

pckeyboard documentation

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Chapter 1

pckeyboard documentation

1.1 Pckeyboard - the documentation.

Pckeyboard documentation

This is the pckeyboard AmigaGuide documentation. Choose one of the topics available:

Legal stuff	READ THIS.
Introduction	What is it?
Usage	How to use it?
Problems	Problems.
Future	Future.
Hardware	Hardware docs.

Pygmy Projects -- "We make it small!"

1.2 How does it work?

Objectives

We wanted to keep the Amiga hardware unmodified and keep the price as low as possible. This resulted in heavy software load, the pckeyboard software is not especially fast.

Hardware

Pckeyboard adapter hooks into the parallel port, taking advantage of the "hidden" serial port there. The adapter receives the signals from the PC keyboard and outputs them into the Amiga parallel port. Hardware on the adapter also allow Amiga to send data to PC keyboard.

Software

The software is a very big part of pckeyboard. The large size of the program is due to the simple hardware, the software has to do a lot of things that the hardware doesn't. Output from PC keyboard is not simple

either. (Nothing is simple when the word PC is mentioned ;)

1.3 Legal stuff.

DISCLAIMER

We accept no responsibility for any kind of damage caused by the usage of this software or the hardware described here. Use the software and hardware entirely at your own risk.

DISTRIBUTION

You may distribute this program freely, as long as the archive is kept intact. This means that all files must be present, and no files may be added to the package.

1.4 Introduction to pckeyboard

1. Description

"pckeyboard" is a program which allows you to connect one of those nifty PC keyboards to your Amiga and avoid using the not-so-nifty Amiga keyboard. This only works while you operate under the Amiga OS, however.

2. Reasons for existence

Well.. This fusion of hardware and software exists because we simply got tired of using the truly inferior A1200 keyboard. To put it politely, Amiga keyboards suck, atleast the new ones. PC keyboards are very cheap compared to their quality and are widely available. If you accidentally destroy your PC keyboard you haven't lost much, another 200 fim and you're back in business.

1.5 Usage

You need the following things to run the program:

- the hardware connected to the parallel port (naturally ;)
- "pckeyboard.config" file placed in "ENVARC:pckeyboard".
(in effect, the file will also be in "ENV:pckeyboard")

Then you just need to type

```
1> Run pckeyboard
```

and the program should start. A more convenient way is to run the program at some point in your startup-sequence with the output redirected to NIL. This way, the program will not need any Shell windows open to work.

```
1> Run >NIL: pckeyboard
```

(the command needs to be given before the shell window is opened)

1.6 Problems

CIA problems

At first the pckeyboard used a timer of CIA-B. This made most stuff work with the pckeyboard. The only exception I could find was PlaySID which required too many timers.

Then the software was fixed to use only the SR interrupt of CIA-B. Now even PlaySID works but a new problem arose. Some (stupid) programs assume that if they get timers, they can bang ICR all they want. This is ofcourse not true because there are other things in ICR besides timer controls -- SR is one of them. So the new version failed with f.ex. Colonization because the game just ran over the pckeyboard handler.

Probably the best solution would be to make the allocation of timers optional in the commandline. Or, the user could allocate/release one of the CIA-B timers to make stupid programs work (some key combination perhaps).

Unfortunately there seems to be no really good solution because the problem is in the other programs, not pckeyboard.

Demos and games

As you might guess, demos and games don't usually work with pckeyboard. Not even OS games since they usually hit the CIAs without shame. Demos also usually hit ICR so the pckeyboard is run over with many demos. Remember that originally this software/hardware was made for coding, not playing games etc :).

Weird bugs

Sometimes pckeyboard just ceases to get interrupts and the program enters an infinite wait. We don't really know why this happens so watch out. Don't panic if this happens--just use the original keyboard to save your work and restart the machine. This effect usually happens if you leave the machine untouched for a long time.. Never caught the bug in action though :).

1.7 Future

There is a lot to be done still. Currently you can't edit the pckeyboard configuration file yourself (unless you want to hack it :). The file contains repeat rates etc, which are adjusted to our taste--lightning fast 8).

To Do:

- config/keymap editor
- advanced control window opened by a keystroke (with CIA control options etc)

1.8 Hardware

DISCLAIMER

We take NO responsibility for any damage (any form of damage, might it be mental, material or any kind of damage) direct or indirect caused by constructing and/or using this hardware. If you don't know what you are doing, then please don't make this hardware, because it might break your computer. DON'T plug this hardware into any other computer than Amiga, since the parallel port might (almost certainly) differ from the Amiga's parallel port.

IN OTHER WORDS:

***** YOU ARE MAKING EVERYTHING AT YOUR OWN RISK! *****

* COPYRIGHT *

All copyrights of the hardware design owned by Jani Vaarala.
If you want to start to build and sell these adapters, you need my written permission to do so. Software copyright for hardware access/control part also owned by Jani Vaarala. Other parts of the software owned by Sami Vaarala. Ofcourse producing this hardware for own use is allowed. If you want to include support for this keyboard hardware then contact me at this address.

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NOTE: DONT CONTACT ME IF YOU WANT ME TO BUILD AN ADAPTER FOR YOU! I DON'T HAVE TIME FOR THIS, BECAUSE OF MY STUDIES.

Hardware originally consisted of 5 chips (2* 8-bit shifters, counter, nand-chip and an OC nand-chip). But I was told that Amiga parallel port has a TTL/CMOS compatible 8-bit shift register (Thanks to Teemu Suikki!). So I dug some info from hardware manual and decided to make a hardware using that internal shifter. Now the hardware consists of 2 chips (counter and an OC nand-chip) and 1 resistor. To get enough power for the keyboard I use joystick port

VCC and GND pins.

Parts list

```

74LS191 TTL      (counter)
74S03  TTL      (OC nand)      *1
D-25   male      (parallel port)
D-9    male      (joystick port)
D-9    female     (joystick port)
D-5    female     (keyboard)
1 MOhm  resistor  (pull-up resistor)

```

*1 I used 74S03 because I could get few of the free from some junk boards. You can also use LS/F chips, *but* the 1 MOhm pull-up resistor might not do the job (you need to select correct resistor yourself). I heard that CMOS chips should work with 1 MOhm pull-up also.

Used Pins

Parallel port

```

pin no
2  Data 0
3  Data 1
4  Data 2
11 Busy  (data)
12 Pout  (clk)

```

Keyboard connector

```

1  Clock
2  Data
3  NC
4  Ground
5  VCC (+5 V)

```

NOTE! as you face the back of the keyboard connector (back meaning the side where you solder the wires to) the pins are from left to right: 1,4,2,5,3

Game port

```

7  VCC (+5 V)
8  GND

```

74LS191

```

1  D1  preload counter value
2  Q1  flip-flop out (not used)
3  Q0  flip-flop out (not used)
4  _CE count enable
5  _U/D up/down count selector
6  Q2  flip-flop out (not used)
7  Q3  flip-flop out (not used)
8  GND ground
9  D3  preload counter value

```

```

        10  D2  preload counter value
        11  _PL parallel load
        12  TC  terminal count
        13  _RC ripple clock (not used)
        14  CP  clock
        15  D0  preload counter value
        16  VCC +5 V

74S03    1   A input A(1)
        2   B   input B(1)
        3   Y output (1)
        4   A input A(2)
        5   B input B(2)
        6   Y output (2)
        7   GND ground
        8   Y output (3)
        9   B input B(3)
        10  A input A(3)
        11  Y output (4)
        12  B input B(4)
        13  A input A(4)
        14  VCC +5 V

```

Connection list

```

PAR_D0 (pin 2)  <-> NAND_1   (pin 1) \
NAND_1 (pin 1)  <-> NAND_2   (pin 2) /
NAND_3 (pin 3)  <-> KBD_CLK  (pin 1)

PAR_D1 (pin 2)  <-> CNT_PL   (pin 11)

PAR_D2 (pin 4)      <-> NAND_9   (pin 9)
|
GAME_VCC (pin 7)  <-> 1 MOhm resistor  /

CNT_TC (pin 12)  <-> NAND_4   (pin 4) \
NAND_4 (pin 4)   <-> NAND_5   (pin 5) /
NAND_6 (pin 6)   <-> KBD_CLK  (pin 1)

KBD_CLK (pin 1)  <-> NAND_13  (pin 13) \
NAND_13 (pin 13) <-> NAND_12  (pin 12) /
NAND_11 (pin 11) <-> NAND_10  (pin 10)

NAND_8 (pin 8)   <-> PAR_POUT (pin 12)

KBD_DATA (pin 2) <-> PAR_BUSY (pin 11)

GAME_GND (pin 8) <-> NAND_GND (pin 7)
                  <-> CNT_GND  (pin 8)
                  <-> CNT_D2   (pin 10)
                  <-> CNT_CE   (pin 4)
                  <-> KBD_GND  (pin 4)

GAME_VCC (pin 7) <-> NAND_VCC (pin 14)
                  <-> CNT_VCC  (pin 16)
                  <-> CNT_D0   (pin 15)

```

```
<-> CNT_D1    (pin 1)
<-> CNT_D3    (pin 9)
<-> CNT_U/D   (pin 5)
<-> KBD_VCC   (pin 5)
```

In this package there is also a picture which might explain a lot more than this text-form explanation (actually the picture is quite poor). If someone is willing to make a better wiring list (maybe with better pictures, etc), feel free to do so. If someone want's to make additions to this hardware one may do so as long as the person doing so remembers that I (Jani Vaarala) have the full copyright of this schematic and the new (maybe improved) schematic may not be produced to be sold without my written permission to do so.

If you have any bug reports about this hardware, please contact in the address(es) found in the copyright part.
BUT! DON'T mail if you want me to build this hardware for you, because I WON'T!

```
CNT_xx  = 74LS191 pin
PAR_xx  = parallel port pin
NAND_xx = 74S03 pin
KBD_xx  = keyboard pin
GAM_xx  = game port pin
8OC = Open Collector
```

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