# Overtone Cheat Sheet 0.9.0

## Sounds

### Instruments (overtone.inst.*)

| | |
|---|---|
| Drums | `kick kick2 kick3 kick4 dub-kick` |
| | `dry-kick small-hat closed-hat` |
| | `close-hat2 open-hat hat3 soft-hat` |
| | `noise-hat round-kick snare snare2` |
| | `noise-snare tone-snare tom clap bing` |
| | `dance-kick quick-kick haziti-clap` |
| Piano | `piano` |
| Sampled Piano | `sampled-piano` |
| Sampler | `granular` |
| Bass | `bass grunge-bass vintage-bass daf-bass` |
| Synth | `ticker ping tb303 mooger rise-fall-pad` |
| | `pad overpad buzz ks1 ks-stringer` |
| | `fm-demo harmonic-swimming whoahaha` |
| | `bubbles supersaw cs80lead simple-flute` |
| IO | `mic` |

### Synths (overtone.synth.*)

| | |
|---|---|
| Sampled Piano | `sampled-piano` |
| Stringed | `guitar` |
| Ixi | `impulser kick kick2 kick3` |
| Retro | `tb-303` |
| STS | `prophet` |

## Timing

### Scheduling

| | |
|---|---|
| Function Application | `now after-delay periodic` |
| | `interspaced apply-by apply-at` |
| OSC | `at` |
| Stopping | `stop-player kill-player` |
| Feedback | `show-schedule` |

### Metronome

| | |
|---|---|
| Create | `metronome` |
| Manipulate | `metro-start metro-tick metro-beat` |
| | `metro-bpm metro-tock metro-bar metro-bpb` |
| bps | `beat-ms` |

## Studio

### Mixer

| | |
|---|---|
| Control | `volume input-gain` |

### MIDI

| | |
|---|---|
| Connected Controllers | `midi-connected-devices` |
| | `midi-connected-receivers` |
| | `midi-find-connected-devices` |
| | `midi-find-connected-device` |
| | `midi-find-connected-receivers` |
| | `midi-find-connected-receiver` |
| Info | `midi-device-num` |
| | `midi-full-device-key` |
| Player | `midi-poly-player midi-player-stop` |
| | `midi-inst-controller` |
| Discovery | `midi-capture-next-controller-control-k` |
| | `midi-capture-next-controller-key` |
| Keys | `midi-device-keys` |
| | `midi-mk-control-key-keyword` |
| State | `midi-agent-for-control` |

### Scope (overtone.gui.scope)

| | |
|---|---|
| Create & Reset | `scope pscope spectrogram` |

### Recording

| | |
|---|---|
| Stop & Start | `recording-start recording-stop` |
| Query | `recording?` |

### Inst Effects

| | |
|---|---|
| Instrument | `inst-volume inst-out-bus inst-fx! clear-fx` |
| FX | `fx-noise-gate fx-compressor fx-limiter` |
| | `fx-sustainer fx-freeverb fx-reverb` |
| | `fx-echo fx-chorus fx-distortion` |
| | `fx-distortion2 fx-distortion-tubescreamer` |
| | `fx-bitcrusher fx-rlpf fx-rhpf fx-feedback` |
| | `fx-feedback-distortion` |

## REPL helpers

| | |
|---|---|
| Documentation | `odoc ugen-doc find-ugen find-ugen-doc` |
| Examples | `examples example get-example` |
| Shell | `ls grep` |
| Synths | `unify-synthdef` |
| Pretty Printing | `opp pp-synth pp-unified-synth` |
| | `pp-sc-synth pp-unified-sc-synth` |

## Synth Design

| | |
|---|---|
| Design | `definst defsynth` |
| Examples | `defexamples` |
| CGens | `defcgen` |
| Auditioning | `demo run` |
| Checking | `with-no-ugen-checks with-ugen-debugging` |
| Arguments | `synth-args synth-arg-index` |

## Synth Control

| | |
|---|---|
| Live Control | `ctl kill` |
| Node Liveness | `inactive-node-modification-error` |
| | `inactive-buffer-modification-error` |
| | `block-node-until-ready?` |
| | `without-node-blocking` |
| | `with-inactive-node-modification-error` |
| | `with-inactive-buffer-modification-error` |
| | `with-inactive-modification-error` |

## Server

| | |
|---|---|
| Startup | `boot-server boot-internal-server` |
| | `boot-external-server` |
| | `connect-external-server` |
| Shutdown | `kill-server` |
| Control | `stop clear stop-all clear-all` |
| OSC Communication | `snd recv clear-msg-queue at` |
| | `snd-immediately` |
| Diagnostic | `server-status server-info` |
| | `server-opts server-connected?` |
| | `server-disconnected?` |
| | `server-connecting?` |
| | `internal-server? external-server?` |
| | `connection-info server-sample-rate` |
| | `server-num-output-buses` |
| | `server-num-input-buses` |
| | `server-num-audio-buses` |
| | `server-num-buffers` |
| | `ensure-connected!` |
| Debug | `sc-osc-log-on sc-osc-log-off` |
| | `sc-osc-log sc-debug-on` |
| | `sc-debug-off external-server-log` |
| | `sc-osc-debug-on sc-osc-debug-off` |

## Event Handling

| | |
|---|---|
| Add | `on-event on-sync-event on-latest-event` |
| | `oneshot-event oneshot-sync-event` |
| Fire | `event sync-event` |
| Remove | `remove-event-handler` |
| Debug | `event-debug-on event-debug-off` |
| | `event-monitor-on event-monitor-off` |
| | `event-monitor-timer event-monitor` |
| | `event-monitor-keys` |
| Ugen Triggers | `trig-id on-trigger on-latest-trigger` |
| | `on-sync-trigger` |

## External Assets

### Generic URLs

| | |
|---|---|
| Auto cache & Return Path | `asset-path asset-seq` |
| | `asset-bundle-path` |
| | `asset-bundle-dir` |

### Freesound.org

| | |
|---|---|
| Playable Function | `freesound` |
| Auto cache & Query | `freesound-info freesound-path` |
| | `freesound-pack-info` |
| | `freesound-pack-dir` |
| | `freesound-search freesound-searchm` |
| | `freesound-search-paths` |

## Algorithmic Composition

### Chance

| | |
|---|---|
| Choice | choose choose-n weighted-choose |
| Dice | weighted-coin ranged-rand |

### Scaling

| | |
|---|---|
| Range | scale-range |
| Rounding | closest-to round-to |

### Trig

| | |
|---|---|
| Scaled | cosr sinr tanr |

### Functions

| | |
|---|---|
| Cycling | cycle-fn |

### List

| | |
|---|---|
| Rotation | rotate |
| Creation | fill |

## Music

### Pitch

| | |
|---|---|
| Ratios | unison octave fifth sixth third fourth min-third min-sixth |
| Note Shifting | shift flat sharp invert inc-first dec-last |
| Notes | note octave-note nth-octave nth-equal-tempered-freq canonical-pitch-class-name note-info mk-midi-string match-note |
| Scales | scale resolve-scale scale-field nth-interval resolve-degree degree->int degree->interval degrees->pitches resolve-degree resolve-degrees interval-freq |
| Chords | chord resolve-chord rand-chord invert-chord chord-degree |
| Discovery | find-scale-name find-note-name find-pitch-class-name find-chord |
| Frequencies | cents midi->hz hz->midi |
| Amplitude | db->amp |

## Sound Data

### Buffers

| | |
|---|---|
| Create & Free | buffer buffer-free buffer-alloc-read |
| Generate Buffer Data | data->wavetable create-buffer-data |
| Read & Write To Server | buffer-read buffer-write! buffer-write-relay! buffer-fill! buffer-set! buffer-get buffer-save buffer-data buffer-read |
| Write To Filesystem | write-wav |
| Streaming In & Out | buffer-stream buffer-stream? buffer-stream-close buffer-cue buffer-cue? buffer-cue-pos buffer-stream-close |
| Query | buffer? buffer-info? file-buffer? buffer-out-stream? buffer-in-stream? |
| Info | buffer-info num-frames buffer-id |

### Samples

| | |
|---|---|
| Create | load-sample load-samples sample defsample |
| Playback | mono-player stereo-player |

### Busses

| | |
|---|---|
| Create & Free | control-bus audio-bus free-bus |
| Modify & Read | control-bus-set! control-bus-set-range! control-bus-get control-bus-get-range |
| Query | bus? control-bus? audio-bus? |
| Info | bus-id |
| Monitor | bus-monitor control-bus-monitor audio-bus-monitor |

## Nodes & Groups

| | |
|---|---|
| Create & Free | node group node-free group-free group-clear group-deep-clear |
| Manipulate | node-start node-pause node-place node-control node-control-range node-map-controls node-map-n-controls group-prepend-node group-append-node |
| Info | node? node-live? node-loading? node-active? node-tree pp-node-tree node-get-control node-get-controls |
| Foundation Groups | foundation-overtone-group foundation-output-group foundation-monitor-group foundation-input-group foundation-user-group foundation-default-group foundation-safe-group foundation-safe-pre-default-group foundation-safe-post-default-group |
| Manipulation Handlers | on-node-destroyed on-node-created on-node-paused on-node-started |
| Event Keys | node-destroyed-event-key node-created-event-key node-paused-event-key node-started-event-key |

## Visualisation

### Graphviz

| | |
|---|---|
| Dot Notation | graphviz |
| Show PDF | show-graphviz-synth |

## Persistence

### Local Store

| | |
|---|---|
| Access | store-get store-set! store |

## CGens

| | |
|---|---|
| Audio In | sound-in |
| Buffer Playback | scaled-play-buf scaled-v-disk |
| Control | hold |
| Oscillators | pm-osc square |
| Mix | mix splay sum |
| Pitch | add-cents |
| Tapping | tap |
| Range | range-lin |

## UGen Helper Constants

| | |
|---|---|
| Done Actions | NO-ACTION PAUSE FREE FREE-AND-BEFORE FREE-AND-AFTER FREE-AND-GROUP-BEFORE FREE-AND-GROUP-AFTER FREE-UPTO-THIS FREE-FROM-THIS-ON FREE-PAUSE-BEFORE FREE-PAUSE-AFTER FREE-AND-GROUP-BEFORE-DEEP FREE-AND-GROUP-AFTER-DEEP FREE-CHILDREN FREE-GROUP |
| FFT Windows | SINE HANN RECT |
| Lines | LINEAR LIN EXPONENTIAL EXP |
| Onset Analysis | POWER MAGSUM COMPLEX RCOMPLEX PHASE WPHASE MKL |
| Infinity | INFINITE INF |

## UGen Envelope Helper Functions

env-perc env-triangle env-sine env-lin env-cutoff
env-dadsr env-adsr env-asr

## Unary UGens

```
neg not-pos? abs ceil floor frac sign squared cubed
sqrt exp reciprocal midicps cpsmidi midiratio
ratiomidi dbamp ampdb octcps cpsoct log log2
log10 sin cos tan asin acos atan sinh cosh tanh
distort softclip rect-window han-window wel-window
tri-window
```

## Binary UGens

```
+ - * / mod = not= < > <= >= min max and or xor
round round-up round-down atan2 hypot hypot-aprox
pow ring1 ring2 ring3 ring4 difsqr sumsqr sqrsum
sqrdif absdif thresh amclip scale-neg clip2 excess
fold2 wrap2
```

## B Equalization Suit UGens

```
b-low-pass b-hi-pass b-all-pass b-band-pass
b-band-stop b-peak-eq b-low-shelf b-hi-shelf
```

## Buffer IO UGens

```
play-buf t-grains buf-rd buf-wr record-buf
scope-out local-buf max-local-bufs set-buf
clear-buf
```

## Chaos UGens

```
quad-n quad-l quad-c cusp-n cusp-l gbman-n
gbman-l henon-n henon-l henon-c latoocarfian-n
latoocarfian-l latoocarfian-c lin-cong-n lin-cong-l
lin-cong-c standard-n standard-l fb-sine-n
fb-sine-l fb-sine-c lorenz-l
```

## Compander

```
amplitude compander normalizer limiter
```

## Delay UGens

```
delay1 delay-n delay-l delay-c comb-n comb-l
comb-c allpass-n allpass-l allpass-c buf-delay-n
buf-delay-l buf-delay-c buf-comb-n buf-comb-l
buf-comb-c buf-allpass-n buf-allpass-l
buf-allpass-c
```

## Demand UGens

```
demand duty t-duty demand-env-gen dseries dgeom
dbufrd dbufwr dseq dser dshuf drand dxrand dswitch1
dswitch dwhite dbrown dibrown dstutter donce dpoll
```

## Envelope Ugens

```
done free-self pause-self free-self-when-done
pause-self-when-done pause free env-gen linen
i-env-gen
```

## Fixed Frequency Oscillator UGens

```
f-sin-osc klang klank blip saw pulse p-sin-grain
```

## FFT UGens

```
fft ifft pv-mag-above pv-mag-below pv-mag-clip
pv-local-max pv-mag-smear pv-bin-shift pv-mag-shift
pv-mag-squared pv-mag-noise pv-phase-shift90
pv-phase-shift270 pv-conj pv-phase-shift
pv-brick-wall pv-bin-wipe pv-mag-mul pv-copy-phase
pv-copy pv-max pv-min pv-mul pv-div pv-add
pv-mag-div pv-rand-comb pv-rect-comb pv-rect-comb2
pv-rand-wipe pv-diffuser pv-mag-freeze
pv-bin-scramble fft-trigger
```

## Extra FFT UGens

```
pv-conformal-map convolution convolution2
convolution2-l stereo-convolution2-l convolution3
pv-jenson-andersen pv-hainsworth-foote running-sum
```

## Filter UGens

```
resonz one-pole one-zero two-pole two-zero apf
integrator decay decay2 lag lag2 lag3 ramp lag-ud
lag2-ud lag3-ud leak-dc rlpf rhpf hpf bpf brf
mid-eq lpz1 lpz2 hpz1 hpz2 slope bpz2 median slew
sos ringz formlet detect-silence
```

## Grain UGens

```
grain-sin grain-in warp1
```

## Information UGens

```
sample-rate sample-dur radians-per-sample
control-rate control-dur subsample-offset
num-output-busses num-input-busses num-audio-busses
num-control-busses num-buffers num-running-synths
buf-sample-rate buf-rate-scale buf-frames
buf-samples buf-dur buf-channels check-bad-values
poll
```

## Input UGens

```
mouse-x mouse-y mouse-button key-state
```

## IO UGens

```
disk-out disk-in v-disk-in in local-in lag-in
in-feedback in-trig shared-in out replace-out
offset-out local-out x-out shared-out
```

## Line Ugens

```
line x-line lin-exp lin-lin amp-comp amp-comp-a k2a
a2k t2k t2a dc silent
```

## Machine Listening UGens

```
beat-track loudness onsets key-track mfcc
beat-track2 spec-flatness spec-pcile spec-centroid
```

## Miscellaneous UGens

```
pitch-shift pluck part-conv hilbert freq-shift
g-verb free-verb free-verb2 moog-ff spring ball
t-ball check-bad-values gendy1 gendy2 gendy3
```

## Noise UGens

```
white-noise brown-noise pink-noise clip-noise
gray-noise crackle logistic lf-noise0 lf-noise1
lf-noise2 lf-clip-noise lfd-noise0 lfd-noise1
lfd-noise3 ldf-clip-noise hasher mantissa-mask dust
dust2
```

## Oscillator UGens

```
osc sin-osc sin-osc-fb osc-n v-osc v-osc3 c-osc
formant lf-saw lf-par lf-cub lf-tri lf-gauss
lf-pulse var-saw impulse sync-saw wrap-index
index-in-between detect-index shaper degree-to-key
select vibrato index
```

## Pan UGens

```
pan2 lin-pan2 pan4 balance2 rotate2 pan-b pan-b2
bi-pan-b2 decode-b2 pan-az x-fade2 lin-x-fade2
```

## Random UGens

```
rand-seed rand-id i-rand t-rand ti-rand n-rand
exp-rand t-exp-rand coin-gate lin-rand
```

## STK UGens

```
stk-pluck stk-flute stk-bowed stk-mandolin
stk-saxofony stk-shakers stk-banded-wg
stk-voic-form stk-modal-bar stk-clarinet
stk-blow-hole stk-moog stk-bee-three
```

## Trig UGens

tw-index trig1 trig t-delay send-trig send-reply
latch gate pulse-count set-reset-ff peak
running-min running-max stepper pulse-divider
toggle-ff zero-crossing timer sweep phasor
peak-follower pitch in-range fold clip wrap
schmidt in-rect trapezoid most-changed least-change
last-value

## AY Extra UGens

ay

## BBCut2 Extra UGens

analyse-events2

## Bat Extra UGens

coyote trig-avg w-amp markov-synth frame-compare
needle-rect skip-needle

## Berlach Extra UGens

lpf1 lpfvs6 lpf18 bl-buf-rd clipper4 clipper8
clipper32 soft-clipper4 soft-clipper8
soft-clip-amp4 soft-clip-amp8 os-wrap4 os-wrap8
os-fold4 os-fold8 os-trunc4 os-trunc8 drive-noise
peak-eq2 peak-eq4

## Bhob Extra UGens

henon2-dn henon2-dl henon2-dc henon-trig
gbman2-dn gbman2-dl gbman2-dc gbman-trig
standard2-dn standard2-dl standard2-dc
standard-trig latoocarfian2-dn latoocarfian2-dl
latoocarfian2-dc latoocarfian-trig lorenz2-dn
lorenz2-dl lorenz2-dc lorenz-trig fhn2-dn fhn2-dl
fhn2-dc fhn-trig pv-common-mag pv-common-mul
pv-mag-minus pv-mag-gate pv-compander pv-mag-scale
pv-morph pv-x-fade pv-soft-wipe pv-cutoff
nested-allpass-n nested-allpass-l nested-allpass-c
double-nested-allpass-n double-nested-allpass-l
double-nested-allpass-c moog-ladder rlpfd
streson nl-filt-n nl-filt-l nl-filt-c gauss-trig
lf-brown-noise0 lf-brown-noise1 lf-brown-noise2
t-brown-rand dbrown2 d-gauss t-gauss-rand
t-beta-rand gendy4 gendy5 t-grains2 t-grains3

## Blackrain Extra UGens

amplitude-mod b-moog iir-filter svf

## Distortion Extra UGens

crossover-distortion smooth-decimator sine-shaper
decimator disintegrator

## Glitch Extra UGens

glitch-rhpf glitch-hpf

## Mda Extra UGens

mda-piano

## Membrane Extra UGens

membrane-circle membrane-hexagon

## RFW Extra UGens

switch-delay average-output

## SLU Extra UGens

breakcore brusselator double-well double-well2
double-well3 gravity-grid gravity-grid2

## Stk Extra UGens

stk-pluck stk-flute stk-bowed stk-mandolin
stk-saxofony stk-shakers stk-banded-wg
stk-voic-form stk-modal-bar stk-clarinet
stk-blow-hole stk-moog stk-bee-three

## VOSIM Extra UGens

vosim

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