

VINCENT, HOMESICK FOR THE LAND OF PICTURES

for mezzo-soprano voice, keyboard, viola and bass clarinet
text by Peter Gizzi
duration ca. 25-30 minutes

Samuel Vriezen, 2011-2013

Written for Trio Scordatura

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INTRODUCTION

Vincent, Homesick for the Land of Pictures is a song based on the poem of the same name by Peter Gizzi.

Gizzi's poem is an extended meditation of the work of Vincent van Gogh. It reflects intensely on light, paint, nature and color, uncovering a complex realm of relationality in nature preceding the "whoop ass and vision" of the everyday political world. The poem shows a constant awareness of the life of color, but also of the complex interlacing play of light and darkness, the known and the unknown, existence and nothingness, in kinship with the grand themes of the Romantic tradition.

The song is set in a microtonal style, with a different 'tuning color' for each of the poem's 14 stanzas and another one for the middle section of the piece. Just as colors in Gizzi's poem exist at the crossroads between the polarities of light and darkness, the harmonic colors in the piece result from an interplay of harmonic and subharmonic series.

The harmonic field in each section is considered to emanate from a central melodic gesture. This melodic material is shared by the voice and the two instruments, and the notes are in the keyboard part as well. The keyboard is conceived of as a 'fluid continuo', or tampura-like intonation of the harmonic field, projected from the melody, and organized on the basis of harmonic and subharmonic series.

In addition to the notes of the melody and the harmonic field, extra notes color the texture, coming from each of the performers. The densities of these colorations decrease as the song comes closer to its centre, after which they increase again. The extra notes again emanate from the harmonic field, being always harmonically related to it.

There is no score; coordination between the parts is very free.

TUNINGS

The harmonic fields are divided into two parts, the 'core' and the 'corona'.

The core is based on either one low note and two high notes, or two low notes and one high note. It consists of all frequencies that are both overtones of the low note(s) and subharmonics of the high note(s). In the tuning tables, the core is notated in white notes. The corona consists of notes that are related to the core by intervals that appear in the core itself. These are notated as black notes in the tables.

Over the course of the piece, the low notes gradually descend an octave from an F at 1/6 of central C, to the F at 1/12 of central C, until the middle is reached, when the process reverses. Likewise, the high notes descend (and after the middle of the piece, ascend) stanza by stanza from a high D at 18/1 to central C, to a high G at 12/1 to central C.

Section	Low Note(s)	High Note(s)	Primes
A1	bA (1/5), F (1/6)	D (18)	2, 3, 5
A2	F (1/6), [^] D (1/7)	#C (17)	2, 3, 7, 17
A3	[^] D (1/7), C (1/8)	C (16)	2, 7
A4	bB (1/9), C (1/8)	B (15)	2, 3, 5
A5	bA (1/10), bB (1/9)	vbB (14)	2, 3, 5, 7
A6	dbG (1/11), bA (1/10)	vdA (13)	2, 5, 11, 13
A7	F (1/12), vGb (1/11)	G (12)	2, 3, 11
M	F (1/12)	G (12)	2, 3
B1	F (1/12)	G (12), vdA (13)	2, 3, 13
B2	dbG (1/11)	vdA (13), vbB (14)	2, 7, 11, 13
B3	bA (1/10)	vbB (14), B (15)	2, 3, 5, 7
B4	bB (1/9)	B (15), C (16)	2, 3, 5
B5	C (1/8)	C (16), #C (17)	2, 17
B6	[^] D (1/7)	#C (17), D (18)	2, 3, 7, 17
B7	F (1/6)	D (18), bE (19)	2, 3, 19

The fields can be derived as follows: multiply the three determining interval ratios (for inverted ratios, use the whole-number version). Thus, for A1, multiply 5, 6 and 18 to get the number 540. Then take all divisors of this number (in A1, these are 1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 27, 30, 36, 45, 54, 60, 90, 108, 135, 180, 270, 540). These give the numbers of the overtones (in this case, of 1/5 and of 1/6) and of the subharmonics (of 18) to use. Disregard all notes higher than the guiding high note (18) or lower than the fundamentals (1/6). The notes in the core will be those, which appear both as a harmonic of a low note, and as a subharmonic of a high note; the notes that only appear as either a harmonic or as a subharmonic constitute the corona.

In this way, the color of each harmonic field is determined by the prime factor structure of the generating notes, giving rise to very diverse fields. So A1 is in a simple 5-limit tuning, M is even pythagorean, A3 uses only octaves and septimal seconds, while A6 and B2 are highly unusual 13-limit fields.

NOTATION

The notation for the pitches uses the extended Helmholtz-Ellis system of accidentals for Just Intonation notation, as developed by Marc Sabat and Wolfgang von Schweinitz.

In the charts, pitches are notated using the accidentals, with the ratio to central C also being given, as well as the adjustment (in cents) to what would be the equal temperament pitch, if only flat/sharp and natural accidentals would be taken into account. Please note that some items are in fact quite far removed from the equal temperament pitch. For instance, the pitch for 13/11 is notated as an e, lowered by both an 11-limit quarter tone and a 13-limit third tone, giving a total adjustment of -111 cents, making this “e” in fact lower than an ordinary e flat.

Not all of the pitches given in the charts are actually used in the piece.

Voice

Three forms of notation.

The melody is indicated by a slur, and is to be sung.

An x-shaped note indicates that the words are to be delivered in a mode that can be freely between speech and song; the note written can be taken as reference tone for a (semi-)spoken delivery or as the note on which to intone. There may be a very fluid boundary between speech and song.

A note with an fermata-like arc above it indicates a note that may be held longer.

Rhythm is generally very free and should follow the diction of the text, inflected by the styles of delivery indicated. Pauses (for breathing, etc.) ad lib.

Keyboard

Key action

Keyboard action is to be reprogrammed to function in an unusual way. Pressing a key and then depressing it will start a sound at the pitch played. The length of the sound depends on MIDI velocity and on stanza. The softest possible attack will always yield a note of 1 second, the hardest possible attack will yield a note with the maximum duration for that stanza, an average attack will yield a note with the geometric mean duration for that stanza. After scaling the velocities to a number between 0 and 2, the duration is given by this formula:

$$\text{duration} = \text{stanza_average} \wedge \text{scaled_velocity}$$

Dynamics

The dynamic envelope is a smooth crescendo/decrescendo over the course of the entire duration. The high point of the envelope is to be controlled by the duration parameter from the keyboard. If the key has been pressed for a second or more, the high point comes at the middle; the shorter it has been pressed, the more the high point comes at the start of the note. The precise formula is as follows:

$$\text{high point} = \text{note duration} * \text{key duration} / 2$$

with key duration in seconds, and a maximum value of 1. The maximum dynamics is given per section.

Notation

The function of the keyboard part is to keep the harmonic field going. The top three staves notate the pitches of the harmonic field. These again are grouped in two, with the middle staff shared by the two groups.

Play the pitches ad lib, shifting between the two groups, giving equal time to each group. If a pitch is played more loudly, it will last longer. This way, a dynamically changing electronic harmonic field is maintained. White notes indicate central pitches for the melody; these are to be more consistently present than the black notes.

Below the staves, one to seven individual pitches are notated. These are from the 'corona' pitches. Each of these will be played exactly one time during the stanza.

Timbre

The timbre is to be deliberately electronic sounding (no sampled instruments). Timbre may change per section, in which case the timbres chosen should have overtone structures that are related to the prime factors generating the harmonic field of that section.

Viola, Bass Clarinet

Two types of material are given.

On the top two staves, the melody of the section is given (in two motives). Below, notes are given.

The notes are played once each during the section, in any order. They may be played as isolated notes, or slurred to the next note or melody statement. One of four dynamic shapes is written for each note: crescendo, decrescendo, cresc/decresc, none (even tone). The precise dynamics are ad lib, with a maximum dynamic given per section.

The melody material is played ad lib. A motive may be played once, or may be repeated ad lib. Incomplete statements of the motive may be played, and also repeated ad lib. Dynamics of the melody material are free.

Rhythm of the melody is free. No note more than twice as long or short as any other note. Not fast. In case of repetitions, repeat the rhythm of the phrase in the exact same way, generating a sense of meter.

There is a maximum of isolated notes that can be played between statements of the melody material, depending on the section:

section	maximum number of notes between melody statements
A1, B7	7
A2, B6	6
A3, B5	5
A4, B4	4
A5, B3	3
A6, B2	2
A7, B1	1

PERFORMANCE

Performance begins and ends together (at the end, directly on the final T of “Vincent”, the keyboard takes its volume level to zero, cutting off anything sounding).

After the singer has finished the text for a stanza, the keyboard may change to the tuning for the next stanza and start playing its material. Then the others can start playing the material for the new stanza, and the voice can enter again. There will be no silences between stanzas.

Keyboard playing is continuous for stanzas A1-A7 and B1-B7. After A7, however, the keyboard lets its material ring, while the voice and instruments perform section M, duration ad lib, without keyboard accompaniment. After some undefined amount of time, the keyboard starts playing B1.

ALTERNATIVE ENSEMBLES

The present version is written for voice, keyboard and two instruments, but arrangements can be made for voice, keyboard and any one or more instruments, provided that the instruments can play the melody material in terms of range. To produce other parts, for every section, notes are to be chosen from the ‘corona’, or from the core, that are not in the melodic material. Sections A1 and B7 use seven such notes four times each, A2 and B6 seven notes three times each, A3 and B5 five notes three times each, A4 and B4 five notes two times each, A5 and B3 three notes two times each, A6 and B2 three notes once each, A7 and B1 only one note once. Dynamic shapes for each note may be determined by chance procedures.

VINCENT, HOMESICK FOR THE LAND OF PICTURES

Is this what you intended, Vincent
that we take our rest at the end of the grove
nestled into our portion beneath the bird's migration
saying, who and how am I made better through struggle.
Or why am I I inside this empty arboretum
this inward spiral of whoop ass and vision
the leafy vine twisting and choking the tree.
O, dear heaven, if you are indeed that
or if you can indeed hear what I might say
heal me and grant me laughter's bounty
of eyes and smiles, of eyes and affection.

To not be naive and think of silly answers only
not to imagine answers would be the only destination
nor is questioning color even useful now
now that the white ray in the distant tree beacons.
That the sun can do this to us, every one of us
that the sun can do this to everything inside
the broken light refracted through leaves.
What the ancients called peace, no clearer example
what our fathers called the good, what better celebration.
Leaves shine in the body and in the head alike
the sun touches deeper than thought.

O to be useful, of use, to the actual seen thing
to be in some way related by one's actions in the world.
There might be nothing greater than this
nothing truer to the good feelings that vibrate within
like in the middle of the flower I call your name.
To correspond, to be in equanimity with organic stuff
to toil and to reflect and to home and to paint
father, and further, the migration of things.
The homing action of geese and wood mice.
The ample evidence of the sun inside all life
inside all life seen and felt and all the atomic pieces too.

But felt things exist in shadow, let us reflect.
The darkness bears a shine as yet unpunished by clarity
but perhaps a depth that outshines clarity and is true.
The dark is close to doubt and therefore close to the sun
at least what the old books called science or bowed down to.
The dark is not evil for it has indigo and cobalt inside
and let us never forget indigo and the warmth of that
the warmth of the mind reflected in a dark time
in the time of pictures and refracted light.
Ah, the sun is here too in the polar region of night
the animal proximity of another and of nigh.

To step into it as into a large surf in late August
to go out underneath it all above and sparkling.
To wonder and to dream and to look up at it
wondrous and strange companion to all our days
and the toil and worry and animal fear always with us.
The night sky, the deep sense of space, actual bodies of light
the gemstone brushstrokes in rays and shimmers
to be held tight, wound tighter in the act of seeing.
The sheer vertical act of feeling caught up in it
the sky, the moon, the many heavenly forms
these starry nights alone and connected alive at the edge.

Now to think of the silver and the almost blue in pewter.
To feel these hues down deep, feel color wax and wane
and yellow, yellows are the tonality of work and bread.
The deep abiding sun touching down and making its impression
making so much more of itself here than where it signals
the great burning orb installed at the center of each and every thing.
Isn't it comforting this notion of each and every thing
though nothing might be the final and actual expression of it
that nothing at the center of something alive and burning
green then mint, blue then shale, gray and gray into violet
into luminous dusk into dust then scattered now gone.

But what is the use now of this narrow ray, this door ajar
the narrow path canopied in dense wood calling
what of the striated purposelessness in lapidary shading and line.
To move on, to push forward, to take the next step, to die.
The circles grow large and ripple in the hatch-marked forever
the circle on the horizon rolling over and over into paint
into the not near, the now far, the distant long-off line of daylight.
That light was my enemy and one great source of agony
one great solace in paint and brotherhood the sky and grass.
The fragrant hills spoke in flowering tones I could hear
the gnarled cut stumps tearing the sky, eating the sun.

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the leafy vine twisting and choking the tree
this inward spiral of whoop ass and vision.
Or why am I I inside this empty arboretum
saying, who and how am I made better through struggle
nestled into our portion beneath the bird's migration
that we take our rest at the end of the grove
is this what you intended, Vincent.

Peter Gizzi

VINCENT, TERUGVERLANGEND NAAR HET LAND DER SCHILDERINGEN

Is dit wat je beoogde, Vincent
dat we rust nemen aan de rand van de boomgaard
genesteld in ons deel onder de trek van de vogels
met de vraag, wie en hoe ben ik door strijd gesterkt.
Of waarom ben ik ik in deze lege bomentuin
deze inwaartse spiraal van pak rammel en visie
de bladerrijke klimplant die de boom omwindt en verstikt.
O, lieve hemel, als je dat tenminste bent
of als je toch kunt horen wat ik misschien zeg
heel mij en gun me de gulheid van het lachen
van oog en glimlach, van oog en genegenheid.

Niet naïef te zijn en slechts aan dwaze antwoorden denken
noch geloven in antwoorden als enige bestemming
noch is kleur bevragen überhaupt zinvol nu
nu de witte straal in de verre boom oplicht.
Dat de zon dit met ons doen kan, elk van ons
dat de zon dit doen kan met alles binnenin
het gebroken licht door bladeren gefilterd.
Wat de ouden vrede noemden, geen voorbeeld helderder
wat onze vaders het goede noemden, geen viering geschikter.
Bladeren stralen in het lichaam zoals ook in het hoofd
de zon dieper tast dan het denken.

O zinvol te zijn, van nut, voor wat je werkelijk ziet
ergens deel van uitmaken door je daden in de wereld.
Er bestaat wellicht niets groters dan dit
niets is trouwer aan wat goed voelt en zich innerlijk roert
zoals midden in de bloem die ik jouw naam geef.
Overeen te stemmen, vrede hebben met organisch spul
zwoegen en denken en teruggaan en schilderen
vader, en verder, de migratie der dingen.
De tocht terug van ganzen en bosmuizen.
De overvloedige sporen van de zon in alle leven
in alle leven dat je ziet en voelt en alle atoomdeeltjes ook.

Maar overdenk, wat je voelt bestaat in schaduw.
Het duister draagt een glans nog niet door helderheid gestraft
maar misschien een diepte die helderheid overschittert en waar is.
Het donker staat dicht bij twijfel en daarom dicht bij de zon
tenminste wat de oude boeken wetenschap noemden of eerbiedigden.
Het donker is geen kwaad want er zit indigo en kobalt in
en laten we het indigo nooit vergeten en de warmte ervan
de warmte van de geest weerspiegeld in een donkere tijd
in de tijd van schilderijen en gebroken licht.
Ah, ook hier is de zon in de poolstreek van de nacht
de dierlijke nabijheid van een ander en van dra.

Erin te stappen als in een hoge golf laat in augustus
uit te gaan onder al wat boven je glinstert.
Je verbazen en dromen en ernaar omhoogkijken
verwonderlijke en vreemde metgezel van al onze dagen
gezwoeg en getob en dierlijke angst altijd bij ons.
De nachthemel, het diepe ruimtegevoel, echte lichtlichamen
de edelstenen verfstreken in stralen en flonkering
stevig vastgehouden, vaster gewikkeld in het zien.
Het zuiver verticale voelen erin verstrikt
de hemel, de maan, de vele hemelse vormen
deze sterrennachten alleen en levend verbonden aan de rand.

En denken nu aan het zilver en het bijna blauw van tin.
Deze tinten diep doorvoelen, de kleur die wast en afneemt
en geel, gelen zijn de tonen van werk en brood.
De diepe gedurige zon die neerstrijkt en indruk maakt
en hier zoveel meer bereikt dan waar zij duidt
op de grote brandende bol in de kern van al het bestaande.
Stelt het niet gerust dit begrip van al het bestaande
hoewel misschien niets er de laatste, echte uitdrukking van is
dit niets in het midden van iets dat leeft en brandt
groen wordt mint, blauw wordt lei, grijs en grijs naar violet
tot lichtende schemer tot stof dan verspreid nu vergaan.

Maar wat is nu het nut van deze dunne straal, deur op een kier
het nauwe pad overhuifd door dicht hout roepende
en dan de gegroefde doelloosheid in lapidaire schakering en lijn.
Doorgaan, doorstoten, de volgende stap zetten, doodgaan.
De kringen verwijden en rimpelen in gearceerd immer
de kring op de horizon die steeds opnieuw de verf inrolt
tot in het niet-nabije, nu-verre, de ver verwijderde daglichtlijn.
Dat licht was mijn vijand en grote bron van kwelling
een grote troost in verf en broederschap, lucht en gras.
De geurige heuvels spraken bloeiend van toon en zo hoorde ik
hoe knoestige stronken de hemel verscheurden, de zon aanvratte.

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tenminste wat de oude boeken wetenschap noemden of eerbiedigden.
Het donker staat dicht bij twijfel en daarom dicht bij de zon
maar misschien een diepte die helderheid overschittert en waar is.
Het duister draagt een glans nog niet door helderheid gestraft
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Vertaling: Samuel Vriezen. Met dank aan Hester Schoute

The Extended Helmholtz-Ellis JI Pitch Notation

microtonal accidentals designed by Marc Sabat and Wolfgang von Schweinitz, 2004

3-LIMIT (PYTHAGOREAN) INTERVALS

♭♭ ♭ ♮ ♯ ×

FUNCTION OF THE ACCIDENTALS

notate 35 pitches from the series of untempered perfect fifths
 $(3/2) \approx \pm 702.0$ cents;
perfect fifth (3/2); perfect fourth (4/3); major wholetone (9/8)

5-LIMIT (PTOLEMAIC) INTERVALS

♭♭↓ ♭↓ ♮↓ ♯↓ ×↓ ↑♭♭ ↑♭ ↑♮ ↑♯ ↑×

notate an alteration by one syntonic comma $(81/80) \approx \pm 21.5$ cents;
*major third (5/4); minor third (6/5); major sixth (5/3); minor sixth (8/5);
 minor wholetone (10/9)*

♭♭↓↓ ♭↓↓ ♮↓↓ ♯↓↓ ×↓↓ ↑↑♭♭ ↑↑♭ ↑↑♮ ↑↑♯ ↑↑×

notate an alteration by two syntonic commas
 $(81/80) \cdot (81/80) \approx \pm 43.0$ cents;
augmented fifth (25/16); diminished fourth (32/25)

♭♭↓↓↓ ♭↓↓↓ ♮↓↓↓ ♯↓↓↓ ×↓↓↓ ↑↑↑♭♭ ↑↑↑♭ ↑↑↑♮ ↑↑↑♯ ↑↑↑×

notate an alteration by three syntonic commas
 $(81/80) \cdot (81/80) \cdot (81/80) \approx \pm 64.5$ cents;
minor diesis (128/125)

7-LIMIT (SEPTIMAL) INTERVALS

↳ ↴
 ↳↳ or ↳↳↳ ↴↴ or ↴↴↴

notate an alteration by one septimal comma $(64/63) \approx \pm 27.3$ cents;
*natural seventh (7/4); septimal wholetone (8/7);
 septimal diminished fifth (7/5); septimal tritone (10/7);
 septimal minor third (7/6); septimal quartertone (36/35)*

notate an alteration by two septimal commas
 $(64/63) \cdot (64/63) \approx \pm 54.5$ cents;
septimal sixtitone (49/48)

11-LIMIT (UNDECIMAL) INTERVALS

† †

notate an alteration by one undecimal quartertone
 $(33/32) \approx \pm 53.3$ cents;
undecimal augmented fourth (11/8); undecimal diminished fifth (16/11)

13-LIMIT (TRIDECIMAL) INTERVALS

‡ ‡

notate an alteration by one tridecimal thirdditone $(27/26) \approx \pm 65.3$ cents;
tridecimal neutral sixth (13/8); tridecimal neutral third (16/13)

PRIMES IN THE HARMONIC SERIES OCTAVE 16 - 32 (5-limit signs are given here relative to "A")

⊖♭ ⊖♯

notate an alteration of the 5-limit accidental by one 17-limit schisma
 $(16/17) \cdot (16/15) = (256/255) \approx \pm 6.8$ cents;
*Galileo's "equal-tempered" semitone (18/17);
 17-limit diminished seventh chord 10:12:14:17*

⊖♮ ⊖♮

notate an alteration by one 19-limit schisma
 $(19/16) \cdot (27/32) = (513/512) \approx \pm 3.4$ cents;
19-limit minor third (19/16); 19-limit minor triad 16:19:24

↑♯ ↓♭

notate an alteration by one 23-limit comma
 $(23/16) \cdot (8/9) \cdot (8/9) \cdot (8/9) \approx \pm 16.5$ cents;
raised leading tone (23/12)

↑
♯

↓
♯

notate an alteration of the 5-limit accidental by one 29-limit comma
 $(29/16) \cdot (5/9) = (145/144) \approx \pm 12.0$ cents

-
♯

+
♯

notate an alteration of the 11-limit accidental by one 31-limit schisma
 $(32/31) \cdot (32/33) = (1024/1023) \approx \pm 1.7$ cents

PRIMES IN THE HARMONIC SERIES OCTAVE 32 - 64 (5-limit signs are given here relative to "A")

{
♯

{
♯

notate an alteration of the 11-limit accidental by one 37-limit schisma
 $(36/37) \cdot (33/32) = (297/296) \approx \pm 5.8$ cents

{
♯

{
♯

notate an alteration of the 5-limit accidental by one 41-limit schisma
 $(32/41) \cdot (81/64) \cdot (81/80) = (6561/6560) \approx \pm 0.3$ cents

{
↑

{
↓

notate an alteration by one 43-limit comma
 $(43/32) \cdot (3/4) = (129/128) \approx \pm 13.5$ cents

{
♯ or {
♯

{
♯ or {
♯

notate an alteration of the 7-limit accidental by one 47-limit schisma
 $(32/47) \cdot (48/49) \cdot (3/2) = (2304/2303) \approx \pm 0.8$ cents

{
♯

{
♯

notate an alteration of the 5-limit accidental by one 53-limit comma
 $(32/53) \cdot (5/3) = (160/159) \approx \pm 10.9$ cents

{
♯

{
♯

notate an alteration of the 13-limit accidental by one 59-limit schisma
 $(32/59) \cdot (24/13) = (768/767) \approx \pm 2.3$ cents

{
♯

{
♯

notate an alteration of the 7-limit accidental by one 61-limit schisma
 $(61/32) \cdot (21/40) = (1281/1280) \approx \pm 1.4$ cents

IRRATIONAL AND TEMPERED INTERVALS

♭

♭

♯

♯

×

notate the respective Equal Tempered Semitone;
may be combined with a cents indication to notate any pitch

NOTE ABOUT CENTS INDICATIONS

optional cents indications may be placed above or below the respective accidentals and are always understood in reference to Equal Tempered semitones, as implied by the Pythagorean accidentals

(A I)

-2 +14 +16 -2 +14 0 +16

$\frac{1}{6}$ $\frac{1}{5}$ $\frac{3}{10}$ $\frac{1}{3}$ $\frac{2}{5}$ $\frac{1}{2}$ $\frac{3}{5}$

-2 +14 -16 +18 0 +16 +2

$\frac{2}{3}$ $\frac{4}{5}$ $\frac{5}{6}$ $\frac{9}{10}$ 1 $\frac{6}{5}$ $\frac{3}{2}$

-16 +18 0 +16 -14 +2 -16

$\frac{5}{3}$ $\frac{9}{5}$ 2 $\frac{12}{5}$ $\frac{5}{2}$ 3 $\frac{10}{3}$

15 +18 0 +4 -14 +20 +2 +18

$\frac{18}{5}$ 4 $\frac{9}{2}$ 5 $\frac{27}{5}$ 6 $\frac{36}{5}$

15 -12 +4 -14 +20 +2 -12 +4

$\frac{15}{2}$ 9 10 $\frac{54}{5}$ 12 15 18

A II

+31 -2 +31 -2 +34

$\frac{1}{7}$ $\frac{1}{6}$ $\frac{2}{7}$ $\frac{1}{3}$ $\frac{17}{42}$

+33 0 +34 +33 0

$\frac{3}{7}$ $\frac{1}{2}$ $\frac{17}{21}$ $\frac{6}{7}$ 1

-33 +36 0 +36 +3

$\frac{7}{6}$ $\frac{17}{14}$ 2 $\frac{17}{7}$ $\frac{17}{6}$









+2 -31 +36 +3 -31 +2





3 $\frac{7}{2}$ 15 $\frac{34}{7}$ $\frac{17}{3}$ 6






15 -31 +38 +5 +38 +5

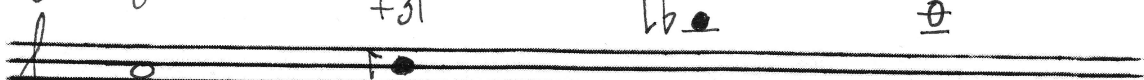
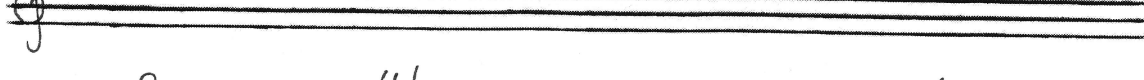



7 $\frac{51}{7}$ $\frac{17}{2}$ $\frac{102}{7}$ 17

A III

0	+31	0	+31
			
$\frac{1}{8}$	$\frac{1}{7}$	$\frac{1}{4}$	$\frac{2}{7}$
0	+31	-31	0
			
$\frac{1}{2}$	$\frac{4}{7}$	$\frac{7}{8}$	1

+31	-31	0	+31
			
$\frac{8}{7}$	$\frac{7}{4}$	2	$\frac{16}{7}$

15	-31	0	+31	-31
				
$\frac{7}{2}$	4	$\frac{32}{7}$	7	

15	0	+31	-31	0
				
8	$\frac{64}{7}$	14	16	

A IV

-4 0 -10 -2 -16 -4 0 -10 -2

$\frac{1}{9}$ $\frac{1}{8}$ $\frac{5}{36}$ $\frac{1}{6}$ $\frac{5}{24}$ $\frac{2}{9}$ $\frac{1}{4}$ $\frac{5}{18}$ $\frac{1}{3}$

+2 -16 -4 0 -10 -14 -2 +2 -16

$\frac{3}{8}$ $\frac{5}{12}$ $\frac{4}{9}$ $\frac{1}{2}$ $\frac{5}{9}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{5}{6}$

-4 0 -10 +4 -14 -2 +2 -16 -12

$\frac{8}{9}$ 1 $\frac{10}{9}$ $\frac{3}{8}$ $\frac{5}{4}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{5}{3}$ $\frac{15}{8}$

0 -10 +4 -14 -2 +2 -16 +6 -12

2 $\frac{20}{9}$ $\frac{9}{4}$ $\frac{5}{2}$ $\frac{8}{3}$ 3 $\frac{10}{3}$ $\frac{27}{8}$ $\frac{15}{4}$

15 0 -10 +4 -14 -10 +2 -16 +6 -12

4 $\frac{40}{9}$ $\frac{9}{2}$ 5 $\frac{45}{8}$ 6 $\frac{20}{3}$ $\frac{27}{4}$ $\frac{15}{2}$

15 0 +4 -14 -10 +2 -16 +6 -12

$\frac{8}{9}$ 9 10 $\frac{45}{4}$ 12 $\frac{40}{3}$ $\frac{27}{2}$ 15

A V

+14 -4 +12 -21 -2 +14 -4 -19 +16

$\frac{1}{10}$ $\frac{1}{9}$ $\frac{2}{15}$ $\frac{7}{45}$ $\frac{1}{6}$ $\frac{1}{5}$ $\frac{2}{9}$ $\frac{7}{30}$ $\frac{3}{10}$

+16

-21 -2 -35 +14 -4 -19 0 -18 +12 -2 -17 -35

$\frac{14}{45}$ $\frac{1}{3}$ $\frac{7}{18}$ $\frac{2}{5}$ $\frac{4}{9}$ $\frac{7}{15}$ $\frac{1}{2}$ $\frac{5}{9}$ $\frac{3}{5}$ $\frac{2}{3}$ $\frac{7}{10}$ $\frac{7}{9}$

+18 -19 0 -18 -33 +16 -2 -17 +2 -35 -16

$\frac{9}{10}$ $\frac{14}{15}$ 1 $\frac{10}{9}$ $\frac{7}{6}$ $\frac{6}{5}$ $\frac{4}{3}$ $\frac{7}{5}$ $\frac{3}{2}$ $\frac{14}{9}$ $\frac{5}{3}$

+18 0 -16 -18 -33 -17 +2 -35 -16 -31 +18

$\frac{9}{5}$ 2 $\frac{21}{10}$ $\frac{20}{9}$ $\frac{7}{3}$ $\frac{14}{5}$ 3 $\frac{28}{9}$ $\frac{10}{3}$ $\frac{7}{2}$ $\frac{10}{5}$

15 -49 0 -16 +4 -33 -14 +2 -14 -16 -31 -49

$\frac{35}{9}$ 4 $\frac{21}{5}$ $\frac{9}{2}$ $\frac{14}{3}$ 5 6 $\frac{63}{10}$ $\frac{20}{3}$ 7 $\frac{70}{9}$

15 -16 +4 -33 -14 -29 -47 -14 -31

$\frac{42}{5}$ 9 $\frac{20}{3}$ 10 $\frac{21}{2}$ $\frac{35}{3}$ $\frac{63}{5}$ 14

A VI

-51 $+14$ -103 -51 $+14$

 15 $\frac{1}{11}$ $\frac{1}{10}$ $\frac{13}{110}$ $\frac{2}{11}$ $\frac{1}{5}$

-103 -65 0 -111 -65 0

 $\frac{13}{55}$ $\frac{5}{11}$ $\frac{1}{2}$ $\frac{13}{22}$ $\frac{10}{11}$ 1

$+65$ -111 -46 0 $+65$ -111 -46

 $\frac{11}{10}$ $\frac{13}{11}$ $\frac{13}{10}$ 2 $\frac{11}{5}$ $\frac{26}{11}$ $\frac{13}{5}$

15 -14 $+51$ -125 -59 -14 $+51$

 5 $\frac{11}{2}$ $\frac{65}{11}$ $\frac{13}{2}$ 10 11

15 -125 -59

 $\frac{130}{11}$ 13

A VII

-2 -51 -53 -49 -2 -51 0

15 0 0 0 0 0 0

$\frac{1}{12}$ $\frac{1}{11}$ $\frac{4}{33}$ $\frac{3}{22}$ $\frac{1}{6}$ $\frac{2}{11}$ $\frac{1}{4}$

-49 -2 -51 0 -49 -2 -51

$\frac{1}{3}$ 0 0 0 0 0 0

$\frac{3}{11}$ $\frac{1}{3}$ $\frac{4}{11}$ $\frac{1}{2}$ $\frac{6}{11}$ $\frac{2}{3}$ $\frac{8}{11}$

+2 -47 +49 0 -49 -2 -51

$\frac{3}{4}$ $\frac{9}{11}$ $\frac{1}{12}$ 1 $\frac{12}{11}$ $\frac{4}{3}$ $\frac{16}{11}$

+2 -47 +49 0 -49 +51 +2

$\frac{3}{2}$ $\frac{18}{11}$ $\frac{1}{6}$ 2 $\frac{24}{11}$ $\frac{1}{4}$ 3

15 -47 +49 0 -49 +51 +2 -47







$\frac{36}{11}$ $\frac{1}{3}$ 4 $\frac{48}{11}$ $\frac{1}{2}$ 6 $\frac{72}{11}$

15 +49 0 +53 +4 +51 +2






$\frac{22}{3}$ 8 $\frac{33}{4}$ 9 11 12

(M)

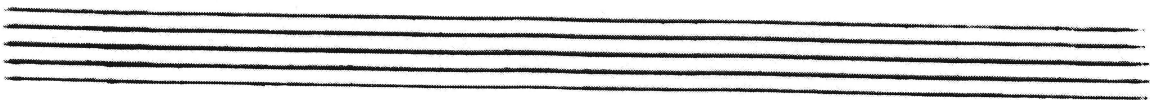


	+4	-2	+2	-4	0
				b 0	0
					

	$\frac{9}{16}$	$\frac{2}{3}$	$\frac{3}{4}$	$\frac{8}{9}$	1
--	----------------	---------------	---------------	---------------	---

	+4	-2	+2	-4
				b 0
				

	$\frac{9}{8}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{16}{9}$
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(B I)

-2 -63 +58 -4 +61 0 +59 -2

15

$\frac{1}{12}$ $\frac{13}{144}$ $\frac{4}{39}$ $\frac{1}{9}$ $\frac{3}{26}$ $\frac{1}{8}$ $\frac{2}{13}$ $\frac{1}{6}$

-63 +61 0 -61 +59 -2 -63 +61

15

$\frac{13}{72}$ $\frac{3}{13}$ $\frac{1}{4}$ $\frac{13}{48}$ $\frac{4}{13}$ $\frac{1}{3}$ $\frac{13}{36}$ $\frac{6}{13}$

0 -61 -2 -63 +2 -59 +61 0

$\frac{1}{2}$ $\frac{13}{24}$ $\frac{2}{3}$ $\frac{13}{18}$ $\frac{3}{4}$ $\frac{13}{16}$ $\frac{12}{13}$ 1

-61 -2 -63 +2 -59 0 -61 +2

$\frac{13}{12}$ $\frac{4}{3}$ $\frac{13}{9}$ $\frac{3}{2}$ $\frac{13}{8}$ 2 $\frac{13}{6}$ 3

15 -59 0 -61 +2 -59 +2 -59

$\frac{13}{4}$ 4 $\frac{13}{3}$ 6 $\frac{13}{2}$ 12 13

B II

-51 -23 +31 +59 -80

15

$\frac{1}{11}$ $\frac{14}{143}$ $\frac{1}{7}$ $\frac{2}{13}$ $\frac{13}{77}$

-51 0 +28 -111

15

$\frac{2}{11}$ $\frac{1}{2}$ $\frac{7}{13}$ $\frac{13}{22}$

-82 -28 0 +28

15

$\frac{7}{11}$ $\frac{13}{14}$ 1 $\frac{14}{13}$

-111 -82 -28 0 -111

15

$\frac{13}{11}$ $\frac{14}{11}$ $\frac{13}{7}$ 2 $\frac{26}{11}$

15 -59 -31 -142 -59 -31

15

$\frac{13}{2}$ 7 $\frac{91}{11}$ 13 14

B III

+14 +33 +12 +31 -4 +16 -2 +17 -6

$\frac{1}{10}$ $\frac{3}{20}$ $\frac{2}{15}$ $\frac{1}{7}$ $\frac{7}{50}$ $\frac{3}{20}$ $\frac{1}{6}$ $\frac{5}{20}$ $\frac{14}{75}$

+14 +33 -19

$\frac{1}{5}$ $\frac{3}{14}$ $\frac{7}{30}$ $\frac{7}{25}$ $\frac{3}{10}$ $\frac{1}{3}$ $\frac{5}{4}$ $\frac{2}{5}$ $\frac{3}{7}$ $\frac{7}{15}$ $\frac{1}{2}$

+19 -4 +16 -2 -17 +17 +2 -19 0 +19

$\frac{15}{20}$ $\frac{14}{25}$ $\frac{3}{5}$ $\frac{2}{3}$ $\frac{7}{10}$ $\frac{5}{7}$ $\frac{3}{4}$ $\frac{14}{15}$ 1 $\frac{15}{14}$

-33 +16 -14 -17 +2 0 -16 +19 -33

$\frac{7}{6}$ $\frac{6}{5}$ $\frac{5}{4}$ $\frac{7}{5}$ $\frac{3}{2}$ 2 $\frac{2}{10}$ $\frac{15}{7}$ $\frac{7}{3}$

-14 -17 +2 -31 -12

$\frac{5}{2}$ $\frac{14}{5}$ 3 $\frac{7}{2}$ $\frac{15}{4}$ $\frac{2}{5}$ $\frac{14}{3}$ 5

+2 -31 -12 -16 -14 -29 -31 -12

6 7 $\frac{15}{2}$ $\frac{42}{5}$ 10 $\frac{21}{2}$ 14 15

B IV

-4 +8 0 +12 -18 -6 -2 +10 +2 +14 -16 -4

$\frac{1}{9}$ $\frac{16}{135}$ $\frac{1}{8}$ $\frac{2}{15}$ $\frac{5}{36}$ $\frac{4}{27}$ $\frac{1}{6}$ $\frac{8}{45}$ $\frac{3}{16}$ $\frac{1}{5}$ $\frac{5}{24}$ $\frac{2}{9}$

0 +12 -18 -6 -14 -2 +10 +2 +14 -16 -4

$\frac{1}{4}$ $\frac{4}{15}$ $\frac{5}{18}$ $\frac{8}{27}$ $\frac{5}{16}$ $\frac{1}{3}$ $\frac{16}{45}$ $\frac{3}{8}$ $\frac{2}{5}$ $\frac{5}{12}$ $\frac{4}{9}$

0 +12 -18 -6 -14 -2 +2 +14 -16 -4 -12

$\frac{1}{2}$ $\frac{8}{15}$ $\frac{5}{9}$ $\frac{16}{27}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{4}{5}$ $\frac{5}{6}$ $\frac{8}{9}$ $\frac{15}{16}$

0 +12 -18 -14 -2 +2 +14 -16 -4 -12 0

1 $\frac{16}{15}$ $\frac{10}{9}$ $\frac{5}{4}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{8}{5}$ $\frac{5}{3}$ $\frac{16}{9}$ $\frac{15}{8}$ 2

-18 -14 -2 +2 +14 -16 -12 0 15 -18 -14

$\frac{20}{9}$ $\frac{5}{2}$ $\frac{8}{3}$ 3 $\frac{16}{5}$ $\frac{10}{3}$ $\frac{15}{4}$ 4 $\frac{15}{40/9}$ 5

15 -2 +2 -16 -12 0 -18 -14 +2 -16 -12 0

$\frac{16}{3}$ 6 $\frac{20}{3}$ $\frac{15}{2}$ 8 $\frac{80}{9}$ 10 12 $\frac{40}{3}$ 15 16

B V

0 +5 -5 0

15 1/8 17/128 4/17 1/4

+5 -5 0 +5

17/64 8/17 1/2 17/32

-5 0 +5 0

16/17 1 17/16 2

+5 15 +5 0

17/8 4 17/4 8

15 0 +5

17/2 16 17

B VI

$+31$ $+30$ -2 -3 $+32$ $+31$ -2

15 $\frac{1}{7}$ $\frac{10}{119}$ $\frac{1}{6}$ $\frac{3}{17}$ $\frac{17}{7}$ $\frac{2}{7}$ $\frac{1}{3}$

-3 $+34$ $+33$ 0 -1 $+34$ $+33$

$\frac{6}{17}$ $\frac{17}{42}$ $\frac{3}{7}$ $\frac{1}{2}$ $\frac{9}{17}$ $\frac{17}{21}$ $\frac{6}{7}$

$+1$ 0 -1 $+36$ $+35$ $+1$ 0

$\frac{17}{10}$ 1 $\frac{10}{17}$ $\frac{17}{14}$ $\frac{9}{7}$ $\frac{17}{9}$ 2

$+36$ $+35$ $+3$ $+2$ 15 $+36$ $+3$ $+2$

$\frac{17}{7}$ $\frac{10}{7}$ $\frac{17}{6}$ 3 $\frac{34}{7}$ $\frac{17}{3}$ 6

15 $+38$ $+5$ $+4$ $+38$ $+5$ $+4$

$\frac{51}{7}$ $\frac{17}{2}$ 9 $\frac{102}{7}$ 17 18

(B VII)

-2	-8	+6	0	+4	-2
○	♭●	●	●	○	○
15	1/6	9/100	9/30	1/4	6/19
				○	1/3

-8	+6	0	-6	-2	-8
♭●	●	○	♭●	○	♭●
19/54	9/19	1/2	19/36	2/3	19/27

+6	0	-6	+2	-4	0
♭●	○	♭●	○	♭●	○
18/19	1	19/18	3/2	19/12	2

-6	+2	-4	15	+4	-2	+2	-4
♭●	○	♭●	○	♭●	○	○	♭●
19/9	3	19/6	9/2	19/4	6	19/3	

15	+4	-2	-4	+4	-2
○	○	♭●	♭●	○	♭●
9	19/2	30/3	18	19	