

How to Arrange the Weights of the Stops on the Physical Reels of a Multi Line Slot Machine

On the Wizard of Odds website in appendix 6 for slot machines there is a lookup table for a single payline red white and blue slot machine. By using this lookup table, one can calculate the weights for the various symbols for each reel. The Wizard shows these weights in a separate table and uses them to calculate the slot machine's expected return of .8658.

In a 3 payline red white and blue slot machine, the pay for 3 red sevens is 1000 instead of 1199 reducing the expected return from .8658 to .8635 for one coin play. A combination of red seven, white seven, blue seven pays 4,800 on the top payline and it pays 10,000 on the bottom payline.

Using the Wizard's lookup table, I calculate that if a gambler plays two coins on a 3 payline red, white, and blue slot machine, his expected return per coin played will be 1.56 giving him a positive expectation game.

I assumed the weight for the top payline for a given symbol would be equal to the sum of the weights of the blank stops just below the symbol's stops on the physical reel because when the blank stops are on the center payline, the symbols will be on the top payline.

So I went through the lookup table and added the weights of those blank stops below a symbol and created my own total weights for the top line table. I put these weights into an excel spreadsheet which calculates the expected return.

The expected return for the top payline is 2.2615 . The expected return for the center payline is .8635. So the total expected return for playing two coins is 3.125 . Dividing this by 2 gives an expected return per coin of 1.56 .

Here is my top line total weights for red white and blue:

Symbol	First Reel	Second Reel	Third Reel
Red 7	5	5	5
White 7	3	3	3
Blue 7	3	3	3
3 Bar	10	10	10
2 Bar	6	6	6
1 Bar	5	5	5
Blank	32	32	32
Totals	64	64	64

If you go to the Appendix 6 lookup table you can verify these numbers by adding the weights of the blank stops below each of the symbol stops

Below is an arrangement of the symbols that is consistent with what's seen when playing a three payline red white and blue slot machine on Masque Slots software.

With the weights shown , the total weights for both the top line and the bottom line agree with the Wizard's total weight's for Red, White, and Blue .

Physical Reel 22 stops:

	Reel 1	Reel 2	Reel 3
	Blank 3	Blank 1	Blank 4
	White7 3	2 Bar 3	3 Bar 2
	Blank 3	Blank 3	Blank 2
	3 Bar 3	Blue7 1	White7 4
	Blank 1	Blank 2	Blank 6
	Red 7 1	1 Bar 4	1 Bar 5
	Blank 1	Blank 5	Blank 5
	Blue7 3	2 Bar 3	2 Bar 5
	Blank 2	Blank 3	Blank 1
	2 Bar 3	Red 7 3	3 Bar 3
	Blank 2	Blank 3	Blank 3
	1 Bar 3	3 Bar 3	2 Bar 3
	Blank 3	Blank 1	Blank 5
	White7 3	White7 1	White7 3
	Blank 3	Blank 1	Blank 1
	3 Bar 3	Blue7 2	Blue7 1
	Blank 5	Blank 4	Blank 1
	2 Bar 4	3 Bar 4	Red 7 1
	Blank 5	Blank 6	Blank 1
	Blue7 3	1 Bar 4	2 Bar 1
	Blank 4	Blank 3	Blank 3
	1 Bar 3	Blue7 4	1 Bar 4
Weight totals	64	64	64

The weights in the table above are arranged so that the sum of the weights of a symbol's stops on the reel, match the sum of the weights of the stops above them and match the sum of the weights of the stops below them. If a symbol occurs only once on a reel, the stop above and the stop below have the same weight as the symbol.

Using this method, the total weights for the symbols will agree for all paylines.

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