I. Rhythm

--- NOTE SHAPES ---

<table>
<thead>
<tr>
<th>Name</th>
<th>Maxima</th>
<th>Long</th>
<th>Breve</th>
<th>Semibreve</th>
<th>Minim</th>
<th>Semiminim</th>
<th>Fusa</th>
<th>Semifusa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note</td>
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<tr>
<td>Rest</td>
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</tbody>
</table>

--- LIGATURES ---

1. Basic ligatures with no stems

a. Two-note ligatures:

recta descending

recta ascending

obliqua

b. Ligatures of more than two notes:

• Beginning and ending notes follow the rules for two-note ligatures
• Every note in the middle is a Breve («)

Example:

2. Stems and other effects

a. At the beginning of a ligature:

• An upward stem to the left always makes the first two notes Semibreves (○)

Examples:

b. At the middle or end of a ligature, a stem is always downward, and turns the note to the left into a Long (♫)

Examples:

c. Any stretched notehead is a Maxima (♫)

Example:
1. Mensuration

- O and C are the signs of perfect and imperfect tempus: i.e., whether a Breve (واء) contains 3 or 2 Semibreves (اء) by default
- Presence or absence of a dot (•) in the center of the tempus sign indicates major or minor prolation: i.e., whether a Semibreve (اء) contains 3 or 2 Minims (اء) by default

<table>
<thead>
<tr>
<th>C (imperfect tempus, minor prolation)</th>
<th>□ = • • = • • •</th>
</tr>
</thead>
<tbody>
<tr>
<td>C (imperfect tempus, major prolation)</td>
<td>□ = • • = • • • •</td>
</tr>
<tr>
<td>O (perfect tempus, minor prolation)</td>
<td>□ = • • • = • • •</td>
</tr>
<tr>
<td>O (perfect tempus, major prolation)</td>
<td>□ = • • • = • • • • •</td>
</tr>
</tbody>
</table>

- Major modus refers to the number of Longs (اء) in a Maxima (اء) (perfect is 3, imperfect is 2)
- Minor modus refers to the number of Breves (واء) in a Long (اء) (perfect is 3, imperfect is 2)
- Modus is detected most easily by observing how many Long rests are in a Maxima rest, and how many Breve rests are in a Long rest:

<table>
<thead>
<tr>
<th>Imperfect major modus, Imperfect minor modus</th>
<th>Imperfect major modus, Perfect minor modus</th>
<th>Perfect major modus, Imperfect minor modus</th>
<th>Perfect major modus, Perfect minor modus</th>
</tr>
</thead>
<tbody>
<tr>
<td>❀</td>
<td>❀</td>
<td>❀</td>
<td>❀</td>
</tr>
</tbody>
</table>

2. Other signs and proportions

- Modus cum tempore signs use the circle to show minor modus and a numeral to show tempus:

<table>
<thead>
<tr>
<th>C2 = Imperfect minor modus, Imperfect tempus</th>
<th>C3 = Imperfect minor modus, Perfect tempus</th>
</tr>
</thead>
<tbody>
<tr>
<td>O2 = Perfect minor modus, Imperfect tempus</td>
<td>O3 = Perfect minor modus, Perfect tempus</td>
</tr>
</tbody>
</table>

- Under these mensurations, the tempo is quicker and the beat is on the Breve

- A numeral or pair of numerals changes the speed of a part proportionally; e.g., 3 2 changes the speed so that 3 notes are sung in the time of 2 (usually Semibreves or Minims)
- Shorthand proportion signs:

  O = 4:3

  3 = 3:2

  2 = 2:1

- When the sign O or O appears in one or more voices simultaneously with C or O in other voices, the music in O or O is twice as fast as the other voices (2:1 diminution)
- By the late 15th century C or O in all voices at once often indicates some type of speeding up
# Imperfection and Alteration

## 1. Imperfection: Taking away 1/3 of the length of a ternary note

<table>
<thead>
<tr>
<th>From the back (“a parte post”):</th>
<th>From the front (“a parte ante”):</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{o o o o} = \text{o .</td>
<td>o d</td>
</tr>
<tr>
<td>[ \text{c o o o} = \text{d d d .</td>
<td>o .} ]</td>
</tr>
</tbody>
</table>

### By smaller values:

<table>
<thead>
<tr>
<th>From the back (“a parte post”):</th>
<th>From the front (“a parte ante”):</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{o o o o} = \text{o d d</td>
<td>o .} ]</td>
</tr>
<tr>
<td>[ \text{c o o o} = \text{d d d d d \text{d d d d .</td>
<td>o .} ]</td>
</tr>
</tbody>
</table>

### “Like before like” (“similis ante similem”) is never imperfected:

<table>
<thead>
<tr>
<th>From both sides:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{c o o o o o} = \text{d d d d d</td>
</tr>
</tbody>
</table>

### Never by a ternary group:

<table>
<thead>
<tr>
<th>From both sides:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{c o o o o} = \text{d d d \text{d d d</td>
</tr>
</tbody>
</table>

**Rests are never imperfected (but they can imperfect notes):**

### By “remote parts” (“a partibus remotis”):

<table>
<thead>
<tr>
<th>From both sides:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{c o o o} = \text{d d d</td>
</tr>
</tbody>
</table>

## 2. Alteration: Doubling a note value to complete a ternary grouping

### Between two perfect notes, always occurs:

<table>
<thead>
<tr>
<th>From both sides:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{o o o} = \text{d o .</td>
</tr>
</tbody>
</table>

### Always the last possible note:

<table>
<thead>
<tr>
<th>From both sides:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{o o o o o o o} = \text{d d d d d d</td>
</tr>
</tbody>
</table>

### Rests are never altered:

<table>
<thead>
<tr>
<th>From both sides:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \text{o o o} = \text{d d . \text{d d .</td>
</tr>
</tbody>
</table>
DOTS

1. Dot of Addition (“punctus augmentationis/additionis”)
   - Increases the length of a note by half (like the modern dot)
   - Can only be applied to binary note values (e.g., a Semibreve under \( \odot \))
     \[
     \odot \odot \cdot \odot = \ \cdot \ | \ . \ | \ . \\
     \]

2. Dots of Division/Perfection/Alteration/etc.
   - Act as measure dividers for ternary values (e.g., a Semibreve under \( \odot \))
   - In order to separate ternary groups, can force imperfection and alteration or prevent them
     \[
     \odot \odot \cdot \odot \ | \ . \ | \ . \ | \ . \\
     \]
   - The rare \( \text{punctus reductionis or syncopationis} \) (dot of syncopation) can appear in the middle of a ternary group; by preventing alteration or imperfection it causes syncopation
     \[
     \odot \odot \cdot \odot \cdot \odot = \ | \ . \ | \ . \ | \ . \\
     \]

COLORATION

1. Imperfection coloration
   - At ternary mensural levels, colored notes are always imperfect and cannot be doubled through alteration
   - Colored notes are often found in groups adding up to pairs of ternary measures
   - Dots in coloration groups are dots of addition (affecting the imperfect, unaltered values)
     \[
     \odot \odot \cdot \odot \ | \ . \ | \ . \ | \ . \\
     \]
   - Such groups fall at measure beginnings, causing alteration if necessary
     \[
     \odot \odot \cdot \odot \cdot \odot = \ | \ . \ | \ . \ | \ . \\
     \]

2. Proportional coloration
   - For binary note values, coloration takes away 1/3 of the value (creating modern triplets)
   - The rules for imperfection coloration still apply (all notes imperfect, no alteration)
     \[
     \odot \odot \cdot \odot \ | \ . \ | \ . \ | \ . \\
     \]
   - Some special cases (later 15th and 16th centuries):
     \[
     \odot \odot \cdot \odot = \ | \ . \ | \ . \ | \ . \\
     \]

\[4\]
II. Pitch

<table>
<thead>
<tr>
<th>Gamut</th>
<th>Hexachords</th>
<th>Note names</th>
<th>Principal clefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ee</td>
<td>la</td>
<td>ee la</td>
<td></td>
</tr>
<tr>
<td>dd</td>
<td>la sol</td>
<td>dd la sol</td>
<td></td>
</tr>
<tr>
<td>cc</td>
<td>sol fa</td>
<td>cc sol fa</td>
<td></td>
</tr>
<tr>
<td>bb/ff</td>
<td>fa mi</td>
<td>bb/ff fa mi</td>
<td></td>
</tr>
<tr>
<td>aa</td>
<td>la mi re</td>
<td>aa la mi re</td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>sol re ut</td>
<td>g sol re ut</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>fa ut</td>
<td>f fa ut</td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>la mi</td>
<td>e la mi</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>la sol re</td>
<td>d la sol re</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>sol fa ut</td>
<td>c sol fa ut</td>
<td></td>
</tr>
<tr>
<td>b/ff</td>
<td>fa mi</td>
<td>b/ff fa mi</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>la mi re</td>
<td>a la mi re</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>sol re ut</td>
<td>G sol re ut</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>fa ut</td>
<td>F fa ut</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>la mi</td>
<td>E la mi</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>sol re</td>
<td>D sol re</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>fa ut</td>
<td>C fa ut</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>mi</td>
<td>A re</td>
<td></td>
</tr>
<tr>
<td>Γ</td>
<td>ut</td>
<td>Γ ut</td>
<td></td>
</tr>
</tbody>
</table>

- In any hexachord, the step mi – fa is a semitone; every other step is a whole tone.
- The sign \( \text{♭} \) ("round b") marks a note as fa, which means it is only a semitone above the step below it; usually this means the marked note must be flattened by a semitone.

\[
\begin{array}{c}
\text{♭} \quad \text{♭} \quad \text{♭} \\
\rightarrow \quad \text{♭} \quad \text{♭} \quad \text{♭}
\end{array}
\]

- The sign \( \text{♮} \) ("square b") marks a note as mi, which means it is a semitone below the step above it; this usually causes the marked note to be sharpened by a semitone, cancelling the effect of \( \text{♭} \) if necessary.

\[
\begin{array}{c}
\text{♮} \quad \text{♮} \quad \text{♮} \\
\rightarrow \quad \text{♮} \quad \text{♮} \quad \text{♮}
\end{array}
\]

- The sign \( \text{△} \) ("dyesis") simply causes a note to be sharpened by a semitone, without necessarily changing the hexachord syllable; it is often used loosely, however, with the same meaning as \( \text{♮} \).

\[
\begin{array}{c}
\text{△} \quad \text{△} \quad \text{△} \\
\rightarrow \quad \text{♮} \quad \text{♮} \quad \text{♮}
\end{array}
\]
**DIRECTED PROGRESSIONS**

- In counterpoint, when an imperfect consonance (3rd, 6th) moves to a perfect consonance (unison, 5th, octave), the imperfect consonance should be performed as major or minor in order to approach the perfect consonance with the smallest movement (e.g., a 6th expanding to an octave should be major, a 3rd contracting to a unison should be minor).
- Sharps and flats can be performed to ensure this type of “closest approach”

6 - 8  
\[ \begin{array}{c}
\text{\#} \\
\downarrow \\
\text{\#} \\
\end{array} \]

3 - 1  
\[ \begin{array}{c}
\text{\#} \\
\downarrow \\
\text{\#} \\
\end{array} \]

3 - 5  
\[ \begin{array}{c}
\text{\#} \\
\downarrow \\
\text{\#} \\
\end{array} \]

6 - 8  
\[ \begin{array}{c}
\text{\#} \\
\downarrow \\
\text{\#} \\
\end{array} \]

3 - 5  
\[ \begin{array}{c}
\text{\#} \\
\downarrow \\
\text{\#} \\
\end{array} \]

**MELODIC LEADING TONES**

- The “returning note” melodic phrases re ut re, sol fa sol, and la sol la should be performed with a sharp leading tone (raising the lower neighbor note by a semitone).
- Such melodic phrases often appear in ornamented forms, which require the same sharpening

\[ \begin{array}{c}
\text{\#} \\
\downarrow \\
\text{\#} \\
\end{array} \]
PERFECT INTERVALS IN COUNTERPOINT

- In counterpoint, “false consonances” (augmented and diminished perfect consonances) between two voices are to be avoided: augmented and diminished 5ths, octaves, unisons.
- If the default reading produces a false consonance, one voice should lower its pitch by a semitone and call that note fa, which will produce a perfect consonance.

PERFECT MELODIC INTERVALS

1. Melodic phrases

- If a melodic phrase outlines a tritone (an augmented 4th, e.g., F fa - b mi), the higher note should be lowered by a semitone and called fa, to make a perfect 4th.

- If the phrase continues by step in the same direction to complete a melodic 5th, no flattening is necessary.

2. Leaps

- Leaps of a 4th, 5th, and octave should be rendered as perfect intervals, using flattening (with the syllable fa) if necessary.