

13 Mechanical Workshop

K. Bösiger, B. Lussi, R. Maier, M. Schaffner, S. Scherr (since April 2005),
P. Treier (retired September 2005), O. Fardin (apprentice since August 2005) and
R. Reichen (apprentice)

The mechanical workshop of the institute is equipped with a large variety of special tooling and machines needed to solve all kinds of mechanical tasks in relation with the research projects of the different groups at the institute. It contributes also to the education of young people which is clearly of vital importance. Presently two apprentices are being educated and in addition the workshop gives the basic courses in mechanical treatment, such as drilling, milling, welding, etc. for the students in physics. These courses were accomplished in autumn 2005 and in spring 2006. Four courses with 35 working hours each were organized. Also in this reporting period a fraction of the activities was devoted to special designs, modifications and small series for other institutes of the university and outside companies. These tasks provide also some income to the workshop. The workshop maintains in addition the metal and technical material supply store, which was again used by more than 30 institutes⁸. The modern infrastructure of the workshop was again complemented with a new modern mill. The machine was delivered in December 2005 and installed in January 2006. It combines the flexibility of a modern universal milling machine with the performance potential of a vertical machining centre. The machine achieves maximum productivity and flexibility with such innovative features as a linear drive in the X-axis and a tool magazine with double gripper. The NC-rotary table with a large swivel-range permits machining angles of up to -18 degrees. Capabilities ranging from 5-sided machining with 5-axis positioning to 5-axis simultaneous contour machining expand the spectrum of applications. This means bundled performance, both for complete machining of single workpieces and for serial production with high precision and flexibility.

After the training courses in operating the machine for the members of the workshop and the adaptation of the CAD Software we will be prepared to produce also more complex mechanical parts in the in-house. A selection of projects is listed and illustrated below:



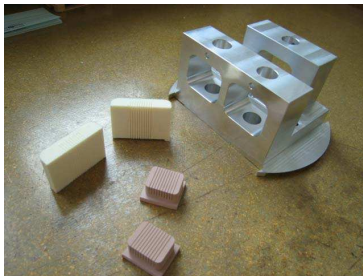
Figure 13.1:
The new mill installed in the workshop.



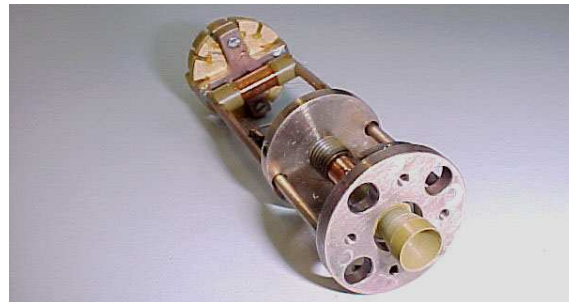
Figure 13.2:
The NC-rotary table of the new mill.

¹For a catalogue see <http://www.physik.unizh.ch/groups/werkstatt/dienstleistung.html>

- **LHCb inner tracking detector**
Group Straumann, Sec. 7
Different prototype parts for tests were manufactured. The production of the final detectors and the support structures started and is an ongoing main job. The pictures show single parts during the production and the completed frames for the electronic racks and the detector frame.

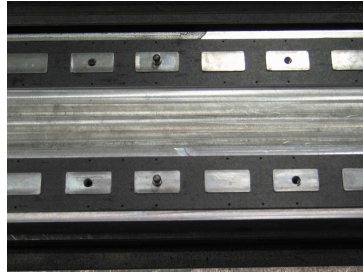
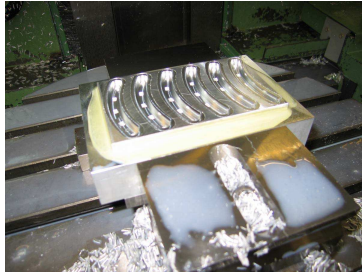


- **Solid State Physics**
Groups Keller, Sec. 9 and Schilling, Sec. 10
For these groups we designed and constructed different specimen holders. The picture on the right shows one complete workpiece.
- **Surface Physics**
Group Osterwalder, Sec. 11
Here the main focus was maintenance and repair work. We also built a series of Borazon cooler units which are shown in the figures to the right and below.



- **CMS pixel detector**
Group Amsler, Sec. 8

All the necessary tooling and the parts for the detector support structure were manufactured. The pictures were taken during the production of the different parts.



- **H1 Experiment at DESY**
Groups Straumann and Truöl, Sec. 5

In November and December 2005 we were involved in the repair of the H1 Detector at DESY in Hamburg. We partly had to replace the front end electronics of a detector which was built at our institute.



- **Physics of Biological Systems**
Group Fink, Sec. 12

Different mechanical infrastructure was manufactured and some test setups were built.