



IEEE

# VEHICULAR TECHNOLOGY SOCIETY

## NEWSLETTER

Vol. 35, No. 4, November 1988 ISSN 0161-7887 Editor: A. Kent Johnson

### Trevor Jones Receives Special VTS Award



Dr. Trevor Jones receiving plaque from Dr. Robert Fenton, Past Pres. VTS in center with Stu Meyer, incumbent VTS President on left and incoming VTS President George McClure of Martin Marietta, Orlando, FL, on right.

See "About the Cover" page 3

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# President's Message



**Stuart Meyer**  
President  
IEEE Vehicular Technology Society

There are so many things happening within our Society that I hardly know where to start this message.

For starters; We have just learned that the Annual Conference of our Land Transportation Division will coincide and be part of the Vehicular Technology Society Annual Conference starting with our 1991 meeting in St. Louis. Incidentally I just returned from that area and can honestly report that the committee is shaping up and enthusiasm is high under the able leadership of Jay Underdown.

While on the subject of conferences, we have recently approved sponsorship of the VNIS, (Vehicular Navigation and Instrumentation Systems) Conference scheduled for the fall of 1989 in Toronto, Canada. You will be reading a lot more about this event elsewhere in this issue and in forthcoming VTS Newsletters. Vehicle location is finally beginning to emerge and its marriage with Radio Dispatch Systems is a natural so that the dispatcher knows where the vehicle is regardless of what the driver tells him.

Once again it is time to bid you farewell as President of your Society. This is my second tour of duty in this capacity (previously 81-83) and it has been a pleasure serving you and meeting many of you. Starting January 1, 1989 your new Society President will be George McClure who is employed by Martin-Marietta in Orlando, Florida. I am running for re-election on the board and hope to continue in the capacity as a Director of your Vehicular Technology Society. I look forward to a continued relationship with you as in the past as well as with the newer members from the Land Transportation Division who have recently come under our wings.

I wish all of you a very joyous and happy holiday season.

Most Sincerely,

*Stu*  
Stuart Meyer  
2417 Newton Street  
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February	12-27-88	1-28-89
May	3-11-89	4-15-89
August	6-10-89	7-15-89
November	9-16-89	10-14-89

# Editor's Notes



**A. Kent Johnson**  
Newsletter Editor

As the November issue of the VTS newsletter goes to press, we have just completed an eventful meeting of the VTS Board of Governors. The meeting was held in conjunction with the Convergence Conference in Dearborn, Michigan. Two events of particular note took place at this meeting: a special award was presented to Trevor Jones, and an election for new VTS officers was conducted.

A special award was presented to Trevor Jones for "...his pioneering vision and leadership in transportation electronics and his role in both founding and continuing CONVERGENCE...". We have featured the presentation of this award on our November cover (see, "About The Cover").

Officers were elected whose terms will begin 1/1/89. They are as follows:

President	George F. McClure
Vice President	Roger Madden
Secretary	Samuel A. Leslie

Arthur Goldsmith will continue as treasurer. We look forward to working with these men who have given many years of dedicated service to VTS.

## About The Cover

In 1974, Trevor O. Jones and his associates envisioning that the emerging electronics technology would have a profound impact on the transportation industry, founded CONVERGENCE--Internation Conference on Transportation Electronics. This conference is a unique event gathering together world renowned leaders in the transportation electronics industry which has proven to be both technically comprehensive and professionally rewarding for all levels of engineering and management.

This Society is proud to recognize Mr. Jones for his pioneering vision and leadership in Transportation Electronics and his role in both founding and continuing CONVERGENCE.



**IEEE** THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.  
DIVISION III: COMMUNICATIONS TECHNOLOGY

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Ralph W. Wyndrum, Jr.

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October 12, 1988

**A Letter from your Director**

Our nearly 800 Chapters, it is clear, give many of our members their window on the technical issues and thrusts for which our 36 Societies hold responsibility and which are crucial to the professional careers of our members. For many, the Chapter meetings and technical programs meet the needs that other members gain from their Transactions and Conferences. While the latter are generally viewed as well supported by our Societies, the Chapter programs are not.

I write this column (and have communicated similar thoughts to our Division III Presidents) as a result of a number of direct communications to me from various Chapter officers and members who plead for speakers for their programs. And they are not looking for just any speakers...they need to advance the understanding of the latest technology in their chapters, for their members, in an environment where they can ask questions and interact with the speakers on a regular basis several times a year. Many of the Chapters, working within their Sections, support their parent Society Conferences, but economics and distance preclude their regular attendance at national and international conferences.

I believe that the Societies can expand their speakers' bureau programs by encouraging and facilitating their technical and academic leaders' participation, usually in conjunction with other travel to a given Chapter's location. There are many ways to pick up the marginal costs of a speaker who stays over one evening to join a Chapter lecture program, and our Societies must proactively assess and implement these approaches. But mainly it is you, our members, who must volunteer to serve their fellow members. Please do so, working with your Society officers to support your Chapters!

Sincerely,

*Ralph W Wyndrum Jr.*

**Society Officers and Board of Governors**

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BOARD OF GOVERNORS

NAME(Term thru)	RESPONSIBILITY
J.R. Cruz(90)	Newsletter, Communications Editor
Robert E. Fenton(88)	Junior Past President
Arthur Goldsmith(90)	Treasurer
Leo M. Himmel(89)	Chairman, Education Committee
A. Kent Johnson(89)	Newsletter Editor
Samuel A. Leslie(89)	Society Secretary
Fred M. Link(89)	Chairman, National Site Selection
Charles Lynk(88)	Chairman, Paper of Year Comm.
Roger Madden(90)	Chairman, Constitution revision
George F. McClure(88)	Vice President, Chairman of Publications Comm. and Transactions Editor
Samuel R. McConoughey(89)	Senior Past President
Stuart Meyer(88)	President
Evan B. Richards(90)	National Conference Coordinator
Eric Schimmel(88)	Chairman, Personal Radio Comm.
Raymond C. Trott(90)	

DUES ALERT!!

The IEEE 1989 Societies & Periodicals brochure mailed out with the membership dues renewal notice contains a strategic error. The last sentence should read "...including systems associated with public transit." The paragraph unfortunately reads "excluding."

The Land Transportation group, formerly part of the Industry Applications Society, has been a Division of the VTS for the past two years. The necessary changes in Society charters have been approved and the IAS description reflects it, but the VTS description has not yet been updated by IEEE Headquarters.

We regret any confusion this may have caused.

**Board of Directors Report**



**Samuel A. Leslie**  
VTS Secretary

MINUTES OF THE IEEE VTS BOARD OF GOVERNORS MEETING

The IEEE VTS Board of Governors met on October 18, 1988 at Hyatt Regency, Dearborn, in conjunction with the 1988 Convergence Conference. The meeting was called to order at 9:00 AM.

ROLL CALL

The following were in attendance:

# Linda Sue Boehmer	88-89 LTD Chairman
# J. R. Cruz	Assoc. Newsletter Editor
# Robert E. Fenton	Jr. Past President
David Goodman	Publicity & Education
# Leo M. Himmel, Sr.	Education Committee
# Kent Johnson	Newsletter Editor
Trevor O. Jones	Member-at-Large
W. C. Y. Lee	Publications Chairman
# Sam Leslie	Secretary
# Fred Link	VTC Site Selection
# Roger Madden	Constitution. & Bylaws
Robert A. Mazzola	Vehicular Elect. Liaison
# George McClure	Vice President
# Stu Meyer	President
# Evan Richards	Natl. Conf. Chairman
Jim Sears	Membership Chairman
# Ray Trott	Membership Committee

(# denotes elected Board member)

Bob French also attended the executive committee meeting the previous day.

Eleven of the 16 present were elected Board members. A minimum of eight elected is necessary for voting on matters that come before the Board. Thus, a quorum was present.

Evan Richards moved, George McClure seconded that the agenda for the meeting be approved as presented. The vote was unanimous in favor.

Also, Fred Link moved, Kent Johnson seconded that the minutes of the March 3 and June 16 minutes be approved as published. The vote was unanimous in favor.

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\*Inputs for newsletter staff editors should be received by newsletter editor at least one week before these dates.

## TREASURER'S REPORT

Arthur Goldsmith was unable to attend this meeting, but submitted a written report which indicates that the Society continues in a strong financial condition.

Art notes that the transfer of \$90K to the IEEE Foundation for the Transportation Electronics Fellowship is in process.

Also, Stu Meyer indicated that net worth of the Society (and IEEE) has now recovered to the point where it is greater than the net worth before the stock market retrenchment in late 1987.

In regard to the IEEE investment policy for the Society's funds, George McClure moved, Evan Richards seconded that the Society continue with the present arrangement with IEEE for aggressive investment. The vote was unanimous in favor.

Evan Richards moved, George McClure seconded that the Treasurer's report be accepted. The vote was unanimous in favor.

## PUBLICATIONS

George McClure reported that both the May and August issues are in production, and should be mailed shortly. Papers are now going in for the November issue.

The recommended page budget for 1989 is 272 pages, for four 64-page issues, plus 4 covers each.

Dr. Giorgio Rizzoni has volunteered to assume the role of associate editor for vehicular electronics. Bill Misskey has forwarded the vehicular electronic papers needing review to Sang Rhee, and Sang will work with Giorgio in getting the review process completed.

The board discussed at length the organization of the publications committee. After careful consideration of logistics, work loads, and the ability of various editors to support the transactions activity, George McClure made the following motion:

A position titled "Chairman of the Publications Committee" is to be created, and is to be chaired by Bill Lee. Also, Bill Lee is to be assigned a corresponding position as chairman of the papers procurement committee. Sang Rhee is to be assigned the position of Transactions Editor, with J. R. Cruz, Richard Uher and Giorgio Rizzoni as the associate editors for communications, transportation systems and vehicular electronics, respectively.

Fred Link seconded the above motion, and the vote was unanimous in favor.

Later during the board meeting, Bill Lee proposed an alternative approach to the organization of the publications committee. After discussion, the board decided that it would be best to leave the motion as originally approved for now. George McClure in consultation with Bill Lee and Sang Rhee will prepare written job descriptions detailing the duties of the chairman, publications committee, and editor, transactions, for review by the board at the next meeting.

Kent Johnson reported that most inputs for the November issue of the newsletter have been received, but that he is still awaiting an input from Stu Meyer and any other inputs which may be appropriate as a result of this board meeting.

## CONFERENCES AND MEETINGS

38th VTC Philadelphia Conference

The board noted that the success of this conference was due in large part to the recent upsurge of interest in digital cellular. Many papers relating to cellular radio issues were given at this conference.

39th VTC San Francisco Conference (1989)

Evan Richards noted a problem with getting the call for papers out in a timely fashion for this conference. The board instructed Evan to update

the VTS Conference Manual to allow the conference committee to use local printing facilities as an option to speed the printing process.

The registration fees for the San Francisco conference will be the same as those used for the Philadelphia conference.

Several members of the board expressed concern over the solicitation of fees from manufacturers. Two levels are being considered by the San Francisco committee, with one being a "contributor" and the other being a "supporter". Both would be listed in the conference program, and in addition the "contributor" would be provided a table at the conference for the dissemination of manufacturer's advertising material. It was noted that the manufacturers were allowed to conduct symposiums in return for their support at past conferences.

Abstracts for over 120 papers have been received for this conference so far, mostly from the communications sector. Papers are still needed from the transportation systems and vehicular electronics sectors of the Society, and Roger Madden is to survey the authors participating in the Post Convergence workshop for possible submission to the San Francisco conference.

40th VTC Orlando Conference (1990)

George McClure corrected the dates selected for the Orlando conference to May 6-9. This conference will be held at the Crowne Plaza hotel. George also provided updated cost analyses based on different attendance levels, and recommended that the registration fees be held at the same level as those used for the Philadelphia conference.

George also discussed a possible tour to the Kennedy Space Center, particularly for those who are attending from foreign countries. An interpreter could also be provided for the Japanese attendees. This tour would be arranged separately from the conference, and on a minimum financial exposure basis.

41st VTC St. Louis Conference (1991)

Stu Meyer reported that the Sheraton Westport has been tentatively selected for this conference. The dates for this conference is still being decided, and it was noted that the dates should be coordinated with the board to make sure that conflicts with other industry-related functions occur will be held at a minimum.

The conference committee has asked for a printout of all VTS members within a 125 mile radius of St. Louis. Eleven have been found, of which three have been recruited so far to help with the conference.

Stu noted that Southwestern Bell is building a technology center in St. Louis, and that this should help considerably in the both the running and the attendance at this conference.

42nd VTC Denver Conference (1992)

Fred Link noted that John Tary is a proven performer in the running of VTS conferences, and that this conference likewise should be very successful. Evan Richards is to write a letter to Denver to confirm board action in selecting Denver for the 1992 VTC.

Evan Richards moved, Ray Trott seconded that \$3K be provided to St. Louis and \$3K be provided to Denver for seed money for initial expenses in getting these two conferences going. The vote was unanimous in favor.

1993 VTC Conference

The board directed Fred Link to start investigating potential sites in the Northeast for the 1993 VTC. Ray Trott volunteered to help with this function. No site is to be selected at this time, but the board would like to have a list of potential candidates to discuss at future board meetings.

Joint Railroad Conference

Linda Sue Boehmer reported that ASME and the Joint Railroad Confer-

ence committee have agreed to switch meeting locations to allow joint VTC/Railroad conferences starting in 1991. The 1990 Joint Railroad Conference will be held in Chicago, while it will be held in St. Louis in 1991 and in Denver in 1992 in conjunction with the annual VTS conferences.

Between 115 and 130 registrants can be expected for the Joint Railroad Conferences.

Linda Sue Boehmer and Al Engel will be the coordinators to assure an orderly transition to the joint conference meetings.

Convergence '88

Bob Mazzola reported that over 1200 had registered for the conference, and that this conference would be the most successful ever. The Convergence conference committee is expected to select a new chairman for the 1990 conference, possibly from the international sector.

1988 VTS/IES Convergence Workshop

Roger Madden reported on the Convergence vehicular electronics workshop being held on the day after the Convergence conference. A total of 13 papers will be presented at this workshop, and an attendance of from 60 to 80 people is expected. Roger expects that the authors of some of these papers will be candidates for paper submissions to the 1989 VTC.

Scandinavian Distinguished Speaker Tour

Bob Fenton reported that he has not received a response to his letter inquiring about the effectiveness of the current distinguished speaker tour. Bob will follow up with another letter.

1989 VNIS Conference

Stu Meyer reported that the VNIS conference committee has agreed to move this conference to the September-October time frame in Canada next year to avoid a potential conflict with the San Francisco VTC. Stu also noted that this conference has strong backing from the Canadian Government.

Bob French from R. L. French and Associates has also been appointed to the board as Chairman of the Vehicle Navigation and Information Systems committee.

Third Generation Wireless Access Information Networks

David Goodman reported on a workshop being planned at Rutgers University next June 15 and 16, 1989. After discussion, Roger Madden moved, Evan Richards seconded that the Society participate in, with an option to sponsor, this workshop. The vote was unanimous in favor.

Kent Johnson moved, George McClure seconded that the board accept the conference reports as presented. The vote was unanimous in favor.

## COMMITTEE REPORTS

Land Transportation

Linda Sue Boehmer reported that the membership mailing list for land transportation interests is too broad, and hence very expensive for mailings. Means for narrowing the mailing list were discussed, with one approach involving using a mailing list based on attendance at land-transportation related conferences for the past few years.

Also, a reoccurring problem with the wording in the IEEE description of the VTS charter was discussed, where the wording excludes rather than includes public transit activities. Bob Fenton reported that he has written several letters to headquarters trying to correct this problem, but to no avail.

Bob Fenton and Jim Sears are to follow this problem and get it corrected.

In addition, Linda Sue is to generate a letter to those who have expressed an interest in land transportation. This letter is to clarify that the wording on the IEEE membership brochure is incorrect, and that public transit systems is included rather than excluded from VTS interests. This letter is also to invite membership into the Society.

Constitution and Bylaws

Roger Madden reported that, in a move of computer files between offices, he had lost the version of the constitution which had been reviewed and edited by IEEE headquarters. This discrepancy has now been straightened out, and headquarters is asking whether we want to save the expense of an additional ballot mail-out for approval of the constitution by waiting until the next general ballot. After discussion, it was determined that this could delay the constitution approval for up to a year. Roger Madden then moved, Bob Fenton seconded that the board should proceed with a separate ballot, to be received by the membership by the end of the year. The vote was unanimous in favor.

Roger also discussed a preliminary proposal to change the VTS board member voting process to assure that adequate representation is provided by the vehicular electronics and the land transportation domains. The ballot would be arranged such that, of the five positions available for each election, one position would be set aside for vehicular electronics, another position would be set aside for transportation systems, and the remaining three would be for "at-large" positions including vehicular communications. After discussion, Roger Madden and Stu Meyer agreed to refine the proposal further and to report back to the board at the next meeting.

Membership Report

Jim Sears reported that membership is up by 135 to 2,518 from this time last year. After discussion, the following action items were determined:

The membership chairman is to generate a white paper for publication in the various trade journals which may be read by radio technicians. This white paper is to invite these technicians to become associate members of IEEE and the VTS. Ray Trott, Leo Himmel and Fred Link is to work with Jim Sears in disseminating this information. Avenues for dissemination of this information include the Mobile Radio Technology magazine, the C&S mailings, and NABER mailings.

A membership booth is to be set up at the San Francisco conference. Also, this is to be done at future conferences, and Evan Richards is to add this requirement to the VTS conference manual. A check-off list is also to be provided to assure that the person manning the membership booth will have all the information necessary for the potential applicant.

The IEEE "Potentials" magazine has proven to be a poor investment in the recruitment of VTS members. Ads for VTS membership in this publication will be dropped.

Evan Richards is to include in the VTS conference manual a requirement to advertise to those conference attendees that check the non-member rate that they can attend at the member rate if they fill out an application to join the Society (and IEEE, if appropriate).

Publicity

After discussion, David Goodman agreed to take on the task of publicity for the Society. Bob McKnight is to provide assistance over the next few months in getting Dave going on the intricacies of publicizing the Society's activities.

CCIP Representative

There was no report available on CCIP activity.

USAB Engineering R&D

Likewise, no report was available for this activity.

Transportation Electronics Fellowship

Bob Fenton reports that his committee is on target for awarding a transportation electronics fellowship next year. The procedure for awarding this fellowship will follow that which was generated for the Noble fellowship award. The amount of the stipend is to be \$7500, and the title of the award is to be "Convergence Fellowship in Transportation Electronics".

However, unlike the Noble fellowship, there are no corporate sponsors available that are willing to absorb the costs of administering this fellowship. After discussion, Fred Link moved, Kent Johnson seconded that up to \$1000 be set aside for administrative fees involved in awarding next year's transportation electronics fellowship award. The vote was unanimous in favor.

The fellowship committee consists of Bob Fenton, Lou Nagy, and Keith Struthers.

Noble Fellowship

There was no report available on the Noble fellowship status. Tony van den Heuvel has been transferred to a new location, and a new contact point will have to be established at Motorola. Stu Meyer volunteered to call Motorola and determine the status of this fellowship.

Chapter Activities

A written report from Gaspar Messina indicates that the L-31 forms are now being returned more frequently.

Stu Meyer reported that the Washington D.C. chapter has fallen to the inactive status, and that he and Sam McConoughey are going to work on getting this chapter back on track.

Also, concern was expressed over the recent lack of activity from the Cleveland chapter, which had been one of the most active for the past several years. Increasing activity was also noted for the San Francisco and the Los Angeles chapters.

Standards

No new information in regard to standards was available at this meeting.

Awards

Stu Meyer noted that Sam McConoughey is to continue with the Avant-garde activities, and that he will continue with the remainder of the award activities.

Two board members are retiring from board activity, and Bob Fenton moved, Evan Richards seconded that plaques indicating the Society's appreciation for their service be obtained for presentation to these two people. The vote was unanimous in favor.

Fellows Report

A written report from Al Isberg indicates the following:

Two VTS members have been recently elevated to Fellow Member grade. They are Sam McConoughey and Richard Frenkiel.

Two additional nominations are in process.

New guidelines from IEEE are out for the fellow grade evaluation committees. Under these guidelines, the Society should be submitting about six nominations each year.

Educational Activities

David Goodman has also volunteered to chair this committee.

Nominations Committee

Bob Fenton reported that a total of eight names have been placed on the ballot for board election, and that members should already have received their ballots. A ninth name did not make the list due to a last minute foul up at headquarters in validating VTS membership.

In a separate action, the board officially recognized Linda Sue Boehmer as the official representative of the land transportation division for the upcoming year.

OLD BUSINESS

The VTS and IEEE policies for life membership were reviewed. It was noted that the Society has no control over who may become a life member of IEEE.

On a separate matter, a written motion submitted by Sam McConoughey in regard to life member admission to conferences was discussed. This motion was modified by the board to read as follows:

"Any IEEE and/or VTS life grade member attending any Vehicular Technology Society annual conference shall be granted free registration, together with all privileges associated with such registration. Free registration does not include luncheons, dinners, conference records, or other charges over and above the conference registration fee."

The Society's conference manual is to be updated to reflect the above motion. The manual is also to include a requirement that the life member applying for free registration has to submit proof thereof.

Fred Link moved, Evan Richards seconded that Sam McConoughey's written submission as modified above be approved. The vote was unanimous in favor.

NEW BUSINESS

Bob Fenton submitted the following executive committee nominations for the 1989 year:

George McClure — President  
Roger Madden — Vice President  
Art Goldsmith — Treasurer

The floor was opened for additional nominations. After hearing none, Fred Link moved, Evan Richards seconded that the slate be accepted as presented. The vote was unanimous in favor.

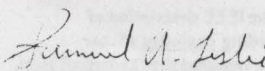
NEXT MEETING

The next board meeting is scheduled for February 10, 1989 in Orlando, Florida.

ADJOURNMENT

The meeting was adjourned at 4:05 PM.

Respectfully submitted,

  
Samuel A. Leslie  
Secretary

## CALL FOR FELLOW NOMINATIONS

Election to the grade of Fellow is an important element in pursuit of the IEEE objective of recognizing excellence among its members in the advancement of the theory and practice of electrical and electronics engineering.

The IEEE Board of Directors and the Fellow Committee are seeking to enhance the recognition accorded to the electrical engineering practitioner for outstanding technical contributions. The practitioner is to be distinguished from the academic who teaches the content of the electrical engineering profession and from the theoretician who deals with the basic science underlying electrical engineering practice. The work of the practitioner can be described as product design and applications, and the construction, operation and evolution into practical use or manufacturing of items or systems. Part of the difficulty in providing recognition to the outstanding practitioner is that proprietary considerations of the corporation in which he practices his profession sometimes prevent full documentation of his contribution in the open literature. Recognition of the practitioner must be based on the product (which is publicly visible), by assurances from those within his company regarding his individual role in creating and developing the product (Fellow references that are suitably specific) and by documentation from within the company which confirms, to a group of evaluators in the IEEE, that the individual's relation to the product is as cited. Some level of disclosure of the nature of the product and the individual's specific technical contribution embodied in it is necessary to assure the integrity of the selection process, but with the passage of time such disclosure is ultimately palatable for most organizations.

It is not the intention of this pursuit of enhanced Fellow recognition for practitioners to reduce the

standards for recognition of technical contributions. The goal is to accord to those whose contribution is of a proprietary nature and not immediately publishable, and to those whose contribution is the product and its application, the same recognition now available to those who can publish and/or patent their results and the products that stem from them. The standards for associating the product with the individual and his individual technical contribution must be, if anything, more stringent since the information is not generally available in public documents and errors in attribution and faulty perspective regarding the importance of the contribution must be guarded against.

This note is intended to encourage those who are seeking to nominate outstanding practitioners. Such nominations will be given special attention by the Society Evaluation Committees and by the Fellow Committee. It is strongly urged that those who were discouraged by the previous emphasis on publicly documented individual contributions should proceed to submit practitioner nominations with the assurance that such nominations will be regarded with a positive attitude by the evaluators.

It is important that qualified Members upgrade their status to Senior Member grade in order that their peers can nominate them for Fellow Membership. VTS has 2230 members, 332 are Senior Members and 80 are Fellows. We have typically submitted two to three Fellow nominations each year; under the broadened policy we should nominate about six. If you know of anyone who should be nominated for Fellow Member grade, please write to:

R.A. Isberg, Chairman  
VTS Fellow Search Committee  
1215 Henry Street  
Berkeley, CA 94709  
(415) 526-1446

## NEAL H. SHEPHERD

Neal H. Shepherd (SM'54-F'70-LF'88) died at his home in Lynchburg, VA on August 24, 1988 at the age of 68.

Neal received the B.S.E.E. degree from Texas A&M College, College Station, TX. in 1942. After graduation he served four years as communication officer in the U.S. Signal Corps and the U.S. Air Force. One of his assignments while in the military service was the design, installation, and maintenance of a communication network for fighter control installations in the San Diego and Los Angeles areas. In 1946, he joined the General Electric Co. where he held various positions until his retirement from that company in 1982. His earlier work included development of mobile communication equipment, design of L-band radar transmitters, and the design of an antenna system for the Titan II weapons system sites. Twenty years prior to retirement, he was a consulting engineer engaged in the development of advance mobile communication systems, propagation studies, noise measurements, standards committee work, and international radio regulations. One of his later assignments was to assist in the development of alignment and check out procedures for the Los Angeles Police Department simulcast radio system. He has had several technical papers published.

Mr. Shepherd was elected to the grade of Fellow in the Radio Club of America in 1978. He received the Avant Garde Award of the IEEE Vehicular Technology Society in 1980; the Founder's Award of the IEEE Electromagnetic Compatibility Society in 1983, and the IEEE Centennial Medal in 1984. At the time of his death, he was Chairman of the Propagation Committee of the IEEE Vehicular Technology Society. The Propagation Committee published its initial work in a "Special Issue on Mobile Radio Propagation" in the IEEE Transactions on Vehicular Technology in the February 1988 issue.

A memorial fund has been established in his memory "to further the knowledge of radio propagation." Those wishing to, should send their contributions to:

The Radio Club of America, Inc.  
Dr. Stoll, Treasurer  
P.O. Box 414  
Bogata, New Jersey 07603

The contribution, which is tax deductible, should be designated for the "Neal H. Shepherd Memorial Fund".

Tribute To A Friend  
Neal H. Shepherd, Fellow  
VTS - Avant Garde

When Neal H. Shepherd died, I, --we, lost a friend and a man of quiet greatness.

Appearing elsewhere in this issue is his obituary. A reading of it will inform those that did not know him of his many contributions to advancing knowledge in the field of mobile communications.

It was my privilege, over more than thirty years, to have had the opportunity to work with and get to know Neal Shepherd. This association included times we were both employed by General Electric Co. and when we participated in the ITU CCIR Study Group 8A of which he was Convener. We also shared a mutual interest in the IEEE and the Vehicular Technology Society.

In all those years, Neal Shepherd was the Engineer's Engineer; he was Ambassador of the United States, par excellence; and, he was an Electrical Engineer and Inventor dedicated to advancement of the profession. It was this dedication which led him to actively volunteer his services to the IEEE and many other technical organizations.

Neal Shepherd was this Society's first Chairman of the Propagation Committee. The "Special Issue on Mobile Radio Propagation" of the Society's most recent issue of Transactions was the result of this committee's efforts.

Farewell, Neal Shepherd. All of us, those that knew you and even those that did not will miss you and what you stood for.

I, --we, only hope that others among us can draw inspiration from you and pick up your torch and carry it as high as you did in your lifetime.

Sam McConoughey

## Chapter News



Gaspar Messina  
Chapter News Editor

## Meetings

## San Francisco Bay Area VTS

**Subject:** Planning 1988 Seminar/1989 Conference/1988 Conference Report

**By:** Mr. Frank Thatcher  
564 Market Street, Suite 612  
San Francisco, California

**Held:** June 21, 1988

**Attendance:** 10 (1 guest)

**Subject:** FCC Update

**By:** Mr. Stuart Meyer, President, Vehicular Technology Society

**Subject:** New Developments in Automatic Vehicular Location Systems

**By:** Mr. Wrex Beaman, ETAK Incorporated.

**Subject:** New Trends in Cellular Radio

**By:** Mr. Jim Proffitt, Pactel Mobile Services.

**Subject:** Trunked Radio Panel

**By:** Mr. Frank Thatcher, Moderator

Mr. B Olson, Motorola

Mr. R. Numely, General Electric

Mr. John Thompson, E.F. Johnson Co.

Mr. Michael Branch, UNIDEN

Mr. G.Gray, APCO

**Held:** June 28, 1988

**Attendance:** 76 (57 guests)

**Subject:** Seminar Review, Critique of Technical Presentation/Panel

**By:** Mr. John Powell, University of California Police, Berkeley, California

**Held:** July 12, 1988

**Attendance:** 9 (2 guests)

Gaspar Messina

Editor and Chapter Activities Chairman

9800 Marquette Drive

Bethesda, Maryland 20817

Upcoming Meetings  
Land Transportation Division  
Philadelphia Section

**When:** Thursday, December 15, 1988  
7:00 PM - Reservations required

Call Harvey Glickenstein or Dana Fidell at 569-1795

**Where:** 30th Street Station, Meet at Amtrak Information Window

**Subject:** Tour of Amtrak's CETC Installation at 30th Street Station

Tour will be led by Andrew Jones, Engineer Electronic SCADA Systems for Amtrak

This guided tour, which is limited to approximately 15 people, will start at the Information Window at 30th Street Station. Participants will be taken up to the top of the Station, where the facility is located in a secure area. Mr. Jones will explain the workings of the CETC system, which is presently controlling both power and train dispatching between Washington, DC and Wilmington, DE. Participants will view the control room area, which consists of a large projection tv board and separate consoles for power dispatchers, train dispatchers, and other support personnel. Participants will also have an opportunity to see the computer room from which the CETC system is controlled.

**When:** Thursday, February 16, 1989 7:00 PM

**Where:** Rittenhouse Laboratory, University of Pennsylvania, 33rd & Walnut Streets

Free Parking at University Lot #1-Enter on 33rd Street between Walnut and Chestnut Streets

**Subject:** Vital Microprocessors for Railroad Signaling  
**Speaker:** James P. Miccolis, System Engineer, Consolidated Rail Corporation

Railroads have just recently started using vital microprocessors to replace relays in safety circuits. The speaker has been involved in handling the design and installation of this type of apparatus on Conrail. He will explain some of the pitfalls encountered when changing over from conventional relay circuitry.

**When:** Thursday, April 20, 1989 7:00 PM

**Where:** Rittenhouse Laboratory, University of Pennsylvania, 33rd & Walnut Streets

Free Parking at University Lot #1-Enter on 33rd Street between Walnut and Chestnut Streets

**Subject:** To be announced.

**When:** Thursday, June 15, 1989

**Where:** Rittenhouse Laboratory, University of Pennsylvania, 33rd & Walnut Streets

Free Parking at University Lot #1-Enter on 33rd Street between Walnut and Chestnut Streets

**Subject:** Computer-Aided Dispatching

**Speaker:** Joseph F. Donlan Sr., Circuit Engineer, Consolidated Rail Corporation

The speaker has been heavily involved in Conrail's computer-aided dispatching program almost since its inception. He will describe the facilities installed on this major freight railroad in Buffalo, New York, Chicago, Illinois, and other locations.

Harvey Glickenstein  
District Manager  
Transportation System Engineering  
Thomas K. Dyer, Inc.

# Transportation Systems



**Bob McKnight**  
Transportation Systems  
Editor

Communication & Signal Division,  
Association of American Railroads,  
has an expanding role

Communication and signaling, a vital part of any railroad's operations, are also playing a little-known but key role in the Association of American Railroads.

Important functions of the Communication & Signaling Division include:

- Coordinate radio frequencies for the railroad industry.
- Provide liaison with federal regulatory agencies including the Federal Communications Commission (FCC); Federal Highway Administration (FHWA); Federal Railroad Administration (FRA); and others.
- Develop recommended practices for telecommunications and signaling systems for railroads.
- Monitor development of the Advanced Train Control System project. C&S Division obtained the use of six frequency pairs in the UHF radio spectrum from the FCC for ATCS.
- Participate with AAR's Mechanical Division and Research & Test Department in the hot bearing detector/freight car truck compatibility test program.
- Represent the AAR on the National Committee on Uniform Traffic Control Devices, which advises FHWA on warning devices used at rail-highway grade crossings.

General policy for the C&S Division is made by its Committee of Direction consisting of senior representatives of AAR member railroads. Policy is carried out by Leo M. Himmel, Sr., Executive Director, and the Division staff under his direction.

Liaison with the FCC and other agencies dealing with communications is handled by the Communications Liaison Subcommittee.

In the signal area, including rail-highway grade crossing warning systems, matters are handled by the Signal Liaison Subcommittee. This subcommittee maintains contact with FHWA and FRA, as well as other agencies.

Developing recommended practices for telecommunications and signaling is handled by five technical committees:

- Committee C- Telecommunications Systems.
- Committee D- Highway Grade Crossing Warning Systems.
- Committee E- Signal Systems.
- Committee F- Special Applications.
- Committee G- Education and Training.

Liaison with FCC is vital to the railroads. C&S Division with its staff and communications liaison subcommittee has over the years provided a valuable liaison function with the FCC in bringing the railroad message to the Commission. Two recent actions of the Commission favorable to the railroads indicate the value of keeping federal regulatory agencies apprised of one's interests.

In one on the flexibility of interconnecting private microwave systems to the public switched telephone network, FCC pre-empted the Texas Public Utility Commission and upheld Atlantic Richfield Co.'s (ARCO) right to pass its voice and data traffic over its own microwave system and interconnect to the public telephone network at a place of ARCO's choosing.

On February 4, 1988, the FCC affirmed an order of its Common Carrier Bureau pre-empting the authority of the Texas PUC to control the points of interconnection between privately operated point-to-point microwave systems and the networks operated by the telephone companies.

This FCC decision is important for the railroad industry because it operates over 44,000 route miles of private point-to-point microwave systems and must have the flexibility to determine how those systems are to be used.

In another area, Executive Director Leo M. Himmel, Sr., and C. L. Allman, Director Railroad Radio Service & ATCS Spectrum Management, have been successful in their quest for obtaining frequencies for the Advanced Train Control System project. In an order released February 14, 1988, the FCC authorized the AAR to use six frequency pairs in the 896, 897, 935 and 936 MHz bands for ATCS. AAR has filed 756 license applications for 2,059 land mobile base stations and 30,000 mobile units. Also, AAR intends to file for another 941 base locations. FCC waived rules to permit a construction period of 10 years. (See VTS Newsletter for May 1988).

#### Frequency coordination, a vital service.

Radio communications are used extensively by railroads in their day-to-day operations. They use 91 channels (frequency assignments) allotted to them by the FCC. Railroads must have an FCC license to operate each mobile, portable or base station radio.

An important element in the use of radio is that there must be a coordination of frequency usage so that one train crew using its radio does not hear someone else talking. For safety and operational reasons, railroads must have interference-

free channels upon which to operate. This is where the AAR and the C&S Division come in. AAR has been the frequency coordinator for the Railroad Radio Service, an FCC designation, since the late 1950s.

On October 12, 1986, the FCC shifted to the AAR the primary responsibility for the receipt and handling of radio frequency license applications. This work is handled by C. L. Allman. All applications are coordinated and reviewed for accuracy and completeness before being forwarded to the FCC. AAR charges fees for this work. Also, since April 1, 1987, FCC has been charging fees for the licenses. Thus, the AAR coordination work involves the chore of seeing that the FCC gets its money with the application.

At present, the computerized data base maintained by the C&S Division has data on approximately 52,000 radio licenses, and this does not include those for ATCS. Not only does C&S handle license applications for AAR member roads, but also for short line railroads, rapid transit authorities and others.

#### Hot Bearing Detector/Freight Car Truck Compatibility Test Program

Committee F- Special Applications of the C&S Division, AAR, is participating in an AAR C&S/Mechanical Divisions Ad Hoc Task Force set up to deal with compatibility of hot bearing detectors and freight car trucks. The task force consists of members from C&S Division Committee F, members of the Mechanical Division staff and its Car Construction Committee, and staff from the AAR Research & Test Department.

Testing is conducted at the AAR's Transportation Test Center in Pueblo, Colorado. The following hot bearing detectors have been donated by railroads and manufacturers to TTC to provide a representative sample of hot bearing detectors in service on North American railroads:

- Servo 7707D donated by ConRail.
- Servo 8909 donated by Norfolk Southern.
- Servo 9000 donated by Servo Corp. of America.
- General Railway Signal WTSU-1 donated by Santa Fe Railway.
- General Electric donated by Union Pacific, which also donated two 8 ft. by 20 ft. instrument housings.
- Harmon WCO-32 donated by Harmon Electronics.
- Mark NS-1 donated by Norfolk Southern.

Testing consisted of operating conventional roller bearing cars (one high side gondola with 36-in. wheels and one TTX 89-ft. flat car with 28-in. wheels) by the detectors at various speeds with specific heat induced into certain instrumented bearings.

Along with the gondola and TTX car various test cars have been or will be

operated with certain bearings instrumented. The following are included in plans for this hot bearing detector/freight car truck compatibility test program:

- Single-axle flat cars.
  - Converted bearing cars in which a roller bearing has been installed in a friction bearing housing.
  - Three-axle truck cars.
- Also, the Ad Hoc Task Force, Committee F and the AAR Research & Test Department will be cooperating in an effort to develop guidelines for the performance of hot bearing detectors.

#### Short Lines have many options in communications, says AAR's Himmel.

Short line railroads have several communications systems available for their efficient and safe operations. Speaking recently to the Southern Regional meeting of the American Short Line Railroad Association, Leo M. Himmel, Sr., Executive Director, Communication & Signal Division, AAR, said the following radio systems could be used by short lines:

- Railroad Radio Service has 91 channels in the 160-161 MHz band that can be used for communications related to safety and efficiency of operations.
  - Also available are 7 channels in the 450-460 MHz band that must be shared with motor carriers.
  - In the 806-866 MHz band there are 50 channels that must be shared with industrial and land transportation users.
  - Another 100 channels are available in the 866-941 MHz band that must be shared with industrial and land transportation users.
  - Personal and business uses can be made in the Citizen's Band of 27 MHz which consists of 40 channels; but these are not interference-free. Channels 24-40 are not heavily used.
  - Cellular radio provides mobile telephone service, but at present is mostly in urban areas.
  - Community repeaters can be used with mobile radios to provide extended coverage.
  - Special mobile radio systems operate like community repeaters and could provide service for mobile radios.
- Thus, there are several types of radio systems that the short line railroads can use to provide for office-to-train communications and for train crew communications.

In his address, Mr. Himmel pointed out that the 1987 World Administrative Radio Conference in Geneva, Switzerland, reaffirmed its stand not to disturb railroad use of VHF frequencies. AAR attends these WARC meetings because the ability of the railroads to continue to use most of their VHF frequencies depends on an exception provided by international regulations.

In most parts of the world, these frequencies are allocated to the maritime radio services and there are continuing efforts to do the same in the U.S. as well. Agreement at WARC is a treaty and

will be submitted to the U.S. Senate for ratification. Thus, it appears that the railroads' use of 91 VHF channels will continue without treaty interference.

Thus, one can see that the Communication & Signal Division, AAR, is continually working to provide a service to members as well as keeping abreast of developments and trends in communications and signaling.

Short course available on electric traction systems for rail transit

December 5-9, 1988 are the dates for a course dealing with electric traction systems for rail transit. The course is presented by the Rail Systems Center of Mellon Institute, Pittsburgh, PA.

The course begins with a fundamental tutorial on train motion, energy, principles of adhesion and train performance methodology. Various types of propulsion systems are described and the economic and technical advantages and disadvantages are discussed.

Likewise, the same discussion is conducted with friction brake and power distribution systems. The exploration of these types of propulsion, friction brake and power distribution systems is followed by actual application in equipment both domestic and overseas. Items which affect economics, such as electromagnetic compatibility, equipment reliability and maintainability, and energy conserving traction operation are presented.

Life cycle cost methodology applied to traction equipment and operation is outlined. Finally, some attention is given to microprocessor control of traction systems and trends expected in the future.

Fee for the course is \$795. Details may be obtained, as well as registration by contacting Pamela Sellitti, Administrative Assistant, Mellon Institute, Rail Systems Center, 4400 Fifth Ave., Pittsburgh, PA 15213. Phone (412) 268-2960.

IEEE Land Transportation history fills a void

A 100-page volume has recently been published that fills a void in the history of railroad transportation in the United States.

"A History of Land Transportation in the Institute of Electrical & Electronics Engineers" by Keith Uher, a history graduate of Carnegie Mellon University, surveys the role of the Land Transportation Committee in the electrical engineering society.

LTC began in 1884 as the Electrical and Railway Signal Committee of the

American Institute of Electrical Engineers. In 1917, it became the Traction and Transportation Committee and 10 years later, the Transportation Committee. And, of course, much later the Land Transportation Committee.

LTC membership played key roles over the years in the development and implementation of railway electrification. Much of this book is devoted to a selected chronicle of LTC papers and developments in railway electrification. For one who is primarily interested in railway electrification, this book presents a condensed overview of the subject.

As with other technical societies, LTC often had papers presented long after the installations were in service. In other instances, LTC papers covered designs of systems yet to be installed or never placed in service.

One drawback of this book is the shallow treatment of many subjects presented. More extensive excerpts from papers would have provided much needed descriptions of trends and interesting material concerning important events and developments.

For various reasons never dealt with by the author, railway signaling or communications got very little attention in this slim volume.

Following merger of the Institute of Radio Engineers with the AIEE in 1963, one would have expected railway communications to be more fully treated by the Land Transportation Committee. But it is not and the author never explains.

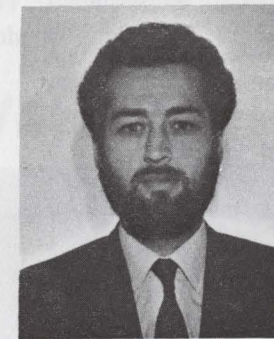
Two major defects are the lack of meaningful caption on Figures and captions listed in the back of the book are not in any order to make it easy for the reader to identify the illustrations when reading the text.

The second major defect is the lack of identifying by job title or company affiliation of authors of LTC papers. Apparently the author assumed that readers would be familiar with the people mentioned in the book. Not necessarily so, and the book would have much wider appeal if people were more definitely identified. One must assume the people mentioned are important, but authors must never assume readers are so informed.

Also editorial or author's judgements have crept in which detract from the overall credibility. There are several unsupported assumptions concerning trends in railway electrification that should be better explained.

Overall, if one is interested in railway electrification as viewed by electrical engineers in the Land Transportation Committee of the IEEE, then A History of Land Transportation in the IEEE can be recommended. It is published by Carnegie Mellon University Press, 1988. Price is \$19.95 and copies can be ordered from CMU's Rail Systems Center, 4400 Fifth Ave., Pittsburgh, PA 15213.

## Communications



**J. R. Cruz**  
Communications Editor

### ABSTRACTS

"Computation of Single-Tone Spurious Effects in Radio Communication Systems," J. Gavan, IEEE Proc., Vol. 76, No. 7, July 1988.

Since the probability of single-tone spurious interferences is greater than any other RFI disturbance, this letter describes a new and straightforward semiempirical computational method for disturbing single-tone spurious magnitudes and frequencies. Measurements on an analyzed UHF radio system gave similar results. This method proved very useful in the design and development of Radio Communication Systems.

"Asymptotic Performance of M-ary Orthogonal Signals in Worst Case Partial-Band Interference and Rayleigh Fading," M.V. Hegde, and W.E. Stark, IEEE Trans. Commun., Vol. 36, No. 8, August 1988.

In this paper, we show that for large  $M$  the symbol error probability  $P_e$  of an orthogonal signal set transmitted over a channel with partial-band Gaussian interference is

$$P_e = \lim_{M \rightarrow \infty} P_e(M) = \begin{cases} 1 & E_b/N_I < \ln 2 \\ \frac{\ln 2}{E_b/N_I} & E_b/N_I > \ln 2 \end{cases}$$

where  $E_b$  is the transmitted bit energy and  $N_I$  is the average power spectral density of the interference. This is in contrast to the additive white Gaussian noise channel which has asymptotic probability of error going to zero for  $E_b/N_0 > \ln 2$ . We also show that for a Rayleigh fading channel for large  $M$  the symbol error probability is  $P_e = 1 - e^{-\ln 2 / (E_b/N_0)}$ . Finally, we provide numerical computations of the minimum  $E_b/N_0$  required to achieve a symbol error probability of  $10^{-5}$  to illustrate the asymptotic behavior described above.

"The Design of Trellis Coded MPSK for Fading Channels: Performance Criteria," D. Divsalar, and M.K. Simon, IEEE Trans. Commun., Vol. 36, No. 9, September 1988.

It has been well established in the literature that the appropriate criterion for optimum trellis coded modulation design on the additive white Gaussian noise channel is maximization of the free Euclidean distance. We show here that

when trellis coded modulation is used on a Rician fading channel with interleaving/deinterleaving, the design of the code of optimum performance is guided by other factors, in particular, the length of the shortest error event path, and the product of branch distances (possibly normalized by the Euclidean distance of the path) along that path. Although maximum free distance ( $d_{free}$ ) is still an important consideration, it plays a less significant role the more severe the fading is on the channel. These considerations lead to the definition of a new distance measure for optimization of trellis codes transmitted over Rician fading channels. If no interleaving/deinterleaving is used, then once again the design of the trellis code is guided by maximizing  $D_{free}$ .

"The Design of Trellis Coded MPSK for Fading Channels: Set Partitioning for Optimum Code Design," D. Divsalar, and M.K. Simon, Vol. 36, No. 9, September 1988.

In a companion paper, we discussed criteria for designing trellis coded MPSK modulation to achieve minimum error probability performance on the Rician fading channel. Indeed, it was shown that the analogy to maximizing diversity was to design the code such that the length (as measured by the number of MPSK symbols) of the shortest error event path is maximized. We observed that for trellises with parallel paths, conventional trellis codes (i.e., those with one MPSK symbol per branch) are limited to a diversity of one. Furthermore, for trellises with no parallel paths, the diversity achievable with conventional trellis codes is still limited to the number of branches along the shortest error event path.

Here, we demonstrate that allowing for multiple symbols per trellis branch, i.e., multiple trellis coded modulation (MTCM) provides an additional degree of freedom for designing a code to meet the optimization criteria on the fading channel. In particular, we are able to achieve diversities larger than those achievable with conventional trellis codes having the same number of trellis states. It is here where the MTCM technique exploits its full potential.

## Professional Activities



**Frank E. Lord**  
Professional Activities Editor  
IEEE USA

That's not a typo. Although there is still a USAB (United States Activities Board), surveys continue to reveal that most members do not know what it is, what activities it embraces, or what it accomplishes. As a



result, a change has been made in how the many pursuits under the aegis of USAB are publicized. Dr. Ed Bertnolli, Vice President, Professional Activities, and Chairman of the United States Activities Board has recently announced a method for projecting a more positive image of our professional activities. Henceforth all correspondence and publication about these activities will be under the banner IEEE United States Activities or IEEE USA. The use of the word Board will only be associated with USAB business and deliberations. In terms of people and expenditure of man hours IEEE USA is the larger operation by far. Dr. Bertnolli pointed out that IEEE USA is involved in promoting career and technology policy interests of electrical, electronics, and computer engineers and has chosen to include that phrase in the banner of the IEEE USA stationary. He went on to remind us that over the last 15 years the organization under other names has helped to influence government action on career and technology matters at all levels, and contributed to industry practice in such areas as ethics, career maintenance, and professional development. He also emphasized the importance of the more than thirty committees, grouped in five councils, in carrying out the United States Activities.

Dr. Bertnolli urged members to contact IEEE-USA at (202) 785-0017 when they are in need of information or wish to express a concern. Readers of this column also know that they can contact their PACE (Professional Activities Committees for Engineers) representatives in their Society, Group Chapter, or Section. My address and phone number are listed with the other members of the newsletter staff near the front of this publication.

You may recall that USAB began as the United States Activities Committee in 1973, in response to a need, voiced by many members, for the Institute to expand its role. In order to do that, the IEEE Board of Directors, in 1972, had called a special meeting to propose a Constitutional amendment that would include among the Institute's purposes one termed: "... professional, directed toward the advancement of the members of the profession it serves; means to this end include, but are not limited to, the conduct and publication of surveys and reports on matters of professional concern to the members of such professions, collaboration with public bodies and with other societies for the benefit of the engineering profession as a whole, and the establishment of standards of qualification and ethical conduct. The IEEE shall not engage in collective bargaining on such matters as salaries, wages, benefits, and working conditions, customarily dealt with by labor unions. The IEEE shall strive to enhance the quality of life for all people throughout the world through the constructive application of technology in its fields of competence. It shall endeavor to promote understanding of the influence of such technology on the public welfare."

That proposed change was based in part on member survey results, where members voted two-to-one in favor of becoming more active in political and economic matters concerning the profession. A vote on the proposed amendment itself showed that 86.8 percent of the members who voted favored the Constitutional change.

Programs were immediately under way to improve employment practices, with special emphasis on ethical matters, patent agreements, and the development of guidelines to professional employment. Government relations were established through monitoring legislation of concern to the profession, providing technical expertise to policy-makers, and establishing Congressional Fellowships.

By 1974 USAC had concentrated its efforts in two prominent areas: organizational structure of the Committee, and professional programs of benefit to the membership. Those programs were organized within divisions, similar to the Council divisions that exist today, and administrative committees were set up. Projects such as manpower planning, careers, and employment practices proceeded. Press conferences were sponsored to obtain better media coverage of IEEE conferences. Efforts at technology forecasting continued.

A 1974 report considered the underlying historical and policy considerations of IEEE's professional programs. It said in part, "It is apparent that IEEE, in the professional area, has a double obligation to maintain close contact with government and legislatures: to gain acceptance of the valid claims of the engineering professions to the economic and societal support of the government on the one hand, and on the other to supply needed expertise and sound judgement on matters of public policy and decision-making in areas dependent on technology for their resolution."

In 1975, a bylaw change was made, establishing USAC as a separate Board of the Institute, named the United States Activities Board. Just as the USAC was funded by an additional dues assessment of U.S. members, USAB activities were also supported by an assessment collected from members residing in the six U.S. Regions.

USAB's first "Program Plan" was submitted to the Board of Directors for approval in 1976. It outlined USAB's program organization under five basic goals, and listed specific tasks to be accomplished under those goals: financial and economic benefits for members, career conditions and opportunities, professional status, government relations and the communication of USAB aims, activities, and accomplishments.

Through its Washington Office, USAB's participation in national affairs grew. USAB's successful support of science and technology policy legislation under which the Office of Science and Technology Policy was established in 1976, became an example of how IEEE could achieve meaningful results. Engineers and scientists became recognized as a national resource. Also, since 1976 was a national election year, IEEE had the opportunity to present testimony before both the Democratic and Republican National Platform Committees.

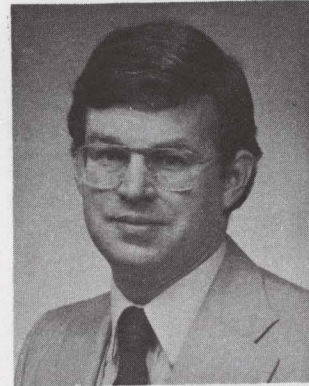
USAB continued to move ahead, focusing on such issues of primary concern as pension reform, salaries and service contracts, and technology policy. 1979 became the most active year USAB had so far experienced, with more than 30 oral or written presentations given to House and Senate committees, and 97 visits made by IEEE members to Congressional offices to voice Institute concerns.

USAB continued to develop and to be effective. More positions are developed, testimonies are given, surveys and reports are published, and increased guidance, support and services are available to members.

Volunteer Involvement has been the corner-stone of

USAB's achievements as it will be for IEEE-USA, with increasing numbers of members serving on national Committees and Task Forces, as local PACE leaders and advisers to state governments, and as Congressional Fellows.

## Vehicular Electronics



**Bill Fleming**  
Vehicular Electronics Editor

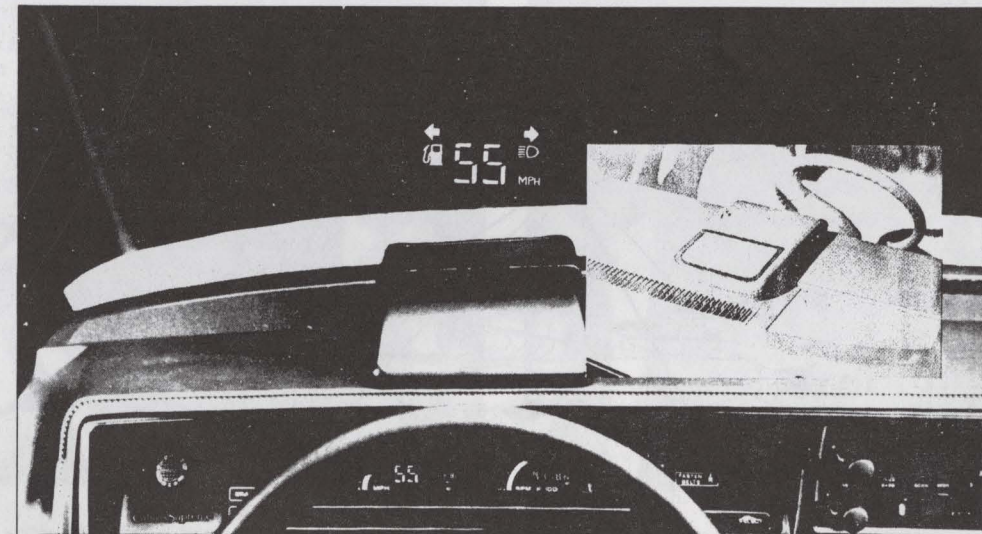
### OLDSMOBILE AND NISSAN RUSH DEVELOPMENT OF HUDs (HEAD-UP DISPLAYS)

Automotive dashboards may never be the same as automakers rush HUDs (Head-Up Displays) towards production [1]. HUDs allow you to keep your eyes on the road by projecting vital information (speed, fuel, and turn indicators) onto the windshield surface, where it becomes part of the driver's view. This eliminates "blind time," the time required for eyes to refocus from the far-field (scene) to the near-field (instrument panel).

Some people thought that HUDs were just another technological gimmick, but first-time users report that, "it's positively captivating! ... and it will become an essential driving aid." The display focal length is set at or near the front of the car, and it soon becomes a read-out to be relied upon.

Future HUD possibilities are great. A tachometer display, a radio station frequency-tuned-to display, or even a simplified (block-by-block, turn-by-turn) navigation display might be called up as selected by driver request [1]. Oldsmobile's Cutlass Indy Pace Car Replicas will have 54 HUD-equipped vehicles for sale this year (a slow, but sure start), whereas Nissan's 240 SX car line eventually will be making 5000 HUDs/month.

At the same time, aerospace cockpit design is going far beyond simple HUD technology. New cockpit displays feature systems called The Pilot Associate and The Big Picture [2]. The Pilot Associate monitors and prioritizes all incoming information and produces a condensed output of fused information for the pilot. The Big Picture combines on one screen all information now available to pilots from numerous gages and small viewing screens. Systems like these may spin off to automobiles, just as HUD has done.



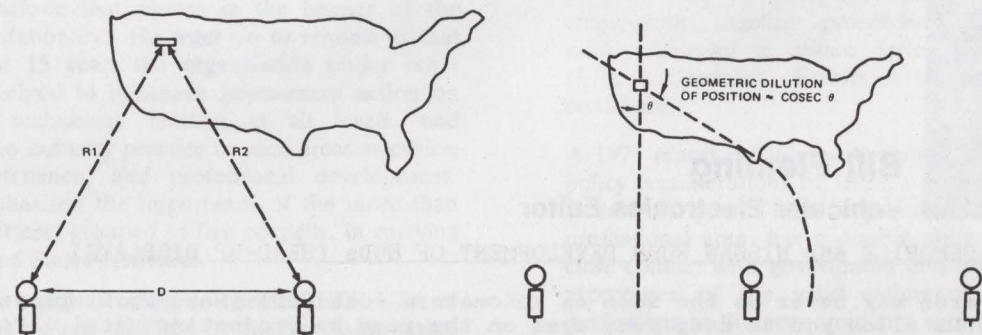
Oldsmobile HUD System Installed on a Indy Pace Car Replica Cutlass [1]

LOW-COST VEHICLE LOCATION BY SATELLITE

Vehicle location by satellite has been around for a number of years, but existing systems usually require use of several government-owned satellites, and provide positioning accuracies in excess of the commercial user requirements. Therefore, Hughes Aircraft has proposed a low-cost vehicle location-by-satellite system [3].

It is shown that the positioning accuracy of a simple two-satellite system, with satellites being closely spaced in orbit and with vehicle altitude known, is higher than that of the non-military GPS three-satellite system with satellites spaced further apart, but where vehicle altitude need not be known. The cost-effective simpler system would use two geosynchronous satellites, spaced 30-to-40 degrees apart in orbit.

For this system, the vehicle on the ground would require a transponder, but this would allow forwarding of other messages to the user such as route guidance and emergency warnings [3].



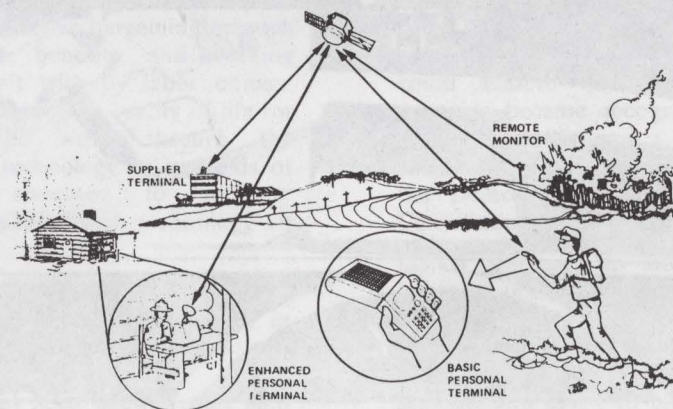
Two-Satellite Vehicle Location Based on Trilateration With Earth's Radius (Vehicle Altitude)

Three-Satellite Vehicle Location Based On Time-Difference-of-Arrival Concept

PERSONAL ACCESS SATELLITE COMMUNICATIONS SYSTEM

A voice/data communications system, operating at low rates in the 20/30 GHz bands, is proposed by Jet Propulsion Laboratory [4]. This system could go beyond mobile vehicular satellite service, and is designed for personal voice/data access throughout the contiguous United States by the early 2000s.

The system, illustrated below, would offer the following services: (a) voice communications and data base inquiry, (b) paging and low-rate broadcasting, (c) data distribution networking and remote monitoring (and control), and (d) disaster and emergency communications.



Personal access satellite system concept

RVX -- THE ROBOT VEHICLE EXPRESSWAY

Right now, our Interstate Highway System is wedded to stone-and-mortar technology, and will be for a long time. If the US is not to lose its transportation leadership to Japan and Europe, the US now needs to make a long-term commitment to revamp the outdated Interstate system. A high-speed, Robot Vehicle eXpressway (RVX) is therefore proposed [5].

You could commute to your job in the city, over 100 miles away, in half an hour. In fact, for any trip up to 500 miles, you could drive there faster than it would take to go to the airport and fly. In other words, for trips up to 300-to-700 miles travel distance, use of the RVX system would be equivalent to having an executive jet today, and a car waiting for you at the other end of the trip. But the only way this can be done is to get away from driver-imposed limitations -- by making cars into robotic vehicles and our roads into electronic guideways.

Obviously, the RVX system raises many questions regarding feasibility and funding, but the National Aerospace Plane, the "Orient Express," faced the same issues and it captured \$3.3 billion in US funding. If the public were given the opportunity to choose, would they prefer to see more and more R&D funds spent on the "Orient Express" to be used by a relatively few people, or on an RVX system that could be used by everyone, everyday? [5].

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3. K. Johannsen, "Radio Position Determination By Satellite," Conference Proceedings, 38th IEEE Vehicular Technology Conference, Philadelphia, PA, June 15, 1988, pp. 647-652.
4. M.K. Sue et al., "A 20/30 GHz Personal Access Satellite System Study," Conference Proceedings, 38th IEEE Vehicular Technology Conference, Philadelphia, PA, June 15, 1988, pp. 453-460.
5. J. Haugen, "RVX - The 150 MPH Robot Vehicle Expressway," Automotive Industries, July 1988, pp. 32-34.



Trevor Jones with his close friend Bob Fenton, Past President of VTS and Ohio State Univ. Dean Electrical Engineering. Both men are also IEEE Fellows.



Stu Meyer, Pres. VTS, passing the gavel to George McClure new President VTS whose term starts January 1, 1989.

**WORKSHOP ON  
THIRD GENERATION  
WIRELESS ACCESS INFORMATION NETWORKS**

**RUTGERS UNIVERSITY  
NEW BRUNSWICK, NEW JERSEY  
JUNE 15, 16, 1989**

Cellular radio and cordless telephones are new services with rapidly expanding markets. Present products use first generation technology with analog voice transmission and limited network control. Second generation systems are scheduled for introduction over the next three years.

Researchers are now turning their attention to the third generation when cellular systems, cordless phones, and pagers will merge into a single service. The Rutgers Workshop will bring together members of the wireless access community to exchange ideas and discuss early research results.

For further information, please write to:

-----  
David J. Goodman  
Department of Electrical and Computer Engineering  
Rutgers University  
P.O. Box 909  
Piscataway, New Jersey, 08854

201-932-3262 Phone      201-932-5313 Fax

\_\_\_\_ Please send me more information on the Rutgers Workshop on Third Generation Wireless Access Information Networks.

\_\_\_\_ I am interested in giving a talk on \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_



## Vehicle Navigation & Information Systems



IEEE  
Vehicular  
Technology  
Society



Ministry  
of  
Transportation  
Ontario



Transport  
Canada

International Conference \* Toronto, Ontario, Canada \* September 12-14, 1989

**Announcement & Call for papers** — Papers are invited on vehicle navigation and information systems technology and applications, with emphasis on the topics outlined below. Presentations are welcome on user requirements, choice of technology, operations, economic assessment and performance evaluation. Of particular interest are papers on

research and development programs and pilot projects, as well as those dealing with critical issues affecting system implementation such as standards, cost, market size, privacy, safety, human factors, private and public sector roles. A major goal of the Conference is to encourage interaction between the developers and potential users of this technology.

### Technology

#### Systems

- Autonomous navigation systems
- Terrestrial and space-based radio location and navigation systems
- In-vehicle route guidance systems
- Automatic vehicle identification, monitoring and control systems
- Digital maps and geographic information systems
- Mobile data communications

#### User Interfaces

- Visual displays, aural communications, system controls
- Human factors considerations

#### Systems Analysis & Evaluation

- Simulation and graphics — traffic flow, routing, vehicle movements
- Route optimization — algorithms, static/dynamic/interactive
- Performance analysis — location, navigation, communications, control
- Lab and field test results — systems/subsystems

#### Technical Exhibits

A technical exhibition is planned in association with the conference. Potential exhibitors should contact the Conference organizers at the address below.

#### Address correspondence to:

**VNIS '89 Conference**  
c/o Insight Planners Inc.  
133 Richmond St. W., Suite 502  
Toronto, Ontario  
Canada M5H 2L3

Telephone: (416) 868-6565 Fax: (416) 868-0936

### Applications

#### Driver Information

- Road and traffic conditions — pretrip and en route
- Route guidance — turn advisory, optimal routing, driver response
- Auxiliary — special data bases (roadside services, electronic "yellow pages", business, entertainment), mobile office, etc.

#### Fleet Management

- Monitoring — vehicle, cargo, emergency conditions, tolls, etc.
- Dispatching and routing — emergency, public and commercial fleets, dangerous goods, etc.
- Enforcement — vehicle weight, cargo, route, etc.
- Record keeping — time, distance, routes, speed, fuel.

#### Traffic Management

- Supply management — traffic flow and route optimization, collective/individual control
- Demand management — access control, priority treatment, restrictive zoning, road pricing, automatic billing, etc.
- Parking management — space availability and location, billing, etc.
- Data collection — traffic flow, O-Ds, trip times, incidents, etc.

#### Schedule

- Abstracts (500 words/6 copies) due January 2, 1989
- Notification of acceptance sent by March 27, 1989
- Camera-ready manuscript of paper due June 26, 1989
- Conference: Toronto, September 12-14, 1989.

Abstracts should clearly summarize the content of the proposed paper and contain the author's name, title, correct mailing address, telephone number and fax number. All papers will be reviewed with respect to completeness, clarity and technical soundness. Those meeting generally accepted criteria for technical papers will be published in the Conference Record.



August 22-25, 1989, Tokyo, Japan  
The Institute of Electronics, Information and Communication Engineers

## Final Call for Papers

### 1989 International Symposium on Antennas and Propagation, Japan

The 1989 International Symposium on Antennas and Propagation, Japan (ISAP '89, Japan) will be held at the Nippon Toshi Center in Tokyo, Japan, August 22 (Tuesday) through August 25 (Friday), 1989. This Symposium, the fourth ISAP in Japan, is sponsored and organized by the Institute of Electronics, Information and Communication Engineers (formerly the Institute of Electronics and Communication Engineers of Japan), and is supported by the International Union of Radio Science, the Antennas and Propagation Society of the Institute of Electrical and Electronics Engineers, and the Electronics Division of the Institution of Electrical Engineers.

#### OBJECTIVE

The ISAP '89 is intended to provide international forums for the exchange of information on the progress of research and development in antennas, propagation, electromagnetic wave theory and related fields as shown in the SCOPE. It is also an important objective of this meeting to promote mutual interaction among participants. Based on the success of the previous symposium and the rapid progress of antennas, propagation and their related technology, this fourth ISAP is planned to be held in Tokyo in 1989.

#### SCOPE

This symposium will treat a wide range of subjects. The topics shown here are suggested; papers concerned with other aspects of antennas and propagation will also be considered. In addition, the Steering Committee has designated the five special topics for inclusion in the program, to treat these new trends in research and development in antennas and propagation.

#### Antennas and Related Topics

- A 1 Adaptive and Signal Processing Antennas
- A 2 Aperture Antennas
- A 3 Array Antennas
- A 4 Electrically Small Antennas
- A 5 Microstrip and Printed Antennas
- A 6 Multibeam Antennas
- A 7 Spacecraft and Aircraft Antennas
- A 8 Wire and Slot Antennas
- A 9 Antennas for Biomedical Use
- A10 Antenna Measurements
- A11 Computer-Aided Antenna Design
- A12 Optical Techniques in Antenna Systems
- A13 Radio Telescopes and VLBI

#### Propagation and Related Topics

- P1 Tropospheric Propagation
- P2 Ionospheric Propagation
- P3 Propagation of Millimeter, Submillimeter, and Light Waves
- P4 Urban Propagation
- P5 Earth-Space Propagation
- P6 Prediction Methods for Propagation Effects
- P7 Radiowave Remote Sensing
- P8 Others

#### Electromagnetic Wave Theory

- E1 Analytic and Numerical Techniques
- E2 High Frequency Techniques
- E3 Scattering and Diffraction
- E4 Guided Waves
- E5 Inverse Scattering
- E6 Random and Nonlinear Media
- E7 Transient Fields
- E8 Others

#### Special Topics

- S1 Large Deployable and Inflatable Space Antennas
- S2 Very Small Earth Station Antennas for Satellite Communications and Broadcasting
- S3 Active Array and Monolithic Integrated Antennas
- S4 EM Computation Techniques using Supercomputers
- S5 Digital Mobile Radio System Design Techniques Related to Antennas and Propagation



#### PREPARATION OF PAPERS

Original papers are solicited that have not been presented previously and that describe new contributions in the area suggested in the SCOPE. Each author is requested to submit one English original and two copies of a 4-page paper, including all text, references, figures and photographs. The papers should be typed single spaced on white paper approximately 21.0cm x 29.7cm (8.5" x 11") in size. The title should be centered in capital letters 2.5cm (1") from the top of the first page. The author's name and complete organizational affiliation should be two lines below the title and the text should start three lines below this and be typed with 12-pitch characters (12 characters per inch). Left and right hand margins should be 2.5cm (1"). A 2.5cm (1") margin should be left at the top and bottom of all pages. Please see also the "format for papers". As the "Proceedings" will be produced directly from the author's originals with a reduction to 83% in linear dimension, the text should not be output by dot-printers. Please attach the ISAP '89 contributed paper categorization form and the copyright transfer form with papers. Those forms are enclosed.

#### COPYRIGHT

IEICE (the Institute of Electronics, Information and Communication Engineers) owns the copyright to the contributions. Authors **must** submit a signed copyright transfer form with their papers.

#### PRESENTATION

The working language is English. Standard viewgraph (overhead) projectors and 35mm slide projectors will be provided in each technical presentation room. Poster Sessions will also be scheduled.

#### EXHIBITION

ISAP Exhibition '89 will be held during the period of ISAP '89 at the Nippon Toshi Center. Antenna related technologies, measurement instruments, and materials will be shown.

#### TECHNICAL TOUR

A one day tour to visit Nobeyama Radio Observatory of National Astronomical Observatory will be arranged on Saturday, August 26. Nobeyama is located 150km west of Tokyo, on a plateau with an altitude of 1350m. Mt. Fuji and beautiful rural scenery can usually be seen during the bus trip to Nobeyama.

#### SUBMISSION OF PAPERS

The author(s) should send one English original and two copies of a paper, ISAP '89 contributed paper categorization form and signed copyright transfer form to :

Prof. Kiyohiko Itoh  
Chairman of ISAP '89 Technical Program Committee  
Department of Electronic Engineering  
Faculty of Engineering  
Hokkaido University  
North 13, West 8, Kita-Ku, Sapporo, 060 Japan  
PHONE : +81-11-716-2111 Ext. 6524  
FAX : +81-11-717-4745  
TELEX : 0932-302 HOKUEN-J

All papers must be received before March 1, 1989.  
Authors will be notified of acceptance by May 1, 1989.

#### PRELIMINARY PROGRAM SCHEDULE

August 21(Mon)	1500-1900	Registration (the Nippon Toshi Center) Yakitori and sake party
22(Tue)	0830-1700	Registration (the Nippon Toshi Center)
	0900-0930	Opening session
	1000-1700	Technical sessions
	(1000-1500)	Accompanying person's program)
	1800-2000	Buffet party
23(Wed)	0900-1700	Technical sessions
	(0900-1700)	Accompanying person's program)
24(Thu)	0900-1700	Technical sessions
25(Fri)	0900-1700	Technical sessions
26(Sat)	0730-1900	Technical tour

#### • Nobeyama Radio Observatory (NRO)

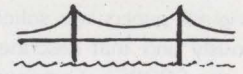
NRO is the largest radio observatory in Japan. Many excellent study results on star forming regions, molecular line spectroscopy, VLBI and solar radio physics have been achieved by exploiting the following facilities :

- 45m mm-wave telescope with 0.15mm surface accuracy by a homologous deformation design technique.
- mm-wave super-synthesis interferometer composed of five 10-m antennas with 2 x 550m baselines.
- solar interferometers (160MHz, 17GHz) and polarimeters (70MHz to 80GHz).

The observatory should be impressive to both antenna and propagation engineers.



GATEWAY TO NEW CONCEPTS IN VEHICULAR TECHNOLOGY  
 39TH IEEE VEHICULAR TECHNOLOGY CONFERENCE  
 SAN FRANCISCO, APRIL 29 - MAY 2, 1989  
 VEHICULAR TECHNOLOGY SOCIETY



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PLEASE REPLY TO:

**NEWS RELEASE FOR 1989 VTS CONFERENCE**

Frank Thatcher reports that the San Francisco Chapter is actively planning the 1989 VTS Conference to be held on May 1st to 3rd. As of October 21st, they had 139 abstracts of technical papers and they are expecting about 15 more of which some are from the recently held convergence conference. The convergence papers will cover the automotive electronics side of the society, which has been not as well represented during the past few conferences.

They have been able to negotiate very attractive prices for the hotel rooms which are on the cable car line near Union Square of \$95.00 for a single, and \$110 for a double. This is about 30% less than similar rooms in the Union Square area. They have also negotiated a price of \$34.00 a person for the wine country tour, which includes transportation, a tour guide, wine tasting at two well-known wineries and a box lunch. This event will take place on the Sunday before the Conference.

Another important event, they are planning will take place after the Conference. It is a student and faculty program designed to stimulate interest in the Vehicular Technology Industry. It will start at noon on May 3rd with a buffet lunch and continue on to 3:00 P.M.

There will also be a full program for wives and guest.

The 1989 VTC promises to be an intellectual, recreational, and exciting experience which should not be missed.