IEEE
VEHICULAR TECHNOLOGY
SOCIETY NEWSLETTER

FEBRUARY 1978

EDITOR: OLIN S. GILES

28th ANNUAL VTS CONFERENCE
DENVER, COLORADO
MARCH 22-24
THE PRESIDENT'S MESSAGE

At the Administrative Committee meeting held in Los Angeles on December 6, 1976, the announcement that I was elected President and Roger Madden of the FLC was elected President-elect of the Society. I was elected President and Roger Madden of the FLC was elected President-elect of the Society. At that time, many of you may not know me, a few words about my background are in order. At present, I lead a group of engineers involved in automotive control system research within the Electronics Department of the General Motors Research Laboratories. We are engaged in applying control system theory and microprocessor technology to develop electronic controls for the automatic engine with the objectives of improved fuel economy and reduced exhaust emissions. I was elected to the Administrative Committee (AdCom) in 1973 and have served the past four years as a director, a recording assistant, and a vice-president. Prior to that I was active in the Southeastern Michigan VTI Chapter and served as chairman for 1972-1973. On a personal note, I am married and the father of two children.

Looking back since I became a member of your AdCom, I have been substantially involved in a number of other activities, but I believe this resulted from good leadership, an active and productive organization, and the exemplary efforts of a number of people. You have always been willing to do your share, and the Society has done well. I would like to thank you for the hard work and dedication you have all given to the Society. Your efforts and dedication are what make the Society strong, and I look forward to working with you all to make the Society even stronger.

As I write this, I have just received a letter from the AdCom announcing our annual conference to be held in Denver, March 27-28, 1977. I am impressed with the program and the Society's ability to continue to improve our annual conference. In addition to the main technical sessions containing almost 70 papers, there will be a wide variety of other activities as indicated below:

A BIRDSEYE VIEW OF LAND MOBILE RADIO AND VEHICULAR TECHNOLOGY WEEK
(March 26-24, 1977)

National Business Radio Dealers Conference
IEEE Vehicular Technology Society Conference
IEEE Microwave Mobile Symposium
IEEE Microprocessor Tutorial Course
Radio Club of America and IEEE Denver Section Banquet
Colorado Council of Amateur Radio Clubs
Land Mobile Communication Council
National Association of Business & Educational Radio
Senior Communication Symposium, NABER
IEEE Electromagnetic Compatibility Group
Forest Industries Telecommunications
IEEE EMC Symposium
IEEE Electromagnetic Compatibility Group

Of special note is the scope of the technical program. In addition to the many sessions on communications, there are sessions on electronic vehicles, automotive electronics, and for the first time in my term as President, there is a session on the automotive vehicle. You can expect to see more of this in the October sessions and the future. The scope of the technical program is a reflection of the Society's dedication to the advancement of automotive technology and its many applications. The technical program is a reflection of the Society's dedication to the advancement of automotive technology and its many applications.

In conclusion, I'd like to hear from you. Please contact me with your comments, complaints, praise, or suggestions.

Happy New Year!
John Cassidy
REPORT TO THE MEMBERSHIP

The “final” 1978 budget has been approved by the Technical Activities Board. The following figures and data for VTS are extracted from the Finance Committee Report.

<table>
<thead>
<tr>
<th>Income Item</th>
<th>Amount</th>
<th>Percent of TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership Fees</td>
<td>$21,700</td>
<td>21%</td>
</tr>
<tr>
<td>IEEE Support &amp; Miscellaneous</td>
<td>20,800</td>
<td>20</td>
</tr>
<tr>
<td>Publications Sales</td>
<td>29,700</td>
<td>28</td>
</tr>
<tr>
<td>Meetings Receipts</td>
<td>37,300</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$104,500</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Expense Item**

<table>
<thead>
<tr>
<th>Expense Item</th>
<th>Amount</th>
<th>Percent of TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transactions &amp; Conference Records Expenses, Printing, Indexing, Editorial Production, etc.</td>
<td>$51,500</td>
<td>52%</td>
</tr>
<tr>
<td>Newsletter</td>
<td>7,800</td>
<td>8%</td>
</tr>
<tr>
<td>Meetings &amp; Miscellaneous</td>
<td>9,300</td>
<td>9%</td>
</tr>
<tr>
<td>HQ Charges</td>
<td>20,800</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$90,000</td>
<td>100%</td>
</tr>
</tbody>
</table>

In my report to you last year, I incorrectly stated the amount received from the Automotive Electronics Conference, “Convergence ’76.” The correct amount for meeting receipts was $27,000 rather than $17,000. Of this amount, $5,000 was from “Convergence.” Assuming this coming year goes as budgeted, we will show a surplus for the year of about $14,500.

ROGER MAIDEN
Treasurer, VTS

NEWSLETTER STAFF

<table>
<thead>
<tr>
<th>Position</th>
<th>Editor</th>
<th>Phone</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter News</td>
<td>Sam McCanney</td>
<td>703-476-6400</td>
<td>Federal Communications Commission</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>919 “M” Street, N.W.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Washington, D.C. 20554</td>
</tr>
<tr>
<td>Automotive</td>
<td>Dr. William J. Fleming</td>
<td>301-837-6485</td>
<td>General Motors Corporation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>General Motors Technical Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Warren, Michigan 48090</td>
</tr>
<tr>
<td>Communications</td>
<td>A. E. Guthrie</td>
<td>703-476-6400</td>
<td>General Electric</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Technical Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Customer Service Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lynchburg, Virginia 24502</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(804) 846-7111, Ext. 2688</td>
</tr>
<tr>
<td>ADCOM News</td>
<td>George J. Mitchell</td>
<td>814-664-6495</td>
<td>RCA/Public Communications Systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Meadowlands, Pennsylvania 15347</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(814) 228-6495</td>
</tr>
<tr>
<td></td>
<td>Eric Schimmel</td>
<td>703-476-6400</td>
<td>NASCO Communications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P.O. Box 19322</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Washington, D.C. 20036</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(202) 659-4400</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2780 South Hill Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Los Angeles, California 90007</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(213) 233-7191</td>
</tr>
<tr>
<td>Transporation</td>
<td>Dr. Ronald G. Rule</td>
<td>703-476-6400</td>
<td>Automated Transportation Systems</td>
</tr>
<tr>
<td>System Editor</td>
<td></td>
<td></td>
<td>Boeing Aerospace Company</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P.O. Box 3999, Hill Stop 84-51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Seattle, Washington 98124</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(206) 775-9012</td>
</tr>
<tr>
<td>Advertising</td>
<td>Stuart F. Meyer</td>
<td>703-476-6400</td>
<td>E. P. Johnson Company</td>
</tr>
<tr>
<td>Director</td>
<td></td>
<td></td>
<td>1320 T Street, N.W.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Washington, D.C. 20005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(202) 367-3100</td>
</tr>
</tbody>
</table>

IEEE Vehicular Technology Society Newsletter is published quarterly by the Vehicular Technology Society of the Institute of Electrical and Electronics Engineers, Inc., Headquarters: 345 East 47th Street, New York, NY 10017. Sent automatically and without additional cost to each member of the Vehicular Technology Society. Printed in U.S.A. Second-class postage is paid at New York, NY and at additional mailing offices.

EDITOR'S NOTES

In this first Newsletter of the new year, the dominate coverage is devoted to the upcoming 36th Annual VTS Conference in Nov. All indications point to an exciting event at an exciting location. Perhaps the most impressive aspect of this conference is the number of technical papers that will be presented—over ninety papers, and this count doesn’t include any of the papers or seminars sponsored by other organizations. Thanks to the efforts of Winston Scott, you will find brief abstracts on each of these papers in this issue.

In addition to the conference coverage, this issue contains the regular feature articles from members of the Newsletter staff.

That’s it for now. Please note the deadline for the May issue.

Olin Giles

VT'S NEWSLETTER DEADLINE

<table>
<thead>
<tr>
<th>Month</th>
<th>Final Copy To Be Rec'd. By Editor</th>
<th>Target Mailing Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>4-3-78</td>
<td>5-3-78</td>
</tr>
<tr>
<td>May</td>
<td>5-3-78</td>
<td>6-3-78</td>
</tr>
<tr>
<td>June</td>
<td>6-3-78</td>
<td>7-3-78</td>
</tr>
<tr>
<td>July</td>
<td>7-3-78</td>
<td>8-3-78</td>
</tr>
<tr>
<td>August</td>
<td>8-3-78</td>
<td>9-3-78</td>
</tr>
<tr>
<td>September</td>
<td>9-3-78</td>
<td>10-3-78</td>
</tr>
<tr>
<td>October</td>
<td>10-3-78</td>
<td>11-3-78</td>
</tr>
<tr>
<td>November</td>
<td>11-3-78</td>
<td>12-3-78</td>
</tr>
<tr>
<td>December</td>
<td>12-3-78</td>
<td>1-3-79</td>
</tr>
</tbody>
</table>

No inputs for newsletter staff editors should be received 1-2 weeks before these dates.

SAM LANE

I hope to see you all at our annual conferences, and industry functions, and I am looking forward to the continued growth of our organization.
ABSTRACTS OF TECHNICAL PAPERS

WEDNESDAY MORNING ACTIVITIES

Session: AUTOMOTIVE VEHICLE LOCATION SYSTEMS
Session Chairman: MITRE Corp.
Time: Wednesday Morning 9:30 to 12:00 Noon

Automatic Vehicle Location System Selection
Geoffrey D. Wilson
The Aerospace Corporation

When employed in police operations, an automatic vehicle location system becomes one element of the overall police system. The characteristics of such systems are discussed and examples of uses for the location system and even the city layout and topography influence system design and must be afforded consideration in the selection process. This paper describes the relationships between operational requirements and system performance parameters and identifies the technical and administrative factors that should be considered in the selection and deployment of cost-effective automatic vehicle location systems.

An Integrated Approach to Automatic Vehicle Monitoring and Mobile Digital Communications
A. Borelli and S. Saha
Hazeltine Corporation

This paper presents a description of an integrated system operating in the 800 MHz band which accomplishes (1) automatic vehicle location and status reporting (AVM) and (2) two-way mobile digital communications (MDC) in support of vehicle fleet command and control.

Analysis of Test Data from an Automatic Vehicle Monitoring (AVM) Test
John S. Ludwick, Jr.
The MITRE Division of the MITRE Corporation

The AVM Division of the MITRE Corporation

Automatic Vehicle Monitoring systems provide to a central control point the locations of members of a fleet of vehicles. A recent series of tests has been held in Philadelphia for four improved location systems. The basic technologies represented were: VHF spotlight, microwave spotlight, pulse trilateration and Loran C. This paper analyzes the test results obtained from these technologies.

Comparative Analysis of Six Commercially Available AVL Systems
E. N. Skomal
Aerospace Corporation

Results of experimental and theoretical comparisons of six commercially available AVL systems are presented and discussed. The study included positioning accuracy, communication links, central computer requirements, and environmental factors such as road conditions which influence performance.

Session: COMMUNICATIONS AT 800 MHz
Session Chairman: B. L. Hanson
Time: Wednesday Morning 9:30 to 12:00 Noon

A Comparison between the Energy Deposition in Portable Radio Operators at 800 MHz and 450 MHz
R. B. LeBlanc, G. Gay, R. F. Steel
Motorola Inc.

In this paper, the results of an experimental investigation on the power deposition into "phantom" operators of portable transmitters at 800-900 MHz are compared with the results of previous work at 450 MHz, a traditional portable communication band.

Mobile Telephone Control Unit Design Objectives for the High Capacity Mobile Telecommunication Systems
J. Thomas Walker
Bell Laboratories

The control unit provides a vehicle with access to mobile telecommunications service in much the same manner that the telephone station set serves people in homes and offices. In establishing design objectives for the HCMTS control unit, physical design and calling procedures, two considerations are discussed which have not been encountered in our land-line telephone experience.

Human Factors Evaluation of Calling Procedures for the High Capacity Mobile Telecommunication System
B. L. Hanson and C. E. Bronnill
Bell Laboratories

The Bell System's High Capacity Mobile Telecommunication System design results in some major departures from present telephone service in the mode of user operation. This paper presents the new system and experimental program designed to test the most usable call placing procedure, the least ambiguous button labels, and to explore problems of mobile system usage in general.

The Chicago Developmental Cell System
J. T. Kennedy and D. L. Huff
Bell Telephone Laboratories

The Federal Communication Commission has authorized Illinois Bell Telephone (IBT) to construct and
operate a Developmental High Capacity Mobile Telecommunications Laboratory in the Chicago area. This paper will describe the system, the prerequisite activities, and their historical phases, and the status of activities as of November, 1977.

**WEDNESDAY AFTERNOON ACTIVITIES**

**Session: ELECTRIC VEHICLES**
**Session: CONVERSATIONS AT 800**
**Session: ELECTRIC PROPULSION AND CONTROL**

**Time:** Wednesday Afternoon
**Time:** Wednesday Afternoon
**Time:** Wednesday Afternoon

**Room:** Bell Laboratories, Holmdel
**Room:** Bell Laboratories, Holmdel
**Room:** Bell Laboratories, Holmdel

**Chairman:** W. H. Chris
**Chairman:** Frank P. Calani
**Chairman:** Frank P. Calani

**Chairman:** M. Bryant, Plessey Semiconductors
**Chairman:** Gary S. Goldman, Goldline Engineering Consultants
**Chairman:** D. P. Grybos and G. R. Cooper, Purdue University

**Ernest H. Wakefield**
**James M. Bryant**
**M. Marina, S. Tanimoto, K. Suzuki**
**T. O. Jones, H. B. Stewart, D. W. Wilson**

**IEEE Alpha Inc.**
**Plessey Semiconductors**
**Mitsubishi Research Institute Tokyo, Inc.**
**Mitsubishi Communication Industrial Co., Ltd.**

**The author reviews the historical development of electric vehicles with many interesting anecdotes. For example, did you know that for awhile, the world speed record was held by an electric automobile (57 mph in 1900)? Recent developments of interest to the electric vehicle industry are also described.**

**New Type of Band-Pass Filters for Mobile Radio Communication**

**Japan has experienced increased market demands for mobile radio communication units that have small size, high performance, and high quality. This paper describes a new type of band-pass filter of small size which is an important component in the RF modules of 500 MHz communication units. The filter is more compact than conventional capacitor-loaded resonators. The paper's excellent performance is described in the paper.**

**A Receiver Feasibility Study for the Spread Spectrum High Capacity Mobile Radio System**

**Considerable theoretical work has been done on the application of spread spectrum techniques to high capacity cellular mobile radio systems. This theoretical work assumes a receiver structure that is mathematically convenient and does not address the problem of implementing such a receiver. The study examines a number of possible configurations and modifications of the mathematical model with respect to the feasibility of their physical implementation with advanced and state-of-the-art components.**

**Analytical Models in Monitoring Mobile Packet Radio Devices**

**Once a Mobile Packet Radio Network is initialized with the pertinent connectivity information, it is necessary to monitor the performance of the system. Such monitoring is divided into two categories:**

1. **Traffic monitoring;** necessary to ensure that the system does not become overloaded and experience an appreciable decrease in throughput.
2. **Connectivity control;** necessary to insure that every repeater in range is correctly labeled and thus able to communicate with the station.

**In this note we concentrate on the latter type of monitoring.**

**On Connectivity in Mobile Packet Radio Networks**

**Israel Gitman and Daniel Minoli**

**Network Analysis Corp.**

**This paper describes the functional usage of Packet Radio (PR) Repeater and Mobile Packet Radio Networks (MPRNET). Also presented is a method for computing connectivity as a function of time. Other methods presented are general; however, they have particular significance for predictable mobile packet's station shows the trajectories of repeaters.**

**The Power Wheel-Electromotive Torque for Vehicular Applications**

**The Power Wheel is a compact, self-contained motor in a wheel so that an electromechanical drive is established. The motor includes a microprogrammed controller and dual-FET brushless commutation/polyphase rectification circuitry which are also contained entirely within the wheel. A brief discussion of the design, methodology, and operating principles is presented.**

**Regeneration in Electric Vehicles**

**Regeneration in electric vehicles has been promoted for energy recovery, reduced wear on mechanical brakes, reduced heat damage to braking systems, and increased range of energy-storage vehicles. This paper reviews the purpose, methods, and advantages of regeneration for such electric vehicles as locomotives, multiple-unit electric trains, light-rail vehicles, PRT's, and energy-storage vehicles.**

**M. Marina, S. Tanimoto, K. Suzuki**
**D. P. Grybos and G. R. Cooper**
**Gary S. Goldman, Goldline Engineering Consultants**
**D. P. Grybos and G. R. Cooper**
**William N. Watkins and Hel Black**

**Network Analysis Corp.**
**Purdue University**
**WD Enterprises, Walt Disney Productions**

**The Evolution of a Linear Induction Motor People Mover System**

**PeopleMover system at Disneyland employed track mounted drive wheels acting on a traction surface on the bottom of each car. The second generation system at Walt Disney World, after extensive testing of linear synchronous motors was ultimately fitted with linear induction motors.**

**Inductive Power Coupling for an Electric Highway System**

**J. G. Bolger, F. A. Kirsten**

**Lawrence Berkeley Labs**

**An electric highway system in which power can be continuously supplied to a moving vehicle is under development. This system can provide extended range and improved performance to electric vehicles of many types, such as electric trucks and buses as well as automobiles. The system is based on a unique inductive coupled power transfer mechanism, which is explained in the paper.**

**Design Study for a Flywheel-Electric Car**

**W. M. Brobeck**
**W. M. Brobeck and Associates**

**The paper describes the design of a flywheel-generator unit and its application to a vehicle. The flywheel is of fiber-composite material, supported on magnetic bearings and driven by an inductor-type generator. The moving part runs in high vacuum in an enclosure mounted on gimbals. An arrangement of the equipment in the car will be shown with the results of calculations of weight, efficiency, and performance.**

**Obstacle Protection with Unmanned Vehicles**

**B. W. Hucklep**

**Lear Siegler, Inc./Automated Systems Division**

**The use of electric powered vehicles is slowly expanding in the industrial workplace into offices, hospitals and "clean" manufacturing areas. Most of the people operating these vehicles are not familiar with automated vehicles, special safety precautions must be included in the vehicle. This paper describes a vehicle system which is unaffected by external interference from radio stations, electric typewriters, computers, and other equipment.**

**Regeneration in Electric Vehicles**

**R. H. Miller, J. J. Breckman, Alexander Kusko**
**BART and A. Kusko Inc.**

**Regeneration in electric vehicles has been promoted for energy recovery, reduced wear on mechanical brakes, reduced heat damage to braking systems, and increased range of energy-storage vehicles. This paper reviews the purpose, methods, and advantages of regeneration for such electric vehicles as locomotives, multiple-unit electric trains, light-rail vehicles, PRT's, and energy-storage vehicles.**
Session: AUTOMATIC VEHICLE LOCATION
Session Walter Scales
Chairman: MITRE Corp.
Time: Wednesday Afternoon 11:30 to 5:00 p.m.
Loran C Tracking of Land Vehicles using Microcomputers
A. A. El-Sawy, J. W. Fuersteln, K. P. Mayer
MITRE Corp.

The concept, design, test, and evaluation of two
similar Loran C land vehicle tracking systems are
presented. One system was developed to field
demonstrations of applications of Loran C location
techniques. The second system was configured for
the Philadelphia Health Management Corporation to
automatically display the position and location of
two emergency medical service (EMS) vehicles to
aid in a more efficient ambulance dispatch and control
functions. All system controls and calculations are
provided by a microcomputer.

Wednesday Evening Activities
RADIO CLUB OF AMERICA & IEEE Denver Section Banquet

The Huntington Beach Automatic Vehicle Monitoring System Utilizing Overlapping RF Signposts
George W. Graver
Hoffman Information Systems

In the 1975 ITG Conference in Toronto, the author
reported on a onedimensional direct proximity approach to
RFRF utilizing overlapping RF signposts. Vehicle
location was determined, in each vehicle, through
simple processing of the signal strengths and binary
codes received from pairs of adjacent signposts
separated by 500 feet. This paper describes the
system which has been operating for over a year in
Huntington Beach, California.

An Experimental System for Processing Vehicle Movement Data
Toshihiro Tsumura
University of Osaka, Japan

This paper presents a proposed experimental system for
processing movement data of a vehicle. Using a
self-contained on-line computing processor which
computes position and bearing angle (heading), the
trajectory of the location of the vehicle has been
successfully displayed.

Dead Reckoning Vehicle Location using a Solid State Rate Gyro
M. D. Kotzeln and A. P. van den Heuvel
Motorola Inc.

Automatic vehicle location is an area of continuing
study at a number of laboratories. Among the various
methods being considered is dead reckoning using
continuous vehicle heading information in conjunction with
odometer data to provide regular updates of estimated
vehicle position. This paper describes the design and
experimental evaluation of one such method employing a
solid state rate gyro as the heading sensor.

Philadelphia Field Tests of an Overlapping Signpost AVM System during the UWMP Multi-User AVM Program
George W. Graver
Hoffman Information Systems

A comprehensive field test and evaluation in Philadelphia,
Pa., of an electronic multi-signpost AVM System is
described. The system tested is a direct proximity RF
signpost system using monostatic signposts operating
at 49.88 MHz. An objective of the program is the
selection of an AVM location technology for
implementation in the Southern California Rapid
Transit District and its evaluation as a Multi-User
AVM System in the Los Angeles area.

Role with Learjet is well known. He has received many honorific awards from his significant contributions
in many fields.

Thursday Morning Activities
Session: COMMUNICATIONS TESTING AND TECHNIQUES
Session Marshall T. Treado
Chairman: National Bureau of Standards
Time: Thursday Morning 9:00 to 12:00 Noon
Communications Security Devices (CSD)-Techniques, Constraints, and Selection
Arnold M. McAlmon
TCC
A number of advanced and fairly sophisticated communications security techniques are briefly described and
depicted by use of audio tapes, monograms, and text.
A discussion then follows of the various constraints and
considerations affecting the proper use of CSDs in
different types of communications systems.

Selecting Signallers for Portable Applications
Leonard E. Nelson
Motorola Inc.

In the selection of a selective signalling technique
for use in portable systems, consideration must be
given to code capacity, speed, reliability, sensitivity,
false alarm rates, flexibility, and system mainte-
nance. One technique, multiple sequential tone
signalling, has been used extensively; however, this
technique does not provide the flexibility and low
system maintenance required by binary signalling
approaches. In this paper, the characteristics of
multiple tone signalling are described and the stringent
requirements of the portable environment are explored.

15-KHz Channel Spacing Tests in the 150-MHz Band
R. A. Christie
Bell Laboratories

Tests were conducted in Portland, Oregon to establish
certain parameters of the system. These tests included
to determine the characteristics of mobile telephone
users, a mailed questionnaire survey of Bell System
mobile telephone customers was conducted. The
questionnaire was divided into several topics. Results of
the survey, and its implications, will be discussed.

Adaptive Signal Processing in the Coastal Harbor Radio
Telephone System
C. W. Schackle
Bell Laboratories

This paper describes methods by which land-based
receivers can correct for fades in a coastal harborside
radio telephone system. These methods have been implemented in the Coastal Harbor radio-
telephone system in Boston. Test results indicate that
the receivers are able to operate reliably in the non-
stationary noise and signal environment.

Testing the Electronic Industries Association Land
Mobile Antenna Gain Standards at the NBS
H. E. Taggart and J. F. Shafer
National Bureau of Standards

The Electronic Industries Association has a published standard, E145-3230, Minimum Standards for Land-
Mobile Communications Antennas. This standard details the minimum performance requirements, test
methods, and standard antennas for evaluating the performance of fixed and base station antennas at frequencies
from 25 to 1000 MHz. The National Bureau of Standards calibrated some antenna standards. Two antennas
were calibrated in the 450-512 MHz band and two in the 900-950 MHz band. This paper describes in
detail the measurement techniques used in the program, the measurement results, and uncertainties.

County Emergency Medical Communications in a High Density Metropolitan Area with Dynamic Frequency Assignments
N. W. Beeman, H. K. Spence, R. Flanagan, G. E. Austin
County of San Mateo, California

The County of San Mateo, California, in cooperation with the Communications Division, has purchased and
installed a County-wide Communications System, for the purpose of allowing those personnel responding to an
emergency medical need to cooperate fully and quickly to that need. This paper explores the standard oper-
ating procedures and current operations of the system.
ACT Operating Experience at Morgantown and EXPO '75

The two systems are briefly described in terms of their layout, characteristics, and technical development. The operating histories of the two systems and operational statistics are also provided. This data includes availability histories, downtime, and failures between systems, and available data for both systems. The data is summarized in a convenient form for general correlation and use by other systems.

The Animated AirTRAN System, purchased by the Dallas/ Ft. Worth Airport Board from the Bouquet Corp., went into revenue service on the day the general airport opened in January 1974. Since then, it has served as a generally convenient and rapid connector between the airport's widely spaced passenger terminals. This system provides the necessary service of the system to date.

Station Design Impact on Reliability Assessment

Eugene B. Sagalow

TRW/Colorado Electronics

This study describes a methodology that can be used in evaluating a transit system, placing emphasis upon station configuration and the establishment of reserve zones for passenger handling. Station areas are described in terms of operational policies. In order to determine quantity of vehicle service at a specified time, the operational policies are also examined.

Session: RECENT ADVANCES IN AUTOMOTIVE ELECTRONICS
Session: A Review of Wheel-loc Control Systems for Air-Brake Vehicles

Time: Thursday Morning
9:30 to 11:30 a.m.

A Review of Wheel-loc Control Systems for Air-Brake Vehicles

T. O. Jones and D. J. Bonaventure

General Motors Proving Grounds

The stopping distances prescribed in Federal Motor Vehicle Safety Standard 112 require that all wheels on the vehicle develop near-peak retarding force. This paper discusses brake systems which achieve near-peak retarding force at each wheel regardless of load distribution. The electronic control sensors will be described with results on RFI caused wheel lock-up and brake failure problems.

The Reliability History of Airtrans

C. W. Watt

D. M. Elliott

G. S. Trans. Systems Center Dallas-Ft. Worth Airport

The automated AirTRANS system, purchased by the Dallas/ Ft. Worth Airport Board from the Bouquet Corp., went into revenue service on the day the general airport opened in January 1974. Since then, it has served as a generally convenient and rapid connector between the airport's widely spaced passenger terminals. This paper summarizes the performance of the system to date.

Suppression of Radio Frequency Interference at the Distributor Motor Gap

W. C. Kepner

General Motors Research Laboratories

Traditionally, the suppression of Radio Frequency Interference (RFI) caused by the ignition system of a motor vehicle has been achieved either by using the ignition cable an inefficient antenna or by reducing the ac components of the current flowing in the ignition cable. Recently, novel suppression techniques have been applied with success to the design of ignition systems; often only subtle changes of the distributor rotor gap are involved. This paper summarizes a study carried out to identify the important physical mechanisms in modifications to the rotor gap.

The Use of In-Line Repeaters in Leaky Feeder Radio System for Coal Mines

David J. R. Martin

National Coal Board

Leaky feeder techniques are being used increasingly to provide radio communication with men and vehicles in mines and tunnels. A continuing study by the UK National Coal Board has devoted considerable attention to the use of line-repeaters in such systems to compensate for line losses at many levels. A variety of different ways of achieving doubling communication with simple one-way repeaters have been developed and tested. The system is capable of providing a far more even and reliable performance than was previously possible.

Medium-Frequency-Fire Communications

Robert L. Chuo


Wireless radio transmission at medium frequency is feasible for both personnel and vehicular communications in underground coal mines. This paper describes a propagation which occurs via either a coal seam waveguide or electromagnetic coupling into out of mine wires, trains and wires or, on both.

Radio Communication in Subways and Tunnels through Rayleigh Waves and Leaky Guided Cables

R. A. Isberg

Consult LTD

This paper is a report of the author's visits to London Transport, the National Coal Board's Winding Research Establishment and the Cadby Hill Coal Mine, where a single channel repeater and leaky feeder systems are used for underground communication. The report also includes results of the author's investigation of one-channel repeater systems in buildings and multi-channel repeater systems in subways and tunnels.

Passive Reflectors as Means for Extending UHF Signals Down Intersecting Cross Cuts In Mines orCorridors

R. A. Isberg

Consult LTD

Robert L. Chuo

U. S. Bureau of Mines

Passive reflectors are used extensively for extending microwave communication around obstacles above 2000 MHz and the theory of their design and operation is well documented and understood. During recent 950 MHz propagation tests in a room and pillar limestone mine, which is approximately one half mile in diameter, it was found that the transceivers could communicate satisfactorily down straight drifts (corridors) but the range of communication down intersecting drifts was quite limited.

New York World Trade Center-Three Station, Common Antenna-Two-Way Repeater Radio System

Michael J. Ceruso and David Geller

The Port Authority of New York and New Jersey

This paper describes an indoor/outdoor antenna system that serves the World Trade Center's three two-way radio stations, simultaneously, each on different UHF channels. Each station provides a) base to portable or mobile communications, b) portable to portable repeater operations and, c) one-way paging. The indoor sections of the antenna system consists of many branches of leaky type antenna transmission line distributed via carefully selected runs through the six subterranean areas of the building in the size of several football fields.

THURSDAY AFTERNOON ACTIVITIES

Session: PERSONAL RADIO SERVICE

Casey E. Hegge

Deputy Chief of Commerce

Time: Thursday Afternoon
1:30 to 5:30 p.m.

Personal radio from a social perspective

Floyd Shoemaker

Dover Research Institute

United States Army

Citizens band (CB) radio has risen from an obscure hobby to a public mania in the United States in just a few years. The increase in the U.S. mass media of the social impact of this new technology, but little empirical data are available on the topic. This paper describes a study to develop baseline data to answer important policy-related questions concerning the behavioral and social consequences of the adoption and use of CB radio in the U.S.

Possibilities for Future Personal Radio Services

Ronald Stone and Carlos Roberts

FCC

The FCC is now in the process of formulating a decision on the future of personal radio services. The Commission's Personal Radio Planning Group (PRPG) has evaluated different scenarios, in order to determine the best approach to this service as it is, to creating new services, possible at VHF or UHF during the planning forecasts, and the FCC's analysis, scenario evaluation process, and the FCC's results.
User Satisfaction and Demand Models for Personal Radio Paging

Ronald Stone

FCC

This paper discusses user satisfaction and demand projections for the CB Radio Service and for possible new personal radio services at VHF or UHF frequencies. These projections were generated by a computer model developed by the Advanced Research Projects Agency (ARPA) for the FCC’s Personal Radio Planning Group (PRPG).

Interference Potential of Personal Radio Services

Mark W. Swartzwout

FCC

One of the major problems faced against the CB Radio Service is the large amount of interference caused to other services or devices. Interference to television, other broadcast receivers, home electronic devices, cable television and land mobile systems was studied. This paper provides an analysis of the interference and presents some of the results. The extent of interference caused by the CB service as well as the effects of the creation of new services or changes to CB are described.

The Extent and Nature of Television Reception Difficulties Associated with CB Radio Transmissions

John R. Huda

FCC

The Federal Communications Commission (FCC), Field Operations Bureau (F 0B) has released the results of a "real-life" study on interference with television reception associated with Citizens Band Radio. The report is based on investigation of a random selection of interference cases received by six FCC field offices -- Boston, Buffalo, Kansas City, Norfolk, San Francisco, and Seattle -- over a one-year period.

A Motorist Aid System with Passive Cooperation

S. J. Lipoff

Arthur D. Little, Inc.

The need and utility of a motorist aid system is presented. The present state of the art of motorist aid systems is reviewed, compared, and critiqued. A novel system concept is presented that resolves many of the difficulties of existing approaches. The new approach requires inexpensive radio based, digital communication systems to be installed on new automobiles.

Urban Congestion and Solar Cycle Effects on CB Radio Range

Leslie A. Berry

Institute for Telecommunication Sciences

The proliferation of Citizen Band radio has occurred during a period of low solar activity when sky-wave propagation phenomena was unusually acute. It is pointed out that ionospherically propagated interference...

The Communication link between the radio receiver and the CB radio receiver within a vehicle might significantly decrease the local range of CB radio services, depending on whether the other car is near the CB radio receiver within a vehicle. This idea is based on the assumption that the radio receiver in the other car is close enough to make the signal stronger than the other car.

The maximum mainlobe and coupling between the radio receiver in the other car are used to displace the CB radio receiver within a vehicle. The coupling between the radio receiver in the other car is used to displace the CB radio receiver within a vehicle. This idea is based on the assumption that the radio receiver in the other car is close enough to make the signal stronger than the other car...

SSB for the Citizen Band

A. K. Yesufu

University of Ilorin, Nigeria

This paper suggests that to make efficient use of available CB spectrum space, a large number of channels will need to be allocated for single-sideband suppressed carrier (SSB). A few channels will be reserved for double-sideband suppressed carrier (DSB). This paper suggests a modification of a present SSB system to realize distortionless reception with minimum bandwidth.

A Highway Safety Policy for Automated Highway Operations

Robert E. Fenton

Ohio State University

Individual-vehicle automated ground transport is one promising approach toward the solution of transportation problems. The suggested configurations have focused on captive-vehicle systems for use in a restricted geographical area to dual-mode systems for intra- and/or intercity applications. This paper emphasizes the latter with its many potential advantages.

Programmable Digital Vehicular Control System

D. B. Freytag and R. P. Land

Boeing Aerospace Company

The paper describes the design of a digital vehicular control system for automated transit systems. The design is intended to be suitable for a variety of applications, including urban and rural transit systems. The system is modular and can be expanded or modified as needed.

Stability of the Collision-Proof and Related Braking Control Systems

Robert M. Starwicz

General Motors Research Laboratories

This paper discusses three braking control laws: one is the collision-proof law put forth by Schwarze, the other two are modifications of the Schwarze law. The collision-proof law requires that the kinetic energy of a following vehicle equals the kinetic energy of a leading vehicle by more than the amount which can be dissipated in the distance between the two vehicles. In addition, there is a finite time delay at which the vehicle is partially compensated for by projecting vehicle acceleration.

An Unified Approach to Vehicle Following Control System Design

Brian Pulk and Robert J. Hyns

Boeing Aerospace Company

The longitudinal control system for a vehicle follower automatically for the vehicle to follow the leader has the requirements of the leader in the front of the leader. This paper describes an alternative method that is based on simultaneous loop design with gain scheduling is proposed.

Preprocessing Techniques on Computer Simulation of Motor Vehicle Crash Victims

B. D. Dimitriadis and P. P. Grigopoulos

Florida Technological University

Methods of solution of algebraic equations generated by current computer simulation schemes for motor-vehicle victim crash victims are reviewed. Preprocessing...
techniques, usually found in the literature applied in other araeas, are for the first time applied in this paper.

Session: MARINE SYSTEMS

Session Chair: Virgil Rinehart
Chairman: Office of Advanced Ship Operations
Maritime Administration
Time: Thursday Afternoon
11:30 to 11:50 p.m.

The First Year Operation of MARIAT
David W. Lipke
COMSAT General Corporation

During 1976, three MARIAT satellites were launched into geostationary orbit over the Atlantic, Pacific and Indian Ocean regions. Commercial communications services were initiated in the summer of 1976 between shore stations located in the United States and a large variety of ocean-going vessels. Over the past year and one-half, the use of the MARIAT system has expanded considerably.

This paper reviews briefly the elements of the MARIAT system and presents information on the types of services provided, the classes of ships and offshore platforms using the system, and the growth in system usage.

Simulation of Ship Steering Control for Underway Replenishment (USRRP)
J. G. Dimick, S. H. Brown, R. Alvestad
David W. Taylor Naval Ship Research & Development Center

This paper discusses subject areas such as the USRRP simulation, early simulation results, simulated automatic control, quickened steering display, quickened USRRP steering simulation, and sensor requirements.

Alaska Tanker Simulation Experiments with New Precision Navigation Displays
Dr. William McIlroy
U.S. Merchant Marine Academy

In confined and congested harbor areas the need has arisen for an all-weather precise navigation system to process Loran-C information with the minimum of human intervention.

An ideal system was tested on the GOARF real-time simulator, during a series of experiments in Valdez, Alaska. The system is more reliable than an ideal radar system in giving better track keeping performance.

Human Factors Simulator Experiments Using a Prototype True Motion Vector Display for U.S. Navy Docking
Dr. Justus R. Riek, James J. Johnson, Elliott Manaker
U.S. Merchant Marine Academy

A ship handling experiment was conducted on GOARF to study ship performance in the presence of varying winds. A new true motion vector FPI display was used as a docking aid to enhance perception of low speeds. Test subject acceptance of the display was enthusiastic and the equipment otherwise offers evidence that such pictorial information may be more useful than existing docking aids.

Optimized Location for Navigation Transponders
Joseph J. Fee
MITRE Corp.

A procedure for determining the optimum sites for the fixed elements of a surface navigation system is presented. The procedure is then implemented as a computer algorithm for a simplified range measurement system and two typical examples of site optimization in the presence of constraints are treated.

FRIDAY MORNING ACTIVITIES

Session: REGIONAL COMMUNICATIONS

Chairman: Cyril People
Regional Communications Center

Session: Bos. D. McCaslin, Jr.
Boulder Regional Communication Center

Time: Friday Morning
9:00 to 11:30 a.m.

San Francisco Bay Area Communications Plan and Implementation for Coordination of UHF MES Channels Among Nine Counties
W. W. Beaman and R. E. Austin
County of San Mateo, California

Operation of a region-wide emergency Medical Communication system requires the coordinated sharing of the eight available UHF MES Channels, authorized by the FCC for voice and telemetry use. An "EMS" coordinated plan has been agreed upon, and it is the purpose of this paper to describe the technical and operating details of the EMS switching matrix, as outlined in the performance of the system to date.

Constraints under the Control of the Nationwide High Capacity Land Mobile Radio System
R. P. Eckert and P. M. Kelly
Kelly Scientific Corp.

The constraints upon the development of the nationwide high capacity land mobile radio system encompass considerations of national policy, regulatory requirements, economic, and technology. Those constraints considered to be of priority importance are presented and the presentation is considered to be essential for planning for system realization.

Low Cost Satellite Land Mobile Service for Nationwide Applications
J. P. Metro
Fairchild Space & Electronics Co.

A satellite land mobile system using mobile radios in the UHF band, and "band Communications Routing Terminals" (BCRT's), for a nationwide connection from any mobile location to any fixed or mobile location from any fixed or mobile location. The technical features and advantages of such a system are discussed.

This paper describes in detail the technical and operational aspects of the Iowa Public Safety Mobile Communications System. The mobile telecommunications system is unique in its design and applies many technological advances to land mobile applications.

This figure is expected to double by the year 1990.

For the past ten years planners have been attempting to come up with a design that would handle the projected passenger flow through the year 2000. The design finally adopted employs the use of a People Mover System which will carry passengers between the terminal and four concourses.

The People Mover System is the fifth generation system built by Westinghouse. Westinghouse has deployed People Mover Systems in Tampa, Seattle, and Busch Gardens in Williamsburg, Virginia. Another system will go into operation at Miami International Airport late in 1978. The Atlanta Airport People Mover System will begin operation in mid-1980.

The People Mover System will utilize new technological advancements recently developed for the Westinghouse system. These are the use of a new switch design, a new power rail system and use of microprocessors to control the operation and safety of the Vehicle System. The system will provide a service availability of greater than 99.999%.

The People Mover System will provide continuous passenger service and will consist of six trains of up to four cars each. The trains will circulate over 12,000 feet of guideway in a tunnel designed for that purpose. Thirteen train switchs will be used to facilitate a reverse turnback movement and provide for redundant operational modes in cases of failure. The system will operate on headways of less than 100 seconds.

The paper will describe the Atlanta People Mover System with emphasis on the new technological advances made by Westinghouse.

Session: MORGANTOWN SYSTEM OVERVIEW

Chairman: Dale G. Shellhorn
Boeing Aerospace Company

The initial portion of the Morgantown system has been operating in passenger service since September 1977. This paper defines the extended system necessary to complete the Morgantown system. It also discusses in detail how the observed in operations to design changes that will be incorporated into the Morgantown system. The brief program history, system element description, and operational scenario is included for continuity.
Radio Propagation in Urban Areas
Anita G. Longley
Dept. of Commerce, O/TTS

This report reviews much of the earlier work on radio propagation in urban areas, including a good deal of data from measurement programs. A number of investigators have also developed propagation models for use in urban areas. Most of these are largely empirical, and are presented as curves with various correction factors for antenna height, frequency and terrain irregularity.

MEETINGS

1978 CARNABIAN CONFERENCE ON CRIME IN ALASKA
Carnahan House
Lexington, Kentucky
May 17–19, 1978

INTERNATIONAL CONFERENCES ON COMMUNICATIONS
Sheraton Hotel
Toronto, Ontario, Canada
June 4–7, 1978

VEHICULAR TECHNOLOGY CONFERENCE
Regency Hotel
Denver, Colorado
March 22–24, 1978

ELECTRONIC COMPONENTS
Disneyland Hotel
Anahean, California
April 24–26, 1978

OFFSHORE TECHNOLOGY
Houston, Texas
May 8–11, 1978
CHAPTER NEWS

Sam McConoughy
CHAPTER NEWS EDITOR

"Performance of Mobile Gain Antennas in a Multipath Environment at 900 MHz" by Bill Turner, Senior Engineer, Antenna Systems Research, Motorola, Inc. Held at Lancaster Steak House, Schaumburg, Ill., on September 27, 1977, with 13 attending.

Mr. Turner explained in detail why mobile gain antennas don't always work. His talk was based on many measurements made on 900 MHz mobile antennas.

"What Every Engineer Should Know . . . But Probably Doesn't" by Roy K. Hofer, Partner, Ham, Clement, Brinks, Williams & Ode, Ltd. Held at Lancaster Steak House, Schaumburg, Ill., on November 9, 1977, with 17 attending.

Mr. Hofer explained that engineers working individually or for corporations often identify patentable ideas. The legal patent process is frequently foreign to the Engineer. Mr. Hofer identified the "sign posts" of invention, how to keep records, the costs of obtaining a patent, how the U. S. Patent Office processes a patent application, and what to expect if your patent is challenged.

"RF Power Measurements and Techniques for Communications" by Paul Cornell, Bird Electronics and by Daniel Montville, Spectronics, Inc. Held on December 19, 1977, with 19 attending. A presentation on RF power measurement techniques in tuning up various kinds of antennas was given by these two speakers. A Bird Theruline Wattmeter, donated by Spectronics, Inc., was awarded as a door prize.

"Police, Fire and Emergency Communications" by Bob Gray, City of Columbus Held on September 14, 1977, with 10 attending.

"Ohio Bell's Mobile Communications" by John Carter, Ohio Bell Telephone Co. Held on October 12, 1977, with 10 attending.

"Business Meeting" by Bill Boll, General Electric Co., Chairman presiding. Held on November 9, 1977, with six attending.

"WCHY Accuses" by Robert E. Dyke, Chief Engineer, WCHY-TV Held on December 14, 1977, with 15 attending.


"The Basis for Automotive EMC" by Edwin L. Brounough, Southwest Research Institute Held on September 13, 1977, with 25 attending. A joint meeting with the EMC Group. Mr. Brounough discussed past and current programs for determining radiation and susceptibility of automotive electronic systems and provided a summary of currently available data on the subject.

SAN FRANCISCO BAY AREA

"Packet Radio" by Ken Kanetsune, Stanford Research Institute Held on October 17, 1977, with 14 attending.

"900 MHz" by Tom Ulrich, Motorola, Inc. Held on November 21, 1977, with 18 attending.

WASHINGTON, D. C.

"Major Policy Issues Affecting Mobile Communications in the Future" by Carla F. Roberts, Chief, Office of Plans and Policy, Federal Communications Commission Held on October 7, 1977, with 28 attending. Mr. Roberts discussed the status of planning at the FCC for the Personal Radio Service, spread spectrum techniques, and potential regulatory impacts on mobile services.

"New Technology and Land Mobile Radio" by Dr. Charles L. Jackson, Staff Engineer, House Communications Subcommittee Held on December 9, 1977, with 70 attending. Dr. Jackson discussed the relationships between technological innovation and regulation. New technologies require regulatory changes, he concluded.

MORE ELECTION RESULTS

New York
Mr. Hal Nimberg, Chairman (November 1978)
38 Easter Street
Brooklyn, New York 11235
(212) 374-6763

Florida West Coast
Mr. Harry B. Orr, Jr., Chairman (June 1978)
7636 Derby Court
Tampa, Florida 33615
(813) 224-4791

Miami
Mr. Curtis C. Whitney, Chairman (June 1978)
11000 S.W. 164 Terrace
Miami, Florida 33176
(305) 263-3873

Central New England
Mr. Mark F. Horr, Chairman (May 1978)
215 Pleasant Street
Worsham, Maine 02090
(617) 567-2001

Denver
Mr. J. F. Shafer, Chairman (June 1978)
941 Teller Circle
Boulder, Colorado 80303
(303) 499-1000, Extension 3724

Los Angeles Council
Mr. Thomas H. Rubenstein, Chairman (June 1978)
11380 Barbers Court
Cypress, California 90630
(213) 444-1103

Dallas
Mr. G. W. Weaver, Chairman (July 1978)
7107 Mockingbird Lane
Dallas, Texas 75214

"800 MHz Systems - An Overview" by Elliott Loew, Systems Engineering Manager, Motorola, Inc. Held on November 15, 1977, with 38 attending. Mr. Loew covered the following areas in his overview of 800 MHz systems: FCC Rules and Regulations, 800 MHz propagation, available equipment, site design, and trunked and cellular systems.
HELLO - ARE YOU THERE?

Chapters not heard from:

Central New England Council (Boston)
Canton
Cincinnati - Dayton
Cleveland
Dallas
Florida West Coast (Tampa)
Miami
Orlando
Michigan S.E. (Detroit)
New York
Philadelphia
Pittsburgh
Sacramento
Toronto
Vancouver
Santa Clara Valley (San Jose)

Notes
Mail your Meeting Reports to Sam McConoughy at the address shown under "Newsletter Staff," this issue. Some of you are still sending them to John Dettra.

Still Needed
Suggestions for speakers on automotive subjects.

Need Speakers?
In addition to the Speakers Bureau published in the preceding two issues, you may wish to contact some of the speakers that have appeared at other chapters. Contact your C. E. Editor or the chairman of the chapter where he spoke if you need assistance.

Santa Claus
The AACE approved an increase in the travel budget for the "Speaker of the Year." Mr. Fred Link is the current "Speaker of the Year." Have you contacted him about appearing on one of this season's programs?

Continuing Education Program
In the embryonic stage is a thought to develop a program on Land Mobile Communications. It would be a training seminar developed with the help of the Educational Activities Board and put on locally with the help of the chapters. Shortly we expect to circulate a questionnaire to the membership about this. More on this later.

Happy New Year!
It's '79, and the Vehicular Technology Group is a thing of the past. We are now the Vehicular Technology Society. Best wishes to all chapter officers and members from your Chapter Chairman and News Editor. May '79 be our best year ever.

AUTOMOTIVE ELECTRONICS

DATETIME: DETROIT

BILL PLEMMING
AUTOMOTIVE ELECTRONICS EDITOR

REACT UPDATE

In the November 1977 issue, I reviewed the activities of REACT, Radio Emergency Associated Citizens Teams. Jerry Reese, Managing Director of REACT, wrote me a letter which included some information to update their current activities.

Jerry reports that REACT has been awarded a Federally funded contract to develop a CB Channel 9 monitor-training program. The object is to train volunteers and public safety personnel to efficiently handle highway emergencies and requests for road information. The program, NEAR (National Emergency Aid Radio) also utilizes state-appropriated Federal Highway Safety funds in order to train volunteers from state and local authorities can purchase CB radios. The program aims to develop nationally standardized procedures for coordinating efforts between state and local authorities and volunteer organizations such as REACT.

Jerry noted that REACT dues are $5 per year, which covers the cost of mailing the publication, REACT, to the member at his home address.

Jerry also suggested that REACT could assist our Vehicular Technology Group by updating us on new highway safety activities.

PLANS UNDERWAY FOR CONVERGENCE '78,
THE INTERNATIONAL CONFERENCE ON AUTOMOTIVE ELECTRONICS

It is my pleasure to serve on the Convergence '78 conference committee as a representative for IEEE-VTG. This year's conference will be held September 25-27, 1978, at the Hyatt Regency Hotel in Dearborn, Michigan. The general chairman is Mr. Joseph H. Simek of Ford Motor Company, who is doing an outstanding job of putting together another quality meeting. This year, the conference is being organized with the help of The Society of Automotive Engineers, and is co-sponsored with IEEE and the Automotive Electronics Committee.

Responding to suggestions on improvement of the Convergence Conference, the Convergence '78 Program Planning Committee has elected to add two sessions covering electronic technology, where papers will emphasize technical detail and will be given by R&D engineers. As usual, however, the core of the Conference program will consist of five sessions, in addition to the two above, covering the status and future of automotive electronics.

If you wish to be included on the Convergence '78 registration mailing list, send a note to:
Convergence '78 Registration c/o Mr. N. J. Assensio, Jr. Society of Automotive Engineers, Inc. 2180 W. Big Beaver Road, Suite 206 Troy, Michigan 48084

TODAY'S TOPIC
With the introduction of the '78 models, many new automotive electronics products have been unveiled. For example:

- At Chrysler: The Lean Burn engine control program is expanded, a radio with memory is introduced, and electronic fuel control has been announced.
- At Ford Motor: A miles-to-empty computer display, a Closed-Loop fuel-mixture control system, and a combined spark-IGN system are introduced.
- At General Motors: Two new engine spark control devices, a Closed-Loop fuel control, an automatic vehicle leveler, a powerful travel guidance computer, and four new radios are introduced.

Some of these new products are described in the November 1977 special issue of IEEE

21
Spectrum on "The Automobile." It is outside the scope of this report to review all the 1978 advances, so I decided to concentrate here on radios. In the next newsletter, I'll describe new automotive electronic systems.

CB RADIO: HERE TO STAY

This article follows up earlier reviews of automotive CB radio (see the August 1976 and August 1977 issues of the VCG Newsletter).

The public wants more complex entertainment and the automotive marketing and electronics people aim to please. Fancier car radios provide dealers with a system in which to sell their expensive merchandise. To help them cash in on the craving many drivers have for "good buddy" mobile communications. Car companies believe that new integrated systems are demanded by particular car models, emphasizing electrical noise suppression, and offering disappearing tri-band AM/FM/CB antennas to lure a substantial market of new car buyers.

As recently as 1973, some 65 percent of California buyers of automobiles were licensed to AM reception only, but in 1977 the AM market share dropped to fewer than 40 percent. Don Atwood of DM Delco Electronics forecasts that "by 1980, under 20 percent will be simply AM radio." For example, in 1977, the rate for new car CB radio was about 7 to 8 percent, but it is expected to reach 15 to 18 percent this year in high-line GM cars.

I surveyed recent issues of trade journals and found advertisements and stories describing some 100 new and improved CB and automotive radios. A summary of the new 1978 car radios is given in the following (alphabetical) list of manufacturers:

- A.R.A. Manufacturing, Grand Prairie, Texas, offers a 40-channel CB radio (in-dash) CB with one-hand, built-in controls and a digital channel readout, which can be stored out of sight beneath the dash.

- J-J-L. Corporation of America, Inc., Compton, California, offers a computerized 40-channel two-transistor (in-dash) CB radio with a remote control unit in which the audio output is transmitted via a digital LED channel readout and a keyboard-actuated channel selector that can tune any channel at any time. It also includes a scan button to continuously scan all 40 channels, while pausing at in-use channels, and stopping on command. It also automatically searches for and stops at clear channels to allow transmission. It writes (memories) up to five programmed channels for instant recalls, and scans only those five if one desires.

- Chrysler Corporation, Huntsville Electronic Manufacturing Company, a subsidiary of Chrysler, AM/FM, and a search-tone AM/FM stereo radio. The unit features both AM and FM broadcast units and both allow the user to select between AM/FM and AM or FM broadcasts. The search-tone radio contains a microprocessor and a 10-digit keyboard that can change radio stations directly by punching in the appropriate carrier frequency. A station can be recalled from the radio's computer memory by a push of the button. Automatic searching for other stations, at two sensitivity levels, is initiated by a foot switch, and the station frequency is digitally displayed by an LED display.

- Ford Motor Company, Electrical and Electronic Division, offers a 40-channel remote control CB transceiver, an AM radio with digital clock, and an AM/FM stereo with cassette tape player (Fig. 1). The CB unit has an automatic scan feature that can be started by pressing two buttons at any time. The CB radio has automatic noise limiting and automatic gain control.

- General Motors Corporation, Delco Electronics Division, offers a deluxe 40-channel CB/AM/FM stereo with integral 8-track tape player, an AM/FM/8-track channelized AM radio, a signal seeking and scan AM/FM radio having digital display with in 8-track tape player, and an AM/FM stereo with cassette tape player. The 30-channel approach to AM/FM stereo (Fig. 3) is integrally packed and can be mounted in the dash. A signal override of the radio and tape functions which actuate electronics to entertainment a Baltimorist of the CB conversation. The signal seeking AM/FM/8-track channelized AM radio has automatic electronic frequency selection, plus digital display of station frequency and time. In the scan mode, this radio tunes from one station to the next, sampling each station for signal strength. In the seek mode, the tuner stops at the first signal of pre-set strength. The display normally shows time, unless interrupted by the 8-track channel.

- Panasonic offers a 40-channel CB/AM/FM stereo which is integrated constructed for in-dash installation (Fig. 7). The set includes a digital LED channel display, an RF signal strength meter, and a standby mode that allows the user to receive CB calls while listening to AM or FM.

AUTOMOTIVE RADIO: LOOKING AHEAD

The ultimate answer to in-car communications is CB, but probably will be a radio-tele- phone cellular system now approved by the FCC. This system offers both privacy in communication and long range — two significant advantages over CB. Nonetheless, CB will probably continue to be a permanent part of the automobile audio world, both for communications and for entertainment.

Presently, only 47 thousand out of 134 million US vehicles have mobile telephone service. This is primarily because of the high cost of mobile telecommunications. The cellular concept aims at reducing the cost and broadcasting the use of mobile communications. Two major demonstrations of the cellular system: one in Chicago and one in the Washington, D.C. area. The two systems are compatible with each other, including all electronic frequency selection, plus digital display of station frequency and time. In the scan mode, this radio tunes from one station to the next, sampling each station for signal strength. In the seek mode, the tuner stops at the first signal of pre-set strength. The display normally shows time, unless interrupted by the 8-track channel.

The cellular system operates at the FCC's newly approved 800-MHz band. This promises to greatly expand mobile telephone services, thus more conveniently at 450 MHz and below, to second-story-below subscribers using the same frequency channels as other systems, reusing the same frequency channels in different geographic areas. The cellular system is, thus, the first in which the spectrum is to be used more efficiently.

The system allocates a set of frequencies to each cell (geographic area), with neighboring cells using different frequencies to avoid interferences. For cells that are far enough apart, simultaneous use of different channels is made possible. The important parameters include channel size, as well as well as cell size, the same frequencies can be reused in the adjacent cells. The call channels are more efficiently used.

REFERENCE


3. Automatico News (advertisements), September 26 and October 31, 1977.

FIG. 2. GM Delco Electronics AM/FM Stereo with Cassette Tape Player (Ref. 3).

FIG. 3. Delco Electronics Four-Function Entertainment Center, an Integral In-Dash Unit, 40-Channel CB/AM/FM Stereo with 8-Track Tape Player, as Installed in a 1978 Cadillac (Ref. 2).

FIG. 4. GM Delco Electronics AM/FM/8-Track Unit, Featuring Signal Seeking and Signal Scan (Ref. 3).

FIG. 5. J.I.L. Computerized 40-Channel CB Transceiver Handset (CB Chassis is Remote Mounted), Connected to J.I.L. AM/FM Stereo with Cassette Tape Player (Ref. 3).

FIG. 6. Motorola 40-Channel CB/AM/FM Stereo with 8-Track Tape Player, Integral In-Dash Unit (Ref. 3).

FIG. 7. Panasonic 40-Channel CB/AM/FM Stereo Integral In-Dash Unit (Ref. 3).
TRANSPORTATION SYSTEMS

RONALD RULE

TRANSPORTATION SYSTEMS EDITOR

YOUR INPUTS WANTED

Newsletter contributions in the area of Transportation Systems would be greatly appreciated. Simply give me a call, (206) 773-9011, if you want to discuss the feasibility or format of an input, or send the information via my address at the beginning of the newsletter. I would like to cover a broad range of areas including traffic control systems, automatic vehicle identification, location and monitoring systems, automated transport systems, moving walkways, and other people-movers.

FIRST CHOPPER CONTROLLED TROLLEY BUSES

I received a letter from Mr. John Aurelius of Seattle METRO informing us that an order has been placed by two municipalities in the area for the first series of chopper-controlled trolley buses in North America. The Southwestern Pennsylvania Transportation Authority (SPTA) of Philadelphia ordered 110 buses, and the Municipality of Metropolitan Seattle (METRO) ordered 109 buses. An Executive Corporation is the prime contractor, Randravons is the propulsion subcontractor, and funding assistance is coming from the Urban Mass Transportation Administration.

It is significant that the chopper system was offered at a price only slightly above that for a conventional switched-resistor propulsion system. Since trolley buses cost far less than railcars, the extra cost of a premium propulsion system becomes visible at a lower level.

The chopper system, which is unique to conduits, is less costly than conventional systems, saves 15-20% in electricity energy use, and has the prospect of savings in maintenance costs.

Randravons has a 25-year-old trolley bus and installed a pre-prototype chopper in it for laboratory and demonstration purposes. Test runs have been made on actual trolley bus routes in San Francisco, and on other grades, including a 25% grade with the bus containing the weight of a seated load. First deliveries of production vehicles are scheduled for January 1979.

AUTOMATED AIRPORT BAGGAGE SYSTEM

Airport baggage transportation systems are often required to process large volumes of baggage, have multiple or dispersed load or unload points, sort packages, and transport it over long distances to satellite terminal facilities. One unique system for these requirements is the Boeing Airport Equipment Telescoping System. One such system in the Breef International’s passenger terminal at the Dallas-Fort Worth Airport provides fully automated processing of outbound, inbound, and transfer baggage.

The Nude Following Vehicles

The track following vehicles are the key to the Telescoping System. Powered by linear induction motors, they move through service passages below the floor of the terminal, carrying baggage on almost 8,000 feet of track between various check-in locations, flight make-up areas, and claim carousels. Fully automated belt conveyors and elevators provide interfaces between places them on a conveyor belt system and other types of baggage handling equipment.

Shortest-path routing is also automated. Computers track the vehicles through the underfloor area, and if a claim area or loading gate number is changed for any reason, individual bags can be redirected in a matter of seconds.

The Man-Machine Interface

Outbound bags enter the system at any of Breef’s nine check-in locations. An agent ticket the bags and places them on a conveyor belt. When he codes the flight number, destination, and number of bags into a keyboard, as an empty vehicle is available, the bags are loaded directly from the conveyor. Computers then dispatch the vehicle to the proper loading gate area for sorting. Cart unloading is also automated. At each make-up area, the vehicle is loaded onto the vehicle body and sorted into accumulation lanes. Each lane serves a different flight, and conveyors transfer the luggage to vans which are attached directly to the aircraft for loading.

Bar-Code Vehicle Identification

Each vehicle in the system carries a permanent bar-code identification on its side. This code is read by optical scanners mounted along the track network. Data is fed to the control system which consists of twenty-six Intel-computers plus redundant central computers.

Vehicle Characteristics

The Telecar vehicle is 36 inches long, bumper to bumper with the ends of 36 inches, which is the design for the Telecar complete with a baggage pallet insert weighs 190 pounds and has a total payload capacity of 100 pounds. The design of the running gear permits a turn radius as short as five feet and rapid elevation changes at angles up to 35 degrees. Vehicles operate at speeds up to 10 feet per hour. As pictured, the Telecar is designed to carry baggage in the "handle up" position while providing positive restraint during transport. The Telecar is said to be a carry-on baggage car, pallet and effectively "containerizes" the baggage during loading, unloading, and transport.

LHM Propulsion

The linear induction motor may be described as a rotary motor with an infinite radius, consisting of a flat stator and a rolling rotor (or slider). By placing the linear motor in the track and mounting the slider on the bottom of the Telescoping System, a means of propulsion is obtained with a practical physical contact with the Telescoping System. Propulsion force (thrust) is generated by the interaction of the linear motor with the slider. In order to generate this traveling wave, a linear motor system must be driven by flight, caused by the velocity of pole pairs normal to its length, the distance between poles being determined by the design of the Telescoping System. Isolating the exciting coils with alternating current, the intensity and direction of the magnetic field at each of the poles varies sinusoidally and "flows" down the length of the stator. As a slider, located within the range of this flowing magnetic field, is propelled in a manner as a surfboard is propelled on ocean waves.

Speed is determined by the number of poles per linear measure (pole pitch) and the excitation frequency. Propulsion force, or power input determine thrust.

Optimum System Performance

Several types of stators have been developed to optimize motor performance for the different functional requirements within a baggage handling system. Main line stators are employed for the maximum efficiency near their line velocities. Their maximum thrust is approximately doubled by the heaviest loaded car, thus providing a major margin of stability to the system. Inclined stators have stator characteristics to their level-end counterparts, but provide the greater thrust needed to propel Telescoping System loads.

Low-speed short stators are designed to provide maximum thrust at low velocities consistent with typical start/stop operations in storage systems. Acceleration may be needed to accelerate a Telecar from a standing stop to the desired line velocity in 10 seconds. High-speed accelerations of 0.5 seconds for low-speed accelerations and 0.2 seconds for high-speed accelerations may be required. A small or package is to be provided to simplify installation and either individual or common flaring or black firing or black firing of stators.

SCR Stator Control

All stators are controlled by SCR power switches actuated by solid-state optical sensors preceding the induction motor. A pulser, directly coupled to the Telecar, passes by the sensor, the SCR switch turns on stator current which, for a specified length of time, sufficient to assure car passage. Thus, motors are activated only momentarily during their duty cycle with a resultant reduction in size, cost, and power consumption.

One additional advantage of the Linear Motor is that failure of an individual stator does not normally have a significant affect on Telecar performance. Since a car traveling at 10 mph will coast several hundred feet, a Telecar will normally coast past a failed stator and be accelerated back up to main line speed by the next operational stator.

The Linear motor propulsion system has no moving parts, experience no wear, and has only minimal cleaning requirement for maintenance. Since the system has no power on the track, there are no required and shock hazards are virtually eliminated.

URBAN TRANSPORTATION LABORATORY

The General Motors Transportation Systems Division (GMS TD) is currently working with the city of Cincinnati in a cooperative program of research, development and demonstration of innovative public transit services and products. The program, called the Urban Transportation Laboratory (ULT), initially started with a large number of American cities in which the GM TD analysts identified Cincinnati as being representative of many other urbanized urban areas and, therefore, a preferred site for the laboratory.

An existing transportation corridor in Cincinnati was selected for a series of experimental projects with the following objectives:

1. Test the sensitivity of transit ridership to improvements in transit service and transit products.
2. Evaluate public transit products in terms of their potential effectiveness in improving system performance under realistic operating conditions.
3. Help achieve more balanced urban transportation systems, in which both public and private transportation modes are used more effectively.

At this time, a number of buses have been equipped with GM’s Automatic Vehicle Monitoring (AVM) equipment and a series of小巧的 units are strategically placed along bus routes in the selected corridor. Information provided by this data acquisition system can be collected by a control center and used to improve both transit system management and service to passengers.

ELECTRIC VEHICLE SYMPOSIUM

The Fifth International Electrical Vehicle Symposium will be held in Chicago during the weekend of March 3-5, 1978. In addition to the International Electric Vehicle Symposium, there will be a symposium on Electric Vehicle/City Center. Both meetings are sponsored by the Electric Vehicle Symposium (EVS) and the Electric Vehicle Council (EVC). The symposium, concludes the EVS’ 15th annual meeting which will be held in conjunction with the Electric Vehicle/1978 Show, and will be devoted to technical papers concerning better designed road vehicles and apparatus. The International Electric Vehicle Symposium, a follow-up to the 1977 meeting in Chicago, will involve exhibits of electric vehicles, people movers, rail mass transit, and the like. The meeting will feature a field trip of electric vehicles moving from City Hall to the Philadelphia Museum Of Art.

Information about the conference and the symposium is available from Edward A. Campbell, Executive Secretary, Electric Vehicle Council, 90 Park Ave., New York, N.Y.
WHAT'S HAPPENING!

Not much, as evidenced by this skinny column. But then, that's not out of character for the present Administration. In this column one year ago, I noted that with a change in administration, some changes in key personnel at the Federal Communications Agencies could be anticipated. At this writing I still cannot give you any specifics other than the two new commissioners, including the new FCC Chairman.

As the wheels of government turn laboriously forward, it now appears that FCC Chief Engineer Ray Spence, and Safety and Special Radio Services Bureau Chief Charlie Higginbotham will be among the first to be passed. It is likely that their successors will be known to us by the time we convene our annual meeting in Denver. I'm tempted to editorialize on some of these changes, but will reserve any such commentary for casual conversation in Denver.

Ironically, the names of key appointees to the new National Telecommunications and Information Administration are becoming public, although the organization will not officially come into existence for some months. Slated to head the new Commerce Department appendage is Henry Geller, a former FCC General Counsel. Don Hardby, presently with the Executive Office of Telecommunications (OTP), is earmarked to head the technical branch. As most of you know, OTP has been dismantled and replaced by NTIA. The Commerce Department's present internal Office of Telecommunications (IOT), will also be integrated into the new organization. Since part of NT's functions out of Boulder, Colorado, we should be able to get some first hand briefings while in Denver.

As noted above, and in the absence of anything more significant to report, we are reproducing below a recent FCC release of bios of the present Commissioners.

FCC COMMISSIONERS

CHARLES D. PERRY, CHAIRMAN — Democrat. Born Boston, Mass., April 9, 1933. Nominated FCC Chairman, Sep-


JAMES H. QUELLO — Democrat. Born Laurium, Mich., April 21, 1914. Nominated to Commission by President Nixon on September 20, 1973, confirmed by Senate on April 23, 1974, sworn in April 30, 1974. Rose from position of promotion manager radio station WJR, Detroit, to President, General Manager 1960; retired as Vice President, Capital Cities Broadcasting Corporation in 1972. Was a Detroit Housing and Urban Renewal Commissioner 1951-1973, and trustee Michigan Veterans Trust Fund 1951-1974. Was member of the Governor's Special Commission on Urban problems; Governor's Special Study Committee on Legislative Compensation; Assistant National Public Relations Chairman F.W.K.; National Chairman United Foundation; Executive Board Member of Boy Scouts of America; and Board member American Negro Exmination Centennial.

INTERFERENCE

During the past year and a half, the most vivid and positive sign of the radio regulatory scene has been the FOC's focus on interference. The word itself could probably qualify for the non-of-the-year award. Much has been written on this, and in addition to numerous trade and press articles, a number of briefs and reports have been published to assist the industry in dealing with various types of interference problems. The following are cited as a list for your reference.

FOC- How to Identify and Resolve Radio-TV Interference
FOC/GOV 79-93

The Extent and Nature of Telecommunications Spectrum Interference Associated With Radio Transmissions, July 1977
FOC/70/FAA 77-02

Interference to Audio Devices and Shopping Carts, 1977
FOC/14-87-02

Electronics Industries Association/Consumer Electronics Group
Consumer Electronics Service Technician Interference Handbooks

Television Transmission Interference
Unit 1 Audio Rectification

HI-FI News and Record Review

A.K.'KENNY' GUTHRIE
COMMUNICATIONS EDITOR

This isn't a "What to do 'til the doctor comes" article. The assumption here is that you are the "doctor" and that you're already faced with a "patient"--a "click" two-way radio. Your task is to move from symptom, to procedure, to diagnosis and then to treatment. This is the "cure"--with directness which befits a professional practitioner of the art. This image is enhanced when you focus quickly on the portion of the radio which needs fixing, and avoid digging-out the portions which don't need your ministrations.

There is a systematic approach to troubleshooting which fits any transmitter or receiver which ever worked properly--be it big or little and whether its normal habitat is on land, on wheels or on feet. It's built on standard practice and not the few observations or facts, done in an order which yields valuable information fast and minimizes test equipment manipulations. The procedures are detailed in the troubleshooting charts, taken from my own Test & Troubleshooting Handbook (available postpaid for your $3.50 check to GR Marketing Communications, Box 4197, Lynchburg, VA. 24502).

You enter each chart at the upper left and make the first test or observation. If the results are "normal" you move on. If they are "abnormal" you move to the right. When you reach a "TROUBLESHOT" entry, you're in the broad area--the next step is up to you. Find and fix the specific problem, and get back on the track. When you reach the bottom, turn your attention to the next chart.

For transmitters, the first jump is the big one. Normal power output is praiseworthy evidence that the microwave power output from oscillator to antenna changes switch is in "apple pie" order. Move along the next steps. If your power output is abnormal (including zero) you're in trouble. Common problems are wrong or little more. Start at one end of the chart and work toward the other, using the test indicators in the unit and proceed to its maintenance manual.

Inability to set to the proper frequency points toward the crystal, oscillator circuit or the complete circuit.

When the transmitter passes the maximum deviation test, you know that the entire audio path (from input through modulator) is alive. If not, adjust everything in that path. When direct deviation (in hard limiting) is unacceptable, recheck with audio output at the input side. When output is symmetrical, the modulator limiter suspect. If output remains nonsymmetrical, look for modulator trouble or gross audio distortion. With a major portion of the audio/modulator circuitry checked out, failure to display normal audio sensitivity usually points to audio gain problem. Examine and correct, then listen to the audio stages.

RECEIVER TROUBLESHOOTING

The first "test" requires no test equipment. With no signal applied and the Channel Switch ("squelch"...I mean "tone squelch") decoder disabled, rotate the squelch control over its full range. If the receiver squelches and unsquelches normally, you know that a whole lot of things are right...noice is being produced in the mixer(s). There's enough IF gain to drive the detector, there is enough detector output to drive the squelch circuits, the audio amplifiers amplify, the squelch circuits do their thing, and the switched amplifiers do their thing. But every one of them, which in major clues is the pre-IF RF gain and the status of the injection circuit. If the receiver won't unsquelch and make noise, the chart leads you in that direction.

Audio distortion, which is taken with a "rock crawling" chart, shows that the injection chain is alive, gives you a chance to set down and work the trouble. If you have developed rated audio power, and confirms the distortion chain, and you can respond positively to the oscillator/injection circuits. If distortion is skyrocketing, recheck distortion with greatly reduced modulation deviation. If the distortion is the same, look for selectivity problems.

Failure to pass the selectivity test implies lack of gain or improper selectivity (gross audio distortion having been ruled out). If 20 dB quieting sensitivity, you
next, is failed, you have a gain problem. If passed, you have a selectivity problem.

If results from the modulation acceptance handshaking and sub-standard look for a selectivity problem. And if Critical & Maximum Squelch numbers can't be met, having gone this far successfully, you have squelch trouble.

**CHECKOUT PAYS OFF**

The troubleshooting sequence minimizes the test equipment manipulations, making the ideal order for equipment checkout. Given a well arranged bench with office Monitor in front and reading SINAD meter and a dedicated distortion analyzer, the entire sequence, transmitter and receiver, can be run in less than 2 minutes! That's not much effort to swap for the assurance that the radio is right!

### CALL FOR PAPERS

**3RD WORLD TELECOMMUNICATIONS CONGRESS**

**GENEVA, SWITZERLAND**

**SEPTEMBER 23-26, 1979**

The World Telecommunication Forum 1979 will focus on "The integration of the world's communications networks: Technologies of the eighties". Highly technical and scientific in character and yet at the same time universal, Forum 1979 is recognized as the world's leading congress of communications specialists. It will be sponsored by the International Telecommunication Union on behalf of its 153 member countries in association with a great number of national and international professional engineering societies and scientific institutions.

You are invited to submit an original, unpublished paper reporting ideas or experiments relevant to the Forum 1979 theme. Suggested technical topics are listed below.

In addition to 15 plenary and parallel sessions with some 150 invited and carefully selected papers, one special session of the Forum will be devoted to the celebration of the 50th anniversary of the International Radio Consultative Committee (CCIR). Present and future activities of the CCIR will be described in technical contributions read by world leaders in this field.

One-page abstracts (100-200 words) should be submitted before 30 September 1978. If the abstract is accepted by the Paper Review Board a full paper, the text of which should not exceed 6000 words, will be expected by January 15, 1979, for reproduction in the World Telecommunications Forum Proceedings. Papers should be submitted preferably in English, French or Spanish and the oral presentation should be planned for 20 minutes. Authors of accepted papers will be required to submit preliminary versions of the written contribution to be used at the presentation. They will receive forms and instructions for material to be printed in the Forum Proceedings.

**ABSTRACTS AND PAPERS SHOULD BE SENT TO:**

**Professor Dr. P. L. Stumpers**
Chairman, Technical Programme Committee World Telecommunication Forum
B. V. Philips' Gloeilampenfabrieken
Research Laboratories
Eindhoven
(Netherlands)

OR TO:

**Mr. W. G. Wolter**
Chairman, Management Committee World Telecommunication Forum
International Telecommunication Union
Place De Nations
CH-1211 Genève 20
(Switzerland)

IN THE UNITED STATES AND CANADA, ABSTRACTS SHOULD BE SENT TO:

**Mr. A. E. Joel, Jr.**
Past President
IEEE Communications Society
Bell Telephone Laboratories
Room 2C-632
Holmdel, New Jersey 07733
(United States)

**MAIN SUBJECT AREAS:**

The list of topics is intended to give an appreciation of the scope of technical subjects to be investigated at the World Telecommunication Forum Technical Sessions. It is not intended to be complete. The Program Committee welcomes your suggestions for additional subjects.

### The Integration of the World Telecommunication Network

- The World Telecommunication Network - An Overview
- Structure and Technology
- Communications Systems
- Services
- Customers' Needs
- Future Demand on Technology and Services

**From Existing to New Networks**

- Evolution and Implementation of New Networks
- Transition from Existing to New Networks
- Economic and Social Implications
- Operational Aspects of Systems

The Future of Worldwide Integrated Communications

- The Role of the ITU (Standardization, Frequency Management, Planning, Coordination)
- Integration of Systems
- Integration of Services
- Telecommunication Studies
- Network Models for the Future

**ADVANCED TRANSIT AND URBAN REVITALIZATION - AN INTERNATIONAL DIALOGUE**

**SHATT REGENCY HOTEL**

**INDIANAPOLIS, INDIANA**

**APRIL 24-28, 1978**

A major international conference on innovations in urban transportation will be held this spring under auspices of the newly-formed Advanced Transit Association (ATAA).

ATAA is an international organization devoted to improvement of urban transportation through the judicious application of appropriate advanced transit technology and dedicated to open, objective and thorough evaluations of all transit alternatives.

**Advanced Transit and Urban Revitalization - An International Dialogue** will be the theme of the four-day session, April 24-28, at the Indianapolis, Indiana Hyatt Regency hotel. Some 500 delegates are expected from around the world to join in discussions of urban transportation problems and how they can be solved.

Dr. E. Henry Lankin, Jr., majority leader of the Indiana House of Representatives and an ATA board member, will be general chairman for the event. Robert L. Paulin, Research and Development Resources Manager for the U. S. Department of Transportation, will be program chairman.

Mornings will involve panel discussions with participation by urban planning officials, land developers and architects, transit operators, manufacturers, legislators and other government officials. Afternoons will be devoted to the presentation of more than 100 technical and non-technical papers. There will be continuous programs and exhibits of interest to both lay people and professionals.

Among speakers already committed are Howard Kohl, executive vice-president for research and development at General Motors Corporation, and John Hinton, director of the American Institute of Planners.

Conference planners do not want to concentrate on any single area of transit. Technical papers representative of all types of systems, including fixed railways, the newer electrical vehicles, auto-
matically-controlled vehicles, demand-response systems, advanced bus transit services and others are needed.

ATRA hopes to attract major exhibitors from both the public and private sector study many transportation

Attendees will emerge fr
c with keener insights abou

1977 ELECTION RESULTS

Ballots for the election of the VTS Administrative Committee were received and counted last fall just prior to the December 1977 ACOM meeting in Los Angeles. The following nominees were elected:

- Carl Brooks, who is currently with the Antenna Specialists Company as Vice President-Engineering.

- Trevor Jones, Director of the General Motors Proving Grounds in Milford, Michigan.

- Sam Lane, VTS Junior Post Chairman and Vice President of Moviola/Magnasync.

- Fred Link, Consultant and whom we all know.

- Sam McConoughey, Chief of the FCC Mobile Services Division in the Common Carrier Bureau, Washington, D.C.

The terms of the candidates began on January 1, 1978 and run through December 31, 1980.

This is a particularly fine slate this year and we welcome you aboard. Congratulations to all of you.

Nick Alimpich
Chairman, Nominating Committee

MEETING NOTICE

AUTOMOBILE RADAR

A technical session on automobile radar is planned for the upcoming 1978 SAE Congress and Exposition in Detroit on Thursday, March 2, 1978. Following the paper presentations, an informal panel discussion entitled, "Automobile Radar - Where do we go from here?", will be conducted to address the present status and future plans for automobile radar warning, headway control and automatic braking systems. The panel discussion will reflect views from industry and government from within as well as outside the U.S.

A list of the panelists is given below:

Panel 1  Dale Grimes; Head, Electrical Eng. Dept., University of Texas
Chairman:

Panel 2  Erwin Belohoubek; Head, Microwave Circuits Technology, RCA Laboratories
Members:

Werner Fogy; Representative for the German Government

Trevor Jones; Director, GM Proving Grounds, General Motors Corporation

Scott Shadle; Safety Standards Eng., U.S. Department of Transportation

William Troll; Group Manager, Bendix Research Laboratories

It is anticipated that a sixth panelist will be added to present the Japanese view on this subject.