BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Video Games - Did They Begin At Brookhaven?

First Pong, now Space Invaders, next Star Castle - video games have mesmerized children of all ages across the country and around the world. Where did it all begin? Possibly at Brookhaven National Laboratory.

In 1958, William Higinbotham, then head of BNL's Instrumentation Division, designed what may have been one of the first video games. Back then, Brookhaven had visitors days in the fall, and thousands of people came to tour the Lab and see exhibits set up in the gymnasium. Higinbotham's game was an illustration of what the Instrumentation Division could design and build.

"I knew from past visitors days that people were not much interested

Mort Rosen

William Higinbotham

in static exhibits," said Higinbotham, "so for that year, I came up with an idea for a hands-on display - a video tennis game."

It was wildly successful, and Higinbotham could tell from the crowd reaction that he had designed something very special. "But if I had realized just how significant it was, I would have taken out a patent and the U.S. goverment would own it!" he said.

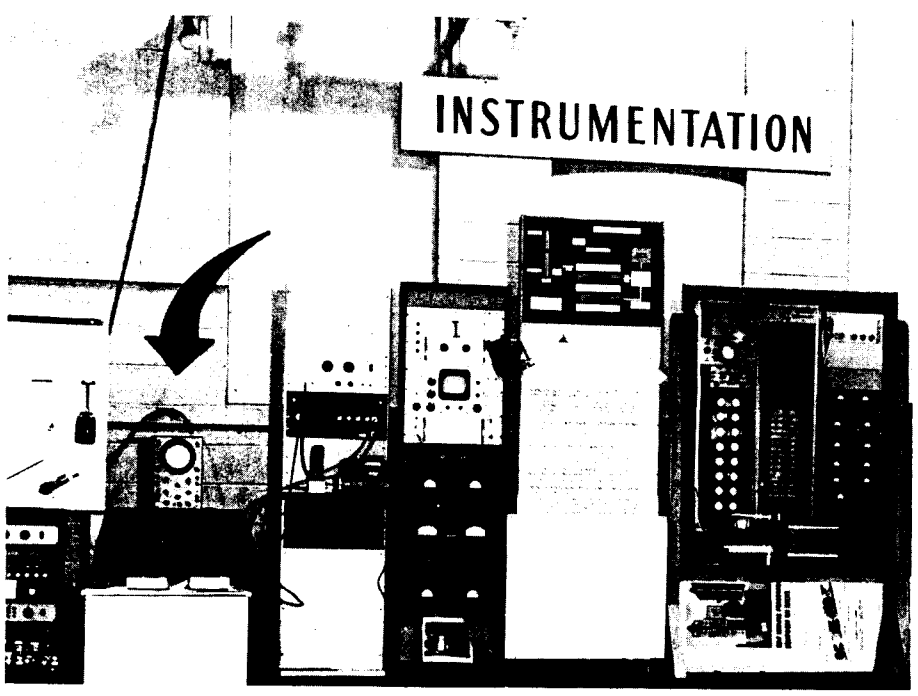
As it is, the only public recognition of Higinbotham's game, prior to this article, has been a mention of Brookhaven Lab in the introduction of a book, *Basic Computer Games*. Author David Ahl, now publisher/editor-in-chief of Creative Computing magazine, wrote that Brookhaven may be where video games started. How did Ahl know about it? He was at the Lab on one of those visitors days. Ahl went to high school in Malverne, Long Island, and toured the Lab as a Grumman scholarship winner. He said he knew about computer gaming done at MIT and by a small company in Cambridge as early as 1961, but was not aware of it being done anywhere else prior to the year in which he spotted the video tennis game at Brookhaven.

Whether it was the first or not, Higinbotham's game had in effect the same features found in today's video games. Simulated on a screen was a vertical side view of a tennis court showing the edge of a floor with the edge of the net perpendicular to it. Each player had a knob and a button. Rotating the knob changed the angle of the ball and a press of the button sent the ball toward the opposite side of the court. If the ball hit the net, it rebounded at an expected angle. If the ball went over the net, but was not hit back, it would hit the floor and bounce again at a natural angle. If it disappeared off the screen, a reset button could be pressed, causing the ball to reappear and remain stationary until a hit button was pressed.

The game was run by an analog computer hooked up to an oscilloscope. "It was simple to design," remembered Higinbotham. "Back then, analog computers were used to work out all kinds of mechanical problems. They didn't have the accuracy of digital computers, which were very crude at the time, but then you didn't need a great deal of precision to play TV games."

Higinbotham said it took about three weeks to put the game together. It was actually built by Robert V. Dvorak, a Technical Specialist in the Instrumentation Division who died in 1969. "Bob and I worked very closely together," said Higinbotham. "I made some drawings, gave them to Bob, he made a patchboard, we changed the things that didn't work, and got it running in time for the first tour."

(Continued on page 2)



Walton / Rosen

In 1958, William Higinbotham, then Instrumentation Division Head, designed a video tennis game as an exhibit for visitors days. It was repeated in 1959, and this picture records that exhibit. The arrow points to Higinbotham's game, perhaps one of the earliest video games.

L.I. Association

At the luncheon, Dr. Vineyard with Charles Hayward (left), chairman of the Long Island Association, and L.I. Congressman Gregory Carman.

Long Island Honors BNL Director

Long Island congressmen, business leaders and university heads gathered together on March 6 to salute Lab Director George Vineyard when he was inducted into the Long Island Hall of Fame.

The Hall of Fame is an activity of the Sky Island Club, an organization of top executives who several times a year honor an outstanding person who has brought recognition to Long Island. Vineyard now joins 17 other people so honored for their work in various fields. Among those who have been inducted since 1972, when the L.I. Hall of Fame was established, are Robert Moses, Alicia Patterson Guggenheim, Leroy Grumman, Judge Harold R. Medina and Carl Yastrzemski.

On his induction, Dr. Vineyard said he was "taking the honor for Brookhaven, rather than myself." He noted that the Long Island community "has proved to be a marvelous asset to the Laboratory," and he appreciated the way it has supported BNL's endeavors.

Over 300 people came to lunch at the IBEW Local 25 Hall in Melville to hear numerous community leaders praise Dr. Vineyard for his work and for the accomplishments of the Laboratory.

A sculpture, entitled "Picture," by Hofstra University Professor of Fine Arts David Jacobs, was unveiled. It will be placed in the L.I. Sculpture Garden at Stony Brook in honor of Dr. Vineyard. The Long Island Forum of Technology presented him with their award for distinguished service, the first time such an award has been given. Among other honors were the Front Page Award from the L.I. Mid-Suffolk Businessmen's Association; an album of photgraphs commemorating the March 6 event from the Long Island Association; a framed copy of the program from the L.I. Business Review, and a record of the proceedings on cassette tapes from the L.I. Teachers Union.

Congressmen Gregory Carman, William Carney and Thomas Downey all spoke of Brookhaven's importance to the Island, and Carman said that he had noted Dr. Vineyard's accomplishments in the March 3, 1981 Congressional Record.

Maurice Goldhaber participated in the ceremony as president-elect of the American Physical Society. He brought greetings from the Society and, in a playful reference to the awards, said that "it was fun to see my good friend, George, framed, boxed and recorded."

BNL's excellent audio-visual "63 Years of Camp Upton" premiered on this occasion and was enthusiastically received. Culled from old photos collected by Lab Historian Lou Harson, the presentation was designed by Doug Humphrey. It will be shown to employees at a date to be announced.

Apollo 13 astronaut Fred Haise was Master of Ceremonies and the colors were presented by members of the U.S. Marine Corps.

L.I. Association

Dr. Vineyard holds a unique putter given to him by Larry Austin, president of Austin Travel. The club was designed with a loop in the shaft. Vineyard was the winner of a local invitational golf tournament last year.

Lecture Reminder

Sam Morris, Biomedical and Environmental Assessment Division of DEE, will speak about "Taking A Chance On Life" at the next BNL Lecture, Wednesday, March 18, at 8 p.m. in Berkner Hall.

Credit Union Update

About 2100 employees have responded positively to the question of joining a credit union. Of these, a large majority preferred to join an existing credit union, rather than establish a new one. The responses are now in the hands of Teachers Federal Credit Union who are proceeding to seek an amendment to their charter which would allow BNL to become a member of their organization. This process is expected to take about six weeks. As soon as we know the outcome, you will be informed.

BERA Election Coming Up

Voting to elect two candidates to serve on the BERA Board, replacing outgoing trustees Carol Beckner and Gail Williams, will take place during the week of March 23. Eligible voters include employees of BNL, AUI, DOE, and permanent on-site employers (Saga Food Service, Barclays Bank, etc.)

Ballots may be cast during the following times at the designated voting stations:

Monday	3/23	11:30 - 1:00	Cafeteria
Tuesday	3/24	11:30 - 1:00	Gymnasium
Wednesday	3/25	11:30 - 1:00	Cafeteria
Thursday	3/26	11:30 - 1:00	Cafeteria
Friday	3/27	9:00 - 3:00	Bank

Absentee votes, for employees who will not be on site during voting week because of business trips or other reasons, will be accepted by sending a signed memo with candidate selections to the Recreation Office, Building 185. Memos must be received no later than 5:00 p.m., Thursday, March 26.

Board Candidates (Choose Two)

James Ho came to the Laboratory in 1974 as an AMD Mathematician. His BERA interests include the French Club, the Concert Series and the Tennis Program. Bulletin readers may remember Jim being billed as "A Man of Good Taste" in an article telling about his expertise in wine tasting.

James Ho

Janet Sillas

Andrew Kevey, a Mechanical Engineer in the Physics Department, has worked at the Laboratory 22 years. During that time, Andy was chairman of the Tennis Committee and co-captain of the Industrial League BNL Tennis Team. In the early 1970's, he was instrumental in setting up free tennis clinics for BNL employees. Andy also participates in badminton, table tennis, soccer, jogging, and is a "regular" in the exercise room.

Nelson Tyler

Andrew Kevey

Mort Rosen

Janet Sillas has been at the Laboratory since 1974 and is presently a Public Relations Assistant. She is a member of the Theater Group and delights audiences with her outstanding singing voice in the group's entertainment productions. Janet is also a member of the BERA Exercise Club.

Nelson Tyler, an Excess Property Procurement Supervisor in S&M, started employment at BNL in 1964. Nelson served as a member of the BERA Nominating Committee in 1979, and is an active participant in the Aviation Club, Archery Club, and the Bowling League.

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. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. Staff members should call Ext. 3484.

BNL 51124 **$6.00**
Thin-Film Flat-Plate Solar Collectors for Low Cost Manufacture and Installation. J.W. Andrews and W.G. Wilhelm.

BNL 51249 **$8.00**
New High Temperature Cementing Materials for Geothermal Wells: Stability and Properties. Final Report. D.M. Roy, et al.

NUREG/CR-1651
BNL-NUREG-51258
Constitutive Relations in TRAC-P1A. U.S. Rohatgi and P. Saha.

NUREG/CR-1717
BNL-NUREG-51263
Soil-Structure Interaction Methods - Summary Report. Volume I. C.A. Miller

NUREG/CR-1717
BNL-NUREG-51263
Soil-Structure Interaction Methods - Slave Code. Vol. II. C.J. Costantino and C.A. Miller.

NUREG/CR-1717
BNL-NUREG-51263
Soil-Structure Interactions Methods - SIM Code. Vol. III. C.A. Miller and C.J. Costantino.

BNL 51269
The Avoided Costs Associated with Cogeneration: A Case Study of Con Ed. R. Bright, et al.

BNL 51270 **$6.00**
The Acceleration of Polarized Protons in Circular Accelerators. E.D. Courant and R.D. Ruth.

BNL 51279 **$5.00**
The Value of Forestation in Absorbing Carbon Dioxide Surrounding A Coal Fired Power Plant. V.D. Dang and M. Steinberg.

BNL 51294 **$5.00**
The 1980 Breeding Bird Censuses. G.S. Raynor.

Equipment Demo

The ACS Division of North Atlantic Industries, Inc. will give an exhibit of System MicroChassis for DEC-compatible circuit boards on Monday, March 16 from 10 a.m. to 3 p.m. in the large conference room in Instrumentation Building #535. Featured will be quad-height/dual-height modular chassis for LSI-11/2 or LSI-11/23 systems with plug in power supplies, logic controls, Q-bus backplane wiring, and cooling fans.

Women In Science

The activities of the Brookhaven Council will be the subject of a talk by Ling Lie Wang, former Council chairman, at the Women In Science luncheon meeting scheduled for Thursday, March 19, at noon in Berkner Hall, Room C. Attendees should bring their own lunch.

Selected Reading

Science News 119 (6) February 7, 1981
Vitamins against Down's syndrome. 85-6.

Scientific American 244 (3) March 1981
The eruptions of Mount St. Helens. Robert Decker and Barbara Decker. 68-80.

Nature 289 (5797) February 5, 1981
Cutback on West German development. 433.

National Review 33 (3) February 20, 1981
Huber Matos the undefeated. 153-184.

Bio Science 31 (2) February 1981
An age of scarcity in books. Daniel N. Fischel. 91.

JAMA 245 (7) February 20, 1981
Van Gogh's vision. T.C. Lee, M.D. 727-9.

Video Game (continued)

Based on Higinbotham's original drawings, official BNL blueprints were done by Alexander Elia, a Design Engineer still with Instrumentation. Higinbotham said the blueprints show a few relay contacts in the wrong position, but the game worked beautifully, so they must have been fixed in the actual circuit.

The electronics consisted mostly of resistors, capacitors and relays, but where fast switching was needed - when the ball was in play - transistor switches were used. "These days, this sort of simulation is done with solid state switches, not with relays," said Higinbotham. "Where I needed it, I took a step in the right direction."

Only BNL visitors in 1958 and 1959 had a chance to sample video tennis. After that, the computer and oscilloscope were separated and used for other jobs. For the next visitors day, Higinbotham and his colleagues designed a new exhibit - a spark chamber that showed cosmic rays passing through. Little did he realize that his video game may have spawned an entertainment medium that may last into the next century.

Higinbotham learned his electronics as a physics graduate student at Cornell, working as a technician in the physics department. He then worked at MIT's Radiation Lab on radars and at Los Alamos for the Manhattan District Project. In 1948 he came to BNL to work in the Instrumentation Division, and was division head from 1951 to 1968.

Since his work at Los Alamos, he has been concerned with nuclear safeguards, and was instrumental in establishing the Technical Support Organization here at Brookhaven to provide technical advice and assistance to the Atomic Energy Commission on safeguards for nuclear materials. When TSO was formed in 1968, he transferred to work full-time with that group.

Higinbotham has received about 20 patents on electronic circuits, most notably the "bootstrap" sawtooth generator widely used in oscilloscopes, and the Higinbotham Scaler, which made it possible to count reliably and electronically random pulses from radiation detectors at high rates.

Time For A Change

Cooperative Extension suggests growing the following unusual vegetables in your home garden.

Jerusalem artichoke - a widely adaptable perennial native to the United States. The plant is very tall, ranging from four to six feet, and has an attractive daisy-like flower. It must be contained. Use the tubers, which grow underground, the same way you use white potatoes, but be sure not to overcook them or they will lose flavor and texture. They taste somewhat like the base of the globe artichoke.

Sweet potato - grows well in light sandy soil that is well-drained. Long Island's climate is suitable for growing sweet potato, but the plant is very sensitive to frost.

Celeriac - often called stump rooted celery, excellent celery flavor in soup. It grows with a swelling of the stem just above the soil level. Celeriac can withstand lack of water and high temperatures better than celery. If you haven't had luck growing celery, try celeriac.

All you need to grow fine, vigorous grass is a crack in your sidewalk.

Budget Flash

It has been learned that funds for Project ISABELLE have been cut from $41 million to $21 million for Fiscal year 1982. This is a result of President Reagan's program to reduce federal spending and is included under the specific decision to stretch out the time required for the building of new research instruments. The revised budget is intended to provide a slowdown, but not a stoppage, of ISABELLE construction.

James Sanford, ISABELLE Project Head, notified ISABELLE personnel of this reduction by memorandum on March 11. He said that "this move has been a major disappointment to us and it will have a very serious impact upon our construction of the new machine. As detailed information on all the funds becomes available, we will map out the best strategy to follow in the weeks ahead. We have no information about the other funds that support the development work for ISABELLE, but we do not anticipate further reductions."

See Film On Brookhaven House

The Brookhaven House, located on Upton Road, is an energy conserving residence that demonstrates how thermal mass materials can be used to cut heating costs in conventional single family housing. A DOE film explaining construction of the house and the design principles involved will be shown on Thursday and Friday, March 19 and 20 in Berkner Hall. Show times are 12 noon and 12:45 p.m. each day, with a brief question and answer period following each showing.

As announced in last week's *Bulletin,* a Laboratory colloquium on the Brookhaven House is scheduled for Tuesday, March 17 at 3:30 p.m. in Berkner. The film will also be shown then.

Degree Days

March

2	3	4	5	6	7	8
31.0	34.2	37.0	33.5	31.0	30.0	29.7

Retiree

Mort Rosen

Geraldine M. Laino retires March 18 from her position as Senior Research Services Assistant in Biology. She came to the Lab in 1964 and is now looking forward to devoting a lot of time to her hobby, arts & crafts. Among her talents are working in crewel and needlepoint and creating little dolls and sachets. At this point, she said, "I'm going to try to do it all!"

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Concert Memo

The Rogeri Trio will present a concert on Thursday, March 19 at 8:30 p.m. in Berkner Hall. A youthful ensemble which has met with critical acclaim, they will play a program of Mozart's Trio in G Major, K. 496; Shostakovich's Trio in E Minor, Op. 67; and Beethoven's Trio in B-flat Major, Op. 97, "Archduke."

This concert in the BERA series originally featured the Stuttgart Trio, which cancelled its American tour this season.

Billiard Bids

A second-hand billiard table will be sold by BERA to the highest bidder. The table is housed in the Recreation Building and may be inspected at that location by anyone interested, on Tuesday, Wednesday and Thursday of next week, between the hours of 5:00 and 9:00 p.m.

All written bids (minimum $100) must be delivered to the Recreation Office no later than Monday, March 23.

Dismantling and transporting the table will be the responsibility of the buyer.

To Your Health!
Stopping Nosebleeds

Nosebleeds are very common, especially in cold weather. They often look a lot worse than they really are and can usually be stopped quite easily by doing the following: sit up straight or lean slightly forward with legs crossed and elbow resting on knee or upper leg (don't lie down). With one hand pinch the soft part of the front of the nose together, just above the nostril opening. With the other hand hold a piece of ice on the bridge of your nose. Continue treatment for at least 5 minutes. If this doesn't work and bleeding persists, seek medical help.

—Caroline Kramer R.N

Camera Club

Plans for beginners' photography classes and classes on color printing will be formalized at the next meeting of the Camera Club, on Wednesday, March 25, at 7:30 p.m. in the Recreation Building. In addition, three slide shows will be presented on the following topics: Film Types and Uses, Camera Handling, and Composition.

Recreation Policy For Guests

Guest Usage

The Lab policy for guest usage of the swimming pool, gymnasium, recreation building and recreation park is as follows:

One Guest

An employee is allowed to bring one guest per visit without special permission or prior arrangement. The guest must be accompanied by the employee in order to be admitted at the Main Gate.

Two to Five Guests

Advance arrangement for two to five guests may be made at the Recreation Office. (No more than five guests per employee is permitted.) When such an arrangement is made, the Recreation Office issues an admission card stating the sponsor's name and life number, the number of guests permitted, the date of visit, and the facility to be visited. Guests must be accompanied by the employee, who will be requesed to show the admission card when entering the Main Gate.

Sponsoring employees are responsible for their guests during the entire time they are on site.

Bowling

Pink League

Deb Johnson had high series of 483 with games of 181/174 and Karen Alberico had high game with a 193. Other good games were bowled by Helen Keeley 191, Ellie Kristiansen 181, Ellie Adams 166, Maryann Larsen 159, Fran Briening 158. The Pinsplitters are still in front by three.

Red League

The Strangers shut out the Freon Loaders 11-0 with F. Griswold grossing 633. Isa Team won 8-3 in a match with the Phoubars with J. Sauls grossing 635, W. Kollmer (205) 617, R. Barberich rolling a 208 game, and E. Sperry IV 612 gross. The 76'ers took the Sandbaggers 8-3 with A. Dick grossing 620, R. Larsen (213) 616 and J. Morris 606. The Designers won 8-3 against the Sparks. J. Ferrante (228) grossed 651. The Old Timers could only manage 3 against the Pinball Wizards.

Green League

The Light Source took 11 from the Blue Jays maintaining their lead for first place. For the losers, H. Marshall rolled a 220. The Old Timers II took 8 from the Trouble Shooters with B. Galen bowling a 213. The Pinball Wizards took 8 from the Old Timers, the Sparks took 3 from the Designers and the Phoubars took 3 from Isa Team.

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40th L.I. Industrial Tournament

Representing BNL are R. Adams, R. Larsen, E. Meier, J. Morris, K. Riker. For the first week of bowling, R. Larsen bowled games of 201/213 for a 604 series.

Volleyball

Results as of 3/9/81
End of Third Quarter

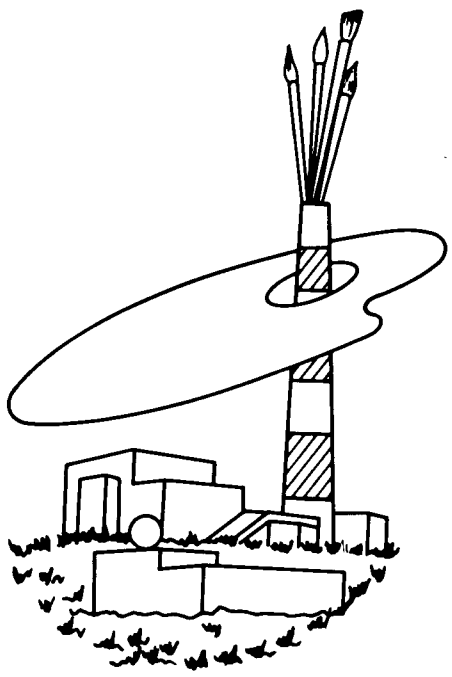
A Division

No Names	13-2
Mixed Ups	11-4
High Society	9-6
Las Bolas	6-9
Nuts & Bolts	6-9
Kings Court	0-15

B Division

Leftovers	11-4
Puff & Stuff	11-4
TNT	9-6
Oh No's	7-8
Lemufs	6-9
Semi Tough	1-14

A playoff between the Leftovers and Puff & Stuff will be held at the end of the season to determine winners of the third quarter, B Division.



Art Show Opening

Featuring the works of 24 BNL artists, the Employees' Art Exhibit will open on Tuesday, March 17, at Berkner Hall from 5:00 to 8:30 p.m. The evening opening was planned for the convenience of employees who wish to stop in to meet the artists and view their work before going home.

Come and see an interesting collection of artworks ranging from mixed media creations, to sculptures, to paintings rendered in tempera, watercolor, oil, and acrylic.

The BERA-sponsored show will continue through March 27 on weekdays from 9 a.m. to 5 p.m.

Arrivals & Departures

Arrivals

June A. Herbert ..... Personnel
Linda Matyevich ..... Energy & Env.
Raymond G. Regan ..... Plant Engrg.

Departures

Pradip K. Bandyopadhyay ..... Biology
Lawrence A. Beck ..... Biology
Robert D. McCambridge, Jr. ..... Reactor

Cafeteria Menu
Week Ending March 20, 1981

Monday, March 16

Mulligatawny soup	(cup)	.55
	(bowl)	.65
Baked ham w/orange sauce & 1 veg.		1.55
Beef chowmein & rice		1.55
Hot Deli — Roast Beef	(on bread)	1.65
	(on roll)	1.75

Tuesday, March 17

Split pea soup	(cup)	.55
	(bowl)	.65

St. Patricks Day Special
Choice of
Cup of Split Pea Soup or Small Juice
Corned Beef & Cabbage
Choice of Boiled Potato or Beets
Slice of Irish Soda Bread or Roll
Holiday Cake or Jello
Coffee or Tea
$1.87 plus tax

Baked fillet of fish & 1 veg.		1.55
Hot Deli — Knockwurst	(on bread)	1.60
	(on roll)	1.70

Wednesday, March 18

Old fashioned lentil soup	(cup)	.55
	(bowl)	.65
Roast turkey & stuffing w/cranberry sauce		1.55
Meatloaf & gravy w/1 veg.		1.55
Hot Deli — N.Y. style steak hero		1.80

Thursday, March 19

Cream of mushroom soup	(cup)	.55
	(bowl)	.65
Veal Madeline w/1 veg.		1.60
Spaghetti w/sausages & garlic bread		1.55
Hot Deli — Monte Cristo		1.70

Friday, March 20

Seafood chowder	(cup)	.50
	(bowl)	.70
Breaded fried fillet w/cole slaw & 1 veg.		1.60
Eggplant parmesan & 1 veg.		1.50
Hot Deli — Pastrami	(on bread)	1.65
	(on roll)	1.75

Phone Facts

The key to learning how to use the new telephone system may well be learning how to "talk" with your phone!

The new system offers so many options that some form of two-way communication is necessary to confirm that the right signals are being conveyed. Users will "talk" to their phones through **access codes** — combinations of symbols and numbers that tell the computer what features users want to employ. Phones will "talk" back to users with **tones** — tones that are **distinctive** or **interrupted** or **fast**; tones that are used for **verification** or **acknowledgement**.

Communication is dependent on the phone face having a **keypad** with twelve pushbuttons. Ten of those buttons replace the ten holes on the standard telephone dial. The * and the # are the symbols that combine with numbers to form access codes.

To see how it works, let's consider one of the features of the new telephone system: **Station Camp-on with Call Back**. The object of this feature is to save time by "camping" a call onto a line that's busy until the called phone is free and the call can be completed. Here's what happens:

The caller dials a four-digit extension by pressing four digits in the **keypad** . . . only to hear a busy signal!

With the old system, the caller would hang up and try again — perhaps several times before the call could be completed.

With the new system, the caller communicates with the phone by depressing the **hookswitch** momentarily. (The hookswitch is now used to signal the operator. With the new system, it will have other functions.) A **distinctive** dial **tone** — somewhat different than the normal dial tone —**verifies** that the hookswitch action was completed properly. Then the caller communicates further with the phone by pressing the keypad buttons "*6" — the **access code** that will program the phone to call back when the called line is free. Successful completion of this step is **acknowledged** by an **interrupted** dial **tone**. Then the caller hangs up, free to go about his or her business, knowing that every possibility is covered.

For example, if the busy phone becomes free, but the caller has become involved in another call, the program will wait to be activated until both phones are free at the same time. When this happens, the caller's phone rings first. Picking up the receiver, the caller will hear the ringback normally associated with a call that's going through successfully. When someone answers the phone, the program is completed.

In the event that the caller must leave the phone after programming it, the phone will ring six times, then the program will be cancelled.

Classified Advertisements

Autos & Auto Supplies

74 VW - 412, 59,000 orig mi, am/fm stereo cassette. LeRoy James, Ext. 4582 or 286-1615.

77 PONTIAC - Bonneville, excel cond. $2,000 or best offer. 878-8002.

68 FAIRLANE - 500 SW, 289 V8, p/s, p/b, rr, new tires, good cond. $500. 744-6423.

78 DATSUN - 200SX, polyglycoat, rustproof, under coat, 5 spd, a/c, sunroof, special int, am/fm, radials, tinted windows, rear defr, excel body and mechanically. $5,650. Terry, 281-0360.

71 AUDI LS 100 - sunroof, new tires, brakes, needs paint, battery and some minor work. $800. Tony, 281-0350.

79 CHEVY - Malibu Classic, 4 dr, V6, 27,000 mi, p/s, p/b, a/c, excel cond. $5,200. B.J. Ext. 7918 or 286-0898.

78 FORD - Fiesta, 2 dr, hatchback cargo cover, am radio, steel belted radials. Ext. 3504 or 878-0499, 878-1013 after 6 pm.

CAR STEREO - "Clarion" am/fm stereo and speakers, out of '78 Datsun 200SX, push button. $50 firm. 281-0360.

VW DUNE BUGGY - Manx body, shortened 15", 4 chrome slots, 2 white spokes, dune diggers, new wiring. Augie, Ext. 4220

72 CHEVY - van, V8, auto, carpet, panel, no rust, good mechanically. $1,550. Jack, Ext. 4100.

74 JEEP - CJ-5, yellow w/brown soft top, 3 spd, 304 eng, 11-15 tires. $2,900. 654-8278 eves.

70 BUICK - 4 dr, sedan, excel cond. Asking $550. Tony, 732-3338.

RIMS - (2) F78-14. $5. Ext. 3486.

PARTS - 1969 Chev Carryall, also '66 Merc Comet. John, Ext. 4976 or 744-4386.

67 CHEVY - Belair wgn, Hurst 4 spd, 327 eng, Holley 4 Barrel, L-60-15 tires on Corvette rims. $700. 654-8278 eves.

75 VW BUG CUSTOM - am/fm radio, new upholstery, 55,000 mi, good cond, good gas mi. $2,500. Ext. 4622 or 929-4840.

79 SUZUKI - GS850 custom seat, luggage rack, many extras, excel cond. $2,500. 981-9474.

77 FORD LTD - 54,000 mi, excel cond, fully powered, a/c, am/fm stereo, fabric seats. $2,800. Garfield, Ext. 2901 or 736-1673 after 5:30 p.m.

77 DODGE CLUB - cab pickup cap, a/t, V8, new tires, 38,000 mi. $3,200. 736-3112.

76 HONDA - Elsinore CR, dirt bike, 2 stroke, rebuilt engine, very fast. Pat, 473-8716.

TIRE - new Michelin w/w radial on GM wheel, 225x15, orig $90. Sell for $70. Alyce, Ext. 2902.

77 SUZUKI - TT500, 12,000 mi, excel cond. $850. 744-9361 eves.

72 PONTIAC - Ventura, no rust, new paint, excel mech cond. $1,500. Karl, Ext. 4068 or 698-6409.

66 WAGONEER - 4 w/d, 6 cyl. $600. Ext. 2384.

73 CADDY - all power, a/c, am/fm, reg gas, all new: trans, generator, starter and drive shaft, runs excel. $1,300. 281-6759.

69 ECONOLINE - camper, new brakes, load-levelers, batt, water pump, tires, recent trans (auto), 6 cyl, extras. Asking $1,300. 281-0360.

79 CHEVY - C10 P/U, 31,000 mi, p/s, p/b, a/t, 6 cyl, am/fm 8 trk, radial tires, slight damage l/fender. $3,800 negotiable. Ken, Ext. 2350.

77 PONTIAC - Grand Safari Wgn, V8 a/t, p/s, a/c, very good cond, reasonable mi. $4,200. Avail March 26. 744-5375.

72 COUPE DE VILLE - 472 motor, 90,000 mi, very clean inside and out, excel running. $1,200. 585-8656 eves.

69 CHRYSLER - Town and Country Wgn, good cond, reg gas, snows, p/w, p/s, stereo fm. $350 or best offer. Russ, Ext. 3059 or 744-7242.

TIRES - (2) Dunlop SP-68, radial, 155-SR14, almost new, from MGB-GT. $30. Bob Peck, Ext. 3565.

72 TRIUMPH - Daytona 500cc twin, 2,500 orig mi, stock, restored, black/ chrome, perfect! $1,500. Ed, Ext. 4447 or 821-1783.

KG TRAVEL TRUNK - and luggage rack, off '78 Honda CB750K, $100; sissy bar for Honda, $25. 286-3377 after 6 p.m.

68 MUSTANG - conv, 289 ci, a/t, $500; 1969 Ford Van, 240 ci, needs battery. $500. Ext. 4278 or 928-5684.

SILHOUETTE FARING - fits Honda custom models, $60; engine guards fits Honda CB750K, $15. 286-3377 after 6 p.m.

73 VOLVO - 2 dr, 4 cyl. 25 mpg, fuel injection, Ext. 3420 or 345-3177.

SPARK PLUG - wire sets, 4, 6, and 8 cyl. $5. Bill S., Ext. 4434.

72 DODGE DART - p/s, p/b, a/c, 22 mpg, 73,000 mi, good cond. $850. Rob, Ext. 4985 or 736-1729 eves.

8 TRACK PLAYER - Realistic, like new. Ext. 3431 or 744-9677.

CAR STEREO - Craig power play fm cassette, power booster, excel cond. $100. 281-2722.

73 CHARGER - S.E. yellow, black vinyl, p/b, a/c, new trans, 318 engine and body good cond. $1,200 or best offer. 924-0960.

75 FORD F-250 - Camper Special Pickup truck w/10½' Hornet camper slide on, self-contained, many extras. $6,500. Will sell camper separately. Ext. 4622 or 929-4840.

Boats & Marine Supplies

1976 - 15' MIRRO CRAFT - alum boat, galv Shoreline tr, 15 hp Johnson, plus accessories, used little. Ext. 3992 Or 298-4172.

25' FIBERGLASS BOAT - 225 hp Chrysler inboard f/w cooled. $7,500. 286-4504 after 7 p.m.

1965 CENTURY 21' - cabin, fully carpeted, engine shot. $250. Jim, Ext. 2957 or 286-0796.

FIBERGLASS PADDLE BOAT - 2 seater, good cond. $200. 698-3030 after 6 wkdays.

Miscellaneous

LIVING ROOM - 10 pc set, 3 tables, 3 chairs, 3 antique brass lamps, (1) 7 ft sofa, mint cond. Best offer. Ext. 2065 or 981-1327.

DISHWASHER - Hotpoint automatic, top loading, white, good cond. $50. 281-2292 after 6.

AIR TIGHT STOVE - Gibralter II, large cooking surface, brick lined firebox. Sacrifice. 475-6938.

REFRIG - Sears Coldspot, frost free w/freezer below, 14 cu ft, white, works fine, looks good. $100. Ext. 2927.

CHAIN SAW - dynamark 16 in bar, needs carb work, idles fine, stalls when revved up. As is, $50. Ext. 2927.

TV - 25" Zenith color console, med cab, excel cond, $350; med tables, (1) coffee table, 2 end tables. $110. 732-4821.

LIGHT FIXTURE - wagon wheel, wood and iron. $50 or best offer. Gail, Ext. 3338.

EASTER CANDIES - chocolate and other assorted goodies. Joe, Ext. 7636 or 924-6971.

BEIGE DOUBLE SINKS - for bathroom, good cond. $40. Terry, 499-8377.

COLONIAL SOFA - wood frame w/cushions, good cond. $75. Ext. 3995.

MOTORCYCLE HELMET - Bell, 1 yr old, white, excel. $25. Ext. 4613.

LAMBRETTA SCOOTER MANUAL - for Li series, TV 175 series, Grand Prix, J range and Luna Line. Victor, Ext. 7154.

BICYCLE - Motorbecane Touring, 21" vitus double butted tubing, high quality components. $400. Ext. 2482.

TRICYCLE - like new, $20; 8 trk tapes, $2-3; directors chair, chrome & black vinyl, $30. George, Ext. 4460 or 4453.

COLONIAL SOFA - wood frame, maple w/cushions, good cond. $75. Ext. 3995.

MAGNAVOX - Channel plus converters wide range stations including HBO. 281-3988 between 6 & 10 p.m.

BICYCLE - Ross compact 10 spd, 24", good cond. 744-5375.

KEROSENE HEATER - Noble Warm Knight, 9000 BTU's, removable tank. Best offer. Ron, 581-0468 eves.

BICYCLE - Motorbecane Touring, 21" Vitus double butted tubing, high quality components. $400. Ext. 2482.

STEREO PHONO SYSTEM - Lafayette, $50; Toaster-Oven-Broiler, GE (T26), used once, $35. Nihal, Ext. 3420 or 345-3177.

REASONABLE - Demi-Johns, wine-crocks, encyclop. Brittanica, modern sofa, chair, driftwood lamps. 669-9234 after 6 p.m.

RECORDER - GE am/fm radio cassette, Sanyo cassette recorder, Sanyo am/fm receiver, all-portable, like new. Nihal, Ext. 3420 or 345-3177.

FRENCH BOOKS - 13 different; typewriter, antique, Remington Model 10, manual, 1940's era, excel cond, works. Dennis, Ext. 4259 or 736-2534 eves.

OLD MILL - woodburning stove, Model OM55 (can use as insert) w/blower & screen, used one season, like new. $425. 331-1572 after 7:30 p.m.

SOLID OAK DESK - $50; pine bureau, $30; pine coffee table, 2 end tables, Trestle style, $150. all three; Wheel Horse tractor, 10 HP, grass cutter, $500; alum. ladder, 30 ft. $50; pine floor lamp, $40; iron stone dishes. service for 8, new. $25. 878-1630.

ELECTRIC DRYER - Apt. size, 115V, 2 drying cycles, plus fluff, like new appearance and operation. Ext. 4945.

BABY SWING - Swingomatic automatic w/2 attachments, cradle for sleeping and also regular swing, $20. Ext. 7530.

SKIS - Olin Mark IV, 195cm, excel cond. $90. 567-9025 after 6 p.m.

BAND SAW - 12", motor and stand, heavy duty, excel cond. $200. Ext. 3027 or 286-8794.

VELVET LOVE SEAT - coffee table, china cabinet, formica twin bed box, S&M excel cond. 878-4201.

BLACK LABRADOR PUPS - AKC reg. M/F. Horn, 281-0173 after 5 p.m.

GM INFANT CAR SEAT - $8; portable stone base for wood or coal stove, $20. Diane, 929-6748.

CLARINET - B-Flat Vito Model 7100 and stand, good cond. 286-1205. $125.

LIVING ROOM - 10 pc. set, 3 tables, 3 chairs, 3 antique brass lamps, one 7 ft. sofa, mint cond. Best offer. Ext. 2065 or 981-1327.

DINETTE SET - table w/leaf, 4 chairs, small china cabinet, $150; pool table 8 ft. x 4 ft. w/cues, rack for cues, cover. $150. Jim, Ext. 7772.

CENTER TABLE - Mahogany formica top, screw-on legs. $15. 924-7025.

BEDROOM SET - Queen size bed, w/mattress, 2 bureaus, night tables, excel cond. 744-4838.

PARAGON OIL BURNER - motor like new, $25; chrome kitchen table & 2 chairs plus odd chairs, $15. complete. 751-5539.

LOVESEAT - Contemporary, brown & beige. $150. Ext. 7744.

DINING ROOM - Meditt. Fruitwood, triple lighted Hutch, pedestal table, 6 chairs, excel. $750. Firm. 286-2435.

BIKE - Girl's 20" pink, excel cond. $30. 289-0753.

COMMERCIAL FREEZER - 21 cu. ft. white, 2 yrs. Up-right, Unity. $300. Charlie, Ext. 4592 or 281-1827.

TYPEWRITER STAND - & dictaphone, reasonable. 751-2867.

VIVATAR - #292 flash unit w/recharger, hardly used. $65. Jim, Ext. 4452.

POOL - 12x18 oval, all alum. siding & rail, ampro filter. $300. 475-2735.

SKIS - 160cm Voikl Methodils w/444 Salomon bindings, $50. Ext. 4192 or 744-2461 after 6 p.m.

SEWING MACHINE - Singer Stylist Zig Zag #533 in cabinet #237 w/chair, $325. new. 289-2295 after 5 p.m.

WHITE PORCELIN - knobs & self-closing cabinet hinges, various sizes. Walt, Ext. 7154.

TURNTABLE - dual model #1019 w/new Shure cartridge (78,45,33-1/3 RPM) Sell as is. $50. Alyce, Ext. 2902.

PIANO - Chickering, antique, rosewood upright, professionally restored inside & out, very reasonable. 751-4985.

AIR COND - Coldspot, 23,000 BTU. $50. 473-0537 after 6 p.m.

POOL TABLE - 8' Brunswick, all accessories, automatic ball return, mint cond. Stan, Ext. 4278.

HOUSE CONTENTS - bedroom sets, dining room, couches, tables, lamps, etc. Organ. 924-3755.

ANTIQUE SEWING MACHINE - in Treadle cabinet, $40; Colonial hanging lamp, brass finish, 5 lights. I. Merritt, 589-5126.

CAMERA - 35mm SLR, 50mm Lens, 135mm telephoto lens, 24mm wide, angle lens, auto, recharge. Flash. Ron, Ext. 2491.

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

MIDDLE ISLAND - beautiful custom built on 1/2 acre, walk to Golf course, 3 bdrms, 2 baths, country kit, mudroom, family rm, l/r, d/r, w/w, 5 appliances, 2 car garage. 924-3312 after 5 p.m.

PT. JEFFERSON STATION NORTH - non-development ranch, 100x100 lot, full bsmt, garage, new roof, walk to all shopping, R.R., theater, minutes to Harbor, beach. $38,900. 473-0178 eves.

SELDEN AREA - Lot 100x175, city water, Asking $10,000. Tony, 732-3338.

FARMINGVILLE AREA - Corner lot 60x165, fruit trees, city water. Asking $10,000. Tony, 732-3338.

NORTH SHIRLEY - Custom built Colonial on 100'x217' land, 9 rms plus many extras. $12,000 cash over; no additional fees, just move in. 924-0960.

For Rent

SHIRLEY - 3 min. from Lab, walking dist. to shopping center, 4 lg. rms., looking for a working single person or couple, no pets. $275/mo. util. incl. 281-4178 after 6 p.m.

SHOREHAM - month of July, house, walk down hill to beach, furnished, all util. $400. excel for visiting scientist & family. Ext. 2902.

MIDDLE ISLAND - 3 bdrm Colonial on Carmen's river, swim, fish, boating. Quiet area, no thru street, dishwasher, dryer, Ref/freezer, furn. or unfurn. $500/mo. + util. 924-3755.

RIDGE - 10 min. from BNL. Fully furn. & carpeted, 1 bdrm apt. $275/mo. incl. all util. Female preferred. Ext. 7996 or 929-6034.

CORAM - 1 bdrm, lg. l/r, furn., kitchen, bath, a/c, patio, fp, w/w, quiet single occupancy. 928-8071.

N. PATCHOGUE - large studio apt, eik, full bath, w/w, cablevision, priv. entr. single only, no pets. $265. pays all. Ken Orsini, Ext. 3354 or 289-3917.

RIDGE - 3 bdrm ranch on approx. ½ acre, fenced yard, appliances, a/c, Don M. Ext. 2022 or 878-2215 after 6 p.m.

BELLPORT - 2 bdrm apt, 1 person only. Chris, Ext. 2907.

Wanted

REPAIRS - on wooden chairs, including caning; also E78x14 tires, in good cond. Morris, Ext. 4188.

MOORING BUOY - I have anchor and chain. Art, 588-3055.

RIDE - BNL to Stony Brook, every Tues. Thurs. 8:30-9:30 a.m. Pay gas. M.K. Ext. 2285 or 345-3222 after 5.

STOCKADE FENCING - 5' or higher; sm. boys' bike. Liz, 286-8563

FURNISHED APT - for mature single man, close to Lab & reasonable, must be clean. Need for May. Sheldon, Ext. 3354.

GM CAR SEAT - for small child. Artie, Ext. 4278 or 325-0743.

SLIDING GLASS DOORS - 5' or 6'; also Volvo 122 Station Wgn, running or not. H. Sauter, Ext. 3783.

BICYCLE - adult sz., man & woman. George, Ext. 2699.

HOUSE - in Bellport Village south of So. Country Rd., 3 bdrms. Ext. 7637 or 286-4639 eves.

DRIVER - a Bayside Queens resident will pay driver for long term riding arrangement to & from Lab. Ext. 3671.

SAILING DINGHY - 8' under 100 lbs. Pete, Ext. 4782 or 289-7218.

BOAT TRAILER - for 20' boat, any cond. Ext. 2384.

PLUMBING TOOLS - used. 281-7986.

ITALIAN LESSONS WANTED - English lessons given in exchange. 744-3853.

ROTOTILLER - any make, any cond, reasonably priced; Pressure canner w/gage; 10" table saw with or w/o motor & stand. Bob, Ext. 3565 or 924-9210.

POWER LAWN MOWER - cheap but working. Don, Ext. 3493.

USED FORD BATTERY - Call Diane, Ext. 2882/3.

CUB SCOUT UNIFORM - shirt, any sz/cond., need left front panel. Dennis, Ext. 4259 or 736-2534 eves.

BUSINESS ASSOCIATES - excellent income potential, tax advantages, no investment required, for appt. call 698-5861 after 7:30 p.m.

PIANO - Ext. 3443.

Car Pools

MASSAPEQUA/SO. FARMINGDALE - and vicinity. Plotkin, Ext. 4717.

LAKE GROVE - wish to join car pool as paying rider. Walter, Ext. 3956.

MILLER PLACE/ROCKY POINT - to BNL, Van pool w/one vacancy available. Don, Ext. 3284.

Lost & Found

FOUND - gold watch, top of trailer A.G.S. May have been lost a long time. E. Bihn, Ext. 3840.

Services

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

ROTOTILLING - $15/hr. Free garden consultation & planning w/every job. Bob, Ext. 2957 or 878-4556.

FIRESIDE CHIMNEY SWEEPS - fireplace & stove chimneys. Protect against chimney fires. Insured. Lab Discount. Bill, 584-6425.

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

1980 TAX RETURNS. - by experienced tax accountant, low fees, eves & wkends. Bob, 475-3981.

WILL BABYSIT - for working mothers, my home. Vicky, 289-1665.

WEDDING PHOTOGRAPHS - experienced, several packages to choose from, reasonable prices. Rick, Ext. 2012 or 467-1090.

PAINTING - of ceilings, walls, trim, etc. Reasonable rates, neat professional work. 399-2076 anytime.

LOG SPLITTING - by machine, no job too big or small, very reasonable. HR 2-1875 after 5:30.

SIGHT SEEING FLIGHTS - Aerial photogr. Long Island, Conn., New York, Modern all weather aircraft. Ron, Ext. 2491.

POODLE GROOMING - 473-6432.

SAND BLASTING TRAILERS - chassis, any kind equipment, with or w/o primer coat, reasonable rates. 744-3968 after 4 p.m.

MOTORCYCLE ACCESSORIES - for street & dirt. Best prices, Lab discounts. Ext. 2311.

BABYSITTING - will babysit child, any age. 928-6930.

KEROSENE HEATER REPAIRS - most brands, overhauls, parts, wicks, ignitor coils, siphon pumps. Ron, 581-0468 eves.

HOUSE PAINTING - outside & in, qualified, insured, reasonable. Call Bob, 289-7657 after 6 p.m.

EXPERIENCED BABYSITTER - available 5 min. from Lab., near Ridge. Am a non-smoker. Reasonable rates. 929-8809.

HOUSE CLEANING - professional results, reasonable rates, references. 744-0821.

1980 TAX RETURNS - by experienced Tax accountant, low fee, p.m. & wkends. Bob, 475-3981.

ROTOTILLING - new or existing gardens, lawns, $18/1000 sq. ft. Dave, Ext. 7517, 288-3011 eves.

PILLOWS - custom patchwork by Un-Hee. 736-2534.

PET BEHAVIOR CONSULTANTS - Problem w/a pet? Call a professional for advice. 399-3882.

PROFESSIONAL TYPING - Ext. 2484 or 289-9560 after 6 p.m.

PROFESSIONAL INCOME TAX - service by experienced preparer. Jack, Ext. 7942 or 864-2236.

CARPETS INSTALLED - repaired, quick dependable service, free estimates. Jim, 821-0187 after 5 p.m.

HANDCANE - and fiber rush. Quality work at reasonable prices. Jim, Ext. 3307 or 821-1704 eves.

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

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.