neither **ANVIL** nor **PULLEY**

A LAPTOP-PERCUSSION QUARTET (WITH TURNTABLE)

COMMISSIONED BY SO PERCUSSION

**Dan Trueman**
2010
**neither Anvil nor Pulley** [a.k.a. Spirit of the Machine]
for laptop-percussion quartet (with turntable)

commissioned by So Percussion
composed by Dan Trueman

1. Another Wallflower  [from Long Ago]
2. 120bpm  [or, What is your Metronome Thinking?]
3. A Cow Call  [please oh Please Come Home!]
4. Feedback  [in Which a Famous Bach Prelude becomes Ill-Tempered]
5. Hang Dog Springar  [a Slow Dance]

**Program Notes:**
*neither Anvil nor Pulley* is, in short, an epic musical exploration of the "man"/machine relationship in the digital age. Unlike the anvil or pulley, the computer hides its purpose—to strike or yank will likely only break it. Even the name "computer" is a bit of misnomer: while some of us use the computer to compute, for most of us it’s really a big storage bin. It’s where we keep stuff. Musically, this means the computer is a really big room full of records. Or, rather, a room full of records AND a fancy record player. Ultimately, then, the computer is a tool for manipulating time; events from Long Ago and Far Away can be re-created, at least in part, here and now.

Unlike an old fashioned record player, which might wobble a bit with delightful and seemingly human imperfection, the computer is a ruthless timekeeper. I’ve long been interested in how differently machines and people measure time. Oddly, we assume that the machines are always “right,” whatever that might mean. But, for many, the “unhuman” quality of time that machines lend to music is heard as flawed and musicians know only too well how brutally unfair, and unmusical, metronomes can seem. In the second movement of *neither Anvil nor Pulley*, the machines and the humans duke it out. The laptops provide a constant click at 120 beats-per-minute (at first; later the pulse slows to 60bpm, and then 30bpm, and then the pulses begin accelerating, methodically, still within a 120bpm framework; finally Stockhausen rears his head and we begin to hear “overtones” of 120bpm layered on top of one another, one by one; the lower overtones are gradually subtracted, until we are left with a wonderful 50Hz hum… to make a long story short…), but the humans can reset the metronomes at any time by striking a handy piece of wood. Not to be thwarted, the clicks keep re-emerging, like whac-a-mole, relentless. What’s remarkable about this almost dopey relationship is that a whole host of musical meters
and rhythms can emerge, some seemingly having nothing to do with 120bpm, but all derived from fairly simple numerical relationships to 120bpm; amazingly, at one point, something akin to the wildly asymmetrical Norwegian telespringar dance meter (which has three stubbornly uneven beats) emerges—I couldn’t believe it myself.

So, the computer is a storage bin, but it also gives us nice ways to mess with the things we store. And Long-Ago might actually be Short-Ago; in musical terms, this means the computer might store something we give it, change it in some way, and feed it back to us (and back into itself) some time later, perhaps a really REALLY short time later (like, small fractions of a second later). In fact, the vast majority of “digital effects” that musicians use involve feedback of this sort. This idea is explored in the fourth movement of nAnP. If the woodblocks and sticks in 120bpm represent the “1s” of the digital world, the concert bass-drum in Feedback stands for the “0s.” It becomes a speaker that is caressed (by speaker drivers taped to its heads) rather than struck, and its output is fed back to the computer with hand-held microphones (yes, Stockhausen is again an inspiration here). The computer stores that sound for a very short period of time, works some magic, and then sends it right back out again, transformed, to the speaker-drum, where the process starts again. The result is a concert bass-drum that, perhaps incongruously, attempts to utter the glorious lines of Bach’s famous C-Major Prelude from the Well-Tempered Clavier; music from Long Ago… Surrounding the concert bass-drum are an array of digital drum machines that also use feedback in unusual ways, and a real-live drummer, who attempts to survive what amounts to a brutal, accelerating, digital blender: this truly is man versus machine!

Composing for (I really should say “with”) So Percussion is an incredible pleasure. Their collaborative and adventurous spirits (not to mention their sheer musical abilities) are awesome. In the past, I’ve had the privilege of actually performing my own music with them, and to this day, I’ve never become comfortable with that traditional (or is it?) role of the composer: sitting in the audience. I’d much rather be up there with my fiddle! Well, placed around and in between 120bpm and Feedback are three fiddle tunes that sound from long ago. As a fiddler and electronic musician, I am keenly aware of how differently fiddlers and laptops deal with time, and these tunes highlight the differences, while also allowing me to cheat by almost performing with So Percussion. This cheating extends beyond the fiddle tunes themselves; embedded deep within 120bpm are sounds of my fiddle, frozen in time, and somehow extracted from the computer via, of all things, a modified $12 golf video game controller.
Drop the needle on the turntable to begin this tune.
At first, we hear only the fiddle; gradually, subtly, the percussionists join.

The "fiddle tune" movements (1,3,5) are largely un-instrumented; I leave it up to the ensemble to bring these tunes to life with their own instruments in the most tasteful, compelling manner possible. The recordings of the fiddle used in the performance should also serve as a reference for performance style, particularly with regards to rhythm (there are notes throughout about times where the notation is clearly a rough approximation; listening to, and playing with, the recording as much as possible is crucial. The notes here break the tune up into the most obvious "voices" (including the foot-stomping, on the bottom staff) that can be used for each percussion instrument. However, it is not essential that these lines be presented in their entirety by single instruments; the ensemble as a whole can find various ways for the notes of the tune to be heard.
Cut the fiddle tune here, by lifting the needle. Or not.

not really 5/8. First "beat" (three 8ths) is a bit short. This should really feel like 5/8 as much as 2/4, with a somewhat long first beat. *** listen to the recording. play with the recording ***
start evening out
"beats"; second 2/8
becomes closer in length
to the 3/8, 3/8 becomes
more evenly divided...

\[ \text{\( q = 90 \)} \]

\( \text{rall.} \)

\( \text{\( \downarrow = 90 \)} \)

ok at this point the short first "beat" of the 5/8 becomes
equal to "beat" 2 (listen to the recording!)

\( \text{\( \downarrow = 90 \)} \)

easy long beat 2
throughout here, float on it

\( \text{\( \downarrow = 90 \)} \)

* this isn't quite right either.
I really want the first note to be a bit short of a short 8th note,
and for the 2nd note to feel like "beat" 2 (really early) of the 3/4 bar.
this new 2nd "beat" should then feel really float-y, hanging...
each player starts their clicks independently
initiating their clicks randomly, unsynced with the others, so the opening is disorganized...
(or, if directly following Another Wallflower,
these clicks can be initiated by everyone or
a single player on the final beat of Another Wallflower)

120bpm
(or, What is Your Metronome Thinking?)

\[ p_0 \text{ (software preset 0)} \]

- cliks, synced from woodblock

\[ \begin{align*}
\text{begin clicker, independently of others} \\
\text{begin clicker, independently of others} \\
\text{begin clicker, independently of others}
\end{align*} \]

\[ \frac{120}{bpm} \]

(begin precisely together, then diverge)

(Free Gestural A-rhythmic using given instruments. Allow
clicks to appear, but not steady pulse (< 3 contiguous at 120bpm).
Not sync'ed with others)

\[ \boxed{\text{strike/trem shafts together}} \]

\[ = > \]

…continue until…

(not in sync with player 4)

wait for player 2 cue

\[ \text{gt} \] gravity tremolo
let the mallet head fall
and ricochet to rest
single mallet tremolo with mallet shaft
unsynced with one another
still unsynced with one another

(pitch the delayed version of this pipe will transpose to, treble clef)
unsynced clicks

12: second

10: second

8: second

6: second

(p2) trem on pipes, second time only;
first time just strike the pipes

(p3)

x6

(p4)

(p5)
Clikks on beats 1/3, every bar; not notated here, for clarity.

60 clikks/minute, so texture should be sparser than earlier FGA sections, to allow occasional clikks to appear.
slow clik (30bpm) means much sparser; approximately three "events" before allowing clik to emerge

20:s:second =>
warped metric modulation; subdivide the dotted quarter in half, yielding 3/4 where it feels like:

but in reality the  \( \frac{3}{4} \) will be a bit slower, due to the clik timing.

accelerating pitched clicks begin here; at first, ignore them

swells are reversed delays
careful! no wood trigger on some of these.
pitched cliks notated here, reset with wood-block. Rather than using a time signature, here the players follow the accelerating cliks, counting them as needed.

this downbeat comes when the 5th (N+1th, where N is the boxed number above the clik beam) clik from the previous bar is expected. and so on, throughout this section.
wrong in pvc program! need to rerecord
(sync with player 4's clicks, ignoring accelerating clicks)

(sym with player 1's clicks, ignoring accelerating clicks)
p61 8::seconds

(clicks at 30bpm (1 per bar) still, but "overtones" are gradually added) all move to tethers

back to sticks

back to sticks

pickup at 120bpm

247

20
Once again, drop the needle to begin the recording; in this one, the recording plays through in its entirety.

A Cow Call
(please oh please come home!)

*VERY* rough rhythmic notation; listen to the recording...
something(s) sustained; melodica? rolls? humming?

imagine the fiddle part here, to keep time...

continue directly into Feedback
Bass-drum is prepared as described in the Technical Notes, with a "sound exciter" taped to each skin. Microphones are used by each player to conjur feedback from the drum; pitches are created via filters in laptops 2/3, and cycle slowly and automatically through these pitches. Feedback should be expressive, gentle but on the edge of explosive (and occasionally explosive), and constantly varying. Sensitivity to the textures going on around, to the flow, the shape of the piece as a whole, is of course very important; best to sometimes lay out completely, let other things emerge, while other times howling inexusably.

Players should always make great effort to have the fundamental sound as notated, though there will be undoubtedly times when various harmonics take over.

Note that in this movement, the players move amongst the laptops, so, for instance, player 4 may be playing Laptop 3 (L3) at any particular moment.
player 1 initiates each bar, player 4 follows with pitch changes on MIDI keyboards, at a leisurely pace. each bar can last as long as necessary.

freely choose from these notes, playing bowed, struck, however. distribute unevenly, and respond to feedback bass drum as appropriate. use vibes + some other small pitched instruments? whistles, something....

(bowed; first note always bowed through here)

players 2/3 remain at bass drum, expressively creating feedback with mics

freely choose from these notes, playing instrument(s) of your choie: whistles kids toys, melodica, bells, whatever inspires...
clicks in delayed vibraphone sample (created by software delay-based drum-machine) will begin to indicate tempo/meter, as will descending numbers on computer interface.
begin to tune into meter, and subtly associate free playing with the meter

(laptops 1/4 should be synced at this point)

sync button on keyboard controller

L4 (laptop 4)
K \[\frac{4}{2}\] (mallets)

\[124\] => \[3\] => \[4\] 2

\[163\] => \[3\] 2

\[208\] => \[3\] 8

\[253\] => \[3\] 8

\[308\] => \[3\] 8

\[363\] => \[3\] 8

\[418\] => \[3\] 8

\[473\] => \[3\] 8

\[528\] => \[3\] 8

\[(laptop changes can happen before triangle, since they take a while to "speak" in the bass-drum; in general the timing of the L2 and L3 notes is not exact for this reason)\]

\[11 + 10 + 9 + 8 + 7 + 6 + 5 + 4 + 3\]

\[\frac{4}{2}\] 2

\[\frac{3}{2}\] 3
move to laptop 1

move to drum kit...
Player 4: articulate these meters with kit; spare, quiet at first
\[ \text{continue to articulate beat cycles, as indicated above...} \]
...5/16+4/16+3/16+2/16+3/16+4/16 metric cycle, underneath 3/4 approx. 15"
wood/tom parts here are tentative; probably omit
(yes, no letter $P$, and right to $P6$; due to revision)

kick pad

$\frac{11}{16} + \frac{7}{16} + \frac{5}{16} + \frac{7}{16}$

(sounds 8vb)
quarter-note pulse will emerge through here....

largely out through here; free flourishes are good...
begin to articulate cycle (above) again...

(sounds 8vb)

cue, for others big now...
276 kick pad

13/16 + 11/16 + 7/16 + 5/16 + 3/16 + 5/16 + 7/16 + 11/16

kick pad
kick pad

17/16 + 13/16 + 11/16 + 7/16 + 5/16 + 7/16 + 11/16 + 13/16

17/16 + 13/16 + 11/16 + 7/16 + 5/16 + 7/16 + 11/16 + 13/16
19/17 + 17/16 + 13/16 + 11/16 + 7/16 + 11/16 + 13/16 + 17/16

kick pad
\[ \frac{19}{17} + \frac{17}{16} + \frac{13}{16} + \frac{11}{16} + \frac{7}{16} + \frac{11}{16} + \frac{13}{16} + \frac{17}{16} \]

Drop articulations here again, free flourishes
$\frac{23}{16} + \frac{19}{16} + \frac{17}{16} + \frac{13}{16} + \frac{11}{16} + \frac{7}{16} + \frac{5}{16} + \frac{3}{16} + \frac{2}{16} + \frac{1}{16} + \frac{2}{16} + \frac{3}{16} + \frac{5}{16} + \frac{7}{16} + \frac{11}{16} + \frac{13}{16} + \frac{17}{16} + \frac{19}{16}$
sync first time only, unless needed 2nd time
repeat letter V 6 times

resync every time
pad kick
real kick (floor tom)

7 Big
Uneven
Beats:
Players 1/3 improvise freely/fully on pads in last bar to make long sustain...

insanity insues.

resync every time

p13

p14

Player 4 cues sudden stop.
laptops fade, bass drum feedback fades, all move to Hang Dog Springar

4 Big Uneven Beats:
Hang Dog Springar
(a slow dance)

Drop the needle again, to start this one; as usual, begin with fiddle alone

a slow, SLOW (tele)springar type groove. beat one is longer than beat two, which is longer than beat three, throughout. must *listen* to *recording*.

first percussionist enter gently around here...

some quiet, droney stuff

counter-voice joins
Instrument Setup, Key, and Technical Notes

Core Setup (each of the four main stations has this):

- Laptop
  - Macbook running OSX, circa 2008 or later
  - Audio interface (Firewire or USB), with two mic preamps (channels 1 and 2), and at least 6 outputs
- Crude piece of wood (not wood block)
  - Piezo pickup taped to wood, connected to input 3 of audio interface
    - These can be made cheaply from parts, or premade pickups with ¼” TS outputs can usually be purchased (for instance, the K&K Sound BigTrig 5-pack).
- Two Pitched Metal Pipes, cut to the appropriate length to get the pitches indicated below
  - Piezos attached to each of these pipes and merged together into channel 2 of the audio interface
    - The merge can be done simply with a stereo-to-mono adapter or similar
    - Gain needs to be set carefully to achieve healthy signal without distortion
- USB MIDI keyboard controller, 25-key or more, with 8 (or more) drum pads, and foot-pedal switch
  - Something along the lines of an M-audio Axiom-25 or Axiom-49
  - If an integrated unit isn’t available, then separate keyboard and drum-pad units can be used
  - Used to control the software drum-machine that articulates metric structures in Feedback.
- Floor Tom
  - Each tom should be tuned slightly differently from one another, starting with Player 1 (highest pitch) down to Player 4 (lowest pitch)
- Wild Cards
  - Two instruments of the player’s choice, or one instrument with two (or more) different sounds/pitches
- “Tether” controller, or alternative controller
  - The tether is modified video game interface that provide two 3-axis joysticks (one for each hand). The 3rd axis is a “string” that can be pulled out to about 12 feet in length, and then released (it will automatically retract). we are using the Mad Catz Gametrak golf game controller, hacked as follows to it behaves like a standard USB HID device: http://x37v.com/x37v/post/2008/08/madcatz-gametrak-mod.html.
  - If a tether is not available, an alternative controller can be used; instructions for how to modify the software for use with an alternative controller are included with the software; some minor proficiency with Max/MSP will be required.
**Additional Instruments:**

- Stations 1 and 4 each require a kick drum
- A full drum kit, placed somewhere in between the main four stations
- A vibraphone
- Additional instruments (player's choice) for Feedback and for each of the “fiddle tunes” (movements 1, 3, and 5)
  - For instance, Josh Quillen uses steel-drums, as indicated in the example stage plot (created by So Percussion)
- A USB turntable, connected to one of the laptops
  - This is used to cue the fake old-sounding “fiddle tune” recordings, via included software
- A big concert bass-drum, prepared as follows:
  - A sound-exciter attached (taped with gaff) to both skins
    - Sound Exciters are elements that can be attached to surfaces to turn them into “speakers.”
    - Examples include the Dayton Audio DAEX25
    - Optimal placement of these has to be determined by trial and error
  - A stereo amplifier is required to drive the audio exciters
    - Output 1 from the audio interface on laptop 2 is connected to input channel 1 on the amplifier
    - Output 1 from the audio interface on laptop 3 is connected to input channel 1 on the amplifier
    - Should be placed relatively near the bass-drum so the player can easily make adjustments to it
  - Two microphones (SM58 or 57 or similar)
    - One microphone connected to input 2 of laptop 2’s audio interface
    - One microphone connected to input 2 of laptop 3’s audio interface
    - These are used to create tuned feedback through the bass drum; tuning created by filters in the laptop software.
The tethers control playback position in pre-recorded soundfiles. Each soundfile has two "events," which are clearly identifiable in the graphic display (see image below). The upper soundfile is controlled by the right hand, the lower by the left. The red vertical line indicates where the soundfile is currently sustaining. This is a spectral playback instrument, meaning it will sustain continuously at whatever point the tether indicates (the tether does not have to move to make sound). For those who care, the soundfiles have been pre-analyzed (FFT) and the cursor position indicates which frame to resynthesize (IFFT) from; it's a phase-vocoder.

A note-head on the middle line of the staff indicates that the tethers should be drawn to the point where the red cursor is at the seam between the two “events,” so we are hearing the transition moment between the events. This point will vary from preset to preset, as the sounds and their lengths change with each preset, but the crucial point is to be aware of where that seam is, and to be on the correct side of it (since most of the time the notation calls for being on one side or other of the seam, not directly on it). The notation works as follows:
The upper red cursor is very close to the seam between events (middle line on the staff), whereas the lower red cursor is fully in the rightmost event (probably near the second line from the top of the staff).
**Sound Setup:**

Having a good monitor setup and engineer is essential for this piece. It can be handy for the players themselves to manage their own monitor setup (and the software is setup to support that) via something like a Hear Technologies system or JamHub GreenRoom (which is what So Percussion uses); this makes it easy to make adjustments on the fly, and not spend an entire sound-check adjusting monitor levels.

A minimum of five monitors is required, and basic mic’ing of all the instruments is typically necessary (see the So Percussion stage plot as an example). Electronics in the house should be mixed to blend as much as possible with the percussion, and an ideal setup will have the house speakers very near the players, so as to avoid a sense of separation between acoustic and electronic sound.

The **three “fiddle tune” movements** (1, 3, and 5), all depend on a fake old-sounding recording of a fiddle tune (there’s nothing old about the tunes, which were composed as part of this piece) which is “played” via a turntable that controls software to playback digital soundfiles of the tunes, giving the illusion that the sounds are on LP. This comes from channels 1 and 2 of one of the laptop stations (up to the players to decide which laptop to set this up on), and needs to be mixed appropriately with the percussion instruments; the fiddle tune should never overwhelm and be too loud. The audio engineer may be required to fade out the fiddle tunes at certain points in the piece.

With **120bpm**, the laptop software is setup with the following outputs for the audio interface:

- channels 1 and 3; pitched outputs (delayed pipes)
- channels 2 and 4; unpitched outputs (clicks, and noise at end)
- channels 5 and 6; mixes of unpitched and pitched

So, channels 1/2 can be sent to on onstage monitoring setup, and the relative gains can be set by the players themselves. 3/4 can be sent to house system and balanced by engineer appropriate for the hall; typically, the players need to hear more clicks than pipes, while the audience should hear more pipes than clicks. Channels 5/6 can be used in a pinch when there is a minimal audio system available; might be difficult to have good sound in the hall and manageable monitors, however.

Similarly, in **Feedback**, the channels are as follows for Laptops 1 and 4 (for no good reason, these are inverted from 120bpm):

- Channels 1 and 3; unpitched percussion samples and delays
- Channels 2 and 4; pitched samples and delays
• Channels 5 and 6; mixes of both pitched and unpitched

For Laptops 2 and 3, the feedback signal from the bass-drum filters goes out all the channels (alternate channels corresponding to the two skins on the drum). Two of these channels (or the headphone out) are required to send signal to the amplifier that is driving the sound exciters on the bass-drum.

**Regarding the “Fiddle Tunes”:**

The "fiddle tune" movements (1,3, 5) are largely un-instrumented; I leave it up to the ensemble to bring these tunes to life with their own instruments in the most tasteful, compelling manner possible. The recordings of the fiddle used in the performance should also serve as a reference for performance style, particularly with regards to rhythm; listening to, and playing with, the recording as much as possible is crucial. The notes here break the tune up into the most obvious "voices" (including the foot-stomping, on the bottom staff) that can be used for each percussion instrument. However, it is not essential that these lines be presented in their entirety by single instruments; the ensemble as a whole can find various ways for the notes of the tune to be heard.

**Software:**

See the documentation with the software for further details.
We will need 4 DI Boxes or 4 TRS send capability, and 5 monitors on stage with 5 separate mixes available.

DI Box needed

Power supply

Microphone