

Cell Division & 7th Arpeggios for Guitar

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It's very useful to have a comprehensive understanding of 7th arpeggios over the entire fretboard, rather than memorising a few shapes, it is possible to use a little theory to build a complete and practical picture. Here are some studies that will really improve your understanding and playing.

This approach takes the idea of *cells* - one octave patterns that may be transposed around the entire fretboard - this perspective simplifies the approach. However it is complicated a little by the guitar's standard tuning, and the anomaly of the major 3rd between the 2nd and 3rd strings. Some guitar tuning systems eg. NST or EADGCF do not have this problem, but nor do they have a heritage of repertoire or the extent of variety of fingerings. Swings and roundabouts.

Concept 1. Fixed range: varied cell

For this exercise take a fixed root and fretboard position. In this range execute a number of cells. In this case let's take C with root on string 4 (fret 10) with an 'outside hand' position (position V or VI) and we'll run through maj7, min7, dom7 and min7(b5). We are just picking these for now, but any arpeggio or set of intervals could be selected. Tab is included here to most easily represent fingerings.

Cell position 4o
4th string-outside hand

C Major 7 C7 Cm7 Cm7b5

R R 3 5 7 R 3 5 b7 R b3 5 b7 R b3 b5 b7

T 7 (6) (6) (6) (6)

A 10 9 8 (12)* 10 9 8 11 10 8 8 11 10 8 (7) (6) 11

B 10 10 10 10

R 3 5 7 R 3 5 b7 R b3 5 b7 R b3 b5 b7

* Alternate fingerings are bracketed

Although written as ascending, these cells should be considered a set of notes with no particular direction. Practise them ascending, descending and at least one other order.

Here's another cell position, with the root on the 5th string played with finger 1 or 2 ('inside hand')

Cell position 5i 5th string-inside hand

C Major 7 C7 Cm7 Cm7b5

2 or 1

R R 3 5 7 R 3 5 b7 R b3 5 b7 R b3 b5 b7

T 4 3 3 5

A 3 2 5 4 3 2 5 3 3 (1)* 5 3 3 (1)* 4 5


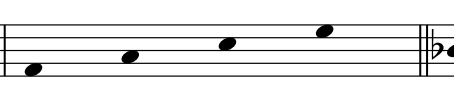
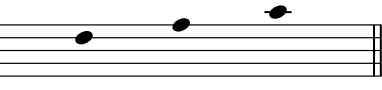
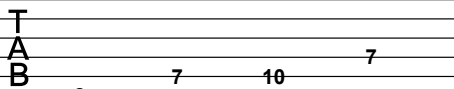
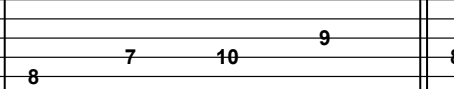
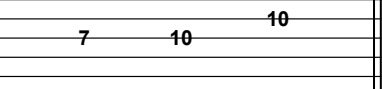
B 3 3 (7) 3 (7) 3 6 5 3 3 6 4 5


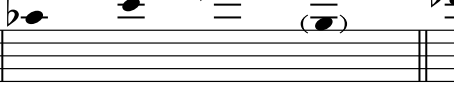

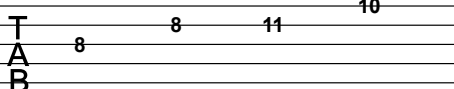
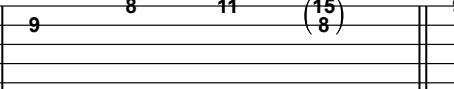
R 3 5 7 R 3 5 b7 R b3 5 b7 R b3 b5 b7

* Alternate fingerings are bracketed


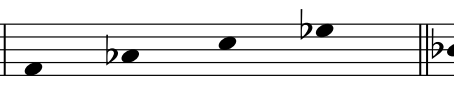
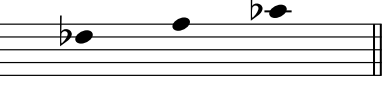
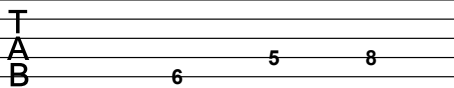
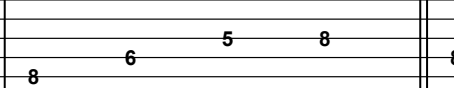
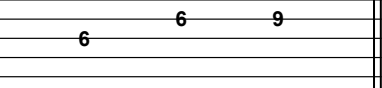
Concept 2. Fixed Cell: Vertical realization

There are of course many other possible cells (and variants) one way to explore them is by transposing a cell shape by 4ths vertically on the fretboard, dealing with the tuning anomaly where necessary. Here are, for example, the 'inside' variants of major 7 cells. Those starting on strings 1 and 2 are incomplete, but may be completed by changing position or switching octaves (as indicated in parentheses).


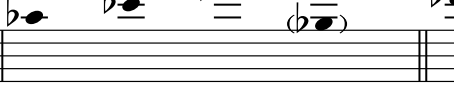

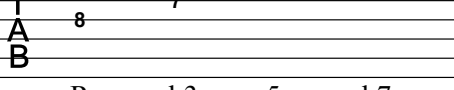
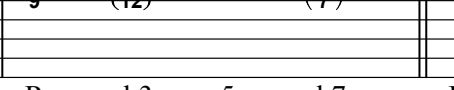
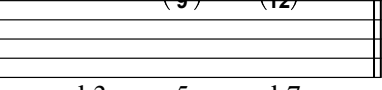
Cmaj7	Fmaj7	Bbmaj7
		
R 3 5 7	R 3 5 7	R 3 5 7
		
8 7 10 7	8 7 10 9	8 7 10 10
R 3 5 7	R 3 5 7	R 3 5 7

Ebmaj7	Abmaj7	Dbmaj7
		
R 3 5 7	R 3 5 7	R 3 5 7
		
8 8 11 10	9 8 11 (15/8)	9 13 (16/9) (20/13)
R 3 5 7	R 3 5 7	R 3 5 7

And here are the 'inside' minor 7 variants.

Cm7	Fm7	Bbm7
		
R b3 5 b7	R b3 5 b7	R b3 5 b7
		
8 6 5 8	8 6 5 8	8 6 6 9
R b3 5 b7	R b3 5 b7	R b3 5 b7

These inside and outside variants should be found for dom7 and min7b5 (as well as the many other useful cells)

Ebm7	Abm7	Dbm7
		
R b3 5 b7	R b3 5 b7	R b3 5 b7
		
8 7 6 9	9 (12) 11 (14/7)	9 12 (16/9) (18/12)
R b3 5 b7	R b3 5 b7	R b3 5 b7

Concept 3. Fixed Cell Type: Horizontal realization

Once a cell and its variants have been established, it is instructive to explore them horizontally on the fingerboard. A musically useful approach in this case is to find the diatonic arpeggios of one key. For example here are the diatonic 7th arpeggios of F major using the 4o cells.

F Major 7	G Minor 7	A Minor 7	Bb Major 7								
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">3 2 1 5</td> <td style="width: 25%; border-right: 1px solid black;">5 3 3 6</td> <td style="width: 25%;">7 5 5 8</td> </tr> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">8 7 6 10</td> <td style="width: 25%; border-right: 1px solid black;"></td> <td style="width: 25%;"></td> </tr> </table>				T A B	3 2 1 5	5 3 3 6	7 5 5 8	T A B	8 7 6 10		
T A B	3 2 1 5	5 3 3 6	7 5 5 8								
T A B	8 7 6 10										

C7	D Minor 7	E minor 7 (b5)	F major 7								
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">10 9 8 11</td> <td style="width: 25%; border-right: 1px solid black;">12 10 10 13</td> <td style="width: 25%;">14 12 15 15</td> </tr> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">15 14 13 17</td> <td style="width: 25%; border-right: 1px solid black;"></td> <td style="width: 25%;"></td> </tr> </table>				T A B	10 9 8 11	12 10 10 13	14 12 15 15	T A B	15 14 13 17		
T A B	10 9 8 11	12 10 10 13	14 12 15 15								
T A B	15 14 13 17										

And here are the diatonic 7th arpeggios of C major, in the 5i form.

C Major 7	D Minor 7	E Minor 7	F Major 7								
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">3 2 5 4</td> <td style="width: 25%; border-right: 1px solid black;">5 8 7 5</td> <td style="width: 25%;">7 10 9 7</td> </tr> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">8 7 10 9</td> <td style="width: 25%; border-right: 1px solid black;"></td> <td style="width: 25%;"></td> </tr> </table>				T A B	3 2 5 4	5 8 7 5	7 10 9 7	T A B	8 7 10 9		
T A B	3 2 5 4	5 8 7 5	7 10 9 7								
T A B	8 7 10 9										

G7	A Minor 7	B minor 7 (b5)	C major 7								
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">10 9 12 10</td> <td style="width: 25%; border-right: 1px solid black;">12 15 14 12</td> <td style="width: 25%;">14 17 15 14</td> </tr> <tr> <td style="width: 25%; border-right: 1px solid black;">T A B</td> <td style="width: 25%; border-right: 1px solid black;">15 14 17 16</td> <td style="width: 25%; border-right: 1px solid black;"></td> <td style="width: 25%;"></td> </tr> </table>				T A B	10 9 12 10	12 15 14 12	14 17 15 14	T A B	15 14 17 16		
T A B	10 9 12 10	12 15 14 12	14 17 15 14								
T A B	15 14 17 16										

Concept 4. Connecting Cells

Here's a short study connecting many of the G7 cells.

G 7 6i G 7 4o G 7 2i G 7 3o

TAB: 3 2 5 3 | 5 4 3 6 | 8 7 10 13 | 13 10 12 12

G 7 5o G 7 5i G 7 3i

TAB: 10 7 9 10 | 10 9 12 10 | 12 12 15 13 | 15

And using a similar pattern of cell positions, Gm7.

Gm 7 6i Gm 7 4o Gm 7 2i Gm 7 3o

TAB: 3 6 5 3 | 5 3 3 6 | 8 11 10 13 | 13 10 11 12

G 7 5o G 7 5i G 7 3i

TAB: 10 7 8 10 | 10 13 12 10 | 12 15 15 13 | 15

Concept 5. Negotiation of Harmonic Progression

With some work, one can find 100s of ways to negotiate a harmonic progression, selecting cells for musical expression and not limited by the fretboard knowledge Here's just one through a well-known jazz progression. Write one (or several) of your own.

First system of musical notation showing a Cycle 5 progression: Cm7, F7, Bbmaj7, Ebmaj7. The notation includes a treble clef staff with notes and a guitar fretboard diagram with fret numbers for the T, A, and B strings.

Second system of musical notation showing a Cycle 5 progression: Am7(b5), D7, Gm7, G7. The notation includes a treble clef staff with notes and a guitar fretboard diagram with fret numbers for the T, A, and B strings.

The above study should be practised with ascending cells, descending cells and other patterns such as (3, R, 5, 7) written below. Note how in this type of Cycle 5 progression, the transition from the 7th of one chord to the 3rd of the next is very smooth.

First system of musical notation showing a Cycle 5 progression with a different fretting pattern: Cm7, F7, Bbmaj7, Ebmaj7. The notation includes a treble clef staff with notes and a guitar fretboard diagram with fret numbers for the T, A, and B strings.

Second system of musical notation showing a Cycle 5 progression with a different fretting pattern: Am7(b5), D7, Gm7, G7. The notation includes a treble clef staff with notes and a guitar fretboard diagram with fret numbers for the T, A, and B strings.

Although the initial process may well feel mechanical (and challenging), once a set of cells has been learned - and the neural pathways sufficiently scoured - they provide a powerful foundation for improvisation. An effortless negotiation of complex harmony and musical expression can emerge from the understanding of cells. Particularly when musically phrased, edited and embellished with diatonic and non-diatonic connecting notes. This will all be explored, but in the meantime, spend 20 minutes a day for two weeks on these exercises, and most importantly applying them to your repertoire. you will also want to explore the following cells:

- (R, 2, 3, 5) for Major chords,
- (R, b3, 4, 5) and (R, 2, b3, 4) for Minor chords
- (R, b3, 4, b5) for Minor7(b5) chords
- (R, b9, 5, b7) for Dom7(b9) chords.

Which are a useful starting point of 4-note cells also known as 'tetra-chords'.