MESSAGE FROM THE PRESIDENT

The Administrative Committee, at its last meeting held in San Francisco on June 16, 1975, has acted on a number of proposals and suggestions from its committees and members. I would like to review some of these decisions to give you an idea of how they are intended to improve the usefulness of the services the VTG provides for you. It is interesting to note that in spite of the small number of attendees, much was accomplished. We can thank Secretary Tom McKee for a suggested change in meeting format that resulted in more business being transacted.

One thing I have gleaned while talking to many of you at our Conferences and local chapter meetings is that most of you feel strongly about the value of the Transactions. George McClure, our new Editor, is moving out smartly by soliciting papers for the Transactions from several areas. Currently, George is working on a prospective "Special Issue" in the marine radio area. This has been a rather neglected area recently and deserves attention. George also is continuing to pursue publication of special issues on Propagation and On Emergency Medical Radio Service.

In committee action, we agreed to fund a membership survey. The survey will require your cooperation and the results will, hopefully, provide us with a better understanding of what you really expect from the VTG.

We also agreed to sponsor the Automotive Electronics Committee in their CONVERGENCE '76 endeavor. CONVERGENCE '74 was a huge success and CONVERGENCE '76 should be better, since a symposium was not held in 1975 due to economic conditions in the automotive industry.

The Adcom agreed on several recommendations of the Educational Committee for promoting VTG interest amongst its members. This includes a recognition program for the best student paper, a primer on mobile radio system application for the young engineer, and audio cassettes on subjects of particular interest to VTG members.

In other committee action, Adcom voted to: (1) continue to support and promote the establishment of an active Transportation Committee; (2) continue our $500 investment in the IEEE council on Ocean Engineering and support participation in the new council; (3) actively pursue work on Societal status for the VTG; (4) withdraw from activities in Technology and Forecasting; (5) rewrite bylaws to include an amendment permitting Adcom to terminate an elected Adcom member for inactivity, and; (6) select Orlando, Florida as the meeting place for the 1977 National VTG Conference.

In addition to the above, and with your interests in mind, I have divided the responsibilities for overseeing committee activity amongst the 5 members of the Executive committee. Because of the long interval between our Adcom meetings and the need to establish better communications between us, the result of this division should be improved services to you.

As always, we in Adcom solicit your comments and appreciate the opportunity to help you in any way we are able.

NICK ALIMPICH
With the ending of summer and the start of a new school year, it's tough to get in the groove again. So many activities are in sync with the school calendar, in addition to this issue of the Newsletter, that I've found this year's transition to be especially difficult. Thanks to the cooperation of all contributors, however, we should go to press with this issue on time.

Chapter activities are getting underway again after the summer recess. New officers have been selected at most locations and plans are being set in motion. John Dettra, our Chapter News Editor, reports an enthusiastic increase in chapter activities. Several inactive chapters are being reorganized, we have added a Denver-Boulder Chapter, and there is interest in organizing a Houston Chapter. Moreover, the chapters are regularly reporting the statistical results on their meetings to John for inclusion in the Newsletter.

Let's set our sights a little higher in this area, however. I would like to see the chapters forward a 50-100 word abstract or summary of the technical papers presented at their meetings. With this information, an interested reader could seek out more information from the speaker via a telephone call or letter. If copies of the paper are available from the speaker, this should be indicated along with the author's address. Most speakers, I believe, would be willing to make such a contribution if asked in advance. Can we try it? If so, forward this information on to John Dettra in time for the various Newsletter deadlines. Also, if you have a Polaroid or 35 mm photo of the meeting, send it along too.

Sam McConoughy, who is the technical program chairman for the upcoming annual VTC conference in March, has asked that I make an urgent appeal to everyone for more papers. Quality papers are needed in all areas of interest to the VTC membership: mobile and portable communications hardware and systems; automotive electronics, and transportation systems. Maybe you know a colleague who is not a member of VTC but who is a potential author for an interesting technical paper. A reprint of the Call for Papers appears in this Newsletter, so pass your copy on to him.

You will find a number of interesting articles in this issue of the Newsletter. I'll close for now with my comments and let you proof through it.

OLIN GILES
MEETINGS

CHICAGO:
POLICE COMMUNICATIONS PLANNING IN THE CHICAGO AREA
BY BERNARD EPSTEIN, ILL. INST. OF TECHNOLOGY RESEARCH
INSTITUTE ON MAY 21, 1975, 15 ATTENDING.

COLUMBUS:
TOUR OF COMMUNICATIONS AND COMPUTER CENTER
BY MAX HART, COLUMBIA GAS SYSTEM SERVICE CORP.
ON AUGUST 13, 1975, 8 ATTENDING.

THE WORLD DIRECT TO YOU (FILM)
BY BILL CRISL, OHIO BELL TELEPHONE COMPANY
ON JULY 11, 1975, 14 ATTENDING.

TOUCH TONE APPLICATION AND EQUIPMENT
BY TED RISTOFF & LARRY GUEGLEY, BRAMCO CONTROLS
ON JUNE 13, 1975, 26 ATTENDING.

ORLANDO:
SATELLITE TERRESTRIAL COMMUNICATIONS
BY CHARLES F. WHITNEY, GENERAL ELECTRIC CO.; EARTH
STATIONS DEPT. ON MAY 15, 1975, 58 ATTENDING.

SACRAMENTO:
EARL WILSON MCCLELLAN AFB, ENGINEERING LAB
ON MAY 20, 1975, 20 ATTENDING.

HOUSTON:
ORGANIZING-VOLUNTEER-HELP-HOUSTON
CONTACT: CHARLES H. WHITE, SYSTEMS ENGINEERING
HOU STON LIGHTING & POWER CO.
P.O. BOX 1700, HOUSTON, TX 77001
713/228-9211x2771

DALLAS:
AN EXCELLENT PROGRAM WAS PRESENTED AT THE FINAL WashITON AS TECH
NOLOGY MEETING OF THE YEAR ON MAY 6, 1975, WITH 44 ATTENDING.
CHIEF BILL ROBERTS OF THE DALLAS FIRE DEPARTMENT AND CHARLES
BOLLES OF THE COMMUNICATION SERVICES DEPARTMENT GAVE A MOST
INTERESTING AND INFORMATIVE PRESENTATION OF THE NEW EMERGENCY
AMBULANCE SYSTEM SERVING THE CITY OF DALLAS.

DENVER:
INTERNATIONAL TELECOMMUNICATIONS IN RELATION TO U.S. INDUSTRY.
THE TOPIC OF DISCUSSION ON MAY 15, 1975, AT THE U.S.
DEPARTMENT OF COMMERCE LABORATORIES.
BOULDER MEMBERS OF THE PANEL INCLUDED JACK HERBSTTIFT, FORMER
DIRECTOR OF THE INTERNATIONAL RADIO CONSULTATIVE COMMITTEE;
GEORGE HAYDON AND ROBERT KIDY.

ALL THREE WERE FORMERLY SCIENTISTS WITH THE NATIONAL BUREAU OF
STANDARDS AND WITH THE OFFICE OF TELECOMMUNICATIONS, INSTITUTE FOR
TELECOMMUNICATION SCIENCES IN BOULDER.

DOUGLAS J. G. JOHNSON, VICE PRESIDENT OF MARKETING FOR WESTERN
TELECOMMUNICATIONS, INC. IN DENVER, SERVED AS MODERATOR FOR THE
PANEL OF INTERNATIONAL COMMUNICATION SPECIALISTS.

LECTURER-OF-THE-YEAR
LIVING WITH LIGHTNING
DALLAS OCT. 9
PITTSBURGH OCT. 16

AUTOMOTIVE ELECTRONICS
DATELINE: DETROIT
By BILL FLEMMING

BEST SPEAKER AWARDS

Last June, the officers of our Southeast Michigan chapter of VEC met to select the chapter Speaker of the Year for 1974. There were seventeen speakers to choose from-the winner and next two runner-ups of this selection were as follows:

• Winner, 1974 Speaker of Year:
Donald S. Reimer of the U.S. Army/ Automotive Command, "On-vehicle Diagnostics."

• First Runner-Up:
Richard Post of Lawrence Livermore Laboratory for his talk, "Flywheels-Energy Storage for Electric Propulsion."

• Second Runner-Up:
Alex Dolgos of Antenna Specialists for his talk, "Solving the Communications Antenna Problem Through the Use of Site Geometry."

For the record, results of the 1975 Speaker awards are also listed here. They are as follows:

• Winner, 1975 Speaker of Year:
Jack Morgan of Motorola for his talk, "On-Vehicle Electrical Transients."

• First Runner-Up:
Jerry Rivard of Bendix for his talk, "Closed-Loop Control of an EFI Engine."

• Second Runner-Up:
John McCormick of General Electric for his talk, "Mobile Radio Systems."

The officers of our chapter have resolved to present award plaques to the winning speakers. This selection is to be a regular highlight of our chapter functions.

ELECTRONIC INSTRUMENTATION AND CONTROL SYSTEMS IN HIGHWAY SAFETY RESEARCH

The final meeting of the Southeast Michigan chapter of VEC was held May 12, 1975 in Ann Arbor, Michigan at the University of Michigan Highway Safety Research Institute (HSRI). Three staff members of the Institute gave an overview of the work underway at HSRI.

Meeting attendance of 20 persons was disappointingly small, this was attributed to the unusually fine spring weather and longer daylight hours which kept many members home.

The meeting was nonetheless most interesting and I thought it would be worthwhile to highlight the technical proceedings.

For background, one should know that HSRI was created in 1965 with gift funds of over $10 million from Ford, General Motors, and the Motor Vehicle Manufacturers Assoc. The Institute now employs a staff of 190 persons engaged in highway safety research on a broad front ranging from the vehicle itself to social, medical, and legal environments.

Bob Ervin, an Associate Research Scientist at HSRI, described an automatic controller used for testing of vehicle handling characteristics. The objective was to obtain precision measurements of vehicle emergency maneuvering capabilities in order to assist in the writing of Federal standards on handling characteristics.

Two systems were built-one system (dron controlled) was radio operated and the other (robot controlled) was programmed to operate in set patterns. In both systems, the vehicle included three servo controllers to operate, respectively, the steering, brake, and accelerator. Vehicle response was measured by conventional accelerometers and force transducers, and output data were recorded on tape (FM analog). Vehicle trajectories were computed by integration of vehicle acceleration signals.

Experiments were carried out on a specially paved airport runway near Texas A&M University. Severe brake/steering command signals were applied to many different domestic and foreign made vehicles in an assessment of vehicle roll potential. Film clips were shown to demonstrate that certain vehicles were more prone to roll-over than others.

Bob concluded by stressing that the HSRI work, although it is only an open-loop experiment, provides one with a level of precision for study of vehicle handling never before achieved. He then pointed out that the major void in this work was neglect of driver response to emergency situations. Some studies have shown that, typically, about 23 of 25 drivers cannot perform emergency maneuvers which are within the capability of the vehicle.
After the talks, the speakers conducted a tour of the MSRIRI facilities. Other project areas, not described here, are also under study at MSRIRI are the following:

- Accident Investigation and Data Analysis
- Occupant Protection and Human Tolerance to Impacts
- Roadway Design and Traffic Engineering
- Driver Improvement and Public Policies

During 1974, the MSRIRI research expenditures were in excess of $13.1 million. Research is conducted by 190 University of Michigan undergraduate and graduate students. Staff members backgrounds range from zoology, social science, and psychology to mathematicians, physics, anatomy, anthropology, and engineering.

- John Campbell, Senior Research Associate at MSRIRI, reviewed work on rear lighting studies. This project involves two experiments: first, a scale model simulator, and second, a special research vehicle for highway studies.

The simulator consists of a model car, carrying special rear lighting arrangements, which is driven on a 50-foot long belt of S-foot width. The model car is run through various maneuvers while displaying different lighting signalling patterns. A test subject is seated in a simulated driver's compartment equipped with brake and accelerator pedals. The object is to measure driver response to the model car during various following and signalling maneuvers. Relative closure velocity, headway distance, and reaction time are measured at a 30 Hz sampling rate, and recorded by a digital computer.

The model car runs free on the belt and is controlled by a servo-positioned magnet located underneath the belt. Variable parameters of the setup include number and location of lights on the model, light intensity, and light flash rate.

The research vehicle, together with a companion following car, are set up for tandem road experiments designed to evaluate effectiveness of rear-lighting systems. Data of test subject response to lead car lighting are recorded for computer analysis. Test data were used to develop a computer simulation model to assess performance of various lighting systems.

- Chris Winkler, Senior Research Associate at MSRIRI, described work on mobile truck tire dynamometers and a truck suspension measurement machine.

The tire tester consists of a semitrailer towed by an instrumented highway tractor. The test tire is mounted on the trailer and is vertically loaded by an adjustable air-spring to a maximum of 20,000 lbs. A large disc brake provides braking torque to the test wheel in response to servo-commands. Longitudinal and vertical components of tire force are measured by strain gage load cells. An on-board watering system is used for wetting surfaces and testing of tires.

The suspension measurement machine basically consists of a pivoting platform on which the truck is placed. This allows pitch plane inertial measurements which determine the truck center of gravity and rocking moment of inertia.

**BOOK REVIEWS**

By CARROLL LINDHOLM

BOOK REVIEW EDITOR

Your IEEE has been publishing some useful books lately. I will review in capsule form some of the more recent ones. Many more have been recently announced and I will mention them as they become available. The paperbacks are inexpensive and available to IEEE members only. The clothbound equivalents are available through your local bookstore or direct from IEEE. newer discount editions are available when books are ordered direct from IEEE.

Key Papers in the Development of Machine Intelligence
Edited by P. R. Bariakamp, IEEE Press (N.Y.), 1974

If you have followed coding theory over the past 25 years you have probably noticed two trends. The theory has grown increasingly complex and algebraic while the practice has barely made an impact. Only where the information is very costly to obtain has the additional effort been made to incorporate the advantages of coding theory (e.g., Space Missions). But today's digital circuits can implement many of the encoding and detection functions and even simple single-error correction functions are now available.

But coding theory itself is becoming full of dead ends. Proof of discontinuity, laborious calculations to prove something cannot be done. But on this desert of nonresults are found oasis of great beauty. And the information-communication codes, the convolutional decoding techniques and others.

In your researches in this area, you will have encountered continual references to one or more of the "key papers" gathered here. Of principal value to students and to old guys (like me), this collection chronicles the great moments in a still very active field.

**COMPUTER COMMUNICATIONS**

Edited by Paul E. Green, Jr., and Robert K. Lucky
IEEE Press (N.Y.), 1974

Much more down-to-earth and real-world relevant is this third book. But if you are into interconnected computers, even simple ones, this volume has collected some useful data. From papers on Traffic Rates and Security through Modems, Multiplexers and Concentrators, Media on thru total systems (Computer Networks) this has it all. And it's not dull. Much of it is dated. Get your copy before it is all history! About 90 papers are included to offer something of interest to everyone. This is a useful desk book. It has charts, tables, summaries, even an IBM manual included (on TCO).
ADCOM HIGHLIGHTS
ADCOM NEWS EDITOR
By TOM MCKEE

June Meeting

The summer meeting of the VTC Adcom was held on June 16, 1975 at the Fairmont Hotel in San Francisco, California.

The following persons were present:
Mike Alligpich  George McClure
Arnold Brenner  San McConnel
Bob Cassie  Tom McVee
Sam Lane  Dave Talley (guest)
Ruger Hadden  (former member)

The following Adcom members were unable to attend the meeting:
Carl Brooks  Stu Meyer
John Cassady  Jack Neubauer
Larry Cooper  Jack Remer
Fred Link  Neal Shepard
Dick Moore

The Treasurer reported that 1975 expenses exceeded income by almost $1K. VTC's net worth at the end of 1974 was about $11K. The Treasurer recommended a number of actions to stabilize or improve the group's financial picture.

Approval was granted for a limited membership survey to help the Adcom better understand what the members want and expect from membership in the group.

The Adcom approved sponsorship of the Convergence '76 automotive electronics conference to be held in the Detroit area in the fall of 1976.

Bob Cassie, VTC's representative on the IEEE Oceanographic Coordinating Committee, was present and reported that the committee was being disbanded and a new IEEE Council on Ocean Engineering was being formed. After discussion of the pros and cons of transferring membership from the old committee to the new council, including the possible adverse impact of the council's new

There was a brief report indicating that planning for the 1976 VTC Annual Conference was going well. The conference will be held in Washington, D.C., March 24-26, 1976.

After discussion of several possible locations for the 1977 VTC Annual Conference, the Adcom selected Orlando, Florida as the conference site.

In recognition of the Institute's reduced support for technological forecasting and assessment activities, the Adcom voted to discontinue VTC's involvement in this area.

Arthur Brenner presented some guidelines covering the work of the VTC Educational Committee. The guidelines were developed by Arnie and Dale Crains of the University of Michigan. During discussion, additional items were added by the Adcom members. The committee was directed to select two or three of the best proposals as the basis for VTC's initial efforts in the educational area. Considering the items proposed, the emphasis of the committee's work will be on educational programs for the VTC membership, but other areas, such as programs for student members, may be included also.

There was a brief discussion of the need for a procedure which could be used to terminate the Adcom membership of elected Adcom members who cannot or will not work for VTC and who cannot or will not attend the Adcom meetings. The President indicated his support for the Constitution and Bylaws Committee to draw up a bylaw revision dealing with this subject. The revision will be considered by the full Adcom at a future meeting.

VTC publications were the subject of a separate threehour meeting held just prior to the Adcom meeting. George McClure, the new VTC Transactions Editor, dis-

EXPANDED COVERAGE PLANNED

The President introduced a new plan involving all of VTC efforts in closer monitoring of the work of the VTC committees. As indicated below each officer is now responsible for monitoring the work of several committees. This system should result in more time being devoted to the supervision of VTC committee activities. The responsibilities are assigned as follows:

**President:** Planning, Publications, Committee Technology and Forecasting, Technical Activities Board (TAB), Constitution and Bylaws

**Vice President:** National Meetings, Membership, Chapter Activities, Education, Technical Programs, Intergroup Liaison

**Secretary:** Transportation, Environmental Quality

**Treasurer:** Awards, Paper of the Year, Publicity, Historical

**Past Chairman:** Nomination, Public Safety and Emergencies, Oceanography

Plans are shaping up for expanding the coverage of the IEEE Transactions on Vehicular Technology, including special topic-oriented issues. The Transactions staff-George McClure, Editor; Bob Panton, Associate Editor for Transportation Systems, Dave Nowath, Associate Editor for Automotive Technology; and Ruger Hadden Associate Editor for Communications— are assisted by reviewers in the specific technical areas.

Papers are sought and solicited on the theory, design, and applications of electrical and electronics technology to vehicles and vehicular systems. Both tutorial papers and papers describing original work are welcome, as are "how-to" papers dealing with such topics as interference suppression and site management.

Objectives in the five-year plan for the Transactions include expansion publication to 400 pages per year, in four issues, one of which will be devoted to a single topic area as a special issue. For special issues, the invitation and coordination of papers will be done by a Guest Editor who is active in the field being covered.

Plans for special issues are now being formulated and dates have not been set yet, but topics under consideration include radio paging, marine communications, emergency medical services, propagation, automotive electronics, and 900 MHz mobile communications systems. Ideas for other special issues are welcomed by the Editor, in addition to suggestions for candidates to serve as Guest Editor for those special issues.

In order to encourage submission of papers, whether by members of VTC or by others, emphasis is being placed on completing the reviews in a timely manner. Authors will usually be notified of actions taken on their papers within two months, but will always be informed within three months. The cooperation of reviewers is being sought so that we can stay within these time limits.

It is not necessary to have a paper completed in order to have it considered for publication in the Transactions. Submission of an abstract and outline, or summary of the paper, will enable the editors to work with the authors, advising on the shape and content of the final paper.

Submission of papers is encouraged, as it benefits both the author and the VTC membership as a whole. Conference or symposium papers may be published in the Transactions, following the same review process as for contributed and invited papers.

GEORGE MCCLURE, EDITOR—VTC TRANSACTIONS
SAFER STREETS THROUGH IMPROVED COMMUNICATION
By MARSHALL TREADO*

The policemen of today have benefited greatly from the technology developed for other uses within this country. Nowhere is this more evident than in the field of communications. Law enforcement agencies are now purchasing lightweight radios, mobile digital terminals, automatic vehicle location equipment and microwave transmitters and receivers. They are automatically transmitting and receiving data from computers located at all levels of government, that is, local, state and Federal.

This influx of new and highly sophisticated electronics equipment has created a need for equipment performance standards and a means of disseminating technical information to non-technical personnel. This need was noted in 1967 by the President's Commission on Law Enforcement and Administration of Justice, which said, "Standardization of police mobile equipment should contribute substantially to field efficiency." The Commission then went on to recommend that a program of nationwide standardization of police mobile radio equipment be established.

This program, the development of standards for law enforcement equipment communications, is presently being pursued by the Law Enforcement Standards Laboratory (LESL) at the National Bureau of Standards. In addition to standards, LESL is developing reports and guidelines to assist the law enforcement community in the selection and procurement of communications equipment.

How are these documents generated? Generally, they are produced only after laboratory and field testing of a representative sample of equipment being offered to police for their use. In most cases, the tests are qualitative and true samples. In others, new test methods have been developed to keep pace with new and more sophisticated electronics equipment being used by policemen. Within LESL, this testing - and subsequent generation of communications equipment standards documents - is accomplished primarily by the Electromagnetics Division located in Boulder, Colo.

Standards Needed

As reported in the LESL Police Equipment Survey of 1972, the three communications items most needed as standard were mobile radios, portable radios and batteries. Volunteer performance standards are being developed in these areas, as well as for base station equipment, personal transceivers, repeaters, transmitters used in undercover work and mobile digital communications equipment.

Guidelines and reports are being written that cover these areas as well as voice privacy equipment, automatic vehicle location techniques and electronic tracking and monitoring equipment. These documents should provide the law enforcement community with both the technical and non-technical information to purchase and utilize new and improved communications equipment.

Use of this better equipment ought to mean more reliable communications with a subsequent improvement in emergency help. It should provide an increased number of transmissions, improved communications security, better response time and improved service for both the police officer and the general public.

*Mr. Treado is Manager of the Communication Systems Program within NBS' Law Enforcement Standards Laboratory. This article was originally published in the U.S. Department of Commerce's "Dimensions" periodical. Mr. Treado has agreed to write a follow-up article on a future issue of the VIG Newsletter. The available Standards and Reports are listed below.

PRODUCTS OF THE LAW ENFORCEMENT STANDARDS LABORATORY
NATIONAL BUREAU OF STANDARDS FOR COMMUNICATIONS EQUIPMENT

Standards

NRL-SC-STD-0010, September 1972. Fixed and Base Station Transmitters (Stock No. 2700-00125); Price 65 cents

NRL-SC-STD-0012, October 1974. Mobile FM Transmitters (Stock No. 2700-00201; Price 70 cents

NRL-SC-STD-0013, October 1974. Personal/Portable FM Transmitters (Stock No. 027-500-00123; Price 70 cents

NRL-SC-STD-0025, May 1974. Mobile Antennas (Stock No. 2700-00155; Price 55 cents


Reports


LESP-BPT-0001, May 1974. Batteries Used with Law Enforcement Communications Equipment: Comparison and Performance Characteristics (Stock No. 2700-00125); Price 50 cents

LESP-BPT-0001, June 1973. Batteries Used with Law Enforcement Communications Equipment: Chargers and Charging Techniques (Stock No. 2700-00014; Price 80 cents

LESP-BPT-0001, June 1973. Technical Terms and Definitions Used in the Law Enforcement Communications Equipment (Radio Antennas, Transmitters, and Receivers (Stock No. 2700-00011; Price $1.55

LESP-BPT-0004, May 1974. Voice Privacy Equipment for Law Enforcement Communications Systems (Stock No. 2700-00240; Price 65 cents

URGENT CALL FOR PAPERS

HELP! HELP! HELP! Technical papers are needed now for the upcoming 25th Annual Vehicular Technology Conference, Washington, D.C., March 24-26, 1976. The deadline for the submission of an 800-1000 word outline is approaching and many more papers are needed to assure a successful conference. Won't you please help?

Papers are sought devoted to the following areas:

- Satellites to Extend Mobile Coverage to aeronautical, maritime and land Mobile Units.
- Microwave Mobile Communications Systems.
- Air-Ground Public Radiotelephone Systems.
- Digital versus Analog Techniques in the Mobile Service.
- Automatic Transmitter Identification.
- Automatic Vehicle Location, Monitoring, and Identification of Mobile Units.
- Methods for Achieving Improved Spectrum Utilization in Mobile Services, including Tracking and Multiple Access.
- Spectrum Requirements for the Mobile Services.
- Public Safety and Emergency Medical Systems.
- Industrial and Transportation Uses of Mobile Communications.
- Propagation at 900 MHz and above in Mobile Service.
- Systems and Equipment Operating in the 900 MHz Band.
- Role of Regulation and International Treaty Matters.

* New Hardware and System Developments.
* International Developments in the Mobile Services.
* Motorist's Aid Systems.
* The Amateur and Citizen's Use of Land Mobile.
* ECM and EFI in the Vehicular Environment.
* Marine VHF Systems.
* Electronic Control Systems for the Engine.
* Fuel Injection Systems.
* Onboard Microprocessors.
* Automobile Electrical Components and Systems.
* Sensors and Actuators for Onboard Use.
* Automated Highways.
* Crash Avoidance Systems.

If you have an idea for a technical paper, submit six (6) copies of an 800-1000 word outline by November 15, 1975 to the Technical Program Chairmen:

Mr. S. Conley
911 Federal Communications Commission
1919 M Street, N.W., Room 8308
Washington, D.C. 20554

Selection of papers and notification to the authors will be completed by December 10, 1975. Outlines or summaries should be submitted single spaced in a two-inch left-hand margin, typed in a 4-3/4 inch wide column and with a 1-3/16 inch top and bottom margin. The title and name(s) of author(s) and affiliations should be included, with complete address and telephone number.

Copies of the summaries of selected papers will be distributed to the Technical Program Committee, which will be distributed at the conference. Selected papers will be considered for publication in the IEEE Transactions. Thus, all authors should submit a complete paper at the time of the conference.
A V A I L A B I L I T Y  
C U S S E D  &  D I S C U S S E D  

By A. K. "Kenny" Guthrie  
COMMUNICATIONS EDITOR

How many spare mobile or personal radios should one have for a radio system? The answer is in the graph. If 95 percent of the units are "available" (for use), then 5 percent are spare units, whether intended or not. The user will be better served if the allocation is intended and planned for.

While MBTP, WTPR and the other military-style indicators do have a place, they seldom fit directly into management of the typical public safety two-way radio system. The effect of the factors used to calculate these numbers is often "washed out" by administrative and other elements of the real-life situation.

In the military-type environment, it takes paragraphs or even pages to define "failure" so that failure rate can be calculated. Being practical about it, a radio has failed when it will no longer do its job and goes to the shop.

"Time to repair" also gets into innumerable complications. But, being practical about it again, the significant matter is "downtime per failure." How much time elapses from all causes between the time the radio becomes "non-available" due to failure and the time it becomes available again?

Most people give major consideration to failure rate—how often the unit fails. This is a major factor, but it isn't the only one. The "downtime per failure" is usually influential, and may actually control availability. After all, one can achieve 100 percent availability with either zero failures or zero downtime.

Downtime per failure usually focuses upon the competence and efficiency of the shop. This is only part of the story. In assessing availability, one should adopt the point of view of the end user and consider all of the elements which render the radio non-available, including:

- Get radio to the place of repair
- Get through the shop backlog
- Troubleshoot
- Procure parts
- Repair and test
- Get radio back to the end user

Availability is one of those things which does not become an issue until you don't have enough of it. It does become an issue when there are insufficient "available" radios to meet the needs of the user. Too often, this realization triggers lumping to one of two conclusions: (1) the failure rate is too high, or (2) the people in the shop can't fix radios. While either of the assumptions may prove to be true, in whole or in part, you'll never know until you have actually determined the failure rate and isolated the factors which total up to downtime per failure.

Once the facts are known, one can determine both the best and quickest ways to bring availability to an acceptable level.

You can seldom do anything constructive about failure rate in the short term. The rate merely reflects the consequences of what has already happened. For short-term improvement, zero-in on "downtime per failure." If it is found reasonable, the answer is: Add Units. If it is way too high, enough to support the operation. Perhaps you find fat in the downtime. Get it out. If the problem is administrative delay in the using organization—streamline the procedures. If the problem is shop backlog, do something to increase capacity to get and stay current. This may call for more people; it may indicate a need for better test equipment or training. If the problem is parts availability, increase the parts inventory. If it is usual, defining the problem is the first step toward solving it.

The graph is plotted from this relationship:

\[ A = \frac{365 \times Fd}{F} \]

where:

365  = D = Availability (100 = 100 percent)
F = Failure rate (per unit per year)
d = Mean Downtime per Failure (days).

Failure Rate can be approximated, thus:

\[ F = \frac{12 f}{n} \]

where:

n = Number of units
f = Total number of failures recorded for n units in d months

The approximation is most accurate when d, mean downtime per failure, is small. The more accurate approach which excludes "non-available days" from the calculation is:

\[ F = \frac{12 f}{nt} \]

which reduces to:

\[ F = \frac{12 f}{nt} \]

One can best determine Mean Downtime per Failure with a sample of actual experience. Count the number of days lost from each of a number of failures, sum them, and divide by the number of failures. Go through the exercises. Actual numbers are invariably larger than estimates because estimators tend to leave out some of the factors.

Availability can be determined by entering the graph with the approximated failure rate, or by calculating from the computed failure rate, thus:

\[ A = 1 - \frac{365}{365 + \frac{12 f}{nt}} \]

For a sample study, we assume values which might be typical for a personal radio system with fairly tough use: 135 total failures (f), in 45 units (n), over 12 months (t). Mean downtime per failure (d) is 14 days. Using both the approximate and more accurate formulas we have:

\[ f = 12 f = 12 \times 135 = 3.0 \] (approximately).

\[ nt = 45 \times 12 \]

Entering the graph with this value, indicated availability is about .885. This says that 11.5 percent of the 45 radios, or 5 of them, are serving as spares. If the user needs only 40 radios at a time, all is well. Otherwise, availability must be improved. If downtime per failure can be squeezed down to 7 days, availability improves to 94 percent, and the user has use of two more of his radios. The value of two radios will pay for carrying additional parts inventory.

We get to the same availability with the more accurate approach:

\[ f = 12 f = 3.39, \] and
\[ nt = 0.0329 \] (ft)
\[ A = 1 - \frac{\frac{365 \times 12}{365}}{12} = .885 \]

However one goes about it, the important thing is: do go about it! When the total number of radios times availability yields enough units to do the job, you have a good system.
THE WASHINGTON SCENE
By ERIC SCHIMMEL
WASHINGTON NEWS EDITOR

Legislative Activity

Telecommunications is notoriously non-legislative, in that the FCC can perform most of its regulation by the authority given to it in the Communications Act of 1934. As such, Telecommunications suffers from relatively low visibility in contrast to other national issues which get kicked around on Capitol Hill. Recently, however, two bills have been introduced in the House, proposing significant changes in the structure and operation of the Federal Communications Commission. Five members of the Commission shall be assigned to one of such changed terms in the organization of the Bureau. The unexpired terms on the Commission immediately preceding the occurrence of such second vacancy shall be assigned to the Commission a pro-ven expired term immediately preceding such vacancy re- ceiving the shortest changed term.

(a) Subsection (e) of such section 4 is amended to read as follows:

"(e) Each Commissioner appointed under this Act shall hold office for a term of ten years and until a successor is appointed and has qualified, except (1) as provided in section 2 (a) (3) (B) of the Federal Communications Commission Reorganization and Reform Act; (2) that no Commissioner who shall continue to serve beyond the expiration of the next session of Congress subsequent to the expiration of his term of office, and (3) that any person chosen to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed only for the remainder of such term. No vacancy in the Commission shall be filled by the remainder of the powers of the Commission."

(b) Subsection (b) of such section 4 is amended by inserting immediately before the last sentence thereof the following: "Any Commissioner may be removed by the President only for neglect of duty or malfeasance in office."

REPORTS ON CERTAIN MEETINGS AND COMMUNICATIONS

Sec. 4. Section 411 of the Communications Act of 1934 is amended at the end thereof by adding the following:

"(2) The Commission shall adopt rules requiring each Commissioner and each employee of the Commission who is engaged in any significant policy-making decision, as determined by rules of the Commission, to disclose in public reports to be filed in timely fashion with the Secretary of the Commission information concerning meetings or communications with persons outside of the Commission concerning any pending Commission proceeding on any policy matter. To the extent practicable each such report shall set forth (a) the date, time, and place where such meeting or communication occurred, (b) the name of each person participating in such meeting or conversation, and (c) a summary of the subject matter covered in such meeting or communication. The
SEC. 6. (a) Section 4 of the Communications Act of 1934 is further amended by adding at the end thereof the following new subsection:

"(o) If the Commission determines at any time that additional legislation is necessary or desirable, it shall submit to the President and Congress, with appropriate background information thereon to the Congress, no such proposed legislation shall be subject to review or approval by any department or agency of the executive branch of the Federal Government."
ADCOM ELECTION

On December 31, 1975, the three-year term of the following members of the Administration Committee (ADCOM) will expire:

Nick Alimpich
Marty Cooper
Rodger Madden
Dick Moore
Jack Reimer

During the month of October, each member of the VTC will receive a ballot to vote for 5 out of 11 nominees for the term of 1976-78 in ADCOM. Each of the 11 nominees has offered to serve on the ADCOM and each in well qualified to represent the interest of all of the members of VTC. Each member should study the resume of each of the 11 nominees and vote for the five nominees he thinks will best serve, not only his interest, but the interest of our portion of the engineering profession. All of our members can vote for as many as five of these 11 nominees for their work in our group and profession.

The five nominees elected will serve with the following 10 members to make up the 15-member ADCOM for the year 1976.

A. Brennan - Motorola
J. Cassidy - General Motors
S. Neyar - RCA
J. Neuhauer - Urban Sciences
N. Shepherd - General Electric
G. Brooks - Consultant
E. Lane - County of Los Angeles
F. Libb - Consultant
S. McConnell - FCC
T. McKea - General Electric

Bob Royer
Nominating Committee

ADCOM NOMINEES VOTE FOR FIVE

NICHOLAS ALIMPICH (CM’57 – SM’63)

PRESENT EMPLOYER: Michigan Bell Telephone Company
Detroit, Michigan

IEEE HISTORY
1974-1975 - President- VT-6 AdCom
1972-1973 - Vice President- VT-6 AdCom
1970-1971 - Treasurer- VT-6 AdCom
1966-1969 - Secretary- VT-6 AdCom
1972 - Chairman - Southeastern Section IEEE
1970-1971 - Vice Chairman - Southeastern Section IEEE
1969 - Secretary - Southeastern Michigan VT-6
1966-1967 - Chairman - Southeastern Michigan VT-6

PROFESSIONAL BACKGROUND
Project Engineer - Michigan Bell Telephone Company
Radio; Transmission

OTHER PROFESSIONAL SOCIETIES
Radio Club of America - Fellow
Electromagnetic Compatibility Group IEEE
Communications Society IEEE

EDUCATION
1957-1958 - University of Detroit
1946-1946 - University of Michigan

Mr. Alimpich, a native of Michigan, is married and has three grown children. He has been active in radio since receiving his Amateur Call W8PAK in 1934. During World War II, he spent four years in Navy Communication and Radiar.

JUNE E. DETERA, JR. (S’55 – A’57 – M’61)

PRESENT EMPLOYER: Dettra Communications, Inc.
2029 E Street, N.W.
Washington, D.C. 20006

IEEE HISTORY
1973-Present Chairman, Chapter Activities, VT-6
1970-1971 - Vice Chairman, 25th Anniversary Conference, VT-6
1969 - Chairman, Washington Chapter, VT-6
1968 - Vice Chairman, Washington Chapter, VT-6
1946 - Secretary, Washington Chapter, VT-6

PROFESSIONAL BACKGROUND
Dettra Communications, Inc., President
President Steel, Andrus & Adair, Consulting Engineers
George P. Adair Engineering Company, WHRBF, First Class Radiotelephone Permit

OTHER PROFESSIONAL SOCIETIES
Association of Federal Communications Consulting Engineers
MANS, NABER, ICl/CT, AERL
1946 B.S.E.T., Capital Institute of Technology
1955 A.S., Copter Radio Engineering Institute
Meculated: USNA Graduage School, Chicago Tech.
College & University of Virginia.
Since 1956, he has been engaged in many phases of
consulting radio engineering work in the broadcast, marine,
aircraft, and television fields. He prepares the
preparation of the use of vacuum tubes, antenna
systems, and interference studies, and has been
one of the principal radio engineers on the staff of the
and many state public utility commissions.

** WILLIAM E. ENSER (1960)**

**PRESIDENT EMPLOYER:** American Trucking Associations, Inc.
Washington, D.C.

**IEEE HISTORY**

1975 Chairman - Environmental Committee
1973-1974 Treasurer - VT-6 Awards
1971-1972 Secretary - VT-6 AdCom
1970 Chairman, Washington Chapter VT-6
1969 Vice Chairman, Washington Chapter VT-6
1968 Secretary, Washington Chapter VT-6
1966 Member, IEEE/VT-6

**PROFESSIONAL BACKGROUND**

1957-1974 Vice President, Telecommunications Association, AT&T
1948-1957 Field Engineer - Capital Airlines

**OTHER PROFESSIONAL ASSOCIATIONS**

Treasurer - Land Mobile Communication Council
Advisory Committee to FCC National Industry Advisory Committee FCC
Radio Club of America

**EDUCATION**

1946-1948 Ohio State University

**IEEE HISTORY**

1974-1975 Member - VT-6 Newsletter and appointed
member of VT-6 AdCom
1974 Organized and served as the VT-6 Session Chairman at the 1974 International Conference on Communications
1969 & 1974 Author of two papers for the VT-6 Transactions:

- "Multiple Frequency Reception with a Priority Channel", 1969

1962 Member IEEE
1960 Student Member of IEEE

**PROFESSIONAL SOCIETIES**

1975-1978 Manager, Mobile and Station Engineering, General Electric Company
1971-1975 Manager, RF Design Engineering, General Electric Company
1962-1966 Engineer, General Electric Company

**EDUCATION**

1968 M.S. - Physics, Lynchburg College
1963 Advanced Engineering A-Course, General Electric Company
1962 B.S.E.E., North Carolina State University, Member of Eta Kappa NU

Mr. Grimes has been active in communications work since 1962. Recently he was named to the position of Manager
Mobile and Station Engineering where he is responsible
for managing all of the work associated with the design
and development of GM's mobile and satellite systems.
Mr. Grimes is currently serving as the Editor of the IEEE
VT-6 Newsletter, and he has been responsible for broad-
ening the scope and coverage of the Newsletter. He
holds two U.S. Patents. Age: 35. Married; two children.

**DAVE M. GRIMES**

**PRESIDENT EMPLOYER:** The University of Michigan

**IEEE HISTORY**

1974 Session Chairman, Automotive Electronics, Detroit SAE
1974 Session Vice Chairman, Auto Radar Meeting, Detroit SAE
1974 Session Co-Chairman, Automotive Electronics, SAE
1973 Organizer, four sessions on Computers and the Automobile, Nat'1 Computer Conference, New York
1959 Chairman, Conference on Magnetism and Magnetic Materials, Detroit

**PROFESSIONAL BACKGROUND**

1974-1975 Prof. of Electrical Engineering - University of Michigan, Director of Vehicular Electronics Laboratory
1960-1963 Chief Scientist, Conception Corporation
1956-1961 Ass't. and Assoc. Prof., Dr. Electro- Magnetic Lab., University of Michigan

**OTHER PROFESSIONAL SOCIETIES**

AAAI, Int'l Solar Energy Society, APS, Int'l Electrotechnical Commission (51), Eta Kappa Nu, Pk IIpsilon, Sigma XI

**EDUCATION**

1956 Ph.D. (EE) University of Michigan
1956 M.S. (Phys.) Iowa State University
1956 B.S. (Phys.) Iowa State University

Dr. Grimes' interest covers the application of electronics
to magnets and solid state electronics to today's
problems. He has published about 25 technical papers and
two books. He is married and has two children.

**CARL A. KOLANDA**

**PRESIDENT EMPLOYER:** Michigan Consolidated Gas Company

**IEEE HISTORY**

1972-1975 Program Chairman - S.R. Michigan VT-6
1964-1974 Member

**PROFESSIONAL BACKGROUND**

1972-1973 Manager, Electronic Design Co.
1964-1968 Communications Engineering Technician

**OTHER PROFESSIONAL SOCIETIES**

Engineering Society of Detroit Petroleum Industry Electrical Association IEEE Computer Society

**EDUCATION**

1972 Bachelor's Degree in Electrical Engineering, Detroit Institute of Technology
1971 Graduate work, Wayne State University

Mr. Kolenda has been engaged in planning, designing,
and specifying utility company microwave and sub-
marine cables in various capacities during the past
10 years. Mr. Kolenda holds a Class Radio Tele-
phone Operators License and is an active amateur radio
operator with an advanced class license call
KB8"DND.

**ROGER MADSEN**

**PRESIDENT EMPLOYER:** Federal Communications Commission

**IEEE HISTORY**

Associate Editor - Communications on "Transactions on Vehicle Technology" and member of SAE since 1957. Active in Chicago VT-6 Chapter. Originally joined VT-6 in 1962. Formerly a member-
at-large of Central Illinois Section of IEEE.

**PROFESSIONAL BACKGROUND**

Acting Regional Manager, FCC, Chicago Regional Office. Formerly Chief, Engineering Branch; Chief, Illinois Section; and Chief, Spectrum Utilization Section of same office. Previously employed in Engineering positions at Magnavox, Urbana, Illinois; General Electric, Bloomington, Illinois; and Motorola, Chicago, Illinois.

**EDUCATION**

1963 B.E.E., University of Louisville, Kentucky.

**GREGOR F. MCCUNE**

**PRESIDENT EMPLOYER:** Martin Marietta Aerospace

**IEEE HISTORY**

1975 Editor, IEEE Transactions on Vehicular Technology; Named Engineer of the Year by Orlando Chapters, VT-6 and Orlando Society
1973 Organizer and Chairman, ICC-75 Session, Paging and Reporting System, Orlando and First Chairman, Orlando, VT-6
1974 Chairmen, Orlando Chapter, Communications Society
1973-1974 Chairmen, Orlando Chapter, Communications Society

**PROFESSIONAL BACKGROUND**

Senior Group Engineer; Section Head - Communications Systems Design
1964-1973 Staff Engineer, Systems Design, Mobile Communications Systems
1961-1966 Engineer, Systems Design, Communications and Missile Systems
1955-1957 Instructor, Dept. of Elec. Engrg., U.S. Naval Academy
1955-1957 Communications Officer, UNR, Amphibious Communications

**EDUCATION**

1946-1953 B.S. - Electrical Engineering, University of Illinois
1955-1957 Postgraduate study, University of Southern California
1975 David Sarnoff Award for Outstanding Technical Achievement. This award is RCA's highest technical honor.

Charles M. White

Present Employer: Houston Lighting & Power Company

IEEE HISTORY

1961 Master of Science in Engineering, Univ. of Florida
1954 Bachelor of Electrical Engineering, Univ. of Florida
1952 Assoc. Arts, Jacksonville Junior College (Florida)

George McClure is engaged in the design of computer controlled radio communications systems, including mobile telephone, dispatch, and emergency medical systems. He directs design work for both commercial and military applications, authored FCC filings, published papers on vehicular and amphibious communications, and organized technical sessions at national and international conferences.

*A. M. Missenda

Present Employer: RCA

IEEE HISTORY

1972–Present Program Chairman Pittsburgh Chapter
1972–1975 VT-6 AdCom, Membership Chairman
1969–1972 VT-6 AdCom, Chapter Activities Chairman
1967–1969 Chairman, Pittsburgh Chapter VT-6/CS
1960 Member IEEE

PROFESSIONAL BACKGROUND

1964–Present RCA Mobile Communications Systems
1975 Manager, Portable Products
1974 Program Manager - TACTEC
1973 Manager - Advanced Development
1972 Leader - Advanced Development
1968 Senior Member of Tech. Staff - Base Sta. Design Org.
1964 Member of Tech. Staff - Receiver Design Group

EDUCATION

1960 B.S.E.E., University of Pittsburgh
1966 N.S.E.E., University of Pittsburgh

Mr. Missenda is 39 years old, married and the father of three children. He has been active in EIA and/or PCC Committees on Land Mobile Channel Splitting at 450 MHz, Land Mobile/TV Sharing and 900 MHz Technical Standards. He has held a First Class Radiotelephone License since 1955. He was a member of the team which received the 1975 David Sarnoff Award for Outstanding Technical Achievement. This award is RCA’s highest technical honor.

Charles M. White

Present Employer: Houston Lighting & Power Company

IEEE HISTORY

Member of IEEE and VT-6
Chair a session at 1972 VT-6 meeting in Dallas on “Vehicular Electronics and Communications”
Presented paper to Dallas Chapter VT-6 1975 Organizing a VT-6 Chapter Houston, Texas

PROFESSIONAL BACKGROUND

Supervisor - Communications, Houston Lighting and Power Company

Dist. Sales Mgr. - General Electric Company

Mobile Radio Dept. Midland, Texas and Albuquerque, N. M.

Product Planning and System Design Engineering, General Electric Company, Lynchburg, Virginia

Communications Engineer, General Electric Company, San Antonio, Texas

Asst. Dept. Communications, City of Fort Worth, Texas

National Telecommunications Conference

Fairmont Hotel
New Orleans, Louisiana
December 1–3, 1975

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