Straus Theory Exercises
Ch. 3: I. 1-3 (p. 114)

Common Tones under T_n

ANSWERS

I. 1.

a. Examine the interval class vector of all tetrachordal set classes to determine which of them retain two common tone(s) at T_2:

4-1, 4-2, 4-10, 4-11, 4-22, 4-23, 4-24, 4-25

b. Examine the interval class vector of all pentachordal set classes to determine which of them retain four common tone(s) at T_4:

5-21, 5-33

c. Examine the interval class vector of all hexachordal set classes to determine which of them retain two common tone(s) at T_6:

6-2, 6-Z3, 6-Z4, 6-9, 6-Z10, 6-Z11, 6-15, 6-16, 6-Z19, 6-Z24, 6-Z25, 6-Z26,
6-31, 6-33,6-Z36, 6-Z37, 6-Z39, 6-Z40, 6-Z44, 6-Z46, 6-Z47, 6-Z48

I. 2.

Transpose the following pc sets by T_1, T_4 and T_6. Identify which pcs are preserved by underlining them. Report the total number of pcs that are preserved by the transformation. Verify your answer by determining the pc set's set class and interval class vector.

Don't forget to multiply the ic6 vector entry by 2.

a.
T_1 [3.4.5] = [4,5,6] - 2 common tone(s) preserved at T_1
T_4 [3.4.5] = [7,8,9] - 0 common tone(s) preserved at T_4
T_6 [3.4.5] = [9,10,11] - 0 common tone(s) preserved at T_6

3-1 (012) <210000>

b.
T_1 [1,3,7,9] = [2,4,8,10] - 0 common tone(s) preserved at T_1
T_4 [1,3,7,9] = [5,7,11,1] - 2 common tone(s) preserved at T_4
T_6 [1,3,7,9] = [7,9,1,3] - 4 common tone(s) preserved at T_6

4-25 (0268) <020202>

c.
T_1 [2,3,6,7,10,11] = [3,4,7,8,11,0] - 3 common tone(s) preserved at T_1
T_4 [2,3,6,7,10,11] = [6,7,10,11,2,3] - 6 common tone(s) preserved at T_4
T_6 [2,3,6,7,10,11] = [8,9,0,1,4,5] - 0 common tone(s) preserved at T_6

6-20 (014589) <303630>

d.
T_1 [1,5,7,8] = [2,6,8,9] - 1 common tone(s) preserved at T_1
T_4 [1,5,7,8] = [5,9,11,0] - 1 common tone(s) preserved at T_4
T_6 [1,5,7,8] = [7,11,1,2] - 2 common tone(s) preserved at T_6

4-Z29 (0137) <111111>

I. 3.

Which of the following pc sets are *transpositionally symmetrical*? That is, which of the following pc sets map onto themselves under T_n (other than T_0)? If the pc set is transpositionally symmetrical, at what T_n-level does it map onto itself? (All sets map onto themselves at T_0, so that will be ignored in the answers below.)

a. Is the pc set [F,G,B,C#] transpositionally symmetrical? That is, does the pc set [F,G,B,C#] map onto itself (hold 4 common tones) for some T_n? If so, at what T_n?

First determine the set class to which the pc set belongs:

4-25 (0268)

Then examine its interval class (ic) vector:

<020202>

The answer is: **Yes** [F,G,B,C#] is transpositonally symmetrical at **T_6**
because 2 * the ic6 entry in the ic vector = 4, the cardinality of the pc set.

I you wish to double-check your work, you can verify your answer by performing the transformation:

T_6 [F,G,B,C#] = (B,C#,F,G)

b. [B,C,D#,G]

4-19 (0148) <101310>

No [B,C,D#,G] is NOT transpositionally symmetrical because ic vector entry equals 4, the cardinatlity of the set.

c. [Eb,E,F,A,Bb,B]

6-7 (012678) <420243>

Yes [Eb,E,F,A,Bb,B] is transpositonally symmetrical at **T_6**
because 2 * the ic6 entry in the ic vector = 6, the cardinality of the pc set.

d. [C#,F,A]

3-12 (048) <000300>

Yes. [C#,F,A] is transpositonally symmetrical at **T_4**, & **T_8**
because the ic4 entry in the ic vector = 3, the cardinality of the pc set.