



Secretariat

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**Committee on the Peaceful
Uses of Outer Space**

**Information furnished in conformity with the Convention
on Registration of Objects Launched into Outer Space**

**Letter dated 9 December 2016 from the Permanent Mission of
Denmark to the United Nations (Vienna) addressed to the
Secretary-General**

The Permanent Mission of Denmark to the United Nations (Vienna), in accordance with article IV of the Convention on Registration of Objects Launched into Outer Space (General Assembly resolution 3235 (XXIX), annex) and General Assembly resolution 62/101 of 17 December 2007, has the honour to transmit information concerning space objects launched by Denmark (see annex).



Annex

Registration data on space objects launched by Denmark^{*}

AAU CUBESAT

Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space

Committee on Space Research international designator	2003-031G
Name of space object	AAU CUBESAT
National designator/registration number	2003-DK-01
State of registry	Denmark
Other launching States	Russian Federation
Date and territory or location of launch	30 June 2003 at 1415 hours 0 seconds UTC Plesetsk Cosmodrome Site 133/3, Russian Federation
Basic orbital parameters	
Nodal period	101.4 minutes
Inclination	98.7 degrees
Apogee	830 kilometres
Perigee	818 kilometres
General functions of space object	Student satellite demonstrator. The mission itself was the demonstrator. AAU CUBESAT was on the very first student CubeSat launch. AAU CUBESAT was designed and built within a two-year time frame.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Date when space object is no longer functional	1 September 2003
Website	http://cubesat.aau.dk http://studentspace.aau.dk
Space object owner or operator	Aalborg University, Fredrik Bajers Vej 5, DK-9220 Aalborg Ø
Launch vehicle	Rokot/Briz-KM
Other information	Estimated year of re-entry: 2045

^{*} The information was submitted using the form prepared pursuant to General Assembly resolution 62/101 and has been reformatted by the Secretariat.

DTUsat**Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space**

Committee on Space Research international designator	2003-031C
Name of space object	DTUsat
National designator/registration number	2003-DK-02
State of registry	Denmark
Other launching States	Russian Federation
Date and territory or location of launch	30 June 2003 UTC Plesetsk Cosmodrome, Arkhangelsk Oblast, Russian Federation
Basic orbital parameters	
Nodal period	101.32 minutes
Inclination	98.70 degrees
Apogee	827 kilometres
Perigee	814 kilometres
General functions of space object	DTUsat (DTUsat-1) was built by students at the Technical University of Denmark and as such provided a platform for hands-on teaching of space technology and systems engineering. The student satellite's primary mission was to test an electrodynamic tether to be used as a tool for space debris mitigation. The tether would reduce the deorbiting time. Secondary payloads were a camera and the successful sun sensor based on micro-electro-mechanical systems (MEMS). The sensor has now flown on six missions. Contact was never established with DTUsat-1.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Date when space object is no longer functional	30 June 2003
Website	dtusat1.dtusat.dtu.dk
Space object owner or operator	Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark
Launch vehicle	Rokot-KM
Other information	The adapter to the launcher was a Poly Picosatellite Orbital Deployer (P-POD), carrying three CubeSats. Integration of the satellites and the P-POD was carried out at the University of Toronto Institute for Aerospace Studies in Canada.

Some ambiguity exists on the exact launch time: 1409 hours 36 seconds UTC or 1415 hours UTC.

The spacecraft was launched prior to the implementation of United Nations regulations on space debris. It has lost 3 km altitude during a period of 10 years. It is expected that the spacecraft will remain in orbit for at least 100 years.

AAUSAT-II

Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space

Committee on Space Research international designator	2008-021F
Name of space object	AAUSAT-II
National designator/registration number	2008-DK-01
State of registry	Denmark
Other launching States	India
Date and territory or location of launch	28 April 2008 at 0554 hours 0 seconds UTC Satish Dhawan Space Centre, Sriharikota, India
Basic orbital parameters	
Nodal period	97.2 minutes
Inclination	98.0 degrees
Apogee	634 kilometres
Perigee	616 kilometres
General functions of space object	Student satellite demonstrator. The payload is an experimental gamma ray detector based on a solid cadmium zinc telluride (CdZnTe) crystal technology. The crystal's dimensions are $10 \times 10 \times 4$ mm, and weighs less than 5 grams. This specific crystal has a detection range from 5 to 300 keV with a resolution of 3 keV at 60 keV, making this small crystal a very usable scientific device. No valid results were obtained.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Date when space object is no longer functional	29 April 2010
Website	http://aausatii.aau.dk http://studentspace.aau.dk

Space object owner or operator	Aalborg University, Fredrik Bajers Vej 5, DK-9220 Aalborg Ø
Launch vehicle	PSLV-CA C9
Other information	Estimated year of re-entry: 2028

AAUSAT3

Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space

Committee on Space Research international designator	2013-009B
Name of space object	AAUSAT3
National designator/registration number	2013-DK-01
State of registry	Denmark
Other launching States	India
Date and territory or location of launch	25 February 2013 at 0554 hours 0 seconds UTC Satish Dhawan Space Centre, Sriharikota, India
Basic orbital parameters	
Nodal period	100.4 minutes
Inclination	98.6 degrees
Apogee	793 kilometres
Perigee	776 kilometres
General functions of space object	Student satellite demonstrator. Demonstrate a student developed Automatic Identification System (AIS) receiver for tracking ships in oceans, in particular in the Arctic region. A traditional-style modem and a digital signal processor (DSP) AIS receiver have both shown very good capabilities. After new decoding software uploads, the DSP-style receiver could, by the end of the mission, decode more than 20,000 messages per hour.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Date when space object is no longer functional	1 October 2014
Website	http://aausat3.aau.dk http://studentspace.aau.dk
Space object owner or operator	Aalborg University, Fredrik Bajers Vej 5, DK-9220 Aalborg Ø
Launch vehicle	PSLV-CA C20
Other information	Estimated year of re-entry: 2035

GOMX-1**Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space**

Committee on Space Research international designator	2013-066Q
Name of space object	GOMX-1
National designator/registration number	2013-DK-02
State of registry	Denmark
Other launching States	Russian Federation
Date and territory or location of launch	21 November 2013 at 0710 hours 10 seconds UTC Yasny launch base, Orenburg region, Russian Federation
Basic orbital parameters	
Nodal period	98.7 minutes
Inclination	97.7 degrees
Apogee	811.7 kilometres
Perigee	597.6 kilometres
General functions of space object	Technology demonstration satellite with the purpose of demonstrating global aircraft tracking by means of space reception of Automatic Dependent Surveillance-Broadcast (ADS-B) signals.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Website	www.gomspace.com
Space object owner or operator	GomSpace ApS, Alfred Nobels Vej 21A, DK-9220 Aalborg Ø
Launch vehicle	RS-20B (Dnepr launch vehicle)
Other information	Expected year of de-orbiting: 2060

DTUsat-2**Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space**

Committee on Space Research international designator	2014-033W
Name of space object	DTUsat-2
National designator/registration number	2014-DK-01
State of registry	Denmark
Other launching States	Russian Federation
Date and territory or location of launch	19 June 2014 at 1919 hours 19 seconds UTC Yasny launch base, Orenburg region, Russian Federation

Basic orbital parameters	
Nodal period	96.97 minutes
Inclination	97.99 degrees
Apogee	622 kilometres
Perigee	605 kilometres
General functions of space object	DTUsat-2 was built by students at the Technical University of Denmark and as such provided a platform for hands-on teaching of space technology and systems engineering. The satellite has a genuine scientific objective, which was selected by an external jury in an open national “call for payload” competition. The successful mission proposal was submitted by Kasper Thorup, an ornithologist at Copenhagen University. In his proposal, he suggested to use the satellite for the tracking of birds that migrate long distances and have a body mass of 100 grams or less.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Website	www.dtusat.dtu.dk
Space object owner or operator	Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark
Launch vehicle	RS-20B (Dnepr launch vehicle)
Other information	Despite being unable to command the satellite, valuable data have been received from DTUsat-2, and it remains an instrument of calibration for radio amateurs worldwide. As at 7 October 2016, it was expected that the spacecraft would be in its current semi-operational phase for at least 1 to 2 years. The spacecraft is scheduled to re-enter the Earth’s atmosphere before June 2039, thereby abiding by United Nations regulations on space debris.

AAUSAT5

Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space

Committee on Space Research international designator	1998-067GZ
Name of space object	AAUSAT5
National designator/registration number	2015-DK-01
State of registry	Denmark
Other launching States	Japan, United States of America

Date and territory or location of launch	5 October 2015 at 1355 hours 0 seconds UTC International Space Station (ISS)
Basic orbital parameters	
Nodal period	92.69 minutes
Inclination	51.65 degrees
Apogee	416 kilometres
Perigee	409 kilometres
General functions of space object	Student satellite demonstrator. At the request from the European Space Agency (ESA), AAUSAT5 is a modernized replica of AAUSAT3. At the invitation of ESA, the launch was made as part of the ISS mission that also featured the first space mission by a Danish astronaut, Andreas Mogensen.
Date of decay/re-entry/deorbit	15 March 2016
Additional voluntary information for use in the Register of Objects Launched into Outer Space	
Date when space object is no longer functional	15 March 2016
Website	http://aausat5.space.aau.dk http://studentspace.aau.dk
Space object owner or operator	Aalborg University, Fredrik Bajers Vej 5, DK-9220 Aalborg Ø
Launch vehicle	Kounotori 5 (HTV-5) and ISS deployment
Other information	AAUSAT5 was launched from Japan in cargo module HTV-5 to the ISS on 19 August 2015. It was deployed from a Nanoracks deployer on the ISS on 5 October 2015. AAUSAT5 re-entered the atmosphere on 15 March 2016 and burned up during descent.

AAUSAT4

Information provided in conformity with the Convention on Registration of Objects Launched into Outer Space

Committee on Space Research international designator	2016-025E
Name of space object	AAUSAT4
National designator/registration number	2016-DK-01
State of registry	Denmark
Other launching States	France
Date and territory or location of launch	25 April 2016 at 2302 hours 0 seconds UTC French Guiana (France)
Basic orbital parameters	
Nodal period	98.22 minutes
Inclination	98.18 degrees

Apogee	686 kilometres
Perigee	442 kilometres
General functions of space object	Student satellite demonstrator. AAUSAT4 is a modernized replica of AAUSAT3. The mission is one of three CubeSats flown in the Fly Your Satellite! programme of ESA. Two-way communication and control were achieved. Damage of the antennas has prohibited the AIS payload to work correctly and communication to the ground has been difficult.

Additional voluntary information for use in the Register of Objects Launched into Outer Space

Website	http://aausat4.space.aau.dk http://studentspace.aau.dk
Space object owner or operator	Aalborg University, Fredrik Bajers Vej 5, DK-9220 Aalborg Ø
Launch vehicle	Soyuz-STA Fregat-M
Other information	As at September 2016, AAUSAT4 was expected to be in operation for one more year. Re-entry is estimated in 2019.
