

Re: An alternative to Orion/Constellation?

Source: <http://sci.tech-archive.net/Archive/sci.space.policy/2009-04/msg00408.html>

- *From:* "Jeff Findley" <jeff.findley@xxxxxxxxxxxxxx>
 - *Date:* Fri, 24 Apr 2009 10:40:03 -0400
-

"David Spain" <nospam@xxxxxxxxxx> wrote in message
news:88GdnZ3vC-NLfm3UnZ2dnUVZ_vmdnZ2d@xxxxxxxxxxxxxxx

Posted this email to a friend today in response to a email

It pretty much sums up my views on Orion/Constellation and what I think we (USA/NASA) should be doing instead.

This has been discussed extensively on the usenet sci.space... news groups.

I'm a bit of a heretic over there because I'm very critical of the Orion/Constellation program.

I think it's a big waste of time and money. We will once again focus on the moon to the exclusion of all else, esp. planetary exploration.

We should **not** be building a water landing capsule. Ala Apollo 2.0. We should be building a manned glider (w/o payload capacity) that can either ride atop an expendable rocket or can be launched from a mother-ship ala Scaled Composites' SpaceShipOne [2]. It's sole purpose would be to ferry people up to orbit and ferry people down from orbit.

Such a vehicle would be much more expensive to develop than Orion.

Shuttle costs got out of control when we decided to make it big enough to carry a significant payload other than people [1].

One of the biggest problems with the shuttle is complexity. Making it smaller wouldn't have made it (much) less complex. Some things could have been cheaper (i.e. TPS due to smaller surface area and fewer tiles), but other things would remain the same in terms of complexity (life support, crew cabin, computers, control surfaces, windows, and etc).

Re: An alternative to Orion/Constellation?

If it were just to ferry people it could have been made a lot smaller with a lot more launch options which would have improved the economies of everything.

A water-landing capsule gets us nowhere in terms of reducing access cost to space.

I'm not a fan of water-landing, but this isn't because Orion is a capsule. There have been many proposals for land-landing capsules, including Orion. That functionality is being dropped from Orion more because of Ares I's payload shortfall than anything else.

A moon-base is a poor run-up to any kind of Mars exploration and will eventually be abandoned when whatever small political support for it vanishes. Any Mars program that starts after Constellation will be finding itself starting over from square one.

There are arguments for a lunar base and against a lunar base when you claim it's a first step to Mars. As an example, man has spent precious little time actually on the moon and it will provide a way to gain EVA experience on a body other than earth. How well the *particulars* translate to a Martian EVA is what's debatable. The atmosphere on Mars is thin, but does complicate cooling. The gravity is higher than the moon, making lightweight suits and life support critical. Abrasive dust (like the moon) may not exist on Mars due to wind erosion.

There are countless other ways that a moon base could help us learn how to live and work in space before we attempt a Mars mission. But in the end, Mars isn't the moon...

Instead...

We should be focusing on building what I call a 'traveling space habitat'. Something on the order of a very small space station that can be sent out of low Earth orbit (LEO) on orbital exploration missions. First to the moon, then maybe Venus, and eventually Mars. It would be self-sufficient and fully reusable and capable of supporting a 6 person crew nearly indefinitely. Such a vehicle would get us well past the moon, but could be effectively used in a lunar exploration program as well as giving us a pathway to the planets.

Re: An alternative to Orion/Constellation?

We can do "spam in a can" missions in LEO. That's what ISS is for. Changing the venue to lunar orbit or Martain orbit doesn't make much of a difference in terms of the engineering, science, or even public interest. Actually setting foot on the moon, an asteroid, or Mars is completely different.

Besides, if you're going to pay the delta-V to send your habitat to Mars, leaving out the landing part is pretty silly. You're 90% of the way there, why not go that extra 10%?

We need not another moon capsule but a better shuttle and the ability to construct stuff in low Earth orbit (LEO). The moon can wait IMO. Colonization should be left up to the private sector when there is sufficient economic reason to do so. That's the only way it will ever be sustainable.

Meh.

Dave

[1] The other reason I remember was the unique ability to 'retrieve' payload from orbit. IIRC this was done exactly *once* with a comm sat (whose PAM module failed to ignite?) and failed to achieve proper orbit. IIRC, the company that lost the satellite received an insurance payout and the insurer got back the retrieved satellite which I assume they sold to someone else to try again? It appears that this once taunted feature of the shuttle was never really that important.

You forgot LDEF, which was an important thing to retrieve:

<http://en.wikipedia.org/wiki/LDEF>

Yes, LDEF experiments could have arguably been done on many more smaller satellite missions, but this was an example where retrieval of a satellite provided useful scientific data. Today, such experiments would be done on the outside of ISS, but the US didn't have a space station when LDEF flew.

[2] No I'm *not* implying that a White Knight could do the job. Only something new that was designed for a much, much smaller shuttle that launches from the carrier

Re: An alternative to Orion/Constellation?

craft using (expendable) rocket assist with only OMS pods and wings for return from orbit where it would glide to a respectable runway landing.

Do the math. Your carrier aircraft is going to have to be really huge for such a proposal. Note the size of the shuttle ET. You're going to need a tank almost that size to get your smaller space plane to orbit (no SRB's means the liquid rocket engines would be doing more of the work).

As an aside, I don't for the life of me understand this compulsion to throw everything out with each new generation of space transport and start over. My whole engineering career in the commercial sector has seen incremental improvements where technology is refined and refined. The one exception being due to the break through from vacuum tubes to solid state. I suppose a space-elevator would be the equivalent type of break through in space transport. But I don't see one yet. But why do we go from capsule to shuttle now back to capsule? This makes no sense.

Reusability would be a good thing, if the flight rate was higher. Starting with a reusable first stage is where I'd start. A reusable capsule won't save money if the flight rate is going to be very low due to using expendable launch vehicles (the latest Ares I proposal is to delete the Ares 1-Y test flight and delete SRB recovery to save development costs and get it flying sooner). NASA is definitely going away from reusability in its panic to keep Ares I and Orion funded.

Jeff

—

"Take heart amid the deepening gloom that your dog is finally getting enough cheese" – Deteriorata – National Lampoon

.