

2

Sehr rasch (♩)

1 heftig *6-236* *5-3: [6,7,9,(11)] (modus nos 4-5-6-7-3)*

*P2 unord.* *P6 unord.*

2 *tail notes of diskant*

3 poco pesante *4-18 (CI)* *I9 (unord.)* *End d P3* *End I9* *P4? - character of first chord* *P5 (3,6,7) unord.*

*Sainte monten* *P3* *P6* *I6 unord.* *P4 inc. (81)*

6 *P9 unord.* *frei 7 = bar 1* *accel.* *P2* *I6* *5-32 CIII* *6-2+4 = C#* *P6-2+9* *CI*

8 etwas ruhiger im Ausdruck *I2* *I1 unord.* *I9* *rit.*

*I5* *ppp* *pp* *f* *ppp* *rit.* *relato I2*

10 *bas 5 R.H.* *P5 unord.*

langsam beginnend *stacc.* *P2* *P9* *P4* *P11*

The score consists of five systems of piano music. Each system includes a key signature change, a tempo or mood marking, and dynamic markings. The first system is marked 'Sehr rasch' and 'heftig'. The second system is 'poco pesante'. The third system is 'etwas ruhiger im Ausdruck'. The fourth system is 'langsam beginnend'. The score is heavily annotated with handwritten notes, including performance directions like 'frei', 'accel.', and 'rit.', and various chord symbols and fingerings. Circled letters and numbers (P2, P3, P4, P5, P6, P9, I1, I2, I5, I6, I9) are scattered throughout, likely representing specific chords or motifs. The notation includes treble and bass clefs, time signatures (3/4, 4/4, 9/16, 16/16), and various rhythmic values.

6-219 invav. buto. successive Toprad. forms

Schoenberg, Op. 23/2

m. 4  
IT

9-3 IT<sub>1</sub> (7, 8, 11)  
unordered

m. 5

3-3

4-18: {3, 6, 9, 10} is in m. 2

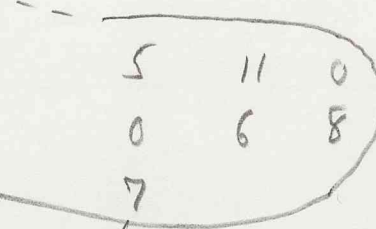
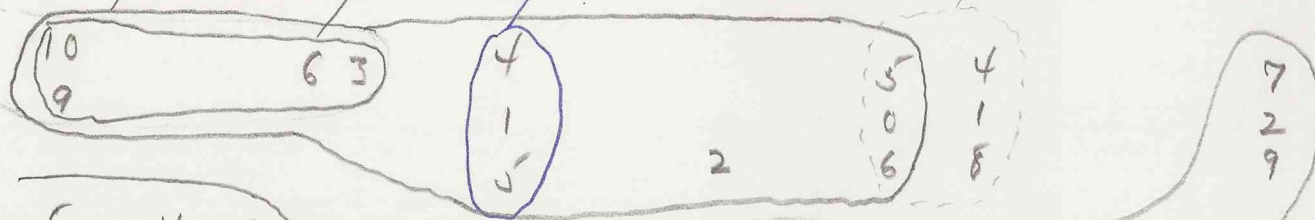
same as l.h. m. 8

? 6-16:  
9, 0, 1, 4, 5, 6, 8?

m. 6

9-3 IT<sub>1</sub> (7, 8, 11)  
~~unordered~~

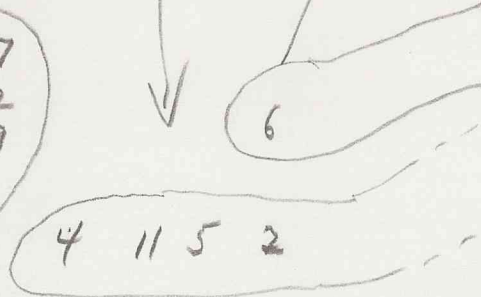
(2)



9-3 T<sub>10</sub>  
unordered



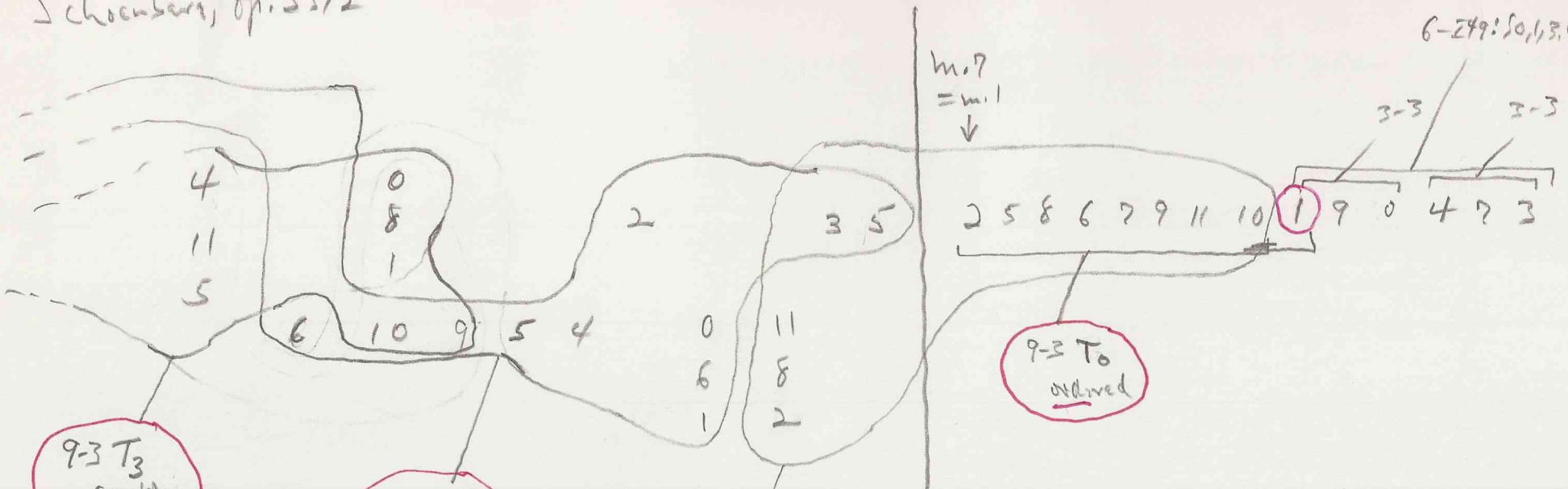
9-3 IT<sub>10</sub> (4, 5, 8)  
unordered



~~9-3 T<sub>3</sub>~~ (3, 6, 7)  
unordered

Schoenberg, op. 23/2

6-249: 5, 0, 1, 3, 4, 7, 11 (3)



9-3  $T_3$   
Cont'd.

5, 8, 11, 9, 10, 0, 2, 1, 4

9-3  $IT_1$   
Cont'd.

Iq: 9 6 3 5 4 2 0 1 10

IT  
word 6

2 11 8 10 9 7 5 6 3

8 invariants  
with  $P_0$   
(only differ w/  $p_{c3}$  and  $p_{c1}$ )

This is  $IT_0$  of the ordered  $T_0$ !

(0, 1, 4)

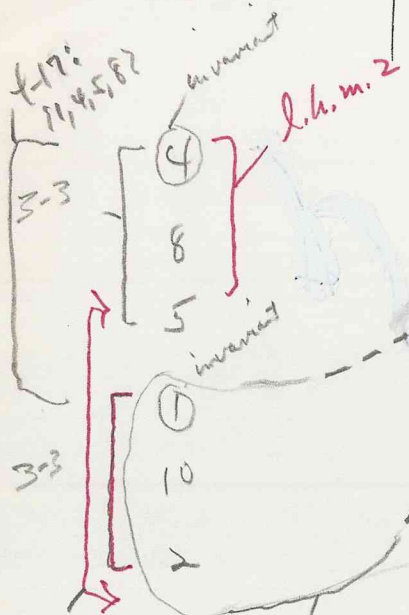
9-3  $T_0$   
ordered

6-249  $\subset$  9-3  
IX  
Could be completed by  
8 10 11 (I)  
or 8 6 5 (IT4)

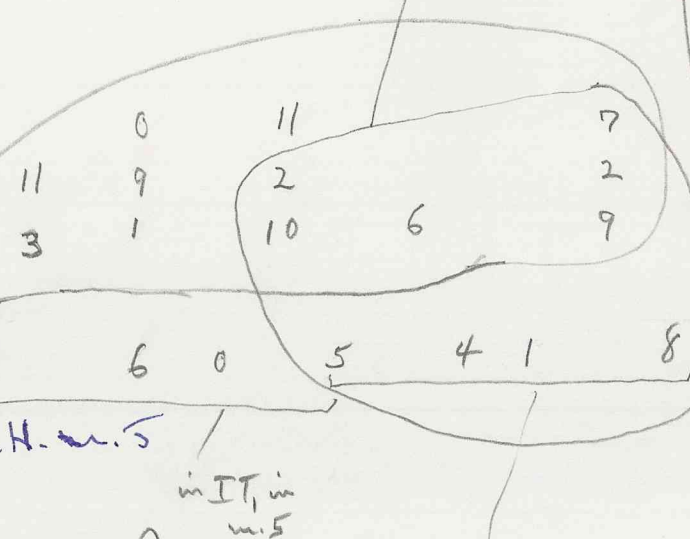
0 3 4  
2 1 4

Schoenberg, p. 23/2

m. 7, cont'd



m. 8  
(= m. 5)

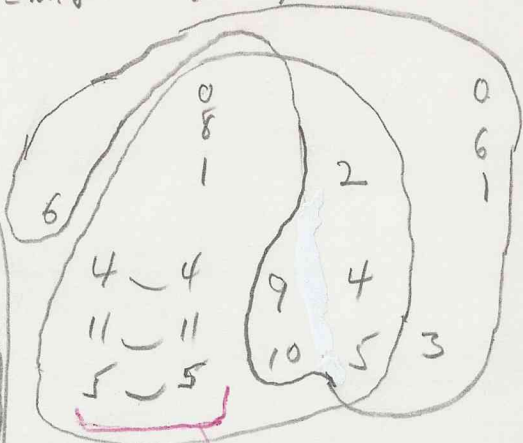


$IT_7$   
unord.

= m. 6

m. 9

$IT_1$



$IT_6$  in m. 6  
- here refers to  
 $IT_{0d}$   
ordered  
Prime  
(first  
trichord)

from  $T_0$   
first and  
last dyads

$IT_{10}$   
unord.  
 $I_6$   
6 3 0 2 1 1 9 10 7

in  $IT_1$  in  
m. 5  
↑  
4-19:  
{6, 9, 0, 1}

4-19:  
{1, 4, 5, 8} as in m. 7

6-244

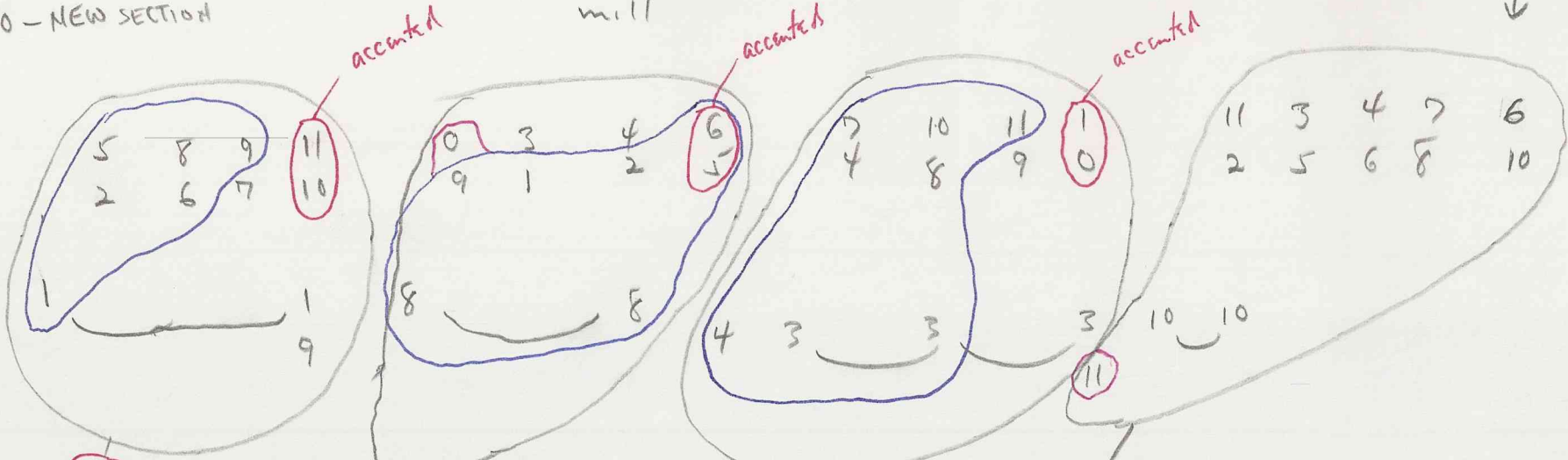
6-249  
{1, 2, 4, 5, 8, 10}  
t=1 (of previous  
statement)  
Could be  
completed  
by 9110 ( $T_3$ )  
or 679 ( $IT_5$ )

7 8 4

m. 10 - NEW SECTION

m. 11

m. 12  
↓



9-3  
P<sub>0</sub> (0, 3, 4)  
invariant

9-3  
P<sub>2</sub> (2, 10, 11)

9-3  
P<sub>2</sub> (2, 5, 6)

9-3  
P<sub>9</sub>

t=7  
invariant  
6-219:  
{1, 2, 5, 6, 8, 9}

t=7  
invariant  
6-219  
{8, 9, 9, 1, 3, 4}

t=7  
invariant  
6-219:  
{3, 4, 7, 8, 10, 11}

t=3  
invariant  
7-19  
{11, 2, 3, 4, 5, 7, 8}

Common

Common

Notes  
L.H. part

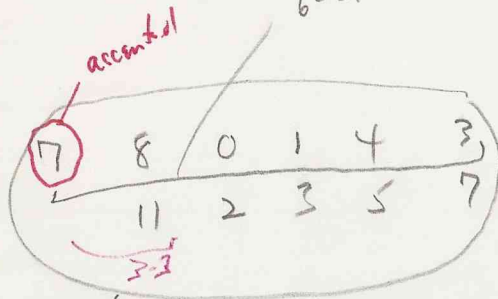


1, 8, 9

3, 4, 8

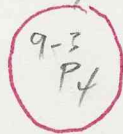
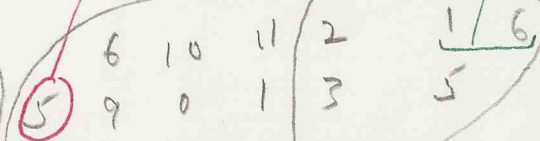
Schramm, Op. 23/2

6-219: {7, 8, 0, 1, 3, 4}

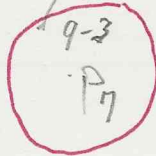


$t=2$   
invariant  
6-219:  
{0, 1, 2, 3, 5}

accepted



$t=3$   
invariant  
7-16:  
{0, 1, 2, 3, 5, 6, 9}



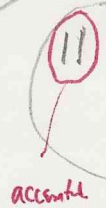
m=13 m=2 (8b-6b)



3-3  
long character

4 2 0

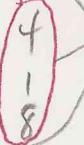
m=5



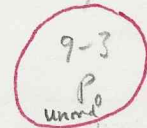
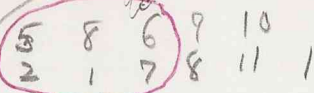
accepted

$t=5$   
invariant  
6-219:  
{1, 2, 5, 6, 8, 9}  
AA at beginning  
of transposition cycle

accepted REPRISÉ



m=14  
-m=1  
d, m=5  
n.b.



{6, 7} 2nd

m. 15  
= m. 2

vertical degree m. 7

= m. 3

m. 16

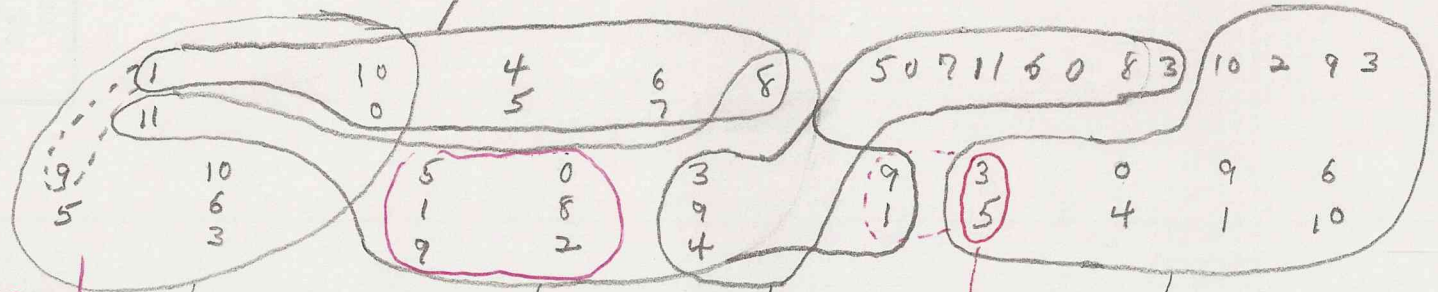
T<sub>11</sub> (Jack's pc 9)

m. 17  
= m. 4

11  
9

6  
10

4  
8



? 6-9  
{4, 6, 8, 9, 10, 11}

T<sub>4</sub>  
(Jack's pc 2)

IT<sub>0</sub>  
T<sub>8</sub>

T<sub>10</sub>

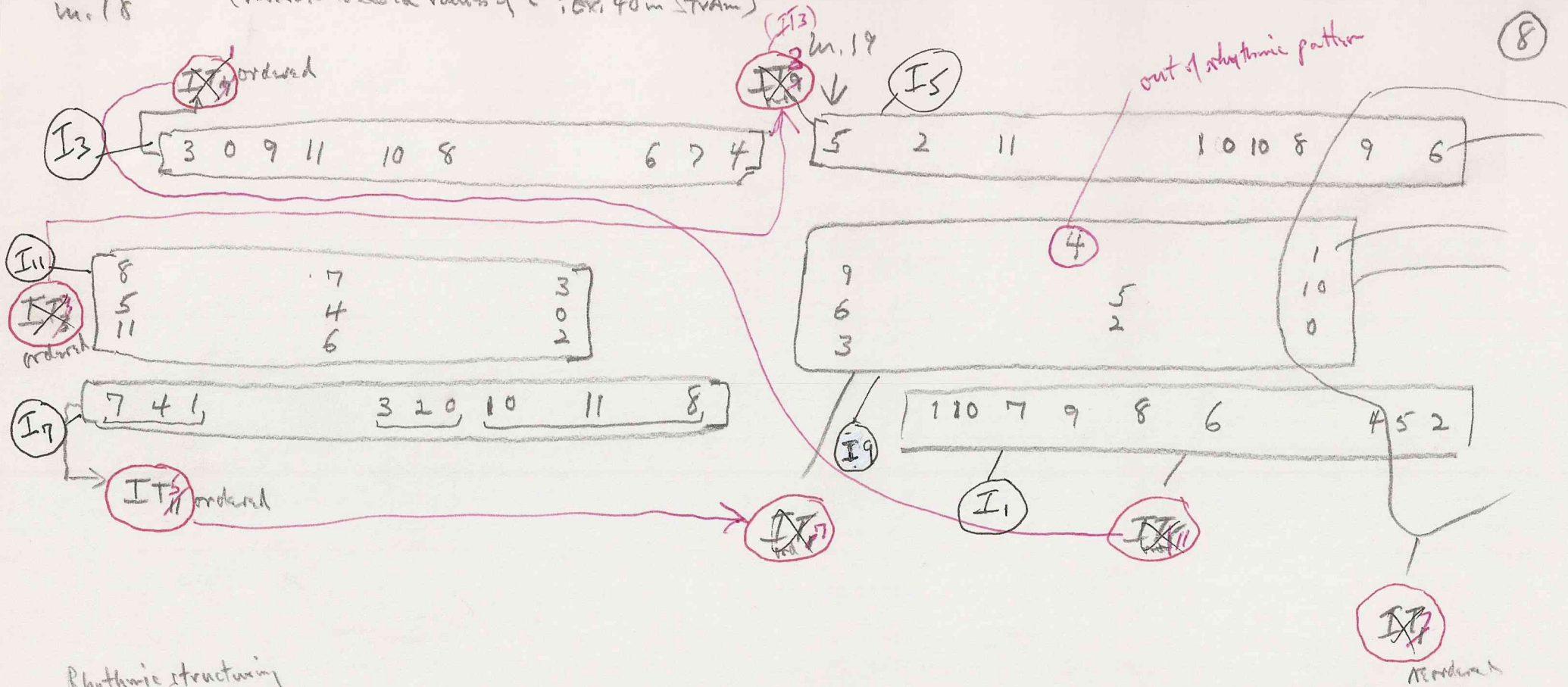
accented  
and change  
of register

IT<sub>1</sub>

could be completed by:

(IT<sub>7</sub>) 0, 3, 7

m. 18 (inversion-related values of  $t$ ; ex. 40 in Strav)



Rhythmic structuring

$t=2$   
 $I_5$   $\wedge$   $I_1$   
 $I_{11}$  &  $I_7$  share 6-2:  $\{10, 0, 1, 2, 3, 4\}$   
 $t=6$   
 $I_3$  &  $I_9$  share 6-30:  $\{11, 0, 2, 5, 6, 8\}$   
 $I_7$  and  $I_5$  share 6-2:  $\{4, 6, 7, 8, 9, 10\}$   
 $\checkmark$   $t=2$

[with respect to  $T_0$ , of course, the situation changes]



m.20

m.21

m.22

9

~~IT cont'd~~  
Iq. Cont'd

1  
10  
6 3 5 4 2 2 0 1 1 10

2 5 8 6 7 9 11 10 1 7 6 10

3-11    3-2    3-2

P<sub>2</sub>

ordered  
(trichorial layout)

3-3

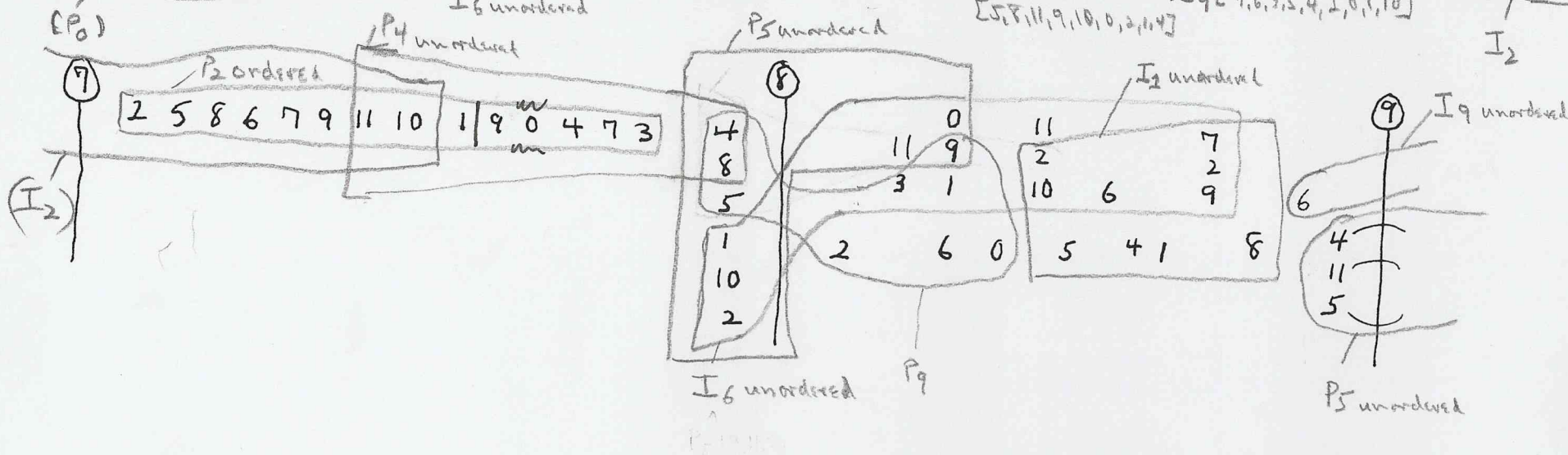
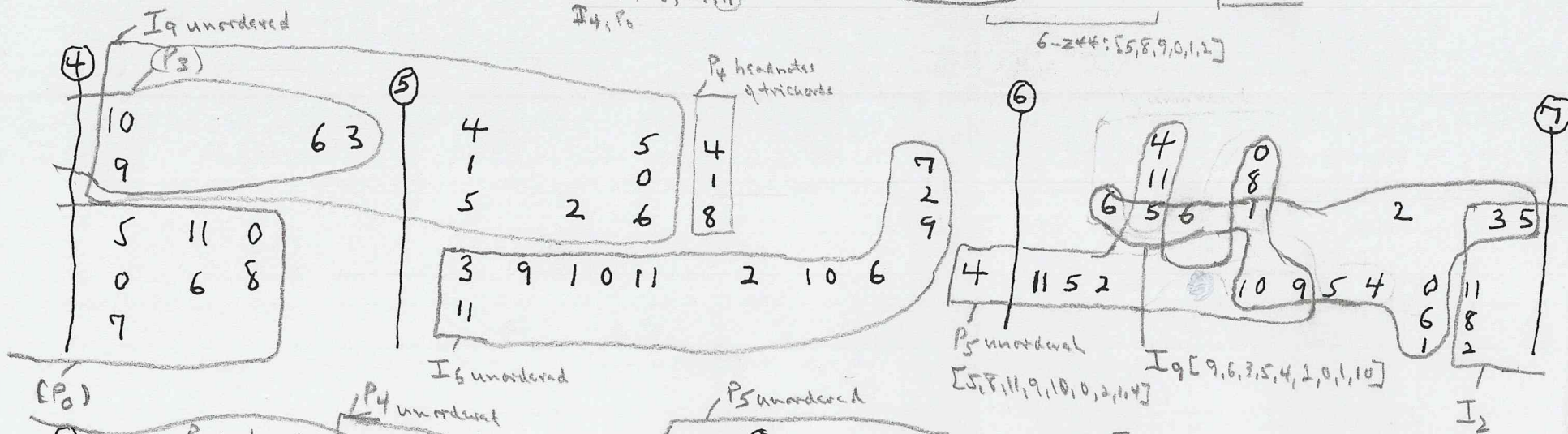
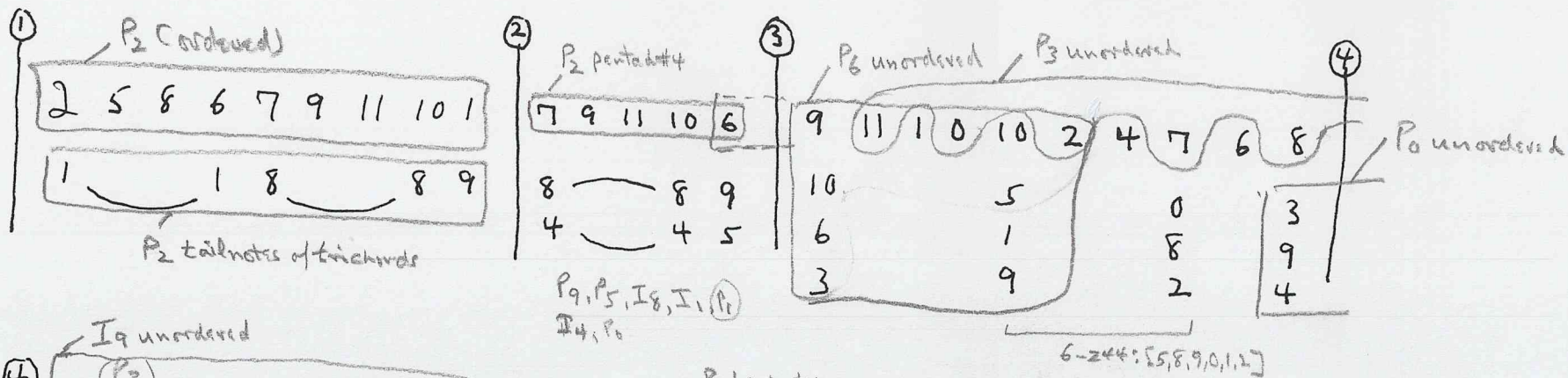
2 6 7 7 10  
0 2 4 5 8 9 11 1

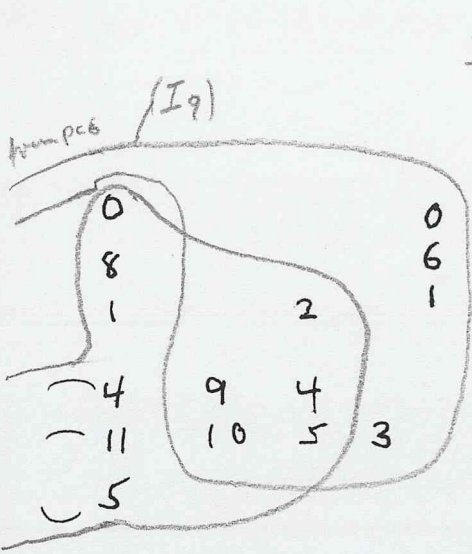
P<sub>2</sub> ~~Trichorial~~

P<sub>5</sub>

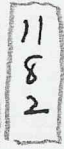
~~IT~~  
unord

END  
END

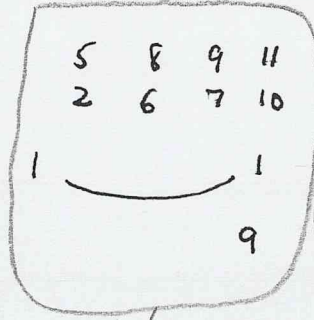




I<sub>2</sub> first trick and (ordered)

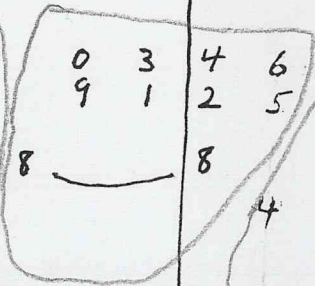


10

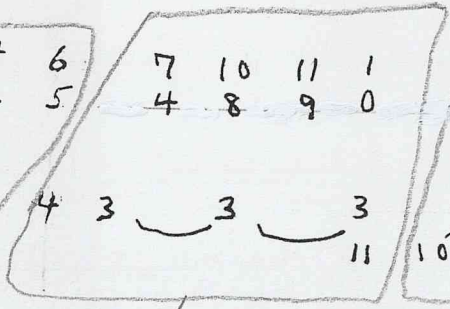


P<sub>2</sub>

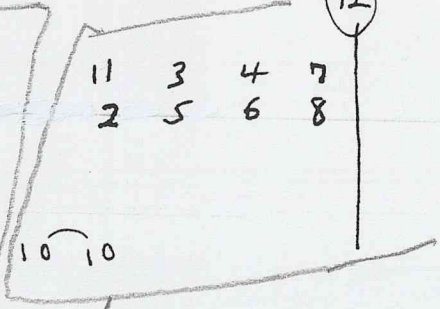
11



P<sub>9</sub>



P<sub>4</sub>



P<sub>11</sub>

12

12

6  
10

12 *accelerando - cresc. -*

13 *molto rit. -*

*sf NS* *sf NS* *ff* *fff NS*

*P8* *P6* *P9* *P2* *P1*

14 *- etwas langsamer*

15 *2/4* *cresc.*

16 *molto cresc.*

*pp* *fff*

*P2* *P6* *lacks pc2* *I8* *P0*

*Pesante*

17 *3/4* *fff*

18 *3/4* *sf dim.*

*sf* *sf*

*allmählich langsamer werden*

*larkin pc9* *P0* *I8* *I9* *I3* *I11* *I7* *T4/8*

19 *3/4* *dim.*

20 *6/4* *dim.* *(des letzten Taktes)*

*dim.* *non legato* *ord.*

*I5* *I9* *I1* *P2*

21 *4/2* *pp*

22 *dolce*

23

*unord.* *ord.* *except / w Db*

Schoenberg, Op.23/2

9-note row 9-3 with complement 3-3

2	5	8	6	7	9	11	10	1	0	3	4
11	2	5	3	4	6	8	7	10	9	0	1
8	11	2	0	1	3	5	4	7	6	9	10
10	1	4	2	3	5	7	6	9	8	11	0
9	0	3	1	2	4	6	5	8	7	10	11
7	10	1	11	0	2	4	3	6	5	8	9
5	8	11	9	10	0	2	1	4	3	6	7
6	9	0	10	11	1	3	2	5	4	7	8
3	6	9	7	8	10	0	11	2	1	4	5
4	7	10	8	9	11	1	0	3	2	5	6
1	4	7	5	6	8	10	9	0	11	2	3
0	3	6	4	5	7	9	8	11	10	1	2

The inversions, labelled from headnotes at the top of each column, are ordered: each pc integer  $m$  in the inversion column is the inverse modulo  $n$  of pc integer  $n$  in the corresponding row position. That is  $m_i + n_i = t$ , whose unique value ranges from 0 to 11 modulo 12.  $t$ , the "transposition operator" then appears in the expression  $T_t I$ , which yields the unordered "real" transposition of the inversion. Thus, reading across row 1 and down column 1, the sum of 2 + 2 means that the ordered inversion that begins on pc2 ( $I_2$ ) is  $T_4 I$ . The inversion that begins on pc5 forms the sum 7 with 2, hence is  $T_7 I$  of  $P_2$ , the inversion that begins on pc8 forms the sum 10 with pc 2, hence is  $T_{10} I$  of  $P_2$ , and so on. These computations can be easily verified by working with the 3-3 complements of course.

Interval vector (transpositional invariants): [767763]

Inversion-invariance vector (inversional invariants) for  $P_2$ :

0	1	2	3	4	5	6	7	8	9	10	11	Transpositions
6	6	7	6	6	8	8	6	7	8	7	6	Number of invariants

Schoenberg, Op.23/2 9-note row, with complement 3-3

The image displays a handwritten musical score for Schoenberg's Op. 23/2. It consists of 11 staves of music, each containing a 9-note row. The notes are written in a sequence that alternates between a row and its complement. The first row is: G#4, A4, Bb4, C#4, D#4, E4, F#4, Gb4, A#4. The second row is its complement: A#4, B4, C4, D4, E4, F4, G4, Ab4, Bb4. The third row is the first row again: G#4, A4, Bb4, C#4, D#4, E4, F#4, Gb4, A#4. The fourth row is the complement: A#4, B4, C4, D4, E4, F4, G4, Ab4, Bb4. This pattern continues for the remaining staves. The notation is in treble clef with a key signature of one sharp (F#). The notes are written as quarter notes on a five-line staff.

Invariant subsets under inversion for prime form of 9-3

P0 & I0  
6-Z28: 3,4,6,8,9,0 Complement of octatonic hexachord 6-z49  
P0 & I1  
6-20: 0,1,4,5,8,9  
P0 & I2  
7-22: 0,1,2,5,6,8,9  
P0 & I3  
6-Z42: 0,1,2,3,6,9 Complement of octatonic hexachord 6-z13  
P0 & I4  
6-Z37: 0,1,2,3,4,8  
P0 & I5  
8-7: 0,1,2,3,4,5,8,9  
P0 & I6  
8-3: 0,1,2,3,4,5,6,9  
P0 & I7  
6-1: 1,2,3,4,5,6  
P0 & I8  
7-8: 0,2,3,4,5,6,8  
P0 & I9  
8-17: 0,1,3,4,5,6,8,9  
P0 & I10  
7-Z37: 1,2,4,5,6,8,9  
P0 & I11  
6-Z13: 2,3,5,6,8,9 (CII)

Summary of Invariant Subsets Under Inversion

6-1: 1,2,3,4,5,6  
6-Z13: 2,3,5,6,8,9  
6-20: 0,1,4,5,8,9  
6-Z28: 3,4,6,8,9,0  
6-Z37: 0,1,2,3,4,8  
6-Z42: 0,1,2,3,6,9  
7-22: 0,1,2,5,6,8,9  
7-8: 0,2,3,4,5,6,8  
7-Z37: 1,2,4,5,6,8,9  
8-17: 0,1,3,4,5,6,8,9  
8-3: 0,1,2,3,4,5,6,9  
8-7: 0,1,2,3,4,5,8,9

Invariant Subsets Under Transposition

Value of t	Setname
1/11	7-3
2/10	6-2
3/9	7-16
4/8	7-21
5/7	6-z19
6	6-30 (CII)

Two sets I-related at  $T_n$

9-3 IIVEC in 0,1,2,3,4,5,6,8,9 (prime) (one)

0 1 2 3 4 5 6 7 8 9 10 11  
6 6 7 6 6 8 8 6 7 8 7 6

I D V E R S I T E

Generalized Any T

$T_4 I$  0 3 4  
0 1 4

$T_7 I$  0 3 4  
3 4 7

$T_{10} I$  0 3 4  
6 7 10

$T_8 I$  0 3 4  
4 5 8

$T_9 I$  0 3 4  
5 6 9

$T_{11} I$  0 3 4  
7 8 11

$T_1 I$  0 3 4  
9 10 1

$T_0 I$  0 3 4  
8 9 0

$T_3 I$  0 3 4  
~~1 2 3~~  
~~10 11 3~~  
11 0 3

~~0 3 4~~  
 $T_2 I$  10 11 2

$T_5 I$  0 3 4  
1 2 5

~~0 3 4~~  
 $T_6 I$  2 3 6

0 3 4 0 9 8	4 1 0		
$T_{10} I$	$I_{10}$	1 inv.	7
$T_1$	$I_{11}$	0 inv.	6
$T_2$	$I_0$	0 inv.	6
$T_3$	$I_1$	2 inv.	8
$T_4$	$I_2$	2 inv.	8
$T_5$	$I_3$	0 inv.	6
$T_6$	$I_4$	1 inv.	7
$T_7$	$I_5$	2 inv.	8
$T_8$	$I_6$	1 inv.	7
$T_9$	$I_7$	0 inv.	6
$T_{10}$	$I_8$	0 inv.	6
$T_{11}$	$I_9$	0 inv.	6

~~11 0 3~~



$I_5$  5 2 ⑪ 1 0 1 0 ⑧ 9 6  
 $I_9$  9 6 ③ 5 ④ 2 0 1 1 0  
word 9 6 5 2 0 1 1 0 ⑦-21

$I_5$  5 2 11 10 10 8 9 6  
 $I_1$  ① 10 ⑦ 9 8 6 ④ 5 2  
word 110 9 8 6 5 2 ⑦-21

$I_9$  9 6 ③ 5 4 2 ⑩ 1 1 0  
 ~~$I_4$  5 4~~ 1 1 0 ⑦ 9 ⑧ 6 4 5 2  
 word. 1 1 0 9 6 4 5 2 ⑦-21

08.23/2

Summary of row forms used

I1

I2

I3

I5

I6

I7

I8

I9

I11

P0

P1

P2

P3

P4

P5

P6

P8

P9

P11

9-3: [767763]

Schoenberg, Op. 23/2  
Bars 18-19 (See StrAM pp. 35-37)  
Ordered forms given here

I3: 3 0 9 11 10 8 6 7 4

I11: 11 8 5 7 6 4 2 3 0

I7: 7 4 1 3 2 0 10 11 8

I5: 5 2 11 1 0 10 8 9 6

I9: 9 6 3 5 4 2 0 1 10

I1: 1 10 7 9 8 6 4 5 2

1. Vertically aligned set forms have  
the same common subset between pairs:  
7-21

2. Laterally aligned row forms share subsets  
as follows: I3 & I5: ~~6-2~~; I11 and I9: 6-2;  
I7 and I1: 6-30.

Composite Attack Pattern  
Attack-Release Partition

36(2) 16(3) 9(6) 12 2(6) 18 24

72      48      54      12 12      18 24

3 : 2

24 : 27

9 : 2

1 : 1

2 : 3

3 : 4

Determined by change of attack pattern  
Ratios

Proportional pattern determined by duration of partition cell:

2 3 6 12 6 18 24

2 3

1

2

1

2

2

1

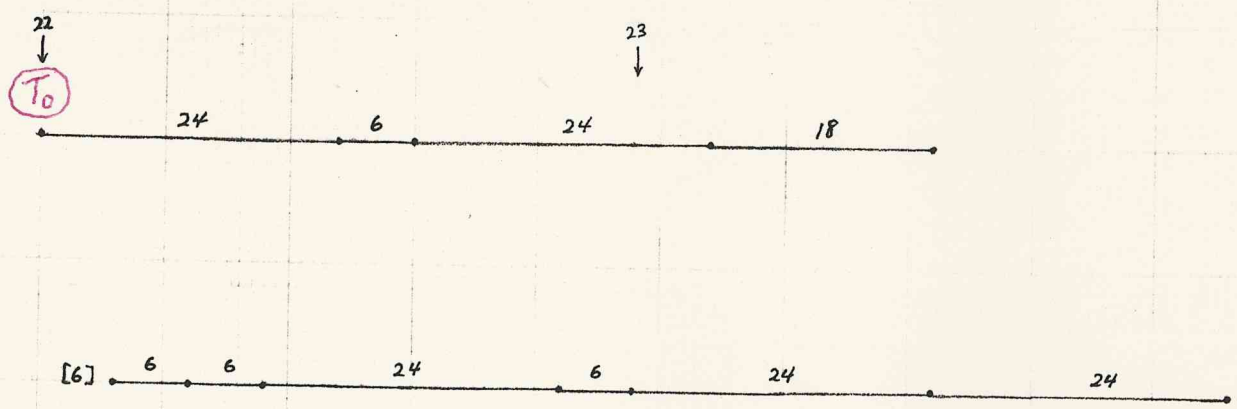
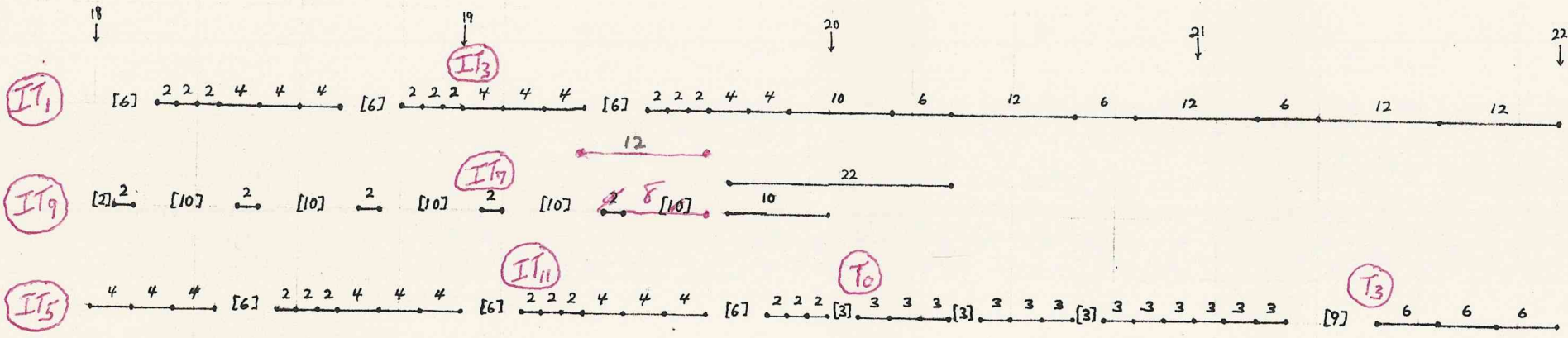
1

3

3

4

Schoenberg, Op. 23/2  
 Proportional Graph of Measures 18-23



DURATIONS OF 9-3 (PITCHED)

IT <sub>1</sub>	24	IT <sub>11</sub>	24
IT <sub>9</sub>	6	IT <sub>3</sub>	36
IT <sub>5</sub>	30	IT <sub>7</sub>	36

Opus 23/2

Forms of 9-3 in order of appearance. (Local inversions circled)

	P2	2	5	8	6	7	9	11	10	1	
t=3/9	P6	⑥	⑨	0	⑩	⑪	①	3	②	⑤	7-21
	P3	③	⑥	⑨	7	8	⑩	0	⑪	2	6-242
	P0	①	③	⑥	4	5	⑦	⑨	⑧	11	6-242
	I9	⑨	⑥	③	⑤	④	2	0	1	10	5-242
	I6	<del>⑥</del>	<del>⑨</del>	<del>0</del>	<del>⑩</del>	<del>⑪</del>	<del>①</del>	<del>3</del>	<del>②</del>	<del>⑤</del>	7-16
	P5	⑤	8	⑪	⑨	⑩	0	②	1	4	6-144
	P9	⑨	0	3	①	②	④	6	⑤	⑧	7-21
	P2	②	⑤	⑧	⑥	7	⑨	11	10	①	6-219
	I6	⑥	⑨	0	⑩	⑪	1	3	②	⑤	6-244
	I1	1	10	7	9	8	6	4	5	2	
	I9	9	6	3	5	4	2	0	1	11	
	P2	2	5	8	6	7	9	11	10	1	
	P9	0	0	3	1	2	4	6	5	8	
	P4	4	7	10	8	9	11	1	0	3	
	P11	11	2	5	3	4	6	8	7	10	
	P8	8	11	2	0	1	3	5	4	7	
	P6	6	9	0	10	11	1	3	2	5	
	P9	9	0	3	1	2	4	6	5	8	
	P2	2	5	8	6	7	9	11	10	1	
	P6	6	9	0	10	11	1	3	2	5	
	I8	8	5	2	4	3	1	11	0	9	
	P0	0	9	6	8	7	5	3	4	1	
	I9	9	6	3	5	4	3	0	1	10	
	I7	7	4	1	3	2	0	10	11	8	
	I11	11	8	5	7	6	4	2	3	0	
	I3	3	0	9	11	10	8	6	7	4	
	I5	5	2	11	1	0	10	8	9	6	
	I9	9	6	3	5	4	2	0	1	10	
	I1	1	10	7	9	8	6	4	5	2	
	P2	2	5	8	6	7	9	11	10	1	
	P5	5	8	11	9	10	0	2	1	4	
	P2	2	5	8	6	7	9	11	10	1	

✓ ✓ ✓ ✓ ✓ ✓  
 ⑥ ③ ① ② ① 11 ⑤ ⑩ 7  
 5 8 ⑪ ⑨ ⑩ 0 ② ① 4

# Op. 23, 1

Abteilung II  
Reihe B, Band 4 Kritischer Bericht

Die Teil-Erstniederschrift **A** enthält außer **A1** einige vom Endtext abweichende Lesarten, die durchweg jedoch bereits korrigiert sind; die Teil-Erstniederschrift **B** ist im Gegensatz zu **A** gekennzeichnet durch das Fehlen der meisten Vortragsbezeichnungen (die erst in der Abschrift **H** auftreten). Im folgenden wird zunächst **A1** mitgeteilt, dann werden die Korrekturen und die vom Endtext abweichenden Lesarten verzeichnet; auf eine Liste aller in **B** noch fehlenden Vortragszeichen wird verzichtet.

Als Ende der Teil-Erstniederschrift **A** bietet **A1** eine frühere Version von T. 22(Ende)-23; die Streichung dieser Passage erfolgte nach der Neufassung von T. 23 am Beginn von **B** bei Anfügung der Abschrift **H** an **A**. **A1** zeigt, daß die ‚Reprise‘ des Stückes in der Erstfassung dieser Takte (**A1** : T. 22, 3. 8el) mit dem Krebs der Oberstimme von T. 1-3 beginnen sollte; die endgültige Fassung **B** (T. 23, Beginn) korrigiert das zur variierten Wiederaufnahme des gesamten Stimmenkomplexes der Anfangstakte.



Gestrichen ab T. 22, letztes 8el. | T. 22, Taktvorschrift: Zähler 3 post corr. (vermutlich aus 4); nach Streichung des letzten 8els in I und II je 8el-Pause nachgetragen.

Takt	System	Bemerkung
1	über I	<b>A</b> hat ante corr. die Vorschrift <i>Sehr mäßige</i> ♩ (ca 54).
1,4,7		<b>A</b> hat ante corr. die Taktvorschrift $\frac{2}{4}$ .
13	über I	<i>etwas</i> in <b>A</b> korr. aus <i>viel</i> .
19	I	Die beiden letzten Zweiklänge sind in <b>A</b> 16tel statt 32stel, erklingen also mit den beiden letzten 16teln in II zusammen.
31	I	In <b>B</b> ist das 6.-8. 32stel g'' punktierte 8el, <b>H</b> hat den Endtext.
33		In <b>B</b> lautet die Taktvorschrift ante corr. $\frac{5}{4}$ , post corr. $\frac{5}{8}$ , in <b>H</b> deuten Rasuren auf die gleiche Korrektur.
34		In <b>B</b> lautet die Taktvorschrift $\frac{4}{8}$ , diese Lesart ist nach <b>H</b> übernommen und dort zu $\frac{2}{8}$ korrigiert.

# Op. 23, 2

Die Skizzen des offensichtlich in Konnex zu Quelle **D** stehenden Blattes **a** betreffen die Takte 1-13 und 18-Ende. (Vgl. die Reproduktion von **a** oben S. VIII.)

Skizze **a1** bietet eine weitläufige 16taktige Erstfassung der späteren Takte 1-9.

**a1**  
Sehr rasch ♩ = 152

Handwritten musical sketch for Op. 23, 2, showing staves for a1, measures 1-9. The sketch includes time signatures 2/4 and 3/4, dynamic markings (mp, f, p), and various annotations. A diagram at the bottom shows fingerings for measures 7-8 and 24-5.

Annotations:

- inner voice D fixed
- ? transcription errors Explains E at beginning (T4I)
- Reordered as
- 5-8: [7,9,10,11,12]
- 5-3: [6,7,9,10,11] almost ordered substit 1P2
- 6-245: [7,9,10,11,14] vom I4
- 6-24: [5,6,7,9,10,11]
- invers. 7-8
- variatio transcr. Error

Diagram of fingerings:

2 5 8 6 7 9 11 10 1  
4 1 10 0 11 9 7 8 5  
1 0 9 11 8 10 5 7 4

Diagram of fingerings (circled):

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Schoenberg, Op.23/2

9-note row 9-3 with complement 3-3

TI	[4	7	10	8	9	11	1	0	3	2	5	6]
	2	5	8	6	7	9	11	10	1	0	3	4
	11	2	5	3	4	6	8	7	10	9	0	1
	8	11	2	0	1	3	5	4	7	6	9	10
	10	1	4	2	3	5	7	6	9	8	11	0
	9	0	3	1	2	4	6	5	8	7	10	11
	7	10	1	11	0	2	4	3	6	5	8	9
	5	8	11	9	10	0	2	1	4	3	6	7
	6	9	0	10	11	1	3	2	5	4	7	8
	3	6	9	7	8	10	0	11	2	1	4	5
	4	7	10	8	9	11	1	0	3	2	5	6
	1	4	7	5	6	8	10	9	0	11	2	3
	0	3	6	4	5	7	9	8	11	10	1	2

[767763]

II vector w/r P2

766886787666

The inversions, labelled from headnotes at the top of each column, are ordered: each pc integer  $m$  in the inversion column is the inverse modulo  $n$  of pc integer  $n$  in the corresponding row position. That is,  $m_i + n_i = t$ , whose unique value ranges from 0 to 11 modulo 12.  $t$ , the "transposition operator" then appears in the expression  $T_t I$ , which yields the unordered "real" transposition of the inversion. Thus, reading across row 1 and down column 1, the sum of 2 + 2 means that the ordered inversion that begins on pc2 ( $I_2$ ) is  $T_4 I$ . The inversion that begins on pc5 forms the sum 7 with 2, hence is  $T_7 I$  of  $P_2$ , the inversion that begins on pc8 forms the sum 10 with pc 2, hence is  $T_{10} I$  of  $P_2$ , and so on. These computations can be easily verified by working with the 3-3 complements of course.

Amplification (positions begin w/r P)

Row 1, Col 1 Positions

Pcs

$m$  (col.)  $n$  (row)

0	0	$2 + 2 = 4$
1	1	$11 + 5 = 16 = 4 \text{ mod } 12$
2	2	$8 + 8 = 16 = 4 \text{ mod } 12$

i.e. Col. 2 in  $T_4 I$  of Row 1

Row 1, Col 2

0	0	$2 + 5 = 7$
1	1	$5 + 2 = 7$
2	2	$3 = 19 = 7 \text{ mod } 12$



I	Types	#(I wanted)
0	0, 3, 4	6
1	3, 0, 4	6
2	0, 3	7
3	3, 0, 4	6
4	4, 0	8
5	0, 1	
6		
7		
8		
9		
10		
11		

Correct II

	REFERENTIAL ROW in $P_2$										<del>Non-mono</del>	<del>#(I wanted)</del>
	2	5	8	6	7	9	11	10	1	0		SET CLASS
$T_0 I(P_2)$	10	7	4	6	5	3	1	2	11	4, 3	7-22	
$T_1 I$	11	8	5	7	6	4	2	3	0	4, 3, 0	6-242	
$T_2 I$	0	9	6	8	7	5	3	4	1	0, 3, 4	6-242	
$T_3 I$	1	10	7	9	8	6	4	5	2	4	8-7	
$T_4 I$	2	11	8	10	9	7	5	6	3	3	8-3	
$T_5 I$	3	0	9	11	10	8	6	7	4	3, 0, 4	6-1	
$T_6 I$	4	1	10	0	11	9	7	8	5	4, 0	7-8	
$T_7 I$	5	2	11	1	0	10	8	9	6	0	8-17	
$T_8 I$	6	3	0	2	1	11	9	10	7	3, 0	7-237	
$T_9 I$	7	4	1	3	2	0	10	11	8	4, 3, 0	6-213	
$T_{10} I$	8	5	2	4	3	1	11	0	9	4, 3, 0	6-228	
$T_{11} I$	9	6	3	5	4	2	0	1	10	3, 4, 0	6-20	

7 6 6 8 8 6 7 8 7 6 6 6  
~~6 6 7 6 6 6 8 6 7 8 7 6~~

## Invariant subsets of pc set 9-3 under transposition

t = set

1/11 7-3

2/10 6-2

3/9 7-16

4/8 7-21

5/7 6-z19

6 6-30

## Opus 23/2

Forms of 9-3 in order of appearance.

P2	2	5	8	6	7	9	11	10	1
P6	6	9	0	10	11	1	3	2	5
P3	3	6	9	7	8	10	0	11	2
P0	0	3	6	4	5	7	9	8	11
I9	9	6	3	5	4	2	0	1	10
I6	6	9	0	10	11	1	3	2	5
P5	5	8	11	9	10	0	2	1	4
P9	9	0	3	1	2	4	6	5	8
P2	2	5	8	6	7	9	11	10	1
I6	6	9	0	10	11	1	3	2	5
I1	1	10	7	9	8	6	4	5	2
I9	9	6	3	5	4	2	0	1	11
P2	2	5	8	6	7	9	11	10	1
P9	0	0	3	1	2	4	6	5	8
P4	4	7	10	8	9	11	1	0	3
P11	11	2	5	3	4	6	8	7	10
P8	8	11	2	0	1	3	5	4	7
P6	6	9	0	10	11	1	3	2	5
P9	9	0	3	1	2	4	6	5	8
P2	2	5	8	6	7	9	11	10	1
P6	6	9	0	10	11	1	3	2	5
I8	8	5	2	4	3	1	11	0	9
P0	0	9	6	8	7	5	3	4	1
I9	9	6	3	5	4	3	0	1	10
I7	7	4	1	3	2	0	10	11	8
I11	11	8	5	7	6	4	2	3	0
I3	3	0	9	11	10	8	6	7	4
I5	5	2	11	1	0	10	8	9	6
I9	9	6	3	5	4	2	0	1	10
I1	1	10	7	9	8	6	4	5	2
P2	2	5	8	6	7	9	11	10	1
P5	5	8	11	9	10	0	2	1	4
P2	2	5	8	6	7	9	11	10	1

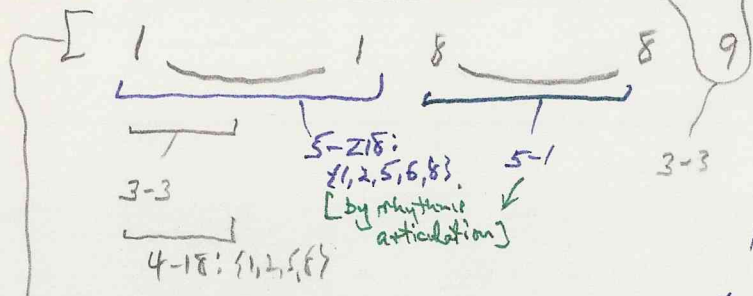
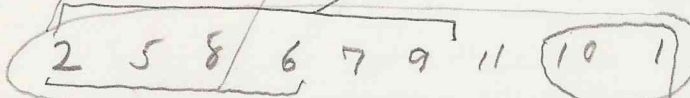
Schroenberg, sp. 23/2 (July 26, 1920)

m.1

9-3 (T<sub>0</sub>) (0,3,4)

4-12: {2,5,6,8} July 8-26

6-236



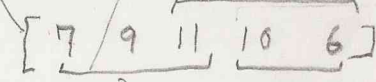
3-4: {8,9,1} upper units in m.2

5-3: {6,7,9,10,11} m.2

3-5: {4,7,8}

3-3: {5,6,9}

3-4: {6,10,11}



3-3: {4,5,8}

3-3: {5,6,9}



4-7 {4,5,8,9}

? 8-1: {4,5,6,7,8,9,10,11}

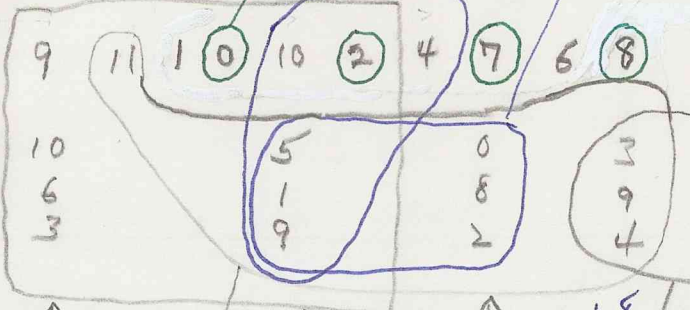
6-236: {4,7,8,9,10,11}

NB. 8-1 ≠ 9-3

m.3

9-3 T<sub>4</sub> (4,7,8) unordwed accepted

6-219: {9,10,11,2,4,5} 6-218: {5,6,9,0,1,2,3}



4-18 {3,6,9,10}

9-3 T<sub>0</sub> unordwed

4-19 {9,10,1,5}

4-16 {7,8,9,2} (same as accepted pcs)

9-3 T<sub>10</sub> unordwed

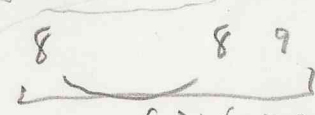
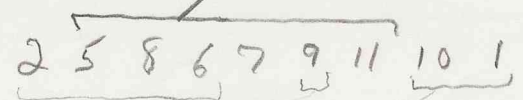
Same as upper part in m.4

4-18: {3,6,9,10}

q. first tetrad

SUBSETS OF 9-3

6-2: {5,6,7,8,9,11}

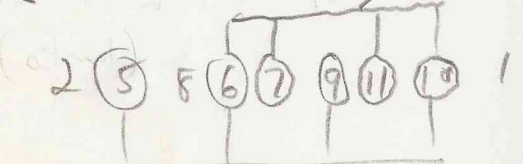


6-2: {7,8,9,10,11,1}

? 7-21: {1,2,5,6,8,9,10}

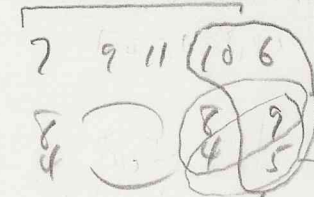
none contiguous {5,6,9,10,1,2} {8,10,11,1,2,5,6}

4-7: {6,7,10,11}



4-7: {5,6,9,10}

4-2 as in previous line



3-4

3-4

4-7: {5,6,9,10}

Beginning with pc 11 (and including needed notes and trill in m.4 plus after part: 9-3 T<sub>1</sub> (1,4,5))