

## POST-TONAL THEORY

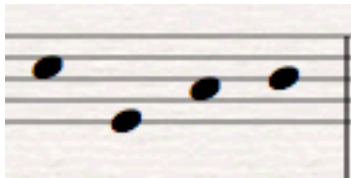
27 Feb 2019

# NORMAL FORM

- Put collection of notes in tightest possible formation so the smallest interval possible is created between lowest and highest notes.



- If you see a large interval, invert it...



# NORMAL FORM

(now with integers)

- Put collection of notes in tightest possible formation so the smallest interval possible is created between lowest and highest notes.



- 049E (put integers in ascending order)

- Compare possible configurations to find smallest outside interval
  - 049E, 49E0, 9E04, or E049

# NORMAL FORM

## 049E

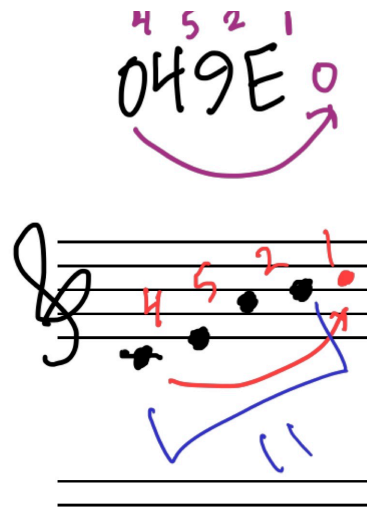
- Measure OPCI between first and last ( $E-0 = 11$ )
  - It's bigger than 6, so invert it (move 0 to top)
    - $49E0 =$  outside interval of 8
- Repeat ( $0-4 = -4$  so 8)
  - 8 is bigger than 6, so invert it (move 4 to top)
    - $9E04 =$  outside interval of 7
- Repeat ( $4-9 = -5$ , so 7)
  - 7 is bigger than 6, so invert it (move 9 to top)
    - $E049 =$  outside interval  $9-E = -2$ , so TEN — oh no!

# Find the smallest outside interval

- Measure OPCl between first and last ( $E-0 = 11$ )
  - It's bigger than 6, so invert it (move 0 to top)
    - $49E0 =$  outside interval of 8
- Repeat ( $0-4 = -4$  so 8)
  - 8 is bigger than 6, so invert it (move 4 to top)
    - $9E04 =$  outside interval of 7
- Repeat ( $4-9 = -5$ , so 7)
  - 7 is bigger than 6, so invert it (move 9 to top)
    - $E049 =$  outside interval  $9-E = -2$ , so TEN — oh no!

# Shortcut!

- Put notes in ascending order
  - 049E
- Measure all adjacent intervals
  - Which is the largest?



# Normal Form

When inverted, the largest interval (5) becomes the smallest (7)

The diagram illustrates the transformation of a chord from its original form to its normal form through inversion. It consists of three parts: the original chord, its first inversion, and its normal form.

- Original Chord:** Labeled "049E" with interval numbers 4, 5, 2, 1 above it. A purple arrow points from the 5th degree (E) to the 1st degree (0), indicating an interval of 5.
- First Inversion:** Labeled "049E" with interval numbers 4, 5, 2, 1 above it. A green arrow points from the 5th degree (E) to the 4th degree (9), indicating an interval of 2.
- Normal Form:** Labeled "[9E04]" with interval numbers 2, 1, 4 above it. A blue arrow points from the 4th degree (4) to the 1st degree (0), indicating an interval of 4.

The musical staff below shows the notes on a treble clef. The original chord (049E) has notes on the 4th, 5th, 2nd, and 1st lines. The first inversion (049E) has notes on the 4th, 5th, 2nd, and 1st lines. The normal form ([9E04]) has notes on the 2nd, 1st, and 4th lines. A blue bracket labeled "7" spans the interval between the 4th and 1st lines in the normal form.

# Notating [Normal Form]

- [9E04] – collection surrounded by brackets indicates normal form



# What if there's a tie?

The image displays two staves of handwritten musical notation. The top staff uses a simplified notation system with letters and numbers, while the bottom staff uses standard musical notation with notes and stems. Both staves illustrate a sequence of four measures, with a tie between the first and second measures.

**Top Staff (Simplified Notation):**

- Measure 1:  $048E$  with a tie to the next measure. Fingerings: 4, 4, 3, 1.
- Measure 2:  $048E$ . Fingerings: 4, 4, 3, 1.
- Measure 3:  $48EO$ . Fingerings: 4, 3, 1.
- Measure 4:  $8EO4$ . Fingerings: 3, 1, 4.

**Bottom Staff (Standard Musical Notation):**

- Measure 1: Four notes (F, G, A, B) with a tie to the next measure. Fingerings: 4, 4, 3, 1.
- Measure 2: Four notes (F, G, A, B). Fingerings: 4, 4, 3, 1.
- Measure 3: Four notes (F, G, A, B). Fingerings: 4, 3, 1.
- Measure 4: Four notes (F, G, A, B). Fingerings: 3, 1, 4.

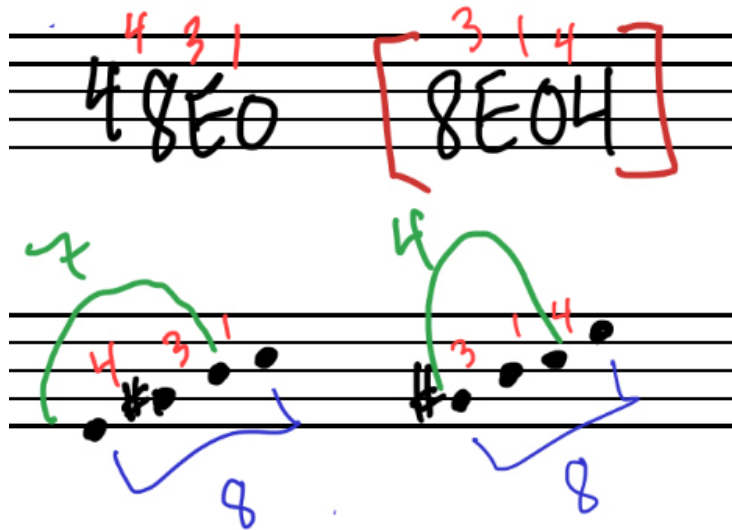
Handwritten annotations include:

- A purple arc under the first measure of the top staff.
- A green box around the first two measures of the top staff, with a green arrow pointing from the second measure to the third.
- A blue bracket under the first measure of the bottom staff.
- A green box around the first two measures of the bottom staff, with a green arrow pointing from the second measure to the third.
- Blue brackets under the third and fourth measures of the bottom staff, with the number '8' written below each.

# Check first to penultimate

Penultimate (second to last)

Smallest wins!



# TRANSPOSITION

- Once you put your collection (AKA “set”) in normal form, you can transpose it
- $T_1[9E04] = [T015]$ 
  - Add 1 to all the numbers
- $T_7[9E04] = [467E]$ 
  - Or subtract the **complement**
  - Instead of  $9+7=16-12=4$ , you could take  $9-5=4$

# Finding the interval of transposition

- [157] and [6T0]
  - Make sure they are in normal form
  - Make sure they share the same spacing intervals
    - [4] [2] for both
  - Figure out OPCI of first two values
    - $6-1 = 5$
  - Make sure the rest of corresponding OPCI's are same
    - $T-5 = 5$
    - $0-7 = -7$  which is 5
- $T_5[157] = [6T0]$

# What if reversed?

- $[6T0]$  and  $[157]$ 
  - Make sure they are in normal form
  - Make sure they share the same spacing intervals
    - $[4] [2]$  for both
  - Figure out OPCI of first two values
    - $1-6 = -5$  which is 7
  - Make sure the rest of corresponding OPCI's are same
    - $5-T = -5$  which is 7
    - $7-0 = 7$
- $T_7[6T0] = [157]$