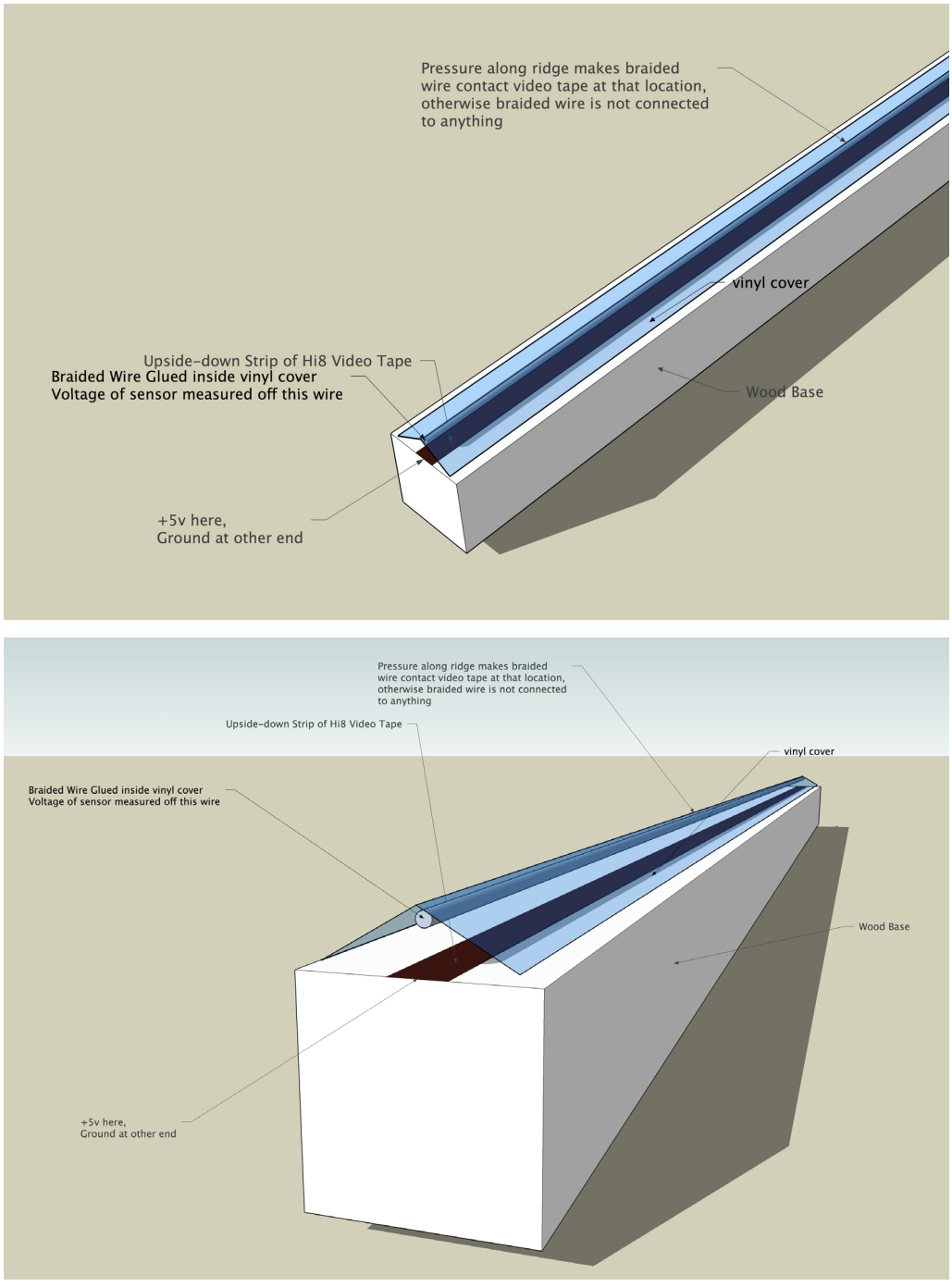
Climate Controlled: Interface Design and Technical Notes

Arvid Tomayko-Peters

Interface for Visitor Interaction

Visitors to Climate Controlled interact with the installation using a 60” long touch - sensitive timeline interface similar to a large keyboard ribbon controller. By pressing his or her finger at any point on the controller, the visitor can travel to that point in time in the geologic record. When the finger is removed, the installation continues moving at the speed and direction of the last touch.



1. Illustrations of one section of the controller

The timeline controller operates as a large potentiometer. A wire in the vinyl covering makes contact at some position along a resistive strip when pressed and a voltage is sent to a microcontroller which interprets it as a 10-bit number (0-1023) and sends it to the computer running the installation. The timeline controller was actually split in half and built as two separate potentiometers to get double the resolution (2048 possible states instead of 1024) to give the user finer control over time.

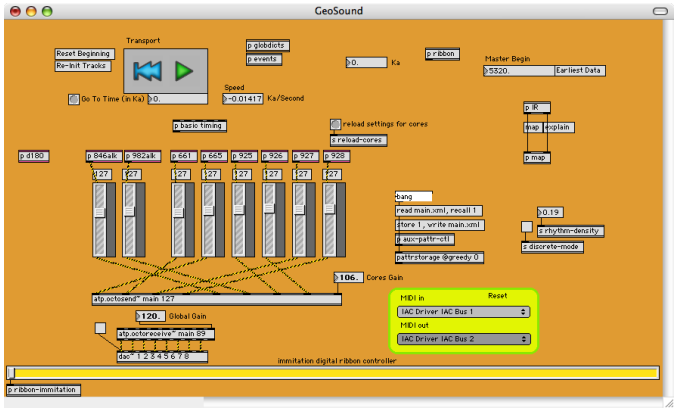
The ‘wiper’ of the potentiometer is the braided shielding of an audio cable contact-cemented to the underside of the vinyl cover. The resistive strip is the backside of Sony Hi8 video tape, double-stick taped to a wooden base. One end of each section of the video tape was connected to ground, the other to +5v.

Software

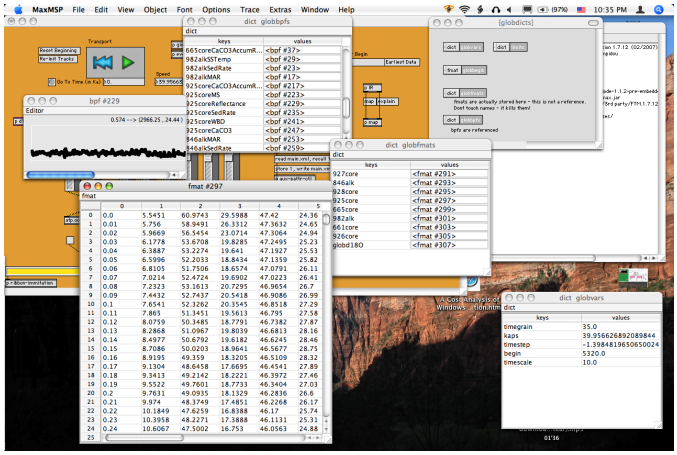
The sound and visuals of Climate Controlled are created in realtime using custom software developed in the Max/MSP environment and Quartz Composer. A Max/MSP patch stores and interprets the climate data, takes and conditions user input from the timeline controller and buttons via MIDI, controls movement through time, synthesizes sound for the 8 speakers, sends out MIDI control to a LanBox to control the lighting in the space via DMX, and sends MIDI on an internal bus to to control a patch in Quartz Composer, where the projected visuals are rendered using OpenGL.

Realtime storage, processing and retrieval of geologic data in Max/MSP is accomplished using the FTM set of externals from IRCAM which allow for the easy manipulation of large amounts of data within Max.

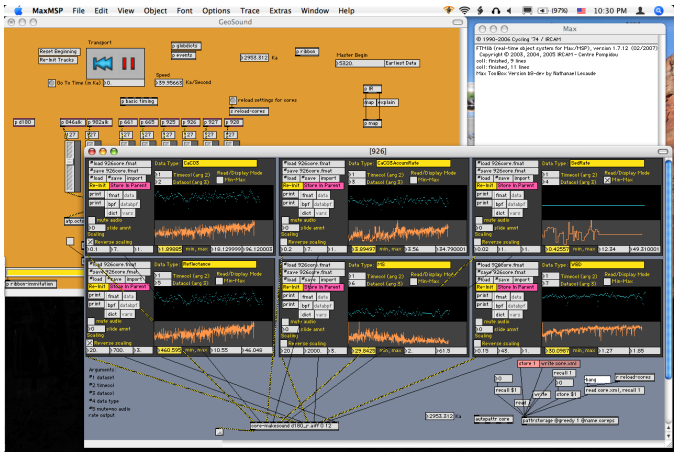
The patch has a deceptively simple main interface:



Under the hood is a hierarchical and dynamic data storage system with a spreadsheet-like GUI provided by FTM:

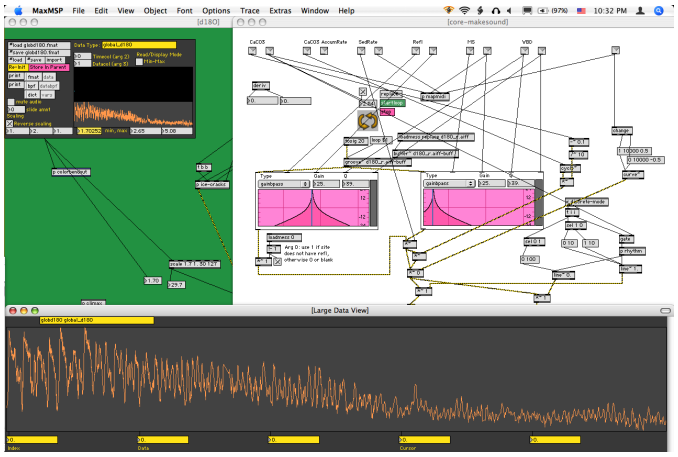


Each core's data is displayed and accessed via a modular system. The following window is the data for site 925:



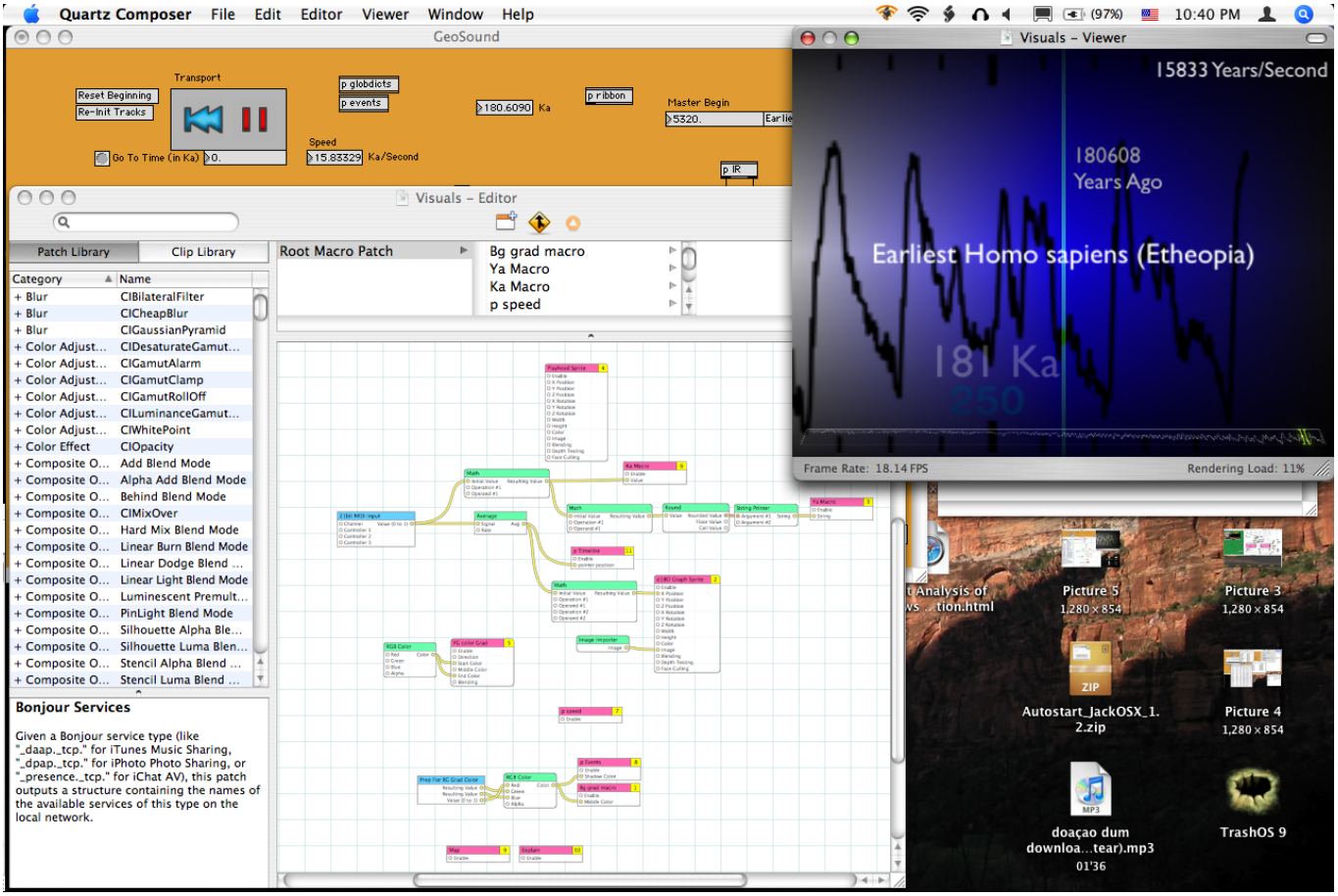
There are 49 data recall and scaling modules in total, 6 of which are shown above, each representing a different property of the 925 deep-sea sediment core. All settings are saved to a master XML settings file.

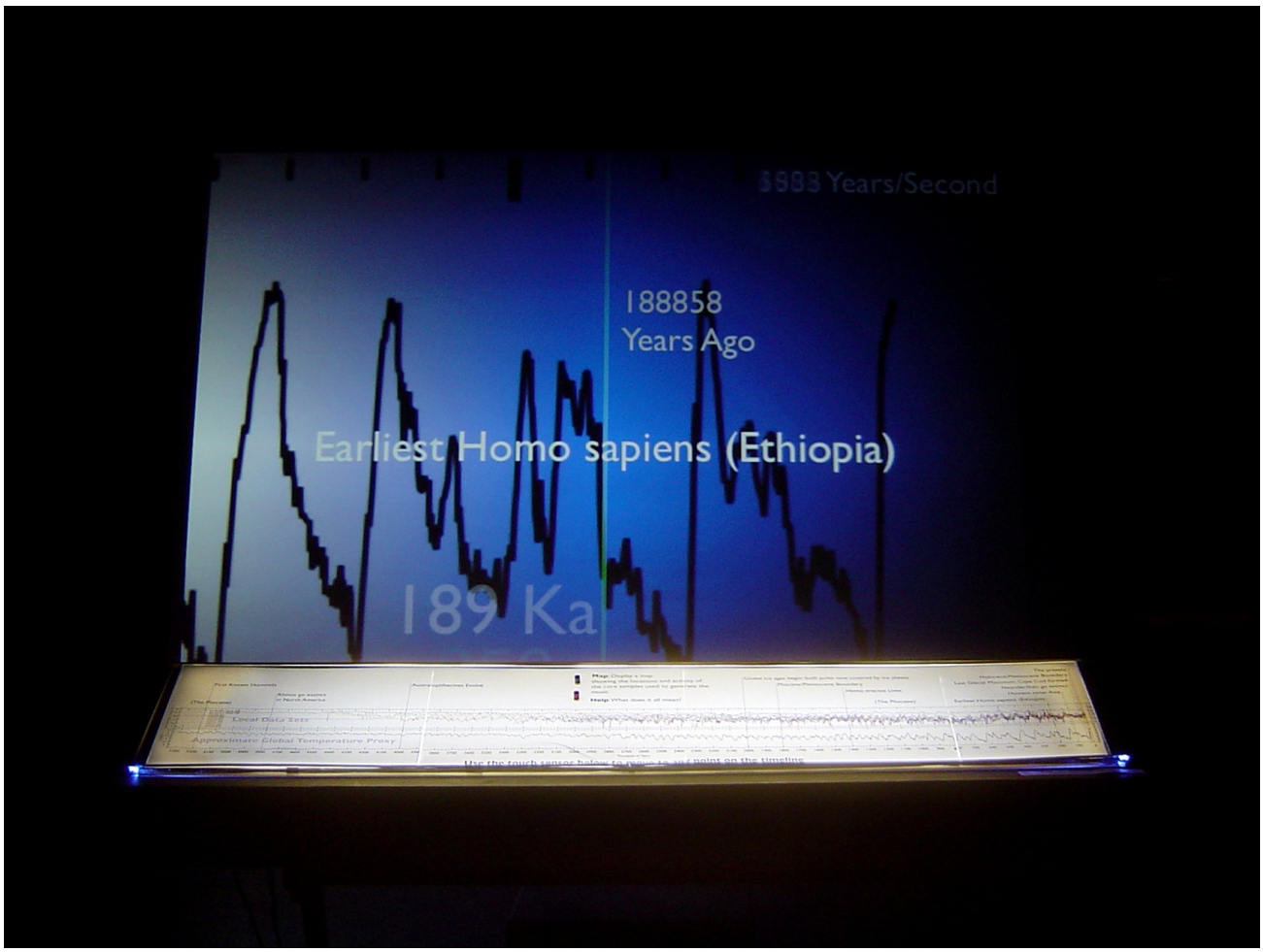
Each module can be clicked to display a larger plot (as below with global δ18O). The screenshot below also shows one of the 8 sound synthesis engines:



The projection visuals were created in Quartz Composer - a visual OpenGL programming software included free with the Apple Developer Tools. The 'patching' paradigm in this environment is similar to that of Max/MSP.

The following screenshot of the software and photo of the timeline interface and projection as realized in the installation, show approximately the same point in time.


Quartz Composer File Edit Editor Viewer Window Help
GeoSound
Transport
Reset Beginning
Re-Init Tracks
Go To Time (in Ka)
p globdicts
p events
180.6090 Ka
p ribbon
Master Begin
Speed
15.83329 Ka/Second
Visuals – Editor
Patch Library
Clip Library
Root Macro Patch
Bg grad macro
Ya Macro
Ka Macro
p speed
Category
Name
Bonjour Services
Given a Bonjour service type (like "_daap._tcp." for iTunes Music Sharing, "_dpap._tcp." for iPhoto Photo Sharing, or "_presence._tcp." for iChat AV), this patch outputs a structure containing the names of the available services of this type on the local network.
Visuals – Viewer
15833 Years/Second
180608
Years Ago
Earliest Homo sapiens (Etheopia)
181 Ka
250
Frame Rate: 18.14 FPS
Rendering Load: 11%
Picture 5
1,280 × 854
Picture 3
1,280 × 854
Autostart_JackOSX_1.2.zip
Picture 4
1,280 × 854
doaçao dum downloa…tear).mp3
01'36
TrashOS 9


188858
Years Ago
Earliest Homo sapiens (Ethiopia)
189 Ka