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;=====
;           -Digital Synthesis Final Project-
;                   Joseph Weidinger
;=====

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<CsoundSynthesizer>

<CsInstruments>

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sr      =    44100
kr      =    4410
ksmps   =     10
nchnls  =     2

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;=====
;   some reverb
;=====
garvbsig  init    0

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;=====
;   INSTRUMENT 1 - WIND
;=====

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instr 1
koscil  oscil    .4, .1, 1 ;controls kbeta (noise opcode's
integrated filter) ;this is my attempt to use an oscil as an
envelope, it keeps the wind from becoming static. It's regular
in pattern, but so slow it is hard to identify.
kdynamic linseg 400, 100, 400, 5, .001, 14, .001, 6, 400, 45,
400, 5, .001; this allows me to customize the dynamics of the
wind throughout the piece, with simple linear hairpins
anoise noise kdynamic, koscil
kpitch oscil    100, .07, 1 ;controls the pitch of the filter,
I wanted the cps to not be easily divisible or else there would
be some pattern, using .1 and .07 gives many variations between
the pitch and dynamics of the filters
ares reson anoise, 600+kpitch, 100
aoutput balance ares, anoise
outs aoutput, aoutput
garvbsig      =    garvbsig+(aoutput*.15)
endin

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;=====
; INSTRUMENT 2 - FILTER SWEEPS
;=====

instr 2
kdynamics linseg p4, .2, p4*20, 1, p4*5, 6, p4/2
kpitch linseg p5, p6, p7
kband expseg p8, p9, p10 ; defines clarity of pitch
anoise noise kdynamics, 0
ares reson anoise, kpitch, kband
aoutput balance ares, anoise
outs aoutput, aoutput
garvbsig = garvbsig+(aoutput*.15) ;smoothes out sound
endin

;=====
; INSTRUMENT 3 - DESERTED (2 branch)
;=====

instr 3
ipitch = cpspch(p4)

;=====
; 1 - bell - attack
;=====

kbellstrike expon p5, 4, .0001
abell oscili kbellstrike, ipitch*2, 1 ;simple sine wave + 8va

;=====
; 2 - wind - decay
;=====
kenv line -.9, p3, .9 ;line envelope that affects
filter (kbeta)
anoise noise p5, kenv
kfadetowind linseg 1, 3, 1, (p3-3), 100 ;makes pitch less
discriminate after 3s
ares reson anoise, ipitch, kfadetowind
aoutput balance ares, anoise
areduction = aoutput*.06 ;make sure there are no samples out
of range
a1 = areduction+abell
outs a1, a1
garvbsig = garvbsig+(a1*.15)
endin

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;=====
;  INSTRUMENT 5 - PLUCK
;=====

instr 5
ipitch = cpspch(p5)
a1 pluck p4*20000, ipitch, ipitch, 1, 5, .5, p6 ;weighting
average method of decay, parameters affecting length of note
outs a1, a1
garvbsig = (garvbsig+(a1*.15)*p7)
endin

;=====
;  INSTRUMENT 6 - CELESTIAL COLLISION
;=====

instr 6
kenvttest      expon      .99,      5,      .2
khairpin       linseg     p4, p6, p7, p8, p9, p10, p11, p12, p13,
p14, p15
imode          = 4      ;1-16? different types of waves
ikpw           = .5      ;for modes 2/4 between .01 - .99, pulse width
ikphs          = .5      ;oscillator phase .01-.00
inyx           = .5      ;default .5, bandwidth of waveform, between 0
and .5
ipitch         = cpspch(p5)
asound vco2    khairpin, ipitch, imode, kenvttest, .5, .5
outs asound*.6, asound*.6
endin

;=====
;  INSTRUMENT 7 - LEAD VOX
;=====

instr 7
kenvttest      linseg     .01, .4, .6, .4, .8, .4, .9, .4, .95, .4,
.97 ;designed to imitate some logarithmic function because kpw
is sensitive .9-.99
ipitch         = cpspch(p5)
ipitch2        = cpspch(p6)
kgliss         expseg     ipitch2, p7, ipitch, (p2-3), ipitch
khairpin       linseg     .01, p8, p4, p9, p4, p10, .01
asound vco2    khairpin, kgliss, 4, kenvttest, .5
outs          asound, asound
garvbsig       = garvbsig+(asound*.15)

```

endin

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;  
; INSTRUMENT 8 - I THINK... THE WORLD IS GONNA END...  
;
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instr 8

kmodulatingfreq expseg .001, 10, .001, 20, 1, **p3-20**, 1 ; I use this to bring the sound in, a very low modulating factor means very small, mellow sound

kcarrierfreq expseg .2, 33, .2, 15, 1 ; this next event has a siren effect that slowly changes the factor involved with producing the carrier frequency (I chose to let it keep running afterwards)

krandbandwidth expseg 5, 48, 5, 20, 20000, 5, 1 ; this next event gradually increases the randomness of pitches. For the first 48 seconds, there is a very narrow bandwidth in pitch selection (5+/-), by the end, there is a huge range. The last 5 seconds narrows the bandwidth so that a pitch can be heard and is not just white noise. Of course this is not a single pitch because it is changing by this time 1000 times per second!

krandfreqchange linseg 5, 48, 5, 20, 1000, 5, 1000 ; this is similar to the last one but controls the rate at which these random pitches happen

kpitch expseg 749, 68, 749, 5, 20000 ; this even along with the hairpin under takes the pitch to the limits of our hearing... literally

kdynamics expseg .001, 10, 3000, 58, 3000, 5, 6000 ; the last even simply makes a cresc. hairpin towards the end

krandom randi krandbandwidth, krandfreqchange

asig foscili kdynamics, krandom+kpitch, kcarrierfreq,

kmodulatingfreq, 6, 1

outs asig, asig

garvbsig = garvbsig+(asig*.15)

endin

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;  
; GLOBAL REVERB - from Blue Cube  
;
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instr 99

a1 reverb2 garvbsig, p4, p5

outs a1,a1

garvbsig = 0

endin

</CsInstruments>

<CsScore>

```
f1 0 32768 10 1
f2 0 1024 10 0 1 0.3 0 0.15
f3 0 512 7 1 17 1 0 0 495
f10 0 65 7 0 64 1
f11 0 65 5 0.01 64 1
f12 0 65 7 0 32 1 32 0
f13 0 65 5 0.01 32 1 32 0.01

i1 0 180

i2 0 10 700 10000 .2 1000 500 7 1000
i2 2 10 300 20 1 1000 500 7 1000
i2 2.6 10 300 20 1 2000 500 7 1000
i2 5 10 225 500 .2 100 500 7 1000
i2 8 10 325 .001 7 10000 500 7 1

i3 27 10 8.09 3000
i3 27 10 9.01 3000
i3 33 10 9.00 3000
i3 33 10 9.04 3000

i3 157 10 8.09 3000
i3 157 10 9.01 3000
i3 163 10 9.00 1000
i3 163 10 9.04 1000

i5 116 0.17 0.1 7.04 0.1 .3
i5 + 0.34 < 7.11 < <
i5 + 0.17 < 7.04 < <
i5 + 0.34 < 7.11 < <
i5 + 0.17 < 7.04 < <
i5 + 0.34 < 7.11 < <
i5 + 0.17 < 7.04 < <
i5 + 0.34 < 7.11 < <
i5 + 0.17 0.3 7.04 < 1
i5 + 0.34 < 7.11 < .
i5 + 0.17 < 7.04 < .
i5 + 0.34 < 7.11 < .
i5 + 0.17 < 7.04 < .
i5 + 0.34 < 7.11 < .
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```

i5 + 0.17 < 7.04 0.4 .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 < 7.11 . .
i5 + 0.17 < 7.04 . .
i5 + 0.34 0 7.11 . .

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```

i6 114 40 10000 4.04 4 .001 4 .001 3
4000 20 4000 9 .001
i6 114 40 10000 5.04 4 .001 4 .001 3
4000 20 4000 9 .001
i6 114 30 2000 5.00 3 8000 4 8000 3
.001

```

;9 is sustain value and p10 is decay, p9 = p3-p8-p10 (couldn't get to work in instruments)

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;p1 p2 p3 p4 p5 p6 p7 p8 p9 p10
i7 128 6 4000 8.09 8.05 1 2 3 1
i7 133 5 4000 8.08 8.09 1 2 2 1
i7 137 10 4000 10.06 8.08 1 2 7 .01
i7 139 8 3000 10.08 10.06 1 2 5 .01

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i8 40 73

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i99 0 300 6 .2

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</CsScore>

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</CsoundSynthesizer>

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