

WormWars

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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  |#
#*=====*#
```

```
Overview
New Features
Usage
Other Information
```

```
Title Screen
Field Editor
How to Play
```

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. FSET 4.1-4.3 are supported.
Project Open...	Amiga-O	
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 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 orthagonal 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
- History
- Future
- Other Products

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 Amiga/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 authoritative

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

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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 . . . . .
... .. A S D F . . . . . U
Shift . Z X C . . . M . . . Shift L D R
.. .. ----Spacebar---- .. ..

```

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 orthagonally (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 bomblast 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 (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
#	#	#	#

1.37 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 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.

1.44 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 orthogonal 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 will 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.
