CENTRE NATIONAL D'ÉTUDES SPATIALES

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PRESS RELEASE

20TH ANNIVERSARY OF LAUNCH OF SPOT 1 EARTH OBSERVATION SATELLITE

Since the launch of SPOT 1 on 22 February 1986, CNES has accumulated close on 50 years of operations of Sun-synchronous satellites. For the agency and France's space industry, SPOT 1 was the starting point for many other satellite projects dedicated to science or observation.

The first image from SPOT 1 was broadcast on 25 February 1986, a remarkably short time after its launch, confirming the maturity of CNES's SPOT system operating teams.

Robust architecture: based on an ambitious and innovative design, SPOT 1's technologies and 10-metre resolution clearly set it apart from the U.S. Landsat satellites. The system's robust architecture was able to accommodate a succession of enhancements during the decade that followed, culminating in 2002 with the launch of SPOT 5, the civil Earth observation satellite most used in the world today, with a resolution of 2.5 metres.

Mature organization: CNES, working closely with its space industry partners, focused on developing the end-to-end skills required to operate the SPOT system. As system integrator and operations manager, it was also able to achieve the requisite result and establish processes to improve system manufacturing.

An extended family of exceptional satellites: The SPOT satellite bus was re-used for ERS-1 and ERS-2, for ESA's Envisat satellite and for the METOP series of weather satellites. In France, the SPOT series also served as an essential building block for the Helios systems developed by CNES for the nation's defence requirements.

A rich source of expertise for CNES: The skills acquired in developing the SPOT series have enabled CNES and its industry partners to establish a presence in all areas of satellite-based remote sensing, from sophisticated satellites and instruments to image reception and processing, orbit control and payload tasking, and the design and implementation of complex space systems.

Today, CNES is gearing up to succeed SPOT with Pleaides, a high-resolution optical Earth observation system being pursued with Italy under the joint ORFEO civil and military multisensor programme.

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SPOT family tree

22 February 1986:	*launch of SPOT 1, deorbited in 2003*
22 January 1990:	*launch of SPOT 2, still in service*
26 September 1993:	*launch of SPOT 3, accomplished its mission until it failed on 14 November 1996*
24 March 1998:	*launch of SPOT 4, still in service*
3 May 2002:	*launch of SPOT 5 to assure continuity of service until 2007*

SEVEN QUESTIONS ABOUT SPOT

What is the purpose of photographing Earth from space?

Before satellites there were balloons, which were used by Nadar to produce the first aerial views of Paris. Then came the aeroplane and aerial photography. But it was satellite images that first gave us the ability to survey a complete hemisphere at a single glance. This amazing feat has now become second nature for many civilian and military users. The main advantage of satellite images over aerial photography lies in their geographic coverage and geometric quality. Nevertheless, satellite images are obviously not as detailed as photographs taken from low altitude. We shall therefore continue to use aerial photographs to view densely urbanized city centres.

Why a fifth SPOT satellite?

SPOT 5 is the last in a long line of Earth observation satellites designed by CNES and developed in cooperation with Belgium and Sweden. Created in 1986, the SPOT family is not only composed of satellites, but also operations centres that control and task the satellites and produce images. SPOT 5 joined its sister satellites in orbit to ensure the continuity of this service. It keeps a watchful eye over our planet, providing imagery of better quality than anything before.

What are SPOT 5's key advantages?

Imagine a photograph covering a landscape 60 kilometres square, in which you can make out features as small as 2.5 metres. Thanks to its Supermode sampling process, SPOT 5 does just that, giving it a clear advantage over its American competitors. U.S. very-high-resolution satellites are able to capture details as small as one metre, but to "photograph" the urban area of Paris they would need to acquire 36 separate images, where SPOT 5 can perform the same task with just one image. This advantage appeals to many users. Thanks to its High Resolution Stereoscopic instrument (HRS), which points both forward and aft along the satellite track, SPOT 5 can also map relief. This winning combination—resolution + wide swath + stereoscopy—is what sets it apart.

What can SPOT 5 see?

SPOT 5 can't see at night, or through clouds, and it can't peep into our homes either. Each of its two High Resolution Geometric (HRG) telescopes operates like a digital camera. Depending on the imaging mode and the user's requirements, it can detect features of 10 metres down to 2.5 metres in size. With Supermode, a SPOT 5 image can pick out houses, pathways or even count olive trees in a field.

Who uses SPOT 5 imagery?

The broad community of SPOT 5 users includes cartographers, armed forces, local authorities, farmers, forest managers and many more besides. Cartographers use SPOT 5 imagery to update their databases; local authorities can monitor and plan urban development more effectively; farmers use it as an aid in making crop declarations; and forest management is also greatly improved. With a resolution of 2.5 metres, it is even possible to pick out trees and determine whether they are coniferous or broad-leaved. SPOT 5 was also a precious aid in assessing storm damage in France's forests in December 1999.

Seeing is all very well, but can SPOT 5 imagery help us to mitigate natural or military hazards?

SPOT 5 is primarily a civilian satellite. Mitigating earthquakes, cyclones, floods or volcanic eruptions also requires knowledge of land cover and soil types. After an earthquake, SPOT 5 can detect damage to industrial buildings that might lead to a risk of chemical pollution, or identify unaffected areas for organizing emergency response. With three SPOT satellites in orbit, we can be sure that at least one of the satellites in the constellation will acquire an image of a disaster area within a day, enabling disaster managers to establish a data archive for comparisons before and after the event.

How are SPOT 5 images obtained?

There's no point in peering up at the sky: SPOT 5 images do not come down by parachute or on a space shuttle! Like television, SPOT data is transmitted by radio waves, which undergo a series of processing operations on the ground to convert them into images. Since 1986, CNES subsidiary Spot Image has devised, developed and sold a broad range of products and services derived from SPOT satellite data.