AMSAT Update

July 10, 2020

Presented by Paul Stoetzer, N8HM

Executive Vice President, AMSAT

Agenda

- Introduction to AMSAT
  - Current AMSAT Satellites
  - Future AMSAT Satellites
  - Ongoing Projects
  - ARISS
- Resources
- Virtual Symposium

About AMSAT

The Radio Amateur Satellite Corporation, or AMSAT, is a worldwide group of Amateur Radio Operators (Hams). It was formed in the District of Columbia in 1969 as an educational organization.

For over 50 years AMSAT groups in North America and elsewhere have played a key role in significantly advancing the state of the art in space science, space education, and space technology. The work now being done by AMSAT volunteers throughout the world will continue to have far-reaching, positive effects on the future of both Amateur Radio, as well as other governmental, scientific and commercial activities in Space – The Final Frontier.

AMSAT Mission

- AMSAT's goal is to foster Amateur Radio's participation in space research and communication. The Organization was founded to continue the efforts, begun in 1961, by Project OSCAR, a west coast USA-based group which built and launched the very first Amateur Radio satellite, OSCAR, on December 12, 1961, barely four years after the launch of Russia's first Sputnik.
- Today, the "home-brew" flavor of these early Amateur Radio satellites lives on, as most of the hardware and software now flying on even the most advanced AMSAT satellites is still largely the product of volunteer effort and donated resources.
- Though we are fond of traditions our designs and technology continue to push the outside of the envelope.

AMSAT's Current Operating Satellites

AO-7 launched November 15, 1974 by a Delta 2310 launcher

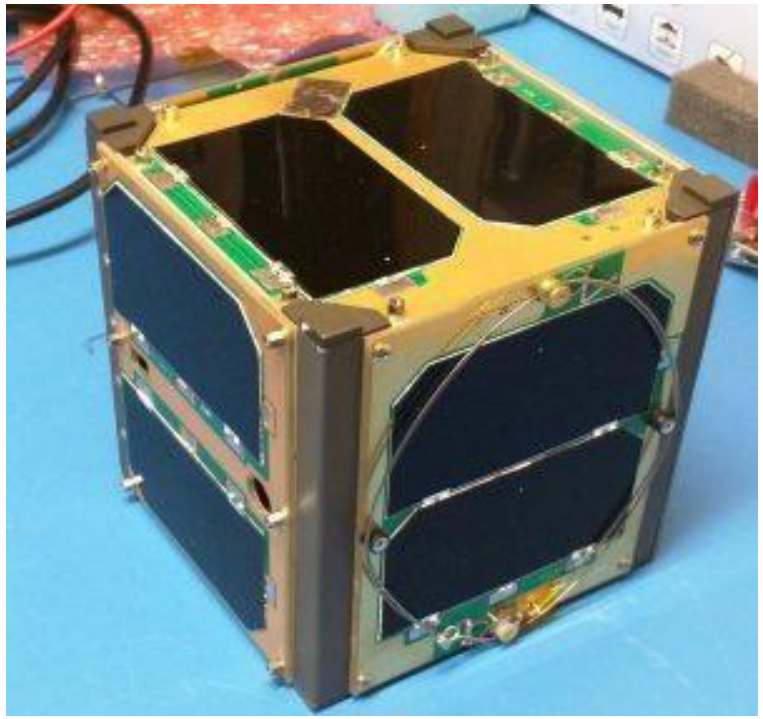
AO-91 (Fox-1B/RadFxSat) launched by a Delta II on November 18, 2017

AO-92 (Fox-1D) launched aboard Indian PSLV-C40 on January 12, 2018

AO-95 (Fox-1Cliff) launched via SpaceX Falcon 9 on December 4, 2018

Fox-1 [A,B,C,D] Satellite Overview

- 1u CubeSat 10x10x10cm (4 inch cube)
  - Standardized Space Frame
  - Fixed Solar Panels
  - Deployable Antenna
- Low Earth Orbit (LEO)
  - Nominal 600- 800 km, depending on launcher.
- Single channel FM transponder; Mode U/v
- Fox-1C and D include L-Band “downshifter” Mode L/v
- 500-800 mW EIRP
- Experiments
  - Radiation/Gyroscope/Camera
- Data Under Voice (DUV) FSK telemetry



AMSAT's Upcoming Satellites

Fox-1E (RadFxSat-2)

- Final in Fox-1, 1U cubesat series; linear transponder.
- Launch via Virgin Galactic LauncherOne ~ Q3 2020.

GOLF-TEE

- Will serve as testbed for future missions and include Fox-1E linear transponder + new SDR transponder with a 10 GHz downlink. Launch as early as 2021.

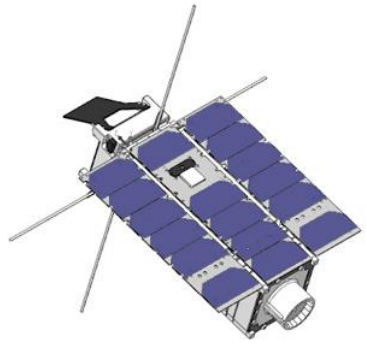
GOLF-1

- Will aim for higher LEO orbit as the first official "Greater Orbit, Larger Footprint" AMSAT CubeSat. Launch is targeted for 2021.

Additional AMSAT Projects

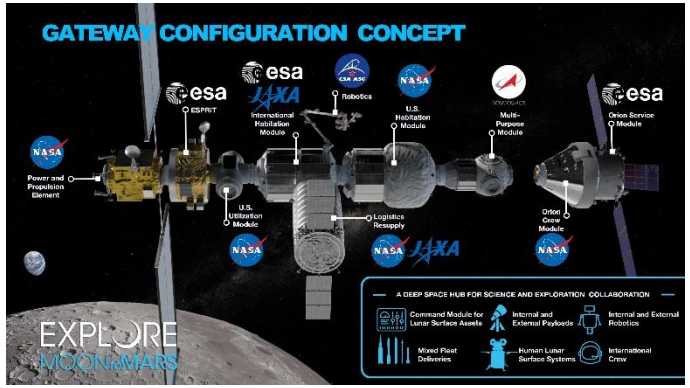
Linear Transponder Module

- First one flew aboard HuskySat-OSCAR 107 earlier this year.
- Several other CubeSat projects have tentatively planned to fly this transponder. Stay tuned!



Lunar Gateway

- AMSAT, along with our ARISS partners, is developing an amateur radio package, including two-way communication capability, to be carried on-board Gateway in lunar orbit.



Amateur Radio on the International Space Station

About ARISS

- Amateur Radio on the International Space Station (ARISS) inspires students, worldwide, to pursue interests and careers in science, technology, engineering and math through amateur radio communications opportunities with the **International Space Station (ISS)** on-orbit crew. Students learn about life on board the ISS and explore Earth from space through science and math activities. ARISS provides opportunities for the school community (students, teachers, families and community members) to become more aware of the substantial benefits of human spaceflight and the exploration and discovery that occur on spaceflight journeys. Students have the opportunity to learn about space technologies and the technologies involved with space communications through exploration of amateur radio. ARISS is a cooperative venture of amateur radio societies and space agencies that support the ISS -- in the US, AMSAT, ARRL, CASIS, NASA.

Join AMSAT

Membership includes the AMSAT® Journal and discounts on purchases made through the AMSAT store. Membership also supports many AMSAT activities including:

- OSCAR satellite operations
- Amateur Radio on the ISS
- Educational support
- Hamfest forums
- Beginner materials
- Technical achievement awards
- Future satellites

https://launch.amsat.org/

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The AMSAT Journal

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As a member of AMSAT, you are helping to sustain amateur radio's presence in space. Your membership supports AMSAT activities such as

- working in partnership with government, industry, educational institutions, and fellow amateur radio societies to foster Amateur Radio's participation

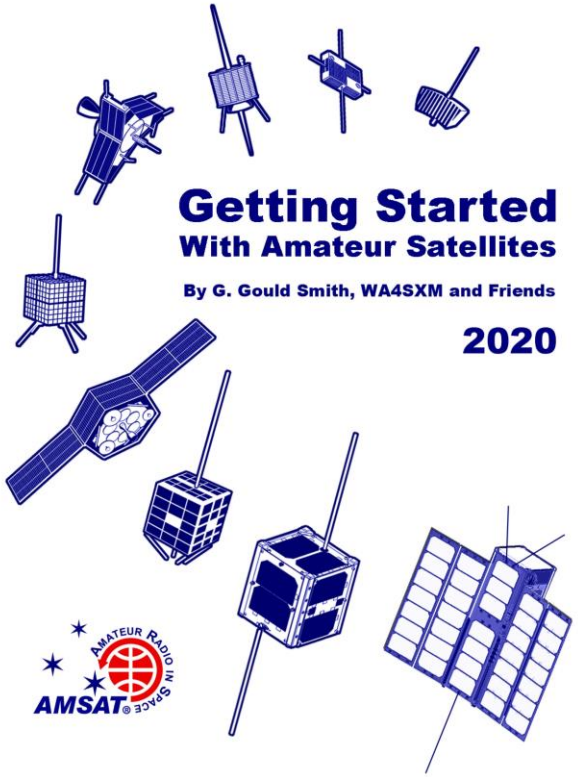
https://www.amsat.org/

Recommended Reading

Getting Started with Amateur Satellites, 2020

This definitive reference is written for the new satellite operator by Gould Smith, WA4SXM, but includes discussions for the experienced operator who wishes to review the features of amateur satellite communications. The new operator will be introduced to the basic concepts and terminology unique to this mode. Additionally, there are many practical tips and tricks to ensure making contacts, and to sound like an experienced satellite operator in the process.

https://www.amsat.org/product/2020-edition-of-getting-started-with-amateur-satellites-digital-download/



38th Annual Space Symposium – Virtual Event

Virtual Event – October 2020

- The 38th Annual AMSAT Space Symposium and Annual General Meeting in-person event scheduled to be held in Bloomington, Minnesota has been canceled. The event will be shifted to a virtual, online platform. This comes after a decision made between AMSAT's Senior Leadership and Board of Directors in response to the ongoing COVID-19 pandemic. While AMSAT recognizes the national challenges related to recent events in Minneapolis, they have no bearing on the Symposium decision whatsoever. We anticipate holding 2021's Annual Space Symposium at the previously announced 2020 venue i.
- The in-person event was scheduled to occur Friday, October 16th – Sunday, October 18th. As the 2020 virtual event plans are developed, they will be announced via the usual AMSAT channels.

https://www.amsat.org/amsat-symposium/

Q & A

Questions?