

Space Medicine Program

The Space Medicine Program provides a Basic Research Function and Design Support Function. The Design Support Function provides human factors inputs to the Astronautics Section of the Technical Development Department to assist in design problems of manned space systems. Anticipated design problems orient the Basic Research activities of the Space Medicine Section. The Basic Research Function includes laboratory research in physiological, ecological, and psychological factors related to manned space activity.

Man in space will be exposed either continuously, intermittently, or in occasional emergencies, to a variety of extreme environmental conditions to which he is not generally exposed in his normal terrestrial environment. These are often conditions which will threaten survival of a man unassisted by special cabin design or personal equipment. The mission of basic research in human factors is to determine the parametric limits and acceptable operating ranges of man in space and to make appropriate recommendations to design engineers concerned with the human component in the manned space system. Attainment of this competence requires continuous investigation in basic research areas of physiology, ecology, psychology, and human engineering. A continuing investigation program of this kind requires, in turn, adequate personnel, equipment, and space for each of the areas indicated.

Physiological studies relevant to sealed cabin design will include research on atmospheric components, pressures, vibration, radiation, and appropriate instrumentation and regulation techniques.

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Ecological systems research will be conducted on problems of photosynthetic gas exchange, waste utilization, water recovery, atmospheric control, and food production based on hydroponic techniques.

Psychological research will be concerned with crew efficiency and morale relating to various factors of the work situation, rest schedule and arrangements, crew interactions, exercise facilities, and recreational activities. Effects of pertinent space environment variables upon stimulus discrimination, response discrimination, and complex decision functions will also be examined.

Human engineering research will study a variety of problems concerned with efficient performance of man-machine interactions. This includes investigation of best methods of information presentation, whether pictorial-analogue type or digital-instrument type, and of optimal design characteristics of information displays. Optimal controls features, sizes, shapes, movement characteristics, and placement must also be examined.