

# 2004 World Computer Bridge Championship

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<http://ny-bridge.com/allevy/computerbridge/NYC.html>

The American Contract Bridge League's 8th annual World Computer-Bridge Championship was held in New York City from July 13-18, 2004 at the ACBL's summer North American Bridge Championships. Eight of the best bridge-playing software programs, or robots, competed for the title of 2004 World Computer-Bridge Champion.

## Technical Remarks

A bridge "table" consists of a central server, or Table Manager (TM), and four connecting computers, which "seat" the robots. The TM distributes the four hands of each board to the robots. Play proceeds automatically with the TM receiving and passing information to the robots and recording the play. This year P4 2.4 GHz/512 MB PCs were used, running under Windows XP. The speed of play was set at 2 minutes per pair per deal, approximately half that of human play.

Without getting into the details, most of the robots are programmed with a combination of knowledge-based AI, or sets of rules, and search-based AI, or simulations.

## Preparation

This is very much a group effort between the organizer, the computer-bridge software developers and the ACBL. An administrative committee sets the Conditions of Contest with input from the software developers and bridge experts.

It is important that the software developers understand their opponent robots' methods in advance of the competition so that they can prepare defenses. In human play, advance notice is not necessary when unusual systems are not allowed, as is the case in this competition. However, in computer-bridge play the robot developers need time to *program* defenses and store information about the opponent robots' methods. Contestants are required to submit a Convention Card (CC) one month before the competition. This is in the form of a spreadsheet, with over 100 questions. Once the CCs are published contestants ask each other (through email) even more detailed questions about their methods and conventions. Since this information is stored in the robots' memories before the competition begins, few *alerts* are necessary during play. In the few instances where alerts are required the pertinent information is input into memory and play continues.

## Play Format

The competition is in the form of team matches, with a team's robots seated N-S at one table and E-W at the other table. The boards in a match, or part of a match such as a 16-board set, are played sequentially, first at one table (closed room) and then at the other table.

The five-day event starts with a 24-board round-robin with the top four robots advancing to a 64-board knockout (KO) semifinal with carryover. The round-robin is scored on an international 30-VP scale, where the winning team receives a maximum of 25 VPs for a 52 or more IMP victory. To earn a carryover in a semifinal or final KO match, a team must both win its head-to-head round-robin match against its KO opponent and finish higher in the overall round-robin standing. The carryover is the lesser of these two VP differences.

## The Bridge World Editorial on the use of a Qualifying Round-Robin Preliminary to a Knockout Phase

In the August 2004 issue of the Bridge World, Jeff Rubens comments that while a round-robin preliminary segment may provide a substantial amount of guaranteed play for entrants who may have endured considerable expense to play, there are so many flaws that its use may sacrifice tournament quality.

Some of the flaws mentioned for human-play are: the scoring system, where the closer it is to win-loss, the greater the danger that small differences will have enormous consequences, and the closer it is to total score, the greater the danger that winning margins of strong teams against weak teams will be relevant; sportsmanlike dumping is a theoretical threat in late matches that will determine who are matched in KO round, or who qualifies for the KO round; and preparation against many different systems is required which severely increases the preparation needed.

In computer-play some of these flaws do not exist and others are minimized. The robots aren't allowed to dump and their brains can be checked if there is an accusation. The robots aren't influenced by the state of affairs so the timing of the matches is irrelevant, except for the suspense of the spectators. *[In fact, this was the case this year. Viewing Table 2 we see that the stronger robots played each other in early matches therefore greatly reducing spectator suspense at the end. In the future the highest ranked robots will be matched near the end of the round-robin rather than near the beginning.]* In our competition the preparation needed to study and defend against all the opponents is limited. This is due, in part, to only allowing systems and conventions that are common international methods so that the software developers can concentrate on improving their robots' bridge skills and spend less time on understanding and defending against complicated methods. In our competition Convention Cards are due one month before the competition. While the list of allowable conventions is large (standard methods vary around the world) the robots' photographic memories easily digest the methods of their opponents. For certain classified uncommon treatments the robots explain the meaning to the opponent robots through electronic or manual means. We use a 25-VP scale. It is not close to win-loss and the winning margin against weak teams is softened as the VP award is topped at 25, not 30. As can be seen in this year's competition, beating-up on the weaker teams did not affect the round-robin standing. With one exception, the top five round-robin finishers scored 25 VPs against the weakest three teams. The one exception was Micro Bridge scoring a 20-10 VP win over the sixth place finisher, Blue Chip Bridge.

## The Competition

The round-robin ended with Bridge Baron topping all competitors with 147 VPs. Closely behind were Wbridge5, with 145 VPs, Jack, with 138 VPs and Micro Bridge with 131 VPs. Q-Plus Bridge needed a 20-10 VP win over Q-Plus in their last round match to take the fourth and last semifinal KO spot, but Micro Bridge won 20-10 VPs.

The robots, their developers and the final round-robin standing are shown in Table 1. Table 2 shows the IMP/VP results of each round-robin match and the round that each match was played.

**Table 1:** Entries along with the 24-board round-robin final standing.

| <b>Robot</b>      | <b>Developers</b>   | <b>Country</b>  | <b>VPs</b> |
|-------------------|---|-----------------|------------|
| Bridge Baron      | Stephen Smith, George Yanakiev, Jason Rosenfeld, Tom Throop | United States   | 147        |
| Wbridge5          | Yves Costel   | France          | 145        |
| Jack              | Hans Kuijf, Wim Heemskerk, Martin Pattenier                 | The Netherlands | 138        |
| Micro Bridge      | Tomio and Yumiko Uchida                                     | Japan           | 131        |
| Q-Plus Bridge     | Hans Leber  | Germany         | 108        |
| Blue Chip Bridge  | Ian Trackman, Mike Whittaker                                | United Kingdom  | 63         |
| Meadowlark Bridge | Rodney Ludwig   | United States   | 37         |
| Sabrina           | Rierre Cormault, Gérard Joyez                               | France          | 3          |

**Table 2. Round-Robin Match Results**

|                  | Jack  | Bridge Baron | Wbridge5 | Mirco Bridge | Q-Plus Bridge | Blue Chip Bridge | Meadowlark Bridge | Sabrina | Position |
|------------------|-------|--------------|----------|--------------|---------------|------------------|-------------------|---------|----------|
| Jack             | IMPs  | 72-15        | 47-53    | 27-58        | 44-45         | 74-6             | 152-1             | 124-8   | 3        |
|                  | Round | 1            | 2        | 3            | 4             | 5                | 6                 | 7       |          |
|                  | VPs   | 25-5         | 14-16    | 9-21         | 15-15         | 25-3             | 25-0              | 25-0    | 138      |
| Bridge Baron     | 15-72 |              | 62-36    | 56-21        | 81-19         | 95-35            | 114-33            | 121-12  | 1        |
|                  | 1     |              | 3        | 4            | 5             | 6                | 7                 | 2       |          |
|                  | 5-25  |              | 20-10    | 22-8         | 25-4          | 25-4             | 25-1              | 25-0    | 147      |
| Wbridge5         | 53-47 | 36-62        |          | 60-31        | 80-30         | 94-6             | 102-10            | 151-5   | 2        |
|                  | 2     | 3            |          | 5            | 6             | 7                | 1                 | 4       |          |
|                  | 16-14 | 10-20        |          | 20-10        | 24-6          | 25-0             | 25-0              | 25-0    | 145      |
| Micro Bridge     | 58-27 | 21-56        | 31-60    |              | 77-40         | 70-44            | 136-2             | 141-1   | 4        |
|                  | 3     | 4            | 5        |              | 7             | 1                | 2                 | 6       |          |
|                  | 21-9  | 8-22         | 10-20    |              | 22-8          | 20-10            | 25-0              | 25-0    | 131      |
| Q-Plus Bridge    | 45-44 | 19-81        | 30-80    | 40-77        |               | 101-22           | 152-18            | 184-4   | 5        |
|                  | 4     | 5            | 6        | 7            |               | 2                | 3                 | 1       |          |
|                  | 15-15 | 4-25         | 6-24     | 8-22         |               | 25-2             | 25-0              | 25-0    | 108      |
| Blue Chip Bridge | 6-74  | 35-95        | 6-94     | 44-70        | 22-101        |                  | 55-31             | 97-32   | 6        |
|                  | 5     | 6            | 7        | 1            | 2             |                  | 4                 | 3       |          |
|                  | 3-25  | 4-25         | 0-25     | 10-20        | 2-25          |                  | 19-11             | 25-3    | 63       |
| Meadowlark       | 1-152 | 33-114       | 10-102   | 2-136        | 18-152        | 31-55            |                   | 112-19  | 7        |
|                  | 6     | 7            | 1        | 2            | 3             | 4                |                   | 5       |          |
|                  | 0-25  | 1-25         | 0-25     | 0-25         | 0-25          | 11-19            | 19-112            |         | 37       |
| Sabrina          | 8-124 | 12-121       | 5-151    | 1-141        | 4-184         | 32-92            | 19-112            |         | 8        |
|                  | 7     | 2            | 4        | 6            | 1             | 3                | 5                 |         |          |
|                  | 0-25  | 0-25         | 0-25     | 0-25         | 0-25          | 3-25             | 0-25              |         | 3        |

Q-Plus Bridge did not make the semifinals but it did win the round-robin “best-played hand” award for its play on this deal which occurred in the fourth round against Jack.

## Semifinal

In the semifinals, round-robin first place finisher, Bridge Baron, had a 14 IMP carryover against fourth place finisher, Micro Bridge, and second place finisher, Wbridge5, had a 2 IMP carryover against third place finisher, Jack.

The last time Jack played Wbridge5 in a championship KO stage was the 2002 finals. That final was the closest KO final in computer-bridge history with Jack winning by 1 IMP. This year Jack continued its winning ways, this time defeating Wbridge5 more comfortably, 157-118. In the other semifinal match Bridge Baron defeated Micro Bridge 166-126.

| Semifinals            | Carry-Over | 1-16 | 17-32 | 33-48 | 49-64 | Total |
|-----------------------|------------|------|-------|-------|-------|-------|
| Bridge Baron, USA     | 14         | 48   | 38    | 43    | 23    | 166   |
| Micro Bridge, Japan   | 0          | 49   | 33    | 19    | 25    | 126   |
| Wbridge5, France      | 2          | 19   | 42    | 20    | 35    | 118   |
| Jack, The Netherlands | 0          | 58   | 21    | 26    | 52    | 157   |

There was no carryover as Jack defeated Bridge Baron in their head-to-head round-robin match and Bridge Baron finished higher in the round-robin standing.

Jack defeated Bridge Baron, 157-97, to claim the championship for the fourth year in a row.

| Semifinals            | Carry-Over | 1-16 | 17-32 | 33-48 | 49-64 | Total |
|-----------------------|------------|------|-------|-------|-------|-------|
| Bridge Baron, USA     | 0          | 16   | 39    | 13    | 29    | 97    |
| Jack, The Netherlands | 0          | 40   | 22    | 40    | 55    | 157   |

## Skill and Luck

This set of sixteen boards shows that many IMPs can be gained on both skill and luck. The luck includes inferior but lucky contacts, bad bids that work out well and good bids that work out poorly, vulnerability, and timing of scores. Of course the luck balances out in a long match. While 16 boards are not enough to rule out luck playing a significant role, 64 boards greatly reduce the luck factor.

Board 1 saw Jack bid well to avoid 3NT. However, luck was with Bridge Baron. Bridge Baron reached the bad 3NT contract and made when the opening leader made the normal forth best lead from AKxxx. Jack did well to reach the excellent 4<sup>™</sup> contract and was unlucky not to have gained 9 more IMPs.

On Board 3 Bridge Baron had an accident at one table and made a good decision at the other table. The accident cost 9 IMPs, while the good decision, to bid game, came at an unlucky time. It reduced the total score from 630 (if BB played in 3<sup>™</sup>) to 380, and gaining only 3 IMPs. *[As can*

*be seen from this board and boards 14 and 15, Bridge Baron often takes unilateral shots at game with great success.]*

Board 7 saw Jack pay for a bad bid and Bridge Baron get away with a “less bad” bid. The vulnerability made a difference also. Had both sides been non-vulnerable, the margin would have been only 5 IMPs rather than 9 IMPs.

Board 9 saw Jack gain 11 IMPs when diamonds divided 3-3 (31.75%). If not 3-3 Bridge Baron would have gained 11 IMPs. Gaining 11 IMPs was a technical “lucky” gain for Jack. However, without a relay system, reaching 6NT was normal and unlucky to be only a 32% slam. So while a technical “lucky” 11 IMP gain for Jack, if diamonds weren’t 3-3 it would have been a practical “unlucky” 11 IMP loss for Jack.

Board 14 saw Jack give away 11 IMPs on defense. This was caused, in part, by Jack’s interpretation of Bridge Baron’s hand based on the bidding and, in part, by the way computers play, namely, if there are two ways to get to the same ending it doesn’t matter which way you take.

Board 15 saw Bridge Baron defend 3NT well enough to gain 13 IMPs.

Board 16 saw Bridge Baron make a good decision to gain 5 IMPs.

In this set of boards, both sides were rewarded for good play with the “lucky” IMPs gains and lost by both sides.

## **General Remarks**

After 296 boards Jack demonstrated the most consistent good play and the title of computer-bridge world champion is well deserved. Bridge Baron, Wbridge5, Micro Bridge and Q-Plus Bridge also demonstrated fine play.

The level of play of the top robots has greatly improved over the past seven years, with the top programs such as Jack, Bridge Baron, Wbridge5, Micro Bridge, Q-Plus Bridge and GIB (not entered in this championship for the past two years) making great progress. Before this championship began in 1997 the best robots were barely approaching Intermediate play. Now the best robots would be hard to beat in club play and a pair of Jack-Jack robots would be stars. This has been demonstrated recently in matches pitting expert human players against a team of Jack robots (Australian Bridge, Vol. 34, No. 5, October 2003, p.4 and International Computer Games Association Journal, Vol. 27, No 1, March 2004, p. 52).

For more information on the World Computer-Bridge Championship, including its history, past championship results, articles and photos, go to:

computerbridge.com or  
ny-bridge.com/allevy/computerbridge.