



## INFORMATION ON NEXT MEETING

### ***SOUND REINFORCEMENT GOING DIGITAL ?***

Thursday 4<sup>th</sup> of OCTOBER 2001, 17h30 at Radio DRS, Studio 2, Brunnenhofstr.22, 8057 Zürich

**SPEAKER:** Andy Cooper, Yamaha R&D centre, London

**ORGANIZERS:** Joël Gödel, Markus Erne & Patrick Roe      **LANGUAGE:** English

**PS:** our full apologies for the change of date in this meeting (scheduled for the 6<sup>th</sup> of Sept.) for reasons beyond our control.

The theme for the first meeting in the Autumn is "Sound Reinforcement going Digital". Andy Cooper of the Yamaha R&D Centre in London, will be looking into the reasons for the rise in popularity of using digital audio products in sound reinforcement applications. He will be presenting the advantages digital products have over analogue products and how digital products are developed to help make the job easier for sound engineers. He will also talk more specifically about the Yamaha PM1D digital mixing system, giving examples of how it has been used in a variety of applications, while giving an overview of how to operate it.

#### **Biographical Notes**

**Andy Cooper**, is a professional audio digital product specialist for Yamaha, based at their Research and Development Centre in London, England. Previously, he studied music and electronics at Keele University (England) and spent 6 years as a sound engineer in a radio station broadcasting via satellite throughout Europe. He has held his current position for the last two years and has had the opportunity to work with sound engineers for Eric Clapton, Radiohead, Bjork,

#### **Special offer to Swiss Section Members**

### ***4<sup>TH</sup> MULTICHANNEL FORUM IN PARIS***

There are ten (free) tickets reserved for the Swiss Section Members for the 4<sup>th</sup> Multichannel Forum to be held at the screening theatre Les Audis de Boulogne in Paris on the 25 and 26<sup>th</sup> of October 2001. Anyone interested should e-mail Terry Nelson at [studio.equipment@bluewin.ch](mailto:studio.equipment@bluewin.ch). Tickets will allocated on a first come first served basis.

#### **THURSDAY 25 OCTOBER 2001:**

- Morning**      Opening of the Forum followed by Keynote presentation and debate from Tomlinson Holman, "The Past and Future of Surround Sound"
- Afternoon:**    Multichannel Sound for Broadcast with presentations from Florian Camerer/ORF and France 3.  
Chair: Christian Hugonnet
- Evening:**      Cocktail Party followed by Special Event "Hollywood Night" - film sound by Gary Rydstrom.  
Chair: Tomlinson Holman and John Rutledge

#### **FRIDAY 26 OCTOBER 2001**

- Multichannel Sound for Cinema  
New Directions with Vincent Arnardi  
Chair: John Rutledge
- Multichannel Sound on DVD Video/Audio and SACD  
Chair: Jürg Wuttke - Schoeps  
Installation of multichannel sound systems with Günther Theile, Chair: Tomlinson Holman
- Round table with industry leaders on the present state and future of surround sound commercially.  
Chair: Keith Spencer-Allen, a leading commentator from the international press.

## REPORT ON PREVIOUS MEETING

# ***THE USE OF DIGITAL SIGNAL PROCESSING IN LOUDSPEAKER TECHNOLOGY***

Thursday 14<sup>th</sup> of June 2001, 18h00 at Studer Professional Audio AG

**SPEAKERS:** Alain Roux, Relec SA  
Dr. Ulrich Horbach, Studer Professional Audio AG

**REPORTER:** Attila Karamustafaoglu, Studer Prof. Audio AG

About 40 interested participants attended the meeting in the class room at Studer for the two speeches and demonstrations.

Alain Roux opened the programme with an interesting speech about his actual work and possible extensions using digital technology. He gave detailed explanations about implementation and the advantages of a digital interface to the loudspeaker to send not only audio data but also to exchange control data. This data can be used for simple, obvious purposes such as volume control, but in a manufacturer's view also to calibrate systems without having to open and tune them by hand. The thoughts were illustrated by a number of block diagrams projected during the presentation.

Dr. Ulrich Horbach then made a presentation on his research and that of his group and partners. He started with a general introduction to loudspeaker history and pointed out the status of Hi-Fi loudspeakers in society with examples of the 1980s where a Hi-Fi was much more a status symbol than today. Some well-chosen stories about loudspeaker models then lead him to make a call to take the discipline of loudspeaker design with more courage than today's manufacturers do.

The actual research at Studer on loudspeaker reproduction was then described; it is mainly within the context of a European funded research project called CARROUSO where a consortium of eleven partner institutes are carrying out research on a system to record, transmit and reproduce three dimensional audio scenes using the technique of wave field synthesis, initially developed by the technical university of Delft in the Netherlands. The next topic of discussion was the "perfect" loudspeaker and some approaches to it.

His ideas of using horns or waveguides for their controllable off-axis responses were shown to be

very useful in combination with digital equalization and he presented some block diagrams and examples of simulations graphs.

As a future view to loudspeaker reproduction the wave field synthesis was then discussed in its principle. Here, arrays of loudspeakers are used to recreate the convex or concave wavefronts as they appear with natural sources. By this technology sound sources which are not coincident with the speaker positions do not any longer have to be reproduced as phantom sources but appear practically as in reality, independent from the listeners position or so called "sweet spot".

The second part of the evening was taken up by the demonstrations. The audience was split into two groups who switched locations after each demonstration. The first was a demonstration of new studies of loudspeakers for stereo reproduction. One was a digitally controlled horn loudspeaker which applied the methods discussed in the speech. Another model of a loudspeaker was then shown which was a vertical array with digital processing to control the vertical response of the system, in order to avoid floor and ceiling reflections. The demonstrations were made with selected music material from a CD player.

In the adjacent hall, Mr. Corteel another member of the team demonstrated a very newly constructed loudspeaker system which consisted of four flat panels equipped with eight DML (Distributed Mode Loudspeaker) exciters each. This was Studer's first prototype for wave field synthesis using 3 pc's to do all the processing. Some sample parameter sets were demonstrated which auralized sources at defined locations.

The evening was followed by a dinner at the Trend Hotel close to the Studer factory.