

# **Music Theory**

**Intermediate Level**

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## Introduction

This document is part of a compilation of a series of threads that deal with music theory and that were originally published by Eowyn on [www.mysongbook.com](http://www.mysongbook.com). The compilation has been reorganized into three separate documents:

- Basic Music Theory
- Intermediate Music Theory – this document
- Advanced Music Theory

This has been done for two reasons:

1. The size of one single file was too large for download
2. The material covered by the different topics is of varying levels of complexity and targets different audiences.

The text of the original threads has been modified and/or extended in several places where it was deemed appropriate for increased readability. The rather crude layout of the original text (due to the limitation of the forum) has also been improved. Finally, the text has been proof-read by Arnold and Blackiel.

This is by no means an exhaustive treatise about music theory and harmony. Much more modestly, the purpose of this series of topics is to give those willing to better understand what they are doing with their guitar, the ability to get this knowledge into a quick and concise form. The underlying objective is lead work and improvisation in a rock music context (broadly speaking), but most topics are of a more general nature and they can also easily be adapted to other musical genres.

There are numerous books and web sites about general music theory and more specialised topics. Interested readers will find a short reference list at the end of the document.

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## Target Notes

I like to define improvisation as "instantaneous composition". In order to create a good solo it helps to be a good composer, with all the implied musical skills; but additionally you must be able to act on the spot in front of an audience – despite the stage fright and the stress!

Those who have tried it know that this is far from easy, and poses two related challenges:

- Select the right notes at the right moment
- Play as musically and meaningfully as possible

Music is and remains an art, and the theory is only there to acknowledge and establish what seems to work well. The rules are only there to provide guidance; in many cases they can be broken. But guidance is useful when you learn something new. And improvisation can be learned!

I have broken down the theoretical aspects in three topics:

- In this topic we will address the problem of selecting the *target notes* of the solo based on the chord progression.
- In the next topic we will explore chord progressions themselves.
- In the topic after that we'll discuss the general "rules" regarding melodic movements.

## Theory

Some solos are purely rhythmic and chord oriented. In most cases however, the lead player is expected to create a melodic composition that blends with the harmonic structure of the piece of music currently played by the band. This might be called *constrained* composition. When you are composing a piece of music, you are of course totally free to pick any harmony you want. As a lead guitarist, however, you will have to make do with the chord progression currently played by the band. The notes of the lead lines will inevitably interact with the chords played by the background and we want to make sure this interaction is as smooth and musical as possible.

Fundamentally, this boils down to two separate but related aspects:

- Note selection (characteristic notes)
- Phrasing

### Characteristic Notes

The *characteristic notes* of a chord are the notes that help uniquely identify and characterise that chord (hence the name). You will recall that chords are usually built by stacking up thirds, so the characteristic notes of the chord are the notes 1, 3, 5, 7, 9, etc., where the third and the seventh can be minor or major, the fifth can be perfect, augmented or diminished, and so forth.

The **root** of the chord is a *neutral tone*. It is neutral because it remains the same in a very large number of chords: C, Cm, C7, Cmaj7, Cm7 all have the same root note C. The root does not characterise the chord very well.

The **5<sup>th</sup>** in the chord is called a *second-order characteristic note*; it is less uniform than the root, but still pretty stable across different types of chords. All the chords mentioned previously actually

share the same 5<sup>th</sup> (G) in addition to sharing the same root. But there are certainly C chords with a different fifth: Caug = (C,E,G#) and Cm(b5) = (C,Eb,Gb) are examples.

The 3<sup>rd</sup> and 7<sup>th</sup> in a chord are the *first-order characteristic notes* of the chord; they give the chord its colour. The third immediately tells whether the chord is major or minor, while the seventh adds a lot of colour and accounts for totally different *functions* in the harmony. As we will see shortly, these notes play a fundamental role in improvisation.

Higher order chord extensions such as the 9<sup>th</sup> (not to mention the 11<sup>th</sup> and 13<sup>th</sup>) are also considered first order characteristic notes, and are frequent in jazz music but you're not likely to see them as often in rock music.

## Phrasing

The impact of a note in a solo not only depends on its pitch and function, but also on its placement in the bar, its rhythmic value, and the effects applied to it. This together is called "*phrasing*".

### **Placement**

Rock music is predominantly 4/4 (four to the beat) music, so we'll focus on that. In a 4/4 bar, the 1<sup>st</sup> and 3<sup>rd</sup> beats (the downbeats) are strong (although the 3<sup>rd</sup> beat is slightly weaker than the 1<sup>st</sup>), while the 2<sup>nd</sup> and 4<sup>th</sup> beat (the upbeats) are definitely weak. This simply means that the 1<sup>st</sup> and 3<sup>rd</sup> beats get more emphasis than the other two beats. You can clearly hear that if you listen to a typical percussion track: bass drum on the 1<sup>st</sup> and 3<sup>rd</sup> beats, snare on the 2<sup>nd</sup> and 4<sup>th</sup> beats.

In 3/4, the first note of the bar is strong, while the other two are weak.

**The general rule when soloing is to place characteristic notes on the strong beats of the bar. These become your *target notes*.**

In other words, the theory requires you to try and place the 3<sup>rd</sup> or the 7<sup>th</sup> of the underlying chord on the downbeats, or else the 5<sup>th</sup> or the root. In rock music, you will typically (although not *systematically*) avoid the 9<sup>th</sup> and higher order extensions.

In practice, you will want to handle the 7<sup>th</sup> with care: the major 7<sup>th</sup> may sound too jazzy, and the minor 7<sup>th</sup> may require an unwanted resolution (see next topic). On the other hand, the root, 3<sup>rd</sup> and 5<sup>th</sup> always sound right.

### **Rhythmic Value**

If a bump note is an 8<sup>th</sup> note or a 16<sup>th</sup> note, it will cause less aural damage than if it's a longer note, because it will resolve very quickly in harmonically more acceptable sounds and go almost unnoticed.

- Therefore, the rule above is of high importance for quarter notes and longer, and slightly more flexible for short notes (8<sup>th</sup> notes and faster).

- Also, strictly speaking the rule above is only valid when the notes are within an interval of two octaves; beyond that, the distance becomes too large for the ear to be sensitive to the relationship between the notes.

However, if you're not yet a seasoned lead guitarist I strongly recommend sticking to the rule, even for short duration notes and high pitches.

A very effective trick when you're not sure about the target notes is to start your musical phrases slightly after the downbeats, or downright on the upbeats. For example, when using 8<sup>th</sup> notes, you may decide to start on the second half of the first beat, or on the first upbeat. Even if the first note you play is off, its impact will be much less dramatic due to its more favourable position in the bar. Moreover, this technique produces a very driving effect. It is very commonly used in blues.

### **Effects**

We guitarists are happy to have several fretting-hand and picking-hand effects at our disposal: slides, hammers, pull-offs, bends, rakes, harmonics, muting, tapping, you name it!

Again, applying effects on characteristic notes will dramatically enhance their role and importance. But beware of clichés.

## **Usage**

Granted, a solo should ideally flow naturally as an instant composition. You "think" the melody you want to play, and here it comes on the fret board... But as you will probably acknowledge if you have tried it, there is quite a distance between your brain and your fingers. Everybody needs to learn, so it will do no harm constructing your solo on the principles mentioned above. Fluency comes with practice.

In general, when you're asked to play lead in a chorus:

1. Quickly analyse the harmonic progression (the chords you need to play over), and identify their characteristic notes. For mainstream rock music, you will probably want to stick with the root, 5<sup>th</sup> and 3<sup>rd</sup> of the chords, and only use 7<sup>th</sup> (especially major 7<sup>th</sup>) sparingly. Other genres will have their own stylistic requirements and opportunities.
2. Mentally select the characteristic notes you will play, and place them on the strong beats; this sequence of target notes becomes the melodic backbone of your solo. Try to locate and visualise those target notes on the fret board a little *before* you play them; that way you will always know where you are going. Don't be discouraged if you find this hard to do: it is very hard to do and requires a lot of practice!
3. Fill in the "gaps" with short connection phrases - initially try to use as few notes as possible, and try to be consistent with the melodic flow of the target notes: you want to tell a story, not running up and down some scales. As you get comfortable with this, create longer and more complex phrases. Playing only long characteristic notes with expression and effects is *much* preferable over a waterfall of fast but meaningless notes!

4. When working out your solos this way, you will occasionally produce very pleasant phrases; whenever that happens, repeat that phrase, exploit it and create all sorts of variations for it.
5. When the length and complexity of your solo phrases increase, it remains critical to select your starting notes carefully, but the importance of the other target notes decreases somewhat. This is because the human ear tends to remember the first note much more than the other notes, especially if the tempo is fast. Please make sure you only relax the rule when you have become sufficiently comfortable with it!

Here is a very simple example. Suppose the chord progression of the song is:

C - - - / Dm - - - / G7 - - - / C - - -

One possible backbone for the lead could be:

**e - g - / a - - - / g - d - / c - - -**

(lower case indicates notes, not chords).

Based on this sequence of target notes, a simple melodic fragment using only quarter notes or longer could then be:

**e f g b / a - - - / g a d - / c - - -**

Another simple and very effective approach to soloing is to play *arpeggios*. An arpeggio is simply a chord whose notes are played sequentially instead of being played simultaneously. Take the same progression as above:

C - - - / Dm - - - / G7 - - - / C - - -

It should be obvious that all the notes of a C chord (in whatever order) will work on the first bar; similarly, all the notes of a Dm chord (in whatever order) will work on the second bar, etc. Referring to chord theory (see Basic Level material), you will be able to enrich the arpeggios with compatible chord extensions. You may even decide to play chord substitutes; for example, when the band plays that C chord, you might decide to play an Em7 chord (E G B D). The combination of a C chord and an Em7 chord would produce a Cmaj7(9) chord – very jazzy indeed! We will explore all this in more details in the next topic.

## Chord Progressions and Tonality

We are now going to discuss the "rules" that govern harmonic progressions, bearing in mind once again that in music theory most of the rules really come after the facts. Rules in music theory usually acknowledge best practices from their time, after the most successful musicians have established them (usually by breaking the existing rules!). *Making technically acceptable music consists in following the rules; making innovative music consists in creatively breaking the rules!* But as always, you have to learn how to walk before you can run.

Please make sure you've read the sections on Major and Minor scales before moving on. In particular, remember the basic scale harmonisations:

Major	I <sub>maj</sub> 7	ii7	iii7	IV <sub>maj</sub> 7	V7	vi7	vii7(b5)
Harmonic minor	imaj7	ii7(b5)	III <sub>maj</sub> 7(#5)	iv7	V7	VI <sub>maj</sub> 7	viidim
Melodic minor	imaj7	ii7	III <sub>maj</sub> 7(#5)	IV7	V7	vi(b5)	vii7(b5)

## Theory

Before looking at the chord progressions themselves, here are three fundamental facts about tensions and note movements that you should be aware of:

1. a note always has a tendency (however faint) to move and resolve into another note located a 5<sup>th</sup> below it, or a 4<sup>th</sup> above it
2. in a major scale, the 7<sup>th</sup> degree (called the "leading tone") has a very strong tendency to move a half-tone upwards towards the tonic
3. an augmented 4<sup>th</sup> interval (often called a *tritone*) such as F - B is extremely unstable (dissonant), and wants to resolve into a stable consonant interval, as follows: the lower end will move a half-tone down, while the upper end will move a half-tone up, stretching the augmented fourth into a perfect fifth; so for example the F - B interval will want to become an E - C interval

These facts account for a large part in the theory of chord progression, and tonal harmony in general.

## Diatonic Progressions

We will concentrate on the major scale here, but the discussion below also applies to the harmonic (and melodic) minor scales. Remember that the harmonic minor scale was invented to benefit from the same sort of strong conclusive movements that are possible in the major scale, owing to the presence of the leading tone (the 7<sup>th</sup> degree of the scale, only a half tone away from the octave).

In the harmonisation of the scale:

- taken together, the triads on the 1<sup>st</sup>, 4<sup>th</sup> and 5<sup>th</sup> degrees contain all the notes of the scale (you may want to verify this). For that reason they are sometimes called "generator chords". They are self-sufficient: the simplest melodies can be harmonised with these three chords only.
- the I chord is the strongest of the three; in the kingdom of tonality, the I chord rules. He very often opens the song, and almost always terminates it. He also shows up at regular intervals during the execution of the song, he himself or one of his delegates. All the chord sequences in the song tend to progress directly or indirectly towards the I chord. He represents the tone centre of the song.

The strongest supporter and herald of the I chord is the V chord. Whenever you hear the V chord, the I chord is usually on its way. Consider this:

- the root of the V chord calls for a resolution onto the tonic in a descending 5<sup>th</sup> movement or ascending 4<sup>th</sup> movement. For example: G -> C
- the V7 chord contains the so-called tritone, a very unstable interval of an augmented 4<sup>th</sup> (and the only interval of its kind in the major scale); in C Major, this is the interval (F - B). Because of its instability, the tritone needs urgent resolution: its lower end will move down by an H, while its upper end will move up an H towards the tonic. The strongest way to establish a tonality is to play the progression V7 -> I

However, the I chord is also a bit suicidal: its own root is attracted a 4<sup>th</sup> upwards, towards the IV chord... In any scale, you will always have this power game between the I chord (who currently reigns), and the IV chord (who wants to take control).

## Chord families

The entire tonality is divided into three political parties, supporting one of the generator chords.

1. The iii7 and vi7 have several notes in common with the I chord, and the I chord itself can come in several varieties (I, Imaj7, I6, etc.). These chords are collectively called "*tonic chords*"; by definition *they contain neither the 4th degree of the scale, nor the tritone*. Therefore, they are very stable chords.
2. The chord on the 4<sup>th</sup> degree, called the subdominant chord, has one main supporter: the ii chord. These chords and their variants ( IVmaj7, ii7, etc.) are called "*subdominant chords*"; by definition *they contain the 4<sup>th</sup> degree but not the tritone*. Because they contain the subdominant, they are somewhat less stable (tonality wise) than the tonic chords.
3. The chord on the 5<sup>th</sup> degree (dominant chord) has one single supporter: the vii(b5) chord. They form the "*dominant group*"; chords in this group *contain the sub-dominant as well as the tritone*. They are very unstable in the sense that they imply a resolution on the tonic chord.

All the other chords which are not build strictly out of thirds can always be associated with one of these three groups. For example, C6 (C - E - G - A) does not contain the 4<sup>th</sup> nor the tritone, and therefore belongs to the tonic group.

Similarly, Dsus2 (D - E - A) also belongs to the tonic group, for the same reason.

Harmonically, all the chords in a given group are equivalent. That means they can usually replace each other, and we can take advantage of that to:

- enhance a somewhat dull and boring chord progression, or
- simplify an harmonically complex progression, for example in order to give the lead more room and emphasis.

Here are two examples.

#### Example 1: Enrichment

Suppose we have the following chord progression:

G - - - / G - - - / C - - - / D7 - - - / G - - -

This is the (in)famous I - IV - V progression in G Major. But the progression dwells over the I chord for two bars, which is a bit dull. In order to make it more interesting, we could (for example) decide to replace the second bar with:

Bm7 - Em7 -

which are equivalent tonic chords in G Major (they all belong to the tonic group). So the progression becomes:

I - - - / iii7 - vi7 - / IV - - - / V7 - - - / I - - -

We could have chosen to highlight the subdominant chord (C) instead; in that case, we could have replaced the bar with the IV chord with

ii7 - IVmaj7 -

Or we might choose to do both, giving:

I - - - / iii7 - vi7 / ii7 - IVmaj7 / V7 - - - / I - - -

Of course, when you want to alter an existing harmonic progression, you need to do that in agreement with the other musicians! Simultaneously playing a chord and a substitute of that chord will usually not produce very good results!

#### Example 2: Simplification

Suppose we have the following chord progressions:

Imaj7 - iii9 - / iii7 - vi7 - / IVmaj7 - ii7 - / V7 - - - / Imaj7 - - -

Such a rich harmony will not leave much room for the lead guitarist to be creative; so for the duration of chorus we may decide to simplify the harmony into the harmonically equivalent sequence:

I - - - / I - - - / IV - - - / V7 - - - / I - - -

## The role of the bass

The actual effect of a substitution will depend primarily on the movement of the bass (which does *not* need to be the root of the chord, of course):

- if the bass moves by a 4<sup>th</sup>, a 5<sup>th</sup> or an octave, substitutions have a *very strong* effect
- if the bass moves by a 3<sup>rd</sup> or m3, the effect will be *moderate*
- if the bass moves by a 2<sup>nd</sup>, the effect will be *subtle*

You can control this impact by carefully selecting the voicing of your chords: the larger the movement in the bass, the more dramatic the effect.

Here's a progression that should be familiar to you:

ii - - - / V7 - - - / I - - -

For example:

Dm - - - / G7 - - - / C - - -

This progression (called "two five one") is pervasive in all musical genres, from classic to jazz.

Let's analyse its impact (assuming root position for all chords):

- the first chord change implies a strong movement of a 4<sup>th</sup> (from the 2<sup>nd</sup> to the 5<sup>th</sup> degree, that is from D to G in the example)
- the second change implies a movement of a 5<sup>th</sup> - the strongest possible movement (from G to C in the example)!

The overall effect of this progression is quite strong.

If you invert the V7 chord into a V7/5 (a V7 chord with its 5<sup>th</sup> in the bass, that is G7/D), the first movement disappears since the bass will stay on the D note, and the second movement is reduced to a second (from D to C). The effect is much less dramatic.

If the ii chord is voiced ii/5 (A in the bass) and the V7 chord is voiced V7/3 (B in the bass), the amplitude of the bass movement is limited to seconds (from A to B to C), and the progression becomes very soft.

## Non-diatonic progressions

In the previous discussion, we have seen that the V - I progression is an extremely strong and effective way to establish a tonality. Progressions that enforce and establish a tonality are called "cadences".

Using the basic principle of the V - I cadence, we can actually go a step further. Look at the following progression:

C - - - / E7 - - - / Am - - - / A7 - - - / Dm - - - / G7 - - - / C - - -

There is apparently something very wrong with it: it looks like a C major progression, but the E7 and A7 chords contain notes that don't belong to C Major (E contains a G# and A7 contains a C#)!!!

What happens here is that some chords are preceded by their respective V7 chords, even though they are *not* diatonic to the original tonality. So, the Am chord is preceded by its own V7 chord in the A harmonic minor tonality (that is to say E7), and the Dm chord is preceded by its own V7 chord in the D harmonic minor tonality (that is to say A7). From a harmonic analysis standpoint, this will be represented as follows:

I - - - | V7/vi - - - | vi - - - | V7/ii - - - | ii - - - | V7 - - - | I - - -

The main tonality is and remains C Major throughout, but we have introduced additional *local tone centres* in the harmonic progression. Everything happens as if Am and Dm temporarily became the new tone centres. Those foreign V7 chords are called "*extended dominant chords*".

Now, if V7 -> I is a great way to establish a tonality, ii -> V7 -> I is even better! So how about also introducing the ii chord of the local temporary tone centre, and not just the V7? For the case above, that gives us (for example):

C - - - / Bm7 - E7 - / Am - - - / A7 - - - / Dm - - - / G7 - - - / C - - -

Harmonically, we analyse this progression as follows:

I - - - | ii7/vi - V7/vi | vi - - - / V7/ii - - - / ii - - - / V7 - - - / I

### **Dominant Substitutions**

We know that vii7(b5) is a dominant chord (it belongs to the dominant group) and it can therefore be a substitute for V7. However, this is not a very frequent substitution, because that vii7(b5) chord really doesn't sound so good (although you may have a different opinion, of course).

But look at this:

C - - - / Dm - - - / Db7 - - - / C - - -

By the looks of it, Db7 replaces a G7: it is located at a place where you would expect a perfect cadence (i.e. V7 -> I), especially since it is preceded by the ii chord. But again, we seem to have a problem, in that Db certainly doesn't belong to C Major. And yet, this progression sounds great; the halftone bass movement in particular is very interesting and soft. Let's have a closer look at what happens here.

The Db7 chord is made of the notes (Db, F, Ab, B).

So this chord actually contains the (unstable) tritone in C Major (F – B), and as such calls for the urgent resolution we have already described. The Db and Ab notes being foreign to C Major will also be more than happy to resolve one half-tone down onto C and G respectively. So this chord actually creates the same effect as a V7 chord, and is therefore functionally equivalent to it.

**In general, it is always possible to replace a V7 chord with a major chord rooted a half-tone above the tonic of the current key.**

This is called a "*substitution dominant*". For example, in A major, you can replace E7 with Bb7, and the ii – V – I cadence then becomes Bm – Bb7 – A.

We have seen above that it is possible to associate the local ii chord to an extended dominant; we can apply a similar trick with substitution dominants; for example:

Cmaj7 - Dbm7 Gb7 / Fmaj7 - Bbm7 Eb7 / Dm7 - - - etc

We analyse this harmonic progression as follows:

- The extended dominant for Fmaj7 (first chord of the second bar) is C7; the substitution dominant is Gb7.
- Then Dbm7 is the ii7 in the tonality for which Gb7 is the dominant chord! Pfew!!

## Usage

As you can see, there are quite a few possibilities!

All these extensions and substitutions and bass movements can be used to spice up the harmonic structure of a song. How much spicing is a matter of taste. Although *you* are ultimately the only judge, I suggest using these harmonic devices with care in mainstream rock music, because they will quickly start to sound very jazzy.

At this point we also need to link back to the previous section (characteristic notes).

We have concentrated on the *chords* and their progressions here, but you can't really dissociate the chords (harmonic background) from the melody. Melody notes do cause chord extensions (e.g. an A note over a C chord will actually create an overall C6 chord; similarly, a G note over an A chord will result in an A7 chord). The progression can be affected by these extensions, and you need to consider the whole thing globally.

The target notes are always characteristic notes; since by definition they belong to the chords, they will always sound OK, at least technically. But you should also be careful to select the other notes *so as to avoid chord migrations*.

## Chord migration

We have seen that chords can be subdivided into three basic categories: tonic, subdominant and dominant. While chords of a given category can always be freely substituted for one another, they should *never* be replaced by chords of *another* category.

Suppose the harmony is in C major and currently rests on a Dm chord; this chord belongs to the subdominant group. If we happen to play a long B note over that chord, we effectively transform it into a Dm6 chord, which belongs to the dominant group, since the chord now contains the tritone (the interval F – B is now part of the chord). This implies a resolution that is not likely to happen (the next chord the band is going to play is probably *not* a C); the harmonic effect of this is disastrous.

Similarly, suppose the current chord of a C major progression is C. If we play a long F note over it, we make that chord a member of the subdominant group (since it now contains the subdominant) and the result will be far from pleasant, because the subdominant will clash with the 3<sup>rd</sup>. Please note that this is different from playing the 4<sup>th</sup> instead of the 3<sup>rd</sup>: in that case, you are playing a sus4 chord (whichever way you go after that).

If the current chord is Em (another tonic chord), the subdominant note (F) will introduce the tritone and the chord will now belong to the dominant group.

Let us now consider what happens when the current chord is the V7. Playing the tonic (C) over G7 will in effect resolve the chord and destroy the resolution effect that was planned by the band.

So, to avoid chord migration, consider the following:

- On tonic chords, avoid the subdominant (4<sup>th</sup>)
- On subdominant chords, avoid the leading tone (7<sup>th</sup>)
- On dominant chords, avoid the tonic (because playing a tonic will unduly anticipate the resolution: you will be playing ahead of the harmony)

Again, these rules apply mostly for downbeats and relatively long notes.

## Melodic Movements

While some melodies sound great others are just average (to say the least!). In this section we will try to analyse *why* this is the case, and what makes up a good melody. This is clearly useful to a lead guitarist who wants to play melodic solos; it is equally important to songwriters who want to write the next summer hit, and it is even important to bass players (we have already briefly touched upon this subject in the previous section).

The “theory” of melodic movements is very old. Originally it aimed at determining which intervals would be considered appropriate (and feasible) for the human voice to sing, and for the human ear to hear. Some parts of this theory may be considered outdated by today’s standards, or applicable in specific genres only (mostly classic). But before breaking the rules, it is useful to at least understand them.

This theory also constitutes the foundation for the study of harmonic movements or voice leading techniques (i.e. the melodic movements of several voices simultaneously).

As this is a fairly complex subject, we will limit our study to the most important aspects.

### Theory

When two (or more) distinct notes are sung or played sequentially, the melody is said to make *movements*.

There are two types of melodic movements:

- Step movement: the melody moves from one note to an adjacent note by a 2<sup>nd</sup>
- Leap movement: the distance between two consecutive notes is larger than a 2<sup>nd</sup>.

In general, step movements are preferred over leap movements; when the melody contains leaps, some intervals will be favoured, other intervals will be tolerated, and a few intervals will in principle be forbidden.

### Recommended Movements

All the movements implying intervals that are easy to sing are favoured; those intervals can be minor, major or perfect, but will typically be small or moderate (from the minor 2<sup>nd</sup> to the minor 6<sup>th</sup>). As an exception the octave is also accepted; despite being clearly very large, it is very easy to sing.

### Forbidden Movements

All movements implying large intervals (from major 6<sup>th</sup> upwards) or dissonant intervals (augmented 2<sup>nd</sup>, augmented 4<sup>th</sup>, major and minor 7<sup>th</sup>) must be avoided.

Large intervals such as a 7<sup>th</sup> or a 9<sup>th</sup> should be broken down in two (or more) smaller intervals; if only one intermediate note is used, it is recommended that one of the two resulting intervals be a 2<sup>nd</sup>. For example, in C major, the ascending interval (C – B) should be broken down into (C – A –

B) (or possibly (C – D – B) although the first solution would probably be preferred by most listeners).

## Tolerated Movements

Chromatic movements (i.e. movements consisting of half tones) are accepted.

The diminished 5<sup>th</sup> interval is in principle forbidden (see above) but it is tolerated if it resolves by a step movement onto a note belonging to that interval.

- For example, suppose the movement goes from B to F (aug 5<sup>th</sup>) in C major; as such, this movement is not acceptable. To make it tolerable, you need to “resolve” the dissonance onto an E (i.e. from the F you need to proceed to a note belonging to the interval F – B and located a step away).
- Similarly, let us consider the (descending) movement F – B; this time you need to resolve the dim 5<sup>th</sup> on a C (a note located a step away from B and that is part of the interval).

The same tolerance and the same rule apply to the dim 4<sup>th</sup> (which you won’t find in the major scale but can occur in the harmonic and melodic minor modes), and also to the minor 7<sup>th</sup> (which is found in the harmonic minor mode); for example, in D harmonic minor (relative of F major), the movement C# - F needs to be resolved onto an E.

As indicated above, the major 6<sup>th</sup> is in principle to be avoided (too large); however, when the movement is from the first degree of the tonality to the sixth degree then the interval is accepted (and only then).

Double leaps implying larger intervals than the major 3<sup>rd</sup> should be avoided, except when the last note is an octave away from the first note.

- For example, in E major, (B – E – B) would be accepted, whereas (B – E – A) would not.

The leading tone (7<sup>th</sup> degree) should always be followed by the tonic, except when the next chord does not contain the tonic note, or if the leading tone does not belong to a V chord.

- For example, in C major, if B is part of a G chord, its normal resolution would be a C note. However, if B is part of an Em chord, or if the next chord is not a C chord, that B note is free to go anywhere it wants.

## Usage

It is extremely instructive to analyze existing melodies, and I suggest you do that for as many melodies as you can; you will find that most of them actually stick to the rules quite well.

For example, take a look at Satriani’s “Always with me, always with you”, or at all the songs composed by the Beatles. You will find very few exceptions to the “rules” described above.

## Diminished and Augmented Chords

When we harmonised the major scale we met a strange chord: the chord built on the 7<sup>th</sup> degree. It is a minor chord with a diminished 5<sup>th</sup>, and we have seen that it belongs to the dominant group. This chord is sometimes called *semi-diminished*. But here we will talk about his even stranger brother, the *diminished* chord, and his cousin the *augmented* chord.

WARNING 1: if you're a mainstream rocker, don't even think of reading this!!! This is classical and jazz harmony stuff.

WARNING 2: the explanations below can cause severe headaches. Please grab some tablets, just in case...

### How to build them

Easy: simply stack up minor thirds. The general chord formula for a dim chord is:  
(R, b3, b5, bb7)

Note the notation (bb7) meaning yet a half-tone lower than a minor 7<sup>th</sup>; the resulting interval with respect to the root is a diminished 7<sup>th</sup>. In practice, the note Bbb is of course equal to A.

And there is more good news: there are really only three different dim chords, because all the other ones are inversions of those three!

#### First Group:

Cdim7 = (C, Eb, Gb, Bbb = A)

Ebdim7 = (Eb, Gb, A, C)

Gbdim7 = (Gb, A, C, Eb)

Adim = (A, C, Eb, Gb)

#### Second Group:

Dbdim7 = (Db, E, G, Bb)

This one gives birth to Edim7, Gdim7 and Bbdim7, as you can easily verify.

#### Third group:

Ddim7 = (D, F, Ab, B)

giving birth to Fdim7, Abdim7 and Bdim7.

Those dim chords are chromatic to the major scale, but diatonic to the harmonic minor scale. For example, G#dim7 = (G#, B, D, F) doesn't belong to C major, but is the vii in the A harmonic minor scale (which is a relative minor scale of C major, as you will remember).

But with these chromatic chords, we can create a whole lot of new *functions* in the major scale, and they will be written:

Idim7 #Idim7 iidim7 #iidim7 iiidim7 IVdim7 #IVdim7

Or

biidim7 biiidim7 bVdim7 ...

So what's the difference between a #iidim7 and a biiidim7?

- A dim chord is written #Idim7, #iidim7, #iiidim7, etc. when it is part of an ascending cadence
- It is written biiidim7, biidim7, etc. when it's part of a descending cadence.

If this isn't 100% clear yet, read on, it will become clear in a moment - I hope!

Now for the difficult part...

## How to use them

### As approaching chords

Any chord can always be approached from above or from below by a dim chord located a half-tone away from it. Example:

- C - - - / F - - F#dim7/ G - - -
- C - - Gbdim7/ F - - -

### As passing chords

Dim chords let you chromatically link two diatonic chords. The resulting bass movement of a half-tone is smoother and harmonically richer than the whole tone movement between the bass notes of the diatonic chords (assuming root position, of course).

For example:

- Dm7 - D#dim7 - Em7
- Em7 Ebdim7 Dm7

Similarly, we could have:

IVmaj7 #IVdim7 V7 or V7 bVdim7 IVmaj7

and so on and so forth.

But of course, chords don't have to be in root position: they can be inverted. That opens up a can full of worms!

For example:

- Dm7 D#dim7 C6/E where the dim chord resolves on the I/3.

- Fmaj7 F#dim7 C6/G where the dim chord resolves on the I/5
- Or even Em7 Ebdim7 G7/D where the dim chord resolves on a V7 chord.

### As dominant chords

This is a very frequent usage in jazz. To understand why that works, you have to realise that in a dim chord, there are always two tritones.

For example, in Ddim7 = (D, F, Ab, B), the first tritone is (D - Ab) and the second is (F - B).

This makes the dim chord very unstable, and capable of resolving in two different ways (can you predict these possible resolutions?).

Now, please fasten your seatbelts...

Take the following chord: A7(b9) = (A, C#, E, G, Bb)

Remove the root from this chord; you obtain

(C#, E, G, Bb)

which is C#dim7 (= Edim7 = Gdim7 = Bbdim7).

But as a dominant 7th chord, A7(b9) resolves on a D or Dm chord (the fact that it is extended by a b9 doesn't change its fundamental nature of dominant chord).

So, if we had the progression:

Cmaj7 - - - / Dm7 - - - / Em7

we could enhance it as follows:

Cmaj - - C#dim7 / Dm7 - - D#dim7 / Em7

Where:

- C#dim7 is a subs for A7(b9), itself an extended dominant resolving in Dm7
- D#dim7 is a subs for B7(b9), itself an extended dominant resolving in Em7

**In general, in order to find all the equivalent V7 chords for a given dim chord, you take the dim chord located one halftone below it. Each note of that new chord becomes the root of a V7(b9) chord.**

Example: Find all equivalent V7 chords for C#dim7.

The dim chord 1/2 step below is Cdim7 = (C, Eb, Gb, A), and the resulting V7 chords are C7(b9), Eb7(b9), Gb7(b9) and A7(b9).

Hence:

- C#dim7/C is equivalent to C7(b9)
- C#dim7/Eb is equivalent to Eb7(b9)
- C#dim7/Gb is equivalent to Gb7(b9)
- C#dim7/A is equivalent to A7(b9)

You're still there??... Great. Then on to aug chords. They are a lot simpler.

### **Augmented chords**

An aug(mented) chord is simply a chord in which the 5th is raised a half-tone. For example, C<sub>aug</sub> (or C<sub>+</sub>) is (C, E, G<sup>#</sup>).

In other words, their formula is (R + 3 + 3); there is a constant interval between all the constituent notes. Consequently, they allow the same sort of permutations as the dim chords: C<sub>+</sub> = E<sub>+</sub> = G<sup>#</sup><sub>+</sub>

Aug chords are used primarily as passing chords in a V - I cadence, as follows:

V7 - V7<sub>+</sub> - I

For example:

G7 - G7<sub>+</sub> - C

Let's analyse this progression:

G7 = (G, B, D, F)

G7<sub>+</sub> = (G, B, D<sup>#</sup>, F)

C = (C, E, G)

This makes the progression smoother as D moves to D<sup>#</sup> before resolving into E.

Augmented chords can also be used in other progressions, such as:

I - I<sub>+</sub> - IV

or in minor tonalities:

i - iii<sub>+</sub> - iii

Pardon me? You've run out of headache tablets? No problem, we're done!

## Pentatonic and Blues Scales

In this section we will talk about the pentatonic scales (and the so-called blues scales, which are derivatives of the pentatonic scales). These scales are at the heart of the blues and rock music. In the early days they were in fact used almost exclusively by the lead guitarists, and even today many top guitarists continue to build great solos with the pentatonic scales only.

### Theory

There are several pentatonic scales. In fact, there is an infinity of them! But we will stick to the most important ones.

#### Pentatonic Major Scales

Let's start (again) with the major scale:

T      2      3      4      5      6      7      8

If we drop the 4<sup>th</sup> and 7<sup>th</sup> degree from this scale, we are left with a new five notes scale, as follows:

T      2      3      5      6

This scale is called the *pentatonic major scale* (it is a "major" scale since its first 3<sup>rd</sup> is a major third). For example, the C pentatonic major scale is:

C      D      E      G      A

But, you may ask, why did we drop those two degrees specifically, and not say E and G? The answer to this question is not trivial. The most important reason is to be found in the very strong tonal function of the fourth and seventh degrees of a scale. Remember our discussion on chord progressions: in C major, the 4<sup>th</sup> and 7<sup>th</sup> degrees are F and B, which form the tritone F - B; this interval calls for a resolution to the I chord, and immediately drives the chord progression home. Whenever you hear F and B together, you want to hear a C chord immediately thereafter. However, many forms of ethnic music elsewhere in the world aren't tonal at all: they are *modal*. The pentatonic scale is the scale of choice for those musical genres: getting rid of the two most important tonal pivots in the scale helps a lot when you *don't* want to sound tonal (more on modes and modal music later).

#### Pentatonic Minor Scale

Let's now start from the relative natural minor scale, for example A minor (relative of C major):

A      B      C      D      E      F      G      (A)

From this scale, we drop the second and sixth degrees (i.e. the same 4<sup>th</sup> and 7<sup>th</sup> degrees we dropped from the parent major scale), leaving us with:

A C D E G

Interval-wise (with respect to the tonic) we now have:

T b3 4 5 b7

This is the *pentatonic minor scale* (it is minor because the first third is a m3).

For example, the E pentatonic minor scale is:

E G A B D (E)

The A pentatonic minor scale and the C pentatonic major scale are relative to each other, exactly as their heptatonic counterparts. Since they contain the same notes, they are *completely interchangeable*.

## Blues Scales

If we take the pentatonic minor scale, and add a flatted fifth (b5) as a passing note between the 4<sup>th</sup> and the 5<sup>th</sup>, we obtain the following scale:

T b3 4 (b5) 5 b7

This b5 note is called the "*blue note*" and is responsible for the unique bluesy sound of the scale. The pentatonic minor scale with an additional b5 is therefore often called the "*blues scale*". Please remember: the blue note is very dissonant and you always use it as a passing note: never dwell on it!

In fact, the name "blues scale" is not very appropriate. Let's compare a pentatonic minor scale (with blue note) and the pentatonic major scale with the same tonic; for example in G:

Pentatonic minor:	G	Bb	C	(Db)	D	F
Pentatonic major:	G	A	B		D	E

Merging these scales gives the following hybrid scale:

G A Bb B C (Db) D E F

Interval-wise:

T 2 b3 3 4 (b5) 5 6 b7

This hybrid scale is the "real" blues scale, **which is neither minor nor major**, since it contains a minor third *and* a major third! In reality, this is only a western simplification: in the genuine "blues scale" (as originally "imported" from Africa) the "third" is a note somewhere *between* the minor 3<sup>rd</sup> and the major 3<sup>rd</sup>! This note doesn't exist in our scale system, but if we arbitrarily decide to call it "3\*", we can write the "real" blues scale as follows:

T      2      3\*      4      (b5)      5      6      b7

This ambiguous third interval can be simulated by playing the b3 and the 3 often in the same solo, one quickly after the other. But on a guitar, we can also actually play this undetermined third interval by bending up the b3 a little (e.g. 1/4 of a tone)!

The minor/major ambiguity is also reflected by the characteristic harmonic structure of a typical twelve bar blues. In G, you would have the following chord progression:

G7 - - - /  
 C7 - - - / C7 - - - / G7 - - - / G7 - - - /  
 D7 - - - / C7 - - - / G7 - - - / D7 - - - /

This is puzzling, because in terms of classical harmony we seem to have three different tonalities! The chords G7, C7 and D7 indicate the tonalities of C, F and G respectively, since these are the only tonalities having those dominant 7th chords.

In fact, in blues the progression (G7 C7 D7) remains fundamentally a I7 IV7 V7 progression in the tonality of G. What happens is:

- the G7 chord (G B D F) reminds us to the fact that the blues scale contains a b7 degree (F)
- the C7 chord (C E G Bb) reminds us to the fact that the blues scale "also contains" a b3 degree (Bb)
- the D7 chord (D F# A C) is the real dominant 7th of the tonality, and allows us to "turn around" into G

The fact that the I7 and IV7 chords don't resolve into a I chord is another peculiarity of the blues!

### **Dominant 7<sup>th</sup> Pentatonic Scales**

A final pentatonic scale that turns out to be useful in practice is the dominant 7th pentatonic scale.

This scale is defined as follows:

T      2      3      5      b7

In fact, it is nothing but the pentatonic major scale where the 6 is replaced by a b7.

For example:

G      A      B      D      F

## Usage

By definition, pentatonic scales only contain five notes. When you run up or down a pentatonic scale, you will therefore play intervals larger than the whole tone.

Take the G pentatonic major scale:

G      A      B      D      E

The interval between the 3<sup>rd</sup> and 4<sup>th</sup> degree of the scale is a third, not a second. This “gap” helps breaking the monotone linearity of the scale, and is one of the big advantages of this type of scales.

Another advantage of the pentatonic scale is the fact that its fingering is typically easier and more compact than the corresponding major scale. This not only makes it easier to play, but also allows a more energetic play, very welcome in rock music!

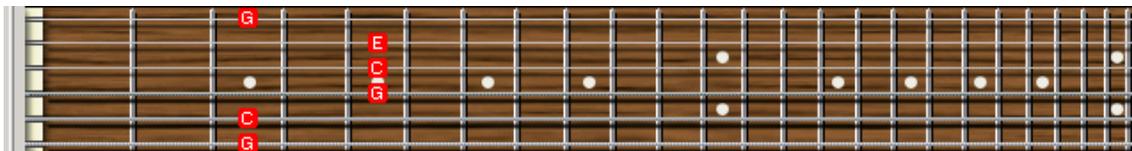
## The CAGED system

There are many interesting theoretical patterns and symmetries on a guitar fret board, and they can help us visually keep track of where we are and where we need to go. One of those patterns is called the CAGED system.

Here is a fret board with a C chord in its most fundamental position:

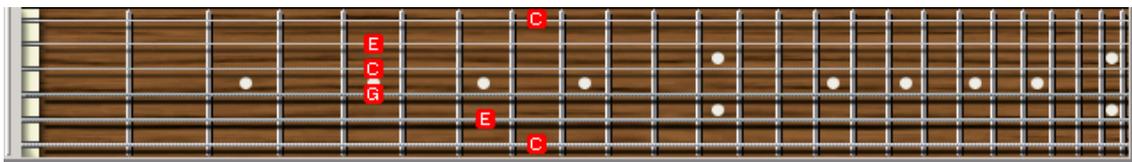


That same C chord can also be played as a barre chord at the 3<sup>rd</sup> fret, as follows:



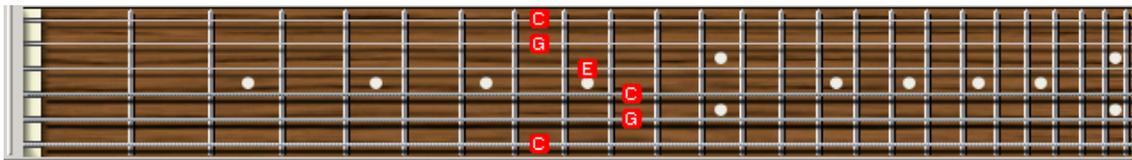
As you certainly recognize, this is actually the shape of an open A chord played three frets higher.

The next possibility is to play the C chord as follows:



This is a G shape barred at the 5<sup>th</sup> fret.

Next, we'll have an E shape barred at the 8<sup>th</sup> fret, as follows:



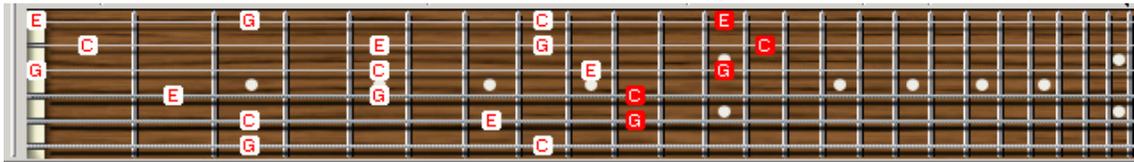
The final shape will be a D chord played at the 12<sup>th</sup> fret and barred at the 10<sup>th</sup> fret

The sequence C - A - G - E - D is what gives its name to the system.

In fact, this sequence and its regular permutations are absolutely general: if you start with a major chord in G shape somewhere up the neck, the next shape will be an E shape three frets higher and the previous shape is an A shape two frets lower.

The CAGED system is useful from an improvisation perspective for several reasons.

First, it tells where you are on the fret board and it gives you anchors. Here are all the 5 fundamental positions of the C chord; please note the position of the root (C) in each of them:



Next, knowing the location of the root in each shape, you can easily locate the most important notes from an improvisation perspective, i.e. the 3<sup>rd</sup>, the 5<sup>th</sup> and the 7<sup>th</sup> (characteristic notes). This boils down to knowing the position of those notes in the basic chord shapes C, A, G, E and D.

Finally, the CAGED system allows you organize your solo around chord shapes, so you can very easily play arpeggios and also extend the harmony. Suppose for example that we are improvising in C major, around the E shape at the 8<sup>th</sup> fret. Knowing the shape (i.e. the root, 3<sup>rd</sup> and 5<sup>th</sup>) not only allows us to securely locate the characteristic notes, but also to very quickly and visually spot all the other extensions. For example, if you want to play a C7 chord, you can easily spot the required note by comparison with an E7 basic form.

The CAGED system as such only works for major chords, but there is nothing to stop you from turning the major 3<sup>rd</sup> into a minor 3<sup>rd</sup> and voilà! You have a CAGED system for minor chords as well.

The CAGED system also makes it visually clear that you can very easily connect the shapes to obtain complete freedom across the neck. There are two basic connecting moves:

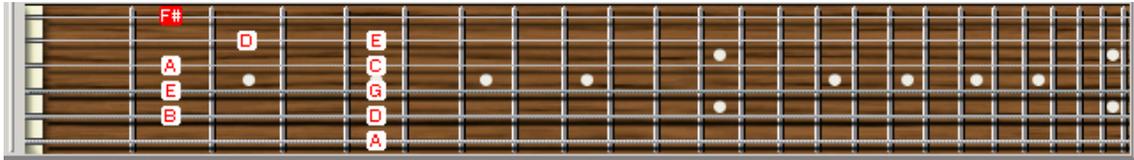
- Connecting shapes on the same string
- Connecting shapes across strings

In order to connect shapes on the same string, you only have to remember that:

- A displacement of one fret up or down corresponds to a half-step
- A displacement of two frets up or down corresponds to a whole step

Of course, the same half-step and whole step movement can also be performed between strings, as such:

Whole step movement:



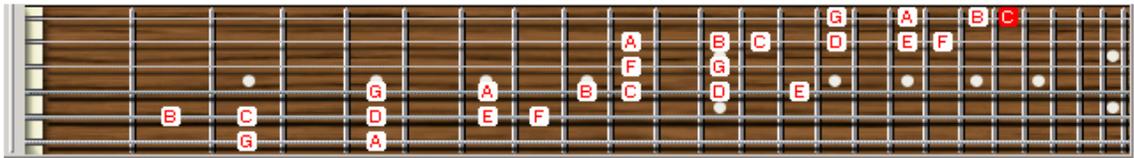
Half step movement:



The diagrams above show the note located a whole tone or half tone higher than the corresponding note on the previous string, fifth fret; this is of course general and true anywhere on the neck.

The half-step movement across the strings is clearly not very easy to play, but remember that in most cases you don't have to actually play that. Those shapes are only there for you to visualize, so you never lose track of where you are.

Using the shapes of the C major chord as visual references and applying the fundamental moves as explained above, we can "wipe" the fret board in an infinite number of ways. For example:



You may find that the chord shapes are not very apparent anymore in this continuous scale diagram. This is true, and is a perfect illustration of the duality between chords and scales!