

Argos: A Bright Future Ahead

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View of the first Argos Nanosatellite ANGELS (on the right), precursor of the future Kinéis nanosat, with an Argos-4 payload. The constellation of 20 nanosats makes it possible to have a much faster revisit time.

Since the late 1970s, Argos is the only satellite system that caters to biologists, with miniaturized platforms, low power transmitters, and the ability to send data in extremely difficult conditions. Thanks to collaboration between Argos users, tag manufacturers, such as Microwave Telemetry, and the French Space Agency, who designs Argos instruments, the limits of Argos satellite telemetry have been pushed ever further, to track more than 1,000 species today.

Capitalizing on its long experience in state-of-the-art, innovative instrumentation, the French Space Agency, CNES, improved the capabilities of the Argos system, by investing in a new generation of Argos payloads, called Argos-4, that will fly on the satellites of its international partners starting in 2019.

Argos-4 technology promises to be a turning point in Argos history, especially for animal tracking applications. With increased bandwidth (7 times more capacity than Argos-3), Argos-4 caters to very low power transmitters. The spectrum analyzer function on-board will be able to check the overall frequency bandwidth and identify interferers, and small transmitters will be deployed in dedicated “clean” and “uncrowded” frequency bands. With the ongoing collaboration of innovative Argos tag manufacturers, who continuously strive to push the system limits ever further, the objective is to decrease output power of tags to 100 mW.

Argos-4 also provides an improved Argos downlink @ 466 MHz, representing a new modulation (spread spectrum), compatible with US frequency regulations and ensuring better performance in noisy environments.

Argos-4 will send ever more data even more efficiently, improving performance for existing applications as well as opening the door for a host of new ones, including investigation of the ecology of species. It is completely compatible with all existing generations of Argos tags.

In parallel, CLS, with the support of the French Space Agency CNES, is working to develop a completely new generation of dedicated satellites, using nanosat technology to decrease drastically the satellite revisit time for the transmitters (10-15 minutes on average) everywhere and thus add new dimensions to Argos animal tracking. This constellation of 20 nanosatellites, called Kinéis, based on Argos-4 technology and fully compatible with already existing Argos tags, builds on the dynamic of the NewSpace movement while keeping close ties to the international space agencies (CNES, ISRO, EUMETSAT, NOAA) who have historically managed the Argos system.

CLS's subsidiary, Kinéis, aims to become a major player in NewSpace and allow, by 2030, several million objects to be

connected wherever they are on the surface of the globe. Thanks to the increased capacity of this system, biologists as well as the general public, will have access to a global satellite location and connectivity service, which will be very easy to use and very affordable. The constellation of nanosatellites will be developed with strategic partners: Thales Alenia Space, Nexeya, Syrlinks.

With Argos-4 and Kinéis, CLS and its partners are revolutionizing Argos and democratizing a system that has enabled the history of animal migration to be rewritten. More efficient, easier and affordable, the unique and universal connectivity offered by Kinéis provides service continuity to today's faithful users of the Argos system. In parallel, the international space agencies continue to maintain the Argos system with Argos-4 payloads and beyond launched on satellites of the European Agency for Meteorological Satellites (EUMETSAT) until 2036.

For 40 years, Argos has been the key tool of Earth scientists and life scientists to study our physical environment and reveal the mysteries of the animal world. As we enter a new era of satellite telemetry, CLS, Argos users and Microwave Telemetry, Inc. will continue to work together to find the best-adapted solutions for tracking highly migratory species, collecting essential data along their trajectory, understanding and analyzing their behavior, and thus continuing to protect biodiversity around the globe.

TIMELINE

- Current constellation status: 7 operational satellites by January 2019 (Argos-2 and Argos-3)
- Argos-4 will be launched in 2019 by ISRO on OceanSat-3
- U.S. government is committed to continue support of the Argos system
- CNES is launching the Argos ANGELS project (Argos NEO Generic Economic Light Satellites) with the launch of the 1st Argos nanosat in 2019
- The European Agency for Meteorological Satellites, EUMETSAT, is committed to launching Argos payloads onboard European satellites until 2036
- End 2021: Kinéis, subsidiary of CLS, will launch new connectivity based on 20 nanosatellites

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