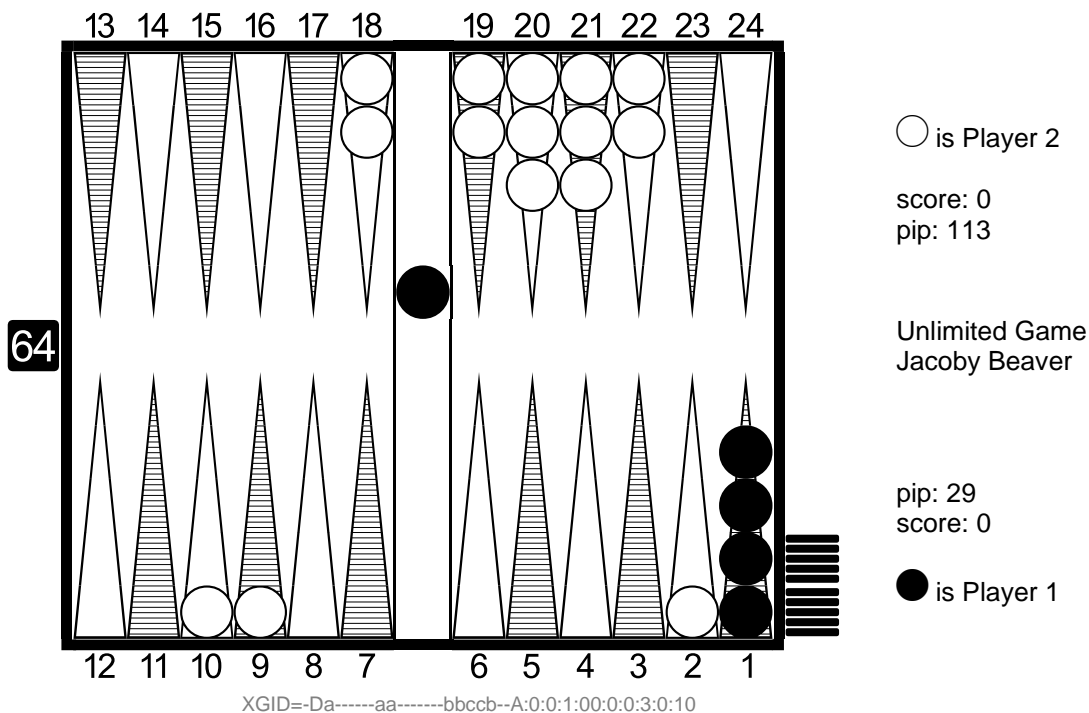


PROBLEM OF THE WEEK #20 – APRIL 27, 2021

THE POSITION:



● on roll, cube action?

THE PROBLEM:

This week's problem is based upon a problem submission from Jeff (the "Jeffster") Misrahi. It comes from a match that I played with him in the Monday online "For the Glory" tournament circuit. This is a position from a game type that is commonly referred to as a "Containment Game." If White is successful in closing his board while keeping Black on the bar, the game type will become a "Post-Ace-Point Game." I've removed the match score from the equation, as doubling decisions in these types of situations are extremely common, and proper play in a money game situation will generally serve as the best baseline for gaining an understanding of proper cube action and improving your game.

THE GAME SITUATION:

Black is on roll with a centered cube. He has borne off 10 of his checkers and has a checker on the bar. White has established a five-prime on his own side of the board. Before rolling, Black needs to consider whether he should double. If he does double, White will have a take/pass decision of his own.

THE QUESTION:

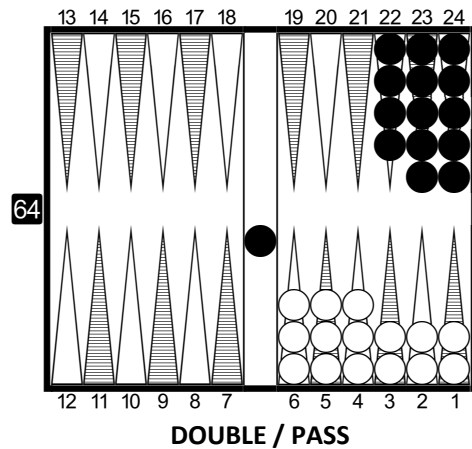
So, what is the proper cube action for this position? Should Black double? If he does, should White take the double?

HINT

In order to make determinations as to the proper cube action in a Post-Ace-Point Game, there are several reference positions that you should commit to memory.

This is the prototype reference position:

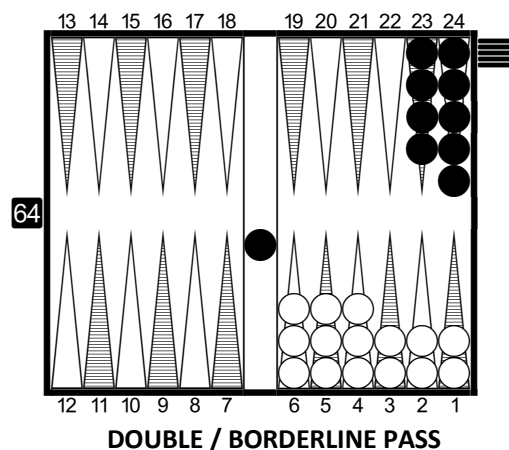
Position #1 – White on Roll



White has managed to close his board with Black having a single checker on the bar. White's starting bearoff position is ideal insofar as he has managed to place his three spares on the 6-point, the 5-point and the 4-point. In this position, Black has not yet borne off any of his checkers. Obviously, White has a huge double, and Black should pass.

The prototype position is not particularly interesting, but it becomes more interesting as you update it to reflect situations where Black has managed to bear off some of his checkers before he gets closed out.

Position #2 – White on Roll

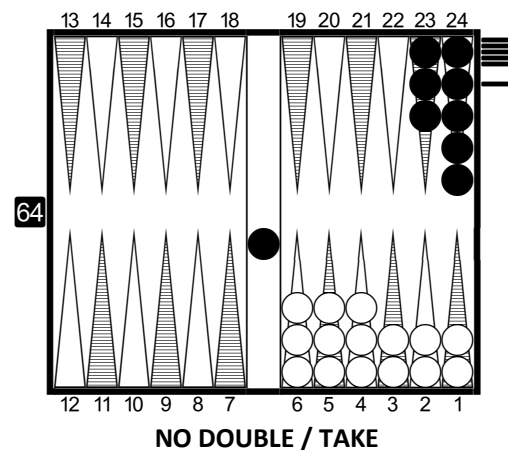


In Position #2, Black has managed to bear off five of his checkers. White has a double, and Black has a very borderline pass. (Black averages a loss of 1.001 units per game if he takes the cube, while he'll lose 1.000 units per game by passing).

Note that this is a pass only because White has managed to obtain the ideal bearoff formation. Move White's spare checker on the 4-point to the 3-point, and Black will have a close take.

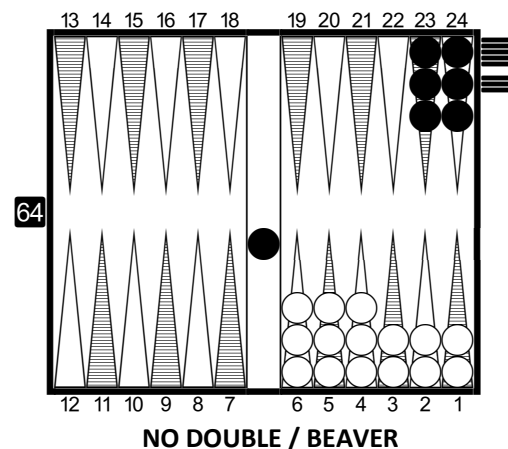
Let's continue to remove additional Black checkers and see what happens.

Position #3 – White on Roll



If Black has borne off six checkers, White doesn't quite have a double, and Black has a very comfortable take.

Position #4 – White on Roll

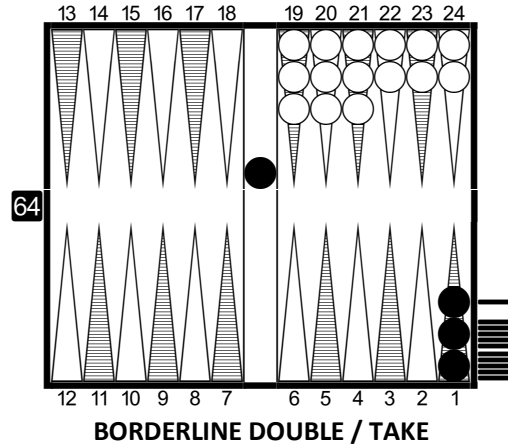


With Black having borne eight checkers off, chances are about 50/50. An Extreme Gammon

rollout shows that White wins 50.44% of the time in this position.

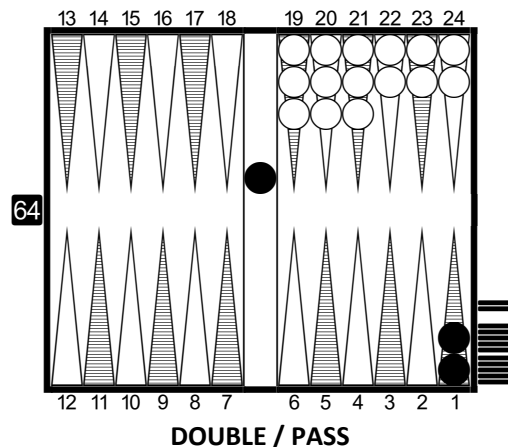
Since there is value in cube ownership, Black will have a proper beaver if White mistakenly turns the cube in this position.

Position #5 – Black on Roll



If Black has borne off 11 checkers, then it is actually Black that can double, although it's a very borderline double. White has an easy take.

Position #6 – Black on Roll



With Black having 12 checkers off (or more), White has a pass.

While these references provide a good foundation for addressing proper cube actions in post-ace-point games, it will often be the case that you don't run into a position that matches the above positions exactly. However, you can use these reference positions as a baseline for evaluating actual positions that you may reach in over the board play.

You should now reexamine the problem position with these reference positions in mind. Key things to consider:

- How many checkers does Black have off?
- Has White reached a closeout position? Is he close to reaching one?
- Is White's bear off structure "ideal"? Or are there structural deficiencies that will slow down his bearoff and cost him some equity.
- Do Black's remaining checkers occupy the lowest points in his home board, ensuring that he'll have a speedy bearoff once he gets his checker on the bar back in play?

SUMMARY TABLE

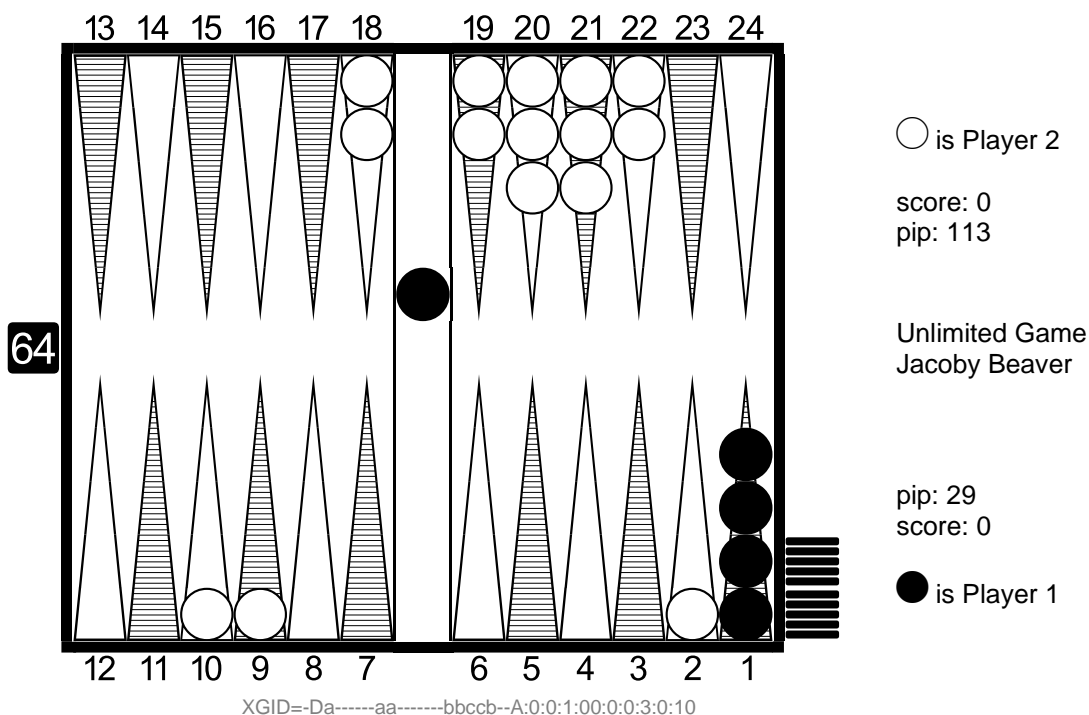
# of Men Off	White's Win Pct.
0	97.3% (3.4% Gammons)
1	95.6%
2	93.2%
3	89.6%
4	84.8% (Double/Pass)
5	78.0% (Double/Close Pass)
6	69.4% (No Double/Take)
7	61.1%
8	50.4% (No Double/Beaver)
9	42.0%
10	33.0%
11	24.3% (Double for Black)
12	17.1% (White has a pass)
13	21.4%
14	8.3%

The above table summarizes all of the main variants of the prototype reference positions – *i.e.*, White has achieved an ideal closeout formation and Black has borne off between 0 and 14 checkers, with a checker on the bar. Note that White's chances actually improve when Black has 13 checkers off, rather than 12. This is because with 13 checkers off, Black will have a blot on his ace-point instead of a made point. This gives White additional winning chances in those variations where White gets hit during his bearoff.

The "5-8-11 Rule" – in making doubling decisions in post-ace-point game positions: five checkers off is a double and a borderline pass, eight checkers off leaves equal chances, and 11 checkers off is a borderline double for the player on the bar.

SOLUTION

Extreme Gammon Rollout Results:



● on roll, cube action?

Analyzed in Rollout	No double	Double/Take
Player Winning Chances:	71.98% (G:6.85% B:0.66%)	71.93% (G:6.78% B:0.68%)
Opponent Winning Chances:	28.02% (G:0.00% B:0.00%)	28.07% (G:0.00% B:0.00%)
Cubeless Equities	+0.515	+1.026
Cubeful Equities		
No double:	+0.783 (-0.045)	±0.008 (+0.775..+0.791)
Double/Take:	+0.828	±0.009 (+0.819..+0.837)
Double/Pass:	+1.000 (+0.172)	
Best Cube action: Double / Take		
Rollout details		
1296 Games rolled with Variance Reduction.		
Moves: 3-ply, cube decisions: XG Roller		
Double Decision confidence:		100.0%
Take Decision confidence:		100.0%
Duration: 19.1 seconds		

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Analysis:

In this position, Black has 10 checkers off with a man on the bar and four checkers stacked on the ace-point. If White had already completed his closeout (and established an ideal bearoff structure), Black would have 67% winning chances (as shown in the chart above in the Hint section) and he'd be a bit short of having a cube.

However, in our problem position, Black is better off than he is in the reference positions. White hasn't yet achieved a close out and it is unlikely that he'll be able to achieve the ideal bearoff structure when he does so.

Specifically, to win this game White needs to do three things (of course, sometimes he'll be able to skip the first and/or second step, but usually these steps will be his path to victory):

1. Complete a six-prime before Black is able to escape his last checker.
2. Roll the prime forward, closing out Black; preferably ending up with his spare checkers on his high points to allow for an efficient bear off.
3. Bear off all of his checkers before Black is able to escape, run around the board, and bear his own checkers off. White also needs to fade another way that Black can win – Black might be able to hit a lucky shot as White bears off, and then finish his bear off before White does.

The first two steps involve converting what is now a “containment” game into a “post-ace-point” game. If he can manage to do this, we'll arrive at a close variant to one of our now known reference positions.

For the first step, to complete a six-prime, White will maintain his five-prime and slot the back end of it. If Black's checker comes in on or otherwise gets to White's deuce-point, White will attack the blot. With Black having no board, White will have no problems in reentering a hit checker and coming back around to once again try to complete his six-prime. Occasionally, after hitting a Black blot on his deuce-point, White will get to complete his prime by making that point if Black fails to return hit from the bar. Since White has already completed a five-prime, and he has two attackers/builders on top of his prime, as well as three checkers back that can be used to make the back end of a six-prime, his prospects to complete a six-prime are actually quite good.

Of course, before White nails down a six-prime, Black will have several opportunities to escape his back checker with a joker roll (*e.g.*, a 26 roll from the bar). There will also be variations where Black is able to get to the deuce-point, White is unable to hit, and then Black is able to leap the five-prime with a six. In addition, sometimes White will roll awkwardly, perhaps getting some big numbers or an inopportune double, and he'll find himself overrunning his priming structure. Overall, though, White will usually be able to complete the six-prime – I'd guess that he gets there about 90% of the time (maybe a little more).

The second step, rolling the six-prime forward, should actually prove to be relatively straightforward. The process is for White to repeatedly slot a checker on the next point that is at the front end of the prime, and follow through by covering the blot if it is missed. If the blot is hit, White simply recirculates the hit checker, comes back around the board and tries again. With careful placement of his three extra spare checkers, White should be able to mostly avoid a breakdown of his prime. Since the front of his prime is already at the 3-point, White won't have too far to go to get to a closeout position. Also, if White fails to get an actual closeout, there are positions where he'll establish a five-point board and begin his bear off. While not as good as a closeout position, White will have reasonable winning chances from these positions as well. I'd guess that once White completes a six-prime, he'll be able to complete a closeout from there about 95% of the time.

For the third step, winning the game from the closeout position, we can refer to our reference positions. With Black having 10 checkers off, White will win with an ideal bear off structure 33% of the time. Since White will seldom reach an actual “ideal” bear off, we can reduce that figure by a little – let's estimate that White will win following a successful closeout about 32% of the time. Overall, we can estimate his winning chances to be:

(Chances of completing a six-prime) x (Chances of completing a closeout after making a six-prime) x (Chances of winning from a closeout position) = 90% x 95% x 32% = 27.4%.¹

¹ Note that the percentages in this equation are just very rough estimates of the chances of White's being able to successfully execute on the three stages that the game must go through for him to win (the third percentage is, of course, slightly more reliable, insofar as it is based upon a known quantity taken from one of our reference positions). The rollout results for the problem position show that the actual winning chances are about 28%, so even though this analysis is a bit rough, it comes fairly close to determining the actual equities of the two players.

Since that figure is well in excess of the 22% winning chances (approximately) that a player needs to take a double,² White has a very clear take if Black doubles.

Since Black has winning chances in excess of 70%, and there is a fair amount of volatility in the position (*e.g.*, if Black rolls 26 from the bar or enters on the deuce-point, in either case followed by White failing to roll a hitting number, Black's winning chances will improve markedly), Black has a clear double.

Conclusion and Best Play:

Black has a proper DOUBLE and White should TAKE the cube.

Of course, you mostly won't be able to do the mathematics that are described in the above analysis in over the board play. However, by knowing that in a closeout position 10 checkers off is not yet a double, 11 checkers off is a borderline double and a close take, and 12 checkers off is a double and a pass, you could infer the solution to this problem position. You would first note that Black actually has only 10 checkers off, which is not quite a double in a closeout position, but it is somewhat close. Also, Black is not yet facing a closeout situation, so in addition to his winning chances from a closeout position, he'll also get some wins when he can escape his back checker before White is able to achieve a closeout. Given that he has better chances than he does in the reference positions described in the Hint section, it is safe to conclude that Black has a reasonable double in this position.

From White's perspective, although he hasn't achieved a closeout, it is clear that he is doing quite well in the containment game. He has a solid five-prime, Black is on the bar, and his builders are reasonably well positioned to work towards making the back end of the prime, as well as to attack Black's checker if it enters on (or gets to) the deuce-point. Since White can expect to reach a closeout position fairly frequently, and since Black only has 10 checkers off, it would seem that a take is very much in order here.

The important thing to recognize in analyzing this problem position, though, is that without a working knowledge of the reference positions that have been presented in the Hint section above, any attempt to ascertain the correct cube action in this spot would essentially amount to pure guess work. These types of positions occur relatively frequently, though, so if you want to handle the cube expertly when they do arise, a basic understanding of the relevant reference positions is essential. In fact, if you just know the "5-8-11 Rule" and one of these types of positions arises, you'll be miles ahead of any opponent that doesn't.

REFERENCES

Olsen, Mark Brockmann, *Cube Like a Boss*, 2019, Chapter 7, "Post Late Hit," pp. 194-227.

Robertie, Bill, *501 Essential Backgammon Problems*, Cardoza Publishing, 3rd Ed., 2017, Chapter 24, "Post-Ace-Point Games," Problems 385-418, pp. 295-315.

Woolsey, Kit, *The Backgammon Encyclopedia – Volume 1: Cube Reference Positions*, The Gammon Press, 2001, Chapter 8, "Post-Ace-Point Games," pp. 97-105.

² Note that in a last roll position, the take point for the underdog in the game is 25%. This is the break even point in comparing taking and passing. If you take a 2 cube in each of four games and you win one of the games (25%), you'll win 2 units once and lose 2 units three times, for a net loss of 4 units. This is the same amount that you lose if you pass in each of the four games. Since there is value in owning the cube (in that you can play to the end and you will also sometimes be able to either double your opponent out or double him in when you have a strong position), the underdog can generally take with about 22% winning chances if there is a reasonable chance that he may be able to turn the cube at a later point in the game.