

FH MMA – Michele Gaggia – Auditive Gestaltung

BASIC PRINCIPLES OF COMPOSITION

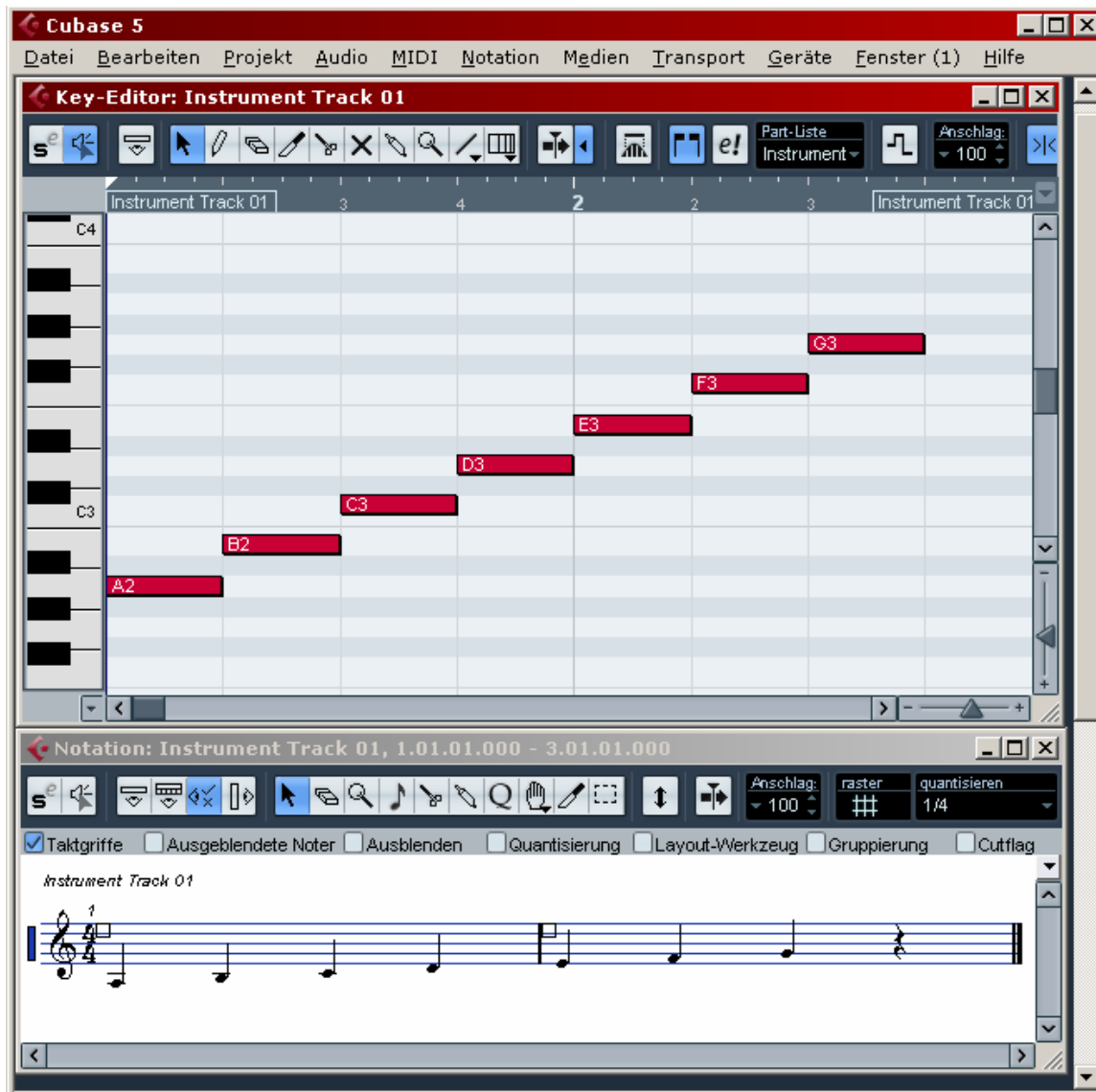
The 7 notes

The basic notes are called A B C D E F G and correspond with the white keys of a piano.

However, the total number of tones available including the black keys is twelve, organized as 12 equal “half tone” intervals. Additional signs (# = sharp and b = flat) added after the basic letters are used to identify those black keys.

Most western music is based on “scales” or “tonalities” which only use 7 of these 12 tones.

This is how the basic 7 notes (A B C D E F G) look on the piano and in standard notation:



B and H

The note B was already in the Gregorian chant period sometimes performed as B “natural” (the white key) and sometimes as B “flat” (the black key a half-tone lower). The symbol for “natural” resembles a H, hence “B natural” is now called “H” in German; the symbol for “flat” resembles a small “b”, hence “B flat” is now called “B” in German.

In other languages, notes are called differently: for example, in Italian they are called “Do Re Mi Fa Sol La Si Do” (Do = C, etc.)

Intervals

Intervals are counted including the start note. This is not very logical, as it is not really counting the “steps”, but it always includes the starting step. So C-D is just one step, but it is called an interval of “Second”.

So for example starting from C:

C-C is an Unison; C-D is a Second; C-E a Third ... C-C⁸ is an Octave (the same note higher or lower).

This is how intervals starting from C (from Unisono to Octave) look on the keyboard and in standard notation:

The screenshot displays the Cubase 5 interface, specifically the Key-Editor and Notation windows for Instrument Track 01. The Key-Editor window shows a piano keyboard with red boxes indicating the notes C3, D3, E3, F3, G3, A3, B3, and C4. The Notation window shows the corresponding musical notation for these notes on a staff, starting with a treble clef and a 4/4 time signature. The notes are: C4 (quarter note), D4 (quarter note), E4 (quarter note), F4 (quarter note), G4 (quarter note), A4 (quarter note), B4 (quarter note), and C5 (quarter note).

Scales (Keys) and Modes

Major and minor Scales

Most of the western music written in the last five centuries is based on two systems of 7 notes called the “Major” and “minor” scale. These are found using only the white piano keys starting from C (for the Major scale) and from A (for the minor scale).

The Major and minor scales are defined by the sequence of Tones and Half Tones. This pattern must remain unchanged also when “transposing”, which means shifting the scale starting from different notes than C (for Major scales) and A (for minor scales).

When transposing, “sharps” (# = 1 HT up) and “flats” (b = 1 HT down) are used to adjust the intervals.

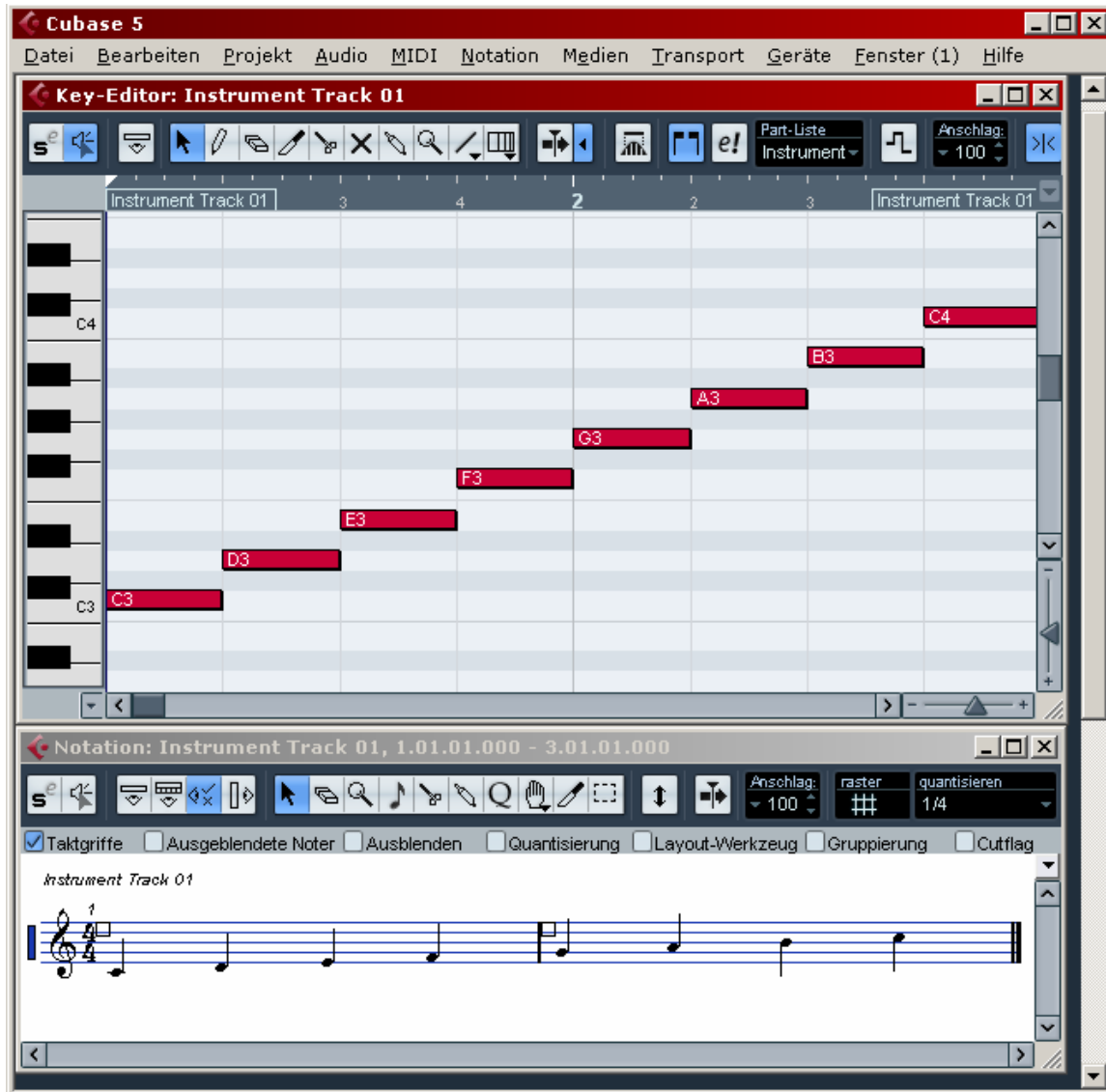
Legend: T = 1 Tone (2 HT)
 HT = ½ Tone (1 HT)
 T+ = augmented Tone (3 HT)

Each step of a scale have different characters and functions, for example:

1st step – Tonic:	the main centre of balance of a tonality based on that scale
3rd step – Median:	defines whether the scale is Major (2 T) or minor (1T + 1 HT)
4th step – Sub-Dominant:	together with Tonic and Dominant, the 3rd most important centre of balance
5th step – Dominant:	the 2nd most important centre of balance of the tonality based on that scale

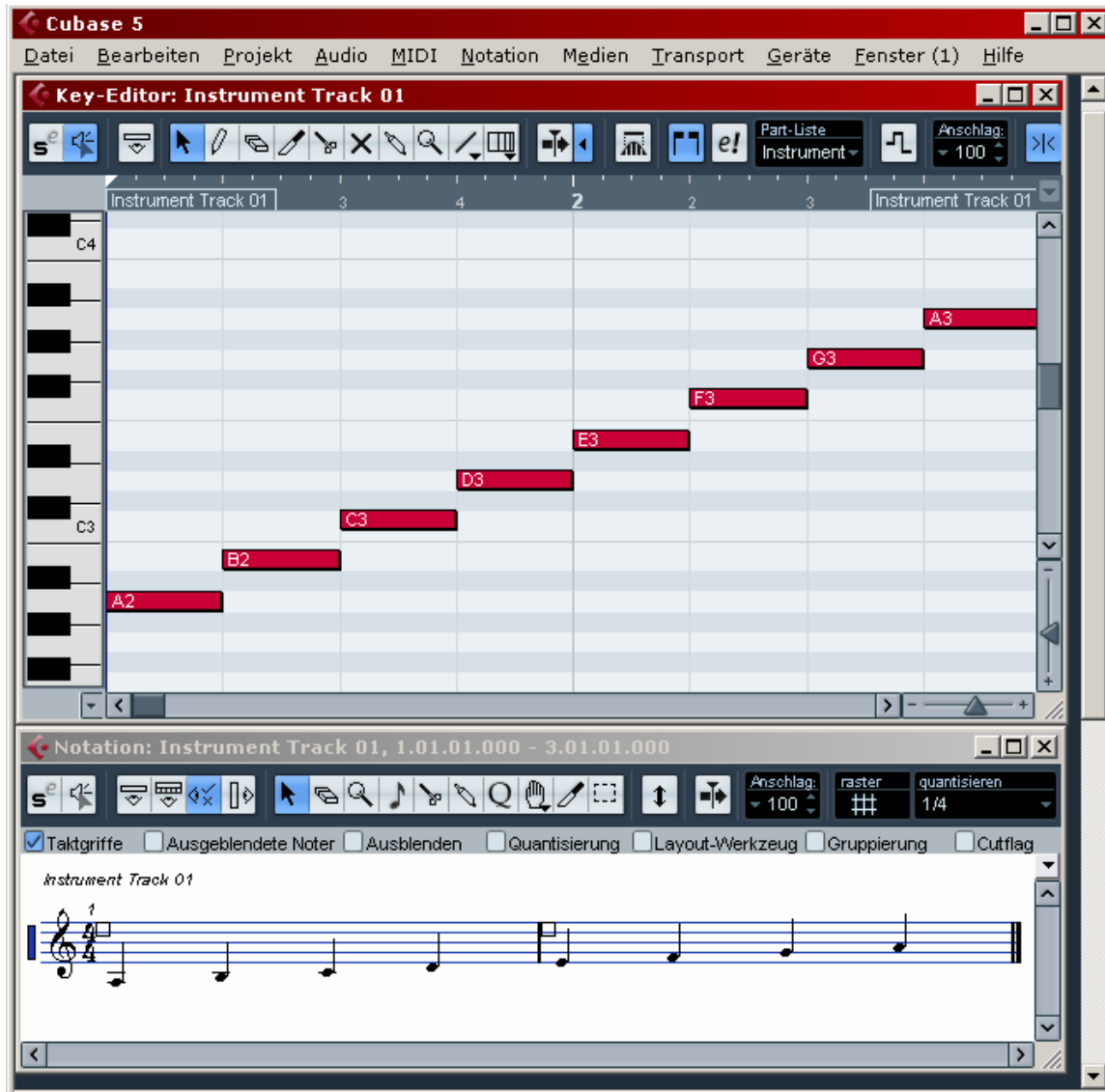
Major scale interval sequence: T T HT T T T HT

This is how it looks on the piano and in standard notation (in the example, the reference scale C-Major):



minor scale interval sequence: T HT T T HT T T

This is how it looks on the piano and in standard notation (in the example, the reference scale A-minor):



Additionally, there are two variations of the minor scale that are commonly used in western classical music:

harmonic minor scale: T HT T T HT T+ HT

melodic minor scale, ascending: T HT T T T T HT

melodic minor scale, descending: same as standard minor scale

Other Scales

There are of course many other types of scales, here some examples:

Pentatonic scale (= 5 notes)	F G A C D (for example: Chinese and other types of oriental music)
Chromatic scale:	C C# D D# E F F# G G# A A# B (for example: used in Dodecaphony, introduced by Schönberg in 1921)
Whole-tone scale:	C D E F# G# A# (for example: used by Debussy and Ravel)

Modes

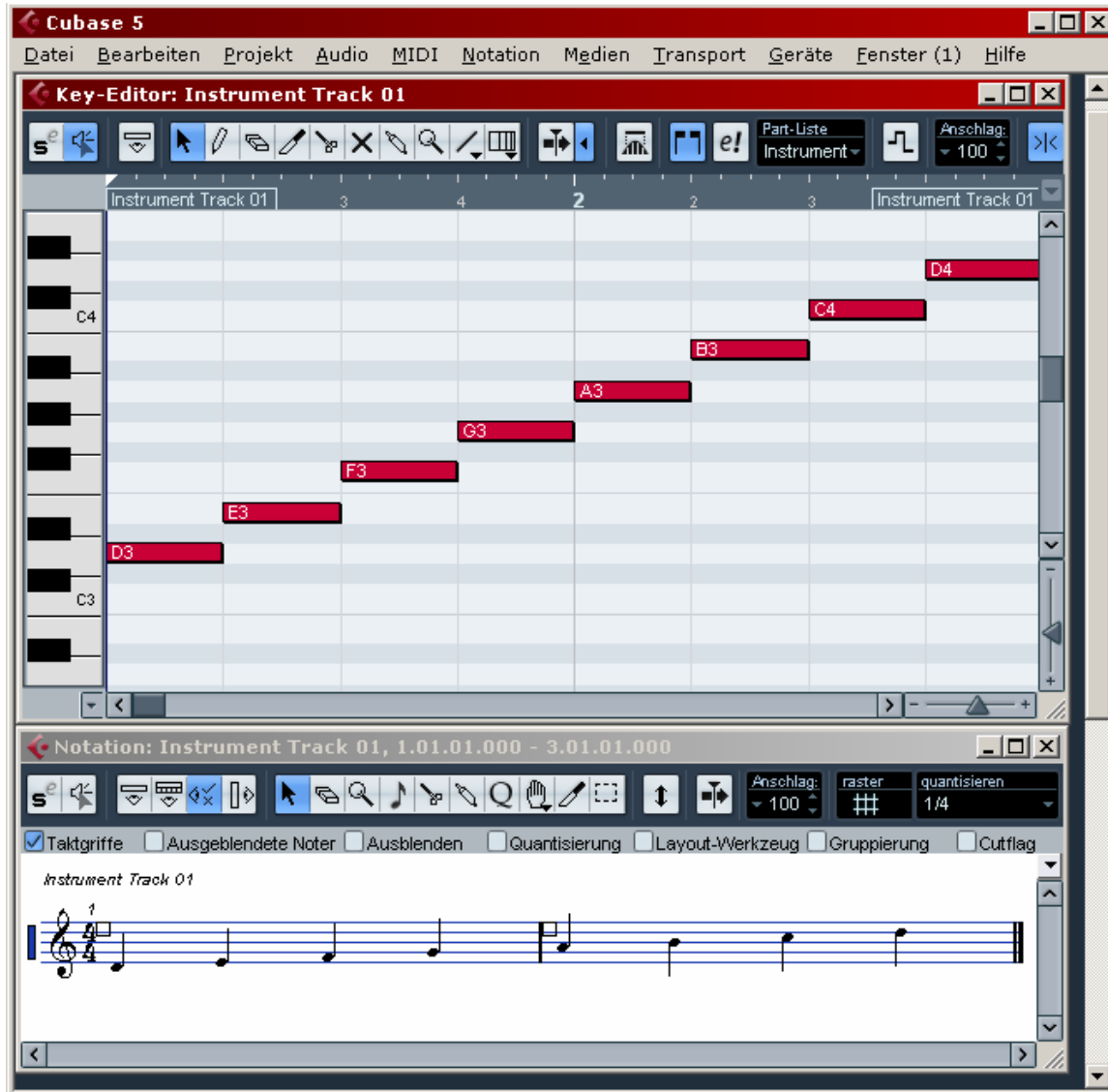
Before minor and major scales were commonly used (for example, during the middle-ages until later in the Renaissance), western music was not just based on a Major and minor scale, but on up to eight different “Modi”, that basically are found by using just the white keys on the piano keyboard, and starting from different notes (not just C or A).

For example, these are four of the eight Gregorian Chant Modi:

I	Dorian	final: D	dominant: A	scale: D E F G A B C
III	Phrygian	final: E	dominant: B-C	scale: E F G A B C D
V	Lydian	final: F	dominant: C	scale: F G A B C D E
VII	Mixolydian	final: G	dominant: D	scale: G A B C D E F

The “final” note corresponds to what is today called the “tonic” of a scale. The origin of the modi names is to be found in the Greek Tetrachords (scales of four notes). The Gregorian Modi are still used today in jazz, pop and many other music styles.

I Dorian



If you want to use the Dorian mode (interval sequence: T HT T T T HT T) starting from another note, you will have to adjust some notes to get the right sequence of T and HT.

For example: starting from A A B C D E F# G A
 starting from G G A Bb C D E F G

III Phrygian

The screenshot displays the Cubase 5 interface. The top window is the 'Key-Editor: Instrument Track 01', which shows a piano roll with notes E3, F3, G3, A3, B3, C4, D4, and E4. The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 3.01.01.000', which shows the musical notation for the notes in the piano roll. The notation is in 4/4 time and shows a sequence of notes: E3, F3, G3, A3, B3, C4, D4, and E4.

Basic Principles of Harmony

Most of the western music harmony is based on a rather simple principle: chords are built by adding major (2 T) or minor (1T + 1 HT) 3rd intervals on top of each other.

So for example starting from D you can build D F A (3rd + 5th intervals, a Triad), or D F A C (adding a 7th) or D F A C E (adding a 9th), and so on.

Depending on the scale and the interval you start from, the resulting chord will sound different, as it will contain Major Thirds (2 T) or Minor thirds (1T + 1 HT).

Here a minor triad, a minor 7th and a minor 9th chords based on D:

The screenshot displays the Cubase 5 interface. The top window is the 'Key-Editor: Instrument Track 01', which shows a piano roll with notes for a D minor triad (D3, F3, A3), a D minor 7th chord (D3, F3, A3, C4), and a D minor 9th chord (D3, F3, A3, C4, E4). The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 3.01.01.000', which shows the corresponding musical notation on a staff.

Inversions

Three note chords like D F A (D-minor Triad) have three inversions depending on the order of the notes:

D F A – F A D – A D F

The screenshot displays the Cubase 5 interface for 'Instrument Track 01'. The top window is the 'Key-Editor', which shows a piano roll with three chords represented by red bars. The first chord (measure 1) consists of notes D3, F3, and A3. The second chord (measure 2) consists of notes F3, A3, and D4. The third chord (measure 3) consists of notes A3, D4, and F4. The bottom window is the 'Notation' editor, which shows the musical notation for these chords on a staff. The notation includes a treble clef, a key signature of one flat (B-flat), and a 4/4 time signature. The notes are grouped into three chords, each with a stem and a common time signature.

Four note chords like for example D F A C (D-minor Seventh) have 4 possible inversions:

DFAC – FACD – ACDF – C DFA

The screenshot displays the Cubase 5 interface for editing Instrument Track 01. The top window is the Key-Editor, which shows a piano roll with four chords: D3-F3-A3-C4, F3-A3-C4-D4, A3-C4-D4-F4, and C4-D4-F4-A4. The bottom window is the Notation window, which shows the musical notation for these chords in 4/4 time. The notation includes a treble clef, a key signature of one sharp (F#), and a time signature of 4/4. The chords are represented by vertical stems and horizontal lines indicating the duration of each note.

Voicing

Chords can be “voiced” open or close. The examples above are all close voicing.

Now let’s take DFAC for example: in open voicing it could be arranged as D A F C, which will sound much nicer and interesting on most instruments.

To experiment with different inversions and voicing you just have to “transpose” some notes of the chord one octave higher, or lower. Here some examples of variations on the D-minor 7th chord:

The screenshot displays the Cubase 5 interface, specifically the Key-Editor and Notation windows for Instrument Track 01. The piano roll shows a D-minor 7th chord (D2, F2, A2, D3, F3, A3, C4) across four measures. The notation window shows the corresponding musical notation in 4/4 time, with the chord in the first measure and individual notes in the subsequent measures.

Key-Editor: Instrument Track 01

Measure	Notes (Pitch)
1	C4, A3, F3, D3, A2, D2
2	C4, A3, F3, D3, D2
3	A3, F3, D3, C3, D2
4	A3, F3, D3, C3, F2

Notation: Instrument Track 01, 1.01.01.000 - 3.01.01.000

Notation settings: Anschlag: 100, raster: #, quantisieren: 1/16. Options: Taktgriffe (checked), Ausgeblendete Noter (unchecked), Ausblenden (unchecked), Quantisierung (unchecked), Layout-Werkzeug (unchecked), Gruppierung (unchecked), Cutflag (unchecked).

Creating a Chord Sequence

Let's try to build a simple chord sequence in D – Dorian Mode, starting from the final or tonic (D), and then going to the dominant (A), the 7th step (C) and the sub-dominant (G). Each of the chords will be one bar long.

This would be a sequence of simple "Triads", which are built adding a 3rd and a 5th to the main notes (in red).

The screenshot displays the Cubase 5 interface. The top window is the 'Key-Editor: Instrument Track 01', which shows a piano roll with a grid. The notes are organized into four measures. The notes are: D3 (red), A2 (red), C3 (white), E3 (white), G3 (white), B2 (white), and G2 (red). The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 5.01.01.000', which shows the musical notation for the same sequence. The notation is in 4/4 time and shows the notes on a grand staff (treble and bass clefs).

We can also add a 7th to the same four chords as shown here:

The image shows a screenshot of the Cubase 5 software interface. The top window is the 'Key-Editor: Instrument Track 01', which displays a piano roll for four measures. The piano roll shows the following notes for each measure:

- Measure 1: C4, A3, F3, D3, C3, A2
- Measure 2: G3, E3, C3
- Measure 3: B3, E3, C3
- Measure 4: F3, D3, B2, G2

The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 5.01.01.000', which shows the musical notation for the same four measures. The notation is in 4/4 time and shows the following notes for each measure:

- Measure 1: C4, A3, F3, D3, C3, A2
- Measure 2: G3, E3, C3
- Measure 3: B3, E3, C3
- Measure 4: F3, D3, B2, G2

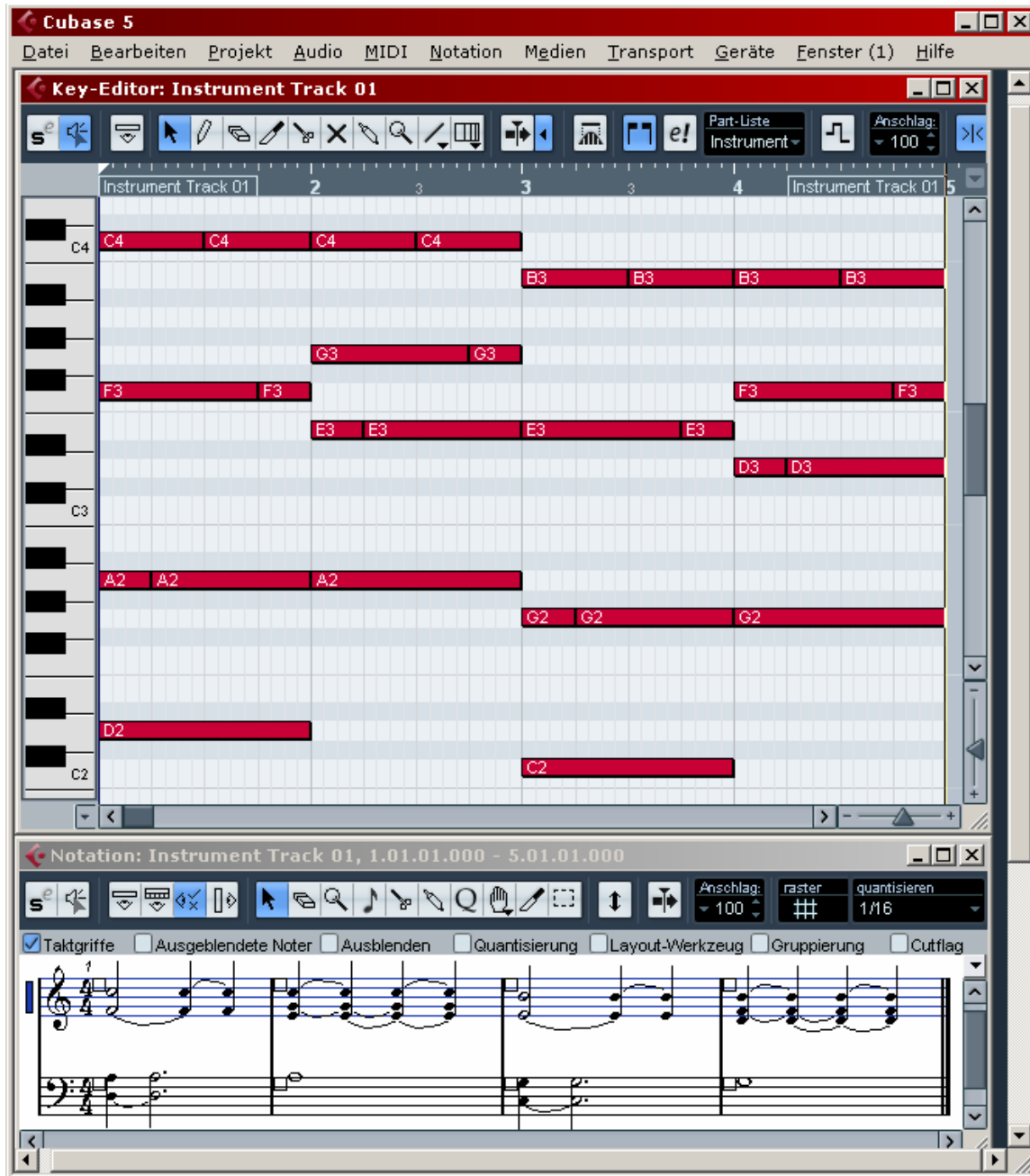
Now we can change the voicing of the chords to “open”; this is achieved transposing some notes within a chord one octave up or down:

The screenshot displays the Cubase 5 interface. The top window is the 'Key-Editor: Instrument Track 01', which shows a piano roll with red bars representing notes for chords. The notes are labeled with their pitch classes and octaves: C4, B3, C3, F3, E3, A2, D2, G2, and C2. The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 5.01.01.000', which shows the musical notation for the same chords on a grand staff (treble and bass clefs). The notation includes a treble clef, a 4/4 time signature, and a key signature of one sharp (F#). The chords are represented by groups of notes on the staff.

Now we will create an “arpeggio” sequence (the notes of a chord will not be played all together).

This is done in 3 steps:

1. Set the quantization to 1/4 and use the scissors tool (Trennen) to cut the notes according to the following pattern:



2. Remove the parts that are not required:

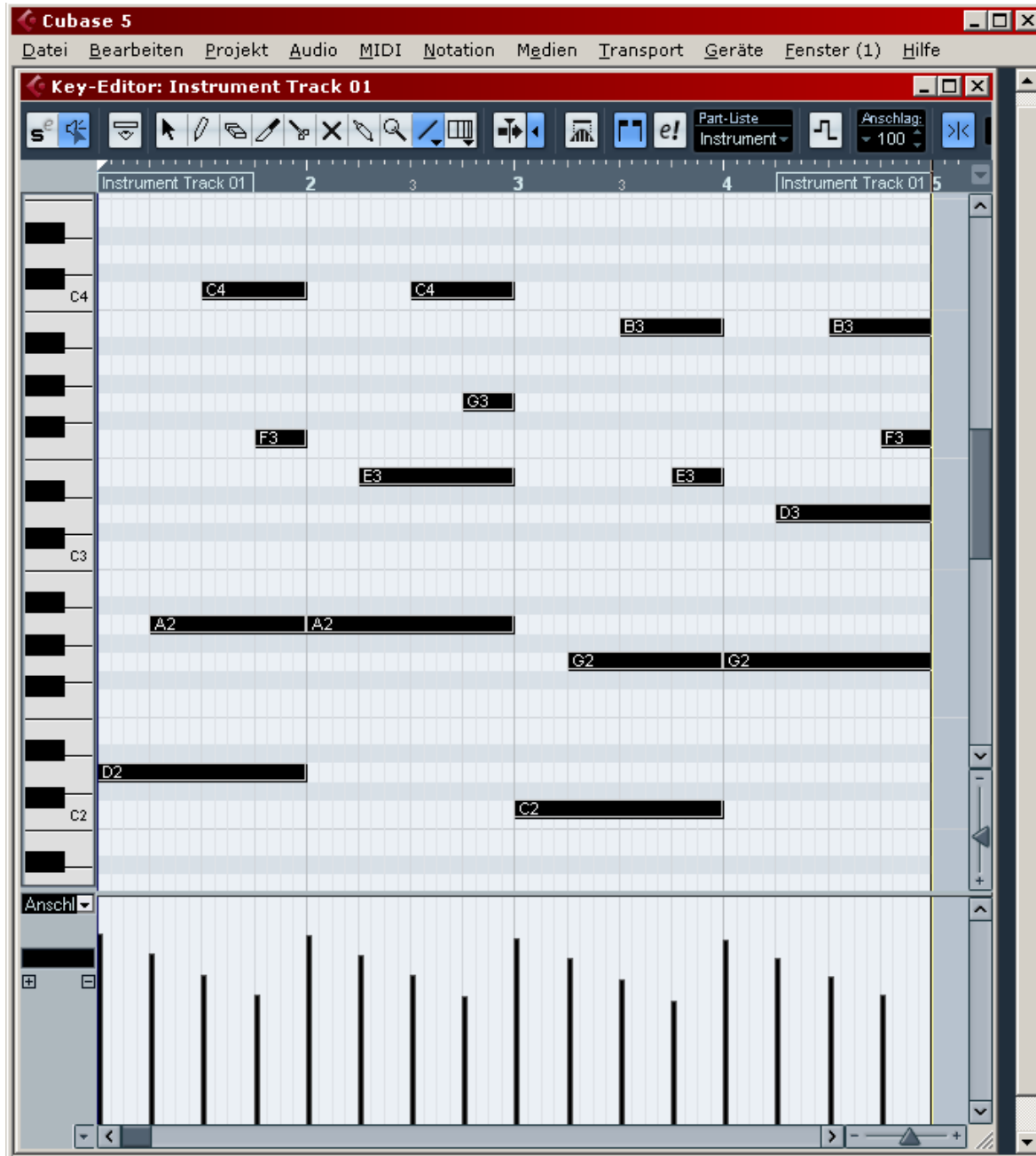
The image shows a screenshot of the Cubase 5 software interface. The top window is the 'Key-Editor: Instrument Track 01', which displays a piano roll with a grid. The vertical axis represents pitch, with labels for C4, C3, and C2. The horizontal axis represents time, with measures 2, 3, 4, and 5 visible. Red rectangular blocks represent notes or chords. The notes are: C4 (measures 2-3), F3 (measures 2-3), E3 (measures 3-4), D3 (measures 4-5), A2 (measures 2-3), G2 (measures 4-5), and C2 (measures 3-4). The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 5.01.01.000', which shows a musical score in 4/4 time. The score consists of two staves: a treble clef staff and a bass clef staff. The treble clef staff contains a melody of quarter notes: C4, E3, G3, B3, A3, G3, F3, E3. The bass clef staff contains a bass line of quarter notes: D2, A2, G2, F2, E2, D2, C2, B1. The notation window includes a toolbar with various editing tools and checkboxes for 'Taktgriffe', 'Ausgeblendete Noter', 'Ausblenden', 'Quantisierung', 'Layout-Werkzeug', 'Gruppierung', and 'Cutflag'.

3. Modify the note dynamic values to make the performance sound more natural.

This is done as follows:

- Visualize the dynamic of the notes (r-click anywhere in the Key-Editor and choose “Weitere Controller-Spur öffnen”)
- Select “Anschlagstärke” from the small drop-down menu left)
- Edit the vertical bars the pencil (Stift) or line (Linie) tool (Strg+A to select all notes first!)

Try this with piano or guitar samples!



You can of course try to build chords out of other note sequences, and you can vary the length of the chords: they need not always start at the beginning of the bar, nor be exactly one bar long.

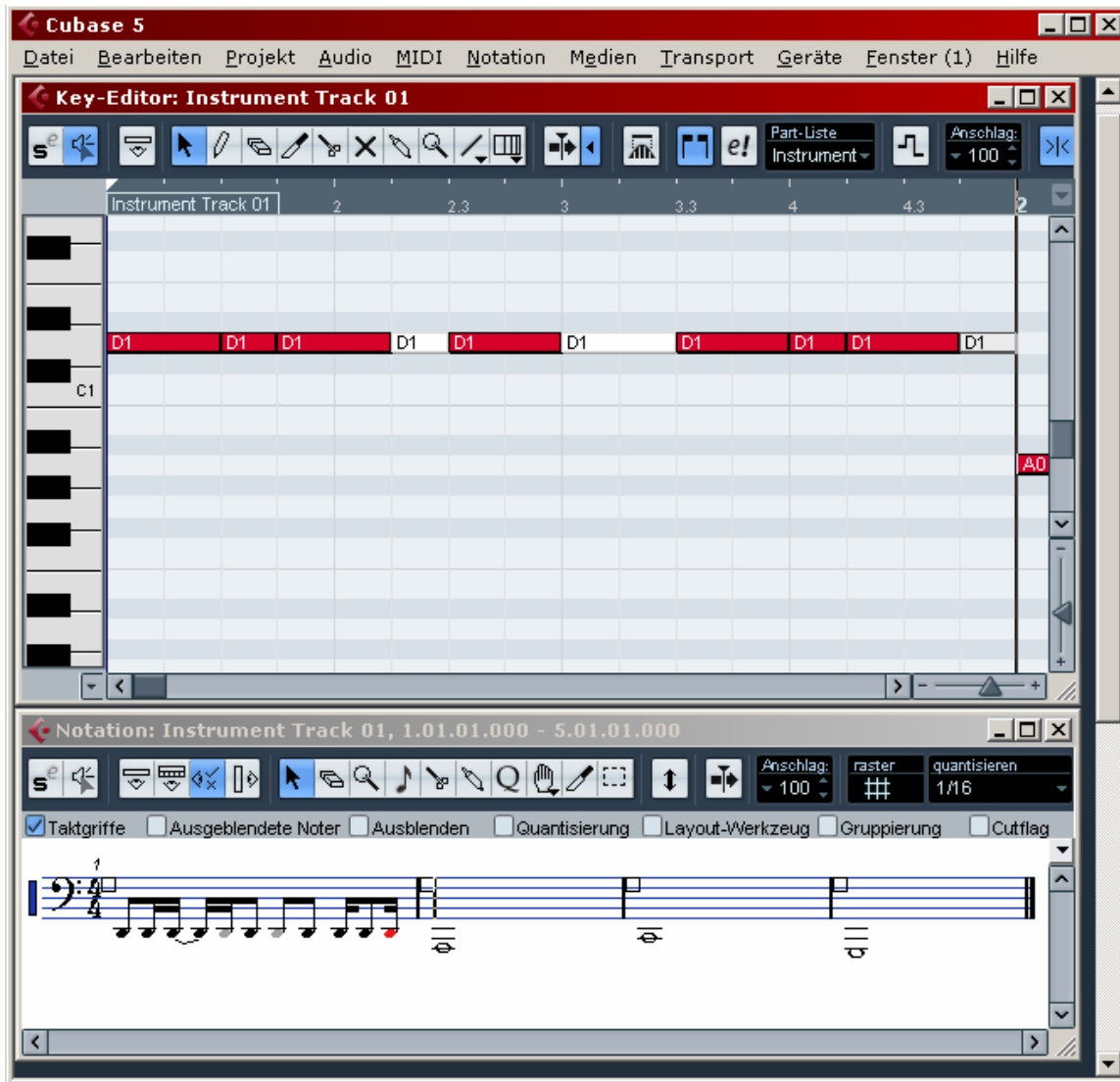
Adding a Bass Line

Adding a simple Bass Line to an existing chord sequence is rather simple. We will here show how to add a bass line to the chord sequence described above.

1. Copy the lowest notes from each used chord, transposed one or two octaves lower:

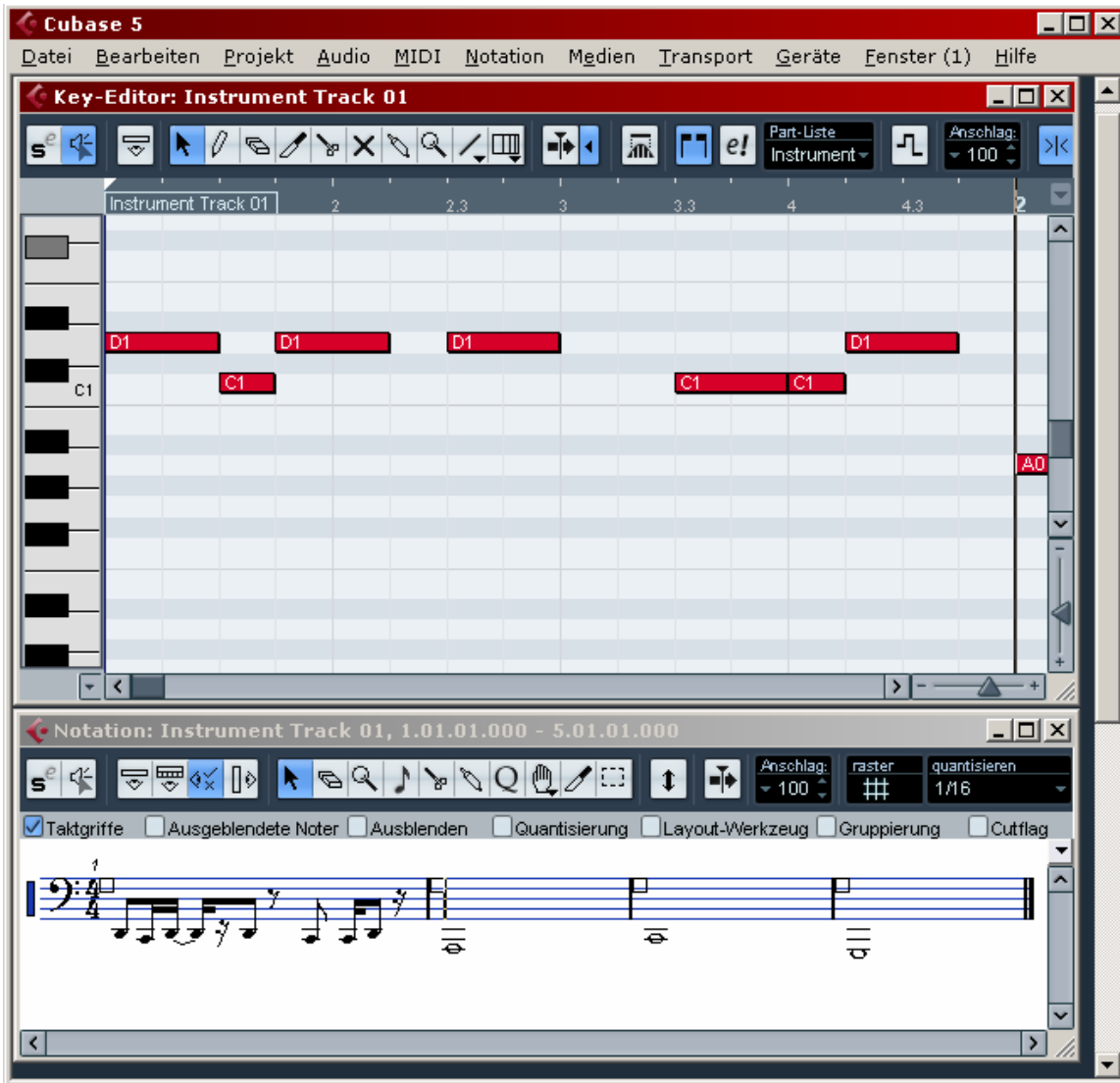
The screenshot displays the Cubase 5 interface. The top window is the 'Key-Editor: Instrument Track 01', which shows a piano roll with a grid. Four red horizontal bars represent chords: 'D1' (measures 1-2), 'A0' (measures 2-3), 'C1' (measures 3-4), and 'G0' (measures 4-5). The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 5.01.01.000', showing a bass clef staff with four notes: D1, A0, C1, and G0, corresponding to the chords in the piano roll above. The notation window includes a toolbar with various editing tools and checkboxes for 'Taktgriffe', 'Ausgeblendete Noter', 'Ausblenden', 'Quantisierung', 'Layout-Werkzeug', 'Gruppierung', and 'Cutflag'.

2. Set the quantization to 1/16 and use the scissors tool to cut the notes according to the following pattern:



3. Remove the notes marked in white.

4. Transpose some of the tones one tone lower or higher (as “passing” note) to create a nicer riff, like in this example (for the first bar):



5. Repeat the same process for the other bars. Please note that in this example to remain all within the D-Dorian mode there is only a half-tone interval between C and B (third bar):

The screenshot displays the Cubase 5 interface. The top window is the 'Key-Editor: Instrument Track 01', which shows a piano roll with notes and chords for five measures. The notes are color-coded by pitch: D1 (red), C1 (black), AC (green), G0 (blue), E (orange), and F (purple). The chords are labeled as D1, C1, AC, G0, E, and F. The bottom window is the 'Notation: Instrument Track 01, 1.01.01.000 - 5.01.01.000', which shows the musical notation for the same five measures. The notation is in bass clef and 4/4 time, with a key signature of one flat (B-flat). The first measure is marked with a '1' and the third measure with a '3', indicating first and third endings. The notation shows a sequence of eighth and quarter notes, with rests and ties.

6. You can also add some dynamic accents to the line, similarly as we did for the piano part:

