Air Force Space Command (AFSPC)
Modeling, Simulation, and Analysis (MS&A)
For Space and Cyberspace Capabilities (MSCC)

Technical Report – Study/Services for Modeling and Simulation for Space and Cyberspace II (MSSC II) Public Astrodynamic Algorithm Distribution Site (PA²DS), v2.8 Software User Manual (SUM)

7 December 2018

DSoft Technology, Engineering and Analysis
1155 Kelly Johnson Blvd.
Suite 304
Colorado Springs, CO 80920

Table of Contents

List of Tables and Figures

1.0 Public Astrodynamic Algorithm Distribution Site (PA²DS) Overview

The Public Astrodynamic Algorithm Distribution Site (PA²DS) is a website where users can browse information related to the Air Force Space Command (AFSPC) Standardized Astrodynamic Algorithm (SAA) Library (SAAL) and, if they have valid reasons and credentials, can submit a request to obtain algorithms in the SAAL.

This site is not a replacement of the distribution functionality contained on the Space/Cyberspace Analysis Resource Portal (SARP) but rather augments SARP to provide users who do not have access to SARP on the Non-Secure Internet Protocol Router Network (NIPRNet) a way to request the algorithms.

2.0 Using PA²DS

PA²DS can be reached at *https://www.astrodynamicstandards.org* and requires no special permissions to browse. The site contains multiple static content pages that contain useful information about the SAAL and how to request the algorithms.
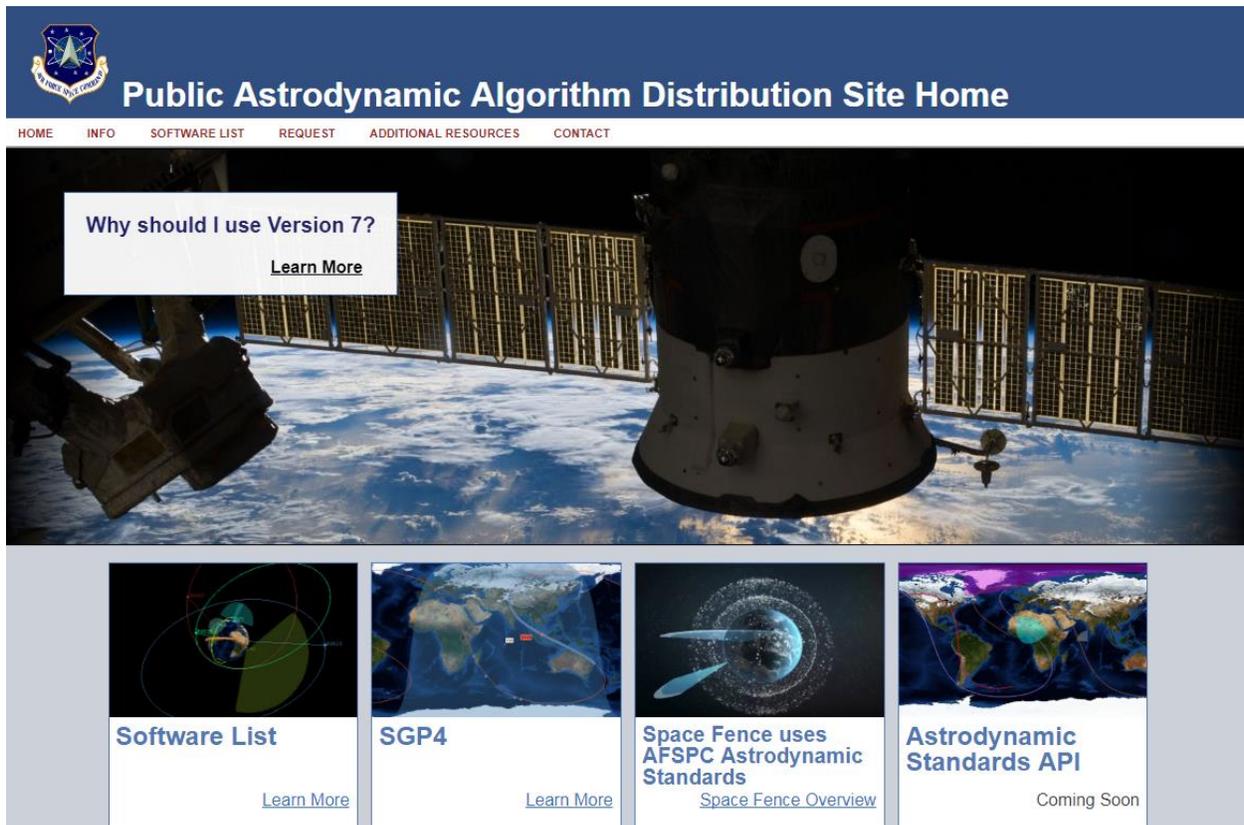

Figure 1: PA²DS Home Page

2.1 Browsing

The site requires no special permissions and is accessible to anyone. Navigation is provided through a navigation bar on the top of the page and a sitemap on the bottom.
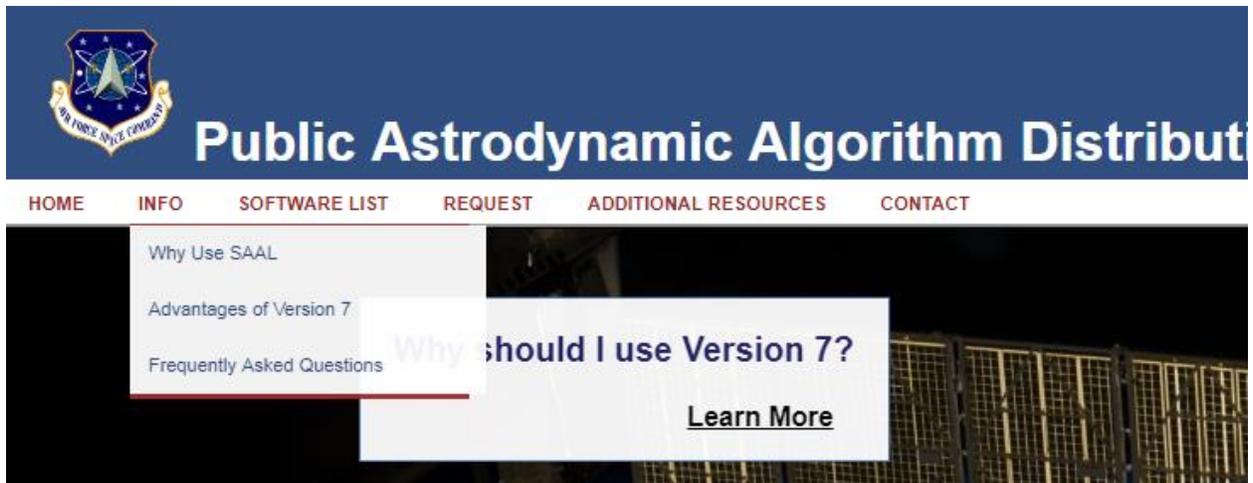
Figure 2: PA^{2}DS Menu

The site provides several informative pages regarding the SAAL including Why Use the AFSPC SAAL, Benefits of Version 7 of the SAAL, and Frequently Asked Questions regarding the request process and the algorithms.

2.2 Requesting Software in the SAAL

In accordance with AFSPC Instruction (AFSPCI) 17-105, *Distribution of HQ AFSPC Standardized Astrodynamic Algorithm Library*, dated 13 June 2018, the requesting agency is required to send a formal request letter to HQ AFSPC/A2/3/6SF.

The letter will identify the specific U.S. Government requirement and state technical justifications for access to the AFSPC SAAL. The request letter should also include a statement of impact describing consequence(s) if the request is denied. Additionally, as an attachment to the request letter, there should an Acknowledgement of Use that outlines the specific use for the software request. The Acknowledgement of Use also states that the software is export controlled by the Arms Export Control Act and falls under the International Trade and Arms Regulation (ITAR).

In an effort to make the process easier and less prone to error, the process of requesting the export controlled software has been automated. For users who do not have access to the Non-Secure Internet Protocol Router Network (NIPRNet) using a Common Access Card or PKI certificate, requests for SAAL can be made on this website. Users that do have access to NIPRNet should make their requests on SARP (*https://halfway.peterson.af.mil/SARP*).

Requests for the Specialized General Perturbations #4 (SGP4) algorithm (removed from the Export Control list in July 2015) can be made by selecting the Space Track link found on the *https://astrodynamicstandards.org/additional-resources/* page.

Any visitor to the website can submit a request for software in the SAAL by selecting the "Request Astrodynamic Algorithms" menu item. The user is first asked whether they are a contractor, a United States of America government employee, or a representative of a foreign government and are given different fields to complete based on which they choose.

Contractors working in a government facility should make a contractor request. Any sub-contractors who will use the algorithms should be included in the contractor request.

2.2.1 Requesting SAAL for a Government Program with Support from Contractors

To comply with ITAR and AFSPCI 17-105 the following process must be adhered to for requests by contractors and sub-contractors supporting a government program.

2.2.1.1 Request Process

Two separate requests for SAAL software are needed for contractors, one from the contractor and the second from the government program office. The list of requested software will be the same for each request.

Even though the government may already have the software, they are required to make a request each time their contractor makes a request to ensure that the list of algorithms and versions match.
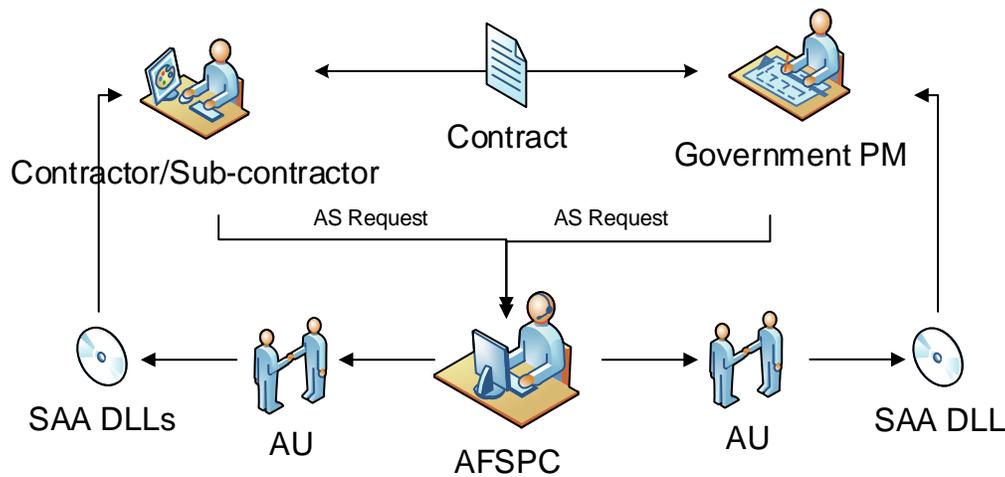

Figure 3: Contractor/Subcontractor Request Process

2.2.1.2 Development and Delivery Process

The contractor will develop the system or software using the provided SAA but will loosely couple the integration to allow for the delivery of the system or software without the SAA. This is typically done by design and architecting the system so that all the SAA DLLs are placed in a folder. Redistribution, according to the Acknowledgement of Use, is prohibited.

At the end of the contract, the contractor will no longer be able to use the SAA. This enforces the Acknowledgement of Use.

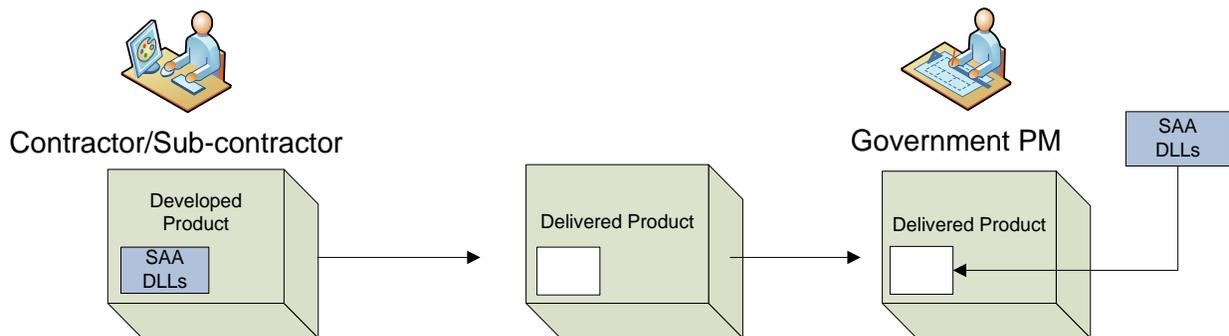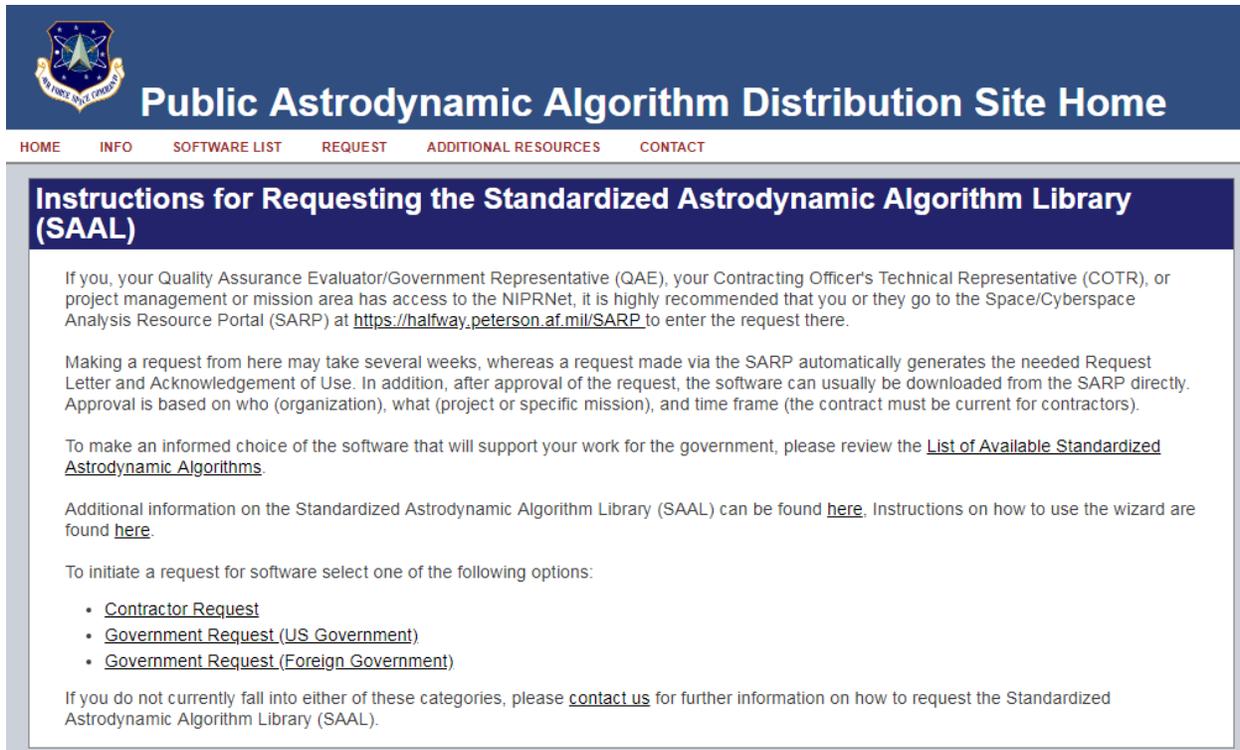Since the Government PM has requested the same SAA, they can plug in the government-provided SAA.

Figure 4: Contractor Delivery of Products per Acknowledgement of Use

3

2.2.2 Requests from Foreign Governments for SAAL Executable.

Users from certain Foreign Governments (no contractors) may request the SAAL, under their respective SSA Sharing Agreements. These countries are currently Canada, Australia, the United Kingdom, New Zealand, German, and France. Users may either use SARP or PA^{2}DS to make their request.

After the request is approved by AFSPC/A2/3/6SF, the software will either be available for download (if the request was made on SARP) or a CD will be provided to you (if the request was made on PA^{2}DS).

2.2.3 Initiating a Request

Figure 5: Requesting ASDA Software

Users are provided a warning that if they have access to the NIPRNet they should make their request using SARP. If they proceed with making their request, they are warned that they need to be prepared to enter multiple Points of Contact Information. A link to this manual is provided on the website.
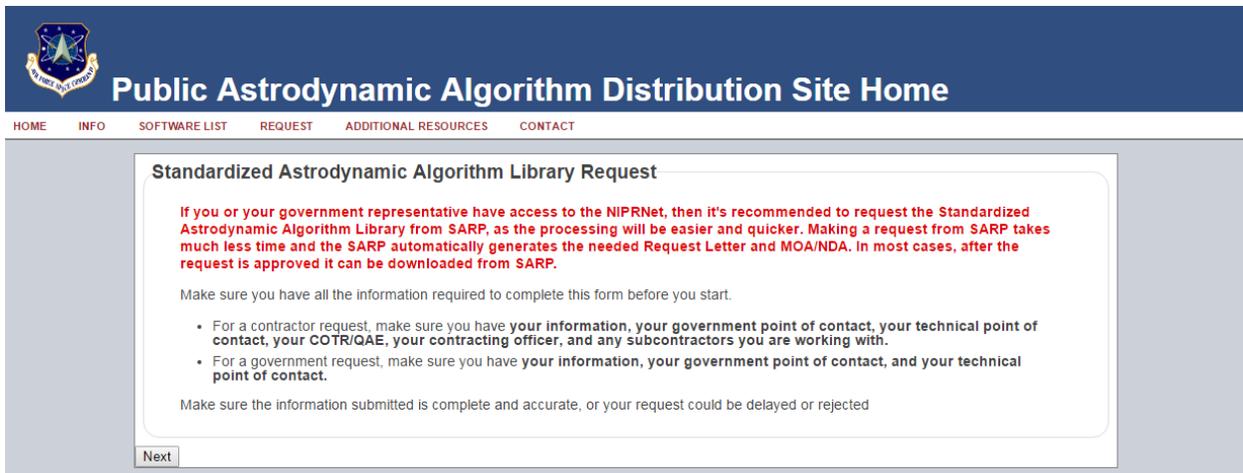
Figure 6: Warning Page

Every user is required to provide the name of the project that will be using the SAAL and the reason why they need the software. Please provide a detailed explanation why the software is required and how the program is benefiting the government. It is necessary to identify the specific U.S. Government requirement and state technical justifications for access to the AFSPC SAA Library. The reason should also include a statement of impact describing consequence(s) if the request is denied.

If the request program name or the reason for the request is classified, enter the following and email the appropriate person with the details for the request.

Program Name	Classified
Reason for Request	Justification for request has been emailed to SIPRNet:*Kathie.E.Reece.ctr@mail.smil.mil* JWICS:*Kathleen.E.Reece@coe.ic.gov*

Figure 7: Project Name and Request Reason

After providing this information, contractors are prompted for their contract number and expiration date. Government users go directly to the software request page.

Figure 8: Contract Information

The software request page provides a list of available software. For more information, please visit the *https://www.astrodynamicstandards.org/software-list/* page and the *https://www.astrodynamicstandards.org/software-list/available-astrostandards/* page. You can also download a list of available software by clicking the "List of Available SAAL DLLs" link on the *https://astrodynamicstandards.org/additional-resources/* page.

Figure 9: Software Request

The "Export Controlled" column indicates whether the software is subject to export controls. At least one file MUST be selected before advancing to the next Wizard page.

Future Support: AFSPC starting on 1 October 2017 will only be supporting Version 7 of the SAAL. Distribution and techical support of previous versions of the software will no longer be provided as of 1 October 2017. Users of previous versions should plan accordingly and build into their development schedule the transition to Version 7 of the software. Also, SUN and SGI versions will not be ported to Version 7.

In very limited cases, users can mix the two versions, V5.4 and V7 of the SAAL. Please contact AFSPC for guidance. The complete library of V7 is currently not available but updates will be provided to you as they are completed. Anticipated completion of the entire V7 library is October 2016. If you need further assistance or guidance, please email *afspc.astrostandards@us.af.mil* or call 719-556-0936. You can also use the Contact Us page to request information or assistance.

After the screen in Figure 5, the requests require different Points of Contact (POC) information depending upon whether the request is a contractor or government request. These POCs are needed for the Acknowledgement of Use. Please see the chart below to determine which contacts you need to collect information on prior to initiating the request.

Contractor Request - Points of Contact	USA Government Request - Points of Contact	Foreign Government Request - Points of Contact
Contractor Information	US Government Requestor Information	Foreign Government Requestor Information
Requestor: Prime Contractor Program Manager	Requestor: US Government Military Commander (O5) or Civilian Equivalent (GS14/GG14)	US Government Point of Contact
US Government Point of Contact	US Government Point of Contact	Foreign Government Point of Contact
Technical Point of Contact	US Government Technical Point of Contact	Foreign Government Technical Point of Contact

US Government Contracting Officer Representative (COR) or Quality Assurance Evaluator (QAE) Point of Contact	Shipping Point of Contact/Address (USPS) Must be a US Government Employee	Shipping Point of Contact/Address (USPS)
US Government Contracting Officer (CO)		
Subcontractor(s) Program Manager		
Prime Contractor Shipping Point of Contact/Address (USPS)		

Figure 10: List of Required Contacts

Here is an example of the screen that collects contact information. Note that the title states which type of contact you are entering.

Figure 11: Sample POC Screen

When the requesting agency is a Prime Contractor that employs and manages subcontractors to carry out specific parts of the contract and those subcontractors require access the SAAL to fulfill the government requirement, use the "Add a Subcontractor Contact" link to add the Subcontractor Program Manager as a contact for each of those subcontractors. The table lists the entered subcontractor's contacts and allows for editing and deleting them.

Figure 12: Adding Subcontractors

Select the Finish button to submit the request. The request is then submitted and emailed to the SAAL Distribution Manager.
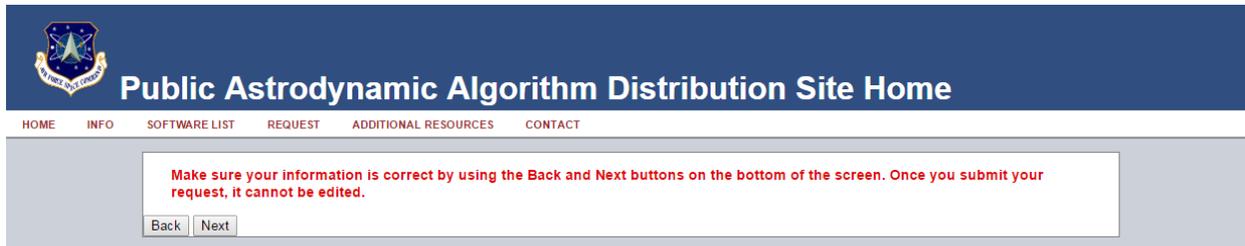

Figure 13: Submitting your Request

After receiving the request, the SAAL Distribution Manager will submit it into the SARP. This application automates the request process for AFSPC/A2/3/6SF and it will generate the formal request letter and Acknowledgement of Use. These documents will be sent to the requestor for signatures. Once the signatures are obtained, the request letter and Acknowledgement of Use will be forward to AFSPC/A2/3/6SF for approval. Once the formal request has been received and approved, the SAAL Distribution Manager will mail a Compact Disk (CD) to the requesting agency with the approved software.

Your request will take approximately a week for review and acceptance by the government. Once you receive via email your request letter and Acknowledgement of Use, you will be responsible for collecting the necessary signatures and then emailing the signed letter and Acknowledgement of Use to Mr. Mark S. Riddle, HQ AFSCP/A2/3/6SF at *mark.riddle.2@us.af.mil*. If you have any questions regarding your request after submitting, please contact Mr. Riddle via email or at 719-554-9582, DSN 692-9582.

Appendix A – Acronyms

- A -	
AF	Air Force
AFSPC	Air Force Space Command
AFSPC/A2/3/6	Directorate of Integrated Air, Space, Cyberspace and Intelligence Operations
AFSPC/A2/3/6SF	Missile Warning/Missile Defense and Surveillance Ops Branch
AFSPC/A2/3/6Z	Advanced Space Analysis Division
AFSPC/A5/8/9	Directorate of Strategic Plans, Programs, Requirements and Assessments
AFSPC/A9XY	Strategic Analysis Branch
AFSPCI	AFSPC Instruction
- B -	
- C -	
CD	Compact Disk
- D -	
- E -	
- F -	
- G -	
- H -	
- I -	
IE	Internet Explorer
ITAR	International Trade and Arms Regulation
- J -	
- K -	
- L -	
- M -	
MSSC	Modeling and Simulation for Space and Cyberspace
- N -	
NIPRNet	Non-classified Internet Protocol Router Network
- O -	
- P -	
PA²DS	Public Astrodynamic Algorithm Distribution Site
- Q -	
- R -	
- S -	
SAA	Standardized Astrodynamic Algorithm
SAAL	Standardized Astrodynamic Algorithm Library
SARP	Space and Cyberspace Analysis Resource Portal

SUM	Software User Manual
	- T -
	- U -
	- V -
	- W -
	- X -
	- Y -
	- Z -