

HUB HILDENBRAND

# ADVANCED GUITAR BOOK

## CHAPTER V

59 pages (434–492 of book)

### SCALES

CHURCH MODES

THE 33 REGULAR SCALES

ALL FINGERINGS ACROSS THE NECK (CONCEPTS)

PRACTICING SCALES (EXERCISES)

72 SOUTH INDIAN SCALES

THE SCALE ALAP

ALL (66) PENTATONIC SCALES



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# Chord-Scale System

The tones of a scale (usually a heptatonic, or 7-note scale) are falling into one of the following groups, or categories:

## I. STANDING TONES (stable)

Chord-tones (harmonic framework, fundamental chord, harmonic function); 1, 3, 5 (and 8), the skeleton

## 2. GOING TONES (unstable)

Nonchord-tones or nonharmonic tones; 2, 4, 6 and 7

Nonharmonic tones are perceived as dissonant and create intervals of a second, fourth, sixth or seventh. Their tendency is to resolve to a chord-tone.

### Categories of Nonchord tones:

- **Passing tone** (german: Durgangston). They can also contain more notes
- **Neighbor Tone** (german: Wechselton), upper or lower neighbor tone
- **Anticipation** (german: Vorausnahme)
- **Suspension** (german: Vorhalt), which can be prepared or unprepared (german: freier Vorhalt). **Retardation** is a suspension which resolves upwards
- **Escape tone** (german: abspringender Nebenton) is a neighbor tone that is approached stepwise from a chord tone and resolved by leaping usually in the opposite direction back to a chordtone
- *Escape tone reverse* (german: angesprungener Nebenton) is a neighbor tone that is approached by leap from a chord tone and resolved stepwise usually in the opposite direction back to a chordtone
- *Free Neighbor Tone* (german: freier Nebenton) is a neighbor tone that is approached and left by a leap
- **Pedal tone**

Generally Nonchord tones can be **diatonic** and **chromatic**.

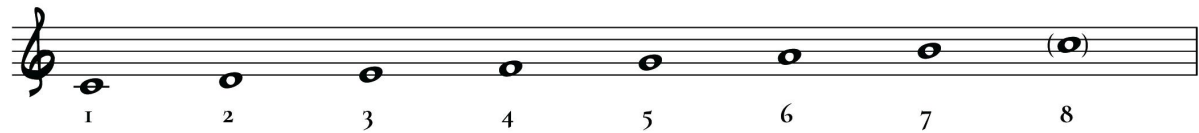
If more Nonchord tones taking place at the same time, Passing-, Suspension- or Neighbor-chords can be generated.

If Nonchord tones become part of a chord, they are called tensions or extensions.

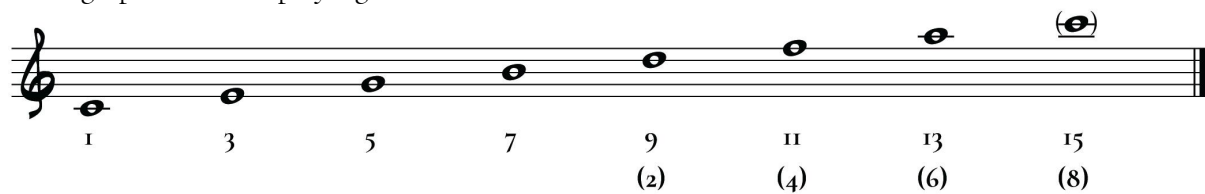
## A CHORD AND A SCALE IS ONE AND THE SAME

Chord and scale are intertwined

Stacking up seconds (stepwise) it is a scale



Stacking up thirds and playing them at the same time it is a chord



In both cases the pool of notes is just the same. A chord always implies one or more possible scales, and a scale always implies one or more possible chords.

This pool is the source of melody and harmony.

# Examples of Nonharmonic Tones

Em Aeolian

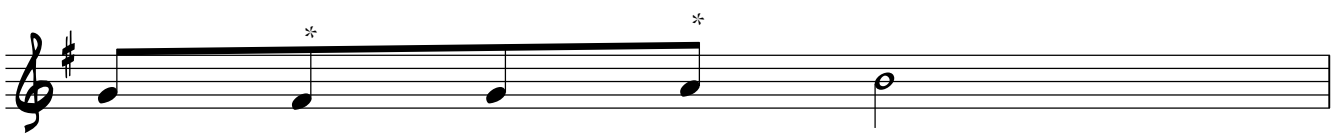
Passing tone



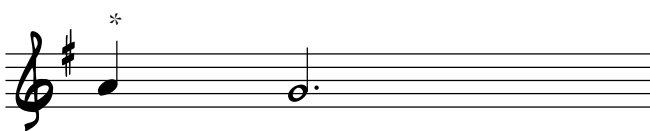
Passing tones



Neighbor Tone



Suspension



Retardation



Escape Tone



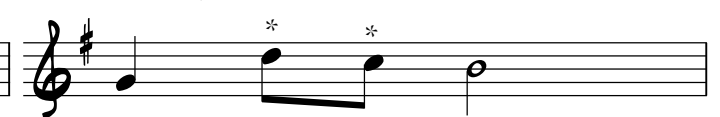
Escape Tone (reverse)



Free Escape (or Neighbor) Tone

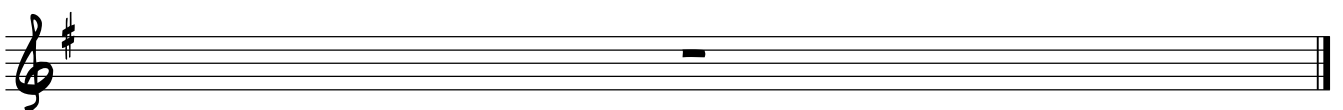
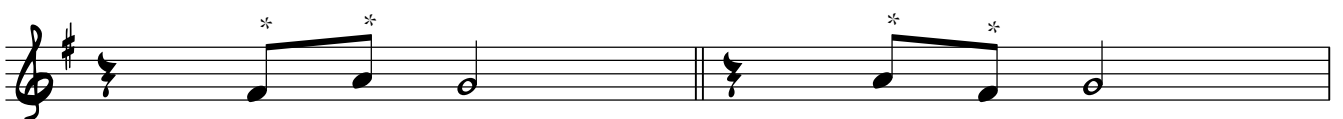


Free Escape (or Neighbor) Tone + Passing Tone



Diatonic Chord Tone Approaches

Enclosure



# Fm Harmonic Minor Scale

chord-tones (F, Ab, C) on the beat, non-chord-tone (scale) off the beat (on *Ra*), stepwise motion only  
whole scale is present E $\natural$  - F - G | G - Ab - Bb | Bb - C - Db

The image displays a musical score for the Fm Harmonic Minor Scale in 4/4 time, consisting of ten staves of notation. The key signature is three flats (Bb, Eb, Ab) and the time signature is 4/4. The notation is written in a single treble clef. The first staff shows the scale starting on F4, moving stepwise up to C5. The second staff continues the scale from C5 down to F4. The third staff shows the scale starting on F4, moving stepwise up to C5, with a fermata over the final C5. The fourth staff continues the scale from C5 down to F4. The fifth staff shows the scale starting on F4, moving stepwise up to C5, with a fermata over the final C5. The sixth staff continues the scale from C5 down to F4. The seventh staff shows the scale starting on F4, moving stepwise up to C5, with a fermata over the final C5. The eighth staff continues the scale from C5 down to F4. The ninth staff shows the scale starting on F4, moving stepwise up to C5, with a fermata over the final C5. The tenth staff continues the scale from C5 down to F4. The notation includes various rhythmic values (quarter, eighth, and sixteenth notes) and rests, as well as dynamic markings like accents (>) and fermatas (') to emphasize specific notes and phrases.

# Tonal Tendencies of Scale Tones

Music is the miniature of a universe. When we exam the tendencies of scale tones, we will understand, what that means.

The root is the gravitational center (a definition of tonality: *A tone to which all the others gravitate to*). Generally all notes can resolve directly to the root.

**The perfect fifth stabilizes the tonality and confirms the root.**

The Tonal **Framework 1** (Root and 5th) gives the root its stability. Beside the octave, the perfect 5th is merging to the highest possible degree with the root and is the next strongest tone of gravitational force besides the root.

Both neighbour tones 7 and 2 want to resolve to the root (or octave) and 4 and 6 want to resolve to the 5th.

The only note which doesn't disturb the tonal framework 1, is the **third**. Whether major or minor, it tends to follow directly the gravitational pull of the root, and at the same time having itself an attraction to the 2 and the 4 to gravitate to. **The major third even confirms the root!**

General point: do not confuse the resolution of harmonic tension with the relaxation of the vocal chords moving down in pitch!

The voice tends to prefer smaller intervals (steps), since they are easier to sing. Larger intervals (larger leaps) are already adding expression.

Harmonic Series: Generally you can say, that partials 1 – 6 make up the tones of gravitivity/resolution and the tonal framework. The minor 3rd can be seen as a variation of the 5th partial (the major third).

Legend:

- black notes: "going tones" (labil, unstable)
- white notes: "standing tones" (stable), framework, gravitation

**Characteristic pitch: in Ionian and Aeolian the highest tension of a note in the scale:**

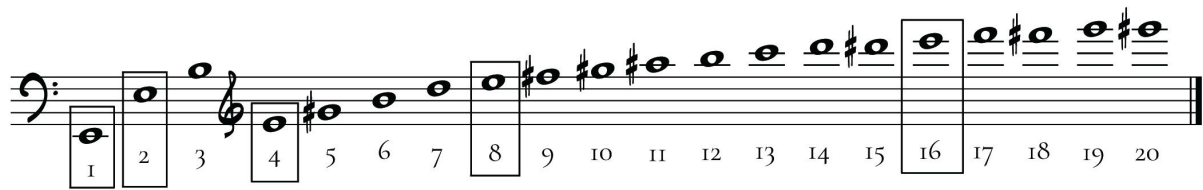
A minor second above a framework tone is perceived to have a lot of tensions. It really fights for for supremacy. Its a question of either-or and not of coexistence. When singing that pitch you really feel the dissonance. That is very true for the b6 in Aeolian and to a lesser degree of course, for the 4 in Ionian. In Ionian the dissonance of the 4 has another added reason, which is the danger of the 4, becoming the tonal center itself and even confirmed by the root, which would be the perfect fifth of the 4 (*Framework 2*), the subdominant!

## The harmonic series and the decrease of gravity:

The intervals of the harmonic series are, in a way all confirming the fundamental as the root, but with a very fast decrease of gravity, or less and less confirming the fundamental as the harmonic series rises. For our purposes, and for practical use, I consider only the first 9 partials. The perfect 5th has the most prominent function in supporting the root, and the same goes, with a lesser degree for the major third. The minor third of the fundamental (coming very late – partial 19 – in the harmonic series), I consider (see also Paul Hindemith) as just a variation of the major third. Another way to perceive a minor third is the association of it as part of a major triad. You can hear that the minor third *E* and *G* tend to resolve to *C*! That is very easily explained in the harmonic series (partials 5 and 6).

Caution: when deriving rules from the harmonic series for our music can be sometimes critical, since the intonation of the harmonics and our 12-ET is different to varying degrees. For example partials 7 to 8 and partials 8 to 9, both form a major second, but of different size. In the harmonic series in both cases 8 is confirmed as the root, whereas in our music (12-ET) it is not clear which note of a major second is more of a gravitational center. We tend to give the lower note that function, since 8 to 9 (204 cent) is closer to our system than 7 to 8 (231 cent)!

The harmonic series from E:



Decreasing level of blending (increasing dissonance).

Its fascinating, that it took some time, in music history to recognize the octave as just a repetition of the root in a higher register!

## Tonal Harmony

The tonal Framework 1 is the perfect 5th. The added minor or major third is the only interval we can add, without having the interval of a 2nd to the root or 5th! In other words: the addition of the 3rd is the only interval which will not question the tonality/stability.

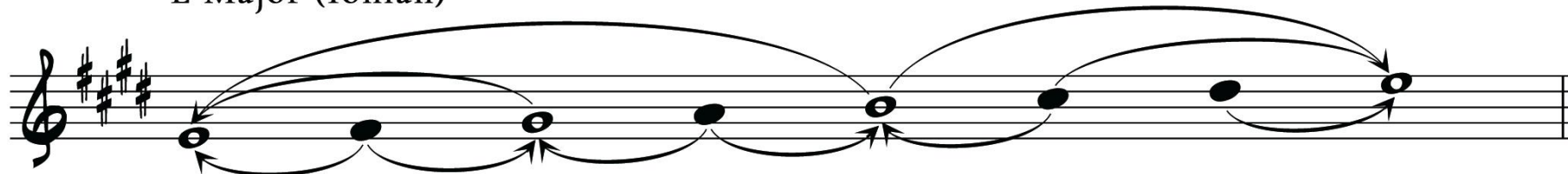
E F# G A B C D E

The 4 traditional triads (tertian harmony) – major, minor, diminished, augmented – are the only 3-Note Structures which don't include a major or minor second.

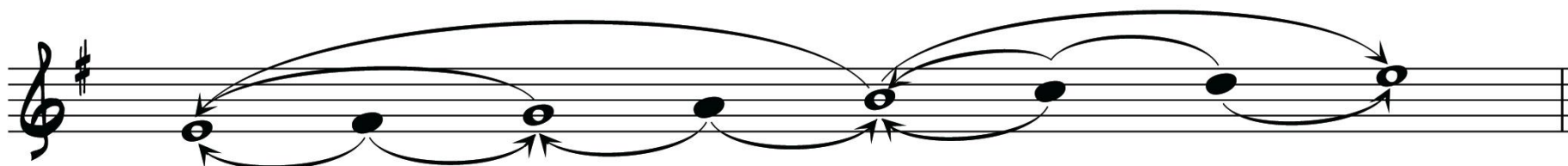


Tonal Tendencies of Scale Tones

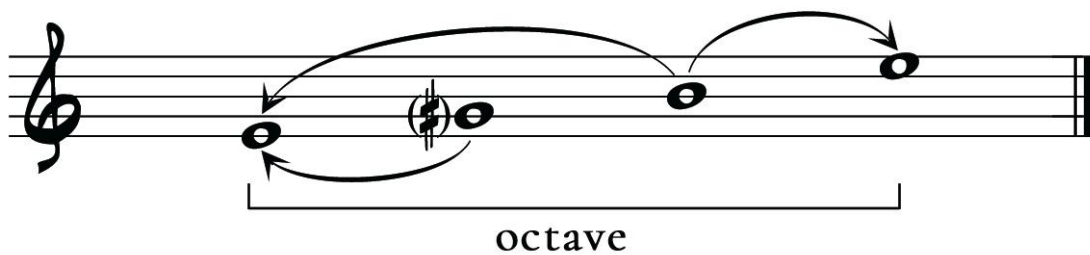
E Major (Ionian)



E Minor (Aeolian, Natural Minor)



E, Tonal Framework 1 with 3rd



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# Church Modes 1st Exercise, Singing

## Lesson 01

### Ionian

Sing

Play (drone)

sing names of the notes

### Dorian

### Phrygian

2

### Lydian

Two systems of musical notation for the Lydian mode. Each system consists of two staves. The first system shows a scale in the upper voice and a scale in the lower voice with slurs. The second system shows a scale in the upper voice with a fermata on the final note and a scale in the lower voice with slurs.

### Mixolydian

Two systems of musical notation for the Mixolydian mode. Each system consists of two staves. The first system shows a scale in the upper voice and a scale in the lower voice with slurs. The second system shows a scale in the upper voice with a fermata on the final note and a scale in the lower voice with slurs.

### Aeolian

Two systems of musical notation for the Aeolian mode. Each system consists of two staves. The first system shows a scale in the upper voice and a scale in the lower voice with slurs. The second system shows a scale in the upper voice with a fermata on the final note and a scale in the lower voice with slurs.

Locrian

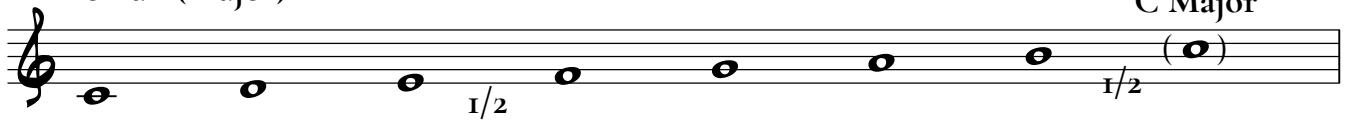
3

The image displays musical notation for the Locrian mode. It consists of two systems, each with two staves. The top staff of each system shows a scale of quarter notes: G2, A2, Bb2, C3, D3, E3, F3, G3. The bottom staff of each system shows a series of slurs, indicating a specific fingering or articulation for each note of the scale. The word "Locrian" is written above the first system, and the number "3" is written above the second system.

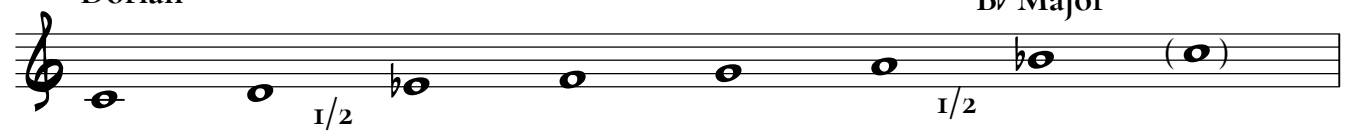
# Lesson 02

## The Church Modes

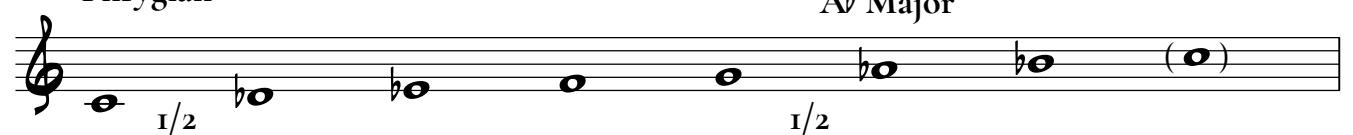
Ionian (Major) C Major



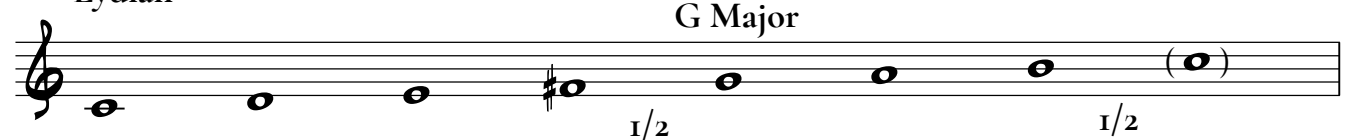
Dorian B $\flat$  Major



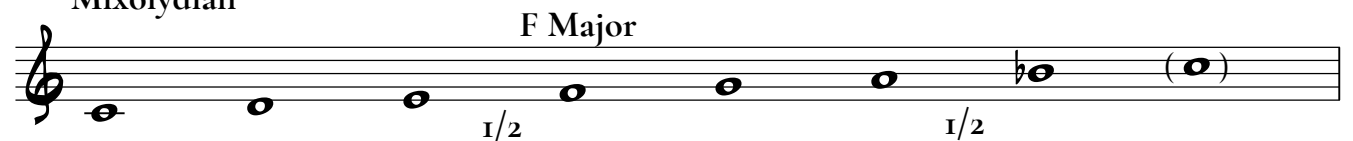
Phrygian A $\flat$  Major



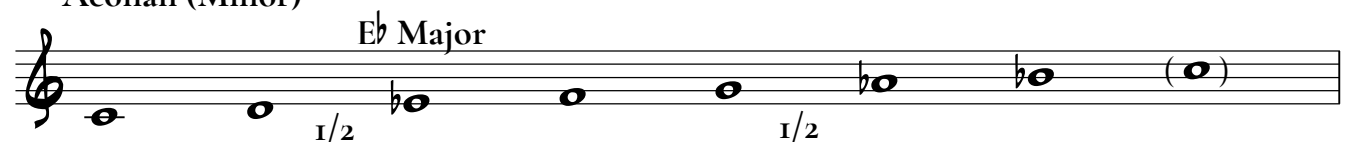
Lydian G Major



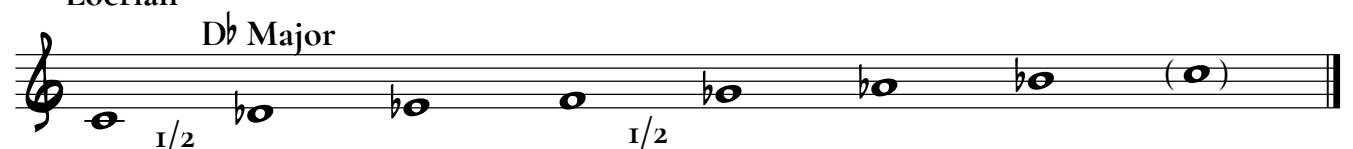
Mixolydian F Major



Aeolian (Minor) E $\flat$  Major



Locrian D $\flat$  Major



# 7 Church Mode Melodies

- a) all seven notes of the scale should be present
- b) "C" should always sound as the root (resolution)

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## C Ionian



## C Dorian



## C Phrygian



## C Lydian



## C Mixolydian



## C Aeolian



## C Locrian



# The Church Modes Put In Systematic Order

c.n. = characteristic note

## MAJOR TRIAD - C E G ("Major Scales")

Lydian BRIGHT

#4 the lydian 4th

the major scale

Ionian

Mixolydian

b7

## MINOR TRIAD - C Eb G ("Minor Scales")

Dorian

b6 the dorian 6th

natural minor scale, the minor scale

Aeolian

b6

b2 the phrygian 2nd

Phrygian

## DIMINISHED TRIAD - C Eb Gb ("Diminished Scale")

Locrian DARK

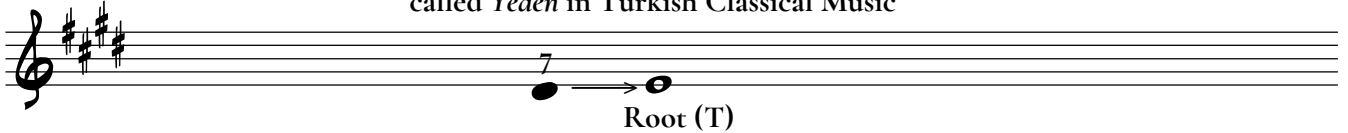
b5

Scales are also arranged from "bright" to "dark"

# Scale Organization (E Major)

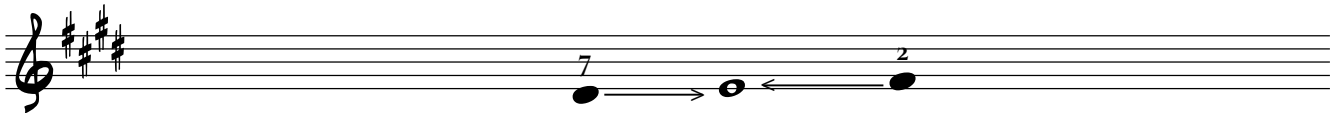
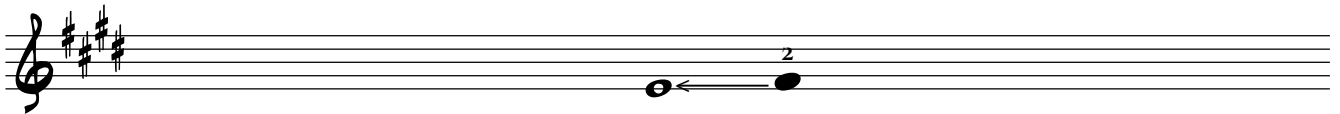
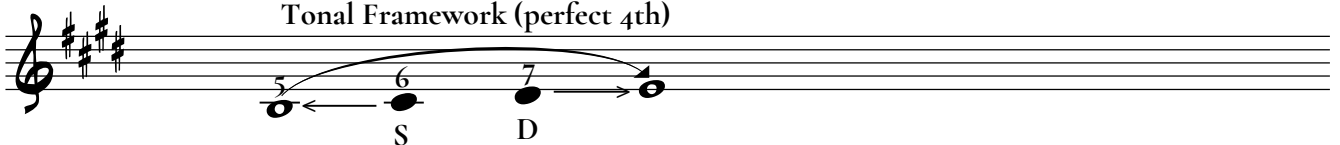
similar in E minor

Leading Tone (D)  
called *Yeden* in Turkish Classical Music



the leading tone wants to go up to tonic but is also opening the door to downward movement (lower Tetrachord)

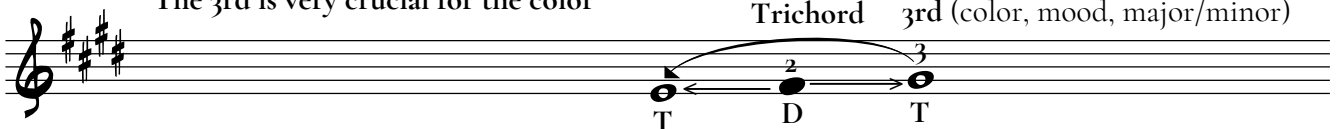
Tonal Framework (perfect 4th)



Trichord, also *Cesni* (Maqam), which means taste, smell, character

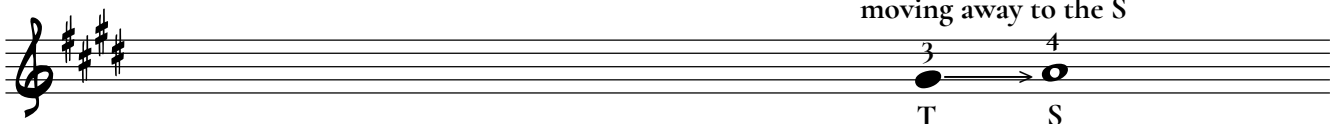
The 3rd is very crucial for the color

Trichord 3rd (color, mood, major/minor)



The concept of *Cesni* in maqam music is very connected to the importance the 3rd has in western music, which gives the main mood!

moving away to the S



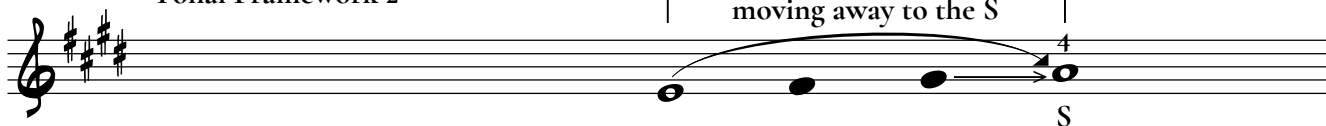


2

Tonal Framework 2

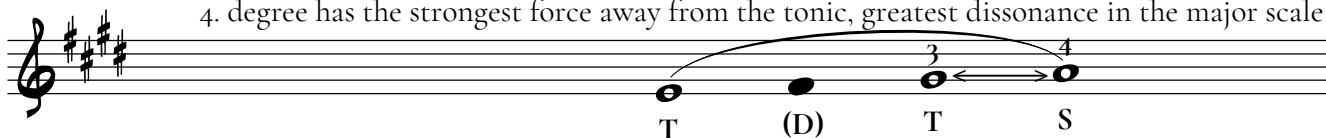
Tetrachord

moving away to the S



A pendulum between tonic and subdominant (two gravitational forces)

4. degree has the strongest force away from the tonic, greatest dissonance in the major scale

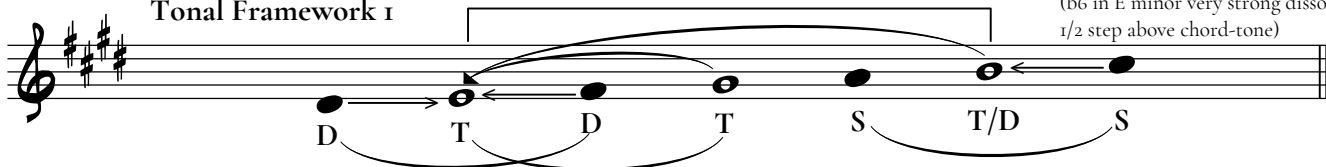


The major triad (E, G# and B) you find at partials 4, 5 and 6 of the harmonic series

Tonal Framework 1

Pentachord

(b6 in E minor very strong dissonance, 1/2 step above chord-tone)

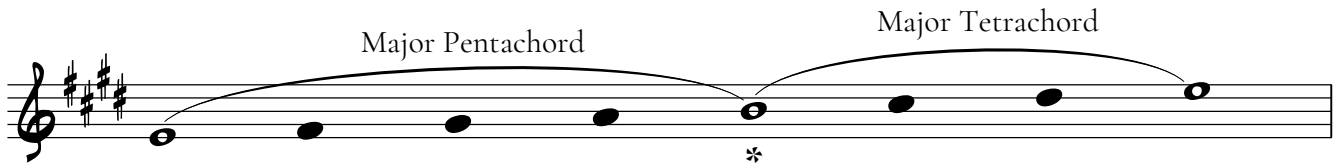


Tonal framework I is the heart of the tonality

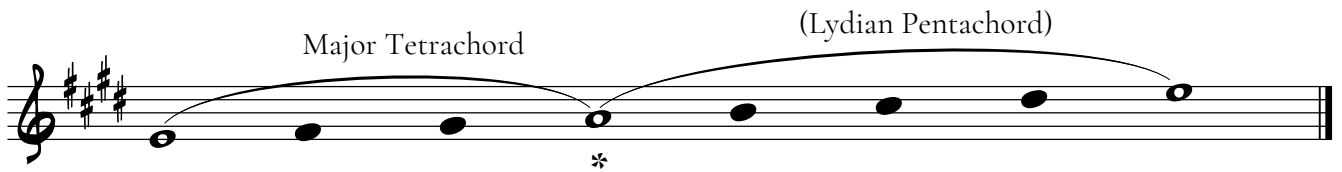
T : Tonic | D : Dominant | S : Subdominant  
Each note has one or two of these 3 functions

Two PLATEAUS! A 7-note scale is constructed by connecting a pentachord with a tetrachord.

Tonal Framework 1 (*authentic*)

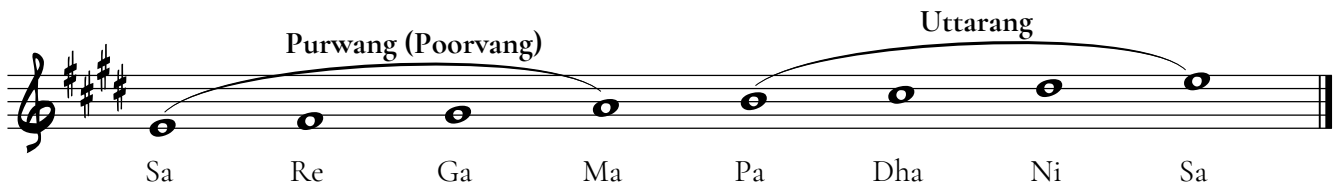


Tonal Framework 2 (*plagal*)



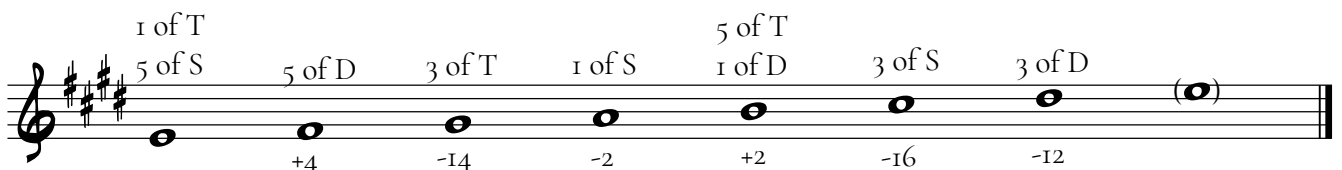
\* : The *Güçlü*, the note which connects the pentachord with the tetrachord.  
It is the next strongest note to the tonic. The most dominant note.

Upper and lower limb (-ang) of the Saptak (whole scale, 7 notes) of Raga



It seems very natural that the perfect intervals relating to the root are creating strong forces, which are directed towards T, D or S. A strong framework is automatically created.

In early music the major scale was tuned to just intonation: major triads on I, IV and V tuned perfectly to the harmonic series:



By emphasizing a new tone instead of the tonic,  
you can open a door to a complete shift of gravity!



# THE REGULAR SCALES

The aim here is to organise, to arrange all the possible scales into groups, categories. The regular scales is the first category.

## Rules for scale construction:

- 2 can be followed by 2 or b2
- b2 can be followed by 2 or #2
- #2 can only be followed by b2

This results in the following laws:

- only 2 can follow after itself
- #2 is only reached and left by b2. Otherwise it sounds as if a tone is missing. For example: b2 #2 2 (C Db E F#) implies a missing D#. Or enharmonically C Db Eb Fb Gb. (Compare also: Pentatonic)
- b2 on b2 is avoided (it is considered chromatic, non-diatonic)
- **from each tone a major or minor third can be formed.** The 5 forms/trichords are: major third (3): 2 2, b2 #2, #2 b2 and minor third: 2 b2, b2 2.

Following the above rules, 33 different scales (modes) can be constructed, which then can be traced back to 7 parent scales.

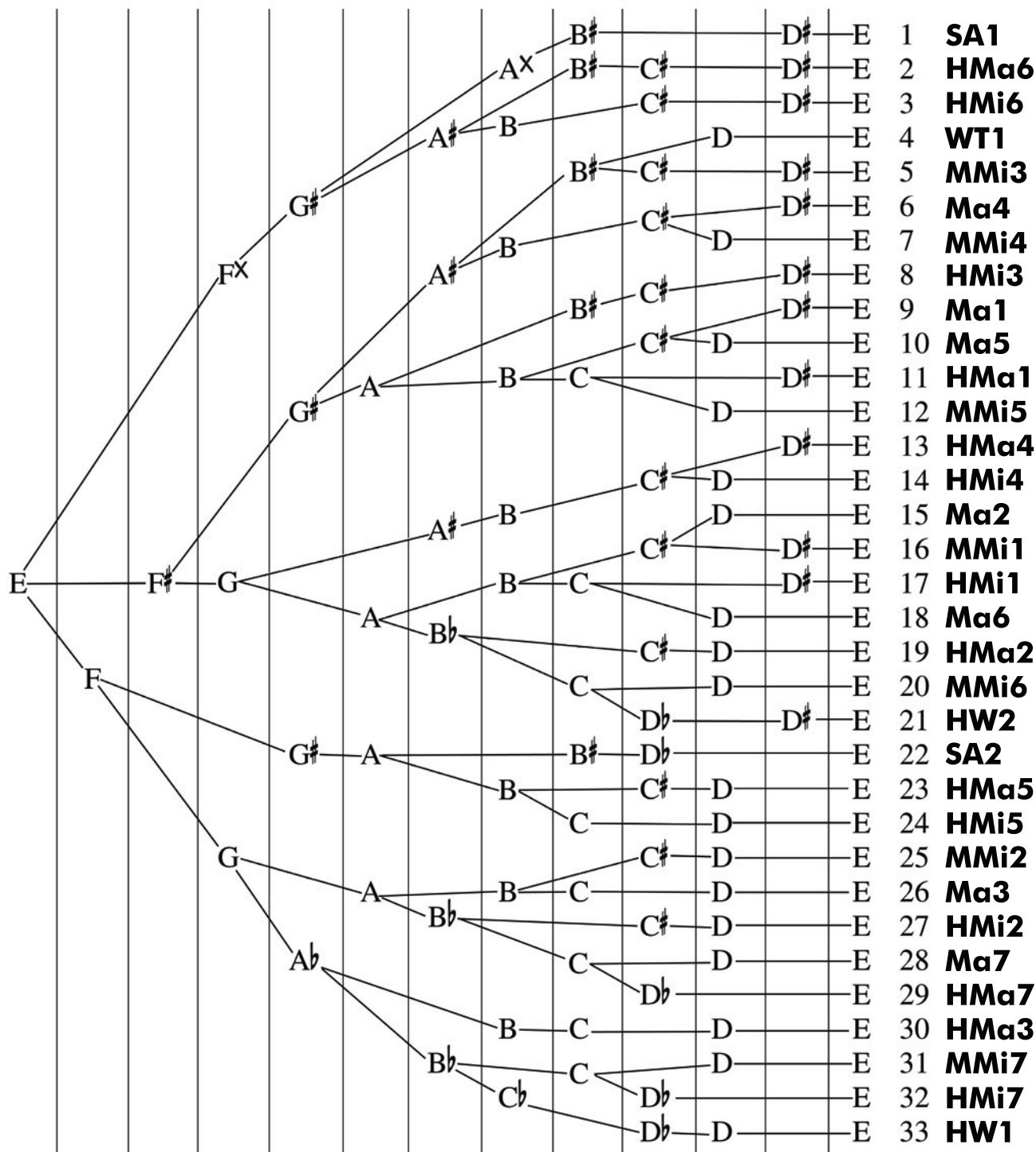
Legend:

b2 = minor second

2 = major second

#2 = augmented second

# The 33 Modes of the 7 Parent Scales



# 7 Parent Scales (in E)

## 7-NOTE SCALES (Non-Symmetric)

(28)

### Major (Ma)

1 2 3 4 5 6 7

2 2  $b2$  2 2 2  $b2$

### Harmonic Minor (HMi)

1 2 3 4 5 6 7

2  $b2$  2 2  $b2$  #2  $b2$

### Melodic Minor (MMi)

1 2 3 4 5 6 7

2  $b2$  2 2 2 2  $b2$

### Harmonic Major (HMa)

1 2 3 4 5 6 7

2 2  $b2$  2  $b2$  #2  $b2$



## SYMMETRIC SCALES

(5)

### Whole Tone Scale (WT)

6 notes

1

2 2 2 2 2 2

### Symmetric Augmented Scale (SA)

6 notes

1 2

#2  $b2$  #2  $b2$  #2  $b2$

### Half Tone Whole Tone Scale (HW)

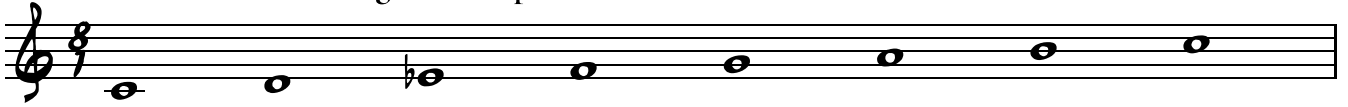
8 notes

1 2

$b2$  2  $b2$  2  $b2$  2  $b2$  2

# Modes of Melodic Minor

Melodic Minor (Raga Patdeep)



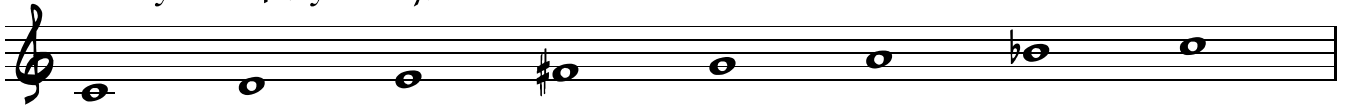
Dorian b2, Phrygian b6



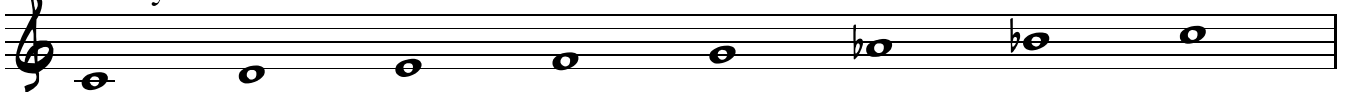
Lydian-Augmented (Lydian #5)



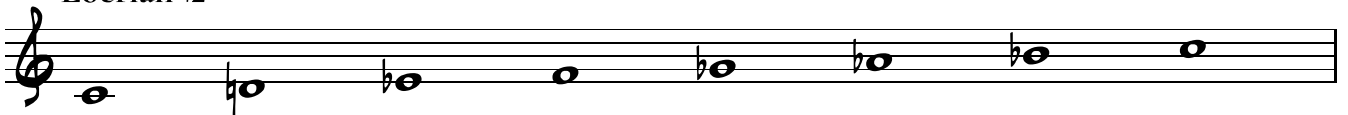
Mixolydian #4 (Lydian b7)



Mixolydian b6

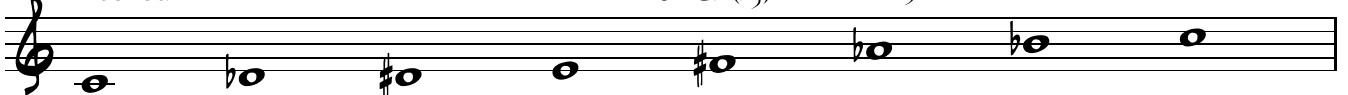


Locrian b2



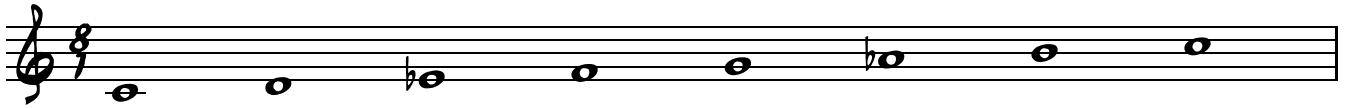
Altered

or Gb (b5) or G# (#5)



# Modes of Harmonic Minor

Harmonic Minor (Raga Kirwani)



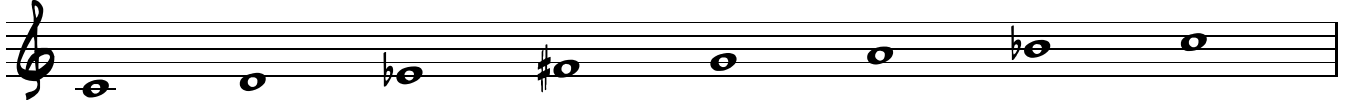
Locrian  $\flat 6$



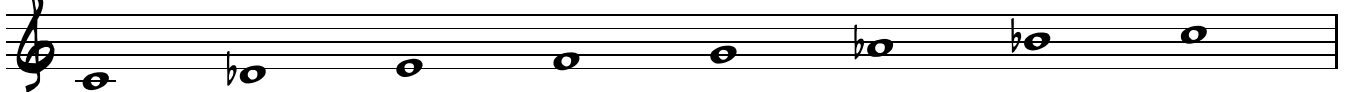
Augmented (Ionian  $\sharp 5$ )



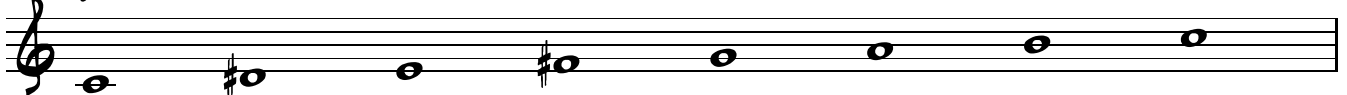
Dorian  $\sharp 4$



HMV - Harmonic Minor 5th Mode (Mixolydian  $\flat 2$  and  $\flat 6$ , or Phrygian Major)



Lydian  $\sharp 2$



(Locrian  $\flat 4$ ,  $\circ 7$ , Superlocrian, Altered  $\circ 7$ , Mixolydian  $\sharp 1$ )



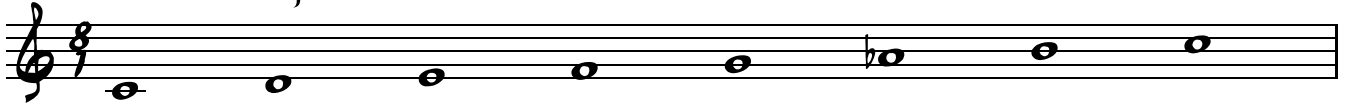
$A\flat$  HMV / C

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# Modes of Harmonic Major

Harmonic Major



Locrian  $\frac{1}{2}$  and  $\frac{1}{6}$  (Dorian  $b_5$ )

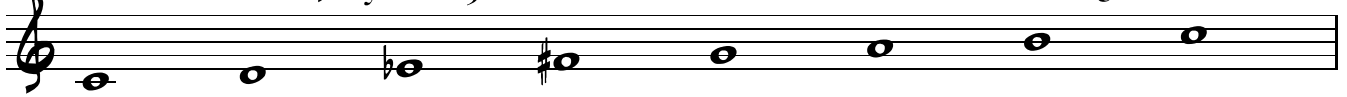


Altered  $\frac{1}{5}$  (Phrygian  $b_4$ )



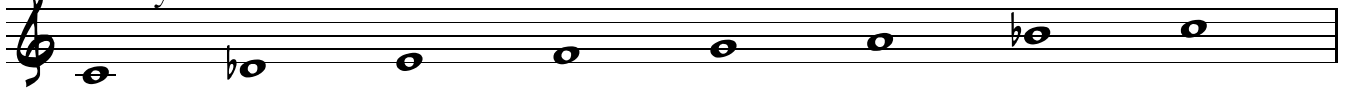
Melodic Minor  $\#_4$  (Lydian  $b_3$ )

(Raga Madhuvanti)



Mixolydian  $b_2$

(Raga Ahir Bhairav)



Lydian-Augmented  $\#_2$



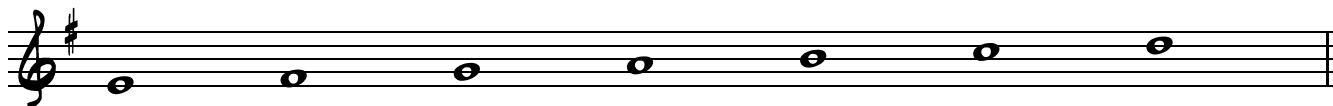
Locrian  $^{\circ}7$



# A 7-Note Scale Contains...

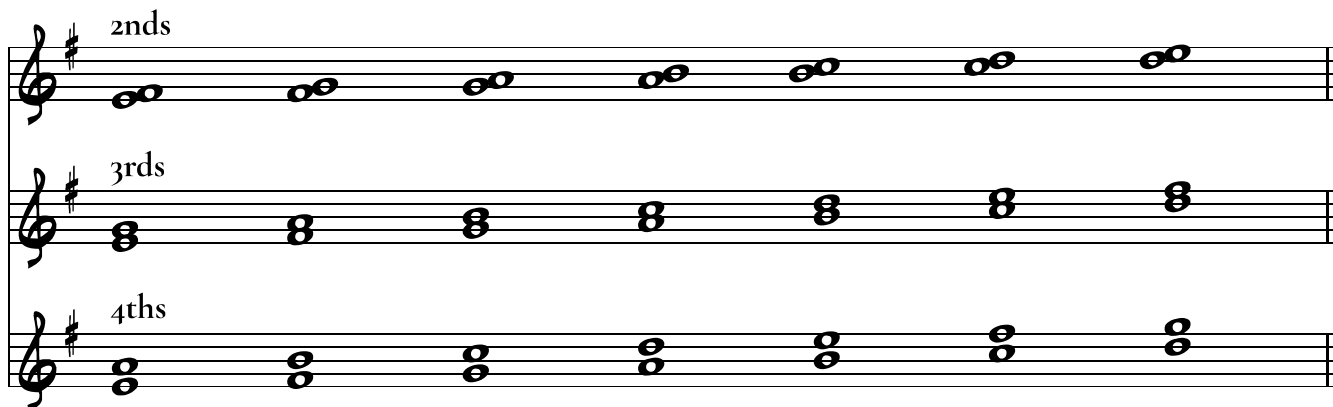
## 7 single notes plus 119 Structures of 2, 3, 4, 5, and 6 notes

7 Single Notes (*mono-*), all notes together: Heptatonic\*

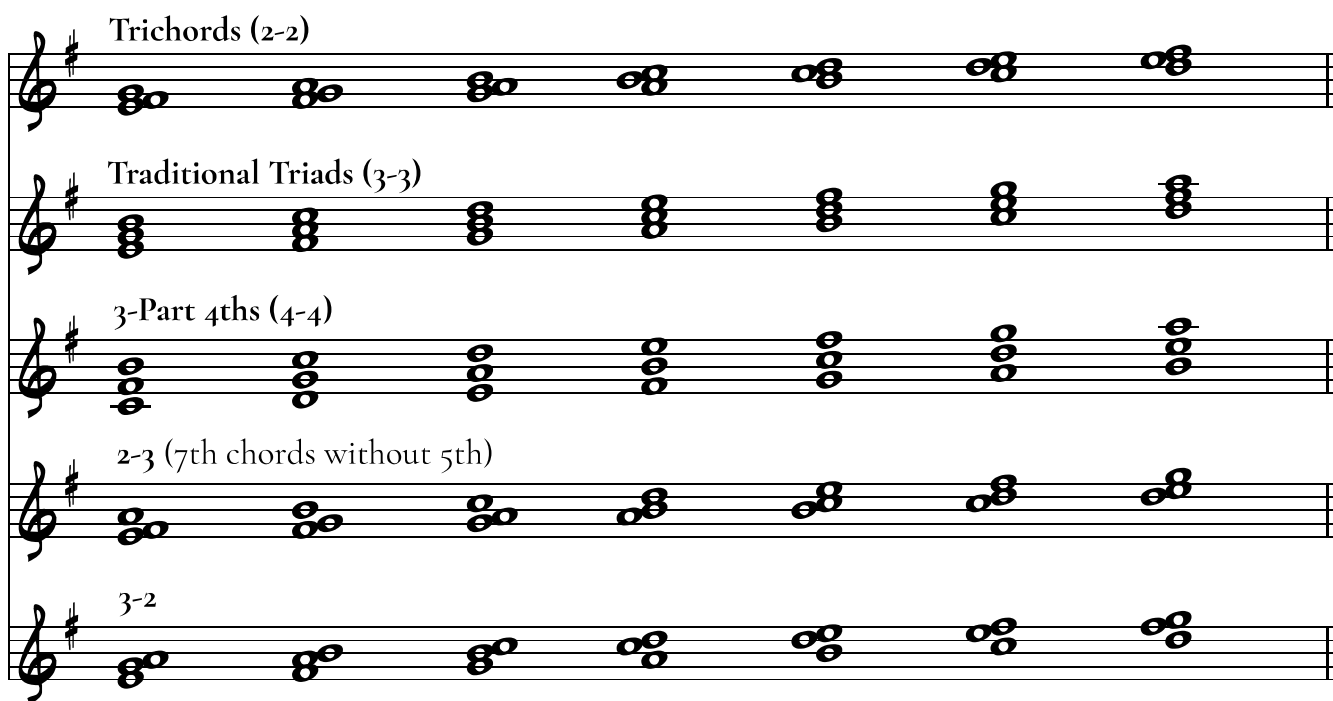


\* a 8-Note Scale is an Octatonic

21 2-Note Structures (3 Families), Intervals, Dyads (*di-*)



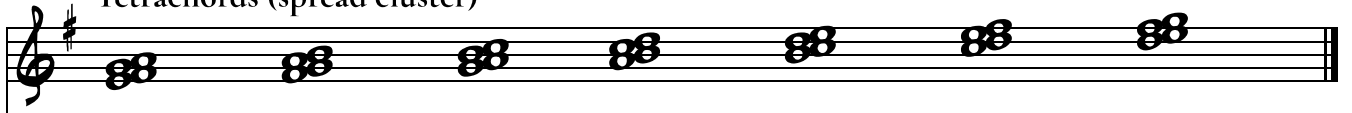
35 3-Note Structures (5 Families), Tritonic



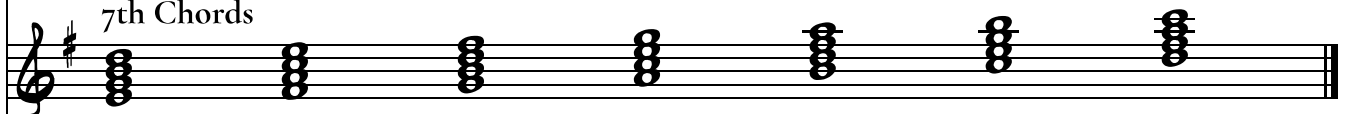
## 35 4-Note Structures (5 Families), Tetratonic

2

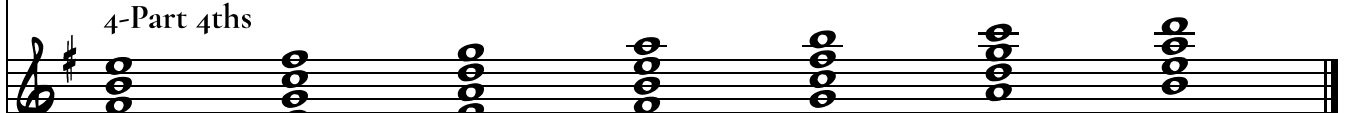
Tetrachords (spread cluster)



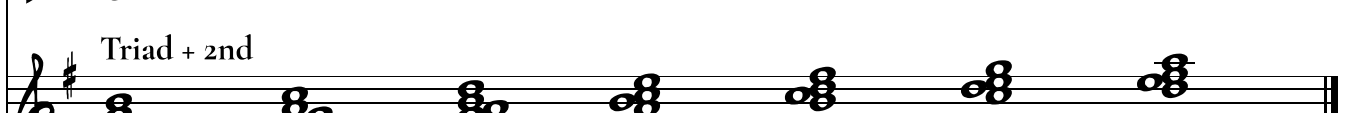
7th Chords




4-Part 4ths



Triad + 2nd

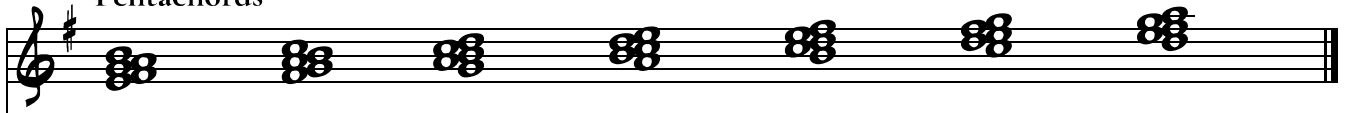


Triad + 4th




## 21 5-Note Structures (3 Families), Pentatonic

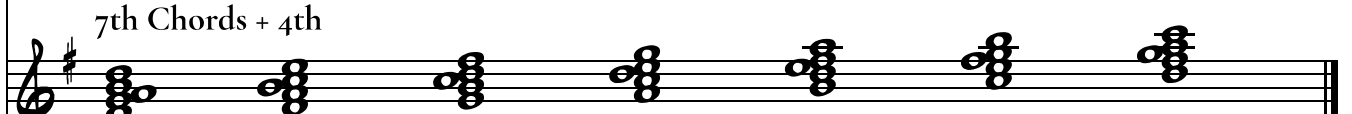
Pentachords



7th Chords + 2nd (equals 7th Chords with 6th)

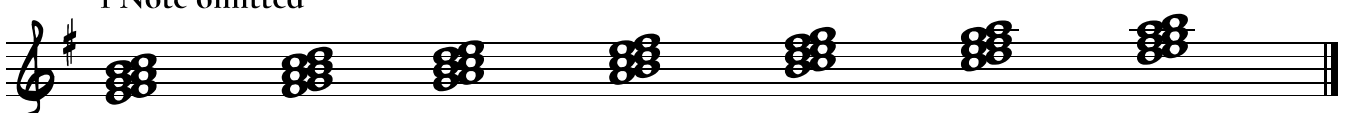


7th Chords + 4th



## 7 6-Note Structures, Hexatonic, Hexachords

1 Note omitted



# Expanding Our Repertoire Of Scales

## Adding the *chromatic triad*

Our starting point are the **33 regular scales**, which we came up with, by applying three simple rules:

1. A major second can be followed by another major second, or a minor second
2. A minor second can only be followed by a major second, or an augmented second
3. An augmented second has to be followed, and preceded by a minor second

We explained those rules in a previous lesson.

Since many many more scales are possible and in use in all the different cultures, we want to take a gradual journey through all the different possibilities, by taking a very systematic approach, adding more and more (musical) rules, expanding the 33 possibilities which bring us the three rules shown above.

In this next step we allow chromatic, meaning that **a minor second can be followed by one more minor second**. But we restrict that rule to only three situations: **the middle note should be either the root, the perfect fifth, or the major 3rd**, as shown on the other pages. In those situations a real audible chromaticism is avoided.

By **adding** the above rule (the other three rules are still valid, too) we come up with the 14 scales shown on the next page. With the exception of 3 scales, those are found in the Melakarta system of the 72 scales. In that classification each is given a unique name, too.

## All possibilities of scale degrees and their alterations

	Db	D	D#	(Fb)	F	F#		Ab	A			
C			Eb	E		Gb	G	G#	Bbb	Bb	B	C

These chromatic triads (triads with versions of 3 different natural notes) are possible:

**B-C-Db**

(D-Eb-Fb)

**D#-E-F**

E-F-Gb

**F#-G-Ab**

G-Ab-Bbb

G#-A-Bb

The **bold** ones are the most convincing, since the  $\frac{1}{2}$  steps of the *chromatic triad* are arranged around a very stable function (root, perfect 5th, and major 3rd, core pillars, partials 1 – 6 of the harmonic series). In this arrangement, the functions of tension and resolution are very clear, and the occurrence of a chromatic passing tone between the notes of a major second is avoided, since it will never sound as such.

# 3 Chromatic Triads

root (partials 1, 2, 4)

major 3rd (partial 5)

perfect 5th (partials 3, 6)

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# Example of b2-b2, Which Is Not Chromatic

notes of the C major triad

The image displays a musical score in 7/8 time, consisting of two staves of music and a third empty staff. The first staff begins with a treble clef, a key signature of one flat (B-flat), and a 7/8 time signature. The melody consists of eighth and quarter notes. Above the first staff, the text "notes of the C major triad" is written, with eight downward-pointing arrows indicating the notes C4, E4, G4, C5, E5, G5, C6, and E6. The second staff continues the melody, ending with a double bar line. The third staff is empty.

# 72 Scales (Carnatic/South Indian Melakartas)

## all combinations of:

It is very interesting, that although those resulting scales are sometimes very weird, the root (Sa) and the perfect fifth (Pa) are never altered, and always present! (see Framework 1)

### 12 Lower Tetrachords

Indu Chakra	Netra Chakra (Phrygian)	Agni Chakra (HMV)
Veda Chakra (Minor)	Bana Chakra (Major)	Ritu Chakra
Rishi Chakra	Vasu Chakra	Brahma Chakra
Disi Chakra	Rudra Chakra (Lydian)	Aditya Chakra

### 6 Higher Tetrachords

1	2 (Phrygian)	3 (HMV)
4 (Minor)	5 (Major)	6



# All Possibilities

## CHROMATIC TRIAD: B - C - D $\flat$

Agni Chakra + 5 Sooryakantam, the 17th Melakarta

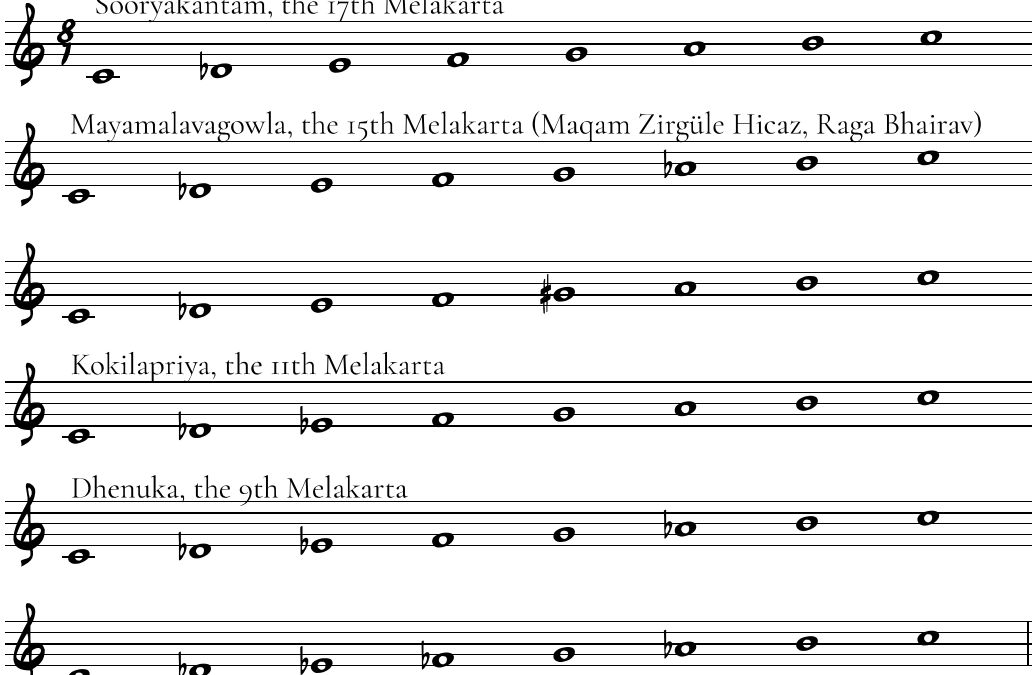
Agni Chakra + 3 Mayamalavagowla, the 15th Melakarta (Maqam Zirgüle Hicaz, Raga Bhairav)

not in the *Melakarta*-system

Netra Chakra + 5 Kokilapriya, the 11th Melakarta

Netra Chakra + 3 Dhenuka, the 9th Melakarta

not in the *Melakarta*-system

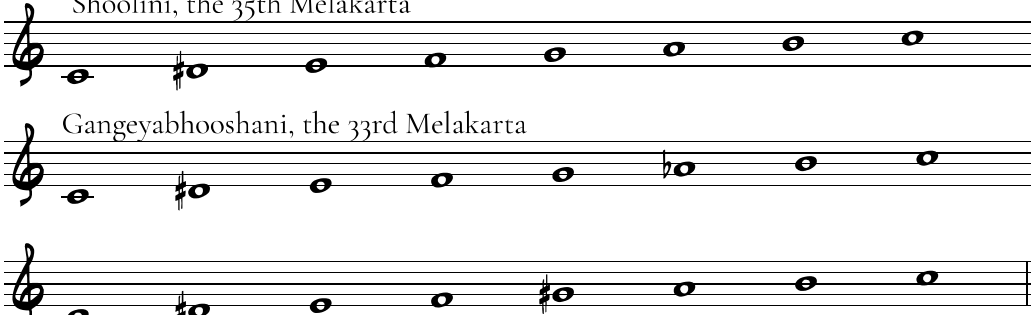


## CHROMATIC TRIAD: D $\sharp$ - E - F

Ritu Chakra + 5 Shoolini, the 35th Melakarta

Ritu Chakra + 3 Gangeyabhooshani, the 33rd Melakarta

not in the *Melakarta*-system



## CHROMATIC TRIAD: F $\sharp$ - G - A $\flat$

Aditya Chakra + 3 Dhatuwardani, the 69th Melakarta

Rudra Chakra + 2 Rishabhapriya, the 62th Melakarta

Rudra Chakra + 3 Latangi, the 63rd Melakarta

Disi Chakra + 2 Shanmukhapriya, the 56th Melakarta

Disi Chakra + 3 Simhendramadhyamam, the 57th Melakarta (Harmonic Minor #4, Oriental Minor)



# Pathways

## Scales

### Vertical

- The Open Position<sup>†</sup> (1)
- 12 Positions (see Mick Goodrick),  
Strict Positions (12)
- Organization of the fingerboard into 5 Areas (5)

### Horizontal

- Single String (6)

### Diagonal

- Whole Range (4 to 5 notes per string)
- Use the same (previous) fingers at half step
- 1 Note / String (*close position*)
- (4 Notes / string, tetrachords, each finger one tone)
- 3 Notes / String
- 2 Notes / String

### Free

- Entire range with constantly changing paths and fingerings, even with only one finger.
- free combinations. Also with open strings and harmonics...

---

<sup>†</sup> all possible open strings



# C Harmonic Minor

		3.		5.		7.		9.		12.		15.		17.		19.
7	4	5	$b6$		7	1	2	$b3$	4	5	$b6$		7	1	2	7
5	1	2	$b3$		4	5	$b6$		7	1	2	$b3$		4	5	2
2	$b6$	4	7		1	2	7		4	5	$b6$		7	1	2	7
	7	1			5	$b6$			7	1	2		4	5	$b6$	
	4	5	$b6$		7	1	2	$b3$	4	5	$b6$		7	1	2	7

		5	$b6$		7											
		2	$b3$		4											
		4	7		1	$b6$										
	7	1			5	$b3$										
		5	$b6$		7											

		$b6$		7	1											
		$b3$		4	5											
		7		1	2											
		1	$b6$		4											
		5	$b3$		7											
		$b6$		7	1											

					7	1	2	$b3$								
					2	$b3$	4									
						7	1									
					(7)	4	5	$b6$								
						1	2	$b3$								

							2	$b3$		4						
							4		7	1						
							1		5	$b6$						
							5	$b3$	2	4						
							2		7	1						

										4		5	$b6$			
										1		2	$b3$			
										$b6$		4				
										$b3$		1				
										4	7	5	$b6$			
										1		2				


# C Melodic Minor

	4	3.	5.	7.	9.	12.	15.	17.	19.
7	4	5	6	7	1	2	5	6	7
5	1	2	b3	4	5	b3	2	b3	4
2	b3	6	7	1	2	4	6	1	2
6	7	4	5	b3	6	1	2	b3	4
	4	5	6	7	1	2	b3	4	5

		5	6	7					
		2	b3	4					
b3	6	4	7	1					
(4)	7	1		2	[b3]				
	5	6							

			6	7	1				
			4	5	b3				
		7	1	2	4	[7]			
			5	6	7				
			2	b3	4				
			6	7	1				

				7	1	2	(b3)		
				2	5	6			
				b3	4	4			
			b3	6	7	1			
				4	5	2	[b3]		
				7	1	2			

						2	b3	4	
						6		1	
						4		b3	
					[7]	1		2	
						5		6	
						2	b3	4	7

							b3	4	5
							7	1	2
							5	b3	6
							2	4	7
							6	1	5
						b3	4	7	5


# C Harmonic Major

		3.	5.	7.	9.		12.		15.	17.	19.		
3	4	5	b6	7	1	2	3	4	5	b6	7		
7	1	2	7	3	4	5	7	1	2	7	3	4	7
5	b6			3	4	2	5	b6	7	3	4	2	2
2		3	4	5	b6	7	1	2	3	4	5	b6	7
		7	1	2	7	3	4	5	b6	7	1	2	3
3	4	5	b6	7	1	2	3	4	5	b6	7	1	2

		5	b6	7															
		2	7	3	4														
				3	4	5	b6												
		3	4	5	b6														
		7	1	2	7														

		b6	7	1	5														
		7	3	4	2														
			3	4	b6														
		(b6)	7	3	4	5	2												
			7	3	4	5	2												

					7	1	2												
					2	5	b6	4											
					[b6]	3	7	1	5	b6									
					3	4	7	1	5	2	b6								
					7	1	2	5	b6	4									

							b6	2	3	4									
							3	4	7	1									
							7	1	5	2									
							7	1	5	2	b6								
							7	1	5	2	b6	3	4						

									3	4	5	(b6)							
									7	1	2								
									5	b6									
									7	1	2								
									b6	3	4								
									(3)	4	7	1	5	[b6]					


# Harp Scales

idea from Bill Frisell's article in a book. I think it was this one:  
"Arcana: Musicians on Music" by John Zorn (2000).

By using the following fingering, every note can overlap to the following note (or even more),  
creating a harp like effect.

The image displays two musical staves in treble clef, illustrating harp scale fingerings. The first staff shows a descending scale with notes G4, F4, E4, D4, C4, B3, A3, G3, F3, E3. The second staff shows an ascending scale with notes E3, F3, G3, A3, B3, C4, D4, E4, F4, G4. Fingering numbers are provided below each note, and fret numbers (7, 12, 7) are indicated for the B3, C4, and G4 notes respectively.

Staff	Note	Fingering	Fret
1	G4	6	
1	F4	6	
1	E4	5	
1	D4	5	
1	C4	5	
1	B3	4	7. fret
1	A3	4	
1	G3	4	
1	F3	4	
1	E3	4	
2	E3	3	
2	F3	2	
2	G3	3	
2	A3	2	
2	B3	4	7. fret
2	C4	2	12. fret
2	D4	1	
2	E4	3	7. fret
2	F4	3	
2	G4	1	

# MODAL STRUCTURES

Example in D Dorian

When we have a 7-Note Scale it is a good idea to check all its note combinations (structures) for getting a more complete idea about the possibilities which are inherent in that scale.

In a 7-Note scale we find:

- 21 2- Note Structures (6 different structures possible)
- 35 3-Note Structures (19 different structures possible)
- 35 4- Note Structures (43 different structures possible)
- 21 5- Note Structures (66 different structures possible)

Now we take a look at the different structures, I came up with. The ones I like, I selected. I put them together in the following chart. You are strongly advised to go through the process above with another scale by yourself. This chart just serves as an example.

Those structures can have two functions:

- TONIC FUNCTION (static, resolution)
- CADENCE FUNCTION (tension, resolving nicely to a tonic function structure)



	TONIC	CADENCE
2-Note Structures	<ul style="list-style-type: none"> <li>• D + F</li> <li>• D + A</li> <li>• F + A</li> </ul>	<ul style="list-style-type: none"> <li>• C</li> <li>• F G C (Csus4, Fsus2, G 4 4)</li> </ul>
3-Note Structures	<ul style="list-style-type: none"> <li>• Dm</li> <li>• D E A (Dsus2, E 4 4)</li> </ul>	
4-Note Structures	<ul style="list-style-type: none"> <li>• Dm/E</li> <li>• Dm/G</li> <li>• Dm7</li> <li>• Am/D</li> <li>• G 4 4 #4 (G C F B) ! melody descending: c b g f</li> <li>• Bm7(b5) = Dm6</li> </ul>	<ul style="list-style-type: none"> <li>• C/F</li> <li>• C/D</li> <li>• G/C</li> </ul>
5-Note Structures	<ul style="list-style-type: none"> <li>• D Minor Pentatonic (D F G A C)</li> <li>• D Minor 6 Pentatonic (D F G A B)</li> <li>• A Minor Pentatonic (A C D E G)</li> </ul>	

Other nice colors which do not really fit into the two categories of tonic or cadence function:

- F/G
- G/C
- Am/B
- etc.

# Practicing Scale Sequences

For practicing the scale sequences it is a good idea to practice with a *drone*, to always hear the relationships. This is a good eartraining exercise at the same time. And is more inspiring.

# Scale Sequences (Alankar)

♩ = 16th at 88 - 107

Terachords Variation:

Da Ra

Trichords (see also page on *Da Ra Da*)

Pentachord

Tetrachord

Thirds

different starting point

(>) (upward) (downward)



foot on quarter notes, difficult if played fast!

and same downwards

Ra Da Ra Da Ra Da  
also(!) Da Ra Da Ra Da Ra

Whole octave patterns (*Murchhana*, Modes). *Murchhana* means *modulation*

or

downwards

Variation downwards

Variation (only downwards)

(only upwards)

Chhoot Murchhana?

Di Ri Di Ri Di Ri Da Ra

or downwards:

or downwards:

Da Ra Da Ra Da

Da Ra Da Ra Da

Variations of 3-Note Cascades (Trichords)

(or downwards) (or upwards)

Exercise for the right hand!

Extension by one note higher (or lower) each time  
(2 - 3 octaves range)

etc etc

(practice in position)

(4x) or upwards

Extension (4x) or upwards

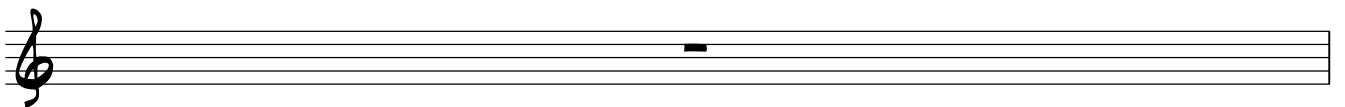
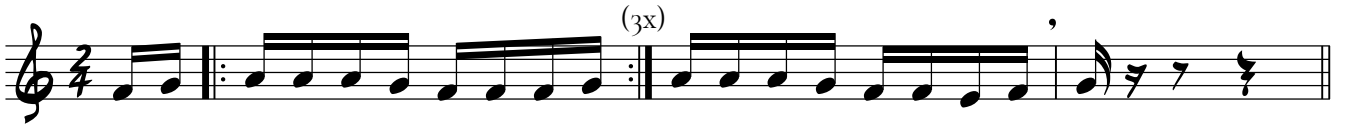
Da Ra Da Ra Da

Da Ra Da Ra Da

or upwards:



or downwards:



# Fast Movements

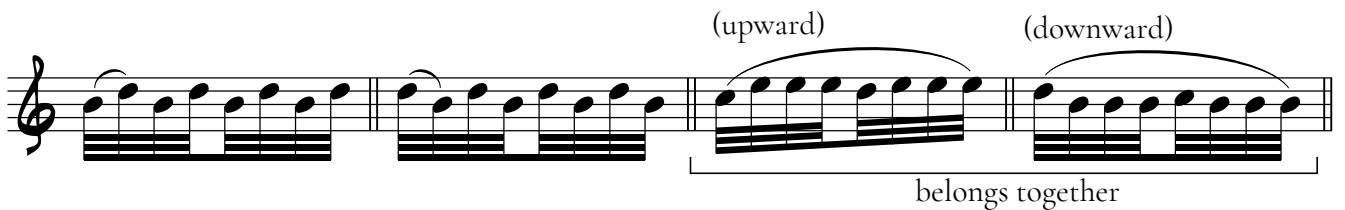
Zamzama, Jamjama

All patterns can sequence upwards and downwards - except where indicated  
All fast movements can be played as *normal* (slower) scale sequences, too.

♩ = 32th at 74 - 76 (mostly horizontal, single string movements)

all Di Ri Di Ri

tie: repeated portion



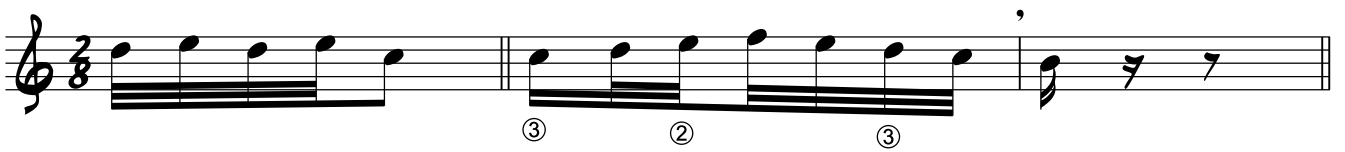
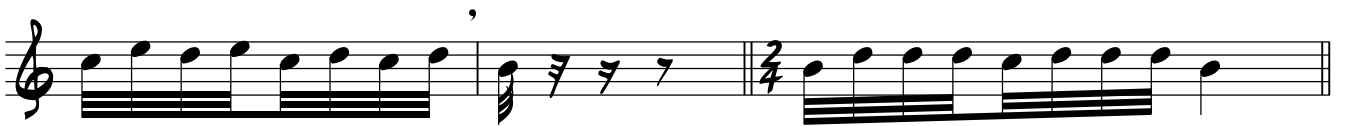
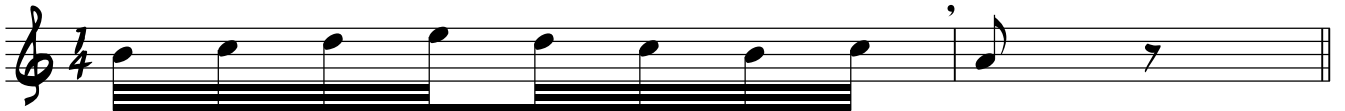
IV.

IV.



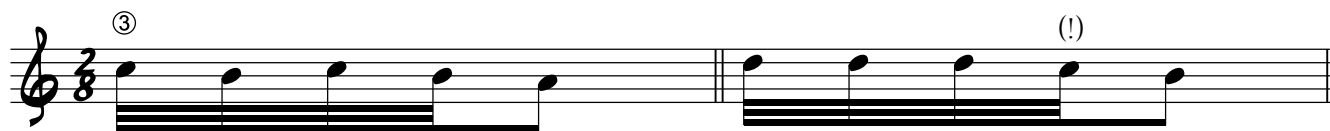


VI.

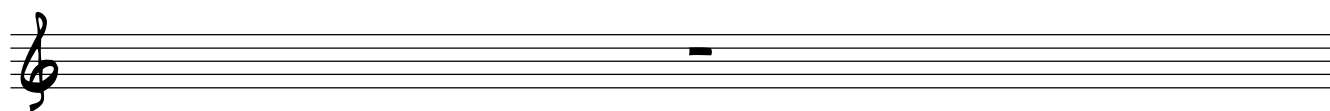
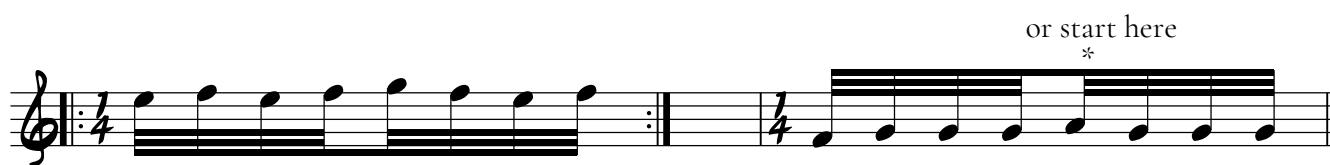


Di Ri Di Ri Da





II.





# Scale Sequences, and Variation Techniques

## Sequences (*Alankar*) & Musical Phrases (*Palta*)

**Palta** (lit. *turn*) is a general word for exercise (or *tan*), which also contains the alankars, but in practice *paltas* are the (more musical, typical) phrases in raga. When *paltas* are sequenced, this must be done within the constraints of the rag's movements, which often differs in up- and downward movement.

**Alankar** (lit. *ornament*) is a specific type of a melodic pattern, worked out with permutations of notes, and typically played and practiced as a sequence on every scale degree. Alankars are practiced in *that*, which means just plain scales, not raga.

In the general theory of *alankar*, they are classed according to how many notes are in the pattern (from one to seven), and the number of beats or *aksharas* (commonly from 2 to 24).

*Alankars* and *Paltas* can vary from simple to complex.

- for instance, a 2-note alankar with 2 beats could be either Sa Re, or Re Sa.
- a 2-note, 3-beat alankar could be SSR, RSS, SRR, RRS, SRS, or RSR.
- for a 4-note, 6-beat alankar, the possibilities are enormous, but a few of them might be: SRGmRS, SGRmGR, SmRGSR, etc.

(Indian scale degrees Sa Re Ga Ma Pa Dha Ni, equal Do Re Mi Fa Sol La Si)

We can workout different permutations of an alankar by applying these variation techniques:

- Prime: original row
- Inversion: upside down (same intervals, but opposite direction)
- Retrograde: backwards (german: *Krebs*, *Krebsgang*)
- Retrograde-Inversion (german: *Krebsumkehrung*)

notes:

In our scale sequences we adjust the intervals to the scale (a minor 2nd can become major, etc.). In 12-tone music we take the exact (chromatic) inversion.

# Variation Techniques

The diagram illustrates four musical variation techniques arranged in a 2x2 grid:

- Prime** (top-left): Original melody.
- Retrograde** (top-right): Original melody played backwards.
- Inversion** (bottom-left): Original melody with intervals mirrored across a horizontal axis.
- Retrograde-Inversion** (bottom-right): Retrograde of the inverted melody.

Transformations are indicated by arrows:

- Horizontal double-headed arrows labeled "vertical mirror" connect Prime to Retrograde and Inversion to Retrograde-Inversion.
- Vertical double-headed arrows labeled "horizontal mirror" connect Prime to Inversion and Retrograde to Retrograde-Inversion.

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# The Scale Alap

This is a nice path exploring a scale.

The idea is to build up a scale gradually starting with the root, playing it for a while and then slowly introduce the notes in scalewise order up and down note by note.

After playing the root for a while introduce the upper or lower 2nd. What does introducing mean here? Imagine you give a party and slowly the guests arrive. You will not just open the door, but you will introduce the new arrival to the other guests who are already there. You have to treat him nicely otherwise he will not come back. In a way you show how he relates to the whole group of guests. Try to introduce every new guest to everybody else who is already there.

Do this very meditative, and gently. Ali Akbar Khan had this metaphor, that the alap is like taking a glass of water which is so full, that it already exceeds the rim, and bring it from the floor up on the table. Go very slow and very conscious.

You may also want to sing along in unison.

A good road map would be to go first from the root slowly down to the 6th, back to the root and up to the octave, maybe exceeding it a bit (to the 9th, or 10th).

In the Indian Alap you have frequently these sections:

- **Asthai:** exploring the middle octave
- **Antara:** moving to the high *Sa* (the root up an octave) and above
- **Sanchari:** A more quick recapitulation of the Asthai
- **Abhog:** Joined to the sanchari, and explores the very highest (and or lowest) extremes of an instrument's (and a rag's) registers.

**There are some beautiful concepts:**

- There is the technique of *kan* (not meaning the ornamentation): Before actually really playing the new tone, you just hint at it very briefly. It is the slight touching of a tone in anticipation of its being brought into full development.  
It is also advised to pre-hear the new note mentally, before you actually played it.
- *Svar vistar:* You build up or release tension by creating a micro-universe around one tone for some time. This note is your center and you circle around it – you orbit it.
- Inventing permutations: Increase tension by creating ever-changing combinations of 2, 3, 4 or more notes.

# 13 Strict Positions (12 Strict Positions + Open Position)

Position are indicated by roman numerals (I., II., III., etc.)

3. position: III.

	<b>I</b>	<b>2</b>	<b>3</b>	<b>4</b>	
<b>SI</b>		<b>2</b>	<b>3</b>	<b>4</b>	
	<b>I</b>	<b>2</b>	<b>3</b>		<b>S4</b>
<b>SI</b>		<b>2</b>	<b>3</b>		<b>S4</b>

four forms

s = stretched (1st or 4th) finger

## Observations:

- A strict position is approximately the area that can be seen in focus when looking at the fretboard
- In every position EVERYTHING - within 2 octaves plus 1 perfect fourth - is playable (every scale, every arpeggio, etc.)
- 6 tones are available twice
- Rule: preferably not the same left hand finger in direct succession.
- Rule: preferably avoid stretching
- The open position: equals the first position, but uses the open strings instead of any stretches (except for the high A on the high e-string, no stretches are necessary)

## 5 Areas

- As an area I am defining a more loose position. The location of the left hand can shift between a few close positions.
- The 12 (13) strict positions include ALL possible fingerings: all notes on all strings with all fingers (including stretches).
- The procedure: to extract the 5 areas out of the 12 strict positions, they need to be evaluated:
  - a) First mark everything in every strict position that fall well in the hand.
  - b) Combine the marked fingerings, and put them together into an area.
- When deciding on the most convenient fingering, not only physical and technical aspects but also memorability, visual shape, and logical understanding (i.e. same notes on the high and low e-string) are relevant. They all go hand in hand. (In german language there is the word '*begreifen*' which combines both)





# All 66 Pentatonic Scales

If you have 12 notes and you choose 5 this equals to 792 possibilities.

If you divide the number by 12, for the 12 transpositions, you end up with the 66 basic (non transposed) forms.

Generally a normal heptatonic scale (7 notes) implies 21 different possible pentatonic scales (complementary to the 21 possible dyads). These can be grouped into 3 families:

- Pentachords
- Seventh Chord + 2
- Seventh Chord + 4

One Pentatonic contains:

- 10 intervals (dyads)
- 10 3-Note Structures
- 5 4-Note Structures

There are only 3 pentatonic scales which contain no minor seconds

- 2 2 2 2 3 (C D E F# G# C), whole tone pentachord
- 2 2 b3 b3 2 (C D E G Bb C), C7 + 2
- b3 2 2 b3 2 (C Eb F G Bb C), Cm7 + 4

Note: With 5 notes (pentatonic) it is not possible to divide the octave symmetrically!

# All Pentatonic Scales

C	Cis	D	Dis	E	F	Fis	G	Gis	A	Ais	B	
x	x	x	x	x								chromatic 5
x	x	x	x		x							chromatic 4 + 4
x	x	x	x			x						chromatic 4 + #4
x	x	x	x				x					chromatic 4 + 5
x	x	x	x					x				chromatic 4 + #5
x	x	x	x						x			chromatic 4 + 6
x	x	x	x							x		chromatic 4 + b7
x	x	x		x	x							chromatic 3 + 3 + 4
x	x	x		x		x						chromatic 3 + 3 + #4
x	x	x		x			x					chromatic 3 + 3 + 5
x	x	x		x				x				chromatic 3 + 3 + #5
x	x	x		x					x			chromatic 3 + 3 + 6
x	x	x		x						x		chromatic 3 + 3 + b7
x	x	x			x	x						chromatic 3 + 4 + #4
x	x	x			x		x					chromatic 3 + 4 + 5
x	x	x			x			x				chromatic 3 + 4 + #5
x	x	x			x				x			chromatic 3 + 4 + 6
x	x	x			x					x		chromatic 3 + 4 + b7
x	x	x				x	x					chromatic 3 + #4 + 5
x	x	x				x		x				chromatic 3 + #4 + #5
x	x	x				x			x			chromatic 3 + #4 + 6
x	x	x				x				x		chromatic 3 + #4 + b7
x	x	x					x	x				chromatic 3 + 5 + #5
x	x	x					x		x			chromatic 3 + 5 + 6
x	x	x					x			x		chromatic 3 + 5 + b7
x	x	x						x	x			chromatic 3 + #5 + 6
x	x	x						x		x		chromatic 3 + #5 + b7
x	x	x							x	x		chromatic 3 + 6 + b7
<b>All Pentachords of the 33 Regular Scales:</b>												
x		x		x	x		x					pentachord [Ma1, Ma5, HMa1, MMi5]
x		x	x		x		x					pentachord [Ma2, Ma6, MMi1, HMi1]
x	x		x		x		x					pentachord [Ma3, MMi2]
x		x		x		x	x					pentachord [Ma4, MMi4]
x	x		x		x	x						pentachord [Ma7, HMi2, HMa7]
x		x		x		x		x				pentachord [WT1, MMi3]
x			x	x		x	x					pentachord [HMi6]
x	x			x	x		x					pentachord [HMi5, HMa5]
x	x		x	x		x						pentachord [MMi7, HMi7, HW1, ]
x			x	x			x	x				pentachord [SA1]
x			x	x			x		x			pentachord [HMa6]
x	x			x	x			x				pentachord [SA2]
x		x	x		x	x						pentachord [HW2, HMa2, MMi 6]
x		x		x	x			x				pentachord [HMi3]
x		x	x			x	x					pentachord [HMa4, HMi4]
x	x		x	x			x					pentachord [HMa3]
<b>More Pentachords</b>												
x	x		x			x	x					pentachord C Db Eb F# G
x	x			x		x	x					pentachord C Db E F# G

Seventhchord + 2nd											
x		x		x			x			x	Cmaj7 + 2
x	x		x				x			x	Cm7 + b2
x		x	x				x			x	Cm7 + 2
x	x		x			x				x	Cm7(b5) + b2
x		x	x				x			x	Cm maj7 + 2
x		x		x			x			x	C7 + 2
x			x	x			x			x	C7 + #2
x	x		x			x			x		C°7 + b2
Seventhchord + 4th											
x				x	x		x			x	Cmaj7 + 4
x				x		x	x			x	Cmaj7 + #4
x				x	x			x		x	Cma7(#5) + 4
x				x		x		x		x	Cmaj7 (#5) + #4
x			x		x		x			x	Cm7 + 4
x			x			x	x			x	Cm7 + #4
x			x	x		x				x	Cm7(b5) + b4
x			x		x	x				x	Cm7(b5) + 4
x			x		x		x			x	Cm maj7 + 4
x				x	x		x			x	C7 + 4
x				x		x	x			x	C7 + #4
x			x		x	x			x		C°7 + 4

# Selection of Pentatonic Scales of Traditional Repertoire

Cm7 + 4

Minor Pentatonic, Hindustani Raga Dhani

A musical staff in treble clef showing the Cm7 + 4 scale. The notes are C4, Bb4, A4, G4, F4, and Eb4. A vertical line connects the Bb4 note to the text 'Major Pentatonic, Hindustani Raga Bhupali'. Another vertical line connects the Eb4 note to the text 'Hindustani Raga Durga'.

C7 + 2

A musical staff in treble clef showing the C7 + 2 scale. The notes are C4, D4, E4, F4, G4, and Ab4. A vertical line connects the Ab4 note to the text 'Minor Pentatonic with major 6th (used by John Coltrane)'.

Cmaj7 + 4

A musical staff in treble clef showing the Cmaj7 + 4 scale. The notes are C4, D4, E4, F4, G4, and A4. A vertical line connects the D4 note to the text 'Hindustani Raga Bhupal Todi'.

Cm7(b5) + 4

A musical staff in treble clef showing the Cm7(b5) + 4 scale. The notes are C4, Bb4, Ab4, G4, F4, and Eb4. A vertical line connects the Ab4 note to the text 'Hindustani Raga Hindol'.

C7 + 4

A musical staff in treble clef showing the C7 + 4 scale. The notes are C4, D4, E4, F4, G4, and Ab4. A vertical line connects the C4 note to the text 'Transcribed from African Kora music'.

An empty musical staff in treble clef.

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