Computer Music Association
Newsletter
Vol. 4, Nos. 1 & 2
July 1983

The Computer Music Association
General Information

The Computer Music Association is a non-profit, tax exempt entity, functioning internationally, devoted to the furtherance and promotion of the art and science of computer music.

The CMANewsletter is an unrefereed quarterly periodical distributed to all CMA members. Any item of interest to the computer music community (including program listings) may be submitted for publication in CMAN and must be presented in facsimile form. Articles, studio reports, reviews, and announcements of concerts, conferences, workshops, etc. can be submitted in any language, however if written in other than English, a brief abstract in English should be included.

CMA Publications consists of a variety of conference proceedings and scholarly papers pertaining to computer music. Materials are refereed and may be submitted to CMA at the address, below, for review.

A limited number of advertisements are accepted for publication in CMAN. For rate and deadline information, write to The Computer Music Association.

Back issues of all Newsletters are available on request for US$3.00 each to members and US$4.00 each to non-members.

All communications should be mailed to:

The Computer Music Association
P.O. Box 1634
San Francisco, CA 94101
U.S.A.

CMA NEWS

The Computer Music Association is soliciting pre-recorded computer music for a variety of purposes: a) an archive, b) a catalog, c) upcoming concerts. If you have pieces to submit or would like further details concerning this aspect of CMA's endeavors, please send all materials and/or questions to CMA, P.O. Box 1634, San Francisco, CA 94101, USA

In December of 1982, a committee including Herbert W. Franke (computer artist), Stephan Kaske (composer), and Otto Laske founded The Computer Aided Arts Institute Munchen (CAAIM) as a non-profit organization. The decision was made after successful negotiations with the German computer industry, especially Digital Equipment Corp. (DEC). The Institute is planned as comprising four divisions, one each for the visual arts, music, choreography and poetry. The first two are headed by H. Franke and O. Laske, respectively. The other two are open at the moment. It is the purpose of the Institute to be the receiver of digital equipment and other donations for setting up computer studios for the four arts mentioned. The structure of the Institute is modeled after the Dessau Bauhaus. A first meeting of the members of the Institute, especially of experts in the fields concerned, is planned for the fall of 1983 in Munich. For further information contact: CAAIM, Elisabethstr 12/V, 8000 Munchen 40, Tel. (089)-27-17-200.

The Computer Music Gatherings are informal get-togethers held of the 4th Sunday of each month at CCRMA at Stanford University. The Music Gatherings provide an opportunity for San Francisco Bay Area computer music enthusiasts to meet and exchange ideas. For further information write to 537 Jones St., Apt. 8817, San Francisco, CA 94102 Tel. (415)-323-2818.

The Computer Music Association is proud to announce the addition of Rob Gross to our existing staff. Rob has taken over the job of coordinating and distributing the CMA Publications. Rob's acceptance of this position will greatly ease the work overload which has resulted from the high demand for our publications and will ultimately mean faster and more reliable service for those who order from us. Thanks Rob and GOOD LUCK !!!

CMA Board Elections

Five members are to be elected to the CMA Board of Directors for four-year terms. Please place an "x" next to the names of FIVE candidates of your choice. Board members serving terms through 1985 are William Buxton, Goffredo Haus, Hubert S. Howe, Jr., Gary Kendall, and Otto Laske.

____ Larry Austin, USA

____ Marc Battier, FRANCE

____ James Beauchamp, USA

____ Thomas Blum, USA

____ Donald Byrd, USA

____ James Dashow, ITALY

____ Dorothy Gross, USA

____ Robert Gross, USA

____ Curtis Roads, USA

____ John Strawn, USA

Mail this ballot by September 30, 1983 to Computer Music Association, P.O. Box 1634, San Francisco, CA 94101-1634, USA, Attn: Elections

AIMI

CENTRO DI SONOLOGIA
COMPUTAZIONALE
UNIVERSITA' DI PADOVA

Iscrizione

La domanda di iscrizione al corso dovrà essere inviata entro il 15 giugno 1983 usando la scheda allegata.

La quota di iscrizione è fissata a L. 177.000, ridotta a L. 88.500 per i soci AIMI (Associazione di Informatica Musicale Italiana). Tale quota deve essere versata sul c/c bancario n. 310127/L intestato a « Graziano Tisato, C.S.C., Corso di Informatica Musicale 1983 », Agenzia n. 1 - Cassa di Risparmio di Padova e Rovigo - Padova.

Tecniche di composizione del suono nella musica informatica

Padova, 27 giugno - 1 luglio 1983

Il Corso è promosso dalla Associazione di Informatica Musicale Italiana, AIMI, c/o Biennale Musica, San Marco, Cà Giustinian, 30124 VENEZIA.

Segreteria e sede del corso :
Centro di Sonologia Computazionale
Via S. Francesco, 11 - Tel. 049/661969
35100 PADOVA

Inviare a :
Centro di Sonologia Computazionale
Università di Padova
Via S. Francesco, 11
35100 PADOVA

Tecniche di composizione del suono nella musica informatica

Corso per musicisti e ricercatori

Centro di Sonologia Computazionale
Università di Padova

Lunedì 27 giugno - Venerdì 1 luglio 1983

Corso estivo di Informatica Musicale 1983
C.S.C. Università di Padova

Lo sviluppo delle moderne tecnologie informatiche ha consentito la realizzazione di sistemi computazionali direttamente utilizzabili per la composizione musicale. Queste innovazioni tecnologiche richiedono però un ampliamento delle conoscenze tradizionali del musicista. Allo stato attuale, la didattica della Computer Music non trova un adeguato spazio nei normali corsi di formazione musicale.

Il Centro di Sonologia Computazionale, che da diversi anni svolge attività di ricerca, produzione e didattica nel campo della musica informatica, organizza questo corso estivo con l'intento di soddisfare le esigenze di molte persone che non possono seguire i corsi regolari.

Il corso è articolato in lezioni intensive e laboratori individuali ed intende fornire gli elementi teorici necessari alla sintesi del suono orientata alla composizione musicale. E' accompagnato da esercitazioni e metterà i suoi partecipanti in condizione di saper progettare degli oggetti sonori da eseguire mediante elaboratore.

Il corso si rivolge a musicisti e ricercatori che vogliono utilizzare in musica le tecnologie informatiche e che hanno nozioni elementari di acustica, psicoacustica musicale nonché una conoscenza di base sugli elaboratori elettronici.

Programma delle lezioni :

— uso dell'elaboratore per la generazione del suono;

— acustica e psicoacustica musicale;

— tecniche di sintesi del suono: additiva, sottrattiva, moltiplicativa, modulazione di frequenza, distorsione non lineare;

— trattamento dei suoni concreti e sintetici: missaggio digitale, riverberazione, spazializzazione;

— linguaggio per la sintesi dei suoni MUSIC 5;

— sistema interattivo ICMS;

— applicazioni nella composizione musicale;

— progettazione e sperimentazione di oggetti sonori da eseguire all'elaboratore.

Orario : 9.30 - 12.30 ; 15.30 - 18.30.

Esercitazioni individuali :

— sviluppo di strumenti MUSIC 5;

— esecuzione di partiture;

— applicazioni delle varie tecniche di sintesi;

— trattamento dei suoni con il sistema ICMS.

Orario : 8 - 19.

Domanda di iscrizione :

Nome .....

Cognome .....

Istituzione .....

Via ..... n. .....

CAP. ..... CITTA' ..... PROV. .....

Tel. .....

Desidera partecipare al corso di « Tecniche di composizione del suono nella musica informatica » in qualità di :

☐ Socio AIMI L. 88.500

☐ Non socio L. 177.000

Ha versato in data .....
la quota di iscrizione sul c/c bancario n. 310127/L intestato a *Graziano Tisato, C.S.C., Corso di Informatica Musicale 1983,* Agenzia n. 1, Cassa di Risparmio di Padova e Rovigo, Padova.

Data .....

Firma .....

Docenti :
Giovanni De Poli, Roberto Doati, Mauro Graziani, Marco Stroppa, Graziano Tisato, Alvise Vidolin.

Apparecchiature :
Hardware :
— Elaboratore IBM S/370/158; Elaboratore IBM S/7; 4 convertitori D/A;
Software :
— Sistema Musica; ICMS; MUSIC 5.

Inviare entro il 15 giugno 1983 a:
Centro di Sonologia Computazionale
Università di Padova
Via S. Francesco, 11
35100 PADOVA

The purpose of this article is to generate interest and participation in the programming of the Grand Canonical Ensemble, a sound synthesizer designed by the Altered Media Project in Berkeley, California.

First we want to provide an overview of the design of the GCE. This is a special purpose computer made into a sound synthesizer/processor, through repeated execution of one set of instructions rapidly enough to create, in effect, 128 general purpose building-blocks, or "modules"; these may be defined as a variety of devices. Each one can be defined as an oscillator, making in all 128 oscillators capable of mutual frequency and amplitude modulation, and with individual frequency and amplitude envelopes. The waveshapes of these oscillators may be defined arbitrarily, limited only by the amount of memory space available; 16 different waveshapes are available at any one time. The the same modules can be defined as 32 filters. In various numbers and combinations, the modules can execute other synthesis algorithms---waveshaping (programmmed frequency modulation), comb filtering, voice simulation, processing of external signals. Note that the GCE is expandable to provide up to 512 modules.

There are two "envelope generators" per module, the level, slope, direction, slope angle, and duration of which are totally variable. There is also a random number/noise generator available to each module. Hence frequency and amplitude of each oscillator, cut-off frequency and Q of each filter, are individually controllable. Signals are summed and sent to the outside world through a multiplexed 16 bit DAC (providing stereo outputs).

The hardware used to form the GCE consists of four elements:

1) Busses: a 16 bit S-100 bus for moving parameters about and to supply a backbone for the local computer, and a "signal bus" for moving 24 bit sound sample values between signal processing components.
2) A Computer: a 16 bit S-100 processor. Its support components like memory, a DMA link to the main or master processor, and of course an S-100 backplane. The processor is a Motorola 68000 which is available on an S-100 board from a number of commercial sources.
3) Signal processing components: The signal processing unit now being debugged is a two board unit optimized for creating digital oscillators, but also capable of digital filtering and other kinds of signal processing. Under consideration is a unit with a lot of slow memory and simple arithmetic capabilities, to be used for reverberation and certain kinds of signal analysis. Also in the works is a fast arithmetic processor for more cost effective implementation of digital filters and other new processing algorithms. Signal processing components communicate with the processor via the S-100 bus and with each other via the "signal bus" which is primarily used for moving sample values from one process to another. The signal bus is created by the "signal control board" which is responsible for specifying the movement of information from one signal processor to another. Each signal processor has a number of signal registers for holding the results of computations and values to be further processed. The signal bus controller is capable of moving values from a signal register of one processor to a signal register of another at specified times during a sample computation time. The controller can also pass results back to the computer or to the digital-to-analog convertors. The signal bus will support a maximum of 6 processing units, which is probably more than the GCE's local computer will be able to keep up with.
4) Assorted extras: such as the 256 channel 8 bit analog to digital converter we're making for interfacing to physical controls for "playing" the sys-

tem. Other extras might include a high precision (14-16 bit ADC for sampling sound, graphics controllers, or something for running the lights.

There are three obvious configurations for using the GCE. It could be used as a self contained sysem with a large disk memory, a substantial amount of core storage, and some means to make backup copies of the disk. It could also be run with minimal memory resources as a performance instrument, using programs that were developed either on another system or in a different configuration. Or one or more GCEs could connect to a master computer which would be responsible for musical matters. This configuration would do more, faster, and support more processing units. In this case the musician and the master computer would speak to each other in a musically oriented language such as POD or MUSICn, or a language which we will presently develop. The master and the GCEs would communicate in a language that describes segments of sound or the physical actions occuring at the knobs, buttons, and keys of the system. The computer in the CCE translates the sonic language into the strings of bits requited to control the signal processing boards.
This distribution of labor means that it will be possible to create a stable, cooperative, working environment. This is done by standardizing the language that the master computer and GCE speak to each other. If new components are developed, they can be added with minimal disturbance to the system. If new abilities are introduced into the GCE, the language can be extended but the old ways of doing things would still be supported. Since the language that the GCE understands is standard, musical programs can be easily exchanged, and since they dont have to deal with the details of driving the hardware, the programs can be developed by the more musically oriented instead of hardware hackers.

There are two software projects which will be undertaken. The programs which run on the GCE itself will have to be written by crack hardware programmers. This, in fact, will be the first stage of software development. Concurrently, and as part of the same project, code will be written which will allow the interfacing of this hardware level of software to a higher level music synthesis language. Several such languages exist (C-music, POD, etc). This will allow us to use the instrument, though not in real time.

The second project (which could procede at the same time as the first) is the development of a language tailored specifically to our instrument. This would allow real time control of all aspects of the synthesizer, both in a performance mode and in a studio mode. In both cases, input devices such as terminals, keyboards, knobs, joysticks, switches, etc. would be mapped to the parameters of sound synthesis. In the performance mode, emphasis would be placed on absolute real time control and a flexible but to some degree pre-patched set of responses to the inputs. In the studio mode, the real-time constraint would be somewhat relaxed to allow for the exploration and development of more complicated algorithms. Emphasis would be placed on editing functions, overdubbing, sound-sampling, etc. This second project is the more ambitious of the two, but it is the approach that will utilize the full potential of the synthesizer.

Programming will be undertaken in "C" language in a Unix environment. If you would like to participate in the development of this software, call or write:

Gabriel Stern
5252 Claremont Ave.
Oakland CA. 94618
Ph. 415-658-9562

Alden Jenks
1842 Gaspar Drive
Oakland, CA. 94611
Ph. 415-658-9562

Efrem Lipkin
1811 Ward St.
Berkeley, CA. 94703
Ph. 415-549-0476

THE SYSTEM:

Digital to Analog Converter:

- channels: 2 multiplexed from one
- dac precision: 16 bits to 1/2 lsb
- minimum sample period: about 15 microseconds/channel
- full sample rate: 67 kHz/ channel

Signal Bus:

- maximum number of units on bus: 6
- precision (bus width): 24 bits
- speed: 1 transfer every 240 nanoseconds

OSCILLATOR/SIGNAL PROCESSOR:

Clock:

- minor cycle (a single movement of data): 60 nanoseconds
- major cycle (execution of a complete operation): 240 ns apparent
- instruction cycle: 240 ns
- one trip through the system: 1200 ns (5 stations)

Signal (output) Registers:

- number: 8 or 16
- precision: 24 bits
- speed: one transfer in and out every 240 nanoseconds
- operations:
  - add to signal register
  - clear signal register
  - clear and add to (load) signal register
  - read signal register

Multiplier:

- input precision: 16 bits for both inputs
- output precision: 24 bits
- operations:
  - multiply
  - pass left input
  - pass right input

Random Number Generator:

- precision: 16 bits
- speed: may be used for each major cycle (240 ns)
- method: Xor's for maximum length sequence

Wave Table:

- actual length: 2k to 8k words (expandable to 32k)
- actual width: 24 bits
- maximum precision: 16 bits
- maximum number of sub-tables: 16
- subtable sizes (a single wave: 1/2K, 1K, 2K, 4K, 8K only
- operations: lookup using:
  - x-axis symmetry
  - y-axis symmetry
  - interpolation between values using a constant step taken up to 8 times
  - any combination of the above

example: an apparent 64K point full sinewave table with 16 bit precision can be stored in 1K of the wavetable.

CMA BULLETIN BOARD

Please address all inquiries to the appropriate person(s) listed below.

*** For Distribution ***

1) Score/Tape THRESHOLD by Craig R. Harris, 1317 Park Ave., Rochester, NY 14610 USA for chamber group and computer generated tape. Contact composer for terms.

2) Software Vshell/Mshell menu-based, interactive front-end for Unix program development, computer music and signal processing. Contact: Stephen T. Pope, Ziegelstadel str. 44, Salzburg, A-5026, AUSTRIA

3) Score/Tape Various computer generated composition for tape and performer(s). In most cases, willing to swap. Contact: Shawn L. Decker, 803 Monroe Apt. 3, Evanston, IL 60202 USA.

4) Software Notable Software, P.O. Box 1556, Philadelphia, PA 19105 produces a variety of music-games for the Apple II microcomputer. These games are aimed at increasing musical skills for beginning, intermediate and advanced musicians of all ages. For prices and complete information, contact Notable Software directly at the address, above.

CMA Bulletin Board is a quarterly Newsletter feature giving members an opportunity to directly offer, receive, or exchange computer music artifacts from other CMA members. If you have works that you want to make available or request, send us a list. Be sure to include your address, medium of the work(s) (and, if determined, the terms of the offer).

Computer Music Association, POB 1634, San Francisco, CA 94101, USA

1982 ICMC Proceedings Now Available

The Proceedings of the 1982 VENICE International Computer Music Conference have been compiled by Thomas Blum and John Strawn and published through CMA Publications. The set consists of approximately 800 pages and includes roughly 85 percent of all papers presented during the September-October conference. You can order a copy now (refer to the CMA Publications Order Form in this issue) but PLEASE ALLOW 6-8 WEEKS for delivery. The price is $40.00 to CMA members, $45.00 to non-CMA members, and $50.00 to institutions.

New Members
Computer Music Association

Austin, Larry; Denton, Texas, USA
Baccigaluppi, John; Olympia, Washington, USA
Bestor, Charles, Amherst, Massachuset, USA
Bigelow, Mark; Concord, California, USA
Decker, Shawn; Evanston, Illinois, USA
Donahue, Douglas; Amherst, New York, USA
Dowdle, Michael; Baltimore, Maryland, USA
Grossmann, John; Adelphi, Maryland, USA
Harris, Craig; Rochester, New York, USA
Hatley, H.J.; Muskogee, Oklahoma, USA
Hobbs, James; Evanston, Illinois, USA
Klingler, Joseph; Toledo, Ohio, USA
Kreter, Leo; Fullerton, California, USA
Lanier, Jaron; Palo Alto, California, USA
Leistner, Ulrich; Hennef, WEST GERMANY
Lloyd, William; Atlanta, Georgia, USA
Ordansky, Jerold; Brooklyn, New Yord, USA
Paske, Richard; St. Paul, Minneapolis, USA
Reid, Sarah Johnston; Abilene, Texas, USA
Reynolds, George; Saranac Lake, New York, USA
Roberts, Arthur; Kaneohe, Hawaii, USA
Schweizer Gesellschaft fuer Computermusik; Summerau, SWITZERLAND
Slater, Joseph; University, Mississippi, USA
STACE; Abington, Pennsylvania, USA
Swift, G.W.; Winnipeg, Manitoba, CANADA
VanHoffelen, Guy, Antwerp, BELGIUM
Woda, Alex; Downsview, Ontario, CANADA
Wold, Erling; Oakland, California, USA
Zurynski, Robert; Rootz Hill, NSW, AUSTRALIA

New Institution/Sustaining Members

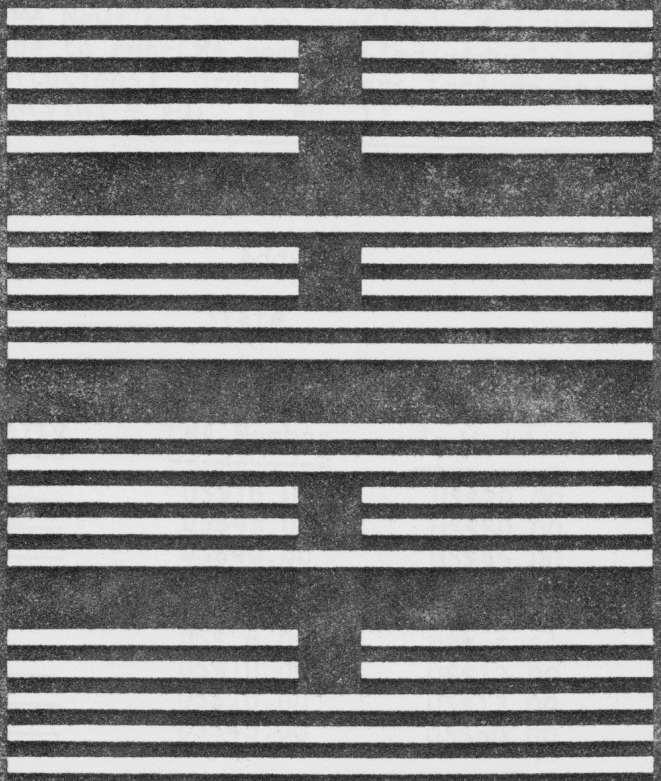
Fred Clarke; Santa Barbara, California, USA
Florian Schneider; Dusseldorf, WEST GERMANY
Spencer R. West; Daly City, California, USA

PROCEEDINGS

of the

1982 INTERNATIONAL COMPUTER MUSIC CONFERENCE

VENICE, ITALY



Compiled by

Thom Blum and John Strawn

Computer Music Association
Post Office Box 1634
San Francisco, California 94101
USA

The Computer Music Association
Publications

P.O. Box 1634, San Francisco, CA
94101-1634 USA

Order No.	Title	CMA Members
PR100	Proceedings of the 1977 International Computer Music Conference (at UCSD). 270pp.	US$16.00
PR200	Proceedings of the 1980 International Computer Music Conference (at Queens College). 842pp.	US$45.00
PR300	Proceedings of the 1982 International Computer Music Conference (in Venice, Italy). approx. 800pp.	US$40.00
PB100	Computer Music at the Institute of Cybernetics of the University of Milan - by Goffredo Haus. 26pp.	US$ 5.00
PB200	Using MUSIC360 - by James Dashow. 23pp.	US$ 5.00
PB300	Composing Grammars - by Curtis Roads. 130pp.	US$10.00
PB400	Musical Semantics - A Procedural Point of View by Otto Laske. 93pp.	US$10.00
PB500	Music and Mind - An Artificial Intelligence Perspective by Otto Laske. 497pp.	US$45.00

Back Issues of the CMA Newsletter are available for US$3.00/issue to CMA members, US$4.00/issue to non-CMA members(individuals), US$5.00 to non-CMA members(institutions). Order numbers include the volume and issue number (e.g., NLV1N1 = Vol. 1, No. 1).

Computer Music Association Publications
Order Form

Name _____ Address _____

City _____ State _____

Zip _____ Country _____

Order No.	Quantity	CMA Member	Non-Member Individual	Non-Member Institution
PR100	_____	US$16.00	US$20.00	US$25.00
PR200	_____	US$45.00	US$50.00	US$55.00
PR300	_____	US$40.00	US$45.00	US$50.00
PB100	_____	US$ 5.00	US$ 8.00	US$10.00
PB200	_____	US$ 5.00	US$ 8.00	US$10.00
PB300	_____	US$10.00	US$13.00	US$15.00
PB400	_____	US$10.00	US$13.00	US$15.00
PB500	_____	US$45.00	US$50.00	US$55.00
NLV1N1	_____	US$ 3.00	US$ 4.00	US$ 5.00
NLV1N2	_____	"	"	"
NLV1N3	_____	"	"	"
NLV1N4	_____	"	"	"
NLV2N1	_____	"	"	"
NLV2N2	_____	"	"	"
NLV2N3	_____	"	"	"
NLV2N4	_____	"	"	"
Total	_____			

Date _____

* All orders must be prepaid with check drawn on U.S. bank made payable to Computer Music Association. Prices include 4th class postage. Allow 6-8 weeks delivery.

COMPUTER MUSIC ASSOCIATION
APPLICATION FOR MEMBERSHIP

The Computer Music Association is active in developing and furthering the art and science of computer music. The Association, which is a non-profit corporation registered in the State of California (federal tax-exempt status is pending), serves as a place for exchanging information about the use of computers and digital hardware and software for musical purposes. In addition, the Association serves the computer music community by assisting in the organization of the International Computer Music Conferences.

There are four classes of membership: general, student, sustaining, and institutional. Student memberships are available to students enrolled in a recognized school, college, or university. Sustaining memberships are available to persons making a substantial donation (currently, no less than US$30.00) to the Association. Institutional memberships are available to libraries, corporations, and similar organizations. The Association has members in North and South America, Europe, Japan, and Australia.

Each member receives a copy of the quarterly Newsletter published by the Association. Other benefits of membership include membership discounts for CMA Publications, which include the Proceedings of the various International Computer Music Conferences (publications order form available on request).

To apply for membership in the Association, complete this form and mail it to:

Computer Music Association
P.O. Box 1634
San Francisco CA 94101-1634
U.S.A.

Membership rates (effective Jan. 1, 1982)

Regular:	US$12.00 per year	Check Here
Student:	US$ 8.00 per year	If Renewing
Sustaining:	US$30.00 or more per year	Membership ------
Institutional:	US$30.00 per year	

Make check or money order (drawn in US$ on a US bank) payable to Computer Music Association.

Name _____

Address _____

_____

Affiliation _____

Computer Music Association Membership Survey

NAME_____
ADDRESS_____
CITY|STATE_____ ZIP_____
COUNTRY_____
TEL._____ _____

Your Permission to Disclose Address to CMA Members

____ yes ____ no

CURRENTLY EMPLOYED AS_____
CURRENTLY EMPLOYED BY_____ (optional)

BRIEFLY DESCRIBE YOUR BACKGROUND IN COMPUTER APPLICATIONS TO MUSIC_____
_____
_____
_____

DESCRIBE YOUR CURRENT COMPUTER MUSIC ACTIVITIES_____
_____
_____

DESCRIBE BRIEFLY THE HARDWARE/SOFTWARE SYSTEM YOU ARE USING FOR FOR COMPUTER MUSIC_____
_____