Of Scales and Modes

A mini thesaurus of common scale usage

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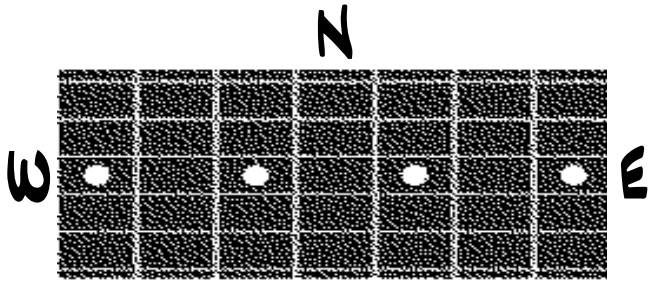
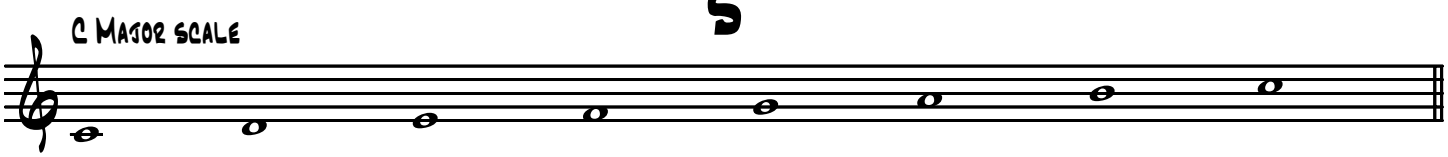
The word scale is derived from the latin/Italian word scala, which means stair. Eric Blom in his book "Everyman's Dictionary of Music" defines a scale as " a sucession of adjoining notes whether proceeding in ascent or descent". Vincent Persichetti in his Book "twentieth Century Harmony" expands the definition to include modes: "A central tone to which other tones are related can establish tonality, and the manner in which these other tones are placed around the central tone produces modality". Scales and modes have been a primary building block in all types of music across the globe for centuries. They are the cornerstone from which we invent melody, counterpoint, and harmony. As contemporary musicians, having a thorough knowledge of scales and derivitive modes is essential to our study of music. Since the study of scales is so big and multi-faceted, I'm limiting this lesson to cataloging some of the more commonly used varieties and their derivitave modes as applied to the guitar.

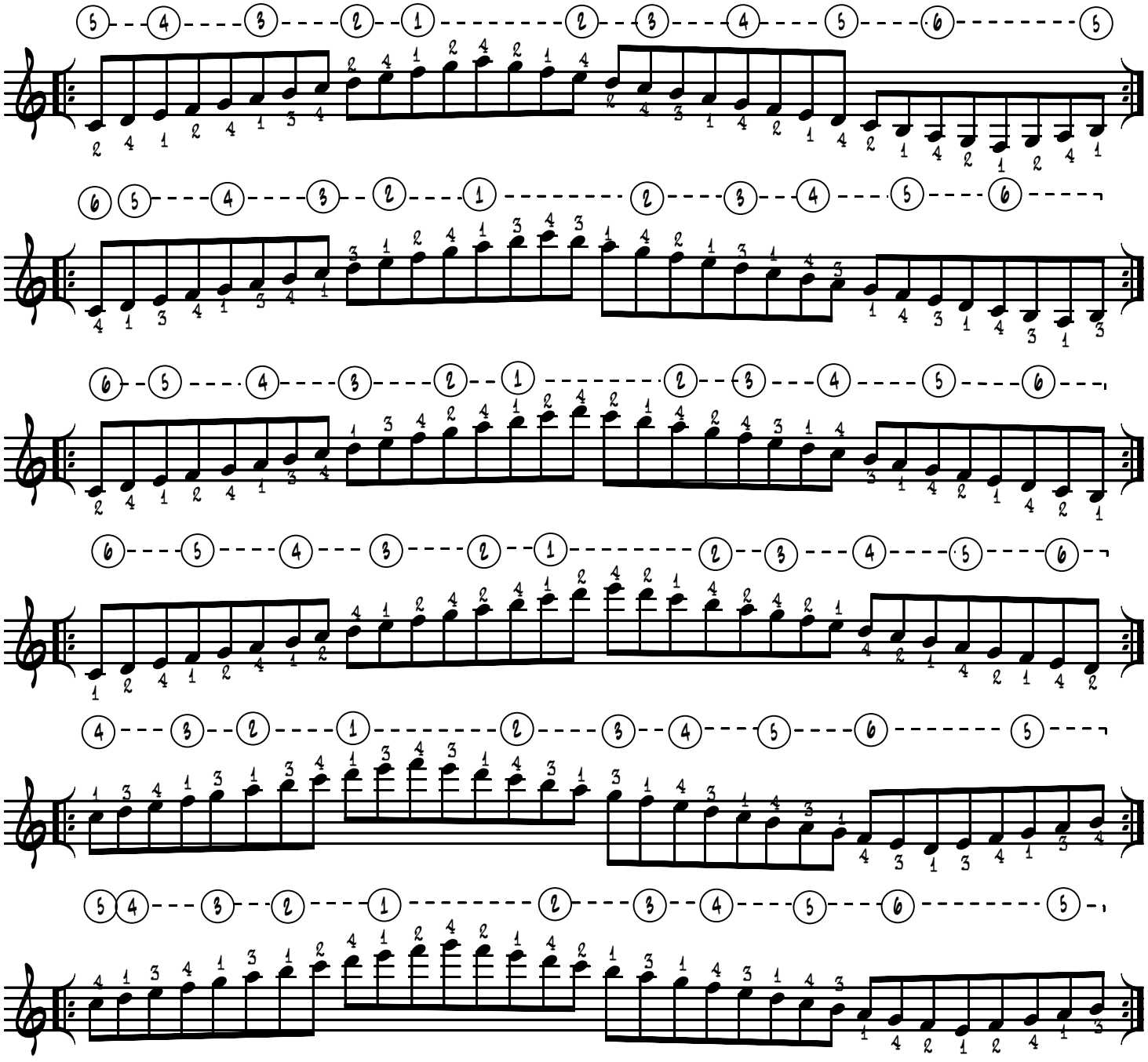
There are many scales out there to study. If you really want to go crazy, check out Nicholas Slonimsky's "Thesaurus of Scales". This is <u>THE</u> definative work on scales and scalar permutations and could be a lifetime of study in itself. My aim here is to provide you with a good basic vocabulary of commonly used scales, especially within the jazz vernacular. Scales are constructed of whole and half steps, with the occasional "giant step" or minor third interval showing up. (If you don't know how to construct scales, take a look at my "Harmony Primer" in this lesson series). They can be constructed of varying amounts of notes. Common scales in the jazz players palette are: pentatonic scales, constructed of five notes, whole-tone scales of six notes, seven-tone scales (which make up the bulk of western music's scalar vocabulary) contain seven notes, eight tones in the octatonic or diminished scale, all twelve notes in the chromatic scale, and varying amounts of notes in "artificial" or "composit scales". But before I list some of these scales, let's think about fingering orientation on the guitar by starting with the most common of all the western scales, the major scale.



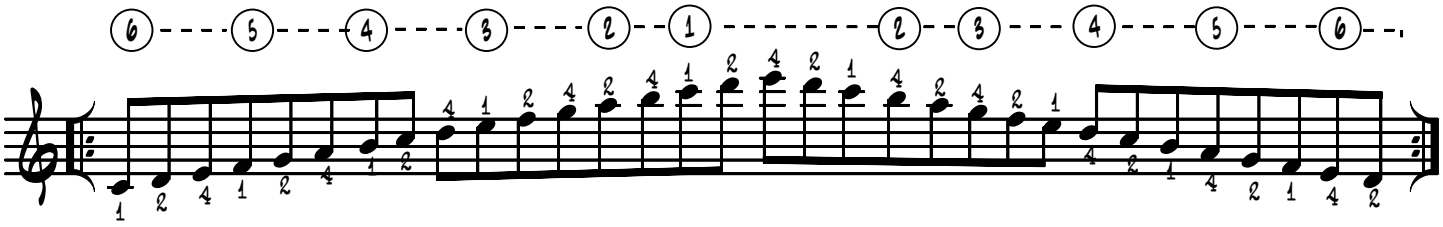


The major scale can be navigated many ways on the fingerboard. If one thinks in terms of direction, north, south, east, and west (or up, down, and side to side) along with diagonals, you get myriad possibilities for note locations.
And that doesn't even account for the fingerings! Your perspective of the directions can be from behind the guitar neck, or looking at the high strings as being "north" vs. "south", etc. Whatever helps! These scales can be played in one, two, and three octave versions on the guitar. Most of the examples to follow will be in two octave form. Major scales are a great place to start with because their fingering shapes can be altered to produce other seven-tone variants.

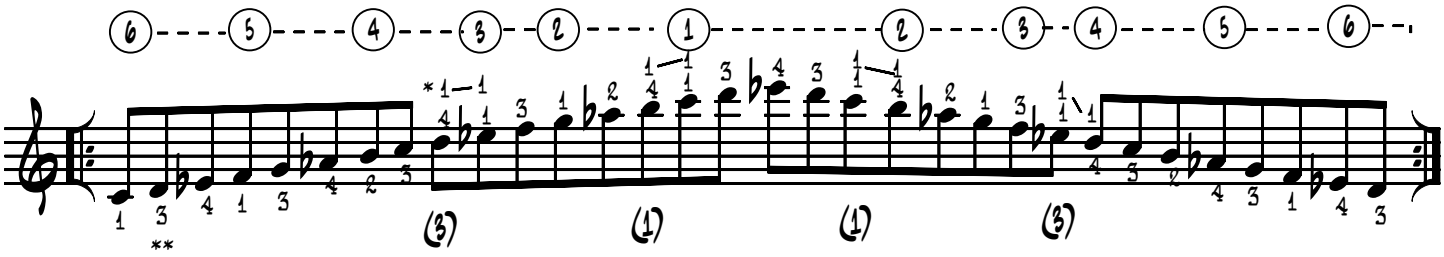
Since there are so many ways of fingering scales, let me suggest some ways to start. The "classic" Berklee way to organize scale fingerings was through the position concept. Joe Pass and Howard Roberts also taught similar systems. Position playing was primarily organized as a tool to organize blocks of tonal musical activity within a limited range of frets. It was also a convenient way to teach sight-reading. In a position, each finger corresponds to a fret, with the first and fourth fingers being designated to stretch an additional fret (first finger to the left or west, and the pinky to the right or east). The idea here was to train the hand to play in a "box" of activity so one could improvise or read music without having to look at the fingerboard while playing. Many of us started out with this concept and there's a lot of value in organizing some of our (or portions of) fingerings this way. Here are some "in position" fingerings for the major scale. All examples are in the key of "C", circled numbers are strings, plain digits are fingers from the index. Notice that many of these fingerings exceed the range of the scale's tonic and incorporate as many diatonic notes from the scale as will fit in a position. This will help to locate and finger modes related to parent major scales. More later!



Keep in mind that these "master" major scale fingerings can be changed to any other seven-tone scale form by altering the basic 1 2 3 4 5 6 7 formula and changing the fingering accordingly. For instance, the formula for a harmonic minor scale is 1 2 ♭3 4 5 ♭6 7 1. Take any of the previous major scale fingerings, lower the third and sixth degrees by a half step (by playing those notes one fret lower) and you now have the sound of and fingering for a harmonic minor scale.

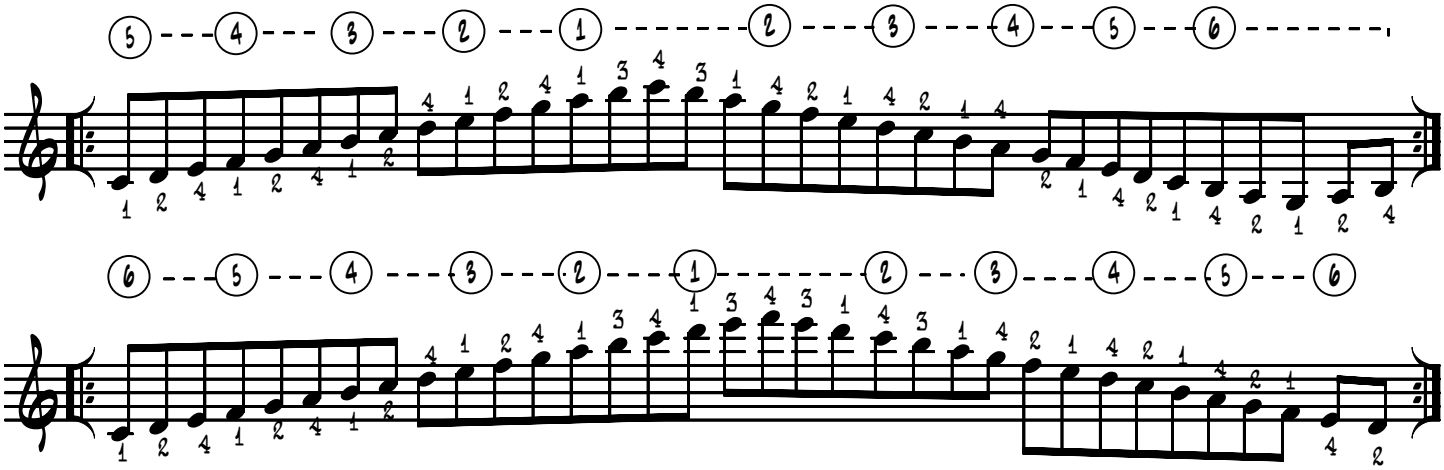


Major scale fingering converted to harmonic minor



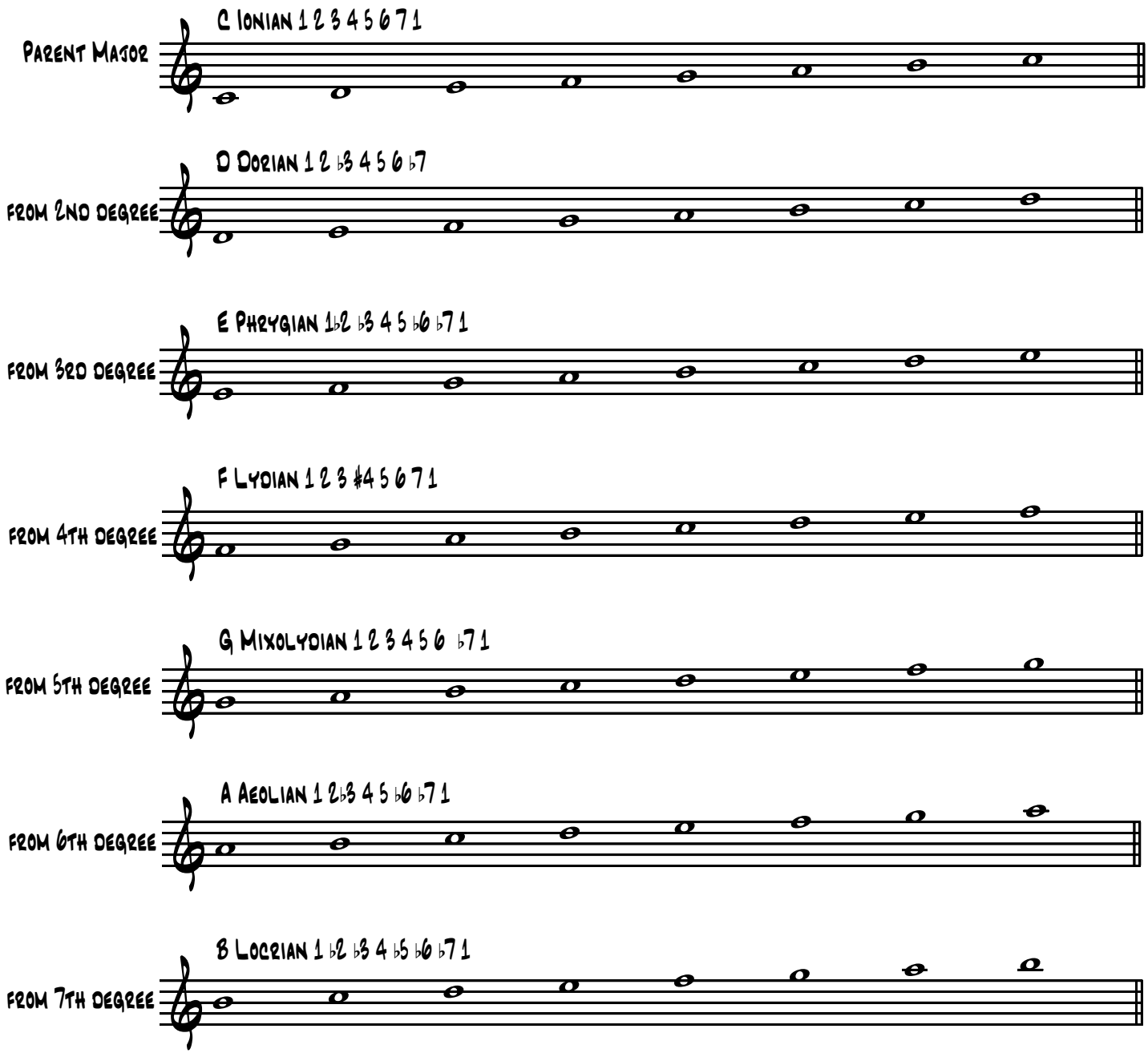
Feel free to experiment with the fingerings. For instance, many guitarists like to slide the first finger on some of the half steps on the above harmonic minor fingering*. I've also changed a couple fingerings, for instance, the second note D**to give the scale a more minor chord shape orientation (play a minor triad barre chord on fret eight and you'll understand). In position scale fingerings are a little "stiff", but contain many arppegio and chord shapes that are useful for improvisation and rendering musical ideas in general. Now, let's move on to some non-position fingerings.

When guitarists started exploring the "horn phrase" ala Wes Montgomery, the position concept of fingering started coming up short when it came to phrasing in improvisational settings and the ordering of jazz sounds on guitar in a modern way. Wes Montgomery was arguably the most successful of the '50's bop guitarists to incorporate the horn phrase in his playing. A completely self-taught player, Wes learned to cop the phrase quality of Charlie Parker on the guitar. His playing (and fingering concept) had an enormous impact on many great younger guitarists of his day, including George Benson, Pat Martino, and Jim Hall. Jim Hall also had some very unique fingering concepts himself, and Wes along with Jim heavily influenced the next great generaqtion of jazz guitarists in their phrasing concepts. One way to start moving in this direction is to play scales and their derivative modes more "diagionally". Here are two major scale forms that we can use as "master" diagonal fingerings.



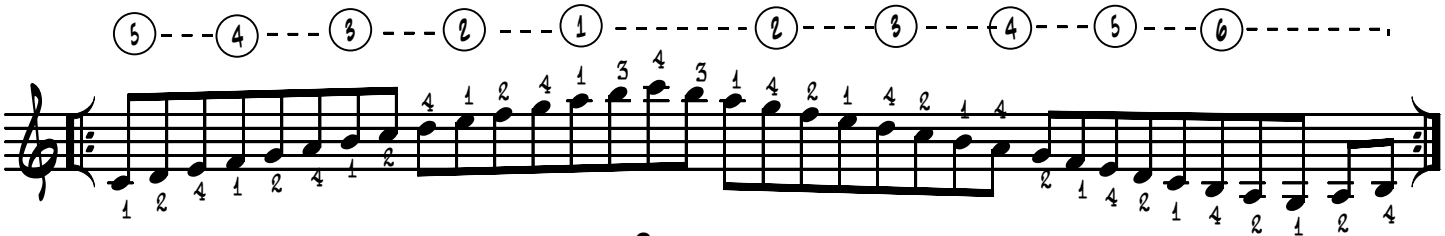
This kind of fingering became widespread in the '60's and '70's. Commonly known as three per string, this organizational concept helped open the door to guitarists learning not only the primary seven-tone scales, but their modes as well. Time to take a look at modes. Modes are notes of a scale that are reordered. An easy way to look at constructing modes comes from these three per string fingerings. You'll notice that the two "diagonal" fingerings for the major scale start with the first finger. Let's start with the diagonal fingering for the "C" major scale on the fifth string. Play the major scale, then staying on the fifth string, go to the next note in the "C" scale, which is "D". Play the notes that are diatonic to C major (C D E F G A B C), but starting from the note "D" with your first finger. Play from "D" to "D" two octaves. The result is a "D" dorian scale. This method is known as derivative. Continue to "derive" modes by moving up the scale degrees of the "C" major starting on the same string, with the first finger starting each new mode. Here's the "C" major scale (also known as Ionian) and its derivative modes in one octave form.

C Ionian and derivative modes

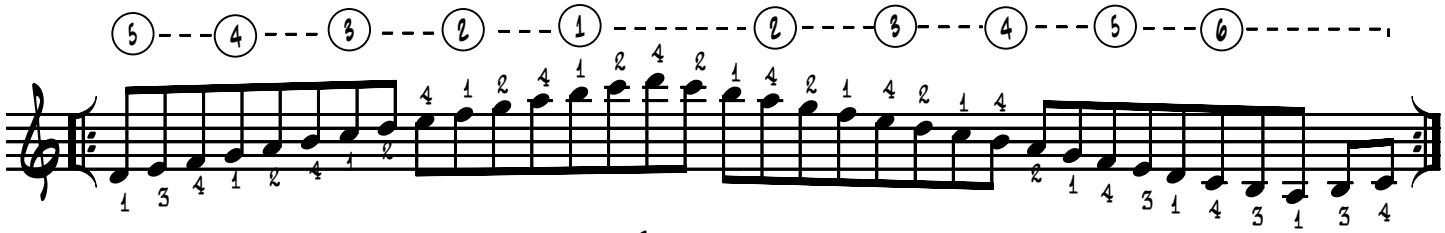


So, as you can see the modes of the C major scale are just a reordering of the same pitches starting from the different scale degrees. With the three per string concept, one moves up the neck through the modes with each new scale starting with finger 1. Here are a couple of examples in two octave form.

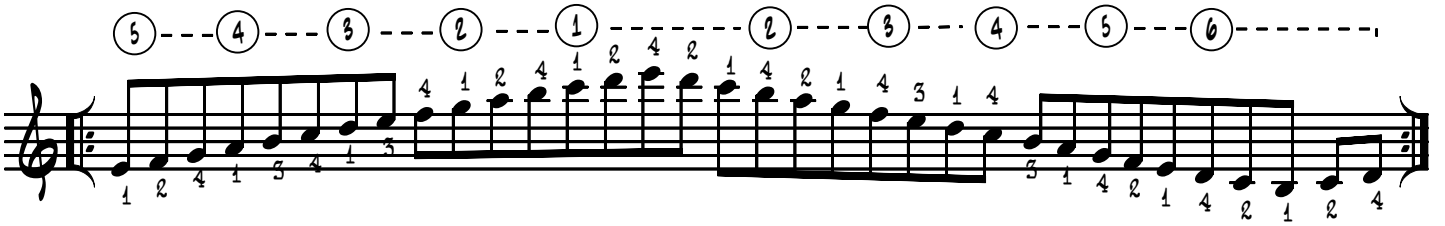
C major or Ionian



D dorian



E phrygian



Continue with this method to derive two octave fingerings for the remaining major scale modes. Feel free to put these scale shapes into pictographic form and start transposing the scale fingerings to other tonics. Then try the derivative modes from the sixth string fingering. Depending on the parent major key and fingering, some keys (like F) will fit all seven scales ascending up the same starting string within a comfortable range on the neck. Other keys might start in the middle of the neck, then run out of room and recycle to the bottom of the neck or to another string starting point.

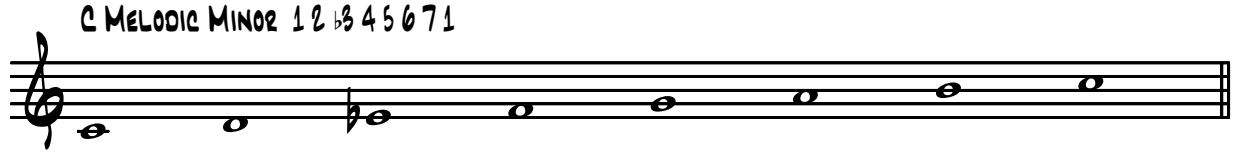
You'll notice that on the previous page where I give the derivative modes of the major/Ionian scale that I've also included a numeric formula. In addition to the three per string, we can now go back to the six major scale "in position" fingerings on page two and apply the formulas for the modes to each individual fingering. Each of these major scale fingerings will now yield six additional modes via what is known as parallel construction. The previous example of the harmonic minor scale being created from altering the notes of the major scale is a parallel application. As noted in the beginning of this lesson, major scales are a great place to start with as their fingering shapes can be altered to produce other seven-tone variants.

And speaking of variants, it's time to explore the three other seven-tone scales and their modes that we use in the Berklee guitar syllabus. These scales are the melodic minor (aka jazz minor), harmonic minor, and harmonic major. Bear in mind that a quick alteration of the major scale and the given fingerings will yield these new scales and their off-shoot modes. The melodic minor is basically spelled like a major scale, but with the third degree flatted (1 2 ♭3 4 5 6 7). The harmonic minor flats the 3rd and the 6th (1 2 ♭3 4 5 ♭6 7). The harmonic major scale flats the 6th (1 2 3 4 5 ♭6 7). Plug these new scales and their modes into your major scale fingerings. Think "in position" and "diagonal" for fingerings, and parallel and derivative for construction. Here are these three scales and their modes notated.

C Melodic Minor (aka Jazz Minor) and Derivative Modes

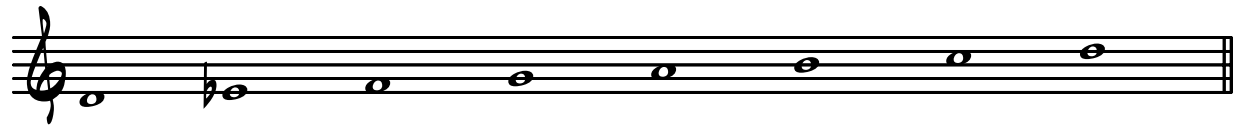
C Melodic Minor 1 2 ♭3 4 5 6 7 1

Parent Minor



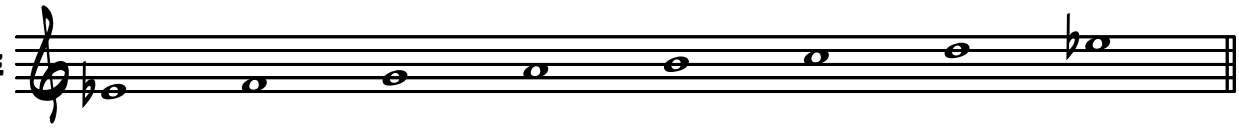
D Dorian ♭2 1 ♭2 ♭3 4 5 6 ♭7 1

from 2nd degree



E♭ Lydian Augmented 1 2 3 #4 #5 6 7 1

from 3rd degree

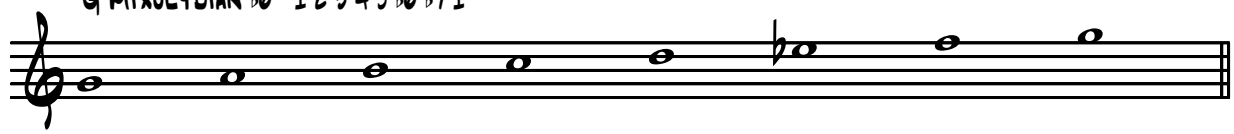


F Lydian ♭7 1 2 3 #4 5 6 ♭7

from 4th degree

G Mixolydian ♭6 1 2 3 4 5 ♭6 ♭7 1

from 5th degree

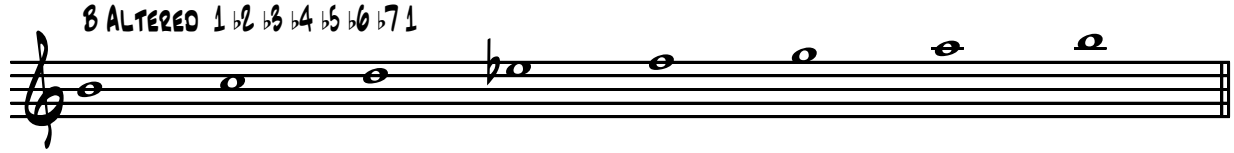


A Locrian ♮2 1 2 ♭3 4 ♭5 ♭6 ♭7 1

from 6th degree

B Altered 1 ♭2 ♭3 ♭4 ♭5 ♭6 ♭7 1

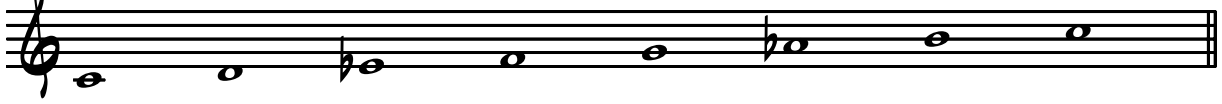
from 7th degree



C harmonic minor* and derivative modes

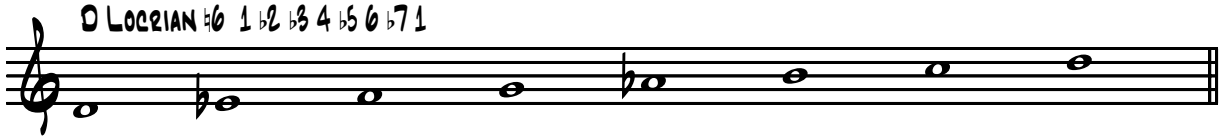
C harmonic minor 1 2 ♭3 4 5 ♭6 7 1

parent minor



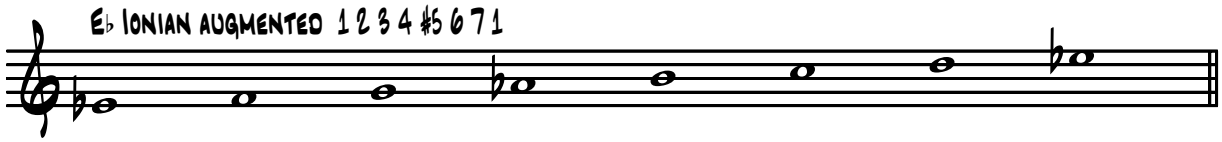
D Locrian ♮6 1 ♭2 ♭3 4 ♭5 6 ♭7 1

from 2nd degree



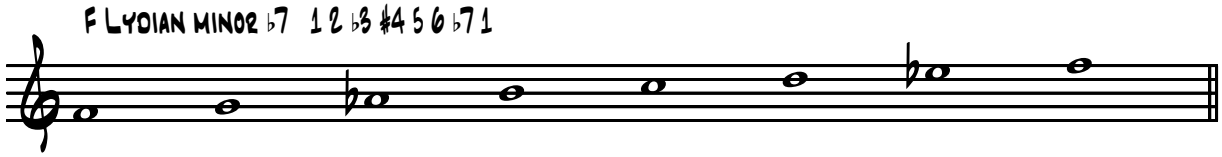
E♭ Ionian augmented 1 2 3 4 #5 6 7 1

from 3rd degree



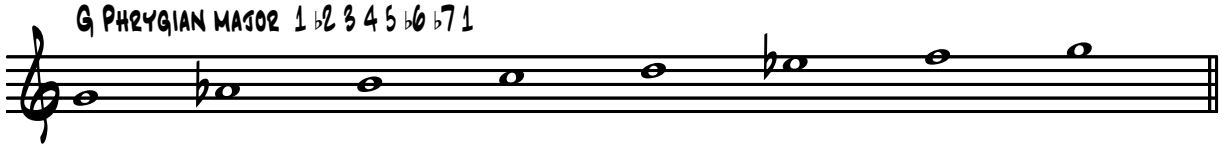
F Lydian minor ♭7 1 2 ♭3 #4 5 6 ♭7 1

from 4th degree



G Phrygian major 1 ♭2 3 4 5 ♭6 ♭7 1

from 5th degree

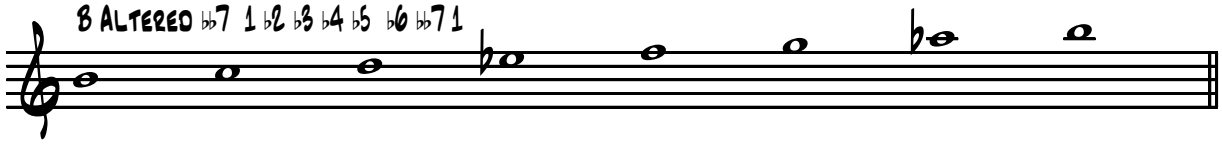


A♭ Lydian #2 1 #2 3 #4 5 6 7 1

from 6th degree

B Altered ♭♭7 1 ♭2 ♭3 ♭4 ♭5 ♭6 ♭♭7 1

from 7th degree

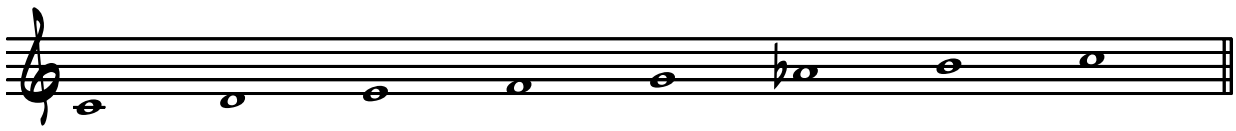


* The modes of the harmonic minor scale are not exactly household names. Designations like altered ♭♭7 come mainly from analysis. These scales are more commonly referred to as mode 2, mode 3, etc. of harmonic minor, or harmonic minor from the 2nd degree, etc.

C HARMONIC MAJOR AND DERIVATIVES MODES*

C HARMONIC MAJOR 1 2 3 4 5 ♭6 7 1

PARENT MAJOR

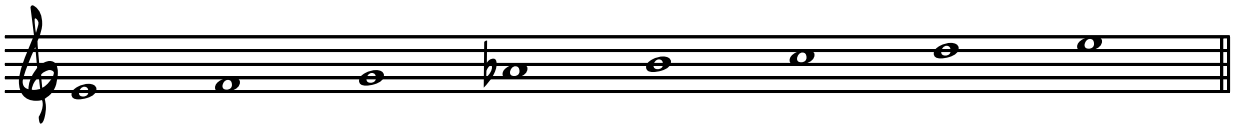


D DORIAN ♭5 1 2 ♭3 4 5 6 ♭7 1

FROM 2ND DEGREE

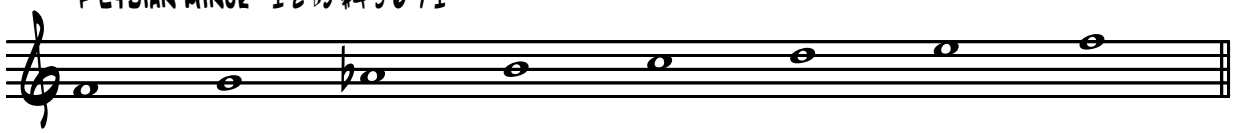
E PHRYGIAN ♭4 1 ♭2 ♭3 ♭4 5 ♭6 ♭7 1

FROM 3RD DEGREE



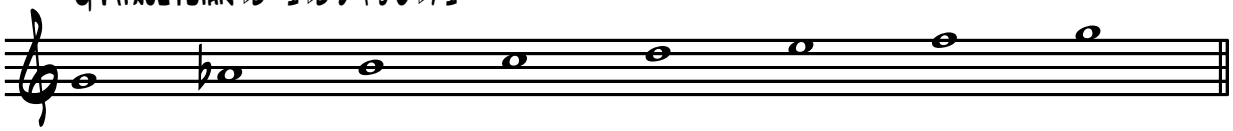
F LYDIAN MINOR 1 2 ♭3 ♯4 5 6 7 1

FROM 4TH DEGREE



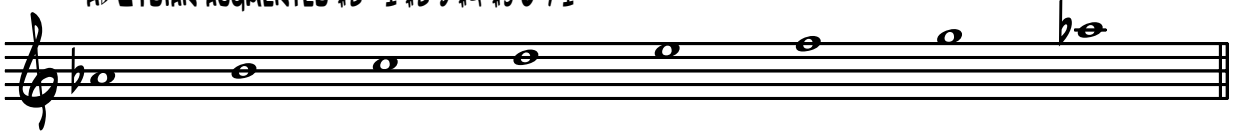
G MIXOLYDIAN ♭2 1 ♭2 3 4 5 6 ♭7 1

FROM 5TH DEGREE



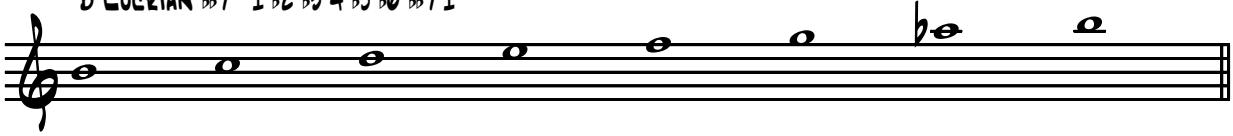
A♭ LYDIAN AUGMENTED ♯2 1 ♯2 3 ♯4 ♯5 6 7 1

FROM 6TH DEGREE



B LOCRIAN ♭♭7 1 ♭2 ♭3 4 ♭5 ♭6 ♭♭7 1

FROM 7TH DEGREE

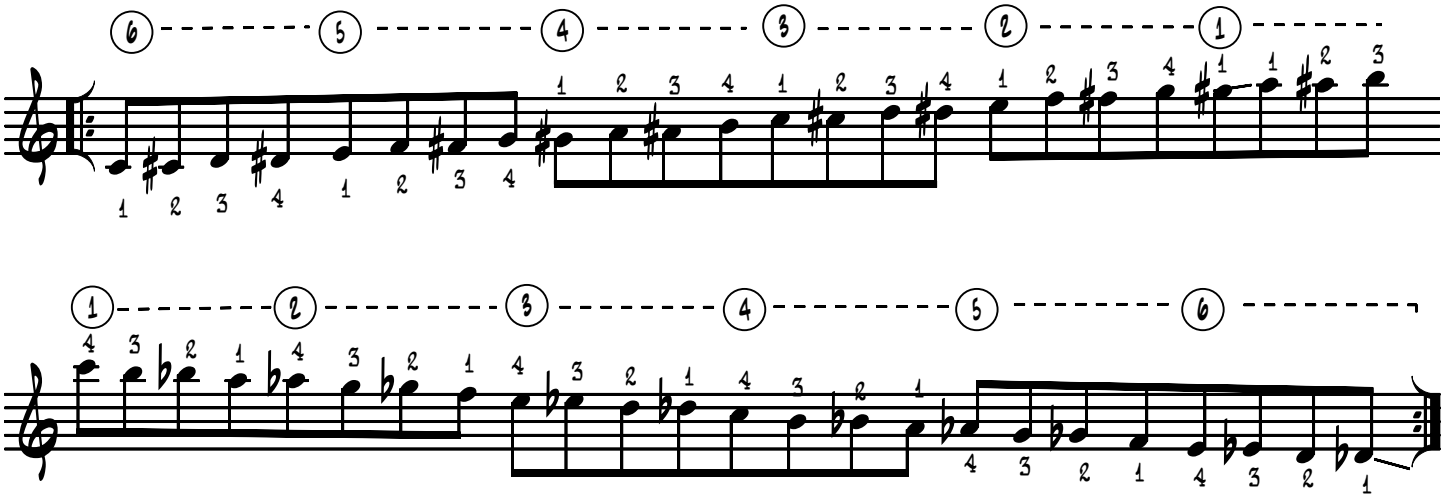


* ONCE AGAIN, LIKE THE HARMONIC MINOR SCALE, THE HARMONIC MAJOR SCALE CREATES SOME PRETTY STRANGE ANALYSIS AS FAR AS THE NAMES GO. THINK SCALE BY DEGREES.

In addition to the previous seven-tone scales, there are many other scales that are commonplace in compostional and improvisational usages. The four additional scales that we focus on at Berklee are: The chromatic scale, the whole-tone scale, the diminished scale, and the pentatonic scale. These scales are very "guitar-oriented". Because of the guitar's tuning in fourths, these scales and their off-shoot sequences tend to form geometric shapes and patterns on the fingerboard. These "shapes" have many constant structure aspects which make them easy to visulize, finger, and to transpose the fingerings symetrically. Check out some of Pat Martino's writing and videos on this subject.

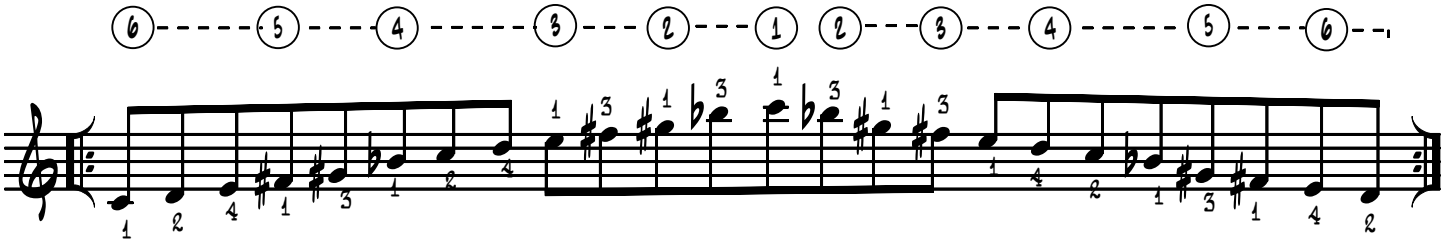
The Chromatic Scale

The chromatic scale contains all twelve notes, and moves diagonally across the fingerboard in a very user-friendly pattern utilizing one finger per fret, with a couple of shifts:

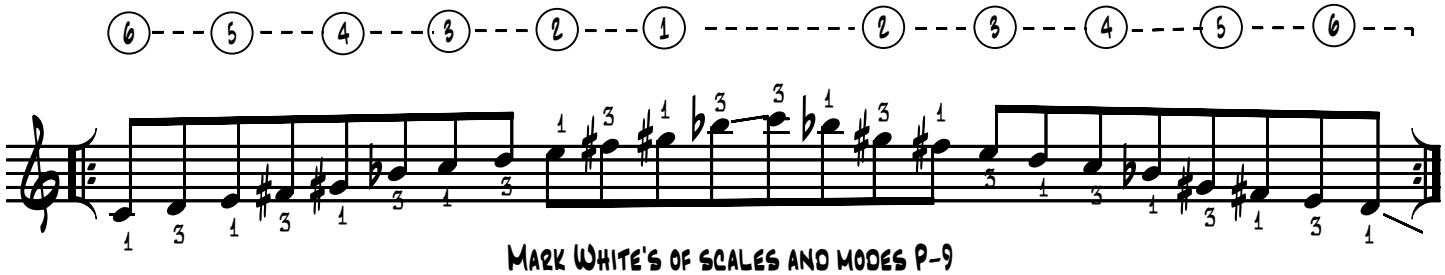


The Whole-Tone Scale

The whole-tone scale, containing six notes, has a strong affinity to augmented triads and augmented seventh chords, in addition to lots of other applications. There are only two whole-tone scales as six notes divide the octave (twelve half-tones) by two. The whole-tone scale can be named from any pitch you start on, but notice that the same collection of six notes and the same fingering recyle themselves every two frets or at the interval of a major second. This useful fingering is derived from one of the "in-position" major scale shapes.



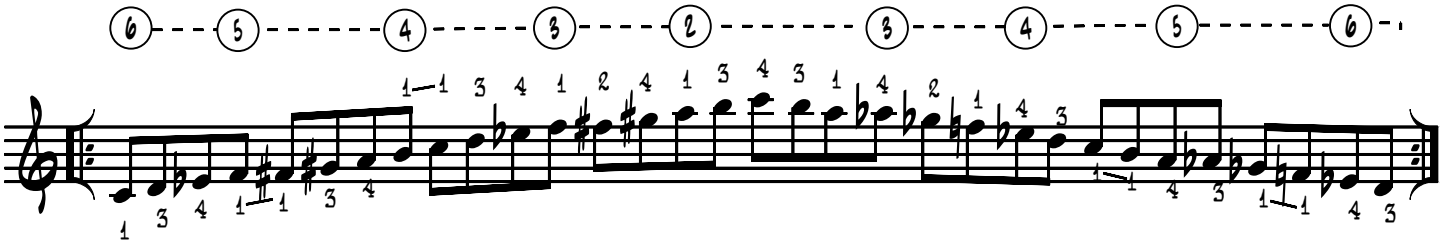
Here's another fingering, this time using only the first and third finger.



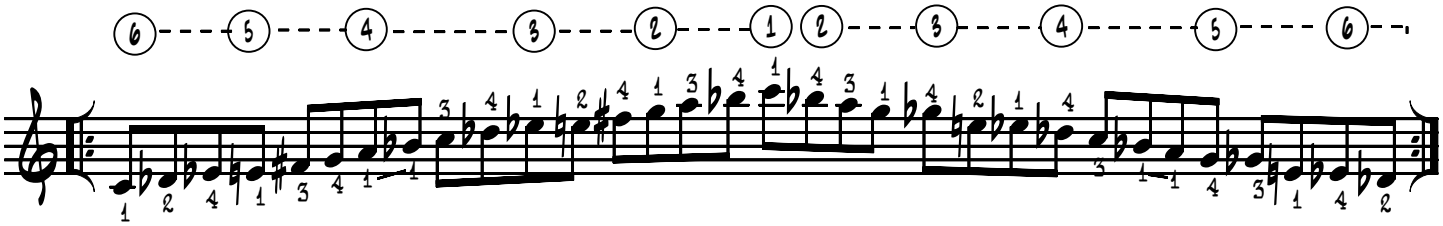
The Diminished Scale

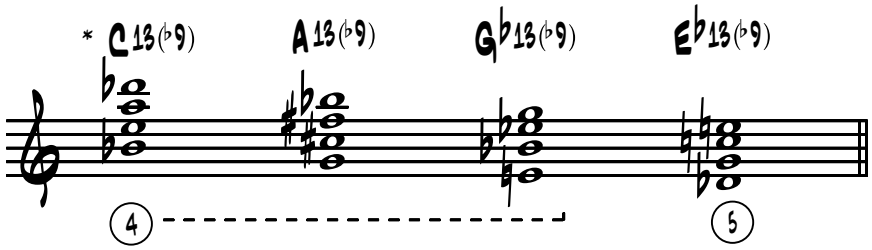
The diminished scale, also known as the octatonic scale, contains eight notes. Constructed by a formula of constant whole-step/half-step, or half-step/whole-step intervals, the scale repeats itself after eight notes. There are three diminished scales, which repeat themselves in minor thirds. This divides the octave (twelve half-steps) into four. Obviously related to the diminished 7th chord, the scale like the chord and its fingering repeat with the same collection of notes after the interval of a minor third. The diminished scale has strong improvisational applications over the diminished 7th and dominant 7th chords (dominant 7th with diminished characteristics ♭9, ♯9, ♯11, 13). This scale has been widely used compositionally in diverse contexts from composers such as Alban Berg to many great writers for film and television.

Here's the whole-step/half-step version. Notice the direct connection to the C dim7 chord and its symmetric inversions E♭ dim 7, G♭dim7, and A dim7



This next version is the half-step/whole step formula. Notice its relationship to C7♭9 and the other dominant chords moving symmetrically in minor thirds around it: A7♭9, G♭7♭9, and E♭7♭9. Furthermore, the diminished characteristic tensions ♭9, ♯9,♯11, and 13 can be attached to these four chords. the shapes will transpose drawing the same tensions from the scale on each structure. For instance, C13♭9, A13♭9, G♭13♭9, and E♭13♭9 can all be spelled from the same C half/whole diminished scale, and the same chord shape (grip) moved in minor thirds produces the same structure (13♭9) on all four roots (C, E♭, G♭, and A).

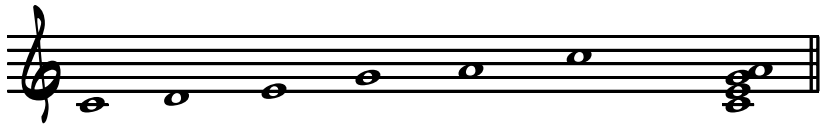




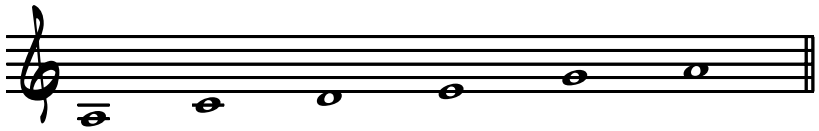
* some of these chord tones are spelled with enharmonic equivalents to preserve the interval structure from the chord root. All of the notes still come from the above diminished scale.

The Pentatonic Scale

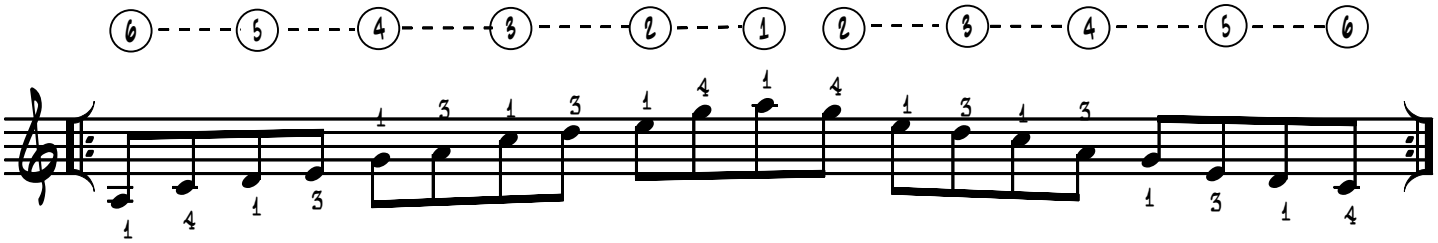
Pentatonic scales and their usages are a big subject. We'll simplify here and follow the Berklee syllabus again. The two pentatonic scales we work with are the tonic major (1, 2, 3, 4, 5, 6) and minor (1, 2, ♭3, 4, 5, 6). Both scales contain five notes and can be played from any note in the scale which creates modes. The major pentatonic starting from note one has an obviously strong relationship with a major 6th chord:



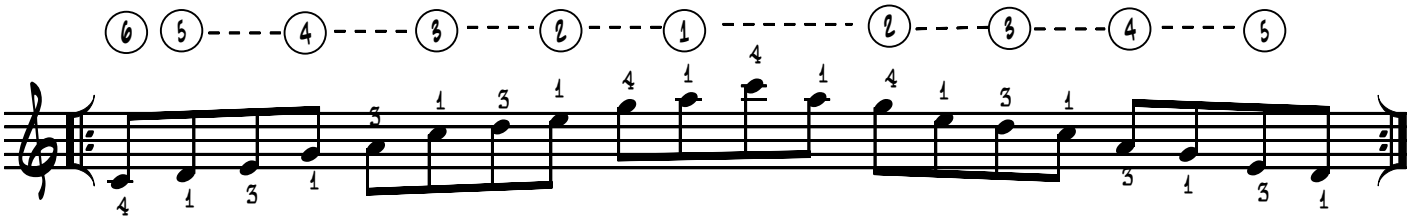
But while the tonic major version has a strong major quality, we guitarists more typically use the scale from its fifth note, creating the "classic" minor seventh pentatonic:



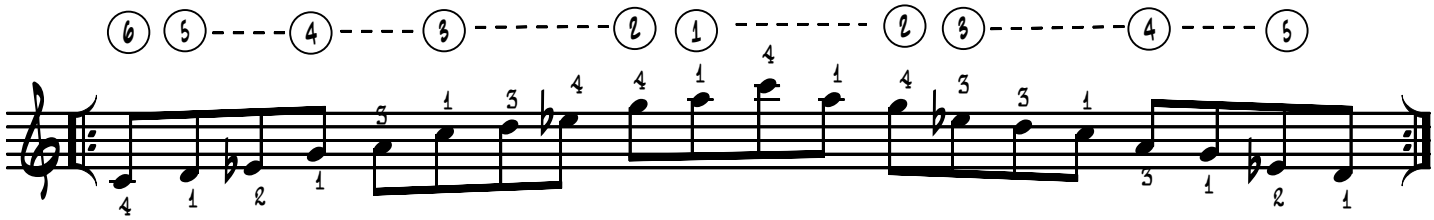
In a two-octave version, many of us learn this fingering/location first:



You can see how it relates directly to the parent major scale given here in two octaves.



By lowering the third note of the previous major pentatonic we now have the minor sixth pentatonic (1, 2, ♭3, 4, 5, 6).

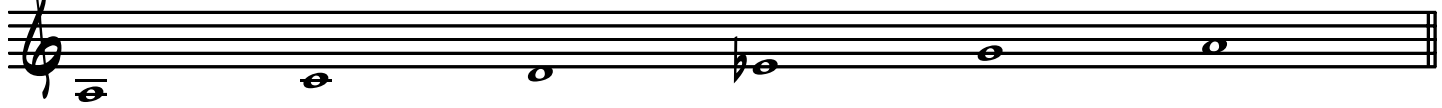


Naming these pentatonic scales and their modes is not like the seven-tone scales and their off-shoots. No familiar scale names like Dorian or name tags other than the analysis/description of the scale quality. Such as: major or minor and any other characteristics that can be related to a chord or scale degree. The A minor seventh pentatonic above is an example. This could also be called mode five of a C major pentatonic.

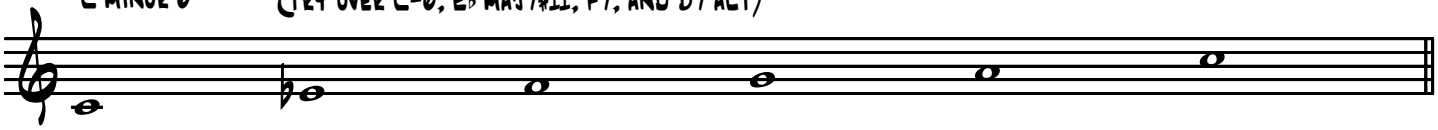
As you can see, one can create many variations just by changing a note or two. Here are some commonly used pentatonics and their relationships to some harmonies for improvising. Try changing the notes of the previous major and minor scales fingerings to locate these new scales on the fingerboard. Also experiment with more diagonal fingerings. Look ahead to the pentatonic three octave fingerings and try the 3/2 scheme in two octaves.

This is the previously shown minor seventh pentatonic, but now with a ♭5. I've written it starting on "A" again.

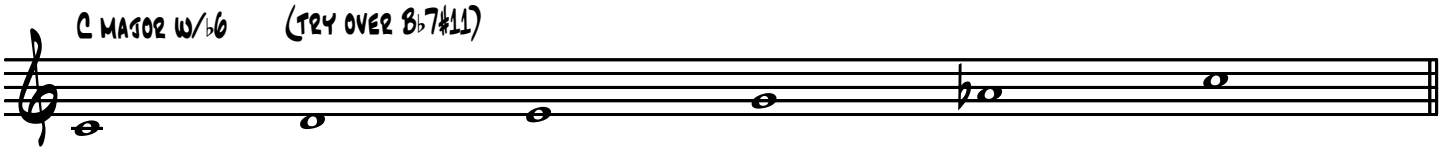
A minor w/♭5 (try over A-7♭5, A♭9, D7♭9, and E♭-6)



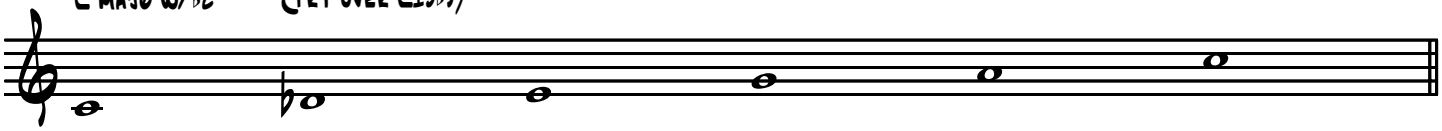
C minor 6 (try over C-6, E♭ maj7#11, F7, and B7 alt)



C major w/♭6 (try over B♭7#11)

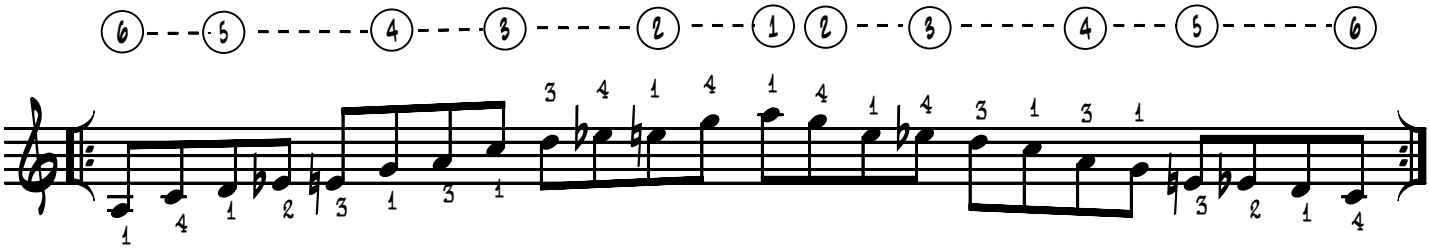


C maj6 w/♭2 (try over C13♭9)



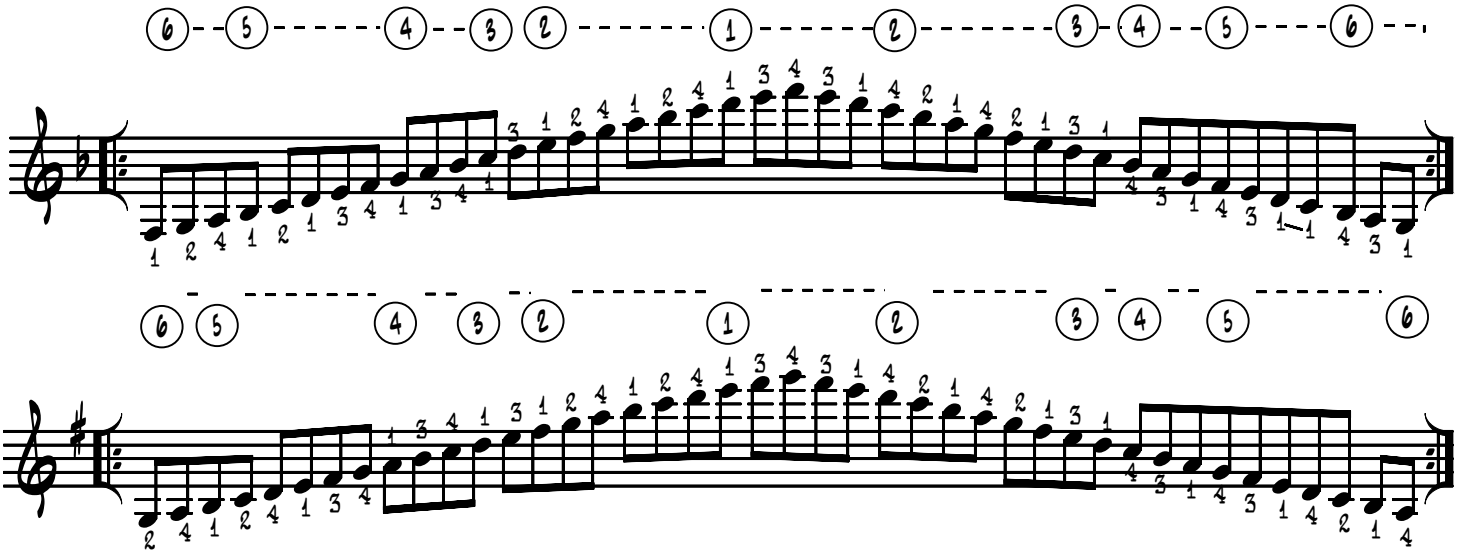
The Blues Scale

One last scale to add to our collection here, the blues scale. While containing six notes (and therefore technically not a pentatonic scale) it's a kissin' cousin to the minor seventh scale listed previously. Its formula (1, ♭3, 4, ♭5, ♮5, ♭7) fits nicely into the formers fingering shape. I've writen it here again on "A" as the tonic. Countless blues, jazz, and pop melodies and solos have been "born" from this scale and especially this particular fingering on the guitar.



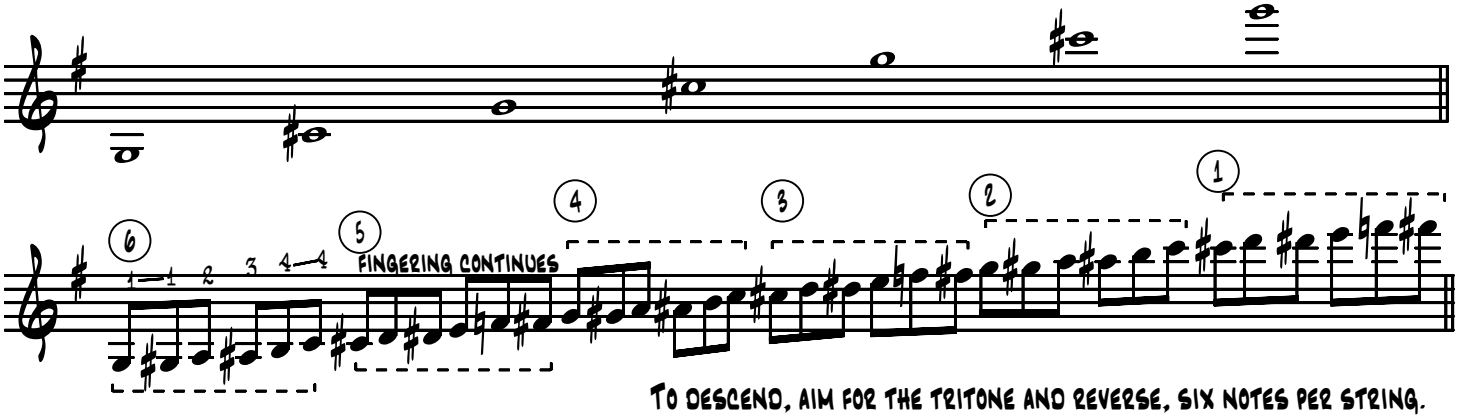
That's going to do it for our scale list. There's enough here to keep anyone busy for a long time! The key point I want to make here is that the locations for these scales can be derivative from shapes you've already encountered. Whether a scale is five, six, seven, or any number of notes, there's bound to be some relationship content-wise to a fingering location you already know. And speaking of location, you'll have noticed by this time that all of the fingerings have been in two octave form. Two octaves is a good place to start. Many music schools audition/test their students with two octave scales in the early semesters. There are many good technical reasons to practice scales including two-handed co-ordination, flexibility of the joints, intonation, etc. that are essential for younger players "guitaristic" development. Two octave fingerings are easy to memorize and there's a lot of visual continuity between the scale forms.

In the later semesters at Berklee, students begin working in three octave configurations of the scales presented here. Andres Segovia's book "Major and Minor Diatonic Scales" also presents his scale fingerings in three octave form. I'll take a moment here to show you how to convert to three octave scale fingerings. The easiest way to create fingerings is to overlap portions of the two octave versions. Sometimes I'll use just a fragment from a scale then shift into another scale shape and continue this way until I've got the three octave form. Here are a couple of examples:



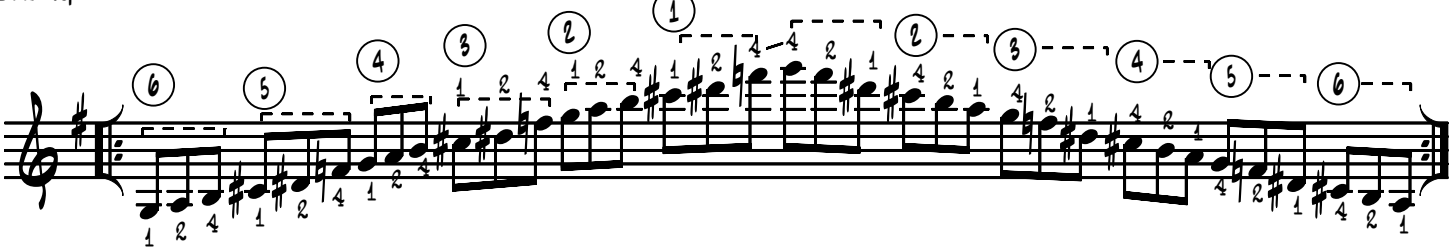
Can you see the underlying major scale forms that these fingerings are made of? Feel free to shift where you like and convert these scales into melodic minor, harmonic minor, etc. Most seven-tone scales will derive easily from these fingerings, but scales like the chromatic and the symmetric scales take on a little more "mathematical" fingering shape.

The three octave chromatic scale can be played by orienting to the interval of a tritone, then filling in the chromatic notes in between. Let's start on the pitch "G" this time.

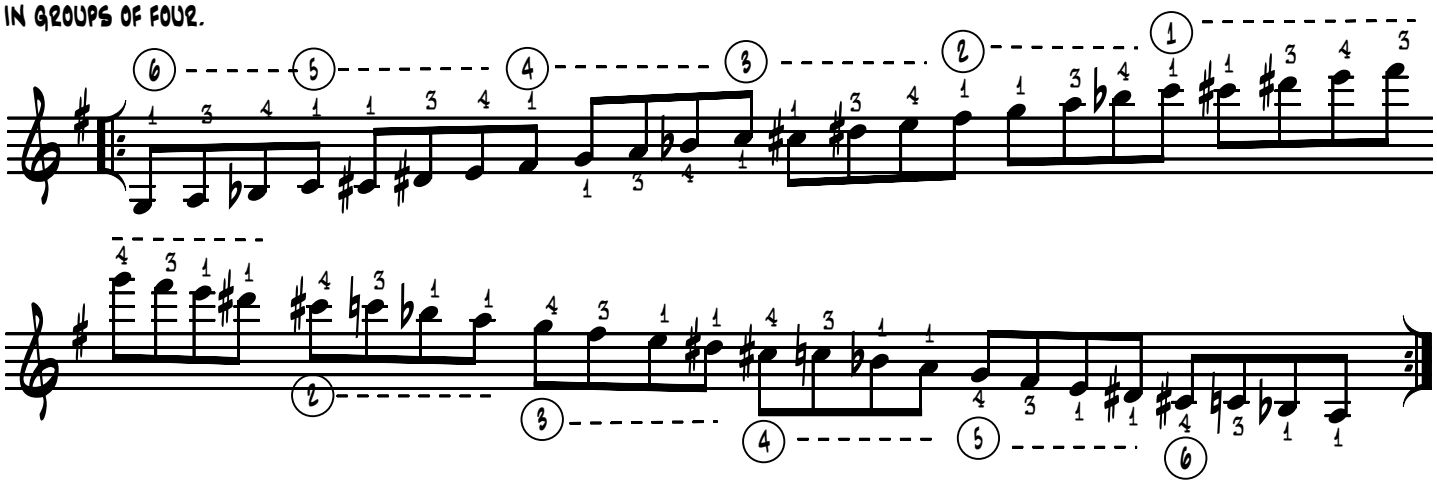


To descend, aim for the tritone and reverse, six notes per string.

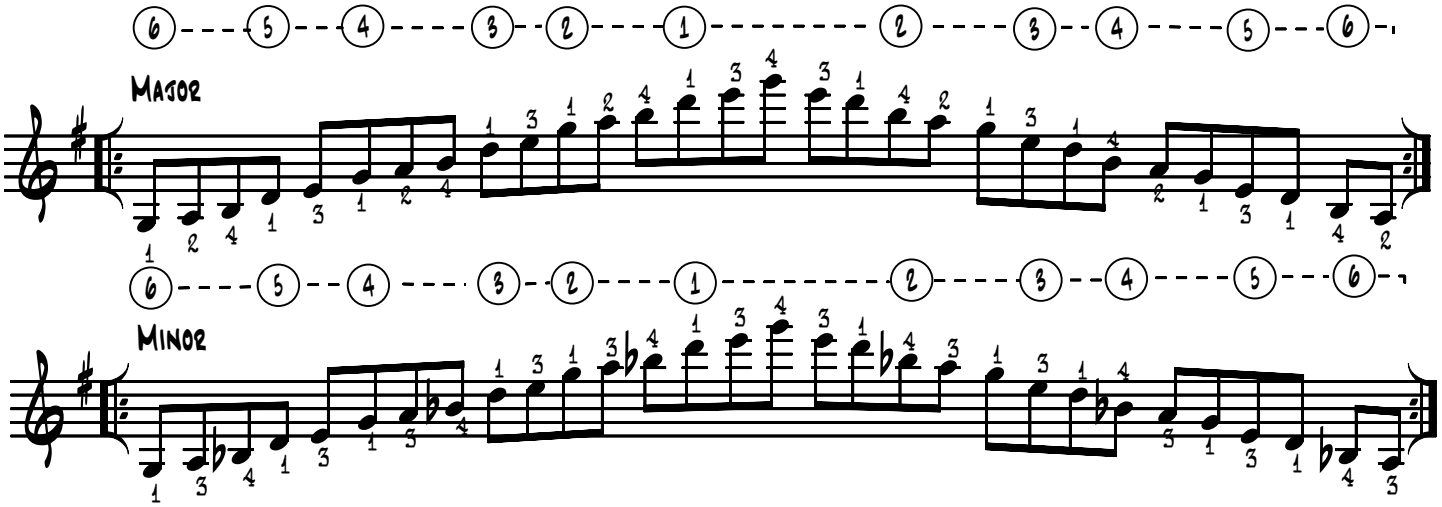
The whole-tone scale in three octaves can be oriented in a similar way. Aim for the tritones and play three notes per string.



The diminished scale can also be oriented toward the tritone target we've been using. Ascending chromatically, approach the notes of the tritone from a half-step below. Descending, play directly from the notes of the tritone in groups of four.



The major and minor pentatonic w/6th scales fit well in a three on one string, two on the next scheme.



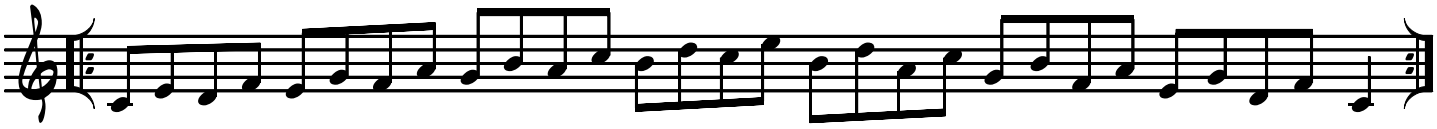
These three octave scale examples should get you started. They by no means cover every possibility, or for that matter very many available tonics. Try taking similar "visual" ideas and start some fingerings on the fifth string as well. This will be necessary to play these scales in twelve keys, though in a few situations it will be impossible to play a full three octaves on some guitars. Three octave scale forms give us the maximum amount of register on the guitar and are a good challenge to play smoothly. They also pave the way for more extreme register content in some music.

There are, of course, many different ways to "realize" and phrase ideas on the guitar. Not all of them even need two or three octaves of register to execute. Many times just a portion of a two-octave fingering moving on to another fragment of a different scale or arpeggio is the best way to move. This last topic is what I consider to be the key ingredient of contemporary guitar playing, phrasing up and down the string legnth. Many of the scale examples shown here without fingerings are presented in one octave and can be played in position or diagonally. The two octave versions can of course, be split into halves, and there's two possibile one octave versions. But we can also begin to realize the one octave scale versions moving up or down the neck using just one string at a time. This is a very natural thing to do on the guitar. Most of us picking up the guitar for the first time tried to pick out a melody on one string. Remember? Wes Montgomery used this idea in rendering some of his single-string lines, but was particularly adept at organizing melodies harmonized with chords in this fashion. Jim Hall in particular also took advantage of organizing melodies on a single string at a time, creating a trademark sound.

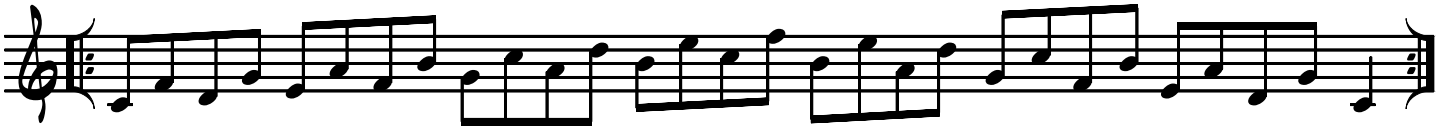
Playing up a single string at a time imparts a "breathing" or horn quality to a line. This quality of phrasing became the hallmark of the next generation of great jazz guitarists. Sometimes called "The Boston School of Guitar", this concept of guitar phrasing and orientation is personified by players like Mick Goodrick, Pat Metheny, John Scofield, Mike Stern, and John Abercrombie among others. While this lesson is not particularly oriented to improvisation, the usage of scales plays a key role in improv content . You can begin exploring this concept by playing the preceeding scales in one octave up and down a single string. A tall order to be sure! The benefit of two and three octave scales is the constant transposition and the visual aspect of a "master" scale form that can be altered by changing a note here and there to create other scales. Not so in the side to side concept. First of all, each string starts with a different pitch, so the order of a scale's whole and half-steps occurs in different places. Plus by starting down around the nut you might be playing the fifth of the scale as lowest available note on that string. Seconoly, because of the scale spellings in different keys, a particular scale or mode may utilize an open string where another one may not. This leads to irregularities in the fingerings, and a less "visual" aspect to organizing, but it's worth the effort. Try singing the scales and melodies on one string. This is a good way to "stratify" your hearing on guitar. One string at a time becomes a managable task, whereas the entire fingerboard and all the possibilities for movement (and learning to hear those movements) is considerably more involved! Experiment with your fingerings too. Connecting notes by shifting the same finger vs. using the fingers in sequence can have a vey different feel and phrase quality.

And speaking of sequence, to end off this lesson I'd like to suggest some ways to vary all this scale content we've learned. Scales by themselves are great technical and organizational tools. They make up a good portion of musical content and can be embellished by chromaticism (bop-scales), etc. But they're still just scales. So once you get some of these scales together (in whatever configuration), I suggest you vary them and move them one step closer to musical application by the use of sequence. A scalar sequence is a succession of notes drawn from a scale as opposed to, say, an arpeggio. A diatonic scalar sequence means that the succession of notes is drawn only from the pitches of that scale, in that key. Diatonic sequences are a great place to start, and there's almost endless variation. Start first with diatonic intervals in seconds, thirds, fourths, fifths, sixths, and sevenths. It doesn't matter which scale you use, but all the pitch choices in the sequence will be drawn exclusively from that particular scale. You'll notice that in some cases an interval such as a third will sometimes be major, sometimes minor because of the note choices being drawn only from the set of pitches contained in the scale at hand.

This is a one octave sequence of diatonic thirds in C major.
Try it in various positions and playing up/down the fifth and fourth strings.

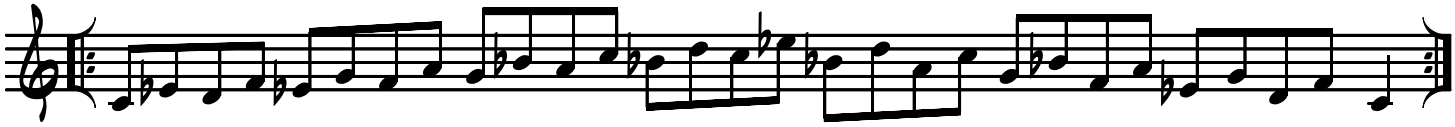


This is a one octave sequence of diatonic fourths in C major.
Try it in various positions and playing up/down the fifth and fourth strings.

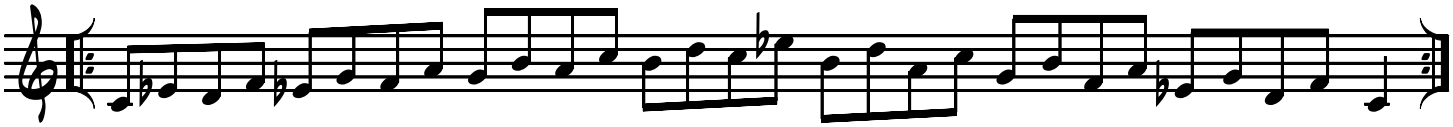


These diatonic interval studies can be configured in one, two, or three octave versions. The one octave sequences can be fingered in position, diagonally, and side to side moving up and down the neck on just two strings. The two octave sequences can be played diagonally, in position, as well as side to side (you'll need two or more sets of two strings to complete the extra range). Three octave versions can be combinations of all three fingering methods. When you get the major scale sequences down, you might begin to explore the derivative modes, or parallel applications of formula to a pitch. Then try using a different parent scale, such as the melodic minor.

This is a one octave sequence of diatonic thirds in C dorian.
Try it in various positions and playing up/down the fifth and fourth strings.

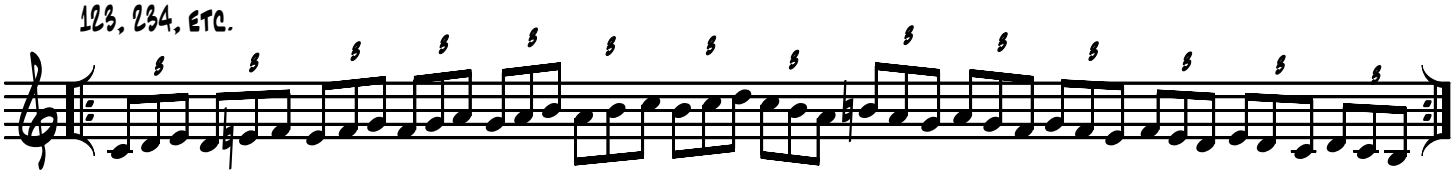


This is a one octave sequence of diatonic thirds in C melodic minor.
Try it in various positions and playing up/down the fifth and fourth strings.



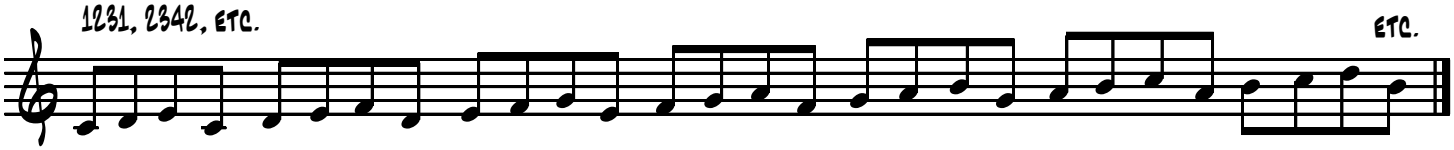
In addition to the interval sequences, we can use use any combination of scale numbers to create sequences. These "number" seuences can work in groups of three, four, five, whatever. Some major scale examples coulo be:

123, 234, etc.



1231, 2342, etc.

etc.



Sequences can be a very useful tool for learning how to hear on the guitar. Completion of a sequence coordinates the ear with the fingers in the rendering of these basic melodies. While there are countless permutations, try getting just a few together at first. Try playing them in twelve keys and explore the different possibilities for fingering in one, two, and three octave configurations. All the scales presented here (major, melodic minor, harmonic minor, harmonic major, and all their modes, along with the chromatic, whole-tone, diminished, pentatonic, and blues scale) can be utilized for sequences. Keep an "ear out" for use of sequences by your favorite players and experiment with their usage in your improvisations and compositions.