

[Home](#) \* [Board Representation](#) \* [Bitboards](#) \* [Pawn Pattern and Properties](#) \* **Backward Pawns**

## Table of Contents

[Backward](#)

[Straggler](#)

[Telestop Weakness](#)

[Dynamic Backwardness](#)

[A further Pass](#)

[Stops with negative SEE](#)

[See also](#)

[Publications](#)

[Forum Posts](#)

[External Links](#)

[References](#)

[What links here?](#)

[Kmoch's](#) definition of a [backward pawn](#) or straggler: A half-free pawn on the second or third rank whose stop square lacks pawn protection but is controlled by a [sentry](#). The definition of a backward pawn seems a bit ambiguous. May an [isolated pawn](#) also be a backward one? Or an pawn on a [closed file](#)? What about a backward [ram](#) or [faked candidates](#) or even [levers](#)?

## Backward

We may use a more general definition of backwardness, to consider certain subsets independently. All pawns, which [stop](#) is not member of own [front-attackspans](#) but controlled by a sentry are **backward**:

```
U64 wBackward(U64 wpawns, U64 bpawns) {
```

```
U64 stops = wpawns << 8;
U64 wAttackSpans = wEastAttackFrontSpans(wpawns)
                  | wWestAttackFrontSpans(wpawns);
U64 bAttacks      = bPawnEastAttacks(bpawns)
                  | bPawnWestAttacks(bpawns);
return (stops & bAttacks & ~wAttackSpans) >> 8;
}
```

## Straggler

Stragglers are the intersection of backward with [open pawns](#) and the second or third rank:

```
U64 wStraggler(U64 wpawns, U64 bpawns) {
    return wBackward (wpawns, bpawns)
        & wOpenPawns(wpawns, bpawns)
        & 0xffff00; // rank 2,3
}
```

In the strict sense, we still need to exclude [levers](#). On the other hand, levers are subject of [quiescence search](#) anyway.

## Telestop Weakness

As pointed out by [Sam Hamilton](#) <sup>[1]</sup> considering stop squares might be insufficient for pawns which may actually push, but have a permanent weakened [telestop](#), f.i.:

8/5p2/6p1/p1p3P1/P1P5/7P/1P6/8 w - -

On the other hand, such a backward prospective pawn has a vital [tempo](#), which is often decisive in certain [pawn endings](#), so one should be careful to don't make the penalty too worse. Anyway, one may either apply the above [wBackward](#) algorithm with so far movable pawns shifted one rank up, or alternatively determine a *backward square area*, which is the black [attack span](#) of all black attacks which are outside the white [front attack spans](#):

white pawns

```
. . . . .
. . . . .
. . . . .
. . . . . 1 .
1 . 1 . . . .
. . . . . 1
. 1 . . . . .
. . . . .
```

black pawns

```
. . . . .
. . . . . 1 .
. . . . . 1 .
1 . 1 . . . .
. . . . .
. . . . .
. . . . .
. . . . .
```

~white front

&amp;

black attacks

-&gt; stop squares

attackspans

dominated by black

```
. . . . 1 . . .
. . . . 1 . . .
. . . . 1 . . .
. . . . 1 1 . 1
. 1 . 1 1 1 . 1
. 1 . 1 1 1 1 1
1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1
```

&amp;

```
. . . . .
. . . . .
. . . . 1 . 1 .
. . . . . 1 . 1
. 1 . 1 . . . .
. . . . .
. . . . .
. . . . .
```

```
. . . . .
. . . . .
. . . . 1 . . .
. . . . . 1 . 1
. 1 . 1 . . . .
. . . . .
. . . . .
. . . . .
```

stop squares

dominated by black

filled down

-&gt; white

&amp;

white pawns

-&gt; backward pawns

backward area

```
. . . . .
. . . . .
. . . . 1 . . .
. . . . 1 1 . 1
. 1 . 1 1 1 . 1
. 1 . 1 1 1 . 1
. 1 . 1 1 1 . 1
. 1 . 1 1 1 . 1
```

&amp;

```
. . . . .
. . . . .
. . . . .
. . . . . 1 .
1 . 1 . . . .
. . . . . 1
. 1 . . . . .
. . . . .
```

```
. . . . .
. . . . .
. . . . .
. . . . .
. . . . .
. . . . . 1
. 1 . . . . .
. . . . .
```

## Dynamic Backwardness

### A further Pass

Another issue is that some pawns or their stop squares are statically member of their own [attack spans](#), but those spans could not be realized, since their pawns are either backward or [rammed](#) (or both). Those pawns (f.i. white pawn c4, and mutually black pawn a4 in the diagram) may determined in a second pass, only considering attack spans of movable pawns.

8/8/1p6/8/p1P1p3/3pP3/1P1P4/8 w - -

## Stops with negative SEE

A more sophisticated definition of backwardness was given by [Vincent Diepeveen](#) <sup>[2]</sup>, even a member of a [pawn duo](#) may be backward, if its stop square has a negative [SEE](#) score, also considering pieces. Here b7 is considered backward, no matter whether the other friendly pawn is on c7 or c6, since its stop square b6 has a negative SEE in both cases.

8/1pp5/8/2P5/8/8/1R6 w - -

## See also

- [Backward Pawn](#)
- [Open Pawns](#)
- [Sentry](#)
- [Attack Spans](#)
- [Sneaker](#) from [Candidates \(Bitboards\)](#)
- [Hidden Passed Pawn](#)
- [Faker](#)
- [Hans Knoch](#)

## Publications

- [Hans Knoch](#) (1959, 1990). *Pawn Power in Chess*. New York: Dover, 1990. Previous ed.: New York: McKay, 1959. ISBN 0-486-26486-6

## Forum Posts

- [WHAT is the definition of a backward pawn?](#) by [Bas Hamstra](#), [CCC](#), December 23, 2002
- [Backward Pawns](#) by [Mark Lefler](#), [CCC](#), March 24, 2008
- [Doubled and Backward Pawn Engine "Definitions"](#) by [Brian Richardson](#), [CCC](#), September 07, 2009
- [What is a backward pawn?](#) by [Lyudmil Tsvetkov](#), [CCC](#), May 12, 2014

## External Links

- [Backward pawn from Wikipedia](#)

## References

1. [^ Re: Doubled and Backward Pawn Engine "Definitions"](#) by [Sam Hamilton](#), [CCC](#), September 13, 2009
2. [^ Re: WHAT is the definition of a backward pawn?](#) by [Vincent Diepeveen](#), [CCC](#), December 24, 2002

## What links here?

Page	Date Edited
<a href="#">Backward Pawn</a>	May 5, 2017
<a href="#">Backward Pawns (Bitboards)</a>	May 5, 2017
<a href="#">Bas Hamstra</a>	Feb 4, 2018
<a href="#">Dartmouth CP</a>	Jan 19, 2018
<a href="#">Design Principles</a>	Jan 17, 2018
<a href="#">Hans Knoch</a>	Nov 11, 2017
<a href="#">Lyudmil Tsvetkov</a>	Mar 28, 2018
<a href="#">Murka</a>	Nov 11, 2016
<a href="#">Open Pawns (Bitboards)</a>	Aug 24, 2017
<a href="#">Pawn Attacks (Bitboards)</a>	Mar 4, 2010
<a href="#">Pawn chain</a>	Jan 17, 2018
<a href="#">Pawn Pattern and Properties</a>	Nov 11, 2017
<a href="#">PawnKing</a>	Sep 5, 2014
<a href="#">Weak Pawns</a>	Dec 19, 2013

[Up one Level](#)