

## OPINION SPACE

# Putting The Buzz Back Into NASA and Space Exploration

by Morris Jones  
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More than thirty years after Apollo 11, moonwalker Buzz Aldrin is still trying to advance human spaceflight. But Dr Aldrin has not been a part of NASA for decades, and his current views on some of America's space activities border on the adversarial.

In addition to his writing and speaking activities, Buzz Aldrin is the founder of Starcraft Boosters, Inc., an aerospace engineering firm working on proposals for new launch vehicles and spacecraft. He recently spoke to Space Daily's Dr Morris Jones on a visit to Australia.

**SpaceDaily:** China recently launched an astronaut. What is your reaction to this?

**Buzz Aldrin:** It's no real surprise. They've been working on this for a long time. I'm not concerned, and I welcome having another nation moving in the same direction. There will probably be a reaction in the USA about the military implications of Shenzhou, but that's a typical response that also happens if a new tank or a new aircraft is deployed.

There could be ways of cultivating a peaceful human spaceflight effort in China that works with what we're doing. We could help them out with some aspects such as rendezvous and docking, or lunar exploration. We could be useful to them, and they could be useful to us. We could eventually use Shenzhou as a lifeboat for the International Space Station. That would relieve us in the USA from having to develop a new vehicle for crew transfer and crew rescue. That's confounding the development of the Orbital Space Plane right now.

I don't know who is going to open the door to China. NASA doesn't have the foreign policy role to do it. The State Department is concerned with other things right now. All I can say is that the door could be opened and it could be useful.

**SpaceDaily:** This has not been a good year for NASA, with the loss of Columbia and the ISS program being criticised. What does NASA need to do to restore its image?

**Buzz Aldrin:** They need to find the next step in space. They're focusing too much on short-term interests that suit contractors rather than visions of evolving a human spaceflight capability beyond Low Earth Orbit. They should consider a shuttle-derived Evolved Expendable Launch Vehicle (EELV). We (Starcraft Boosters, Inc.) would like to put three RS-68 engines on the bottom of a Space Shuttle External Tank as part of the Aquila launch vehicle we have proposed. Three of these engines operating at two-thirds thrust would be fine, because if you lose power in an engine you just throttle up the others. The upper stage of Aquila is a pod with an RL-10 engine.

With the current approaches to the EELV being considered, a main engine failure would probably place the vehicle in the ocean. In Aquila, if you lose the RL-10 at ET separation, you can put the crew module into one or two orbits and then recover it.

You could upgrade to more solid motors and liquid engines on the vehicle and get something like a super Saturn 5. You can't grow the current EELVs like that.

So I think NASA has the wrong launch vehicle, and they're also making a mistake by trying to combine crew transfer and crew rescue in the one vehicle. They should charge ahead and get a crew rescue vehicle soon. If necessary, NASA should resurrect the X-38 program. But you won't save face if you end up reversing that decision. NASA is stuck buying Soyuz vehicles, but you could eventually buy Shenzhou as well.

The crew vehicle we're proposing for Aquila is based on the HL-20 design derived from a Russian BOR-4 mini Shuttle design, one of which was photographed being recovered from the ocean by the Australian military. It's my understanding that aspects of the HL-20 design are more advanced than other entries for the Orbital Space Plane. Our engineers have looked at an 8-person module that we could build in three stages of capability. Block one would be crew-return only, and could be carried with wings folded up in the Shuttle cargo bay. Block two would be carried on the side of the external tank core of Aquila and could be used for crew escape at any stage in the launch, including parachute recovery from the launch pad. Block three would have parallel sides with wings folded against them, but the wings would only be deployed after re-entry.

We think that we (Starcraft Boosters, Inc.) have a better plan than what NASA is currently doing, but NASA won't look at us because we're not capable of handling the whole manufacturing.

**SpaceDaily:** So if NASA eventually developed a new launch vehicle and crew return system for the ISS, what should be the next task after that?

**Buzz Aldrin:** We think a visionary goal needs to be stated at the Kitty Hawk ceremony later this year (celebrating the centenary of powered flight) so we can proceed and develop the Orbital Space Plane based on that vision. That vision should be an Earth-Moon L1 human-tended facility. We think you could do that with only two or three

launches of an advanced launch vehicle, not the dozens of launches required for ISS.

L1 is the stepping stone that opens up access to the lunar surface, near-Earth objects, and telescopes that we want to build in space.

Some scientists talk about putting a facility at Sun-Earth L2, but it's cold there! It's in shadow all the time. You could put telescopes there but I don't think humans should be there. If you want to service a telescope at Sun-Earth L2, you move it to Earth-Moon L1. You can move a telescope there very slowly and get fuel efficiency, but you can't ship humans that slowly. I'm dismayed at the fact that some scientists don't seem to understand orbital mechanics.

**SpaceDaily:** What would an L1 facility look like?

**Buzz Aldrin:** It would have a central hub with two cylinders on either side that could be moved away from the hub on cables. You could spin it for artificial gravity and run elevators along the cables. We need to pioneer artificial gravity for future missions to Mars. A simple prototype of the L1 facility could be made to co-orbit with the ISS using one or two launches of EELVs. It would consist of FGB-2 which is sitting in Russia right now, or an inflatable module from Bigelow Aerospace, and a wet-dry demonstration of an upper stage of a heavy Delta 4. We could launch a Delta 4 with wet tank connected to the payload that's a dry tank, a bit like Skylab.

**SpaceDaily:** How do you feel about the X-Prize entrants and dot-com millionaires financing launch vehicles for sub-orbital space tourism?

**Buzz Aldrin:** Since we don't have the option of flying civilians on the Shuttle, especially after the loss of Columbia, we have nothing else to use right now for orbital tourism but Soyuz, which is very expensive and requires a lot of training for tourists. To keep public interest afloat in space tourism, it would be good to have cheaper sub-orbital vehicles operating in the short term. But I'm also concerned about the safety aspects of these new vehicles. If there's an accident, it could set back the whole concept of space tourism.

**SpaceDaily:** How much closer are we to reaching Mars?

**Buzz Aldrin:** We will use L1 as a first step, then we should set out for missions to near-Earth objects. We should develop and test technologies for deflecting asteroids that could impact the Earth and do sample return. Missions to near-Earth objects would be cheaper than setting up a base on the moon. You can go to Mars later, but even before you touch down on the surface, you should spend some time sending human expeditions to the Martian moons. All this is part of a 30 to 40 year plan. We need to set it all out in four-year increments, because that's the length of a Presidential term.