

August 17, 1989

To: National Endowment for the Arts

From: John Chowning, Director, Center for Computer Research in Music and Acoustics
Patte Wood, Administrative Director, CCRMA

FINAL DESCRIPTIVE REPORT NEA 86-3170-0823
(January 1, 1987 - May 31, 1989)

The original concept for the project was proposed in October of 1986. At that time, a proposal to the National Endowment for the Arts was submitted for a project that would include the commissioning of a work by composer Dexter Morrill, to be done at CCRMA, in collaboration with trumpet player Wynton Marsalis. The result of the project was to be a documentary film of the compositional collaboration and a performance of the resulting composition. The National Endowment for the Arts granted CCRMA \$10,000 toward the project to pay for the composer's fee for the commission of the piece.

As the project progressed, and negotiations with the production company for the film continued (Alvin Perlmuter Productions in NY represented by Paul Kaufman), the original concept was revised and the project was partitioned into two parts: One part being the production of the film and the other part the composition of the piece with Dexter Morrill at CCRMA and the collaboration with Wynton Marsalis regarding the composition.

Work progressed on the composition of the piece at CCRMA. A date for the performance of the piece was contracted by Stanford University with Wynton Marsalis for May 14, 1989. Dexter Morrill made several visits of various lengths to CCRMA to work on the technical aspects of the project. He was assisted at CCRMA by graduate student Perry Cook. Dexter Morrill collaborated with Wynton Marsalis several times during the course of the project between January 1987 and February 1989 and the composition of the piece progressed. There were also ongoing meetings with Paul Kaufman regarding the film part of the project.

In March 1989, due to the fact that funding for the film part of the project did not materialize, Wynton Marsalis decided that he did not have sufficient time in his schedule to complete the project.

Impact of the project

The composition, "Sketches for Invisible Man," for MIDI trumpet and live electronics by composer Dexter Morrill was completed in the fall of 1988 and premiered in San Jose on June 10 and at Stanford University on July 19, 1989.

Although the performance of the composition by Wynton Marsalis did not take place, many performances and presentations of the composition have resulted from the project. The project has had and will have an important impact in the area of music performance and composition. Interest in the composition and in the use of the modified trumpet and software developed for performance of the piece has been expressed by many composers and musicians including jazz musician Randy Brecker. A commercial brass instrument company has expressed interest in making this technology generally available to the public.

A summary of the results of this project, a summary of expenses incurred on the project, and a narrative report by composer Dexter Morrill follows:

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Performances:

The premier performance of the composition took place at San Jose State University on June 10, 1989 and at CCRMA's Annual Computer Music Festival at Frost Amphitheater on July 19, 1989. The piece was performed by Dexter Morrill to an estimated audience of 1200 people.

Performances of the piece will also take place in the Northeast of the United States during the Fall of 1989. Scheduled concerts are at Colgate College, Bowdoin College, Bates College, and Portland, Maine. Other scheduled performances include: the International Computer Music Conference in Columbus, Ohio in November 1989; Poland, Czechoslovakia, and Zurich in May 1990 and Saint Louis in the Fall of 1990.

Presentations:

Presentations of the technical work involved in the composition were made at the CCRMA Annual Industrial Affiliates Meeting at Stanford on May 11, 1989 (45 representatives for the music industry), the International Association of Computer Graphics, special session on Computers and Music in San Jose in June 1989 (500 people) and The International Trumpet Guild Conference in Santa Barbara in August 1989 (700 people). A presentation will also be made at the International Computer Music Conference in Columbus, Ohio in November 1989.

Media Recordings:

A videotape of the composition and a digital recording of the performance have been made and are available for broadcast.

Technical Research Results:

Technical Research Results have been many and will result in further compositions by composers and use by performers of the technology developed for this project.

Hardware:

Construction of two prototype brass instrument controllers:

One trumpet with mouthpiece mounted microphone, valve mounted triggers, and bell mounted microphone.

One valve trombone with mute mounted microphone, valve mounted triggers, valve mounted thumb slider, and valve position sensors.

Construction of an integrated brass instrument performance system, including pitch detection, envelope detection, instrument mounted control sensor encoding, control computer, and synthesizers.

The sensing of valve position, and the use of this information for more accurate pitch detection has been disclosed with the Stanford Office of Technology Licensing for possible patenting and licensing.

Software:

Programs were written in MIDI Lisp which perform real time processing of information from the instrument sensors. The composer/performer can interactively change the parameters which control the processing and save settings for later recall in performance. Program types include:

MIDI special effects such as echoes and imitative patterns.

Accompaniment programs which play back stored patterns under player control.

Harmonization algorithms which provide harmonic patterns based on switch positions and time information. The harmonic tones can be provided by synthesizers or from real time pitch shifted versions of the natural instrument sound.

Routines based on a tape-recorder paradigm, which allow the performer to record events into the computer, and immediately trigger events based on the stored information. One program allows the player to record melodic and rhythmic information on a series of tracks, each of which plays back with a different instrument sound. Thus the composition evolves as new information replaces previously recorded patterns.

Programs which use the valve position information to improve the pitch detection process. This system improves both the response time and accuracy.

Programs which allow the player to control spatial placement of sound from the instrument.

Enclosed:

A Summary of Project Costs
Narrative Report by Dexter Morrill
Cassette Recording of the Composition
Videotape of Composition
A sampling of posters, programs, and reviews

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Summary of Project Costs

Salaries and wages (including benefits)	\$ 5,590.00
Composers fee	10,000.00 (NEA grant)
Travel	5,640.00
Technical Research Assistant Perry Cook	6,500.00
Technical facility costs	8,360.00
Equipment	4,500.00
University indirects	<u>9,439.00</u>
Total Project Costs	\$50,479.00

The project was supported by funding from the NEA, Stanford University Music Department (CCRMA), the Stanford University Centennial Celebration Committee, and Colgate University.

Narrative Report - Sketches for Invisible Man
Dexter Morrill

I am pleased to report that the composition for the Wynton Marsalis Project at CCRMA is now complete, and this report will document the work that has been done over the past two years, with support from the National Endowment for the Arts, CCRMA, the Stanford University Centennial Committee, and Colgate University.

From the beginning, this project was a challenging one, involving a star Jazz performer, a new technology for the trumpet, a mixing of musical mediums, a large outdoor concert, and a television documentary. None of these components could be viewed separately, but the television aspect of the project was certainly most important in attracting Wynton Marsalis to the project. He was contacted first by producer George Olzack in 1985, and expressed interest in the project. We had several interesting meetings in the following months, but he did not sign a contract until late in 1988, only a few months before the composition was to be completed, and the concert was to take place. All of these expensive and complicated legal arrangements were carried out by the Alvin H Perlmutter television firm in New York City. By the end of 1988 it was clear that the Perlmutter firm was having trouble finding commercial advertizing funds for the project. Without this television funding Marsalis became unavailable for work on the project. It should be noted here that he was contracted for twelve days of collaboration with myself and the CCRMA staff for rehearsal and filming. It was during this time that many of the technical details were to have been worked out with him. When the television funding for these days was not available, his agents filled his schedule with concerts and other commitments.

My work on the composition *Sketches for Invisible Man* was carried out in two stages. In my early discussions with the CCRMA staff, it was clear that we wanted to carry out a new technical plan of live interaction for the trumpet soloist, where he could directly control synthesis equipment onstage, while performing. This important decision meant that a good deal of hardware and software development had to be carried out before the composition could be started. A second stage involved meeting with Marsalis to discuss the work, and introduce him to the new MIDI trumpet, which would be used to perform the music. It was during this second stage that I composed parts of the *Sketches for Invisible Man*, and developed some plans for the solo improvisation that he was to perform.

I traveled to Palo Alto from Hamilton, New York about twelve times between 1986 and 1989, in order to develop the new instrument for the project. The technical work at Stanford was carried out by a brilliant young engineer, Perry Cook. All of our original goals for the instrument: were met by the summer of 1988. Since I had been an active trumpet player in college, I began to perform on the instrument, testing its capability and developing musical ideas from that performing experience. I made two long five week stays in 1987 and 1988. Perry Cook traveled to New York early in 1989 to demonstrate our programs and the new instrument to Marsalis, just before the television project was abandoned.

I also met three times with Marsalis in Washington and New York to discuss the musical material. He had no understanding of how the computer equipment worked, and no experience playing on this new instrument. This worked to our disadvantage because he insisted on using the entire band for the concert until January of 1989, an idea that greatly complicated the composing project. Our meetings were friendly and professional, and we shared many common musical interests. Just before the television project was abandoned, we had a fine meeting in New York at his home. He performed on the new instrument and quickly agreed that a solo work was most

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practical. At that time our ideas began to mesh and I was terribly disappointed that our financial support for the rehearsals was lost.

In December of 1988 I performed a sketched version of the work on a mid-west concert tour, which helped me to shape a final version later in 1989. A version of the work was performed on June 10 in San Jose and then the composition was premiered July 19, 1989 at Stanford University. These performances represented a final version of the composition, with myself performing.

Several important performances are scheduled for this year, in New York, Santa Barbara (for the International trumpet Guild), in Columbus Ohio (for the International Computer Music Conference) and Troy, New York. Several trumpet players have contacted me about performing the work, and the new instrument has generated a substantial interest on the part of brass players, who have never had the ability to control synthesis equipment with their instruments. Perry Cook and I have also been approached by a commercial brass instrument company to develop an improved MIDI instrument for brass players.

It is my belief that a new instrument will lead to a host of compositions which take advantage of new brass sounds and musical control, and I am especially appreciative of the generous support from the National Endowment for the Arts which made this work possible. While the project has brought some disappointments to me, it has been the most challenging and potentially valuable experience in my composing career. The CCRMA staff has served me in special ways and made every aspect of this work interesting. I am fortunate to have worked at the finest American music center in order to compose this work.

Concerts feature trumpet-assisted computer

By Paul Hertelendy
Mercury News Music Writer

WHAT Wynton Marsalis was unable to do last season, composer-trumpeter Dexter Morrill will do for himself Wednesday evening in Stanford University's computer-music concert at Frost Amphitheater.

The highlight of the two nights of concerts (which conclude Thursday) is Morrill's "Sketches for Invisible Man," which was commissioned for Marsalis' concert on campus last season but postponed when the \$300,000 for a tied-in TV show could not be raised.

Think of it as a 20-minute duo for live trumpet soloist and computer, but with a new wrinkle: The trumpet is also a controller for the computer, having so-called MIDI electronic controls tied to its valves. The trumpet thus has at least three functions: as a natural, live instrument, as an instrument "processed" through the computer, and as a control center for the sounds stored in the computer.

This MIDI-modified trumpet was developed jointly by Morrill and Stanford graduate student Perry Cook.

Morrill sees a whole family of conventional instruments being developed to control computers as well, just the way keyboard instruments have long been doing.

The device enables the trumpeter to play multiple roles as soloist, conductor and co-composer.

For the first time, the computer-music group known as CCRMA (Center for Computer Research in Music and Acoustics, pronounced "karma") will give two programs over two days in its traditional summer Frost homestead, featuring several pieces with live interaction of instruments or voice.

The starry outdoor concerts rank among the most successful computer-music concerts any-



Dexter Morrill and his electronically enhanced trumpet will be the star attractions at Stanford's annual computer-music concerts.

where, drawing a varied audience of engineers, hobbyists, musicians, and audio fanatics, as many as 2,000 at a time.

Still, for all its potential, computer music has not turned the corner and entered the regular programs of major institutions such as symphony and opera, apart from a few isolated ventures in London, New York and San Francisco. Why?

"I don't think computer music will turn any corners," says com-

poser Morrill, 51, who is a professor at the University of Delaware and a frequent CCRMA visitor. "It will keep doing what it's been doing."

He points out that new developments in music, such as the invention of the piano or of valved instruments, took many decades to be fully invoked. Computer music has been around only since 1958.

"As for the orchestra, I view it as a museum. That medium isn't so responsive. It's hard enough to

bring Bach and Beethoven together into one program."

Calling his specialty "a very strange medium," he identifies the computer as neutral, not tied to any particular mode or inclination.

Thus it can be used in many ways, in many types of concerts. And his own works have appeared in chamber music, piano recitals and trumpet pieces.

"We're developing new instruments and pieces, which will form a standard repertoire (of their own). And technology is being dispersed to other media."

But for many who have eagerly waited for the computer to become a frequent ingredient in new operas and orchestral pieces, the

wait is getting very long.

Wednesday's concert features works by Morrill, Anthony Holand, Chris Chafe and Johannes Goebel. Thursday's concert, with more live ingredients, has Fred Malouf, Todd Winkler, Amnon Wolman, Richard Karpen and William Schottstaedt.

Gates open at 7 p.m. Picnics, blankets and warm clothes are encouraged; no chairs are provided on the spacious lawn.

COMPUTER MUSIC CONCERT from Stanford University's CCRMA studios. Frost Amphitheater (outdoors) Stanford, 8:15 p.m. Wednesday and Thursday (separate programs). Tickets \$7. (415) 723-4317.

Music Review

Computerized trumpet blows cool jazz

By Paul Hertelendy
Mercury News Music Writer

DEXTER Morrill — computer-music whiz, composer, instrument designer, professor and trumpet soloist — single-handedly saved a computer-music concert Wednesday at Stanford University's Frost Amphitheater.

He nudged an experimental medium toward mainstream music-making — at last! — while unveiling technology to facilitate it.

Until he performed, the concert before 500 laid-back listeners on the grass was kept afloat mostly by the ambience: twinkling stars, the rushing of balmy wind through the giant surrounding trees, the Hoover Tower looming on the right and occasional planes.

Morrill's "Sketches for 'Invisible Man'" (1988), after the novel of that name, uses the new MIDI (computer-controlling) trumpet, through which he produces a myriad of sounds: everyday trumpet, trumpet sounds metamorphosed by the computer and his synthesized music (or "live electronics").

More accessible work

What's special about this University of Delaware professor is his feeling for cool jazz and his improvisation. That brings the work out of the laboratory and sets it squarely at center stage (where Wynton Marsalis was originally to have played it this past season), for a much broader audience.

His programmatic four-movement piece is surely too conventional for most composers and regulars at Stanford's Center for Computer Research in Music and Acoustics, which presented two nights of concerts; its mood is closer to Aaron Copland's half-century-old "Quiet City."

But the MIDI connection enables the solo trumpet in the "Circle Blues" segment to sound like an entire big-band trumpet section performing in triadic harmonies. The strummed synthetic string-bass effect furnished down-under

counterpoint, while the sounds of a jazz band wafting over from adjacent campus buildings added a delectable spontaneity.

The Stanford environment becomes an inseparable part of the listening experience, and it makes these annual July concerts unforgettable.

Morrill's cool jazz took other paths. In "Lazy Man," delay circuits brought back the live trumpet's phrases, but they were flattened out, like the illegible penny on the railroad track.

Other computerized sounds roll in and out like the tide, providing not only a deep-pile carpet under the solos, but also erasing the dividing line between trumpet sampling and purely synthesized sound sources.

The abrupt ending of the 20-minute work needs revision, and the piece would benefit from surround-sound.

Morrill was assisted at the console by Perry Cook, who co-developed the computer-controlling trumpet.

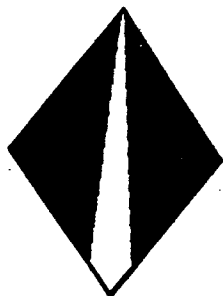
The only other computer-live interaction Wednesday was Anthony Holland's Beethoven-inspired "The Heiligenstadt Testament," with composer Holland's fine-honed lyric baritone live on stage.

Strongly contorted speech and song worked through the German text of Beethoven's anguished will, written with the threat of suicide prompted by his deafness (and probably syphilis as well) at the age of only 32. Barely recognizable

mosaic pieces of Beethoven's Symphonies Nos. 3-9 illuminate the text.

Other episodic synthesized pieces rounded out the program, including Geir Johnson's new age "Radar" and the percussive "Vanishing Point" by computer music center veteran Chris Chafe, who programmed most of these two concerts.

The evening ended with a loud, turbine-room-type continuum called "Of Crossing the River" by Johannes Goebel. Crossing the river took 18 minutes. After another 18 minutes contemplating the silence of the amphitheater, then I was headed home in the glint of the rising gibbous moon, enlightened and refreshed.



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