

Syzygy Tablebase Explorer

User Manual

A free web application for perfect chess endgame analysis
using the Lichess Syzygy tablebase API

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File: syzygy-explorer.html

1. Introduction

Syzygy Tablebase Explorer is a self-contained HTML application. You set up positions with up to 7 pieces (or load a FEN from the URL) and query the free public Syzygy endgame tablebases hosted by Lichess. The app returns perfect-play evaluations, distance-to-mate (DTM), and a ranked list of all legal moves.

Open **syzygy-explorer.html** in any modern browser. An internet connection is required only when probing the tablebase.

2. Getting Started

2.1 Opening the Application

Download **syzygy-explorer.html** and open it in your browser (double-click or File → Open). No installation is required. You may also host it on a web server.

2.2 User Interface

Area	Description
Piece palette (above board)	White pieces on the first row, black pieces on the second. Right side: Clear (trash), side-to-move (W/B), Syzygy button.
Chessboard	Click a selected piece then a square to place it. Drag pieces to move; drag off the board to remove. Left/right edges navigate history when no piece is selected.
Results panel	After a successful probe: ranked moves with Result and DTM. Click a row to play that move and re-probe.

3. Setting Up a Position

3.1 Placing Pieces

1. Click a piece in the palette (highlighted when selected).
2. Click a square on the board to place it.
3. Drag pieces to move them; drag off the board to delete.
4. Press Syzygy (or click the same palette button again) to deselect.

3.2 Clear, Side to Move, Piece Limit

- **Trash button** – clears the board and history.
- **W / B button** – toggles who is to move. If one king is in check, the app tries to set that side automatically.
- **Maximum 7 pieces** (including both kings). Exactly one white king and one black king are required to probe.

4. Querying the Tablebase

Click the green **Syzygy** button. The position is sent to the Lichess tablebase API. If the HTTP response is 400 (often wrong side to move while in check), the app may flip the side once and retry. En passant positions skip that auto-flip so EP rights stay valid.

5. Understanding the Results

5.1 Columns

Column	Meaning
Move	SAN. Click a row to play the move on the board and probe the new position.
Result	Outcome for the player who makes this move: win, loss, draw, cursed win, blessed loss, etc.

DTM	Distance to mate in half-moves (plies), including this move. Mate moves show 1. Draws always show “—”.
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5.2 Special Categories

Cursed win – theoretical win that becomes a draw under the 50-move rule.

Blessed loss – theoretical loss that becomes a draw under the 50-move rule.

5.3 DTM Lookahead

When the API does not provide DTM on a move, the app looks ahead: it applies the move, queries the resulting position, and if needed continues along the best line (recursively, up to 30 plies) until a DTM is found. The displayed number includes the current move. Cells show “...” while lookup is in progress. Draws never receive a lookahead number.

5.4 Move Sorting

1. **Wins** – fastest mate first (lowest DTM)

2. **Draws**

3. **Losses** – slowest mate first (highest DTM), so the most resilient defence is on top

6. Navigating Moves

- **Click a table row** – play that move and re-probe.
- **Left edge of the board** – take back one move (history), when no palette piece is selected.
- **Right edge of the board** – play the best (first) move in the current table.

Navigation zones are invisible and disabled while a piece is selected so a- and h-files remain placeable.

7. Loading a Position from the URL

You can open the app with a FEN so the position is loaded and Syzygy runs automatically:

`syzygy-explorer.html?fen=FEN_STRING`

Spaces in the FEN may be written as `_` or as `%20`. Optional extra parameters: **ep** (en passant square), **castle** (castling rights).

7.1 FEN Fields

Field	Example	Meaning
Placement	4k3/8/.../4Q3	Piece positions (8 ranks)
Side to move	w or b	Who moves next
Castling	KQkq or -	K/Q white, k/q black; - = none
En passant	g6 or -	EP target square if available
Halfmove / fullmove	0 1	Optional; ignored for probing

*Castling and en passant **are used** for the tablebase query. Halfmove and fullmove clocks are not needed for Syzygy results.*

7.2 Example URLs

Queen endgame, White to move

`?fen=4k3/8/8/8/8/8/4K3/4Q3_w_-_0_1`

En passant (hxg6 should appear)

`?fen=8/7k/7p/1R4pP/5K2/8/8/6r1_w_-_g6_0_1`

White can castle kingside (O-O should appear)

`?fen=4k3/8/8/8/8/8/8/4K2R_w_K_-_0_1`

Same without castling rights (no O-O)

?fen=4k3/8/8/8/8/8/8/4K2R_w_-_0_1

Both sides castling rights

?fen=r3k2r/8/8/8/8/8/8/R3K2R_w_KQkq_-_0_1

Black to move, kingside castling

?fen=4k2r/8/8/8/8/8/8/4K3_b_k_-_0_1

Separate query parameters

?fen=8/7k/7p/1R4pP/5K2/8/8/6r1_w&ep=g6

?fen=4k3/8/8/8/8/8/8/4K2R_w&castle=K

8. Tips and Limitations

- Maximum 7 pieces; exactly one king per side.
- Internet required for probing; board works offline.
- DTM is not stored for every position; recursive lookahead usually fills gaps.
- Some 6–7 piece lines may still show “—” if no DTM exists in the public API.
- Please use the free Lichess API reasonably (no rapid automated bulk requests).
- After updating the HTML on a server, hard-refresh the browser (Ctrl+F5) to avoid cached old versions.

9. Technical Notes

- Board: chessboard.js (Wikipedia piece set).
- Optional helpers: chess.js for check detection.
- Backend: Lichess Syzygy API (tablebase.lichess.ovh), up to 7 pieces.
- Single self-contained HTML file; FEN via **?fen=**, optional **?ep=** and **?castle=**.