# A SPACE POLICY FOR THE DEFENCE OF EUROPE

**SPACE WORKING GROUPS**

**EURODEFENSE ASSOCIATION**

## *I. The importance of space for Europe*

Forty years ago, space assets did not exist. Today, they have a wide range of applications in civil society, where they are now indispensable. All of us use them in our daily lives − often without realising it − for example, when we consult weather forecasts or watch the news on television.

With the recent publication of the White Paper on a European Space Policy, Europe has underlined the importance of the contribution space systems can make to implementing the European Union's policies in areas such as the information society, the environment, transport and agriculture. Space is a driving force for economic growth and job creation, providing new services as a result of space-based facilities: clusters of satellites and their accompanying ground segments. Europe's decision to launch the Galileo satellite navigation programme is one example of its resolve to forge ahead with a space policy.

But what is even more fundamental is Europe's role as a key contributor to any defence strategy and indeed to anything more comprehensive, because access to space, its use and the ability to exploit it are now seen to be essential attributes of any power, just as in previous centuries a country able to boast mastery of the seas was in a position of undisputed freedom and autonomy when it came to choosing its political and economic partners.

The biggest challenge today is to guarantee Europe's political self-sufficiency by ensuring that it has an autonomous threat assessment capability − space-based systems can monitor distant places without the constraints associated with sovereignty, and anticipate events by providing the global information superiority that is so crucial to the decision-making process and chain of command. More particularly, there is a need to maintain the technological base Europe has developed over a period of forty years of investment and which today provides it with most of the key technologies that are necessary for developing space systems.

All space assets form a system that is central to the requirements of armed forces: observation, electronic surveillance, transmissions, navigation, ballistic surveillance and warning, oceanography and capacities for the future radar observation of the trajectories of satellites in low earth orbit.

As we shall see later on, Europe has significant assets which give it the credentials of a recognised space power. However, in terms of the use of space systems for security and defence purposes those assets are essentially confined to the national level. This means that they are fragmented and are accorded different degrees of importance in the various countries.

It may well be Europe's intention to continue to be a credible and recognised partner and not be overtaken by emerging space powers such as China, India or Israel. However, it will not be seeking to compete with the United States − whose budget is 20 times bigger than that of Europe − but instead to cooperate in a more balanced way. If that is indeed our ambition, then we must have a level of self-sufficiency that will give Europe the wherewithal to continue to be an autonomous and independent space power.

This self-sufficiency has to be assessed and given effect at the European level: the orbital path of an observation satellite gives it a global reach, but also allows operations to be focused on a given priority area. A communications satellite can transmit information irrespective of distance and borders. By their nature space systems imply that countries have to cooperate and share the corresponding infrastructure in order to attain the necessary level of self-sufficiency. There is already a very substantial European input into civil programmes and it is

only logical that European countries should wish to share military space assets given the dual nature of many systems. In addition to France and the United Kingdom, Italy and Spain are engaged in developing military space systems and Germany is now following in their footsteps. The sharing of space systems is already a reality (one example being Helios) and paves the way for a pooling of forces should the situation call for it.

The need to share the financial cost among Europeans is already widely accepted, as can be seen in the case of Ariane, which is launched from Kourou to provide Europe with access to space, or that of the Galileo satellite navigation programme.

Having joint systems helps to ease the financial burden. One example of such cooperation is the tender submitted jointly by France, Italy and the United Kingdom to supply NATO with secure satellite telecommunications capacities.

This could be followed by other original initiatives provided that Europe can agree to a sort of European interdependence in order to make for an improved global economic performance.

Let us consider a few examples:

- Cooperation on the surveillance of ballistic missile launches would enable Europe to make "threat forecasts" similarly to what it has achieved with civil weather forecasts, meteorology being an area in which we also have a balanced partnership with the United States, India and Japan. France's decision to develop an early warning demonstrator is a first step in this direction.

- Establishing a European secure telecommunications operator, or concluding agreements between national operators, would encourage the development of resources at the European level for managing and sharing the capacities of each national system and would help to provide a solution for backing them up or complementing them.

- A concerted effort could be made to identify technological areas in which Europe might cooperate with the United States on ballistic warning and missile defence, and vice versa.

The time is now ripe for this sort of development: many factors − such as the White Paper recently published by the European Space Agency and the European Commission, the Star 21 report produced by the Commission with the participation of the High Representative for the CFSP and the European Parliament, the work that led to signature of the "Common Operational Requirements" document or the measures being taken as part of the European Capability Action Plan (ECAP) to define what capabilities are necessary, all advocate greater consultation among the member states as to what resources need to be deployed.

The creation of the European Defence Agency will provide an institutional framework for work on the definition of joint requirements, the choice of research priorities and joint procurements. It is only logical that this Agency will be able to draw on the European Space Agency and the national agencies with a view to developing the new programmes that are needed.

Industry has been reshaped as a result of the resolve several member states have shown to form European companies in the area of defence, the idea being to ensure better cost-effectiveness while preserving visible national participation. Airbus is a good example of this.

A space capability to meet Europe's security and defence objectives is possible − it reflects Europe's ambitions and should be compatible with its financial resources.

Europe's current space assets are the result of the decisions taken by visionary political leaders and scientists on programmes extending over months, and indeed in most cases, years.

Today's choices will determine the research, industrial tools and headquarters agreements and activities that will be decisive for tomorrow's achievements. The responsibility for building the future lies with today's decision-makers and public opinion.

*Eurodéfense* proposes, through the discussions at this Vienna colloquy, to make a joint contribution to shaping the awareness of that future responsibility and of Europe's role in the new global balance that is gradually emerging.

## *II. The European Security and Defence Policy and space − operational requirements*

### *2.1 The ESDP*

At its Helsinki summit in December 1999 the European Council underlined "its determination to develop an autonomous capacity to take decisions and, where NATO as a whole is not engaged, to launch and conduct EU-led military operations in response to international crises."

At the same meeting it took the decision to acquire the necessary military capabilities to attain what is now commonly known as the EU "Headline Goal":

> "Cooperating voluntarily in EU-led operations, Member States must be able, by 2003, to deploy within 60 days and sustain for at least 1 year military forces of up to 50 000-60 000 persons capable of the full range of Petersberg tasks".

The Petersberg Declaration adopted by the WEU member states in 1992 made provision for:

- "humanitarian and rescue tasks;
- peacekeeping tasks;
- tasks of combat forces in crisis management, including peacemaking".

The new Constitutional Treaty defines EU missions in somewhat broader terms, stipulating that "all these tasks may contribute to the fight against terrorism, including by supporting third countries in combating terrorism in their territories".

The principle of a European defence entity has been accepted since the Franco-British Saint Malo summit in December 1998, where it was agreed that "the European Union will also need to have recourse to suitable military means (European capabilities pre-designated within NATO's European pillar or national or multinational European means outside the NATO framework)".

As a result of the major efforts undertaken since those declarations of principle, a number of institutional structures for politico-military and military crisis-management have been established within the Union. An agreement guaranteeing the Union access to NATO's operational planning capabilities (the "Berlin plus agreement") is now in force (Copenhagen summit, December 2002).

As regards forces, the European Union declared in June 2003 that it was now able to generate forces for Petersberg operations in accordance with the Helsinki headline goal. However, corrective measures are required to make good the large number of shortfalls that were identified under the European Capability Action Plan (ECAP). As regards the use of space for military purposes, a project group on "Space" was set up under the French Presidency in the ECAP framework. It has submitted to the EU Military Committee (EUMC) a document entitled "Space Systems Needs to support ESDP", which is due to be approved by the Chiefs of Staff in October 2004.

### *2.2 Space and Europe's strategic autonomy*

For many years the superpowers have identified space technology as the driving force behind a nation's strategic autonomy: witness the race between the US and USSR to launch the first satellite, then the Apollo programme of manned flights to the moon.

These days a sizeable part of the United States' military budget is devoted to the concept of "space dominance". If Europe wishes to acquire capabilities giving it the decision-making and operational autonomy that is commensurate with the abovementioned strategic choices, then it must acquire the necessary space-based capabilities, in accordance with agreed priorities.

In strategic terms decision-making autonomy means having permanent access to regularly updated satellite images of the military installations of potentially hostile countries and of probable crisis zones − this forms the basis for strategic documentation.

Decision-making autonomy for Europe calls for the creation of a Situation Centre (SITCEN) and military staff (EUMS) like those which currently exist in Brussels in the EU framework. Those bodies must have up-to-date satellite images of European origin, together with structures for processing and analysing them, like the Torrejón Satellite Centre, now an EU body.

Equally crucial is the ability to monitor, hence verify, the application of arms control treaties, such as the Treaty on Conventional Forces in Europe (CFE), which also requires space-based observation capabilities.

Finally, in view of the development of weapons of mass destruction and ballistic delivery vehicles close to the borders of Europe, thought should be given to setting up space-based ballistic missile warning systems on satellites equipped with infrared detection systems.

### *2.3 The use of space-based assets for crisis prevention and crisis management*

Space-based assets play an essential role at the political, diplomatic and strategic level during the risk prevention and threat analysis phases. They are equally important for operational crisis management.

*a) Crisis prevention*

During the crisis-prevention phase it is necessary to collect a maximum amount of information using the various means of reconnaissance − positioning and electronic surveillance in particular − in order to obtain an independent analysis of the situation and decide on a course of action. Space systems, which can be used discreetly and non-aggressively to monitor latent crises before they evolve into a real threat, are vital and irreplaceable for political decision-makers as a tool for autonomous decision-making and assessment during a potential crisis.

Crisis-prevention strategies are based on diplomacy, exchanges of information, economic assistance and military cooperation. We must see how that prevention can be organised at European level. Intelligence − from space-based observation systems in particular − is vital for effective prevention. If Europe is to develop the autonomous means for assessing crises and taking appropriate political measures to contain them, it must have at its disposal an all-weather, high-speed, high-resolution imaging and surveillance capability.

*b) Crisis management*

Crisis management pursues precise political objectives, in terms of establishing a defined social, military, economic, humanitarian and institutional situation by the end of an operation.

When a crisis starts, satellites are a necessary complement to the range of tools (remotely guided devices, UAVs, reconnaissance aircraft, human intelligence etc.) required to manage the situation. It must be possible where necessary to rapidly deploy a force to assist people in distress or put a stop to exactions. This can only be done on the basis of intelligence, which therefore has to be acquired as quickly as possible. The more complex the situation (in terms of distance, deficiencies in the local infrastructure, diplomatic constraints etc.), the more difficult the mission will be to accomplish without effective positioning systems, intelligence and communications. Space-based capabilities are therefore vitally necessary.

During the military intervention phase space-based systems are crucial not only for intelligence and communications, but also for a number of other applications:

- civil and military observation satellites allow the digitalisation of the terrain, which is necessary for certain weapons systems (such as cruise missiles);
- the detection, targeting and destruction process using airborne capabilities (UAVs or aeroplanes), calls for huge satellite data transmission capacities and a satellite positioning system such as GPS or Galileo;
- most meteorological and oceanographic forecasting systems are based on data from dedicated satellites;
- in-theatre intelligence is obtained not only from optical, infrared and radar imaging, but also from space-based electronic surveillance (COMINT) and transmission-interception (ELINT) capabilities;
- the threat of ballistic missiles being using against forces deployed in external theatres of operation must be taken very seriously. Space-based ballistic surveillance systems using satellites equipped with infrared sensors is an option that should be envisaged.

*c) Crisis resolution*

“Crisis resolution” consists in ensuring people’s safety in the event of guerrilla operations or terrorist attacks in a crisis zone. At the same time reconstruction work must begin and economic activity must be resumed by transferring power to the local authorities as soon as possible. As in the “management” phase of a crisis, the need for high-tech intelligence, combined with more conventional forms of intelligence, is indispensable. This also applies to satellite imagery, even though access time requirements are less stringent.

Troops deployed in the field in counter-guerrilla operations need all the data satellite systems can provide: positioning, telecommunications, weather, electronic surveillance (COMINT), etc.

The following table summarises the different (existing or desirable) space-based capabilities that can be used during the different phases of a crisis to give Europe the means to take autonomous decisions and action:

***Role of space-based systems in the different phases of a crisis***

| DESIRABLE CAPABILITIES | Anticipation/ assessment of threats | Crisis management | Crisis resolution |
|---|---|---|---|
| Optical and radar reconnaissance | xxx | xx | xx |
| Telecommunications | xx | xxx | xx |
| Navigation, positioning | x | xxx | x |
| Space surveillance | xx | xx | x |
| Meteorology and oceanography | x | xxx | x |
| ELINT/COMINT | xxx | xx | x |
| Ballistic surveillance | xx | xx | x |

"x" indicates the level of importance

### *2.4 The use of space-based systems for border surveillance*

Together with terrorism, illegal immigration and drug trafficking are currently the most serious problems threatening the European Union's security and stability. With their continuous global observation capability, space-based systems can provide information about areas bordering on the EU's boundaries, especially maritime zones. Such information is valuable for the purpose of implementing measures to fight these scourges and will enhance their effectiveness for the benefit of all EU member states.

## *III. European programmes and cooperation*

### *3.1 The past*

The first example of cooperation in the field of purely military satellites was Helios I, comprising a series of optical observation satellites. This was a trilateral programme developed by France, Italy and Spain. What started as industrial cooperation led to operational cooperation in a field in which, traditionally, such cooperation is rare: that of intelligence. Because the cooperation arrangements were organised somewhat late in the day, they did not give the Italian and Spanish participants an industrial return on the space segment that matched their level of participation, but they did get a major return on the user ground segment. The Helios I system was declared operational in October 1995. The second satellite was launched in December 1999. The two-satellite system has been operational since the beginning of 2000 for the benefit of the three participating countries.

### *3.2 Programmes under way*

Civil and commercial programmes which may provide valuable services for security and defence needs are not listed here. However, they have to be taken into due consideration in order to find cost-effective solutions to meet operational requirements. Examples are the purchase of civil telecommunications from commercial satellites and satellite images from civilian operators.

### *3.2.1. Observation*

The situation in the field of observation is not overly positive because it is primarily national programmes that abound. However, various countries have specialised in different areas − radar or optical − and are envisaging exchanging capacities.

Until the horizon 2005-2006 the following national systems will continue to exist alongside each other in Europe:

- France: HELIOS II (defence) and PLEIADES (dual-use);
- Germany: SAR-LUPE (defence) and TERRASAR (dual-use);
- Italy: COSMO-SKYMED (dual-use);
- Spain: Project under development;
- United Kingdom: TACSAR project.

That juxtaposition of national systems does not give Europe any real synergy among the programmes of the different European countries.

*Helios II*

The system will consist of two satellites which will be considerably more sophisticated than the Helios I satellites. Each satellite is to have two instruments: one of the Spot 5 type for medium resolution/wide field requirements and the other with very high resolution/narrow field characteristics and an infrared capability.

The user ground component for Helios II is compatible with Helios I but its capacity and image processing times will be considerably improved.

Compared with Helios I, the European industrial cooperation structure for Helios II follows a different pattern. France was obliged to launch it on its own. Belgium, followed by Spain in 2001, decided to participate in the programme but with no industrial cooperation and with a contribution rate of only 2.5% of the programme's cost, which will give them a compatible Helios II ground segment and a 2.5% programming right as regards the images taken by the satellite system. Helios II is now a collaborative programme.

*SAR Lupe and Terra SAR*

After the Kosovo crisis Germany decided to develop the SAR Lupe radar observation programme consisting of two satellites operating as an X-band radar system.

The fact that optical and radar satellites are clearly compatible led France and Germany to conclude an agreement on the exchange of capacities between Helios II and SAR Lupe, based on the sharing of ground segments. While this will enable the data that can be extracted from existing images to be exchanged, each country will retain control over the choice of images to be taken by their own satellites.

In parallel, Germany is engaged in cooperation with the United Kingdom on the Information Terra/Terra SAR programme consisting of two high-resolution radar satellites, due to be commissioned around 2006, which will provide a dual-use (civil and military) observation capability.

*The Franco-Italian agreement (Orfeo)*

Italy is developing a radar observation satellite system called Cosmo Skymed which is to have four satellites (X-band) and the corresponding ground segment.

As a follow-on to its Spot 5 (civil) and Helios II (military) systems, France for its part has developed a dual-use optical system called Pleiades (2 satellites due to be launched in 2008).

The ground user segment, developed jointly by France and Italy, is intended to be used for planning and controlling missions and for data acquisition and processing. The system will be accessible to several types of user but tasks commissioned by the defence ministries will be given priority, implying compliance with a number of security constraints.

This cooperation venture also covers the use of systems already in service or being developed such as Helios I and II under existing agreements, and Spot 5. In exchange for giving France access to resources in the Italian SAR radar component, Italy will have access to a share of the resources of France's optical satellite systems.

Furthermore, the defence ministries of both countries have confirmed that the system will be open to all the European countries, and particularly to Belgium and Spain, which are cooperating on Helios, and to Sweden, which is cooperating on Spot. Other member states of the European Space Agency which have expressed interest in the Franco-Italian programme are Austria, the Netherlands, Norway and Switzerland.

### *3.2.2. Communications satellites*

In the telecommunications sector each major European country is developing its own system:

- United Kingdom: SKYNET 5
- France: SYRACUSE 3
- Italy: SICRAL
- Spain: SPAINSAT
- Germany: GMILSATCOM

NATO for its part is developing NATOMILSATCOM. A positive development in terms of cooperation was a joint offer from three states (France, Italy and the United Kingdom), based on their existing national systems, to provide capacities to cover NATO's secure telecommunications requirements.

In contrast to other sectors, in the field of navigation satellites the Galileo programme is a model of European cooperation.

It is a real challenge for Europe. The programme has been launched and the first two satellites in the constellation of 30 are scheduled for 2005. The problem of overlapping military frequencies between the United States' GPS and the EU's Galileo system has now been resolved.

This programme has been opened for international cooperation (India, China, Israel, etc.) to the exclusion of any involvement in the PRS (Public Regulated Service) and in security issues.

### *3.2.4. Launchers*

The decisions taken by the European Space Agency's Ministerial Council on 27 May 2003 confirmed Europe's resolve to have autonomous access to space. The decisions to upgrade the Ariane 5 launcher, start work on the EGAS (European Guaranteed Access to Space) programme and continue with the restructuring of the launcher sector with a view to reducing costs and reorganising and reallocating responsibilities ensured that European access to space has been preserved in the short term. But the question of whether this will also apply in the longer term is one which will need to be followed up and taken further (e.g. small satellites/small launchers).

Furthermore, a major study on the future prospects for the European launcher sector (FLPP: Future Launcher Preparatory Programme) was initiated. Finally, it was agreed that Soyuz spacecraft could be launched from French Guiana.

### *3.3 Prospects for the future*

Cooperation will need to be organised for the future generations of telecommunications and observation satellites. However, the process of reflection on such cooperation should start as soon as possible and focus on achieving systems interoperability.

In other, more innovative areas (electronic surveillance, early warning, laser links) France is embarking on a phase of demonstrators in order to check the feasibility of these different systems before moving on to their operational development in the framework of European collaborative projects. Those demonstrators are: ESSAIM (electromagnetic surveillance), LOLA (laser links) and SPIRALE (early warning). They are being developed at national level, but the operational systems should be developed in cooperation; thought must be given as of now to the planning process. The systems will be developed using technologies which by definition are dual-use.

Finally, these capacities will need to be supplemented by specific space surveillance capabilities for identifying dubious satellites, monitoring space debris, checking the state of friendly satellites, etc. Space-based surveillance will be necessary for controlling e operations such as launches, orbital rendezvous and the removal of satellites from orbit at the end of their useful lives. France has an experimental radar surveillance system for that purpose, known as GRAVES. There are other possibilities in Europe, particularly in Germany. Both radar and optical operational surveillance should be developed at European level, with a view to tracking all space objects flying over European territory. Such systems would also have a civilian application, which would be to predict the re-entry of space objects into the earth's atmosphere, in order to guarantee people's safety.

Other needs are emerging in respect of the control of space, such as rapid access to space and the launch on request of mini- and micro-satellites.

## *IV. Proposals*

The White Paper has made a clear proposal for a European Space Policy to cover Europe's commercial and institutional needs including those relating to security. However, this does not encompass the specific requirements which follow from military operational requirements. These specific requirements deserve political attention and require a link to be forged between the European Space Agency and the newly created European Defence Agency.

In view of the growing requirement for operational space-based systems for the ESDP and of the insufficient number of cooperation programmes in the fields of observation and military telecommunications, a policy of interoperability and the exchange of capabilities needs to be developed in Europe, building on existing systems.

To that end Europeans must work together on a solution to interconnect the ground segments that currently belong to various national systems and to NATO. The new European Defence Agency has an important role to play in this respect and should take as its basis the work of the ECAP project groups.

As far as the Torrejón Centre is concerned, it should have a real-time image-processing capability, this being particularly important during a crisis. To achieve this goal a military cell is required.

Clearly, the Galileo project has a specific role in the civil sector, but Europeans should together define what services they expect the system to make available for defence purposes, and provide the funding for the associated Public Regulated Service (PRS).

In addition to decisions to ensure in the short term the continuation of the Ariane 5 programme and the capacities of the Kourou launch centre (for Soyuz rockets), there is a clear need for Europe to maintain its satellite launch capability in the longer term. To that end it should procure the necessary means and in particular establish effective cooperation between the European Space Agency and the European Union in order to guarantee autonomous access to space.

In the field of ballistic weapons surveillance and the satellite launch capabilities of countries which need to be kept under surveillance, Europe should acquire a space-based capacity to detect missile launches so that it can assess new threats emanating from ballistic missiles or satellites.

In view of the current threat of terrorism, improved intelligence, communications and navigation (Galileo) capabilities are essential.

In the specific case of border surveillance, a unit should be set up for analysing the data collected by systems which already exist about areas adjacent to the EU's boundaries, especially maritime zones. Such a unit could be devised as one of the applications of the GMES programme. The information would be sent to the various member states concerned to help them fight illegal immigration and drug trafficking. The unit could be located on the premises of the EU's Satellite Centre in Torrejón.

To sum up, Europe should embark on reasonable development of its space-based facilities by embracing the concept of self-sufficiency: this entails the acquisition of assets which are modest compared to American equipment, but which will enable it to verify and analyse data that are sensitive and crucial for decision-taking in the event of a crisis, in accordance with the principle of "autonomous capabilities" which the European Council has endorsed many times over. As far as space-based infrastructure is concerned, Europe should have capabilities that are consistent with the Headline Goal 2010 adopted by the European Union.

If Europe is to acquire these capabilities, the first step is to engage in a phase of cooperation and coordination to create a network of security and defence-related systems that already exist. This will in due course lead to the development of joint programmes that will ensure that these capabilities are further enhanced in the future.