Looking at the earth through the omnipresent eye of satellites

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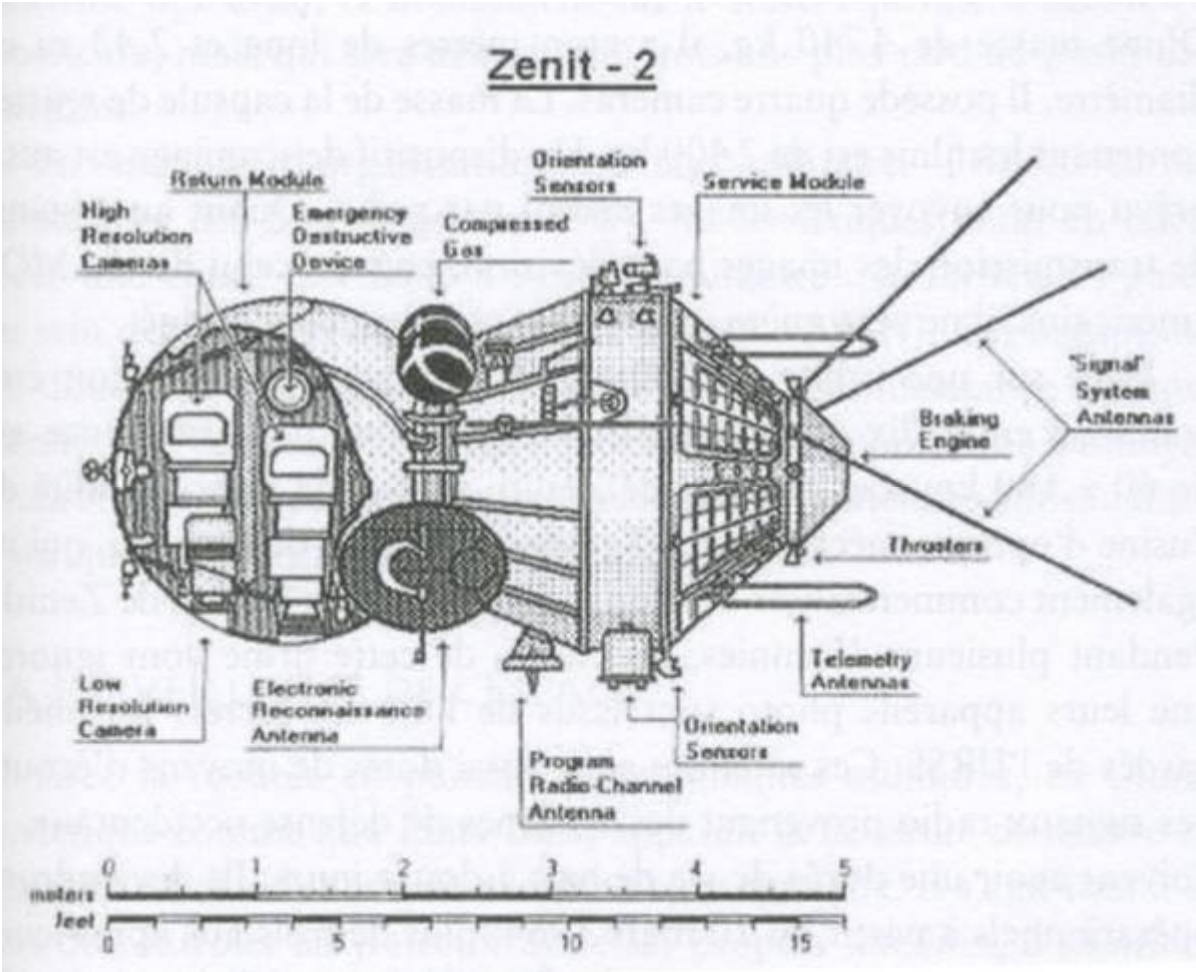
Earth has been observed from space since 50 years…

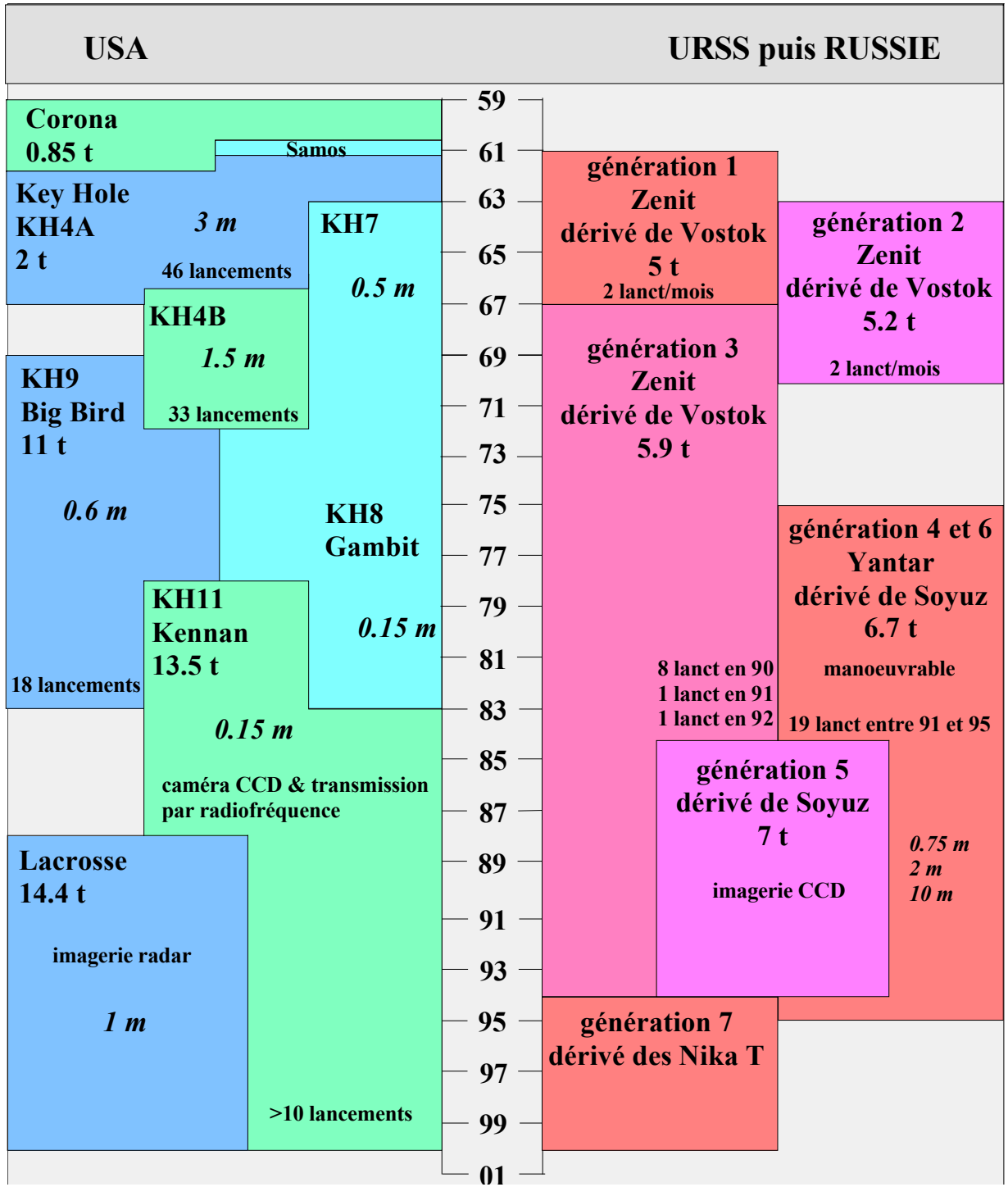
As soon as they have been able to launch satellites into orbit, Americans have developed reconnaissance satellites. This is the Corona programme.

As soon as they have understood that they are observed by American satellites, Soviet Union has started their own programme.



From 1970 to 1989, SOYUZ launcher put in orbit, yearly, between 20 and 30 reconnaissance satellites

American and Soviet reconnaissance satellites from 1959 to 2001



Earth observation in the world during the twentieth century

United States started civilian applications with satellites in the seventies: Landsat series of satellites developed by NOAA.

In **USSR** and after **Russia**, earth observation remains a strategic asset in the hands of military authorities.

China would have launched its first reconnaissance satellites as soon as 1975, but with little accuracy. High resolution satellites have been developed after 2000.

France, with **Belgium** and **Sweden**, launched SPOT in 1986. It's for civilian applications and the first reconnaissance satellite Helios, developed in cooperation with **Italy** and **Spain**, was launched in 1995.

Israel started in 1988 with Ofeq 1 and for military application with Ofeq 3 in 1995.

India started also in 1988 with the series of civilian IRS satellites with resolution making possible military applications. Today, India has pure military satellites Cartosat.

Europe developed ERS satellites. ERS-1 was launched in 1991 and ERS-2 in 1995.

Canada put in orbit its first Radarsat satellite in 1999.

New comers in the present century

- Pakistan launched in 2001 the Badr-1 reconnaissance satellite
- Taïwan put in orbit in 2002 the Rocsat satellites built by Astrium (2m)
- in 2003, Japan put in orbit two military satellites, one optical and one radar.
- South Korea launched Kompsat-2 in 2006
- Egypt launched MisrSat-1, alias Egypsat-1 in 2007
- In 2007 too, Saudi Arabia started operation of Saudisat-3 with a surveillance capability.
- In 2008, Thaïland launched a small optical satellite Theos built by Astrium
- This year, Algeria and Chile must launch their first satellites with 2 m resolution.

In Europe, France continues with Pléiades satellites for both civilian and military applications. The resolution is 70 cm. Several partners are associated: Belgium, Sweden, Italy, Spain and Austria. Germany has developed radar satellites, Sar-Lupe The first of the series was launched in 2006. Italy has launched since 2007 the constellation of satellites Cosmo-Skymed with radars of one meter resolution.
ESA launched the Envisat satellite in 2002 with a lot of instruments. Next generation will be called Sentinel satellites and they will be developed in the frame of the GMES programme.

Earth observation: towards a commercial application

In 1992, Russians started to commercialise the images obtained from their observation satellites. They opened their archives for scenes of more than 2 meters resolution.

By reaction, in 1994, President Clinton authorized private companies to sell high resolution images. This decision was the starting point for Ikonos with 1 meter resolution (2001), Quickbird with 60 cm (2002) and more recently (2008) Geo-eye with 41 cm.

In France, CNES has broadly supported the commerce of SPOT images creating SPOTIMAGE with the role of prime shareholder. But, today, industry, in fact EADS Astrium, has become the reference shareholder of SPOTIMAGE. Recently, they took the decision to invest in the construction of two additional SPOT satellites (6 & 7) through the Astroterra programme. The first launch is expected in 2012.