Sketchy Documentation for "Wigette-02:"
A non-traditional synthesis tool based on Arun Chandra's
"Wigout."

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(Arun Chandra's Web Site contains a rich trove of information
that can be accessed at http://academic.evergreen.edu/users6/arunc/

Description:
"Wigette-02" implements pieces of Arun Chandra's "Wigout" for
the MacIntosh in a slightly more interactive mode. "Wigette-02"
permits the creation of 4 "states" (see Chandra's Web site for
more info) and the combination of those states into a "segment."
"Wigette-02" implements all Wigout state features: wiggles,
twiggles and ciggles are supported, and these can be slanted if
desired.

"Wigette-02" creates a mono AIFF file of user-specified duration
which can be played within the application. It is assumed that
sound files would be saved for use in other synthesis and
sequencing applications. The duration of the soundfiles are
limited by available memory.

Background:
Wigette-02 and Wigout are based on a principle of iteration of
elements, an element being a unit of duration and amplitude at
its most basic. In Wigout, states have a starting duration,
increasing to a maximum and then decreasing to a minimum before
returning to the starting state. This is done in a user
specified increment. For example, consider A as a range of
durations with 6 increments and B as a range of amplitudes with
8 increments:

A: 123456123456123456123456
B: 123456781234567812345678

This state takes 24 iterations to return to the beginning.
Because Wigette-02 permits durations between 0-1000 and
amplitudes between –128 and 127, the iterations can be quite
long before they return to the beginning.

A major difference between Wigette-02 and Wigout is that in
Wigette-02 elements are drawn on a graph rather than specified,
so quite a range of iterative behavior can be created.

Arun Chandra's manual for Wigout is an important source of
information in understanding the implications of this time
domain synthesis technique.

Glossary:
Duration (period): refers to the number of samples (at 44,100)
that form an element of duration and amplitude. These can range
from 0-1000 where 3 samples correspond to a frequency of
13289.752hz and 1000 a frequency of ~43hz. See the end of this
document for a table relating duration to frequency.

Base Amplitude: refers to the given amplitude on an element in
the range of –128 to 127. Base amplitude is used to construct
wiggles and is combined with Peak amplitude to construct
twiggles and ciggles.

Wiggles: are elements having a square waveform characteristic.

Twiggles: are elements having a trapezoidal waveform
characteristic.

Ciggles are elements having a sinusoidal waveform
characteristic.

Peak Amplitude: refers to the amplitude range between the base
and the peak of ciggles and twiggles. Peak amplitude takes on
ranges between –128 and 127.

Peak Location: refers to where from the start to end of an
element of certain duration the trapezoidal or sinusoidal peak
is reached. This takes on a range of 0-100 units.

Dur, period: duration abbreviated
Bamp: base amplitude abbreviated
Pamp: peak amplitude abbreviated
Ploc: peak location abbreviated

Description of the Wigette-02 patcher screen:
The left hand side of the screen features 4 interface devices
that enable the specification of states. They are labeled 1-4.

The left 3 buttons enable opening, closing and clearing the
graph tables that specify duration base amplitude, etc.

The pull-down menu sets the waveform characteristic for that
state and the check-box specifies the slant characteristic.

The 4 number boxes specify the number of increments for each of
the parameters (Note: these number boxes set the "size" of the
MAX/Msp [table] object. Setting them after drawing in the table

will either truncate the previous results or expand the [table] will undefined values)

On the right hand side, topmost button fills the buffer by iterating through the states in the order specified by the text box below. Filling the buffer can be slow when the buffer size gets above 10 seconds.

The text box labeled "SEGMENT" enables specifying which, and in what order, the states are iterated through. 1 2 3 4 would write an iteration of 1 followed by an iteration of 2 and so on before returning to 1 again. Likewise, 1 1 2 would write 2 iterations of 1 before writing 1 of 2. (and write no iterations of 3 or 4). Numbers should be followed by spaces as separators.

The buffer size number box sets the size of the waveform buffer in milliseconds. Maximum size is limited by the memory partition given the MAX/Msp. Wigette-02 iterated through the segment and states until the end of the buffer is reached.

"BUFFER CONTROL:" these buttons will open a graphical view of the buffer, write the buffer to a file, or clear it completely. (If not cleared, I believe the buffer will be written at the end with uncertain results.)

"AUDIO ON/OFF" will loop the resultant file at the correct period. Volume may be adjusted and the meter indicates the volume setting.

"PRESETS" save the information in the increment boxes and the segment text box. Table data is saved with the patcher.

Some thoughts:
Fixed duration, variable amplitude
Variable duration, fixed amplitude (only for ciggles and twiggles)
Few duration increments, many amplitude increments
Spaces where base amp is zero, others where peak amp is zero
Duration and ampltitude increment are large prime numbers (ie lloonngg iterations!)

Sampling Rates

name	Hertz	11025	22050	44100	48000
a0	27.500	401	802	1604	1745
a#0	29.135	378	757	1514	1647
b0	30.868	357	714	1429	1555
c0	32.703	337	674	1348	1468
c#0	34.648	318	636	1273	1385
d0	36.708	300	601	1201	1308
d#0	38.891	283	567	1134	1234

name	Hertz	11025	22050	44100	48000
e0	41.203	268	535	1070	1165
f0	43.654	253	505	1010	1100
f#0	46.249	238	477	954	1038
g0	48.999	225	450	900	980
g#0	51.913	212	425	849	925
a1	55.000	200	401	802	873
a#1	58.270	189	378	757	824
b1	61.735	179	357	714	778
c1	65.406	169	337	674	734
c#1	69.296	159	318	636	693
d1	73.416	150	300	601	654
d#1	77.782	142	283	567	617
e1	82.407	134	268	535	582
f1	87.307	126	253	505	550
f#1	92.499	119	238	477	519
g1	97.999	113	225	450	490
g#1	103.826	106	212	425	462
a2	110.000	100	200	401	436
a#2	116.541	95	189	378	412
b2	123.471	89	179	357	389
c2	130.813	84	169	337	367
c#2	138.591	80	159	318	346
d2	146.832	75	150	300	327
d#2	155.564	71	142	283	309
e2	164.814	67	134	268	291
f2	174.614	63	126	253	275
f#2	184.997	60	119	238	259
g2	195.998	56	113	225	245
g#2	207.652	53	106	212	231
name	Hertz	11025	22050	44100	48000
a3	220.000	50	100	200	218
a#3	233.082	47	95	189	206
b3	246.942	45	89	179	194
c3	261.626	42	84	169	183
c#3	277.183	40	80	159	173
d3	293.665	38	75	150	163
d#3	311.127	35	71	142	154
e3	329.628	33	67	134	146
f3	349.228	32	63	126	137
f#3	369.994	30	60	119	130
g3	391.995	28	56	113	122
g#3	415.305	27	53	106	116
a4	440.000	25	50	100	109
a#4	466.164	24	47	95	103
b4	493.883	22	45	89	97
c4	523.251	21	42	84	92

name	Hertz	11025	22050	44100	48000
c#4	554.365	20	40	80	87
d4	587.330	19	38	75	82
d#4	622.254	18	35	71	77
e4	659.255	17	33	67	73
f4	698.457	16	32	63	69
f#4	739.989	15	30	60	65
g4	783.991	14	28	56	61
g#4	830.609	13	27	53	58
a5	880.000	13	25	50	55
a#5	932.328	12	24	47	51
b5	987.767	11	22	45	49
c5	1046.502	11	21	42	46
c#5	1108.731	10	20	40	43
d5	1174.659	9	19	38	41
d#5	1244.508	9	18	35	39
e5	1318.510	8	17	33	36
f5	1396.913	8	16	32	34
f#5	1479.978	7	15	30	32
g5	1567.982	7	14	28	31
g#5	1661.219	7	13	27	29
name	Hertz	11025	22050	44100	48000
a6	1760.000	6	13	25	27
a#6	1864.655	6	12	24	26
b6	1975.533	6	11	22	24
c6	2093.005	5	11	21	23
c#6	2217.461	5	10	20	22
d6	2349.318	5	9	19	20
d#6	2489.016	4	9	18	19
e6	2637.021	4	8	17	18
f6	2793.826	4	8	16	17
f#6	2959.956	4	7	15	16
g6	3135.964	4	7	14	15
g#6	3322.438	3	7	13	14
a7	3520.000	3	6	13	14
a#7	3729.310	3	6	12	13
b7	3951.066	3	6	11	12
c7	4186.009	3	5	11	11
c#7	4434.922	2	5	10	11
d7	4698.637	2	5	9	10
d#7	4978.032	2	4	9	10
e7	5274.042	2	4	8	9
f7	5587.652		4	8	9
f#7	5919.912		4	7	8
g7	6271.928		4	7	8
g#7	6644.876		3	7	7
a8	7040.000		3	6	7

a#8	7458.620	3	6	6
b8	7902.133	3	6	6
c8	8372.019	3	5	6
c#8	8869.845	2	5	5
d8	9397.273	2	5	5
d#8	9956.064	2	4	5
e8	10548.083	2	4	5
f8	11175.305		4	4
f#8	11839.823		4	4
g8	12543.855		4	4
g#8	13289.752		3	4