

## Re: Death Sentence for the Hubble?

**Source:** <http://sci.tech-archive.net/Archive/sci.astro/2005-03/3568.html>

---

**From:** Eric Chomko (*echomko\_at\_\_at\_polaris.umuc.edu*)

**Date:** 03/29/05

Date: Tue, 29 Mar 2005 17:43:18 +0000 (UTC)

Jeff Findley ([jeff.findley@ugs.nojunk.com](mailto:jeff.findley@ugs.nojunk.com)) wrote:

: "Eric Chomko" <[echomko\\_at\\_\\_at\\_polaris.umuc.edu](mailto:echomko_at__at_polaris.umuc.edu)> wrote in message  
: news:d1vbr7\$1glp\$1@news.ums.edu...  
: > Jeff Findley ([jeff.findley@ugs.nojunk.com](mailto:jeff.findley@ugs.nojunk.com)) wrote:  
: > : There would still be UPS, FedEx, DHL, and etc, all using the same  
: standard  
: > : cargo containers flying on the same types of cargo aircraft. In  
: addition to  
: > : these "big players", many other companies ship items by air.  
: >  
: > Right and at one time Bell had a monopoly on the telephone. You used to be  
: > forced to buy their phone service and rent their equipment. The government  
: > forced the modular design and the phone equipment monopoly soon went away.

: The best thing the US government did for telecommunications was to  
: deregulate the phone industry and allow it to operate as a capitolic  
: endeavour rather than a socialistic, government regulated monopoly. Now we  
: have dozens of different companies in the long distance business, local  
: phone systems owned by companies other than "ma bell", cell phones, and  
: voice over IP (to say nothing of beepers, text messaging, and the Internet).  
: We couldn't have gotten that variety of telecommunications service without  
: letting go of the strict government control over the Bell telephone  
: monopoly.

: NASA must let go of their control over the US manned spaceflight industry in  
: order for that industry to evolve into more than what it is today.

The industry has nothing to evolve into right now. Space tourism will be a side industry to a commercial space infrastructure that doesn't exist right now.

: > : Many (most?) cargo aircraft are simply passenger airliners with the  
: seats  
: > : and overhead bins removed (and other relatively minor modifications).  
: The  
: > : way the plane operates and flies isn't changed, so these cargo aircraft  
: > : aren't really unique at all. They are a commodity item you can buy new

sci.astro: Re: Death Sentence for the Hubble?

: or

: > : used.

: >

: > And many commercial customers exist for it not just the USPS.

: It wasn't that way in the beginning. In the early days of aviation, the  
: government was a much bigger player. In order to stimulate private industry  
: and innovation, they started paying for delivery of air mail. They could  
: have mandated government sponsored aircraft designs for this (just as they  
: do with military aircraft), but that wouldn't have had the same stimulating  
: effect on the industry. Instead, they paid to have mail delivered on just  
: about any aircraft capable of the task and left it up to the industry to  
: come up with better designs on their own.

: Why should we not follow the same model for spaceflight? Why should NASA  
: maintain such tight control over US manned spaceflight? Why should it  
: mandate designs that fly out of its government owned facilities? Why can't  
: it just buy crew and cargo space on privately owned and operated vehicles  
: that fly to ISS? Guarantee that the US will pay for so many flights per  
: year and see what kind of vehicles private industry comes up with.

: Preliminary designs for reusable vehicles (capable of carrying both cargo  
: and people) that would be able to visit ISS have been done by small  
: companies before (locations of PDF's have been posted to these groups  
: before). They just need NASA to promise to buy their services in order to  
: get private investors to feel comfortable enough to put money into the  
: designs.

: Again, the investment money won't come unless NASA is forced to get out of  
: the business of developing it's own "next generation manned space vehicle".  
: Force NASA to buy rides on private vehicles instead of waiting for those  
: vehicles to materialize as NASA continues flying their own vehicles.

Investment? People want to invest in commercial space companies that are  
successful not as start ups.

: > : The point is that these cargo companies don't go to Boeing and have them  
: > : design a new aircraft type for them. They pick and choose from what  
: Boeing  
: > : has to offer. Many times, they simply buy used passenger aircraft and  
: rip  
: > : out the seats (among other minor modifications). Boeing, in turn,  
: listens  
: > : to \*all\* of its customers when it is designing new aircraft types.  
: >  
: > : This isn't how NASA obtained the space shuttle. NASA had nearly  
: complete  
: > : control over the design and continues to have nearly complete control  
: over  
: > : its operation.  
: >

## sci.astro: Re: Death Sentence for the Hubble?

: > That is because NO ONE knows best how to build a commercial spacecraft due  
: > to the fact that there is no real commercial need for them like airplanes.

: I see. You're one of those people who believes that space is "hard" and  
: that LEO is a "hostile" environment and that only the large government  
: contractors are capable of producing vehicles that can tackle that  
: environment.

Based upon results you can't prove otherwise.

: Sorry, but space isn't really that hard. Vacuum is only 1 atm of pressure  
: difference from sea level. Submarines deal with pressures orders of  
: magnitude higher.

: Re-entry is only "hard" because we've always done it with very dense  
: re-entry vehicles. An RLV will be mostly empty tankage, so the heating  
: during reentry will be far less severe than what any other US reentry  
: vehicle has encountered in the past.

: Note that early on, the ET on the shuttle included a vent on the nose to  
: force it to tumble as it re-entered. If it didn't tumble, it was possible  
: that it might actually hit the ocean more or less intact. Note that the  
: original material of the ET was a fairly simple aluminum alloy and the  
: insulation a fairly simple (cheap) spray on insulation instead of the  
: reinforced carbon-carbon and silica tiles on the shuttle.

: The thermal environment in LEO isn't as hard as it's made out to be.  
: Insulation to keep "out" the cold and radiators to dump excess heat solves  
: the problem nicely. Most spacecraft have used this solution and it works!

: Cooling of electronics has also been solved. The cheapest way to do this is  
: to do what the Russians have always done. Even on an unmanned craft, stick  
: your electronics in a pressure vessel at 1 atm and add a few fans to  
: circulate the air. Then you can test your electronics on the ground without  
: expensive vacuum chamber tests. On top of that, you can use more "off the  
: shelf" components because nearly everything you can buy is rated for 1 atm  
: operation. ;~)

: > : Too some degree. Notice that Boeing has just now returned the Delta IV  
: to  
: > : the commercial market under pressure from the US Air force. It's  
: possible  
: > : that without such pressure, Boeing would have been content at keeping  
: Delta  
: > : IV alive solely on the US taxpayer's dime. And the shuttle is still  
: > : operated by NASA, despite the fact that many of the paychecks say USA on  
: > : them. NASA has, in the past, gotten contractor employees fired. You  
: > : wouldn't think they'd have that kind of control over a private company's  
: > : employees, but they do.  
: >  
: > I know that they do. And they can get employees that they like hired as

Re: Death Sentence for the Hubble?

sci.astro: Re: Death Sentence for the Hubble?

: > well. Again, NASA being the only large customer of the US space industry  
: > isn't NASA fault as you imply. It is simply where we are in the industry.  
: > Remvong them isn't necessarily going to make the industry better. In  
: > fact, it may kill what we have of it now.

: It won't kill the military launches, or the GEO comsat industry. The only  
: thing it will stop, at least temporarily, is manned spaceflight. At this  
: point, that may not be such a bad thing. NASA is spending far too much on  
: shuttle/ISS for little gain. Maybe it's time for another long break in US  
: manned spaceflight. Maybe it's time to stop going round and round in LEO  
: until we have cheaper access to space (again, I'm looking for at least two  
: orders of magnitude cheaper \$ per lb to LEO).

: > : You got it. That's why Boeing and Lockheed Martin remain the only two  
: big  
: > : players in the US ELV market. That's why they're pushing for evolutions  
: of  
: > : their ELV's for future NASA missions. They have low development "cost"  
: at  
: > : the beginning, but high "plus" value on every launch.  
: >  
: > It seems like your gripe with NASA could easily be with USA, yet you seem  
: > to not mention that part.

: USA is controlled completely by NASA. They are a separate entity in name  
: only. They exist only to do NASA's bidding. The formation of USA was a fig  
: leaf to hide the fact that manned spaceflight with the shuttle will always  
: be a government controlled endeavour. It gives NASA more flexibility in  
: how they (indirectly) pay and hire/fire employees as they aren't bound by  
: the same rules as government employees.

: > : True, which would theoretically mean that you'd never be able to turn a  
: > : profit if your business was in competition with the government. Not is  
: the  
: > : government agency prohibited from making a profit, but who's to stop the  
: > : government from heavily subsidizing their agency, making it impossible  
: for a  
: > : private corporation to compete?  
: >  
: > Well another govt. agency should oversee that to make sure it doesn't  
: > happen.

: More government oversight won't solve this problem.

: > : Note that is exactly what the US government was trying to do with the  
: > : shuttle. It was to be \*the\* US launch vehicle, so commercial launches  
: on it  
: > : \*were\* heavily subsidized by the US government. It's a bit hard to  
: compete  
: > : with the US government in that situation.  
: >

Re: Death Sentence for the Hubble?

sci.astro: Re: Death Sentence for the Hubble?

: > NASA isn't and shouldn't be in the commercial launch business, it should  
: > be more for science and the like.

: NASA shouldn't be in the launch business at all.

: > : Without investors, CATS will never happen. Without a guarantee that the  
: US  
: > : government will stay out of the marketplace, investors won't want to bet  
: > : their money against the US government.  
: >  
: > You make it sound like the US Govt. wouldn't take advantage of CATS. I  
: > disagree.

: That's not what I'm saying. You're putting the cart before the horse. NASA  
: is banned by law from launching commercial payloads on the shuttle. It  
: would be nice if they were banned by law from developing and running future  
: launch vehicles (manned or otherwise) as well. This would assure investors  
: that the companies in which they are investing won't find themselves in  
: direct competition with NASA.

: You won't get CATS without private investors. The government has tried in  
: the past to fund NASA programs that would lead to CATS, but they've all  
: ended in failure (e.g. NASP, X-33, and the like). We need to stop repeating  
: our mistakes and try something new.

: > : CATS won't come cheaply, especially if the US government doesn't openly  
: > : support it. Their current policies simply don't support CATS. As we  
: both  
: > : seem to agree, the US government seems content to keep giving huge cost  
: plus  
: > : contracts to the usual suspects (Boeing and Lockheed Martin).  
: >  
: > Well force them to use 8-A firms and you might get them to follow. It  
: > works in other areas in NASA.

: That might help.

: > It will have to come from govt. customers despite the barrier you see. It  
: > is a chicken and egg problem and the only big customer IS the govt. So,  
: > the govt. will have to actually pay for it and some sort of breakthrough  
: > will have to be made. Once done, and the cat is out of the bag (pun!),  
: > CATS will be the norm, despite what you perceive as a conspiracy.  
: > I don't think that a commercial space industry will bootstrap itself into  
: > existence in any likely timeframe before the aforementioned breakthrough.  
: > Find the breakthrough!

: There is no breakthrough to find. There is no technological barrier to  
: building an RLV. That's all a smokescreen to hide NASA's inability to  
: properly manage failed programs like NASP and X-33. The "space is hard"  
: mantra is used far too often as an excuse for terrible economic assumptions  
: bad program management.

Re: Death Sentence for the Hubble?

sci.astro: Re: Death Sentence for the Hubble?

: For example, the idea that hypersonic air breathing engines will make access  
: to LEO cheaper is folly. Such an engine only saves you oxidizer. Note that  
: LOX is one of the single most inexpensive fluids on the planet. It's made  
: from air for Pet's sake! Why would we care about minimizing the cost of LOX  
: when it's so damn cheap?

: The problem is that no one has tried to make a reasonable reusable launch  
: vehicle. The shuttle ceased to be a reasonable reusable launch vehicle  
: before the design was done. It ceased to be a reasonable RLV when the  
: decision was made to go with a stage and a half configuration with SRB's and  
: an ET drop tank. This decision was made largely because the development  
: funding was fixed. In order to stay within its development budget, NASA  
: sacrificed reusability (hence the stage and a half with drop tank design).  
: As a result, the STS is a design with very high maintenance and  
: infrastructure costs which result in high recurring costs.

: The design leads to a super dense orbiter with a hideous re-entry heating  
: problem, a too small engine compartment, high strung staged combustion  
: SSME's, a high speed glider landing, toxic hypergolic OMS/RCS propellants,  
: toxic SRB exhaust, segmented SRB's, ET with spray on foam that impacts the  
: orbiter, fragile tiles that are damaged by rain (impacts and soaking into  
: the silica), dependence on high cost (modified) Saturn V ground  
: infrastructure, no self ferry capability...

: I could go on, but what's the point? We all know the shuttle's weaknesses  
: and how they contribute to its high cost.

:> :> Who launched IntelSat and other commercial satellites?

:>

:> : <http://samadhi.jpl.nasa.gov/msl/Programs/intelsat.html>

:>

:> : Looks like they started off using Delta D and then used various other

:> : Delta's, then switched to Atlas Centaur. Following that, they used

:> : Ariane's and Titans in addition to the Atlas Centaur. Please note that

: all

:> : of these launch vehicles were developed with heavy government subsidies

: and

:> : most (the US models) were directly derived from military missiles and/or

:> : launch vehicles.

:>

:> : So even the so-called commercial satellites need govt. funding.

: They used government launch vehicles because they existed, not because they  
: were the optimal solution to the problem. Costs have remained high and  
: launch failures have remained frequent enough to cause insurance premiums to  
: remain high. ELV's can't improve cost and reliability at the same time.  
: They've found their optimal design which is dictated by the cost/reliability  
: tradeoff inherent in being expendable.

:> : Let's see you convince investors that the US government can be forced

: into

Re: Death Sentence for the Hubble?

sci.astro: Re: Death Sentence for the Hubble?

:> : buying your launch vehicle, when they've got a vested interest in  
: keeping  
:> : jobs at KSC and Vandenberg AFB.  
:>  
:> Depends on where I'm located. I guess if I answered an RFP and bid and  
:> won the contract then I'd actually be in rather than outside looking in.  
:>  
:> : Because the shuttle flight rate wasn't ever going to be high enough for  
:> : them to fly all the birds that they needed to fly. The Challenger  
: disaster  
:> : let them use the "safety" issues at VAFB as an excuse to pull out. The  
:> : reality was that they couldn't live with the low flight rate coupled  
: with  
:> : multi-year stand downs whenever a disaster happened. And as history has  
:> : shown, there was another disaster which caused another multi-year  
: shuttle  
:> : stand down.  
:>  
:> But is the shuttle disaster rate high based upon DOD standards of death due  
:> to engineering failure? I think not. I think the DOD simply doesn't need  
:> or want a shuttle.

: The disaster rate wasn't the biggest issue. The biggest issue was the low  
: flight rate, leading to too few launch opportunities for too many classified  
: payloads. Because the DOD shuttle flights were all classified, it's not  
: easy to figure out how big their backlog was at the time DOD finally pulled  
: out of the shuttle program.

: The shuttle design is mostly ELV with a bit of RLV thrown in for appearance.  
: When DOD pulled out, NASA was still pulling SSME's off the shuttle after  
: every flight. How reusable is that? Certainly the situation is a bit  
: better today, but that was only after pouring enormous amounts of money  
: into continued SSME improvements over the decades.

:> : DOD did the right thing. They put national security first and pulled  
: out of  
:> : the shuttle program at the first opportunity.  
:>  
:> "National security" is a euphemism for cheap access to oil (CATO-TM).  
:> Since the shuttle doesn't lend itself to that, you're right, why use it?

: National security refers to the military satellites that DOD launched on  
: the shuttle. These were (very likely) spysats, military comsats, and the  
: like. This was all about the Cold War and keeping our eyes on the Soviets.  
: Even after the fall of the Soviet Union, the inertia of these Cold War  
: programs continued for many years.

:> : There are many proposals and many startups. What they lack the most is  
:> : funding. My suggestions would include a guarantee from the US  
: government  
:> : that NASA won't develop its own launch vehicle to replace the shuttle,

Re: Death Sentence for the Hubble?

sci.astro: Re: Death Sentence for the Hubble?

: > : making private investors more likely to invest. My suggestions would  
: also  
: > : have the US government provide prizes and/or contracts to startups which  
: > : actually develop a vehicle that meets certain goals, like getting people  
: and  
: > : supplies to ISS and back.  
: >  
: > Well the shuttle does do that, though not cheaply.

: "Not cheaply" is the single most important issue. Cheaper access to space  
: changes the entire paradigm. You can start throwing mass at problems  
: instead of expensive engineering, testing, and the like.

: > : Sending people and supplies to ISS is something the US is committed to  
: do  
: > : \*anyway\*, so why not use that money to pay startups for their services  
: > : rather than awarding the money as cost plus contracts to the usual  
: suspects?  
: >  
: > I would agree with that. I guess getting a payload to ISS would guarantee  
: > another paid-for launch and extra based upon the payload.

: And we can do it without a NASA mandated design. If Russia, ESA, and Japan  
: are (or will be) doing it, why not private industry in the US? Isn't  
: private industry in the US up to the task?

I answered this post and right before I sent it my server crashed. Anyway,  
second time around is more sparse.

Regarding private industry being up to the task, you tell me!??

You want NASA to get out of the way. Okay, fine. What exactly do you see  
happening in manned spaceflight? An industry magically appears?!

Eric

: Jeff  
: --  
: Remove icky phrase from email address to get a valid address.