

**Amoric v0.9**

**COLLABORATORS**

	<i>TITLE :</i> Amoric v0.9		
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# Chapter 1

## Amoric v0.9

### 1.1 Amoric v0.9

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Amoric (v0.9)  
The first ORIC Atmos 48K emulator for the Amiga  
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\*\*\*\*\*

- Introduction
- Configuration
- Features
- Setup
- Startup
- Keyboard map
- Hints
- Tape Import
- Other platforms
- Changes
- Bugs
- Working Games
- To do
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Register

Acknowledgements

The author

## 1.2 Introduction

### INTRODUCTION

As the ORIC Atmos was my first computer, I never forgot its fantastic 8 fixed color games. The games were not that bad or ininteresting but the main problems were :

- Tape loading durations could drive you mad, mostly if that doesn't worked because of the volume, or treble, or tape speed, or the washing-machine, etc...
- The f...ing protections in games forced you to switch on and off the ORIC, damaging the chips.
- What a shame to plug in the ORIC again in 1995 to play games while you've got a new computer at your work or at home
- While C64, Amstrad, ZX81, VIC20, BBC, Apple II emulators exist for the Amiga, there were no room for the ORIC domain, while ORIC was very popular in Europe (actually, more than the Vic20 or the BBC !!)

That's why I decided to write Amoric. I first wrote a UNIX X/Windows version, then I tried to adapt it on my favourite computer : the Amiga.

I waited a long time for another programmer to release an Amiga version but noone did, so I think I'm the first one :-)

## 1.3 Features

This ORIC emulator features :

- A quite good 6502 emulation.
- Graphics emulation (HIRES and TEXT mode, including double height and flash ↔ modes)
- 6522 and 8912 emulation, including Timers 1 & 2, the keyboard, and the P.A.S.E ↔ joystick.
- Load on Floppy/Hard Disk (faster than the tape (really ?))
- Control Metakeys to perform different operations (Reset button, etc...)
- Sound (Not perfect yet...)

Obviously, this is not a real Oric, that means that there are problems in ↔ emulating

some software. See the

Bugs

chapter for more information.

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This emulator does NOT emulate :

- 50/60Hz switch (it could but I don't know how to reproduce a desynchronized screen (60Hz is NTSC and it is still synchronized))
- Half-TEXT Half-HIRES mode, used in some games
- Most of undocumented instructions of the 6502 (but that doesn't matter)

## 1.4 Setup

### USER PREFERENCES

The oric.cfg file contains the user preferences. You can edit this file to change them.

An example config file is the best way to explain the features :

Note : The config file format has changed from version 0.8b

```
--- oric.cfg : cut here ---
```

```
Atmos.ROM
HOPPER.DAT
/games
/dumps
0
1
1
7
```

```
--- cut here ---
```

```
Atmos.ROM <--- Allows you to specify the ROM you want to run
HOPPER.DAT <--- Allows you to specify the tape inserted once at amoric startup
/games <--- Allows you to specify the default directory for tapes
/dumps <--- same thing, but for hexdumps (snapshots, memblocks)
0 <--- sound on/off (1/0)
1 <--- patches some ROM routines for speedup, 0 turns it off.
7 <--- Screen refresh rate (in frame/sec, in PAL).
```

### WARNING:

You can use Oric 1 and Oric Atmos ROMs and you can modify the ROM files for your personal use only. However, there are some locations which are patched after ROM loading by the emulator (Tape load, others) . Modifying those routines may lead to Oric crashes.

## 1.5 Configuration and Requirements

### CONFIGURATION AND REQUIREMENTS

AmOric is written both in C and in 680x0 assembler code. It was adapted from a former emulator that I wrote for UNIX platforms, and which was

---

written exclusively in C. But UNIX workstations are usually a lot more powerful than a 68030 or even a 68040 Amiga. Due to the RISC architecture, C programs are usually faster than assembler programs, if the compiler is worth (gcc), and that also allows portability on others processors. My emulator worked fine on HP-PA1, Sun SPARC, PowerPC and Silicon Graphics.

But on Amiga, we must accept to program in assembly language for this type of software as speed is critical during the emulation, and the famous Amiga chipset (Paula, Denise, Gary...) can't help us with processor emulation. Furthermore, the 6502 and the 680x0 have got lots of common features, and the main idea is to use them (direct CCR flags conversion, same instructions...) with a minimum of adaptation.

There were 2 versions : a 68000 version and a 68020 version, but I had decided to give up the 68000 version, as I thought it would be really too slow. But a 68000/28 user asked me for the 68000 version and here it is, but don't expect miracles !

I don't conceal that Amoric will be SLOW on a basic A1200 and VERY SLOW on a A500. Try REAL fast RAM.

Anyway, I tested the precedent version on a A1200/020/14MHz with fast RAM and it worked at a good speed. I think the current version should run nearly at nominal speed.

Now, it runs at 120% speed on a 68030/40MHz, but I should optimize it in later versions, even if I think it will be hard to go further, but Fabrice Frances gave me an idea how to improve speed again.

Anyway, if your computer is slow, you can always experiment with the frame rate refresh in the

```
    oric.cfg
    file.
```

It should run on any Kickstart and requires asl.library for the requesters ( ← optional).

It has been succesfully tested on :

```
68030 KS 1.3
68030 KS 3.0
68020 KS 3.0
68000 KS 1.2
```

## 1.6 Startup

HOW TO RUN AMORIC

Here, I'll explain how to get started with Amoric.

Simply click on the Amoric icon or type Amoric in the shell  
The program will try to load the ROM file and the config file.  
Then, the Oric screen will appear.

If you press the HELP key at any moment, the summary of the commands will appear on the Oric screen.

---

To exit Amoric, simply press F10.

To select a tape, just press F3. The screen will return to the Amiga part and a requester will ask you for a tape file. After that, just type CLOAD"" like you were used to. If CLOAD"" stays stuck in 'Searching...', maybe that you've not selected a tape, or that you've reached the end of the current tape. So select a tape or press F7 to rewind the current one (if there is one).

## 1.7 Keyboard Map

There is a unique keyboard mapping, that does not depend on the localization of the keyboard, but on the raw keycodes only, which means that it matches USA keyboard.

Anyway, some extra keys are used to perform useful control functions :

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
Reset	Refresh	Change	Reboot	Toggle	Rewind	Break			
	Tape	Sound	Tape						

The F1 key jumps to the NMI oric routine (the unreachable black button under the computer).

The F2 key refreshes completely the screen (may be useful).

The F3 key allows you to change the current tape.

The F5 key has the same effect as swithcing on/off the computer.

The F6 key toggles sound on/off

The F7 key allows you to rewind the current virtual tape.

F10 allows you to return to the workbench screen and to stops the emulation

Help displays a helpscreen reminding you those useful control keys.

The Oric Atmos 'FUNCT' key is emulated by the Right Alt key.

Del acts the same as backspace.

The numeric keyboard can also be used, as well as 'Enter' instead of 'Return'.

Note: With some games, for instance Zorgon's Revenge, the keys X and Down Arrow are used to go up/down because they are supposed to be one above the other, but that is no longer true for the Amiga and I'm sorry.



## 1.8 Hints

### USEFUL HINTS USING AMORIC

- Because I adress directly the hardware (interrupts,screen), I had to disable multitasking during the emulation. I'm sorry for that but I'm not a very good system programmer. But don't worry, Amoric won't trash the memory. It always frees everything before exiting. I saw multitasking emulation (A-MAX !!) and I was very impressed but if you're not happy with my program, just delete it ;-)  
Just take care of not writing on hard disks while you start amoric. If for any reason the emulator crashed, you could have to revalidate your HD. But the problems I met until now were in the tape loading part, where multitasking is active, and I can ensure that the emulation cannot crash the machine (only the Oric programs can be affected ;-))
- To improve speed, you can turn caches/burst mode on (68030) and also copyback (68040). I don't use self-modifying code or DMA transferts so all the caching devices should work. You can also relocate the VBR in Fast Ram, with tools such as TUDE from N.O.M.A.D, or SystemPrefs, to improve speed while fetching ←  
interrupts  
vectors.
- As I don't consider the Amiga timers but only the Oric ones, on slow machines ←  
you  
could have some difficulties to make the keyboard react, because the key could be pressed and released just before the Oric ROM routine tests the key, and ←  
misses  
the key on peak. In this case, just press longer on the key. In later versions, ←  
I'll  
try to buffer the keyboard accesses.

## 1.9 Tapeimport

### IMPORTING GAMES OR SOFTWARE FROM TAPES

THAT'S an intricate part. How to get games or programs that are originally stored on audio tapes ?

On the ORIC, the 6522 and the ROM manage to receive and send this horrible and unmelodious 2400 baud signal. This fucking signal is the easier bridge between today's computers and the ORIC (ORIC Microdisk or Jasmin would be hard to emulate for me.

I've no knowledge about electronics, although I'm supposed to, and ORIC disks are 3'', that means there would be no way to read them with Amiga or PC drives. Anyway there isn't much documentation about Oric disks. The C64 drives were more documented and many interfaces for drives were developed for the Amiga (A64 package...))

I will not talk about RS232. I think the ORIC has got one but I've no idea how to program it neither on the ORIC nor on any other computer. Anyway, you'd need to carry your ORIC with you to do that (not convenient). That would be the safest way to transfer data though.

But I concentrated more on sound tape recordings :

On any computer, it's easy to sample sounds, if you've got enough mem or hard disk space.

For this operation, you'll need some !

First, sample your cassettes at a high rate in 8-bit mode (22050 KHz or more).

The format is lo8 (unsigned 8 bit : range 0-255)

After that, use the program 'transf', written by Boris GRANVEAUD, included in this package. It's not very user-friendly because it's supposed to be seldom used. The syntax is as follows :

```
> transf file.lo8 GAME.DAT
```

You'll be asked for the sample rate you recorded the file.

The program displays info about the file (name,length) and reads the data.

Because of a timing difference between ORIC-1 and Atmos, before reading data, the program skips some bytes in the sample (time for the Atmos to display Saving... GAME OF THE DEATH C, while the ORIC-1 only displays Saving...).

If an error occurs, try to transfer as follows :

```
> transf file.lo8 GAME.DAT wretwr
```

wretwr can be eirutu or uerhgiugh (or even nbmnmnb), because the test is made only ← on the number

of args passed to the program. In this case, the program will skip no byte in the sample. Conversely, an error will (normally) occur at the first byte.

As it is really hard to motivate Boris to improve his program, just consider this error as a feature.

55 U Error found.

New value: <- Here just enter the value above in hexadecimal (here 55)

If you get another error, two possibilities :

- 1) Your tape or/and your tape player is/are fucked up
- 2) The sampling rate is not high enough
- 3) The volume is not loud enough
- 4) The program doesn't use the same method to read bytes than the 6522 as the 6522 is an analogic device and here we process the data numerically
- 5) It's merely a tape from ZX-Spectrum.

Actually, it makes five possibilities but that doesn't matter.

If you manage to load tapes on the ORIC (if your cat hasn't pissed on the keyboard) and not with this program, just use a copy program on the ORIC and send back the loaded data to the digitizer.

The program manages perfectly with a direct ORIC signal. If that doesn't work, or if you can't carry your ORIC, save the signal on a new tape : it will improve the signal.

ORIC's 6522 chip is very good at reading tapes and correcting errors.

Take ORIC loading program as the only reference.

If the game has many parts, save them separately, and then join them (cat).

Sometimes you'll need to put some 0x16 bytes between them (don't ask why).

Good luck !

For any technical questions, don't hesitate to contact

me

.

PS : I provided the C source code for the 'transf' routine and you should be able to compile it on UNIX Workstations and Pee Cees, if you find that sampling is more convenient on those platforms.

Anyway, you can get almost all the existing games on the Oric in a http site:

<http://arlesienne.ensica.fr/LOCAL/ORIC>

managed by Fabrice Frances and Olivier Balet.

IMPORTANT: If Amoric refuses to load some games, that's because the tape sync is too short. It's my very fault !! I uploaded games on the http site, and some of them have got this problem. To correct this, use the

TapeInfo  
tapeinfo program, provided in this archive.

## 1.10 Other platforms

### UNIX VERSION

As I told before in this text, my first attempt to an Amiga emulation was on a UNIX platform. I released a version which did not handle graphics correctly, and I contacted

Fabrice Frances  
at the same moment,

who had wrote a version for PC (Euphoric). He introduced me to Olivier Balet, which improved my UNIX version with graphical optimizations, but now they try to release a UNIX version with Fabrice. Maybe that I'll release a XMotif version later.

### PC VERSION

For your friends owning a PC and who want to get a very good emulation, you should try Euphoric from

Fabrice Frances

Fabrice is really an amazing programmer and his emulator is really a jewel in the jungle of PC software. You can upload it at [ftp.ensica.fr](ftp://ensica.fr) or at the http address given above.

There's also some interesting Netscape information about the ORIC, its history, etc...

We often exchanged ideas and suggestions with Fabrice. If you're yourself the unlucky owner of a Pee Cee, Euphoric should wipe your tears away.

It is fast and supports sound emulation, Oricl, Atmos, and Telestrat (!), Oric Microdiscs, virtual disks, RS232, there's almost nothing missing...

### ATARI-ST VERSION

Olivier Galibert

downloaded my emulator for UNIX and e-mailed me telling me he was going to make an emulation for ST. He gave me precious hints

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which allowed me to correct 6502 emulation bugs and to gain a lot of speed. I hope his excellent knowledge of the 680x0 will allow him to release his emulator soon, even if the ST is a bit obsolete now. (What about the amiga...)

#### ORIC VERSION

Very accurate, it was developed by Oric Systems, UK in 1983.

#### ZX-81 VERSION

No version seems to come on this platform, sorry.

## 1.11 Disclaimer

#### DISCLAIMER

I cannot be held responsible for any damage caused directly or indirectly by the use of this program, irrespective of its correct or improper usage. Use it at your own risk.

## 1.12 Changes

#### CHANGES SINCE THE PRECEDENT VERSION

Amoric has been released under version number 0.9. The version number increased because new features have been added.

- \* The sound has been added (but it's still not perfect)
  - \* I still improved 6522 emulation (Thanks again for the dox, Fabrice).
  - \* Swedish documentation (but it is the V0.8b guide)
  - \* Oric 1 ROM support (with all the patches)
  - \* Speed improvement (5-8%) when running the ROM keyboard routine, owing to the optionnal patch in the routine which writes into the AY-3-8912. Calling that routine was very time-consuming because the emulation had to be very accurate, and it was called about 6400 times per second !
  - \* Tested successfully with Enforcer and Mungwall
  - \* I stopped crunching the executable programs with CrunchMania because some people reported crashes due to that cruncher. Thanks Kamel for your bug report.
  - \* Added the  
    TapeInfo  
    program to allow tape correction  
in some cases, and tape file information.
-

## 1.13 Bugs

### BUGS AND PROBLEMS

The main bugs come from difficulties with the emulation.

I had some difficulties in making some games work. In fact, some bugs in games taught me a lot about ORIC internal structure, and allowed me to improve a lot the fidelity of the emulation. For me, trying 10 or 20 games is compulsory when you program an emulator, most of all when it is a 8bit one, which has no other utility than allowing you to play the old games !

\* First, I did not implement all the undocumented instructions properly (there are a lot of them), but they are implemented as NOPs with skips. That is because a few programs use them, and it is often not on purpose but due to a frequent error from the programmers who believed that the BRK instruction returned at PC+1 after the RTI while it's actually PC+2.

If you don't believe me, just try this on your Oric :

```
DOKE #400,#6000 -> BRK
      -> RTS
POKE #402,#4C -> JMP $FAE1 (ZAP)
DOKE #403,#E1FA
```

If you type CALL #400 you will hear ZAP which means that the RTS instruction is skipped.

Note : On C64 and Apple II, undocumented instructions were found very convenient by some foolish programmers and were used on purpose.

Actually, Amoric handles the undocumented instructions by skipping the PC by the same number of bytes as they did on the real 6502, but they don't perform any other operation. Amoric will only quit if it meets some instructions which originally crashed the Oric (like \$x2).

\* Second, I did not implement in a very natural way the screen refresh, in order to improve the speed, that's why some bugs could occur when flipping in HIRES. Some games use a hybrid video mode half-text half-hires (DOGGY,FIRE FLASH, ...), which is hard to reproduce without corrupting the emulation of the others ones (TEXT and HIRES). Those modes are not supported yet, but although I told in the docs of version 0.8 that they would be supported for sure in the next release, and that IS the next release, you can see that I lied ;-), but I tried hard to implement it, I swear, and I had lots of problems. I could do a good graphics emulation but it will considerably slow down your CPU.

\* Third, the 6522 VIA, used for I/O (Keyboard, sound), is non-trivial to emulate. I tried to emulate the vital functions (Timer 1, Timer 2, Communication with 8912), I have some trouble with Timer 2 and with PCR, and some functions are activated on a read, and as I can't intercept every read, they will never work ! I'll ask Fabrice Frances for more details about it.

\* A naughty bug comes from the fact that I do not use a real Intuition screen :

If you click with LMB, the Amiga hangs. It's because of a conflict before intuition events and my display. That's why I emulate both of the Oric joysticks with the same amiga joyport.

## 1.14 Working Games

THE GAMES WHICH WORK OK WITH AMORIC

The list is increasing from version to version.

Some of these games had to be patched to work since they needed a too much accurate emulation. (Clock cycles...)

They are followed by an asterisk \*.

3D-FONGUS (Loriciels)  
3D-MUNCH (Loriciels)  
L'Aigle d'Or (Loriciels)  
Andromeda et Persepolis  
Le Spectre d'Anubis (Eric Chahi)  
Archerons'S Rage  
Arena  
Baston (Sprites)  
Bering (Dialog)  
Bombyx (Dialog)  
James Bond Part 1 (Severn)  
Breakout (Tansoft)  
Categ-Oric (No Man's Land)  
Centipede (PSS)  
Chess I et II (Tansoft)  
Chopper (Severn)  
Corsaire (Hebdogiciel)  
Crocky (Loriciels)  
Damsel in Distress (IJK)  
DEFENCE FORCE (Tansoft)  
Le Diamant de l'île maudite (Loriciels)  
Don Juan et Dragueurs (Micropuce)  
Don't press 'Q' (Andrew Moore)  
Dracula's Revenge (PSS)  
Driver (Dialog)  
Elektro Storm (PSS)  
Esquive (Oric France)  
Frelon (Loriciels) (Don't use the version from the Oric Page, because it's ←  
corrupt)  
Frogger  
GALAXION (Loriciels)  
GALAXIANS  
GALAXION (Loriciels)  
GASTRONON (Loriciels)  
Le Manoir du Docteur Genius (Loriciels)  
Ghost Gobbler (IJK)  
GHOSTMAN (Infogrames)  
GRAPH (Loriciels)  
Gravitor (Severn)  
HADESASM  
HADESMON  
HARRIER ATTACK (Durell)

---

The Hobbit (Melbourne)  
Honey Kong (Sprites)  
Hopper (PSS)  
Hu\*Bert (Loriciels)  
HunchBack (Ocean)  
Hyper Olympics (Rotten game from mine in 1984)  
INVADERS (IJK)  
L'Immonde Dr Kokus (Rotten game from mine in 1986)  
KRILLYS  
LAND-ILL (Tansoft)  
Light Cycle (PSS)  
Lilla et Jacky (MicroPuce)  
LMPLUS  
LOCUS  
M-A-R-C (PSS)  
Macadam Bumper (ERE)  
MISSION  
MR WIMPY (Ocean)  
Mushroom Mania  
Le Trident de Neptune (No Man's Land)  
Nibbler (Hebdogiciel)  
Nowotnik Adventure  
Orion (Loriciels)  
Panic (No Man's Land)  
Pastablasta (Arcadia)  
Pengo  
Playground 21  
Tendre Poulet (Sprites)  
Probe 3 (IJK)  
Le Protector (Loriciels)  
Psychiatric (Ere)  
Lone Raider (Infogrames)  
Le rendez-vous de la terreur (Ere)  
Le retour du Dr Genius (Loriciels)  
S.A.G.A (Ere)  
SKRAMBLE (Micropuce)  
Spooky Mansion  
StarFighter (Severn)  
Starter 3D (No Man's Land)  
Strip 21 (Micropuce)  
Super Jeep (Loriciels)  
Two Gun Turtle  
Le secret du tombeau (Loriciels)  
Le tour du monde en 80 jours  
Triathlon (Ere)  
TrickShot (Ijk)  
Trouble in store  
TYRANN (Norsoft)  
WAYDOR  
WYX (Hebdogiciel)  
XENON 1 (IJK) \*  
XENON 3 (IJK)  
ZEBBIE (IJK)  
ZODIAC (IJK)  
Zoolympics (No Man's Land)  
Zorgon's Revenge (IJK)

---

## 1.15 To do

Some things remain undone :

- \* half-text/half-hires mode. Really a drag !
- \* Better sound emulation.
- \* Multitasking support
- \* A true intuition screen
- \* Some floppy disk emulation (virtual or real).
- \* Improvement of the flash mode

## 1.16 Register

### REGISTER

I gave up the idea of releasing Amoric while asking people to register to it for many reasons I don't think it's necessary to expose.

Amoric is Giftware, so send me anything you want to 'register'. I accept registrations for games and/or utilities that you've written, and also translations in German, Spanish, and other languages for the manual.

Anyway, if you've lost all your money playing Mortal Kombat II, or you have no time to translate the dox in czech, or you can't program, you can send me a mail to tell me what you think of my program. Many people already e-mailed me about Amiga when I uploaded the UNIX version because I said in the .readme that I had got an Amiga. I think the worst thing is indifference.

## 1.17 Acknowledgements

### ACKNOWLEDGEMENTS

I would like to thank the following persons :

- Fabrice Frances, who provided me the complete 6522 and AY-3-8912 docs, and who gave the PC world a program it doesn't deserve ;-). He helped me to correct bugs in the Unix version and gave me his 6522 emulation code (in i80x86) and a lot of hints. Moreover, we work at 500m one of another !!
  - Olivier Galibert, who contacted me about the Unix version to report me a bug.
-



Great thanks for your powerful hints in 6502 emulation with 68000, and for your accurate docs on the 6502 emulation (including undocumented opcodes). Maybe Amoric would have never been released without you.

- Boris Granveaud, who wrote the tape digitizing routine, for his friendship and his great debugging help when I decided to write the Unix version.
- Christer Bjarnemo, for his translation of this documentation in swedish. He did not even know the Oric, but he enjoys emulators a lot.
- Olivier Balet, for working on my Unix version.
- Sylvain SOUCHE and Jean-Yves ROSSI for providing me some games the tape of which I had eaten.  
Special thanks to Jean-Yves who lent me his ORIC (I had lost mine), his cables and his (f\*\*\*ing) tape recorder.
- Bruno Thiebolt, builder of OricLink, who transfered lots of games from the Oric to the Oric Page on the Web.
- The late 'Theoric' french magazine, in which precious technical information was found on the 6522 and on the tape format.
- Eric Totel, for his testing on his A1200, and for letting me use his RKM ↔ Libraries.
- Oliver Rummeyer, for his great program "RO", of which I'm currently the french official dealer (Advertisement)
- The Amiga, for being such a great computer.
- All the people who tested and enjoyed this program on its UNIX form the ORIC nostalgics and the others, and who e-mailed me about it.
- The Pixies, the Breeders, and Franck Black. That's not music for PC users !

## 1.18 The Author

THE AUTHOR

If you have any feeling about this program, or you want to make suggestions or bug reports, please contact me at one of my e-mail addresses :

fabre@supaero.fr  
or  
fabre@cert.fr

Mails of love or death threatening ones will be welcome.

## 1.19 Fabrice Frances

---

FABRICE FRANCES

He wrote the PC version, available at ftp.ensica.fr.  
He is very active in the Oric Mailing List.  
To reach him, you can try :

```
frances@ensica.fr  
or  
frances@laas.fr
```

## 1.20 Olivier Galibert

OLIVIER GALIBERT

He is currently writing the ST version.  
To reach him, you can try :

```
Olivier.Galibert@mines.u-nancy.fr
```

## 1.21 The TapeInfo program

TAPEINFO : Gets some information about tape files and allows to correct them.

I wrote TapeInfo recently in order to correct some tape files in an automated way.  
When I transferred those files, I did not write enough sync bytes (\$16).  
The files worked OK with Amoric 0.8, 0.8a, 0.8b but they did not work with ↔  
Euphoric,  
the PC Oric emulator from Fabrice Frances, and won't work from this version of  
Amoric (0.9), and Fabrice asked me to correct the relevant tapes.

HOW TO USE:

1) To get infos on a tape file

```
tapeinfo [file]
```

Example:

```
6.SERVICE:Programmation/ORIC48K/games> tapeinfo DEFENCE.DAT
```

```
-- Amoric TapeInfo -- Written by JF FABRE --
```

```
Loading source file : DEFENCE.DAT...
```

```
File size : 58686 bytes.
```

```
Analysing tape...
```

```
Program 1 : Offset $0
```

```
Good Sync found at offset $0.
```

```
Program name : L
```

```
Start : $6000   End : $69ff   Length : $9fe
```

Program 2 : Offset \$a0f  
Good Sync found at offset \$a0f.  
Program name : A  
Start : \$4fd End : \$4dff Length : \$4901

Program 3 : Offset \$5321  
Good Sync found at offset \$5321.  
Program name : B  
Start : \$2980 End : \$727f Length : \$48fe

Program 4 : Offset \$9c30  
Good Sync found at offset \$9c30.  
Program name : C  
Start : \$4e00 End : \$96ff Length : \$48fe

2) To correct a wrong sync, even on a multipart tape file :

tapeinfo -c [file]

Example :

```
6.SERVICE:Programmation/ORIC48K/games> tapeinfo -c HOPPER.DAT
```

```
-- Amoric TapeInfo -- Written by JF FABRE --
```

```
** Correcting mode activated...
```

```
Loading source file : HOPPER.DAT...  
File size : 19218 bytes.  
Analysing tape...
```

```
Program 1 : Offset $0  
Weak Sync found at offset $0.  
Program name : HOPPER  
Start : $500 End : $5000 Length : $4aff  
Correcting part 1...
```

The program won't modify the file if all the syncs are OK.

You can use this program with an Opus program like RO, Browser II or Directory ↔  
Opus.

WARNING: Don't use this program with anything else than tape files, because it may ↔  
interpret  
your data and destroy them (even if enough checks are done to avoid this).

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