

The cryostat pictured above arrived at the Lab on July 2. It is one of three cryostats needed for the construction of the DØ detector.

The DØ experiment, which was proposed in 1983, is entering its final construction phase. Scheduled to begin its first run next summer, the experiment is a collaboration of about 200 physicists representing various institutions in the U.S., France and the Soviet Union.

This summer, the DØ collaboration will see the arrival of two of the three cryostats for the DØ calorimeters. The cryostats were manufactured by Process Engineering, Inc. in New Hampshire. (See page 2 for story about the cryostat's journey to the Lab.) All three cryostats are part of the DØ detector which is designed to track and measure the energy of all the particles coming out of a collision between protons and anti-protons in the Tevatron Collider. According to **Roger Dixon**, DØ Construction Project Manager, energy is measured in a set of three large liquid argon uranium calorimeters that effectively cover all possible angles of particles being emitted from the collision point except for those that escape down the beam pipe.

Each calorimeter consists of an array of modules that are constructed out of uranium, copper or stainless steel plates (depending on the location of the module within the calorimeter) with printed circuit readout boards sandwiched in between. The modules are immersed in liquid argon, which

fills all of the gaps between the plates. As particles from the collision pass through the calorimeter, they produce showers of particles in the plates which pass into the liquid argon and ionizes it. The charge from the ionization is collected on the printed circuit readout boards and the magnitude of this charge gives a measure of the energy deposited in the calorimeter.

Since the calorimeter must operate in a bath of liquid argon at a temperature of about 80 degrees above absolute zero, the structure is that of a large thermos bottle, i.e. a cryostat. The cryostat which recently arrived from Process Engineering, Inc. in New Hampshire is for one of the DØ end calorimeters. It will be tested and plumbed for liquid argon before being transported to DØ where the calorimeter modules will be loaded into it.

The first cryostat to arrive at the Laboratory was for the Central Calorimeter which is presently in the DØ clean room. It already has all of its modules installed and is now being welded closed. It will move to its position on the detector platform in August. The last cryostat scheduled to arrive this month will house modules for the final end calorimeter.

WHAT A TRIP !

THE STORY OF SUPPORT SERVICES ROLE IN BRINGING THE DØ CRYOSTAT HOME

The first of the DØ end calorimeter cryostats arrived at the Lab on July 2. It was manufactured by Process Engineering, Inc. in Plaistow, New Hampshire and transported by truck to the Lab. Before Process Engineering was awarded the bid to manufacture the cryostat, the issue of moving it from New Hampshire to Fermilab was fully researched. Due to the massive size of the cryostat, it was decided that truck transport was the only viable transportation alternative. The finished cryostat weighed over 50,000 pounds and was 17 1/2 feet in diameter and 9 feet high. It was too wide to be shipped by rail and the cost of transporting by barge was prohibitive.

After the decision was made to truck the cryostat to the Lab, the Offices of the Department of Transportation of all the states between New Hampshire and Illinois were contacted regarding transportation permits. All were agreeable and no transportation problems were foreseen. When the cryostat was completed, however, the story changed. The finished cryostat was larger than initially estimated, and the move which was originally planned for the winter was now to take place in the summer. Seasonal road construction and increased traffic due to the tourist industry made truck transport very unfavorable to many of the states that had two years earlier agreed to issue permits. The increased width also ruled out some passages. It was at this point that Traffic Administrator **Carol Weissart-Jagger** found that bringing the cryostat home was to be no easy feat.

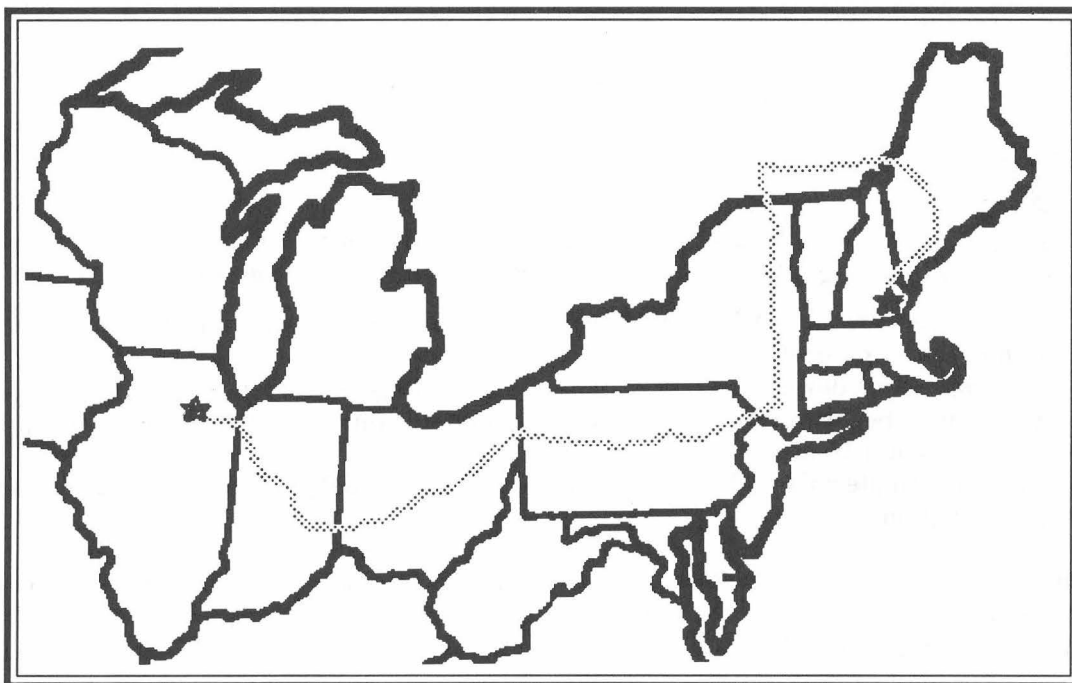
Carol was asked to act as the liaison between the Laboratory, the trucking and rigging company, the permit agency and the various Departments of Transportation in the states to be travelled. While helping to orchestrate the cryostat's fifteen day journey, Carol found that her sense of humor and her ability to "roll with the punches" were definitely positive attributes. Working with representatives from W.J. Casey Trucking and Rigging and the permit agency they had employed, Carol spent many hours devising transportation routes and obtaining all necessary permits. Tasks, that at times, required the diplomacy of a statesman, as various rules and regulations were discussed and negotiated.

"The first problem we encountered was just getting the cryostat out of New Hampshire," said Carol, as she pulled a massive file out her desk that contained the notes and correspondence that tracked the journey. The original plan had been to move the cryostat through Vermont and into New York. But, when Vermont was asked to issue a transportation permit, the answer was a very firm no. "There was no one we could appeal to. Their Department of Transportation said no and that was it!" Vermont cited bridge and road construction, which they felt would make

travel through their state hazardous, as the reason for denial. Now Carol, the trucking firm and the permit agency were faced with finding an alternate route. After much study, it was decided to bring the cryostat out of New Hampshire into Maine, through Canada and back into the U.S. "This was a tricky route. We crossed into New York at the 1,000 Mile Bridge. The maximum width of the bridge was 18 feet. The cryostat was 17 1/2 feet, so we were just able to make it," related Carol. "We were also held up in Quebec for 5 days due to insurance problems and paper work that needed to be put in order. Each country and state has its own transportation regulations and requirements. We had to take the trip one step at a time, one state at a time. It would have been nice if we could have just applied for all the permits at once and rolled along, but the system doesn't work that way."

The cryostat left New Hampshire on June 18. Because most states have very strict regulations regarding time of transport, the permits usually restricted transportation during heavy traffic hours. This greatly limited the number of miles that could be covered each day. "For the most part, we could only travel between 10:00 a.m. and 3:00 p.m., Monday through Friday. On the weekends, the truck had to pull off and wait. Ohio considered Monday and Friday part of the weekend when issuing permits. That limited travel to just three days a week as it made it way through that state," Carol reported. "The five day hold up in Quebec was a costly time factor. We wanted to have the cryostat at the Lab before the heavy July Fourth traffic," Carol continued.

Delays also caused other very significant problems. Most transportation permits expire within a relatively short time frame, some within 48 hours. "If a delay occurred, we were then faced with reapplying for a new transportation permit into the next state and often times renegotiating the regulations," cited Carol. This caused even further delays and if possible more problems. When obtaining a transportation permit, the permit agency must submit a travel route. Often times the state will change the submitted route. It is then necessary to change all travel plans into the next state. This happened as the cryostat travelled through Indiana and into Illinois. Indiana was very specific about which routes could be travelled and so was Illinois. Unfortunately, the exit route out of Indiana was about 100 miles away from the entrance route into Illinois. "There were a lot of situations when we had to think on our feet. Just when we thought we had a travel plan solidified, something would come up and we were back to the drawing board," commented Carol. It also represented one of the many times Carol was called into play to use her powers of persuasion. But, smiling, she added, "There were times when we got lucky. Like the time the truck broke down in



Footprints of a Cryostat

The DØ cryostat left New Hampshire on Monday, June 18 and arrived at Fermilab on Monday, July 2. It traveled through Canada and seven states on its fifteen day journey.

Page two "Trip" con't

New York. It happened on a Friday (when we had to pull off and wait for Monday to travel anyway) and we were only seven miles from a dealership who could do all the repairs. We were back on the road by Monday morning!"

Another problem faced with bringing the cryostat home was the issue of escorts. Some of the states required that the truck have an escort provided by the trucking firm as well as a state police escort. In one state, the police escort had to be arranged for 24 hours in advance, and not, as Carol found out, 48 hours or even 23 hours in advance. When escort arrangements were made, they were often subject to change due to schedules and other demands on police departments.

One of the last obstacles faced as the cryostat made its way across the Midwest turned out to be a very weighty problem, quite literally. When the cryostat was completed and readied for shipping, the manufacturer estimated the cryostat to weigh about 30,000 to 35,000 pounds. Because they did not have a scale large enough to weigh it, it was only an estimate. Transportation permits through the various states have weight limitations. To be on the safe side, permits were applied for with a 50,000 pound limit. It wasn't until the cryostat got to Ohio that it fit on road scale. As it turned out, the cryostat weighed in at 58,000 pounds, eight thousands pounds over the permitted weight. The trucking company was fined and the realization set in that the remaining permits for Indiana and Illinois were also incorrect.

"We had to make a decision on how we were going to proceed. Delays were costly and the heavy traffic of the Fourth of July weekend was fast approaching," said Carol. The permits obtained for Illinois travel allowed the excess weight. Indiana was the only state where the cryostat's weight represented a problem. Once that problem was solved, we felt like we were almost home free."

As the truck entered Illinois, everyone was ready to breathe a sigh of relief. There were a few more obstacles to overcome in terms of negotiating routes and arranging escorts with the State Police, but the end of the journey was finally in sight. Due to Illinois road construction, traffic and low overpasses, the cryostat had to be rerouted over 14 times before reaching its destination. On July 2, at 11:45 a.m. the truck and the cryostat rolled in on Eola Road, safely home before the Fourth of July holiday and eagerly awaited by the DØ Construction Group. As for Carol and Support Services, they can relax, at least until the next one is shipped this month!

The Art Series Presents:

**Toshiko Akiyoshi and Lew Tabackin
Jazz Quartet**

**Saturday, August 11, 1990 at 8:00 p.m. in
Fermilab's Ramsey Auditorium.**

Admission to this evening of jazz is \$10.

Our Environment

WHAT A WASTE

In 1982 officials in Albuquerque, New Mexico determined that local residents were generating 1.6 million pounds of hazardous waste- and were dumping 90% of it into sewer systems, garbage or the ground.

Background. Most Americans don't know how to dispose of household hazardous wastes properly. Some of us, for example, innocently dump toxins down the drain or into the sewer system—which might be the worst possible way to get rid of them, since wastewater treatment plants aren't designed to handle hazardous materials, and the result can be serious water contamination.

Disposing of them in landfills doesn't work, either; hazardous wastes dumped into a landfill can seep into the groundwater, run off into surface water or pollute the air.

Since there are so many hazardous products in use—and since they can have such a lethal impact on the environment—it's important for us to learn what products we have, how to store them and what to do when we're done with them.

DID YOU KNOW

- Hazardous wastes often found around homes include: paints and paint thinners, car batteries, oven and drain cleaners, mothballs, floor and furniture polish, brake or transmission fluid, antifreeze, rug and upholstery cleaners, pesticides and furniture strippers. Even products used to clean toilets are considered hazardous.

- People seem to have little idea when they're dealing with hazardous wastes. According to Environmental Hazards Management: "It has been estimated that in an average city of 100,000 residents, 3.75 tons of toilet bowl cleaner, 13.75 tons of liquid household cleaners and 3.44 tons of motor oil are discharged into city drains each month."

- How do you figure out what's hazardous and what isn't? Use available reference materials. Recommended: **Hazardous Wastes from Homes**. Cost is \$4.25 from Enterprise for Education, 1320A 3rd St., Suite 202, Santa Monica, CA 90401.

SIMPLE THINGS TO DO

Store hazardous materials properly:

- Keep them in their original containers. Don't take the chance that someone might mistake and misuse them.
- Make sure labels are securely fixed to containers.

- Keep them in a cool, dry place—out of reach of children.
- If the original container leaks, put the whole thing in a larger container... and don't forget to mark it.

Try to reduce the amount of hazardous products you use:

- Buy exactly what you need. Remember, the more you buy, the more you have to dispose of. If you've got extra (e.g. paint), share it with neighbors, friends and family. Try to use it up.

- Use safer substitutes whenever possible.

Dispose of it properly:

- Recycle whenever possible. Used motor oil, car batteries, paint thinners and some solvents can be refined and reused. Local civic groups can help you identify recycling programs.

- Municipal incineration is a way of dealing with some hazardous wastes. Check with local authorities to see what they accept. Never use incinerators in your home; they don't work.

- Find a licensed contractor or recycling agency. (Look in the yellow pages.) If there's none in your area, call the local wastewater treatment plant for info on disposing of liquid waste, or the local sanitation department for info on disposing of solid wastes.

- Participate in a local professional collection program. Many communities do not yet provide this kind of service. If there's none in your community, contact local civic leaders and officials with suggestions for a program. Many of the best collection programs in the country today began with one concerned citizen.

RESOURCES:

Water Pollution Control Federation, 601 Wythe Street, Alexandria, VA 22314-1994, (703) 684-2438. Call or write for their *Household Hazardous Waste Chart*.

Call the EPA hotline (800) 424-9346 to find out who to contact in your state about household hazardous waste pick-up.*

Quality Corner

You can create solutions to complicated problems by being the only one to break that complicated problem down to its basic causes.

The following are suggestions regarding purchasing procedures received by the QA Office. These suggestions were investigated by Business Services for their feasibility and cost effectiveness. Don Beatty prepared the following comments and conclusions in collaboration with Jim Finks, Dick Auskalnis and Jim Richardson.

Suggestion: "...purchase orders, in the form they go out to the vendor, often reach the originator way too late to do any verification or to catch errors."

"...we may intercept incorrect orders in time to do something about them."

Response: Because of how our procurement system actually operates, conceptually this would be much like closing the gate long after the horse galloped out of the corral. The vendor already has the purchase order and is working on the delivery of the material by the time the original requestor would review the copy of the purchase order. Granted, typos do happen. But, to Purchasing's credit, it is a rare event when they change the intent of a purchase requisition. Prior to the issuance of the purchase order, Procurement makes it a practice to inform the requestor if the purchased manufacturer or model is different from the original purchase requisition.

Conclusion: Although it is feasible to make an additional copy of each purchase order (e.g. 2-3,000/month) and mail it to the original requestor, the frequency of such documented errors does not justify the additional expense.

Suggestion: "Many times the PO copy gets sent back to the administrative entity, which doesn't always forward it to the originator, who is the only person who really understands the technical points. An immediate way to fix this would be to ask the procurement agent to mail one copy directly, and immediately, to the originator of the request."

Response: Procurement sends the purchase order copy to whatever mail station is noted in the "Mail Station for Paperwork" box on the purchase requisition form. If the requestor wants a copy of the purchase order, he needs to fill in that box, insure that his Division/Section Office does not change it (which happens), and, if he shares the same mail station, leave instructions with his Division/Section Office that the copy should be forwarded to him.

Conclusion: Procedures are already in place for the requestor to have Procurement forward the purchase order copy to his mail station.

Suggestion: "Ultimately, one would really like to see a computerized system for requesting, authorizing, ordering and receiving."

Response: The Business Services Section has been planning on adding this enhancement to the PARS system in the upcoming years. Personally, I am hopeful that it will be part of PARS II. Currently, we are still programming modules of PARS.

Conclusion: To the Business Services Section, it's not an "ultimate" wish list item, but a conceptual design change that we have been building toward for several years.

Suggestion: "...would it be technically possible to send the PO contents (never mind the preprinted stuff) via E-mail to the originator?"

Response: It's a great idea that no one had thought of before! The purchase requisition form will have to be changed slightly to pick up the longer (than mail station) E-mail address, some reprogramming will be needed to separate purchase order mail copies from purchase order E-mail copies and some programming is necessary to transfer the information from the IBM to the VAX, but technically it should work.

Conclusion: An Information System Service Request has been prepared and the Laboratory should see an announcement of its availability hopefully, as budget allows, in FY 91.

Note: If you have a suggestion on how to improve the quality, efficiency, reliability or effectiveness of a Laboratory service or operation, please send it to Mark Bodnarczuk, MS 200 or Bitnet Bodnarczuk @ FNAL.

Classified Ads

The Fermilab Experience

A student's viewpoint

Miscellaneous:

Snapper Riding Mower, 8 h.p., rear bagging, \$500. Call x2875 or 879-2364 after 5 p.m.

Pool Table, 4' x 8', \$25. **Large Hamster Cage**, 21" x 19" x 11", 3 levels, exercise wheel, ladders, slides, etc., \$25. Call Steve at x4975.

Moving Sales:

Sofas; Queen-size Bed; Chairs, Desk; Stereo with turntable, double-deck tape recorder and radio; **Shelves; Dishes; Glasses; Pots and Pans** and much more, low prices, must sell. Call Gian at x4494.

Sears Window Fan, like new, \$25. **Queen-size Bed frame with Headboard**, \$20. **Craftsman Electric Hedge Trimmer**, \$20. **2-Dunlop Tires**, size 165/70-13, @\$10. **Toshiba Room Humidifier**, \$20. **Sears Space Heater**, 30,000 BTU, runs on kerosene, \$65. **Schwinn 24" Men's LeTour Road Bike**, 10-speed, \$125. **Lazy Boy Recliner**, like new, \$250. Call Larry at x3377 or 3378.

Wanted:

Loving Home for Cat, female, 3 yrs., spayed, up to date on all shots, must find new home before Sept. 1. Call Scott at 879-5896 after 5 p.m.

Real Estate:

2 Bedroom Condo, Woodridge Club (77th & Woodward, Woodridge, IL), just a few minutes from the entrance to I-355, all brick, swimming pool & clubhouse, very large master bedroom, 2nd floor, balcony overlooks landscaped courtyard, by owner - \$44,900. Call Dick at x4167 or 708-469-4547 after 6 p.m.

Charming 3 Bedroom Ranch, great St. Charles location, all amenities, neutral decor, \$115,000. Call x3452 or 377-7832.

Terez Renee King, an engineering physics major at Morgan State University is participating in the SIST program at Fermilab. SIST is a summer internship program for college level minority students sponsored by Fermilab's Equal Opportunity Office. As part of her internship, Terez is working in the Materials Development Lab in the Technical Support Section. She is one of thirteen students, who represent eight different educational programs, employed this summer by the Technical Support Section.

As part of her Lab experience, Terez is conducting measurement tests to assure that the SSC coil designs have the necessary properties to reach and maintain a value of prestress adequate to insure that the coils will not move during use, which would cause heating and loss of superconductivity.

As the summer draws to an end, Terez was asked to evaluate the value of her Fermilab experience. The following is her description:

What Fermilab means to me:

Fermilab is an Acronym

The **F** stands for the Fascinating fusion of students who harmoniously (?) work together in the Lab.

The **E** is for the Educational experience of scientific work one acquires outside of the classroom.

The **R** implies Research, research and more research.

The **M** makes the Mechanics of the machinery that is supposed to adequately operate.

The **I** Suggests Ideas and theories to be proved.

The **L** symbolizes Learning from long lectures and laborious hour of hard work.

The **A** alludes to a deeper Application of the sciences - physics, engineering, mathematics, chemistry and computer.

The **B** besets Fermilab as Better than the rest.

All in all, Fermilab has been a channel that I have used to expand my knowledge of physics, engineering and success!

The deadline for the Friday, August 17 issue of *FermiNews* is Wednesday, August 8. Please send your article submissions or ideas to the Publications Office, WH6NW, MS 107, FNAL::TECHPUBS or call x3278.

Applause Applause Applause

Bill Wickenberg, operations specialist in the DØ electronics group, has found a way to mitigate the stress caused by the long hours of working to get an experiment up and running. He is a member of the Naperville Men's Glee Club. Bill has been a member of the Glee Club since its inception in January, 1988. The Glee Club generally performs once or twice a month and gives a full concert twice a year. As an added attraction to this year's performance schedule, the Glee Club has recently been notified that they have been selected by the management of the Chicago White Sox to sing the National Anthem during the opening ceremony of the White Sox/Toronto baseball game to be held Wed., August 15 at 7:00 p.m. in Comiskey Park, Chicago. The Naperville Glee Club pursued this opportunity by submitting an audition tape to the White Sox.

The members of the Glee Club have a rich musical background, including experiences in college men's glee clubs, church choirs, professional and semiprofessional groups,

barbershop and community choral organizations. They are a traditional men's glee club, performing a wide variety of accompanied and a cappella music. Admission to the Glee Club is by invitation or audition.



Bill Wickenberg (C. fifth from R.) and members of the Naperville Men's Glee Club will sing at Sox Park, August 15.

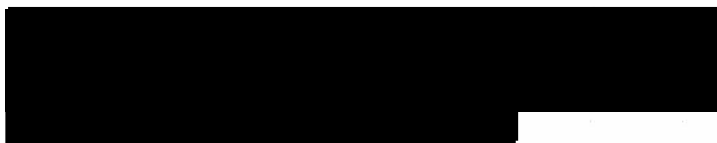
Aside from providing high quality entertainment, the Naperville Men's Glee Club is a registered not-for-profit organization involved in community service. One philanthropic program that they sponsor is called the "Great Piano Round-up and Organ Transplant." According to Bill, "This program allows people to make their piano and organ a tax-deductible contribution to the organization."

Members of the Glee Club then find a new home for it where it will be played and appreciated. Many of these pianos and organs have found new homes in churches, health and convalescent centers, senior centers and community centers. The Naperville Men's Glee Club has also set up an Endowment Fund. The interest from this trust is used to enhance the arts and to help young vocal talent.

As a charter member, Bill chairs the advertising solicitation for the annual programs.

Milestones

Congratulations to:



Wedding bells

Joy Perington (Users Office) married Michael Miletic in an outdoor ceremony in the Oak Grove at Kishwaukee Country Club in DeKalb, Illinois on July 23 at 5:30 p.m. The couple spent their honeymoon in the Bahamas. They will reside in North Aurora.

...From Harper's Index

Percentage of Americans who say that, given the choice, they would rather hear the bad news first: 63
Incidents of international terrorism since 1977 that involved a BMW: 33
Incidents of international terrorism that involved a Chevrolet Camaro: 1

Security Interests

Theft Happens!

Right here at Fermilab - believe it! Of course you already know this, if you were the operator of one of the recently stolen personal computers. If you were, you also know your former computer was either not locked down or was locked down with a light weight cable system. You have also come to realize some of the hidden costs of theft. Not only are you, or your department's budget, out the cost of the hardware stolen, you may have lost software, work files, even your back-up disks. Your project may suffer delays while hardware is replaced and files rebuilt. In addition, there is the cost of investigating and reporting the theft and the cost of processing orders for replacing equipment, as well as a negative impact on office morale. So you ask, "What can I do **before theft happens?**" The answer is simple. You can place an order with Work Central to have your personal computer, related peripherals and other valuable office machines locked down. You can also call the Security Department to have your work area evaluated and to get a recommendation for necessary security measures.

What does the Security Department recommend for securing your personal computer?

There is no pat answer and there is no foolproof solution. There are, however, several guidelines the Security Department strongly endorses: 1) If your office is not individually securable or you work in a portakamp, anchor your computer and peripherals. 2) Etch your equipment with identifying numbers or markings. The FNAL property tag is not a deterrent to theft. 3) Report evidence of tampering, such as unauthorized attempts to access computer files. Someone may be shopping in your area! 4) Even if your office is securable, it is probably wise to anchor your equipment. Get a second opinion before ruling out additional measures. 5) Backup your files and store the back-up disks in a secure location separate from the hardware.

What type of anchoring device does the Security Department recommend?

Anchor Pad is generally recommended especially in unsecurable offices and portakamps. In addition to their excellent theft resistance, the manufacturer, Anchor Pad International, offers a warranty enhancement that covers the actual physical loss from theft of any machine as a result of the defeat or failure of the Anchor Pad. We have several Fermilab employees certified to install an Anchor Pad. It may not be necessary for everyone. There may be some relatively secure environments where a heavy duty cable system is a reasonable alternative. An evaluation by the Security Department could answer that question for you.

— *Bill Flaherty*

Trudy's Corner NALREC News

"Taste of Fermi"

NALREC is going all out for the "Taste of Fermi." We hope everyone has their calendar marked for this event to be held August 17 beginning at 4:30 p.m. We will have a huge selection of door prizes and game prizes for both children and adults. We are also going to have the biggest bargain of the year on food. We will be selling most items for \$1.00 or less and we will begin serving around 5:00 p.m. We feel these prices will allow everyone to bring the entire family for an evening of food, games, pony and Ferris wheel rides, moonwalking and dancing. So—get there early, because when the food runs out—the food runs out.

Just a note to clarify some of the previous advertising concerning the "Taste of Fermi." In my last article, I stated that the pool would be open for swimming. This does not mean the pool is free for the evening. It will be open until 9:00 P.M. for season pass holders or at the daily fee. The equipment for volleyball or softball games will be available. See Jean Guyer that evening, if you wish to put together a game.

NALREC will also be selling the T-shirts, hats and frisbees that Connie usually sells at the front desk. Hopefully, we will also have coffee mugs and jackets by "Taste" time. This would be a good time to shop for a gift for that special occasion.

MAKE TODAY A GREAT DAY.—Trudy Kramer

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