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Status of Japanese Experiment Module (JEM) Activities

Aug. 6, 1991

Houston, Texas

National Space Development Agency of Japan

(NASDA)

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HISTORY

- 1984~ Conceptual Study, Basic Design
- March 1989 MOU Signed.
- Sep. 1989 Acceptance of IGA by the Japanese Diet.
- Jan. 1990 Approval to start JEM Program Preliminary Design received and Development Test for Elements started.
- Feb. 1991 Interim Design Reviews conducted.
- March 1991 Design of Engineering Model started.

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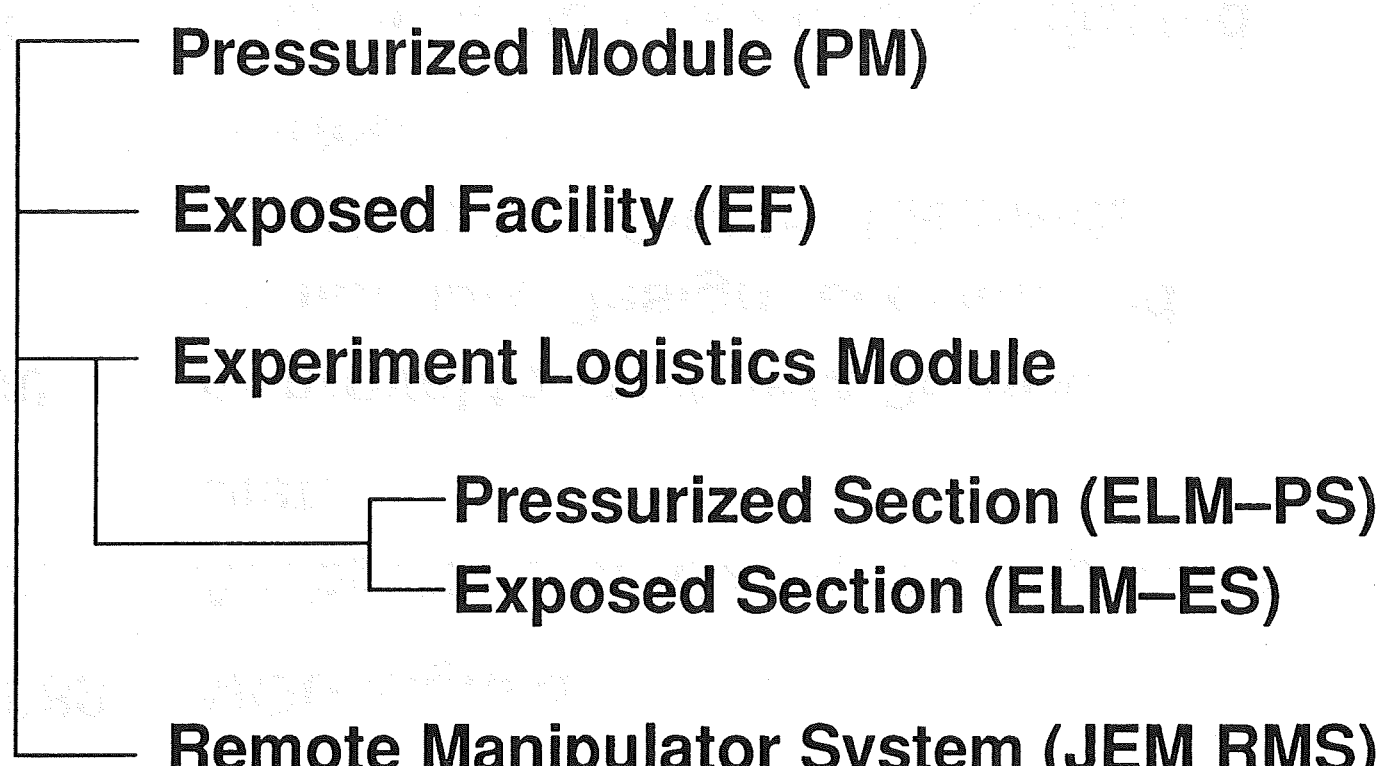
JEM CONFIGURATION



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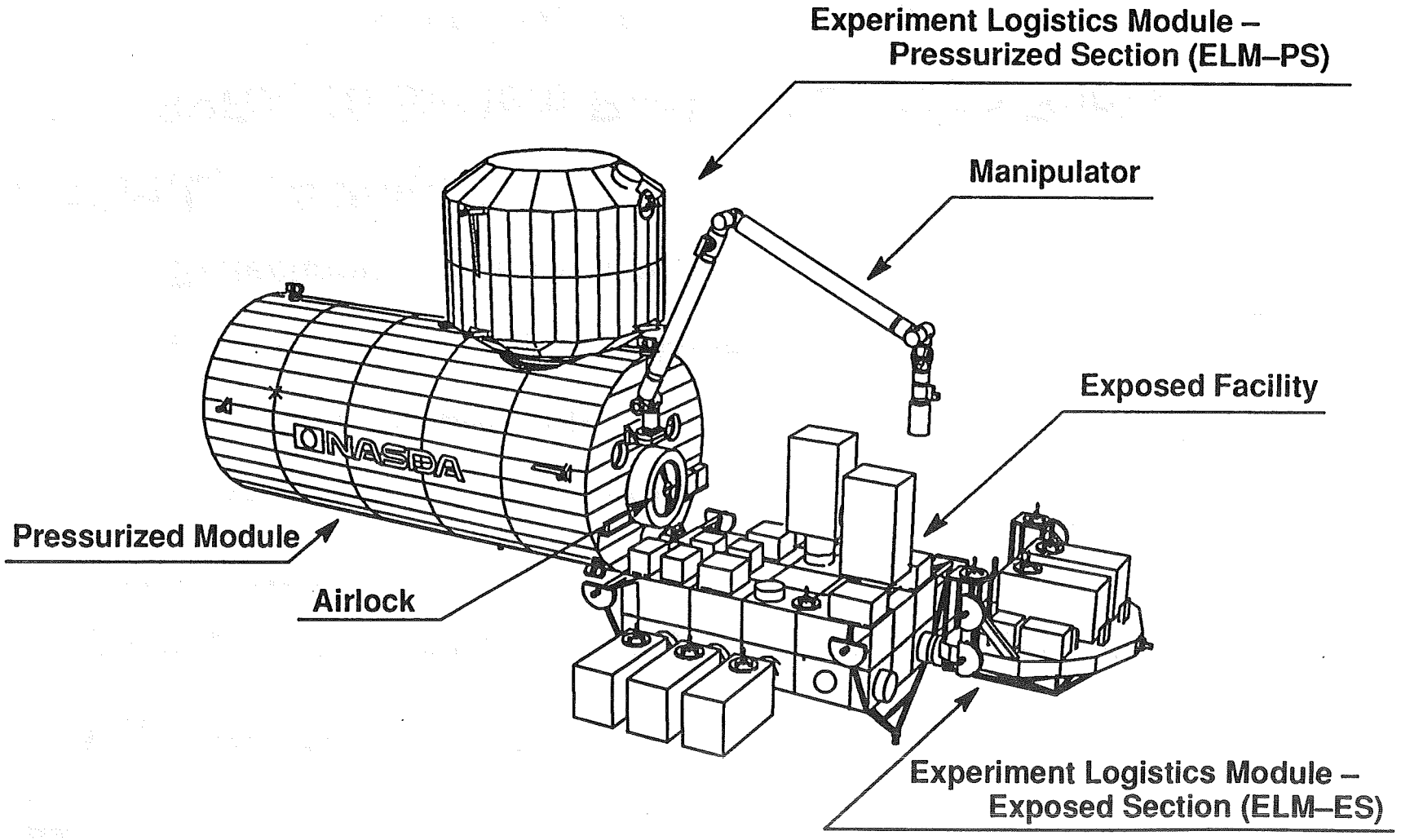
JEM Configuration



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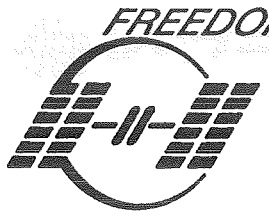


PRESSURIZED MODULE (PM)

- Attached to the SS Node 2.
- Experiments conducted by crew in shirt–sleeve environment.

  Space Medical Experiments

  Biological Experiments

  Material Production Experiments

  Biotechnological Experiments

- 11m(L) × 4.2m(ID)
- 10 ISPRs, 10 System Racks, 3 Storage Racks
- Airlock at the Aft–end Cone 1.3m(D)

EXPOSED FACILITY (EF)

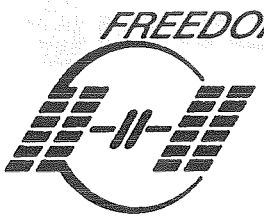
- Open to Space Environment
- Facility for conducting

  Scientific Observation

  Earth Observation

  Experiments in Communications, Technology Development, and Material Science

- 5.3m(L) × 5.0m(W) × 3.7m(H)
- 10 Attached Payloads (Replaceable)



EXPERIMENT LOGISTICS MODULE (ELM)

– Pressurized Section (ELM–PS)

- Attached to the side port of PS.
- Provides functions such as storage and Transportation of Experiment Devices and Specimens as well as Mission Logistics
- 4.1m(L) × 4.2m(D), 8 Racks

– Exposed Section (ELM–ES)

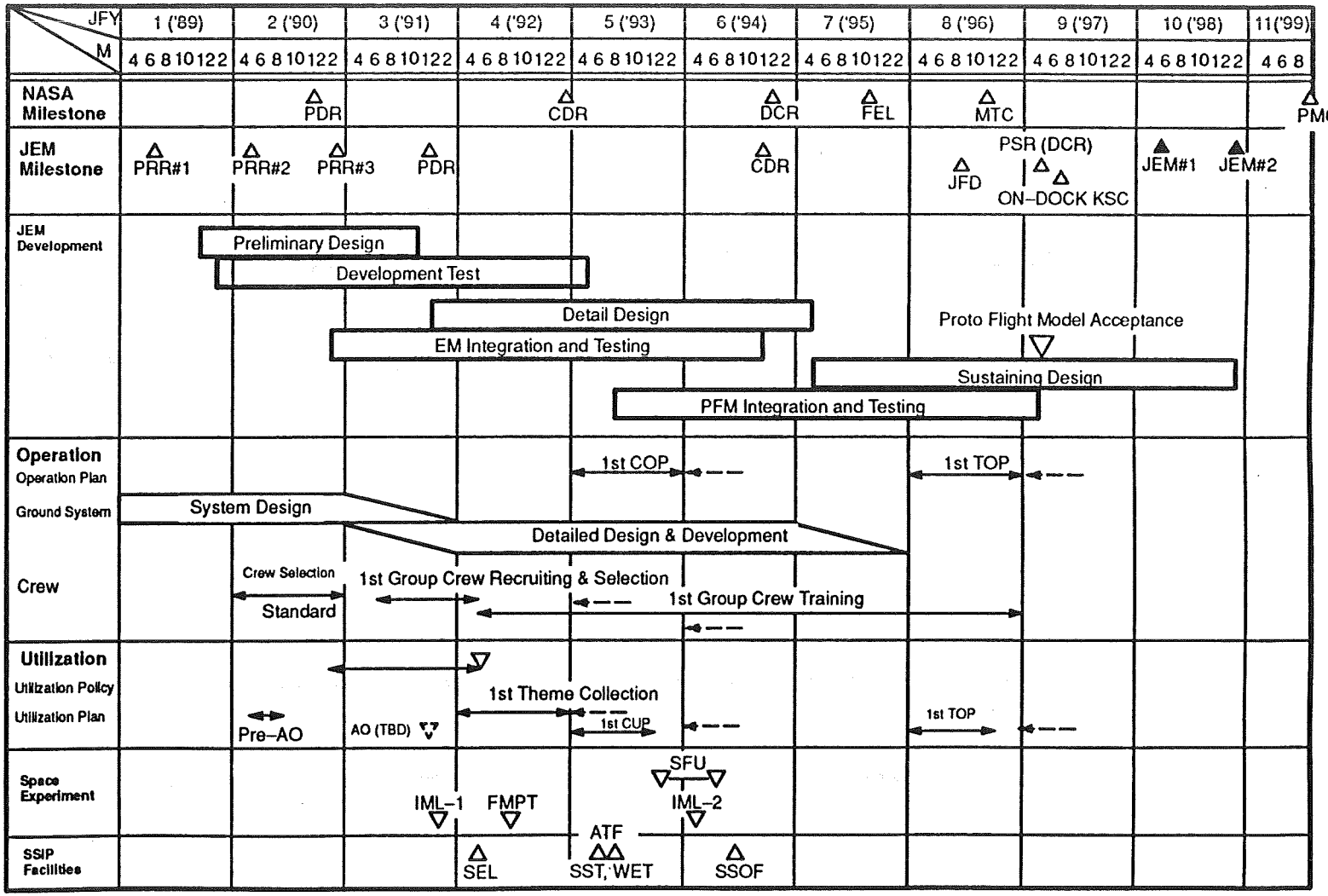
- Attached to the tip of EF.
- Provides services such as Transportation of EF Payloads and ORUs.
- 1.8m(L) × 4.9m(W) × 3.6m(H)

REMOTE MANIPULATOR SYSTEM (JEMRMS)

- Attached to the aft end Cone of PM.
- Operation Console located inside of PM.
- Composed of a Main Arm and a Small Fine Arm which is attached to the SEE of the Main Arm.
- Main Arm is 10m long, with maximum handling capability of 7000 Kg.
- Small Fine Arm is 1.8 m long and performs dextrous tasks.

Space Station Master Schedule

(as of July 1991)

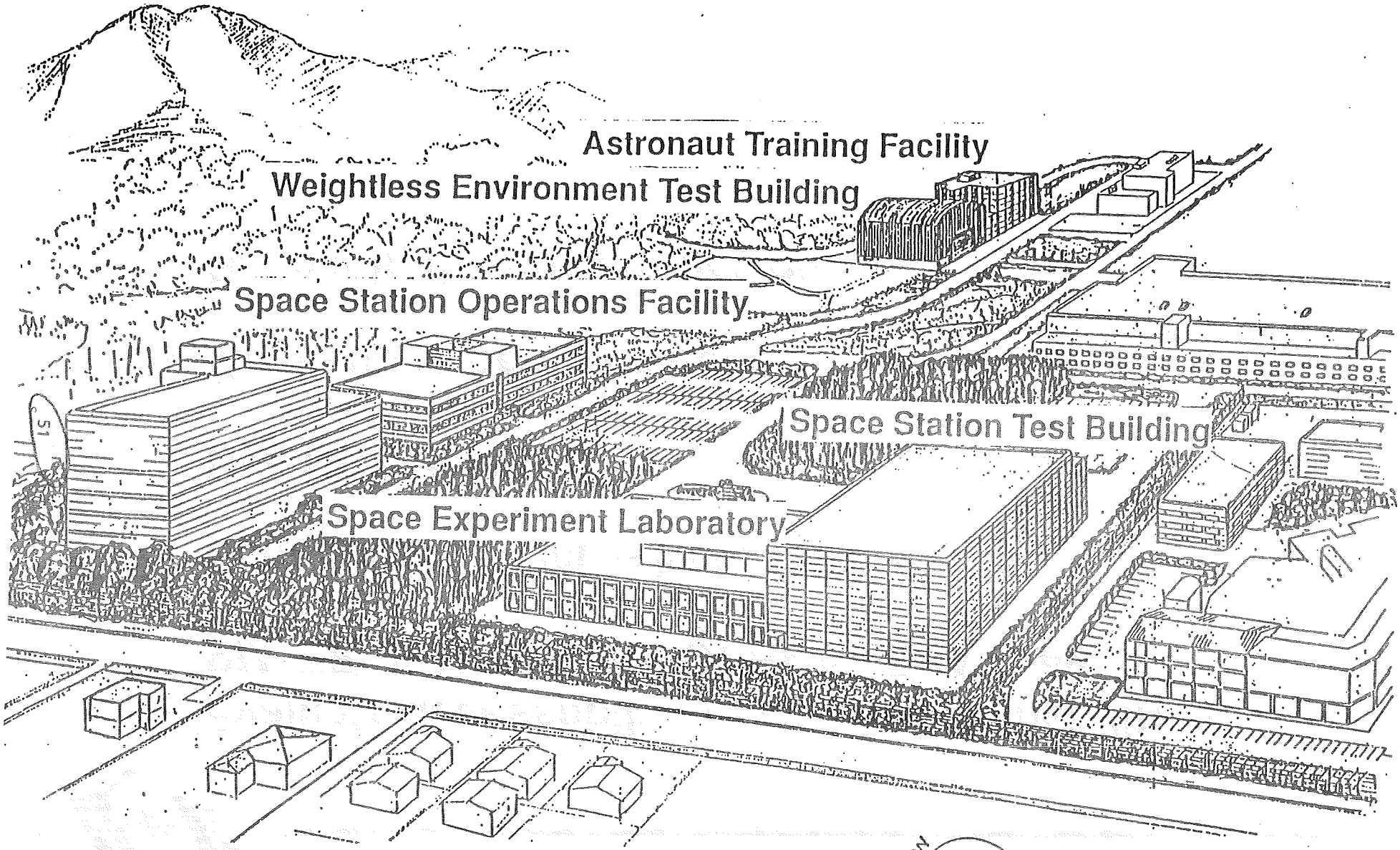


JEM DEVELOPMENT TEST

- Structure and Mechanism
- Electrical Power System
- Data Management System
- Thermal Control System
- Environment Control System
- Experiment Support System
- Remote Manipulator System

SPACE STATION INTEGRATION & PROMOTION (SSIP) CENTER

- **Purpose**
  - To conduct
    - JEM development
    - Operations, Training
    - Planning and management
    - Engineering support
- **Configuration**
  - Located at Tsukuba Space Center
    - Space Experiment Laboratory (SEL)
    - Space Station Test Building (SST)
    - Astronaut Training Facility (ATF)
    - Weightless Environment Test Building (WET)
    - Space Station Operations Facility (SSOF)



pace Station Integration & Promotion (SSIP) Center

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EVA DEVELOPMENT TEST

- Evaluate accessability to and maintainability of PM, EF, JEMRMS and OURs by EVA Crew.
- Scheduled Oct. – Nov. 1991
- Use NBS in MSFC
- Mock–up is being designed.
- Reflect in the current design.

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JEM DATA RELAY VIA COMETS

- Provide JEM–to–Ground data link

  50 Mbps data rate through Ka–band.

  Up link not planned to JEM.

- Equipment installation including antenna on JEM–EF as an experiment payload.

- Use COMETS (Communications and Broadcasting Test Satellite)
  - Multifrequency Band integration technology
  - Scheduled to be launched in 1997.
  - Missions:Interorbit communications

    Advanced mobile satellite communications

    Advanced satellite broadcasting

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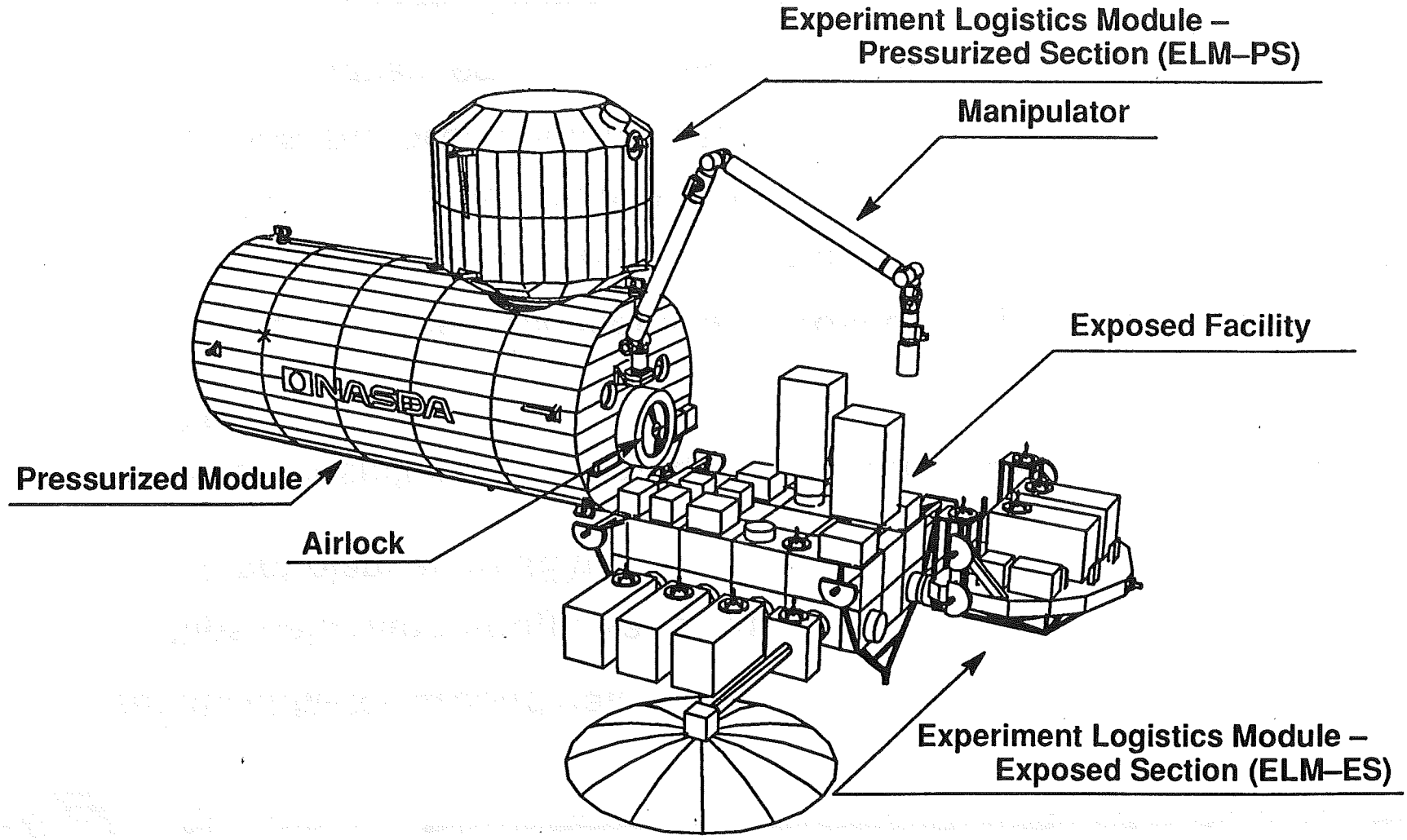
JEM Configuration–1



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H–II ORBITING PLANE (HOPE)

- To carry cargo to / from Space Station / JEM
- Launched by H–II or H–II derivative Vehicle
- Unmanned, fully automatic and reusable
- Operational in the early 2000's
- Gross weight of 20 tons at launch
- Payload Weight of 3 tons (up) and 5 tons (down)
- Cargo bay : 6m (L) × 2.8m (D)
- Phase A study