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Five Point Match

By Kit Woolsey

Five point matches are the standard for most blitz and last chance events you will find in tournaments. In addition, unless a longer match is a runaway one of the match scores from a five point match is likely to be reached. It follows that understanding of cube and checker play strategy for all the possible scores of a five point match will pretty much be sufficient for almost any critical decision. In this article I will examine every possible score for the five point match and look at cube and checker play strategy for each score.

First of all, let's review the match equity table for the five point match. It is as follows:

Original MET

	1	2	3	4	5
1	50	70	75	83	85
2	30	50	60	68	75
3	25	40	50	59	66
4	17	32	41	50	58
5	15	25	34	42	50

Kazaross XG2 MET

	1	2	3	4	5
1	50	68	75	81	84
2	32	50	60	67	74
3	25	40	50	57	65
4	19	33	43	50	58
5	16	26	35	42	50

The above figures give the winning chances for each match score, with the numbers on the top and to the left representing the number of points to go for each player. For example, suppose you are leading 2 to 0 in a five point match. You have three points to go, and your opponent has five points to go. Look to see where three and five intersect, and you will find the number 66. This means that the leader has 66% match winning chances, and the trailer has 34% match winning chances. When one player has one point to go, the equity is for the Crawford game at that score.

We will now look at each possible match score. If the leader has 1 point to go, we will examine both if it is the Crawford game and if the Crawford game has passed.

4-4 (1 away, 1 away)

This is as simple as it gets. No cube, no gammons, just whoever wins the game wins the match. Double match point. Play can be quite different here than under normal circumstances. Since gammons won't help you, you should be less inclined to make blitzing oriented plays. These are plays which tend to win more gammons when they succeed, but leave you with an overextended position which is more likely to lose when they fail. Similarly, you should be less concerned about being attacked than usual, since the cost isn't as great. The race becomes even more important than it is normally. Getting ahead in the race and bringing the position home is a very good approach for winning at double match point. However back games also have their value, since a well-timed back game will win more often than not. Since gammons don't matter, the player of the back game is the favorite. However a badly-timed back game is the kiss of death. Consequently timing and forcing your opponent to crunch are even more important than at a normal score.

Here are a couple of examples which illustrate the difference between play at double match point and at a normal score.

is Player 2
score: 4
pip: 110

5 point match

pip: 106
score: 4

is Player 1

XGID=-ABbBCC-----ccbbB--:0:0:1:61:4:4:0:5:10
to play 61

- | | | | |
|----|----------------------|---------------------------|---|
| 1. | Rollout ¹ | 23/17 7/6 | eq: -0,513 |
| | Player: | 24,37% (G:7,36% B:0,21%) | Conf.: ± 0,002 (-0,515...-0,511) - [100,0%] |
| | Opponent: | 75,63% (G:18,81% B:1,27%) | Duration: 12 minutes 27 seconds |
| 2. | Rollout ¹ | 23/16 | eq: -0,533 (-0,020) |
| | Player: | 23,37% (G:6,95% B:0,15%) | Conf.: ± 0,002 (-0,535...-0,531) - [0,0%] |
| | Opponent: | 76,63% (G:20,52% B:1,33%) | Duration: 11 minutes 50 seconds |
| 3. | Rollout ¹ | 7/1 6/5 | eq: -0,535 (-0,022) |
| | Player: | 23,24% (G:3,53% B:0,04%) | Conf.: ± 0,001 (-0,537...-0,534) - [0,0%] |
| | Opponent: | 76,76% (G:11,21% B:0,36%) | Duration: 11 minutes 14 seconds |
| 4. | XG Roller++ | 23/17 2/1 | eq: -0,500 (+0,013) |
| | Player: | 25,01% (G:6,21% B:0,13%) | |
| | Opponent: | 74,99% (G:25,40% B:0,86%) | |
| 5. | XG Roller++ | 23/17 6/5 | eq: -0,503 (+0,010) |
| | Player: | 24,87% (G:6,15% B:0,17%) | |
| | Opponent: | 75,13% (G:25,30% B:0,88%) | |

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

Under normal circumstances, breaking the anchor would be too risky. Black has several builders ready to pounce, and White would be running too great a gammon risk. White is better off playing 7/1, 6/5 and hoping to get lucky later while minimizing the gammon risk. At double match point, it is another story. Now getting gammoned is no longer a consideration. If White doesn't escape now he will probably be forced to crunch his board shortly, after which it will be difficult to win the game. His best winning chance is to get out into the outfield with 23/16. He may get blitzed, but a gammon is just a loss. If Black fails to carry out the attack, White has very real winning chances by escaping the other back checker and controlling the outfield.



is Player 2

score: 4
pip: 153

5 point match

pip: 151
score: 4

is Player 1

- | | | | |
|----|----------------------|---------------------------|---|
| 1. | Rollout ¹ | 20/10(2) | eq: +0,525 |
| | Player: | 76,27% (G:13,52% B:0,80%) | Conf.: ± 0,002 (+0,523...+0,528) - [100,0%] |
| | Opponent: | 23,73% (G:2,49% B:0,20%) | Duration: 37 minutes 33 seconds |
| 2. | Rollout ¹ | 20/15(2) 9/4*(2) | eq: +0,448 (-0,078) |
| | Player: | 72,38% (G:20,06% B:1,44%) | Conf.: ± 0,002 (+0,445...+0,450) - [0,0%] |
| | Opponent: | 27,62% (G:4,49% B:0,39%) | Duration: 39 minutes 17 seconds |
| 3. | Rollout ¹ | 9/4*(2) 6/1*(2) | eq: +0,372 (-0,153) |
| | Player: | 68,62% (G:37,27% B:0,71%) | Conf.: ± 0,002 (+0,370...+0,375) - [0,0%] |
| | Opponent: | 31,38% (G:5,85% B:0,50%) | Duration: 29 minutes 44 seconds |
| 4. | Rollout ¹ | 9/4*(2) 8/3(2) | eq: +0,368 (-0,158) |
| | Player: | 68,38% (G:32,59% B:3,27%) | Conf.: ± 0,002 (+0,365...+0,370) - [0,0%] |
| | Opponent: | 31,62% (G:5,57% B:0,44%) | Duration: 22 minutes 04 seconds |
| 5. | 3-ply | 20/10 9/4*(2) | eq: +0,357 (-0,169) |
| | Player: | 67,84% (G:19,12% B:0,84%) | |
| | Opponent: | 32,16% (G:6,87% B:0,20%) | |

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

With gammons counting, it would be clear for White to blast away with 9/4(2)*, 6/1(2)*. White has ammunition to carry out the blitz, and with two Black checkers on the bar against a three point board the blitz is a real possibility. At double match point, this isn't necessary. White should simply play 20/10(2) and coast home for the win. If he attacks and Black survives, White may have difficulty extracting the back checkers safely. White doesn't need a gammon, and 20/10(2) is the best play to win the game.

4-3 (1 away, 2 away) Crawford game

Now gammons come into play, since the trailer can use a gammon while the leader cannot. In fact, a gammon for the trailer (relative to simply winning) is even more valuable than it is under normal circumstances. We can see this as follows:

Suppose you have a sure win available, but are considering making a risky play which increases your gammon chances but involves some danger of losing the game. Early in the match (or for money), your odds are as follows (assuming the cube is on 2):

If you win (no gammon) you are +2 points.

If you win a gammon, you are +4 points.

If you lose, you are -2 points.

So by making the dangerous play you are risking 4 points (from +2 to -2) in order to gain 2 points (from +2 to +4), so you are giving 2 to 1 odds on your play. Consequently, you need to have your play win twice as many extra gammons as there are extra losses in order to justify the risk.

At the 1 away, 2 away score, it is another story. Let's suppose you are the trailer, and again are considering the risky play (if you are the leader gammons have zero value, so obviously you would take no risks as far as winning the game goes in order to win a gammon). This time instead of points

we will be looking at match equity:

If you win (no gammon), the score is 4-4 (1 away, 1 away), so your equity is 50%.

If you win a gammon you win the match, so your equity is 100%.

If you lost the game you lose the match, so your equity is 0%.

By making the dangerous play you are risking 50% equity (from 50% to 0%) in order to gain 50% equity (from 50% to 100%), so you are getting even money odds on your play. If your play generates as many or more gammons than it generates losses, it is worth it. Quite a difference from normal circumstances! An example:

is Player 2
score: 4
pip: 114

5 point match
Crawford

pip: 80
score: 3
is Player 1

XGID=-BABA BBBB---a---cccb-----0:0:1:64:3:4:1:5:10
to play 64

1.	Rollout ¹	8/2 8/4*	eq: +0,975
	Player:	71,56% (G:27,21% B:0,45%)	Conf.: ± 0,002 (+0,973...+0,977) - [100,0%]
	Opponent:	28,44% (G:3,23% B:0,18%)	Duration: 3 minutes 25 seconds
2.	Rollout ¹	9/5 9/3	eq: +0,938 (-0,038)
	Player:	88,75% (G:8,13% B:0,13%)	Conf.: ± 0,002 (+0,936...+0,939) - [0,0%]
	Opponent:	11,25% (G:0,64% B:0,04%)	Duration: 3 minutes 59 seconds
3.	3-ply	7/3 7/1	eq: +0,782 (-0,194)
	Player:	82,56% (G:6,52% B:0,02%)	
	Opponent:	17,44% (G:1,23% B:0,01%)	
4.	1-ply	9/3 8/4*	eq: +0,345 (-0,630)
	Player:	51,89% (G:15,36% B:0,10%)	
	Opponent:	48,11% (G:18,77% B:0,43%)	
5.	1-ply	9/5 8/2	eq: +0,260 (-0,715)
	Player:	55,26% (G:7,76% B:0,04%)	
	Opponent:	44,74% (G:6,56% B:0,08%)	

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

White can virtually lock up the win by playing safe with 9/5, 9/3, but he then has small chances of winning a gammon. The big play of 8/4*, 8/2 increases his gammon chances considerably, but if he gets hit back he is likely to lose the game. Under normal circumstances it wouldn't be worth the risk. White will not win twice as many extra gammons as he will incur extra losses from the hitting play. At this match score it is another story. If White survives after the hitting play his gammon chances are quite reasonable, and since he only needs to win more extra gammons than he loses extra games it appears worth the risk to play 8/4*, 8/2.

Early checker play should take the match score into account. The leader should stive for gammon-free positions, while the trailer looks for positions which may lead to gammons. The leader likes races and holding games. The trailer likes blitzes, priming battles, and back games (for either side!). Thus, both players try to steer toward the type of game which suits them considering the match score. Most important for the leader is to establish an advanced anchor quickly. If he can do so the game is likely to turn into a race or a holding game with relatively few gammons. The trailer wants to prevent the leader from doing this.

Opening play can be quite important. Consider how to play an opening 4-3. At a normal match score

one could either make the building play of 13/10, 13/9, or one of the splitting plays 24/20, 13/10 or 24/21, 13/9. There is little difference between these plays, and your choice should be what suits your style and personal preference. Not so at the 2 away, 1 away match score! The leader is going after an advanced anchor and a race or holding game, so it is imperative that he make one of the splitting plays. Building a strong inner board is not as important to him as grabbing an advanced anchor. The trailer, on the other hand, is going after gammonish positions. He doesn't want to let the leader get that advanced anchor. He must play 13/9, 13/10, steering for a priming battle.

Here is a simple example of an early play decision which is sharply affected by the match score.



- | | | | |
|----|----------------------|---------------------------|---|
| 1. | Rollout ¹ | 9/5 8/5 | eq: +0,451 |
| | Player: | 55,27% (G:17,28% B:1,69%) | Conf.: ± 0,004 (+0,447...+0,455) - [100,0%] |
| | Opponent: | 44,73% (G:12,75% B:1,53%) | Duration: 56 minutes 56 seconds |
| 2. | Rollout ¹ | 24/20 23/20 | eq: +0,393 (-0,058) |
| | Player: | 56,20% (G:13,46% B:0,94%) | Conf.: ± 0,004 (+0,389...+0,397) - [0,0%] |
| | Opponent: | 43,80% (G:10,29% B:0,86%) | Duration: 1 hour 08 minutes |
| 3. | 4-ply | 24/21 13/9 | eq: +0,305 (-0,146) |
| | Player: | 52,37% (G:12,88% B:0,55%) | |
| | Opponent: | 47,63% (G:12,16% B:0,44%) | |
| 4. | 4-ply | 23/20 13/9 | eq: +0,296 (-0,155) |
| | Player: | 51,65% (G:13,14% B:0,58%) | |
| | Opponent: | 48,35% (G:12,21% B:0,49%) | |
| 5. | 4-ply | 13/10 13/9 | eq: +0,266 (-0,185) |
| | Player: | 50,00% (G:13,29% B:0,59%) | |
| | Opponent: | 50,00% (G:13,23% B:0,63%) | |

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

White can choose whether to make the offensive or the defensive five point. At an even match score it would be a close choice, with the nod probably going to 24/20, 23/20. However if White is behind 4-3, he clearly should play 9/5, 8/5. That is the play which leads to more gammons for both sides, since it strengthens the offensive board but leaves the back checkers in dangers. If White were ahead 4-3 it wouldn't be close. 24/20, 23/20 would be very clear. Locking up the defensive five point cuts down considerably on the chances of being gammoned.



is Player 2

score: 3
pip: 164

5 point match
Crawford

pip: 162
score: 4

is Player 1

1.	Rollout ¹	24/20 23/20	eq: -0,049
	Player:	54,60% (G:15,14% B:1,48%)	Conf.: ± 0,003 (-0,053...-0,046) - [100,0%]
	Opponent:	45,40% (G:7,06% B:0,52%)	Duration: 1 hour 25 minutes
2.	Rollout ¹	9/5 8/5	eq: -0,156 (-0,107)
	Player:	54,72% (G:20,97% B:2,98%)	Conf.: ± 0,004 (-0,160...-0,152) - [0,0%]
	Opponent:	45,28% (G:12,54% B:0,95%)	Duration: 1 hour 13 minutes
3.	4-ply	24/21 13/9	eq: -0,208 (-0,159)
	Player:	52,37% (G:14,39% B:0,83%)	
	Opponent:	47,63% (G:12,76% B:0,47%)	
4.	3-ply	23/20 13/9	eq: -0,223 (-0,174)
	Player:	51,96% (G:14,30% B:0,73%)	
	Opponent:	48,04% (G:13,11% B:0,45%)	
5.	3-ply	13/10 13/9	eq: -0,265 (-0,216)
	Player:	50,11% (G:13,84% B:0,65%)	
	Opponent:	49,89% (G:13,35% B:0,60%)	

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

It should be noted that this theme applies at all match scores where one player is ahead. In general, gammons favor the trailer more than the leader. The reason is that the trailer can use the extra points from the gammon more than the leader can, particularly after the cube is turned. Extra points from a gammon may be more than the leader needs to win the game, while for the trailer they may be enough to vault him into the lead.

4-3 (1 away, 2 away) Post-Crawford

At first glance, this looks very simple. Obviously the trailer will double at his first legal opportunity, since he has everything to gain and nothing to lose. After the leader takes the winner of the game will win the match, so in essence it is double match point.

It is true that once the cube has been turned and accepted both players should play as though they are playing at double match point, but the leader is not required to accept the double. Let's see how it looks from his point of view:

If he takes, he is playing the game for the match.

If he drops the score is 4-4 (1 away, 1 away), and he has 50% equity.

It is clear that the leader should accept the double only when he is the favorite. If he is the underdog, he should refuse the double. This is what is called the free drop for the leader, since he can drop the double without giving up anything.

Does this affect the play of the opening roll? If the leader wins the opening it won't matter. The trailer will double however the leader plays, and the leader will take unless he feels he is the underdog (which he might be on some of the weaker opening rolls -- that is not clear). However if the trailer wins the opening roll his play can make a significant difference. The reason is that the trailer can't double immediately. He has to wait for the leader to roll and play, and the leader can now examine the position and see who is the favorite.

For example, let's consider the opening roll of 2-1. Normally both the splitting play of 24/23, 13/11 and the slotting play of 13/11, 6/5 are reasonable, and the choice of play is largely a matter of personal preference. At this score, however, it isn't close. It is mandatory to avoid the slotting play.

Suppose the trailer plays 13/11, 6/5. If the leader hits the blot (or rolls a good doubles such as 1-1, 3-3, or 6-6) he is the clear favorite and will happily accept the double. Otherwise he is the underdog, and will decline the double. Consequently slotting the five point won't work, since the trailer will not have the opportunity to cover the blot -- we will be playing a new game. Therefore he should play 24/23, 13/11. Now most of the leader's rolls do not lead to a decisive advantage for one player, which is what the trailer would prefer.

It may seem obvious that the trailer should always double at his first opportunity, but that is not clear. Suppose we have the best possible start for the trailer -- he rolls 3-1 and the leader rolls 6-2 (playing 24/18, 13/11 let us say). Obviously if the trailer doubles the leader should drop. But perhaps the trailer should play on for a gammon! It is quite unlikely that the leader will roll well enough on the next exchange to take the advantage. If in the future the leader threatens to gain the advantage the trailer can always double and move on to the next game, but if things continue to go the trailer's way he can continue to play on for the gammon. It should be noted that you should not do this unless you are sure that your opponent understands the free drop concept. If there is some chance that he will just take the initial double, it would be foolish not to double.



Analyzed in Rollout

Player Winning Chances: 56,51% (G:19,84% B:1,28%)
Opponent Winning Chances: 43,49% (G:10,81% B:0,78%)
Cubeless Equities +0,527

Cubeful Equities

No double: +1,078
Double/Take: +1,281 (+0,203)
Double/Pass: +1,000 (-0,078)

Double/Take

57,03% (G:21,94% B:3,42%)
42,97% (G:11,32% B:1,40%)
+1,281

±0,005 (+1,073..+1,083)
±0,006 (+1,275..+1,287)

Best Cube action: Too good to double / Pass

Percentage of wrong take needed to make the double decision right: 27,9%

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence: 100,0%
Take Decision confidence: 100,0%
Duration: 49 minutes 12 seconds

[Xtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

4-2 (1 away, 3 away) Crawford game

This is considerably different from the 4-3 score. Now gammons have very little value for the trailer. If the trailer wins this game he will be permitted to double immediately next game, therefore the next game will be played for the match regardless of whether or not the trailer wins a gammon now. The only difference is that the leader will not have a free drop next game if the trailer wins a gammon. The

free drop gives the leader a very small advantage, but not enough to take into consideration. The trailer should play exactly as though it were double match point. He should not risk losing the game in order to increase his gammon chances. Similarly the leader should always make the best play to win the game, without worrying about gammon danger.

Backgammons, however, are another story. If the trailer wins a backgammon, he wins the match. This is a big improvement over the 50% (or slightly less if the leader has a free drop) equity he would have if he wins a single game or a gammon. Consequently, it may be worthwhile for the trailer to take considerable risks in order to win a backgammon. Similarly, the leader should make an extra effort to avoid getting backgammoned. While the leader should not be afraid to play a back game since gammons cost him virtually nothing, he must beware of getting backgammoned -- perhaps running his back checkers slightly sooner than he normally would. Here is one example illustrating the extremes one might go in order to score a backgammon at this score:



- | | | | |
|----|----------------------|----------------------------|---|
| 1. | Rollout ¹ | 3/Off 2/Off | eq: +1,236 |
| | Player: | 88,34% (G:76,11% B:21,08%) | Conf.: ± 0,002 (+1,234...+1,238) - [100,0%] |
| | Opponent: | 11,66% (G:0,00% B:0,00%) | Duration: 10 minutes 25 seconds |
| 2. | Rollout ¹ | 3/1 3/Off | eq: +1,207 (-0,029) |
| | Player: | 99,59% (G:98,64% B:8,14%) | Conf.: ± 0,001 (+1,206...+1,208) - [0,0%] |
| | Opponent: | 0,41% (G:0,00% B:0,00%) | Duration: 47,3 seconds |

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

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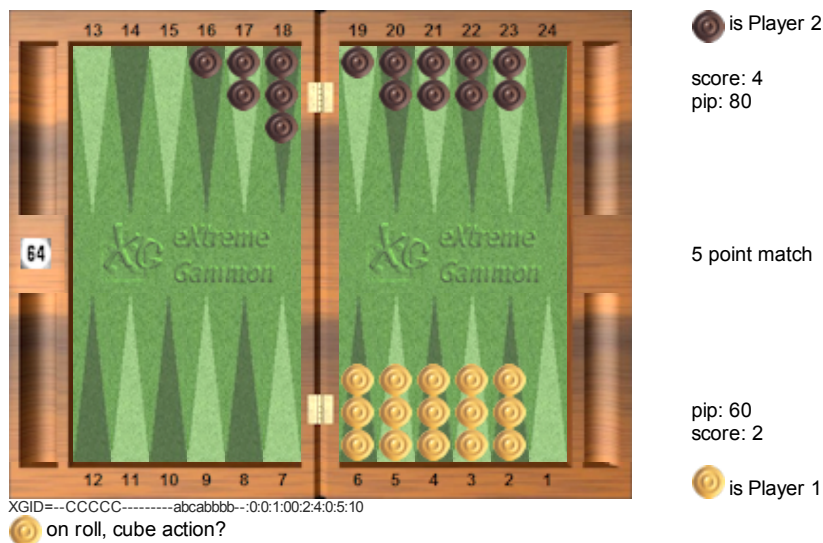
At a normal match score it would be folly not to play safe. The gains from the extra backgammons would not nearly compensate for the losses from not winning a gammon or possibly losing the game when the shot is hit if White takes two checkers off. At this match score, things are different. First of all the difference between winning a gammon and winning a single game is negligible. Secondly, there is a very high premium on winning a backgammon. Taking the extra checker off will result in White bearing off one roll sooner if the shot is missed, and that extra roll will often be the difference between winning a backgammon and not winning a backgammon. Also White will have enough checkers off so even if the shot is hit he will still win more often than not. Putting it all together White will win more extra backgammons from taking two checkers off than he will lose games, so 3/0, 2/0 is the correct play.

4-2 (1 away, 3 away) Post-Crawford

It is important to see that the leader does not have a free drop available when the trailer has an odd number of points to go. The reason is that the trailer will be turning the cube immediately for the rest of the match, so it is the same if the trailer has X points to go as if he has X-1 points to go, provided X is an even number. Thus, it is correct for the leader to always take the double even if the trailer jumps out to an advantage. The theoretical action should always be double-take.

There is a way to potentially gain an advantage against an unknowledgable or unsuspecting opponent if you are the trailer. Instead of doubling immediately, intentionally forget to double. Instead, wait

until you have a very strong (but not gammonish) position. Now turn the cube. As the previous analysis shows your opponent should take, of course, almost no matter how bad his position is. If your opponent makes an error and drops, you have essentially won a free point. This may seem like a silly ploy, but I have used it successfully many times, often against quite competent opposition. Note that if the position starts to get gammonish it is now necessary to double. If your game becomes so strong that it is more likely you will win a gammon than lose the game, it now becomes correct for your opponent to drop. Until there is a danger of that happening it is safe to wait, giving your opponent an opportunity to make an error when you finally double.



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities
Cubeful Equities

No double

95,69% (G:0,00% B:0,00%)
4,31% (G:0,00% B:0,00%)
+0,914

Double/Take

95,70% (G:0,00% B:0,00%)
4,30% (G:0,00% B:0,00%)
+0,961

No double:

+0,956 (-0,005)

±0,000 (+0,956..+0,956)

Double/Take:

+0,961

±0,000 (+0,961..+0,961)

Double/Pass:

+1,000 (+0,039)

Best Cube action: Double / Take

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:
Take Decision confidence:
Duration: 1 minute 41 seconds

100,0%
100,0%

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

After the cube has been turned and taken, the situation is exactly equivalent to the 4-3 (Crawford) game. If the trailer wins a single game the match is tied 4-4; if the leader wins he wins the match, and if the trailer wins a gammon he wins the match. Thus the playing strategy is the same, with gammons being of extra value for the trailer.

4-1 (1 away, 4 away) Crawford

This appears to be similar to the 4-3 Crawford score. Gammons are of extra value to the trailer, since winning a gammon would make the score 4-3 with the Crawford game out of the way. Since the trailer can now double, he is virtually even money (except for the slight edge from the free drop). It turns out that there is quite a difference. The reason is that if the trailer wins a single game (making the score 4-2), he doesn't necessarily have to win two more games to win the match. He might win a gammon. To get a ballpark figure for what the trailer's chances are behind 4-2 post-Crawford, let's assume that the trailer will then win the game 50% of the time, and that 24% of his wins will be gammons (which comes to 12% of the total games). This gives us:

Leader wins 50% (100% match equity for leader)
Trailer wins single game 38% (50% match equity for leader)
Trailer wins gammon 12% (0% match equity for leader)

Multiplying this out, leader's equity is 50×100 plus $38 \times 50 = 69\%$. Now we can calculate the odds the trailer is getting when he makes a risky play to win a gammon at the 4-1 score:

Leader wins: trailer's equity is 0%

Trailer wins single game: trailer's equity is 31%

Trailer wins gammon: trailer's equity is 49% (giving the leader 1% for the free drop)

This means that if the trailer is considering making a big play which risks winning the game in order to increase his gammon chances, he is risking 31% match equity in order to gain 18%. These odds are far from the even money odds the trailer gets at the 4-3 match score; in fact, they are fairly close to the normal 2 to 1 money odds. Thus, while gammons are of importance to the trailer, they are not much more important than they would be for money.

Another key consideration at this match score is the unimportance of backgammons. As we have seen, there is little difference between 4-4 and 4-3 post-Crawford. Consequently the leader can ignore backgammon risks if there is some chance of saving the gammon or even winning the game. As an extreme example:



1.	Rollout ¹	11/5	eq: -1,980
	Player:	0,69% (G:0,00% B:0,00%)	Conf.: ± 0,000 (-1,981...-1,980) - [100,0%]
	Opponent:	99,31% (G:91,51% B:75,31%)	Duration: 1,6 seconds
2.	Rollout ¹	24/18	eq: -2,017 (-0,037)
	Player:	0,00% (G:0,00% B:0,00%)	Conf.: ± 0,000 (-2,017...-2,017) - [0,0%]
	Opponent:	100,00% (G:99,23% B:0,00%)	Duration: 0,0 second
3.	XG Roller++	11/10 6/1	eq: -1,983 (-0,002)
	Player:	0,57% (G:0,00% B:0,00%)	
	Opponent:	99,43% (G:91,52% B:75,31%)	
4.	XG Roller++	11/6 2/1	eq: -1,994 (-0,014)
	Player:	0,43% (G:0,00% B:0,00%)	
	Opponent:	99,57% (G:92,31% B:75,57%)	
5.	XG Roller++	11/6 3/2	eq: -1,994 (-0,014)
	Player:	0,44% (G:0,00% B:0,00%)	
	Opponent:	99,56% (G:92,37% B:75,54%)	

¹ 5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

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Under normal circumstances it would be foolish to do anything but play 24/18. The danger of losing a backgammon far outweighs the gains from staying for a possible last ditch shot. At this match score, with backgammons virtually meaningless, it is correct for White to play 11/5. If Black does roll an ace and White hits the shot White definitely gets off the gammon, and on a very good day he could even win the game. The gains from this are greater than the miniscule cost of losing the backgammon vs. losing the gammon, since all saving the backgammon would do for White is retain his free drop next game. Even though this play will get White backgammoned far more often than it will save him the gammon or win the game, it is the correct play at this match score.

4-1 (1 away, 4 away) post-Crawford

Since the trailer has an even number of points to go, the leader has a free drop available. This will always be the case at any post-Crawford game where the trailer has an even number of points to go. Winning one point doesn't really put the trailer any closer to winning, since the cube will be on two every game. Thus, the cube strategy is about the same as if the score were 4-3 (1 away, 2 away) post-Crawford.

The only difference is that if the leader accepts the double and loses the game without getting gammoned, he retains his free drop for the next game. This means that if when the leader is doubled he is a **very** slight underdog it might be correct for him to take the double. This should not be overdone. In general you want to use your free drop any time you are an underdog.

Once the cube has been turned and accepted, playing strategy is about the same as if the score were 4-3 (1 away, 2 away) Crawford. The reason is that if the trailer wins a single game he is now behind 4-3 and can turn the cube immediately next game, so for all practical intents and purposes it will be double match point. Of course if the trailer wins a gammon, he wins the match. Once again gammons are super-valuable for the trailer, and both players should adjust their play accordingly.

4-0 (1 away, 5 away) Crawford

Strategy for this score is pretty much the same as 4-2 (1 away, 3 away) Crawford. Gammons aren't particularly important to the trailer, as there is little difference between a 4-1 and a 4-2 score post-Crawford. Backgammons, however, are very valuable. Thus the play for both sides is basically like double match point, except if a backgammon is a possibility.

4-0 (1 away, 5 away) post-Crawford

Just like the 4-2 score, the leader does not have a free drop available. He should take any double, regardless of the position. In theory the trailer should double immediately, but he may choose to wait and double later, hoping to induce the leader to make an error and pass.

If the trailer wins a gammon the match is tied at double match point, and if the trailer wins a single game he will be behind 4-2. Therefore once the cube has been turned and accepted the situation is almost equivalent to the 4-1 (1 away, 4 away) Crawford game. Gammons are valuable for the trailer, so the trailer should strive for gammonish positions while the leader tries to avoid them. The main difference is that here backgammons are of importance to the trailer (they win the match for him), so if a backgammon becomes a possibility it has to be taken into account.

3-3 (2 away, 2 away)

There has been much written about cube strategy at this score. The truth is that it is very simple. You should double if it is at all possible that after the next exchange (you roll, he rolls), your opponent will have a pass. Even if you double when you can't lose your market, that is not an error. The only error you can make is to lose your market.

Why is this so? Normally, there are two possible not to double (not counting playing for the gammon) when you have the advantage.

- 1) You believe that even if things improve you will be able to double later (and your opponent will still have a take) if you wait. If you double now, only your opponent will have the opportunity to double in the future.
- 2) If things go badly, your loss will be less if you don't double. In addition if you own the cube initially you prevent your opponent from doubling.

At the 2 away, 2 away score, these considerations do not apply. It will not be any advantage for your opponent to own the cube once you double, since the cube will then be dead. Furthermore you don't gain by waiting, since you can't prevent your opponent from doubling any time he wants without cost.

It can be shown to be correct to double any time you have a potential market losing sequence as follows: Suppose you and I are playing a two-point match, and I declare to you that I will follow the strategy I suggest (namely doubling any time I have a potential market losing sequence). Therefore, I will never lose my market. If you take a more conservative approach, it will be possible for you to

lose your market. Therefore, the only games which won't be played to completion will be those games where you waited too long and lost your market. Since you would have done better (on average) if these games had been played to completion, you have lost equity. Consequently if your opponent is playing correctly, it is vital for you to double if it is at all possible to lose your market.

While the above is theoretically correct, it might not be the best practical strategy. If you believe that your opponent may not understand the concepts involved in a two-point match, then it may be worth taking a slight risk of losing your market. Your hope is that your opponent will potentially make a bigger mistake, fail to double when he should, and lose his market. However this strategy can only gain if your opponent errs. Playing against an opponent who understands these concepts, you can only lose by failing to double when you should.

If the above discussion is not clear to you, or if you are playing an expert whom you believe understands the concepts better than you, there is a very simple solution. Double at your first legal opportunity, regardless of what happens! This will automatically make it a one-point match, and there is nothing your more knowledgeable opponent can do about it. This may seem silly, doubling when your opponent wins the opening 3-1 roll, but it can't cost anything. The point is that unless you roll a very strong response your knowledgeable opponent will double on his next turn, since it may be possible for him to lose his market. Since you can't prevent this (and it will happen), you don't lose anything by doubling yourself.

Once the cube has been turned and accepted, as it always should be unless someone makes an error, you are simply playing double match point. Since it is expected that at some point a double will be taken, play strategy from the beginning of the game should be as though this is the double match point game.

3-2 (2 away, 3 away)

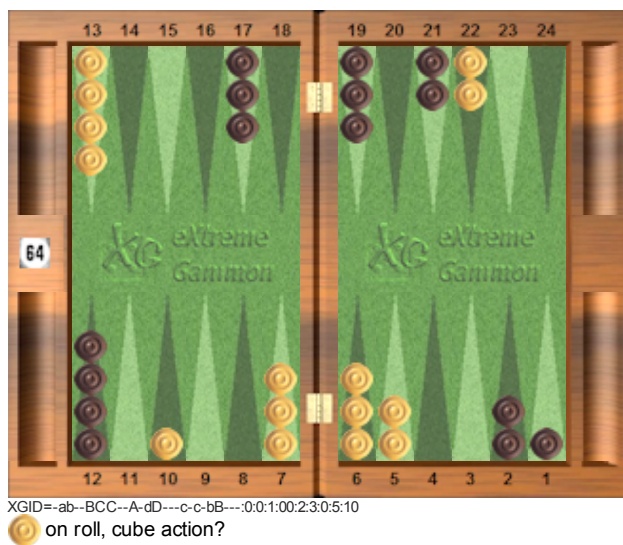
Now we start to examine some of the more interesting match scores. First of all, let's look at what is going on when the trailer has the advantage and is potentially turning the cube.

How do things look from the leader's point of view? Cube ownership is of no value to him, since he only needs two points to win the match. Therefore if he takes, the game must be played to a conclusion. For the moment let's assume that there is zero gammon potential in the position. Then the leader's possibilities are:

- 1) If he passes the score is 3-3, for 50% equity.
- 2) If he takes and wins he wins the match, for 100% equity.
- 3) If he takes and loses he is behind 4-3 Crawford, for 30% equity.

This means that the leader risks 20% equity (the difference between 50% and 30%) in order to gain 50% equity (the difference between 100% and 50%). Not nearly as good as the 3 to 1 odds one gets for money when considering whether or not to take a double. In addition he doesn't have any use of the recube, which makes things still worse than for money. He will have to win the game played to a conclusion close to 30% of the time in order to justify taking the double.

The above analysis assumed gammons weren't in the picture. Let's examine a typical position where there is a moderate gammon threat.



is Player 2

score: 3
pip: 172

5 point match

pip: 155
score: 2

is Player 1

Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities
Cubeful Equities

No double

62,72% (G:19,62% B:2,17%)
37,28% (G:9,13% B:0,90%)
+0,406

Double/Take

62,90% (G:19,55% B:3,38%)
37,10% (G:9,37% B:1,20%)
+0,914

No double:

+0,823 (-0,091)

±0,007 (+0,816..+0,829)

Double/Take:

+0,914

±0,008 (+0,905..+0,922)

Double/Pass:

+1,000 (+0,086)

Best Cube action: Double / Take

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 1 hour 24 minutes

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

White has a clear advantage, but Black has a solid position with plenty of play. For money it appears that if White were to double Black would have a trivial take, and that a double by White would be quite premature. A Snowie rollout confirmed this:

White wins gammon: 18.8%
White wins single game: 44.0%
Black wins single game: 29.3%
Black wins gammon: 7.9%

The above comes out to a cubeless equity of .373 for White. As expected it is a trivial take, and the position is clearly not volatile enough to justify a double.

At the match score, it is another story. Look at Black's equity if he takes:

White wins gammon: 18.8% X 0 (White wins match)
White wins single: 44.0% X 30 (White leads 4-3)
Black wins: 37.2% X 100 (Black wins match)

This totals to 50.4%. If Black passes the double the score is tied, which would give Black 50% equity. So if these rollout results are accurate, Black has a bare take at the match score. Strengthen White's position just a bit more and Black should pass. Clearly White has a monster double. Quite a difference from the evaluation for money, where Black has a trivial take and White has a ways to go before he has a double.

The above analysis indicates that the leader is much quicker to pass than he would be for money, and consequently the trailer is much quicker to double. This is not surprising; that is usually the case in a match when one side has the lead. It also illustrates the importance of gammons. A gammon threat gives the trailer more cube leverage. As usual the leader should avoid gammonish positions, while the trailer strives for them.

The trailer is not the only one who has access to the cube. The leader may also turn the cube if the time is right. Obviously if he does so and the double is taken the trailer will immediately redouble, so the game will be played for the match. Let's see how things look from the trailer's point of view if he is doubled:

Trailer passes: Behind 4-2, 25% equity.

Trailer takes and wins: Wins match, 100% equity.

Trailer takes and loses: Loses match, 0% equity.

Thus, the trailer is risking 25% to gain 75%. Exactly 3 to 1 odds; the same as money decisions. However, there are two factors which make the situation quite different from money. First, we are just talking about winning the game. Gammons will not matter. Second, the trailer doesn't get the recube vig he would have for money. He will recube immediately, of course, but then the game has to be played to conclusion. For money you can take positions with less than 25% winning chances, because the potential recube means that you will win some games you would have lost had the game been played to conclusion. Not so at this score -- the game has to be played to conclusion.

The above analysis indicates that if the position doesn't have much gammon potential the trailer's pass/take decisions are pretty much the same as they would be for money -- in fact, he will be a bit quicker to pass. It follows that the leader's doubles are about the same as they would be for money. He will be a bit cautious on the marginal doubles since he doesn't want to give the trailer an easy road to win the match. The solid doubles he definitely should make, and if the trailer chooses to accept then they just play the game for the match. For example:



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:

Cubeless Equities

No double:

Double/Take:

Double/Pass:

No double

76,77% (G:2,43% B:0,03%)
23,23% (G:1,10% B:0,02%)
+0,568

+0,957 (-0,043)

+1,170 (+0,170)

+1,000

Double/Take

77,21% (G:3,13% B:0,03%)
22,79% (G:0,93% B:0,04%)
+1,733

±0,002 (+0,954..+0,959)

±0,006 (+1,164..+1,176)

Best Cube action: Double / Pass

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 16 minutes 54 seconds

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

If White doubles for money, it looks like Black has a close decision. His cube access means that if he hits a shot he will probably be able to claim with the recube, and that may be sufficient to get his winning chances over 25%. At this match score Black will have to prove himself after hitting the shot, and those few games which slip away after the shot is hit are probably sufficient to drop his win percentage below 25% which makes it a pass at the match score. At any rate, White clearly has a

booming double.

If a lot of the leader's advantage is a gammon threat, it is another story. The leader can win the match without turning the cube if he wins a gammon, so he shouldn't give his opponent the choice of either passing and living to see another day or taking and redoubling which would make the gammon meaningless. If the leader has some decent gammon chances, it is virtually never correct to turn the cube at this match score. This is another reason why the leader should strive to avoid gammonish positions. For example:



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities

Cubeful Equities

No double:

Double/Take:

Double/Pass:

No double

67,55% (G:43,61% B:1,60%)
32,45% (G:8,07% B:0,87%)
+1,081

+0,882

+0,359 (-0,523)

+1,000 (+0,118)

Double/Take

67,04% (G:44,55% B:1,32%)
32,96% (G:7,30% B:0,73%)
+1,019

±0,008 (+0,874..+0,890)

±0,009 (+0,349..+0,368)

Best Cube action: No double / Take

Percentage of wrong pass needed to make the double decision right: 44,9%

Rollout details

5184 Games rolled with Variance Reduction.

Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

Take Decision confidence:

Duration: 1 hour 34 minutes

100,0%

100,0%

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

This position arises after Black rolls 5-2 and splits, White rolls 5-5, and Black flunks. For money this is a huge double and a pretty clear pass due to the big gammon threat. At the match score, it would be a serious error for White to double. Most of his edge is the gammon threat, and by doubling he loses that advantage. Black will easily win 25% of the time, so he should quickly take and send it back for the match. However even if Black mistakenly passes, he is probably better off than he would have been had White simply played on.

3-1 (2 away, 4 away)

This score more than any other score emphasizes the importance of doubled gammons for the trailer, since he needs exactly four points to go out. On the other hand, the equity difference between one point and two points isn't so great for the trailer. This means that if the trailer doubles there are very different standards for the leader depending on gammon potential.

First, let's suppose there is no gammon possibility. From the leader's point of view, we have:

If he passes, he is ahead 3-2 with 60% equity.

If he takes and wins he wins the match, for 100% equity.

If he takes and loses the score is 3-3, for 50% equity.

The leader is getting 4 to 1 odds on his take, better than the 3 to 1 he would be getting for money. True he won't have any recube potential, but if he can win the game more than one time in five that is sufficient to take. Consequently in straight races the trailer should actually be more conservative with his doubles than normal.

When gammons come into play, it is another story. A moderate gammon threat can turn what would normally be an easy take into a pass for the leader. For example, consider the following position:



Analyzed in Rollout

Player Winning Chances: 60,67% (G:21,54% B:2,31%)
Opponent Winning Chances: 39,33% (G:13,65% B:1,42%)
Cubeless Equities +0,215

Cubeful Equities

No double: +0,804 (-0,196)
Double/Take: +1,098 (+0,098)
Double/Pass: +1,000

Double/Take

60,79% (G:21,42% B:4,08%)
39,21% (G:14,02% B:1,87%)
+1,098

±0,007 (+0,797..+0,811)
±0,010 (+1,088..+1,108)

Best Cube action: Double / Pass

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence: 100,0%
Take Decision confidence: 100,0%
Duration: 51 minutes 20 seconds

[Xtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

White clearly has the advantage, with his back men split and having the direct shot. However Black certainly has plenty of winning chances. Also, this sort of position will produce a fair amount of gammons. A reasonable estimate might be:

Leader wins 40%
Trailer wins single game 40%
Trailer wins gammon 20%

This would be a huge take for money. At the 3-1 match score, however, if the leader takes the double we have:

Leader wins: Leader wins match for 40% X 100
Trailer wins single game: Score is 3-3 for 40% X 50
Trailer wins gammon: Trailer wins match for 20% X 0

This totals to 60% equity for the leader if he takes the double. If he passes he will be ahead 3-2, also 60% equity. So what would be a very easy money take becomes a borderline pass/take at the match score.

What about when the leader has the advantage? If he doubles and the trailer passes, the score will be 4-1 Crawford, with 17% equity for the trailer. If the trailer takes, he will immediately redouble for the match. Thus the trailer can take with better than 17% winning chances. Provided there are no gammon

threats, the leader can double with close to 83% winning chances. Even if the trailer has a close take, the leader should be willing to play for the match rather than risk losing his market by a lot. If there are any real gammon chances, however, the leader should never double at this score. Doubling simply makes his gammon threats worthless.

The above analyses show how important it is for the leader to avoid gammonish positions, while the trailer strives for them. This may at first not appear to be the case, since the leader needs exactly two points to win the match, so he would like winning an undoubled gammon. If the cube stays at one, we have:

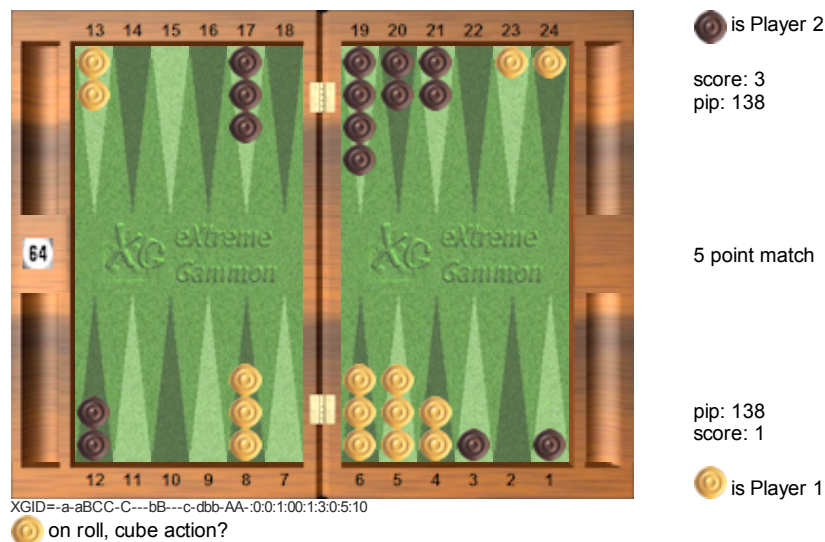
Leader wins single game: 4-1, for 83% equity.

Leader wins gammon: Leader wins match, for 100% equity.

Trailer wins single game: 3-2, for 60% equity.

Trailer wins gammon: 3-3, for 50% equity.

According to the above analysis it would appear that the leader gains 17% from winning a gammon while losing 10% from getting gammoned, so gammons favor him. The catch is that the cube isn't staying at one. As soon as there are gammons in the air and the trailer has any potential market losing sequences he will be quick to turn the cube. With the cube at two, the leader gains nothing from winning a gammon, while he loses 50%. For example:



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities
Cubeful Equities

No double

54,52% (G:23,09% B:1,51%)
45,48% (G:17,08% B:2,10%)
+0,034

Double/Take

54,31% (G:24,44% B:2,35%)
45,69% (G:18,89% B:3,25%)
+0,937

No double:

+0,609 (-0,328)

±0,007 (+0,602..+0,616)

Double/Take:

+0,937

±0,009 (+0,927..+0,946)

Double/Pass:

+1,000 (+0,063)

Best Cube action: Double / Take

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 52 minutes 32 seconds

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

White is a slight favorite, mainly because he is on roll and has the potential to deliver the first strike. While for money this would be a grossly premature double, at the match score it is quite correct for White to turn the cube. The volatility is high and, more important, there is a reasonable chance that somebody will win a gammon. It is vital for White to make sure that if he wins a gammon it is with the cube on two.

3-0 (2 away, 5 away)

This score has many similarities to the 3-1 score. Gammons still favor the trailer, of course, and the leader wants to avoid them while the trailer encourages them. However the effect of gammons isn't as sharp as it is at the 3-1. The reason is that winning a gammon doesn't put the trailer out, while at 3-1 it puts him out exactly. To see this, let's examine the hypothetical position we looked at before, where the leader won 40%, the trailer won a single game 40%, and the trailer won a gammon 20%. At the 3-0 score, the possible results are:



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities

No double

60,64% (G:21,72% B:1,62%)
39,36% (G:13,70% B:1,53%)
+0,155

Double/Take

60,67% (G:21,82% B:1,53%)
39,33% (G:14,14% B:1,96%)
+0,735

Cubeful Equities

No double: +0,639 (-0,096)

Double/Take: +0,735

Double/Pass: +1,000 (+0,265)

±0,007 (+0,632..+0,646)

±0,009 (+0,726..+0,743)

Best Cube action: Double / Take

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 40 minutes 42 seconds

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

Leader wins: Leader wins the match, for 40% X 100

Trailer wins single game: Score of 3-2, for 40% X 60

Trailer wins gammon: Score of 3-4, for 20% X 30

Adding these up, we see that the leader will have equity of 70% if he takes the double. If he passes the score will be 3-1, for 68% equity. Thus what was a borderline decision at the 3-1 score becomes a very clear take at 3-0.

If there are no gammon possibilities, the leader can once again be quite loose with his takes. The reason, as before, is that two points puts the leader out exactly. Here are the numbers:

Pass the double: Ahead 3-1, 68% equity.

Take and win: Win the match, 100% equity.

Take and lose: Ahead 3-2, 60% equity.

The leader is risking 8% to gain 32% on his take, so he is getting 4 to 1 odds. Once again in a gammon-free position the leader can take more liberally than for money, and the trailer must be more cautious.

If the leader has the advantage, naturally he should not be doubling if gammons are possible. With gammons not in the question, the cube action is fairly normal. Let's look at the numbers from the trailer's point of view:

Trailer passes: Behind 4-0 (Crawford) for 15% equity.
 Trailer takes and wins: Ahead 4-3 (Crawford) for 70% equity.
 Trailer takes and loses: Loses the match, for 0% equity.

The trailer is risking 15% to gain 55%. He is getting between 3 and 4 to 1 odds, and needs to win about 21.5% of the time to justify a take. This is quite different from the 3-1 score, where 17% is all the trailer needs. Since the trailer won't have use of the recube (he redoubles immediately, of course, but then the cube is dead), we are talking about playing the game to conclusion. Thus the situation is not too different from a money double. There the trailer needs to win 25% of the time, but that takes his recube leverage into account, so in practice he usually needs to win around 22% of the time.

Last roll positions, where the roll will decide the game, can lead to tricky decisions. Now the trailer can't count on getting the cube to 4, since the opportunity won't arise. This drastically changes the odds. For example, consider the following simple position:



Analyzed in Rollout	No double	Double/Take
Player Winning Chances:	63,89% (G:0,00% B:0,00%)	63,89% (G:0,00% B:0,00%)
Opponent Winning Chances:	36,11% (G:0,00% B:0,00%)	36,11% (G:0,00% B:0,00%)
Cubeless Equities	+0,278	+1,157
Cubeful Equities		
No double:	+0,278 (-0,722)	±0,000 (+0,278..+0,278)
Double/Take:	+1,157 (+0,157)	±0,000 (+1,157..+1,157)
Double/Pass:	+1,000	

Best Cube action: Double / Pass

Rollout details

5184 Games rolled with Variance Reduction.

Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 0,6 second

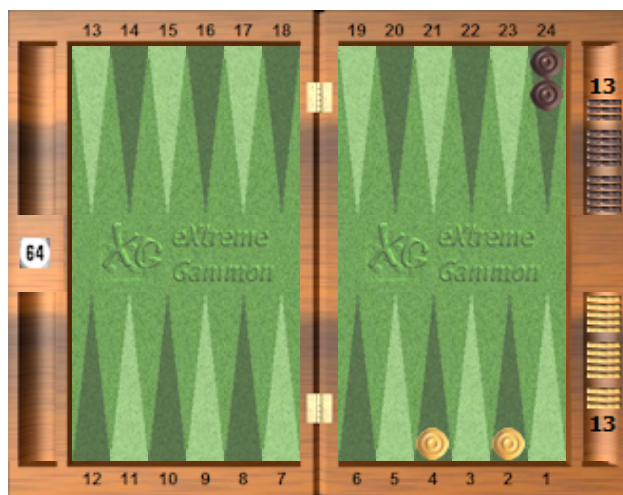
[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

If White doubles, should Black take? White will fail to get off 13 rolls out of 36, which is about 36% of the time. White is ahead in the match and 36% is way higher than 25%, so obviously Black has an easy take, right? Wrong!

Black takes and wins: Behind 3-2, for 36% X 40 (remember, he doesn't get the recube)
 Black takes and loses: Loses the match.

So if Black takes his equity is only 14.4%. If he passes he is behind 4-1 Crawford, for 15% equity. Passing is the percentage action.

To complete the analysis of this score, let's examine the same position but now suppose that Black is ahead 3-0. What should the cube action be? We have already seen that the leader can be quite liberal with his takes in races, so obviously if White doubles Black has an easy take. Should White double? Let's look at the numbers:



XGID=--A-A-----b-0:0:1:00:0:3:0:5:10

on roll, cube action?

is Player 2

score: 3
pip: 2

5 point match

pip: 6
score: 0

is Player 1

Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities

Cubeful Equities

No double:

Double/Take:

Double/Pass:

No double

63,89% (G:0,00% B:0,00%)
36,11% (G:0,00% B:0,00%)
+0,278

+0,278

+0,129 (-0,149)

+1,000 (+0,722)

Double/Take

63,89% (G:0,00% B:0,00%)
36,11% (G:0,00% B:0,00%)
+0,129

±0,000 (+0,278..+0,278)

±0,000 (+0,129..+0,129)

Best Cube action: No double / Take

Percentage of wrong pass needed to make the double decision right: 14,6%

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 0,4 second

[extreme Gammon](#) Version: 2.10, MET: Kazaross XG2

White doesn't double and wins: Behind 3-1, 32% equity.

White doubles and wins: Behind 3-2, 40% equity.

White doesn't double and loses: Behind 4-1 (Crawford), 15% equity.

White doubles and loses: Lose the match, 0% equity.

Thus White gains only 8% by doubling if he wins, while he costs himself 15% if he doubles and loses. He needs to win over 65% of the time to justify doubling. As we have seen he only wins 64% of the time, therefore he should not double. It is remarkable that at this score it is double and pass if the leader doubles from the side which has checkers on the four and two points, but it isn't even a double if the trailer has that position. This is completely contrary to our intuition which says that the leader should be more conservative and the trailer more aggressive with the cube.

2-2 (3 away, 3 away)

Play is close to normal backgammon at this score, but you should tend to drop quicker than usual. A look at the numbers illustrates why. Let's assume gammons aren't an issue, and you are being doubled.

If you pass: You are behind 3-2, 40% equity.

If you take and win: You are ahead 4-2 (Crawford), 75% equity.

If you take and lose: You are behind 4-2, 25% equity.

As can be seen the taker is risking 15% to gain 35%. This is worse than the normal money 3 to 1 odds -- you need 30% winning chances to justify the take. If there were anything special about the recube value it wouldn't be so bad, but the recube is normal. If your opponent passes, he will be behind 4-2 (Crawford) for 25% equity. If he takes, it is for the match. Therefore your opponent will have the normal 3 to 1 odds on his take; his only disadvantage will be that the cube will now be dead so he will have to play the game to conclusion.

Since the drops come quicker at this score, the doubles come quicker also since the doubler doesn't want to lose his market. Otherwise, play is fairly normal.

2-1 (3 away, 4 away)

This can be one of the trickiest scores to deal with, and even veteran players can become confused. The difficulties come when trying to figure in the potential value of the recube. So far we haven't had to worry much about this. When the trailer doubles and the leader is 2 away, he simply doesn't redouble. When the leader is 2 away and doubles, if the trailer takes he has an automatic redouble. At the 2-1 score there is no automatic action as far as the redouble goes, and that can confuse issues.

Let's suppose the leader doubles. Forgetting about gammons, what percent winning chances does the trailer need to take? If we don't take the recube into account, we get the following:

Trailer passes: He is behind 3-1, 32% equity.

Trailer takes and wins: He is ahead 3-2, 60% equity.

Trailer takes and loses: He is behind 4-1, 17% equity.

The trailer is risking 15% in order to gain 28%. Thus, he has to win almost 35% of the time in order to justify taking. Can that possibly be right? Our instincts tell us that if anything the trailer should be more liberal with his takes than for money, but apparently this is not the case.

The error we have made is that we haven't taken the potential recube into account. Certainly the trailer will be quick to redouble. How quick we can discuss later, but he will be redoubling a lot. How can we figure this redoubling potential into the picture?

As a start, let's suppose the trailer's strategy is to redouble immediately, regardless of the position. We know he can do better than that, but this assumption will give us some idea about what is going on. Now we can throw the previous calculations out the window. If the trailer redoubles immediately, that is for the match. Since the trailer would be behind 3-1 if he passes, this means that if he can win the game 32% of the time he will do better by taking and redoubling immediately. This 32% is considerably less than the 35% we calculated by assuming that the trailer never redoubles. That illustrates how important the potential recube is, and why it is vital to figure that recube into the equation.

The trailer doesn't have to redouble immediately and risk losing the whole match. He can wait until things start going his way and then redouble. He will be very aggressive, of course, but if things never go his way he won't have to redouble. Let's assume that the trailer never risks losing his market (which means he will always have redoubled when he wins), but that on half of his losses he never saw daylight so he didn't redouble. By this assumption he will always win the match when he wins the game, but on half of his losses he only loses two points (which puts him behind 4-1 for 17% equity). Then his average equity when he loses will be about 9% (midway between 17% and 0%). We can now figure the percentage of games he needs to win in a more sensible manner:

Trailer passes: Behind 3-1, 32% equity.

Trailer takes and wins: Wins match (since by our assumption he always redoubles in time).

Trailer takes and loses: Average equity of 9%.

Now he gains 68% when he takes and wins, while losing an average of 23% when he takes and loses. This is close to the 3 to 1 odds which we intuitively know it should be, rather than the 35% we initially calculated when we ignored the redouble.

Speaking of redoubles, when should the trailer be redoubling once he has taken the double. Let's look at it from the leader's point of view and consider his pass/take decision:

If he passes, he is behind 3-2, 40% equity.

If he takes and wins, he wins the match.

If he takes and loses, he loses the match.

So, the leader needs 40% winning chances just to take the redouble. It follows that the trailer should redouble any time his winning chances get to even money, or perhaps a bit worse if the position is volatile. Note that from the trailer's point of view he stands to gain 40% from a successful redouble

(the difference between being ahead 3-2 and winning the match), while he risks only 17% (the difference between being behind 4-1 and losing the match), so he has a lot of margin for error. In fact, if it were the last roll of the game he should redouble as a 2 to 1 underdog! The only reason he doesn't do so earlier is that he doesn't have market losers, so there is no need to redouble.

Now let's look at things when the trailer makes the initial double. Assuming no gammon threat and forgetting about redouble potential, we have:

Leader passes: 2-2, for 50% equity.

Leader takes and wins: Ahead 4-1 (Crawford) for 83% equity.

Leader takes and loses: Behind 3-2, 40% equity.

He is risking 10% to gain 33%, slightly better than 3 to 1 odds. This is somewhat compensated for by limited recube use. Since the trailer will be able to take a redouble with 17% winning chances (because his alternative would be to play from behind 4-1 Crawford), the leader will only be redoubling when he almost has a claim.

It should not be surprising that gammons change the picture considerably, since the trailer needs exactly four points to go out. Let's look at our prototype from before (leader wins 40%, trailer wins single game 40%, trailer wins gammon 20%). For now we will ignore the leader's recube, and also ignore any gammon potential the leader may have.



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities

Cubeful Equities

No double: +0,653 (-0,136)
Double/Take: +0,789
Double/Pass: +1,000 (+0,211)

No double

60,54% (G:21,86% B:2,47%)
39,46% (G:13,71% B:1,24%)
+0,249

Double/Take

60,49% (G:21,90% B:4,28%)
39,51% (G:13,90% B:1,97%)
+0,975

±0,009 (+0,644..+0,661)

±0,013 (+0,776..+0,802)

Best Cube action: Double / Take

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 55 minutes 20 seconds

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

Leader wins: Ahead 4-1 (Crawford), for 40% X 83.

Leader loses single game: Behind 3-2, for 40% X 40

Leader loses gammon: Loses the match, for 0%.

This totals to 49.2%, which is less than the 50% the leader would have if he passed the double. Of course the leader does have some recube value even if small, and if the game is complex he may have some gammon value also. These extra pieces are probably enough to put him over the 50% mark and

give him a take. But it is close, once again illustrating the huge value of gammons to the trailer when he has four points to go.

Checker play is what you would expect. The leader wishes to avoid positions with gammon threats, while gammons suit the trailer fine. Also when there are gammons floating around the leader will be slow to double, while the trailer can double very quickly. For positions with no gammon danger, cube action is approximately the same as it would be for money.

2-0 (3 away, 5 away)

Many of the same considerations for the 2-1 score apply here. The leader doesn't need the full four points, while the trailer can use them. This means that the leader should be more cautious about actions which potentially involve doubled gammons or the cube reaching the four-level. Of course things aren't quite as serious as at the 2-1 score, since winning four points doesn't put the trailer out. Therefore the leader can be a bit more liberal with his initial takes or his takes of redoubles.

There is, however, one further consideration which we haven't seen before. At this score, the trailer can use more than four points. Thus if the leader makes a loose double in a dangerous positions where he could be gammoned if things go badly, the trailer has the potential to take the cube, redouble to 4 at an appropriate moment, and win a gammon to win the match. The same redouble hangs over the leader's head at the 2-1 score, but not the threat of a redoubled gammon. This means that the leader should be more cautious than usual making an initial double when either side might get gammoned. Often it is just best to roll on. If things go well he can try for an undoubled gammon, while if things go badly he will be glad he didn't double. The becomes even more true when the leader has three points to go and the trailer is farther behind. The most extreme case occurs at the score 3 away, 8 away. Here the leader should virtually never double if there is some chance he could get gammoned. It is too easy for the trailer to take, whip it back to 4 on any excuse, and win a gammon to suddenly win the match.



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities

Cubeful Equities

No double:

Double/Take:

Double/Pass:

No double

68,41% (G:32,26% B:1,70%)
31,59% (G:9,95% B:0,69%)
+0,677

+0,676 (-0,037)

+0,713

+1,000 (+0,287)

Double/Take

68,57% (G:32,11% B:2,75%)
31,43% (G:9,87% B:0,82%)
+1,172

±0,006 (+0,670..+0,683)

±0,009 (+0,704..+0,722)

Best Cube action: Double / Take

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:
Take Decision confidence:
Duration: 1 hour 50 minutes

100,0%
100,0%

White has a strong position and will win a lot of gammons, but Black has plenty of potential counterplay if he survives White's first punch. In addition it is not out of the question for Black to win a gammon if things go his way. Black certainly figures to win at least 30% of the games, which gives him an easy take. At the 2-1 score I would double as White. There is just too much potential not to do so. At 2-0, however, I believe it is correct to wait a roll. If White rolls well he can just play on for the gammon most of the time, while if things go badly he will be glad he didn't double. It is very dangerous to let Black get his hands on a 2-cube in this sort of position when White has a good lead in the match.

1-1 (4 away, 4 away)

Finally, both players can use all four points. It might seem as though cube action is the same as it would be for money, but there are some subtle differences. First off all, let's suppose gammons aren't an issue and somebody doubles.

Pass: Behind 2-1, 41% equity.

Take and win: Ahead 3-1, 68% equity.

Take and lost: Behind 3-1, 32% equity.

The taker is risking 9% to gain 27%; exactly 3 to 1 odds. So far, just like for money. However when we take the recube into consideration we see another picture. If the redouble is passed, the player is behind 3-1 with 32% equity. If he takes it is for the match. Therefore, the initial doubler must win 32% of the time cubeless in order to justify a take of a potential redouble. This means that the original taker has far more recube leverage than normal, so he can take more liberally than for money. It is interesting that it is correct to pass more quickly than for money at the 2-2 score, but take more quickly at the 1-1 score.

It should come as no surprise by now that gammons change the picture. With the doubler needing exactly four points, a gammonish cube should be treated with extra caution. Since passing the double means being behind only 2-1 for 41% equity, it isn't a good idea to risk the whole match on a serious gammon threat even with the powerful recube vig.



Analyzed in Rollout

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities
Cubeful Equities

No double

62,95% (G:38,18% B:0,76%)
37,05% (G:9,46% B:0,82%)
+0,648

Double/Take

63,01% (G:39,78% B:1,31%)
36,99% (G:9,79% B:1,24%)
+2,004

No double:

+0,768 (-0,232)

±0,008 (+0,760..+0,776)

Double/Take:

+1,456 (+0,456)

±0,015 (+1,440..+1,471)

Double/Pass:

+1,000

Best Cube action: Double / Pass

Rollout details

5184 Games rolled with Variance Reduction.
Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

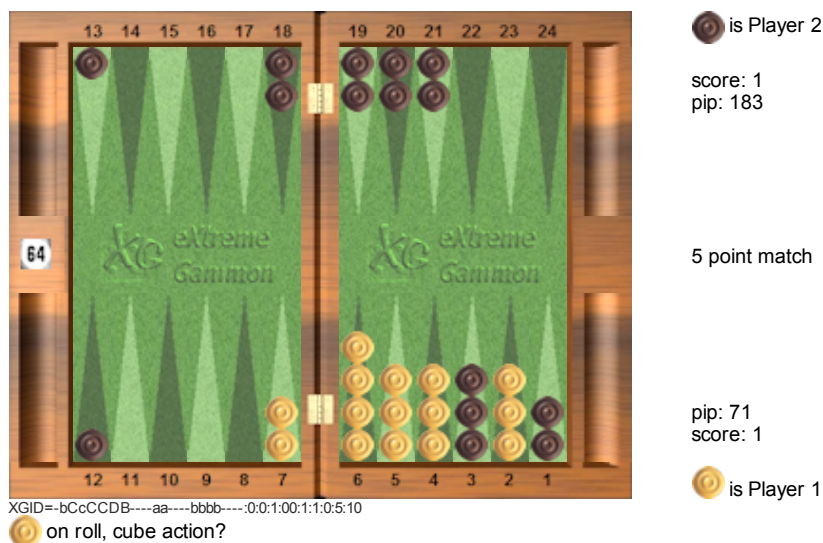
100,0%

Duration: 1 hour 37 minutes

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

For money Black has a pretty clear take, despite the gammon threat. Black should win at least 35% of the time, and if he survives the immediate blitz he will probably be the favorite. At the 1-1 match score, it is probably correct to let it go. White simply wins too many gammons and they end the match. If Black could count on winning four points every game he wins while losing only two points when he avoids getting gammoned, he could justify taking, but he can't do that.

The fact that both sides need exactly four points to go can generate some pretty interesting cube positions, particularly in complex games. For example, look at the following back game.

**Analyzed in Rollout**

Player Winning Chances:
Opponent Winning Chances:
Cubeless Equities
Cubeful Equities

No double:**Double/Take:****Double/Pass:****No double**

46,30% (G:29,60% B:7,49%)
53,70% (G:3,13% B:0,16%)
+0,435

+0,197**-0,758 (-0,955)****+1,000 (+0,803)****Double/Take**

44,99% (G:29,80% B:13,55%)
55,01% (G:2,13% B:0,12%)
+1,046

±0,011 (+0,186..+0,208)**±0,019 (-0,777..-0,738)****Best Cube action: No double / Take**

Percentage of wrong pass needed to make the double decision right: 35,2%

Rollout details

5184 Games rolled with Variance Reduction.

Moves: 3-ply, cube decisions: XG Roller

Double Decision confidence:

100,0%

Take Decision confidence:

100,0%

Duration: 1 hour 02 minutes

[eXtreme Gammon](#) Version: 2.10, MET: Kazaross XG2

Black's timing is good enough that he figures to be the favorite to win the game. White has the advantage, however, because of the gammon potential -- a high percentage of White's wins will be gammons. If White made the mistake of doubling, Black would happily take, and even if Black redoubled immediately Black would be the favorite in the match. By turning the cube, White would be giving Black the opportunity to redouble and negate White's gammon potential. Black, however, can't afford to double even when he gets his shot. White can comfortably take, since White will still win at least 25% of the time. And since some of White's wins will be gammons, this would put White out exactly. Obviously White would never redouble unless the game becomes a race where he has a sufficient advantage. Even if Black hits a shot, he may have to wait a while before doubling. Thus, due to the match score, it is wrong for both players to double for quite a while even if things go their way.

1-0 (4 away, 5 away)

Once again both players can use the full four points, so initial cube and checker play is pretty much normal. Since the trailer can use more than four points, the leader should be a bit wary about turning

the cube in 2-way gammon positions, but otherwise play pretty much like money. It is the redoubles which are more interesting.

Let's suppose the leader is redoubling. If the trailer takes, he will of course send it back to 8 for the match. If he passes, he will be behind 3-0 with 25% equity, so he has to be able to win 25% cubeless to justify taking. Since the leader goes out with four points he should refrain from redoubling if he has reasonable gammon threats; otherwise his redoubling strategy is normal.

What about the trailer's redoubles. First let's assume no gammons. From the leader's point of view:

If he passes, he is behind 2-1 with 41% equity.

If he takes and wins, he wins the match.

If he takes and loses, he is behind 4-1 with 17% equity.

Thus, he is risking 24% in order to gain 59%, which means he must win almost 29% if the time without use of the recube. If there is gammon danger his odds are worse, for if he loses a gammon his equity is 0% instead of 17%. Since the leader needs to win a higher percentage than normal, it follows that the trailer will be quicker to redouble than normal. This is a theme which is consistent for longer matches. Initial cube action is pretty much like money play unless one player is close to going out, but when it comes to higher cubes the trailer should be more aggressive and the leader more conservative.

0-0 (5 away, 5 away)

Finally, the five-point match. Armed with the knowledge of proper cube strategy and checker play for all possible future scores, you are now prepared to play the match to the best of your ability. Initial actions are pretty normal. There may be subsequent actions involving redoubles which are out of the ordinary, but your knowledge of the possible scores and how to tackle the problems should see you through any difficulties. Good luck, and I hope to meet you in the finals of the next blitz or last chance tournament.

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