(参考3)

Summary Report of the First Meeting of the Standing Senior Liaison Group (Draft)

November 20, 1980

The first Meeting of the Standing Senior Liaison Group met on November 20, 1980 in Tokyo. The meeting was co-chaired by Dr. M. Yoshiki, Acting Chairman of the Space Activities Commission, and by Dr. R. Frosch, Administrator of NASA. A list of participants is attached.

In this meeting, both sides presented overviews of their respective space activities. NASA particularly described the newest progress in the development of Space Shuttle and the space science and space application programs. The Japanese side particularly presented the progress of the development of H-I launch vehicle and the earth observation satellites program.

The meeting reviewed the present status and assessed the progress of seventeen cooperative projects which are now being implemented. Both sides confirmed that those projects were proceeding smoothly, and agreed that the most important objective for the future was to sustain progress on these projects while remaining alert to additional opportunities which may arise as these projects are completed.

Both sides also agreed that the Standing Senior Liaison Group should meet, in principle, once a year in order to promote Japan/US cooperation in the space field. The two sides agreed to hold their next meeting in Washington, D.C. in Autumn, 1981.

The following summarize the current status of the projects and identify actions to be undertaken jointly or separately to further implementation of these projects:

JOINT STATUS REPORTS ON APPLICATIONS PROJECTS

for

The First Meeting of the Standing
Senior Liaison Group

November 20, 1980

STUDY OF WINDS AND WAVES ASSOCIATED WITH TYPHOONS

Scientific Objectives

Through the analysis of coincident satellite and in situ data it should be possible to obtain a detailed Lagrangian description of the evolution of severe cyclonic disturbances together with the ocean surface response. Our limited understanding of these mesoscale storms can be significantly enhanced through snyoptic analyses while existing surface response models can be both improved and validated. Additionally, through the use of the in situ data, it will be possible to extend the range of scatterometer wind velocity validations and assess SMMR performance thereby providing a scientifically more useful data set.

Project Status

The terms of a Letter of Agreement, defining steps to project implementation, have been negotiated.
Principal points of contact have been named ; they are :
Japan : Dr. Akira Katayama, TRD, MRI
US : Dr. W. Stanley Wilson, NASA Headquarters.
Activities under this project began in June 1979 and are progressing according to the Specific Implementation Plan recommended by the joint NASA/SAC Study Group.

Major Activities

US : Evaluate the adequacy of satellite observations obtained over the Northwest Pacific during the summer of 1978.

Japan : Evaluate the adequacy of in situ observations obtained over the Northwest Pacific during the summer of 1978.

Both : Select an appropriate coincident satellite and in situ data set. Establish the scope of the cooperative study, performing those mutually agreed to analyses.

Major Milestones

1980 : Select appropriate data sets for analyses, establish scope of study. Begin analyses as agreed.

1981 : Joint meeting to discuss and combine results. Prepare a final report of the results of the cooperative study.

Problems/Issues

The primary problem encountered has been the evaluation and selection of the coincident data set. Both sides feel that these tasks are now complete and are prepared to define the exact scope of a joint analyses.

STUDY OF OCEAN DYNAMICS

Scientific Objectives

The temporal variability of western boundary currents, such as the Kuroshio, are not well known, particularly over short time scales. By analyzing a hybrid data set consisting of an altimetric time series (SEASAT) and in situ observations (hydrography) it will be possible to examine the high frequency time dependent transport while differentiating the barotropic from the baroclinic fields.

Project Status

A Letter of Agreement between Japan and the US, defining steps to project implementation, has been concluded.
Principal points of contact have been named ; they are :
Japan : Dr. Toshihiko Teramoto, University of Tokyo
US : Dr. W. Stanley Wilson, NASA Headquarters.
Activities under this project began in June 1979 and are progressing under the terms of the existing Letter of Agreement.

Major Activities

Both the US and Japan have agreed to evaluate the quantity and quality of the hybrid data set, jointly establish the scope of the cooperative study, then perform those mutually agreed to analyses.

Major Milestones

1980 : Complete evaluation of the combined data set, establishing the desirability to conduct joint scientific studies.

1981 : Define the scope of a scientific study, perform analyses as agreed to and produce a final report on the findings of the study.

Problems/Issues

Reduction and evaluation of the hybrid data set has caused a delay in this cooperative effort. Although there is merit in analyzing these data, logistical and personnel problems involved in a joint analysis appear to outweigh the benefits. Under the terms of the Letter of Agreement, NASA proposes to conduct separate analyses on these data with both sides informing the other of relevant results.

STUDY OF MARINE RESOURCES

Scientific Objectives

At this time, the quantitative link between ocean color measurements and marine fisheries productivity has not been well established. The utility of coastal zone color scanner data in providing this information can be determined through a cooperative data exchange.

Project Status

A Letter of Agreement, defining the steps to project implementation, is currently under negotiation.
Principal points of contact have been named ; they are :
Japan : Dr. Ichiro Yamanaka, Japan Fisheries Agency
US : Dr. W. Stanley Wilson, NASA Headquarters.
Activities under this project were postponed until 1980 and have just begun.

Major Activities

US : Provide CZCS data corresponding to in situ data obtained by the Japanese ; schedule and acquire CZCS data as requested by the Japanese.

Japan: Provide appropriate in situ data to allow for the evaluation of the CZCS data and continued refinement of the chlorophyll algorithm.

Milestones

1980 : Evaluate the chlorophyll algorithm over areas of high productivity such as the East China Sea.

1981 : Apply CZCS data to the determination of productivity in other regions in the North Pacific, and as well, other regions such as the Southern Ocean if possible.

1982 : Joint meeting for discussion of the result of study. Prepare a final report documenting the results of the cooperative data exchange.

Problems/Issues

CZCS data have been and continue to be acquired as requested by Japan, however, problems in reducing these data have impeded progress on the exchange. Although clouds have obscured much of the potentially useful CZCS imagery, new processor capabilities in the US should eliminate the data reduction difficulty prior to the end of this calendar year. NASA proposes that a Letter of Agreement, defining steps to the implementation of this cooperative data exchange, should now be concluded.

MEASUREMENT OF CLOUD HEIGHT BY SATELLITE STEREOGRAPHY

Scientific Objectives

By synchronizing GMS and GOES-West observations, cloud height fields can be derived from the resulting picture pairs. These fields will be of value in studying height variations with seasons and with differing meteorological situations (such as typhoons and other severe storms). Additionally, these data will be valuable for evaluation as a supplemental forecast tool.

Project Status

A Letter of Agreement between Japan and the US, defining steps to project implementation, has been concluded.
Principal points of contact have been named ; they are :
Japan : Dr. Keikichi Naito, MRI, JMA
US : Dr. James Dodge, NASA Headquarters.
The project is in its second year and progressing according to the terms of the Letter of Agreement.

Major Activities

Both the US and Japan have agreed to a project plan which provides for synchronization of observations for GOES-West and GMS. Four separate synchronizations have been attempted.

Milestones

Demonstrate synchronization of the two satellites and analyse the resulting stereo picture pairs.

Problems/Issues

To date, only one attempt has had the GMS synchronized to within 6 seconds of the scheduled GOES-West scan time. Technical limitations and observational priorities have delayed the demonstration.

A primary problem encountered is in ensuring the precise scheduling of the satellite observations. Since this is essentially a communications problem, NASA intends to designate Professor T. Theodore Fujita of the University of Chicago as the US project coordinator. With closer communication both sides are concentrating their efforts on accumulating the necessary stereographic image data.

RECEPTION OF MOS-1 DATA

Scientific Objectives

Both the US and Japan share an interest in applying satellite remote sensing techniques to observations of the marine environment to gain further information on air-sea interaction processes. In as much as the characteristics of the sensors being considered for MOS-1 are similar to those on NIMBUS, the launching of MOS-1 would augment the capability to make these observations.

Project Status

Progress under this project has proceeded according to the terms of the Specific Implementation Plan adopted by the NASA/SAC Joint Study Group.
Principal points of contact have been named ; they are :
Japan : Mr. Kazuo Matsumoto, NASDA
US : Dr. W. Stanley Wilson, NASA Headquarters.
Activities under this project were initiated in September 1979, and NASDA provided the new paper of MOS-1 to NASA in October 1980.

Major Activities

NASDA will provide NASA with periodic information on MOS-1 as it becomes available.

NASA will continue to evaluate the desirability and feasibility of direct reception of MOS-1 data and will inform Japan of its interest in persuing direct reception when the evaluations are complete.

Problems/Issues

None.

SNOW PROPERTIES RESEARCH

Scientific Objectives

Develop amd test a general method which effectively utilizes remote sensing and conventional data to obtain snow property information for improved water resources management. The approach includes model, data, and analysis exchanges from US and Japanese test sites for comparison and joint reporting. The areas of research include snowmelt runoff model testing, field and NIMBUS-7 SMMR microwave measurements over snow and data collection system sensor studies.

Project Status

A Letter of Agreement, defining steps to project implementation, has been concluded.
Principal points of contact have been named ; they are :
Japan : Mr. Kaname Takeda, NIR, STA
US : Mr. Michael Calabrese, NASA Headquarters.
Activities under this project began in May 1980 and are progressing according to the terms of the Letter of Agreement.

Major Activities

Develop and test snowmelt runoff models in the southern Sierra and compare results with similar water sheds in Japan (Tadami river basin) to extend models from small basin (40-400km^2) to larger basins (2000-5000 km^2). Conduct microwave aircraft and field experiments to monitor snow properties over high elevation Colorado test sites and compare with Japanese experiments in lower elevation test sites. Analyze SMMR data on snowpack properties in the Great Plains and compare with results from Japanese test site on the Ishikari Plain, Hokkaido. Snowpack properties ground measurement techniques will be demonstrated and evaluated for US test sites and compared with similar efforts on Japan test sites.

Major Milestones

1981 : Conduct Scientific Exchange in US. Conduct Workshop in Japan

1982 : Conduct Scientific Exchange in US.

1983 : Conduct Workshop in US. Prepare final report.

Problems/Issues

None.

POTENTIAL EVAPORATION STUDY

Scientific Objectives

Contributions of remote sensing data to evapotranspiration (ET) studies has not been well established. By developing and testing techniques for applying satellite data to these estimates, an effective methodology can be realized.

Project Status

A Letter of Agreement between Japan and the US, defining steps to project implementation, has been concluded.
Principal points of contact have been named ; they are :
Japan : Mr. Kaname Takeda, NIR STA
US : Mr. Michael Calabrese, NASA Headquarters.
Activities under this project began in May 1980 and are progressing according to the terms of the Letter of Agreement.

Major Activities

A survey and exchange of techniques for employing satellite data in ET estimates will be conducted by both sides. Measurements will be made over Japanese test sites and comparable US test sites in the western US and applicable models will be developed and tested. The survey of techniques will include multispectral sampling, thermal infrared methods, and microwave moisture budget approaches.

Major Milestones

1981 : Established framework in US. Conduct Scientific Exchange in Japan.

1982 : Conduct Workshop in US.

1983 : Conduct Scientific Exchange in US. Conduct Workshop in Japan. Prepare final report.

Problems/Issues

None.

STUDY OF CRUSTAL PLATE MOTION

Scientific Objective

Demonstrate intercontinental Very Long Baseline Interferometry (VLBI) measurement capability using the Radio Research Laboratories (RRL) 26-m antenna at Kashima and US-operated VLBI observatories in North America, Alaska, Hawaii, and Australia.

Project Status

A Letter of Agreement between Japan and the US, defining steps to project implementation, has been concluded.
Principal points of contact have been named; they are:
Japan: Dr. Nobuhiro Kawajiri, Radio Research Laboratories
US: Dr. Edward A. Flinn, NASA Headquarters.
The project is in its second year and progressing according to the terms of the Letter of Agreement.

Major Activities

Japan: Construct a broad-band data system compatible with the US Mark-III data system, and of comparable accuracy.

US: Supply technical asssitance to the RRL as needed, and continue development of US VLBI observatories.

Both: Conduct joint VLBI experiments.

Major Milestones

Technic l information on the Mark-III system has been provided occasionally to the RRL staff, and several meetings have taken place.

To date, all engineering work is, on the whole, proceeding on schedule.

1981-1983: Subsystem and system-level tests of the Kashima facility.

1983-1984: System-level experiment to be followed by the actual joint VLBI experiments.

Problems/Issues

The international geophysical community hopes that the joint VLBI experiment is not just an end in itself, but will be the first of a continuing series of observations of baselines from Japan to Australia, Hawaii, Alaska, and North America. NASA proposes that an agreement to continue these experiments (for example, for five years beginning in late 1984) should now be considered.

It is desirable for RRL to continue these joint experiments. RRL, in a general way, consents to NASA's proposal. Both RRL and NASA will discuss in detail on this matter in near future.

EXCHANGE OF EXPERIMENTAL COMMUNICATIONS SATELLITE DATA

Scientific Objectives

To further understanding of radio propagation, particularly the effects of the atmosphere on allocated bands above 10 GHz and satellite operations and control by ground station, through exchange of experimental communications satellite reports.

Project Status

Principal points of contact have been named; they are:
Japan: Dr. Masaichi Hirai, NASDA
US: Mr. Donald Dement, NASA Headquarters.
Exchange of lists of available reports has taken place according to the Specific Implementation Plan agreed to by the NASA/SAC Study Group. Further agreements for actual exchange of data can be initiated by either side.

Major Activities

The joint project was limited to an exchange of reports of experiments already performed. US data would be from NASA satellites ATS-5 and -6 and CTS, but could include data and conclusions from non-NASA satellites (COMSTAR, SIRIO). Japanese data would include reports on CS (Communication Satellite), BSE (Broadcast Satellite, Experimental), ETS-II (a propagation research satellite). The exchanging of report list continues. The study team define several subjects for further consideration which continue to be discussed.

Major Milestones

The exchange of initial report lists was completed in Summer of 1979. No further milestones have been set.

Problems/Issues

NASA has identified several reports of interest and proposes to proceed with actual exchange of reports under the terms recommended by the NASA/SAC Study Group.

JOINT STATUS REPORTS ON SPACE SCIENCE PROJECTS

for

The First Meeting of the Standing
Senior Liaison Group

November 20, 1980

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Collaborative Comet Halley Studies

Description: Program objectives involve joint studies of comet Halley throughout its 1986 apparition. Specific activities now contemplated include Japanese participation in the International Halley Watch Program and possible US support for the Japanese Planet-A Mission.

Status/Activities To Date: The nature of the cooperation envisaged in the original NASA/Japan study program has changed somewhat since the US is now not planning to proceed with the Halley/Tempel 2 Rendezvous Mission. In Japan, the Planet-A Mission has been approved by the Space Activities Commission. A number of informal discussions have been held concerning possible Japanese participation in the International Halley Watch Program. Participation would include the placing of Planet-A data in the Common Halley Data Pool which will be developed. Exploratory discussions have been held concerning possible US support for the Planet-A Mission. Although no firm requirements for such support have been identified, topics which have been raised have included ephemeris development and possible navigation and tracking support. Additional discussion will be needed to further define and refine the nature of any collaborative effort.

Future Activities: During the next year Professor Uesugi from ISAS will be in residence at the Jet Propulsion Laboratory. Part of his activities there will include service as a liaison to continue discussions of possible collaborative Halley Comet studies. Details of possible participation in the International Halley Watch Program will be worked out and additional work will be done to explore the needs and possibilities for US support of the Planet-A Mission. Further discussion of these issues will also occur when Professor Hayashi visits NASA Headquarters in December.

Remarks/Issues: Additional work needs to be done to define the nature of the possible collaborative effort. The form of the collaboration will be the subject of further negotiations between ISAS and NASA.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Saturn Orbiter Dual Probe Mission

Description: This project involves a detailed investigation of the Saturnian system using a Saturn orbiter, a Saturn atmospheric probe and Titan atmospheric probe and lander. Possible Japanese participation involves the possible provision of a pre-entry science package or packages.

Status/Activities To Date: A letter agreement defining various joint NASA/ISAS mission definition activities has been signed. During the past year a number of preliminary feasibility assessments have been performed for various mission strategies, and system preliminary designs developed for the spacecraft, trajectory, propulsion module, atmospheric probes, science instrument pay load, and information system. During the past year a liaison engineer from ISAS, Dr. Haruto Hirosawa, has been in residence at the Jet Propulsion Laboratory to participate in these studies. In September 1980 a meeting was held in Tokyo to review study results and to discuss further plans for participation in the study.

Future Activities: During the next year, a delegation from ISAS (Professor Uesugi and Professor Shimizu) will be sent to the US to continue Japanese involvement in the mission definition. Professor Shimizu will spend some time at the Ames Research Center working on Probe design. Professor Uesugi will be in residence at the Jet Propulsion Laboratory. In addition to work on the Saturn Mission, he will also serve as a liaison to discuss possible collaborative Halley Comet studies as well as maintain a general awareness of the status of various NASA programs. In general, work will continue on refinement of concepts for the pre-entry science packages.

Remarks/Issues: Both sides reaffirm their interest in continuing to collaborate on studies of this mission. It is understood by both NASA and ISAS that the Saturn Orbiter and Dual Probe Mission is a candidate for a possible program start no earlier than 1986.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Origins of Plasmas in the Earth's Neighborhood (OPEN)

Description: The OPEN program is a multi-satellite mission intended to carry out a comprehensive study of the deposition, transport, storage and dissipation of energy in the Earth's Magnetosphere. The possibility being explored is that the OPEN-J satellite now under consideration for development by Japan will become part of the total OPEN program. In addition, other small satellites might also be able to contribute to the program. Such additional satellites can provide valuable complementary and supplementary information to the data to be obtained by the 4 planned US spacecraft.

Status/Activities To Date: Activities to date on the joint program have largely been confined to informal discussions at the working level. On the US side an Announcement of Opportunity was released in October 1979. The proposals are now being evaluated with a selection planned during the Spring of 1981. On the Japanese side, Dr. A. Nishida, who has been a member of the OPEN Working Group, is now serving as the chairman of the OPEN-J Working Group of ISAS. This group in planning to carry out a preliminary design study of the OPEN-J Mission to be completed next Spring in Japan.

Future Activities: Following the US selection in the Spring, an OPEN Mission Science Working Group will be formed. It is currently anticipated that the first meeting of this Working Group will take place in June or July of 1981. The formation of this Working Group will begin the phase of the mission design when many of the important details of the mission will be worked out. Current plans are for an invitation to be extended for Japanese participation in the Working Group.

Remarks/Issues: Active Japanese participation in the Science Working Group from the beginning of its activities will be required in order to optimize the scientific return from the mission. A number of substantive issues need to be addressed as early as possible. These include:

1. Selection of satellite orbits, and
2. Provision for mutual access to data bases which in turn will require compatibility of data formats and communication standards and protocols.

It is recognized by both sides that the science to be returned from the mission and the value of participation in the mission depend in a fundamental way upon the existence of a coordinated data base.

Interest has been expressed in Japan in the possibility of US scientists participating in OPEN-J. Further discussion of this point will be needed particularly with regard to differences in the systems for selection of experiments in the two countries. NASA will undertake an examination of its selection system to see whether a procedure can be found which will be mutually agreeable to both parties.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Trans-Pacific Ballooning

Description: This program involves the use of long duration balloon flights across the Pacific to carry out experiments in gamma ray and cosmic ray astrophysics. Initial activities have concentrated on technical studies of the feasibility of such a program.

Status/Activities To Date: A letter agreement has been prepared and signed establishing the Joint Study Program. Preliminary meteorological studies have been carried out both in the US and Japan and study reports have been exchanged. A launch site survey has been carried out in Japan. Some studies have also been carried out in Japan regarding the technology which is needed for such long duration flights.

Future Activities: A number of specific questions still must be investigated mostly by the US. These include:

1. Problems associated with possible balloon recovery in Mexico;
2. The feasibility of a telemetry link during flight over the Pacific;
3. Availability of TIROS-N data to support the meteorological studies for the prediction of flight trajectories; and
4. Status of super pressure balloons and other advanced technology.

In addition a joint working group still must be set up to look at the questions of feasibility and program implementation in much greater depth than has been done to date.

Remarks/Issues: Both sides reaffirm their interest in the possibility of initiating a program of trans-Pacific ballooning. Despite this interest, prograss to date has been considerably slower than originally anticipated. Both the US and Japan look forward to the possibility of accelerating the pace of studies on this program. Immediate attention must be paid the specific questions mentioned earlier. The setting up of the Joint Study Group referred to in the original agreements is felt to be very important. Such a study group should be set up at the earliest opportunity.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
X-Ray Astronomy

Description: Both the US and Japanese scientific communities are deeply involved in X-Ray Astronomy. Study objectives are to define possibilities for collaborative programs in X-Ray Astronomy with US participation in the Japanese CXGT program having been specifically identified as a candidate for such a cooperative project.

Status Activities To Date: As the result of the activities of the NASA/SAC Study Group, Dr. M. Oda was invited to participate as a member of the Advanced X-Ray Astrophysics Facility (AXAF) Science Working Group. During the past two years the Japanese plans in X-Ray Astronomy and the concept for the CXGT Mission have continued to evolve. In particular an Astro-C Mission is now planned to take place between Astro-B (now in development) and a later CXGT Mission. Both parties have agreed that until the nature of the CXGT Mission and the possible US role in it was better defined no further formal activities would take place. However, numerous informal discussions have been held to consider US and Japanese planning for X-Ray Astronomy, the possible nature of the CXGT Mission and the relationship between planned US and Japanese initiatives in this field.

Future Activities: At this time no formal activities have been planned. However, it is anticipated that informal discussions will be held to continue to explore possibilities for cooperation in X-Ray Astronomy. Professor Oda and Professor Tanaka plan to visit NASA Headquarters in December to discuss the CXGT Mission.

Remarks/Issues: Both sides reaffirm their strong interest in X-Ray Astronomy and in the possibility of cooperative programs. Both sides also recognize the need for programs which complement each other rather than competing. Detailed information on planning will continue to be exchanged. Japanese interest in the possibility of US technical assistance in the development of CXGT is noted and will have to be the subject of intensive discussions to thoroughly explore all the issues. In view of the changes in thinking which have taken place during the past few years, it may be necessary to reassess the basis for a possible cooperative program. Both sides have expressed their willingness and interest in actively continuing to discuss the issues.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Joint Tether Projects

Description: The Tethered Satellite System (TSS) will provide the capability on Spacelab of deploying and retrieving a small satellite on a long conducting or non-conducting tether for carrying out a variety of magnetospheric, ionospheric, and upper atmospheric investigations.

Status/Activities To Date: Substantial progress has been made in the initiation of a rocket-based Tethered Payload Experiment intended to develop the technology for and determine preliminary performance characteristics of a tether system intended for use in electrodynamic studies. The rocket program involves a collaboration between Professor K. Hirao of ISAS and Dr. R. Willaimson of Utah State University. A Japanese scientist has spent a year at Utah State University as part of this effort. The first rocket experiment was launched in Kagoshima Japan on January 16, 1980. Two more flights are currently planned for launch in Japan in January 1981 and January 1982. Preliminary planning is proceeding for continuation of the rocket flight series in the United States in 1982 and 1983. Discussions have been held in the United States in July 1980 with Professor Hirao and Dr. K. Oyhama concerning Japanese interest in the Shuttle-based Tether Program. These discussions were held in conjunction with their attendance at a meeting of the Atmospheric and Space Plasma Physics Working Group which reviewed the Tether Program in detail. The United States has continued to keep the Japanese informed of planning for the development of the Shuttle-based Tether System.

Future Activities: As indicated above, the Rocket Tether Program will be actively pursued. Current plans for the Shuttle Tether System call for the establishment of a Science Working Group in the US in 1981. At the time that this Working Group in established it is planned to invite Japanese representation to the Group in order to continue to explore Japanese interest in participating in the development of the Shuttle Tether System and possible areas of cooperation.

Remarks/Issues: At the present time exploratory discussions are also being carried out between the US and Italy on the Shuttle Tether Program. The Japanese have been kept informed of these discussions. It is recognized that all of these discussions are still at a very early stage and that, in particular, much more work must be done to define Japanese interests and the nature of possible Japanese participation in a total Shuttle Tether Program. Such a Shuttle program may be a long-term evolutionary one involving participation and contributions by several countries.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Collaborative Solar Studies

Description: The purpose of this program is to carry out a coordinated study of major problems in solar flare physics using observations from NASA's Solar Maximum Mission and Japan's Astro-A Mission in conjunction with ground-based observations and theoretical work to be carried out by both countries.

Status/Activities To Date: Excellent progress is being made on this project. Both the US and Japan are committed to the coordination of observations and there has been regular communication at the working level. Highlights of activities to date include the following:

1. The US SMM investigators have put together sample sets of data from their instruments which are being provided to the Japanese Astro-A investigators. A list of some possible specific collaborative observing programs has been generated.

2. The Astro-A Program Director, Dr. Y. Tanaka, and Dr. K. Tanaka, visited NASA in April and August 1980 to carry out detailed discussions of specific plans for collaborative studies.

3. A letter agreement regarding the collaboration has been prepared and signed.

4. A Japanese Engineering Satellite MST 4 has been successfully launched. The purpose of this satellite was to demonstrate that the technological requirements of Astro-A can be met. In addition to engineering tests the MST 4 satellite also carried a scientific instrument for solar x-ray spectroscopy. The United States has been informed about results from the MST 4 program and further discussions and exchanges of information are planned.

Future Activities: A number of near-term activites are already in process.

1. The SMM Project Scientist (K. Frost) and other SMM Science Investigators will attend a planning meeting in Japan in December 1980 to firm up observing and communication planning.

2. Following the launch of Astro-A in February 1981 the US and Japanese scientists will exchange relevant observing schedules and selected sets of observational data as part of the collaboration. This exchange will be followed by publication of joint papers.

3. It is currently planned that a joint SMM-Astro-A workshop will be held in 1982 after approximately one year of Astro-A observations.

Remarks/Issues: Although progress to date has been excellent, the ultimate success of the program will depend on the free exchange of data and the opportunities to compare and discuss results. Adequate provision will need to be made for participation in Scientific Workshops and regular visits by collaborating scientists.

STATUS & ASSESSMENT
SPACE SCIENCE PROJECTS
Spacelab Life Sciences Studies

Description: NASA has defined a Spacelab Life Sciences Program to study the physiological impact of the low G environment and long term effects of exposure to space radiation. Japan has initiated work on its program for Spacelab Missions in early 1986. Possibilities for collaboration involve identification of appropriate life sciences equipment or facilities that could be developed by Japan for possible common use, definition of terms under which such equipment might be available for use by either side and identification of mutually beneficial opportunities for participation by Japanese scientists in NASA Life Sciences Missions.

Status/Activities To Date: A number of informal information exchanges, discussions and meetings between US and Japanese scientists and engineers interested in Life Sciences experiments have taken place. Japanese scientists participated in the meetings at NASA Headquarters and the Johnson Space Center when Spacelab proposals submitted in response to the US Life Sciences Announcement of Opportunity were evaluated. A delegation of Japanese scientists headed by Dr. H. Matsumiya visited the Ames Research Center to discuss various aspects of space flight experiments in the Life Sciences. Discussions have also been held concerning medical standards and training requirements for payload specialists. Progress has been made in identifying items of equipment which might be developed by the Japanese. Examples include an optical microscope and a high speed centrifuge. Japanese interests in participating in a program of vestibular research have also been expressed. Discussions to date have been exploratory in nature and firm plans or commitments have not been made.

Future Activities: Futher more intensive discussions regarding potential joint efforts need to take place during the coming year. One attractive possibility which has been raised is for the Ames Research Center to hold an Experimenter's Workshop for potential Japanese Life Science Investigators. Such a Workshop would involve briefings on Spacelab capabilities, Life Sciences Laboratory Experiment (LSLE) equipment, animal facilities, etc. Interactions with US flight experiment program engineers and managers would be possible. The goal of such a meeting would be to further define a possible joint program.

Remarks/Issues: Both sides restated their interest in pursuing the concept of joint Japanese/US activities in the Life Sciences. Much more intensive work will be needed to define the nature of a mutually beneficial program.

Attachment

List of Participants

The first Meeting of Standing Senior Liaison Group

10:00-15:30, November 20, 1980

Room Hakucho, Hotel Takebashi Kaikan

NASA Participants

Dr. Robert A. Frosch	Administrator
Mr. Samuel W. Keller	Deputy Associate Administrator for Space and Terrestrial Applications
Mr. Kenneth S. Pedersen	Director of International Affairs
Dr. Jeffrey D. Rosendahl	Acting Assistant Associate Administrator for Space Science
Dr. Robert P. Chase	Manager, Oceanic Circulation and Climatology Programs, Environmental Observation Division, Office of Space and Terrestrial Applications
Mr. Justin L. Bloom	Counsellor for Scienific and Technological Affairs, Embassy of the United States of America

Japanese Participants

Dr. Masao Yoshiki	Acting Chairman, Space Activities Commission
Dr. Shigebumi Saito	Commissioner, Space Activities Commission
Mr. Tamotsu Shoya	Director General, Research Coordination Bureau, Science and Technology Agency
Mr. Nobuo Kozu	Deputy Director General, Research Coordination Bureau, Science and Technology Agency
Mr. Hitoshi Ohsaki	Deputy Director General, Science and International Affairs Bureau, Ministry of Education
Dr. Minoru Oda	Science Adviser, Science and International Affairs Bureau, Ministry of Education (Professor, Institute of Space and Aeronautical Science, University of Tokyo)
Mr. Yoshitaka Kurihara	Director General, Radio Research Laboratories, Ministry of Posts and Telecommunications
Dr. Masao Yamanouchi	President, National Space Development Agency of Japan