::: performance score :::

Commissioned by David Whitwell

Giffen Good

for trombone + live, interactive electronics

Louis Goldford (2014)

[*dur. ca.* 11"]

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instrumentation

trombone, with —
— Harmon mute & stem
— alto saxophone mouthpiece

*live electronics**

**Software and assistance are available from the composer: ljgoldford@gmail.com.*

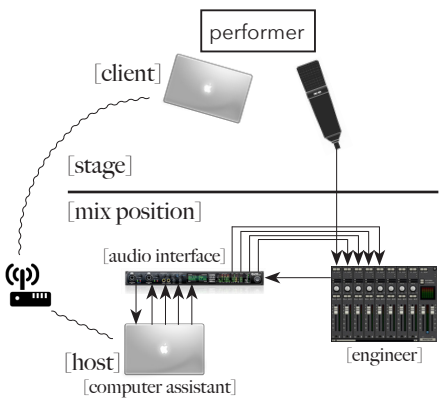
installation

Software is available as a Max package folder, containing all patcher files and links to user libraries (downloaded separately), compatible with Max v6.1+ or Max 7 (download from www.cycling74.com/). The piece also runs in the free version, Max Runtime, also from the provided URL.

All 3rd-party user libraries, whose rights are bound by their original licenses, are linked in the provided README.txt file. Without these externals, the piece will not run.

For assistance or software download requests — ljgoldford@gmail.com.

ideal stage setup



1. a laptop, situated at eye level for the performer on stage, running the "Client" patch (i.e. software);
2. a laptop, at mix position, running the "Host" patch. This computer processes sound, is linked to a mixer, and is run by a Computer Assistant;
3. a reliable wireless router, possibly in addition to House WIFI, providing for communication between Host and Client;
4. an audio interface connected to the Host laptop (recommended: MOTO 828 mk. III)
   > *The piece runs in either stereo or 4-channel surround;*
5. a condenser microphone placed appropriately for the soloist, ideally in a cardiod polar pattern;
6. a mixing console, amplification, and loudspeakers.
   > *Digital reverb and all DSP are implemented in the Host patch.*

alternate stage setup

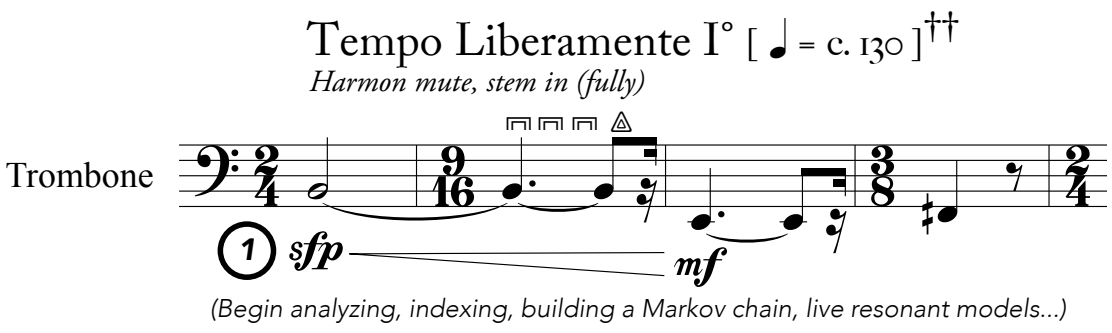
Giffen Good may be performed in the absence of a Computer Assistant. The software download contains an earlier version of the Host patch (then called "Parent Patch"), which allows the soloist to control the pacing of the electronics. Using this version of the piece, the soloist will not need a router but will need a simple USB-pedal, a.k.a. "stomp box," for advancing cues from the stage. The computer on stage will then need to be routed into the mixer, as it is the only computer outputting sound.

A complete walk-through of the software setup, including screenshots of the interfaces, is provided later in this score preface.

performance notes

As described on page 1 of score, tempo is somewhat free and *ad lib*. As a generative piece, certain score elements are controlled by the the state of the current price of gold. Since these move unpredictably, a kind of improvised counterpart between the solo part and the electronics is expected, and the soloist is asked to respond to the electronics *flexibly* — i.e. stretching phrases, sometimes waiting or pushing ahead, though always responding musically.

Please note that this is NOT a piece for fixed media, and therefore the soloist is NOT asked to simply "follow" the electronics (with the exception of a transitionary section, marked Tempo Liberamente II°.)



(Begin analyzing, indexing, building a Markov chain, live resonant models...)

Circled numbers indicate cues in the electronics, triggered by the spacebar on the Host laptop (or by tapping the USB-pedal in the "alternate stage setup") at the horizontal position in the score. These cues always appear UNDER the staff. Additional comments describing changes in the electronics also appear here.

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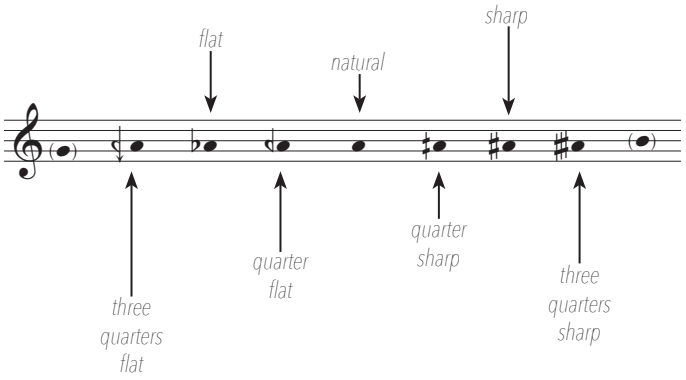
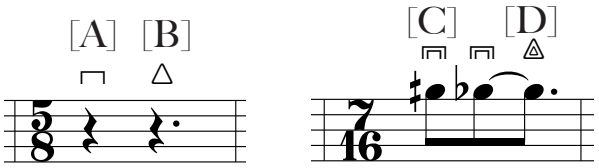
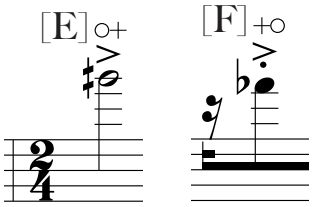


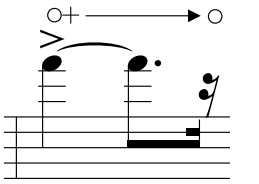
Tuning is in quarter tones.



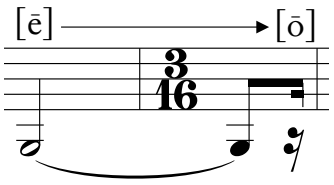
Désormière groupings suggesting subdivisions of assymetric meters or durations. A pair of eighth notes [A] or a pair of sixteenths [C] show duple subdivisions; a triple of eighths [B] or of sixteenths [D] show compound subdivisions.



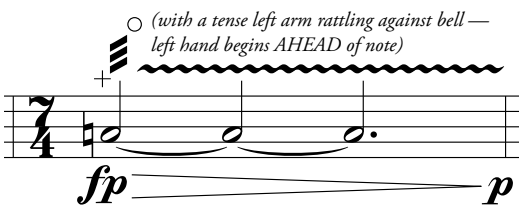
In addition to normal mute positions of open (o) and closed (+), a fast motion from open-to-closed [E] and from closed-to-open [F] are also used. Both should be executed quickly regardless of the duration of the note below it, to enhance articulation and provide a clear "wah" or "ow" vowel formantization.



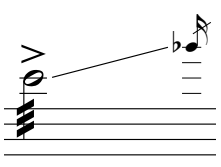
Gradually change mute positions over the indicated duration. In this case, attack the note with a fast motion from open-to-close, as in [E], and gradually move to open position over the course of seven sixteenth notes.



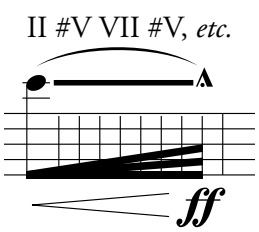
Gradually change vowels formed by the throat while playing normally. Results in a glissando of bands of higher harmonics, i.e. a change of spectral envelope. *Do not sing*. At other times the performer is asked to sing; at such moments the distinction between what to sing and what to play will be clear.



Rapid, unmeasured tremolo between open & closed mute positions, accompanied by the left hand rattling against the bell / mute as it tremolos.



Rapid, unmeasured flutter tongue (Flz.) produced by double-tongue or fast single tongue.



Rapid same-note slide glissandos as described in Dempster, pp. 21-23: the sound should be rough, bringing out the "slotting" between the partials at the indicated slide positions. The lip fights against the changing tube length for the same note, but the sound should emphasize the disruptively changing partial structure.

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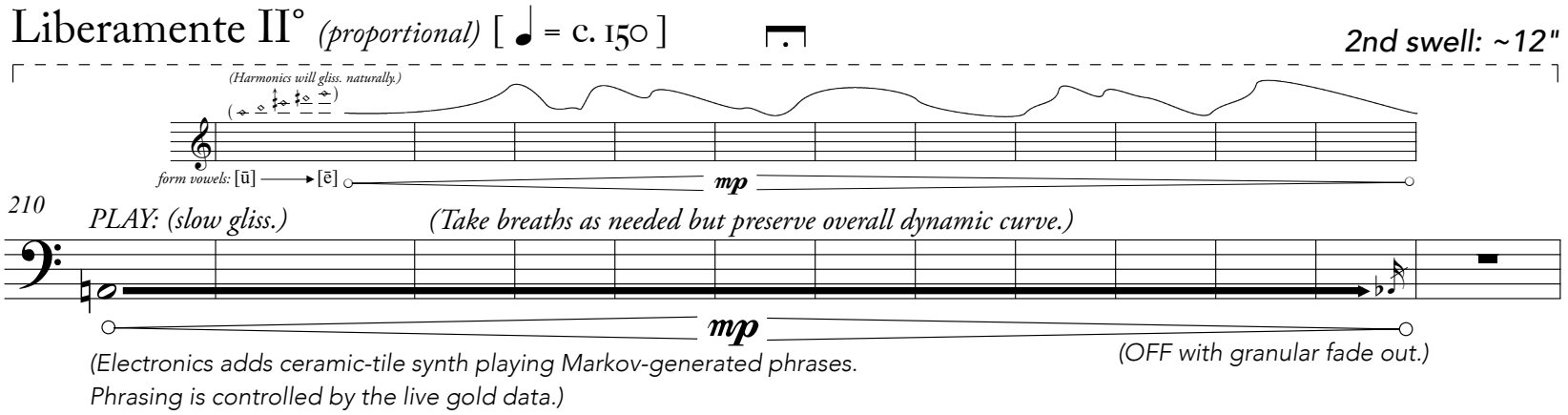
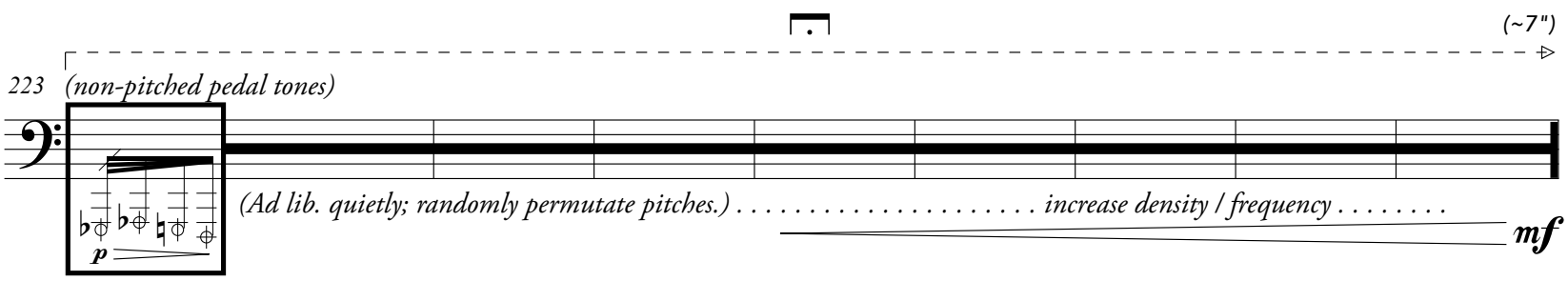
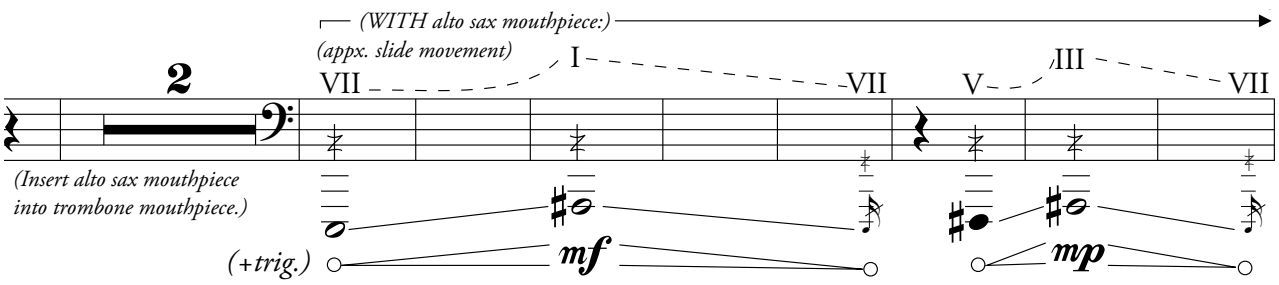


Vowel harmonics (upper staff) while playing a gradually changing fundamnetal pitch (lower staff). As indicated, stagger breath where necessary, but taper breaths and preserve overall dynamics. The upper staff suggests a range of vowels (though this should be customized by each player to obtain the approximate upper partials given). The curve above the upper staff indicates the approximate shape of the vowel movements (that is, the approximate glissando over the range of given partials). This sound mimics digeridoo playing. At times, the player is asked to sing an indicated pitch in the lower staff while playing and executing these glissandi for an enriched, complex tone.



Non- or semi-pitched pedal tone as described in Dempster, p. 43: the tongue interrupts the air flow to produce a "thuck" sound, much like a woodwind slap tongue.



Insert the alto saxophone mouthpiece into the trombone mouthpiece, and begin playing (with a saxophone embouchure) the indicated slide positions and pitches. By playing the alto saxophone mouthpiece we obtain low subharmonics.

Play a saxophone mouthpiece, in this context, should not require any cumbersome or novice struggle. The use of a saxophone mouthpiece on the trombone has been developed by trombonist David Whitwell, who may be contacted about the technique.

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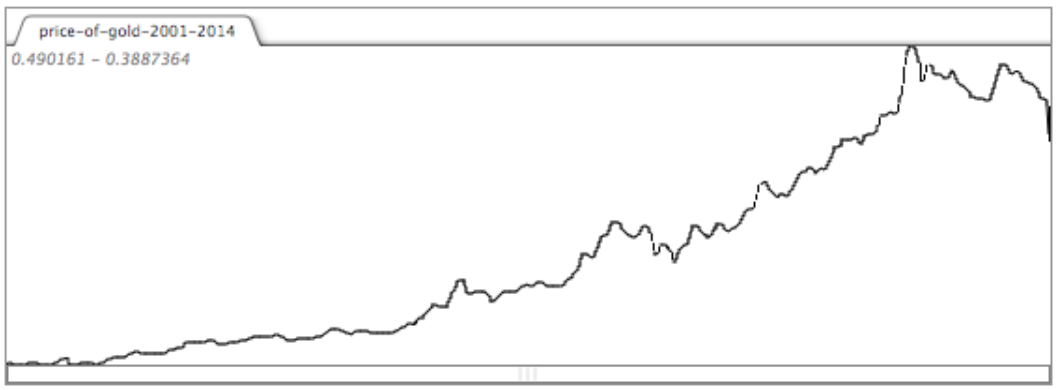
program note

I certainly wasn't expecting David Whitwell to ask for a piece that was "economics-themed." But when he approached me with the idea I thought back on my years of study (one of my undergraduate degrees was in economics) and realized how much has changed since then. This was just before the financial crisis of 2008. Our speculative financial world, once dominated by the big hedge funds, has been turned on its heals. I set out to compose a piece that would metaphorically acknowledge the trends rapidly shaping our new socioeconomic era.

A Giffen good is one that is consumed more as its price rises. As the price of alternative goods rises, the substitution effect causes consumers to buy less, and to seek out substitute goods.

Violating a traditional law of demand, few of these goods have ever actually been found. The Irish potato famine is the classic example.



Giffen goods are still in demand when their prices rises along with other goods, because it is still a cheaper and necessary alternative to other goods whose prices (or opportunity costs) are rising more rapidly.

Since 2008, some have suggested that this mere footnote in an economics textbook has become a reality. The liquidity trap has caused investors to sell off shares of increasingly higher risk stocks and buy low-risk, safe financial assets instead. Some have even suggested that gold, the ultimately liquid form of wealth, may be showing signs of "Giffenness." Pictured is a model of the price of gold from 2001 to 2014, where one can observe steady increases much more rapidly in the most recent years; an effect of the world recession. If more investors are moving their assets into low risk, highly liquid goods, what will the consequences be at various levels of society years away?

In the music, I've used this curve to generate rhythms for the notated part, a kind of *talea* against a *colour* in the form of a second order Markov chain that indexes an analysis of samples I prepared with trombonist Brennan Johns at Indiana University. A similar Markov chain is also used in the live performance; it indexes the live performance and generates score material. This Markov process, once used to predict the movements between bear, bull, and stagnant markets, echoes the presence of live gold data pinged from Yahoo Finance during the course of the piece. Its fluxuations are magnified and heard throughout. How important are these micro-movements in price? What will be their long term impact?

Similar statistical methods are adopted to match audio descriptors such as mel frequency cepstrum coefficients. Audio analysis / resynthesis methods pervade the structure of the piece and its texture.

Louis Goldford
May 2014
Bloomington, IN

software setup instructions — next page

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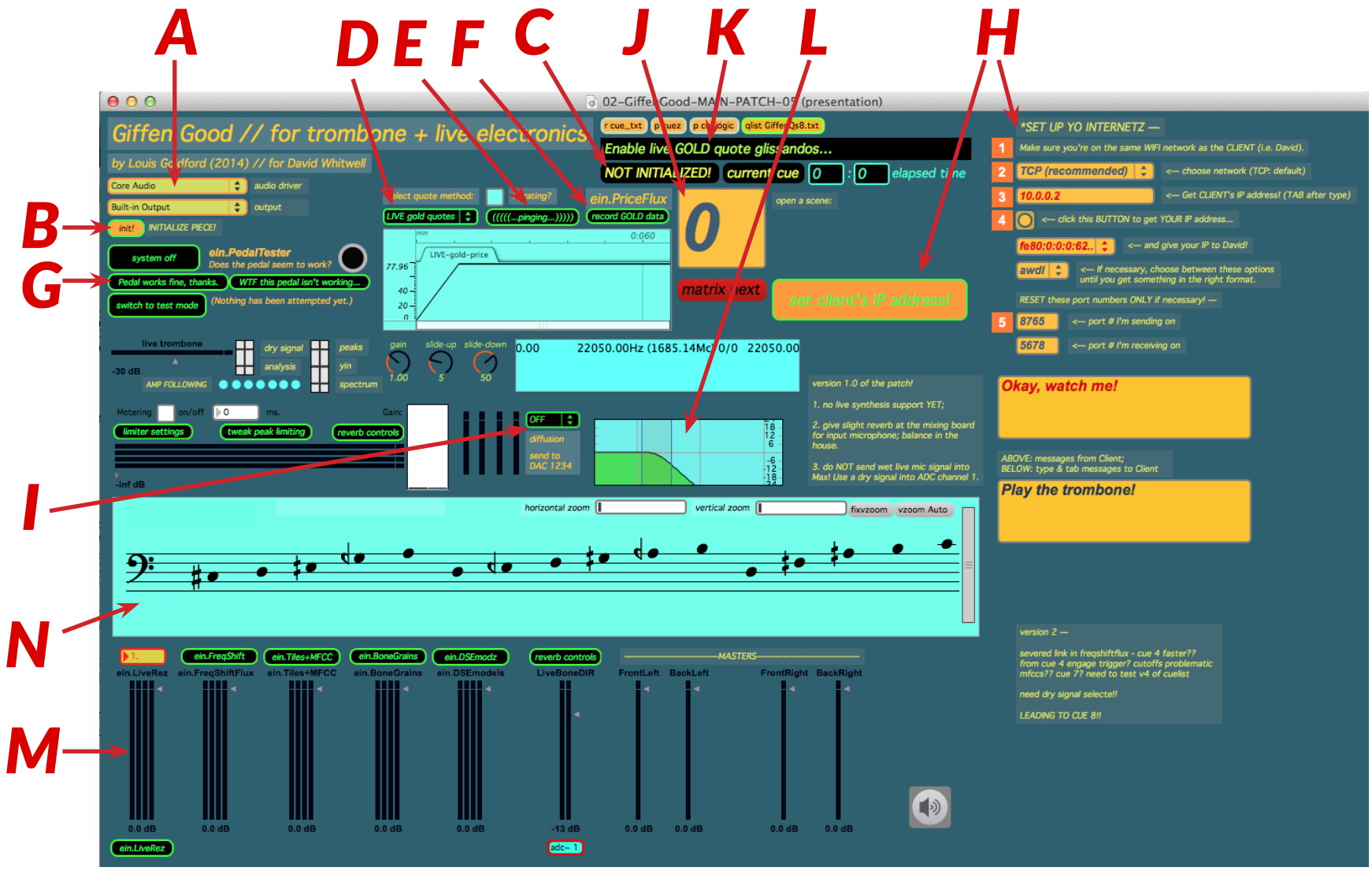
software setup — overview of the HOST patch

Download and unzip the master patches folder. Place this inside your Max/packages folder and open the README file. Follow its instructions to download the various libraries, placing them in the appropriate folder (either /packages or /patches).

Once you've completed this, launch Max and open 02-GiffenGood-MAIN-PATCH-05.maxpat —



This Host patch, or "Main Patch," runs the piece from mix position. A Computer Assistant follows the score and advances each cue by pressing the spacebar, adjusting levels throughout alongside a mixing engineer. Here is an order of operations for the Host patch —

A. Adjust audio driver settings.Be sure the output is set to the audio interface.
B. Click the 'INIT" button;
C. This changes the prompt from "NOT INITIALIZED" to "Ready to go."
D. If using a text file with previously-recorded stock data, select "previously collected quotes" from this menu and choose your text file after the prompt. If using live stock data, just skip this step! (More on the use of previously collected quotes soon.)
E. Once the piece begins, this will flash, ensuring that the system is either live scraping stock quotes or reading from a text file.
F. If you need to record stock data prior to a performance, click here and follow the easy instructions.
G. DEPRECATED: If using an earlier patch for on-stage control, use this to test the pedal. Easy to follow instructions.
H. Set up the network for communication with the Client patch. Easy to follow instructions, steps 1—5. The blinking "set client's IP address!" button will stop once this process is complete, or you may click the button to stop it manually.
I. If diffusing on a stereo system, select "stereo." This should default to four-channel, a.k.a. "quad" output.
J. BEGIN THE PIECE! Press the space bar. Notice this changes from cue 0 to 1, and will continue to update throughout. This is the current cue of the piece.
K. System information about what's happening gets printed here. For example, check this box during cue #13 to be sure you're playing with the correct "swell" structure.
L. Low pass filter to boost low end in lieu of a subwoofer. Could be especially helpful in last two pages of the piece.
M. Metering of individual synthesis components. Computer Assistant adjusts balance throughout.
N. For cues #3, 5 and 7, the system generates pitches to improvise on and sends them to the Client patch. After 15 seconds, the words "Back to Score!" will blink in red.

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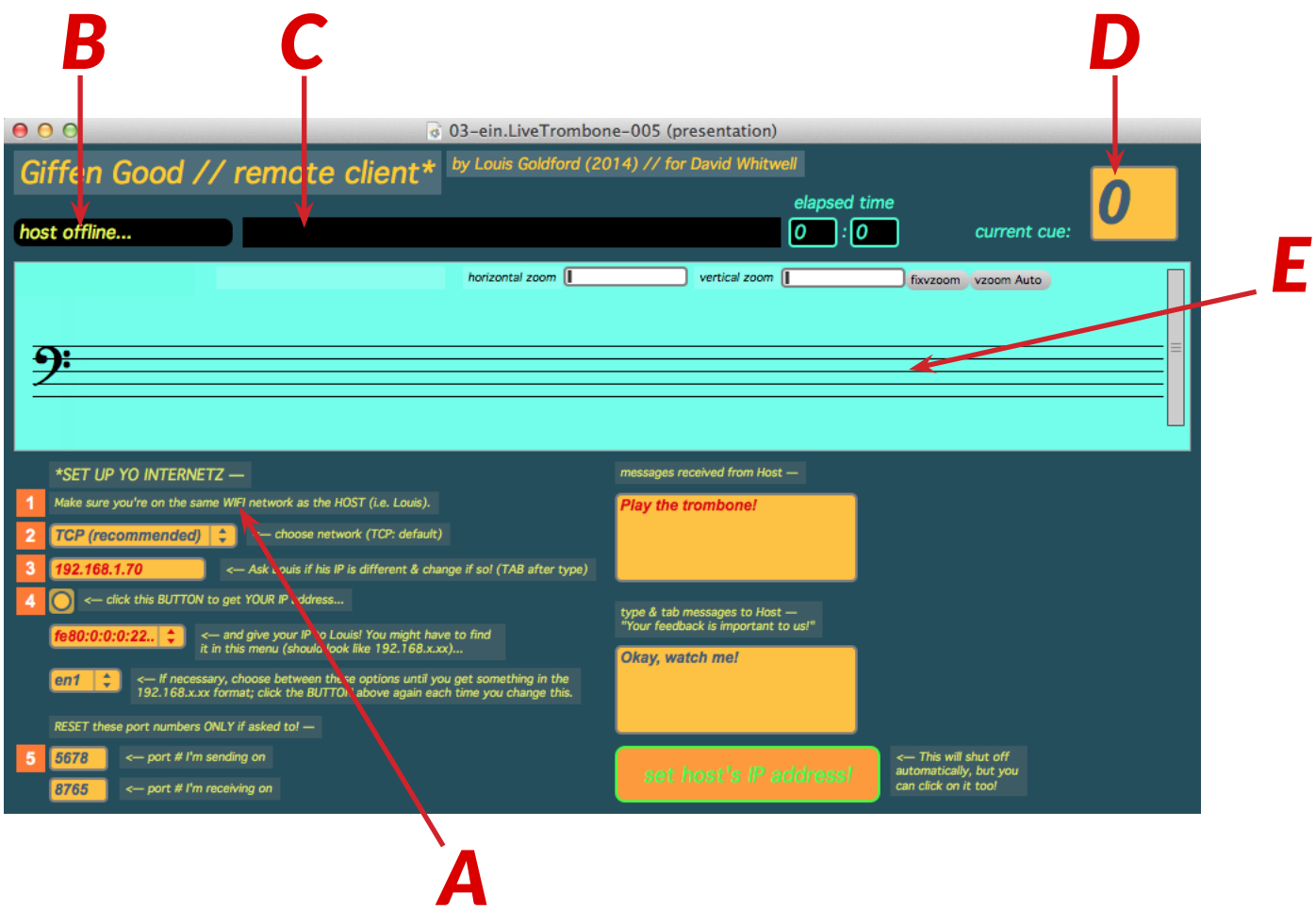
software setup — overview of the CLIENT patch

On the stage laptop, open 03-ein.LiveTrombone-005.maxpat —



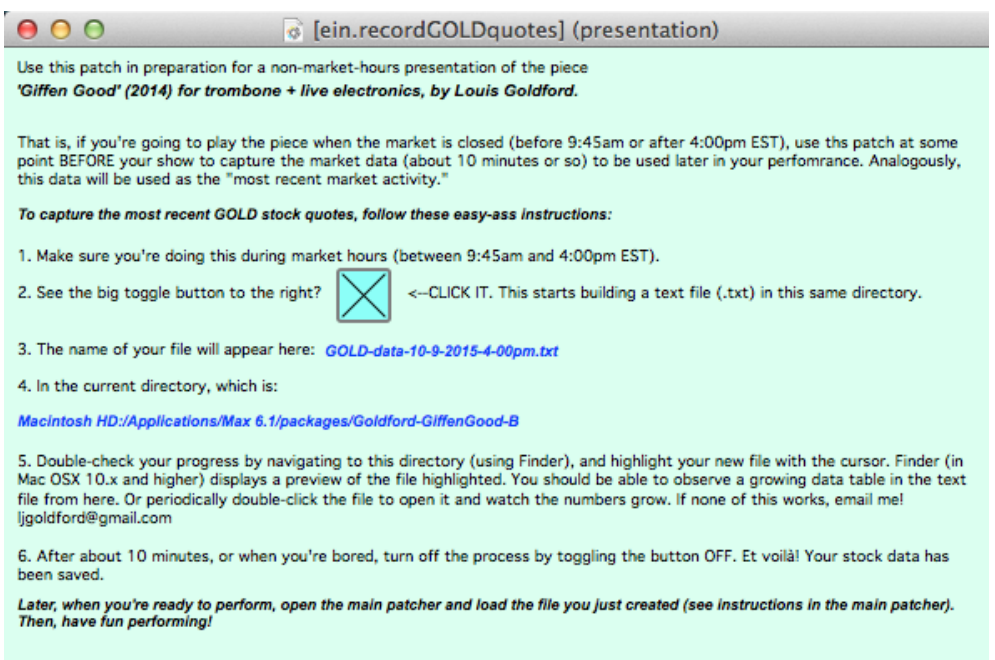
This Client patch receives information from the Host and tells the performer where the piece is. This is NOT the patch used to perform the piece from the stage without a Computer Assistant. Here is an order of operations for the Client patch —

A. Same simple instructions for setting up the network to communicate with the Host patch.
B. When the Host clicks the "INIT" button, "Ready to Go!" will appear here. If the Host patch crashes, it will reset to "host offline..."
C. Reprints system information (K on previous page). Useful for cue #13.
D. Current cue number.
E. For cues #3, 5, and 7 the system generates pitches to improvise on (N on previous page). After 15 seconds, the words "Back to Score!" will blink in red.

capturing live gold data for performances during non-market hours

Parts of the score are generated by the live stock price of gold. It is recommended that the piece be performed during regular market hours (i.e. between 9:45 am and 4:00 pm EST Monday through Friday). Realizing that this is hardly an optimal performance time, for performances that take place outside of market hours, one must record a stream of data in a text file as close as possible to the performance. For example, if a performance should take place on a Saturday night, the perfomer is kindly asked to record stock data for about 10 minutes late in the afternoon on Friday.

This is an easy on/off click that is handled in the patch ein.recordGOLDquotes.maxpat, which can also be accessed from F on the previous page. During a performance, the text file recording of gold quotes is loaded into the Host patch via D on the previous page.


[ein.recordGOLDquotes] (presentation)

Use this patch in preparation for a non-market-hours presentation of the piece
'Giffen Good' (2014) for trombone + live electronics, by Louis Goldford.

That is, if you're going to play the piece when the market is closed (before 9:45am or after 4:00pm EST), use ths patch at some point BEFORE your show to capture the market data (about 10 minutes or so) to be used later in your perfomrance. Analogously, this data will be used as the "most recent market activity."

To capture the most recent GOLD stock quotes, follow these easy-ass instructions:

1. Make sure you're doing this during market hours (between 9:45am and 4:00pm EST).
2. See the big toggle button to the right? <--CLICK IT. This starts building a text file (.txt) in this same directory.
3. The name of your file will appear here: *GOLD-data-10-9-2015-4-00pm.txt*
4. In the current directory, which is:

Macintosh HD:/Applications/Max 6.1/packages/Goldford-GiffenGood-B

5. Double-check your progress by navigating to this directory (using Finder), and highlight your new file with the cursor. Finder (in Mac OSX 10.x and higher) displays a preview of the file highlighted. You should be able to observe a growing data table in the text file from here. Or periodically double-click the file to open it and watch the numbers grow. If none of this works, email me! ljgoldford@gmail.com
6. After about 10 minutes, or when you're bored, turn off the process by toggling the button OFF. Et voilà! Your stock data has been saved.

Later, when you're ready to perform, open the main patcher and load the file you just created (see instructions in the main patcher). Then, have fun performing!

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contact information

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Giffen Good was commissioned, premiered, and toured by David Whitwell.
This piece is dedicated to David, who has performed it extensively
and whose advice and instrumental command have become central to the work.
Some performance highlights include —

The Composit New Music Festival, Rieti, Italy, 7/12/2014
James Madison University, Harrisonburg, Virginia, 10/6/2014
Mars Hill University, North Carolina, 10/8/2014
Virginia Commonwealth University, Richmond, 10/9/2014
Brooklyn College, NYC, 10/20/2014
New York University, 10/22/2014
Spectrum, NYC, 10/24/2014
Manhattan School of Music, NYC, 10/30/2014

and

The 41st International Computer Music Conference (ICMC)
Lyric Theatre, University of North Texas, Denton, 9/27/15

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for David Whitwell

Giffen Good

for trombone + live electronics†

Before starting the piece, press "INIT"
and be sure "ready to go" appears on screen.

Louis GOLDFORD (2014)

Tempo Liberamente I° [♩ = c. 130]††

Harmon mute, stem in (fully)

Trombone

1 *sfp* *mf* *fp* *ff*

(Begin analyzing, indexing, building a Markov chain, live resonant models...)

8 *mp sub.* *fp* *ff*

16 *mp sub.*

24 2 *(Enable live GOLD quote glissandos.)*

31 *(mp)* *fp* *f* *mp sub.*

37 [ē] [ō] [ē] [ō] *p* *(V.S.)*

†MaxMSP patches are available from the composer (*ljgoldford@gmail.com*) with complete installation and setup instructions.

††There are two main tempos, I° and II°, and both are semi-free as their names imply. I° is slower and somewhat more flexible. This marking is used when the live market price of gold, unpredictable in its fluxuations, conrols the phrasing of the Markov generator. Therefore, even though I° suggests a steady pulse of 130 BPM, the player must respond to the phrasing of the "market." Adapt the notated part at will to changes in the phrasing as well as the onset of resonant models (as in the opening section). Try to insert the onset of new phrases where the Markov generator leaves space; or respond to its increased density of activity with similar dynamics and tempo. Do the same for the live resonant models when they are captured and played back as"waves" of partials; leave space for these or respond dynamically. II° is more rigid, and functions as a guide for the proportional notation that corresponds to sequenced electronics at cue #13. These bars of 2/4 at 150 BPM are not strict; they are provided simply as a convenience for approximating the times given in seconds above each bracketed phrase.

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Giffen Good :: Louis Goldford :: 10/09/15

~15" (Laptop signals with "Back to score!")

45

3 Turn to the screen and improvise on the given analyzed pitches. Rhythmic / phrase shapes may vary from the suggestions above. After 15" the program will indicate "Back to score!" Continue from measure 46.

46

mp sub.

54

mf *f* *fp* *p*

(with a tense left arm rattling against bell — left hand begins AHEAD of note)

4 *(+ MFCCs of trombone; chorus of trombone textures.)*

60

mp sub.

67

sf *mp sub.*

74

sf > *mf*

alla marcia

80

molto vibrato (lip + diaphragm)

f

85

vib. norm.

mp sub.

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p

~15" (Laptop signals with "Back to score!")

98

5 *Turn to the screen and improvise once again on newly analyzed pitches.*
After 15" the program will indicate "Back to score!" Continue from measure 104.

104

sf *mf sub.* *mp*

(Electronics add resonant "pings" here to thicken texture.)

111

p *sf* *sf* *sf* *sf*

119

fp *pp* (*pp*) *mp*

126

mf sub. *pp* *mp*

132

mf *sf* *(V.S.)*

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138 molto vibrato (lip) vib. norm.

mp sub. sf (f)

144

mp sub. sf (f)

151

mf sub.

156

mp sub. sf (mp)

6 (Faster models / glissandi...)

157

sf (mp) p

~15" (Laptop signals with "Back to score!")

163

7 Turn to the screen and improvise once again on newly analyzed pitches.
After 15" the program will indicate "Back to score!" Continue from measure 169.

169

sf f

(Faster models / glissandi...) p sub.

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165

Dense, dramatic [← ♩ →] ~10"

remove mute

ff (Expanding / contracting granulation.)

8

without mute

Flz. *(rapid double-tongue)*

179

II #V VII #V, *etc.*

similie (Flz.) *(trig.)*

sfz *ff* (Granulation setting #2.) 9

f *f* *f* *ff*

188

ben marcato

III V VII V, *etc.*

(*ff*) *f* *ff* (OFF.) 10

(lip)

mp sub. *f* (Granulation setting #3.) 11

196

cracked, raspy

III V VII V, *etc.*

molto vib.

ff *mp sub.*

IV VI IV II, *etc.*

ff (Granulation setting #4; grain rate increaes...) 12

203

ben marcato — vib. norm.

sub. f *ff* (Release of granulation and long echo.) 13

(Gliss./swells follow — See next page.)

(V.S.)

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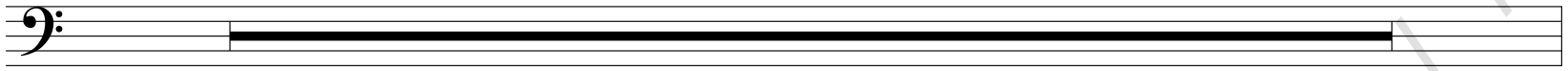
1st swell: ~9"

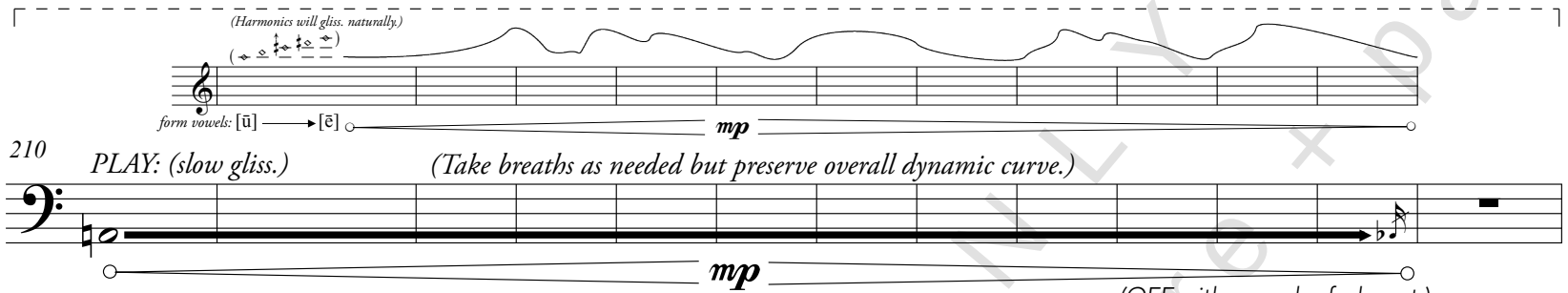
208



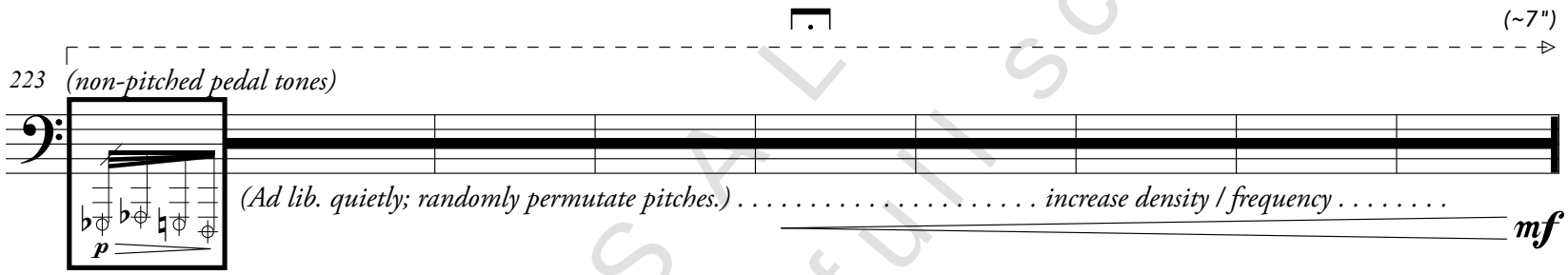
(Each large fermata in this section spans an increasingly longer fade in / out of a steady downward glissando in the electronics. Very doppler-like. This section is the only tempo-relative-dependent in the piece. The performer should attempt to scale the length of the following phrases with the glissando-swells. For convenience, the approximate lengths have been meaured out in bars of 2/4.)

Liberamente II° *(proportional)* [♩ = c. 150]

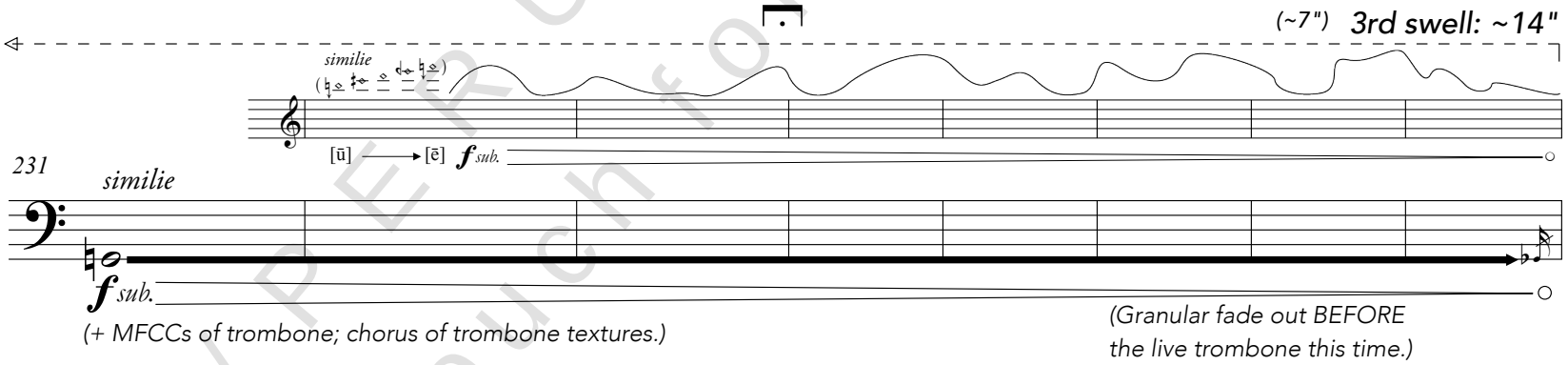
2nd swell: ~12"



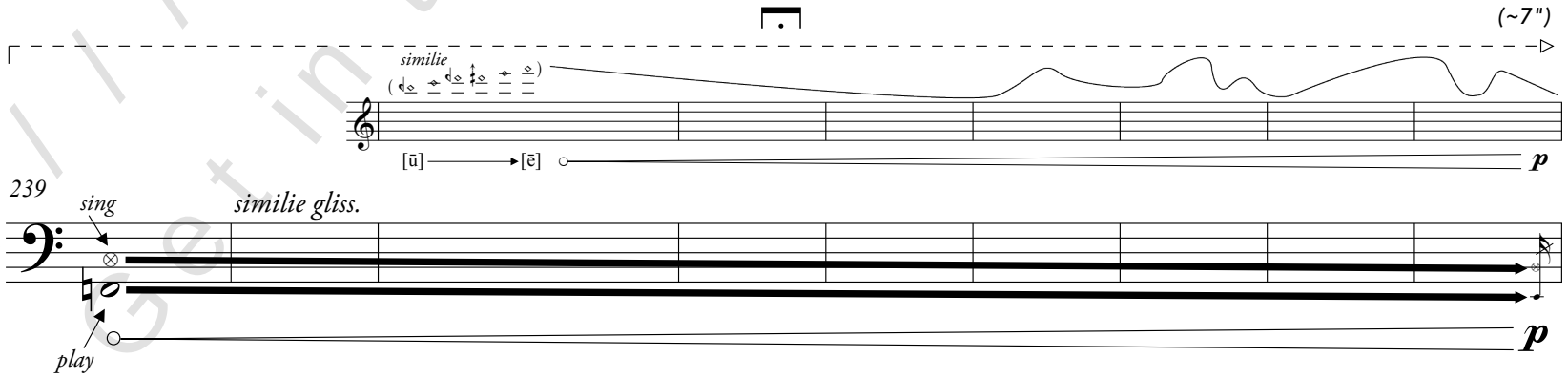
(~7")



(~7") 3rd swell: ~14"



(~7")



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(~9") 4th swell: ~16"

248 *Sing these pitches (upper staff) against those to be played (lower staff) to produce combination tones.*

sub. mf mp p

248 gliss. (#o)

sub. mf mp p

(~6")

257

fp 5 f

(Fading in here:
Resonant model: 01.02-no-odds-70.txt :: D♯ = perceptible tonic
Filtered by sounds of the Dutch Stock Exchange.)

mp sub.

f

(~7") (~11") 5th swell: ~18"

(WITH alto sax mouthpiece:)

266 (appx. slide movement)

VII I VII V III VII

mf (Insert alto sax mouthpiece into trombone mouthpiece.)

(+trig.) mf mp

(~6")

(WITH alto sax mouthpiece:)

278

VI II V I VII

ff f (Remove alto sax mouthpiece.)

(~6")

286

mf sub. f

(Resonant model a bit louder...)

mf sub. f

(V.S.)

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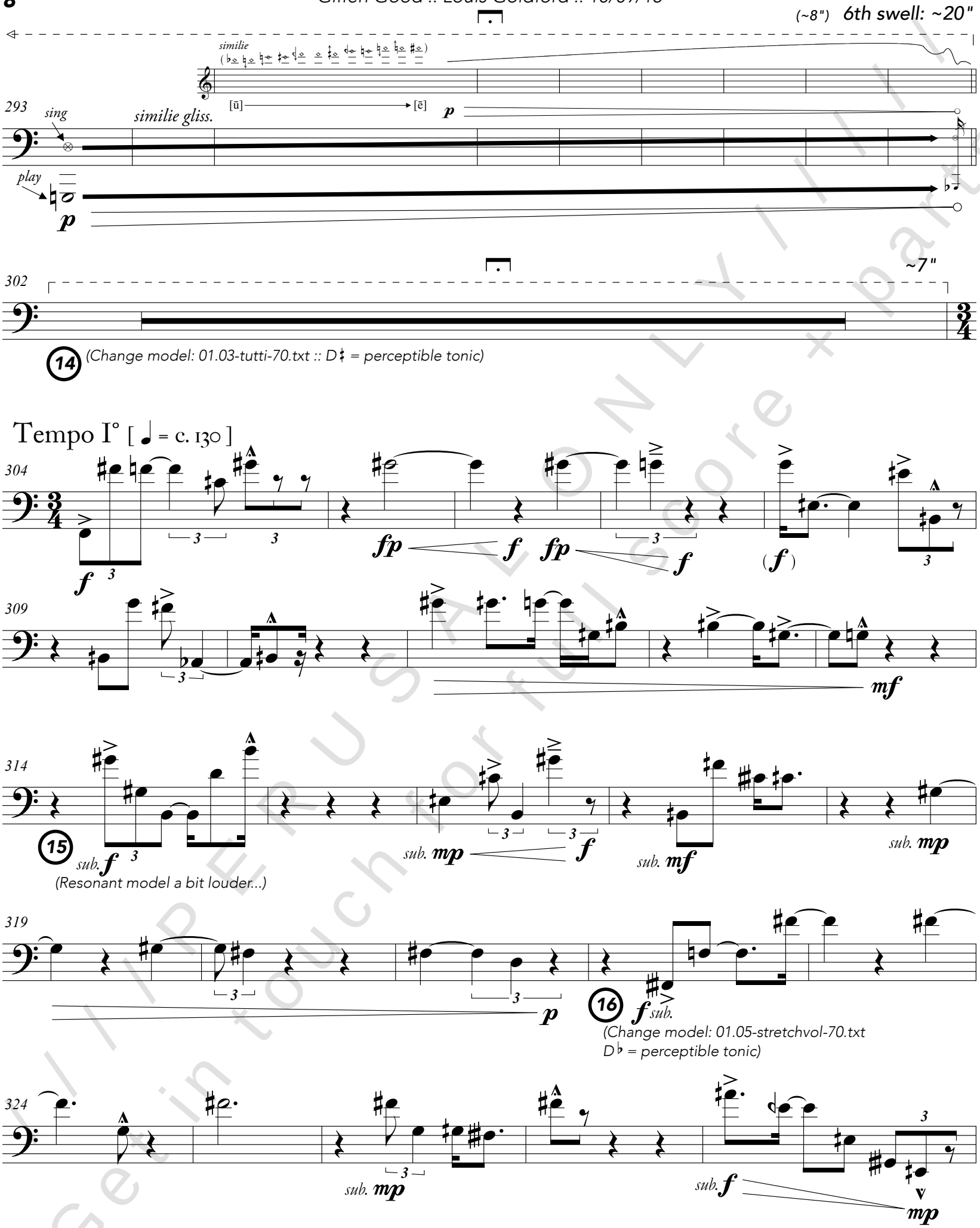

// // PERUSAL ONLY // // //
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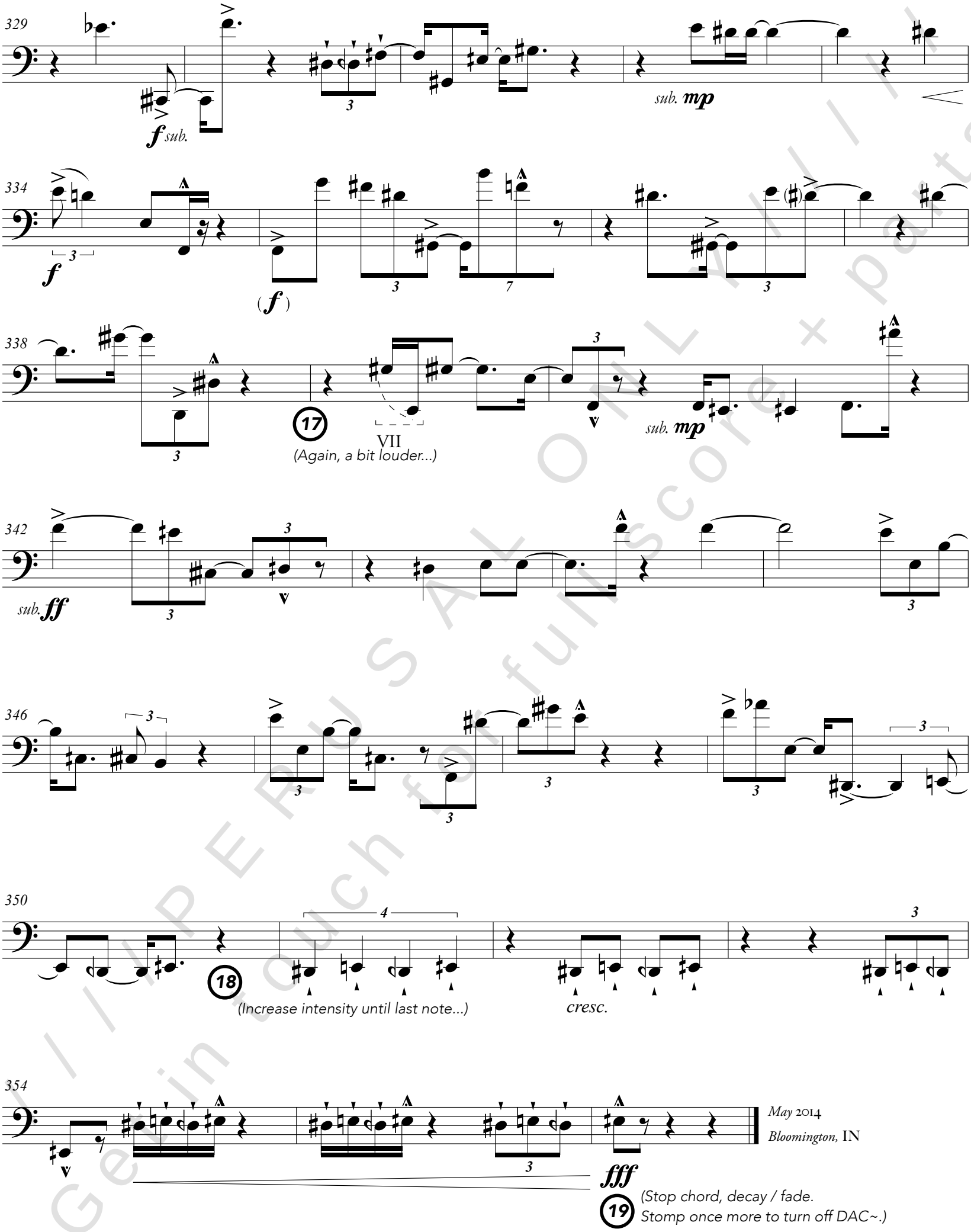

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