

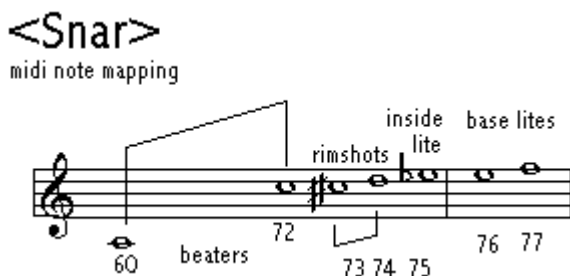


<Snar>

This musical robot consists of a new high quality snare drum automated with 13 beaters hitting different spots of the membrane from the inside. Two solenoid driven drum sticks, mounted externally, take care of the rimshots. Of course, all beaters have a precise and wide range velocity control. The snares can be activated through a special solenoid driven mechanism, offering gradual control. Controlling this robot is realized using a standard midi protocol. It was designed to form an extension of our drumming machine [<Troms>](#) and hence it occupies the same midi channel and port.

Musically, the snare drum may be considered to be the most sensitive instrument of the entire percussion section. In classical music however it doesn't play such an important role, the exception being the infamous 'Bolero' by Maurice Ravel, but in the most advanced styles of jazz and improvised musics, it constitutes the touchstone of musicianship for the drummer. We have done our best at rendering all nuances so typical of a good snare drum playing possible with this automate. Of course it will be up to the programmer and/or composer to take benefit of the possibilities offered.

From an electronics point of view, there were no new problems to be solved in the development of this automate, except to a certain extent the snare push and release mechanism, involving gradual control using PWM. We used the same circuit boards and design as we developed for such robots as [<Vacca>](#), [<Vitello>](#), [<psch>](#). The data sets in the PIC lookup tables for the velocity scaling of course are fully different.



In 2014 we finished a second version of the robotic snaredrum. It was designed as a commission from Aphex Twin, who also delivered us the Ludwig snare drum to be automated. One of the elements that forced us to recalculate and redraw the design was in the fact that this snaredrum has ten tuning pegs whereas <Snar> only had eight. Also, this snare drum is equipped with an internal controllable damping felt pad, occupying some space. Although possible, we decided not to automate this component. All these differences made placement of automation components in this snare drum a bit more complicated. From an electronics point of view, there were no new problems to be solved in the development of this automate, except to a certain extent the snare push and release mechanism, involving gradual control using PWM on two separate solenoids.. The mechanics for the rimshot beaters are an improvement over the first design. Here we use heavy duty pull-type solenoids. The height of the final robot is determined by the height of the drum itself, the height of the electronic components -in particular the hefty power supply- and the acoustical requirement that for preservation of the sound integrity of the drum a free space of about half the skin diameter had to be reserved between the resonance skin underneath and the electronic components on the base. For mechanical reasons, the drum should only be used in a fully horizontal position.