

INTERDEPARTMENTAL COMMUNICATION

July 3, 1958

TO: J. G. Gaume, M.D.
CC: Dr. R. Gafford, Messrs. D. Richardson and E. Romano
FROM: R. H. Edgerley, Ph.D.
SUBJECT: Space Medicine Handbook for Design Engineering

The following flexible outline for a permanent notebook is submitted for your suggestions and approval. It is believed that such a notebook maintained by the Space Medicine personnel would:

- 1) gradually relieve us of a great deal of work and,
- 2) represent design policy to both ourselves and the purely engineering groups concerned.

The latter advantage would be especially helpful to new personnel who may be concerned with project work.

The decimal system will act as an index, an easy means to revise sections, and provide for expansion.

Space Medicine Handbook for Design Engineering

1. Personal Equipment

1.1 Suits

1.1.1. Pressure Suits

1.1.1.1. Clarke, Lightweight (MC-2)

1.1.1.2. Goodrich, Lightweight

1.1.1.3. Arrowhead, Lightweight

1.1.1.4. Berger Brothers, Lightweight

1.1.1.5.

1.1.1.6. Space Suits

1.1.2. Anti-G Suits

1.1.3. Ventilation Suits

1.1.4. Restraint Suits

1.2 Oxygen Equipment

1.2.1. Oxygen Masks

1.2.2. Bailout Oxygen

1.2.3. Suit Supply

1.3 Escape Devices

1.3.1. Parachutes

1.3.2. Ejection Seats

1.3.3. Capsules

1.4 Flotation Equipment

1.4.1. Life Vests

1.4.2. Life Rafts

1.5 Sustenance Equipment

1.5.1. Food

1.5.2. Water

1.5.3. Foraging

1.6 Signal Equipment

1.6.1. Electronic

1.6.2. Lights, Flares

1.6.3. Dye Marker

1.6.4. Mirrors

1.6.5. Miscellaneous

2. Visual Problems

3. Wind Blast

- 4. Temperature Problems
- 5. Spatial Disorientation
- 6. Human Factors Monitoring, Equipment and Techniques
 - 6.1 Physiological
 - 6.1.1. Respiration
 - 6.1.2. Oxygen Consumption
 - 6.1.3. Heart
 - 6.1.4. Galvanic Skin Resistance
 - 6.1.5. Body Temperature
 - 6.2 Psychological
 - 6.3 Miscellaneous
- 7. Cabin Atmosphere
 - 7.1 Cabin Leakage
 - 7.2 Oxygen
 - 7.2.1. Partial Pressure Requirements
 - 7.2.1.1. Oxygen Toxicity
 - 7.2.1.2. Hypoxic Level
 - 7.2.1.3. Maintenance of Normal Alveolar Tensions
 - 7.2.2. Total Oxygen Supply Requirements
 - 7.2.3. Oxygen Equipment
 - 7.2.3.1. Oxygen System
 - 7.2.3.2. Monitoring Equipment
 - 7.2.3.3. Lox Equipment
 - 7.2.3.4. High Pressure Containers
 - 7.3 Total Barometric Pressure
 - 7.3.1. Dysbarism
 - 7.3.2. Rapid Decompression
 - 7.3.3. Fire Hazard

7.3.4. Pressure Equilization

7.3.4.1. Ascent

7.3.4.2. Descent

7.4 Water Vapor

7.4.1. Tolerance

7.4.2. Control

7.5 Carbon Dioxide

7.5.1. Tolerance

7.5.2. Control

7.6 Noxious Gases

7.6.1. Carbon Monoxide

7.6.2. Ozone

7.6.3. Freon

7.6.4. Radon

7.6.5. Metal Vapors

8. Accelerations

8.1 Physics

8.2 Tolerance

8.2.1. Positive

8.2.2. Negative

8.2.3. Transverse

8.2.4. *Cyclic*

8.3 Performance

9. Weightlessness - Agravic State

9.1 Physiological Effects

9.2 Psychological Effects

10. Radiations

10.1 Ionizing Radiations

10.1.1. Externally Applied

10.1.1.1. Permissible Dose

10.1.2. Internally Applied (Radio-Nuclides)

10.1.2.1. Permissible Dose

10.1.3. Solar X-rays

10.1.4. Cosmic Radiations

10.1.4.1. Light Nuclei - Protons and Alphas

10.1.4.2. Heavy Nuclei

10.2 Micro Waves (Radar)

10.3 Ultra-violet

10.4 Visible Light

11. Vibrations

11.1 Physics

11.2 Biological Effects

11.3 Safety Criteria

12. Noise

12.1 Physics

12.2 Biological Effects

12.3 Damage Risk Criteria

13. Water Supply in Space Vehicles

13.1 Requirements

13.2 Methods of Supply

13.2.1. Recycling

14. Food Supply in Space Vehicles

14.1 Requirements

14.2 Methods of Supply

15. Waste Disposal in Space Vehicles

15.1 Requirements

15.2 Methods

16. Stress - General Adaptation Syndrome

16.1 Physiological

16.2 Psychological

17. Displays

18. Controls