BROOKHAVEN BULLETIN
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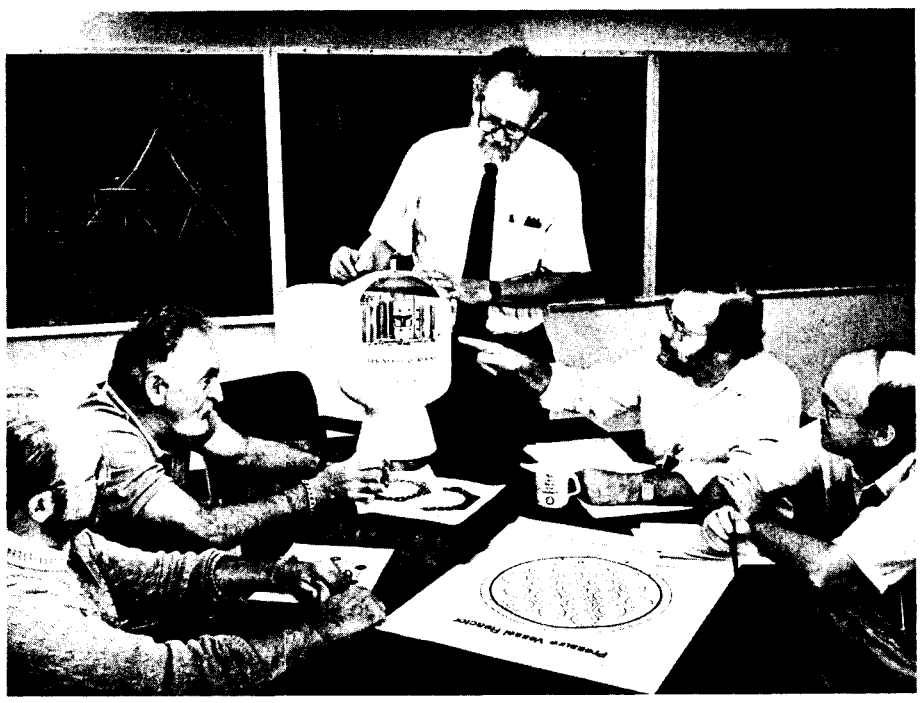
BROOKHAVEN NATIONAL LABORATORY

Rocketing Into the Next Century With BNL's Particle-Bed Reactor

In the darkness of outer space, the ship moves quietly and steadily, far beyond the faint blue ball that is planet Earth. Suddenly, the vehicle accelerates. The only clue as to what triggered its tremendous burst of speed is the white-hot glow of the exhaust nozzle.

That scenario may become a reality in future years, according to James Powell, Department of Nuclear Energy (DNE). Within that department, Powell heads the Reactor Systems Division, which consists of about 30 people who are playing a critical role in developing a nuclear rocket for space use.

Their work is part of the Space Nuclear Thermal Propulsion (SNTP) program managed by the U.S. Air Force's Phillips Laboratory. Other collaborators in this joint industry-laboratory partnership include Grumman Space and Electronics Division, Babcock and Wilcox Space and Nuclear Systems, and Sandia National Laboratories.



Using a model of the particle-bed reactor, James Powell (standing) discusses its design with: (from left) Michael Todosow, Donald Schweitzer, George Maise and Hans Ludewig, all of the Department of Nuclear Energy. — Photos by Roger Stoutenburgh

Nuclear Versus Chemical

BNL's role is to determine the feasibility of using a so-called particle-bed reactor (PBR) for nuclear-rocket propulsion. The work involves fundamental studies in such areas as reactor physics, fluid dynamics and heat transfer, fuels, and materials, with the goal of developing higher-performance materials and a very light, compact nuclear rocket.

Says Powell, "As the work has proceeded, we've become more confident that there are no technical show-stoppers."

According to Powell, the particle-bed reactor being developed by the SNTP program will provide over twice the specific impulse of conventional, hydrogen/oxygen rockets with the same thrust-to-weight ratio.

Specific impulse is the length of time a pound of a given propellant will produce a pound of thrust. The PBR-based rocket has a specific impulse of 1,000 seconds, compared to 450 seconds for a hydrogen/oxygen rocket and 270 seconds for a kerosene/oxygen rocket.

Thus, when compared to a conventional hydrogen/oxygen rocket, the PBR-based rocket can carry approximately three times the payload at the same velocity, or travel two to three times faster with the same payload.

Simply stated, a nuclear rocket gets better gas mileage.

Simplicity in Design

A particle-bed reactor is a nuclear fission device about the size of a 55-gallon drum. Instead of the long fuel rods found in commercial power reactors, it uses tiny fuel pellets, half-a-millimeter in diameter, made of a uranium-carbide core and coated with carbon and zirconium carbide. The pellets are packed between two porous cylinders.

To start the reactor, hydrogen, which is the rocket propellent and reactor coolant, is introduced into the cylinders and the control rods are withdrawn, allowing nuclear fission

(continued on page 2)

Patents Awarded

Donald G. Schweitzer, Department of Nuclear Energy, and **Mary S. Davis,** Director's Office, have been awarded U.S. Patent No. 4,935,943 for inventing a corrosion-resistant long-term storage container for quarantining radioactive waste.

The new container contains a number of sealed corrosion-resistant canisters of different sizes. Smaller canisters are placed within larger canisters, with predetermined spaces between them. Combined, the plural surfaces of the canisters and their spacing allow the container to resist corrosion, thereby preventing waste material from leaking from the innermost canister into the ambient atmosphere.

Storing radioactive material in multiple-layered containers is a common practice in the nuclear industry. In previous containers, however, each layer has been made of a different material. This increases the possibility for corrosion because it allows electrolytic cells to form between the different materials. Such containers appear most suitable for short-term storage of radioactive waste.

The new container is more suited for long-term use because it is made of essentially the same material throughout to prevent the electrolytic cells from forming. Also, the spacing between the canister inhibits the free flow of liquids between them, which provides for a large surface area for adsorbing reactants that cause corrosion.

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U.S. Patents No. 5,021,572 and No. 5,116,980 have been awarded to BNL Guest Scientist **Detlef Gabel,** of

(continued on page 2)

Assuring Safety Of Nuclear Rockets

Are nuclear rockets safe? Assuring their safety is a key issue in the Air Force project to develop one.

A nuclear rocket is essentially an engine using uranium-235 as fuel. When the rocket fires in outer space, the level of radiation would be equivalent to background radiation back on earth. When the rocket operates, the radioactivity rises because of the generation of fission products. Nevertheless, virtually no radioactivity would be released because the fuel is coated and the fission products would be contained.

Since safety is of the highest priority in the development of the nuclear rocket, the program will include large-scale tests to examine safety performance. — M.R.

BNL Signs CRADA to Develop Novel Spectrometer

BNL has signed a Cooperative Research and Development Agreement (CRADA) with E.G. and G. ORTEC Corporation (EG&G), a nuclear measurements instrumentation company based in Oak Ridge, Tennessee, to develop a novel gamma ray detector, known as an Anti-Compton Spectrometer (ACS). Such devices have been constructed in laboratories as needed for the past 25 years, but there has not been a commercial model available.

This is the third CRADA that the Laboratory has signed this year. CRADAs — agreements between federally owned facilities and private transfer projects — were initiated by the U.S. Department of Energy (DOE) to improve American competitiveness and create more jobs.

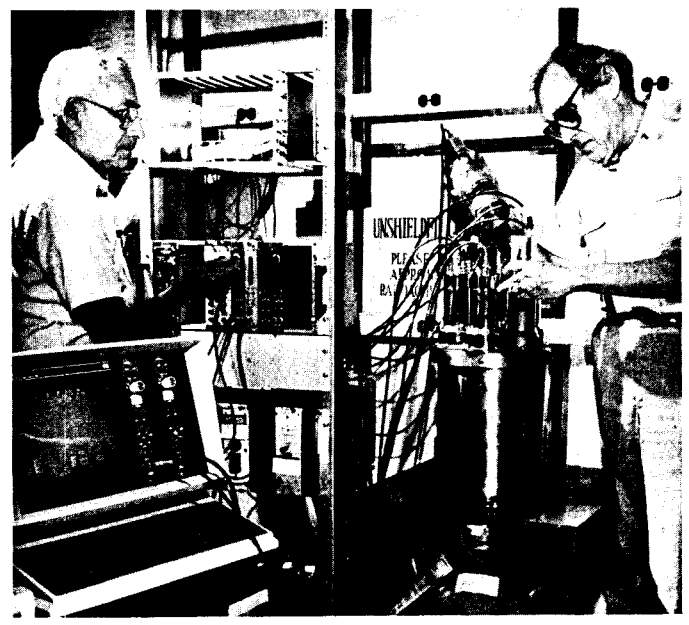
The principal Brookhaven researchers involved in the new CRADA are Senior Scientists James Cumming and Garman Harbottle, both of the Chemistry Department. Joining the Brookhaven team will be Sheldon Landsberger, a professor at the University of Illinois.

The ACS is a germanium gamma-ray detector, which means that it measures the photons emitted by a nucleus in transition between two energy levels. Standard detectors of this type are limited by the scattering of gamma rays by the Compton process, which leads to a general spectral background that can obscure gamma-ray lines of interest.

In the new ACS, Compton-scattered gamma rays are detected in a large sodium iodide detector surrounding the germanium, and their contribution to a spectrum can be eliminated. Thus more precise gamma-radiation measurements are possible.

Cumming and his collaborators first developed a prototype ACS at BNL about ten years ago. A novel feature of the Brookhaven ACS is that the samples to be investigated are placed in a well inside the central germanium detector to achieve high detection efficiencies.

Harbottle plans to use the ACS at Brookhaven for an ongoing project to measure radon in soils. "With this device, samples can be a great deal smaller," he said. "Also, by suppressing interfering radiation, we can detect weak gamma rays. We can come up with suggested refinements to the instrument after actually using it in our research. Also by using it, we can show its range of research applications, thus making the device more competitive."



The Chemistry Department's James Cumming (left) sets up operating conditions, while Garman Harbottle prepares to insert a sample into BNL's Anti-Compton Spectrometer.

As part of the CRADA, Cumming will seek to increase the sensitivity of the ACS still further for specific radionuclides and to make the device more versatile for the wide range of gamma-ray energies that are encountered in many applications. When fully optimized through this technology-transfer project, the ACS will be a state-of-the-art commercial instrument used for a range of scientific studies, including environmental, geochemistry and nuclear waste research.

The basic research at Brookhaven that led to this CRADA opportunity was supported by the DOE Office of Energy Research's Nuclear Physics and Environmental Research Divisions. Funding for Brookhaven's participation in this CRADA comes from the Technology Transfer Program in DOE's Laboratory Management Division, also within the Office of Energy Research.

Apartment Area Home-Away-From-Home

BNL visitors who stay in the Lab's apartment area come and go, and, over the years, they may come back again and again. But very few have accumulated more than six years of time there — as have Wolfgang and Miriam Rothenstein.

Their years in the apartment area added up over a 34-year period due to one postdoc, three sabbaticals and 14 other visits ranging from less than a week to three months plus.

"After all these years, the Housing Office knows us well," says Wolfgang Rothenstein.

The couple first came to the Lab in December 1957, after Rothenstein completed his Ph.D. in atomic collision theory at the University of London. Within BNL's Department of Nuclear Energy (DNE), he then served as a postdoctoral research associate in the Reactor Physics Group, which was headed by the late Jack Chernick. For some time, Rothenstein worked with BNL's Paul Michael on the early design calculations for High Flux Beam Reactor.

For their first stay at BNL, the couple arrived with their then 2½-year-old daughter, and, while they were here, the first of their two sons was born.

Thirty-three years and 17 visits later, the Rothensteins returned to BNL this June.

For several years, Wolfgang Rothenstein has been a guest at the National Nuclear Data Center of DNE, where he has collaborated with BNL's Sol Pearlstein and Charles Dunford. This summer, Rothenstein returned there to perform safety-related studies of the temperature dependence of criticality for different reactor types, and reactor-lattice benchmark calculations to test computational models and basic nuclear data.

Between their first arrival at BNL and today, the Rothenstein's three children have grown and visited them at Brookhaven — with children of their own. And, last October, Wolfgang Rothenstein retired as a nuclear engineering professor emeritus from the Technion, the Israel Institute of Technology.

Brookhaven Perennials

"Despite the redecorating going on in the apartments, very little has changed," comments Miriam Rothenstein. "When we first came here, we didn't have a toaster, iron, carpet sweeper or fan. Now we do, but the layout of the apartments is the same, everything is kept in the same place, the dishes are the same pattern as years ago — in principle, everything is the same. So it doesn't matter which apartment we are given, we know what to expect and where to find things."

Other Brookhaven perennials include "a special patch of lilies of the valley, which, if we're here, we pick in May," she says.

While the flora and fauna are still the same, "There are many more deer, but fewer rabbits and groundhogs. I'm sure the blackberries are still here, but we don't venture into the woods like we used to for fear of ticks and Lyme disease," she adds.

Wolfgang and Miriam Rothenstein in BNL's apartment area. — Photo by Stoutenburgh

Apartment area residents have always had to do their shopping off site. Earlier on, comments Miriam Rothenstein, "the only place where we shopped was Patchogue — so, although there are now shopping areas everywhere, we still enjoy going to Patchogue because we like the downtown and the assortment of shops."

In conclusion, the Rothensteins have liked their Brookhaven home-away-from-home "since the morning after the first evening."

"The first evening that we arrived here in 1957, we put our daughter to bed and sat down together, quite depressed, because we realized that we were in the middle of nowhere. After we got up the next morning, we liked it here because of all the wonderful people who welcomed us to the Lab and who have remained our true friends over the years," concludes Miriam Rothenstein.

— Marsha Belford

Patent (cont'd)

Bremen, Germany, for synthesizing boron-containing derivitives of thiourea compounds, and showing how to prepare and use them in treating malignant melanoma by boron neutron capture therapy (BNCT).

Thioureas are substances that accumulate in malignant melanoma. Currently, this fatal form of cancer is treated by surgery and/or conventional radiation therapy with no great success.

In BNCT, a promising new treatment, the patient is injected with a boron-carrying compound that will concentrate in the tumor rather than the bloodstream. The tumor is then irradiated with a beam of epithermal neutrons, which lose some energy as they pass through body tissue, becoming thermal neutrons, which are captured by the boron in the tumor. The irradiated boron emits cell-killing alpha and lithium particles that travel only about the radius of a single cell. Thus, the tumor is destroyed, while nearby non-boronated, healthy cells are essentially unaffected.

Key requirements for BNCT are that the boron-carrying compound must selectively accumulate in tumor cells; be stable, so that very little boron separates from the compound to remain in the healthy cells; and be readily prepared. Gabel's new thiouracil compounds meet all these demands.

In Memoriam

The last living incorporating trustee of Associated Universities, Inc. (AUI), **William W. Watson**, died on August 3, in Hamden, Connecticut. He was 92.

Chairman of the Physics Department at Yale from 1940 to 1961, Watson took a leave of absence from that university during World War II, to head part of the effort at the University of Chicago to develop the atomic bomb. Following a stint working with the allied Canadian-British bomb-building project in Montreal, he returned to Yale in September 1945, one month after the first atomic bomb was dropped on Hiroshima.

After the war, Watson joined representatives from other institutions in the northeast to discuss establishing a government laboratory dedicated to basic peacetime nuclear research in their region.

As a result, on July 18, 1946, William Watson became one of the first five trustees of AUI, which is the nonprofit management firm that founded BNL and continues to operate it for the federal government.

On that date, the Education Department of the State of New York granted an absolute charter incorporating the late George Brakeley of Princeton University, George Pegram of Columbia University, I.I. Rabi of Columbia, Henry Smyth of Princeton, and Watson "and their associates and successors as an educational corporation under the corporate name of Associated Universities, Inc. . . ."

From that date, Watson served as a trustee, until he retired from the board on October 19, 1962.

Former AUI President Gerald Tape, who had served on the board with Watson from 1951 until his retirement, recalls, "William Watson was very supportive of the concept of Brookhaven both as a laboratory strong in its own right and as a national resource for visiting scientists. In addition, he encouraged strong participation by Yale scientists at the Lab."

William Watson is survived by his wife, Elizabeth Watson, two daughters and two grandchildren.

Reactor (cont'd)

to occur. The hydrogen is heated by the fuel pellets, causing the invisible gas to rush out of a nozzle, thereby providing thrust.

Certain aspects of the design are key to the rocket's superior performance. For one, the fuel pellets can withstand temperatures in excess of 2,700°C. In comparison, conventional nuclear reactors usually operate at about 300°C.

As temperature is directly related to specific impulse, the extreme temperatures achieved in the particle-bed reactor result in an extraordinarily high value of specific impulse.

The Reactor's History

The particle-bed reactor is so named because its fuel particles are directly cooled and contained in a stationary bed, instead of being embedded in graphite blocks, as in commercial high-temperature, gas-cooled reactors.

The origins of the particle-bed reactor can be traced back to the late 1960s and early '70s, as part of the Lab's general work on advanced reactor designs.

At the time, DNE researchers had invented and were developing a rotating-bed reactor, in which the fuel particles are contained in a rotating, porous cylinder and kept in place by centrifugal force.

Then, in the 1980s, drawing in part on that early reactor technology, the scientists developed a non-rotating, fixed-bed reactor, which has evolved into the particle-bed reactor concept now being pursued for space propulsion. Two of the original researchers, Powell and Hans Ludewig, are still involved with the current PBR project.

Powell points out that the particle-bed reactor has other potential uses.

For nuclear-generated electric propulsion in space, the PBR is capable of a 500-megawatt burst of power when operating in an open-cycle mode, directly exhausting to space. In a closed-cycle mode, using high-temperature heat radiators, it could generate up to 10 megawatts of continuous power.

Potential terrestrial applications of this reactor are based on its extraordinarily high neutron flux. For example, the PBR could be used for the transmutation of actinides and fission products found in nuclear waste.

It could also serve as a source of intense neutron beams for basic research, generating beams of much greater intensity than those generated by the Lab's High Flux Beam Reactor.

In Outer Space

As a nuclear thruster, the particle-bed reactor can be used in a wide variety of military and civilian space applications. These include advanced upper stage rockets for space launch, orbit-transfer vehicles, and propulsion vehicles for the President's Space Exploration Initiative (SEI), which would involve NASA and the U.S. Department of Energy, and which includes, among other programs, a piloted mission to Mars.

A round trip to Mars is much more feasible with a nuclear rocket. With its higher specific impulse, astronauts' exposure to galactic cosmic rays, solar flares and other hazards would be significantly reduced by the shorter trip time. The round-trip would take as little as 270 days, according to Powell, compared to a 600-day voyage using a chemical rocket.

Interplanetary travel, the stuff of science fiction, could indeed become science fact with the successful development of a nuclear rocket.

— Mona S. Rowe

Inside Info

BNL Senior Scientist **Charles Meinhold,** Deputy Head of the Radiological Sciences Division within BNL's Department of Nuclear Energy, was unanimously elected president of the International Radiation Protection Association (IRPA), during a meeting the association held this May.

Meinhold will serve as IRPA president for four years, during which time he will oversee this forum for the international exchange of scientific knowledge and research results on health physics and protection against ionizing and nonionizing radiation. Founded in 1966 and based in the Netherlands, IRPA has 35 member societies and 15,000 members, from 40 nations.

Meinhold is also president of the National Council on Radiation Protection, a scientific organization that was chartered by Congress in 1929. Headquartered in Maryland, the Council is made up of more than 500 American scientists interested in disseminating information on radiation protection.

Arrivals & Departures

Arrivals

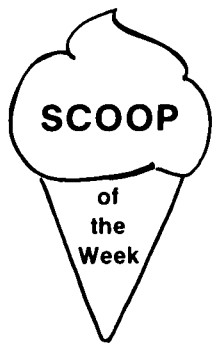
Jennifer P. Rodriguez.....Biology

Departures

This list includes all employees who have terminated from the Lab, including retirees:

James J. Biamonte.....Staff Serv.
Earle O. Dickerson.....Plant Eng.

Scoop of the Week



This week's Scoop of the Week goes to Lenny Newman of the Department of Applied Science for suggesting the interview with Wolfgang and Miriam Rothenstein for the story "Apartment Area Home-Away-From-Home."

For giving the Bulletin a hot tip on a publishable story and scooping its informed sources, Newman wins an official Scoop of the Week certificate, suitable for framing or redeeming at the Cafeteria in exchange for his favorite frozen dessert.

To enter this summer's fifth annual Scoop of the Week contest, rush your hot tips for BNL news and features to the Brookhaven Bulletin, Bldg. 134; or call Ext. 5053.

Touch Football

The BERA Touch Football League will begin its six-week season on Monday, September 14, with games on Mondays and Thursdays at 5:20 p.m., at the softball fields. These refereed games of one-hand touch are spirited and a lot of fun.

The Football League is interested in new players or complete teams eager to participate. So, if you want to stay active after the softball season is over, come down and join. To get involved or for more information, call either Fran Loeb, Ext. 2092, or Wayne Rambo, Ext. 2284.

Film badges will be changed tomorrow. Please place your badge in its assigned rack space before leaving work today.

Cafeteria Menu

Luncheons

Monday, August 31

Soup: Chicken noodle	.80/1.10
Entree: Linguine w/clam sauce	3.20
Fitness: Baked fish Kiev	3.45
Carvery: Hot pastrami sandwich	2.95
Grill: Monte Cristo	2.95

Tuesday, September 1

Soup: Navy bean	.80/1.10
Entree: Ravioli w/red sauce	3.20
Fitness: Veal Florentine	3.45
Carvery: Hot roast beef sandwich	2.95
Grill: Swordfish steak w/fries	3.65

Wednesday, September 2

Soup: Italian vegetable	.80/1.10
Entree: Baked herb chicken	3.35
Fitness: Fresh vegetable quiche	3.20
Carvery: Hot baked ham sandwich	2.95
Grill: Chicken breast w/fries	3.65

Thursday, September 3

Soup: Corn chowder	.80/1.10
Entree: BBQ pork ribettes	3.35
Fitness: Eggplant Parmesan	3.20
Carvery: Corned beef sandwich	2.95
Grill: Reuben sandwich	2.95

Friday, September 4

Soup: Manhattan clam chowder	.80/1.10
Entree: Pork chow mein	3.35
Fitness: Stuffed fillet of fish Creole	3.20
Carvery: Turkey sandwich	2.95
Grill: NY shell steak w/fries	3.85

Cafeteria News: 59¢ hamburgers; 69¢ cheeseburgers; ¼ pound hamburger, $1.45; ¼ pound cheeseburgers, $1.65; fixings bar.

Movie Night at the Center Club changed to Thursdays: *Fisher King*, **8/24**

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Get Your Picnic Tic . . . Today!

A $3 ticket to the Lab's 45th Anniversary Family Picnic on Saturday, September 19 includes unlimited soda, beer, popcorn, ices, ice cream, a parade, face painting, magic, games, contests, D.J., dancing, cotton candy — and a challenge to all comers to beat Deryk's Boys, the champion team from the AGS that won the last BNL Picnic's Fun Olympics!

Tickets will be on sale today and Monday, August 31, at the Teachers' Federal Credit Union from 9 a.m. to 3 p.m., as well as at the BERA Sales Office in Berkner Hall, from 9 a.m. to 2 p.m. Sales end September 1, so hurry!

Softball

1992 Final Standings

League I		League 2	
Blue Jays	11-3	Titans	12-2
Phoubars	9-5	Cocoon	10-4
Ravens	8-6	Dirty Sox	9-5
Up and Atom	8-6	Scram	8-6
Magnuts	6-8	Phase Out	8-6
Cool 'n Gang	5-9	Antiques	4-10
Revised Edition	5-9	Lights Out	4-10
Six Pax	4-10	Lunatechs	1-13
League 3		**League 4**	
Big Sticks	10-1-1	Sting Rays	12-2
Surefire	9-3	Personnelities	10-4
Quantum	8-3-1	Roustabouts	9-4
Bombers	6-6	Snakebites	9-5
Medical	3-9	Simply Awesome	7-7
Dangerous Curves	2-10	Just 4 Fun	4-10
DOEnuts	2-10	Park Avenue	2-11
		Source	2-12
League 5			
Good Timers	9-3	Leadbottoms	4-7
Molson Express	9-3	Snafu	2-10
Ha Has	9-3	Jerry's Kids	1-11
What's on Second	8-4		

Mum's the Word

A Mum Sale is being held outside the Cafeteria today, Friday, August 28, from 9 a.m. to 2 p.m., by the Association for the Help of Retarded Children, which will use the proceeds to fund activities for mentally retarded adults.

Equipment Demo

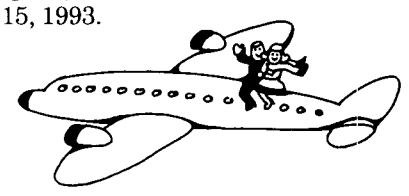
On Tuesday, September 1, Data General Corporation and Next Computer will discuss open systems technology in Room D, Berkner Hall, from 9:45 a.m. to 3 p.m. Technical components of Data General's AVIION and the Next Workstation product lines will be discussed. Hands-on demonstrations of the Next Step operating environment will also be provided.

Eligible Air Travelers Invited To Join Class-Action Suit

If you purchased a domestic airline ticket between January 1, 1988, and June 30, 1992, you may be part of the class that is eligible to file a claim in a class-action antitrust lawsuit charging U.S. airlines with price fixing.

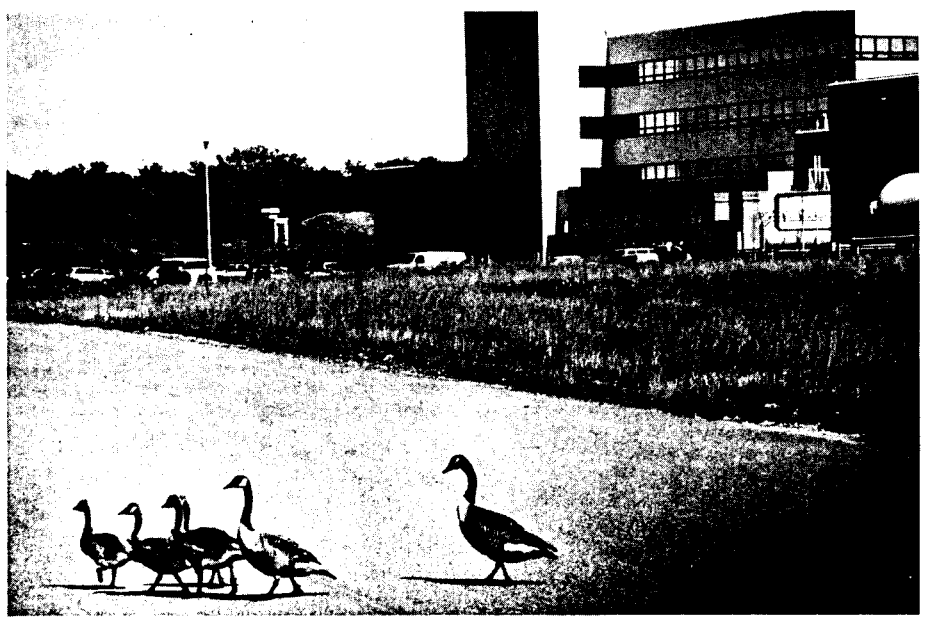
Proposed settlements have been established in this suit, and final approval is expected this fall. Under the proposal, class members may now claim certificates usable toward the purchase of tickets for air travel. The value of certificates that claimants may receive will depend on the number and dollar value of claims filed.

The BNL Travel Office will be filing claims on behalf of the Lab for official travel ticketed on the BNL corporate credit card. For personal travel, anyone wishing to obtain a claim form or additional details about the proposed settlement should write to: Airline Antitrust Litigation, P.O. Box 209, Philadelphia, PA 19107. Claims must be postmarked on or before February 15, 1993.



The class eligible to file a claim includes all persons who bought a domestic airline ticket between January 1, 1988, and June 30, 1992, on American, Continental, Delta, Midway, Northwest, Pan American, TWA, United or USAir, on flights to, from or connecting at one of the following cities: Atlanta, Baltimore, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Dallas/Ft. Worth, Dayton, Denver, Detroit, Houston (IAH), Indianapolis, Kansas City (Missouri), Los Angeles, Memphis, Miami, Minneapolis/St. Paul, Nashville, Newark, New York (La Guardia or Kennedy), Orlando, Philadelphia, Pittsburgh, Raleigh/Durham, St. Louis, Salt Lake City, San Francisco, San Jose, Syracuse or Washington D.C.

Sighted Around Site



Touring the site of the Relativistic Heavy Ion Collider one spring day, this Canada goose family was sighted and snapped by BNL Photographer Roger Stoutenburgh.

Let's Dance

The BNL Ballroom, Latin & Swing Dance Club will resume its dance classes on Wednesday, September 9, with a six-week series for beginners on swing and cha-cha. All BNLers and their dance partners are welcome.

Taught by Giny James of Dance Elektra, the classes will be held Wednesdays, September 9, 16, 23 and 30, and October 14 and 21, from 5:15 p.m. to 6:30 p.m., in the North Ballroom of the Brookhaven Center, unless members are notified otherwise. The cost is $15 per person, payable at the first lesson in a check made out to the BNL Dance Club.

For more information, contact Walter Loss, club president, Ext. 3086; or Marsha Belford, vice president, Ext. 5053.

Weight Watchers

New and continuing on-site Weight Watchers may register for the fall session of 12 lunchtime classes on Wednesday, September 9, from noon to 1 p.m. in the south dining room of the Brookhaven Center. The first class will start the following Wednesday, September 16, be held at the same time in the same place.

Classes are open to BNL employees and their dependents. Payable at registration, the cost is $90, as the Lab is paying $10 of the $100 fee. For more information, contact Health Promotion Specialist Mary Wood, Ext. 5923.

Notice for U.S. Permanent Residents

Permanent residents of the United States are advised that the Resident Alien Card, commonly called a green card, which documents their status, may require updating.

Resident Alien Cards that bear no photograph, fingerprint or signature of the resident alien must be reissued before August 1, 1993. Failure to obtain a new card will cause difficulty if re-entering the U.S. after foreign travel.

New cards will be valid for ten years, and there is a $70 processing fee. Call the U.S. Immigration & Naturalization Service, (800) 755-0777, for more information and application forms.

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position. Consideration is given to candidates in the following order: (1) present employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present employees within the Laboratory; and (3) outside applicants. In keeping with the Affirmative Action plan, selections are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

Each week, the Personnel Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Personnel, and, second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (282-7744), for a complete listing of all openings.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

MK 0860. CHEMISTRY ASSOCIATE POSITION (term appointment) - Requires a BS/MS, Ph.D. preferred, in chemistry and demonstrated ability to conduct independent research. Duties include use of fast kinetic techniques to study reactivity of metal with organic compounds. Experience in inorganic synthesis and HPLC techniques is desirable. Chemistry Department

NS 2343. ENGINEERING POSITION - Requires BS in engineering, MS preferred; a Ph.D. in instructional technology desirable. In addition, requires a knowledge of computers, state-of-the-

(continued on page 4)

Classified Ads (cont'd)

art learning strategies using videodiscs, CBT, DVI, AI, programmed learning and other technologies. Duties will include developing learning strategies to teach highly technical courses (engineering and physics), developing training and delivering routine lectures, as well as occasionally completing engineering tasks. Department of Nuclear Energy.

DD 1065. OFFICE SERVICES POSITION (part-time, term appointment) - Requires previous relevant work experience and demonstrated organization skills. Duties will include maintenance of master drawing files, use of ozalid printing machine, print folding and distribution of prints and engineering documents. Additional responsibilities include maintenance of engineering change-order logs and print paper supplies. Computer and/or word-processing experience highly desirable. Accelerator Development Department.

DD 1066. DESIGN POSITION (term appointment) - Requires AAS and ten years' mechanical drafting/design experience. Knowledge of engineering fundamentals, machine design, machine-shop procedures and understanding of MIL-STD-100 and ANSI YK-5-1982. Will perform professional-level design functions. Accelerator Development Department.

LF 10176. BIOLOGY ASSOCIATE POSITION (part-time) - Requires a BS in physics or equivalent and experience in protein crystallography. Duties include reduction of 3-D data, refinement of crystal structures, and graphical analysis of density maps. Will assist in 3-D data collection, phase determination experiments and maintaining crystallographic software packages. Biology Department.

Motor Vehicles & Supplies

91 TOYOTA TERCEL - 5-spd., ac, tape deck, blue, $7,599. Walter Loss, Ext. 3086.

90 CHEVY CAVALIER - white, blue int., am/fm, cruise, tilt, p/s, p/b, 53k mi., excel. cond., $4,795 neg. Kenny, 289-9658.

90 GEO PRISM - 4-dr., a/t, p/s, p/b, ac, am/fm cass., 55k mi., excel. cond., orig. owner, $5,200. 331-8170 after 6:30 p.m.

89 PONTIAC GRAN PRIX - 2-dr., gray, a/t, ac, 60k mi., $6,500 firm. Pat, Ext. 2539.

89 COLEMAN POP-UP - tub & shower, hot water, refrig., heater, awning, queen bed, must see, $5,000. 474-3080.

87 HYUNDAI EXCEL - h/b, am/fm, ac, runs well, good body. Rany, Ext. 7653.

87 HYUNDAI GLS - 5-spd., 5-dr., p/sunroof, HP stereo, v.g. cond., $2,200. Phil, Ext. 7601.

87 KINGSTON HORSE TRAILER - 2-horse, extra wide, bus window, less than 2k mi., mint cond. in/out, $3,200. Marny, 277-1817.

86 CHEVY CELEBRITY - s/w, 6-cyl., cruise, a/t, ac, am/fm, p/s, p/b, new brakes & muffler, $1,800. Igor, Ext. 5801.

85 BUICK SKYHAWK - 2-dr., black, p/s, p/b, am/fm stereo, ac, new battery, good cond., asking $2,350. Mike, Ext. 3981.

85 JEEP CJ7 - 6-cyl., p/s, 63k mi., new tires & summer & winter tops, excel. cond., $5,500 neg. 878-6729 after 4:30 p.m.

84 HONDA ACCORD - h/b, maroon, 2-dr., 5-spd., am/fm cass., new tires, clutch, brakes, looks great, runs well, $2,500. Tom, Ext. 7196 or 286-2505.

82 VW JETTA - 90k mi., am/fm stereo cass., Pirelli tires, new fuel inj., distributors, batt., alt., starter, needs minor work, excel. body, $1,200. Ext. 3593.

80 VW RABBIT - diesel, runs well, no rust, $400. 584-5972.

80 CHEVETTE - h/b, 2-dr. sedan, 127k mi., a/t, ac, am/fm/stereo/tape, good brakes & m/s tires, new timing belt, $650. Ext. 3061 or 751-0894.

77 BMW 530i - $1,750. Steve, Ext. 4008.

79 FORD FAIRMONT - s/w, p/s, ac, stereo cas., runs well, $700. Roy, Ext. 7531 or 929-3550.

71 GMC VAN - heavy-duty, 35 series, 350 V-8, 8-lug rear axle, needs brake line repair, $200 firm. Bill, 924-5505.

31 CHRYSLER - 2-dr., rumble seat, all orig., excel. cond., ask. $8,000. Rosalie, Ext. 3160 or 289-5704.

RIMS - 4, 5-lug, alum., Chevy, 15"x7" wide, $75 for all. Jim, Ext. 4026 or 821-9814.

TIRES - 4, 175-70Rx13, Bridgestones, whitewalls, RD 116 model, steel-belted radials, $80 for all. Ken, 281-0843.

TIRES - 13" & 14" radials, $20 ea. or $35/2. 369-0432.

RUNNING BOARDS - Dee-Zee, aluminum, never used, 67" long, orig. $180, asking $90. Chris, Ext. 2022 or 395-6112.

CARRIER - car-top, excel. cond., $65; Tuffbox carrier for mid-size pickup, lockable, new, $75. Ray, Ext. 4428 or 467-8297.

RADIO - am/fm digital stereo, Ford factory, $40. Jim, Ext. 4026.

Boats & Marine Supplies

25' MORGAN SAILBOAT - sail away, will help, recent sails, ob., free use of mooring, $4,000. Steve, Ext. 4008 or 821-0686.

22' MARSHALL CATBOAT - freshwater-cooled Yanmar diesel, VHF radio, depth sounder, Danforth compass, head. Gordon, 477-2269.

21' RENKEN - 1980, cuddy cabin, port-a-potty, Volvo eng., fish finder, etc., best offer. 878-5825.

15' BOAT - 1987, alum., 15-h.p. motor, trailer, 2 gas tanks, lights, extras, excel. cond., asking $1,100 Walt, Ext. 3848 or 758-9220 after 6 p.m.

LORAN C - Simrad, old, reliable, accurate, TDs only, no navigation capabilities, w/cables & manuals, $50. Graham, Ext. 4168.

LOBSTER POTS - 2, wood, new, never used, $24 ea. John Toner, Ext. 2769.

Furnishings & Appliances

CHAIRS - rattan, swivel, w/cushions, $150; Formica dressers, 6 drawers & 3 drawers, $150. H. Martin, Ext. 7761.

COUCH - 4-piece sect., blue, w/chair & sleeper, 2 yrs. old, $1,500. Tom, Ext. 7287 or 744-4535.

COUCH - Ethan Allen, 7', excel. cond. 325-0447.

DINETTE SET - 48" table w/18" leaf, 4 swivel bucket seats, $100; refrigerator, dorm-size, 1.5 cu ft., good cond., $75. Penny, Ext. 2625 or 467-8297.

DINING ROOM - cherry, 6 chairs, table, china closet, buffet, $1,500; kitchen set w/4 chairs, $175; king-size headboard, $75. Ext. 4519 or 924-6051.

DISHWASHER - Kitchen Aid, works well, $45; modern padded & chrome easy chair, $35; kitchen table, $10; table lamp, $5; more. Ext. 2241.

FOOD PROCESSOR - Moulinex-Regal La Machine, brand-new, never used. 475-0373.

FREEZER - upright, $200; twin headboard, wicker, $20; area rugs, 4'x6', $50/ea.; king-size bedspreads, country blue, $25/ea. Corinne, Ext. 3662.

KITCHEN TABLE - oak, w/4 chairs, hardly used, $150; telephone, $8; alarm clock, $1.50; wall clock, $10. Angela, Ext. 7321.

LIVING ROOM - sofa bed, bone white, loveseat, glass & brass tables, good cond., $890. Doug, Ext. 4661 or 434-7812.

OVEN - Farberware, convection, 13¼"D x 20½L x 14'H, drip tray, 2 chrome racks, chrome interior, self-clean, $75. 475-7257, leave message.

SOFA BED - queen-size Posturepedic mattress, white w/designs, perfect, $350 neg. 286-9458.

SOFA BED - Castro convertible, gold w/brown trim, king size, v.g. cond., $150. Tom, Ext. 4507 or 878-1060.

TABLE - oval, kitchen, w/4 cloth seats on rollers, leaf, $350; oak microwave cart w/shelf, $75. Tom, Ext. 7287 or 744-4535.

TV CART - oak finish, swivel top, new, $15; Wallmaster film screen, 5', $20. Patricia, 758-3952 after 6 p.m.

Tools, House & Garden

LANTERN - Coleman, propane, 2-mantle, never used, w/4-mantle bags, fuel cannister, $15. Ext. 2733 or 878-8491.

LAWN MOWER - John Deere model GX75, w/tricycler kit for mulching, 2 mo. old, must sell, asking $1,800. Tom, 928-7539.

KITCHEN CABINETS - Formica, birch white; Kenmore refrig., 19 cu ft., brown; GE dishwasher, white; all v.g. cond. Ext. 5058 or 689-9869.

LAWN VACUUM - $75. Ext. 4519 or 924-6051.

MAPLE TREES - Japanese red, $10-$45+; well pump, 1½ h.p., FW, 3 stage, $75; Deming shallow well pump, ¾ h.p., $75. 265-6542 after 6 p.m.

PICNIC TABLE - 60" round, redwood, w/4 benches, $150; two #20 propane tanks,, $10/ea. Harris, 758-7911.

PLOWS - 2, bottom, for Ford tractor, 3-point hitch, $100; table saw, $35; firewood, split, seasoned locust, you pick up, $100/cord. 878-6637.

WHITE PINES - white spruces, nursery grown, up to 5', you dig, $2/foot. John, 744-5867.

Sports, Hobbies & Pets

BICYCLES - his & hers, 10-spd., like new, used twice, $300/both. 586-7402 after 6 p.m.

BICYCLE - 3-spd., Schwinn, $15; child's bicycle, good cond., $30. Paul, Ext. 3308.

BICYCLE - 10-spd., 21" frame, many alloy parts, v.g. cond., $75. Phil, Ext. 7601.

BIRD CAGE - large, pedestal, can be used as open perch, $60. 584-5972.

CAMERA - 35mm, Pentax 1000, w/adjustable focus, carry case; b&w TV, 12". Kathy, Ext. 2267 or 395-6520.

CAMERA - folding cartridge, Hawkeye 3A, 122 film, antique, excel. cond. 298-8851.

CAMERA - Nikon N6006 35mm, 5 mo. old, 1½ yrs. left on warranty, $350 firm. Lenny, Ext. 5046 or 878-3064.

CAMERA - Nishika 35mm 3D, w/case, flash, instructions, brand-new, never used, orig. $400, asking $350. Angela, Ext. 7321.

DOG CHAIN - tie-out runner, 15', new, $4; dog collar, 20", $6; 17", $5. Dolores Janes, Ext. 2907.

ELECTRIC GUITAR - Aria Pro II T350, excel. cond., $40. John, Ext. 4090.

EXERCISE BICYCLE - clone of Tunturi ergometer, w/40 lb. flywheel, speedometer, mech. energy computer, $50. Tom, Ext. 7196 or 286-2505.

GOLF CLUB - driver, Lynx USA Tour, Co-Cr head & graphite shaft, hardly used, orig. $180, sell for $110. Ext. 7546.

GOLF CLUBS - Lynx radials 3-PW, $125; metal wood, Imit Taylors, 1,3,5, $100; metal woods, closed face, 1,3,5, $100. Hank, Ext. 3894.

HOME GYM - Weider Flex HTS, w/stepper, timer, hardly used, orig. $200, sell for $125. Bob, 395-4885 after 4 p.m.

LENS - Soligor 75-205 zoom, Macro lens, F3.5, w/built-in lens hood & Nikon AI mount, $75. Chris, Ext. 2326.

PIANO - Steinway, 1976, professional, upright, w/bench, auto. climate control, $3,500. 744-3744.

ROWER - Sears best, $75. Ext. 7761.

Audio, Video & Computer

B&W TV - $20; fold-up bed, $10; juice extractor, $20; dish, $10; exercise bike, $20; 21" fan, $18. Kathy, 744-2203.

CD PLAYER - Sony CDP-C705, 2-20 kHz, 5-disc carousel, 8x oversampling, 18 bit D/A fade, peak search, $250. Hans, Ext. 4584 or 981-3365.

LP RECORDS - *Great Men of Music* & Franklin Mint collection, practically new. Janet, Ext. 2345 or 929-3910.

MOVIE PROJECTOR - Berkley Keystone Dual 8, excel. cond., $10; 2 electric pole lamps, w/aluminum poles, like new, $25/ea. 298-8851.

SATELLITE DISH - 8', ground-mount, remote controlled, receives 20 satellites, 24 channels per satellite, you remove, $800. Lloyd, Ext. 5225.

The Brookhaven Bulletin is printed on paper containing at least 50 percent recycled materials, with 10 percent post-consumer waste.

STEREO - Yorx am/fm stereo, double cass. recorder, phone player, 2 speakers, remote, $85. Angela, Ext. 7321.

TAPES - VCR, Maxell GP, new, $3/ea.; El Nikkor, 50mm, 2.8 enlarging lens, $75. Susan, Ext. 7647.

Miscellaneous

AIRLINE TICKETS - 2, Islip-Ft. Lauderdale, round-trip, 9/5-12, $125/ea. Toni, 821-0379.

AIRLINE TICKETS - 2, Tampa, FL, round-trip, 9/3-13, USAir, $157/ea. Ripp, Ext. 4672.

CAR SEAT - Fisher Price, like new, $30. Steve, Ext. 2897.

CURLERS - electric, used once, $15; professional gold-tip curling iron, $10; Walkman, $5; 2 bookholders, $1. Angela, Ext. 7321.

FOOT MASSAGER - Acuvibe from Sharper Image, like new, orig. $220, sell for $90. 586-7402 after 6 p.m.

LUGGAGE - suiter, burgundy, $5; refrigerator, 1.4 cu. ft., dorm-size, excel. cond., $90. Pat, Ext. 3807.

TENNIS TRIP TICKETS - 2, U.S. Open bus trip, 9/8, $40/ea. incl. all. Ext. 2345.

TOYS & BOOKS - games, developmental toys. Miriam, 744-5023.

Free

DOG - 8 mo. old, neutered female, has all shots, needs loving home. Kelly, 563-6062.

Yard & Garage Sales

PATCHOGUE - 8/28-29, 8 a.m. to 4 p.m., many antiques, furn., books, china, everything must go, 17 Maiden La. 289-1674.

PATCHOGUE - 8/29-30, 9 a.m.-3 p.m., multi-family, housewares, furn., tires, more, 245 Carman St., south of Main St.

ROCKY POINT - 8/29, rain date 8/30, 10 a.m.-3 p.m., household, toy & baby's items, 41 Tarpon Rd., north of McCarrick's Dairy.

SHIRLEY - Sat.-Sun., 8/29-30, rain or shine, furn., area rugs, household items, appliances, more, 479 Revilo Ave.

Lost & Found

FOUND - magnetic key case & key at the pond on Weaver Dr. Ext. 2296

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed, sex or national origin of the applicant.

For Rent

CENTER MORICHES - prof. offices, near rr, parking avail., priv. ent., reas., ac, approx. 1500 sq. ft., can be divided, furnishings, immediate occup. Angela, 878-0526.

CORAM - own room in priv. home, $350/single, $550/huge master bdrm. w/priv. bath. Ext. 7897 or 331-0807.

LAKE RONKONKOMA - 3 lg. rooms, eik, l/r, bdrm., bath, own thermostat, w/w, cable, priv. ent., ½ mi. LIE Exit 60, 1 mi. LIRR, 20 min. BNL, $700/mo. all, 1 mo. sec. 588-2477 after 5:30 p.m.

MEDFORD - 1-bdrm. apt., l/r, kit., tile bath, priv. ent., sep. thermostat, cable & util. incl., 12 min. to Lab, avail. end Sept. Betty, 758-2653.

MEDFORD - new 1-bdrm. apt., l/r, kit., full bath, cable, priv. ent., single nonsmoker, no pets,, $600/mo. incl. all, 1 mo. sec., avail. 9/1. 475-0373.

MIDDLE ISLAND - share townhouse, master bdrm., walk-in closet, furn., pool, tennis, cable, $430/all. Ext. 3160 or 289-5704 after 5 p.m.

MILLER PLACE - new, furn. studio, full bath, kit., priv. ent., deck, no pets,, nonsmoker, mature single, refs., sec., $475/mo. + ⅓ elec. 473-6950.

N. SHIRLEY - 1-bdrm. apt., full bath, lg. kit., lg. l/r, priv. ent., first floor in new hi-ranch, $650/mo. incl. all 399-3950.

RIDGE - 2-bdrm. condo, 1½ baths, l/r, d/r, kit., w/w, w/d, 5 min. from BNL, $750/mo. Kathy, Ext. 2267 or 395-6520 after 6 p.m.

RIDGE - small house w/big yard, 5 min. to Lab. Mary, 924-3104.

RIDGE - furn. apt., priv. ent., yard, deck, w/w, all appl., util., cable, 3 mi. to Lab, $625/mo., 1 mo., sec., avail. 9/1. 924-0577.

SELDEN - studio apt., priv. ent., kit., close to shops, $550/mo. incl. util., 1 mo. sec., immed, occup. 689-1539.

SHIRLEY - 2½ rm. apt., employed nonsmoker only, priv. ent., driveway, 10 min. to Lab, $450/mo. 281-6263.

SOUTHHOLD - 3-bdrm. ranch, 2½ baths, 1 acre waterfront, unfurn., 1 fam. only, no pets, 10/1 occup., $1,175/mo. + 2 mo. sec. Dan or Mara, 821-0469 day or evening.

SINGER ISLAND, FL - 2-bdrm. furn apt., 2 baths, on ocean, pool, near W. Palm Beach airport, near PGA golf course, 1 mo. minimum. Joyce or Paul, 289-5770 after 6 p.m.

MT. DESERT ISLAND, MAINE - lakefront, full furn. 1 rm. cottage w/sleeping loft, kitchenette, bath, fp, deck on Echo Lake, Acadia Nat. Park, to 10/15, $425/wk. Bob, Ext. 2514.

HILTON HEAD ISLAND, SC - 2-bdrm. condo, sleeps 6, fully furn., 2 baths, pool, beach, golf nearby, through Sept., $450/wk for BNLers & family. Guy, Ext. 3147 or 689-5378.

MT. HOLLY, VT - 2½-bdrm. A-frame, fully furn., kit., bath, wood stove, deck, 10 min. to Okemo Mt., near lakes, boating, hiking, horseback riding, $225/wknds., $325/wk. Tom, Ext. 2823.

For Sale

BELLPORT - 3-bdrm. ranch, l/r w/fp, d/r, bath, full bsmt., deck, 3-car gar., shy ½ acre, SCSD, city water, near village & dock, ask. $145,000. Maryann, Ext. 5241 or 286-3377 after 7 p.m.

BELLPORT VILLAGE - house near golf & tennis, French doors, decks, outdoor Jacuzzi, 2-bdrm. w/sleeping loft, 2 full baths, ⅔ acre, s. of S. Country, $248,000. Sue, Ext. 2888 or 286-0422.

CENTER MORICHES - 0.6 acre bldg. lot close to town $49,000. 878-8847.

CORAM - 2-bdrm. townhouse, 2 full baths, gar., eik, d/r, l/r, fp, cac, cul-de-sac, all appl., skylights, rec. hall, etc., $149,000. A. Romano, Ext. 5024.

CORAM - Bretton Woods, 3-bdrm. townhouse, den, new appl., skylights, golf, tennis, 3 pools, bowling, $147,000. Peter, Ext. 3535.

CORAM - n. of Rt. 83, mint, 4-bdrm. contemp. Colonial, l/r, d/r, fam. rm., fp, fin. bsmt. w/night-club, 2-car gar., ⅓ acre, $134,900. Ext. 7897 or 331-0807.

EAST MARION - 1-acre bldg. lot, adjacent to green belt, walk to Sound. 325-0447.

E. PATCHOGUE - 1 bdrm., bath, eik, l/r, util. rm., detached gar., $80,000. 475-7241.

HAMPTON BAYS - 2-bdrm., 1-bath, pool, gym, track, tennis, $84,000. Pam, Ext. 7286 or 581-7656 after 5 p.m.

HAMPTON BAYS - 1985 Polaron Solar mobile home, 14'x56', 2-bdrm., 1 bath, 2 decks, w/d, d/w, new carpets, eik, br/ac, fam. park, park rent $245, $30,000. 722-5910.

HOLTSVILLE - 2-bdrm. ranch, l/r, d/r, big kit., fp, pool, fenced backyard, low taxes, 15 min. BNL, $97,900. 289-1732 after 6 p.m.

MANORVILLE - 3-bdrm. house, 2½ + acres, lg. kit., lg. l/r, d/r, laundry rm., many cabinets, closets, 30' carport, 2 gar., storage sheds, 260'x450' landscaped, $160,000 firm. 878-6637.

MASTIC - 3-bdrm. hi-ranch, 1½ baths, l/r, d/r, kit., fam. rm., Florida rm., bsmt., gar. w/elec. opener, 2 acs, shed, fenced, extras, $140,000. Joan, Ext. 2549 or 281-3797 eves.

MIDDLE ISLAND - Fairview at Artist Lake, 2-bdrm. condo, 1½ baths, cac, French doors, w/w, GE appl., upgrades, pool, clubhouse, 5 min. from Lab, $77,000. Mark, 924-1561.

MIDDLE ISLAND - Coventry Manor, 3-bdrm. townhouse, 2 full baths, l/r, d/r, kit., laun. rm., cac, 5 appl., encl. patio, clubhouse, etc., ask $95,000. Rosalie, Ext. 3160 or 289-5704 after 5 p.m.

MIDDLE ISLAND - Lake Pointe at Artist Lake, upper 1-bdrm. coop, deck, cac, w/d, pool, clubhouse, etc., $59,990 neg. Bill, 924-1346.

MIDDLE ISLAND - 4-bdrm. Colonial, ½ acre, lg. kit., d/r, den w/fp, bsmt., 2-car gar., $139,000, 10 min. to Lab. Susan Dwyer, Ext. 3496 or 924-2722.

MT. SINAI - 3-bdrm. ranch, 1½ baths, ½+ acre, gar., lg. bsmt., low taxes, excel. school dist., near shopping, $136,000. Mark, Ext. 3783 or 331-6473.

N. SHIRLEY - 3-bdrm. ranch, ⅓+ acre, fenced yard, new boiler, HW heater, windows. renovated contemp. kit., bsmt., igs, by Southaven Park, extras, $114,000. Jim, Ext. 2957 or 281-4541.

PORT JEFFERSON STATION - 3-bdrm. ranch, ⅓ acre, lg. l/r, d/r, eik & den, full fin. bsmt., multi-level deck to agp, new bath, windows, carpeting, $147,500 neg. George, 474-2247.

PORT JEFF VILLAGE - ranch, Harbor Hills, 4 bdrm., eik, d/r, l/r w/fp, den, 2 baths, cul-de-sac, secluded yard, beach, country club, low taxes, $172,000. 928-0516.

RIDGE - 4-brm. custom, 2½ baths, l/r, fam. rm., d/r, lg. kit., full bsmt., oak floors, Andersen windows, detached gar., 1.35 acre, quiet area, 16 yrs. old, extras, $175,000. 924-3476 after 6 p.m.

RIDGE - Leisure Knoll Adult Community, 1-bdrm. duplex, cac, all appl., very close to pool, clubhouse, etc., $57,000, immed. occup. Ted, Ext 4589 or 475-8581 eves.

ROCKY POINT - 4-bdrm. Colonial, 2½ baths, gas heat, cac, l/r, d/r, eik, den,. fin. bsmt., gar., low taxes, ask. $142,990. Don, Ext. 7237 or 744-2921 after 5 p.m.

SELDEN/CORAM - 1-bdrm. co-op, 15 min. to Lab, l/r, d/r, eik, new cac, gas heat, pool, avail. Nov., tax advantages, no down payment if necessary, $52,000. Frank, Ext. 3144 or 698-5046 eves.

WADING RIVER - priv. beach comm., 3-bdrm. ranch, 1½ baths, eik, all appl., fd/r ac, treed, ½ acre, bsmt., lg. shed, county water, $128,000. Saxon, 929-4701.

WADING RIVER - on beach, 10 rm. year-round house, 5 bdrm., 2 baths, d/r, l/r w/fp, upper/lower decks, full bsmt. w/apt. w/sep. ent., incl. adj. lot, SWRSD, $259,000. Kathy, 929-8443.

YAPHANK - Whispering Pines, 3-bdrm. condo, 2½ baths, eik, d/r l/r, fin. bsmt., gar., new w/w, fp, 5 appl., immac., pools, tennis, 5 min. to Lab, red. to $109,900. J. Bennett, Ext. 5406.

YAPHANK - Colonial Woods, 2-bdrm. condo, 5 min. to Lab, 1½ baths, fin. bsmt., wet bar, pool, tennis, rec. facilities, $99,000. Monica, 924-3846.

ITHACA, NY - 5 min. to Cornell Univ., 2-bdrm. mobile home, 2 baths, quiet park, $400/mo. incl. mort., util. & lot rent. Dave, Ext. 2686.

Wanted

BABY'S ITEMS - highchair, playpen, umbrella sttroller, backpack, excel. cond., safety-apprioved only. Paul, 286-7127.

BICYCLE - 16" girl's bike. 744-5023.

BOWLERS - for Tue. night men's league 6-9 p.m., in Port Jeff. Nick, Ext. 2461.

GARAGE - near Lab to house 19'x2'x1.5' sea kayak, too big for my apt., name your price. Jim, Ext. 5160.

HEATH CONSTRUCTION MANUALS - for Model MI2900 & MI2901 depth indicators, need calib. procedure parts list & schematics. Ed, Ext. 4561.

PAINTER - paint older 26' sailboat at my home, perfection not necessary, exp. required, looking for good price. Mike, Ext. 5972 or 744-4579.

PIGEONS - excess birds, nuisance birds, any birds, will come trap if necessary. Scott, Ext. 5320 or 929-4563.

POP-UP CAMPER - trailer, any size, reasonable price. 878-4285.

RECORDS - rock & roll, polka, LPs or 45 rpm, don't throw them away, call Frank. Ext. 3120.

SCUBA DIVERS - winter dive trips, small or large groups. John Toner, 543-7065.

SEWING MACHINE - merrow, in good cond., also craft fabrics reas. priced. Corinne, Ext. 3662.

TIRES - good cond., P205/758-14 or F78-14. Susan, Ext. 7647.

WINTER POOL COVER - for 18' round pool. Bob, Ext. 7238.

Classified Ad deadline is 4:30 p.m. Friday for publication Friday of the next week.