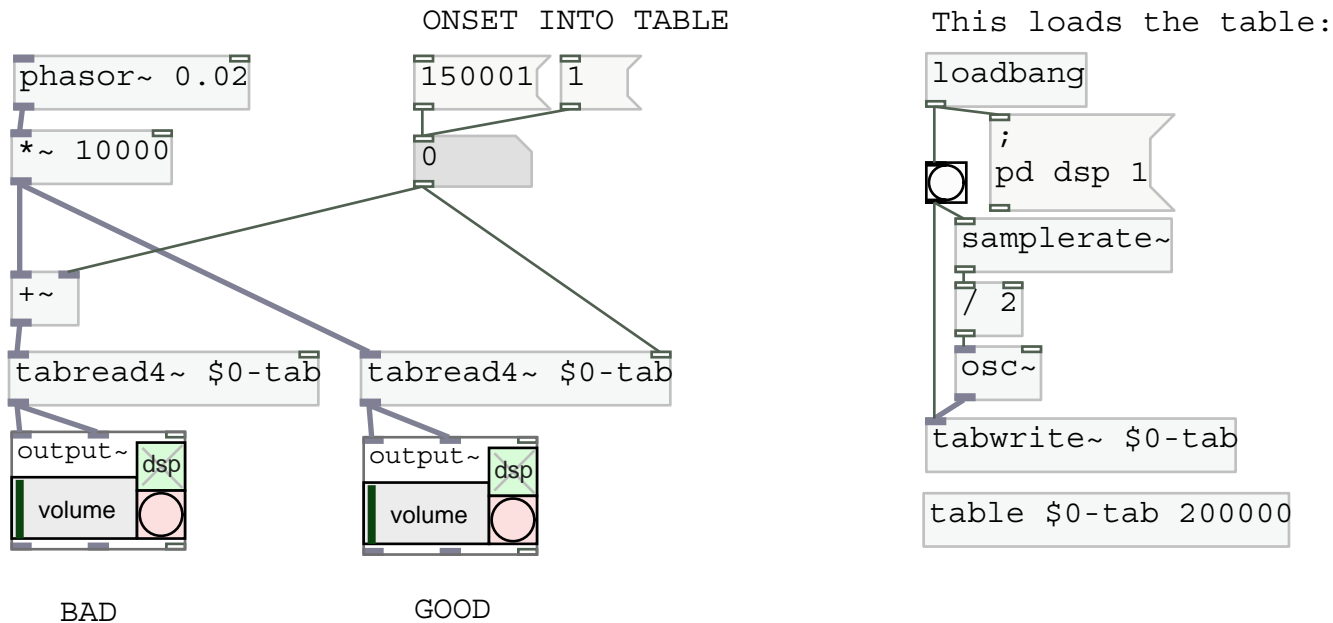USING ONSETS INTO TABREAD4~ TO IMPROVE ACCURACY

Pd is usually compiled to work on 32-bit audio samples.
These do not, in general, have enough precision for use as
indices into an array of more than about 32K samples. This
is because the mantissa of a 23-bit floating point number
has only 24 bits, out of which you would be using 16 bits
or more to address a sample more than 32K into the array,
so there would remain 8 or fewer bits to supply the
fraction. In the most extreme situation possible, the
sample could contain a Nyquist frequency sinusoid and the
output would then have only about 8 bits of accuracy!

You can use the "onset" inlet to tabread4~ to get good
accuracy reading longer arrays. The tabread4~ object adds
the index and the "main" (signal) inlet in 64-bit
precision. So if, for example, the onset inlet could
specify an integer exactly up to about 8 million (190
seconds at 44100 Hz), and the signal inlet could act as a
displacement.

At left below an onset (1 or 150000 samples) is added to
the index of a table lookup. If you select the onset of
150001, you should hear the truncation error. (The table
contains a Nyquist signal and the "correct" output should
be a 100 Hz. tone.) At right, the onset is presented in the
separate onset inlet. The worst-case truncation error drops
by about 30 dB.

ONSET INTO TABLE               This loads the table:

| phasor~ 0.02 | | 150001  1 | | loadbang |

| *~ 10000 | | 0 | | ; <br> pd dsp 1 |

| | | | samplerate~ |

| +~ | | | / 2 |

| tabread4~ $0-tab | | tabread4~ $0-tab | | osc~ |

| output~  dsp <br> volume | | output~  dsp <br> volume | | tabwrite~ $0-tab |

| | | | table $0-tab 200000 |

    BAD              GOOD

| tabread | - WRITE NUMBERS TO A TABLE | *Adapted From:* pd\doc\5.reference\tabread-help.pd |

INLETS:

- LEFT:   Float - A float at the left inlet will become the new value
         of the chosen index (whichever index is currently selected
         at the right inlet).

         List - The left inlet also accepts pairs of floats (longer
         lists will be truncated). A number pair represents "value"
         and "index" - corresponding to "left" and "right" inlets.
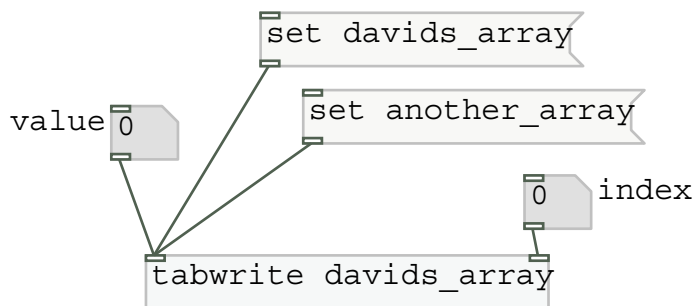
         Set - the "set <arrayname>" message allows you to write to
         dynamic locations. You can change the table at any time
         using the "set" message.

- RIGHT:  Float - selects which index in which to write the new value.

ARGUMENTS:  One - the argument informs [tabwrite] which array to write
         to. The array must exist in an open Pd patch/canvas or an
         error message will appear in the terminal window.

OUTLETS:  None.

EXAMPLES:  Open the tables and use your mouse to draw new values in
         the arrays - otherwise [tabread] will always output "0".

         davids_array

         set davids_array

         set another_array

         value 0

                                    0   index

         tabwrite davids_array                another_array

SEE ALSO:  doc/2.control.examples/15.arrays.pd

         doc/2.control.examples/16.more.arrays.pd

         pd Related_Objects

         pd More_Info

         pddp  - Dave Sabine, April 29, 2003