

## *Chapter 2*

### **French Military Space, Addressing the Tipping Point: from Necessity to Dependency**

*Jean-Daniel Testé*

For many years we have measured how much space has been a tool of choice for providing autonomous situation awareness and decision making along with being a unique force-multiplier in support of military operations. In that sense, space has long been considered as a strategic asset.

Today, more than 30 years after the launch of the first French military payload in space (Syracuse I Telecom payload in 1982), space capabilities have gained an increasing importance in the whole range of defense and security operations. To such an extent, we currently have reached a tipping point where military space and space infrastructures at large have evolved from being a necessity to become a dependency.

Entering into the second decade of the twenty first century compels us to review our space heritage from the Cold War. Our many military operations have largely demonstrated the relevance of this new paradigm.

France is historically the third space-faring nation. After more than 50 years of well-established vision and sustained investments in our space industry and programs, we have developed innovative and credible capabilities which have ensured our independence and appeared as a tangible asset to build coherent European defense space cooperation. The White Paper on Defense and National Security, issued in 2008, gave the green light to create **the French “Joint Space Command”**. **Its mission is simple: to provide space capacities for operations.** The main operational capacities, that the French armed forces have to fulfill in the following years, have been reaffirmed in 2013: *“Initial Entry, Precision Strikes, Special Forces, Framework Nation responsibility within an international coalition”*.

They require many prerequisites before the ‘go’ decision can be taken:

- Prior knowledge of the theatre and its environment: field of geography;
- Precise knowledge of the enemy and engaged forces: field of intelligence;

- Precise knowledge of targets: field of targeting;
- Capacity to perform missions in complete safety and without collateral damage: domain of operations;
- Ability to dispatch orders and assign responsibilities: domain of Command and Control.

In addition to that, modern soldiers must face **three new emerging game changers**:

The first one is time: **time** is critical, the time of decision makers, the time of the media, the time of social network and globally the internet's new dimension. The second is **tempo**: Operations have to be conducted fast, with visible results and a limited foot print in a shrinking military capabilities and manning context. And the Third is **adversary**: we are facing a new kind of foe. Indeed its nature covers now a wide range, from small terrorist groups to organizations, using conventional weapons and cyberspace capabilities, easily switching from one status to another such as the ISIS. The great news is that we now are able to answer all these challenges; it is only possible because we have a complete full spectrum of space capabilities.

- observation and localization are required for Geography;
- observation and eavesdropping are necessary for Intelligence;
- observation and accurate localization which permit performant Targeting;
- Navigation and SATCOM are a unique support for operations;
- SATCOM are mandatory for command and control.

The availability of all these space capacities for all the warfighters enable French armed forces to perform military operations at the right TIME, with the right TEMPO, whatever the kind of ADVERSARY they will fight against.

While space has provided the fantastic leverage we needed, their support is essential without efficient alternative. Therefore these capacities need to be protected and preserved.

To achieve this goal, establishing mutual assistance among allies if our space infrastructures are threatened is a key objective. Consequently, a continuous dialogue between space-faring nations in European partners and with closest allies has to prevail.

We must also strengthen the robustness and the resilience of our systems to ensure the protection of our space infrastructures. France will always push for

dialogue and mutual understanding between space-faring nations. However self-defense remains an inherent right for France.

Space has been quickly evolving as our society is constantly changing. Military space has to face with the irruption of new comers and private investments as well as with new phenomena such as *Big Data*. The use of Space is no longer restricted to our confined traditional environment and to the Military-Industrial complex. We have to deal with these facts.

Around the year 2025, the French defense will have to take into account this new complexity context to replace and reinforce its space assets.

Whatever the application is concerned, the key driving factors will be: guaranteed service; data integrity; services and systems security; best possible cost/efficiency ratio.

The acquisition of French space military capabilities will be done according to three principles:

- **Sovereignty.** This condition is essential mainly for strategic capabilities that cannot be offered by commercial systems: very high protected SATCOMs (X, UHF, Ka bands); high performances imagery (EHR, MIR, TIR, hyperspectral...); ELINT; warning remain core strategic capabilities;
- **Assurance/Guaranteed access.** This relates to data or services available through bilateral cooperation or through fully reliable commercial partnership: high rate communications (today Ku band, later Ka band for UAVs); dual imagery (Very High Resolution) or cooperation imagery (radar); space surveillance services (SST UE) are the main areas of concern;
- **Complementary.** Data or services, commercially available worldwide, must be harnessed, whatever the provider: Communications, but also space surveillance (space tracks) and commercial imagery are natural candidates for this enlarged approach.

Based on these conditions, a key challenge will be to secure our assets and to deliver the same level of support to operations as currently ensured in the fields of observation, telecommunications, ELINT and navigation. Hence we need to fix the priorities of our developments and programs.

The cornerstone priority for the short term is **Awareness**: it is the ability to know what is happening in space, to establish a relevant situation of both friendly and enemy capabilities, to be able to assess any threat and react if

necessary.

At this point, with this awareness, we should be able to:

- Conduct diplomatic actions;
- Perform a space maneuver to avoid the threat.

For the long term, the idea is to be able to create an equivalent credible threat to the space segment of the enemy. It is a kind of space deterrence giving more security to our satellites.

The second priority is **Continuity**:

The ability to provide the same level of support to the warfighter as we are doing now in the field of Observation with a significant improvement of the image resolution and spectral bandwidth as well as an increase of the agility of the satellite for the near term.

For the long term, instead of resolution, the priority will be accessibility, recurrence, coverage and bandwidth (hyper spectral...)

In term of telecommunications, new systems should bring more capacity in terms of bandwidth flow supported by high level of security and confidentiality.

To be able to deliver images to warfighters, we must also ensure coherence between image size and communication bandwidth.

Space systems are **essential** for the success of military operations.

We need now to protect them and prepare future systems in order to deliver the same level of support to forces in operations. This essential requirement will be satisfied by already decided programs:

Concerning observation, the first CSO follow-on should be ready in late 2020's;

Regarding telecommunications, the successor of COMSAT NG should be launched beginning of 2030's;

As regards ELINT, CERES NG should be operational in late 2020's;

Finally, the GALILEO constellation, just like the GPS, should be regularly renewed from 2025.

A key requirement will remain the security of these operational systems based on space surveillance assets to be modernized (GRAVES SATAM) or developed (optical systems...). The objective is to achieve:

An accurate knowledge of space situation in order to assess risks and threats;

An ability to act quickly in case of immediate risk and to conduct safely the appropriate avoidance maneuver;

For the long term, a capacity to identify a real aggressor leading to a capacity to respond.

The third priority concerns desirable requirements to develop – only if the financial resources are available – deals with space capacities that are not available today for French defense: **warning and maritime surveillance**. Commercial access to this capacity is currently perceived as a promising interim option.

In complement of these priorities the French Joint Space Command aims at **developing partnerships** with allied space faring nations. First, to improve operational services by getting more data (imagery and SSA) and more capacities (satcoms, PNT) in support of military operations, then to enhance resiliency of national assets in case of failure of any origin.

For more than 30 years, French armed forces and services have been using space systems. Nowadays, satellites are an important component to operations. They play an integral part of the success and security of French military operations. We can no more plan an operation without a relevant space support. To be able, in the future, to sustain such a support, we need to secure and to modernize our assets in conjunction with a new and ambitious international cooperation.