

IEEE VTS NEWS DIGEST

Connecting the Mobile World

Companion to VTS News, Volume 48, Issue 4 November 2001

Features

- 3 cdma2000 1X: New Capabilities for CDMA Networks
- 3 The Evolution of GSM-R
The New European Wireless Standard for Railways
- 3 Speech Processing for Vehicles: What's Next?
- 5 California Fuel Cell Partnership HQ Opening

Contents

- 1 Foreword
- 2 VTS Directory
- 4 Standards
- 4 Transportation Systems
- 4 Automotive Electronics
- 4 Mobile Radio
- 6 News
- 7 VTC2002-Spring in Birmingham, AL, 5-9 May 2002
- 8 8 May 2001 VTS Board of Governors Meeting Report
- 10 JRC2002 in Washington D.C.
- 11 VTC2002-Fall in Vancouver
- 12 Calendar of Events

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

Well, the new generation of mobile phones has well and truly arrived. cdma2000 networks have been operating for some time now, but the Japanese launch of NTT DoCoMo's FOMA Freedom of Mobile Multimedia Access has been much anticipated since it uses the rival WCDMA system which requires the deployment of a new air interface rather than the upgrade of an existing one. A large amount of money is resting on the outcome, not just in terms of the cost of the new infrastructure, but in the spectrum licences which network operators have mortgaged their networks to buy.

Early signs are good. NTT DoCoMo's trails were oversubscribed, and it sold 4000 of its terminals on the first day for a service which is currently only available in Tokyo. The terminals are not cheap ¥48,000 (\$400) for a standard terminal and ¥68,000 for the video phone, while a PC card data terminal for a laptop costs ¥28,000 so it would seem that there is a market for unsubsidised terminals.

A slow take up in Japan would force a serious re-think amongst operators in other markets, which explains much of the nervousness amongst operators at the moment. Sir Christopher Gent, Chief Executive of Vodafone, summed up this mood when he said that he was grateful to DoCoMo for doing this first. However, the converse is not necessarily true. The take-up of i-mode, which continues

its inexorable upward march, is not mirrored by similar WAP services in other markets.

WAP has been predominantly deployed over circuit switched bearers, whereas i-mode uses packet switching, but while this would make WAP inherently more expensive, even when network operators provide free WAP access to their own portal, take-up has been slow. It is not the technology which is the differential here; the data rate of i-mode is only 9.6kbit/s. However, DoCoMo has been very successful at getting other content providers to provide i-mode sites, and this aspect of the business has not been repeated with WAP. 3G gives higher data rates, although not all that much greater than enhanced 2G networks in the first instance. However, except for a PC card in a laptop, the Internet experience will still be constrained, this time by the size of the terminal itself. Japan has i-mode over 3G to fill this gap, but an open question is where this content will come from in other markets.

Over the next few months we will be publishing articles on the different 3G technologies, starting with cdma2000 in this issue. However, the technology has arrived. cdma2000 and WCDMA are here. EDGE still needs chipsets for which the target is next year, but the GPRS 2.5G service is currently being deployed. The new focus needs to be on services they are the new challenge for mobile systems.

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Feature Articles in the November Issue

cdma2000 1X: New Capabilities for CDMA Networks

Edward G. Tiedemann, Jr., QUALCOMM Incorporated

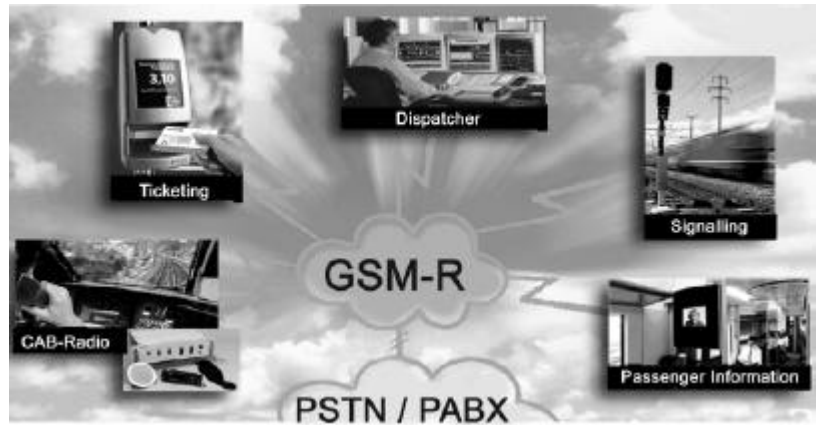
cdma2000 is the first of the new 3G mobile technologies to be deployed in revenue earning service. In the first of a series of articles on the new radio technologies for future mobile systems, Qualcomm's Senior Vice-President of

Engineering, Edward Tiedemann, introduces cdma2000 and describes its relationship to the TIA/EIA-95 systems it has evolved from.

The Evolution of GSM-R The New European Wireless Standard for Railways

Robert Sarfati, SYSTRA Group

In 1993, the UIC decided to use GSM as a basis for a standardised radio communication system for railways within Europe, GSM-R. The Robert Sarfati of SYSTRA, Project Manager of the MORANE project, which was set up in order to conduct trials on the system, discusses the standard and its motivation.



Speech Processing for Vehicles: What's Next?

Thomas Kuhn, TEMIC TELEFUNKEN microelectronic GmbH

Robert Theis, TEMIC Automotive of North America, Inc.

The human voice is and remains the best form of communication. Therefore, spoken language interfaces to computers are a topic that has engaged engineers and speech scientists since the fifties. Once limited to the realm of science fiction, speech technology has now passed the threshold of practicality. The commercial deployment of these systems has already begun, although the applications are still specialized for certain purposes. This paper presents a speech recognition system that is particularly

suited for drivers and passengers in a vehicle environment. The first chapter is describing a typical system design of today. Tens of thousands of these units are already in use. Thereafter a future system design will be described, in which the voice control of a navigation system is the most challenging problem. Finally the paper shows as an outlook, what comes next after the future. In particular, distributed speech processing systems will be used based on client-server architecture.

Regular Columns in the November Issue

Automotive Electronics

Bill Fleming, Senior Editor

These are the items covered in the Automotive Electronics column in the November 2001 VTS News. Please see the printed version for the full article.

- Gasoline-Electric Hybrid Vehicle Sales Spurt
- Intelligent Engine Cooling
- Saturn Continuous-Variable-Transmission
- Next-Generation Automatic High Beam Control
- How Distracting Are Cell Phones?
- Handheld Cell Phone Ban Spurs Telematics

Transportation Systems

Harvey Glickenstein, Senior Editor

These are the items covered in the Transportation Systems column in the November 2001 VTS News. Please see the printed version for the full article.

- Florida passed a constitutional amendment requiring the state to build a high-speed rail system in the November 2000 election. The law implementing this amendment has been passed by the legislature and signed into law by Governor Bush. It sets up a 9-member High Speed Rail Authority and provides \$4.5 million for the first year of funding.
- Alstom unveiled its first Pendolino tilting train for use in the UK in July. The trains, which are being manufactured in Birmingham, are scheduled to be delivered to Virgin, operator of the West Coast Main Line, starting in November
- Bombardier Transportation, in consortium with Alstom, has received an order from RATP (the transport authority for Paris) for 161 five-car MF-2000-type rail rapid transit units - a total of 805 rail rapid transit cars.
- Portland has opened a new streetcar system in downtown. This system is supplementary to the existing MAX light rail system, which was scheduled to open its airport extension in September.
- New Jersey Transit (NJT) formally retired its President Conference Committee (PCC) cars that had been running in the Newark City Subway. On Monday, August 27 NJT began operating new light rail vehicles (LRVs) in the subway.

Mobile Radio

Javier Gozalez, Senior Editor

These are the items covered in the Mobile Radio column in the November 2001 VTS News. Please see the printed version for the full article.

- Migration to 3G: TDMA and CDMA
- 3G trials and roll-out
- Technology and research news
- M-commerce and location-based services
- Initiatives and Forums
- FCC & US mobile market
- Mobile satellite communications
- Mobile phones and health concerns
- Wireless industry forecasts and surveys
- Spectrum licenses
- Wireless LAN and Bluetooth
- Asian mobile market
- African mobile market
- Other news

Standards

Denis Bodson, Senior Editor

These are the items covered in the Automotive Electronics column in the November 2001 VTS News. Please see the printed version for the full article.

- cdma2000 1xEV-DO recognized as a IMT-2000 standard
- TIA published New Project 25 Standard
- DECT/GSM interworking
- ETSI releases report on HIPERLAN interworking with 3G
- Distributed Speech Recognition is included in 3GPP
- IEEE-SA Board of Governors
- IEEE-SA Standards Board Meetings
 - June 2001 IEEE-SA Standards Board Meeting
 - Target Extension Requests:
 - Revised PARS
 - September 2001 IEEE-SA Standards Board Meeting
- IEEE Standard Helps Us Connect In A Wireless World
- IEEE 802 Standards Group Authorizes Wireless Coexistence Study
- Recently Published IEEE LAN/MAN Standards

California Fuel Cell Partnership HQ Opening

Don McGrath and Bob Wing

The world's largest assembly to date of fuel cell electric vehicles marked the opening of the California Fuel Cell Partnership new headquarters in West Sacramento. Don McGrath and Bob Wing report on the event and the vehicles on display.

At a ceremony attended by more than 400, the doors to the newly constructed California Fuel Cell Partnership headquarters facility were opened on November 1, 2000. The new 55,000 square-foot facility includes a hydrogen fueling station, offices, work bays for partnership members, and a public gallery with educational exhibits, fuel cell models, and an interactive kiosk. The facility will house more than 50 fuel cell vehicles that will be tested on California's diverse roadways in real world driving conditions. Twenty fuel cell buses will also be demonstrated in regular transit operations.

The California Fuel Cell Partnership was formed in April 1999. The Partnership (www.fuelcellpartnership.org) is intended to promote development and public acceptance of FCVs over the next four years.

Many of the participating partners and associates gave brief presentations before the exhibits opened. Ride and drive opportunities were provided later.

For the first time in history seven different manufacturers of fuel cell cars were gathered together at one time for this event. Three fuel cell buses were also demonstrated.

This was by far the most exciting of any EV show exhibits to date, surpassing the excellent exhibits at EVS-12 at Disneyland, California and EVS-14 at Orlando, Florida. These fuel cell vehicles provide us with a look at the future of ultra low pollution transportation.

Inaugural Ceremonies

The inaugural ceremonies were emceed by Alan Lloyd, Chairman of the State of California Air Resources Board, who introduced the Partner members. Partner members today include automakers DaimlerChrysler, Ford, General Motors, Honda, Hyundai, Nissan, Toyota and Volkswagen; energy providers BP, Shell, and Texaco; fuel cell companies Ballard Power Systems and International Fuel Cells (IFC); and state and national agencies concerned with clean transportation.

John Wallace, executive director of Ford's TH!NK group and Chairman of the Partnership Steering Committee, was then asked to introduce the Associate Partners assisting in certain specialties include hydrogen gas suppliers Air Products and Chemicals, Inc., and Praxair; Methanex, a methanol fuel supplier; and bus transit companies AC Transit, operating in the San Francisco Bay area, and Sunline Transit Agency, Palm Springs, CA.

Following the introductory talks, a hydrogen fueling demonstration was given, using a Honda's new FCX-V3. After the fueling demonstration, visitors were treated to a parade of prototype Fuel Cell Vehicles (FCVs), which included the Ford P2000, the Ford Focus FCV, the Honda FCX-V3, Volkswagen's Bora HyMotion, the DaimlerChrysler NECAR 4, the Nissan FCV, and

Hyundai's Santa Fe FCEV. Parked nearby were three FCBs (Fuel Cell Buses), two XCELLSIS-powered buses, one being tested by Sunline and the other owned by the Federal Transportation Administration, and a bus by Daimler Benz.

Hydrogen Storage

The West Sacramento hydrogen fueling station is modeled after similar facilities in Dearborn, MI and Nabern, Germany. Liquid hydrogen is delivered by truck and stored in a 4,500 gallon tank. At present, it provides gaseous hydrogen at two pressures, 3,600 psi and 5,000 psi. The dispensers look a lot like a gas station hose, one size filler nozzle for cars at the lower pressure and another set for busses. Fueling is quick and automated, taking just four minutes. Methanol distribution is expected on-site later. If there is a need for delivery of liquid hydrogen in the future, the capability can be easily added.

Exhibits and Ride and Drive

The **Honda FCX-V3** is a truly fine piece of engineering. It is based upon the EV+ platform. With regenerative braking power pumped into an ultra capacitor developed by Honda, it is quiet, has very peppy acceleration, and has very adequate room in both front and back seats. Instrumentation is similar to that of the EV+ but is totally new, designed for FCV operation. Honda's 3rd generation FCX has a 10-second start-time, compared to 10 minutes for previous models. The fuel is pure hydrogen stored at 3600 psi in a 100 liter composite carbon fiber tank. The FCX-V3 has a 60 kW motor, weighs 1750 kg (3850 lbs) with a range of 110 miles.

The four-door **Ford Focus FCV** is based on the Focus gas car and labeled as being powered by TH!NK to highlight the company's environmental brand. The heart of the car's drive train is a Ballard Mark 900 fuel cell stack. This model has a 67 kW motor capable of speeds up to 75 mph but no regeneration. In the Ford work bay there were several other Th!nk models, a smaller two passenger for local street use at under 35 mph and a golf cart type with roof but no doors for use in gated communities. Ford has set up a new assembly plant for alternative fueled vehicles at Carlsbad, California, north of San Diego, with John Wallace as Executive Director. Th!nk models will be assembled there. Ford, along with DaimlerChrysler, is a major investor in Ballard and part of joint ventures with the two of them for marketing both fuel cell power plants (XCELLIS) and electric drive trains (Ecostar).

The **Ford P2000** fuel cell passenger car is a 4 door sedan with a curb weight of 3340 lbs, 100 mile range, Ballard Mark 700 Series fuel cells, 67 kW motor with peak efficiency of 91%. The Ford P2000 was driven in the Ride and Drive. The P2000 is a first generation vehicle, superseded by the Focus FCV. Acceleration was only fair, and there was a lot of noise from the air compressor used to inject air into the fuel cell. Based upon the specifications, the Focus FCV should be a significant improvement, but unfortunately, there was no time to test drive it.

The **Hyundai FCEV** had its first public showing at West Sacramento and is a light weight aluminum chassis based on the gas Santa Fe SUV. It uses International Fuels FCs which produce 75 kW of power and is built on an aluminum chassis, 65 kW motor. It is equipped with a 5000 psi storage tank enabling the vehicle to go more than 100 miles on one fueling. Electric drive train, motor and control unit are from Enova systems of Torrance CA. Top speed is 77 mph, range 100 miles and weight 1,620 kg (3,572 lb), 0-60 in 13.4 sec, and a starting time of 10 secs.

The **DaimlerChrysler NECAR 4** (new electric car) was test driven. It is quite small, roomy enough for two adults in the front seat but the back seat only large enough for children. Acceleration was adequate. An unusual feature was the regenerative braking system, which was used to heat water, presumably for passenger cabin heating.

The **DaimlerChrysler NECAR 5**, also called the California NECAR, is based on the Mercedes-Benz A-class and was especially built for the California Fuel Cell Partnership showing. It has a 50 kW electric drive system, a Ballard Mark 900 Stack with an output of 75 kW. The stack weighs on about 2/3 of the NECAR 4 unit and takes up only half as much space. As a result the entire passenger and luggage compartment can now be used to full capacity. Top speed is 90 mph, and range is about 120 miles.

The **GM Opel** fuel cell car is GM's seventh generation model, it was developed in Germany and the US and it is based on an Opel Zafira 5-seat passenger van which half the size of GM's previous model and 25% smaller than its nearest competitor. This was used as the pace car at the 2000 Olympic marathon in Sydney, Australia last summer. Costs are reduced as the fuel cell requires only half the platinum previously used. A commercial version is at least 4 or 5 years away. This car model is half the size of GM's previous model and 15% smaller than its newest competitor. Reporter Bob Wing can attest to that! He had trouble getting his six foot frame through the door and into the seat. In fact all of the models in the ride and drive were a tough fit for head room. The Zafira has a range of 250 miles per liquid hydrogen fill, and an 87 mph top speed.

The **Nissan Xtera FCV** was shown to EVS-17 in Montreal. No other information was available on this car at the

show, nor was a Toyota FC observed. The **VW Bora Hymotion** was shown only as a mock up.

Panel Discussion

In the afternoon, Mr. Wallace chaired a panel of 22 experts from automobile companies, energy companies, fuel cell manufacturers and government. All agreed that many obstacles must be overcome, including lack of infrastructure, high cost, and short vehicle range. The partnership is still in a pre-competitive phase and a cooperative effort is essential. The path to a hydrogen economy is not clear. The general public's first exposure to fuel cells will likely not be FCEVs. It's much more likely that the first consumer-oriented products will be auxiliary power units and portable power supplies. Consumers will not buy FCEVs because of low emissions. An example is the failure of battery EVs to create a market. Consumers will only buy FCEVs if and when it is economically advantageous to do so.

Several speakers felt that fuel cells had a great future in distributed power, particularly in areas where there is no well established or extensive power grid. As for vehicles, the first applications will be for public transportation (e.g., buses) and for fleets. The most often quoted date for introduction of is 2004.

Bob Wing (bwing@svn.net, POB 277, Inverness CA 94937-0277.) is an EV consultant and Book Review Editor, Electrifying Times. A past West Coast Editor, EV News/Advanced Technology Vehicles, he is now driving a leased Ford Ranger pickup with NiMH batteries. He drove his 59 MGA Roadster as an EV test bed for 27 years, the last version with Zapi regeneration controller, Zivan charger and battery management system with 18 Optima sealed Pb-acid batteries.

Don McGrath (vinter@pobox.com) drives a 2000 Toyota Prius with a cruise control he installed himself, 10.4 gallons of gas from Napa to Los Angeles. He has converted a Fiat X1/9 to an EV using Zapi controller and Zivan charger and battery management system with sealed Optimawith sealed AGM batteries. Don McGrath and Bob Wing were the first two EV home converters in the US to have bought and installed the Italian Zivan battery management system.

VTS News

VTS Board of Governors Election Results

This year's ballot for IEEE VTS Board of Governors election was highly competitive, with nine candidates for the five positions which fall vacant this year. This year's successful candidates were:

Charles Backof
Dennis Bodson
Samuel R. McConoughey
Tadashi Matsumoto
Eric J. Schimmel

Charles Backof, currently Society Treasurer, Dennis Bodson, Executive Vice President, and Sam McConoughey, a Past President, are existing members of the Board. Eric Schimmel will be well known to members of the Society. An elected member of the Board of Governors until 1999, he is currently Vice President Mobile Radio and Senior

Past President, having been Society President during the period 1997-8.

Tad Matsumoto will also be familiar to members as the Secretary for the very successful VTC2000-Spring in Tokyo, which set records in terms of the surplus generated for the Society. Dr Matsumoto gained his B.S., M.S. and PhD degrees from Keio University, Yokohamashi, Japan in 1978, 1980 and 1991 respectively. After his Masters degree, he joined Nippon Telegraph and Telephone Corporation (NTT), serving variously in NTT DoCoMo and NTT America. He is currently a head of radio signal processing laboratory at NTT DoCoMo. Tad Matsumoto's election is a landmark for the Society as it is the first from outwith North America.

This year's election sees the retirement of Robert Fenton. His term on the Board of Governors comes to an

end at the end of the year, and he did not stand for re-election. Bob Fenton is a well-respected member of the Board. He has a very long-standing relationship with the society, having been Chairman of the Papers Procurement Committee back in 1972, at a time when the Society was working with the SAE to set up what has now become the Convergence conference. Bob has served on the Board of Governors since 1980, in various capacities as Treasurer, Vice President, and then was elected President in May 1985. He held this position until 1988.

More recently, Bob Fenton was responsible for liaison with the Convergence conference, and for the Convergence

Fellowship, the graduate fellowship in Transportation Electronics established jointly by IEEE VTS and the Convergence Education Association to support a student for one year of graduate study. Chairmanship of the Convergence Fellowship Committee has now been taken over on by Mark Ehsani.

Two other candidates from this year's election will continue to serve on the Board of Governors in an appointed capacity. Kent Johnson, as President of the Society from 1999 to 2000, will remain on the Board as Past President until 2003. Mel Lewis, who is Conference Coordinator, was appointed to the Board last year for a three-year term.

VTS Executive Committee Elections

Elections were also undertaken at the October Board of Governors meeting for the Executive Committee for 2002. J. R. Cruz was re-elected to serve as President for 2002. The sitting candidates in the other Executive positions were also re-elected to serve for 2002, with the exception of Harvey Glickenstein, who having served four years as Vice President Land Transportation, is not eligible to stand again. His position is taken by John Kingham, of STV Inc., who is Chair of the VTS Land Transportation Division. Harvey Glickenstein will remain as VTS News Senior Editor for Land Transportation.

Transactions in VT Ranked Top Again

IEEE Transactions on Vehicular Technology ranked first in its subject category again in the Institute for Scientific

Information newly released 2000 Journal Citation Report. The ISI study ranks journals impact by the number of times they are quoted or cited by other scientific publications in their initial year of publication.

This reflects another good year for IEEE journal and magazine citations performance. The IEEE had 9 of the top 10, 16 of the top 20 and 40 of the top 60 most influential journals in the field of electrical and electronic engineering, based on a selection of 202 journals in this category. The IEEE publishes 6 of the top 10 publications in telecommunications. The Proceedings of the IEEE was the most highly cited IEEE journal in electrical & electronic engineering, ranking second. The number one ranked journal in the field was *Progress in Quantum Electronics*, published by Elsevier, although this journal publishes a much smaller number of articles.

Also ranking first in their categories were *IEEE Transactions on Automatic Control*, *IEEE Transactions on Semiconductor Manufacturing*, and *IEEE Transactions on Robotic Automation*.

Dan Noble Fellowship

There were no candidates for the Daniel E. Noble Fellowship for the coming year. The Graduate Fellowship in Electrical and Electronic Engineering, which has a value of \$7500, is jointly established by the IEEE VTS and Motorola as a memorial to Daniel E. Noble, in recognition of his valuable contributions to the development of two-way vehicular communications and solid state technology. Recipients of the award are selected by a committee on the basis of the candidate's potential to contribute to the profession of Electrical and Electronic Engineering, specifically in the technology areas covered by the VTS.

VTC2001-Fall in Atlantic City

Despite the tragic terrorist attacks on the East Coast, VTC2001-Fall went ahead as planned from 7-11 October 2001. Attendance was down, at about 400 rather than the 650 originally envisaged, but in this the conference was not as badly affected as some other mobile conferences. A full report will appear in the next issue.

VTC2002-Spring in Birmingham, AL, 5-9 May 2002

The VT2002-Spring Conference will be held in Birmingham, AL on 5-9 May 2002.

The objective of the conference is to provide the opportunity to present technical papers and posters, tutorials and panel sessions, and exhibits that represent technical innovation and applications associated with an ever-expanding mobile wireless industry. Although the main focus of the conference is voice and data wireless mobile communications, technical papers, tutorials and panels addressing rail and automotive transportation topics are included. Attendees will have multiple opportunities for interactive participation.

Birmingham is located in North Central Alabama and early May is the peak of spring time in the Magic City. Attractions include: NASA's Marshall Space Flight Center

at Redstone Arsenal in nearby Huntsville, AL; The Robert Trent Jones Golf Trail; Alabama Sports Hall of Fame; The McWane Center, an interactive hands-on science adventure that also includes an IMAX Dome Theatre; Mercedes Benz, manufacturer of the M-Class ATV, who offers tours of the facility, and Honda. Both Mercedes Benz, located in Vance, AL and Honda, located in Lincoln, AL are within a one hour drive of Birmingham.

Important dates are:

- ◆ December 15, 2001: Notification of Accepted Papers
- ◆ February 15, 2002: Deadline for Submission of Full Paper

Further details of technical subject areas, registration, the conference program and activities will be forthcoming on the VTC-02 Spring web site, www.ieee.org/vtc02spring.

Visit the web site: www.ieee.org/vtc02spring

8 May 2001 VTS Board of Governors Meeting Report

The VTS Board of Governors Meeting was held at VTC 2001-Spring in Rhodes. Attendees included Charles Backof, Dennis Bodson, J.R. Cruz, Bob French, Art Greenberg, Ghobad Heidari, James Irvine, Preston Jackson, Kent Johnson, Anil Kripilani, Mel Lewis, Bob Mazzola, George McClure, Sam McConoughey, Reuven Meidan, Stefan Parkvall, Tom Rubinstein, Joel Snyder (2001 IEEE President), Mihael Sternad, Gordon Stuber, Ray Trott, Jim Worsham, and Yu-Dong Yao. As a citizen of Taiwan, the secretary required a visa to attend the meeting and this could not be obtained in time.

VTC2001-Spring Reuven Meidan gave a report on the conference in Rhodes. 608 papers had been accepted and were printed in the proceedings, of which 420 were oral papers and 188 were posters. In total about 800 papers had been submitted. 639 people registered for the conference, and about 200 people had attended the tutorials. A total of 305 who attended were registered as students, which meant that income was lower than expected. Reuven highlighted the problem that 83 people had registered for the conference but had not turned up, 61 of whom were students. This could not have been due to the change in venue since registration only started after the change had been confirmed. He noted that for students, submitting a paper and then paying the \$75 registration fee to ensure that the paper is printed in the proceedings is a very cheap way of getting published. If that student co-authored multiple papers, it became cheaper still, since only one co-author was required to register for the paper to be printed, and in some cases a single author was involved as many as five papers. The large number of no shows would suggest that at least some people submitting papers do not plan to come, and an additional problem is the student registrations are subsidised and do not cover actual costs. Boston had had a similar number of no shows, at about 10 to 15%.

It was expected that there would be a loss from the conference, since the large local support that had been expected from Israel would not be repeated in Rhodes. This would reduce income, while expenses were larger than expected due to the costs of bringing people and equipment from Israel. There were some savings and room costs (\$70 compared to \$150 in Israel), but in Rhodes conference facilities had to be rented as opposed to the situation in Israel where the conference facilities were thrown in with a minimum room allocation. Therefore \$40 were added to the room rate to compensate.

Mel Lewis noted that there was a problem of not having the paper copies of the conference proceedings available at the conference. Reuven said that the aim was to have the paper copies by the conference, but the firm doing the printing had taken longer than promised due to problems with PDF files coming from different parts of the world.

Treasurer's Report Charles Backof reported that the society had made an operating loss during the previous year. No conferences were closed in the year 2000, while service charges from the IEEE went up very significantly. The loss was around \$65,000. The loss would not have occurred if conferences had been closed out or if the service charges had not been increased, but with both occurring the loss was unavoidable. In addition to this there was \$146,000 charge on reserves to cover IEEE corporate deficit. It was likely that another \$240,000 would

go the same way in the year 2001, although the Society budget for this year includes a surplus. The net worth of the Society was now about \$1.2 million.

Bylaws Change. Dennis Bodson proposed a change in section 2 of the bylaws to remove the word "elected". Bob Mazzola seconded the motion. The bylaw would therefore read "The President or the Executive Vice President must be members of the Board of Governors". The reason for the change is that the election results may not be available prior to the last Board of Governors meeting, so the election to the executive may occur prior to return the Board of Governors elections, which means in the current situation second guessing the Board of Governors election results. Ken Johnson noted that although he supported the amendment, the way round the problem was to get the election done right so the result is available, and that if this was done there was no requirement for an amendment. George McClure said that while ideally this may be the case, the change in the bylaw would give the additional flexibility if some unforeseen delay did occur. The bylaw change was passed by 12 votes for with none against, with President J R Cruz, in the chair, abstaining.

Conferences and meetings : Mikael Sternad made a presentation on behalf of the Swedish chapter proposing Sweden's as a site of the spring conference in 2005. They would be targeting early June. VTC was held in Sweden in 1994, the first time ever outside North America, and 750 people attended and a \$17,000 surplus was made. Issues raised included a possible conflict with ICC, and the short notice from the fall VTC which a June date would entail. The Swedish chapter were encouraged to bring back a formal proposal and budget.

Preston Jackson gave a report on the VTC2002-Spring in Birmingham. This conference will be based on volunteers rather than a conference organising company. Three-quarters of the organising committee had previous experience in organising a successful conference in Birmingham in 1986. The submitted budget has been approved.

Professor Khaled Ben Letaief presented on VTC2002-Fall on behalf of Vijay Bhargava. A detailed budget was submitted and a call for papers is now out. There were some concern that some of the figures were a little low, and Mel will work with them to revise them.

The newly reactivated Vancouver chapter requested matching funding of \$500 to hold a workshop on 3rd generation CDMA. This was approved.

Awards Committee Ray Trott reported that the awards were "in transit". He put forward motion to make some minor modifications to bring the formal description of the awards into line with current practice, and this was approved. This will now go into Technical Activities Board (TAB) to get final approval. It was agreed that awards for conference chairman of the considered individually after the each conference closed.

For the record, the awards did in fact arrive one hour before the awards lunch!

VTC2001-Fall. Art Greenberg gave a comprehensive presentation on the plans for the event. They have a full committee in place and the keynote speech in the shape of Dr George Zysman, past CTO, Lucent Wireless. On the last day the conference they will have a half day workshop on application driven interaction assessment presented by

companies. Fifteen tutorial proposals had been submitted to date, along with 780 abstracts. The social programme will include tours to Cape May, the FAA, Philadelphia, Renault Winery and a Historic Town Tour.

Past Conferences: Jim Worsham reported on past conferences. He had attended the IEEE Conference Workshop and reported that money from conferences is becoming a greater proportion of IEEE funding. There was a requirement for common branding, with 'IEEE' appearing in the conference name, and another issue raised in the workshop was that of tax in respect of overseas conferences. Given the reaction at the workshop from some parties to the possibility of not having printed proceedings, he felt that printing had a long future. Libraries are the major post conference buyers of proceedings, and they do not consider CD-ROMs are achievable. Six conferences are currently awaiting closure. JRC 1999 and 2000 are currently cosponsored by Vehicular Technology Society, although in practice the conference was run ASME, and the reports the IEEE require are not available. It was therefore proposed to change to Technical Co-sponsorship which involves no financial commitment. This was agreed unanimously. On VTC'99-Spring in Houston, there was nothing at report, and he was still pressurising the local committee without results. The board agreed that matters would have to be taken further, as until the conference is closed the Society is being penalised by \$750 per quarter. Charles Backof recommended that in future the situation be avoided by the use of concentration banking as an audit trail then exists; the 2002-Spring conference is already using this method. Regarding VTC'99-Fall, the IEEE recommended more control be kept of overseas conferences. There was some discussion on this point and the need for someone from the Board to sit on the local organising committee of conferences. It was suggested that this might be done by rotation round board members given the number of VTC conferences. VTC2000-Spring is basically done. There was a currency exchange variation in the money received by the IEEE which needs to be verified. It is likely this conference will be close within the next few weeks. VTC2000-Fall looks like it will produce a surplus of about \$100,000.

Mel Lewis gave a short report on VTC2003-Spring and VTC2003-Fall. Regarding the former, a hotel had now been lined up. For VTC2003-Fall, he had been maintaining contact with Dr Mohsen Guizani, the conference chair.

Joel Snyder, IEEE President visited the meeting at this point. San McCourtney noted that this is the first time in the Society's 50 year history that a Board meeting had had the pleasure of the company of the IEEE president. Joel Snyder was asked about budget for 2002. He said that this is starting to be prepared and they were targeting a break-even budget by looking at both income and expenditure. They are looking at several methods to cut back on expenditure, as well as looking at the market value for services, conferences and publications to see how income could be improved. 1.25 million documents had been downloaded through the IEEE Xplore system in the first two months of the year, and this system will start to make money this year. The large amount of investment of the past few years had cost money, but was now starting to bear fruit.

VTC 2003-Spring: Tom Rubenstein reported that a subcommittee had been formed to look at whether Milan or Genoa was the better option. Mel Lewis and Bob Mazzola had visited both locations. Bob reported that there was

more to do in Millan, but more within walking distance in Genoa. Access to both cities is about the same, and the same conference organising company would be used for either location. It was agreed to go for Genoa.

Future Conferences: Different locations were being considered for VTC2004-Fall. Of these, Los Angeles was most keen, but their sponsoring arrangements might prove difficult. Discussions are still ongoing. As well as the proposal from Sweden reported earlier, there was a tentative proposal from London for Spring 2005. They will be invited to come back with more a detailed proposal which can be considered along with the Swedish proposal.

Publications. The report was given by JR Cruz on behalf of Greg Bottomley, who proposed a supplement the given to the system administrator working on the online peer review process at Ericsson. This was agreed. James Irvine reported on the newsletter, and the fact that with the small changes made to the headings from the May issue almost all of the changes approved by the Board the previous year have now been implemented. The new branding rules for the IEEE would be implemented with effect from the May issue. It was also now possible to use up to two pages of full-colour per issue. It was agreed to purchase a desktop publishing package to speed the processing of copy before it is sent to the IEEE.

An advertising policy for the newsletter was agreed whereby conferences not sponsored by the VTS would be charged for advertising in the VTS News.

Distinguished Speakers and the Fellows Committee: Gordon Stuber reported that an additional member had been appointed to the Fellow's committee. He also reported on the distinguished speakers programme, where he has been trying to get an additional four figures on the roster; two in North America, one in Europe and one Asia. The speaker from Asia had not yet been identified but the others were in place. The board agreed that speakers be appointed for a two-year period.

Electric Vehicles: Bob Mazzola reported for Mark Ehsani on the Electrical Vehicles committee. Two invited sessions have been prepared for the conference in Atlantic City. Bob also reported that Convergence 2002 has now been fixed at 21-23 October 2002.

Chapter Development: Anil Kripalani reported that he was following up on opportunities for new chapters.

ITS Bob French reported on ITS. Societies within the council, of which VTS is one, were asked to consider themselves co-sponsors of ITS Council conferences. The Council is now collaborating with the Aerospace Policy Committee, but this did not prevent individual societies from raising issues directly. Eric Schimmel does this for VTS.

Board of Governors elections Kent Johnson reported on nominations for the Board of Governors elections. Bob Fenton was not running for re-election. There are four candidates whose term expires this year who will be running again, along with Mel Lewis, Tad Matsumoto, Evan Richards, Mark Ehsani, and Eric Schimmel. The board approved the slate.

Standards. Dennis Bodson reported that Standards Association membership was grown well, and it now has about 10,000 members. Bob Laurent is now the acting chairman of SEC 32.

Election for Division IX George McClure is running for the position of Director of Division IX. The last time a VTC Board member had been director was Art Goldsmith more than ten years ago.

Five Year Review: Kent Johnson reported on the outcome of the five-year review, which had been very favourable, and was accepted by the Society without comment. Their comments included the fact that with two conferences every year, the surplus generated by the conferences would be reduced, but it increases the societies exposure and provides a better service members. Other areas which were commended were the increased page count and use of color in the VTS News, and the extensive standards activities. The review did point to the need for a greater international presence in on the Board of Governors, and the need for more equitable split between a different areas of activity identified in the charter of the Society, i.e., radio, land transportation, and automotive electronics.

Wireless Title: The meeting ended with some discussion on the use of the term Wireless in the name of

the Society and for the transactions. Previous discussions had lead to agreement on the title Vehicular and Wireless Technology, but there was no eternal support for this within TAB. JR Cruz reported that the situation had moved on since then, and it was no longer a discussion between the Communications Society and the VTS, but rather many more societies were wishing to get involved in the "wireless" area. The brand is therefore losing some of its appeal. It was agreed to discuss this matter more fully at the next meeting.

Student registration for conferences: Bob Mazzola will circulate a paper for the Board so that advice can be given to Atlantic City.

Next Meeting It was agreed that the next meeting would be in Atlantic City during VTC-Fall.

Calls for Papers

2002 IEEE/ASME Joint Rail Conference in Washington, D.C.

23-25 April 2002

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. Join your peers to share information, learn about technology progress, share operating experiences, and find new approaches to current and future challenges.

The Joint Rail 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. The 2002 Conference will be held in Washington D.C. at the Washington Plaza Hotel. The Conference is scheduled for Tuesday, April 23 through Thursday, April 25, 2001.

You are invited to submit abstracts of papers for inclusion in this Conference. Papers should cover topics of current interest in railroad 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.

This year's conference will feature a special theme:

*Rail Industry Productivity and Safety
A Capital Call for Progress*

Papers in the areas listed below are especially appreciated; all papers of interest are also welcome. Topics can include:

- ◆ Maintenance procedures, monitoring and fault detection, remote diagnostics.
- ◆ Computer modeling and simulation of transportation systems.
- ◆ Rail transportation, high speed passenger rail, rail transit, systems.
- ◆ Braking systems, coupling/cushioning systems, truck suspension systems
- ◆ Passenger and Freight Car Mechanical Design and Analysis
- ◆ Crashworthiness of vehicles locomotives, cab cars, light rail cars
- ◆ New freight transportation concepts.

Authors are requested to submit 200-300 word abstracts by electronic mail (preferred) or by 5 printed copies **no later than November 15, 2001** to:

Margaret Burnett, Papers Chair

Land Transportation Division, IEEE-VTS

LTK Engineering

401 S. Jackson St.

Tel: 206-689-3322, Fax: 206-689-3339

E-mail: burnnettm@soundtransit.org

If submitting by mail or fax, please forward a diskette copy of your abstract, preferably in Microsoft Word format.

Notification of paper acceptance will be made by November 30, 2000. Selected papers must be submitted in acceptable format, as instructed, **no later than January 15, 2001** for publication in the Conference Proceedings.

Lead author Advance Registration for the Conference will be required.



VTC2002-Fall in Vancouver, British Columbia, Canada

Hyatt Regency Hotel, 24-29 September 2002

The VTC-2002 Fall Conference, to be held in Vancouver, Canada, aims to capture and present the current state of the innovative and highly active mobile wireless industry. We seek to present the changing face of wireless technology and a glimpse in the future of this exciting field. Over 400 full technical papers and posters are

expected to be presented, along with tutorials, business application/panel sessions and exhibits. Authors are invited to submit extended abstracts describing original research results, innovative applications, and experimental or field trial/test results in the following mentioned fields of wireless communication.

- ◆ **Antennas and Propagation (01):** Space-time processing, Smart antennas, Channel modeling, Prediction tools, Indoor propagation
- ◆ **Wireless Access (02):** Spread-spectrum technology, OFDM, Multi-carrier modulation, Medium access control protocols, Channel assignment/reservation schemes
- ◆ **Transmission Technology (03):** Modulation, Source/Channel coding, Interference rejection techniques, Equalization, Synchronization, Multi-user detection, Software radio, Transceiver Design, Turbo coding, Transmit diversity, MIMO systems
- ◆ **Multimedia, Networks and Systems (04):** Mobile multimedia technology, Quality of service assurance, Ad-hoc networks, Mobile data/computing/navigation networks, Wireless ATM, Enhanced mobility IP, Bluetooth, IEEE 802.11, Wireless e-commerce
- ◆ **Wireless Personal Communication Systems (05):** 3.5G and 4G Technologies, Broadband mobile communication systems, LMDS, Cellular technology, Bluetooth technology, Location techniques, Systems integration issues
- ◆ **Mobile Satellite (06):** Mobile satellite communications, GPS, LEO/MEO/GEO systems, Navigation
- ◆ **Transportation (07):** Intelligent transportation/vehicle systems, Satellite digital audio radio system, Vehicular electronics

Paper Submission Guidelines

Authors MUST submit an extended abstract (up to 2 pages) at the SAME time of their short abstract submission (approx. 150 words). Forms for submission are soft copy in MS Word, PDF or PS file formats. The

submission must include the name, complete mailing address, telephone and fax numbers, the designation number of the Technical Subject Area of the paper and the email address of the author(s).

Panel Sessions & Tutorials

Proposals for Tutorials and Panel sessions are also accepted in the VTC-2002/Fall. Tutorials (half-day or full-day sessions) that are intended to provide in-depth learning on a specific topic of interest to the participants. Panel sessions are 90 minutes long. They present leaders in a particular area discussing a topic of interest to the attendees of VTC-2002/Fall. There is usually significant

audience participation in Panel sessions. Proposals for Tutorials and Panel sessions should consist of a 250 word summary, a 100 word abstract, and a cover page listing the details of the author(s) as given above. Summaries should be submitted electronically (MS Word, PDF or PS) by February 15, 2002. Submissions should be made at the website <http://www.fallvtc2002.org>

Important Dates

Nov 01, 2001	First date for submission of abstracts (Authors MUST submit the short and extended abstracts at the same time)
Feb 15, 2002	Last date for submission of abstracts
May 15, 2002	Notification of acceptance
July 15, 2002	Last date for submission of camera-ready version of accepted papers

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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
13-16 November 2001	ISCOM01	Tainan, Taiwan	http://www.ncku.edu.tw/~ISCOM01
14-16 November 2001	ISCIT 2001	Chiang Mai, Thailand	http://www.kmitl.ac.th/~iscit/
25-29 November 2001	Globecom 2001	San Antonio, TX	http://www.globecom2001.com
20-24 January 2002	Int. Conf. On Micro Electro Mechanical Systems (MEMS)	Las Vegas, NV	mailto:kkcline@pmmconferences.com
26-28 February 2002	European Wireless 2002	Florence, Italy	http://www.ing.unipi.it/ew2002
19-21 March 2002	11 th Int. Conf. On Road Trans. Information and Control	London, UK	http://conferences.iee.org/RTIC
28 April 2 May 2002	ICC2002	New York, NY	http://www.icc2002.com
6-10 May 2002	VTC 2002-Spring	Birmingham, AL	http://www.ewh.ieee.org/soc/vtc02spring/
6-8 May 2002	3G2002	London, UK	http://conferences.iee.org/3G2002
28-31 May 2002	3G Wireless 2002	San Francisco, CA	http://delson.org/3gwireless02/
16-21 June 2002	APS International Symposium / URSI Radio Science Meeting	San Antonio, TX	http://www.ieeeaps.org/2002APSURSI/
16-21 June 2002	IST Mobile Summit	Thessaloniki, Greece	http://www.iti.gr/summit2002
2-5 September 2002	ISSSTA 2002	Prague, Czech Republic	http://www.ure.cas.cz/isssta2002 ✓
15-18 September 2002	PIMRC 2002	Lisbon, Portugal	http://www.pimrc2002.org
24-29 September 2002	VTC 2002-Fall	Vancouver, BC	http://www.fallvtc2002.org ✓
21-23 October 2002	Convergence 2002	Detroit, MI	http://www.convergence2002.org
27-30 October 2002	WPMC 02	Honolulu, Hawaii	http://www.wpmc02.gatech.edu/ ✓
17-21 November 2002	Globecom 2002	Taipei, Taiwan	http://www.globecom2002.com
24-26 March 2003	Int. Symp. On Wireless Systems and Networks (ISWSN 03)	Dhahran, Saudi Arabia	http://www.kfupm.edu.sa/ee/ISWNWeb/first_call.htm ✓
21-24 April 2003	VTC 2003-Spring	Seoul, Korea	mailto:jhlee@gong.snu.ac.kr
23-25 April 2003	EMPC2003	Glasgow, Scotland	mailto:j.dunlop@eee.strath.ac.uk
11-15 May 2003	ICC2003	Anchorage, AK	
Fall 2003	VTC 2003-Fall	Lake Buena Vista, FL	mailto:mguizani@cs.uwf.edu
Spring 2004	VTC 2004-Spring	Genoa, Italy	mailto:vatalaro@ing.uniroma2.it

Conferences marked ✓ have open calls for papers as of 15 November 2001. 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.