

# **ArcaOS 5.0**

## **Installation Guide**

May 2017  
(revision 1)



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# 1 Introduction



Arca Noae brings OS/2 into the 21st Century

**This manual is intended to help you plan the installation of ArcaOS on your computer.**

It is not intended to be an exhaustive reference of all technical aspects of ArcaOS and its components. Such information is available through the integrated help; some of this is available during installation, while additional information may be accessed once the system has been installed.

**Before starting, please check the Prerequisites section to confirm that your machine, and especially the layout of your hard disks, is compatible with ArcaOS.**

Also note that additional information is covered in the various Appendices at the end of this manual.

Once ArcaOS has been installed, many settings and components may be customized and additional software may be installed using the package manager. These topics are briefly covered near the end of this manual.

## 2 Prerequisites

ArcaOS has some specific requirements of which you should be aware before installing. These requirements include the need for a traditional BIOS or proper emulation thereof, hard disks partitioned using the Master Boot Record partitioning scheme, and compliance with OS/2 Logical Volume Management.

### 2.1 Traditional BIOS

A *traditional BIOS* (Basic Input/Output System) refers to the firmware used to boot personal computers before this task was taken over by *UEFI* (Unified Extensible Firmware Interface) on newer systems. No special setup is required to use ArcaOS on machines with a traditional BIOS.

### 2.2 Modern UEFI with CSM

Newer machines use *UEFI firmware* to boot and some additional settings may need to be made to enable booting ArcaOS on the machine. The UEFI firmware has to be able to emulate a traditional BIOS, which is usually done using a *Compatibility Support Module* (CSM). To enable this functionality, look for an option called 'Compatibility', 'Legacy Support', 'Compatibility Support Module', or similar terms, in the UEFI setup; and, if found, **enable the option**.

### 2.3 Hard Disk Partitioning Scheme – MBR Scheme Required

Just as with BIOS and UEFI, hard disk partitioning has changed from the *Master Boot Record* (MBR) method, to the *GUID Partition Table* (GPT) method.

☞ Installing ArcaOS requires an MBR-partitioned hard disk. The GPT partitioning scheme is not supported by ArcaOS 5.0.

### 2.4 Partition Alignment – LVM Compliance

ArcaOS views hard disks in terms of Cylinders, Heads, and Sectors (CHS), instead of the alternative *Logical Block Addressing* (LBA) method. The *Logical Volume Management* (LVM) system of ArcaOS expects partitions to be CHS-aligned, a requirement which may not be met if the disk was originally (or last) partitioned by foreign (non-OS/2-aware) partitioning software. This holds true especially if the partitions already present are aligned on megabyte (MiB) boundaries, instead of CHS boundaries.

### 2.5 A Bootable DVD Drive is Required to Install ArcaOS

This means that the firmware (BIOS/UEFI+CSM) must be capable of booting the ArcaOS DVD, and in a way that conforms to a traditional BIOS. While booting the ArcaOS DVD from a USB DVD device is supported, booting from a USB stick which holds a copy of the DVD image (ISO file) is not.

### 2.6 Migration from Other Distributions of OS/2 is not Supported

ArcaOS 5.0 installation does not support migrating from any version of IBM OS/2 or eComStation.

Be aware that the installation will format the target partition and thus wipe (erase) whatever was there!

☞ If you are re-using an existing partition, ensure you have **two (2) fully tested backups** of anything you need to keep, **before** beginning the installation.

### 3 Burning the ArcaOS ISO Image to DVD

Before installing ArcaOS, you need to have your copy of the *ArcaOS Installation Disc* on DVD.

You may have received your copy of ArcaOS as a **7z-compressed archive**. This archive contains the **ArcaOS ISO image**, together with a file containing the checksum of the image. In order to create the ArcaOS Installation DVD, the archive must first be unpacked. After unpacking, it is wise to verify the integrity of the ISO image by running a checksum on it, and comparing that to the checksum listed in the accompanying checksum file, which it should match.

The next step is to write (burn) the ISO image to a DVD. It is important to understand that the ISO image must be burned **as an image**, not as a file. The difference is that when burned as a file, this creates an ordinary data disc containing the ISO image as a file, which is not bootable; whereas writing the ISO as an image correctly copies the ISO directly to the disc, resulting in a bootable installation disc.

Depending on the DVD burning software you use, search for the option to “burn raw image” or similar wording. This option should allow you to select the image to burn, as well as the target device which holds the blank DVD to be burned.

## 4 Before You Begin – Examining Your System

A successful installation of ArcaOS depends to a large extent on the layout of the hard disk(s) onto which it will be installed. This includes such factors as whether recovery partitions are present, what other operating systems (if any) are installed, how the disk was initially (or last) partitioned, and related aspects like geometry and size.

### 4.1 Recovery Partitions and Discs

Some systems, especially laptops, may contain so-called *recovery partitions*. Such partitions contain the information needed to restore the system to certain factory defaults. Usually, these are formatted using a well known filesystem like FAT, FAT32 or NTFS, but their System ID often does not reflect the filesystem used, so as to hide the partition from other operating systems.

On some systems, the recovery may be activated from the BIOS, whereas on other systems, you may create one or more recovery CDs or DVDs.

**Such recovery procedures often restore the complete disk to a factory state, erasing all data!**

Other recovery procedures may enable you to restore an operating system to a particular partition, mostly preserving other partitions and systems.

☞ You should familiarize yourself with the recovery procedures of your system before continuing. If the recovery procedure offers a way to burn a recovery CD or DVD, you are advised to do so.

### 4.2 Windows Systems Present

If Microsoft Windows is present on your system, the way it was installed greatly depends upon the particular version of Windows installed and on the system manufacturer. Earlier versions, such as Windows XP, use the CHS partition alignment method, which is compatible with ArcaOS. Later Windows versions use MiB partition alignment, which will cause the OS/2 Logical Volume Manager to issue warnings about such partitions.

### 4.3 Linux Systems Present

Linux is usually booted using the GRUB (or GRUB 2) boot loader. If the first stage of the GRUB boot loader is currently installed in the first track, it should be relocated to the partition where the Linux system is installed. This may often be accomplished by using a Linux installation disc or live DVD. Once GRUB is relocated to the partition, it may be chain loaded by either the IBM or AiR-BOOT Boot Manager.

### 4.4 Summary of Important Considerations

- Is the MBR partitioning scheme used on the target disk?
- Are all existing partitions CHS aligned?
- Is a recovery partition present?
- Are there other operating systems installed?
- Is the disk larger than 512GB?
- Do you have at least **two tested backups** of important data?



# 5 Preparing Your ArcaOS Installation

Before proceeding with the installation of ArcaOS, it is a good idea to give some thought to the topics mentioned below. Doing so will help you make the appropriate choices both when preparing your hard disk and throughout the installation process.

## 5.1 Type of Installation Partition – Primary or Logical

When ArcaOS is the only operating system to be used, installing it into a primary partition is generally the easiest method to use. This does not require the installation of a boot manager or further planning of how to allocate disk space. On the other hand, since only four primary partitions may exist in an MBR partitioning scheme, using a primary partition may limit the ability to install additional operating systems in the future, especially those which require one or more primary partitions to be available.

When ArcaOS is not the only operating system to be used, the recommended approach is to install ArcaOS into a logical partition. While this involves the installation of a boot manager, it does not consume a primary partition.

## 5.2 Drive Letter Assignments – Different Systems, Different Meanings

ArcaOS has its own method of assigning drive letters to partitions. This means that a specific drive letter used by ArcaOS may very well refer to a different hard disk partition than it might under other operating systems installed on the same computer. Furthermore, ArcaOS is capable of assigning drive letters to partitions used by these other systems which may be different from the drive letters which they use when booted. This may or may not be desirable, depending upon preference and application requirements.

## 5.3 Participating in a Local Area Network

ArcaOS is capable of participating in Local Area Networks (LANs) based on the older LANMAN protocol or the newer SMB/CIFS protocols. If your ArcaOS installation is going to participate in a LAN, it is advisable to gather information about the type(s) of server(s) used to provide LAN services, such as file and printer sharing, as well as the domain or workgroup name, server hostnames and/or addresses, and so on.

ArcaOS comes with a modern network connection manager, *ArcaMapper*, which utilizes the cross-platform Samba software. *ArcaMapper* is generally suitable for connecting to modern LAN environments. For compatibility with older LAN environments, such as those based on Windows NT or OS/2 Warp Server, utilizing the LANMAN protocol, the classic IBM LAN Requester (the *File and Print Client*) is also available.

## 5.4 Role of the ArcaOS System – Personalities

ArcaOS may be used as a personal productivity system, enterprise workstation, or an SMB/CIFS server. Furthermore, some components may be installed on volumes other than that of the base operating system, enabling a more compartmentalized system. To facilitate such roles, ArcaOS comes with some predefined ‘personalities’. Considering the computer’s anticipated role beforehand might make it easier to select one of these personalities during the actual installation process.

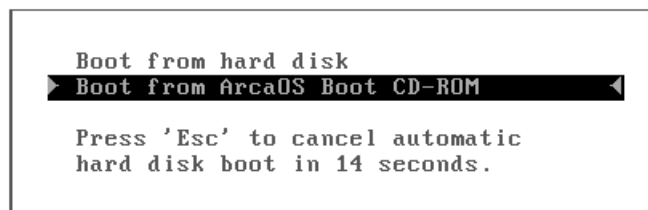
Personalities are designed to make it easier to install a useful volume layout and set of options for a given role. Conversely, selecting a Custom installation type allows for setting all available options.

## 6 Booting from the ArcaOS Installation Disc

The ArcaOS Installation Disc boots a minimal instance of ArcaOS which is used to install the system to hard disk. It may also be used to perform advanced preparation tasks such as managing or formatting disk volumes, or to perform maintenance on or recovery of an already-installed system.

### 6.1 The Boot Selection Menu

When booting from the ArcaOS Installation Disc, the following menu will be shown if a bootable hard disk is detected:



#### **Boot from hard disk**

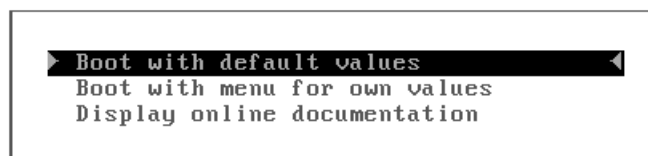
Selecting this option will transfer control to the boot code on the hard disk, bypassing a DVD boot.

#### **Boot from ArcaOS Boot CD-ROM**

This is the option to select in order to begin installing ArcaOS. Selecting this option will present you with the Boot Options menu.

### 6.2 The Boot Options Menu

After selecting the ArcaOS Boot CD-ROM as the boot source, the following menu will be shown (this will be the first menu displayed if no bootable hard disk was detected):



#### **Boot with default values**

Selecting this option will continue the boot process from disc by using default values for various driver and system settings. These defaults are determined using information from your system; for example, on a physical machine, the default values will most likely enable ACPI for modern hardware, while booting in a virtual machine might disable ACPI or otherwise adjust its functionality for virtual environments.

#### **Boot with menu for own values**

Selecting this option will start the pre-boot configuration program. With this program, it is possible to set specific options for ACPI, video driver, disk driver(s), etc. to customize the environment when booting from disc. This may be of help when video does not work correctly with the default values or when additional drivers need to be loaded (or parameters for them need to be set). Please refer to *Appendix A – Pre-Boot Configuration Program* for a detailed description of the pre-boot configuration program.

# 7 Preparing Your Hard Disk

The objective of this chapter is creating a volume suitable for the ArcaOS installation.

This may be as simple as creating a new volume on an ArcaOS-ready hard disk, or as complex as shrinking existing partitions with foreign filesystems which might be utilizing MiB boundary alignment, and which might extend beyond the 512GB boundary, or combinations thereof.

Thus, depending on how the target hard disk was initially partitioned, it may be necessary to first use foreign partitioning tools (i.e., third party applications not included with ArcaOS) before the ArcaOS partitioning tools may be used.

It is also important to realize that adjusting hard disk layouts may result in data loss and that no party may be held responsible for such loss except the person doing the adjusting. So, it is important to be able to return the system to its state before the adjusting started, which is commonly achieved by restoring from a backup.

If the ArcaOS installation program recommends you adjust your disk layout, it is assumed that you will be capable of recovering from any mishaps.

## 7.1 Backing up Important Data

While it is beyond the scope of this installation manual, this subject will be briefly covered to assist you with this important task. Generally, there are two types of backups: file-based backups and image-based backups.

### File-Based Backups

A file-based backup is not much more than a copy of files from one storage area to another.

This type of backup is often used to make backups of personal files and possibly configuration files that were explicitly modified. The backup may be accomplished using a file manager or from the command line of the system. Since this implies using filesystems, care should be taken that the target filesystem is capable of storing the files from the source system. This involves understanding file attributes, allowable characters in file names for both the source and backup filesystems, and file size limits for each filesystem.

### Image-Based Backups

An image-based backup is similar to a CD or DVD ISO image. Instead of the source being an ISO image, it may be a partition or even a complete disk, and the target may be a file on a filesystem capable of holding it. The advantage of this method is that it acts like a mirror of the data, independent of source filesystems used. The disadvantage is that it may require considerable space on the backup medium and generally, it must be restored as a whole (unless special software is used to extract just the desired files for recovery). If you have the disk space available, this method is recommended because it allows for a complete, one-step restoration.

### Disk Layout Backups

This backup type does not back up actual data, but rather the partition *layout*. Data on hard disks is stored in one or more partitions and there are important areas on the disk that contain pointers to these partitions. Manipulating the layout of a disk may result in partitions becoming inaccessible if a pointer is

removed or incorrectly updated. Restoring access to the data in this case may be as simple as correcting the partition pointers.

Backing up the disk layout involves copying these important pointer areas to files so that they may be examined or restored.

## 7.2 Determining Hard Disk Readiness for ArcaOS

Unless specifically deselected in the pre-boot configuration program, the Disk Utility will automatically start upon accessing the Target Volume or Target Volume(s) page (see , below). However, in some cases, it may be desirable to check readiness of the hard disk(s) prior to actual installation.

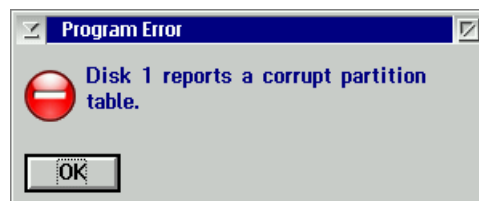
As mentioned in the Prerequisites, ArcaOS uses Logical Volume Management which has specific requirements with regard to the layout of the hard disk. These requirements are a combination of the CHS partitioning alignment used in conjunction with LVM-specific information sectors. The best way to determine if the hard disk layout is ArcaOS-compliant is to start the Graphical Volume Manager. It should issue warnings if there are issues with the layout of the hard disk. Some of these may be readily fixed, some involve more complex operations, such as resizing and/or moving existing partitions, and some cannot be fixed without complete re-partitioning.

### Checking LVM Compliance with the Graphical Volume Manager

During installation, the Graphical Volume Manager is started by using the *Manage Volumes* button on the Target Volume or Target Volume(s) page of the ArcaOS installer (see Chapter 8). You may also access it from the System Management page as follows:

1. Boot from the ArcaOS Installation Disc.
2. At the Welcome Screen, press the *System Management* button.
3. From the menu, select *Disk→Manage Volumes (Graphical)*.

The Graphical Volume Manager will determine the state of the attached/installed hard disk(s) upon starting. If issues with a disk or partition layout are detected, an error message such as the following will be presented:

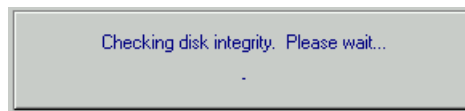


This may be due simply to missing LVM information, or more complex issues with partition alignments and sizes. If this error is shown, the next step is finding out what the Disk Utility thinks of the situation.

### Checking LVM Compliance with the Disk Utility

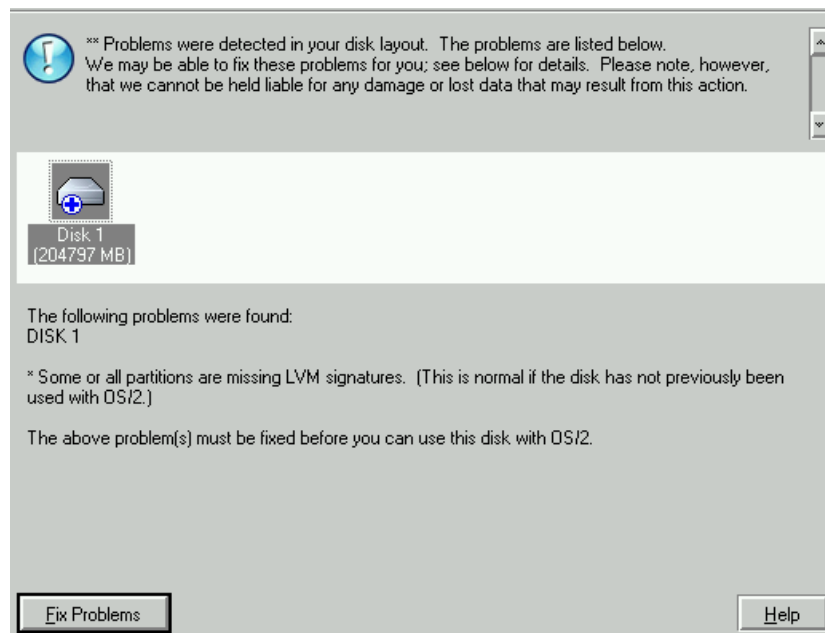
The Disk Utility checks the first two hard disk(s) attached to or installed in the system for various issues known to cause compatibility problems with ArcaOS. As previously mentioned, it normally runs automatically during the guided ArcaOS installation process. To run it manually at any other time, access the System Management page, and select *Disk→Disk Utility* from the menu.

When the Disk Utility starts, the following message will be shown while it examines the disk(s):



Depending on the number and size of the hard disk(s), this process may take from a few seconds to several minutes.

If the disk(s) has/have never been used by OS/2, there will likely be no LVM information present yet, and the following message should appear:



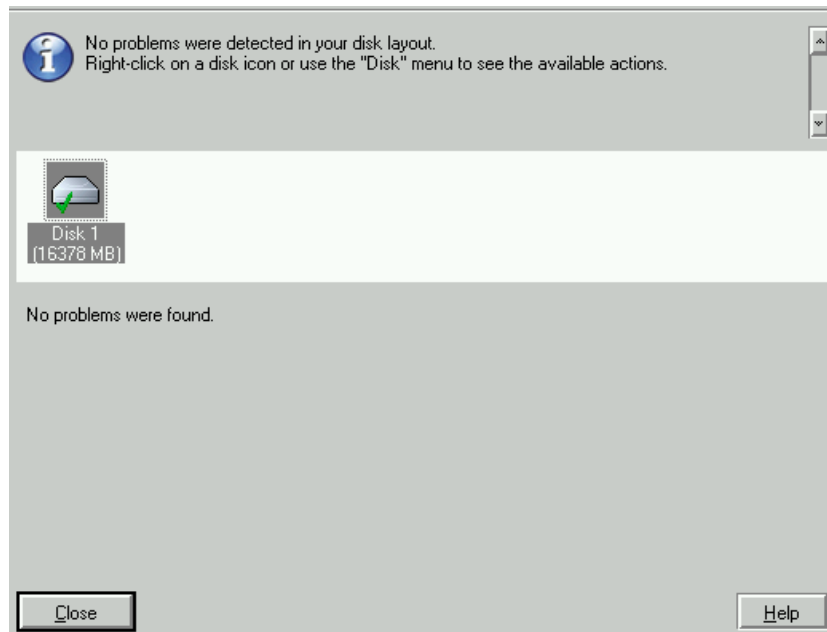
Verify that the problem description in the dialog above pertains to missing LVM information and then press the *Fix Problems* button to let the Disk Utility attempt to correct the condition by adding the LVM information.

After the missing LVM information has been added, you will be prompted to reboot the system. Confirm the message and reboot from the ArcaOS Installation Disc the same as before.

The next time the Disk Utility runs (either during the guided installation or from the System Management menu), it will re-examine the disk(s).

Another issue which may potentially be detected is that of partitions which do not end on CHS boundaries. This is often caused by the last partition extending to the end of the disk and thus failing proper LVM alignment requirements. Such misalignments may often be corrected by making the last partition slightly smaller (by even 1 or 2MB) so that the partition then ends on a CHS boundary. If this is the case, the Disk Utility will prompt you to launch the Disk Resizer. Follow the directions presented there to resize the partition.

During a normal guided installation, the Disk Utility will simply complete with no problem report if no issues are found. When the Disk Utility is run manually, a message such as the following should be displayed if no further problems have been detected:



While the Disk Utility is able to identify (and correct) many issues pertaining to OS/2 LVM compliance, the above dialog should not be interpreted as an absolute guaranty that the disk(s) is/are now fully compliant.

To further check for OS/2 LVM compliance, start the Graphical Volume Manager (see ), and verify that it no longer reports corrupt partition tables.

If the Logical Volume Manager still reports corrupt partition tables or presents other error messages, there may be more incompatibilities with OS/2 LVM which need to be resolved prior to installation. Such issues may best be addressed using third party tools. For further suggestions, see the ArcaOS support wiki.

### 7.3 Creating a Target Volume for ArcaOS

Start the Graphical Volume Manager (see ).

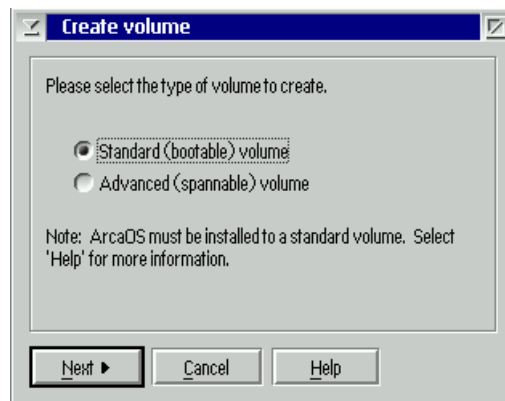
To illustrate the process of creating volumes, this description will use Sample Disk Layout described in Appendix C – Sample Disk Layout, except that the ArcaOS volume has not yet been created.

Left-click on the free space to select it and then right-click on it to raise its context menu:

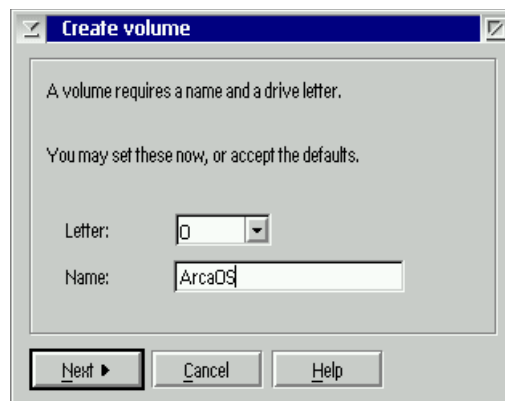
	Size (MB)	File System	Type	Notes
C:	2,000	FAT16	Primary	Startable
W:	4,000		Primary	
	7	Boot Manager	Primary	In Use
H:	705	HPFS	Logical	
J:	902	JFS	Logical	
L:	501	JFS	Logical	Advanced
L:	501	JFS	Logical	Advanced
	7,757		None	Free Space

Create volume... Ins  
Delete Del  
Set name & letter... Ctrl+N  
Make startable

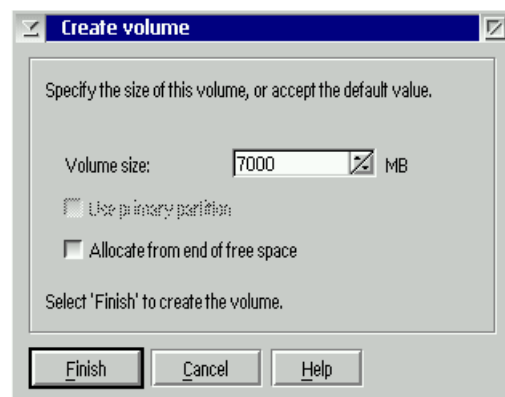
Select *Create volume* from the menu. The following dialog will be shown:



A standard bootable volume is the default choice. Pressing Next will show:



Here we have selected the drive letter (O:) to use and also entered the name ('ArcaOS') for the volume. Pressing Next will show:



Here we have adjusted the size to 7000MB.

In this case, there are no available primary partitions available in this sample disk layout. Thus, the volume to be created will be a logical one, and the option to use a primary partition is unavailable.

Press Finish to create the volume and it will be shown in the overview:

L:	501	JFS	Logical	Advanced + Spanned
*->0:	7,004	unformatted	Logical	
	753		None	Free Space

From the menu, select *System*→*Save changes* to write the modifications to disk, and then press **F3** to exit the Graphical Volume Manager.

The target volume has now been created, and will appear in the list during the installation process when the target volume must be selected.

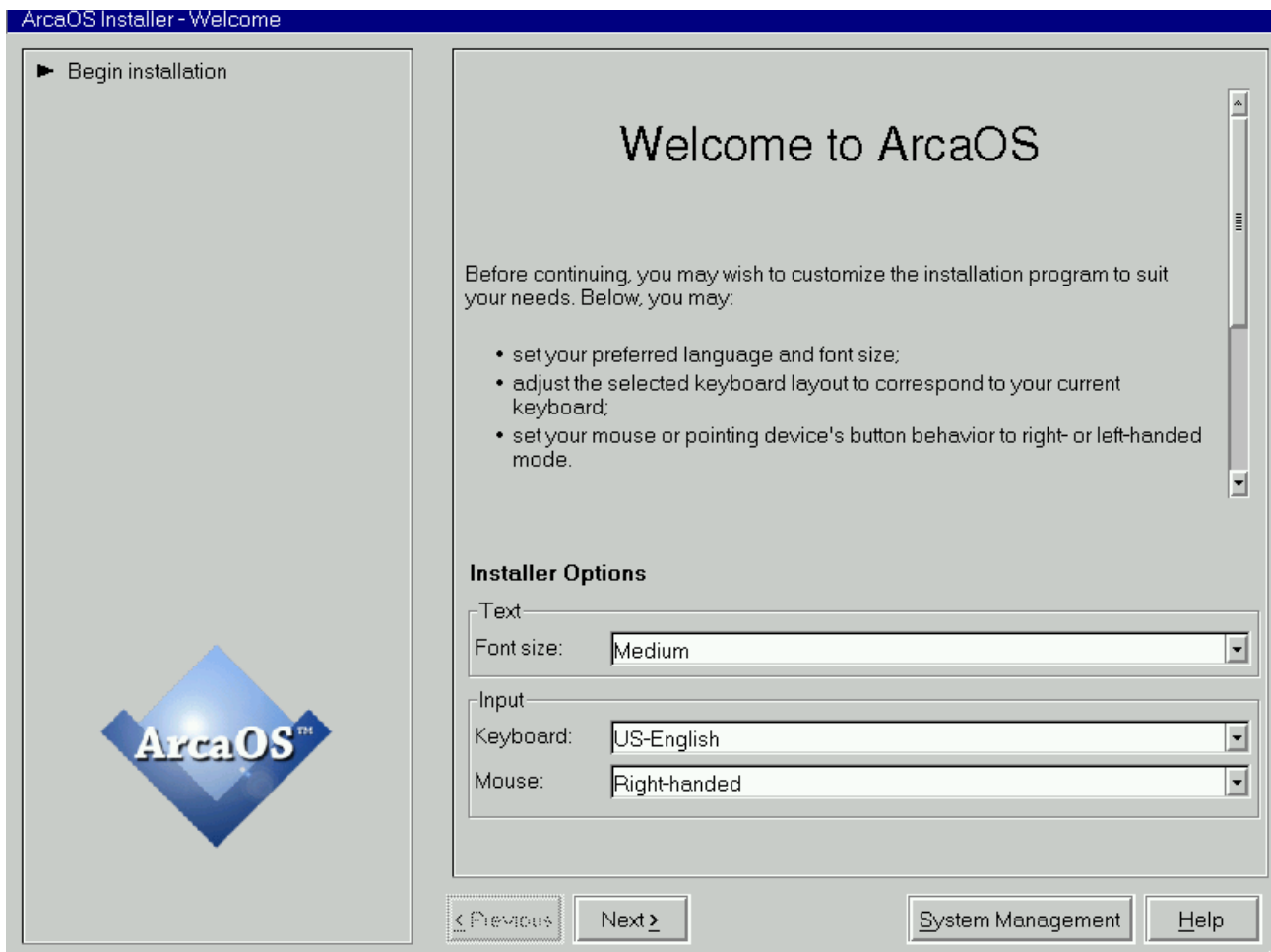


# 8 Installing ArcaOS

The purpose of this chapter is to perform a simple 'next → next → next' type of installation, preview some of the Installer pages, and complement the Installer Help with some additional information and/or references to the appendices.

## 8.1 The Welcome Screen

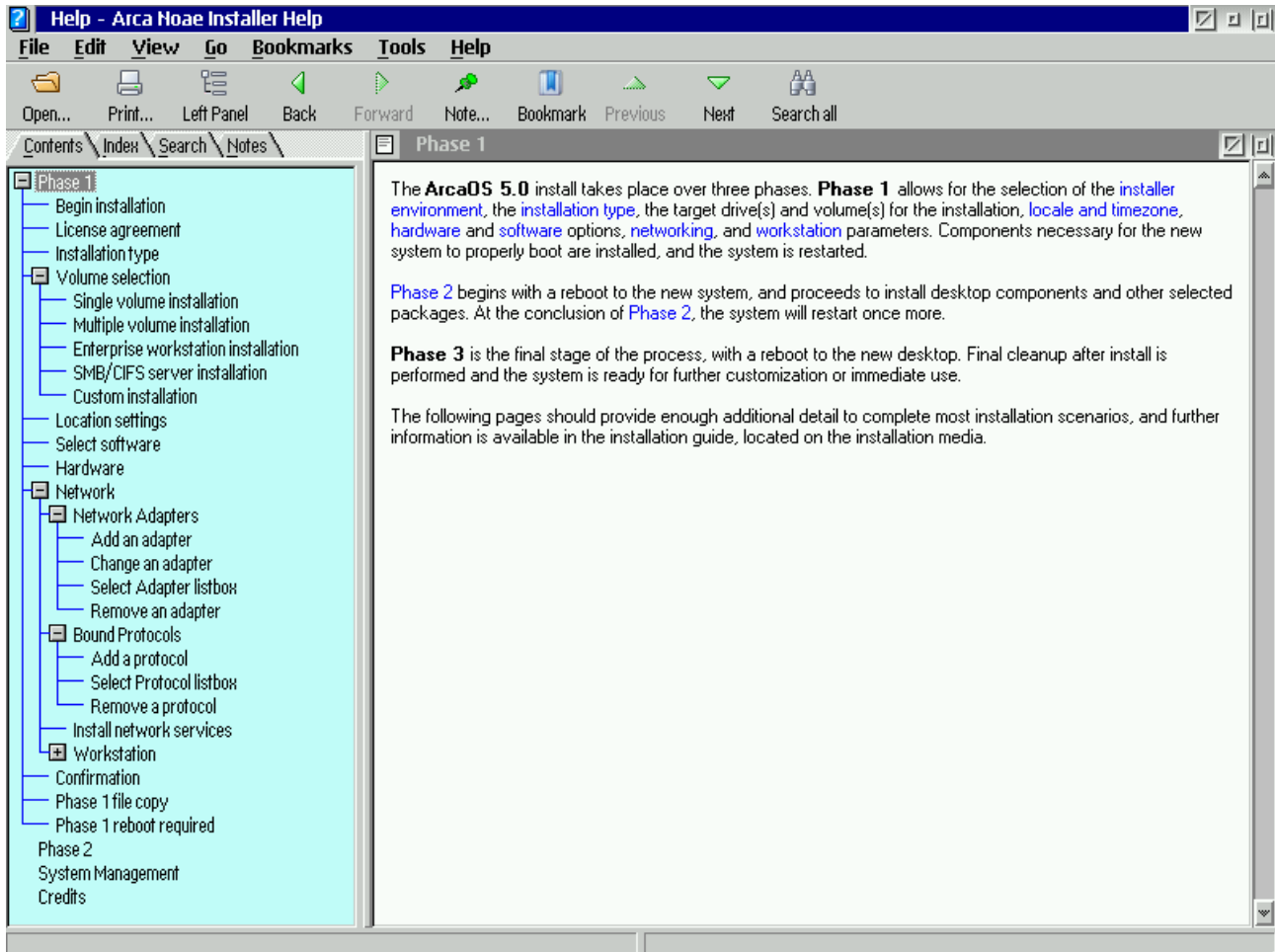
Once booted from the ArcaOS Installation Disk, the initial Welcome Screen is shown. This screen offers the choice of starting the ArcaOS installation, which is done by pressing the Next button, or to access the System Management page, where various pre-installation, maintenance, or recovery operations may be performed.



With properly prepared disks, installing ArcaOS is a relatively straightforward process. More details of this installation process may be found in the context-sensitive Installer Help, which is accessed by pressing the Help button on any page.

## 8.2 Installer Help

Much of the installation process is covered in the Installer Help. In the image below, you see the expanded topics on the left and you are advised to review those topics you consider relevant to the installation you are performing.



## 8.3 ArcaOS End User License Agreement

Before the installation may continue, please review the license agreement and acknowledge your consent by clicking the checkbox beneath the license. Use the scrollbar on the right to move down through the text. The checkbox will be enabled when the scrollbar reaches the bottom. When you have acknowledged your consent, the Next button will be enabled allowing the installation to proceed.

## 8.4 Installation Type

### Using a Predefined Personality

A personality is a kind of profile (see 5.4). It selects a specific combination of software packages and settings to perform the installation. In ArcaOS 5.0, the following personalities are available:

#### Single volume with default options

This is the most streamlined installation personality. ArcaOS is installed onto a single volume, with default

software selections for a typical general purpose workstation. Selecting this and pressing Next will move to the Single volume installation page where the target volume for the installation must be selected.

#### Multiple volume with default options

This is similar to the Single volume personality, but with the ability to select more than one volume for the installation. This allows for installing the base operating system on one volume while networking, applications, Unix compatibility components, and/or temporary files may be placed onto different volumes. Selecting this and pressing Next will move to the Multiple volume installation page where the target volume(s) for the installation must be selected.

#### Enterprise workstation

This is similar to the Multiple volume personality, but with the addition of certain options suitable for enterprise environments. This personality includes the classic NetBIOS-based IBM File and Print Client (see 5.3) as an additional networking component. Selecting this personality and pressing Next will move to the Enterprise workstation installation page where the target volume(s) for the installation must be selected.

#### SMB/CIFS server

Similar to the Multiple volume personality, but with the addition of the popular Samba server for file and print sharing (see 5.3). Selecting this and pressing Next will move to the SMB/CIFS server installation page where the target volume(s) for the installation must be selected.

### Specifying Custom Settings

This installation is not a pre-configured personality and provides the greatest flexibility in the components to be included in the installation. Choose a single or multiple volume layout, select additional hardware drivers and networking components as well as utilities and applications to include. Selecting this and pressing Next will move to the Custom installation page where the target volume(s) for the installation must be selected.

### Scripted (Using Response File)

Selecting this installation type will cause the installer to prompt for a response file which supplies all of the selected options necessary for the installation. Selecting this and providing the response file will move to the Confirmation page where after pressing Next the scripted installation will be launched.

Please note that the remaining sections of this installation chapter are based on the Single Volume personality.

## 8.5 The Target Volume

As mentioned earlier, for this sample installation the target volume was prepared in advance. In this case, the Sample Disk Layout is used, where the target volume is a logical partition of 7GB formatted with JFS using the O: drive letter.

Select the target volume from the list. If the target volume is not present in the list, press the *Check Volumes* button, select the target volume from the list, and press the *Check* button. After the check has completed, press the *Close* button and recheck the list of target volumes, where it should now be present.

Note that for the Single volume personality, a valid target volume must at least be 2GB in size.

After selecting the target volume, specify the filesystem to use in the Format as: dialog box. The filesystem defaults to JFS but may be changed to HPFS. (Be aware that HPFS is limited to files no larger than 2GB, volumes no larger than 64GB, and may have performance issues with software like Apache Open Office. In addition, HPFS is not a journaling filesystem, so disk checks may take longer to complete.)

## 8.6 Location Settings

A locale is a set of values that define how numbers, dates, times, currency, and other country-specific values are presented. Many applications are aware of these system-wide settings. In many cases, the locale also determines the default language which applications use to display messages, although whether or not this is the case depends on each application.

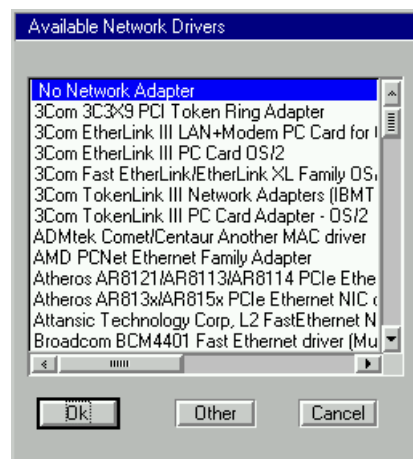
A codepage is an encoding table which translates bytes into human-readable characters. The 850 primary codepage is a multilingual variant of the 437 secondary codepage, and on the command line the CHCP command may be used to switch between them.

## 8.7 Configure Hardware

ArcaOS will attempt to detect the computer's hardware; this should correlate with the automatic selections made on this page. Please verify that these selections are correct before continuing.

## 8.8 Network Adapters

Like the other hardware components, most network adapters should be automatically detected. If, however, the wrong adapter is displayed or adapters are missing, then press the *Change* or *Add* button. The list of available network adapters will appear; select the appropriate adapter for your system.



If your adapter is not listed, press the *Other* button to supply the drivers for the unlisted adapter.

## 8.9 Workstation Configuration

### Computer name

This is the name by which this computer identifies itself on the SMB/CIFS network. The name in this field is automatically generated, though you may change it to something else. For a list of valid characters and length limits, please consult the Installer Help.

### Workgroup name

This is the name of the SMB/CIFS workgroup or domain in which this computer will participate. When the computer is going to be a member of a domain, it may be necessary to also create a machine account on the domain server. For a simple peer-to-peer workgroup this not required.

### Default user name

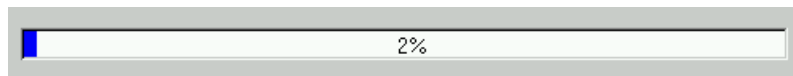
This is the default name used to connect. For a list of valid characters and length limits, please consult the Installer Help.

## 8.10 Overview of the Installation Settings

This screen provides a short overview of the selections made for the ArcaOS installation. Please verify these are correct and then press *Next* to begin the actual installation process.

**This will format the target volume.**

## 8.11 Preparing filesystems and copying files



The installation volume will be formatted and files will be copied onto it. Depending upon various installation settings and components, this process may take several minutes.

When the first phase has finished, the system will automatically reboot, after which the second phase continues the installation. When this phase has finished, the system will automatically reboot again and the final phase is entered which will result in the display of the ArcaOS Desktop.

**ArcaOS should now be installed.**

# 9 Adding Additional Software

One of the methods by which additional software may be added to ArcaOS is by installing software packages from local (on disk) or remote (on LAN or across the internet) repositories. This concept is used by many Linux distributions. In addition, it is possible to install additional software using the well-established WarpIN installer and even the venerable IBM installer

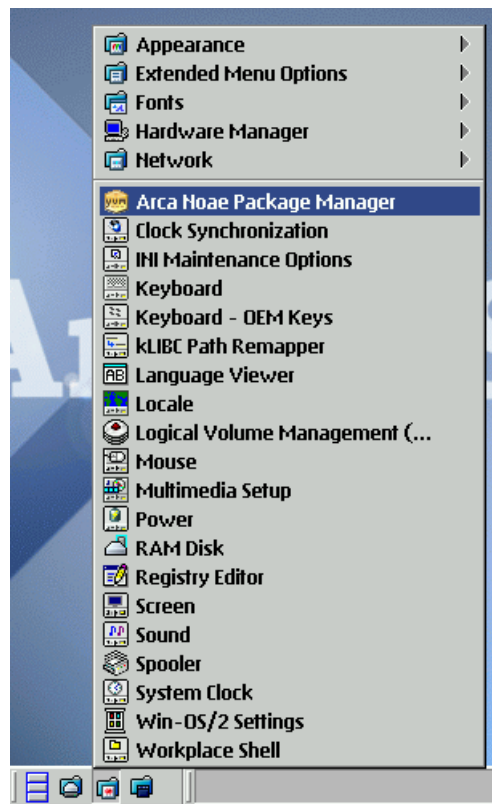
Software packages continue to be ported from Unix-like platforms and repackaged as RPMs so that they may be installed and run on ArcaOS. New software is ported and updated regularly, which means that keeping up with new arrivals generally requires a package management utility to organize such operations.

At the lowest level, RPM-based software packages are installed by command line tools such as 'rpm' and 'yum'. Many people find that such command line tools are difficult to use, so ArcaOS includes the Arca Noae Package Manager.

## 9.1 Arca Noae Package Manager

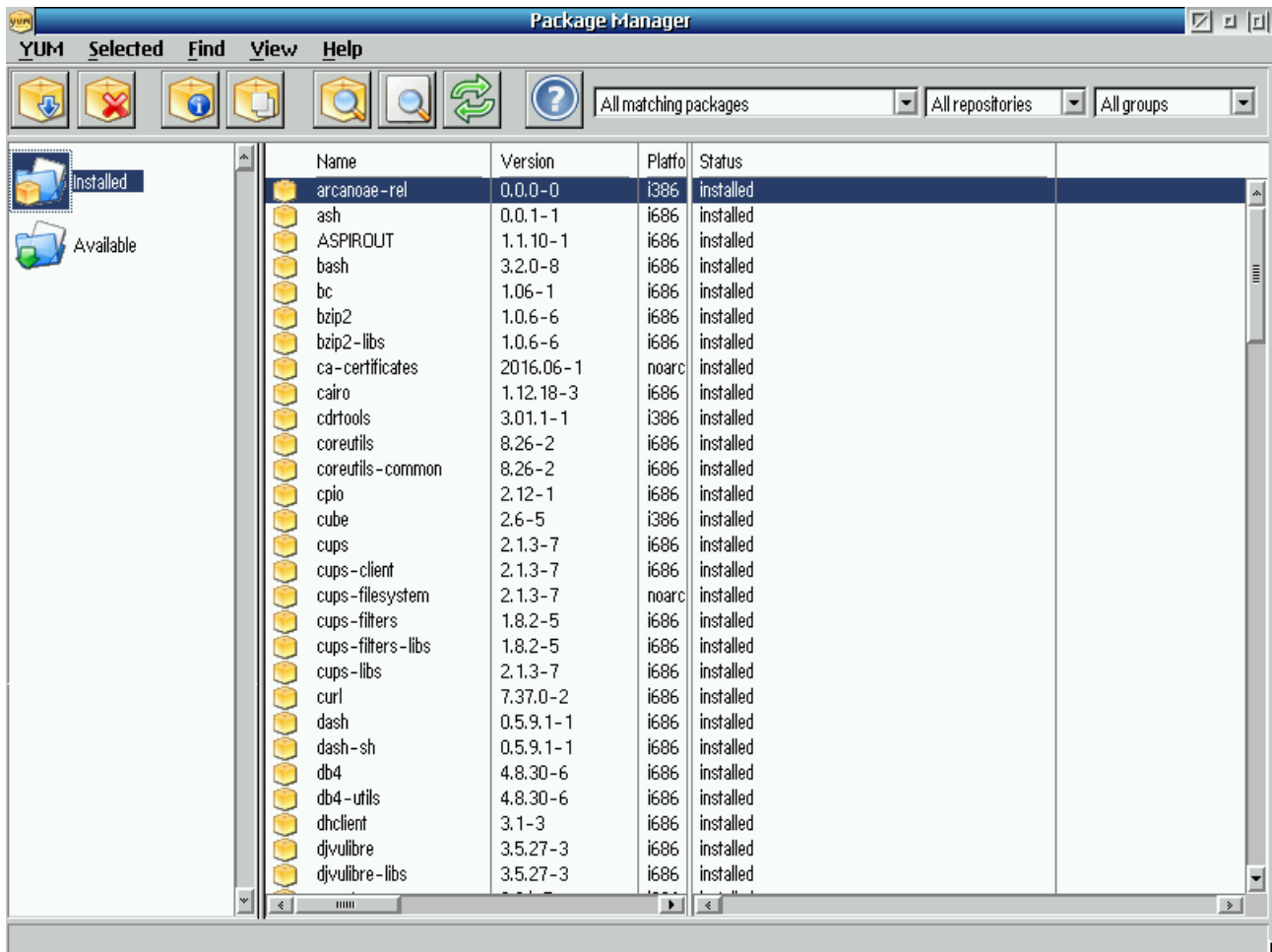
The Arca Noae Package Manager is a graphical front-end program to make installing additional software as easy as possible. It remembers which software packages are already installed, discovers which new software packages are available, and which software packages may be updated to newer versions.

Since many software packages use functionality of other software packages, there are dependencies between such packages. The Arca Noae Package Manager takes care of such dependencies, effectively shielding the user from the most difficult aspects of dependency management.



The Arca Noae Package Manager may be started from the object in the System Setup folder, as seen above.

The main Arca Noae Package Manager window looks like the following:



### Installed

This container provides the list of currently installed packages. When new versions of packages are available, an update indicator is shown.

### Available

This container provides the list of additional packages available for installation. Some packages depend upon other packages and these dependencies are automatically resolved.

For more information on using the Arca Noae Package Manager, refer to its extensive online help guide.

# Appendix A – Pre-Boot Configuration Program

When **Boot with menu for own values** is selected, a temporary RAMDISK will be created and some boot files will be copied to it. Depending on the speed of the machine and whether it is a physical or a virtual machine, this may take a few seconds or more.

The pre-boot configuration program is horizontally divided in two sections. The left section contains the names of the 5 pages: **Help, System Type, Devices, Network, Boot Options** – while the right section displays the the selected page.

Configurable items consist of entry-fields, check-boxes, and the like. Use the **Tab** key to go to the next configurable item and **Shift+Tab** to go back to the previous one.

Pressing **F1** while on a configurable item will display context-sensitive help.

When you are viewing a configuration page, the current item will be slightly highlighted and the cursor will be positioned in it. You may move directly to another configuration page by pressing **PgDn** or **PgUp**.

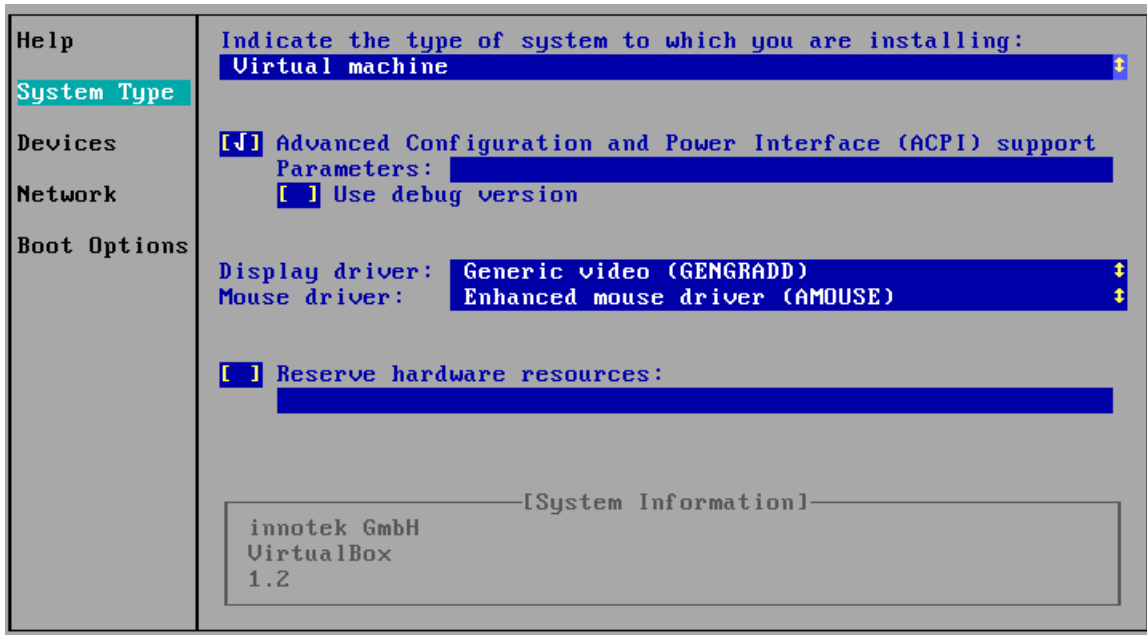
## Help

<b>Help</b>	Next page:	PgDn	
	Previous page:	PgUp	
<b>System Type</b>	Next option:	Tab	
<b>Devices</b>	Previous option:	Shift+Tab	
<b>Network</b>	Next list item (↕)	Up	
	Previous list item (↕)	Down	
<b>Boot Options</b>	First list item (↕)	Home	
	Last list item (↕)	End	
	Toggle checkbox [ ]:	Space	
	Save and continue booting:	F10	
	... verbose driver mode:	Alt+F2	
	... pause after each driver:	Alt+F4	(except BASEDEUs)
	Reset to default values:	F11	
	Show help for current item:	F1	v1.0.0-en

This page provides a quick reference for all recognized navigational and function keys. There are no configurable items here. Context-sensitive help is available on the pages which follow.



## System Type



### Indicate the type of system to which you are installing

If the system is not virtualized and supports ACPI, Modern hardware is generally the best choice. Older, pre-ACPI systems are also supported, as are virtual machines running under several different hypervisors.

### Advanced Configuration and Power Interface (ACPI) support

This toggles the loading of the ACPI Platform Support Driver. For safety, the PSD is loaded here with the MAXCPU=1 option, along with any other known configuration parameters required by hardware which has been selected elsewhere. Specify any additional options in the Parameters field.

### Display driver

Select the desired video driver from the list. The Panorama VESA driver, which is the default on most systems, is unaccelerated but provides overall high quality output and standard resolutions. VGA and GENGRADD are also available for compatibility with systems which may not be able to utilize Panorama effectively.

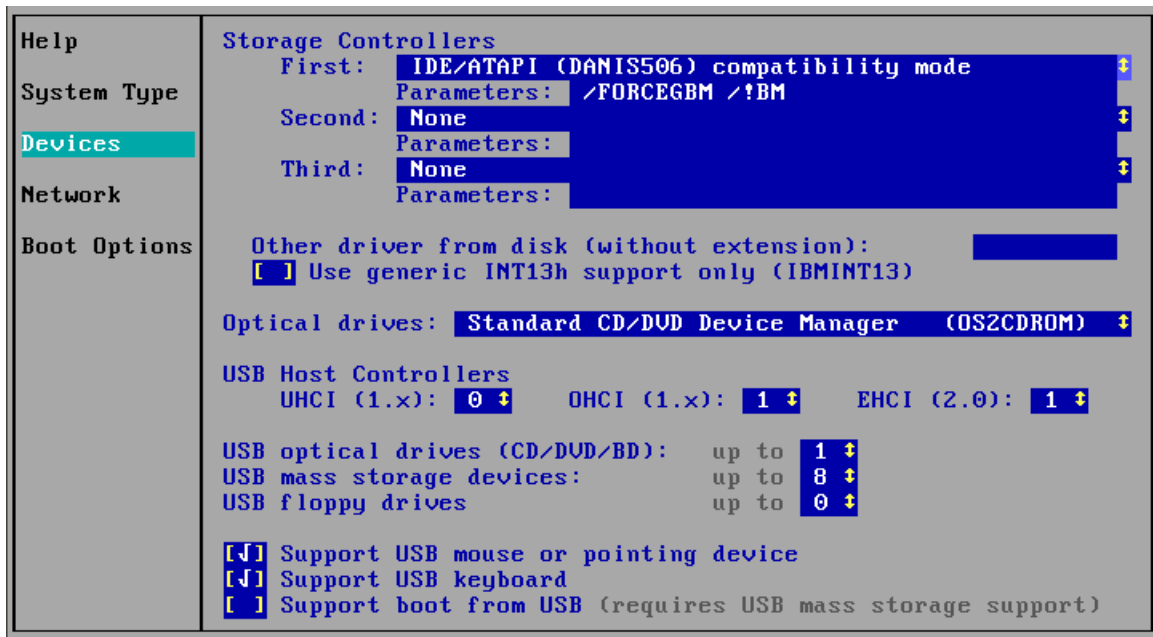
### Mouse driver

Supported pointing device drivers are AMOUSE (the default) and SMOUSE, the standard IBM mouse driver, which may function better on some systems. If after booting to the desktop, the mouse seems erratic or sluggish, try rebooting and choosing the alternate driver.

### Reserve hardware resources

In order to reserve certain hardware resources (I/O port, IRQ, DMA, memory, etc.) for non-plug'n'play hardware, set this checkbox and specify the resources to be reserved for the device in the field below. This should only be necessary in certain rare circumstances.

## Devices



### Storage Controllers

The first storage controller (HAB or HBA) is listed here, if detected. If the installed adapter is not available, reboot, supply the necessary driver on supplementary media during boot, return to this page, select the “Use other driver” option, and enter the driver name in the “Other driver” field, below.

### Other driver from disk

Enter the name of the supplied driver (without extension) here. The driver must have been provided on supplementary media during this boot cycle in order to be loaded.

### Use generic INT13h

Selecting this checkbox loads the IBMINT13 driver which provides support for generic DASD (Direct Access Storage Device) controllers by utilizing the BIOS present on the DASD controllers themselves. Note: This setting is exclusive to any other detected controllers, and IBMINT13 will be the only storage controller driver loaded.

### Optical drives

Select the desired optical Device Manager Driver (DMD) if the default OS2CDROM driver is not optimal for the system. Available choices include JJSCDRM with enhanced configuration options and the older OS2CDROM (OLDCDRM) which does not support DVD. Note: Use of OLDCDRM requires special media to install ArcaOS.

### USB Host Controllers

Select the number of UHCI (Universal Host Controller Interface) or Intel-type USB 1.x controllers in the system. This value should be detected automatically, but may be configured manually. Up to 8 such controllers may be enumerated here.

### USB optical drives

Select this to include support for USB-attached CD, DVD, and/or Blu-ray Disc devices. This value is pre-configured, but may be set manually. Up to 4 such devices may be enumerated here.

Note: Each such device will reserve another drive letter which when not attached may still appear as another drive in device listings.

### USB mass storage devices

Select this to include support for USB-attached hard disks and/or thumb drives. This value is pre-configured, but may be set manually. Up to 8 such devices may be enumerated here.

Note: Each such device, when not attached, may appear as an “unavailable” disk drive of 96MB capacity in device listings.

### USB floppy drives

Select this to include support for USB-attached floppy disk devices. This value is pre-configured, but may be set manually. Up to 4 such devices may be enumerated here.

Note: Each such a device will reserve another drive letter which when not attached may still appear as another drive in device listings.

### Support USB mouse

Select this to include support for USB-attached mouse or pointing device(s). When selected, any such devices should be accessible to the system.

### Support USB keyboard

Select this to include support for USB-attached keyboard device(s), including numeric or other auxiliary keypads(s). When selected, any such devices should be accessible to the system.

### Support boot from USB

Select this to include support for booting from USB-attached mass storage devices, including CD, DVD, Blu-ray Disc, hard disk, thumb drive, and floppy devices. This option is only available when one or more USB mass storage devices have been enumerated, above.

## Network

Help  
System Type  
Devices  
**Network**  
Boot Options

**Network Adapter:**  
Intel(R) PRO/1000 Legacy Network Driver (MultiMac32-MMLEM) MMLEM .OS2 MMLEM .NIF

Edit adapter parameters

Static IP configuration

IP address: [ ] . [ ] . [ ] . [ ]  
Subnet mask: [ ] . [ ] . [ ] . [ ]  
Gateway: [ ] . [ ] . [ ] . [ ]  
Name server: [ ] . [ ] . [ ] . [ ]

Domain name: [ ]

Hostname: [ ]

### Network Adapter

The first detected network interface adapter is listed here. If the installed adapter is not available, reboot, supply the necessary driver on supplementary media during boot, return to this page, select the “Use other driver” option, and enter the driver and NIF names in the “Other driver” fields, below.

### Edit adapter parameters

Selecting this checkbox will pause the boot sequence to allow for editing adapter options in PROTOCOL.INI, such as SSID for WLAN adapters.

Note: This option is only useful for drivers which support such configuration options.

### Static IP configuration

Selecting this checkbox enables the entry fields for IP address, subnet mask, default gateway, primary DNS server, and default domain. When unchecked, these parameters are acquired via DHCP.

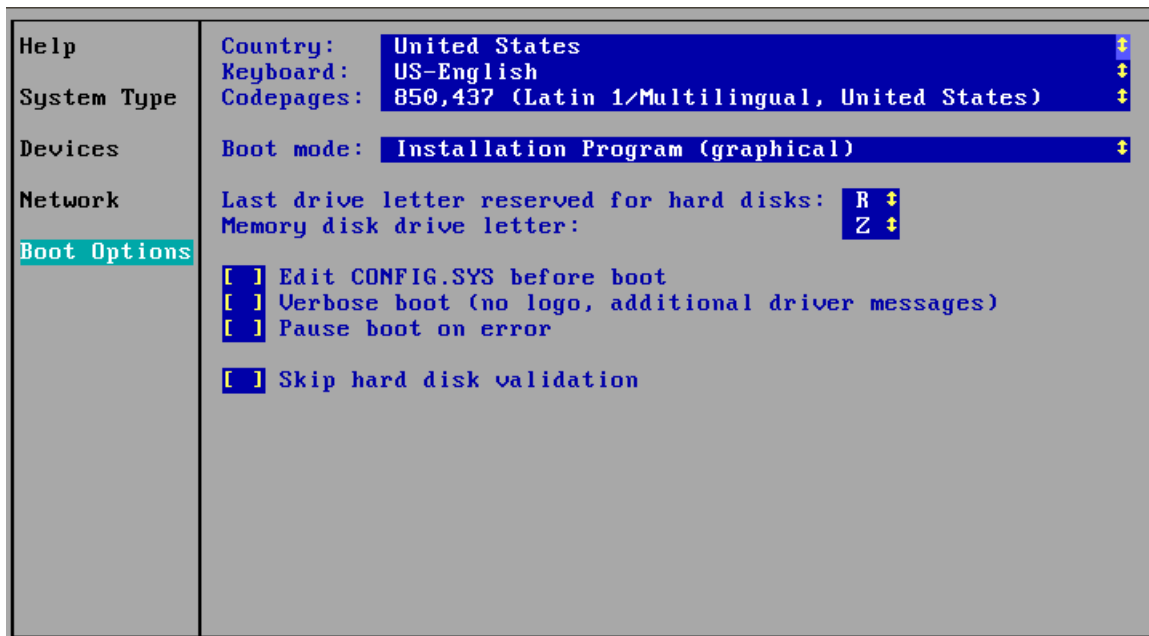
### Domain name

Enter the default domain for the local system here. The maximum length of this field is 33 characters.

### Hostname

Enter the hostname of the system here. The maximum length of this field is 51 characters.

## Boot Options



### Country

Select the desired locale (country/region profile) from the list. This determines time and currency formatting, and similar regional settings.

### Keyboard

Select the desired keyboard layout from the list.

### Codepages

Select the desired codepage set from the list. ArcaOS uses the primary codepage upon startup, and can switch to the alternate one as necessary. A codepage contains the language characters, letters, numbers and symbols to print and display in a particular language.

### Boot mode

Select the desired boot environment from the list. Options here include graphical installation (the default), maintenance and recovery (to repair a damaged system or to perform maintenance tasks), and a generic CLI (command line interface).

#### Last drive letter reserved for hard disks

Set this to the last drive letter between D and X to be reserved for non-optical devices attached to the system. The first optical device will be assigned the next drive letter. Thus, when R: (the default) is the last reserved letter, the first detected CD, DVD, or Blu-ray Disc will be assigned S:.

#### Memory disk drive letter

Set this to the desired letter between C and Z to be assigned to the RAM disk upon booting the selected environment, above. By default, Z: is assigned to the RAM disk.

#### Edit CONFIG.SYS before boot

Selecting this checkbox will pause before the boot sequence begins to allow editing the generated system configuration (CONFIG.SYS). The editor provides basic search and replace functionality, and is useful to make changes not available from the menus provided here.

#### Verbose boot

Selecting this checkbox will suppress the display of the boot logo, allowing early boot messages to be visible. In addition, where available, drivers will have their known verbosity switches enabled to provide more boot-time feedback. This options may be useful for troubleshooting startup issues.

#### Pause boot on error

Selecting this checkbox corresponds to the PAUSEONERROR=YES kernel directive, which pauses the system during boot if a driver load error occurs while processing CONFIG.SYS, prompting for confirmation to continue. This option may be useful for troubleshooting startup or other issues, such as missing devices, unexpected display, etc.

#### Skip hard disk validation

Selecting this checkbox bypasses the normal verification of any attached mass storage devices (hard disks, etc.). This may be useful to expedite the installation process at the expense of some safety, but when the integrity of the target media is known to be good.

# Appendix B – More about Hard Disks

## OS/2 Extended Geometry

When a disk is larger than 512GB, ArcaOS uses a hard disk geometry which has a sectors per track (SPT) value larger than the usual 63 SPT. Depending on the driver used for the hard disk, the value for SPT may be 127 or 255. This extended value is recorded in the LVM information on the hard disk and it is usually not recognized by other operating systems or their partitioning tools.

Since the OS/2 Logical Volume Manager requires CHS-aligned partitions, and, in the case of hard disks larger than 512GB, requires this CHS alignment to use the extended geometry, such partitions cannot (easily) be created with non-OS/2-aware partitioning tools.

Partitions created with the OS/2 partitioning tools using the extended geometry with SPT > 63 are not a problem for other operating systems, since these systems usually use the LBA method (see 2.4).

## Partitions Aligned on MiB Boundaries

Many modern systems often come with hard disks partitioned using MiB alignment and accompanying partitioning tools often use the MiB alignment method as the default. This alignment method is not compatible with ArcaOS and will cause its Logical Volume Management tools to view such partitions as damaged or corrupt, which should be interpreted more accurately as ‘incompatible’.

## Shrinking Disk Partitions

While it is not advised to use foreign (non-OS/2-aware) disk tools to manage hard disks which contain an installed version of ArcaOS, they may need to be used to prepare a hard disk for the installation of ArcaOS. Such preparation may include the shrinking of partitions to make room for ArcaOS as well as realigning partitions to ensure compatibility with ArcaOS LVM CHS alignment requirements.

## Shrinking Windows Partitions

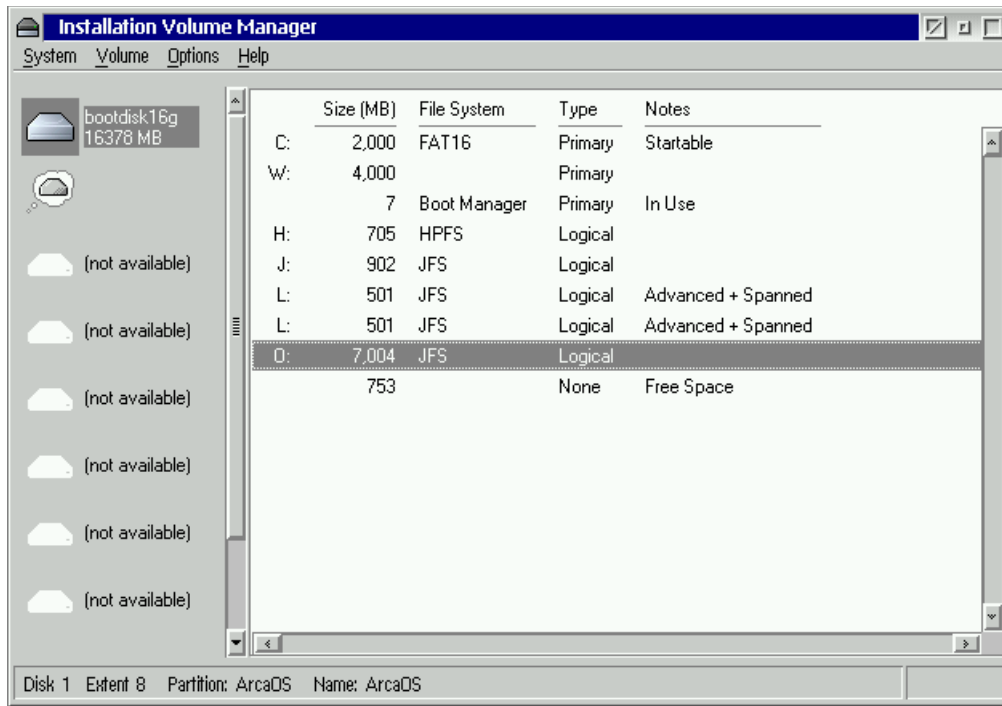
A general rule is that for manipulating partitions belonging to a specific operating system, the disk tool(s) which were included with that operating system should be used. Thus, to shrink partitions used by Windows, it is best to use the tools included with the Windows version in use. Only use these tools to shrink partitions to make room, do not use these tools to create partitions for ArcaOS. Please consult the documentation of the Windows version in use about how to properly shrink Windows partitions. Arca Noae does not provide support for non-OS/2 operating systems.

## Shrinking Linux Partitions

A well known disk tool used on Linux is *GParted*. This tool is capable of shrinking partitions using one of the many filesystems Linux can use, like ext2/3/4, ReiserFS, XFS, JFS, etc. If using GParted or another Linux tool, the same rules apply as mentioned above for Windows: use it only to shrink existing partitions to make room. Do not create the partitions for ArcaOS using GParted, but instead, once space is available, use the ArcaOS LVM tools for that. When using any Linux partition tool, ensure you change the alignment method from MiB to Cylinder in the resize dialog or other options panel.

# Appendix C – Sample Disk Layout

The image below shows a sample disk layout which is referenced by various parts of this guide:



## C: partition - 2000MB

This partition contains PC-DOS7. While it is marked startable, this is only because its boot flag is set in its partition table entry. With a non-interactive boot loader, such as MBR code, this would be the system booted. When a boot manager is present however, these flags have no meaning because the system to boot is selected from a menu.

## W: partition - 4000MB

This partition was created to later install some version of Windows. Note that the drive letter W: is an OS/2 LVM drive letter assignment and is not the drive letter which would be used by Windows.

## IBM Boot Manager partition - 7MB

On this sample layout IBM-BM was installed for testing purposes. It usually requires a partition of 1 cylinder in size which, on a regular disk, would be 255 heads × 63 sectors of 512 bytes, resulting in a partition slightly greater than 7MB in size.

## H: partition - 705MB

This data partition is formatted with the HPFS filesystem. It is present for the purpose of the AiR-BOOT boot manager initially also showing data partitions, which have to be manually hidden from its menu by using the AiR-BOOT SETUP.

J: partition - 902MB

This data partition is formatted with the JFS filesystem. It is present for the same reason as the HPFS data partition: initial visibility in the AiR-BOOT menu.

L: partitions - 2 x 501MB

These JFS formatted partitions form a Spanned Volume. This means that both partitions are combined by the OS/2 Logical Volume Management engine to form one volume accessible with the L: drive letter. This spanned volume was created to show it is hidden from the AiR-BOOT menu. This is because by definition, a spanned volume is non-bootable.

The 753MB Free Space

This space could be used to create one or more partitions. Such new partitions would be logical because all primary partition entries have been consumed: one for DOS, one for Windows, one for IBM Boot Manager, and one for the extended container which holds the logical partitions.



# Appendix D – Boot Loaders and Managers

## Simple MBR Boot Loader

The simplest boot loader is the loader code present in the Master Boot Record (MBR) of a bootable hard disk. Such code checks which of the four possible primary partitions has the bootable flag set, then loads its Partition Boot Record (PBR) and transfers control to it. The code in the PBR takes care of the further loading of the operating system.

This method of starting an operating system is used when only one operating system is present and thus no selection of which system to start needs to be made. A limitation of this method is that it is only useful to start a single operating system which is installed in a primary partition marked active (bootable flag set).

If you have chosen to install ArcaOS into a primary partition, and this primary partition has been set active, then this MBR Boot Loader is automatically installed and turning on or restarting the system will directly boot ArcaOS.

## IBM Boot Manager

The IBM Boot Manager as supplied with OS/2 from IBM requires a single track on one installed disk, and consumes a primary partition. As mentioned previously, this partition is usually slightly more than 7MB in size.

Boot Manager is configured using LVM tools, reading the LVM volume names for volumes which have been added to its menu as bootable. It generally identifies volume filesystem formats by their partition types, and so to Boot Manager, an OS/2 JFS partition will be listed as HPFS because they both share the type 7 descriptor. Boot Manager is capable of booting operating systems from logical or primary partitions.

Boot Manager has other limitations, as well, and as such may not be suited to today's larger, more complex devices and layouts. However, if present and available, ArcaOS may be installed and added to the Boot Manager menu.

## AiR-BOOT Boot Manager

ArcaOS comes with the AiR-BOOT Boot Manager, which is capable of starting ArcaOS from either primary or logical partitions as well as starting other operating systems.

The AiR-BOOT Boot Manager is an alternative boot loader which aims to address some of the issues inherent in the IBM Boot Manager on modern systems.

AiR-BOOT is a TRACK0 loader, so it does not require a partition of its own. Thus, it does not consume one of the four primary partitions available in an MBR partitioning scheme.

# Appendix E – System Management

The System Management page may be used to perform various maintenance tasks. It may be accessed the System Management button when booted from the ArcaOS Installation Disc. In addition, when pressing Cancel from any other page where that button appears, the System Management page is displayed. The following is a summary of utilities accessible from the menu:

- ◆ Disk Utility
- ◆ Resize Partitions
- ◆ Manage Volumes
- ◆ Check Disk
- ◆ Format Disk
- ◆ Refresh Removable Media
- ◆ Search Files
- ◆ Text Editor
- ◆ Document Viewer
- ◆ Archive Viewer
- ◆ Web Browser
- ◆ Process Monitor
- ◆ Command Prompts

When booted from the Installation Disc and using System Management, the hard disk is not in use by the booted system, meaning that files on disk are unlikely to be locked. This makes it easier and safer to perform various maintenance tasks on the system.

The included web browser may be used to view local HTML files or if the internet is accessible, to browse for assistance or more information. A useful set of bookmarks is also provided.

The document viewer is capable of presenting PDF and several image formats.

# Appendix F – Installing Linux after ArcaOS Install

Note that Arca Noae does not provide installation or operation support for non-OS/2 operating systems. Information provided in this appendix is done so as a courtesy to ArcaOS users, and should only be used as background material. As always, consult the documentation which accompanies the software or operating system which you are installing.

Linux usually requires at least two partitions, one for swap and one for the root filesystem and a boot manager for which GRUB (or GRUB 2) is most often used.

## Create partitions using the OS/2 Logical Volume Manager

To retain OS/2 LVM compliance, the Linux partitions should be created using the OS/2 Logical Volume Manager. Linux has no problem using such partitions because it uses the LBA disk addressing scheme (see 2.3). Linux is capable of booting from logical partitions, so it is generally good practice to create these partitions in the extended container.

## Special kernel parameter for cylinder alignment

Some Linux distributions realign the base of the extended container to a MiB boundary. This may cause problems because it breaks the LVM compliance. To prevent this from happening, you should be able to use the kernel parameter `partman/alignment=cylinder` when booting from the Linux installation medium.

## Correct Linux partition types

Partitions created with the OS/2 Logical Volume Manager default to type 6. When installing Linux, the swap and root filesystems are formatted and normally the partition type is also corrected. If they are still type 6 after the Linux installation has been completed, they need to be corrected to 82 hex (Linux Swap) for the swap partition and 83 hex (Linux Native) for the root partition.

## Install GRUB into the partition for the root filesystem

When installing Linux, there is usually a choice where to install the GRUB boot manager, which defaults to track0 of the disk. Be sure to change this to the partition of the root filesystem. When GRUB is installed in the partition of the root filesystem, it should be possible to chain load it from the IBM or AiR-BOOT boot manager. This presents the IBM or AiR-BOOT boot manager upon starting the system, and allows selecting the Linux installation's GRUB from that menu.

# Appendix G – Support for ArcaOS

If you do run into trouble installing or using ArcaOS, we want to help you resolve your issue as fast as possible. Since your problem may have already been encountered by other users, we use a searchable bug tracking system where issues may be reported. Aside from the obvious benefit of a centralized issue database, this bug tracking system also allows issue-related communication, which is much more effective than communication by e-mail.

## The Main Arca Noae Website

Support for ArcaOS is backed by the Arca Noae website, located at: <https://www.arcanoae.com>

## Creating an Arca Noae Account

Having an Arca Noae account enables you to report issues and download content provided as part of your support subscription. If you don't have an account yet, you may create one here:

<https://www.arcanoae.com/my-account>

## Reporting An Issue

Please visit:

<https://mantis.arcanoae.com>

and log in with your Arca Noae account credentials.

## Tickets

Issues are referenced by ticket numbers, so reporting an issue is done by creating a new ticket.

Before you create a new ticket, please search the existing tickets (whether open, resolved, or closed) to determine whether the issue which you have encountered has already been reported by somebody else (and has possibly been resolved) . Doing so prevents the creation of duplicate tickets, in turn streamlining problem resolution.

## Issue description

When creating a ticket, please enter a brief but accurate description of the problem.

## When does the issue occur

Did it occur when booting from the installation disc, during installation of ArcaOS, or when using ArcaOS after it had been installed? If possible, provide exact steps to recreate the issue.

## One ticket for each issue

If you encounter multiple problems, please create one ticket for each, unless they are clearly part of the same overall issue.

For instance, if your printer does not produce output from any application and the web browser crashes when viewing a particular page, report these as two separate issues. However, if your printer will not produce output from the browser while viewing a page which subsequently crashes the browser, but which prints from everything else, this may be a single issue.

## Screenshots and logfiles

If you receive error information on the screen, a screenshot can convey more than a whole page of words. Please attach such screenshots and logfiles whenever possible, but try to keep the sizes of such attachments to a reasonable size. Nobody needs a 5MB screenshot of the entire desktop in the highest resolution possible when all that is required is a single dialog box.

Detailed diagnostic logs and related information will normally be found in the file **install\_###.zip** located in the \sys\install directory on your ArcaOS boot volume, where '###' is either a date string (in the event of a completed installation) or 'abend' (if the ArcaOS installation failed before completing). In the event of a failed installation which is non-bootable, simply reboot from the installation DVD, access the management Console, and use the web browser there to access the bug tracker and upload **install\_abend.zip**.

# Appendix H – ArcaOS Installation Checklist

**ArcaOS Installation Checklist for:** \_\_\_\_\_ (Machine identity)

Machine make/type: \_\_\_\_\_ Host (Machine) name: \_\_\_\_\_

Domain / Workgroup: \_\_\_\_\_ DHCP / IP address: \_\_\_\_\_

Default User / Password\*: \_\_\_\_\_ / \_\_\_\_\_

\* Record password only if this document will be kept secure or destroyed immediately following use.

Language / Keyboard: \_\_\_\_\_ / \_\_\_\_\_

Installation Type: Single / Multi / Enterprise / Server / Custom / Scripted \_\_\_\_\_

Volume Plan                  Disk Size: \_\_\_\_\_                  Disk Identity: \_\_\_\_\_

No:	Drive	Type	Format	**	Size (MB)	Name	Used for
1	C:	07	JFS	1	6000	ArcaOS5	System

\*\* Bootable / Installable

System Type:                  ACPI                  APM

Storage:                          AHCI                  IDE                  SCSI

Serial:                          USB Controller Type/number:                  /                  /                  /

Graphics Driver:                  SNAP / Panorama / GENGRADD / VGA

Mouse Type:                  AMOUSE                  SMOUSE                  Other:

Audio:                          UNIAUD                  Other:

Notes: