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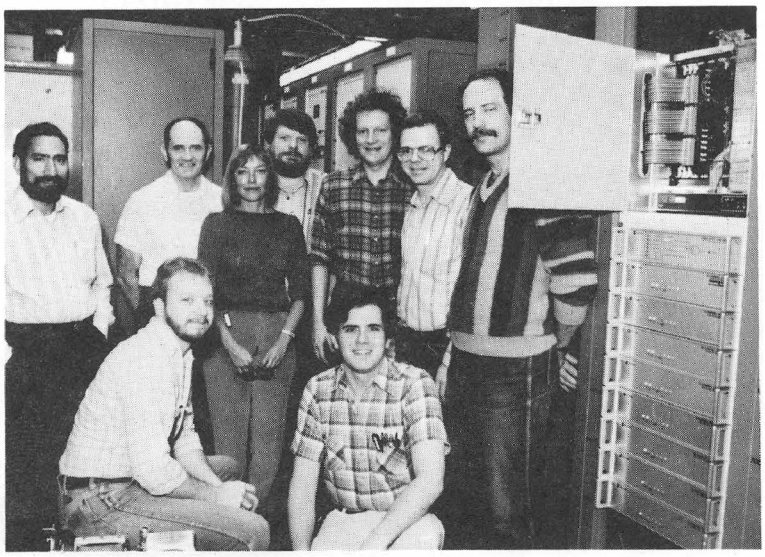
FERMI NATIONAL ACCELERATOR LABORATORY
FermiNews

THREE TEAMS WORK TO IMPROVE LINAC



Controls team, left to right, seated are Brian Pientak and Allen Forni; standing, Jay Ticku, Mike Shea, Barbara Bennett, Al Jones, Bob Florian, Bob Goodwin, and Charlie Briegel. A local control station is in rack at right of photo.

by Cyril Curtis

Energy-Doubler installation continues as a laboratory activity of the highest priority. However, there is other activity in the Accelerator Division. While not directly a part of the Doubler effort, work in progress on linear accelerator systems is important to future Doubler operation, when a proton beam is needed. Changes and improvements are under way in the computer-control system and radio-frequency system. During the past several months, intensive work has involved people from the controls, linac, neutron therapy, and mechanical support groups. Some people from the Linac group have contributed to multiple areas of Linac activity.

Installation of a new distributed computer-control system for the entire Linac began in November and is now complete. Linac operation for cancer therapy was suspended November 30 to permit completion of installation. Out of their experience with microprocessors over the past few years, Michael Shea, Robert Goodwin, and others in the controls group have developed a stand-alone MC68000-based local control station that performs all the data acquisition, control, and device monitoring for a local area of an accelerator. The Linac control system consists of seventeen of these local stations and one primary station all in a loop connected by fiber-optic cable. Although the new system replaces the obsolete Xerox hardware, it uses Xerox's modern Ethernet communication protocol to link with the accelerator central computers. The system features synchronous 15-Hz response and extensive control from any secondary station or from the

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The Linac rf team, left to right, first level: Lester Wahl, Sharon Whelchel, Tony Waitz, Larry Allen, Tony Donaldson; second level: Ken Bodle and Jon Sonenfield; third level: Allan Forni and Wayne Ganger. Missing from photo is Mike Savignano.

NEW LINAC SYSTEMS ARE NOW OPERATIONAL

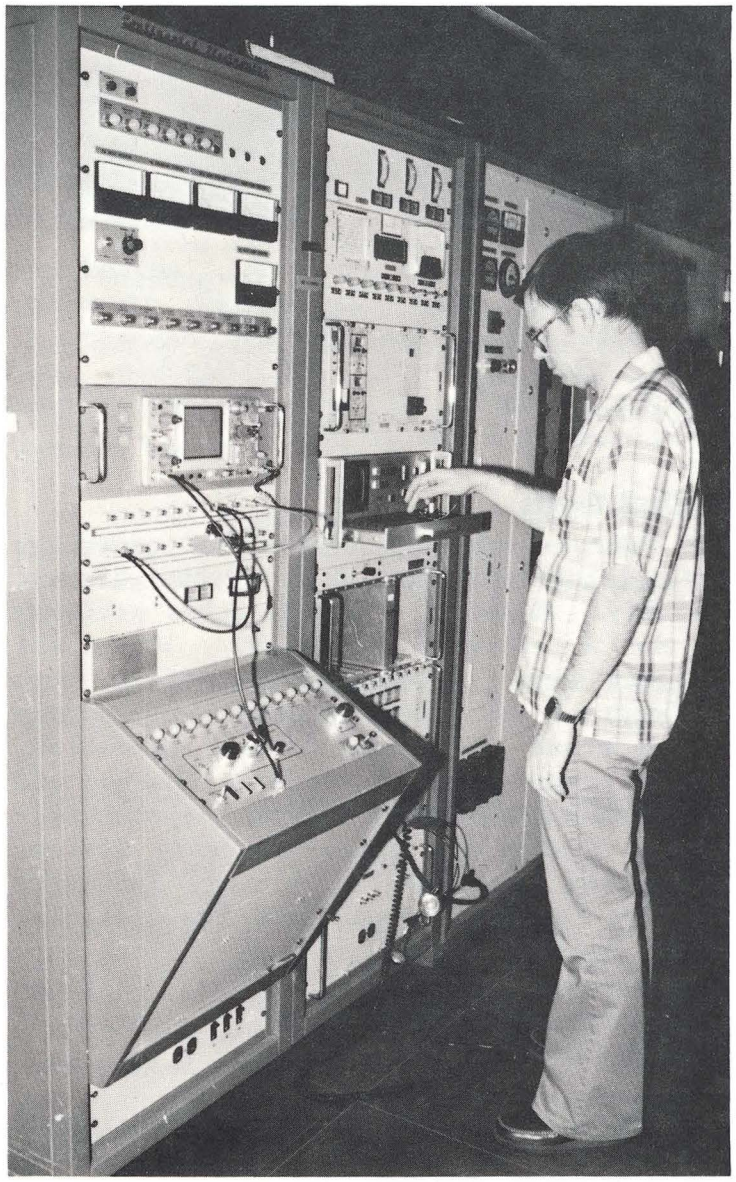
(cont'd. from pg. 1)
Main Accelerator Control Room. Expectations are high for its efficient noise-free operation and ease of maintenance.

Preaccelerator and mechanical support team, left to right, Chuck Schmidt, Walter Correa, guest engineer from Mexico, Jim Wendt, Danny Douglas, Ray Hren, and Dan Black. Missing from photo are Ben Ogert and Elliot Treadwell. Ion source dome is in background.

The rf system modulators, which control five megawatts of pulsed rf power per station, are undergoing multiple changes and improvement, especially in the lower level pulse circuitry. Anthony Donaldson heads this work. The new modulators have increased frequency response of the pulse amplifier chain. Increased reliability is expected from solid-state amplifiers, which replace some unreliable vacuum tubes. Problem diagnosis will be aided by electronic circuits under development. Testing of the new modulator began in the summer, and installation of essential components in all rf systems is complete. Curtis Owen set this improvement as a goal several years ago; with the accelerator shut-down it finally became possible to implement the improvements.

In addition, ion source studies have resumed. A problem which has plagued one of two operating negative ion sources for the past year has yet to be solved. Charles Schmidt has assembled instrumentation for comparative residual gas and optical spectroscopy which may determine agents that affect source operation and lifetime. With the help of Finley Markley, surface physics analysis has revealed potentially harmful contaminates. Also, recent tests of a modified source showed the potential for reduced erosion and thereby increased lifetime and more efficient operation for the ion source.

Although some changes are still under way, all Linac systems are again functional. A 30-mA H^- beam has been accelerated to 200 MeV with the new control system and with new modulators in use. Operation continues with and without beam for shakedown tests of equipment and software programs. The Linac group anticipates the resumption soon of normal operation.



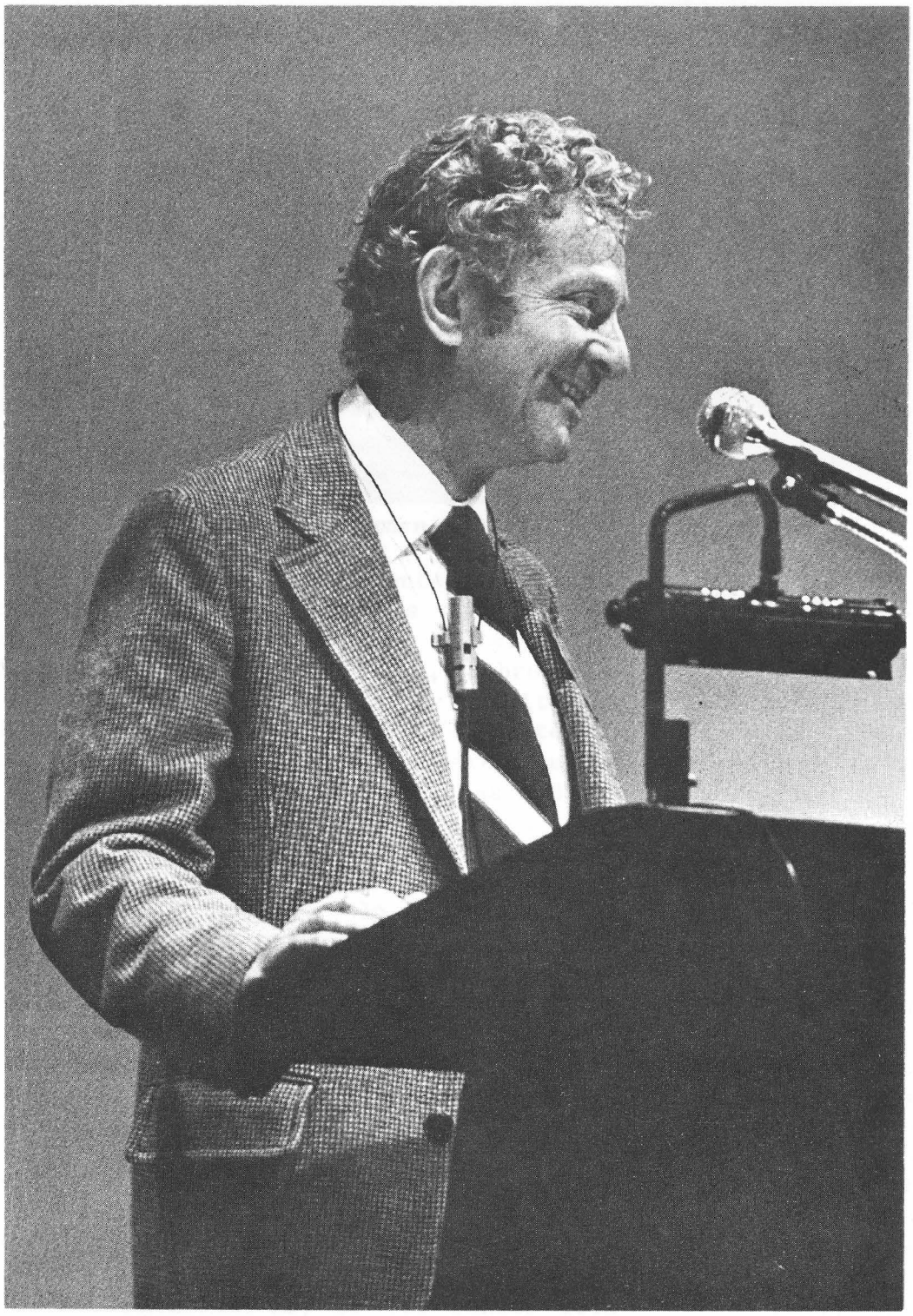
Bob Goodwin operates the local Linac microprocessor control console. Each local console allows control of all Linac devices.

Post Deadline Extra!

LEDERMAN, PERL SHARE PRESTIGIOUS PRIZE

Leon Lederman, director of Fermilab since 1979, and Martin Perl of SLAC have been awarded the Wolf Foundation prize for physics "for their experimental discovery of unexpected new particles establishing a third generation of quarks and leptons." Lederman was awarded the prize for his discovery of the upsilon particle in 1977, Fermilab Experiment #288 (see special edition of **The Village Crier**, August 1977).

Lederman and Perl will share the $100,000 physics prize. Lederman, as a professor of physics at Columbia University, together with collaborators from the State University of New York at Stony Brook, led the experiment that discovered the new particle. Perl headed the experiment at SLAC that discovered the tau neutrino in 1975. Both experiments were pioneer studies into unique areas of particle research to understand the nature of the universe.



Fermilab Director Leon Lederman speaking at an international symposium at Fermilab in 1979.

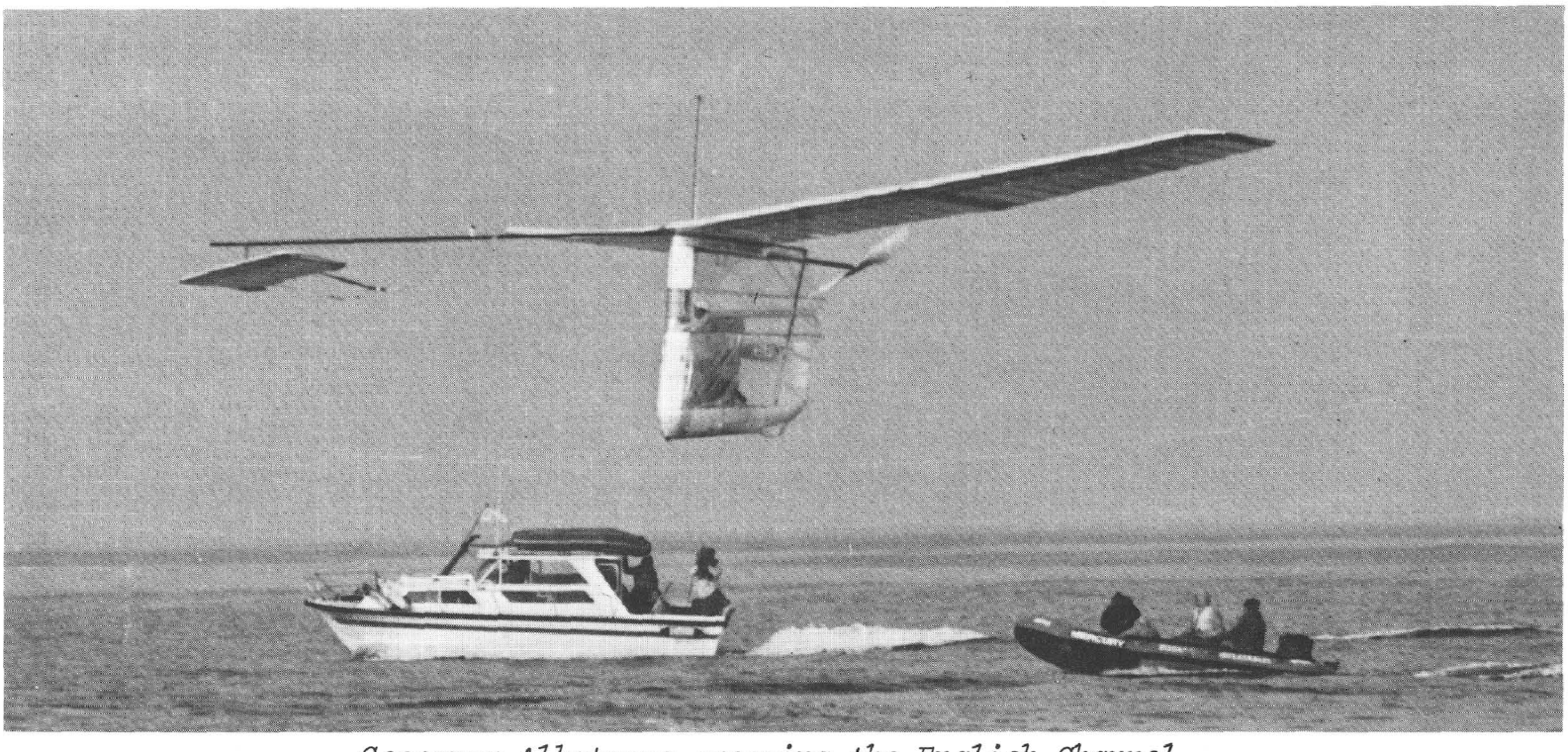
The Wolf Foundation was started in 1976 by the late chemist Ricardo Wolf, a Cuban envoy in Israel who remained in the country after his tenure until his death last year at the age of 93, who contributed $10 million for annual prizes in the fields of chemistry, medicine, agriculture, mathematics, physics, as well as in the arts. Recipients have typically been scientists globally recognized for achievements in their field. Of the 42 winners since the Wolf Foundation prize was created in 1978, four later received Nobel Prizes in physics and medicine. The prize will be awarded May 8 in Jerusalem.

In addition to teaching at Columbia for thirty years, Lederman led an intensive and wide-ranging series of experiments which have provided major advances in understanding the fundamental particles.

GOSSAMER CONDOR, ALBATROSS CREATOR TO SPEAK

by Jane Green

Man has always wanted to fly like the birds. On August 23, 1977, this dream became a reality when the first human-powered aircraft, the Gossamer Condor, completed a figure eight course to take the $95,000 Henry Kremer Prize. Dr. Paul MacCready, the aircraft's creator, went on to develop the Gossamer Albatross, which crossed the English Channel to win the $213,000 Kremer Prize, as well as the world's first two solar-powered aircraft, the Gossamer Penguin and the Solar Challenger.



Gossamer Albatross crossing the English Channel.

These recent achievements will be discussed by MacCready, in his talk, "Flight by Muscle and Sunbeams: Catalyst for Global Thinking," on Friday, February 4, 1983, at 8 p.m. in Ramsey Auditorium. MacCready will also describe such technological ventures as human-powered surface vehicles and photovoltaic cells as a developing energy resource.

MacCready has degrees in physics and a Ph.D. in aeronautics. In 1970, MacCready founded AeroVironment, Inc., a company focused on air quality consulting, development of alternative energy sources, and products relating to atmospheric monitoring and energy conservation. He is the recipient of numerous honors, including the Engineer of the Century Gold Medal, and the 1982 Lindberg award, an honor annually bestowed on an individual who contributes significantly to achieving a balance between technology and the environment.

Admission is $2, $1 for senior citizens. For further information, phone ext. 3353.

SCHOLARSHIP APPLICATIONS DUE

Universities Research Association scholarship applications are now available in the Training Office, WH15SE. The deadline for returning them is March 1.

Each year, URA sponsors a minimum of 15 scholarships for children of full-time employees. A single scholarship can be for as much as $2,000 a year. It covers tuition and fees and is renewable for up to four years as long as the student remains in good standing at the school.

The students who receive the scholarships are selected on the basis of their American College Testing (ACT) scores. To be eligible for a scholarship, a student must be a high school senior who plans to pursue a four-year college curriculum leading to a degree.

Those students who are awarded scholarships will be notified around April 1. For additional information, call ext. 4367.

PLAUDITS TO NALREC FOR CHRISTMAS DINNER DANCE

NALREC group picture taken at the Dinner Dance. Pictured are left to right, first row: Pete Gutierrez, Ginny Ritchie, Bob Shovan, Helen McCulloch, Carmen Vera, Jesse Guerra, Glen Lee; second row: Jim Fritz, Linda Even, Jo Baaske, Jean Plese, Nancy Shanahan, Charles McNeal; third row: Mike Frett, Jim Fourmont, Gary Andrews, Joe Morgan, John Satti, Ed LaVallie.

The Annual Christmas Dinner Dance sponsored by NALREC was held on December 4 at St. Andrews Country Club, West Chicago. The committee in charge of the Dinner Dance was Jesse Guerra, Jo Baaske, and Jean Plese. The festive event was attended by 250 people.

MOTORISTS! KEEP ROAD-CONDITION HOTLINES HANDY

The most valuable tool a motorist can have to get through the winter is information. To steer residents to sources for travel and road condition information, this list of phone numbers is offered:

Tri-Cities: Detailed road information is available from the Emergency Services and Disaster Agencies in each city--**Geneva**, 232-9555; **Batavia**, 879-1510; and **St. Charles**, 377-4416.

Illinois tollroads: Whether a person answers the phone or you are greeted by a recorded message, you can find out tollroad conditions for the **Elgin** area at 742-7642; **Oakbrook**, 323-1111; and **Chicago**, 283-6204.

DeKalb County: Sheriff's office recording, 815-895-8151.

Kendall County: Sheriff's office recording, 553-5856.

McHenry County: Sheriff's office, 815-338-2145.

National Weather Service: For a recorded message that gives a general account of weather conditions throughout the country, call 298-1413. At the end of the recording, the line will ring and the person answering can then answer specific questions.

Des Plaines: The number to call is 827-7101; for **Joliet**, 815-727-5471; **and Rockford**, 815-962-7051.

Should it be necessary to close Fermilab because of emergency storm conditions, that information will be broadcast on the following radio and television stations. This is provided as a community service through the facilities of a storm information center.

Radio Broadcasts (AM): WGN 720; WIND 56; WMAQ 670; WCFL 1000; (FM): WCLR 102; WBBM 96; WFYR 103 1/2; WMET 95 1/2, and WYEN 107.

Television Broadcasts: WGN-TV channel 9 and WFLD-TV channel 32.

WEIGHT LOSS PROGRAM OFFERED

The Fermilab Medical Office in conjunction with Geneva Community Hospital will hold an on-site "Choose to Lose" weight reduction program on consecutive Tuesdays beginning February 15. An orientation session will be held in the Comitium conference room on February 1 at noon, and all interested persons are encouraged to attend. For more information, contact the Medical Office, ext. 3232.

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