



### SPOT 1 to SPOT 5 payloads

Each SPOT payload comprises two identical optical imaging instruments, two tape recorders for image data, and a payload telemetry package for image transmission to ground receiving stations.

The SPOT 5 satellite is also flying the HRS high-resolution stereoscopic imaging instrument to simultaneously acquire stereopairs.

**The SPOT high resolution optical instruments** (HRV – High Resolution Visible on SPOT 2; HRVIR - High Resolution Visible Infra Red on SPOT 4 and HRG - High Geometric Resolution on SPOT 5) offer an oblique viewing capability, the viewing angle being adjustable through +/- 27 degrees relative to the vertical. The ground stations can steer each instrument's strip-selection mirror remotely to view regions of interest not vertically below the satellite.



Two spectral modes of acquisition are employed, panchromatic (P) and multispectral (XS).

Both instruments can operate in either mode, either simultaneously or individually.

Sensors	Electromagnetic Spectrum	Pixels Size	Spectral bands
SPOT 5	Panchromatic	2.5 m or 5 m	0.48 - 0.71 $\mu\text{m}$
	B1 : green	10 m	0.50 - 0.59 $\mu\text{m}$
	B2 : red	10 m	0.61 - 0.68 $\mu\text{m}$
	B3 : near-infra-red	10 m	0.78 - 0.89 $\mu\text{m}$
	B4 : short-wave infrared (SWIR)	20 m	1.58 - 1.75 $\mu\text{m}$
SPOT 4	Monospectral	10 m	0.61 - 0.68 $\mu\text{m}$
	B1 : green	20 m	0.50 - 0.59 $\mu\text{m}$
	B2 : red	20 m	0.61 - 0.68 $\mu\text{m}$
	B3 : near-infra-red	20 m	0.78 - 0.89 $\mu\text{m}$
	B4 : short-wave infrared (SWIR)	20 m	1.58 - 1.75 $\mu\text{m}$
SPOT 1	Panchromatic	10 m	0.50 - 0.73 $\mu\text{m}$
SPOT 2	B1 : green	20 m	0.50 - 0.59 $\mu\text{m}$
SPOT 3	B2 : red	20 m	0.61 - 0.68 $\mu\text{m}$
	B3 : near-infra-red	20 m	0.78 - 0.89 $\mu\text{m}$

**The HRS (High-Resolution Stereoscopic imaging instrument)** flown on SPOT 5 is dedicated to taking simultaneous stereopairs of a swath 120 km across (width of the observed scene centred on the satellite ground track) and 600 km long (maximum length of a scene). The stereopairs are acquired in panchromatic (black and white) mode with a spatial resolution of 10 metres (along-track sampling of 5 metres) and a telescope viewing angle of  $\pm 20^\circ$ .



**VEGETATION instrument**, flown on SPOT 4 (VEGETATION 1) and SPOT 5 (VEGETATION 2): a very wide angle (2 250 km-wide swath) earth observation instrument offering a spatial resolution of 1 km and high radiometric resolution. It uses the same spectral bands as the HRVIR instruments (B2, B3 and mid-IR) plus an additional band known as B0 (0.43-0.47  $\mu\text{m}$ ) for oceanographic applications and for atmospheric corrections.

### **Solid state memory**

On SPOT 4, the recording capacity of each of the two onboard recorders is increased from 22 to 40 minutes. In addition, a solid-state memory of about 10 Gbit has been added to increase the overall reliability of onboard recording and extend the design life, while ensuring a greater storage capacity.

On SPOT 5, a solid-state memory of 90 Gbits (up to 200 scenes can be recorded)

### **Other passengers**

**Doris** (precision satellite-based orbit determination and radio positioning system) onboard package, identical to those carried by Spot 2 and -3. This system, successfully demonstrated by the Doris/Spot 2 mission, allows the calculation of the spacecraft's position in space (after ground data processing) within 10 cm. It is also used to locate ground beacons with the same accuracy. For the Spot 4 mission, additional software has been tested (Doris/Diode experiment) to determine the spacecraft's position in real time, to within a few tens of metres, using data generated by the Doris package. This position data is, in turn, included in the auxiliary data transmitted with the image telemetry.

**Pastel**, or SPOT laser communications passenger, a component of the European Space Agency's Silex experiment. Silex (semiconductor intersatellite link experiment) is a satellite-to-satellite laser communications system using solid-state laser transmitters and receivers. In December 2001 the first images were transmitted by Pastel over a laser link at a high bit rate, via the Artemis geostationary relay satellite.