

LIBRARY 477 (KHET) DOCUMENTATION

(An adaptation for the HP50G calculator of a wickedly fun strategy game)

WHAT IS KHET?

Khet is a fun and easy strategy game that uses lasers and mirrors, which adds dimension to traditional moving-piece board games. It is a turn-based, two-player game where each player either rotates his or her game piece one-quarter turn, or moves their game piece one space in any direction. The object is to hit the opponent's pharaoh with your laser.

The Khet board game and official game documentation are available from www.khet.com.

COPYRIGHT AND DISTRIBUTION

Khet has been adapted for the Hewlett-Packard HP50G, and equivalent, graphing calculators for one's personal use only. Commercial distribution of this game is prohibited. All attributes of the game, including the name, game piece definitions, board layouts, and rules of play have been reproduced from the Khet board game from Innovention Toys, LLC, New Orleans, LA 70131 USA. Innovention Toys, LLC holds the appropriate trademarks and copyrights for the respective aspects of the game. Library 477 (KHET) is Copyright © 2006 Scott Thompson. Library 477 (KHET) is provided without charge and may only be distributed without cost, in its entirety and unchanged. All documentation and notices must be included.

WARRANTY

This software is provided "as-is" and without warranty of any kind. Although this software has been carefully developed using standard procedures and system calls, *it is vital to make a backup of any data that should be protected from loss before installing this library*. Refer to the calculator's documentation for suitable procedures.

SOFTWARE REQUIREMENTS

Library 477 (KHET) requires about 25 kB of memory and may be stored in Port 0, 1, or 2. It runs slightly faster from RAM (Port 0 or 1). It requires Library 1738 (OpenFire) Version 2.8 or greater. Library 477 (KHET) and Library 1738 (OpenFire) are both available from www.hpcalc.org.

INSTALLATION

Install Library 477 (KHET) and Library 1738 (OpenFire) as you would any other.

After the libraries are stored in a suitable port, with the calculator turned on, press and hold the **ON** key and simultaneously press and release the **C** key. This causes a warmstart, and the libraries will be attached to the HOME directory.

To run the game, either type **K H E T** on the stack and press **ENTER**, select the command “KHET” from the catalog, or press **→** **LIB** and navigate to the Khet library to expose the KHET command.

GAME OPTIONS SCREEN

The welcome screen displays various options that may be set with this game. These options select the board layout, player colors, and the game save filename.

The various board layouts are:

- ① Classic;
- ② IMHOTEP;
- ③ Dynasty;
- ④ Custom; and
- ⑤ Saved Game.

Options ① – ③ are replicas of the respective board game layouts. Option ④ allows custom playfield creation, and option ⑤ allows for the continuation of a saved game. For option ⑤, provide the name of the save file in the Game File dialog option (the last field on the form).

The next two dialog options sets the two player colors. The range for each are numbers from one (1) to nine (9), either typed from the keyboard or selected from the list. A lower number yields a lighter color on the playfield, whereas a higher number produces a darker color.

Finally, the last option sets the name of the saved game filename (a global variable that will be stored and/or recalled from the HOME directory). This filename will be also be the filename under which subsequent saves will occur. The data is a special file that can only be read with this library.






Press **ENTER** or **F6** to continue playing Library 477 (KHET), or press **F5** or **ON** to exit.

CUSTOMIZE PLAYFIELD



There are two ways to bring up the Customize Playfield feature:

- ① Select “Custom” from the welcome screen “Board Layout” dialog; or
- ② Press CUSTOM during normal game play.

A custom board layout (from the welcome screen) yields a blank playfield to work with. To edit one of the default playfields, simply select the one desired from the welcome screen and then press the CUSTOM key when the game is waiting for user input.


To edit the custom playfield, press the cursor keys (   ) to move the position indicator targets to the desired cell and either press the  key to remove the item, or press the corresponding key that appears next to the game piece shown on the display to install that piece at the current location. The counts under each game piece shows the available pieces.

To fire Player 1’s laser, press the  key. To fire Player 2’s laser, press the  key.




To finish editing the playfield and play the game, press the  key. To abandon the game, press .

To save a custom board layout, simply save and quit (see below) after returning to the game. To save the board layout for future use, try using the built-in filer to copy the file to a different name.

SAVE AND QUIT

To save the current game and quit, press the  key during a game in progress. The game will be saved as a global variable under the name provided in the welcome screen dialog, and the game will end. Library 477 (KHET) will only save and restore from the HOME directory, so please ensure that a game file is placed there to continue a saved game.

FIRING LASERS, REMOVING GAME PIECES, AND DECLARING A DRAW (RESTART)

To fire the laser assigned to the current player, press the  key. To fire the opponent’s laser, press the  key. If a piece is hit that should be removed from play, it will be highlighted briefly and a message will flash stating that either Player 1 was hit, or Player 2 was hit. Move the cursor to the indicated location and press the  key to remove the game piece. If the piece removed is the pharaoh, the player who’s pharaoh remains wins the game.

To declare a draw and restart the game, simply press the  key.

RULES OF PLAY

Please refer to the Khet documentation available at www.khet.com. General rules of play are described below and detail the Library 477 (KHET) implementation. This version makes no provision to maintain strict adherence to published rules.

The game pieces included for each player are the pyramid (x7), obelisk (x4), djed (x2), and a pharaoh (x1). The pyramid and djed pieces have mirrors that reflect the incoming laser beam at a 90 degree angle to the incoming beam. The icons shown on the playfield show the path a laser beam would travel. If there is not a path indicator for a particular section (for example, the back of a pyramid piece), the piece will get removed from play if a laser hits it there.

The obelisk piece can be stacked two high; the object's icon changes to reflect a stacked obelisk. The djed piece can swap adjacent places with a pyramid or an obelisk *of either color*; neither piece rotates during the move. An opponent's piece is not allowed in specially-marked "home" spaces of the opposite color.

A turn usually consists of either moving a piece one square in any direction or rotating a piece counter-clockwise (left) or clockwise (right). The laser is fired and any piece hit by the beam is removed from play. Control is then passed to the next player by pressing **NXT**.

THE KEYBOARD









The directional keys (   ) control cursor movement.

The  key rotates the game piece counter-clockwise one-quarter turn for each press.

The  key rotates the game piece clockwise one-quarter turn for each press.

The **SPC** key enables/disables MOVE mode (described next) for the current player.

During a MOVE, the following keys are active and define the relative final position:

-  : Up and left
-  : Up
-  : Up and right
-  : Left
-  : Right
-  : Down and left
-  : Down
-  : Down and right

TECHNICAL

Library 477 (KHET) was created using a combination of Debug4x, EMU48, Nosy, SDiag, and various tools and conversion facilities gathered from www.hpcalc.org.

This code makes use of the OpenFire grayscale library, which configures the calculator to use either 4-bit (16 shades of gray), or 2-bit (4 shades of gray) hardware-based grayscale. Once configured, the grayscale processing is completely transparent and requires almost zero effort to maintain the grayscale effect for the duration of the game. If the calculator fails to respond and requires a warmstart, it may not appear that the calculator is responding and the screen may look like random garbage. There are a few solutions available to help restore the display to normal operation.

First, try typing the command “DONEGS” and press **ENTER**. This is the OpenFire command to close the grayscale driver and restore normal calculator operation. You may also try turning the calculator off and then back on. Finally, there is the reset button located on the back of the calculator that can be depressed with an unfolded paperclip.

The keyboard routine utilizes a polled topology; the calculator runs at its full clock rate. This helps the display to not flicker during grayscale operation. However, the calculator will not power down when not being used for a prolonged period of time.

Because of the potential for the battery to completely drain, there is a built-in feature that saves the current game under the global name “KHETlowbat” to the HOME directory. The game then exits with a low battery error message. Most likely, the calculator will then enter a light sleep while it waits for a key and the calculator will turn off normally after a time-out.

PROGRAMMING THANKS

A huge amount of thanks go to the all fine people who compiled the lists of entries, created the powerful debugging and development environments, produced the volumes of detailed guides and references, Manjo for making grayscale so easy with his OpenFire library, and to everyone at [news:comp.sys.hp48](http://news.comp.sys.hp48) who has provided valuable code tips, tricks, and ideas.

Enjoy,



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