

PERFECT SPREAD - BRYAN LAKE

Determining the value of a space between values
spread evenly throughout a bipolar range.

Divide the range by the number of spaces between the values spread throughout that range. If the range is bipolar (-1 to 1), you can divide the number of spaces by 2 in order to determine the value of the space between the values spread throughout that bipolar range. For instance, if you have 6 values spread throughout a bipolar range of -1 to 1, then you obviously need 5 spaces between those 6 values, so...

$$2 \div 5 = 0.4$$

0.4 is the value of the space between the values spread throughout that range. In order to determine these 6 values...

Starting with -1.0

$$-1.0 + 0.4 = -0.6$$

$$-0.6 + 0.4 = -0.2$$

$$-0.2 + 0.4 = 0.2$$

$$0.2 + 0.4 = 0.6$$

$$0.6 + 0.4 = 1.0$$

So, your 6 evenly spread values are going to be -1, -0.6, -0.2, 0.2, 0.6 and 1. This way, you can spread any number of values evenly throughout a bipolar range. Of course, it doesn't always work out that neatly. Decimations are inevitable, and rounding may be necessary. The space between 8 values spread throughout a bipolar range amounts to 0.2857142857142857.

Let's round that out a bit...

Starting with -1.0

$$-1.0 + 0.28 = -0.72$$

$$-0.72 + 0.28 = -0.44$$

$$-0.44 + 0.28 = -0.16$$

$$-0.16 + 0.28 = 0.12$$

$$0.12 + 0.28 = 0.4$$

$$0.4 + 0.28 = 0.68$$

$$0.68 + 0.28 = 0.96$$

Obviously, as a result of the rounding, we didn't make it all the way to 1, but since there is a shortage of .04, we could try "nudging" the starting point from -1 to -0.98 like this...

Starting with -0.98

$$-1.0 + 0.28 = -0.7$$

$$-0.72 + 0.28 = -0.42$$

$$-0.44 + 0.28 = -0.14$$

$$-0.16 + 0.28 = 0.14$$

$$0.12 + 0.28 = 0.42$$

$$0.4 + 0.28 = 0.7$$

$$0.68 + 0.28 = 0.98$$

So, even though we sacrifice .04, we've managed to evenly space each of these 8 values across a bipolar range without fussing with absurdly long decimations. Of course, you can round things out for a full spread from -1 to 1, but then the values will not be perfectly spaced.

Perfection is optional ;)