



# HOTLINE

PRINCETON PLASMA PHYSICS LABORATORY

Vol. 2, No. 21

August 21, 1981

## CICADA Acceptance Tests

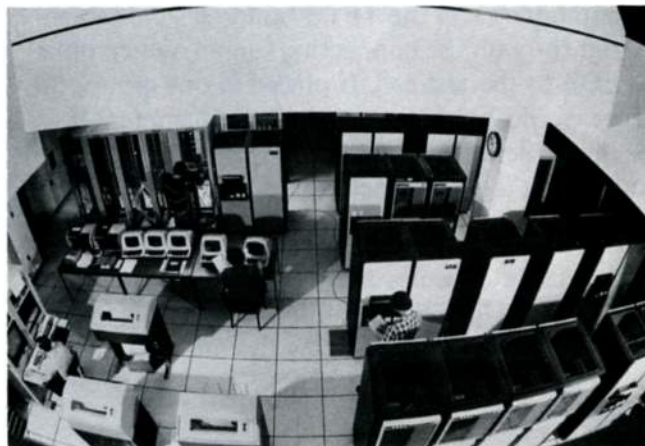
The CICADA (Central Instrumentation Control and Data Acquisition) computer system for TFTR has passed the test phase of the acceptance procedures with flying colors.

In the first test, the hardware and software features of the 14 computers were demonstrated by System Engineering Laboratory (SEL), the computer vendor. This was followed by a one-month system performance test to measure availability. All 14 computers were required to be available as a system 90 percent of the scheduled time, and a subset of 12 computers necessary to operate TFTR was required to be available 98 percent of the scheduled time. The final phase of acceptance testing, correction of outstanding problems, is currently underway by SEL.

The CICADA system will control all TFTR operations. It will include 14 SEL Model 32/75 computers, a control room, inter-system hard-wired interlocks, CAMAC (Computer Automated Measurement and Control) modules and fiber optic links that carry signals between the computers and CAMAC modules. The CAMAC modules, which will be located in the test cell, will translate signals back and forth between the computers and the machine diagnostics or control hardware.

Currently, all but one of the computers are installed in the TFTR control area in the LOB east wing basement. The remaining unit is being used in the PLT x-ray imaging experiment run by Dr. S. von Goeler, and will be moved to the basement later this year.

The computers are presently configured in two separate systems: a development system and an on-line system. The former is used to develop programs and test users' center hardware. The latter supports present user requirements, such as calibra-



*The CICADA (Central Instrumentation Control and Data Acquisition) complex for TFTR, as seen from the LOB visitor's gallery overhead.*

tion of TFTR instrumentation and pre-operations testing. Next year, the computers will be reconnected into a single on-line system.

The security and fire alarm system for both B and C-Sites, the TFTR/MG Room, and the pumphouse are now hooked into the computers.

The computers use a software (programming) operating system furnished by SEL. An updated version, both faster and more convenient than the present software, will be installed in November or December 1981 as part of the continuing software updating process.

The control room presently has more than half of its required hardware, which includes CRT terminals for data display, computer controls and television screens for visual inspection of TFTR. Color display terminals will be used by machine operators, since colors capture attention faster. This allows operators to react quicker to phenomena, thus avoiding damage to TFTR. The resolution of the color terminals was recently doubled, and equipment testing is continuing.



Half of the estimated 2000 CAMAC modules have been delivered. CAMAC modules that will interface with diagnostics have special requirements; the diagnostics are expected to use 12 to 15 kinds of modules. Specifications for three of these modules have been completed and placed on order. Specifications for the remaining modules are being developed, and additional non-diagnostic CAMAC modules are on order.

Fifty fiber optic cables have been installed between the computers and the TFTR building. The cables are run through the connecting tunnel, which links the LOB to the test cell. If placed in one group, the cables would be about one inch in diameter. If coaxial cables were used instead, the collection would be at least five inches in diameter.

Several of the optical cables are now in use to control portable consoles and CAMAC equipment located in the TFTR/MG building. Each fiber optic cable is capable of transmitting five million bits/sec, which is comparable to 500 to 600 pages of an average book.

During August, pre-operational testing of the TFTR/MG system and the first energy conversion power supply with the CICADA system will begin.

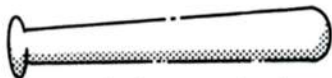
## ERC Nominations

Elections for ERC members to serve for fiscal year 1982 will be held September 22, 1981. Nomination forms will be sent to all employees during the last part of August and nominations will be accepted during the first week of September.

Now is the time to start thinking about who you want to represent you on the ERC next year.

See future issues of the *Hotline* for more details.

## Women's Softball



Players are being sought for a women's softball team now being organized. The team will compete in a women's league next season, and would play one night per week after work.

All women employees of the laboratory are invited to participate. For further information, contact Pat Pugliesi at ext. 2127.

## Perceptions of Fusion

While the characteristics of fission and fusion differ in many respects, the two have been closely linked in the minds of the public.

That is the major finding of a study conducted by John A. Hebert and Richard Shikar, prepared for the Program on Commercialization of Magnetic Fusion Power of the Battelle Pacific Northwest Laboratory. The report, "Perceptions of Fusion Power", measured how four groups feel fusion energy stacks up against other energy schemes.

Sampled groups included the "pros" (groups favoring nuclear power and economic growth); the "cons" (those favoring strict energy conservation and environmental protection); the "neutrals" (those assumed to have no strong predilection on the question); and the "experts" (those involved in the nuclear and fusion fields).

The 198 survey respondents were asked to rank a number of energy strategies (fusion, oil, coal, nuclear fission, biomass, solar, hydro and wind) in relation to their similarities and attributes (such as hard versus soft technologies, polluting versus non-polluting, and so on). Each method of energy production was defined in terms of producing electricity.

The study found that the con group's emphasis was heaviest on the hard/soft technology distinction, resulting in a "slightly unacceptable" rating for fusion. The expert group rated fusion first in acceptability, grouping it with nuclear, hydro, wind and solar options. The pro group favored all ways of producing electricity, while the neutrals found fusion "slightly acceptable".

The study concludes that fusion and fission are seen as very similar by all four groups, and cautions that public attitudes toward fission might be transferred to the fusion effort. While passive tolerance of fusion may be anticipated, the report pointed to topics of health, cost, necessity, risk, pollution and fuel availability as possible points of contention in the future.

## Extension Change

All questions on employee benefits should be directed to Eleanor Schmitt at her new telephone number, ext. 2046.



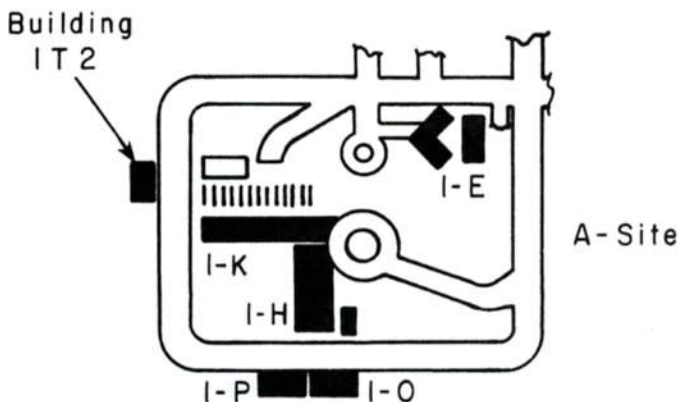
## Relocation

Current PM&O renovations have caused the Transportation Services office, Dispatcher and vehicle fleet to be temporarily relocated to the 1T2 Building at A-Site. The 1T2 Building is on the periphery road around A-Site, off the west end of Building 1K (next to the vehicle maintenance garage). The building is directly on the shuttle route.

To arrange for a vehicle or any other services (such as material handling, rigging, material pick-up or delivery and so on), come to or call the new location. The phone numbers remain the same: Supervisor Henry Miller, ext. 3109; Group Leader Pat Zeedyk, ext. 3736; Dispatcher Patricia Olsen, ext. 3108; and the maintenance garage, ext. 3110.

During this interim period, it will not be necessary to call the PM&O scheduler-expediter at ext. 3092 to arrange for transportation services.

Fuel may still be obtained from 8:30 to 9 a.m., 11:30 a.m. to noon, and 3:45 to 4:15 p.m. Monday through Friday at the pumping facility behind the Maintenance building.



## Credit Union Changes

The Board of Directors of the Princeton University Employees' Federal Credit Union recently voted to revise two loan policies. Both actions became effective on August 5.

Applications for loans will now be considered by the Credit Committee only for those who have been members of the Credit Union for at least three full months.

The Credit Union has also discontinued student loans, which had been available under the aegis of the Department of Higher Education of the New Jersey Higher Education Assistance Authority.

Several circumstances prompted the halting of student loans, according to Credit Union president Bruce Finnie. Recent legislation has imposed new restrictions on the loans, including a means test and a fee. Problems that lending institutions have encountered in collecting student loans were also a determining factor in discontinuing loans.

Finnie reported that some lenders continue to grant student loans, and the Credit Union will be happy to direct potential borrowers to them. The Credit Union will supply to members who currently hold a student loan through PUEFCU a letter releasing them to borrow elsewhere.

The Credit Union board noted that Princeton University makes low-cost educational loans available to employees to help with the costs of their children's postsecondary education.

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## Bus Trips Slated

The Princeton Get-Away Club has planned two bus trips to the Garden State Arts Center for the end of the summer.

Tickets are available for Anne Murray's August 30th show. The bus will leave lot 23 at the university at 6:45 p.m. Tickets are \$14.45 each, which includes transportation to the Arts Center and admission to the show.

Tickets are also available for the performance of the New York Philharmonic Orchestra, under the direction of Zubin Mehta, on September 9. Tickets are \$16.95 per person, including transportation to the Arts Center and admission to the performance. The bus leaves lot 23 at 6:45 p.m.

For reservations, send your check to the Princeton Get-Away Club, Dod Hall Mail Room, Princeton University, Princeton, NJ 08540. For further information, call 921-6620 after 5:30 p.m.



## New Fire House

Five former PPL fire chiefs helped the PPL Emergency Services Unit open their new fire house on C-Site recently.

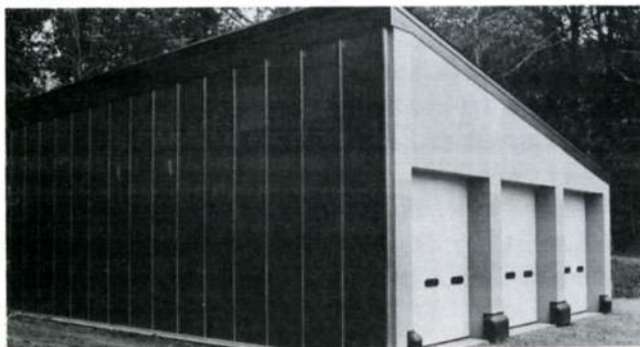
Former chiefs John Hirthler, Walt Weyman, Bob Sylvester, Ray Pressburger and Dick Carlese joined present chief Jack Anderson at the dedication ceremonies for the 45 ft. x 61 ft. building. Laboratory Director Harold Furth, Associate Director Richard Rossi, Assistant Director Mary Shoaf, and members of the Emergency Services Unit were also present at the dedication.

The new fire house features three bays and a shop area, with capacity for parking all of the laboratory's emergency vehicles. Solar heating is incorporated into the building through a trombe solar heat wall on the south side of the structure. Louvers on the wall can be opened or closed to control the interior temperature.

Chief Anderson is expected to move his office into a trailer adjacent to the new fire house later this month.



*Former fire chiefs John Hirthler, Walt Weyman, Bob Sylvester, Ray Pressburger and Dick Carlese (left to right) joined laboratory Director Harold Furth, Associate Administrative Department Head Robert Smart, DOE-PFPO Director J. Nelson Grace, present fire chief Jack Anderson, and laboratory Associate Director Richard Rossi at the opening of PPL's new firehouse (above). The building features a trombe solar heating wall (below).*



## Bloodmobile

The Bloodmobile will again visit the laboratory, September 1 from 10 a.m. to 3 p.m. at Sayre Hall. Those wishing to donate blood should contact Meg Gilbert at ext. 2036 to set up an appointment. Donors will be scheduled every 15 minutes and refreshments will be served.

Although employees are covered for blood needs under a group plan, the university must meet its yearly quota of blood donations to continue to offer this benefit.

## Blairstown Potpourri

Something old and something new will be featured at the annual Blairstown Potpourri, scheduled for September 19 in Jadwin Gym.

As in past years, the Potpourri will offer a large selection of house and outdoor plants for sale. A craft sale will include wall hangings, macrame, and other handcrafted items. Books and baked goods will also be on sale during the Potpourri, and the annual raffle will feature a \$500 "trip of your choice" donated by the Kuller Travel agency.

Tickets for the raffle are available from any ticket committee member, or from Ellie Weed, ext. 2438. Those interested in purchasing table space for the day should also contact Ellie.

The new activity at the Potpourri is a games festival for students, youngsters and adults. Group fun, rather than competition, is emphasized; there will be no winners and losers in the festival.

All proceeds from the Potpourri go to support the Princeton University's summer camp program in Blairstown, N.J. The camp conducts an outdoor adventure program, mainly for youths from the center cities. Camp counselors are mostly Princeton University undergraduates with extensive outdoor experience.

Those wishing to make a donation of items for sale at the Potpourri should contact Ellie Weed to arrange for pickup of the items.



# ppl people

## Soaring

From the dawn of time, man has always envied the birds for their ability to fly. Although one can now cross the globe in the Concorde in record time, many still long for the silent, swooping flights of eagles lazily riding the air currents. For these people, the desire for "pure" flight can only be satisfied by soaring.

Soaring enthusiasts, such as Applied Physics Division head John Schmidt, regularly climb into planes resembling overgrown versions of children's toys. The wings seem almost unnaturally long, and there is but a single wheel directly under the body. The glider must be towed into the air by a motored plane, but when the towline linking them is cut, the glider pilot can soar with the eagles for as long as the forces of nature—and his skill—will permit.

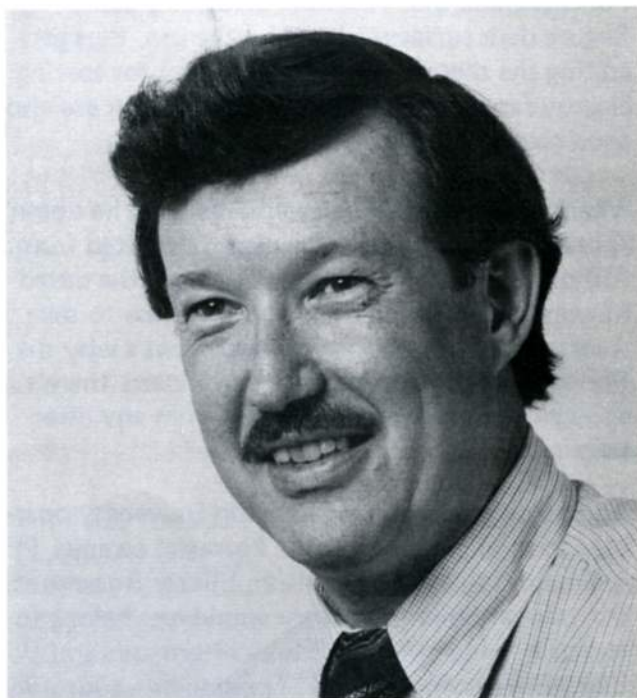
John recalled he's always been interested in flying, "but I never had the funding to do it. (Soaring is) a way of flying without making the tremendous financial and time commitment that you have to to fly a motored airplane."

What's the allure of riding the wind without a propeller, using only a set of wings? Pilots contend that gliding is to flying a power plane as canoeing is to a motor boat. A motor powered pilot is trained to operate with a motor; when he loses that, that's an emergency situation. A glider pilot has no motor to worry about; there's just one less thing to break.

There's also the peace that makes soaring a definite plus for some pilots, who feel very serene and peaceful when they're flying.

John fully agrees. "You can be going through all kinds of problems on a Friday, then go out at noon, go up to 3,000 feet, and find a great way to relax."

While the motored pilot may be concerned with



*John Schmidt*

his gas reserve, the glider pilot's main concern is where to land his aircraft. The glider is pulled aloft by a motorized towplane connected to the glider by a rope. At a designated height (usually between 2,000 and 3,000 feet), the glider pilot pulls the knob that releases his craft from its "umbilical cord". From that point until he returns to the ground, he must use his knowledge of weather patterns and his flying skill to keep himself airborne. He utilizes lift (provided by thermal currents, certain cloud formations or updrafts of air created by land masses) and sink (air being channeled downward instead of upward) to manipulate the height of his plane. If he makes a miscalculation, he may be forced to land very quickly—and unexpectedly.

That's part of the challenge, according to John. "You versus the thermals (maintains the challenge). You never know, when they drop you off at 3,000 feet, whether you're going to come down in 15 minutes or whether you're going to get a thermal and stay up for 2½ hours—and that's a chal-



lenge...Why do you climb mountains? In part because you can see a long way, but in part because you may fall off!"

The PPL area offers a variety of good sources of thermal currents. The laboratory parking lot, the TFTR construction site, Forrestal Center construction sites, and the Princeton Shopping Center all feature dark surfaces heated by the sun, thus generating the thermal updrafts necessary for soaring. Nearby farms with sun-baked brown earth are also good sources of thermals.

When a glider pilot does eventually land, he doesn't necessarily land in the same place he started from. Although the planes are launched from the paved runway, pilots usually land on the grass to save wear and tear on the single wheel. That's why the Forrestal airstrip is very safe for gliders: there's enough room to land in the grass from any direction.

The Soaring Society of Princeton University operates four sailplanes from the Forrestal campus. PPL graduate students Lynn Olson, Eliezer Rosengaus, and several other laboratory employees belong to the club, which flies on Friday afternoons and all day Saturday and Sunday. Training procedures for prospective pilots are parallel to the procedures motor power pilots follow, and both groups are regulated by the Federal Aviation Administration (FAA). More than half the club's members who hold their private glider pilot license also hold a private power plane license.

"It's not a particularly cheap sport," John emphasized, "although flying from this airfield with this club is relatively cheap compared to other organizations. It's a well-run, economical undertaking.

They don't charge you to learn; you don't get billed for the instructor, and that's a big savings."

"The big problem with learning is developing confidence," John believes. "Otherwise you're so stiff that you don't do anything right. But pretty soon you realize that you really can fly this thing, and get it to do what you want it to do, and that it's safe. That's the biggest step in learning."

John pointed out that although soaring may seem like a dangerous sport, the dangers are easily minimized. "In power planes, you run into the most accidents when people try to fly when they shouldn't. They're forced to go from one place to another on a day when they shouldn't be up. In a sailplane, you just don't do that; if the weather's lousy, you don't even want to go up. You never end up forcing yourself into conditions you shouldn't be flying in."

Although John hasn't flown in some time due to increasing travel on the job, he maintains that "certainly the risk I take if I were flying every week are exceeded by orders of magnitude by the risk I would take driving a car during a week....In a sailplane you're up there at 3,000 feet and there's nothing near you to run into. In a car, you're going 60 miles per hour and two feet away from you is something that, if you make a mistake and turn into, will kill you....People associate danger with height, but height doesn't kill; it's the relative velocity of the impact with something. Being 3,000 feet is very safe; there's not much to run into up there!"

For John, the risks are more than balanced by the beauty of the flights spent in the silent realm of the eagles.

