



Assembly of Western European Union

DOCUMENT 1546

13 November 1996

FORTY-SECOND SESSION

Prospects for space cooperation between Europe and Japan

REPORT

submitted on behalf of the Technological and Aerospace Committee
by Mr Valleix, Rapporteur

Prospects for space cooperation between Europe and Japan

REPORT¹

*submitted on behalf of the Technological and Aerospace Committee²
by Mr Valleix, Rapporteur*

TABLE OF CONTENTS

DRAFT RECOMMENDATION

on prospects for space cooperation between Europe and Japan

EXPLANATORY MEMORANDUM

submitted by Mr Valleix, Rapporteur

- I Introduction
- II Some preliminary considerations on Japan's defence policy
- III. Japan's space policy
- IV. Civil space cooperation between Europe and Japan - future prospects
- V. Feasibility of military space cooperation between Europe and Japan
- VI. Conclusions

1 Adopted unanimously by the Committee.

2. *Members of the Committee:* Mr López Henares (Chairman); MM Lenzer, Marshall (Vice-Chairmen); Mrs Aguiar (Alternate: Coelho), MM Arnau, Atkinson, Mrs Blunck, Mrs Bribosia-Picard, Mr Cherribi, Sir John Cope, Mr Diana, Mrs Durrieu, Mr Feldmann, Mrs Gelderblom-Lankhout, MM Jeambrun, Le Grand, Litherland (Alternate: Sir Dudley Smith), MM Lorenzi, Luis, Magginas, Martelli, Olivo, Probst, Ramírez Pery, Sofoulis, Staes, Theis, Valleix.

Associate member: Mr Dincer.

N.B. *The names of those taking part in the vote are printed in italics.*

Draft Recommendation

on prospects for space cooperation between Europe and Japan

The Assembly,

- (i) Considering the interest space cooperation between Europe and Japan presents in scientific, technological and industrial terms and also in strategic terms;
- (ii) Regretting that many difficulties of various kinds on both sides have so far prevented any progress on such cooperation;
- (iii) Welcoming the major advances Japan has made in space in recent years,
- (iv) Noting that Europe's and Japan's interests, budgets and priorities as regards space development are broadly similar;
- (v) Considering that Japan has achieved autonomy in some areas of its space activities, which could enable it to reconsider its dependence on the United States and seek more balanced forms of cooperation allowing it to play a more active part on the international stage,
- (vi) Regretting that pressure from the United States in its commercial dealings, in practice prevents European satellite manufacturers from gaining access to the Japanese market, despite the latter's concern to remain open to international competition;
- (vii) Deeply regretting that the European Space Agency as yet has no office in Tokyo to represent it and build up its relations with Japanese government agencies;
- (viii) Commending the European Business Community in Japan, and notably its Space Subcommittee, for the work it has done, with financial support from European industry, the national Chambers of Commerce in Japan and the European Union, to promote cooperation and coordination between these various organisations, acting as their spokesman in contacts with the Japanese authorities;
- (ix) Also noting with interest Japan's growing tendency to strengthen its capability for international action, particularly in the military sphere;
- (x) Welcoming the fact that Japan is increasingly giving higher priority to its contribution to international security, particularly to United Nations peacekeeping operations;
- (xi) Noting that Japan maintains regular contact with the North Atlantic Treaty Organisation;
- (xii) Considering furthermore the interest with which the Japanese Ministry for Foreign Affairs is following WEU initiatives in developing a European space-based observation system;
- (xiii) Considering the importance of the current debate in Japanese society on the expediency of Japan acquiring an independent earth observation capability for security and defence purposes;
- (xiv) Noting that the arguments put forward for possessing such a capability are identical to those that have led Europe to take similar decisions;
- (xv) Aware that a project such as this must have the fullest public support and that the public must be informed and involved in discussions leading to decision-making;

(xvi) Taking note, finally, of Japan's Earth Observation Centre and its programme for building a data relay test satellite, both of which correspond to activities and projects of major interest to WEU,

RECOMMENDS THAT THE COUNCIL

1. Urge member states to develop a common space strategy which, in view of the existing opportunities for cooperation with Japan, will give the European space industry access to the Japanese market, taking into account all relevant Japanese agencies and institutions, thereby allowing technical and industrial contacts to be established at appropriate levels;
2. Propose that the European Space Agency open a permanent office in Tokyo, thus paving the way for permanent and thorough dialogue with Japanese government agencies, and that the national space agencies of member states strengthen bilateral ties with Japan;
3. Discuss with the Japanese methods of improving cooperation between Europe and Japan in fields of joint interest such as the exploitation of space for civilian and military purposes and other issues affecting security;
4. Task the Space Group to examine the possibility of entering into a dialogue with the Japanese authorities with a view to future cooperation in areas such as Japan's plan to build a military space-based observation system and a data relay test satellite, and possible collaboration between the Torrejón Satellite Centre and Japan's Earth Observation Centre, making sure that such cooperation is not confined to exclusively strategic concerns but also covers industrial and technological issues.

Explanatory Memorandum

(submitted by Mr Valleix, Rapporteur)

I. Introduction

1. In 1973, the Technological and Aerospace Committee paid its first visit to Japan and produced a report on "Advanced Technology in Japan and the consequences for Europe" (Assembly Document 617, Rapporteur Mr Van Lent). With reference to space developments in Japan, and more specifically to international cooperation the report stated:

"Collaboration with western Europe started with a note in December 1972 on cooperation between the Science and Technology Agency and the European Space Research Organisation

According to this note the agency and ESRO.

- (a) will periodically exchange scientific and technical information published by them without restriction as to use;
- (b) will endeavour to exchange information on space programmes and projects of mutual interest with the aim of studying their possible coordination;
- (c) agree in principle to arrange the exchange of visits of specialists aiming at mutual familiarisation with scientific work in progress;
- (d) agree to hold meetings of their officials as required in order to discuss general matters of interest to the parties, particularly general policy problems and other such problems as concern the fields where closer cooperation of the parties is desired."

2. One of the conclusions drawn in the report was that it would be difficult for Europe to take such action until the European Space Agency had been set up (which was scheduled for April 1974). It added that Europe and Japan had parallel interests in many space sectors. Both wished to gain an independent capability in launchers and telecommunication satellites, to be followed subsequently by remote-sensing satellites concentrating on earth resources, navigation and maritime safety. Finally,

the report noted that both the European and Japanese space industries were working with the United States on a bilateral basis and that this cooperation might well become tripartite, a prospect which was considered both reasonable and desirable.

3. Thus one of the recommendations of the report addressed to the WEU Council was to

"Invite member countries to establish within the framework of the OECD, a special committee of the Ministers responsible for technology and industry and of the permanent representatives in order

(a) To concert their views on:

the transformation into trilateral collaboration of the bilateral space collaboration between Japan and the United States and Europe and the United States covering all fields of space research, development and space applications ..."

4. Later, in 1983, the Committee again visited Japan and the same year produced a report entitled "Assessment of Advanced Technology in Japan" (Assembly Document 956, Rapporteur Lord Northfield)

5. A chapter of the report was dedicated to the then current Japanese space programme and future projects. International cooperation, it pointed out, was mainly with the United States. As far as Europe was concerned, annual consultations were held with the European Space Agency and there were exchanges of information on matters such as telecommunication and remote-sensing satellites.

6. In Lord Northfield's view, the reason for the lack of real cooperation up to that time with ESA and with individual European countries had been inequality of technological know-how. Nevertheless, the report stated, Japan felt it had caught up and there was a desire on both sides for genuine cooperation.

7. At the time, papers on mutual use of scientific and communication satellites, on Spacelab

and on electronic equipment were being discussed. Japan also reached agreement with NASA and ESA on wave frequencies, a 1986 launch by Japan of a marine observation satellite and use of tracking stations in Guiana and Australia, and with France on the tracking of the Spot satellite, to be launched in 1985. Lastly, the report noted that the law creating the National Space Development Agency of Japan (NASDA) explicitly prohibited any military activity by the latter under the Japanese space programme, a factor to which the Committee's attention was specifically drawn.

8 Finally, among the recommendations contained in the report by Lord Northfield are two with a bearing on the present report. These call upon the Council to

"Instruct the Standing Armaments Committee to study Japanese progress in military high technology, or technology which may have military applications, together with its prospects and submit the conclusions of this study to the Assembly;

...

In order to develop practical collaboration in space, and taking account of the fact that Japan has just appointed a permanent representative to Paris for space matters, propose the nomination of a permanent representative of ESA to Japan to enable ESA to consult continuously on collaborative projects."

9. In response to the first of these recommendations, in September 1985 the Standing Armaments Committee published a report entitled "Outlook for future developments in the Japanese armaments industry and its possible repercussions on Europe¹".

10. Referring to Japan's space capability, Chapter V of that report noted that although Japanese space policy admitted only to exclusively civil ambitions, it was clear that no hard and fast distinction was made between civil and military use of space and that a launcher or observation satellite could have either a civilian or military purpose, depending on the payload carried by the launcher or what the satellite was supposed to observe.

11. The report's authors (the International Secretariat of the Standing Armaments Committee) concluded in this connection that the latest computer technology (such as Japan had at the time) made it possible for a country to make use of images from civil observation satellites for military observation purposes.

12. The report also notes that the then Japanese Prime Minister, Mr Nakasone, held public debates at the Diet on whether it was time for Japan to have a military satellite. Indeed in early January 1985, the Head of Government stated before the Diet that Japan should have its own "spy" satellites, if their use became more widespread. This statement did not lead to a major public outcry and the centre (Komeito) and left-of-centre (Social Democrat) opposition parties refrained from any criticism.

13. In February 1985, the Prime Minister again acknowledged publicly to the Diet that his country would use the American naval satellite, Fleetsat, to receive and send military data in the course of joint military exercises with the United States and in emergencies.

14. It should be borne in mind that in 1985, President Reagan had already launched his Strategic Defence Initiative and that allies of the US were already giving thought to their possible participation. Mr Nakasone had declared himself in sympathy with the US project.

15. Nevertheless the report noted the very great difficulties there were for Japan in engaging in the militarisation of space. Probably the biggest obstacle was the deeply-entrenched pacifism of the Japanese public, which would be further reinforced by the increase in budget spending that any commitment by Japan to join the military space race would imply.

16. The report also reiterated the argument of an influential senior civil servant in the Japanese Ministry of Foreign Affairs, to the effect that while the Strategic Defence Initiative aimed to stop enemy nuclear devices in flight, it was nonetheless assumed that some of those missiles would pass through the new defence system, and that the nuclear powers would therefore be tempted to increase their arsenal of offensive nuclear weapons in order to penetrate enemy defences. By taking part in a space defence system Japan would, paradoxically, be contributing to the build-up of nuclear arms.

1. Document SI (85) D/19

17. Notwithstanding such intuitive reactions and reasoned arguments, Japan patently did not want to remain peripheral to the scientific and technical progress such projects and the research associated with them would bring.

18. The report concluded that Japan would very soon become a space power in the civil sector, although it regarded that country, at that point in time, as lagging behind the United States and Europe. On the military side, Japan would in future openly undertake the military observation missions it was, even then, engaged in covertly.

19. As will become apparent later, the debate on military observation satellites is still an issue in Japanese political life and the time when politicians will have to make a decision is drawing closer.

20. The above account aims to give a brief overview of the present Committee's work on the Japanese space industry. In the chapters which follow, your Rapporteur will endeavour to present an assessment of space cooperation between Japan and Europe and how this might develop in the future, particularly in the military space sector, the area of special interest to the Committee.

21. The Committee's recent visit to Japan, in July 1996, and the preparation of the present report serve to demonstrate members' interest in this area and their desire that Japan should be part of the prospects for military space development that are opening up to WEU. We must be aware, nonetheless, of the difficulties involved in such an undertaking given the unusual features such issues present in a country such as Japan, which has its own highly characteristic approach, but which without doubt also has a number of interests in common with our own

II. Some preliminary considerations on Japan's defence policy

22. Your Rapporteur feels that a brief discussion of the political and constitutional limitations within which Japan must work in relation to defence and the armed forces is in order, to enable us to understand the, at times, ambiguous way such subjects are dealt with in Japan.

23. Chapter II Article 9 of the Japanese Constitution, which was imposed on the country by the United States and enacted on 3 November 1946, states.

"Aspiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes.

In order to accomplish the aim of the preceding paragraph, land, sea and air forces, as well as other war potential, will never be maintained. The right of belligerency of the state will not be recognised."

24. Shortly afterwards, the Korean War and the start of the cold war led initially, in 1950, to the formation of a National Police Reserve, which in 1952 became the National Security Force and then in 1954 the National Self-Defence Forces. This development was to lead to the statement some years ago by the Chairman of the Japanese Socialist Party that self-defence forces were legal, if unconstitutional. Japan's Supreme Court ruled that such forces were in fact legal.

25. Yet another factor of crucial importance were the Japan-US Security Arrangements. On 8 September 1951, a peace treaty was signed in San Francisco between Japan, the United States and the other powers that had fought Japan except the Soviet Union, the People's Republic of China, and India, which refused to accede.

26. Several months later, in April 1952, at the same time as the treaty came into force, the first of the Japan-US Security Arrangements was implemented, whereby the United States gave an undertaking to protect Japanese territory and was authorised to station its troops there.

27. Shortly afterwards, in October 1953, immediately after the end of the Korean war, the Japanese Minister for Foreign Affairs and his American counterpart made a joint declaration advocating a progressive increase in Japan's defence capability. In 1954 an agreement to provide mutual assistance in defence matters was signed between the two countries

28. According to Daniel Coulmy's excellent study of "Le Japon et sa défense"², two opposing political trends held sway in Japan at the time, with the conservatives in favour of maintaining relations with the United States on a basis of equality and

2. *Le Japon et sa défense*, Daniel Coulmy, FEDN, Paris 1991

mutual respect, and the progressives wanting Japan not to take sides in US-Soviet confrontation. Moreover the conservatives wanted to see constitutional reform, especially in relation to defence, while the progressives were opposed to such reform

29 As the conservatives could not muster the necessary two-thirds majority in parliament, they changed their tactics and argued that since Japan's sovereignty had been restored, the country needed a military structure, the sole aim of which would be to defend Japan's national territory – an argument, in their view, in keeping with the letter of Article 9 of the Constitution and which led, as stated earlier, to the formation, on 1 July 1954, of the National Self-Defence Forces.

30. In the absence of a Ministry of Defence, these forces came under the authority of the Defence Agency, headed by a civilian Director-General with the rank of Minister of State. The Defence Agency was directly answerable to the Prime Minister.

31. In July 1956, Daniel Coulmy³ writes, the Council of Defence was set up, under the chairmanship of the Prime Minister, comprising the Minister for Foreign Affairs, the Finance Minister, the Director-General of the Defence Agency and the Director of the Agency for Economic Planning. In 1957 the Defence Council laid down the principles of national defence which would form the basis for the government's defence policy

32. Two of them were to form the cornerstone of that policy. The first held that the armed forces would be used only for strictly defensive missions, limited to protection of the national territory. The second provided that response to external aggression could take place only within the framework laid down in the Japan-US security treaty.

33. The Japanese Defence white paper, published in 1994 by the Defence Agency, states that the Japan-US Security Arrangements are vital to Japan's existence and prosperity and that the era of peace Japan has known since the second world war is due in large measure to Japanese defence efforts and the smooth application of those arrangements. The white paper furthermore states that these should remain the basis of Japanese

national policy as they play a vital part in Japan's security, contributing to peace and security in the Far East and forming the core of Japan's relationship with the United States and the basis for Japanese diplomacy.

34. Finally, it should be noted that these arrangements not only cover cooperation on defence but also on political and economic matters. This means that the United States is Japan's sole source of defence procurement abroad and also that military cooperation is possible only with the US.

35. According to data provided by the Japan Defence Agency, in 1993 69% of the Japanese population regarded existing military structures, in other words the arrangements with the United States plus the National Self-Defence Forces, as the best means of defending the country. 4% were of the view that the security arrangements should be abolished and the self-defence forces increased, 7% that the security arrangements should be abolished and the self-defence forces reduced and 20% gave a different answer or did not reply. In 1978 the respective percentages were 61%, 8%, 5% and 26%.

36 Regarding Japan's participation in United Nations peacekeeping operations, in 1993 responses were as follows: 48% approved or partly approved, 31% disapproved or partly disapproved, while 21% answered "depends or don't know". The figures for 1990 were 46%, 38% and 17% respectively.

37. Jean-Marie Bouissou⁴ considers that the majority view, both among conservative politicians and within the Social Democratic Party, favours strengthening Japan's capability to act in the international sphere, militarily as in other respects, despite a hostile response to this aspiration both from public opinion in Japan and from neighbouring countries. Attempts are being made to deflect this hostility by putting forward two arguments.

- the need for the United States to continue to play an active role in any international effort to maintain order in Asia, even if it means Japan paying more towards the cost of a US presence, and

4 Japon, Problématiques et perspectives des évolutions politiques. Bulletin du Centre d'analyse et de prévision, No. 66, Spring 1996. Ministry of Foreign Affairs, Paris.

3 *op. cit*

- the need for any projection of Japanese forces outside the country to be strictly within a United Nations' framework, under international command.

38 Your Rapporteur will return later to some of the aspects of Japanese defence policy briefly outlined in the present chapter.

III. Japan's space policy

39 The Space Activities Commission (SAC) attached to the Prime Minister's Office (see Table 1) was established in 1968 with the aim of bringing together the space activities of the various government agencies and promoting Japan's space development

40 In March 1978, the SAC drew up the "Fundamental Policy of Japan's Space Activities", setting out the basic principles which are to guide Japan's space activities in the longer term. This policy has been revised on various occasions to take account of political, scientific and technological developments at home and abroad.

41 In line with SAC thinking, Japan promotes space development for peaceful purposes based on the following principles

- (a) Promotion of creative scientific research and technology development, the aim being to increase knowledge about space, leading to a deeper understanding of the origins, structures and evolution of the universe and the solar system, earth sciences, which investigate long-term global environment changes and other matters relating to the planet, using space observation data; and materials and life sciences that use space as an environment; increasing efforts to maintain Japan's technological expertise on a par with international levels.
- (b) Application of the results of space development to other areas in society and promotion of space activities in order to respond to the increasingly complex and varied needs of society

- (c) Special efforts to reduce space transport costs and increase the cost-effectiveness of satellites in order to win more public support for space development
- (d) Active promotion of international space cooperation appropriate to Japan's position in the world
- (e) Balanced development of manned and unmanned space systems. Manned flight systems are to be developed within the framework of international cooperation
- (f) Development of the Japanese space industry, including space hardware and component manufacturers.
- (g) Protection of the space environment, avoiding production of more space debris when pursuing future activities in space.

42. The priority areas for Japan's space development are as follows:

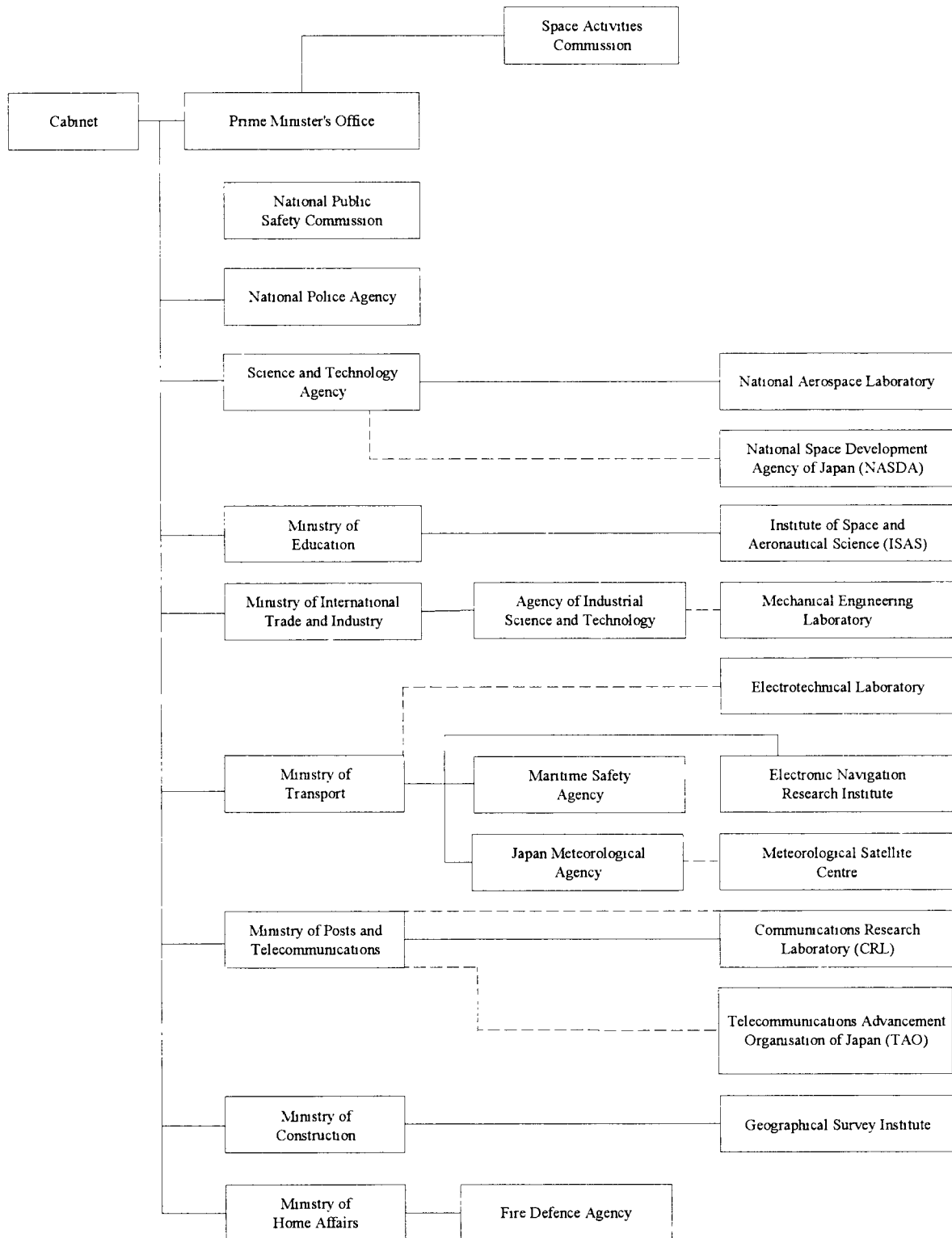
(a) Earth observation and earth sciences

The SAC recognises that earth observation by satellite will become increasingly important as a source of useful information to advance earth science and resolve global environment problems. To this end, Japan intends to proceed with the systematic and ongoing development and use of earth observation satellites to meet society's needs. The process is to consist of developing observation sensors, restructuring existing information networks and strengthening the international structure so that wider use can be made of observational data.

A global earth observation system will also be established "through international consultation and coordination". Its purpose will be to achieve harmonious integration of the observation satellites of the countries involved in the project.

Table 1

National organisations involved in space activities



(b) Promotion of space science and lunar exploration

Japan intends to promote astronomical observation and scientific research on the solar system, planets and asteroids, and undertake further exploration of the moon to evaluate possibilities for its exploitation.

(c) Consolidation of space utilisation activities

Japan is to be involved in the International Space Station through the Japanese Experiment Module (JEM), also known as the Orbital Laboratory. JEM will play a central role in research activities both in space and on Earth. A general research system will be established in partnership with the JEM to consolidate space utilisation activities.

(d) Enhancement of generic satellite technology and utilisation

Japan not only intends to continue to enhance these technologies but will also develop advanced satellite missions and equipment for telecommunications, broadcasting and navigation.

(e) Development and operation of new space infrastructure

New space infrastructure will be developed to implement viable space activities including the following projects.

- the advanced H-II launch vehicle (H-IIA) designed both to respond flexibly to the growing demand for various satellite-launch missions and to keep launch costs down;
- the HOPE-X designed to develop the main technologies for a reusable transport vehicle, which would drastically reduce transport costs;
- the Data Relay Test Satellite (DRTS) system designed to ensure effective transmission of earth observation data and data from experiments carried out in space.

43. SAC's view regarding observation satellites, which are of major interest to WEU and certainly to

this Committee, is that they should contribute to a better understanding of areas such as weather forecasting, climate-change prediction, monitoring oceanic phenomena, geology, the exploration of earth resources, vegetation, agriculture and oceanic ecosystems, and aid research into other environmental issues such as global warming or ozone layer depletion or into natural disasters such as earthquakes, volcanic eruption and the like. SAC stresses the importance of expanding activities in this field.

44. Again according to SAC, a number of earth observation satellites are to be developed and operated systematically to meet the needs of users at home and abroad and to keep Japanese projects at a level commensurate with other countries' observation and research projects.

45. This is to be done through NASDA (the National Space Development Agency) in collaboration with universities, research institutes, government agencies and the private sector.

46. The various earth observation satellites fall into two types: atmospheric and oceanic observation satellites and land observation satellites.

47. Finally, SAC states that efforts will be made, through close cooperation between the development and implementing agency and user organisations, to enhance sensor precision and resolution and to develop a new sensor.

48. As Table 1 shows, many agencies, answerable to different ministries, are involved in space activities. However, it may be noted that the Japan Defence Agency has not been given any responsibility for space matters.

49. The Space and Technology Agency (STA), which is directly answerable to the Prime Minister's Office, plans, programmes and promotes space policy, generally coordinates space activities among governmental agencies and conducts research and development activities through its subordinate research institution, the National Aerospace Laboratory (NAL), and NASDA.

50. NAL's principal activities are research into basic technologies for spaceplanes in the fields of aerodynamics, advanced composite structures, flight control and propulsion systems, manned space flights and orbiter manoeuvring motors. It also carries out joint research with NASDA on

aerodynamics, guidance and control and the design structure for the H-II Orbiting Plane (HOPE) It is also undertaking research on oxygen-hydrogen rocket engine components and on satellite systems and space environment utilisation.

51 NASDA was founded in 1969 as the national organisation for the implementation of Japan's space development programme and the promotion of space activities for peaceful ends.

52. NASDA's main tasks are to develop satellites and launch vehicles, to launch and track such vehicles and to set up the procedures, facilities and organisational structures to that end, in accordance with the space development programme.

53 NASDA has put several satellites into orbit using the N-I, N-II and H-I launch vehicles. NASDA's first satellite, the Engineering Test Satellite I (ETS-I) was launched by the N-I in 1975. The N-I was used to launch a further six satellites. The N-II has launched eight satellites in all since 1981 and the H-I nine since 1986.

54. Last but not least, NASDA has developed the H-II launch vehicle using technology that is 100% Japanese. Its first flight, in February 1994, was highly successful.

55. Apart from launch installations such as the Tanegashima Space Centre, the Yoshinobu Launch Complex and other space centres such as that at Tsukuba, and the Karuda Propulsion Centre, NASDA also runs the Earth Observation Centre.

56. This centre receives and processes remote-sensing data from Japan's Marine Observation Satellite (MOS-1/1b), Landsat (United States), Spot (France), the first European Remote-Sensing Satellite (ERS-1) and Japan's Earth Resource Satellite (JERS-1)

57 To date, no contact would seem to have been established between the Earth Observation Centre and WEU's Satellite Centre at Torrejón.

58 The Institute of Space and Astronautical Science (ISAS) was founded in April 1981 when a reorganisation took place of the Institute of Space and Aeronautical Science of the University of Tokyo, which in 1970 had already launched Japan's first satellite, Ohsumi. ISAS is a national research institute attached to the Ministry of Education and run in association with a number of Japanese universities.

59. ISAS carries out scientific research using space vehicles and to this end develops and operates sounding rockets, satellite launchers, scientific satellites, planetary probes and scientific balloons. By February 1993, 21 scientific and test spacecraft had been launched, including Susei and Sakigake which explored Halley's Comet in 1986

60 ISAS has various facilities, among them the Kagoshima Space Centre, which is used for rocket launches and also has telemetry, tracking and guidance stations for rockets and satellites.

61. The Ministry of International Trade and Industry promotes the industrial utilisation of space with special focus on remote-sensing and micro-gravity. Among other projects, MITI is working on the development of ERS-1 observation systems and the Advanced Spaceborne Thermal Emission and Reflection radiometer (ASTER), which is an advanced multiband, high-resolution searching sensor to be mounted on NASA's Earth Observation System-A (EOS-AMI), and also on research and development of technology and facilities for using remote-sensing data

62 As Table 1 earlier in the present chapter shows, other institutions besides those mentioned have a space remit and undertake work in the field. Table 2 shows the annual budget statistics for space development for the 1995 and 1996 financial years.

63. Finally your Rapporteur feels it important to mention, albeit briefly, two earth observation satellite programmes, ADEOS and DRTS, which could be of special interest to the Committee

64. Following on from the MOS-1/1b and JERS-1 satellites, the ADEOS (Advanced Earth Observation Satellite) programme aims principally to:

- develop advanced earth observation sensors,
- develop a modular satellite that is the key technology of the future platform,
- conduct experiments on earth observation data relay using data-relay satellites to form a global observation network, and
- contribute to national and international cooperation by carrying sensors developed by national and/or foreign organisations in response to Announcements of Opportunity.

Table 2
Budget for the 1995-1996 financial year
Space development

Notes: 1. Amounts in millions of yen 2. Financial year: starts April and ends March of the following year			
Organisation	1995 financial year	Draft budget for 1996 financial year	
Science and Technology Agency (STA)	177 002	178 297	100.7 (%)
National Space Development Agency of Japan (NASDA)	172 398	172 999	100.3
National Aerospace Laboratory (NAL)	4 000	4 323	108.1
National Police Agency (NAP)	676	677	100.1
Environment Agency (EA)	761	820	107.8
Ministry of Education (MOE)	21 414	22 072	103.1
Ministry of International Trade and Industry (MITI)	12 754	11 017	86.4
Ministry of Transportation (MOT)	12 328	13 722	111.3
Ministry of Posts and Telecommunications (MPT)	2 033	2 999	147.5
Ministry of Construction	1 487	1 566	105.3
Ministry of Home Affairs	37	62	167.6
Total	228 508	231 245	101.2

Source: Science and Technology Agency

65. The programme includes the ADEOS-I and II satellites. Launch of the first of these is scheduled for 1996 and the second for 1999, both by the H-II space vehicle. The satellites, which are to operate at an altitude of 800 km, will weigh 3.5 and 3.6 tonnes respectively. The programme brings together various Japanese bodies and institutions (NASDA, MITI etc.) with NASA and CNES.

66. ADEOS-I will have a resolution of 8 metres using the AVNIR (Advanced Visible and Near Infrared Radiometer) sensor and 700 metres using the OCTS (Ocean Colour and Temperature Scanner). ADEOS-II will incorporate new antennas, in particular, a microwave radiometer, and will also make use of global imaging.

67. The data relay test satellite, which will store data from other observation satellites and transmit it to a ground station, will provide 85% coverage of the Earth's surface. The DRTS-W is scheduled for launch in 2000 and the DRTS-E in 2001, both by the H-II space vehicle. It should be noted that the need for this type of satellite was referred to in the development studies for a European space-based observation system carried out by the Study Management Team. The high cost of such a satellite ruled it out, at least in the first phase of the project.

68. Before bringing this chapter to a close, it is worth noting certain unusual features of Japan's space industry. On the whole, Japan has no specialist aerospace industry but the major industrial groups devote a part of their activity to space, although it accounts for only a fraction of their turnover. The space sector is thought to provide some 11 000 jobs. The technological and commercial power of these firms would in any event suggest that they will become formidable competitors in the near future. Indeed, they are already highly competitive as regards the ground segment as a whole.

69. There are two major aerospace federations, the Japanese Federation of Economic Organisations (Keidanren), with its own special Space Activities Promotion Council, and the Society of Japanese Aerospace Companies (SJAC) which coordinates sales promotion campaigns.

70. The Science and Technology Agency, NASDA and MITI have joined forces with private industry to form a number of consortia and mixed public/private companies, with the aim of improving development conditions and competitiveness.

71. Japan's primary industrial group with space interests is Mitsubishi. This includes Melco (Mitsubishi Electronic Corporation), whose Kamakura installations the Committee visited during its recent trip to Japan. Melco builds telecommunication satellites – it built the ISS and ERS earth observation satellites – and telecommunication satellite receiving stations. It also forms part of the consortium created to develop the Engineering Test Satellites ETS-V and VI and was responsible for the CS-2 and CS-3 and Intelsat-5 and 6 communication satellites, in conjunction with the American Ford Company.

72. Mitsubishi Heavy Industries Ltd. was involved in building the N-I, N-II and H-I and H-II launch vehicles. The N-I launchers were developed under licence from McDonnell-Douglas. It is also building the H-II launcher's two cryogenic stages and the combustion chambers.

73. Mitsubishi Precision Co. Ltd. manufactures attitude control and guidance systems and also develops control systems while Mitsubishi Space Software Co. Ltd. is involved in software development.

74. The Nissan Motor Co. Ltd. produces sounding rockets. It developed ISAS's M-V launch vehicle and the boosters for the H-I launcher.

75. Toshiba produces direct broadcasting satellites and is the prime contractor and manufacturer of the BS-2 broadcasting satellite, in association with GE-RCA. In addition, it participated, as part of a consortium with Melco and NEC, in the building of ETS-V and VI.

76. The NEC Corporation, whose Tsukuba research centre the Committee also visited recently, builds scientific satellites. NEC built the GMS (Geostationary Meteorological Satellite) and MOS (Marine Observation Satellite) and was a member of the manufacturing consortium with Melco which built ETS-V and VI. It produced the BS-3 in conjunction with the American firm GE-RCA and has built telecommunication satellite receiving stations.

77. Kawasaki Heavy Industries Ltd. builds the launch pads for the N and H launch vehicles and the fairing for the H-II. Fujitsu Ltd. manufactures small ground stations and remote-sensing radiometers, telemetry systems, microwave amplifiers and data-processing systems.

78. Finally (although the list cannot be said to be exhaustive), Hitachi Ltd manufactured the data-processing system for the ASTRO-C and EXOS-D satellites. Ishikawajima-Harima Heavy Industries Co. Ltd. builds rocket engines and the Japan Aviation Electronics Industry Ltd. makes optical fibres and electronic aerospace equipment.

*IV. Civil space cooperation
between Europe and Japan – future prospects*

79. The European Business Community (EBC) in Japan is a private organisation representing European companies and relies on support from them, from the national Chambers of Commerce in Japan and from the European Commission. Its aims are to promote closer cooperation and coordination between the national Chambers of Commerce, improve and formalise information networking and act as spokesman for the European business community vis-à-vis the Japanese authorities in all areas relevant to the industrial and commercial sectors.

80. The EBC works through committees, one being the Aeronautics and Space Committee, which itself has a Space Subcommittee, chaired by Mr Claudon, head of the Arianespace Tokyo office. The Subcommittee was extremely helpful in organising the Committee's recent visit to Japan and assisting with the present report. The bureau of the Technological and Aerospace Committee and your Rapporteur had the opportunity to meet the Subcommittee and discuss in depth many of the aspects of greatest interest to our aims.

81. The EBC has just published a white paper for 1996. This points out that Japan is a world leader in the space sector, with a budget around half that of Europe's space budget. The recent successful launch of the H-II rocket gives Japan the independent access to space it has been seeking. In the satellite sector Japan is building and launching approximately one satellite per year.

82. However the weakness of Japan's space industry lies in its underdeveloped commercial sector where manufacturers rely almost exclusively on the domestic market, in other words on orders from NASDA or ISAS. As a result, Japanese satellite manufacturers are for example unable to compete on the world satellite market due to their low volume of business. They therefore concentrate on component manufacture – payloads, solar panels, ground stations and the like.

83. The white paper also notes that there is as yet no cooperation on space worth mentioning between European and Japanese companies, and the only notable European success from a commercial point of view has been the sale of launch services by Arianespace to Japanese satellite operators.

84. The EBC identifies a series of key factors, pointing first to the fact that NASDA has until recently followed a policy of Japanese technological independence with little regard to cost, which meant that virtually all foreign cooperation was ruled out. Nevertheless, doubtless owing to pressure on budgets, there is now greater emphasis on cost and foreign purchases are being authorised or even recommended.

85. Moreover, Japanese companies still have very little autonomy, particularly in research and development where government contracts are split between many different companies, making cooperation with foreign companies difficult, if not impossible. According to the EBC this policy prevents Japanese industry from competing and therefore excludes it from world markets, to the detriment of all the parties.

86. Government agencies are still very much in control of manufacturers in the space sector, which makes discussion at industry level and the implementation of long-term cooperation strategies very difficult. Lastly, there is very little cooperation between NASDA and the European Space Agency (ESA).

87. According to ESA⁵, cooperation between the Agency and Japan began in 1972 with an exchange of letters providing for annual bilateral meetings and limited exchanges of personnel. In 1988 a tentative move began towards more substantial cooperation. The scope for cooperation is gradually emerging and covers the exchange of scientific and earth observation data, joint experiments for the validation of future data-relay satellites, demonstrations for robotics, product assurance contracts and support for tracking stations.

88. While ESA acknowledges that progress has been achieved over the years, it feels that relations with Japan are limited in content. It nevertheless sees promising prospects opening up for future cooperation over the space station, where Japan and Europe are making very similar contributions, and

⁵ ESA/IRC (94) 45.

in other fields such as earth observation. ESA considers that in the longer term there could be fruitful collaboration in areas such as manned and automatic space transport systems, and lunar exploration

89. Some ESA member states, such as France, Germany and Sweden, are cooperating with Japan on earth observation, microgravity experiments and satellite tracking.

90. Areas that are competitive are subject to political pressure from the United States in trade negotiations, with the result that none of the European satellite manufacturers has been awarded a contract with Japan since the international market for commercial and operational satellite procurement was, theoretically, opened up in 1990. All such contracts have gone to American firms.

91. ESA concludes that future relations between Europe and Japan in the field of civil space activities will be influenced by three factors:

- (i) The combination of Japan's R&D plan, covering all applications and space transport and advanced technologies, with a steadily rising space budget will strengthen Japan's position on the international stage. Moreover there is a high level of institutional consensus in Japanese society and Japan's space industry has already consolidated its leading-edge position in ground segment equipment and is in the process of acquiring the full range of up-to-date know-how;
- (ii) Japan's relative autonomy in specific sectors of space activity such as transportation and satellite technology may well prompt it to reconsider its dependence on the United States and look for more balanced alliances allowing it to play a more active role on the international stage;
- (iii) The Japanese market for satellite systems, hardware and industrial components is growing. Although Japanese suppliers have acquired new competence, the country must look to complementary European and American expertise for its post-2000 programmes.

92. In conclusion, ESA reckons that, as a result of its stable development and business growth, Japan could emerge as a reliable partner for Europe and offer it a potential market. But Europe must formulate a space strategy that addresses the potentialities of cooperation while facilitating the entry of European industry to the Japanese market. Such a strategy should take into consideration all the relevant Japanese bodies and promote the building of closer political and technological relations with them at the appropriate level. ESA and the Commission of the European Union should take such action as is appropriate.

93. A report by the European Commission's DG XII⁶ makes the point that while there are clearly opportunities for further cooperation between Europe and Japan, it has to be recognised that Japan has built up its own expertise in space through twenty years of cooperation with the United States in the public and private sectors. Its natural instinct is thus to look to that country first when it comes to possibilities for cooperation and this applies at government and, even more so, at industrial level.

94. Japan regards Europe's space expertise as a largely unknown or untested area. Moreover, it sees in the cancellation of the Hermes programme and the limitations on Columbus signs of uncertainty over ESA's long-term programme.

95. The report points to the need for Europe to ensure that its expertise on space has a higher profile in Japan, since the latter prefers to develop cooperation on the basis of a long-term relationship. The first step would be for ESA to establish an office in Tokyo, since the absence of one is interpreted by the Japanese as a lack of interest in fostering cooperation with Japan. The ESA office should work closely with the Tokyo Delegation of the European Commission and with the European Business Community. The report makes the point that the Japanese find it difficult to understand how the Europeans conduct their work in relation to space and would prefer to have a single interlocutor. As this is impossible to achieve, it would at least be desirable for European representatives in Japan to work in close contact to present a common front, and, in any event, to avoid contradictions.

96. Another very important consideration is to enter into discussions on cooperation at an early

6. Japan in Space: Challenges and possible opportunities for Europe. BIS Strategic Decisions, Paris and EUPAC, November 1994.

stage, while it is still possible to influence concepts. Japan is not particularly interested in taking part in a project once it has already been defined, preferring, as suggested earlier, to become involved in longer-term projects or research.

97 The EBC's Space Subcommittee also feels that a fuller, ongoing dialogue between Europe and Japan should be established as soon as possible and that ESA must open a Tokyo office with the backing of the European Union, at the same time, the space agencies of the leading members of ESA should strengthen bilateral relations with Japan

98. The Subcommittee stresses some of the factors that should help to foster cooperation such as: the fact that Japan's technology is on a par with Europe's, their budgets are of the same order, there are many similarities in their space policies (for example space development for peaceful purposes), which is not necessarily true of the United States, and they have many common interests

99 Lastly, the EBC's white paper, to which reference has been made throughout this chapter, sets out a series of recommendations we find very interesting.

100 It recommends first that the Japanese agencies should allow Japanese manufacturers more

flexibility and independence. Even in negotiations and cooperative ventures between European and Japanese companies, Japanese government agencies have an overweening influence in commercial decisions or over the detail of cooperation arrangements.

101 Cooperation at industry level should be encouraged so as to be effective. Japanese agencies should unreservedly accept European standards

102 Finally, the EBC stresses that significant cooperation will be possible only if promoted by the respective European and Japanese government agencies in such fields as launchers, space stations, remote sensing, navigation and global information systems.

V. Feasibility of military space cooperation between Europe and Japan

103. Chapter II of the present report outlined certain characteristics governing Japan's defence policy. Constitutionally, Japan's defence budget accounts "only" for about 1% of GNP, although the actual figure is higher than the amount countries such as France, Germany or the United Kingdom allocate to their defence (as shown in Table 3)

Table 3
Outline of defence-related expenditure

Classification	1994 financial year (yen)	1993 financial year (yen)
Defence-related expenditure	4 683.5 billion	4 640.6 billion
Growth over previous year	0.9 %	1.95%
Percentage of GNP	0.948 %	0.937%
Percentage of general account budget	6.4 %	6.4 %
Contract authorisation and ongoing expenses (new)	1 853.1 billion	1 801.1 billion
Future commitments	2 889.7 billion	2 847.1 billion
(new)	(1 830.1 billion)	(1 772.0 billion)
(already committed)	(1 059.7 billion)	(1 075.0 billion)

Note: Figures are rounded to the nearest whole, therefore totals may not tally

Source: *Defence of Japan, 1994, Defence Agency*

104. Japan has built up a defence industry which is able to meet most of its needs. The industry has operated mainly under licence and through technology transfer but, increasingly, Japan is moving towards developing independent capabilities.

105. According to the EBC, the present situation prevents the Defence Agency and firms within the defence industry providing information on equipment specifications to the outside world, other than the United States. This means that European companies are only able to sell non-vital equipment and only if there are no competing Japanese or American suppliers. Cooperation with Europe is not on the agenda.

106. The EBC is asking for the regulations on technology transfer, as these apply to European companies, to be relaxed to bring them into line with those for US companies so that the former can also take part in public tenders and industrial cooperation. The EBC also notes that, given the unassailable strength of the United States defence industries, there are only a very few cases where European industry can compete, and pleads that in these at least, suppliers should be chosen on merit and not on the basis of political considerations.

107. Notwithstanding the above, it has to be said that changes are beginning to make themselves felt. Now that the cold war is over, nations are clearly seeking to achieve a new world order based on today's realities. Japan is part of that movement and, in various political, military, academic and local community forums, is beginning to rethink its security and defence arrangements as a key issue of national policy.

108. In short, a process of discussion has begun within Japan, the aim of which is to review the present national defence concept and generate ideas that may provide the basis for an alternative.

109. Among the various forums for discussion, the Advisory Group on Defence Issues is one that deserves particular mention. Created in early 1994 as a non-statutory advisory group to the Prime Minister, it comprises senior representatives from industry, insurance, banking and the academic world. The outcome of its discussions is made public and many of its conclusions are worthy of particular attention.

110. First, the Group feels that the network of alliances formed during the cold war period, at the

heart of which lies the United States, should be preserved. Reference is made both to the Japan-US Security Arrangements and to NATO

111. However, the United States no longer dominates the rest of the world, particularly in the economic field, where competition between it and other highly developed industrial countries continues to grow sharper. The Group feels that despite present conflicts of economic interests, and any that may arise in future, the focus of security and defence cooperation should continue to be the United States.

112. The question, as far as the Advisory Group is concerned, is whether the United States will be able to show leadership in multilateral cooperation. The answer will depend in part on other nations' positions with regard to cooperation with the United States. Arrangements for resolving security problems through international cooperation are not yet perfect, but the signs of progress are obvious, both at United Nations and regional levels.

113. The point is also made that whether or not the United Nations is able to continue its peacekeeping operations in future will depend to a large extent not only on continuing cooperation between the five members of the Security Council but also between major nations, such as Japan and Germany, which make a very substantial financial contribution to peacekeeping efforts.

114. One cannot lay enough stress on the very great weight Japan attaches to what it calls its international contribution, and particularly to UN peacekeeping operations. The review, *Defence of Japan, 1994*, to which the present report makes reference throughout, states:

"It is this country's international obligation to make such contributions in international society, and such efforts contribute to the maintenance of peace and security of international society and are eventually conducive to Japan's own security."

115. Returning to the conclusions of the Advisory Group to the Japanese Prime Minister, the Group maintains that the dangers facing the world today are varied and difficult to predict and must be tackled through cooperation between the United States and other larger nations, under a mandate from the United Nations, and with the assistance of other regional organisations.

116. However it goes on to say that under present circumstances, countries should have their own defence capability and, that being so, Japan should divest itself of the passive security policy it has followed until now and henceforward play an active part in designing the new order – indeed it has a responsibility to do so.

117. If Japan is to assume that responsibility, it will need to make the effort it requires by bringing all available policy, diplomatic, financial and defence-related means to bear, in order to build a rational and comprehensive security policy which the Advisory Group defines as:

- (a) promoting multilateral security cooperation on a global and regional scale;
- (b) enhancing the functioning of the Japan-US security relationship; and
- (c) possessing a highly reliable and efficient defence capability based on strengthened information and prompt crisis-management capabilities

118. In connection with this last point, the Group highlights the importance of intelligence systems to improve risk-assessment capabilities; for this, well-organised C3I systems will be necessary, as well as various types of sensors, including reconnaissance satellites.

119. On 5 May 1996, the Japanese press reported that the Japan Defence Agency envisaged building an independent data-gathering facility through the launch of a military reconnaissance satellite in the medium term.

120. Both the *Nihon Keizai Shimbun* and the *Nikkei Shimbun* of that date carried reports that the Defence Agency wanted to procure an independent reconnaissance satellite to enhance its capability for gathering intelligence on the military situation in neighbouring countries. The Agency has until now relied on data of American origin to meet its requirements for high-definition satellite images but feels that in order to be in a position to deal with geopolitical instability in the Far East, and particularly developments on the Korean peninsula, an independent data-gathering system is necessary.

121. A current of opinion in favour of an independent reconnaissance satellite has existed for

some time within the Agency, as there has always been a fear that if tension mounted in the Far East, access to vital intelligence might not be possible when it was most needed.

122. The issue is further complicated by a resolution on the peaceful use of space adopted by the Diet in 1969, whereby space cannot be used for military purposes. This resolution had until recently acted as a deterrent to any military satellite procurement initiative. However, from 1994, high-definition image technology, developed in the United States for the Strategic Defence Initiative, started to become available in part for civilian applications, thus enhancing commercial satellite capabilities.

123. Under the circumstances, the Defence Agency seems to feel that the launch of a satellite for military use, providing a service and results similar to those of civil satellites, need not raise issues of principle. Everything would seem to indicate that the Agency wishes to firm up the project for three-phase implementation as follows: first, convince the government that procurement by the Agency of a reconnaissance satellite with functions similar to those of civil satellites does not infringe either the principle of peaceful use of space or the purely defensive aims of the Agency; second, study the type of satellite required, the ground station functions and launch systems; and last, include the launch in the next medium-term military procurement plan, beginning in 2000 and ending in 2005.

124. The debate has also been taken up by the Liberal Democratic Party. Thus sections of the Japanese press reported on 16 May 1996 that the party's Foreign Affairs and Security Committees had held a joint meeting at which representatives of the Agency and satellite manufacturers had been invited to give their opinions on whether Japan needed to have its own satellite system for information-gathering for military purposes.

125. At the meeting, the satellite manufacturers made the point that the development, production and launch of a "spy" satellite could take up to eight years and that the cost of the satellite, plus a second, back-up satellite, a data-relay test satellite (DRTS) and a ground station, could come to about 200 billion yen. They also emphasised that Japan had the necessary technology to undertake the programme on its own.

126. On 19 May, the *Nihon Keizai Shimbun* reported that in order to obtain more accurate

information on the military situation in neighbouring countries, the Defence Agency was preparing to sign contracts with American firms able to receive sharper satellite images than the Landsat images the Agency had been using. This was regarded as a first step towards the Agency acquiring its own satellite. Lastly, it made reference, this time more openly, to the fear that in times of crisis when Japan was most in need of information, the United States Government might, for reasons of national security, restrict foreign sales of civil satellite images – a situation which had affected many countries during the Gulf War

127. On 22 May, the Japanese Upper House in full session passed a law establishing a new Intelligence Department in the Joint Staff Council, to strengthen military intelligence-gathering. This provided for the establishment the following January of the Defence Intelligence Headquarters, with a staff of 1 600 people engaged in military intelligence-gathering and analysis. On the same day the daily *Asahi* reported that the Defence Agency had agreed with the Pentagon that the latter would supply the Agency with military satellite data giving early warning in the event of ballistic missile attack. This could also mean that the United States would speed up development of a theatre missile defence (TMD) system in partnership with Japan

128. Lastly, it is interesting to note in the context of discussions on the 1997 budget that the Minister for Foreign Affairs has asked for the inclusion of a sum of 10 million yen, to begin a study on possible procurement of observation satellites.

129. In short, the process whereby Japan is to become self-sufficient in observation technology for defence purposes in the near future, has reached a stage where political decisions are imminent. This being so, initial talks, followed later by possible cooperation between Europe and Japan should certainly not be ruled out and, indeed, should be viewed as a goal to be pursued.

130. At a time when three European countries, France, Italy and Spain, are working together on Helios I in a highly satisfactory way with Germany likely to join them in work on Helios II, when plans for cooperation in Germany's Horus radar satellite programme are starting to take shape and, finally, when WEU is giving thought to its involvement in

the European multinational project, it does not seem at all far-fetched that there should, in the first instance, be an exchange of ideas with a country such as Japan, which appears to have the same overall needs as Europe in terms of military observation.

131. In your Rapporteur's opinion, dialogue with Japan is possible, therefore, on a shared needs basis, and need not be restricted to political and military issues but might also take in industry and technology.


132. In today's world, with the cold war over and 50 years on from the second world war, it does not seem reasonable to perpetuate situations preventing or hindering nations from cooperating freely, particularly on matters where the aim is to ensure international peace and security.

VI. Conclusions

133. Europe and Japan have the shared aim of using space for peaceful purposes, in particular to guarantee international stability and security. The similarities between them go beyond the interests they have in common, extending to their budgets and space development priorities.

134. Space development in recent years has been spectacular in both Europe and Japan, but has unfortunately not gone hand in hand with the mutual cooperation that might have been of equal benefit to both. In your Rapporteur's view, the problems, essentially of a political nature, come mainly from the Japanese side, and are the result of pressure because of United States commercial interests.

135. However, the time has now come to surmount all the obstacles preventing cooperation or holding it back. This can be achieved through a dialogue that is devoid of preconceptions about our common political, economic, technological, industrial and commercial interests in both the civilian and military spheres. A series of what your Rapporteur regards as feasible, down-to-earth proposals are contained in the draft recommendation that prefaces this study. They are intended as the first steps towards cooperation between Europe and Japan.

IMPRIMERIE  ALENÇONNAISE
Rue Édouard-Belin : 4^e trimestre 1996
N° d'ordre : 37194

PRINTED IN FRANCE

