DIEM: STUDIO REPORT

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Abstract
DIEM is Denmark’s national center of electroacoustic music. DIEM is an independent, non-profit organization whose purpose it is to assist in the production, teaching, research and performance of all styles and forms of electroacoustic music in Denmark. The institution is primarily funded by the Danish Ministry of Culture. The staff includes a director, an administrator, an audio engineer, a hardware engineer, a software coordinator and a secretary. This report is a description of the facilities and recent activities that have taken place at DIEM.

1 Location
The institution is located in the concert hall of Denmark’s second largest city, Aarhus. The concert hall, consisting of a symphony hall as well as a chamber music hall, is owned and operated by the city of Aarhus. DIEM, which is a national institution, is leasing studio and office space from the concert hall. The building also houses the Aarhus Symphony Orchestra and The Danish National Opera. The studio itself consists of two rooms, 60 square meters each, which were designed and constructed as a recording studio and control room when the concert hall was built in 1982. Four offices are also located in the building.

2 Equipment
The main recording studio provides fully digital mixing and recording facilities. The mixer is a Yamaha DMC 1000 digital mixing console with 22 inputs, 8 digital outputs and full automation. Connected to the console, via a digital patch bay, is a Power Macintosh with a ProTools IV hard disk recording system and an 8-channel ADAT digital tape recorder as well as two Samplecell cards. This system is integrated with two stereo DAT mastering tape recorders and a CD audio recorder. Software includes Csound, Audiosculpt, Sound Designer, SoundHack, MAX, Patchwork and Symbolic Composer. An SGI 02 has recently been acquired for real time applications. Numerous MIDI synthesizers and effects units are also available. Studio II includes a 16 channel mixer, a Power Macintosh computer with a 32 channel of Pro Tools system, a Samplecell card and a number of synthesizers. The two studios and offices are linked via ethernet and there are direct audio links with both concerts halls for live recording and playback. DIEM also has a powerful four channel D&B F-1 sound system with subwoofers used for indoor and outdoor concerts with electroacoustic music as well as a four channel Genelec system for smaller venues.

3 Productions
Studio time is made available to composers of all types of electroacoustic music regardless of their artistic background or stylistic orientation and there is no charge for working in the studio. For most projects an audio engineer is also provided. The digital recording studio is of course attractive for work in the tape medium, and many tape pieces have been produced at DIEM. But there has also been a great amount of interest in live computer music, and DIEM also provides studio time and technical and financial assistance to projects involving live electronics and interactive computer systems. A short description of a few works recently produced at DIEM follows.


Sunleif Rasmussen: Vox Humana. A work for four channel tape commissioned by DIEM with support from the Danish Arts Foundation and premiered at the Steno Planetarium in Aarhus.

Jens Hørsving: plucked.projected. A work for four channel tape commissioned by DIEM with support from the Danish Arts Foundation and premiered at the Steno Planetarium in Aarhus.
Hans Peter Stubbe Teglbjærg: *Mere Lys*. A work for mezzo-soprano and computer premiered by Helene Gjerris at the DIEM computer music marathon in Aarhus.

Rasmus Lunding: *Det nødvendige*. A work for four channel tape premiered at the Steno Planetarium in Aarhus.

Nicola Sani: *Non tutte le isole hanno intorno il mare*. A work for harp and tape by a visiting composer commissioned by Sofia Claro and premiered at the Danish Radio in Copenhagen.

Lars Graugaard: *Encrustations*. A work for harp and tape commissioned by Sofia Claro and premiered at the Danish Radio in Copenhagen.

Fausto Romitelli: *New work for harp and tape*. A work for harp and tape by a visiting composer commissioned by Sofia Claro.

Rene Mogensen: *Winter Waves*. A work for tape by a visiting composer from New York.

Wayne Siegel: *Match II*. An interactive work for flute and computer commissioned by Lars Graugaard and premiered at the Danish Radio in Copenhagen.


Wayne Siegel: *Tunnel Vision*. A work for four channel tape commissioned by the Boxiganga Performance Theatre and premiered at the Steno Planetarium in Aarhus.

**4 C D ’s**

Music for Planetarium
CD with tape music by Birgitte Alsted and Michael Nyvang. Da Capo, 1997


**5 Teaching**

Although DIEM is not affiliated with any educational institution, open seminars and workshops are conducted regularly. In September 1997, a two-year course in computer music was initiated for composition students studying at the Royal Academy of Music in Aarhus.

**6 Concerts & Festivals**

**Computer Music at the Planetarium**

In October 1995 DIEM started a concert series with computer music and slide shows at the new planetarium in Aarhus. The dome theater is equipped with a star projector and 30 slide projectors that can cover the entire dome and can be synchronized with two 8 channel digital tape recorders for multimedia productions.

**DIEM Computer Music Marathon**

On May 15th, 1998 DIEM presented a Computer Music Marathon between 21:00 and 02:00 at the Concert Hall in Aarhus in connection with the annual Aarhus Night of Culture. Performances included works for ensemble and computer, interactive dance, performance art, an outdoor installation and works for computer generated tape. The entire 5-hour program was broadcast live on Danish national radio.

**7 Research: Digital Dance**

The Digital Dance System was developed by Jens Jacobsen and Wayne Siegel. The interface consists of up to 16 bending sensors, which measure the angles of various joints on the dancer’s body.

Data from these sensors is sent via a small wireless transmitter placed on the dancer to a receiver. The receiver converts incoming data to standard MIDI controller data for each sensor. The system can thus be used in any sort of MIDI setup. Software for interpreting sensor data and mapping this data to musical structures and events can be created in any MIDI programming environment.

Funding was provided by the Danish Ministry of Culture and the Danish Council for Research in the Humanities. The system was first used for a public performance in April 1997 in connection with the NUMUS Festival. Two works were performed which utilize the Digital Dance System: a work for solo dance by Wayne Siegel and Helen Saunders in which the dancer controls various parameters of the composition and a work for
violin and computer by Ivar Frounberg, where the system is used to monitor the violinist’s vibrato and bow movement. Both works have been performed extensively. The system has been further developed and is now being made commercially available. Research on the artistic implications of interactive dance is being conducted in collaboration with various Danish contemporary dance companies, and future plans include the use of two systems in an interactive pas de deux.

8 Conclusion
Although DIEM is a relatively small institution, activity has increased steadily in recent years. By making professional computer music facilities and experienced personnel available to Danish and foreign composers and by offering extensive courses in computer music, DIEM has contributed to the artistic development of computer music in Denmark. Through concerts, festivals and collaborations with performance and broadcasting organizations, DIEM has sought to bring electroacoustic music to a wider audience. Through research DIEM has sought to develop new artistic tools.