

# The Ships Game

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This is a documentation of the Ships game, which is based on the package of ‘Simon Tatham's Portable Puzzle Collection’. Find the hidden ships.

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# Chapter 1: How to compile the code

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The code is written in C. Because it is based on the package of ‘Simon Tatham's Portable Puzzle Collection’, it must be compiled as if it were a part of the package. Specifically, in Linux do the following:

1. Copy the file `ships.c` to the source directory of the ‘Collection’.
2. Add the game specification to the `CMakeLists.txt` file:

```
puzzle(ships
  DISPLAYNAME "Ships"
  DESCRIPTION "Ship-finding puzzle"
  OBJECTIVE "Find the hidden ships."
)
```

3. Execute the commands:

```
cmake -S <source_directory>
cmake --build <build_directory>
```

To run the game, execute the file `ships` in the `<build_directory>`.

## Chapter 2: How to play

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The aim of the game is to determine the positions of ships in a grid, given the sum totals of ship cells per row or column. A ship is a sequence of grid cells in the horizontal or vertical direction. The ships cannot touch each other horizontally, vertically or diagonally.

The sum totals of rows and columns are specified on the left of and above the grid, respectively. The lengths of the ships to find are listed below the grid, in the line beginning with the word ‘ships’. There are as many ships as the lengths specified.

The end cells of a ship are marked by *triangles* that point along the ship axis in the directions away from the inner cells. The inner cells are marked by *squares*. In the special case of a one-cell ship, the cell is marked by a *rhombus*. To indicate that a cell is occupied by a ship, it can be temporarily filled with a *white background*; to solve the puzzle, the cell must be eventually marked with a triangle, a square or a rhombus. A cell not occupied by a ship can be marked by a *dot*, but this is not required to solve the puzzle (except in the case where dots are used to indicate the limits of a ship, see section 2.1).

### 2.1 Ships controls

An unfilled cell can be marked occupied by *left-clicking* it. Left-clicking a filled cell removes the mark. The *right* click labels an unfilled cell with a dot indicating that the cell is not occupied, or removes an existing dot. Multiple cells in a row or a column can be marked with dots or cleared from dots by a right *drag*.

Alternatively, the cell mark can be switched between ‘occupied’, ‘not occupied’ and ‘unfilled’ by consecutively pressing *Enter*. The cursor can be moved around the grid by using the *arrow* keys.

The game takes care of labeling the occupied cells with a specific symbol (triangle, square, rhombus) automatically. The player, however, must tell the game where the ship ends by placing a dot in the cell next the end cell of the ship along the ship axis (unless the ship ends at the border). A one-cell ship is marked by placing dots next to its all four sides.

Some cells are marked at the time of generating the puzzle. They can be distinguished by a thicker border. The marks of these cells cannot be changed, with the exception of white filled cells without a symbol, where the symbols are to be determined during the game.

The sum totals for rows and columns can be left-clicked to mark them done (grey them out) or unmark them again. Completed ships are greyed out automatically (which does not necessarily mean, however, that their positions are correct).

(All the actions described in section 2.1 of the documentation of ‘Simon Tatham's Portable Puzzle Collection’ are also available.)

## 2.2 Ships parameters

These parameters are available from the ‘Custom...’ option on the ‘Type’ menu.

### *Height, Width*

Size of grid in squares.

### *Difficulty*

Controls the difficulty of the generated puzzle. At the Basic and Intermediate levels the one-cell ships are avoided (they are more difficult to find). At the Advanced and Unreasonable levels some of the sum totals for rows and columns may be hidden. The Unreasonable level may require backtracking.

## Appendix A: Licence

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