TINGUELY

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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Schuyler Tsuda

Tinguely

for strings, percussion and built instruments

Jean Tinguely

Jean Tinguely was a French-born, Swiss artist who designed and fabricated works of kinetic sculpture. Often involving complex networks of interlocking, moving parts, many of Tinguely's kinetic sculptures would, over the course of a performance, "come to life" and eventually destroy themselves. The artist was famous for a performance entitled *Homage to New York* in which a large kinetic sculpture spanning an entire stage, set itself on fire during its New York performance while, to the delight of Tinguely, the flaming gears of the sculpture kept on spinning and firemen worked to extinguish the flames.

Instrumentation

Percussion (with four small alligator clips, 12" metal ruler and music wire):

- zither
- sizzle cymbal
- tam-tam
- timpani (32")
- bass drum

Built Instruments 1 (with two $\frac{1}{8}$" diameter steel rods 6" to 8" in length):

- steel cello
- spring reverb

Built Instruments 2 (with two $\frac{1}{8}$" diameter steel rods 6" to 8" in length, 12" metal ruler and 10" to 12" Chinese cymbal):

- modified guitar
- table and tines

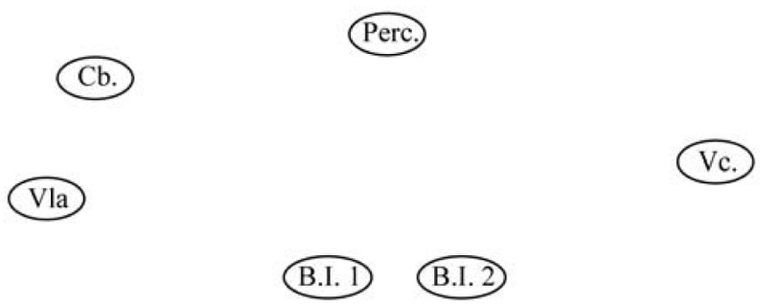
Viola (with four small alligator clips and 6" metal ruler)

Cello (with 10cm long, 4mm diameter Allen wrench, 6" metal ruler and two small alligator clips)

Contrabass (with 12" metal ruler and 6" metal ruler)

Stage Arrangement

The ensemble should be arranged in a semi-circle as follows, with performers at extreme ends of the performance area:



Clefs

There are four kinds of clefs in *Tinguely*. When and where they are used depends largely on the material that is being presented in the score. The first kind of clef is a standard alto or bass clef, utilized where specific pitched tones in the strings are desired. The second kind of clef is a standard percussion clef. This clef is used when an action upon the instrument is more important than the pitch or string specification. The third clef is a Roman numeral clef. This clef may have one or more lines, which represent the string or strings given by the Roman numeral. All actions take place on the string specified. The last clef is seen only by the percussionist. It is designated by a specific pitch in reference to a string on the zither. All actions take place on the string specified.

Cueing Network

This piece utilizes what I call a "cueing network," which allows the piece to be performed unconducted. Players should physically cue each other with a visible head nod or another subtle, non-distracting method of communication where indicated in the piece. Half arrows pointing up indicate that a cue must be given by the specific performer on whose staff it appears. A large, full arrow pointing up is a cue given to the entire group. A bold, dashed line and bracket with a time duration indication leads to a half arrow pointing to an event on another performer's staff. This indicates that the event in question should be played the given number of seconds after the cue was received.

Time Indications

Time indications are given with brackets marking the beginning and end of the events to which the times pertain. The times given represent approximate durations. Some flexibility can be taken within reason for the duration of a musical event. However, all cued events should follow the time indication for the onset of the event as accurately as possible. Once the ensemble has a firm understanding of the piece, however, time may be "felt" rather than counted.

Built Instruments

Steel Cello and Spring Reverb

Two pairs of built instruments are required to perform *Tinguely*. The first pair consists of a *steel cello* and a spring reverb unit. The *steel cello*, so called by instrument builder Robert Rutman, is a simple instrument constructed from a sheet metal plate with a music wire strung tight from one corner to another. The surface of the plate should be contact miked and preferably run through a good DI or buffer preamp to amplify its acoustic resonance. While the dimensions of the steel plate are left to the instrument builder, the *steel cello* should be able to produce extremely low tones as well as high harmonics.

The spring reverb unit may either be stripped from an existing instrument or may be built. Either way, the spring reverb must have three parts: 1) a metal frame, 2) a suspended metal plate within the metal frame with exposed edges, and 3) thin and light springs attached to the plate, which can be easily accessed by the performer. The spring reverb unit should be contact miked on its plate and like the *steel cello*, put through a good DI or buffer preamp if possible. The spring reverb unit should produce extremely low tones and a strong subsonic resonance when amplified.

Modified Guitar and Table and Tines

The second pair of built instruments consists of a modified guitar and a table and tines. The guitar should be a solid-body electric guitar modified to include a wooden wheel made to rub against the inner two strings near the bridge or tailpiece like a hurdy gurdy, and a hand crank should be fabricated to allow the performer to turn the wheel at will. In lieu of a modified guitar, a lap steel guitar with an Ebow, may be used. The guitar should be amplified using its pickups.

The table and tines may be created with a small, 1 square foot or so, panel of wood with a set of metal tines fastened to the surface. These tines may be either be stripped from a toy piano or fabricated with ⅛" diameter rod welded to a square-stock steel brace. The tines need not be pitched according to any tuning scheme, but they should produce an array of high frequencies like that of an old toy piano.

Instrument Preparations

Throughout the piece, the ordinary sound of each instrument is altered in specific ways through the use of object preparations or manipulations of objects during sound activation. These objects and preparations are necessary to create the sound world of *Tinguely*.

Zither

The zither should, from the beginning to end of the piece, be prepared with four small alligator clips. These clips should be clamped around the 2nd and 4th lowest strings on the left bridge and the 1st and 3rd lowest two strings on the right bridge and pushed outward so that they are touching or almost touching the bridges. The ends of the clips should hang freely back towards the performer, and where strings would collide with the ends, the ends of the clips should lay freely over them.

Where indicated in the score, a large, 12" metal ruler should be placed flat over the middle of the zither where the right treble strings and bass strings cross. The ruler should be placed so that it contacts as many strings as possible.

Sizzle Cymbal

The sizzle cymbal should be prepared with a music wire from beginning to end of the piece. While mounted on a traditional cymbal stand, the music wire should be made to clamp tightly around one of the rivets under the cymbal. The other end of the wire should go through a leg of the stand and be stretched tight to wrap around a rivet on the opposite end of the bottom of the sizzle cymbal. The telescoping arm of the stand may also be lengthened to tighten the string. The stand should be adjusted to tilt the angle of the cymbal down so that the vibrations of the string are allowed to transfer to the cymbal, which, like the string, must vibrate along its length. All of the rivets must be taped down on the surface of the cymbal so that they do not rattle.

Tam-Tam

The tam-tam, like the sizzle cymbal, is prepared with music wire for the duration of the piece. The wire should run from one of the tam-tam's holes and pulled tight to the bottom of the tam-tam's frame.

Four alligator clips are clamped on to the edge of the tam-tam in locations of the performer's choosing where indicated in the score.

Timpani

Music wire strung loosely between two music stands should be made to lie over the timpani so that it bounces and rattles over the head as the timpani is struck with force. The timpani should be fixed at the lowest tuning possible as long as it does not result in a floppy drum head.

Bass Drum

The bass drum is prepared with four small alligator clips at the center of the drum head. The bass drum should therefore be played on its side and made as level as possible so that the alligator clips may stay on the surface of the head while it is struck. When a roll is performed, the clips will rattle or bounce, depending on the strength and area of the roll. The performer should control the jumping of the clips so that they rattle like a tight vibration at a soft dynamic level and bounce freely at an extremely loud dynamic level.

Steel Cello

The steel cello is performed with a cello bow. Additionally, a $\frac{1}{8}$" diameter steel rod should be used where indicated in the score.

Spring Reverb

Along with the fingers and a cello bow, $\frac{1}{8}$" diameter steel rods are used to play the spring reverb unit where indicated in the score.

Modified Guitar

⅛” diameter steel rods are placed in between strings so that the length of the rods stick out on one side and stay fixed in between the strings on the other. The rods may be anywhere between 6” to 8” in length. When struck, the rods should vibrate freely between the strings. The guitar strings may be detuned to allow for longer vibration.

Table and Tines

The table and tines will often be played with two ⅛” rods.

A large (12”) metal ruler should be set over the tines at their brace for the duration of the piece except when manipulated as indicated in the score.

A small 10” to 12” Chinese cymbal should be placed upside-down on the table when indicated in the score. The cymbal should wobble slowly when struck in this position and accelerate as it returns to center.

Viola

There are three different preparations with small alligator clips in the viola part. The first utilizes a single alligator clip hanging loosely around IV in between the edge of the fingerboard and the bridge. The clip may be allowed to drift, but should always be in between the bow and the fingerboard instead of between the bow and the bridge. The second preparation with alligator clips involves one clip on IV and one clip on III. The ends of both clips should rest loosely on the higher string. The clips should be touching or very close to the bridge and should not drift from this position aside from the occasional rattle. The last preparation using alligator clips requires four clips to be placed on IV, hanging loosely between the edge of the fingerboard and the bridge. The clips should be pushed to the edge of the fingerboard so that they rattle against each other and the fingerboard when the viola is bowed. In this preparation, the bow should always be between the clips and the bridge.

The viola is also prepared with a small, metal, 6” ruler. This ruler is placed in between strings I, II and III, with the ruler going under III, over II and under I so that it is fixed in place by the tension of the strings. It should be positioned so that both ends of the ruler stick out from the strings an equal amount, and the long edge facing the bridge should be more or less in line with the edge of the fingerboard.

Cello

The cello is prepared with an Allen wrench, a small ruler and two alligator clips. A 4mm diameter, 10cm long Allen wrench is wedged in between strings I, II and III at the 5^{th} partial on the bridge side with the Allen wrench going over I, under II and over III. The straight end of the Allen wrench should face the left of the player to facilitate flicking, while the cornered end should be oriented upward, away from the cello so that the end does not contact the cello. Both ends should stick out from the strings a roughly equal amount. As the Allen wrench is hit, it may shift. It is advised that the player reset it from time to time when necessary so that it does not drop from the strings.

When the Allen wrench is held in the left hand as indicated in the score, the cornered end should be held loosely in the left hand, and the straight end should be used to contact the strings.

Where indicated, a small 6” steel ruler is fixed between strings I, II and III. The ruler goes under III, over II and under I and should be placed in roughly the same area and position as the Allen wrench, although the placement need not be as specific due to the fact that the ruler will contact the strings at more than one harmonic node.

The two alligator clips are placed around strings I and IV, with the teeth ends facing inward towards strings II and III. Both clips should be pushed snuggly near the nut so that they their tips are touching the inner string. In this position, the clips should not fall towards the bridge when bowing normally.

Contrabass

For the duration of the piece, string IV should be detuned to G_0. This should allow the string to be toneless and floppy.

A large, 12” steel ruler is prepared in between the strings where indicated in the score. The ruler is weaved under III, over II and under I so that string tension keeps it fixed in place. The ruler should be centered so that equal lengths stick out from either side beyond the strings, and it should be positioned in an area just above the edge of the fingerboard, near the 4th partial.

The contrabass also utilizes a small, 6” steel ruler, which is prepared in exactly the same way as the large ruler.

Note to All Performers

All events should be performed senza vibrato except when specified in the score.

Each performance instruction continues for the duration of each event and ends at the next event unless otherwise noted.

Microtonal Notation

¼-tone sharp

Symbols


perform the action specified for the length of the bold line


play specified action in the rhythm implied by segments


segment enclosed in parentheses may be omitted or included


niente

continue to play sequence given within repeat bars for the duration or number of repeats given

transform previous sequence to new sequence with each iteration

circular bow stroke downward towards bridge

circular bow stroke upward towards edge of fingerboard

 flick specified object

 flick specified object or instrument while performing the indicated action

 pizzicato or pluck as indicated

 play specified action while muting with the left hand (where indicated in the score footnotes)

 play specified action while unmuted (where indicated in the score footnotes)

 glissando towards bridge

 glissando away from bridge

Percussion Techniques

Bow Pressure Vibrato

Bow pressure vibrato is a kind of vibrato produced by applying quick, periodic pressure to the bow with the first finger of the right hand so that the bow is momentarily pushed into the string with extra pressure.

Irregular Nervous Staccato

A type of staccato bowing in which multiple short notes of irregular durations are taken in rapid succession with the same bow stroke.

Built Instrument 1 Techniques

Frame Pushes

Push the plate of a spring reverb unit down to its frame with the end of a $\frac{1}{8}$" diameter rod or other specified object so that the plate taps the frame while maintaining constant contact between the rod and the plate.

Ultra-Nervous Frame Pushes

Perform *frame pushes* in rapid succession by releasing just enough pressure on the plate to be able to press it down into the frame again with audible impact.

Left-Hand Bow Trill

As the bow is being drawn, perform a fast and steady roll with the first two fingers of the left hand on the stick near the tip of the bow to produce a volume trill.

Plate Buzz

After performing a specified action on the spring reverb, hold the plate to the frame with the end of the ⅛" rod with just enough pressure to allow the plate to vibrate against the frame as it resonates.

String Techniques

Ultra-Nervous Staccato

An *ultra-nervous staccato* is an extremely tight and fast nervous staccato that uses as little bow and as little movement as possible. The resultant sound should be so short that little to no tone is heard.

Diagonal Ricochet

A *diagonal ricochet* is long, toneless ricochet produced by dropping the bow forcefully, straight down on the string and immediately pulling the bow inward and upward in the direction of the nut in a slightly diagonal path while constantly keeping the bow perpendicular to the string and allowing the bow to bounce sympathetically on the string.

Side String Trill

A *side string trill* is a “fluttering” sound that fluctuates rapidly between open and half-stopped tone produced by drawing the bow while periodically touching the side of the string very lightly near the nut.

Half-Stopped Broken Tone

Like the *side string trill*, the *half-stopped broken tone* is performed by half-stopping the string near the nut. The finger stopping the string, however, remains at a fixed position. The resultant tone is a complex mixture of the fundamental tone, harmonics and noise.

Col Legno Buzz

Lay the wood of the bow on the string and simultaneously perform a hard pizzicato by pressing the string down towards the fingerboard and rolling off, allowing the string to shoot upward hitting the bow multiple times.

Ricochet Drop

A *ricochet drop* is an accelerating, vibrating sound produced by dropping the bow forcefully, straight down on the string while increasing bow pressure.

Harmonic/Open Trill Gliss

This technique has two components. The first component, the *harmonic/open trill*, is produced by alternating between fingered harmonic and open string. The second, is a glissando between the regions specified. Because this glissando is periodically broken by the release of the fingered harmonic, it may be more accurately thought of as a scale of harmonics.

Pressure Multiphonic

Draw the bow aggressively, sul ponticello near the bridge with extra bow pressure to produce a complex tone that is a mixture of fundamental and harmonics.

Shifted Harmonic

A *shifted harmonic* is a complex tone produced on a single string that sounds as if two tones are "beating" together. It is performed by playing a harmonic slightly sharp or flat and depressing the string with just enough pressure so that it resonates as a natural harmonic and a stopped note simultaneously.

Underbow

Underbow in *Tinguely* refers to bowing the under side of the string.

Grind Tone

In each instance of the *grind tone* in *Tinguely*, the string is muted with the left hand and bowed with flat hair somewhat sul tasto so that the position of the bow is close to halfway between the left hand and the bridge. Extreme bow pressure and slow bow speed are required to produce this low, growl-like tone.

Allen Wrench Buzz

Holding the cornered end of the Allen wrench loosely in the left hand, the straight length of the wrench is made to touch the side of the string just above the bow at a slight angle so that its weight rests on the string. Bowing the string should cause the Allen wrench to rattle on the string.

Allen Wrench Subtone

Like the *Allen wrench buzz*, the Allen wrench is held to the side of the string. Unlike the *Allen wrench buzz*, the *Allen wrench subtone* is produced by holding the Allen wrench near the bridge, below the bow. Bowing the string in this manner should allow a tone one octave lower than the string to emerge as a result of the

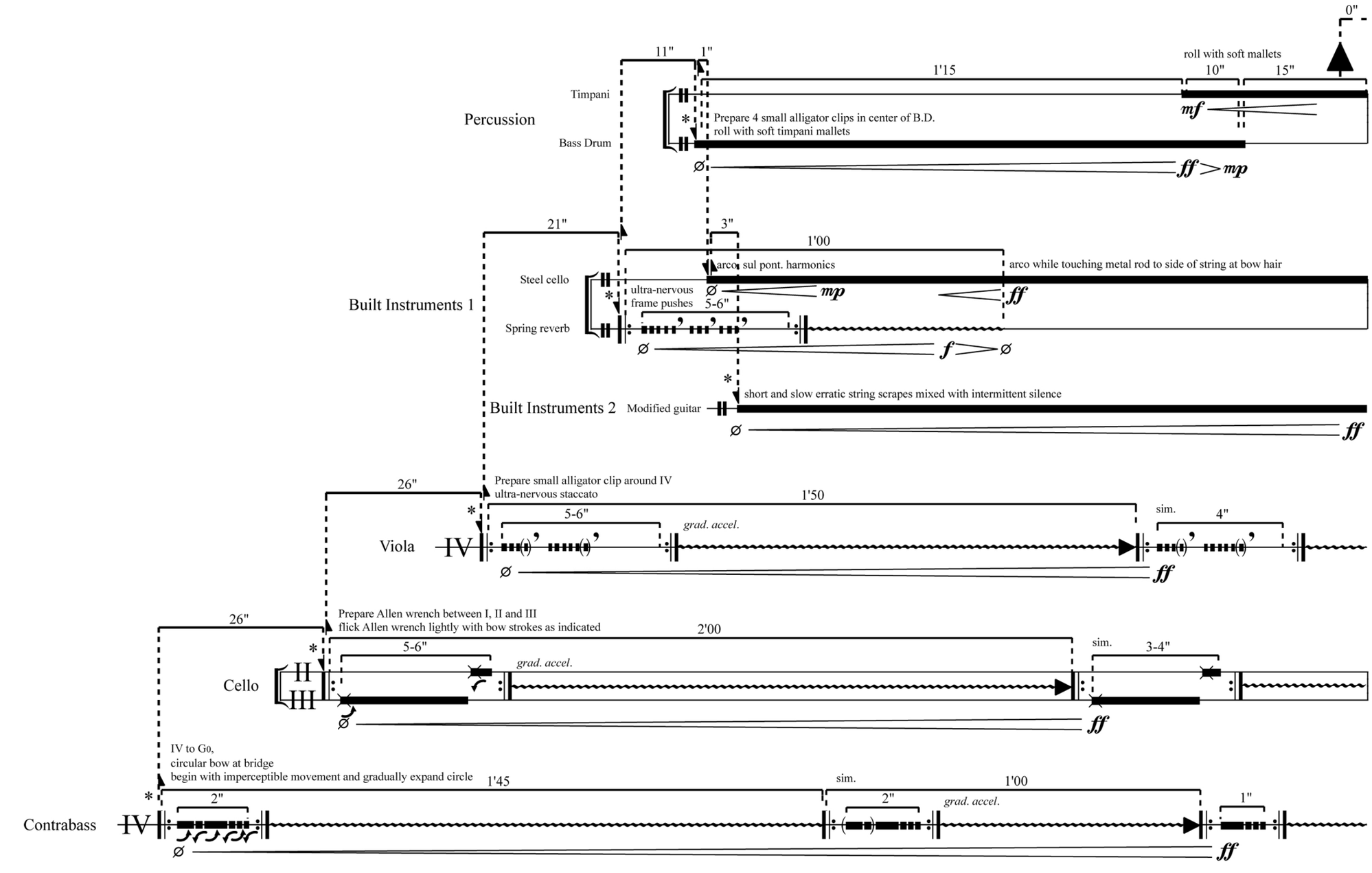
periodic bounces of the Allen wrench becoming pitched oscillations. The periodicity of the bounces may be controlled to a degree by controlling the tightness of the left hand grip on the Allen wrench.

Allen Wrench Noise Tone

Similar to the *Allen wrench buzz*, the *Allen wrench noise tone* involves holding the Allen wrench to the side of the string just above the bow. The tension of the grip on the Allen wrench is altered, however, by slightly tightening the grip on the Allen wrench, pushing it to the string with enough pressure so that bowing the string results in a complex tone comprised of a dense cluster of high partials and noise.

Tinguely

Schuyler Tsuda



* All performers begin motionless with bows, mallets, hands or rods already placed on instrument.

Tinguely

Perc.
Sizzle Cymb.
Tam-tam
Timp.
(0")
25"
8-10"
arco wire sul pont.
10x
17"
3"
11-13"
6x
arco wire sul pont.
sfff
f
mp

B.I. 1
Stl. Vc.
Sp. Rverb.
25"
1'20
28"
irregular nervous staccato, sul pont.
sim.
pluck and scrape springs
in irregular rhythms with 3-10" between plucks
Prepare two rods between strings
at opposite ends of the guitar
circular rub strings with rod near nut
1'05
35"
Remove rods
flick rods in irregular rhythms with 1-6" between flicks
mf

26"
3"
14-18"
arco, sul pont.
3x

B.I. 2
Mod. Gtr.

Vla.
IV
Remove alligator clip
diagonal ricochet
9"
side string
trill
6"
4x
7"
13"
2x
15"
half stopped
broken tone
near nut
14-17"
3x
mf
p

Vc.
I
III
Remove Allen wrench
Prepare small ruler between strings I, II and III
flick ruler with each
bow stroke as indicated
4"
6x
arco
fast, irregular
bow bounces
5"
15x
sim.
fast, irregular
bow bounces,
allow ruler
to vibrate
6"
2x
ad lib fast, irregular bow bounces
and arco sul ponticello harmonics
Remove ruler, and
prepare alligator clips
on strings I and IV
sffz
p
mf

Cb.
IV
arco with L.H. pizz.,
let string hit fingerboard
col legno
ricochet
11"
L.H. pizz,
col legno
buzz to
bridge
2x
arco w/L.H. pizz.,
let string hit
fingerboard
arco,
sul pont.
13"
4x
20"
1'00
mp

* This *side string trill* may be placed either as notated or before the first cesura in the sequence with each iteration.
** This event should continue from the decay of the previous event as if emerging from it.

Tinguely

8'40

Perc. Tam-tam

bow pressure vibrato on wire at bridge

10"

flick tam-tam surface where notated

arco tam-tam 4"

pizz. wire

3"

1'10

arco, sul pont. irregular nervous staccato on wire

arco norm. wire

arco, sul pont. on wire

To zither

B.I. 1 Stl. Vc.

col legno tratto with bow and rod

0"

arco with rod on side of string at bow hair 2/3rds from bridge

0"

bow and rod to bridge

col legno battuto

arco with rod sliding freely on side of string

50"

arco with rod on side of string at bow hair

arco, bow and rod to opposite bridges

3"

B.I. 2 Mod. Gtr.

scrape strings and allow Ebow or cranked wheel to emerge intermittently

To table and tines

Vla.

Vc. enters during last Vla. swell

Prepare small ruler between strings I, II and III

press down on ruler with bow so that ruler is wedged between bowand IV and bow touches III

flick ruler as notated

press bow to I and III over ruler

arco

20"

arco

press bow to I and III, scrape bow to bridge

arco norm. near ruler

flex ruler so that it touches IV, arco and momentarily release pressure on IV in irregular rhythms

9"

11"

Remove small ruler

Vc.

arco, L.H. muted to open

bow bounces

sul pont. spicc.

diagonal ricochet

50"

nervous staccato, gliss to bridge

ricochet drop

diagonal ricochet

sul pont. ricochet

tremolo with harm./open trill, gliss from edge of fingerboard to bridge

irregular tremolo at bridge with intermittent pressure multiphonics

18"

Remove alligator clips

Cb.

(1'00)

Prepare contrabass with large ruler between I, II and III

* Adjust tuning so that "beating" occurs between viola and cello tones.

Tinguely

10'40

Perc. Zither

rest left hammer sideways on string, hit left hammer with right hammer while sliding left hammer from bridge to middle and back

hit left hammer resting upright on string with right hammer while sliding from bridge to middle and back

hit left hammer resting upright on string with right hammer while increasing then decreasing pressure on string

multiple stroke roll on C♯ with intermittent hits on D

Prepare tam-tam with 4 Alligator clips

4" 50" sim. multiple stroke roll 2" sim. 2"

B.I. 1 Stl. Vc.

(3") (50") 0" arco, L.H. bow trill 0" To spring reverb

B.I. 2 Table and tines

rub wood with fingers

scrape wood with rods

hit tines, then scrape wood with rods

hit tines and wood with rods

scrape wood with rods

brush tines,then scrape wood with rods

pluck tine

hit tine with rod, dead stick

pluck tine

hit tines, then scrape wood with rods sim.

hit ruler

5" 1'00

flex ruler so that it touches IV, arco and momentarily release pressure on IV in irregular rhythms

Remove small ruler

arco 1" 2"

Prepare alligator clips around III and IV

Vla. IV 8" 14" 13"

press down on ruler with bow so that ruler is wedged between bow and IV and bow touches III

flick ruler as notated

arco, allow bow to bounce

press ruler to IV with bow, arco on edge of ruler

bow drops in swells moving towards bridge

arco, sul pont.

arco, sul pont. on III, pizz on I and III

pizz.

Remove large ruler, prepare small ruler between I, II and III

harm. shifted harmonic 32"

Vc.

Cb. I II III IV 43" 11" 10" 15" 17"

* Alternate randomly between I, II and III.

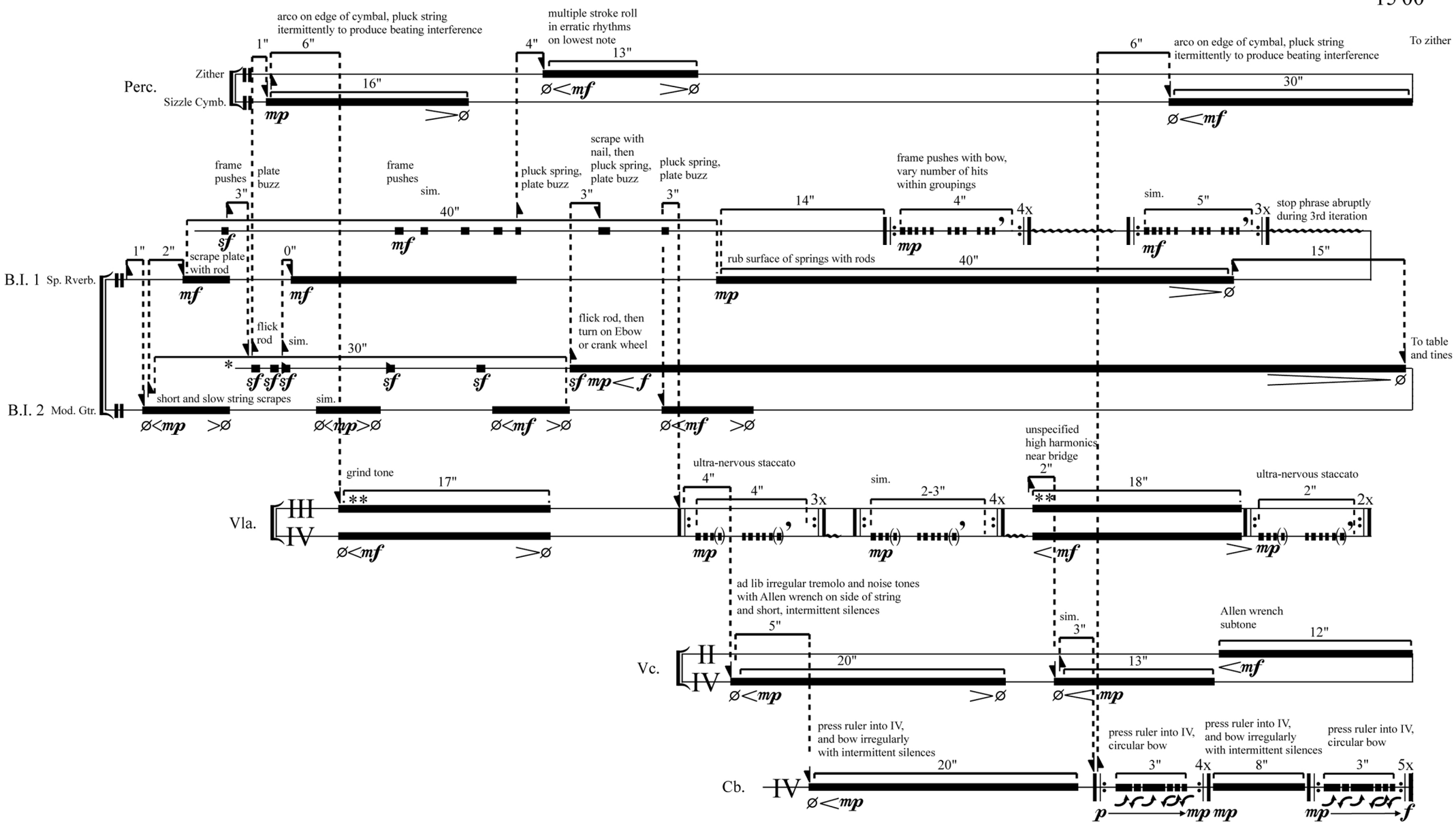
Tinguely

Perc.
Zither
A4
A3
Tam-tam
mute string with left hammer while striking string with right hammer in swells
gradually unmute string, allowing left hammer to bounce sympathetically on strings
0" 26" 0" 0" 9" 5"
Prepare large ruler on center of zither
To sizzle cymb.
<p> sim. <mf > ø
erratic bowing on tam-tam wire
p
beater roll
p mp < f
9" frame pushes
6" 15"
sf sim.
scrape plate with rods
mf
B.I. 1
Sp. Rverb.
2"
multiple stroke roll with rods
ø < mp
> ø
B.I. 2
Mod. Gtr.
Tbl. and Tines.
4"
Prepare two rods between strings at opposite ends of the guitar
flick rod, L.V.
sf
scrape edge of large ruler on tines
p
> ø
accelerating ricochet while muting string with L.H.
sim.
col legno batt., begin and end swells with L.H. mute
sim.
grind tone to accelerating ricochet
grind tone to harm./ open trill at 5th pos. to L.H. muted accelerating ricochet
1'40
col legno batt. (unmuted)
sim.
grind tone
10"
unmuted harm./open trill gliss from 5th position to bridge
Remove clip on 3, Prepare 4 alligator clips on IV
1"
Vla.
I II III IV
** **
<mf><mf> <mf><mf> <ff > <mf > <mf><mf> <ff
> ø
spiccato sul pont.
sul pont. ricochet
diagonal ricochet to riochet with Allen wrench buzz
ricochet with Allen wrench buzz, gliss to bridge
ricochet drop
diagonal ricochet
bow drop to ultra-nervous staccato with Allen wrench buzz
sim.
Allen wrench subtone
Allen wrench noise tone
4" 30" 12" 13"
(32")
Hold Allen wrench in L.H.
Vc.
I II III IV
mf mp mf ff >mf
col legno battuto
sim.
col legno buzz
L.H. pizz, col legno buzz
flick string
sim.
push ruler to IV to interfere with string
arco, push ruler to IV to interfere with string
arco, push ruler to IV, pressure vibrato
arco, gradually release pressure so ruler interferes with IV
lay stick on string sul pont.
underbow IV, press ruler to IV to interfere with string, volume swell on each downbow
sim.
flick ruler, and underbow I and IV
6" 35" 9" 8" 7" 5" 50" 11"
Cb.
I II III IV
*
sf mf sf mf f < ff > p < ff p mf p sim. > ø f > ø

* For this bracketed segment only, a normal sound block ▮ is performed while muting with the left hand, while a "winged" sound block ◗ is performed unmuted. Longer blocks indicate a longer decay.
** Alternate randomly between III and IV.

Tinguely

15'00



* For this bracketed segment only, a normal sound block ▮ is performed while muting with the left hand, while a "winged" sound block ◗ is performed unmuted.
** Alternate randomly between III, IV and double stop III and IV.

Tinguely

18'40

Perc. Zither

multiple stroke roll on lowest string — 12" — 12" — Ø<*mp*>Ø

dead roll in irregular rhythms on lowest 4 strings — 18" — *mf* >Ø

multiple stroke roll on lowest string, interrupt texture with 1-5" of silence at various moments during segment — 30" — *mp* — *ff*

multiple stroke roll in irregular rhythms beginning with lowest string and ending with highest — 25" — *ff*

dead single strokes and short (2-5 hit) rolls 1-2" apart, gradually expanding to 3-5"; gradually introduce a simultaneous second layer of single strokes in faster, erratic rhythms from *niente* to *mezzo-piano* — 1'00 — *ff* — *mp* Ø

rub hammers quickly and with rapid repetition in a downward motion along the strings over the bridge at both ends of zither — 20" — *mp* — 55" — *mp* — Ø — 12"

B.I. 1 Stl. Vc. / Sp. Rverb.

4" — frame pushes with bow, vary number of pushes within groupings, simultaneously bow frame slowly and erratically, after 2nd iteration, interrupt texture with 2-5" of silence at different moments within each iteration — 30" — 5" — *mf* — *ff*

frame pushes with bow, simultaneously bow frame slowly and erratically; ad lib accented frame pushes based on previous notated sequence — 30" — *ff*

bow frame slowly and erratically after notated ad lib accented frame pushes — 1'00 — 2" — 5" — *ff* — *mp*

col legno tratto with bow and rod — Ø<*mp* — >Ø

B.I. 2 Tbl. and Tines

Prepare cymbal on table — 4"

hit cymbal and ruler on tines with mallets in erratic rhythms, allowing time for cymbal to wobble and ruler on tines to vibrate; interrupt texture with 1-4" of silence at various moments during segment — 45" — *mf* — *ff* — *mp mp*

hit cymbal and ruler on tines with mallets in erratic rhythms, starting with a dense cluster of events and gradually slowing to allow time for cymbal to wobble and ruler on tines to vibrate — 45"

scrape edge of large ruler on tines — 6" — Ø

Vla. IV

arco norm., after 3rd iteration, interrupt repeated sequence with 3-7" of silence at different moments within each iteration — 2" — 30" — 2-3" — *mf* — *ff*

arco; ultra-nervous staccato at *piano* dynamic under notated sequence; interrupt last iteration with silence — 3" — 3x

arco; ad lib number of attacks in each iteration; ultra-nervous staccato at *piano* dynamic under notated sequence — 25" — 1-2"

ultra-nervous staccato at *mezzo-forte* dynamic level with erratic ad lib *fortissimo* accented attacks based on previous notated sequence — 20" — *f* — *ff*

ultra-nervous staccato at *mezzo-piano* dynamic after notated accented attack — 25" — 3" — 1" — *f* — 3" — *mp* >Ø

sim. — 6"

Vc. III / IV

Allen wrench buzz, gliss., irregular nervous staccato with short intermittent silences — * — 3x — 3" — 6-8" — *mf*

sim. — 2" — 2x — 8" — 36" — *mp*

ad lib irregular tremolo and noise tones with Allen wrench on side of string and short, intermittent silences — 30" — 3" — *mp* — *ff*

Allen wrench buzz, gliss., interrupt repeated sequence with 2-3" of silence at different moments within each iteration — 1" — 3"

Allen wrench buzz, gliss. — .5-1" — 6x — 2-3" — *ff*

Allen wrench buzz, gliss., gradually introduce irregular nervous staccato with short intermittent silences — .5-1" — 11x — 2-3" — *ff* — *mp*

Allen wrench buzz, gliss., irregular nervous staccato with short intermittent silences — 5" — Ø

Cb. IV

sim. — 2-3" — 4x — *mp* — *mf*

press ruler into IV, short, jerky bowing with intermittent silences — 2" — 3" — 4x — *f* — *sff*

sim. — 4" — *mf* — *mf*

press ruler into IV, circular bow, after 2nd iteration, interrupt repeated sequence with 2-4" of silence at different moments within each iteration — 30" — 3" — *mp* — *ff*

press ruler into IV, circular bow — 2" — 7x — 2-3" — 1" — 6x — *ff*

sim. — 2-3" — 5x — *ff* — *f*

press ruler into IV, short, jerky bowing with intermittent silences — 2-3" — 10x — (*mp*) — *mf*

sim. — 10" — *mp* — Ø Ø

circular bow without activating string tone while slowly and repeatedly depressing ruler lightly into IV — *mp* — Ø

April 18, 2010

* Glissando between edge of fingerboard and bridge where notated from here to end of piece.