in (or out of) step (2016):

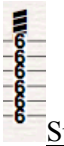
For 4 electric guitars - The scordatura of each guitar creates a 20 note equal tempered scale. This tuning necessitated a score written out in tablature. Additionally, since the guitar itself is designed with frets to play a 12-tone equal temperament scale, certain positions must be 'bent' up to a degree to equal a note in the newly devised tempered scale.

The high register develops according to the silver ratio (in number of measures), and the low register according to the golden ratio (number of measures). The rhythms are determined by the equivalents of radical 5, radical 3, and radical 2 in approximate numerical form. The rhythm gradually moves from radical 5 to radical 2 (the shorter figure). Then, to further diminuted figures.

This piece is in response to Easley Blackwood's *Twelve Microtonal Etudes for Electronic Music Media Op. 28.*

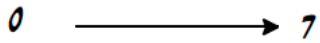
: Harmonic [half note clarification if lower/near stem]

: Plucked note/Bartok pizz. like (without volume swells; sudden shift in volume may be necessary)



<u>Spoon between strings</u>: weave metal spoon between strings with handle facing down strike top of spoon to create a tremolo-effect (applies to any fret #)
(Weaving method: under/over/under/over/under/over)

* Indicates level of bend in string (before reaching subsequent pitch)
* = ¼ of full semitone bend
** = ½ of full semitone bend
*** = ¾ of full semitone bend
(Indicated bends are continuous for indicated note)



: Arrows and numbers underneath staff indicate level of volume (gradual crescendo/decrescendo) i.e. volume swells

*Guitar amplification should be localized as well as clean with moderate reverb and ideally performed with a volume pedal.

Open string guitar Scordatura planning:

20th root of 2 = 1.0353

Starting pitch:
65.41HZ (great octave)* 1.0353 = *0. 67.7*1.0353 = 70.1*1.0353 = **72.58**

[Roman Numeral = Guitar string]
[Parenthesized Number = Guitar in quartet]

1st Octave	2nd Octave	3rd Octave
0.72.58-VI(1)	20. 145.15	40. 290.31
1. 75.14	**21. 150.27- IV(2)**	**41. 300.54- I(1)**
2. 77.79- VI(2)	22. 155.57	42. 311.14
3. 80.53	**23. 161.06- IV(3)**	43. 322.12
4. 83.37 VI(3)	24. 166.74	**44. 333.48- I(2)**
5. 86.31	**25. 172.61–IV(4)**	45. 345.24
6. 89.35 (V1(4)	26. 178.71	**46. 357.41- I(3)**
7. 92.5	**27. 185.01 – III(1)**	
8. 95.77	**28. 191.53- III(2**)	
9. 99.14 –V(1)	29. 198.29	
10. 102.64	**30. 205.28 –III(3)**	
11. 106.26 –V(2)	31. 212.52	
12. 110.0	**32. 220.0- II(1)**	
13. 113.89	**33. 227.77- II(2)**	
14. 117.9	**34. 235.8- III(4)**	
15. 122.06- V(3)	35. 244.12	
16. 126.36	**36. 252.73-II(3)**	
17. 130.82– V(4)	37. 261.64	
18. 135.43	**38. 270.87- II(4)**	
19.140.21 - IV(1)	**39. 280.42 – I(4)**	

20 note equal temperament open guitar string possibilities:
0, 21, 2, 23, 4, 25, 6, 27, 28, 9, 30, 11, 32, 33, 14, 35, 16, 37, 38, 19

GTR 1	GTR 2	GTR 3	GTR 4
VI(1)-0	VI(3)- 4	VI(2)- 2	VI(4)- 6
V(1)-9	V(3)- 15	V(2) – 11	V(4)- 17
IV(1)-**19**	**IV(3)- 23**	**IV(2) – 21**	**IV(4)- 25**
III(1)-27	III(3)- 30	III(2) – 28	III(4)- 34
II(1)-32	II(3)- 36	II(2)- 33	II(4)- 38
I(1)-**41**	**I(3)- 46**	**I(2) – 44**	**I(4)- 39**

Resulting pitches of Guitar Frets: *Underlined* = *Possible with string bending*
Bold = *Available without bending*

VI(1)	V(1)	IV(1)
0. 72.58	**0. 98.83**	**0. 140.14**
1. 76.8	1. 104.66	1. 148.41
2. 81.33	2. 110.83	2. 157.17
3. 86.13	**3. 117.37**	**3. 166.44**
4. 91.21	4. 124.29	4 176.26
5. 96.59	5. 131.62	5. 186.66
6. 102.29	6. 139.39	**6. 197.67**
7. 108.33	7. 147.61	7. 209.33
8. 114.72	8. 156.32	8. 221.68
9. 121.49	9. 165.54	**9. 234.76**
10. 128.66	10. 175.31	10. 248.61
11. 136.25	*11.* 185*.65*	11. 263.28

III(1)	II(1)	I(1)
0. 184.52	**0. 219.16**	**0. 300.24**
1. 195.41	1. 232.09	1. 317.95
2. 206.94	2. 245.78	2. 336.71
3. 219.15	**3. 260.28**	**3. 356.58**
4. 232.08	4. 275.64	*4. 377.62 (188.81)*
5. 245.77	5. 291**.9**	5. 399.9 (199.95)
6. 260.27	6. 309.12	**6. 423.49 (211.75)**
7. 275.63	7. 327.36	*7. 448.48 (224.24)*
8. 291.89	8. 346.67	8. 474.94 (237.47)
9. 309.11	9. 367.12 (183.56)	**9. 502.96 (251.48)**
10. 327.35	10. 388.78 (194.39)	10. 532.63 (266.32)
11. 346.66	11. 411.71 (205.86)	11. 564.06 (282.03)

VI(2)	V(2)	IV(2)
0. 77.69	**0. 105.87**	**0. 150.12**
1. 82.27	1. 112.12	1. 158.98
2. 87.12	2. 118.74	2. 168.36
3. 92.26	**3. 125.75**	**3. 178.29**
4. 97.7	4. 133.17	4. 188.81
5. 103.46	5. 141.03	5. 199.95
6. 109.56	6. 149.35	**6. 211.75**
7. 116.02	7. 158.16	7. 224.24
8. 122.87	8. 167.49	8. 237.47
9. 130.12	9. 177.37	**9. 251.48**
10. 137.8	10. 187.83	10. 266.32
11. 145.93	11. 198.91	11. 282.03

III(2)
0. 190.98
1. 202.25
2. 214.18
3. 226.82
4. 240.2
5. 254.37
6. 269.38
7. 285.27
8. 302.1
9. 319.92
10. 338.8
11. 358.79 (179.4)

II(2)
0. 226.84
1. 240.22
2. 254.39
3. 269.4
4. 285.29
5. 302.12
6. 319.95
7. 338.83
8. 358.82 (179.41)
9. 379.99 (190)
10. 402.41 (201.21)
11. 426.15 (213.08)

I(2)
0. 332.88
1. 352.52
2. 373.32 (186.66)
3. 395.35 (197.68)
4. 418.68 (209.34)
5. 443.38 (221.69)
6. 469.54 (234.77)
7. 497.24 (248.62)
8. 526.58 (263.29)
9. 557.65 (278.83)
10. 590.55 (295.28)
11. 625.39 (312.7)

VI(3)
0. 83.22
1. 88.13
2. 93.33
3. 98.84
4. 104.67
5. 110.85
6. 117.39
7. 124.32
8. 131.65
9. 139.42
10. 147.65
11. 156.36

V(3)
0. 121.5
1. 128.67
2. 136.26
3. 144.3
4. 152.81
5. 161.82
6. 171.38
7. 181.49
8. 192.2
9. 203.54
10. 215.54
11. 228.26

IV(3)
0. 160.82
1. 170.31
2. 180.36
3. 191
4.202.27
5. 214.2
6. 226.84
7. 240.22
8. 254.39
9. 269.4
10. 285.29
11. 302.12

III(3)
0. 204.58
1. 216.65
2. 229.43
3. 242.97
4. 257.31
5. 272.49
6. 288.57
7. 305.6
8. 323.63
9. 342.72
10. 362.94 (181.47)
11. 384.35 (192.18)

II(3)
0. 251.5
1. 266.34
2. 282.05
3. 298.69
4. 316.32
5. 334.98
6. 354.74
7. 375.67 (187.84)
8. 397.84 (198.92)
9. 421.31 (210.66)
10. 446.17 (223.09)
11. 472.49 (236.25)

I(3)
0. 356.56
1. 377.6 (188.8)
2. 399.88 (199.94)
3. 423.47(211,74)
4. 448.45 (224.23)
5. 474.91 (237.46)
6. 502.93 (251.47)
7. 532.6 (266.3)
8. 564.2 (282.1)
9. 597.49 (298.75)
10. 632.74 (316.37)
11. 670.07 (335.04)

VI(4)
0. 89.14
1. 94.4
2. 99.97
3. 105.87
4. 112.12
5. 118.74
6. 125.75
7. 133.17
8. 141.03
9. 149.35
10. 158.16
11. 167.49

V(4)
0. 130.15
1. 137.83
2. 145.96
3. 154.57
4. 163.69
5. 173.35
6. 183.58
7. 194.41
8. 205.88
9. 218.03
10. 230.89
11.244.51

IV(4)
0. 172.26
1. 182.42
2. 193.18
3. 204.58
4. 216.65
5. 229.43
6. 242.97
7. 257.31
8. 272.49
9. 288.57
10. 305.6
11. 323.63

III(4)
0. 234.78
1. 248.63
2. 263.3
3. 278.84
4. 295.29
5. 313.71
6. 331.16
7. 350.7
8. 371.39 (185.7)
9. 393.3 (196.65)
10. 416.51 (208.26)
11. 441.08 (220.54)

II(4)
0. 269.42
1. 285.32
2. 302.15
3. 319.98
4. 338.86
5. 358.85 (179.43)
6. 380.02 (190.01)
7. 402.44 (201.22)
8. 426.18 (213.09
9. 451.32 (225.66)
10. 477.95 (238.98)
11. 506.15 (253.08)

I(4)
0. 280.28
1. 296.82
2. 314.32
3. 332.87
4. 352.51
5. 373.31 (186.66)
6. 395.34 (197.67)
7. 418.66 (209.33)
8. 443.36 (221.68)
9. 469.52 (234.76)
10. 497.22 (248.61)
11. 526.56 (263.28)

<u>Available frets for 20 note equal temperament notes without bending</u>:

(Parenthesized = achievable with relative ease)

VI(1)
0,3,6,9 (1,4,7)

V(1)
0,3 (4,6,9)

IV(1)
0,3,6,9

III(1)
0,3,6 (1,4,9)

II(1)
0,3 (6,9)

I(1)
0,3,6,9 (4,7)

VI(2)
0,3,6,9 (1,4,7)

V(2)
0,3 (1,4,6,9)

IV(2)
0,3,6,9

III(2)
0,3,6 (9)

II(2)
0,3 (6,9)

I(2)
0,3,6 (9)

VI(3)
0,3,6 (1,4,7,9)

V(3)
0 (3,6,9)

IV(3)
0,3,6,9

III(3)
0,3 (6,9)

II(3)
0 (3,6,9)

I(3)
0,3,6 (4,9)

VI(4)
0,3,6 (1,4,7,9)

V(4)
0 (3,6,9)

IV(4)
0,3,6 (9)

III(4)
0 (3,6,9)

II(4)
O (3,6,9)

I(4)
0,3,6,9 (7)

In (or out of) step

SEANKILEY

♩ = 70

Electric Guitar
VI-72.58 Hz
V-99.14 Hz
IV-140.21 Hz
III-185.01 Hz
II-220.0 Hz
I-300.54 Hz

Gtr. 1

Electric Guitar
VI-77.79 Hz
V-106.26 Hz
IV-150.27 Hz
III-191.53 Hz
II-227.77 Hz
I-333.48 Hz

Gtr. 2

Electric Guitar
VI-83.37 Hz
V-122.06 Hz
IV-161.06 Hz
III-205.28
II-252.73
I-357.41

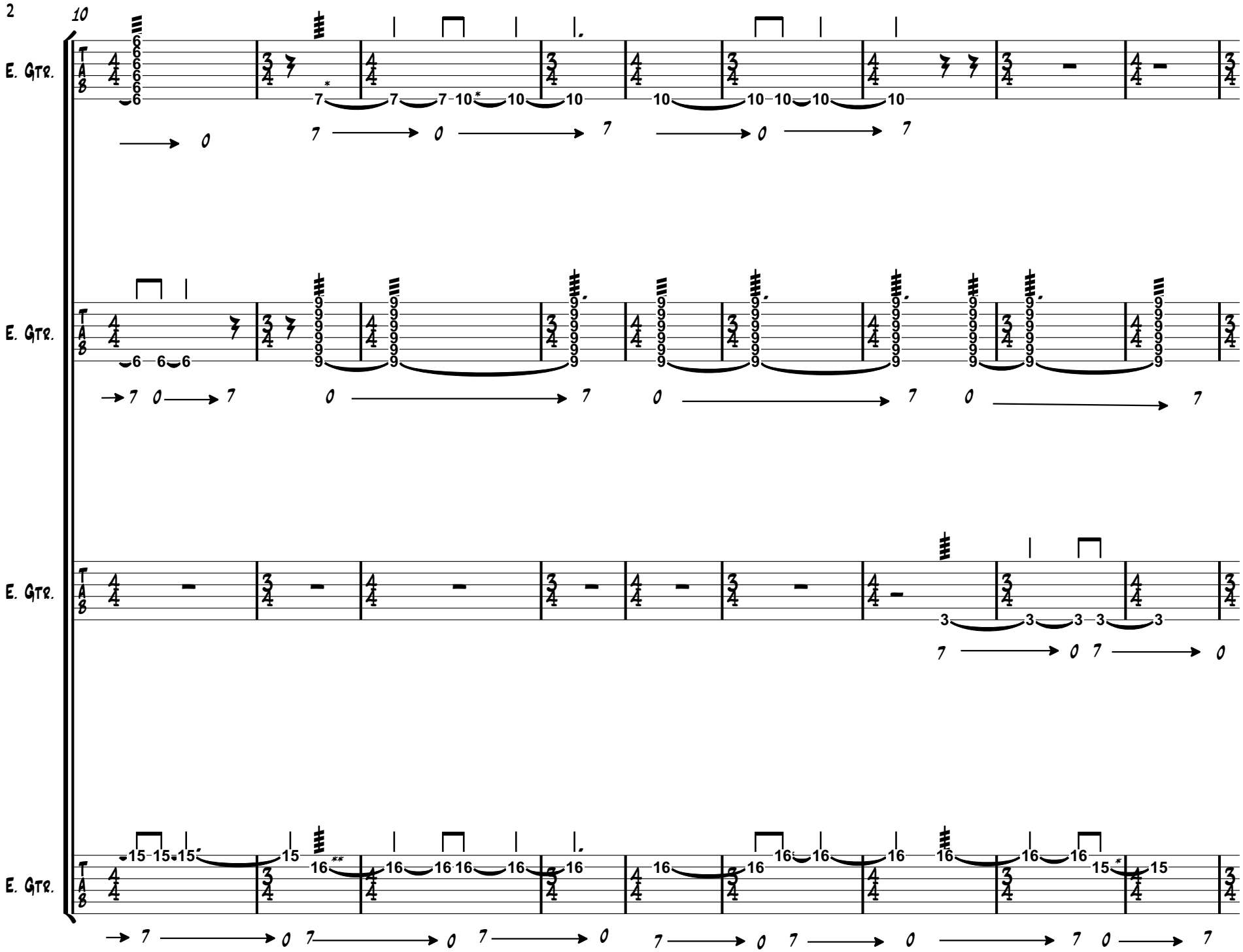
Gtr. 3

Bridge pickup

Electric Guitar
VI-89.35
V-130.82
IV-172.61
III-235.8
II-270.87
I-280.42

Gtr 4.

Fretboard pickup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28

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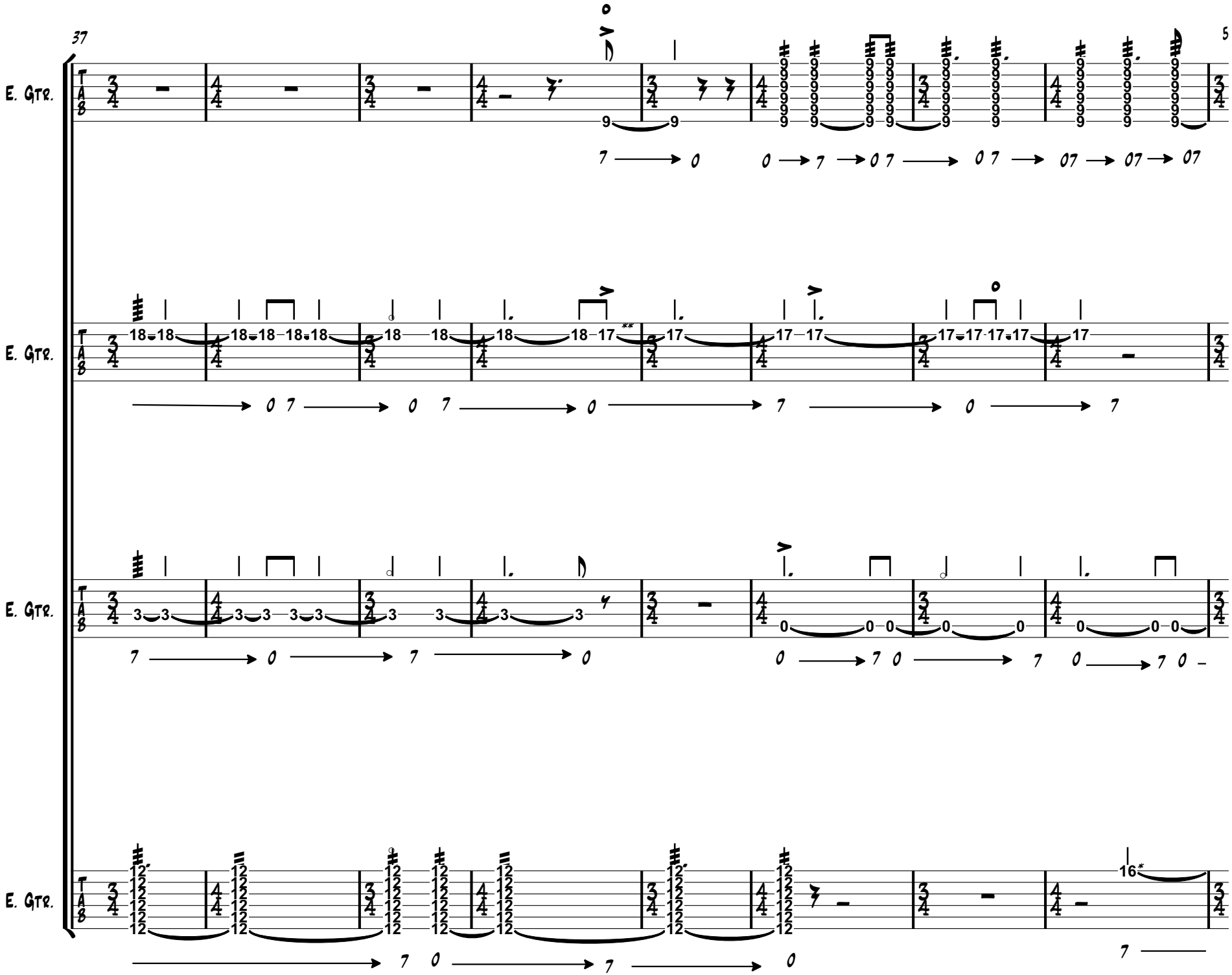
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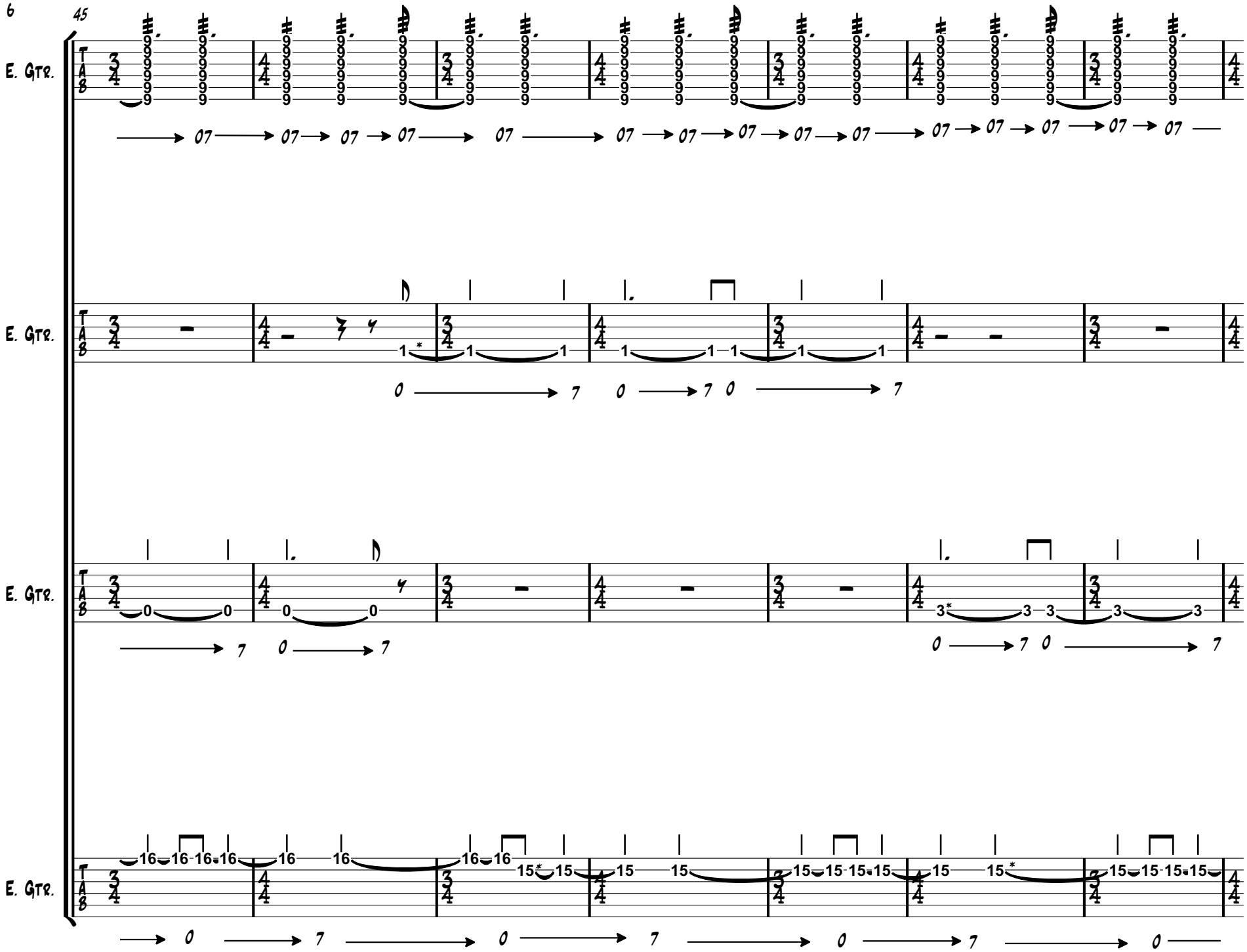
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CONT. SIM

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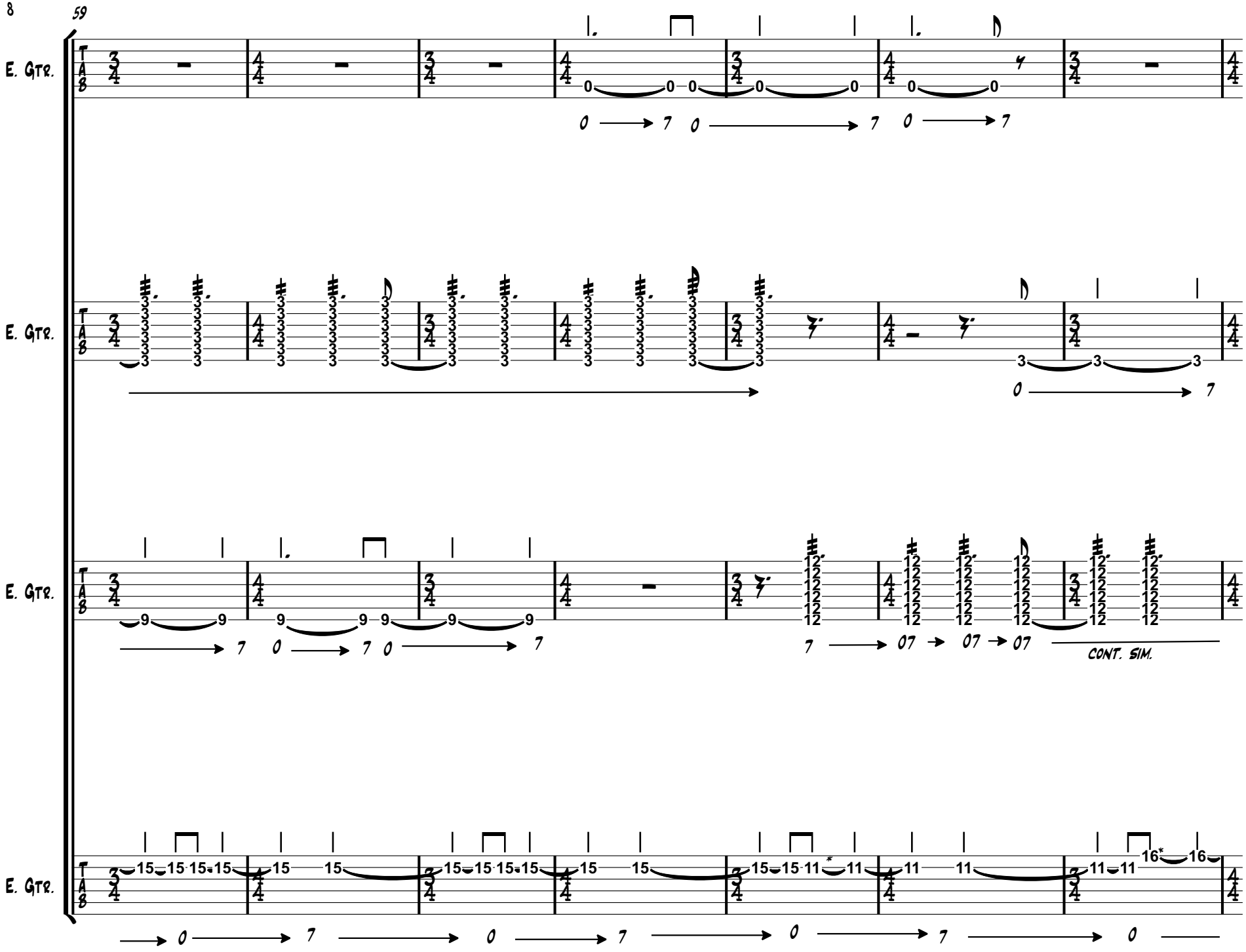
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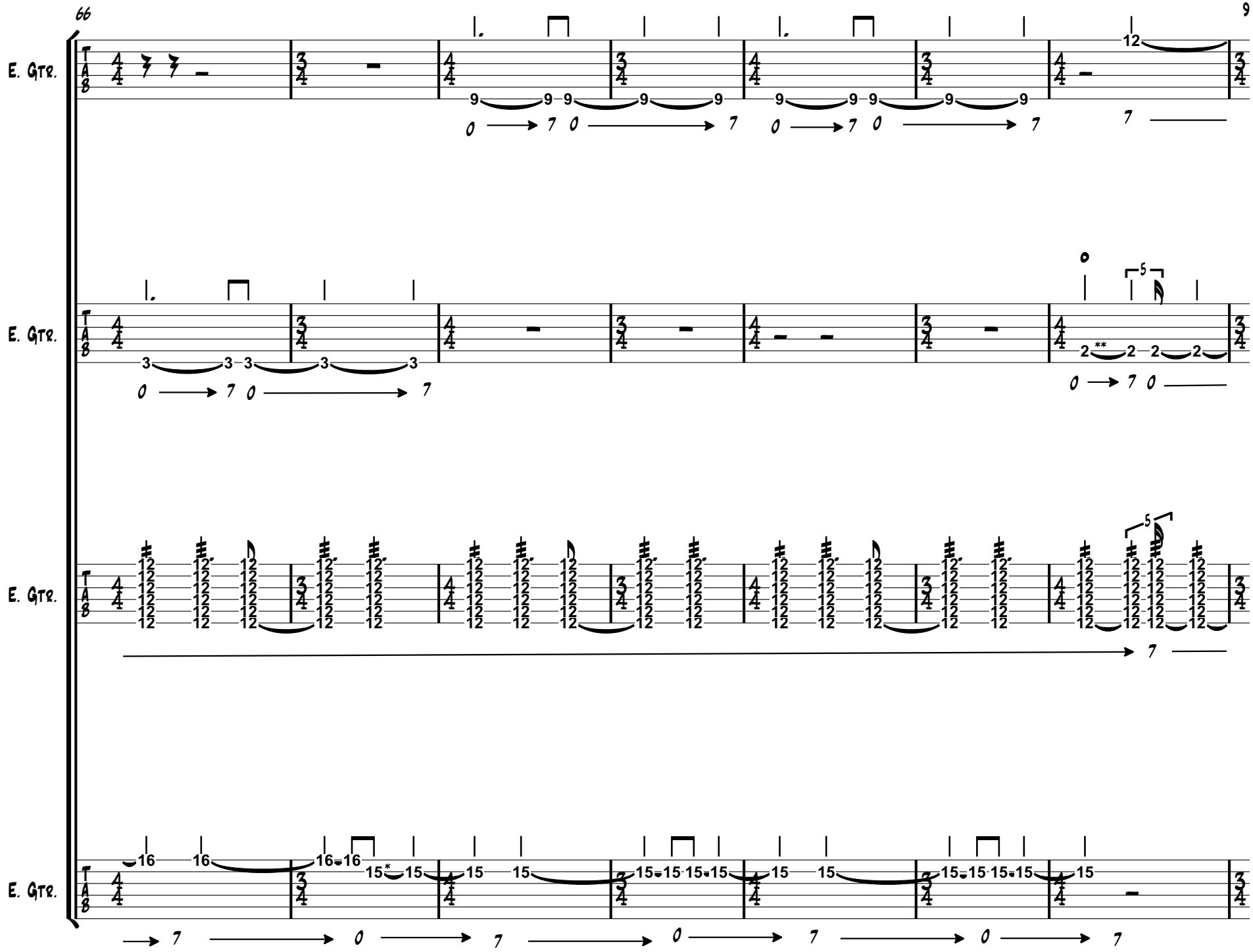
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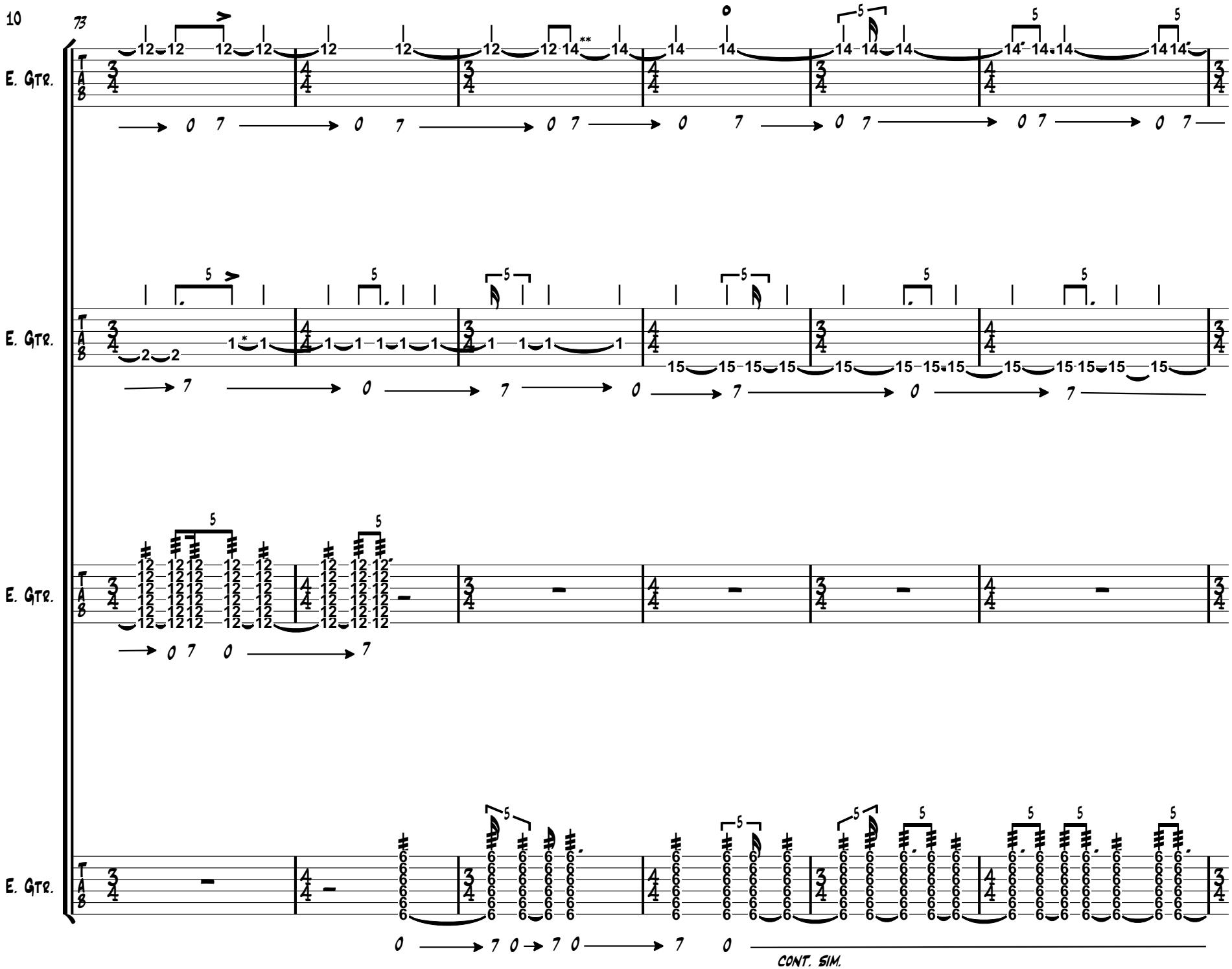
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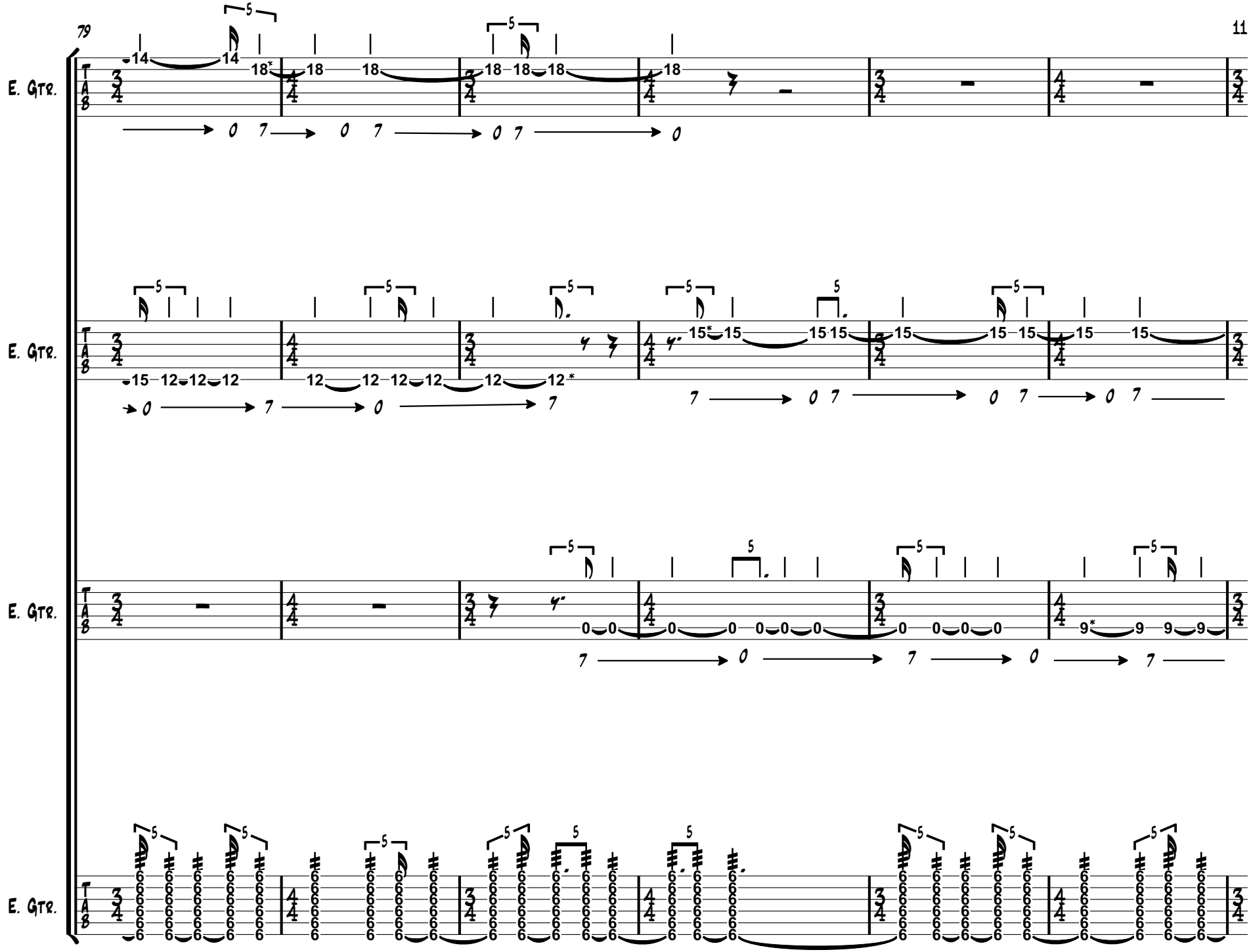
CONT. SIM.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85

E. Gtr.

CONT. SIM.

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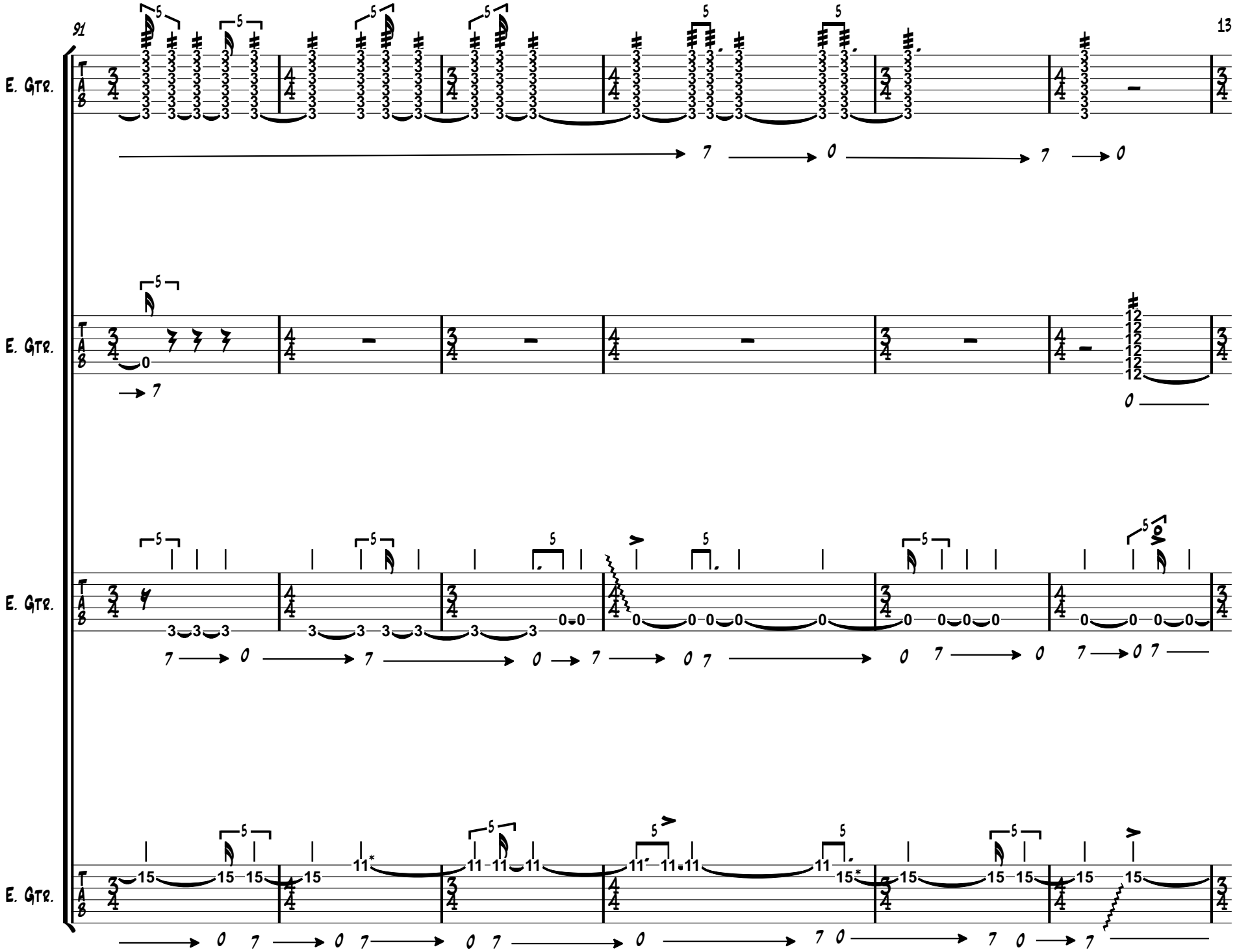
E. Gtr.

E. Gtr.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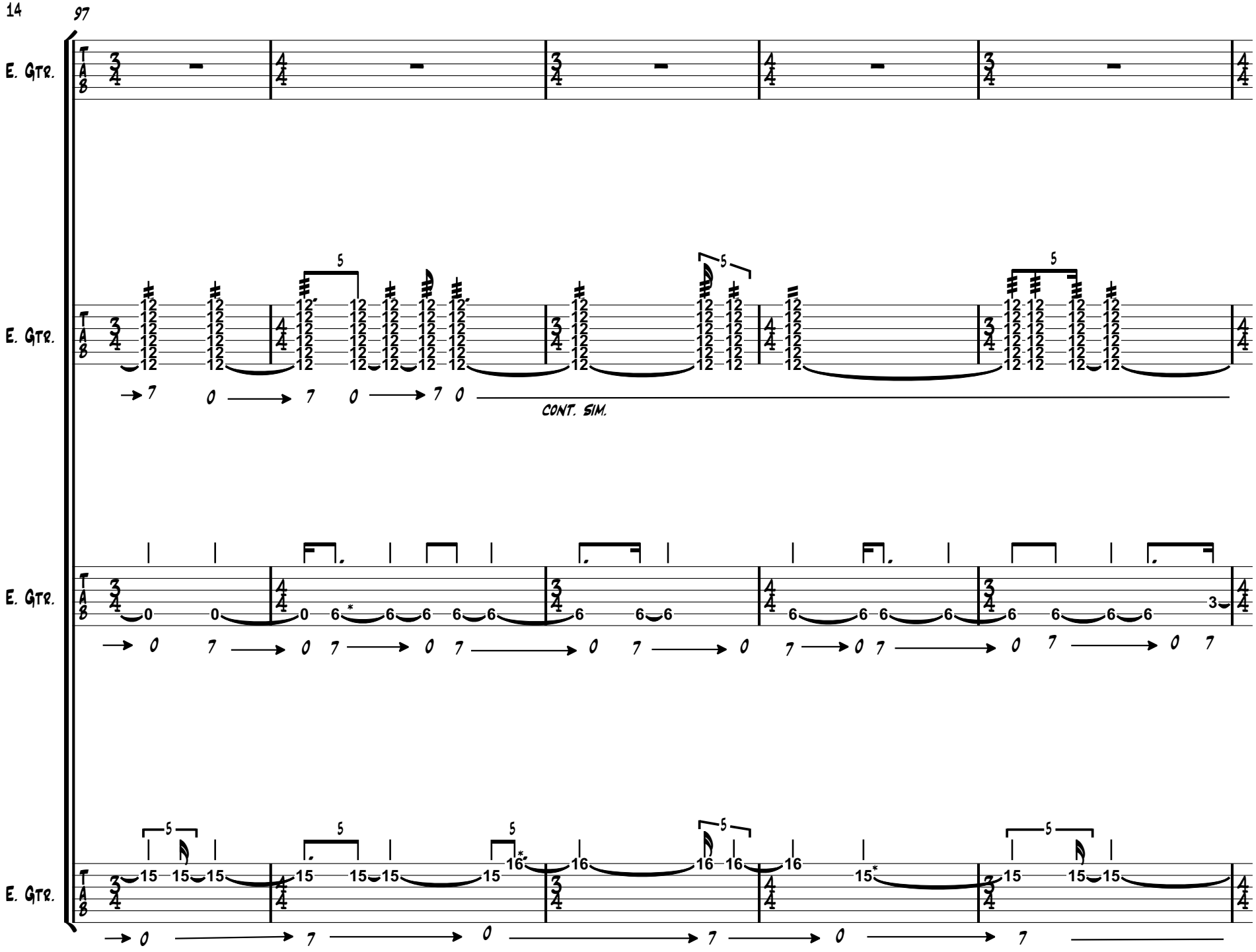
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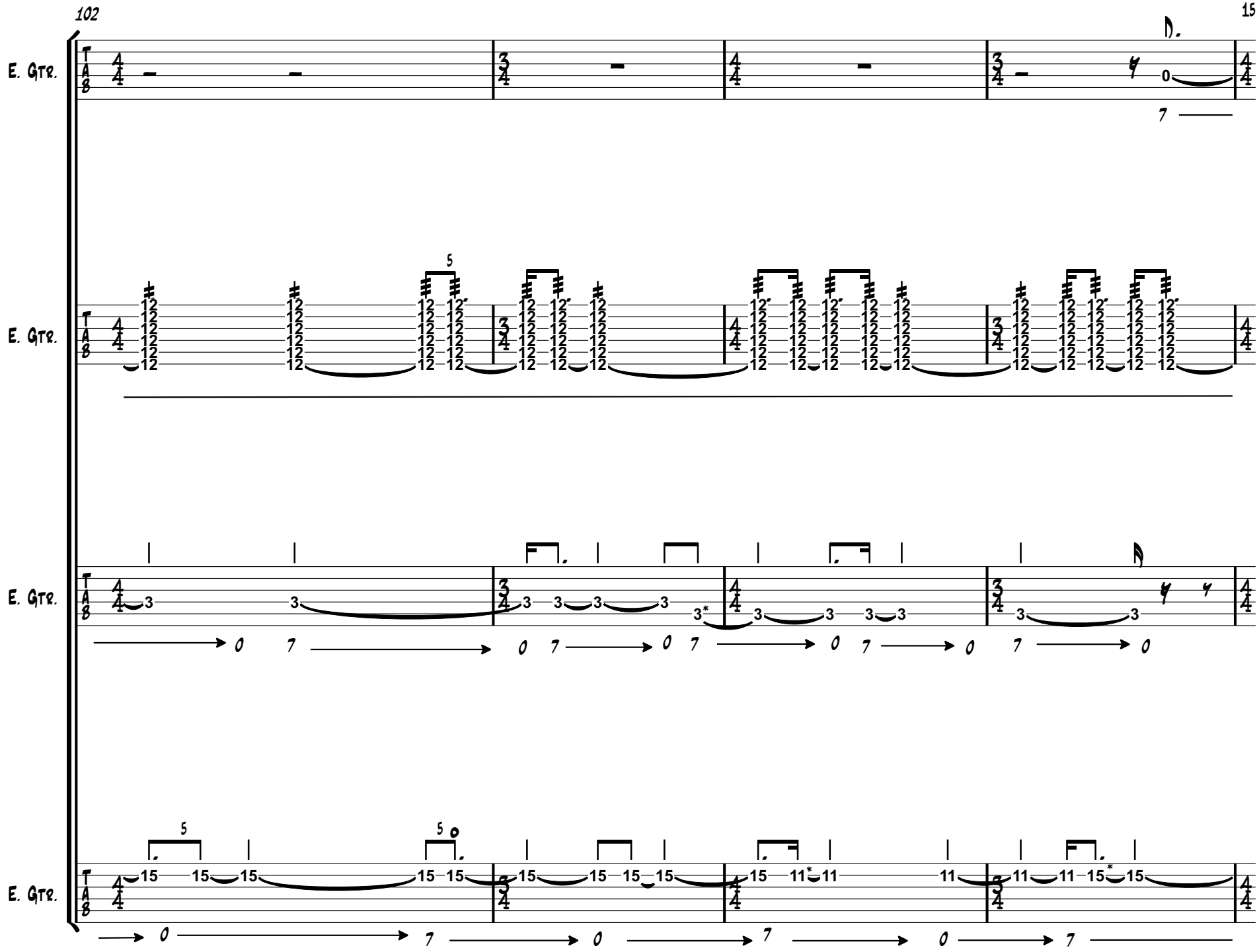
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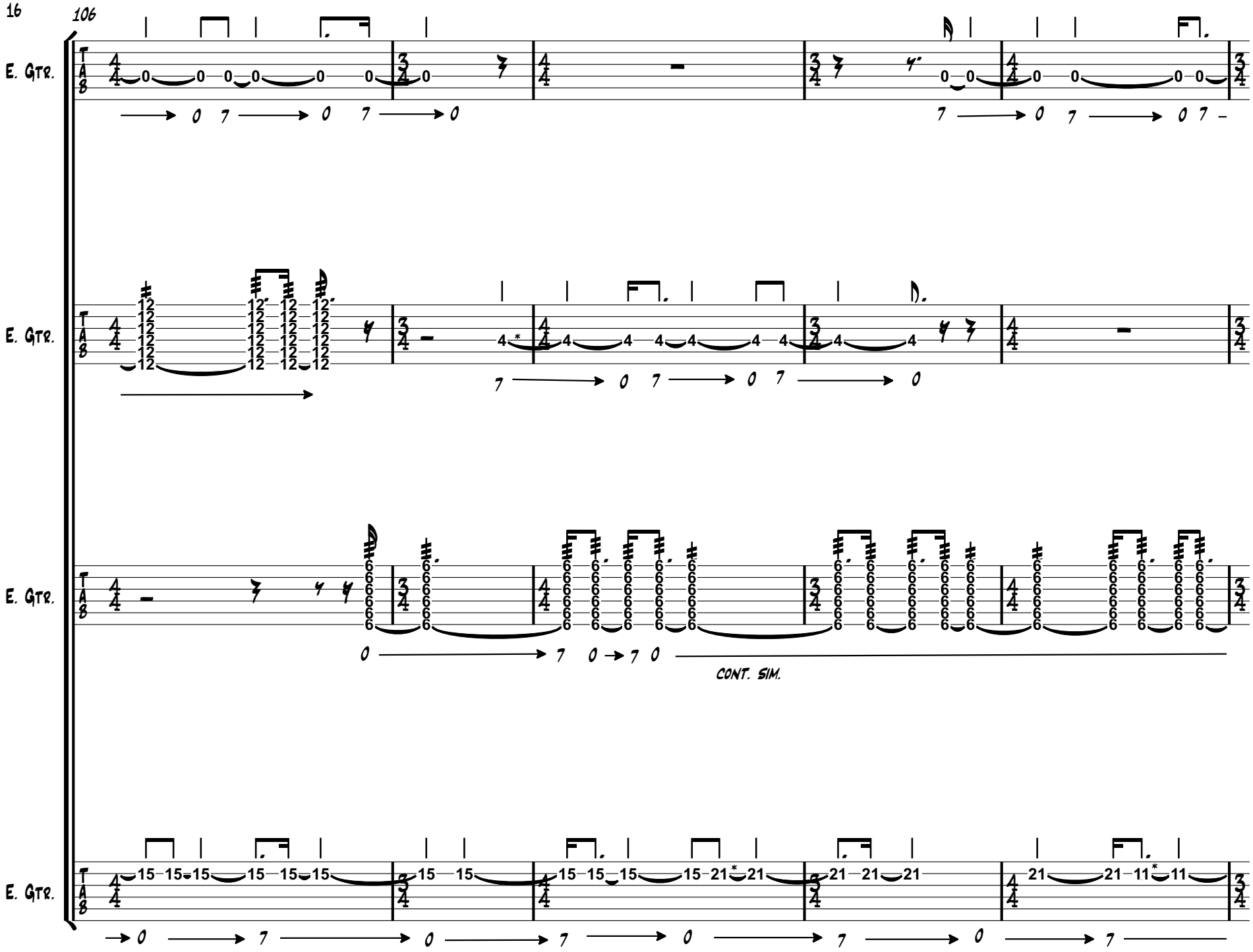
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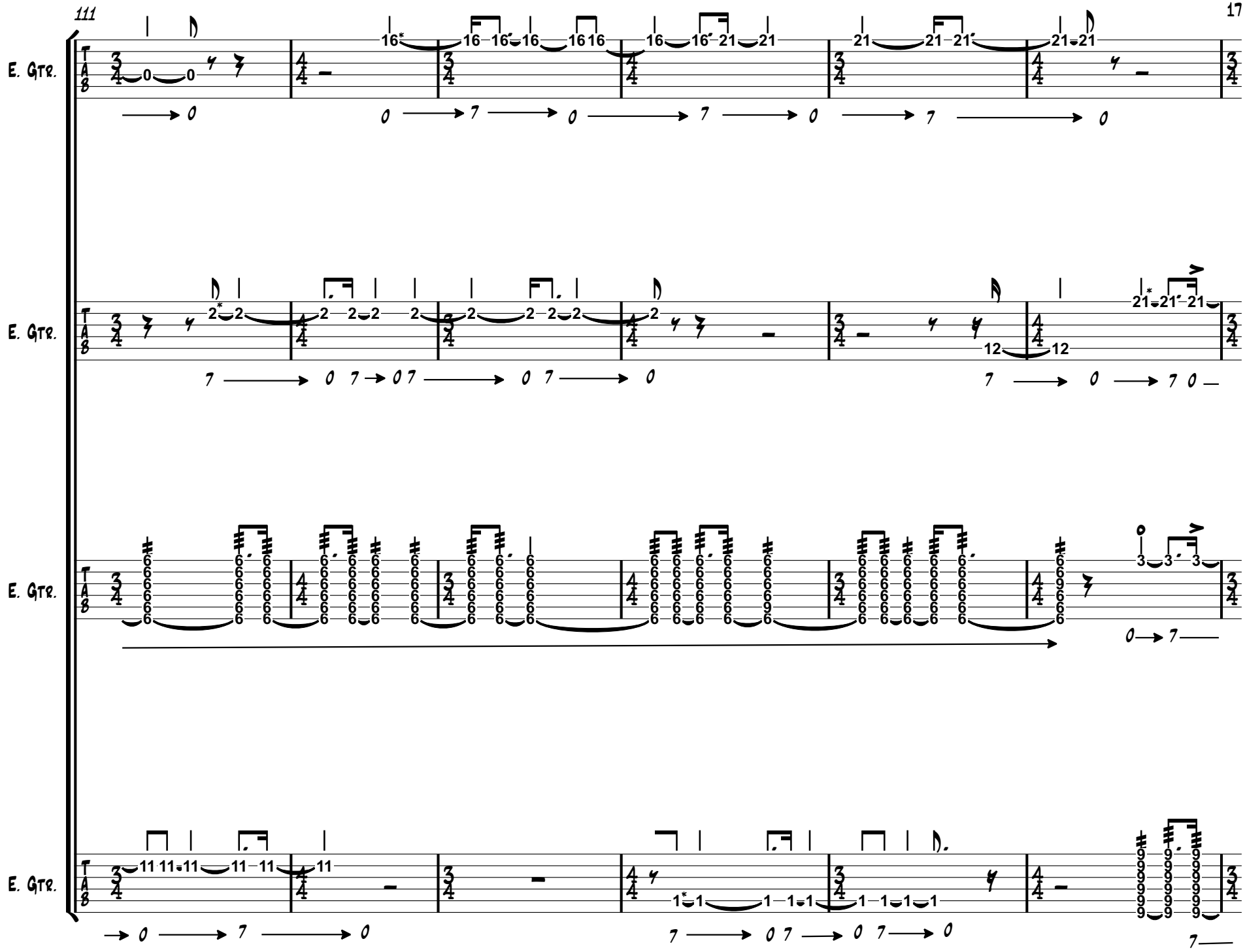
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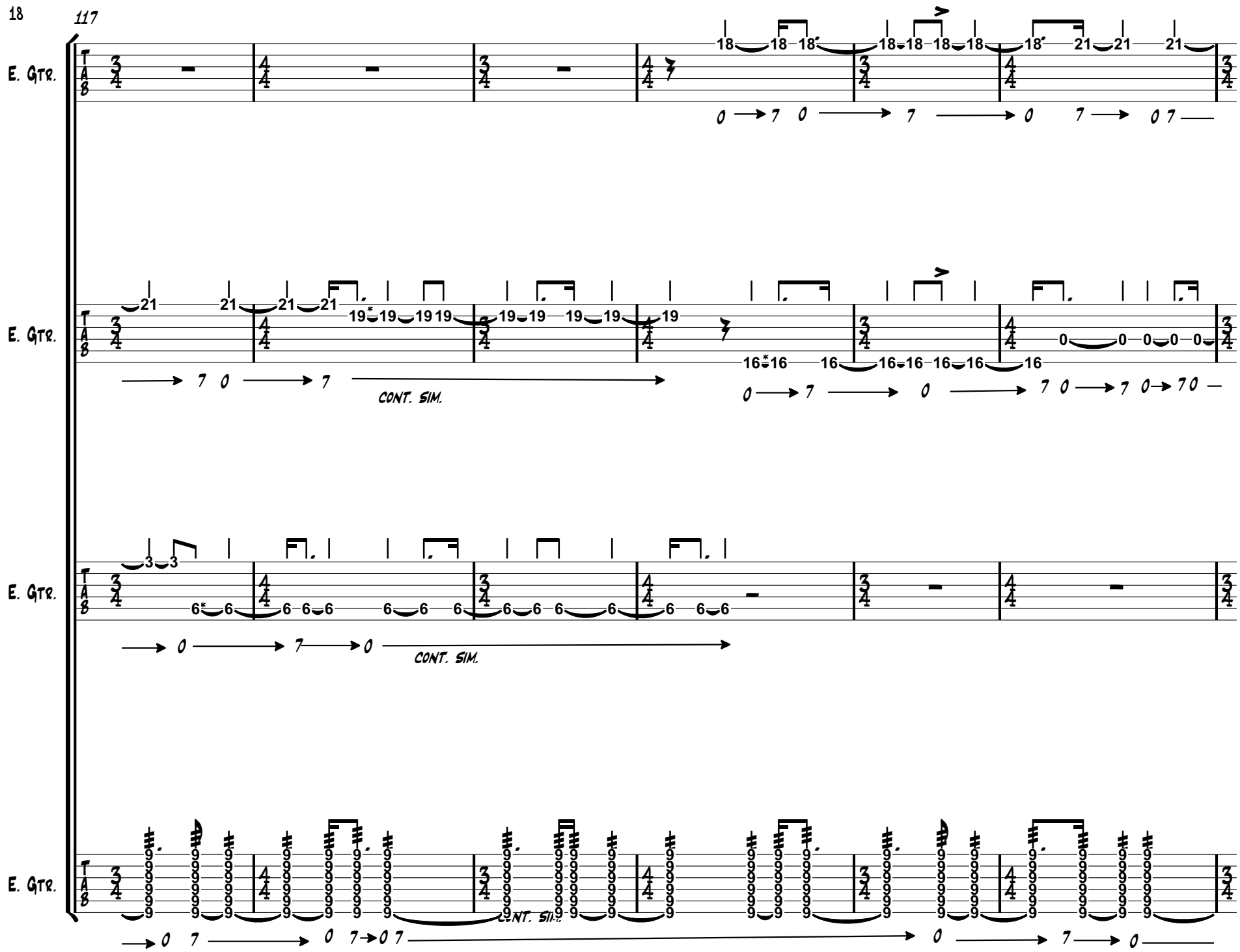
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CONT. SIM.
E. Gtr.
CONT. SIM.
E. Gtr.
CONT. SIM.

123

E. Gtr.

E. Gtr.

E. Gtr.

E. Gtr.

CONT. SIM.

128

E. Gtr.

CONT. SIM.

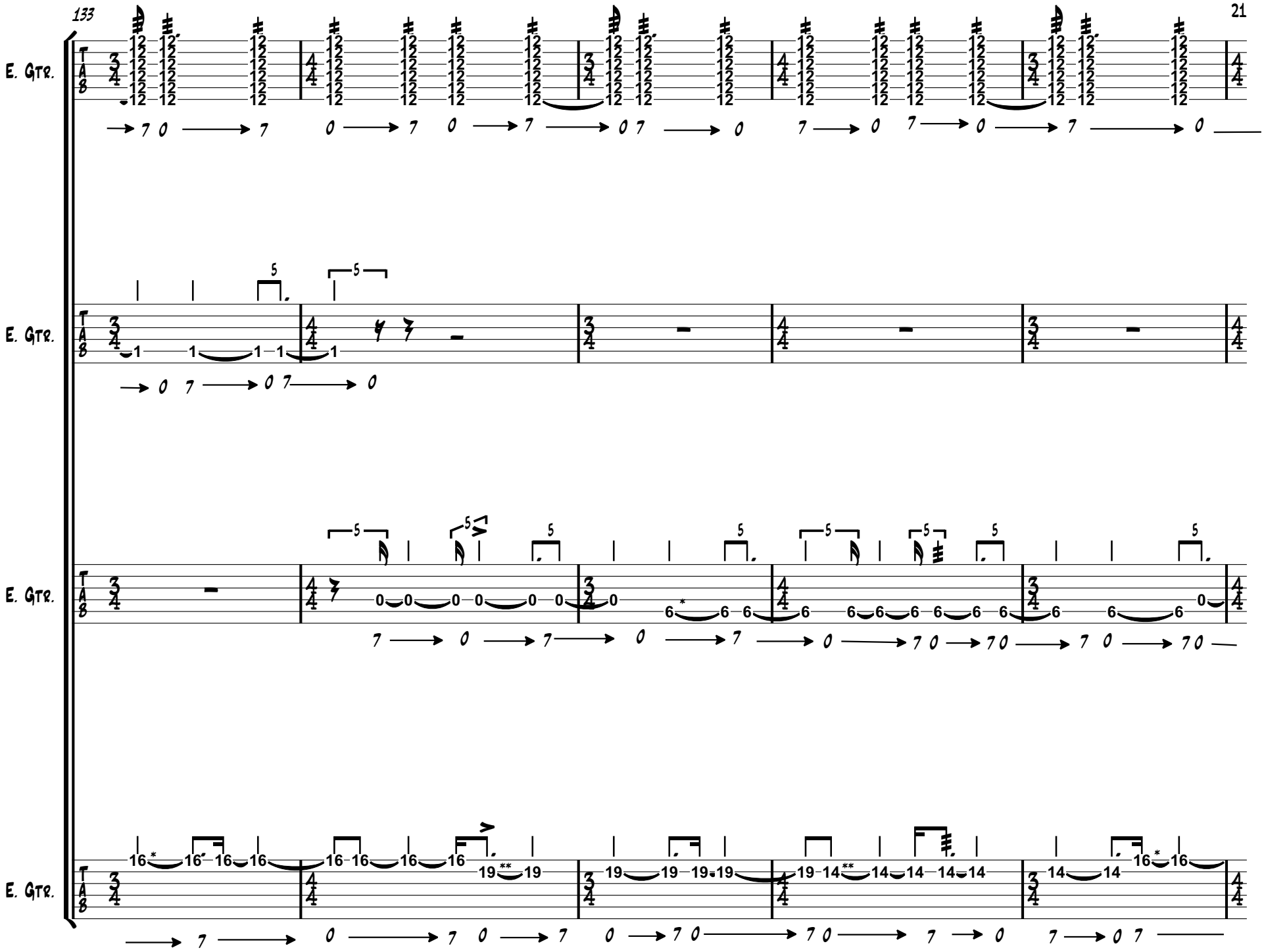
E. Gtr.

E. Gtr.

CONT. SIM.

E. Gtr.

CONT. SIM.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138

E. Gtr.

E. Gtr.

E. Gtr.

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E. Gtr.

E. Gtr.

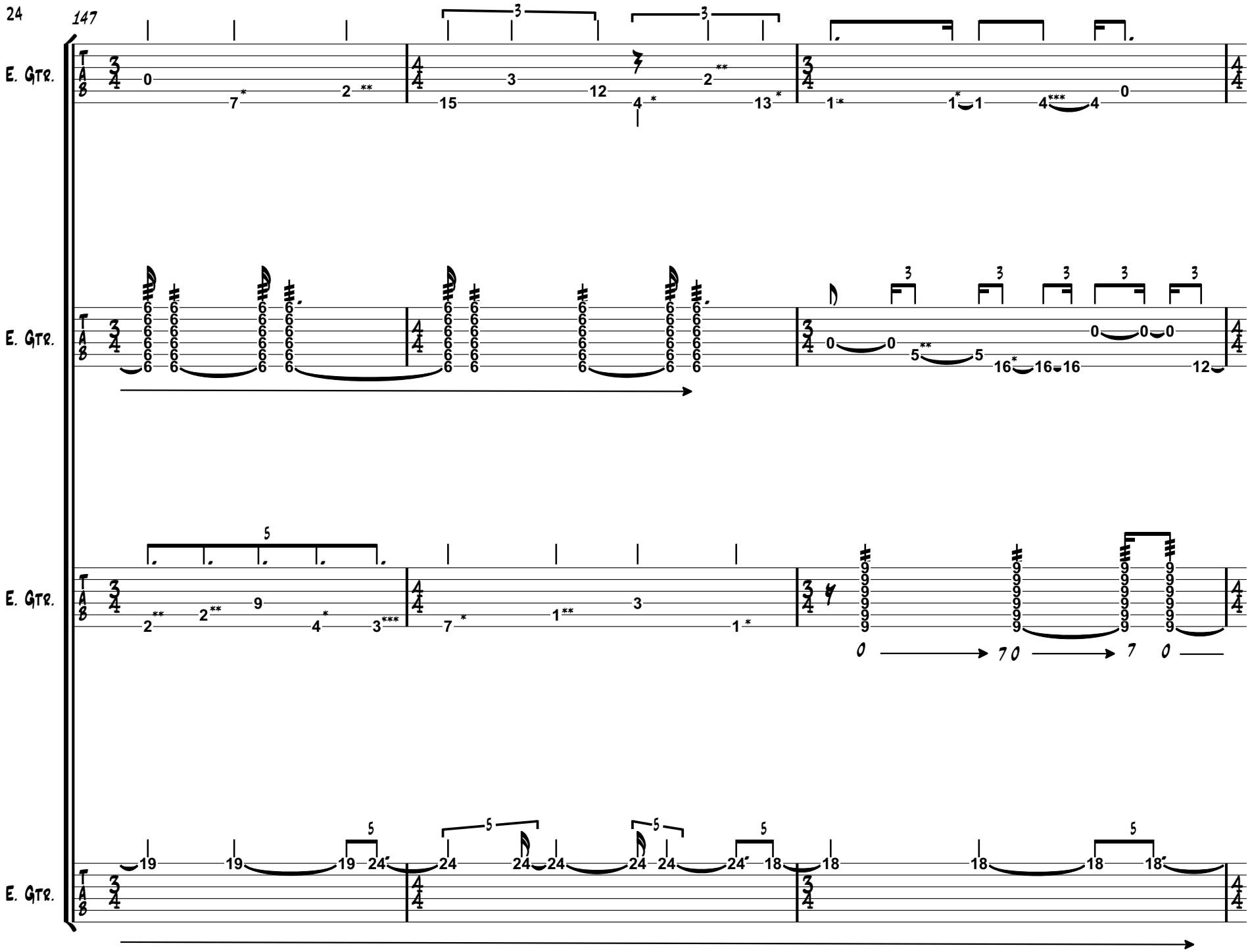
CONT. SIM.

E. Gtr.

(9)

E. Gtr.

CONT. SIM.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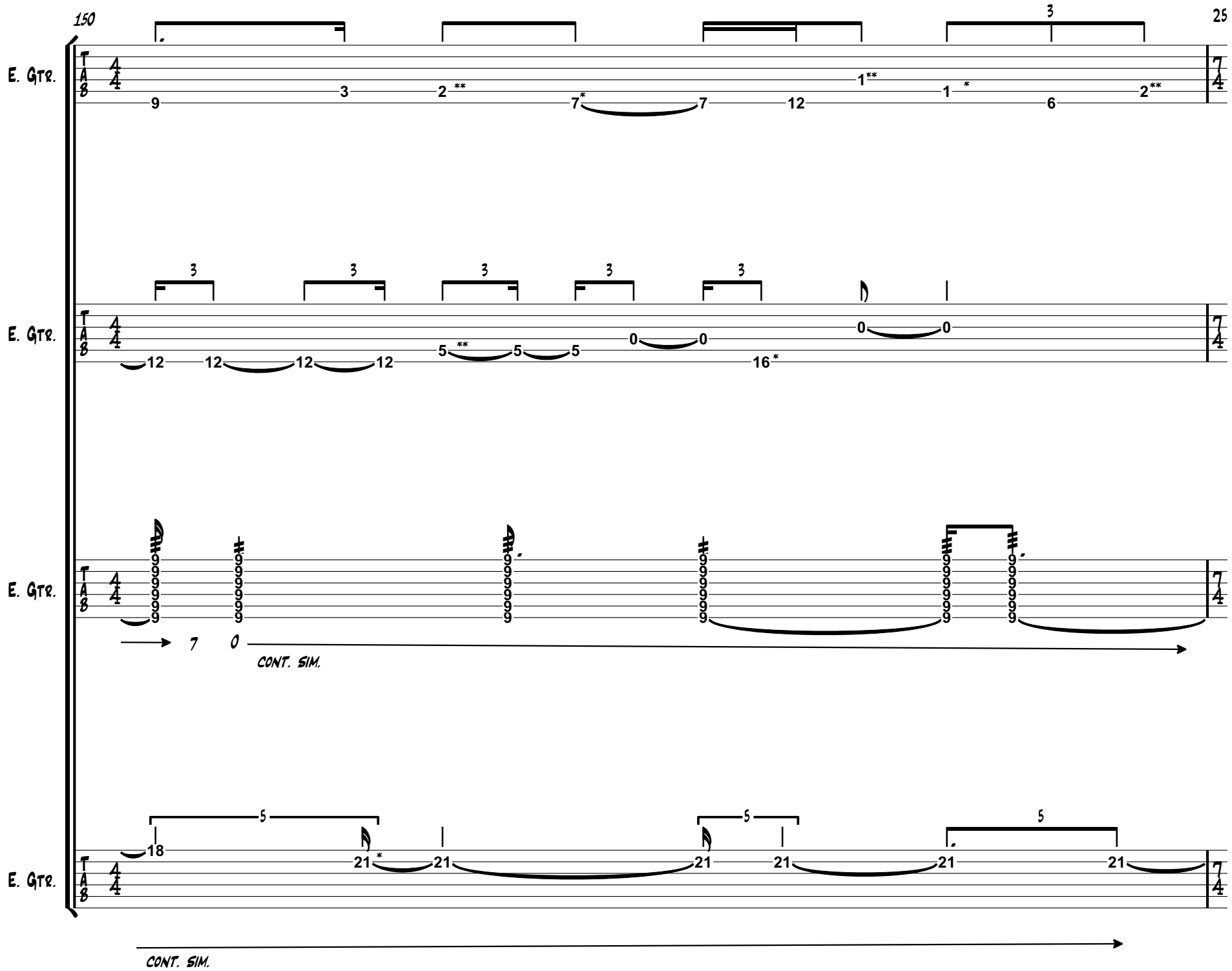
E. Gtr.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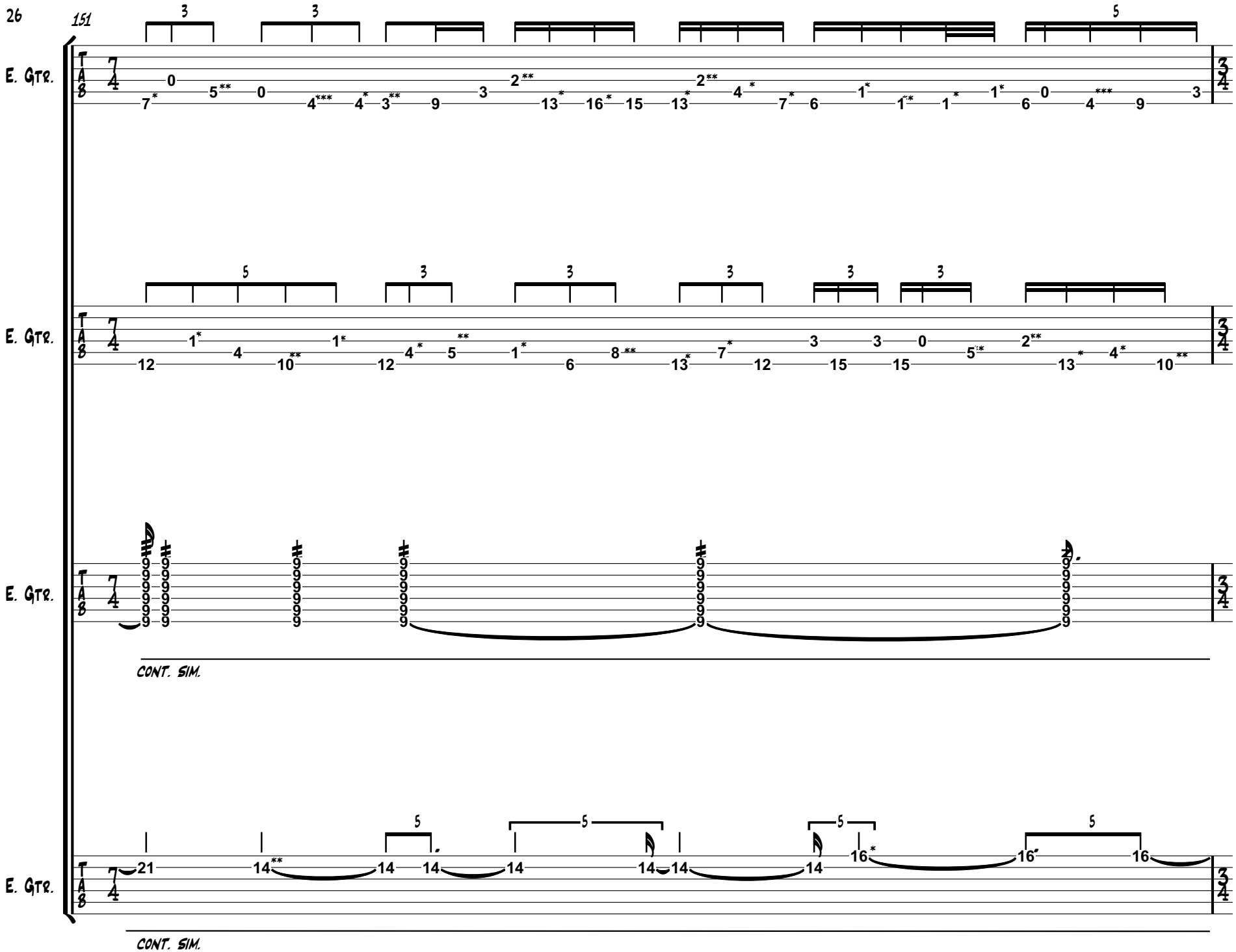
E. Gtr.
CONT. SIM.
CONT. SIM.


151
E. Gtr.
E. Gtr.
E. Gtr.
CONT. SIM.
E. Gtr.
CONT. SIM.

E. Gtr.

(9)

E. Gtr.

E. Gtr.

CONT. SIM.

E. Gtr.

(9)

155

E. Gtr.

E. Gtr.

E. Gtr.

CONT. SIM.

E. Gtr.

0 → 7 0 → 7 0

159

E. Gtr.

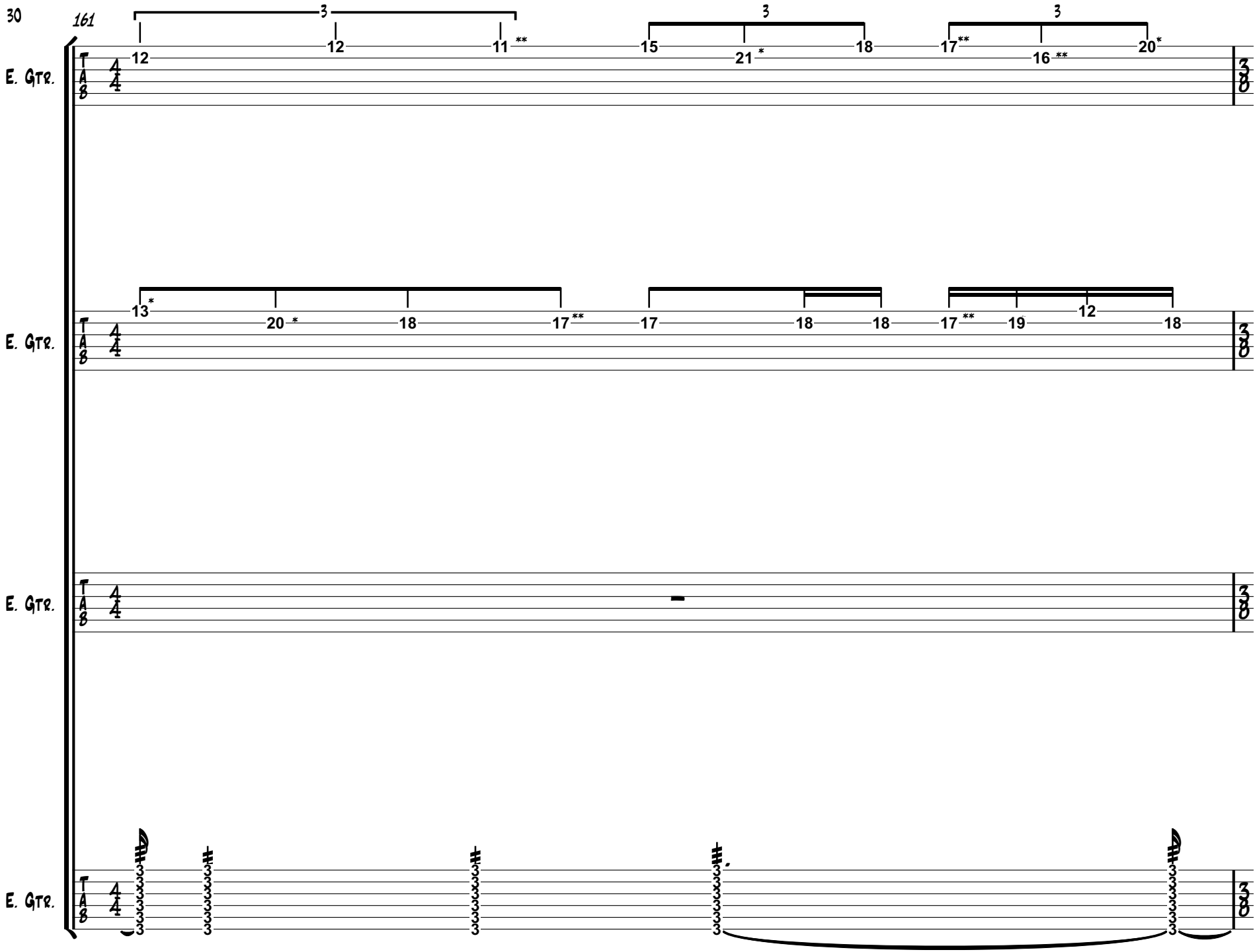
E. Gtr.

E. Gtr.

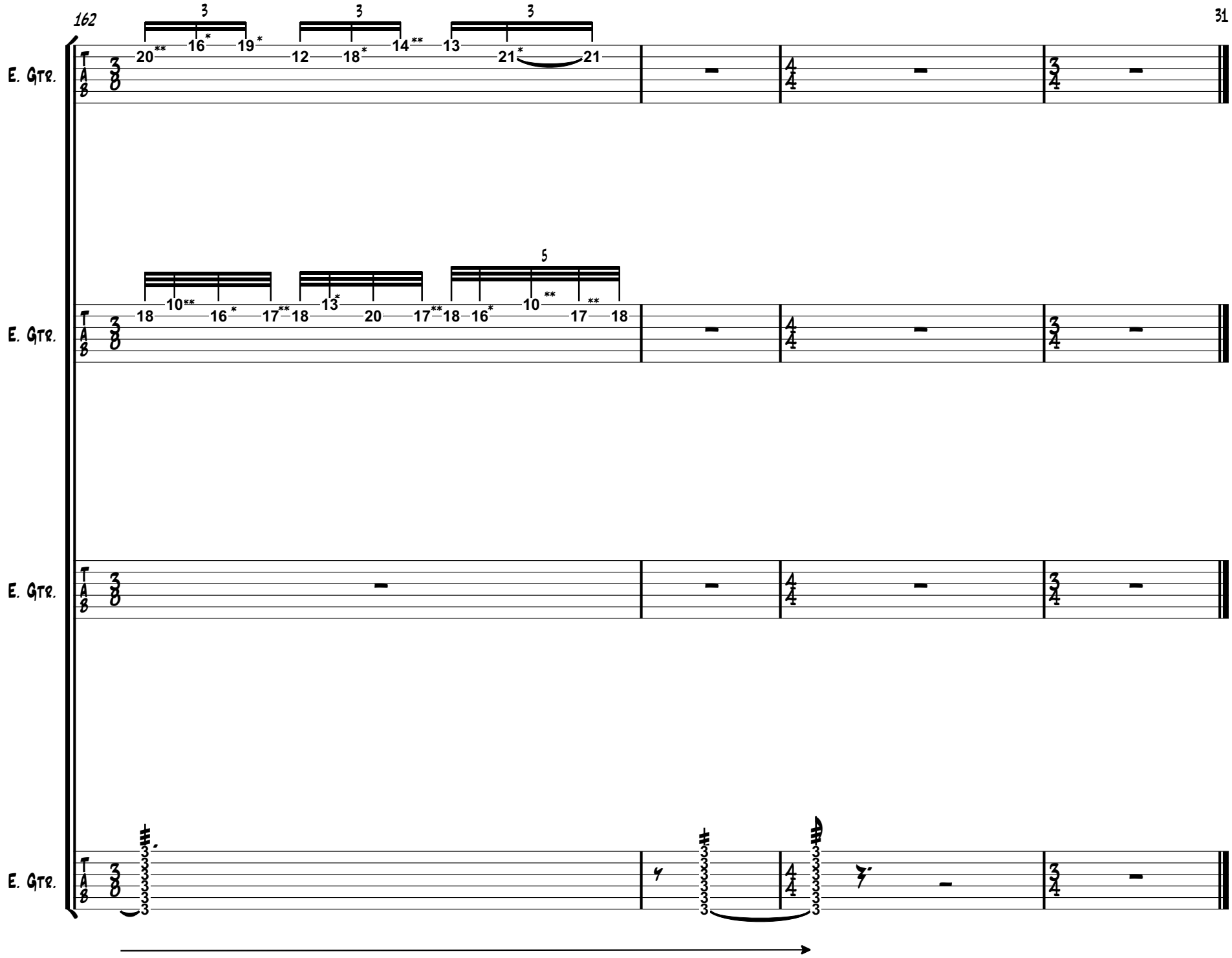
E. Gtr.

Cont. sim.

Cont. sim.



CONT. SIM.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E. Gtr.
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