31st IAA SYMPOSIUM ON SPACE AND SOCIETY (E5)
Virtual Presentations - 31st IAA SYMPOSIUM ON SPACE AND SOCIETY (VP)

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THE INNER COURTYARD CONCEPT IN THE ARCHITECTURE OF PERSPECTIVE ORBITAL STATIONS

Abstract

K.E. Tsiolkovsky, the father of astronautics, postulated: "The main goal and the first achievements relate to the propagation of man in the ether ...", that is the goal of creating manned spacecraft is exploration of interplanetary space. This goal requires for example developing new layouts for manned orbital stations. In these stations extra attention will be paid to ensuring safe human activity not only in the pressurized inhabited modules, but also in extravehicular activity. In this regard, the experience gained by world architecture can be of high relevance. It is known that while spreading across the Earth's territory, humans gradually switched from the appropriating economy to the transforming economy. During this process, the habitat inherent to all living organisms gradually became the space of active life inherent only to humans. This activity is characterized by several basic aspects: conceptual, functional and spatial. Each of these aspects is governed by the laws inherent to the process of the emergence, formation and deployment of the human-created living space. The analysis of the tribal primary living revealed that all traditional cultures had a common type of residential building – a house built around a courtyard. This courtyard was the center of the economic and social life of a large family. Many sacred functions were transferred to the central courtyard. The same principle was and is still being utilized when designing and constructing various types of residential and public buildings. In the centre of such a courtyard there is always a focal object representing the lower support of the vertical axis of this community world. These are the laws for constructing the space of the human and society activity on Earth. The challenge of constructing a human habitat on board the space station involves many of the similar laws and spatial patterns. The volume of a manned spacecraft was initially a spherical capsule, then an extended module with compartments, and in case of an orbital station it first was an orthogonal branched structure, and then an orthogonal spatial lattice. And still this structure is devoid of an inner courtyard. The paper presents the general patterns of the spatial deployment of the human habitat in comparison with the deployment options for the space station. We propose possible options for spatial deployment of a relatively safe and protected "orbital household courtyard" intended for research, operation and tourist purposes in the near-station space environment.