BROOKHAVEN BULLETIN
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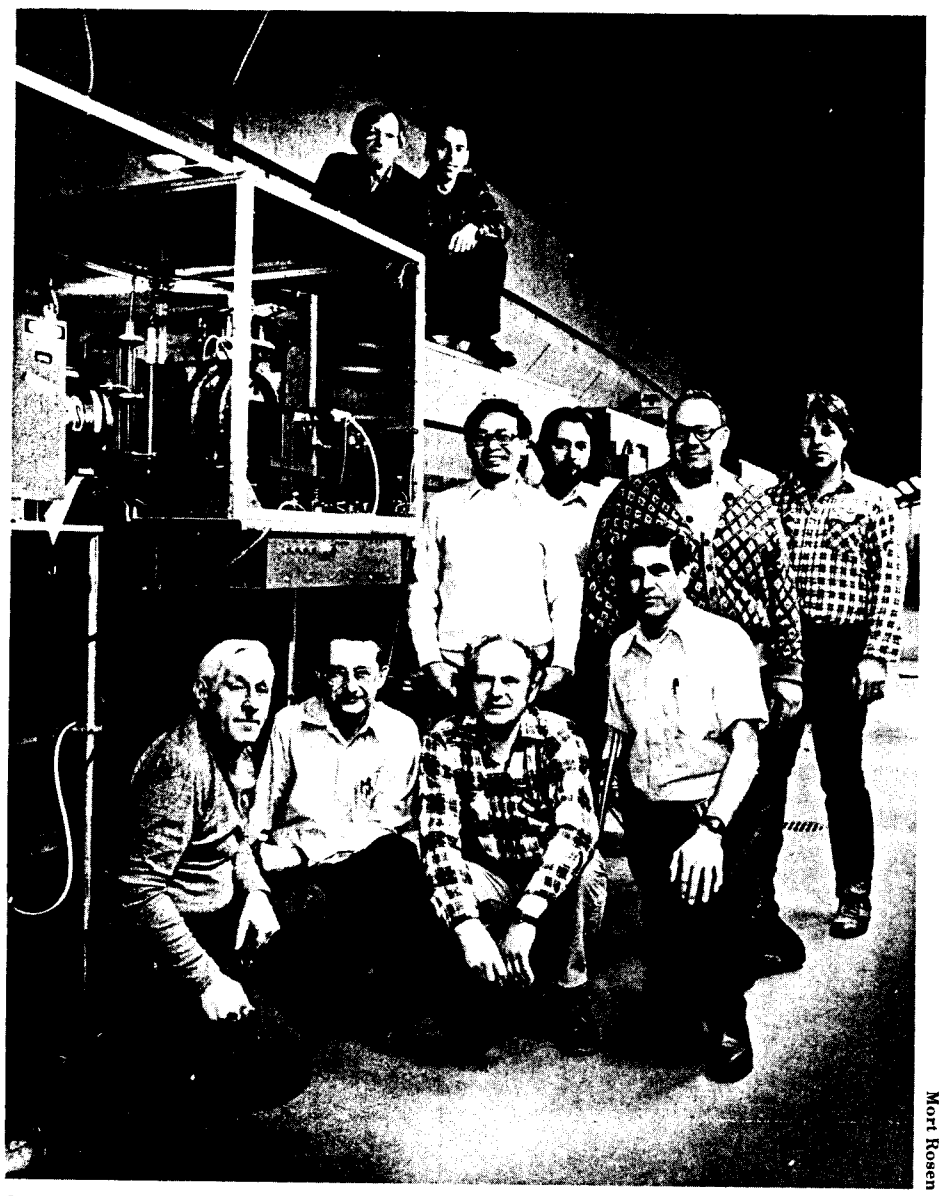
BROOKHAVEN NATIONAL LABORATORY

Extracting Protons By The Bunch



Mort Rosen

Standing by the E-5 kicker magnet in the AGS ring are some of the people who were most involved in its development and commissioning: (kneeling, from left) Harold Alexandersen, Walter Frey, Siegfried Naase, Edward Gill; (standing, from left) Wu-tsung Weng, Joseph Tuozzolo, John Gabusi, Steven Bennett; (top, from left) John Post, Joseph Funaro.

After a couple of hundred thousand turns, in the space of about 0.5 second, the protons that circulate in the Alternating Gradient Synchrotron (AGS) are extracted and sent down an experimental beam line. Until last week, two methods were used to take those protons away — a slowly extracted beam (SEB) mode and the fast extracted beam (FEB) mode. Tests at the AGS on Monday, January 17, proved that a third extraction mode — single bunch extraction (SBE) — is now ready to offer new opportunities to researchers.

SBE is exactly what its name implies — a method of extracting only one bunch of protons at a time from the AGS. During most of the accelerating cycle, the circulating protons are divided into 12 tight bunches. All 12 bunches are used in SEB and FEB, but for SBE, said Wu-tsung Weng, physicist in charge of the project, "the name of the game is to just pull a single bunch out without disturbing the other eleven."

The SBE mode of operation is crucially dependent on the operation of a beam extraction magnet, which has to meet three critical requirements. First, in the 180 nanoseconds (ns) (ns = one billionth of a second) between proton bunches, enough power, 3 kiloamperes (kA), must be generated to kick out the oncoming bunch. Next, the power must stay within tolerable limits for 40 ns to encompass and eject the entire group of protons. Finally, within the next 180 ns, the power must drop to its zero level, so it will not disturb the next bunch. A sinusoidal waveform with a base of less than 400 ns was found to be ideal for this situation.

To do all this, the SBE mode is dependent on a new magnet, the E-5 kicker, which owes its own existence to another magnet, the H-5 kicker, employed in 1981 to extract 12 bunches of protons for neutrino experiment 734. The H-5 takes only 180 ns to rise in current from 0 to 3 kA. Then it levels off for 2.5 microseconds to kick out all the beam.

"About a year ago, we went through several conceptual designs for the single bunch extraction," said Weng. "The one we chose was based on putting a spare H-5 magnet at the E-5 position of the AGS ring, to extract a single bunch into the slow beam channel before fast extraction is used on the remaining 11 bunches. The only thing we had to rebuild was a new charging circuitry, to create a very short pulse." This task was assigned to Walter Frey and Steve Bennett.

The final design was chosen in August 1982, and, Weng said, "Everything got accomplished in four months. Because we used the spare H-5, it could be finished quickly; otherwise it would have taken one year just to order the required material."

The January 17th test was the first to combine the magnet body and its new charging circuitry in actual extraction conditions. On hand to observe the results of this crucial test were members of several groups in the Accelerator Department, including the Beam Component Group, which built the magnet kicker; the Electrical Support Group, responsible for the new charging circuitry; the Experimental Areas Group, which set up the D-line to receive the protons extracted by SBE; and the AGS Operations Group, which assisted in the commissioning of the magnet.

Testing began at 9 a.m. and at 1 p.m. observers first knew that one bunch had been extracted (see photos). "It was quite an exciting thing,"

(Continued on page 2)

Safeguards — And The Limits Of Authority

When may shooting someone be justifiable or excusable? That is a question Jerry Cadwell wrestles with as part of his job at Brookhaven.

Cadwell is a lawyer in the Technical Support Organization for Nuclear Safeguards, DNE, which advises the U. S. Department of Energy on how to safeguard nuclear and other sensitive materials. He is the group's expert on constitutional law, criminal law, and administrative law. He also has extensive experience in nuclear engineering, having worked for over 15 years in the nuclear industry as a mechanical engineer.

Shooting — or the use of deadly force — is a major issue in safeguards. Cadwell says there are three ways to safeguard special nuclear material: build a better mousetrap, such as metal detectors; use better computers to keep track of sensitive materials; and employ guards.

The last area is where Cadwell's expertise comes in — knowing the laws on the books, how they work and what new laws are needed. On the practical side, he is also involved in making sure that guards understand their legal position, so they can operate effectively.

Cadwell says that before December 4, 1981, the guards at DOE's sensitive facilities had the same arrest authority as private citizens. In other words, if they made a mistake, they could be charged with false arrest, false imprisonment, and invasion of privacy, among other things.

Mort Rosen

Jerry Cadwell

On December 4, 1981, Congress passed a law pertaining to U.S. property in the custody of DOE or its contractors. It gives DOE guards limited arrest capabilities, which means that if a guard has probable cause, he or she may make an arrest. If it turns out that there was no crime committed, the guard is allowed a reasonable mistake. So if he or she operates reasonably, then there is no liability associated with what they are able to do. The guards now have the same arrest authority as a police officer, but, again, only when pertaining to

(Continued on page 2)

Astronaut To Speak At BNL

Dr. Joseph Allen, Mission Specialist on last November's Columbia shuttle flight, will pay a return visit to Brookhaven on February 7. He is scheduled to speak on "NASA Space Shuttle for Fun and Profit?" at 3:30 p.m. in Berkner Hall. An informal reception will precede the talk at 3 p.m. and those attending the lecture are also invited to the reception.

Allen will be able to renew old acquaintances at BNL. From 1963 to 1967 he commuted between Yale University and the Laboratory where he was doing research for his doctoral thesis in nuclear physics. He was selected for the NASA program in 1967.

He completed flight training at Vance Air Force Base, Oklahoma, and has now logged more than 2,800 hours flying time in jet aircraft. Allen was a member of the astronaut support crew for Apollo 15 and also a staff consultant on science and technology to the President's Council on International Economic Policy. He was NASA Administrator for Legislative Affairs in Washington, D. C. from 1975 to 1978.

Allen returned to the Johnson Space Center in 1978 and was assigned to the operations mission development group. He served as a support crew member for the first orbital flight test of the space transportation system, and in 1980 and 1981 worked as the technical assistant to the Director of Flight Operations.

A telephone interview with the scientist astronaut appeared in the Bulletin on November 5, 1982, prior to his flight in Columbia on November 11. At that time, he was looking forward to doing a space walk with Dr. William B. Lenoir, the first walk from the Columbia shuttle. Although the pair were unable to leave the shuttle because of faulty space suits, they and the two other members of the crew of STS-5 (Shuttle Transportation System), successfully concluded many other tests during their 81 orbits of the earth.

Dr. Allen's talk is sponsored by the AUI Lectureship Committee.

— NASA photo

Joseph P. Allen

The Allen ARC Singers who will take part in A Gospel Extravaganza at BNL next week.

Gospel Singing Spectacular

Several groups of gospel singers will gather on stage in Berkner Hall on Saturday, February 5 at 7 p.m. for **A Gospel Extravaganza**. Presented by the Afro-American Culture Club and sponsored by BERA as part of a celebration of Black History Month, A Gospel Extravaganza will feature five exciting gospel groups:

- The Allen ARC Singers will lead the evening's performance. The singers in the group are all former drug victims who were returned to useful, productive lives through the Addicts Rehabilitation Center. The center was founded 25 years ago by James Allen, himself a former addict. This choir has performed their *a capella* brand of gospel for hundreds of churches and community groups both in and out of the Harlem community.
- The Young Peoples Choir of 1st Baptist Church of Somerset, New Jersey — Approximately 40 members make up this gospel group.
- The Abyssinian Baptist Church Male Chorus — This group includes about 30 members, with an organist.
- The C.B. Ensemble — This choir is from Southampton's Community Baptist Church.
- The Galileans — These eight young people are from the Galilee Church of God in Christ in Riverhead.

Before the gospel roundup, the audience is invited to step into Room C, to view a photography exhibit called "*Creative Photography by Sonny Day*," which will be open that evening from 6:30 to 10 p.m. "Sonny Day" is the professional name often used by Riverhead photographer Walker Turner, Jr., who calls his work "creative photography" because of the various techniques he has perfected to achieve unusual effects. His photographs have been exhibited widely and have won many significant awards, among them First Place at the Westhampton Beach Art Show. His show will also be on display weekdays, from noon to 1:30 p.m., February 1-11.

Tickets to A Gospel Extravaganza cost $5 each and can be purchased from the following people:

Name	Bldg.	Ext.
April Donegain	197	2903
Mary Durham	464	3427
Sandra Green	535	4933
Michele Henderson	555	4303
Frances Ligon	460	3316
Mac Thomas	318	2959

Or send a check, payable to BERA, to Afro-American Culture Club, P.O. Box 441, Upton, N.Y. 11973.

Protons (Cont'd)

said Weng, who explained that this first test was run at a fairly low intensity for the AGS, 2×10^{12}. Testing at full intensity, 1×10^{13}, is scheduled for early February, and will focus on refining techniques for transporting the bunch of protons to a target down the D-line.

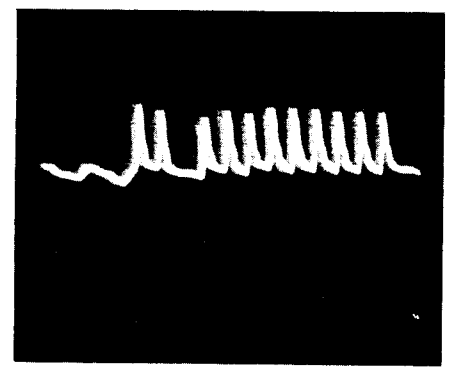
As to last week's test, Weng said, "It worked beautifully. The success was a result of a job professionally done by a group of conscientious and competent people." The results were good news not only for all those who helped create the E-5, but also for those who plan to reap its benefits, the researchers who will participate in AGS experiment 745.

In 1979, a CERN/Columbia proposal was submitted for an experiment they called "An Improved Test of QED." QED stands for quantum electrodynamics, a cornerstone of particle physics. Derek Lowenstein, Deputy Chairman of the AGS, explained that the experiment "would put stringent limits in an area of QED where they have not been well-measured." The proposal was approved as AGS experiment 745 with I-Hung Chiang as BNL liaison physicist.

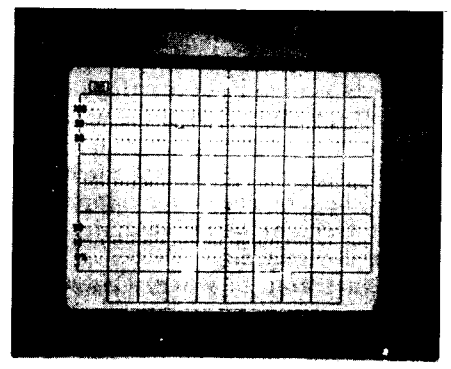
A key component of 745 is that a laser irradiate a target of helium at the same instant it is being bombarded by mu mesons produced by the AGS protons. Since the laser pulse width is limited to a timespread of 50 ns, all of the mu mesons have to arrive on target during the same time interval, which requires the AGS to supply 10^{12} protons (one bunch) in this time window. That was the original motivating factor behind the development of SBE.

Besides expanding the research opportunities available at the AGS during scheduled FEB time, single bunch extraction has ramifications for the Colliding Beam Accelerator (CBA) injection system. Weng explained, "In our original proposal for CBA injection, we required 11 bunches of protons from the AGS, determined by the circumference ratio of the AGS and CBA. So as a bonus, by removing a single bunch out of 12, we have also realized the injection scheme for CBA."

—Anita Cohen



When these waveforms appeared on the AGS control panel, they gave visual proof that the single bunch extraction mode was working. Only 11 bunches of protons remain in the signal above after one bunch was extracted and sent down the D-line. The waveform below shows how the kicker strength rises and falls within 400 ns.



Safeguards (Cont'd)

U.S. property in the hands of DOE or its contractors. Cadwell describes the law as part of a general tightening of security. "DOE believes that in light of world affairs, it is prudent to improve security," he says.

He also says passage of the law raised more questions about the guards' capabilities. And that's what led him into his most recent project for DOE — developing a new policy on the use of deadly force.

"When is shooting someone justifiable in the interest of national security?"says Cadwell. "That's a controversial issue, for several reasons."

First, he points out that there are three sets of laws. Under common law, any fleeing felon can be shot. Under modified common law, a fleeing felon can be shot only if he or she has committed a dangerous felony, such as burglary, robbery, rape or arson. Under the model penal code, shooting is justifiable only if the escape of the felon would cause an immediate danger of serious bodily harm or death to someone.

Different states apply different laws, says Cadwell. For example, Texas and Kentucky have adopted the model penal code. New York uses the modified common law. Most other states apply common law.

"There are actually very few federal cases on the books. And where there is no applicable federal law, as is the case in the use of deadly force, the state law normally applies," says Cadwell. So, for example, a guard at a DOE facility in Texas is operating under a different set of laws than one in New York.

To add to the confusion, under the model penal code, it is not clear what constitutes immediate danger or serious bodily harm in the theft of special nuclear materials. In Cadwell's opinion, it depends on how much is being stolen. He also takes the legalistic approach. What is the law in that state?

"Militant types say, 'shoot first, ask questions later. After all, it is special nuclear material.' In the interest of government security, they say shooting is justified," says Cadwell. "But, gradually, we have been getting away from a military approach and have been heading toward a more liberal viewpoint," he says. "President Truman could not take over the steel companies in the interest of national security during the Korean War. President Nixon could not authorize wiretapping. Yet, within this new consciousness, we want to safeguard nuclear materials as best we can. The problem is that the field of safeguards is so new. There are no precedents."

"So the debate continues," he concludes. "And lawyers will do as they always have - look at the law and try to predict how it will be applied."

— Mona S. Rowe

Tax Tip: Pension

Effective with the tax year beginning January 1, 1982, employment related pension and annuity income of up to $20,000 a year can be excluded (subtracted from adjusted gross income) for New York State and New York City income tax returns.

This change in the tax law will apply to retired Brookhaven employees who have attained the age of 59-1/2, and are receiving annuity benefits from TIAA-CREF. This law also applies to beneficiaries of BNL employees who are receiving monthly TIAA-CREF annuity benefits.

Individuals who are required to file a declaration of estimated tax for New York City or State should consider this pension benefit exclusion in computing their estimated taxes for 1982.

If you have any questions regarding this tax change call Dick Schonberg, Ext. 2881.

Tune Up The Tune-In Program

What's a Tune-In? Old hands are well aware of it, and over 600 of them have used this device to air a complaint, question a practice, or sound off generally — all in the strictest confidence. Newcomers should know that Tune-Ins provide a means of directing questions or complaints to members of management, while the sender's name is protected.

To transmit your message, get one of the orange Tune-In forms addressed to the Editor of the Bulletin. These should be contained in a plastic box in your building. If there is no such box, let your department administrator know. To order a supply of Tune-In forms, call Frank Norton, Ext. 2534, or Public Relations, Ext. 2345.

When a Tune-In is received at the Bulletin office, it is numbered and typed without the author's name and forwarded to the appropriate person for reply. The reply is then sent to the employee, and no record is kept of the identity of the writer. Sometimes letters of general interest are published in the Bulletin.

Tune-In queries cover a broad field. In the past year, for instance, they have explored such subjects as the repair of a manhole cover, the 1982 holiday schedule, the cooking facilities in Fleming House, the new IPAP system, and the meaning of an item on paycheck stubs.

So tune up the Tune-In program by being an active participant. It is an easy and confidential means of communicating your views to management, and you are guaranteed a reply.

In Print

Brookhaven Highlights '80-'81 is now available from the Technical Information Division. The report number is BNL 51550 and can be ordered by calling Ext. 5068.

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Quiet, Please

The National Radio Astronomy Observatory in Deer Creek Valley, West Virginia, is within the only National Radio Quiet Zone in the world. In this zone, using giant saucer-shaped telescopes often likened to electronic ears, radio astronomers "collect" radio waves emitted by many kinds of celestial objects, to study the cosmos. Their instruments are now so sensitive that radio silence is imperative if the astronomers' observations are to be precise.

Radio telescopes measure signals so weak that an ordinary fly landing on the back of a deer releases 10 times more energy than all the energy received by all the world's observatories since radio astronomy started in 1933.

And, according to a story from the National Science Foundation, some homely items can make celestial observations go awry.

Interference was once traced to a cow rubbing against an electric fence. Automobiles are barred from getting near the telescopes because spark plugs cause radio interference. NRAO astronomers move about the area in old Checker cabs that have diesel engines which don't use spark plugs. An unexpected series of impulses was found to be caused by a pair of electric hair clippers being used by a nearby housewife. A local resident's electric blanket with a faulty heat sensor was found to be the culprit when radio interference ruined an astronomer's observations.

As special Quiet Zone rules and regulations do not apply to household items, the NRAO relies on the cooperation and goodwill of its neighbors to help solve these problems. In the matter of the electric blanket, for instance, NRAO bought the householder a new blanket that worked properly, and everyone was happy. And the housewife with the electric hair clippers agreed to use these only when they were not liable to cause interference.

A French Scandal

"Stavisky," a film depicting the life of a charismatic con man whose activities rocked the government of France, will be presented by the French Group of BNL at Berkner Hall, Thursday, February 10, at 8 p.m.

"Stavisky" is an intelligent, rewarding, and visually stunning film, as can be expected from director Alan Resnais ("Last Year at Marienbad," "Night and Fog"). Jean-Paul Belmondo is at his best, and Charles Boyer and Anny Duperey are also in the cast.

"Stavisky" is in French with English subtitles. Admission is $3 for nonmembers, $1.50 for students.

In Stormy Weather

The following radio stations will announce Laboratory closings and delayed openings in the event of storm conditions.

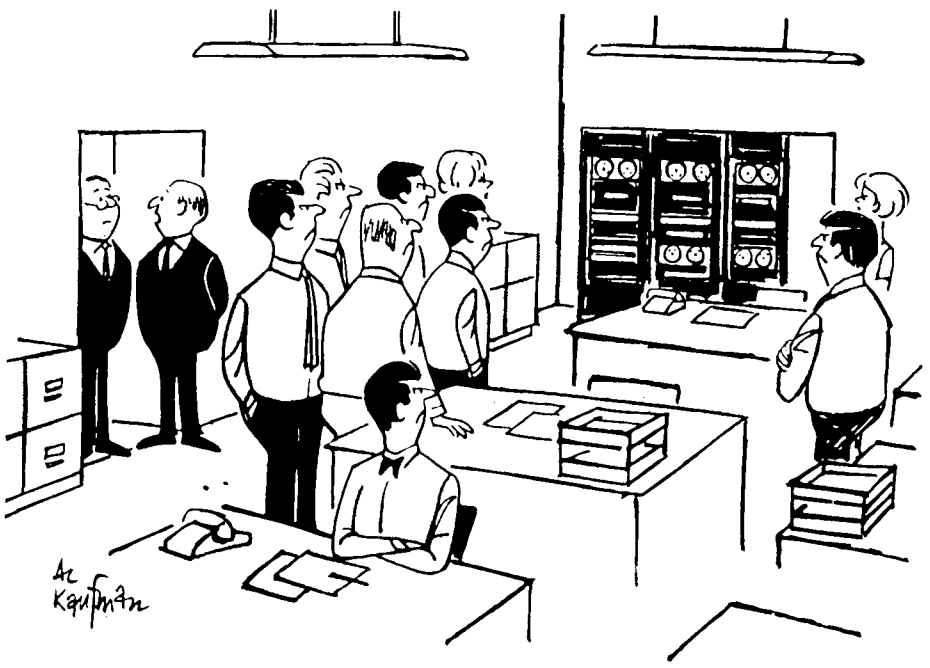
Station	Area	AM	FM
WCTO	Smithtown	——	94.3
WGLI	Babylon	1290	——
WBLI	Patchogue	——	106.1
WLIX	Islip	540	——
WHLI	Hempstead	1100	98.3
WBAB	Babylon	1440	102.3
WLNG	Sag Harbor	1600	92.0
WALK	Patchogue	1370	97.5
WRIV	Riverhead	1390	——
WRCN	Riverhead	1570	103.9
WWRJ	Southampton	——	95.3

Nutri-C.U.E.

How's your personal nutrition? Nutri-C.U.E., a new service provided by the Cooperative Extension Association of Suffolk County, can provide insights into the nutritional value of the food you eat as well as suggestions on how to eat a balanced diet. Designed to be utilized by individuals with no special health problems, Nutri-C.U.E. is a complete analysis of from one to three days' food consumption.

To request an analysis send a check to the Cooperative Extension Association, 246 Griffing Avenue, Riverhead, N.Y. 11901. The charge of $5 for a one-day analysis and $7.50 for a three-day analysis covers expenses for this non-profit program.

In return for your check, you will receive a food diary form on which you will list the food items and amounts eaten during the selected time period. When the food list is returned, the Cooperative Extension will run it through the Nutri-C.U.E. microcomputer program, written by a nutrition expert in association with a programmer. When the analysis is completed, you will receive a packet which includes a printed analysis of your diet, a customized sheet of comments and suggestions, and two booklets on nutrition and diet.



"The computer won the football pool!"

Contest! Contest!

An amorous young man from the Lab
Knew a girl whom he thought was just fab.
So he penned a few lines
Of such sweet-sounding rhymes
That before long her heart he did nab!

If that young man had entered his poem in the Bulletin's Love Limerick contest, he might also have nabbed the box of Valentine candy we are offering as first prize. But the field is still wide open. Just send your Love Limerick to Public Relations, Bldg. 134, by Friday, February 4. Enter as many as you wish, but remember — your poem must be in limerick form and stick to a theme suitable for Valentine's Day. The best of the bunch will be published in the Bulletin February 11.

So if you enjoy making things rhyme,
And limericks are right up your line,
Just pick up your pencil,
Your pen or your goose quill
And write fast — so you finish in time!

Hospitality News

The Hospitality Committee's next morning get-together will be held on Tuesday, February 1, from 9:30 to 11:30 a.m. at the Brookhaven Center. The guest speaker will be Betsy Kinney and she will talk about "Rock Gardening."

Wives of Laboratory employees and guests are welcome. Please come and bring the children. Babysitting will be provided free of charge. Coffee, tea and danish will be served.

Cafeteria Menu

Week Ending February 4, 1983

Monday, January 31

Cream of celery soup	(cup)	.65
	(bowl)	.75
Western omelet & hash browns		1.80
Turkey à la king on white rice		1.85
Hot Deli — Cooked corned beef	(bread)	1.85
	(roll)	1.95

Tuesday, February 1

Beef barley soup	(cup)	.65
	(bowl)	.75
Top round of beef & 1 veg.		2.00
Fish and shrimp newburg on white rice		2.00
Hot Deli — Pastrami	(bread)	1.85
	(roll)	1.95

Wednesday, February 2

Cream of potato soup	(cup)	.65
	(bowl)	.75
Chicken breast Parmesan & 1 veg.		1.95
or w/spaghetti		2.15
BBQ spare ribs & 1 veg.		1.95
Hot Deli — Baked ham	(bread)	1.85
	(roll)	1.95

Thursday, February 3

Turkey vegetable soup	(cup)	.65
	(bowl)	.75
Western-style chili on white rice		1.90
Shrimp cakes & 1 veg.		1.85
Hot Deli — Roast top round of beef	(bread)	1.95
	(roll)	2.05

Friday, February 4

New England clam chowder	(cup)	.65
	(bowl)	.75
Breaded fish fillet & 1 veg.		1.85
Macaroni & cheese w/1 veg.		1.80
Hot Deli — Italian-style meatball hero		1.95

Tax Counseling

Income tax counseling for older persons who need assistance in filing tax returns will be available in 26 Public Libraries in Suffolk County starting in February. Persons who wish to use this service should call their local libraries for scheduling.

The counseling is sponsored by the Retired Senior Volunteer Program (RSVP). The volunteers have taken a 40-hour course which is given annually at the Suffolk Cooperative Library System by the IRS and the State Tax Bureau. RSVP has counseled some 600 persons a year for the past eight years.

Appeaser: one who feeds a crocodile—hoping it will eat him last.

Barometer: an ingenious instrument which indicates what kind of weather we are having.

Budgeting: the most orderly way of going into debt.

A Tape Is Missing

A magnetic computer tape labeled HTGR Bldg. 703 #NE3275 was mailed from Applied Math on January 17. It has not yet arrived at Bldg. 703 and all efforts to trace it have proved negative. If you have any information about the whereabouts of this tape, call Ext. 2590 or 4949.

Bowling

White League

The Pinsplitters are the winners of the first half. High games were bowled by J. Griffin 221/244/202/667 scratch, K. Asselta 213/244/637 scratch, G. Hassell 213/209, D. Adams 212/202, J. Ferrante 205/204, G. Fales 203, T. Erickson 202, P. Manzella 183/212, M. Stoeckel 187.

Pink League

M-G Meier rolled a 180, D. Johnson 177, J. Thiede 175, H. Keeley 174, E. Kristiansen 160.

Red/Green League

High games were bowled by L. Schairer 223/200 (602 scratch), R. Wiseman 213/206 (608 scratch), R. Larsen 228, E. Meier 213, J. Morris 213, H. Arnesen 212, J. Ferrante 205, R. Jones 204, E. Sperry 202, N. Combatti 200.

Volleyball

Standings as of 1/25/83

Mixed League

A Division

Dinkers	3-0
Nuts and Bolts	2-1
Teddybares	2-1
Mixed Ups	1-2
Nuclear Wastrels	1-2
EPO's	0-3

Starting off the third quarter were the following scores: Dinkers over EPO's, 15-6, 15-9, 15-8. Nuts and Bolts over Nuclear Wastrels, 1-15, 15-3, 15-3. Teddybares over Mixed Ups, 15-13, 15-5, 6-15.

B Division

Phoubars	23-7
TNT	23-7
Up Fagrabs	19-8
Semi Tough	17-7
Puff and Stuff	15-12
Chungas Revenge	12-15
Screwballs	11-16
KMA	8-19
Nuke Yorkers	8-19
Quirks	2-28

Open League

Final standings for the end of the second quarter.

Phoenix	16-0
Raiders	11-5
FRE8D	7-7
Brewmasters	6-10
Random Errors	6-10
Half Lifes	2-14

Arrivals & Departures

Arrivals

Walter F. Brander ..... Medical
Laurence D. Gibbs ..... Physics
Thomas E. Williams, Jr. ... Plant Eng.

Departures

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

Kiyoichiro Motoya ..... Physics
William E. Swatton ..... Central Shops

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, 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 Personnel Placement Supervisor, Ext. 2882.

The vacancies listed below have been exempted by the Director's Office from the current freeze on open requisitions.

LABORATORY RECRUITMENT: Opportunities for present Laboratory employees.

1821. MATERIAL HANDLER (3 openings) - Supply and Materiel Division.

1822. TOOL AND INSTRUMENT MAKER - Group Leader. Central Shops Division.

Autos & Auto Supplies

VW PARTS - muffler assemblies, $28; bumpers, $27; repair manuals, $16; 009 distributor, $36; all brand new. Augie, Ext. 2419 or 325-0594 eves.

LIFT GATE - 1,500 lb., $300. 929-8749 days.

79 HONDA - CM400T, 2,000 mi., garaged, ;must sell, $1,000. Ext. 7125.

82 DATSUN - B210, Blue, 4 dr. auto, immac. 16K miles 32-34 mpg. $6,200. Frank, Ext. 4113.

80 DATSUN PICKUP - must sell, 5 speed, insulated cap, alarm, radials plus more. $4,500. 281-8318 eves.

TIRE - snow E-70/14, good cond. $15. Ext. 3701.

DUNE BUGGY - many new parts, new paint, best offer, cash and/or trade. Ext. 5385 or 744-0290.

76 VW RABBIT - very good cond, well maintained, 4 speed, 30+ mpg, must sell $2,250. Chip, Ext. 2256 or 928-5836.

73 FORD - F-350 camper special. Steve, Ext. 2674 or 588-1889.

69 CHEVELLE CONVERTIBLE - new top and paint. Good condition. Asking $1,695. Ext. 3319 or 928-8010.

VEGA - 3-speed tranny, like new, $75. M21 tranny 4 speed, excel. cond. $100. Frank, 924-8740.

73 DODGE DART - Sport, 6 cyl. auto, p/s, am/fm, many new parts, excel. running. $900. 929-4487.

78 CAMARO - LT, 4 spd, 305, jet black/red int., p/s, p/b, ac, am/fm cassette with equalizer, rear spoiler, 64,000 miles. Mint cond. in & out. $4,900. 981-5993.

80 SUZUKI - GS1000L, lug. rack, c/c, custom seat, many extras, mint, must sell. $2,500. Ext. 7187 or 981-9474.

74 VEGA WAGON - ps/pb, am/fm, radials, $650 (neg.), good cond. 399-1713 days or 758-7353 eves.

72 FORD PINTO - Excellent cond., 4 spd, must be seen. 281-5258 after 6 p.m.

77 VOLVO - 245 a/t, p/s, a/c. 653-5350.

82 DODGE CHALLANGER - p/s, p/b, a/c, am/fm cassette stereo, 5 spd., much more. 744-5752 after 5 p.m.

RIMS - w/snow tires, GM, 2 ea., 7.75-15, $10. Dave, Ext. 4520.

78 CHEVY CUSTOM VAN - auto, high mileage, am/fm/cb, cassette player. $5,500 firm. Tony, Ext. 3198 or 924-5248.

75 CAMARO - 4 spd. Hurst, mags, good mechanically, needs some body work. $1,475. Ect. 4289 or 732-6489 after 5 p.m.

82 KAWASAKI — KZ550 LTD, low miles, blk w/red pinstripes, mags. $2,300. Ext. 4289 or 732-6489 after 5 p.m.

74 CHEVY IMPALA STATION WAGON - good cond., heavy duty hitch. $695. 878-2657.

69 CHEVELLE - S.S. 350, sm/block, 3 spd. 727-7099 after 5:30 p.m.

73 IMPALA - 4 door, 7 cyl., a/c, p/s, p/b, 90,000 miles, vinyl top, excellent cond. 265-7089.

76 FIAT - 131s, 5 speed, a/c, am/fm. Asking $1,400. Ext. 2521 or 928-8379 eves.

77 CHRYSLER CORDOBA - p/s, p/b, a/c, s/s wheels, white, Landau roof, 6 way power seats, mint cond., must sell, 727-0948.

63 FORD GALAXIE - new tires and exhaust system, 289 V8, v.g. cond. Mike, Ext. 4987.

75 VW RABBIT - body good, am/fm cassette 4-speed, needs very little work. Asking $1,000. 331-4287 eves.

74 PINTO - Runabout, excel. cond., a/c, 4 sp trans, must be seen. Don, Ext. 5329 or 878-2215 after 6 p.m.

77 CHEVY SUBURBAN - K-10, 4x4 Silverato, p/s, p/b. a/c, am/fm sereo, much more. $5,200. Paul, 727-4859.

80 MONZA - V-6, auto., p/s, p/b, am/fm radio, a/c, new tires, good cond.. Vinny, 281-7230.

MAGS - alum., 15", Ford set of four. $70. 878-9534.

79 CHEVY MONZA - Hatchback, 4 speed, p/s, am/fm, excel. cond. $2,850. 286-1427 after 6 p.m.

80 DATSUN 200SX - Hatchback, SL package, loaded, am/fm cassette, new radials, rims, sunroof. Asking $6,300. 732-1849.

73 BUICK SKYLARK - runs good. $550. 286-2899 eves.

74 IMPALA - a/c, p/s, p/b, 4 new radials, plus 2 good snows, some rust, runs good. $850. Tom, Ext. 4524.

73 FORD STATION WAGON - 351, good for transportation. Asking $300. Lou, Ext. 2021 or 698-6585 after 6 p.m..

Boats & Marine Supplies

SEARS 79 GAME FISHER - 12' alumimum v-hull with oars. $300. 744-5752 after 5 p.m.

Miscellaneous

LENS - Nikon 1.8-50mm, new, $100; aud. vis. slide proj., $250; Sunbeam and Norelco razors, $25 ea; fish gear, $500; Zenith B&W console TV, $75. 475-9395 eves.

DINING ROOM SET - walnut table w/leaf, table pad & 4 chairs. $150. George, Ext. 4227 or 751-0894 eves.

END TABLES - (2), step type, $15 ea. Ext. 2952.

SINGER SEWING MACHINE - $75; toaster oven, $15; bookcase headboard, $25; Quartz heater, $30; pole lamp, $25, 2 table lamps, $25 each. 744-6874.

SKIS - Rossignol, 190 cm, Look bindings, poles, carrying cases, Nordica boots, men's sz. 11, used 3 times. $210. 928-8060.

BABY'S BASSINET - extra mattress and skirt. $25. 924-7723.

BED FRAMES - (3), adjustable, $10 ea. Ext. 2952.

DRUMS - 13 piece set w/cases and accessories, Slingerland, Ludwig, Zildjian. $1,500. 588-0567.

LAMP - contemporary, chrome ceiling lamp, good cond. $45. Ext. 3701.

CORNER DOUBLE SINK - spigots, spray & traps, all aluminum. $30. Howard, Ext. 2000.

DISHWASHER - Whirlpool, good working cond. $40. Ext. 2980 or 289-0532.

QUEEN SIZE WATER BED - heater, liner and pine frame, 3 yrs. old, $130; 3 peice bedrm set, $125. Pine storage cabinet, $30; fireplce mantel, $10. 751-8240 or 924-4685 eves.

PINE END TABLES - $50. ea.; combined lamp table, solid pine, $55. 363-6121.

WASHER AND DRYER - Sears compact, $250 pair. 363-6121.

VERMONT SLATE — (Alot), $20; draperies for sliding glass doors w/wooden hardware, $75; old Singer sewing machine in cabinet, $25; large shop desk, $15. 751-8240 or 924-4685 eves.

SKI PANTS - men's 34-R, dk. blue, Eko Bart stretch, never worn. $80. Ext. 4727.

TIBETAN RUGS - made in Nepal, all wool, hand-woven, natural dyes, 3x6 ft., $250. Ext. 2108 or 475-5935.

MAPLE DESK - 47", 8 drawers, $65; maple dresser, 44", 6 drawers, $65; very good cond., sturdy. 878-6637.

GRUNDIG RADIO - SW, FM, TR, w/HiFi record player, in good Black Forest dark cabinet, made in Germany, good cond. $50. 878-6637.

KEROSENE HEATERS - Radiant King, discount prices, factory-sealed cartons, guaranteed. Jim, 924-7665 eves.

SKI BOOTS - Nordica ladies size 6½. $25. Ext. 4312.

BATH TUB - cast iron, claw legged, good cond. Make offer. Second tub salvage. Mary. Ext. 3747.

IRONING BOARD - Proctor Silex, almost new w/cover, $21, electronic flash, new, $10. 751-1884.

WALL OVEN - w/infra-red broiler-Caloric Ultramatic (propane), stainless steel finish, very good cond., $75 or best offer. Ext. 2492.

KITCHEN CABINETS - and counters, all formica, var. sizes from a 12'x18' kitchen, good cond., all from $250. Ext. 2492.

GRAVELY SULKY - for model "L"; cane chairs, 6 antique; Lapis Lazuli 24" necklace. Ext. 3688 or 363-7032.

BOX SPRINGS - (2), twin size, one new for bunk bed, $10; one reg., good cond., $10. Ext. 2952.

MET OPERA - Boheme (4), Feb. 17, Carlo (3), Mar. 3, $27.50 each, dress circle. Dave, 2694 or 941-9022.

HOCKEY TICKETS - (4), Islanders vs. Boston, March 22. Would like trade, will sell. Boyce, Ext. 3734.

COMPUTER - TRS-80, color, 4K ram, datacorder, joysticks, 2 program packs, manuals, all cables, new, $300. 589-8394 eves.

WICKER - antique sofa and chiar, contemporary brown and tan love seat, excel. cond. Ext. 2145.

PANASONIC TAPE PLAYER - portable 8 track; TV black and white, Ext. 2950.

MOUTON LAMB JACKET - very good cond., size 14-16, brown. $75. 475-0144 after 6 p.m.

TV - 13" Sanyo, black and white, 9 mos. old. Asking $50. 981-9584 eves.

COFFEE TABLE - large Spanish style and 2 red velvet high back living room chairs Spanish style. Asking $200. 654-0810.

WASHER - 3 yrs. old, 2 speed, good cond., must sell. Ext. 3366.

TV - 19" GE color, w/remote control, 9 mos. old. Asking $430. 981-9584 eves.

BEDROOM FURNITURE - 6 drawer dresser and 2 drawer night table, attractive, good cond. $110. Sandy, Ext. 3369 or 286-1022.

SKIS - Spalding 150 cm w/Solomon 444 or 222 bindings and poles, $80/set or best offer. Ext. 4663 or 724-7891 eves.

STEREO - Panasonic quad 8-track, cassette, AM/FM, phono, compact with 4 speakers, excel. cond. $125. Ext. 3273.

BLANK CASSETTE TAPES - BASF C-90, CrO_2, $2.75 ea. Ext. 2521 or 928-8379.

LIGHTED BEER SIGNS - for the home bar or playroom. $10 ea. Rich, 363-6845.

WASHER - $300; dryer, $100; refrigerator, $175; electric range, $100; bedroom set, $300. John, Ext. 5171.

COLLECTORS PLATE - 1977 Edwin Knowles "Over the Rainbow." Mint with all papers. $190 or offer. Rick, Ext. 3051.

CABLE TV — descrambler, new. $169. 654-1731.

WALKMANS - AM/FM stereo, $19; cassettes, $40; LCD watch pens, $4.50; 1750W hair dryers, $10; Ferrari sunglasses, $6 ea.; 25 pc-1/2" socket set, $17; wrench sets, $12 up; calculator watch, $20; men's/ladies watches, $7 up. Paul, 727-4859.

KENMORE SEWING MACHINE - new, 25% off the price; ladies winter coat; maternity winter coat, Hamilton Beach 14-speed blender, new; baby swing and other baby items. Wick, Ext. 4372 or 924-0582.

COMPUTER - Sinclair ZX81, brand new, used once. Asking $75. Don, Ext. 4551 or 281-3093.

KITCHEN SUPPLIES - pots, dishes, utensils, more. 821-1039.

LADIES BIKE - Ross Gran Tour II, new, 10 spd, light weight, $160. Ext. 3890 or 924-4250.

STAINED GLASS WINDOWS - 3 Eng. Tudor, set in lead, cast iron frames. Jim, 473-0695.

TABLE - 1920 marbled, mirrored. Jim. 473-0695.

STEREO SPEAKERS - 1 pair 3-way, $55; 12" B&W TV w/rabbit ears, $35. 878-0201.

POWER HACKSAW - $150; Delta 10" cut-off wheel, $350. 929-8749 days.

Free

KITTEN - male, 6 mo., playful, litter box trained. 289-0532.

DOG - for adoption, 1 yr. old male, lab-shepherd-husky, excel. temperment, house broken. 289-8212.

Real Estate

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

For Sale

CORAM - 2 yr. old 3 bdrm ranch, eik, l/r, d/r, 1½ baths, garage, appliance's, fenced in backyard w/pool, completly landscaped, 15 min. to Lab. Assumable mortgage, $52,000. Ext. 4289 or 732-6489 after 5 p.m.

UPSTATE - 23+ acres, pond, well, septic electric. Boarded on 3 roads next to state land, $15,600. 585-8420 after 6.

ROCKY POINT - 3 bdrm ranch, l/r, d/r, eat-in kitchen, full bsmt, 1 car garage. Assumable 6% mortgage, $59,900. 744-9760.

For Rent

MILLER PLACE - north of Rt. 25A near beach, available Feb. 15-Aug. 15, unfurn, or partly furn., prefer couple or small family, no animals. $450/mo. Ext. 7532 or 282-3070.

MANORVILLE - Pine Hills, 1 bdrm, chalet, extras incl. f/p, dishwasher, garage & prime location, 10 mins. to Lab, $420/mo. incl. heat, golf, tennis, pool. 654-3041.

S.W. FLORIDA - Golfers paradise, tennis, pool. Garden condo. fully furn. 2/bdrm, 2 bath, sleeps 6. Naples Marco area. Call for more details after 6, 864-3941.

BERKSHIRES CHALET - 3 hrs. from NYC; 3/bdrm, 2 baths, fully equipped kit., electric heat, deck w/spectacular view, near lake, hiking trails, near ski areas, cross cty. skiing on property. Available weekends/weekly. After 6 p.m., 929-6946.

VERMONT - 3 bdrm. house, f/p, fully equip. beautiful view, x-country & downhill skiing, reasonable vacation family oriented. Avail. weekly/weekends. After 6 p.m., 732-6499

N. SHIRLEY - Mother/daughter house, 3 bdrm/2 bdrm, priv. entrances, garage, avail. March 1, 2 mos. security, reasonable rent. Bob, 281-5605, 6-8 p.m.

MASTIC BEACH - 3 bdrm house, ½ mi. to water, encl. porch, large fenced property, 2 mos. security, $450/mo + util. Bob, 281-5605, 6-8 p.m.

FARMINGVILLE - Partially furn. apart. for single person. L/r, bdrm, partial kit., full bath, clean, private. $325 monthly w/security includes utilities. Pat, Ext. 2907.

SOUND BEACH - spacious 1 bdrm apt., full bath, sun porch, yard, walk to beach, $430/o. incl. util. Rose, 744-3160 after 6:30 p.m. or Ext. 7908.

YAPHANK - Two just renovated apartments located on Main St. Each apart. has 2/lg. rooms plus full bath. Excellent condition. Call Ext. 7908 or 744-3160 after 6 p.m.

Car Pools

RONKONKOMA - Driver to join 3 person pool, LIE exits 59, 60, 61. Victor, 2395

PLAINVIEW/BETHPAGE - 8:30 - 5:00 on time, non-smoker, drive/ride or pay. Walter, Ext. 4605.

FARMINGDALE/MASSAPEQUA VICINITY - Leave from near exit 32 Southern S. Pkway. Plotkin, 4717.

BABYLON/W. ISLIP - Driver needed for 4/person car pool. Ext. 2500.

ISLIP - Looking for someone to form a 2/person pool. Ken, Ext. 7959 or 581-1169 eves.

PATCHOGUE - on time pool, opening for paying rider. Alyce, Ext. 2902.

Lost & Found

LOST - red BERA sweatshirt in gym, 1/19/83. Ext. 7961 or 981-5213.

Wanted

LOVING HOME - medium-sized dog. Loves kids (not cats), good watch dog. Lois, Ext. 2959 or 751-0023.

BOY'S BIKE - w/training wheels, old desk, also bookcases for child's room. Must be sturdy. 751-6781.

LAUDEL PATTERN TEACUPS - made only for Macy & pattern discontinued, other Laudel pieces. Irene, 589-5126.

TIRE - E78x14 or equivalent. Must be better than passing. Morris, Ext. 4192.

OUTBOARD - 2HP Evinrude or Johnson. Ext. 4008 or 821-0686.

BABY HIGH CHAIR - cheap. 744-9677.

MATURE PERSON - for child care and housekeeping in our home 20/30 hrs/wk. East Patchogue. 286-2155.

HIGH CHAIR - and collapsable baby stroller needed. Ext. 4505 or 928-2803.

WORKING WOMEN - new members for business and professional women's club. National and International Affiliations. Alyce, Ext. 2902.

ROOMMATE - share comfortable 3 bdrm condo in Ridge, 5 mins. to Lab, w/w, washer/dryer, cable TV. $210 per mo. + 1/2 utils. 924-0309.

ROOMMATE - share house, Pt. Jeff Village, $138 plus utilities. Jack, Ext. 3433 or 331-3959 eves.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommended by the Bulletin.

PAINTING - paneling, wallpaper, carpentry, free estimates, ref. upon request. John, 924-5012.

VW PARTS - full line of OEM at wholesale prices, complete machine shop service for VW. Augie, Ext. 2419 or 325-0594 eves.

OIL BURNER SERVICE - 24 hr. service. Trouble-shooting & repairs. 15 yrs. exp. Maintenance incl. complete vacuum of fire box, new nozzle new filter. Reasonable. 286-8862.

PROFESSIONAL INCOME TAX SERVICE - by experienced preparer, IRS enrolled, on-site preparation. Jack, Ext. 7942 or 864-2236.

HOUSE PAINTING - interiors, winter discount, professional, insured, many BNL references. Bob, 289-7657 after 6 p.m.

BABYSITTER - any age welcome. Young non-smoking woman prefers infants in her home. Ext. 3011.

CHILD CARE - fenced yard, lunches, snacks, playmates, continuous supervision and TLC, reasonable rates, references. 399-5407.

MASONRY - spackling & taping, general contracting, reasonable rates. Walter, 878-8320.

LICENSED ELECTRICIAN - reasonable rates. No job too small. Residential, commercial, specializing in service changes. 744-0722.

CLEANING SERVICE - office, home or apt. Work by owners, free estimate, references. Ray, 732-4885 eves.

SHEETROCKING - and spackling, free estimate. Kevin, 567-6651.

HOUSEKEEPER - seeking work in North Shore area. Thorough, reliable. Ext. 3744 or 821-9781 eves.

1982 INCOME TAXES - prepared by expert tax accountant, low fees. Bob, 286-5829.

TAXES - prepared by tax consultant, your home or mine, reasonable. John, 732-2472.

WATERPROOFING - 15 years experience, all work guaranteed in writing, free estimates, Lab discount. 281-5445.

TRUCK FOR HIRE - moving and odd jobs, no job too small. 281-5445.

PLUMBING AND HEATING - Lab discount. John, 654-8189.

EXTERMINATING - licensed men, pest contol and termite specialist, work guaranteed in writing, Lab discount. 281-5445.

Classified Ad Policy

Deadline is 4:30 p.m. Friday for publication Friday of the following week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's property.
3. Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
4. Ads for the sale or trade of firearms will not be accepted.
5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated. One ad per person per week.
7. **Property for sale or rent cannot be accepted on this form. Special Real Estate Ad Forms are available at the office of the Brookhaven Bulletin, Building 134.**

☐ For Sale: Autos & Auto Supplies ☐ For Sale: Boats & Marine Supplies ☐ For Sale: Miscellaneous ☐ Car Pools ☐ Lost & Found ☐ Services ☐ Wanted ☐ Free

Please print your ad below in 15 words or less using one word per block. Include name and phone number to call.

Note: The following must be completed for your ad to appear.

NAME (Please Print) .....

Employee's Signature ..... Life No. ..... Ext. .....

Send to: Brookhaven Bulletin, Building 134 (Ext. 2345).

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