

ASTROHAB: A Modular Construction System for Lunar Bases

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This high costs of space accessibility and the need to maximise the utilisation of local resources has been the basic design requirement for this habitation construction system which could be used for stations and bases on the Moon.

Other particular design parameters were:

- minimum load from Earth
- maximum utilization of local resources
- minimum number of components
- simplicity of assembly
- minimum transportation space
- flexibility of use and expansion possibility

The system is composed of two basic forms in carbon fibers, stackable for transportation purposes, with a minimum weight, that properly assembled allow any type of flexibility. The functional module form allow the construction of habitats and any other function such as office, medical facilities, laboratories, rover shelter etc. while the connector module form, assure the connection between the functional units.

The single functional unit is composed of 24 forms that joined together allow a closed space, self supporting of a diameter of about 8 meters and a height ranging from 2.30 to 3.50 meters.

Each module is composed by two form a U-shaped that are joined together and filled with lunar regolith to assure stability, radiation protection and insulation.

The floor part of the modules could be filled with water, substituting the need for external water tanks.

These units, connected between them by Connectors, O-shaped forms, allow the construction of stations or bases of any dimension and for any functional requirement. Their extremely light weight allow the erection of the station by the astronauts without the need of heavy construction equipment and their size the possibility to move them manually to their utilization location.

This system is actually being developed as prototypes by our organization and we expect to eassemble a simulated lunar or martian base in Italy utilizing the AstroHab system in the next months.

In the enclosed images the system and the assembly sequence and most utilizations are shown.