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### Albertan Ties for Second in World Championship!?

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A world computer-chess championship was held recently in New York. The event, sanctioned by the International Computer Chess Association (ICCA) and recognized by FIDE, was the fourth in a triennial series, which have previously been held in Linz (Austria), Toronto (Canada) and Stockholm (Sweden). The primary sponsor on this occasion was the Association for Computing Machinery (ACM), who invited grandmaster M. M. Botvinnik to be their honored guest. Dr. Botvinnik is himself the force behind a chess program (Pioneer) which is, however, perhaps less well known than the other Soviet program, former champion Kaissa, by Donskoy, Adelson-Velsky, Arlazarov and others.

Prior to the tournament the acknowledged leaders were the previous champion, Belle, and perennial contenders Chaos, Blitz, Nuchess and BeBe. Three of these programs use large computers such as an Amdahl or a Cray, while Belle and BeBe are self-contained units employing a high-speed processor and special hardware assists. With the exception of Chaos, all the leading contenders employ brute force techniques, trying to examine more than a million chess positions per move. All study every continuation to some fixed length and beyond, depending on the time available. Because the best programs think upon the opponent's time, they are formidable speed-chess players. Most other programs also fall into the brute force category, but are weaker because of slower processor speeds or lack of essential chess knowledge. More significantly, during the event Belle was recognized by the USCF as the first program to attain a US master rating, and was presented with a certificate to that effect.

While all programs employ searching methods which allow them to minimize the number of chess positions that must be examined, a few try to reduce this further through a process of elimination which discards quickly any variations that show little promise. Chaos has used this method quite effectively; Awit, carrying the approach to the extreme, has usually been less successful. Awit's technique of employing a selective search supposedly like that of a human, has been likened to playing with half a mind, or with one eye closed! As a consequence Awit has had a chequered career, earning such banner headlines as "Computer loses in King-sized blunder" [New York Times, 1970], and "\$5 million maxi loses to \$5 micro" [Washington Post, 1978]. Nevertheless, in the most recent tournament, after receiving a deservedly low initial ranking, Awit executed a nearly perfect "swiss gambit" to finish amongst the leaders, without playing any of the original contenders! On the other hand, the previous champion, Belle (by Ken Thompson), was out-searched by its serious opponents, Blitz (Robert Hyatt) and Nuchess (David Slate), and their superfast computers. The cross-table shows the final standings of all the programs in this international event, which attracted teams not only from the USA (9) and Canada (3) but also from Germany (3), England (3), Austria, Sweden, Finland and the Netherlands.

Awit (University of Alberta) was recognized as the most improved/lucky program of the event and tied for second place after difficult games against its Canadian rivals Ostrich from McGill and Phoenix of Waterloo, as well as a fine victory over Patsoc from Carnegie-Melon. Despite the mention of all these Universities, one must not conclude that the event was the exclusive domain of academics. On the contrary, more than half (13) of the teams were private entries, or from Corporations with an eye firmly on the consumer market. Consider, for example, the performance of experimental versions of microprocessor-based commercial products like the Novag Constellation and the Fidelity Super-Sensory 9. These two rivals seem to be comparable in playing strength and achieved a creditable 50% score, such as one might expect from a strong class B player. The calibre of these products can be seen by examining the game by my own program (Awit) in its match against the Novag Experimental. This game is interesting because of the way the opening is handled, because it illustrates the difficulty that programs have when draws are possible and both sides have winning chances, and because the game was brought nicely to a conclusion even though passed pawns exist.

More information on the subject of computer chess, and scores of the many excellent games which occurred between the best programs, will appear in the next issue of the ICCA Journal [available by annual subscription of US\$10 from W. Blanchard, Room 4A165 Bell Laboratories, Naperville, Il. 60566].

22:53:05      Oct. 23, 1983  
           Novag      Awit

1.   d4       Nf6  
 2.   c4       g6  
 3.   Nc3       d5  
 4.   Pxd5      Nf6xd5  
 5.   e4       Nd5xc3  
 6.   Pxc3       c5  
           White has left his book.  
 7.   Nf3       Bg7  
 8.   Bc4       Nc6  
 9.   Bd5       c5xd4  
 10.  Pxd4      O-O  
           Black leaves book.  
 11.  Be3       Qa5 +  
 12.  Bd2       Qa6      prevents castling.  
 13.  Bc3       Bg4  
 14.  h3       Bxf3      Queen recapture will lose a pawn.  
 15.  Pxf3       e5  
 16.  Pxe5       Nxe5  
 17.  Bxe5       Bxe5  
 18.  Rc1       Bf4  
 19.  Rc5       b6      White loses a tempo  
 20.  Rc2       Ra8-c8 !

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    :: Rb ::      Rb Kb ::
Pb   ::      :: Pb :: Pb
Qb Pb  ::      :: Pb ::
::      :: Bw ::      ::
    ::      :: Pw Bb   ::
::      ::      :: Pw :: Pw
Pw :: Rw ::      Pw   ::
::      :: QW KW      :: Rw
White's move 21.

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Awit has studied 3854 positions so far in this game,  
an average of 385 positions per move.

- 21. Rg1 ?        a mechanical move of Rook to King file
- 21. ...        Rc8xc2
- 22. Qxc2       Rc8 !
- 23. Bc6        b5 !
- 24. Kf1 !      avoids the mate threat
- 24. ...        Rxc6
- 25. Qb2        Rc1 +
- 26. Kg2        Rxcg1 +
- 27. Kxcg1      f6
- 28. Qb3 +      Kg7
- 29. Qd5        Qa3
- 30. Kg2        a6

Awit has studied 10,003 positions so far in this game,  
an average of 500 positions per move.

- 31. Qd7 +      Kh6
- 32. Qf7        Qb2
- 33. Qf8 +      Kh5
- 34. Qf7        White is recovering
- 34. ...        a5 ?
- 35. Qxh7       Bh6
- 36. Qd7 !      an excellent square for the Q
- 36. ...        Bd2
- 37. f4 !?     Kh6
- 38. Qd8        Bxf4
- 39. Kf3 !      Kg5
- 40. Qxa5       Qe5
- 41. Qb6        Qc3 +
- 42. Kg2        Qc4 !    two pawns enprise
- 43. Kg1        Qxe4
- 44. Qxb5+     Kh4

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    ::      ::      ::      ::
::      ::      ::      ::
    ::      ::      Pb Pb  ::
:: QW  ::      ::      ::
    ::      :: Qb Bb   Kb
::      ::      ::      :: Pw
Pw ::      ::      Pw   ::
::      ::      ::      KW
White's move 45.

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45. Qd7 ! f5  
 Black's computer became "sick" for one hour  
 at this point, but had 1.5 hours on its clock  
 before the next time control at move 50!  
 Meanwhile, White made extensive computations!

46. Qh7 + Kg5  
 47. Qf7 If 47. h4+ Kg4; 48. Qxg6+ Kh3 !  
 47. ... Be5  
 48. a3 Qf4  
 49. Qe7 + Bf6  
 50. Qe1 ? White thinks it has the advantage, but expected  
 was Qh7 threatening h4+ etc. with drawing prospects.  
 50. ... Kh4  
 51. Kg2 Qa4 ! Threatening Qe5+ exchanging Queens

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      ::      ::      ::      ::
  ::      ::      ::      ::
      ::      ::      Bb Pb ::
  ::      ::      :: Pb ::
  Qb ::      ::      ::      Kb
  Pw      ::      ::      :: Pw
      ::      ::      Pw KW ::
  ::      ::      QW      ::
  White's move 52

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52. Qb4+? Qxb4  
 53. Pxb4 Bd4  
 54. b5 Bc5 ! trying to establish zugzwang  
 55. f4 Bd4  
 56. Kh2 Be3  
 57. Kg2 Bxf4  
 58. b6 g5  
 59. b7 Bb8  
 60. resigns White is zugzwang

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      Bb      ::      ::      ::
  :: Pw ::      ::      ::
      ::      ::      ::      ::
  ::      ::      :: Pb Pb
      ::      ::      ::      Kb
  ::      ::      ::      :: Pw
      ::      ::      :: KW ::
  ::      ::      ::      ::
  White's move 60.

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