This year our March schedule includes two meetings at Itasca Country Club. On March 9 we will be having our regular meeting. The main subject will be “Robot Simulation and Offline Programming” and a very timely coffee talk will be on “Tax-Advantaged Investing for 1993”. We will also be awarding 25-year plaques. Then on March 23, we will be hosting a joint meeting with the local IEEE section. The subject of that meeting will be about Hybrid Electric Vehicle Technology with a coffee talk on Low-Loss Superconducting Bearings and High-Efficiency Flywheels. The Activity Vice Chairs organizing these meetings are Linda Gogola and Bob Larsen. Both of these meetings should be very interesting so please come out and support the section and the organizers.

Also let us know how we can better serve you as members. On March 9 we have scheduled a second strategic planning workshop to be moderated by Becky Fadick from SAE International. Our objective will be to clarify our mission and set goals for the Chicago Section. We need your input so contact any board member with any ideas that you have for the Section.

The Section nominating committee is working diligently on developing a slate of officers and board members to serve the Section next year. If you are interested and willing to help, please contact one of the present board members. If you didn’t save the list of Governing Board members from prior issues, contact the Section Office at 708/663-0010.

Officially, I will also remind you that any five or more members of the Chicago Section, in good standing with SAE, may form a special nominating committee and present a competing slate of officers and board members. Such special nominating committee must present its list of consenting candidates to the Governing Board at least 40 days before the final meeting of the year, which this year is planned for May 11. Thirty days before the final meeting, a ballot would be mailed to all Section members and votes must be counted in time to announce the results at the final meeting.

Jim King
Chairman, Chicago Section
MEMBER HIGHLIGHTS

This page in the Chicago Section News is being devoted to people in our industry who deserve recognition for their accomplishments or involvement in a special event. The person’s employees, co-workers, or peers may submit information about the individual to the Editor of the Chicago Section News. *Deadline for each issue is five weeks before the meeting date (but it is definitely permitted to send in News material earlier than that).*

**James W. Macqueene** has BS and MS degrees in Agricultural Engineering from Purdue University. He is currently employed by DAI Technologies, Inc. (formerly Dohner & Associates, Inc.) and is a member of their technical staff. On November 10, 1992, Jim was awarded United States Patent No. 5,161,405 for developing a system which provided Clutch Pedal Position Sensor Continuous Calibration.

Prior to receiving his degrees in 1979 and 1981, he worked summers at John Deere Dubuque Works and the Sperry Research Center, Sudbury, Mass. After receiving his degrees, he was employed by International Harvester Farm Equipment Engineering Center in Hinsdale, Ill., then at U.S. Robotics, Inc., in Lombard, Ill. In March of 1984 he joined DAI Technologies.

Jim is a member of American Society of Agricultural Engineers, SAE International, Society for Experimental Mechanics, and Chicago Lacrosse Club.

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**MEETINGS CAN--**

“Bring people with divergent points of view into face-to-face contact for discussion, airing differences and resolving conflicts.

“Disseminate information to fairly large groups of people, with an opportunity for on-the-spot questions, explanations and feedback.

“Create a participative work environment through encouragement and sincere acceptance of ideas, suggestions and complaints from all segments of the organization.

“Focus a group’s attention on a specific, critical problem for immediate resolution.”--Drake Business Review
**J I CASE**

What is J I Case? More appropriately, who is J.I. Case? How do these questions relate to the Chicago Section of the Society of Automotive Engineers?

Jerome Increase Case founded the J I Case Company 150 years ago. 1992 has been a year of parades and celebrations across the United States to honor this milestone. He was what we would call an entrepreneur today. In the company of Cyrus Hall McCormick, John Deere and others, the roots of modern day farm equipment manufacturing were formed.

Under the watchful eye of Old Abe, the company logo, which is an eagle perched on the world globe, products such as threshing machines, steam engines and luxury automobiles were developed. Today, loader backhoes, Magnum and Maxxum Tractors, wheel loaders, Axial Flow Combines, crawler tractors, Cyclo Planters, excavators, and the Cotton Express light the marquee of innovative products.

Quality has been the cornerstone of Case since its very beginning. A favorite story related to a threshing machine on a Minnesota farm that a dealer and plant mechanic were unable to repair. J.I. Case travelled from Racine, Wisconsin (corporate headquarters) to attempt to repair the thresher. Unable to make the repairs and disgusted that such a product left his factory, Case doused it with kerosene and set it on fire! The next day, the farmer received a new Case Thresher.

Case’s presence in the Chicago area is through its Technical Development Center in Hinsdale. Engineers working in this facility, operated by International Harvester Company until 1985, represent the third largest company membership in the SAE Chicago Section. T.D.C. houses the heart of agricultural equipment and component engineering for the company. Ten acres under roof accommodate the design, prototype and test functions.

**April 13, 1993, will afford a unique opportunity to tour Case’s Technical Development Center as part of the Chicago Section’s monthly meeting schedule. A guided afternoon tour will be followed by an evening program at Ashton Place in Willowbrook. The technical presentation will focus on the hows of cotton harvesting which should be of universal interest.**

Mark April 13, 1993 on your calendars now and don’t miss this interesting event.
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DynaForce, a grid based tactile measurement system, is composed of data acquisition hardware, software, and thin flexible sensors. The sensors are composed of rows and columns and cross to form a grid; each intersection of the grid is capable of measuring the contact pressure. Scanning across the grid at rates as high as 100 times per second allows contact pressure distribution maps to be viewed in real-time on an IBM AT-compatible computer. Since its introduction in 1991, DynaForce has found its way into many engineering and development labs in the transportation industry. (Under License from Tekscan, Inc., Boston, MA)

Force Imaging Technologies is introducing a new real-time force sensing product line as a complement to their DynaForce grid based tactile measurement system. The new product line UniForce, uses thin flexible single point sensors to measure contact forces. Due to their minimal thickness of .004 inches (.1mm), the UniForce sensors can be located where conventional load sensing devices cannot. The UniForce Experimenter’s Kit is the initial product in the UniForce product line. Like DynaForce, the Experimenter’s Kit is designed to work with IBM-AT compatible computers. Offered at under $1,000, the Kit contains hardware and software as well as a variety of UniForce sensors. This product will afford the user a unique real-time force sensing tool for research and development. The Experimenter’s Kit can also serve as a platform for evaluation of more sophisticated applications of the technology.
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When I saw the following in the January 20, 1993, issue of the "Washington Newsletter" of the National Tank Truck Carriers, Inc., it reminded me of some SAE papers I have read:

"Wanted--A Government Where English is Spoken--...we offer the following extract from a government report (we hasten to note that it IS your government):

"Is there a potential technological, or sociotechnological design for strategic objectives that might induce a convergence of the paradigm with each reauthorization?"

"We think it means, 'Is there a better way to do this?' to which we say, 'Yes.'"
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Recently I received an unusual wall plaque that is put together by J. Mayer & Associates. It is a collection of “Natural Highs”. The following is a partial list of some of them:

“Having a wish come true. Payday. A job well done. When your boss says, “Perfect”. When your dog jumps around because he’s glad to see you. Watching a child do something for the first time after you taught him. Working a successful project with a good friend. Lying in bed and listening to the rain outside. Feeling when the fish takes the bait and is off and running. White water rafting. Seeing someone you love do something outstanding. Making the winning score. Being told you did an excellent job by your peers. A new hobby. An unexpected present. Hitting the lottery. Solving a problem. A job well done. A great idea. The quiet after a snowfall. Hitting the winning run in the bottom of the ninth. A letter from a friend. The first spring flower.”

There are many more on the plaque and I am sure each of you can think of a “Natural High” you have experienced. If you would like to share it with us, please send it to the Editor, SAE Chicago Section, 2460 Wisconsin Avenue, Downers Grove, IL 60515.

From INDUSTRY WEEK, February 1, 1993, issue:

“Free Access to Technology

A continuing frustration of industry has been its inability to get its hands on the storehouse of technology locked up in more than 700 federal laboratories, whose 100,000 researchers conduct $24 billion of research annually. But now that access is easier. The National Technology Transfer Center, located at Wheeling (W.Va.) Jesuit College, has opened its doors to help commercialize the labs’ research results. Companies can tap into the Center’s database--for free--by calling 800-678-NTTC.”
For an engine to stand up to the tough grind of STOP GO IDLE, it has to be tough. International diesels constantly strive to set the standards for medium diesel engines—and that's made us the NUMBER ONE producer of truck diesels in North America. Operators trust International diesels because they deliver when others just talk.

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If you're looking for the medium duty diesel engines built to handle the tougher stop go idle applications... you've just found them—INTERNATIONAL DIESEL ENGINES.
ROBOT SIMULATION AND OFFLINE PROGRAMMING

by Christopher J. Nehrbass

What is robotic offline programming? Concisely, it is a modeling system that allows users to simulate robot movements. What benefit can be realized from this tool? Robot availability is increased as manufacturing becomes more responsible to engineering changes. Mr. Nehrbass's presentation will discuss the implementation of offline programs, while considering the technical and managerial issues.

CHRISTOPHER J. NEHRBASS is a Manufacturing Systems Engineer, Construction and Mining Products, for Caterpillar. He holds both a BS in Industrial Engineering and an MS in Manufacturing Systems Engineering.

COFFEE TALK

TAX-ADVANTAGED INVESTING FOR 1993

by Mary Kay Kluge

Are you paying too much to Uncle Sam on April 15? As we struggle with our 1992 tax returns, we implement now to take advantage of the tax laws in 1993 to lower our tax bill?

Ms. Kluge will discuss Tax-Free versus Tax-Deferred investment alternatives, the effects of high rates and your tax brackets, and strategies to use to keep more of what you earn!

MARY KAY KLUGE is an Associate Vice President with Dean Witter Reynolds in Naum’s Planning and Investments and consults with individuals, as well as business owners, to define their financial goals. Ms. Kluge earned her Bachelors Degree in Economics from the University of Dayton and her MBA from Northwestern University in Finance and Marketing. She has worked in the Financial Services Industry for 15 years.

LINDA GOGOLA is a Design Engineer, Construction and Mining Products, for Caterpillar. She holds a BS in Aerospace Engineering from the University of Illinois in 1990.
Enjoy the formal atmosphere of an elegant dining room combined with the thrill of a major sporting event. A Day at the Races will be held Saturday, May 15, 1993, in the Governors Room located on the third level clubhouse side of beautiful Arlington International Racecourse.

The Governors Room features a great view of the homestretch, a large patio with outdoor furniture, numerous TV monitors throughout the room, private pari-mutuel windows for betting, and private washroom facilities.

The Governors Room will open at 12:00 p.m., with serving time at 12:30 p.m. Ticket price is $40.00 each and includes admission, program, and dinner buffet (roast sirloin of beef, seafood, etc.)

Ticket Deadline is Friday, April 23, 1993.

Dress Code Required:
Coat and tie for gentlemen and dresses for ladies.

Hotel Reservations:
The Woodfield Hilton offers a weekend special: $79.00 per night double occupancy, including a Continental Breakfast for two. The Woodfield Hilton is located 1/2 mile west of Arlington Park at 3400 West Euclid, Arlington Heights, IL 60005, phone 708/394-2000.
INTERNATIONAL
CHICAGO SECTION

Saturday, May 15, 1993

LADIES DAY

RESERVATION REQUIREMENTS

Limited accommodations require the following procedure:

(1) Advance ticket purchase.

(2) Reservations by mail or phone. Tickets issued on first come, first served basis. Check made payable to SAE Chicago Section must accompany reservation. Money due Friday, April 23, 1993. NO REFUNDS after April 23, 1993.

(3) Ticket price $40.00 per person.

(4) Cash Bar.

(5) A self-addressed, stamped business size envelope must be included with your ticket application and check.

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Hybrid electric vehicles (HEVs) were once considered to be the "Worst of Both Worlds" when it came to vehicle technology. Incorporating an electric drive train as well as a heat engine, the extra complexity of HEVs can outweigh its potential benefits. However, increased emphasis on improved fuel economy and very low emissions has caused major auto makers to renew their interest in HEVs. Uniting the latest technology from electric vehicles with advanced heat engines in light weight bodies, current HEVs now show evidence of being the "Best of Both Worlds," maintaining current levels of vehicle performance while significantly reducing fuel consumption and environmental impacts.

**DR. LAWRENCE J. OSWALD** is Program Manager, Hybrid Vehicles, North American Operations Engineering Center, Advanced Vehicle Engineering, General Motors Corporation. Larry graduated from the University of Michigan in 1971 with a PhD in Mechanical Engineering. Joining General Motors after his graduation, he has worked on most areas of vehicle engineering: aerodynamics, engine mechanics, body and structure design, low rolling resistance tire mechanics, and active noise control. He began working on HEVs early in 1989, and in January 1991 was named Hybrid Vehicle Program Manager, the position he holds today.
Recent advances in high-temperature superconductors have resulted in simple experimental magnetic bearings that exhibit very low effective "coefficient of friction" and require no feedback mechanism or parasitic losses in control circuits. If this technology can be applied at larger scales, then such bearings could be used in flywheel energy storage devices to provide very high total efficiencies on a diurnal basis. Such flywheels may have application to transportation and to electric power diurnal storage requirements.

Dr. JOHN R. HULL is a staff scientist and manager of the Superconductivity Applications Section in the Materials and Components Technology Division at Argonne National Laboratory. In 1971 he received a BS in Physics from Iowa State University, and in 1979 he received a PhD in Physics from the same institution. Dr. Hull is Division Coordinator for superconductivity applications research and principal investigator of several research projects in different superconducting applications areas. He is author of more than 100 scientific papers and inventor of 12 U.S. patents in the fields of applications of superconductivity, electromagnetic levitation and propulsion, energy storage, interference optics, magnetohydrodynamics, natural convection, numerical modeling, and solar energy.

ROBERT P. LARSEN is a Transportation Systems Engineer in the Center for Transportation Research at Argonne National Laboratory. Bob has been responsible for organizing a series of SAE student engineering research competitions with the goal of improving alternative fuel technology, beginning with the Methanol Marathon in 1989. Currently, he is working on organizing the 1993 Hybrid Electric Vehicle (HEV) Challenge, the 1993 NGV Challenge, and the recently announced 1994 HEV Challenge, as well as a number of collegiate electric vehicle competitions. His responsibility also includes data collection on a fleet of alternatively-fueled vehicles and managing other energy conservation programs at Argonne.
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The many questions after the presentation.

Another successful Chicago Section Dinner Meeting. The topic during the January meeting was Fuzzy Logic.

The Speaker, Robert Sciog, showing application of Fuzzy Logic.
The evening's Tech Chairman, Bob Lenell, and Speaker, Robert Sciog.

The evening's social half-hour sponsors.

Chicago Section Chairman Jim King and Leroy Pickett, Engineering Week Coordinator.
The advent of new technologies in this high-tech world necessitates having a well trained work force. Unfortunately, a large percentage of today's students will either not qualify for college or will not be able to afford a college education. In addition, not all jobs require a college degree but do require technically competent people in the work force.

While scanning a recent issue of the CN MOVIN magazine, an article caught my attention:

**Apprenticeship Today**

A medieval idea wins a 20th century edge. That edge? Apprenticeship. Writing in Management Review in 1991, S.L. Berry explained that "many companies are turning back the clocks and trying their hand at one of the oldest training methods: apprenticeship. As defined by the U.S. Department of Labor, apprenticeship is structured, supervised training in occupations that require a wide and diverse range of skills and knowledge as well as maturity and independence of judgment. In practice, that translates to paid on-the-job training and technical training and technical instruction for workers new to a particular job." Berry said that apprenticeships now cover not only skilled grades like plumbing and carpentry but also laboratory technology, computer programming, and customer service.

Garrison Moore, director of research for the National Alliance of Business Systems, said that about 75 percent of the people who'll be working in the United States in the year 2000 are already in the workforce. Unless those people are educated and trained, and upgraded and retrained continuously, we're going to lose our competitive edge. Apprenticeship training offers significant potential to the educational system, government and to business and labor.
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