

## Satellite communication for the new millennium

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'Satellite Telecommunications is always new' and this is not a slogan. In fact, one feature of satellite telecommunication is that it does not stop progressing and finding new interesting fields of applications; another feature is that telecommunication is the most successful space application and, together with launchers, constitutes the main business revenue from space.

This ICSS Conference in Toulouse is the first of the new millennium. What will satellite communication give us in the next years? What will it need from us? I see two main avenues ahead of us.

The first avenue is *Broadband interactive multimedia*. This field of rapid growth has been triggered by people wanting to exchange more and more information. This has increased Internet delivery requirements and is now evolving from an unbalanced interactive link (forward link by telephone, return link by satellite) toward a full broadband interactive system. American consulting firms forecast that broadband satellites will most probably capture 30% of the market for Internet access by 2007 with a total of 50 million users. Furthermore, this market will exceed 100 billion US\$ by 2010. What the new millennium brings is that the scenarios envisaged only a few years ago, involving several LEO constellations and a number of GEO systems with worldwide coverage, have now been revised in favor of more modest GEO-only systems with regional coverage, at least initially.

The second avenue is that of *Mobility*. Here also Global Services provided by LEO constellations proved unable to face the rough competition from ground-based systems providing similar services at much lower cost. As in the case of satellite broad-

band multimedia, the tendency is now toward regional GEO systems, which are being designed taking into account current and future competing systems – GSM and UMTS being the most obvious. Indeed, the definition of a forthcoming S-UMTS integrated in the terrestrial infrastructure will be an important step to allow satellites to play a more significant role. Within the mobile telecom area, digital radio systems, which are potentially one of the most efficient means to disseminate all types of audio and data products, certainly deserve special attention. We observe a blooming of initiatives in the US as well as in Europe. Car satellite terminals able to receive a mix of radio and data files and, perhaps, a full set of navigation services, could indeed pave the way to the introduction of 3rd generation satellite mobile systems.

How does ESA intend to move vis-à-vis these new market, systems and technological challenges?

ESA's role in telecommunications has been historically that of helping the European industries to improve their competitiveness and make them better able to compete in the worldwide market. This role can no longer be carried out without careful monitoring of the market evolution. In addition, in response to the ever-increasing role played by the 'non-space segment', *ESA needs to focus more and more on applications, services and, above all, on the end-users*. This requires a fundamental broadening of the ESA horizon. The added challenge is how to effectively play this role of support to the telecom family in a market-dominated-field without distorting the rules of competition.

ESA's action plan for most of this decade is contained in our Long Term Plan for the next Ministerial Council in November this year, based on an extension and reinforcement of the current ARTES programme.

This Plan responds to the principles laid out in the ESA/EU European Space Strategy and underlined in the 'Three Wise Men report'; both stressing the role of

Telecommunications as 'a key component of European strategy'.

This plan is structured as follows:

1. Maintain and reinforce our role in *preparatory activities* as the breeding place of future actions.
2. Maintain and reinforce our role in *standardization activities*, both at the regulatory level (i.e., supporting the elaboration of standards within the appropriate consultative and regulation fora) and developing the appropriate validation tools needed for their implementation. The DVB-RCS is a very good example of the recent achievements. We think furthermore of creating a multimedia and mobile application hub where we will implement system demonstrators and test beds for a number of applications. Standardisation is, and will continue to be, a key element for the success of the European industry and operators involved in developing new satellite communication services.
3. Initiate a *more substantial Application line*, including Integrated Applications. These are applications resulting from the merging of satellite and/or terrestrial based solutions, offering, in addition to Telecom, any other relevant application, e.g., Navigation, Imagery, etc. A special case is formed by applications of public interest, such as those relative to emergency/disaster management (RemSat, Eodis). I just would like to recall here that ESA, together with CNES and the Canadian Space Agency, has signed, in November of last year, an International Charter on Space and Major Disasters, engaging the Agency to respond quickly to the needs of the international community in case of catastrophes. In these applications, as said earlier, Telecom plays a transversal role triggering the synergy with the other disciplines.
4. Develop the *technology for the key applications*, i.e., multimedia and mobility, covering all the segments: space, ground and user.
5. Initiate a specific technological development of a *Large Platform*. Larger platform capacity, for example with electrical power of the order of 25 kW, must match the competition faced by the European Primes and the evolution of the operators' needs in the near future. Modularity and co-

ordination of onboard subsystems specifications should lead to a more versatile and efficient approach.

6. Initiate lines of action, in co-operation with Industry and Operators, to *cover Service and technological demonstrations*, in orbit and/or ground to convince potential customers. It is clear that setting up such demos involves risks and costs that may not be borne by industry alone. In the past; the need to test in orbit the technologies developed, was met by developing large technological satellites, such as OTS, Olympus and Artemis. However this process took many years, too many when compared with the rapid pace of evolving technologies and market needs. Our approach now will be to launch small demonstration missions, using an ad-hoc demonstration platform. In this respect we have already identified two missions: one will test an optical inter orbit link with the International Space Station, the other will verify the in orbit performance of large antennas.

All these activities, multimedia, mobile and public interest applications, require close coordination and co-operation with the European Commission, which we continue to pursue actively. As an example, an ESA/EC coordinated call on the topic 'Multimedia applications in the mobile environment' will be issued this year.

Finally, as concerns our relationship with industry, we will continue to put great care in promoting and giving responsibility to all the various categories of firms involved in the telecom sector (primes, system suppliers, equipment manufactures, operators, service providers, etc). Special attention will be devoted to promoting the capabilities of SME's and *start-up companies*, from whom most of the innovation in applications and service demonstrations is expected in the next years.

I would like to conclude my statement by saying that I feel the role of ESA in the field of telecom is that of a watchdog and pusher of European competencies. As I said at the beginning, telecom is always new, and in order to catch up with its fast evolution, ESA must always try to anticipate the future, act fast and think ambitiously.