

THE NUMERICAL SYSTEM

FOR LEARNING AND PLAYING THE GUITAR

BY ALAN PINCHES

DESIGN BY DAVE TOWLER

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INTRODUCTION

The numerical system was originally developed to fill a gap that existed in the guitar world.

That gap was the lack of a system for assembling and putting in order the fundamentals of the instrument.

Although a few anomalies pop up here and there, the original logic of the idea carries through from the major scales to all the thousands of scales / arpeggios etc. that derive from those basic shapes.

Over the last thirty years its severest critic has been its author who now relies on it !



ABOUT THE AUTHOR

In a long and varied career as a guitarist Al has worked with some of the greatest names in entertainment.

He has played in over twenty West End shows, performed in numerous TV / radio sessions and played thousands of gigs.

Al has also been teaching the guitar all this time.

For more biographical information visit www.jazzguitarworld.co.uk

THE NUMERICAL SYSTEM

(for learning and playing the guitar)

THE SEVEN MAJOR SCALE SHAPES

There are seven basic major scale shapes on the guitar. They are the primary technical and positional tools for learning the instrument. Much of the other important information derives from these shapes.

When the seven major scale shapes are played in the second position they will give the keys of :-

C B \flat A G F E D

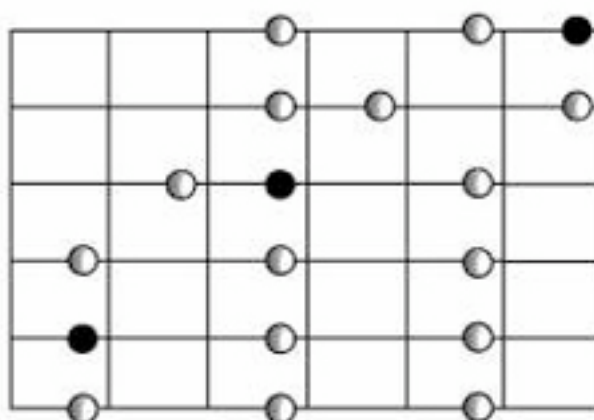
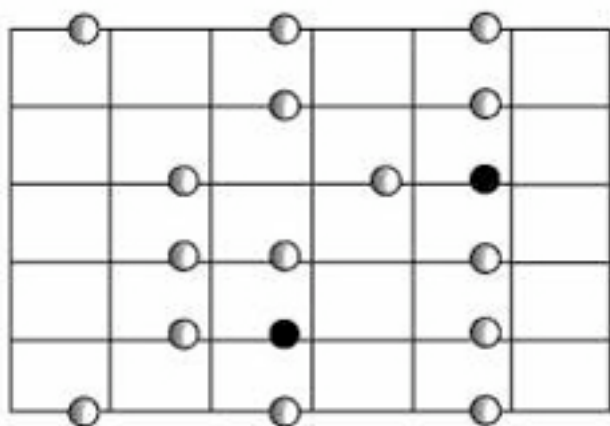
However the scales can be positioned ascending the neck so that they all give the same key.

The numerical system simply numbers the ascending scales, 1 through 7.

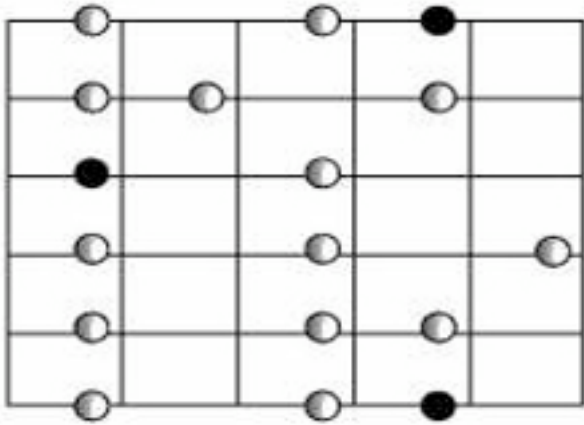
Shape 1 will be the scale of C in the second position and the other six shapes will number 2 through 7 as they ascend the neck.

THE SEVEN MAJOR SHAPES IN NUMERICAL ORDER

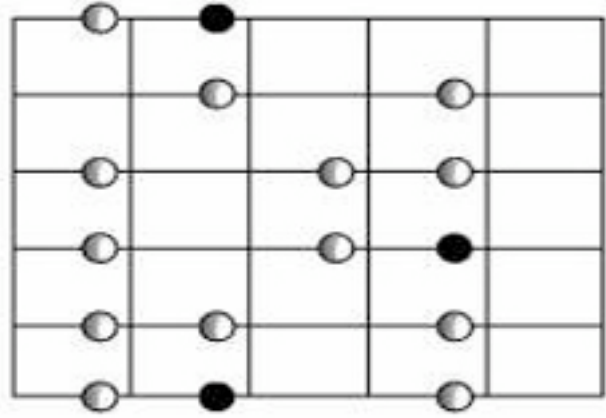
Shape 1 middle finger fifth string root **Shape 2** front finger fifth string root



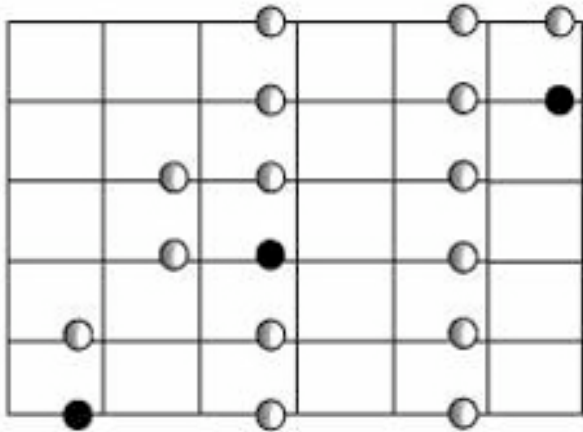
Shape 3 back finger sixth string root



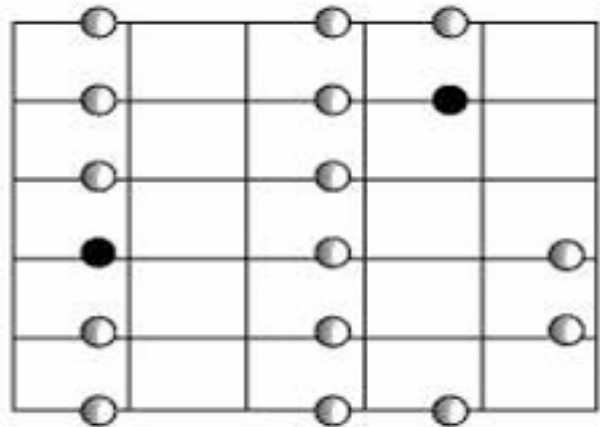
Shape 4 middle finger sixth string root



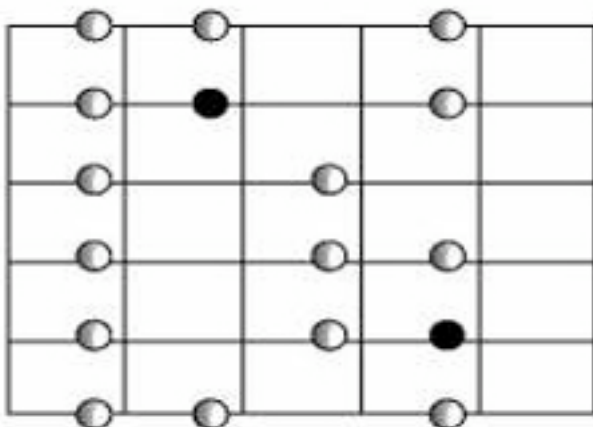
Shape 5 front finger sixth string root



Shape 6 front finger fourth string root

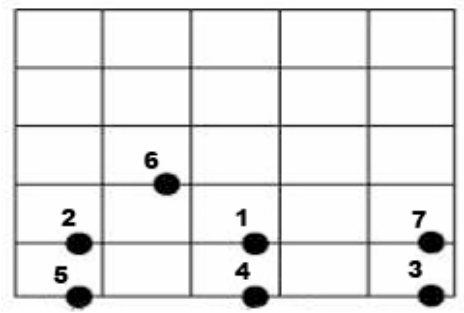


Shape 7 back finger fifth string root



There are alternative fingerings for all seven shapes but these are, in the writer's opinion, the best starting shapes.

THE "ROOT FINDER" DIAGRAM

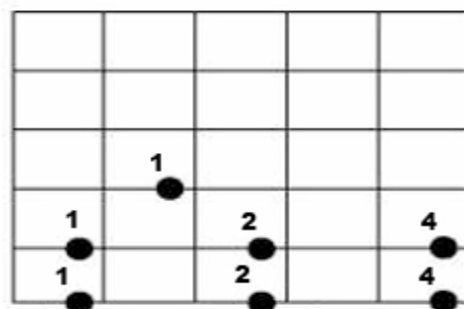


The diagram above gives the root points of the seven shapes (anywhere on the neck)

The root points are numbered 1 – 7, the root point No 1 will be the root for shape 1 etc.

When the root point notes are played in numerical order they produce a tune which is easily memorised

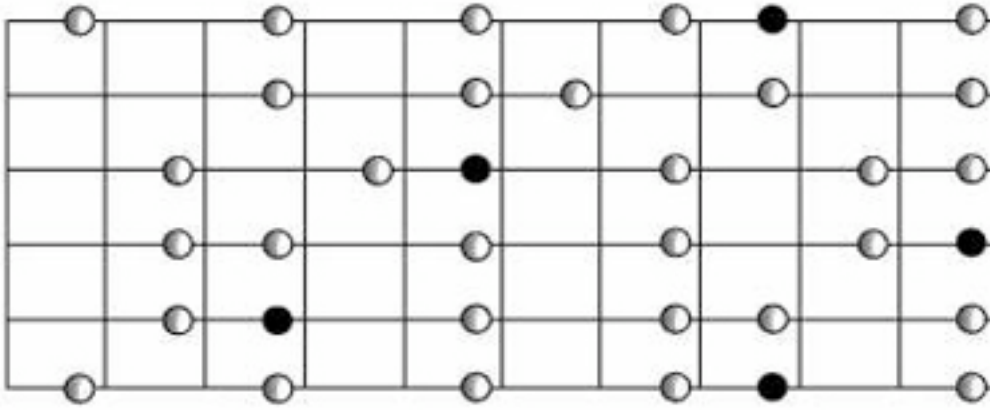
THE FINGERING FOR THE ROOT POINTS



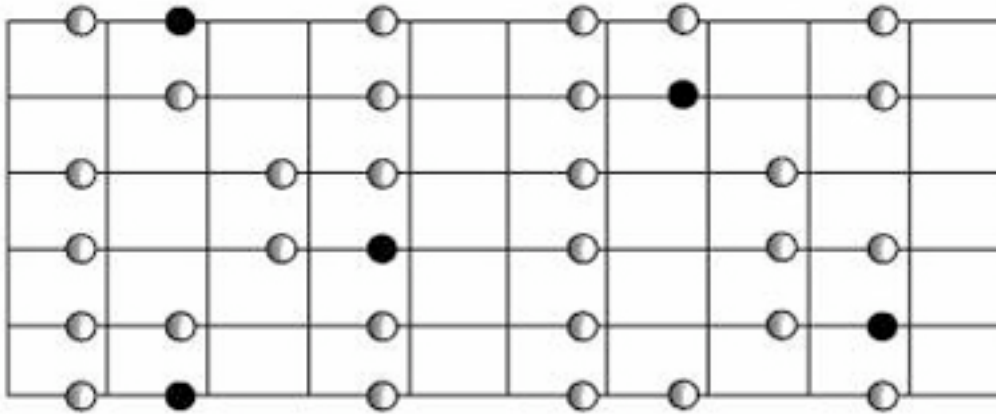
- 1 – first finger
- 2 – second finger
- 4 – fourth (little) finger

The above diagram gives the fingering for the seven root points. The same fingering that is used when playing the actual scales.

SHAPES 1 – 2 – 3 – 4 CONNECTED



SHAPES 4 – 5 – 6 – 7 CONNECTED



FRONT MIDDLE AND BACK

In the numerical system the left hand (or the right hand for a left handed player) is divided into three sections, front middle and back.

FRONT	FIRST FINGER
MIDDLE	SECOND OR THIRD FINGER
BACK	FOURTH OR LITTLE FINGER

Six of the seven scales have their roots at the front, middle or back of the hand on the bottom two strings. The other one (shape six) has its root at the front of the hand on the fourth string. Thus :-

SHAPE	ROOT
1	MIDDLE FINGER FIFTH STRING
2	FRONT FINGER FIFTH STRING
3	BACK FINGER SIXTH STRING
4	MIDDLE FINGER SIXTH STRING
5	FRONT FINGER SIXTH STRING
6	FRONT FINGER FOURTH STRING
7	BACK FINGER FIFTH STRING

OVERLAPS

Some of the shapes will overlap when they are laid out in numerical order. For instance shapes 1 and 3 meet with shape 2 spreading between. This means that there will not be seven of certain types of derivative scales or chords etc. Where this happens, for instance in the case of pentatonic scales, the pentatonic shape will be numbered according to its “parent” major scale shape, thus :-

MAJOR SCALES	1	2	3	4	5	6	7
PENTATONIC SCALES	1	-	3	4	-	6	7

The pentatonic shapes remain “numerical” although numbers 2 and 5 will be missing.

POSITION

Your “position” is the fret your first finger usually occupies, however sometimes the first finger stretches back one fret, as in shapes 1, 2 and 5. It is safer therefore to say that your “position” is always one fret below the second finger.

LOCATING THE SHAPES NUMERICALLY

EXAMPLE 1 – (To find shape 4 key of A)

- Play through the root point diagram until your middle finger reaches root point number 4
- Make that finger (the second) on that string (the sixth) go to the note A
- You are now in the correct position to play shape 4. The scale of A.

EXAMPLE 2 – (To find shape 7 key of F)

- Play through the diagram until your back finger reaches root point number 7
- Make that finger (the fourth) on that string (the fifth) go to the note of F
- You are now in the correct position to play shape 7 the scale of F.

MAJOR AND RELATIVE MINOR

Each major scale has within it a minor scale constructed from the same set of notes. This minor scale is called the natural minor and the scales are said to be related. They are effectively the same scale making two different sounds as the same set of notes could make two different tunes.

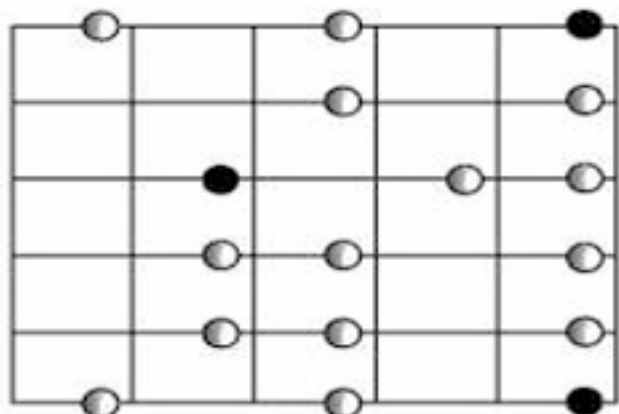
The scale of C relates to A minor. If the two scales share the same position and key they will share the same number. The two scales in the second position will both be called shape 1.

The pentatonic scale of C will similarly relate to A minor pentatonic and share the same shape number. So we can say that in the numerical system...

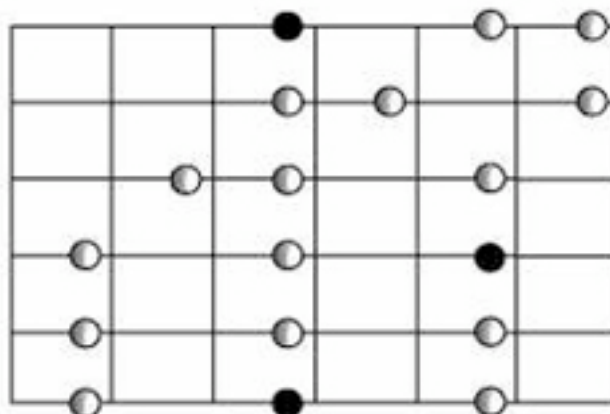
Shape numbers will correlate across related keys.

THE SEVEN RELATIVE MINOR SCALE SHAPES (THE NATURAL MINORS)

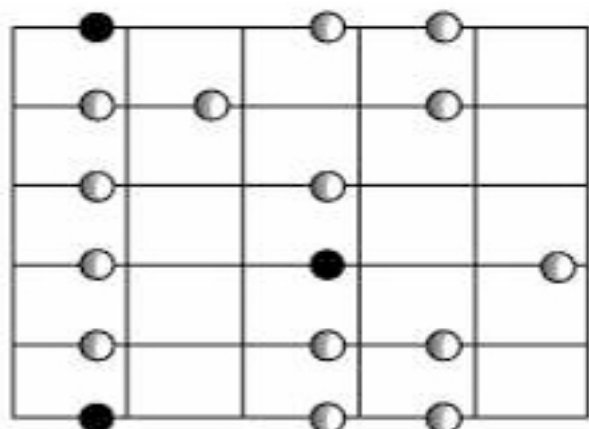
SHAPE 1



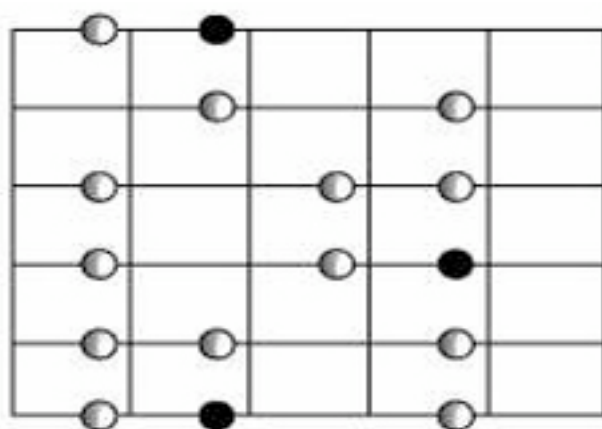
SHAPE 2



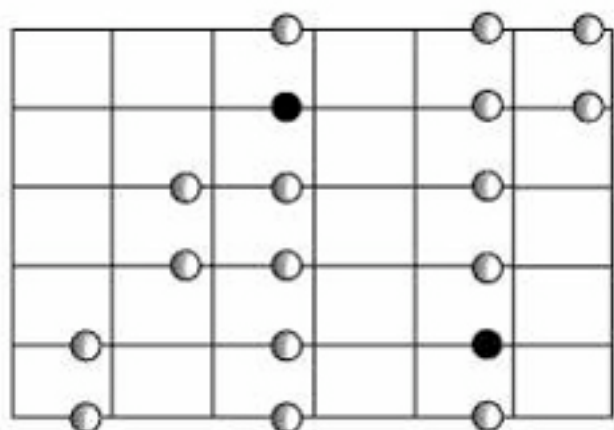
SHAPE 3



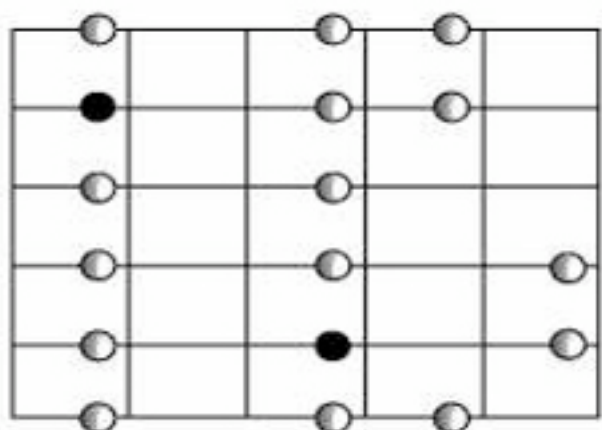
SHAPE 4



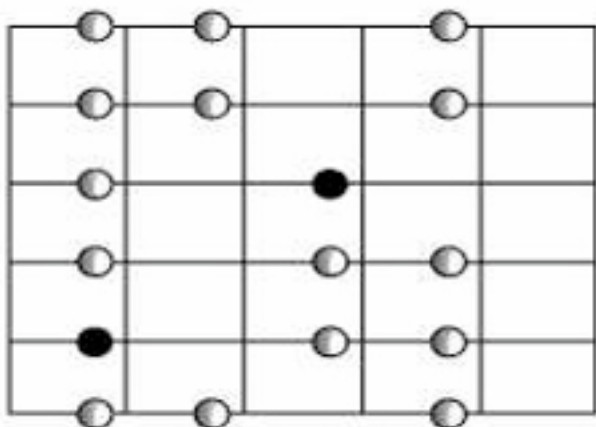
SHAPE 5



SHAPE 6

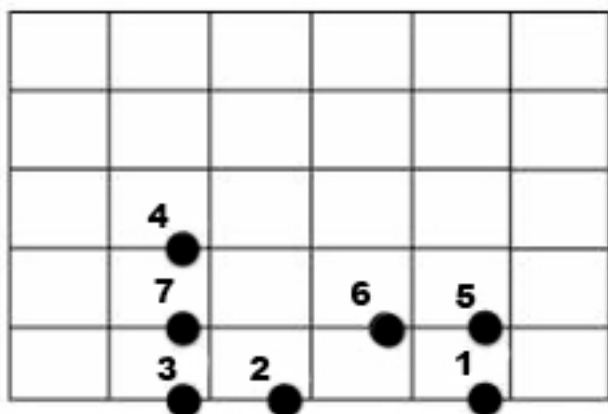


SHAPE 7



- It will be seen that the natural minors are exactly the same shapes as the major scales.
- Only the root points are different

ROOT POSITIONS FOR THE RELATIVE MINOR SCALE SHAPES (THE NATURAL MINORS)



EXAMPLE (RELATED KEYS)

Shape 1 in C major - root point middle finger fifth string

Shape 1 in A minor - root point back finger sixth string

HARMONIC AND MELODIC MINOR SCALES

The 'altered' minor scales, harmonic and melodic minor will share their shape numbers with the natural minor scale. Thus...

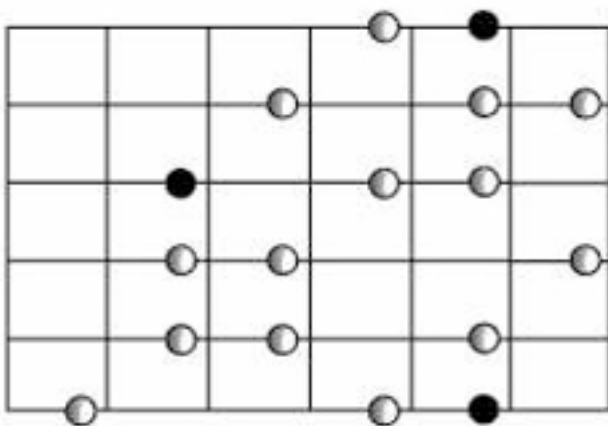
'A' NATURAL MINOR	A	B	C	D	E	F	G	A
'A' HARMONIC MINOR	A	B	C	D	E	F	G #	A
'A' MELODIC MINOR	A	B	C	D	E	F #	G #	A

Will all relate to and thus share the number of their related major scale. So...

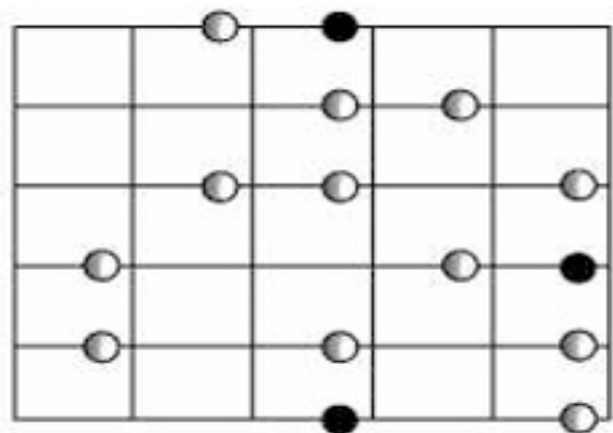
C major shape 1 ←  A natural minor
A harmonic minor
A melodic minor

THE SEVEN HARMONIC MINOR SCALES

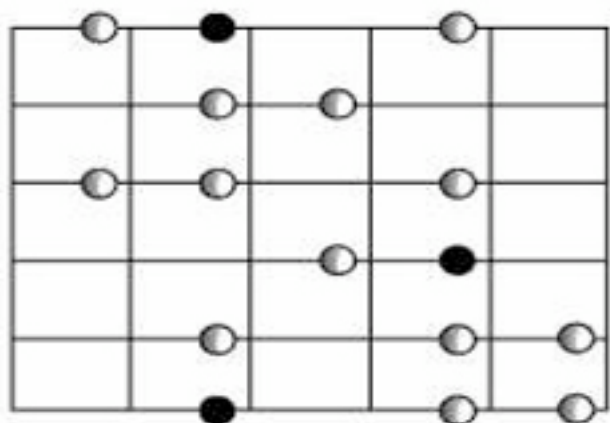
SHAPE 1



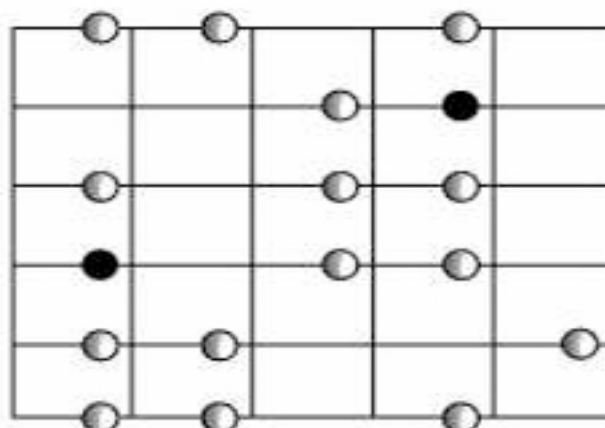
SHAPE 2



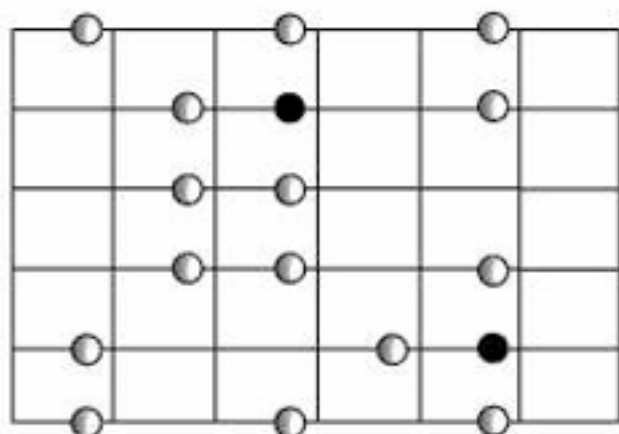
SHAPE 3



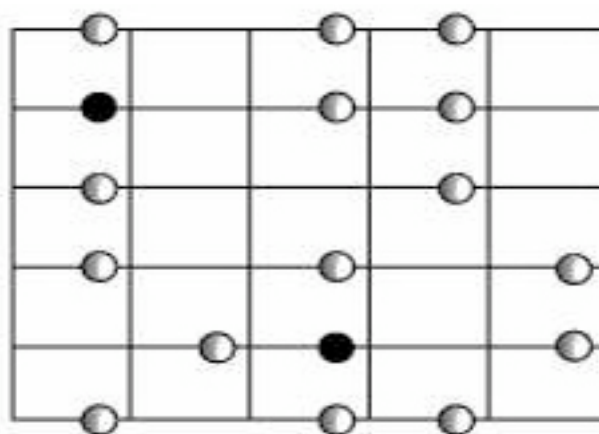
SHAPE 4



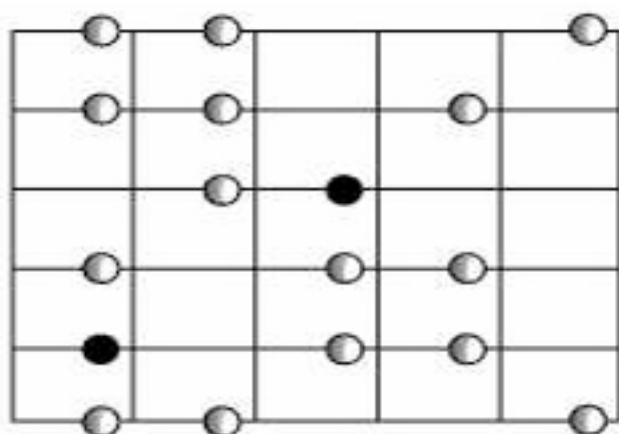
SHAPE 5



SHAPE 6



SHAPE 7



Alternative fingerings proliferate in the minor scales.

PENTATONIC SCALES

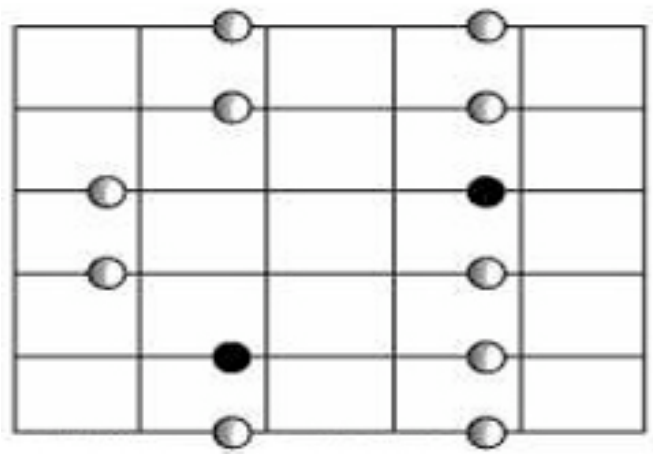
There are five pentatonic scale shapes in general use on the guitar. In the numerical system they are numbered after their “parent” major scale shapes. However, because shapes 2 and 5 major scales overlap between the surrounding shapes they cannot act as the parent to a pentatonic scale. Thus...

MAJOR AND RELATIVE MINOR SHAPES	1	2	3	4	5	6	7
MAJOR AND RELATIVE MINOR PENTATONIC SHAPES	1	-	3	4	-	6	7

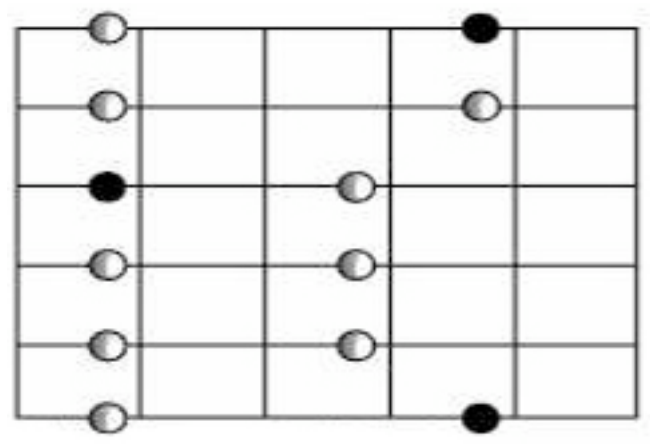
The pentatonic scales remain “numerical” but with the numbers 2 and 5 missing.

THE FIVE PENTATONIC MAJOR SHAPES

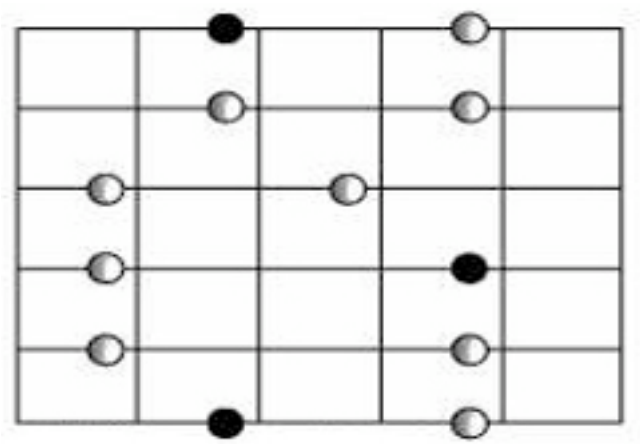
SHAPE 1



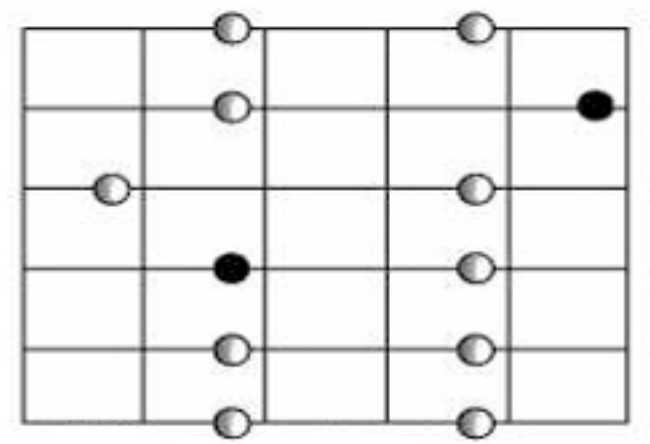
SHAPE 3



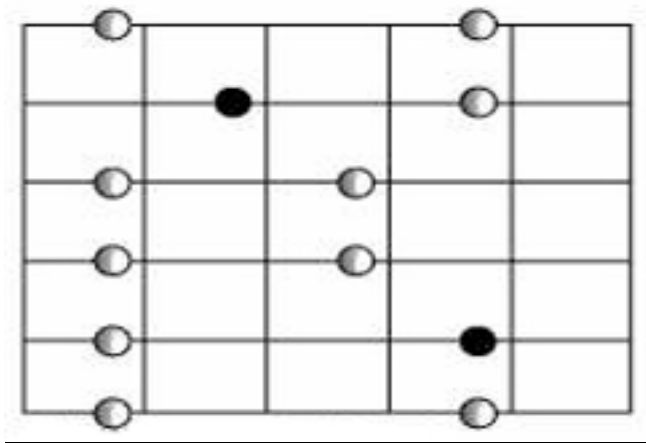
SHAPE 4



SHAPE 6

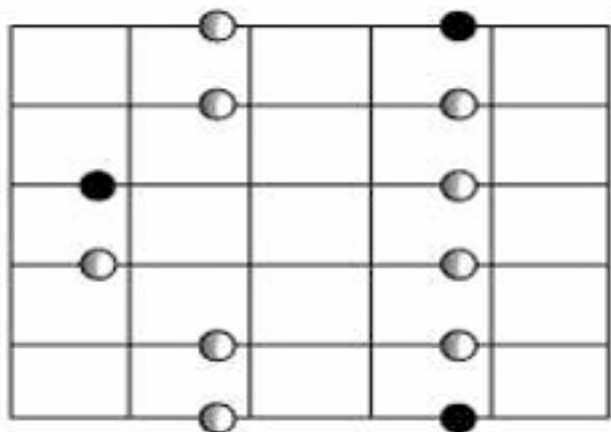


SHAPE 7

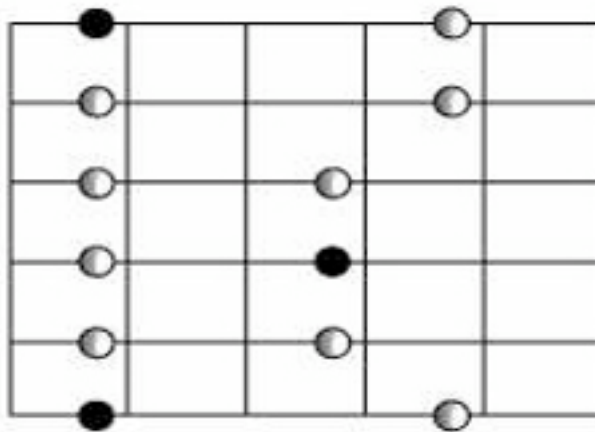


PENTATONIC MINORS Same shapes but with different root points.

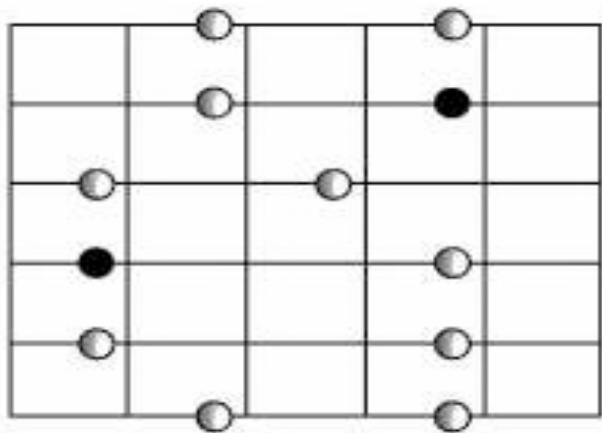
SHAPE 1



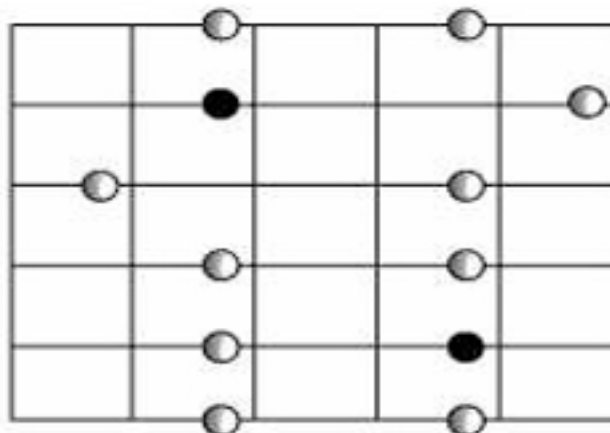
SHAPE 3



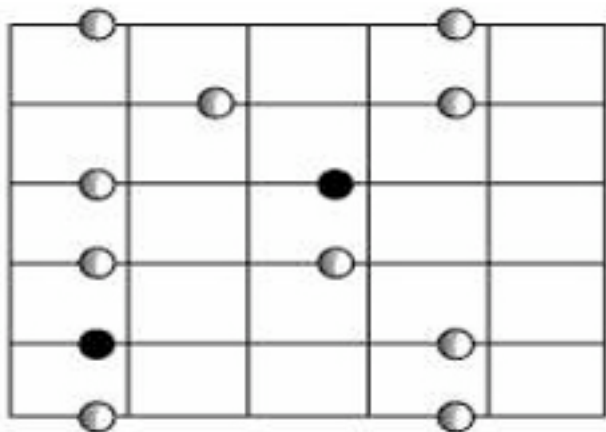
SHAPE 4



SHAPE 6



SHAPE 7



Although originally a five note Chinese scale the pentatonic scale is used extensively for improvisation in modern music forms.

If the scale is used in its major configuration it will generate a country / light blues sound. The minor scale gives a heavier blues sound. Both sounds are distinctively American.

If major and minor are the same shape, what causes the contrasting major or minor sound?

1. The use of the major or minor resolution points
2. The scale's relationship with the accompaniment sound.
3. The way the passage is played.

MAJOR / PENTATONIC CONSTRUCTION

MAJOR SCALE OF C	C	D	E	F	G	A	B
PENTATONIC MAJOR SCALE OF C	C	D	E		G	A	

LOCATING THE PENTATONIC SHAPES NUMERICALLY

EXAMPLE 1 - To find shape 3 in A minor

- Play through the relative minor root point diagram (page 11) until your finger hits root point number 3 (front finger bottom string)
- Make that finger on that string go to the note A

EXAMPLE 2 - To find shape 4 in Bb major .

Follow the same procedure

- Play through the major root diagram (page 6) until your finger hits root point 4 (middle finger bottom string)
- Make that finger on that string go to the note Bb.

THE BLUES SCALES

The pentatonic scale can be extended by adding a variety of notes. There is however one note that is used more commonly than any other.

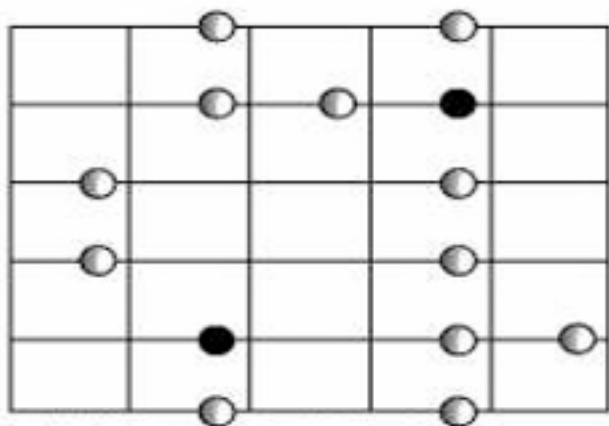
That note is the minor third in the major pentatonic which would be the flattened fifth in the minor pentatonic.

This note adds to the scale considerably and does not affect the shape numbers.

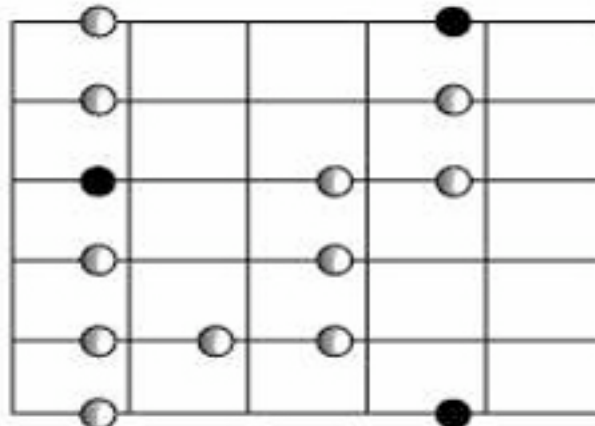
When extended in this way the scale is usually called the 'blues scale'.

THE MAJOR BLUES SCALES

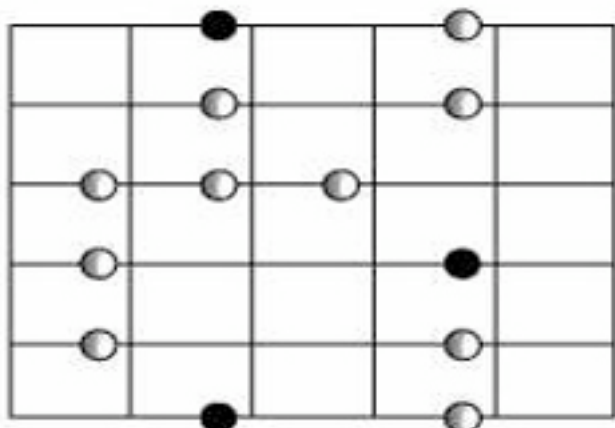
SHAPE 1



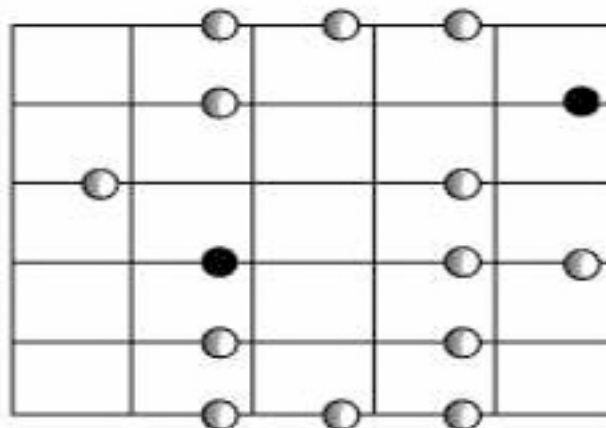
SHAPE 3



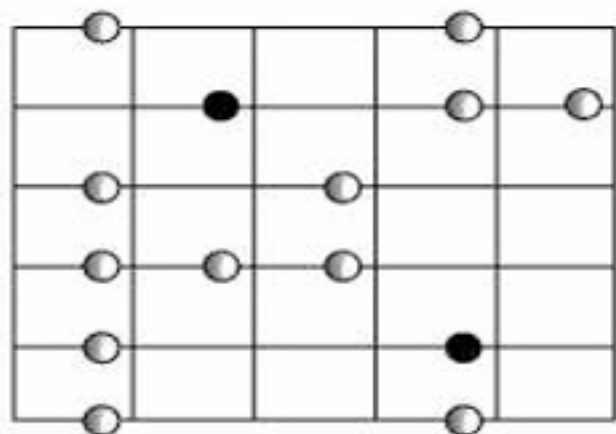
SHAPE 4



SHAPE 6

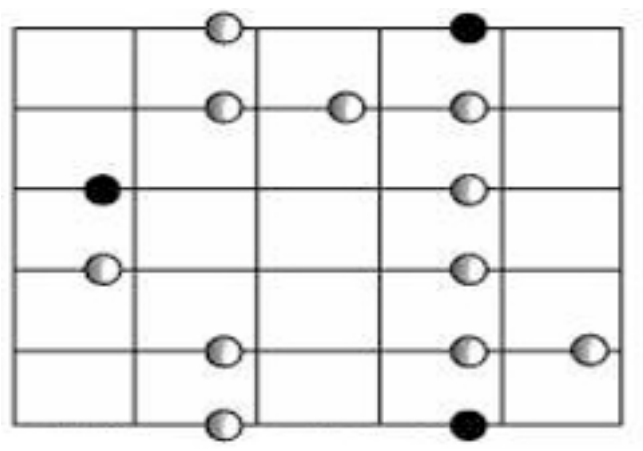


SHAPE 7

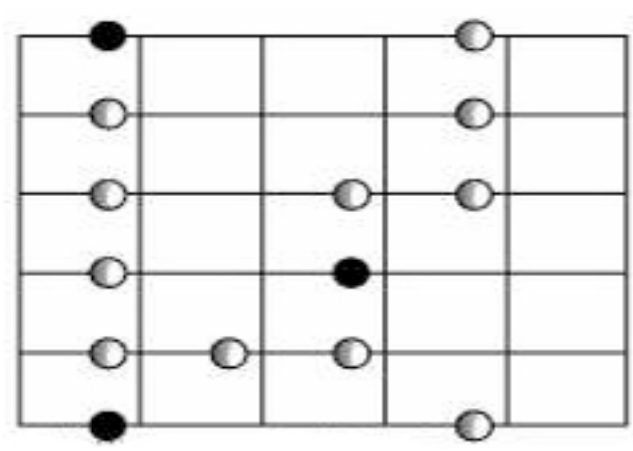


THE MINOR BLUES SCALES – Minor roots shown in black

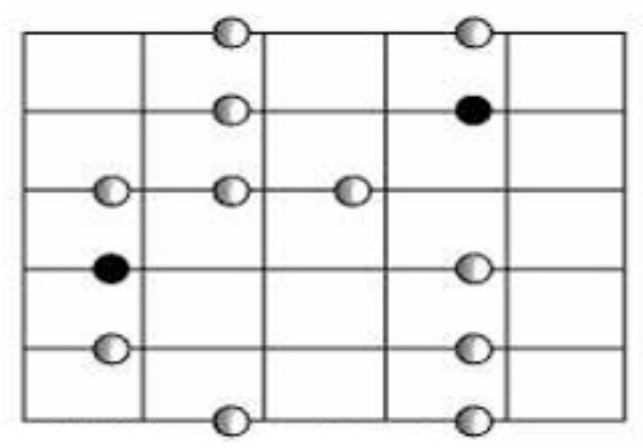
SCALE SHAPE 1



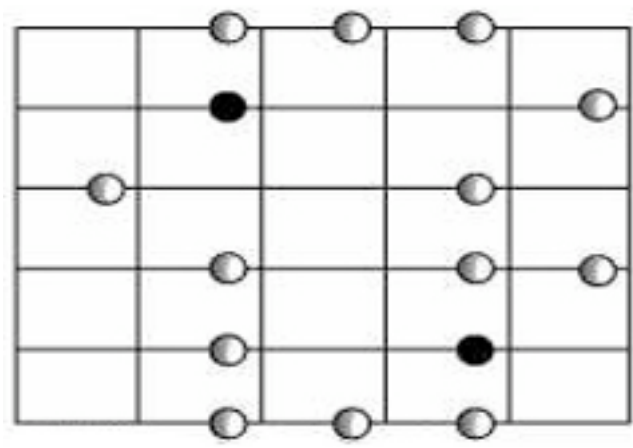
SCALE SHAPE 3



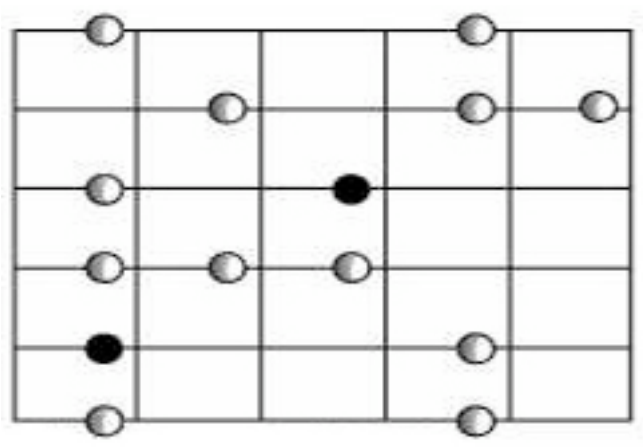
SCALE SHAPE 4



SCALE SHAPE 6

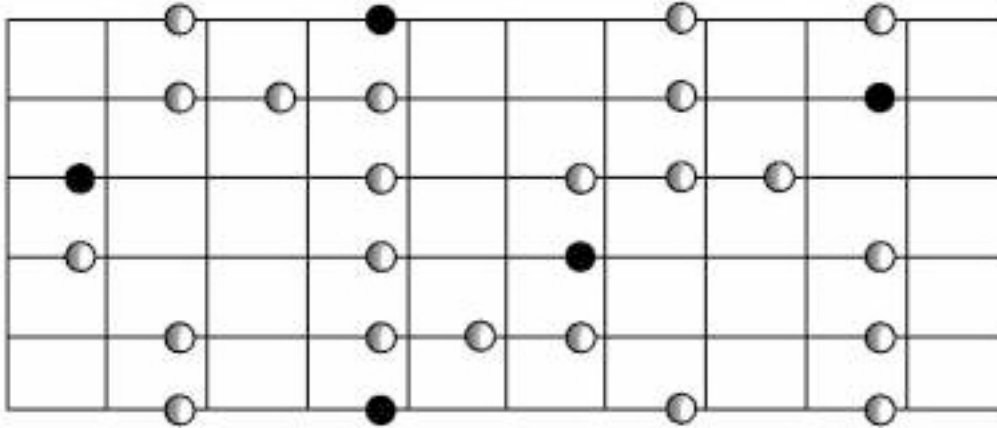


SCALE SHAPE 7

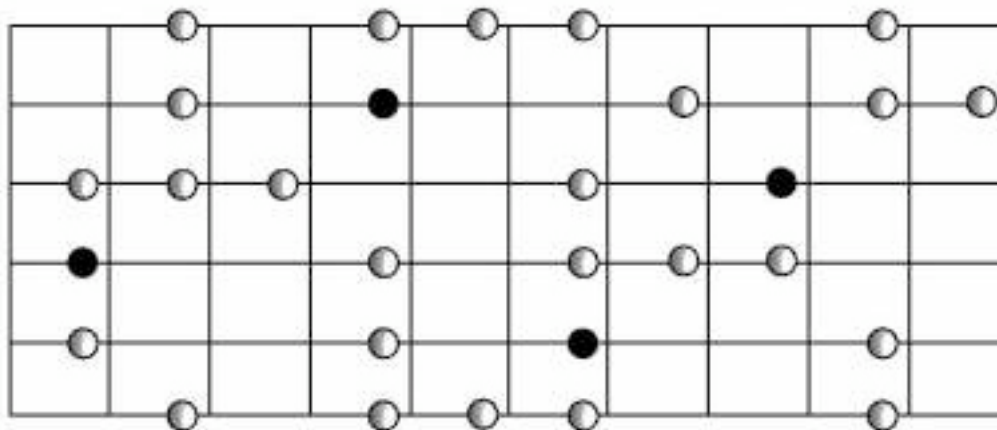


THE BLUES SCALES CONNECTED

SHAPES 1 – 3 – 4



SHAPES 4 – 6 – 7

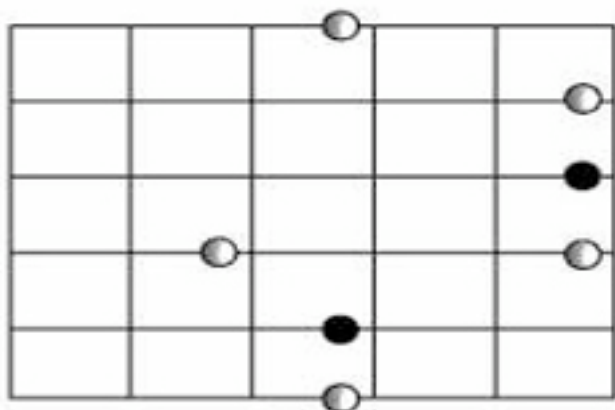


It will be seen that the top of shape 7 is the bottom of shape 1. Thus the octave is reached and everything replicates itself above the twelfth fret.

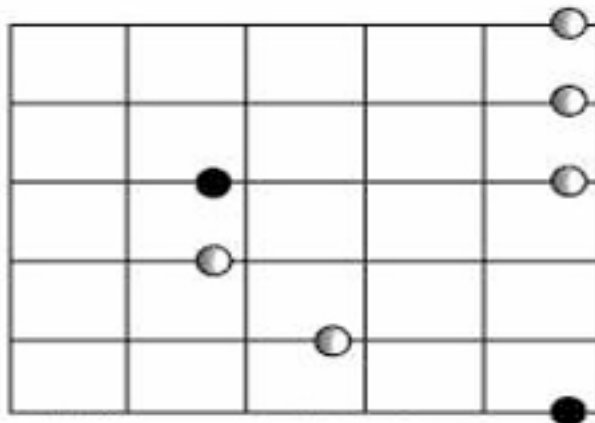
MAJOR AND MINOR ARPEGGIOS

Arpeggios follow the same rule of correlation across related keys, thus the arpeggio C major (second position) would relate to and be found in the same position as A minor and be part of the same scale, shape 1.

SHAPE 1 C MAJOR SECOND POSITION



SHAPE 1 A MINOR SECOND POSITION



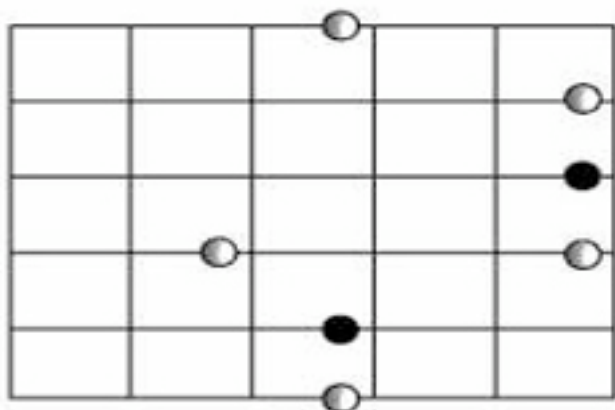
If the third is flattened in the above arpeggio (shape 1 C major second position) the chord would change to C minor. It would then become part of the scale of C minor and the root point, although being the same note, would become minor root point number 6

Similarly, if shape 1 A minor (above) is changed to A major by naturalising its third, the chord would become part of the scale of A major and the root point would become the major root point number 3.

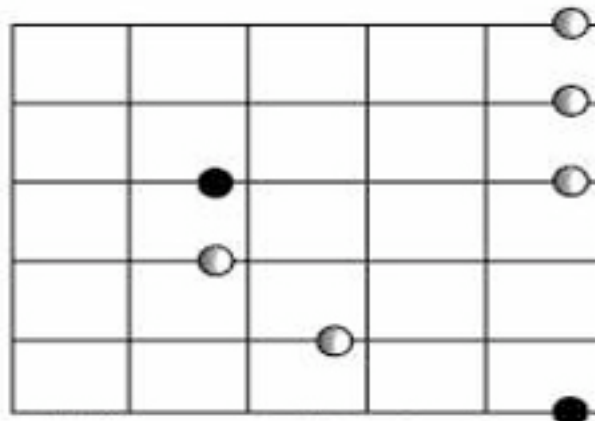
Thus, whilst related arpeggio shapes are in the same key and share the same shape numbers, same name majors and minors are in different keys and therefore have different shape numbers.

THE MAJOR AND RELATIVE MINOR ARPEGGIOS

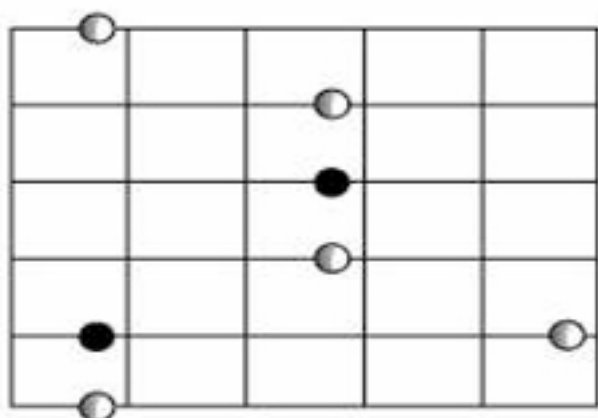
SHAPE 1 MAJOR



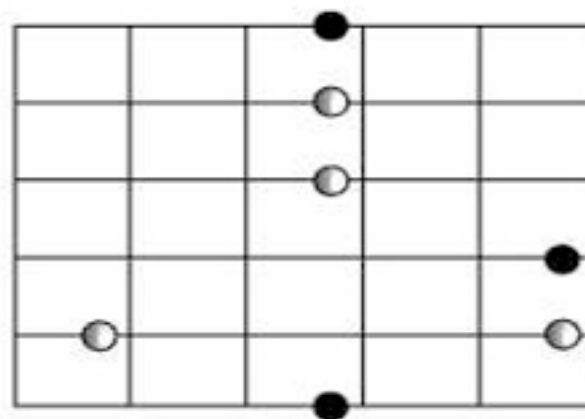
SHAPE 1 RELATIVE MINOR



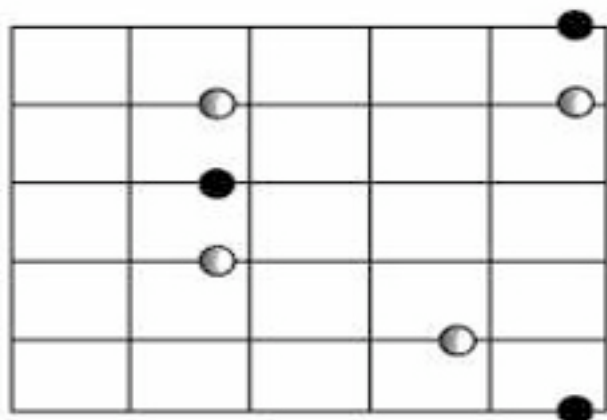
SHAPE 2 MAJOR



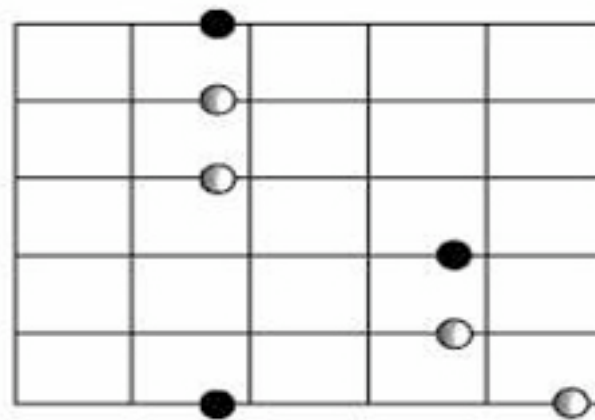
SHAPE 2 RELATIVE MINOR



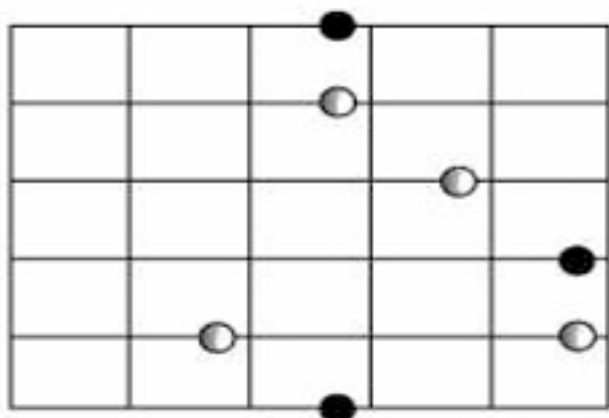
SHAPE 3 MAJOR



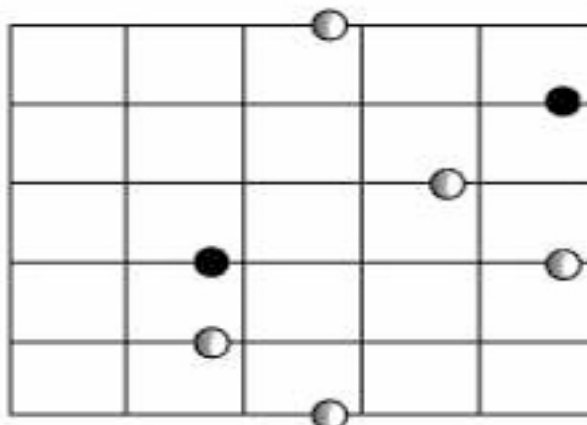
SHAPE 3 RELATIVE MINOR



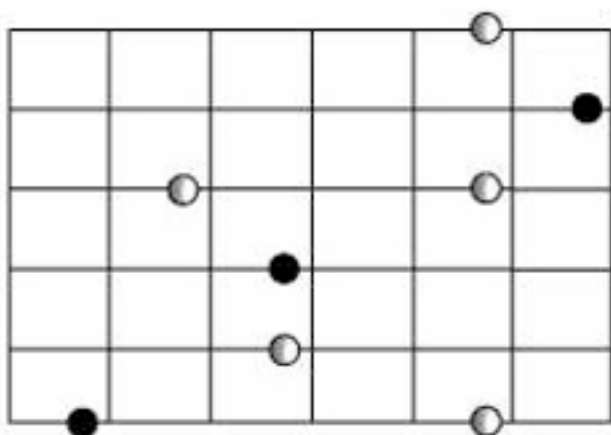
SHAPE 4 MAJOR



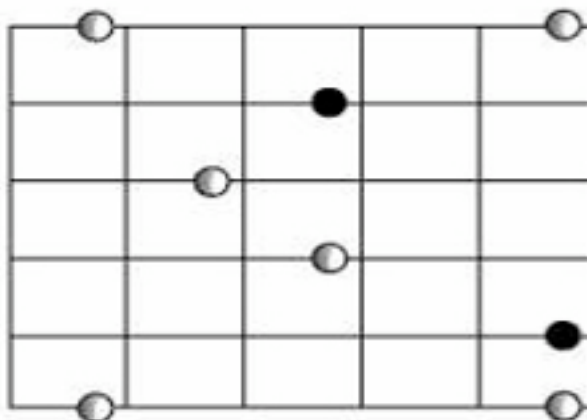
SHAPE 4 RELATIVE MINOR



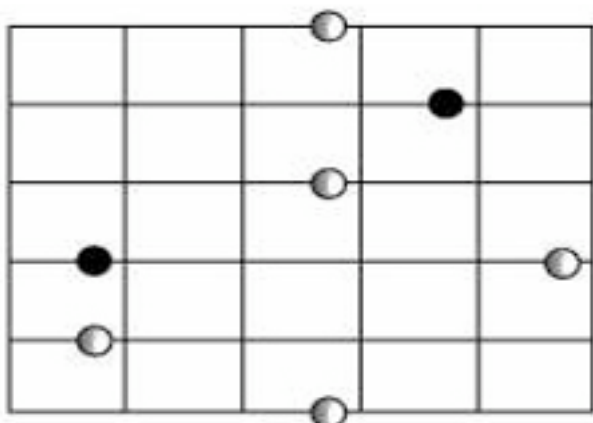
SHAPE 5 MAJOR



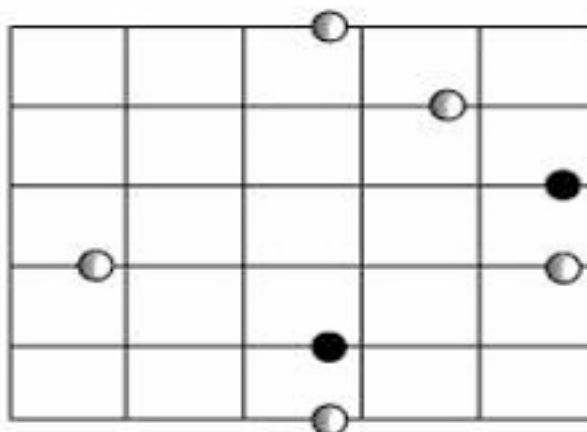
SHAPE 5 RELATIVE MINOR



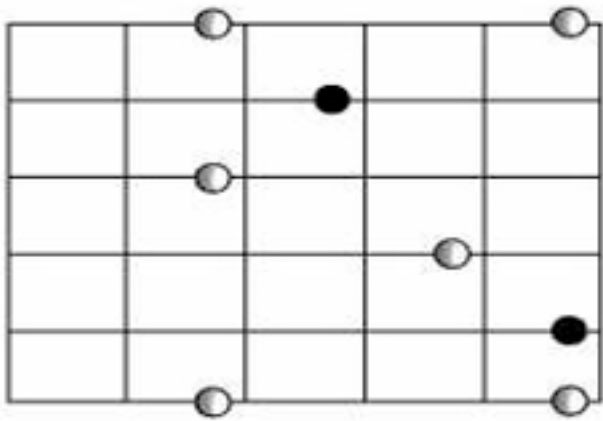
SHAPE 6 MAJOR



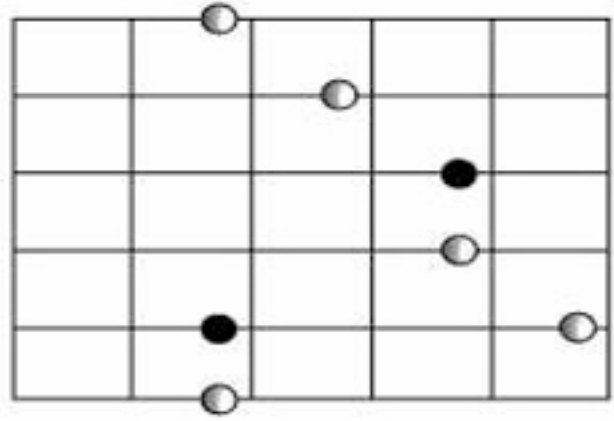
SHAPE 6 RELATIVE MINOR



SHAPE 7 MAJOR

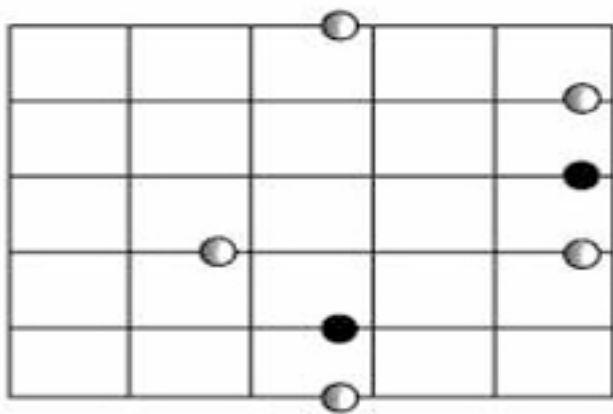


SHAPE 7 RELATIVE MINOR

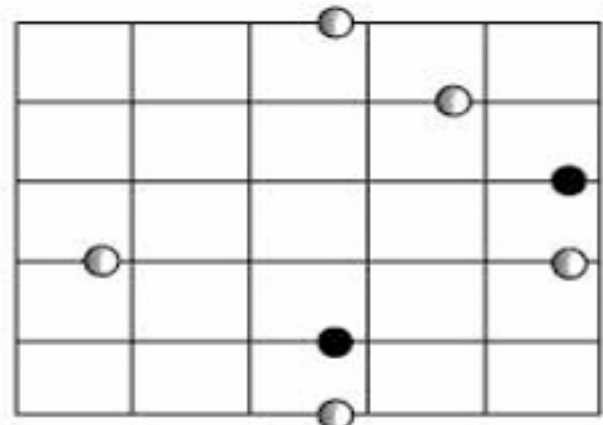


THE MAJOR AND SAME NAME MINOR ARPEGGIOS

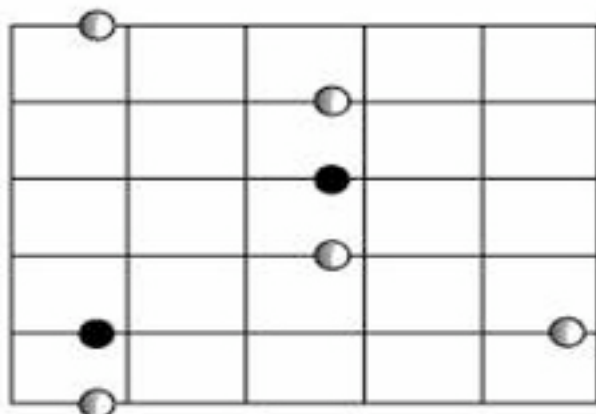
SHAPE 1 MAJOR



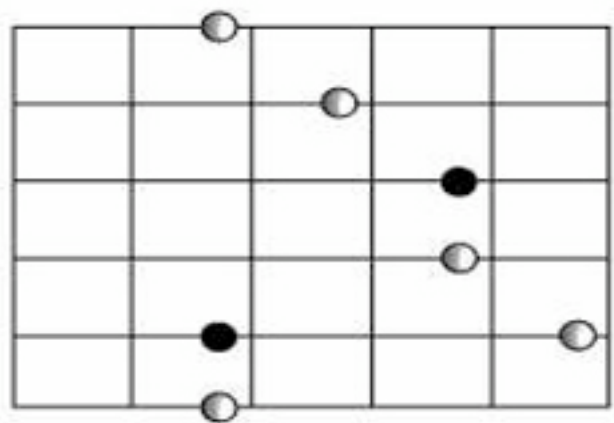
SAME NAME MINOR SHAPE 6



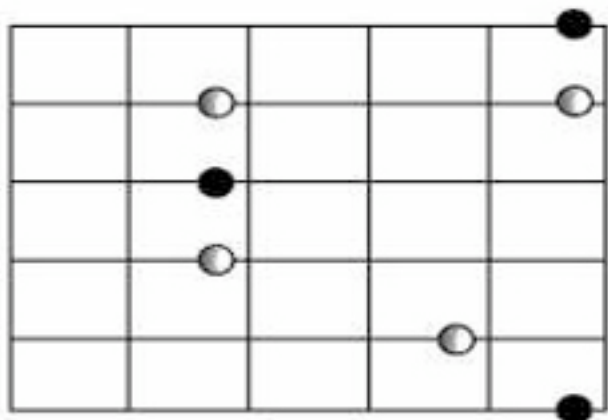
SHAPE 2 MAJOR



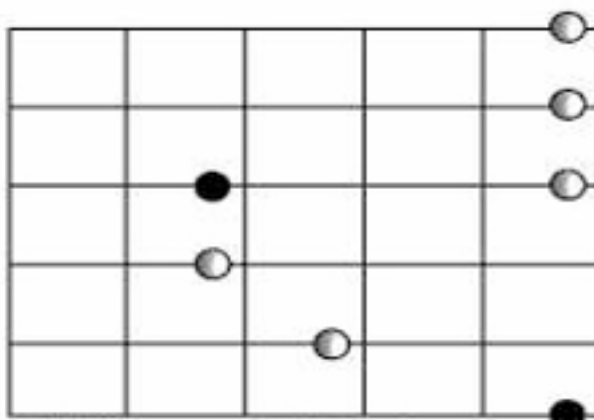
SAME NAME MINOR SHAPE 7



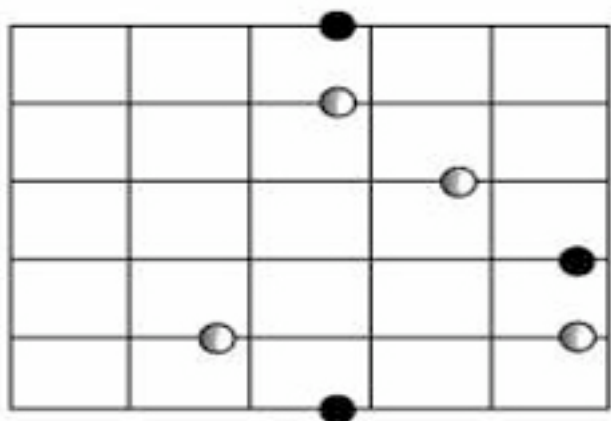
SHAPE 3 MAJOR



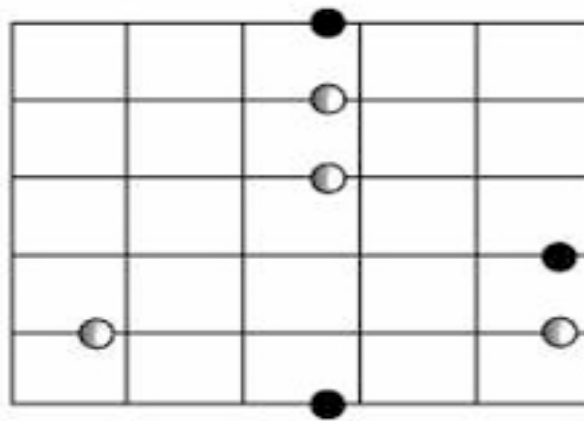
SAME NAME MINOR SHAPE 1



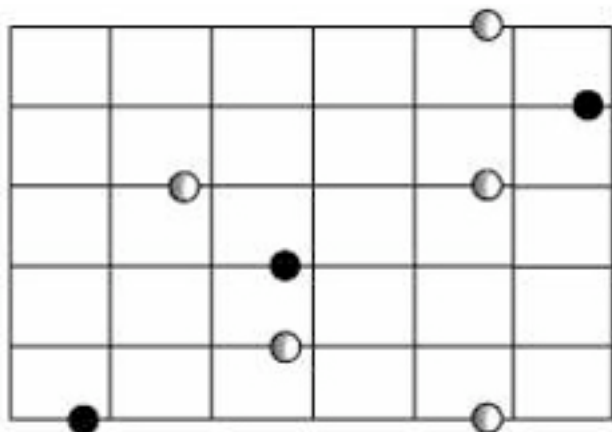
SHAPE 4 MAJOR



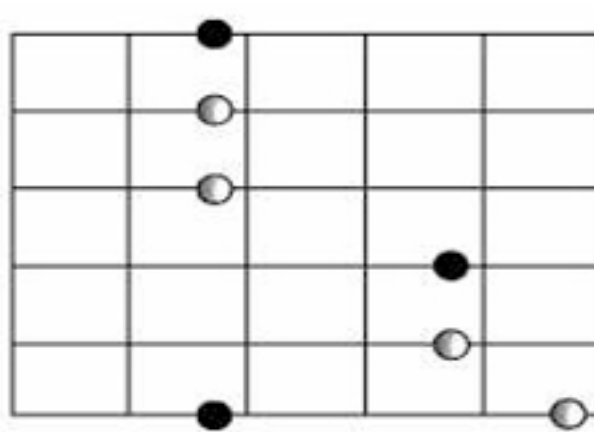
SAME NAME MINOR SHAPE 2



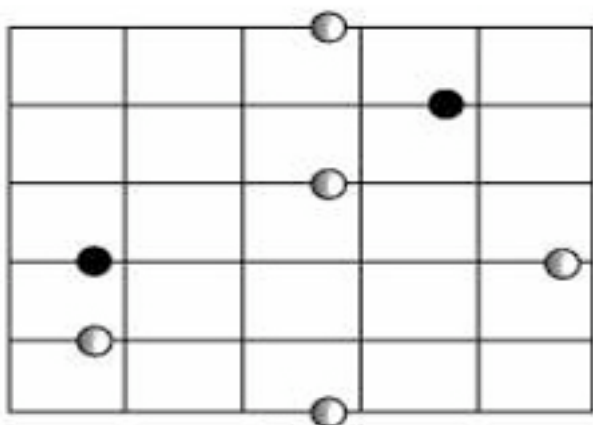
SHAPE 5 MAJOR



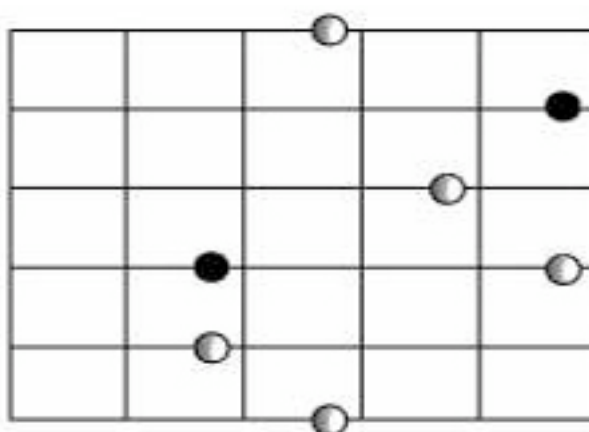
SAME NAME MINOR SHAPE 3



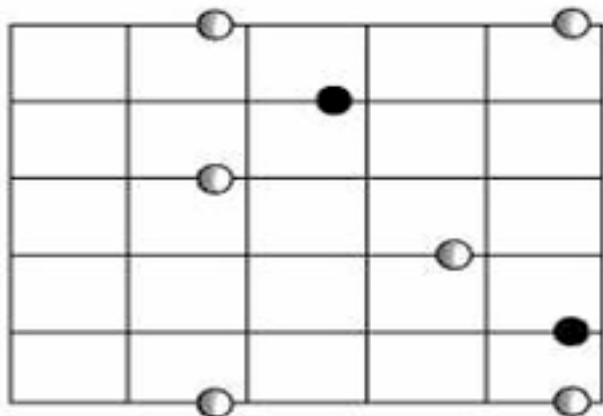
SHAPE 6 MAJOR



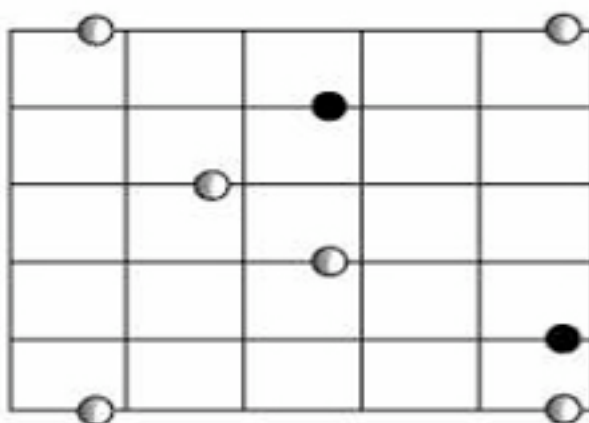
SAME NAME MINOR SHAPE 4



SHAPE 7 MAJOR



SAME NAME MINOR SHAPE 5

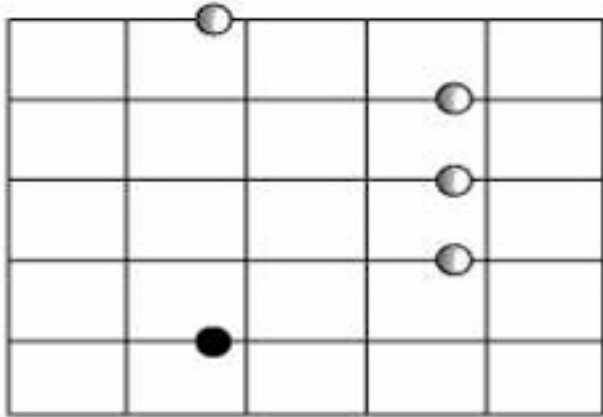


In the numerical system –

- If an arpeggio is a minor chord having a minor or flattened third it will have a minor root point and take its number from that point.
- Major chord arpeggios will take their numbers from their major root points

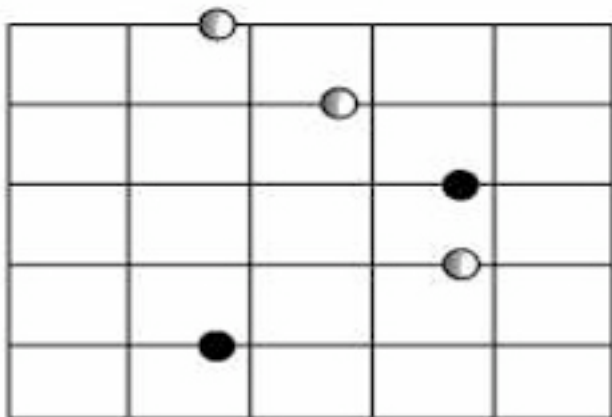
CHORD SHAPES

Chord shapes take the number of their parent arpeggios and scales, thus the chord of C major third position:-



would be shape 1. It would share the position and key of scale and arpeggio 1 and therefore the shape number.

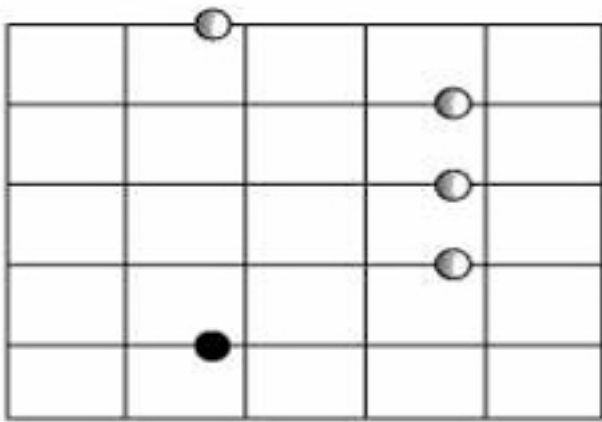
If however we flatten the third of the chord and change the shape to C minor:-



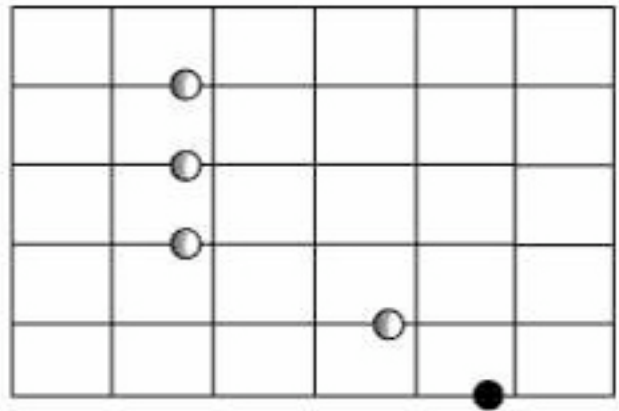
The root point, would be a minor root point (shape 7) and relate to the key of Eb.

THE FIVE BASIC MAJOR CHORD SHAPES

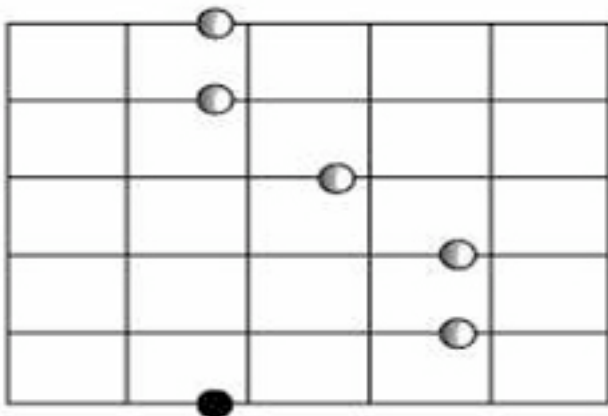
SHAPE 1



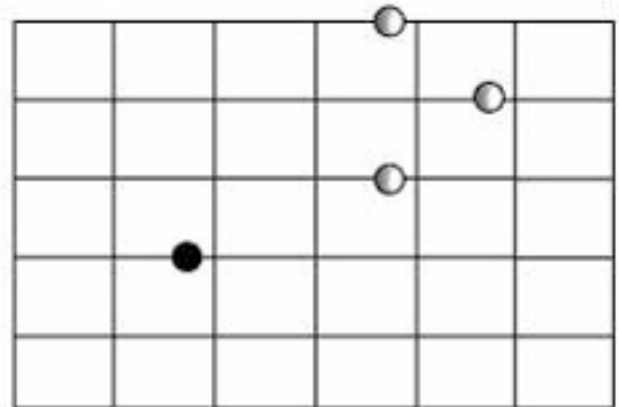
SHAPE 3



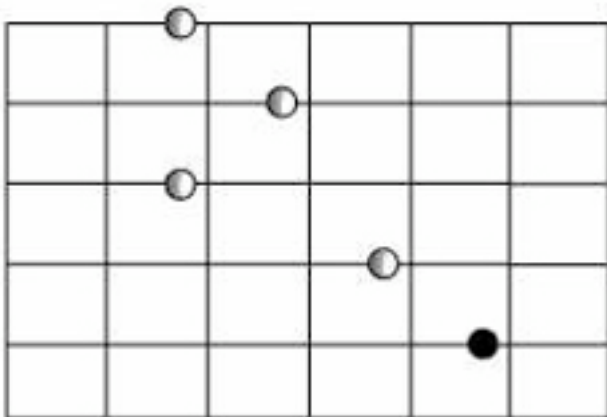
SHAPE 4



SHAPE 6



SHAPE 7

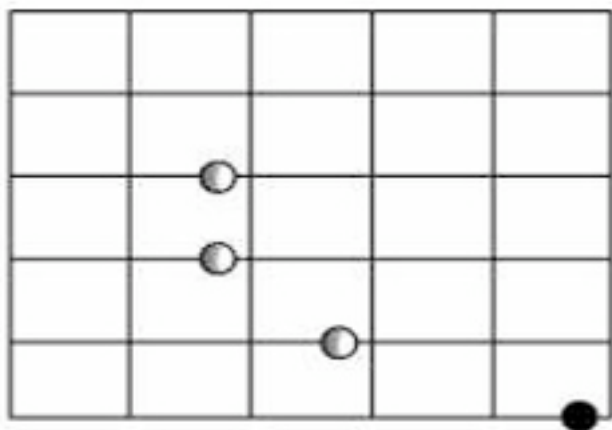


Because of overlaps in the seven major scale shapes:-

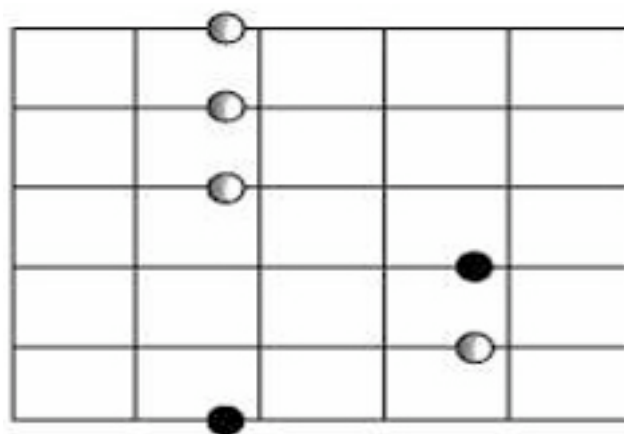
- Scale shapes 1 and 2 share the same chord (shape1)
- Scale shapes 5 and 6 share the same chord (shape 6)

THE FIVE BASIC MINOR SHAPES

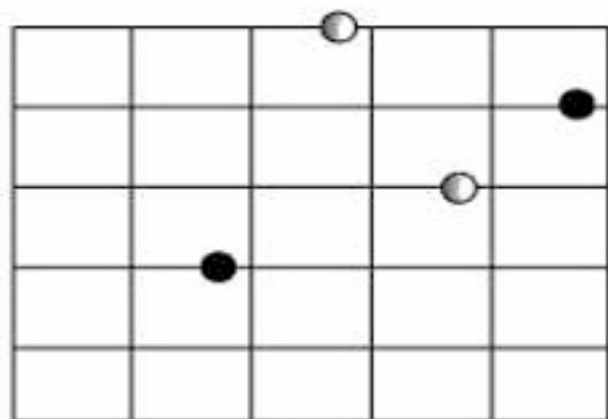
SHAPE 1



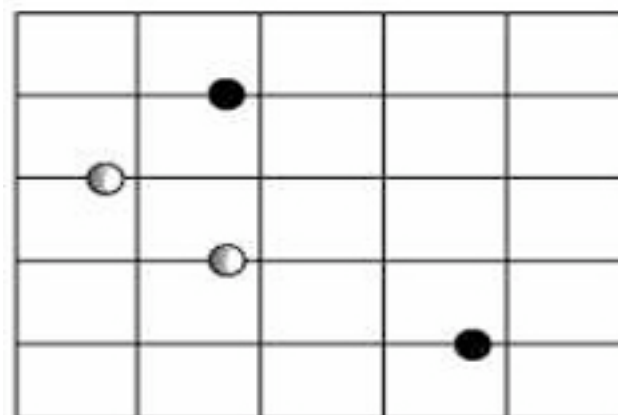
SHAPE 3



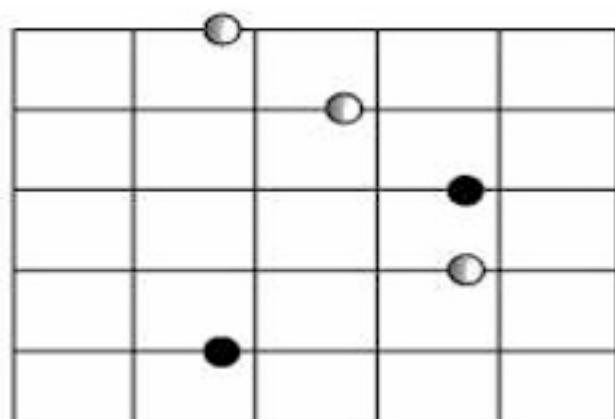
SHAPE 4



SHAPE 5



SHAPE 7



Because of overlaps in the natural minor scale shapes

- Scale shapes 2 and 3 share the same chord (shape 3)
- Scale shapes 5 and 6 share the same chord (shape 5)

Thus :-

MAJOR SCALE SHAPES	1	2	3	4	5	6	7
MAJOR CHORD SHAPES	1	/	3	4	/	6	7
RELATIVE MINOR CHORD SHAPES	1	/	3	4	5	/	7

NOTE

Limited fingering options for chord shapes with middle finger roots produces some anomalies.

Chord 1 could fairly be numbered 1 or 2. With standard fingering the major chord uses root point 2 but the relative minor shape uses root point 1. Also all derivative scales, arpeggios etc use root point 1. So on balance chord 1 stays as chord 1.

Chord 4 is a similar case. Standard fingering places the chord on root point 5 but taking scales and arpeggios into consideration 4 is a better number.

Also it will be seen that the relative minor chord for shape 6 changes its position and moves down to root point number 5

MAJOR SCALE MODES

Each major scale has within it seven modes, these modes being themselves scales that start from each of the notes of the original major scale. Thus :-

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

Each of the modes made from the scale of C (for example shape 1) are part of the scale of C but have different root points.

The second mode (Dorian) is made of C scale notes but is in fact an altered scale of D minor (having a sharpened sixth) its root point would therefore be minor root point number 5.

Three of the modes are major modes and the other four are minor. The major modes will therefore have major root points and the minor modes have minor root points.

NOTES	MODE NAME	ROOT POINT
C D E F G A B	IONIAN IN C	MAJOR ROOT POINT 1
D E F G A B C	DORIAN IN C	MINOR ROOT POINT 5
E F G A B C D	PHRYGIAN IN C	MINOR ROOT POINT 4
F G A B C D E	LYDIAN IN C	MAJOR ROOT POINT 5
G A B C D E F	MIXOLYDIAN IN C	MAJOR ROOT POINT 4
A B C D E F G	AEOLIAN IN C	MINOR ROOT POINT 1
B C D E F G A	LOCRIAN IN C	MINOR ROOT POINT 7

Traditionally 'Dorian in C' can also be named 'D Dorian'. If this name is used it must be remembered that a Dorian Mode is a minor mode and has a minor scale root point.

THE SEVEN MODES OF THE HARMONIC MINOR

Example – A Harmonic Minor

MODE 1	A	B	C	D	E	F	G#	—	—	—	—	—	—
MODE 2	—	B	C	D	E	F	G#	A	—	—	—	—	—
MODE 3	—	—	C	D	E	F	G#	A	B	—	—	—	—
MODE 4	—	—	—	D	E	F	G#	A	B	C	—	—	—
MODE 5	—	—	—	—	E	F	G#	A	B	C	D	—	—
MODE 6	—	—	—	—	—	F	G#	A	B	C	D	E	—
MODE 7	—	—	—	—	—	—	G#	A	B	C	D	E	F

Three of the modes of the harmonic minor are major modes and therefore have major root points. Four are minor or altered minor modes and have minor root points. Thus, for shape 1 harmonic minor:-

NOTES	MODE	ROOT POINT
A B C D E F G #	FIRST M. HAR M	MINOR ROOT POINT 1
B C D E F G # A	SECOND	MINOR ROOT POINT 7
C D E F G # A B	THIRD	MAJOR ROOT POINT 1
D E F G # A B C	FOURTH	MINOR ROOT POINT 5
E F G # A B C D	FIFTH	MAJOR ROOT POINT 6
F G # A B C D E	SIXTH	MAJOR ROOT POINT 5
G # A B C D E F	SEVENTH	MINOR ROOT POINT 2

SUMMARY

The seven major scale shapes are collectively the most important technical tool for any guitarist.

The numerical system seeks to simplify the learning and playing of the guitar by setting in order and numbering these major scale shapes and derivative scales, arpeggios and chord shapes. Each scale shape will be given a number, one through seven. Sharing that number will be.....

- **THE RELATED NATURAL MINOR**
- **THE RELATED HARMONIC MINOR**
- **THE RELATED MELODIC MINOR**
- **THE MAJOR AND RELATED MINOR PENTATONIC AND BLUES SCALES**
- **THE SEVEN MODES OF THE MAJOR SCALE AND RELATED MINOR SCALES**
- **THE MAJOR AND RELATED MINOR CHORD SHAPES AND ARPEGGIOS**
- **ALL DERIVATIVE MAJOR AND RELATED MINOR CHORD ARPEGGIOS**

We can have....

- **Seven shapes in one position or**
- **Seven positions for one shape**

Whatever number we start from the scales will always ascend the neck numerically. Thus, the numbers will be in numerical order whatever the key or position. This will enable the guitarist to more easily learn the geography of the fingerboard.

The numerical system is really a very simple idea. The seven scale shapes are numbered from one to seven and everything is based on that.