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Space launching base in stratosphere

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In the general frame of the MAAT (Multiple body Advanced Airship for Transport) project, sponsored by the European Union in the WP7 research program, a cruiser-feeder airship combination concept – completely conceived as an autonomous green and renewable energy powered transportation system, we are considering the possibility to utilize such system, conveniently revised, as a stratospheric platform to launch a variety of different space payloads .

Starting from an analysis of the proposed MAAT system components, the cruiser , as a modular expandable vehicle in permanent orbit in VLEO (Very Low Earth Orbit) at stratospheric 15 Km altitude, and the feeder, as a smaller vehicle utilized for two way transportation of cargo and passengers from the surface to the flying cruiser, the same components could be utilized for the purpose of establishing a stratospheric rocket launching base lowering substantially launching costs and increasing payload capacity.

The envisaged stratospheric platform will be a cruiser type modular airship, which is permanently stationed in the stratosphere, placed at a convenient location, with facilities to:

1- Manufacture LOX (liquid oxygen), with oxygen provided by the atmosphere to fuel the incoming rocket engines since the vehicles would be transferred without fuel

2- Receive incoming feeders, with attached space rockets, fuel and prepare them for launching,

3- Launch rockets and payloads to LEO (Low Earth Orbit), GEO (Geostationary earth orbit) or more distant space destinations.

Such airship will be powered as MAAT, by photovoltaic cells during the day, and Hydrogen fuel cells by night, in order to render the entire system completely autonomous (without ground refueling).

It will be equipped with the LOX manufacturing systems and facilities, to allow the envisaged docking of the incoming feeders that will transfer the rockets and their payloads for fueling.

Once fueled and ready, the rockets will be launched directly to space from a dedicated platform in the cruiser vehicle. After the launching, and completing the expected mission at higher altitudes, the feeder will be able to return safely to its land base and resume its transfer activity.

Such system may reduce the space accessibility costs by an order of magnitude, because it allows the transfer at high altitude of larger vehicles for more demanding missions - expected to require heavy payloads.

In this paper, we describe the above mentioned concept and its preliminary design, by involving systems, supporting vehicles and putting forward the necessary procedures, in order to make the entire operation possible, thus to successfully achieve the expected goals.