



Aleph One Limited

486 Second Processor Card Supplementary Instructions

Release note v1.871

This print of the ReadMe file contains the latest information on the Aleph One 486 Second Processor Card and its software.

This code will only run on a Risc PC Second Processor card. The defaults settings are specific to the Aleph One Second Processor Card (Mark I). For use with an Acorn 486 PC card you need to change the 'New A20gate control' (newa20) to off, and turn 'coprocessor' off, otherwise lots of stuff will behave very badly.

This preliminary release is shipped with the Manual for Aleph One PC Expansion (podule) card, as new manuals are not yet ready. It is important that you read this ReadMe file, as much information here supersedes that in the Manual

If you have a Aleph One (16 bit = A5000/A400/A300/A3000) or Acorn (8bit = A4000/A3020) podule PC card then you need a different version of the software with the suffix 'st', 'e' or 'a'. You can obtain this from Aleph One.

The document contains:

- * Conrenrs
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Contents

This floppy contains the following items:

- !PC - the application needed to drive the PC card.
- !PCConfig - an application to set options for the PC Card.
- Readme - This file which contains the latest information on the PC Card.
- DOSFS - Module allowing access to DOS partitions bigger than 32MB Drivers:
- AMouse/COM - a simple DOS bus-mouse driver.
- CDROM - directory containing a DOS PC card CDROM device driver and info.
- Windows - directory containing Windows driver and Windows Setup file

If you have ordered the Network drivers, they will be supplied on a separate disc. Note that you need the 'Network Links (v07)' release or later to work with this software. Network Links (v10) is also available in beta form including DCI4 support:

If you are upgrading from an earlier version of !PC then read the notes at the end of this file.

Changes from the Manual

1.1 No T-piece or back panel are supplied. *2 Installation*

This card goes into the co-processor slot, not an expansion slot. It must go in the real of the two slots for proper cooling and physical fitting. If your ARM processor card *is* already in this slot then move it to the front slot. Obviously there is no blank panel & T-piece fitting requirement.

2.1 Checking the card is correctly installed and *3 Installing the PC support software* Ignore these sections and follow the instructions below

Before you can use the PC 2nd-processor Card you must

- * install the latest version of DOSFS
- * copy the PC card software onto your computer
- * set up a DOS partition
- * install DOS (for a new partition)

Read the rest of this file and the manual before actually doing any of the following.

Install DOSFS by copying the !boot from the floppy onto the root directory of your hard disc. Note that this is only a partial !boot structure so you MUST NOT delete your existing one first. This gives access to partitions bigger than 32MB from the RISCOS desktop.

Copy the !PC and !PCConfig applications into a suitable place on you1 drive. The other files you may need are in the drivers directory. These are DOS files and can be copied to your DOS partition after you have set it up and decided what you need.

Remove the !PC software floppy & reset your computer. This is necessary so that configuration with !PCConfig is possible.

4 Configuring your PC partition or drive

There are a few new config options

PC to Arc switching control' is explained below in the PC card control' section.

Windows Video Mode' and 'Video RAM' settings are explained in the Win_ReadMe file in Drivers. Windows.

PCRAM defines how much RAM the PC card can use. This should normally be specified in multiples of 1024KB, as not all values are possible and the PC card approximates to the nearest (lower) value. This value does not include the RAM used in the Video RAM option. or the memory used by !PC itself. Obviously you need enough RAM in your host machine to run RISCOS & !PC, and still allocate the video RAM & PC RAM values specified.

5.2 Using the PC Expansion Card

You do not need to select the window before double-clicking to change from Multi-tasking to single-tasking.

The Printscreen key functions just as on a normal PC.

5.6 Using the keyboard with the PC Expansion Card

The keyboard must be configured as a UK or British keyboard. This is normally done when installing DOS and Windows.

5.7 Using the mouse with the PC Expansion card

Modern versions of DOS & Windows are both supplied with mouse drivers, called MOUSE.COM. This will be installed as part of the DOS installation procedure. There is no need to use the Aleph One mouse driver unless you need to save memory or you do not have a mouse driver supplied with your version of DOS.

5.8 Using Microsoft Windows with the PC Expansion card

You need to specify a British keyboard on installation. The custom option is still required to specify the VGA (version 3.0) driver. No special configuration is needed to run DOS boxes under Windows.

5.10 Installing the Aleph One Windows Driver

This driver now takes the form of one multi-mode file ARMDRV.DRV which is capable of using any mode that your system can display for Windows. Read the Win_Readme file in the Drivers.Windows subdirectory on the release floppy which explains how the drive1 works, how to install it. and how to configure it. Ignore the manual.

5.11 Using extended/expanded memory from DOS

This section is still valid, although with a modern version of DOS there should be no reason to read it except for interest. Your default DOS installation should deal with everything for you. If you wish to specify your own memory allocations it is important to note that the ROM has increased in size from 32K to 48KB.

and therefore occupies the region F400-FFFF in the DOS memory map.

6 The PC expansion card hardware

The Aleph One 2nd processor PC Card (Mark I) uses a Cyrix DX40 or DX2/80 CPU. These CPUs are using write-back cache and operate at 5V. Note that the write-back caching is extremely important to the performance of the chip, and other CPUs which do not have this facility will go much more slowly. (An Intel DX2/80 for example would go at about one third the speed of the Cyrix DX2/80). Thus chip upgrades are not possible unless faster 5V write-back cache chip are produced.

6.1 Numeric coprocessor

The Cyrix DX CPUs have a coprocessor built in (that is the meaning of the DX appellation).

6.2 Installing SIMMS

This version of the PC card does not have its own RAM. You use the PCRAM option in !PCconfig to specify how much of the host machine's RAM the PC card can use.

6.3 PC Expansion card Serial & Parallel ports

This card does not have its own ports. It must use the host machine's. See 'Serial & Parallel port use' below.

6.4 Floppy drives

Ignore this section
7 Networking your PC card
You will get an update to this section with the Network Links software should you choose to network your PC card

8 Printing via the Risc PC

You can use the RISCOSPrinter option to specify which (if any) DOS logical printer port is connected to the RISCOS print stream. The chapter is still basically correct but the whole thing is hugely simplified by the fact that you now have just one port.

RISCOSprinter Off => no LPT ports available in DOS

RISCOSprinter 1 => LPT1 goes to the RISCOS print stream

RISCOSprinter 2 => LPT2 goes to the RISCOS print stream

Note that DirectParallel does not need to be on to use this facility.

Printing over a RISCOS network is problematic. DOS does not explicitly 'close' a printer stream. RISCOS does. Thus !printers expects a file to be closed and never sends it for printing or closes the spool file unless this happens. Thus printing from the PC card will not be sent unless the file is closed manually. Acorn and Aleph One are working on software changes to fix this problem.

9 PC Card sound output

The beep is still passed over in software. There is no 'PC speaker' sound option on this card. The next step is 'Soundblaster' sound which currently requires a parallel port sound adaptor such as the Media Vision Audioport or the PortAble sound plus. The Acorn 16-bit sound upgrade, when used with appropriate driver software which should be available soon will also supply this facility with better integration and performance.

10 CD-ROM driver for Aleph One PC systems

This chapter is all correct, but note that modern version of DOS are supplied with MSCDEX and the version supplied should be used in preference to the one supplied in the release floppy. Only use this if you do not have one.

New features:

1.65 First 2nd processor release 256 colour windows driver

1.66 Risc PC keyboard support

1.67 XBDA bug fix: Fixes NE2000 twice' and Local hard drive problems I.

72 Risc PC Serial & Parallel port support

Since v1.72

- 1.73 16 & 32 bpp windr^y support (see Win_ReadMe)
- 1.73 Bad stop code' error much less likely
- 1.73 More than 16MB RAM now supported - up to 32 MB
- 1.75 DMA support
- 1.77 CTS line PCIO support bugfix
- 1.80 Full Palette support for DOS & Windows
- 1.80 Removes SWI conflict with !Larger
- Net07 Networking probs with some RPCs and etherB & WfWG, or TCPIP fixed
 - 1.81 Microsoft 1.7MB (MDF/XDF) floppy format supported
 - 1.83 add Net08 DC14 network support
 - 1.83 Soundblaster support for Sound Card
 - 1.84 fix to stop video pages becoming unavailable on RPC
 - 1.85 co-processor autodetected
 - 1.85 PCRAM specified in MB
 - 1.86 Gemini II ASIC support/new config options

Parallel & Serial port use

The PC card can *use* the Risc PCs parallel and serial ports. To do this you need to turn on the DirectParallel' or DirectSerial' options in !PCConfig. Printing to a printer plugged into the Risc PC will work without setting DirectParallel on.

When one of these options is on, the specified port *is* taken over completely for bi-directional use by the PC card and thus cannot be used by RISCOS until you quit from !PC.

There is currently a problem with the serial port in that after quitting !PC (using DirectSerial), the serial port remains inaccessible until you do an RMreinit SerialDeviceDriver. This is now on the end of the !Run file for you to enable if it causes you problems.

Do not use the printer Re-direction (RISCOSPrinter) & DirectParallel options at the same time. You are likely to get no printer output at all, *as the* data cannot go to two places at once.

Problems with TurboDrivers

The PC Card printer mechanisms interact with Computer Concepts TurboDrivers in ways that can cause problems.

1. If you have a TurboDriver cable and use DirectParallel to print with, then everything will be completely garbled by the cable, *as* the data does not get appropriately pre-scrambled by the TurboDrivers modules because DirectParallel bypasses them. You must either change the cable fo1 PC printing (eg with a data switch) or not use DirectParallel and TurboDrivers.

2. If you use the RISCOSPrinter redirection, then everything works but can go very slowly, because !PC prints a byte at a time, and this causes the turbodrivers to work very inefficiently. There are a number of things which can be done to ininimise these problems until a software solution is available.

The current release version of the TurboDrivers (4.03) is supplied with !PrintQFS 0.43. This does not have the extra buffering to speed up single byte writes. CC can supply a newer version of !PrintQFS (0.45) which includes some extra buffering (EMail(preferred)/fax/write to Gerald Isles at Computer Concepts). mailto: g erry@cconcepts.co.uk

The best way to print is to set the PC driver to print to FILE: (set the file to C:\PRINTOUT) and once it has finished, return to the desktop. freeze the PC and run the following basic program...

```
REM >PrintPC
partition$="<Diva.SDir>.^HardDisc_C" :REM or whatever
file$="PRINTOUT"
SYS "OS_FSControl".26,partition$+"," +file$,"printer.".2
END
```

This will copy the printout file to the RiscOS printer stream. You should have a TurboDriver selected.

Alternatively, if this is irritatingly complex, the throughput can be increased by pausing the TurboDriver

queue until all the data has been transferred (Alt-select on the TurboDriver icon followed by adjust on the 'Queue..' button then hit the Pause queue' button).

Monitor Modes

Mode 27 is used for VGA: 640x480x16 display in DOS

Mode 31 is used for SVGA 800x600x16 display in DOS. (DOS mode 6Ah).

Note that the default definitions of these modes for the AKF65 monitor gives a slow refresh rate and thus a very flickery display. We recommend that you edit the monitor definition file to give a better display. Games which use strange-shaped screen modes attempt to use the Risc PC's mode-descriptor feature to select full screen modes: this should allow people to write their own modes to fit these. Only attempt this if you understand what you are doing.

This forced multi-tasking is also often caused by software which tries to generate illegal video modes (non-CGA/EGA/VGA). Note that the biggest VGA mode is 640x480x16. DOS Software which needs more pixels or colour than this will not run (except 800x600x16 using VESA support).

These are the modes supported by the PC Card software. The host system will not be able to display modes beyond 10h if you do not have a VGA-standard monitor (eg A300. A400 systems)

Standard DOS modes

Mode 0 (CGA/EGA/VGA) 40*25 text

Mode 1 (CGA/EGA/VGA) 40*25 text

Mode 2 (CGA/EGA/VGA) 80*25 text

Mode 3 (CGA/EGA/VGA) 80*25 text

Mode 4 (CGA/EGA/VGA) 320*200 4-colour graphics

Mode 5 (CGA/EGA/VGA) 320*200 4-colour graphics

Mode 6 (CGA/EGA/VGA) 640*200 mono graphics

Mode 7 (Mono/EGA/VGA) 80*25 text

Modes 8-0Ch aren't officially defined

Mode 0Dh (EGA/VGA) 320*200 16-colour graphics

Mode 0Eh (EGA/VGA) 640*200 16-colour graphics

Mode 0Fh (EGA/VGA) 640*350 mono graphics

Mode 10h (EGA/VGA) 640*350 16-colour graphics

Mode 11h (VGA) 640*480 mono graphics

Mode 12h (VGA) 640*480 16-colour graphics

Mode 13h (VGA) 320*200 256-colour graphics

SuperVGA modes Mode 6Ah (SVGA) 800*600 16-colour graphics

Odd modes 360 x 480.256-colours (obtained by messing around with VGA registers)

On RISCOS 3.5, will also support other modes obtained by messing round with VGA registers, provided they are supported by the display & fit into one of the following categories:

16-colour graphics, using 4 video planes as VGA. up to 524288 pixels

256-colour graphics, based on mode 13h. up to 65536 pixels

256-colour graphics using Plane Mask / Read Plane Select registers (as 360x480x256 mode), up to 262144 pixels

"Messing round with the VGA registers" is a highly moveable target, so there will still be some software that will not work.

Windows 95

This is not yet properly supported but can be persuaded to install and run. On installation you must select the custom install option and disable the checking for CDROMs and PCMCIA support.

On startup the banner screen uses a 320x400x16 display. There is no standard RISC OS mode of this shape. so the PC Card will revert to multi-tasking unless you define an appropriate mode:

```
# Modefile written by !MakeModes version 0.27 (21st December 1994)
```

```
# Add this definition to your existing mode file to prevent Windows 95 switching
```

```
# to multi-tasking mode. This will cure the crashes when shutting down Win95.
```

```
# 320 x 400 (71Hz)
```

```
starrmode mode_name:
320 x 400
x_res:320 y_res:
400 pixel_rate:
12750
h_timings:24.32,2,320,28.0
v_timings:3.28.0.400.0.9
sync_pol:3
endmode
```

There are still some bugs in the windows driver: icons come up in odd colours and some are 'stripy'

. Processor cache initialisation

The cache initialisation is now controlled by two config settings. L1 cache and L2cache. Each of these can have three values:

```
0 = cache disabled
1 = Write through cache
2 = Write back cache
```

The correct values depend on the type of hardware you have. If you have obtained the correct software for your card they will already be set correctly for your hardware.

Acorn 486 PC Cards require:

```
L1 cache 1
L2cache 1
```

Aleph One (Mark1) 2nd processor cards require:

```
L1 cache 2
L2cache 2
```

These settings supersede the 'cacheconfig' setting which combined these features.

A20gate control

The 'A20gate' config option controls whether this line is controlled by the ASIC or by the !PC software. This must be on if you have a card with an added AC74 IC. Viz Cyrix DX cards with the Mark I ASIC (0291.720 Rev A). You will get an 'unable to control A20 line' error from HIMEM if this setting is wrong.

This option should now set itself automatically, so you should remove it from your config file,

PC Card control

1) You can disable the various methods used by !PC to switch from full-screen to single-tasking mode. To do this, use one of the following lines in the Config file -

```
SuspendOption 0 - neither alt-break or middle-mouse-button work
SuspendOption 1 - only middle-mouse-button works
SuspendOption 2 - only alt-break works
SuspendOption 3 - both alt-break and middle-button work (default)
```

If 'SuspendOption 0' is combined with 'AutoStart 1' you can prevent people from _ever_ returning to RISCOS once DOS is started (unless you crash it...).

2) !PC can now be stopped or made to go multitasking from DOS program control - the calls are

```
Int 15h with AX = BA00h: go into multitasking mode
Int 15h with AX = BA01h: quit !PC (may not have immediate effect!)
```

both return AX = 00BAh. carry clear for success.

Known Limitations

* !PC only runs DOS & Windows up to 3.11. No other operating systems are yet supported apart from a version of Linux with modified disc drivers. OS/2. Xenix. Windows NT etc will not work. Windows 95 can be made to work. although it is not yet officially supported. The Linux drivers are available from Pling Boot: Email: Mark Brinicombe <amb@phlam.ph.kcl.ac.uk>

WWW URL: <http://www.ph.kcl.ac.uk/amb/linux.html>
Mail: PlingBoot, 50 Fordhook Avenue, Ealing, London W5 3LP
Tel: 0181 993 2394 Fax: 0181 992 6735

* PhotoCD is not yet supported

* Apps (usually games) which program up odd modes via the video controller can only be supported by such a mode being supplied by RISCOS. You can add modes to your Monitor definition file to allow such applications to multi-task. Where a mode does not exist, !PC will revert to multitasking and show the display in a window.

* The floppy driver obviously does not have a real PC hardware controller and thus must be accessed via the BIOS. Software that does not do this will not work. Known offenders are a) copy-protection schemes involving non-standard floppy formatting, and b) backup software (MSbackup, Norton Backup, PCTools Backup, Fastback). We recommend the use of PKZIP v2 instead.

* CMOS settings are constructed on boot, not saved in real CMOS, so applications which save their status in this area will forget each time.

* Extended hard disk partitions >128MB not recognised. An extended partition is the second one when there are 2 logical drives in one DOS partition.

Upgrading from previous versions of !PC

Config Options

The A20gate option stressed in v1.731-v1.851 should now be automatic - remove it from your config file unless this gives problems (see above)

Coprocessor detection is now automatic - remove the coprocessor option from your config file.

The cache configuration options have changed (see above). Check your config file.

The amount of PCRAM is now configured in MB rather than KB. Check your Config file.

Module Versions

Recent releases have had a number of changes in the support modules. This means that you need to be very careful about which modules are loaded. Typical problems from incorrect modules are 'unable to allocate PCRAM' (PCMEM), and all mouse clicks doing nothing in DOS or RISCOS (386PCsupport). Thus if you are trying things with old & new software you must always do a Ctrl-Reset when changing versions.

Windows Drivers

The windows driver now support 4,8,16,& 32 bits per pixel, and palette control in 256 colour modes. The extra modestrings that are permitted are detailed in the Win ReadMe file.

If Windows starts up, and then after the banner, flashes a fleeting message on the screen before returning to DOS, then you are using a version of ARMDRV that is too early for the version of !PC you are running. Reinstall it as detailed in the Win ReadMe file.

New Network Drivers

If you are using the network links software then you need to be careful. Support for DCI4 networking has now been added and DCI2 will be developed no further. The move needs to be complete and changing may imply changes/updates for other software you use. For the time being you have the choice of which setup to use. See the Network Links Net ReadMe file for more details

Problems

First read the manual AND the ReadMe files!

Bug reports and problems to Wookey (Tech support) Aleph One Ltd. The Old Courthouse, Bottisham, CAMBRIDGE CB35 9BA

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