ABSTRACT: The LIEM-CDMC is a composition oriented laboratory and an overview of its music output from the last season is reviewed. The lab is involved as well with the development of software for all stages of composition whenever is needed. One software project, MEGAPRO, is explained in detail, as well as the facilities and other activities like concerts and seminars.

INTRODUCTION

The "Laboratorio de Informática y Electrónica Musical" (LIEM) belongs to the "Centro para la Difusión de la Música Contemporánea" (CDMC); this institution depends from the Ministry of Culture and is a focal point in the promotion and stimulus of Contemporary Music in Spain. The LIEM opened two years ago and since then has been very active due mainly to the big interest in electronic and computer music now in Spain. The LIEM is mainly an instrument for composers where they can develop and produce their compositions for tape or research the possibilities of real time electronics. The variety of technical means are broad but we are aware that in spite of the fact that today's commercial software and hardware is enough for one half of the composers that come to our lab, the other half keeps asking things that make a necessity either to develop our own more general software or get it from other institutions.

COMPOSITION

Being a small studio the amount of music produced last season is high. That is due to the fact that there is always a technical assistant with the composer and because most of the users have small personal systems at home, so they come the LIEM to polish or multiply their previously elaborated ideas.

Five commissions have been made to be premiered at the "Festival Internacional de Música Contemporánea" in Alicante (September 1991): for tape "Aquéllos objetos" by J.L.Carles and "Espacio Deconstruido" by M.Mancio; for cello and tape: "Secuencia X" by A.Lewin-Richter and "Présence I" by A.Thomassin; and for clarinet and tape "Tríptico" by R.González Arroyo.

Other works finished include "Perfil Nocturno" (tape) by R.Mosquera; one part of the Symphonic Piece "Les Taureaux" (based on the bullfights sound landscape) made by R.Carré also in the INA-GRM; a fragment of the opera "Luz de Oscura Llama" commissioned by the CDMC to E.Pérez Maseda; "Vida" (tape) by C.Díez; "Duo" (saxo and tape) by A. Charles; "Quita" (tape) by A. Oliva; several recordings for multimedia works by J. Iges and providing the sound for some
installations in the exhibition that F. Torres presented in the Centro Reina Sofia (the Contemporary Art Museum where our lab is located). On progress there is an analysis and processing of the voice and speech for a multimedia work about Shakespeare’s Macbeth done by C.Zuñiga and J.Ordinas; “Dialogue avec l’écho” by J.M.Chouvel based on processing of voice and guitar; and many other that are not yet definite.

SOFTWARE DEVELOPMENT
Our first goal regarding this point is to answer the demands of composers, providing them with tools that are to be used in musical contexts. We are less interested in the tool by itself than in what can be done with it: be that a fragment of a composition or research in new musical relationships. The development is done either by our staff or by external collaborators. For simplicity we limit ourselves to the Macintosh environment but since it is already saturated with very good software, we are building our own in a way that is compatible and takes advantage of the products in the market without duplicating features. For instance, in the MIDI domain, it is clear that a conventional software sequencer is an almost essential tool for composition, but in a multitasking environment every “track” of it can be fed by another program generating arbitrary data. This is the case of MEGAPRO, a graphical, modular system developed by C.Céster, capable of generating and processing MIDI sequences in several ways (see below).

Algorithmic Composition: A very important project in progress is to implement in MIDI (with MEGAPRO or MAX) the most known methods for algorithmic composition, like stochastic functions, filtering by rules, Markov Chains, fractional noises, fractals, dynamic systems, etc. This can be useful to composers not only for exploring these vast territories but as reference points for comparison with new methods and stimuli for new ideas. We also are starting to use a version of Project 2 by G.M.Koenig for the Atari computer and studying porting it to the Macintosh. “Pitiel” is a program for interactive and real-time composition being implemented by S.Josed in MAX (see elsewhere in these proceedings).

MEGAPRO: Our “MIDI Event Generator and Processor” (MEGAPRO) is an ambitious software development project being realized by C.Céster. The main idea is to create a straightforward and easy-to-manage modular MIDI algorithmic composition environment. Existing software often makes it very hard for a composer without deep computing knowledge to implement his algorithms, which surprisingly often are just a combination of the “classic” algorithms mentioned above. So the software includes all these as independent modules to be interconnected in a user-friendly, TurboC++-like fashion. Almost all MEGAPRO modules can generate as well as modify music parameters in real time, each being specialized on a specific musical task, including pitch, timing and dynamics. Several chains can be mixed together to create more complex setups. Modules for playing MIDI Files and receiving real-time input from the outside or from another program through Apple’s MIDI Manager are provided, making this software ideal for use in a MIDI multitasking environment including a sequencer. All modules can be programmed to
change their behavior over time. Also included are typical real-time MIDI filters, such as transposers, delays, sieves, etc.

The development is being done on a Macintosh IIx computer, using Apple's Macintosh Programmer's Workshop (MPW) Object Pascal and the MacApp library. The choice of an object-oriented language was quite obvious, as the entire philosophy lying behind MEGAPROC is to have modules sending MIDI messages to each other to be further processed. It also makes expansion a lot easier, as a basic MEGAPRO object structure can be given to composers/programmers in our studio who are interested in implementing algorithms not included in the basic set. Every object is compiled as an independent code resource and put in a folder containing all modules to be loaded on program startup.

Some screen shots of working MEGAPRO patches will be shown and briefly explained in the presentation, and we look forward to fully presenting and demonstrating the software in next year's ICMC.

Synthesis and DSP: We are starting setting up the Developer's Kit for the Sound Accelerator, and our plans include to develop simple tools for analysis of signals for extracting envelopes of frequency, global amplitude, etc that can be applied to process other signals. But previously we want to push to the limit the implementations of classical software synthesis programs like Music 4C or CSOUND on the Macintosh.

Other: A system for MIDI controlled specialization of several independent sound sources as well as a MIDI sync generator is being developed by C. Cáceres and J. Arias; for the near future it is expected to have a general MIDI editor and filter of scales with arbitrary tunings.

FACILITIES AND STAFF

The lab has three rooms communicated by audio, MIDI and LAN lines. One of the rooms is equivalent to a recording control room, with a digital 24 track tape recorder, automated analog mixer and a MIDI studio controlled by a Mac SE or an Atari ST-4. Equipment includes a variety of MIDI synthesizers, samplers, processors, MIDI routing devices, SMPTE to MIDI synchronizer and master tape recorders in analog and DAT formats. The second room is for direct software synthesis and microphone sound input, it includes stereo monitoring and a few MIDI devices controlled by a Macintosh IIx with a 300 MB hard disk, Sound Tools and AES-EBU interface. The third room is going to house a NeXT workstation together with MIDI monitoring equipment. There is also another Mac II in the CDMC office that can be used for development and a set of mobile equipment for concerts. The software includes most of the commercially available one for MIDI, synthesis and sound editing, and a variety of development environments like MPW, Smalltalk, M4SL, Mach2, THINK C, MIDI-Lisp, etc. Adolfo Núñez is the director of LIEM, and Javier Rubio and Carlos Cáceres are the technicians, the administration and secretary comes from the CDMC.
CONCERTS AND OTHER ACTIVITIES

The LIEM organizes and participates in many concerts in the CDMC's season that are devoted to program the works done in the studio as well as works and performers from other environments and countries. Every year there is a concert in the "Festival Internacional de Alicante" with the premiers of works commissioned to be realized in our studio. The LIEM provided the technical support for the International Festival of Electronic Music (Madrid, November 1990), organized by the AMEE, the Spanish Association for Electroacoustic Music. Other concerts include the "Bienal Bordeaux-Maltró", piano and electronics, the assistance to the group l'Itineraire and a Spanish Electronic Music concert presented in the Flykingen (Stockholm, February 91).

The pedagogical activities have being limited to short demonstrations for information to composers or music professionals in general, a lecture by X.Serra on "Spectral modeling synthesis" (February 1990) and a one week seminar given by H.Vaggione on "Computer Music Composition" (July 1991). Since the demand for these seminars and lectures has been very high we expect to organize them more regularly.