

N85 - 29571

EXPERIENCES
WITH
NEUTRAL BUOYANCY TESTING
MOCKUPS

PRESENTED TO:
SPACE STATION
HUMAN PRODUCTIVITY
WORKING GROUP

MARCH 2, 1984

PRESENTED BY:
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NASA QUESTION :

CAN AN EVA CREWMAN REMOVE AND REPLACE ELECTRICAL CONNECTORS
ON TIMING UNIT?

NB-51

SPACE PLATFORM CONTINGENCY OPERATIONS

QUICK LOOK TEST REPORT #1 DATE: AUGUST, 1982

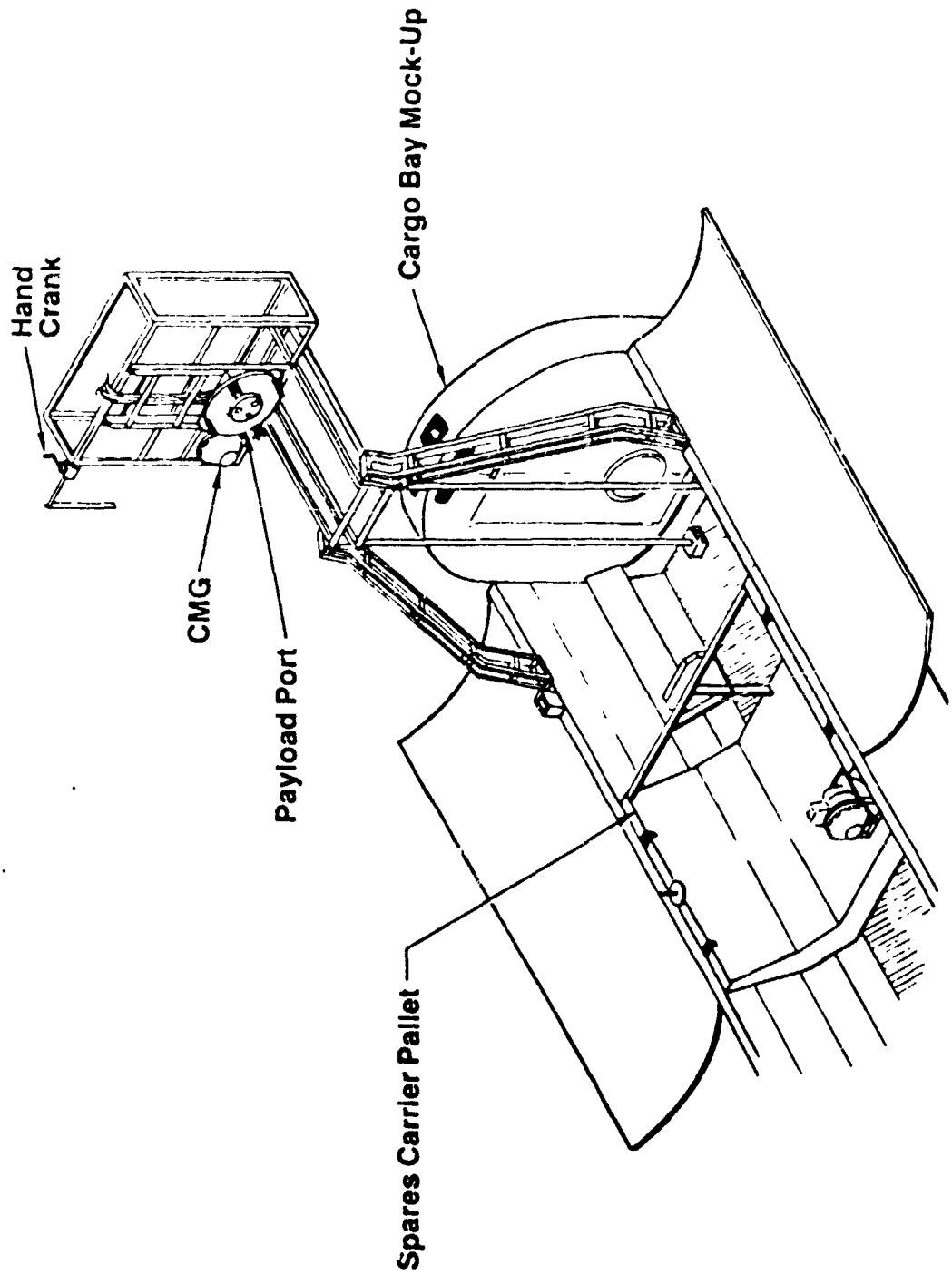
NEUTRAL BUOYANCY SIMULATION

SPACE PLATFORM CONTINGENCY OPERATIONS

- TASK 1. AFT PAYLOAD PORT DEPLOYMENT/RETRACTION
- TASK 2. CONTROL MOMENT GYRO(CMG) REMOVAL/REPLACEMENT
- TASK 3. MANUAL HAND CRANK APPENDAGE DEPLOYMENT

SPACE PLATFORM NEUTRAL BUOYANCY MOCK-UP

VFW323



NB-51

SPACE MAINTENANCE AND CONTINGENCY OPERATIONS SIMULATION

QUICK LOOK TEST REPORT #2 DATE: NOVEMBER 1982

NEUTRAL BUOYANCY SIMULATION

SPACE MAINTENANCE AND CONTINGENCY OPERATIONS SIMULATION

TASK 1. SOLAR ARRAY WING EXCHANGE

TASK 2. COLD PLATE MOUNTED BLACK BOX EXCHANGE

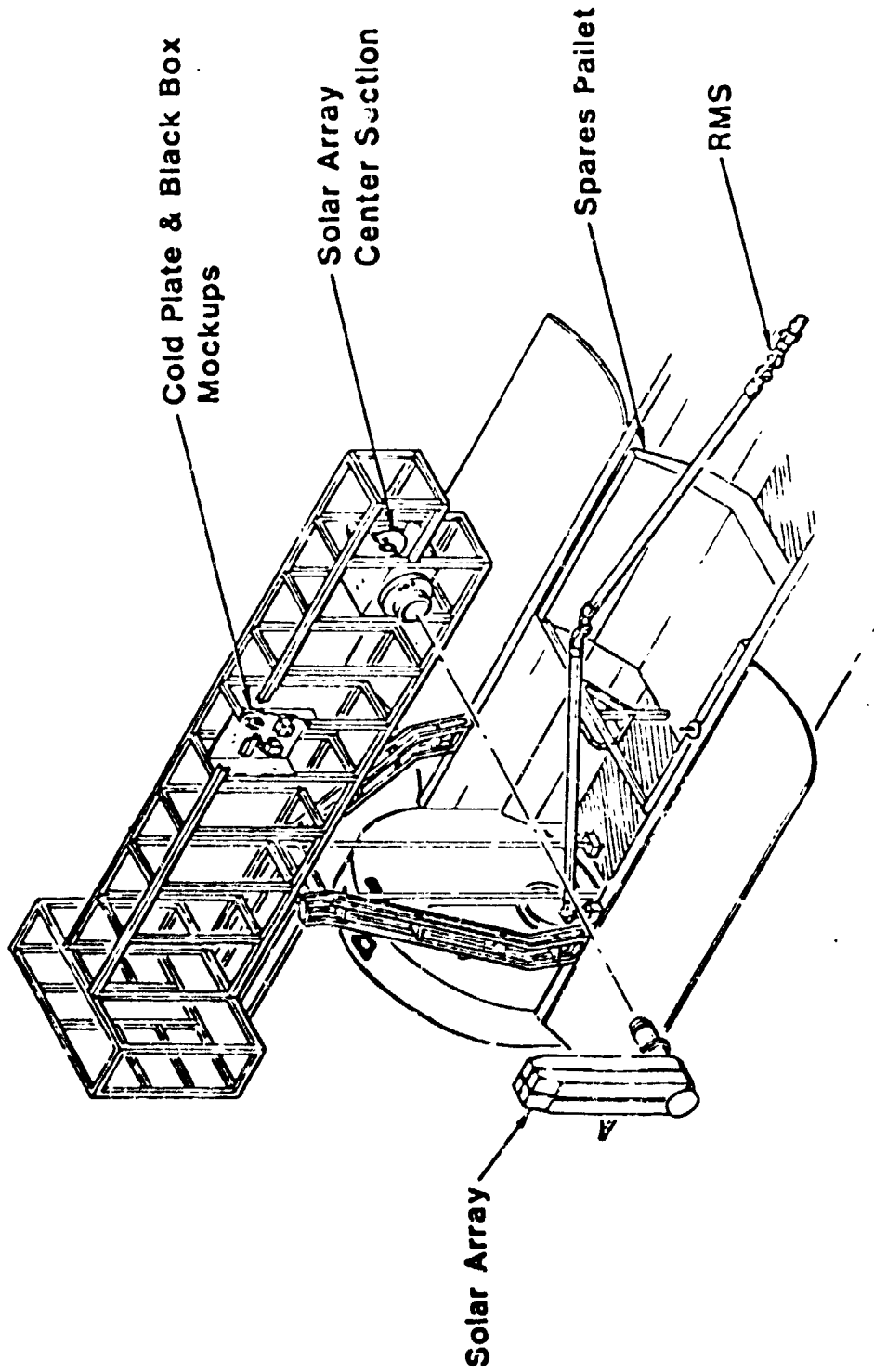
- ADJUSTABLE FOOT RESTRAINT EVALUATION
- BATTERY INSTALLATION
- FLUID DISCONNECT MATE/DEMATE
- OVERCENTER LATCH/BLIND MATING ELECTRICAL CONNECTOR
- D-SERIES (RECTANGULAR), ELECTRICAL CONNECTOR DEMATE/MATE
- CIRCULAR CONNECTOR (STANDARD AND COAX) DEMATE/MATE

TASK 3. SOLAR ARRAY BLANKET BOX EXCHANGE

SPACE PLATFORM NEUTRAL BUOYANCY MOCK-UP

VFX925

ORIGINAL PAGES
OF POOR QUALITY



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SPACE MAINTENANCE AND SERVICING SIMULATIONS

QUICK LOOK TEST REPORT #3 DATE: SEPTEMBER 1983

TASK ACTIVITIES:

TASK 1. MANUAL HAND CRANK APPENDAGE DEPLOYMENT

TASK 2. COLD PLATE MOUNTED ORU EXCHANGE

- SINGLE FOOT ADJUSTABLE FOOT RESTRAINT EVALUATION
- SMALL BOX (50 LB) OVER CENTER LATCH FASTENING CONCEPT
- MEDIUM BOX (150 LB) COARSE THREAD CAPTIVE FASTENERS
- LARGE BOX (250 LB) FINE THREAD CAPTIVE FASTENERS

TASK 3. CONNECTOR TOOLS/ADJUSTABLE FOOT RESTRAINT EVALUATIONS

TASK 4. CONTINGENCY OPERATIONS

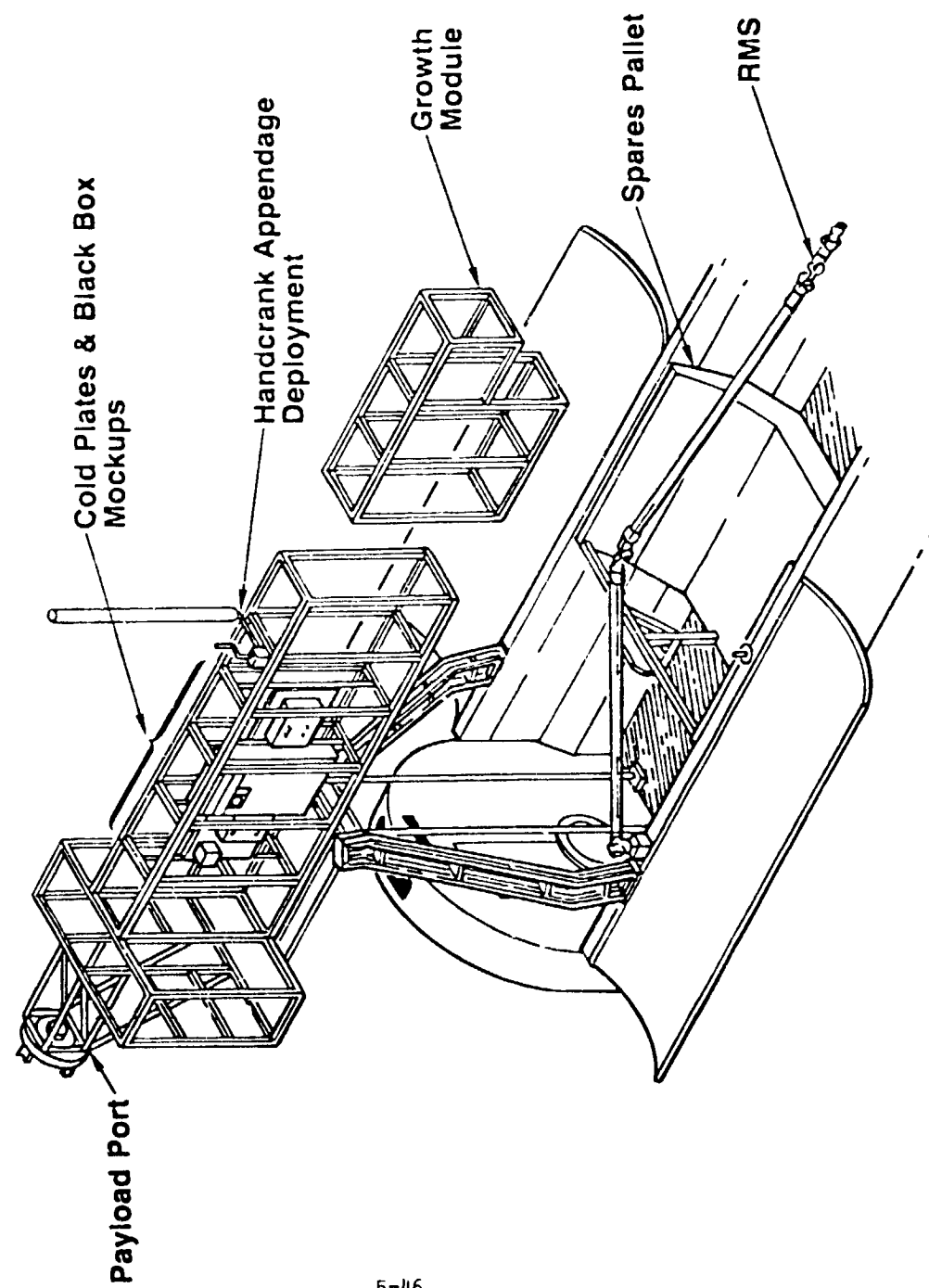
- MANUAL APPENDAGE JETTISON
- FLUID TRANSFER SIMULATION

TASK 5. STRUCTURAL MODIFICATION - PAYLOAD PORT STRENGTHENING

TASK 6. SATELLITE GROWTH ACTIVITY

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SPACE PLATFORM NEUTRAL BUOYANCY MOCK-UP SEPTEMBER TEST SERIES



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SUMMARY OF NEUTRAL BUOYANCY TESTING

• SIGNIFICANT RESULTS

- DEMONSTRATED EVA CREWMAN FINE MOTOR ACTIVITIES ARE ACHIEVABLE WHEN SIMPLE AIDS WHICH ENHANCE PERFORMANCE CAPABILITIES ARE PROVIDED.
- DISCOVERED THAT CERTAIN TASKS WERE ACCOMPLISHED WITH LESS EFFORT WHEN THE EVA CREWMAN WAS AFFORDED ADDITIONAL MOBILITY BY RESTRAINTS OTHER THAN FIXED FOOT RESTRAINT PLATFORMS.
- ILLUSTRATED MANUAL TRANSLATION OF LARGE MASS ITEMS IS FEASIBLE, BUT MECHANICAL AIDS SHOULD BE PROVIDED TO ASSIST EVA TRANSLATIONAL OPERATIONS.
- DURING THE INSTALLATION PROCESS OF REPLACEABLE UNITS, APPLICATION OF ALIGNMENT INDICATORS (I.E., PINS, PLACARDS, GUIDES, ETC.) PROVIDES SIGNIFICANT ASSISTANCE TO THE EVA CREWMAN. THIS IS ESPECIALLY EVIDENT AS MASS AND SIZE INCREASE.