ALPHA PC
Expert User's Guide

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This document is an expert user's guide to Unix on the Alpha PC. It explains how to plug the machine together, and how to boot it the first time. It expects that expert users can deal with changing the password file, the default file systems file, the network configuration files, and so on, without help.

Unpacking

You should receive:

1) An Alpha PC system unit, with its line cord. Unless you have heard otherwise from us, the system unit contains an EV4 CPU chip, 32 megabytes of memory, a Western Digital WD8013 (16 bit) Ethernet adaptor, an ATI 8514-Ultra display adaptor, an Adaptec AHA-1522 SCSI disk controller, and a DEC RZ25 disk pre-loaded with software. You will also get a console key, which fits in the keylock on the front of the box.

2) A BCT-5339 101 key keyboard.

3) A Logitech 3 button mouse.

4) A keyboard/mouse adaptor cable. This is a short cable (about a foot long) with a 7 pin connector on one end (which plugs into the system unit) and a black piece of plastic that looks like a torpedo on the other end. If you look closely at the torpedo you will see that it has a a keyboard connector on one side and a mouse connector on the other side.

5) A DEC VRT13 VGA display, with it's video cable and line cord, unless you are not in North America, in which case you will use your own monitor, since we have no 220 volt compatible monitors.

Plugging Everything Together

Everything goes together as you expect.

The system unit's line cord goes into the wall. If you are not in North America you should take the cover off the box (single screw on the back, top center) and check that the line voltage selector switch on the side of the power supply is in the 220 volt position (we try to remember to switch these, but we do forget sometimes).

The monitor's line cord goes into the wall. The monitor video cable goes between the monitor and the 15 pin D-sub on the back of the display card.

The Ethernet plugs onto the BNC on the back of the Ethernet card. The card is configured for thinwire. If you want to use thickwire you can do so by taking the cover off the box, removing the Ethernet card, and moving the XXX stake pins on the card (we've never done this; if you try it and it works, tell us).

The keyboard and the mouse plug into the adaptor cable, and the adaptor cable plugs into the system unit. The mouse connector will not go in as far as you might expect, because Logitech changed the connector and it isn't quite the same as the socket on the adaptor cable, but if you push it in as far as it will go everything is fine.

If you want to connect a serial console to the machine, the terminal should be set to 9600 baud, and plugged into serial port A, which is the 9 pin D-sub closest to the edge of the box.

Booting

You should first try booting from the serial console. Set the keyswitch on the front of the machine to the locked position, and turn the machine on. The boot roms should display the date they were made, and prompt for input. Type the commands to fill memory with zeros, load the system image from the disk, and jump to it.

```
Beta EPROM: Thu Dec 19 18:57:14 EST 1991
(bdu) fill 20000 780000 0
(bdu) fill 800000 2000000 0
(bdu) scsiboot 2 vmunix.4
(bdu) jtopal 20000
```

The "4" on the end of "vmunix.4" indicates that this is an EV4 image. If you know that your Alpha PC has an EV3 in it instead, you should use "vmunix.3" instead. The "vmunix.4" image assumes that the chip has a floating point unit, so it will die a horrible death if you run it on an EV3.

Unix will come up, and you'll get a single user prompt. At this point you should check the file systems. If fsck announces that you should HALT PROCESSOR WITHOUT SYNCING DISK you should just hit the reset button on the front panel and start everything over. Eventually you will get the filesystems clean, and you can type "^D" to bring the system the rest of the way up.

If you want to boot directly from the keyboard and display the procedure is the same, except that you set the keyswitch on the front of the machine to the unlocked position. The glass-terminal screen is 640x400, so it will come up on just about any VGA monitor.

Reconfiguring the Hardware

We put the controller on SCSI id 7 and the local disk on SCSI id 2. The internal SCSI cable is terminated at one end by the RZ25 and at the other end by 3 resistor packs on the SCSI controller. The resistor packs should probably be removed if you use the external SCSI connector (or you can just do what we do, which is plug it in, and hope that it works, which it usually does). If you decide to remove the terninators they are located on the SCSI board right along side of the 50 pin connector that goes to the internal disk cable. There are 3 of them, they are yellow, and they are in sockets (there are actually 4 of them in a row, but the fourth one isn't a SCSI terminator, and isn't in a socket). Just pull them out with small pliers. If you plug them back in pin 1 (marked with a dot on the package) goes toward the front of the machine.

The keyboard handler should be able to drive most AT compatible keyboards, so if you can't stand the one you get, you can go buy another and try it. Like everything else in the IBM PC world, there is no real specification for the keyboard, so it is possible that some keyboards will not work.

Reconfiguring the Software

NFS works fine. When mounting NFS filesystems set the read and write sizes to 1024 or you will overflow the (puny) packet buffers in the Western Digital controller, and get lots of errors.

Hints

Most users boot off the serial console, check the file systems, then move the keyswitch to the unlocked position and bring the system the rest of the way up. This gives them an X11 display to use, but leaves console printf's on the serial console. This is important, because there are no debugging tools, and often the "pc" and "ra" typed on the console are the only hint as to what is going wrong when a user program blows up.