

Functional Harmony

Lesson 1

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The V to I Chord Progression

Play the exercise below. Notice how the first chord sounds like it's *resolving* into the second chord? This is the sound of the V to I chord sequence. In a way this little sequence is responsible for hundreds of years of music, from Bach to the Beatles.

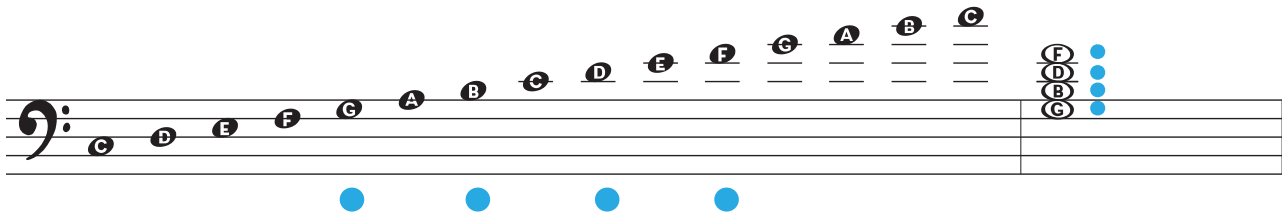
The exercise is written in bass clef, 4/4 time. It shows a G7 chord (G-B-D-F) resolving to a C chord (C-E-G). The notes are played in a descending sequence: G (4th line), B (3rd space), D (3rd line), F (2nd space), F (2nd space), D (3rd line), B (3rd space), G (4th line), then C (3rd line), E (3rd space), G (4th line). Below the staff, a fretboard diagram for the bass shows the fingerings: 10 (G), 9 (B), 12 (D), 10 (F), 10 (F), 12 (D), 9 (B), 10 (G), 10 (C), 8 (E), 10 (G).

The V7 Chord

Chords are built from scales by harmonising every second note. If we harmonise the C major scale starting at C, the root, up to the seventh we will create a CΔ7 chord.

The exercise shows the C major scale in bass clef, starting on C (3rd line) and ending on C (3rd line). The notes are C, D, E, F, G, A, B, C. Below the staff, blue dots indicate the positions of the notes on the fretboard. To the right, a diagram shows the CΔ7 chord structure: C (root), E (3rd), G (5th), B (7th), and C (octave).

If we start at the fifth scale degree, G, and harmonise a four note chord the resulting chord is G7.



This chord type is called a *dominant chord*.

Dominant chords have a tendency to “want” to resolve down a fifth. That is to say - the strongest way to resolve the tension that is built into a dominant chord is to resolve it down a fifth.

Because dominant chords naturally happen at the fifth degree of major harmony and they naturally want to resolve down a fifth, dominant chords help establish and maintain the a sense of the major key signature.

Voice Leading

The reason why V7 to I has such a strong sense of resolution is that the tension notes within the V7 chord seem to “relax” into more harmonious positions when the I chord arrives.

We can explore this sound by playing chords on bass.

NOTICE THAT THESE CHORDS DON'T CONTAIN ALL THEIR NOTES. PART OF THE ART OF PLAYING CHORDS, ESPECIALLY ON BASS, IS KNOWING WHICH NOTES TO LEAVE OUT.

See below how the seventh note in the G7 chord resolves down chromatically to become E, the third of C major. Also note how the third of G7, B, resolves up chromatically to become C, the root of C major. In all V7 to I sequences the seventh and third of the V7 chord leading chromatically to the third and root of the I chord.

The diagram illustrates the voice leading from a G7 chord to a C major chord on a bass instrument. At the top, a chord diagram shows the G7 chord with notes B, F, G, and C. Dashed lines indicate the resolution of these notes to the C major chord notes C, E, and G. Below this, a bass staff shows the progression from G7 to C major. The G7 chord is represented by a single note G on the first line, with a bass clef and a key signature of one flat. The C major chord is represented by three notes: C on the first line, E on the second line, and G on the second space. Fingerings are indicated below the notes: 16, 15, 15 for G7 and 17, 14, 15 for C major.

This is called *voice leading*. The reason why certain chords sound good moving in sequence is often due to the voice leading that is taking place.

V7 Chord The Doorway to New Keys

When dominant chords appear in other places, instead of at the fifth degree, they can be used to change key signatures.

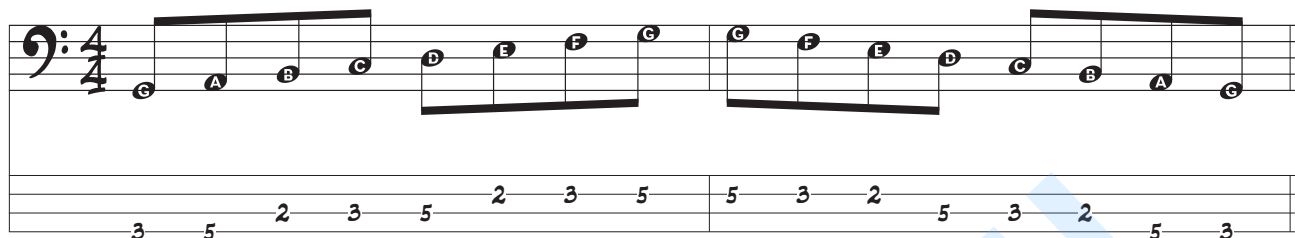
Play the exercise below to hear how V7 chords can create doorways to new key centres.

The exercise is written for cello in 4/4 time and consists of three systems, each with a staff and a corresponding fingering line below it. The first system is in C major, starting with a C major triad (C-E-G) and moving through a sequence of notes: C, E, G, C, E, G, C, E, G, C. The second system is in F major, starting with an F major triad (F-A-C) and moving through a sequence of notes: F, A, C, F, A, C, F, A, C, F. The third system is in Bb major, starting with a Bb major triad (Bb-D-F) and moving through a sequence of notes: Bb, D, F, Bb, D, F, Bb, D, F, Bb. Each system includes a V7 chord (C7, F7, and Bb7 respectively) which acts as a 'doorway' to the next key. The fingering line shows the sequence of notes and the corresponding fingerings (8, 7, 10, 10, 10, 10, 7, 8, 8, 10, 7, 8).

Notice how the chord immediately after each V7 chord sounds so “right”? JS Bach used this very technique to change key signatures. In his G Major Cello Suite Prelude he changes key from G major to D major using the A7 chord.

The Mixolydian Mode

Play the scale below to hear the sound of G mixolydian.



The G mixolydian mode is what you get when you play the C major scale from G to G. G mixolydian has the sound of G7 built into it.

C MAJOR SCALE **C MIXOLYDIAN** **F MAJOR SCALE** **F MIXOLYDIAN**

Bb MAJOR SCALE **G MIXOLYDIAN**

6 8 5 6 8 5 7 8 3 5 2 3 5 2 3 5

Technical Study

By playing primary chord tones (root, three, five, seven) on beats we can make the harmony really stand out using nothing but scales (no arpeggios or harmonised chords). This is an old jazz trick.

Play through the exercise below. It will take you through all twelve keys.

The exercise consists of four systems, each for a different key. Each system includes a bass staff with a 4/4 time signature and a tablature staff below it. The first two systems are for C major and F major, and the last two are for Bb major and Eb major. Each system contains two parts: a scale run and a primary chord tones exercise. The primary chord tones exercise is a 4-measure phrase where the root, third, fifth, and seventh of the chord are played on the beats. The scale runs are 8-measure phrases. The tablature staff shows the fret numbers for each note.

C^Δ7 **C⁷**

F^Δ7 **F⁷**

B^bΔ⁷ **B^b7**

E^bΔ⁷ **E^b7**

A $\flat$ 7

A $\flat$ 7

Handwritten musical notation for the A $\flat$ 7 scale in bass clef. The scale is written across two staves. The first staff contains the notes: A $\flat$, B $\flat$, C $\flat$, D $\flat$, E $\flat$, F $\flat$, G $\flat$, A $\flat$. The second staff contains the fingering: 4 6 3 4 6 3 5 3 | 6 3 5 3 6 4 3 6 | 4 6 3 4 6 3 4 3 | 6 3 4 3 6 4 3 4.

D $\flat$ 7

D $\flat$ 7

Handwritten musical notation for the D $\flat$ 7 scale in bass clef. The scale is written across two staves. The first staff contains the notes: D $\flat$, E $\flat$, F $\flat$, G $\flat$, A $\flat$, B $\flat$, C $\flat$, D $\flat$. The second staff contains the fingering: 4 6 3 4 6 3 5 8 | 6 3 5 3 6 4 3 6 | 4 6 3 4 6 3 4 8 | 6 3 4 3 6 4 3 4.

G $\flat$ 7

F $\sharp$ 7

Handwritten musical notation for the G $\flat$ 7 and F $\sharp$ 7 scales in bass clef. The first staff contains the notes for G $\flat$ 7: G $\flat$, A $\flat$, B $\flat$, C $\flat$, D $\flat$, E $\flat$, F $\flat$, G $\flat$. The second staff contains the notes for F $\sharp$ 7: F $\sharp$, G $\sharp$, A $\sharp$, B $\sharp$, C $\sharp$, D $\sharp$, E $\sharp$, F $\sharp$. The third staff contains the fingering: 2 4 1 2 4 1 3 1 | 4 1 3 1 4 2 1 4 | 2 4 1 2 4 1 2 1 | 4 1 2 1 4 2 1 2.

B7

B7

Handwritten musical notation for the B7 scale in bass clef. The scale is written across two staves. The first staff contains the notes: B, C $\sharp$, D $\sharp$, E $\sharp$, F $\sharp$, G $\sharp$, A $\sharp$, B. The second staff contains the fingering: 7 9 6 7 9 6 8 6 | 9 6 8 6 9 7 6 9 | 7 9 6 7 9 6 7 6 | 9 6 7 6 9 7 6 7.

E Δ 7

E7

Two systems of musical notation for E Δ 7 and E7 chords. The first system shows the E Δ 7 chord with a bass clef, a key signature of one sharp (F#), and a sequence of notes: E, F#, G#, A, B, C#, D, E. The second system shows the E7 chord with a bass clef, a key signature of one sharp (F#), and a sequence of notes: E, F#, G#, A, B, C#, D, E. Below the notes are two lines of fret numbers: 0 2 4 0 2 4 1 4 2 4 1 4 2 0 4 2 0 2 4 0 2 4 0 2 4 0 4 2 0 4 0.

A Δ 7

A7

Two systems of musical notation for A Δ 7 and A7 chords. The first system shows the A Δ 7 chord with a bass clef, a key signature of two sharps (F#, C#), and a sequence of notes: A, B, C#, D, E, F#, G#, A. The second system shows the A7 chord with a bass clef, a key signature of two sharps (F#, C#), and a sequence of notes: A, B, C#, D, E, F#, G#, A. Below the notes are two lines of fret numbers: 5 7 4 5 7 4 6 4 7 4 6 4 7 5 4 7 5 7 4 5 7 4 5 4 7 4 5 4 7 5 4 3.

D Δ 7

D7

Two systems of musical notation for D Δ 7 and D7 chords. The first system shows the D Δ 7 chord with a bass clef, a key signature of two sharps (F#, C#), and a sequence of notes: D, E, F#, G, A, B, C#, D. The second system shows the D7 chord with a bass clef, a key signature of two sharps (F#, C#), and a sequence of notes: D, E, F#, G, A, B, C#, D. Below the notes are two lines of fret numbers: 5 7 4 5 7 4 6 9 7 4 6 4 7 5 4 7 5 7 4 5 7 4 5 9 7 4 5 4 7 5 4 5.

G Δ 7

G7

C Δ 7

Two systems of musical notation for G Δ 7, G7, and C Δ 7 chords. The first system shows the G Δ 7 chord with a bass clef, a key signature of one sharp (F#), and a sequence of notes: G, A, B, C, D, E, F#, G. The second system shows the G7 chord with a bass clef, a key signature of one sharp (F#), and a sequence of notes: G, A, B, C, D, E, F#, G. The third system shows the C Δ 7 chord with a bass clef, a key signature of no sharps or flats, and a sequence of notes: C, D, E, F, G, A, B, C. Below the notes are two lines of fret numbers: 3 5 2 3 5 2 4 2 5 2 4 2 5 3 2 5 3 5 2 3 5 2 3 2 5 2 3 2 5 3 2 3.

Functional Harmony

Lesson 2

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The ii V I Chord Progression

Play the chordal passage below. This is the sound of the ii V I progression.

Chord progression: D-7, G7, C

Fingerings (Bass line):

- D-7: T 17, A 15, B 17
- G7: T 16, A 15, B 15
- C: T 17, A 14, B 15

The Dorian Mode

C MAJOR FROM D TO D

D DORIAN

Play C major from D to D. If we treat that series of notes like its own scale it becomes the D dorian mode.

If we harmonise the Dorian mode we get the ii chord. The ii chord is a minor seventh chord occurring at the second degree of major harmony.

D DORIAN

The ii Chord

The ii chord is known as a *pre-dominant* chord because it often leads to the *dominant* chord (the V7 chord).

Here are the first three chords of “Autumn Leaves”. This is a classic ii V I sequence.

D-7

G7

CΔ7



Here are the first four chords of “All The Things You Are”.

A-7

D-7

G7

CΔ7



Notice that there are two minor seventh chords. In this case A-7 is a vi chord and D-7 is the ii chord.

Use the key signature and/or the presence of any V7 chord to identify whether or not a minor seventh chord is a ii chord.

Voice Leading & Root Movement

In the ii V I progression several interesting things happen. All the chords flow into each other with descending fifths root movement. For example in the key C major the ii chord is D-7, the V7 chord is G7 and the I chord is C major.

The root of D-7 is D, which falls a fifth to the root of G7 which falls a fifth to the root of C major.

The voice leading also flows logically. The seventh of D-7 is C, which falls chromatically to become B, the third of G7. The third and seventh of G7, B and F, then resolve chromatically, becoming C and E, the root and third of C major.

The image displays a musical score for a ii V I progression in C major, consisting of three measures: D-7, G7, and C major. The notation is presented in two systems. The top system uses a bass clef and a 4/4 time signature. The first measure (D-7) contains notes C4, F3, and D3. The second measure (G7) contains notes B3, F3, and G2. The third measure (C major) contains notes C4, E3, and C2. Dashed lines indicate the voice leading between the measures: C4 moves down a half step to B3, F3 moves down a half step to E3, and D3 moves down a fifth to G2. The bottom system shows the figured bass for each measure. For D-7, the figures are 17, 15, and 17. For G7, the figures are 16, 15, and 15. For C major, the figures are 17, 14, 15, and 8.

Measure	Chord	Figured Bass
1	D-7	17, 15, 17
2	G7	16, 15, 15
3	C	17, 14, 15, 8

ii V I The Doorway to New Keys

Just as the V7 chord can be used to “normalise” new key centres, the ii V7 sequence can create smooth pathways through related key centres.

Play the exercise below to hear the sound of ii V I setting up new key signatures.

The exercise consists of three systems of musical notation, each with a melodic line and a corresponding fingering line. The first system is in C major, the second in F major, and the third in Bb major. Chord symbols are placed above the notes to indicate the harmonic context.

System 1 (C major):

- Chord symbols: C, G-7, C7
- Fingering: 3 2 5 5 5 2 3 | 3 6 5 3 3 2 5 3

System 2 (F major):

- Chord symbols: F, C-7, F7
- Fingering: 1 0 3 3 3 0 1 | 3 6 5 3 1 0 3 1

System 3 (Bb major):

- Chord symbols: Bb, D-7, G7
- Fingering: 1 0 3 3 3 0 1 | 5 3 7 5 3 2 5 3

The Dorian, Mixolydian and Ionian Modes

So far in the *Functional Harmony* lesson series we have learned about the mixolydian and dorian modes. The major scale itself can be thought of as a mode: the ionian mode.

I use the traditional word “mode” to remind us that these scales first come from the major scale. Going forward I use the words “mode” and “scale” interchangeably. A mode is a type of scale.

Play the exercise below to hear how the ii V I progression can be sounded using the dorian, mixolydian and ionian modes.

NOTE HOW THE CHORD TONES ARE EMPHASISED USING A SPECIAL MELODIC SHAPE ON THE DESCENDING IONIAN LINES.

The exercise is presented in three systems, each for a different key. Each system consists of a bass staff with a melodic line and a piano staff with a fingered scale line.

System 1 (Key of D):

- Chords: D-7, G7, CΔ7
- Modes: D DORIAN, G MIXOLYDIAN, C IONIAN
- Fingerings: D Dorian (5 7 8 5 7 4 5 7), G Mixolydian (3 5 2 3 5 2 3 5), C Ionian (3 5 2 3 5 2 4 7 5 2 4 2 5 3 2 5)

System 2 (Key of F):

- Chords: C-7, F7, BbΔ7
- Modes: C DORIAN, F MIXOLYDIAN, Bb IONIAN
- Fingerings: C Dorian (3 5 6 3 5 2 3 5), F Mixolydian (8 10 7 8 10 7 8 10), Bb Ionian (6 8 5 6 8 5 7 5 8 5 7 5 8 6 5 8)

System 3 (Key of Eb):

- Chords: Bb-7, Eb7, AbΔ7
- Modes: Bb DORIAN, Eb MIXOLYDIAN, Ab IONIAN
- Fingerings: Bb Dorian (6 8 9 6 8 5 6 8), Eb Mixolydian (6 8 5 6 8 5 6 8), Ab Ionian (4 6 3 4 6 3 5 3 6 3 5 3 6 4 3 6)

Technical Study

Play through the exercise below to hear how the chord tones of ii V7 I can be emphasised using the dorian, mixolydian and ionian modes.

Technical Study Exercise: Chord Tones of ii V7 I in various modes.

The exercise is divided into four systems, each featuring a bass line and a guitar line (fingerings).

System 1: Dorian Mode (D)

- Chords: D-7, G7, CΔ7
- Bass Line: D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4
- Guitar Line: 10-12-13, 10-12, 9-10, 9, 12-10-9, 12-10-7-8, 10, 8-10, 7-8-10, 7-9, 7, 10-7-9-7, 10-8-7, 8

System 2: Mixolydian Mode (E)

- Chords: E-7, A7, DΔ7
- Bass Line: E4, F#4, G#4, A4, B4, C#5, D5, C#5, B4, A4, G#4, F#4, E4
- Guitar Line: 7-9-10, 7-9, 6-7, 6, 9-7-6, 9-7-4-5, 7, 5-7, 4-5-7, 4-6, 4, 7-4-6-4, 7-5-4, 5

System 3: Ionian Mode (F#)

- Chords: G#-7, C#7, F#Δ7
- Bass Line: F#4, G#4, A4, B4, C#5, D5, E5, D5, C#5, B4, A4, G#4, F#4
- Guitar Line: 4-6-7, 4-6, 3-4, 3, 6-4-3, 6-4-1-2, 4, 2-4, 1-2-4, 1-3, 1, 4-1-3-1, 4-2-1, 2

System 4: Dorian Mode (F)

- Chords: F-7, Bb7, EbΔ7
- Bass Line: F4, G4, Ab4, Bb4, C5, Bb4, Ab4, G4, F4, Eb4, D4, C4, B3, Ab3, F4
- Guitar Line: 1-3-4, 1-3, 0-1, 0, 3-1-0, 3-1, 3-4-1, 6-8, 5-6-8, 5-7-10, 9-5-7-5, 8-6-5, 6

E^b-7 **A^b7** **D^bΔ7**

11-13-14 11-13 10-11 10 13-11-10 13-11-8-9 11 9-11 8-9-11 8-10 8 11-8-10-8 11-9-8 9

C-7 **F7** **B^bΔ7**

8-10-11 8-10 7-8 7 10-8-7 10-8-5-6 8 6-8 5-6-8 5-7 5 8-5-7-5 8-6-5 6

A-7 **D7** **GΔ7**

5-7-8 5-7 4-5 4 7-5-4 7-5-2-3 5 3-5 2-3-5 2-4 2 5-2-4-2 5-3-2 3

F[#]-7 **B7** **EΔ7**

2-4-5 2-4-6 2 1 4-2-1 3-2 4-5-2 0-2-4 0-2-4 1-4 2-4 1-4-2-0 4-0

E-7

A7

DΔ7

Bass line for E-7, A7, and DΔ7 chords. The first staff shows the notes, and the second staff shows the fret numbers.

Notes: E-7 (E, G, B, D), A7 (A, C#, E, G), DΔ7 (D, F#, A, C).

Fret numbers: 12-14-15, 12-14, 11-12, 11, 14-12-11, 14-12, 9-10, 12, 10-12, 9-10-12, 9-11, 9, 12-9-11-9, 12-10-9, 10.

C#-7

F#7

BΔ7

Bass line for C#-7, F#7, and BΔ7 chords. The first staff shows the notes, and the second staff shows the fret numbers.

Notes: C#-7 (C#, E, G, B), F#7 (F#, A, C, E), BΔ7 (B, D, F, A).

Fret numbers: 9-11-12, 9-11, 8-9, 8, 11-9-8, 11-9, 6-7, 9, 7-9, 6-7-9, 6-8, 6, 9-6-8-6, 9-7-6, 7.

Bb-7

Eb7

AbΔ7

Bass line for Bb-7, Eb7, and AbΔ7 chords. The first staff shows the notes, and the second staff shows the fret numbers.

Notes: Bb-7 (Bb, Db, F, Ab), Eb7 (Eb, Gb, Bb, Db), AbΔ7 (Ab, Bb, Db, F).

Fret numbers: 6-8-9, 6-8, 5-6, 5, 8-6-5, 8-6, 3-4-1, 4-6, 3-4-6, 3-5, 3, 6-3-5-3, 6-4-3, 4.

G-7

C7

FΔ7

Bass line for G-7, C7, and FΔ7 chords. The first staff shows the notes, and the second staff shows the fret numbers.

Notes: G-7 (G, Bb, D, F), C7 (C, Eb, G, Bb), FΔ7 (F, A, C, E).

Fret numbers: 3-5-6, 3-5, 2-3, 2, 5-3-2, 5-3, 0-1, 3, 1-3, 0-1-3, 0-2, 0, 3-0-2-0, 3-1-0, 1.