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அரசன்

அரசன் ^[5] (Arasan) , King in [Tamil language](#) ^[6]

Arasan,

an [open source engine](#) written by [Jon Dart](#) in [C++](#). Arasan's development started in the early 90s, the first version, released in 1994 was a 16-bit program running under [Windows 3.1](#) using an [8x8 Board](#), [incremental updated attack tables](#) and its own [GUI](#), evolving to a portable 32-bit and later 64-bit program, utilizing [bitboards](#) to determine its [sliding piece attacks](#) with [rotated bitboard lookups](#). In 2008, rotated were replaced by [Magic bitboards](#), which gave Arasan about a 20-25% speedup ^[1].

Despite its own GUI, Arasan early supported the [Chess Engine Communication Protocol](#) and later [UCI](#) as well, to run under [Windows](#) , [Linux](#) and [Mac OS](#) ^[2]. The latest version of Arasan and all major versions, including Version 1.0 from March 1994, are available as source code from the Arasan.org site ^[3] . Jon's change logs, bug fix reports and tournament reports over the time are available from [forum archives](#), as well the recent ones from the Arasan blog ^[4]

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Bitboard Trials

[Jon Dart](#), May 1996 ^[7]

Lately I've been working on a new major release of Arasan. I have spent the last few months working on the search engine, trying to improve speed and performance. I tried some experiments with a [bitboard](#) move representation, but I have backed off on that for now.

With bitboards, I got a nice reduction in tree size (bitboards allow a more accurate [swap-down analysis](#) than I had before, and this improves [move ordering](#) and allows better "culling" of losing captures in the [quiescence search](#)).

However, currently the program relies pretty heavily on [incrementally generated attack information](#), and I didn't have that implemented to

work with bitboards, so I had to compute attacks as needed. Unfortunately, the current program "needs" to do this much more often than [Crafty](#) does, so the loss from computing attacks more than balanced out the gains from bitboards. This is fixable, I'm sure, but I've put off further work on it for now.

Magic Bitboards

[Jon Dart](#), August 2008 ^[8]:

The main change has been to re-work the code to use ["magic" bitboard logic](#) instead of [rotated bitboards](#). This has given about a 20-25% speedup. I have also had to re-write the [evaluation function](#) to take advantage of bitboard attack functions for [king safety](#) and [mobility](#).

PEXT/PDEP Bitboards

Arasan 20.3, released in November 2017, performs [PEXT/PDEP Bitboards](#) if compiled for the [BMI2](#) instruction set ^[9] to replace [Fancy Magic Bitboards](#) in looking up [sliding piece attacks](#) ^[10]

Automated Tuning

Arasan **19.2**, released in November 2016, now applies [Texel's Tuning Method](#) by default and supports the [Adam gradient descent](#) algorithm ^{[11] [12]}.

Tournament Play

Arasan went online in December, 1996 ^[13], and played almost all major online computer chess tournaments, such as [CCT Tournaments](#), [ACCA Americas' Computer Chess Championship](#), [ACCA World Computer Rapid Chess Championship](#), [TCEC](#), and [International Gsei Web Tournaments](#). Arasan 15.1 ^[14] won the [ACCA 2012](#) ^[15], Arasan 16.0 the [WCRCC 2013](#) ^[16]. Over the board, Arasan is active at the [CSVN Programmers Tournaments](#) operated by [Tessa Pijl](#). Arasan was runner-up behind [The Baron](#) in May 2014 at the [PT 46](#) one point behind, as well in June 2015 at the [PT 48](#) with the same score according to the tiebreak rules ^[17].

Photos & Games



[PT 48](#), Two Kings fighting, [Johan de Koning](#) and [Tessa Pijl](#) in [Arasan](#) vs. [The King](#) ^[18]

```
[Event "PT 48"]
[Site "Leiden, NL"]
[Date "2015.06.14"]
[Round "7"]
[White "Arasan"]
[Black "The King"]
[Result "1-0"]
```

```
1.d4 d5 2.c4 c6 3.Nf3 Nf6 4.Nc3 e6 5.e3 Nbd7 6.Bd3 dxc4 7.Bxc4 b5 8.Bd
3 a6
9.a4 b4 10.Ne4 c5 11.Nxf6+ Nxf6 12.dxc5 Bxc5 13.e4 Bb7 14.Qe2 O-O 15.O-
O e5
16.Bg5 h6 17.Bh4 Qd6 18.Bg3 Rfe8 19.Rfd1 Re7 20.Bh4 Qc6 21.Rac1 Rc8 22
.Rc4 Re6
23.Bxf6 Rxf6 24.Rdc1 Qb6 25.Kh1 a5 26.Qc2 b3 27.Qe2 Qd6 28.R4c3 Rf4 29
.g3 Rf6
30.Bc4 Rb8 31.Rxb3 Bb4 32.Rd3 Qc7 33.Kg2 Rf8 34.Rdd1 Rc6 35.b3 Re8 36.
Kg1 Rc8
37.Rd5 Re6 38.Rd3 Rf6 39.Rcd1 Re8 40.Nh4 Qb6 41.Nf5 Rf8 42.Rf3 Kh8 43.
Nh4 Kg8
44.Rd7 Bc8 45.Rd5 Rd6 46.Rxd6 Qxd6 47.Rd3 Qc7 48.Qh5 Kh7 49.Nf3 f6 50.
Nh4 Bd7
51.Bf7 Bc8 52.Bg6+ Kg8 53.Bf5 Qc2 54.Qf3 Re8 55.Kg2 Rf8 56.Rd5 Bc5 57.
Bxc8 Rxc8
58.Rd7 Bf8 59.Qg4 h5 60.Qg6 Qe2 61.Nf3 Qc2 62.Qf7+ Kh8 63.Qxh5+ Kg8 64
.Nd2 Rb8
65.g4 Rc8 66.Qf7+ Kh8 67.Qh5+ Kg8 68.Qg6 Kh8 69.Qf5 Kg8 70.g5 fxc5 71.
Nf3 Qc6
72.Nxg5 Qh6 73.Rd3 Rc7 74.Rf3 Bb4 75.Rh3 Bf8 76.Rxh6 1-0
```

See also

- [Chess Pieces](#)
- [King](#)
- [Nobility](#)

Forum Posts

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- [Arasan 2.0 \(Windows chess program\) available via ftp](#) by [Jon Dart](#), [rec.games.chess](#), July 4, 1995
- [Arasan 2.1 \(Windows chess program\) available via ftp](#) by [Jon Dart](#), [rec.games.chess.misc](#), October 23, 1995
- [Arasan 2.2 \(Windows chess program\) available via ftp](#) by [Jon Dart](#), [rec.games.chess.misc](#), December 10, 1995
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- [Arasan 5.0 released](#) by [Jon Dart](#), [CCC](#), January 13, 1999

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- [Arasan 5.4 released](#) by [Jon Dart](#), [CCC](#), May 25, 2000
- [Arasan vs. IM Paunovic](#) by [Jon Dart](#), [CCC](#), June 16, 2000
- [Arasan now under Linux](#) by [Jon Dart](#), [CCC](#), September 02, 2000
- [A few notes from Arasan's games in CCT2](#) by [Jon Dart](#), [CCC](#), November 05, 2000 » [CCT2](#)
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- [Arasan 8.4](#) by [Jon Dart](#), [CCC](#), February 26, 2005
- [Arasan in CCT8](#) by [Jon Dart](#), [CCC](#), February 26, 2006 » [CCT8](#)
- [Arasan @ WCRCC tournament](#) by [Jon Dart](#), [CCC](#), July 23, 2007 » [WCRCC 2007](#)
- [Arasan 10.0](#) by [Jon Dart](#), [CCC](#), September 02, 2007
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- [Arasan 11.6](#) by [Jon Dart](#), [CCC](#), November 18, 2009

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- [Arasan 11.7](#) by [Jon Dart](#), [CCC](#), February 07, 2010
- [Arasan 12.0 released](#) by [Jon Dart](#), [CCC](#), August 07, 2010
- [Arasan 12.2 released](#) by [Jon Dart](#), [CCC](#), November 11, 2010

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- [Arasan 15.6](#) by [Jon Dart](#), [CCC](#), May 21, 2013
- [Arasan on github](#) by [Jon Dart](#), [CCC](#), May 22, 2013 ^[19]
- [Arasan games from WCRCC](#) by [Jon Dart](#), [CCC](#), July 21, 2013 » [WCRCC 2013](#)
- [Arasan 16.0](#) by [Jon Dart](#), [CCC](#), July 24, 2013
- [Arasan 16.1](#) by [Jon Dart](#), [CCC](#), September 01, 2013
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- [test position: Rookie-Arasan](#) by [Jon Dart](#), [CCC](#), January 27, 2014 » [Rookie](#), [Zugzwang](#)
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- [Experiments with eval tuning](#) by [Jon Dart](#), [CCC](#), March 10, 2015 » [Automated Tuning](#), [Texel's Tuning Method](#)
- [Arasan 18.0](#) by [Jon Dart](#), [CCC](#), July 30, 2015
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- [Arasan 18.3](#) by [Jon Dart](#), [CCC](#), February 02, 2016
- [Arasan Syzygy support \(working with Windows, too\)](#) by [Jon Dart](#), [CCC](#), March 10, 2016 » [Syzygy Bases](#)
- [Arasan 19.0 + updated test suite](#) by [Jon Dart](#), [CCC](#), April 29, 2016
- [Arasan 19.1](#) by [Jon Dart](#), [CCC](#), August 09, 2016
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- [Arasan 20.1](#) by [Jon Dart](#), [CCC](#), April 28, 2017
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- [Arasan 20.5](#) by [Jon Dart](#), [CCC](#), April 08, 2018

External Links

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- [Arasan Chess](#) by [Jon Dart](#)
- [Arasan Programmer's Guide](#) by [Jon Dart](#) ^[20]
- [Arasan Test Suite](#)
- [Arasan 8.4 released, short interview with Jon Dart](#) by [Frank Quisinsky](#), March 01, 2005, [Arena Chess GUI](#), Archive 5, 72
- [jdart1/arasan-chess · GitHub](#) ^[21]
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