A Terminal Unit Mounted on a Small Garden Tractor
This goal and others will be discussed at the next Board of Directors meeting in early December when we will discuss goals and priorities for the next few years. You, the membership, are invited to submit your comments and suggestions to any of the Board members. In addition, if you are interested in serving on a committee, please let us know. We would welcome hearing from you.

Editor’s Notes

A. Kent Johnson
Newsletter Editor

Newsletter Advertising Available

Are you interested in running an ad or an institutional listing in the VTS Newsletter? If you are interested, we would like to make that service available and accordingly announce the following rate structure:

For ads:
-
Full Page $300/Issue
-
Half Page $210/Issue
-
Quarter Page $120/Issue
-
 Eighth Page $80/Issue

Discounts of 5, 10 or 15 percent will be given for ads that are listed in 4, 8, or 12 consecutive issues, respectively.

Also, the following rates for institutional listings (approximately 1.0 x 3.25 inches in size) are available:

- 4 Consecutive Listings: $500
- 8 Consecutive Listings: $1000
- 12 Consecutive Listings: $1700

All ads and institutional listings must be camera ready and accompanied by checks made payable to IEEE/VTS. For further details contact the Newsletter Editor.

Newsletter Deadlines

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IEEE Vehicular Technology Society Newsletter

November 1985

Board of Directors Report

Samuel A. Leslie
VTS Secretary

TO: IEEE VTS Board of Directors

Date: November 12, 1985

Dear Bob Fenton,

I am writing to bring a recommendation before the Board at the next full meeting.

EIA LAND MOBILE SHOWCASE

Sam McConoughy reported that, as of September 11, three panels have been selected for the EIA VTS seminar at the EIA Show. They are:

- Dr. John Davis, Director, Cellular Telecommunications Laboratories at AT&T Bell Laboratories.
- Mr. Richard Sell, Program Manager Data Communications Systems at Motorola, Inc.
- Mr. Boyd Fair, Assistant Director of ErI International

An EIA booth will be present at this show, and will be staffed by Roger Madden and others. Membership kits will be available, and Sam indicated that IEEE H0 will not accept exhibit numbers for payment of membership application fees. Furthermore, he noted that IEEE is considering reimbursement of the various Societies for new member solicitations.

NOMINATIONS COMMITTEE REPORT

Stu Meyer reported that the following Board member's terms expire at the end of this year:

- Bob Fenton
- Gary George
- Stu Meyer
- Eric Schimmel

Penton, George, and Schimmel have all agreed to run for re-election again, and Stu is in the process of contacting McCune and Lynn to see if they are also willing to stand for re-election. In addition, Stu has received word of an agreement from Vino Vinodrai and Leo Himmel to run for election.

Stu also mentioned that George McCulre is running for Division III Director.

PUBLICITY REPORT

Bob McKnight distributed three publicity release papers with the following titles:

- "Papers Sought For ARSIE/IEEE Joint Railroad Conference"
- "Papers Sought For May 1986 Vehicular Technology Conference"
- "New Officers Elected To IEEE Vehicular Technology Conference"

It was noted that elected board members Meyer, Schimmel, McCulre, and Lynn were inadvertently omitted from the publicity announcement.

KILLESTONES PROGRAM

Sam McConoughy reported that IEEE now has a milestones program to erect monuments (plagues) commemorating historic events. An example would be a plaque at a police building where FM mobile radio was first used. Sam will report further on this subject at the next Board meeting, and welcomes suggestions for candidate locations.

IEEE TRANSFER

Bob Fenton reported that he has received a letter from Dr. Eng, indicating that the transfer of the Land Transportation portion of IEEE-IAS to VTS has been officially completed. However, the IAS-LTC merger has not yet been transferred; it will be up to VTS to invite those members of the Land Transportation Committee to join VTS.

Bob Fenton is to mail a letter to the 480-plus members of the IAS-LTC to ask them to join VTS. In a late input, Bob also stated that he is appointing Dr. Tony Eastham as Chairman of the VTS Transportation Systems Committee. Tony held a similar position in IAS-LTC, the Board welcomes him in his new position. Tony's mailing address is:

Dr. Tony Eastham
Department of Electrical Engineering
Queen's University
Kingston, Ontario E7J3M6
Office Phone: (613) 547-4935

MEMBERSHIP BROCHURE

Sam McConoughy submitted a draft membership brochure for review by the Executive Committee. After a few minor suggestions and corrections, Bob Fenton asked Sam to proceed with getting the membership brochure published.

PROPOSITION COMMITTEE REPORT

Bob Eckert (Secretary of the IEEE-VTS Propagation Committee) reported on the progress of his committee. He stated that they are on target for a special issue either in the VTS Transactions or possibly a joint special issue with IEEE-AAP (Antennas and Propagations). Sam McConoughy noted that the members of this committee (Chair by Neal Shepherd) have assimilated much useful data and have put in long hours in coming up with what will be a very useful document.

POTENTIALS

Bob Fenton noted that VTS has run two advertisements in recent issues of the IEEE POTENTIALS magazine for students. The magazine is requesting the Society to run new advertisements again. Bob Fenton is to work on a camera-ready copy for publication in next February's magazine.

PLANNING OBJECTIVES FOR 1986

Bob Fenton submitted a list of objectives for the VTS Board during next year. These objectives are:

1. Integration of LTC members into VTS
2. Upgrading the Vehicular Electronics area of VTS
3. Increasing VTS membership
4. Finalizing and implementing our awards program
5. Completion of Constitution and Bylaws revision
6. Completion of Radio Propagation report and publication of S numbered items
7. Strengthening of Chapter ties

Bob made special note of item 2 above, in that the publication of papers relating to vehicular electronics in the VTS Transactions has dropped sharply over the past few years. This appears due in large part to SAE putting increasingly higher priority on vehicular electronics in their activities. The consensus of the Executive Committee is that the Board should be more involved in this area, perhaps in working more closely with SAE and the Conference committees to determine if there are papers that would not be suitable for one organization that would be acceptable to the other. Bob Fenton and Roger Madden are to start this process.

In regard to Item 3, Bob noted that Carl Stevenson is looking for guidance from the Board on how to increase membership. The upcoming membership brochure was mentioned. In addition, Stu Meyer is going to contact some of the trade publications (such as Mobile Radio Technology) to see if some publicity can be generated for associate and possibly full membership candidates.

Bob also stated that the Board ties to the VTS Chapters have always been difficult, with only a few Chapters actually able to report activity. Bob suggested that a telephone campaign by the Chapter Activities Chairman would be most useful in prodding many Chapters into action, and that the Board should help the Chapters more by providing assistance when asked. He noted that the Board will reimburse expenses incurred with the telephone campaign activity.

On a separate note, Stu Meyer noted that a few Chapters were not IEEE members, which is in variance with the current IEEE VTS Bylaws.

NEXT BOARD MEETING

The next VTS Board meeting will be held in Washington, D.C. at the Embassy Suites Hotel on December 13, 1985. The meeting will start at 8:30 AM, and will end at 4:00 PM. In addition, there will be a dinner get-together the night before at Blackie's Restaurant (near the Embassy Suites Hotel) at 7:30 PM, for those who can make it. As before, our meeting room will be available at a reduced rate if enough members register at the Hotel. We will mail a questionnaire approximately four weeks before the meeting to determine who will be attending and who will be staying at the Hotel in order to mention that you are a part of the IEEE VTS party when you make reservations. The telephone number of the Embassy Suites Hotel is (202) 657-9998.

Respectfully submitted,

Samuel A. Leslie
VTS Secretary
Chapter News

Gaspar Messina
Chapter News Editor

November 1985

Meetings

New Jersey Coast (EPC/71/42)

The Feasibility of Measuring Ocean Surface Currents from Low-Flying Platforms
by Prof. Robert E. McIntosh, Electrical and Computer Engineering Department, University of Massachusetts, Amherst, Massachusetts

Held May 21, 1985, with 15 attending.

Cellular Radio Relationships for Three-Dimensional Modeling for Co-Channel Reuse
by Mr. Philip T. Porter, Bell Communications Research, Holmdel, New Jersey

Held June 18, 1985, with 13 attending.

List of Officers for September 1985 to September 1986, New Jersey Coast

Chairperson
Mr. John Nauensber
Honeywell, Inc.
P.O. Box 54, Eatontown, N.J. 07724

(201) 342-3400

Vice-Chairperson
Mr. Anthony Hoepel
Bell Communications Research
309 Yorke Ave., Bnome
Long Branch, N.J. 07750

Secretary
Mr. Rob Davis
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(201) 338-2311

Treasurer
Mr. Mike Sligh
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P.O. Box 54, Eatontown, N.J. 07724

(201) 342-3400

Gaspar Messina
Editor and Chapter Activities Chairman
9800 Marquette Drive
Bethesda, Maryland 20817

November 1985

Professional Activities

Frank E. Lord
Professional Activities Editor

Professional Awareness

It is a common fault never to be satisfied with our fortune nor dissatisfied with our understanding.

de la Rochefoucauld

One of the many activities of the United States Activities Board is the concern of the Professional Activity Committees for Engineers (PACE) to sponsor and organize Student Professional Awareness Conferences (S-PAC). Through these conferences student become aware, often for the first time, of the many facets of an engineering career in addition to those that are purely technical. To date, nearly 200 such conferences have taken place with very successful results. Some of the material in the PACE Source Sheet on S-PAC can also serve as a reminder to practicing engineers of the many non-technical aspects of an engineering career. Therefore, I am presenting an extract from that material here.

"WHAT IS PROFESSIONAL AWARENESS?"

Engineers must be technically proficient, professionally astute, and aware of their responsibility to society. Professional awareness includes those subjects that affect engineers’ careers, regardless of how well prepared they may be technically. It includes such subjects as:

- "SELF ASSESSMENT." Unless people know themselves, they cannot determine their positive and negative attributes. They cannot improve or sell themselves from a strong position, nor can they set realistic goals and objectives.

- "ORAL COMMUNICATION." The ability to communicate adequately is an important skill that usually is not taught in school. Engineers must be able to communicate technical ideas to a lay audience, to people who may not speak the same language.

- "LISTENING." Listening is key to understanding what is being said, and is an important part of oral communication.

- "REVIEWING." Engineering is a process of reviewing past experiences in order to make informed decisions about future projects.

- "NEGOTIATING." Engineers must be able to negotiate with clients and colleagues, as well as with government agencies and regulatory bodies.

- "HUMAN RELATIONS." Engineers must be able to work effectively with people from diverse backgrounds, including people from different cultures, religions, and socioeconomic groups.

- "POLITICAL SKILLS." Engineers must be able to influence political decisions that affect the engineering profession, such as those relating to taxes, regulations, and laws.

- "RESOLVING CONFLICTS." Engineers must be able to resolve conflicts that arise in the workplace, such as those between clients and contractors, or between employees and employers.

- "LEADERSHIP." Engineers must be able to lead teams and organizations, and to inspire others to achieve their goals.

- "ACCOUNTABILITY." Engineers must be accountable for their work, and must be able to take responsibility for their mistakes.

- "INITIATIVE." Engineers must be able to take the initiative to solve problems and to develop new ideas.

S-PACs: (1) oral and written communication, (2) listening, (3) observing, (4) interviewing, (5) negotiating, (6) human relations, (7) political skills, (8) delegating, (9) decision-taking, (10) responsibility, authority, and accountability, and (11) initiative.

"ECONOMIC CONSIDERATIONS." Earning a living and maintaining a reasonable standard of living is a common concern of everyone. For engineers there are some additional considerations: (1) initial salary vs. job interest, challenge, growth, security, risk, and other factors; (2) location vs. cost of living, potential for continuing education, and active participation in a professional society; (3) compensation of salaries over a career span in engineering vs. career changes; (4) stability of business or an enterprise within an industry; (5) opportunity to save for future family and career needs; (6) prevalence of career obsolescence in the industry and the particular enterprise; (7) personal responsibilities that are acquired, and how they affect career mobility and flexibility.

"PROFESSIONAL FACTORS." Engineering is more than a job or a succession of jobs. It is a profession encompassing an integrated continuum of several important professional activities, including: (1) continuous active association with an engineering society, (2) civil and social responsibilities, (3) learning and growth through volunteer services, (4) licensure and registration, (5) continuing education, and (6) publications, talks, and other services to the profession.

These aspects of engineering careers, as well as others, are addressed by the many constituent and task forces of USAB. These entities are organized into four Councils and the Operational Steering Board. Each of these are members of USAB. Reports are made periodically which serve to keep us up to date. You can keep informed through your sector PACE chairperson, your Society PACE chairperson, or through your Washington Office. You are also encouraged to make inputs through these paths. These inputs may be your own thoughts and desires. In some areas there is also need for case history type information to support our efforts in specific areas, such as age discrimination, intellectual properties and pensions. One thing that is greatly appreciated by those who are working steadily for our professional betterment.
Transportation Systems

The work is to be conducted through the first quarter of 1984. Two subcontractors are involved, each bringing extensive experience in railway technology, and Philip A. Long, L.E. istam, specialising in telecommunications engineering.

The VTS group will produce a cataloguing of the more commonly needed functions in terms of effectiveness, availability, reliability, safety and cost. This information is needed for cost/benefit analysis. Arter will apply the system development process in assisting the AASHTO Objectives.

The process provides the logical and transitional needs to ensure that the system design is ultimately responsive to user functional needs. It involves the internal training and support of users and it is a technologically advanced one.

VTS group makes good progress on radio propagation modeling

The growth of users in land-mobile services in the 800 MHz band for common carrier, cellular, mobile, land-mobile, and private and commercial carrier radio paging systems. Work is well along and the final report is planned for submission near year end.

The report will:  
- Define the technical factors that affect 800 MHz performance.
- Summarize current knowledge in making 800 MHz propagation estimates for land-mobile systems.
- Explore the relationship between the propagation characteristics of the service area and the equipment used.
- Address such issues as prediction accuracy, performance margins, and the relationship of reliability criteria to system complexity shall be outlined to meet the needs of the users that are expected for certain functions and development of mobiles found to be most cost effective.

VTS Group has given great emphasis to the construction of mobiles that could be underway in the first half of 1984.

Several task forces have been set up, including the following:

- Radio electronics
- Citrus knowledge.
- Economic assessment
- System design

Major research areas include:

- System design
- System economics
- System design
- Project development
- Public relations

Canada - Transport and Telecommunications Commission

The major concern is to develop a common methodology which-by benefits of the research work-
- Develop a comprehensive guide to the process of users who
- Will identify mobiles that are likely to be used to optimize the process of the sequence of development.

1. VTS Group and VTS Objectives

- VTS Group objectives have fostered a need for better understanding of radio propagation in this area. However, there are no generally accepted methodologies for providing adequate and reliable estimates.
- VTS Group objectives have fostered a need for better understanding of radio propagation in this area. However, there are no generally accepted methodologies for providing adequate and reliable estimates.
News From Washington

Eric Schimmel
Washington News Editor

IEEE Vehicular Technology Society Newsletter

November 1985

BACKGROUND

The private land mobile radio service represents the largest group of licence holders and the most active user group of the land mobile radio service. The private land mobile radio service is used by a wide range of users, including government agencies, public utilities, public safety organizations, as well as many others. The provision of a dedicated and exclusive radio service for such users is considered an important aspect of the public policy. However, the private land mobile radio service is not without its challenges. The rapid growth of mobile communications has led to increasing demand for additional spectrum, which is a scarce resource. This has led to the consideration of additional spectrum allocations, which may impact the existing private land mobile radio service. The Federal Communications Commission (FCC) has been considering additional spectrum allocations for the private land mobile radio service, which is expected to provide additional spectrum for the growing demand. The decision regarding the allocation of additional spectrum for the private land mobile radio service is expected to be made in the near future. However, the decision is not without its challenges. The decision will have to balance the interests of the existing users with the needs of the growing demand for additional spectrum.
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evaluate local demand for communications services and have an incentive to act to minimize the number of such inefficiencies. This paper examines the potential benefits and limitations of different policies for encouraging service competition, with a focus on how the policies might change if some of the more extreme views of future service developments were realized.

Communications services provided under this flexible allocation environment would be subject to the same market forces that influence other types of services in the economy. The government would have a range of tools at its disposal to influence the behavior of the market, including taxation, regulation, and subsidies. For example, the government could use taxes to discourage unnecessary use of communications services or to encourage the development of new technologies. Alternatively, it could use subsidies to promote the expansion of certain services or to provide access to underserved communities. The key issue is how to design policies that are efficient and fair, and that take into account the unique characteristics of communications services.

The government would have to be careful in designing its policies, however, because the market is likely to be very competitive. This suggests that any government intervention should be minimal, and that it should focus on providing a level playing field for all participants. In addition, the government should be mindful of the potential for abuse of market power, and should ensure that any policies that are adopted do not give any one firm a competitive advantage.

In summary, this paper has argued that the government should adopt a flexible allocation environment for communications services, and that it should be careful in designing its policies. The government should focus on providing a level playing field for all participants, and should ensure that any policies that are adopted do not give any one firm a competitive advantage.

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1.5 The fluid flow principle is simple and the associated pressure adjustment factor would be a function of the free boundary. However, because of the problems of estimating the fluid flow strength of existing networks and the need for a reliable method for estimating the fluid flow strength of existing networks, this approach may be simplified by the use of pressure adjustment factors. The pressures and pressures on the nodes must be related to the flow of the fluid.
THE CANADIAN REPORT

VTS NEWS FROM REGION 7

William J. Misskey
Canadian Report Editor

This issue of the IEEE Vehicular Technology Society Newsletter presents a news report from Region 7, the Canadian region, of interest to IEEE VTS members.

If you have any item which you would like to have appear in "The Canadian Report," please feel free to send it to me at the following address:

William J. Misskey
Electrical Information Systems Engineering
University of Regina
Regina, Saskatchewan
S4S 0A2
Canada

or phone me at (306) 584-4060. Please note the deadline dates for receipt of final copy listing on page 1 of every newsletter.

This Issue we have news from the IEEE VTS Toronto Chapter and two items on interesting mobile applications in agriculture.

November 1985

Communications

J. R. Cruz
Communications Editor

In this issue we are publishing an article on the future communication needs of the automotive industry. Although most of our readers are interested in civilian applications, we felt that it might be of interest to learn about current military communications planning and research from someone who is deeply involved in this area, Dr. William A. Sander from the U.S. Army Research Office, kindly agreed to give us a brief summary of their current program needs and needs, and current research efforts.

We have been getting some feedback from the readership about our contributions. We appreciate your comments and will endeavor to make the newsletter as responsive to your needs as we possibly can. Please address all correspondence to:

Dr. J.R. Cruz
Communications Editor
IEEE VTS Newsletter
School of Electrical Engineering
Computer Science
The University of Oklahoma
Norman, OK 73019

ABSTRACTS


"Videophone Service for Farm Tractors," W. Seall.


The performance of adaptive decision feedback equalization applied to high bit rate digital communications in the presence of multipath propagation is analytically investigated. Minimum phase (MP) and nonminimum phase (NMP) type fades as well as the transition periods between these two states are considered. Insight is given into the IF receiver's decision loop and its dependence on the decision feedback equalizer (DFE) behavior, especially during transitions. Regular equations on the DFE structure for ensuring its maximum performance are derived and a modified updating algorithm is presented. Finally, dynamic simulation results are reported and compared to theoretical results. They show that the proposed structure is capable of coping with most propagation conditions.


In this paper we consider differential detection of narrow-band binary FM, using a
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**November 1985**

**Richard M. Emerson, Director Emeritus of the Institute of Electrical and Electronic Engineers, Dies**

Former IEEE Executive Director/Pioneer in Radio Electronics

Richard M. Emerson, Director Emeritus and a member of the Board of Directors of the Institute of Electrical and Electronic Engineers, Inc. (IEEE), died on Friday, July 19, 1985, in a burglary at his home in Vincennes, Indiana. He had devoted much of his energy and vision to the IEEE, above all as Executive Director and General Manager. He had made innumerable contributions to the fields of optics, lasers, and radio astronomy. Dr. Emerson was 71 years old and had been ill for several months.

Speaking for Dr. Emerson's friends and colleagues, IEEE President Charles A. Eaton waged a war for communication with the public in his remembrance: "Dr. Emerson's 23 years of leadership own us the rich legacy of the IEEE's all-consuming interest in people. A wise and caring man, he acquainted himself with every person, every event, every policy and procedure covering the Institute's activities. In many ways, he helped develop the techniques of the society's visionaries, professional judgment, and industrious spirit underpinned by the IEEE toward its present structure."

Dr. Emerson was elected Executive Director and appointed Director of Service and Technical Services in 1966, and Director of Technical Services from 1963 to 1975.

**Communications Research in the U.S. Army**

**Dr. William A. Sander**

**Electronics Division**

**U.S. Army Research Office**

This article begins by describing the general concepts of modern land warfare which are important to the current Army communication systems. This is followed by a description of the general technology and needs which are possible solutions to future Army communications needs. The reader should note that they are only possible approaches. It is hoped that the reader will formulate his original ideas for research which could contribute to solving the Army's needs in communications.

Communications research in the Army is highly predicated on the environment in which the equipment is to be fielded; they have defined several concepts of modern warfare with the result of improved communications. These concepts are Airland Battle (ALB) for the current concept, ALB 2000 for the year 2000 timeframe, and Army 21 for the 21st century. These concepts call for larger numbers of smaller forces with greater mobility resulting in large geographical area of operations distributed over a broader geographical area. The greater mobility means that the topography, or structure, of Army communications networks is rapidly and continuously changing.

Another characteristic of modern warfare as ALB 2000 is a high level of electronic warfare. In such environments, the success of recent conflicts has largely been attributed to superiority in electronic warfare capability. In any conflict between major powers, both sides attempt to maintain an electronic warfare system which use the most advanced technology available. Thus the outcome of a conflict could be highly sensitive to the influence of electronic warfare and the ability of the force's electronic systems to realize electronic warfare.

**Technology in areas other than communications**

In contrast to the electronic warfare capability, the success of military operations depends on the ability of the force to adapt to changing conditions. This is the need to increase the influence of information provided by the electronic warfare and the ability of the force's systems to realize electronic warfare.

Continuous availability of effective communication is essential to success in battle. Effective battlefield communication is often possible only if the enemy is in the process of deployment. The ability to provide effective communication is therefore dependent on the ability to increase the influence of information provided by the electronic warfare and the ability of the force's systems to realize electronic warfare.

**Conclusions**

The increasing availability of information and the increasing need for effective electronic warfare are critical factors in the success of modern warfare. The continued availability of effective communication is essential to success in battle. Effective battlefield communication is often possible only if the enemy is in the process of deployment. The ability to provide effective communication is therefore dependent on the ability to increase the influence of information provided by the electronic warfare and the ability of the force's systems to realize electronic warfare.
change so that they can make the necessary changes to match a receiving terminal's transceivers. The incorporation of a header into packet radio networks also requires new protocols to provide additional capabilities of spread spectrum such as multiple access. Techniques for fast acquisition and synchronization of spreading codes throughout the network are needed in order to minimize the time required for this function and to increase the throughput of the network. It is also important to provide commanders with a mobile communication capability which permits them to access the network while moving.

The command posts in the Army are required to be widely dispersed to minimize the effects of detection and enemy fire. This need only makes the task of moving the communications terminals which support such posts more difficult since many cables must be removed and reconnect. Millimeter wave links because of their high atmospheric absorption and the short propagation path are well suited to meet low probability of interception and fiber optic cables because of their light weight and wide bandwidth are possible solutions to this problem.

The propagation of narrowband radio waves in well understood and models are available for accurate simulation of these systems. However, the propagation of wideband signals such as spread spectrum is not well understood. Theoretical models and models which can be used to accurately simulate wideband propagation. There is a need for models which can accurately predict reliable communication on range for spread spectrum systems and models of wideband propagation need to be developed especially for UHF and microwave frequencies. Models for propagation in built-up areas and through foliage are also needed.

Another component of the Army communication system which must be made compatible with these concepts is the antenna. Research is needed in adaptive null-steering and beam-steering antennas. Wideband adaptive antennas are also needed for use in spread spectrum systems. Research in electrically small or low profile antennas is also encouraged in order to reduce their weight. The Army also needs antennas which can be easily erected, lowered, and stored to facilitate rapid movement. Another potential area of research is in mobile antennas with improved performance.

Army communications networks in the future will be distributed and adaptive. At present there is no theory which can be used to design such networks. A number of theories and models have been developed for pieces of the problem under highly restricted conditions. These theories and models need which can be integrated into larger simulations in a coordinated and controlled manner. Simulation and theory of the large, complex adaptive and distributed networks needed to design and develop reliable Army communication networks are needed. Large scale connectivity and effectiveness in the modern battlefield environment are needed.

**Automotive Electronics**

**Dateline:** Detroit

**Bill Fleming**

**Automotive Electronics Editor**

**COLLISION AVOIDANCE USING LASER RADAR**

A laser-radars safety system designed to avoid automobile collisions has been developed jointly by Nissens Motor Company and Nielsen Company [1]. The system consists of two laser diodes, a PIN photodiode and a range detector circuit. It is capable of detecting objects at a distance of up to 120 meters. Width of the beam is about 4.5 meters, approximately the width of a roadway.

According to Nissens, when installed in the grill of an automobile, the radar prevents the vehicle from running into another vehicle ahead by keeping it a certain distance from that vehicle. In addition, the laser-radar can be produced at a cost less than one-tenth of a cost of a microwave radar.

The laser transmitter consists of two laser diodes mounted side by side to provide a wide beam width, high strength output beam. Each laser diode provides 12 watts peak output power. The laser receiver includes a Fresnel lens attached to a PIN photodiode which is used to block ambient light. Detection range is reduced by approximately a factor of three, from its clear-air value. Moreover, water splashed by other vehicles can reduce the detection range some times by as much as a factor of three. Fog can reduce the detection range by a factor of two. In cases when the sun is within ten degrees of the axis of the laser beam the laser-radar is totally blinded. On the other hand, the laser-radar has excellent resolution and a well defined beam for good target discrimination.

**DEMAND HYDROGEN FUEL GAS GENERATOR**

A new and remarkable process by which hydrogen can be generated on-board a vehicle, according to demand, has been announced [3]. When the engine is idling, very little hydrogen is generated; when power demand is high, a lot is generated. The vehicles "fuel" tank is filled with plain water, which is consumed along with a special aluminum alloy during the hydrogen generation process. The hydrogen gas is produced by a combination of electrolytic and physical processes at a rate determined by instantaneous demand, using a generator unit small enough to fit in a car engine compartment. In this system, a length of aluminum alloy wire, serving as a catalyst, is fed against a rotating drum submerged in a small pool of plain water. Voltage applied between the advancing wire electrode (anode) and the conductive drum (cathode) causes a discharge at the interface with a mechanical action comparable to that applied in Hig welding. The resultant reaction forms aluminum oxide, which sinks to the bottom of the tank as a slurry, and liberates hydrogen gas from the water. The gas bubbles to the surface for collection, and immediate combustion by the engine. One reel of 500 meters of one-millimeter wire (one kilogram) can last for 5 to 8.3 hours of driving. Reels are reported to cost about $2, which is the only outlay for fuel ignoring an insignificant figure for water consumption. Electrical requirements are 32 volts ac with current varying between 18 and 60 A. A specially designed, engine-driven alternator supplies the required electrical power for the discharge circuit.

Vehicle consumption, by fluid volume is estimated at about 80% of the equivalent rate for gasoline, and a standard fuel tank could serve for on-board storage.

A vehicle has been built and driven on British highways using hydrogen fuel generated on board. This development is funded by the International Energy Coalition, a European-based group of scientists and engineers with registered offices in Geneva, Moscow and the Gvanian Islands [1].

**VEHICULAR ELECTRONICS YOU MAY OR MAY NOT WANT**

The Buick question concept vehicle features heads-up instrumentation like those used in aircrafts [4]. The heads-up display may soon be popping up in the steering columns of your vehicle. The experimental instruments, used in Buick's quest, display a number of operating parameters, such as coolant level and battery voltage.

Another innovation, offered by Mercedes-Benz, is a power-adjustable steering wheel [5]. A small electric motor is followed by a complex gear train with a final worm-gear-segment mechanism in the (power) steering column. Controlled by a finger tip rocker switch, this gives a total of 60 millimeter telescopic movement to very reach.
Mazda has introduced a model 323 passenger car. The audio equipment list includes a Pioneer-built digital audio disc player, Japan's first such system offered by a car manufacturer. In addition, an air-purifier system that force-filters stale cabin air through a negative-ion generating, honeycomb charcoal filter and sterilizing lamp light chamber is offered as an optional accessory [6].

REFERENCES