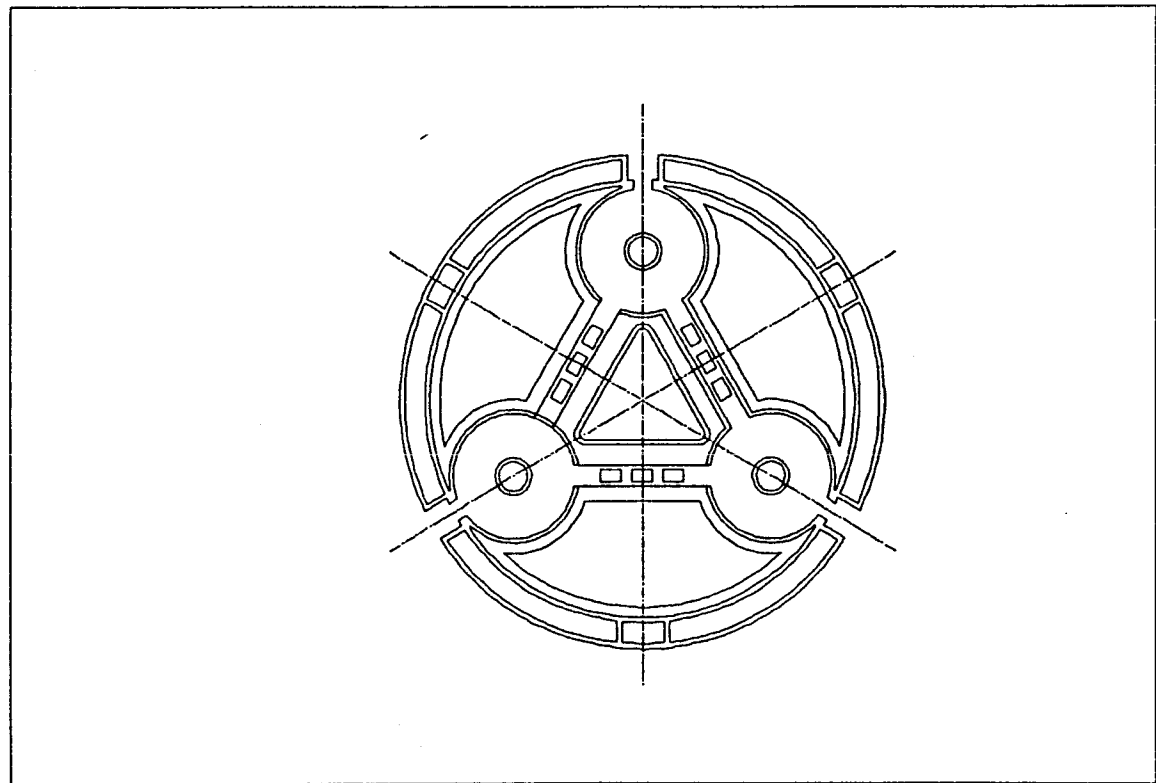

LUNAR BASE GENESIS

Stephen J. Frahm



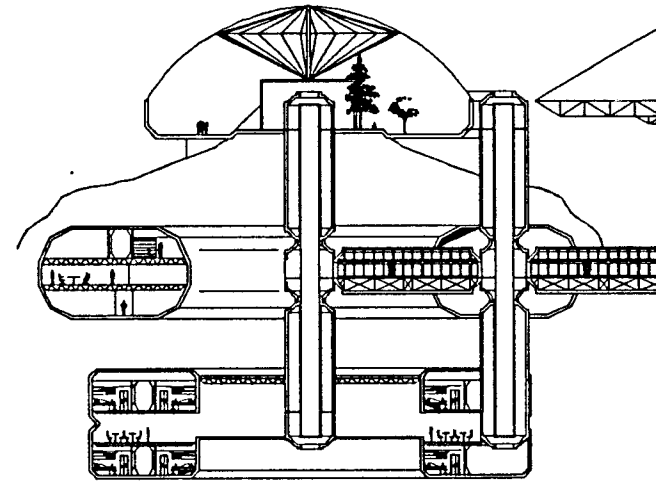
The following design scenario placed great emphasis on systematic phasing of the base's growth. The design was structured so that each phase of construction was linked to its particular function. The base is radially orientated. Areas became more specialized as the base grows in size. The overall amount of space per inhabitant also dramatically increases as the base grows. While early stages rely on earth manufactured structures, later base growth is dependant on the use of lunar materials.

The amount of radiation protection varies throughout the base. Generally, the amount of protection the structure offers increases as one descends to levels further underground. Areas in which a great deal of time is spent are therefore located on lower levels. Modules which are not buried beneath the lunar surface are protected by man-made radiation shields. these shields are constructed using space frame technology and are covered with bags of packed regolith. The shield's modular design permits rapid placement, accessability and expansion.

Life support and power supplies are located in the core of the structure and back-up systems are located at various levels. The living quarters occur closest to the core area with science, manufacturing and ground support areas located in the large outer ring. Further base expansion can occur through links to this outer ring.

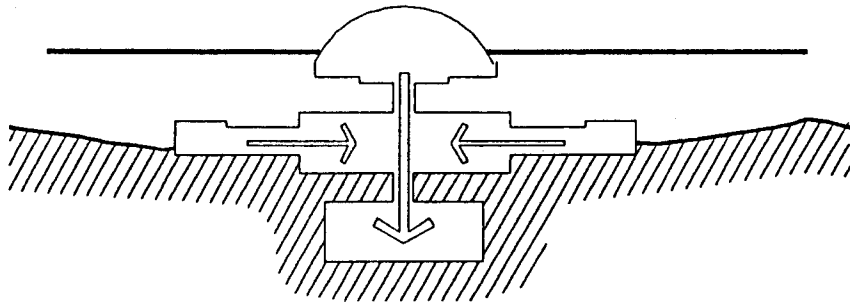
Early phase construction is of modular earth manufactured panels. Later construction schemes utilize lunar concrete to form radiating expansion areas. Later phases of base expansion involve the addition of plant growth areas. A large dome structure atop the base would serve various requirements. Besides supplying a portion of the base's food requirements, the dome would allow a large area for relaxation and recreation.

Interior spaces are organized according to activities and the amount of time they are used. Therefor, crew quarters are larger than laboratories and work stations, and allow for individualization.



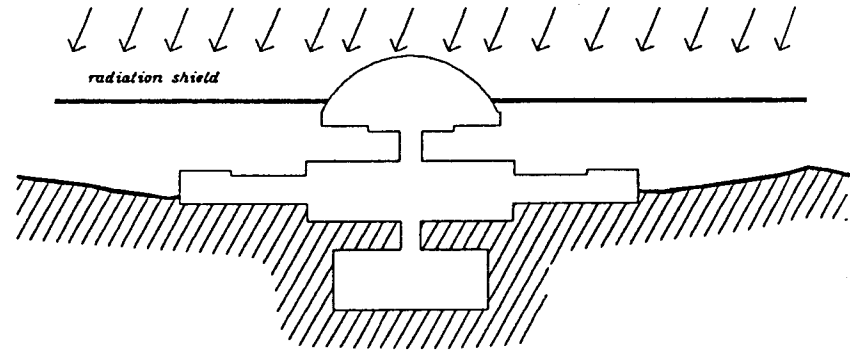
Section through completed base showing stratification

RADIATION PROTECTION



The deeper the penetration into the base, both in the vertical direction and in the horizontal direction, the greater the amount of radiation protection. The lowest point of the base thus has the greatest amount of radiation protection making it the safety shelter from the occasional solar flare thrown out by the sun. Storage of the vital elements such as food and water are stored within the inner core of the base.

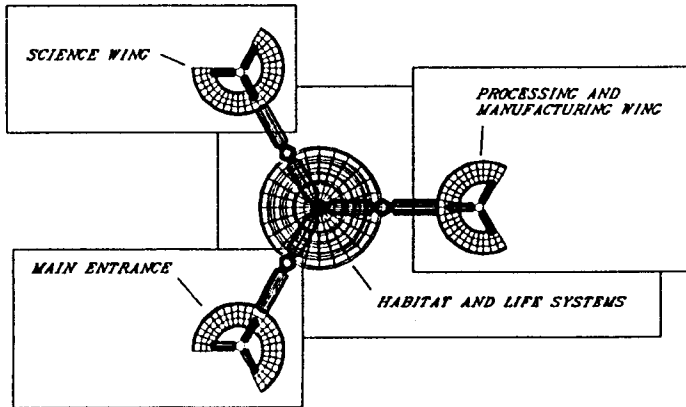
RADIATION PROTECTION



The separate radiation shield over the base is covered with bags of packed regolith. The external frame allows for the easy access to and expansion of the lunar base. Each 32x32 foot "pad" is constructed of lightweight aluminum and is supported by cables from above. The easy of assembly and time of erection are an added plus to the system. The modularity and lightness of the structure make it easy to move and easy to construct while still providing a strong support for the regolith protection system.

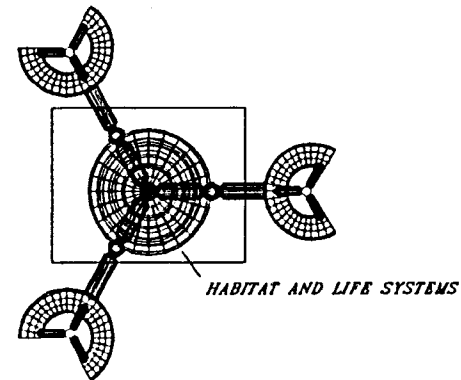
BASE ORGANIZATION

The base is actually designed as for separate bases. Each capable of supporting itself in case of crisis, having separate entrances and access points in several key areas, and able to function as a whole.

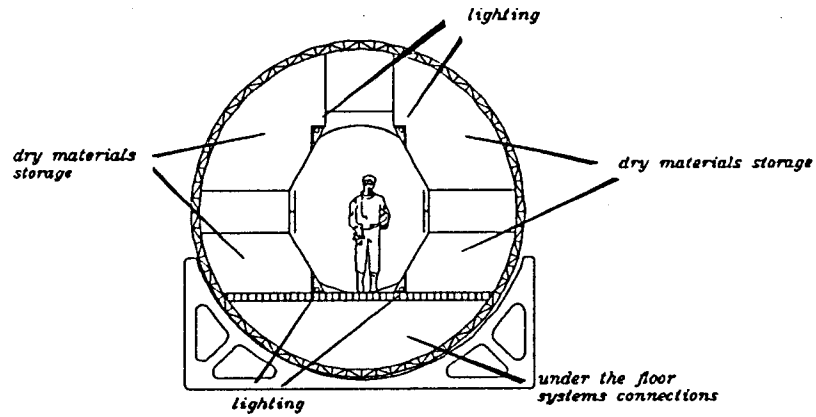


THE HABITAT SYSTEM

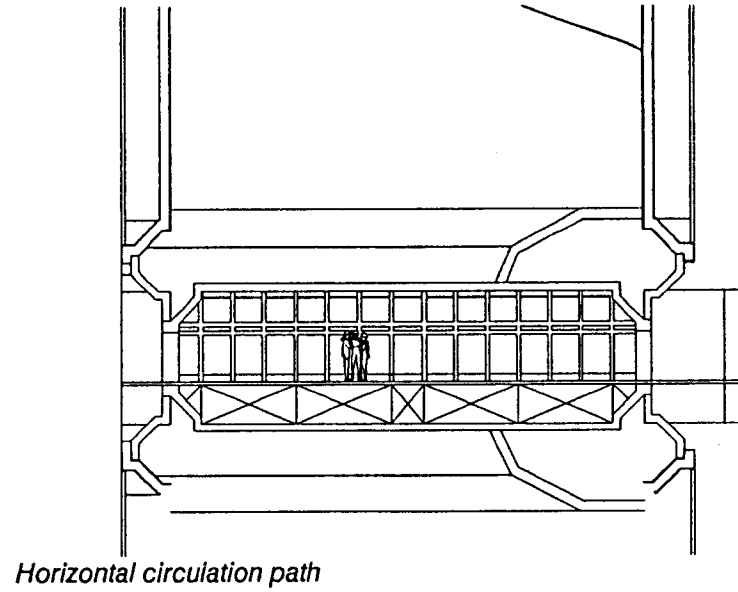
Located in the heart of the base is the life support systems. By locating the life support systems in the heart of the base, the system is assured the greatest amount of protection from the harmful radiation.



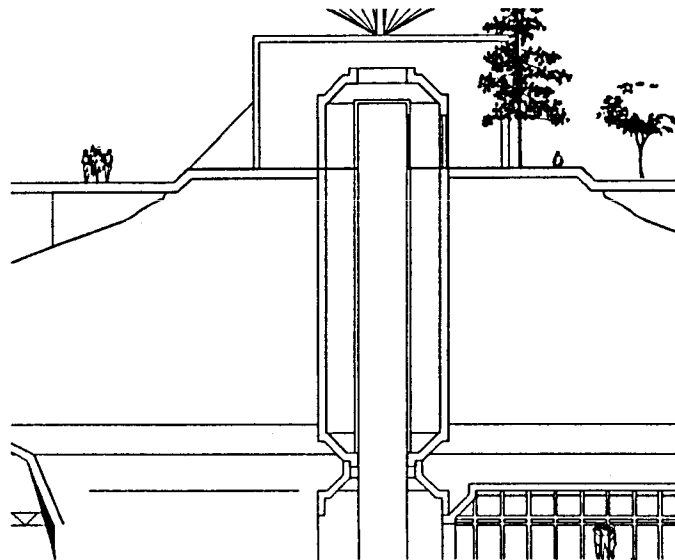
section through the circulation corridors



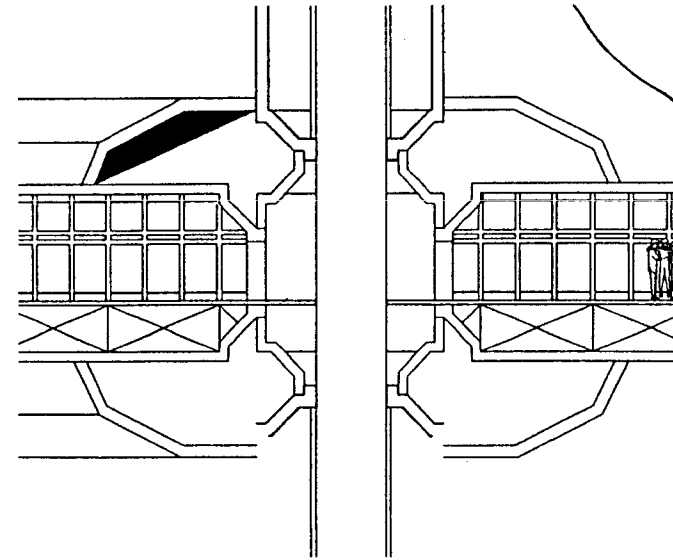
Detail of earth manufactured pathway modules



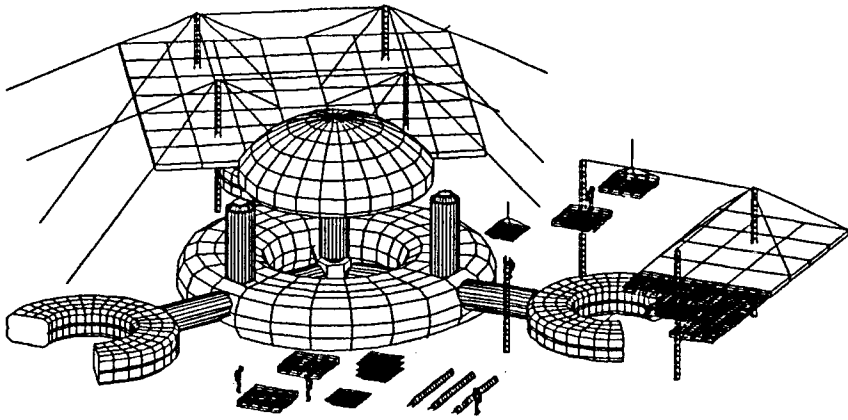
Horizontal circulation path



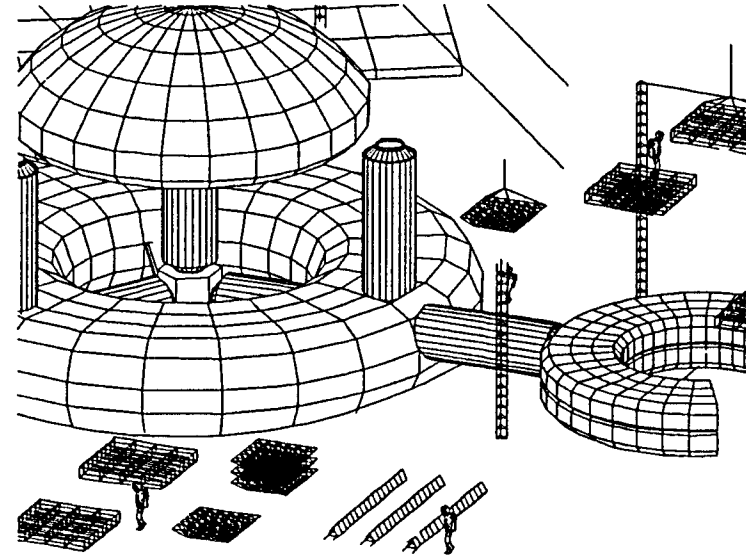
Vertical circulation path



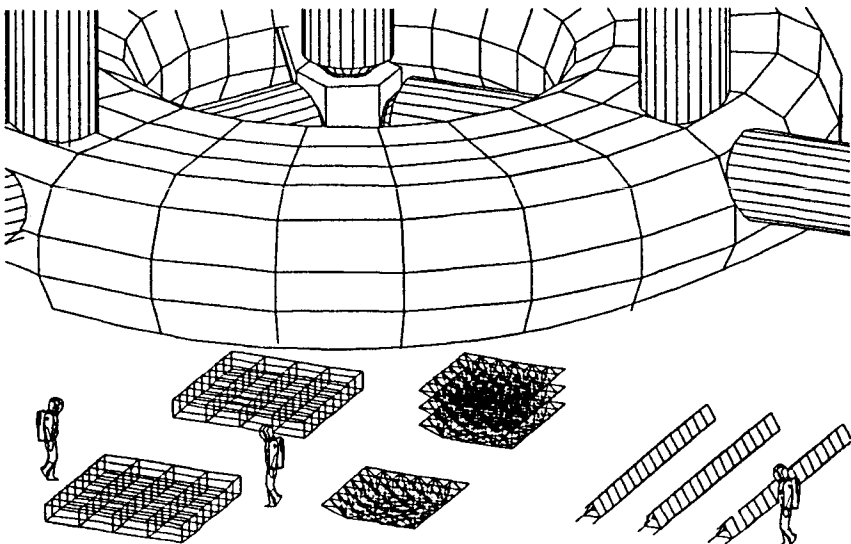
Intersection of vertical and horizontal pathways



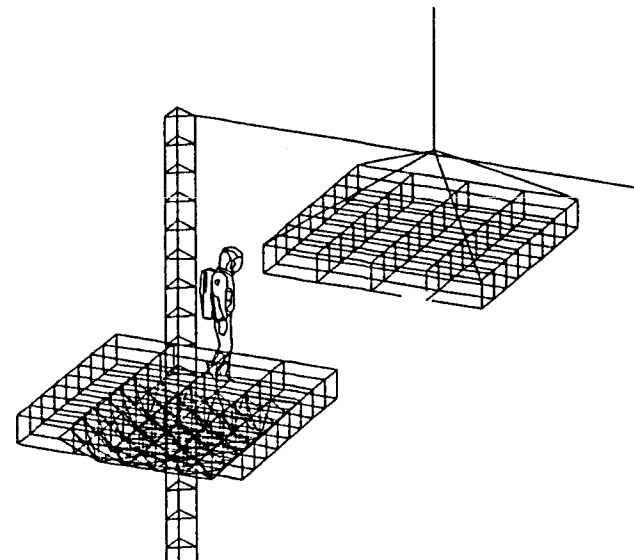
Base isometric



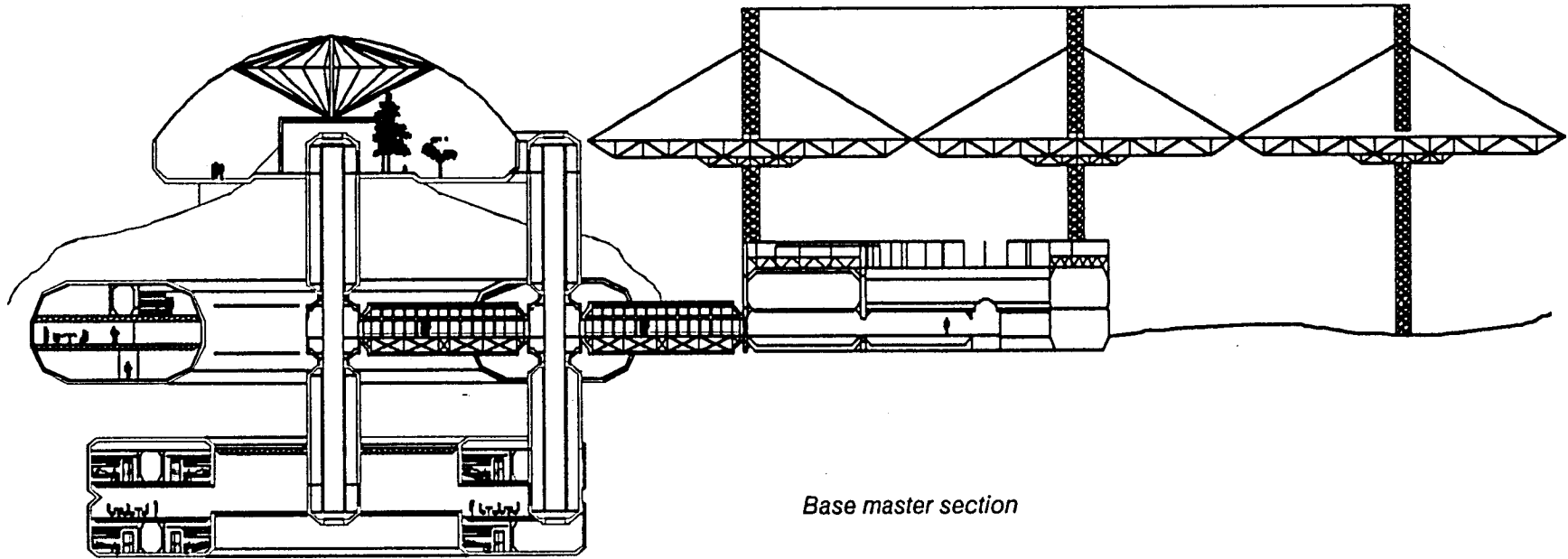
Base construction isometric



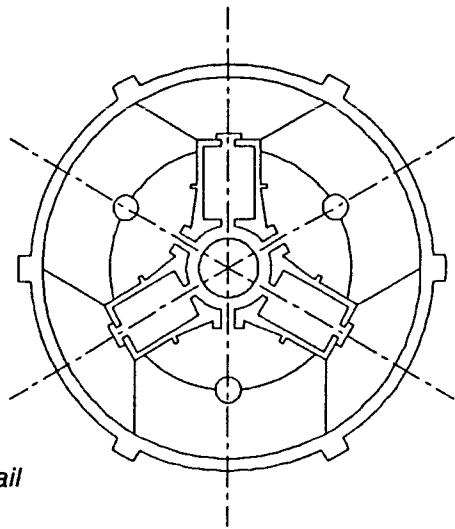
Base construction isometric



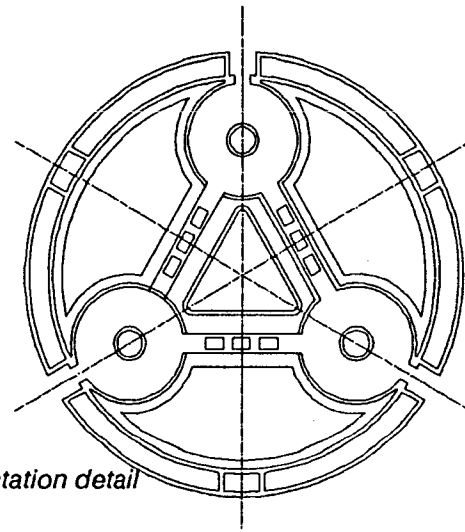
Construction detail = Spaceframe shielding



Base master section



Launch pad detail



Power supply station detail