WormWars

James R. Jacobs

	COLLABORATORS		
	TITLE : WormWars		
ACTION	*NAME*	*DATE*	*SIGNATURE*
WRITTEN BY	James R. Jacobs	June 25, 2022	

	REVISION HISTORY		
NUMBER	DATE	DESCRIPTION	NAME

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Chapter 1

WormWars

1.1   Worm Wars 4.3 for Amiga

```
                              #*=======================*#
              #|   W O R M   W A R S   |#
              #|     for the Amiga     |#
              #|       Version 4.3     |#
              #|  Sun 5 September 1999 |#
              #|                       |#
              #|   by James R. Jacobs  |#
              #*=======================*#


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1.2   Overview

Worm Wars is an advanced 'snake' or 'Tron' arcade game. It combines the
playability of the basic concept with 21 interesting object types,
6 species of creature, and other enhancements, for more diverse
and strategic gameplay.

One to four 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.

It is enjoyable either for one player, or for competitive multiplayer
games, and demo mode is available. Amiga control can be specified for
any worm. Two keyboard players and one joystick player are supported.
It is system-friendly, style compliant and it multitasks.

It is available for the Amiga and for Windows 95/98/NT, and is portable
to other platforms.

1.3 New Features

                        . New object:
                clock
                .
    . Isometric 3D support for Amiga.
  . AmigaOS 3.5-aware icon.
  . Edit menu.

1.4 Usage

                System Requirements

                Installation and Startup

1.5 System Requirements

Hardware	Required	PAL capability
		about 256K free RAM
		about 2Mb disk space
	Recommended	Colour monitor
		68020+
		Joystick
		Mouse
		about 1Mb free RAM
		Keyboard with numeric keypad
Firmware	Required	Kickstart R2.04+
		exec.library V36+
		dos.library V37+
		gadtools.library V37+
		intuition.library V37+
Software	Required	Workbench/CLI R2.04+
		asl.library V37+
	Recommended	MEDPlayer.library (included)
		MultiView
		SetPatch

1.6 Installation and Startup

Installation and Uninstallation

No Installer script is provided or required: simply copy
the WormWars/ directory and its contents to your preferred
installation location. It is suggested you move MEDPlayer.library
to LIBS:.

To uninstall, simply delete the WormWars/ directory and its contents.

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

Command Information

                                WormWars

Format: WormWars [-p=<priority>] [-f|nofx] [-m|nomusic]
                   [[file=]<fieldset>]]

Template: WORMWARS -F=NOFX/S,-M=NOMUSIC/S,-P=PRI/K/N,-O=OVERHEAD/S,
                   FILE/F

Purpose: To run the Worm Wars game.

Specification: <priority>: 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. A leading '+' for a positive number is
                              optional.

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

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

                   -o: select overhead viewpoint at startup.

                   <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, or your default fieldset cannot
                         be loaded, the default is 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/
                                             subdirectory of parent
                                             directory, and run at priority
                                             level +5
             WormWars ?                      display command format
```

No Workbench ToolTypes are currently supported.

1.7 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 4.1-4.3 are supported.
Project|Save         Amiga-S
Project|Save As...   Amiga-A
Project|About...     Amiga-?, Help        Credits window.
Project|Quit         Amiga-Q, Esc         Exits to CLI/Workbench.
```

Gadgets

```
        Key   Colour      Human Controls      Letters


          1    Green       Left Keyboard

        C and L

          2    Red         Right Keyboard

        O and E

          3    Blue        Joystick

        M and T

          4    Yellow      None

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

1.8 Field Editor

The field editor allows you to load, edit and/or save the ←
                    playfields
which the worms compete on. You can create any pattern you desire, subject
to a few minor rules, and therefore the onus is on the creator to ensure
that the field is well-designed.

You are allowed to have up to 30 levels in each fieldset, and must have
at least 1. (The 'treasury', 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 .. ..
.... 1 2 3 4 5 6 7 8 . . . . . . .   Del Hel    ( ) . .
..... Q . E . . . . I O . . . Ret              7 8 9 .
Ctr .. A S D F . . . K . . . . ur      U       4 5 6 .
Shift . . . . . . 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.

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

Numeric 0 toggles 'sticky mode'. The sticky indicator will light
up or be extinguished, as appropriate. Sticky mode 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.)

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, O	Loads a fieldset.
Project|Save	Amiga-S, S	Saves current fieldset.

```
Project|Save As...    Amiga-A, A                  Saves with new filename.
Project|Quit          Amiga-Q, Q, Shift-Esc       Exits to CLI/Workbench.
Project|About...      Amiga-?                     Credits window.
   Edit|Cut           Amiga-X
   Edit|Copy          Amiga-C
   Edit|Paste         Amiga-V
  Level|Insert        Amiga-I, I                  Inserts blank level here.
  Level|Delete        Amiga-D, Shift-D            Deletes this level.
  Level|Erase         Amiga-E, Shift-E            Clears this level.
  Level|Append        Amiga-K, K                  Adds blank level to end.
```

Remember that the menus, and their Amiga-key shortcuts, are
unavailable whilst the pointer is over the playfield. The other shortcuts
for the menu items will still be available.

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.

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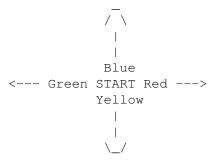   will teleport to each other
during gameplay. They are completely independent of any teleports that
may be created randomly as the game progresses. It is illegal to have
only one teleport as it would lead to nowhere. Therefore, whenever the
field is saved or you return to the title screen, any lonely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

```
                                   _
                                 / \
                                  |
                                  |
                                Blue
                  <--- Green START Red --->
                               Yellow
                                  |
                                  |
                                 \_/
```

1.9 Hints

One starting location is specified for all worms. It must be a
considerable distance from all barriers as worms may emerge from it
in any orthogonal direction. Also, try not to make any field give an
unfair advantage to any particular worms. (The easiest way to ensure this
is through the use of symmetry.) Remember especially to give plenty of
room in the Y-dimension, as the Y-axis is smaller than the X-axis.

Avoid the temptation to make mazes which have their corridors only 1
square wide, unless you realize that it will be very difficult to play.
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.

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

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.

1.10 Other Information

Contact Details

Platforms

Development System

Source Code

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1.11 Contact Details

Registration

You are strongly encouraged to register your copy of Worm Wars for
$AUS20 or $US20. 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.

This Amiga version of Worm Wars is freeware. 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. You
are allowed to create and distribute other 'distributions' of Worm Wars,
for example, with other fieldsets and music, for non-commercial purposes.

Registering on the Amiga version entitles you to all the benefits of
IBM-PC registration, and vice versa.

Bugs

Official Commodore development and style guidelines have been adhered to,
using the official Amiga Technical Reference Series as authoritive
reference.

Please contact us immediately if any bugs are found.

Submissions

Fieldsets, music (ST/MED format), samples (IFF 8SVX/WAV) 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.
Thanks to Jilles Tjoelker for his suggestions.

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 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 repetition flag of the sample (ie. play once or loop), and the volume
  of the sample, are set in the game header files.

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

Contact details

Mail   James Jacobs
                              Amigan Software
                              11 Yate Gdns
                              RIVETT ACT 2611
                              Australia

Voice   (H) Australia (02) 6287 4917

EMail   james_jacobs@altavista.net

URL   http://users.interact.net.au/
                                   ~cjaj/amigan.html

1.12 Platforms

Worm Wars 4.3 is available for the Commodore/Escom/Gateway Amiga and
also for Microfilth Windows 95/98/NT.

It is directly in your interests to register this software.
Amigan Software has and always will continue to provide quality Amiga
software. The Amiga community which has fallen on hard times needs to
support its users and developers. As a mark of respect for the Amiga
we have not released a crippleware version on it: the freely
distributable Aminet version contains all features, including field
editor and source code, unlike the IBM-PC versions, in which registration
policy is enforced more harshly, because I loathe IBM-PC users! :-)
Nevertheless I regret to say that the lack of Amiga community support
has been the reason I have done an IBM-PC version.

1.13 Amiga Development System

Real Amiga

Hardware   Commodore Amiga 1200HD/40

```
                                40Mb 2.5" IDE hard disk
                                2Mb chip RAM
                                14,400 bps NetComm Roadster 144P modem
                                Commodore 1084S colour monitor
                    Quickshot QS-131 joystick
                    Amiga International mouse and mat
Firmware                        Kickstart 3.0
Software                        Workbench/CLI AmigaOS 3.1
                                SAS/C 6.3 and SAS/C Editor
                                Deluxe Paint 4
                                IFF 2 Source 1.0
                                OctaMED 5 and MEDPlayer Programmer's Sources
                                MultiView 39.16
                                CodeWatcher 1.4
                                LhA 1.51
                                SoundBox 2.2


Emulated Amiga

Hardware                        IBM-PC compatible Pentium 133 minitower
                                1.2Gb (0.8Gb FAT) 3.5" SCSI hard disk
                                2Mb chip RAM
                                usually about 4Mb fast RAM
                    14,400 bps NetComm Roadster 144P modem
                    Teco 14" Super VGA colour monitor
                                Quickshot QS-209F Skyhawk joystick
                                Lexmark Colour 1000 inkjet printer
                                Microfilth mouse and Telstra mat
                                ESS MF-1868 Soundblaster Pro-compatible
                                   soundcard
Firmware                        Kickstart 3.1
Software                        WinUAE 0.7.5b
                                Fellow 0.3.3
                    Workbench/CLI AmigaOS 3.5 Prerelease
                                Other software as above
```

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

1.14 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,
Audodoc-style function descriptions, background information and source
code for either or both platforms is available free to

               registered users
                  .

```
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.
stdafx.h  Blank header file, for compatibility with IBM-PC.
ww.s        AmigaDOS script to link modules into executable.
SCOPTIONS   SAS/C options we prefer to compile with.
libproto.h  MEDPlayer.library C header.
```

The source code for the IBM-PC version is included with the registered IBM-PC
version. It uses several additional files.

Note that the executable is not optimized, and the executable is MC68000
code. Recompiling with optimizations enabled, and for your exact CPU type,
will increase the speed and reduce the size of the game.

Porting

Developers are welcome to port Worm Wars to other platforms. There are no
plans by Amigan Software to ourselves concurrently develop more than the
two existing platforms, but registered users will be given assistance in
porting to any desired platform. After all, now that there is a Windows
95/98/NT version, nothing is filthier than that! :-)

Developers can rewrite system.c for their target platform, and
use the existing generic engine.c, which will continue to be
updated automatically for them by Amigan Software.

1.15 History

```
4.3  [Amiga 2.04+][Windows 95/98/NT]. Sun 5 Sep 1999.
4.2  [Amiga 2.04+][Windows 95/98/NT]. Sat 7 Aug 1999.
4.1  [Amiga 2.04+][Windows 95/98/NT]. 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 beta [Amiga 1.0+]: Sun 5 Feb 1995.
2.1  [Amiga 1.0+]: Tue 27 Dec 1994.
2.0  [Amiga 1.0+]: Sat  3 Dec 1994.
1.7  [Amiga 1.0+]: Wed 26 Oct 1994.
1.6  [Amiga 1.0+]: Sun  9 Oct 1994.
1.5a [Amiga 1.0+]: Thu 25 Aug 1994.
1.5  [Amiga 1.0+]: 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.
```

1.16   Future

              The future of this software is dependant on the
              support
               it
receives from its users. Your contribution will support further Amiga
software development and enhancement, at the expense of the IBM-PC version.

1.17   Other Products

Worm Wars 4.3 for Windows 95/98/NT

The Amiga version of Worm Wars has long proved its worth in the Amiga
community, acknowledged as the premier snake game for many years. Now at
last it is available to the masses of benighted Windows users. This
version is equivalent to the very latest incarnation of the Amiga game,
and even has features lacking from the Amiga version, such as dockable
toolbars, a status bar, isometric 3D and automatic saving/reloading of
configuration information.
   Worm Wars 4.3 for Windows 95/98/NT is now available from Amigan
Software or Enable Software. The earlier versions, for inferior machines
(Jaemol Tron), are still available (V2.2 beta for Kickstart 1.0-2.0 and
V1.4 for MS-DOS).

1.18   How to Play

              Worm Wars is an arcade game for zero to three human players. Each ←
                player

              controls
               a
              worm
              . They move around a rectangular (53x39) playfield,
leaving their tails behind them. Each
              worm
               aims to amass the most
possible
              points
              , to
              complete
               the levels and to survive
as long as possible.

The edges of the field are semi-toroidal.
              Worms
               and
              orbs
              can cross sides.
              Protectors
              ,
              killers
              ,

```
            bullets
            ,

            missiles
            ,
            bombs
            ,
            fragments
             and
            drips
             respect the field edges.


             Controls

             Worms

             Letters

             Orbs

             Objects

             Killers

             Scoring

             Protectors

             Strategy

             Slime

             High Scores

             Drips

             Fragments

             Teleports
```

1.19 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. It can turn 90\textdegree{} in any direction. Normally, it can ←
    only
move orthogonally (north, south, east, west), but a
                nitro
                will enable diagonal movement.

The worm can pass through most types of square, though some cause damage.
Wood and tail slow the worm down, halving its speed for every square
traversed (to a minimum of 'slow'). Stone, metal, killers and blocked

                teleports
                , however, 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 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]

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

1.20 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, all newly created orbs, killers, fragments and drips will be
at double their usual speed, and the frequencies of orbs, killers, slime
and drips will also be doubled, until the level is completed. Anything
already in existence at the time is unaffected.
```

1.21 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

        Grower
             50       Uncommon

        Healer
             90       Very rare

        Ice
             60       Very rare

        Life
             50       Uncommon

        Missile
             40       Uncommon

        Multiplier
             50       Rare

        Nitro
```

```
                10       Uncommon


        Powerup
                30       Uncommon


        Protector
                50       Rare


        Slayer
                40       Rare


        Switcher
                70       Rare


        Tongue
                20       Uncommon


        Treasure
                100      Very rare


        Umbrella
                100      Very rare
```

1.22   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.

1.23   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 silver behind it.
If you have
                    bias
                    , the trail will be of gold.

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.

is bounded by	field edges
destroys	tails
destroys	empty/silver/gold
destroys	objects
is absorbed by	skulls
if biased, destroys, else is absorbed by	wood
is absorbed by	stone
is reflected by	metal
is teleported by	unblocked teleport
is absorbed by	blocked teleport
harms and is absorbed by	unarmoured worm heads
is absorbed by	armoured worm heads
explodes and is absorbed by	unarmoured orbs
is absorbed by	armoured orbs
passes through	friendly protectors
is absorbed by	enemy protectors
passes through	friendly missiles
destroys	enemy missiles
bonusizes and is absorbed by	killers
destroys and is absorbed by	fragments
is absorbed by and sets off	timebombs
destroys	drips

When a bullet sets off a timebomb the effect is as if the timebomb had
elapsed its countdown and detonated normally (ie. you do not receive
points for the blast, and can be harmed by it). So beware.

1.24 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.
```

1.25 Bias

```
              Provides these benefits:


              missiles
               will not chase you.
     when you get
              bonuses
              , the
              letter
               will be one you need.
     you can
              shoot
               through wood.
     whenever you
              shoot
               you will also launch a
              missile
              ,
              unless you already have an active
              missile
              .
     whenever one of your
              bullets
               goes through a
              teleport
               it will
              thereafter leave a trail of gold instead of silver.
     vampirism: whenever you cause a
              worm
               to take damage,
              you gain as many lives as they lost. Whenever you kill
              an
              orb
               or
              killer
              , you gain
              a life.
     any bombblast by you will turn squares to silver, not empty.
     any colour of drip you get will be as if it were your own colour.
     when you get a grower, your tail will also grow.

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
              .
```

1.26 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.

is bounded by	field edges
does not affect	empty/silver/gold
destroys	objects
does not affect	skulls
does not affect	wood
does not affect	stone
does not affect	metal
does not affect	teleports
harms	unarmoured worm heads
does not affect	armoured worm heads
bonusizes	unarmoured orbs
does not affect	armoured orbs
does not affect	friendly protectors
does not affect	enemy protectors
does not affect	friendly missiles
destroys	enemy missiles
bonusizes	killers
destroys	fragments
destroys	timebombs
destroys	drips

A bomb may at any time randomly change to a timebomb, which 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 things, or shot, or hit by a fragment, or an orb,
it will detonate immediately. If this was from pushing against things,
or the timebomb was shot by a
worm bullet
, the worm responsible
gets the points from the blast. If an orb set the timebomb off, it gets
the points. In any other case, no points are given from the blast. There
can be up to four timebombs onscreen simultaneously.

If a timebomb is pushed over a
skull
, the skull is
destroyed and points are given to the pusher, but none of dead worm's
attributes are acquired.

1.27 Bonus

You will be given a random
letter
. It may be one you already have,
unless you have
bias

. You do not receive
skill points
for
letter
 collection, only your points for collecting
this
object
.

1.28 Clock

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

1.29 Grower

This will cause all gold and silver onscreen to 'grow', expanding into
their neighbouring squares if those neighbouring squares are empty. If you
have bias, all tail of your colour will also grow.

1.30 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.

1.31 Ice

Ice will freeze all
orbs
,
killers
,
drips
,

fragments
,
missiles
, timebombs and enemy
worms
 for a
short period of time. There is no defence against ice. Additional ice will
be added onto your amount remaining.

1.32   Life

This provides 2-6 lives.

1.33   Missile

Missiles are automatically guided. They hunt the following things:

```
worms                preferred
enemy missiles       preferred
orbs
killers
```

The missile hunts whatever is nearest, and recalculates its target
every move. An orb or killer must be twice as close as the nearest
'preferred' target (worm or enemy missiles) for the missile to hunt it.

Missiles will not cross field edges. They move at 'fast' speed.

Although they will hunt
                armoured

                worms
                 and
                armoured
                 orbs,
they cannot harm them and will be themselves destroyed on impact.

Although friendly missiles never chase you, you will destroy them by
getting in their way, and will be yourself harmed if
                unarmoured
                ,
so beware. Only one missile can be active for each worm at any given time.

destroys	tail
destroys	silver and gold
is absorbed by	skulls
destroys	objects
destroys	wood
is absorbed by	stone
is absorbed by	metal
is teleported by	unblocked teleports
is absorbed by	blocked teleports
harms and is absorbed by	unarmoured worm heads
is absorbed by	armoured worm heads
destroys and is absorbed by	unarmoured orbs
is absorbed by	armoured orbs
passes through	friendly protectors
is absorbed by	enemy protectors
bonusizes and is absorbed by	missiles
bonusizes and is absorbed by	killers
destroys and is absorbed by	fragments
is absorbed by and sets off	timebombs
is absorbed by	drips

If you collect a missile:

        while you already have an active missile; or
        there are no other worms, missiles, orbs or killers alive

then you will receive only points; no missile will be generated.

1.34 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).

1.35 Nitro

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

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

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

1.37 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                               killers
reflects                                fragments
is invisible over                       timebombs
destroys                                drips
```

1.38 Slayer

                   Slayers are used instantly. They will destroy all
                   killers
                   ,

                   slime
                    and
                   drips
                   , and cause damage to all
                   unarmoured
                   enemy worms. All
                   orbs
                    will
                   explode
                    simultaneously;
use it with care.

1.39 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.

1.40 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.

1.41 Treasure

The worms will enter the treasury 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.

1.42 Umbrella

This skips 1-3 levels.

1.43 Strategy

Killers 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 killer, 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.

The only way to destroy stone or metal is to kill a killer which is on it.
If stone, you can simply jump over it.

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 leas
 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.

1.44   High Scores

Each fieldset can have up to five (5) high scores. If you quit out of a
game, no worms will be able to put up a new high score, as the game was
aborted. The high scores are not always truly comparable, as it is easier
to play if you are the only worm than it is if you are playing against
three others.

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.

Note that if your worm has been resurrected, its old score is forgotten
and cannot get on the high score table. The newest score is eligible.

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

1.45   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
change to a skull temporarily. This is a visual change only.
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 worm had at the time of death
(
                    multiplier
                    ,
                    bias
                    ,
                    power
                    ,

                    ammo
                    ,
                    armour
                    ,
                    tongue
                    ,
                    nitro
                     and
                    affixer
                    ), in
addition to what you yourself already had.

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
                killer
                 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

All worms can be hurt by the following methods:

Method	Damage	Notes
enemy drip	5 lives	unless biased
blocked teleport	5	worm motion is stopped
killer	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:
```

worm bullet	5	
enemy missile	5	
enemy protector	5	
orb	5	
fragment	3	if armoured, fragment is reflected
bombblast	3	
enemy slayer	2	
slime	2	

```
            Untongued
             worms can also die by the following methods:
```

worm head	5	
worm tail	1	worm is slowed
wood	1	worm is slowed

1.46 Orbs

Orbs are controlled by the Amiga. There can be up to seven (7) ←
orbs at a
time. They move diagonally and bounce whenever they hit a tail, metal,
stone, wood or
killer
, so their motion can be predicted
by the skilled player. Orbs have their own scores. Their scores are added
to 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.
    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.
    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.
    Slayer      The orb will explode, if unarmoured.
    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 an armoured orb. (Both orbs explode .
#	Collision with worm tail .
.	Collision with an armoured worm.
.	Collision with a protector .

Unarmoured orbs can also be slain in these ways:

*	Worm bullets .
*	Fragments .
*	The orb collects ammo or slayer .

```
        *
                Drips
                 .
        #
                Bombblasts
                 .
        #
                Missiles
                 .
        #       Collision with an
                unarmoured
                 orb.
        .       Collision with an
                unarmoured
                 worm.
        .       Collision with
                slime
                 when unarmoured and
                        untongued.


        Symbol  Explanation

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

1.47 Killers

Killers walk along the top of stone, metal, wood, tails and slime, ←
        firing

fragments
        randomly when they are at an edge. An 'edge' is for
our purposes defined as where the killer is next to somewhere it can't go.
Killers prefer to be at an edge and tend to move towards and stay at one.
When not at an edge, they cannot fire.
  Up to eight (8) killers can exist simultaneously. Each killer can only
have one fragment onscreen at a time.

Killers can be slain in these ways:

Worm bullet

Fragment

Slayer

Orb
 bouncing off it

Bombblast

Missile

Drip
Dead killers always turn into
bonuses
. This is the only way
to destroy stone or metal.

1.48 Slime

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

Normal orbs   are destroyed by it
Armoured orbs   bounce off it
Tongued orbs   pass through and destroy it
Normal worms   are harmed by it
Armoured worms   pass through and destroy it
Tongued worms   are harmed by it
Killers   can traverse it
Protectors   destroy it
Fragments   destroy it
Worm bullets   destroy it
Slayers   destroy it
Bombblasts   do not affect it
Drips   destroy it

1.49 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 (or another colour, if you have bias) are worth
100 points. Drips of the wrong colour hurt you. In either case, the drip
is destroyed.

1.50 Fragments

Fragments are generated by:

orb
 explosions. Eight fragments will be
generated by each explosion, one for each direction.

killers
 firing. One fragment will be generated
per shot.

Fragments travel at a uniform speed until they are absorbed or reach
the field edges, by which they are bounded.

is bounded by	field edges
destroys	tails
destroys	silver and gold
destroys	objects
is absorbed by	wood
is absorbed by	stone
is reflected by	metal
is absorbed by	blocked teleports
is teleported by	unblocked teleports
harms and is absorbed by	unarmoured worm heads
is reflected by	armoured worm heads
explodes and is absorbed by	unarmoured orbs
is absorbed by	armoured orbs
is reflected by	protectors
destroys and is absorbed by	missiles
bonusizes	killers
destroys and is absorbed by	fragments
sets off and is absorbed by	timebombs
bonusizes	drips

1.51   Teleport

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

The following are teleported:

worms

orbs

worm bullets

fragments

missiles

drips
If a teleport is blocked (there is stone, metal or a
killer
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, but you will
still get points for them being there, as if they had teleported.

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.

1.52 Scoring

                Square points

    All

          1   Empty
         10   Silver
         20   Gold
         40   Teleport
        100   Skull

             Objects
              are worth various amounts of points.

    Worms and protectors

        100   Drip of your colour
        100   Letter of other colour
        200   Letter of your colour

Skill points

    All

         50   Kill a killer.
        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.
         50   You hurt something (worm, orb or killer) by shooting it.
        100   Push a timebomb off field edges or into a teleport.
        500   You are the last surviving worm (all other worms are dead).

    There are also
                level
                 completion bonuses.