Aeolus, ESA's Wind Watcher

It is easy to measure wind speed and direction at one place on the ground, but what are the winds like at different heights over the entire Earth? A remarkable new European satellite, called ADM-Aeolus, will soon provide the answer.

Usually known simply as “Aeolus”, the mission is named after the god in Greek legend who was appointed “keeper of the winds”. Scheduled for launch in 2008, the spacecraft will spend three years staring down at the Earth and measuring the winds that sweep around our planet.

ESA’s wind watcher will carry one large instrument (ALADIN) that will probe all levels of the atmosphere to a height of 30 km. ALADIN consists of a powerful laser and a large telescope linked to a very sensitive receiver. The laser sends short pulses of intense light into the atmosphere. This light is scattered by molecules of gas, dust particles and water droplets.

Some of the backscattered light is collected by the spacecraft’s telescope and sent to the onboard receiver. By analysing the signal, it is possible to calculate the speed and direction of the moving air at different heights in the atmosphere.

Many measurements have to be averaged in order to achieve accurate wind observations. For every 700 laser pulses, one wind profile will be obtained. Data stored on board Aeolus will be transmitted every 90 minutes to a ground station in Svalbard, Norway. This flood of information will not only help improve weather forecasts, but also contribute to long-term climate research.

Build your own Aeolus model

Aeolus Model Instructions

Print the page of Aeolus parts on an A4 size sheet of thick paper.
You will need some small scissors, a ruler and glue.

C - Body of the satellite
Cut out the body of the satellite C.
Cut along the two red slits.
Run the blunt side of the scissors along a ruler to score the body and flap fold lines.
Fold down all flaps.

A - Instrument
Cut out instrument A.
Score the flap fold line.
Fold down the triangular tabs.
Roll and bring A-1 to A-2 to make a cylinder.
Glue flap A-1 to the inside of the cylinder.
Glue the instrument on the body of the satellite in C-3, red arrow in front of red arrow.

D - Mirror
Cut out the mirror D.
Glue to the body of the satellite, inside the instrument, red arrow in front of red arrow.

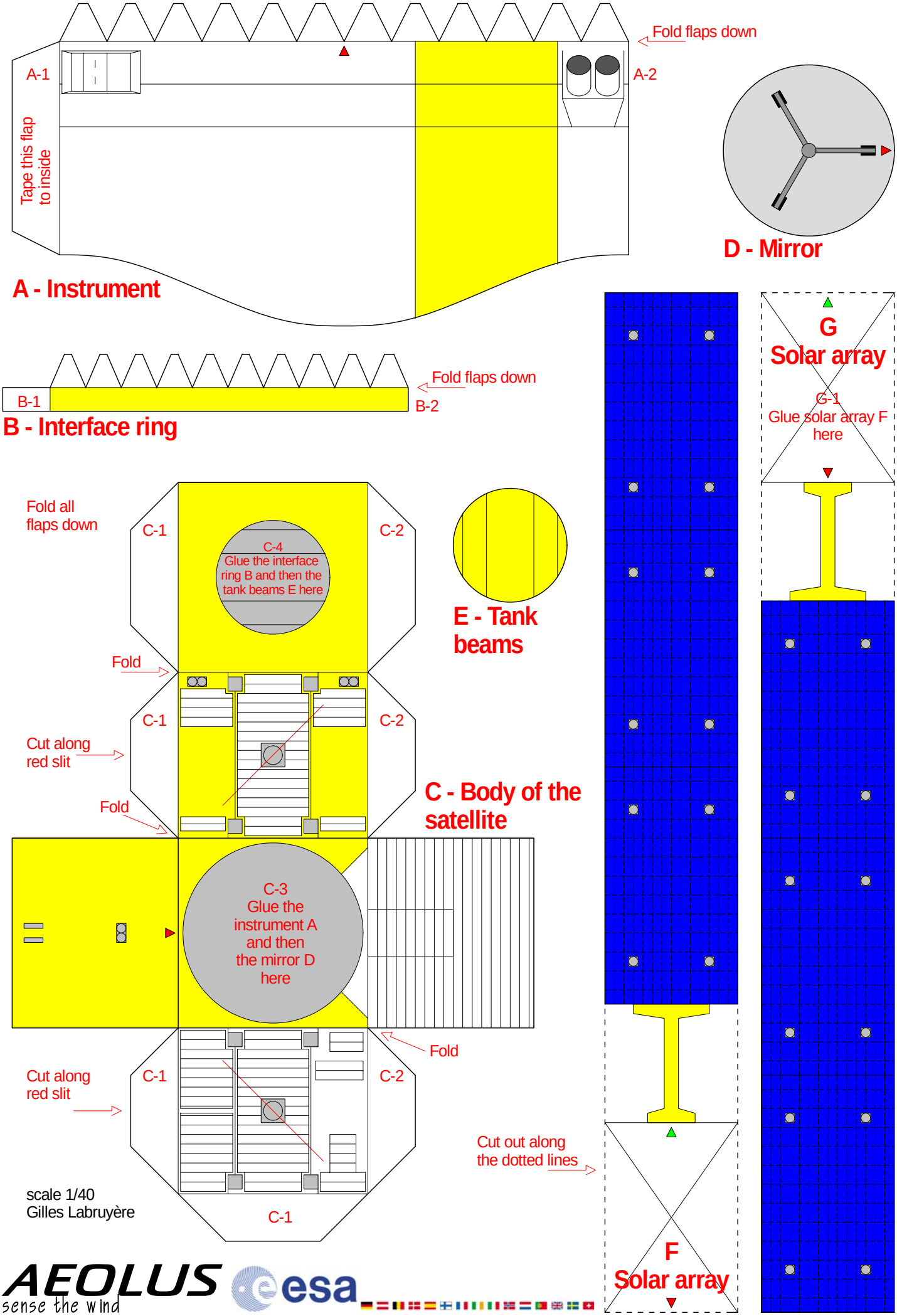
B - Interface ring
Cut out interface ring B.
Score the flap fold line.
Fold the triangular tabs down.
Roll and bring B-1 to B-2 to make a cylinder.
Glue flap B-1 to the inside of the ring.
Glue the interface ring on the body of the satellite in C-4.

E - Tank beams
Cut out the tank beams
Glue to the body of the satellite, inside the interface ring, with the lines aligned.

C – Body of the satellite
Fold the 6 panels to make a box.
Glue flaps C-1 to the inside of the body.

F & G - Solar arrays
Cut out solar arrays F and G, following the external dashed lines.
Glue solar array F onto solar array G, red arrow on top of red arrow and green arrow on top of green arrow.
Slide the solar array into the two slots you cut in the body of the satellite, with their blue face towards the interface ring.

C - Body of the satellite
Close the body of the satellite.
Glue flaps C-2 to the inside of the satellite's body.



AEOLUS
sense the wind
esa