

# **A Computer's Twist:**

**Play Problems for You with  
Bridge Baron Analysis**

by

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## About this Book

This book serves many purposes and was created for many reasons. It was a true work of love for both authors and we hope this shows in the book. We also hope that you are able to learn a lot about bridge and a lot about Bridge Baron and computer bridge while reading it.

Since February of 2006, Great Game Products has been posting a challenging bridge deal on its website every week as a Deal of the Week. Interesting and challenging bridge deals that are either played in competition, observed in online matches while kibitzing, or submitted to us are written up and presented on the web for our readers and customers to enjoy. Each deal on the web is written with a problem statement, a hint, and a solution. Additionally, we provide some computer analysis of the deal that Bridge Baron is able to provide, such as “what is the double-dummy correct play on this deal” or “what is the par contract on this deal”. We also encode the deal electronically, so that readers who own a copy of Bridge Baron can download the deal and experiment with it on their computers. And we provide a discussion board for users to post comments about the deals and give us feedback. You can view the Deal of the Week archives at:

[http://www.greatgameproducts.com/weeklydeals/list\\_dealoftheweek.cfm](http://www.greatgameproducts.com/weeklydeals/list_dealoftheweek.cfm)

The idea behind this book was to take resources that we created on our website, expand upon them, and present them in a book both to reach a larger audience and also provide a unique and never before seen look into the mind of a computer playing bridge.

Each deal included in this book was entered into Bridge Baron and played by the computer. We would then use development tools as programmers for the game and our inside knowledge of Bridge Baron’s programming, to examine exactly what Bridge Baron was “thinking” on

each of these problems. By doing this, we can show you how a computer plays bridge, what Bridge Baron's shortcomings are, what its strengths are, and let you judge computer bridge for yourself. This analysis essentially creates a look at how computers play bridge and uses deals themselves to explain it, rather than just providing a boring technical explanation. Explaining computer bridge through the prism of bridge deals also has the side effect of creating an interesting and readable book of bridge deals that any bridge enthusiast should enjoy.

Rather than saying, "computers are better bridge players than you may think", we thought we would use a book of very challenging deals to help prove, via example, the high-level of bridge play that computers are capable of. Rather than tell you, "a shortcoming of computer bridge play is a computer's inability to make inferences based on the opponents' bidding and plays", we thought we would demonstrate to you, again via example, the types of deals on which this is problematic, and how it negatively effects Bridge Baron's play of the hand. All final conclusions are left up to you. Regardless of the conclusions that you draw, this is the first time, that we are aware of anyway, that this dramatic a wealth of information about computer bridge play in high-level bridge problems has been created. And we hope that you are able to enjoy it and obtain a new perspective on computer bridge through it.

Each deal in the book was played with a pre-release version of Bridge Baron 18. Great Game Products comes out with a new version of Bridge Baron each year. In each version, we make significant improvements to both the bidding and the play of the hand. Problems, which in this book, Bridge Baron gets incorrectly, it may solve once Bridge Baron 19 is released. Similarly, problems it solves correctly may not be solved correctly if played on a version of Bridge Baron 17 or of Bridge Baron 16. Whenever we say Bridge Baron throughout the course of this book, we are specifically referring to the version of Bridge Baron on which the deals were tested, with the specific configuration they were tested under, and on the specific computer on which the deals were examined. The speed of your computer and its processing power can greatly affect Bridge Baron's play of the hand as can the configuration of your Bridge Baron. To accommodate for a very diverse set of users Bridge Baron can be configured in thousands of different ways, with different bidding

systems and lead and signaling agreements, all of which can affect Bridge Baron's play on any specific hand.

The representation of deals in this book is not entirely objective, we confess. When choosing which deals to include, we did tend to favor deals on which Bridge Baron would succeed. Though, to be fair, we also favored deals on which Bridge Baron failed where there was an interesting reason as to why it failed. Most of all though, the determining factor in deal selection was the caliber of the deal itself; you simply cannot write a book of bridge deals without a strong set of deals. If, in the analysis of the computer play, you note an enthusiasm for Bridge Baron and a rooting for it, we apologize, but as programmers of Bridge Baron we can't help but be excited when the computer performs brilliantly and disappointed when it under performs.

Most importantly, while reading this book, we hope that all readers enjoy the deals themselves. Bridge is a true passion of both authors and we have each read dozens of similar "deal books" and enjoyed them immensely. We hope that the bridge content and analysis will stand the test of time on its own and provide valuable experience and tips to players learning the game and fun and challenging deals to those already well entrenched in it.

We hope you enjoy.

Sincerely,

Jason Rosenfeld & Prahalad Rajkumar  
August 17, 2007

## 1 – Taking No Chances

♠ A 5  
♥ A 8 5 2  
♦ A K 10 8 5 3  
♣ 4



♠ K Q J 10 4  
♥ K 10 4  
♦ J 7  
♣ A 6 3

This hand came up in the Round-of-16 Vanderbilt match-up between teams captained by Bart Bramley and George Jacobs, at the 2007 St. Louis NABC. Mark Feldman of the Bramley team reached 6 ♠ as South (hands rotated for convenience) after a complicated auction, during which the opponents were silent throughout. Plan the play after the ♣ Q is led. The scoring is IMPs.

### Hint

If diamonds divide 3-2, the hand presents no problems. You should devote your time to thinking about how to protect against possible 4-1 diamond breaks. And, remember, the scoring is IMPs, so you need not worry about giving up overtricks.

## Solution

Let us look at some possible lines of play:

### *Ruffing Diamonds*

When diamonds divide 4-1, you will need to ruff two diamonds (unless the singleton is the  $\diamond$  Q or  $\diamond$  9) in your hand in order to set up the suit. If you need to ruff two diamonds and trumps also fail to split, an opponent will be left with more trumps than you and the contract will fail.

Therefore, setting up diamonds by ruffing is not a high percentage line of play.

### *The Diamond Finesse*

Another solution is simply to take the diamond finesse. The snag in this plan is that if East has four diamonds to the queen, the defense can score a diamond ruff. If you draw trumps before taking the diamond finesse, you will have no club control and the defense can cash club tricks, should the diamond finesse fail. The contract is too good to stake it on a 50% chance, so there must be a better line than simply relying on the diamond finesse.

### *Cashing Your Top Diamonds*


What about playing the  $\diamond$  A-K immediately, before drawing trumps?

This is a better plan than the previous two and wins whenever the opponent with the singleton diamond also has the long trump. However, if the person with four diamonds also has long trumps, then the hand short in trumps will ruff your  $\diamond$  K and you will not be able to set up your long diamonds without setting up a long trump for the opponents.

### *Giving Up a Diamond Trick*

The correct play on this deal is to give up a diamond trick early on. However, giving up a diamond trick at trick two would still allow the opponents to get a ruff if diamonds were 4-1. To counter this, you must first *cash the  $\diamond$  A and then lead a diamond towards your jack*, intending to concede the trick. Whenever diamonds are no worse than 4-1 and spades are no worse than 4-2, this play guarantees the slam. On this deal, as it was played in St. Louis, East has four diamonds headed by the queen, but has no counter to your well-thought-out play.



	♠ A 5	
	♥ A 8 5 2	
	♦ A K 10 8 5 3	
	♣ 4	
♠ 9 8 7 3		♠ 6 2
♥ J 9 3		♥ Q 7 6
♦ 6		♦ Q 9 4 2
♣ Q J 9 8 2		♣ K 10 7 5
	♠ K Q J 10 4	
	♥ K 10 4	
	♦ J 7	
	♣ A 6 3	

If East wins the ♦ Q at trick three and plays back a diamond, you will ruff high, draw trumps and claim.

If East wins the ♦ Q and plays a club, you will ruff in dummy, unblock the ♠ A, return to hand with the ♥ K, draw trumps and claim.

Suppose East refrains from playing the ♦ Q and lets West ruff the trick. If West returns a club, you ruff in dummy, unblock the ♠ A, ruff a diamond high, draw trumps and claim. If West returns a heart, you must take care to preserve the ♥ A as an entry to dummy, and win the heart in your hand with the king. You can then reenter dummy with the ♠ A, ruff a diamond high, draw trumps, and then use the ♥ A as an entry to the good diamonds.

### Post Mortem

At the other table, Zia Mahmood and Michael Rosenberg reached 7 ♠, which is an excellent contract if diamonds split 3-2, a 68% chance. Since diamonds were 4-1 on this deal, 7 ♠ goes down, and making 6 ♠ netted 17 IMPs for the Bramley team, who went on to win the match.

## Bridge Baron's Play of the Hand

Bridge Baron did not find the optimal play on this deal. Bridge Baron's line was as follows. Win the ♣ A at trick one; ruff a club low at trick two; cash the ♦ A at trick three, carefully unblocking the ♦ J along the way; cash the ♠ A at trick four; then play a heart to the king and draw the outstanding trumps. It then led ♦ 7 towards dummy, found out the bad news, and ended up going down two when it could not recover.

Bridge Baron's line of play relied on either diamonds being 3-2 or there being queen fourth of diamonds with West. This is respectable percentage, but is also a clearly inferior line of play.

Deals like this, finding safety plays in high-level contracts, are normally a strength of computer bridge play, so what led Bridge Baron awry? The answer is that because there are so many different ways this hand can be made, on most layouts, Bridge Baron did not create a firm plan for the play. It essentially kept delaying its decision on how to play the hand, until it forced itself into relying on diamonds being 3-2.

Think of all the different possible ways to make this contract: diamond finesse, dropping a singleton or doubleton ♦ Q, hearts being 3-3 and pitching a club loser on the 13<sup>th</sup> heart, etc. Bridge Baron plays the cards based on double-dummy simulations and therefore always assumes it will go right later in the hand. On a deal like this one, with so many different possible ways to make, it doesn't understand that its plays are eliminating some of its chances and making the contract more difficult. Instead, it simply "knows" it is always going to go right later in the hand and considers all of its plays to be essentially equal.

On this particular hand, it was actually the club ruff at trick two that started the problems. Obviously, the club ruff is not what cost Bridge Baron the contract, so Bridge Baron assumed it would always make later and didn't see any risk to this play. Similar problems resulted from Bridge Baron's decision to unblock the ♦ J at trick three. The contract was technically still cold, but Bridge Baron had further limited its flexibility.

It was ultimately the cashing of the ♠ A that sealed Bridge Baron's fate. The problem was that after ruffing the club at trick two and unblocking the ♦ J at trick three, Bridge Baron had put itself into a position where its best percentage play was to rely on diamonds being 3-2 or the ♦ Q being onside, so that was the line it took.

Analyzing this deal reveals that Bridge Baron, like many beginning human players, has a difficult time when there are too many options available to it. Bridge Baron doesn't plan ahead well enough, so as to combine its chances in the most efficient way possible. Bridge Baron actually tends to delay making its decision while it can and ends up painting itself into a corner on deals like this. Through a series of technically "double dummy correct" plays it forces itself into an inferior and single-dummy incorrect line.

## 26 – Snip, Snip

♠ 9 6 5 2  
♥ Q 10 9 2  
♦ A 10 9  
♣ K 2



♠ A Q J 8 4  
♥ 3  
♦ K Q J 7 6 4  
♣ 9

<i>West</i>	<i>North</i>	<i>East</i>	<i>South</i>
			1 ♦
Dbl	1 ♥	2 ♣	2 ♠
3 ♣	4 ♠	All Pass	

Nobody is vulnerable on this deal, and West leads the ♥ A (ace from A-K) against your 4 ♠ contract. East discourages with the four. West switches to the ♦ 3 at trick two. What are your thoughts?

### Hint

The ♦ 3 has the ominous look of a singleton. Is there anything you can do to prevent an impending diamond ruff?

## Solution

You must prevent the defense from engineering a diamond ruff. If East has the ♠ K, the contract is safe. In the more likely case that West has three spades to the king, you need to be careful. With this trump holding, the usual precaution against a ruff is to spurn the finesse and play the ace and queen of spades. However, that is not the right precaution on this deal. West will win the ♠ K, play a club to East's ace, and if he still has a trump, get his diamond ruff.

Forewarned is forearmed. The bidding has given you enough clues about the East and West hands — West is likely to have three spades to the king and the ace and king of hearts, and East figures to have the ♣ A for his free bid of 2 ♣. You should stymie the threat of a diamond ruff by *leading the ♥ Q at trick two and discarding the ♣ 9*. This loser-on-loser play has the effect of disrupting communication between the defenders, and as a result East can no longer gain the lead. This maneuver has been aptly named the *Scissors Coup*, as it takes on the role of a pair of scissors and cuts defensive communication.

The full deal is:

	♠ 9 6 5 2		
	♥ Q 10 9 2		
	♦ A 10 9		
	♣ K 2		
♠ K 7 3			♠ 10
♥ A K 8 5			♥ J 7 6 4
♦ 3			♦ 8 5 2
♣ Q 10 8 5 3			♣ A J 7 6 4
	♠ A Q J 8 4		
	♥ 3		
	♦ K Q J 7 6 4		
	♣ 9		

## Post Mortem

The West defender did well on this deal to switch to his singleton diamond at trick two. Doing so created a difficult problem for you. However, had he led the singleton diamond at trick one rather than cashing the ♥ A first, the contract would no longer have been makeable. You would not have been able to throw your club loser in time and thus would not have been able to keep East off lead.

Interestingly, even though from a double-dummy perspective 4 ♥ cannot be made, the par contract on this deal is 5 ♣ doubled by East-West (who are not vulnerable). 5 ♣ will fail by only one trick, so it is a good save against North-South's cold 4 ♦ contract. East-West might have done more bidding on this hand, especially as they are not vulnerable and would have only gone down one trick in 5 ♣. There is also an argument for bidding the South hand differently. Many players would open the South hand 1 ♠ instead of 1 ♦, emphasizing the importance of a five-card major in modern bidding style. After a 1 ♠ opening bid the auction might have gone 1 ♠ – Pass – 2 ♠ – Pass – 4 ♠ – All Pass, in which case the defense would be harder, but the Scissors Coup would also be much more difficult to find.

## Bridge Baron's Play of the Hand

Bridge Baron has apparently been reading lots of books on spectacular bridge plays of late and finds the Scissors Coup on this deal. In fact, it finds it quickly and makes the play look routine.

From the auction, Bridge Baron places the West hand with ten or more high-card points, four or more clubs, three or more cards in both hearts and spades, and at least seven cards in the majors. It places East with five or more high-card points and five or more clubs. And the opening lead of the ♥ A enables it to place almost all of the high-card points. It "knows" West has the ♥ K and that since West has at least three spades, he also strongly rates to have the ♠ K. This leaves few high-card points for East and Bridge Baron is able to deduce that East "must" have the ♣ A. From this point, the play of the hand is routine, and the Scissors Coup is a necessity. The computer does not realize it is making a rare

bridge play, it is just trying to make the contract, and it knows that to do so it must keep East off lead.

Interestingly, Bridge Baron also eschews the ♥ A lead with the West cards in favor of the singleton diamond lead. This decision is a difficult one for the program, but it ultimately decides the diamond is better. Were it on opening lead against your 4 ♠ contract, regardless of the brilliance of your declarer play, you would not have been able to salvage a plus score.

Human defenders tend to believe that it is “always” right to lead from an A-K holding against a suit contract, because the lead enables you to see dummy and develop a plan. The computer has not had this lesson and simply tries to find the best lead, whether it holds an A-K combination or not. Opening leads are the most difficult part of the game, both for humans and for Bridge Baron. On this deal Bridge Baron did well. On many others the heart lead would have been superior. One thing that favors a diamond lead on this deal is the ♠ K. You know declarer’s long side suit is diamonds; and that he won’t be able to run it before knocking out your ♠ K; so if it was right to cash two heart tricks, you’ll get another chance. Also, you know you’ll be getting back in with the ♠ K, so you are almost assured of a chance to reach partner’s hand for a diamond ruff later. Who knows, it may even be necessary to underlead your ♥ A-K later point in order to defeat the contract.