Trevor Jones Receives Special VTS Award

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

See “About the Cover” page 3
President’s Message

Stuart Meyer
President
IEEE Vehicular Technology Society

There are no many things happening within our Society that truly 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. Stated 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,

Stuart Meyer
2417 Newton Street
Vienna, VA 22180 (703) 281-3806

November 1988

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November 1988

Editor’s Notes

A. Kent Johnson
Newsletter Editor

As the November issue of the VTS newsletter goes to press, we have just completed an excellent 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—Innovation 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.
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.

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**IEEE Vehicular Technology Society Newsletter**

**November 1988**

**Society Officers and Board of Governors**

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**BOARD OF GOVERNORS**

**NAME(Term thru)**

J.R. Cruz(90)
Robert E. Fenton(88)
Arthur Goldsmith(90)
Leo M. Himmel(89)
A. Kent Johnson(89)
Samuel A. Leslie(89)
Fred M. Link(89)
Charles Lynch(88)
Roger Madden(88)
George F. McClure(88)
Samuel R. McConoughy(89)
Stuart Meyer(88)
Evans B. Richards(90)
Eric Schimmell(88)
Raymond C. Trot(90)

**RESPONSIBILITY**

Newsletter, Communications Editor
Junior Past President
Treasurer
Chairman, Education Committee
Newsletter Editor
Society Secretary
Chairman, National Site Selection
Chairman, Paper of Year Comm.
Chairman, Constitution Division
Senior Vice President, Chairman of Publications Comm.
Chairman, Constitution Division
President
President
Chairman, Personal Radio Comm.

**DUES ALERT!!**

The IEEE 1989 Societies & Periodicals brochure mailed out with the members 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.

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**IEEE Vehicular Technology Society Newsletter**

**Board of Directors Report**

**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 Bohmer
- J.R. Cruz
- Robert E. Fenton
- David Goodman
- Leo M. Himmel, Sr.
- Kent Johnson
- Trevor O. Jones
- W.C.Y. Lee
- Sam Leslie
- Fred Link
- Roger Madden
- Robert A. Mazara
- George McClure
- Stu Mayer
- Evan Richards
- Jim Sears
- Ray Trot

(88-89 LTO Chairman

- J.R. Cruz
- Robert E. Fenton
- David Goodman
- Leo M. Himmel, Sr.
- Kent Johnson
- Trevor O. Jones
- W.C.Y. Lee
- Sam Leslie
- Fred Link
- Roger Madden
- Robert A. Mazara
- George McClure
- Stu Mayer
- Evan Richards
- Jim Sears
- Ray Trot

(q 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.

Even 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.*
IEEE Vehicular Technology Society Newsletter

TREASURER'S REPORT

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

Act notes that the transfer of $600 to the IEEE for the Trans- performance Electronic Fellowships program.

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

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

Evans 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 press and should be mailed shortly. Papers are now being go in for the November issue.

The recommended page budget for November is 272 pages, for 44-page issues, plus covers each.

Dr. Giorgio Rizzoli has volunteered to assume the role as associate editor for vehicular electronics. Bill Minner has forwarded the vehicular electronics papers needing review to Sang Hah, 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, workloads, and the ability of various editors to support the transactions activity, George McClure made the following motions:

A position titled "Chairman of the Publications Committee" is to be created, and is to be filled by Stu Mayer. Also, Bill Minner is to be assigned the position of Associate Editor for Communications, Transportation Systems and Vehicle Electronics, respectively.

Fred Link assumed the motion above, 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 proposed for new George McClure in consultation with Bill Lee and Fred Link, who will prepare written job descriptions detailing the duties of the chairman, associate editor, and editor, respectively, for review by the board at the next meeting.

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

CONFERENCES AND MEETINGS

10th VTC Philadelphia Conference

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

9th VTC San Francisco Conference (1988)

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 attendees. Two levels are being considered by the Society 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, and are under review. The editorial committee is in favor of preparing a newsletter of selected papers. The conference committee is in favor of printing a complete version of the conference proceedings.

40th VTC Orlando Conference (1990)

George McClure corrected the dates selected for the Orlando conference to May 1990, conference with the Conference Planning Committee. George also provided updated cost analysis 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 Mayer reported that the Sheraton Westport has been tentatively selected for this conference, and that the dates are 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 150-mile radius of St. Louis. Eleven have been found, of which three have been recruited so far for the board.

Stu noted that Southwestern Bell is building a technology center in St. Louis, and that this should be considered in the board's meeting at the attendance at this conference.

40th VTC Denver Conference (1992)

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

Evans Richards moved, Ray Truet seconded that $300 be provided to St. Louis and $300 to Denver for meals for new executive in keeping these two conferences going. The vote was unanimous in favor.

1993 VTC Conference

The board elected Fred Link to start investigating potential sites in the Northeast for the 1993 VTC. Ray Truet 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 Behnre reported that ASME and the Joint Railroad Conference committee have agreed to switch meeting locations to allow joint VTC/Railroad conference starting in 1990. The Railroad Conference will be held in Chicago, while it will be held in St. Louis in 1991 and Denver in 1992 in conjunction with the annual VTS conference.

Between 115 and 132 registrants can be expected for the Joint Railroad Conference.

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

Convenence '98

Bob Maddox reported that over 1200 had registered for the conference, and that this conference would be the most successful ever. The conference committee expressed interest in selecting a new chairman for the 1998 conference, possibly from the international sector.

1988 VTS/IEEE Convergence Workshop

Roger Maddox reported on the Convergence Vehicle electronics workshop being held on the day after the Convergence Conference. A total of 47 papers will be presented at this workshop, and an attendance of from 6 to 8 people is reported. Roger expects that the authors of some of these papers will be candidates for paper submissions in the 1998 VTC.

Scandinavian Distinctive Speaker Tour

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

1989 VNS Conference

Stu Mayer reported that the VNS conference committee has agreed to move this conference to the September—October time frame in Canada and solve a potential conflict with the San Francisco VTS. Stu also noted that this conference has strong backing from the Canadian government.

Bob French from R. L. French and Associates has also appointed a chairman of the Vehicle Navigation and Information Systems committee.

Third Generation Wireless Access Information Networks

David Goodman reported on a workshop being held at Rutgers University next June 15 and 16, 1989. After discussion, Roger Maddox moved, Evan Richards seconded that the Society participate in, with an emphasis on speakers. This motion was unanimous in favor.

Ken 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 Behnre reported that the membership mailing list is due 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 recurring problem with the wording in the IEEE description of the VTS charter was discussed, where the wording excludes the charge published vehicle activity. Bob Fenton reported that he has written several letters to headquarters trying to correct this problem, but to no avail.

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 Dine going on the publicity of the Society's activities.

CCP Representative

There was no report available on CCP activity.
November 1988

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 evaluator.

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
Call Harvey Glickenstein or Dana Fidelis at 569-7195
Where: 35th 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. Miccoli, System Engineer, Consolidated Rail Corporation

Railroads have just recently started using vital microprocessors to replace relay 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. Dostlan 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 & Signaling 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 (AAR).

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), and others.
- Develop recommended practices for telecommunications and signaling systems for the railroad industry.
- Monitor development of the Advanced Train Control System (ATCS).

Cas Division obtained the use of six frequency pairs in the 866-868 MHz spectrum from the FCC for ATCS.

Participate with AAR's Mechanical Division in the hot bearing detector/freight car truck compatibility test program.

Represent the AAR on the National Committee on Railroad Communications (NCRC), which advises FHWA on warning devices used at rail-highway grade crossings.

General policy for the Cas Division is one of cooperation, with a committee consisting of senior representatives of AAR member railroads. Policy is carried out by the executive director, and the division staff under his direction.

Liaison with the FCC and other telecommunications regulators 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. The same Subcommittee also maintains contact with FHWA and FRA, as well as other agencies.

Developing recommended practices for telecommunications in the Cas and the Gas Division is handled by five technical committees:
- Committee C: Detector/Freight car truck
- Committee F: Radio Systems
- Committee G: Signaling Systems
- Committee E: Special Applications
- Committee Q: Education and Training.

Liaison with FCC is vital to the railways. Cas Division has its staff and communications liaisons that have over the years provided a valuable liaison function with the FCC in handling the railroad message to the Commission. Two recent actions of the Commission favorable to the railroad industry include 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 authority of the Texas PUC to control the interconnect between privately operated point-to-point microwave systems and the network operated by the telephone companies. This supports the industry's need for growth in 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 used.

In another area, the executive director, Leo J. Himmel, Sr., and the director of the Railroad Service & ATCS Spectrum Management, have been successful in their quest in recent years for obtaining frequencies for the advanced train control system project. In an order released February 14, 1988, the FCC authorized railroad user groups to provide three licensees with 12 frequencies in the 866-868 MHz band.

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

- 7700 series: 7700 donated by Conrail.
- Servo 8909 donated by Norfolk Southern.
- Servo 6000 donated by Servo Corp.
- General Railways Signal VSU-1 donated by NLR.
- General Electric donated by Union Pacific.
- Mark 3 donated by Norfolk Southern.

Harmon WCU-32 donated by Harmon Electronics.

Testing consisted of operating commercial roller bearing cars (one high side gondola with 36-in. wheels, one high side gondola with 26-in. wheels) by the detectors at various locations. The heat induced into certain instrumented bearings.

Along with the gondola and TVG car, various test cars have been or will be operated with certain bearings in place. The following are included in plans for this hot bearing detector/freight car truck compatibility test program:

- High-side flat cars.
- Converted bearing cars in which a roller bearing has been installed in a friction bearing housing.
- Three-axle truck cars.
- Experimental Task Force, Committee F and the AAR Research & Test Department are working in an effort to develop guidelines for the performance of hot bearing detectors.

Short lines have many options in communications.

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, Jr., executive director, and chairman, Communication & Signaling Division, AAR, said the following radio systems could be used by short lines:

- Railroad radio service has 91 channels in the 160-174 MHz band that can be used for communications related to safety, security and operations.
- Also available are 7 channels in the 400-470 MHz band that are shared with motor vehicles.
- The 896-961 MHz band has 50 channels that must be shared with industrial and land transportation users.
- Another band, the 460-494 MHz band, may be made available for radio control systems. This band is not interference-free. Channels 24-40 are available, but channels 41-70 are reserved for federal radio control systems.
- Cellular radio provides mobile telephone service, but at present is too expensive to be considered.
- Repeaters can be used with many types of portable mobile radios.

Cellular mobile radio systems operate like community repeaters and could be used for communication in the railroad industry.

Thus, there are several types of radio systems that the short line railroads can use to improve communications and for train crew communications.

In his address, Mr. Himmel pointed out that the National Administrative Radio Conference in Geneva, Switzerland, reaffirmed its commitment to the development of international railroad radio systems. This body met to take a decision because the legal ability of the railroads to continue to use certain radio frequencies depends on an exception to current international regulations.

A part of the world, these frequencies are allocated to the maritime radio service, but some countries are considering additional efforts to do the same in the U.S. as well. Agreement at MARS is a treaty and...
Communications

J. R. Cruz
Communications Editor

ABSTRACTS


Since the probability of single-tone spurious interference 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.


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

\[ P_e \approx \lim_{N \to \infty} \Pr(M) \leq \left\{ \begin{array}{ll}
E_b/N_0 \leq 2 & \\
E_b/N_0 > 2 &
\end{array} \right. \]

where $E_b$ is the transmitted bit energy and $N_0$ 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 $E_b/N_0 > 1$. We also show that for a Rayleigh fading channel for large $M$ the symbol error probability is

\[ P_e \approx \frac{E_b}{N_0} \]

Finally, we provide multiple signal computations of the minimum $E_b/N_0$ required to achieve a symbol error probability of $10^{-3}$ to illustrate the asymptotic behavior described above.


It has been well established in the literature that the appropriate criteria 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 $(d_{mf})$ is still an important consideration, it plays a less significant role than the other factors. We show that the design of the trellis code is guided by maximizing $d_{mf}$. 


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 maximum 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 by the number of branches along the shortest error event path.

Here, we demonstrate that 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 optimisation 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 MTGM 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 USA (United States Activities) survey conducted annually, the USAB (United States Activities Board) survey contains a question that reveals 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 theegis of USAB are publicized. Dr. Ed Bertolino, 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 and will be used in concert with the words business and deliberations. In terms of people and expenditure of man hours IEEE USA is the largest division by far.

Dr. Bertolino 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 stationery. 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 that the over 30,000 members, grouped in five councils, in carrying out the United States Activities.

Dr. Bertolino 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 should also know that they can contact their PAC (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 issue.

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 this, the USAB Board of Directors, in 1972, had called a special meeting to propose a Constitutional amendment that would include among the Institute's purposes one term: professional, directed toward the advancement of the number of members in the profession, and 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. This amendment was passed by the USAB Board of Directors, in 1976. It outlined USAB's program organization under five basic goals, and listed specific projects under each goal: 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, social security, public policy.

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

Vehicular Electronics

Automotive dashboards may never be the same as automakers rush HUDs (HUD - Head-Up Displays) towards production [1]. HUDs allow you to keep your eyes on the road by projecting vital information (speed, fuel, turn signals) 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".

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, a Cutlass Indy Face Car Replica 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 HUD/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 Operating 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.

Bill Fleming
Vehicular Electronics Editor

OCDOMOBILE AND NISSAN HIGH DEVELOPMENT OF HUDS (HEAD-UP DISPLAYS)

Oldsmobile HUD System Installed on a Indy Face 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 30-40 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).

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.

REFERENCES

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:

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P.O. Box 909
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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

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

- 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

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, 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

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.

Address correspondence to:

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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 dotprinters. Please attach the ISAP'89 contributed paper classification form and the copyright transfer form with papers. These forms are enclosed.

COPYRIGHT

IEICE (the Institute of Electronics, Information and Communications 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.

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Preliminary Program Schedule

August 21(Mon) 1500-1900 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
                      26(Fri) 0900-1700 Technical sessions
                      26(Sat) 0730-1000 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.
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.