Memory Cloud: the manual

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Pressing this button will choose a random sound from your library. It will pick each sound once before it is chosen a second time.

Grains
size   density
filter
Autoplay
speed   freeze
on
Randoms
pan
location
pitch
play
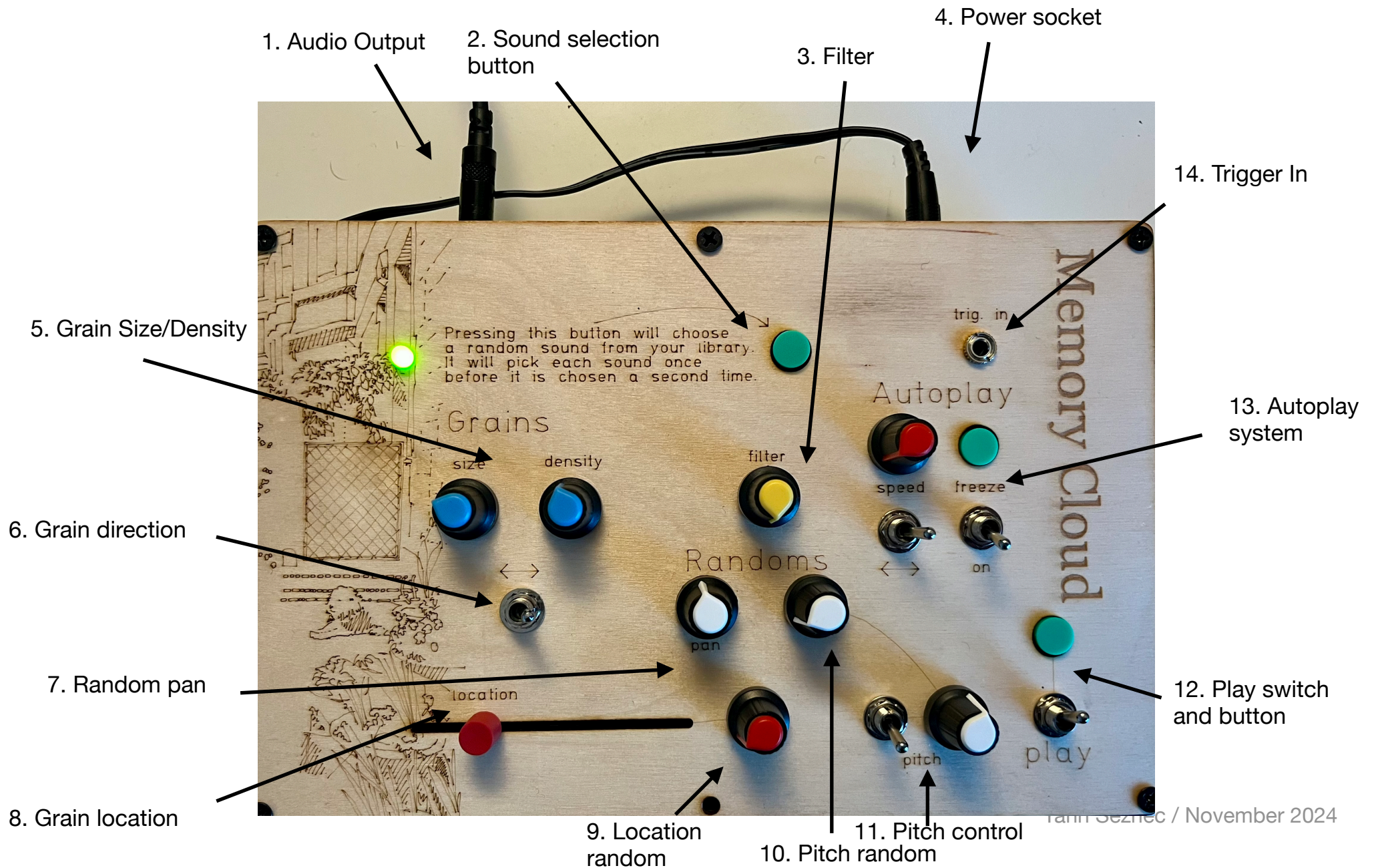Memory Cloud

Welcome to the Memory Cloud!

This instrument contains all of the sounds from your cloud library. It's the only one like it, it's all yours. It is also a granular synthesiser that breaks apart your memories and lets you use them as sonic material to work with and explore.

Inside the box is a Raspberry Pi running a Pure Data patch, among other things. If you'd like to see how this works on your computer, you can <u>download the code here</u>. The Pi version is called "granular_pi.pd".

Some notes on this as a prototype object:

There are various reasons for using a Raspberry Pi, which I won't bore you with. In any case this means that the instrument has a few quirks to be aware of.

Quirk #1: Startup time

This device takes about 30 second to start working. To start, plug in the power supply and be patient. The LED will light up to indicate that the instrument is ready to play.

Quirk #2: Audio quality

The built-in audio output from the Raspberry Pi is not amazing. There will occasionally be some noise on this output when there is no audio playing. A future version of this instrument may improve this, but for the moment it is what it is.

Quirk #3: What happens when it breaks

Very occasionally the code may crash. This can be very confusing, mainly because the LED will probably stay lit. If you think it has crashed, the only solution is to unplug the power and plug it back in (and wait another 30 seconds).

1. Audio Output

3.5mm stereo output. Suitable for headphones or out to a mixer or recorder or interface. There is no volume control on the device, if you want volume control you'll need to do that externally. The sounds that are loaded in the device have been normalised, which should even things out a little bit but you will still likely find some quite big differences between sounds.

2. Sound selection button

All of the sounds from your library are currently in the device, but only one can be loaded into the granular system at a time. Pressing this button selects a new sound from your library to be played with. If the soundfile is quite large this may take a moment to load. The order of selection is shuffled, so you can only hear a sound a second time once you have already heard every other sound in the library. There is no way to go back to a previous sound. Each time you are loading one sound you are also leaving your current sound behind.

3. Filter

A standard low-pass filter, with some resonance. If you don't hear any sound when you are expecting to, you should always make sure this is turned up. At the maximum setting there should be no audible filtering and you'll hear the sound normally.

4. Power socket

Please use the included power supply, unless you really know what you're doing. The socket is centre-positive and the instrument requires 5v. Anything higher than 5.25v risks permanently damaging the electronics.

5. Grain size/density

These are the two main controls of the granular aspect of the device. Grain "size" refers to the length in time of each grain of sound, while "density" refers to how often the grains are triggered. A very low "density" means the sounds are triggered very rapidly, while a higher setting of density means they are triggered more rarely. These two settings are interrelated, to help avoid unintended distortion - thus in certain circumstances changing only one of the settings will also effect the other.

6. Grain direction

This switch has three positions. When set to the rightmost position, all of the grains are played back in the forward direction. In the middle position, the forward and reverse directions are randomised, giving a mix of the two. In the leftmost position, the grains are all played backwards.

7. Random pan

This knob sets how much randomisation is applied to the stereo location of each grain. When set to 0, each grain is played back in the middle of the stereo field. As this knob is turned, the grains are spread out across the stereo field, resulting in a sense of width.

8. Grain location

This slider sets the current playback location of the grains in the soundfile, taking into account any other randomisation settings. When the location random knob (9) is set to 0, the grains will be triggered from the location in the sound set by this slider. This location is relative to the length of the sample, so a very short sound and a very long sound both have the same amount of space on the slider. **Please note**: when "Autoplay" is activated (13), this slider does nothing at all.

9. Location random

This knob sets how much randomisation is applied to the current grain location, which is otherwise set by either the location slider (8) or the autoplay system (13). The closer this knob is to 0, the less randomisation is applied. The randomisation is essentially the distance from the current location, so as this is raised the potential range of distance from the set location grows higher. At it's highest, grains could be triggered from nearly every place in the sound file.

10. Pitch random

This knob selects how much randomisation is applied to the pitch. When set to 0 there is no randomisation at all, and the pitch is set entirely by the pitch control (11). As this knob is turned, the potential of range of pitches for the grains grows. This is relative to the pitch setting, creating a cluster of pitches above and below the current settings. The knob controls the range of this cluster.

11. Pitch system

The switch here activates pitch control of the grains, which is then controlled with the knob. When the switch is off, the pitch is reset to the default (apart from any randomisation settings from the random knob (10)). When the switch is on, turning the knob brings the pitch of the grains up and down. **Please note:** this setting is also related to the grain size and density (5). And very high densities the pitch knob will feel very responsive, but at lower densities the pitch control may feel like it is lagging. This is because the pitch is being assigned to each grain individually and if the grains are being triggered slowly you may not immediately hear the effect.

12. Play switch and button

This switch turns on the granular system, triggering grains at the rate set by the size/density settings (5). Turning the switch off stops the stream of grains. This can sometimes take a moment to go silent, depending on your density settings. The button triggers a single grain on each press. If your grain size is very small this may be hard to hear.

13. Autoplay system

These four controls are for automating the playback location of the grain, allowing you to "play" the currently loaded soundfile at any speed or direction. This can be used and misused in various ways. The lower-right switch turns the autoplay system on, shifting location control away from the location slider (8). The play switch (12) must be switched on as well for this to work. When activated, the grain location will automatically move at the speed set by the knob in the upper left of the section. The switch in the lower left of this section sets the direction of playback. The "freeze" button will temporarily stop the movement of the location while the button is held down.

Please note: Apart from the location slider, all of the other settings are also applied to the grains. To get a fully linear and "normal" playback, the following settings are required: grain size roughly medium, grain density low, the grain direction forward, location random 0, pitch random 0. To play the sound backwards, the autoplay direction and the grain direction can both be set to backwards. The autoplay system starts to become much more interesting when it is used more creatively and "incorrect" settings are applied, however this can be confusing at first due to the interdependence of the different parameters.

14. Trigger input

Eurorack-style 3.5mm jack for trigger input from a modular or similar system. This takes a 5v trigger signal and uses it to play one grain, identical to the play button (12). Sending a very high frequency of trigger signals will generate a similar sound to the play switch. **Please note**: this trigger input will naturally override the "density" setting. However the grain size and density settings will remain linked, so turning the density knob may change the sound somewhat despite having no real effect on the density. Similarly, if you trigger quickly enough using this input you may trigger the grains faster than they have time to decay, causing some clipping or similar noise. This might be fun, who knows.