ETH Native Oberon System 3 Release 2.3.6 (Stand–alone)

Native Oberon is a self–contained operating system for Intel–based personal computers. The latest information about the system is available at http://www.oberon.ethz.ch/native/

This text describes how to install stand–alone Native Oberon. We recommend printing it for reference during installation. The stand–alone version is best installed in a separate partition on the hard disk. A DOS–based version of Native Oberon is also available, which boots from DOS or Windows 95. Refer to the separate installation documentation on installing the DOS–based version.

1. HARDWARE REQUIREMENTS

The system runs on the bare PC in 32–bit mode, and does not use the 16–bit drivers in the PC BIOS, or drivers from other operating systems.

The *minimum* hardware requirements are:

- Processor: 80386, Pentium or compatible
- Bus: ISA, EISA or PCI
- Memory: 4Mb
- Disk space: 3Mb
- Disk controller: IDE, EIDE (ATA), ESDI, Adaptec AIC 7xxx (beta), Adaptec 1520 or NCR 810 SCSI
- Display controller: VGA (SVGA recommended)
- Diskette: Drive supporting 720k/1.44Mb media
- Mouse: PS/2 or serial mouse (3–button recommended)
- Keyboard: US, UK, Swiss German, German, Canadian, Norwegian, Turkish, Polish, French or Dvorak

The following optional hardware are supported:

- NIC: 3Com 3C509 Etherlink III or 3C905B FastEtherLink
- Dialup: Standard modem (not WinModem) with SLIP or PPP internet service provider
- Sound: Soundblaster

2. INSTALLATION DISKETTE

To install the system, an installation diskette must be available. This diskette can be created by writing the installation diskette image file (oberon0.dsk) to a formatted 1.44Mb diskette. This is done using the DOS rawrite.exe program provided or the Unix dd tool. Note that the install diskette is a bootable diskette that can not be read by DOS.

2.1 Creating the diskette on DOS

Run rawrite.exe and enter the image name (oberon0.dsk) when prompted for a source file name. Assuming that a: is a diskette drive containing a 1.44Mb formatted diskette, enter "a" when prompted for a destination drive. The diskette image is written to the diskette and verified.

The same procedure can be used on Windows 95/NT or OS/2. (On OS/2 the loaddskf utility can also be used instead of rawrite.exe. Use: "loaddskf oberon0.dsk a:").

2.2 Creating the diskette on Unix

Place a 1.44Mb formatted diskette in the drive (say /dev/fd0) and enter the command "dd bs=512 if=oberon0.dsk of=/dev/fd0" to write the image to the diskette.

3. INSTALLING NATIVE OBERON

The installation diskette contains Oberon–0. This is a small ramdisk–based Native Oberon system which is used to install the basic Native Oberon system on a hard disk.

Standalone Native Oberon can co–exist with other operating systems on the same hard disk in at least

three ways:

o Separate bootable partition with boot manager. A boot manager (not supplied) allows booting of Oberon or other operating systems.
o Separate bootable partition without boot manager. Oberon boots directly from the hard disk. The other operating system is booted from a diskette.
o Separate non–bootable partition. The Oberon kernel is booted from a diskette and then proceeds to load from the hard disk.

3.1 Booting the installation diskette

Insert the installation diskette and switch on the machine. It will display "OBERON System 3" and then display the "OBL>" prompt. Here configuration strings can be entered before continuing the boot process. In the normal case, no additional configuration strings are required, so simply enter "c" to continue. The screen will go blank, and the diskette will become active again while the ramdisk is initialized. In less than a minute the Oberon screen will appear with a colorful pattern, and then the mouse configuration program will appear. You must configure the mouse by following the on–screen instructions before continuing. If the Oberon screen does not appear, see the troubleshooting section of this document.

Important: If the QNX operating system is installed on your system, the default partition type of Native Oberon must be changed to avoid conflicts by entering "PartType=80" at the OBL prompt. (The Technical section of the Native Oberon web site documents more configuration options).

3.2 First–time Oberon users

If you have never used Oberon before, you will have to get used to its novel user interface. A small tuturial is included in the Oberon–0 system. To open the tutorial text, move the mouse cursor to the first blue–colored "Edit.Open" command in the Install.Tool text, and press the middle mouse button on a three–button mouse. If you only have a two–button mouse, the keyboard Ctrl key is used instead of the middle mouse button. (Oberon uses all combinations of the three mouse buttons heavily, so a three–button mouse is highly recommended).

The "Edit.Open" command described above will open a text called Introduction.Text, which introduces the concepts of the Oberon user interface necessary to continue the installation process.

3.3 Using Oberon–0 to install Oberon

The Install.Tool text contains instructions for installing Oberon. Only the first page is relevant when installing the system the first time. The rest of the text contains "appendices" on various topics.

1. Select the appropriate disk driver from one of the options provided. Do this by executing the relevant blue command by clicking the middle button on it. The command will display your selection in the system log. It might take a couple of seconds for the driver to initialize.

2. Install the Oberon system files on your hard disk. Open the tool provided and follow the instructions there. The tool presents several options, of which you have to choose one. Take a few minutes to understand the different options presented. (If you need to free up partition space for Oberon, a product like PartitionMagic or the freely available FIPS can be used).

3. Configure the system by specifying the display and keyboard driver and, if required, modifying the customization options. Then write the configuration using at least one of the options presented. That's it!

Note that you can use Oberon–0 at any time to reconfigure your existing system. Boot the installation diskette and go to step 3 in Install.Tool.

If at any time during installation a trap viewer or an error message appears that can not be explained, contact the author at the address mentioned below. Please note exactly what happened, and if possible follow the instructions in Appendix C of Install.Tool.

3.4 Optional packages

The basic Oberon system that has been installed above is a fully functional Oberon programming environment containing text and documentation editors, networking (Telnet and Mail) and an Oberon compiler.

In addition, the following optional packages are available. They are installed from within Oberon (not Oberon–0).

Gadgets: Graphical user interface & WWW tools
Documentation: Guides, examples & book (requires Gadgets)
Applications: Additional applications (requires Gadgets)
Tutorials: Old hypertext tutorials for Gadgets (requires Gadgets)
Pr3Fonts: 300 dpi Oberon Fonts for printing
Pr6Fonts: 600 dpi Oberon Fonts (for PostScript printer only)
Source code: Full sources of the system, excluding the Kernel and some beta code

The Gadgets package contains the Gadgets graphical user interface framework and some standard Gadgets–based applications. Rembrandt is used to edit bitmaps and Leonardo is used for complex line–based illustrations. All standard applications are reachable via hyperlinks from the System3.Tool text. The Gadgets framework supports window tiling (useful for programming or text editing) and a desktop interface with arbitrary window overlapping. The Gadgets package also contains additional Internet tools: a simple WWW browser, a Mail tool with Oberon document support, an FTP tool and Gopher, News and Finger clients. All the additional tools are reachable from the Network.Tool text. The Gadgets package is a prerequisite.

The Documentation package contains extensive documentation and examples about Oberon System 3 and the Gadgets framework and applications, as well as an electronic copy of the Oberon Companion book. The SamplePrograms.Tool lists the examples and the Documentation.Tool contains links to all the documentation.

The Applications package has several additional applications and games contributed by ETH students and other Oberon users. The Applications.Tool has links to all the applications. Most of the applications require the Gadgets package, and some require networking support.

The Tutorials package contains hypertext–based tuturials (now slightly out of date) for the Oberon system. The Gadget packages is required.

The Pr3Fonts (300dpi) and Pr6Fonts (600dpi) printer font packages are only necessary when a printer driver is configured. Currently only the PostScript and LPR printer drivers support 600dpi printing.

The sources are only required if you want to study or modify the system.

3.5 Installing packages

The packages are distributed as Oberon–compressed .arc files. These files must reside on a DOS–format hard disk or diskette drive during package installation. This means they have to be copied from the Internet or distribution CD to a local hard disk or to DOS–formatted diskettes. The following table lists the package file names and approximate installed size (Mb compressed and Mb uncompressed) and shows how the files could be distributed on 7 diskettes (plus one for Oberon–0) for further installation.

PACKAGE	FILENAME	SIZE		DSK
Oberon-0	oberon0.dsk			0
Gadgets	gadgets.arc	1.4	2.9	1
Documentation	docu.arc	1.3	2.5	2
Applications	apps.arc	1.3	2.8	3
Tutorials	tutorial.arc	0.3	0.8	4
Pr3Fonts	pr3fonts.arc	0.3	0.6	4
Pr6Fonts	pr6fonts.arc	0.5	1.8	4
Source1	source1.arc	0.9	2.5	5
Source2	source2.arc	1.2	3.5	6
Source3	source3.arc	0.6	1.7	7

During installation some temporary disk space is required. Therefore you will need about 30% more disk space than indicated above (30Mb is enough for all packages).

To install one or more packages from within Native Oberon, open the System.Text with the Script.Open command provided at the top of the System.Tool and follow the instructions in the section "Installing the optional packages".

4. ADDITIONAL INSTALLATION INFORMATION

4.1 Appendices in Install.Tool

The Install.Tool in Oberon–0 contains appendices with additional commands that may be useful for recovery purposes. Appendix A describes how to reactivate the previous operating system if the PC does not boot any more. Appendix B describes how to recover a Native Oberon file system with a damaged directory. Appendix C suggests how to send an error report to the author. Appendix D contains commands for advanced users.

4.2 Disk drivers

The new "Standard ATA/EIDE" driver is recommended for all IDE and EIDE drives, and should detect most modern drives (>100 Mb) automatically. The new driver is incompatible with the old Atapi CD driver. Symptom: When a button on the CDAudio.Panel is pressed, a TRAP 8 occurs in Kernel.InstallIP. Workaround: Set config string IDE1=0 at the OBL> prompt when installing the system, or at a later time. This disables access to the secondary controller and allows the old Atapi CD driver to control the CD connected to the secondary controller.

For older IDE drives (e.g. WD93044–A), the "Standard IDE (old)" driver is recommended. This driver supports only one controller and assumes it is at the standard primary addresses IRQ 14, IO base 1F0H & 3F6H. If your controller is not located at this address, or if your hard disk for Oberon is on the secondary IDE controller, you can configure the correct values at the initial OBL> prompt. For example, if the secondary controller is at IRQ 15 and IO base 170H & 376H, enter: "IDE=15,170H,376H". You also have to specify the disk size manually using a string like "Disk0=1200Mb" (example for 1.2Gb disk). It is safe to specify a value smaller than the actual disk size.

The "Adaptec 1520 SCSI" driver parameters can also be configured at the OBL> prompt. For example, if the controller is at IRQ 12, port 140H and host id 5, enter: "AHA1520=12,140H,5". The default values are IRQ 11, port 340H and host id 7.

The "NCR 810 SCSI" driver supports NCR PCI cards and configures itself automatically.

The new "Adaptec AIC7xxx" driver also supports PCI cards only and configures itself automatically. It should work on most modern Adaptec SCSI cards, e.g. the 2940 family.

Important: If any of the disk drivers produce a "trap" during installation, please make detailed notes on the trap information and report it to Oberon help (address below). It is wise to switch the machine off completely after such a trap, to ensure the controller is reset completely.

4.3 Linux LILO boot manager

The Linux LILO boot manager can be used to load Native Oberon. Install Native Oberon as described above. Then boot Linux, log in as root and run "fdisk –l". Look for a partition of type 0x4f (the Oberon partition), say /dev/hda2. Edit /etc/lilo.conf, adding a section like the following:

```
other=/dev/hda2
    label=Oberon
    loader=/boot/chain.b
```

Execute "lilo" to initialize the boot manager. It will say "Adding Oberon" (among other things). Oberon will now appear in the LILO menu when you boot.

You can also boot Native Oberon from a logical drive using LILO. To do this you must create the Oberon partition using Linux fdisk, and then use OPTION 3 (overwrite a partition or logical drive) in step 2 of the installation process.

Native Oberon has been tested successfully with the OS/2, PartitionMagic and Windows NT boot managers. Read the documentation supplied with those products for installation information. For Windows NT, the freely available Bootpart utility can be useful.

5. TROUBLESHOOTING

5.1 Oberon–0 does not boot

If the "OBERON System 3" message does not appear, or only the first few characters appear, it is very likely that the install diskette contains bad sectors. Use another diskette, or reformat it (not quick–format) and try again.

If the screen goes blank, and the Oberon display does not appear, there might be compatibility problems between the Native Oberon drivers and your PC. To help us track down these problems, please do the following:

o Boot with the install diskette.
o At the "OBL>" prompt, enter the following command: "Init=9090".
o Enter "c" to continue booting.

Some trace information will appear in red on the screen. If a run–time error occurs, TRAP xx will be displayed and at the end will be a list of module names with PC = nnn values. It might be possible to infer from this what is causing the problem. If not, please send the first few lines of the module name information, as well as the number of the TRAP to us. This will help us pinpoint the error in the source code.

If no trace messages appear, it could mean that the CPU type detection is not functioning on your processor. Override the detection by entering a command of the form "CPU=n" at the "OBL>" prompt, where n is 3 for a 386, 4 for a 486 and 5 for a Pentium or compatible processor.

5.2 Black screen when booting Oberon

If the screen stays black when booting a successfully installed system for the first time, there could be device driver conflicts. Boot Oberon–0 again and try with some other display device drivers (e.g. the standard VGA driver, or the VESA 2.0 driver, if your display is VESA 2.0 compliant). You may skip step 2 (installing the files).

If this still does not work, try the following:

o While booting the installed Oberon system (from boot diskette or partition), hold down a shift key or activate ScrollLock. The "OBL>" prompt will appear, allowing you to edit the configuration strings.
o Continue as described in the previous section (Oberon–0 does not boot). Some trace information will appear on the screen, which will help to locate the problem.

If the "black screen" symptom occurs after the system has functioned correctly for some time, the file system might have been corrupted, or a system module may have been overwritten or deleted. Boot the install diskette (Oberon–0). Then execute Install.Directory to see if the directory is accessible. If no trap occurs, the file system is probably intact, and you can re–install the basic system modules using the "update" option in step 2. If Install.Directory causes a trap, the file directory is corrupt. Reboot Oberon–0 again and use the Scavenger commands in Appendix B to rebuild the directory, as explained below.

Execute Scavenger.Scan to scan through the whole file system for file headers and build a new directory in memory (this takes long). Scavenger.Display can optionally be used to display the list of files found. Then use Scavenger.WriteDirectory to write the new directory. In case multiple versions of a file is found, the Scavenger recovers the one with the latest time and date. It should therefore only be used as a last resort, and only if the real–time clock of the PC functions correctly.

5.3 Grey screen when booting Oberon

If the installed system seems to boot correctly, but displays a grey screen instead of the default viewers, there is probably something wrong in Oberon.Text. Press Ctrl–Break to get a trap viewer to type commands. Type the command Edit.Open Oberon.Text (or ET.Open) and middle click on it to open the configuration text. Check if the braces and quotes in recently–edited parts of the text occur in matching pairs.

5.4 NetSystem configuration problems

To help trace network configuration problems, the NetSystem module has a command NetSystem.Show, which displays the current network parameters. Other network modules contain some global counter variables that can be viewed with System.State ↑. The most useful counters are in the Net3Com509 module (the 3Com EtherNet driver). Nsent counts the number of EtherNet packets sent and Nreceived counts the number of packets received. There are also Nsent and Nreceived counters in modules NetIP, NetUDP, NetTCP and NetDNS.

6. LEGAL INFORMATION

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7. CONTACT ADDRESSES

http://www.oberon.ethz.ch/native/ – The Native Oberon web site, with information about projects, releases, technical aspects, and general Native Oberon news. It also provides a module name registry to avoid naming conflicts when you distribute your Oberon software.

http://www.oberon.ethz.ch/faq.html – The Oberon System 3 FAQ answers many common questions and is updated frequently.

mailto:native–oberon@inf.ethz.ch – This mailing list is a forum for Native Oberon users. To subscribe, mail a message with any subject and "subscribe native–oberon Your Name" in the body, to listproc@inf.ethz.ch.

mailto:oberon@inf.ethz.ch – Oberon help. Manned by volunteer André Fischer at the ETH.

news:comp.lang.oberon – Oberon users all over the world.

Postal address: Oberon System 3 Team, Institute for Computer Systems, ETH Zentrum, CH–8092 Zurich,

SWITZERLAND. Fax: +41 1 632 1307.

Pieter Muller
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