PPL HOTLINE

PRINCETON PLASMA PHYSICS LABORATORY

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# TFTR Limiter Plate Program

Final fabrication of the armor plating that will protect both the TFTR vacuum vessel walls and bumper limiter is nearing completion.

The basic design work on the TFTR protective armor began as a joint venture between PPL and General Atomic Technologies, Inc. in 1979. General Atomic fabricated approximately half the amount of the internal protective plate armor required; it was installed in the vacuum vessel during the last shutdown, in preparation for initial TFTR neutral beam experimentation.

A vendor competition for the design and fabrication on the remaining plates was held last year. A good project team, relatively low cost, and the ability to meet a short schedule helped McDonnell-Douglas win the contract.

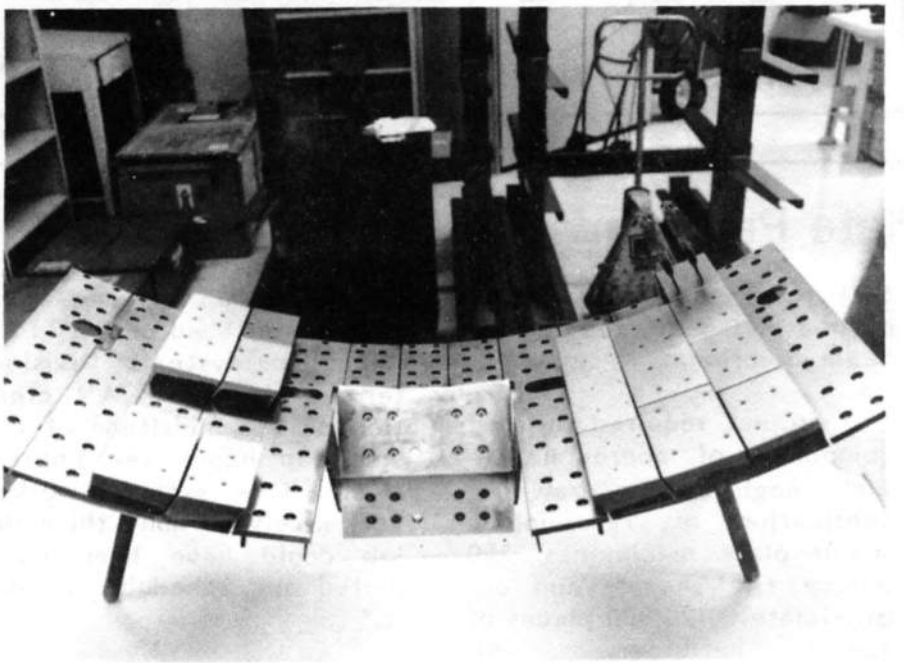
The current project involves fabricating an additional 25 square meters of carbon tiles and associated backing plates. Each plate is composed of high-strength steel, with tiles attached to its front side and water cooling tubes brazed onto the reverse side. The 69 plate assemblies and 2400 graphite tiles, which should be installed within TFTR during its next vacuum vessel opening, will help protect the vessel walls during plasma disruption and neutral beam injection.

The project required the development of approximately 600 engineering drawings, fabrication of 129 unique major plate machinings, 550 unique tile shapes, and approximately 120,000 pieces of special hardware. All McDonnell-Douglas detailed tile design work was completed on a computer-assisted design (CAD) system; fabrication was accomplished by a computer-assisted manufacturing (CAM) system. Dr. Roy Little, head of the TFTR Technical Systems Division, termed the CAD/CAM creation of the multitude of tile sizes and shapes "very impressive. (The system) worked very nicely. I don't think the job could have been completed on schedule without it."

Dr. Little recently visited McDonnell-Douglas facilities in St. Louis to observe test fittings of several carbon tiles

*McDonnell Douglas Project Manager Clarence A. Trachsel, TFTR Technical Systems Division Head Roy Little, and McDonnell Douglas Advanced Device Development Manager Dale A. DeFreece (left to right) assembling final TFTR protective plate tiles at McDonnell Douglas.*

to their steel backing plates. The $9 million project should be completed on schedule, with delivery of the first completed protective plates expected this month.



*A TFTR protective plate, which will be used to protect the vacuum vessel wall from plasma disruption and neutral beam impingement.*

## Check Cashing

Personal checks for $15 or less, made payable to M. Doran, may now be cashed in Module II.

Mary Jane German will be available in the Module II reception area to cash personal checks from 8:30-10 a.m. and from 3-4:30 p.m. daily. She will also be selling postage stamps; however, stamp purchases are limited to two stamps per customer.

Although both these servives were previously provided throughout the day at the C-Site reception desk, they are now being provided ONLY during the hours listed above.

## Golden Golfer

Subcontractor administrator Bill Caldwell became a golden golfer when he won a golden putter for shooting a hole in one.

Bill's prize came from an Anheuser-Busch-sponsored contest for golfers at the Princeton Meadows Country Club. Players who aced a designated hole received golden putters from the company.

Bill's ace came on the sixth hole of the country club course, which is a 160 yard par three hole.

## Bus Schedule

In an effort to better serve graduate students and PPL employees, two trips between downtown Princeton and the Forrestal Campus have been added to the Princeton Area Transport (PAT) bus schedule.

The PAT bus will leave the Graduate College from the parking lot next to Cleveland Tower at 8:15 a.m. daily. The bus leaves Lawrence Apartments at 8:20 a.m., and departs from the Butler Apartments stop on Hartley Avenue at 8:30 a.m. The bus arrives in front of the LOB at 8:45 a.m.

On the afternoon run, the PAT bus will leave the LOB at 5:25 p.m., arrive at Butler Apartments at 5:35 p.m., stop at the Lawrence Apartments at 5:45 p.m., and return to the Graduate College at 5:50 p.m.

## Unemployment Compensation

New Jersey officials have announced that the maximum weekly benefit rate for unemployment compensation has been increased to $192.00, and temporary disability has been increased to $180.00, effective October 1, 1984. Effective January 1, 1985, the maximum weekly benefit rate for temporary disability will be increased to $189.00

Questions about unemployment and temporary disability benefits should be directed to Mary Moore, ext. 2043, or Eleanor Schmitt, ext. 2046.

*The PPL HOTLINE is issued by the Princeton University Plasma Physics Laboratory, a research facility supported by the United States Department of Energy. Correspondence should be directed to PPL Information Services, Module 2, C-Site, James Forrestal Campus, ext. 2754.*

## Training Courses

The following Health and Safety training courses are scheduled for November:

| Course | Responsible | Date Scheduled |
|---|---|---|
| New Employee Safety Orientation | M.A. McBride<br>Ext. 3468 | November 28,<br>9-10 a.m. |
| Chemical Handling<br>(Support Engineer Physicists) | K. Semel<br>Ext. 2531 | November 13,<br>9 a.m.-noon |
| Respiratory Protection | K. Semel<br>Ext. 2531 | November 20,<br>9-11:30 a.m. |
| Back Injury Protection | M.A. McBride<br>Ext. 3468 | November 15,<br>8:30 a.m.-noon |
| Rigging | H. Miller<br>Ext. 3109 | November 7,<br>10 a.m.-noon |
| Fire Extinguisher Training | S. Larson<br>Ext. 3166 | November 13 and 27<br>2-3:30 p.m. |
| Cardiopulmonary Resuscitation<br>(CPR) | S. Larson<br>Ext. 3166 | November 26, 28 and 30<br>9 a.m.-noon OR 1-4 p.m. |
| Self-Contained Breathing<br>Apparatus | S. Larson<br>Ext. 3166 | November 27,<br>9:30-11:30 a.m. |

Employees must obtain permission from their immediate supervisor to attend any course listed. Supervisors must call the responsible instructor to enroll their employees.


Virtually all chemicals used at PPL constitute hazardous wastes upon disposal. These include solvents (such as Philsolve, Inhibisol, J88, acetone and so on), uncured epoxies, varnishes, nonwater base paints, acids, caustics, alkali metals, and asbestos. They CANNOT be disposed of down the drain, in sewers, or in dumpsters.

Identification cards, available at both stockrooms and from Materiel Control, are an integral part of PPL's hazardous waste program. Since the lab's hazardous waste contractor cannot dispose of an unknown substance, proper labeling of such waste is essential.

When disposing of any substance, make sure you know what the waste is. It should be placed in a suitable container and properly labeled; unlabeled containers will not be disposed of. It would be wise to keep the original container for the chemicals and use it to hold any waste material.

If the waste is hazardous, fill out both halves of the hazardous waste identification card as completely as possible for each waste. Leave the space for the number blank, but be sure to include the location

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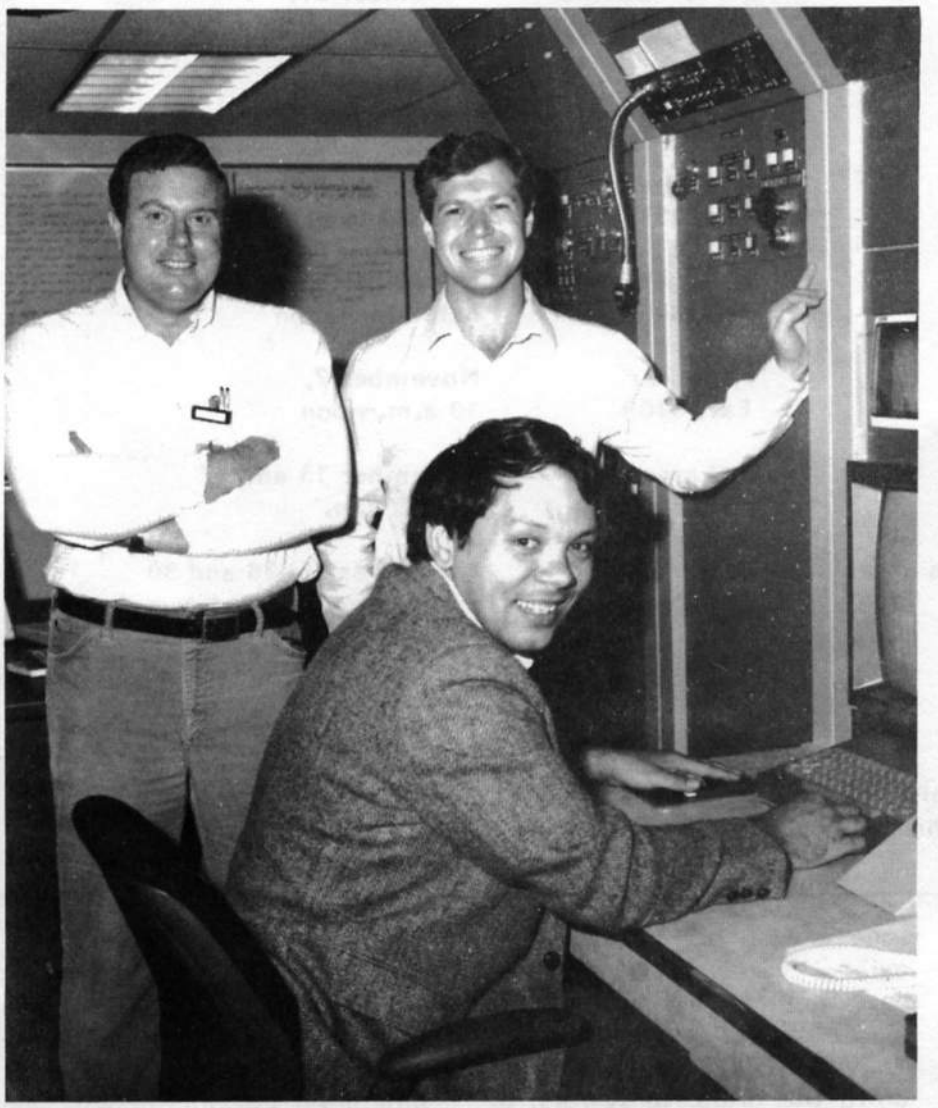
where the waste can be found. Attach the top half of the card to the container and send the bottom half to Material Control. Material Control will then contact you to arrange pickup of the waste material.

If you are not sure whether a substance is a hazardous waste, contact Ken Semel of Occupational Medicine and Safety at ext. 2531, or Material Control at ext. 2328.

## Spotlight On: Chief Operations Engineers



*Chief Operations Engineers (standing, left to right) John McCann, Mike Viola, and Mike Pereira (seated).*

Keeping a major project like TFTR operating on its stringent experimental schedule calls for careful coordination of resources. The responsibility for maintaining that delicate balance lies with a trio of chief operations engineers (COEs).

While the overall TFTR project goal has been established by the Department of Energy, monthly experimental goals are set by Don Grove, Dale Meade, and Jim Sinnis. Chief operations engineers Mike Viola, Mike Pereira and John McCann then orchestrate the facilities, personnel, and equipment required to achieve the daily and weekly portions of those goals.

That may sound simple, but in reality it demands the reflexes of a juggler. According to COE John McCann, a successful chief operations engineer must contend with the rapid tempo of operation which a large machine requires, be able to hold two or three conversations at once, and keep track of a plethora of paperwork. "A COE must be capable of thinking on his feet, considering the safety of staff and equipment, and responding appropriately to developing situations," he maintains.

Since TFTR operations alternate a test week with an operations week, those situations may involve reconciling conflicting scheduling demands with the overall experimental plan. John explained that "it's the chief operations engineer's job to stand back and keep the big picture in mind while he coordinates the little things that make the big picture happen. However, you can't get so involved in the little things that you lose track of your objectives."

"The chief operations engineer is the focal point for operations," John continued. "We're expected to think of things that could go wrong, and to take the necessary action to see that they won't. It's a hard job, and we haven't

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got it perfected yet -- but we're working on it!"

Mike Viola pointed out that as a COE, "Keeping track of details has to be something you like to do. You have to have a knack for it, coupled with a rounded professional background. The COE must constantly be thinking of how he can most effectively use every minute of time, given the available resources at his disposal. For example, if the diagnosticians need to access the machine areas for an adjustment or repair during the course of a run, the COE must use knowledge gained from past experience, estimate the downtime, and take advantage of it by fixing other problems which may have cropped up earlier and been placed on the back burner."

"Fortunately," Mike added, "the TFTR technicians are an extremely dedicated group of individuals who put the operations of TFTR high on their priority list. It is through their willingness to fully respond on a monent's notice that we can achieve the maximum use of time."

Mike Pereira pointed out that "We're dealing with operation of the machine on an hour to hour basis, and objectives can change at any moment. We can also be faced with conflicting requests for facility or manpower use. So we have to rely on each other to keep on top of the situation."

All three COEs are former Navy men, and feel their service training prepared them for their current position. "Being in the Navy develops a certain discipline, an approach to operations, and a certain formalized chain of command that this position requires," John contends. "That's important when you're operating big machines like TFTR, as opposed to projects where the same people design, build, and run the machine."

One of the Navy carryovers that has been most helpful to the trio is the pass-down log. "Since we each work on a different shift," Mike Viola said, "it's difficult for all of us to individually keep track of the large scope of operations because information may come in to any one of us. That's why we established the pass-down log; it ensures that the man on the next shift knows what problems were encountered on the shift before his, what he can expect to have to deal with, and any changes in the schedule." The pass-down log also serves as a cross-reference document, detailing what occurred on a specified shift on a given day.

One COE also participates in a rollover meeting every Monday, during which goals are incorporated into the operations schedule, and suggestions on how to efficiently implement the schedule in light of the time and resources available are made.

This summer's TFTR vacuum vessel opening emphasized the importance of teamwork among the COEs. Once the decision to open the vacuum vessel had been made, Mike Viola recalled, "John prepared a preliminary opening schedule off the top of his head, and I broke it into segments. Mike Pereira kept the ball rolling inside the vacuum vessel. We stayed on that schedule to the hour until we began doing leak checking."

TFTR was opened on a Sunday morning. On Wednesday, the vacuum vessel was closed and pumpdown to vacuum began. Only half a dozen port covers had been removed during the opening; time for replacing and leak checking those covers had been incorporated into the schedule. But stresses encountered while releasing the machine from vacuum, allowing it to attain normal pressure, and pumping it down to vacuum again are suspected to have caused two other leaks to occur in areas untouched during the opening. Finding and sealing those leaks proved to be a major undertaking.

Once all leaks were sealed, the heating system was turned on to allow the vacuum vessel to "bake out" at approximately 150°C. Pulse discharge cleaning followed, during which low-power plasmas are created every four to eight seconds. The machine was cooled, and despite the delays encountered during leak checking, operation resumed just 12 days after shutdown.

"It was a good experience for us," John reported some weeks later. "We devised a plan, and executed it as efficiently as possible. That was really gratifying."

In addition to their duties as chief operations engineers, all three men have other responsibilities. John is formalizing TFTR procedures. Mike Pereira's specialty is the vacuum vessel internals, while Mike Viola deals with crew technicians and machine grounding.

The trio share another responsibility that "gives us all

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telephone calls in the middle of the night," according to Mike Viola: alternating as TFTR duty officer. During nonoperating periods, the duty officer makes frequent contact with key personnel in any TFTR sections that might be conducting ongoing test programs. The duty officer also attends scheduling meetings, ensuring his awareness of up-to-the-minute scheduled activities. The duty officer is contacted at the beginning and end of scheduled test activities, so that communication, coordination, and safety are improved throughout the project.

During actual machine operations, the "TFTR Operations Hotline" (ext. 2300) or the duty officer's pager is available for any calls requiring immediate coordination or configuration changes at D-Site.

All three are also working to standardize the duties of their position by acting as troubleshooters for each other, reporting on breakdowns and failures so the day's plan can be adjusted accordingly. "Our days are becoming more routine as we work to make them that way," John said.

## Tour Guides

The torrid pace set this spring by the laboratory's tour program cooled a bit over the summer months. A total of 703 visitors viewed PPL's progress between July and September, with almost half of them arriving in July. We'd like to thank the following guides who kept those tourists in tow:

JULY

Jeff Alton
Dave Ciotti
Diane Carroll
Fred Dylla
John Doane
Ernst deHaas
Austin Erlich
Nate Fisch
Cliff Fortgang
Melvin Gottlieb
Harold Johnson
James Kamperschroer
Naren Kokatnur
Sid Medley
Tom Meigham
George Martin
Dale Meade
Donald McNeill
Michael Periera
Greg Rewoldt
Hank Rozenbroek
Stan Schweitzer
Terry Snyger
Irving Zatz

AUGUST

Kees Bol
Mark Bowles
Charlie Bushnell
Diane Carroll
John Coonrod
J. Caulavan
Fred Dylla
Ernst deHaas
Cliff Fortgang
Ralph Izzo
John Johnson
Robert Kress
John Lovberg
Milt Machalek
Hank Rozenbroek
Robert Smart
Wolfgang Stodiek
Mike Ulrickson
Shoichi Yoshikawa
Irving Zatz

SEPTEMBER

Mark Bowles
Diane Carroll
Joseph Cecchi
Robert Ellis
Fred Kloiber
Naren Kokatnur
George Levitsky
Ed Lawson
George Martin
Lorand Meray
Holt Murray
Raj Mukherji
Ernest Neischmidt
Jim Reedman
Jean Schwob

## Womanspace Aids Abused Women

United Way Offers Battered Women Places to Call for Help

Once every 18 seconds, a woman somewhere in America is beaten by her husband, boyfriend or companion. In fact, violence occurs in one out of every two marriages.

Women and children, often helpless to defend themselves and without financial resources to escape, have been battered -- and sometimes killed -- in 58 percent of New Jersey homes.

The victims of domestic violence are of all ages, racial, and ethnic groups. Violence occurs among the wealthy, educated, and privileged as often as it does among the poor and disadvantaged.

Women who are dating or living with individuals displaying characteristics of childhood violence, alcohol or drug ad-

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diction, insecurity, dislike of women, emotional problems, cruelty to animals, or family pressures probably need outside help.

In the past year, about 250 women living in the Princeton area contacted the Mercer County Women's Center for help and information. About 30 women from the area actually fled to the center for temporary shelter.

The Center, also known as Womanspace, is a member agency of the United Way-Princeton Area Communities. The United Way began funding the agency because Womanspace offers alternatives for battered women in the United Way's 13-community service area.

Abused women can contact Womanspace 24 hours a day, seven days a week, by calling 609-394-9000. They can also go directly to police stations or hospitals, where Womanspace can be contacted.

Services offered by Womanspace include:

Shelter -- Emergency temporary, safe housing for women and their children is available for up to six weeks .

Telephone Hotline Referrals -- A trained counselor will respond immediately to a request for shelter admission, counseling services, legal aid, child abuse services, and referrals to other agencies.

Counseling and Advocacy -- A staff member will aid women with transportation to and assistance with medical, legal, welfare, housing, and employment appointments.

Child Advocacy -- The child care staff can assess the health and educational needs of children of battered women who stay at the shelter.

Support Services -- Meetings are held on nutrition, legal assistance, health, parenting, and living independently.

Children of battered women are also welcome at Womanspace. If child abuse is part of the problem, however, additional help is available by contacting the 24-hour Child Abuse Hotline of the State Division of Youth and Family Services (DYFS). The Hotline number is 800-792-8610; the Mercer County district office of DYFS can also be reached by calling 609-984-6300 between 9 a.m. and 5 p.m.

In addition, information on any issues related to women is available from the Women's Referral Center. A state service, the Center can be reached 24 hours a day by calling 800-322-8092.

Many of the services of Womanspace are possible thanks to the financial contributions made by people and businesses to the United Way.

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## Volunteers: People People

*The following volunteer listings were supplied to the HOTLINE by the Voluntary Action Center (VAC) of Morris County. For further information on any activity, contact the VAC at 201-538-7299.*

Do you have professional experience in filing health insurance claims? If so, you can help families with seriously ill members cope with the maze of health insurance forms. Offer your aid on an 'on-call' basis.

Are sports your game? Then lend your expertise to a youth organization dedicated to sports for handicapped children. The post requires attendance at monthly meetings, and arranging one aspect of a sports meet.

Are you a media maven? Writers, editors, layout specialists, graphic artists, or photographers are in demand to assist nonprofit organizations in publicizing their services. Assignments are matched to your availability and skill. Share your talents and build your portfolio; both you and the community will benefit!

*The following volunteer listings were provided by the Princeton Area Council of Community Services, a member of the United Way - Princeton Area Communities. For further information on any volunteer position, contact each agency directly.*

Interim Homes, a service of the Princeton YWCA, offers emergency shelter for adolescents who need a temporary alternative living arrangement due to stressful home situations. A youngster is placed with an interim family within the community for up to 30 days while reconciling family problems through counseling. Families, single parents, or single individuals of any age who will open their homes to young people in Princeton, Hopewell, Montgomery, East and West

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Windsor, and Hightstown are being sought. Placement in an interim home is at the convenience of the interim family on a regular, once a year, or emergency basis. Volunteers are also needed for the group's advisory commitee, which meets approximately four times yearly. To offer your assistance, call coordinator Linda Loberg at 609-924-5571, ext. 20.

The Princeton Senior Resource Center offers hospital and home visits, housing aid, Saturday hot lunches, and a variety of counseling services to the elderly. The Center is seeking volunteers with talents in music, recreation, or arts and crafts, as well as assistants to help with the lunch programs, transportation, or food shopping. Call 609-924-7108 to lend a hand.

The Princeton Joint Commission on Civil Rights is responsible for eliminating illegal discrimination on the basis of race, religion, color, sex, age, and national origin from every phase of public and community life. The Commission is active in housing, public accommodation, and employment, and maintains a skills bank for unemployed or underemployed women and minorities. The Commission needs volunteers with typing, filing, and telephone skills, as well as someone to maintain the Commission's scrapbook. To get involved, call 609-924-7138.

*The following volunteer opportunities have been supplied by the Voluntary Action Center of Middlesex County. For further information about any listing, contact the VAC at 201-249-8910.*

A new shelter facility for single women and homeless families in Edison needs tutors to help children with homework, recreation leaders for children and adults, workshop leaders, and housing volunteers to aid individual families in obtaining housing. Training is available.

John F. Kennedy Hospital is seeking aides to watch children in the pediatric rehabilitation department during classes on Mondays from 7 to 9:30 p.m. Workers who will unload trucks, assist buyers, oversee try-on booths, and help keep merchandise neat are also needed for the hospital's November 30 winter new clothing sale.

The Arthritis Foundation is searching for an assistant volunteer coordinator, assistant program coordinator, and speakers for their speakers bureau. Training is available.

Many agencies are in need of tutors for youngsters and adults, and drivers to transport sick or elderly clients to doctor's appointments. To offer your help, contact the VAC.

## Transitions

The HOTLINE staff congratulates these staff members, who have recently become proud parents:

Rich Borusovic and his wife Diane, whose son Jonathan Ryan was born September 20;

Tom Carr and his wife Marjorie Lynne, whose daughter Kimberly Ann was born September 24;

Jim Taylor and his wife Candy, whose daughter Ashley was born October 8.