

Shutdown Update (I): Research Div. Keeps Busy

by Mark Bodnarczuk

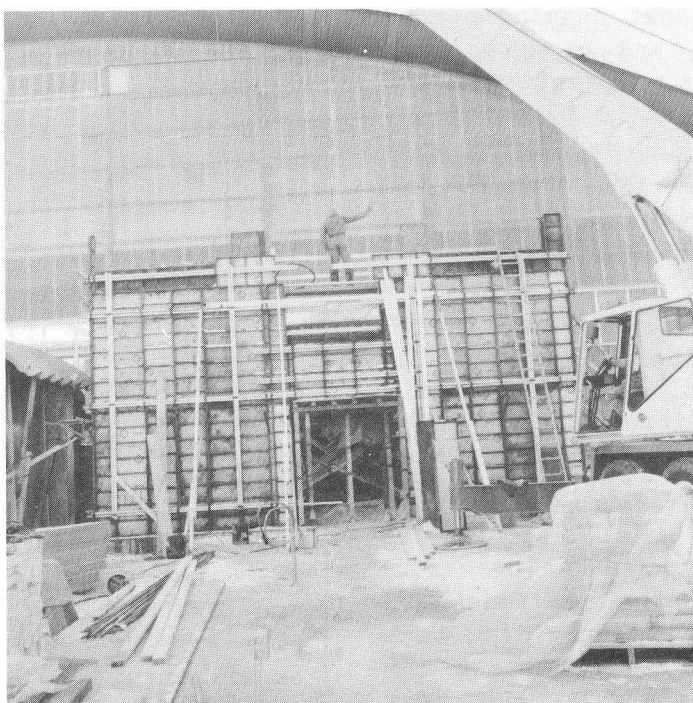
The Research Division is in a shutdown! Does that mean they're not doing any work? By no means! Shutdowns, contrary to what the name implies, involve lots of work. But it's a different kind of work than that done during accelerator running periods. A shutdown is a time of preparation. A running period is a time of operation and data collection.

Both the fixed-target Experimental Areas and the Collider Detector at Fermilab (CDF) are part of the Research Division. This year's fixed-target physics program ended on August 29, 1985, after an eight month running period. CDF began accepting beam on September 13, 1985, and, following a series of 1.6 TeV center-of-mass collisions, ended on October 13, 1985. CDF is scheduled to start-up again in September of 1986, with the fixed-target experiments once again taking protons in December of that same year. What goes on during shutdown periods is best described by looking at the way scientific experiments progress from beginning to end.

Some of our scientific forefathers would probably be amazed at the complexity of modern-day physics experiments and the apparatuses necessary to carry them out. When Isaac Newton wanted to measure the speed of sound, he used a pendulum and a long corridor at Oxford University as his apparatus. He spoke a word, then timed how long it took for the echo to reach him relative to the swinging pendulum. By short-

ening the length of the pendulum, which made it swing faster as the length decreased, he was able to measure the speed of sound to within about 20% accuracy. His brain served as the computer, collecting and analyzing the data results.

There are several things that Fermilab experiments have in common with Newton's



Work progresses on the secondary enclosures for the M-west beamline.

experiment and all scientific experiments. Much like Newton, present-day experimenters perceive a need to measure some physical quantity or observe some as yet unobserved behavior! However, due to the size and complexity of modern day high-energy physics experiments, physicists must pool their resources when proposing experiments. The complexity of an apparatus demands long months of design, research, and development. Once the proposal is complete, the Program

Planning Office screens the proposal for clarity and attempts to estimate the cost of carrying the experiment out. It is then submitted to the PAC for further evaluation. The PAC suggests whether or not the experiment should be approved and our Director, Leon Lederman, invariably takes their advice. If approved, the experiment is assigned a time slot, when the accelerator is running, and given an area in a beamline to set up the apparatus. Anyone who has seen the CDF detector or a modern fixed-target detector knows that "setting up" the apparatus is not an overnight job! During shutdown periods, experiments which have finished taking data are

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disassembled and new experiments are installed in their place. It's kind of like renting a row boat; when your hour's up, the next guy wants his turn.

Having successfully completed eight fixed-target experiments last running period, these detectors will be removed or modified, making room for the next group of experiments. Sometimes the installation of a new experiment necessitates modifications to existing beamlines or the construction of new beam transport systems. A few examples in the fixed-target experimental areas are the completion of two new beamlines in the Meson Area: the M-West and M-Polarized beams. The experiments that will run in Meson during the next running period are E-690, E-706, E-731, and an assortment of test beams. In fact, an entirely new test beam will be built in the M-Test line. During the shutdown, E-690 and E-706 will be installed. E-731 will continue the run they started during the last running period (they decided to rent the boat for another hour.)

In the Neutrino Area, the Muon Beamline, which was commissioned at the end of the last running period, will be totally completed by the addition of spoiler magnets and additional shielding. Three experiments will be installed, E-649, E-652, and E-665, while E-711 and E-653 will continue to run.

In the Proton Area, the new Wide Band Beamline will be completed, providing beam for E-687 which is currently being installed. E-705 will continue from the last running period and E-756 will be installed in Proton Center.

In order to prepare for their September 1986 start-up, CDF will complete a multitude of tasks. A major project is the completion and installation of the forward and backward muon detection system. Also, an assortment of electronics, gas systems, and scintillator calorimetry will be installed.

As the 1986 shutdown progresses and the next generation of detectors are installed, there's a feeling of expectation throughout the Lab. Much like musicians and recording engineers setting up to record a live concert, Fermilab experimenters and Research Division personnel are carefully installing their equipment. Next year as 800-GeV beams from the Tevatron are

collided together or through fixed targets, particle resonances, vector bosons, and rare quark combinations will be created and quickly die like the sound of music. When it's over, much like a recorded symphony, the only evidence that these particles ever existed will be the data tapes. When the data is published, shedding new light on the fundamental constituents and forces that make up our Universe, many of the results will become "standards" by which we define and interpret the world we live in.



The following articles of current interest and relevance can be found in the Fermilab Library, WH 3E:

The February 1986 issue of *SCIENCE digest* contains the article "Fermilab...Where Science is Art" by Dr. Crypton.

The December 1985 issue of *Physics Today* carries the article "Congressmen review SSC with budget deficits on their minds."

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For FermiNews readers who are not also recipients of the monthly technical publications listing circulated by the Publications Office, "An Operational Approach to High Energy Physics Detectors at Fermilab" (TM-1368) by Mark Bodnarczuk, offers a comprehensive, and comprehensible, overview of particles, accelerators, and detectors, including a step-by-step analysis of two Fermilab experiments, E-705 and E-691. Copies may be obtained from the Publications Office, WH 3E, MS 107, ext. 3278.

On Friday, January 10, 1986, the Fermilab International Film Society will present **The Draughtsman's Contract** in Ramsey Auditorium.

"Mr. Neville, the 17th century draughtsman, is hired by Mrs. Herbert to do 12 drawings of the Herbert estate, for a salary consisting of Mrs. Herbert's sexual favors. The finished drawings may or may not give clues about a murder."

Admission is \$2 for adults, and 50¢ for children. Tickets are available at the door.

Benefits Notes . . .

TIAA-CREF PARTICIPANT NOTE

TIAA-CREF participants will be receiving ammendments from TIAA-CREF which should be attached to annuity contracts. The ammendments are provided in order to comply with federal legislation, the Retirement Equity Act (REACT), signed into law on August 23, 1984.

REACT is designed to give greater recognition to "marriage as an economic partnership and the substantial contribution to that partnership of spouses who work both in and outside the home." To this end, REACT automatically provides minimum survivor protection to the spouse:

- half of the annuity death benefit if the participant dies before beginning retirement income (the Pre-Retirement Survivor Death Benefit), or

- a lifetime survivor income when the participant does begin retirement income (the Survivor Income Annuity).

What does all of this mean to a married participant? A spouse's written consent is now required before a participant can name someone other than a spouse as beneficiary, choose an annuity income option for retirement that does not provide a lifetime survivor income, elect the Retirement Transition Benefit, and take full or partial cash withdrawal from a TIAA-CREF SRA.

If you are a married participant, 35 years or older, you should review your current beneficiary designation. If you have directed that more than 50% of the death benefit go to someone other than your spouse, you may want to file a spouse consent waiver to insure that your intentions are consistent with REACT. Married participants younger than 35 are eligible to waive spouses' rights only if they have terminated their employment with Fermilab.

REACT gives further sanction to the existing power of state courts to split pension benefits between divorced and separated spouses by recognizing decrees called "Qualified Domestic Relations Orders." A qualified domestic relations order that creates or recognizes an alternate payee pre-empts other named beneficiaries.

The Participant, the TIAA-CREF publication dated December, 1985, has a de-

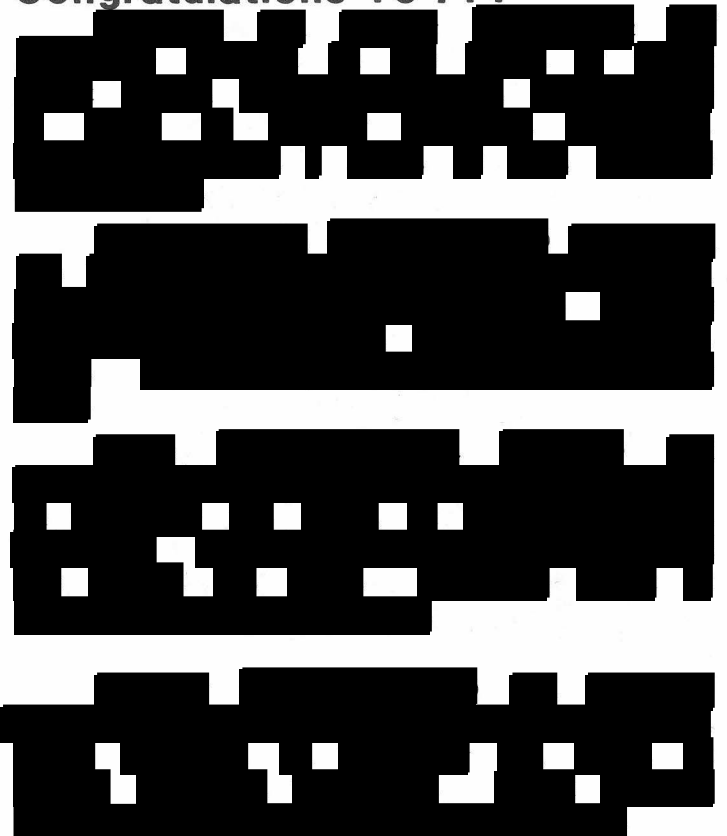
tailed explanation of the provisions of REACT. It is a good idea to read it to see whether you may be an exception to REACT. TIAA-CREF and the Employee Benefits Office, WH 15E, have spouse waiver consent forms should you need one.

Connecticut General Medical Insurance

The Hospital Preadmission/Certification Program has been operational since November 1, 1985. Most employees have remembered to call Intracorp prior to their hospital stay and 24 hours after an emergency admission. Unfortunately, we have had a few employees forget to have their hospital stays certified. To avoid this costly mistake, attach the wallet-sized pre-certification instruction card to your Connecticut General I.D. card (the card was part of the pre-cert kit mailed to you). The card includes instructions for both emergency and non-emergency hospitalizations. This way, when you present your insurance I.D. card, it will remind you to have your hospital stay certified. Keep in mind, the Intracorp program applies to in-patient hospitalization, not out-patient services.

--Paula Cashin

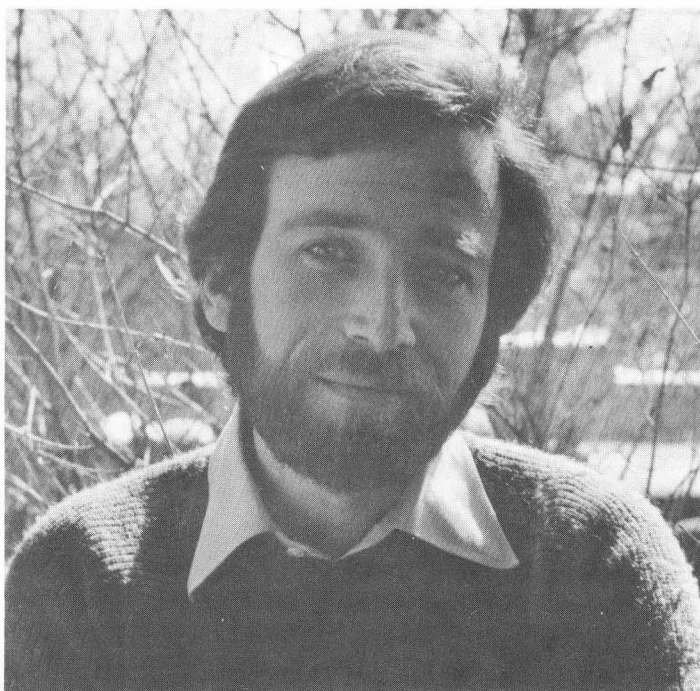
Congratulations To . . .



Human Nature is Next Topic in Fermilab Lecture Series

Why do we behave as we do, and why does human nature so often fail to serve our best interests? Why is it our nature to aspire to the heights but fall short of the mark? Melvin Konner of Emory University will bring an updated, scientific perspective to these age-old questions in the next Fermilab lecture. Entitled "Biological Constraints on the Human Spirit," Professor Konner's talk will be presented at 8 p.m. on Friday, January 24, 1986, in Ramsey Auditorium.

Formerly an Associate Professor of Anthropology at Harvard University, Melvin Konner is the author of the recent book, *The Tangled Wing: Biological Constraints on the Human Spirit*, which has been described as a "beautifully written, well-balanced interpretation of human nature." His extraordinary synthesis draws on the most recent advances of the biological sciences as well as on psychology, anthropology, and the great works of philosophy and literature. Among the issues he addresses are: Why do we experience rage? Fear? Joy? Love? Why is it the human condition to be overweight? And, can the defects of human nature, which now threaten our survival, be overcome?



Melvin Konner

At Emory University, Professor Konner is Chairman of the Department of Anthropology as well as an Assistant Professor of Psychiatry in the School of Medicine and an Affiliate Scientist of the Yerkes Regional

Primate Research Center. While at Harvard he spent two years in Africa, studying infant and child development among the !Kung San bushmen of Northwestern Botswana. He completed an M.D. at Harvard Medical School in 1985. Professor Konner is also a Guggenheim Fellow, a published poet, and author of the column "Human Nature" which appears regularly in *The Sciences* magazine.

Admission to Dr. Konner's talk is \$2, \$1 for senior citizens. Tickets are available from the Information Desk in the Atrium of Wilson Hall, ext. 3353. The desk is staffed between 10 a.m. and noon, or 1 p.m. to 4 p.m. Phone reservations are held for only five days awaiting payment. Due to ticket demand, those reservations not paid for within five working days are released for sale.

—Jane Green

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Tickets are still available for the Mendelssohn String Quartet on Saturday, January 11, 1986, in Ramsey Auditorium at 8 p.m.

The Resident Quartet at Merkin Hall in New York and at the Santa Fe Chamber Music Festival, the Mendelssohn has been acclaimed for its "luminous interpretation" and "ravishing sounds." At Fermilab, the Quartet will perform Dvorak's Quartet in E-flat major, Op. 51, the Haydn Quartet in G major, Op. 77, No. 1, and Beethoven's Quartet in F major, Op. 59, No. 1. Admission is \$7.

This appearance by the Mendelssohn String Quartet is part of the Auditorium Committee's special subscription package, as noted in the last issue of **FermiNews**. The Empire Brass Quintet (appearing Saturday, March 1, 1986) and the Sinfonia da Camera of Illinois (appearing Saturday, May 3, 1986) round out the Arts Series package offer. Tickets for all three Ramsey Auditorium concerts are still available at the discounted subscription price of \$18, a \$5 savings off the price of individual purchase. Series subscribers will enjoy not only this substantial savings, but are also assured the same choice seats for all three concerts. Subscription, and individual, tickets are available at the Atrium Reception Desk.





On December 5, 1985, the latest group of 10-year employment veterans gathered for the ritual celebration, which included the taking of the photograph shown above.

Front row, left to right: William Arnold, Ivan Huffmaster, Dominick Carullo, May West, Vivian Jacobsen, Moyses Kuchnir, Roberta Forester, and Ernest Villegas.

Second row, left to right: J.P. Berge, William Robotham, Carol Davis, Michael Oros, Sharon Lackey, Michelle Gleason, Edith Brown, Nancy Shanahan, Elizabeth Quigg, Penny Driscoll, Don Rapovich, and Joe Trevino.

Third row, left to right: James Fitzgerald, Jo Gordon, Clare Morton, Donald Fisher, Sharon Koteles, Randi Franck, Albert Lindner, Jr., John L. Crawford, James Moncrieff, Mel Magnuson, Howard Casebolt, Frank Turkot, Michael Becker, Charles Brown, Richard Lundy, and David Hanabarger.

Top row, left to right: Richard Thies, William Baldrige, Allen Forni, Gordon Koizumi, James Krebs, John Hackemer, Norville Jordan, and Philip Livdahl.

Congratulations, one and all.



Cleaning Schedule for Wilson Hall, X-Gallery Revised

Effective February 3, 1986, Wilson Hall and Cross Gallery cleaning will be done on weekday evenings, instead of the current daytime schedule.

Kathy Cooper will be the group leader assigned to the 15-person evening-shift cleaning crew, and Bertha Salgado will be the lead janitor; Flora Shockley is the day-shift group leader, and all three report to Denise Blayney, Custodial Maintenance Manager.

Anticipated benefits from this re-scheduling include: freed-up elevator time during normal working hours; fewer interruptions of building occupants during normal working hours; and increased janitorial productivity.

Vacuuming services will continue to be provided upon request (call Custodial Maintenance on ext. 3807).

—Don Fichtel

Hawaiian Luau Next for NALREC

Break out your grass skirt and your Don Ho albums and get ready for a night of paradise in the dead of winter because on Saturday, February 1, 1986, NALREC will present "A Hawaiian Luau" in the Wilson Hall Atrium and Cafeteria area.

"The Heartbeats" will provide dance music for the estimated 300 to 400 attendees. The "Hawaiian look" is encouraged but not required.

Menu: Roast pig, chicken Hawaiian, Hawaiian salad, baked beans, corn on the cob, bean salad, potato salad, vegetable jello, fruit jello, rolls and butter, coconut cake, lemon cake, and coffee and punch.

Ticket price is \$10 per person and the deadline for tickets is January 24, 1986, so buy your tickets "wiki-wiki".

For more information and to reserve tickets contact Bob Shovan, p-407, Lucy Reuter, ext. 4623, Nancy Shanahan, ext. 3494, Alma Karas, ext. 3387, or Sharon Koteles, ext. 3598.



NALREC '85 - '86 committee members, front row from left are Helen McCulloch, Bob Shovan, Mary Fray, Alan Petit, Rose Callaghan, Jesse Guerra, Lucy Reuter, Dominick Carullo, Jane Pesetski, Pete Gutierrez, and Nancy Shanahan.

Second row from left are Bob Lootens, Ann Casperson, Jim Fourmont, Claudia Foster, Joe Morgan, Jean Plese, Phil Calahan, Alma Karas, George Davidson, Jim Fritz, Gary Andrews, and Mike Frett.

Third row from left are Ed LaVallie, Marsha Patterson, Jim Fitzgerald, Walter Coleman, Sharon Koteles, Ed Justice, Glenn Lee, John Satti, Jo Baaske, and Gary Smith.

Belle's Constant: The ratio of time involved in work to time available for work is usually 0.6

Bonafede's Revelation: The conventional wisdom is that power is an aphrodisiac. In truth, it's exhausting.

Cosgrove Bids Lab Adieu



Dave Cosgrove celebrated what he called his "ceremony of changing bosses" at his retirement party. On Dave's right is his "new boss," wife Polley, and on his left is his "old boss" Jack Lindberg.

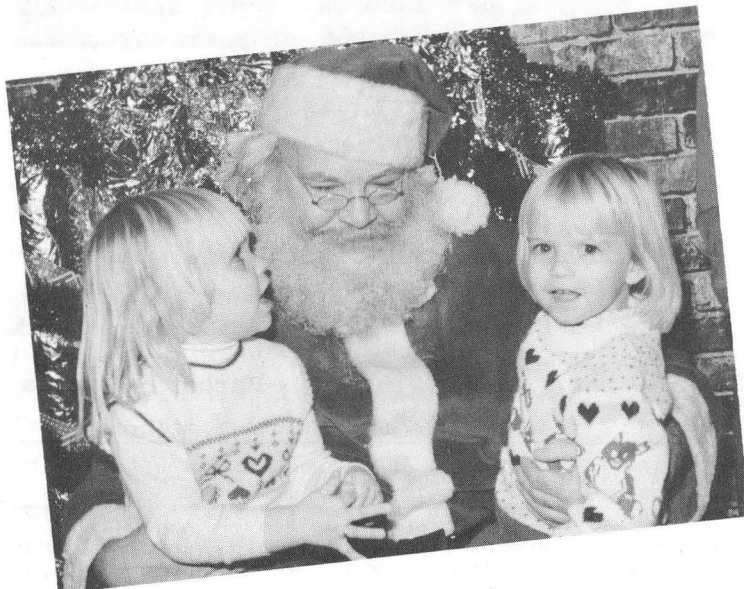
"Dave Cosgrove retired on January 4, 1986, thus ending over 12 years of work at Fermilab. He won't get away quite so easily, though, as he will be returning on a temporary basis to complete work on assembling the E-706 Liquid Argon Calorimeter," said Jack Lindberg, Dave's supervisor, "Dave has been the responsible project engineer for the internals of this calorimeter. He was also invited to help part-time with the medical accelerator."

Dave came to the Research Division Mechanical Department about three years ago and before that, was a member of the Accelerator Division, working mainly in the Booster. During his time at Fermilab, Dave has been actively involved in the prairie restoration project.

After retirement, Dave plans to further his studies of Greek civilization and travel to the capitals of Eastern Europe.

"Dave will be sorely missed by the Mechanical Department and we wish him great success in his new-found independent life," added Jack.





"With the excitement of Christmas, my children were discussing the Santa Claus seen during a TV commercial.

"'All Santas look so fake,' John said. 'Yeah--there is only one real Santa and he comes to Fermilab every year,' Brian replied. Needless to say Michael chimed in and agreed completely, 'Yeah--Santa was at Fermilab--and he's the real one.'"

"Thanks, Santa..."

—Dick Adamo

The "real" Santa Claus has been showing up at NALREC's Children's Christmas Party for 15 years now. The beard is real, and so is the warmth passed between Santa and the kids.

The "real" Santa is Jack Jagger of the Conventional Magnet Facility. For the last 10 years, Jack has been assisted by Sherry Hickey, also of Conventional Magnets, in the role of Mrs. Claus.

John Satti, who has organized the Children's Christmas Party for the past four years, said he is "always impressed by the time Jack takes with each child. He really listens to them, and he's a pretty convincing argument for the existence of Santa Claus."



FOR SALE:

AUTOS:

1984 PLYMOUTH COLT. (Mitsubishi-made in Japan) Front wheel drive, 18,000 mi., red, stick shift, radio, excellent condition; \$4200. Call Moacyr Souza, ext. 4106/4915

1984 PLYMOUTH COLT. (Mitsubishi - made in Japan), 4-dr., "twin" stick shift, radio, front wheel drive, 19,000 mi., excellent condition; \$4400. Call John Anjos, ext. 4106.

1980 MAZDA RX7/LS. Loaded, engine excellent, body good; \$6000. Call Lloyd, ext. 4048.

1980 TOYOTA TERCEL DELUXE. Blue hatchback, 52,000 mi., 1350 cc., stick shift, front wheel drive, new brakes, water pump, and starter, excellent condition; \$2950. Call John Anjos, ext. 4106.

1979 PLYMOUTH HORIZON. Red, auto trans., radio, new water pump, battery, muffler, and disk pads, 88,000 mi., excellent condition; \$1600. Call Sergio Zimmermann, ext. 3551/4861.

1978 PONTIAC TRANS AM. Auto, A/C, radio, PS, PB, PW, new brakes, good condition, 67,000 mi.; \$2950. Call Bill, ext. 3779.

1976 CHEVY NOVA. 70,000 mi., runs well, started every day but one last winter, some chassis rust; \$800 or best offer. Call Janice, ext. 4007 afternoons and evenings, or leave a note in E-400 mailbox, WHILE.

1972 FORD TRUCK. 6-cyl., manual trans.; \$400. Call Mark, ext. 4190.

MISC:

FLORIDA MOBILE HOME FOR SALE. West Coast, Shady Acres Park, 12x60, 2 bdrms, 1-1/2 bths, furnished, plus 18x11 sun room; \$16,000. Call Jim, ext. 4889 or (815) 436-2274.

ACT-V TERMINAL. 300 to 9600 Baud, 10" b/w screen, LEX-11 modem, 300 baud. Call ext. 4331.

9.5 JOHNSON OUTBOARD BOAT MOTOR. I will tune before selling; \$400. Call Mark, ext. 4190.

For the following items call Lloyd, ext. 4048: Double mattress and box spring, \$20 each; 2 tennis rackets, \$20 each; 1 tennis racket, \$5; 4-man canvas tent, \$15; downhill skis, \$20; ski poles, 2 sets, \$5 each set; brand new Weber standard size charcoal grill, 22-1/2 in. diameter, 37 lbs., \$55; heavy duty 3 chambered, 3 person inflatable boat, \$50; roof ski rack, adjustable, lockable, \$15.

For the following items call Bill, ext. 3169: Sears 8-inch bench saw, complete w/stand and 3/4 HP motor, \$50 or best offer; Sears automatic water softener, \$35 or best offer.

For the following items call Mark, ext. 4776 or (312) 695-3263: Toro S-200 snowblower, excellent condition, 2 yrs. old, \$300; Ariens 420C snowblower, 4-hp, 20" cut, excellent condition, 10 yrs. old, \$300.

WANTED:

WANTED ALIVE! Toyota truck, must have good gas mileage. Call Dennis Sieh, ext. 3925.