Calling 4-Bets

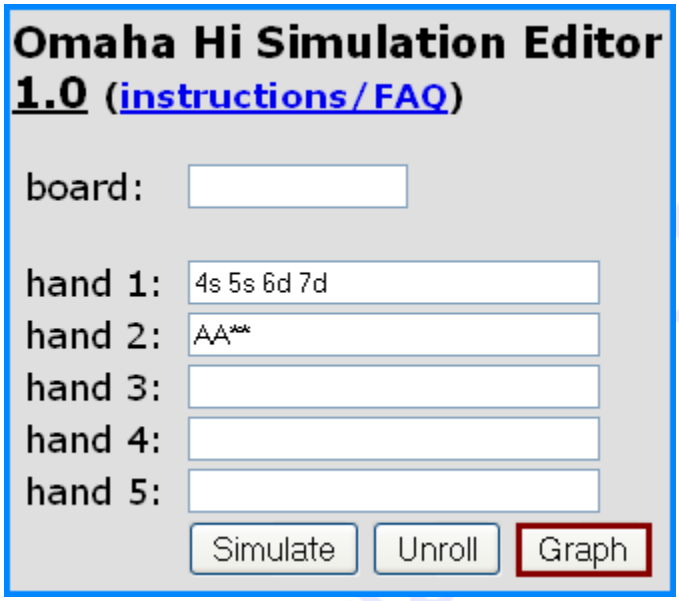
3-betting in position is a very profitable play and is hard for anyone to counter. Naturally, you should increase your 3-betting frequency as you improve. Some opponents will fold to 3-bets all day. Some will call and almost always check-fold missed flops. Some will play back and will start 4-betting light. Thus, it is important to know what to do in these situations. The best approach is to learn the math behind 4-bet pots. Don't worry, the math is not complicated and has the same difficulty as Algebra.

The following simulations will give you an idea on how to determine whether calling a 4-bet is profitable or not. To keep the situation simple, the stack sizes are 100BB. Once you have an idea how to figure out the post-flop EV of calling a 4-bet after you 3-bet, you can adjust the stack sizes to your liking.

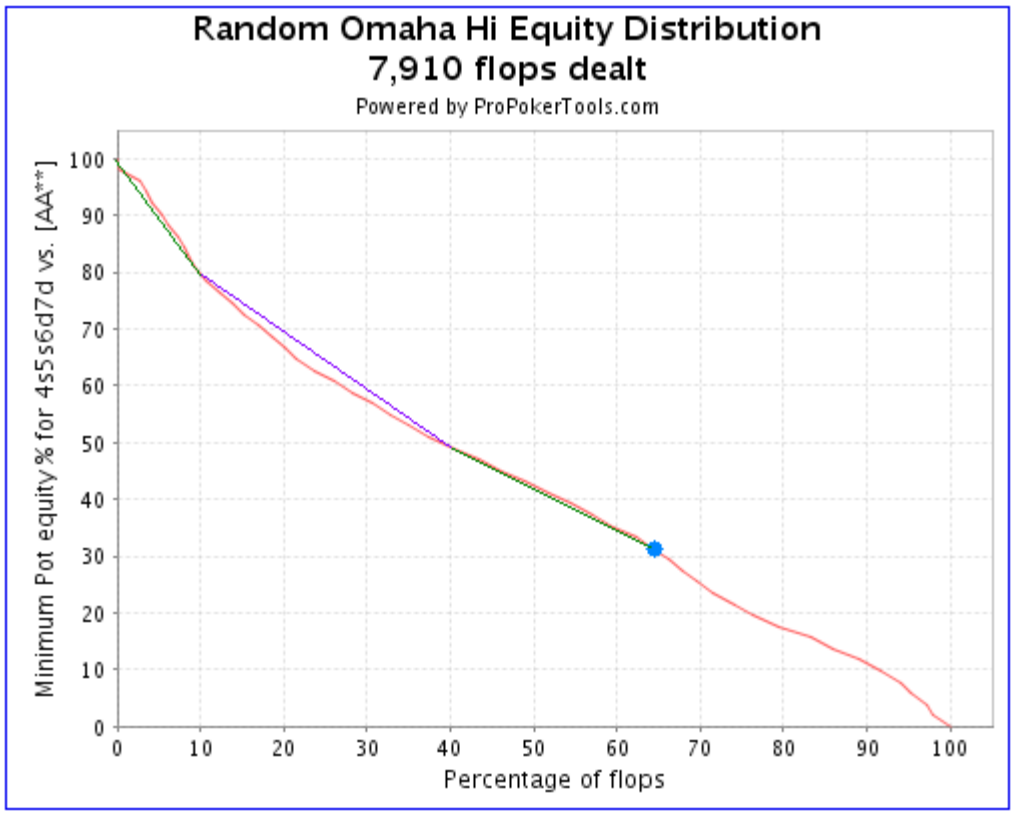
Example 2.1: $5/$10 6-max
SB: $1000
BB: $1000
UTG: $1000
MP: $1000
CO: $1000
Hero (BTN): $1000

Preflop: Hero is BTN with 4♠5♠6♦7♦
2 folds, CO raises $35, Hero raises to $120, CO raises to $375, Hero ???

In Example 2.1, after Villain 4-bets, it is $255 for us to call. Assuming Villain has AAxx and will auto-shove on almost any flop, is this a call pre-flop? Before answering the question, let's look at a graph of the equity simulation between 4♠5♠6♦7♦ and AAxx. You can get the graph by clicking the graph button instead of the simulation button. This is a very important feature and will be great help to your PLO game.



The y-axis is the equity 4♠5♠6♦7♦ has versus AAxx and the x-axis is the percentage of flops we achieve equity.



After Villain 4-bets to 375, he will have 625 left. The pot size on the flop will be 375+375+15 ~ 765. Once Villain shoves, the pot will be 765 + 625 ~ 1,390. We will need 625 / (1390+625) ~ 31% equity to break even. We will use the equation below to help us determine whether calling a 4-bet is +EV. Our call is +EV if our post-flop EV is larger than the amount we need to call the 4-bet.

EV (post-flop) = Call% * (Total_Pot_Size*Avg_Equity – Flop_Shove)

- **Call%** is the percentage of flops where we have enough equity to call.
- **Total_Pot_Size** is the total amount after we call a flop shove.
- **Avg_Equity** is our average equity when we call the flop shove.
- **Flop_Shove** is the amount Villain shoves or the amount we have to call, whichever is less.

a. According to the graph, we can call 64% of flops because on these flops, our equity will be 31% or higher. Thus, Call% equals 64%. You can get this information by looking for a blue dot on the graph.

b. To figure out Avg_Equity, we have to break the graph into smaller segments to have a more accurate calculation. On graph 1, we divided the graph into segments where each segment kind of has its own slope. The more segments we have, the more accurate our Avg_Equity will be. For Example 1, we will use three segments and each is segment has the color green or purple. The color choice has no actual value and is used so you will have an idea where each segment begins and ends. You can use as many segments as you would like. It is recommended that you use a minimum of three.

c.

Avg_Equity = 10/64 * [(98+80) / 2] + 30/64 * [(80+48) / 2] + 24/64 * [(48+31) / 2]
= 10/64 * .89 + 30/64 * .64 + 24/64 * .39
= .59

As you can see from the equation, the first segment covers 10% of flops and this segment has an average of 89% equity. The second segment covers the next 30% of flops and this segment has an average of 64% equity. The third segment covers 24% of flops and this segment has an average of 39% equity. It is important that sum of percentage in these segments equal the percentage of flops we can call or the equation is wrong. In this case, the sum of percentage is 64%.

d.

EV(post-flop) = .64 [2015 * Avg_Equity – 625]
= .64 (2015*.59 -625)
= .64 (563.85)
~ 361

The post-flop EV for calling the 4-bet is $361. Since our call cost us $255, our EV is $361-$255 ~ $106. Thus, whenever we have double suited rundowns and our 3-bet gets 4-bet, we should call and get it when we have a piece on the flop. Considering that 4♠5♠6♦7♦ has 37.48% equity against AAxx on a board of K♠7♣2♥, the requirement for having a piece isn't too stringent.