

IEEE VTS NEWS DIGEST

Connecting the Mobile World

Companion to VTS News, Volume 47, Issue 3 August 2000

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Short articles are available on-line. For longer articles, only the abstract is available on-line. VTS News is sent to all VTS members, and is included in the society subscription. Non-VTS members can subscribe at a cost of \$30 per year. For details of this, or for pricing information of single copies, contact the IEEE Customer Service on 1-800-678-IEEE (USA and Canada), + 1 732-981-1393 (outside USA and Canada), and FAX: + 1 732-981-0027

Foreword

James Irvine, Editor

In this issue we report the outcome of the recent VTS News questionnaire. This has given us a good idea of what members think. The obvious question is 'what are we going to do about it?'

A clear outcome of the survey is that members want the VTS News to keep them informed of what is going on in the field. Articles on recent technological developments were rated the most popular and useful. I am very fortunate to have a team of Senior Editors who spend considerable amounts of their time keeping abreast of developments and reporting them in their columns. The gap of mobile radio coverage has been filled, and from the next issue, Dennis Bodson will join the team with a new column to report on standards activities.

As well as the regular columns, we are reintroducing the practice of publishing feature articles giving a more detailed look at different subjects. The VTS has a wide variety of members with interests in the three different areas of the Society's activities – Automotive Electronics, Mobile Radio and Transportation. The aim will be to print articles which will interest both the specialist in the particular area, and also society members in the other two areas. In this the VTS News will complement the *Transactions in Vehicular Technology* by publishing articles with a broader scope than is appropriate for that publication. The aim will be to publish at least three such

articles in each issue, ideally one from each area, but that will depend on whose arms we can twist into writing. Volunteers, anyone?

The Board approved an increased budget for the VTS News to allow for the increased use of colour. This will allow us to improve our presentation of information.

Given the importance so many respondents placed on information about the society when it came to the aim of the VTS News, the usefulness on the society news type columns reported in the second part of the questionnaire was disappointing. It is clear that we need to improve our communication of the society's activities. We are looking at ways of doing this with chapter and meeting reports. The way we report Board of Governors' meetings has already changed with the printing a shorter report giving all the relevant information rather than the full minutes, which could be rather cryptic at times. Other reporting options will be looked at so you remain fully informed of what is going on.

Finally, a big 'thank you' to all those who took the time to respond and give their views. While this questionnaire is now completed, I am still very keen to hear members' views on the VTS News. So please, if you have any comments, suggestions, criticisms, etc., send them to me at the address opposite. Remember, the VTS is your society; the VTS News belongs to its readers.

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Feature Articles in the August Issue

The Latin-American Mobile Communications Marketplace

Heidi Rivas Hernández, DIGITEL CORP

In this article, Heidi Rivas Hernández reviews developments for public cellular communications in the fast-growing Latin-American market.

The Millennium Dome Goes Digital

Jane Wenham, Simoco Europe Ltd

When the organisers of the Millennium Dome in Greenwich, London had to find a communications system for its 5,000 Dome staff, they decided to go digital by deploying a TETRA system supplied by Simoco. Their Jane Wenham gives an overview of the system.

Voice Driven Information Access in the Automobile

Charles T. Hemphill, Rajeev Agarwal, Yeshwant K. Muthusamy, and Yifan Gong, Texas Instruments Incorporated

Until recently, the user experience in the automobile consisted of driving and listening to the radio. With recent advances in wireless communications and speech recognition, however, the possibilities for information access in the automobile have expanded tremendously. We describe our voice recognition technology and how it enables convenient voice interaction with information from

the Web, E-mail, voice mail, and electronic map services. We also describe recent advances we have made in our technology to operate robustly in the harsh environment of the automobile. With these advances, we foresee driving in the future becoming much more safe, productive, convenient, and fun.

Join the IEEE Antennas and Propagation Society

Many VTS members work on mobile radio, but relatively few are members of the IEEE Antennas and Propagation Society. To give you an idea of the activities of the society, we are printing some information about it and a sample article from their magazine. They will be reciprocating by printing information about the VTS in their magazine.

The IEEE Antennas and Propagation Society is the premier Society for issues related to experimental and theoretical advances in antennas and propagation for wireless, satellite, and vehicular communications; the propagation of electromagnetic waves, including their scattering, diffraction, and interaction with various media and structures; and pertinent applications, such as communications, microwave, millimeter, and sub-millimeter wave techniques, remote sensing, and biological interaction.

You should join the society if your work involves:

- ◆ Antenna design, testing, or analysis for any application
- ◆ Propagation effects of electromagnetic waves
- ◆ Wireless, mobile, satellite, or vehicular communications
- ◆ RF/microwave interactions with biological media
- ◆ Broadband communications systems
- ◆ RADAR systems or remote sensing

Your membership in the IEEE Antennas and Propagation Society provides you:

- ◆ Subscription to the IEEE Transactions on Antennas and Propagation, the leading monthly peer-reviewed, archival publication in the field, providing up-to-date technical articles critical to the interests of Society members

- ◆ Subscription to the IEEE Antennas and Propagation Magazine, a bi-monthly peer-reviewed, archival publication featuring
 - ◆ Features on topics of current interest to AP Society members
 - ◆ Help you can use through more than 20 columns, such as *Wireless Corner*, *Antenna Designer's Notebook*, *Telecommunications Health and Safety*, *EM Programmer's Notebook*, *Reviews and Abstracts*, *Patents*, and *PCs for AP*
 - ◆ Announcements of upcoming conferences, symposia, meetings, short courses, and online courses
- ◆ Discounted rates to international symposia and short courses sponsored by the Society, such as
 - ◆ 2001 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, July 8-13, Boston, MA
 - ◆ 2000 IEEE-AP-S Conference on Antennas and Propagation for Wireless Communications, November 6-8, Waltham, Massachusetts
- ◆ All of this and more is available for only \$12 per year with your IEEE membership

Further information can be found at www.ieeeaps.org To join the Antennas and Propagation Society, contact the IEEE by Tel: (800) 678-IEEE (4333); by Fax: (732) 981-0225; or by E-mail: membership@ieee.org

The August VTS News reprints 'Antennae', an article on the origin of the term originally printed in the Antennas and Propagation Magazine, February 2000 (Volume 42, No 1, pp 61-63).

Regular Columns in the August Issue

Automotive Electronics

Bill Fleming, Senior Editor

These are the items covered in the Automotive Electronics column in the August 2000 VTS News. Please see the printed version for the full article.

- Best OEM Engineers - according to supplier respondents
- Delphi Forecast for Automotive Electronics
- Pay-For-What-You-Use (Or Abuse) Car Insurance
- High-Speed Car Chases May Be Eliminated
- Black Ice Warning Device
- Kenworth's "Smart" Truck
- Telematics/Distracted Study

Mobile Radio

Javier Gozalez, Senior Editor

These are the items covered in the Mobile Radio column in the August 2000 VTS News. Please see the printed version for the full article.

- 3rd Generation Mobile Radio
 - Standards Activities
 - 3G licenses: auction or "beauty contest"?
- Private Mobile Radio
 - TETRA standard nears completion
 - Public Safety
- m-commerce
- World Radiocommunication Conference 2000
- Mobile Internet
 - Japanese Market Takes Off :
 - Wireless Application Protocol (WAP)
- FCC news
- Satellite mobile communications
- Mobile phone health risks
- China Unicom discards national narrowband CDMA plans
- Bluetooth
- Trade News

Transportation Systems

Harvey Glickenstein, Senior Editor

These are the items covered in the Transportation Systems column in the August 2000 VTS News. Please see the printed version for the full article.

- New Jersey Transit's Hudson Bergen Light Rail Line opens from 34th Street in Bayonne and West Side Avenue in Jersey City to Exchange Place.
- Melbourne has ordered 59 trolley cars from Siemens.
- The land connection between Denmark and Sweden is complete.
- Pittsburgh has broken ground for its Stage II Light Rail Transit Project.
- San Francisco inaugurated a new historic trolley service in March.
- Electric bicycles are being pressed into service in the San Francisco area.
- The Nottingham Express Transit (NET) in the UK is now under construction.
- The Japan Transport Ministry is reviewing recommendations for increased rail service in Tokyo and Yokohama.
- Xian, the Chinese city famous for the terra cotta figures, is proposing a metro line.
- The Spanish National Railways (RENFE) has started the tendering process for new high speed trainsets for the Madrid to Barcelona route

Professional Activities

Frank Lord, Senior Editor

In this article, Frank Lord discusses the IEEE-USA web site and efforts to promote information exchange, as well as the Immigration Reform Grassroots Network.

Convergence 2000

For over 25 years the Convergence Transportation Electronics Association (CTEA) has sponsored the premier automotive electronics conference in the world – Convergence. This conference has continually brought together the leading technologists, engineers, and executives in the world.

The theme for Convergence 2000 is Automotive Electronics: Delivering Technology's Promise. In the opinion of Convergence 2000 Conference Chairman, J. T. Battenberg III, the industry has yet to deliver that promise. Mr Battenberg, Chief Executive of Delphi Automotive Systems, goes on to say that the conference will provide a forum to answer the following questions "What must we do as an industry to deliver? What are the major challenges we face as we carry out this formidable challenge? What are our social responsibilities? What are the implications of this infotronics revolution?"

From October 16-18, 2000, the conference will showcase three executive panels and thirteen technical sessions examining everything from smart sensing, mobile information and entertainment to trends, standards and even the "electronic cocoon". Convergence 2000 will provide a thought-provoking, global forum for more than 6,000 attendees to participate and learn. Additionally, this year's event will have double the exhibit space of the last conference to showcase over 140 state-of-the-art exhibits. Due to the continued growth and overwhelming interest, Convergence 2000 will be held, for the first time ever, at Cobo Center in Detroit, Michigan.

The Keynote speakers for Convergence 2000 are a virtual "who's who" in the electronics and automotive industries. Participants include CEOs from Sun Microsystems; Sega Enterprises, Ltd.; Hewlett Packard; and AT&T, while the conference banquet will feature William Ford, Jr., Chairman of the Board of Ford Motor Company.

Electronics, technology and innovation exemplify Convergence – make plans to attend Convergence 2000.

Keynote Speakers

After a welcome by the Convergence 2000 Chairman, J. T. Battenberg III, the conference will be addressed by Scott McNealy, Chairman and CEO of Sun Microsystems. Scott McNealy co-founded Sun Microsystems 17 years ago, and as CEO has he has steered the company to its position as the leading global supplier of network computing solutions with revenues last year of more than \$11.7 billion.

Sun has been pursuing a strategy of providing customers seamless connectivity – to anyone, anywhere, anytime on any device. A key part of this strategy has been the development of its Java™ technology, which is gaining acceptance throughout industry not just as a language for Internet software but also for more traditional applications and increasingly for embedded software.

After lunch, an address will be given by Shoichiro Irimajiri, president of Sega Enterprises Ltd., a \$3 billion company which is an industry leader in interactive digital entertainment media. Before joining Sega, Mr Irimajiri was executive vice president of Honda Motor Co. Ltd., where he was responsible for directing the company's development and production activities.

Tuesday begins with an address by Carleton (Carly) Fiorina is President and CEO of Hewlett-Packard Company (HP). She became President in July 1999, prior to which she spent a total of nearly twenty years at AT&T, and then at Lucent, where she spearheaded the spinoff of that company from AT&T. For the second year in a row, she topped *Fortune* magazine's list of the most powerful women in American business.

Following the Awards Ceremony on the 18th, C. Michael Armstrong, Chairman and CEO of AT&T, will give a keynote address. AT&T is one of the world's leading communication services companies, with revenues of \$53 billion and more than 80 million customers. Before becoming chairman of AT&T in 1997, Dr Armstrong was for six years chairman and CEO of Hughes Electronics.

The Convergence 2000 banquet will be addressed by William Ford, Jr., Chairman of the Board of the Ford Motor Company. Mr Ford joined the company in 1979, working in a number of posts in the company before being elected to the board in 1988. He became chairman at the beginning of 1999.

Technical Sessions

The thirteen technical sessions include over 75 papers. The sessions are:

Electronic Cocoon

This session will deal with electronics that enhance the safety of the vehicle to prevent impending collisions, turning the vehicle into an electronic cocoon for safe, stress free driving. With the appropriate enabling technologies, vehicle electronics will actually assist in the prevention of collisions thereby providing a protective enclosure for the passengers. Electronics will sense the activity 360 degrees around the vehicle as well as the condition of the vehicle and surrounding environment so that all preventative measures possible can be taken to avoid collision. Electronics will turn the car into a safe haven, the driver's personal safety system.

Infotronics, Part I: Dynamic Route Guidance

This first part of the Infotronics Sessions will compare Service Center vs. On Board Route Guidance, for example such subjects as fast algorithms that would optimize trips based on different criteria such as driving on the expressway, surface streets or avoiding certain areas that might be undesirable to drive in. These issues include comparisons of route guidance using turn-by-turn, map, or other means of communicating with the driver.

Future Design Processes for Electronic Systems

This session addresses all aspects of future electronic system design from powertrain to infotainment vehicle applications. It consists of a series of methodological presentations that cover how to deal with shrinking time to market and increased electronic content demands; IP handling between OEMs and suppliers; reliability and testing of electronic systems; and an overview of existing tools and their automotive applications.

Power Generation & Management

The average electrical load in a high end vehicle is expected to exceed several kW by 2005, and the current alternator/electrical system is incapable of supplying this load. There is already international acceptance of a new 42 V standard to help meet the challenge, and substantial discussion is occurring on the subjects of new, more efficient alternator designs, combined starter/alternators, and the need for sophisticated energy/power management.

Occupant Protection

This session considers what happens when the driver, with help of the Electronic Cocoon, cannot avoid a crash. We will cover the range of possible interventions from the time of an imminent crash to the time post crash when fast arrival of resuscitative help is crucial. Vehicle based intervention may include crash sensing and crash activation of integrated safety systems such as occupant restraints. Land based intervention may include the responsiveness of Emergency Medical Services. Vehicle to land based notification systems in case of a crash may include Onstar or other similar crash notification systems. Crash protection of children merits special attention for the session. Crash recorders are technically feasible today. How data from such recorders should be used to improve crash protection and how privacy of individuals should be protected will be discussed in our session.

Infotronics, Part II: Mobile Information

We are scratching the surface with what kind of services might be provided in the way of information. Discussions will include electronic commerce, e-mail, stock market quotes, etc. The information must be given to the driver in a manner consistent with the driver workload. Other items could be information on congestion with some discussion of systems that exist today in Germany where the driver is given information about parking availability.

Electronics for PNGV's Fuel Efficient HEV's

The year 2000 is a benchmark year for development and delivery of a New Generation of ultra-fuel-efficient (>70 mpg) hybrid-electric family-of-five-sized vehicles. Concept vehicles are being demonstrated in 2000 as milestone deliverables from the Partnership for a New Generation of Vehicles (PNGV), and possibly other programs. Those vehicles rely on a new generation of electronics and control systems designed for efficient energy management. This session focuses on the design, implementation and demonstration of these energy management systems. R&D efforts that have advanced electronic componentry for these energy management applications will also be described in this session.

Infotronics, Part III: Mobile Entertainment

This session will discuss both the content of the entertainment that may be available and the technical issues, like how the content is delivered; broadband communication, antennas, display, and audio systems. Other topics include systems that deliver front seat television, movies or games for the back seat, etc.

Environment (Electronics Only)

This session will deal with clean efficiency, fuel cells in hybrid vehicles as well as recycling, but with electronics as the focus. For example, the elimination of lead in electronic components that would facilitate the recycling of whole

vehicles. Another aspect would be advanced engine controls, i.e., using electronics to reduce pollution and reduce emissions further as well as improve fuel economy and thus minimize effects on the environment.

Robust Smart Sensing

With the help of electronics we are moving beyond sensors to smart sensors. Such sensors, not only have self-calibrating features such as removing zero drift, temperature compensation, etc., but also can communicate with a data box so that information can be shared. Issues include the use of sensor fusion in vehicles to minimize the number of sensors and to make more intelligent use of existing sensors and those could be discussed, and new ideas to provide new sensors that could be used for the vehicle.

E/E Architecture

A present automobile has a very complex power and signal distribution architecture, which is gradually being simplified, by having at least one communications bus. However, OEM's must ensure the capability of increased function is at a minimal cost impact to the customer. In the future, we expect that there may be more than one power bus (12V, 42V, etc.) to deliver the necessary functions customers will demand. The discussion should center on the questions; what is an electrical architecture, how does it drive the industry, what are the necessary standards, and who owns these standards? Another topic that can be discussed would be the life cycle mismatch between the vehicle and the electrical components. Life cycle of electrical components can be as little as a few months where as vehicles designed today would still be cold 10 years from now. Open vs. closed architectures in such extreme applications as multimedia and powertrain with traction control would be an item that could be discussed in this session. Additionally the session will address the processes and methodologies to design a future electronic architecture taking into account safety, fail safe modules, fault tolerance and diagnostics.

Distractions - Minimum; Attractions - Maximum

The idea here is to discuss the human-machine interface as well as other human factors that affect driving. An important area would be to discuss driver workload so that information is given to the driver when the driver can absorb it. For example, one should avoid giving non-essential information (e.g., cell phone ringing) when the driver is attempting to pass or exercise a critical safety maneuver. The session may include regulations and legal issues for minimizing distractions to the driver.

Electronics and the Evolving Driving Experience

The automobile and the experience of piloting a vehicle have been traditionally been key elements of cultural life worldwide, particularly in the United States. However the introduction of new electronic technologies into the automobile will now allow us to reshape the "driving experience" and what we mean by a "car". This session will review central ideas about the car and the driving experience as well as their re-definition as they are driven by the revolution in electronics.

Report on VTC2000-Spring

The 51st IEEE VTS Vehicular Technology Conference, and the first to be held in Asia, took place in Tokyo from the 15th to the 18th of May 2000. More than 800 abstracts from 37 countries were submitted, with the largest contribution coming from the USA, followed by Japan, Korea, and then the UK. Of these papers, 385 had been accepted for oral presentation, and 165 for poster presentation. The total of 1009 attendees from 33 countries, about one fifth of whom were students, was the largest attendance since the conference was split into a twice yearly event. The committee had arranged that they were no evening panels, to leave delegates time to enjoy Tokyo's night life. One of the more unusual aspects of this was an area known as 'Electric City', where every possible electrical gadget was on display, although more expensive in their native country than many delegates were used to. Pride of place went to huge displays of mobile phones, with every possible shape and size from small to incredibly tiny, and a rainbow of colours from blues and greens to some rather

garish varieties of pink. Most had large displays for i-mode, a few even dispensing with the keypad, replacing it with a larger touch-sensitive screen. The occasional phone even boasted a CCD camera for use as a video-phone, but although the stickers showed high-res colour images, the performance on a 9.6kbit/s link can only be imagined.

The theme of the conference was described by Professor Hatori, when he opened the conference, noting that 3rd Generation mobile communications (3G) were now completing standardisation and the focus was moving to 4th Generation (4G). The conference addressed the issues of these systems - 10-20 Mbps transmission, adaptive resource management, efficient use of the air interface, quality of service control, and multimedia.

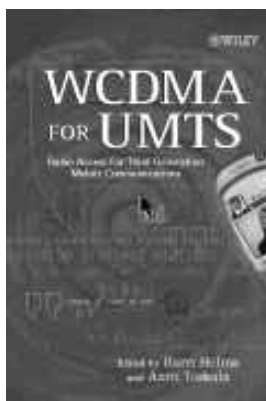
A full version of the report can be found in the printed version of VTS News for August 2000, along with reports on the Technical Tours to the Yamanashi Magnetic Levitation (Maglev) Test Center and to the Yokosuka Research Park to see new IMT2000 equipment.

Book Reviews

WCDMA for UMTS

Radio Access for
Third Generation Mobile
Communications

Edited by Harri Holma
and Antti Toskala
Published 2000 by
John Wiley & Sons
ISBN 0 471 72051 8
Price \$79.95



Reviewed by Ian Groves

Mobile wireless systems have become the ubiquitous means of mass telecommunications over the past 15 years. The early 'first generation', analogue systems were optimised for voice communications only but the proliferation of differing standards, particularly within Europe led to the development of a common digital based approach. The resulting 'second generation' system, GSM, now dominates the world mobile market; however this system, too, was designed and optimised primarily for voice services, albeit with the option for low speed data over the over the voice channel. Over recent years the growth in demand for access to internet based multi-media services on fixed networks has served as the driver for the 'third generation' a world-wide, high data rate, multi-media enabled mobile telecommunications system.

What is now emerging, globally, is a range of proposals under the generic title IMT2000 for a terrestrial system based on five radio interfaces standards and three core network technologies - all of which should provide for full inter-working of services and applications in all continents!

Next generation mobile wireless systems clearly embrace a wide range of technical disciplines and are influ-

enced in no small part by the underlying commercial and political aspirations of the many parties world-wide committed to its successful implementation. Indeed it is difficult for any individual to remain expert in all the necessary areas.

Within Europe the adopted approach is known as UMTS. A new radio interface based on WCDMA (Wide Band Code Division Multiple Access) is currently in the final stages of standardisation for a first release (R '99) and the initial UMTS system will be based on a GSM core network as enhanced to support the soon to be publicly launched GPRS packet data system.

The standardisation work for UMTS is being carried out under the auspices of 3GPP, the 3rd Generation Partnership Project and the editors and chapter contributors of this new book, all of whom are with Nokia, are to be congratulated on providing a detailed description of the WCDMA air interface and its utilisation and in providing a set of references to the appropriate 3GPP Technical Specifications.

Chapter 1 introduces the third generation air interfaces, the spectrum allocation, the time schedule and the main differences from second generation air interfaces. Chapter 2 presents example UMTS applications, concept phones and the quality of service classes. Chapter 3 introduces the principles of the WCDMA air interface, including spreading, the Rake receiver, power control and handover. Chapter 4 presents the background to WCDMA, the global harmonisation process and the standardisation. Chapters 5-7 give a detailed presentation of the WCDMA standard, while Chapters 8-11 cover the utilisation of the standard and its performance.

Chapter 5 describes the architecture of the radio access network, interfaces within the radio access network between base stations and radio network controllers and the interface between the radio access network and the core network. Chapter 6 covers the physical layer (layer1), in-

cluding spreading, modulation, user data and signalling transmission, together with the main physical layer procedures of power control, paging, transmission diversity and handover measurements.

Chapter 7 introduces the radio interface protocols, comprising the data link layer (layer 2) and the network layer (layer 3). Chapter 8 presents the guidelines for radio network dimensioning, gives an example of detailed capacity and coverage planning and addresses GSM co-planning. Chapter 9 covers the radio resource management algorithms that guarantee the efficient utilisation of the air interface resources and the quality of service; these algorithms are for power control, handover, admission and load control.

Chapter 10 presents packet access in WCDMA and includes the results of dynamic system simulations. Chapter 11 analyses the capacity and coverage of the WCDMA interface at rates up to 2 Mbps. Chapter 12 introduces the time division duplex (TDD) mode of the WCDMA air interface and its differences from the frequency division mode (FDD). A brief overview of the characteristics of multicarrier CDMA, one of the alternative air interfaces proposed for IMT2000 is given in Chapter 13.

Whilst not a book for the novice, WCDMA for UMTS does achieve its objective in presenting a detailed description of the FDD operating mode. The TDD mode, which in the opinion of this reviewer will have a very significant part to play in the future of UMTS, particularly given the asymmetric nature of multi-media traffic and the unpaired spectrum allocations available both now and likely

as extension bands for UMTS, does not receive all the attention it deserves and, inevitably, the standardisation activities have moved on in both this area and that for packet access since the book was published. And for those seeking an overview of the complete UMTS System, the text does not address the core network for UMTS.

That said, this is the first book published to describe the UMTS air interface and I would certainly recommend it as the starting point for anyone seeking a way in to the 3GPP Technical Publications.

Dr Ian Groves, formerly with BT Laboratories, is an independent telecommunications consultant and former Chair of the UK Third Generation Advisory Group

Members can order this book direct from the Publisher, John Wiley & Sons, at the special price of \$67.95 plus shipping & local sales tax. Please e-mail nlaverde@wiley.com, or send your order to Nelson Laverde, STM Marketing, John Wiley & Sons Inc, 3rd Avenue, New York, NY10158-0012 quoting VTS 8/00.

Editor's Note: The VTS has arranged for a discount on this book as a service to members, but this should not be taken as a recommendation for a particular book, publisher or technology proposal. The review was commissioned by the VTS News, not the publisher. If you have an idea for a book review, please contact the editor.

Letters

May 19, 2000

Dear Sir,

I have the following informational comments on the excellent article by Amtrak's Mr. Andrew L. Jones ("Amtrak's Richmond Static Frequency Converter Project", on pages 4-10 of last issue, VTS News, Volume 47, No 2):

Page 5, left-hand column, first paragraph.

The following North American locomotives were motor-generator machines that converted the single-phase AC to DC for the traction motors. All but one of these electrifications were at 25 Hz. (The specified page numbers refer to Reference [1]).

- a. Detroit, Toledo and Ironton Railroad. Operated 1925 to 1930. Two units, 22kVAC to 600 VDC. (Pages 372-374.)
- b. Carol Mining Division of the Iron Ore Company of Canada (near Labrador City, Province of Labrador, Canada). Operating from 1963 to the present. Nine units, 2.3kVAC (60 Hz) to 600 VDC. (Pages 406-407 and 435.)
- c. New York, New Haven and Hartford Railroad. Class EF-2 freight locomotives (seven units) from General Electric. Operated 1926 to early 1950's. 11kVAC to ?VDC. (Page 97.)
- d. Great Northern Railroad. 11kVAC to various DC voltages. Locomotive classes: Z-1 (of 1926 and 1928), five units; Y-1 (of 1928 and 1931), eight units; and W-1 (of 1947), two units (all retired 1956). Note; seven Y-1

units were used by the Pennsylvania Railroad (1957-1962). (Pages 167-173.)

- e. Virginian Railroad. Locomotive class EL-2B (four units). Operated 1948 to 1962. 11kVAC-600 VDC. (Pages 195-199.)

Page 6, Figures 3 and 4.

Pictured is a model of a three-phase high-voltage (12 kV) highspeed (200-250 km/h) Siemens and Halske railcar from 1901. This sample car (and a similar AEG railcar) were tested on a 22.5 km German military railroad (Zossen-Marienfelde, near Berlin) during 1901-1903. The three-wire "catenary" was only on one side of the single test track. (Details may be found in Reference [2]).

Page 6, right-hand column, second paragraph.

The mentioned 25 Hz phase balancer (three-phase input to single-phase output) was in use from 1914 (when the initial segments of the Philadelphia-to-Paoli suburban electrification were energized) until 1971 (probably when PECO de-energized its last 25 Hz three-phase generator). (See "Schuylkill" in Reference [3])

Page 7, right-hand column, third paragraph.

Note that Figure 9 was not printed in this publication. Also, the existing Richmond motor-generator frequency converters were capable of being directly fed by the 13.8 kV bus of PECO's Richmond Generating Station before that facility was retired. (See Figure 8 on page 7.)

Fred M. Perilstein, P.E.
Springfield, New Jersey

References

- [1] Middleton, William D.; "When the Steam Railroads Electrified", 1974, Kalmbach Publishing Company, Milwaukee, Wisconsin.
- [2] Haut, F. J. G.; "A History of the Electric Locomotive, Volume II, Railcars and the Industrial Locomotive", 1981, A. S. Barnes and Company, La Jolla, California. Pages 34-37.
- [3] Jones, Andrew L.; "A New Power Supply for the Northeast Corridor", 1993 ASME/IEEE Joint Railroad Conference Proceedings, page 59. See the table labeled, "Original 25 Hz Traction Power Supply".

Chapter News & Meetings

Gaspar Messina, Senior Editor

Note to VTS Chapters

VTS Chapters world-wide are eligible to receive \$100.00 U.S. at the end of the calendar year for submitting L-31 Meeting Attendance Forms reflecting their Chapter's periodic meeting to VTS Chapter Activities Chairman.

Gaspar Messina,
9800 Marquette Drive,
Bethesda, Maryland 20817, U.S.A.

Philadelphia, Pennsylvania

This chapter has held two meetings recently. The first, on 8 March 2000, was an update on Amtrak's High Speed Programme, which was given by Mr Frank Grabouski from LTR Engineering. Then on April 12, Mr John Samean from Systra gave a talk on "SEPTA's Market Frankford Subway Elevated Line Automatic Train Control Project".

New York Section

The IEEE NY Section Vehicular Technology and Communication Society Chapters will co-sponsor a technology-sharing forum: **Rail Signal System Innovations Forum** on October 18, 2000, 6:00 to 8:00 PM at **Nortel Networks** 320 Park Avenue, (50th ST) NYC.

Lead panelists will explain and answer questions on the Communication Based Train Control (CBTC) system that is being developed for the Southeastern Pennsylvania Transportation Authority and the new signal system being developed for the Southern New Jersey Light Rail Transit System with a shared Right-of Way for freight service.

Lead panelists are **John LaForce** and **Brian Middleton**. John is an IEEE Member, Voting Member on the IEEE CBTC Standards Committee, and Deputy Chief Engineer Operations for SEPTA. Brian is the Booz-Allen & Hamilton Rail Systems Project Manager working on the NJ Transit Southern New Jersey Light Rail Transit System. Systems engineers, suppliers, installers, and operators are invited to share insights.

Future IEEE NY Section, Vehicular and Communication Society Technology Sharing forums are being planned for:

- Fiber Optic Communication networks for Rail Vehicle control,

- NYC Transit R-143 Rail Car propulsion, control, and signage,
- Automatic Bus Location and Control Systems, and
- Wayside and Railcar PA and Customer Information Systems

There is a \$35.00 charge for the forum and refreshments commencing 5:30 PM. **Advance registration is required for admission.**

IEEE Members and non-members may register for the October 18,2000 forum by sending \$35.00 checks payable to IEEE NY Section to RT&T Inc., 30 Woodlake Dr., Croton-on-Hudson, NY 10520. IEEE Members please provide membership number and indicate interest in participating on one or more of the planned forums.

Benelux

The Joint Chapter on Vehicular Technology and Communications made three best paper awards at VTC'99-Fall last September. These were:

- To **Y-C Liang, F Chin,** and **K Y Ray Lui** for "Downlink beamforming for DS-CDMA Mobile Radio with Multimedia Services"
- To **A S Stefanov** and **T M Duman** for "Turbo Coded Modulation for Wireless Communications with Antenna Diversity"
- To **J S Hammerschmidt, A A Hunter** and **C Drewes** for "Comparison of Single Antenna, Selection Combining and Optimum Combining Reception at the Vehicle"

Communications Symposium 2000

Also from the Benelux, the Chapter will be holding this event on 19 October 2000 at the IMEC Auditorium in Leuven, Belgium. Guest speakers include Prof Hikmet Sari, Pacific Broadband Communications, Prof. Savo Glisic, University of Oulu, Prof Lajos Hanzo, University of Southampton and Prof. Arogyaswami Paulraj from Stanford. Further details of the event can be found on <http://www.imec.be/IEEE-VTC/>

VTS News

Call to Members in the Boston Area

VTS is looking for a member who would like to take on the challenging opportunity of Chairperson which would both mold a chapter to the Boston, MA environment, and grow professional in the process.

If interested please provide a description of VTS Activities and interests to Gaspar Messina, VTS Chapter Activities Chairman at 9800 Marquette Drive, Bethesda, Maryland 20817 or Fax: 202-418-1412.

A selection committee will make the choice. The individual selected will receive full support in forming a chapter from the VTS Board of Governors.

The individual selected will have to take over on going work there from the interim chair for an upcoming conference in the Boston area this fall.

Convergence 2000 Venue Change

Due to the demand for exhibit space, the Convergence Conference has been moved to Cobo Hall in downtown Detroit from the Hyatt Regency in Dearborn where it has been held for over 20 years. The dates for the Conference remain the same i.e. October 16-18, 2000. Hotels in Detroit that are close to Cobo Hall include the Westin in Renaissance Center and the Marriot (formerly the Omni). See the article in this issue for further details.

Propagation Committee

We regret that Sam McConoughey was slightly misquoted in the report of the 21 February 2000 VTS Board of Governors' meeting. The result left the impression that the Propagation Committee was no more!

The full text should have read, "Sam McConoughey expressed concern over the apparent demise of the Propagation Committee's *selected reprint volume on Land-Mobile Communications Engineering*." This volume, originally issued in 1983, is a very useful compilation of many classic papers in mobile radio propagation, and as reported at the May Board meeting, plans are now well in hand for the reprint. A few missing words make all the difference here!

The IEEE VTS Propagation Committee's e-mail discussion-list has attracted almost 300 participants and

the Propagation web site has had a few thousand visitors since the committee was reactivated last year. Anyone with an interest in radiowave propagation is encouraged to contribute to both the on-line discussion and the web site content. For more information, please visit <http://members.home.net/propagation/> or contact the Propagation Committee Chair, Dr. Dave Michelson, <dmichelson@ieee.org>.

Al Gross Awarded LEMELSON-MIT Lifetime Achievement Award

Mr. Al Gross, IEEE-VTS Fellow, and member of the VTS Distinguished Speakers Program, received a prestigious honor April 27, 2000, when he was given the LEMELSON-MIT Lifetime Achievement Award both as a pioneer inventor for wireless communication devices, and for his tireless commitment as an invention educator.

The award ceremony was held at the American Museum of National History in New York City.

VTS Awards

Unfortunately our increased page budget has still been outstripped by the increase in material to publish, which has meant that the awards column for VTC2000-Spring has had to be held over to the next issue.

VTC 2001-Fall Web Site

The address of the web site for VTC 2001-Fall, which will be held in Atlantic City, New Jersey, 7-11 October 2001 has changed from a dot.com to a dot.org. The new address is <http://www.fallvtc2001.org> A Call for Papers for the conference will appear in the next issue.

VTS News Questionnaire Results

In the November 1999 VTS News, we published a short questionnaire to seek feedback on the areas members felt were most important for us to cover. Response to the questionnaire was quite good for a survey of this sort. In total, 45 responses were received.

Perhaps not surprisingly, there was unanimous support for the idea that it was important that the VTS has a newsletter. Anyone holding the opposite viewpoint would probably not have bothered to return the questionnaire. However, one respondent did point out that it was only important if it was done well.

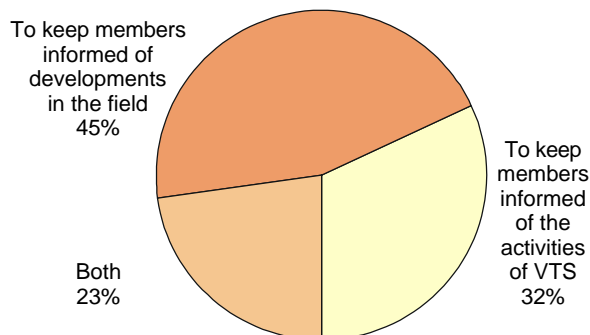


Figure 1 Primary Purpose of the VTS News

Responses to the second question, "Do you think that the primary purpose of the VTS News should be to keep

members informed about the VTS and its activities, or to keep members informed about developments in the area of the vehicular technology?", were interesting because although the intention was that the question be answered either/or, 23% of respondents picked both boxes. This includes almost all written responses – members filling out the questionnaire on the web found it physically impossible to choose both as it was set up as a radio box. Of those expressing a specific preference, technology developments were favoured.

The next question asked respondents to rate various types of articles on a scale of 1 (least important) to 5 (most important). The outcome is shown in Figure 2. The clear winner is technological reports on recent developments. Historical and review type technology articles, reports on VTS activities, conference reporters and the conference calendar come next along with government and regulatory development. Calls for papers and book reviews are not far behind. However, Board of Governors' minutes, chapter reports and reports on the IEEE activities do seem to be less popular. The latter is not particularly relevant to the VTS News as members can find the information out from other IEEE publications. The lack of interest in the first two, however, is disappointing.

The next question invited members to contribute to the VTS News. In fact about half of the respondents volunteered. Work and family commitments were the most common reasons for declining, although one member said

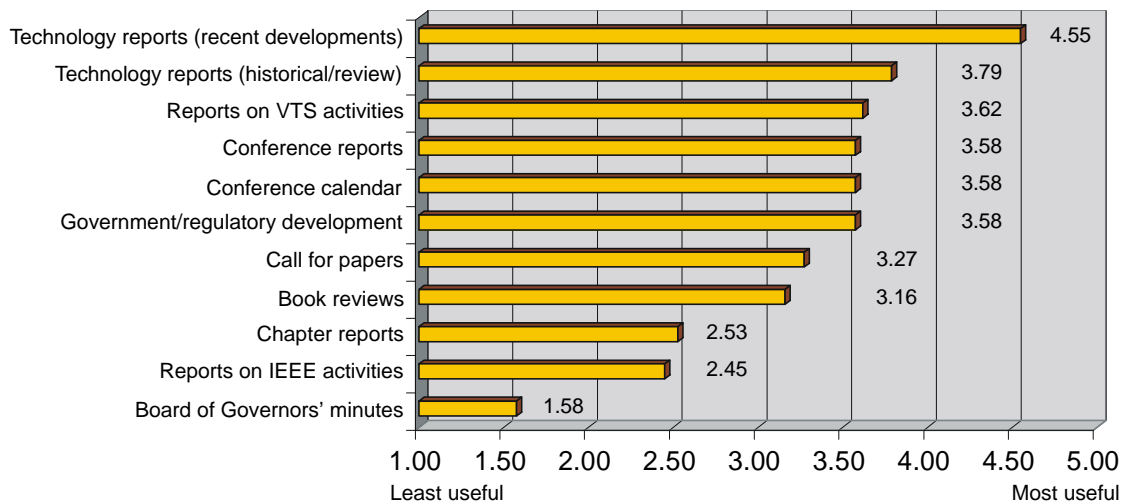


Figure 2 Ratings of usefulness of different types of articles

that at 85 years of age, he should not contribute. With that level of experience, the opposite should be the case.

Respondents were invited to specify one single thing which would improve the newsletter for them. While these are obviously very specific to the individual they are nonetheless interesting. Information on upcoming conferences or conference programmes in advance were cited by number of responses. Understandable technical articles were the theme of a number of responses, with the wish for review type tutorial papers, and articles from practising engineers. One respondent noted the importance of tutorial articles, since it can be difficult for academics and engineers to admit to gaps in their

knowledge. Requests for additional content range from the very general “overall increase in content” to requests for more land mobile radio communication articles and for more rail transit material, or a broader spectrum of coverage of transportation. The current format came in for praise, with the thematic grouping of articles and consistent format. The most innovative suggestion was for a “VTS people” column to list notable biographies.

Other comments were a few in number, but one sums up the whole exercise: “what is needed is value for money”.

For a response from the Editor, please see the Foreword on Page 1.

17th May 2000 VTS Board of Governors Meeting Report

The VTS Board of Governors' Meeting was held at VTC 2000-Spring in Toyko. President Kent Johnson was in the chair, with Board Members Charles Backof, Dennis Bodson, J. R. Cruz, Bob French, Anil Kripalani, Mel Lewis, George McClure, Sam McConoughey, Tom Rubinstein, Ray Trott, and Vice President Harvey Glickenstein. Also present at the meeting were Vijay Barghava, James Irvine, Jae Hong Lee, Tadashi Matsumoto and Reuvan Meidan.

Before the meeting started, a presentation was made to Tadashi Matsumoto in appreciation of his work for the conference. Mel Lewis, responsible for conference liaison, and Kent Johnson both agreed that he had set a new standard in conference organisation.

VTS President Kent Johnson reported that the new IEEE financial model, which would ‘tax’ societies to fund the central overspend based on members rather than surplus, has not yet been approved. This means that the claw-back is likely to be based on the amount of savings which each society has, so in effect the society was being taxed for doing a good job. Other societies are just as vocal in their opposition to the proposal. On other matters, in the 1998 citation report, Transactions in Vehicular Technology was rated 36th out of 208 for total number of citations and 51st out of 206 in terms of articles cited.

Kent Johnson said that there was a need for a Board Member to have responsibility for membership recruitment. The membership brochure also needs updating. James Irvine proposed over printing the next issue of VTS News so that all registrants at the next VTC receive a

copy. This can be done within the existing budget and was agreed. Dennis Bodson suggested checking who of the conference attendees were not members, and those who were not could be given free six-month memberships. Some of them may then renew at the end of the year. This technique has been used successfully by the Communications Society. It was agreed to pass on all ideas to the membership board member when appointed.

VTC 2001-Spring Chair Reuvan Meidan, reported on plans for the conference. The technical programme committee is now staffed and an organising committee is in place. A call for papers is now available, with a deadline of the end of September 2000. The social programme includes a tour of Jerusalem rather than a banquet. Attendees will receive a CD and a booklet with extended abstracts rather than paper proceedings. They had hoped to dispense with paper copies of the proceedings, but as the proceedings are part of the IEEE All Publications package, hard copies must be produced.

Ray Trott, Awards Committee Chair, gave a list of the awards which would be presented at the conference. Full details will be included in the next issue of VTS News.

Charles Backof, Treasurer, reported that there was an exceptional increase in conference income from closed conferences which went through the books in 1999. This made 1999 a very good one for the society, with a \$419,000 surplus from an income of \$1,636,100 and expenses of \$1,216,500. Transactions costs were increased for the year – this is caused by increasing the page count. Subscription

income increased due to an increase in the subscription charge for non-members. Given the transactions healthy ranking in the citation scale, IEEE headquarters had recommended another increase for non-members, but it was decided to scale this back due to the last increase, and the subscription will therefore rise from \$375 to \$385 for 2001. As of September 1999 there were 4545 members, 733 student members, 7 affiliates and 140 other members, making a total membership of 5436. It was noted that publications break even overall; profit in the transactions paying for the newsletter. Current reserves pay for one and a half years of running costs. Foundation accounts are generating enough income to offset expenses, and so are in good shape. The budget for 2001 was approved. It was also agreed to move \$100,000 to the long-term investment account.

Sam McConoughey, Past President and Elected Board Member, suggested that the society's founder, Jim Evans, was not fully recognised. He proposed that the Avant Garde award be changed to the James Evans Avant Garde award with a purpose-designed medal.

Administrative Matters : There was a surplus of about 90 sets of hardcopy proceedings from VTC in Tokyo. It was decided to revise the number of printed copies suggested in conference guidelines. After some discussion as to whether to sell the remaining copies off at below cost price, it was decided not to do so given the number purchased at full price. It was agreed that in future only the copies required will be printed, with members wishing hard copies having to register before the advance registration deadline.

Mel Lewis proposed that the society purchase a higher quality electronic camera for recording meetings in conferences to increase the graphic content in the newsletter and other publicity material. This was agreed.

VTS News Editor, James Irvine, reported an agreement for the next August edition of the newsletter whereby the Antennas and Propagation Society would publish publicity for the Vehicular Technology Society in their magazine, and the Vehicular Technology Society would reciprocate in the VTS News. George McClure agreed to write the page for the Antennas and Propagation Magazine.

Sam McConoughey asked whether advertising had been considered for the newsletter. While this has been done in the past, it was not particularly effective. After some discussion, it was agreed that the primary purpose of the newsletter was as a resource to members and not as a source of income, and so would not be appropriate to seek advertising. The Newsletter Editor proposed an update to the front cover to allow the tag line, "Connecting the Mobile World" to be made more prominent. This was agreed, as were proposals to increase the budget of the VTS News to allow for increased content and use of colour.

Web Based Wireless Course : Mel Lewis made a presentation on the wireless course. There is still some further work required to complete the course, but after discussing the current state of work the Board felt that given what had been learned, a better use of the time may be to write off the original course. It was agreed to report the comments back to the chair of the Education Committee, Yu-Dong Yao. It was further agreed to proceed with the IEEE/VTS videos proposed on *Wireless Networking* and *CDMA* as stand-alone ventures.

VTC 2003-Spring Chair, Prof. Jae Hong Lee gave a short report on progress. This was followed by a report on

VTC 2002-Fall by Chair Prof. Vijay Barghava. They have a contract with the Hyatt Regency in Vancouver for 24-28 September 2002, and room rates are approximately \$215 Canadian. They are aiming for about 350 oral papers, emphasising relevance, quality and industrial content. Vijay Barghava noted that many the papers in Tokyo were presented by students. This promoted some discussion on the relative merits of student participation and whether the conference committee should not plan on accepting more papers.

Dan Noble Fellowship Chairman, Charles Backof, who had already given his treasurer's report, reported on the Fellowship. They are planning to award the Fellowship in the fall.

Dennis Bodson, Chair of the Standards Committee, has updated web site with new rail standards. He is preparing for a new column for the VTS News from November. There is an online subscription scheme for new standards, and details of this will be included on web site. Dennis has recently been elected to the board of the IEEE Standards Association Board of Governors, where one of the entities he is responsible for is the VTS.

J. R. Cruz, Editor of the Transactions on Vehicular Technology, reported that the page count for the transactions for next year will be 2500 pages, which is the same as for last year. This increase had made a major dent in the backlog, and another year should allow the transactions to catch up. He has also tasked an associate editor to look at Manuscript Central, a program for electronically managing the review process for articles.

Bob French, ITS representative, reported that the last ITS Council meeting was in November 1999 and the next one was not planned until the first of October this year, so as yet there was nothing to report. The ITS Council is concentrating on its annual conference now it is established. He had agreed to review the ITS video and make recommendations regarding its possible updating to the ITS Council at its next meeting, which will be next October.

Anil Kripalani, Elected Board Member, agreed to take on responsibility for new member recruitment, and he will be assisted by George McClure, Sam McConoughey and Kent Johnson. The VTS brochure is to be updated.

Mel Lewis, Conference Coordinator, reported on the remaining conferences. **VTC 2000-Fall** in Boston is well under way. They have received over 1000 papers, and expect to accept around 700 of them. There is room to present 500 as oral papers, with the remainder as posters. Author notification is imminent. Only the Award Luncheon will be hosted; the remaining lunches will be pay-as-you-go lunch boxes with seating in the poster area to encourage networking. Five tutorials are arranged, with two more in the planning stages and the advance programme should go out in mid June. **VTC 2001-Fall** in North Jersey will be in the Sheraton Atlantic City Convention Centre Hotel between the 6th and 11th of October 2001, which avoids religious holidays. The IEEE will be handling registration, and a call for papers is being prepared. **VTC 2001-Spring**, **VTC 2002-Fall**, and **VTC 2003-Spring** were subject to separate reports earlier in the meeting.

Jim Worsham, Elected Board Member, sent in a written report on the past conferences which are not yet closed. The surplus from VTC'99-Spring exceeds \$72,000 and has been sent the IEEE, but the final audited accounts

are not yet available, and until this is received by the IEEE the money will not be released. This is being pursued. For VTC'99-Fall in Amsterdam, final figures are awaited, but initial indications are to expect a loss of around \$10,000. The 1997 Joint Rail Conference has now been closed out. The 1999 Joint Rail Conference is still open. There is currently a small surplus, but there may be some final bills to come in.

It was agreed that the fine for late close out of conferences, from this autumn onwards, will be charged to the chapter or section proportion of a surplus rather than shared between them and the VTS, since it is the chapter or section's responsibility to complete the accounts on time.

Bob Mazzola, Convergence Conference Committee Representative and Vice President Motor Vehicles, submitted a written report. He reported that Convergence 2000 had to be moved from the traditional Hyatt Regency Hotel in Dearborn to Cobo Hall in Detroit, Michigan due to the overwhelming need for additional exhibit space. He has also worked with Bob Fenton in selecting this year's Convergence Fellowship Award recipient. The Award, which includes a \$12,000 stipend, will be presented by President Kent Johnson at Convergence 2000 in Detroit.

George McClure, Publicity Committee Chair, reported on the chapter development work he has been undertaking in conjunction with Gaspar Messina. An e-mail reflector has been set up to make communications with chapters easier. Some chapters have been sending L31 forms as required to the IEEE in Piscataway, but not sending them to Gaspar Messina. In fact only three had done so. One problem was that there are many joint chapters with other societies. There was a subsidy of \$100

dollars to chapters who do send in the correct forms, and there is a need to advertise this. Gaspar Messina will be writing a report on the recent award for Al Gross for the newsletter.

Tom Rubinstein reported on **Conference Site Selection**. It had proved impossible to find anywhere in Region 9 to hold VTC in spring 2002. Birmingham, Alabama had proposed themselves as a site for VTC in spring 2003, and he proposed that this be the site for spring 2002. Some concerns were expressed regarding the draw of the location, and transportation links. After a vote, it was agreed to hold VTC 2002-Spring in Birmingham. For fall 2003, he had received an inquiry from Budapest, but due to location of spring 2003, the next conference should be held in North America. He will therefore suggest that they might think of spring 2004. On **new member liaison**, he has updated the letter from the President. A new member had suggested a compilation CD of conference records. He had made some updates to the **web site** since last board meeting, and has switched to a new domain vendor. The new vendor allows subdomains (such as conferences.vtsociety.org), as well as e-mail forwarding. The latter feature will be used to allow aliases to be set up for the various roles within the society (for example, president@vtsociety.org).

Eric Schimmel, Past President sent in a report stating that he hoped to start the election process in July to avoid having to hold a further board meeting after the one in September. Nominations were therefore required by the end of June.

The next Board meeting will be held at VTC2000-Fall in Boston.

Meeting Report – Next Generation Wireless Networks

Mel Lewis

VTS is pleased to report on a symposium on "Next Generation Wireless Networks" The Vehicular Technology Society was represented on the organizing committee by Mel Lewis, who you also may know as VTS conference coordinator. This meeting was held on 26 May 2000 at NJIT (the New Jersey Institute of Technology, in Newark).

This one day event was presented by the New Jersey Center for Wireless Telecommunications, NJCWT, which is a consortium of four research universities (NJIT, Stevens-Tech, Princeton, and Rutgers). The NJCWT has four focus areas: Propagation and RF Engineering, next generation wireless transceivers, wireless networking, and services/applications/technology transfer. The NJCWT conducts frequent seminars, workshops, and symposia on the topic.

We also learned that the center is backed by the New Jersey Commission on Science and Technology, with first year support of over one million dollars from that agency. Administration of the NJCWT is located at NJIT, and led by Prof. R. Haddad, its director (haddad@adm.njit.edu).

There were over 60 attendees - representing academia, industry, the IEEE, and government. The call for papers resulted in speakers from 3 continents (Australia, USA, and Europe). Dr. S. -T. Mau, dean of the Newark College of Engineering, a unit of NJIT, gave the welcoming address. Dr. Sirin Tekinay, associate director, (teki-

nay@adm.njit.edu) gave an overview of the center (refer to www.njcwtt.org for much more information).

The theme of the symposium was wireless networks, characterized by new architectures allowing broadband services (voice, data, image, video) via circuit and packet switched environments, with emphasis on wireless access to the internet and location-aware wireless services.

The morning session covered such topics as mobility tracking as applied to wireless internet service, Infostations, InfoCity (and QoS to mobile hosts), wireless ad hoc networks and geo-location. There were also talks on wireless broadband multimedia and IP applications via mobile ATM satellites.

The afternoon session, was just as cutting-edge, with 4 papers on such topics as assisted-GPS for wireless phone location, evaluation of location determination technologies, GSM mobile positioning trials. A popular presentation described a merger of wireless, geolocation, and life sciences in a unique product which is under development by NJCWT and a newly formed company. There was a paper on enhancing coverage and fault recovery using geolocation, and finally a talk on designing a killer application (UMTS applications development).

A printed bound handout was available with registration, and a formal proceedings will soon be available (with extended versions of the papers) from Kluwer Academic Publishers.

Call For Papers

VTC2001-Spring

May 6-9, 2001

David Intercontinental Hotel, Tel Aviv, Israel

The VTC 2001-Spring will be held in Tel-Aviv, Israel. At this moment in time, the industry is at the brink of a revolutionary leap forward. That of moving from the plain telephone services to the new era of multimedia, internet and e-commerce services all for the mobile user. In view of the commercial success of wireless mobile telephony on one hand and the wireline internet on the other, their marriage is very much in focus of society and the focus of our conference. On this background papers are solicited along the following primary areas.

- ◆ **Antennas & Propagation (01)**
Adaptive Antennas and Arrays, Channel Measurement/Modeling/Prediction, Indoor Propagation.
- ◆ **Wireless Access (02)**
Multiple Access Technology, Spread Spectrum Technology, OFDM Techniques, Access Protocols, Channel Assignment, Spectrum Efficiency, Resource Allocation, 4G Methods.
- ◆ **Transmission Technology (03)**
Modulation/Demodulation, Source/Channel Coding, Interference Rejection, Equalization and Synchronization, Multiuser Detection, Software Radio, Transceiver Design.
- ◆ **Multimedia, Network, and Systems (04)**
Mobile Multimedia Technology, Mobile Data/Computing/Navigation Networks, Wireless Packet Networks, Media Access Control, Enhanced Mobility IP.
- ◆ **Wireless Personal Communications (05)**
IMT-2000, Broadband Mobile Communications Systems, Cellular Technology, Location Techniques, 2.5G and 3G System Performance, Radio Network Design, Power Control Techniques, SS7/AIN meets IP
- ◆ **Mobile Satellite Communications (06)**
Mobile Satellite Communications, LEO/MEO/GEO Networks, Navigation
- ◆ **Transportation Applications (07)**
Intelligent Transportation/Vehicle systems, Vehicular Electronics, Communication Interfaces for Vehicle Operators.
- ◆ **Applications (08)**
Wireless Internet Methods, Wireless E-Commerce, Software agents, Hybrid Solutions.

Authors should submit an extended abstract up to 2 pages. Forms for submission are, camera ready (in 3 original) hard copies, or soft copy in MS Word, PDF or PS. The submission must include the name, complete return address, telephone and fax numbers, the designation number of the Technical Subject Areas of the paper, and e-mail address of the authors. Submissions should be sent to:

The VTC 2001 Secretariat,
Dan Knassim Ltd.
P.O.Box 193 1, Ramat Gan 52118, Israel

Web-Site:<http://www.congress.co.il/ieee-new>
Tel: +972-3-6133340 (Ext. 209), Fax: +972-3-6133341
Email: vtc2001@congress.co.il

Important Dates

- ◆ Abstracts due by **September 30th, 2000**
- ◆ Notification of acceptance **December 15th, 2000**
- ◆ Submission of full paper by **February 15th, 2001**

2001 IEEE/ASME Joint Rail Conference

April 17-19, 2001

Toronto, Ontario, Canada

New applications of technology in the railroad and rail transit industries are presented periodically at conferences and trade shows. The annual IEEE/ASME Joint Rail Conference offers a unique and comprehensive technical forum. Welcome the new Century and new Millenium at the 2001 Conference in Toronto. Join your peers to share information, learn about technology progress, share operating experience, and find new approaches to current and future challenges.

The Conference is sponsored by the Land Transportation Division of the Vehicular Technology Society (VTS) of the IEEE, and the Rail Transportation Division of the ASME

Papers are invited covering topics of current interest in system design, hardware/software development, transportation technology, service experience, or related issues. Papers are solicited from members of the supply industry, rail transportation corporations and rail transit agencies, governmental agencies, consulting/engineering firms, academia, technical organizations, and others for presentation and discussion at the Conference. Prizes will be awarded to the top 3 IEEE papers presented.

This year's conference will feature a special theme: New Technology to Meet the Rail Industry Challenges of the 21st Century. Papers in this area are especially appreciated. All papers of interest are welcome on:

- ◆ Rail transportation, high speed passenger rail, heavy rail transit, light rail transit, automated people mover, and magnetic levitated systems.
- ◆ AC and DC traction propulsion and control systems, electric power distribution and energy efficiency.
- ◆ Signal and communication systems, automation and microprocessor control, Communications-Based Train Control (CBTC), and EMI/EMC issues.
- ◆ Automated train dispatching, data management systems, and operation control centers.
- ◆ Maintenance procedures, monitoring and fault detection, safety and quality assurance programs.
- ◆ Computer modeling and simulation of transportation systems.
- ◆ New starts and renovation projects.
- ◆ Rail-Highway Intersection Warning Systems and related ITS applications.
- ◆ Other applications of electrical or electronic technologies in rail transportation.

Authors are requested to submit 200-300 word abstracts in 5 printed copies. Electronic mail submission preferred. If submitting by mail or fax, please forward a diskette copy of your abstract, preferably in Microsoft Word 97 format

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Important Dates

- ◆ Abstracts due by **October 1st, 2000**
- ◆ Notification of acceptance **November 15th, 2000**
- ◆ Submission of full paper by **January 15th, 2001**

Conferences of Interest

The following table shows VT-06 sponsored and co-sponsored conferences as well as related conferences not sponsored by the Society. While every attempt was made to ensure accuracy, you should contact the respective conference committee to confirm date and location.

DATE	CONFERENCE	LOCATION	WEB PAGE
22-25 August 2000	ISAP	Fukuoka, Japan	http://www.crl.go.jp/pub/ISAP2000/
10-13 September 2000	RAWCON '00	Denver, CO	http://rawcon.org
12-14 September 2000	European Wireless 2000	Dresden, Germany	http://www.comnets.rwth-aachen.de/Wireless2000/
18-21 September 2000	PIMRC 2000	London, United Kingdom	http://www.pimrc2000.com
23-28 September 2000	WCNC 2000	Chicago, IL	http://www.wcnc.org/2000
24-28 September 2000	VTC2000-Fall	Boston, MA	http://www.vtc2000.org
1-3 October 2000	3rd IEEE Conf. on Intelligent Trans. Sys. ITSC-2000	Dearborn, MI	http://www.ewh.ieee.org/tc/its/itsc2000/cfp-itsc-2000.html
1-4 October 2000	Mobile Communications Summit 2000	Galway, Ireland	http://www.mobilesummit.ie/
4-5 October 2000	2000 European Conference on Wireless Technologies	Paris, France	http://www.eumw.com
4-5 October 2000	IV 2000 IEEE Intelligent Vehicles Symposium	Dearborn, MI	http://WWW.CE.UniPR.IT/iv2000/
16-18 October 2000	Convergence 2000	Dearborn, MI	http://www.convergence2000.org
19 October 2000	Communications Symp. 2000	Leuven, Belgium	http://www.imec.be/IEEE-VTC/
22-25 October 2000	MILCOM 2000	Los Angeles, CA	http://www.milcom2000.org
6-8 November 2000	APWC '00	Waltham, MA	http://www.eece.unm.edu/apwc2000
6-9 November 2000	7 th World Congress on ITS	Turin, Italy	http://www.torino2000.itscongress.org
12-15 November 2000	WPMC-2000	Bangkok, Thailand	http://www.tc.ait.ac.th/wpmc.htm
19-23 November 2000	ICCS 2000 7 th IEEE Singapore Int Conf on Communications	Singapore, Singapore	http://iccs.cwc.nus.edu.sg/
22-25 November 2000	5 th CDMA International Conference CIC 2000	Seoul, Korea	http://cic.etri.re.kr
27 November – 1 December 2000	Globecom 2000	San Francisco, CA	http://delson.org/si/gc00/
17-20 December 2000	ICPWC '00	Hyderbad, India	http://www.citr.ece.uvic.ca/icpwc2000
20-22 February 2001	EPMCC 2001	Vienna, Austria	http://www.epmcc.com ✓
17-19 April 2001	Joint Rail Conference	Toronto, Canada	See previous page ✓
6-9 May 2001	VTC 2001-Spring,	Tel Aviv, Israel	http://www.congress.co.il/ieee_new/ ✓
11-15 June 2001	ICC2001	Helsinki, Finland	http://www.icc2001.com ✓
9-12 September 2001	WPMC'01	Aalborg, Denmark	✓
7-11 October 2001	VTC 2001-Fall	Atlantic City, NJ	http://www.fallvtc2001.org
Spring 2002	VTC 2002-Spring	Birmingham, AL	
September 2002	VTC 2002-Fall	Victoria, BC	mailto: bhargava@enr.UVic.CA
Spring 2003	VTC 2003-Spring	Seoul, Korea	mailto:m.lewis@ieee.org

Conferences marked '✓' have open calls for papers as of 31 August 2000. This list is based upon the conference calendar at our web site, which is updated more frequently than this list can be. To access it go to the following URL: <http://www.vtsociety.org/>, then click on "Conference List" in the left frame.

Corrections and additions to this list are most welcome. We are particularly interested in adding listings for Automotive and Transportation conferences. Please send corrections and additions to Tom Rubinstein at t.rubinstein@ieee.org.