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5-Man "Sealed Cabin" Research Facility

1. The work to be accomplished in this facility is:
   a. Collect metabolic data on man and animals under simulated space conditions.
   b. Determine effects of various gas mixtures on man.
   c. Test photosynthetic gas exchange systems.
   d. Test cooling systems.
   e. Test oxygen supply systems.
   f. Test CO_2 removal systems.
   g. Test H_2O removal and recovery systems.
   h. Determine water requirements and the water cycle.
   i. Determine fire hazard limits.
   j. Study waste disposal methods.
   k. Investigate pre-launch problems pertaining to atmosphere.
   l. Investigate accumulation of toxic gases.
   m. Evaluate displays and controls layouts.
   n. Evaluate living quarters arrangements.
   o. Investigate psychological problems of crews.
   p. Develop and evaluate cabin leak - detection and repair methods.

2. Requirements of a facility to accomplish the above objectives are:
   a. An external shell capable of evacuation to 8 mm. mercury pressure.
   b. An internal chamber capable of pressurization to 15 psia in an 8 mm. mercury pressure environment.
   c. No leakage of internal chamber.

d. Ability to re-pressurize external shell to 7 psia in 15 seconds.

e. Ability to purge inner chamber with special mixtures of gases.

f. Volume of inner chamber approximately 1000 cubic feet.

g. Thermal insulation of inner chamber.

h. Provision for subjecting inner chamber to extremes of temperature.

i. Ability to remove heat from inner chamber without disturbing composition of its atmosphere.

j. Closed circuit TV for viewing inner chamber interior.

k. Adequate entry to inner chamber (preferably 5 ft. height).

l. Provisions for subjecting the inner chamber to radiation.

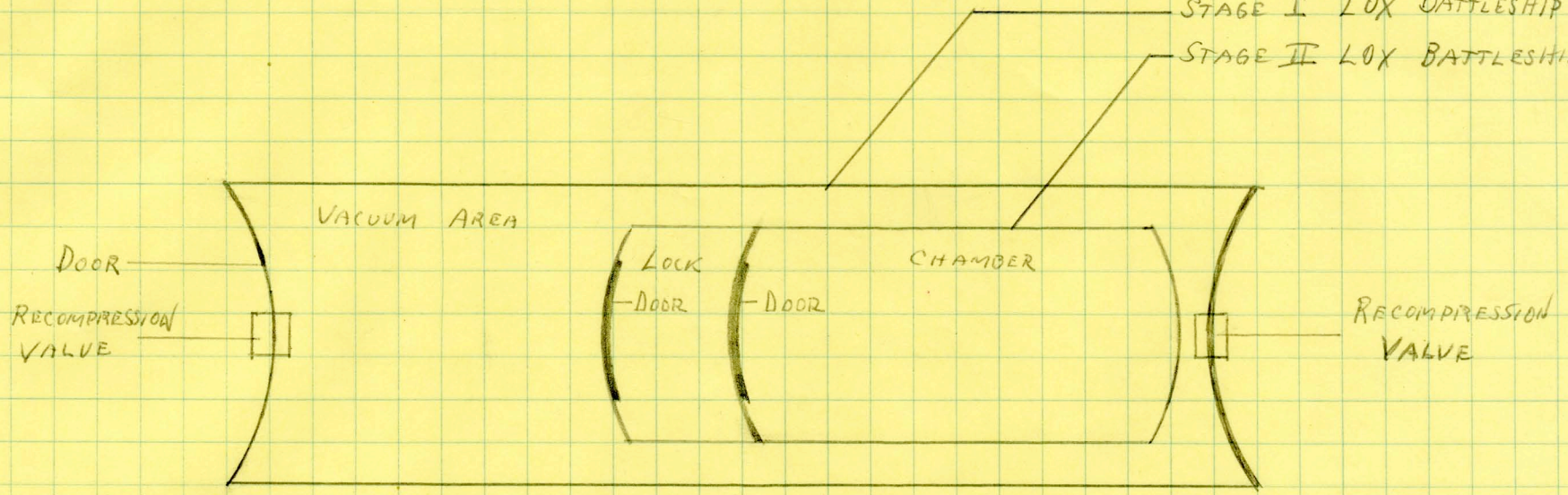
3. It is suggested that the feasibility of modification of a Stage I LOX battleship tank for the outer shell and of a Stage II LOX battleship tank for the inner chamber be investigated.

a. What minimum pressure can the Stage I LOX tank withstand?

b. What structural modifications are necessary in order to realize the 8 mm.Hg. requirement?

c. What internal pressure can the Stage II LOX tank withstand?

d. Feasibility of using an aluminum inner chamber for easier transmission of heat and radiation.



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