# Top-hole Golf

A 3D golf game for the Commodore 64 microcomputer.

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# Introduction

Please note: in the following text, JOY2LEFT, JOY2RIGHT, etc. refer to the various controls on the joystick plugged into port 2.

JOYLEFT, JOYRIGHT, etc. refer to the controls on the current player's joystick, which could be either port 1 or port 2.

# Main menu



Use JOY2UP and JOY2DOWN to navigate through the items and press JOY2FIRE to select.

The 'notches' next to the 'Players' menu item indicate how many players are currently signed in. For example, in the screenshot above, there are currently three players signed in.

# Signing in

To add a new player or edit an existing one, select 'Players' from the main menu to go to the signing-in screen. In the example below, three players are currently signed in.

On this screen there are two modes to the user interface: *browse* mode and *edit* mode.

# Browse mode

In browse mode, either one of the slot numbers (1-4) or the 'hamburger' icon at the top left of the screen will be flashing. In the screenshot above, the number '4' is flashing, indicating that we're in browse mode. Use JOY2LEFT/RIGHT/UP/DOWN to navigate through the slots (where appropriate) or to and from the 'hamburger'.

Press JOY2FIRE on the flashing 'hamburger' to go back to the main menu.

Press JOY2FIRE on a flashing number to begin editing an existing player or add a new one.

To delete an existing player, navigate to the appropriate slot and press [INST/DEL] on the keyboard.

To swap two players, navigate to one of the players so that their slot number is flashing, then press the number of the other player on the keyboard. For example, in the screen above, if we wanted to swap 'MrBond' and 'Galore', we move the joystick up so that number '3' is flashing, then press [1]

on the keyboard. This feature is useful for rearranging teams if you're going to play a round with four players and match play scoring.

# Edit mode

You are able to specify five attributes for each player: name, sex, skin color, shirt color and control method (joystick 1 or 2).

Edit the player's name at the flashing cursor, as in the screenshot below. Up to 10 characters can be entered. Delete a single character by pressing [INST/DEL], or the whole string by pressing [C=] (i.e. the Commodore key) and [INST/DEL]. Press [RETURN] on the keyboard to finish editing the name. If you press [RETURN] on an empty string, the player at this slot is deleted and you will return to *browse* mode.
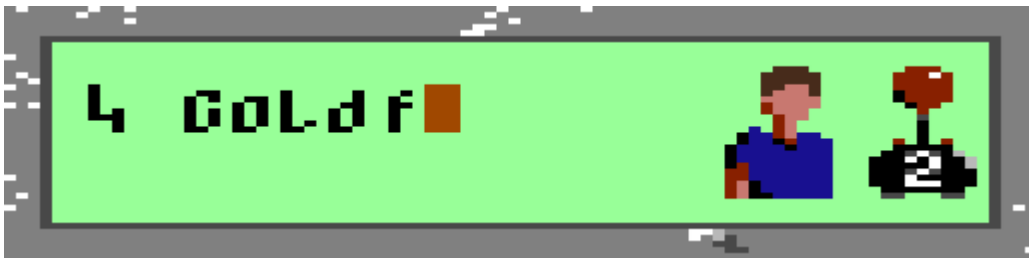


Next you can specify the player's sex, skin color and shirt color. There will be a flashing border around the player's portrait icon (see below). Use JOY2LEFT and JOY2RIGHT to change shirt color, JOY2UP to change sex and JOY2DOWN to change skin color. JOY2FIRE will confirm your selections.



Finally you can set the control method for this player. (A flashing border appears around the josytick icon.) Use JOY2RIGHT to select a joystick in either port 1 or port 2 and press JOY2FIRE to confirm.
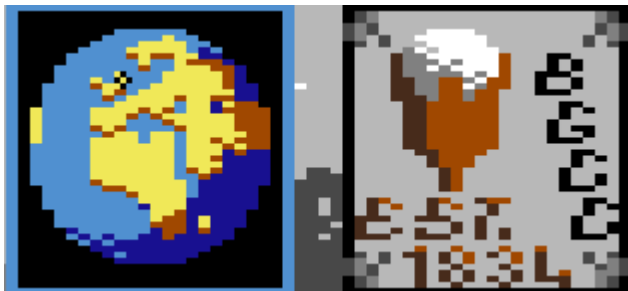
# Settings



Access the 'settings' screen (as seen above) by selecting the 'Settings' menu item from the main menu. Six different aspects of the game can be changed: golf course, scoring system, number of holes, and the difficulty of bunkers, greens and wind conditions. Each of these is represented by a large icon on the screen. Use JOY2LEFT/RIGHT/UP/DOWN to navigate through these. To exit to the main menu, navigate to the 'hamburger' icon at the top left of the screen and press JOY2FIRE. Now we will discuss each setting in turn.

# Golf course



With a flashing border around the 'globe' icon, press JOY2FIRE to browse the different golf courses available. (Use JOY2FIRE to browse through the options for all the other settings as well.) The corresponding club badge will be drawn to the right of the globe. You do not need to 'confirm' your selection in any way - how you leave this setting screen configured will determine the game to be played.

# Scoring system



You can choose between *stroke play* and *match play*. In stroke play, the winner is the player who completes the course in the fewest number of strokes. In match play, the round is played per hole, with the winner of each hole earning one point. If the hole is drawn, each player (or team) earns one half point. The winner of the round is the team with the highest score.
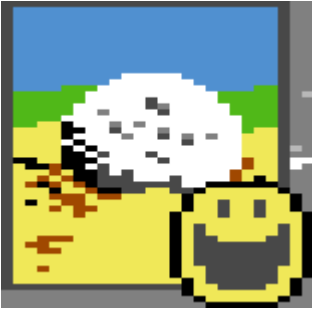
For match play, you need two teams of either one or two players each. If you are playing two against two, players #1 and #2 will play against players #3 and #4.

# Number of holes



You can elect to play either a full eighteen holes or, for a shorter game, just the front or back nine.

# Bunkers



This determines how much power is available if you're in a bunker. Easy = two thirds of full power; intermediate = one half; hard = one third.

# Greens



The harder the setting, the steeper the slopes on the greens.

# Wind



The harder the setting, the stronger the wind conditions.

# Game display



The screen above represents a four-player match play game that is about to start. *MrBond* and *Felix* are playing against *Galore* and *Goldfinger*.

1. **MrBond,Felix:** the current team is *MrBond* and *Felix*, and it's *MrBond's* shot. Note how his name is drawn in dark blue but *Felix* is in light blue.
2. **=/18:** the teams are all square and there are eighteen holes still to play. If this team were two holes up with five holes still to play, you would see **+2/5**.
3. **1:** the current hole.
4. **1-2-3-4:** this is a par 4 hole and *MrBond* is taking his first shot, so the *1* is highlighted in white.
5. **377yds:** the distance to the pin in yards. Once you're on the green, this distance is expressed in feet.
6. **00:00:** this information is for match play only. It shows you how many shots each team has taken so far, with the current team highlighted in white. When a ball has been holed, a small 'notch' appears next to the corresponding team's tally.
7. **The power arc device:** we'll look at this in detail in the next section.
8. **The shot crosshair:** use this to position your shot.
9. **x1:** maximum available power for the current shot. In this example, 100% power is available. When you're in the rough, this will read **x2/3**, meaning your maximum power will be only two thirds of what's potentially available.
10. **Overhead map:** a bird's eye view of the current hole. A pulsing cross shows the position of your ball. The black 'spot' marks the location of the pin.

# Power arc
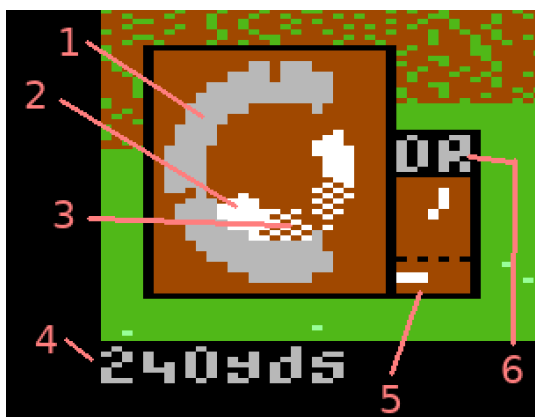


The power arc device and associated panels allow you to select a club and then determine the strength and spin of your shot, as well as providing information about the current wind conditions or, when putting, the slope of the green.

1. **Outer power arc:** shows how much power the shot will have. Maximum power is at the 'notch' at 12 o' clock. Beyond this, power will diminish quite rapidly.
2. **Inner precision arc:** determines how straight your shot is. If the 'precision marker' is stopped at the center, the shot will be perfectly straight. Before this point and your shot will have some hook (or draw), causing it to swerve to the left. After the center point and your shot will have slice (or fade), and will swerve to the right. If you miss the inner arc altogether, you will scuff your shot.
3. **Dithered inner arc:** if you're trying to get out of a bunker, the precision marker must be stopped within the dithered area of the inner arc for the shot to be successful.
4. **Maximum carry:** for the currently selected club, here you will see the maximum carry in yards. This is how far the ball will carry if you hit it from the fairway with 100% power and no wind or spin. Carry is the distance the ball travels up until its first contact with the ground. When putting, this distance is in feet and records the maximum distance the ball will travel with maximum power and no slope.
5. **Wind/slope:** the upper panel shows the direction of the wind or, if on the green, the slope (- it always points **DOWN** the slope!). The lower panel shows the relative strength of the wind, or steepness of the slope. With practice, you'll become adept at judging these relative values.
6. **Club:** the currently selected club. Here we are about to play the driver.

# Swing mechanic

JOYLEFT/RIGHT to set the direction of your shot with reference to the crosshair device.

JOYUP/DOWN to select a club. If in a bunker you can use only the sand wedge (*SW*). And on the putting green, only the putter (*PT*) is available.

Press and hold JOYFIRE. The outer power arc will begin to fill up in a clockwise direction. Release JOYFIRE when you think you have sufficient power. If you release JOYFIRE at exactly 12 o' clock for maximum power, you will receive some aural and visual feedback to confirm this.

After a short pause, the precision marker will begin to describe the inner arc in a counterclockwise direction, starting at 12 o' clock. Press JOYFIRE at the correct moment, either for a straight shot or to get some draw/fade.

# Putting

When on the green, only the putter is available for play. JOYDOWN will temporarily hide the golfer if they are obscuring the hole, allowing you to line up your shot with more accuracy. The swing mechanic is the same as above, except that you set only the power; there is no precision marker when putting.



# Playing order

## Stroke play

For the first hole, golfers tee off in the same order as they were registered on the 'signing in' screen. On subsequent holes, golfers are ordered as per the number of strokes they have so far played. The leading golfer (i.e. who has made the fewest strokes) tees off first. After everyone has teed off, it is always the player furthest from the pin who plays next.

## Match play

Team #1 tees off first on the odd-numbered holes; and team #2 tees off first on the even-numbered holes. After everyone has teed off, the order of play is the same as for *stroke play*, with the golfer furthest from the pin being the next to play.

So for neither scoring system do you follow the strict rules of golf. (It was just a bit easier to program this way!)

# Score tables

# This for a birdie!

A 3D golf game for the Commodore 64 microcomputer.

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Entered for the Forum64 & Protovision Game Competition 2017.

## CONTENTS

## INTRODUCTION

Welcome to Beechings Golf & Country Club!

Practise your golfing skills on our magnificent 18* holes set in an idyllic (and surprisingly flat!) corner of North Yorkshire, England.

Tree-lined fairways, shimmering lakes and immaculate greens as well as fiendish bunkers will provide you and your friends with, we hope, an enjoyable and challenging experience.

* You may notice a remarkable similarity between the first 9 holes and the second 9. (Refunds are at the management's discretion...)

# TITLE SCREEN



You need a joystick in port #2 to navigate the title screen.

The game supports up to 4 players and 2 joysticks.

- Type your name at the flashing cursor and press *RETURN* when finished. The letters A-Z and hyphen are allowed.
- Now select your gender (joystick left/right) and skin tone (joystick up/down) and press the fire button to confirm.
- Select your control method (joystick left/right) and again press the fire button to confirm.

Repeat this for any other players. Pressing *RETURN* at the flashing cursor (without entering a name) will skip over the remaining slots and take you to the *WEATHER* option.

Select the weather with joystick left/right and confirm with the fire button. This is really the game's difficulty setting and determines how much the wind will affect your game once out on the links.

The text *TO THE LINKS!* will now be highlighted. Press the fire button to start the game!

# GAMEPLAY

Firstly, here is an explanation of the 'stats' panel at the top of the screen.

1. Current player's name and overall score. Even par ('E') is drawn in white, below par (e.g. '-2') in red and above par (e.g. '+1') in green.
2. Number of shots taken so far for the current hole. While the ball is in motion, this number will 'pulse', and increment by one as soon as the ball stops.
3. Currently-selected club. Change this with joystick up/down.
4. Distance from the hole. If you're on the green (and armed with a putter), this value will be in feet; otherwise in yards.
5. Details for the current hole. These should be fairly self-explanatory. When you're on the putting green, the value for wind (in mph) will be replaced by the value for the slope (as a gradient).
6. Camera shake icon. If this is highlighted, the camera shake is enabled; or if it's greyed out (as in this screenshot), disabled.
7. Wind/slope indicator. Shows the direction of the wind/slope vector.

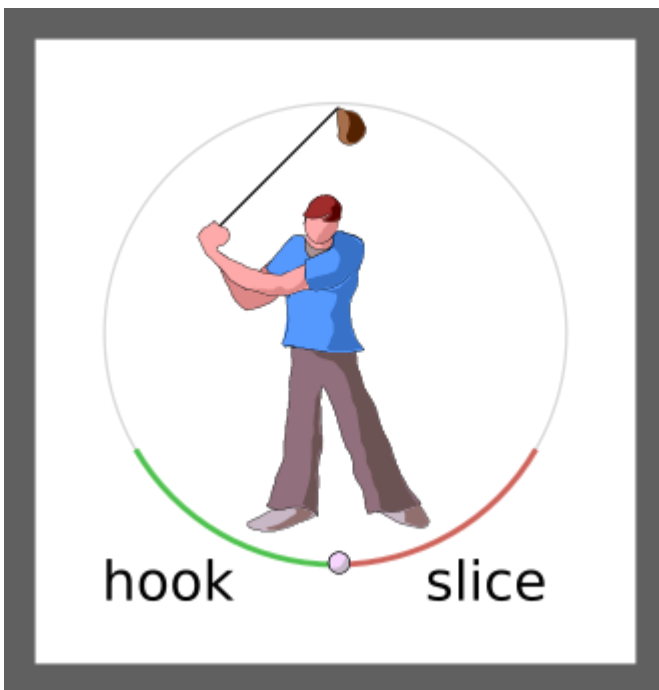## SWING



Select your club with joystick up/down.

Position your shot with joystick left/right - the 'pulsing' crosshair will move accordingly. If there's a strong cross-wind, you might want to take that also into account.

To start the swing, press and hold the fire button. While you're holding the button down the shot is 'powering up' - the club shaft will turn grey to indicate this.

Release the fire button when you think you have enough power or, for maximum power, keep pressing the button until the very top of the swing - the club shaft will turn black again when this point is reached.

On the downward swing you may press the fire button once to determine the precision/spin of the shot.



The two arcs of that circle, labelled *hook* and *slice*, make up the precision zone of the downswing. During this period the club shaft will turn grey unless/until you've pressed the fire button. If you press the fire button before you (or rather, your club head) reaches this zone, your shot will have maximum hook; if you press the button after you've exited this zone, or don't press the button at all, your shot will have maximum slice.

For as straight a shot as possible, try to press the fire button as the club head makes contact with the ball. The relevant sound effect, as well as camera shake (if it's enabled), may help you to determine when this contact happens.

**NOTE:** Hook makes the ball swerve to the left; slice to the right.

## TERRAIN

There are four types of terrain: fairway/green, rough, bunker and water.

If your ball lands in water, you must take the shot again.

In the rough and bunkers, the maximum power your club can generate is reduced by 1/3 and 1/2 respectively.

Also, if you're in a bunker, the precision zone for your downswing is much shorter. You have to press the fire button at or just before the club head strikes the ball, otherwise you'll 'scuff' the shot (- the ball will just hop forward a few inches). And you have to use the sand wedge - no other club selection is allowed.

## PUTTING

The mechanism is the same as for the swing but there is no second button press required for precision. You just need to set the power of the putt by pressing, holding and releasing the fire button at the appropriate moments - or leave the button depressed for maximum power.

Once the ball has stopped moving and the golfer's animation has completed, you can press the fire button to advance to the next player/shot.

## PLAYING ORDER

When you begin the round, players are in the same order as they were entered on the title screen.

After everyone has teed off, the next player to go is the one furthest from the hole.

At the beginning of subsequent holes, playing order is based on overall scores - the lowest score (i.e. the best player) goes first.

# IN-GAME OPTIONS

These can be set while your golfer is lining up their shot.

- **F1** - toggle camera shake on/off
- **F3** - cycle through the border colors (in case you don't like black)
- **F5** - change the sky color (it can be either cyan or light grey)
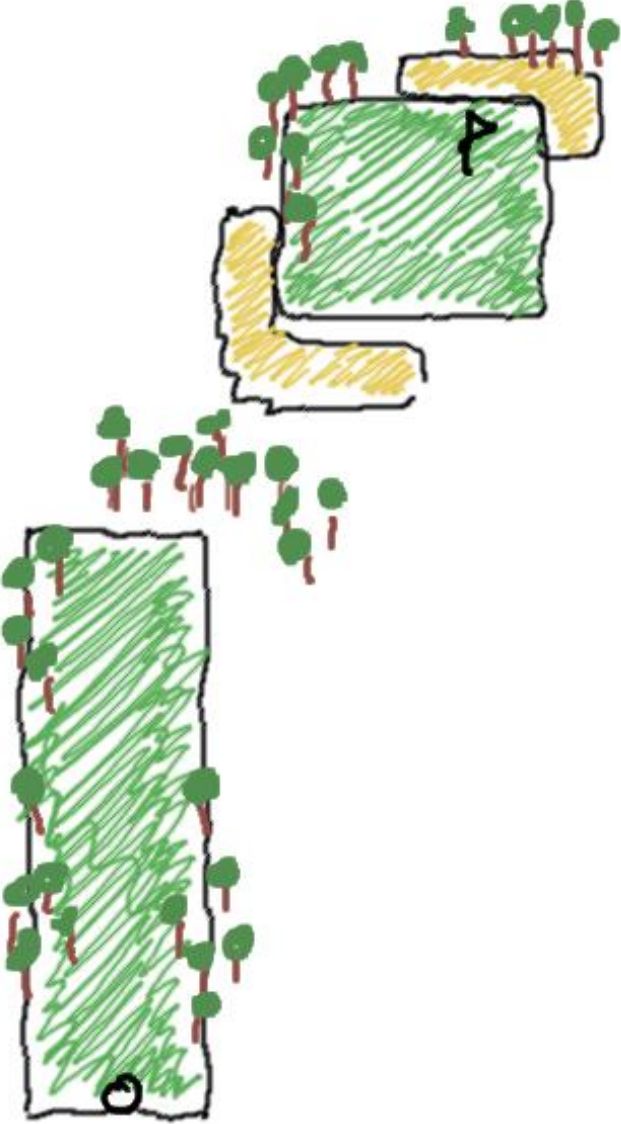
# COURSE MAPS

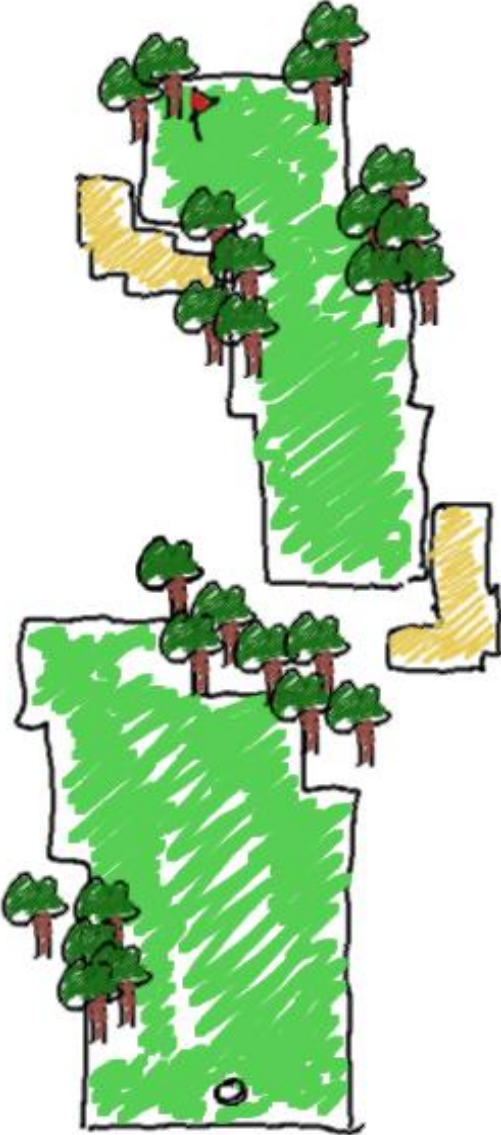(Note to self: **BETTER MAPS NEEDED!**)

Hole #1
Par: 3

Distance: 161 yds

Hole #2
Par: 3
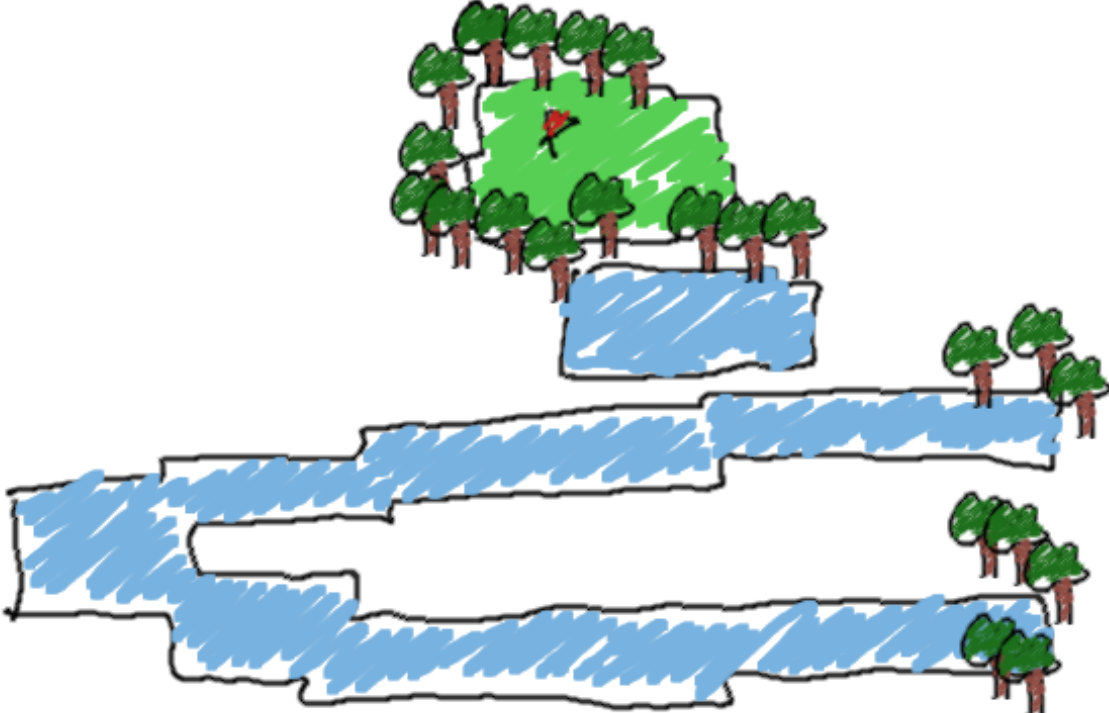
Distance: 210 yds



Hole #3
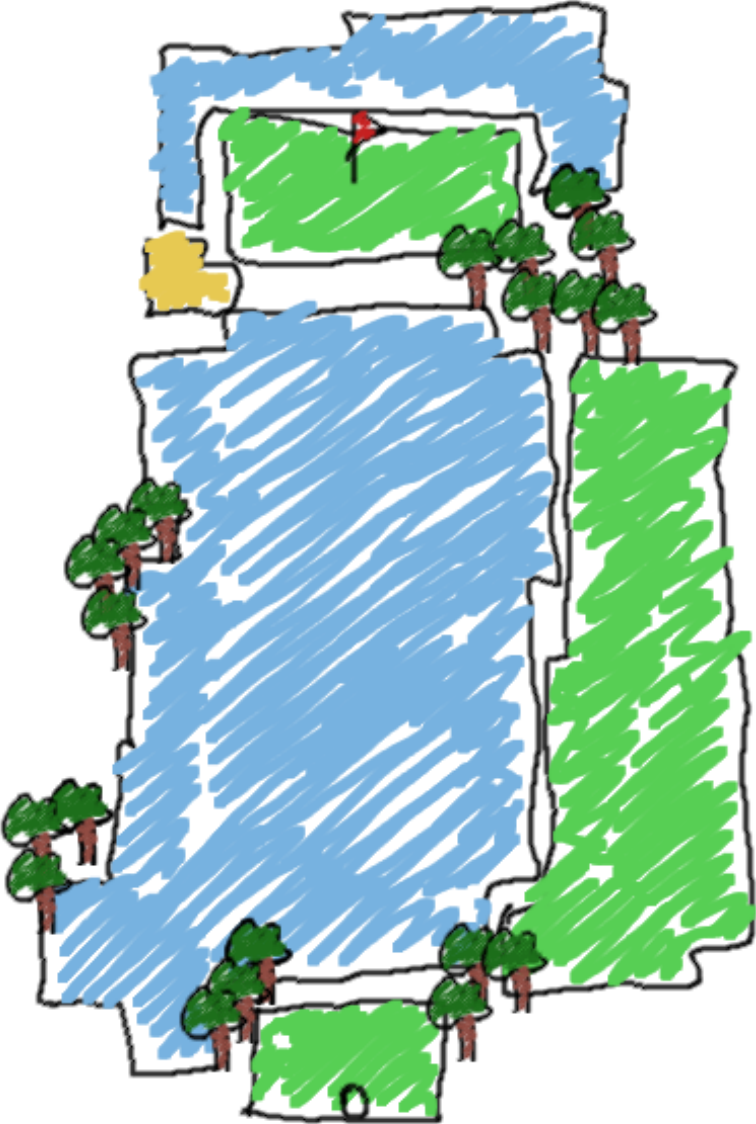Par: 4

Distance: 390 yds



Hole #4
Par: 4

Distance: 240 yds



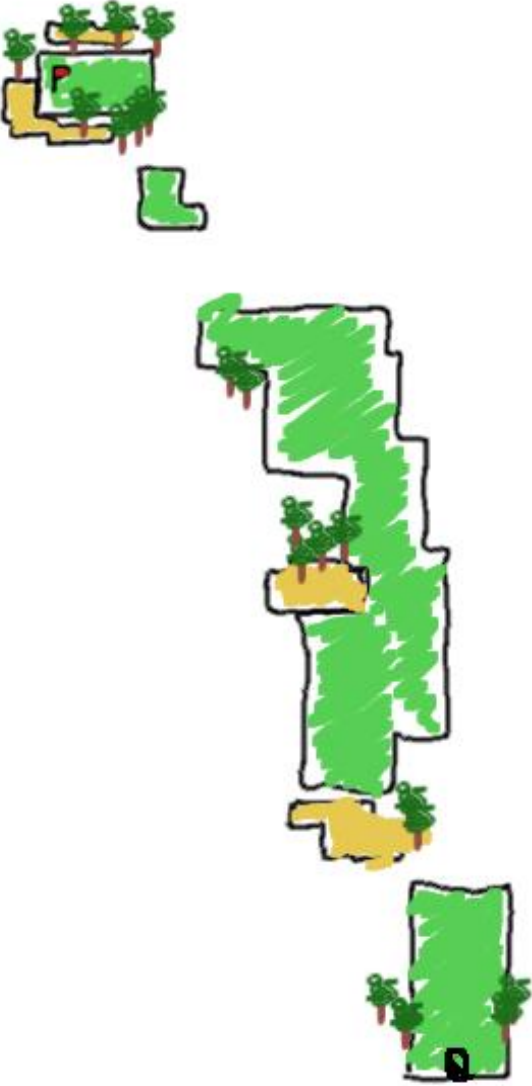Hole #5
Par: 4

Distance: 220 yds
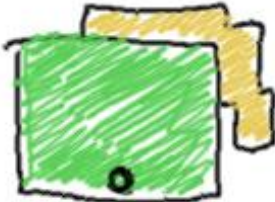


Hole #6
Par: 5

Distance: 550 yds

Hole #7
Par: 5

Distance: 443 yds

Hole #8
Par: 3

Distance: 210 yds



Hole #9
Par: 3

Distance: 183 yds



# CLUB STATISTICS

Speed (at launch), apex and carry for all clubs (except putter). These should be taken as a guide rather than gospel. These figures also assume maximum power, no wind and zero spin (hook/slice).

NOTE: *DR* = driver, *W* = wood, *I* = iron, *PW* = pitching wedge, *SW* = sand wedge.

| CLUB | SPEED (MPH) | APEX (YDS) | CARRY (YDS) |
|------|-------------|------------|-------------|
| DR   | 140         | 12         | 241         |
| 3W   | 120         | 14         | 230         |
| 5W   | 105         | 17         | 215         |
| 3I   | 97          | 18         | 204         |
| 4I   | 88          | 20         | 194         |
| 5I   | 80          | 20         | 173         |
| 6I   | 73          | 22         | 163         |
| 7I   | 68          | 23         | 152         |

| 8I | 64 | 25 | 145 |
| PW | 56 | 27 | 120 |
| 9I | 60 | 26 | 133 |
| SW | 50 | 27 | 97 |

# KNOWN BUGS

If you position the crosshair at the extreme left or right, and then swing with the driver (or most any other club), it might seem that the ball swerves into the middle of the screen in a manner not very true to the physics of the thing. This is an optical effect due to the camera having a very wide (certainly *too* wide) field of view. So when it looks like the ball should fly offscreen, the camera still projects it onto its *plate* and so it gets sucked back into the picture, so to speak. In the math routines under the hood (which you can't see), the ball is actually travelling directly straight, or at least as straight as spin and wind effects allow.

Tree trunks are entirely non-interactive. Both the ball and flag sprites don't know anything about them so they won't be drawn correctly with respect to depth, and ball-trunk collisions will never be recognized. This is a limitation of the graphics engine in its current form.

Sometimes your ball will land in the water (presumably!) but you won't hear the *splash* sound effect and the scene will be re-rendered before you can take another shot. I don't know the cause of this yet.

There's occasional screen-flicker in response to a ball-tree collision. Quite a lot of processing goes on inside the raster interrupt so it misses the next one (i.e. the next raster interrupt), meaning the screen isn't updated correctly.

# TECHNICAL

*This for a birdie!* is written in 6502 assembly with the venerable *acme* cross-assembler. My operating system is Xubuntu Linux 16.04 (LTS) 64-bit and my main text editor is gvim. They run on an HP Pavilion g6 laptop with an AMD E2-3000M and 4GB of RAM.

In no particular order, here's some of the other software I used to write the game:

- VICE (C64 emulator)
- gimp (raster graphics)
- inkscape (vector graphics)
- SpritePad
- CharPad
- GoatTracker 2
- mousepad (text editor)
- base_converter (my own number-base converter thing)
- LibreOffice Calc (spreadsheets)
- markdown (a command-line program that turns markdown into html - it's how I'm writing this!)
- Pike (an awesome scripting language)
- Perl (another awesome scripting language)

- bash (programmable shell)
- Tiled (a tile-map editor - but with a bit of persuasion (and scripting) you can use it to edit quite a lot of other things)

## AND...

The game's obviously hugely inspired by (and indebted to) the pioneering *Leaderboard* series by Bruce and Roger Carver, as well as the PC game, *Front Page Sports: Golf*.