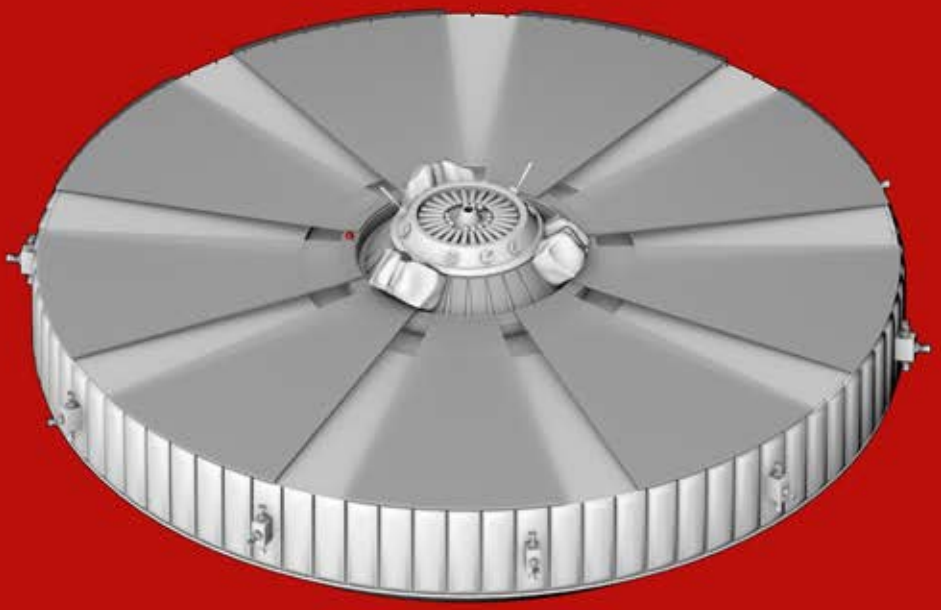
OSV
A PROPOSAL



BUILDING UPON THE FINDINGS OF NASA'S 1996 TSS-1R MISSION TO DEVELOP A NOVEL GENERATION OF REUSABLE ORBIT-TO-SURFACE SHUTTLE, RECONNAISSANCE AND LIFTING VEHICLE BASED ON CURRENTLY APPLICABLE TECHNOLOGY AND PRINCIPALS

[ABSTRACT - Using repellent electromagnetic force between an orbit deployed vehicle and the magnetosphere to affect safer EDL into planetary atmosphere at lower than conventional velocity, powered by electrical induction] – 2,350 words

[redacted]

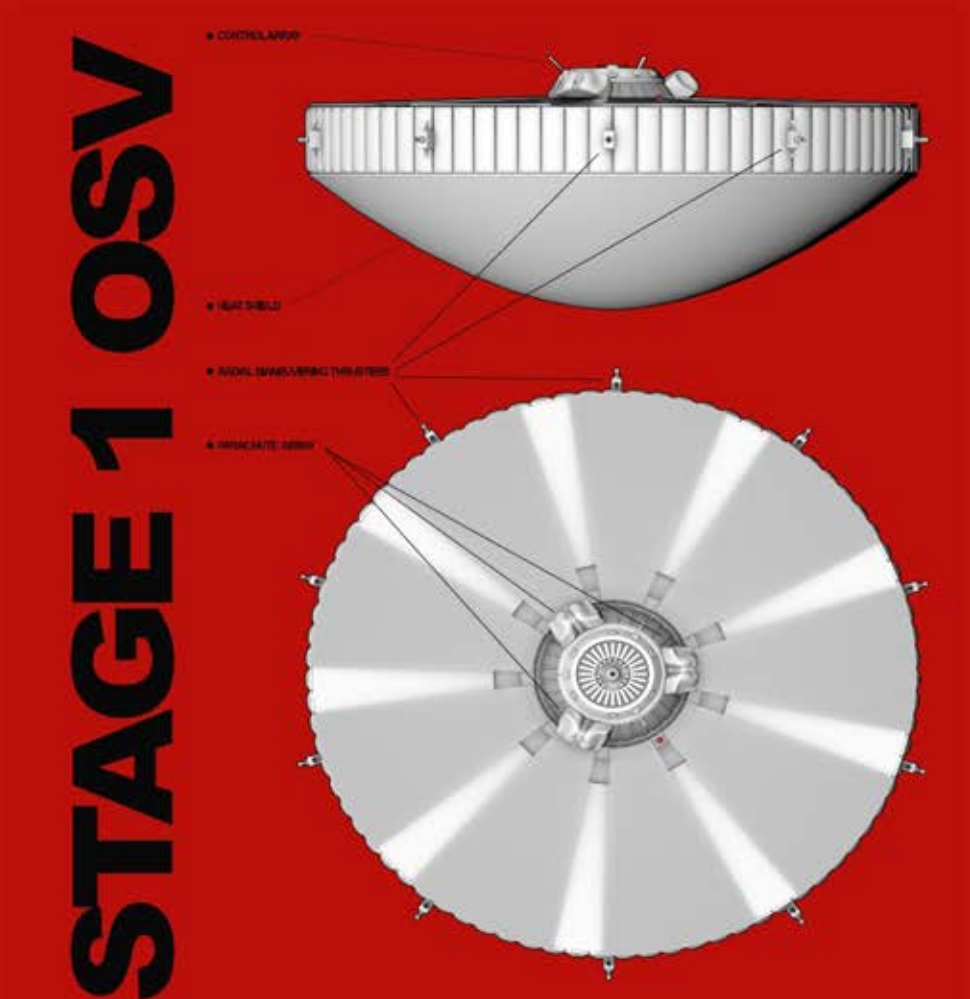
INTRODUCTION:

Since the onset of the Space Program and at this time of writing, man has successfully launched into space and returned safely some 600 souls, at least as far as near earth orbit and back and, in the coming decades, we intend to send out and return who knows how many more?

Through our commitment to space and manned space exploration during that time some 30 individuals have tragically perished, at least a third of those casualties caused by problems concerning re-entry.

Existing methodologies used to facilitate atmospheric EDL, though brute-force, are efficient and well understood - but the potential for failure is never far from occurring and, when such failure does arise, that failure is almost always catastrophic.

The aim of this proposal is to address that by adopting a safer methodology using already very well applied and understood physics and technology, just simply applying them in a way never tested or tried before.



PRINCIPAL:

As you no doubt know, conventional methods of affecting EDL – in the immediate term - into earth atmosphere require any craft so doing to not only have to approach the atmosphere while still traveling under considerable inertia acquired from having attained near earth orbit in the first place but, once descent is initiated, that vehicles mass is then accelerated further at a rate of 9.8 m/s/s uncontrollably in an earthward trajectory until such time it hits outer atmosphere – by which point it is traveling at something in the region of 21 times the speed of sound with no way to reduce that velocity until such violent and dangerous contact has been encountered.

Due however to its active geothermal core our world – as well as any similar planetary body elsewhere – produces a magnetic field extending through atmosphere and out into space, far further than near earth proximity.

The idea is simply to build a vehicle capable of producing its own magnetic field while in orbit, orientate itself so as the polarity of its own EMF repellant to that of the earths at point of contact occurs on the earthward facing side of the craft and, once descent is initiated in the normal way, allowing gravitational force to result in electromagnetic resistant force as opposed to an uncontrolled earthward acceleration, thereby facilitating a slower, safer entry into atmosphere and enduring while within full atmosphere.

METHOD

The most straightforward means to accomplish this is simply to construct the principal of the vehicles mass out of conductive material, arrange its assembly gyroscopically and induce it to spin prior to release – as NASA's 1996 TSS-R1 space tether experiment demonstrated, Faradays Laws of Electrical Induction apply – both the vehicles orbital motion through the earth's magnetic field at a velocity of 7.8 km per second, coupled with the rotation of its conductive assembly as it moves, will induce a charge of electrical current direct from the earth's EMF allowing the craft to produce an EMF of its own: in addition, spinning the assembly will orientate the craft gravitationally presenting it with a stable earth facing underside.

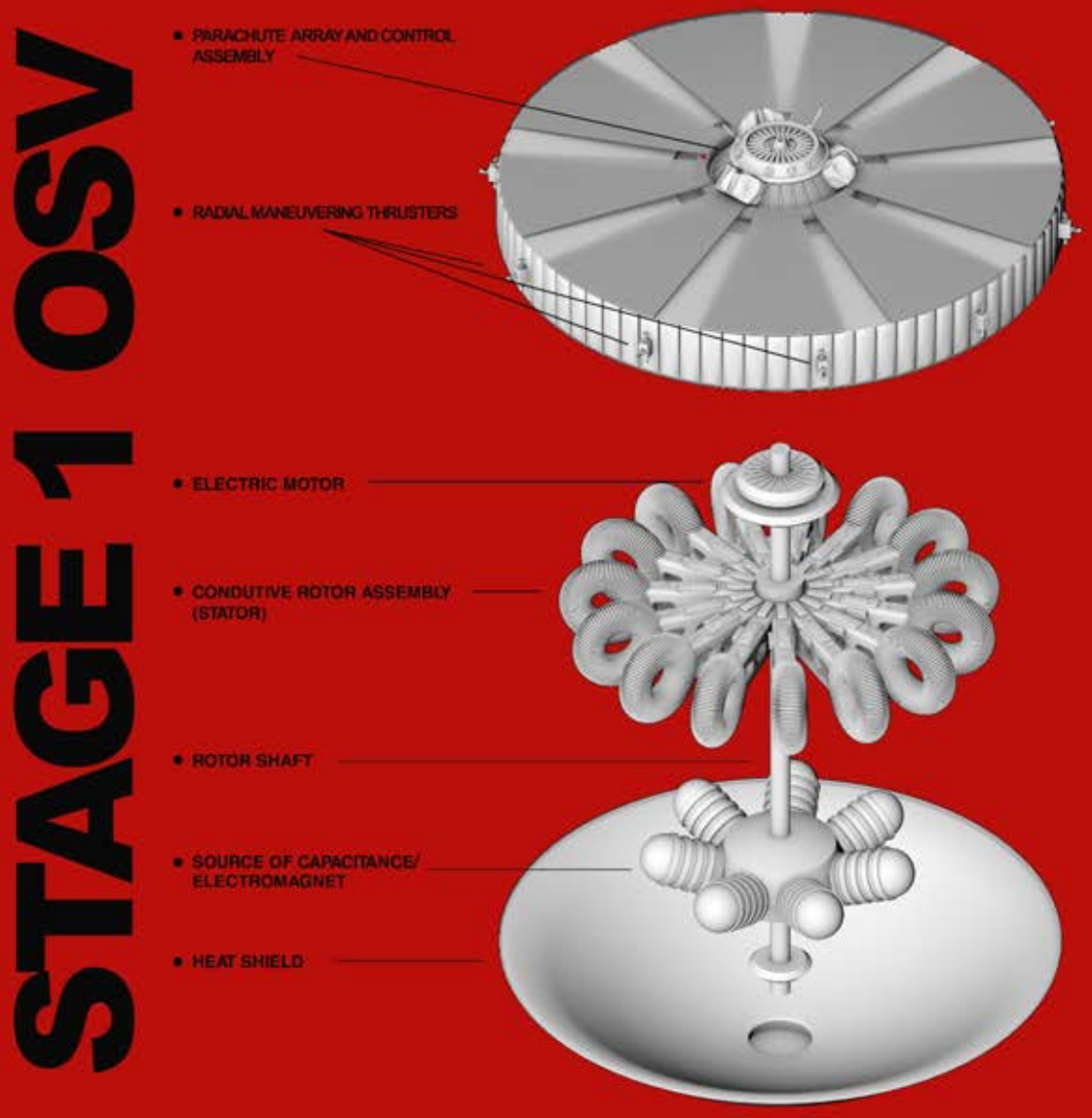
The rest is elementary physics.

Though initially weak at the onset any decrease in orbital inertia resulting in an earthward trajectory for the craft – so long as it continues inducing an EMF of its own and remains stably orientated - will result in an increase in EM resistant/repellent force between it and the earths EMF exactly the same as when two hand held magnets of like polarity face each other and are forced to come closer together.

In such an instance it is not the fields themselves which produced any of the resistant/repellent force felt occurring between – it is actually the force being applied to overcome each polarity's abhorrence of the other that is being constrained by the fields occurring in between to work in the direct opposite to which that force is being applied.

In other words, the repellent force occurring between two hand-held magnets of like polarity is produced by the person forcing the magnets together.

In the context of an EMF inducing craft and the earths EMF – *gravity* provides the repellent/resistant force, which can only increase with closer proximity brought about by lower altitude.



An exploded view of the Stage 1 OSV – note, Stage 1 is not envisioned as a manned vehicle, this is proof of concept proposal only. **Stage 2** will focus on the craft's range and maneuvering capabilities within atmosphere and not until **Stage 3** is a crewed vehicle anticipated, providing Stages 1 and 2 prove the viability of a manned test

CONCEPT

It's important to understand, the concept being discussed here is for the development of an entirely novel class of vehicle – the OSV (Orbit to Surface Vehicle), once deployed into orbit by conventional means, is envisioned to operate as a true "space craft".

As such, in operation, the OSV - primarily envisioned serving the role of a CRV (Crew Return Vehicle) - will be deployed from orbit. Full atmosphere will be its mid-operational range away from orbit and the earth's surface the apogee of its operational range. When done it will return to orbit under its own power.

Weather this can be accomplished via a single craft or such a range requires some form of multistage arrangement to accomplish is not currently determined however, even the proof of concept Stage 1 vehicle outlined here should manage to enter full atmosphere safely and return to its original altitude under its own power and operation.

Before going further than simply proving the concept however there are certain things that yet need to be worked out practically, first – such as controlling the craft.

Putting it simply, the OSV is not envisioned to use flight or flight principals of any description in atmosphere rather EM repellent/resistant force. Further, the way it will behave in atmosphere will be highly distinctive and counter intuitive to what is normally considered usual "flight" behavior.

Because the principal of the vehicles mass is induced to spin while carried in near earth orbit, much of its initial inertia will be retained. Further, because it's arranged gyroscopically and spinning that mass doesn't care in which direction horizontal to its vertical axis of rotation it heads in.

A brief burst from a directional thruster will be sufficient to send it on a new heading with virtually no decrease in speed in its initial heading at what appears to be an impossibly abrupt, sharp angle, appearing to act in contradiction to Newton's 1st Law of Mass and Motion.

Obviously, nothing in practice will be the case – but, from the point of view of observation this vehicle will appear striking in terms of both configuration and behavior, especially in atmosphere where the highly charged nature of its induced EMF will most probably cause a distinct amount of fluorescence to occur surrounding the vehicle.

Equally, its ability to abruptly change heading at high velocity may cause problems for a manned crew to handle in terms of acceleration and g-force experienced, hence why Stage 1 and 2 are envisioned as wholly unmanned projects until such time as the practical aspects of the crafts handling and flight behavior can be properly worked out.

So long as it continues to induce its own EMF however, it will in practice remain "airborne" although its airframe is designed more to facilitate the crafts smooth passage through the medium of air in a multitude of directions rather than provide any kind of flight surface.

ENERGY EFFICIENT ATMOSPHERIC TRANSPORTATION

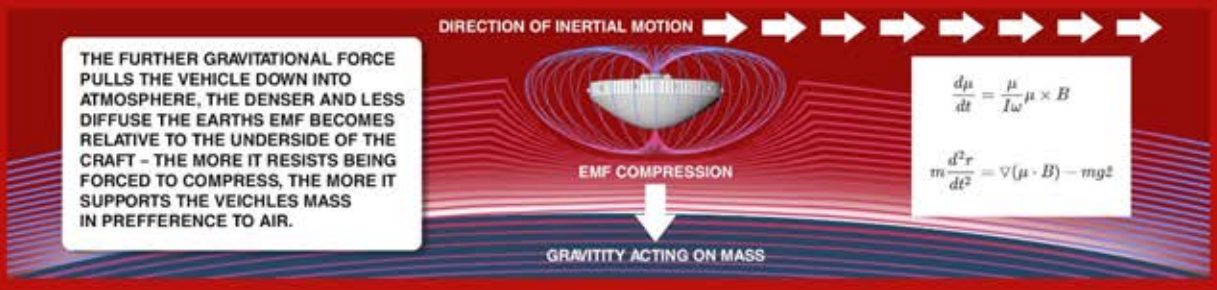
As stated, the principal purpose of the project is to exploit the benefits of starting out in a micro-gravitational environment and use EM repellent/resistant force to facilitate slower, safer EDL in planetary atmosphere – something impossible to attempt from the ground up in an attempt to bring about lift because gravitational force is simply too strong to overcome at the onset.

Initiated from orbit however EM repellent/resistant force between the earths EMF and that of an induced EMF of the vehicles own would wholly be the product of gravitational force and could only increase as gravitational force pulls the vehicle earthward further into atmosphere – because of the repellent EMF's intervening gravitational force is simply prevented from resulting in an *uncontrolled* increase in earthward inertia as one would otherwise usually expect.

Because the vehicle would still be traveling under a considerable portion of its initial orbital inertia and the world is basically a ball that spins, the potential to employ the OSV as a means of energy efficient transportation should be thoroughly considered.

There must come a point in atmosphere where earthward gravitational force is counterbalanced by the earths EMF's resistance to be caused to compress further – rather as spin-stabilized levitation and/or maglev works – although the process here it must be noted is not actually levitation at all.

Though initially weak and magnetically diffuse, providing gravitational force hasn't been allowed to result in the vehicles uncontrolled acceleration toward earth as envisioned – repellent/resistant EM interaction bought about by gravity's pull will cause the earths EMF to become denser on the underside of the vehicle relative to the point of interaction with the vehicles own induced EMF.



When that point is reached, spin-stabilized EM suspension will be attained at altitude, preferably before hitting the ground – hence the parachute array, just in case.

The OSV is a mass traveling under considerable lateral velocity purely through inertia with no preference in what direction horizontal to its vertical axis of rotation it travels in – not only does it not have to burn fuel to move at considerable speed due to that inertia already

applied from being deployed in orbit its own internal operation at lower altitude will be actively generating more electrical energy than it actually needs to remain operational.

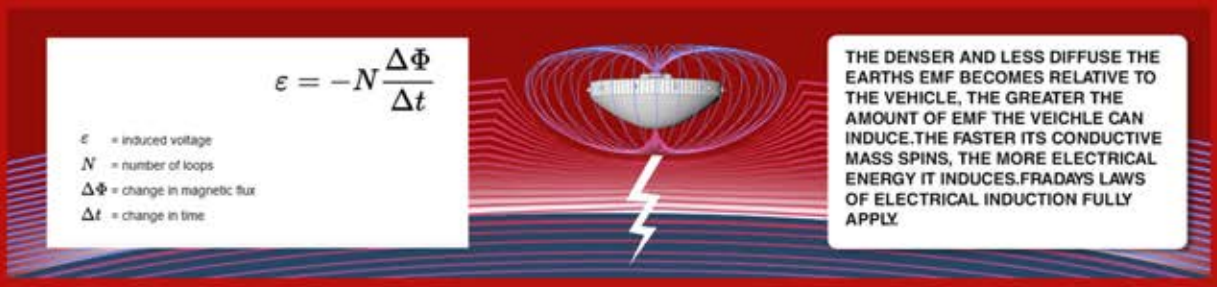
Providing it remains operational, the ability to exploit the planet's surface rotation in order to reach any particular point upon it is potentially unlimited.

Further, the longer it runs, the faster it spins, the greater the degree of EM density bought about by EMF compression local to it – in other words, the lower into the atmosphere it goes - the more electrical energy it will produce in accordance with Faraday.

ELECTRICAL POWER GENERATION

Although conceived as simply an energy efficient means of controlling a vehicles earthward speed and rate of descent prior to reaching atmosphere one can't help but observe, in being successful in this primary endeavor, this same arrangement would also be serving as a principal means by which electrical energy may be induced directly from the earths EMF wholly for the purpose of electrical power generation.

As stated previously - Faradays laws of Electrical Induction apply.



At the onset, as established by NASA's 1996 TSS-R1 space tether experiment, the OSV is expected to generate an initial charge of be no more than 3500 volts – sufficient to burn a 100-watt lightbulb possibly, little more however – being in a micro gravitational to begin with – the strength of any EMF initially produced is irrelevant. It is simply establishing repellent EMF interaction at the onset that matters – gravity provides the strength of any repellent force intervening - not the strength or density of either EMF.

However, as gravity pulls the vehicle earthward both the vehicles as well as the earths EMF relative to it will compress and become relatively denser local to the crafts stator and thus increase the degree of electrical charge induced the lower into atmosphere the further controlled atmospheric EDL progresses.

Equally the more electrical charge generated, the faster the conductive principal of the vehicles mass can be caused to spin and, thus, the greater the degree of electrical energy produced.

This is direct from the earth's magnetic field. It can't be efficiently exploited on the ground because that field itself under natural circumstances is too large and defuse to yield very much charge at all, but - from space down and with a methodology such as outlined here – the principals applied to allow this device to function as a vehicle also provide the means – potentially – of facilitating unlimited, clean, energy efficient electrical power generation at no extra or additional developmental cost or operational expense.

Basically, much like its applications for unlimited atmospheric travel – the benefit is a side effect.

CONCLUSIONS

- Quite literally, this proposal is a win/win scenario in every conceivable sense.

- This proposal doesn't rely on the development of new and/or never before tried technology or theoretical principals – quite the opposite. This proposal requires the application of established physical principals already known and well understood behaving as these physics should, applied via technology we widely use already simply applied in a novel way to bring about a given effect that of itself is perfectly conceivable, just something never tried or attempted before in this proposed context.

- It is not the intention or purpose of this proposal to expect anything outlined to give rise to any behavior hitherto previously unknown or unexpected – no hitherto unknown means of exotic propulsion, for example, or in fact any form of constant propulsion at all – this essentially is a totally engineless craft simply taking advantage of inertia already applied to it, maneuvering via means of short burst directional thrusters only.

- Even if proven only to function on the level of facilitating slower, controlled, safer EDL into planetary atmosphere as a CRV as proposed – development will result in greater safety for mission crew and help ensure human life well into the foreseeable future of the space program.

- Should, as hoped, the practical operation of this proposal go beyond such initial expectation, the potential in applying our existing knowledge of really quite elementary physics in this particular way with the intent to facilitate these particular ends as outlined has potential to go far beyond this being simply a means of safely getting down from orbit.

- Its potential as an atmospheric transportation craft should be considered and assessed as well as its potential as a principal means of extracting electrical energy direct from the earths own EMF could allow us, for the first time, to tap a potentially limitless supply of clean, pollution free electrical energy indefinitely.

Thank you for your time in reading. I trust the idea proves something of interest, worthy your day.

Sincerely.

EXTERNAL REFFERENCES

https://pwg.gsfc.nasa.gov/Education/wtether.html

http://www.physics.ucla.edu/marty/levitron/spinstab.pdf