

National Aeronautics and Space Administration
Lyndon B. Johnson Space Center

OPERATIONAL TEST REQUIREMENT
FOR
SPACELAB MISSION SIMULATION

Title: Hooded Workbench/Surgical Table for Spacelab

OTR Number

Principal Investigator(s): Paul X. Callahan

Sept. 20, 1976

Signature

Date

Signature

Date

SHUTTLE SPACELAB MISSION SIMULATION
OPERATIONAL TEST REQUIREMENTS AND CRITERIA

Section 1

Administrative

Hooded Workbench/Surgical Table for Spacelab

1. Title

OTR No.

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2. Principal Investigator(s)
(Name[s])

Sponsoring Orgn.

Phone

3. Project Engineer

Division

Chief

Date

Directorate

Director

Date

Section 2

Technical Information

1. Background and Purpose: The proposed dedicated Life Sciences Spacelab requires a workbench and table for animal surgery, for chemical and biological operations requiring a hood, for radioisotope experiments, and for a general-purpose work area. To fulfill these requirements and to optimize use of the limited volume available in the Spacelab, a conceptual pre-breadboard of a hooded, multipurpose workbench/surgical table was tested in the CVT II simulation. The concept appeared sound. It provided for adjustable hood, negative laminar flow, animal surgery, sink drained by vacuum, utilities, radioisotope and chemical work, and general workbench functions. An upgraded breadboard requires testing before proceeding to a flight prototype.
2. Functional Objectives: The primary objective is to develop and test a workbench which will satisfy all general laboratory requirements and as many experiment-specific requirements as possible. Additional objectives would include obtaining information as to the placement of ancillary equipment, and the gaining of expertise in this area in order to guide and direct contractual definition, design and development of a flight hardware unit. Experience of this nature should lead to a significant improvement in our capability to define, develop and design flight hardware.
3. Participants: Participation will be defined by the needs of the experiments chosen for SMD III. All experiments acceptable for this simulation study will be reviewed for potential need of a workbench area to conduct the experiments. Experiments specific requirements will be used as drivers in modifying facilities, incorporated equipment, and equipment placement. Payload specialists and mission specialist will participate as required by experiments selected.
4. Performance Requirements and Conditions: Defined by Flight Operations Plan. All crewmen will note both positive and negative aspects of performance of unit during conducting of experiments. Evaluation of unit will be by de-briefing of crew following simulation.

Section 3

Engineering Information

1. Hardware (or Software) Identification and Description: Hooded workbench will occupy one double rack. It will contain three blowers and a catalytic combustion unit, as well as liquid/gas separators, an air/liquid spray and 15 gallons of self-contained water and waste disposal. Vacuum and air pressure, and 110vac TBD.

2. Interface Information:

A. Location of Hardware (or Software):
One double rack

B. Mounting Requirements:
Hard mount to rack floor.

C. Utility Requirements (Electrical, Gases, Fluids, etc.):
110/220vac

D. Support Equipment Information:
N/A

E. Other Interface Information:
N/A

3. Environmental Constraints:
N/A

Section 4

Operational Requirements

1. Test Operational Requirements:

A. Preflight (Training, Support, etc.)

Will be defined by experiments selected. In addition, 1-2 hrs of briefing will be required to familiarize the crew with the operation of the unit.

B. Inflight (Crew Requirements, Constraints, Frequency, etc.)

(1) Test Preparation Defined by experiments selected

(2) Test Operations Defined by experiments selected

(3) FDF Requirements N/A

C. Postflight Debriefing on performance of unit

2. Flight Operational Requirements (Crew Communications, Real-time Operational Support, Specific Data, etc.):

N/A

3. Data Support Requirements:

A. Preflight (Including Close-out Photos)

N/A

B. Inflight

N/A (Experiment-monitoring photos would be helpful)

C. Postflight (Data Retrieval, Special Handling, DTU Access, etc.)

N/A

D. Data Analysis Support

N/A