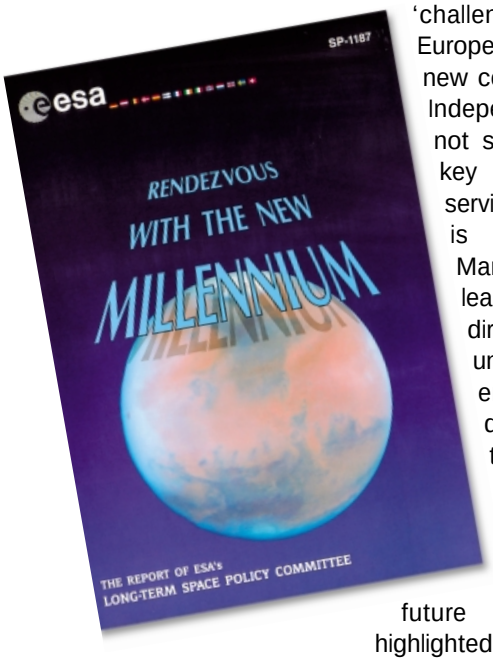
The Second Report by ESA's Long-Term Space Policy Committee (LSPC)

G. Naja
Directorate of Strategy and Technical Assessment, ESA, Paris

Background
The Long-term Space Policy Committee was created by the ESA Council in 1993 and submitted its First Report to the ESA Council at Ministerial Level in Toulouse (F) in October 1995. It was unanimously endorsed by the Ministers, who requested that the Committee continue its reflections and prepare a Second Report as a framework for a long-term European Space Policy.

The Second Report by ESA's Long-term Space Policy Committee has provided the Agency's Member States with a comprehensive framework for long-term strategic thinking and decision making on European space policy. Many of the ideas proposed in the Action Plan contained in this Second Report are already being pursued and put into practice within the Agency.

The Committee thus worked from 1996 to early 1999 to prepare that Second Report. In it, three 'challenges' have been identified that Europe has to face now, at the dawn of the new century. The first is the 'Challenge of Independence' – to ensure that Europe is not strategically dependent in particular key areas like navigation, information services or peace-keeping. The second is the 'Challenge of Planetary Management' – to secure Europe's leading position in the worldwide effort directed towards achieving a better understanding of our planet, a cleaner environment, and sustainable development for all to share. The third is the 'Challenge Beyond': in a longer term perspective, humanity will have to expand into space and to use its resources, and Europe must be a major player in this future effort. The Committee's work highlighted the fact that Europe needs an ambitious space policy and programmes to respond properly to these three challenges and to play a role on the world stage commensurate with its economic weight and cultural heritage.



The LSPC's First Report (ESA SP-1187, October 1995)

The Committee also drew up an 'Action Plan' as an integral part of its Report. Tomorrow's successes depend on actions initiated today, and the LSPC's Action Plan therefore aims to deliver a clear sign that Europe has understood the upcoming challenges and is preparing to face them. The twenty actions proposed are modest in funding, but each represents a first step in a promising field in which Europe must demonstrate and establish its presence.

This Second Report, together with its Action Plan, was presented to the ESA Council Meeting at Ministerial Level in Brussels in May 1999. The Ministers welcomed the Report and invited the Director General 'to prepare and submit to the Council at Delegate Level an assessment and implementation plan for the actions listed in the Report'. A proposal for the implementation of the LSPC's Action Plan was therefore presented to and discussed at the ESA Council meeting on 14 December. Delegations generally welcomed the implementation plan. A number believed, however, that since no new money could be made available, there was a need to prioritise within existing budgets and that the different Actions should therefore be considered, discussed and decided upon by the appropriate Programme Boards. Council also requested that it be given a report at a subsequent meeting on the progress of those discussions in the various Programme Boards, and the Actions that are starting to be implemented as a result.

Why must Europe invest in space?
Over the forty years of the space era, space has already transformed daily life, thanks to the quality and efficiency of such space-based services as telecommunications, broadcasting, weather forecasting and navigation. Space has also enabled quantum leaps to be made in our knowledge of our planet and of the Universe, fulfilling scientists' wildest aspirations. Indeed, space data have modified our view of Earth and have led to a new understanding of our planet and the complex interactions of its oceans,

The LSPC's Second Report (ESA SP-2000, May 1999)

land masses and atmosphere. Space systems have thus become crucial to the understanding and management of our planet, to the provision of goods and services in the global marketplace, and to regional and global security and peacekeeping. They are also the source of a large number of highly skilled jobs: space employs about 35 000 people directly in Europe, and an estimated 400 000 indirectly.

The LSPC's basic assumption was that in the 21st Century an enlarged European Union will want to play a leading political and economic role commensurate with its size, wealth and cultural heritage. In order for Europe to fulfil this role, a full space capability is essential, including the associated industrial capabilities. A full space capability means the freedom to access space and to define, build and operate complete space systems in all strategic areas. As the American example shows, this capability is increasingly being used as an instrument for and integral part of overall political, economic and military leadership.

Europe already possesses certain elements of this capability, in particular in the fields of science, launchers and applications, but these need to be sustained and expanded as a basis for continued success. However, Europe is falling behind in key applications of space technology, in which it must acquire real strategic independence. Europe must also continue to be a leading partner in global cooperation on space systems for research into and monitoring of the Earth's ecosystem. Beyond that, Europe has to be able to lead in some areas of future commercial space applications. Success in the potentially huge space market requires forward-looking policies and investments that go beyond short-term commercial concerns.

Last but not least, in order to prepare itself for the future Europe must also invest in ideas and concepts that will lay the foundations for as yet unforeseen applications, and contribute to its future as a leading global power in the 21st Century.

It was against this background that the LSPC identified its three main challenges that Europe will have to face and respond to in the next few years. The short-term challenge – the Challenge of Independence – is clear. Europe has to consolidate and expand its overall space capability, avoiding reliance on others in strategic areas of space. The medium-term challenge – the Challenge of Planetary Management – aims at responding to threats to the planet's environment. Europe must be a major and responsible player in the worldwide effort to ensure the sustainability of civilisation on planet Earth. The longer-term challenge – the Challenge Beyond – is for Europe to play its role in the future exploitation of the resources of space and man's expansion into the Solar System.

To start to respond to these challenges, the Committee's Action Plan contains 'Twenty Actions for Year 2001'. Each of these twenty initiatives includes a first step that can be implemented quickly and at moderate cost (see Tables 1, 2 and 3).

Proposed implementation of the Action Plan

The Action Plan itself can be organised around three key themes, which are the following:

Global security

This theme involves the traditional meaning of 'security', as well as newer concepts of environmental security in the widest sense. Thus it also involves all actions aimed at promoting a clean and safe environment for Earth and human activities. The relevant LSPC-proposed actions are: Action 5 - European Systems for Security and Peacekeeping, Action 9 - Space Monitoring of Compliance with Environmental Regulations, Action 10 - Disaster Warning from Space, Action 11 - Space Weather, Action 12 - Space Debris, Action 13 - Threat of Cosmic Collision, and Action 17 - Weather Modification from Space.

Exploration

This theme involves all Actions relating to the longer-term objective of exploration of the Solar System, working towards an eventual manned

Table 1. Global Security Actions

Action	Implemented/On-going	Supplementary Action	Follow-on Steps
European Systems for Security and Peacekeeping (5)	Synergy assessments (SAR images utilisation), contacts with WEU	Technological studies for dual-use	Technological developments
Space Monitoring of Compliance with Environmental Regulations (9)	Study on Kyoto Protocol requirements. Needs for space observations	Enlarging on-going study to include air-based elements	
Disaster Warning from Space (10) (earthquakes and volcanoes)	Numerous pilot projects (ERS) on disaster management and prediction	Study on earthquake-prediction methodology. Similar study for volcanic eruptions	Operational-service feasibility study
Space Weather (11)	Workshop autumn 1999; start of a study on space-weather programme; ESA internet server established	Next step: extension of data-distribution infrastructure for operational service, extension of orbital data-gathering means	
Space Debris (12)	Coordination meetings with partners; maintenance of database; study on forecasting and mitigation means	Increased effort on development of mitigation measures and of independent means of verification	
Threat of Cosmic Collision (13)	Study of global network for research on NEOs; IMPACT workshop (adoption of Torino Scale); assessment of spaceborne system; use of ISS	Host the Spaceguard Central Node in ESRIN; study feasibility of an annual contest between European astronomers for detection of close NEOs	
Weather Modification from Space (17)	SE&U study: use of microwave energy from space	International Workshop on the subject	Assessment study, including risk assessment

Table 2. Exploration Actions

Action	Implemented/On-going	Supplementary Action	Follow-on Steps
Search for Earth-like Planets (1)	IRSI/Darwin mission-feasibility studies; discussions with NASA on international cooperation; experiments for ISS		Large interdisciplinary workshop
Innovative Space Station Utilisation (3)	Activities on ISS as assembly platform; use of inflatable technologies; ISS Utilisation Conference	Session of ISS Utilisation Utilisation Conference dedicated to innovative uses	
Small Business Innovation Initiative (7)	ESA SME Initiative		Increase financial level of SME Initiative
Micro-miniaturisation Technology Initiative (8)	EC's Network for Excellence for Functional Microsystems; TRP axis; GSTP; GSP studies		
Telepresence Demonstration Project (14)	Numerous studies and activities concerning Mars exploration in GSP, TRP, GSTP; robotic activities within ISS Programme	Check applicability of on-going studies and activities to robotic Moon exploration	Demonstration programme
European Lunar Initiative (15)	Lunar Exploration and Exploitation Conference in July 2000		
Space Energy and Resources	System-level study in SE&U study performed	Technological watch, study of demonstration opportunities	Phase-A/B study of demonstration mission

Table 3. Enabling Factors and Organisational Aspects

Action	Implemented/On-going	Supplementary Action	Follow-on Steps
Cheaper Access to Space (2)	FLTP studies and activities	Feasibility study on airborne launch systems, semi-reusable	Joint venture with international partners
Future Navigation Services (4)	On-going activities on EGNOS and Galileo programmes	Call for ideas within ARTES for innovative applications	
Creation of a European Telecom. Regulatory Body (6)		Re-open the question together with EC; technical support to be provided by ESA	
European Space Education Programme (18)	Office for Education Project Outreach Activities	Progressive raising of financial level of activities. Organisation of a "Space Day" in European schools	
Public Awareness Initiative (19)	ESA Image Study; implementation of study recommendations	Further implementation of recommendations of the Study; creation of country desks. Revision of ESA Web Site	
European Space Policy Institute (20)	Informal contacts taken regarding location	Call for Proposals from Member States for hosting the Institute	

mission. It therefore also includes Actions aiming at encouraging and stimulating innovation, whether by use of the Space Station or by a specific programme focusing on small- and medium-sized enterprises. The relevant LSPC-proposed actions are: Action 14 - Telepresence Demonstration Project, Action 15 - European Lunar Initiative, Action 16 - Space Energy and Resources, Action 7 - Small Business Innovation Initiative, Action 8 - Micro-miniaturisation Technology Initiative, Action 3 - Innovative Space Station Utilisation, and Action 1 - Search for Earth-like Planets.

Enabling factors and organisational aspects
This third theme involves conditions for success of the European space programme in general. The Actions concerned are very diverse in nature and content: for instance the creation of a regulatory body for telecommunications, the reflection on future commercial services associated with a European Navigation Satellite Programme, a European Space Education Programme, and low-cost access to space investigating airborne launchers. This theme therefore embraces: Action 2 - Cheaper Access to Space, Action 4 - Future Navigation Services, Action 6 - Creation of a European Telecommunications Regulatory Body, and Actions 18, 19 and 20 - European Space Education Programme, Public-Awareness Initiative and European Space Policy Institute.

Clearly, several Actions are of a general nature and of strong interest to the Agency and the European space community. A number of Actions have already been started while the LSPC was still completing its work, based on the Committee's reflections. Supplementary actions have to be initiated rapidly.

The three accompanying tables summarise for each group of Actions – global security, exploration, enabling factors and organisational matters – what is already in progress and what 'Supplementary Actions' need to be initiated rapidly. Ways of funding these Supplementary Actions will be proposed at a future Council. The 'Follow-on Steps' identify the work that remains to be done once the Supplementary Actions have been completed.

Conclusion
Successful implementation of the LSPC's proposed Action Plan is essential for the overall future of space activities in Europe. History has shown on numerous occasions that those nations that cease to explore and conquer the unknown, usually for economic reasons, ultimately lose out both politically and economically. Indeed space is not only about return on investments, but also about new dimensions to be explored and new discoveries to be made, thus responding to one of man's deepest needs. Moreover, the history of space endeavours has proved that the greatest technological advances, eventually leading to spin-offs and wealth-generation in other economic sectors, are often achieved in the most far-reaching programmes. If Europe wants to play a global role in economic development, peace-keeping, protection of the environment, and information collection and distribution, successful implementation of the LSPC's Action Plan could well prove to be a critical factor. esa