

# Amiga-FAQ

---

Frequently asked questions and answers

26 September 1995

## Ignaz Kellerer

Copyright © Ignaz Kellerer

Georg-Habel-Str. 11

81241 Munich (Germany)

Tel. (+49) 089 / 885147

Internet: [kellerer@informatik.tu-muenchen.de](mailto:kellerer@informatik.tu-muenchen.de)

This document lists some frequently asked questions and tries to give answers. Its intention is to help new users and to reduce the amount of news that most experienced users don't like to read anymore.

Permission is granted to make and distribute verbatim and modified copies of this document following the terms of the "GNU General Public License" provided the copyright notice and this permission notice are preserved on all copies.

The author gives **absolutely no** warranty that the answers given here are correct. Many of them were contributed by other users and I cannot even make marginal checks. If you think that something should be changed, please tell me. Suggestions, contributions, new answers, critics, flames (oh, how I like this 'nil:' :-)) are rather welcome.

Please notice that there are many questions that aren't answered yet, even more: Whole sections that remain empty! I feel that I cannot give satisfying answers. So it's your turn: Fill the gaps and tell me what i should include into this document!

---

# 1 CPU, Custom chips, RAM and other stuff

This chapter contains questions concerning the Amiga-Hardware.

## 1.1 What are 68EC020, 68EC030 and 68LC040?

Motorola, the company producing the 680x0 family offers crippled versions of their processors. They are a little bit cheaper than the originals, that's why Commodore decided to build the 68EC020 into the A1200 and the 68EC030 into the A4000/030.

The difference between the 68020 and the 68EC020 is that the latter can address just 16Mb of memory. That's why the A1200 cannot have more than 10 Mb RAM. In most cases you will not notice the difference.

This is not the case for the 68EC030: Many owners will notice that the 68030 has an MMU and the 68EC030 doesn't have. There are some important programs depending on an MMU, for example Enforcer (a debugging utility), GigaMem (a program to emulate virtual memory) or all current Unix versions (see Section 7.1 [Unix], page 43). Other Amigas than the A4000 and the A3000 need an additional processor card using a 68030 or 68040 or 68060 to run these.

Finally the 68LC040 is a 68040 without FPU. See Section 1.2 [FPU], page 1.

## 1.2 What's an FPU?

The first 680x0 processors (upto 68030) could process integers only. Floating point operations had to be emulated by the software. An FPU is a chip (or part of a chip) that can process floating point operations, a mathematical coprocessor.

One separates three FPU types on the Amiga: The 68881, 68882 and the 68040's internal FPU. The 68882 is up to 1.5 times faster than the 68881, because it is splitted in two parts: A conversion unit (the FPU's are using an 80 bit format internally) and the arithmetic unit. The 68040's internal FPU adds a pipeline, but misses the trigonometric instructions of the others. These are still emulated by the software, 68040.library for example.

Special programs (Raytracing, DTP, Mathematics, TeX) are offered in a special coprocessor version which are up to 50 times faster than the original versions.

Michael Kaiser (kaiser@ira.uka.de)

### 1.3 Can I use a 3.5' HD in my A1200?

Many people would prefer to use a 3.5" instead of the smaller 2.5" drives as the former are much cheaper. This is possible, but you need a special cable to connect the drive to your IDE controller. Additionally you should put some isolating material between the drive and the main board. Some people report termic problems but I did not notice anything.

Some dealers offer a set which contains the cable, isolating material and for about 20\$. See the magazines for more information.

Thomas Schuh (thomas@stepout.tynet.sub.org)

If you are going to install an IDE-harddisk, regardless if 2.5" or 3.5", you should always consider that the it may not work flawlessly, if the drive and ROM-version have not been tested and approved by Commodore. Regarding the A1200, one should also remember that this Amiga has not been designed to hold 3.5" harddisk drives. The 2.5" drives, which are mainly thought for portable computers, may have some advantages (for example in power consumption, heat emission or shock resistance) that could pay off because of the small keyboard case of the A1200 and the limited power supply. With the larger 3.5" drives, ventilation inside the computer might also be disturbed. If it is necessary to remove some shielding inside the A1200 to make the drive fit inside, even radio interference may occur.

To sum it up: if 3.5" harddisk drives could really be used in the A1200 without any problems, you could be sure Commodore themselves wouldn't have used the slightly more expensive 2.5" drives in the A1200-HD.

## 2 The Operating System

This chapter handles questions concerning the operating system, Kickstart as well as the Workbench.

### 2.1 Can I use another Kickstart than the builtin?

First let's drop some words on the Kickstart's Copyright: This belongs to Commodore, you **must not** use Kickstarts, without the right to do it! Especially it isn't allowed to make an image of anyone else's Kickstart and run this on your own Amiga. (I even doubt that it is allowed to do this on your own Amigas, if you have more than one.)

But of course it is possible and allowed for some people, developers for example. There are two different ways, a hardware solution and a software solution. The former is to buy a card which can hold two or more Kickstart ROMS and allows to select between when the System is booting.

The software solution needs a program (softkicker) and an image of the ROM. The softkicker allocates RAM, loads the ROM image into the allocated memory and reboots. Of course you have less RAM after the Reboot: 256Kb when running Kickstart 1.2 or 1.3 and 512Kb for Kickstart 2.0 or higher.

There are different Softkickers, some of them needing a MMU (see Section 1.1 [MMU], page 1). I recommend SKick 3.43 (Aminet, directory 'util/boot') because it doesn't need a MMU and supports many different Kickstarts. It is rather easy to create the ROM image using the following program:

```
#include <stdio.h>

#define kickorig 0xf80000 /* 0xfc0000 for Kick 1.2 und 1.3 */
#define kicklen  0x080000 /* 0x040000 for Kick 1.2 und 1.3 */

void main(int argc, char*argv[])
{
    FILE *fh;

    if ((fh = fopen("kickstart.file", "w")) != NULL) {
        result = fwrite(kickorig, kicklen, 1, fh);
    }
    fclose(fh);
}
```

## 2.2 The Graphical User Interface

Die standardmäßig mitgelieferte Oberfläche "Workbench" ist nur die Grundlage zum Aufbau einer guten, angenehmen Oberfläche.

Zu diesem Zweck gibt es zahlreiche Tools, die den Anwendern das Leben erleichtern. Einige von diesem findet man auf dem Aminet in den Verzeichnissen 'util/#?/'.

## 2.3 What is MUI?

MUI is a set of shared libraries which are used to build a comfortable GUI (**Graphical user interface**). The general idea of MUI is that the programmer determines only the logical structure of the GUI and the look (Font, Size, Windows on Workbench, Public Screen, own Screen, ...) is determined by the user only. From the programmers point of view using MUI is simpler than `gadtools.library` but much more powerful. On the other hand MUI interfaces are slower than GadTools-Interfaces, especially on old 68000 machines.

MUI is found in two archives, one for developers only and one for users. Source: Aminet, 'dev/misc'.

### 2.3.1 Icon collections and Backgrounds

The standard icons aren't beautiful, indeed. But there do exist some beautiful icon collections. I know of `MagicWB` and `NewIcons`.

`MagicWB` is Shareware. The icons are drawn beautiful in pastel with every known trick. You also get a lot of good backgrounds which beautify workbench windows and MUI programs. Fine and good readable fonts replace the clumsy `topaz8` font. You also get good icons for the `ToolManager`. You can find a test version of `MagicWB` on Aminet.

`NewIcons` is Freeware. The icons do have relative intensive colors and are drawn as three dimensional objects floating slanted in space. You can find `NewIcons` on Aminet, '`util/wb/NewIcons.lha`'.

- F:** How do I turn off the "Gag" of MagicWorkbench (the intro which appears sometimes during booting)?
- A:** In S: should be a file called '`mti.data`'. Delete it.
- F:** How can I create `NewIcons`?
- A:** The author of `NewIcon` currently works on an `IconEd`. Until then, `Iconian 2.9x (I3)` is the only way to create `NewIcons`.
- F:** How can I prevent `MagicWorkbench` Icons to appear in incorrect colors?
- A:** Register `MagicWB 2.0`, it contains a tool which patches the palette, or get one of the different tools from Aminet.

#### `MagicColors`

#### `ShoveColors`

Its a good program, you can find it in `Iconian`, `PictIcon` or '`Aminet:util/wb/`'.

## 2.4 What is the Amiga equivalent of . (Current directory)?

The AmigaDOS equivalent for the `.` representing the current directory on Unix and certain non-reentrant interrupt handlers is the empty string, which is written as `""`.

Example:

```
COPY S:Startup-Sequence ""
```

copies your `Startup-Sequence` to the current directory.

There is some FD software available to patch a Unix-like interpretation of `.` and `..` into the AmigaDOS, including, but not limited to, Martin Scott's `UnixDirs`. (Aminet, '`os20/util/UnixDirsII.lha`' or Fish-disk 837)

Arno Eigenwillig (arno@yaps.dinoco.de)

## 2.5 The PIPE: queue-handler

In the AmigaOS release 2.04, a new handler for passing data between programs was introduced. This handler is called ‘L:Queue-Handler’, better known as the ‘PIPE:’ device.

‘PIPE:’ implements a true `pipe` familiar from UNIX systems. Its function is to pass the output of one program to another program as input. You can chain several programs together using multiple pipes.

The advantages of using pipes are:

1. No need for a lot of RAM to keep the temporary files, or, no need to slow things down by storing temporary files on the HD.
2. Faster operation since the intermediate data doesn’t need to be stored anywhere between programs.

The ‘PIPE:’ device differs from the UNIX pipes in two important respects:

1. It is a device, so the input and output of the programs doesn’t need to be a redirected standard output, although that is the general case. You can also use ‘PIPE:’ instead of files, with two restrictions; you can not read a directory from ‘PIPE:’, and the ‘PIPE:’ ‘file’ can not be ‘seeked’ in.
2. It does not support a flush operation. If all of the data written in a ‘PIPE:’ device is not read out, it will stay there, buffered. Thus you must always ‘empty’ a pipe before closing it.
3. Because of the above, if unread data exceeds the size of the ‘PIPE:’ internal buffer, the program writing to the pipe will ‘block’ (that is, suspend operation) until the data is read. See below on how to manually flush a pipe.

The PIPE: handler name syntax is ‘PIPE:name/bufsize/bufnum’, where ‘name’ is the name for the pipe channel. Using names you can have several simultaneous pipe operations. The optional arguments `bufsize` and `bufnum` specify the size and number of the buffers used by ‘PIPE:’. Normally, you would just use ‘PIPE:name’.

The default buffer size of ‘PIPE:’ is 4096 bytes, and the number of buffers (ie. channels) is unlimited.

Osma Ahvenlampi (Osma.Ahvenlampi@hut.fi)

### 2.5.1 Using PIPE: in a standard AmigaShell environment

First, make sure ‘PIPE:’ is mounted. You can do this by giving the command

```
1> Mount PIPE:
```

in a Shell window. On an AmigaOS 2.1+ system, 'PIPE:' is normally mounted on startup by placing the mount entry file 'PIPE' in the drawer 'DEVS:DosDrivers'.

In an AmigaShell window, give the commands:

```
1> Run List SYS: >PIPE:Listoutput
1> More <PIPE:Listoutput
```

1

These two commands list the contents of the 'SYS:' volume to a pipe and then type it in the Shell window. You could also use:

```
1> Run List SYS: NOHEAD >PIPE:Listoutput
1> Run Sort PIPE:Listoutput PIPE:Sortedoutput
1> More <PIPE:Sortedoutput
```

Notice that you need to 'Run' all the programs except for the last one. This is so that you can get them all running simultaneously. You could also use several Shell windows, or any other way of running all the programs at the same time. Also this might not work if 'More' isn't the standard Commodore AmigaOS 2.04+ More found in 'SYS:Utilities'.

In case you need to manually flush a pipe, for example because the program that was reading from it aborts prematurely, it can be done with the command:

```
1> Type PIPE:name TO NIL:
```

## 2.5.2 The Pipe command

As you can see, this is a somewhat difficult way of using pipes, needing a lot of typing especially compared to the UNIX pipes. There is a solution for that.

Andy Finkel, a former Commodore software engineer wrote a command called `Pipe` (not to be confused with 'PIPE:') that simplifies the use of the 'PIPE:' device. Unfortunately, this command did not make it into the 2.04 release. However, Commodore has given the permission to distribute this, and a few other commands, freely. (Sources: Fish disk 673, Aminet, 'util/cli/finkelshelltools.lha')

For some reason Commodore did not include these commands in the later OS releases, although they work fine even with OS 3.1 (V40). Thus all users are required to get them from the above sources if they wish to use them.

---

<sup>1</sup> Note that '1>' is the prompt AmigaShell gives when it is waiting for a command. The number varies, and the prompt can be customised to look completely different. It is not a part of the command.

The Pipe command usage is simple. The commands to be run with their inputs and outputs piped together are given as arguments to the command, separated by the | (vertical bar) character:

```
1> Pipe List SYS: | More
    or
1> Pipe List: SYS: NOHEAD | Sort IN: OUT: | More
```

Notice how Sort needs 'IN:' and 'OUT:'. These devices don't actually exist, but the Pipe command simulates them with the PIPE:. This is necessary because C:Sort can not use the 'standard IO', but insists on files.

The separator character | can be configured to be something else with the local variable `_pchar`.

### 2.5.3 Pipe command support in AmigaShell

There is a little known and quite useful undocumented feature built in the 2.04+ AmigaShell, that is, AmigaShell knows about the Pipe command. By setting the local variable `_pchar`, you can use pipes without even entering the Pipe command. AmigaShell will prepend it on the command line automatically if it sees the pipe separator command specified by `_pchar` on the command line.

Thus, after the command:

```
1> Set _pchar "|"
```

2

the above examples can be used like this:

```
1> List SYS: | More
    or
1> List SYS: NOHEAD | Sort IN: OUT: | More
```

Those familiar with the UNIX pipes will notice how the usage is very similar to the UNIX pipe usage.

### 2.5.4 Quick usage guide

1. Get the ShellTools archive from the Fish disk 673, or from Aminet, 'util/cli/hacks204.lha'.
2. Install the commands in this archive in your Shell search path, preferably C:.
3. Put the command 'Set \_pchar |' in your 'S:Shell-Startup' file.
4. Restart your AmigaShell so that it reads the 'S:Shell-Startup'.

---

<sup>2</sup> The quotes around the vertical bar are important, to avoid AmigaShell interpreting the command as an attempt to use PIPE:, if `_pchar` is already set (for example if the Shell is started from within another one).



5. Try 'List SYS: | More'
6. Read the ShellTools documentation and experiment.

### 2.5.5 Related things

The variable `_mchar` is used to separate one command from another in a shell line. So, after the command:

```
1> Set _mchar ";"
```

you can put more shell commands into the same line, separated from each other by `;`.

### 2.5.6 Troubleshooting

- Q:** When I try the command 'List SYS: | More' I get an error  
PIPE: Unknown command
- I have 'PIPE:' mounted, what's wrong?
- A:** AmigaShell is referring to the command `Pipe` in the error, not the 'PIPE:' device. You haven't installed the commands in the ShellTools archive.
- Q:** I get a requester that says  
Please insert volume PIPE: in any drive
- when I try any of the command examples.
- A:** 'PIPE:' is not mounted. Try 'Mount PIPE:'. If that doesn't work, refer to your AmigaDOS manual or a friend that knows how to mount devices.
- Q:** When I try any of the examples the More window pops up but nothing is shown/I get an error afterwards/More pops up a file requester.
- A:** You are not using the standard AmigaOS `More` command. Either use another name or install a command that supports pipes. Possibilities are the `C= More`, `Less`, or `Most` for example.
- Q:** With use of PIPE:, sometimes characters get lost. What happened?
- A:** Up to OS 3.1, the queue-handler has some bugs which don't allow a really foolproof transmission of data. A compatible replacement for the queue-handler can be found on Aminet, 'util/sys/HWGQueue.lha'.
- Q:** None of these happen but it still doesn't work as you described.
- A:** Are you using OS 2.04 later? Are you using the standard AmigaShell? Try with all extras disabled.

## 2.6 ARexx, the program control language

- Q:** I want to send an ARexx command through CLI or through a shell script, but that (rx ADDRESS PORTNAME;COMMAND) doesnt work.
- A:** You have to put quotation marks. (rx "ADDRESS PORTNAME;COMMAND"). It also prevents upcasing the portname when it should be lowercase.

## 3 How about Graphics?

Graphics is one of the major strengths of the Amiga. Why don't we have more answers here? :-)

### 3.1 What are chunky and planar displays?

Simply put, the terms **chunky** and **planar** (short for **bitplanar**) refer to different ways of storing graphics information in a computer's memory. They are rather easy to understand, as far as things go, but incredibly difficult to explain:

Computer images are arranged as a grid of pixels, each of which can be thought of as a number representing the color number of the pixel, sort of like a paint-by-numbers scheme. For example, here's a simplified example image, in four colors:

00302132

The Amiga stores this image in a **bitplane** mode. That is, it is represented by several planes of bits (binary digits, 1s or 0s). This is a four-color image, so each color number could be represented by two bits. Therefore there are two bitplanes:

```
00100110   Here's bitplane 0
00101011   And here's bitplane 1
-----   Now, let's add them up, binary style:
00302132
```

Which is the final image. If the image was in two dimensions, it would truly be composed of bit planes. However, I'd need three dimensions to show multiple bitplanes overlaid, and therefore for simplicity we're working in one dimension (which is all we need).

Now, there's another way of storing this image. How about if we localize the bit data in little chunks?

00 00 11 00 01 10 11 01 = 00302132

This is the principle of the **chunky** pixel mode.

Both methods of image storage are perfectly logical, and no one can say that one is better than the other. However, there are certain technical aspects which cause certain advantages and disadvantages.

First, if you've seen colored text scroll on your Amiga, you know there is a bit of "flicker" that arises. Specifically, what happens is that while the text is scrolling, its color temporarily changes to something completely different. What's happening is that the computer's moving several bitplanes of data while the raster (monitor electron gun) is sweeping across the screen. What that means is that, if the raster catches the data while it's being moved, you can end up with some bitplanes being moved and some not. What if we filled bitplane 1 in the example above with 0s? Instantly all the 3s become 1s, and the 2s become 0s! This is what causes "flicker" when certain colors are scrolled. By contrast, if a chunky pixel display is caught while scrolling, all we see is a partially-scrolled image; the colors are preserved (since their units are the small ones).

That's a disadvantage to planar pixels, but what about chunky pixels? Well, recall that a computer organizes information in terms of 8 bit bytes. These groups are static; you cannot decide to all of a sudden organize data in terms of three bytes or something! Therefore, when using chunky pixels, things get complicated if we decide to use a nonconvenient number of bits per pixel. In practice, the 8-bit (256-color) mode, and 24-bit (16 million color) modes are the most common candidates for chunky pixel displays.

Finally, certain effects can be accomplished with the different systems. Bitplanar mode is particularly useful for things like shadows (where an extra bitplane is set with 1s instead of 0s), and chunky mode is great for perspective and "mapping" (since the data for each pixel is localized in a single "chunk"). The latter advantage makes chunky pixel mode really great for games, and is what made Wolfenstein 3-D possible.

We all know that Amigas use the bitplane system for storing images. However, the Macintosh and PC(VGA) both use chunky pixel modes. While we can optimize our RAM usage with "bizarre" modes like 8- and 128-color, they gain the advantages of non-flicker scrolling, and the programming simplicity of just writing a byte where you want the pixel to go.

The difference between the two modes becomes problematic in things like emulation. EMPLANT has a "chunky to planar" routine which it uses to convert a Macintosh display into an Amiga one. "Chunky to planar" routines are also useful for getting chunky-inclined things to run on Amigas (see TMAPDemo, rotdemo). On a side note, there was some confusion as to what EMPLANT used the MMU for with regard to chunky to planar. The MMU itself is incapable of performing the algorithm for the conversion; rather, it is used to detect what portions of the display memory are updated from the Mac side, and therefore the processor is saved from having to perform the chunky to planar conversion for the entire display.

I sincerely hope that helped clear up most of the mystery concerning the terms "Chunky" and "Planar"!

(Joseph Luk, jluc@eis.calstate.edu)

## 3.2 What is doublebuffering?

Don't be ashamed if you haven't a clue as to what this is. It's rather simple, really. Imagine you wanted to animate something by drawing out each frame. Now imagine you had only one piece of paper. Even if you drew pretty fast, it would be difficult to see what the animation looks like because you'd have to erase the frame you just drew, in order to draw the next one!

What if you had two pieces of paper? Why, then, you could see the difference between two adjacent frames. First you'd draw your first frame on the first piece of paper, then you'd draw the second frame on the other piece. Then you'd erase the picture on the first piece of paper, and draw in the third frame. Then you'd erase the picture on the second piece of paper, and draw in the fourth frame, and so forth.

This is the principle of doublebuffering. The computer shows you the picture it just drew, then turns around and draws the next one. It then swaps the picture in front of you with the one it just drew, and repeats the process. The result is a smooth animation, because you never need to see the computer draw; all you see is each finished product.

(Joseph Luk, jluc@eis.calstate.edu)

## 3.3 What monitors will work on my Amiga 1200/4000?

Monitors can be classified after the horizontal scan frequency they require. TVs, as well as C=’s 1084 monitor, need frequencies around 15 kHz. VGA/SVGA need approx. 30 kHz. Multisync monitors can take many frequencies.

In short: You can use any monitor you want with an A1200. BUT:

- If you use a regular VGA/SVGA monitor, you can only use a few display modes (like DblPAL, DblNTSC and/or Productivity). I.e. (320|640) x (256|512|1024) for DblPAL. This is great for Workbench and all "serious" utilities (DTP etc), but don't expect any games to work... they don't use your preferences, just take over the machine and assume a 15 kHz monitor. Also, you cannot utilize the "Early Startup Control" screen (you know, disable cache, and that stuff), which also requires a 15 kHz monitor. Furthermore, VGA monitors don't have speakers. And the VGA-type modes don't support Genlocks. But for a lot of "serious" work, a VGA monitor is quite adequate.
- You already know what happens with a 15 kHz monitor; the flickering in Interlace mode. A small tip: Try to use NTSC instead of PAL. This increases the refresh rate from 25 Hz to 30 Hz, at the expense of lower vertical resolution (482 lines maximum). The NTSC and PAL modes aren't as bad as many people think. If your monitor has a lot of phosphorous (long afterglow),

PAL Laced can be quite OK, and it gives you a resolution of 1448x566 in SuperHiRes. That's the highest resolution currently supported on AGA Amigas, in `_any_` display mode.

- A Multisync gives you the best of both worlds. The 1940 and 1942 monitors from C= are quite OK, although rather cumbersome to use... The h/v size and offset must be set manually each time you switch display mode.<sup>3</sup> The 1960 monitor doesn't have this problem, but it's a bit more expensive.

For a VGA/SVGA or Multisync monitor, you'd need a little shiny box which gives you the standard 15-pin "D" connector. It costs around \$15.

There are other alternatives... like the "AmiVGA" box (\$50 or so), which I think is a cheapo version of the Flicker Fixer. (But it's really a shame to use this on an AGA Amiga.)

Also, you can get a VGA monitor, and hook up your TV to the composite or RF port on the Amiga - one monitor for games, one for serious stuff.

(Per Espen Hagen, [per.e.hagen@ffi.no](mailto:per.e.hagen@ffi.no))

### 3.4 How do I switch between PAL and NTSC?

PAL and NTSC are two different video standards, the former being European, and the latter being American. PAL has a slightly taller screen (256 lines non-interlaced, non-overscanned) as opposed to NTSC (200 lines), so if you see the bottom portion of a program's screen getting cut off on your American machine, chances are the program was written for PAL, and is running on your shorter NTSC screen. PAL and NTSC differences are somewhat less important to European users; since their machines default to PAL, running an NTSC program is no more than a minor annoyance having the screen only appear in the top portion of the display.

Therefore, for us NTSC folks, switching into PAL mode becomes important to avoid loss of some picture on Euro Demos, etc.

First, the most common misconception about switching between PAL and NTSC is that you need a Multiscan or special monitor for such a purpose. Not so! Just about any monitor can handle the minor signal difference between PAL and NTSC (50Hz vertical refresh versus 60Hz). The 108x, 19xx, and 20xx series, and even most TVs, can display both PAL and NTSC. Sometimes it is necessary to perform minor tweaking of vertical hold and/or v. size on your monitor to achieve full display, though this is trivial.

---

<sup>3</sup> A patch is available on Aminet for Kickstart 3.0 to do this without manual actions in the file `'os30/util/Monitor30Patch.lha'`.

What IS needed to switch between PAL and NTSC in software, is a "Fatter" (1MB) Agnus or better. If your system has more than 512K of CHIP RAM (use the avail command to find out) you have this chip. If you do not, ou can still construct a hardware switch (see below).

The following directions assume you're an NTSC user who wants to switch into PAL mode, but the procedure for going from PAL to NTSC is much the same.

The most common use of switching into PAL is for self-booting games, demos, etc. The best way to accomplish this on pre-3.0 systems is to use Chris Hames' Degradar program (most recent version: 1.30). Once you have procured this program, the switch is as simple as selecting "50Hz", and "50Hz System", then installing the program's ROMTag (little program that runs at boot-time) by pressing the "Survive Reset(s)" button.

AmigaDOS 3.0 added a PAL/NTSC switch feature to its Boot Menu, and all you need to do in order to access this is hold down both mouse buttons as the computer boots. Select Display Options, Display Mode/PAL, and then Boot. If the program still fails to go into PAL mode (Zool is one I've found), you may wish to get Degradar anyway and try that.

Software PAL/NTSC switching is easy and painless. Some people have gone even further by installing hardware PAL/NTSC switches. This results in a system which even the most nasty hardware-banging programs can't bring to its original configuration (if it has been switched). The procedure is simple – most Amigas have jumpers already – but beyond the scope of this document.

Therefore, if your screen is too short or cut off, seek the different screen mode. You'll "see new horizons", literally!

(Joseph Luk, jluc@eis.calstate.edu)

4

## 4 Programming

This chapter handles problems arising for programmers and compiler-users only.

---

<sup>4</sup> PAL/NTSC switching with a MultiSync monitor is possible on 2.0+ and easily accomplished by moving the PAL monitor type to (or NTSC, as applicable, I have them both in) the Devs/Monitors drawer (from the Storage/Monitors drawer), reboot, then go into the Prefs drawer and select the ScreenMode program. You will see at least two PAL modes available (PAL and PAL Interlaced). Simply select one of the (usually non-interlaced for demos) and select "Use". All windows on the Workbench will close, the video mode will change, and then the windows will reopen – that simple!

Allen J. Newton, anewton@alturia.abq.nm.us

## 4.1 What documentation do I need as an Amiga programmer?

The best information available are the RKMs (ROM Kernel Manuals), 3rd edition, by Commodore, published by Addison-Wesley:

The Amiga ROM Kernel Manual: Libraries, ISBN 0-201-56774-1  
 The Amiga ROM Kernel Manual: Devices, ISBN 0-201-56775-X  
 The Amiga ROM Kernel Manual: Includes and Autodocs, ISBN  
 0-201-56773-3  
 The Amiga Hardware Manual, ISBN 0-201-56776-8  
 The Amiga User Interface Style Guide, ISBN 0-201-57757-7

Especially the RKM: Libraries is a must. The RKM: Includes and Autodocs isn't that much worth: Better get the same stuff on disk instead to have it online. See Section 4.3 [Includes], page 16.

AmigaDOS isn't included in these books. The Autodocs give much information, but to go deeper you probably need

The AmigaDOS Manual, 3rd Edition, ISBN 0-553-35403-5

published by Bantam Books.

A better choice for developers is

The Amiga Guru Book

by Ralph Babel. The book starts with a survey on different aspects of programming the Amiga. (About 250 pages) Useful for beginners are the sections on the Amiga's data types (not to be confused with the 3.x DataTypes used by MultiView, for example), the Includes and the amiga.lib. But even experienced programmers will find useful things here that are missing in the RKMs. But the largest part are about 500 pages on AmigaDOS and, as I think, the most important, because AmigaDOS is the worst officially documented part of the OS. The book is rather concise and hence not as easy to read as the RKMs, but I recommend it as an addition and instead of the AmigaDOS manual. (Not, however, a replacement for the Libraries and Devices, which aren't covered here.) Unfortunately the book has no ISBN and is available in special stores only. But there are some mail order companies which offer it for about 50\$ and which accept credit cards:

NBG USA, Inc.	Almathera Systems Limited
482 Holly Avenue	Southerton House
St. Paul, MN 55102	Boundary Business Court
USA	92-94 Church Road
Voice: +1 (612) 290 9447	Mitcham, Surrey CR4 3TD
Fax: +1 (612) 290 9449	England
	Voice: +44 181 687 0040
	Fax: +44 181 687 0490
	E-Mail: <almathera@cix.compulink.co.uk>
Hirsch & Wolf OHG	Stefan Ossowskis Schatztruhe
	Gesellschaft für Software mbH

Mittelstraße 33	Veronikastraße 33
D-56564 Neuwied	D-45131 Essen
Germany	Germany
Voice: +49 (2631) 8399-0	Voice: +49 (201) 788778
Fax: +49 (2631) 8399-31	Fax: +49 (201) 798447
	E-Mail: <stefano@tchest.e.eunet.de>

Someware  
27 rue Gabriel Péri  
59186 Anor  
France  
Voice: +33 27596000  
Fax: +33 27595206  
E-Mail: <didierj@swad.someware.com>

See Section 9.10 [FAQs], page 53.

## 4.2 What is CATS?

This is a department at Commodore West Chester which was formerly named **Commodore Amiga Technical Support** and was later renamed **Commodore Application and Technical Support**. These are people that work independently of Engineering, but close together with them, and try to help developers outside of Commodore to create nice Amiga applications, software or hardware. To achieve this, CATS has gathered a lot of informations and tools, on floppy, CD, or paper. Much of this material is also available to the general public.<sup>5</sup> But don't mix this up with some sort of Hotline for everyone!

For Americans the address to get this material is

CATS  
Commodore Electronics Limited  
950 Rittenhouse Road  
Norristown, PA 19403

for all Europeans it's a company in Germany:

Fa. Hirsch & Wolf  
Mittelstr. 33  
56564 Neuwied  
Tel. 02631/83990

Dr. Peter Kittel, peterk@cbmger.de.so.commodore.com

---

<sup>5</sup> Which means: For Non-Developers.



### 4.3 Where do I get the Amiga includes?

The only legal way to get the includes and autodocs (and you *should* get them, they are very useful!) is to become a developer (see Section 4.4 [Developer], page 16) or to buy the NDU (Native developers update kit, also known as NDUK or NDK), which is offered by CATS. They cost about 30\$ plus shipping and this seems to me to be a fair price. See Section 4.2 [CATS], page 15. The current version is 3.1.

If you need only the includes, you could get them as well with a compiler (commercial compilers only) or by getting the Fresh Fish CD. See Section 9.6.2 [Fish CD], page 52.

### 4.4 How do I become a developer?

You need the ADSP (Amiga Developer Support Program) documents. To get this write a letter to your local Commodore branch asking for these documents. Everything else should be explained there. The german address (for the US address see Section 4.2 [CATS], page 15) is

Commodore  
Lyoner Strasse 38  
60528 Frankfurt

There are three different developer versions:

#### **Registered**

developers get access to the CBMNET (kind of a Commodore-internal Usenet), which makes it possible to discuss problems with other developers, Commodore engineers included. Registered developers pay about US\$80 per year, plus initial US\$30 initially.

**Certified** developers seem to me the most interesting class: They have the possibility copy the most beta versions of the system software (Kickstart and Workbench) and the respective Includes and AutoDocs. (Not all beta versions and especially no beta hardware.) You pay about US\$250 per year plus US\$50 initially for this.

#### **Commercial**

developers finally have in most details the same as certified developers, but may expect to get more beta versions and sooner, included beta hardware (This has **not** always been so in the past.), hence they pay about US\$400 plus US\$50 initially.

The above describes the prices and the situation in Germany and might be different elsewhere. Especially not all Commodore branches offer the registered status. A hint is to build a group of users and become a developer group, so the costs are reduced.

All developers have to sign non-disclosure agreements (NDA) which specify that we may not discuss information outside of authorized areas even to other developers until given explicit permission by Commodore.

## 4.5 What compilers (assemblers) are there?

There is a lot of programming languages on the Amiga, commercial as well as freely distributable. I will enumerate only those that I know or which seem it worth to me otherwise.

**Assembler** All C-compilers have an Assembler included. Freely distributable are A68K and PhxAss (directory 'dev/asm' on Aminet or Fish disks 521 and 906)

Commercial Assemblers are MaxonASM, OMA3.0 and DevPack3.14.

### Basic

The following commercial Basic-compiler/interpreter are available: BlitzBasic2, Amos and MaxonBasic3.

### C

**C++** Freely distributable C-compilers are gcc (which has its own directory 'dev/gcc' on Aminet) and the evaluation version of Dice (for example per FTP from ftp.uni-paderborn.de, directory '/news/comp.binaries.amiga/volume91/languages' or on Fish disk 491). The advantage of gcc is that you find gcc versions all over the world and on all computer systems. Another advantage is that C++ is included into gcc! But it is slow and needs 4Mb of RAM or more. See Section 4.13 [The GNU C compiler], page 28. See Section 9.9 [Mailing lists], page 53.

Commercial C compilers are Aztec-C, Dice, SAS/C and MaxonC++. Aztec-C doesn't seem to get further development any more. It should be remarked that the commercial compilers have especially wonderful debugging utilities (Source level debuggers!) that the others are missing.

SAS has announced to drop support of the Amiga-Compiler, too, due to the Amiga's bad situation. However, the compiler is still available and up-to-date and has a cross-compiler included, which translates C++ to C and supports the source level debugger too. Considering the price of just 99\$ for students and updates from recent versions or other compilers it is still the most recommendable of the three. In Europe the compiler is available from

SAS Institute, Inc.  
Book Sales  
SAS Campus Drive  
Cary, NC 27513  
USA

SAS Institute GmbH  
PO Box 10 53 40  
69043 Heidelberg  
Germany

Phone: (919)677-8000  
EMail: sasdsb@vm.sas.com

Phone: (49)6221-4160  
EMail: eurdoc2@vm.sas.com

Dice is the cheapest and fastest commercial compiler. The greatest disadvantage of Dice (compared to the other commercial compilers) is the so-called Source-Line-Debugger: This means that you see the current line of source and can execute the program step by step, like with the other debuggers. On the other hand you can examine memory

only, not the variables. To get information about DICE, send email to info@oic.COM. An automatic system will return complete details, including upgrade prices.

Comeau C++ is a crosscompiler like SAS/C++. That wouldn't be a problem, but Comeau C++ doesn't have a C compiler included. You need SAS/C, Aztec-C or Dice additionally. But it is AT&T cfront 3.0 compliant and supports exceptions. And like gcc it runs on many platforms. Maxxon C++ is offered in Germany. I cannot say anything on it. Both compilers are commercial. Comeau's address is:

Comeau computing  
91-34, 120th Street  
Richmond Hill, NY, 11418-3214  
USA

E-Mail: Greg Comeau, comeau@bix.com

Maxon C++ is both a C++ and a C compiler. There is a light version and a developer version. The developer version matches the AT&T standard 3.0. Maxon-light includes a compiler and a editor. Developer includes a source level debugger, Amiga classes library and Hot Help with documentation to the amiga libs. It is a german product, and compiler and documentation are german. The compiler has some little bugs, but you can work with it well, anyway.

**Forth** JForth is said to be an excellent Amiga port of Forth. Among its advantages are object oriented extensions, full Amiga interface and an application generator. It is available from:

Delta Research  
P.O. Box 151051  
San Rafael, CA 94915-1051

Phone: (415) 453-4320  
E-Mail: Phil Burk, phil@ntg.com  
Mike Haas, haas@starnine.com

**Fortran** (Sigh! Still people who need it :-<) Freely distributable are BCF (Fish disk 470) and f2c, a Fortran to C converter (Aminet, directory '/dev/lang'). A commercial compiler is offered from ABSOft. All these are Fortran 77 compilers, I don't know any Fortran 90 compiler on the Amiga.

**Lisp** Freely distributable Lisp interpreters are XLisp (Fish disk 181) and OakLisp (Fish disks 519 and 520) and CLISP ('/pub/lisp/clisp/binaries/amiga' at the server 'ftp.ma2s2.mathematik.uni-karlsruhe.de'). Lisp compilers are Gambit (Fish 764 and 765) and Scheme-to-C (Fish disks 556, 557 and 558). See Section 9.9 [Mailing lists], page 53.

**Prolog** '/dev/lang/UNSWProlog.lha' and 'dev/lang/sbp3\_1e.lha' on Aminet as well as 'SBProlog' on Fish disk 141 and 'SBProlog' on Fish disk 145 are freely distributable Prolog interpreters.

**Modula-2** M2Amiga is offered in Europe, Benchmark Modula-2 in the U.S. Both are said to be very good, have a powerful source-level-debugger, a large library. Especially M2Amiga has great support by a german user-group (AMOK) which for example offers own PD disks. See Section 9.9 [Mailing lists], page 53.

M2Amiga is offered by:

A+L AG  
Daderiz 61  
2540 Grenchen  
Schweiz

Tel.: +41/65/52 03-11  
Fax: -79

Benchmark Modula-2 is available from:

Armadillo Computing  
5225 Marymount Drive  
Austin, Texas 78723  
USA

Phone/FAX: 512/926-0360.  
EMail: Jim Olinger, jolinger@bix.com

## **Oberon**

**Oberon-2** Two compilers (both Oberon-2) are available: AmigaOberon (commercial) is offered by the same company as M2Amiga. It is integrated into a full developers environment and has a large library of modules. Library linker and source level debugger are available.

Oberon-A is a Freeware compiler. (Source: Aminet, 'dev/obero' directory) However, this is a beta release, especially the module library is limited. See Section 9.9 [Mailing lists], page 53.

The AMOK user group supports AmiOberon as well as M2Amiga.

In addition to these two standalone compilers which are thought mainly for creating AmigaOS applications, there is an Amiga port of the Oberon Sytem V4, too. The Oberon System is implemented as an AmigaOS-Task using a separate screen and includes an Oberon-2 compiler. You can use it to write software that will work on all implementations of the Oberon System V4 (for example Macintosh, Windows or Sparc) without any changes.

**Pascal** There is a PD-compiler called PCQ (Directory 'dev/lang' on Aminet or Fish disk 511). It doesn't support all of Pascal and major features are missing. P2C, a pascal to C converter is on disk 341. (Aminet: '/dev/misc/p2c120.1ha') Additionally there are two commercial compilers called HiSoft Pascal and KickPascal. HiSoft Pascal and P2C claim to be compatible to Turbo Pascal up to 5.0. HiSoft has a source level debugger included.

## 4.6 Those never working Esc sequences!

Many printers come with a manual that explains which ESC sequence causes which action on the printer. But there happen weird things when you try to send these sequences to your printer, either it does nothing, or it does something completely different. There is a reason, the Amiga printer drivers. These drivers are made in a way that they only understand a certain set of ANSI Esc sequences, not the special ones defined (differently) by the various printer manufacturers. The purpose is that every application on the Amiga just uses this one standard set of control sequences and this way doesn't need to know which printer is actually connected. The printer driver then translates these standard sequences into the special sequences a certain printer understands. A list of the available ANSI Esc sequences is found in the current Workbench manuals (or older AmigaDOS manuals). Now if you want to issue a control sequence to the printer that's not available as an ANSI command, you have two possibilities to achieve this:

1. Bypass the printer driver (that would unsuccessfully try to interpret the sequence) and send your output **only** during this sequence to 'PAR:' (or 'SER:', respectively). For this you have to close and open printer output channels very often which is rather tedious, and you have to know where ('PAR:' or 'SER:') your printer is connected.
2. Use a special ANSI sequence, made exactly for this case:

```
'Esc [<n>"<x>'
```

where '<n>' is the decimally typed number of bytes in the string '<x>', which actually contains your special printer sequence. This ANSI sequence tells the printer driver to not interpret or translate the next '<n>' bytes.

But both methods have one big disadvantage when used in an application program: You lose the printer independency! If you stick to ANSI sequences, you can output to any printer on earth, as long as there is an Amiga printer driver for it. If you start to use special control sequences, your program will be tied to this single printer model and will not be useful for any other (or you would have to provide some dozen new printer drivers for your application).

Dr. Peter Kittel, peterk@cbmger.de.so.commodore.com

## 4.7 Is it possible to use AmigaBasic on the A1200?

AmigaBasic wurde (als einziges Amiga-Programm) von Microsoft entwickelt und ist entsprechend fehlerhaft.

Man kann es auf dem A1200 trotzdem zum Laufen bringen, wenn man folgendes beachtet:

1. run NoFastMem (or turn off FastMem).
2. Switch off sound output in the Sound prefs editor.

3. Better avoid SUBs and use GOSUBs instead, then the compatibility with newer processors will be higher.
4. There is a patch you should run at the beginning of AmigaBasic:

```

----- CUT HERE -----
' " AmigaBASIC patch to let AmigaBASIC work on A1200 and other newer machines.
' " Start at the beginning of AmigaBASIC or invoke AmigaBASIC with this program

OPEN "AMIGABasic" AS 1 LEN=1
FIELD #1,1 AS d$
i&=&HF3*256+&H87 : PRINT i&
GET #1,i& : a$=HEX$(ASC(d$))
PRINT a$
IF a$="79" THEN
    LSET d$=CHR$(&H78)
    PUT #1,i&
END IF
CLOSE 1
----- CUT HERE -----

```

Andreas Mixich, humpty@tomate.tng.oche.de

## 4.8 How do I localize my program?

Suggest, you want to write a `HelloLocalWorld.c`. Your final program will look like this:

```

#include "HelloLocalWorld_Cat.h"
#include <clib/exec_protos.h>

struct Library *LocaleBase;

void main(int argc, char *argv[])
{
    /* Open the locale.library. No kill, if not successfull.
       (Just use the builtin catalog strings instead.) Note, that
       we open locale.library here, even if our compiler supports
       AutoOpening.
    */
    LocaleBase = OpenLibrary("locale.library", 38);
    OpenHelloLocalWorldCatalogs(NULL, NULL);

    printf(GetString(MSG_Hello));

    CloseHelloLocalWorldCatalog();
    if (LocaleBase) CloseLibrary(LocaleBase);
}

```

The routine `GetString` checks, if the wished catalogs are available and returns a pointer to either the builtin string or the catalog string. (In my case the german string.)

You see, the main difference besides the minor opening and closing stuff (`OpenLibrary`, `OpenHelloLocalWorldCatalogs`, ...) (which too can be dropped, too, with `FlexCat`) is to replace strings with a function call. Hence we need a file `'HelloLocalWorld_Cat.c'`, which holds `OpenHelloLocalWorld`, `GetString`, `CloseHelloLocalWorld` and the builtin strings (this could be an array, where

```
array[MSG_Hello] = "Hello, local world.\n";
```

is defined) and an include file `'HelloLocalWorld_Cat.h'`, which defines the message ID's like `MSG_Hello`. You don't need to know, how these files work internally, especially you don't need to know `locale.library`!

There are some catalog generators (in what follows: CGs) available (`'CatComp'`, for developers only, `KitCat`, german docs only, `'MakeCat'`, which I don't know and `FlexCat`, which I recommend, because it is most flexible in the generated source and supports catalogs on 2.0 and any language, even Amiga-E, Cluster, Pascal, ... and besides that: I'm the author ;-)) are tools, that create `HelloLocalWorld_Cat.h`, `HelloLocalWorld_Cat.c` and the real catalogs for you. (The above code might differ slightly between the different CGs.) (See Aminet, directory `'dev/misc'`.)

Of course they need to know how to use them. First create a so-called `catalog-description` file. This could look like this:

```
; Lines beginning with a semicolon are comment lines.
# language english
; the language of the builtin strings
# version 0
; the catalog version (0 = any)
MSG_Hello (1/15/30)
Hello, local world
```

Any string is defined by a line like the last two lines above: `MSG_Hello` is the message-ID, (1/15/30) says, that the value of `MSG_Hello` should be 1 (you may omit this, in which case just the next free number is used) and the string must not be shorter than 15 characters or longer than 30 characters. (These may be omitted too.)

Now write your program. Once you are ready, use the CGs to create a so-called catalog translation file. (One for any language different than the builtin.) In my case (german) this could look like this:

```
; Lines beginning with a semicolon are comment lines.
## language deutsch
; the catalog language (german)
## version $VER: Deutsch.catalog 1.0 (22.12.93)
; the catalog files version string
MSG_Hello
```

```
; Hello, local world
```

Note the empty line after the message ID. (The arguments of `##` language and `##` version would be missing as well.) You have to fill in the german strings here. Again using the CGs you create a catalog file from this. Additionally note, that no informations on the strings ID or length are behind `MSG_Hello`. They are taken from the catalog description file.

Once you change the program (adding strings, changing the string length) you change the catalog description as well, use the CGs in the same way to update the catalog translation and hence the catalogs.

## 4.9 How to obtain a pointer to a console's window

The following function returns the window pointer of a CON window. It can be executed safely under all versions of the Amiga's OS.

```
struct Window *getConWindowPtr(BPTR fh)
{
    struct Window *w;
    struct FileHandle *cfh;
    struct StandardPacket *sp;
    struct InfoData *id;
    struct MsgPort *mp;

    w = NULL;

    if ((cfh = BADDR(fh))->fh_Type != NULL) {
        if (sp = AllocMem(sizeof (struct StandardPacket),
                          MEMF_PUBLIC | MEMF_CLEAR)) {
            if (id = AllocMem(sizeof (struct InfoData),
                              MEMF_PUBLIC | MEMF_CLEAR)) {
                if (mp = CreatePort(NULL, 0)) {
                    sp->sp_Msg.mn_Node.ln_Name = (char *) &sp->sp_Pkt;
                    sp->sp_Pkt.dp_Link          = &sp->sp_Msg;
                    sp->sp_Pkt.dp_Port         = mp;
                    sp->sp_Pkt.dp_Type        = ACTION_DISK_INFO;
                    sp->sp_Pkt.dp_Arg1       = MKBADDR(id);

                    PutMsg(cfh->fh_Type, &sp->sp_Msg);
                    (void) WaitPort(mp);
                    (void) GetMsg(mp);

                    if (sp->sp_Pkt.dp_Res1)
                        w = (struct Window *) id->id_VolumeNode;
                }
            }
        }
    }
}
```



```

        DeletePort(mp);
    }
    FreeMem(id, sizeof (struct InfoData));
}
FreeMem(sp, sizeof (struct StandardPacket));
}
}

return w;
}

```

Notes:

Accessing a console's window directly may interfere with operations performed by the CON handler. Be careful!

To obtain the window pointer of a CLI's console, pass the FileHandle returned by `Open("*, MODE_OLDFILE)` to the above function.

The result of the above function may well be NULL, e.g. in case of an AUX handler or if an AUTO CON handler is unable to open its window.

Sending an ACTION\_DISK\_INFO packet to an AUTO CON handler (2.0+) causes its window to lose its special AUTO properties (i.e. it can no longer be closed at any time by clicking on its Close gadget), as the window pointer returned in `id_VolumeNode` must remain valid from now on.

All in all: Don't use this function. :-)

For more information, please refer to pages 273, 276, 435, 463, 485, and 629 in "The Amiga Guru Book" (see Section 4.1 [Manuals], page 14).

Ralph Babel, rbabel@babylon.pfm-mainz.de

## 4.10 What are pragmas?

Pragmas are special compiler commmands which control certain features of a C-compiler. Two problems arise when using pragmas:

1. Pragmas are compiler specific. You cannot expect that one compiler will understand pragmas of another compiler, even if both run on the Amiga.
2. You are not guaranteed that a compiler ignores pragmas, that he doesn't understand. Even more: It might not help, to use something like this:

```

#ifdef MY_COMPILER
#pragma DoAnything
#endif

```

A workaround is to put pragmas in a special include file (BTW, the same holds true for statements like `#asm` (Aztec-C) or `#extern` (C++) and replace the above with

```
#ifndef MY_COMPILER
#include <mypragmas.h>
#endif
```

But what do pragmas on the Amiga? The most common usage (not the only, but most meant when talking about pragmas) is to tell the compiler about how to call library functions: Simple C functions expect their arguments on the stack, but library functions want their arguments in special processor registers and additionally the library base in register a6. Lets have a look at a pragma command of the Aztec-Compiler.

```
#pragma amicall(SysBase,0xd2,FreeMem(a1,d0))
```

This tells the compiler to put the first argument of `FreeMem` in register a1, the second in register d0 and the value of the variable `SysBase` in register a6. Maxons pragmas look the same, Dice pragmas and SAS pragmas look a bit more complicated;

```
#pragma libcall SysBase FreeMem d2 0902
```

Here d2 is (like 0xd2 above) the library vector offset (see below), the digits 09 are codes for the argument register in reversed order (Register codes are 0=d0, 1=d1, .., 8=a0, 9=a1, a=a2, ..), the following 0 is the result's register (always d0) and the final digit 2 is the number of arguments.

A command `'FreeMem(fib,sizeof(*fib);'` could produce the following code, if the compiler has seen a pragma statement like above:

```
move.l  _fib,a1
move.l  260,d1      ; sizeof(struct FileInfoBlock)
move.l  _SysBase,a6
jsr     -0xd2(a6)   ; 0xd2 = _LV0FreeMem
```

Calling `FreeMem` in that way is shorter and faster than pushing the arguments on the stack, calling a function `_FreeMem` which would do just the same like the above code by pulling the arguments from the stack.

The best way to use pragmas is to include statements like the following in your program:

```
/* SAS/C, Dice and GNU-c (since version 2.6.1) make it */
/* very simple: */
#if defined(__SASC) || defined(_DCC) || defined(__GNUC__)
#include <proto/exec.h>
#else

/* Get the prototype for the function; note, that this */
/* is compiler independent. */
#include <clib/exec_protos.h>
```

```

/* Get the pragma; compiler dependent, but most pragmas */
/* are in files with the same name. */
#ifdef AZTEC_C
    #include <pragmas/exec_lib.h>
#elif defined(__MAXON__)
    #include <pragmas/exec_pragmas.h>
#endif

/* Declare the SysBase variable */
extern struct ExecBase *SysBase;
#endif

```

The above example can be compiled on all these compilers and produce the best code. (Besides, the proto/\*.h-files do nothing else than reading clib/\*\_protos.h and pragmas/\*\_pragmas.h with #include and then declare the SysBase variable.)

A final question arises: How to get the pragmas? Most compilers have them included. However, sometimes you want to produce pragmas for yourself, for example if you are using new libraries or new versions with additional functions. In that case you can produce them from the so-called FD files which should be a part of the developer docs of the library. (The NDU has a directory FD which contains FD files for all libraries and devices of the OS. see Section 4.3 [Includes], page 16) Most compilers have a utility with the name 'fd2pragma' or similar included which can do that for you. A freely distributable version which can produce pragmas for Aztec, Dice, SAS and Maxon as well as LVO files for assembler and stub routines for the tag versions is available on Aminet ('dev/misc/fd2pragma2\_0.lha' and on the Fish CDs.

For pragmas under gcc see Section 4.13.5 [Inline Headers], page 29.

## 4.11 My Compiler/Linker is complaining about missing symbol xxx.

First be sure, that the function is really missing: For example floating point functions are in a special link library and you need a linker option like '-lm' to include it into your program. Another possibility would be that you are using a library function and didn't notice it. This might lead to a missing library base, 'IntuitionBase' for example. In that case just put something like

```
struct Library *IntuitionBase;
```

somewhere in the global part of your program. (Don't forget to call OpenLibrary() and CloseLibrary! :-)

However, you could as well use a function which really isn't present in your library at all. If you have, for example, an amiga.lib from 2.0 you would hardly find the locale functions or the pool

memory functions.<sup>6</sup> Best solution is to get the NDU (see Section 4.3 [Includes], page 16), but you probably don't want to wait for it. In that case you have to find what kind of function you are missing.

Simple library functions (Examples: 'exec/AllocPooled', 'locale/OpenCatalogA') can be called with pragmas. However, you need informations on the name of the library base and where to put the arguments. See Section 4.10 [Pragmas], page 24.

Tag functions are mostly just stub functions which call library functions. If you have, for example, 'dos/AllocDosObject' which expects a constant and a pointer to an array of tags, you have the varargs version 'AllocDosObjectTags' which expects tags on the stack as well! Just create the following function:

```
#include <clib/dos_protos.h>
#include <pragmas/dos_pragmas.h> /* Probably wrong name */

void *AllocDosObjectTags(ULONG objtype, Tag tag1, ...)
{ return(AllocDosObject(objtype, (struct TagItem *) &tag1);
}
```

Some functions still remain: Amiga.lib has some functions which are really doing valuable things and not just call a library: The BOOPSI functions ('DoMethod', 'DoSuperMethod') the memory pool functions ('LibAllocPooled', 'LibCreatePool', which are replacements of 3.0 functions). The only way to replace these is to get equivalents. The AmigaFAQ archive contains some of them (DoMethod, DoSuperMethod and HookEntry) in the 'programmer' directory as well as the most common pragma files and some examples of varargs functions. See [Amiga-FAQ Archive], page 54.

## 4.12 Where do I find the function xxx?

If you are not sure about the name of the appropriate function for a certain job or in which library to find it, you can search in these places:

In the Autodocs for each library you find at the very beginning a contents table listing all functions available in this library. They are sorted alphabetically, just like in the rest of the Autodocs. In the body part of the Autodocs you find complete explanations and specifications for each library function. See Section 4.3 [Includes], page 16.

The .FD files also offer a very compact overview over all functions of the diverse libraries, complete with a short information about the function arguments. If you already know roughly what you search for and e.g. only need the precise order of the arguments, you can find all needed information here. See Section 4.10 [Pragmas], page 24.

---

<sup>6</sup> This problem arises most frequently for owners of Aztec which is no longer supported and owners of Dice, which has sometimes rather incomplete libraries. I own both ...

Dr. Peter Kittel, peterk@cbmger.de.so.commodore.com

## 4.13 The GNU C compiler: general information and installation

This chapter contains general and installation information about the amiga-port of the GNU C compiler gcc.

### 4.13.1 Current Version

Gcc current version is now 2.6.0 and 2.6.1 is in work. It does include a new version of ix-emul.library, v40.3, but users are urged to get ixemul404.lha on Aminet site or my own FTP site, due to errors for 68000 systems. A new library, libnix, avoid using ixemul.library. 2.6.1 will include protos, like SAS-C, making SASC ports to GCC easier. A new assembler, gas-2.5 is included, a package called q\_anote enables output of mixing C/Asm code for debugging purposes. Work is in progress to implement stack growing facility, thus avoiding setting stack before launching gcc.

### 4.13.2 Requirements

Any Amiga (ranging from A1000 upto A4000/40) will run amigados-gnu utilities. A minimum of 4MB memory is needed in order to compile small/medium projects. More memory will be needed for large projects, such as recompiling gcc itself, or programming C++. Gigamem and VMM do work with GCC so \*maybe\* less memory will work. But in this case, an MMU equipped Amiga (A3000,A4000/40) is necessary. See Section 1.1 [68EC0xx], page 1.

A full installation, including C++/ObjC related files, inline headers, cbm-headers, (see Section 4.3 [Includes], page 16) roughly requires about 20 MB of HD space.

Support for 1.2/1.3 is dropped. If you have 1.2/1.3, get a better Kickstart version. Gcc works under KS 1.2/1.3, but the full functionality is only available under KS 2.x+. A fast CPU (eg. 68030@25MHz or better) is also of help.

### 4.13.3 Authors

Gcc and related GNU-software has been ported to the Amiga by the following folks: See Section 4.13.9 [How to get help], page 32.

```
Gcc v2.2.2 port:   Markus Wild
Gcc v2.3.3 port:   Markus Wild
Gcc v2.4.5 port:   Philippe Brand, Lars Hecking, Fred Fish
Gcc v2.5.0 and up: Philippe Brand, Fred Fish, Leonard Norrgard

Ixemul.library:   Markus Wild, Leonard Norrgard, R. Luebbert
```

Libnix: Matthias Fleischer, Gunther Nikl  
 Gerlib: Gerhard Mueller

#### 4.13.4 Sources for Gcc

All GCC sources & binaries are available on:

1. Aminet sites (wuarchive.wustl.edu and mirrors such as ftp.luth.se) in /pub/aminet/dev/gcc
2. Ramses The Amiga Flying BBS:
 

+33-1-60037015	HST Dual v32 terbo	4800-21600
+33-1-60037713	SupraFax v32bis	4800-14400
+33-1-60037716	Tornado v22bis	1200-2400

 in Topic 'Development', Area 'Gcc' (are 156).

GNU source code is available on:

1. the same FTP site you've taken the binary distribution from
2. gnu.prep.ai.mit.edu (18.71.0.38) in '/pub/gnu'
3. Ramses The Amiga Flying BBS in Topic 'AmigaUnix/Unix/Linux/NetBSD', Area 'Gnu Source Code'

These archives should contain everything necessary to get you going, they don't include sources for ixemul.library, which are available on Aminet sites in '/pub/aminet/dev/gcc/ixemsrc3947.tar.gz' (as of this writing, work is in progress for the v40 version of ixemul.library, sources will be available on an Aminet site near you).

As stated by Richard Stallman of the FSF:

"The GPL says that any distribution of binaries must contain either the source code or a written offer to supply source code (see the GPL for details of what is required)."

#### 4.13.5 Inline Headers

The inline headers for gcc can be created from the original CBM fd files. See Section 4.3 [Includes], page 16. See Section 4.10 [Pragmas], page 24. They can be created as follows:

```
CLI> Assign INCLUDE: GCC:os-include
CLI> Assign FD: INCLUDE:fd
CLI> Makedir INCLUDE:inline
CLI> cd USR:bin/geninline
CLI> gen31
```

This will create all inline-headers in 'GCC:os-include/inline'. If you have 2.0 headers, use gen20 instead, if you have 3.0, use gen30. OS3.1 (rev 40.13) inline headers are included with the current version of gcc. See Section 4.13.1 [Current Version], page 28.

NOTE: perl scripts do not handle correctly AmigaDOS include files, which seems to mean they are somewhat broken. This needs some voluntary work ...

There is also another way of generating inline headers, using fd2inline program:

```
CLI> fd2inline <fd_file> <proto_file>
```

### 4.13.6 Amiga Libraries

Starting from this release an AmigaDOS compliant library is provided, thanks to libnix authors (Matthias Fleischer and Gunther Nikl).

Anyway if you want to rebuild one, there are two methods:

1) Using hunk2gcc; the AmigaDOS object converter made by Markus Wild. To achieve this, simply grab a copy of latest amiga.lib (from Commodore Development Kit, see Section 4.3 [Includes], page 16) and make a new directory where you want your converted object files to go, cd into it, and enter

```
hunk2gcc amiga.lib [..further libs if you like..]
```

This generates an a.out object file for every program unit present in the hunk file (in this case, from amiga.lib).

As the final step convert all those files into an a.out style library by issuing:

```
ar qc libamiga.a obj.*
ranlib libamiga.a
```

The ranlib run builds a symbol table in the archive, and makes accesses to the library much faster.

2) Creating a libamiga.a library with libnix is fairly easy, but takes some time. Just uncompress sources.lha from libnix distribution and run a 'make libamiga.a'.

**Note:** As long as you make no AmigaDOS specific calls, you can create a dummy library using:

```
cat "int dummy;" >dummy.c
gcc -c dummy.c
ar crv libamiga.a dummy.o
mv libamiga.a gcc:lib
```

### 4.13.7 Installation

1. If this is your first installation of GCC:

Do the following:

```
cd place_with_lot_of_space ; EDIT! specify one
```

```
makedir gnu
lha x gcc260-base.lha          ; first part, you need it
```

Now you have to append 'gnu/s/user-startup' to your 's:user-startup' (replace Devel:GNU by your own gnu path).

Continue:

```
execute gnu/s/user-startup    ; makes important assigns
copy gnu/envarc/#? ENVARC:
```

**Edit** the following lines! If you have a 68000 or 68010 Amiga, remove the "-020" from the following lines wherever it appears!

```
lha x gcc260-c-020.lha        ; C-compiler part; you need it
lha x gcc260-doc.lha          ; only if you want Gcc documentation
lha x gcc260-c++-020.lha      ; only if you want C++
lha x gcc260-objc-020.lha     ; only if you want Objective-C
lha x gcc260-utils.lha        ; only if you want additional utilities
                                ; (recommended for Unix compatibility)
lha x gcc260-utilsdoc.lha     ; if you want all utilities documentation
```

You must restore links between some programs by running the script 'restorelinks':

```
sh /gnu/s/restorelinks        ; EDIT! Append a " copy" to this line
                                ; if you don't want to use makelink
                                ; but rather copy file
```

Last part:

```
lha x gcc260-diffs.lha        ; if you want to rebuild all distribution
lha x gcc260-texi.lha         ; if you want to build Postscript doc files
```

Now skip to next paragraph and happy compiling!

2. If you "upgrade" your gcc environment from v2.5.x, just unarchive first 2 archives as it would normally include all what you need (thus gcc260-base and gcc260-c). Make sure you delete your previous ixemul.library wherever it is (usually LIBS:).

**Note:** new version of ixemul.library is provided, make sure you don't have another copy somewhere which may conflict with gcc.

### 4.13.8 Compiling

What about a nice Hello World ?

```
#include <stdio.h>

main()
{
    printf("Hello World!\n");
}
```

This was pretty simple ;-) Now we have to compile it. There's a lot of options in gcc but simplest way to compile this would be:



```
CLI> gcc -o hello hello.c
```

Simple ?

Here's more options.

Target processor for Motorola family: You can compile plain 68000 code, 68020, 68030, 68040, 68881 (have a look at GCC documentation, either in info or AmigaGuide format, chapter 'Invoking Gcc/SubModel Options/M680X0 Options for Motorola specific compilation flags').

```
CLI> gcc -m68020 -m68881 -o hello hello.c
```

This will compile your programs using 68020 code and direct calls to math-processor, and will link with accelerated libraries, located in 'GCC:lib/lib020'.

Optimization: Either you don't want optimization, or you can provide '-O', which will optimize your code, or if you really want top optimization, use '-O2' flag (for more discussion about optimization, read info or AmigaGuide doc chapter Invoking Gcc/Optimize Options). There's now even a '-O3' optimization option, which will go even further.

```
CLI> gcc -O2 -o hello hello.c
```

You'll never have a "Hello World" program running so fast ;-)

Code generation: Perhaps you want to generate resident programs. Flag is -resident, at compile and link stage.

```
CLI> gcc -resident -o hello hello.c
```

Of course you can mix all options, resulting in:

```
CLI> gcc -O2 -m68020 -m68881 -resident -o hello hello.c
```

This will make a 68020+68881 executable highly optimized and resident.

IMPORTANT: If you only use AmigaDOS functions or you don't want to use ixemul for philosophical reasons, you can get rid of ixemul.library with:

```
CLI> gcc -noixemul -o foobar foobar.c
```

provided you have libnix distribution (included with 2.6.0 distribution).

### 4.13.9 How to get help

The current amiga-gcc-port maintainer is available:

Philippe BRAND  
 Fidonet: Ramses The Amiga Flying BBS 2:320/104.21  
 Email: phb@colombo.telesys-innov.fr (ONLY for personal email).  
 Ftp: colombo.telesys-innov.fr:/pub/amigados-gnu  
 or /pub/incoming/uploads for uploads.

There's also an amiga-gcc mailing list running in Finland. See Section 9.9 [Mailing lists], page 53. Philippe Brand will forward all questions to that list, but you'd be better off using it directly ;)

## 5 Applications

This chapter offers informations about major Applications.

### 5.1 Text Editors

Text Editors are programs allowing to enter and edit unformatted text. Generally, this means text that is meant to be manipulated by machine, rather than human. Programmers use these to enter the text for compilers. Since UNIX machines don't typically have word processors, most text processing starts with a text editor, then is filtered through a page layout system (Section 5.4 [LaTeX], page 35, for example) to produce attractive paper results.

#### Commercial Products

CygnusEd Professional and TurboText seem to be the main contenders in the professional realm. The Fred Fish disks contain dozens of other shareware text editors. A demo version of TurboText is on Fish disk 445. A very old demo of CygnusEd is on Fish disk 95 (testament to its lasting-power). In the following some freely distributable editors will be discussed.

- Emacs** Gnu Emacs (the "G" is not silent) comes from Unix and is probably the king of editors – it's huge (about 1 Megabyte), feature-packed (it does windows and even contains a game!) and extensible (if you know lisp you can write new emacs functions and bind them to any key combination). On the other hand, it may be too huge, its feature-ladenness is imposing, and its extensibility often means you can't use someone else's emacs configuration. Source: Aminet (directory 'util/gnu').
- Vi** The leaner, less configurable, non-extensible cousin to gnu emacs is vi (pronounced "vee eye"). Unix people like vi especially because you find it on *any* Unix machine. What you choose is personal preference, and will mark you for life. Vim is a good vi for the amiga, and is on Fish disk 591 or in the 'util/gnu' directory of Aminet.
- DME** Many Amiga programmers like DME. It's fast, fully configurable; menus may be created and any key may be mapped. It's much easier to learn DME than than Emacs or Vi.

There are three different versions: AmokEd, DME and XDME. It's a matter of opinion which you prefer. (Oberon and Modula programmers like AmokEd because it's written in Oberon and supports AmigaOberon error messages, C programmers like DME or XDME.) Sources: Aminet (directory 'util/edit'), Fish disk 776 (XDME) and 749 (AmokEd), AMOK 90.

## 5.2 What word processors are there?

A word processor is the typical application for writing notes, letters or reports on a computer. Unless you prepare newsletters on a weekly basis, your word processor is probably your workhorse program. Thus choosing one you are comfortable with determines how comfortable you are with your computer. Word processors can offer a variety of features, and many can approach the sophistication required for Desktop Publishing (see Section 5.3 [DTP], page 34) but no one uses them for programming, for which text editors are more suited.

One distinguishes between Wysiwyg programs (What you see is what you get) and page layout languages. Wysiwyg programs should be fast, comfortable and easy to use. Most people prefer them. The alternative is an approach that works similar to compilers. You feed text files to a program that produces the layout which may be previewed on screen or printed. LaTeX takes this approach. See Section 5.4 [TeX], page 35. Lout is another such system which seems smaller, easier to learn and has full documentation included, but it is nonstandard. Lout produces Postscript output. (I don't know if this is an advantage or disadvantage. ;-). See Section 5.5 [Postscript], page 36. Both programs are freely distributable.

There are a lot of wysiwyg programs, but only commercial products: FinalWriter, Final Copy II, Wordworth, Word Perfect, AmiWrite, Beckertext II, Maxon Word and many others. I don't dare to recommend any. All I can say is: Give yourself time to make a selection.

## 5.3 Desktop Publishing

These programs offer features lacking in word processors, usually tailored to flexible arrangement of text, but often don't provide all of the text manipulation that a good word processor provides. The best desktop publishing programs strive to provide the features of both, just as the best word processors strive to provide the features of desktop publishing programs. Microsoft Word (Mac, PC) is a good example of a word processing program that offers many page layout features. Framemaker (UNIX, Macintosh, DOS, etc.) is an example of a desktop publishing system that offers most needed word processing functions. As yet, no Amiga program has bridged the gap, though the main word processors are coming close. (On the other hand, even many sophisticated programs don't support typesetting mathematics, tables, producing bibliographies, indexes, or cross-references. The page layout languages do, and programs like Frame are improving their

support of such features.) Unless you need to prepare fancy newsletters or promotional literature, a word processing program is probably enough. See Section 5.2 [Word Processors], page 34.

There are not yet any freely distributable wysiwyg desktop publishing systems. Commercial products are ProPage and PageStream. They have been playing leapfrog for the past few years. It appears that PageStream 3.0 is about to leap ahead. A more detailed description of these products and their differences is welcome. Both programs' list prices are \$299. Student discounts are available (approx 40% discount.)

## 5.4 What is TeX and where can I get it?

TeX is a very powerful wordprocessing system. It can display mathematical formulas or complex tables as well as function graphs, creates indices, contents and many other things. Its greatest advantage is that it is freely distributable (TeX, not the previewers and the printer drivers!) and that you find TeX all over the world on every computer family. Its greatest disadvantage is that it isn't very handy (works similar to a compiler) and it isn't wysiwyg. But many people like it. (BTW: This document is written using TeX. 8-) See Section 5.2 [Word Processors], page 34.

There are two major implementations on the Amiga. The first one, Amiga-TeX, from Thomas Rockicki and Radical Eye software is commercial. It is said to be excellent and his owners seem to be very satisfied. But it costs at least 200\$.

I recommend PasTeX, a freely distributable version. People seem to have problems installing PasTeX, especially the font loading and generation (It's a quite complex program.) but I did not here anyone upset once it was installed. (A friend with knowledge of TeX helps immensely.) A few words should be said what you need:

- 5 disks containing the TeX-compiler itself
- 2 disks containing MetaFont
- Nothing more

Jörgen Grahn has written a short essay on how he personally did to make LaTeX work on his Amiga. It's on Aminet as '`text/tex/UsingLaTeX.lha`'.

Many people ask for fonts. They are included in the MetaFont-package and can get compiled by you. All you need to do is setting up your TeX-system in the right way which is described in the documentation. Please note that the PasTeX disks are compressed using the program Zoom. (see Section 8.2 [Endings], page 45) Sources: FTP at `ftp.uni-passau.de`, directory '`/pub/amiga/tex/PasTeX1.3`' and the Fish CDs.

## 5.5 Are there any Postscript interpreters?

PostScript is a programming language designed to be used to describe printing on pages. Apple helped make PostScript popular by selling printers with built in PostScript interpreters. Many programs have evolved to produce PostScript programs as their output, making PostScript the lingua franca of printing. Until recently, in order to print a PostScript file, you had to have a relatively expensive laser printer. The development that changed this was the software PostScript interpreter. These programs allow your computer to interpret PostScript programs, and produce the matrix of dots to send to your normal graphics printer.

One of the benefits of PostScript is that it is resolution independent. What this means is that it can support the highest resolution of your device – and that you can reasonably preview PostScript on a low resolution screen.

There are two free PostScript interpreters for the Amiga. Post and Ghostscript. Post comes as an Amiga shared library along with front ends for previewing to the screen and printing. This structure allows others to write programs that can show PostScript images on screen. In fact, AmigaTeX uses Post's library to support incorporation of PostScript into documents. Ghostscript similarly comes in two programs, but not as a shared library. Ghostscript is the rendering engine, and Ghostview is the front end. Sources: Aminet (directories 'text/print' and 'text/dtp'), Fish disk 669

## 5.6 Font Concepts

The Amiga is able to use two different concepts of fonts. First of all there are the bitmap fonts. These fonts are created by drawing a letter pixel for pixel onto the screen. The advantage is that they look good at small sizes, but are not very good for printout. Also they don't look very good when you change their size. Therefore you have to recreate the font for each size. Second there are the vector fonts. They are created by curves which are stored as mathematical formula. This has the advantage that changing the sizes does not effect the output. But this only applies for larger sizes and print-outs. Vector fonts also use less memory.

### 5.6.1 Amiga Font Formats

1. Agfa IntelliFont (suffix: .type or .lib) is the native font format on the Amiga. You can use it in any application and it can be converted to the standard bitmap format using the system utilities 'IntelliFont' (OS 3.x) or 'Fountain' (OS 2.x).
2. Postscript Type 1 fonts can be used within many applications, it can be used in every word processor and DTP program. There are two versions of the Type 1 format: Binary and ASCII (suffix: .pfb & .pfa). The Amiga software uses the Binary format, but you can easily convert them with TypeSmith or some PD software products (z.B. PFB2PFA) . In Addition to the

files mentioned above, there are the metrics files with the suffixes .afm or .pfm. They contain information about the size (width) of the letters and most programs expect this file to be in the same directory as the font file.

3. Postscript Type 3 fonts (suffix: .ps or nothing) are not often used on the Amiga, but some applications do support this font format (e.g. PageStream). There are also some download utilities from PD sources available.
4. TrueType fonts (suffix: .ttf) are not very common on the Amiga, there is one word processor supporting this format (Wordworth 3.0). Due to the lower quality of the format, Amiga users tend to use higher quality for their DTP, DTV and word processing... There are also two formats: Mac & Windows available. The Amiga software is able to use the Windows format.
5. DMF fonts is the privat format of PageStream (suffix: .dmf), since PageStream is the market leader in DTP programs on the Amiga, so this format is very common!
6. Bitmap fonts (suffix: .font and numbers in a directory by the name of the font, sometimes .otag when converted from IntelliFont) were used in the OS 1.x, but have been replaced by the superior IntelliFont Format in OS 2.0. Under 2.0 or higher you still are able to use the bitmap fonts for small sizes, but for printouts you should use the IntelliFont format or any other vector font format mentioned above.
7. Colour Bitmap fonts (same suffixes as Bitmap Fonts, but the numbers have in addition a C, e.g. 35C) are also very common on the Amiga, they are mainly used for DTV applications, like the Video Toaster and Scala.

### 5.6.2 Frequently Requested Amiga Fonts

1. First place to look for fonts is the AMINET archive. This is the biggest archive of Amiga software and there you will find also quite a lot of fonts. The Aminet consists of many mirrors around the world. Here are some of them:
  1. ftp.wustl.edu,
  2. ftp.luth.se,
  3. ftp.eunet.ch,
  4. ftp.uni-paderborn.de,
  5. ftp.doc.ic.ac.uk.

Just log in as ftp and go to the directory  
/pub/aminet/text/font.

2. Another good ftp server to look is the CICA-server:
  1. ftp.cica.indiana.edu

To this server are also some mirrors around the world available.

3. Also a good place to look for is the following WWW server:

1. <http://jasper.ora.com/Internet-Font-Archive.html>
4. Another good place is the Fresh Fonts I CD-ROM, there you will almost certainly find some nice fonts. The CD is available from
  1. Fred Fish / Amiga Library Services ([orders@amigalib.com](mailto:orders@amigalib.com))
  2. Stefan Ossowski / Schatztruhe GmbH

The CD is for free when buying another CD from that company.

You can also access the HTML pages on the CD under the following address:

1. <http://macke.gris.informatik.uni-tuebingen.de:4711/~damor/>

### 5.6.3 Commercial Font Sources

Commercial fonts can be obtained from a number of different companies, including the large font houses: Adobe, Font Haus, Font Company, Bitstream, and Monotype. At these companies, fonts cost about \$40 for a single face, and must be purchased in packages. Adobe, Bitstream, and Monotype also sell pre-designated type collections for slightly lower prices.

There are also a lot of PD reseller who have a vast quantity of fonts, check out your local Amiga magazin for more information.

Please consult the vendor list for a more complete list of vendors.

### 5.6.4 Non-Latin fonts on the Amiga

Due to the really bad information policy by C= there was actually no information about non-latin fonts. But still it is possible to use them, without difficulty. You just have to get yourself some additional files. First of all you need the non-latin font files. There is a large selection of them on the Fresh Fonts CD-ROM mentioned above. In order to use the non-latin font files, you have to get yourself the appropriate keymap file, this will remap the keys on the keyboard to the appropriate letters of the foreign alphabet, e.g. in order to use a Russian font, you should set the russian keymap file in the preferences (via PREFS/INPUT).

Not only that you can write with a non-latin alphabet, you can also localize your workbench. How about a Greek workbench or a Hebrew workbench? Have a look into the AMINET archive (mentioned above) for these files!

In addition to this you can easily use Hebrew & Arabic in any word processor incl. writing from right-to-left! This can be easily done by setting the kerning value to negative values (like this the cursor moves left and not right) and moving the characters into the negativ part! You can get fonts from me with this feature!

### 5.6.5 Amiga Font Installation

The installation of Postscript, DMF and TrueType fonts is described by the application that use them. Please refer to the manuals of the software packages.

The installation of Intellifonts is very easy. Just start 'Intellifont' (OS 3.x) or 'Fountain' (OS 2.x) and follow the guidelines from within the program.

In order to install bitmap fonts, either copy them to the logical device FONTS: or assign the directory with your bitmap fonts:

```
ASSIGN Fonts: <your_directory> ADD
```

Right after this you can start your application and use them. When using non-latin fonts, don't forget to set the appropriate keymap file!

### 5.6.6 Amiga Font Utilities

#### 1. Intellifont

Intellifont is the system program by OS 3.x which lets you install Agfa Intellifonts and converts them to bitmap fonts. The program is located in the drawer 'SYS:System/'. For more information read your Workbench 3.x manual.

#### 2. Fountain

Is the preceding program to Intellifont and comes with the now obsolete OS 2.x. Please read the section about Fountain in your Workbench 2.x manual.

#### 3. PFB2PFA

This neat little utility lets you convert Postscript Binary files to Postscript ASCII files. This is needed in order to use DOS & Amiga Adobe Type 1 fonts on the Mac!

#### 4. CacheFont

This great program caches the fontlist for you, in order to save a huge amount of time. The program looks for all fonts available on the system and creates a special cache-file on disk.

#### 5. TypeSmith

This is the best font converter on the Amiga, besides this function it is also a full blown font editor (see below :-). The program is able to convert between:

1. TrueType
2. DMF
3. Adobe (Type 1 & 3)
4. Intellifont
5. Bitmap (Amiga, Adobe, DMF)



### 5.6.7 Making Outline Fonts

This is very, very difficult. Many people imagine that there are programs that will simply convert pictures into fonts for them. This is not the case; most fonts are painstakingly created by drawing curves that closely approximate the letterforms. In addition, special rules (which improve hinting, etc.) mandate that these curves be drawn in specific ways. Even designing, or merely digitizing, a simple font can take hundreds of hours.

The easiest way of learning how to create fonts, is to have a look at existing fonts and try to change some letters.

Given that, there are two major programs used for font design on the Amiga, TypeSmith 2.5 (\$150) and FontDesigner (\$100). These programs will allow you to import scanned images, and then trace them with drawing tools. The programs will then generate Adobe type 1, 3, TrueType, AGFA Intellifont, DMF and Bitmap fonts for either the Amiga, the Macintosh or the IBM PC. They will also generate automatic hinting. They also open previously constructed outline fonts, allowing them to be modified, or converted into another format.

As far as I know, there are no shareware programs that allows you to generate outline fonts.

There are also two programs for creating bitmap fonts. Personal Fonts Maker and Calligrapher. The second one has not been updated for several years, but it still is a good tool to work with. The first Program was created by adding some features to a good bitmap paint program (Personal Paint).

There are some shareware tools to create bitmap fonts which you can convert to outline (vector) fonts with TypeSmith.

### 5.6.8 Problems and Possible Solutions

1. Pagestream does not recognize your newly installed font.

This happens when you have two fonts with the same ID. The solution is to load such a font into a font editor and enter a new ID for one of the fonts. Still it might happen that you choose another one, that has already been used by!

2. Your application does not find the IntelliFont.

This happens when you haven't set the local device FONTS: to your drawer. You can change this by typing the following command into your SHELL or add this line to your 'S:User-Startup' file:

```
ASSIGN Fonts: <your_drawer> ADD
```

3. You're using a non-latin font and the wrong characters appear when typing.

This happens when you forget to set the appropriate keymap file. Enter the Prefs directory and start the program 'INPUT'. There you can choose your keymap file.

## 5.7 How to deal with Non-Latin texts?

Currently I know only programs for read japanese and chinese texts.

Siepieau Pang (siepieau@gbamail.mincom.oz.au)

### 5.7.1 Japanese editors and viewers

ANS (Amiga Nihongo System) version 1.0, produced by

```
SoftHouse Tecnode
102 Coupo Izumi
1-4-5 Houya-shi
Izumi-machi
Tokyo 202
JAPAN
```

and distributed in Japan by MIQ Japan, Ltd. has been released in Japan. It offers a Japanese environment for Commodore Amiga users, is compatible with Amiga DOS 2.0 (works fine with version 1.3, too), and requires at least 1MB RAM (more recommended). ANS features Japanese windows/menus (these replace the English menus), 12 and 24 dot-matrix Japanese fonts, Jinput/Joutput (both constitute a Japanese front-end processor), XEDmini (a simple Japanese text editor with built-in font editor, and can be used as a Japanese terminal), a kana-to-kanji conversion dictionary for XEDmini and Jinput, Jfilter (for viewing Japanese files while connected to an MS-DOS console), and utilities for Japanese code conversion and communication. Note that XEDmini uses pcj (Japanese version of pcd) for communications, and that one can do binary uploads/downloads while working on files). I hear that it is reasonably priced, and very easy to use.

JemTeX is a preprocessor that turns a Japanese text file (i.e., a TeX file with Japanese text) into a standard (La/Mu)TeX file. The archive (zipped) comes with the jis2mf utility along with a 24-dot bitmapped kanji font and a program for generating kanji tables. With jis2mf you can make metafont files out of the bitmapped font. JemTeX v2.0 will compile on an Amiga using SAS/C, or on a UNIX machine using gcc. This program is available at the FTP site utsun.s.u-tokyo.ac.jp (133.11.11.11). JemTeX v2.0 was written by Francois Jalbert (jalbert@iro.umontreal.ca or jalbert@cs.ubc.ca).

The following are PD viewers on Aminet (text/show directory)

JISStoJi by Bart Mathias automatically identifies electronic texts written in Old-JIS, New-JIS, Shift-JIS, or EUC-JIS (as well as ASCII) and displays them on screen, or prints them to dot-matrix printers. Will run on Kickstart 1.3 and up.

jmore (Japanese more) is basically a more clone that also reads ns-kanji (Shift-JIS) text. It opens its own hires interlaced screen and requires a font handler called jFontSys to be running.

The archive includes jmore, jFontsys and the wlook/16 bitmap font. However, you will also need the kanji fonts. (Aminet, 'text/font/amknj16.lzh') All the documentation comes as Japanese text, so you need a JIS viewer to read the installation instructions. For your convenience, I have summarized the installation procedure below:

1. Place the wlook/16 font in your 'FONTS:' directory
2. Assign 'JFONTS:' to where you unarchive the amknj16 fonts. This need not be the same as your 'FONTS:' directory
3. Place the file 'jFont-startup' in the 'S:' directory
4. Insert the following line into your 'startup-sequence':

```
run >nil: jFontSys
```

5. To use execute the following command

```
jmore <japanese.txt>
```

JISconvert by Dwight Hubbard is a japanese text conversion utility for Amiga computers. It supports conversion between EUC, New JIS, Old JIS, NEC JIS and Shift JIS. It also has options to convert half-size katakana to full size and repair files with ESC characters stripped. No installation required. Requires AmigaDOS 2.04 or newer.

### 5.7.2 Chinese text viewers

HZview (by Ji Ma) shows 8-bit Guo Biao encoded chinese text documents. Requires AmigaDOS v2.1 and above, and cclib.16 bitmap library (included).

**NOTE:** This is a pre-release version. What the doc file does not tell you is that you need to do the following:

1. Open a default public hires interlaced 1 or 2-bit deep screen
2. The size of the file to be read is restricted to about 30K (on my machine, A1200, WB3.0)
3. An FPU is required if you want to scroll the text without crashing
4. The cclib.16 should be in the same directory as the file to be read

Other small bugs still exist which may crash the machine.

## 6 Connecting your Amiga to the world

## 7 Emulators

What? The Amiga isn't good enough? You really want it to be another machine? Well, look here...

### 7.1 Can I run Unix on my Amiga?

Actually there are three Unix versions on the Amiga. All of them need at least 68030 (see Section 1.1 [MMU], page 1), probably a 68040 in the near future and seem to have problems with many hard-drive-controllers. You should have a good look into the documentation before installing it. Unix needs much resources, say at least 10Mb RAM and a 150Mb Unix-partition on the hard-drive.

1. Commodore offered a System V Unix in the past. It contained TCP/IP, X11 and other software and seemed to make a good job, but it was expensive and after all Commodore has dropped developing it. Commodore-Unix needs a streamer because it is distributed on tapes.
2. A Linux port is prepared. But actually there is not very much than the kernel. Specialists might like to use it, but it cannot be recommended for now. Linux is freely distributable. Sources: `ftp.tsx-11.mit.edu` or `ftp.uni-erlangen.de`, both directory `‘/pub/Linux/MIRROR.tsx-11/680x0’`. Or `ftp.leo.org`, directory `‘/pub/comp/os/linux/680x0’`.
3. NetBSD is freely distributable too. Like Linux it isn't ready for now, but it seems to make big steps. Most GNU software is said to run, especially emacs and gcc. I think it's worth to have a look on it. Sources: `ftp.uni-erlangen.de`, Directory `‘/pub/amiga/unix/NetBSD-regensburg’`. See Section 9.6.2 [Fish CD], page 52.

### 7.2 Is it possible to use the Amiga as X11 terminal?

Yes, it is. There are three different packages available:

GfxBase offers a commercial version which is said to be excellent, but expensive. The distribution includes different window managers and clients. A demo version is on Aminet. (`‘gfx/x11/GfxBase-X11-Demo.lha’`)

AmiWin is a Shareware X11R6 product supporting AmiTCP, AS225 and different graphic cards. A demo version is available on Aminet, `‘gfx/x11/AmiWin*.lha’`.

DaggeX is freely distributable and probably not finished yet. (It calls itself version 0.91.) Source: Aminet, `‘gfx/x11/DaggeX-0.91.lha’` and `‘gfx/x11/twm_930531.lha’`.

### 7.3 Is there a way to start MS-Dos programs?

PC-Task is a software only IBM-PC emulator for all Amiga computers allowing use of MSDOS and MS Windows 3.1 software (provided RAM/HD space is sufficient). The current release is 3.1 which includes emulation of 80286 with MDA/CGA/EGA/VGA/SVGA, serial and parallel ports, mouse, two harddrives, two floppies and CDROM support. A demonstration version can be obtained from aminet sites: `‘/pub/aminet/misc/emu/PCTaskDemo31.lzh’`. Author Chris Hames (bytey@werple.mira.net.au) Publisher (pctask@quasar.dialix.oz.au)

### 7.4 How to mount MsDos-formatted Syquests on Amiga

To mount a MSDos-formatted Syquest on Amiga, you need with an (DOSen) Adaptec-Controller the following Mount-entry in `‘DEVS:Mountlist’`: If your medium does have more than one partition, you need to copy the following Mount-Entry for every partition and give each partition another name (eg. SyC:, SyD:, SyE:, etc.) You don't need to change LowCyl and HighCyl for each partition; CrossDOSFileSystem does that automatically.

```
SyC: /* SyD:, SyE:, etc. */
      Filesystem      = L:CrossDOSFileSystem
      Device          = scsi.device
      Unit            = 2
      Flags           = 1
      Surfaces        = 1
      BlocksPerTrack = 1
      BlockSize       = 512
      Reserved        = 1
      Interleave      = 0
      LowCyl          = 0
      HighCyl         = 524287
      Buffers         = 128
      BufMemType      = 0
      Stacksize       = 4000
      Priority         = 5
      GlobVec         = -1
      DosType         = 0x4D534800
      Activate        = 1
#
```

For different (DOSen) controllers this entry should work, too, but maybe you have to adjust it. When inserted, the Syquest-270MB medium is (in this case) automatically mounted (as drive SyC:) and can be used with help of the CrossDOS-Filesystem as usual.

Gerhard Schneider (fido@incubus.sub.org) Andre Keller (keller@rs11.hrz.th-darmstadt.de)

## 8 Miscellaneous

This last chapter contains some questions that don't fit in the chapters above.

## 8.1 Is there any unix version of LhA?

See Section 8.2 [Endings], page 45.

## 8.2 What are files ending with ...?

Most endings on FTP sites or Fish disks tell you that the file is compressed and/or is an archive containing more than one file. Some programs even archive whole disks. Frequently found endings and programs to handle the related files are:

- .sfx**            Compressed archives which are included in an executable program: Just call the program and it will extract itself (sfx = self extract)
  
- .lha**
- .lzh**            Compressed archives; recommended: LhA ('util/arc/LhA\_e138.run' on Aminet or Fish disk 715) or Lx ('util/arc/lx100.lha' on Aminet), Unix version available ('misc/unix/lha-1.00.tar.Z')
  
- .dms**            Disks compressed using DMS ('util/arc/dms111.sfx' on Aminet or Fish disk 406)
  
- .zom**            Disks compressed using Zoom ('util/arc/Zoom\_5.4.lha' on Aminet, Fish disk 682); an older version which you probably need for uncompressing PasTeX is found on Fish disk 459.
  
- .zoo**            Compressed archive; recommended: Zoo ('util/arc/zpp2-10.lzh' on Aminet or Fish disk 527)
  
- .Z**
- .z**
- .gz**            Compressed files; recommended gzip ('util/pack/gzip124x.lha' on Aminet), note that this are Unix files in most cases
  
- .tar**            Archive; recommended: tar ('util/arc/tar.lha' or 'util/arc/gtar10.lha' on Aminet or Fish disk 445), note that tar is a Unix archiver and you often find something like **.tar.Z**.
  
- .arj**            Compressed archive; recommended unarj ('util/arc/unarj-0.5.lha' on Aminet)
  
- .zip**            Compressed archive; recommended UnZip ('util/arc/unzip-5.1.lha' on Aminet), note that this are MS-Dos archives in most cases

### 8.3 Is there a Stacker-like utility to pack my hard drive?

XFH does a good job. It operates as a handler and uses the XPK-libraries, so you have different compression modes (RAKE is a good choice) and possibly even more in the future. The only disadvantage is, that the size of a file is limited by RAM: Don't use it with less than 2MB of RAM.

XPKDisk by Olaf 'Rhialto' Seibert is another stacker program that takes advantage of the variety of XPK libraries available. Unlike other harddisk compressors it does not compress the files, but creates a pseudo partition and stores the whole tracks as compressed files on your harddisk. Its major advantage is that it does not limit the maximum file size, because it works similar to trackdisk.device and therefore does not need too much temporary storage.

But be careful if you want to use ReOrg on a comprimized partition: ReOrg should be set to leave enough memory for the xpkdisk buffers. And because of ReOrgs buffering, you can use few buffers for xpkdisk (perhaps as few as 2 or 3). Don't use ReOrg if you don't know the memory needs of XFH or XPKDisk.

Another possibility is EPU. It's shareware and should offer the same as XFH, but without limiting the file size.

Sources: Aminet, directory 'util/pack', Fish disks 754 (XFH) and 858 (EPU)

### 8.4 Where do I get Fish disk xxx?

Those FTP servers have that much space (or a CD-Rom) to have all fish disks available online:

ftp.isca.uiowa.edu	(USA, directory '/amiga/fx/fxxx')
ftp.hawaii.edu	(USA, directory '/pub/amiga/fish')
ftp.funet.fi	(Finland, directory '/pub/amiga/fish')

Note that the CD-Rom's are not always mounted. See Section 9.3 [FTP], page 47.

Another possibility would be to ask your local dealer. :-)

## 9 Where and how do I get software and other informations?

Three questions arise in this context: Which programs can be found, where are they and how to get them and transfer them home?

## 9.1 Files and databases on freely distributable software

Of course you need to know where you find things. Many good choices are listed in this paper, as I hope. Other sources are:

### **AmigaSciSchool**

is a list of software and where you find it in Ascii format. It is posted monthly to the newsgroups `comp.sys.amiga.applications`, `comp.unix.amiga`, and `news.answers`. Additionally you will find it on Aminet sites (`'text/doc/AmigaSciSchool-4.01'`). It handles everything listed here and many more, for example GNU software, libraries (linked and shared), shells, Unix commands, educational and scientific software and much more.

**FishCon** are lists of the Fish disk contents. (`'fish/doc/fishcon-???.lzh'` on Aminet)

**FishXref** is a cross reference list of the Fish contents. (`'fish/doc/fishxref-???.lzh'` on Aminet) FishXref and Fishcon are in Ascii format.

### **KingFisher**

A Fish disk database, (`'fish/doc/Kingfisher1_30.lha'`, which is the program and `'fish/doc/KFData850.lha'`, which contains the data, on Aminet or Fish disk 863) allows search by name and context. See Section 9.6 [Fish], page 51.

## 9.2 A collection of tests

`Comp.sys.amiga.reviews` is a moderated newsgroup where tests of soft- and hardware, books and anything else relevant to the Amiga are posted. Its always a good idea to check this newsgroup for a review, if you are interested in something special. Of course you always find only the latest reviews, but the older postings are available per FTP from `math.uh.edu`, Directory `'/pub/Amiga/comp.sys.amiga.reviews'` or on the Fish CDs.

## 9.3 Getting files from a FTP server

Things are easy for those who have access to the Internet and a program called FTP (File Transfer Program). Nearly all Unix computers have it, but not all of them allow the use of FTP.

FTP allows you to gain access to some other machines and store and/or retrieve files. Normally one needs an account on the remote machine to use it, but a number of machines have a setup that allows everybody to log in as the user `ftp` or `anonymous`, so anybody may get files from them. The most important of this servers are the Aminet servers, which mirror each other and hence should have the same files. They are the best choice if you are looking for Amiga software. Aminet hosts are



Land	Name	IP Adresse	Pfad	Files
USA (MO)	ftp.wustl.edu	128.252.135.4	pub/aminet/	ALL
USA (CA)	ftp.cdrom.com	192.216.222.5	pub/aminet/	9000
USA (TX)	ftp.etsu.edu	192.43.199.20	pub/aminet/	5000
USA (WI)	ftp.netnet.net	198.70.64.3	pub/aminet/	10000
Scandinavia	ftp.luth.se	130.240.18.2	pub/aminet/	10000
Switzerland	ftp.eunet.ch	146.228.10.16	pub/aminet/	5500
Switzerland	ftp.math.ethz.ch	129.132.104.6	pub/aminet/	1000
Switzerland	litamiga.epfl.ch	128.178.151.32	pub/aminet/	300
Germany	kelly.uni-paderborn.de	131.234.128.206	pub/aminet/	ALL
Germany	ftp.uni-paderborn.de	131.234.2.42	pub/aminet/	ALL
Germany	ftp.uni-stuttgart.de	129.69.18.15	aminet/	4500
Germany	ftp.uni-erlangen.de	131.188.3.2	pub/aminet/	7000
Germany	ftp.cs.tu-berlin.de	130.149.17.7	pub/aminet/	4000
Germany	ftp.tu-chemnitz.de	192.108.33.193	pub/aminet/	4000
Germany	ftp.fh-augsburg.de	141.82.16.242	pub/aminet/	
Germany	ftp.uni-bremen.de	134.102.228.2	pub/aminet/	
Germany	ftp.uni-oldenburg.de	134.106.40.9	pub/aminet/	2500
Germany	ftp.uni-kl.de	131.246.9.95	pub/aminet/	1500
Germany	ftp.uni-trier.de	136.199.8.81	pub/aminet/	
Germany	ftp.uni-siegen.de	141.99.128.1	pub/aminet/	1500
Germany	ftp.informatik.rwth-aachen.de	137.226.225.3	pub/aminet/	
Germany	ftp.stud.fh-heilbronn.de	141.7.1.41	pub/aminet/	600
Germany	ftp.rz.uni-wuerzburg.de	132.187.1.2	pub/aminet/	700
France	ftp.cnam.fr	163.173.128.15	pub/aminet/	
Portugal	ftp.ci.ua.pt	193.136.80.6	pub/aminet/	
UK	ftp.doc.ic.ac.uk	155.198.1.40	pub/aminet/	ALL
UK	micros.hensa.ac.uk	148.88.8.84	pub/aminet/	8500

All these mirrors have a directory '/pub/aminet', where you will find much stuff. Please use a mirror close to you! Some other important hosts are

```
ftp.funet.fi          (Finland)
ftp.isca.uiowa.edu   (USA)
ftp.hawaii.edu       (USA)
ftp.cso.uiuc.edu     (USA)
ftp.dfv.rwth-aachen.de (Germany)
```

Note that grind, aachen and erlangen have the full collection of Fish disks available! See Section 8.4 [Fish disk xxx], page 46. If you don't find a specific file on your local mirror, try ftp.wustl.edu, ftp.uni-paderborn.de or ftp.doc.ic.ac.uk; they keep all files.

To connect to a special host (ftp.uni-erlangen.de for example), you should type

```
ftp ftp.uni-erlangen.de
```

The host answers by requesting your login. You should type

```
ftp
```

No you are asked for a password. Please type your Email address here, if you have one. If not, use the password ftp.

Now you're inside the host. There is a number of commands you may execute here. The most important are:

- ?** Prints the help text of the FTP command. Additionally you may type **? command** to get information on a special command.
- bin** Tells the FTP program that you wish to transfer binary files. It is always a good choice to type bin as the very first command! Files you load without the bin command can be corrupt.
- get <file>** Loads the given file from the host. On most Unix machines you can type something like 'get file.txt -' or 'get file.txt |more' to show a text on the screen. Note that there **must not** be any blank between the | and the word more!
- mget <pat>**  
Loads the given files. pat may contain Unix style like wildcards.
- put <file>**  
**mput <pat>**  
Like get and mget, but transfer files from you to the remote host. This is in most cases not allowed, except for a special directory called 'incoming'. You can place files here which you want to make public.
- cd <dir>** Like the usual cd command. The commands get, mget, put, mput, dir and ls refer to the current working directory.
- dir [<dir>]**
- ls [<dir>]** Like 'list' and 'dir' on the Amiga. Note that the FTP-dir corresponds to the Amiga-list!
- bye** Leaves the FTP program.

When you have used FTP for the first times you will notice, that you always begin with executing the same steps:

1. Type the login (ftp in most cases)
2. Type the password (your mail address in most cases)
3. Enter the bin command
4. Change the current working directory ('/pub/aminet' for example)

This may get executed automatically. What you need is a file called '.netrc' in your home directory. Note that it needs to be protected against others! The FTP program doesn't use it, if it can be read by anything else than you. (Protection is set using the command 'chmod go-rwx

.netrc'.) The .netrc file contains some entries for your most favourite FTP sites, each separated by empty lines. A typical entry may look like this:

```
machine ftp.uni-erlangen.de
login ftp
password <your mail address> or <ftp>
macdef init
    bin
    cd pub/aminet
```

Note that on some machines it is possible to use the machine name 'default' which meets all machines not listed in .netrc.

## 9.4 Getting files from a Mail server

Another way to get files is to use a mail server. This assumes that you can send mail to Internet addresses and get mail from Internet hosts. It works by sending a mail to the server specifying some commands, for example send commands for the files you want. Important mail servers are

```
ftpmail@decwrl.dec.com
mailserver@nic.funet.fi
mailserver@leo.org
mrcserv@janus.mtroyal.ab.ca
mail-server@ftp.cs.tu-berlin.de
mail-server@rtfm.mit.edu
ftp-mail@uni-paderborn.de
```

The most important commands are:

**Help**            Tells the server that you wish to get an Ascii file containing detailed explanation how to use the server.

**Limit <number>**

Specifies that you wish to get not more than <number> Kbytes per mail. Larger files get splitted into small pieces of at most <number> Kbytes which are sent as separate mails each. Note that the mails may get larger because of overhead.

**Cwd <dir>**

Sets the current working directory to <dir>. This directory is used by the commands send and dir.

**Index**            will return a list of files and/or directories that the server offers. Note that this may be **very** large!

**Index <item>**

returns a list of files containing <item> in their names.

**Dir [<dir>]**

returns a list of the files and directories in the given directory.

**Send** <file1> <file2> ... <fileN>

Tells the server to send the given files to you.

**Begin** Tells the server to ignore all lines above this command.

**End** Like Begin, but specifies to ignore the lines below. (A signature for example!)

A typical session would be to send the following mail to the mail server:

```
BEGIN
CD /pub/aminet/util/arc
SEND LhA_e138.run
END
```

## 9.5 Getting files from a mailbox

You also can get files from one of the many BBS's (**Bulletin Board System**). Most of these are driven by private users, so there is nearly everywhere a mailbox which doesn't cause a too expensive telephone bill.

I want to publish a list of all Amiga mailboxes here. So please send to me a list of all mailboxes which are related to the Amiga - in any way. I need all telephone numbers of the boxes and their name. Tell me the nation where the box resides and - if possible - some more info (Does the box have Aminet or the Fish PD or FRAS? Is the box especially for Amiga users?)

Thanks, Ignaz Kellerer

For a list of mailboxes in Germany or Austria or Switzerland, look at the German version of the AmigaFAQ.

## 9.6 The Fish PD series

A very good source is the Fish PD series. One distinguishes between the floppy disks and the CD-Roms.

### 9.6.1 The Amiga Library disks

Fred Fish has started in the middle eighties to collect freely distributable software on floppy disks. There are 1000 disks and very much good stuff on it. Most Amiga dealers sell them and most magazines contain addresses of people mailing them to you for about 3\$ per disk or less. Fred Fish has terminated offering software on floppy disks. Instead, there is a dealer who offers the new software from the CD-Roms on floppy disks.

There are some things which can be found on the Fish disks, but not on Aminet. However, you can get them with FTP. See Section 8.4 [Fish disk xxx], page 46.

## 9.6.2 The Fresh Fish CD-Roms

Fred Fish is going on to offer freely distributable software. But now he collects it on CD-Rom's. He releases two different kinds of CD's:

1. Monthly released disks are divided into roughly three sections:
  1. New material, which includes the material from the new unreleased floppy disks as well as material which does not appear in the floppy distribution, about 84Mb on the first disk.
  2. Useful utilities that can be used directly off the CD-ROM if desired, thus freeing up the corresponding amount of hard disk space (GNU Emacs, Gnu C, GNU C++, Amiga E, PasTeX, AmigaGuide, Installer, 2.0 and 3.0-Includes, different archivers, tape drivers, the AmiCDROM filesystem and many other GNU and BSD tools, ...), about 150Mb on the first disk.
  3. Older material from previous released floppy disks or CD-ROM's, about 404 Mb on the first disk. (Fish disk 600-910)
2. Disks containing the latest software as well as recent software in packed format only. (These are intended to be used for example in BBS's.)

I recommend especially the first kind of Fish CD's. They cost about 20\$ plus 3\$ for shipping (5\$ outside USA/Canada/Mexico) and are available from

Amiga Library Services  
610 N. Alma School Road, Suite 18  
Chandler, AZ 85224-3687  
U.S.A.

Phone/FAX: (602) 917-0917

## 9.7 How do I Read and write MS-Dos disks?

No problem for owners of Workbench 2.1 or higher: The program CrossDos is part of the Workbench. All you have to do is mounting the device 'pc0:' by putting it into the drawer 'Devs:DOSDrivers' or by double-clicking the icon in 'Sys:Storage/DOSDrivers'. Ms-Dos disks in drive 'df0:' can now be handled in the usual manner replacing the word 'df0:' by 'pc0:'. For example the directory can be shown with the command `dir pc0:.`

People still running Workbench 2.0 or lower need a program called MSH. You will find this on the Aminet (directory misc/emu) and on Fish disk 382. See Chapter 9 [Sources], page 46. After editing the file 'devs:MountList' as described in the documentation you have to say `Mount msh:` in the CLI and can now do the same as above replacing the word 'pc0:' with 'msh:'.

## 9.8 How do I split large files?

There are some archives which are too large to fit on one disk. To transfer them on disks you need to split them into smaller pieces and transfer each part on a separate disk. I recommend Martin Schlodder's **Splitter**. (Aminet, 'util/misc/splitter\_121.lha'. The archive contains binaries for MS-DOS and should be compilable without problems on any Unix system.

## 9.9 Discussing things

A mailing list is a server that allows to discuss special things via Email. The server holds a list of people that are interested in the respective topic. For example, the gcc mailing list will discuss bugs, new features and other problems of gcc. (see Section 4.5 [Compilers], page 17) If a mail is sent to the server from someone he will forward this mail to all the other people on the list.

You will be added to the list by sending a mail to the server which will usually contain the word 'Subscribe' or something similar. Once you are no more interested in the mailing list you can unsubscribe.

Unfortunately the servers have a different syntax of subscribing and unsubscribing. The best way to find how to subscribe is to send a mail with the word 'Help' to the server. He will reply a mail which should explain how to handle this special server.

Some mailing lists are:

Topic	Server
Amok	listserv@amokle.stgt.sub.org
Dice	dice-request@castrov.cuc.ab.ca                    or dice-request@hactar.hanse.de (Germany)
gcc	listserv@lists.funet.fi
Lisp	amigalisp@contessa.phone.net
Mui	mui-request@taloa.unice.fr
Oberon-A	oberon-a-request@wossname.apana.org.au

## 9.10 Other FAQ's

This is not the only FAQ, of course. Lots of FAQ's are available either by being posted to newsgroups or by access via FTP.

### German Amiga-FAQ

This is the german translation of the AmigaFAQ you are reading. Newsgroups: de.comp.sys.amiga.misc, zer.z-netz.rechner.amiga.allgemein HTML: '<http://www.leo.org/archiv>' Aminet: 'docs/misc/AmigaFAQg.lha' Maintainer: Ignaz Kellerer, kellerer@informatik.tu-muenchen.de

**Amiga related books FAQ**

This is a list of books for the Amiga, including short discussions, prices and sources.  
 Newsgroups: comp.sys.amiga.misc, comp.sys.amiga.introduction, comp.sys.amiga.programmer  
 (monthly) HTML: <http://eksl-www.cs.umass.edu/~atkin/amiga/books.faq.html>  
 Ftp: rtfm.mit.edu, 'pub/usenet/comp.sys.amiga.misc'. Maintainer: Marc Atkin,  
 atkin@cs.umass.edu

**AmiTCP/IP FAQ**

This is for users of AmiTCP/IP, a set of programs which allows to include an Amiga into a TCP/IP network. (Most well known nets, Internet for example use TCP/IP.)  
 Newsgroups: comp.sys.amiga.misc, comp.sys.amiga.datacomm, comp.sys.amiga.networking  
 (biweekly) Ftp: rtfm.mit.edu, pub/usenet/comp.sys.amiga.networking Maintainer:  
 Neil J. McRae (atcpfaq@domino.demon.co.uk)

**Amiga Networking FAQ**

Unlike the AmiTCP/IP FAQ this one wants to cover all aspects of networking, including TCP/IP and Envoy. Newsgroups: comp.sys.amiga.datacomm, comp.sys.amiga.hardware  
 Ftp: rtfm.mit.edu, pub/usenet/comp.sys.amiga.networking Maintainer: Richard Norman (norman@afas.msfc.nasa.gov)

**Point Manager FAQ**

Networking seems to be quite a problem: This FAQ os for Point Manager, a FidoNet-client (so-called points). Newsgroups: comp.sys.amiga.datacomm Ftp: rtfm.mit.edu, pub/usenet/comp.sys.amiga.datacomm Maintainer: Eric Krieger (pm\_faq@quasar.hacktic.nl)

**All about FTP**

Explains the usage of the file transfer program FTP. See Section 9.3 [FTP], page 47.  
 Newsgroups: comp.sys.amiga.misc (monthly) Ftp: Aminet, info/start Betreuer: Urban Dominik Mueller (umueller@amiga.icu.net.ch)

## The Amiga-FAQ archive

The Amiga-FAQ is available in different formats: Ascii format (which is posted to the nets) AmigaGuide format (which is the adequate format on the Amiga) and in dvi format (to be printed). Additionally there is some stuff, that might be useful or interesting, but could not be included into the Amiga-FAQ:

txt/amiga.history	On the Amiga's history
txt/story.txt	The Commodore story (or: the Tramiel story ;-)
txt/amiga.newsgroups	Overview on comp.sys.amiga.*
txt/amiga.sites	List of FTP sites
txt/AmigaOverview.tex	A short overview on the Amiga-Soft- and Hardware
txt/Hardware.tips	For those people who can't live without solder

src/JWSplit.c	The source of a file splitter
src/JWJoin.c	The opponent to JWSplit
src/addtoc.c	Utility to add a toc to texinfo-created docs (this document uses it)
programmers/*	Some stuff for programmers: pragmas, vararg versions of some tag functions and some amiga.lib functions (HookEntry, DoMethod)

I decided to collect these in the Amiga-FAQ archive. It is called AmigaFAQ.lha and can be found on Aminet, directory 'docs/misc'.

## Contributions

This FAQ can neither get useful nor hit further development without your help. Suggestions, contributions, new answers, critics, anything is rather welcome.

Please note, that very major subjects are absolutely missing yet: Nothing about sound, nothing on graphic cards, no Animation. These are some of the Amiga's best points! But I don't know them ... :-)

So grab your keyboard (Your pencil? Well, if there's no other way...) and send mail to:

Ignaz Kellerer  
Georg-Habel-Str. 11  
81241 Munich (Germany)  
Tel. (+49) 089 / 885147

Internet: [kellerer@informatik.tu-muenchen.de](mailto:kellerer@informatik.tu-muenchen.de)

## Credits

My thanks go to:

### **Reinhard Spisser and Sebastiano Vigna**

for the Amiga version of texinfo. This is written with it.

### **The Free Software Foundation**

for the original version of texinfo and many other excellent programs.

### **Dylan McNamee**

for contributing the sections on Editors, Word Processors, DTP and Postscript and some wording fixes.

### **Joseph Luk**

for help in the section on chunky/planar, double buffering and PAL/NTSC



**Urban Dominik Mueller**

for the FAQ on FTP and Mail-servers.

**Lars Hecking (lhecking@nmrc.ucc.ie)**

**Philippe Brand (phb@colombo.telesys-innov.fr)**

for the complete gcc part

**Jochen Wiedmann (zrawi01@decap2.zdv.uni-tuebingen.de)**

for the composition and posting of the Amiga FAQ until July 1994.

# Index

•	
. (replacement)	4
.arj	45
.dms	45
.gz	45
.lha	45
.lzh	45
.netrc	47
.sfx	45
.tar	45
.z	45
.Z	45
.zip	45
.zom	45
.zoo	45
-	
_mchar	8
_pchar	6
<b>6</b>	
68EC020	1
68EC030	1
68LC040	1
<b>A</b>	
A1200 (HD)	2
AmiBooksFAQ	53
Amiga Library disks	51
Amiga networking FAQ	53
Amiga-FAQ archive	54
AmigaBasic	20
AmigaSciSchool	47
Aminet	47
AmiTCP/IP FAQ	53
Anonymous	47
ANS	41
ARexx	9
Assemblers	17
AutoDocs	16
<b>B</b>	
Basic	17
BBS	51
<b>C</b>	
C	17
C-program (gcc)	31
C++	17
Catalog description	21
Catalog translation	21
Catalogs	21
CatComp	21
CATS	15
Chunky displays	9
Commodore, Frankfurt	16
Commodore, West Chester	15
comp.sys.amiga.reviews	47
Compilers	17
Console window	23
Contributions	55
Credits	55
CrossDos	52
Current directory	4
<b>D</b>	
DaggeX	43
Desktop Publishing	34
Developer	16
DoMethod	26
DoSuperMethod	26
Doublebuffering	11
DTP	34
<b>E</b>	
Editors	33
Emulators	43
endings	45

Enforcer .....	1
Esc sequences .....	20

## F

FAQ's, others .....	53
FD-files .....	24
fd2pragma .....	24
file endings .....	45
Fish CD-Rom .....	52
Fish disks .....	46
Fish floppy disks .....	51
Fish PD .....	51
FishCon .....	47
FishXref .....	47
FlexCat .....	21
Forth .....	18
Fortran .....	18
FPU .....	1
Fresh Fish CD-Rom .....	52
FTP servers .....	47

## G

GadTools .....	3
Gcc .....	28
gcc-amiga-libraries .....	30
gcc-authors .....	28
gcc-compiling .....	31
gcc-current .....	28
gcc-how-to-get-help .....	32
gcc-inline-headers .....	29
gcc-installation .....	30
gcc-requirements .....	28
gcc-sources .....	29
GfxBase .....	43
GigaMem .....	1
Graphics .....	9
GUI .....	3
Guo Biao .....	42

## H

HD (A1200) .....	2
HD compression .....	46
Hirsch & Wolf .....	15

history .....	54
HookEntry .....	26
HZview .....	42

## I

IBM emulator .....	44
Icons .....	4
Includes .....	16

## J

JemTeX .....	41
JlStoJi .....	41
jmore .....	41

## K

Kanji .....	41
KingFisher .....	47
KitCat .....	21

## L

LibAllocPooled .....	26
Linux .....	43
Lisp .....	18
locale.library .....	21
Localizing .....	21

## M

MagicWB .....	4
Mail-server .....	50
mailbox .....	51
Mailing lists .....	53
MakeCat .....	21
Memory, virtual .....	1
Missing functions .....	26
MMU .....	1
Modula-2 .....	19
Monitors .....	11
MS-Dos (emulator) .....	44
MS-Dos (Syquest) .....	44
MS-Dos disks .....	52
Msh .....	52
MUI .....	3
Multiscan .....	11

MWB ..... 4

## N

NDA ..... 16

NDK ..... 16

NDU ..... 16

NDUK ..... 16

NetBSD ..... 43

NewIcons ..... 4

NTSC ..... 12

## O

Oberon ..... 19

Oberon-A ..... 19

## P

packers ..... 45

packers on Unix ..... 45

Page Layout Languages ..... 34

PAL ..... 12

Pascal ..... 19

Pipe (command) ..... 6

PIPE: ..... 5

Planar displays ..... 9

Point manager FAQ ..... 53

Postscript ..... 36

pragmas ..... 24

Printer control ..... 20

Prolog ..... 18

## Q

Queue-handler ..... 5

## R

Reviews ..... 47

RKMs ..... 14

Rom Kernel manuals ..... 14

## S

Splitting files ..... 53

Stacker ..... 46

Syquest ..... 44

## T

TeX ..... 35

Text Editors ..... 33

## U

Unix ..... 43

Unix-LhA ..... 45

## V

VGA ..... 11

## W

Word Processors ..... 34

Workbench ..... 3

Wysiwyg ..... 34

## X

X11 ..... 43

XFH ..... 46

XPK ..... 46

# Table of Contents

<b>1</b>	<b>CPU, Custom chips, RAM and other stuff.....</b>	<b>1</b>
1.1	What are 68EC020, 68EC030 and 68LC040?.....	1
1.2	What's an FPU?.....	1
1.3	Can I use a 3.5' HD in my A1200?.....	2
<b>2</b>	<b>The Operating System.....</b>	<b>2</b>
2.1	Can I use another Kickstart than the builtin?.....	2
2.2	The Graphical User Interface.....	3
2.3	What is MUI?.....	3
2.3.1	Icon collections and Backgrounds.....	4
2.4	What is the Amiga equivalent of . (Current directory)?.....	4
2.5	The PIPE: queue-handler.....	5
2.5.1	Using PIPE: in a standard AmigaShell environment.....	5
2.5.2	The Pipe command.....	6
2.5.3	Pipe command support in AmigaShell.....	7
2.5.4	Quick usage guide.....	7
2.5.5	Related things.....	8
2.5.6	Troubleshooting.....	8
2.6	ARexx, the program control language.....	9
<b>3</b>	<b>How about Graphics?.....</b>	<b>9</b>
3.1	What are chunky and planar displays?.....	9
3.2	What is doublebuffering?.....	11
3.3	What monitors will work on my Amiga 1200/4000?.....	11
3.4	How do I switch between PAL and NTSC?.....	12
<b>4</b>	<b>Programming.....</b>	<b>13</b>
4.1	What documentation do I need as an Amiga programmer?.....	14
4.2	What is CATS?.....	15
4.3	Where do I get the Amiga includes?.....	16
4.4	How do I become a developer?.....	16
4.5	What compilers (assemblers) are there?.....	17
4.6	Those never working Esc sequences!.....	20
4.7	Is it possible to use AmigaBasic on the A1200?.....	20
4.8	How do I localize my program?.....	21
4.9	How to obtain a pointer to a console's window.....	23
4.10	What are pragmas?.....	24

4.11	My Compiler/Linker is complaining about missing symbol xxx...	26
4.12	Where do I find the function xxx? .....	27
4.13	The GNU C compiler: general information and installation .....	28
4.13.1	Current Version .....	28
4.13.2	Requirements .....	28
4.13.3	Authors .....	28
4.13.4	Sources for Gcc .....	29
4.13.5	Inline Headers .....	29
4.13.6	Amiga Libraries .....	30
4.13.7	Installation .....	30
4.13.8	Compiling .....	31
4.13.9	How to get help .....	32
<b>5</b>	<b>Applications .....</b>	<b>33</b>
5.1	Text Editors .....	33
5.2	What word processors are there? .....	34
5.3	Desktop Publishing .....	34
5.4	What is TeX and where can I get it? .....	35
5.5	Are there any Postscript interpreters? .....	36
5.6	Font Concepts .....	36
5.6.1	Amiga Font Formats .....	36
5.6.2	Frequently Requested Amiga Fonts .....	37
5.6.3	Commercial Font Sources .....	38
5.6.4	Non-Latin fonts on the Amiga .....	38
5.6.5	Amiga Font Installation .....	39
5.6.6	Amiga Font Utilities .....	39
5.6.7	Making Outline Fonts .....	40
5.6.8	Problems and Possible Solutions .....	40
5.7	How to deal with Non-Latin texts? .....	41
5.7.1	Japanese editors and viewers .....	41
5.7.2	Chinese text viewers .....	42
<b>6</b>	<b>Connecting your Amiga to the world .....</b>	<b>42</b>
<b>7</b>	<b>Emulators .....</b>	<b>43</b>
7.1	Can I run Unix on my Amiga? .....	43
7.2	Is it possible to use the Amiga as X11 terminal? .....	43
7.3	Is there a way to start MS-Dos programs? .....	44
7.4	How to mount MsDos-formatted Syquests on Amiga .....	44

<b>8</b>	<b>Miscellaneous</b> .....	<b>45</b>
8.1	Is there any unix version of LhA?.....	45
8.2	What are files ending with ...?.....	45
8.3	Is there a Stacker-like utility to pack my hard drive?.....	46
8.4	Where do I get Fish disk xxx?.....	46
<b>9</b>	<b>Where and how do I get software and other informations?</b> .....	<b>46</b>
9.1	Files and databases on freely distributable software .....	47
9.2	A collection of tests .....	47
9.3	Getting files from a FTP server .....	47
9.4	Getting files from a Mail server .....	50
9.5	Getting files from a mailbox.....	51
9.6	The Fish PD series.....	51
9.6.1	The Amiga Library disks.....	51
9.6.2	The Fresh Fish CD-Roms .....	52
9.7	How do I Read and write MS-Dos disks? .....	52
9.8	How do I split large files? .....	53
9.9	Discussing things.....	53
9.10	Other FAQ's .....	53
	<b>The Amiga-FAQ archive</b> .....	<b>54</b>
	<b>Contributions</b> .....	<b>55</b>
	<b>Credits</b> .....	<b>55</b>
	<b>Index</b> .....	<b>57</b>