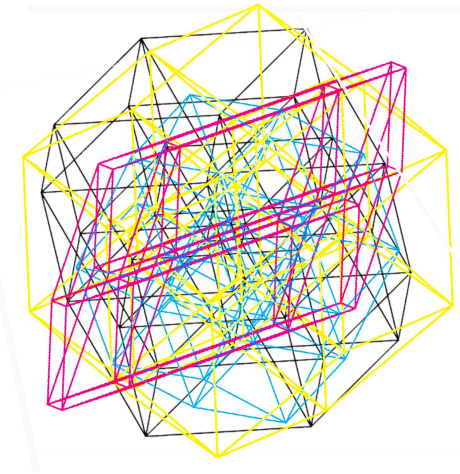


I am sitting in a *room*
Distance *between* things

Blinded by the *moment*
Subdued by *its* effect

In phase and out of *it*
*Space* is the *place*

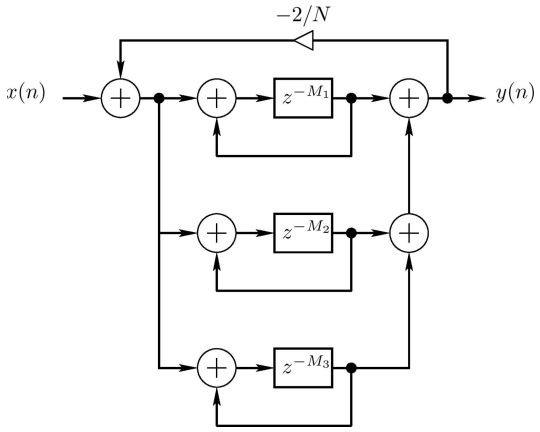
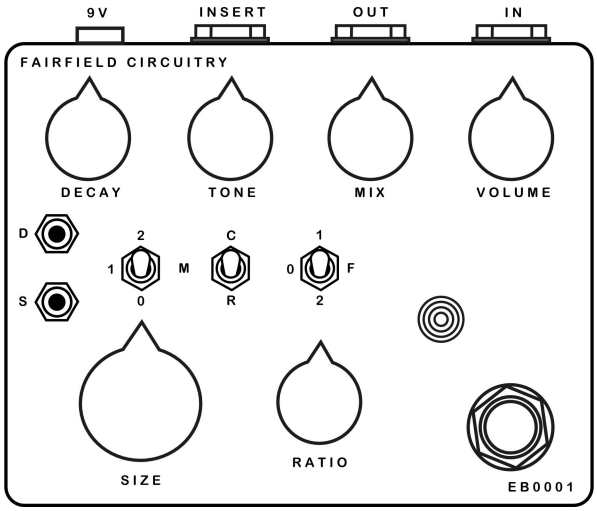



**figure 1**, *Householder-reflection feedback matrix, as proposed by Jot, in "Digital delay networks for designing artificial reverberators" published in 1991.*




Three independent analogue delay-lines act as foundation to this particular type of feedback-delay-network.

A householder-reflection feedback matrix (figure 1) creates context for quick echo density; every delay line feeds back only to every other delay line.

The excitation is looking for the longest way out.

Surprisingly, this analogue implementation of a basic digital reverb algorithm sounds quite unique.

Creating space that is both familiar *and* unusual.

**HIGHLIGHTS**

Truly unique approach; analogue emulation of a digital reverb algorithm using bucket brigade devices. The signal path is all-analogue.

Controls altogether allow for a surprising array of possibilities:

- large bingo halls
- bathrooms and shower stalls
- spring-like flavours
- semblance of plate reverbs
- unrealistically small rooms
- real close to flanging

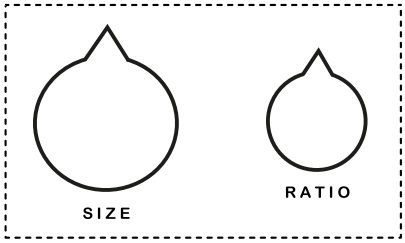
The fully variable controls offer direct control of the room, no presets. Emphasizing the analogue nature of the circuit. Making the night more interesting.

There's a real adventure in tuning SIZE and RATIO, an adventure through nodes of flutter and diffusion.

Digital control allows all three delays to have their own unique, random and cyclical modulations rendering rooms that move ever so slightly while also improving smear.

## FRONT PANEL CONTROLS

### DELAY LENGTHS



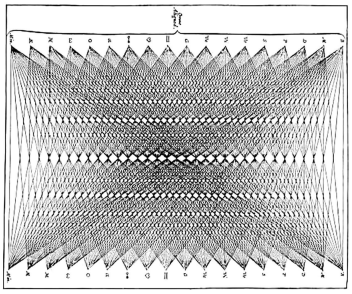

Sets initial room **SIZE**; a reference delay from which the other two delays are scaled according to **RATIO.**

Wide range, exploiting the full range of the BBD. From tiny rooms bordering on flanging, to longer delays, in the slap-back range.

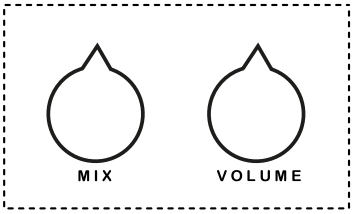
When **RATIO** is exactly in the middle, all three delay lines are the same length. Turning clockwise increases the second and third delay lengths, counter-clockwise reduces them.

### MODULATION

| DEPTH | | TYPE |
|---|---|---|
| more | 2 C | cyclical |
| slight | 1 M | both |
| none | 0 R | random |



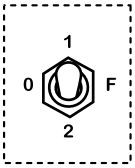
### OUTPUT SECTION




**MIX** between fully dry, to fully wet.

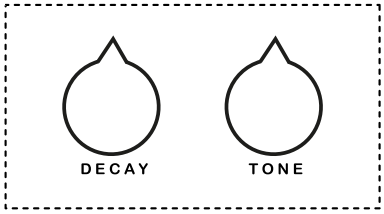
Unity gain around noon. Plenty of output **VOLUME**.

### LOW-PASS 1st ORDER FILTER CUTOFF




| | |
|---|---|
| slight | 4kHz |
| open | 8kHz |
| more | 2kHz |

### FEEDBACK AND EMPHASIS




**TONE** sets the mood of the room. A tilt filter centered around 500Hz.

Flat in the middle, CW cuts lows and boosts highs. CCW cuts highs and boosts lows.

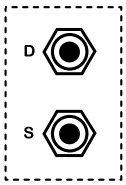
Affects overall **TONE** of wet signal and main feedback path. Interacts strongly with **DECAY** control and overall reverb quality.

Are the walls made of ceramic tiles or cork?

**DECAY**; from single reflection CCW, well-into self-oscillation CW. Sets the gain of all four feedback paths. Onset of decay is around 2-3 o'clock but depends on **TONE, M**odulation depth, **SIZE** and **RATIO** settings. When self-oscillating, the circuit will start singing distinct notes. This can be overriden with strong input signals or by introducing delay-time modulation.

### CV INPUTS

**modular levels ok**



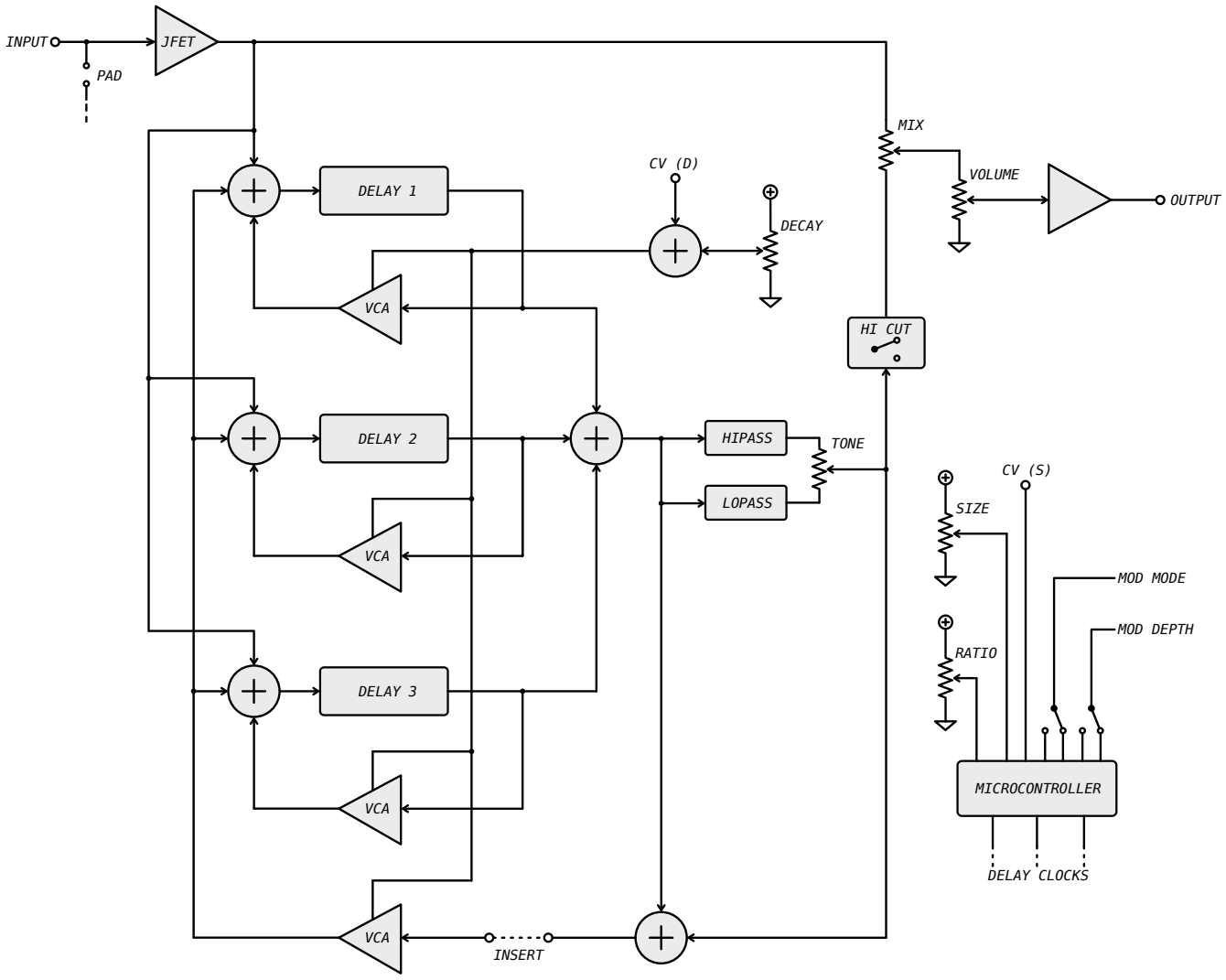

**D - DECAY control voltage**
Summed with DECAY control. Useful range +-5V

**S - SIZE control voltage**
Flips delay lengths, short becomes long, etc. Useful range 0 - 5V

### SIDE PANEL CONNECTORS

| | |
|---|---|
| **IN** | Hi-Z (intrument-level) mono input. Jumper inside for line-level with -6dB pad |
| **OUT** | Lo-Z mono output |
| **INSERT** | FX loop on main feedback. Tip is send, ring is return. |
| **9V** | Center-negative, regulated 9V power input, demands around 80mA of current. |

**BLOCK DIAGRAM** (please forgive the inaccurate phase relationships)




**INTERPRETATION**

There are three parallel delay-lines each with their own nested feedback paths. These paths are out of phase.

There is a fourth feedback path consisting of the sum of the three delay-line outputs with the resulting tilt filter output. This path is in phase.

All four feedback paths have a VCA to control their gain. They all share the same control voltage, DECAY.

This means each delay-line’s nested feedback gets cancelled. The resulting feedback consists only of the other two delay-lines.

There is no compression or expansion, no “companding”. Although these methods are useful to minimize noise, there is no way to include them in the feedback path without hurting the reverb. That said, adding a compressor in front of Placeholder is pure magic.

Although the signal path is all-analogue, the delay clocks, modulation type and depth are controlled digitally.

The TONE control is, in essence, a tilt filter. Not only is the TONE output used as the WET output, it’s also fed back through the fourth feedback path, simulating various damping factors within a place.

## MORE INFORMATION

***Placeholder doesn't create washy pads like some digital reverbs, instead it sings. If you find it singing, play along with it or reduce feedback conditions.***

***Insert is unruly, strong oscillations may occur, reduce DECAY and/or insert loop gain.***

***Noise is present and emphasized with longer delay times, high TONE and MIX settings. F switch can help.***

***Please do not adjust trimpots.***

### FEEDBACK ONSET

The range on DECAY allows for the network to self-oscillate. Other settings will also affect the threshold of oscillation.

As a rule of thumb, oscillations are more likely to happen when TONE is at either extreme and when Modulation is at 0.

When TONE is in the middle and Modulation is maxed out, you'll find the threshold of feedback to require higher DECAY settings.

Typically, onset of feedback will occur between 2-3 o'clock on the DECAY control.

SIZE and RATIO settings can also affect feedback; some delay-time combinations will self-oscillate quicker than others.

### F - HI-CUT SWITCH

With so much noise from the BBDs, the F hi-cut switch was added as a last resort. Hopefully you can leave it open, but some circumstances might require high-end sacrifice.

### MOD SWITCHES

Depth is intentionally subtle, use CV S jack or INSERT for more extreme modulations.

C mode is cyclical. The cycle rate is proportional to the delay-length. Shorter delays have a higher rate.

R mode is random. Each delay-line gets its own randomness.

When selecting between Cycle, Both or Random, delay-lines are cleverly rotated. This can be heard as a distinct pluck when DECAY level is high enough.

### CONTROL VOLTAGES - S and D

S adds a distinct layer of interaction with the delay-lengths. D allows CV control of DECAY.

### INSERT

Destabilizes the feedback network.

Requires a TRS insert cable.
TIP is send, RING is return.

Keep insert chain levels as close to unity as possible, reduce DECAY to keep away from self-oscillation.

Try with delays, pitch-shifters, modulation and dirt, who knows what sounds you'll make.

### PAD/LINE JUMPER

Reduces input Z from 1MΩ to 100kΩ and applies a -6dB pad to input. Located inside the pedal, between the case and the IN jack. Use needle-nose pliers or tweezers to move jumper. Default is HI-Z, instrument input.

## TECHNICALS

- delay range 12 - 160 milliseconds
- input impedance 1MΩ (100kΩ @ -6dB)
- output impedance 1kΩ
- true bypass
- power supply 9 - 9.6VDC
- current draw ~80mA @ 9.6VDC
- dimensions 4.7" x 3.8" x 1.9"

## NOTES ON POWERING

Placeholder was designed to operate using your typical centre negative, regulated 9 VDC power supply.

The pedal is protected against reversed polarity conditions.

Always check your power supply for proper voltage and polarity before connecting. There is no battery connection inside the pedal.

## EXTENDED WARRANTY

Fairfield Circuitry will repair or replace any malfunctioning product for a period of 2 years after purchase date. Problems resulting from modifications or misuse may cancel this warranty. The owner will cover all shipping expenses.

In short, the best thing to do is to contact us as soon as possible with a description of the symptoms, even if the warranty is expired.