

Larry Kukacka, Process Technology Division (DAS), took this picture of concrete polymer sections of pipe, curbing and precast manholes which were on display when he recently visited the Civil Engineering Institute in Moscow.

## BNL Process Goes Round The World

The concrete polymer technology developed at Brookhaven has produced a new industry which is flourishing abroad and just getting started in the United States. Larry Kukacka, Leader of the Materials Systems Group in the Process Technology Division, DAS, saw considerable evidence of this during his recent trip to Russia. Under the US-USSR scientific exchange agreement, he traveled with representatives from US governmental and private labs to Moscow, Kiev, Tashkent and Samarkand, and saw the Russian laboratories and some of their applications of concrete polymer.

The USSR Land Reclamation Ministry programs uses polymer concrete as erosion resistant material to line spillways, dams and water outlets from dams in place of standard materials. These materials are

also used in irrigation systems, particularly where the soil has a high sulfate content, to prevent deterioration from high acidity. Kukacka said they visited a big state farm in Central Asia which produces 70 per cent of all the cotton grown in the Soviet Union. Twenty years ago it was a desert. Some of the piping for the drainage system on this reclaimed land is made of concrete polymer.

A basic difference between the use of concrete polymer in the US and in the USSR is their utilization of large precast sections. In the USSR they produce about 20,000 cubic meters a year of this material for building new structures. In the US polymer concrete is used mostly to repair existing structures and is cast in place. Precast production of the material is virtually zero.

Not only in Russia is this new industry thriving, but West Germany is applying concrete polymer in many ways. Polished precast sections for building exteriors. Polished concrete polymer staircases that look like terrazzo. Subway staircases that have electrical heating elements embedded in them to melt the ice. "You couldn't do this with concrete, because the water would penetrate the concrete and short out the heaters," says Kukacka. They also precast curbs for subway platforms.

In Japan they use the material for heavy support beams, piling and precast manholes. In Montreal, concrete polymer is not only in use as wall panels in subway stations, but is under active consideration for subway rails.

And what is going on in the United States? So far, most of the work has been in the nature of demonstration projects for the repair of roads, bridges, dams, spillways and concrete-lined pipe. But the interest is growing and an industry is slowly developing.

Recently the New York State Department of Transportation awarded a contract to a Denver, Colorado firm to repair the Greenport Bridge, and DAS will provide technical assistance on the project. Kukacka says that the use of concrete polymer materials for the reconstruction of tunnels in the upgrading of the northeast railroad corridor is under consideration by the Department of Transportation. Brookhaven would provide technical assistance for this project. A company in the south has plans for making polymer concrete electroplating baths which are resistant to acid. Similar units are in use in the USSR.

Polymer impregnated concrete and polymer concrete electrical insulators are generating a lot of interest both here and

(Continued on page 3)

## ISABELLE Advances In Congress

Brookhaven's proposal for ISABELLE, a new colliding-beam accelerator, took a large step toward becoming a funded construction project this week. On Monday both the Senate and the House passed a Public Works Appropriation Bill which includes \$5 million for detailed design and some long lead time procurements on the ISABELLE project in the upcoming fiscal year. The Public Works bill that was passed earlier in the House had included \$10.5 million for these purposes, but the original Senate bill had none. The bill passed Monday was the result of action by a Senate-House Conference Committee last week, and is the final appropriation bill.

Still to be completed in Congress is the authorization bill, which ordinarily precedes the appropriation. Here the House Committee on Science and Technology has approved authorization of \$10.5 million for initial construction, while the corresponding Senate committee did not include funds. Hopes are high that the final authorization will include nearly the \$10 million for the Brookhaven project.

These bright prospects for a start of the project this fall are the direct result of the strong interest and vigorous actions taken by Congressman Jerome Ambro of Huntington. Ambro is a member of the House Science and Technology Committee and also of the McCormack subcommittee which has direct responsibility for authorization of the ERDA high energy physics budget. Ambro introduced an amendment to the FY 1978 ERDA authorization bill to include construction funds for ISABELLE and secured acceptance by the Committee.

Other members of the Long Island Congressional delegation, particularly Representatives Pike, Downey, and Wydler have backed the project strongly at all stages. It has also had explicit aid from Senators Javits and Moynihan, as well as other members of Congress. Ambro, Wydler, and their staffs have been working hard to see that funds for ISABELLE get all the way through the long and difficult Congressional process. Full authorization will be sought in FY 1979. The limited authorization and funding for FY 1978, if secured, will make full approval more likely in FY

1979 and will hasten completion of the project.

ISABELLE would consist of two interlaced rings of superconducting magnets more than two miles in circumference. Each ring would contain a beam of high energy protons, and the beams would collide head on at several intersections. The rings would be fed by protons from the AGS, which would then be accelerated in the rings. The design has been developed over several years with research funds provided in ERDA operating budgets. It would produce collisions of particles at high rates and at effective energies up to 800 GeV. The effective energy is more than an order of magnitude higher than that provided by any other accelerator in the world. The machine will be used for research into fundamental properties of matter and energy.

## Conservation Still #1

The third edition and the second annual revision of ERDA's energy plan has been issued as "A National Plan for Energy Research, Development and Demonstration" (ERDA 77-1).

Conservation is again emphasized.

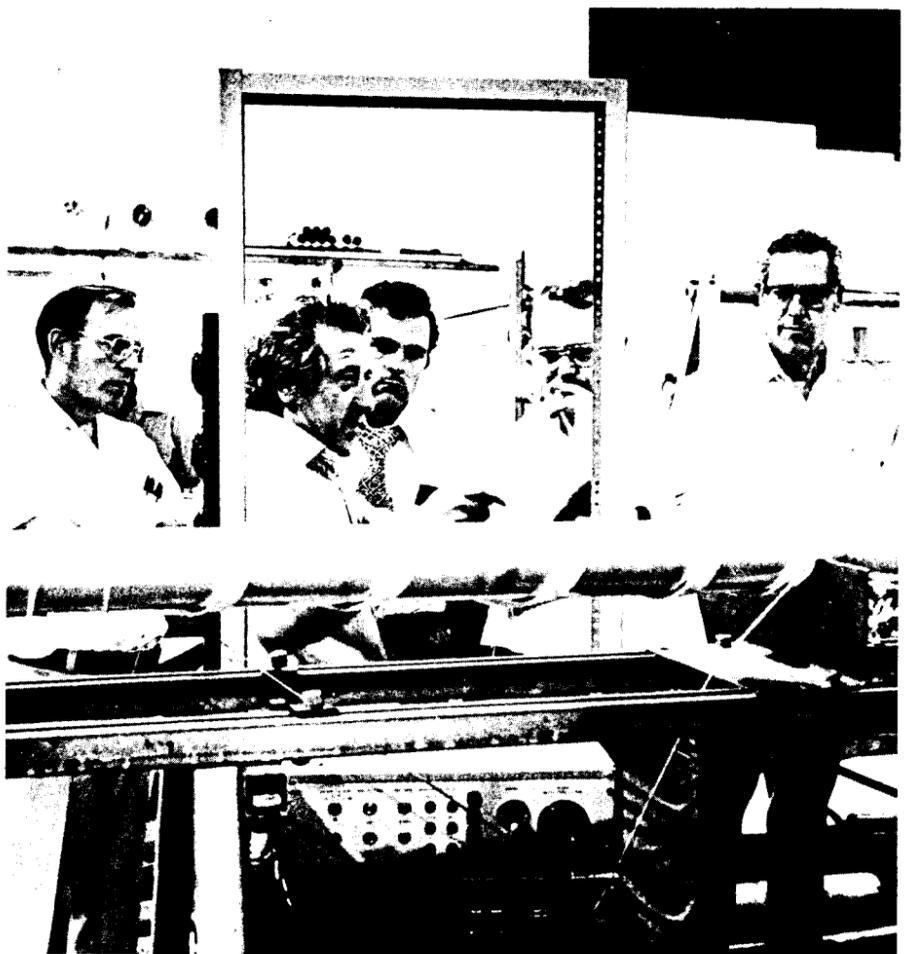
"In general, increasing the efficiency of energy use can have the greatest immediate impact on the Nation's energy system between now and 2000," the Plan states. "This impact can be obtained through a coordinated set of actions involving voluntary efforts, economic incentives, regulatory actions, and development of more efficient technologies to use and produce energy." It adds:

"The expansion of the production and use of existing fuels such as oil and natural gas, coal and uranium using a once-through fuel cycle in light water reactors) can also provide a substantial contribution to solving the Nation's energy problem between now and 2000. The expansion of existing fuels combined with increases in energy efficiency will provide most of the impetus in meeting the Nation's energy goals in the 1977-2000 period . . ."

—ERDA News



In the field in Imperial Valley, California, is Jack Amaro of the Process Technology Division of DAS. In his hand is a section of polymer concrete lined pipe which is ready to be installed in the geothermal well in the background.



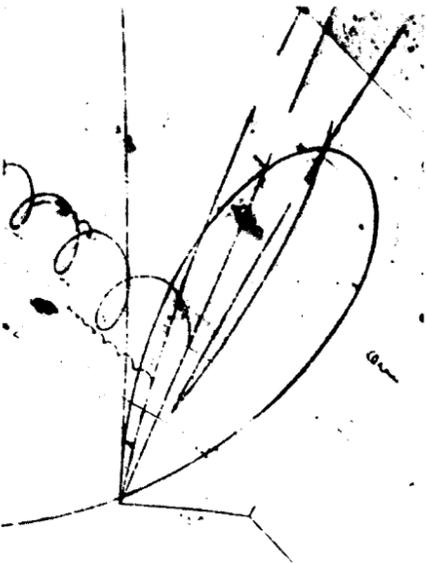
Dr. Douglas Pewitt, (second from right) an examiner from the Office of Management and Budget, came to Brookhaven last week, accompanied by several ERDA officials, to acquaint himself with the Laboratory. He was particularly interested in seeing and hearing about new projects at the Lab which are under the jurisdiction of ERDA's Division of Physical Research. With him at the ISABELLE research facility are, from left, Mark Q. Barton, BNL; Henry J. Halama, BNL; D. Stubenrauch, Division of Basic Energy Science, ERDA; and Laboratory Director George Vineyard.

## High Energy Physics Keynote Of Tour

Visitors to the Laboratory this weekend may have some of the mystery removed from what is called "charm" and other events in high energy physics. A mini-tour of the Physics Department will be the central attraction of the public tour tomorrow and Sunday.

Physicist Ronald Peierls will first acquaint the visitors with research in the Physics Department and then will talk about some of the high energy physics programs. On view will be the bubble chamber film of neutrino interactions, the same kind which recorded the famous "charm-event." The film processing, special scanning and measuring of the neutrino film using high precision scan tables, with assistance from an on-line computer, will be explained by scientists, and the technicians who do the scanning.

In another area, the public will look at some of the particle detectors constructed in the Physics Department for use in high



This photograph is reproduced from original film taken by the 7' bubble chamber. It shows evidence for the existence of a new type of subatomic "charmed particle." Visitors will see the scanning laboratory where the "charm-event" was first seen.

energy physics experiments. They will see the scintillation counters and track chambers which are used for detection of particles. Large numbers of tracks are detected very quickly by counters and, once a rare event is found, the track chambers make the process more precise. One scientist likens the process to "looking for a needle in a haystack."

The complete Laboratory tour takes about 2½ hours, and visitors may arrive any time between 10 a.m. and 2:30 p.m. Besides a look at high energy physics, the tour includes a guided bus tour of the site and a stop at the Exhibit Center which houses models and exhibits of Brookhaven's diverse research, scientific games and a science store.

## Soccer

BNL won its first game of the summer league 1-0 over Chi Chi. Late in the second half, a breakaway was started by Guidee passing to Vera-Ruiz who pushed the ball through to Turner. The defense marked Turner who passed to Batchelor on the other side of the area, who in turn beat the goalie.

The win was tempered by a loss 4-0 to Moriches, the league champions. It was the worst loss in the last few years.

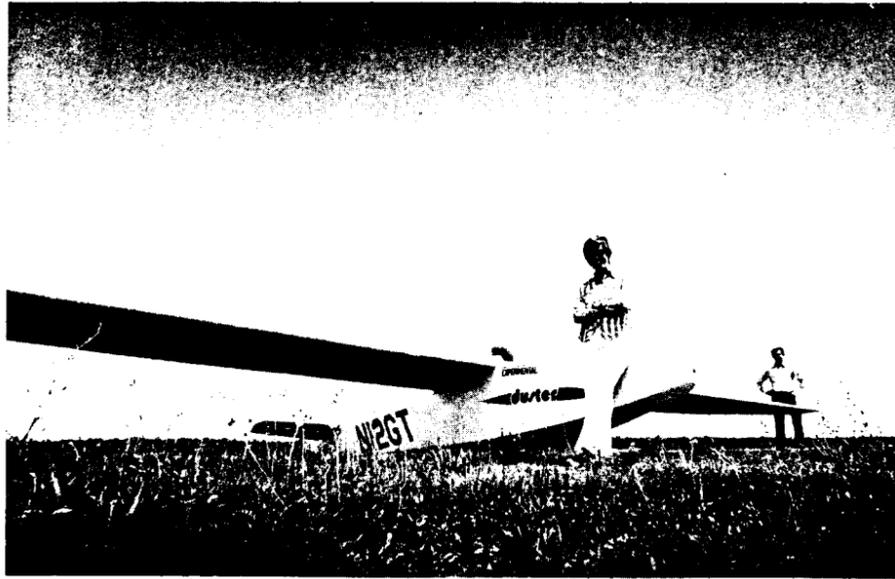
Next week BNL will meet Port Jeff Station on August 2, at Ward Melville and Stony Brook on August 4, at West Middle Island.

## Golf

The Long Island Industrial Athletic Association held its annual tournament at the Huntington Crescent Club on July 21. Despite the record heat, the BNL contingent did very well. In the championship division, BNLers George Korhut and Roger Young with a 81-84, 165 total, placed third behind LILCO's 153 winning score.

The BNL social foursome, comprised of Audrey Blake (100), Jack Fontana (93), Brant Johnson (93) and Dick Hanney (80), sampled a lot more of the course than did Roger and George.

Everyone enjoyed playing the course and cooling off at the awards dinner.



Kathleen and George Taylor and the sailplane that George built.

## The Flying Taylors

A sailplane seems to float effortlessly in the sky and one imagines the pilot relaxing happily as he glides along with the air currents. How tranquil and yet how dangerous, one thinks, to be up there sailing around without an engine.

It turns out that neither of these assumptions are true. First of all, "it isn't tranquil, it's exciting," says sailplane pilot Kathleen Taylor, Chemistry Department. Soaring requires considerable skill and a watchful eye on the weather and on what other air traffic is up to. You're working at it all the time," says her husband, George Taylor, Applied Math Department, a veteran power and sailplane pilot.

Because there is no engine, one must use the old noggin'. "It's a cerebral sport," George emphasized, "there's no brute strength required, and it's non-daredevil."

They think there is more risk involved in flying a power plane than a glider. "Although sailplanes look fragile," says Kathleen, "they are not." "They can take greater stress than a power plane, they have a slower stall speed, and they can get over trees and stop in a small space."

"Some people think soaring is like flying a kite," George adds, "if the wind stops, the plane hits the ground. The fact of the mat-



George Taylor holds the yaw string which is affixed to the wing of the plane and by the way it blows shows the pilot if he's flying with his controls coordinated. Inside the plane, the only other instrumentation is an altimeter, a compass, an air speed indicator and two variometers.

ter is that you can always glide, whether there is wind or not."

Kathleen has been soaring for about 2½ years and is now learning to fly a power plane. George has been flying since 1960 and has been an "airplane nut" as long as he can remember. He built the sailplane they fly and when Kathleen wants to go up, he pilots the power plane which tows her. As soon as Kathleen gets her power license, she will be eligible to become a tow pilot.

George built their all wood sailplane over a four-year period from a kit engineered for the home builder. And where did he build it? Upstairs in their house in Bayport. The plane has a 13-meter wing span, but can be disassembled in about 10 minutes by the removal of eight pins to detach the wings. No piece is over 18 feet long,

so when construction was complete, the plane was removed from the house in sections via the upstairs window, and transported to Brookhaven Airport on a trailer. When it was reassembled, Kathleen was the test pilot.

The Taylors are members of the L.I. Soaring Association and fly out of Brookhaven airport. As most of Long Island is controlled air space, the area for sailplaning is restricted and, generally, it's on this side of Islip airport. A sailplane isn't able to maintain a prescribed altitude or course, so the glider pilots have to stay out of regular traffic lanes.

The glider is attached to the power plane by a 200-foot rope. When they get to an altitude of 1000 feet or higher, and the rate of climb is at least 500 feet a minute, the sailplane releases itself. George says that on a really good soaring day in the spring, a sailplane can climb at 1000 feet per minute.

"Soaring pilots dream of getting in the jet stream and going around the world," Kathleen says. Apparently, it's theoretically possible but has not yet been attempted. So far, the record altitude is 52,000 feet and the record round trip distance is 1000 miles.

The Taylors aren't out to break records. To them soaring is an engrossing sport, and they take off as often as possible. You can be sure that when an ideal soaring day comes along - "northwest winds, cumulus clouds, a cold front passage and a clear blue sky" - the Taylors will be taking a vacation day.

## Summer Program

### On-Site Recreation

Treasure Island was alive again last Friday morning when the kids of the apartment area searched for hidden goodies with the help of maps and clues provided by the program counselors. As cryptic as the clues were, the children were clever enough to seek out every nook and cranny to come up with all the treasures that the ghost of Captain Kidd had hidden away.

Coming Events: this week - scavenger hunt; next week - Halloween party.

### Friday Pool Special

The first, second and third place winners of the kickboard races at the swimming pool last Friday afternoon were:

**Four to Six Year Olds**  
Philip Goldberg, Mark Burger,  
Donald Lircher

**Seven to Nine Year Olds**  
So Hara, Brian Dawson, Cathy Cassidy.

**Ten Year Olds and Over**  
Ted Devlin, Sean Holden, Joram Binbenboym.

Coming Events: this week - diving contest and plate race; next week - relay races.

### Clinics and Tournaments

Now is the time to sign up for the upcoming basketball and tennis events.

Basketball Clinic for boys and girls ages 7 - 15 is scheduled for the week of August 1 through 5 in the gymnasium.

Tennis Tournament for boys and girls ages 7 - 16 during the week of August 8 through 12 on the courts.

Children of all on-site employees are invited to participate.

## Cafeteria Menu Week Ending August 5, 1977

### Monday, August 1

Tomato Bouillon  
Franks & Beans 1.10  
Barbecued fresh ham & 1 veg. 1.35  
Hot deli - pastrami

### Tuesday, August 2

Cream of chicken soup  
Chopped steak & 1 veg. 1.10  
Chinese pepper steak on rice 1.30  
Hot deli - knockwurst

### Wednesday, August 3

Puree of mongol  
Beef turnover & 1 veg. 1.30  
Hot deli - Italian peppers & sausage

### Special

Fried shrimp, fr. fr., cole slaw,  
Small soda or tea \$1.87 plus tax

### Thursday, August 4

Split pea soup  
Broiled chicken livers & 1 veg. 1.05  
Baked stuffed ziti & 1 veg. 1.20  
Hot deli - roast beef

### Friday, August 5

Clam & celery soup  
Seafood cakes & spaghetti 1.10  
Pot roast & 1 veg. 1.30  
Hot deli - smoked tongue

## Retiring Today



Edwin Hagerberg, a Technical Associate in Safety & Environmental Protection, has been with the Laboratory since March 8, 1948. He plans to live in Hagerstown, Maryland.

—Photos by Rosen



Charles Brockner, a Master Welder in Central Shops, came to Brookhaven February 19, 1962. He and his wife, Margaret (Medical Department) reside in Middle Island.

## Selected Reading

Eng. Sci. 40, May-June 1977  
The next eighty years. H. Brown. 3-6  
New Sci. 74, June 30, 1977  
Facts behind the Soviet nuclear disaster. Z. Medvedev. 761-4  
The shocking history of phosphorus. J. Emsley. 769-72  
About the original woman. P. Laurie. 793  
New Yorker July 18, 1977  
The quark. 22-3  
Sci. Am. 237, July 1977  
Gauss. I. Stewart. 122-31  
Science 197, July 8, 1977  
Thomas S. Kuhn: Revolutionary theorist of science. N. Wade. 143-5  
Synchrotron radiation: Large demand spurs new facilities. A.L. Robinson. 148

# BROOKHAVEN BULLETIN

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## Polymer Concrete (Cont'd)

abroad. Testing has indicated that this material is a much better electrical insulator than porcelain and is an energy saver because it doesn't need to be fired, as does porcelain. It is also easier to make attachments to them because the connectors can be cast in. It may be particularly advantageous for substations in remote areas, says Kukacka, because the insulators could be made right in the field, eliminating the necessity for transporting these big pieces to the site.

Back at Brookhaven in the Process Technology Division, one of their current programs is the development of these materials for use in geothermal processes, one of the technologies being investigated as a source of energy. Tested in the laboratory and in the field, "the material holds up very well," says Kukacka. Some geothermal reservoirs which have high temperatures, over 200° C., concrete polymer is not only being considered for liners and pipe, but also as a cementing material for well casings. Standard cementing materials used for these purposes tend to decompose in extreme heat and in an acidic environment.

Another program the Division has with the Federal Highway Administration is to improve the wear-resistance properties of aggregate. Aggregate is the sand and gravel filler that is used in concrete, and the skid resistant properties of concrete are highly dependent upon the quality of these materials. Aggregates impregnated with organic materials are harder than generally available materials and therefore are less susceptible to polishing under severe traffic loads. As Kukacka says, "I don't think we'll ever get to the point where we will impregnate all of the aggregate for highways, but it could be done for certain critical regions like high speed curves where you need a high skid resistant surface."

As concrete polymer costs perhaps four times as much as standard concrete, on a per pound basis, businessmen have been deterred from taking a chance on the new material. However, besides cost, there are a number of other factors to take into consideration. One is its durability. Kukacka cited the repair they made on the Major Deegan Expressway in New York three and a half years ago. So far, they haven't had to make a return visit and, formerly, the repair crews had to go out on a weekly basis. And this represents a lot of dollars. Nobody knows for sure just how long the material will last, but based upon laboratory data it is many times more durable than concrete.

The material hardens very fast, so there is no need to close down bridges, roads, tunnels, or whatever, for a long period of time. Also, because of its greater strength and other properties, the quantity required is less than ordinary concrete.

Apparently, just about anything can be made from this material, from gravestones to containers for hot brine. Many uses have already been identified and, in Russia and other countries, they are producing things for these uses. In the United States, says Kukacka, more people must specify the material for various projects, before a producer will consider it economically feasible to set up producing plants. But the know-how is there, ready and waiting.

## Free Books

The Research Library has a collection of 200+ scientific and technical books, old and new, which may be had, without charge, to any BNL employee or summer student. These books are located in the Acquisitions and Cataloging Section of the Library.



The McLain Family Band who will bring their bluegrass music from Berea to Brookhaven on August 11.

## Bluegrass Comes To BNL

The McLain Family Band, an outstanding bluegrass group from Berea, a small Kentucky town, will perform at Berkner Hall on Thursday, August 11, at 8 p.m. General admission is \$3, and \$1.50 for persons under 18 or over 65.

Bluegrass music is fun to listen to, and inherits much of its liveliness from the wide range of its origins; the Anglo-Saxon ballad, minstrel shows, singing games, square dance calls, ragtime, blues and cowboy music.

This family group consists of Raymond K. McLain, who plays guitar, and his three children, Alice (mandolin), Ruth (bass), and Raymond (banjo and fiddle). Raymond K. McLain, a musicologist educated at Harvard, Denison and the University of North Carolina, is on the faculty of Berea College.

They began performing publicly in 1968 and made their Nashville debut in 1973 at the Grand Ole Opry. In reviewing their first appearance in Nashville, the *Music City News* said, "... the thunder of the show was

actually stolen by a group from Berea, The McLain Family Band."

They have performed throughout the United States and are well known for their frequent appearances at the major summer-time festivals, and on college campuses. An appearance with the Cincinnati Symphony Orchestra combined symphonic programming and bluegrass music.

In 1974 they premiered composer Phillip Rhodes' "Bluegrass Festival Suite" with the Louisville Orchestra, a work commissioned by the National Endowment for the Arts. They have been featured on the "Today Show" and articles about their lifestyle and reviews of their performances have appeared in the *New York Times*, *The Washington Post* and other major newspapers.

After an appearance at the Kennedy Center for the Performing Arts in Washington, D.C., one reviewer said, "The bluegrass group turned the sober, politely applauding audience into foot-stomping whistling Kentuckians."

## Tickets Available '77 US Open Tennis

A limited number of tickets were bought by BERA and will be sold at the Sales & Services Office in the Cafeteria starting at 12 noon on Tuesday, August 2. Sales will be on a first-come, first-served basis with a limitation of 2 tickets per employee for the 9/7 and 9/8 games.

Available are:

Date	# of Tickets	*Price/Ticket
9/6-11:00 am	20	\$8.50
9/6- 7:30 pm	10	\$6.50
9/7-11:00 am	8	\$13.00
9/8-11:00 am	8	\$13.00

\*Includes 50¢ BERA service charge.

## Rifle & Pistol Club

The Yankee Gun Shop Inc., with stores in Coram and the Brookhaven Town Range has agreed to offer discounts to BNL Club members upon showing of I.D. and Club cards.

No discounts are available for handguns, rifles or shotguns.

## Arrivals & Departures

### Arrivals

Richard J. Conklin.....Safety & Env. Prot.  
James G. Lofstrand.....Applied Science  
James R. Rowehl.....Personnel

### Departures

M. Elizabeth Ibarra.....Applied Math.  
Richard L. Klobuchar.....Chemistry



Six students who were selected for the BOCES II Summer Institute for gifted and talented secondary school students have spent the last three weeks at Brookhaven as science interns. Each student has been placed with a scientist who is involved in a form of scientific inquiry that is of mutual interest. The objective of the BOCES program is to help the student develop a conceptual understanding as to the application of the scientific method and the types of techniques and instrumentation employed in this process. From left to right, are: Alan Bornbusch (Bellport HS), Valerie Hook (Islip HS), Mary Purpura (Center Moriches HS), June Kasminoff (Sachem HS), Christine Smith (Rocky Point HS), and Anthony Ricci (Islip HS). —photo by Walton

## Softball

### Employee's League

#### Oldtimers 20 - Ravens 9

Homeruns by J. Roesler, L. Musso and 2 hits by T. Jesaitis. J. Fontana helped his pitching effort with 3 hits and 3 RBI. W. Reams had 4 hits & 4 RBI.

#### Charlie Browns 17 - Medical 16

In a seesaw battle the CB's rallied for five runs in the bottom of the seventh inning to beat the Medical team. The CB's regained their composure and capitalized on their opportunities to grab victory with two outs in the seventh.

#### Nuke Powers 32 - Power Packers 11

Four solo homers by the Pack could not stop Mad Herman and the Nukes. Herman's two home runs and the Nuke's key hitting with men on base proved to be the deciding issues in the game.

#### Circuits 23 - Dirty Sox 5

Frank Stepnoski continued his streak by hitting his 12th home run. That's one home run per game. Also hitting home runs for the Circuits were Scrambles Pearlstein, Artie White and John Schmidt. It was a very well played game.

#### Six Pax 15 - Bubble Boys 14

For the Six Pax, Brian Briscoe hit a home run and Ken Riker was 4 for 4. In a losing effort, Vinnie Chiampou had a home run.

### Mixed League

#### Diamonds 15 - TNT 14

The Diamonds won a hard fought game with Chuck Carlson hitting a home run.

#### Hard Ballers 30 - Trouble 8

John Usher's pitching led the Hard Baller to victory. It was a full team effort with everyone hitting and home runs by Mike Losquadro and Chris Jacinski.

#### Turkeys 8 - Balls & Strikes 7

In another close game between these two teams Gail Thompson caught a line drive and turned it into a double play. Mike Zguris made the difference with two home runs.

#### OK's 10 - I Don't Know 4

Sydell Lamb went two for three. Home runs were hit by Leroy James and Jim Garrison.

## It's . . . Cricket

Lurking beneath its mild-mannered exterior, the game of cricket has hidden ferocity, excitement and danger. This was proven once again last Saturday, when three more injuries held back the BICC cricketers in a very near loss to the famed Staten Island Cricket Club. The final score, 90-83. The tension before the last wicket fell was excruciating, as Pradip Saha valiantly blocked ball after ball, to give team captain John Millener a few more chances to hit for four, very nearly pulling it through.

Staten Island's innings might have been even longer if it weren't for Paul Thompson's extraordinary fielding, taking no less than three wickets with diving catches and deadly accurate throws to the stumps. Run-outs aren't often seen in BICC matches - a rare treat. And Millener's fast bowling, always a special treat for intrepid visiting batsmen, this time took six wickets!

Another home match is scheduled for Sunday, July 31, at the usual 1 p.m. time, against Oyster Bay. Supporters and spectators are more than welcome to come and cheer the team (politely, of course). You don't have to play to be a member of the BICC, so let us know if you'd care to join or if we can send you our newsletter. Call Ext. 2633, or 2032.

### Coming Events

Event	Home/Away	Date
Oyster Bay	home	Sun. July 31
*The Festival*	home	Sat. Aug. 20
(rain date)		Sun. Aug. 21
Princeton	home	Sun. Aug. 28
Staten Island	(tentative)	Sat. Sept. 3
Oyster Bay	home	Sun. Sept. 18
Haverford	away	Sat. Oct. 1

## Summer Volleyball

	Won	Lost	Pct.
New Team	24	9	.800
Thunderbirds	23	10	.697
Scurves	21	15	.583
Setups	16	20	.444
Pushovers	6	30	.167

We will play a four-team double elimination tournament for the league championship on Monday, August 1. There could be a maximum of five rounds if the winner comes up through the loser's division. Each match will be best of three 11-point games.

## 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.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific 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, as indicated below. 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. 2874 or 2882.

**LABORATORY RECRUITMENT:** Opportunity for present Laboratory employees.

#### Correction

258. MACHINE MAINTENANCE MECHANIC - Central Shops Division.

265. MECHANICAL ENGINEER - BSME or equivalent with design and analytical competence and a knowledge of high tolerance fabrication of one of the following: magnets, vacuum systems, cryogenics, optical instruments or precision experimental apparatus. National Synchrotron Light Source, Physics Department.

**OPEN RECRUITMENT:** Opportunity for present Laboratory employees and outside applicants.

266. TECHNICIAN - AAS or equivalent in electronics with background in pulse analog circuitry and with development and testing of high voltage and rf systems. National Synchrotron Light Source, Physics Department.

267. TECHNICIAN - AAS or equivalent in mechanical technology or engineering science to assist in the operation, maintenance and repair of the 7" Bubble Chamber and the 8° Bending Magnet. Shift work. Particle Detector Department, Accelerator Department.

268. TECHNICIAN - AAS or equivalent with emphasis in engineering or physical sciences. Radiation monitoring experience desirable. May involve shift work. Safety and Environmental Protection Division.

269. COMPUTER OPERATOR - Shift work. Applied Mathematics Department.

270. OFFICE SERVICES ASSISTANT - Three positions; one in Reference Section, one in Acquisitions Section and one in Circulation and Serials Section. Previous library experience is desirable. Technical Information Division.

271. PATROL OFFICER TRAINEE - Safety & Environmental Protection Division.

272. COMPUTER OPERATOR - Shift work. Temporary position. Applied Mathematics Department.

### Autos & Auto Supplies

75 Suzuki 550 - \$975; 72 Honda, \$800, excel cond. Bob, Ext. 3313.

67 CADILLAC - Ps/pb/pw, am/fm 8-track, white w/ black roof, good cond. \$700. Frank, 744-0819.

70 FORD FAIRLANE - 76,500 mi, 302 cu in, V8, auto, ps, good cond, make offer. Ext. 3130/3998.

66 CHEVY SS - 283, auto, on floor, good cond, 84,000 mi, \$500. Steve, 929-8723.

CIBI - \$100. 878-0201.

68 FIAT - 850, needs battery. \$200. Frank, Ext. 3531, 281-7578.

2 RIMS - For VW bus or campmobile, \$8 each; aux side step, \$10. Howie, Ext. 2502.

67 CADILLAC - All new components, very good cond. Ext. 3828, 751-7250.

70 FORD LTD - V8, 2 dr, ps/pb, at, 64,000 mi, snow tires, vinyl roof. 269-2972.

74 FORD VAN - Red, window, std shift, 35,000 mi. \$2500. Bob Wieser, Ext. 3080.

67 DODGE CORONET 500 - Hi mileage, good body & running cond, 273 V8, work horse eng, good commuting car. \$425. Ext. 2206, 751-0833 eves.

69 DODGE MONACO - High mi, new battery, 2 new tires, good mpg. \$650. 286-8517 after 5:30.

72 VW BUS - 65,000 mi, recent rebuilt eng, new steel belted radials, excel running cond. \$1400. Tony, Ext. 4207, 928-1644.

68 CHEVY CAPRICE - Auto, 8 cyl, body terrible, mechanically excel. 744-2214.

4 MICHELIN TIRES - 185 R-14ZX, \$39 each, only 1733 mi, E78-14, firm. Patricia Preston, 732-8444.

69 FORD TORINO - 428 Cobra, 3 spd auto, good cond. \$800. 727-6253 after 5:30.

74 GREMLIN - 43,000 mi, very clean. \$1500. John, Ext. 3354.

69 CADILLAC - Sedan deVille, fact ac, excel cond. Asking \$1150. John, 661-5520.

71 TOYOTA - White Celica, 4 spd, good cond. Asking \$1700. 928-5875 after 5.

77 280 Z - Dark green, ac, am/fm, 5 spd, 6800 mi. 878-9412 after 7.

76 HONDA - Auto, 10,000 mi, excel cond. Asking \$2800. Evelyn, Ext. 4526.

70 Torino GT - Convertible, high mi, red w/white top. \$400. Charlie Nielson, Ext. 3935, 325-0968.

73 INTERNATIONAL - 4-wheel dr, pick up, short bed 4 spd, ps. Sacrifice \$2050. Ext. 4050, 929-6961.

RIMS - 6-hole GMC 15" rims, 5" & 8", free installation, \$5 & \$8 each. Fred Usack, Ext. 4597 lunch only or 475-4935 eves.

GM 14" RIMS - \$5 each, free installation & leak testing. Fred Usack, Ext. 4597 lunch only or 475-4935 eves.

RADIALS - 155 x 12, GR 78-14, GR70-14, DR-78 x 14, 205 x 14, free installation. Fred Usack, Ext. 4597 lunch only or 475-4935 eves.

65 PLYMOUTH BARACUDA - Recent battery & brakes. \$225, 732-8853.

63 VOLVO - 544, much body rust, good B-18 eng fits later Volvos, std 4 spd trans, all running gear good, make offer over \$100. Adams, Ext. 2011.

TRUCK CAP - Red alum, fits 8' bed, good cond. \$125. Rick, 286-2108.

72 PLYMOUTH DUSTER - 3 spd std, 66,000 mi, good cond, 20 mpg, orig owner, just tuned. Best offer over \$1000. 281-1419.

68 MUSTANG - 302 V8, ps/pb. Mitch, Ext. 4360.

63 VW - Sunroof, good body, motor runs but needs work. \$75. 589-9103.

69 DODGE MONACO - 2 new tires, new 5 yr battery, high mi, good mpg. \$650. 286-8517 after 5:30.

65 PLYMOUTH BARRACUDA - Automatic, 6 cyl, new brakes, in running cond. \$250 or best offer. 281-0093 after 6.

65 BUICK LE SABRE - Reblt eng, good cond, new brakes & shocks. \$200. 281-3856.

70 RENAULT - R-10, 4 dr, auto, 50,000 mi, 32 mpg, good cond. 821-1296 after 6.

AM RADIO - Good cond for up to '74 Dodge van. \$20. John, Ext. 3292.

73 PLY DUSTER - Ac/ps/pb, auto, am/fm, burgler sys, steel belt radials, immac. \$1950. 727-1329, 727-1617.

70 DODGE DART - 6 cyl, auto, ps, radio, 4 dr, excel mech shape, body good. \$550. 727-7304.

76 HARLEY DAVIDSON - 125cc, 250 mi, dual purpose, excel cond. \$600. 286-8758 after 5.

VW BUCKET SEAT - Black vinyl, low back, good cond. \$15. 331-1203 after 5:30.

C4 AUTOMATIC TRANSMISSION - B&M blt, 1000 mi, holeshot converter & drive shaft, excel cond. \$200. Chris, Ext. 4612.

67 OLDS CUTLASS - 4 dr, green, body & mech excel. Dave, 475-4068, 6-10 p.m.

73 GREMLIN - A-1 cond, am/fm 8-track stereo, good on gas, 23 mpg. Al, 588-4703.

### Boats & Marine Supplies

34' RICHARDSON - 1957, fly bridge, sleeps 6, fresh water cooled Chrysler crowns, in water. \$5600. 286-0505.

18' THOMPSON RUNABOUT - Lapstrake, 75 hp Johnson, Mastercraft trailer, good cond. Ext. 4626, 472-1532.

17' COBIA - 1971, 55 hp, Chrysler, ob, full elec, 2 tanks, 19' Shoreline trailer, many extras. \$2700. Ext. 4254, 281-3122 after 6:30.

16' CLAMBOAT - Kirkcup, 1967, wood hull, just painted. \$400. Alan or Doug, 475-6240 after 6.

24' SAILBOAT - Fiberglass twin keel tylercrafter, sleeps 4, galley, encl head, lg Genoa, excel family boat. \$3200. Ext. 3039, 744-2549.

OUTBOARD - British Seagull, 2 1/2 hp, 40+ long shaft, excel cond. \$200. C. Nauman, Ext. 3412, 286-3764 eves.

60 HP OUTBOARD - Evinrude, 5 yrs old, 16' MFG, fiberglass w/trailer. Asking \$1700. Ext. 2632, 821-0850.

30' PACEMAKER - 1961 sport fisherman, f/b, s/s, fwc, press water, sleeps 4, asking \$3200. 878-4342 eves.

73 LUND - W/elec start 40 hp 1974 Johnson motor, 15' fiberglass V hull, complete accessories, trailer, must see. \$3500. 281-4179.

25' BROADWATER - Sleeps 4, head, htdp, excel cond, many extras, in water. 698-5701.

68 PEMBROKE - 28' cabin cruiser, sleeps 4, galley, head, twin 190 hp Chevy engs. \$6000. 928-5130, 928-2727.

31' BALTZER - Family or fishing boat w/camper back, head, galley, dinette, sleeps 4, twin 125 hp Chrysler engs w/60 hrs. \$3300, terms avail. 331-1718.

### Miscellaneous

YARD SALE - Everything goes after 40 yrs, furn, yard stuff, kitchen stuff, etc. 37 N. Howell's Pt Rd, Bellport, 10-4, Fri & Sat, July 29 & 30.

YARD SALE - Antiques, lamps, clothing, much more, 27 Chapel Ave. Brookhaven, July 30-31.

YARD SALE - Family is moving, Sat, July 30, 10-8, 11 Morris Ave, N. Patchogue, 1 block south of Woodside Ave, 1 block east of Rt 112. 289-2382.

GARAGE SALE - Misc items, Sat, July 30, 10-3, 43 Neptune Ave, E. Patchogue.

75 WILDERNESS TRAILER - 24 1/2', sleeps 8, bath, w/ tub, dbl sink, 60 gal holding tank, 35,000 btu heater, 12V elec sys, mint perfect cond, used once round trip vacation to Calif. Asking \$5000. Bonnie, Ext. 4512.

PUPPIES - Yellow labrador retriever, AKC champions & hunting stock, 4 weeks old. 399-0531.

POODLES - Mini, AKC, silver, 7 weeks, bred for temperament. 928-1084.

GOATS - Saanew, milking qt/day, Toggenberg male; \$45 each, both \$80. 924-3544.

RABBITS - Mature, \$5; bunnies, \$4. 924-3544.

CAMPING TRAILER - Apache Mesa II, sleeps 6, sink, stove, ice box, excel cond. \$925. 289-0413.

BICYCLE - Boy's 3 spd Raleigh Colt, hand & coaster brakes, 19" frame, 26" wheels, good cond. \$45. 286-3679.

BIKES - Boy's 26", 3 spd heavy frame, American made, \$15; 24" boy's Schwinn, \$20; 20" girl's Schwinn, \$10. Joan, 744-3919, Jack, Ext. 4447.

26" BICYCLE - Fleet wing, boy's. \$15. Mike Tesla, Ext. 3284.

12" B&W TV - GE, excel cond. Mike, Ext. 2048.

21" B&W TV - RCA console. Ext. 3494.

CONSOLE STEREO - Electrophonic, am/fm, 8-track, excel cond. \$175. 727-7450 eves.

TAPE DECK - 8-track, Longiness Symphonette, solid state, stereo 8, good cond. \$20. 281-7763.

18 TAPES - 8-track, incl Grand Funk, Grass Roots, Ike & Tina Turner, Kris Krist, Paper Lace. \$12. 281-7763.

LOUD SPEAKER - Klipschorn, in cabinet. \$350. 475-4963 after 7.

GARRARD RECORD PLAYER - Good cond. \$17. Ext. 3688.

ORGAN - Lowery, double keyboard, pedals, bench incl. excel cond. \$350. 727-7450 eves.

ORGAN - Wurlitzer #4520, theatre organ, excel cond, priv owned. 732-3296 after 6.

TYPEWRITER - Elec, wide carriage, Royal office machine. \$100 or best offer. Alan, Ext. 2924, 924-4551.

SOFA - 7' colonial, 4 yrs old, perfect cond. \$175. John, Ext. 2501, 751-6390.

4 KITCHEN CHAIRS - Daystrom. \$15. 727-1617.

LIVING RM CHAIRS - Rocker, straight back, maple server, Hollywood bed, conv bed. 363-6845.

TRIPLE DRESSER - Fr prov, \$40; comb desk, dresser, bookcase, excel cond. \$50. D. Friedman, 475-3308.

KITCHEN CHAIRS - Colonial print plastic-covered, 4, \$20. 289-8212.

DOLL HOUSE - Wooden 6 rm, 2 story, hinged roof, 26" x 14" x 19" high. \$25. Joan, 744-3919, Jack, Ext. 4447.

COACH CARRIAGE - Good cond, \$20. Larry Arnold, Ext. 2024, 281-2136.

BABY SEAT - Pak-a-poose, for back carrying. \$5. Ext. 3828, 751-7250.

SHOES - Black leather pumps, 2 1/2" heels, only worn twice, 7M. \$15. Ext. 2348, 727-6539.

CORNER DESK - Walnut; Kenmore washer; painted corner desk. 399-1954.

BUFFET - Thomasville, 8' long, custom drawers & shelves; 8' glass coffee table top, 3/4" thick. 399-1954.

DINING TABLE - Black African oakwood, webbed matching chairs, 2 capt, 4 side. 399-1954.

BEDRM SET - Modern white, dbl bookcase, headboard, ft board, 9-drawer dresser & mirror, chest of drawers. 399-1954.

SAMOYED - Female, 2 1/2 yrs old, white w/black points, AKC. Best offer. 399-1954.

DROPLEAF TABLE - Solid maple, excel cond. 878-1922 eves.

GUN CABINET - 7-stock, extremely heavy, bottom storage drawer. Barbara Nichols, Ext. 3872.

TOILET - Wall hung tank & bowl, new. \$30. Mike, 2048.

SOLDERING GUN - 100 watt, Weller, \$4; sander, \$5. Ext. 2543.

CB ANTENNA - Hustler mobile trunk mt, new, \$6; Rand McNally campground & trailer park guide, new \$4. Bill, Ext. 4636.

HEATHKIT - Scope model 10-104, fact aligned DC, 15 MHz triggered sweep, calibrator. Bill K., Ext. 4636.

20 FENCE POSTS - Steel, 6' long, for wire fencing. \$20. 289-6490.

73 ACE TRAILER - 18 1/2', self-cont, sleeps 6, 6 cu ft, gas/elec refig, shower, many extras, mint cond. \$2690. Pete, Ext. 3297, 586-3579.

TRAILER - Sears pop-up, sleeps 6, 6 1/2 x 12', excel cond, tent good. \$300. Art, Ext. 3550, 929-6177.

68 INTERNATIONAL - Travel all, 4 wheel dr, snow plow, mint cond, 3 sets tires, am/fm, stereo. \$2000. 286-8758 after 5.

### 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

MASTIC BEACH - 3 bedrm ranch, 1 1/2 bath, 100x100 corner lot, immac. \$31,000. 281-7531.

HOLBROOK - 2 bedrm ranch, garage, newly decorated. \$26,000. Ext. 3284.

YAPHANK - Lakefront acre, 3 bedrm, brick/mahogany, modern ranch, high 60's. 924-3178.

MEDFORD PINES - Mother/daughter, priv entr, 7 appl, 2 baths, 4 bedrm. \$37,500. David, YA4-7516.

SHOREHAM - Contemp 3 bedrm ranch, treed & fenced, quiet, ac, carp. \$34,500. 744-6772.

MASTIC - Contemp 8 rm hi ranch, 2 bath, low taxes, good schools. \$36,000. 694-1674.

FLORIDA - West Coast, Cape Coral, 80x125, developed area. Ext. 2311, 567-5131.

RIDGE - 3 bedrm ranch w/full bsmt, 100x113 lot, lake rights. \$32,000. 929-8723 after 5.

BELLE TERRE - Port Jeff, custom colonial, brick/cedar shingle, 1 wooded acre, fp, appl, oil hot water heat, insulated, mid 80's. 473-2507 after 6.

WADING RIVER - 3-4 bedrm cape, 3/4 treed acre, fp, w/w carpet, full bsmt. \$49,900. 929-8313 after 5:30.

SHIRLEY - 3 bedrm, finished bsmt, storm windows, fenced, near water, 50x300 lot. 281-5328.

E MORICHES - Colonial cape, 6 bedrm, 3 bath, fp, full bsmt, 3/4 acre. \$69,000. Ext. 3950, 878-1540.

PATCHOGUE - Custom 6 rm ranch, full bsmt, carp, appl, landscaped, fenced. \$34,900. 289-0129.

PATCHOGUE VILLAGE - 3 bedrm ranch, exp attic, fin bsmt, appl, \$34000. Ext. 2951, 475-7694.

ROCKY POINT - Custom ranch, w/w, 5 appl, garage, huge kit, 3 bedrm. \$46,500. 821-0042.

N MASSAPEQUA - 3-4 bedrm, split, 2 bath, ac, fp, 6 appl, w/w carp. \$45,000. 796-1317.

SHOREHAM - 4 bedrm colonial, 2 1/2 baths, extras, full acre. \$58,500. 744-2821.

W SAYVILLE - 3 bedrm ranch, fin bsmt, lg yard, all appl. \$37,000. 567-1196.

SHOREHAM NORTH - 4 bedrm lg colonial, 2 1/2 baths, den w/fp, \$55,000. 744-3660.

TERRYVILLE - 3 bedrm, full bsmt, 2 baths, fp, corner lot, 100x100. \$34,000. 473-6333.

E PATCHOGUE - Durkee area, spacious 4 bedrm, fp, 2 bath, glassed porch. Asking 67,500. 475-6916.

MASSAPEQUA - 100x100 waterfront lot, all util in st, garage, driveway, cesspool, etc. 727-7769.

MEDFORD - 1 bedrm, w/w carp, appl, ac. rec facilities. \$29,500. 732-5252, 286-0838 eves.

### For Rent

VT CHALET - Furn, fp, recreation on land, nr summer theater, music, antiques. 757-5599.

E PATCHOGUE - 2 1/2 rm apt, priv entr on water, all util, no pets, children. \$200/mo. 475-4930.

ROCKY POINT - Near LI Sound, no pets. 744-9724.

BELLPORT VILLAGE - Roomy 1 bedrm apt, priv entr, 2 singles or couple. \$225 incl util. 286-8850.

BSMT APT - Lg 3 rm, furn, ac, on beach. \$250/mo incl util. 929-8443.

REMSENBURG - 4 bedrm, all appl, w/w carp, garage, wadded, walk to bay. \$400/mo. 325-1928.

PATCHOGUE AREA - 2 bedrms, priv entrance, newly decorated. \$250/mo (incl heat). Walt, Ext. 2907, 698-0576.

### Wanted

2 SPEAKERS - For stereo, reasonable. Ext. 2027.

STORM WINDOWS - Wooden, need 4, 2 3/4 x 39 1/2. 331-1203 after 5:30.

MANUALS - Car owner's, shop, repair, sales lit for pre 1960 cars. Mike, 281-3460.

HOME - For 6 week old puppy, mother golden retriever, father german shepherd. 585-4741.

TRUNK OR FOOT LOCKER - Going away to college; also need luggage, reasonable. Ext. 3441.

RELIABLE MATURE BABYSITTER - For 2 children 8-4:30 in or near Ridge. Ext. 3438, 924-0056.

DATSUN 240Z - 1973, in very good cond. Tony, Ext. 3195.