**Artinfuser Harmony rules**

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# Color legend

High priority rule – should not be violated.

Medium priority rule – generally recommended not to violate, but special cases should be consulted with professor.

Low priority rule – sometimes following this rule can increase quality of exercise.

Prohibited.

Not recommended.

Allowed, but avoiding this can increase quality of counterpoint.

This rule is considered not important and is not implemented in Artinfuser Harmony yet.

# Melodic rules

*Желтые правила стагнации и разрешения скачков контрапункта в гармонии пропадают, а красные становятся желтыми, если в сопрано. В целом такой подход можно применить ко всем правилам, но некоторые правила можно вообще отключить.*

*Количество тоник не важно, кроме как в сопрано.*

*Повторы не важны, даже в сопрано.*

*VII#-III запрещено желтым. Не разрешенный вводный тон в гармонии красным (во всех тактах если после доминанты идет аккорд, содержащий тонику - более детально послушать в видео 2019-11-03 в конце), а в контрапункте желтым (в каденции).*

*- Отличия правил гармонии от правил контрапункта:*

*+ Часть мелодических правил отключается*

*+ Первый и последний аккорды должны быть более пустыми в контрапункте, чтобы создать эффект начала и конца и устойчивости, а в гармонии они должны быть полными так же, как и остальные аккорды.*

*+ Удвоение терции нежелательно (можно удваивать тоники или квинты в определенных условиях по Способину или всегда по Пистону). V-VI можно удваивать терцию только если VI в основном положении.*

*+ После V ступени VI должна быть в основном положении.*

*+ Как и в контрапункте, нельзя удваивать ноты тритона*

*- В гармонии стоит показывать желтым цветом в басу ошибки, связанные с мелодией, те что были красные в контрапункте. А те, что были желтым цветом в контрапункте - в гармонии не показывать вообще. В сопрано цвета менять не нужно - здесь анализ мелодии будет такой же как в контрапункте. Например, много тоник и много повторов нот (sp1) в сопрано и в басу показывать можно, а в средних голосах не нужно.*

*Некоторые мелодические правила все-таки нужно учитывать во всех голосах. Например, разрешение больших скачков, большое количество скачков подряд (у баса возможно больше скачков чем в некрайних голосах).*

*Если увеличенный интервал образуется от гармонической ноты к гармонической ноте, то это разрешено, а в других случаях желтым показываем.*

*Правила по несоседним параллельным октавам оставляем как в контрапункте.*

*Движение должно быть преимущественно поступенным в альте и теноре, скачки должны отводиться. Скачки на каденцию (в конце фразы) не обязательно отводить.*

# Harmonic rules

### Voices

School harmony exercises are usually written for 4 voices.

Lowest voice is called “bass”, while highest voice is called “melody”.

School harmony is not necessarily intended for vocals, but for convenience voices are often called the same names as in a common choir:

1. First (highest) voice is often called “soprano” or “melody”.
2. Second voice is often called “alto”.
3. Third voice is often called “tenor”.
4. Fourth (lowest) voice is often called “bass”.

### Voice range

Range of each voice in harmony exercise is not limited, but interval between adjacent voices should not exceed an octave (12 semitones), especially a major tenth interval (16 semitones).

**s:\app\mgen\mgen\docs\button_exception.png** Interval between bass and the next adjacent voice is not limited.

### Voice crossing

Voice crossing is the intersection of voices in a composition, leaving a lower voice on a higher pitch than a higher voice (and vice versa). Voice crossings are often justified by melodic development of the voices. Yet, because this can cause registral confusion and reduce the independence of the voices, it should be avoided for good polyphonic balance. Voice crossing is prohibited in harmony exercises, because it creates harmonic ambiguity and can create harmonic disbalance such as undesirable second inversion chords.

### Voice overlapping

Voice overlapping happens when two voices move together, and the lower voice passes where the upper voice was (or vice versa). For example, if two voices sound G and B, and move up to C and E. The overlapping occurs because the second note (C) in the lower voice is higher than the first note (B) in the upper voice. Voice overlapping leads to ambiguity, as the ear interprets the step from B to C in one voice, and is fairly consistently avoided in harmony exercises:



**s:\app\mgen\mgen\docs\button_exception.png** Voice overlapping is allowed between adjacent voices if there is no gap between voice pairs (lower voice of one of the note pairs has the same pitch as higher voice of another note pair).

### Doubling

Doubling of a suspension tone or appoggiatura is allowed if these notes resolve at a different time or if they resolve in different directions stepwise (except that suspension should not sound at the same time as the suspension resolution tone).

Doubling of chord tones – see “Resolution of chord tones”.

### Doubling of a 3rd

3rd tone of the chord should not be doubled until chord tones in all voices are introduced and chord tones are moved[[1]](#footnote-2).

**s:\app\mgen\mgen\docs\button_exception.png** 3rd chord tone of VI chord should be doubled in V-VI chord progression (to avoid consecutive 5ths, because V-VI progression is allowed only in root position of both chords).

**s:\app\mgen\mgen\docs\button_exception.png** 3rd chord tone of VII chord should be doubled if VII chord when it contains a leading tone (to avoid doubling of tritone notes) – which happens in major and melodic minor modes.

**s:\app\mgen\mgen\docs\button_exception.png** 3rd chord tone of tonic chord should be doubled in VIIo-I chord progression (to avoid consecutive 5ths).

**s:\app\mgen\mgen\docs\button_exception.png** 3rd chord tone of II6 diminished chord (in minor mode) should be doubled (to avoid doubling of tritone notes).

**s:\app\mgen\mgen\docs\button_exception.png** 3rd chord tone of II6 minor chord (in major mode) in II6-V progression can be doubled (to avoid consecutive 5ths).

## Chords

### Harmonic rhythm

Same chord should not repeat in the next measure.

**s:\app\mgen\mgen\docs\button_exception.png** Chord can repeat once, if its inversion changes – but not twice.

Chord should not be syncopated: a chord should not start on a weaker beat and continue to a stroger beat.

**s:\app\mgen\mgen\docs\button_exception.png** Changing chord inversion breaks syncope[[2]](#footnote-3).

**s:\app\mgen\mgen\docs\button_exception.png** I64-V progression breaks syncope.

**s:\app\mgen\mgen\docs\button_exception.png** Last chord of a phrase can be syncopated.

**s:\app\mgen\mgen\docs\button_exception.png** Syncopated chords are allowed if more than one chord in each 3 measures of a phrase is syncopated.

Chords should not be more than 2 times longer than surrounding chords.

**s:\app\mgen\mgen\docs\button_exception.png** Last chord of a phrase can have any length.

### First chord of exercise

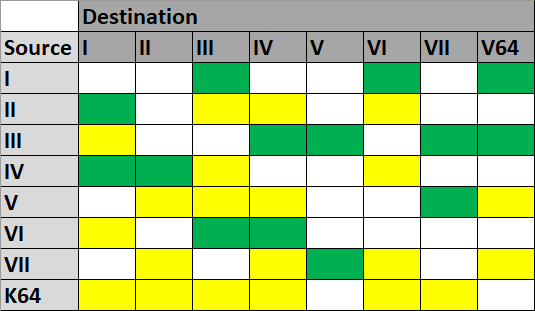
First chord of exercise can be any chord if other rules are not violated (unlike in counterpoint exercises, where first chord should be tonic chord and can be incomplete).

### Last chord of exercise

Last chord of exercise should be tonic chord (unlike in counterpoint exercises, where last chord should be tonic chord and can be incomplete).

### Chords progressions

Chord progressions are listed in the following table



In the table above:

* Chord progressions not highlighted are allowed without limitations.
* Chord progressions highlighted with green are allowed in difficult cases. There should not be more than 2 such chord progressions among 5 sequential chords.
* Chord progressions highlighted with yellow are not recommended.

**s:\app\mgen\mgen\docs\button_exception.png** A sequence of any two chords are allowed if they are connected with stepwise motion of non-common notes or leaping motion of common notes.

**s:\app\mgen\mgen\docs\button_exception.png** If non-harmonic tones form a non-harmonic chord (passing or auxiliary or other) Y between chords X and Z, which are not recommended to connect directly X-Z, and progressions X-Y and Y-Z are allowed, then this progression X-Z is allowed.

A sequence of two chords should not results in more than two new chromatic alterations.

### Second inversion triad

Second inversion triad is only allowed of a root chord and only in authentic cadence (PAC, IAC, HC) before V chord[[3]](#footnote-4).

Second inversion chord should not start on weak beat (but can start on strong or partially strong beat).

Second inversion triad should always have 5th tone doubled.

Second inversion triad resolution should not move 5th tone in bass. 5th tone in non-bass voice can move during second inversion triad resolution only in PAC or IAC.

Root and 3rd of second inversion triad should resolve stepwise.

Second inversion triad should not start with non-harmonic tone (suspension, appoggiatura).

**s:\app\mgen\mgen\docs\button_exception.png** Root or 3rd note of second inversion triad can resolve by leap if it resolves stepwise in a different voice.

### Dominant of the dominant

Dominant of the dominant (V of V) has to resolve to V, VII or second inversion triad.

### Chords formed by non-chord tones

Any chords that are formed by non-chord tones are allowed. These chords can be ignored and not analyzed.

### Incomplete chords

Any chord should have at least one chord tone starting on the first beat of this chord (not tied with the previous chord and not a non-harmonic tone)[[4]](#footnote-5). If not, this chord is considered ambiguous.

3rd chord tone and at least one other tone (root tone or 5th tone) are required on the first beat of any chord[[5]](#footnote-6). If not, this chord is considered incomplete. Three chord tones (root, 3rd, 5th) are recommended on the first beat of any chord for rich sound, if possible.

Any chord before cadential tonic chord should have all three chord tones on its first beat.

### 7th chord

7th chords are allowed in any inversions (root position, first inversion, second inversion, third inversion).

7th chord should start with at least root and 3rd. 7th tone can appear later in the chord.

### Preparation of a 7th tone of a 7th chord

7th degree of a seventh chord should be prepared: it should be used as a chord tone in the previous chord.

**s:\app\mgen\mgen\docs\button_exception.png** 7th degree of a dominant seventh (or dominant seventh of the dominant, or secondary dominant seventh) chord does not need to be prepared.

**s:\app\mgen\mgen\docs\button_exception.png** If the previous chord does not contain a chord tone that is equal to the 7th degree of the current seventh chord, the 7th degree can be prepared by stepwise motion from a chord tone.

**s:\app\mgen\mgen\docs\button_exception.png** 7th degree of a seventh chord does not need to be prepared in advanced mode (when using many seventh and ninth chords).

### Diminished 7th chord

Diminished 7th (dim7) chord consists of minor 3rd, diminished 5th and diminished 7th. It is actually a minor dominant 9th chord without a root and should follow the rules of resolution of a 9th chord: 7th (5th of dim7) and 9th (7th of dim7) tones should resolve stepwise down.

One of four tones of diminished 7th chord should resolve stepwise up by a halftone to the tonic of the resolution chord.

### 9th chord

Only dominant 9th chord is allowed. 9th chords are allowed in any inversions (root position, first inversion, second inversion, third inversion, fourth inversion).

**s:\app\mgen\mgen\docs\button_exception.png** IV and II 9th chords are allowed in difficult cases.

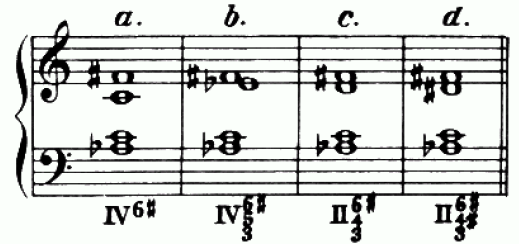
9th chord should start with at least three harmonic tones: root, 3rd and 9th. 7th tone is also often used. If 7th note is not used, chord is called “add9”.

9th degree should be higher than tonic in 9th chord.

The tonic and 9th tone of the 9th chord should not appear in adjacent voices and should be separated by another chord tone, which forms consonance with either tonic or 9th tone.

### Augmented sixth chords

Four augmented sixth chords (altered dominant of the dominant chords) have the interval of the augmented sixth created by the minor sixth degree and the chromatically raised fourth degree. Usually in these chords this interval is found between the bass and upper voice. Usually minor sixth degree is in the bass, but sometimes chromatically raised fourth degree can be in the bass (this is more common for German sixth chord).



1. Augmented sixth (Italian sixth)
2. Augmented six-five-three (German sixth)
3. Augmented six-four-three (French sixth)
4. Doubly augmented fourth

The following doubly augmented six-five sixth chord is rarely used (G key):



Resolution of augmented sixth chord tones:

|  |  |  |
| --- | --- | --- |
| **Chord tone** | **Example in C major** | **Resolution** |
| Root | D or D# | stay on the same note or resolve to 5th of dominant |
| maj 3rd | F# | up stepwise, because it is leading tone to dominant root |
| dim 5th | Ab | down stepwise |
| 7th | C | down stepwise, as a usual 7th |
| 9th | Eb or E | down stepwise, as a usual 9th |

If resolution results in parallel perfect 5ths, they are allowed.

## Resolution and doubling of unstable chord tones

The following unstable chord tones should be resolved to a stable chord tone in the next chord in the same voice and should not be doubled.

Doubled unstable chord tones do not have to begin or end together, but have to sound simultaneously to be prohibited.

|  |  |  |
| --- | --- | --- |
| **Tone** | **Resolution** | **Can double** |
| Leading tone | up stepwise | No |
| 7th | down stepwise | No |
| 9th | down stepwise | No |
| Harmonic tritone: upper tone[[6]](#footnote-7) | down stepwise | No[[7]](#footnote-8) |
| Harmonic tritone: lower tone[[8]](#footnote-9) | up stepwise |
| Augmented 5th: upper tone[[9]](#footnote-10) | up stepwise | No |

**s:\app\mgen\mgen\docs\button_exception.png** Unstable chord tone can stay on the same pitch if it becomes a stable chord tone in the next chord.

**s:\app\mgen\mgen\docs\button_exception.png** Unstable chord tone does not require resolution if it finishes before the end of current harmony.

**s:\app\mgen\mgen\docs\button_exception.png** Unstable chord tone resolution can be delayed with suspension (with the same note) or appoggiatura (which will resolve stepwise up or down to this chord tone resolution).

### Harmonic tritone

Harmonic tritone is a vertical interval formed between two chord tones. Notes of harmonic tritone do not have to start or end together, but they have to sound simultaneously at some point in time to be considered a harmonic tritone.

Resolution in major:

|  |  |
| --- | --- |
| **Note** | **Should resolve to** |
| IV | III |
| VII | I |

Resolution in minor:

|  |  |
| --- | --- |
| **Note** | **Should resolve to** |
| II | III |
| III | II |
| IV | III |
| VI | V |
| VI# | VII |
| VII# | I |

**s:\app\mgen\mgen\docs\button_exception.png** If next chord does not contain note that resolves a harmonic tritone tone, then resolution of this harmonic tritone tone is not required.

### Leading tone

Leading tone is a VII chord tone in major or VII# chord tone in melodic minor, except when current chord is III and next chord is not I:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **First chord**[[10]](#footnote-11) | **Second chord** | | | | | | |
|  | **I** | **II** | **III** | **IV** | **V** | **VI** | **VII** |
| **III** | LT (up) | Not LT | Not LT | Not LT | Not LT | Not LT | Not LT |
| **V** | LT (up) | LT | LT | LT (up/down) | LT | LT (up) | LT |
| **VII** | LT (up) | LT | LT | LT (up/down) | LT | LT (up) | LT |

**Not LT** – in this combination of chords, VII or VII# chord tone in the first chord is not a leading tone.

**LT** – in this combination of chords, VII or VII# chord tone in the first chord is a leading tone and it can go by leap to any chord tone of the second chord (if allowed by other rules).

**LT (up/down)** – in this combination of chords, VII or VII# chord tone in the first chord is a leading tone and it has to resolve stepwise up to I chord tone of the second chord or go stepwise down to chord tone (VI in major or VI# in melodic minor) of the second chord.

**LT (up)** – in this combination of chords, VII or VII# chord tone in the first chord is a leading tone and it has to resolve stepwise up to I chord tone of the second chord. Pay attention, that leading tone should resolve up, not down when going to VI chord.

VII note in major and VII# note in melodic minor cannot be non-chord tone if it is the last note in penultimate measure.

**s:\app\mgen\mgen\docs\button_exception.png** In other modes (ancient modes) except major and melodic minor there is no leading tone. This means that VII note in ancient modes does not have to go to any particular note, and it can be doubled.

## Phrases

Usually a harmonic exercise contains one or two phrases (sometimes more). Phrases can overlap in real-world music, but overlapping of phrases is not allowed in harmonic exercises.

Phrases are usually separated with a pause or phrase ending is marked by chord that is syncopated or is more than 2 times longer than surrounding chords. Phrase usually should not contain a pause or a syncopated note or a chord that is more than 2 times longer than surrounding chords.

**s:\app\mgen\mgen\docs\button_exception.png** Phrase can contain syncopated chords if there is more than one syncopated chord in each three measures.

Each phrase in an exercise should end with a cadence:

* Non-last phrase should end with one of the following perfect or imperfect (first chord in root position but non-root melodic position) cadences:
  + authentic half-cadence (V)
  + plagal half-cadence (IV)
  + deceptive (interrupted) cadence (V-VI)
  + plagal cadence (IV-I)
* Last phrase should end with one of the following perfect cadences[[11]](#footnote-12):
  + authentic (V-I)
  + plagal (IV-I)

## Cadence

Chord progression is called a cadence only at the end of phrase.

In PAC, IAC, PC, DC, HC last chord is allowed only on strong beat (1 or 3 in time 4/4).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **First chord** | **-** | **I (tonic in soprano)** | **I (not tonic in soprano)** | **VI** |
| **V** | HC | PAC | IAC | DC |
| **V7** |  | PAC | IAC | DC |
| **IV** |  | PC | PC |  |
| **II6** |  | (PC) |  |  |
| **II65** |  | (PC) |  |  |

Any voice movement (similar motion in all voices, similar motion to perfect consance, consecutive perfect consonances, any overlap) and any chord progression are allowed after cadence.

### Perfect authentic cadence

Perfect authentic cadence (PAC) happens when V (in root positiont) or V7 (in root positiont) chord resolves to I chord (in root position with tonic in soprano).

PAC is not recommended inside a phrase, because it breaks the momentum.

**s:\app\mgen\mgen\docs\button_exception.png** PAC is allowed inside phrase if tonic chord is on weak beat.

### Imperfect authentic cadence

Imperfect authentic cadence (IAC) happens when V (in root positiont) or V7 (in root positiont) chord resolves to I chord (in root position without tonic in soprano).

### Half cadence

Half cadence (HC) happens when V chord (in root positiont) does not resolve to tonic chord.

### Plagal cadence

Plagal cadence (PC) happens when IV (in root positiont) resolves to I chord (in root position).

Resolution of II6 or II65 (seventh chord in first inversion) chord to I chord (in root position) sounds like plagal cadence, but it is a plagal gesture and usually not considered a cadence. It is usually not used to finish a phrase.

### Deceptive cadence

Deceptive cadence (DC) or interrupted cadence happens when V (in root positiont) or V7 (in root positiont) chord resolves to VI chord (in root position). These two chords should not be connected if any of them is not in root position. 3rd chord tone should be doubled in VI chord (to avoid consecutive 5ths).

### Auxiliary cadence

After tonic chord of an authentic cadence (PAC or IAC) with tonic in soprano, there can be any chord with return to a tonic chord in root position.

Usually this auxiliary chord is approached by stepwise motion, except for common harmonic notes, which can be approached and left by leaps. This auxiliary chord does not require a usual resolution (for example secondary dominant does not require resolution to a secondary tonic chord when used as an auxiliary chord, instead it is resolved to a primary tonic chord).

## Non-harmonic tones

Non-harmonic tone is a melodic note, which is always shorter than current harmony.

### Escape notes

Escape notes are last non-harmonic notes in a harmony, which are followed by a leap. Escape notes are prohibited.

**s:\app\mgen\mgen\docs\button_exception.png** Escape note is allowed[[12]](#footnote-13) if it is approached stepwise (usually up in soprano between penultimate chord and ultimate chord in cadence) from previous harmonic tone, and removing it would result in stepwise motion between two harmonic tones (usually this happens when escape note is followed by a melodic 3rd).

### Appoggiatura

Appoggiatura is a non-harmonic tone, which always happens on a stronger beat (usually first beat of harmony) than beat of its resolution note.

Appoggiatura usually should not be longer than its resolution note.

### Anticipation

Anticipation is a non-harmonic tone at the end of current chord, which is repeated in the same voice with the start of the next chord (anticipation resolution). Anticipation can be approached by leap, while still staying non-harmonic. Anticipation should not be longer than note before anticipation. Anticipation is allowed only before tonic chord in cadence (at the end of final or non-final phrase).

**s:\app\mgen\mgen\docs\button_exception.png** Anticipation is allowed before any chord in advanced mode (when using many seventh and ninth chords).

## Modulation

Modulation is the changing of the key.

Often modulation is started with one or multiple common chords to both keys (pivot chords), but this is not necessary. Usually first pivot chord is not the V of the second key.

1. This means that to represent a trichord in 4 voices, root tone or 5th tone should be doubled. Exception: second inversion chord should always have 5th tone doubled. [↑](#footnote-ref-2)
2. Octave leap in bass does not break syncope. [↑](#footnote-ref-3)
3. Second inversion of a 7th chord is allowed outside cadence. [↑](#footnote-ref-4)
4. This means that at least one voice should not have non-chord tone on the first beat of the chord. [↑](#footnote-ref-5)
5. **s:\app\mgen\mgen\docs\button_exception.png** If chord starts with non-chord tone, then this tone’s resolution can be counted for this rule. [↑](#footnote-ref-6)
6. Upper tone of a diminished 5th (in a chord in root position) is lower tone of an augmented 4th (in an inverted chord). [↑](#footnote-ref-7)
7. Doubling of any of two notes of a harmonic tritone is prohibited if both notes of tritone are chord tones. Both tritone notes and the doubled note do not necessarily need to begin or end together, but all three of these notes have to sound simultaneously to be prohibited. [↑](#footnote-ref-8)
8. Lower tone of a diminished 5th (in a chord in root position) is upper tone of an augmented 4th (in an inverted chord). [↑](#footnote-ref-9)
9. Upper tone of an augmented 5th (in a chord in root position) is lower tone of a diminished 4th (in an inverted chord). [↑](#footnote-ref-10)
10. Each of the first and the second chords in the table can be in root position or first inversion. [↑](#footnote-ref-11)
11. Imperfect cadence (first chord in root position but non-root melodic position) is allowed in difficult situations. [↑](#footnote-ref-12)
12. Leap to a chord tone that requires stepwise resolution cannot be considered an escape tone. [↑](#footnote-ref-13)