

Flamingo

Álmos Rajnai

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COLLABORATORS

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<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
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REVISION HISTORY

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Chapter 1

Flamingo

1.1 Flamingo Plus/4 emulator for the Amiga

```
Flamingo
Plus/4 emulator for the Amiga
by Álmos Rajnai (Rachy of BiøHazard)

Version 1.54, 27.12.2003
```

```
Intro
  Whatta heck is this?

Requirements
  What do I really need?

Installation
  This should be my biggest problem...

Usage
  It works!

Distribution
  Should I register?

Author
  Who cares about this messy guy, eh?

Upcoming
  Should I look that also?

Thanks to...
  Who was his help? (Also guilty!)

Bugs
  "Raid! Fear of every bug!"

History
  The Return Of The B.U.G.

To do
```

"Son, don't forget do the homework!

Plus/4 Facts

Know your enemy!

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Final version for AmigaOS3.x and WarpOS.

1.2 How a story begun

Those were the days...

Can you remember? Or you used to have a Commodore 64? I used to have a Commodore Plus/4... Never heard of it? Well, yes: it was less popular, than his older brother, the C64.

You were one of the users/coders/graphicists/scene members...? I was. I was for a long time on Plus/4. This was my first computer.

I will never forget that day, when we met the first time. He was not a Commodore Plus/4 but some similar: a Commodore 16.

I just loved those small games, they used only 10 Kb of memory, so no space for huge animations, nice pictures were available, programmer should use all of his skills to optimize his code, use hardware tricks, and other "black magic".

Those were the days...

But now, it is the past. Part of history, and always a sign to warn you: don't forget where you came from.

I, probably you too, enjoyed MUCH MORE that time.

Those were the days... But it is the past already.

So, I was always looking for an emulator, a real Plus/4, C16, C116 emulator for the Amiga. The only one I found was A4, which was less than I could ever expect.

I waited, waited, nothing happened. Then a day I woke up, and started coding. And after a year of work, here it comes: a real emulator.

Where did this name come from? Why Flamingo? A beauty bird, flies in the sky among clouds... Untouchable, unreachable, over all of us?

The story of this name: here, in Hungary was a -that time great- paper magazine, called Commodore Világ. Once in this mag -in the readers' forum- started a huge dispute about C64 vs. Plus/4. (There was always a topic, nowadays called PC vs. Amiga, or Linux vs. Windows...)

Once, a C64 lover called the Plus/4 "skywalker flamingo". I just liked those words, always remind me that time.

1.3 Well, you will need at least a Cray! I mean it... :)

So, what do you really need?

- ∅ Kickstart 3.0
- ∅ External libraries: asl.library, gadtools.library, iffparse.library (for snapshot operations), 6581sid.library (for SID emulation), cybergraphics.library V40 (for Cybergraphics video modes), lowlevel.library V40 (for joystick support)
- ∅ At least 68020 processor. (A 68030 or higher is strongly advisable.)
- ∅ ECS, AGA or CyberGfx compatible card. (CGFX card is advisable with native chunky mode, or a PowerPC coprocessor for chunky2planar.)
- ∅ Some free memory. (About 1.5Mb, but it depends on video driver you use. Fast Ram advisable too.)
- ∅ PowerPC processor and PowerUp V4 for PowerPC version and PPC-based AGA video driver

1.4 Why this s**t does not want to work???

At first you have to do to install is:

```
copy all files and subdirs anywhere you want.
```

Then, it requires a rom image, should be placed right in the same directory, and should be named "romimage".

This one can be found in several places, for example at Lando's C16/Plus/4 Classix (see below).

Don't forget: the whole ROM should be placed in one file! Often there are at least two files, called BASIC ROM and KERNAL ROM, rare there are even more files for FUNCTION LOW and HIGH. All you need is BASIC ROM and KERNAL ROM joined together.

Be careful: these files may start with loading addresses (hex. 00 80), but it is not needed, you have to remove it some way. (Not too easy without any tool, you can find a tool for this purpose in the A64 package.)

Note: using rom image is illegal, if you do not own a real C= Plus/4. Using the emulator and the Plus/4 (or more emulators) in the same time is also illegal. (Funny things, eh? I will never understand those laws.)

How can you obtain rom from if you have a real Plus/4? Not an easy job, but here we go:

1. Start the Plus/4 and enter into monitor mode. (Command: MONITOR)
2. Type this line: 'T 8000,FCFF,8000' and press RETURN.
3. Type next line: 'T FF40,FFFF,FF40' and press RETURN.
4. Last line saves it onto floppy: 'S"romimage",8,8000,FFFF' and RETURN.

Of course do not type the ticks (!)!

5. Transfer the ROM file from floppy somehow to the Amiga. I suggest using the Easy1541 package from Aminet.
6. Use the start address chopping utility from the A64 package, and it is ready to use.

It isn't easy? That is right, go for a download instead of this misery... ;))

All the external video drivers should be placed in a "video" subdir same dir where Flamingo starts.

Some interesting Plus/4 sites:

Main Plus/4 program source
<ftp://c64.rulez.org/pub/plus4>

Lando's C16/Plus/4 Classix
<http://plus4.emucamp.com/>

Data about Plus/4 members, groups, programs
<http://plus4.homepage.com/>

Mike Dailly's Plus/4 homepage
<http://www.scotch.demon.co.uk>

The Commodore Plus/4 resource
<http://www.plus4.org>

1.5 Easy-to-use is always suspicious!

Using the emulator

Both 68k and PPC versions are working the same.

Start from CLI, using parameters

Start from icon, using GUI

Special keys under emulation running

Patches in ROM (Loading, saving etc...)

1.6 My fingers are sticking to the keys. I ate jam.

To start from CLI just type Flamingo in Flamingo's dir. You can add some parameter into the command line:

```
PROGRAM,VIDEODRIVER=XVD/K,STARTROM=SR/S,FRAMESKIP=SKIP/K/N,
```

TASKPRI=PRI/K/N,KEEPSYNC/S,NOSOUND/S,NOGUI/S

PROGRAM - it is obsolete already, Flamingo loads this program into the RAM.

VIDEODRIVER - video driver can be replaced by this way to an other external video driver (should be located in video/ subdir).

There are 7 drivers for now:

AGA-Delta 128 colour with delta buffer,

PPCAGA-Delta 256 colour PowerPC (WarpUp) based with delta,

ECS 8 colour gray scale,

MONO 2 colour,

CGX, CGX-Refresh and CGX-Refresh040 256 colour chunky driver for

CyberGraphics boards (thanks to PH03N1X),

Fake, which displays nothing. (This last one is only for test reasons.)

All sources of videodrivers are free, format documentation also provided in video subdir. See more

here

in GUI documentation.

STARTROM - if you used PROGRAM parameter, this switch cause starting ROM instead of loaded program.

FRAMESKIP - the value of skipped (not drawn) frames can be set by this parameter. Default is zero. (Means: all frames to be drawn.) Frame counter displays different value in this case, displayed value means all emulated frames under a second, independently the number of displayed frames.

TASKPRI - priority of the emulator. Default is -1.

KEEPSYNC - if Flamingo runs too fast (for PPC version it is a must) this switch turns on synchronizing of frames to the real Amiga frames. If you left out this parameter from command line, that means there will be no synchronization at all, independently of default.cfg!

NOSOUND - you can turn off the sound emulation of TED, if it drives you crazy. (Causes a small speed-up in some cases.)

NOGUI - Opening of GUI can be suppressed by this switch.

That was all. After default configuration have been loaded, parameters change configured values. (In case of modifying default configuration.)

Unfortunately for changing configuration, you have to start Flamingo with

GUI

. (What a pain! :)

1.7 I am a cat. I love mice.

If Flamingo started from Icon, or from CLI without NOGUI ↔ parameter,

then its GUI appears, can be used for a few setup.

GUI should work with any default font, but if it cannot be fitted onto

your screen, then it is falling back to Topaz 8.

Underlined characters are hotkeys. (Without any qualifier key!)

Click to the buttons for more information!

```

+-----+
| +-Video-----+ +-Program-----+ |
| |                                     | |
| | Driver:                                           |
|
|         Get
|         | | Task Priority:
|
|         | |
| |                                     | |
| |
|         Config
|
|         Info
|         | | CPU Speed: ###
|
|         ##### 100% | |
| |                                     | |
| | Frame skip :
|
|         | | Joy1:
|
|         Joy2:
|
|         | |
| |                                     | |
| | Keep synchron:
|
|         | |
|         Save snapshot
|
|         Load Snapshot
|         | | |
| |                                     | |
| | +-----+ +-----+ |
| | +-Sound-----+ +-Disk-----+ |
| |                                     | |
| |
|
|         TED sound Buffered
|
|         | | #8
|         Dir
|
|         Get
|         | |
| |
|
|         SID card emulation | |
|
|
|         No sound | |

```

```

| |                | | #9
          Dir
          Get
          | |
| | SID base address $
          | |                | |
| |                | |                | |
| +-----+ +-----+ +-----+
|
|
          Start
          Load configuration
          Save configuration
          Quit
          |
|
+-----+

```

1.8 XVD driver string and Get

Driver string for external video driver (XVD). You can simply type its name, or choose by requester clicking on Get gadget.

Video drivers should be located in video/ subdir.

Video drivers are simply chunky to planar converters for some special purposes. I like neither the system provided "c2p", writepixelarray8 function, nor any external, such as rtgmaster.library.

Anyway: it is up to you, you can do your own XVD, both sources and format documentation can be found in this package.

There are 10 drivers for now:

```

AGA-Delta 128 colour with delta buffer
  (by Álmos Rajnai, c2p by Ferenc Zavacki),
PPCAGA-Delta 256 colour PowerPC (WarpUp) based with delta
  (by Álmos Rajnai, c2p by James McCoull & Peter McGavin)
ECS 8 colour, unfortunately no ECS-Delta, may be some time later
  (by Álmos Rajnai, c2p by Ferenc Zavacki),
MONO 2 colour
  (by Álmos Rajnai),
CGX, CGX-Refresh, CGX-Deltarefresh and CGX-Refresh040 256 colour chunky
  driver for CyberGraphics boards (by László Török and Álmos Rajnai),
Fake, which displays nothing, only for test reasons
  (by Álmos Rajnai).

```

PowerPC based AGA driver is working only with WarpUp (by Haage&Parter), sometime gives better speed than a graphcard with native chunky support. (Eg. Mediator boards have a quite slow memory handling.)

Slow graphics cards might get a boost with CGX-Deltarefresh driver, because

it is copying only the changed area from the Fast RAM to the graphics card memory.

CGX-Refresh040 is working only on 68040 processors.

1.9 XVD configuration

External video drivers can be configured. It calls video driver configuration routines.

Screenmode of AGA-Delta, PPCAGA-Delta, ECS, MONO and CGX drivers can be configured here, FAKE does not have anything to configure.

1.10 XVD information

You can get some information about specified external video driver, it pops up an about box.

1.11 Frame skip

Skipping frames is common technology speeding up slow animation. It is almost the same, both rendering into the chunky buffer and chunky2planar conversion will be skipped on skipped frames. You can set up the number of skipped frames here.

Frame counter displays different value in this case, displayed value means all emulated frames per second, independently the number of displayed frames.

Can be set from 0 upto 99, but I see no reason more than 5 skipped frames.

I advice you to set at least 1 if you have a slower machine (eg. 68030-50Mhz or 68040-25Mhz), emulator runs much smoother then. PowerPC version does not require this feature at all.

1.12 Keep synchron

If Flamingo runs too fast (for example the PowerPC version) this switch

turns on synchronizing of frames to the real Amiga frames. It is not working properly yet, it keeps the framerate from 47 FPS upto 52 FPS, but still nice enough.

This checkbox has no effect, when
Buffered TED sound
is used.

Note: if you left out the equivalent parameter from command line (KEEPSYNC switch), that means there will be no synchronization when Flamingo started from cli, independently of default.cfg.

1.13 Task priority

You can specify the task priority by this number. From -9 upto 99, but -1 is perfect I think. Emulator never waits except keep synchron link "GUIsync"} enabled, and you have a really fast machine, or frame skip set to a high value.

1.14 CPU speed

You can specify the relative speed of CPU emulation to its environment. That means CPU emulation can get more time slice from computing power against video and sound. It is similar to frame skipping, but much more usable since all the other things (like interrupts, timers) are working on the original speed, so you can play with high CPU-power consuming games much smoother than on the original Plus/4. (Playing Total Eclipse feels like Doom... :)

The original value is 100%. By increasing CPU speed you will notice an over all slowdown due to CPU emulation eats lot more then, and that is why I advice this function only for stronger computers. (You can make use of wasted waiting time between frames, when keep synchron active.)

On the other hand, decrease the CPU speed may even speeding up some programs, whose are using less CPU time, mostly spending time with waiting for some events, thus you can use this feature speeding up emulation on slower machines.

Be warned! It may confuse programs, which are highly depending on exact CPU speed, and become unstable, or unusable!

1.15 Joystick emulation

Joystick emulation is possible from keyboard, by numeric keypad arrows and left Alt, or from any port by a real joystick.

By this two cycle gadget you can select which port receive what kind of emulation. (Off - no emulation, Key - from keyboard, Joy1 - from joy port 1, Joy2 - from joy port 2.)

1.16 Loading, saving snapshot

You can manage loading and saving snapshot of the state of the emulator. This means it will save all data into a file you specify, and you can load it back anytime, then continue using. It is very useful for games without saving possibility.

Flamingo uses a special new format for the snapshot, called CPS

(Commodore Plus/4 Snapshot), it is an IFF formatted file.

This fileformat is internal, please do not spread it!

Snapshot operations require `iffparse.library`.

1.17 Sound emulation

By this radio gadget you can set up the sound emulation. There are only 3 options:

TED sound is the original Plus/4 sound, using Paula as output device, Using TED emulation there is a possibility of buffered sound output. Buffered sound is system friendly, should work on every sound output device, which is using `audio.device`. All the mixing is done by Flamingo, only one chanel allocated. This option requires a strong machine, or sound will be "glitchy". If this option is on, turning off

Keep synchron
has no effect.

SID card emulation is an extension emulation for the Plus/4 trough the `6581sid.library`, using Paula as output device, you have to set up base address then by
SID base address

No sound is for turning off sound, when it drives you crazy. Audio channels are free-ed then, so you can go for an MP3...

1.18 SID base address

SID chip emulation requires a base address. This address is a hexadecimal number from `$0` upto `$ffff`. The original card uses `$FE80` or `$FD40`, but Plus/4 programmers often use C64 music modules, such as Future Composer modules or similar. Usually they were too lazy to relocate base address, so you can "revert" converting C64 tunes by a good base address setup. It is usually `$D400`, as in the original C64.

Give a try to these addresses too: `$FF40`, `$FF50`, `$F400`

And of course

SID card emulation
should be used...

1.19 Directory-D64 file switch

Unfortunately in this release there are no possibility switching between directory and D64 file based file emulation, so this gadget is disabled.

1.20 Directory based file emulation

Patches
in ROM routines (especially disk routines)
allow you the using of Amiga directories as Plus/4 floppy drives. Two
device emulated this way (#8 and #9).

You can type the directory to be emulated as a drive, or click to the
Get button for a requester.

1.21 Start

This button starts or continues the emulation.

1.22 Quit

This button quits from the emulator.

1.23 Configuration loading/saving

By pressing this buttons a requester appears asking you to choose a
configuration file.

Configuration can be saved anywhere under any name, and can be loaded
back again of course.

Default configuration is always loaded from the file located in the
program's directory and called "default.cfg". You can save your default
configuration into this file.

1.24 - It says: 'Do Not Press The Red Button!' ...Ahem...- Click.

There are a couple of hotkeys while the emulation is running, those are:

F6 - SID emulation on/off (sometimes it plays "garbage" from memory,
that is why this function included)
F7 - frame drawing on/off (speeding up emulation)
F9 - megareset (cannot be disabled from Plus/4 programs)
F10 - normal reset (calls the reset handler)
HELP - back to GUI, or quit emulator, you can continue emulation
pressing "start" button in the GUI

Joy emulation from the numeric keypad:

```
7 8 9
  \|/
4- -6   Fire: left Alt
  /|\
```


1 2 3

A1200 has a bug on keyboard handling, use diagonal keys instead of two keys at the same time. Left Alt works with any key together.

Asterisk (*) on the numeric keypad swaps the joysticks, so you don't have to go back to the setup window.

Run/stop is the Tab, Commodore key is the right Amiga.

1.25 - Does not want to work? Well, I have a new patch...

There are high level patches on I/O routines for disk access. This means loading, saving, file opening, writing to, reading from a file, closing are working. Some lower level not emulated yet (such as listen, unlisten, talk, untalk functions), and no D64 support. Yet...

You can use both DLOAD and LOAD commands for loading files, DSAVE, SAVE for saving (all work from monitor functions also), and DIRECTORY for listing an emulated drive.

Eg. DLOAD"AUF W. MONTY.PRG" loads a file called "auf w. monty.prg" from device 8, DLOAD"AUF W. MONTY.PRG",U9 loads that file from device 9.

There are two special patches for opening a requester, if you don't like the typing, use * (asterisk) or empty name both loading and saving.

Eg. DLOAD"*" or LOAD"",8,1

You can use shift+Run/Stop (shift+TAB on the Amiga keyboard) for loading a program by requester and starting automatically by RUN command.

You can change subdirectory from the requester, Flamingo keeps tracking it, and appears even in the configuration (you can save it).

Be careful on loading files, there are no check for memory overflow. Of course normal Plus/4 files never exceed the emulated memory, but others can do!

1.26 '-How did he look like? -I don't know... He wore a ski-mask.'

"Well, it is small, yellow, and sour... But it is our own!"

Extract from the movie "The Witness" by Péter Bacsó, a leader's opinion about hungarian orange.

Commodore Plus/4 factsheet

Product type: Personal computer

Deput in: 1984

Serial: in same family as Commodore 16 and Commodore 116

(almost same hardware)

Hardware

Main processor: 7501 or 8501 (DIL-40)
clock freq: 1.773 Mhz or 886.7 Khz (chosen for actual bus mode)

Coprocessors: 7360 or 8360 (also called TED, DIL-48),
6551 (also called ACIA, DIL-28)

Main memory: 64Kb, paged in two parts,
~60Kb freely usable RAM
(in Commodore 16 and 116 only 16Kb)
~32Kb ROM, contains built-in BASIC operating system
~32KB ROM, contains some applications
(in Commodore 16 and 116 this ROM part is missing)

Ports: Cassette, Serial, RF out, Video out, Memory expansion,
User port, Joy#0 and Joy#1, Keyboard (internal)
(in Commodore 16 and 116 User port is missing)

Peripherals: Any, which is working with normal Commodore IEC bus
(VC-1541/1571/1581 Floppy Disk Drivers,
MPS801/810 Matrix Printers and so on)

A special Floppy Drive (VC-1551) were made especially for this family. (Uses Expansion port instead of IEC bus, much faster, but a dozen of "turbo loaders" are not working with this model.)

Joysticks (similar to Commodore 64's, but the plug is different)

Commodore Datasette Tape (similar to Commodore 64, but the plug is different)

Display: any PAL or NTSC TV, or monitors with 15Khz line frequency and composite port

Video: 50Hz PAL or 60Hz NTSC screen, 15Khz line frequency, two resolutions: 160x200 and 320x200 pixels in 121 color. (16 base color and 8 level for each, except black.)

Character mode: 40x25 different position, 256 different character in 8x8 bitmap each, or 128 different character and inverse mode. A global background color and a different ink color for each character in high resolution, or 3 global base color and an ink color for each character in low resolution mode. (Ink color can be chosen from the first 8 base color in this case.)

Graphic mode: 320x200 pixel in two colors for each 8x8 pixel group, or 160x200 pixel in 4 colors (2 for the whole screen and 2 for each 8x8 group).

Hardware flashing and hardware cursor in normal character mode.

(Unfortunately no hardware sprites are available at all...)

Audio: 2 independent sound channels, square wave for the 1st and square wave or "white noise" for the 2nd channel. 3 octaves, 8 level of volume, maskable flat-wave for digital sound. (And that's all...)

Software

Operating System: Commodore Basic V3.5
(Very well designed, works perfect, but damn slow.)

Other built-in: Some functional application is provided (called Plus 4 Function), missing from Commodore 16/116.
A simple word processor, and similar Office-like programs (not emulated in Flamingo, those softwares are useless, but contain some bugs, and those errors can cause lot of trouble).

Upgrade possibilities:

- ∅ 60 Kb memory expansion for 16/116 models
- ∅ 256 Kb memory expansion hack for all models
- ∅ SID card sound extension for all models (same port used like for memory expansion at 16/116 models)
- ∅ EPROM softwares for Plus/4 instead of Plus 4 built-in functions.

1.27 Err... What's up, Doc?

Who did this boring/lame/shitty/great emulator?

Rajnai Álmos (Rachy of BiøHazard)
coder, tracer, sometimes even musician...

If you want to contact me, or send me gift, then write to

Snail mail:

H-8360 Keszthely
Bercsényi M.u. 46
Hungary

Or you can find my e-mail address on my web page:

<http://amigos.amiga.hu/rachy>

Please read docs carefully before asking me!

Or on the Plus/4 discussion list (of course...), find out more at:

[HTTP://C64.RULEZ.ORG](http://C64.RULEZ.ORG)

And finally sometimes I am on the IRC channel #amigahu on IRCNET.

(Sorry for my terrible english. I will never learn it.)

1.28 The future is Bright!

What do I plan for the future?

- * Flamingo's updates are on the way of course. 1.54 is the very-very last version for OS3.x and WarpUP, next release planned for AmigaOS4. Motorola 680x0 version will be no longer supported by me, I released the source, I hope somebody will make use of it...
- * I release a guide about PPC programming once I have more time.
- * I am working on a M68k emulator for the PowerPC, based on dynamic recompilation, called Petunia. (For more information check out my web page.) It will be the JIT-based 68k emulator in AmigaOS4.

That's all, Folks! (For today...)

1.29 So you want to register... Don't you?

This software is subject to the "Standard Amiga FD-Software Copyright Note".

It is GIFTWARE as defined in paragraph 4g.

If you like it and use it regularly please send any gift or a registered copy of your software to {"me" link "Author" 0 }.

For more information please read "AFD-COPYRIGHT" (Version 1.4 or higher).

Thanks in advance!

External video drivers are subject to the "Standard Amiga FD-Software Copyright Note".

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For more information please read "AFD-COPYRIGHT" (Version 1.4 or higher).

1.30 Thanks to...

This program could not become to real without those men, and I would like to thank them:

- *Frank Wille for creating and maintaining PhxAss and pasm.
- *Volker Barthelmann et al. for VBCC free C compiler.
- *Christian Bauer for creating and maintaining Frodo.
It gave me a few ideas on optimising and implement features.
Some parts at disk emulation are his works. (Taken from Frodo with his permission.)
- *Török "Ph03nlx" László author of great MooVid for CGFX video drivers and beta testing. (That was a hard work, eh dude? ;)
- *James McCoull & Peter McGavin for PowerPC-based chunky2planar routine.
- *Biczó "Crown" Tibor for lotsa Plus/4-related helps.
- *Marko Mäkelä and John West for great documentations about the 65xx/85xx processors.
- *Mike Daily author of Minus4 for his helps.
- *Tamás Baldauf for the joystick, it was really a must for testing.
- *Stephen "Cobra" Fellner for helps in timing code and for testing.
- *Kémeri "UnReal" Csaba for beta testing, and for never forget asking the question: "When will you finish the next version?".
- *Lando for beta testing, and new ideas.
- *Ferenc Zavacki for lotsa helps in serveral topics.
- *Aminet staff for the great Amiga related work. I probably lost my hope without them.
- *Geo of BiøHazard for all the helps and beers together.
- *Levente Hársfalvi for all his helps.
- *Gáti "gega" Gergely for sending me his code, which gave me some ideas, when I had no one.
- *Markovits "jam" Péter for helps and lotsa beers together...

And you for using it!

Finally greets to:

asdf,
Artlace,
BSZ/Dunkers,
Chip/Kangooroo,
Csaba/NWC,

Darklon/Scoopex,
Dan
Detox/Chrimson Jihad,
Desc0
Enc0re,
ERN0,
Emeric/SpaceHawks,
Flex,
Gato/Impulse,
Jam,
Jocó,
Kovács Dezső,
Lay/Chrimson Jihad,
Louise/AmigaONLY,
Luigi
Magic/AmigaONLY,
Makk Marci,
Pethő Szabolcs,
Petike/AV,
Ray/Therapy,
QXYka,
Rat,
RatMan/Chrimson Jihad,
Sensor/Dunkers,
Steffen Häuser,
Steve,
Stinky/Dunkers,
Szabó András,
Teo/Kangooroo,
Valenta Ferenc,
Vir/NWC,
Watt.

1.31 Beatlejuice! Beatlejuice! Beatlejuice!

Known bugs and missing features:

In the emulation some features are not emulated or working wrong, eg. hardware timers, FFOA-scroll tricks etc. I try to fix this in the future, post any suggestion to me!

Increased CPU speed messes up the hardware timers (\$FF00-\$FF05). It is obvious, this trick is far from the original hardware environment.

There is no double buffering in most of the XVDs, flickering could be annoying sometimes, mostly on CGX direct rendering. (In fact this method is much faster.)

Opened screen borders hardware tricks are not working always as it should.

SID emulation cannot emulate "gate" effects, because this trick requires register refresh under frame rendering, and SID registers are refreshed only the end of each frame. (Eg. try the Last Ninja 2 songs, those will fade out shortly, because of this bug.)

Buffered sound does not sound as perfect as direct audio, because of the low mixing frequency (15600 Hz), probably I add a possibility of doubling this frequency for smoother sound. (You can experience false sounds when the frequency of the tone is higher.)

Some digital sound is yet terrible. This came from hardware tricks used by coders for increasing quantity of digital volume levels. Unfortunately I don't know all the tricks, so I cannot emulate this feature properly.

On the other hand digital sounds require much better timing, but I had not too much intention slowing down the emulation just because of better hardware timer support. (Hopefully in the upcoming AmigaOS4 version.)

1.32 Let's check handkerchief!

As I already mentioned: there will be no more versions for AmigaOS3.x and WarpOS from me, I released the Motorola 680x0 version sources.

But I plan to continue the development for AmigaOS4, there are yet room for improvements (in order of importance):

- ∅ Bugfix... :)
- ∅ Real timer emulation (required for a few defenders and digital sound)
- ∅ Usable external monitor/debugger functions
- ∅ 256 Kb memory expansion emulation
- ∅ Patched routines for D64 support
- ∅ Real D64 support for faster machines (1541/1551 emulation)
- ∅ Animation saver (AVI format?)

1.33 Once Upon A Time...

Flamingo - Plus/4 emulator for the Amiga
History

V1.54 Bugfix, 29.12.03

- * Fixed wrong register layout for \$FF1A and \$FF1B (may caused wrong display or crash)
- * Fixed memory alignment, now it takes up more memory with 128k, but it is not a hack anymore (did not work under AmigaOS4.0)
- * (PPC) Fixed noise appearing beside the screen when the wide border and vertical scrolling appear in the same time
- * Added CGX-Deltarefresh video driver for slow graphics cards

V1.53a Bugfix, 25.05.03

- * Fixed joy support, after implementing both joy reading detection was wrong (thanks for reporting to Alexander Weber)

v1.53 Bugfix and new features, 18.05.03

- * Fixed FPS counter on direct render screens, it flickers only rarely now
 - * (M68k) Fixed messed up screen after snapshot loading
 - * (M68k) Fixed wrong PC calculation in snapshot loading (caused "Processor executed crash opcode" errors after loading a perfectly saved snapshot)
-

- * Added CGX-Refresh040 for 68040 users
 - * Added both joy port support
 - * (PPC) Added snapshot loading/saving
- * Speedup: all screen drawing functions

v1.52 Bugfix, 12.08.01

- * Fixed crash when buffered sound cannot allocate audio channels (came from an error of amiga.lib in VBCC package)
 - * Fixed audio task hangup at every run (it did not terminate itself)
 - * Fixed timer emulation again, works much better now (as a side effect: emulation speed increased again, due to simplified timer code)
 - * (PPC) Fixed ISB, RRA, SAX opcode (some defenders required those undocumented opcodes)
 - * (M68k) Some debugging code removed, speed increased a bit (Hupsie! :)
 - * Fixed crash at SID emulation, when 6581sid.library could not be opened.
 - * (PPC) Fixed ADC/SBC flag emulation, now Mercenary works perfectly. (To tell the truth it was a bit too faaaast, when I tried increased CPU speed settings... ;)
 - * Fixed immediate interrupt checking when CLI command executed (Castle Master is working now)
 - * Fixed buffered sound again, now it seems working properly in both version (digital sounds are not yet perfect)
- * Fixed some parts in the AGA XVDs, sometime may caused hangups.
- * Fixed and added some texts in docs
- * Added 1 frame synchronised buffered sound (without context switch in the PPC version)

v1.51 Bugfix and new features, 10.08.00

- * Fixed joystick support, requires lowlevel.library v40, but works better
 - * (PPC) Fixed 38 row mode
 - * (PPC) Fixed serious error, which caused crash, when non-ppc based XVD ran together with the PPC version
- * Added buffered sound. Lots of the digital sounds are much better now. (Eg. Digital Ball sounds great!)

v1.50 Bugfix and new features, 31.07.00

- * Added PowerPC version (3x-10x faster than 68k version)
 - * Added new keystroke: numeric-* for joystick port swap under emulation (thanks for the idea to Lando)
- * Fixed uncleared high word at indirect addressing, it might cause some program run wrong (Leaper finally works! Yeah! I love it!)
- * Fixed a bug in the GUI: latest invoked function always reappeared on non-hotkey keypresses
- * Fixed GUI: Flamingo can not be started without a valid XVD setup
- * Fixed GUI: XVD error message now really appears
- * Fixed hardware interrupt, break flag now cleared. This bug sometimes caused infinite break loops (eg. in Turbo Assembler v6.0)
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- * Fixed default program loading (after loading Flamingo filled memory with patterns)
- * Fixed a serious mistake in max. FPS counting, it could cause crashes
- * Minor fixes and speedups (discovered under PPC conversion)
- * Fixed frame drawing on/off key (F7), now works independently the frameskipping value
- * Fixed wrong error message on library open fail and I/O error
- * Fixed \$FF1E timing, it behaves almost as most programs expect
- * Fixed raster interrupt, it came earlier than it should, now works right
- * Fixed character matrix switching, aligned to new character-line beginning (splitted graphical/text mode is working right, eg. BASIC graph mode 2)
- * Fixed screen draw on/off emulation, Manic Miner is working now (thanks again to Lando for sending this game)
- * Fixed joy emulation, works better (emulation speed increased a bit again)
- * Fixed wrong FLD scrolling, horizontally scrolling games and magazines are working right

- * Changed processor speed setup, now can be set upto 1000%
- * Changed FPS counter to 3 digits (guess why... ;)
- * Changed the PPCAGA-delta XVD from asynchrone to synchronone. (Unfortunately this caused a bit performance decrease in the 68k version with this driver.)
- * Changed slightly the XVD format, now supports PPC-based drivers without context switches in FlamingoPPC

- * Due to lots of changes and improvements version number raised to 1.50

v1.08 Internal beta

v1.07 Bugfix and new features, 10.08.99

- * Fixed FF07 reset on return to the GUI, it caused wrong character display in some programs
- * Fixed late storing of chunky buffer from given back by XVDs, may cause system crash in some very rare cases
- * Fixed timing system, now more precise, but not perfect yet (keep synchron really keeps the synchron even on graphcard equipped machines)
- * Fixed messed FPS numbers on higher fps than 98
- * Fixed emulating of stack underflow, now works
- * Fixed timer hangup after stepping back to GUI
- * Fixed PHP command on wrong interrupt flag storing

- * Added CPU speed settings
- * Added handling of snapshot files, not fully tested yet
- * Added memory pattern filling on start: it is really weird, but a few programs depend on this filling

v1.06 Bugfix and new features, 12.07.99

- * Fixed PPCAGA-delta XVD, it allocated the screen wrong if the chip memory was fragmented, caused often system crash
 - * Fixed ECS driver, a bug in palette (no trailing zeroes), might cause system crash in some rare cases
 - * Fixed both CGX driver, modulo support added, now works on BVision too. (Thanks goes again to pH03N1x!)

 - * Added modulo for the chunky screen, required for native chunky screens
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- * Added screenmode requester to every XVD (except Fake of course :)
- * Added real joystick support
- * Removed AGA driver, it was totally pointless, AGA-Delta works very well

v1.05 Bugfix and new features, 23.06.99, first public release

- * Fixed wrong calculation of clock cycles, improved speed a bit
- * Fixed kernal save routine patch
- * Fixed some wrong memory write on \$FF40
- * Fixed wrong horizontal counter
- * Fixed keyboard reset
- * Fixed wrong reset after crash opcode
- * Fixed digital sound (it was a silly bug, but not there are more yet)
- * Fixed keyboard reset on file requesters
- * Fixed ROM/RAM marker bit in \$FF13 TED register
- * Fixed wrong sound setup on CLI start
- * Fixed wrong indexing in LAX abs,Y (\$BF) opcode
- * Fixed some bug in TED emulation
- * Fixed wrong raster line counting (caused wrong color, gfx mode switch in some prgs, now works properly)
- * Fixed wrong timers (it is not perfect yet, but I don't have any idea)
- * Fixed wrong keep synchron function (there is yet more trouble: it keeps synchron around 50 FPS instead of constant 50, but that should be not a problem)
- * Fixed wrong character banking in turned off inverse modes
- * Added SID card support with 6581sid.library (awaited for a long time, it is not perfect yet, but still nice enough)
- * Added low(er) level disk support for file system disk emulation (Eg. Directory command works now)
- * Added Extended Color Mode (especially to the news and magazines)
- * Added PowerPC-based AGA external video driver
- * Optimizations improved speed a lot
- * Some parts were rewritten in C for increasing flexibility (and size... ;)

v1.04 Bugfix, 01.11.98

- * Fixed CyberGFX-Refresh XVD driver (thanx to Ph03n1x), now it works even on UAE's Picasso driver (extreme case...)
 - * Fixed ECS problems with levels of black color
 - * Fixed wrong Single clock-Twice clock switching
 - * Fixed wrong task priority change
 - * Fixed AGA, ECS and Mono external video driver at screen opening (thanks to Ferenc Zavacki)
 - * Fixed directory change on patched load and save requesters
 - * Changed C= button from LAmiga to RAmiga
 - * Changed the sizes in GUI, looks much better now (advised by gega)
 - * Optimizations improved speed a bit again (concept changed from dynamic compilation to interpretive, I was so sad, but dynamic mode not worked very well)
 - * Added delta buffer based AGA external video driver, which increment speed
-

much (thanks to Ferenc Zavacki again!)

- * Added chooseable joy emulation from keyboard

v1.03a GUI Bugfix, 02.10.98

- * Fixed GUI, now working on all screens and with all fonts

v1.03 Bugfix and optimization, 26.09.98

- * Fixed BSS memory clearing
- * Fixed memory loss on exit
- * Fixed wrong vertical line size (really 311 lines for now)
- * Fixed(?) wrong interrupt request clearing
- * Fixed wrong status flags in decimal mode
- * Fixed wrong size of every decimal mode SBC
- * Fixed wrong addressing mode in write opcodes (now PRINT 1.1 is working properly... :)
- * Fixed screen size to 311 lines
- * Fixed load patch on absolute load and an Enforcer hit (sometimes causes a guru)

- * Optimized branching opcodes (improves speed a bit)
- * Optimized cache method (improves speed a bit again, and eats less memory)

- * Added version string :)
- * Added save patch

v1.02 Bugfix and new features, 14.09.98

- * Fixed joystick handling, now works perfectly (thanks to Crown)
- * Fixed freq based sound again, now perfectly (hopefully)
- * Fixed FPS counter, now calculates exact FPS (even on NTSC)
- * Fixed vertical line high byte
- * Optimized border colour fill on turned off screen
- * Fixed wrong error message on fail audio open
- * Fixed memory read-write at \$FF20-\$FF3D
- * Fixed all external video driver at xvd_Done

- * Added NOSOUND option
- * Added file-requester on empty filename
- * Added digital sound emulation (buggy, and far slower than it should be)
- * Added GUI
- * Added NOGUI option
- * Added start from icon
- * Added multiple disk unit emulation
- * Added prefs saving/loading

v1.01 Bugfix and new features, 31.08.98

- * Fixed wrong addressing mode cause lot of program crash (especially Cruel-Crunch-ed programs)
 - * Fixed wrong code flushing over \$8000 (himem)
 - * Fixed sound
 - * Fixed bad vertical line interrupt (for Ph03n1x - now Icicle Works is running right, he can play... ;))
 - * Fixed vertical scroll
 - * Fixed wrong multicolor draw
-

- * Added unsupported opcodes
- * Added ECS video driver (still buggy a bit)
- * Added chunky drivers for CGFX (thanks to Ph03nlx)
- * Added KEEPSYNC and TASKPRI options, plus priority change on start
- * Added cursor display

v1.00 First beta, 17.08.98
