

AiR-BOOT

User Manual

Version 1.1.0

(April 2013)

Please note:

*This manual is about ***post*** v1.06 versions of AiR-BOOT.
These post v1.06 versions are not maintained by the original AiR-BOOT developer,
Martin Kiewitz, and are not hosted on sourceforge.
So, for issues with versions v1.07 and above, please don't use sourceforge for your feedback,
but rather use the Trac Project Pages at Netlabs or the eComStation bug-tracker .
See the "Feedback" section for the correct sites and contact addresses.*

*With regard to the original v1.06 version, where these new versions are based upon,
it is inevitable that there are some 'regressions' or freshly introduced bugs.
An example is the broken drive-letter feature in v1.07.
Please use the proper channels to report such issues.*

To "Read before Using" would be a smart thing to do

*Booting multiple operating-systems on today's machines is no trivial process.
While the utmost care has been taken to ensure the proper operation of this version of the
AiR-BOOT Boot Manager, it's impossible to anticipate on all configurations in use today.*

*So, please be sure to read the
"Before you begin", "Trouble Shooting", "Caution !!" and "Disclaimer"
sections in this manual.*

*For a more in-depth information please refer to the "AiR-BOOT Technical Reference".
(not available yet)*

*Since AiR-BOOT is open-source, you can build it yourself .
The "AiR-BOOT Developer Reference" will help you get started.
(also not available yet)*

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Preface

This manual is about the **AiR-BOOT Boot Manager** as introduced with **eComStation v2.1** in may 2011.

It starts with a short introduction of the beast after which the focus shifts to basics like: *Backup*, *Installing*, *Configuring*, and *Removing*. For a more in-depth coverage of advanced AiR-BOOT usage and other related topics, please refer to the AiR-BOOT Technical Reference. (*which is not yet available at this time*)

What is AiR-BOOT ?

AiR-BOOT is a **Boot Manager** that can be compared to boot-managers like IBM-BM, GRUB and others.

Like IBM-BM and GRUB, AiR-BOOT presents a list of operating-systems from which the user can select one to boot the system. The interesting thing about AiR-BOOT is that it works "*on-the-fly*", which means that it detects almost all changes to your disks and partitions without requiring your intervention. Another pleasant feature about AiR-BOOT is that it contains a built-in SETUP and yet is small enough to fit in the first track of the disk, (usually 63 sectors ~30kB in size), thus not requiring a separate partition.

Actually, it is one of the smartest boot-managers around for it's size, I kid you not !

A brief history

AiR-BOOT was invented by Martin Kiewitz more than 10 years ago, so over that time it matured into what it is now. It is completely written in Assembler and that's why it's so small in size, yet powerful enough to contain it's own SETUP together with a load of handy features.

Martin however, does not develop AiR-BOOT anymore and the last version by his hand is v1.06, as hosted on source-forge. Kindly, Martin gave his permission to develop AiR-BOOT for further use with eComStation, a gesture that is highly appreciated. This manual is about the post v1.06 versions that are specially enhanced for use with eComStation to replace IBM-BM. While the initial focus is to replace IBM-BM, the longer term path is to enhance AiR-BOOT further to cope with upcoming things like EFI/GPT and other future developments.

AiR-BOOT replacing IBM Boot Manager

With the release of eComStation v2.1 in may 2011, it was decided to replace the aging IBM Boot Manager with a boot-manager that is capable of handling today's systems. Perhaps the most common situation is an OEM installation of Windows Vista / 7 that uses an extra primary partition for the Windows boot-loader. IBM-BM is not capable of booting Windows Vista / 7 in this situation because it automatically hides one of them, causing the Windows loader code to fail. Other issues are huge hard-disks with sizes over 512GB where IBM-BM does not display it's boot-menu correctly, behaves erratically or does not even work at all.

Here are a few reasons why AiR-BOOT was chosen to replace IBM-BM:

No separate partition required

So the 'fight for primary partitions' can be escaped from, enabling eComStation to be installed alongside Windows Vista / 7 in it's own, preferably logical partition, without requiring a primary partition for it's boot-manager.

Comes with additional tools like SETABOOT that mimic the corresponding tools for IBM-BM

This ensures smooth integration into the eCS environment, especially when installing eCS.
(One of the reasons AiR-BOOT was chosen over GRUB)

It's Open Source

So adjustments, fixes and enhancements are relatively easy to make

A brief Compatibility Check

- Your disk needs to have at least 63 sectors per track, which is practically always the case for modern hard-disks.
- The BIOS of your system needs to have INT13X support, which is also always the case with modern systems.

However, if your system uses some form of non-eCS LVM-software, or other disk related software that uses space in track0, then AiR-BOOT should not be used. Also, GPT or otherwise none-MBR scheme partitioned disks are not supported at this time.

The Basics

This section covers the basic things you need to know on how to use AiR-BOOT.

It does this by presenting a *sample-configuration* with OS/2 Boot Manager (IBM-BM) that get's replaced by AiR-BOOT.

For more advanced usage see the "Advanced Usage" section further down in this manual.

Before you begin -- BACKUP your MBR !

AiR-BOOT installs itself at the start of the disk and modifies the *Master Boot Record (MBR)*.

Besides elementary boot-code, the MBR also contains the *Partition Tables* that provide access to the data areas on the disk. A power outage or accidental reset of the computer during the installation of AiR-BOOT are examples of events that could cause these tables to get lost. Another example would be a severe bug in AiR-BOOT.

So it's important that you make a backup of the MBR to a file before installing AiR-BOOT. Store this file on a diskette or a usb-stick or whatever medium you have access to. Don't store it only on the boot-disk because you cannot access this disk (easily) in case of such an event. Now don't get scared, installation takes less than a second and the chances of ending up with a corrupted MBR are neglectable. But it's always better to be safe than sorry !

Here are some procedures that are readily available under the following Operating Systems:

eComStation

```
- Boot from the eCS CD-ROM
- Start the Maintenance Console
- Attach a medium like a floppy or usb-stick
    (Wait for the pop-up indicating the drive-letter in case of an usb-stick)
    (You cannot use usb-sticks formatted as LARGE FLOPPY, prepare one using eCS and format it with FAT16)
- Open a Command Prompt
- Give the following commands:
?: <ENTER>      (where ?: indicates the drive-letter of the FAT16 formatted medium)
cd \
md MBR_BKUP
cd MBR_BKUP
DFSVOS2 image YYYYMMDD 0 1      (Where YYYY is the 4-digit year, MM is the month and DD is the day, e.g. 20120127)
S: <ENTER>
eject ?:
```

Linux

```
- Download the Knoppix Live CD and boot from it
- Mount your diskette or usb-stick
- Open a Terminal
- Give the following commands:
ls -l /media
sudo su
cd /media/<name-of-the-stick-or-floppy>
mkdir MBR_BKUP
cd MBR_BKUP
fdisk -l      (If it shows /dev/hda stuff then /dev/hda is your first disk, otherwise it's /dev/sda)
dd if=/dev/(h)(s)da of=YYYYMMDD.img bs=512 count=1
cd /
umount /media/<name-of-the-stick-or-floppy>
```

Otherwise

Download a trial-version of the magnificent disk-management tool "DFSee" from <http://www.dfsee.com>

Read the documentation on the site and the accompanied documentation in your download. Consider obtaining a license to DFSee as this tool is like a "Swiss Army Knife" with regard to protecting and recovering your data.

(Nothing else comes close and there might come a day you pity yourself for not doing so)

Use the menu "FDISK->MBR or EBR area operations->Save MBR code, to an IMAGE" to backup your MBR to a file.

Rename it to YYYYMMDD.img, and copy that file to floppy or usb-stick.

Now your MBR is safe and you will be able to restore it in case it somehow gets lost.

However, the MBR you just saved becomes invalid when you make changes to your disk-layout !

Especially if you are now installing a new system; so repeat the MBR backup procedure after successful installation.

In fact, make sure you have an up-to-date MBR-backup everytime you made any changes to your disk.

The DFSee tools contain advanced capabilities for backing up vital disk-information and are highly recommended.

This concludes the "safety measures" you should take into account before installing and using AiR-BOOT.

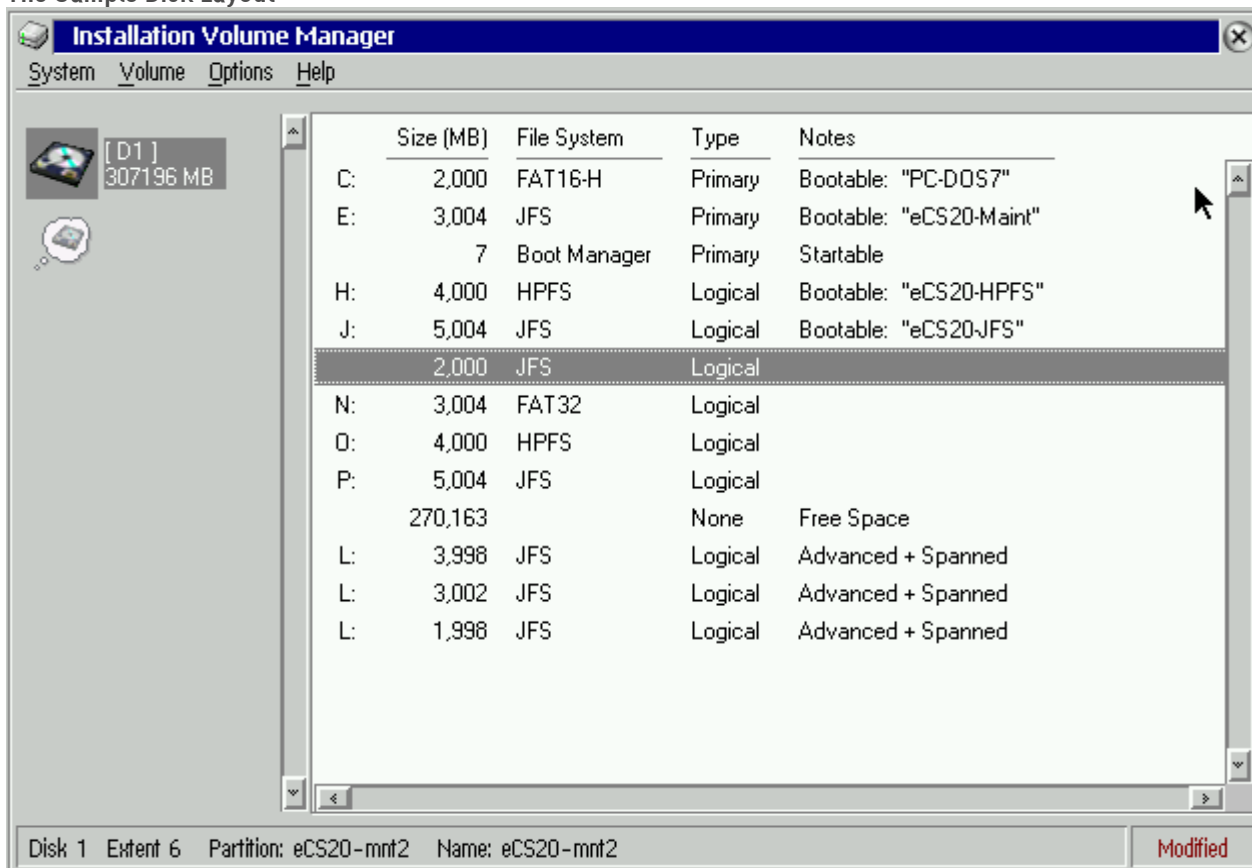
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A Sample Configuration

Since AiR-BOOT was introduced with eComStation v2.1, it makes sense to use a sample configuration of multiple previous eComStation versions that were installed using OS/2 Boot Manager. To further put some "flesh" on the configuration, a PC-DOS7 partition is present, multiple data-partitions and an LVM volume spanning multiple partitions. We will then install AiR-BOOT to replace OS/2 Boot Manager, see if everything still works and what the differences are. Needless to say that the disk was partitioned using the LVM Tools and that proper LVM Partition and Volume Labels have been set.

The Sample Disk Layout



The screenshot shows the 'Installation Volume Manager' window with a menu bar (System, Volume, Options, Help) and a sidebar showing a disk icon labeled '[D1] 307196 MB'. The main area contains a table of disk partitions. The table has columns for Size (MB), File System, Type, and Notes. The partitions listed are C: (2,000 MB, FAT16-H, Primary, Bootable: "PC-DOS7"), E: (3,004 MB, JFS, Primary, Bootable: "eCS20-Maint"), a Boot Manager partition (7 MB, Primary, Startable), H: (4,000 MB, HPFS, Logical, Bootable: "eCS20-HPFS"), J: (5,004 MB, JFS, Logical, Bootable: "eCS20-JFS"), a logical partition (2,000 MB, JFS, Logical), N: (3,004 MB, FAT32, Logical), O: (4,000 MB, HPFS, Logical), P: (5,004 MB, JFS, Logical), a Free Space partition (270,163 MB, None), and three L: partitions (3,998 MB, 3,002 MB, and 1,998 MB, all JFS, Logical, Advanced + Spanded).

	Size (MB)	File System	Type	Notes
C:	2,000	FAT16-H	Primary	Bootable: "PC-DOS7"
E:	3,004	JFS	Primary	Bootable: "eCS20-Maint"
	7	Boot Manager	Primary	Startable
H:	4,000	HPFS	Logical	Bootable: "eCS20-HPFS"
J:	5,004	JFS	Logical	Bootable: "eCS20-JFS"
	2,000	JFS	Logical	
N:	3,004	FAT32	Logical	
O:	4,000	HPFS	Logical	
P:	5,004	JFS	Logical	
	270,163		None	Free Space
L:	3,998	JFS	Logical	Advanced + Spanded
L:	3,002	JFS	Logical	Advanced + Spanded
L:	1,998	JFS	Logical	Advanced + Spanded

Disk 1 Extent 6 Partition: eCS20-mnt2 Name: eCS20-mnt2 Modified

Short description of the Sample Layout

C: Partition "PC-DOS7"

This is a traditional DOS-Partition using the FAT16 file-system.

The -H suffix after the FAT16 identifier in the File System column indicates that this partition is currently hidden. This hiding was caused by IBM Boot Manager that hides all other primary partitions except the one booted. This behavior of IBM BM is one of the reasons why it cannot be used with Windows Vista/7/8, because these systems use a boot-loader partition in addition to their system partition. When one of them is hidden, Windows fails to boot. AiR-BOOT will always unhide all partitions unless you explicitly configure otherwise. More information about this is in the section about configuring AiR-BOOT.

E: Partition "eCS20-Maint"

This is an eComStation v2.0 installation using the JFS file-system.

Nothing much to say about it except that it has been cloned to the logical partition the selection-bar is on to later illustrate booting eComStation installations that use the same drive-letter.

Boot Manager

This is the IBM Boot Manager from eComStation v2.0.

We are going to replace its functionality with AiR-BOOT. Note that installing AiR-BOOT does not remove or cripple IBM-BM, it just disables it by taking over the boot-code in the MBR. That's why AiR-BOOT is able to chain-load IBM-BM. (*Caution when doing that !*)

H: Partition "eCS20-HPFS"

An installation of eCS v2.0 on HPFS.

Note that this is on a logical partition and can only be booted by IBM-BM or AiR-BOOT.

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J: Partition "eCS20-JFS"

An installation of eCS v2.0 on JFS.

The High Lighted Partition

This is the partition that the cursor is on.

As you can see in the status fields in the lower window it's name is: "eCS20-mnt2". This partition is a clone of "eCS20-Maint" to illustrate multiple installations using the same drive-letter. See the Advanced Features section for more information about this.

The N:, O: and P: Partitions

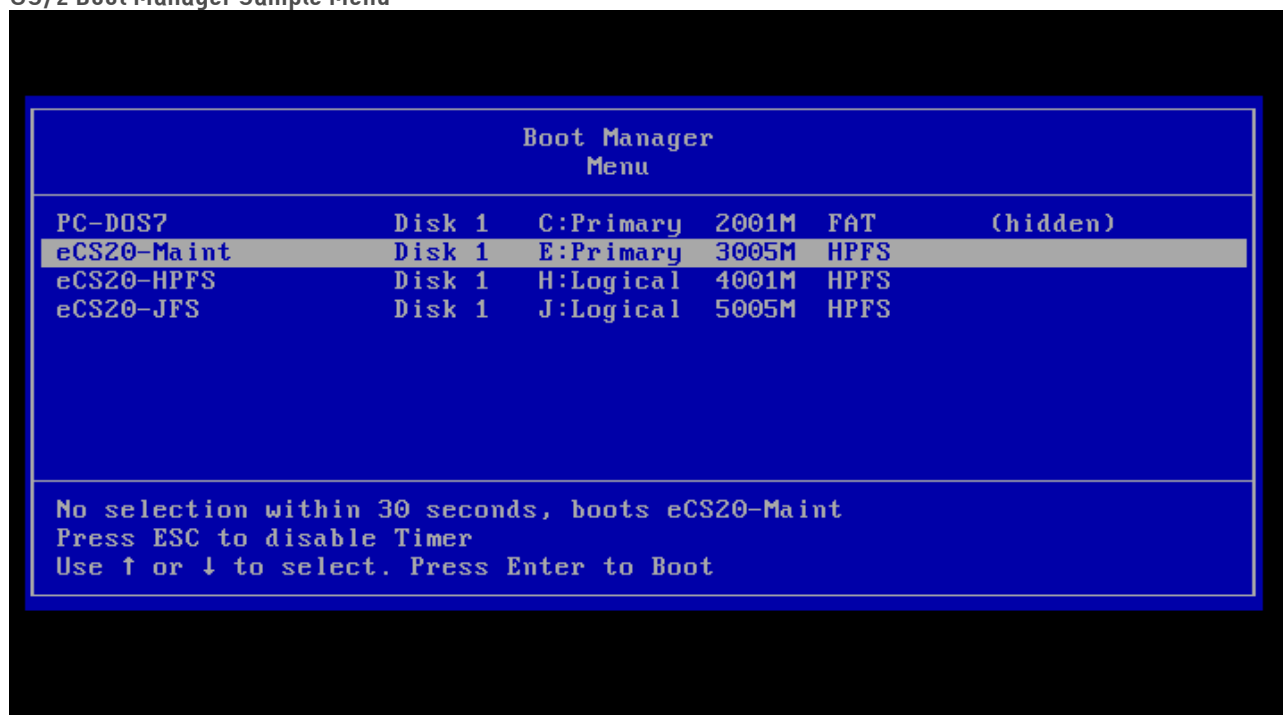
These are data-partitions and thus contain no operating-system.

The L: Partitions

These are spanned data-partitions using the advanced LVM capabilities.

They are not bootable of course.

OS/2 Boot Manager Sample Menu



OS/2-BM automatic primary partition hiding -- why OS/2-BM and Windows Vista/7 cannot live together

Because PC-DOS7 and eCS20-Maint are primary partitions, OS/2 Boot Manager hides one when the other is booted from. This is one of the issues with OEM installations of Windows Vista and Windows 7, that use a separate partition for the Windows Boot Manager.

When the Windows Boot Manager partition is started from OS/2-BM, OS/2-BM hides the partition containing Windows Vista/7 causing it to fail booting.

OS/2-BM displaying incorrect file-system information

Also note that while eCS20-Maint and eCS20-JFS are formatted with JFS, OS/2-BM shows them as being formatted with HPFS which is incorrect. This is because both HPFS and JFS use the 0x07 partition identifier and OS/2-BM has never been updated to recognize JFS.

Installing AiR-BOOT does not remove OS/2 Boot Manager

Because AiR-BOOT is stored in Track0, it does not alter or overwrite OS/2-BM, which is stored in it's own partition. AiR-BOOT is able to get control because it modified the MBR that now, instead of booting a partition marked "active", loads the AiR-BOOT program. So, OS/2-BM is of no hinder to AiR-BOOT and can easily be re-enabled should you not like AiR-BOOT. In fact, AiR-BOOT is able to boot OS/2-BM but this is not recommended and the reasons are explained further along in this manual.

AiR-BOOT does not take over any OS/2-BM configuration settings

While OS/2-BM has some configurable options, like a default system, timeout, etc., AiR-BOOT does not takes these over. AiR-BOOT has it's own configuration, including the above options, and you'll have to set these to your likings.

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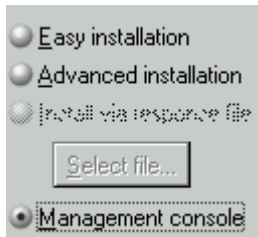
Installing AiR-BOOT

Now we are going to install AiR-BOOT to take over the boot functionality from IBM Boot Manager.

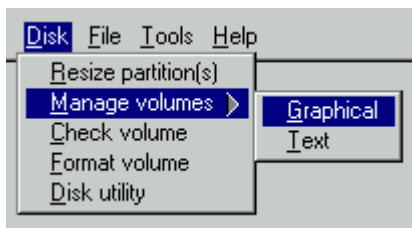
Since this version of AiR-BOOT is specifically enhanced to integrate with eComStation (and vice-verse), the first method that will be discussed is the "eCS-way" of installation. However, AiR-BOOT was designed to be "Operating System Agnostic", meaning it can be installed from other operating systems too.

Installing AiR-BOOT by using the eComStation Boot-CD (v2.1 or higher)

Just boot your copy of the eComStation CD-ROM (v2.1 or higher) and go into the *Management Console*.



Once in the *Management Console* chose: "Disk->Manage Volumes->Graphical" from the menu-bar.



This will start the *Graphical (Installation) Volume Manager*, also known as *MiniLVM*.

It is highly recommended to use the Graphical Volume Manager for all you disk-related tasks when you have eComStation installed.

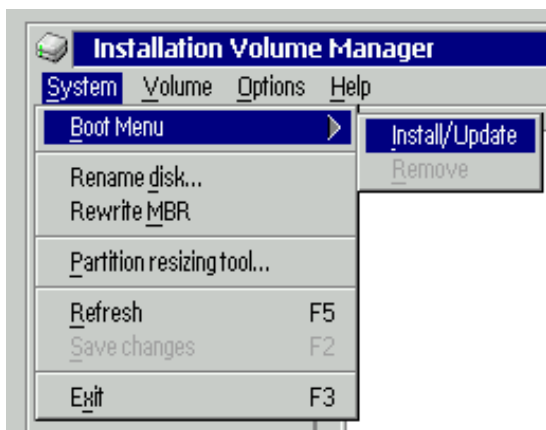
This includes creating and deleting partitions as well as changing their labels.

Using other disk-tools to perform these tasks may render you disk-layout unusable for use by eComStation.

*The Text-mode version to manage volumes is *not equivalent* to the Graphical version and should only be used when special configurations are required. These special configurations include installing or managing the (now) depreciated OS/2 Boot-Manager, selectively setting a partition or volume label or creating so called Spanned Volumes.*

*It is *not aware* of AiR-BOOT and depending on the actions it performs it may actually disable (but not delete) it.*

From it's main-menu choose: "System->Boot Menu->Install/Update".



That's all there is to it !

Some things to be aware of

Atomic operation

Note that, contrary to other operations in MiniLVM, this operation is *atomic*, meaning it takes place *immediately* and does not require you to "Save changes". You can easily revert by choosing *Remove*, and make sure OS/2-BM or some other primary partition is marked *Startable* and then do "Save Changes".

Disabled Remove Menu Entry

Also note that in the above example, the "Remove" entry in the menu is "grayed-out", and not selectable.

This is because AiR-BOOT was not installed in the example above.

If there was an AiR-BOOT installed then this entry would have been selectable, and choosing it would have removed AiR-BOOT. Please refer to the section "Removing AiR-BOOT" for more details.

Install/Update Menu Entry

If there was already an AiR-BOOT installed, the "Install/Update" action would upgrade AiR-BOOT to the version that is present on the eCS Boot-CD, or, if you are using MiniLVM from an installed system, to the version installed with that.

But only if that version is of an higher level than the one already installed, otherwise no action is taken.

See the section for "Upgrading AiR-BOOT" for more details.

Possible OS/2-BM Menu Entry

Also note that when "OS/2 Boot-Manager" is installed, the above menu will look different.

It will also show a menu-entry named "BOOT MANAGER", which would normally manage OS/2 Boot-Manager, if AiR-BOOT were not installed. With AiR-BOOT installed, this entry is still present to indicate the presence of OS/2 Boot-Manager, but you will not be able to manage it because AiR-BOOT is now the boot-manager "in control".

Please refer to the "AiR-BOOT Technical Reference" for more information on the (not advised) use of AiR-BOOT in conjunction with OS/2 Boot-Manager.

Installing AiR-BOOT from eCS the command-line

You can also install AiR-BOOT from the command-line.

This offers a method with more control over the AiR-BOOT installation.

One thing is that you can "downgrade" to a previous version or that you can "rewrite" a default configuration.

*Note however that the use of the command-line tool is considered *advanced usage* and you are expected to know what you are doing.*

Another thing to be aware of is that v1.07 contains a bug with regard to saving the full configuration, so if you do a "code only" downgrade from v1.1.0 this might produce unexpected results. Code downgrading to the v1.06 version is not supported at all at this time since it's configuration is of lower level.

The only way to downgrade is to also "rewrite" the configuration corresponding to the code-version.

The AIRBOOT2.EXE installer

This is the eCS command-line installer, AIRBOOT2.EXE, and it needs the AIRBOOT.BIN file to be present in the same directory.

Running it without any option will check if AiR-BOOT is currently installed. It does this by checking the Master Boot Record for the AiR-BOOT signature. If AiR-BOOT is not installed it will offer to install it.

If there is already an AiR-BOOT installed, it will offer to upgrade it, no action will be taken if the present version is of a higher version.

If it finds a "damaged" AiR-BOOT, like the signature is present in the MBR but the code or configuration is missing or corrupted, it will offer to repair it. A damaged or disabled AiR-BOOT configuration can easily be repaired by using this command-line program and 9-out-of-10 times your configuration will still be intact.

Reinstalling AiR-BOOT in case of a corrupted boot-environment is almost always the best thing to try first.

The '/forcecode' flag on the installer

This flag forces the installer to rewrite the AiR-BOOT code.

It is of value in two situations:

- You want to downgrade to a previous version
Take into account the previous section about downgrading
- You are testing a beta
In this case, the code version of the beta is the same as that of the final release that will follow it, so you need to force the code upgrade otherwise no action will be taken

The '/forceconfig' flag on the installer

The AiR-BOOT configuration has it's own version and it is divided in two parts:

- A part that has the initial settings, like whether to time-out or not
This could be referred to as the 'semi-static' or 'core' configuration
- A part that is dynamic, like the partitions that were found on your disks at the last boot
This changes every time you add or remove partitions

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Installing AiR-BOOT from other Operating Systems

There are no GUI front-ends (like MiniLVM) available for other operating-systems to install AiR-BOOT, so this must be done from the command-line. Like the command-line installer for eCS, there are the **AIRBOOTD.EXE** installer for DOS and the **AIRBOOTW.EXE** installer for Windows. A Linux command-line version, **AIRBOOTL.ELF**, is in the works and may appear in future releases. Also note that the command-line installers for DOS and Windows require certain "environments" to be run successfully. For DOS this means ***no virtualization***, like a "DOS Box" and for Windows NT/2K/XP/Vista/7 it means running them in a Command Prompt that was started as an ***Administrator***.

Installing AiR-BOOT from DOS

The AiR-BOOT installer needs to physically access the hard-disk to install itself. This means that any "emulated" or "virtualized" DOS-environment may pose limitations on accessing real hardware and may interfere with the installation. Even worse, it may cause damage to your disk !

Therefore, it is mandatory that you use a "Real DOS", like one you boot from floppy or hard-disk, to run the **AIRBOOTD.EXE** installer . The recommended way is to create a "FreeDOS" bootable diskette and copy the **AIRBOOTD.EXE** installer and **AIRBOOT.BIN** files to that and then boot this disk and run the installer. You may also use PC-DOS7 or MS-DOS5, but don't use versions lower than 5 for safety reasons. The flags that can be used are the same as for the **AIRBOOT2.EXE** installer: **/forcecode** and **/forceconfig**.

Installing AiR-BOOT from Windows

There are roughly two "families" of Windows:

- The Windows 1.x/2.x/3.x/9x/ME versions
These versions actually run on DOS and thus use the DOS kernel.
Use the **AIRBOOTD.EXE** installer in a DOS Window (1/2/3.x) or DOS-MODE (9x/ME) in these cases.
Better yet, boot from a plain FreeDOS (diskette) for the installation and forget about installing from Windows.
- The Windows NT/2000/XP/Vista and 7 versions
Believe it or not, these versions are remotely based on OS/2 and thus use their own kernel.
Use the **AIRBOOTW.EXE** installer from a Command Prompt opened as Administrator.
Find info on the Windows "RunAs" command for more info if needed.
Vista and 7 implement some brain-dead 'solutions' to the admin/no-admin paradigm in the form of the UAC, (User Access Control). If this piece of wasted bits pops-up try to convince it that you are in control.

A note on installing from Windows

The DOS based Windows versions put many "tentacles" in the vulnerable DOS kernel code, especially for accessing mass storage devices. Since the track0 area is an area of the disk that is normally out-of-scope for regular file-access, unpredictable things can happen. The NT-and-up versions are more reliable but the installer has not been tested as extensively on these versions as it has been on eComStation.

Installing AiR-BOOT from Linux

A Linux versions of the installer is in the works but at the time of this writing not ready yet. However, it seems a good idea to provide some info in advance.

Most Linux versions come with the GRUB boot-manager. There are two versions of GRUB: the legacy version (0.9x) and the new (1.9x) version. The new GRUB is a complete rewrite and differs considerably from the legacy version with regard internal operation and configuration / maintenance. In both cases however, a Linux installation will probably have installed the GRUB loader in the MBR, so installing AiR-BOOT would disable GRUB and make your Linux systems unbootable. AiR-BOOT cannot directly boot Linux but it can chain-load GRUB. So to boot Linux from AiR-BOOT the GRUB loader has to be relocated to a partition. See further down in this manual on how to do that. If you are planning to install a new Linux system and want to use AiR-BOOT too then place grub into the partition you install Linux into and not in the MBR.

In general

Refrain from using Windows to install AiR-BOOT. (Better yet, refrain from using it at all)
Put GRUB in a partition so it can be chain-loaded by AiR-BOOT.

Using AiR-BOOT in other languages

The default language for AiR-BOOT is English.
However, AiR-BOOT also supports German, French, Italian, Dutch, Russian and Swedish.
To use an alternate language, copy the corresponding file, called **AIRBT-??.BIN** to **AIRBOOT.BIN** before running the installer.
The ?? is the 2-letter language identifier.

Now that we have managed to install AiR-BOOT, let's see how it works and what we can do with it...

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Operating AiR-BOOT

After installing AiR-BOOT and rebooting your system you will be greeted by the **AiR-BOOT menu**.

It's presentation and navigation resembles OS/2 Boot-Manager, with the added benefit that it scans your partitions "on-the-fly" every time it is started and that configuration is embedded within and does not need external tools.

In the menu below you can recognize the Sample Configuration we are working with.

The AiR-BOOT menu after replacing OS/2-BM in the Sample Configuration

```
AiR-BOOT v1.1.0 - (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz
```

No	Hd	Label:	Type:	
01		FloppyDrive	Floppy	
02		CD-ROM	via BIOS	
03	01	PC-DOS7	FAT16Big	
04	01	eCS20-Maint	JFS	on drive E:
05	01	eCS20-HPFS	HPFS	on drive H:
06	01	eCS20-JFS	JFS	on drive J:
07	01	eCS20-mnt2	JFS	hidden E:
08	01	DATA-FAT32	FAT32	
09	01	DATA-HPFS	HPFS	on drive O:
10	01	DATA-JFS	JFS	on drive P:

Timed boot enabled. System will boot 'eCS20-Maint' in 15 seconds.

Press [Esc] to toggle timed boot, [Enter] to accept current selection.
Select another with the arrow keys, or press [TAB] to see BIOS POST message.
| DEL to Power Off | F10 to enter Setup |

Explanation of the screen layout

The No column

This column shows the *partition number / index*.

This index is a logical index and does not relate to the order by which partitions are stored on the disk(s).

Manually adding or removing a partition from the AiR-BOOT menu will renumber the list.

The Hd column

This column identifies the *hard-disk* that the partition is on.

For convenience the partition list or ordered by this column, so all partitions on the first (boot) disk are displayed first, then all other partitions on other disks. Note however, that AiR-BOOT disk enumeration depends on the BIOS and that a running eCS system may present disks in a different order, depending on loaded drivers, filters and disk types.

The Label column

This column shows the *Label* of the system.

AiR-BOOT takes this label from eCS LVM-info if present, from a BPB in case it supports one, or it displays the the type of the file-system when no other label-source can be found. While AiR-BOOT is capable of editing labels, you should familiarize yourself with how they are handled because of the different origins they might be taken from. The safest way is to label your partitions using MiniLVM because the presence of LVM information takes precedence over all other label-sources in AiR-BOOT.

Due to track0 space restrictions labels are always truncated to 11 characters in this version of AiR-BOOT.

So if you used MiniLVM to give a longer name, only the first 11 characters will be shown here.

This restriction might be lifted in future versions.

The Type column

This column shows the *type of the system*.

It is not directly a file-system identifier (but mostly is), but rather more a combination of file-system and/or partition-type.

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*A common misconception is that the type of a partition indicates a particular file-system. This is not the case since for instance, type 0x07 indicates an *installable file-system*, which can be HPFS, JFS, NTFS or even exFAT. Likewise a Linux partition of type 0x83 can host a multitude of file-systems, like EXT2/3/4, JFS, XFS, REISER3/4, BTRFS and whatnot.. And in the case of OS/2 Boot Manager (type 0x0a) there is no file-system to speak of, while in an opposite situation, that of many vendor's "recovery partitions", some custom type may be used that actually holds a FAT or otherwise "well known" file-system. As a rule of thumb: A partition type *does not* indicate a particular file-system !*

The bottom screen area

Besides displaying the Timer, this area displays the most important keys for controlling AiR-BOOT. **Esc** to toggle the timer, **ENTER** to boot the selected partition, **TAB** to switch between the menu and post-boot info and finally the **F10** key to enter **AiR-BOOT SETUP**.

Navigating AiR-BOOT

There is not much to say here other than that the bottom screen says it all.

Arrow UP/DOWN to get the cursor on the system you want to boot and press **ENTER** to boot it.

Just like OS/2 Boot Manager.

However, navigating the AiR-BOOT SETUP has a specific behavior because some changes are 'atomic' and other changes require 'saving the configuration'. These will be dealt with in the corresponding section.

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Why almost all partitions are initially listed, even non-bootable ones

At first this may seem strange behavior to you, but take into consideration that AiR-BOOT works *on-the-fly* every time it is started. At every boot, it *rediscovers* your disks and partitions. The only partitions that are hidden by default are IBM Boot Manager and spanned LVM partitions. Below is a more thorough explanation of this behavior.

Removing instead of adding

In OS/2-BM you have to manually *add* any partitions you want to boot to the OS/2-BM menu, using tools like MiniLVM or ClassicLVM.

AiR-BOOT needs the reverse: you have to *remove* any partitions from the menu you don't want.

This is because it *enumerates partitions on-the-fly* each time it is started, thus every time you boot your system.

It always shows all partitions after a fresh installation, whether they are bootable or not. (*Except OS/2-BM or Spanned LVM-Volumes*)

So it's the responsibility of the user to remove any unwanted partitions from the AiR-BOOT menu.

This is a *one-time action* and is only needed after a fresh installation of AiR-BOOT or when new data partitions are created.

When you decide to add a partition to OS/2-BM, *you* say it is bootable and OS/2-BM will happily try to boot it.

Even if it's a non-bootable partition.

AiR-BOOT does the reverse: it adds what it finds and requires you to say it's *not bootable*.

This "inverse logic" actually makes much more sense since any bootable system you add will be found without requiring your intervention and any non-bootable systems are removed with the same ease as adding bootable ones to OS/2-BM.

Why AiR-BOOT cannot safely determine whether a partition is bootable or not

When AiR-BOOT starts, right after getting control from the BIOS, it enumerates all partitions on all disks.

Since eComStation can also be booted from logical partitions, to distinguish such a bootable partition from a data partition would require further investigation with the need to access on the file-system level. And eCS is not the only system that can be booted from a logical partition, so it would require much more interrogation to determine whether such a logical partition is truly bootable or not.

This also goes for primary partitions, since these could be data partitions too. Since AiR-BOOT cannot access partitions on the file-system level, it has no true means to determine if a partition is bootable or not.

The meaninglessness of the 'bootable' or 'active' flag for AiR-BOOT

The 'bootable' or 'active' flag is meaningless to AiR-BOOT since AiR-BOOT is an *interactive* boot-manager. The bootable flag is used by simple MBR-code that do not interact with the user and just boots the partition that has this flag set.

That's also why, when uninstalling AiR-BOOT, you need to take care that a valid primary partition is marked bootable, otherwise you could end up with a non-bootable system.

Removing partitions from the AiR-BOOT menu is the user's responsibility

So, instead of AiR-BOOT making uneducated guesses about the bootability of the partitions it finds, it's up to the user to filter which partitions should be displayed and which should be hidden from the AiR-BOOT menu. This is a one time configuration effort that needs to be performed after a fresh install of AiR-BOOT or when non-bootable partitions are added. Partitions that are physically removed will just not be found when AiR-BOOT starts and will thus automatically disappear from the menu. The only partitions that AiR-BOOT always hides after a fresh install are the OS/2-BM partition and partitions that are part of an *LVM Spanned Volume*, type 0x35, which are not bootable anyway.

Removing partitions from the AiR-BOOT menu is completely unrelated to hiding partitions by changing their type

Note that the removal of partitions from the AiR-BOOT menu has nothing to do with the hiding of partitions by altering their partition type to a so called *hidden type* ! The hiding mentioned above is a feature of AiR-BOOT and only controls the *visibility* of a partition in the AiR-BOOT menu, conceptually equal to removing or adding a boot-entry from or to the OS/2-BM menu.

Removing a partition from the AiR-BOOT menu does not alter the partition or the partition tables in any way.

Now that we have covered these things, let's see how we can make this initial AiR-BOOT boot-menu look more like the OS/2 Boot Manager boot-menu we left behind.

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Hiding the non-bootable partitions

We enter the AiR-BOOT Setup by pressing **F10**, choose PARTITION SETUP and then remove the **B**-flags from entries we do not want shown in the Main Menu. Then we press **ESC** to return to the Main Setup Menu and then **F10** to save the configuration. The partition setup looks something like this:

```
AiR-BOOT SETUP v1.1.0
(c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz
```

No	Hd	Label	Flags	Type	No	Hd	Label	Flags	Type
01	01	PC-DOS7	BUHLP	FAT16Big	02	01	eCS20-Maint	BUHLP	JFS
03	01	OS2 BootMgr	BUHLP	OS2-BMGR	04	01	eCS20-HPFS	BUHLP	HPFS
05	01	eCS20-JFS	BUHLP	JFS	06	01	eCS20-mnt2	BUHLP	JFS
07	01	DATA-FAT32	BUHLP	FAT32	08	01	DATA-HPFS	BUHLP	HPFS
09	01	DATA-JFS	BUHLP	JFS	10	01	DATA-LUM	BUHLP	LUM-Data
11	01	DATA-LUM	BUHLP	LUM-Data	12	01	DATA-LUM	BUHLP	LUM-Data

↑ ↓ → ← : Choose partition
Enter : Edit label

F1 : Flags (press key to toggle)
Esc : Return to main-menu

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<http://svn.netlabs.org/air-boot>

Contact via e-mail: airboot@ecomstation.com

When we return to the Main Menu, it will look something like this:

```
AiR-BOOT v1.1.0 - (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz
```

No	Hd	Label:	Type:
01		FloppyDrive	Floppy
02		CD-ROM	via BIOS
03	01	PC-DOS7	FAT16Big
04	01	eCS20-Maint	JFS on drive E:
05	01	eCS20-HPFS	HPFS on drive H:
06	01	eCS20-JFS	JFS on drive J:

Timed boot disabled; no timeout will occur.

Press [Esc] to toggle timed boot, [Enter] to accept current selection.
Select another with the arrow keys, or press [TAB] to see BIOS POST message.
[DEL] to Power Off [F10] to enter Setup

Doesn't this look surprisingly much like the IBM Boot Manager screen we left behind ?

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Configuring AiR-BOOT

Unlike IBM-BM, AiR-BOOT does not require any external tools to manage its configuration. The next sections will cover the configuration of AiR-BOOT.

Entering and Leaving the Sub Sections

Below are the keys used to enter and leave the sub-menu's in the AiR-BOOT Setup.

Entering the SETUP (F10)

To enter the AiR-BOOT SETUP, press F10.

Having the cursor on an entry and pressing F1 will show a popup with information about what actions can be performed.

Entering a Setup Section (ENTER)

Place the cursor on the entry you want and then press ENTER.

The corresponding menu for the section will then appear.

Leaving a Setup Section (ESC)

Press the ESC key to return to the Main Setup Menu.

Now you can either save your changes by pressing F10 or discard them by pressing ENTER.

The AiR-BOOT SETUP Menu

```
AiR-BOOT SETUP v1.1.0
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PARTITION SETUP
BASIC OPTIONS
ADVANCED OPTIONS
EXTENDED BOOT OPTIONS
DEFINE MASTER PASSWORD
DEFINE BOOT PASSWORD
SAVE & EXIT SETUP
EXIT WITHOUT SAVING

↑ ↓ → ← : Choose Action
Enter   : Select Action

F10 :
Esc  :

HELP

Make your partitions
bootable, change their
name, define hiding
and much more.

<ENTER>

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For more information and source,
http://svn.netlabs.org/ai

Contact via e-mail: airboot@ecomstation.com
```

Please note that the site for "information and sources" displayed on this screen in v1.07 is *incorrect*!
Version v1.1.0 will display the correct information on this screen.

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PARTITION SETUP

The first thing you are likely interested in is hiding the data-partitions from the menu. So we press **ENTER** and a screen similar to this will appear:

AiR-BOOT SETUP v1.1.0
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No Hd	Label	Flags	Type	No Hd	Label	Flags	Type
01/01	PC-DOS7	BUHLP	FAT16Big	02/01	eCS20-Maint	BUHLP	JFS
03/01	OS2 BootMgr	BUHLP	OS2-BMGR	04/01	eCS20-HPFS	BUHLP	HPFS
05/01	eCS20-JFS	BUHLP	JFS	06/01	eCS20-mnt2	BUHLP	JFS
07/01	DATA-FAT32	BUHLP	FAT32	08/01	DATA-HPFS	BUHLP	HPFS
09/01	DATA-JFS	BUHLP	JFS	10/01	DATA-LUM	BUHLP	LUM-Data
11/01	DATA-LUM	BUHLP	LUM-Data	12/01	DATA-LUM	BUHLP	LUM-Data

↑ ↓ → ← : Choose partition
Enter : Edit label

F1 : HELP
Esc :

B - Bootable
U - UBR-Detection
H - Hidden Support
L - Partition Letter
P - Ext-Part MS invent

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Contact via e-mail: airboot@ecomstation.com

Note that the SETUP menu is actually composed of two halves, each displaying about half of all partitions present. Use the arrow-keys to navigate over the entries, press **ENTER** to customize the label.

The BVHLP Flags

These are shortly explained in the HELP popup you can activate by pressing F1.

Since AiR-BOOT comes in several languages these letters are language dependent, so if you use a non-English version of AiR-BOOT please substitute them in your mind when reading the following paragraphs.

Each letter in the Flags field is actually a 'hot-key' and pressing it will toggle the corresponding functionality or pop-up a secondary menu where advanced settings can be made. Both the 'H' and the 'L' activate such an advanced menu.

When a feature is active, its letter will display highlighted, otherwise it's dimmed.

The Bootable feature -- show or hide a partition from the main boot-menu

This is the thing you were probably looking for when you installed AiR-BOOT for the very first time and wondered how to convince it to leave out your data partitions. Pressing it toggles the visibility of the partition in the main boot-menu.

In the default configuration this option is set for all partitions except the IBM-BM partition if present and LVM spanned data partitions.

Depending on your point-of-view, this term "bootable" can be a bit misleading. It does not make a data partition bootable by magically installing partition loader code on it, nor does it remove loader code from a partition that is bootable.

The term Bootable refers to you wanting to boot that partition and thus having it displayed in the main boot-menu.

Setting the B on a non-bootable partition will show it in the boot-menu, but booting it will of course fail.

That is, unless some cosmic radiation has rearranged the magnetic particles on your disk to exactly match the pattern for a partition loader for the x86 cpu architecture...

The Virus Protect feature -- enable / disable virus checking

The loader-code has the ability to protect itself from boot-sector viruses.

It does this by checking whether some interrupt pointers point to ROM or RAM areas. If such a pointer points to a RAM area, the loader-code assumes some malicious program has intercepted the vector because normally control is directly transferred from the BIOS to AiR-BOOT. In such a case AiR-BOOT will refuse to operate any further and a hard reset of the system is required.

With today's advanced systems however, it's possible that this check intervenes with system operation.

If that's the case you can turn this option off by pressing V and save the new configuration.

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The Hide Partition feature -- hide one or more partitions

This is an enhanced feature that shows a popup-menu where you can set which partitions need to be hidden when the corresponding entry is booted. So this is a per-system setting. Some legacy systems, like DOS and also the DOS based Windows systems like Win3x, Win95/98/ME, use partition-loader code that gets confused when multiple primary partitions formatted with FAT are visible. It can happen that you boot the third primary containing PC-DOS7 but that the PBR-code of PC-DOS7 actually boots your DOS 3.3 from the first primary. Using this feature you can mark the partitions you want hidden when booting the corresponding entry.

The advanced popup looks like this:

```
AiR-BOOT SETUP v1.1.0
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No Hd  Label      Flags    Type
-----
01/01  PC-DOS7    BUHLP    FAT16Big
03/01  OS2 BootMgr BUHLP    OS2-BMGR
05/01  eCS20-JFS  BUHLP    JFS
07/01  DATA-FAT32 BUHLP    FAT32
09/01  DATA-JFS  BUHLP    JFS
11/01  DATA-LVM  BUHLP    LVM-Data

↑ ↓ → ← : Choose partition
Enter   : Edit label

Hide Feature
-----
PC-DOS7 [FAT16Big] : Unhidden
eCS20-Maint [JFS]  : Unhidden
OS2 BootMgr [OS2-BMGR] : Unhidden
eCS20-HPFS [HPFS]  : Unhidden
eCS20-JFS [JFS]    : Unhidden
eCS20-mnt2 [JFS]   : Unhidden
DATA-FAT32 [FAT32] : Unhidden
DATA-HPFS [HPFS]   : Unhidden
▼▼▼
<State when booting PC-DOS7>-

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http://svn.netlabs.org/air-boot

Contact via e-mail: airboot@ecomstation.com
```

At the bottom of the green advanced popup you can see to which partition the hide feature will be applied.

It corresponds to the entry highlighted in the main blue menu, in this case PC-DOS7.

Pressing the **SPACEBAR** will toggle the Unhidden/Hidden status in the green advanced popup, **UP/DOWN** will navigate.

Also, pressing **F1** will show a compact help popup.

The Drive Letter feature -- Forcing an LVM drive-letter

This option only effects eComStation LVM drive-letter assignments.

It does not make DOS boot from D: or Windows from W:

It's main function is to force a drive-letter on an eCS bootable partition and it's main usage is to have multiple eCS installations using the same boot-drive-letter. It will not magically make eCS boot from another drive-letter then it was installed to !

Pressing **L** will show a popup and pressing a letter will assign that letter to the LVM-information for that partition.

Pressing **BACKSPACE** will clear the assignment.

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BASIC OPTIONS

Here you can set some basic options and the screen will resemble something like this:

```

                AiR-BOOT SETUP v1.1.0
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Default Selection      : PC-DOS7   Include Floppy Drive  : Enabled
Timed Boot            : Disabled  Show LVM Drive Letters : Enabled
Timed Boot Delay (sec) : 15       MBR Protection       : Disabled
Timed Key Handling    : Do Nothing -> Ignore MBR Writes  : Disabled
Boot From Last If Timed : Enabled
Remember Last Boot   : Enabled   Make Sounds          : Disabled
Remember Timed Boot  : Disabled  Cooper Bars         : Disabled

↑ ↓ → ← : Choose Item      F1 : Show help for Item
PgUp/Dn : Change Item     Esc : Return to main-menu

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      http://svn.netlabs.org/air-boot

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```

Default Selection

This is where you can specify which system you want to boot by default. Press the **SPACEBAR** to cycle through all entries that have the **B**-flag set. Note that this option has no effect when "Remember Last Boot" is enabled.

Times Boot

This option enables / disables the timer. A default AiR-BOOT installation from scratch has the timer enabled, so here is where you can turn it off. Simply pressing **ESC** in the main AiR-BOOT menu toggles the timer activity for the current boot only.

Times Boot Delay

Speaks for itself; it is the boot-delay in seconds when a timed boot is enabled. Use PgUp/PgDn to decrease/increase. (yes, it's a bit counter intuitive)

Timed Key Handling

Here you can set what you want AiR-BOOT to do when a key is pressed while counting down to boot. The options are:
- Do Nothing
- Reset Time
- Stop timer
Press the **SPACEBAR** to cycle to the above options.

Boot From Last If Timed

When this option is enabled, AiR-BOOT will boot the entry that was last booted when using timed-boot.

Remember Last Boot

When this option is enabled, AiR-BOOT will remember the last non-timed boot and the "Default Selection" has no effect.

Remember Timed Boot

When this option is enabled, AiR-BOOT will remember the last timed boot.

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Include Floppy Drive

Enabling this option will show booting from floppy in the AiR-BOOT Main Menu.

Show LVM Drive Letters

Enabling this option will show the corresponding drive-letter for each eCS bootable partition.

It does not show drive-letters for DOS or Windows systems since their assignments are handled differently from eCS LVM.

MBR Protection

This is a left-over from the era where DOS viruses could infect the MBR.

With the enhancements made to AiR-BOOT this feature is currently broken and will probably be removed or changed in future releases.

Best is to leave it off.

Ignore MBR Writes

This feature is also non-functional and should not be changed.

Make Sounds

When this option is enabled, AiR-BOOT will treat you with some audible feedback.

Cooper Bars

Enabling this option will play some nifty tricks with you VGA-card, like smooth scrolling between the main and setup menu's.

Withing virtual machines it will probably act bumpy due to the lack of real hardware to manipulate.

Also, do not get too attached to this bling-bling thingy because it might get removed in future releases to free-up code space.

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ADVANCED OPTIONS

Here you can set a number of advanced options and the screen will resemble something like this:

```

                                AiR-BOOT SETUP v1.1.0
                                (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz

```

Boot Menu : Enabled	Get Floppy Name : Disabled
Partitions Autodetect : Enabled	-> Get Every 2 Seconds : Disabled
-> Security Options <-	Virus Detection : Disabled
Passworded Setup : Disabled	Stealth Detection : Disabled
Passworded System : Disabled	VIBR Detection : Disabled
Passworded Change Boot : Disabled	Continue BIOS Boot Seq : CD-ROM
↑ ↓ → ← : Choose Item	F1 : Show help for Item
PgUp/Dn : Change Item	Esc : Return to main-menu

```

                                This software is released under GPLv3+
                                http://www.gnu.org/licenses/gpl.txt

                                For more information and source, please visit:
                                http://svn.netlabs.org/air-boot

                                Contact via e-mail: airboot@ecomstation.com

```

Boot Menu

Here you have the following options:

Enabled

This is the default and it shows the standard AiR-BOOT Menu.

Detailed

Choosing this option will show the sizes of the partitions in the Hd-column.

However, at the last moment I noticed there is a border-drawing flaw such that the left and right border are not drawn correctly.

Disabled

This will keep AiR-BOOT from displaying the Main Menu when started. (As if it was not installed at all)

It will directly boot the Default Selection you have set.

If you are a die-hard fan of the IBM Boot Manager, you can enable it by setting the B-flag on it's partition, setting it as the Default Selection and then disable the AiR-BOOT Menu. AiR-BOOT will then transparently boot into IBM-BM giving you that "good old feeling" :-)

When the AiR-BOOT Menu is disabled, there is no user interaction so F10 is not available to enter AiR-BOOT Setup. In that case, hold down on of the Alt-keys when AiR-BOOT is starting and you will be thrown into AiR-BOOT Setup.

Partitions Autodetect

As you know by now, AiR-BOOT scans for partitions every time it is started.

New partitions are added to the menu and removed partitions are deleted from it.

Setting this option to disabled makes AiR-BOOT do no scans and use the previous configuration.

Thus, when disabled and you made major modifications to you harddisk layout, things might go very weird.

Security Options

Here you can specify at what places AiR-BOOT should ask for a password before proceeding.

This is handy on machines that are part of a more controlled environment.

The **MASTER** and **BOOT** passwords can be set using the main setup menu. *(as will be shown later)*

Get Floppy Name

This feature is not working currently.

The idea is to show the floppy-label in the menu when booting from floppy is enabled.

Best is to keep it disabled.

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Virus Detection

This option globally enables or disables virus detection for the two entries below it.

Master Boot Sector and Partition Boot Sector viruses stem from the DOS era and are not very common anymore.

Many of them have been rewritten to Word Macro's or ActiveX, where they found a much more comfortable home :-)

Also, with the enhancements made in post v1.06 versions, the virus detection has not been thoroughly tested.

Another thing is that enabling it may interfere with protected mode operating systems like eComStation, so it's best to keep the virus detection disabled.

Stealth Detection

When this option is enabled, an attempt will be made to discover stealth viruses.

Again, this has not been tested with the enhancements made to AiR-BOOT, so better leave it disabled.

VIBR Detection

This checks to see if a Partition Boot Record has been changed since the last time and possibly could contain a virus.

For eComStation however, the PBR will be changed when using the enhanced drive-letter feature.

While such a change will update the CRC of the PBR in the AiR-BOOT Configuration, it's also better to leave this one disabled.

Continue BIOS Boot Seq

This option re-transfers control to the BIOS for a particular device.

The choices are:

- Disabled
- CD-ROM
- Network
- ZIP/LS120

This is highly BIOS dependent and most options here do not work on modern BIOSes.

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EXTENDED BOOT OPTIONS

Here you can set some (less useful) options for booting and the screen will resemble something like this:

```

                                AiR-BOOT SETUP v1.1.0
                                (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz

```

Ignore LVM information : Disabled	
Ext-Part MS Workaround : Disabled	
↑ ↓ → ← : Choose Item PgUp/Dn : Change Item	F1 : Show help for Item Esc : Return to main-menu

```

                                This software is released under GPLv3+
                                http://www.gnu.org/licenses/gpl.txt

                                For more information and source, please visit:
                                http://svn.netlabs.org/air-boot

                                Contact via e-mail: airboot@ecomstation.com

```

Ignore LVM information

When this option is enabled AiR-BOOT will ignore LVM information if present. If you use eComStation, it is highly recommended to leave this option disabled.

Ext-Part MS Workaround

When this option is enabled, the partition identifier of the extended container will be changed to comply with "MS Inventions". Just leave it disabled if non of your doze-systems complain.

A normal extended partition container has an identifier of 0x05. However, Microsoft found it necessary to also introduce the 0x0f identifier to indicate LBA usage. As usual they don't consider the possibility of other operating systems being used and even less that they could be booted from a logical partition like eComStation.

DEFINE MASTER PASSWORD

Here you can define the master password. You will be presented with a popup to enter it. Entering nothing will clear the password. (After giving the correct one if one is set)

DEFINE BOOT PASSWORD

Same as for MASTER PASSWORD.

SAVE & EXIT SETUP

Save your setup changes to the AiR-BOOT Configuration which is stored in track zero.

EXIT WITHOUT SAVING

Do not save your changes. Not however that some changes are 'atomic', like forcing a drive-letter to an LVM partition and even if you exit without saving, the change will be recorded because the configuration is saved when a system is booted. This behavior will be improved upon in future releases.

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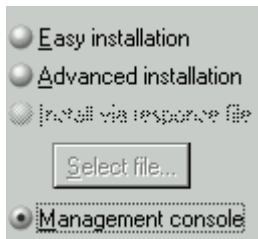
Version 1.1.0

Removing AiR-BOOT

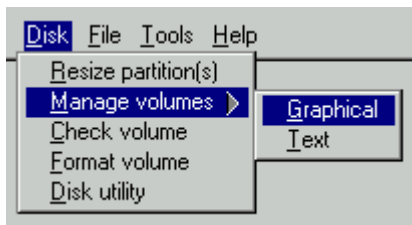
When AiR-BOOT gets installed it replaces the Master Boot Record at the first sector of the disk and puts its code and configuration at the sectors following the MBR. So, to remove AiR-BOOT, all that is needed is to replace the MBR with the standard eCS version. That's what MiniLVM does when removing AiR-BOOT.

Removing AiR-BOOT by using the eComStation Boot-CD (v2.1 or higher)

Just boot your copy of the eComStation CD-ROM (v2.1 or higher) and go into the *Management Console*.

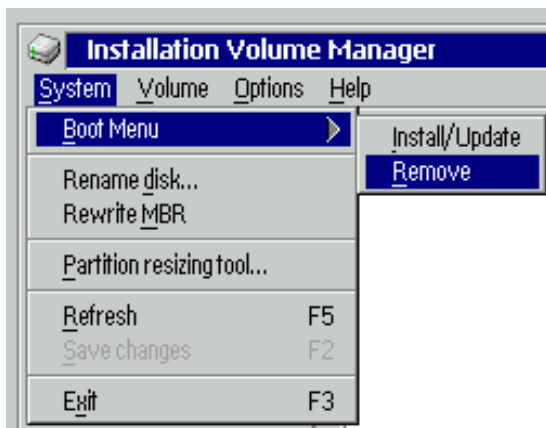


Once in the *Management Console* chose: "Disk->Manage Volumes->Graphical" from the menu-bar.



This will start the "Graphical (Installation) Volume Manager", also known as "MiniLVM".

From its main-menu choose: "System->Boot Menu->Remove".



Some things to be aware of

Now that AiR-BOOT is removed, the MBR has been replaced by a standard eCS MBR.

The code in this MBR looks for an active primary partition, so don't forget to mark a partition as "startable".

You can use the Installation Volume Manager for that and if you have OS/2 Boot Manager installed that would be the partition to mark startable. Without AiR-BOOT or OS/2-BM installed, you cannot boot any logical partitions.

That's all there is to it !

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Removing AiR-BOOT using the command-line installer

This is currently not supported.

The reason is that it would involve rewriting the MBR with a "standard" version. However, such a standard version does not exist. Operating Systems like DOS and Windows use their own MBR-code as do OS/2 and eComStation. Also, such foreign MBR-code cannot be embedded in AiR-BOOT, since it is open-source and this foreign MBR-code is not.

Since booting OS/2, eComStation or OS/2 Boot Manager require special Int13X handling when they are located above the 1024-cylinder limit of the BIOS, the safest MBR-code to use is that from the eCS v2.x version. It is also compatible with DOS and Windows. Such an MBR can be generated with the command: **LVM /NEWMBR:1**

Removing AiR-BOOT by regenerating the MBR using non-eCS systems

Many Operating Systems or disk-maintenance tools incorporate a way to generate a fresh MBR.

If you are using OS/2 or eComStation, using these MBR's might cause some or all of your OS/2 -- eComStation installations to fail to boot. The reason is, as explained above, the absence of special Int13X code in these MBR's.

Some things to be aware of

Now that AiR-BOOT is removed, the MBR has been replaced by a standard eCS MBR.

The code in this MBR looks for an active primary partition, so don't forget to mark a partition as "startable".

You can use the Installation Volume Manager for that and if you have OS/2 Boot Manager installed that would be the partition to mark startable. Without AiR-BOOT or OS/2-BM installed, you cannot boot any logical partitions.

Upgrading AiR-BOOT

This version (v1.1.0) can upgrade AiR-BOOT from v1.06, v1.07 and v1.08. (which was limited distributed test-version) Most if not all configuration settings of the previous version will be taken over, however it's a good idea to check your configuration after an upgrade.

Upgrading from pre-v1.06 versions

Upgrading from v0.9x version should work but it has not been tested.

Upgrading from older versions than v0.9x is not supported, so you'll have to remove the old version and reinstall the new version after which you need to reconfigure AiR-BOOT.

Notice about upgrading from v1.07

Due to the bugs in the v1.07 release, the hidden partitions are cleared, so you have to reconfigure these if you used this feature.

Downgrading AiR-BOOT

If, for whatever reason, you want to downgrade AiR-BOOT, you'll have to do a remove and reinstall.

First remove AiR-BOOT and then install the version you want to use.

Important: use the installer from the version you are installing !

Advanced Usage

Some advanced features / usages are discussed in the next sections.

Cloning eCS Systems

If you are an eComStation developer, you might want to test some new stuff without changing your current system configuration. Doing a fresh install will take some time and configuring it alike will take some more.

With the Drive Letter Feature of AiR-BOOT it becomes more easy to clone a system and even boot it using the same drive-letter.

First prepare your clone partition

Create a new partition with MiniLVM and format it with the same file-system as the original.

Assign it a free drive-letter, it does not matter which one.

This is the partition where the clone system will be copied to.

It does not matter if the original is PRI and the clone is LOG, or vice-verse, just as long as the file-system is the same.

If the file-system also differs then you need to copy the corresponding OS2BOOT to the clone.

Also use a partition / volume name to distinguish it from the original.

Boot from the eCS BOOT-CD to create the clone

Go into Maintenance Mode and very that both partitions are accessible.

Assuming X: is the original and Y: is the clone, give the following command:

```
XCOPY X:\ Y:\ /H /O /T /S /E /R /V
```

This will copy the complete content of the original to the clone, and since you booted from the eCS-CD no files are open.

Reboot to setup AiR-BOOT

Now reboot and enter the AiR-BOOT Setup.

Go to PARTITION SETUP and select the partition of the original.

Now press the L-key and press the letter it boots from, this will force this letter on the original.

Now select the partition of the clone.

Again press the L-key and assign it the ***same*** drive-letter as the original.

Save the configuration.

Booting the clone

When back in the Main Menu, the clone entry will still show the drive-letter you assigned when you created the partition. However, when booting it the drive-letter you forced will be used and the drive-letter on the original will be hidden.

On the next reboot, you will see AiR-BOOT displaying the original with the hidden indicator and both the original and the clone show the same drive-letters. *This hiding is not partition-ID hiding but LVM drive-letter hiding !*

Booting the original will hide the clone, so on next reboot the clone will be shown as hidden.

Using IBM-BM together with AiR-BOOT

While AiR-BOOT can chain-load IBM-BM, you need to be aware of some things when doing so. IBM-BM has been around for a long time and in fact was one of the first truly usable boot-managers of its era. When OS/2 changed from legacy partitioning to LVM partitioning, IBM-BM also changed in functionality. On today's systems there is no real need to use IBM-BM and AiR-BOOT is the preferred boot-manager.

However, if you use old OS/2 systems, you might need the IBM-BM that accompanied them since AiR-BOOT might not be compatible with such old systems yet. Booting IBM-BM from AiR-BOOT involves some things you need to be ware of, wether it's a pre-LVM IBM-BM or a recent one.

Manipulating IBM-BM when AiR-BOOT is in control

IBM-BM is always installed in a primary partition and it gets booted just like any other 'active' partition. However, IBM-BM has a supporting program called SETBOOT, which is able to manipulate the IBM-BM configuration. Also, there are various third-party programs that assume that when an IBM-BM partition (0x0A) is present, IBM-BM is in control. This is ***not*** the case when AiR-BOOT is installed, so manipulating IBM-BM specific stuff by methods other than SETBOOT (*AiR-BOOT version*) will have no effect.

Relocating GRUB from the MBR to the PBR

Relocating GRUB is dependent on the Linux distribution used and the version of GRUB used. The procedure below is for Ubuntu and it's derivatives like Linux Mint, for other distro's consult the accompanied documentation.

These are the steps:

- Boot the live-CD from your distribution or use a recent Knoppix CD
- Open a terminal and give the following commands:

```
sudo su
mkdir /1
fdisk -l
mount /dev/sdxn /1
mount -o bind /dev /1/dev
mount -o bind /proc /1/proc
mount -o bind /sys /1/sys
chroot /1
grub-install --force /dev/sdxn
update-grub
exit
umount /1/dev
umount /1/proc
umount /1/sys
exit
reboot
```

The instructions above make you root in the terminal, create a temporary directory to mount the Linux partition, bind the needed virtual file-systems, enter the mounted system, reinstall and update GRUB, exit the mounted system, unmount the virtual file-systems and reboot the system.

The `/dev/sdxn` is the partition where Linux is installed and where GRUB will be installed after these commands. It can be something like `/dev/sda7` or whatnot and `fdisk -l` or `cdisk` will show a list of your partitions.

When AiR-BOOT is installed your Linux System should be in the AiR-BOOT Main Menu and be bootable. Booting it will chain-load GRUB from where you can start Linux just as before the move of GRUB.

Do *not* attempt the above procedure if you are not familiar with the commands given there !

Trouble Shooting

This section contains some tips on trouble shooting with AiR-BOOT.

Overwritten MBR

Since AiR-BOOT is a track0 boot-loader, it is vulnerable to foreign disk management programs that overwrite the MBR. While this does not destroy the AiR-BOOT configuration or it's code, AiR-BOOT is merely disabled. Therefore it's a good idea to have the AiR-BOOT files at hand when such a thing happens. The files you need are: **AIRBOOT.BIN**, **AIRBOOTD.EXE**, **AIRBOOTW.EXE** and **AIRBOOT2.EXE**. Having these files you are able to repair AiR-BOOT from DOS/Win3x/9x, Windows 2000/XP/Vista/7/8 and eComStation. Simply have them all in the same directory on some medium and run the appropriate installer for the OS you use to repair AiR-BOOT.

Corrupted Code

The AiR-BOOT loader-code is CRC protected.

Every time AiR-BOOT starts it checks the integrity of the loader-code by calculating it's CRC. If the calculated CRC does not match the stored CRC the code is considered corrupted and you will see a screen like this:

```
AiR-BOOT: !ATTENTION!  
- The code of AiR-BOOT is not intact anymore.  
  Please boot via AiR-BOOT disc to restore AiR-BOOT.  
  System halted. Please press RESET._
```

If something like this happens it means that something has altered one or more sectors between the MBR and the AiR-BOOT configuration which is strange since this space is normally not used.

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To repair AiR-BOOT just run one of the command-line installers or use the eComStation CD-ROM to remove and reinstall AiR-BOOT. Below we used the DOS installer for the repair:

```
AiR-BOOT Installer v1.1.0 for DOS
- (c) Copyright 1998-2012 by Martin Kiewitz.

-> ...Please wait... <-
- Loading bootcode from file...ok
- Loading MBR from harddisc...ok

-> ...Current Status... <-
- AiR-BOOT is not intact
- Configuration is intact (v1.1.0)

-> ...Please press... <-
<R> - Repair AiR-BOOT 'v1.1.0/english' on current system
<D> - Delete AiR-BOOT from current system
<Q> - Quit without any change

-----
Add/Repair/Update AiR-BOOT in progress...
  ■ Writing AiR-BOOT code...ok

Your copy of AiR-BOOT is now fully functional.
Please hit ESC to exit AiR-BOOT installer or ENTER to reboot your system...
```

In -> ...Current Status... <- you can see that AiR-BOOT detects that it's not intact anymore and offers to repair. We pressed **R** and this made AiR-BOOT rewrite it's loader-code together with it's MBR, so on next reboot AiR-BOOT is functional again.

Corrupted Configuration

The AiR-BOOT configuration-section is also CRC protected.

So poking values using some sector editor will cause the configuration to become invalid, showing the following screen:

```
AiR-BOOT v1.1.0 - (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz
Build Date: 2013/04/05 01:01:00 [JWasm]

Boot Disk is Huge : NO
eCS Install Phase 1 : NOT ACTIVE

- The configuration of AiR-BOOT is not intact anymore.
  Please boot via AiR-BOOT disc to restore AiR-BOOT.
  System halted. Please press RESET._
```

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Like with corrupted code, if something like this happens it means that one or more sectors in the AiR-BOOT configuration in track0 have been altered, which is strange and should require further investigation.

To Repair AiR-BOOT we again run one of the installers or the eComStation CD-ROM to remove and reinstall AiR-BOOT. Below we used the DOS installer again for the repair:

```
- (c) Copyright 1998-2012 by Martin Kiewitz.

-> ...Please wait... <-
- Loading bootcode from file...ok
- Loading MBR from harddisc...ok

-> ...Current Status... <-
- AiR-BOOT is intact (v1.1.0)
- Configuration is not intact
- Language is english

-> ...Please press... <-
<R> - Repair AiR-BOOT 'v1.1.0/english' on current system
<D> - Delete AiR-BOOT from current system
<Q> - Quit without any change

-----
Add/Repair/Update AiR-BOOT in progress...
  ■ Writing AiR-BOOT configuration...ok

Your copy of AiR-BOOT is now fully functional.
Please hit ESC to exit AiR-BOOT installer or ENTER to reboot your system...
```

In -> ...Current Status... <- you can see that AiR-BOOT detects that it's configuration not intact anymore and offers to repair. We pressed **R** and this made AiR-BOOT rewrite it's configuration. Because the configuration is rewritten, you lost your settings and have to configure them again using the AiR-BOOT Setup.

eComStation does not boot

The following sections cover situations where eComStation fails to boot.

Missing COUNTRY.SYS

If you get the following screen:

```
The system cannot find the file E:\OS2\SYSTEM\COUNTRY.SYS specified
in the COUNTRY statement on line 93 of the CONFIG.SYS file.
Line 93 is ignored.
The system is stopped. Correct the preceding error and
restart the system.
```

Then this means eComStation was installed on a different drive than the one that is currently set in the LVM information. This can happen if you are playing with the drive-letter feature or for some other reason.

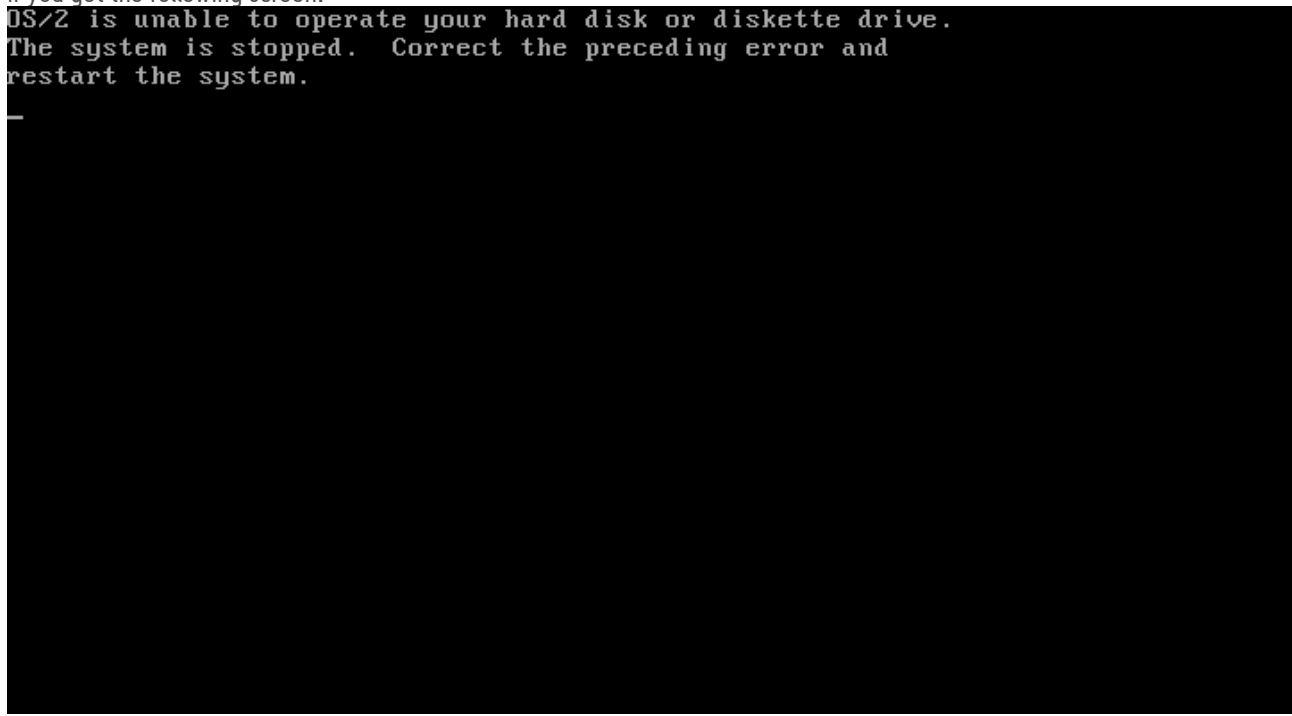
As you can see the drive-letter where the system expects COUNTRY.SYS is displayed, E: in the case above. To solve this problem, force this drive-letter on this boot-entry using AiR-BOOT Setup and try to boot the partition again. This should now succeed. After a successful boot you can remove the forced drive-letter, unless you are using multiple installations using this letter.

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Unable to operate hard disk

If you get the following screen:



```
OS/2 is unable to operate your hard disk or diskette drive.  
The system is stopped. Correct the preceding error and  
restart the system.
```

One reason could be the LVM information is missing or corrupted.

This is not something you can fix from within AiR-BOOT and you have to use the eComStation Disk Utility.

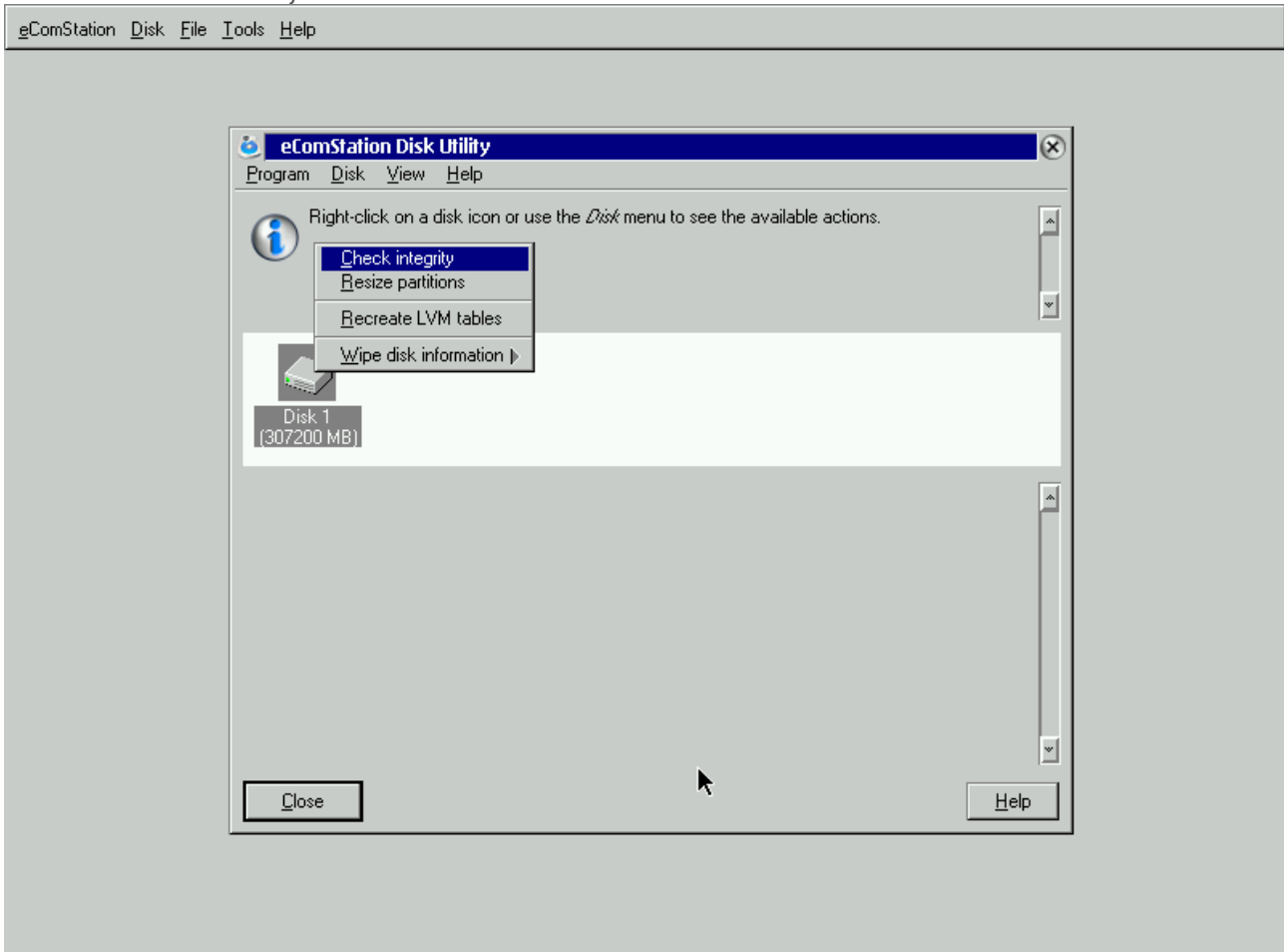
- Boot from the eCS CD-ROM
- Go into Maintenance Mode
- Choose "*Disk-Disk Utility*" from the Menu
- The Disk Utility window will appear
- Now click on the disk in question and click on the *right* mouse-button

You will see a screen like below.

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The screen of the Disk Utility:



Now click on *"Check integrity"* and follow the instructions.
If it states that the LVM signature is missing the let the utility fix it.

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Virus warning

When you have setup AiR-BOOT to detect viruses, it checks the CRC of the Partition Boot Record against the stored CRC in the AiR-BOOT configuration. If there is a mismatch a screen resembling this will appear:

```
AiR-BOOT v1.1.0
(c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz
This is GPLv3+ software, please visit: http://www.gnu.org/licenses/gpl.txt
To obtain the sources, please visit: http://svn.netlabs.org/air-boot

Booting the system using eCS20-Maint partition; please wait...

- !ATTENTION! -> A VIRUS WAS FOUND <- !ATTENTION!
  It is located in the boot-record of the partition, you wanted to boot.
  Use a virus-checking program. It could be false alarm either.
  After removal, you have to reinit the detection variables, go into
  'PARTITION SETUP' and switch VIBR-detection two times (off/on).
  If this was just a false alarm, leave it in off-state.
  System halted. Please press RESET.
```

Of course this could be a valid virus warning.

However, PBR viruses are not so common anymore and a more likely cause for this warning is that some program altered the PBR. You cannot boot this partition until you clear its *'infected'* state:

- Enter the AiR-BOOT Setup
- Enter PARTITION SETUP
- Place the selection bar on the partition in question
- Press the V-key ***two*** times

This clears the infected state of the partition.

Caution !!

This section is about some things you should keep in mind. Some are related to using AiR-BOOT, others may not.

Installation of Windows Vista / 7 and 8(?) overwrites primary partitions with type 0x07

The installation of Windows Vista and Windows 7 has been greatly simplified with regard to Windows XP. Not only with regard to the user but apparently also with the regard to check the file-system used by 0x07 partitions.

Since type 0x07 is an *installable file-system* indicator, and has been introduced in OS/2 v1.1 which supported HPFS, it does not specify a specific file-system or operating-system at all. The OS/2 HPFS, OS/2 JFS, Windows NTFS and Windows exFAT all use this 0x07 identifier.

If you have an eComStation in a primary partition using HPFS or JFS, and thus using the type 0x07 identifier, installation of Windows Vista or Windows 7 can potentially *overwrite* the partition without any warning !

Depending on the layout of your hard disk, the Vista / 7 / 8(?) installation program presents these partitions as unused or usable for the Windows installation you are doing without correctly identifying on which partition it will be installed.

The installable file-system is an invention of Microsoft itself and even a humble program like AiR-BOOT can detect which file-system the 0x07 partition uses.

Therefore this behavior is considered a *deliberate* act to destroy non-Windows systems on the users hard disk.

I wonder if they also overwrite their own exFAT data which also uses type 0x07.

Using AiR-BOOT on USB sticks

Whether AiR-BOOT can be used on USB sticks is highly dependent on how the BIOS handles USB Mass Storage devices and physical disk numbering. Because USB sticks can be put into any system able to boot from them, the functionality of AiR-BOOT is dependent on the system that boots the stick. If the BIOS does not handle disk-numbering the way AiR-BOOT expects, it may overwrite the MBR and possibly track0 of the real hard disk instead of the booted USB stick !

It is not advised to use AiR-BOOT on USB unless you know for sure it works on the systems you boot from it !

Using multiple DOS installations can boot wrong partition

DOS was never designed to boot with other primary partitions visible and formatted with FAT12 or FAT16. More specifically, the DOS PBR boot-code just boots the first primary FAT-partition it sees (and is bootable). When you have two DOS systems installed, on the first and second primary partitions, and you boot the second one, changes are that the PBR code actually boots the first partition. This goes even more for older DOS versions, like the v3.x series.

You can work around this by using the Partition Hiding feature of AiR-BOOT to hide all other partitions for a specific DOS install.

FreeDOS is more flexible and can even be installed in a logical partition, but partition hiding is still needed because also the PBR code of FreeDOS plays some tricks.

The AiR-BOOT 45 Partitions Limitation

AiR-BOOT currently supports upto 45 partitions. This means ***all*** the partitions found (*including non-bootable ones*) on ***all*** disks ! Future versions might lift this limitation.

When more than 45 partitions are found AiR-BOOT starts with a warning notice and halts for you to read it. Pressing **ENTER** makes AiR-BOOT continue, ***but the last partitions will not be accessible !***

To indicate this exceptional situation during AiR-BOOT usage, the selection-bar is colored red.

You should correct this situation as soon as possible !

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The Warning Popup when using >45 Partitions

```
AiR-BOOT v1.1.0 - (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz  
Build Date: 2013/04/05 01:01:00 [JWasm]
```

```
Boot Disk is Huge : NO  
eCS Install Phase 1 : NOT ACTIVE
```

Too many partitions found. AiR-BOOT is supporting up to 45.

The Main Menu with the red selection-bar when using >45 Partitions

```
AiR-BOOT v1.1.0 - (c) 1998-2013 Martin Kiewitz, Dedicated to Gerd Kiewitz
```

No	Hd	Label:	Type:
01		FloppyDrive	Floppy
02		CD-ROM	via BIOS
03	01	PC-DOS7	FAT16Big
04	01	eCS20-Maint	JFS on drive E:
05	01	eCS20-HPFS	HPFS on drive H:
06	01	eCS20-JFS	JFS on drive J:
07	01	Volume 10	FAT16Big
08	01	Volume 11	FAT16Big
09	01	Volume 12	FAT16Big
10	01	Volume 13	FAT16Big
11	01	Volume 14	FAT16Big
12	01	Volume 15	FAT16Big
13	01	Volume 16	FAT16Big
14	01	Volume 17	FAT16Big

Timed boot disabled; no timeout will occur.

Press [Esc] to toggle timed boot, [Enter] to accept current selection.
Select another with the arrow keys, or press [TAB] to see BIOS POST message.
[DEL to Power Off] [F10 to enter Setup]

Quick FAQ

This section attempts to answer some frequently asked questions.

Where is AiR-BOOT stored ?

In track0 of the boot-disk.

AiR-BOOT is a so called track0 boot-loader and does not require a dedicated partition like IBM-BM.

However, the space in track0 is a "nowhere's land" and besides the MBR the rest of the space has no official designation.

Therefore, the space may be claimed by other systems like the Ontrack Disk Manager.

The last sector of track0 is used by the eCS LVM system to store information about the disk geometry and the four partition entries that the MBR can contain. AiR-BOOT of course recognizes this usage.

The layout of track0 when AiR-BOOT is installed is roughly:

- AiR-BOOT MBR
- AiR-BOOT Loader Code
- AiR-BOOT Main Configuration
- AiR-BOOT Internal Tables
- Backup of the MBR last booted
- LVM sector (not part of AiR-BOOT)

Can AiR-BOOT boot Linux ?

Yes, by chain-loading the boot-loader used by the Linux installation.

For this to work the Linux boot-loader, usually GRUB, must be installed in the partition where Linux is installed and not in the MBR space. If you currently have GRUB installed in the MBR you need to relocate it.

I have more Windows Vista / 7 installations and they are all called Windows... (?)

Windows uses it's own PBR boot-loader which can be installed in a DOS partition, a partition it bluntly overwrote that contained your eComStation installation or an NTFS partition where also the Windows system itself is installed.

With one Windows version installed this loader is invisible because it just boots this only Windows system.

With multiple Windows installations however, you are presented with a menu and the fact that they are all called Windows is a feature of the Windows boot-loader. You should know by know that in Microsoft's mind there exist no other operating systems besides Windows. I have found no user friendly way to alter the names presented, but I did not expect that from a brain-dead loader such as this. Call the Microsoft tech support and after that contact their legal department to notify them of your intention to file a class-action law-suit for deliberately destroying eComStation installations when installing Windows.

Can AiR-BOOT boot ancient OS/2 systems ?

Yes, it most probably can.

You may need to use the Partition Hiding feature to be successful.

Also, you could install the IBM Boot Manager of the ancient system in question and chain-load that.

Beware that ancient systems have severe limitations with regard to disk sizes and are often bound to the famous BIOS 1023 cylinder limit. Best is to keep such old systems below the 8 GiB boundary.

Does installing AiR-BOOT destroy IBM Boot Manager ?

No.

It just takes over the MBR that now loads AiR-BOOT instead of IBM-BM.

You can even chain-load your IBM-BM from within AiR-BOOT but use that with caution.

Simply giving the command LVM /NEWMBR:1 in an OS/2 prompt and then setting Boot Manager active will restore IBM-BM as your boot-manager.

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AiR-BOOT versions

There might be a bit of confusion about AiR-BOOT and it's versioning.

The AiR-BOOT version that comes with eComStation is specifically modified to replace the functionality of IBM Boot Manager and to cope with other issues like huge (>502GiB) disks. Below is a more thorough explanation.

AiR-BOOT classic

All AiR-BOOT versions in the v1.x.y scheme are based upon the v1.06 code-base.

This implies that they are track0 bound, written in Assembly and will never exceed 31KiB in size.

Version v1.06

This is the last version developed by Martin Kiewitz.

The eCS enhanced versions, starting with v1.07, are based upon these sources but are not developed / maintained by Martin.

Version v1.07

Version v1.07 was the first eCS enhanced version and was delivered with the release of eComStation v2.1 in may 2011.

It contained the wrong contact information and many people used the source-forgo site to post issues.

This version also contains a number of known bugs, which are:

Force BIOS-LBA Usage must be ***enabled***

Do ***not*** disable this feature when using v1.07 !

When disabled, AiR-BOOT uses CHS-addressing and with todays large harddisks this can lead to troubles.

Drive Letter Feature is broken

The drive-letter feature is broken in that it does not remember the assigned letters on the next boot.

It is even possible that a non-printable character now represents the drive-letter.

This can cause eComStation to fail to boot.

Do not use this feature with v1.07 !

Partition Hiding could fail

This bug and the Drive Letter Feature bug are caused by the extension made to AiR-BOOT v1.07 to support 45 partitions instead of 30.

However, this was not done correctly and using a number of partitions that exceeds 30 and / or hiding more that 29 partitions can cause a table overflow and AiR-BOOT to malfunction.

Booting Windows sometimes failed

Due to a bug in the prepararion of the in-memory passed PBR, some Windows installations failed to boot when the Windows boot-loader was on a FAT32 partition. This has been fixed.

Version v1.0.8

This has been a development version all the way between the release of eCS v2.1 and eCS v2.2.

Some interim "release candidates" have been made available for testing purposes.

To be more compliant with the WarpIN installer, the version display now separates all three numbers, major, middle and minor, with dots. This is a cosmetic change only, the internal (BCD) format has not changed.

Along the way it was decided to use odd minor numbers for test-versions and even minor numbers for release versions.

This with the addition that a change in the middle version represents a major change.

With v1.0.8 having an even minor, and also heavily modified with regard to v1.07, the final version is released as v1.1.0.

Caution !!

All v1.0.8 test-versions before May 2012 contain a severe bug that can wipe the MBR of **all harddisks in the system !!**

Any version of AiR-BOOT v1.0.8 should not be used at all and deleted from the face of the Earth !

Version v1.1.0

This is the version as released with eComStation v2.2 and you are now reading it's User Manual.

Future test-versions will be v1.1.1 with the build-date distinguishing between them.

A compatible new release will be of version 1.1.2.

In case major changes are made, the middle version will be updated indicating incompatibility with the previous release.

AiR-BOOT reloaded

There is another AiR-BOOT project in the works that will address things like EFI and GPT and other stuff needed to keep eComStation installable and bootable on modern hardware. The reloaded version is a rewrite from scratch with the classic version being it's inspiration. It will probably have a 2.x.y versioning scheme.

Don't expect it to be available tomorrow since moderns developments like EFI/GPT are not trivial things to cope with with regard to eComStation.

Some preliminary information

The following sections are subject to change or removal and should not be interpreted as specifications or definitely available features of the reloaded version.

Can be installed in a dedicated partition

With the GPT partitioning scheme there is no concept of Cylinder, Head and Sector anymore, so a concept of "track0" does not exist. Besides that, the space that AiR-BOOT currently uses is being used by the GPT partition-table and is thus unavailable anyway. It is intended that such a dedicated partition can be MBR or GPT based.

Modular Design

The classic version has a monolithic design and can not easily scale, either due to it's monolithic nature or to the lack of code-space. Using components with a well defined interface makes it possible to more easily scale or morph to adapt to certain environments. An example of such a component would be the user interface, where a menu driven one can be used when space allows or a simple 1,2,3 interface when space is severely limited. Both menu components would export the same interface and just differ in the implemented functionality.

Main logic flow in C++

To accomplish a modular and flexible design, object orientation together with abstraction is needed, so the main flow of things will be in C++ to easily glue stuff together. Methods can be implemented in tightly coupled Assembler to retain code compactness and low level control.

Be configurable by external tools by exporting a configuration interface

Such an interface will export an API that can be used by external tools, like DFSee and the WPS, without having to know the internal details of how and where the configuration is stored.

Handle the new EFI and GPT technologies

The BIOS is on the verge of being replaced with EFI and the MBR partitioning scheme with GPT. These developments pose a number of problems with regard to booting eComStation and it could be helper-stuff will be implemented in AiR-BOOT to overcome these issues. At the time of writing this is still much a gray area.

Don't hold your breath

Support for EFI and GPT are not trivial things and it may as well be that modifying something like GRUB proves to be an easier way to support eComStation in the future, rendering the whole AiR-BOOT Reloaded idea redundant. Time will tell...

Feedback

Today's systems are much more complex than the simple IBM XT/AT architecture with which the PC era began. Besides numerous enhancements in disk-interfaces, local buses and whatnot, modern systems are capable of advanced things like swapping disks, booting from USB and other storage devices. Even the BIOS is gradually being replaced by UEFI and the familiar MBR partitioning scheme is being phased out in favor of the GPT partitioning scheme. In light of these things you are very much encouraged to provide feedback to help further development of AiR-BOOT or any other component of eComStation for that matter.

Using the AiR-BOOT Trac Project Page

AiR-BOOT is released under the GPL v3+ so it's sources are freely available.

Please note that the version of AiR-BOOT that is distributed with eComStation is a specially adapted version and it can be considered a fork. While it is based on the v1.06 sources that reside at sourceforge, the sources for this eCS adapted version reside at netlabs. Therefore, please do not report issues with v1.07 or higher at the sourceforge site, but use the links below. The AiR-BOOT Trac Project Page is at: <http://svn.netlabs.org/air-boot>

Browsing the sources

If you want to browse the sources on-line, then use this link: <http://svn.netlabs.org/air-boot/browser/trunk>

Getting the sources

For this you will need an SVN-client v1.5.x or higher.

Create a directory **air-boot**, change to it and then give the following command:

```
svn checkout http://svn.netlabs.org/repos/air-boot/trunk trunk
```

This will create a directory **trunk** that contains the master Makefile and build-scripts.

Reporting issues

As stated your feedback is very important, so if you encounter bugs or other issues it is very much appreciated if you report them by creating and submitting a trac-ticket. This is the link to do so: <http://svn.netlabs.org/air-boot/newticket>

Contributing

Besides providing feedback, there are other ways to contribute to AiR-BOOT.

If you have skills with regard to artwork, a nice theme of icons and other bitmaps would be nice.

Reviewing documentation or contributing paragraphs or chapters you think may be of value are also highly appreciated.

And of course any code fixes and / or enhancements are also welcome.

Using the eComStation BugTracker

This is another way of reporting bugs with regard to eComStation components.

They are all registered in a database and then assigned to a developer by a manager.

To report a problem or issue using the eCS bug-tracker use this link: <http://www.ecomstation.com/ecmdb/bugtracker.php>

Note however that reporting using Trac is preferred because it is project-bound.

Contact using E-Mail

Besides problems or other issues, you might have ideas for enhancements or whatever.

Then you can send an e-mail to: airboot@ecomstation.com

Special Thanks

The following people deserve special thanks.

Martin Kiewitz

For developing AiR-BOOT in the first place.

For making it open-source.

For all his other contributions to the OS/2 - eComStation realm, and

for even responding to problems with the v1.07+ versions which are not by his hand.

AiR-BOOT is a "Piece of Art" and is just what eComStation needed to be able to cope with new systems, huge hard-disks and other recent developments.

It's a "source of inspiration" and future versions will be built upon it's initial concept.

Steven Levine

For his help with tracking down some 'unwilling' bits, the vast knowledge he so kindly shares,

his work on USB and many other projects, his unmissable problem tracking skills

and his valuable "I would do it like this" input.

Alex Taylor

For implementing AiR-BOOT support in MiniLVM.

His awesome work on taming LVM and all his other contributions to the OS/2 - eCS realm.

David Azewerick

For taking the time to tackle a nasty problem with AiR-BOOT and HPFS.

For his much appreciated feedback on technical issues,

and the wonderful work he is doing on ACPI and the other projects he works on.

Barry Landy

For fearlessly testing several beta-versions,

discovering some severe bugs and providing useful suggestions.

The unmentioned

Everyone else who provided valuable feedback to make AiR-BOOT a better product.

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Disclaimer

The current maintainer is in no way responsible for any damage that AiR-BOOT may inflict on your system. If it fries your cpu, blows up your monitor or changes the layout of your keyboard to Dvorak when you're not looking, it's all your fault.

By installing and using AiR-BOOT you acknowledge this and know that you and only you are responsible.

With that out of the way, you are of course not left in the dark where "Nobody can hear your scream". Contact airboot@ecomstation.com and a sincere effort will be made you get you out of the dark.