WormWars

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COLLABORATORS

	TITLE : WormWars	

ACTION	*NAME*	*DATE*	*SIGNATURE*
WRITTEN BY	James R. Jacobs	February 10, 2022	

REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

Contents

Chapter 1

WormWars

1.1 Worm Wars

```
#*======================*#
#|   W O R M   W A R S   |#
#|     for the Amiga     |#
#|      Version 5.6      |#
#|   Wed 19 April 2000   |#
#|                       |#
#|   by James R. Jacobs  |#
#*======================*#
```


1.2 Overview

Worm Wars is an arcade game for 0-4 players. It combines the playability of its basic concepts with 28 interesting object types, 10 species of creature, and other enhancements.

1-4 worms travel around a rectangular maze leaving a deadly trail behind them, competing and sometimes cooperating with other creatures, collecting letters to advance to the next level.

The integral field editor allows you to load, edit and save user fieldsets, for greater lasting attraction. There is support for playing MED and IFF 8SVX files as music and sound effects respectively. Custom fonts and backgrounds are used.

It is enjoyable either for one player, or for competitive multiplayer games, and demo mode is available. Amiga or human control can be specified

for any worm. Two keyboard players and two joystick players are supported.
It is system-friendly, style compliant and it multitasks.

1.3 New Features

. New object: magnet.
. Enclosure.
. Help|Manual... menu item.
. Miscellaneous bugfixes and rule changes.

1.4 Usage

System Requirements
Startup

1.5 System Requirements

Hardware	Required	PAL capability
		about 384K free RAM
	Recommended	Colour monitor
		68030+
		Joystick
		Mouse
		about 1Mb free RAM
		Keyboard with numeric keypad
		Battery-backed clock
		Graphics board
Firmware	Required	Kickstart R2.04+
		exec.library V36+
		dos.library V37+
		gadtools.library V37+
		intuition.library V37+
		icon.library
	Recommended	Kickstart R3.1+
Software	Required	Workbench/CLI R2.04+
		asl.library V37+
	Recommended	OS3.5+
	MEDPlayer.library (included)	
		MultiView
		SetPatch
		Installer 44+

1.6 Startup

Workbench ToolTypes
CLI arguments

```
Startup

If the joyport cannot be allocated on startup, the blue worm cannot be
selected for human control.

The default behaviour is to load the music and sound effects automatically
at startup. The -f and -m CLI arguments prevent loading of the
sound effects and/or music respectively, until needed for use.

If WormWars.font cannot be loaded at startup, Topaz 8 is used.

If the specified default fieldset cannot be loaded at startup,
a blank, five-level fieldset is used instead, with a treasury floored
with silver.
```

1.7 Workbench ToolTypes

```
The following can be specified in the game's .info file. All are optional.

  TOOLPRI=<priority>             eg. TOOLPRI=5
     FILE=<fieldset>             eg. FILE=foo.fset
    GREEN=HUMAN|AMIGA|NONE       eg. GREEN=HUMAN
      RED=HUMAN|AMIGA|NONE
     BLUE=HUMAN|AMIGA|NONE
   YELLOW=HUMAN|AMIGA|NONE
     NOFX                        eg. NOFX
  NOMUSIC
  NOICONS
 OVERHEAD

These are equivalent to the relevant CLI arguments.

If you double-click on a fieldset file, the game will load with that
fieldset. ToolTypes are then, of course, taken from the fieldset's .info
file.
```

1.8 CLI Arguments

```
Command Information

                                WormWars

Format:          WormWars [-p=<priority>] [-f|nofx] [-m|nomusic]
                 [-i|noicons] [green=HUMAN|AMIGA|NONE]
                 [red=HUMAN|AMIGA|NONE] [blue=HUMAN|AMIGA|NONE]
                 [yellow=HUMAN|AMIGA|NONE] [[file=]<fieldset>]]

Template:        WORMWARS -F=NOFX/S,-M=NOMUSIC/S,-I=NOICONS/S,
                 -P=PRI/K/N,-O=OVERHEAD/S,GREEN/K,RED/K,BLUE/K,YELLOW/K,FILE

Purpose:         To run the Worm Wars game.
```

```
Specification:

    -p:         the priority that Worm Wars will be run at.
                Higher priorities can help the game to run
                closer to full speed. Lower priorities can
                help the system multitask, by giving less
                processor time to Worm Wars.

                The allowable range is -128 to +5, with the
                default being 0.

    -f:         don't bother loading sound effects until asked.

    -m:         don't bother loading music until asked.

    -o:         select overhead viewpoint at startup.

    -i:         don't create icons when saving.

    colour=HUMAN|AMIGA|NONE:
                the initial controls for the worms. For example,
                GREEN=HUMAN will select human control for the
                green worm. Unless otherwise specified, RED=HUMAN,
                YELLOW=AMIGA, GREEN=NONE and BLUE=NONE.

    <fieldset>: the pathname of your default fieldset. This
                is taken exactly as entered; an '.fset'
                extension is not automatically appended. This is
                loaded relevant from the current directory. If no
                argument is given, the default is PROGDIR:WormWars.fset.

    ?:          displays the command line argument format, instead
                of running the game.

    The order of the arguments are interchangeable.

Examples:

    WormWars /foo.fset       load foo.fset from parent
                             directory, and run at priority level 0

    WormWars -f -p-3 bar.fset
                             load bar.fset from current
                             directory, and run at priority
                             level -3, without loading sound effects

    WormWars HD1:foo.fset -m -f -p4 -o
                             load foo.fset from root
                             directory of HD1:, and run at
                             priority level +4, without loading music or
                             sound effects, and set overhead viewpoint

    WormWars -p+5 /fsets/bar.fset
                             load bar.fset from fsets/
                             sibling directory, and run at priority
                             level +5
```

```
    WormWars ?              display command format
```

1.9 Title Screen

Keys

```
Esc F1 F2 F3 F4 .. .. .. .. .. ..
.... 1 2 3 4 . . . . . . . . . . <-   ... Hel   . . . .
..... Q . . . . . . I O . . . Ret             . . . .
... .. A S . F . . . . . . . . ur      .      4 . . .
Shift . . . . . . N M . . ? Shift    . . .    1 2 3 E
   .. .. -----Spacebar---- Am ..              -.- . n
```

1-4 or F1-F4 cycles the relevant worm controls through 'None', 'Amiga' and 'Human'. If Shift is held as a qualifier, it cycles backwards.
Return or Enter begins the game.
M toggles the music on or off.
F toggles the sound effects on or off.
I toggles the viewpoint between overhead and isometric 3D.

Menu

Project|New	Amiga-N	Creates a blank, 5-level fieldset titled WormWars.fset.
Project|Open...	Amiga-O	FSET 4.4-5.6 are supported.
Project|Revert	Amiga-R	Reloads the current fieldset.
Project|Save	Amiga-S	
Project|Save As...	Amiga-A	
Project|Quit	Amiga-Q, Esc	Exits to CLI/Workbench.
Settings|Create Icons?	Amiga-I	Create icons when saving?
Help|Creatures...		List of creatures.
Help|Objects...		List of objects.
Help|Manual...		Opens this document.
Help|About...	Amiga-?, Help	Credits window.

Gadgets

Key	Colour	Human Controls	Letters
1	Green	Left Keyboard	C and L
2	Red	Right Keyboard	O and E
3	Blue	Joystick 2	M and T
4	Yellow	Joystick 1	P and E

Any combinations of human and Amiga control are acceptable, but at least one worm must exist.

1.10 Field Editor

The field editor allows you to load, edit and/or save the playfields which the worms compete on.

You are allowed to have up to 40 levels in each fieldset. The bonus level, that is, level 0, is not considered in the count of levels.

The high score table is loaded and saved as part of the fieldset file: there is a separate high score table for each fieldset. Making any modification to the fieldset will clear all the fieldset's high scores.

If you are have modified your field since you saved it and want to do something which will lose the changes you will be asked to confirm your intent.

Hints

Keys

```
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 ..
.... 1 2 3 4 5 6 7 8 9 . . . . .   Del Hel   ( ) . .
..... Q . E R . . . I O . . . Ret             7 8 9 .
Ctr .. A S . F . . . . . . . . ur      U      4 5 6 .
Shift . . C . . . N M . . ? Shift    L D R    1 2 3 E
   Al .. -----Spacebar---- Am Al              -0- . n
```

F1	gold
F2	silver
F3	empty
F4	wood
F5	stone
F6	metal
F7	teleport '1'
F8	teleport '2'
F9	start

M toggles the music on or off.
F toggles the sound effect on or off.

Delete and Help change the current level (lower and higher, respectively). When shifted, they change to level 1 or the final level, respectively.

C centres the cursor in the centre of the field.

Numeric . stamps the current brush at the current cursor location.

Numeric 0 toggles 'sticky mode'. This means that the 'brush' is held down: any single-square keyboard cursor movements will alter squares that the cursor passes over to the current brush. Toggling sticky mode 'on' also does a 'stamp' of the current brush at the current cursor location.

F1-F9, when unshifted, change your brush type to the appropriate type, as if the gadget had been clicked. When shifted, the level will be filled (except for start and teleports) with the requested square type, without change to the current brush.

Alphanumeric 1-9 change the square under the cursor to the relevant type, without affecting the current brush.

The cursor keys or numeric keypad move the cursor around the field. The default movement is one square. (If sticky mode is on, copies of the brush are left behind). Holding Alt moves the cursor in increments of five squares. Holding Shift or Ctrl moves the cursor to the relevant edge of the field. (The cursor is shown as a white square, or in sticky mode as a red square.)

Numeric (and) cycle the brush and square under the cursor through the available objects, lower and higher, respectively.

Menu

Project|New	Amiga-N	Clears the fieldset.
Project|Open...	Amiga-O	Loads a fieldset.
Project|Revert	Amiga-B	Reloads the current fieldset.
Project|Save	Amiga-S	Saves current fieldset.
Project|Save As...	Amiga-A	Saves with new filename.
Project|About...	Amiga-?	Credits window.
Project|Quit	Amiga-Q, Shift-Esc	Exits to CLI/Workbench.
Edit|Cut	Amiga-X	
Edit|Copy	Amiga-C	
Edit|Paste	Amiga-V	
Edit|Erase	Amiga-E	Clears this level.
Edit|Delete		Deletes this level.
Edit|Insert		Inserts blank level here.
Edit|Append		Adds blank level to end.
Settings|Create Icons?	Amiga-I	Create icons when saving?
Help|Creatures...		List of creatures.
Help|Objects...		List of objects.
Help|Manual...		Opens this document.
Help|About...	Amiga-?, Help	Credits window.

Remember that the menus, and their Amiga-key shortcuts, are unavailable whilst the pointer is over the playfield.

Joystick control

A joystick plugged into port ‘2’ can be used in the field editor. Directional controls move the cursor in single square increments. Holding the directional controls continue to move the cursor. The firebutton stamps the current brush at the current location. Holding down the firebutton whilst moving the stick, to produce lines of squares, is not yet supported, though autofire can emulate this behaviour.

You will need to use the keyboard and/or mouse to control other functions of the field editor, such as file operations, changing the brush, etc.

Mouse control

The gadgets to the left of the field will change your current ‘brush’ to the appropriate type. This brush is assigned to the left mouse button, and the keyboard and joystick. The pointer imagery will be altered to reflect your brush type, for some brush types.

The right mouse button, when over the playfield, will function as ‘empty’ rather than bringing up the menus.

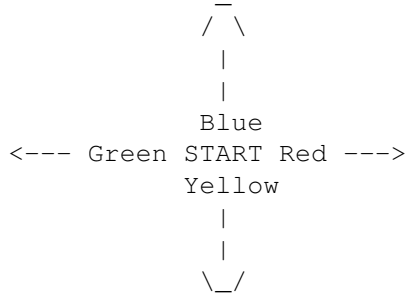
Clicking on the field will change the current cursor location to the chosen square, and change that square to the current brush (or to 'empty' if the right mouse button is clicked).

Teleports:

Two teleports, '1' and '2', may be defined in the field editor. These teleports will teleport to each other during gameplay. They are completely independent of any teleports that may be created randomly as the game progresses. It is illegal to have only one teleport as it would lead to nowhere. Therefore, whenever the field is saved or you return to the title screen, any lonely teleport is removed.

Start:

The starting location for all worms. This is invisible during gameplay. Usually it is best left where it is, in the centre of the field.



1.11 Hints

All worms start from the same square. Worms may emerge from it in any orthagonal direction. Leave enough space. Fields should not give an unfair advantage to any particular worms. The easiest way to ensure this is through the use of symmetry.

Mazes one square wide are difficult. 3-5 squares width is usually more appropriate for less skilled players.

Point-squares (ie. silver and gold) should be used with restraint, and generally only as a reward for difficult maneouvering. The average field should give have only about 5% point-square density. Richer fields can be made for experienced players, but they should be as a reward for skill.

Goats only fire when they are on the edge of the stone/wood/metal/tail/slime, but they move quasi-randomly. Therefore, some configurations will be more deadly than others. For example, thin lines provide maximum contact between worms and goats, and thick square areas will quickly generate new goats.

Lightly sprinkle your treasury with objects. Use objects very sparingly or not at all in other levels.

Metal squares which are aligned with each other can be deadly and

enjoyable, as fragments can bounce between one and the other endlessly
until a collision occurs. Remember also that metal is unjumpable.

1.12 Other Information

1.13 Contact Details

Registration

You are strongly encouraged to register your copy of Worm Wars. The
price for Amiga users is now only $AUS5, $US5 or £UK5!

This will enable continuing development of the software, and provide you
with free online technical support, additional developer support
documentation, regular previews and updates, extra fieldsets and
sound effects, fieldset conversion utilities, limited-edition enhanced
versions and special offers on other Amigan/Enable Software products.
Cheques and money orders should be made payable to James Jacobs.
Registration by credit card is possible via our website.

This software is shareware. There are no limits on usage, distribution
or modification, except that you are not allowed to modify and/or
distribute it for commercial purposes without consent.

Bugs

Official Amiga development and style guidelines have been adhered to,
using the official Amiga Developer CD-ROM 2.1 as authoritive reference.

Please contact us immediately if any bugs are found. You can use our
utility, Report+, to generate bug reports for Worm Wars, though this is
not required.

Submissions

Fieldsets, music (ST/MED format), samples (IFF 8SVX/WAV), backgrounds
(2-colour IFF ILBM 640*256) or even modified versions of the game can be
submitted and may be distributed with a future release, with
acknowledgements to the contributor(s).

Users are invited to contribute suggestions for the future of the game.

Sound effects

```
The game uses IFF 8SVX files for its sound effects. Full IFF 8SVX support
is not required for the purposes of the game, and therefore the following
rules are imposed on the samples:

Must be an IFF 8SVX FORM (ie. not CAT or LIST).
No compression schemes are allowed.
Maximum sample size is 128K.
Must be 'one shot' style rather than 'musical note' style sample.
Only the first (highest, longest) octave is used.
Must be a single channel (ie. monaural) sample.
8SVX.VHDR and 8SVX.BODY chunks are, of course, required.
All other chunks (eg. generic IFF chunk PROP; standard IFF chunks
  NAME, (C), ANNO, AUTH; proposed IFF chunk END; standard IFF.8SVX
  chunks ATAK, RLSE; extended IFF.8SVX chunks CHAN, PAN, SEQN, FADE)
  are ignored.
Sample rate is taken from the 8SVX.VHDR chunk.
The volumes of the samples are set from within the program.

IFF 8SVX or WAV files submitted to Amigan Software as contributions can, if
necessary, be converted by us to fit these restrictions.

Contact details

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                            ~cjaj/amigan.html

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                            RIVETT ACT 2611
                            Australia

Voice                       (H) Australia (02) 6287 4917
```

1.14 Amiga Development System

```
Real Amiga

Hardware            Commodore Amiga 1200HD/40 without DF0:
                    40Mb 2.5" IDE hard disk
                    2Mb chip RAM
                    33,600 bps Redback 336E modem
                    Akai colour television
                    Quickshot QS-131 joystick
                    Amiga International mouse and mat
                    Roctec 880K external floppy drive
Firmware            Kickstart 3.0
Software            Workbench/CLI AmigaOS 3.0
                    IFF 2 Source 1.0
                    OctaMED 5 and MEDPlayer Programmer's Sources
                    MultiView 40.8
                    CodeWatcher 1.4
                    LhA 1.51
```

```
                    SoundBox 2.2
                    AmigaGuide Writer 1.02
                    Installer 43.3

Emulated Amiga

Hardware            IBM-PC compatible Pentium 133 minitower
                    14MHz MC68EC020 (emulated)
                    1.2Gb (0.8Gb FAT) 3.5" SCSI hard disk
                    2Mb chip RAM
                    usually about 4Mb fast RAM
                    33,600 bps Redback 336E modem
                    Teco 14" Super VGA colour monitor
                    Quickshot QS-209F Skyhawk joystick
                    Microfilth mouse and Telstra mat
                    ESS MF-1868 Soundblaster Pro-compatible soundcard
                    Battery-backed clock
Firmware            Kickstart 3.1
Software            WinUAE 0.8.8 R8
                    Fellow 0.3.3
                    OS3.5 with Boing Bag 1
                    SAS/C 6.3 and SLink and SAS/C Editor and CodeProbe
                    Installer 44.7
                    Amiga Developer CD-ROM 2.1
                    BlowUp
                    PatchWork
                    MungWall
                    IO_Torture
                    Sashimi
                    CheckGuide
                    Deluxe Paint 4.5 AGA
                    Amiga Lint 2.0b
                    CygnusEd Professional 4.2
                    Gguide2txt
                    Other software as above

Thanks to all those whose software was used to create Worm Wars.
```

1.15 Source Code

```
The Amiga version is written in C (SAS/C 6.3), whilst the IBM-PC version
is written in hybrid C/C++ (Microfilth Visual C++ 5.0), using Microfilth
Foundation Classes.

Both platforms use the identical game engine, written in C, with API
calls for the relevant OS in other modules.

SAS/C 6.3 source code is provided, with which you may do as you wish
for non-commercial purposes. Developer documentation, graphics files,
and source code for either or both platforms is available free to
registered users.

The Amiga source files are as follows:

system.c        Amiga-specific code, including all AmigaOS calls.
```

```
engine.c        Code common to the Amiga and IBM-PC versions.
diff.h          Header file used by both modules. Amiga-specific.
same.h          Header file common to both modules and both platforms.
ww.s            AmigaDOS script to link modules into executable.
SCOPTIONS       SAS/C options we prefer to compile with.
libproto.h      MEDPlayer.library C header.
stdafx.h        Required for IBM-PC compatibility.
wormwars.ilbm   Graphics in IFF ILBM format.
```

1.16 History

```
5.6   [Amiga 2.04+][Windows 95/98/NT/2000]. Wed 19 Apr 2000.
5.51a [Amiga 2.04+][Windows 95/98/NT/2000]. Wed 29 Mar 2000.
5.51  [Amiga 2.04+].                        Tue 28 Mar 2000.
5.5   [Amiga 2.04+][Windows 95/98/NT/2000]. Tue 14 Mar 2000.
5.4   [Amiga 2.04+][Windows 95/98/NT/2000]. Sun  5 Mar 2000.
5.3   [Amiga 2.04+].                        Sun 13 Feb 2000.
5.21  [Amiga 2.04+][Windows 95/98/NT/2000]. Wed  5 Jan 2000.
5.2   [Amiga 2.04+].                        Wed 29 Dec 1999.
5.1a  [Windows 95/98/NT/2000].              Tue 28 Dec 1999.
5.1   [Amiga 2.04+][Windows 95/98/NT/2000]. Tue 23 Nov 1999.
5.0a  [Windows 95/98/NT/2000].              Tue  2 Nov 1999.
5.0   [Amiga 2.04+][Windows 95/98/NT/2000]. Mon  1 Nov 1999.
4.4   [Amiga 2.04+][Windows 95/98/NT/2000]. Wed 22 Sep 1999.
4.3a  [Windows 95/98/NT/2000].              Wed  8 Sep 1999.
4.3   [Amiga 2.04+][Windows 95/98/NT/2000]. Sun  5 Sep 1999.
4.2   [Amiga 2.04+][Windows 95/98/NT/2000]. Sat  7 Aug 1999.
4.1   [Amiga 2.04+][Windows 95/98/NT/2000]. Sun  6 Jun 1999.
4.0   [Amiga 2.04+].                        Sun  1 Nov 1998.
3.3   [Amiga 2.04+].                        Wed 29 Jul 1998.
3.2   [Amiga 2.04+].                        Tue  3 Dec 1996.
3.1   [Amiga 2.04+].                        Tue 16 Apr 1996.
3.0   [Amiga 2.04+]:                        Thu 18 Jan 1996.
2.2   [Amiga 1.2+]:                         Sun  5 Feb 1995.
2.1   [Amiga 1.2+]:                         Tue 27 Dec 1994.
2.0   [Amiga 1.2+]:                         Sat  3 Dec 1994.
1.7   [Amiga 1.2+]:                         Wed 26 Oct 1994.
1.6   [Amiga 1.2+]:                         Sun  9 Oct 1994.
1.5a  [Amiga 1.2+]:                         Thu 25 Aug 1994.
1.5   [Amiga 1.2+]:                         Sun 10 Jul 1994.
1.4   [MS-DOS]:                            Wed  9 Mar 1994.
1.3   [MS-DOS]:                            Fri 11 Feb 1994.
1.2   [MS-DOS]:                            Thu  4 Nov 1993.
1.1   [MS-DOS]:                                       1993.
1.0   [MS-DOS]:                                       1993.
```

1.17 Future

```
The future of this software is dependant on the support it
receives from its users. Your contribution supports further Amiga
software development and enhancement.
```

1.18 Other Products

Worm Wars for Windows 95/98/NT/2000

The Amiga version of Worm Wars has long been popular in the Amiga community, acknowledged as the premier snake game for many years. It is also available to the masses of benighted Windows users. This version includes dockable toolbars, a status bar and automatic saving/reloading of configuration information.

Report+ 3.0

Report+ is a freeware GadTools-based forms utility with six distinct functions:

1. It is an enhanced, reverse-engineered, 100% byte-compatible replacement for the official Commodore bug reporting tool (40.2).

2. It can generate Aminet-style readmes.

3. It can administer the Amiga Certified Software Engineer test.

4. It can generate C-style autodocs.

5. It can access the official manufacturer and product ID registries.

6. It can access the official IFF FORM registry.

1.19 How to Play

Worm Wars is an arcade game for 0-4 human players. Each player controls a worm. They move around a semi-toroidal rectangular (53x39) playfield, leaving their tails behind them. Each worm aims to amass the most points, to complete the levels and to survive as long as possible.

Controls	Worms
Letters	Orbs
Objects	Goats
Scoring	Protectors
Strategy	Slime
High Scores	Drips
	Penguins
Fragments	Whirlwinds
Teleports	Dogs
Timebombs	Clouds

1.20 Controls

In-game keyboard controls

Esc .. ..

```
.... . . . . . . . . . . . . . . .  ... ...    . . . .
..... Q W E . . . . . . P . . ...              7 8 9 .
... .. A S D F . . . . . . . . . .     U       4 5 6 .
Shift . Z X C . . . M . . . Shift   L D R     1 2 3 E
   .. .. -----Spacebar---- .. ..               -0- . n

     Green worm                     Either    Red worm
```

Esc exits to the title screen.
Shift-Esc exits to CLI/Workbench.
P pauses until P is pressed again.
M toggles the music on and off.
F toggles the sound effects on and off.

Worm control principles

Worm control is an acquired skill and is the single most important factor in playing successfully and enjoyably.

A worm has direction and speed. It is unable to ever stop completely, unless frozen by ice, but its speed is adjustable between three settings. Normally, it can turn 90\textdegree{} in any direction and moves orthagonally (north, south, east, west), but a nitro will enable 45\textdegree{} and 135\textdegree{} turns and diagonal movement.

The worm can pass through most types of square, though some cause damage. Some squares slow the worm down, halving its speed for every square traversed (to a minimum of ‘slow’). Stone, metal, goats and blocked teleports will block the worm’s motion as well as slow it.

Control of the worms is by keypresses; that is, press and release in a normal keystroke motion. There is no reason to ever hold down any key. Only fresh keystrokes are ever looked at by the program. Also, holding down a key may lock out your input (see below).

For joystick control, it is best to nudge the joystick briefly in the direction you want, and let it return to the central upright position.

Each move, a worm is able to do any one of five things:

- fire (in the current direction);
- change direction;
- change speed (one speed in either direction);
- jump; or
- nothing.

The worm will move one square regardless. This means you can:

fire in your current direction	and move in your current direction,
change direction	and move in the new direction,
change speed	and move in your current direction.
jump	leaping 2-4 squares and then landing, in your current direction.
nothing	and move in your current direction.

Speed changes are accomplished using the same keys as for turning. Pressing the direction you are already travelling increases your

speed; pressing against that direction decreases your speed.

Keyboard [green and red]

If only one human is selected for the keyboard, all three sets of keyboard controls are available for that player, whether it is the green or red worm. When only one human is selected for the keyboard, we suggest using the cursor keypad, as it has the best rollover properties (ie. you can press a key whilst another is already held down). However, the cursor keypad obviously does not support diagonal movement.

Two players may use the keyboard, playing at each end. If there are two humans selected for the keyboard, the cursor keypad cannot be used, due to keyboard hardware limitations. The green worm must use the leftmost controls (QWEASDZXC, spacebar) and the red worm must use the rightmost controls (the numeric keypad).

Note that the leftmost and rightmost controls do not rollover properly, due to keyboard hardware limitations. This means that you must release all keys before pressing another one, or the new keystroke is ignored and so is all further input from that player until all keys are released. The other player's keystrokes are completely unaffected by what you do; you can only cause this problem for yourself.

X and C are both down-right for the green worm.
Spacebar is the firebutton for the green worm.

5 and 2 are both down for the red worm.
0 and Enter on the numeric keypad are both firebuttons for the red worm.

Joystick [blue and yellow]

The blue worm can use a joystick plugged into port '2'. If the joystick could not be allocated during initialization then human control will be unavailable.

The yellow worm can use a joystick plugged into port '1'. This uses direct hardware access, rather than using the gameport.device. Therefore allocation can never fail.

1.21 Letters

There will always be one, neither more nor less, letter onscreen at any given time. When a worm collects it, another, which that worm needs, will appear.

The main objective of the game is to complete all the levels.
The level will be completed and the next loaded as soon as a worm has all eight letters, which together spell the word COMPLETE. All worms will then lose all their letters. The worm which completed the level receives these points:

100 x old level

```
   10 x seconds remaining
    1 x tail squares of your colour onscreen
```

Only worms and their protectors go on to the next level;
other creatures perish. Each level is faster than the last, and creatures
are faster and more frequent.

Only 2:00 (two minutes) are allocated for each level. After that time
has elapsed, the speed of all current creatures will be doubled, and the
frequency of all future creatures will be doubled.

1.22 Objects

Type	Points	Frequency
Affixer	60	Very rare
Ammo	20	Common
Armour	20	Common
Bias	50	Common
Bomb	30	Common
Bonus	10	Common
Clock	60	Very rare
Cyclone	90	Uncommon
Grower	50	Uncommon
Healer	90	Very rare
Ice	60	Very rare
Life	50	Uncommon
Lightning	40	Uncommon
Magnet	80	Rare
Missile	40	Uncommon
Multiplier	50	Rare
Nitro	10	Uncommon
Powerup	30	Uncommon
Protector	50	Rare
Pulse	40	Uncommon
Remnants	40	Uncommon
Sideshot	30	Rare
Slayer	40	Rare
Slower	40	Rare
Switcher	70	Rare
Tongue	20	Uncommon
Treasure	100	Very rare
Umbrella	100	Very rare

1.23 Affixer

This causes your protectors to stop rotating and
zigzagging. They are 'fixed' into position at whatever position they
were in at the time. This makes them more useful, as you can more easily
predict where they will be at any given time in advance.

1.24 Ammo

This will provide 2-6 bullets.

Bullets are fired by pressing your appropriate fire control.
If a bullet is available, you will fire. This bullet is instantaneous. If
you have no bullets, you may jump.

The width of your bullet depends on powerups. Normally,
it is 1 square wide, but it can be up to 7 squares wide. In reality,
up to 7 independent bullets are fired.

A bullet which hits a teleport will be teleported and continue on its way.
You will get the teleport skill bonus, too. That segment of
the bullet will thereafter leave a trail of gold behind it.

A bullet which goes through the same teleport twice, or is reflected off
metal twice, will be destroyed.

In the absence of obstructions, a bullet continues going until it reaches
the edge of the field.

1.25 Armour

Armour will protect worms from being hurt by many different causes.
For a list of them, click.

Armour is only temporary. Its power counts down at a constant rate, and
can be extended by the acquisition of more armour. It is a mode.

While you are in armour mode your head-image will be different.
When your armour is nearly gone your head will flash.

1.26 Bias

Provides these benefits:

missiles will not chase you.
you can shoot through wood.
whenever you shoot you will also launch a missile,
if possible.
vampirism: whenever you cause a worm to take damage,
you gain as many lives as they lost. Whenever you kill
an orb, goat, or penguin,
you gain a life.
any bombblast by you will turn squares to silver, not empty.
when you get a switcher, enemy remnants are also switched to your
own colour.

Bias counts down at a constant rate. It can be extended by the
acquisition of more bias. You can use bias in conjunction with one of
the modes.

1.27 Bomb

As soon as you go over one of these the bomb will go off, clearing the area around you. The blast radius is random, but is always constrained by the field edges.

1.28 Bonus

You will be given a random letter. It may be one you already have. You do not receive skill points for letter collection, only your points for collecting this object.

1.29 Clock

If there is still any time remaining, the amount of time remaining is increased.

1.30 Cyclone

When you get this, a whirlwind will be created somewhere on the playfield. It is just as dangerous to you as to everything else.

1.31 Grower

This will cause all gold and silver onscreen to 'grow', expanding into their neighbouring squares if those neighbouring squares are empty.

1.32 Healer

If you have less than your starting lives (100), boosts you back to 100.
If you have 100 or more, boosts you to 200.

1.33 Ice

Ice will freeze all orbs, goats, drips,
fragments, missiles, penguins, timebombs,
whirlwinds and enemy worms for a short period of time.
There is no defence against ice. Additional ice will be added onto your amount remaining.

1.34 Life

This provides 2-6 lives.

1.35 Lightning

When you get lightning, most squares adjacent to your tail flash momentarily. This will harm:

unarmoured enemy worm heads	
unarmoured orbs	replaced by bonus
goats	replaced by bonus
slime	replaced by empty
fragments	replaced by empty
drips	replaced by empty
objects	replaced by empty
penguin	replaced by empty
enemy missiles	reaplced by empty

The things that are not flashed are:

- stone
- metal
- wood
- letters
- skulls

1.36 Magnet

This causes some or all objects to travel towards you in a guided fashion. Apart from the fact that these objects are now 'magnetized' (ie. moving) they remain normal objects in every other respect. Objects which are magnetized may not be remagnetized by other worms.

1.37 Missile

Missiles are automatically guided. They hunt the following things:

- worms
- enemy missiles
- orbs
- goats

The missile hunts whatever is nearest, and recalculates its target every move.

Missiles will not cross field edges.

If you collect a missile whilst there is nothing for it to chase, you will receive only points; no missile will be generated.

1.38 Multiplier

Each time you get a multiplier, your scoring will be doubled. If you get more than one, it is doubled again each time. You can collect up to three (3) multipliers.

Your object points for actually getting the multiplier are affected by the new multiplier itself.

Multipliers	Scoring
0	*1
1	*2
2	*4
3	*8

At the end of each level, your multiplier will be reduced by one (ie. half).

1.39 Nitro

You will be able to move diagonally. Nitro cannot be lost.

1.40 Powerup

This is power for your bullets. Each bullet you fire becomes wider, requiring less aiming accuracy and causing more general devastation.

Symbol	Meaning
<number>	bullet number
:	worm head, facing up (north)
:	worm head, facing up-right (northeast)
#	worm tail

```
1              213            42135          6421357
1              213            42135          6421357
1              213            42135          6421357
1              213            42135          6421357
:               :               :              :
#               #               #              #
#               #               #              #
```

Single (no powerups)	Triple (one powerup)	Quintuple (two powerups)	Septuple (three or more)

```
          1              312            53124          7531246
         1              312            53124          7531246
        1              312            53124          7531246
       1              312            3124           31246
      :               :2             :24            :246
     #               #              #              #  6
```

```
      #               #               #               #
```

1.41 Protector

```
Acquisition of this item will give you a companion who stays near you,
collecting objects for you exactly as if you had moved
over them yourself, and defending you from some forms of damage.

You can have up to three protectors. The first two orbit around
your head. The third will be a 'nose', suspended three squares in
front of your head, which zigzags. The rate of orbiting/zigzagging is
the same as the worm's speed; that is, they move when the head moves.

An affixer will stop the protectors from rotating and
zigzagging.

is bounded by                           field edges
is invisible over                       friendly tail
is invisible over                       enemy tail if protector-worm
                                            is tongued
destroys                                enemy tail if protector-worm
                                            is untongued
destroys and earns points for           empty, silver and gold
destroys, earns points for              skulls
    and earns attributes for
is invisible over                       wood, stone and metal
is invisible over                       teleports
harms                                   unarmoured worm heads
is invisible over                       armoured worm heads
destroys                                orbs
destroys and is absorbed by             enemy protectors
passes freely through                   friendly missiles
destroys                                enemy missiles
bonusizes                               goats
reflects                                fragments
is invisible over                       timebombs
destroys                                drips
```

1.42 Pulse

```
7 fragments are fired outwards when this object is collected, similar to
an orb exploding. If another worm's pulse fragments are still onscreen,
less than 7 fragments will be generated.
```

1.43 Remnants

```
This enables your bullets to leave their remnants behind them as they
travel.

These images of the bullet do no harm to the worm that fired it,
```

nor to any other creature except enemy unarmoured worms.

1.44 Sideshot

This means that whenever you fire, in addition to any forward bullets you will also fire a bullet to each side.

1.45 Slayer

Slayers are used instantly. They will destroy all goats, slime, drips, orbs (by explosion), penguins and enemy missiles, and cause damage to all unarmoured enemy worms.

1.46 Slower

This will slow all fragments, orbs, goats, drips and penguins to half their previous speed. The speed of these is reset at the start of each level.

1.47 Switcher

All tail onscreen is instantly changed to your own colour. The main benefit of this is that you take much less damage over your tail than over an enemy tail, and also that you will receive more points at the end of the level.

1.48 Tongue

Tongue allows you to go through wood and worms (heads or tails) without taking damage.

Whenever a worm with tongue goes over a tail square it receives:

5 points	if it eats friendly tail. Tail turns to silver.
10 points	if it eats enemy tail. Tail turns to gold.

Your protectors will not eat any tails while you are in tongue mode, to help you maximise your score.

Tongue is only temporary. Its power counts down at a constant rate, but can be extended by the acquisition of more tongue. It is a mode.

While you are in tongue mode your head-image will be different. When your tongue is nearly gone your head will flash.

1.49 Treasure

The worms will enter a bonus level for a limited amount of time.
At the conclusion, the next level is reached. The full time bonus
(2:00, which is 1200 points) is given at the end of the treasury.

There are three types of bonus level: treasury, drips and clouds.

1.50 Umbrella

This skips 2-3 levels.

1.51 Strategy

Goats prefer to be near free space (empty, gold or silver), so that
they can shoot.

Faster speeds are useful for:

racing another creature for a letter or object;
hunting another creature when you have tongue or armour;
evading missiles and fragments;
laying tails to trap other creatures;
creating gold/silver with tongue;
amassing more square-points by moving;
amassing more square-points at level completion;
making large jumps;
causing protectors to rotate faster.

Slower speeds are useful for:

making small jumps;
waiting in a certain region of the screen;
not filling the playfield;
easier control.

You will get more points by shooting something than killing it by other
methods, and more from collecting real letters than getting bonuses.

Remember that bullets, bombs, missiles, fragments and drips will not
wrap around playfield edges. If you do, they cannot follow.

Certain objects work well together. Eg.:

bullets, powerups and bias;
multipliers and armour;
tongue and grower;
treasure and ice;
protectors and affixer.

To avoid a missile, get a worm, orb, enemy missile or goat, or a solid
barrier such as stone or metal, between you and it.

Going quickly between teleports yields many points. It is easier when done using tongue.

When you shoot an orb, it will explode, so it is better to be some distance away when doing so.

Shooting an orb (which will explode) or timebomb (which will detonate) can be a useful way of harming, or putting pressure on, an enemy creature which is at the opposite end of the field. However, note that you can be harmed by this. If you have at least triple shot, you can safely shoot an orb if you are not directly lined up with it (and you do not move into the path of the fragments). For shooting timebombs, it is best to be as far away from it as possible.

The best way to handle slime is to encapsulate it with your tail, so it cannot spread.

1.52 High Scores

High scores are part of the .fset file. To save them, save the fieldset. Any changes to the fieldset will automatically clear the high scores.

The Amiga worms have names which honour the four original Amiga designers. Even on the IBM-PC version. :-D

1.53 Worms

Worms can be controlled by humans or the Amiga. For information on how to control them, click.

A worm consists of a head, one square in size, and a tail, which is formed in the wake of the head's passing. As the worm moves, the tail stretches out behind its head. Collision with any part of a worm by the head normally results in damage (to the head).

Worms can move in the four cardinal orthagonal directions and at three speeds; getting a nitro allows diagonal movement.

Worms begin with 100 lives. Whenever you are taking damage your head will flash as a skull. When 0 lives is reached, the worm is dead and the skull is permanent. Every 1,000 points you will be awarded an extra life.

Modes

Armour and tongue are mutually exclusive 'modes'.
You can only have one in use (and therefore counting down in strength) at a time, and it will be whatever was most recently collected. The head's appearance indicates whether it is in a 'mode', and also the direction it is currently travelling. It will flash when the current mode is at low strength. When the strength reaches zero, the other mode is automatically

engaged, if above zero.

Skulls

If a worm or protector collects the skull of a dead worm,
the collecting worm will get everything the dead worm had, in addition of
course to what it already had itself:

- multiplier
- bias
- powerups
- ammo
- armour
- tongue
- nitro
- affixer
- remnant
- sideshot

Skulls absorb any bullets, missiles, drips or fragments,
and are immune to bombblasts.

Jumping

A worm with no ammo can jump instead. If the destination
is stone, metal, a goat or a blocked teleport you will not
jump, and metal cannot even be jumped over. The distance varies according
to your speed, and is shown below.

Name	Speed	Jump distance
. Slow	half speed	2
. Normal	normal	3
. Fast	double speed	4

Pain

Method	Damage	Notes
enemy drip	5 lives	unless biased
whirlwind	5	
blocked teleport	5	worm motion is stopped
goat	2	worm motion is stopped
metal	2	worm motion is stopped
stone	1	worm motion is stopped

‘Worm motion is stopped’: Every move in which the worm takes damage from
that cause, its speed is halved (to a minimum of ‘slow’). The worm is
unable to actually enter the square.

Unarmoured worms can also die by the following methods:

remnant	5	worm is slowed
worm bullet	5	
enemy missile	5	
enemy protector	5	
orb	5	

fragment	3	if armoured, fragment is reflected
bombblast	3	
lightning	3	
enemy slayer	2	
slime	2	
wood	1	worm is slowed

Untongued worms can also die by the following methods:

worm head	5	
worm tail	1	worm is slowed

Enclosure

If your tail forms a square which measures 6x6 inclusive of the tail (4x4 exclusive of it), this is known as enclosure. Any squares within the closed area which are empty, silver, gold or enemy tail are converted to your tail. You receive 10 points for each enclosed square which is thus converted.

Note that enclosure is only checked for when the worm's head is at a corner of the square.

Symbol	Meaning
:	worm head
#	worm tail
.	enclosed area

```
######
#....#
#....#
#....#
#....#
#####:
```

1.54 Orbs

Orbs are controlled by the Amiga. They move diagonally and bounce whenever they hit a tail, metal, stone, wood or goat, so their motion is be predictable. Orbs have their own scores, which are added to the scores of those that kill them.

Objects

Objects can be used by orbs, as follows:

Affixer	This will remove any affixer from any worms.
Ammo	The orb will explode, unless it is armoured.
Armour	Same as worm.
Bias	This will remove all bias from all worms.
Bomb	Same as worm.
Bonus	Points only.
Clock	The time remaining is reduced.
Cyclone	Doubles the orb's speed.

Grower	All wood onscreen will ‘grow’, expanding into their squares if those neighbouring squares are empty.
Healer	The orb will split.
Ice	The orb will split.
Life	The orb will split.
Lightning	The orb will explode, if unarmoured.
Missiles	All missiles will be destroyed.
Multiplier	Same as worm.
Nitro	Doubles the orb’s speed.
Powerup	Doubles the orb’s speed.
Protector	This will slay all protectors.
Pulse	The orb will explode, if unarmoured.
Remnants	This will remove any remnants from all worms.
Sideshot	This will remove any sideshot from all worms.
Slayer	The orb will explode, if unarmoured.
Slower	Double’s the orb’s speed.
Switcher	All tail onscreen is instantly changed to wood.
Tongue	This will allow the orb to pass through wood and tails instead of bouncing off them.
Treasure	The orb will split.
Umbrella	The orb will split.

Splitting

The orb will split into up to four orbs, depending on the number of orbs already in play.

Each orb wilil be an exact clone of the original in all attributes, except starting direction but including score. Once born, they are completely independent, of course.

Modes

Armour and tongue are mutually exclusive ‘modes’.
An orb can only have one in use (and therefore counting down in strength) at a time, and it will be whatever was most recently collected. When the strength of it reaches zero, the other mode is automatically engaged, if above zero. The orb’s colour indicates the ‘mode’ the orb is in:

Colour	Mode
Yellow	None
Blue	Tongue
Red	Armour

Collisions

An orb with tongue passes through and destroys slime.
An orb with armour bounces off slime. An orb with neither dies.

All orbs can be slain in these ways:

Notes	Cause
*	Any worm gets a slayer. All orbs explode.
#	Becoming trapped (unable to move).
#	Collision with another orb.

```
        #       Collision with worm tail.
        .       Collision with an armoured worm.
        .       Collision with a protector.
        .       Collision with a whirlwind.

Unarmoured orbs can also be slain in these ways:

        *       Worm bullets.
        *       Fragments.
        *       The orb collects ammo or slayer.
        *       Drips.
        #       Bombblasts.
        #       Missiles.
        #       Lightning.
        .       Collision with an unarmoured worm.
        .       Collision with slime.

        Symbol  Explanation

        *:      The orb explodes.
        #:      A bonus is left at the site of death.
```

1.55 Goats

```
Goats walk along the top of stone, metal, wood, tails and slime, firing
fragments randomly when they are at an edge (next to
somewhere they can't go). Goats prefer to be at an edge and tend to move
towards and stay at one. When not at an edge, they cannot fire.

Goats can be slain in these ways:

        Worm bullet
        Fragment
        Slayer
        Orb bouncing off it
        Bombblast
        Missile
        Drip
        Lightning
        Whirlwind
        Dog

Dead goats turn into bonuses.
```

1.56 Slime

```
Slime may be randomly created at during play. This slime can 'grow' into
some adjacent squares over time. It never moves, only grows.
```

1.57 Drips

Drips appear near the top of the field, and fall downwards. They can be any of the four colours (green, red, blue and yellow).

Drips of your own colour are worth points. Drips of the wrong colour hurt you. In either case, the drip is destroyed.

1.58 Fragments

Fragments are generated by:

- orb explosions.
- pulse explosions.
- goats firing.

Fragments travel until they are absorbed or reach the field edges.

1.59 Penguin

Penguins are randomly created, independent creatures which move randomly. They are not aggressive but will harm things that collide with them. They only ever move onto empty (or silver/gold) squares.

1.60 Whirlwind

These are created when a worm collects the cyclone object.
They move very quickly in a random fashion, though they tend to drift slightly upwards over time. They are one of the more dangerous types of creature.

They destroy protectors, orbs, goats, penguins, missiles, slime, drips, fragments, metal, stone, wood and tail. They destroy timebombs without detonating them. They are immune to lightning, bullets, bombblasts, fragments. They are affected by slayer and teleports. They harm worms, whether armoured or not, without being themselves destroyed. If they leave the playfield they are destroyed.

1.61 Dog

These appear randomly. They wait patiently until a worm passes over them. Then they begin to awaken and soon they chase the worm along its tail. They cannot cross field edges.

1.62 Cloud

These appear randomly. They only ever move horizontally, left and right, changing direction at each end of the playfield. Occasionally they will shoot out a pair of fragments: one up and one down.

1.63 Teleport

These always come in pairs. Going through one will teleport you to the other, and bestow points also.

If a teleport is blocked (there is stone, metal or a goat next to its partner on the side where you would emerge) then the teleport cannot be used and is dangerous. You will slow down from hitting it and not be able to use it. It is obviously possible for a teleport to be blocked to some approaches and unblocked to others.

Protectors are invisible over teleports.

Two teleports may be defined in the field editor; another two may appear randomly during play. These two sets are completely independent of one another.

1.64 Timebomb

This ticks from 9 down to 0 before detonating. During ticking, it can be pushed around by worm heads. If pushed into a teleport or off the field edges, 100 points are given and the timebomb is destroyed without detonation. If pushed against anything, or shot, or hit by most things, it will detonate immediately, with harmful consequences to anything within its radius. Points are never awarded for timebomb blasts. The explosion is the same as a normal bomb.

1.65 Scoring

Square points

All

1	Empty
10	Silver
20	Gold
100	Skull
100	Letter

Objects are worth various amounts of points.

Worms and orbs

```
         20    Teleport

    Worms and protectors

        100    Drip of your colour

Skill points

    All

         50    Kill a penguin.
         50    Kill a goat.
        100    Hurt an enemy worm, without hurting yourself.

  Orbs are worth their scores to anything that kills them.

    Worms

          5    For each square you turn to silver with tongue.
         10    For each square you turn to gold with tongue.
         10    For each enclosed square which is converted.
         50    You hurt something (worm, orb, goat or penguin) by shooting.
        100    You push a timebomb off the field edges or into a teleport.

There are also level completion bonuses.

All points are multiplied by the number of worms selected for human and
Amiga control, and of course by any multipliers.
```