

# Catégorie:User Manual 4.2 Spacecraft

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## Introduction

This section presents the Spacecrafts implemented in the PATRIUS library. The “assembly” theme contains the mechanisms provided to describe a space vehicle (or any other useful part assemblies with properties amongst the ones available) and all the models associated with its use.

First, explanations are given about :

- A general presentation of the principles of the Assembly
- the general of description of how to build the Assembly and how to use it

Then, the properties and models associated to those themes are described :

- Inertia properties of the different parts and global model of the vehicle
- The different forces whose computation uses informations about the parts : aero and radiative properties (with different shapes for the parts) and global models
- Sensors (a sensor model is associated to only one instrument : a part that contains the sensor property)
- The link budget between the satellite and the ground station (RF property + budget model)

## Applicable and Reference Documents

### Applicable Documents

**[A1]** *CDCF - Fonctions de Base du Patrimoine de Dynamique du Vol*, V1.2, SIRIUS-CF-DV-0049-CN, 2011.

**[A2]** *Dossier de réutilisation Orekit et Commons Math*, V1.0, SIRIUS-DLR-DV-0080-CN, 2010.

## Reference Documents

None applicable.

## Glossary

None applicable.

## Overview

The Spacecraft of the PATRIUS library is made out of an "Assembly" object.

This name has been chosen because an "assembly" can also be used to model other types of objects, such as an earth based antenna.

The Assembly package has been developed according to the SIRIUS Scope Statement **[A1]**.

The themes developed are described hereafter :

### Presentation

Description of the architecture and the main principles of the theme.

### Building and using an Assembly

Help to build an assembly, with code samples, and explains basically how to use it.

### Properties and models

Each model available is described in a dedicated chapter, as well as the associated properties.

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