

## AIRLINE STYLE TRAVEL TO LOW EARTH ORBIT

Space is the future home for all manufacturing activities for planet Earth. Space is the source to unlimited quantities of all known and unknown raw material needed to support life on Earth. Transferring all manufacturing facilities to space will release land and water and make them available to highly in demand agricultural and living facilities which will be in great demand due to population explosion and of course let's not forget about all the pollution which will be eliminated both on Earth and also on low Earth Orbit because of the more efficient solar energy harvest due to absence of the Earth's thick atmosphere. Electricity is only one of the efficient methods of solar energy harvesting procedures. Consider the 600 degrees temperature variance which any object experiences on its sun side and back side.

The current vertical take off and landing space travel system in use at present time is providing a reasonably good lifting capacity for present time space travel requirements, considering the fact that almost all of space travel activities are only experimental but not operational or commercial activities at this point of time. It is also an imperative to mention that the current vertical take off and landing system in use for space travel has no ability to return a good size commercial or military load from space to Earth, its load return capability is limited to three or four astronauts. In less than twenty five years, living and working in space will be a major industry for Earth. We need aerospacecraft capable of providing airline style travel to LEO and back to local airports with airline travel frequency capability.

Current vertical take off and landing system used for space travel at present time is an obstacle to attracting and convincing even a risk taking work force or tourist population willing to travel back and forth to and from space, because the entire launch and recovery procedure looks like a massive and fiery explosion which shoots only three or four astronauts to space and it is followed by a massive rescue operation involving deployment of several parachute systems and deploying a massive sea rescue operation complete with ships, boats and helicopters. Again, We need airline style travel to Low Earth Orbit conducted from local commercial and military airports.

Technology required to create such system has been available since early 1980's or even earlier. In early stages of retired space shuttle system addition of two retracting turbo fan engines providing a powered return to destination airport was considered and unfortunately eliminated from the design. Powered return capability is a must for an aerospacecraft, because an airliner size craft filled with returning astronauts and cargo can not glide and approach an active airport with only one chance to land, it must carry 45 minutes fuel reserve both for astronauts safety and FAA regulations.

Since the Space Shuttle airframe and aerodynamic design goes back to almost 40 years ago, we can expect major weight reduction and aerodynamic performance improvements for the design of the aerospacecraft which will allow for having more cargo and fuel onboard. The only

remaining area of consideration which is off course of great importance is the elimination of “hypersonic return” flight regime which poses a great danger to human occupants of the aerospacecraft. Reducing the hypersonic velocity to supersonic speeds could be achievable using a hybrid, “high by pass ducted fan/rocket “ power plant. This power plant can propel the aerospacecraft from runway surface to 65000 feet and higher using the ducted fan system and to Low Earth Orbit using the rocket system . Assuming most rocket engines operating at specific impulse of about 400S, and comparing them to jet engines which probably operate at specific impulse of 40000S, a middle ground Specific impulse will increase the ascent time to hours from minutes, but it may be able to use some of the fuel it carries to slow the craft down from hypersonic to supersonic speed in its return leg of flight and also provide powered return to local airport.

The aerospacecraft can be designed and manufactured by all major aircraft design and production companies , information about the hybrid power plant system is available in concept stage only and can be forwarded to Herox if needed.

S. Bahram Sadighian  
sbsadighian@yahoo.com