



Centro Ricerche Musicali

**New advancements of the research on the augmented wind instruments:
*Wind-back and ResoFlute.***

Michelangelo Lupone, Silvia Lanzalone, Lorenzo Seno
CRM – Centro Ricerche Musicali, Roma

Abstract

The paper describes two augmented instruments produced at CRM – Centro Ricerche Musicali of Rome, as the result of some researches on the possibility of extending, enhancing and transfiguring the classic features of the wind instruments, to generate new sonorities. The new instruments are called “augmented” because of the timbre-related aspects, the acoustic diffusion, and the performing techniques. Some scientific, technological and aesthetic issues related to the production of augmented instruments will be also discussed.

The WindBack, designed by composer Michelangelo Lupone, was made with a sensor and a speaker, placed on the bell of a saxophone, which are able to capture and influence the air column between the neck and the bell. Real-time algorithms dynamically connect the sensor and the speaker to the actions of the musician, that can control some aspects of the timbre, which depend on the instrument’s resonant structure, and that can also regulate air fluxes on the reed, permitting the production of continuous sounds and the generation of multiphonic tones. The WindBack was first presented on the occasion of the premiere of the piece *In sordina*, composed by Michelangelo Lupone and performed by Enzo Filippetti in Buenos Aires, 2011.

The ResoFlute, designed by composer Silvia Lanzalone, consists of a transverse flute augmented with microphones, sensors, foot pedals and a resonant pipe connected to it. Six miniature microphones are placed inside the headjoint and the body, to collect the sounds from different zones inside the tube. Therefore the six signals, each one having a different frequency profile, are elaborated in real-time to activate a process of feedback with the pipe, hence the result of the augmented sound. The ResoFlute was realized for a new composition by Silvia Lanzalone called *Éleghos*, whose first performance was given by Gianni Trovalusci in Rome, 2014.