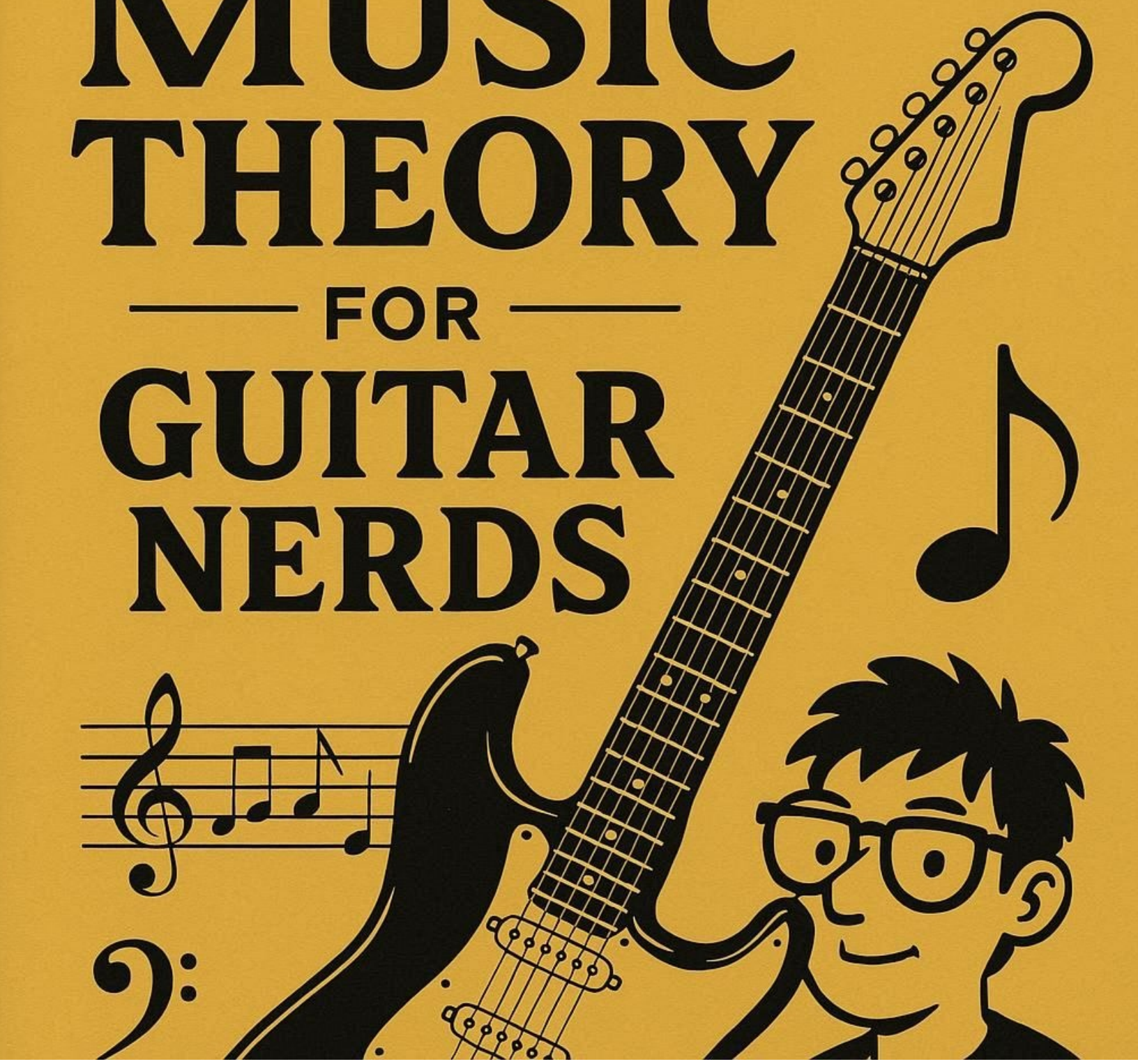
MUSIC THEORY FOR GUITAR NERDS



Music theory for guitar nerds

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Contents

- Gives the recipe not just examples
- If you give a man a fish, you feed him for a day. If you teach a man to fish, you feed him for a lifetime

1 Intervals: where do notes come from?

1.1 Harmonic series

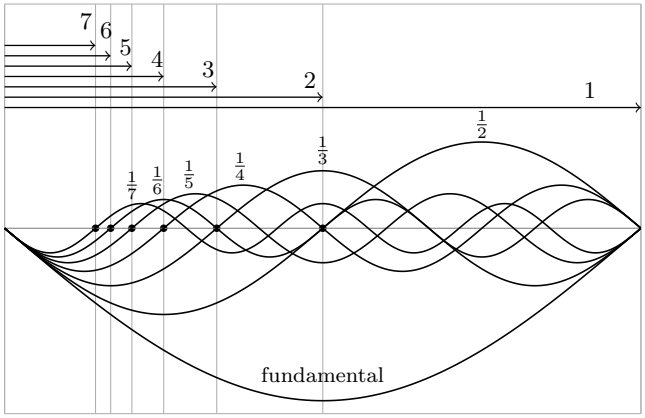

Figure 1: The harmonic series

1.2 Intervals definition

Table Source: https://hellomusictheory.com/learn/intervals/

1.3 Consonance and dissonance

Table 1: Intervals and

Harmonics					Ratio to fundamental	Intervals	Equal Temperament
1	2	4	8	16	1,2,3,4	unison/octave	1.000
				17	$17/16 = 1.0625$	minor second	1.059
			9	18	$9/8 = 1.125$	major second	1.122
				19	$19/16 = 1.1875$	minor third	1.189
		5	10	20	$5/4 = 1.2500$	major third	1.260
				21	$21/16 = 1.3125$	fourth	1.335
			11	22	$11/8 = 1.375$	tritone	1.414
				23	$23/16 = 1.4375$		
	3	6	12	24	$3/2 = 1.500$	fifth	1.498
				25	$25/16 = 1.5625$	minor sixth	1.587
			13	26	$13/8 = 1.625$		
				27	$27/16 = 1.6875$	major sixth	1.682
		7	14	28	$7/4 = 1.7500$	minor seventh	1.782
				29	$29/16 = 1.8125$		
			15	30	$15/8 = 1.875$	major seventh	1.888
				31	$31/16 = 1.9375$		

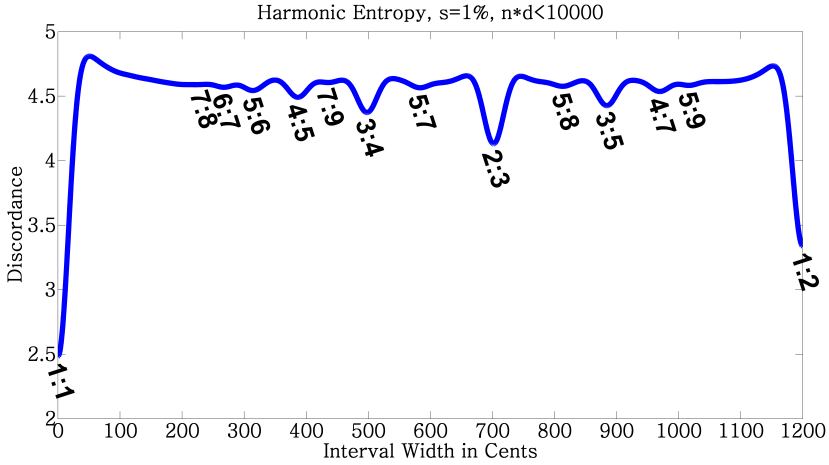

Figure 2: Harmonic entropy

2 Scales

Table 2: Intervals chart in relation to C note. Minor (m or "-"), major (M or "maj"), augmented (A or "aug" or "#" or "+") and diminished (d or "dim" or "b").

Semitones	Name	Notation for scales	Songs
0	Perfect unison	R	-
1	Minor second	b2	JAWS theme
2	Major second	2	**Frè-re** Jacques
3	Minor third	b3	Iron Man by Black Sabbath
4	Major third	3	"**Oh-When** the Saints"
5	Perfect fourth	4	Here Comes the Bride (Wedding song)
6	Triton	b5,#4	"**The - Simp**-sons"
7	Perfect fifth	5	"**Twinkle - Twinkle** Little Star"
8	Minor sixth	b6,#5	The Entertainer
9	Major sixth	6, bb7	Jingle Bells ("**Dash-ing** through the snow")
10	Minor seventh	b7	Theme song Star Trek : The Original Series
11	Major seventh	7	Take On Me ("Take-on")
12	Perfect octave	8	"**Some-where** over the rainbow"
13	Minor ninth	b9	
14	Major ninth	9	
15	Augmented ninth	#9	
16	Diminished eleventh	b11	
17	Perfect eleventh	11	
18	Augmented eleventh	#11	
20	Minor thirteenth	b13	
21	Major thirteenth	13	

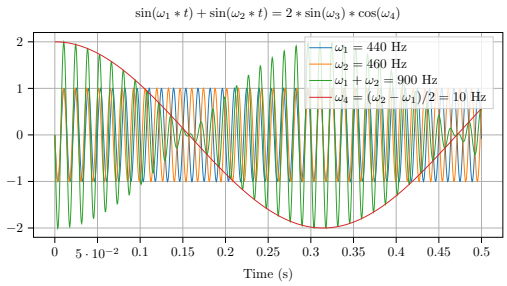

Figure 3: Beat tone

2.1 Major scale

Modes ranked by brightness: Super-locrian, locrian, phrygian, aeolian, dorian, mixolydian, major, lydian, lydian augmented

- Major scales and the modes (and all modes)

Table 3: Scales formula (relative to the major scale)

Scale name	Formula							Comment
Major	1	2	3	4	5	6	7	
Pentatonic Major	1	2	3	-	5	6	-	
Natural minor	1	2	b3	4	5	b6	b7	
Pentatonic minor	1	-	b3	4	5	-	b7	
Harmonic minor	1	2	b3	4	5	b6	7	
Melodic minor	1	2	b3	4	5	6	7	
Ionian (Major)	1	2	3	4	5	6	7	
Dorian	1	2	b3	4	5	6	b7	Mad world, So What
Phrygian	1	b2	b3	4	5	b6	b7	Symphony of destruction
Lydian	1	2	3	#4	5	6	7	Legend of Zelda
Mixolydian	1	2	3	4	5	6	b7	Clock by Coldplay
Aeolian (natural minor)	1	2	b3	4	5	b6	b7	Smell Like Teen Spirit
Locrian	1	b2	b3	4	b5	b6	b7	Rush-YYZ intro
Ionian b6	1	2	3	4	5	b6	7	
Dorian #4 (4^{th} Harm. min)	1	2	b3	#4	5	6	b7	
Phrygian dominant (5th Harm. min)	1	b2	3	4	5	b6	b7	Flamenco, egyptian
Lydian dominant (4th Melo. min)	1	2	3	#4	5	6	b7	Prog futuristic, Simpsons theme
Mixolydian b6 (5th Melo. min) (or Aeolian dominant)	1	2	3	4	5	b6	b7	Prog rock
Neapolitan minor	1	b2	b3	4	5	b6	7	
Bizantine scale (double harmonic major) Lydian #2,#6	1	b2	3	4	5	b6	7	Opeth - Bleak
Ultra-Phrygian	1	b2	b3	b4	5	b6	bb7	
Hungarian minor (double harmonic minor) Oriental (Asian)	1	2	b3	#4	5	b6	7	
Ionian Aug#2	1	#2	3	4	#5	6	7	
Locrian bb3,bb7	1	b2	bb3	4	b5	b6	bb7	

- Pentatonic scale (Major, Egyptian, Man Gong, Ritusen)
- Minor scale (natural, harmonic, melodic)
- Phrygian dominant (hijaz) (I-bII-iiidim-iv-vdim-bVI+-bvii) Ex: Come out and Play The Offsprings

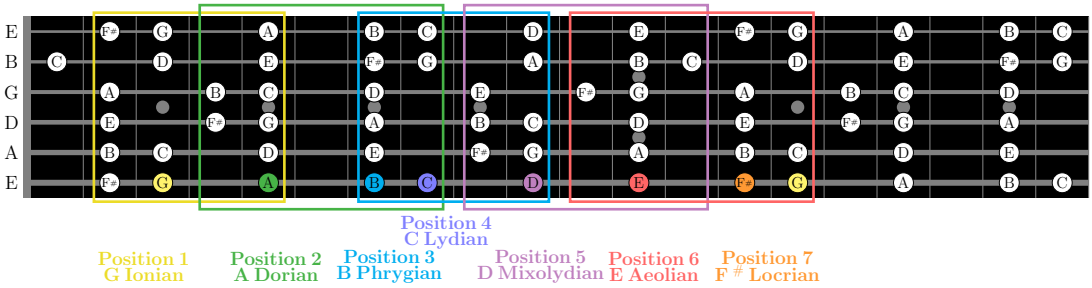

Figure 4: G Major scale on the fretboard

2.2 Pentatonic scale

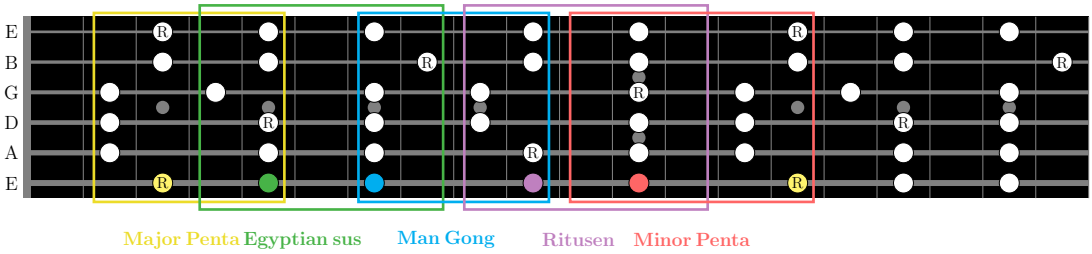

Figure 5: Pattern of pentatonic scales

2.3 Blues

Table 4: Blues scales (relative to the major scale)

Scale name	Formula							
Blues Major	1	2	b3	3	-	5	6	-
Blues minor	1	-	b3	4	b5	5	-	b7

Table 5: Basic 12 bar major blues

I7	I7	I7	I7
IV7	IV7	I7	I7
V7	IV7	I7	I7

Table 6: Basic 12 bar minor blues

i7	i7	i7	i7
iv7	iv7	i7	i7
v7 or V7	iv7	i7	V7

Table 7: Basic 12 bar major blues with a *quick change* and *turnaroun*d

I7	**IV7**	I7	I7
IV7	IV7	I7	I7
V7	IV7	I7 - **vi7**	**ii7** - V7

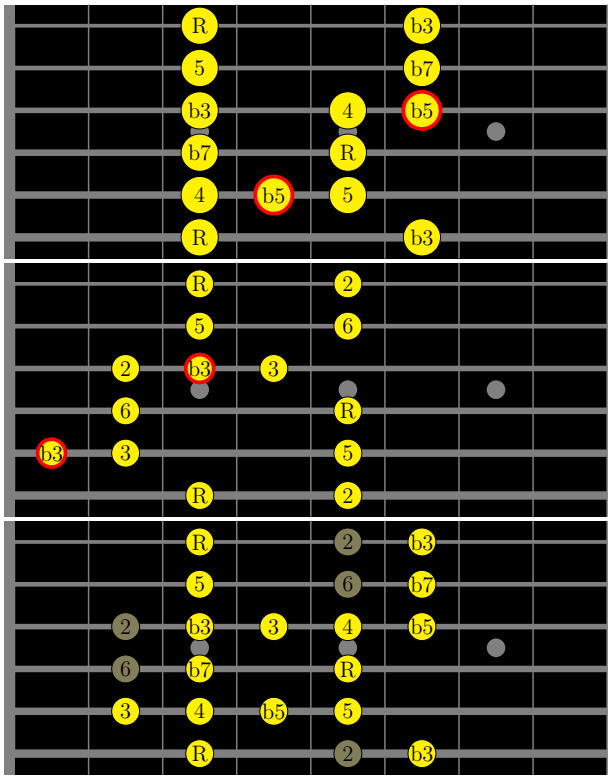

Figure 6: (a) Minor blues scale with blue note (b5). (b) Major blues pentatonic scale. (c) Blues scale

3 Chords

- Tonic: I, iii, vi
- Pre-dominant: IV, ii
- Dominant: V, vii°
- "Sus" chords: chord without third
- "sus9" will often replace the dominant 7th chord

3.1 Formation of chords

arydshln

Table 8: Construction of chords (notation is relative to the major scale)

	chord	symbol							name
triad			1	3	5				major
	m		1	b3	5				minor
	dim	$\circ$	1	b3	b5				diminished
	aug	$+$	1	3	$^{\#}5$				augmented
	sus2		1	2	5				suspended 2nd
	sus4		1	4	5				suspended 4th
tetrad	7		1	3	5	b7			dominant 7th
	maj7	Δ, M7	1	3	5	7			major 7th
	m7	$^{-}7$	1	b3	5	b7			minor 7th
	m7b5	$\varnothing$	1	b3	b5	b7			half-diminished
	dim7	$^{\circ}7$	1	b3	b5	b7			fully-diminished
	mM7	m^{Δ}	1	b3	5	7			minor major 7th
	maj7(#5)	$+^{\Delta}$	1	3	#5	7			augmented major 7th
	7(#5)	$+^{7}$	1	3	#5	b7			augmented 7th
	6		1	3	5	6			
	m6		1	b3	5	6			
	b6		1	3	5	b6			
	m(b6)		1	b3	5	b6			
	m6/9		1	b3	6	9			
	6/9		1	3	6	9			
	add9		1	3	5	9			
	m(add9)		1	b3	5	9			
	7sus4		1	4	5	b7			
	add2		1	2	3	5			
pentad	9		1	3	5	b7	9		Dominant 9th
	maj9	$\Delta 9$	1	3	5	7	9		major 9th
	7b9		1	3	5	b7	b9		
	m9		1	b3	5	b7	9		minor 9th
	mM9		1	b3	5	7	9		minor major 9th
	sus9		1	4	5	b7	9		
	11		1	5	b7	9	11		
hexad	7(13)		1	3	5	b7	9	13	
	7(b9,13)		1	3	5	b7	b9	13	

- Accords: 7, m7, maj7, m7b5 (root sur corde E, A, D)

3.2 Diatonic chords

Table 9: Harmonization of scales (relative to major scale)

	1	2	3	4	5	6	7
Major	I^{Δ}	ii^{-7}	iii^{-7}	IV^{Δ}	V^{7}	vi^{-7}	$vii^{\varnothing}$
Natural minor	i^{-7}	$ii^{\varnothing}$	$bIII^{\Delta}$	iv^{-7}	v^{-7}	bVI^{Δ}	$bVII^{7}$
Harmonic minor	i^{Δ}	$ii^{\varnothing}$	$bIII^{\Delta,aug}$	iv^{-7}	V^{7}	bVI^{Δ}	$vii^{\circ 7}$
Melodic minor	i^{Δ}	ii^{-7}	$bIII^{\Delta,aug}$	IV^{7}	V^{7}	$vi^{\varnothing}$	$vii^{\varnothing}$
Dorian	i^{-7}	ii^{-7}	$bIII^{\Delta,}$	IV^{7}	v^{-7}	$vi^{\varnothing}$	$bVII^{\Delta}$

Table 10: Table of modes

Mode name	Ionian	Dorian	Phrygian	Lydian	Mixolydian	Aeolian	Locrian
Diatonic chords	I	ii	iii	IV	V	vi	vii°
Diatonic seventh	Δ7	$^{-}7$	$^{-}7$	Δ7	7	$^{-}7$	∅
Alternative naming	maj7	m7	m7	maj7	7	m7	m7b5
######	$F^{\#}$	$G^{\#}$	$A^{\#}$	B	$C^{\#}$	$D^{\#}$	$E^{\#}$
#####	B	$C^{\#}$	$D^{\#}$	E	$F^{\#}$	$G^{\#}$	$A^{\#}$
####	E	$F^{\#}$	$G^{\#}$	A	B	$C^{\#}$	$D^{\#}$
###	A	B	$C^{\#}$	D	E	$F^{\#}$	$G^{\#}$
##	D	E	$F^{\#}$	G	A	B	$C^{\#}$
#	G	A	B	C	D	E	$F^{\#}$
-	**C**	**D**	**E**	**F**	**G**	**A**	**B**
b	F	G	A	B^{b}	C	D	E
bb	B^{b}	C	D	E^{b}	F	G	A
bbb	E^{b}	F	G	A^{b}	B^{b}	C	D
bbbb	A^{b}	B^{b}	C	D^{b}	E^{b}	F	G
bbbbb	D^{b}	E^{b}	F	G^{b}	A^{b}	B^{b}	C
bbbbbb	G^{b}	A^{b}	B^{b}	C^{b}	D^{b}	E^{b}	F

3.3 Extended chords

https://music.stackexchange.com/questions/108060/extended-chord-types-for-all-major-scale-degrees

3.4 Chord inversions

- Accords: 7, m7, maj7, m7b5 (root: E, A, D)

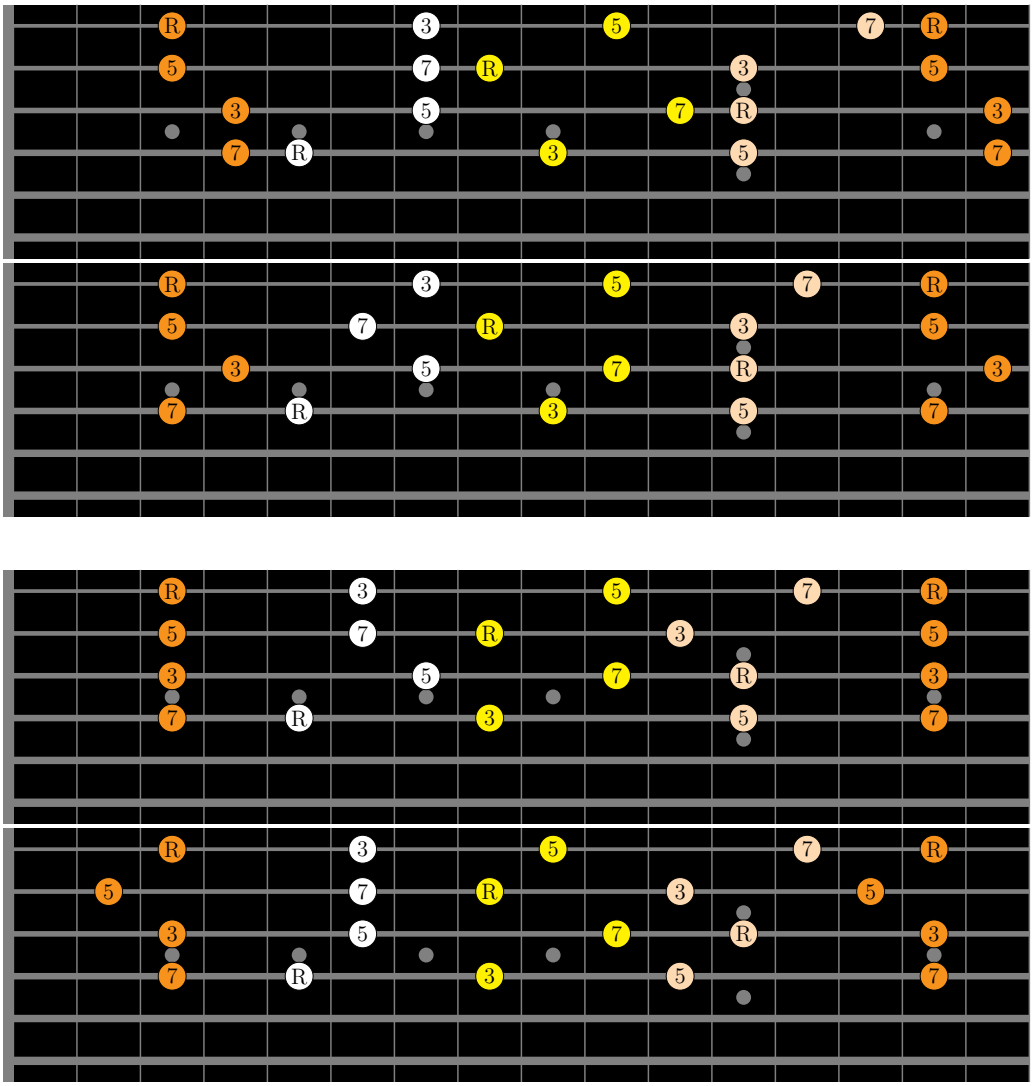

Figure 7: Chord inversion on the D string. (a) maj7 chords. (b) Dominnt 7 chords. (c) m7 chords. (d) m7b5 chords

4 Harmony

4.1 Chord progression and example

Table 11: Famous chord progressions

Name	Progression	Example
Pop major (punk)	$I - V - vi - IV$	Dammit, Let it be, Country Road
Anatol (turnaround)	$I^{\Delta} - vi^7 - ii^7 - V^7$	Blue Moon
50s progression	$I - vi - IV - V$	Every Breath You Take, Crocodile Rock
Ragtime	$I - VI^7 - II^7 - V^7$	I want to be like you (Disney)
Jazz (ii-V-I)	$ii^7 - V^7 - I^{\Delta}$	Autumn leaves
Blues/Rock (Major)	$I^7 - IV^7 - V^7 - I^7$	Johnny B. Goode
Mixo vamp (mixo)	$I - bVII - IV - I$	Hey Jude, Sweet home Alabama
Japanese "Royal road"	$IV^{\Delta} - V^7 - iii^7 - vi^7 - (ii^7 - V^7 - I^{\Delta})$	Shogo theme, anime
"Storyteller"	$I - IV - vi - V$	
Creep chord	$I - III - IV - iv$	Creep, Space Oddity
Pop minor	$i - bVI - bIII - bVII$	Save Tonight, Africa Toto
Aeolian vamp	$i - bVII - bVI - bVII$	Stairway to Heaven, All Iron Maiden
Minor progression 01	$i - i - bVI - V$	Sweet Dreams
Minor progression 02	$i - bVI - bIII - bVII$	
Minor progression 03	$i - bVI - iv - bVII$	Final countdown
Minor progression 04	$i - bIII - bVII - iv$	Boulevard of Broken Dreams
Andalusian (phrygian)	$i - bVII - bVI - V^7$	Happy Together The Turtles
Blues/Rock (minor)	$i^7 - iv^7 - V^7 - i^7$	Minor swing
Anime	$bVI - bVII - i$	
Neapolitan	$i - bII^6 - V - i$	Classic

4.2 Chord substitution

4.2.1 Tritone substitution

Table 12: Tritone substitution: Substitute V7 chord by a 7 chord a tritone above tonic.

ii^7	V^7	$I^{\Delta 7}$	%
ii^7	bII^7	$I^{\Delta 7}$	%

4.2.2 Backdoor II-V

4.2.3 Secondary dominant

Table 13: Backdoor II-V: modal interchage

ii^7	V^7	$I^{\Delta 7}$	%
iv^7	$bVII^7$	$I^{\Delta 7}$	%

Table 14: Secondary dominant

%	ii^7	V^7	$I^{\Delta 7}$
VI^7	ii^7	V^7	$I^{\Delta 7}$

Table 15: Dominant to diminished 7: Replace dominant chord by a diminishe 7 chord half step above the root

ii^7	V^7	$I^{\Delta 7}$	%
ii^7	bVI°	$I^{\Delta 7}$	%

4.2.4 Dominant to diminished 7

Concepts:

- Borrowed chord: chord that is not built from the scale of the tonic. Examples:
  - "Picardy third": a progression with an ending major triad instead of an expected minor triad to create an impression of resolution.
- Transistion Chords:
  - Modulation (Rick Beato):
    - Diatonic common chord ("close" keys have many chords in common that can be used to modulate from a key to another. Common chords are called pivot chords)
    - Chromatic pivot chord
    - Enharmonic dominant
    - Deceptive
    - Enharmonic Dim7
    - Dim7 to Dom7 (lower the root of the dim7 chord to create a dominant chord that leads to a new tonic)
    - Chromatic Mediant
    - Common tone (Pivot note)
    - Direct or Linear (Abrupt change of key without preparation to "lift" the song)

* Chain Modulation ()
* Parallel modulation (Modulation of the mode but keep the same root ex: C to Cm)

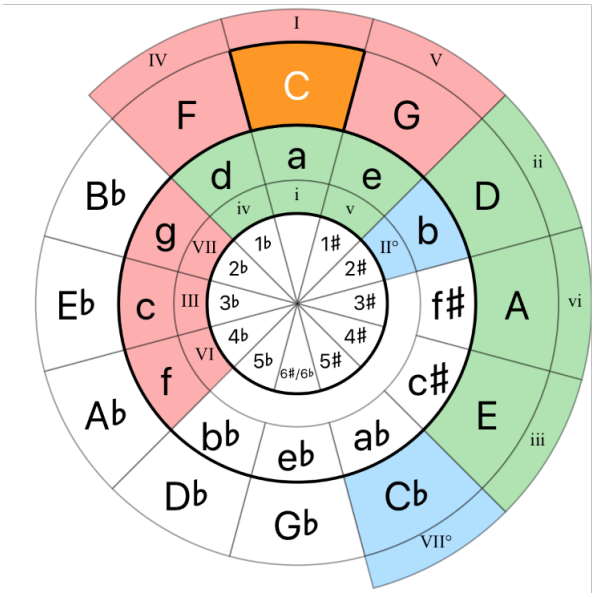

Figure 8

- Substitution tritonique
- Substitution diatonique

5 Arpeggios

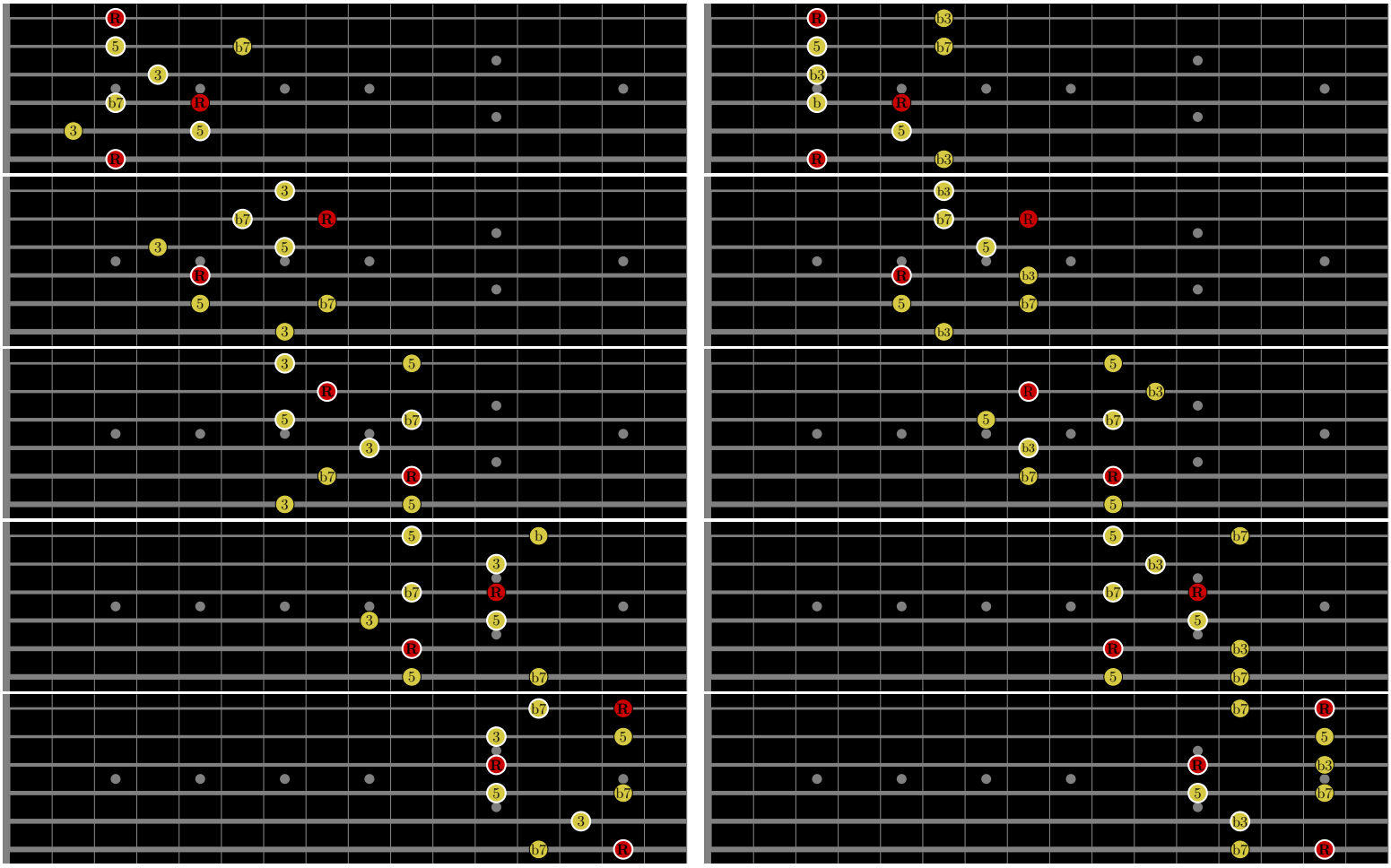

Table 16: (left) dom7 arpeggio. (right) m7 arpeggio. E-shape position, D-shape position, C-shape position, A-shape position, G-shape position (CAGED system)

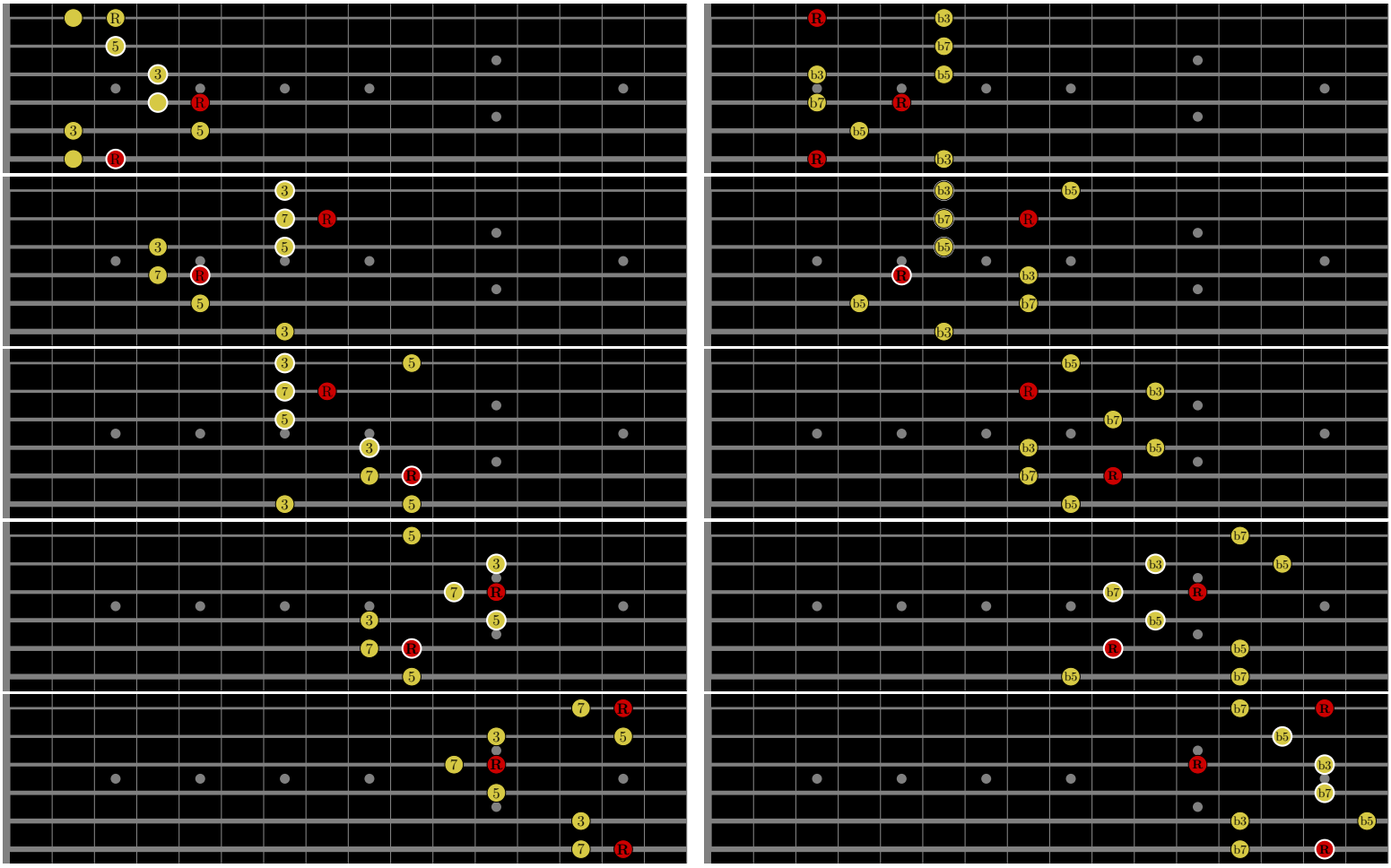

Table 17: (left) maj7 arpeggio (EDCAG). (right) m7b5 arpeggio

6 Modes

- Ionian (Joy), dorian(Jazz), phrygian(flamenco,doom), lydian (floaty,mystery) (ex: E.T., Jurassic Park, Back to the Future), mixo(blues)(ex: AC/DC), aeolian(sad)(ex: Losing my Religion), locrian(tension)(ex:Bjork Army of Me)

7 Transposition

https://www.youtube.com/watch?v=Vxac3hHrxg8

8 Composition variation (Shred Master Scott)

- Pedal tone
- Inversion
- Voice leading

References

[1] Jake Lizzio. *Chord Progression Codex*. 2023.