The Space Between Us

for two string quartets and remote-performed robot percussion and piano, with all instruments spatially distributed throughout the concert hall

David A. Jaffe
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Commissioned by Other Minds, with support from the James Irvine Foundation and the Canada Council for the Arts

Robot instruments created by Trimpin and performed by Andrew Schloss using the “Boîe radiodrum” 3D sensor

Time of performance – 20 minutes

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The Space Between Us - Explanatory Notes
David A. Jaffe

1. This work is spatially conceived and must be performed in the manner described in these notes and illustrated below. While adjustments may be made to suit the particulars of a given hall, the general arrangement must be maintained.

2. The piano and percussion are arranged as follows: On the stage is a Disklavier grand piano and remote-controlled glockenspiel (near center stage), with remote-controlled xylophones on the extreme left and right of the stage (the higher pitched xylophone is on stage right) A set of eighteen remote-controlled orchestral chimes are hung from the ceiling above the audience. These are arranged in three rows (as viewed from the stage.) To the left, from front to back, are chimes C4, D#4, F#4, A4, C5, and D#5. In the center, from front to back, are chimes C#4, E4, G4, A#4, C#5, and E5. To the right, from front to back, are chimes D4, F4, G#4, B4, D5 and F5.

3. The radiodrum performer is situated near center stage, facing the audience. He performs all of the remote-controlled percussion, as well as the Disklavier piano. He also gives some cues to the string players.

4. The string players are positioned in the audience, along the left and right aisles of the hall as follows: The members of string quartet A are on the left side of the hall (as viewed from the stage), while the members of string quartet B are on the right side of the hall. The order of players from front to back is violin 1, violin 2, viola, cello. The violins and violas are positioned in the aisles, while the cellos are along the back wall or a row near the back of the hall. The string players must be positioned such that they can see one another, as well as the radiodrum performer.

5. The work was conceived such that the players proceed independent of one another after each initial entrance. Boxed text gives directions as to who cues each entrance. Where cues are given, these are used to indicate an entrance. The term “independently” is used to indicate a soloistic manner of playing without rhythmic coordination, while the term “synchronized” is used to indicate sections where players must maintain rhythmic coordination.

6. Rehearsal letters are used only where there is a point of synchronization. Not every rehearsal letter appears in every part. For example C2 is a viola/cello entrance that occurs 40 seconds after C1. Since this is not a significant well-defined point of synchronization for the violins, they do not include C2.

7. Fermati in independent sections are at the discretion of the player. Small fermati in parenthesis are relatively short fermati intended primarily to prevent undesirable synchronization.

8. Metronome markings should be followed as strictly as possible, to maintain the appropriate lengths of sections. However, if two players are given the same metronome marking but are marked “proceed independently,” it is assumed that strict rhythmic coordination will not be maintained.

9. The score often shows only the beginning of independent sections, referring to an appendix, which contains the complete material.

10. The radiodrum part is only partially notated. The complete description of the material is given by the combination of the notated directions and the custom software written by the composer in Max MSP. This software is available along with the score.

11. The radiodrum part is organized in a series of program configurations called “cues.” A one octave set of organ-style MIDI foot-pedals are used to advance sequentially through these programs and to enable various modes, as indicated in the score by such indications as “ENABLE PEDAL.” “Whack mode” denotes that an action occurs when the
performer strikes the surface of the radiodrum; in this mode, “velocity” denotes how hard the surface is struck (more precisely, the speed of the change of direction of the mallet as it strikes the surface.) “Continuous mode” denotes that the position of the mallet is sensed in three dimensions above the surface of the radiodrum. “X” and “Y” denote Cartesian coordinates on and above the surface, while “Z” denotes the height above the surface. “Region” denotes a partitioning of the drum into a 4 x 3 grid, with “region 0” in the lower left hand corner of the radiodrum, region 1 to its right, etc.
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Solo (begin alone)

Largamente (♩=68)

espress. sosten., tranquillo, con poco rubato

show shifts, con vib. sul D

loco

Vc. A continues independently; see appendix A

follow cues for Vc. B

follow cues for Vc. A

Vc. B

sul A
Radiodrum

Violin 1A

Violin 1B

Violin 2A

Violin 2B

Viola A

Viola B

Violoncello B

follow cues for Vla. A

follow cues for Vla. B

Proceed independently

espress. sosten., tranquillo, con poco rubato

Vla. A continues independently; see appendix A

Vla. B continues independently; see appendix A

Vc. A continues independently; see appendix A

Vc. B continues independently; see appendix A

con vib.
Radiodrum

Violin 1A

Violin 1B

Violin 2A

Violin 2B

Viola A

follow cues for Vln. 1B

follow cues for Vln. 2B

Proceed independently
express. sosten., tranquillo, con poco rubato

Proceed independently
express. sosten., tranquillo, con poco rubato

Proceed independently
express. sosten., tranquillo, con poco rubato

Follow cues for Vln. 2A

Vln. 2A continues independently; see appendix A

Proceed independently
express. sosten., tranquillo, con poco rubato

Vln. 2B continues independently; see appendix A

Vla. A continues independently; see appendix A

Vla. B and Cellos continue independently; see appendix A
follow cues for Vln. 1A

Violin 1A

Proceed independently; see appendix A

Violin 1B

Vln. 1B continues independently; see appendix A

Violins 2, Violas, and Cellos continue independently; see appendix A
Continue independently.
LH/RH Whack
Sequential drum (play each note)
Glock.

All strings continue independently; see appendix A
Ascending scales.
LH: Cont. Speed X/Y (lower left is fastest)
RH: Whacks pick out ascending scale notes (Y=xyl [far]/piano [near]) - speed up gradually (makes smaller intervals)

All strings continue independently; see appendix A
Andante Maestoso ($\sim$78)

Ascending scales continue (LH: Cont. Speed X/Y)
RH: Sequential drum (piano/glk.)

Raise RH to cue strings to stop.

All strings continue independently until cue from Radiodrum, then play to next rest and stop; see appendix A. Then all strings tacet until section B.
Solo (unaccompanied)

Gradually lower LH, keeping in upper Y region

Continue lowering LH to surface, moving towards lower Y region

Piano

follow cues for Vla. A

Begin together with Vla. B (cue entrance), then proceed independently.

parlando express.

Begin together with Vla. A (follow cue), then proceed independently.
Moderato misterioso \((\approx 92)\) (violins 1 only)

- Proceed independently of violas, but synchronized with Vln. 1B.
- Proceed independently of violas, but synchronized with vln. 1A.

Violas continue; with two additional starts, cued by Vla. A; see appendix B1.

Violas continue; see appendix B.
Violin 1A

Violin 1B

Tacet until section C

Violin 2A

Violin 2B

Tacet until section C

Radiodrum

wait 10" after violins 2 and cellos enter, then proceed independently

Begin together with Vln. 2B (follow cue), then proceed independently

parlando espress.
sul G and D only

When violins 1 finish, begin together with Vln. 2A and Cello B (cue entrance), then proceed independently

parlando espress.
sul D

Violas continue; see appendix B1.

Moderato (♩ = 92) (cellos only)

Begin on cue from Vln. 2B

pesante e misterioso secco

follow cues for Vc. B

Violoncello A

follow cues for Vc. A

pesante e misterioso secco

Continue independently

Violoncello B

p mf

p mf sub.

p < >
**Misterioso (♩=104)**

Radiodrum

Piano, single notes
(pitches constrained as shown in parentheses)
simile

octaves

Advance cue
when cellos
are finished.

Advance cue
when violas
are finished.

Advance cue
when all strings
are finished.

Advance cue
when violins
are finished.

Violins 2 continue until end of material; see appendix B3.

Violas continue until end of material; see appendix B1.

Cellos continue until end of material; see appendix B3.
Solo (1' until Cue 19)

Each cue moves the range higher until it reaches mid-range.

RH: Slow irregular whacks on right side of drum, then just RH and LH up.

Largo (46)

RH: 4 whacks on right side of drum, then LH (cont.) descends and moves left to right quickly.
Make sure violins have entered. Then RH Whack does cut-off (+cue:20)

At peak of radiodrum cresc. (just before cut-off), cue violins to begin together. Then proceed independently.

swing all sixteenths in this section
(\(\frac{3}{8}\) = triplet: \(\frac{\times}{2}\))
Violin 1A continues until end of material; see appendix C1.

Violin 1B continues until end of material; see appendix C1.

Violin 2A continues until end of material; see appendix C1.

Violin 2B continues until end of material; see appendix C1.

Viola A cues C2 after violins have been playing for 40" (violins continue) Enter together with Vla. B and cellos. Then proceed independently.

Begin on cue from Vla. A. Then proceed independently.

Begin on cue from Vla. A. Then proceed independently.

Pizz. sul tasto normale, with two fingers of right hand

Begin on cue from Vla. A. Then proceed independently.

Pizz., poco sul tasto poco pesante

Begin on cue from Vla. A. Then proceed independently.

Adagio \( \langle 72 \)
Violins continue until end of material; see appendix C1.

Viola A continues until end of material; see appendix C2.

Viola B continues until end of material; see appendix C2.

Cello A continues until end of material; see appendix C2.

Cello B continues until end of material; see appendix C2.
Begin independently, 20" after viola/cello entrance.
Repeated note slow-downs.
Whack: RH start, LH stops most recent (goes back in time.)
RH X=pitch, Y=slow-down factor, V=initial speed/dynamic level.
LH Whack: Y=instrument for start/stop (high=glock, mid-high=xyl), when RH in range.
LH Continuous: Z fades out sounding notes.
Use "enable" pedal to cycle between three pitch sets.

Piano + glock./xyl optionally on starts and stops (see above)
X is all low range

+CUE:21
ENABLE PEDAL

Advance cue when violas/cellos finish.

Violins, violas and cellos continue until end of material; see appendix C1 and appendix C2.
Radiodrum

Continue, X now full range.
Start with quiet ascents.

Piano,
glock., xyl. →  →  ←  ←

Solo (50")

Continue, varied dynamics, gradually bring in xyl./glock, though never all the time. Use 8 p notes to "wipe out" annoying loud ones, etc.

Adagio Tranquillo (q=60)

L.V.

Chimes

+CUE:22

+CUE:23
Cue violins and violas to begin together, then proceed independently.  

Vln. 1A continues until end of material; see appendix D1.
Vln. 1A continues until end of material; see appendix D1.

Vln. 2B continues until end of material; see appendix D3.
Vln. 1A continue until end of material; see appendix D1.

\[ \text{D4} \]

\begin{align*}
\text{Begin on cue from Vln. 2A, then proceed independently.} \\
\text{\textbf{j} = 120, ben ritmico} \\
\text{sautille leggiero} \\
\text{Vln. 1B continues until end of material; see appendix D4.}
\end{align*}

\begin{align*}
\text{Vln. 2B and Vla. A continue until end of material; see appendix D3.}
\end{align*}

\begin{align*}
\text{Begin on cue from Vln. 2A, then proceed independently.} \\
\text{\textbf{j} = 120, ben ritmico} \\
\text{sautille leggiero} \\
\text{Vla. B continues until end of material; see appendix D4.}
\end{align*}

\begin{align*}
\text{Begin on cue from Vln. 2A, then proceed independently.} \\
\text{\textbf{j} = 120, ben ritmico} \\
\text{sautille leggiero} \\
\text{Vc. A continues until end of material; see appendix D4.}
\end{align*}

\begin{align*}
\text{Vc. B continues until end of material; see appendix D2.}
\end{align*}
LH Cont. "Circles" on plane slanted up and away from you.*

Wait for any string player to play repeated notes (as shown above) and stop. Then proceed.

Any string player (cues)

*Cue: Start near top of Y, mid-X, above surface so doesn’t play. Make a sweeping circle, quickly, going to lower Ys and closer to surface, then move to higher Xs, then higher Ys, then to above surface. Move faster in the middle of the circle (as if gravity is pulling your hand down.)

All strings continue until end of material; see appendix D1, D2, D3 and D4.
Wait for any string player to play repeated notes (as shown above) and stop. Then proceed.

All strings continue until end of material; see appendix D1, D2, D3 and D4.
Do several faster circles, pause, do a few more, then finish with a slower one, which ends \( p \) (i.e. somewhat off surface) in upper Y region. Repeated notes continue (slowly).

All strings continue until end of material; see appendix D1, D2, D3 and D4.
Synchronized (strings enter based on chime cues) until E2

Adagio (q=54)

Radio-drum

P

\(+\text{CUE:26}\)

Follow cues for chimes

Molto sul tasto senza vib.

Violin 1A

Violin 1B

Violin 2A

Violin 2B

Viola A

Viola B

Violoncello A

Violoncello B

Chimes

RH/LH Whack. Sequential drum (one hit per note.)

Synchronized (strings enter based on chime cues) until E2

Cut-off on radiodrum cue at E2, then proceed independently.
Cue E2 and proceed independently.

Radiodrum

Solo (unaccompanied)

Ad. lib. hocket, start with moderate speed,
front/back diagonal alternation,
"dip" from above misterioso,
various speeds, dynamics, etc.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

Piu lento \( \left( \frac{q}{50} \right) \) parlando espress.

All strings continue until end of material
(see appendix E2), concluding with fermata
(shown in score immediately before E3).
Proceed to E3 when all strings have reached fermata and radiodrum (chimes) has finished.

 accel. - - - Presto

(L.V.)

(Solo continues)

+CUE:28

All strings continue until end of material (see appendix E2) concluding with fermata (shown in score immediately before E3).
Synchronized. Vln. 2A cues strings at each arrow.

Follow string cues

Follow chime cues

Chimes, like a jazz "ride cymbal" pattern.

Vln. 2A cues strings at each arrow.

LH/RH Whack.

12 zones ("drum set" mapping to piano)
Continue playing notated chimes, gradually add zone 0, etc. (but avoid 10 and 11), irregular and syncopated, becoming quite dense.

zone 8
Radiodrum proceeds independently.
Strings follow cues for entrance, then proceed independently.

Harp-like "strums," generally ascending

diminuendo (match chime decay), but with variety in dynamics and range.
Vary speed of "strum" to get different arpeggios.

Vl. B continues until radiodrum stops (before G), then finishes material; see appendix F.

Vc. A continues until radiodrum stops (before G), then finishes material; see appendix F.

Vc. B continues until radiodrum stops (before G), then finishes material; see appendix F.
Radiodrum

Violin 1A

Violin 1B

Violin 2A

Violin 2B

Viola A

follow cues for Vlns. 2 and Vln. 1B

f pesante, con forza

fp

follow cues for Vlns. 2

f pesante, con forza

Vln. 1B continues until radiodrum stops (before G), then finishes material; see appendix F..

Vln. 2A continues until radiodrum stops (before G), then finishes material; see appendix F..

Vln. 2B continues until radiodrum stops (before G), then finishes material; see appendix F..

Vla. A continues until radiodrum stops (before G), then finishes material; see appendix F.

Cellos and Vla. B continue until radiodrum stops (before G), then finish material; see appendix F.
Simple African 6/8 patterns, using zones 0, 1 and 3, 7. Avoid zones 9 and 11 (xyl.)

Continue pattern. Depress pedal to enable LH cont. (No LH whack.)

Solo w/strings (1’ to G)

Vln. 1A continues until radiodrum stops (before G), then finishes material; see appendix F.

Cellos, Violas, Vlns. 2 and Vln. 1B continue until radiodrum stops (before G), then finish material; see appendix F.
Add zones 8 and 10.
Lift pedal.
Depress pedal to enable LH cont.
Include LH whacks also.
(Wait for strings to finish,
then short G.P., then cue G)

+CUE:31

All strings continue until radiodrum stops (before G), then finish material; see appendix F.
Radiodrum cues strings and all parts proceed independently.

Maestoso, meno mosso

Simple African pattern, heavier.
Alternate with steadily-repeated zones with cresc. and dim., causing expansion/contraction of chord.
Enable pedal for LH cont. (X = pitch), disable, enable, etc. Enable pedal disables xyl.
More complex.

Solo w/strings (40")

xyl. doubling added. Dynamic=width of xyl. chord.

ENABLE PEDAL

Vl. A continues.
See appendix G

Vl. 1A continues.
See appendix G

Vl. 1B continues.
See appendix G

Vl. 2A continues.
See appendix G

Vl. 2B continues.
See appendix G

Vla. A continues.
See appendix G

Vla. B continues.
See appendix G

Vc. A Tacet until I1

Vc. B Tacet until I1
Violins and violas ad. lib. cresc./dim, at varying speeds, until radiodrum stops. Then immediately proceed (independently.)

Violins and violas continue (see appendix G) until material is finished, then proceeds to fermati.
Wait for violins to reach high passage (H2) after glissando.
Then proceed (after 3" rest).

LFRH Whack. Y = register. X left versus X right = scale
Extreme X are xyl. only; center X is piano only; mid-L and mid-R are piano+xyl.
Rapid material, patterns, bounces. Varied.

\[ f \quad \text{Solo w/strings at first (1' 20" to I1)} \]

+ CUE: 32

Largo (\( \text{\textsl{L}} \) 48)  \[ \text{\textsl{molto espress. e sosten.}} \]
use one finger throughout

Vln. 1A continues (see appendix H2).

Vln. 1B continues (see appendix H2).

Vln. 2A continues (see appendix H2).

Vln. 2B continues (see appendix H2).

Vla. A Tacet until I1

Vla. B Tacet until I1
Same mapping, but piano continuous mode (LH/RH), xyl. whack mode.

Violins continue (see appendix H2) until material is finished, then Tacet until I1.
Same mapping, but with addition of glock., chimes and piano sus. Xyl. tacet.

Move gradually to minimum Y, then (when strings are playing H1) one RH whack in low Y to start xylophone, then lift Z (LH/RH) suddenly for cut-off.

RH Whack (low Y) starts xyl. ↓

Lift RH/LH (Z) suddenly to cut off all

fff xyl.
All strings play fermata on cue from radiodrum at I1 (immediately before his cut-off). Hold until cue from Vln. 2A. Then proceed, synchronized, following Vln. 2A at arrows.
Continue, synchronized in two groups.
Quartet A follows Vln. 2A at arrows.
Quartet B follows Vln. 2B at arrows.
Continue, synchronized in two groups.
Violins follow Vln. 2A at arrows.
Violas and Cellos follow Vla. B after the initial down-beat.

(wait for violas/cellos to finish)

(wait for violins to finish)
Radiodrum
Violin 1A
Violin 1B
Violin 2A
Violin 2B
Viola A
Viola B
Violoncello A
Violoncello B

**J1**
\( \text{j=100} \)

\( \text{Xyl./piano} \)
\( \text{(w/ octave/tritone duplication)} \)

\( \text{p} \)
\( \text{con rubato (independent for each voice)} \)

**Vln. 2A cues entrance and cut-off.**

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

\( \text{senza vib.} \)
\( 5'' \)
\( 25'' \)

Proceed independently.
Time map*, RH whack to start. RH cont. Z is dynamic scaling.
LH cont. X/Y are delay of lower/upper melodies respectively.
Begin in left lower corner, move right ad. lib. to cause melodies to diverge.

\*Auto-play multiple instances and octave transpositions of sequence shown.
Radiodrum continues until material is finished (see appendix J1).

Then tacet until K1.
Radiodrum continues until material is finished (see appendix J1). Then tacet until K1.

[Violins and violas begin together on cue from Vln. 2A, then proceed independently.]

Violin 1A

Violin 1B

Violin 2A

Violin 2B

Viola A

Viola B

Violoncello A

Violoncello B
Radiodrum continues until material is finished (see appendix J1). Then tacet until K1.
Radiodrum continues until material is finished (see appendix J1). Then tacet until K1.
Radiodrum continues until material is finished (see appendix J1). Then tacet until K1
Radiodrum continues until material is finished (see appendix J1). Then tacet until K1.
Radiodrum continues until material is finished (see appendix J1). Then tacet until K1.
Radiodrum cues strings to cut-off on down-beat of K1 and all parts proceed, synchronized.

Chimes+piano+glock.
Radiodrum

Violin 1A

Violin 1B

Violin 2A

Violin 2B

Viola A

Viola B

Violoncello A

Violoncello B

moltò espress. e legato

sul D

sul A

sul D

moltò espress. e legato

sul D

sul A

sul D

moltò espress. e legato

sul D

sul A

sul D

moltò espress. e legato

sul D

sul A

sul D

moltò espress. e legato

sul D

sul A

sul D

moltò espress. e legato

sul D
piano, doubling string and chime pitches (8va/15ma)

RH/LH Whack: Low Y = string pitches, high Y = chime pitches.
Mid X = current pitch, low X = previous note, high X = next note.
ad lib. speed-ups/slow-downs, various. Sparse at times. Mainly in lower Ys.
Upper right corner of drum plays most recent note on Xyl; pause after playing it.

sul G
sul A
Radiodrum

Violin 1A

Solo, dolce sosten.

---

Violin 1B

---

Violin 2A

---

Violin 2B

---

Viola A

---

Viola B

---

Violoncello A

---

Violoncello B

---

LH

chimes/piano

RH

57

Proceed independently

Vln. 1A continues until end of material (see appendix K3).
Then tacet al fine.

---

Vln. 2A continues until end of material (see appendix K3).
Then tacet al fine.

---

Vln. 2B continues until end of material (see appendix K3).
Then tacet al fine.
Vln. 1A continues until end of material (see appendix K3). Then tacet al fine.

Vlns. 2 continue until end of material (see appendix K3). Then tacet al fine.

Vla. A continues until end of material (see appendix K3). Then tacet al fine.

Vla. B continues until end of material (see appendix K3). Then tacet al fine.

Vc. A continues until end of material (see appendix K3). Then tacet al fine.

Vc. B continues until end of material (see appendix K3). Then tacet al fine.
Cont. mode.
Slowly lower RH/LH to surface.

Radiodrum

Vln. 1A continues until end of material (see appendix K3). Then tacet al fine.

Vln. 1B continues until end of material (see appendix K3). Then tacet al fine.

Vlns. 2, violas and cellos continue until end of material (see appendix K3). Then tacet al fine.
All strings continue until end of material (see appendix K3). Then tacet al fine.
Appendix A

Violoncello A
Largamente (\( \approx 68 \))
Solo (begin alone)
express. sosten., tranquillo, con poco rubato
show shifts, con vib.
sul D
Vc. A

Violoncello B
Largamente (\( \approx 68 \))
Proceed independently
express. sosten., tranquillo, con poco rubato
senza vib.
sul C
Vc. A

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Appendix A (continued)

Viola B
Largamente (q=68)

Proceed independently
espress. sosten., tranquillo, con poco rubato

Vla. B
(Vc. A)

Repeat until radiodrum cue.
Then continue until next rest.

Viola A
Largamente (q=68)

Proceed independently
espress. sosten., tranquillo, con poco rubato

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Appendix A (continued)

Violin 2A
Largamente \( (\text{\textit{j}}=68) \)

\[ \text{Proceed independently} \]

- \textbf{espress. sosten., tranquillo, con poco rubato}
- \textbf{con vib.}

Vln. 2A

Violin 2B
Largamente \( (\text{\textit{j}}=68) \)

\[ \text{Proceed independently} \]

- \textbf{espress. sosten., tranquillo, con poco rubato}

Vln. 2B

Violin 1B
Largamente \( (\text{\textit{j}}=68) \)

\[ \text{Proceed independently} \]

- \textbf{espress. sosten., tranquillo, con poco rubato}

Vln. 1B

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Appendix A (continued)
Appendix B1

Viola A

[B1] Begin together with Vla. B (cue entrance), then proceed independently

parlando express.

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

Vln. 2A

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Appendix B3

Violin 2A

Begin together with Vln. 2B (follow cue), then proceed independently
parlando espress.

Vln. 2A

\[
\begin{align*}
&\text{parlando espress.} \\
&\text{sul G and D only}
\end{align*}
\]

Violin 2B

When violins 1 finish, begin together with Vln. 2A and Cello A (cue entrance), then proceed independently
parlando espress.

Vln. 2B

\[
\begin{align*}
&\text{parlando espress.} \\
&\text{sul G}
\end{align*}
\]

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Appendix B3 (continued)

Violoncello A

**B3**

Moderato (\(=92\))

*pesante e misterioso*

*secco*

\[ \begin{array}{c}
\text{Vc. B} \\
\text{Moderato (\(=92\))} \\
\text{*pesante e misterioso*} \\
\text{*secco*} \\
\text{Vc. B} \\
\end{array} \]

Violoncello B

**B3**

Moderato (\(=92\))

*pesante e misterioso*

*secco*

\[ \begin{array}{c}
\text{Vc. B} \\
\text{Moderato (\(=92\))} \\
\text{*pesante e misterioso*} \\
\text{*secco*} \\
\text{Vc. B} \\
\end{array} \]

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Appendix C1

Violin 1A

At peak of radiodrum cresc. (just before cut-off),
cue violins to begin together. Then proceed independently.

swing all sixteenths in this section

(piano) enters. Then stop immediately.

Repeat, taking longer and longer fermati, until radiodrum
(piano) enters. Then stop immediately.
Appendix C1 (continued)

Violin 1B

C1  
Begin on cue from Vln. 1A. Then proceed independently. Swing all sixteenths in this section (\( \frac{\text{q}}{3} \) = triplet: \( \frac{\text{q}}{2} \))

\[ J = 96 \]

secco

p  mp

mp sub.

\[ J = 104 \]

piu mosso

\[ J = 112 \]

piu mosso

\[ J = 120 \]

piu mosso

Stop immediately when piano enters

simile
Appendix C1 (continued)

**Violin 2A**

\[ \text{\( \frac{\text{C1}}{\text{pp}} \) Begin on cue from Vln. 1A. Then proceed independently con vib.} \]

\[ \text{swing all sixteenths in this section (\( \frac{\text{3}}{\text{2}} = \text{triplet:} \frac{\text{3}}{\text{2}}) \)} \]

\[ \text{\( \frac{\text{mp}}{\text{p}} \) \( \frac{\text{mf}}{\text{f}} \) \( \text{piu mosso (} \frac{\text{q}}{\text{100)} \) \)} \]

\[ \text{\( \frac{\text{mp}}{\text{p}} \) \( \text{piu mosso (} \frac{\text{q}}{\text{108)} \) \)} \]

\[ \text{\( \frac{\text{mf}}{\text{f}} \) \( \text{piu mosso (} \frac{\text{q}}{\text{120)} \) \)} \]

\[ \text{\( \frac{\text{f}}{\text{p sub.} \text{ mf}} \) \( \frac{\text{fermati on repeats only}}{\text{(\( \frac{\text{3}}{\text{2}} \))}} \)} \]

\[ \text{\( \frac{\text{f}}{\text{f}} \) \( \text{Repeat, taking longer and longer fermati, until radiodrum (piano) enters. Then stop immediately.} \)} \]
Appendix C1 (continued)

**Violin 2B**

[C1]

- **Begin on cue from Vln. 1A.**
- **Then proceed independently.**
- **swing all sixteenths in this section** (triplet: \( \frac{3}{4} \))

**Vln. 2B**

- **pp**
- **mp**

**piu mosso** (\( \frac{3}{4} = 92 \))

**Vln. 2B**

- **pp**
- **p**
- **mp**
- **mf**

**Vln. 2B**

- **pp**
- **p**
- **mf**

**Vln. 2B**

- **mp**
- **mf**
- **f**
- **p**

**Vln. 2B**

- **f**

**Vln. 2B**

- **con vib.**

- **secco**

- **fermaturi on repeats only**

Repeat, taking longer and longer fermatì, until radiodrum (piano) enters. Then stop immediately.
Appendix C2

Viola A

Cue C2 after violins have been playing for 40" (violins continue).
Enter together with Vla. B and cellos.
Then proceed independently.

<table>
<thead>
<tr>
<th>Vla. A</th>
<th>C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>pizz. sul tasto &amp; secco &amp; poco rit. &amp; secco &amp; su tasto &amp; normale &amp; poco mosso ((\approx)116)</td>
<td></td>
</tr>
<tr>
<td>f &amp; mf &amp; sosten. sonoro</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vla. A</th>
</tr>
</thead>
<tbody>
<tr>
<td>poco rit. &amp; su tasto &amp; normale &amp; poco mosso ((\approx)126)</td>
</tr>
<tr>
<td>f &amp; mf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vla. A</th>
</tr>
</thead>
<tbody>
<tr>
<td>poco rit. &amp; secco</td>
</tr>
<tr>
<td>f &amp; mf</td>
</tr>
</tbody>
</table>

Viola B

Begin on cue from Vla. A.
Then proceed independently.

<table>
<thead>
<tr>
<th>Vla. B</th>
<th>C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>pizz. sul tasto &amp; secco &amp; poco rit. &amp; secco &amp; su tasto &amp; normale &amp; meno mosso ((\approx)126)</td>
<td></td>
</tr>
<tr>
<td>f &amp; mf &amp; sonoro</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vla. B</th>
</tr>
</thead>
<tbody>
<tr>
<td>poco rit. &amp; su tasto &amp; normale &amp; meno mosso ((\approx)116)</td>
</tr>
<tr>
<td>f &amp; mf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vla. B</th>
</tr>
</thead>
<tbody>
<tr>
<td>meno mosso ((\approx)96)</td>
</tr>
<tr>
<td>f &amp; mf</td>
</tr>
</tbody>
</table>

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Appendix C2 (continued)

Violoncello A

**C2**

Begin on cue from Vla. A.
Then proceed independently

\[=96\]

**pizz., poco sul tasto**

\[=96\]

**poco pesante**

\[=96\]

**rit. piu pesante**

\[=84\]

**piu pesante**

\[=96\]

**subito**

\[=96\]

**subito**

\[=120\]

**poco rit.**

\[=120\]

**piu mosso subito**

\[=96\]

**piu mosso**

\[=96\]

**piu mosso subito**

\[=120\]

**meno mosso**

\[=96\]

**Adagio**

\[=72\]

**pizz., poco sul tasto**

**molto pesante**

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Appendix D1

Violin 1A

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Appendix D2

Violoncello B

Cue violas and Vlc. A, then proceed independently

$\frac{j}{\text{= 84 (ben ritmico sempre)}}$

col legno battuto (use dowel), con vib.

\begin{align*}
\text{Vln. 1A} & \quad \text{mf sosten.}
\end{align*}

\begin{align*}
\text{Vc. B} & \quad \text{p sosten.}
\end{align*}

\begin{align*}
\text{Vc. B} & \quad \text{f}
\end{align*}

\begin{align*}
\text{Vc. B} & \quad \text{as needed to pick up bow arco normale sosten}
\end{align*}

\begin{align*}
\text{Vc. B} & \quad \text{p} \quad \text{f} \quad \text{p}
\end{align*}
Appendix D3

**Violin 2B**

\[ J = 112 \]

\[ \text{ben ritmico} \]

\[ \text{ricochet} \]

\[ \text{Cue Vln. 2A, Vln. 1B, violas, and cellos, then proceed independently} \]

**Viola A**

\[ J = 108, \text{ben ritmico} \]

\[ \text{ricochet} \]

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Appendix D4

Violin 1B

\(\text{mf} \quad \text{qq qq} \quad \text{= 120, ben ritmico} \)

\(\text{Vln. 1B} \quad \text{D4} \quad \text{sautille leggiero} \)

\(\begin{align*}
\text{Vln. 1B} & \quad \text{mf} \\
\end{align*} \)

\(\begin{align*}
\text{Vln. 1B} & \quad \text{= 120, ben ritmico} \\
\end{align*} \)

\(\text{fp} \quad \text{sosten.} \)

\(\text{f} \quad \text{p} \)


Violin 2A

\(\text{mf} \quad \text{qq qq} \quad \text{= 120, ben ritmico} \)

\(\text{Vln. 2A} \quad \text{D4} \quad \text{sautille leggiero} \)

\(\begin{align*}
\text{Vln. 2A} & \quad \text{mf} \\
\end{align*} \)

\(\begin{align*}
\text{Vln. 2A} & \quad \text{= 120, ben ritmico} \\
\end{align*} \)

\(\text{fp} \quad \text{sosten.} \)

\(\text{f} \quad \text{p} \)

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Appendix D4 (continued)

Viola B

\[ \text{D4} \]

\[ \text{mf} \]

\[ \text{sq \ sq} = 120, \text{ ben ritmico} \]

\[ \text{sautille leggiero} \]

Vla. B

\[ \text{fp} \]

sosten.

\[ f \]

p

Violoncello A

\[ \text{D4} \]

\[ \text{mf} \]

\[ q = 120, \text{ ben ritmico} \]

\[ \text{sautille leggiero} \]

Vc. A

\[ \text{fp} \]

f

p

\[ \text{sosten.} \]

\[ \text{f} \]

\[ \text{p} \]
Appendix E2 (continued)

Viola A

\[
\text{parlando espress.}
\]

Viola B

\[
\text{parlando espress.}
\]

Violoncello A

\[
\text{parlando espress.}
\]

Violoncello B

\[
\text{parlando espress.}
\]
Appendix F

Violoncello B

L'istesso tempo (≈80)

f pesante, con forza

Vc. B

f

mf

fp

p

<

p

f

5

con rubato

Vc. B

p

<

fp

p

f

5

Vc. B

fp

Vc. B

Vc. A

L'istesso tempo (≈80)

Proceed independently

Vc. A

f pesante con forza

Vc. A

fp

Vc. A

fp

Vc. A

Vc. A

Vc. A

fp

Vc. A

p

fp

p

f

5

fp

p

<

f

3

fp

p

<

p

f

5

sul G

Repeat until radiodrum stops playing.
Then play to the end of the measure you are currently playing, then jump to φ.

Vc. B

Vc. A

Repeat until radiodrum stops playing.
Then play to the end of the measure you are currently playing, then jump to φ.
Appendix F (continued)

Viola B

L’istesso tempo (≈80)

Proceed independently

Vla.B

Vl.A

Vla.B

sul G, con vib.

secco

con vib.

sul D

con vib.

Vla.B

secco

Repeat until radiodrum stops.

Then play to next 8, then jump to φ.

Viola A

L’istesso tempo (≈80)

Proceed independently

Vla.A

Vla.A

Vla.A

Vla.A

Vla.A

Repeat until radiodrum stops.

Then play to next 8, then jump to φ.
Appendix F (continued)

Violin 2B

\textbf{F} L'istesso tempo (\textit{=80})

\begin{enumerate}
\item Proced independently
\item con vib.
\end{enumerate}

Violin 2A

\textbf{F} L'istesso tempo (\textit{=80})

\begin{enumerate}
\item Proced independently
\end{enumerate}

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Appendix F (continued)

Violin 1B

F1 L'istesso tempo (\( \frac{3}{8} \)=80)

\( f \) pesante, con forza

Vln. 1B

\( f \) con molto vib.

Vln. 1B

\( f \) with one finger

Vln. 1B

\( f \) sul A

Vln. 1B

\( f \) sul A

Vln. 1B

\( f \) sul A

Violin 1A

F1 L'istesso tempo (\( \frac{3}{8} \)=80)

\( f \) pesante, con forza

Vln. 1A

\( f \) con molto vib.

Vln. 1A

\( f \) sul A

Vln. 1A

\( f \) sul A

Vln. 1A

\( f \) sul A

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Appendix G

Violin 1A

\[ \text{Begin on radiodrum cue (with violins and violas), then proceed independently.} \]

\[ J = 72 \]

(soft trill during gliss.) molto vib.

Attacca

Violin 1B

\[ \text{Begin on radiodrum cue (with violins and violas), then proceed independently.} \]

\[ J = 72 \]

(soft trill during gliss.) molto vib.

Attacca
Appendix G (continued)

Violin 2A

Begin on radiodrum cue (with violins and violas), then proceed independently. (semitone trill during gliss.) molto vib. \( \uparrow \)

\( j = 72 \)

Violin 2B

Begin on radiodrum cue (with violins and violas), then proceed independently. (semitone trill during gliss.) molto vib. \( \uparrow \)

\( j = 72 \)
Appendix G (continued)

Viola A

\[ G \]

\[ \text{Begin on radiodrum cue (with violins and violas), then proceed independently.} \]

\[ J = 72 \]

\[ \text{(semitone trill during gliss.)} \]

\[ \text{f sosten.} \]

\[ \text{molto vib.} \]

\[ \text{attacca} \]

Viola B

\[ G \]

\[ \text{Begin on radiodrum cue (with violins and violas), then proceed independently.} \]

\[ J = 72 \]

\[ \text{(semitone trill during gliss.)} \]

\[ \text{f sosten.} \]

\[ \text{molto vib.} \]

\[ \text{attacca} \]
Appendix H2

Violin 1A
Largo ($q=48$) use one finger throughout
molto espress. e sosten.

Violin 1B
Largo ($q=48$) use one finger throughout
molto espress. e sosten.

Violin 2A
Largo ($q=48$) use one finger throughout
molto espress. e sosten.

Violin 2B
Largo ($q=48$) use one finger throughout
molto espress. e sosten.
Appendix J1

Proceed independently.
Time map*, RH whack to start. RH cont. Z is dynamic scaling.
LH cont. X/Y are delay of lower/upper melodies respectively.
Begin in left lower corner, move ad. lib. to cause melodies to diverge.

*Auto-play multiple instances and octave transpositions of sequence shown.
Appendix K3

Violin 1A (from 6 ms. after K3)

L'istesso tempo

Proceed independently

Vln. 1A

\[ \frac{3}{4} \]

\( \text{con vib.} \)

\( \text{spicc.} \)

\( \text{pizz.} \)

\( \text{arco} \)

\( \text{spicc.} \)

\( \text{col legno battuto} \)

\( \text{arco normale} \)

\( \text{ricochet,} \)

\( \text{pizz.} \)

\( \text{slap fingerboard} \)

\( \text{arco sul tasto} \)

\( \text{normale} \)

\( \text{ricochet} \)

\( \text{pizz.} \)

\( \text{arco normale} \)

\( \text{col legno battuto} \)

\( \text{arco normale} \)

\( \text{ricochet} \)

\( \text{pizz.} \)

\( \text{arco normale} \)

\( \text{col legno battuto} \)

\( \text{Tacet al Fine} \)

Violin 2A (from 6 ms. after K3)

L'istesso tempo

Vln. 2A

\[ \frac{3}{4} \]

\( \text{spicc.} \)

\( \text{pizz.} \)

\( \text{arco} \)

\( \text{spicc.} \)

\( \text{col legno battuto} \)

\( \text{arco normale} \)

\( \text{ricochet,} \)

\( \text{pizz.} \)

\( \text{slap fingerboard} \)

\( \text{arco sul tasto} \)

\( \text{normale} \)

\( \text{ricochet} \)

\( \text{pizz.} \)

\( \text{arco normale} \)

\( \text{col legno battuto} \)

\( \text{Tacet al Fine} \)
Appendix K3 (continued)

Violin 2B (from 6 ms. after K3)

L'istesso tempo

Vln. 2B

Proceed independently

ricochet

pizz.

slap fingerboard

arco sul tasto

normale

con vib.

spicc.

Vln. 2B

(p) (senza cresc.)

Vln. 2B

pp

Vln. 2B

ricochet

pizz.

arco sul tasto

Tacet al Fine

Viola A (from 9 ms. after K3)

L'istesso tempo

Vla. A

Proceed independently

sautillé

pizz.

arco spiccato

Vla. A

(p) (senza cresc.)

Vla. A

ricochet

pizz.

slap fingerboard

arco sul tasto

Tacet al Fine
Appendix K3 (continued)

Viola B (from 9 ms. after K3)

L'istesso tempo

Vla. B

\( \text{pp sub. (senza cresc.)} \)

\( \text{p} \)

\( \text{spicc.} \)

\( \text{mp} \)

\( \text{p} \)

\( \text{mf} \)

\( \text{arco sul tasto} \)

\( \text{normale} \)

\( \text{con vib.} \)

\( \text{sautille} \)

\( \text{pizz.} \)

\( \text{ricochet} \)

\( \text{slap fingerboard} \)

\( \text{arco sul tasto} \)

\( \text{normale} \)

\( \text{con vib.} \)

\( \text{sautille} \)

\( \text{pizz.} \)

\( \text{ricochet} \)

\( \text{slap fingerboard} \)

Violoncello B (from 9 ms. after K3)

L'istesso tempo

Vc. B

\( \text{p sub.} \)

\( \text{spicc.} \)

\( \text{mp} \)

\( \text{p} \)

\( \text{mf} \)

\( \text{arco normale} \)

\( \text{sul G} \)

\( \text{sul C} \)

Tacet al Fine

\( \text{arco sul tasto} \)

\( \text{normale} \)

\( \text{con vib.} \)

\( \text{sautille} \)

\( \text{pizz.} \)

\( \text{ricochet} \)

\( \text{slap fingerboard} \)

\( \text{arco sul tasto} \)

\( \text{normale} \)

\( \text{con vib.} \)

\( \text{sautille} \)

\( \text{pizz.} \)

\( \text{ricochet} \)

\( \text{slap fingerboard} \)
Appendix K3 (continued)

Violoncello A (from 11 ms. after K3)

\[
\begin{array}{c}
\text{L'istesso tempo} \\
\text{ricochet} \quad \text{pizz.} \\
\text{slap} \quad \text{arco sul tasto} \\
\text{normale} \\
\text{con vib.} \\
\hline
\text{Vc. A} \\
\end{array}
\]

Violin 1B (from 11 ms. after K3)

\[
\begin{array}{c}
\text{L'istesso tempo} \\
\text{arco} \\
\text{spicc.} \\
\text{col legno battuto} \\
\hline
\text{Vc. A} \\
\end{array}
\]