Blunder Check
User Manual

Client-side chess game analysis with Stockfish 19
Single-file web application: **blunder-check.html**

This manual describes interactive and batch analysis, annotation rules, engine options, file download/append, external tools (PGN-Viewer, Analysis-Editor), and troubleshooting.

Item	Detail
Application file	blunder-check.html
Engine	Stockfish 19 WASM — full (default) or lite
Default depth	16 (≈ mid-3200s+ Elo analysis estimate)
Parsing	chess.js · chessops (Chess960 / multi-game)
Opening book	ECO + Lichess Masters (optional)
Platform	Modern browser (Chrome/Edge recommended for file overwrite)

Table of Contents

1. Overview 3
   - 1.1 Strength (approximate) 3
   - 1.2 What the tool does 3
2. Getting started 3
   - 2.1 Requirements 3
   - 2.2 Opening the application 3
   - 2.3 Quick start (single game) 3
   - 2.4 Quick start (PGN file / batch) 3
3. User interface 3
   - 3.1 Main controls 3
   - 3.2 Automatic modes 4
   - 3.3 Evaluation category thresholds (defaults) 4
4. Annotation rules 4
   - 4.1 Evaluation categories 4
   - 4.2 Move quality marks 5
   - 4.3 Better is ($142) 5
   - 4.4 Variations 5
5. Engine, book, and robustness 5
   - 5.1 Stockfish 19 5
   - 5.2 Opening book 5
   - 5.3 Robustness 5
   - 5.4 Chess960 5
6. Output and integration 5
   - 6.1 Download 5
   - 6.2 Append 6
   - 6.3 PGN-Viewer 6
   - 6.4 Analysis-Editor 6
   - 6.5 URL parameter 6
7. Tips and troubleshooting 6
8. Technical summary 6

1. Overview

Blunder Check is a self-contained HTML application that analyses chess games in PGN format. It runs entirely in the browser with Stockfish 19, classifies moves with quality marks and evaluation symbols, adds alternative lines when useful, and produces annotated PGN.

Workflows: paste a single game and click **Analyse**; load a multi-game PGN with **Load PGN** for automatic batch analysis; or open the page with `?pgn=` for immediate analysis with defaults.

1.1 Strength (approximate)

Full Stockfish 19 at depth 16 (default) is far above human strength — roughly the **mid-3200s+ Elo** range for analysis purposes. This is an estimate only, not a formal CCRL rating. Browser WASM mainly affects speed; evaluation quality at a fixed depth is comparable to the native engine at that depth.

1.2 What the tool does

- Analyses one game or all games from a multi-game PGN file.
- Stockfish 19 full engine by default (optional lite); depths 12–20 (default 16).
- Optional opening book for standard chess (skipped for Chess960).
- Marks only-moves ($8), mistakes (?), blunders (??), and “better is” ($142).
- Writes evaluation categories and variations into annotated PGN.
- Supports Chess960 when the PGN declares the variant.
- Recovers from engine stalls; skips mate/stalemate positions without restart loops.

2. Getting started

2.1 Requirements

- A current browser (Chrome or Edge recommended for file overwrite and save dialogs).
- Internet access at least once for Stockfish and (if used) the opening book; later runs use the cache.

2.2 Opening the application

Open **blunder-check.html** from disk or a static web server. Some browsers restrict Workers on `file://`; if the engine fails to start, host the file via local HTTP.

2.3 Quick start (single game)

- Paste a complete PGN into the text area.
- Optionally adjust depth, full/lite engine, book, and thresholds.
- Click **Analyse** and keep the tab in the foreground.
- Use **Download**, **Append**, **PGN-Viewer**, or **Analysis-Editor** when finished.

2.4 Quick start (PGN file / batch)

- Click **Load PGN** and choose a multi-game .pgn file.
- Analysis starts automatically with default settings.
- Depth, engine, book, and threshold forms are hidden in batch mode.
- Progress shows e.g. “Game 3 / 12 — White vs Black · Analyzing move 24 / 40”.
- When done, **Download** saves one combined annotated file.

Note: *Keep the Blunder Check tab active during analysis. The app requests a screen wake lock when supported and pauses if the tab is backgrounded.*

3. User interface

3.1 Main controls

Control	Purpose
Paste PGN	Input for one or more games.
Depth	12, 14, 16 (default), 18, 20. Hidden in URL/batch auto mode.
Full engine	Default on (~99 MB first load). Uncheck for lite. Hidden in auto mode.
Opening book	Skip in-book moves (not Chess960). Hidden in auto mode.
Analyse	Analyse pasted text (batch if several games).
Load PGN	Load a file and analyse all games automatically.
Clear	Reset input, results, and restore the full form UI.
Status line	Progress text (game and move).
Progress bar	Overall progress across games/moves.
Download	Save annotated PGN (save dialog when supported).
Append	Append to an existing file; overwrites that file when the browser allows.
PGN-Viewer	Open external viewer; hidden if the URL would be too long.
Analysis-Editor	Single game only; opens external editor with the annotated PGN.

3.2 Automatic modes

In **URL mode** (`?pgn=…`) and **batch mode**, depth, engine, book, and threshold forms are hidden; defaults apply. URL mode also hides Analyse / Load / Clear.

3.3 Evaluation category thresholds (defaults)

Parameter	Default	Meaning
Equal if |eval| < … cp	50	Category =
Slightly better/worse from	50	+= / =+
Clearly better/worse from	150	+/– / –/+
Winning/losing from	350	+– / –+
“?” min cp loss	100	Minimum loss for “?”
Only move if 2nd best ≥ …	150	Gap for ■ / $8
Variation if cp loss ≥ …	50	Attach variation without ?/??
Variation min length	7	Target half-moves when the engine PV is long enough

Use **Save thresholds** (localStorage) or **Reset defaults**. Saved values override the defaults until reset.

4. Annotation rules

4.1 Evaluation categories

Symbol	Meaning (White’s POV)
+–	White winning
+/–	White clearly better
+=	White slightly better
=	Equal
=+	Black slightly better
–/+	Black clearly better

Symbol	Meaning (White's POV)
–+	Black winning

Categories appear in curly braces after the move when there is a quality mark or a variation. After only-move ($8), the category is written only if it changed vs the position before the move.

4.2 Move quality marks

Mark	PGN	Rule (summary)
■	$8	Played move is best; 2nd best ≥ threshold worse; 2nd best changes category; not a recapture; side not already clearly worse/losing; **never on mating moves**. Never combined with ?/??.
?	?	One category worse than best continuation and cp loss ≥ "?" threshold. Always has a best-move variation.
??	??	Two or more categories worse than best. Always has a best-move variation.

4.3 Better is ($142)

When there is a better alternative but no ? / ?? / ■, the first move of the variation is marked with NAG **$142** ("better is"). Example:

```
20. a3 (20. d4 $142 exd4 21. Nxd4 {+=})
```

4.4 Variations

- Taken from the engine MultiPV principal variation only (not extended with extra searches).
- Written when cp loss ≥ variation threshold (unless the position before the move is already +– or –+).
- Every ? / ?? always includes a best-move variation.
- Minimum length applies when the PV is long enough; short lines are possible if the PV is short.

5. Engine, book, and robustness

5.1 Stockfish 19

Option	Behaviour
Full engine (default)	Stronger; ~99 MB first download, then cached.
Lite engine	Smaller, faster first start, slightly weaker.
Depth 12–20	Default 16. Higher = slower and stronger.

5.2 Opening book

When enabled: ECO lines and Lichess Masters explorer when available. Chess960 never uses the standard book.

5.3 Robustness

- Screen wake lock during analysis (when the browser allows).
- Background tab: analysis pauses and resumes when the tab is visible again.
- Checkmate / stalemate / draw positions are scored without calling the engine (avoids restart loops).
- Limited automatic engine restarts; a failed move can be skipped so the rest of the game continues.

5.4 Chess960

Variant tags such as Chess960 / Fischerandom use chessops parsing and `UCI_Chess960`. Include a valid starting FEN in the headers.

6. Output and integration

6.1 Download

Uses a native save dialog when the File System Access API is available. Single-game default name: `White-Black_blunderchecked.pgn`.

6.2 Append

Choose an existing PGN. The annotated game(s) are appended. On Chrome/Edge the **same file is overwritten** when write permission is granted.

6.3 PGN-Viewer

Opens `https://thomasheyl.de/chess/tools/pgn-viewer.html` with a double-encoded `pgn` parameter. Hidden if the URL would exceed a safe length.

6.4 Analysis-Editor

Shown only after a **single-game** analysis (and if the URL is short enough). Opens `https://thomasheyl.de/chess/tools/analysis-editor.html`. Evaluation comments such as {+=} are converted to NAGs ($14, $16, …) in the URL so that "+" is not turned into spaces by the editor's parameter handling.

6.5 URL parameter

```
blunder-check.html?pgn=<urlencoded PGN>
```

Starts analysis immediately with defaults. Forms and move list are hidden.

7. Tips and troubleshooting

Issue	What to try
Engine load / Worker error	Use HTTP(S); disable ad-blockers; try lite once; allow unpkg.com.
First full-engine start slow	Expected (~99 MB). Wait; later loads use cache.
Analysis seems stuck	Keep tab active; wait for auto-retry; status may show "continuing…".
Endless download after mate games	Fixed: terminal positions no longer force engine restarts.
No "?" despite large loss	Needs category change vs best + "?" min cp threshold.
■ on a mating move	Should not happen; mating moves never get only-move.
PGN-Viewer / Analysis-Editor missing	PGN too long for URL, or batch mode (editor is single-game only).
Append creates a new file	Browser lacks write-to-same-file; choose the same name if offered.
Old thresholds after update	Click Reset defaults, then Save thresholds if desired.
Chess960 parse fail	Need [Variant "Chess960"] and valid FEN.

8. Technical summary

Component	Implementation
UI	Single HTML file, embedded CSS
Standard PGN	chess.js
Chess960 / multi-game	chessops when available
Engine	Stockfish 19 WASM (Worker + Blob bootstrap)
Search	Main-line positions; MultiPV 2; terminal-position shortcuts
Save / Append	File System Access API when available
Persistence	Thresholds in localStorage (chessAnalysisThresholds)

End of manual. Application: blunder-check.html — Engine: Stockfish 19 (full by default).