STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305

CENTER FOR COMPUTER RESEARCH IN MUSIC AND ACOUSTICS
DEPARTMENT OF MUSIC

Telephone:
(415) 497-4971

January 3, 1980

Mr. A. A. Heckman, President
Jerome Foundation
West 1052 First National Bank Building
St. Paul, Minnesota 55101

Dear Mr. Heckman,

A major American contribution to the arts, sciences, and education exists in the application of a rapidly developing computer technology in the areas of music and the hearing sciences. At Stanford University extraordinary results already have occurred where scientists and musicians have taken the opportunity to bring their respective skills to bear on problems of common interest in a rich interdisciplinary environment. It is an example of cooperation, but more, an expression of the freedom of intellect and invention, where creative minds from diverse disciplines have joined in a common goal to produce fundamental knowledge and to produce works of art which reflect the scientific-technological riches of the present.

Beginning in 1964, progress was made in the analysis, synthesis, and psychology of sound perception in largely unsupported work by professors, graduate students, and staff members. In June of 1975, the Center for Computer Research in Music and Acoustics (CCRMA) was formed with funding provided jointly by the National Science Foundation for research and teaching in computer techniques of interactive sound production and the perception of timbre, and by a one-time grant from the National Endowment for the Arts for computing equipment for musical purposes. One aim of the Center was to establish an international facility where researchers, composers, and students could work with strong computer-based technological support. We have succeeded in this goal.

Perhaps the most distinctive aspect of CCRMA is the breadth of its activities, ranging from music composition and music manuscripting, to perception and computer sciences, but this also poses a difficulty in sustaining such an interdisciplinary enterprise in that it does not fall clearly into existing programs of funding by either public or private foundations. We realize, therefore, that we must continue to "piece together" our support from a variety of sources.

CCRMA's current need is for short term but critical funding support. Below we present a breakdown of our funding needs for the two year period until we become self-supporting. We are not asking, however, the Jerome Foundation to consider funding of the total, but rather to identify the level of funding, the area (program, operating, or equipment), and specific activities (creative arts, education, or science and technology) which might fall within its funding interests.

BACKGROUND AND FUNDING NEEDS:

CCRMA has reached a rather prominent position in research and composition, both in this country and abroad. Our special capabilities in both scientific research and music composition represent a unique interaction between science, high level technology, and the arts. In addition to our teaching and research functions at Stanford, we also serve as a national resource to the larger musical and scientific communities through a summer workshop, positions for more extended periods for composers and researchers, and through aiding other universities in the development of programs for computer research and composition (including Columbia, Colgate, Oberlin, Clark, Carnegie-Mellon, Michigan State and University of California at San Diego).

We have not only served to some extent as a model for the Institute de Recherche et Coordination Acoustique-Musique (IRCAM), the music research institute in Paris directed by Pierre Boulez, but also a substantial interaction and cooperation between the two centers has developed. In 1976 IRCAM acquired the same computer which we have in order to have access to all of the programs which we have developed over the years. This has saved IRCAM tens of man-years of development work, which in a commercial context would have resulted in a large financial return to CCRMA. In the arts such a financial transaction cannot happen, nor should it, which means that the viability of an activity such as CCRMA must find its support elsewhere.

Of course, we cannot expect massive government support for our project as can IRCAM in Paris. Although CCRMA has received more research support from NSF than any university humanities department in the country, it is nevertheless a limited resource and we must look as well to our own resourcefulness and to the private sector. In view of NSF's continuing interest in the scientific aspects of our work, the university's considerable support, and the fact that eventual royalty income could be substantial, the long term prospects look rather good that we can become self-supporting.

PROGRAM - In 1975 Nippon Gakki Co. (YAMAHA) signed an agreement with Stanford University for exclusive rights to a patent which is in my name but assigned to Stanford and which represents a digital synthesis technique to be used in a new generation of electronic keyboard instruments. At the time, YAMAHA estimated 3-4 years for research and development of this patent. Although there will be limited production in 1980, a mass production instrument will not begin to be marketed until 1982. The royalty agreement stipulates that Stanford will receive $10/unit produced, of which approximately $3/unit will be assigned to CCRMA. YAMAHA currently produces 18,000 units/month of the old technology instruments, which if only partially realized with the Stanford patent will provide CCRMA and the university with a considerable income. It is with this income that we had hoped to support a part of our teaching and composition programs in addition to that research of a more musical nature which is not appropriate for funding from the National Science Foundation (NSF).

Since 1975 CCRMA has received a total of $630,000 in research support from NSF. Approximately one third of the total goes directly to the university as indirect costs. From the remainder we have supported various operating costs, graduate students, a full-time system programmer, and ca 1/2 of the staff salaries. The shortfall has been made up from university funds and by "farming out" staff to IRCAM. It is this shortfall for the years 1980 and 1981 for which we now need funding.

	1980	1981
Anticipated staff costs for:	$161,380	$174,291
Expected from NSF and Stanford for research and teaching support of staff salaries:	$ 86,400	$ 95,040
Expected shortfall and total funds needed for two years of program support:	$ 75,380	$ 79,251

EQUIPMENT - Since 1964 the work in computer music has been done in the Computer Science Department's Artificial Intelligence Laboratory. This laboratory has been operated as a cooperative venture with both computer science and music contributing to the development of the facility in proportion to their use. A major part of CCRMA's hardware contribution to the facility came from a one-time grant in 1975 of $160,000 from the National Enfowment for the Arts. Plans have been made over the past several years for for CCRMA to move with the Artificial Intelligence Project into a new Computer Science building which has just been completed. Now, because of unforeseen space constraints in the Computer Science building, CCRMA must become independent and acquire its own system in the next months.

The university has very carefully looked after our interests in this unanticipated separation from the computer science facility and has made available space, physical plant support and up to $100,000 for the purchase of equipment. In addition, we have successfully negotiated with YAMAHA an advance in royalties which will provide $90,000, all of which will be applied to equipment purchase. The remainder we must seek from other sources.

Cost of CCRMA computing system:		$298,000
Funds acquired:		
Source:		
Stanford University	$100,000	
Yamaha	$ 90,000	
total	$190,000	
Total funds needed for computing system:		$108,000

There are few foundations which have an equivalent interest in the musical arts and which are also large enough to consider a portion of the amount of support for which we are asking. Therefore, I am writing to several foundations (including Surdna Foundation), which also seem to take an interest in the arts.

There are a number of people who know our work rather well in both the scientific and artistic domains including Max Mathews at Bell Telephone Laboratories (the "father" of computer music), John Pierce at CalTech, and Pierre Boulez who has spent ten days working at our Center and knows our work rather well. I have asked Max Mathews and Pierre Boulez to write to you on our behalf.

I wonder if it might be possible for me to make a presentation to you and your staff at the foundation in order to give a fair representation of the depth and scope of our work? I can come to St. Paul and would be more than happy to do so.. or alternatively, should you and/or some of your staff be coming to California we could give a demonstration here at Stanford.

Sincerely,

John M. Chowning
Professor of Music
Stanford University

enclosures:

1. Overview of CCRMA
2. Music printing example by computer program developed by Leland Smith