

CERN Courier Archive: 1972

A LOOK BACK TO CERN COURIER VOL. 12, APRIL 1972, COMPILED BY PEGGIE RIMMER

NAL

First pulses at 200 GeV

The National Accelerator Laboratory came into being in the summer of 1967 with the mandate to build and operate a 200 GeV proton synchrotron. The move to the site, around the former village of Weston, Illinois, was completed in September 1968. On 1 December 1968 ground was broken and construction was under way, aiming to have the accelerator built within a budget of \$250 million and operational by 1 July 1972.

On the morning of 1 March 1972 there was a pep talk from Laboratory Director Bob Wilson and from Ernie Malamud reviewing commissioning progress. In the Main Control Room, Frank Cole was leading the new attack on design energy with Jim Griffin at the other end of the intercom in the RF building. Don and Helen Edwards had worked during the night to tidy up the tracking between bending and quadrupole magnets, a possible source of beam

instabilities at energies over about 30 GeV.

At 11.00 a stable beam was achieved after injection of about 10^{11} protons per pulse at 7.2 GeV from the Booster. By 11.30 the beam was through transition and a steady climb to higher energies began. To simplify the removal of magnets which failed, the magnet water-cooling circuits were not operating and pulse rates had to be kept low to avoid overheating. The cycle sequence was forty pulses at 30 GeV, each taking 1 s, followed by a single pulse to 200 GeV field levels taking 5 s.

At 12.30 the scope trace indicating accelerated beams crept out to 167 GeV. Excitement was growing and the Main Control Room became a crowd scene with a huddle of heads round Ed Gray operating the main control console. At 13.08 the shout went up "There it is"; the trace went all the way out to 200 GeV. Design energy



1 March 1972. "There it is". Happy faces cluster around the screen in the NAL Main Control Room. At the scope are (l. to r.) Frank Cole, Jeff Gannon and John Clarke with, immediately behind them, Dick Cassel, Ryuji Yamada, Bruce Strauss and Paul Evan. (Image credit: NAL.)

had been achieved several months ahead of the initial schedule and within the forecast construction budget.

● Compiled from texts on pp120–123.

BUBBLE CHAMBERS

BESSY

In 1969, when the question of processing of film from the 3.7 m [Big] European hydrogen Bubble Chamber BEBC was tackled, it became clear that to use existing scanning devices, regions containing interesting events would have to be roughly identified in advance. The result is BESSY, the BEBC European Scanning SYstem, a scanning and preliminary measuring table not involving high precision.

BESSY has a mirror fixed to the machine, a projection table $1.3 \times 1.6 \text{ m}^2$ and four projection lenses on a single plate giving a total magnification of 17x. Preliminary



A prototype of BESSY, the scanning table designed specifically for use on film from BEBC, delivered to CERN in December 1971. (Image credit: CERN-EX-7204071.)

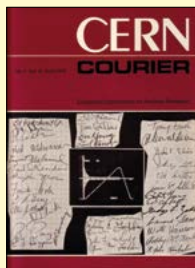
measuring can be carried out in the image plane with a precision of $\pm 170 \mu\text{m}$ (equivalent to $\pm 10 \mu\text{m}$ in the film plane).

The tricks which helped bring the price down to 41,500 SF, less than half the price of a table produced using conventional methods throughout, concern the film driving motors, lenses, film pressure plates, mirrors, projector and condenser. The driving motors are very sturdy car windscreen wiper motors; there are twelve of them at a price of about 50 SF each.

Special lenses were made by Jos. Schneider, Germany, at a price of 1000 SF per unit, to correct distortions caused by the film pressure plates. The mirror has only been polished once; the quality is adequate and the price is less than a fifth that of a high precision mirror. The lamps with incorporated mirror are commercially available units from movie projectors. The condenser is made from a plastic Fresnel lens costing a few tens of Swiss francs.

● Compiled from texts on pp127–128.

Compiler's Note



Mechanical and electro-mechanical devices have long brought out the whimsical and wonderful in inventors, as evidenced in some of the machines for scanning and measuring bubble-chamber film. Even Nobel laureate Ernest Rutherford sanctioned this approach to building apparatus in his apocryphal declaration "If you can't do it with string and sealing wax on a lab bench, it probably isn't worth doing at all".

During the Second World War, semi-automatic analysis machines, invented to help decrypt secret messages of the Axis Powers, were operated by "girls", namely "Wrens" from the Women's Royal Naval Service (WRNS) at the UK Government Code and Cypher School in Bletchley Park.

The Wrens found the devices so comical that they christened them "Heath

Robinsons" in honour of the renowned British cartoonist whose speciality was drawing ridiculously complicated gadgets to solve simple problems. Heath Robinsons were the predecessors of Colossus, the world's first programmable digital electronic computer, and the Wren operators might well be regarded as the predecessors of particle physics' scanning girls (was there ever a scanning boy?).

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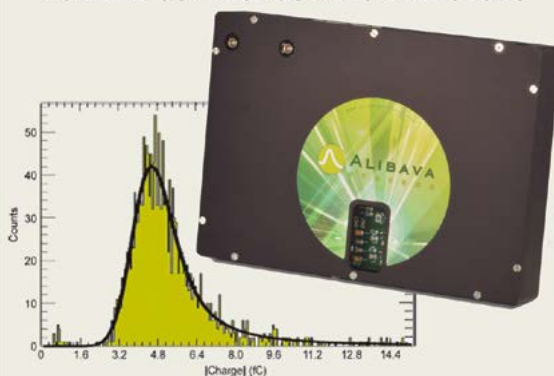
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