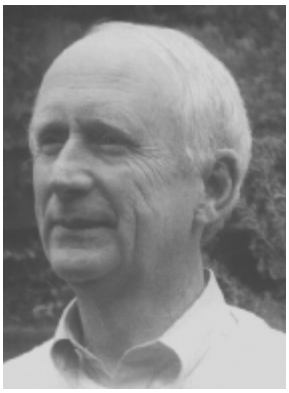
# EMC SOCIETY of AUSTRALIA NEWSLETTER

The official newsletter of the Electromagnetic Compatibility Society of Australia
IEAust 11 National Circuit Barton ACT 2600

A SOCIETY OF THE INSTITUTION OF ENGINEERS AUSTRALIA

**Issue Number 19** **August 2002**


## MESSAGE FROM THE CHAIRMAN



Since our last issue of the Newsletter your Council has been working on several matters to further the interests of the EMC Society and the EMC community in general. One of these has been the planning and launching of the EMCSA Symposium.
We are pleased to have reached the stage of being able to run our first major EMC event, the EMCSA Symposium. It has been one of the EMC Society's goals since formation to run such events, either in conjunction with other organisations, or on our own. The symposium provides an opportunity for authors to present papers on various aspects of EMC for peer review and public comment. It also presents opportunities for sharing knowledge and EMC experiences with colleagues, an activity the Society is always keen to encourage.

For those of you reading this at the Symposium, welcome to the EMC Society and to our Symposium. We hope you enjoy the technical paper presentations and panel discussions to follow. Members of the Council will be available at the Symposium to answer questions about the Society and to receive your input on Society and EMC matters. To our members who are not able to attend, we will make available a record of the proceedings. We are sorry you are not able to join us. Don't forget you can communicate via email at any time. A good place to start is via the EMCSA website (*http://www.emcsa.org.au*) where you will find an email contact address. I would like to issue an invitation and reminder to members to communicate via email with our webmaster so that he can advise you of a new password for access of the members section of the website. The current arrangement for access will be phased out soon.

The Symposium Dinner will follow the day's activities and all are encouraged to attend.
The dinner provides an opportunity to get together and to meet others involved in the discipline of EMC in a relaxed atmosphere, and for networking, swapping stories, and sharing the experiences of a diverse group.
During the Symposium activities there will be two tributes of significance to our EMC community. The first will be to Jack Pluck in recognition of his long service to the EMC community and lately to the EMC Society. The second will be to the winner of our 2001 Student Paper award, Joe Trinkle. Although at different stages of their professional careers, they both have contributed significantly to our knowledge of EMC. Thanks Jack and Joe, and thanks to all our Symposium and student paper authors.

John Hyne, MIEAust.,CPEng.
Chairman

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# LETTER FROM THE EDITOR

August is the month of the EMC Symposium. The IEEE EMC Society's Symposium will be held this year in Minneapolis from 19th to 23rd August and the theme of the conference is "Superior EMC." The EMC Society of Australia is holding a one-day Symposium in Melbourne on the 15th August 2002.

This issue of the Newsletter is mainly dedicated to our Symposium with timetable and paper summaries included. For those members who cannot attend we intend to publish presented papers in future issues of the Newsletter.

We include a summary of the technical presentation by Professor Singer, held on the 15th July in Melbourne. His paper was titled "Computer Simulation for Electromagnetic Compatibility."

Just a reminder to our readers and members of the need to contribute papers and articles of interest for publication.

J Pluck FIEAust CPEng
Editor

# EMC SYMPOSIUM

The EMC Symposium will be held this month at the Institution of Engineers Australia Victorian headquarters in North Melbourne. The Symposium will take place on the 15th August 2002 commencing with registration at 8:15 am and closing at 5:15 pm. The day's activities will be completed with dinner at night commencing with drinks at 6:30 pm.

The timetable for the day's events is published below with a summary of a number of the papers to be presented.

| Session | Time | Presenter | Topic |
|---|---|---|---|
| | 8.15 – 9.00 | | Registration |
| | 9.00 – 9.05 | Jack Pluck | Opening |
| 1A | 9.05 – 9.30 | Gordana Felic and Rob Evans | FDTD Modelling of Electromagnetic Signal Propagation in Power Converter Circuits |
| 1B | 9.30 – 10.00 | Joe Trinkle, Antonio Cantoni, Kevin Fynn | Inductance Associated with SMT Capacitors on Rectangular Power Ground Planes |
| 1C | 10.00 – 10.30 | Franz Schlagenhaufer, Jian He, Kevin Fynn | Example for the Comprehensive Analysis of a Complex Structure Based on Computer Simulations |
| | 10.30 – 11.00 | | Morning Tea |
| 2A | 11.00 – 11.30 | Stephen Phillips | Dealing with Ambient Emissions at the Open Area Test Site |
| 2B | 11.30 – 12.00 | Tee Tang, Ray Fang | An EMC Virtual Laboratory |
| 2C | 12.00 – 12.30 | Chris Zombolas | SAR Approval Requirements for Mobile and Portable Transmitting Equipment in Australia |
| | 12.30 – 1.30 | | Lunch |
| 3A | 1.30 – 2.00 | John Hyne | Electromagnetic Interference Control in Buildings |
| 3B | 2.00 – 2.30 | Mark Mifsud | Mitigation of Medical EMC Problems |
| 3C | 2.30 – 3.00 | Keerthy Mysore | Practical EMC |
| | 3.00 – 3.30 | | Afternoon Tea |
| 4A | 3.30 – 4.00 | Dale Wescombe | The EMC Regulatory Framework |
| 4B | 4.00 – 4.30 | Panel | Questions, Discussion |
| 4C | 4.30 – 5.00 | Panel | Questions, Discussion |
| | 5.00 – 5.15 | Jack Pluck | Close |
| D1 | 6.30 | | Pre-Dinner Drinks |
| D2 | 7.00 | | Dinner |

# SYMPOSIUM PAPER SUMMARIES

## An EMC Virtual Laboratory

Tee Tang and Ray Fang; School of Electrical and Electronic Systems Engineering
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With the advent of high-speed computers and world-wide-web network, on-line teaching (OLT) is now a well established technique for the delivery of teaching materials in a virtual classroom environment. Virtual laboratories (*Virtual Lab*) is one form of OLT that can be used to provide students with interactive experiments. Virtual Lab experiments have been tried successfully at various academic and professional training institutions around the world in many subject areas such as physics, chemistry, mathematics and information technology.

In this paper, a Virtual Lab is described for the teaching of EMC at Queensland University of Technology (QUT) to overcome the problem of equipment availability due to the high costs associated with an EMC laboratory. The aim of the Virtual Lab is to provide an opportunity for the students to familiarise with the processes of EMC measurement, at their own pace of learning.

The conducted emission measurement experiment is used as a pilot project for the proposed EMC Virtual Lab. During an experiment, the students are able to select a range of equipment under test (EUT) as well as a number of EMI receivers. Different types of detectors are introduced. Emission graphs and tables for active and neutral lines are generated for each EUT. Limits from relevant EMC standards are displayed for the students to assess the EUT conducted emission levels. Each student is presented with a slightly different set of data to prevent plagiarism.

When a student is confident with the experiment, he/she can then complete a formal assessment. The assessment may be marked on-line or off-line. All data associated with that assessment are logged for the reference of the assessor.

With the experience gained from the EMC Virtual Lab, a student will be able to proceed more quickly during an actual laboratory experiment. As more experiments and advanced features are developed for the EMC Virtual Lab, it is envisaged that the amount of actual laboratory work can also be reduced.

## SAR Approval Requirements for Mobile and Portable Transmitting Equipment in Australia

Chris Zombolas , Technical Director
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**Summary**
The use of mobile and portable transmitting equipment (MPTE) has recently experienced exponential growth.

There has been a proliferation of consumer MPTE that is used in close proximity to the human body. It is known that exposure of the human body to high levels of Radio Frequency (RF) Electromagnetic Radiation (EMR) leads to adverse health effects. There has recently been much community concern about the possible health hazards from exposure to EMR from MPTE.

To ensure the protection of the public from exposure to RF EMR, the Australian Communications Authority (ACA) has mandated regulations and standards to limit the maximum permissible levels of RF EMR exposure to the public. For manufacturers, agents and importers of MPTE, the regulatory arrangements include RF EMR human exposure limits, evaluation criteria, a mandatory test method, and labelling requirements.

This paper will detail the steps necessary for the approval of MPTE to the ACA SAR requirements. The ACA EMR regulations and the ACA SAR measurement methodology will also be discussed.

# FDTD Modelling of Electromagnetic Signal Propagation in Power Converter Circuits

Gordana Felic and Rob Evans; Department of Electrical and Electronic Engineering
The University of Melbourne, Melbourne, Australia

**Contents**



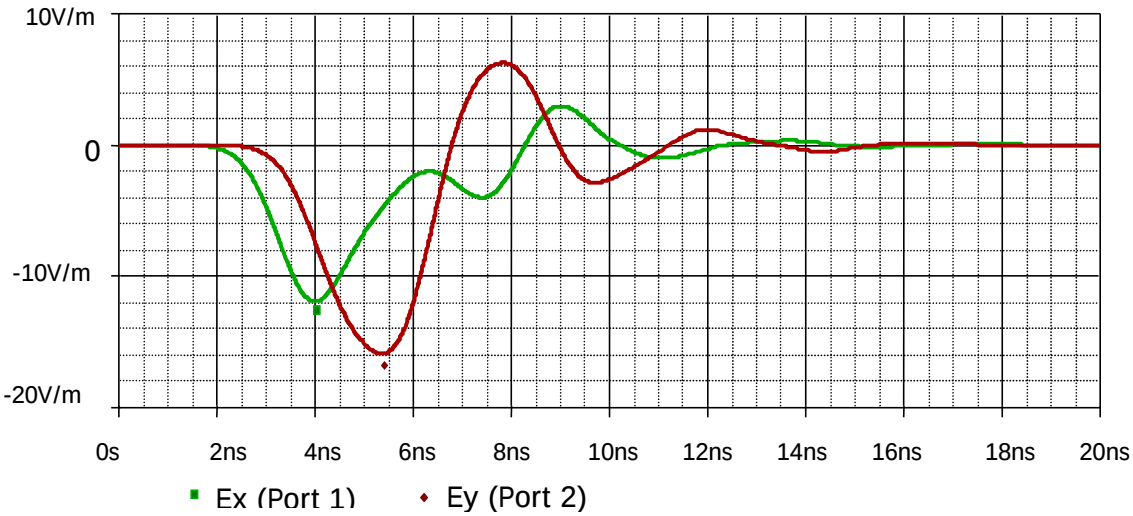
**Abstract**

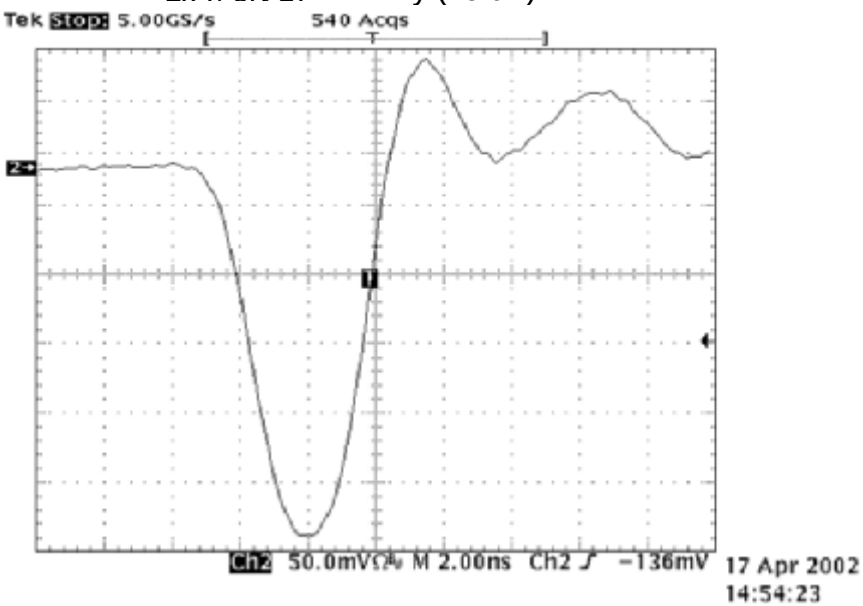
The application of computational techniques in electromagnetic analysis of printed circuit boards is an emerging trend in the field of EMC. Power electronic converters with secondary power of up to 100 W are constructed on printed circuit boards using strip-line PCB wiring. The switching capability of modern semiconductor devices (MOSFET, IGBT, MCT etc) results in voltage and current variations (dV/dt, dI/dt) reaching values in the range of V/ns and an A/ns. These large transient phenomena induce parasitic currents and radiated emissions. Computational and numerical approaches hold the promise of accurately predicting these undesirable phenomena.

**Introduction**

The goal of the present work is to develop a relatively simple power electronic converter model that can be used in the analysis of near electric and magnetic fields and in the determination of dominant EMC effects. In the model development some critical issues such as excitation source, application of boundary conditions and the physical representation of the structures are investigated. The frequency range of interest in this study is above 30 MHz. Our approach involves FDTD modelling of structural elements and nonlinear elements of the power converter.

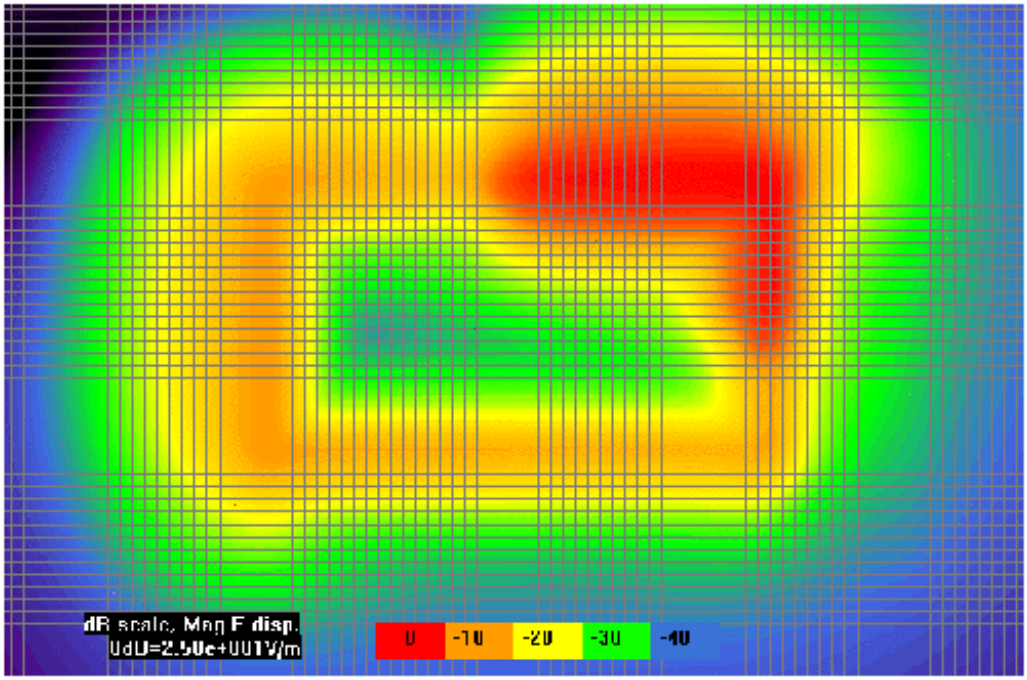
**Simulation and Measurement Results**




**ulse.**

**Time Domain E-probe response at 1cm above Port 2, pulse wd=3ns.**




**Electric field in x-y plane, 1 cm above the traces, t=5ns.**

**Conclusion**
Most practical circuits are located in the presence of other circuits, wires and metallic surfaces. These nearby objects can have significant effects on radiation.
In this paper we combine the modeling of circuit elements and 3-D structural elements using FDTD tools and SPICE based transient analysis.
The use of the FDTD method for near field modeling of a simple power converter can provide reliable results that show the interaction between the EMI source and the circuit structure.

# Inductance Associated with SMT Capacitors on Rectangular Power Ground Planes

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The low frequency impedance of power ground planes is generally decreased to acceptable levels by the addition of Surface Mount Technology (SMT) capacitors. While the series inductance of these capacitors may be very low (fraction of a nano-henry) the additional inductance associated with their connection to the planes by means of a via needs to be considered. This total inductance has two undesirable effects. Firstly it reduces the frequency range over which the capacitor is effective and secondly it introduces a new low frequency resonance as a result of its interaction with the inter-plane capacitance.

The proposed paper will derive an analytical expression for the additional inductance resulting from the connection of the capacitor to the supply planes by means of the via. This inductance arises because of the localization of current near the via. If it were possible distribute the extra capacitance uniformly over the area of the supply planes, (e.g. by increasing the permittivity), this extra inductance would vanish.

The formula for inductance, (1), is derived by assuming the supply planes to be rectangular and closely spaced so that the fields between them are purely two-dimensional. The factors influencing the inductance are shown to be the via radius, the via length (i.e. spacing of the planes) and the location of the via on the planes.

Figure 1 shows a low frequency lumped circuit model for the power ground planes containing one capacitor. The value of the additional inductance of the SMT capacitor, $L_{vd}$, and the additional series inductance due to the via at the measurement port, $L_s$, can both be obtained using (1). Some mutual inductance between $L_{vd}$ and $L_s$ needs to be included if $Z_{in}$ is measured in close proximity to the capacitor

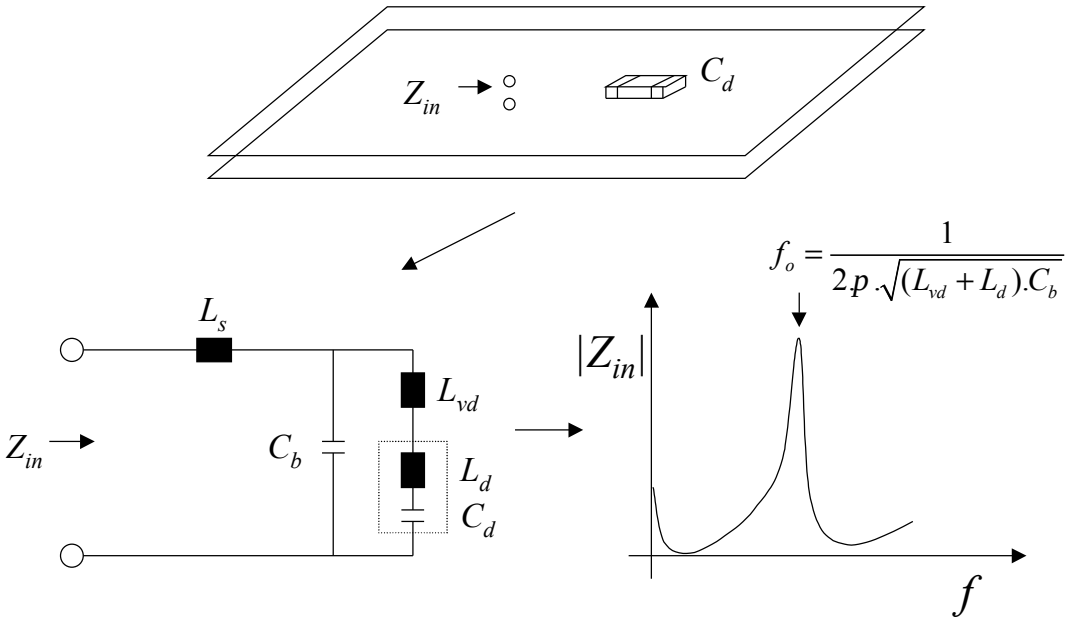


**Figure 1. Model for input impedance with an SMT capacitor connected to supply planes.**

$$L(x,y,r_v,r,d) = \frac{m_0.d}{4.p^2}.\left[T(x,y,r)+T(x,r_v,r)+T(r_v,y,r)+T(r_v,r_v,r)\right], \qquad (1)$$

where $d$ is the separation between the power and ground plane, $r = (\text{x dimension} / \text{y dimension})$, is the aspect ratio of the rectangular planes, $x$ and $y$ are ratio coordinates (i.e. $x \rightarrow x / \text{x-dimension}$ $y \rightarrow y / y\text{-dimension}$ ) and $T(x,y,r)$ is defined as

$$T(x,y,r) = \frac{1}{r}\sum_{n=0}^{\infty}\sum_{m=0}^{\infty}\frac{X_{m,n}\cos(2p.m.x).\cos(2p.n.y).}{m^2+(n/r)^2}\Bigg|_{m\&n\neq 0} \qquad 0<x<1, \quad 0<y<1$$

$$\approx \left\{\begin{array}{l} \frac{2p^2}{r}\left(x^2 - x - \frac{r.\log 2}{p} + \frac{7}{6}\right) \\ \quad -p.\log\left(\left(\cosh(\frac{2p.x}{r}) - \cos(2p.y)\right).\left(\cosh\left(\frac{2p.(x-1)}{r}\right) - \cos(2p.y)\right)\right) \end{array}\right\}$$

**Equation 1. Inductance associated with via and supply planes.**

# Electromagnetic Compatibility - Information for Suppliers of Electrical and Electronic Products in Australia and New Zealand

Dale Wescombe
Australian Communications Authority (ACA)

Summary

Effective radiocommunications contributes significantly to the operations of industry, commerce, safety-of-life organisations and the well-being of the community at large.

To deal with the problem of electromagnetic interference (EMI) to radiocommunications, the Australian Communications Authority (ACA) and the Radio Spectrum Management Group (RSM) of the New Zealand Ministry of Economic Development (NZMED) have introduced the Trans-Tasman Electromagnetic Compatibility (EMC) compliance scheme. The scheme aims to protect the radiofrequency spectrum by introducing technical limits for emissions from electrical/electronic products.

# Dealing with Ambient Emissions at the Open Area Test Site

Synopsis of Presentation.
Since the inception of commercial EMC emission measurements and the Open Area Test Site in the 50's the electromagnetic spectrum has become more and more crowded with man made electromagnetic signals.
Once upon a time it was relatively easy to find a "Low Ambient" Open Area Test Site (OATS) to perform radiated emission measurements.

**Ambient Emissions can be particularly annoying when they mask emissions from a test sample, particularly digital TV and mobile phone signals. We must ensure that emissions from the test sample are not missed because of masking by ambient signals, after all, these ambient signals are the very signals we are trying to protect from interference.**

In Australia the commercial reality for an EMC test lab is to use an OATS rather than a multi million dollar CISPR compliant anechoic chamber.
The main factors in choosing a location for an OATS are accessibility and ambient conditions that can be managed.

This paper describes types and characteristics of ambient emissions experienced at a typical OATS.

It discusses and shows examples of methods prescribed by CISPR to deal with measuring emissions in the presence of ambient signals.
It also discusses and shows other methods developed by the author to measure emissions in the presence of the dreaded digital television "wall of noise".

**Stephen Phillips - Systems Manager; EMC Technologies Pty Ltd; steve@emctech.com.au**

Stephen Phillips is Systems Manager and Co-founder of EMC Technologies Pty Ltd, an independent Australian based company with EMC/EMI, EMR, SAR, Safety and Radiocoms accredited laboratories in Melbourne, Sydney, Brisbane and Auckland (NZ).
He has 26 years electronics experience in the defence and commercial electronics industries, with the last 20 years concentrated in EMC areas.
He is a NATA signatory for testing to various Australian and international Electromagnetic Compatibility, Electromagnetic Radiation, EME modeling -and Specific Absorption Rate standards.
He is responsible for developing and researching test methods and procedures that enable automated -testing to Australian and International EMC/EMR/SAR standards.
Stephen also has 20 years experience in writing instrument control software and has developed in-house software to automate most of the testing EMCT performs.

# Electromagnetic Interference Control in Buildings

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**Summary**
Electromagnetic Interference (EMI) can render buildings unsuitable for intended purposes. EMI control is required for general building services, and for special cases such as computer accommodation, Communications centres, laboratories and hospitals.

EMI cures include use of standards, screening, filtering, and physical separation. Awareness of electromagnetic compatibility (EMC) in building planning and design is required as well as technical solutions. Site surveys are recommended for all computer sites, office accommodation, and laboratories. Building designers commonly fail to allow for interference control measures in both the building design and the project budget.

Technical solutions are available for most EMI problems, but attention to EMC in planning and design of buildings can provide more cost-effective solutions.

# JULY TECHNICAL PRESENTATION SUCCESS

At the July technical presentation, Professor Herrmann Singer of the Technical University Hamburg-Harburg Germany provided a most interesting and informative presentation on Computer Simulation for Electromagnetic Compatibility.

In his introduction, Prof Singer stated that computer simulation can be used to predict electromagnetic shielding, coupling and radiation in engineering disciplines such as wireless communications (mobile telephones), traffic engineering (automobiles, spacecraft and ships) and consumer electronics (microwave ovens, televisions etc).

The professor listed the most common simulation techniques, which were:

| | |
|---|---|
| FDTD | Finite Difference Time Domain method |
| TLM | Transmission Line Matrix Method |
| MoM | Method Of Moments (most common) |
| MMP | Multiple Multipole Method |
| PEEL | Partial Element Equivalent Circuit |
| PO | Physical Optics |
| GTD | Geometric Theory of Diffraction |
| TLTA | Transmission Line Theory Approaches |

Professor Singer then provided some detail on the two methods PO and MoM, which are used most often in his work.

The PO technique assumes an ideally conducting structure that is illuminated by a field so that the shadow area can be calculated.

John Hyne and Professor Singer at the Technical Presentation in July

The MoM technique has a mathematical/physical basis in that it divides the structure into elements, and then currents in the structure are computed. There are two principle configurations used in metallic structures, namely Thin Wire and Surface. Thin Wire configuration models use triangular junctions and the currents in the structure are computed. From these, the system parameters of interest such as electric and magnetic field components and radiation patterns can be computed. The Surface configuration model is similar but the current distribution on the surface elements is computed with current density vectors that have two directional components along the surface.

Jock Spencer, Graeme Richardson and Chris Zombolas exchange pleasantries at the presentation.

A problem with the MoM technique is that it requires increased segmentation as frequency increases. With many segments at high frequencies there are many unknowns to solve mathematically and this requires relatively large amounts of computer memory and relatively long computer processing times. The solution to solving such large equation systems is to use clusters of high-speed computers with memory sharing combined with computational techniques such as iteration.

The Professor then provided a number of examples of simulations his university has performed. The first of these was for a vehicle illuminated by an obliquely incident plan wave of frequency 450 MHz. The graphical output of the modelling indicated the maxima and minima of the current and field distribution in the vehicle. This example was then extended to show the electromagnetic coupling into a wiring harness within the vehicle. Induced voltages in the frequency range were calculated over the frequency range of 1 MHz to 300 MHz using both MoM and hybrid techniques.

The second example was for a ship structure of length 75 m and showed radiation lobes from a transmitter on the ship over the frequency range of 100 MHz to 300 MHz. Interestingly, the MoM technique alone took 282.6 minutes of computational time, whereas a hybrid MoM/PO technique took only 8.1 minutes. It was also shown that knowledge and experience could be used to reduce the number of unknowns and resulting computational time.

The next example was for an Airbus A380 airplane and its antenna located at the aircraft's tail. The antenna induced current density on the structure was shown with a visually stunning simulation. An animation of the three-dimensional radiation

pattern from the same antenna was shown for the swept frequency range of 2 to 30 MHz. This was a telling graphic demonstration of how the radiation pattern changes from the expected simple pattern at 2 MHz to a quite complex pattern at 30 MHz.

A simulation of a horizontally polarized dipole was next. The dipole was located above a ground plane and a double exponential pulse was applied. This simulation was different from the previous in that this predicted the changing electric field in the time domain using time slices of 0.2 ns.

The final radiation example was of a 900 MHz mobile phone located next to a human head. The model predicted the resultant electrical field within the head and showed the shorter wavelength existing within the head.

Professor Singer then demonstrated a number of shielding effectiveness computations. Because of the extremely short physical distances involved in such models a hybrid of MoM and analytical techniques is used. Examples presented were for a copper sphere, a two layer copper and magnetic material sphere, and for an enclosure with a gold plated window. Results for the spheres were shown to be in very good agreement with Kaden data. The final shielding example was the analysis of an IEEE EMC TC-9 Challenge Problem #98-01. This involved an enclosure with a slot at one end, housing two circuit boards mounted on a motherboard. The modelling showed the resultant electric field and internal resonances for various circuit board grounding configurations.

The last modelling example presented was for printed circuit boards (PCB). In this case MoM techniques are suitable and traces are simulated by an equivalent wire. The radiation is calculated for finite size PCB including the effect of the dielectric. The radiation field is calculated from the sum of two components - that due to the current in the trace (without dielectric) and that due to current in the dielectric. The resultant radiation would be much higher without the dielectric. At present this analysis is limited to single layer boards.

The final part of the presentation dealt with the vital question of solution validity. Professor Singer uses both “internal” and “external” checks. Internal checks consist of input data checks, numerical behaviour of the computation and checking of the results. External checks can use experimental results (often difficult), analytical results (simple shapes) and comparison of computational results using different methods.

In summary, Professor Singer showed that there have been huge advances in recent years in new and hybrid techniques in computer modelling of electromagnetic compatibility. His presentation also brilliantly demonstrated the advances and effectiveness of visualisation and animation of such modelling results. Because of these advances, there is increasing application of modelling leading to the replacement of lengthy measurements.
After a series of questions that indicated the interest in this field, particularly from test engineers, John Hyne, the EMC Society Chairman, passed a note of thanks from the members present and presented Professor Singer with a memento of appreciation.


Dean Grey chats with John Hyne

# NEWS FROM ACA

## Limiting exposure to EMR – information booklet for manufacturers and importers

The ACA has released an information booklet for manufacturers and importers of mobile and portable radiocommunications transmitters with integral antennas. The booklet covers regulatory arrangements for limiting human exposure to electromagnetic radiation (EMR).
The requirements under the *Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2001,* and exemptions to the arrangements, are explained in the booklet. It also explains the specific absorption rate test method and covers labelling and compliance requirements, compliance records and the auditing process.
This kind of information had previously been included in a booklet with information for licensees and operators orf radiocommunications transmitters. Because the regulatory requirements that apply to these two groups are different, the information is now being presented in two separate booklets. The information for licensees and operators is currently being updated and the ACA expects to publish it later this year.
The full title of the new booklet is *Human exposure to radiofrequency electromagnetic radiation – information for manufacturers, importers and agents of mobile and portable radiocommunications transmitters with integral antennas.*
**The booklet Is available from all ACA regional offices and the ACA webslte at:**
**www.aca.gov.au/standards/emr/emrbook_lndex.htm.**

## ACIF ratifies radiocommunications infrastructure code

***Community consultation is* a *feature* of a *new code which aims* to *regulate the installation* of *radiocommunications infrastructure, such* as *mobile phone transmitters and base stations, used* to *provide telecommunications services.***

The Australian Communications Industry forum (ACIF) has ratified the Industry Code Deployment of Radiocommunications Infrastructure ACIF C564:2002. An underlying principle of this code is that public health and safety is of paramount importance. Community concerns about the risks of radiofrequency electromagnetic radiation (EMR) exposure are addressed by allowing the community and councils to have greater participation in decisions made by telecommunications carriers.

The code cannot change the existing regulatory regime at local, State or Federal level, but can only supplement the existing requirements already imposed on carriers, It requires carriers to consult the community about the installation of such infrastructure and that the facility be installed in accordance with the 'precautionary principle', This principle applies particularly to locations where community concern has been strongest such as schools, other facilities for children and hospitals.

The precautionary approach in the code is contained in the obligations imposed on carriers. For example, carriers are required to:

- design and operate radiocommunications infrastructure to minimise EMR exposure;
- develop consultation plans about the deployment of infrastructure that is not subject to development approval;
- turn off transmitters that are out of service;
- test their decisions about infrastructure deployment against a range of important factors; and
- document their decision-making processes about infrastructure deployment.

**Among other things, the code will provide site-specific obligations on carriers, the development of written procedures for community consultation and the development of internal complaints handling procedures by carriers.**

This code attempts to deal with some of the issues raised in the community's response to the deployment of certain radiocommunications infrastructure by, for example:

- standardising the obligations on carriers by providing a set of guidelines so that carriers are made aware of their increased responsibilities;
- encouraging all participants in the industry to responsibly exercise the powers and immunities described in current telecommunications legislation; and
- requiring carriers to notify councils about proposals for installation of all radiocommunications infrastructure before construction.

The code will encourage industry participants to be sensitive to the concerns of the community when exercising the powers and immunities described in current telecommunications legislation. However, not all of the community's concerns can be legally dealt with in a code of this sort.

The code was approved by the ACIF Working Committee Radio and Environment Reference Panel on 22 March 2002. The committee comprised representatives from the community and local government as well as the industry. It was ratified by the ACIF Board on 9 April 2002,

ACIF may now submit the code to the ACA for registration under Part 6 of the *Telecommunications* Act *1997.*

**The code is on the ACIF website at: www.aclf.org.au/ACIF/files/CS64_2002.pdf.**

## ACA informs industry at EMC Open Day

The ACA's NSW Regional Office was recently invited to speak at an Open Day run by Testing and Certification Australia (TCA). The purpose was to inform interested companies of the changes to the electromagnetic compatibility (EMC) regulatory arrangements and to advise on standards and testing methods employed by TCA. Other topics included lowering emissions and a practical test demonstration.

ACA staff made presentations on the EMC regulatory arrangements and outlined the changes made to the scheme introduced as a result of the ACA's recent EMC review. The new arrangements came into effect on 7 November 2001 with a two-year phase-in period.

The main changes to the regulations include:

- harmonisation of the EMC schemes between Australia and New Zealand;
- the recognition of a total of 103 standards;
- voluntary C-Tick labelling for products covered by Compliance Level 1;
- the inclusion of battery powered and two and three phase equipment covered under standards AS/NZS 4051 and AS/NZS 1044;
- compliance requirements for telecommunications customer equipment to change from Compliance Level 3 to Compliance Level 2; and

scope of the EMC regulations changed from 'first offered for sale' to 'first supplied'.

# EMC PIONEER RETIRES

After a long and distinguished career in the EMC industry J.H. (Jack) Pluck has announced his retirement from RFI Industries Pty Ltd, the firm which he has headed for many years. Regarded by many as the “father” of the EMC industry in Australia, Jack headed up Belling Lee Australia as the early (and for some time, only) source of screened rooms, filters and EMC general knowledge in the country.

Jack graduated from RMIT after studying communications engineering and in 1963 began a career in the RAAF.

He was commissioned as a Pilot Officer RAAF, and after officer training and further training at the School of Radio at Laverton was posted to Air Trials Unit, Woomera as Officer in Charge, Flight Control, responsible for design, installation, maintenance and repair of radio control, telemetry and recording equipment associated with ground control and operation of unmanned target aircraft. In this capacity he managed a staff of 20 radio technicians.

He was subsequently promoted to Flying Officer rank and appointed Radio Officer, Target Aircraft Squadron with a staff of 38 radio technicians.

In November 1965 Jack was posted to the Staff Officer Telecommunication Engineering (SOTELENG) directorate of RAAF Headquarters Support Command, Victoria Barracks, Melbourne where he was responsible for design, installation and modification of High Frequency (HF) communications equipment. In June 1966 he was promoted to the rank of Flight Lieutenant.

In 1969 Jack joined Belling and Lee of Kilsyth, Victoria as Engineering Manager, responsible for antenna systems and RF shielded enclosures. In 1973 he was appointed Chief Engineer of Scalar Industries dealing in communication antennas and RF shielded enclosures.

He became Chief Engineer and Company Manager, RFI Industries Pty Ltd in 1976, and Managing Director in 1988 responsible for company activities in design, development, manufacture, and testing in RFI/EMI/EMC engineering.

Highlights of Jack’s long career in the Australian EMC industry included:

- Responsibility for the design and establishment of first Anechoic Shielded Test Laboratory in Australia for EMI/EMC testing to World standards.
- Acting as consultant to the Government of India for design and specification of two large vehicular EMI test facilities for the Department of Defence.
- Delivering papers on RF shielded enclosures at national and international conferences in Sydney, Bombay and Bangalore.
- Researching the use and effects of ferrite absorbers in anechoic chambers and developing techniques to suppress magnetic field interference in computer and other electronic installations.

In June 1992 he was invited to become a Fellow of the IEAust. The letter of appointment as FIEAust. recognised "your high achievement and the level of responsibility which you have assumed over an extended period for important engineering decisions, activities and programs. The process of approval (of the elevation to Fellow) involves election by your peers, and approval is hence confirmation of your eminence and high standing within the engineering profession."

In early 1997 Jack sent out a call for expressions of interest in forming an EMC Society. Approximately 150 replies were received, and an inaugural meeting was held on 29th April 1997 to formulate the way ahead. An interim committee was subsequently formed with Jack as chairman. A business plan was formulated and negotiations with the Institution of Engineers resulted in the new EMC Society becoming a technical society of that Institution. A bulletin issued in July 97 noted “ A recent survey of prospective members clearly showed that a quality newsletter was the most important issue.” Jack became the first Editor of the Newsletter, a position he still holds.

Jack remains an active member and Council member of the EMC Society, and continues to edit our Newsletter. The Council of the EMC Society wishes to extend our sincere thanks to Jack for his work in founding and sustaining the Society in its early days and his continuing service as a Council member and Editor.

# 2002 EMC SOCIETY STUDENT PAPER COMPETITION

# Prize: $1000 for the best paper.

The EMC Society of Australia, a Technical Society of the Institution of Engineers Australia, is inviting Tertiary students to prepare a paper on any aspect of EMC technology. All papers will be considered for publication in the Newsletter of the EMC Society.

Conditions:

The Entrant must be a student studying towards a recognised Award from an Australian Tertiary Institution.

The paper must meet the publishing requirements defined in the EMC Society Web site:

*http://www.emcsa.org.au*

Please download the following document Author Instructions.doc

All papers must be received or postmarked by 6:00pm on the 1st October 2002. A confirmation of receipt will be sent within 48 hours.

Papers should be submitted via email or on a CD in MS Word or pdf formats.

Via Post: EMC Student Paper Competition.
EMC Society Of Australia. ( Secretary )
P.O. Box 254, Bayswater Vic 3153.
Via Fax: Attention EMC Society Secretary
+61 3 9762-8501.

The National Committee of the EMC Society will be responsible for judging the papers, and the committee's decision will be final. No correspondence will be entered into.

**All Entrants will receive a critique of their paper by mail on or before 12th November 2002.**

# MAILBOX

We invite all our members and readers to participate in our quarterly newsletter. In order to produce a better newsletter and provide our readers with the information and items of interest looked for, we welcome your comment, advice and criticism. Particularly, we would look forward to receiving technical articles, amusing anecdotes and items of general interest to the EMC community.

# STUDENT MEMBERSHIP

The National Council of the EMC Society has announced that Student Membership of the Society is now free.
We invite all students undergoing study in tertiary education in associated disciplines, electronics or electrical technologies to join our society. Membership is not restricted to these specific fields and indeed, anyone who has an interest in EMC is encouraged to join.
Membership of the Society entitles members to receive free the quarterly newsletter, attend technical presentations and provide access to information and personnel who may assist students in their studies.
**For more details please contact the secretary – Kingsley McRae – telephone 03 9762 6733 or kingsley@rfi-ind.com.au**

# CALENDAR OF EVENTS

## 2002

**August 19 – 23**

**IEEE EMC Symposium Minnesota**
Hyatt Regency, Minneapolis
Dan Hoolihan +1 651 213 0966 d.hoolihan@ieee.org

**September 9 – 13**

**EMC Europe 2002**
Organised by the Associazione Elettrotecnica ed Elettronica Italiana, the University of Rome "La Sapienza", the University of L'Aquila, th eUniversity of Naples "Frederico II", Sorrento, Italy.
Massimo Iandolo Phone: +39 02 77790 218 / 230 Fax: +39 02 798817
emceurope2002@aei.it

**October 6 - 10**

**24th Annual Electrical Overstress / Electrostatic Discharge Symposium**
Charlotte Convention Centre, Charlotte, North Carolina
**Info:** ESD Association, 7900 Turin Road, Building 3, Suite 3, Rome, NY 13440
(315)339-6937 Fax: (315) 330-6793 eosesd@aol.com www.esda.org

**October 7 - 11**

**2nd International Workshop on Biological Effects of Electromagnetic Fields**
**Info:** Visit www.imm.ariadne-t.gr/bioeffects and www.uoi.gr/conf_sem/bioeffects

## 2003

**February 18 - 20**

**15th International Zurich Symposium and Technical Exhibition on Electromagnetic Compatibility**
**Info:** Dr. Gabriel Meyer, Symposium Chairman
**Phonme:** +411 632 27 93 Fax: +411 632 12 09 gmeyer@nari.ee.ethz.ch www.emc-zurich.ch

**May 11 – 16**

**2003 International symposium on Electromagnetic Compatibility,**
**Hilton Hotel, Istanbul, Turkey**
**Info:** ORTRA Ltd., 1 Nirim St. PO Box9352, 61092 Tel-Aviv, Israel
Phone: +972 3 638 4444 Fax: +972 3 638 4455 www.ortra.com/emc2003 emc2003@ortra.co.il

# NEW MEMBERS

For those who have not yet joined our EMC Society we would ask you to fill in our membership application form and encourage your colleagues to follow suit. If you have applied for membership but not yet received an invoice from IEAust, would you please fill in and submit a new application.

# CORPORATE MEMBERSHIP

The EMC Society offers corporate Membership to organisations who may wish to nominate up to three people for membership. It also provides an important source of funding to the Society and we would like to take this opportunity to recognise the 2000 corporate Members.

**ADVANTEC ELECTRONICS Pty Ltd** is a registered NATA test house with accreditations for testing to TS001, TS002, TS004, TS006 and TS008.
Contact: David Stocks (02) 9477 7757
**DEPARTMENT OF DEFENCE** Defence Communications Regulatory Affairs.
Contact: Neal Miller (02) 6266 3642
**RITTAL PTY LTD**
Contact: Lucy Krieg (02) 9525 2766
**ROBERT BOSCH AUSTRALIA** is a manufacturer of white goods and specialised electronic automotive products.
Contact: Steve Offer (03) 9541 5474
**TENIX DEFENCE SYSTEMS** is a manufacturer of specialised defence systems.
Contact: David Willetts (03) 9244 4134

**The EMC Society would like to express gratitude to Advantec, Department of Defence, Rittal, Robert Bosch, and Tenix for their support in 2001.**

## Institutional Listings

The IEAust Electromagnetic Compatibility Society is grateful for the assistance given by the firms listed and invites application for Institutional Listings from other firms interested in the electromagnetic compatibility field.

# Institutional Listings



An Institutional Listing recognises contributions to support the publication of **THE IE AUST ELECTROMAGNETIC COMPATIBILITY SOCIETY** newsletter. Minimum rates are $200.00 for a listing in one issue. Larger contributions will be most welcome. No agency fee is granted for soliciting such contributions. Inquiries, or contributions made payable to the EMC Society, plus instructions on how you wish your Institutional Listing to appear, should be sent to the Editor, EMC Society Newsletter, IE Aust, 11 National Circuit, Barton, A.C.T. 2600.