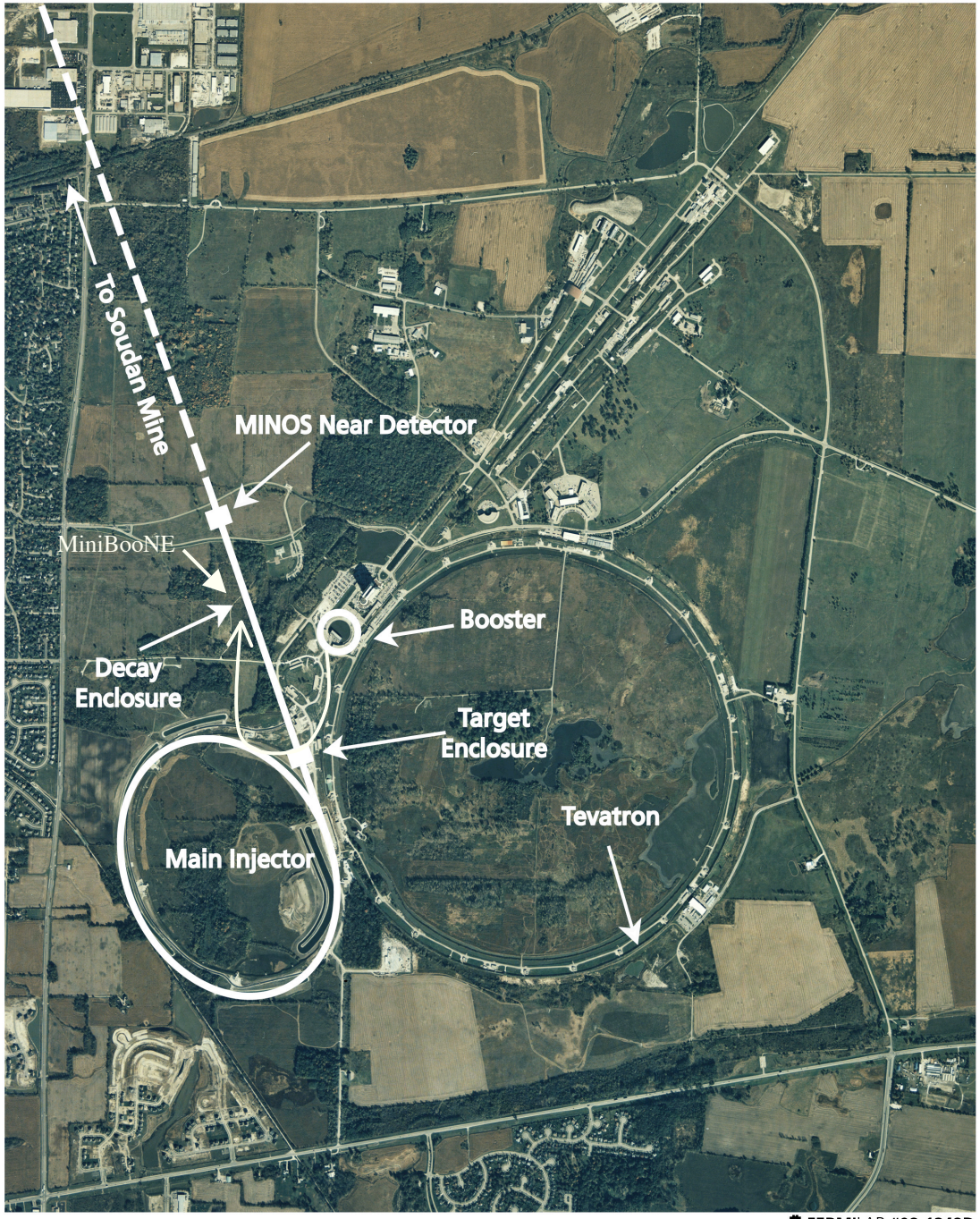
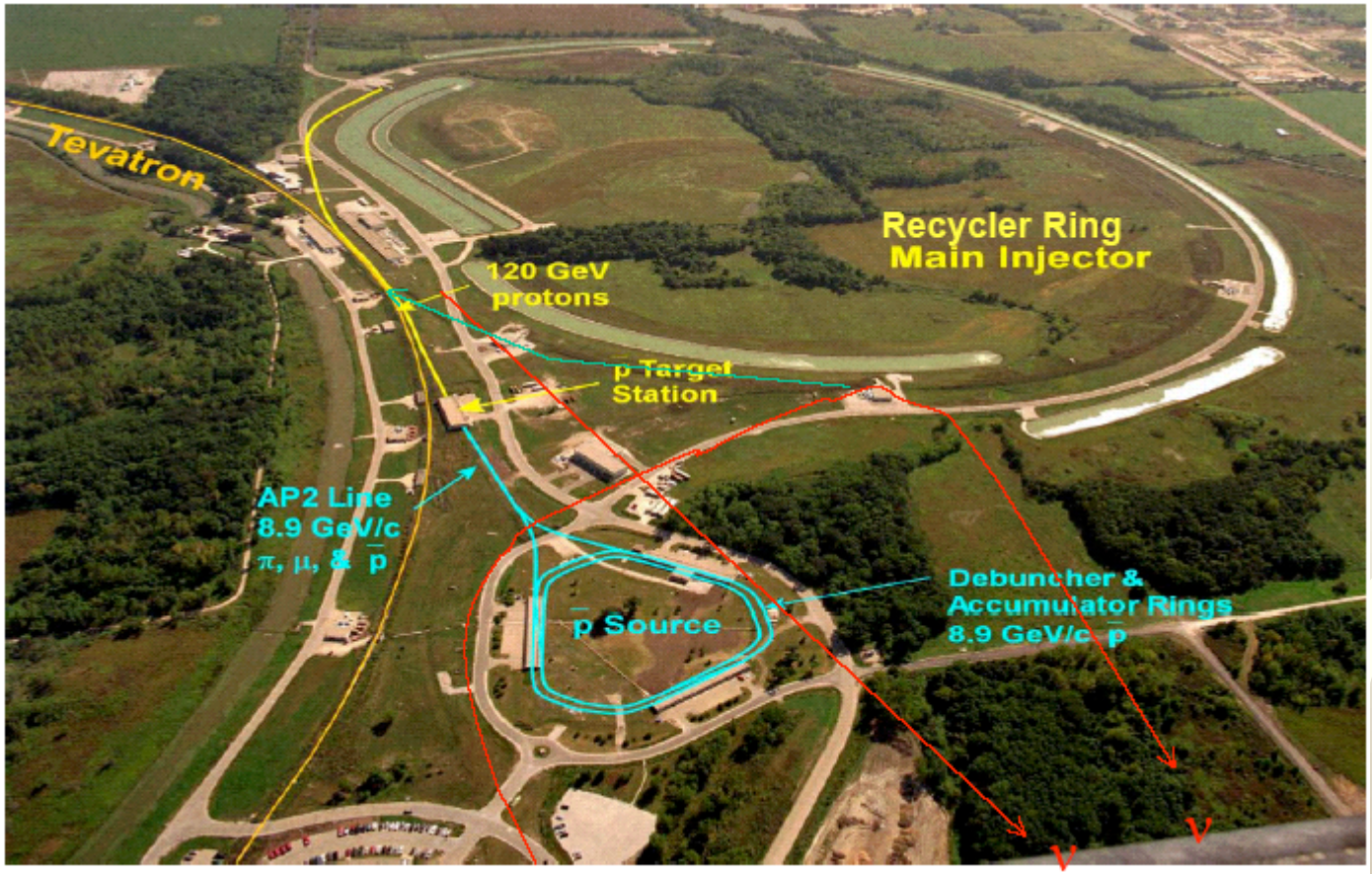
Welcome to BIW06

R. Dixon


To Soudan Mine
MINOS Near Detector
MiniBooNE
Booster
Decay
Enclosure
Target
Enclosure
Tevatron
Main Injector
FERMILAB #98-1348D

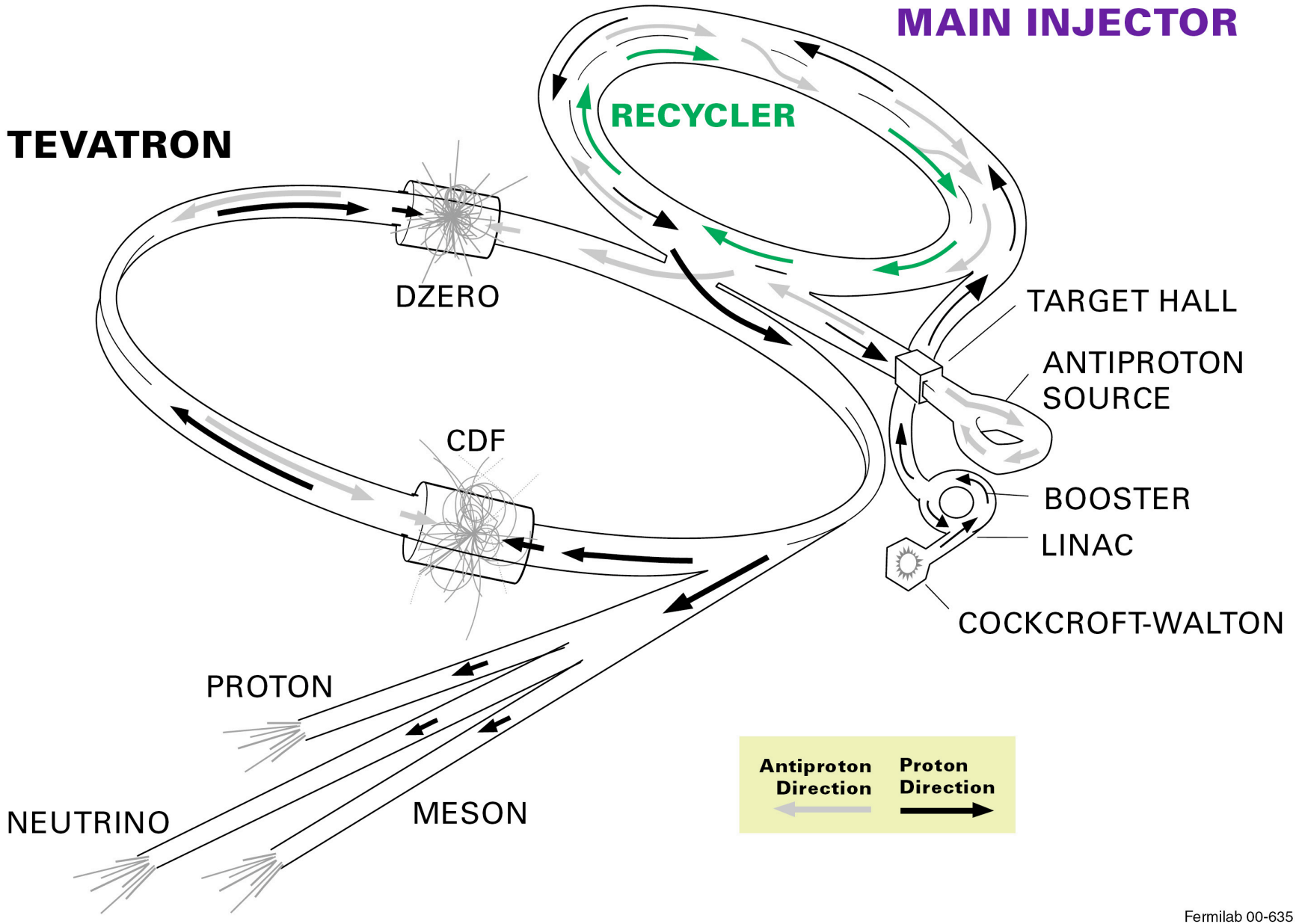
Overview of MI, Pbar Source and Neutrino Beams



Fermilab

- The U.S. Particle Physics Laboratory
- Astrophysics Research
- Fermilab was founded in 1967
  - University's Research Association
    - Such a large accelerator was no longer feasible on a university campus
    - People from institutions around the world carryout fundamental research in particle physics and astrophysics at Fermilab

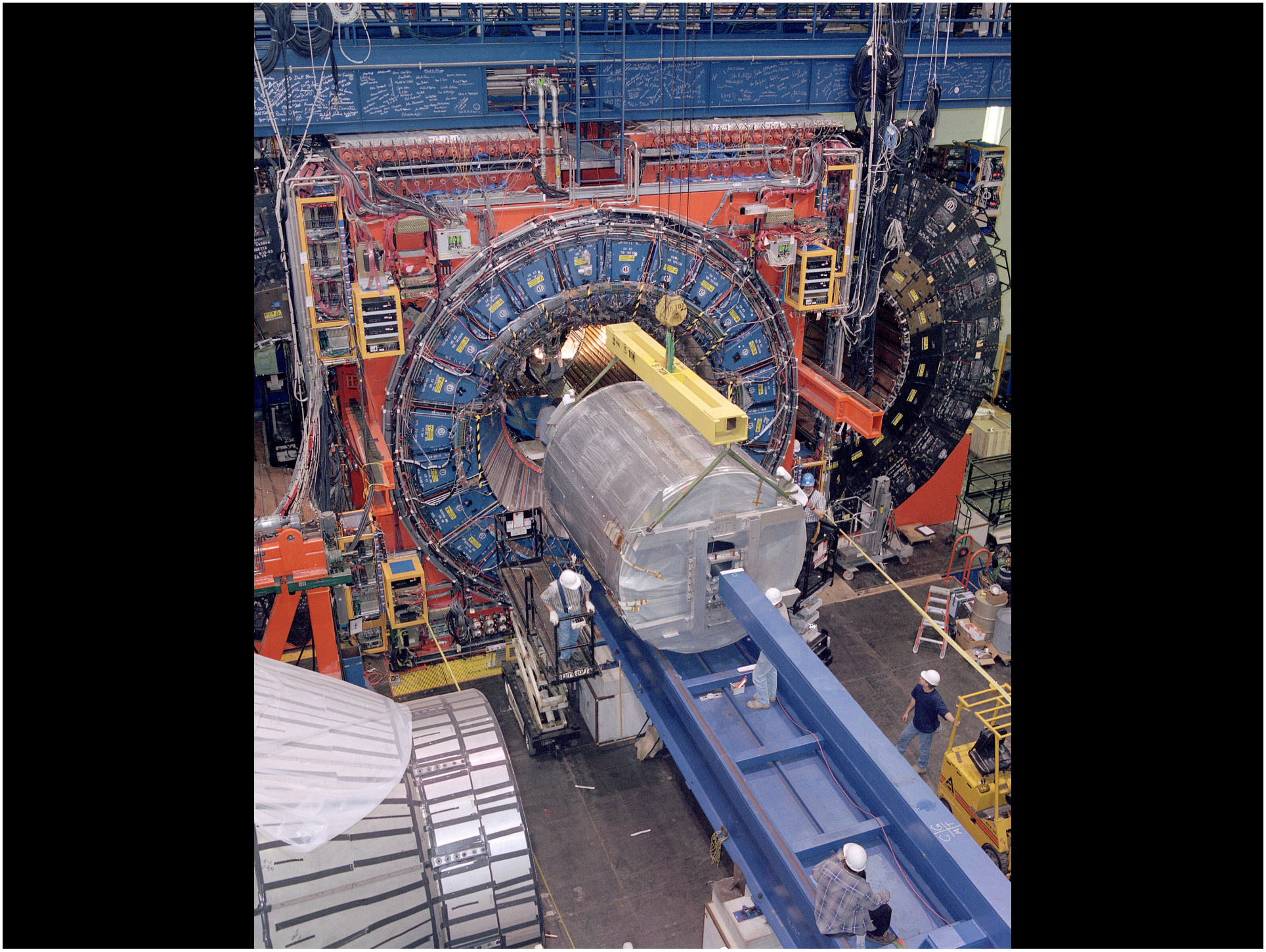
FERMILAB'S ACCELERATOR CHAIN



Fermilab Accelerator Complex

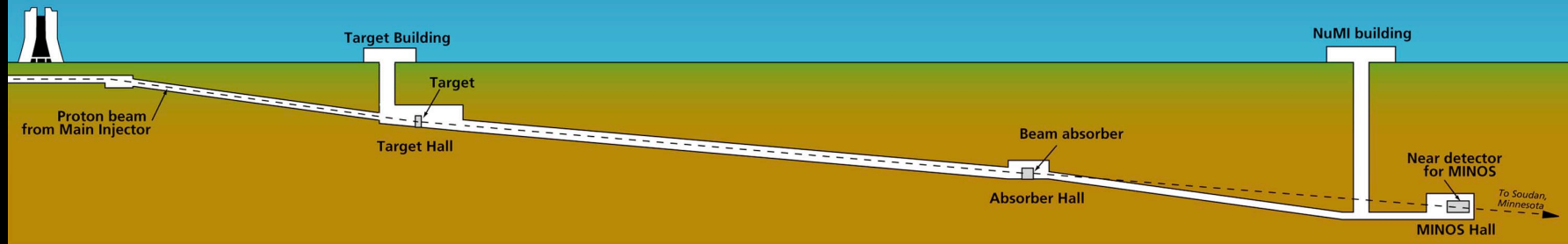
- Complex Accelerator Systems
  - Fermilab-- 11 separate accelerators
    - Cockcroft- Walton (2)
    - Linac
    - Booster
    - Main Injector
    - Recyler
    - Pelletron
    - Debuncher
    - Accumulator
    - Tevatron
    - Fermilab NICADD Photo Injector Laboratory (FNPL)
  - Beam Lines
    - 120 GeV Fixed Target Beams
    - 120 GeV Neutrino Beam (NuMI)
    - 8 GeV Neutrino Beam (Booster Neutrino Beam)

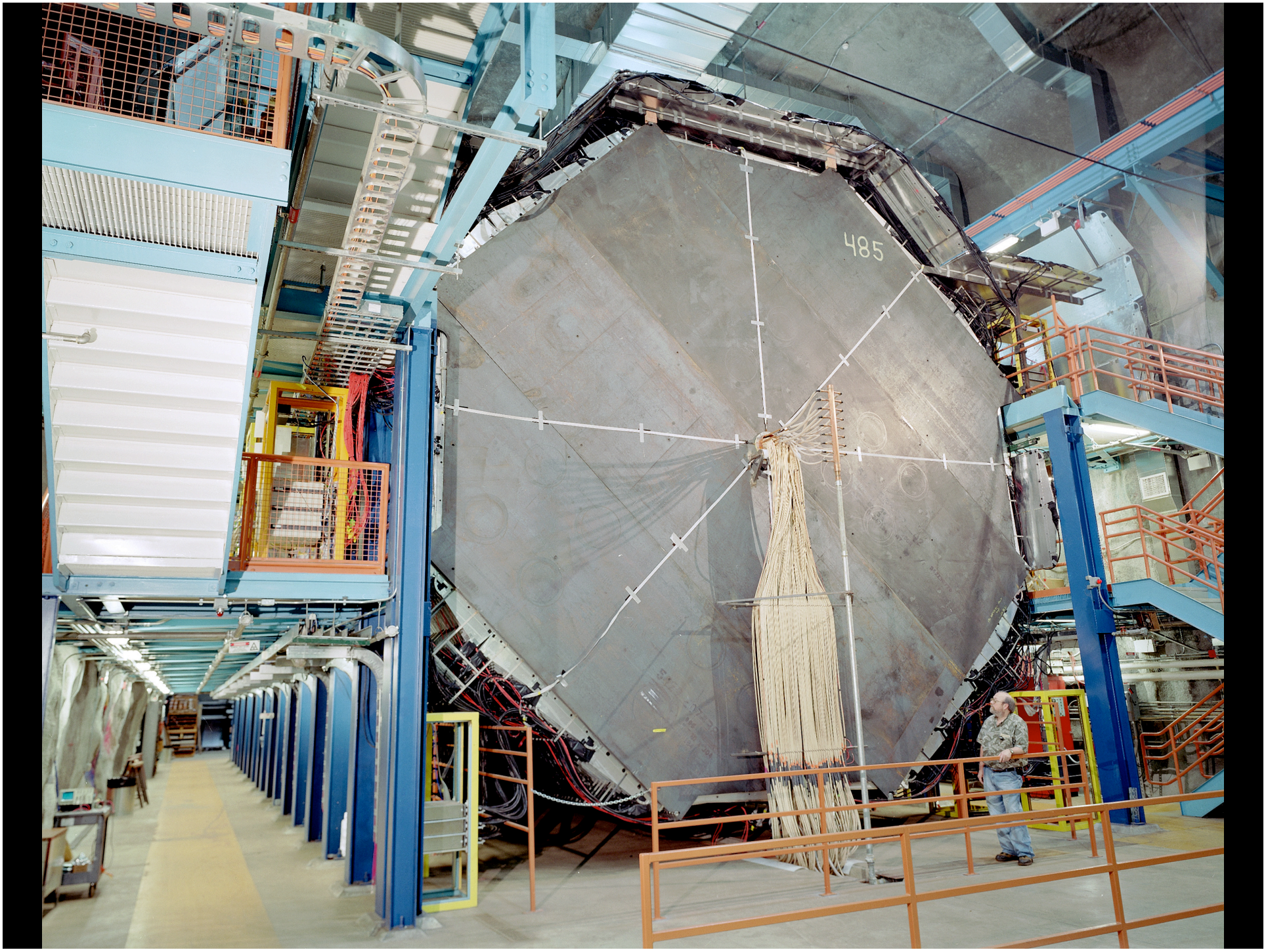

AS-FOUND
COMPLETE




Soudan
Minn.
Wis.
Fermilab
Ill.

NuMI Tunnel Project




485

Accelerator R&D

- ILC
  - Superconducting RF, etc.
- High Intensity Neutrino Sources
- AO Photoinjector
- Muon Cooling

Beam Instrumentation

- Early Days
  - Extracted Beams
  - Beam losses during extraction process
- Demands have grown over the years
  - Superconducting Storage Rings
  - Antiproton Production and Colliders
- Technology has been pushed and kept pace
  - Scopes and photos--> Computers and digital data
- Future
  - 400 MJ Beams
  - Superconducting Linear Accelerators
  - Etc.

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'Beam on the Flag!'

Once again, Fermilab makes accelerator history.

by Judy Jackson, Office of Public Affairs

It really was a dark and stormy night. A rain-soaked north wind gusted and howled around the High Rise. Inside, out of the gale, in the snug confines of Fermilab's Main Control Room, a group of evening-shift operators and Fermilab physicists and engineers hoped to make accelerator history. On this Thursday evening, February 20, they would try for the first time to send a beam of protons down an accelerator beamline using a technology that no one had ever used before. They weren't sure they would succeed, but—just in case—they had a supply of champagne on ice.

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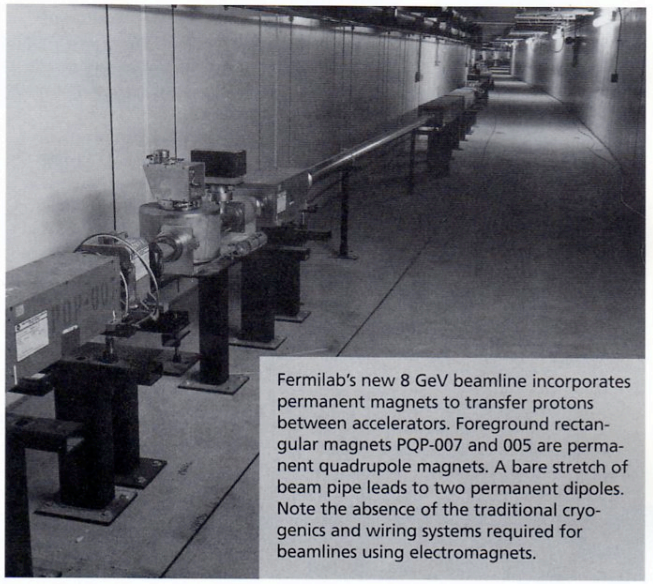

Fermilab's new 8 GeV beamline incorporates permanent magnets to transfer protons between accelerators. Foreground rectangular magnets PQP-007 and 005 are permanent quadrupole magnets. A bare stretch of beam pipe leads to two permanent dipoles. Note the absence of the traditional cryogenics and wiring systems required for beamlines using electromagnets.

Suburban Sprawl Reaches Fermilab

As public officials eye further development, Fermilab stands in the path.

Photos by R. Ahn

A house being built in Batavia. Fermilab's Wilson Hall rises in the background.

Particles and Pavement

by Donald Sena, Office of Public Affairs

On the prairie where once the Potawatomi native tribe hunted and fished, Fermi National Accelerator Laboratory long operated in relative pastoral tranquillity. Now, however, that situation has changed dramatically, and, although the Potawatomi have not returned, another group has settled in—the Cherokees. The Jeep Cherokees, specifically. And the Chevy Blazers. And the Ford Explorers.

Named in tribute to the country's rugged history, these vehicles now symbolize modern-day suburbia, as the relentless westward crawl of Chicagoland development has reached Fermilab.

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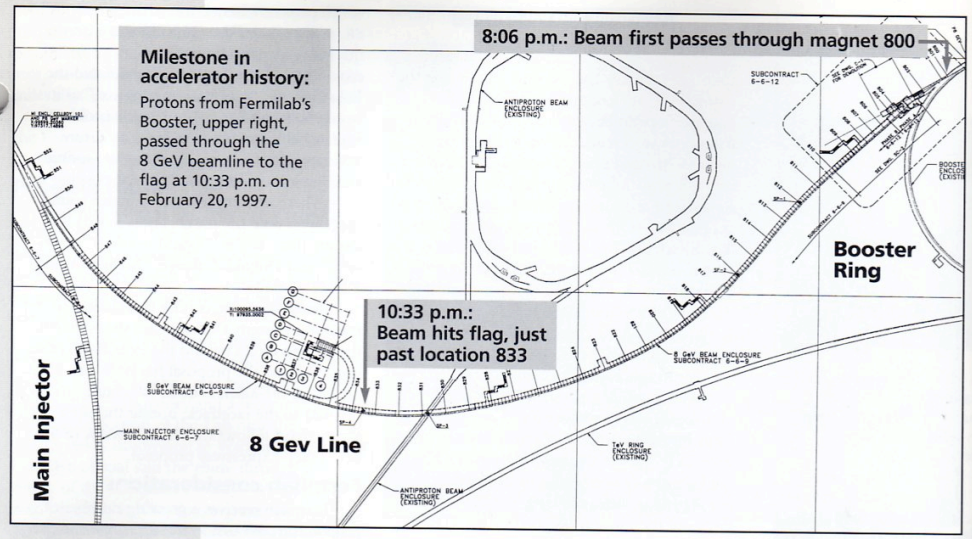


Foster said, "I thought that it would be only a matter of time" before beam showed up at the goal, the flag at 833. As more beam position monitors responded, Main Injector Project Manager Steve Holmes decided that it was time to go. He and engineering physicist Ray Tomlin dashed into the storm to drive to the beamline and see for themselves.

At 10:33, the phone rang in the Control Room. Deputy Project Manager Phil Martin picked it up. "They've got beam on the flag out there!" he yelled a moment later. By now a crowd had gathered, and everyone cheered. Foster grinned. At about midnight, they broke out the champagne.

A few days later, Foster described his relief that the beamline had worked. He was particularly pleased, he said, that the protons had made it to the goal without the need for course correction by the electromagnets that are included in the beamline for this purpose.

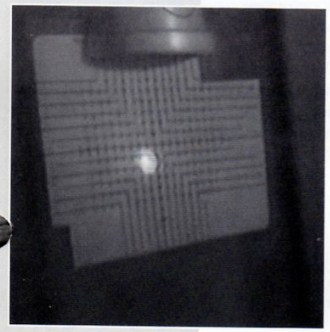
Much work still lies ahead, Foster said, to "move on from this initial success and make the beamline into a bullet-proof, rock-solid, robust accelerator component.

"One of the real joys of this project," he added, "is to see young engineers like Bruce Hoffman, Terry Anderson and Anne Mason step up into the roles of the grand old men who have been building great accelerators around here for years. These are the people who will build the next generation of Fermilab accelerators."

Fermilab Director John Peoples praised the new beamline. "The success of the 8 GeV line demonstrates the wisdom of the choice of innovative permanent magnets for accelerators," he said. "The vision that Bill Foster and [Fermilab physicist] Gerry Jackson have brought will make a major contribution to our ambitious luminosity goal for the Tevatron. It is the first step toward building the Recycler."

The Recycler Ring will be the next Fermilab project to use permanent magnets. It will allow reuse of the antiprotons that remain at the end of a Tevatron store. The smooth commissioning of the new beamline so far encourages Foster in his work on the next project.

"When we bought the champagne for Thursday night," Foster said, "we had a choice: seventeen dollars a bottle or forty dollars a bottle. We went with the seventeen. We'll save the forty-dollar champagne for the night we get beam through the Recycler." ■



Beam on the flag: a fluorescent tile at location 833 glows as the first protons of the Fermilab's new 8 GeV beamline strike it. A video camera recorded the flash.

1979

Har K!

subject: Neutrino Tune

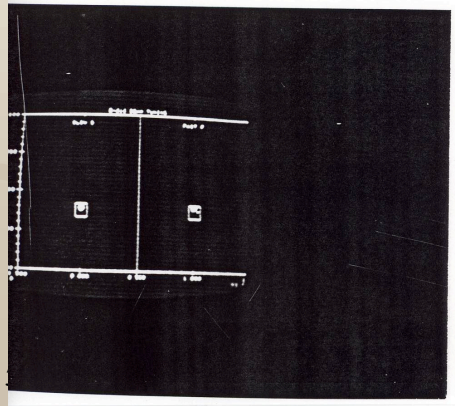
Purpose: Tonight we retuned the neutrino line. The purpose was to come up with a new tune that would enable the Neutrino department to run OHN2 at some higer Level. The reason we wished to do this was OHN2 was running at 23 amps. It would start Ocillating at 15 amps. As a result if our Beam moved a little they couldn't compensate.

Summary: We were some what succesful. OHN2 now can run at 45 amps. This hopefully means that if the beam moves Neutrino should be able to compsate.

I have put copies of the new sytic's in everyones mail box. also a copy in the sy log.

The Key Bread thrugh for all the above was MHT110.

Mar

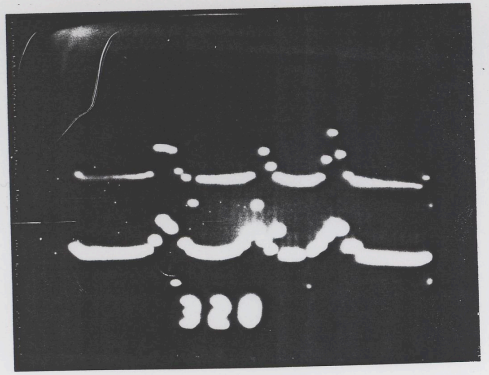


Note we have TWO Neutrino Boxes one For the Fast & one For the slow. You can find it on TV channel # 20 on the neutrino TV system

Mar

November, 1980

SY TUNING STATUS



1) As you can see all 3 Proton Lines have beam

2) After Proton gets settled we ~~shall~~ should do a Esep Alignment (Beware they may burn away)

3) We got Beam To The Front end half of Neutrino on The first Pulse. Lent is high but is some what Fixable with a horizontal Adjustment.

4) Neutrino is NOT using MQ120 & MQ121 in there tune

5) TLM/sem is about 2.2 This was fixed by aligning ES38 & ES39

6) MHT103 is fixed. Changed CC19 & controller

0836 MHT120 tripped ~~off~~ on an interlock problem.

0855 We are making an access into 62 to check the klixons on MHT120.

0958 MHT120 is now on a ramp. The magnet was hot.

11:41 S.Y. notes. Neutrino is tuned up for time being with all quads on. If they request changes work with them and make changes.

Proton Septa should be aligned when intensities are convenient.

CRd

Kick Off

- Modern Beam Instrumentation has led to enhanced performance of all accelerators
- Future Machines place more severe demands on Instrumentation
- That is what you are here about