Granular Gong

for 8-Track Tape

Performance Score / Documentation

Genre:
Electroacoustic Music (Acousmatic)

Javier Alejandro Garavaglia (2000)

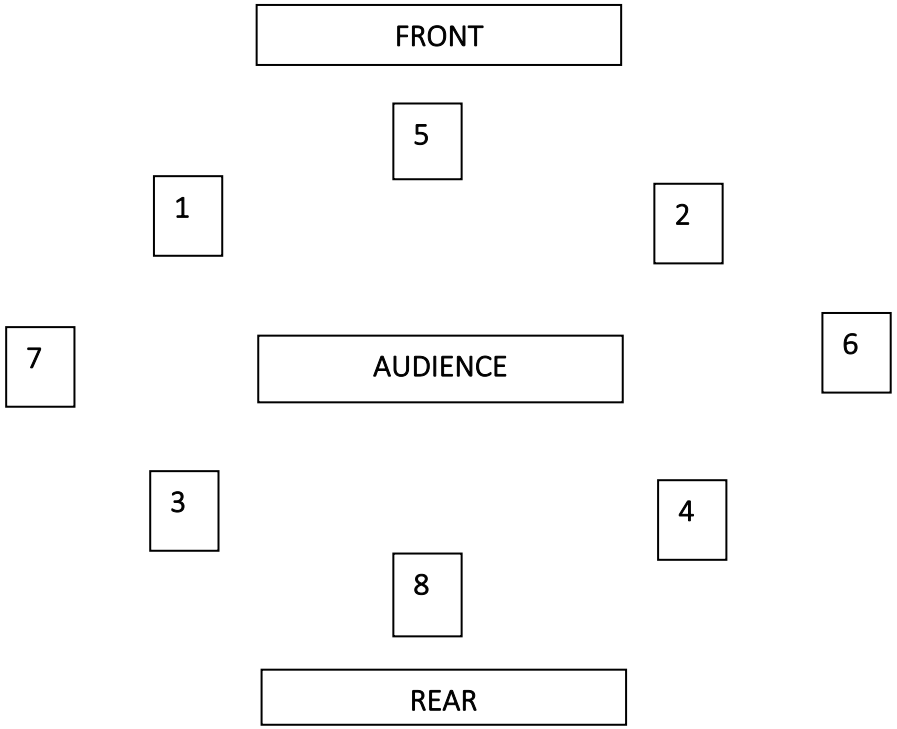
This score has a graphic representation of the final Octophonic mix, with the main purpose of guiding the performer on the mixing desk during the diffusion of the piece in a concert Hall.

Indications for the performance:

This acousmatic piece, composed in 2000, is available on the following different formats (all Octophonic, 8.0):

- ADAT – 48 kHz Sampling Rate
- DTRS – 44.1 kHz Sampling Rate
- 8x separate AIFF files (44.1/16) for upload to any current Audio/MIDI Sequencer for performance on a PC or Apple computer.

The channel distribution for concert purposes follows the “American” diamond octophonic surround disposition, as shown below:



The performer on the mixing desk should not try to diffuse the piece, as all Octophonic movements are already pre-composed and saved on the 8.0 version of the piece. A general indication would be to consider all 8x output busses at 0dB level basis (Unity), but as the overall

dynamics can vary substantially from one system and concert hall to another, the final decision of a common overall level for all 8 channels remains by the performer.

The 8.0 version is the only version which brings the whole compositional ideas together, as the space is indeed a primordial parameter and therefore should be given priority. However, if an Octophonic system is not in place, a quadraphonic reduction should be mixed as follows:

Channel 1 & 5 together (FRONT LEFT)
Channel 2 & 6 together (FRONT RIGHT)
Channel 3 & 7 together (REAR LEFT)
Channel 4 & 8 together (REAR RIGHT)

Commercially available on CD since April 2006, a stereo version of the piece exists as well, but this one only qualifies for radio or home reproduction.

RIGHTS/ROYALTIES

Duration: 13:50

DESCRIPTION

The piece explores the following aspects:

- On one hand, the way of producing making metal-like sounds with sound synthesis procedures (via Chowning-FM) and then varying and combining them with another synthesis procedures, mostly Granular Synthesis (thus the name to the piece) but also Phase Vocoder (for time stretching and pitch shifting), spectral mutations and convolution (multiplication of 2x different spectra).
- On the other hand, it explores composing with large crescendo forms, whose inner tension resolve in other sounds. Hence, very loud and very soft moments are an essential part of the structure of ***Granular Gong***.

- As a third subject to explore is the movement and rotation of these sounds in the performance space or room, shown in the Octophonic mix and original version of the composition.
- Software used for the composition and production of the piece:
    - ***Csound*** (mainly for the modelling of the Gong Sounds), ***Soundhack*** and ***Audiosculpt***.
    - The final mix of the 8x tracks was produced using ***ProTools 2.***

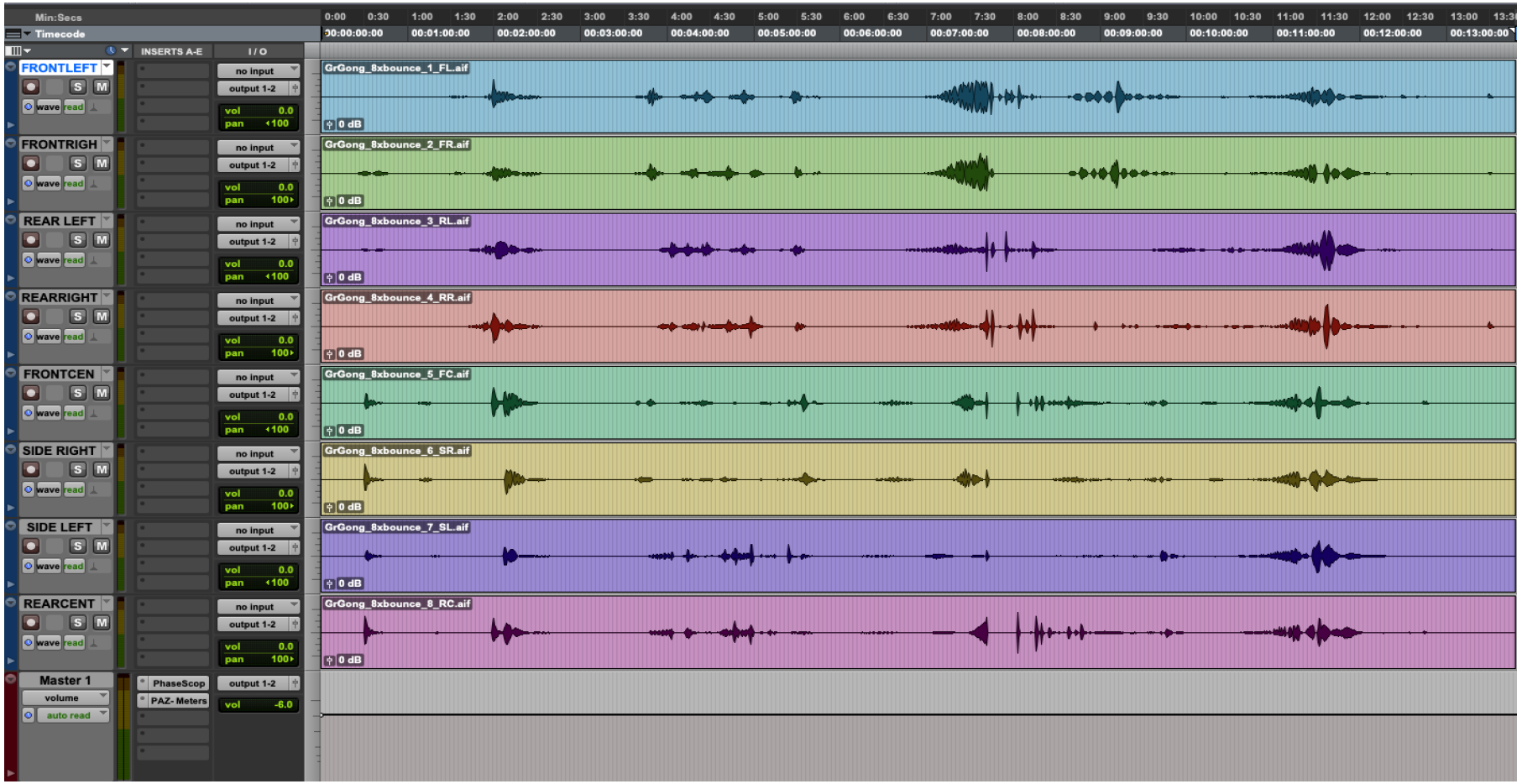
DOCUMENTATION

From page 5 onwards, the documentation shows how sounds were synthetically created using the software ***Csound***, whereby both 'orc' and the corresponding 'sco" files for each sound are provided.

Granular Gong

Octophonic Acousmatic Music (8.0-Track View)

Javier Alejandro Garavaglia (2000)



Csound (ORC & SCO) FILES USED IN THE COMPOSITION

(1) 00_BOOM

```
sr=44100
kr=441
ksmps=100
nchnls=2

garvbboom1 init 0
garvbboom2 init 0

;;;
instr 100
;;;Boom1

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
kindex line 1,p3,2
kndx = kamp * kindex
kbalance line 0,p3,1
afm1 foscil iamp,0.5,1,2,kndx,1
afm2 foscil iamp,0.7,1,3,kndx,1
afm3 foscil iamp,0.4,1,4,kndx,1
aboom = kamp * (afm1+afm2+afm3)

aout1 = aboom * kbalance*0.08
aout2 = aboom * (1 - kbalance)*0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

;;;
instr 101
;;;Bomm2

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
kindex line 1,p3,2
kndx = kamp * kindex
kbalance line 1,p3,0
afm1 foscil iamp,0.5,1,2,kndx,1
afm2 foscil iamp,0.7,1,3,kndx,1
afm3 foscil iamp,0.4,1,4,kndx,1
aboom = kamp * (afm1+afm2+afm3)

aout1 = aboom * kbalance * 0.08
aout2 = aboom * (1 - kbalance) * 0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

instr 10
;;REVERBERATOR only for instr. 100 and 101 (Boom instruments)

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)


kamphall linseg 0,irise,iamp,idec,0,ioff,0
krvbtime1 line 3,p3,5
krvbtime2 line 3,p3,5

areverb1 reverb garvbboom1,krvbtime1
areverb2 reverb garvbboom2,krvbtime2
aboomsout1 = areverb1*kamphall
aboomsout2 = areverb2*kamphall
outs1 areverb1
outs2 areverb2

garvbboom1=0
garvbboom2=0

 endin
```

```
----------------------------------------
t0 60
f1 0 2048 10 1 1 1 1 1 .7 .4 .3 .2 .1

;ins Start Dur amp

i100 0.00   0.35 53
i101 9.00   0.40 45
i100 13.00  0.35 52
i101 17.00  0.45 48
i100 22.00  0.55 47
i101 25.00  0.55 43
i10   0.00 29.00 25
e
```

(2) 000_BOOM

```
sr=44100
kr=441
ksmps=100
nchnls=2

garvbboom1 init 0
garvbboom2 init 0
gindx init 1

;;;
instr 100
;;;Boom1

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
iindex = 1.5
kndx = kamp * gindx
kbalance expseg 0.01,p3*0.5,1,p3,0.01
afm1 foscili iamp,0.5,1,1,kndx,1
afm2 foscili iamp,0.7,1,0.916666667,kndx,1
afm3 foscili iamp,0.4,1,1.1666666667,kndx,1
aboom = kamp * (afm1+afm2+afm3)
;;;kmod are subdivisions of 1 into 12 (1 Hertz divided into 12
parts, to get unison, one tone over unison and a semitone under
the unison)
;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]


aout1 = aboom * kbalance*0.08
aout2 = aboom * (1 - kbalance)*0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain
gindx=gindx+iindex
endin

;;;
instr 101
;;;Bomm2

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.6


kamp linseg 0,irise,iamp,idec,0,ioff,0
;kindex expon 1,p3,7
kndx = kamp * gindx
```

```
kbalance expseg 0.01,p3*0.5,1,p3,0.01
afm1 foscili iamp,0.5,1,1,kndx,1
afm2 foscili iamp,0.7,1,0.916666667,kndx,1
afm3 foscili iamp,0.4,1,1.1666666667,kndx,1
aboom = kamp * (afm1+afm2+afm3)
;;;kmod are subdivisions of 1 into 12 (1 Hertz divided into 12
parts, to get unison, one tone over unison and a semitone under
the unison)

;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]

aout1 = aboom * (1 - kbalance) * 0.08
aout2 = aboom * kbalance * 0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

instr 10

-----------------------------------------
t0 60
f1 0 4096 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

;ins Start Dur amp

i100 0.00 0.35 53
i10  0.00 7.50 40
e
```

```
;;REVERBERATOR only for instr. 100 and 101 (Boom instruments)

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)


kamphall linseg 0,irise,iamp,idec,0,ioff,0
krvbtime1 line 3,p3,8
krvbtime2 line 3,p3,8
;krvbtime1 line 3,p3,5
;krvbtime2 line 3,p3,5

areverb1 reverb garvbboom1,krvbtime1
areverb2 reverb garvbboom2,krvbtime2
aboomsout1 = areverb1*kamphall
aboomsout2 = areverb2*kamphall
outs1 areverb1
outs2 areverb2

garvbboom1=0
garvbboom2=0

endin
```

(3) 0000-filter

```
sr = 44100
kr = 441
ksmps = 100
nchnls = 2
instr 1
;
asig1,asig2 soundin "001boom-granUSIM002sin-gran",0

k1 linseg 0,0.5,1,(p3-p2-1),1,0.5,0
kcres linseg 0.001,p3*0.8,1,p3,0.01
kdecres linseg 1,p3,0.001
alp1 butlp asig1,95
```

```
ahp1 buthp asig1,12500
alp2 butlp asig2,95
ahp2 buthp asig2,12500
aout1= k1*(alp1+alp2)*8
aout2= k1*(ahp1+ahp2)*24

outs kcres*aout1,kdecres*aout2
endin

-----------------------------------------
t0 60
;f1 0 4096 10 1

;ins Start Dur AMP
i1    0    40  60000
e
```

(4) 00boom-gran-RVRSHALL

```
sr = 44100
kr = 441
ksmps = 100
nchnls = 2

instr 1
;
kgap              expseg  0.09,p3,0.01
kgsize            linseg  0.1,p3,0.09
k1                linseg  0,0.5,1,(p3-p2-1),1,0.5,0
a1                granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19,p20,p21,p22
a2                granulep4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19,p20,p21,p22

outs a1*0.2,a2*0.2
endin

-----------------------------------------
t240
f1 0 2097153 1 "00_BOMMsndRVRS.hall" 0 1 0

;p1 p2 p3 p4    p5  p6  p7 p8 p9 p10 p11 p12    p13 p14 p15 p16 p17 p18  p19 p20  p21  p22
i1   0 95 15000 128 1   0  0  1   4  0   0.005  45  10  10  30  30  0.49 1   1.1  1.2  1.3
e

;;;p5  (ivoice) the number of voices is set to 64
;;;p6  (iratio) is set to 0.5, it scan the wavetable at half of the speed of the audio output rate
;;;p7  (imode) is set to 0, the grain pointer only move forward
;;;p8  (ithd) is set to 0, skipping the thresholding process
;;;p9  (ifn) is set to 1, function table number 1 is used
;;;p10 (ipshift) is set to 4(max!!), four different pitches are going to be generated
```

```
;;;p11 (igskip) is set to 0 and p12 (igskip_os) is set to 0.005, no skipping into the wavetable and a 5 mSec random offset is used
;;;p13 (ilength) is set to 10, 10 seconds of the wavetable is to be used
;;;p14 (kgap) is set to 0.01 and p15 (igap_os) is set to 50, 10 mSec gap with 50% random ;;;offset is to be used
;;;p16 (kgsize) is set to 0.02 and p17 (igsize_os) is set to 50, 20 mSec grain with 50% random offset is used
;;;p18 (iatt) and p19 (idec) are set to 30, 30% of linear attack and decade is applied to the grain
;;;p20 (iseed) seed for the random number generator is set to 0.39
;;;p21 - p 24 are pitches set to 1 which is the original pitch, 1.42 which is a 5th up, 0.29
;;;which  is a 7th down and finally 2 which is an octave up.
```

(5) 01_BOMM_P-19stX2-gran

```
sr = 44100
kr = 441
ksmps = 100
nchnls = 2
instr 1
;
kgap expseg 0.09,p3,0.01
kgsize linseg 0.1,p3,0.09
k1 linseg 0,0.5,1,(p3-p2-1),1,0.5,0
a1 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19,p20,p21,p22
a2 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19,p20,p21,p22
outs a1*0.15,a2*0.15
endin


-----------------------------------------
f1 0 4194305 1 "01_BOMM_P-19stX2" 0 1 0

;p1 p2 p3 p4     p5 p6 p7 p8 p9 p10 p11 p12  p13 p14 p15 p16 p17 p18 p19 p20 p21 p22
i1  0 130 15000 128 1  0  0  1  4    0  .005 58  10  10  30  30  .49 1   2.1 0.2 4.3
e
```

(6) 01_BOMM

```
sr = 44100
kr=441
ksmps=100
nchnls=2

garvbboom1 init 0
garvbboom2 init 0

;;;
instr 100
;;;Boom1
iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
kindex line 1,p3,2
kndx = kamp * kindex
kbalance line 0,p3,1
```

```
afm1 foscil iamp,0.5,1,2,kndx,1
afm2 foscil iamp,0.7,1,3,kndx,1
afm3 foscil iamp,0.4,1,4,kndx,1
aboom = kamp * (afm1+afm2+afm3)

;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]


aout1 = aboom * kbalance*0.08
aout2 = aboom * (1 - kbalance)*0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

;;;
instr 101
;;;Bomm2

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
kindex line 1,p3,2
kndx = kamp * kindex
kbalance line 1,p3,0
afm1 foscil iamp,0.5,1,2,kndx,1
afm2 foscil iamp,0.7,1,3,kndx,1
afm3 foscil iamp,0.4,1,4,kndx,1
aboom = kamp * (afm1+afm2+afm3)

-----------------------------------------
t0 60
f1 0 4096 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

;ins Start Dur amp

i100 0.00 0.35 53
i101 9.00 0.40 45
i100 13.00 0.35 52
i101 17.00 0.45 48
i100 22.00 0.55 47
```

```
aout1 = aboom * kbalance * 0.08
aout2 = aboom * (1 - kbalance) * 0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

instr 10
;;REVERBERATOR only for instr. 100 and 101 (Boom instruments)

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)


kamphall linseg 0,irise,iamp,idec,0,ioff,0
krvbtime1 line 3,p3,8
krvbtime2 line 3,p3,8
;krvbtime1 line 3,p3,5
;krvbtime2 line 3,p3,5

areverb1 reverb garvbboom1,krvbtime1
areverb2 reverb garvbboom2,krvbtime2
aboomsout1 = areverb1*kamphall
aboomsout2 = areverb2*kamphall
outs1 areverb1
outs2 areverb2

garvbboom1=0
garvbboom2=0

endin
```

```
i101 25.00 0.55 43
i10 0.00 29.00 30
e
```

(7) 001-granulate

```
sr = 44100
kr = 441
ksmps = 100
nchnls = 2
instr 1
;
kgap expseg 0.002,p3,0.125
k1 linseg 0,0.5,1,(p3-p2-1),1,0.5,0
a1 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,p15,p16,p17,p18,p19,p20,p21,p22,p23
a2 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,p15,p16,p17,p18,p19+0.17,p20,p21,p22,p23
outs a1,a2
endin

-----------------------------------------
f1 0 524289 1 "000_BOMM.snd" 0 1 0
;i1 0 10 2000 64 0.5 0 0 1 4 0 0.005 10 0.01 50 0.02 50 30 30 0.39 1 1.42 0.29 2

;p1 p2 p3 p4    p5  p6 p7 p8 p9 p10 p11   p12 p13 p14  p15 p16 p17 p18  p19 p20  p21 p22    p23
i1  0  16 3000  128 1  -1 0  1  4   0  0.005 7.5 50  0.04 0   40  40  0.39 1   2.42  0.019  4
e
```

(8) 02_BOMM

```
sr = 44100
kr=441
ksmps=100
nchnls=2

garvbboom1 init 0
garvbboom2 init 0

;;;
instr 100
;;;Boom1

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4

kamp linseg 0,irise,iamp,idec,0,ioff,0
kindex expon 1,p3,7
kndx = kamp * kindex
kbalance expon 0.01,p3,1
afm1 foscili iamp,0.5,1,1,kndx,1
afm2 foscili iamp,0.7,1,0.916666667,kndx,1
afm3 foscili iamp,0.4,1,1.1666666667,kndx,1
aboom = kamp * (afm1+afm2+afm3)
;;;kmod are subdivisions of 1 into 12 (1 Hertz divided into 12
parts, to get unison, one tone over unison and a semitone under
the unison)

;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]


aout1 = aboom * kbalance*0.08
aout2 = aboom * (1 - kbalance)*0.08
```

```
outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

;;;
instr 101
;;;Bomm2

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
kindex expon 1,p3,7
kndx = kamp * kindex
kbalance expon 1,p3,0.01
afm1 foscili iamp,0.5,1,1,kndx,1
afm2 foscili iamp,0.7,1,0.916666667,kndx,1
afm3 foscili iamp,0.4,1,1.1666666667,kndx,1
aboom = kamp * (afm1+afm2+afm3)
;;;kmod are subdivisions of 1 into 12 (1 Hertz divided into 12
parts, to get unison, one tone over unison and a semitone under
the unison)

;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]

aout1 = aboom * kbalance * 0.08


-----------------------------------------
t0 60
f1 0 4096 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

;ins Start Dur amp

i100 0.00 0.35 53
i101 12.00 0.40 45
i101 19.00 0.35 52
i100 24.00 0.45 48
i100 28.00 0.55 52
i101 31.00 0.60 43
i101 33.70 0.75 42
```

```
aout2 = aboom * (1 - kbalance) * 0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

instr 10
;;REVERBERATOR only for instr. 100 and 101 (Boom instruments)

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)


kamphall linseg 0,irise,iamp,idec,0,ioff,0
krvbtime1 line 3,p3,8
krvbtime2 line 3,p3,8
;krvbtime1 line 3,p3,5
;krvbtime2 line 3,p3,5

areverb1 reverb garvbboom1,krvbtime1
areverb2 reverb garvbboom2,krvbtime2
aboomsout1 = areverb1*kamphall
aboomsout2 = areverb2*kamphall
outs1 areverb1
outs2 areverb2

garvbboom1=0
garvbboom2=0

endin
```

```
i101 36.00 0.95 41
i101 38.00 0.75 43
i101 40.00 0.60 43
i101 41.70 0.55 43
i10 0.00 49.00 40
e
;;;(start times are set according to the numbers of semitones that there are between the different harmonics of one fundamental (12
;;; being the octave, 19 being octave + fifth (12+7)etc))
```

(9) 002boom-granulate

```
sr = 44100
kr = 441
ksmps = 100
nchnls = 2
instr 1
;
kgap expseg 0.05,p3,3
kgsize expseg 0.01,p3,0.9
k1 linseg 0,0.5,1,(p3-p2-1),1,0.5,0
a1 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19,p20,p21,p22,
a2 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19+0.17,p20,p21,p22,
outs a1*0.8,a2*0.8
endin

-----------------------------------------
f1 0 524289 1 "000_BOMM.snd" 0 1 0

;p1 p2 p3 p4   p5  p6 p7 p8 p9 p10 p11 p12   p13 p14 p15 p16 p17 p18  p19 p20  p21   p22
i1  0  40 3000 128 1 -1  0  1   4   0  0.005 8   50  50  40  40  0.39 1   2.42 0.019 4

;i1 0 10 2000 64 0.5 0 0 1 4 0 0.005 10 0.01 50 0.02 50 30 30 0.39 1 1.42
;;0.29 2
E
```

(10) 03_BOMM

```
sr = 44100
kr=441
ksmps=100
nchnls=2

garvbboom1 init 0
garvbboom2 init 0
gindx init 1

;;;
instr 100

;;;Boom1

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.4


kamp linseg 0,irise,iamp,idec,0,ioff,0
iindex = 1.5
```

```
kndx = kamp * gindx
kbalance expseg 0.01,p3*0.5,1,p3,0.01
afm1 foscili iamp,0.5,1,1,kndx,1
afm2 foscili iamp,0.7,1,0.916666667,kndx,1
afm3 foscili iamp,0.4,1,1.1666666667,kndx,1
aboom = kamp * (afm1+afm2+afm3)
;;;kmod are subdivisions of 1 into 12 (1 Hertz divided into 12
parts, to get unison, one tone over unison and a semitone under
the unison)

;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]


aout1 = aboom * kbalance*0.08
aout2 = aboom * (1 - kbalance)*0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain
gindx=gindx+iindex
endin

;;;
instr 101
;;;Bomm2

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)
irvgain = 0.6


kamp linseg 0,irise,iamp,idec,0,ioff,0
;kindex expon 1,p3,7
kndx = kamp * gindx
kbalance expseg 0.01,p3*0.5,1,p3,0.01
afm1 foscili iamp,0.5,1,1,kndx,1
afm2 foscili iamp,0.7,1,0.916666667,kndx,1
afm3 foscili iamp,0.4,1,1.1666666667,kndx,1
aboom = kamp * (afm1+afm2+afm3)

----------------------------------------
t0 60
f1 0 4096 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

;ins Start Dur amp
```

```
;;;kmod are subdivisions of 1 into 12 (1 Hertz divided into 12
parts, to get unison, one tone over unison and a semitone under
the unison)

;;; ar foscil xamp, kcps, kcar, kmod, kndx, ifn[, iphs]
;;; ar foscili xamp, kcps, kcar, kmod, kndx, ifn[, iphs]

aout1 = aboom * (1 - kbalance) * 0.08
aout2 = aboom * kbalance * 0.08


outs1 aout1
outs2 aout2

garvbboom1=garvbboom1 + aout1 * irvgain
garvbboom2=garvbboom2 + aout2 * irvgain

endin

instr 10
;;REVERBERATOR only for instr. 100 and 101 (Boom instruments)

iamp = ampdb(p4)
irise = 0.2*p3 ;%of total dur, 1=entire dur of note
idec = 0.7*p3 ;% of total duration
ioff=p3-(irise+idec)


kamphall linseg 0,irise,iamp,idec,0,ioff,0
krvbtime1 line 3,p3,8
krvbtime2 line 3,p3,8
;krvbtime1 line 3,p3,5
;krvbtime2 line 3,p3,5

areverb1 reverb garvbboom1,krvbtime1
areverb2 reverb garvbboom2,krvbtime2
aboomsout1 = areverb1*kamphall
aboomsout2 = areverb2*kamphall
outs1 areverb1
outs2 areverb2

garvbboom1=0
garvbboom2=0

endin
```

```
i100 0.00 0.35 53
i101 12.00 0.40 45
i101 19.00 0.35 52
i100 24.00 0.45 48
i100 28.00 0.55 52
i101 31.00 0.60 43
i101 33.70 0.75 42
i101 36.00 0.95 41
i101 38.00 0.75 43
i100 40.00 0.60 43
i100 41.70 0.55 40
i10 0.00 49.00 40
e

;;;(start times are set according to the numbers of semitones that there are between the different harmonics of one fundamental (12 ;;; being
the octave, 19 being octave + fifth (12+7)etc))
```

(11) 003sin-granulate

```
sr = 44100
kr = 441
ksmps = 100
nchnls = 2
instr 1
;
kgap expseg 0.05,p3,3
kgsize linseg 0.01,p3,0.9
k1 linseg 0,0.5,1,(p3-p2-2),1,0.5,0
a1 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18,p19,p20,p21,p22
a2 granule p4*k1,p5,p6,p7,p8,p9,p10,p11,p12,p13,kgap,p14,kgsize,p15,p16,p17,p18+.17,p19,p20,p21,p22
outs a1*0.4,a2*0.4
endin

-----------------------------------------
f1 0 524289 1 "0000-sinus.snd" 0 1 0

;i1 0 10 2000 64 0.5 0 0 1 4 0 0.005 10 0.01 50 0.02 50 30 30 0.39 1 1.42 0.29 2

;p1 p2 p3 p4 p5 p6 p7 p8 p9 p10 p11 p12 p13 p14 p15 p16 p17 p18 p19 p20 p21 p22
i1 0 40 3000 128 1 -1 0 1 4 0 0.005 8 50 50 40 40 0.39 1 2.42 0.019 4
e
```