Richard Karpen: Aperture for amplified viola and interactive electronics (2006)

Program Notes:
Aperture, composed in 2006, is one of a series of my works exploring the extension of musical instruments and performance through live computer enhancement and processing. In addition to the real-time processing of the sound of the viola, this work further integrates the performer with the computer through the use of an accelerometer worn on the wrist of the bow arm of the violist. The device tracks the speed and direction of movement of the arm and sends data to the computer where algorithms process the information to determine the nature of the interaction between performer and computer. For example, small changes in the violist's bow arm speed can create nuanced effects of timbre and dynamics while sudden changes in speed or direction of the violist's arm or just the wrist can trigger immediate and dramatic reactions from the computer.

Aperture also continues my recent departure from composing and giving direction to performers though a written (notated) score. There is no musical score for the first 12:20 of *Aperture* while the second part (10:51 in duration) is based on the music of another composer. The composition was worked out over an extended time of collaborative exploration and practice with violist Melia Watras, for whom the work was composed. The final version of the work is not improvised nor aleatoric in the sense those terms are often used for music, although improvisation did play an important role during the developmental stages of the work. While this kind of experientially developed music has existed in many cultures, I am specifically experimenting with the kinds of techniques used by several film directors for character and script development in which the actors create their characters through organic and rigorous series of directed improvisations and reiterations through rehearsal. Video documentation showing how to perform the work will take the place of a musical score so that the integrity of the work can be maintained over time and the work can be performed by other violists as well as Ms. Watras in the future.

In addition to Melia Watras' role in the development of viola material for *Aperture*, my research team for the development of the hardware and software for the piece included DXARTS Research Associate Joshua Parmenter who developed much of the key underlying code for the control of sound processing and interaction with the accelerometer in Supercollider. DXARTS PhD student James Coupe also worked on design and implementation of the analog electronics circuits for the accelerometer. Thanks also to Blake Hannaford, Professor of Electrical Engineering at the UW for reminding us about the effects of gravity! *Aperture* was commissioned by Melia Watras with support from the Royalty Research Fund and DXARTS at the University of Washington.

--Richard Karpen