

MAXUS

MASER

- Maser 11
- Maser 10
- Maser 9
- Maser 8

HYGROSONDE

STRATOS

MAGIC

MC WAVE

MERMAID

MAPHEUS

NLTE

REXUS

SAGE III

TEXUS

LIST OF ALL LAUNCHES

ROCKET MOTORS USED

MASER 11 - PROJECT MANAGER'S REPORT

These are the MASER 11 project manager's web reports during spring 2008, ending with a "mission completed" report after the successful flight on 15 May!

16 May 2008

After the extremely smooth countdown and successful launch of MASER 11 yesterday May 15, all people involved in the activities were today tired but very happy.

The weather was good with perfect wind conditions throughout the countdown, so there was no need for holds for that reason. Also the experiment preparations ran smoothly after having been rehearsed three times during the previous days. The flight was absolutely perfect with all possible systems working flawlessly, and it was a great joy to receive the live images of the parachute deployment after 10 minutes of flight. We feared that the payload might land on bare ground, since there had been considerable melting of snow during the previous week, but it turned out to be a very soft landing in deep snow with a decimeter thick top layer of hard snow crust.

As quickly as 35 minutes after launch, the recovery helicopter spotted the payload, and returned it safely after 2½ hours to the launching area, where engineers and scientists waited eagerly to take care of the modules and retrieve scientific data. Everyone was happy to notice that there wasn't a single scratch on the surface; only the payload adapter ring, which acts as a landing shock absorber, had a bad dent from a stone hidden in the snow. But this is what it's designed for.

So people were happy for the good results, good cooperation during the whole campaign, and the guests coming from far away were naturally also happy that they could travel home to their families after 2-3 weeks of being away!

Last one to leave the launch site is myself, who will take the 17 hours night train back to Stockholm in a few hours, enjoying relaxation, long sleep and a good book!

Gunnar Florin
Maser 11 Project Manager

15 May 01.30 Local Time

Yesterday on the sixth possible launch day, we had indeed a fair chance to be able to launch Maser 11. Winds were weak, but unfortunately with north and east components, which meant that the launcher settings were outside the allowed elevation settings, i.e. over 88.5 degrees. To understand the reason for the launcher setting requirements, one can picture the situation where we have 90 degrees settings, in the case of which we would be launching vertically, with high risk that the motors land on the launching site in case of problems.

Yesterday's countdown was terminated shortly after 11 o'clock local time, as there were no improvements for the winds, and as scientists had to retrieve their samples in time to prepare them for the following day's countdown. Plus get some sleep, as all of us.

For Thursday 17 May, the countdown was started 15 minutes ago at 01.15 LT, and this time all wind predictions for the day results in acceptable launcher settings. The lift-off is scheduled for 06.00 (04.00 UTC). The sky is somewhat overcast, no visible ground winds (flags don't move) and ground temperature around 0 degrees C.

The previous four launches with the Brazilian VSB-30 rocket motor all took place on a Thursday, and it looks as if this also will be the case for Maser 11!

Gunnar Florin
project manager, MASER 11

Tuesday 13 May 2008

The launch attempt on Sunday 11 May had to be cancelled at T-8 minutes, due to rapidly changing winds in the launch area.

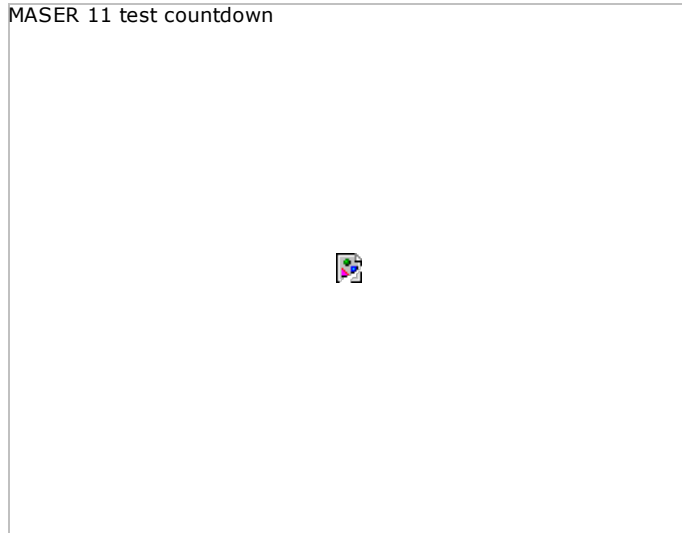
The countdown was started at 02.15 local time, but was set on hold at 05.30 at T-1H30M due to heavy snowfall in the recovery area. The wind conditions were favourable for launch throughout the day until the end of countdown. The recovery area was suddenly clear from snowfall at 12.30, and shortly after 13 the recovery helicopter reported during recognition flight that there was sufficient sight to perform recovery. As we are limited by a launch window 03.00 - 15.00, launch had to take place at 14.45 to have the payload back on ground before 15.00.

The countdown was resumed, and with work carried out with high efficiency, we were ready to launch at exactly 14.45, when the Safety Operations reported a rapid wind change that stopped the launch. This was the wind that had cleared the snowfall away in the recovery area, and now had reached the launching area.

Next launch attempt is planned for Wednesday 14 May 07.00 local time, the forecast for wind conditions is favourable.

Gunnar Florin
project manager, MASER 11

MASER 11 test countdown



Test countdown 6 May

Saturday May 10 2008

Due to strong winds on higher altitudes from the west during May 9, it wasn't possible to launch Maser 11 on May 9. During Saturday May 10, the situation will be even worse. The criteria for launch is amongst others that the ballastic winds are less than 6 m/s. During Saturday, the prognosis foresees winds over 13 m/s, and in the completely wrong direction. Best winds are southern winds.

In the coming days, there is a prognosis for favourable wind conditions on Sunday during a few hours around 9 AM local time. If this forecast is confirmed, then the next countdown will start on May 11 Sunday morning at 2H15 AM, ready for a launch from 7 AM and onwards. The vehicle with payload and motor is ready for launch, and so are all the ground stations.

Over the snow-covered Esrange Space Center there is at this very moment, 5 AM Saturday morning, a tiny snow fall, blue sky (!) and some quite fresh ground winds.

Gunnar Florin
project manager, MASER 11

Monday May 5 2008

The Maser 11 launch preparations are progressing according to plan, and even somewhat ahead of plan. In the afternoon of May 4, the Maser 11 payload stacking was started up, and finalised in the evening. The first payload check-out tests, including self-induced EMI testing, were carried out successfully. In the previous days, the final preparations of the different equipment modules and service modules have



the different experiment modules and service modules have been carried out successfully.



After running the whole payload in a Flight Simulation Test this evening, which includes the whole count-down sequence with late accesses to the experiment modules, the payload will be ready for integration in the launch tower tomorrow morning, after the traditional photographing session.

The rocket motors arrived "just in time" with air freight from Brazil on Saturday evening, and will today, after preparations that went very smoothly, be loaded into the launch tower today.

The first Hot Countdown day is May 9, with a launch window opening already at 03.00 AM. During this season, the rays of the rising sun often create air turbulence in the morning hours, so there might be an interest to launch around 5 AM, but this is subject to daily decision, based on the weather forecast and wind predictions.

Gunnar Florin
project manager, MASER 11

Thursday 1 May 2008

Yesterday we received the happy news that the rocket motor transport departed from Brazil, for arrival on May 2. In the meanwhile, the different experiment and service system module are prepared and tested before the payload stacking begins on May 1. Everything runs smoothly, and we are somewhat ahead of schedule in our activities.

Today the payload separation test was performed, first with manacle ring release test and thereafter with sequence test verifying the correct order of pyro activations (see picture).



The weather at Esrange is wonderful with 2 feet of snow and +15 degrees in the air. Hence, people are not suffering when out-door activities have to be performed, like the beacon test. (below).





Gunnar Florin
project manager, MASER 11

Wednesday 30 April 2008

The Maser 11 launch preparations began at Esrange Space Center two days ago on Monday 28 April. The 60 persons from the south that take part in the campaign were welcomed by 2 feet layer of snow, sunshine and temperatures over +10 degr C! It's really a pity we have to work indoors.

The campaign proceeds according to plan with final preparations of the individual experiment and service modules and getting small things like telephones and internet connections in order. In the coming days we will connect the experiment modules to the service module, and also run the telemetry systems against the payload. In parallel with this, we are eager to learn about the departure of the rocket motor, which was supposed to leave Brazil last night by dedicated air transport. Our first launch attempt is set to 9 May.

Gunnar Florin
project manager, MASER 11

Thursday 10 April 2008

During the past weeks, the items involved in the rocket motor production were repaired, and the last rocket motor item, the 2nd stage nozzle extension, was produced. Today, the activity of X-raying the motors was started, and the motors will be transported from Brazil to Kiruna in Sweden 19-21 April, for arrival in time for the start of the launch campaign, 24 April.

The current planning is to have the first launch attempt on May 5, which is the first day after the long week-end 1-4 May. As we are close to the time of the change of jet stream direction, we expect that the wind conditions will provide favourable wind conditions!

Presently, we are arranging for the accommodation at Esrange of more than 60 people participating in the launch campaign. But before the campaign, the Flight Acceptance Review will take place at ESA on April 15, at which we shall receive go-ahead from ESA to transport all equipment to Esrange and start the launch campaign!

Gunnar Florin
project manager, MASER 11



Friday 14 March 2008

Last week's test campaign was successfully completed on Friday morning with the Flight Simulation Tests. The test sequences simulate a complete count-down sequence, including late access operations on the modules some hours before lift-off, cooling of experiments and actually operating the experiments as if it was a real flight, such as injecting liquid into the SOURCE experiment cell and creating metallic foam in XRMON.

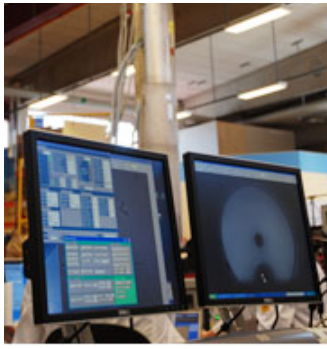
Unfortunately, the launch of MASER 11 has recently been shifted from mid-April to beginning of May, due to problems with the equipment used for producing the rocket motors. An updated launch schedule will be established during the coming week.

Gunnar Florin
project manager, MASER 11



Wednesday 5 March 2008

By today, we have come half way through the System Integration and Test campaign, with initial module verification and Electromagnetic Interference (EMI) tests. At this very moment we have completed the vibration tests, which have been running very



...smoothly.

As can be depicted from the [photos](#), there are numerous image and data screens for the verifications that must be performed during each test, and this also serves as a rehearsal for the real flight situation in mid-April.

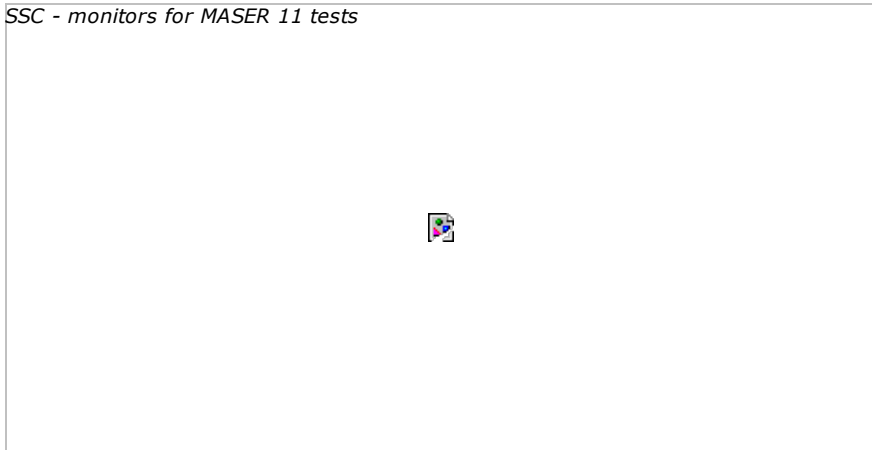
Gunnar Florin
project manager, MASER 11

Monday 3 March 2008

During the passed week-end, the MASER 11 balancing and physical properties measurements were performed. The payload mass has been measured to 382 kg, which indicates an expected microgravity period of almost 6 minutes and 10 seconds. Today, ESA gave the go-ahead for starting up the five-day-long System Test phase, which includes vibration and electrical tests with the integrated payload.

Gunnar Florin
project manager, MASER 11

SSC - monitors for MASER 11 tests



MASER 11 payload integration

Friday 29 February 2008

All MASER 11 experiment modules have passed their Module Acceptance Reviews, and we have now entered the Assembly, Integration and Test (AIT) phase.

This morning, all payload modules (i.e. all four experiment modules and the service module) were transported from SSC's Solna facility to the test facility PackForsk in Kista outside Stockholm.

During this coming weekend, the integrated payload will be submitted to measurements of physical properties (e.g. Moment of Inertia, Centre of Gravity) and balancing. Next week, the system tests – including electromagnetic interference tests, vibration tests and Flight Simulation of the whole payload – will be executed.

After the Easter period, the payload with its Electrical Ground Support Equipment will be transported from Stockholm to SSC's Esrange Space Center, and the launch campaign will start on April 1. The first launch attempt is planned for April 12. As we (for security reasons) are dependent on favourable wind conditions, there might be more than one day of count-down.

Gunnar Florin
project manager, MASER 11

