Studio Report – Kungliga Musikhögskolan in Stockholm

William Brunson, Örjan Sandred, Fredrik Hedelin
Department of Composition
Kungliga Musikhögskolan (The Royal University College of Music)
email: bill.brunson@kmh.se

Abstract
This paper relates the history and development of electroacoustic music at Kungliga Musikhögskolan in Stockholm (The Royal University College of Music, hereafter KMH) since its inception in 1972. In addition to an historical and technical overview, KMHs specialized program for electroacoustic music (eam), current research and future plans are presented. Last but not least, some of the composers and music are discussed.

1 History
The palindromic year 2002 marks the 30th anniversary of the studios for electroacoustic music at Kungliga Musikhögskolan in Stockholm— the largest and oldest college of music in Sweden. Although the story begins somewhat earlier in June 1969 in the wake of the establishment of the national studio EMS under the aegis of the Swedish Radio, the studio at KMH was not operational until 1972 Knut Wiggen and Prof. Ingyvar Lidholm drew up the guidelines. Composer Lars-Gunnar Bodin became the first director and principal teacher.

In its first incarnation, the studio reflected the standard radio studio with three stereo tape recorders and a four-channel recorder complemented by a now classic “Putney” VCS3, reverb, Bruel & Kjaer third-octave filter and various types of waveform and noise generators. An experimental modular mixer designed by EMS was used during these first pioneering years.

By the mid-70s a large Buchla analog synthesizer was installed and by the end of the decade the studio was moved to its present location with a purpose-designed control room and adjacent recording studio. As part of a policy to maintain a technical par with popular music the studio was upgraded with a 24 channel MCI in-line console and 16 track (2 inch) MCI multitrack recorder with dbx noise reduction. Digital delays and harmonizers were installed as was a Dataton digital sequencer. Four channel monitoring was installed as well. In addition, a second studio – Studio B – was established and non-composition students were invited to study eam. Pär Lindgren assumed direction of the studio in 1979 and was joined in 1981 by Bill Brunson.

The digital era was ushered in with the purchase of a Synclavier II system in 1981. Subsequently, the Sample-to-Disk system was added. Designated as Studio C, extensive programming projects in algorithmic composition, digital control of analog synthesizers and digital graphics were undertaken in the Synclavier’s native language XPL.

The arrival of MIDI, the Yamaha DX7 and Apple Macintosh led to significant investments in digital hardware and software during the 1980s. Notable items include products from fledgling companies such as Digidesign, MOTU, Opcode, etc. At one point twelve Yamaha TX81Zs were purchased for additive synthesis; an Akai S900 paved the way for four S1000s.

While the dive into digital audio workstations actually began with the Synclavier, the first DAW was the Dyaxis system in 1989 which was later supplanted by ProTools during the early 1990’s.

Studios A and B were redesigned in 1991. A third fully digital studio (Studio D) was established in 1994 in conjunction with the launch of the new electroacoustic music program.

Highlights of the mid-90’s were the purchases of a Yamaha 02R, a Solid State Logic 4040 G+ series mixer and three powerful, matching ProTools III systems (3 DSP Farm and 1 Sample Cell II card per system).

Recently, Bill Brunson serves as studio director and teaches together with Fredrik Hedelin and Örjan Sandred.
2 EAM Program

The Department of Composition regards the knowledge of music technology — including its aesthetic, theoretical and production aspects — as essential tools and perspectives for young composers. For those wishing to specialize in the area of electroacoustic music composition, KMH offers a four-year program. An additional two-year program is available to qualified students.

Basic topics covered include both digital and analog studio techniques and composition, EAM history and repertoire. Connections between the history and aesthetics of eam, its technical aspects and compositional styles comprise the central thrust of the first two years. The subsequent two years are dedicated to individual projects, often in collaboration with musicians and other students at sister colleges, but also with professional orchestras and ensembles such as Kroumata and The Swedish Radio Orchestra. Advanced courses in interactive composition (MAX/MSP), sound processing (Audiosculpt, Diphone, etc.) and mixing techniques are available as well.

Acknowledging the importance of the acoustic tradition, all eam students are required to take courses in counterpoint, orchestration and form analysis.

Likewise, as music technology plays an nearly inescapable role in the professional life of a composer, all composition students in the "classical" and "jazz" programs are required to study eam for a minimum of 2 years. The overwhelming majority of students continue to work within the eam-idiom during their entire four years.

At present, there are twenty-four students studying composition, including four specializing in eam. Each year, guest teachers – both Swedish and international - are engaged for seminars and as guest teachers. Recent guests include Javier Alvarez, Jon Appleton, Magnus Lindberg, Kaija Saariaho, Denis Smalley, Daniel Teruggi and Alejandro Viñao.

Located in a purpose-designed control room, Studio A is a powerful and professional facility centered about a Solid State Logic SL4040 G+ Series automated analog mixer with Total Recall. Studio A has direct access to a small recording studio and via trunk lines to a large and a small concert hall.

At the heart of Studio B is a Yamaha 02R digital mixer. Originally conceived as a project studio environment, Studio B has recently been completely re-designed into a 5.1 Surround control room.

Studio C is utilized for introductory courses. The studio is based on an Apple Macintosh G4 with Digidesign 001 together with a Mackie 1604 mixer and ADAT recorder.

A fourth studio, tentatively designated Studio S1, mirrors Studio B and is currently being equipped. Shared by the Departments of Composition and Media, the 5.1 Surround control room is intended for composition and video post-production. The audio equipment will be supplemented by an additional G4 computer for digital video editing together with a 42" plasma screen for video display.

The production studios are identically equipped with Apple Macintosh G4 computers, Digidesign Pro Tools (TDM) workstations and a wide range of music software and plug-ins. This permits the free movement of projects between rooms. In addition, Studios A & B each offer 16 tracks of Alesis ADAT controlled by a BRC, while Studio C houses a single ADAT. Synthesizers and samplers include Nord Modular, Yamaha SY99, TG77, TX81Z as well as Emu E4 Platinum and Akai S1000. The number and type of outboard effects vary from studio to studio and range from Lexicon 300, tc electronics M3000 and M-One to Yamaha SPX90 and Lexicon LXP15 and LXP1. Genelec studio monitors are installed in all studios. A large variety of microphones is available.

3 The Studios Today

KMH currently maintains four studios for electroacoustic music composition. Each studio reflects a production situation that students are likely to encounter during their professional careers.

4 Research

Research plays an increasingly important role for the Department of Composition. Previously, research has been officially classified as artistic developmental work, but in recent years has attained a new status of recognition which opens up many new possibilities.

Despite the status of artistic research in the past the Department of Composition has driven research in five general areas during the past ten years as follows:
Program development In this category, we find Composer Tools by Pär Lindgren, which is an extensive programming environment that facilitates easy prototyping and testing of compositional ideas in real-time. Written in Hypercard with external functions in C. Another example is Fredrik Hedelin’s Kimon, a system for algorithmic composition with sound objects which react to each other. The structure, internal relationships and development in time of a musical work can be formalized. Composer Tools and Kimon can be applied to both instrumental or ear. Written in Lisp/CLOS.

Interpretation Several projects revolving around the interpretation of music investigate interactive performance environments and the boundaries between ear and instrumental music. Included here is Örjan Sandred’s transference of a compositional structure from the instrumental to the electronic genre via sound analysis/re-synthesis and treatment with physical models. In his project Erik Peters’ is currently investigating the performance relationships between musicians and the computer. Another angle on interpretation is Joakim Sandgren’s work on recording an instrumental work in an experimental manner for further treatment in the studio.

Spatial studies Martin Jonsson is examining the relations between real acoustic places and virtual rooms and the influence that the real sound and its technological double may have on compositional decisions. Further he is working on the development of virtual models of real spaces as compositional environments.

Pedagogy Hans Lunell has written a book about the Patchwork environment and algorithmic composition. Bill Brunson is assembling an interactive presentation of the craft and techniques of electroacoustic music.

Composition Considering the musical work as a work of research, several composition projects have been undertaken including Per Mårtensson’s work for 13 winds, violin solo and computer (MAX) and the work of Mattias Petterson, Lise-Lotte Norelius and Fredrick Olofsson with the interactive computer instrument SensOrg which was developed by Tamas Ungvary at The Royal Institute of Technology.

5 The Future

With the completion of our two new 5.1 studios, it is a fair assumption that much energy will be devoted to the investigation and mastery of this new mixing environment. Certainly the experiences from four-channel mixes will prove helpful. Another area of current interest is live-interactive music performance; most often realized in MAX/MSP the limits of the concert hall are being questioned and expanded.

On a pedagogical note, KMH has announced its intention to found a “tonmeister” program, which skirts the boundaries of composition, performance, music technology, computer science and physics and electrical engineering. No doubt the confluence of these diverse disciplines will stimulate new ideas and developments.

6 The Music

During the past 30 years, many of Sweden’s active composers have worked in KMH’s studios. Their names and works are too numerous to mention here. We hope to present a retrospective CD (or two) in the near future. After all, it is the music made by the people behind the machines that matters.