

BNL Devices Earn R&D 100 Awards As Three of the Year's Most Significant Inventions

Though the name of the contest has changed — from I-R 100 to R&D 100 — the 26-year-old competition sponsored by *Research & Development* magazine is the same: The contest still recognizes the 100 most significant inventions of the year. And BNL devices are once again among the winners.

At the R&D 100 awards dinner last night in Chicago, three BNL devices earned three of the year's R&D 100 awards. This ups Brookhaven's total to 12 winners since the Lab's first award in 1969 (see box).

R&D 100 awards recognize innovators and organizations for outstanding technical developments that are practical, and they identify the year's significant technical advances.

Winning R&D 100 awards for BNL are:

- a zinc-phosphate coating system

Zinc-Phosphate Coating System

Designed to reduce corrosion of steel surfaces, the patented zinc-phosphate coating system was developed by Associate Chemist Toshifumi Sugama, Chemical Engineer Lawrence Kukacka and Chemistry Associate Neal Carciello, all of the Department of Applied Science.

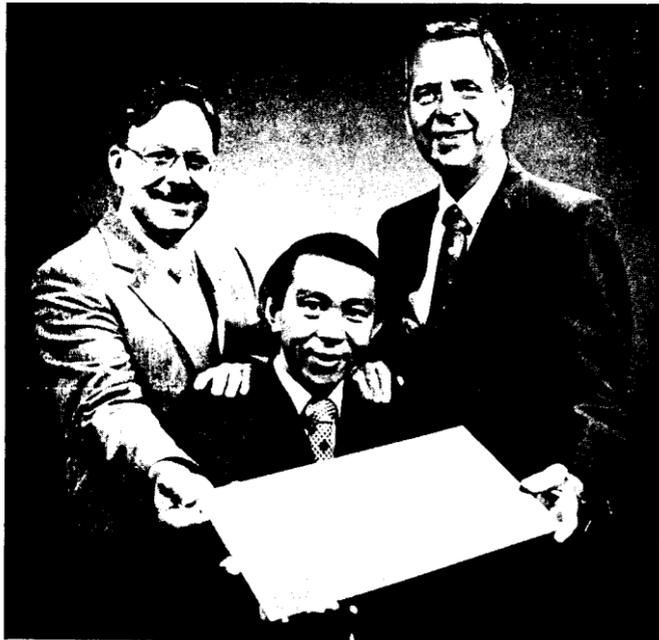
In the United States and other industrialized nations, the annual cost of corrosion is estimated to be 2 to 3 percent of the country's gross national product. Thus, by decreasing both corrosion and the cost of corrosion resistance, industrialized countries can save significantly.

BNL's zinc-phosphate coating system increases the corrosion resistance of materials, while costing less than other corrosion-resistance methods.

The system uses a water solution of



Working with the collimated x-ray microprobe/microscope are some of its developers: (from left) Mark Rivers, Albert Hanson, Stephen Sutton, Barry Gordon and Keith Jones. Not pictured are Joel Pounds and Joseph Smith.



Displaying their patented zinc-phosphate coating system are (from left) Neal Carciello, Toshifumi Sugama and Lawrence Kukacka.

—photos
by Roger Stoutenburgh

that greatly reduces corrosion of steel surfaces,

- an instrument for measuring magnetic fields in magnets for particle accelerators, and
- an x-ray microprobe/microscope that can determine the specific chemical compositions of geological and biological samples.

three chemicals to deposit a dense, flexible and adherent zinc-phosphate crystal coating of a controlled particle size and shape on either low- or high-carbon steel. An organic polymer makes the coating highly corrosion resistant, ductile and able to bond to paint or polymer topcoats as well.

Brookhaven's material can be used to protect industrial equipment and consumer goods, such as vehicle bodies, appliances and ships, as well as military hardware, such as tanks and artillery shells.

Instrument to Measure Magnetic Fields

Brookhaven Lab's second 1988 R&D 100 winner is an instrument that can

analyze the magnetic field strength of particle accelerator magnets. It is called a "mole" because it burrows through the center of a magnet.

The mole was developed by Project Engineers John Skaritka and George Ganetis, both of the Accelerator Development Department.

The mole is made of miniaturized pneumatic motors and rotary components, a gravity sensor, a miniature encoder assembly and a coil assembly roughly three-foot-long. To operate in a high magnetic field, the mole's parts are made of nonmagnetic metals and composite plastics. It also boasts the first use of precision ceramic ball bearings in the motors and coil assembly.

To measure the characteristics of a field, the mole is pulled through a magnet and stops approximately every three feet. The field of each magnet must be analyzed at room temperature. A statistical sampling of magnets must be measured at their operating temperature of 4.5 kelvins (about -450°F) and a magnetic field of 6.6 teslas.

The device is being used to make measurements of prototype magnets for the proposed national Superconducting Super Collider (SSC) and for BNL's proposed Relativistic Heavy Ion Collider (RHIC).

In the completed SSC, for example, the majority of its superconducting magnets will be 60-foot-long dipoles. Since the diameter of these magnets'

center apertures will be only about 1.25 inches, a series of industrial moles would be the only practical way to perform quality control measurements of the magnetic fields during their production.

Future versions of the mole may be self-propelled, so that it can go by itself through many consecutive magnets of an existing accelerator.

X-Ray Microprobe/Microscope

The collimated x-ray microprobe/microscope (CXRM) is a unique analytical instrument for determining the specific chemical compositions of materials. It can measure the concentrations and spatial distributions of trace amounts of elements from silicon to uranium with excellent spatial resolution and sensitivity.

CXRM developers are BNL's Senior Physicist Keith Jones, Chemist Barry

(Continued on page 2)

Coming Up

Leslie Fishbone, a scientist with the Technical Support Organization in the Department of Nuclear Energy, will deliver the first Brookhaven Lecture of the 1988-89 series on Wednesday, September 28, at 4:30 p.m., in Berkner Hall. He will speak about "International Safeguards — Accounting for Nuclear Materials."

Nobel laureate Max Perutz, the creator and first head of the Laboratory of Molecular Biology at the Medical Research Council in Great Britain, will return to BNL next month for his second stay as the Laboratory's third Haworth Distinguished Scientist. On Tuesday, October 4, at 4:30 p.m., he will deliver a Lab-wide lecture in Berkner Hall, entitled "Determining the Atomic Structure of Living Matter: What Use to Medicine?" A wine-and-cheese reception will follow.



With John Skaritka (third from left) and George Ganetis (third from right), the developers of the mole that lies before them, are: (from left) David Cattaneo, Chris Harbach, Daniel Sullivan, Paul Ribaldo, Al Viotto and Louis Russo.

Past BNL Winners

Since 1984, BNL has renewed its interest in sponsoring entries in the annual competition sponsored by *Research & Development* magazine, as a result of the efforts of the Office of Research & Technology Applications, headed by William Marcuse. Here is a list of previous BNL winners:

1987

Ady Herscovitch — probe to measure ion temperature and density in plasma devices.

John Sutherland — electronic imaging system for studying DNA.

Lucien Wielopolski — x-ray device for measuring lead in preschool children.

1986

Dimitri Stephani — triple hybrid pre-amplifier.

Suresh Srivastava — medical kit for labeling human red blood cells with technetium-99m.

1985

Richard Lambrecht — ocular radioactivity monitor.

Dimitri Stephani — trio of electronic preamplifiers.

1984

Richard Lambrecht — radiopharmaceutical delivery system.

1969

Meyer Steinberg — concrete polymer composite material.



Week nine of the Team Safety program* is gone, and there's good news and bad news.

The bad news is that the Plant Engineering Refrigeration & Air Conditioning Team was two weeks from a pennant when an ankle injury sent them to the lockers. Several days lost time resulted, but they're back on the field, hoping for a comeback, with a new goal of November 23.

The good news is that last week was again perfect for all other teams. Just a few more accident-free days and six more teams head for the winners' circle. Supply and Material teams still are all perfect, and Plant Engineering has



The Plant Engineering Grounds & Roads team: (front, kneeling, from left) Joe Lopez, Bob Metz, Roads & Masonry Supervisor Bud Hulse, Skip Anderson, Phil Sgro, Bob Medina, Antonio McGill and Larry Jones; (middle row, from left) Gary Stoner, Jack Kulesa, Tom Crews, General Supervisor Roy Barone, Jeff Mirando, Howard Bell, Bernard Jasper, Joe Tullo, (on the tractor) Felix Thompson, Mel Bonanno, Dollie Johnson, Bob Callister, Keith Detmer, Jerry Hobson, Grounds Supervisor Tage Carlsson, and Superintendent of Site Maintenance & Services Roy McWilliams; (extreme back, from left) Paul Williams and Frank Gaetan. Missing are Ollie Booker, Earl Dickerson, Hubbard Harris, Clarence Hicks, Lonnie Muldrow, Greg Thompson, John Turner and Frank Zambriski.

two contenders. Central Shops is still in the field with two team winners slated for the 26th. Hang in there, teams!

Word on the field is that the Commissioner is thinking of getting some leftover hats from Seoul. The backorder has still not reached the ballfield, and some players will have to be out of uniform for a few more days.

Keep playing it safe!

**Twenty-five teams are participating in the Lab's Team Safety Program. As a team reaches its time goals without incurring any lost-time injuries, team members are being rewarded for their safe practices with a pizza or deli luncheon. Time goals range from eight to 12 weeks, depending on the team's previous lost-time frequency.*

Team Mix-Up

As the Commissioner ruled that teams cannot trade places, the Bulletin apologizes for the transposition of the pictures of the Grounds & Roads team and the Heavy Equipment Shop in last week's story on the first Team Safety winners. The Mets and the Yankees wouldn't like to be confused either, so here are the official team portraits and their rosters again — in proper order this time.



The Plant Engineering Heavy Equipment Shop team: (front, from left) Charlie Botts, Heavy Equipment Shop Supervisor John Niemczyk, John Schuller, John Braband, Kerry Botts, John Popielaski, Ray Patuano, George Wunderlich, Jimmy Durham and Richard Kayte; (aloft, from left) Ralph Giordano and Mike Curtis. Missing are Oscar Mirjah and Bill Sassano.

Patent Awarded

Pavel Rehak, Physics Department, and Emilio Gatti, consultant to the Physics Department and professor of Physics at Politecnico di Milano, Italy, have been awarded U.S. Patent No. 4,688,067 for inventing three semiconductor detectors for particle physics experiments based on a new concept.

The three new detectors are: first, a semiconductive drift detector; second, a charge-coupled device that is fully depleted, that is, all extraneous mobile charges have been swept away; and third, an ultralow capacitance, large-area semiconductor x-ray spectrometer and photodiode.

The concept employed in each of these detectors makes use of the fact that charged particles release electrons and holes when they cross a semiconductor. In the new process, an electrode structure on the surface of each detector fully depletes its semiconductor and provides the transport for the released electrons from their point of creation to an anode where their position is sensed.

The advantages of this invention over previous particle detectors of similar type are that there is significantly higher resolution in sensing particle position, while at the same time, substantially fewer readout channels are needed to reach these better results.

To Your Health

"Talking to Your Kids About AIDS" is the topic to be discussed by Joseph Rukeyser at the next Health Promotion Seminar. Rukeyser is the Associate Director of the AIDS Education Project at the School of Allied Health Professions, State University of New York at Stony Brook. He will speak on Tuesday, September 27, from noon to 1 p.m., in Berkner Hall.

Public Auction Of Motor Vehicles

Thirty-seven motor vehicles, located at Warehouse T-87, will be available for public auction on Thursday, September 29, at 10:30 a.m., at Berkner Hall.

Inspection will be permitted on Wednesday, September 28, from 9 a.m. to 4:30 p.m. Listings should be available at that time for those interested in bidding on a vehicle. The public auction will be conducted by the General Services Administration.

For more information, call Ext. 2977.

IBEW Meeting

Local 2230 IBEW will hold its regular monthly meeting on Monday, September 26, at 6 p.m., in the Knights of Columbus Hall, Railroad Avenue, Patchogue. On the agenda will be regular business, committee reports and the president's report. All group stewards must be present.

Arrivals & Departures

Arrivals

Peter S. Klieger..... Medical
Georgia P. Schwender..... P&G
Seppo E. Valkealahti..... DAS
Emil P. Zitvogel..... Accel. Dev.

Departures

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

Stephen H. Bryant..... Chemistry
Andrew M. Matheson..... Physics
James. J.F. McAndrew..... Chemistry
Yosepha Shahak..... Biology
Asher F. Shor..... Physics
Daniel J. Spandau..... DAS

R&D 100 Awards (Cont'd)

Gordon, Physicist Albert Hanson and Scientist Joel Pounds, all of the Department of Applied Science, in collaboration with Mark Rivers, Stephen Sutton and Joseph Smith, of the University of Chicago.

The instrument uses the technique of x-ray fluorescence to identify each element. In an improvement over the basic technique, however, the specimen is excited with an intense, collimated beam of continuous energy x-rays produced by BNL's National Synchrotron Light Source (NSLS). The NSLS produces more x-rays per unit area per second than any other x-ray source.

CXRM can be used in geological and metallurgical studies to determine and map elemental distributions in heterogeneous samples. For biological research, CXRM can be used to measure the elemental concentrations in living cells and tissue as well.

AMD Courses

CAD Training

The CAD/CAM group in the Applied Mathematics Department (AMD) is offering AutoCad training on a regular basis. Those interested should call Chris Neuberger, Ext. 4160, or Ted Daniels, Ext. 5555.

Introduction to UNIX

The Central Scientific Computing Facility has scheduled an Introduction to UNIX course to be given by AMD's David Stampf in four 2-hour sessions, on Tuesdays and Fridays, September 27 through October 7. Each session will run from 10 a.m. to noon, in the AMD Seminar Room, second floor, Bldg. 515.

One of the fastest-spreading operating systems, UNIX has been installed

on many machines, including micros, minis and mainframes, and emulated by a number of look-alike systems. Course topics will include basics, editors, communications, filters, shell programming and the file system. No prior knowledge of UNIX is required.

For more information or to register, call Ronald Wittlock, Ext. 4112.

On Site

Over the next few months, ongoing work to supply cooling water from the Chilled Water Facility, now under construction on Rochester Street, to other Laboratory buildings will necessitate some road closings. Next week, the following roads may be affected:

- Bell Avenue, at the Rochester Street intersection.
- the network of roads behind the Biology and Medical buildings.

DuPont Speaks on Safety — BNL Listens



E.I. DuPont de Nemours & Company has a safety record 30 times better than the chemical industry average — and 90 times better than the general industrial average. So, when DuPont representatives Roy Saunders (standing, right) and Louis DeFanti spoke on safety management at BNL, 25 BNL first- and second-line supervisors listened.

At the invitation of BNL's Safety & Environmental Protection Division (S&EP), the two DuPont

safety trainers worked with 16 supervisors from Plant Engineering, four from Central Shops and five from S&EP on Wednesday and Thursday, September 14-15. Through role playing, working groups and other interactive techniques, the supervisors practiced what they will be again preaching to those who work under and above them: No job can be well done unless it is done safely.

—photo by Roger Stoutenburgh

Reports Available

The following reports are now available to the Laboratory staff and to affiliates of the DOE, AUI and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Dept. of Commerce, 5285 Port Royal Rd., Springfield, VA 22161. Staff members should call the designated contact the extension listed.

BNL-52054

Contact: L. Kukacka, Ext. 3065
Tapping the Earth's Geothermal Resources — Hydrothermal Today, Magma Tomorrow. Brookhaven Lecture #230. L.E. Kukacka.

NUREG/CR-2331

BNL-NUREG-51454

Vol. 7 #1

Contact: A. Weiss, Ext. 4473
Safety Research Programs Sponsored by Office of Nuclear Regulatory Research. Quarterly Progress Report Jan. 1-Mar.31, 1987. A.J. Weiss et al.

NUREG/CR-2907

BNL-NUREG-51581

Vol. 5

Contact: J.Tichler, Ext. 3801
Radioactive Materials Released From Nuclear Power Plants. Annual Report 1984. J.Tichler et al.

BNL-52105

Contact: F. Donnelly, Ext. 4835
Thermal Distribution Program Plan. Part I: Forced-Air Distribution Systems in Residential and Small Commercial Buildings. Part II: Hydronic and Radiant Heating and Cooling Systems. J.W. Andrews.

NUREG/CR-2907

BNL/NUREG-51581 V.6

Contact: J. Tichler, Ext. 3801.
Radioactive Materials Released From Nuclear Power Plants. Annual Report 1985. J. Tichler et al.

NUREG/CR-4659

BNL-NUREG-52007 V.2

Contact: B. Apuzzo, Ext. 2746
Seismic Fragility of Nuclear Power Plant Components (Phase II). Motor Control Center, Switchboard, Panelboard and Power Supply. K.K. Bandyopadhyay et al.

NUREG/CR-4784

BNL-NUREG-52039

Contact: B. Apuzzo, Ext. 2746
Influence of Ground Water on Soil-Structure Interaction. C.J. Costantino et al.

NUREG/CR-5164

BNL-NUREG-52153

Contact: L. Seymore, Ext. 2276
A Simplified Model for Calculating Early Offsite Consequences from Nuclear Reactor Accidents. I.K. Madni et al.

NUREG/CR-5200

BNL-NUREG-52024

Contact: J. Danko, Ext. 7125
Evaluation of Risks Associated with AOT and STI Requirements at the AND-1 Nuclear Power Plant. P.K. Samanta et al.

ANS Meeting

The September meeting of the Long Island Section of the American Nuclear Society (ANS) will take place on Tuesday, September 27, at the Bavarian Inn, Lake Ronkonkoma. Walter Kato, Chairman of BNL's Department of Nuclear Energy, will introduce the speaker, William Museler, who is LILCO's Vice President-Electric Operations. His talk on "Long Island Power Supply Crisis or LILCO Dodge: Another Bullet in 1988" will begin at 8 p.m.

For information about dinner reservations, call Lydia Ryan, Ext. 2380.

Making Traffic Signs Safer By Cutting Corners

Joseph Modjeska, an Office Machine Repair Mechanic in the Supply & Materiel Division, earned \$25 from the Employee Suggestion Program (ESP) for pointing out that the sharp corners of the Lab's traffic signs are a safety hazard — to pedestrians. Because of his suggestion, as existing signs need replacing, new signs with rounded corners will be posted in their place.

ESP welcomes your suggestions, and those who submit new ideas will receive an ESP mug as a thank-you. To suggest an improvement, obtain an ESP form from the Personnel Division, Ext. 4262, Bldg. 185.



Joseph Modjeska

Roger Stoutenburgh

Touch Football

The Touch Football League is looking for players. Anyone interested in joining the league can contact John Blydenburgh, Ext. 2310, or Wayne Rambo, Ext. 7749, for more information.

Adult Swim Lessons

BERA is again offering a series of eight swimming lessons for adults, after work on Tuesdays, 5:15-6:30 p.m., starting September 27 and continuing through mid-November. The fee is \$20, and paid registrations will be accepted at the swimming pool.

Softball

Election of officers for the Softball League will take place at the softball captains' meeting scheduled for next Friday, September 30, at noon, in Room B, Berkner Hall.

Archery Club

If you are looking for a sport that you can take up now and be in shape for by the 1992 Olympics, consider archery — Denise Parker, the youngest U.S. Olympian ever to compete in the games, mastered the sport in four years, so maybe you can too. Regardless of your aim, join the newly reorganized Archery Club, which is planning to revitalize the inactive archery range. For information, call Louis Cannizzo or Ken Robins, Ext. 4220.

English Courses Offered on Site

English as a Second Language classes will again be available to Laboratory employees, spouses and guests, beginning Monday, October 3. The free classes will be held every Monday evening, from 7 to 9:30 p.m., in the Personnel Training Room, Bldg. 459. For more information, call Pat Knisely, Ext. 7631.

Safety Shoes

The on-site safety shoe representative will be on vacation the week of October 3. Normal hours will resume October 10.

Dispose of Waste Motor Oil on Site

Even if you change your car's motor oil yourself, the Friendly Gulf Service Station on Technology Street will allow you to dispose of your waste motor oils properly — in the station's waste-oil holding tank.

Under New York State law, all gas stations must permit public access to their waste-oil holding tanks. Friendly Gulf requests, however, that employees bring their waste oil during daytime working hours only and that they not leave their waste-oil containers at the station. Waste oils can also be disposed of properly at the Brookhaven Town and other towns' landfills.

Camera Club

If you have taken a photograph worth hanging in a gallery, the Camera Club now has the place for you to display it — in Berkner Hall. The wall facing the main entrance to Berkner has become the Camera Club's gallery. It is the Club's hope that the rotating exhibit of photographs will enhance the walk to the Cafeteria, as well as give employee photographers another reason for putting so much time, effort and money into their hobby.

To submit photographs to be considered for hanging in the Camera Club's gallery, call Ripp Bowman, Ext. 4672, or Lew Jacobson, Ext. 5193, for information. The next Club meeting is Thursday, September 22, at 5:30 p.m., in the Recreation Building.

Bowling

Red/Green League

R. Mulderig rolled a 228, E. Meier 214, C. Bohnenblusch 211, T. Prach 208, N. Parrinello 204, G. Meinken 203, L. Musso 203, W. Kristiansen 202, J. Morris 201.

Pink League

High games were bowled by Maryann Reynolds 202, Andrea Eppele 187, Renie Rosati 182; Alice Costantini converted the 4/7/10 split.

White League

Sharon Smith had a 202, Joyce Pinelli 181.

Purple League

Ed Beadle rolled a 243.

Bowlers are still needed for the Pink League in Port Jeff on Tuesday. Call Maryann Reynolds, Ext. 5241.

Cafeteria Menu

Week of September 26

Monday, September 26

Beef noodle soup	(cup)	.75
	(bowl)	.95
Chicken pot pie w/biscuit		3.10
Swedish meatballs over rice		3.00
Skinless baked chicken & 1 veg.		
(lite-line)		3.10
Hot deli: Baked ham	(bread or roll)	2.85
	(hero)	2.95

Tuesday, September 27

Manhattan clam chowder	(cup)	.75
	(bowl)	.95
Beef shortribs Madeira & 1 veg.		3.10
Pork Polynesian over rice		3.10
Baked fish & 1 veg. (lite-line)		3.10
Hot deli: Roast beef	(bread or roll)	2.85
	(hero)	2.95

Wednesday, September 28

Minestrone	(cup)	.75
	(bowl)	.95
Chicken breast supreme		3.10
Spinach lasagna		3.10
Cottage cheese & fruit plate (lite-line)		2.00
Hot deli: Turkey breast	(bread or roll)	2.85
	(hero)	2.95

Thursday, September 29

Navy bean soup	(cup)	.75
	(bowl)	.95
Beef stew over noodles		2.95
Batter-dipped fish & french fries		3.10
Baked potato bar w/all the fixings		1.50
Plain baked potato stuffed w/broccoli (lite-line)		1.25
Hot deli: Sloppy Joe sandwich		2.85

Friday, September 30

Chicken rice soup	(cup)	.75
	(bowl)	.95
Stir-fry beef Oriental		2.95
Turkey & broccoli divan		3.10
Baked fish w/potato & 1 veg. (lite-line)		3.10
Hot deli: Corned beef	(bread or roll)	2.85
	(hero)	2.95

Scoop of the Week



The end of summer meant the end of this year's Scoop of the Week contest — but not the end of the hot tips that have piled up at the Bulletin office. As summer is only so long and the Bulletin only so big, we will be following

up on leftover summer scoops this fall.

So as not to shortchange the tipsters whose good ideas for news and features have yet to metamorphose into published Bulletin stories but will, we are awarding the last scoops of the summer to: Ron Dobert, Department of Nuclear Energy; Lynette Finlay, National Synchrotron Light Source Department; Gerhart Friedlander, Chemistry Department; John McNeil, Department of Applied Science; Ted Teichmann, Department of Nuclear Energy; and Lorraine Barry, Patricia Manzella and Bonnie Miller, all of the Personnel Division.

And, we award a final Scoop of the Week to Ollie Booker, Plant Engineering, for his poetry that inspired the above jingle.

As they scooped the Bulletin's informed sources with ideas that are suitable to be written up for publication, each of the six will receive an official certificate, suitable for framing or redeemable anytime at the Cafeteria for a scoop of frozen, soft-serve yogurt.

Though we trade hot tips for cold scoops of frozen yogurt only during the summer, the Bulletin welcomes tips for news and features all year round. Send your ideas to the Brookhaven Bulletin, Bldg. 134, or call Ext. 5053.

BROOKHAVEN BULLETIN

Published weekly by the Public Affairs Office for the employees of BROOKHAVEN NATIONAL LABORATORY

ANITA COHEN, Editor
MARSHA BELFORD, Assistant Editor
LIZ SEUBERT, Reporter

35 Brookhaven Ave., Upton, N.Y. 11973
(516)282-2345

Equipment Demo

The products of Foxboro/Jordan will be on display in an exhibit van to be situated in the Berkner Hall parking lot on Tuesday, September 27, from 10 a.m. to 3 p.m.

Foxboro/Jordan produces rotary and linear actuators used for control of all types of valves, dampers and linkages associated with process and motion control, including actuators ranging from a few inch-pounds to thousands of foot-pounds. The newest valve actuator, which can be computer-interfaced for fail-safe or fail-in-place features, will be shown for the first time at BNL.

Also on display will be servo systems position-transmitters/encoders/resolvers, manual control stations and other devices used in automatic closed-loop control systems. A factory engineer will be present to answer questions and furnish application data.

Classified Advertisements

Placement Notices

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

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all non-scientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment.

Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Employment Manager, Ext. 2882.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

2950. **PLANNER/ESTIMATOR - ELECTRICAL** - With a minimum of supervision, performs detailed work analysis, job layout and material selection; develops labor and material estimates, in accordance with industry standards, for electrical repairs and maintenance. Works closely with line supervisors and general supervisors in technical planning, job layout and scheduling of work. Requires considerable trade experience, and proven ability equivalent to that of Craft Supervisor. Uses professional judgment in determining performance standards appropriate to each individual job. Plant Engineering Division.

2951. **TOOL AND INSTRUMENT MAKERS - 3 positions.** (One position is reposting of Job #2885). Central Shops Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2952. **HEALTH PHYSICS POSITION** - Requires a BS or MS in health physics or nuclear engineering. Will be responsible for gathering and analyzing data on the production, transportation, mitigation, dosimetry and biological effects of small radiological particles, such as produced in the primary systems or related systems of nuclear power plants. Department of Nuclear Energy.

2953. **PROGRAMMER** - Requires bachelor's degree in a pertinent discipline and two years' relevant experience in COBOL. Required experience includes programming on-line data-base business systems. Management Information Systems Division.

2954. **OFFICE SERVICES POSITION** - Requires excellent clerical skills, including accurate typing and demonstrated organizational abilities, as well as excellent communication skills. Responsibilities will include preparing paperwork for all new employees and guest appointments, maintaining and updating files, and processing terminations. Previous IBM PC experience desired. Personnel Division.

2955. **ELECTRICIAN** - Under minimum supervision, lays out, constructs, installs, maintains, repairs and operates systems, equipment, controls and related devices. Requires minimum of five years' industrial electrician experience. Plant Engineering Division.

Motor Vehicles & Supplies

86 CAMARO Z-28 - V8 TPI, bright blue, a/t, T-tops, a/c, loaded, 12k mi., \$10,500. Mike, Ext. 3277 or 874-2989.

86 AUDI 4000S - 4-dr. sedan, black, a/c, p/s, p/w, sunroof, alum. wheels, 5-sp., 55k mi., \$9,000 neg. Ken, 281-5565.

86 HONDA SCOOTER - \$550; Alpine car stereo, \$75. Panasonic car stereo, \$50; assorted tires, 12", 14" & 15". 585-6518. 8:30 a.m.-4:30 p.m.

85 NISSAN MAXIMA - wagon, fully loaded, 43k mi., excel. cond., \$9,000. 473-8426.

85 BMW 318i - 5-sp., black/cream, 21k mi., garaged, excel. cond., \$13,000. 472-9887 eves.

84 CHEVY S-10 - p/u, 2wd., 4-cyl., 51k mi., sport, \$3,500. Jay, Ext. 2172 or 751-0538.

84 DODGE 600 - convertible, all options, 45k mi., excel. cond., \$6,000. 473-6116 or (212) 285-0041.

83 RENAULT ALLIANCE - am/fm cass., 47k mi., runs well, excel. cond., \$1,350. Weber, 744-8655.

83 CAPRI - a/t, 4-cyl., a/c, am/fm cass., excel. cond., sacrifice. 475-6452 after 6 p.m.

83 TOYOTA COROLLA - wagon, 5-sp., roof rack, hitch, am/fm cass., 105k mi., mint. Sheryl, Ext. 5384 or 929-8741.

83 TOYOTA CELICA GT - liftback, a/t, cruise, a/c, p/s, p/b, 65k mi., clean. Witkover, Ext. 4607 or 368-0452.

83 CHEVY S-10 - 4-sp., very good cond., 325-0447 after 6 p.m.

83 VOLVO 760 GLE - turbo diesel, 5-sp., 86k mi., loaded, leather, moon roof, silver, excel. cond., \$7,900. 475-5430.

82 CHEVY CAVALIER - p/b, p/s, am/fm, a/c, asking \$800. 878-4214 after 6 p.m.

81 PLYMOUTH CHAMP - 2-dr., h/b, FWD 2.6L., 4-sp., new white paint, clutch, tires. Glenn, 737-3327.

81 HONDA ACCORD - 4-dr., 5-sp., p/s, p/b, stereo cass., excel. cond., \$2,495. 758-5659 eves.

80 CHEVETTE - 4-dr., h/b, 4 cyl., a/t, am/fm, good tires, orig. owner, good cond. Ext. 2055.

80 MUSTANG - 4-cyl., 5-sp., sun roof, bucket seats, new parts, needs water pump, runs well. Ext. 4194 or 924-1277.

79 FRANKLIN MOTOR HOME - 25', custom-built, on Dodge chassis, low miles, sleeps 6, many extras. 265-8093.

79 CHEVY NOVA - 6-cyl., a/t, sun roof, p/s, p/b, am/fm tape, good cond., \$875. Ext. 5235 or 821-6821.

79 TOYOTA CELICA GT - 5-sp., a/c, sun roof, am/fm stereo cass., high miles, excel. gas mileage, \$2,000 neg. 277-2067 after 6 p.m.

79 OLDS CUTLASS - a/c, p/s, p/b, needs trans., excel. body, \$1,200; 71 Chevy Impala, p/s, a/c, runs well. 928-0030 eves.

78 OLDS CUTLASS SUPREME - 8-cyl., fully equipped, new trans., excel. cond., orig. owner. Ext. 4449 or 751-8403 after 6 p.m.

78 FORD VAN - long bed, 65k mi., good engine. Ext. 2054 or 283-6409.

77 CADILLAC - blue, new battery, tires & more, 74k mi., like new, \$1,500. 473-5776.

76 DODGE COLT - 4-dr., good engine, \$300. Ext. 7990.

76 TOYOTA COROLLA - \$300. 744-5069.

76 TRIUMPH TR-7 - 4-sp., hard top, red/black Porche int., car cover, etc. 727-2861 after 5 p.m.

75 TOYOTA CELICA - new clutch, good tires, brakes, battery, etc., excel. cond., \$1,200. Ext. 2752 or 751-6571.

74 HONDA CB360 - rebuilt engine, new tires, crash bar, elec. start, very clean, \$550. Pete, Ext. 4100.

73 NOVA - 2-dr., h/b, m/t, \$200. 473-8426.

72 INTERNATIONAL TRUCK - 7'x7'x14" box, asking \$1,500. 435-0615 eves.

71 FORD TORINO - 2-dr., a/t, p/s, p/b, 76k mi., \$450. Pete, Ext. 2498.

71 CHEVY MINI MOTORHOME - 350 V8-a/t, p/b, cruise, stove, refrig., sleeps 6, asking \$4,000. Ron, Ext. 2467 or 924-8644.

70 DODGE - 56k mi., \$400. Ext. 2543.

67 AMC AMBASSADOR - 4-dr., p/s, no rust, 63k orig. mi., asking \$600. Ext. 4446 or 874-8631 after 5 p.m.

78 305 SMALL BLOCK CHEVY - all parts like new, whole or parts. Glenn, Ext. 3464 or 499-6341 eves.

FORD BACKHOE & BUCKET LOADER - Model 400 OHD, 1/2 yd. bucket, \$2,000. 862-6990, 10 a.m.-2:30 p.m.

TIRES - 4, B.F. Goodrich, all-terrain, 235-15 radials on Mitsubishi rims, new, \$200. Jeff, Ext. 4988 eves.

TIRE - Goodyear, 10-15 AT Tracker M.S., new, \$50. Tony, Ext. 2462.

UTILITY TRAILER - large tires, some rust, \$75. 744-9429.

BRAKE BLEEDER - \$150; tune-up center, \$250; power hydraulic jack, \$300; 5 h.p. electric motor, \$150. Posiden uni-suit, large, \$800. 744-3968.

RIMS - 14", 4-lug; 14", 5-lug. Ext. 2950.

Boats & Marine Supplies

29' ULRICHSON - wood, excel. cond., f.b. fwc, 327, runs well, sleeps 5, range/oven, elec. head, many extras, must see. 732-2754.

26' SEAFARER SAILBOAT - 1981, diesel, 3 sails, KM, DF, VHF, stove, sink, fresh water tank, 2 cabins, \$13,850. Ext. 4752 or 669-0549 after 6 p.m.

21' RENKEN - 1981, cuddly, I/O, no engine, \$750. 924-6761.

18' FIBERGLASS SLOOP - sleeps 2, outboard, trailer, 4 sails, electronics; Sunfish w/trailer. Ext. 7898 or 286-1533.

18' REGAL BOWRIDER - 1977, Deep V, excel. cond., \$2,900 or best offer. 924-6761.

17' SPORTCRAFT BOWRIDER - 1981, Deep V, 470 Mercurier I/O, full canvas, trailer, life jackets, anchor, good cond., \$5,000. 878-1580 after 6 p.m.

17' GLASTRON - 85 h.p. Mercury engine, trailer, extras, \$975. 744-7947.

14' SEA-NYMPH - 1983, alum., 25 h.p. Mercury, w/controls and Cox trailer, will demo., \$1,800 neg. 242-1817.

12' SAILING DINGHY - needs some work, \$450 neg. Rick, Ext. 7178 or 744-6059.

MOTOR - Johnson 40 h.p. outboard, electric start, \$350. 399-3712.

BOAT TRAILER - large tires, some rust, \$75. 744-9429.

BROWNING BOWRIDER - 1976, w/1985 Cox trailer, very good cond., \$3,000. George, 744-9732.

Miscellaneous

WALL UNIT - mirrored, brass/black, 10-piece, brown velvet pit couch, modern. Anne, Ext. 7814 or 475-8456.

WALL UNIT - cherry finish, glass doors on top, storage doors on bottom, 1 yr. old, orig. \$140, \$40; dining table, \$20. Ext. 2679 or 472-6922.

LIVING ROOM FURNITURE - couch, chair & ottoman, good cond., \$75. 924-1346.

ANTIQUE CANOPY BED - full-size, white, matching dresser & desk, asking \$200/all. Bob, Ext. 3512. LOVE SEATS - camel velvet, \$350; Eames chair & stool, tan leather, \$100. 286-3357.

GIRL'S BEDROOM FURNITURE - Ethan Allan, 7-pieces, excel. cond., new, orig. \$2,100, asking \$975. 286-1213 eves.

DRESSER/BUREAU - 46"-52" wide. Elaine, Ext. 5329.

DRESSER - \$15; desk, \$20; bench w/weights, \$25; 2 10-speed bikes, \$10/each. 929-6313.

MATTRESS & BOXSPRING - full-size, new; electric typewriter, stereo speakers. 929-6898.

BENTWOOD ROCKER - camel color, \$35; Singer sewing machine, works, \$25. Ext. 2474.

BEDROOM HEADBOARD - triple dresser, 2 night tables, 2 mirrors, \$400; dining table, china closet, 4 chairs, \$600. 732-7948.

HEADBOARD - king-size, dresser, night tables, birch, \$150; 9x12 rug, \$75. 286-2854.

SOFA BED - full-size, brown, good cond., \$75. 732-5071.

ROCKING CHAIR - maple, w/cushions, good cond. 325-0447 after 6 p.m.

ANTIQUÉ BUREAU - hutch, 42"x20, w/marble top, 2 doors, 2 drawers; oak chair, \$85/each. 475-4199.

WASHER & DRYER - Whirlpool, compact size, 110V, stackable, good cond., \$375. Mel, Ext. 4100.

WASHING MACHINE - portable, good cond., \$75. Ext. 2673 or 744-8632 after 6 p.m.

WASHER & DRYER - Sanyo, portable, \$300. 878-1049 eves.

COFFEE MAKER - Toshiba, never used, \$75; 14-sp. blender, \$15; soda fountain drinkmaster, \$10; adult tricycle, \$100. 585-6518, 3:30 a.m.-4:30 p.m.

MICROWAVE - & cart, \$150; women's golf shoes, size 7, new, \$25; sofa, camel-color, \$200. Ext. 2474.

CHINA - Lenox, 2-5 piece place settings, Olympia pattern, \$50/each. 286-3679.

COLOR TV - 19", \$110. Mike, Ext. 3010 or 3855.

COLOR TV - 19", good cond., \$60 firm. Ext. 2926.

BABY RELAX - \$20. Ext. 2413 or 3030 eves.

CALCULATOR - Hewlett-Packard 22S, brand-new, \$45. Matt, Ext. 4860 or 4216.

SPEAKERS - JBL 3-way, 110 watt, \$225/pair; JVC direct drive turntable, w/cartridge, \$65. Ext. 5211.

BATHROOM VANITIES - 4, w/Kohler sinks & faucets, excel. cond., \$150/each. Tom, Ext. 4084 or 878-1060.

STOVE PIPE - off-set, 2-piece, brand-new, triple wall galvanized, 10" OD, s.s. steel 6" ID, \$75. Gary, Ext. 4095 or 758-5592.

CEILING FIXTURE - fluorescent, 48", Sears, 2x40 watt, maple, carved wood frame, diffuser, excel. for kit., l/r, den, \$50. Frank, Ext. 4584 or 277-0464.

LAWN MOWER - Rickel, gas, 20" cut, new blade, \$65; Totto lawn mower, 21", w/bag, \$85. Dan, Ext. 4987 or 698-7322.

TOPSOIL - fine screened, delivered, \$18/yard, also peat moss, sand, gravel, blend. 924-9427.

FIRE WOOD - seasoned oak, reasonable. 286-8521.

EXTERIOR PAINT - Olympic overcoat, white, 6 gallons, orig. \$20+, asking \$15/gallon. Ray, Ext. 2795.

VACUUM CLEANER - Kirby, upright, industrial quality, w/hose, shampoo attachments, etc., \$120. John, Ext. 2710 or 331-7350.

DOOR - Emco Forever, self-storing, screen/window, brown, 36"x80", excel. cond., \$75. Bob, Ext. 4446 or 654-3989.

16" PLANER - 13" jointer, 4 1/2 h.p. shaper, edge-sander, stroke sander, 220V, 3PH, excel. prof. machine, 1/2 price. 435-0615 eves.

COMPRESSOR - to be used w/air brush. Rick, 3355.

SHALLOW WELL PUMP - Deming, 3/4 h.p., 3-months-old, \$100. Ext. 3762.

SURF ROD - 12", fiberglass, 2-piece, almost new, orig. \$80, asking \$50. Bill, Ext. 2350.

COMPOUND BOW - Bear Grizzly II, left-handed, 30" draw, \$75. Bill, 744-7577.

SURF BOARD - 9 1/2', \$25. Fritz, Ext. 2348 or 286-8521.

PARACHUTE - Strong Enterprises, 26' LoPo canopy, 2" thick backpack, orig. \$865, sell for \$595. Ext. 5400.

BOY'S BICYCLE - Nishiki, 10", w/training wheels, for 2-4 year old, like new, orig. \$75, asking \$50. Ed, Ext. 4447 or 821-1783.

GIRL'S BICYCLE - 16" tires, semi-pneumatic, clean, no training wheels. Ext. 4475.

DOG CHAIN/COLLAR - glass bottle. Ext. 2950.

FURS - F/L red fox, F/L black mink, F/L beige mink, size 6, all mint, sacrifice. Ext. 7814 or 475-8456.

NORWEGIAN BLUE FOX JACKET - 28" long, like new, size medium, orig. \$650, \$400 neg. Ext. 2076.

CRIB - full-size, w/mattress, both sides drop, 4-position spring adjustment, \$40. 661-3471.

BABY CARRIAGE - Welbuilt, 3' convertible, \$50; Cosmos baby stroller, \$25. Ed, Ext. 4447 or 821-1783.

NURSING EQUIPMENT - Kaneson pump system, \$15; electrical pump accessory, \$10; supplemental nursing system, \$20. Ellen, 929-3795.

DOLL MAKING MOLDS - for making reproductions of antique dolls, make offer. 475-4199.

FORMICA - cement, car roof rack, Mirrow ski boots, pulley, door fitting, moulding, any offer. 475-1254.

Yard Sales

MEDFORD - 6 Redpine Rd., 9/24-25, 10 a.m.-6 p.m., rain/shine, moving, everything must go, furniture, wall unit, misc., 475-8455.

RIDGE - 40 Giant Oak Rd., 9/24-25, p.a.m.-5 p.m., furniture, household, misc. 924-9656.

SOUND BEACH - Curtis & Syosset, 9/24, 11 a.m., housewares, books, furniture. Ext. 7178.

Free

RABBIT - male, 1 1/2-years-old, white w/black patches, cage & accessories. Ext. 7505 or 689-8605.

SEASONED FIREWOOD - & miscellaneous scrap lumber, you pick up. 751-3551.

Lost & Found

FOUND - small pewter head of a Shih Tzu dog, probably broken off a keychain. Joan, Ext. 2549.

FOUND - earring, dangling balls, inquire at Personnel.

Car Pool

BELLPORT/E. PATCHOGUE - 4-person pool has opening, pick up 7:45 a.m.-5:05 p.m. Fritz, Ext. 2348 or 286-8521 eves.

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

BELLPORT - 4 bdrm., 3 1/2 baths, Jacuzzi, walking distance of schools, bay & village, avail. unfurnished Oct. 1. 363-8936 eves.

MEDFORD - 2 rm. apt., large, new, full kitchen, bath, w/w, cable, l/r-bdrm. combo, priv. ent., mature person, \$550/mo. incl. all. 654-5411.

MIDDLE ISLAND - 2 bdrm. house, fp, oil heat, very quiet, \$500/mo. + util. Ext. 4058.

MIDDLE ISLAND - Artist Lake condo, 2 bdrms., 2 baths, clubhouse, cable, avail. Oct. 1, \$750/mo. Gail, 924-2743.

RIDGE - 3 bdrm. ranch, eik, l/r, den, 2 1/2 baths, fenced in yard, family neighborhood, near Lab, \$1,150/mo. 744-8632 after 6 p.m.

ROCKY POINT - 3 bdrm. house, 2 full baths, newly remodeled in/out, new appliances, 1/2 acre, avail. Nov. 1, \$1,100/mo. + 929-6898.

SOUTH JAMESPORT - 1 bdrm. cottage, l/r, eik, bath, porch, furn., walk to beach, 20 miles from Lab, suitable couple, no children or pets, \$500/mo. + util. Walt, Ext. 2907 or 698-0576.

STONY BROOK - 3 bdrm. house, wood stove, walk to shops & beach, avail. Oct. 1, \$1,275/mo. + util. 751-3574.

HILTON HEAD, S.C. - 2 bdrm. condo, sleeps six, pool, tennis, golf, beach, Sept. & Oct., 350/wk. 585-9149.

For Sale

MASTIC BEACH - 3 master bdrms., l/r, full bsmt., cabinet-lined eik, stove, refrig., carpeting, 3 blocks from marina, low taxes, \$120,000 neg. 281-8685.

MASTIC BEACH - 3 bdrms., fp, walk to beach and marina, \$107,000. Ext. 3867.

NESCONSET - SD1, 3 bdrm. high ranch, 1 1/2 baths, priv. 1/4 acre lot, oak floors, brick patio, Florida rm., l/r, d/r, den, 1-car gar., ext. driveway, \$180,000. Ext. 5139 or 979-6569.

PORT JEFFERSON - Harbor Hills, 4 bdrm. split ranch, d/r, eik, family rm. w/tp, brick patio, oak floors throughout, 24'x44' bsmt., \$189,000. Ext. 4483 or 929-5699.

PORT JEFFERSON - 5 bdrm. contemporary hi-ranch, M/D, 3 baths, 2 kitchens, gar., vinyl siding, fenced yard, 1/4 acre, mint, \$179,990. 331-1523 eves.

RIDGE - 2 bdrm. townhouse, central a