The Virtual Orchestra; Creative Issues
Frederick W. Bianchi and Richard H. Campbell

Department of Music and Department of Electrical and Computer Engineering
Worcester Polytechnic Institute, Massachusetts

Abstract: The interactive multi-channel computer music system known as the Virtual Orchestra has been used several times in professional opera and theater as an alternative to a live pit orchestra. The technical issues associated with this emerging technology, and the logistical problems of implementing it are presented in a companion paper. This paper describes the equally important issues regarding the creative impact this will have on the industry. In particular, this paper explores the role of the musician/technologist and suggests that many of the fundamental premises of opera production will change as the industry begins to retool. This would include the way opera is rehearsed and performed, how it is created and disseminated, and how it will adjust to the changing demographics of the country.

INTRODUCTION

At no other time in history have musicians witnessed the degree of change and uncertainty which currently confronts the industry. As new musicians enter the field, it is certain that for many, the prerequisite for a working and productive career will include knowledge of not only music performance, theory, and aesthetics, but acoustics, psychoacoustics, computer science and audio engineering. While these broad fields have always been marginally represented in the course catalogs of conservatories and universities, they take on a new urgency as the industry retools and the emergence of this technology on the professional musical horizon becomes a reality. As we look ahead, we see a scenario in which the musician/technologist, working in ensemble with like-minded colleagues, becomes an integral component in an industry-wide labor shift intended to encapsulate the creative and realization process. With the introduction of advanced and sophisticated tools like the Virtual Orchestra (VO), musicians now have control over a diverse set of musical parameters far beyond those accessible with traditional instruments or even synthesizer keyboards. While VO technology can increase the precision and control over a musical performance, it also puts more responsibility in the hands of fewer people.

THE VIRTUAL ORCHESTRA AND THE MUSICIAN/TECHNOLOGIST

In the past, digital music technology was confined primarily to non-real time music production environments such as film, television, radio, and the recording studio. The exception to this would be keyboard-based synthesizers which have populated the commercial music and live performing arts scene for over twenty years. These instruments, however, represent only an extension of traditional music realization techniques and are thus inherently limited. Recently, due to increased microprocessor speeds and larger memory capabilities, a new generation of digital music hardware and software has emerged. This technology is capable of producing stand-alone, intelligent, and non-tactile computer-based music systems. These systems can now be used for realizing music with the accuracy, realism, and speed necessary to qualify it as a real time live performance instrument. It is now feasible to apply this technology to opera, theater, and ballet; mediums in which the integration of various art forms make the musical realization, interpretation, and synchronization quite complex. Because these mediums are usually under the control of a live conductor, the VO is capable of following a fluctuating tempo and adjusting to subtle nuance in real time, even if these parameters change from performance to performance. The emergence and implementation of this technology into the live performance arts marks a radical departure from tradition, and significantly alters the division of labor equation. Unlike the traditional musician/instrumentalist responsible for the realization of a single component part of a larger whole, the musician/technologist must have a more comprehensive understanding and facility for interacting with various components of the whole. Along with a set of powerful technological tools, the musician/technologist must be armed with the knowledge of not only orchestration, synthesis, and musical interpretation, for example, but with a knowledge of acoustics and how the simulation of an environment is achieved through signal processing, imaging, etc... These characteristics and sensibilities point towards a new breed of musician.
THE VIRTUAL ORCHESTRA'S INFLUENCE ON PRODUCTION

The VO, and related music technologies, will have a significant and positive impact on the production of opera, musical theater, and ballet. This will be attributed to the VO's ability to influence the creative process with a high degree of interactivity as well as logistical and economic flexibility. This is a condition which does not exist with the current acoustic pit orchestra. Most opera productions, for example, begin rehearsal three or four weeks prior to the first performance. It is during this period that various elements of the production are explored and eventually finalized. This would include not only the vocal preparation, but staging, set construction, costume fitting, etc...

Some elements of the production may often begin a year in advance such as interpretation and staging, set design, costume design, and lighting design. However, inclusion of the opera orchestra into this scenario usually begins only a few days before the first performance. With VO technology it is possible to have a complete musical realization in place from the first rehearsal or earlier. The benefits of such a scenario are obvious. In addition, the availability of the full musical score, during the entire rehearsal period, would allow for some degree of experimentation, adaptation, or contemporization of the score... similar to what goes on in other areas of production. It is this immediate and interactive accessibility to the structural and sonic components of the musical score which will have a major impact on the performing arts in the coming decade.

While the opera purist would balk at this suggestion, it may be the very lack of modernization and contemporization that is beginning to label the medium as somewhat culturally irrelevant. It is ironic that while every other area of theatrical production has felt the impact of our cultural evolution, the realization of the musical score has not. Throughout this century we have witnessed extraordinary developments both aesthetically and technically in the theatrical arts with no sustained resistance from the audience. In addition, the music of our culture, whether popular, jazz, or film music, is often characterized by reorchestration, manipulation, variation, or arrangement by other artists or ensembles. So why has the opera and ballet score remained untouched as the creative world around it has evolved? Is it artistic purism and integrity that has kept the musical realization of this vast literature frozen in time? I would think not. It is not a question of whether to do it or not to do it, but an admittance that "we can't do it." It is both logistically and financially impossible to undertake the necessary exploration and creative development with a 40 piece pit orchestra under the watchful eye of the union and at union pay scale. However, with the VO and new technologies, the industry now finds itself with alternatives.

The continuation and growth of any art form depends on the infusion and creation of new works, the cultivation of new ideas, and the dissemination of the work. In addition, the creative activity of an organization needs to address new audiences and target the demographic reality of the country. This implies that the creative work must be disseminated through touring and recording, two areas which are extremely problematic with the acoustic orchestra and traditional production strategies. Because of the portability and compactness of the VO, it is now feasible to take the production to the people, play larger venues, and target a population inaccessible to the opera and performing arts genres. To a generation nurtured on CD quality sound, amplified music, television, and film, the idiomatic use of advanced sound technology would be appropriate and relevant to emerging audiences and changing aesthetics. With VO technology and well-trained musician/technologists, it is possible to overcome many of the obstacles inherent in the performing arts industry.