

Dante Rosati

Arbor Low

for 21-Tone Just Intonation Guitar



2/1	octave
15/8	classic major seventh
9/5	just minor seventh
16/9	Pythagorean minor seventh
7/4	harmonic seventh
12/7	septimal major sixth
5/3	major sixth
8/5	minor sixth
14/9	septimal minor sixth
3/2	perfect fifth
10/7	Euler's tritone
7/5	septimal tritone
4/3	perfect fourth
9/7	septimal major third
5/4	major third
6/5	minor third
7/6	septimal minor third
8/7	septimal whole tone
9/8	major whole tone
10/9	minor whole tone
16/15	minor diatonic semitone
1/1	unison

Notes on setup and tuning

The 21-Tone Just Intonation Guitar uses a standard set of guitar strings, although the lowest strings will be tuned slightly below their customary ranges, and the upper strings above theirs. Tuning the guitar to C or C# produces the best results. If we tune the lowest (6th) string to C, which then becomes 1/1, then the 4th and 2nd strings are also tuned to 1/1, with the 4th string being an octave above the 6th, and the 2nd an octave above the 4th. The 5th string is then tuned to G (3/2), with the 3rd string tuned to 3/2 an octave higher, and the 1st string 3/2 an octave above that.

Thus the tuning, from 6th string to 1st is literally:

$$1/1 - 3/2 - 2/1 - 3/1 - 4/1 - 6/1$$

or, more simply,

$$1/1 - 3/2 - 1/1 - 3/2 - 1/1 - 3/2$$

which, if we take the note "C" as our 1/1, gives:

$$C - G - c - g - c' - g'$$

The strings tuned to 1/1 will give the 21 note scale from the open string to the halfway point of the neck (the "12th fret" position on a standard guitar):

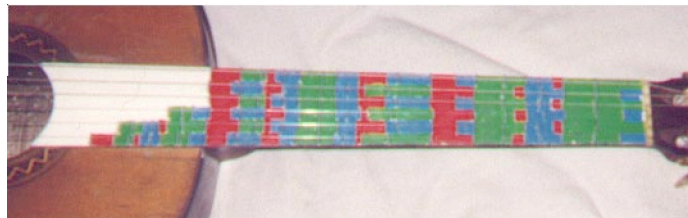
$$1/1 \ 16/15 \ 10/9 \ 9/8 \ 8/7 \ 7/6 \ 6/5 \ 5/4 \ 9/7 \ 4/3 \ 7/5 \ 10/7 \ 3/2 \ 14/9 \ 8/5 \ 5/3 \ 12/7 \ 7/4 \ 16/9 \ 9/5 \ 15/8 \ 1/1^*$$

The strings tuned to 3/2 will continue up the scale as follows:

$$3/2 \ 14/9 \ 8/5 \ 5/3 \ 12/7 \ 7/4 \ 16/9 \ 9/5 \ 15/8 \ 1/1 \ 16/15 \ 10/9 \ 9/8 \ 8/7 \ 7/6 \ 6/5 \ 5/4 \ 9/7 \ 4/3 \ 7/5 \ 10/7 \ 3/2^*$$

Notice that in each case, the octave of the open string, lying at the midpoint of the string, is marked with an asterisk ("*") to distinguish it in the tablature from the open string. Any notes lying above the octave are similarly marked.

The colors for each ratio were chosen to highlight its prime limit factor. Thus, ratios in **red** have a prime number limit of 2 or 3, **green** is 5 and **blue** is 7. For more information on this and how the scale was derived, see my website: danterosati.com.



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2

4/4

5/3 5/4 3/2 7/5 10/9 1/1 16/15 8/5 1/1 8/5 3/2 8/5 1/1 8/5 16/15 8/5

1/1

3

1/1 3/2 1/1 8/5 6/5 3/2 4/3 16/15 1/1 10/9 8/5

8/5 3/2 8/5 8/5 10/9 8/5 1/1

5

1/1 3/2 1/1 1/1 8/5 3/2 8/5 8/5 10/9 8/5 1/1 8/5 3/2 8/5 1/1 8/5 9/8 8/5

7

3/2 4/3 5/4 4/3 3/2 4/3 5/4 3/2 4/3 5/4 3/2 4/3 5/4 3/2 4/3 5/4 10/8

10/9 16/15

9

10/8 5/4 16/15 1/1 14/9 3/2 3/2 14/9 1/1 16/15

1/1 5/4

10

9/7 10/9 1/1 8/5 3/2 3/2 8/5 1/1 10/9 4/4

9/7 8/5 9/7 8/5

4 23

T
A
B

24

T
A
B

25

T
A
B

26

T
A
B

27

T
A
B

28

T
A
B

29

3/2 1/1 16/15 5/4 16/15 1/1 3/2 1/1 16/15 5/4 16/15 1/1

T
A
B

30

3/2 1/1 16/15 5/4 16/15 1/1 3/2 1/1 16/15 5/4 16/15 1/1

T
A
B

31

14/9 3/2 5/4 1/1 12/7 3/2 1/1 5/3 4/3 1/1 15/8 3/2 3/2*

T
A
B

32

1/1 15/8 3/2 1/1 7/5 1/1 7/4 3/2 3/2 5/4 7/4 1/1

T
A
B

33

3/2 5/4 1/1 8/5 3/2 1/1 3/2 5/4 1/1 8/5 3/2 1/1

T
A
B

34

3/2 6/5 1/1 5/3 3/2 1/1 3/2 6/5 1/1 5/3 3/2 1/1

T
A
B

6 35

T $3/2$ $8/7$ $1/1$

A $8/7$ $14/9$ $3/2$

B $10/9$ $14/9$ $3/2$

36

T $3/2$ $6/5$ $1/1$

A $6/5$ $5/3$ $3/2$

B $1/1$ $12/7$ $3/2$

37

T $10/9$ $8/5$ $3/2$

A $8/5$ $5/4$ $1/1$

B $10/9$ $5/3$ $3/2$

38

T $3/2$ $6/5$ $1/1$

A $6/5$ $5/3$ $3/2$

B $1/1$ $12/7$ $3/2$

39

T $10/9$ $8/5$ $3/2$

A $8/5$ $5/4$ $1/1$

B $10/9$ $5/3$ $3/2$

6
4

40

T $5/4$ $14/9$ $3/2$

A $14/9$ $16/15$ $1/1$

B $6/4$ $16/15$ $10/9$

4
4

41 7

T
A
B

42

T
A
B

43

T
A
B

44

T
A
B

45

T
A
B

46

T
A
B

8 47

15/8 6/5 3/2 8/5 1/1 3/2 8/5 6/5 3/2 15/8 1/1 3/2

48

15/8 6/5 3/2 8/5 1/1 3/2 8/5 6/5 3/2 15/8 1/1 3/2

49

15/8 6/5 3/2 8/5 1/1 3/2 15/8 6/5 3/2 8/5 1/1 3/2

50

15/8 6/5 3/2 8/5 1/1 3/2 15/8 6/5 3/2 8/5 1/1 3/2

51

5/3 5/4 3/2 7/5 10/9 1/1 16/15 8/5 1/1 8/5 3/2 8/5 1/1 8/5 16/15 8/5

53

1/1 8/5 3/2 8/5 1/1 8/5 10/9 8/5 8/5 6/5 3/2 4/3 16/15 1/1 10/9 8/5

55

Staff 55: T (1/1), A (8/5), B (8/5). Ratios: 1/1, 3/2, 1/1, 10/9, 8/5, 1/1, 3/2, 1/1, 9/8, 8/5. Beams connect notes in groups of three.

57

Staff 57: T (3/2), A (4/3), B (10/9). Ratios: 3/2, 4/3, 5/4, 4/3, 3/2, 4/3, 5/4, 3/2, 4/3, 5/4, 4/3, 5/4, 3/2, 4/3, 5/4. Beams connect notes in groups of three. Final ratio 10/8.

59

Staff 59: T (10/8), A (5/4), B (1/1). Ratios: 5/4, 16/15, 1/1, 14/9, 3/2, 3/2, 14/9, 1/1, 16/15, 1/1. Beams connect notes in groups of two.

60

Staff 60: T (9/7), A (10/9), B (8/5). Ratios: 9/7, 10/9, 1/1, 8/5, 3/2, 3/2, 8/5, 1/1, 10/9. Beams connect notes in groups of two.

61

Staff 61: T (7/5), A (6/5), B (12/7). Ratios: 7/5, 6/5, 1/1, 12/7, 3/2, 3/2, 5/3, 7/6, 7/5. Beams connect notes in groups of two.

62

Staff 62: T (3/2), A (5/4), B (7/4). Ratios: 3/2, 5/4, 1/1, 7/4, 3/2, 3/2, 7/4, 1/1, 5/4, 7/5. Beams connect notes in groups of two.

10₆₃

T: $5/3$ — $4/3$ — $1/1$ — $3/2$ — $3/2$ — $15/8$ — $1/1$ — $4/3$
 A: — $15/8$ — $3/2^*$ — $15/8$ —
 B: — — — — — — — — —

64

T: $1/1^*$ — $7/5$ — $1/1$ — $7/4$ — $3/2$ — $3/2$ — $7/4$ — $1/1$ — $7/5$
 A: — — — $7/4$ — $3/2$ — $3/2$ — $7/4$ — — —
 B: $1/1$ — — — $5/4$ — — — — — — —

65

T: $1/1^*$ — $7/5$ — $1/1$ — $7/4$ — $3/2$ — $3/2$ — $7/4$ — $1/1$ — $7/5$
 A: — — — $7/4$ — $3/2$ — $3/2$ — $7/4$ — — —
 B: — — — $5/4$ — — — — — — —

66

T: $5/4$ — $7/4$ — $3/2$ — $7/5$ — $1/1$ — $1/1$ — $7/5$ — $3/2$ — $7/4$
 A: — — — $7/5$ — — — $1/1^*$ — $7/5$ — — —
 B: — — — — — — — — — — — — —

67

T: $3/2^*$ — $15/8$ — $3/2$ — $4/3$ — $1/1$ — $1/1$ — $4/3$ — $3/2$ — $15/8$
 A: — — — $4/3$ — — — $5/3$ — — — $4/3$ — — —
 B: $1/1$ — — — — — — — — — — — — —

68

T: $3/2^*$ — $15/8$ — $3/2$ — $4/3$ — $1/1$ — $1/1$ — $4/3$ — $3/2$ — $15/8$
 A: — — — $4/3$ — — — $5/3$ — — — $4/3$ — — —
 B: — — — — — — — — — — — — —

69

Exercise 69 notation: T (5/4, 7/4, 3/2, 1/1, 1/1, 7/5, 7/4), A (7/5, 7/5, 1/1*), B (1/1*). Fret positions are indicated by brackets above the staff.

70

Exercise 70 notation: T (1/1*, 7/5, 1/1, 3/2, 3/2, 1/1, 7/5), A (7/4, 7/4, 5/4, 7/4), B (1/1). Fret positions are indicated by brackets above the staff.

71

Exercise 71 notation: T (1/1*, 7/5, 1/1, 3/2, 3/2, 1/1, 7/5), A (7/4, 5/4, 7/4), B (5/4). Fret positions are indicated by brackets above the staff.

72

Exercise 72 notation: T (5/3, 4/3, 1/1, 3/2, 3/2, 1/1, 4/3), A (15/8, 3/2, 15/8), B (3/2*, 3/2). Fret positions are indicated by brackets above the staff.

73

Exercise 73 notation: T (3/2*, 15/8, 3/2, 1/1, 1/1, 3/2, 15/8), A (4/3, 1/1, 4/3), B (1/1, 5/3, 4/3). Fret positions are indicated by brackets above the staff.

74

Exercise 74 notation: T (3/2*, 15/8, 3/2, 1/1, 1/1, 3/2, 15/8), A (4/3, 1/1, 4/3), B (5/3, 4/3). Fret positions are indicated by brackets above the staff.

1275

T
A
B

5/4 7/4 3/2 1/1 1/1 3/2 7/4

7/5 1/1 1/1 7/5

1/1*

76

T
A
B

5/4 7/4 3/2 1/1 1/1 3/2 7/4

7/5 1/1 1/1 7/5

1/1*

77

T
A
B

5/3 5/4 3/2 7/5 10/9 1/1 16/15 8/5

1/1

1/1

78

T
A
B

8/5 6/5 3/2 4/3 16/15 1/1 10/9 8/5

1/1

1/1

79

T
A
B

14/9 7/6 3/2 4/3 16/15 1/1 10/9 14/9

1/1

1/1

80

T
A
B

1/1 3/2 1/1 3/2

8/5 5/4 4/3 15/8 1/1 3/2

1/1 3/2 1/1 3/2