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SCALE CONSTRUCTION

THE MUSICAL ALPHABET

There are 12 notes in the musical alphabet: seven natural notes A B C D E F G and five sharp/flat notes A♯/B♭ C♯/D♭ D♯/E♭ F♯/G♭ G♯/A♭ in between. The tonal distance—difference in pitch or interval—between a natural note and the next natural note is a whole step (W) or a half step (H). A sharp (♯) raises pitch by a half step, a flat (♭) lowers pitch by a half step. The order of notes is always A--B-C--D--E-F--G--A. The hyphen "-" indicates a half step. Therefore between A--B, there is one whole step, between B-C, there is a half step, between A♯-B or B♭-B, there is a half step.

THE MAJOR SCALE

A scale is a selection from these 12 notes in the musical alphabet: it's a note pool to draw from. For example, C--D--E-F--G--A--B-C is a selection of seven notes and makes up the C Major scale. Hyphens outline the tonal relationship between consecutive notes in the scale: W–W–H–W–W–W–H. If we apply this tonal relationship, starting on a note other than C, such as G, we have G--A--B-C--D--E--F♯-G, the G Major scale. Instead of writing this relationship in terms of W/H or note names, we can write it by assigning numbers—scale degrees—to each note in the scale. The Major scale becomes: 1--2--3-4--5--6--7-8. In C Major, 1 is C, 2 is D, 3 is E, etc. In G Major, 1 is G, 2 is A, 3 is B, etc. This **formula** defines the Major scale. Be it C Major, G Major, or any other Major scale, the notes in the scale change but the formula (scale degrees or W/H) remains the same.

8 is the same note as 1, an octave higher. It is customary to include it in the formula to underline the distance separating the last scale degree 7 and the octave 8. It is not an extra note in the scale. For the same reason, the tonic at the octave can be shown at the end of the notes in the scale (e.g., C added after B for C major).

OTHER EXAMPLES

The Natural Minor scale is a seven-note scale defined by the formula 1--2-♭3--4--5-♭6--♭7--8. The C Minor scale is therefore C--D-E♭--F--G-A♭--B♭--C. Starting on G, we build the G Minor scale made of G--A-B♭--C--D-E♭--F--G. The Minor Pentatonic scale is a five-note scale defined by the formula 1---♭3--4--5---♭7--8. If we apply this formula to C, we have C---E♭--F--G---B♭--C, the C Minor Pentatonic scale. Let's take the note C on string 5, fret 3 and roll out the W/H relationship defining the scale along that string (W+H)–W–W–(W+H)–W. We can repeat this operation, starting on the same note C on string 6, fret 8, this time rolling out the formula across multiple strings.

In a scale formula, scale degrees are compared to the Major scale formula. This is why in the Minor scale, scale degrees 3, 6, 7 are flattened with a ♭ prefix, because they are a half step flat compared to their Major scale counterpart. This is also why in the Pentatonic scale, degrees are not numbered 1---♭2--3--4---♭5 but 1---♭3--4--5---♭7 with scale degrees 2 and 6 being omitted.

MUSICAL ALPHABET

A--B-C--D--E-F--G--A

A - A♯/B♭ - B - C - C♯/D♭ - D - D♯/E♭ - E - F - F♯/G♭ - G - G♯/A♭ - A

C MAJOR SCALE

W W H W W W H — steps

C--D--E-F--G--A--B-C — note names

1--2--3-4--5--6--7-8 — scale degrees

FOR ANY SCALE (NOT JUST THE MAJOR SCALE)
the intervallic formula defines the scale and is always the same, in any key
if a note belongs to the scale, it's *diatonic*, otherwise, it's *chromatic*

G MAJOR SCALE

W W H W W W H

G--A--B-C--D--E--F♯-G

1--2--3-4--5--6--7-8

C MINOR SCALE

W H W W H W W

C--D-E♭--F--G-A♭--B♭--C

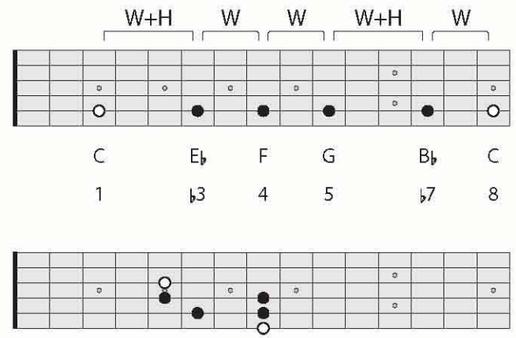
1--2-♭3--4--5-♭6--♭7--8

C MINOR PENTATONIC SCALE

W+H W W W+H W

C---E♭--F--G---B♭--C

1---♭3--4--5---♭7--8



MODES PART 3

DEFINITIONS

MODES OF MAJOR

MODE	SCALE FORMULA	MODE NAME
1	1--2--3-4--5--6--7-8	Ionian
2	1--2-♭3--4--5--6-♭7--8	Dorian
3	1-♭2--♭3--4--5-♭6--♭7--8	Phrygian
4	1--2--3--♯4-5--6--7-8	Lydian
5	1--2--3-4--5--6-♭7--8	Mixolydian
6	1--2-♭3--4--5-♭6--♭7--8	Aeolian
7	1-♭2--♭3--4-♭5--♭6--♭7--8	Locrian

COMPARED TO MAJOR/MINOR
Major
Minor with ♯6
Minor with ♭2
Major with ♯4
Major with ♭7
Minor
Minor with ♭2, ♭5

STEP FORMULA
1–1–½–1–1–1–½
1–½–1–1–1–½–1
½–1–1–1–½–1–1
1–1–1–½–1–1–½
1–1–½–1–1–½–1
1–½–1–1–½–1–1
½–1–1–½–1–1–1

RELATIVE AND PARALLEL APPROACHES

LOCRIAN						1	♭2	♭3	4	♭5	♭6	♭7	8	
AEOLIAN					1	2	♭3	4	5	♭6	♭7	8		
MIXOLYDIAN				1	2	3	4	5	6	♭7	8			
LYDIAN			1	2	3	♯4	5	6	7	8				
PHRYGIAN		1	♭2	♭3	4	5	♭6	♭7	8					
DORIAN	1		2	♭3	4	5	6	♭7	8					
IONIAN	1	2	3	4	5	6	7	8	2	3	4	5	6	7 15
DORIAN	1		2	♭3	4	5	6	♭7	8					
PHRYGIAN	1	♭2		♭3	4	5	♭6		♭7	8				
LYDIAN	1		2		3	♯4	5	6		7	8			
MIXOLYDIAN	1		2		3	4	5	6	♭7		8			
AEOLIAN	1		2	♭3		4	5	♭6		♭7	8			
LOCRIAN	1	♭2		♭3		4	♭5	♭6		♭7	8			

RELATIVE APPROACH

PARALLEL APPROACH

EXAMPLE WITH C

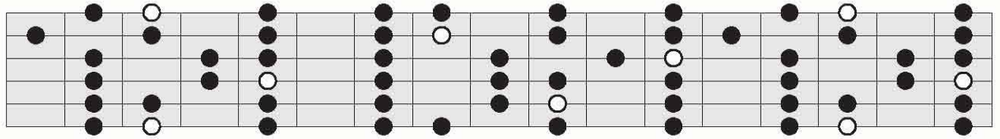
B LOCRIAN						B	C	D	E	F	G	A	B	
A AEOLIAN					A	B	C	D	E	F	G	A		
G MIXOLYDIAN				G	A	B	C	D	E	F	G			
F LYDIAN			F	G	A	B	C	D	E	F				
E PHRYGIAN		E	F	G	A	B	C	D	E					
D DORIAN		D	E	F	G	A	B	C	D					
C IONIAN	C	D	E	F	G	A	B	C						
C DORIAN	C	D	E♭	F	G	A	B♭	C						
C PHRYGIAN	C	D♭	E♭	F	G	A♭	B♭	C						
C LYDIAN	C	D	E	F♯	G	A	B	C						
C MIXOLYDIAN	C	D	E	F	G	A	B♭	C						
C AEOLIAN	C	D	E♭	F	G	A♭	B♭	C						
C LOCRIAN	C	D♭	E♭	F	G♭	A♭	B♭	C						

SAME NOTES (PARENT SCALE C IONIAN)

SAME TONAL CENTRE (NOTE C)

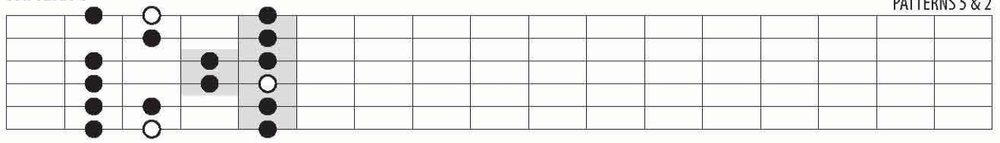
OVERLAPPING PATTERNS

IONIAN (MAJOR)



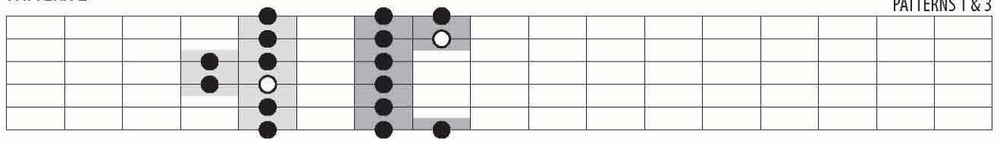
PATTERN 1

MADE FROM PATTERNS 5 & 2



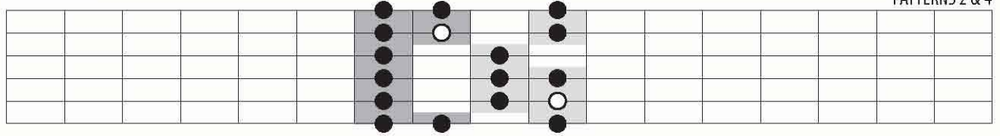
PATTERN 2

MADE FROM PATTERNS 1 & 3



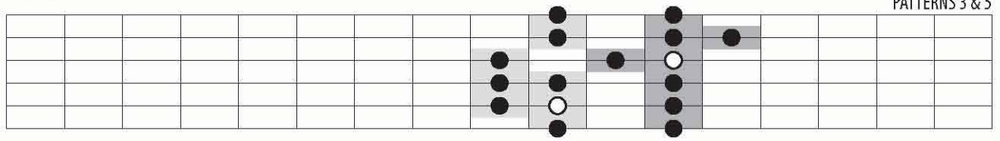
PATTERN 3

MADE FROM PATTERNS 2 & 4



PATTERN 4

MADE FROM PATTERNS 3 & 5



PATTERN 5

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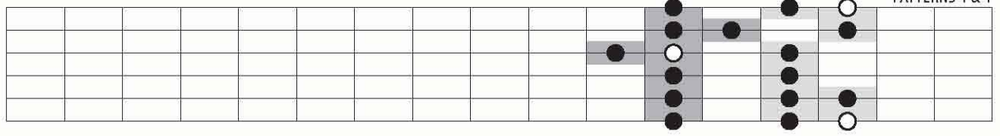
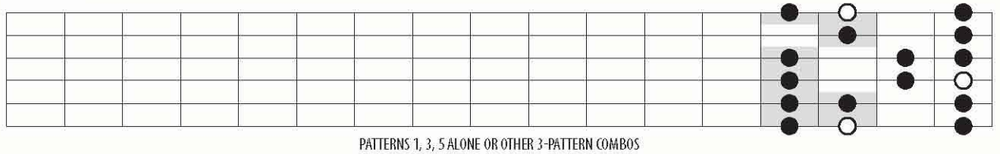


PATTERN 1

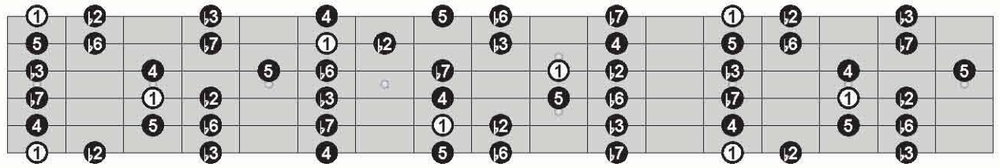


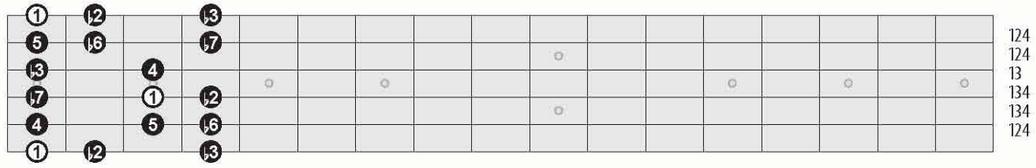
PATTERNS 1, 3, 5 ALONE OR OTHER 3-PATTERN COMBOS COVER THE ENTIRE NECK

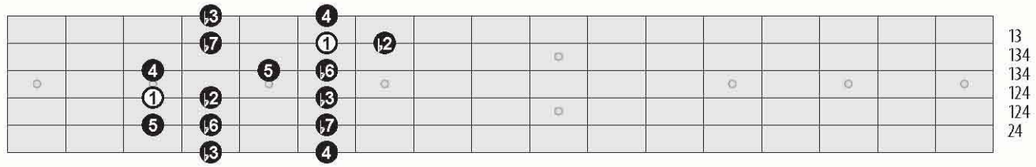
1-♭2--♭3--4--5-♭6--♭7--8

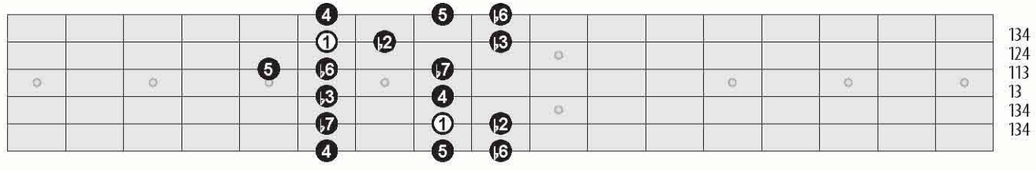
PHRYGIAN

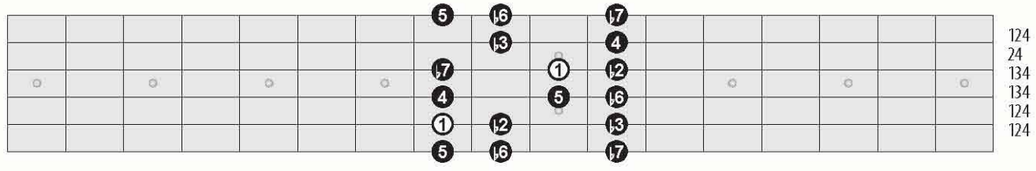
MODE 3 MAJOR

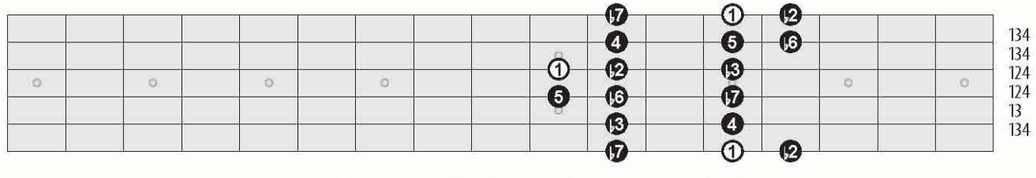


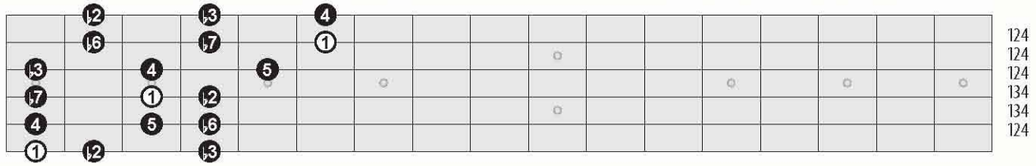


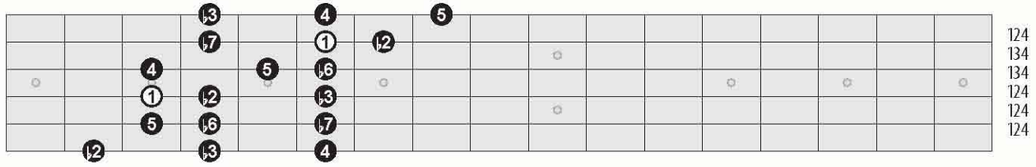


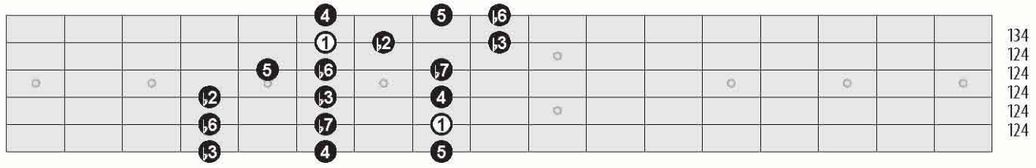


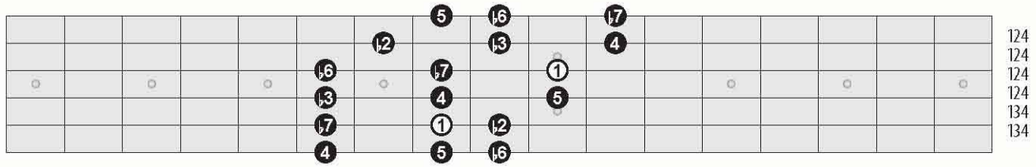


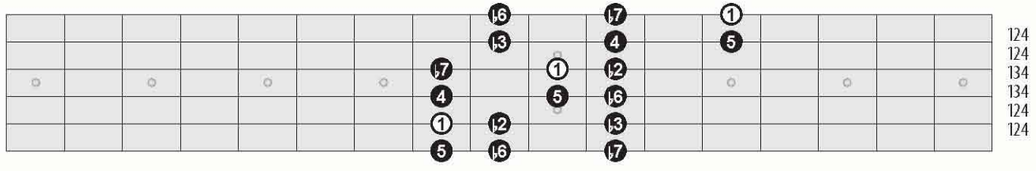


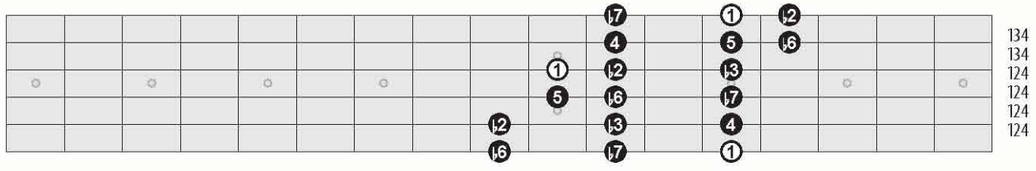


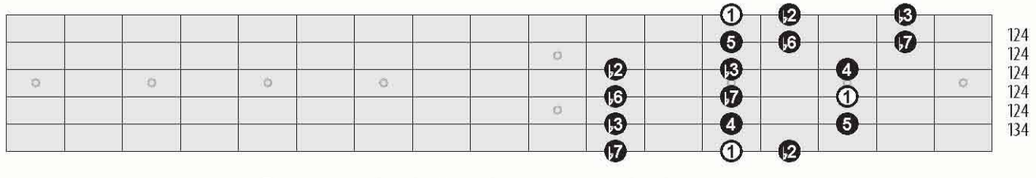








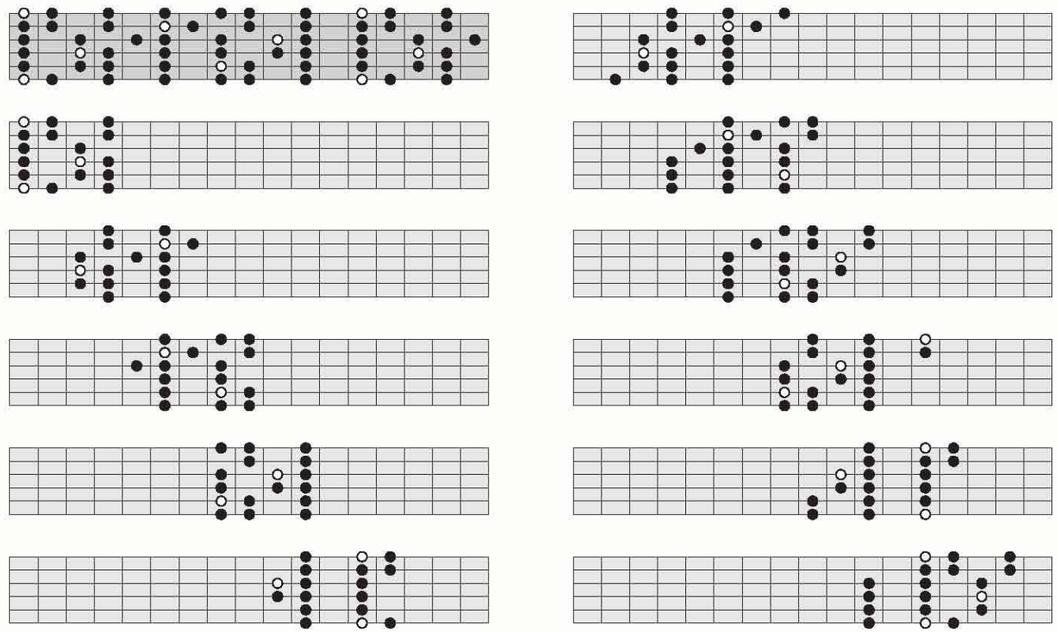




SCALES AT A GLANCE

PHRYGIAN 3M

1-♭2--♭3--4--5-♭6--♭7--8



LYDIAN 4M

1--2--3--♯4-5--6--7-8