

ARKIVEXEMPLAR

**IMPLEMENTING ARRANGEMENT  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
OF THE UNITED STATES OF AMERICA  
AND  
THE SWEDISH NATIONAL SPACE BOARD  
OF THE KINGDOM OF SWEDEN  
FOR  
COOPERATION IN AERONAUTIC AND SPACE RESEARCH  
USING NANOSATELLITE TECHNOLOGIES**

**TABLE OF CONTENTS**

**PREAMBLE**

**ARTICLE 1 – PURPOSE OF COOPERATION**

**ARTICLE 2 – RESPONSIBILITIES**

**ARTICLE 3 – POINTS OF CONTACT**

**ARTICLE 4 – DATA POLICY**

**ARTICLE 5 – INTELLECTUAL PROPERTY RIGHTS**

**ARTICLE 6 – RELEASE OF RESULTS AND PUBLIC INFORMATION**

**ARTICLE 7 – RELATIONSHIP TO THE FRAMEWORK AGREEMENT**

**ARTICLE 8 - AMENDMENTS**

**ARTICLE 9 - ENTRY INTO FORCE AND DURATION**

## PREAMBLE

The National Aeronautics and Space Administration of the United States of America (hereinafter referred to as "NASA"), and the Swedish National Space Board of the Kingdom of Sweden (hereinafter referred to as "SNSB") (together hereinafter referred to as the "Implementing Agencies"):

Recognizing the mutual interest of the Implementing Agencies in the exploration and use of outer space for peaceful purposes;

Recognizing nearly three decades of successful space science cooperation between the Implementing Agencies;

Recognizing the value of international cooperation and of combining efforts for the exploration and use of outer space; and

Recalling the terms of the Framework Agreement between the Government of the United States of America and the Government of the Kingdom of Sweden for Cooperative Activities in the Exploration and Use of Outer Space for Peaceful Purposes, signed at Stockholm October 14, 2005 (hereinafter referred to as the "Framework Agreement");

Have agreed as follows:

## ARTICLE I PURPOSE OF COOPERATION

The purpose of this Implementing Arrangement is to set forth the respective responsibilities of the Implementing Agencies and the terms and conditions under which they will cooperate on aeronautics and space research using nanosatellite (NanoSat) technologies.

SNSB, in collaboration with AAC Microtec AB of Sweden, funded the development of a miniature Remote Terminal Unit (RTU) platform that enables engineers to rapidly design and implement powerful, high-speed sensors on standardized small spacecraft busses. The RTU offers flexibility with integration standards, allowing operation as either an on-board computer with redundant interfaces or as a standard interface module featuring plug-and-play common interfaces. The RTU uses a low temperature, co-fired ceramic substrate with better heat conductivity than printed circuit boards, making it well-suited for use in low-Earth orbit (LEO) programs or environments with up to 30 kilorads of radiation. SNSB, also in cooperation with AAC Microtec AB, funded the development of an advanced 3-dimensional wafer-level packaging (WLP) technology that combines microelectronics and micro-electro-mechanical system (MEMS) sensors in confined spaces using thru-silicon-via (TSV) for wafer stacking and flip-chip technology for forming stacked interconnects.

Cooperation under this Implementing Arrangement will involve an investigation into the standardization and interoperability of these existing technologies and NASA's NanoSat platform. Testing will be conducted at the NASA Ames Research Center (ARC) in both laboratory and real or simulated operational settings. The initial evaluation of a common NanoSat bus and architecture may be followed by a proposal for a joint science mission demonstrating the flexible exchange of payloads, which would require a separate Implementing Arrangement.

## **ARTICLE 2 RESPONSIBILITIES**

NASA shall use reasonable efforts to carry out the following responsibilities:

1. Receive RTU and 3-dimensional wafer packaging technology from AAC Microtec AB for research, evaluation and testing. Use the RTU and 3-dimensional wafer packaging technology for testing purposes;
2. Collaborate with AAC Microtec AB on the development of engineering, configuration and testing protocols to demonstrate RTU and 3-dimensional packaging technology for use with small satellite and space applications;
3. Conduct testing of the RTU and 3-dimensional packaging technology in accordance with protocols developed with AAC Microtec AB;
4. Provide SNSB and AAC Microtec AB with data regarding NASA's test results;
5. Coordinate with SNSB and AAC Microtec AB on the preparation of a final report on the initial integration and testing of NanoSat technologies;
6. Coordinate with SNSB on the potential development of a proposal for a joint scientific mission that may incorporate a NASA experiment and one or two SNSB scientific experiments for interface testing under a separate Implementing Arrangement; and
7. Coordinate with SNSB on any news releases and/or widely distributed publications that result from activities performed under this Implementing Arrangement.

SNSB shall, through AAC Microtec AB, use reasonable efforts to carry out the following responsibilities:

1. Provide NASA with RTU and 3-dimensional packaging technology for research, evaluation and testing;

2. Collaborate with NASA on engineering, software programming, configuration, and testing protocols to demonstrate RTU and 3-dimensional packaging technology for use with small satellite and space applications;
3. Coordinate with NASA on the preparation of a final report on the initial integration and testing of NanoSat technologies;
4. Coordinate with NASA on the potential development of a proposal for a joint scientific mission that may incorporate a NASA experiment and one or two SNSB scientific experiments for interface testing under a separate Implementing Arrangement; and
5. Coordinate with NASA on any news releases and or widely distributed publications that result from activities performed under this Agreement;

NASA and SNSB shall on occasion, as appropriate, provide representatives to visit the facilities of the other Implementing Agency to participate in integration and testing and to observe, confer with, and advise the other Implementing Agency in regard to aspects of standardization and interoperability of NanoSat technologies.

### **ARTICLE 3 POINTS OF CONTACT**

The NASA Headquarters designated points of contact are:

Dr. Jitendra Joshi  
Chief Technical Advisor, Advanced Capabilities Division  
Exploration Systems Mission Directorate  
NASA Headquarters  
300 E Street SW  
Washington DC 20546-0001  
Telephone: (202) 358-5210  
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Mr. Jason Crusan  
Chief Technologist for Space Operations  
Space Operations Mission Directorate  
NASA Headquarters  
300 E Street SW  
Mail Suite 7N39  
Washington DC 20546-0001

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Mr. Brant Sponberg  
Program Executive, SmallSat Programs  
Office of the Chief Technologist  
NASA Headquarters  
Room 5U36  
300 E Street SW  
Washington DC 20546-0001  
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E-Mail: [brant.l.sponberg@nasa.gov](mailto:brant.l.sponberg@nasa.gov)

The NASA ARC designated point of contact is:

Mr. John Hines  
Chief Technologist  
NASA Ames Research Center  
Bldg. 202, Rm. 3  
P.O. Box 1, Moffett Field, CA 94035-0001  
Telephone: (650) 604-5538  
Fax: (650) 604-2970  
E-Mail: [John.Hines@nasa.gov](mailto:John.Hines@nasa.gov)

The SNSB designated point of contact is:

Mr. Christer Nilsson  
Industrial Affairs Officer  
P.O. Box 4006  
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Sweden  
Telephone: +46 8 627 6496  
E-Mail: [Christer.Nilsson@snsb.se](mailto:Christer.Nilsson@snsb.se)

Any change in an Implementing Agency's points of contact, or in the corresponding details, will be communicated in writing by the Implementing Agency making such a change to the other Implementing Agency.

#### **ARTICLE 4 DATA POLICY**

The Implementing Agencies shall have access to and use of all data generated under this Implementing Arrangement at the time the data is generated. The scientific data generated under this Implementing Arrangement will be made available for public access as soon as practicable.

#### **ARTICLE 5 INTELLECTUAL PROPERTY RIGHTS**

1. Nothing in this Implementing Arrangement shall be construed as granting, either expressly or by implication, to the other Implementing Agency any rights to, or interest in, any inventions or works of an Implementing Agency or its Related Entities made prior to the entry into force of, or outside the scope of, this Implementing Arrangement, including any patents (or similar forms of protection in any country) corresponding to such inventions or any copyrights corresponding to such works.
2. Any rights to, or interest in, any invention or work made in the performance of this Implementing Arrangement solely by one Implementing Agency or any of its Related Entities, including any patents (or similar forms of protection in any country) corresponding to such invention or any copyright corresponding to such work, shall be owned by such Implementing Agency or Related Entity. Allocation of rights to, or interest in, such invention or work between such Implementing Agency and its Related Entities shall be determined by applicable laws, rules, regulations, and contractual obligations.
3. It is not anticipated that there will be any joint inventions made in the performance of this Implementing Arrangement. Nevertheless, in the event that an invention is jointly made by the Implementing Agencies in the performance of this Implementing Arrangement, the Implementing Agencies shall, in good faith, consult and agree within 30 calendar days as to:
  - (a) The allocation of rights to, or interest in, such joint invention, including any patents (or similar forms of protection in any country) corresponding to such joint invention;
  - (b) The responsibilities, costs, and actions to be taken to establish and maintain patents (or similar forms of protection in any country) for each such joint invention; and
  - (c) The terms and conditions of any license or other rights to be exchanged between the Implementing Agencies or granted by one Implementing Agency to the other Implementing Agency.

4. For any jointly authored work by the Implementing Agencies, should the Implementing Agencies decide to register the copyright in such work, they shall, in good faith, consult and agree as to the responsibilities, costs, and actions to be taken to register copyrights and maintain copyright protection (in any country).

5. Subject to the provisions of Article 6 (Exchange of Technical Data and Goods) of the Framework Agreement and Article 6 (Release of Results and Public Information) of this Implementing Arrangement, each Implementing Agency shall have an irrevocable royalty-free right to reproduce, prepare derivative works, distribute, and present publicly, and authorize others to do so on its behalf, any copyrighted work resulting from activities undertaken in the performance of this Implementing Arrangement for its own purposes, regardless of whether the work was created solely by, or on behalf of, the other Implementing Agency or jointly with the other Implementing Agency.

#### ARTICLE 6 RELEASE OF RESULTS AND PUBLIC INFORMATION

1. The Implementing Agencies retain the right to release public information regarding their own activities under this Implementing Arrangement. The Implementing Agencies shall coordinate with each other in advance concerning releasing to the public information that relates to the other Implementing Agency's responsibilities or performance under this Implementing Arrangement.

2. The Implementing Agencies shall make the final results obtained from cooperation under the Implementing Arrangement available to the general scientific community through publication in appropriate journals or by presentations at scientific conferences as soon as possible and in a manner consistent with good scientific practices.

3. The Implementing Agencies acknowledge that the following data or information does not constitute public information and that such data or information shall not be included in any publication or presentation by an Implementing Agency under this Article without the other Implementing Agency's prior written permission:

(a) Data furnished by the other Implementing Agency in accordance with Article 6 (Exchange of Technical Data and Goods) of the Framework Agreement that is export-controlled, classified, or proprietary; or

(b) Information about an invention of the other Implementing Agency before an application for a patent (or similar form of protection in any country) corresponding to such invention has been filed covering the same, or a decision not to file has been made.

**ARTICLE 7  
RELATIONSHIP TO THE FRAMEWORK AGREEMENT**

This Implementing Arrangement incorporates by reference and is subject to the Framework Agreement. In the event of a conflict between the provisions of this Implementing Arrangement and the Framework Agreement, the terms of the Framework Agreement shall prevail.

**ARTICLE 8  
AMENDMENTS**

This Implementing Arrangement may be amended through mutual written agreement by the Implementing Agencies.

**ARTICLE 9  
ENTRY INTO FORCE AND DURATION**

This Implementing Arrangement shall enter into force upon the date of the final signature and shall remain in force for ten (10) years unless terminated by one Implementing Agency providing written notice of its intention to the other Implementing Agency at least ninety (90) days in advance of its intent to terminate.

FOR THE NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION:

FOR THE SWEDISH NATIONAL SPACE  
BOARD:





Place: Washington, D.C.

Place: Solna, Sweden

Date: May 10, 2011

Date: May 19, 2011

I certify that this is a true copy  
of the signed original.

 31 May 2011

Patrick Longenbaker  
International Program Specialist