

## **List of new Hungarian PECS projects**

### **Technology activities**

#### **1. High speed capacity mass memory**

During the course of this activity the modules and the architecture for the next generation Solid State Recorder that make use of the latest semiconductor memory technologies in the next solid state mass memory will be designed and developed, in order to achieve 'cheaper, better and faster' equipment and to meet the much more demanding requirements of the next missions (>1 Gps, >500 Gbits). The modular SSR design relying on the selected memory device shall be validated via the development of a demonstrator, including the related test equipment.

#### **2. Piezo-electric motors and linear actuators, drive electronics**

With the advent of small spacecraft missions, a need exists to develop miniature activation devices for use on such programmes. One technical area that appears to offer the possibility of low mass/low power actuators is piezo-electric technology, which is now being dramatically exploited in the commercial camera field. Based on requirements defined by spacecraft electrical interfaces and the drive power needs of piezo-electric motors and linear actuators, the objective of this activity is to design, breadboard manufacture and test two types of excitation power supplies for such mechanisms. The activity would commence by studying various implementation approaches for the required AC driving power supply, taking into account specific constraints with respect to the applied voltage level and excitation frequency. Based on a trade-off and evaluation study, one of the design concepts evaluated for the piezo motor and one of the design concepts evaluated for the linear actuator would then be selected for breadboarding and testing.

#### **3. Participation in the development of a low-cost science on-board data handling system**

Science missions have a need for high-performance, high-reliability and low-cost on-board computers. The objective is to develop and apply commercial components technology in the context of on-board data handling computer with the aim to address the above-mentioned needs. The intention is to design, develop and validate a multiprocessor unit based on commercial components, which will achieve the same goal as a unit with conventional radiation hardened components but at a lower cost. This shall be possible by applying software fault tolerant techniques. The selected processor shall be supported with up-to-date software development environment, Real-Time Operating System and full non-instructive debugging capability. These components shall be commercial off-the-shelf items. The unit could become a core unit with future science spacecrafts and the outcome could be an integral part of the „Virtual spacecraft” and validated within its context.

#### **4. Phase 3-Express Integration**

The integration of a small satellite with a weight category of approximately 150 kg would be of interest for the professional researchers and students especially if the one is a test-bed of a larger space probe planned to fly round the Mars. The on-board equipment will be produced in different universities and will be transported to the TU of Budapest to do the assembling work and to do all launch preparation activity. It is hoped that this work will be a big step forward for the Hungarian space experts to learn more on the complicated satellite integration. It is supposed that after the successful test of Phase 3-Express satellite the larger space probe will also be integrated in Hungary.

#### **5. MONITOR**

It is known that the increased RF energy emitted from the high power radio transmitters has destructive effects in the layers of the Ionosphere of the Earth. The overheating of the cover layers could initiate a degradation effect. The monitored spectrum could start from 100kHz to 30MHz or higher keeping the scanning possibilities for a fine structural analysis. The on-board computer controlled measuring system includes a programmable receiver. The volume of the box is 40x200x200mm. The use of MONITOR on board of ISS requires to modify a few things e.g. the antenna matching unit, the input voltage of the power supply, and the data handling unit for ISS system communication.