The Tarob Lighter-than-air Robot

Mats Hagner

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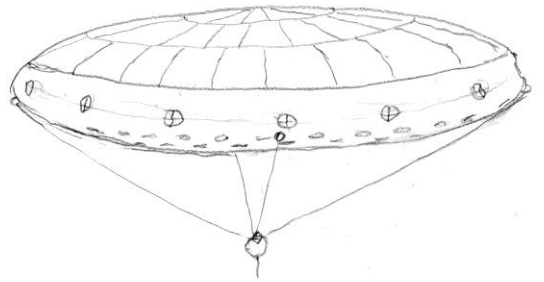
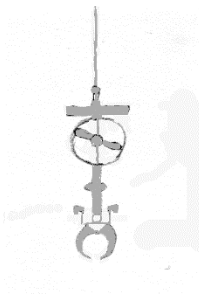
The Tarob is a concept for an environmentally friendly robot that has many possible transport functions and is shaped like a discus, with no front or back.
In daytime solar cells on the upper surface collect energy, which is stored in batteries. The robot is mostly working when sun is low or absent. Air is drawn through holes in the bottom to supply air compressors. Along the vertical sides there are inlets/outlets of air, making the discuss move in any direction**.**

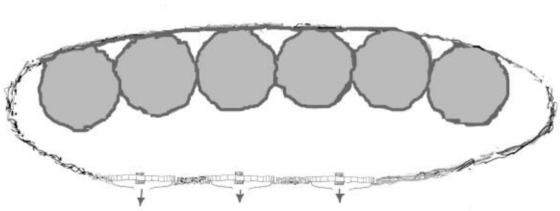


Two ropes attached to the sides are connected, at 90° to each other, to a winch suspended beneath the discus, enabling the Tarob to be tilted in any desired orientation.



The winch is equipped with a 100 m long flexible rope ending in a hydraulic claw to hold loads. It can be governed with the help of two infrared video cameras placed on top of the claw. The claw can be manouvred into precise positions using three reversible propellers, fixed in x, y, and z directions.

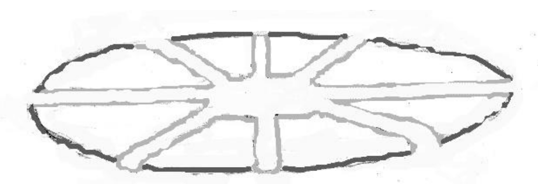
The lifting capacity of the discus is governed by the volume of helium in thin graphene sacks. The sacks are compressed, and the lifting capacity decreased, when air is pressed into its envelope. When



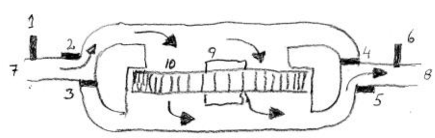
the compressors in the bottom of the discus pump out air the sacks expand, thus increasing the lifting capacity.

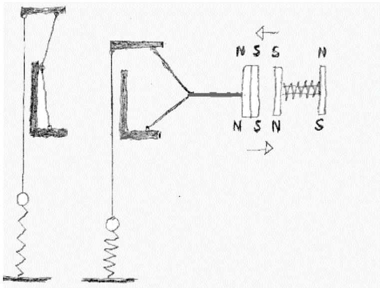
With a large number of compressors the capacity can be rapidly changed.

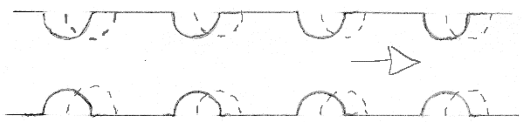
The Tarob is moved by suction of air through inlets at the front (relative to the desired direction of movement) and pushing it out at the back. Speed is controlled by the flux of this air. The direction of the air at the openings of the in- and outlets can be changed by small square rudders placed close to the surface.

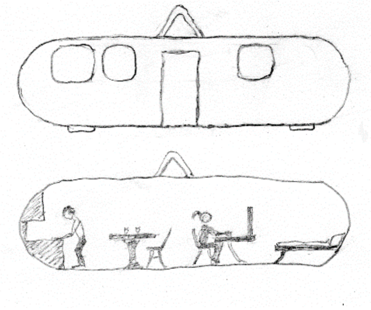


Air is transported through the discus in channels using either a central fan (like the one above a stove), or peristaltic constriction of the channels (like the gut) using electro-magnets.

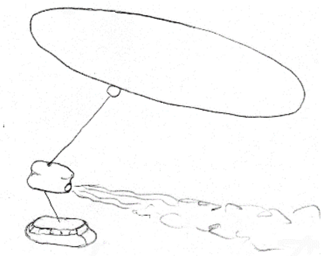




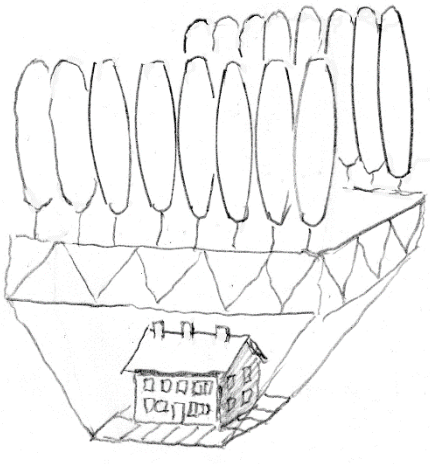




For human transport, people enter pods of various sizes kept on top of their houses or in public stations. As most transport by Tarobs is at night, the pods have facilities for eating and sleeping. Tarobs are ordered by phone to come and carry the pods to desired destinations. A central computer tracks the Tarobs' positions and optimizes journeys, considering the winds at different altitudes. When a Tarob is moved up to the altitude with optimal wind direction the air pressure will drop, so the pods must be airtight and equipped with a pressure regulator.

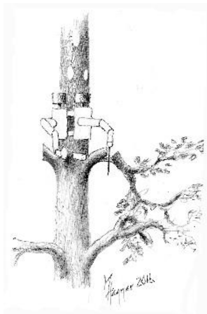


When great speed is needed, e.g. for pod-like ambulances, a jet engine (or an electric engine for aircraft, currently in development) can be attached. Then the discus will function like a wing.'



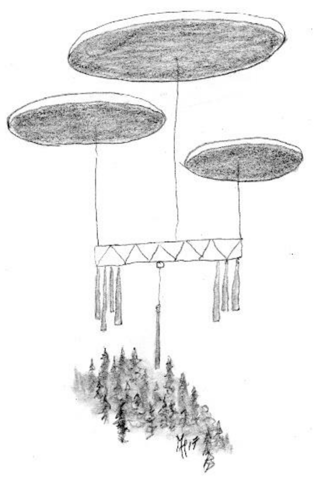
Heavy goods, such as a house, can be transported by arrays of cooperating Tarobs.

My own profession is forestry, and I am convinced that the following system is ideal.
Trees are grown to full size and picked, from the air using a Tarob, when mature. Half-grown trees with potentially good wood-quality are left. Smaller trees with poor quality are removed. All the



trees in stands are scanned by GPS, photographic, laser and other equipment carried by the Tarob before selecting trees to remove.

Stems of selected trees are debranched while they are still standing, using a robot like the one illustrated here. It is placed near the top of the tree by a Tarob, moves down cutting branches, then is moved to another tree-top when the first tree has been fully debranched.



When enough debranched tree-stems are ready for delivery, they are cut at stump-height, lifted straight up and loaded under a suitable number of cooperating Tarobs. When fully loaded, they fly directly to a sawmill and place the long stems on an x-ray analysis board. After analysis they are cross-cut in the commercially optimal manner.

Such a system will avoid injuries to other trees, damage to forest ecosystems caused by heavy machinery moving on the ground, pollution of water in harvested areas, and from removal of needles and branches (thereby improving biodiversity and soil quality). Moreover, it will eliminate needs for timber trucks and most forest roads, reducing CO_2 emissions associated with harvesting trees by an estimated 99%.

Organization of the Tarob system

The Tarob is much simpler to construct than vehicles with internal combustion engines, and very safe as helium gas is non-toxic and used to kill fires. It is an airship floating on the air like a boat, and easily built with no risks of burning or bursting. The Tarob is very reliable, and unlike airplanes, will not fall to the ground even if small holes are made (e.g. by gunfire) in the envelope. Moreover, helium gas is readily available from oil- and gas-wells, and in the future the gas could be exchanged with lighter vacuum, if aerographite is used together with graphene.

Tarobs can be mass-produced with any payloads, e.g. 20, 500 and 1000 kg. Huge cargoes can be transported cooperatively by several Tarobs. They can be readily equipped with radio, GPS, radar, laser, ultrasound, meteorological and other instruments to extend their functions and enable a central computer to coordinate a comprehensive global transport system. Most of the required technology is already available, but the introduction of such a system will change most features of our present world. Hence, it will cause huge political problems, but climate change is such an existential threat that a total revolution in transportation systems is needed very soon.