*Proceedings of the 2002 Conference on New Instruments for Musical Expression (NIME-02), Dublin, Ireland, May 24-26, 2002*

# Experimental Controllers for Live Electronic Music Performance (vs. Copyright).

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## Abstract
This paper describes the design and development of several musical instruments and MIDI controllers built by David Bernard (as part of The Sound Surgery project: www.thesoundsurgery.co.uk) and used in club performances around Glasgow during 1995-2002. It argues that changing technologies and copyright are shifting our understanding of music from "live art" to "recorded medium" whilst blurring the boundaries between sound and visual production.

## Keywords
Live electronic music, experimental instruments, MIDI controllers, audio-visual synchronisation, copyright, SKINS digital hand drum.

## INTRODUCTION
Throughout history, new instrument designs have triggered the creation of new musical genres, and, digital technology has enabled practical ways to control complex sounds and rhythms. However, electronic keyboards and computers have also tended to limit the level of physical interaction that exists between a musician and his/her instrument. That relationship is what transpires during a live performance. This illustrates how the link between performers and their audience can be engineered by the instruments' designers/manufacturers. In the case of electronic music, the possibilities seem infinite, however after 20 odd years of commercial success, the turntable+mixer setup has become the trade mark instrument for performing electronic music whilst the "live set" still suffers the "2 guys twiddling black boxes" stereotype.

## BACKGROUND
Late '80s. The first rave. What's going on? No more guitar soloist to worship, no more MC to deliver attitude, no more stage. The dancefloor's layout tricks the audience's attention to shift inwards and realise it is actually they who are performing, all under the watchful eye of the music "selector" (not creator), whose mission statements are "can you feel it?" and "move your body"[1]. Goodbye the Artist's self-centered exhibition. A page is turned enabling us to rethink the performer-audience link and what should/shouldn't transpire during the human+computer music making process.

## DESIGN CONSIDERATIONS
Qualities required for instruments/controllers dedicated to electronic music performances in club venues:

- Complement (not compete with) the role of the DJ to enable harmonious integration of the clubbing and concert experiences.
- Take into consideration the aesthetic side of performing from an audience's perspective by emphasising the critical human-computer interaction (unlike tiny desktop controllers).
- Demonstrate a unique musical property unlike "master keyboards" and other products claiming to emulate any other instrument.
- Be physically satisfying to play (musician/instrument bond).

## PERFORMANCE INSTRUMENTS 1995-97

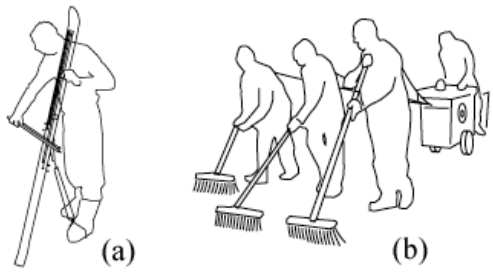

Figure 1

- **Skitar** (1995): four stringed electro-acoustic ski enabling vibrato effects using shoulder pressure. See Figure 1.a.
- **Sound Bin** (1995): self-powered sound system in a dustbin pulled by 3 street sweepers activating rhythmical sound effects as they brush over different textures. See Figure 1.b.

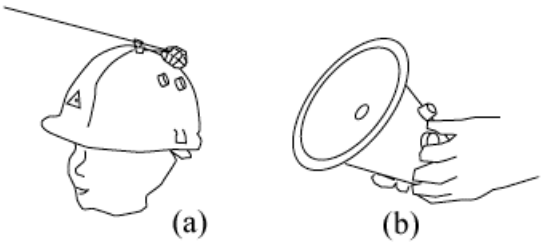

Figure 2

- **Headscan** (1996): electro-acoustic percussion with effect controller and laser pattern generator housed in a hard hat. Different rhythms trigger different patterns. See Figure 2.a.
- **Bleeper** (1997): disturbingly simple hand-held frequency generator. See Figure 2.b.

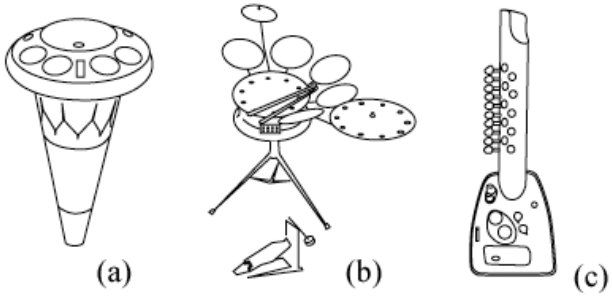

Figure 3

- **Traffic Drum** (1997): a performance drum with both MIDI and processed acoustic sound capabilities made with a traffic cone. See Figure 3.a.
- **Drum Wheel** (1996): free standing compact MIDI drum kit made with car wheels and hubcaps. See Figure 3.b.
- **MIDI Hoover**(1997):sitar-like, percussive/harmonic MIDI controller with tunable keys and made with a Hoover. See Figure 3.c.

## SKINS (1998)

SKINS (Figure 4.a) [2] is a digital hand drum that combines traditional percussion skills with up-to-date sound manipulations. Designed as a practical performance tool for both percussionists and electronic musicians, the instrument features sensitive playing surfaces, 500 CD quality editable sounds, real time sequencing and full MIDI specs, enabling intuitive creation of wide range of rhythmic soundscapes. Designed in collaboration with Ben Smith, the product received the John Logie Baird and Millennium Product Innovation Awards. SKINS is used regularly in performances, but, despite enthusiastic feedback from musicians and audiences alike, the instrument failed to attract commercial backing from established musical instrument manufacturers

## VISUAL MUSIC

In 1910, Skyryabin (1872-1915) composed a musical piece for "clavier a lumières"[3]: an imaginary instrument featuring pitch to light conversion. Synchronised lighting can be used with great effect to enhance a musical composition, creating an "expanded sound system". Indeed one can argue that musical rules extend beyond both sides of the audible spectrum, it is therefore possible to compose music with infra bass, heat or light. Video sampler software now enable real time integration of audio and video, i.e. it is possible to play video from a MIDI controller. The VIDEO SWITCHBOARD (2000) (Figure 4.b) is a video sample/digital effect controller designed as a portable unit for multi-screen audio-visual performance. Giving visual capabilities to a musical instrument optimises the potential of the "expanded sound system" particularly with regard to performance. As more music is created via editing with a graphic interface, real-time video production (such as multi-camera live sporting events or client attended 3D modeling sessions) will benefit from the skills of traditional musicians. Imagine being able to trigger video sequences and effects with the timing and accuracy of a tabla player.

## LIVE ART VS. COPYRIGHT

The invention of the recording technology initiated radical, unreversible change for musical practices: all music (apart maybe from musical automatons and mechanical pianos) used to be live; from then on, music had become the combination of live art and its art of recording. As copyright and publishing rights were introduced along with the proliferation of mass media technologies, the recorded medium (production) gained in value whilst the performing has been increasingly used as promotional exercise aimed at selling records. Since the introduction of multitracking and computers, the "editing" practice began to take over, rehearsing and improvising consequently becoming lesser skills. In the end, the dominant [recording] part of the "industry" has been preventing the full development of performance instruments for electronic music.

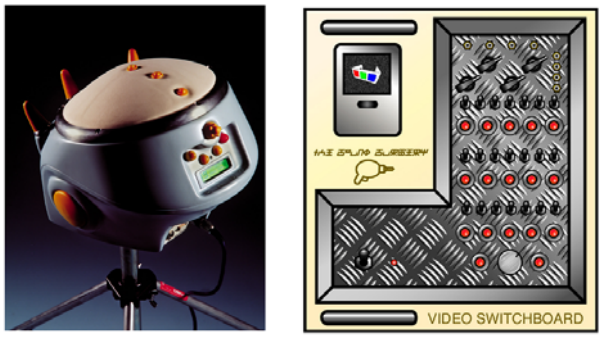

Figure 4

## CONCLUSION

Innovation gave birth to the record and film industries; today further inventions are threatening their business model with new practices such as peer to peer online sharing and sampling[4].

Maybe it's time to re-define (or even abandon) copyright, taking into consideration the wider interest of the media creators (recording artists and film makers), the performers and their audiences at global and local level.

Performance and improvisation skills are at the heart of what we understand music to be. Only by providing opportunities for such practices we can allow new designs to mature into "real" instruments.

## REFERENCES

[1] Fingers Inc, *Can You Feel It*, Jack Tracks, 1988.

[2] <http://www.digitalcow.net>.

[3] Griffith, P., "Modern music: a concise anthology from Debussy to Boulez", Thames+Hudson, 1978.

[4] Toynbee, J., *Creating problems: Social Authorship, Copyright and the production of culture.* Pavis paper number 3, 2001