

# **NIGERIASAT-1**

By

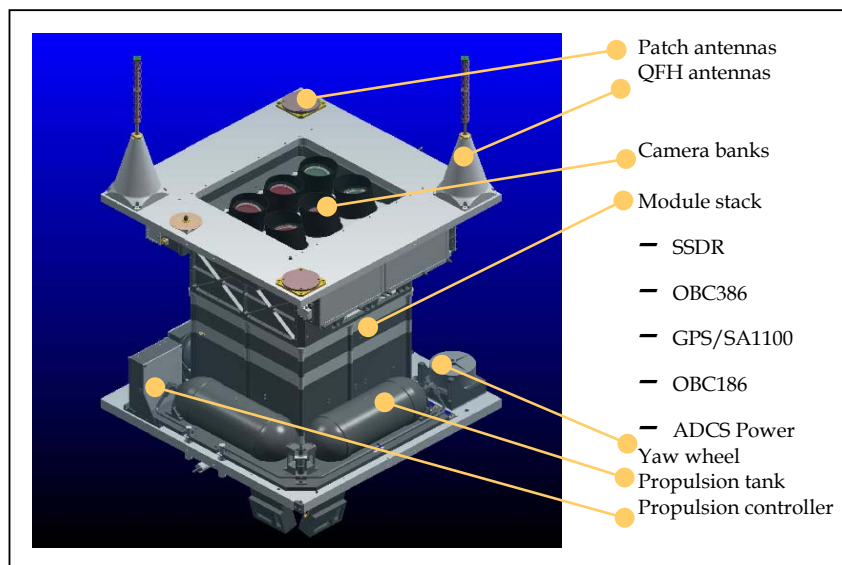
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The Nigerian Federal executive Council at its meeting of May 2001 approved the National Space Policy and Programme. The vision of the policy is to make Nigeria build indigenous competence in developing, designing and building appropriate hardware and software in space technology as an essential tool for its socio-economic development and enhancement of the quality of life of its people. Nigeria signed the contract for the building of the NigeriaSat-1 with Surrey Satellite Technology Limited (SSTL), of the United Kingdom on the 7<sup>th</sup> of November 2000.

The 98kg Microsatellite, which was jointly designed and built by a team of Engineers from SSTL and Nigeria was launched into 686 km Sun synchronous orbit on the 27<sup>th</sup> of September 2003 at 7.07 GMT on board a Cosmos launch vehicle in Plesetsk, Russia. It was designed and built for a Disaster Monitoring Constellation (DMC)



*NigeriaSat-1 Configuration*



*Launcher Selection*

The NigeriaSat-1 carries an imaging payload that provides satellites images of 32m resolution with a swath width of 600km using push broom scanning in three spectral bands (Red, Green and Near Infra Red) and 3-5days revisit and a daily revisit when in constellation with four (4) other satellites.

The spacecraft is equipped with two 0.5Gbyte Solid State Data Recorder (SSDR) for data storage during imaging and a main Receiver Frequency (RF) downlink at S band Frequencies with data rate of 8Mbps using store and forward communications. A 3.7 m dish Mission Control Ground Station manned by Nigerians is installed in Abuja for the Telemetry, Telecontrol and Command of the spacecraft.

Image download from the spacecraft is processed from low-level data (bits and bytes) into full false color images and made available to users in soft copy.

The contract for the building of the NigeriaSAT-1 also included the training of 15 Nigerian Engineers /Scientist in a Know How Technology Training (KHTT), a fifteen months of intensive training in the design and building of all subsystems of the NigeriaSat-1 Spacecraft. The training would enable the engineers to design and build subsequent generations of satellites with very minimal supervision.

The DMC Consortium is a novel international partnership between, Nigeria, United Kingdom, Turkey, Algeria, China, Vietnam, and Thailand. Each of the DMC partners is to provide a spacecraft with almost the same configuration that will work in constellation. The constellation would provide a global coverage and daily revisit with provision of real time data. Only four of the DMC satellites are in orbit presently, namely.

- Alsat 1 - belonging to Algeria
  - NigeriaSat-1 - belonging to Nigeria
  - U.K -DMC - belonging to United Kingdom
  - Bilsat-1 - belonging to Turkey
- (The other satellites of the DMC would join the constellation soon).

Nigeria's collaboration in the DMC will enable her to acquire advanced micro-satellite technologies for business opportunities, such as:

- Low Cost LEO microsatellite technology
- Constellation technology
- Dynamic remote Sensing satellite technology

Through the Nigeria-UK collaboration in LEO Microsatellite and the DMC arrangement, Nigeria will be able to have national independence and accessible, inexpensive, flexible and dynamic remote sensing capabilities. It will stimulate remote sensing applications for various socio-economic activities in the areas of Agriculture, Environmental management, Water resources management, Oil pipeline monitoring.

The spatial and multi-spectral resolutions of the satellites images provided by the DMC satellites are similar to those of the by Landsat systems. The DMC satellites however, provide higher temporal resolution i.e. shorter revisit time than that of the Landsat.

*With South Africa having its own in-house built micro-satellite (GREENSAT and SUNSAT), Algeria (Alsat 1) and Nigeria (NigeriaSat –1) have lately acquired their own micro constellation satellite and Morocco is in the verge of following-up*