Looking forward.

Galileo Avionica S.p.A. , the Italian Leader in Space and Defence Equipment.

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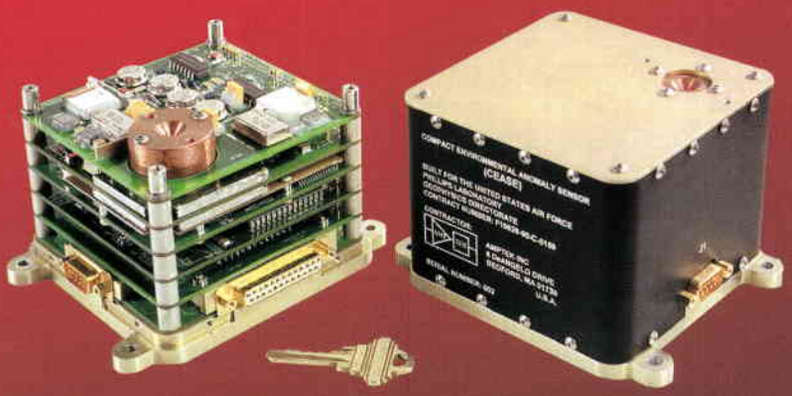
A Finmeccanica Company

Space Radiation Alarm

"CEASE"

COMPACT ENVIRONMENTAL ANOMALY SENSOR



FEATURES:

- Compact: 10 x 10 x 8.1 cm^3, 1 kg
- Low Power: 1.5 W
- Flexible I/O: Supports 1553B and RS422
- Full GSE and operational software
- On-board determination of hazardous conditions

CEASE is a compact, radiation hard, low power, space "weather" hazard sensor developed to monitor the local radiation environment and to provide autonomous real-time warnings of:

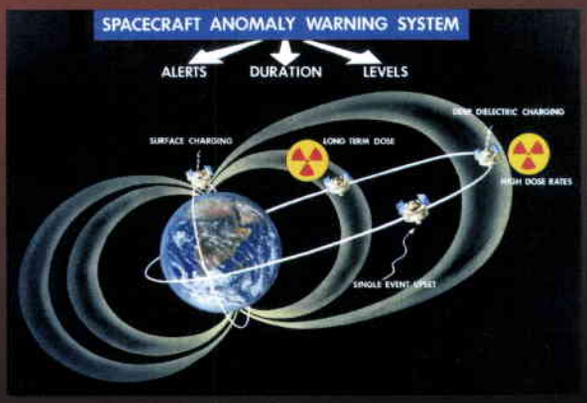
- Total Radiation Dose
- Radiation Dose Rate
- Surface Charging
- Deep Dielectric Charging
- Single Event Effects
- Solar Cell Damage.

CEASE detailed radiation data is used to pinpoint causes of spacecraft anomalies, and to forecast hazardous conditions before they affect the mission. The spacecraft, in turn, can re-prioritize its operations, inhibit any anomaly sensitive tasks such as attitude control adjustments, or initiate other prudent actions as indicated by the **CEASE** warning flags. Device degradation mechanisms and radiation tolerance of components can also be monitored.

The US Department of Defense has selected **CEASE** for several missions, including:

- **TSX-5**
- **STRV-1C**
- **SBIRS LADS**

and the **DSP** operational spacecraft.



Amptek has a long and distinguished track record in the manufacture of space instrumentation. Mission examples include: DMSP, TIROS, CRRES, NEAR and APEX.

Current off-the-shelf Amptek sensors measure spacecraft charging, thermal and suprathermal, and high energy particles. In addition, Amptek provided the X-ray Detector on the Mars PATHFINDER Mission.

High reliability components from Amptek have been the number one choice of many missions, including: GALILEO, CASSINI, GIOTTO, AXAF, SUISEI, CLUSTER, SOLAR, GEOTAIL, SOHO, INTEGRAL, WIND and AMPTE.

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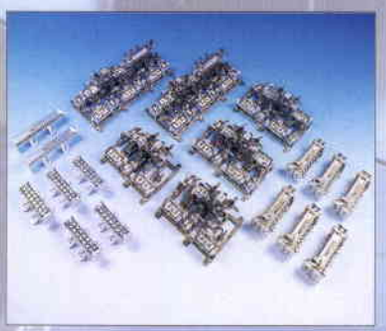

Radiofrequency Equipment

- S-Band TTC Digital Transponders and Transceivers
- S-Band TTC Spread Spectrum Transponders
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- L-Band Transmitters
- BPSK/QQPSK Modulators
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RF Active and Passive, On-Board Data Handling Equipment and Subsystems is our main line of business.
We are specialised in the development and manufacture of a few equipment, through partnership with the main space prime contractors.
Our track record includes participation in more than 45 programs satellites.

Alcatel Espacio is a Spanish subsidiary company of Alcatel Space Industries

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ARCHITECTS OF AN INTERNET WORLD

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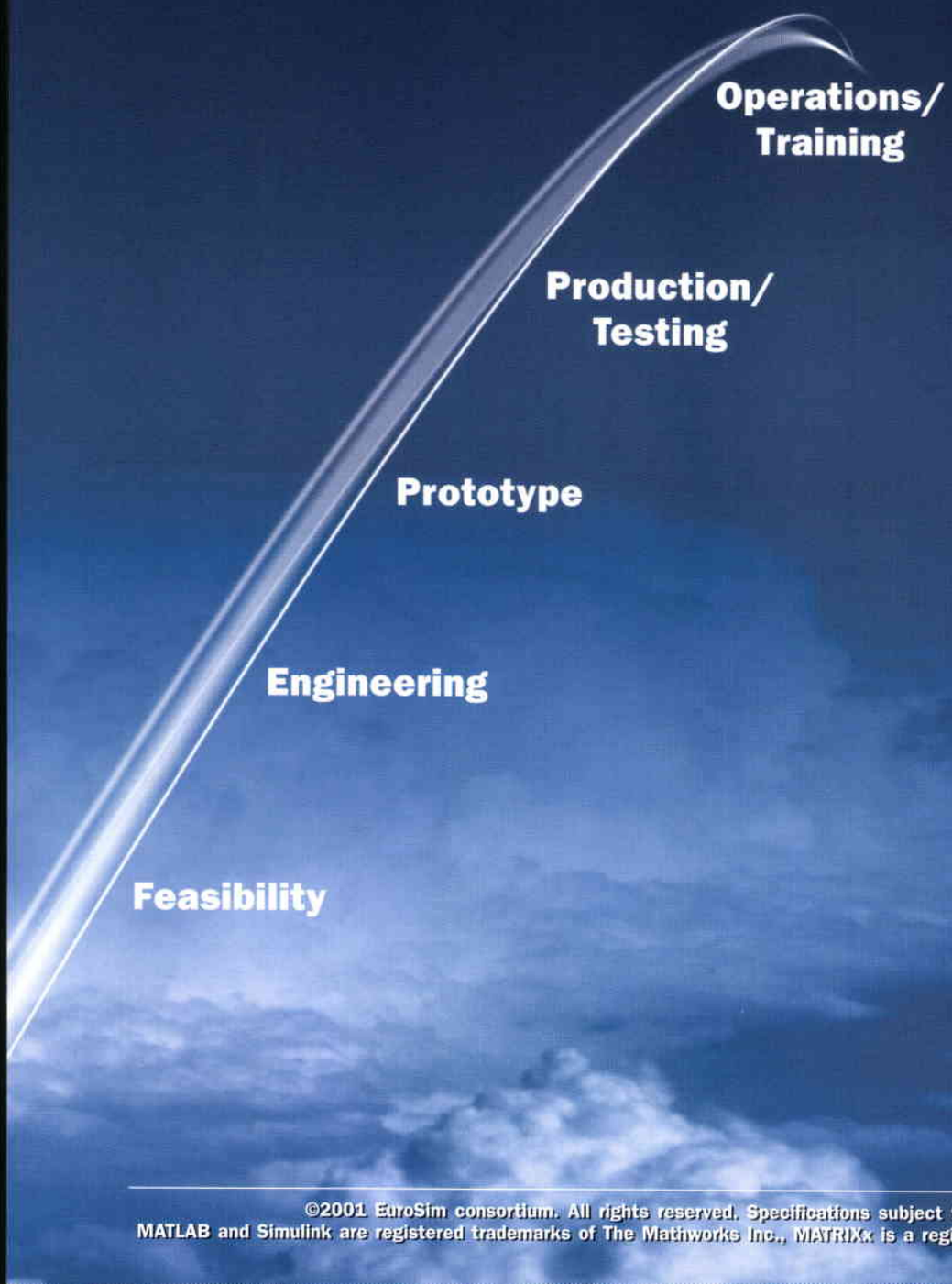

Availability

EuroSim is available as a licensed product, leased, or as part of a turn-key simulation solution supported by the EuroSim consortium.

Add-on products are available for automatic integration of models from MATLAB®/Simulink® and MATRIXx™

EuroSim Consortium

EuroSim is developed and supported by

Fokker Space

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Information

Find out more about EuroSim at **www.eurosim.nl**

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The ESA Council at Ministerial Level

Edinburgh, 14-15 November 2001

The Director General's Proposal for ESA's Policy and Programmes

A. Rodotà

Space services are part of everyday life. TV broadcasting, weather forecasting, protection of the environment, financial services, and car-navigation all rely on globally operated satellite systems. At the same time, space is a vital tool for scientific research, serving the advancement of our understanding of the origins of life, the development of the Universe, and the complexity of the terrestrial ecosystem.

The resources offered by space also contribute significantly to meeting many of the challenges facing the Europe of today. I am thinking here of:

- safeguarding and further improving the well-being, security and prosperity of every citizen,
- protecting the environment and ensuring sustainable development, and
- preserving Europe's cultural identity, diversity and value systems,

in short, becoming 'the most competitive and dynamic knowledge-based economy in the World'.

To meet these challenges, Europe must do more than continue to exploit space effectively, drawing wherever possible on the results already achieved. It must also strive to improve the overall efficiency of the entire European space sector, which includes the efforts of scientists, industrialists, public agencies (national as well as ESA), and service companies.

Within this challenging environment, the European space community is already producing value for Europe. I am thinking in particular of:

- first-class science
- a large share in the World market for space infrastructure and services
- major contributions to public-service provision for citizens.

First-class science

Even with a continuing decline in the budget for science programmes, the European science missions have achieved significant results in the last six years:

- Soho has explored the Sun's internal structure, providing insights into the workings of the solar nuclear fusion reactor and the solar dynamo.
- Cluster is giving us a comprehensive vision of space weather.
- ISO has discovered the ubiquitous presence of water molecules in the Universe.
- XMM-Newton has greatly expanded our understanding of the composition of the enormous high-speed jets emitted by young stars.

A large share in the World market

Worldwide expenditure on space is estimated at around 70 billion Euros in 2001. The public sector still accounts for a very significant proportion of that spending, though the commercial sector is moving rapidly towards a share of about 50%.

Out of total public expenditure of about 38 billion Euros, the United States' share stands at 76%, the figure for Europe being just 14%, equally divided between ESA and the national programmes. The rest of the World spends 10% of the total.

Although in interpreting these figures account has to be taken of variations in purchasing power from one country to another, the fact is that Europe's investment is about one fifth of that of the United States. Even so, Europe has been able to secure a steady increase in its companies' share of the World commercial market – although the USA had a start of almost ten years.

In the early eighties, Europe launched no commercial payloads at all and was completely out of the market for commercial satellites, a market that had come into being some seven years before. Today, twenty years on, thanks to

substantial public investment in developing Ariane and building the first European communications satellites (ECS and Marecs), European companies have gone on to take:
- 56% of the global commercial launcher market, and
- 27% of the global commercial satellite market.

European companies have been equally successful in the telecommunications-services marketplace. They currently account for about 28% of the overall market and are increasingly globalising their business with the acquisition of large overseas international operators.

Public-service provision for citizens
There are at least three areas in which the contribution of space to the everyday life of citizens is both evident and, increasingly, vital.

The first is meteorology. Even though Eumetsat, the Agency that operates meteorological services, is currently a non-profit organisation, studies point to an indirect return on investment in excess of 8. Through the Meteosat and MetOp satellites, which ESA and Eumetsat have been jointly developing for a number of years, Europe is also contributing, together with the USA, Russia, China, India and Japan, to a global network disseminating meteorological information all around the World.

The second example is the use of Earth-observation data for disaster monitoring. The International Charter on Space and Major Disasters, initially signed by ESA and CNES, and later by ISRO, CSA and NOAA, seeks to provide a unified system for acquiring space data and delivering it to people dealing with natural or man-made disasters.

The third example is the contribution being made by space to the information-society infrastructure, providing a complementary but nonetheless important means of access to the Internet, and its enabling role for new services such as telemedicine and distance learning.

These enormously valuable results were achieved through the combined efforts, at European level, of the scientific community, industry and the space agencies.

What specific contribution has the European Space Agency made to the emergence of such first-class capabilities and the achievement of such outstanding results? I would like to focus on what I see as the three main strands of this specific ESA input:
- Programme management
- Technical management
- Internal efficiency.

Programme management
The evolution of mission cost per tonne is a good indicator of ESA's increasingly effective management of space – and in particular satellite – programmes. Mission cost per tonne has been in steady decline since the early eighties, falling by about 40%, with a roughly stable level of risk and innovation in the various programmes.

This in turn means that ESA has, over the last fifteen years, demonstrated its ability to put progressively larger payload masses into space per year, a clear pointer to the growing through-put of the entire European space sector. No such positive trend is to be found in the NASA programmes.

Technical management
It is important to underline that better performance in programme management has been obtained by ESA maintaining product quality. The following are just a few indicators demonstrating the technical quality of the Agency:
- ESA has never had any catastrophic satellite mission failures (compared with a 30% failure rate in NASA programmes).
- ESA has negotiated insurance premiums at about 50% of market rates.
- ESA satellites usually exceed their estimated and planned lifetimes (for instance, ERS-1).

Last but not least, I want to underline the recent recovery of our Artemis satellite, which, together with the earlier recovery of Soho, testifies to the excellence of our technical teams.

Internal efficiency
A lot of effort has been devoted to improving the Agency's internal efficiency. Two indicators confirm the gains in efficiency that have been made.

The first is the amount of budget managed per staff member. For programmes directly managed by ESA, the chart shows a steady yearly increase of 8.2% in recent years, compared to a 2.2% increase obtained by NASA. This has been accompanied by very tight cost control applied to ESA programmes.

The second indicator is the deviation of programme costs at completion from the costs initially estimated. Comparing the status of overruns on major ESA programmes in 1997 and in 2001 clearly demonstrates the effectiveness of the efforts devoted by managers at the Agency to proper control of all programmes, while at the same time organising industrial competition and an acceptable geographical distribution of contracts. Here