

## CHANCES -- No. 19

by Richard Cowan

This deal is based on a recent article of Paul Marston, bridge columnist in *The Australian*. For didactic reasons, I have changed his pip values. This eliminates a few unimportant issues from our discussion and analysis, without altering the spirit of Marston's article.

### North

♠KQJ      The ♣K is led against South's 7S  
♥K7532    contract. Declarer plays the ♣A and  
♦A32      East follows suit with the ♣2. How  
♣AJ      should one play now?

### South

♠A76532    The lead (which implies that West  
♥A6      also holds the ♣Q) has not been  
♦KQ      helpful to the cause, as it has  
♣543      removed perhaps the most useful of  
            dummy's entries.

### The bidding

With dealer North and the opponents silent, the bidding was:

<u>N</u>	<u>S</u>
1H (5+ cards)	1S
2NT (18-19, only 5 ♥s)	3S
4S (3-card ♠ support)	4NT (keys?)
5C (0 or 3)	5D (♠Q?)
6H (yes + ♥K, not ♦K nor ♣K)	7S

This bidding marks South with either 5 spades and no other suit<sup>1</sup> or 6 spades, possibly with 4+ in a minor. Early in the play, he is marked with the ♠A, ♥A, ♦K and ♦Q, given his bid of 7S when not holding the ♣K, ♣Q, ♥Q and ♥J. His 6 spades and 2 hearts are also revealed early; so the opponents can put South's shape as either 6232, 6223 or 6241.

### Assumptions

The defenders have not bid, so I assume that neither West nor East has an 8-card suit or two suits totalling 12+ cards. Also it seems appropriate to rule out West having 7 ♣s (a decent suit, ♣KQ109876) and 4 of another suit.

When defending slams, partnerships often decline to give "count" as signals help declarer more than

they help the defence; we assume that no count-signals apply in this deal.

### Lines of play

It is a simple hand in one respect, as the only way to get the 13<sup>th</sup> trick, adding to the 12 top tricks which are evident, is to create a third trick in the heart suit (or third and fourth, perhaps, allowing the ♦A to be an entry to dummy overtaking the ♦Q).

I shall explore three basic lines of play which attempt to develop the extra heart trick(s) needed. Line C is the approach suggested by Marston whilst Lines A and B have resulted from discussions I have had with Luigi Salemi and Giampiero Bettinetti.

**Line A** starts with one round of trumps, the ♠K. If both defenders follow, declarer plays the ♥A, ♥K and ruffs a heart with the ♠A (or a lower ♠ if this is safe). The ♠Q is then played. If trumps are 2-2, a claim can be made. If trumps are 3-1-or 1-3 and hearts have broken 3-3, declarer plays the ♠J, ♦K, ♦Q overtaken with the ♦A, two ♥ tricks then claims. If neither of the major suits breaks evenly, there are still chances (discussed below).

**Line B** is like Line A, but with the ♦K and ♦Q being played immediately after the ♠K (in the situation where both defenders follow to the ♠K). The reasons for this early unblocking will become evident in our analysis. After the ♦K and ♦Q, the play then continues with the ♥A, ♥K and so on, as per Line A.

**Line C** starts with the ♥A. Then the ♦K and ♦Q are played before crossing to dummy with the ♠K. Now the ♦A is played and the ♥6 pitched. This vital and clever play allows declarer added flexibility in the way he ruffs the hearts. On the next trick he ruffs a heart with a low ♠, saving the ♠A for a second ruff if this proves necessary.

Marston's article showed the opponents' cards and, on that layout, Line C was the only one which worked. It has an added risk, however, in practical play; diamonds are perhaps more likely to be ruffed than in the other two strategies.

So we ask the question: does Marston's Line C have the highest chance of success when considering all card layouts?

<sup>1</sup> With 5 ♠s and (say) 4 ♣s and a hand of 10+ HCP, South would bid 3C over 2NT, implying 5 spades.

## Analysis of Line A

The ♠K is played on trick 2. If one defender shows out, play as follows.

- If West has 4 trumps, play ♠Q, ♠J, ♦K, ♠A, ♥A, ♥K and ♥ ruff. If ♥s break 3-3, cross to the ♦A (wasting the ♦Q as a trick), cash two winning ♥s and claim. Concede if ♥s do not break 3-3.
- If East has 4 trumps, one can play as above, hoping for a 3-3 heart break. But a superior alternative is as follows: ♦K, ♦Q, ♠Q, ♠J, ♦A, ♥A, ♠A, ♠7 and ♠6, squeezing West in ♥-♣ if he has 4+ ♥s (and if East doesn't ruff a red card). Given that East has 4 ♠s, the squeeze strategy succeeds with probability 44.3% whilst the "hope-for-3-3" line has a conditional chance of only 36.6%.

In the more usual case where both defenders follow suit under the ♠K, now play the ♥A, ♥K and a low heart from dummy. Ruff this with the lowest spade that guarantees no overruff – usually the ♠A. Cross back to the ♠Q.

- Claim if trumps are 2-2<sup>2</sup> (as ruffing another ♥ if needed, unblocking diamonds and returning to the ♠J can now be managed without risk).
- If trumps are not 2-2 but the ♥ suit has broken 3-3, draw the last trump and claim.
- If either defender was dealt 3 trumps and 4 hearts, ruff a second ♥, unblock ♦s and return to the ♠J. Claim. Declarer wins provided that the player with long majors has at least 2 diamonds.
- If West was dealt 3 ♠s and 2 ♥s, concede.

If East was dealt 3 ♠s and 2 ♥s, the situation is somewhat complicated. The layout after the first six tricks is:

♠J	
♥75	
♦A32	
♣J	
♠ -	♠ 10
♥ Q	♥ -
♦ ?	♦ ?
♣Q + ?	♣ ?
♠A76	
♥ -	
♦KQ	
♣54	

West has made one discard; since he cannot rule out South having the 6241 shape, a ♦ discard from 4 cards could give declarer 4 diamond tricks. But this is of no importance – as it is clear to West that the contract will succeed anyway if South was dealt ♦KQxx♣x in the minors. West can focus attention on the case with ♦KQ♣xxx in the minors. West's best play (as given by a *game-theoretic* analysis discussed below) is to always discard a diamond.

East has also discarded once and we shall see that he is about to make a second pitch. His discarding strategies are part of an interesting sub-game that has developed between East and South.

On the 7<sup>th</sup> trick, the ♥5 is ruffed with a ♠x (as East will not help declarer by pre-ruffing with his ♠10 – he discards instead).

How should declarer now play? It may seem obvious that, on trick 8, he should play the ♦K, ♦Q, then ♠J and claim. But what if East has discarded one, or perhaps two, diamonds? South's ♦K or ♦Q may be ruffed!

An alternative line after trick 7 is: ♠J, ♥7, ♦K, giving the ending:

♠ -	
♥ -	
♦A3	
♣J	
♠ -	♠ -
♥ -	♥ -
♦ ?	♦ ?
♣Q + ?	♣ ?
♠A	
♥ -	
♦Q	
♣5	

The play of the ♠A would now squeeze West unless East has kept two or more ♦s to guard the suit (and prevent the lowly ♦3 scoring).

This means that, in deciding on which two cards to discard on the 3<sup>rd</sup> and 4<sup>th</sup> rounds of hearts, East would wish to keep his guard position over North's ♦3. So perhaps East would not discard twice from any 4-card ♦ holding or once from a 3-card holding. He might also have misgivings about discarding twice from 3-card diamond holdings.

<sup>2</sup> Or East with 3 ♠s has used one (and been overruffed).

We note that East need not protect against South having the 6241 shape (for the same reason given earlier for West).

We also note that South can place East with no more than six ♦s (because we have ruled out West having 7♣s and 4♥s). More importantly, South knows that East was dealt at least two ♦s (because West was dealt ♠KQ at least) and will therefore know that the “♦-unblock” line will work if East pitches two ♣s.

Analysis of this 2-person sub-game<sup>3</sup>, essentially between South and East (with a complicit West) shows that South’s best line is to always play the “♦-unblock” line. Never be bluffed into the squeeze play! Guarantee a success rate of at least 185/211 on this sub-game!

East can guarantee that South’s success rate is not more than 185/211 by (a) never pitching two ♣s, (b) always pitching two ♦s from a 3-card suit and (c) when holding two, four, five or six diamonds, adopting a suitable randomised<sup>4</sup> play; sometimes pitching one diamond, sometimes pitching two.

West’s best play is to assist his partner by never pitching a low club. If he did this, he informs South that East has at most five clubs (and therefore at least three diamonds).

Using the best strategies from all players, the chances of South making the contract from the position after trick 6 is  $185/211 = 87.68\%$ .

The overall chance of making the contract using Line A is 71.23%.

### Analysis of Line B

Can one gain by unblocking diamonds earlier?

Doing so after trick 2, as stated in Line B, protects against East having the 3-2-2-6 or 3-2-3-5 shapes, but loses in comparison to Line A when trumps are 2-2 and diamonds break worse than 6-2. Chance for Line B = 71.66%.

Note: “Unblocking diamonds after trick 5 in Line A if one sees East pitch a ♦ on that trick” is another approach. You protect against him having

<sup>3</sup> Using the game-theoretic principles of Von Neumann.

<sup>4</sup> See the Appendix for a more precise statement of this randomisation.

3-2-3-5 but lose if trumps are 2-2 and East has < 3 diamonds. Chance = 65.36%.

### Analysis of Line C

South plays ♥A, ♦K, ♦Q and crosses to the ♠K. If a defender reveals 4 spades, declarer fails; he cannot even succeed with 3-3 hearts because too many entries have been used early.

If both defenders follow to the ♠K, however, declarer now discards the ♥6 on the ♦A. This risks a diamond ruff but, if that does not happen, we shall see that declarer now succeeds on all 3-3 and 4-2 heart splits.

He ruffs a heart with a low ♠, then returns to dummy with the ♠Q and claims if trumps are 2-2. If not, a second ruff can now be made with guaranteed safety, using the ♠A.

Declarer also succeeds in the special cases when East has a 3325 or 2326 shape (as East’s ruff of the ♦A is not fatal in this situation).

Basically, declarer succeeds if

- each defender has at least one ♠, two ♥s and three ♦s, or
- a defender with two ♦s has exactly one ♠ and ♥s break no worse than 4-2, or
- East was dealt 3325 or 2326.

The chance of success for Line C is 65.16%.

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### Conclusion

So Line B is the best, by a whisker over Line A. In practice they are equivalent – and, notably, their chance of success in 7S is large enough to justify South’s optimism in bidding to the grand slam.

In view of the superiority of A and B by more than 6% over Line C, the latter should not have been Marston’s recommended play.

But had he not written his article and therefore not exposed his readers to this clever shortening play, a substantial idea would have been lost. Marston’s article remains a nice didactic piece.

\*\*\*\* Appendix overleaf \*\*\*\*

**Appendix:** In game theory, the optimal strategy for each of the two players has the following property.

A player, say South, can publicise his strategy without fear of being exploited – of gaining less than a given game value  $v$ . The other player can also publicise his strategy without fear of losing more than  $v$ .

In the sub-game that arises in this analysis, South's optimal strategy is to always unblock ♦s. He gains at least  $v=185/211$ , regardless of East's actions even if South makes public his strategy.

East's optimal strategy has considerable flexibility; indeed there is a class of strategies for East that can be publicised without fear of losing more than  $v$ .

If we denote the probability that East pitches two ♦s given that he was dealt  $d$  diamonds by  $e(d)$ , then East's class of strategies can be described as follows:

$$e(3) = 1$$

$$e(4) = \text{any number}$$

and  $80 e(5) + 30 e(6) - 2 e(2)$  must be greater than or equal to  $24$  and less than or equal to

$$183 - 75 e(4).$$

In practical terms, East could choose  $e(4)=0$  and (say)

$$e(5) = e(6) = 1 \text{ and } e(2) = 0.$$

This means that he discards two diamonds when dealt 3, 5 or 6 in that suit, but pitches only one diamond holding 2 or 4 in the suit.

This is all a bit esoteric, but the mathematics has its use. The mathematical theory comes up with a range of policies for East which provide some uncertainty for South. Yet, the theory also states that South should take no notice – he should just unblock diamonds and ignore the squeeze.

This conclusion comes because the chance – given the constraints underlying this sub-game – of East being dealt a hand that can damage the unblocking play (i.e. one with 2 or 3 diamonds) is too low compared to the chance of 4, 5 or 6 diamonds (where East's discards are just an attempt to represent danger) to suggest that the squeeze-play be undertaken by South.

For the record, the probabilities that East was dealt  $d$  diamonds, given the possession of 3 spades, 2 hearts, at least one club (and a knowledge that West has the ♣Q)<sup>5</sup> are:

<u>d</u>	<u>probability</u>
2	2/211
3	24/211
4	75/211
5	80/211
6	30/211

If there had been more probability weight at the lower values of  $d$ , the squeeze play would have come into the action (at least a proportion of the time).

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<sup>5</sup> My assumptions about hand shapes due to the opponents' silence in the bidding have also been used here.