

# NanoStructure 6U

## Datasheet

6U structure for nano-satellites

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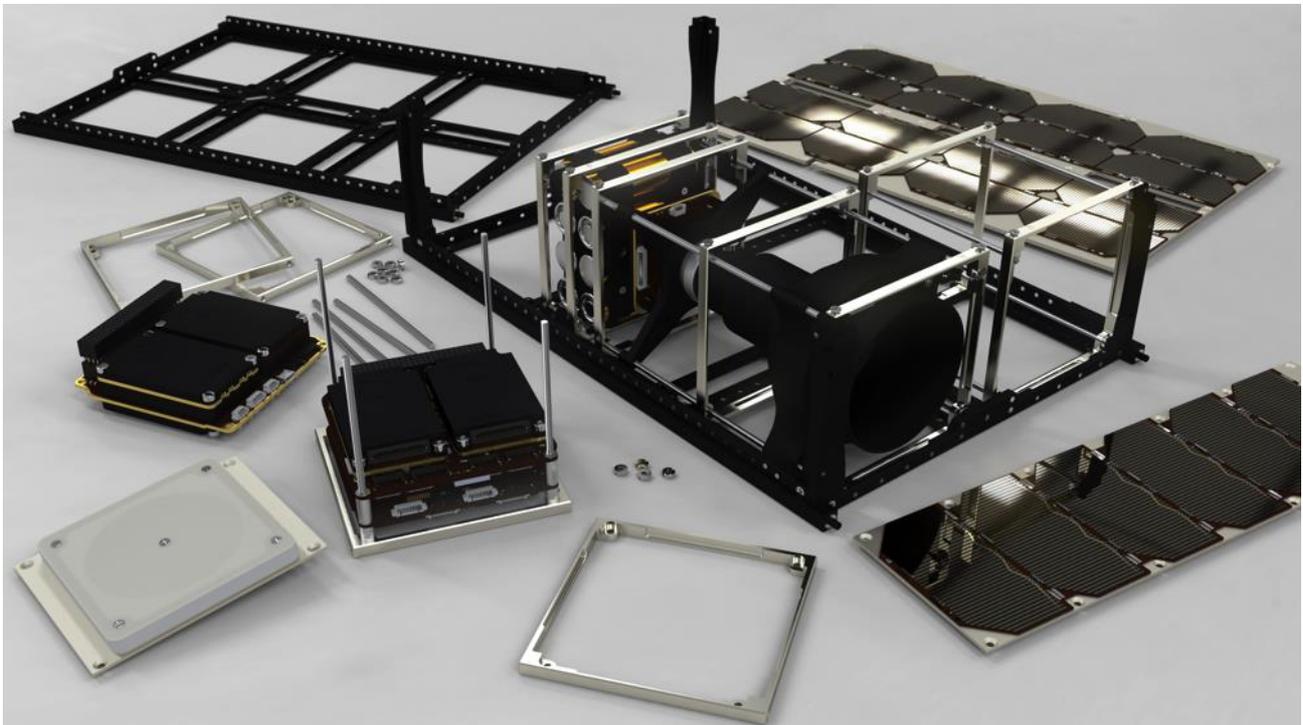
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## 2 Overview

The GomSpace NanoStructure 6U is a generic structure to be used as framework for a 6U nano-satellite. Using mounting rings, hardware can be mounted inside the structure, either in a standard PC104 stack or directly on the structure frame. A stack can be mounted in the structure in multiple orientations. Before mounting surface hardware (e.g. solar panels) all internal hardware is accessible. On the top of the structure there is four kill switches that can be used while the satellite is sitting in its deployer. On the 6U sides are slots for antenna release and sun sensors.

GomSpace has made a number of products that are designed to be used specifically with this structure, these include:

- NanoPower MSP – modular solar panels
- NanoCom ANT-6F – UHF/VHF antenna system
- NanoUtil AR6 – antenna release system
- NanoUtil MSP-FPP – flight preparation panel



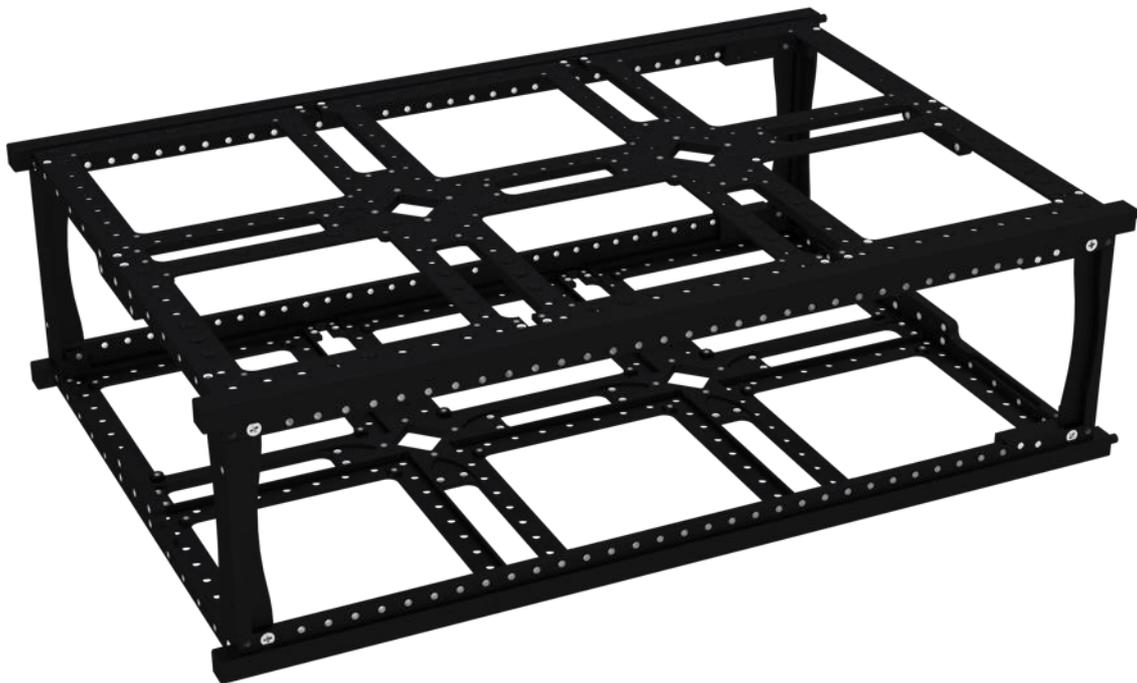
### 2.1 Highlighted Features

- High degree of freedom for hardware mounting with mounting rings
- Four kill switches
- Threaded holes have helicoils and reliability.
- Material: Alu 7075-T7351
- Total mass of default structure: 716 g
- Outside measurements without kill switches: 340.5 x 226.3 x 100.0 mm

### 3 Structure Frames and Corner Brackets

The outer frame is made of two large frames and four corner brackets to join the frames. Each corner is assembled with two screws. Along the frames are made holes for various uses:

- Countersunk holes for internal mounting rings
- Holes for central covering plates
- Holes for solar panels (NanoPower MSP)
- Holes for antenna release (NanoUtil AR6)
- Mounting holes for external systems



All threaded mounting holes have screw lock helicoils. They are used for grounding and for threadlocking without using a liquid locking adhesive solution such as Loctite®.

### 3.1 Kill Switch and Separation Springs

At the top of the structure frame are four switches, which are pressed down while the satellite is placed in its orbital deployer. While the buttons are pressed the satellite cannot power up. As soon as the satellite is released, it can power up and work normally.

Depending on how the switches are connected to the hardware they can be set in either a serial or parallel setup e.g. how many switches to release before power up.

From each kill switch runs a 60 cm flying lead. The lead is soldered to the switch pins and then glued inside the housing.

Regardless of whether any kill switch is connected, the spring plunger is always installed to provide uniform separation force from all four structure feet.

The force from each kill switch is 6 N when the switch is pressed down flush with the structure feet.

## 4 Mounting Rings

The mounting rings are used for a highly modular internal layout, allowing for numerous variations of the PC104 stack. Each stack is mounted inside the structure frame and can point in any of the three main axis's.

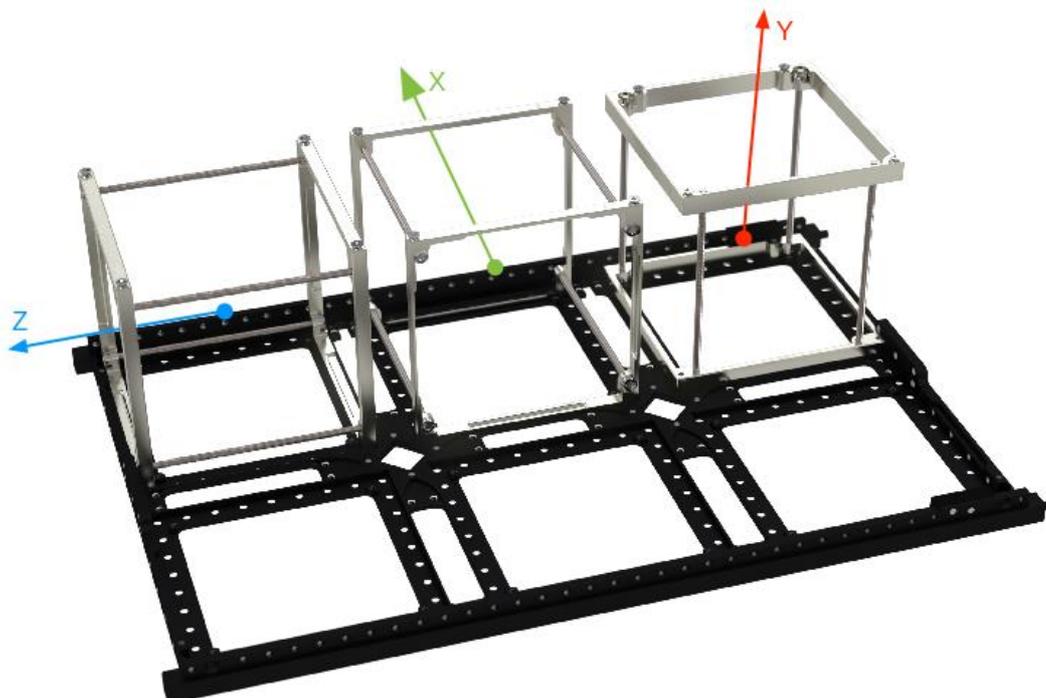
There are two pairs of mounting rings available A, B and YA, YB. Each pair can be connected with threaded rods.

A and B are used in the top and bottom of a PC104 stack when mounting on the frame.

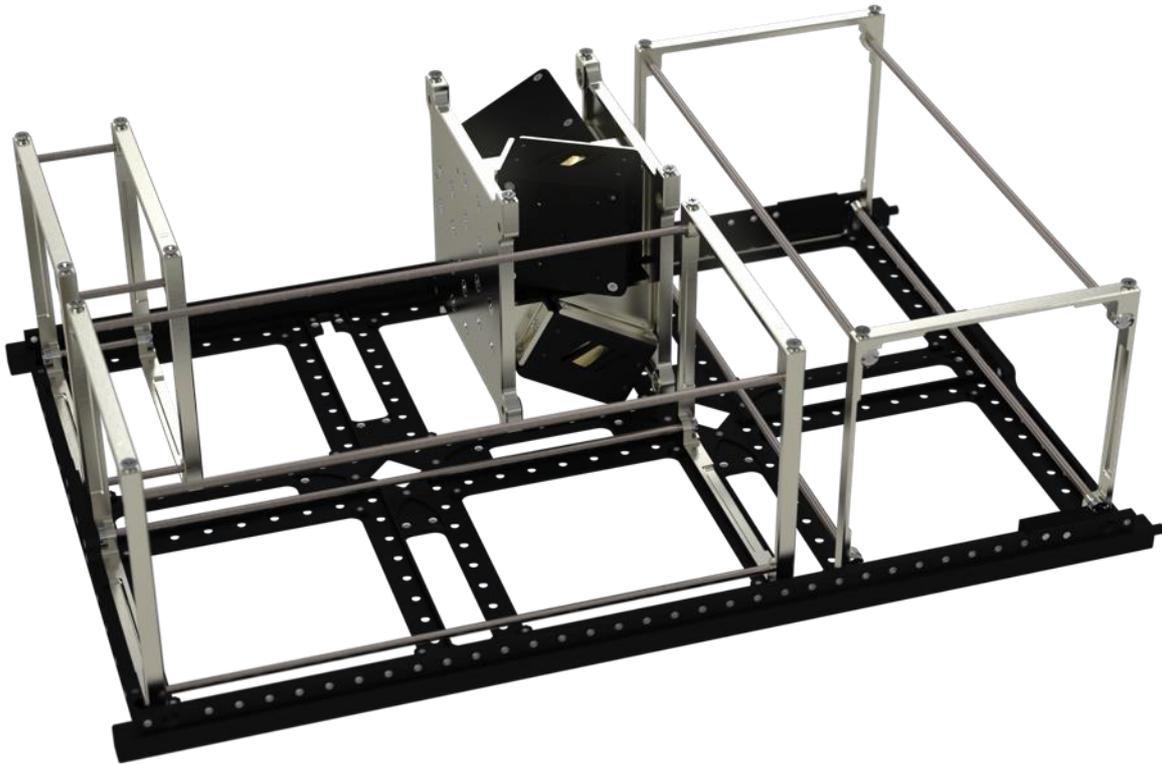


YA and YB are used in the top and bottom of a of PC104 stack when mounting the PC104 stack to point out the 6U side.

Below is a drawing illustrating three stacks pointing in each of the three main axis's. Left and middle are A and B rings, and right are used the YA and YB rings.



The stacks can be mounted shorter and taller than a 1U height. Below is an illustration showcasing various ways the stacks can be used.



Two tall stacks, a small stack and an example of a mounted pyramid reaction wheel (NanoTorque GSW-600). Additional intermediate mounting rings can be inserted in a stack in case additional support is required.

Ring set are ordered through the option sheet.

The threaded rods are M3x0.5.

3U threaded rods can be purchased in sets of four.

## 5 Physical Properties

### 5.1 Size

With deployment switches stowed.

Description	Value	Unit
Size	340.5 x 226.3 x 100.0	mm

### 5.2 Mass

Total mass for default delivered structure, 2x frames and 4x corners.

Description	Value	Unit
Total mass	~716	g

Mass for individual components:

Description	Value	Unit
Large Frame including kill switches	330	g
Corner bracket	14	g
A or B mounting ring	15	g
YA or YB mounting ring	26	g
M3 threaded rod	0.0495	g/mm
Flying Leads, 60 cm	6	g

## 6 Environment Testing

To simulate the harsh conditions of launch and space, the NanoDock SDR has been exposed to several environment tests. For detailed information about the tests please contact GomSpace.

The NanoStructure 6U has flown on several satellites and performed perfectly.

## 7 Disclaimer

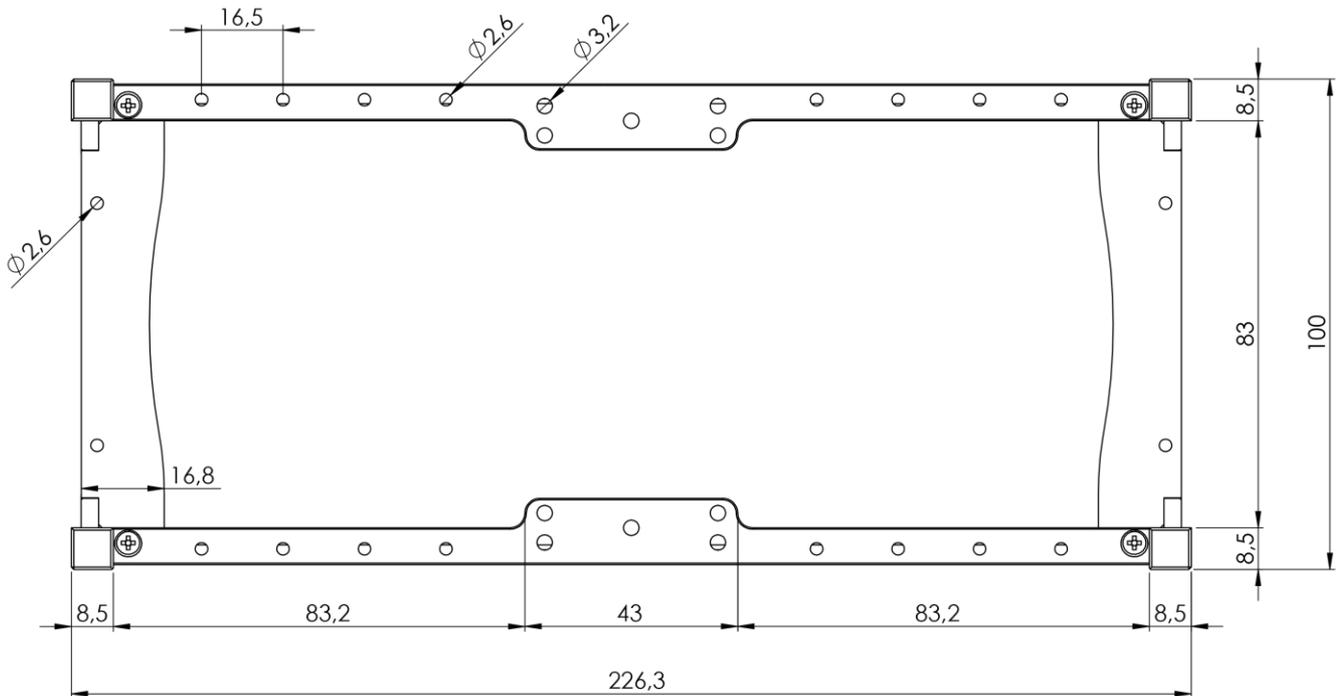
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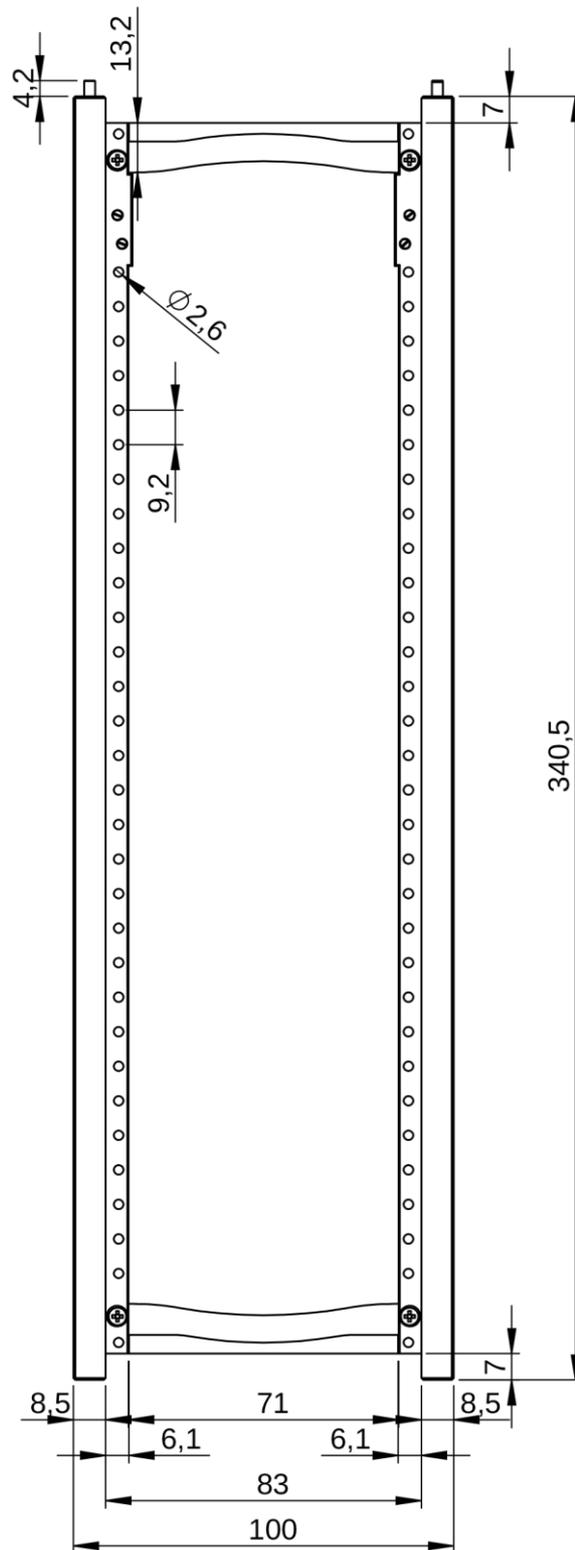
## 8 Mechanical Drawing

All dimensions in mm.

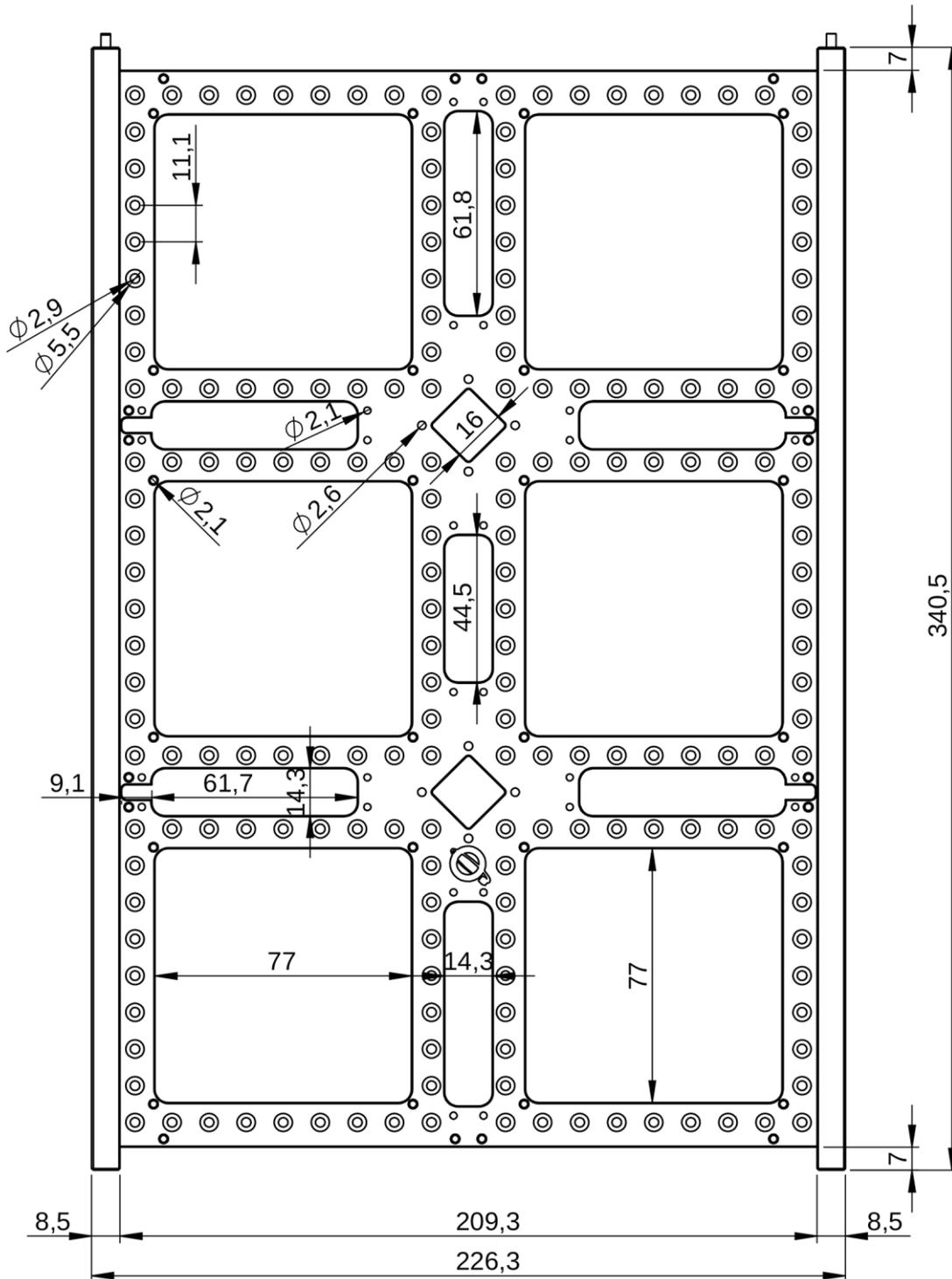
### 8.1 2U Side



## 8.2 3U Side



### 8.3 6U Side

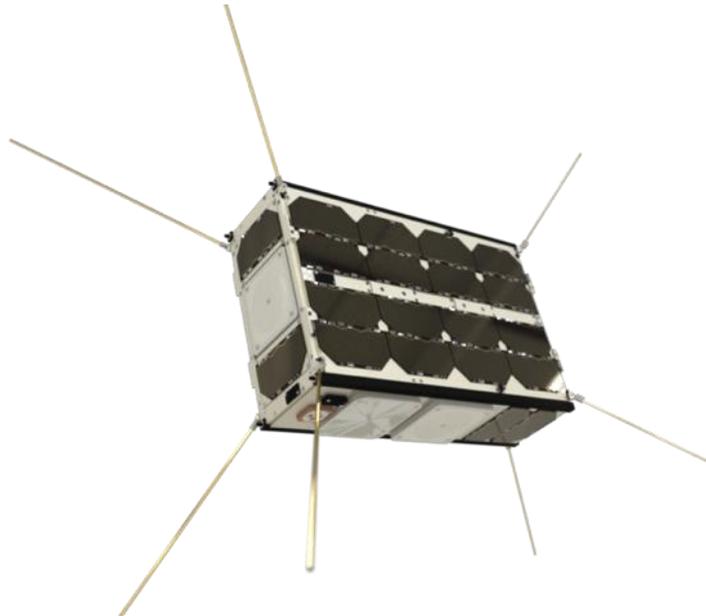


## 9 Related GomSpace Products

View the individual datasheets for further information.

### 9.1 NanoPower MSP

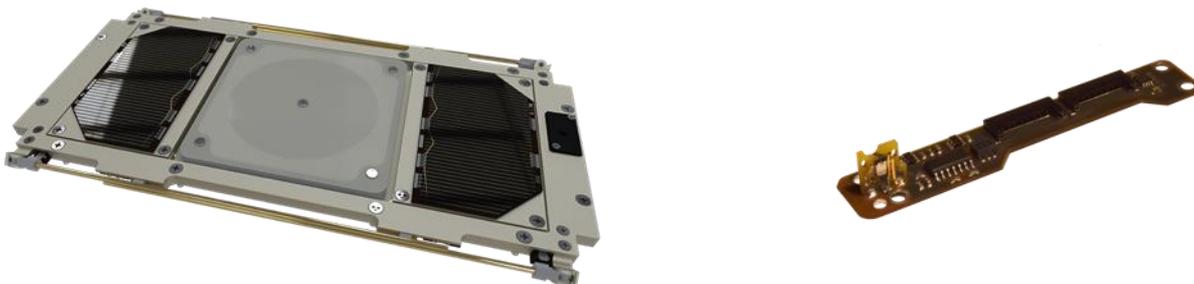
The GomSpace NanoPower MSP is a modular solar panel system for a 6U satellite. The customer can choose between different solar panel setups, and can cover the entire surface of the satellite for optimal power output.



### 9.2 NanoCom ANT-6F and NanoUtil AR6

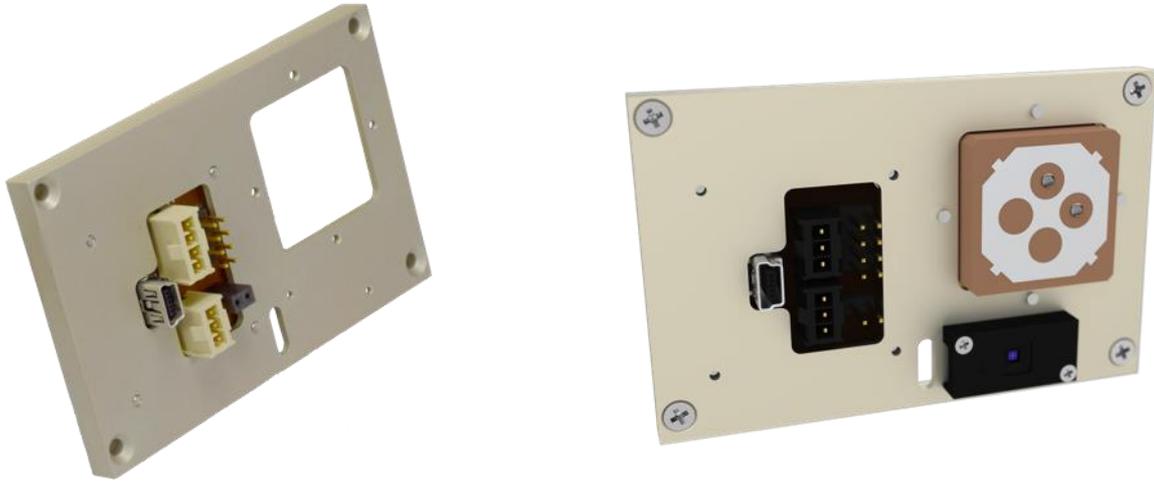
The GomSpace NanoCom ANT-6F is a VHF or UHF antenna at the top or bottom of the 6U structure. On top the PCB, pointing outwards, can be mounted a combination of solar panels, cameras, antennas, propulsions, Flight Preparations Panels etc.etc.

The UHF version has the aerials stowed along the top, and has the antenna release system on the ANT-6F PCB. In the VHF version the antennas are stowed down the length of the 6U side, and the NanoUtil AR6 works as the release system.



### 9.3 NanoUtil MSP-FPP

This is a flight preparation panel that can be mounted on the 3U side of the satellite.



It has option to mount a GomSpace NanoSense Fine Sun Sensor and a GPS antenna (shown on the right).