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MAIN RING STAFF WORKS AROUND-THE-CLOCK TO TUNE ACCELERATOR

...(Lto R) Tony Winchester, Halbert Landers, (in cab) and George Hill operate the giant magnet handling device...

...(L to R) Tony Winchester, George Hill install a replacement magnet in the Main Ring Tunnel...

Photos by Tony Frelo, NAL

The day and night efforts of many men and women are involved in the final efforts to get NAL's accelerator system "on the beam." They are uncovering and solving a number of problems, especially in the complex Main Accelerator -- the largest single component (four miles in circumference) in the NAL system. A partially collapsed vacuum chamber was found in a magnet. A piece of scrap copper was discovered to be shorting out turns of a coil. In spite of these and other technical problems, eight turns of the beam were circulated through the system at the end of June.

At 2:30 a.m. Sunday morning, August 1, a coasting beam was achieved in the Main Ring. Ernie Malamud, Main Ring, in a recent memorandum to all members of the Main Ring section, observed: "All of you contributed to the attainment of this significant milestone by your dedication and hard work."

Malamud's memorandum summarized how the coasting beam was obtained and what it means:

"Bringing the accelerator into operation consisted of a number of important steps: (1) an intensive period of tuning (from June 24 - July 2 this consisted of 180 hours of Main Ring Time; a single turn was achieved at 6:45 a.m., June 30, 1971; eight multiple turns were achieved at 3:20 a.m., July 2, 1971); (2) shut down for accelerator repairs and improvements (as was the case between July 2 and July 21); (3) an intensive period of tuning - from July 21 to August 1, 245 hours; (4) a coasting beam - achieved at 2:30 a.m., August 1, 1971.

"Future milestones planned in the Main Ring include: An accelerated beam; acceleration through transition (17.4 GeV); and, finally, acceleration to 200 GeV.

"During the two periods of intensive 7-day/week, 24-hour/day tuning the Injection System, Linac and Booster and Booster RF, furnished us a stable beam over 50% of the

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MAIN RING STAFF WORKS AROUND-THE-CLOCK TO TUNE ACCELERATOR - continued from Page 1

Time. This is a remarkable record, attained by very hard work by the members of the Accelerator Operations Section.

A short (1 micro-second) pulse of 7 GeV protons is injected once per second. When the beam "coasts", it means that it goes around and around the Main Ring hundreds and thousands of times along a stable equilibrium orbit inside the vacuum chamber. Many requirements are necessary for this to happen: (1) uniform field in all magnets; (2) good regulation in the power supply so the guiding magnetic field doesn't change during the time the beam is coasting; (3) proper gradients and alignment of the quadrupole magnets to keep the beam focussed; (4) good vacuum so not too many protons are "lost" on each circuit due to scattering out of the beam by residual gas."

The Main Ring's first circulating beam, on August 1, was rapidly built up to over 10,000 turns. It is expected that initial acceleration tests can now begin.

There are more than 1,000 magnets in the Main Ring's earth-covered concrete tunnel most of which weigh about 13 tons each. In a new accelerator operation, it is expected, from time to time, that some changes in magnets will have to be made, for one reason or another. So, to expedite the replacement of magnets in the system, the Main Ring has a "magnet moving crew" under the direction of Bob Sheldon, a British-educated scientist who resides in nearby Geneva. Frank Kleber, executive assistant in the Main Ring, describes this crew as "our unsung heroes -- the men who come to the rescue at any hour of the day or night so that we can get the system back to work again."

On Wednesday night, August 11, the Main Ring Control room determined that there was a magnet failure in Sector D of the Main Accelerator. George Hill, who lives on Chicago's South Side, had left the Central Laboratory area for home at about 6:30 p.m. At 12:30 a.m., he received a telephone call to return to the Laboratory to determine just what was wrong in the tunnel. He arranged for three other members of his crew to be called back to work, too -- Vic Garzotto, of nearby Warrenville; Halbert Landers, of Aurora, and Tony Winchester, from Joliet.

They arrived at the Central Laboratory area beginning at about 1 a.m. and went down into the Main Ring tunnel. For nearly five hours, they worked in removing three magnets and then installing three others using a magnet handling vehicle designed by Wally Pelczarski of the Main Ring. It takes from 30 minutes to two hours to replace a magnet, depending upon its location in the Main Ring tunnel. In addition, another hour is used to weld it properly so that the vacuum and water connections are properly aligned. Others who assist in these tasks are Walt Limbaugh, Pete Surman and Jim Forester, all welders from the Machine Shop and vacuum technicians from the Main Ring supervised by Jim Klen.

It was the third time in less than a week that the "unsung heroes" had been called to work in fireman-like fashion. "We realize that we must respond quickly to these calls to replace magnets", says Hill. "We are working to make our crews very proficient at this task since it will become increasingly vital as time goes by to keep this $250,000,000 machine and its components operational and minimize down-time".

...George Hill directs the loading of a replacement magnet for the NAL Main Ring. Each of the more than 1,000 . 13-ton magnets in the Ring is now being checked as part of the operating schedule of the NAL Main Ring Section. The special magnet loading device was designe by Wally Pelczarski, designer, in the Main Ring Section...

Photo by Tony Frelo, NAL

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ED HURST: A MAN WITH MANY INTERESTS

"Anything I don't know is interesting," philosophizes Edmond C. (Ed) Hurst, of NAL's Technical Services. Ed is one of those rare individuals who looks forward to the challenge of each day's problems, regardless of whether they are big or small, technical or humanistic. At present, he is working on improving the design and construction of the cathode in the Cockroft-Walton pre-accelerator -- the Rube Goldgerg-like device imported from Switzerland to initiate the proton beam for the entire NAL accelerator system. He is developing a ceramic cathode (it formerly was metal) to provide the Cockcroft-Walton with a longer life.

...Ed Hurst demonstrates the cathode he built for the NAL Cockcroft-Walton...

At the age of 63, Hurst has had a varied career. Born in Chicago, he started his technological career with a boyish interest in such things as chemistry and erector sets. Whatever need arises, he is there to attempt to figure out a solution. A prolific reader of technical material, he says: "I'm still learning."

A resident of Joliet, Ed spent most of his boyhood years in the Austin area of Chicago. He was married in 1940 and is the father of four sons. One is a mechanic at O'Hare airport; another is a technician in a dental laboratory (inspired, no doubt, by watching his father make several sets of false teeth); another is a "rigger" at the Argonne National Laboratory, and the fourth is a "rigger's apprentice" at Argonne who has just received a private airplane pilot's license. "Papa" Hurst started flying in 1926 in a World War I "Jenny" trainer. He now has a Piper J-3 based at Joliet's airport. "I go up whenever I feel like it for short trips and just to keep current," he says.

On weekends, Hurst is building a helicopter at a farm building he rents near his home. He started with an aluminum block automobile engine and now is working on the propeller blades. "I plan to build them from scratch with raw materials in my work shop," he says. Hurst is also building, with one of his sons, an unsinkable pontoon craft -- a marine dune buggy -- out of polyurethane foam. On previous jobs, Hurst has developed a process for heat treating tungsten and a new style of sublimators for evaporation. He holds several patents. In 1927 Ed worked for an airplane manufacturer in Maywood, at the old Checkerboard Airport, where he built wooden airplanes. Until 1939, he built and drove dirt track racing autos in competitions around the Middle West. "I've made shoes and sewed suits for my children, too," he recalls.

In addition to his work on the Cockcroft-Walton cathode, Ed works on such things as the sophisticated pieces of instrumentation in the NAL system, some of which he both designs and builds, using the most advanced materials and methods. "It's a combination of disciplines -- electro, mechanical, chemical; you combine them with imagination," he says. "Some times it comes out like black magic."

As for NAL, he tells friends: "It is so important. The things that will be learned here are so important to mankind that they are beyond the average man's imagination. I enjoy working here tremendously. There are so many diverse opportunities to do things." And doing things is what Ed Hurst is most interested in. (Photos by Tim Fieldi

Ed Hurst tests a new idea...

...Hurst at stick of his helicopter...

BOWLING SIGN-UPS STILL OPEN

Plans are being made for the 1971-72 NAL bowling season, according to Mrs. Barb Schluchter, of Main Ring, NAL Bowling League secretary. The league will start bowling on September 10, 1971, and complete its schedule May 5, 1972. Bowling will take place at the Bowling Green Sports Center in West Chicago, every Friday from 8 p.m. until approximately 11:30 p.m. except December 17 (Christmas Dance); December 24, Christmas Eve, and December 31, New Year's Eve. It is planned that there will be 12 teams of 5 members each. Persons interested in the bowling competition should call Helen Ecker, Ext. 391.

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REMINDER: NAL FAMILY PICNIC TO BE HELD SUNDAY, AUGUST 29

Preparations are well underway for the 4th Annual NAL Family Picnic to be held at the Village Recreational Area on Sunday, August 29th. Games, rides, free food and drinks, a model airplane show and a strolling German band are among some of the features this year. Neither money nor tickets are needed; all NAL, DUSAF, and AEC employees and their families are invited. So mark your calendars now, and plan to come early and stay late. Watch next week's Crier for more information about the schedule of activities. If you would like to lend a helping hand for a while, call Eric at Ext. 415.

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MORE CHANGES IN THE NAL VILLAGE

The NAL Equal Employment Opportunity Office, formerly located on Sauk Boulevard in the NAL Village, has moved to 14 Potawatomi. Kennard Williams, Warren Cannon, Roel Rodriguez, Eric Jarzab and other members of the NAL EEO staff have their offices there.

Their move is another phase in the relocation of several of the offices located on Sauk Blvd. in the NAL Village in order that the houses may be reconverted into living quarters for visiting experimentalists. The Employment Office, and the office of C. F. Marofske, Personnel Manager, have been consolidated at 21 Sauk.

Public Information has moved to 35 Blackhawk; Housing to 33 Shabbona, thereby leaving four houses on Sauk Blvd. to return to residential use as they were in 1968, when the Laboratory moved to the former Village of Weston.

Bernard Lensmeyer and Miss Cynthia Sazama are co-ordinating the Housing arrangements with the assistance of the Site Modification Office.

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CONGRATULATIONS!

To Richard and Susan Rimbo of Lemont on [redacted]

Dick is employed in the NAL Machine Shop.

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CLASSIFIED ADS

FOR SALE: Living Room Set, IronRite, Ironing Board, Slot Car Track, Bird Cages, Hair Dryer, Roller Skates. Call R. Downs, Ext. 516.

GIVE AWAY: 3-month old Schnauzer-Poodle Puppy, Brown and Black Female. Call 231-0468 or Dottie, Ext. 307.

FOR SALE: 1967 Olds Cutlass Supreme, Loaded, In Mint Cond. Best Offer or $1200. Call Dave 879-2900 Ext 227.

FOR SALE: CB Equipment - 5 Watt Base & Mobile Units, 1 Watt WTS., 5 Element Beam & Rotator, Audio Compressor & Misc.
Call John Simon, Ext. 541.

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