

Composition: Electronic Media I

Sept. 19, 2007

Pitch Networks

1. Pitch change processing and pitch sets.
 - a. Software pitch change compared to pitch-class transposition mod 12.
 - b. Transposition of transpositions
 - c. David Lewin's Transformational Theory

2. Notation.
 - a. t and e for ten and eleven
 - b. $2(0\ 1\ 4) = 2+0, 2+1, 2+4 = 2\ 3\ 6$

3. Transpositions of pitch-class set (0 1 4).

$0(0\ 1\ 4)$	=	0	1	4
$1(0\ 1\ 4)$	=	1	2	5
$2(0\ 1\ 4)$	=	2	3	6
$3(0\ 1\ 4)$	=	3	4	7
$4(0\ 1\ 4)$	=	4	5	8
$5(0\ 1\ 4)$	=	5	6	9
$6(0\ 1\ 4)$	=	6	7	t
$7(0\ 1\ 4)$	=	7	8	e
$8(0\ 1\ 4)$	=	8	9	0
$9(0\ 1\ 4)$	=	9	t	1
$t(0\ 1\ 4)$	=	t	e	2
$e(0\ 1\ 4)$	=	e	0	3

$$0(0\ 1\ 2\ 3\ 4\ 5) \text{ and } 6(0\ 1\ 2\ 3\ 4\ 5) =$$

4. Set theory notation.
 - a. Union: \cup
 - b. Intersection: \cap
 - c. Empty set: \emptyset
5. Set theory definitions for set $X = \{a, b, c\}$ and set $Y = \{d, e, f\}$, then
 - a. $X \cup Y = \{a, b, c, d, e, f\}$
 - b. $X \cap Y = \emptyset$
3. Set theory and hexachordal combinatoriality.
 - a. $0(0\ 1\ 2\ 3\ 4\ 5) \cup 6(0\ 1\ 2\ 3\ 4\ 5) = \text{Aggregate (12-note chromatic collection)}$
 - b. $0(0\ 1\ 2\ 3\ 4\ 5) \cap 6(0\ 1\ 2\ 3\ 4\ 5) = \emptyset$
 - c. Combinatoriality and counterpoint
 - d. Combinatoriality and harmonic areas.
4. For hexachord A, tetrachord B, and trichord C, and a transposition value T_t , consider the following
 - a. If $T_0(A) \cup T_n(A) = \text{aggregate}$, then $T_0(A) \cap T_n(A) = \emptyset$
 - b. If $T_0(B) \cup T_m(B) \cup T_n(B) = \text{aggregate}$, then $T_0(B) \cap T_m(B) = T_0(B) \cap T_n(B) = T_m(B) \cap T_n(B) = \emptyset$
 - c. If $T_0(C) \cup T_m(B) \cup T_n(B) \cup T_p(B) = \text{aggregate}$, then $T_0(C) \cup T_m(B) \dots \cup T_p(B) = \emptyset$
5. Examples of trichord combinatoriality induced by transpositions of pitch-class set (0 1 4).

$$0(0\ 1\ 4) = 0\ 1\ 4$$

- 1(0 1 4) = 1 2 5
- 2(0 1 4) = 2 3 6
- 3(0 1 4) = 3 4 7
- 4(0 1 4) = 4 5 8
- 5(0 1 4) = 5 6 9
- 6(0 1 4) = 6 7 t
- 7(0 1 4) = 7 8 e
- 8(0 1 4) = 8 9 0
- 9(0 1 4) = 9 t 1
- t(0 1 4) = t e 2
- e(0 1 4) = e 0 3

0(0 1 4) = 0 1 4	0(0 1 4) = 0 1 4	0(0 1 4) = 0 1 4
1(0 1 4) = 1 2 5	1(0 1 4) = 1 2 5	2(0 1 4) = 2 3 6
2(0 1 4) = 2 3 6		
3(0 1 4) = 3 4 7	3(0 1 4) = 3 4 7	
4(0 1 4) = 4 5 8	4(0 1 4) = 4 5 8	
5(0 1 4) = 5 6 9		5(0 1 4) = 5 6 9
6(0 1 4) = 6 7 t		6(0 1 4) = 6 7 t
7(0 1 4) = 7 8 e		7(0 1 4) = 7 8 e
8(0 1 4) = 8 9 0	8(0 1 4) = 8 9 0	
9(0 1 4) = 9 t 1	9(0 1 4) = 9 t 1	
t(0 1 4) = t e 2		t(0 1 4) = t e 2
e(0 1 4) = e 0 3	e(0 1 4) = e 0 3	

0(0 1 4 1 2 5 3 4 7 4 5 8 8 9 0 9 10 1 11 0 3) = 0 1 4 1 2 5 3 4 7 4 5 8 8 9 0 9 t 1 e 0 3
 1(0 1 4 1 2 5 3 4 7 4 5 8 8 9 0 9 10 1 11 0 3) = 1 2 5 2 3 6 4 5 8 5 6 9 9 t 1 t e 2 0 1 4

0(0 1 4)	=	0	1	4							
1(0 1 4)	=	1	2	5							
2(0 1 4)	=	2	3	6							
3(0 1 4)	=	3	4	7							
4(0 1 4)	=	4	5	8							
5(0 1 4)	=	5	6	9							
6(0 1 4)	=	6	7	t							
7(0 1 4)	=	7	8	e							
8(0 1 4)	=	8	9	0							
9(0 1 4)	=	9	t	1							
t(0 1 4)	=	t	e	2							
e(0 1 4)	=	e	0	3							

=

0(0 1 4) = **0 1 4**
 1(0 1 4) = **1 2 5**
 2(0 1 4) =
 3(0 1 4) = **3 4 7**
 4(0 1 4) = **4 5 8**
 =

5(0 1 4) =
6(0 1 4) =
7(0 1 4) = 8 9 **0**
8(0 1 4) = 9 t **1**
9(0 1 4) =
t(0 1 4) = e **0** 3
e(0 1 4)

0(0 1 4) = 0 1 4
1(0 1 4) =
2(0 1 4) = 2 3 6
3(0 1 4) =
4(0 1 4) =
5(0 1 4) = 5 6 9
6(0 1 4) = 6 7 t
7(0 1 4) = 7 8 e
8(0 1 4) =
9(0 1 4) = t e 2
t(0 1 4) =
e(0 1 4)