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P3E, An Intermediate Report

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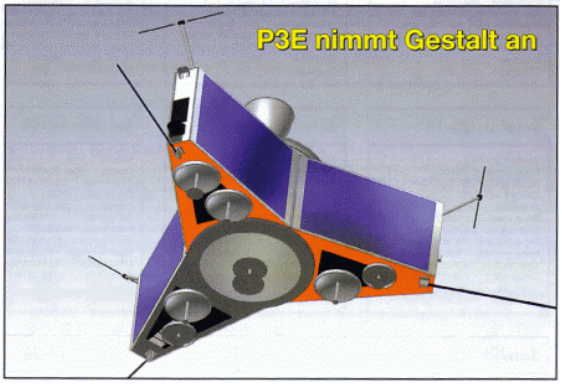
The following picture already shows P3E taking shape with its antenna forms adapted to the modified tasks as compared to AO-10 and AO-13.



As you know, the declared goal of P3E is to offer newcomers access to high orbit satellite communications as well as a future working platform to those operating already through AO-40 in S and K modes. On top of that, communication links to Mars will be simulated and tested, which means more antennas and modules for the microwave bands. Figure 1 shows how crowded P3E will become

The most important news of the last months and crucial for future missions, is the successful radiation resistance test of the CAN controller and the processor for the new IHU-3. Both systems survived without damage after a dose of more than 40 krad. As a result, manufacturing of the CAN modules, as presented in the latest journal, can continue. Our thanks go to Stacey Mills, W4SM and the fellow workers of the blood bank at the University of Virginia's Medical Centre who performed these tests.

Backed by this positive result, work on the IHU-3 can now be started. At present, one could even imagine to mount two redundant IHU-systems in the module shown in figure 1. One of the IHU systems could take over the RUDAK function, e.g. camera image treatment and modulation for transmission while still leaving the option for a new application on the presently unused RUDAK module.

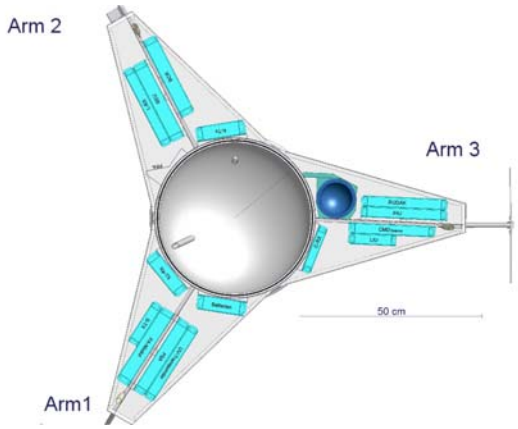


Fig. 1: The module arrangement in the P3E satellite. each free area is used.

Following a meeting with Fill-Factory, a Belgian manufacturer of camera chips, first results also show up for the camera. Fill-Factory produces radiation hardened CMOS cameras and is interested in testing such a system with improved characteristics on P3E. As already demonstrated on AO-40, the camera will play an important role in the navigation of the satellite and also break ground for the future star navigation required for the P5A mission.

With that camera or possibly even several cameras dedicated to different tasks, the space on the upper side of the satellite becomes quite tight. In the title picture one can already see the high density arrangement of small parabolic dishes and patch antennas. At present, there are opportunities to install more microwave systems than antennas would fit. Figure 2 shows a first prototype of a 15 cm dish antenna for 10 GHz capable of illuminating the earth surface at apogee.

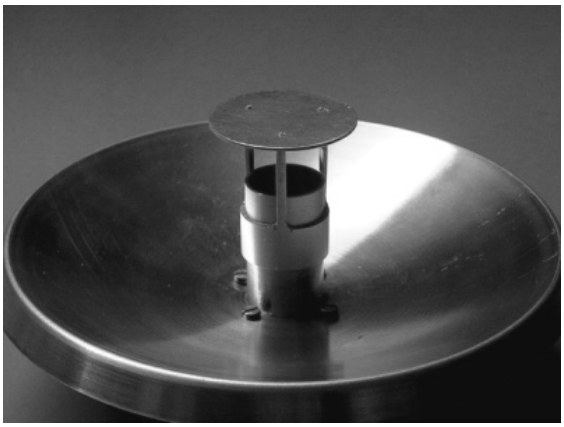


Fig. 2: Prototype of a 10-GHz-Spiegels for P3E.

A big step forward has also been achieved with the SBS and the P3E adapter table, both designed to mount P3E into the ARIANE 5 launcher. The design work on the P3E table, the triangle which goes into the SBS to hold the satellite, has progressed substantially. In the meantime, it has also been clarified that the SBS could be entirely manufactured in Germany for a comparatively low price. However the question of how to cope with the higher requirements imposed for future ARIANE-5 launches, still remains open.

In all, the project is still closely on time. In the coming weeks, the Strawman-Designs from the module manufacturers will be delivered for evaluation. Upon the outcome of that evaluation it will be decided which modules will fly on P3E.