a Jeff Bezos interview with the local paper in west Texas where he owns close to 200,000 acres of ranchland. He plans eventually to fly from that land, and what he'll be flying will be vertical–takeoff, vertical landing rockets – first a suborbital ship, then eventually orbital.

And that's only a fraction of what's been going on lately. The best single site for day–to–day coverage of this fast–moving field is still Clark Lindsey's www.hobbyspace.com "RLV News" section, but even Clark can't get it all. We also recommend Jeff Foust's www.spacetoday.net and www.thespacereview.com, Keith Cowing's www.nasawatch.com, and of course the Space News, Space.com, and Aviation Week sites all come up with good stuff. Over the last year Alan Boyle at www.msnbc.com has written a lot of good space pieces – Alan was responsible for MSNBC cable's coverage of the SpaceShip 1 flights being far more technically informed than the other networks there. Space coverage is showing up in the most unlikely places these days, though; it's impossible to keep with it all.

Interesting times!

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"Reach low orbit and you're halfway to anywhere in the Solar System"

– Robert A. Heinlein

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• *Follow-Ups:*

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◆ *Re: Space Access Update #111 04/05/05 2nd try*

◇ *From:* Ed Kyle

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