Those were rough days. We'd bring up the machine and 'pow'!
—Frank Nezrick

Timeline: A date to remember

February 1972

The experimental program begins

High energy physics experiments can sometimes be compared to fine wine. That is, their character and certainly their complexity improves with time. Good examples of this are the massive collaborations now underway at CDF and DØ — experiments involving thousands of tons of detector equipment and personnel by the hundred. These colliding beam experiments begin at an energy range where the lower energy fixed target experiments leave off and can be viewed as evolutionary in nature.

Other times though, the oft-applied analogy of a vintage improving with age doesn't always apply in physics. Case in point, the very first experiment performed at Fermilab in February of 1972 may have been the best run ever vinted in Laboratory history. Not as measured by short-lived experimental results, but in terms of long-term international significance.

"Expt. 36" was the nondescript number/name given to the first experimental group to run at Fermilab. In all ways, the fifteen people who would ultimately form the team bore no physical differences from the similar though much larger groups conducting research today at the Lab.

The origin of the experiment can be traced to a 1970 conference in Kiev where Fermilab physicist **Ernest Malamud** had met with Soviet physicist Vladimir Nikitin to discuss a collaboration involving the two countries. The idea they presented to Director Robert Wilson shortly thereafter for a proton-proton elastic scattering experiment using a gas-jet target earned his approval, setting the stage for Fermilab's first U.S./U.S.S.R. collaboration.

Chuck Schmidt (AD/Linac), then a young physicist working in the Accelerator Division, remembers well the series of events that led to the startup of the experimental program. He first came to Fermilab in 1969 to build magnets. The expertise he acquired in that discipline later made him a natural candidate to sit at the controls of the machine he helped build.

The early days of the Lab were unique and filled with a sense of anticipation, Chuck recalls, and after two years of building and diagnosing the Main Ring magnets he was eager to see how they performed. Once the Main Ring was completed in 1971, however, it would take another year before operators could tune the accelerator to make the beam complete a single turn around the ring. Then there followed another period of activity to get consistently more than one turn.

Stabilizing the beam could and would be done, it was largely just a matter of perfecting the technique over time. Chuck recalls then-Director Robert Wilson announcing words to the effect that 'We're going to keep people on the shifts until we get beam.' From late 1970 to early 1971, an Accelerator Division operations group of 12 people worked in three shifts, eight hours a day, weeklong to get the accelerator up and running. "We just went seven days a week nonstop," Chuck said.

At the time, **Frank Nezrick** (Physics) was also working the night shift, from 9 p.m. to 9 a.m. Frank was a member of Power Supply Group B, and his job was to get the accelerator running. Moisture that had formed in the magnets after the warm pieces of metal were placed into the cool tunnel, however, hindered the task. "Our job was to bring up the voltage on the accelerator," Frank said. "We'd bring up the machine and 'pow!'' The moisture would blow out a magnet.

Very often, Frank found himself running out of the Main Control Room in the dead of night during winter and jumping into Helen Edward's Jeep to pinpoint the failed magnet's location. Once the problem magnet was located, he and Helen would cut its power. Then, they disconnected the magnet from the accelerator using a chain saw to cut the electrical bus leads to and from the magnet. The beam could coast through the powerless magnet, and Frank returned to the Main Control Room to repower the accelerator. "Those were rough days," said Frank. "She worked me under the table."

By the next day though, the night crew had replaced the failed magnet(s), and Frank would have to restart the process of ramping the accelerator, only this time with a fresh set of variables. "We'd do that day after day after week after month," he remembered.

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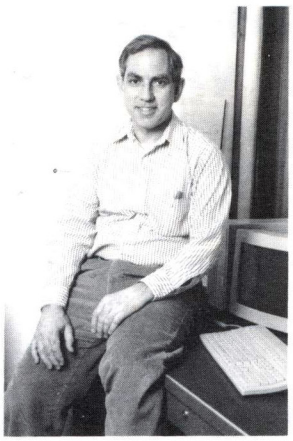
Frank Nezrick (2nd from left) and Chuck Schmidt (2nd from right) sit in the control room shortly after 9:20 p.m. on February 11, 1972 when beam reached 100.4 GeV.



We just went seven days a week nonstop. The first turn [of the beam] was certainly a milestone.
—Chuck Schmidt

By February 11, the power supply group had isolated enough faulty magnets to ramp the accelerator beam to record levels. The first record to fall was the 70 GeV record held by Serpukhov in the Soviet Union. The second was when the accelerator hit 100.4 GeV. "When we hit a milestone, the Main Control Room filled up," Frank said.

One-third of the way around the ring, at CØ, one-half of the E-36 collaborators were keeping up with the pace of the operators. The business end of the accelerator for their purpose wasn't located in a fixed target area or in a collision hall. It was located at an internal target located in the Main Ring. For E-36, the Soviets had built the gas-jet target and contributed the fast electronics the experiment would need. The U.S. had supplied the solid-state detectors, the on-line computers and interface, the liquid helium system and portions of the vacuum system. Weekly telex conversations had preceeded the cross cultural exchange of technology, hoping to work out any defects in the equipment before the two groups had assembled at Fermilab. Though their equipment had preceeded the actual arrival of the Russians, the components they supplied ran smoothly on February 12 when the experiment began receiving beam.

The first Russian physicists and their families finally arrived at Fermilab on March 8, 1973, and a successful series of experiments ensued. E-36 led to another internal target experiment, E-186, and by 1975 a total of fourteen experiments had either been completed or proposed in conjunction with Russian collaborators.

The tradition of exchange still continues today in joint fixed target ventures and in the DØ colliding beam experiment. On a scientific level, the first experiment proved highly successful in uniting two groups of people who were geographically half a world apart and politically polar opposites. The originators of the U.S./U.S.S.R. collaboration not only brought the two countries together in the sometimes partisan field of science, but also on the universal plane of kinship. Perhaps Ernie Malamud sums it up best: "Vladimir Nikitin and I have remained close personal friends since 1970 when we first met." —*Brian Dick*

This is the third in a series of articles celebrating the 25th anniversary of Fermilab (1967-1992). Throughout 1992, Ferminews *will feature* Timeline: A date to remember *as a regular column dedicated to milestones that occurred during the first twenty-five years of physics at the Laboratory.* Ferminews *welcomes employee submissions, either in the form of written articles or story ideas, to the column.*