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IEEE

# VEHICULAR TECHNOLOGY SOCIETY

## NEWSLETTER

Vol. 33, No. 3, August 1986 (ISSN 0161-7887) Editor: A. Kent Johnson

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## President's Message



**Robert Fenton**  
President  
IEEE Vehicular Technology Society

VTC '86 in Dallas was, by all accounts, an excellent event. Our thanks to Al Markwardt and his Conference Committee for providing the participants with an excellent, thought-provoking technical program and warm Texas hospitality. Outstanding job, Dallas!

One of the many high points of VTC '86 was the presentation of special Achievement Awards to Arthur Collins, Founder and President of Collins Radio, and James Weldon, the Founder and Chairman of Continental Electronics. It was a pleasure to meet with these giants of our profession, and I hope that many of you also had that opportunity.

Your Board of Directors met the day before the Conference and considered several issues of considerable importance to the membership. The details are contained in the minutes, which are printed in this Newsletter. Please take time to read them, and forward your comments to me or any other Board member.

Our 37th Annual Conference will be held in Tampa, Florida at the Holiday Inn near the Tampa Airport from June 1-3, 1987. Alan Gondeck, the Conference Chairman, spent several days in Dallas carefully observing their operations, and I think he and his committee will have something special for us. You should receive the Call for Papers in the very near future. Plan now to submit a paper, or at the very least, mark this date on your calendar and plan to attend.

Another important up-coming event--CONVERGENCE '86, The International Conference on Transportation Electronics, will be held at the Hyatt Regency Hotel in Dearborn, Michigan from October 20-22, 1986. This should be the largest conference of its kind in this country, and will be characterized by an outstanding technical program. In addition, it will feature automotive industry leaders in key roles; e.g., F. James McDonald, the President of General Motors Corporation will be the featured speaker at the Opening Session and Donald E. Peterson, Chairman of the Board and Chief Executive Officer of Ford Motor Company, will be the Banquet Speaker. Mark October 20-22 on your calendar for this important event. Additional details are contained elsewhere in this Newsletter.

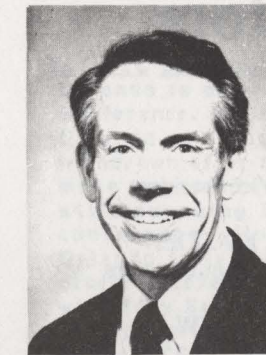
In the near future, you will receive a ballot for the election of VTS Board Members. Sam McConoughy, our Nominations Committee Chairman, has obtained 10 excellent nominees for the five positions available. You should review their qualifications and select the five whom you believe are most qualified to direct this Society. Then please vote! Some critical issues will be facing us in the next few years and you, our membership, should insure that the best possible team is in place.

Your Board of Directors will hold its next meeting on October 21 in Dearborn--in conjunction with CONVERGENCE '86. All of us would appreciate hearing from you about issues which should be considered.

## Newsletter Staff

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## Editor's Notes



**A. Kent Johnson**  
Newsletter Editor

This edition of the newsletter features scenes from the Annual VTS Conference held May 20-22 in Dallas, Texas. Those of you who were fortunate enough to be in attendance at the conference will, I'm sure, join with me in expressing appreciation to the Dallas Committee for a job well done. The great Texas hospitality was abundant and their desire to be gracious hosts resulted in an outstanding conference. It was great to be with you in Dallas.

Many fine photographs of the conference and the board of directors meeting are included in the newsletter. I would like to express sincere appreciation to Bob McKnight and Sam McConoughy for their photographic efforts and for sharing the excellent results with the rest of us.

You will also find in this edition of the newsletter a copy of the program for the upcoming Convergence 86 Conference to be held in Dearborn, Michigan October 20-22, 1986. This is the top management conference on transportation electronics and it would appear that an exceptional conference is in the offing.

Month of Issue	Final Copy to be Rec'd By VTS Editor	Target Mailing Date
November	9-13-86	10-15-86
February	12-30-86	1-27-87
May	3-10-87	4-14-87
August	6-09-87	7-13-87

# Society Officers and Board of Directors

## Board of Directors Report

### Samuel A. Leslie VTS Secretary

TO: IEEE VTS Board of Directors  
VTS Chapter Chairmen

A VTS Board of Directors meeting was held in conjunction with the annual VTS conference in Dallas, on May 19, 1986. The meeting was called to order at 1:10 PM, with the following in attendance:

Bob Fenton	President
Roger Madden	Vice President
Art Goldsmith	Treasurer
Stuart Meyer	Senior Past President
Sam McConoughey	Junior Past President
Bob McKnight	VTS Publicity Chairman
Sam Leslie	Secretary
Bill Misskey	Vehicular Electronics Editor
George McClure	Publications Chairman
Evan Richards	National Conference Coord.
Fred Link	National Conf. Site Sel.
Kent Johnson	VTS Newsletter Editor
Al Goldstein	Noble Scholarship
Alan Gondeck	1987 Conference Chairman
Mark Sihlanick	Membership Chairman
Chuck Lynk	Paper of Year Chairman
Al Isberg	Fellow Awards Committee
Al Markwardt	1986 Dallas Chairman

Thirteen of the 15 elected Board members were present for this meeting. A quorum was thus present for voting on matters before the Board.

George McClure moved, Evan Richards seconded that the agenda presented by Bob Fenton be approved. The vote was unanimous in favor.

Sam McConoughey moved, Evan Richards seconded that the minutes of the December Board meeting be approved as published. The vote was unanimous in favor.

Bob Fenton announced the following recently made appointments:

- Mark Sihlanick to the post of Membership Chairman,
- Art Goldsmith to be the IEEE representative to the AAES Coordinating Committee on Transportation, and
- Leo Himmel as chairman of the Education Committee.

#### TREASURER'S REPORT

Art Goldsmith covered the following budget-related items:

TAB has passed a new ruling that requires membership dues to be rounded off to the nearest dollar. Bill Misskey moved, Evan Richards seconded that the dues be changed from \$12.50 per year to \$13.00 per year to conform to the new TAB requirement. The vote was unanimous in favor.

Also, a guideline from TAB suggests that the student membership dues be nominally half of the nor-

mal membership rate. Sam McConoughey moved, Evan Richards seconded that the student membership dues be increased from \$6.00 per year to \$7.00. After discussion, the Board decided that it was best to leave the dues at the old rate of \$6.00 to encourage student membership. The vote thus was unanimous in retiring this motion.

Also noted was that the subscription rate to the transactions is below the rate recommended by the IEEE formula for non-members. Art Goldsmith moved, Roger Madden seconded that the non-member subscription rate be raised from its current level of 53 dollars to a new level of 64 dollars per year, which will bring the rate closer to the recommended IEEE guidelines. The vote was unanimous in favor.

Art Goldsmith reported the receipt of \$15,000 each from Motorola and the VTS Board for increasing the Dan Noble Scholarship fund amount to \$80,000.

Also, Art noted that a higher investment return possibility exists through IEEE Headquarters, where funds would be available on a 90-day notice. The IEEE rules allow up to 25 percent of the Society's cash reserves to be placed into this fund. Art Goldsmith moved, Sam McConoughey seconded that \$25,000 of the Society's cash reserves thus be placed into this higher yielding fund. The Board vote was unanimous in favor.

#### CONFERENCES AND MEETINGS

Joint ASME/VTS Railroad Conferences: Art Goldsmith and Bob McKnight reported on their meeting with the conference committee attendance at the ASME sponsored 1986 Conference in Norfolk, Virginia on April 7 and 8. The main thrust of this meeting was to determine means for increasing attendance at these conferences, with better publicity being one of the items under consideration.

The next joint railroad conference is to be held in April 1987 in Toronto. Art Goldsmith moved, Evan Richards seconded that up to \$2000 seed money, to be released when needed upon concurrence of both the national conference chairman and the treasurer, be approved. The vote was unanimous in favor.

The possibility of tying the joint railroad conferences in with the annual VTS conference was thoroughly discussed by the board. A conflict in dates appears to exist for the 1988 conference, in that the dates of June 14-17 already picked for the VTC Philadelphia Conference conflicts with the APTA Conference. Bob Fenton appointed Sam McConoughey to serve on a coordinating committee to resolve meeting date conflicts for future joint conferences, with ideal times being late April or early May.

For the record, the Board enthusiastically welcomes these efforts in combining the joint railroad conferences with the VTS annual conferences.

International Conference on Maglev and Linear Drives: This conference was held just before the Board meeting, and no report was available.

Convergence '86 (SAE Sponsored): Bob Fenton reported that the financial questions regarding this conference have been reconciled in accordance with IEEE guidelines. He noted that the Convergence Conference Committee has retained \$25,749 from the 1984 Conference proceeds to finance the 1986 Conference.

1987 Tampa VTS Conference: Alan Gondeck, the Tampa conference chairman, reported that the date has been selected, and is to be June 1-3 at the Holiday Inn near the Tampa airport.

1989 VTC Site Selection: Fred Link reported that Orlando is definitely interested in hosting a VTS Conference. An initial motion by Fred to designate Orlando as the site for the 1989 conference was withdrawn after it was noted that Chicago would be more appropriate for 1989. Also, the Board is still pursuing Detroit as the site for the 1990 conference. However, Fred Link is to contact Orlando to let them know that the Board is definitely interested for 1991. Fred is also to check with Tony Eastham to determine whether Orlando is an appropriate location for the railroad interests in the LTC.

#### PUBLICATIONS COMMITTEE REPORT

George McClure reported that the Transactions publications schedule are nearly back on track, with 60 percent of the papers for the August issue already in hand. However, the Board noted that the scheduled November issue on 900 MHz Propagation is in question due to the inability of the Ad Hoc Propagation Committee to agree on a common propagation model that is acceptable to all concerned.

George also noted that Bob Fenton had contacted the Communications Society re the conflict of interest in their two proposed special issues on portable and mobile communications (1987) and cellular systems for portable and mobile communications (date to be announced). An agreement has been reached where these two issues will be jointly sponsored between ComSoc and VTS.

George reported that the Transactions is now well-represented with editors. Dr. S. M. Elnoubi of the University of Illinois has been added as an assistant editor to assist Bill Lee in the communications area. This is in addition to Sang Rhee of Bell Labs, Bill Misskey in the Vehicular Electronics area, and Dick Uher in the Transportation area.

To counteract the encroachment of special issues by other societies, Sam McConoughey noted that the Transactions committee should develop a two to three year publication cycle of "special" topics in the Transactions. One topic to be considered is Vehicle Location, particularly in light of several papers on this topic being given at recent conferences. George McClure agreed that this is indeed a worthy goal, and that he will work on it.

Kent Johnson reported that he is continuing to get excellent support from IEEE in publishing the Newsletter. He also noted that the past issue was the first one to contain institutional listings.

#### PUBLICITY

Bob McKnight reported that he is to provide more publicity for the joint railroad conference, as reported earlier. Also, he noted that the February ad in the IEEE Student Potentials magazine was the last one authorized by the Board. It was noted that there are 172 student members of VTS, which is somewhat less than 10 percent of our membership. IEEE records indicate that the overall society average is closer to 20 percent. Bob indicated that an ad on the back page of a publication gets the most attention. McKnight then moved, Roger Madden seconded that the

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(703) 941-1323

#### BOARD OF DIRECTORS

##### NAME(Term thru)

##### RESPONSIBILITY

Robert E. Fenton(88)	President
Arthur Goldsmith(87)	Treasurer
Al Goldstein(86)	Conference Coordinator
A. Kent Johnson(86)	Newsletter Editor
Samuel A. Leslie(86)	Society Secretary
Fred M. Link(86)	Chairman, National Site Selection
Charles Lynk(88)	Chairman, Paper of Year Comm.
Roger Madden(87)	Vice President
Robert A. Mazzola(87)	Chairman, Membership Comm.
George F. McClure(88)	Chairman of Publications Comm. and Transactions Editor
Samuel R. McConoughey(86)	Immediate Past President
Stuart Meyer(88)	Senior Past President
William Misskey(87)	Canadian Editor, Newsletter
Evan B. Richards(87)	National Conference Coordinator
Eric Schimmel(88)	Chairman, Personal Radio Comm.

Board approve the expenditure of \$1500 (of which \$100 is to include type-setting) for a half-page ad on the rear of the October Potentials issue, and \$600 for a normal half-page ad inside the December issue. The Board vote was unanimous in favor.

#### VEHICULAR ELECTRONICS REPORT

Roger Madden presented a check in the amount of \$20,000 from the 1984 Convergence Conference Committee to Art Goldsmith, where this is to be added to the amount previously set aside for a graduate scholarship in vehicular electronics. After discussion on the declining rates of interest (\$90,000 would be needed to obtain a \$7500 scholarship at current interest rates), Roger Madden moved, Stu Meyer seconded that the Board approve an additional \$10,000 to be transferred from the VTS general fund to this scholarship fund to bring the total amount to \$90,000. The Board vote was unanimous in favor. Bob Fenton assigned Roger the task of setting up a format for administering this scholarship.

#### NOBLE SCHOLARSHIP REPORT

Al Goldstein reported that John Y. Fong from the University of California at Berkeley is the 1986 recipient for the Noble Scholarship award.

Al also noted that Dr. Anthony Van Den Huevel from Motorola will be taking his place on the Noble Scholarship selection committee.

After several questions and subsequent discussion by the Board, Bob Fenton asked Al Goldstein and Roger Madden to review the selection criteria for the scholarship award, with emphasis to be placed on what the applicant wishes to major in. This review would be for both the present Noble award and the upcoming vehicular electronics scholarship award. Al Goldstein and Roger Madden are to present to the Board recommended changes to the selection criteria, with perhaps a common application form, for discussion at the next board meeting. Also, Bob McKnight is to consider mentioning the availability of these two scholarship awards in the upcoming ads in the Potentials student magazine.

#### CONSTITUTION AND BYLAWS COMMITTEE REPORT

Roger Madden reported that Dr. Irv Engelson has some editorial suggestions for the VTS Constitution that was previously submitted to IEEE Headquarters. Mr. Engelson is returning a marked up set to Roger for review, after which it must be approved by the IEEE Board of Directors before it can be submitted to the VTS membership for ratification. Roger noted that we are at least nine months away from getting the revised constitution to the membership.

#### NOMINATIONS COMMITTEE REPORT

Sam McConoughey reported that he has at least six people who want to run for Board election for the upcoming term. He anticipates that the election will occur on schedule, with the newly elected Board Members being in place by the beginning of next year.

#### INFORMATION AND TELECOMMUNICATIONS POLICY

A written report by Eric Schimmel was circulated at the meeting. This report indicated that the CCIP committee (IEEE Committee on Communications and Information Policy) is continuing with their quest to

file late comments with the FCC in regard to alternate type acceptance procedures. An ad hoc committee consisting of Chuck Lynk, Evan Richards, George McClure, and Stu Meyer was formed to quickly resolve how the Board is to respond to this issue.

#### AWARDS REPORT

Stu Meyer reported that Al Isberg is to make the awards at the Wednesday luncheon, with James Weldon and Arthur Collins being two recipients of special recognition awards.

#### MILESTONES PROGRAM

Bob Fenton and Fred Link are to pursue getting the correct documentation from the Connecticut IEEE Section to allow the milestones program to be completed.

#### PACE COMMITTEE REPORT

A written report submitted by Frank Lord indicates that a major goal of the Professional Activities Committee is to develop a model of the engineering manpower situation as an aid in improving the accuracy of predictions of supply and demand.

#### FELLOWS AWARD COMMITTEE REPORT

Al Isberg reported that one nominee (Bob Fenton) out of three qualified submissions was approved by the IEEE Board of Directors for promotion to Fellow grade. He noted that there are currently around 75 VTS members with the grade of Fellow.

#### STOCKHOLM EUROCON 88 CONFERENCE

Sven Ohrvik, chairman of the IEEE VTS in Sweden, has written a letter soliciting VTS support for this conference, with the theme to be Digital Mobile Radio. Sam McConoughey moved, Evan Richards seconded a motion that VTS will support the Stockholm VTS group if they wish to pursue a joint VTS sponsorship of this conference. The board vote was unanimous in favor.

#### DEVELOPING TECHNOLOGIES WORKSHOP

Bob Fenton noted that VTS has been invited by the IEEE Board of Directors to participate in a "high-level" conference in June, 1987 that focuses on issues crucial to developing technology. Roger Madden moved, Stu Meyer seconded that VTS participate in this IEEE Technology meeting by supplying names of potential speakers who are well-placed in the respective VTS areas of interest. The vote was unanimous in favor. Bob Fenton appointed Sam McConoughey to provide the framework for supporting this conference.

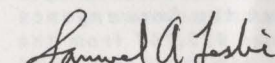
#### NEXT MEETING

The next Board meeting will be held in conjunction with the 1986 Convergence Conference in Detroit, on October 21.

#### ADJOURNMENT

Sam McConoughey moved that the meeting be adjourned at 5:06 PM.

Respectfully submitted:

  
Samuel A. Leslie  
IEEE VTS Secretary

## Chapter News



**Gaspar Messina**  
Chapter News Editor

#### MEETINGS

##### CLEVELAND VTS

Mobile Satellite Service Technology by Mr. Ron Kiesling of Mobile Satellite Corporation. Held March 11, 1986, with 11 attending, including 7 guests.

##### SACRAMENTO (ComSoc/VTS)

Lightwave Equipment Testing by Ms. Eileen Healy of Pacific Bell. Held March 25, 1986, with 22 attending, including 6 guests.

##### San Francisco VTS

Why Use Radio by Mr. Frank Thatcher. Held January 28, 1986, with 20 attending.

Gaspar Messina  
Editor and Chapter Activities Chairman  
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# 1986 VTS Conference - Dallas

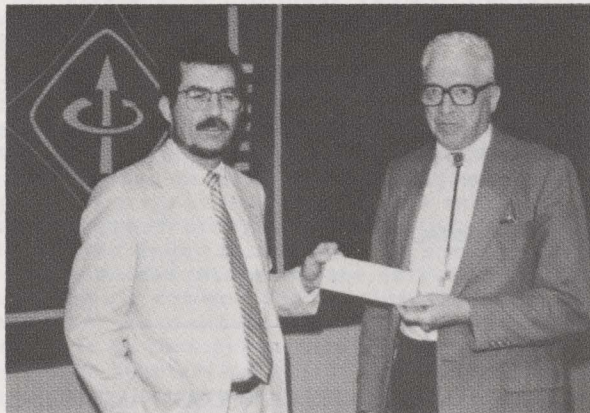
Photos by Sam McConoughey



VTS President Dr. ROBERT FENTON (end of table) presides over Board of Directors meeting.



L to R: FRED LINK, Bd. Member; ART GOLDSMITH, Treas.; EVAN RICHARDS, Board Member; MRS. RICHARDS; BOB FENTON, President, departing for VTC activities during Dallas Conference.



L to R: VTS Vice Pres. ROGER MADDEN presents a check from Convergence to VTS Treasurer ARTHUR GOLDSMITH.



L to R: STUART MEYER, Sr. Past President; MRS. & MR. WM. MISSKEY, Board Member.



L to R: STUART MEYER, Sr. Past President EARL FLATH, V.T.C. Committee LUTHER PULLEY, V.T.C. Committee Dr. ARTHUR GOLDSMITH, VTS Treasurer.



L to R: Board Members FRED LINK and KENT JOHNSON.



L to R: CHUCK LYNK, Board Member, and GEORGE MC CLURE, Board Member, discuss VTS business.



L to R: VTS President ROBERT FENTON and Vice President ROGER MADDEN ponder issues before the Board meeting.

Photos by Bob McKnight



VTS stalwarts known for their pioneering spirit join Astronaut "BUZZ" ALDRIN (second from right) just before the VTS Annual Banquet. From the left are FRED LINK, JAMES WELDON, "BUZZ" ALDRIN and ARTHUR COLLINS. At the awards luncheon the day before, WELDON and COLLINS received Recognition Certificates as a token of appreciation of years of service to the Vehicular Technology Society.



Dr. EDWIN H. ALDRIN, the former astronaut was the key speaker at the VTS annual banquet. Honored as the Honorary Chairman of VTS '86, "Buzz" Aldrin thrilled his audience with plans for astronauts visits to the planet Mars.



JOHN Y. FONG, the Dan Noble award winner, tells of his aspirations to advance his electrical engineering education via a Master's Degree, that will be funded jointly by Motorola and the Vehicular Technology Society.



ARTHUR GOLDSMITH (right) received the Avante Guard medal and certificate for his outstanding work as Vehicular Technology Society treasurer and board member. Pinning on the Avante Guard medal is R. A. "AL" ISBERG, chairman of the Fellows Committee.



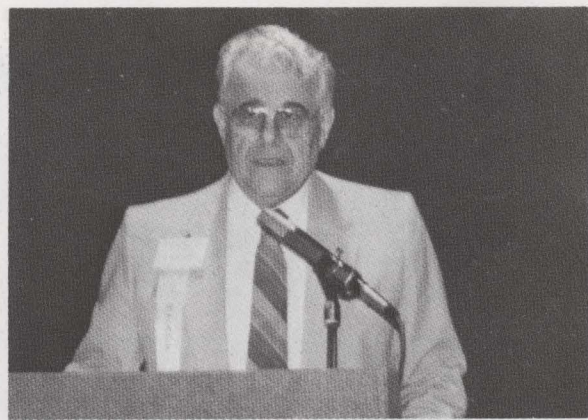
JOHN ROACH, president and chief executive officer of Tandy Corp. was the Awards Luncheon speaker who predicted tremendous growth for cellular radio and telephones along with continued rise in personal computer usage.



JOHN MURRAY (right) received a Recognition Certificate for his excellent work as Chairman of VTS '85 at Boulder, Colorado. Presenting the award was AL ISBERG (left).



JERRY STOVER, one of the pioneers in radio common carrier systems, was the featured speaker at the Tuesday "kick-off" luncheon. He said that there are still major gaps in cellular radio systems to make the radio-telephone really universal. Also, there is considerable night time for more use of radio communications systems.



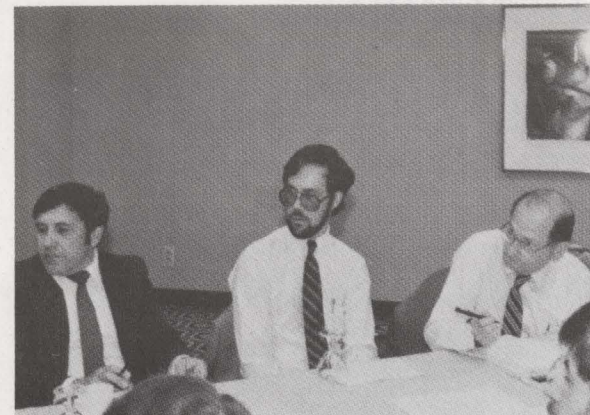
AL MARKWARDT (at podium) welcomed attendees to the kick-off luncheon on Tuesday noon. Attendance at the Dallas, Texas VTC '86 was very good.



ROBERT E. FENTON, president of the Vehicular Technology Society, welcomes those in attendance at the Wednesday Awards Luncheon. Dr. Fenton of Ohio State University received his IEEE Fellow Membership certificate at this luncheon.



ALLAN GONDECK (at podium) invited VTS'ers to come to the annual meeting June 1#3, 1987 in Tampa, Florida. AL MARKWARDT (right) introduced Tampa Chairman Gondeck.



SAM LESLIE (right) listens intently because he is the VTS Secretary. Also interested are ALLAN GONDECK (left) the 1987 VTC Conference Chairman for Tampa, Florida. MARK SIHLANICK (center) is the new Membership Committee Chairman.



WILLIAM MISSKEY (left) is the Canadian Editor of the VTS Newsletter. A. KENT JOHNSON (center) is the editor of the Vehicular Technology Society Newsletter. SAM MC CONOUGHEY (right) is the Immediate Past President of VTS.



AL GOLDSTEIN (left) Conference Coordinator and one of the Motorola "foster parents" of the Dan Noble award, looks through VTS documents. CHARLES LYNK (center) did double duty as Chairman of Papers of the Year Committee and Technical Papers Chairman for the Dallas VTC '86. AL ISBERG (right) is Chairman of the Fellows Committee.



Two stalwarts of the VTS are SAM LESLIE (left) the Secretary, and ARTHUR GOLDSMITH, the Treasurer.



VTS President ROBERT FENTON (left) listens to discussion at Monday afternoon Board of Directors meeting. ROGER MADDEN (center) is VTS Vice President, and ARTHUR GOLDSMITH is VTS Treasurer.



At the VTS Board meeting are (from left to right): GEORGE MC-CLURE, Chairman of the Publications Committee and Transactions Editor; FRED LINK, Chairman of National Site Selection Committee; EVAN RICHARDS, National Conference Coordinator; and STUART MEYER, Senior Past President.

## Transportation Systems



**Bob McKnight**

Transportation Systems  
Editor

For specific information write to Anthony Daniels, Morrison-Knudsen Engineers, Inc., 180 Howard St., San Francisco, CA 94105.

1987 VTS Conference planning includes call for papers

Although the 1987 Vehicular Technology Conference for next year is a year away, electrical engineers should be thinking about presenting papers at this professional meeting.

Areas of interest include but are not limited to the following:

- Antennas
- Communications Systems
- Propagation
- Cellular Systems Engineering
- Transportation
- Automotive Electronics
- Rail Rapid Transit
- Data Transmission & Detection
- Modulation & Coding Techniques
- Automobile Navigation Systems
- Railroad Signaling & Control
- Railroad & Transit Communications
- Communications Systems Design

For more information write to Mr. Gerard Lachs, Technical Chairman, Department of Electrical Engineering, University of South Florida, Tampa, Florida 33620.

Arthur G. Raabe, rail and transit expert, dies

Arthur G. Raabe, Director of Transportation Systems for STV/Seelye, Stevenson, Value & Knecht, died May 3 at the age of 51. He was recognized industry-wide for his expertise in rail transportation issues and his experience in the planning, design and implementation of capital improvements for major railroad systems.

Mr. Raabe began his 30-year career at the Erie and later moved to the New Haven, New York Central and then to the New York State Department of Transportation. Prior to joining SSV&K, he was with the Metropolitan Transportation Authority for 18 years, culminating as Director Transportation Research and Engineering.

He received his Bachelor's Degree in Electrical Engineering from Polytechnic Institute of Brooklyn in 1955 and a Master in Business Administration from New York University in 1965. A registered Professional Engineer in New York and New Jersey, he was an active member in the American Public Transit Association, including Chairman of the APTA Commuter Car Subcommittee. Also, Mr. Raabe was active in the Land Transportation Division of the IEEE and numerous other professional transportation organizations.

Mr. Raabe lived in Plandome, NY and is survived by his wife Elaine and two daughters.

Convergence '86 is top transportation management conference- Oct. 20-22, 1986 at Hyatt Regency in Dearborn, Michigan

The International Congress and Transportation Electronics conference in Dearborn, Michigan will feature Ford Motor Co. Chairman & Chief Executive Officer Donald E. Petersen as the banquet speaker. Other key automotive officials speaking at this 1986 Convergence include F. James McDonald, President, General Motors Corp. and Frederick Z. Herr, Vice President Engineering and Manufacturing, Ford Motor Co.

Technical Sessions and Exhibits cover these areas of interest:

- Electronics applications and future trends.
- Automotive powertrain, chassis and interior systems of the 90's.
- Truck, diesel, transmission and agriculture control systems.
- Automotive entertainment, software, components & navigation systems.

For complete program and information write Convergence, SAE, Suite 602, 3001 W. Big Beaver, Troy, MI 48084. Phone: (313) 649-0420.

Convergence 1986 is co-sponsored by the Vehicular Technology Society IEEE and the Society of Automotive Engineers.

Papers wanted for IEEE/ASME joint railroad conference in Toronto

The 1987 Joint Railroad Conference sponsored by the Vehicular Technology Society, IEEE, jointly with the Railroad Division, American Society of Mechanical Engineers, is seeking papers for this April 21-23, 1987 conference to be held in Toronto, Ontario, Canada.

Areas of interest are in the railroad motive power, rolling stock, communication and signaling design, applications and operations; rail transit power control, vehicle design and application, and automated controls.

## Transportation Systems



ANTHONY J. LA POLLA, Control Supervisor, General Railway Signal Co., described the application of microprocessor technology to classification yards on today's railroads. He spoke at the Transportation & Signal Operations session at the Vehicular Technology Society's VTC '86 in Dallas.



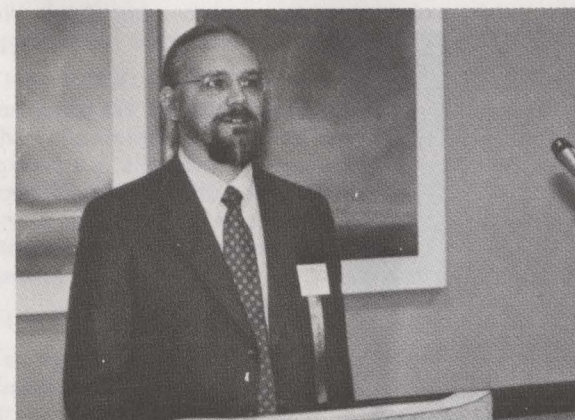
FORREST H. MC INTYRE, General Manager Signals & Electrical, Southern Railway, described his road's modernization of its signal system using electronics and microprocessor technology. He spoke at the Transportation Signal & Operations System session on Tuesday afternoon, May 20 at Dallas, VTC '86.



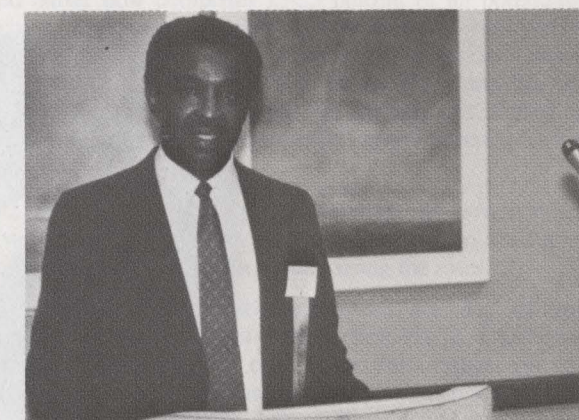
THOMAS H. ENGLE described an innovative train operations concept of an integral train with distributed power and carrying capacity in modular form. This has been presented to the Association of American Railroads. Engle is general manager, new product development, New York Air Brake Co., and he spoke on Tuesday afternoon at the Dallas VTC '86.



THOMAS J. ULRICH, Vice President Arthur N. Ulrich, Co., described application of photovoltaic power systems at the Transportation session on Tuesday morning at the Dallas, Texas VTS Conference.



CARL WILLIAMS described the satellite approach to train management using geostationary orbiting satellites to determine train location. A vice president of Railstar, he spoke at the opening session on Transportation at the Dallas VTC '86 meeting.



FRANK COOPER, JR., Electronics Engineer, Southern Pacific, described his road's DTMF Mobile PBX Access Terminal enabling railroaders with mobile radios to access the SP's dial telephone network. He spoke at the Tuesday morning session of the VTC '86 conference.



DR. TONY EASTHAM, Chairman of the Land Transportation Division, Vehicular Technology Society, also chaired the Power Control for Rail and Transit session at the ASME/IEEE meeting in Norfolk. VTS was the IEEE co-sponsor.



PETER DETMOLD, General Manager Advanced Train Control Systems Project described the new concept to optimize railroad operations through the modern technology of electronic controls and microprocessors. He was the luncheon speaker on April 10, 1986 at the ASME/IEEE Joint Railroad meeting in Norfolk, VA.



WALTER M. SIMPSON, Vice President and Chief Engineer, Norfolk Southern Corp., speaker on April 9 at the ASME/IEEE luncheon pointed out the advantages for his road of the application of the Advanced Train Control System.



ANTHONY DANIELS, Meetings Chairman of the Land Transportation Group, VTS, chaired the Locomotive Rail Car Trends session at the joint ASME/IEEE meeting in Norfolk, VA April 9#10, 1986.



JOSEPH BAMBARA, Engineering Vice President of Servo Corp. described the latest in sophisticated hotbox detector systems at the ASME/IEEE joint meeting in Norfolk, VA.

## Professional Activities



**Frank E. Lord**  
Professional Activities Editor

### YOU AND TAX REFORM

By the time you read this the federal tax reform activity may be completed. Certainly the press has been implying that HR 3828, the tax reform bill, will be rapidly voted into law by Congress. On the other hand, the debate may be continuing and you may want to contact your Congressman and Senators on the matter.

I have pointed out in previous columns that you can track the legislative activity on the national level of particular interest to engineers by asking our Washington Office to put you on the distribution list for Legislative Reports and Legislative Alerts.

Aspects of tax reform that may affect engineers considerably are those items that alter pension related provisions. These include IRAs, company plan vesting requirements and Social Security integration. As a consequence of this, Jack Andersen, Chairman of the Pension Committee, initiated a Legislative Alert on May 21 which was sent to 10 percent of our United States members encouraging them to make their views known to their legislators and asking them to encourage like action among their colleagues. Jack emphasized the need for immediate action. The Alert said in part:

"In addition to major tax simplification provisions, HR 3838, as reported by the Senate Finance Committee (and known as "The 27% Solution"), includes provisions that will significantly change private pension plans and supplementary retirement income programs.

"THE GOOD NEWS is that the Senate Finance Committee bill contains many provisions that IEEE and other engineering and scientific groups enthusiastically support, e.g. expansion of current pension plan coverage requirements, full vesting upon completion of five years of service, and reduction of potentially adverse effects of the integration of social security with private pension plan benefits.

### "NOW FOR THE BAD NEWS!

"The Senate Finance Committee proposal would also eliminate deductions for Individual Retirement Accounts (IRAs) for individuals covered by employer-sponsored pension plans! This would negate the advances achieved

in 1981 when IRAs were made available to all working individuals. The problem, of course, is that highly mobile employees may never vest even under the 5-year rule but will simultaneously be prohibited from investing in an IRA on a tax-deductible basis.

"The IEEE Pension Committee recommends that you communicate immediately with your U.S. Senators concerning the following Senate Finance Committee actions:

\*Support the Finance Committee's Mandatory Five-Year Vesting Provisions

\*Support the Finance Committee's Expansion of Pension Plan Coverage Requirements

\*Support the Finance Committee's Improvement in the Integration Rules

\*Oppose the Elimination of IRA Deductibility for Employees "Covered" by an Employer-Sponsored Pension Plan; Being "Covered" and Being "Vested" Are Not The Same!

There are issues involved here that are sure to affect your financial well being. Who can deny the importance of IRAs to mobile engineers (no pun intended) like many of us are? I cannot emphasize enough the importance of pitching in with action on such matters when requested.

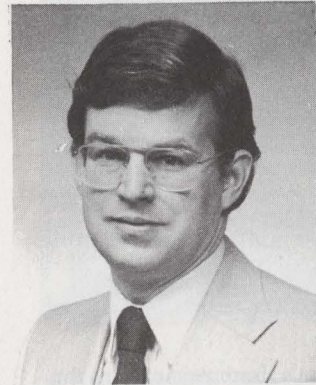
It is beginning to appear that the reform bill will have an adverse effect on at least a portion of the middle class. Middle class wage earners which include most engineers are likely to suffer. Imagine the impact of taxing fringe benefits. This has not yet been discussed openly with respect to the present bill, but it has been mentioned from time to time in the past. Company paid life insurance premiums for protection above a specified level are taxed now, so the wall has already been breached. Another provision of the bill would eliminate the concept of a capital gains rate that is lower than the ordinary income rate. Since there is no talk of offsetting apparent capital gains with an inflation rate index, a confiscatory system worse than the previous system will be established if the bill becomes law in its present form. I have not heard the underground economy mentioned either. This economic activity which avoids taxation through cash transactions and barter now comprises 15-25 percent of all potentially taxable exchanges of labor and services in the United States. The taxes now avoided, if collected, would eliminate the deficit. Provision of the law alone can not eliminate underground activity, but perhaps this burden on the rest of us could be lessened by careful attention to the matter at this juncture.

I'm also wary of giving up deductions for lower rates. Once that is done it is a very simple matter in the future to increase the tax burden by increasing the rates.

If the tax debate is still going on, are any of you concerned? If so contact your Section PACE Chairman, the Washington Office or me for information on the subject that relates to engineers in particular for specific suggestions on how to help. The Washington Office contact is Vin O'Neill at (202) 785-0017.



# Vehicular Electronics



**Bill Fleming**  
Vehicular Electronics Editor

## VDO CITY PILOT SMART COMPASS

The first self contained automotive navigation system on the European market is also the least expensive of any type in the world [1]. Costing only \$400, the system uses the earth's magnetic field as a reference to guide drivers. Test results reveal that drivers using the City Pilot system reach their destinations with an accuracy of 97%, or within 3% of the distance traveled. So if a car travels under City Pilot guidance for 5 km, the driver will reach the destination to an accuracy within 150 m.

The City Pilot system is basically an intelligent electronic compass: in essence, it depends on an earth magnetic field sensor inside the car roof and a distance sensor in the speedometer drive. Using the sensor inputs and the destination identifying coordinate data the driver has entered, a microcomputer in the central control unit calculates the vehicle's location relative to the destination as well as the line-of-site distance to it. Results are continuously shown and updated on a liquid crystal display on the dashboard. Arrows and bearing markings tell the driver which general direction to take to reach the destination, while a three-digit number indicates the distance in fractions of a kilometer. When the car gets within the 3% target area, a beep and a flashing display alert the driver that he is near his destination.

Travel data is carried in bar-coded form on city maps. Prior to the journey, the driver picks the starting and destination points on the map with a light pen, feeding them to a microcomputer. This simple method contrasts with that used in expensive systems in which maps come in digitized form on compact discs or cassettes. City Pilot's price is about one-third to one-quarter that of a cassette-based system developed in the U.S. by Etak Incorporated.



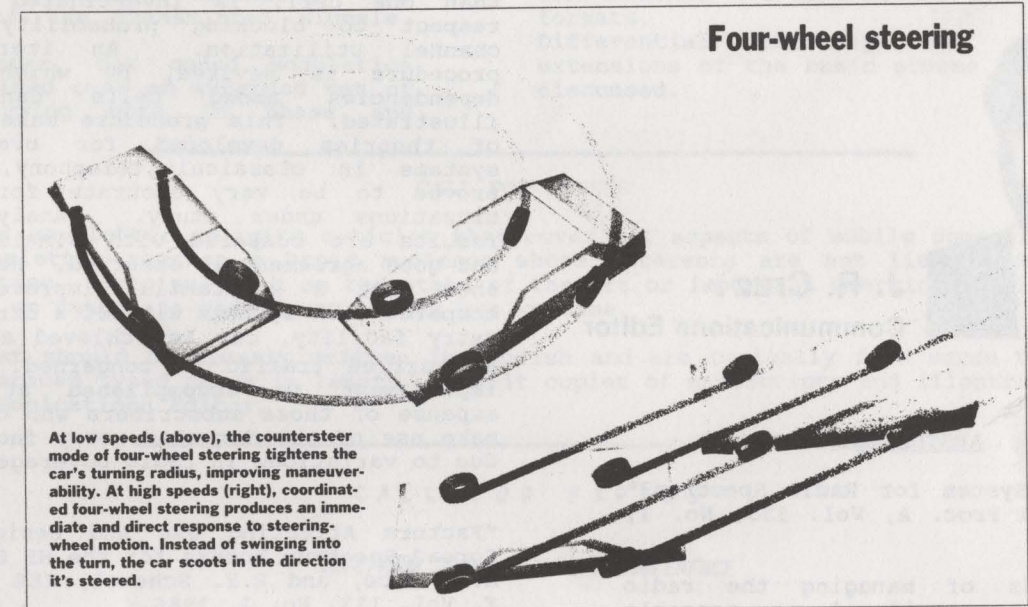
City Pilot Smart Compass Uses Data Picked Up From A Bar-Coded Map By Light Pen and Fed Into A Microcomputer. Distance and Location Information Are Displayed On An LCD.

## ELECTRONIC CHASSIS

As manufacturers in the U.S., Europe, and Japan reexamine the ways their cars handle the road; steering, suspension, and traction systems are suddenly in a renaissance period of development [2]. Among the most significant innovations in chassis design are four-wheel steering, adaptive suspension, and all-wheel drive and traction control systems.

Four-wheel steering improves both high- and low-speed cornering by providing distinct modes for each. For parking and close-quarters maneuverability, rear wheels counter steer, or turn in the opposite direction of the front wheels to provide optimum turning radius. Above a predetermined speed the system's control module is programmed to turn the rear wheels in the same direction as the front wheels for faster steering response. If the rear wheels are controlled properly, vehicle rotation around the center of gravity is no longer needed and the car can start turning the moment the steering wheel is operated.

Japanese car makers have been notable in developing electronic adjustable suspension systems which respond to variation in road roughness, changes in vehicle load, and reaction to inertial changes during cornering, braking, and accelerating. Toyota has the Electronic Modulated Suspension, Mazda has the Adjustable Damping Suspension System, and Nissan has a Sonar-Controlled Suspension on it's Bluebird Maxima model.

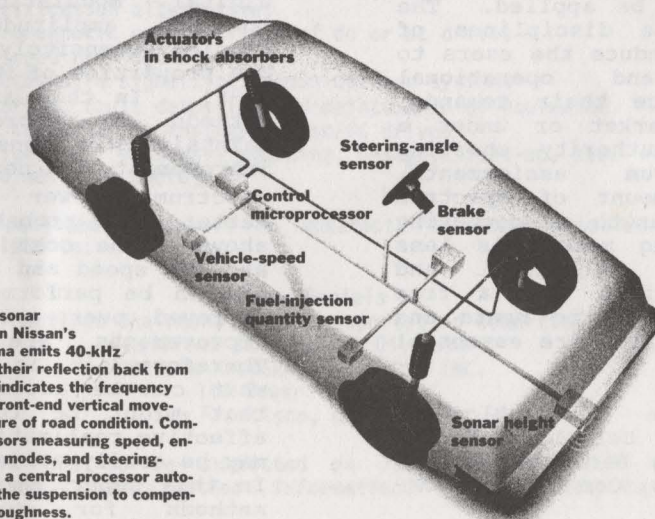


At low speeds (above), the countersteer mode of four-wheel steering tightens the car's turning radius, improving maneuverability. At high speeds (right), coordinated four-wheel steering produces an immediate and direct response to steering-wheel motion. Instead of swinging into the turn, the car scoots in the direction it's steered.

Adjustable suspensions are basically passive, reacting to dynamic changes by varying the amount of energy they can absorb. But a revolutionary active suspension concept developed by Lotus Engineering actually puts energy into the suspension system to control contact between wheel and road. Lotus eliminates springs and shock absorbers all together, replacing them with hydraulic cylinders that synthesize the movement of conventional suspensions. An electronic microprocessor receives data from sensors in each of the four wheel actuators; other sensors monitor lateral and forward accelerations. On the basis of these inputs the system automatically moves each wheel vertically in relation to the body -- just as passive suspensions yield in response to road irregularities, changes in speed and direction, and exterior wind forces.

But unlike the passive suspensions, the active system can make the most appropriate wheel-position change to maintain both smooth ride and optimum dynamic stability. By precisely controlling suspension height in a turn for instance, the system eliminates body roll -- the destabilizing tenancy of a car body to roll toward the outside of a turn, unloading the inner wheels. The prototype system is claimed to net a 10% increase in the speed at which cars can negotiate turns. Although Lotus's system is the most highly publicized, all the major European car companies have programs on active suspension.

## Sonar-controlled suspension



The ultrasonic sonar height sensor in Nissan's Bluebird Maxima emits 40-kHz pulses, timing their reflection back from the road. This indicates the frequency and extent of front-end vertical movement—a measure of road condition. Combined with sensors measuring speed, engine and brake modes, and steering-wheel position, a central processor automatically sets the suspension to compensate for road roughness.

## REFERENCES

1. J. Gosch, "Smart Compass Pilots A Car To It's Destination," Electronics, May 26, 1986, pp. 20-21.
2. J. Zygmunt, "The Chassis Gets Classy," High Technology, June 1986, pp. 17-23.

## Communications



**J. R. Cruz**  
Communications Editor

## ABSTRACTS

"A Renting System for Radio Spectrum?"  
D. Rudd, IEE Proc. A, Vol. 133, No. 1,  
1986.

Four methods of managing the radio spectrum are considered as possible solutions to the problem of a shortage of useful spectrum, which has arisen with the growth of demand due to rapid developments in electronics. The objectives of the solution to this problem and the choice between the methods are analyzed by a six-step methodology defined by Sir John Hoskyns. The constraints arising from technical limitations, international obligations and social factors are included in the analysis. The first method is the current method in the UK; it was criticized in the Merriman Report in 1983. The second would be based on cost-benefit analyses, but the conceptual and economic bases are too indefinite for it to be applied. The other two invoke the disciplines of price mechanisms to induce the users to adopt technical and operational improvements to reduce their demands, either in a free market or under a continuing central authority charging rents for spectrum assignments, depending on the amount of spectrum demanded and the strength of competing demands. The renting method is less hampered by the technical and international constraints than a free market. Publication of the rents and the method of calculation are essential features.

"Channel Utilization and Blocking Probability in a Cellular Mobile Telephone System with Directed Retry,"  
B. Eklundh, IEEE Trans. Comm., Vol. COM-34, No. 4, April 1986.

A directed retry facility, which enables subscribers in a mobile telephone system to look for free radio channels in more than one cell, is investigated with respect to blocking probability and channel utilization. An iterative procedure is devised, by which the dependencies among cells can be illustrated. This procedure makes use of theories developed for overflow systems in classical telephony, and proves to be very accurate for the situations under study. Analytical results are compared with simulations and good agreement is observed. Results show that a substantial improvement, compared with systems without a directed retry facility, can be achieved as far as carried traffic is concerned. The improvement is accomplished at the expense of those subscribers who cannot make use of the directed retry facility due to variations in radio coverage.

"Factors Affecting Use and Design of Spread-Spectrum Modems for the HF Band,"  
A.N. Ince, and R.E. Schemel, IEE Proc. F, Vol. 133, No. 2, 1986.

The design of a spread-spectrum modem for HF channels to combat multipath and interference effects is considered, and the performance results obtained with a prototype system are discussed. The features of the modem include automatic synchronization, diversity operation, provision for an ARQ mode and M-ary block coding.

"Continuous Phase Modulation," C.E. Sundberg, IEEE Comm. Mag., Vol. 24, No. 4, 1986.

Minimum Shift Keying (MSK) [1] or Fast Frequency Shift Keying (FFSK) is a digital modulation technique with constant amplitude which has been studied extensively during recent years. The properties of MSK are now understood [2-5]. In this article, we report on methods to improve on MSK while maintaining a constant amplitude. By improvement we mean a narrower power spectrum, lower spectral sidelobes, better error probability, or all of the above. The cost of signal processing and the speed and complexity with which it can be performed has steadily been improved over recent years. Further improvements are to be expected. Therefore, it is reasonable to study what can be accomplished with methods that might be too complex for cost effective realization today, but perhaps may be easily achievable tomorrow. In this paper, we consider a number of methods for constructing constant

amplitude signals which significantly outperform MSK [5-103]. We also discuss at what level of complexity these improvements are obtained and realized.

"Coded Phase/Frequency Modulation," R. Padovani, and J.K. Wolf, IEEE Trans. Comm., Vol. COM-34, No. 5, 1986.

Channel coding combined with expanded signal sets has been shown [1] to improve error performance over uncoded modulation without expanding the bandwidth of the transmitted signals.

In this paper, new coded modulation formats defined over an expanded set of signals varying both in phase and

frequency are presented. The new schemes combine FSK and PSK modulation and make use of trellis coding and Viterbi decoding to improve error performance over uncoded modulation. The free Euclidean distance is calculated for several classes of codes, and upper bounds and simulation results are also presented for some simple codes. The spectral characteristics of the proposed coded modulation formats are evaluated and compared to conventional two-dimensional modulation formats. Differential encoding and various extensions of the basic scheme are also discussed.

## CALL FOR PAPERS

This newsletter solicits articles that cover all aspects of mobile communications. The newsletter reaches a broad audience whose interests are not limited to narrow specialties. Original work on the state of the art or important emerging developments, as well as tutorials and survey papers are welcome.

Paper should be clearly written in English and are typically from seven to eleven double spaced typed pages in length. Submit copies of manuscripts and illustrations to the Communications Editor.

## CALL FOR PAPERS

## IEEE/ASME JOINT RAILROAD CONFERENCE

ROYAL YORK HOTEL  
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TORONTO, CANADA

The IEEE is the lead society for the 1987 Joint Railroad Conference, and the Land Transportation Committee is seeking abstracts for technical papers to be considered for presentation at this meeting.

Theme papers which review topics of current interest, discuss the design and technical characteristics of current hardware, report R & D work to improve the operation of systems in the railroad and transit industries, or agencies involving new transit starts will be particularly welcome. Topics might include:

- o Automation or microprocessor control in the railroad/transit industries
- o Energy/fuel efficiency of locomotives
- o Electrification alternatives
- o Electromagnetic compatibility of dc or ac drives
- o High speed rail operations
- o Innovations in signalling/communications systems
- o Monitoring, fault detection and maintenance of equipment
- o Power converter technology and ac/dc drives
- o New light rail systems-- planning, design, start-up, etc.
- o People mover technology

Authors are requested to submit an abstract for their proposed paper by September 15, 1986 to:

Anthony Daniels  
Meetings Chairman, Land Transportation Committee  
Railroad and Transit Division  
MORRISON-KNUDSEN ENGINEERS, INC.  
180 Howard Street  
San Francisco, CA 94105

Selected papers are to be submitted on IEEE "Authors' Kit" format by December 15, 1986. For further information, call Anthony Daniels at: (415) 442-7474.

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PROGRAM



**Sunday, October 19, 1986**

5:00 p.m. Registration  
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• *Electronics applications and future trends*

**Monday, October 20, 1986**

7:30 a.m. Registration  
9:00 a.m. — 7:00 p.m. Exhibits  
10:00 a.m. — 12:00 Noon Opening Session  
2:00 p.m. — 5:00 p.m. 3 Technical Sessions

• *Automotive powertrain, chassis & interior systems of the 90's*

**Tuesday, October 21, 1986**

8:00 a.m. Registration  
9:00 a.m. — 5:00 p.m. Exhibits  
9:00 a.m. — 5:00 p.m. 3 Technical Sessions  
6:30 p.m. Reception & Banquet

• *Truck, diesel, transmission & agriculture control systems*

**Wednesday, October 22, 1986**

8:00 a.m. Registration  
9:00 a.m. — 11:30 a.m. Blue Ribbon Panel  
9:00 a.m. — 12:00 Noon Exhibits  
12:00 Noon Conclusion

• *Automotive entertainment, software, components & navigation systems*

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