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# THE GRAND UNIFIED THEORY OF FRETBOARD ORGANIZATION

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How to emerge from a small, dark place, and not getting lost in the wide, bright countryside.



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Bonaire

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## Foreword

When I decided to start playing guitar seriously (and in my mind this actually happened not all that long ago...), I knew I needed to take proper lessons from a real teacher for the first time...

Coming from that first lesson, I was a little dazed and confused by all the new information I had received, and felt very much like somebody who has spent his whole life in a small, dark place, and is now thrown into wide-open lands in which he must find his way.

On my way through this occasionally rough terrain I stepped in some puddles and have taken many wrong turns, some avoidable, some not; the avoidable ones cost me and my teachers much time and energy, and the inevitable have taught me a lot...

I wrote this book for those of you who are looking for a guide to the mysterious landscape that is the fretboard of the guitar, capable of showing a path through the thicket of scales and arpeggios.

However, just as a wilderness scout must make sure that his charges are already capable of walking and looking out for themselves, I would like to point out some conditions that are necessary for you to study this book:

1. Knowledge of the **pentatonic scale** in the "two finger per string"-mode in all 5 positions,
2. Names and locations of **notes on the E- and A- strings**,
3. Elementary technical skills like **clean alternate picking** and simple hammer-on and pull-off techniques, and
4. Basic understanding of the **Ionian System** with its associated chords and scales, please also refer to Appendix B.

This means that this book is not a textbook for total beginners, but rather turns to you as a slightly advanced guitarist who wants to open up his instrument to new sounds and improvisational possibilities.

Surely not by applying the "95th Japanese Hexatonic Scale", mind you, but by consistent orientation work on the fingerboard!

I want you to see this book as a kind of workshop, supposed to run next to your other regular practice (transcriptions, tunes, various techniques). It is also important that you work the book from front to back, because the individual sections build upon each other.

This leads us to what you will **not** find in this book:

Chord voicing tables, Monster Licks, Funk Guitar patterns, Rhythmic exercises, Tablature, Killer Chops, Jazz-Runs...

I hope that you are not putting it away now, because on the next page the fun begins!

## Chapter 1 - A System Introduces Itself

Every musician has likely wished at least once to play to a recording or a session simply by ear without knowing at first what key the piece is in, right?

Even if the tune is in one key "only", often this is not easy, and if you have finally found something that sounds good, then it turns out to be the same old pentatonics or you were limited to a single position, neglecting much of the available fretboard...

Therefore:

Imagine a guitar with an infinitely wide and long fretboard tuned only in perfect fourths!

Then you get something similar to the structure on the right:



The pattern you are seeing represents the positions of the fingers playing a major scale, repeated in a certain way all over this hypothetical instrument!

Interesting are the following points:

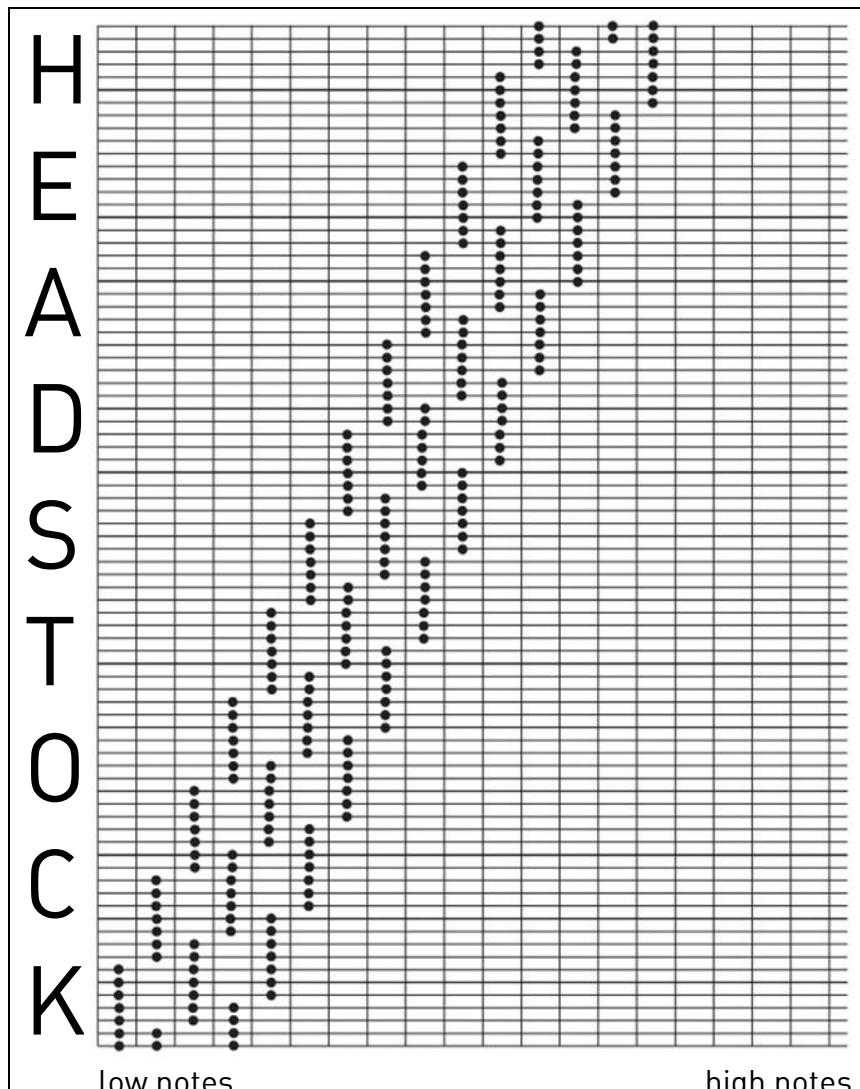


Figure 1

1. You always play three fingers (notes) on each string,
2. Patterns migrate gradually up the "neck", by a semitone every seven strings, and
3. Within this cycle of seven strings, an internal structure exists that repeats itself as well.

For illumination of these facts, please consider the graph below:

As you can see, the aforementioned internal structure consists of three different patterns, namely:

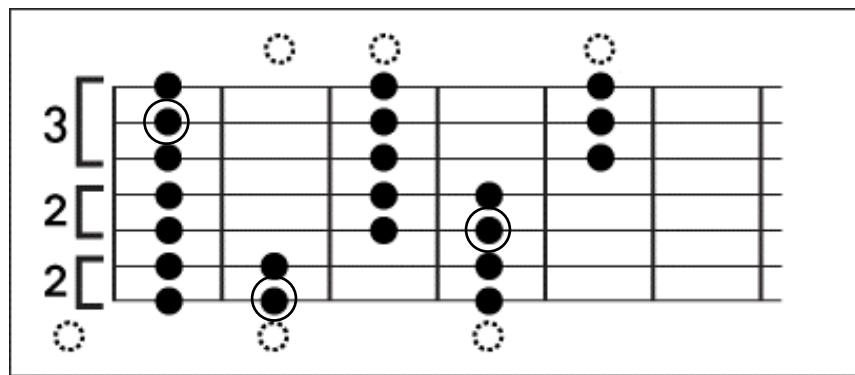


Figure 2

**Type 1**, in which the outer notes are three frets away from each other, and the middle note is closer to the bottom,



Figure 3

**Type 2** where the middle note is located one fret higher (closer to the upper note),



Figure 4

And finally **Type 3**, in which the three fingers are each located two frets apart.



Figure 5

The number of respective types you can take from Figure 2.

The sequence is always the same; it is always 2:2:3, no matter at which of the three patterns you start.

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*You can rely on the fact that there are always **two** patterns of Type 1, followed by **two** patterns of Type 2 and by **three** patterns of Type 3 in any position and on any pair of strings!*

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So, was that complicated?

If so, then check out the graph again, and note the positions of the different types of patterns, there are **really just three types** for all major scales in any key and in any position!

If not, then look again at Figure 2, because that gives us the position of the root notes of the major scale. Thus, each of the three types of patterns contains a root, and you can begin to play the scale either with the **index finger** (Type 3), with the **middle finger** (Type 1), or with the **pinky** (Type 2).

Oh yeah...

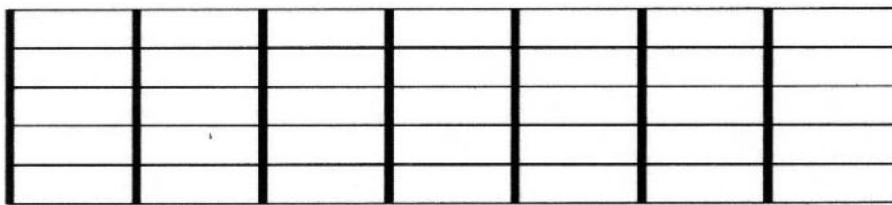
Of course, I forgot to mention that we still do not have a guitar yet to play scales or anything on it, but only a very strange instrument with seven strings, which still happens to be tuned in perfect fourths!

This means you have to be clear about the fundamental differences between this hypothetical instrument and the actual guitar:

- First, **a real guitar has six strings**, so you will never play all seven patterns in a position; there will always be one missing.
- Additionally, the guitar is tuned such, that between the G- and B-strings there is a different interval other than a perfect fourth (five semitones), namely a **major third** (four semitones).
- This will **move all the patterns from the B-string up one semitone**. However, this makes the whole thing only a *little* more difficult, since the sequence still applies.

For practice, you should write the fingering from the image above into the chart again but this time transferred to a guitar, starting with two Type 1 patterns on the low E-string!

Exercise 1



So now, you can play your first major scale improvisation, just grab your favorite tune or simply turn on the radio!

However, in order to practice these things, it is best for you to take a very simple piece of music, such as a children's song, a simple pop song or something similar.

It is important that the piece does not change key, and does not have too many non-diatonic chords in it, because our major scale does not fit those too well.

You can omit the following procedure and use a piece for which you **know the key**, or you can just take just one chord, and then play on this chord basically under "laboratory conditions"...

If you choose a piece of which you do **not know the key**, then you have to figure out the root of the tune which is not so easy sometimes, especially if the arrangement is a little trickier.

A good method is to simply play the scale up and down in order to find the best (i.e.: most harmonious) sounding note.

You will usually land on the **root** or on the **fifth**!

In order to tell both apart, I recommend the following:

- Play your original note, and then play another one that is a **fifth lower** than the one you found,
- If this new note sounds just as good as or even better than the original note, **take this new one**, because you were at the Fifth to start with!
- On the other hand, if the new one sounds **worse** than the first note, **stick with your initial choice**.
- Remember the name of the note, and try to locate it on the **low E-string**.

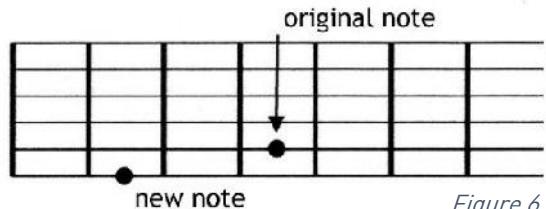


Figure 6

So now put your middle finger on the found root as shown in Exercise 1, and play the notes up the scale one after the other.

Always use one finger per fret, in the upper block, i.e. in the stretched-out pattern, you can choose whether you are playing the middle note with the middle finger or ring finger. Just do it the way it is most convenient for you!

Check if it sounds right and always keep the succession of patterns in your head (Do you know it by heart already?).

Especially the transition to the B-string demands attention, since there everything moves up one fret!

Then play the scale **up and down** a few times, because you really have to master these types of patterns in your sleep!

If you like, you can try to improvise a bit by inventing little melodies, but it is important that you do not leave the pattern at any time, for example by trying to reach a higher note on the same string by sliding.

Better to use the next highest string, since we do not want to jump ahead to a subsequent chapter!



## Chapter 2 - New shores...

Before we will start thinking again along the lines of the last chapter, in this chapter I would like to give you some additional information about the position of notes on the fretboard.

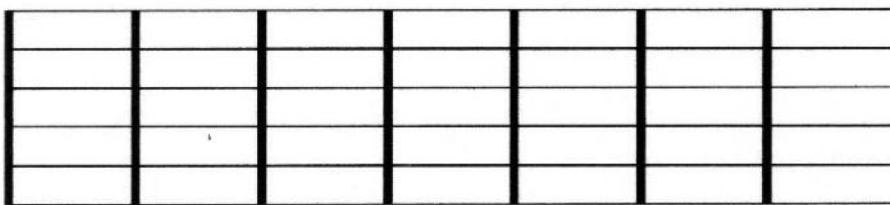
If you have read the preface, you surely noticed that I assume you **know the names of the notes on the A- and E-strings** well.

In order to expand the exercise from the last chapter, remember the name of the root **note you used last time, and try to find it on the A-string**. You should be able to locate it quickly, usually you will find it higher up on the neck.

And here is the trick: just play the same sequence of patterns and just start on the **A-string!**

Since you are not starting on the E-string anymore, you need to **add one pattern** below your lowest root note on the **E-string** according to Figure 2. I suggest you draw the new scale into this diagram just to visualize it better, just start by putting two Type 1 patterns on the A-string!

Exercise 2



See if with this new scale (which is really the same as the last one...!) you can come up with new melodies or maybe it sounds different from the earlier one. You will discover that this is actually the case!

Now you have found two root notes!

Considering the amount of notes available on the guitar, it is very unlikely that these are the only ones available... This simply means there are others you do not know yet!

Here is how you can find the **octaves** (the name of the interval for notes of the same name and timbre) for the notes on the E- and A-string, just check Figure 7 to the right!

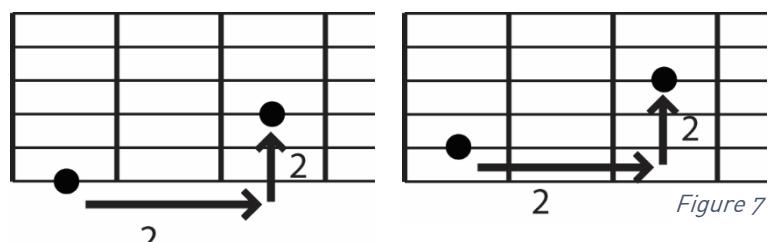


Figure 7

The rule of thumb is:

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*Two strings and two frets higher!*

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Unfortunately, the rule does not apply anymore going beyond the A-string, because there the "**diabolical third**" between the G- and the B-string messes things up again.

This means: From the D-string upward, be mindful finding octaves, you always have to add one fret!

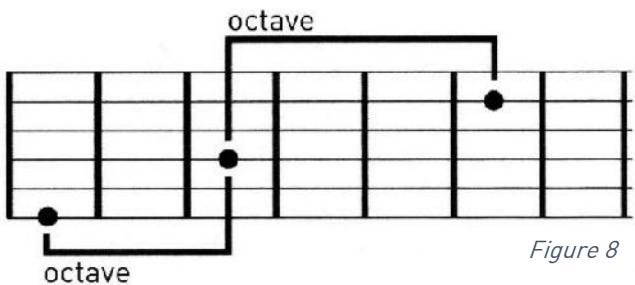


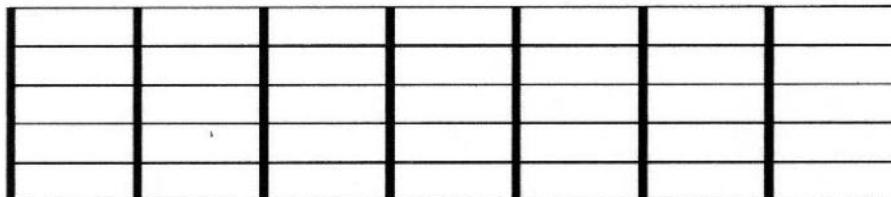
Figure 8

Now things get exciting: Take another tune, of the same sort of that I recommended before, find the root note on the E- or A-string and improvise a little to get into the tune. Then go up one octave (**Using the two plus two rule!**) and place the middle finger there.

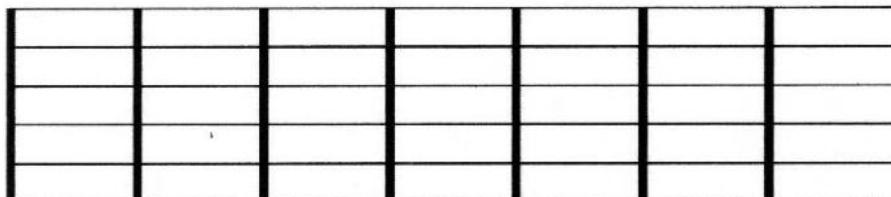
If you are now playing the exact same sequence of patterns as before, just two strings and two frets up, you will find it sounds good... You have just discovered a new area on the guitar!

Again, I would recommend writing these scales starting from the octaves of the notes on the E- and A-strings into the diagrams below. They are easier to remember if you can check the paper from time to time. Furthermore, I would like to ask you to mark the root notes for major, just like in Figure 2.

*Exercise 3*



*Exercise 4*



One of the basics of making music is to **master the instrument technically**, because only with proper technique you can play what you want, without being limited by your fingers.

In order to **develop a good technique**, a lot of practice is required and that is why I would like to recommend the following exercises.

All these technical exercises are meant to be played with **alternate picking**, since this is the foundation for all further techniques, of which I will be talking later.

Please practice these in **both variations**, starting with up-stroke and then with down-stroke.

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*Extremely important in this context is keeping a steady tempo!*

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You will achieve this easiest by using a **metronome**. Adjust the metronome such that you can play one of the groups in the exercises on one of the beats (in 16<sup>th</sup> notes); the meaning is to play flawlessly slow ...

The numbers in these exercises do **not mean fingerings but note numbers** so "1" is the first note of the scale or arpeggio and "2" would be the second and so on and so forth...

*Exercise 5*

**1234-2345-3456-...**

Please play this exercise in groups of four consecutive notes and timed like 16<sup>th</sup> notes.

*Exercise 6*

**1324-3546-5768-...**

This exercise is stacked in thirds, please play slowly in both alternating stroke variations.

You will probably need a moment to play the exercises fluently and by heart, so please check from time to time that you are still following the correct patterns.

If you are then reasonably sure you do, you can ratchet up the tempo slightly but not further than you can play it flawlessly!

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*Please apply a healthy dose of self-criticism!*

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## Chapter 3 - Free climbing

Well, until now it was all quite simple, right?

That is precisely why we are going to move into a new area, the **vertical approach!** However, what does that actually mean?

When constructing melodies (composition, improvisation...) there are two directions you can go, **linear** and "**distributed**".

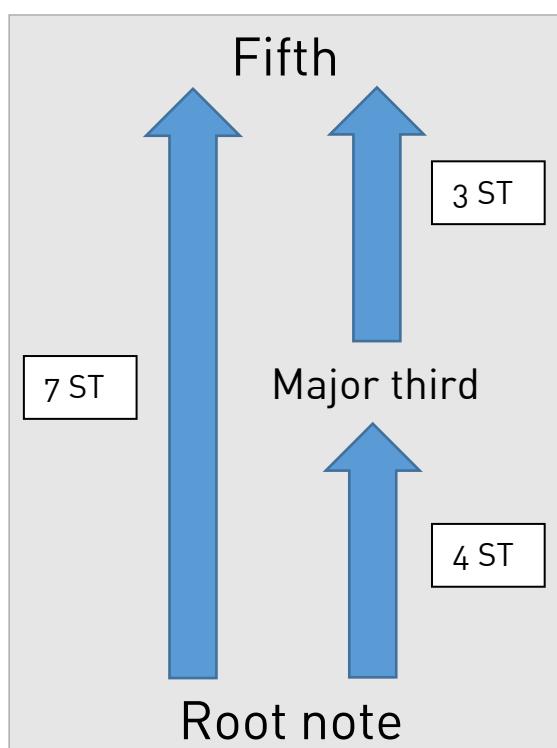
**Linear** I call melodies that contain many small intervals and that are mainly based on a scale, such as "Twinkle, Twinkle Little Star"!

"Distributed" (or: **vertical**) however, are all melodies such as e.g. the American National Anthem, "The Star-Spangled Banner", that contain mostly broken **triads** or seventh chords, the so called **arpeggios**.

I would like to introduce some of these structures to you in this following section.

The structure of a **triad** is always the same, but we distinguish between two different characteristics, and these different tonalities we traditionally call "**minor**" and "**major**".

First, here is how to build a **major triad**, the minor tonality will follow later:



**chord!**

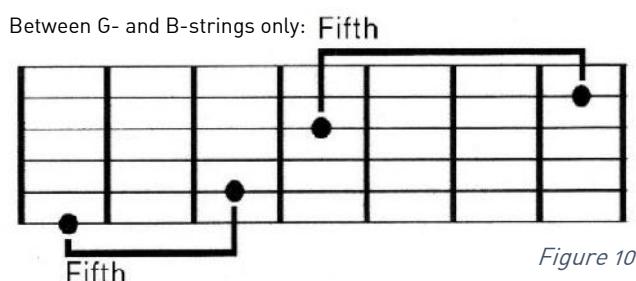
Additionally, it is good to know that the fifth contains seven semitones, as you can take from Figure 9.

The abbreviation "ST" means "**semitones**", it indicates how many of the **smallest units** (because that is what semitones are!) or frets separate either notes, or in other words, how large the **interval between them** is.

As you can see, the respective upper and lower border notes are identical, in both cases these are the **root note** and the **fifth**!

In order to find a fifth interval on the guitar, it is best to follow a procedure similar to finding octaves. Therefore, you choose a root note, but instead of finding an octave, two strings and two frets up, you **only go up one string** as shown in Figure 10.

The "chord" shown in Figure 10 you have likely seen or played before, since it is one of the most widely used chords in rock music, a **power**



Now which is the note that gives this triad its **major character**? Clearly the middle note, the so-called **third**!

In **major**, in the middle there is a major third stacked onto the root, followed by a minor third.

The number of semitones in these intervals you can look up in Figure 9, but it's **four semitones** for the major and **three semitones** for the minor third.

First, you are facing the question how to actually play these intervals on the guitar!

Additionally difficult is the fact that these intervals are small enough to play them next to each other on a single string as well...

Just check Figure 11 on the right:

You can clearly see that there are three and four frets between the notes respectively, at least on the right side. The left side of the diagrams is a little bit trickier, but once you try it yourself, you will see how it works.

Unfortunately, the root notes on the G-string have their thirds on the B-string, and here the diabolical third tries to mess us up again!

Since those look a little different from the ones in the diagrams to the right, you should write those fingerings into Figure 11 as well.

#### *Exercise 7*

Now, how can you practice thirds? Since you should be familiar with the various triads on the scale degrees of the Ionic scale, you could play a G major scale **up on the low E-string**, for example. Then, the second time around, add the thirds in **both variants** as shown in figures 12 and 13.

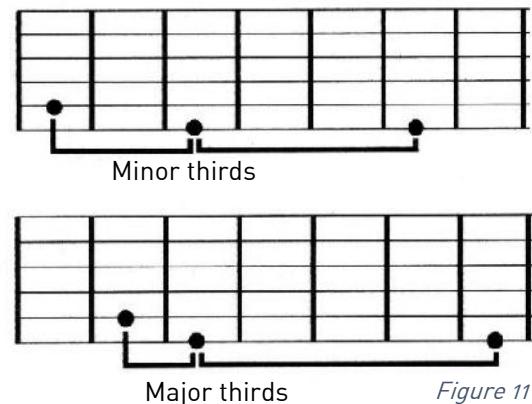


Figure 11

Of course you can play this exercise with a loop, play-along or tune; you will develop new ideas very quickly!

If you start asking yourself where the triads are, you are completely right, because here they are!

For the sake of simplicity, for now we will limit the scope to **major tonality only!**

We are just **putting together the thirds and fifths**, just like indicated in the diagrams to the right.

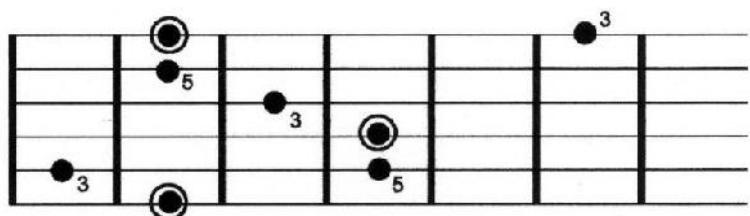


Figure 12

As you can see in Figure 12 and Figure 13, the triads on the A- and E-strings start exactly like the thirds in Figure 11.

However, here I have written the continuation on the remaining strings as well, and encircled the root notes, “**3**” means third and **5**” fifth.

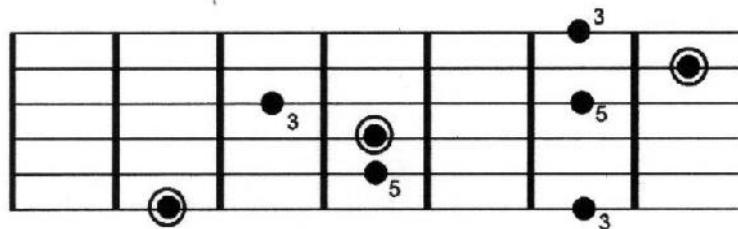


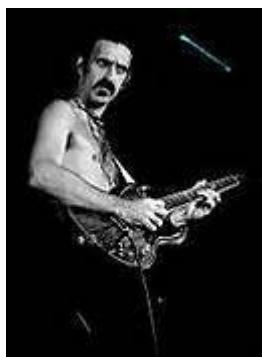
Figure 13

Now you can practice triads all the way to the high E-string and back! I would recommend using the sequences from Exercise 6 and Exercise 5.

And one word about technique:

These triad fingerings are quite literally the **core of this entire concept**, but they are also rather difficult to play!

Always try to play adjacent notes with the “**rolling technique**”! In order to play these fingerings even remotely fluently, you should expect several weeks or even months of practice time, however, your technique will attain an almost mystical quality!



## Chapter 4 - Second Iteration

So, many moons later... ☺

No, of course, it is important to practice everything we have talked about so far, but this does not mean you should not play anything else!

To the contrary, try to incorporate all of this into your **normal playing style** by using these scales instead of pentatonics, for example.

So far, these sound best over tunes in major, and you will notice that this will change the way you approach melodies.

You will start playing more **linearly** using these **scales**, and you will be able to cover much more ground using the **triad arpeggios**.

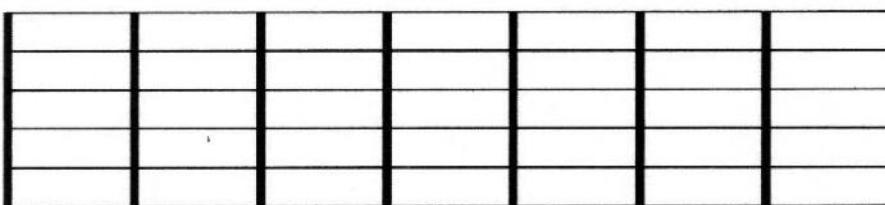
So then, why do I call this chapter “Second Iteration”?

An iteration is the repeated application of an operation to the result of that same operation, meaning you will just feed the result back into the beginning! For example, you can see that the **major scales** from exercise one and three bear an almost uncanny resemblance to the **major arpeggios** you just learned!

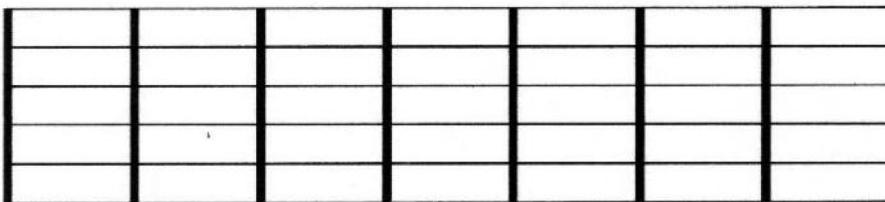
Of course, this is intentional in order to keep the learning curve somewhat flatter, since all the scales and arpeggios **stay within the exact same boundaries** as their respective counterparts!

So please write the other major arpeggios with **the root note on the A-string** into the following diagrams. Please watch to correct labeling of function tones, such as circling the **root notes**, “3” and “5”.

*Exercise 8*



*Exercise 9*



As you might have noticed, these arpeggios contain nontrivial technical difficulties as well... ☺

But please stay cool, because here are some exercises that let you connect everything you learned so far:

*Exercise 10*

Please record the following chord progression in a slow tempo:

|: E | A | D | B :|

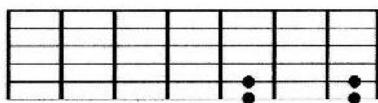
Then you improvise only with notes of the major arpeggios, first on the **lowest three strings**, then on the **highest three strings**, and finally on the **middle two strings**.

This is supposed to prevent you from always playing the same things from the root note and not coming up with well-connected phrases.

Your index finger should not go lower than the fifth position doing this.

Roots are as follows:

↓ 5<sup>th</sup> position



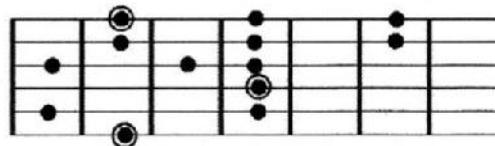
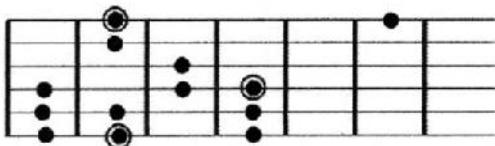
*Exercise 11*

Play any major scale **up** and the respective major arpeggio **down**!

I designed this exercise to show you that the fingerings for scale and arpeggio really stay in the **exact same boundaries**!

Then transfer this principle to the other three positions of the same root note.

Then change the exercise by **only** playing until the octave of the scale and then **switching** to the arpeggio. To come back down, you start with the scale and then switch to arpeggio halfway down, as indicated in the diagrams below.



Surely, it likely took you a while to master all these exercises, but now I would like to show you the last missing form of triad fingering!

You might have noticed that so far you have **only used the first or second finger** for all of these major arpeggios with the root notes on the E- and A-strings!

Now it is time to use the fourth finger as well! The reason I am introducing this new arpeggio rather late at this point is that you actually need a **new fingering** for the octave as well as for the fifth interval as laid out in Figure 14 below!

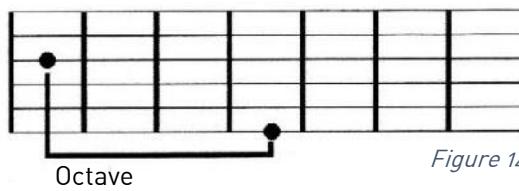
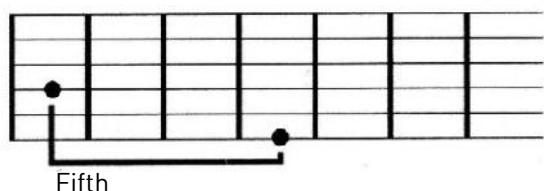


Figure 14

The triads using these new forms look like this:

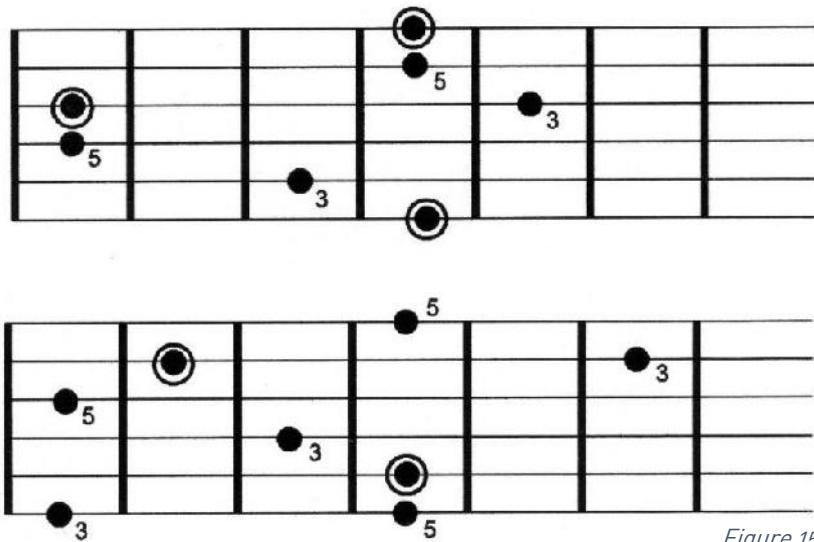
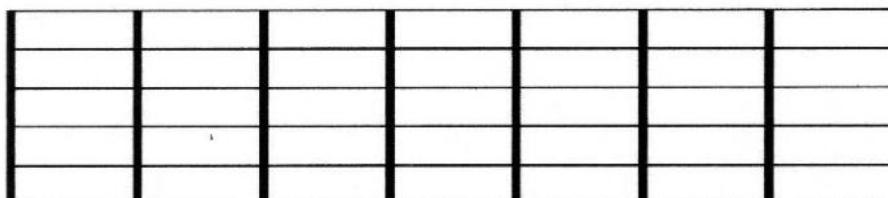


Figure 15

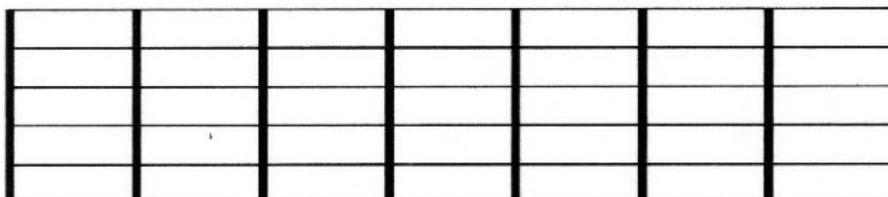
surely be able to write down the respective scales!

Should you have trouble, refer to Figure 2:

Exercise 12



Exercise 13



The position where the root note is played with the **fourth finger on the A-string** is technically the most demanding, at least with respect to these triads.

As you can gather from the lower part of Figure 15, you should be playing the root note on the B-string with the **second finger**, and the following thirds interval is played with the **fourth finger**.

That is quite a stretch!

Initially, this is likely to cause difficulties, however this fingering will be very useful moving towards four-note chords in the following chapters!

And the ordering principle of the major scale is easiest remembered like this: Going up the fretboard, root notes in the same position are played with different fingers successively, first with the **fourth**, then with the **second/third**, and then with the **first**.

As usual, you will see a clear match with the fingerings of the major scale.

Furthermore, it is obvious that there are really only three possible triad forms!

Look at the root note, the third and the fifth on the B-string (from the lower part of Figure 15) starting with the first finger just like the ones on the E- and A-string.

Knowing this, you will

On this page, I have prepared a few exercises for you designed to help you connect what you have learned so far.

*Exercise 14*

Choose a root note on the E-string and just play all scales around it up and down. If you have managed this, here is the “**Big Deal**“:

1. Fourth finger root note arpeggio **up**, then slide up to the third on the high E-string
2. Second finger root note scale **down**, slide up to the root note with the first finger
3. First finger root note arpeggio **up**
4. First finger root note scale **down**, slide down to the major 7<sup>th</sup> with the first finger
5. Second finger root note arpeggio **up**, and slide down again to the major 2<sup>nd</sup> on the high E-string
6. Fourth finger root note scale **down**
7. Voila, we’re home!

Then: Start with playing up the scale!

And: Choose a root note on the A-string!

And finally: **Don’t panic!** ☺

*Exercise 15*

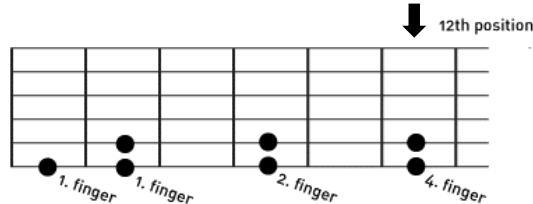
Record the following chord progression:

|: E | A | D | G | C | F | B | B :|

Since the B major triad is a little bit out of range, you will play it twice. Moreover, it sounds better in an eight bar phrase...

Then you use your triad arpeggios just like in Exercise 10. Sounds quite classical, doesn’t it?

Root notes:



So, I hope at this point you did not lose all friends, your parents only know you from hearsay, having to shove your food through a little hatch in the door? ☺

Well, that would not be any fun, and joking aside, you should be a better guitarist now than before starting this book!

To get a different angle concerning the material we talked about so far, think along with me for a moment:

This is an F major scale played on the low E-String:



Figure 16

For support, I have written down a few root notes (But not all of them!) for you.

Try to play the lowest scale, **F major** in this case, up and down and then move up to the next higher one, starting with G.

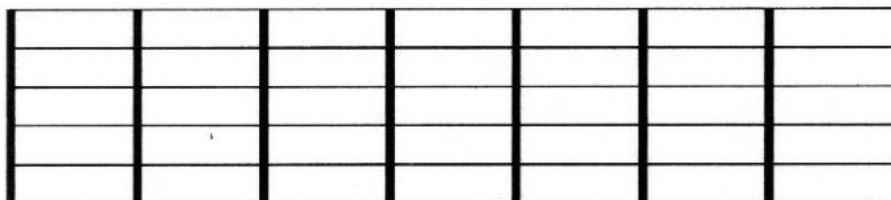
I think you will notice that the sequence of scales originates from starting each note of the major scale with the first finger and then **continue with three notes per string**, just as you have learned.

You will also observe that there is no gap in between the three scales with root note on the A-string and then up to the ones with root note on the E-string. This means the scales are contiguous in this area and you completely know the fretboard in this area!

However, above the ones with root note E string towards back to the ones with root note A-string, there is **one missing!** And: Playing along with Figure 16, this will actually be the second scale you'll play!

Since, obviously, if you start playing on each of seven notes once, you will end up with **seven fingerings**, and not the six we've learned so far!

Exercise 16



For sake of completeness, please write this very important form into the below diagram.

And just like magic, this "black sheep" scale is the one where the transition from to adds to the transition from the G- to the B-string, resulting in a **two-fret step!**

Did you notice it was still missing? ☺

The arpeggio that belongs with it is this:

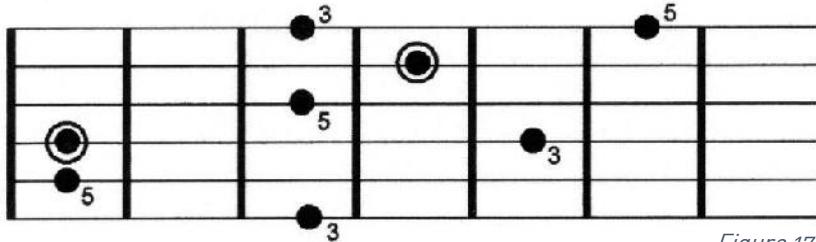


Figure 17

Before we move to the dark half of music together, on this page you will find three exercises that combine everything you have learned so far about major scales:

*Exercise 17*

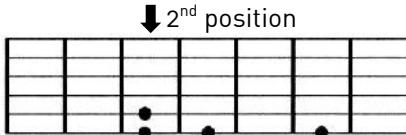
Another chord progression for practice, and this time, there is no chord to be played twice, since now you will use two positions

|: B | A | G | F# :|

Root notes 1:



Root notes 2:



*Exercise 18*

The third sequence (please reference Exercises 5 and 6) for practicing the major scale and in order to perfect your technique is this:

**1342-3564-5786-...**

Try to keep using clean alternate picking!

*Exercise 19*

This is now the “**Really Big Deal**”!

Please have a look again at **Exercise 14**!

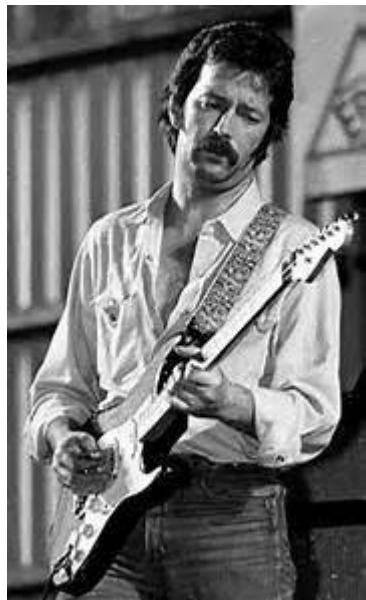
Now we’ll just play this exercise on the **entire** fretboard, since now you have all major scales available!

It is probably best to start from F major again (for recognition purposes...), but later you should also try somewhere in the middle in any other key.

If you now feel like somebody that has not made any real music in a long time, you are not completely at fault...

The considerations we have had so far may look rather dry at first sight (and maybe even at second sight...) but all of these scales and arpeggios are just tools, or guides rather to take control of the fretboard.

As a kid, I have made the experience that is much easier to invent new games in an area you know well than in a place where you have to be careful not to break your ankle all the time!



## Chapter 5 - The Dark Half

The meaning of this somewhat jokingly called "Dark Half" of music is of course the **minor tonality!**

And here is how we build a **minor triad**:

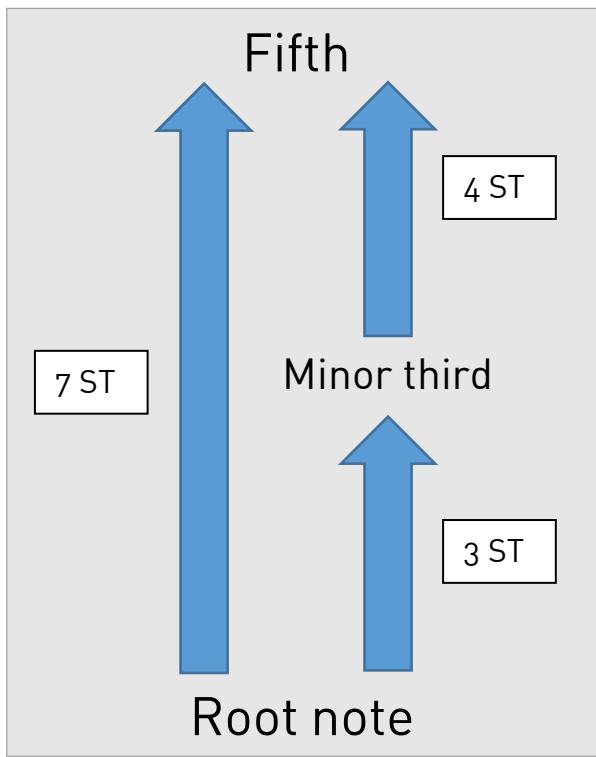


Figure 18

you already know!

As you can see from Figure 18, the only note to change from a major to minor triad is the **third**, which (you guessed it! ☺) is minor in relation to the root where it was major before...

And since in comparison to major only the order of stacked thirds has changed, both thirds still add up to a fifth!

Understanding this, you should be able to play minor triad arpeggios with the help of the drawn-in function note labels from the **major triad** diagrams!

It is critical to keep in mind that the position of all other notes (fifths and root notes) stays the same

This way, you do not have to memorize seven new fingerings, but are able to play with one simple modification of something

The result is that there are **seven minor triad arpeggios again**, of which three start with their lowest root note on the A-string (with fingers 1, 2 and 4), three on the E-string with the same three fingers, and one that's a little special, because the lowest root note is played on the D-string with the first finger.

Just go ahead now and try all these seven minor triad arpeggios to get a feel for the changed notes!

A little hint at this point: Because this procedure is so simple, I would like to encourage you to **not write down the new arpeggios**, but rather create them in real time, not wanting to create any more possibly confusing fingering diagrams...☺!

The way to do this is through the precise knowledge of the unchanged notes' positions, meaning you should develop some kind of **matrix of root notes and fifths** in your head in which you only have to fit in the new, minor thirds. You will see, it works!

To test this, try the following exercise:

*Exercise 20*

The chord progression

|: C | Am | Dm | G :|

is also called a “**turnaround**” and it is used in jazz and pop music extensively, for example in order to return to the beginning of a tune, or to bridge a long occurrence of the same chord.

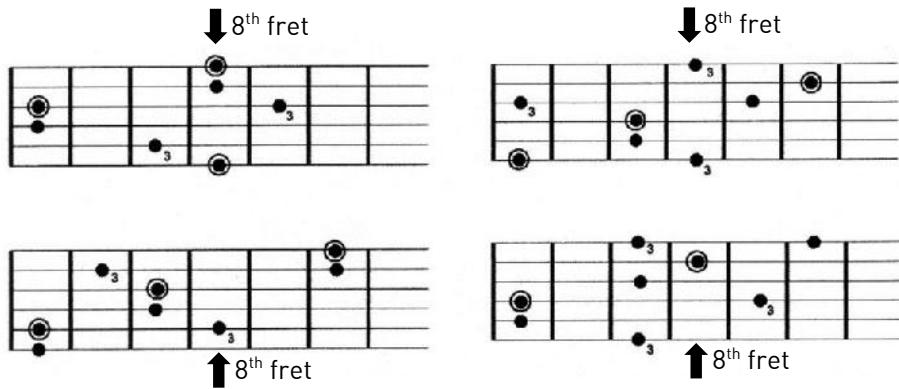
The turnaround in this example is in the key of C major, thus the **first chord** is the one determining the key.

The exercise consists of choosing a position and playing **C major scale in that position**. Then you need to identify the **root notes of the chords**, all of which need to be contained in this position, and start to **play all arpeggios** slowly in this one position only.

If this works satisfactorily, record the progression and play the arpeggios of the underlying chords just as in Exercise 10 first on the lower three strings, then on the upper three strings and then on the middle strings.

Always try to master one single position before moving to the next!

I have detailed an example for a position below:



Difficult?

That is fine, because what you have learned in this exercise is one of the most important basics for playing over chord structures occurring in any pop, jazz or rock tune.

And because of the inherent complexity, this just needs time!

However, now you still do not know what the **minor scale** is!

In the classical sense, a minor scale is the mode originating from the sixth scale degree of a major scale, meaning:

What we call “**minor**” is nothing else but a scale consisting of the same notes as a major scale, but starting from a note a minor third below (or a major sixth above) the major root note!

Obviously, you play it on the guitar with the exact same fingerings and patterns used for the major scale from Figure 2!

This particular, derivative viewpoint does not go far enough however, since I would like you to be able to play the minor scale any mode immediately and anywhere on the guitar! For that, I need you to know the actual structure of the scale, underneath I have written down the structure of a natural (Aeolian) Minor scale for you.



Figure 19

This symbol means a whole tone, this symbol a semitone. It is clear that the structure of this scale is completely different from that of the major scale, but you can still play it with the help of the fingerings used so far!

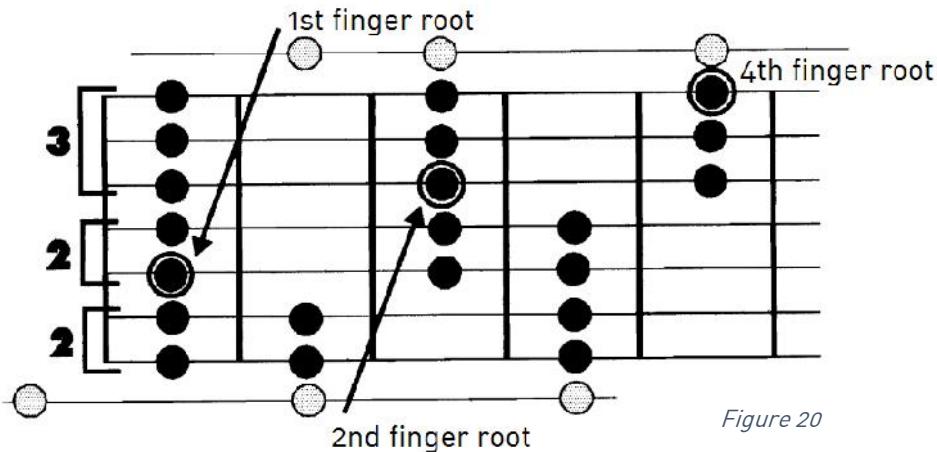


Figure 20

Root notes and fingerings in **Natural minor**:

Looking at Figure 20, you will surely notice the uncanny resemblance with Figure 2!

The reason for this being that in comparison to Figure 2 only the root notes have

changed, not the sequence or kinds of fingerings!

Again, for each of the three fingers of your left hand there is a root note to start with. You can clearly see that the new root notes are indeed situated a minor third under those of the major scale.

Major seconds up from root notes:

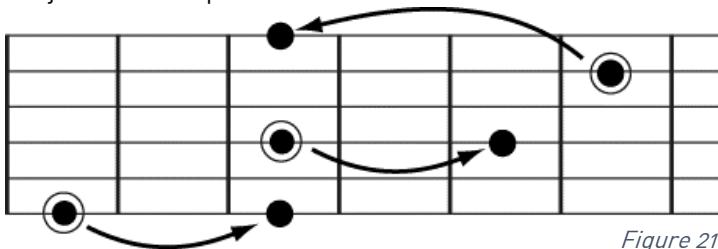


Figure 21

It is also critical to note that the central tones we have used for orientation so far, namely the fifth and the root note, now can take on the function of “**anchors**”!

Which is to say that the notes that make the difference with other minor scales, the major second and the minor sixth are always found in certain distances from these “anchors”.

In the case of the **major second**, this is **two frets** up from the root note (Figure 21), in the case of the **minor sixth** it is one fret up from the **fifth** (Figure 22).

Minor sixths up from fifths:

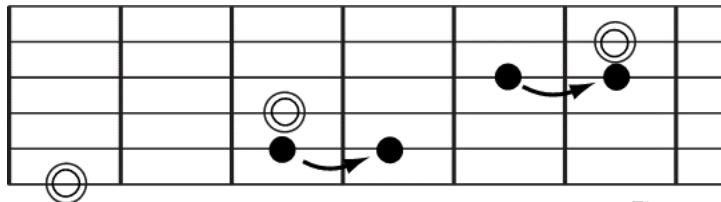


Figure 22

This means you can play the Natural minor scale just like that and just like any of the other minor scales of the Ionic System just by remembering the matrix made up of roots and fifths!

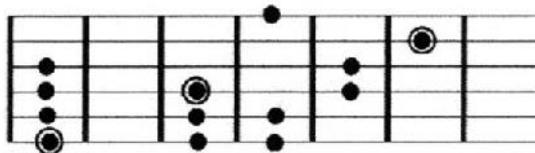
Okay, so one more time: in addition what you have learned so far about thirds, octave and fifths, we will now add **seconds** and **sixths**, which you can deduct from the distance to the **anchor tones**, root and fifth.

Now, how to practice all of this?

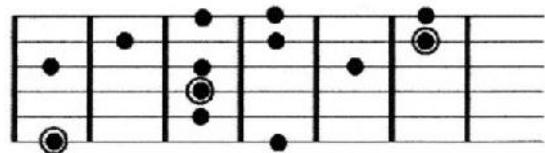
*Exercise 21*

Actually, exactly like in Exercise 11, because this is just another scale/arpeggio construction, and you can practice these best by playing one thing on one half of the available strings, and the other on the other half. Below, I have written down a variant for you:

Up!



Down!



In contrast to Exercise 11, I would like to ask you to transfer it to all seven positions of the minor scale. Please do not get frustrated if that does not work right away, the "Big Deal" needed a little time to work out as well, right?



Here are another two exercises:

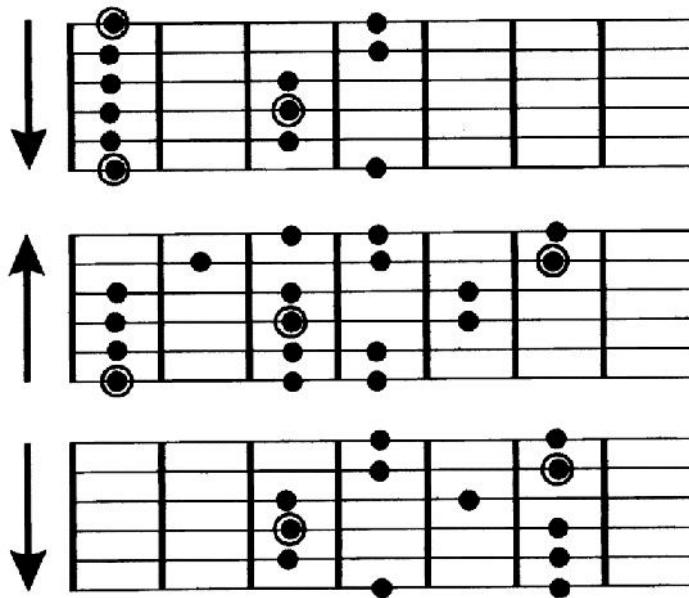
*Exercise 22*

We'll put our old acquaintance, the **minor pentatonic scale**, to good use here, since these new fingerings always include two of the old "two-finger-per-string" pentatonics.

Just try the following:

1. In one position, play down the minor **pentatonic**, then
2. Play **Aeolian minor** up and then from the position that you arrived at,
3. Play **pentatonics** down again, the high

Just like in this example:



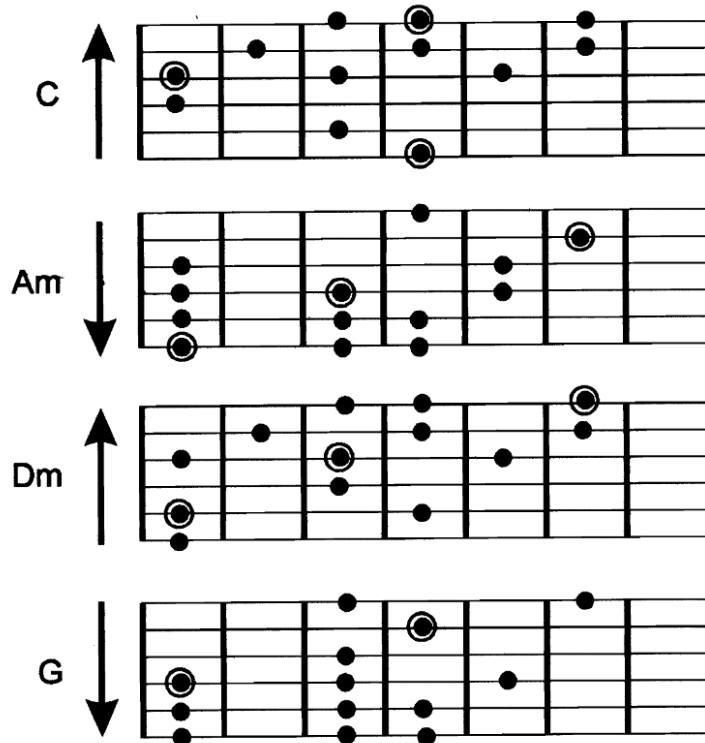
Exercise 23

This exercise is a combination of the minor scale and the respective arpeggios.

So let us go back to the **turnaround chord progression**, and try the following, at first without playback:

1. Play the **arpeggio** over three strings, then
2. The **scale** on the remaining strings. Arrived at the top,
3. play **down** the **arpeggio** of the next chord, and then
4. Further with the **scale**, which is of course the same as before.
5. Then **up** the next, and so on and so forth...

If this does not make sense, please check the example below!



If you have done this without playback a few times, you can start actually making music (*"What is this music thing you're speaking of?"*) with this by improvising with the playback!

If you are starting to get a feel for it, please transfer the principle to the other six positions!

In Exercise 23, you might have noticed a familiarity about the different Root notes in C- and A-minor, in the arpeggio as well as in the scale.

With G- and D-minor however, only the arpeggios should look familiar, the root notes of these scales have nothing to do with minor or major, as you have learned so far. I will discuss these things in the next chapters...

## Chapter 6 - "Dem Funny Old Greeks"...

Since Medieval Music and the Renaissance, composers use the so-called **church modes**. We call them "church modes", because the special characteristics of the respective scales inspired the composers into certain moods, which then gained certain liturgical meanings.

Of course, today, speaking of church scales or modes, we do not consider these connotations any more, even though the scales have not lost their psychological effects, of course!

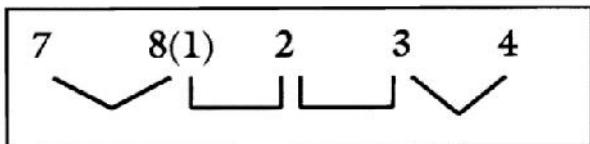
And that's exactly why every serious musician should be studying these...

What are modes in particular?

Well, first of all their scales consist of seven notes, just like minor and major. The differences lie in a changed semitone/whole tone structure, however there is still two semitones in each scale and in addition, they even have the same distance from each other.

For example, the semitone steps 2 → 3 and 5 → 6 in Aeolian (Natural!) minor lie two whole tones apart, just like steps 7 → 8 and 3 → 4 in major (Ionian).

Semitone/whole tone structure of **major**:



Semitone/whole tone structure of **minor**:

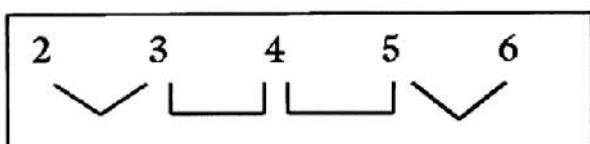


Figure 23

We distinguish between three minor and three major modes:

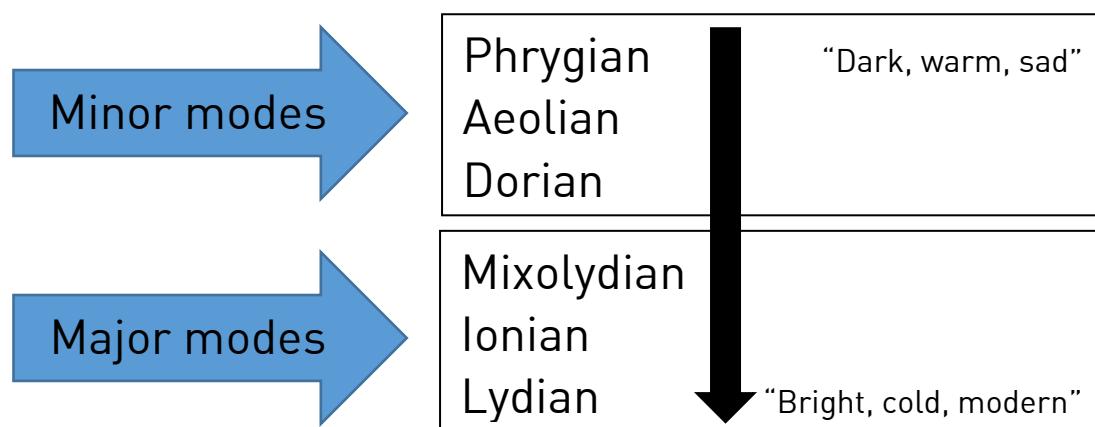


Figure 24

The classical deduction of these modes other than plain minor or major would be to:

1. Use the **major** scale,
2. Starting that same scale from **another note**.
3. This new scale degree note then becomes the root note of the **new mode**.

This so called derivative method I would like to skip over, since thinking like this always relates things back to the major scale.

Rather, I would like to offer you a parallel method with which you can directly play the "color notes" in those scales and change them around!

By the way, "brightness" in this context means the **psychological impression** that the respective mode makes on the listener.

Many people associate e.g. **Phrygian** with a "Spanish" or "oriental" feel, which are darker, more moody colors, whereas with **Dorian** most people feel something like a "bright" or modern, "jazzy" vibe.

Analogously, most people experience the **Mixolydian** mode to be a "bluesy" or "warm" color, but **Lydian** as "cold" or "modern".

In the various modes, specific notes generate these **colors or sounds**, and obviously, these are not the notes contained in the respective triads, but rather the missing four notes of the scale, the seconds, sixths, fourths and sevenths!

Fascinatingly, it just so happens that the **seconds and sixths** create the three **minor modes** and the **three major modes** result from the respective **fourths and sevenths**!

Minor colors: <b>9 (2) and 13 (6)</b>	Major colors: <b>11 (4) and 7</b>
Phrygian ("dark minor"): <b>b9</b> <b>b13</b> Aeolian (minor): <b>9</b> <b>b13</b> Dorian ("bright minor"): <b>9</b> <b>13</b>	Mixolydian ("dark major"): <b>11</b> <b>7</b> Ionian (major): <b>11</b> <b>maj7</b> Lydian ("bright major"): <b>#11</b> <b>maj7</b>
For labeling, the following rules apply:  <b>b9</b> minor ninth <b>9</b> major ninth <b>b13</b> minor sixth <b>13</b> major sixth  The notes of the triad are obvious, the fourth is perfect and the seventh is minor!	For labeling, the following rules apply:  <b>11</b> perfect fourth <b>#11</b> augmented fourth (Tritone) <b>7</b> minor seventh <b>maj7</b> major seventh  The notes of the triad are obvious again; the ninth is major, just like the sixth!

Figure 25

Subsequent minor modes differ in a **single note only**, namely the ninth **or** the sixth!

Subsequent major modes differ only in a **single note either**, namely the fourth **or** the seventh!

The deduction of these structures I will spare you at this point, if you like, you can write down a major scale from their respective scale degrees and analyze the resulting semi-tone and whole tone structures!

Another little question, before we transfer all of this to the guitar: Dorian and Mixolydian differ in how many notes?

Again, only **a single one**, because at this point minor becomes major, which changes the third!

Below I've prepared a few diagrams for you that you need to complete yourself, only the necessary beginning of the modes are already there, the rest *you* need to fill in!

Minor modes:

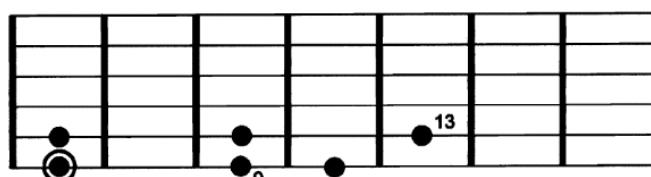
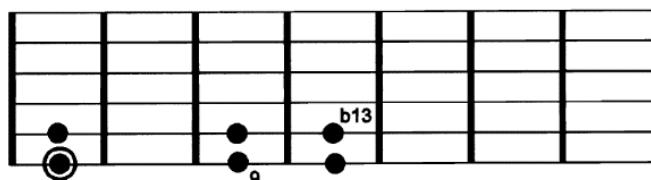
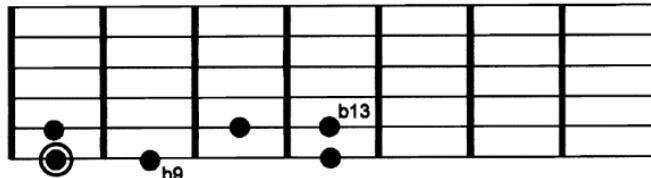


Figure 26

Major modes:

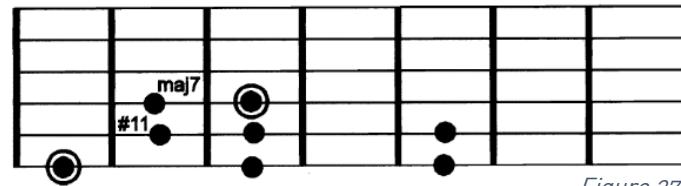
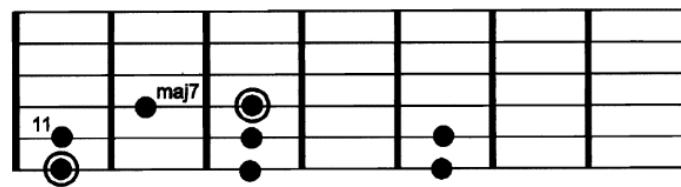
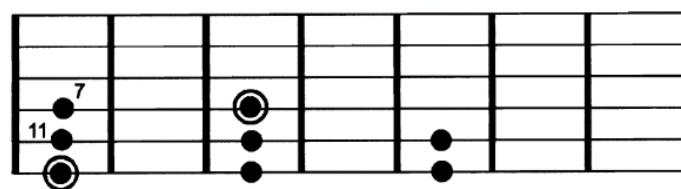


Figure 27

A little afterthought: what happens if you take away all the differing notes from the minor and major scales? Holy Johann Sebastian... ☺

By the way, I forgot to explain the meaning of this chapter's title, the admittedly strange names of the modes are names of old Greek peoples...

Now again, you have plenty of material on your hands, and again we will need to ask ourselves how to practice all of this?

Well, the best is just trying to play with these colors and different moods. As you know, the modes represent various scale degrees of the major scale, and which ones they are, I have written down for you below.

This table associates chord types to the modes that fit with it, this time ascending by scale degree.

Scale degree	Name	Changed notes compared to minor or major	"Mood"
I maj7	Ionian	-	Bright, radiant
II m7	Dorian	13 (major sixth)	Funky, jazzy
III m7	Phrygian	b2 (minor second)	Oriental, Spanish
IV maj7	Lydian	#11 (augmented fourth)	Modern, mysterious
V 7	Mixolydian	7 (minor seventh)	Bluesy, funky
VI m7	Aeolian	-	Soft, sad
VII m7b5	Locrian	b2 & b5 (minor second & diminished fifth)	Dark, mysterious

Figure 28

Just record a groove with the respective, fitting chord type and start playing!

Pay close attention to the mood that the special notes create, which is to say that in order to get a feel for these, you should target ninths and sixths in minor, and fourths and sevenths in major.

In case you get confused about the options (a pro terminology for "special notes") for the various scales, you can use another trick: In the accompaniment, do not just play the chord **directly on the scale** degree, but also the one **right above it**. This not only delivers all notes of the four-note chord, but also all option notes since those are all contained in the chord one degree higher.

Below I have sketched an exercise for you, which outlines every mode in the tonal center of C and with the two chords that go along with it.

*Exercise 24*

### Tonal center: C

Ionian	: Cmaj <sup>7</sup>   Dm <sup>7</sup> :
Dorian	: Cm <sup>7</sup>   Dm <sup>7</sup> :
Phrygian	: Cm <sup>7</sup>   Dbmaj <sup>7</sup> :
Lydian	: Cmaj <sup>7</sup>   D <sup>7</sup> :
Mixolydian	: C <sup>7</sup>   Dm <sup>7</sup> :
Aeolian	: Cm <sup>7</sup>   Dm <sup>7b5</sup> :

The first chord of the progression is thus the **fitting scale chord of the mode**, and the second one is the following one in the respective key.

Example: C-Phrygian is on the third degree of Ab major, and the fourth degree would be Db major.

In Figure 28, you likely noticed another mode, being the one on the **seventh scale degree in major**, called **Locrian**.

This mode does not originate in a minor or major triad, but from a **diminished triad** consisting of two stacked minor thirds.

Later, we will look intensively at this chord type, but for now, we will skip it since it contains a diminished fifth, which is messing up our carefully established anchor point system!



## Chapter 7 - Spreading the disease

After studying the last chapter, you should be able to play all modes (with the exception of Locrian...). Unfortunately, that is true only for the position where you start on the low E string with the first finger...

To remove this a limitation, I will open a possibility in this chapter to play all the modes on the entire fretboard as well!

Again, the trick is to find an **anchor note** for the option note that you are about to change and then to unlock the fretboard by using our immutable sequence of fingerings!

On the next few pages, I will illustrate the procedure using the two examples of **Dorian** and **Lydian**, two of the more important scales to create interesting melodies.

The anchor tone for orientation is the **fifth** in both cases. The sixth, played major in **Dorian** as compared to regular minor Aeolian sixth (please refer Figure 22!), as well as the augmented fourth from Lydian are both very closely located next to the fifth.

Please check out the diagrams below:

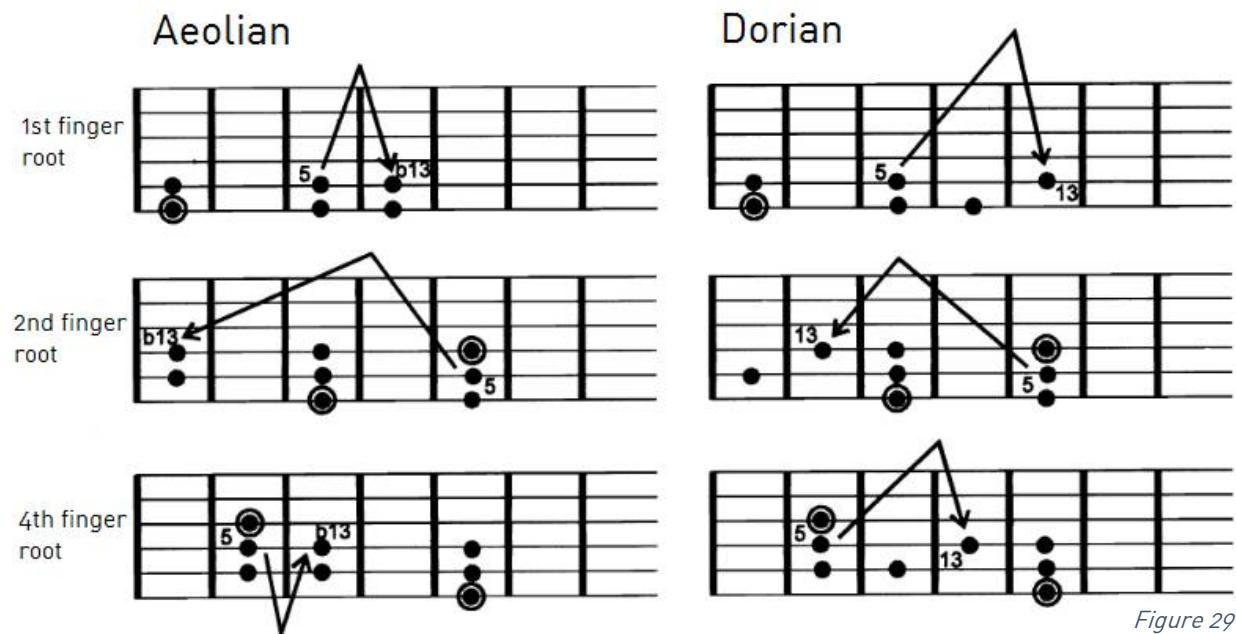


Figure 29

I have drawn the **anchor note**, **the fifth**, and the respective major sixth that is one whole tone away into the diagram. Please complete the scale across the fretboard and then practice it with the chords from Exercise 24.

I find the positions where the sixth and the fifth sit on neighboring strings hardest to visualize, but by now, you should have gotten used to how these scales sound anyway.

Your next job is then to transfer this principle to the positions where the lowest root notes are on the A-string.

And finally, you're still missing that black sheep position where the root note is on the D-string...

You need to practice all of these scales with chords so that your ear can get used to the new fingerings. Sounds strange, doesn't it? However, you surely noticed that you do not have to think about certain runs and notes anymore, and precisely at that moment, your ears control your fingers. This is the entire point of this text!

The other example I would like to give is **Lydian**. This scale is often used as a substitute for the regular major scale because of its interesting open sound. Below I have drawn in the anchor tone fifth and the fourth that is **augmented** by a semitone as opposed to the perfect fourth contained in Ionian.

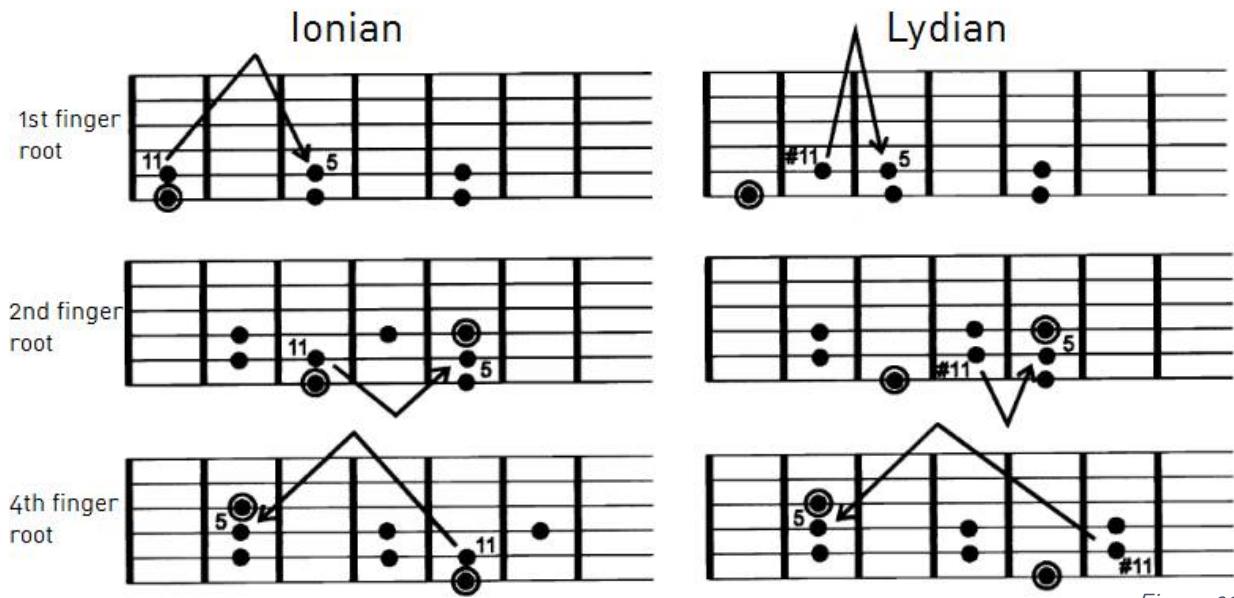


Figure 30

Please complete the diagrams here as well, by drawing in the remaining positions. Do not forget to also label root notes, anchor tones and the options typical for the mode.

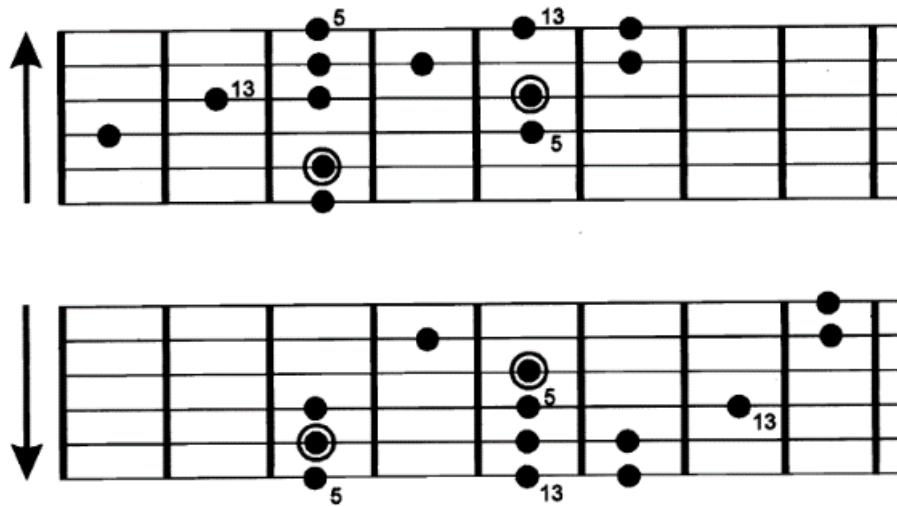
Playing the various modes always follows a certain procedure:

- Take a **known** scale closely related to the one you are looking for.
- **Change** the note typical for the desired mode
- Then you will need **two or maximum three** fingerings until you have established the rest of the scale and are able to play it top to bottom.
- Changing to a different position, you **look for another root** note and start over.

For practicing the modes and the associated arpeggios, I have written down an exercise for Dorian with root note A-string:

*Exercise 25*

Play the triad arpeggio up, and then continue halfway with a scale. Then you slide up one position, play the arpeggio down and continue halfway again with the scale. The diagrams below will illustrate this.



Of course, you can practice all modes in all positions in this way, and working systematically, you will make rapid progress! Always use the well-known sequence!



## Chapter 8 - Foursomes...

Well, so far everything was quite logical, difficult sometimes, but manageable in the end, right?

So why are you still playing those colorless, bland **triad** arpeggios ☺ (at least compared to all those colorful modes...) when developing vertical ideas?

I am willing to consider this grievance and introduce **four-note chords!**

However, what are four-note chords?

Well, mostly the same thing as triads, we only add one note... ☺

As you remember, we build triads by stacking thirds; in **major**, we add a major third and then a minor. In **minor** this is just the other way around, here it is first a minor third and then the major.

Moving to four-note chords, all that really happens is that there is another third being stacked onto the fifth, using a note contained in the respective scale.

The only criterion creating the sequence of chords from Figure 28 is the distance from the seventh to the root note. **Only a chord's and his predecessor's position in the scale determines if a given chord contains a minor or a major seventh!**

It's a good thing that there's only two seventh intervals, since in combination with the triads you already know, these yield **three** related **four-note chord types**, and one new type occurring on the seventh scale degree and stemming from a diminished triad. This, however, we will derive from a minor seventh chord later.

The **anchor note** to create that seventh interval from is the root note itself, since this is the closest one. Again, this results in the possibility of starting with three different fingers, and in combination with the three different four-note chords, these fingerings evolve that I've written down for you on this and the following page.

4 <sup>th</sup> finger root	2 <sup>nd</sup> finger root
<p>m7</p> 	<p>7</p> 
<p>maj7</p> 	<p>7</p> 

Figure 31

As you can see, these four-note chord arpeggios obviously lie within the limits of our well-known fingerings, the very scales that you have been practicing so far.

Furthermore, there is another interesting point: After each of the **three possibilities to start with a certain finger**, the next octave in the same position starts with the **next finger in line**.

This means, that in the examples to the right you need to keep playing with the second or third finger at the octave. You should have done that all by yourself anyway, since you arriving with the first finger from the seventh.

I would like to ask you now to complete the diagrams all the way up to the high E-string.

Surely, you are already seeing the close similarities with the triad arpeggios that you have been practicing so far, so it should not really be necessary to write down all the four-note arpeggios from the A-string, right?

Rather, you should try the following exercises:

#### *Exercise 26*

For practicing Dominant SEVENTH arpeggios, there is nothing better than a blues form:

|: E<sup>7</sup> | E<sup>7</sup> | E<sup>7</sup> | E<sup>7</sup> | A<sup>7</sup> | A<sup>7</sup> | E<sup>7</sup> | E<sup>7</sup> | B<sup>7</sup> | B<sup>7</sup> | E<sup>7</sup> | E<sup>7</sup> :|

Then practice in the well-known way:

First the lower three strings, then the upper three, and finally the middle two.  
Try to find good connections between the cords right away!

Sample Root notes:

7<sup>th</sup> fret



## 1<sup>st</sup> finger root

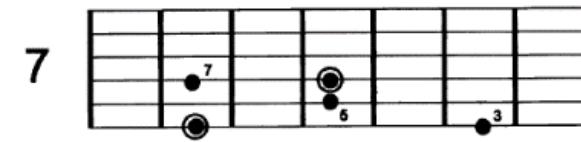


Figure 32

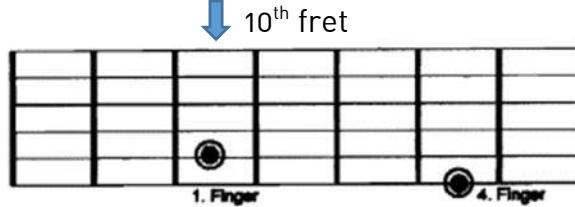
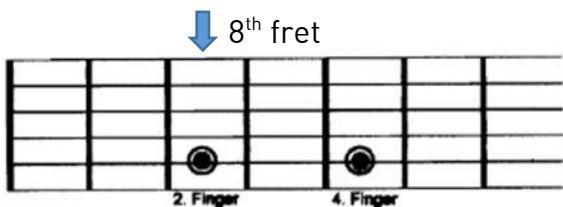
Exercise 27

A very good tune (or part of it) for practicing major seven arpeggios is "Ironic" by Alanis Morissette:

|: Fmaj<sup>7</sup> | Gmaj<sup>7</sup>:|

Practice our well-known procedure slowly and in different positions: Lower three strings, upper three strings and then the middle strings.

Again, two sample root notes:



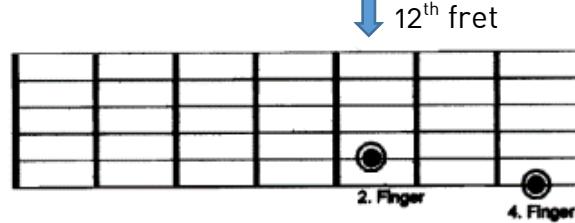
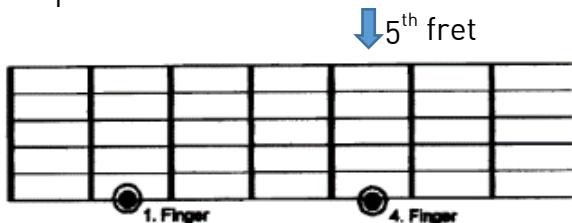
Exercise 28

There are many progressions containing minor seventh cords, but one of the nicer ones is the verse of "Light My Fire" by The Doors:

|: Am<sup>7</sup> | F#m<sup>7</sup>:|

Record this progression in a slow tempo first, since it is not simple. Also, try to keep the fingerings in one position.

Sample Root notes:



Well, after these exercises you should be ready for the one-before-last coup, being the unveiling of the mysterious chord type half diminished!

Actually, this type is not so mysterious per se, but it insidiously sabotages my nice system that worked so great until now.

So far, all the octaves and fifths in a single position were indispensable for anchoring the option notes, please refer to Figure 33 on the next page.

“Anchor Note”	Below	Above
Octaves	Sevenths	Ninths
Fifths	Fourths	Sixths

Figure 33

The diminished triad however does not consist of a minor and a major third in whatever sequence, but of **two minor thirds** and together these form a **diminished fifth**, also called a “Tritone” (b5). This interval, contained in the chord and in the accompanying scale Locranian makes playing this arpeggio so difficult.

The “m<sup>7</sup>b5” chord however, and its associated arpeggio, are called “half-diminished”, because it does not contain only minor thirds, but features a **major third** from the diminished fifth up to the minor seventh.

If this last third were minor as well, it would result in a fully diminished chord.

The scale obviously is still subject to the same principles outlined in Figure 2, and its root note is positioned one semitone under the root note of Ionian.

All of this leads to this half-diminished arpeggio being some kind of a secondary one in the framework of this system, since we cannot derive it from first principles.

This being kind of the first methodical “hurdle” of this treaty, I have, after all this dry theory, written down all seven possibilities for starting a half diminished arpeggio for you on the right!

As you can see, I have really only written the beginnings of the respective arpeggios, please do yourself a favor and complete them.

## Half-diminished arpeggios

Figure 34

Now you have actually gathered all chord types and scales of the so-called "**Ionian System**"!

Of course, we call it that because the reference scale is still Ionian and all modes derived from it share the same whole tone/semitone structure. It is only that they appear in different places and so create the different moods.

Besides, the shape and sequence of fingerings from Figure 2 is **one expression of this half/whole tone structure**, and a stroke of luck on top of it, since it is not self-evident that it should look like this. Moreover, the very moment you leave the Ionian System using other scales as a basis for stacking thirds, the resulting fingering patterns look much different and a whole lot more complex. So now, what to do with it? I could think about a few things:

*Exercise 29*

You could play **all seven scale degrees of the Ionian System after another**, first up the fretboard and down again, and in each of the seven possibilities to play the root. In G major that would be:

- Gmaj<sup>7</sup> arpeggio with the first finger on the E-string,
- Am<sup>7</sup> arpeggio with the first finger on the E-string,
- And so on and so forth ...

Then in D major:

- Dmaj<sup>7</sup> arpeggio with the fourth finger on the A-string,
- Em<sup>7</sup> arpeggio with the fourth finger on the A-string, and
- Keep going! ...

*Exercise 30*

Then **the same in one position**, for example:

- Gmaj<sup>7</sup> arpeggio with a second finger on the E-string
- Am<sup>7</sup> arpeggio with the fourth finger on the E-string
- Bm<sup>7</sup> arpeggio with the first finger on the A-string, and
- Up, up and away ...

Got it?

*Exercise 31*

And finally **sequenced in fifths**, the way these chords occur thousandfold in all kinds of tunes ("Autumn Leaves", "Europa", "Still Got The Blues"):

|: Gmaj<sup>7</sup> | Cmaj<sup>7</sup> | F#m<sup>7</sup>b5 | Bm<sup>7</sup> | Em<sup>7</sup> | Am<sup>7</sup> | D<sup>7</sup> | D<sup>7</sup>:|

The D<sup>7</sup> chord has double the length again, since it completes the eight bar phrase. This exercise is one of the most important in the entire book, so please practice it extra thoroughly!

You need to master this chord progression because it, or parts of it, are nearly **ubiquitous in all kinds of music**.

The key is to practice slowly and in the well-known blocks of different strings and especially in all seven positions. If you like, you can also use the principle from Exercise 23, only now you would be using four-note chords.

Wow, this was a handful, and I hope you weren't too scared of the seemingly complex subject (and haven't sold the guitar to the neighbor yet...), but in the next and last chapter I'll take you back one more time to the modes and moods from the preceding chapters.



## Chapter 9 - Third iteration

I have lost quite a few words about the importance of spicing up your playing with interesting colors and sounds.

Playing linearly, you should be able to do this quite well by now, since using scales in sequence already contains many coloring tones, the so-called **options**. This term actually originates from chord theory, and designates additional tones you can add to chords to make them more colorful or more interesting.

If this reminds you of our considerations transitioning from simple minor or major to the "World of Modes", you have a point!

Following I will give you another possibility to **use these colors even playing vertical with arpeggios**.

I called this chapter "Third Iteration", because you have to go back to the beginning again in order to reuse techniques you have already learned.

Just like transitioning to four-note chords by adding the seventh interval, the options result from stacking further thirds onto a four-note chord, and the resulting notes are exactly those completing the four-note chord towards the seven-note scale.

They are the **second**, the **fourth** and the **sixth** interval in the scale, but since these notes are the result of stacking thirds, the correct nomenclature would be to add seven. Therefore, the options are then the **ninth**, the **eleventh** and the **thirteenth**! Of course, colloquially, you can call them "9", "11" and "13"...

You can easily determine that these notes are all sitting **one scale degree** higher than the notes of the four-note chord on which they are based, and whether they are minor or major intervals, is solely dependent on the scale degree of the base chord!

Now:

If you can create the options by playing a **triad** one scale degree **higher** than the base chord, you can create all colors in concentrated form playing arpeggios as well!

This results in playing only options and none of the notes of the basic chord anymore, so please consider the diagram to the right:

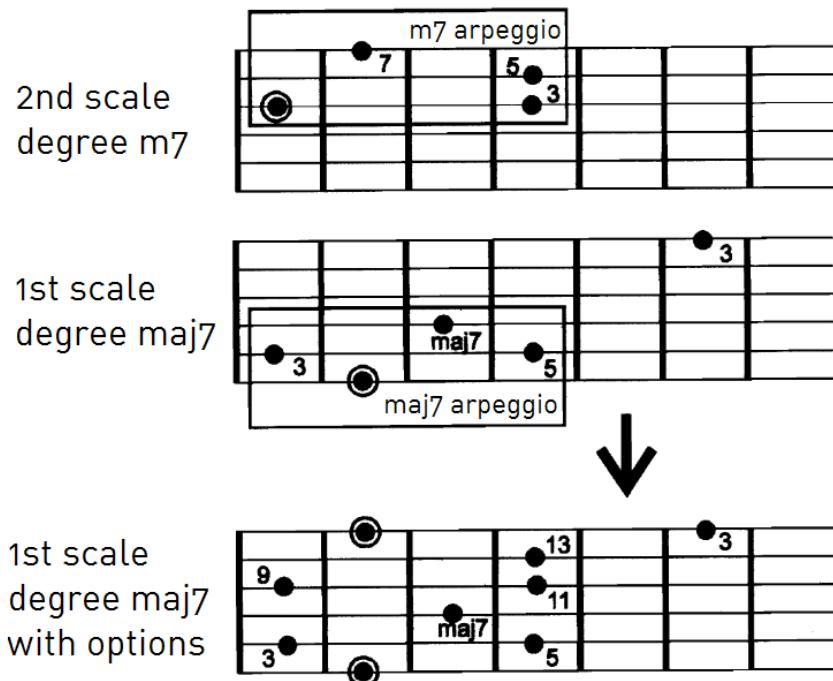


Figure 35

We are in essence adding **the lower part** of the original arpeggio to **the upper part** of the arpeggio located one scale degree higher!

In Figure 35, this would equate to a **m7** arpeggio on top of a **maj7** arpeggio!

In another example, let us say the arpeggio of the **base chord** would be on the **fourth scale degree** (a Lydian chord), and then the **option-generating arpeggio** would need to be a **dominant seven** one whole tone higher.

Later, it will also be very helpful to play options directly and related to the base arpeggio, but this will have to wait until you can identify intervals all over the fretboard and goes a little beyond the scope of this treaty.

Jazz musicians such as Charlie Parker used this procedure to create new sounds extensively, and it fits very nicely into my system.

At this point, I recommend the following exercises:

#### *Exercise 32*

Play every scale degree of the Ionian System **up and down the fretboard!**

You should do this with chord accompaniment, in order to get used to the sounds. Fingering should stay the same, meaning:

Always start the root note on the **same finger on the same string**.

As mentioned above, try later to **play options directly**, always keeping your anchor notes in mind. Add the scale from time to time in order to see how and if it corresponds with the sound of the arpeggio.

#### *Exercise 33*

A nice way to practice this is using modal tunes like for example a Minor Blues:

: **Cm<sup>7</sup>**	Cm<sup>7</sup>	Cm<sup>7</sup>	Cm<sup>7</sup>
**Fm<sup>7</sup>**	Fm<sup>7</sup>	**Cm<sup>7</sup>**	Cm<sup>7</sup>
**G<sup>7</sup>**	G<sup>7</sup>	**Cm<sup>7</sup>**	Cm<sup>7</sup> :

In this form, the simplest way is to see the first chord (**Cm<sup>7</sup>**) as **Aeolian** and the fourth degree (**Fm<sup>7</sup>**) as **Dorian**.

At first, you keep the structure of the arpeggio the same by sliding up a fourth on the string you are playing on.

This will make the difference between the structure of Aeolian and Dorian arpeggios very clear, since you are **changing only one note**.

Afterwards, you can stay in the same position putting the root note on a different string to see the behavior of the arpeggio in this situation, or maybe change the first chord to Dorian also.

A nice option arpeggio for G7 in this respect is playing a maj<sup>7</sup> arpeggio a minor second higher, becoming Abmaj<sup>7</sup> in this case! The explanation for this I will reserve for volume two of this book...

## Final thoughts

Maybe many things seemed dry or excessively cerebral studying this book, or did not seem musical enough?

I can relate to that, since the method I explained here is a condensed product of almost 30 years of thinking about how to structure music theory for improvisation.

However, always keep in mind that music, especially improvised music, is a vastly complex set of affairs and that all seemingly simple tricks and recipes tend to miss the point of:

**Finding your own voice and using that to express  
your thoughts and feelings to the audience**

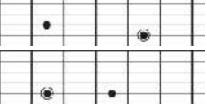
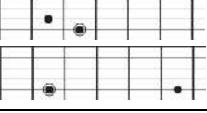
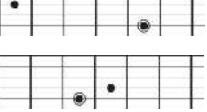
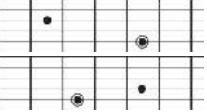
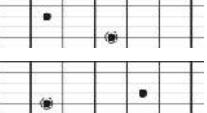
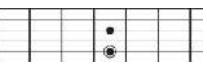
And in order to do this, you need a lot of knowledge, technique and a certain "Big-Picture" overview which will only come with time.

So take this time, and this book as what it wants to be:

***A guide that, giving him the space and trusting him, can show you the way out of a small dark place and into the wide open world of music!***

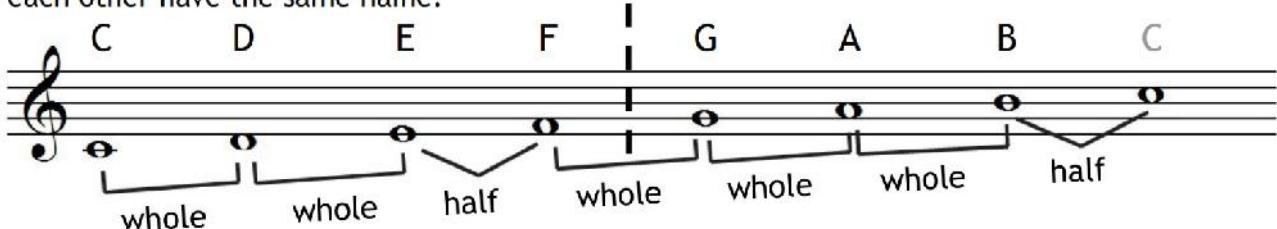
Bonaire, Summer 2016

## Appendix A - Intervals

Name	# of half steps	Minor scale position	Major scale position	Functional uses in chords:			Diagrams
				Within octave	Outside octave	Alteration	
Minor Second	1			b2	b9	b9	
Major Second	2	II	II	2	9		
Aug. Second Minor Third	3	III				#9	
Major Third	4		III				
Perfect Fourth	5	IV	IV	4	11		
Aug. Fourth Tritone Dim. Fifth	6			#4 b5	#11 b5	#11 b5	
Perfect Fifth	7	V	V				
Aug. Fifth Minor Sixth	8	VI		#5 b6	b13	#5 b13	
Major Sixth Dim. Seventh	9		VI	6 dim7	13		
Minor Seventh	10	VII		7			
Major Seventh	11		VII	maj7			
Octave	12	VIII	VIII				

## Appendix B - The Ionian System

Western music is based on half and whole steps (one or two frets on the guitar). They are arranged in sequences called "scales", the most important one is the Major Scale. Notes are named with letters from the alphabet from A to G, however the simplest major scale, C Major, starts from the letter C. It is possible to see the Major Scale as twice the sequence "whole-whole-half", separated by another whole step. The scales used in western music thus mostly contain seven notes before they begin again with a new Octave. An Octave is the interval between a note of double or half the frequency of sound and the root note. The human brain interprets this as "the same note, but higher", so all notes that are Octaves of each other have the same name.



The most common way to create polyphony (more than one note at once) is to stack notes in "intervals". Again, in Western music, the major and minor thirds are the intervals of choice. To remain within the tonality of a certain scale, only those notes are stacked that are contained in the scale. In practice this means stacking every other note! So if the root is sitting on a line in the staff system, all thirds end up on the lines, if the root falls between lines, the thirds also fall in between. A major third contains 4 half steps (or two whole steps), and a minor third has three half steps (or a half and a whole).

Which third gets stacked onto which root depends on its place in the scale, the 1<sup>st</sup>, 4<sup>th</sup> and 5<sup>th</sup> so-called "scale degrees" are major thirds, the rest are minor.

major 3 <sup>rd</sup>	minor 3 <sup>rd</sup>	minor 3 <sup>rd</sup>	major 3 <sup>rd</sup>	major 3 <sup>rd</sup>	minor 3 <sup>rd</sup>	minor 3 <sup>rd</sup>	major 3 <sup>rd</sup>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I. II. III. IV. V. VI. VII.  
1. 2. 3. 4. 5. 6. 7.

Stacking another thirds interval on top of the one already present yields structures known as "triads". Triads are the basis for most Western harmony, and each degree has a certain function that it fulfills within a "chord progression". Chord progressions are basically sequences of triads (or other chords), that resolve or flow along the functional notes of the individual triads/chords. Songs are usually built on chord progressions, and usually resolve in the 1./I. degree, the "Tonic". The Tonic is the most stable and satisfying triad/chord in the diatonic system. The triad on the 5./V. degree (the so-called "Dominant") has the most inherent tension, and resolves directly into the Tonic. This V-I progression with its root movement down a Perfect Fifth is the basis and driving force for all Western music.

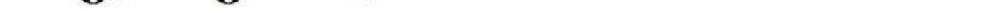
Tonic      V-I progression      Dominant

Continuing to stack further "diatonic" (=contained in the major scale) thirds onto minor and major triads gives us the so-called "seventh chords". This fourth note adds complexity by introducing two different major chords and makes all chords much more interesting by adding color and possibly dissonance.

A musical staff with eight vertical stems representing chords. From left to right, the labels below the staff are: Cmaj7, Dm7, Em7, Fmaj7, G7, Am7, Bm7b5. Above the staff, the word "Tritone" is written above the G7 chord, with a curved arrow pointing to the G7 chord itself.

Now the V-I resolution mentioned in Part 1 becomes clear, since the major 3rd and the minor 7th notes of the V7 dominant chord form a Tritone, the most dissonant of all intervals. Both notes want to resolve into the I. degree (Tonic) by the shortest way possible, so the major 3rd resolves a half step up into the root of the Tonic, and the minor 7th resolves a half step down into the 3rd of the tonic.

Finally, it is possible to stack **three** more notes on top of the four already used. These additional notes are called “options” and can lend additional color and character to a given chord, if chosen carefully. Here, in the example of Cmaj7, you’ll see all possible options first stacked and then transposed down an octave, in order to show the relationship to the scale:


  
**Cmaj7** 9/11/13      C major scale (Ionian)

As you can see, by using all available diatonic options, we are creating a chord that contains all notes occurring in the scale starting with the same root. Such a chord and the associated scale are really one and the same thing, with notes either played together or sequentially. This is the foundation for the concept of the **Diatonic Chord/Scale System**, in which we use certain scales to improvise over certain types of chords. Here are all Major diatonic seventh chords with their associated options and scales, their position in the scale indicated by using Roman numerals:

13	13	b13	13	13	b13	b13
11	11	11	#11	11	11	11
9	9	b9	9	9	9	b9
I maj7	II m7	III m7	IV maj7	V 7	VI m7	VII m7b5
Ionian	Dorian	Phrygian	Lydian	Mixolydian	Aeolian	Locrian

Chords and their associated scales (=reservoir of available notes for improvisation) can be systematically arranged in a number of ways, the easiest would be to arrange them in the order in which they originate, going up and staying within the C diatonic scale, for example: Major (Ionian) from C to C, Dorian from D to D, Phrygian from E to E, and so forth.

A different and very instructive way is to order them according to the psychological effect on the listener. Different note choices (Options) directly affect mood and emotional associations, so we can arrange the seven diatonic scales most efficiently starting from the "brightest" to the "darkest" sounding mode. The three major scales will obviously come first, followed by the four minor scales.

In every new scale, only one note is changed from the previous scale, as indicated.

What is most interesting, is that if we remove the changing notes from either the Major or Minor scales, the result are the Major and Minor pentatonics, meaning that those can be played over any chord of the same tonality!

M  
A  
J  
O  
R  
  
M  
I  
N  
O  
R  
  
m7  
b5

#### IV. Lydian



#### I. Ionian (Major)



#### V. Mixolydian (Dominant)



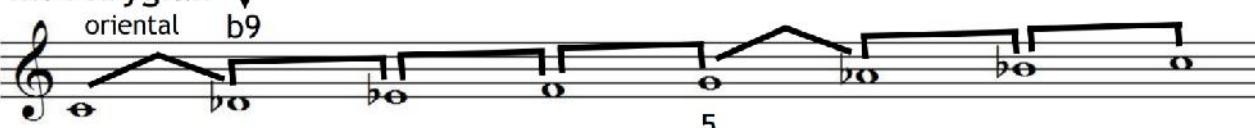
#### II. Dorian



#### VI. Aeolian (Natural Minor)



#### III. Phrygian



#### VII. Locrian

