The Village Crier

national accelerator laboratory

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PROGRESS REPORT - OCTOBER 10 through OCTOBER 15, 1972

The accelerator has run stably at 200 BeV with Multi-Booster pulse injection through the week. Beam was furnished to the Meson Lab on Thursday and Friday for tuning, and to experiments in the Neutrino Lab and Internal Target Section over the weekend.

MAGNET TEST COMPLETED SUCCESSFULLY

...Workmen assembling coils of the giant magnet last February in Lab A of the NAL Bubble Chamber area...

...150-ton superconducting magnet moved to its final location in the NAL 15-foot Bubble Chamber last May...

Early on the morning of Monday, October 10, 1972, the superconducting magnet that is an integral component of the NAL 15-foot Bubble Chamber, finished its first test run with complete success. The magnet reached its full design parameter -- 30 kilogauss central field (about fifty thousand times the earth's magnetic field) -- about 5 a.m. after men and machine had been tested with equal intensity for several weeks. Filling of the magnet with liquid helium was completed on Sunday, October 8, and once full of liquid, the magnet was energized and progress was rapid.

The 150-ton magnet surrounds the 15 ft. Bubble Chamber, still under construction. Its purpose is to act on particles that come from the Main Ring into the chamber by bending the track of the particles so that one may be distinguished from another in the photographs that are taken from the top of the chamber. The high energies obtained with the NAL accelerator mean that the particles are travelling at very high speeds. The magnetic field must be large enough to bend these speeding particles. This magnet is one of the most powerful and most advanced in the world today.

The physical parts of the magnet are fully enclosed in a container filled with liquid heliu The testing that has been underway since September 6 involved first cooling the magnet, about one degree per hour, down to close to absolute zero (-452.1 degrees F) to achieve the physical

(Photos in this issue are by NAL Photographers.)

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effect known as superconductivity in which materials at this low temperature lose resistance to the flow of electricity. In conventional electromagnets, heat is produced because of the resistivity of the current-carrying conductor. Considerable power is used in producing this heat, and that power is simply wasted. Since there is no resistance to current flow in a superconducting magnet, no heat is produced and therefore no power is lost. A relatively small source of electrical power is needed to charge the magnet and electric power is used primarily to keep the refrigeration operating. The saving in power cost over the long run will be substantial.

...(L to R) J. White, G. Athanasiou, and R. Niemann were part of the magnet test effort...

To take advantage of the expertise accumulated at the Argonne National Laboratory during the construction of Argonne's 12-foot bubble chamber several years ago, and to minimize the burden on the staff at NAL for constructing the 15-foot chamber here, the decision was made to have Argonne build the magnet for NAL. This joint effort between ANL and NAL proved to be very satisfactory. During the two-year span of the project, ANL and NAL staff have worked side by side toward successful completion. The project finished within budget estimates, and the cooperation enabled NAL staff to learn of the machine as it was built and to be ready for operating when it was finished. Argonne personnel who worked on the project included John Purcell, Henri DesPortes (visiting scientist from Saclay), Tom Cameron, Karl Mataya, Bruce Millar, and Dick Jones (deceased).

John Purcell speaks of the successful test run by saying, "After going through the tests of the ANL 12-foot bubble chamber magnet, this test was more like a routine run than a test. I would like to thank the NAL operating crews for helping make this the smoothest test in big magnet history."

Members of the NAL Bubble Chamber staff working on shifts during the cooldown were: R. Ahlman, George Athanasiou, F. Bellinger, D. Curtice, R. Davis, J. Fogelsong, H. Kautzky, J. Kilmer, Mike Morgan, George Mulholland, R. Niemann, W. Noe, J. Stoffel, J. Thompson, and J. White.

Also contributing to the magnet construction efforts were: Steve Johnson, George Simon, Paul Thorkelson, David Oprondek, Hoyt Smith, Art Skraboly, Lee Mapalo, George Nosal, Harry Stapay. William Fowler has headed up the Bubble Chamber work at NAL, assisted by Russell Huson.

NAL 30" Bubble Chamber personnel who lent their assistance to the project included: Dick Brazzale, Jim Harder, Gary Hodge, O.P. Keefer, George Powell, Vance Sauter, Fred Walters and Del Q. Wilslef.

Hans Kautzky, one of the NAL people most intimately concerned with the construction, describes the main components of the huge magnet: An upper and lower coil stack each consisting of more than twenty "pancakes." A "pancake" has three layers -- spiral wound from a stainless steel strip for strength, then a mylar strip for insulation, and then a copper strip embedded with superconducting strands (60 strands, each only 15/1000 inch thick) conducting all current (5,000 amps.). The pancakes are stacked, then joined by soldering. The vacuum-tight helium can surrounds this stack. Only two small openings -- one for cooling equipment and one for power leads -- can be found on top. Layer after layer of super-insulation surrounds the can, up to an outer stainless steel skin which is welded all around. Precise, accurate workmanship was necessary at every step because, once closed, the magnet is a completely-sealed unit and none of the components can be reached. Main technical parameters of the magnet are: Field in center: 30 kilogauss. Bore diameter: 14 feet; height 10 feet. Stored energy: 400 megajoules.

George Mulholland who was in charge of operations during the test, views the achievement as follows: "The magnet and its cryogenic system grew out of a marriage of national laboratories, industry, and consulting firms. The totally successful nature of the first test is a credit to all those involved and particularly satisfying to those of us who get to move on to the next Bubble Chamber challenge."

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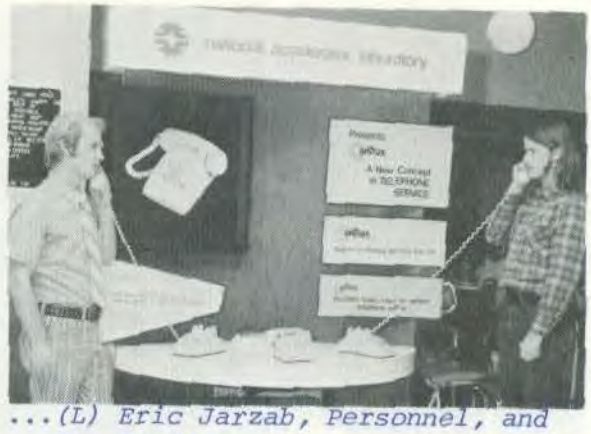
CENTREX GOES TO WORK FOR NAL EMPLOYEES ON NOVEMBER 3rd

WHAT IS CENTREX?

It is a computer-controlled method of operating a telephone system such as that at NAL. The automatic control takes over many of the manual functions previously performed by the switchboard operator and the phone user. The telephone system at NAL will change to Centrex beginning Saturday, November 4th. Two years of planning and installation have been necessary to reach the switch-over point.



...(L) Eric Jarzab, Personnel, and Tim Fielding, Photography, at the Centrex display now located in the Village cafeteria...

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HOW DOES CENTREX AFFECT YOU?

Outside callers will reach you directly when they dial the seven-digit number which is assigned to your phone. Calls can still be referred to you by the switchboard from callers who do not have your number. Transferring calls is simpler. Three-way conference calls can be conveniently connected. One of the most-appreciated improvements over the former system is certain to be that outside lines on the "9" dial should hereafter always be available.

HOW DO YOU LEARN HOW TO USE CENTREX?

All employees will be scheduled for a one-hour orientation to be conducted by Illinois Bell instructors beginning Monday, October 23rd. These sessions are intended to give the information needed to use the system properly. Actual equipment will be used during the instruction. The classes will be held on three consecutive days at 27 Winnebago in the Village. You should receive notification as to which meeting to attend, but if you have not received such notice by October 20th, call Carolyn Hines, Ext. 771. Plan to attend the scheduled meeting; the benefits will be well worth the short time it will take. At the time of this orientation, a new directory listing Centrex numbers of all phones at NAL will be issued. The main outside number of the Laboratory will change to 840-3000. You will be furnished with information on how to notify the persons outside of the Laboratory with whom you deal, of the new number to reach you.

On the weekend of November 3rd, the paging-by-phone and the emergency-call number will be among the first to change over to Centrex. During the period of transition, information will be given by the switchboard operator -- Dial 0 -- if you are in doubt of how to reach someone.

The Village Crier will carry further information next week. It is important to remember that Centrex is a system carefully designed to simplify and assist your communication with others.

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FINAL MAGNET TEST MILESTONE FOR BUBBLE CHAMBER SECTION

...NAL Staff members completing the magnet test included (Front, L to R): J. Thompson, F. Bellinger, J. Kilmer, and J. Fogelsong. Back: W. Noe, R. Ahlman, G. Mulholland, D. Curtice, H. Kautzky, G. Simon, R. Davis, J. Stoffel...

...(L to R) Russell Huson, Hans Kautzky, William Fowler arranging the move of the giant magnet to its final location in May, 1972...

...Winner of the 1972 NALREC Softball season was the Radio Frequency team with a final record of 10-4. Second place was "Been Transferred" team. Winning RF team members shown here are: (Seated L to R) Don Breyne, Chuck Chizzo, Dan Douglas, Jan Wildenradt. Standing (L to R): Tom Schmitz, Fred Sarver, Mike May (Team Manager), Jack Smith, Chuck Grozis (Assistant Team Manager), Allen Fogle, Cutchlow Cahill. Doug Maxwell was not present for picture...

"CHAPAYEV" AT NAL OCTOBER 27th

The NAL International Film Society's second offering of the current season is entitled "Chapayev," an exciting account of a beloved hero of the Russian Revolution. Chapayev carried on a shrewd guerrilla warfare after World War I. He engendered a substantial following. The plot deals with the episodes involved in their achievements and the avenge by his followers after his death.

The film showing will be at the Village Barn at 8 p.m. Tickets are $1.00. All visitors are welcome.

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"GODSPELL" TICKETS ON SALE HERE

NALREC and the Visitors Center are co-sponsoring a theater outing in Chicago to attend "Godspell," on Friday, November 10th. The performance begins at 8:30 p.m. at the Studebaker Theater, 418 S. Michigan Avenue. A limited supply of tickets is available at $9.00 and $8.00 per ticket. Individuals must provide their own transportation. Call Janice Roberts at Ext. 560 or Eric Jarzab, Ext. 396 for additional information and/or ticket reservations.

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CLASSIFIED ADS

FOR SALE - 1962 Ford Galaxie, A/T, P/S. $175 or best offer; 8-ft. pool table (Sears Diplomat) like new with accessories, $275. Call Bill Noe, Ext 355 or 697-2785.

FOR SALE - CAMARO, 70½, Z-28, close ratio 4/spd. 410 positraction, P/S, P/disc. brks., 21,000 mi., $2,400. Call Ed Schmidt, Ext. 534 or 344-1021.

FOR SALE - Childs Tricycle-$5; Pedal Jeep-$4; 50' length heavy rubber garden hose-$4. Call Mike Morgan, Ext. 791 or 448-1838.

FOR SALE - 14,000 BTU/Norge/Air Condr., 5 yrs. old, gd. running cond., $150. Call John B. Stoffel, Ext. 355 or 653-6655.

FOREIGN STAMPS WANTED by Graciela Carbo, 25 Nequa, Ext. 532.

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The Village Crier is published by the Public Information Office of the National Accelerator Laboratory. Margaret M.E. Pearson, Editor. Correspondence may be directed to the address below. Telephone number of the Laboratory is 312—231-6600.

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