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SPACE COOPERATION

Manned Space Station

Memorandum of Understanding
Between the
UNITED STATES OF AMERICA
and JAPAN

Signed at Tokyo May 9, 1985



NOTE BY THE DEPARTMENT OF STATE

Pursuant to Public Law 89-497, approved July 8, 1966 (80 Stat 271, 1 U S C 113)—

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JAPAN

Space Cooperation: Manned Space Station

Memorandum of understanding signed at Tokyo

May 9, 1985.

Entered into force May 9, 1985

Memorandum of Understanding Between the United States National
Aeronautics and Space Administration and the Science and Technology
Agency of Japan for the Cooperative Program Concerning Detailed
Definition and Preliminary Design Activities of a Permanently Manned
Space Station

The National Aeronautics and Space Administration (NASA) of the United States of America and the Science and Technology Agency (STA) of Japan, having recognized successful implementation of cooperative activities in a broad range of space science and applications areas between the two countries have agreed to look towards a cooperative effort in manned space activities for peaceful purposes. This agreement is based on the invitation of the President of the United States to friends of the U.S. to cooperate in the development and utilization of the permanently manned Space Station which, in January 1984, he directed NASA to develop and place into orbit within a decade. NASA will be undertaking detailed definition and preliminary design studies on the Space Station. Japan has indicated its interest in cooperating in the Space Station Program. To this end, STA has decided to undertake detailed definition and preliminary design activities of its potential participation in the Space Station Program. These NASA and STA definition activities will be based on the successful mission analysis and preliminary definition activities undertaken by both Parties for the two years preceding this Memorandum of Understanding (MOU). It is the eventual intent of NASA and STA that the cooperation in this phase, if successful, would lead to cooperation in the following phases of the Program. This MOU does not, however, commit either Party to cooperation beyond the detailed definition and preliminary design phase of the Program.

The cooperation in the detailed definition and preliminary design activities on the Space Station, to be carried out under Article 3 of the 'Agreement between the Government of the United States of America and the Government of Japan on Cooperation in Research and Development in Science and Technology' which was signed in Washington on May 1, 1980,¹ (hereinafter referred to as the Science and Technology Agreement), will support the United States' and Japan's mutual interest in creating a truly productive partnership and further strengthening the bonds of friendship existing between the two nations through science and technology cooperation.

¹ TIAS 9760, 32 UST 1123

1 *Objectives*

This MOU provides for the terms and conditions under which each Party will conduct its Space Station detailed definition and preliminary design activities. The ultimate objective of the activities described in this cooperative MOU are to define cooperation in the development, operation and utilization phases of the Space Station Program and to maximize the mutual benefits to be derived from such cooperation. STA will undertake detailed definition and preliminary design (Phase B) studies on a Space Station Experiment Module mainly composed of a pressurized portion and an attached exposed portion. These studies will be conducted in parallel with NASA's detailed definition and preliminary design studies. During their Phase B's, NASA and STA will also develop and update their Space Station utilization plans, review and evaluate the results of their Phase B efforts prior to proceeding to the next phases, and develop a framework for potential cooperation to be effected during the development, operation and utilization phases. Basic principles for cooperation during the development, operation and utilization phases that will need to be examined during this Phase include, but are not limited to, involvement in the development, operation and utilization of the Space Station, access to and utilization of the Space Station, and development of procedures to provide access to and suitable protection for technology and information.

2 *Description of the Space Station Program*

The Space Station will be a multi-purpose permanent facility for peaceful purposes in low-Earth orbit, comprised of both manned and unmanned elements, that will significantly enhance space operations. It will consist of a manned base and associated man-tended platforms. It is envisioned that the Space Station will be developed through international cooperation. The Space Station will be launched in modular sections and assembled in orbit. The Space Station is foreseen as an evolutionary facility and as eventually serving a number of functions, such as

- a laboratory in space, for the conduct of science and the development of new technologies
- a permanent observatory, from which to observe Earth and the universe,
- a transportation node where payloads and vehicles are stationed, processed and deployed to their destinations,
- a servicing facility with which payloads and vehicles are maintained, repaired and refurbished.

- an assembly facility with which large space structures and systems are assembled and checked out,
- a facility to enable manufacturing in space, where the unique space environment enhances commercial opportunities in space,
- a storage depot where payloads and parts are kept on orbit for subsequent use and,
- a staging base for possible future missions, such as a permanent lunar base, manned mission to Mars, a manned survey of the asteroids, a manned scientific and communications facility in geosynchronous orbit or unmanned planetary probes

3 *Description of NASA and STA Space Station Detailed Definition and Preliminary Design Activities*

3.1 Detailed definition and preliminary design of the Space Station to serve functions such as those described above will be accomplished during NASA's and STA's Phase B's. During the early months of Phase B, a baseline Space Station configuration will be defined, and its interface and systems requirements will be determined. A reference configuration was included in the NASA Phase B Request for Proposal (RFP). NASA formally updated its reference configuration prior to the NASA Phase B contract start date, and will update it at formal configuration updates on a periodic basis after the contract start date. The configuration will then be formalized at the Interface Requirements Review (IRR) (approximately nine months after start of Phase B) and the Systems Requirements Review (SRR) (approximately eleven months after start of Phase B). During this review process, the baseline Space Station configuration will be determined, the major hardware elements identified and the envelope of systems requirements defined.

3.2 To meet the above schedule, STA submitted to NASA its initial reference configuration and its Phase B Statement of Work for an Experiment Module to be studied in Japan and formally updated its reference configuration at the same time. NASA formally updated its reference configuration prior to the NASA Phase B contract start date. STA will formally update its reference configuration at the periodic configuration updates described in the preceding paragraph. To ensure compatibility of the NASA and STA reference configurations, NASA and STA will exchange their configurations when updated. Based on its Phase B activities, STA will provide a configuration update 30 days prior to the IRR.

3.3 The NASA/STA Program Coordination Committee (see Article 6) will reach program-level agreement on the technical and functional aspects of the

Experiment Module After ratification of this program-level agreement by the NASA Administrator and the Minister of State for Science and Technology, STA will formally notify NASA of its proposal of the Experiment Module for preliminary design This notification will take place 30 days prior to the SRR so the Japanese Experiment Module proposed for preliminary design by STA can be integrated by NASA into the baseline configuration for the Space Station This notification will maintain the option for Japanese participation in the Space Station Initial Operating Capability (IOC) Although this notification does not constitute a commitment by Japan to develop the Experiment Module, it does constitute a commitment by STA to conduct preliminary design studies on the Experiment Module during the remainder of Phase B The undertaking of a cooperative program to develop the Experiment Module studied in accordance with above provisions will be subject to the successful completion of Phase B activities, to the satisfactory negotiation of an arrangement for cooperation in the development, operation and utilization of the Space Station and to the availability of funds

3.4 During the latter months of Phase B following the SRR, NASA and STA will perform separate preliminary design studies on their hardware elements of the baseline Space Station configuration NASA and STA will also consider quality and product assurance and documentation procedures for the overall program Throughout their parallel Phase B studies, NASA and STA will continue to exchange views on Space Station growth

4 *Phasing and Scheduling*

4.1 NASA's and STA's Phase B activities are scheduled to begin in April 1985 and last for twenty-four months The envisioned timescale for this Phase B is as follows

- | | |
|--|---------------|
| • Start of NASA and STA Phase B Studies and Activities | April 1985* |
| • Interface Requirements Review | January 1986 |
| • Systems Requirements Review | March 1986 |
| • Systems Design Review | December 1986 |
| • Conclusion of NASA Phase B Studies | January 1987 |
| • Conclusion of STA Phase B Studies | February 1987 |
| • End of Phase B Activities | April 1987 |

The envisioned timescale after Phase B is as follows

*It is generally intended that the events listed in the chart above will occur in the first part of the month [Footnote in the original]

- Start of Development Phase April 1987
- Space Station IOC Early 1990's

4.2 At least six months before the envisioned conclusion of NASA's Phase B studies, the Parties shall enter into negotiations in order to establish the terms and conditions for the continuation of their collaboration through the development, operation and utilization phases of the Space Station Program

4.3 NASA and STA will use their best efforts to conclude negotiations on an arrangement for cooperation in the development, operation and utilization of the Space Station within thirty days after the conclusion of the NASA Phase B studies. NASA and STA will keep each other fully informed of factors affecting the schedules of their respective activities.

5 Respective Responsibilities

5.1 While undertaking the detailed definition and preliminary design of a specific Space Station configuration, NASA will use its best efforts to

- a provide to STA program and technical information, including reference configurations, necessary for the integration of a Japanese Experiment Module into the Space Station Program and necessary for STA to proceed with preliminary design activity on the hardware,
- b integrate the Japanese Experiment Module proposed for preliminary design into the baseline Space Station configuration to maintain the option for Japanese participation in the Space Station IOC,
- c establish a computerized data system to be accessed by a compatible Japanese computer data link for the purpose of exchanging information under this MOU,
- d provide progress and status information on NASA Space Station Program activities,
- e where necessary and appropriate, establish in Japan and accommodate in the U.S. agreed liaison personnel,
- f incorporate the Japanese Space Station utilization plan formally submitted by STA into the Space Station Mission Data Base and provide the Data Base to STA,
- g adjust NASA detailed definition and preliminary design activities to accommodate the Japanese proposal for a Space Station Experiment Module

commensurate with the level of Japanese intent to participate in Space Station development, operation and utilization, and

h at each major program milestone, provide current information on Space Station operations costs and views on the allocation of operational responsibilities which will assist Japan in reaching its decision on participation in Space Station development, operation and utilization

5.2 STA will use its best efforts to

a provide to NASA program and technical information including reference configurations necessary to understand the impact of a Japanese Experiment Module on the total configuration and to integrate the Japanese Experiment Module proposed for preliminary design into the baseline Space Station configuration,

b define and provide an Experiment Module configuration update to NASA 30 days prior to the IRR, and formally notify NASA of its proposal of the Experiment Module for preliminary design 30 days prior to the SRR,

c establish a computer data link which is compatible with the NASA computerized data system referred to in Article 5.1c, for the purpose of exchanging information under this MOU. Agreements regarding this data link will be covered in a separate addendum to this MOU. This addendum will be signed by the Co-Chairmen of the Program Coordination Committee

d following the SRR, undertake preliminary design of the Experiment Module formally notified to NASA

e provide progress and status information on Japanese Space Station Program activities,

f where necessary and appropriate, establish in the U.S. and accommodate in Japan agreed liaison personnel,

g develop, refine and update a Japanese Space Station utilization plan to be incorporated into the Space Station Mission Data Base in cooperation with other concerned Japanese organizations,

h based on consultations with NASA, adjust STA's detailed definition and preliminary design activities to accommodate to the overall Space Station configuration as it evolves, and

i at each major program milestone, provide current information on operations concepts, including operations costs and views on the allocation of operational responsibilities, of a Japanese Experiment Module

6 *Management/Reviews/Liaison*

6.1 *Management* NASA and STA are each responsible for the management of their respective studies and activities. STA designates the National Space Development Agency of Japan (NASDA) to undertake specific responsibilities of STA during Phase B, as described in this MOU, for activities which correspond to those of the NASA Space Station Program Office at the Johnson Space Center (Level B). Management relationships must be established to coordinate the independent studies.

The NASA Associate Administrator for Space Station and the Director-General, Research Coordination Bureau (RCB), STA will be responsible for this cooperative program.

The NASA Space Station Program Manager at the Johnson Space Center and the Japanese Space Station Program Manager at NASDA will implement their Phase B activities under the guidance of NASA Headquarters and STA, respectively.

6.2 *Reviews* A NASA/STA Program Coordination Committee, co-chaired by the NASA Associate Administrator for Space Station and the Director-General, RCB, STA, will be established to coordinate the efforts of the Parties to this MOU and meet on the following schedule:

- 30 days prior to the IRR to review the specific Japanese Experiment Module which STA has initially identified as under consideration for proposal for preliminary design.
- 30 days prior to the SRR to review the interface and system requirements of the Japanese Experiment Module which will undergo preliminary design by STA.
- at three-month intervals following the SRR until the completion of the preliminary design phase for progress reports on the studies and for coordination of activities.

Additional meetings of the NASA/STA Program Coordination Committee will be held as necessary to review detailed definition and preliminary design activities. NASA Level B and STA's designated agency (Level B) will hold periodic technical and schedule progress reviews of their work in the Space Station Program at which both Parties will participate and report on the status of their respective activities.

STA will be invited to participate in major NASA reviews as necessary and appropriate to support the detailed definition and preliminary design of the spe-

cific Space Station configuration and its interface and systems requirements from the perspective of the Experiment Module to be studied by STA. NASA will be invited to participate in major STA reviews as necessary and appropriate.

As necessary and appropriate, reviews will be conducted by the NASA Administrator and the Minister of State for Science and Technology.

6.3 *Multilateral Coordination* International Working Groups, composed of representatives of all Parties participating in the Phase B studies, will be established as necessary and appropriate to link together the efforts of the Parties to this MOU and other international participants in Space Station Phase B studies. These International Working Groups will permit the exchange of necessary and appropriate information among all parallel study efforts. These International Working Groups will cover the full range of subjects where there is common interest: technical integration, operational concepts, and utilization coordination.

Multilateral Reviews will be held on a regular basis so that all international participants in Space Station Phase B activities can report on the status of their respective Space Station activities. Multilateral reviews will also provide a forum for all potential participants in the development, operation and utilization phases of the Space Station Program to present and discuss their views regarding the principles which will govern future cooperation.

6.4 *Liaison* NASA Headquarters and STA will be responsible for overall NASA/STA liaison activities. In order to facilitate the working relationships between the NASA and Japanese Program Managers, as necessary and appropriate, STA may provide and NASA would accommodate STA liaison at Level B at the Johnson Space Center. As necessary and appropriate, NASA may provide and STA would accommodate NASA liaison at STA's designated agency. Following the SRR, based on agreements reached on preliminary design activities by both Parties, additional liaison personnel may be accommodated, where and as appropriate. Agreements providing liaison access for NASA and STA liaison personnel will be covered in separate addenda to this MOU. These addenda, which will specify conditions relating to the liaison relationships including access to technology and information, will be signed by the Co-Chairmen of the Program Coordination Committee.

7 *Utilization and Operations*

7.1 STA will develop in cooperation with other concerned Japanese organizations a Japanese Space Station utilization plan which will be included in NASA's Space Station Mission Data Base. This utilization plan will prioritize missions for the IOC Space Station. In order to facilitate the development of the Space

Station performance envelope and functional requirements, an International Utilization Coordination Working Group will be established in which STA will be a participant. In addition, if desirable and appropriate, STA may be invited to observe the NASA Utilization Working Groups or their equivalent, and NASA may be invited to observe the STA Utilization Working Groups or their equivalent.

7.2 An International Operational Concepts Working Group will be established to consider various operational aspects of the Space Station, such as crew planning and operations costs. Both Parties recognize the importance of understanding operations costs as a basis for a Japanese decision to participate in Space Station development, operation and utilization. NASA and STA will conduct parallel studies on operations costs as part of their Phase B studies, and exchange these results within the forum of the International Operational Concepts Working Group. Results of similar studies undertaken by other Parties participating in the Phase B activities will also be exchanged in the International Operational Concepts Working Group.

7.3 Should STA desire to use the Space Shuttle, Spacelab or other NASA facilities on a cooperative or reimbursable basis to support the development of its Space Station utilization plan, NASA will make best efforts to accommodate STA's proposed requirements and flight schedules.

8 *Advanced Research and Development Program*

8.1 NASA is and STA will be conducting Space Station advanced research and development programs in support of their respective definition and preliminary design activities. Cooperation in such advanced research and development activities will be considered on a case-by-case basis and entered into where it is advantageous to both sides and where there are reciprocal opportunities.

8.2 STA's proposals to use NASA facilities in support of STA's Space Station advanced research and development program will be considered on a case-by-case basis either on a cooperative or reimbursable basis. Likewise, NASA proposals to use STA's facilities in support of NASA's Space Station advanced development program will be considered on a case-by-case basis. Should STA desire to use the Space Shuttle or Spacelab on a cooperative or reimbursable basis to support its detailed definition, preliminary design or advanced research and development activities, NASA will make best efforts to accommodate STA's proposed requirements and flight schedules.

9 *Data Exchange and Rights*

9.1 NASA and STA will exchange all technical information, technical data and goods necessary for the purpose of carrying out the objectives and activities of this cooperative program. It is the intent of the Parties that such exchanges between NASA and STA will be without restriction as to use or disclosure, consistent with Article 9.3.

9.2 In the event the Parties determine that it is necessary to exchange data which is considered by the originating Party or its contractor to be proprietary and/or which is technical data subject to the licensing requirements set forth in any applicable national laws and regulations, the Parties agree to consult promptly and provide in a timely manner for appropriate protective conditions for its exchange and use within this cooperative program. Both Parties recognize the importance of exercising appropriate precautions to protect each other's proprietary information and to protect against dissemination of dual use technology from the program as a whole.

9.3 Exchanges of technical information, technical data and goods between the Parties under this MOU will be in accordance with any applicable national laws and regulations. Both Parties agree to assist each other as necessary and appropriate with administrative processes relevant to their conduct of the cooperative program. Both Parties note that exchanges by entities other than the Parties (e.g., company-to-company exchanges which are likely to develop) are not covered by the terms and conditions of this MOU, such exchanges are subject to any applicable national laws and regulations.

10 *Financial Arrangements*

10.1 NASA and STA will each bear the costs of discharging its respective responsibilities, including travel and subsistence of its own personnel and transportation of all equipment and other items for which it is responsible.

10.2 Further, it is understood that the ability of NASA and STA to carry out their obligations is subject to their respective funding procedures.

11 *Public Information*

Release of public information regarding this project may be made by the appropriate agency for its own portion of the program as desired and, insofar as participation of the other is involved, after suitable consultation.

12 *Liability*

12.1 NASA agrees in accordance with the laws and regulations of the United States of America, that, with respect to cooperative activities undertaken pursuant to this MOU, NASA shall not make any claim with respect to injury or death of its own or its contractors' or subcontractors' employees or damage to or loss of its own or its contractors' or subcontractors' property caused by NASDA or contractors or subcontractors of NASDA, whether such injury, death, damage or loss arises through negligence or otherwise

STA agrees that it will see to it, in accordance with the laws and regulations of Japan, that with respect to cooperative activities undertaken pursuant to this MOU, NASDA will not make any claim with respect to injury or death of its own or its contractors' or subcontractors' employees or damage to or loss of its own or its contractors' or subcontractors' property caused by NASA or contractors or subcontractors of NASA, whether such injury, death, damage or loss arises through negligence or otherwise

12.2 NASA further agrees, in accordance with the laws and regulations of the United States of America, to extend this inter-party waiver of liability to NASDA's Phase B contractors and subcontractors as third party beneficiaries and protect them from such claims that may be made by NASA or contractors or subcontractors of NASA

STA further agrees to see to it, in accordance with the laws and regulations of Japan, that NASDA will extend this inter-party waiver of liability to NASA's Phase B contractors and subcontractors as third party beneficiaries and protect them from such claims that may be made by NASDA or contractors or subcontractors of NASDA

This inter-party waiver shall not apply to claims between NASDA and its contractors or subcontractors or to claims between NASA and its contractors or subcontractors

12.3 STA represents that, under the law of Japan, it is not authorized to waive its right to make an administrative claim against NASA for damage to or loss of its own or its contractors' or subcontractors' property and, further, STA is not authorized to waive its right to make a legal or administrative claim against a NASA contractor or subcontractor for damage to or loss of its own or its contractors' or subcontractors' property. However, STA represents that it shall not involve its own property in cooperative activities under this MOU. STA further represents that no property of a STA contractor or subcontractor will be involved in cooperative activities under this MOU. NASA and its contractors and sub-

contractors will rely on this STA representation. In the event that STA property or the property of STA contractors or subcontractors were to be involved, STA agrees that it shall take appropriate measures protecting NASA and NASA Phase B contractors and subcontractors from any liability or other costs incurred as a result of claims for damages to or loss of such property.

12.4 STA represents that, under the law of Japan, it is not authorized to waive its right to make an administrative claim against NASA for the injury or death of an STA employee and, further, STA is not authorized to waive its right to make a legal or administrative claim against a NASA contractor or subcontractor for the injury or death of an STA employee. STA agrees that it shall take appropriate measures protecting NASA and NASA Phase B contractors and subcontractors from any liability or other costs incurred as a result of claims for damage that STA or STA contractors or subcontractors incur for injury or death of an employee of STA or of a contractor or subcontractor of STA.

12.5 NASA agrees that it shall take appropriate measures protecting STA and Phase B contractors and subcontractors of STA from any liability or other costs incurred as a result of claims for damage that NASA or NASA contractors or subcontractors incur for injury or death of an employee of NASA or a contractor or subcontractor of NASA, or for damage to or loss of property of NASA or a contractor or subcontractor of NASA.

12.6 This approach does not prejudice the approach to liability for a follow-on arrangement covering the development, operation and utilization phases of the Space Station Program.

13 *Customs Clearance and Visas*

NASA and STA will use their best efforts to arrange for free customs clearance of all equipment and other items required for this project. NASA and STA will use their best efforts to facilitate the issuance of appropriate visas for NASA and STA personnel, including contractors participating in the program.

14 *Settlement of Disputes*

Each Party will consult with the other in advance of any factors that may affect the terms and conditions of this cooperative activity. Any disputes in the interpretation or implementation of the terms of this cooperative program shall be first referred to the NASA Associate Administrator for Space Station and the Director-General RCB STA for resolution. Any disputes which cannot be resolved at this level will be referred to the NASA Administrator and the Minister of State for Science and Technology for settlement.

15 *Duration*

This MOU shall remain in force until the end of the Space Station detailed definition and preliminary design activities conducted by NASA and STA. If NASA and Japan agree to cooperate in the Space Station development, operation and utilization phases, an arrangement to cover these phases will be concluded.

16 *MOU Modification*

16.1 This MOU may be modified in writing by mutual agreement of both Parties. Each Party may propose in writing to the other any provision for revision or any amendment it deems necessary. Such proposal, when agreed to by the other Party, shall enter into force when signed by both the NASA Administrator and the Minister of State for Science and Technology or their designees.

16.2 In executing this MOU, if the need arises to stipulate matters in further detail, addenda will be prepared and agreed upon at the appropriate level for that purpose.

17 *Applicable Laws and Regulations*

Activities of both Parties under this MOU will be in accordance with any applicable national laws and regulations and with the Science and Technology Agreement. Activities in subsequent phases of the Space Station Program will also be in accordance with any applicable national laws and regulations.

18 *Entry into Force*

This MOU, done in two originals in the English language, shall enter into force when signed by both the NASA Administrator and the Minister of State for Science and Technology or their designees.

[Signature]

JAMES M BEGGS

For the National Aeronautics
and Space Administration

Date 5/9/85

[Signature]

REIICHI TAKEUCHI

For the Science and
Technology Agency

Date 5/9/85