Organization of CLANG-TINT

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"A compound [sound] color... is produced by the admixture of two or more simple ones, and an assemblage of tones, such as we obtain when the fundamental tone and the harmonics of a string sound together, is called by the Germans a Klange... May we not, like Helmholtz, add the word color to tint, to denote the character of the clang... using the term 'clang-tint' as the equivalent of Klangfarbe?" — John Tyndall (1875)

This brief presentation describes Clang-tint, a competition for eight-channel digital tape and/or performa commissioned by the Japan Ministry of Culture (Bunka-cho), in conjunction with Kunitachi College of Music (Kunitachi Ongaku Daigaku). The paper divides into five parts:

1. Origins—from visual inspiration to sound signal
2. Sound sources—from acoustical instruments, industrial noises, sounds of nature, synthesizers, computer-generated sounds
3. Recordings at Kunitachi from ancient Chinese bells to the Orsons Martens, recorded at the Gakkingaku Shireikan (Institute of Organology)
4. Composition to-sound editors, synthesizers, traditional and exotic signal processing techniques
5. Architecture and organgstration—in five sections: Atrium, Parity, Filth, Robotic, Organic

Origins
The inspiration for the overall structure of the competition Clang-tint followed a visit in November 1990 to an exhibition of photographic works (fig. 1) by the Stark twins at the Akron Museum of Art (Ohio, USA).
These works combined prints and large transparencies with other media to create three-dimensional sculptures. Several aspects of this installation struck me: (1) the use of "sampled" imagery in conjunction with odd materials and innovative methods of construction (tape, clear lacquer, wood, metal pipes and clamps); (2) unusual spatial frameworks (rounded, diagonal forms, three-dimensional convex and concave projections); (3) quality as a parameter in the Staras' work; image quality can vary from high to low within a single piece.

Clang-dint extends these principles into the domain of composition, starting from a large collection of sampled recordings. The work is conceived in three dimensions—spatial projection is an especially important organizing principle; the performance version features playback in eight discrete channels including vertical projection. Sound quality plays the role of an aesthetic variable in Clang-dint, from pristine recordings made carefully with high-quality equipment to garbled signals transcribed from broadcasts of decades past, or distortions imposed willfully in the studio.

Sound Sources

Yandar's conception of music as organized sound (Yandar 1971) appears relevant today. The sound palette of Clang-dint is indeed open, rather than bounded. It takes in acoustic and electric instruments, industrial and mechanical noises, sounds of nature, human and computer voices, animal, bird, fish, and insect cries, analog and digital synthesizers, and computer-generated textures (Ronde 1991). Each of the five movements of Clang-dint takes its identity from a selection out of this broad palette.

Recordings at Kunachi

I was fortunate to have access to the extraordinary Gakkikaku Shigikun (musical instrument museum, or Institute of Organology) at Kunachi. There I recorded 45 instruments, some two millennia old, some as modern as the Under Martenot (~1900, a vacuum-tube 12-key horn synthetizer). These long recording sessions (fig. 2) resulted in a database of two hours of sound.

Special care was taken, using high-quality microphones, preamplifiers, and an external oversampling analog-to-digital converter unit brought to Kunachi for this purpose. The output from these converters was transferred to a DAT recorder via its digital input port, bypassing the converters of the recorder.

Composition Tools

A cornucopia of new tools for music and sound processing appear regularly, replenishing the kit of implements for painting sound color onto the canvas of time. Analog electronic music systems offered a broad brush. In contrast, digital sound tools directly access the extremes of auditory phenomena, from microsurgery on individual sample points, to rearrangement of high-level architecture. With the proper software, nothing more than a personal computer is needed for advanced composition in the electronic medium (Ronde 1994). Using the MacMix editor on the Studer Dynasound, for example, one can hone a note until it has precisely the right weight, proportion, and shape within a phrase. This editing goes beyond edit and splice, to microfiltering of waveforms lasting 100 ms or less. By selective use of signal processing programs (SoundHack, Lemur, HyperDraw), one can construct animated musical phrases using waveforms never seen in nature (fig. 3). For the final production, it is, of course, a convenience to work with a professional power tool like the Studer Dynasound II at the Center for Computer Music and Music Technology at Kunachi, for real-time mixing of the eight-channel master recording.
Architecture and Organization

Table 1 outlines the organisation of each section of Clang-tint.

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<thead>
<tr>
<th>Section</th>
<th>Musical Organization</th>
<th>Typical Material</th>
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<tbody>
<tr>
<td>OVERTURE</td>
<td>Hybrid form: (Clang-tint melody)</td>
<td>Uses materials from all sections plus new material and montages</td>
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<tr>
<td>PURITY</td>
<td>Mixture, harmonies, motets, pulsating</td>
<td>Middle-Pierce scale, sine waves, glissandi, gong, nil drum</td>
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<tr>
<td>FILL</td>
<td>Dense sounds, mass, vast space</td>
<td>Granular synthesis, processed rock sounds, tele-visions</td>
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<tr>
<td>ORGANIC</td>
<td>Complex, crowding, intimate spaces</td>
<td>Bird songs, animal cries, human voice, &quot;insect music&quot;</td>
</tr>
<tr>
<td>ROBOT</td>
<td>Mechanical, valve, polyrhythms, stereos, interstates</td>
<td>Polyrhythms, machine sounds, ALPHA 80 oscillatory drum machine, computer singing</td>
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</table>

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References


