HP-Oberon™ User's Guide

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Introduction

HP-Oberon™ is an implementation of Oberon for Hewlett-Packard Apollo Serie 700 workstations. Both the programming language Oberon-2 and the Oberon System have been implemented. For a complete description of the Language and of the System, one should read the following books:

N. Wirth and M. Reiser: Programming in Oberon. Steps beyond Pascal and Modula-2.
Addison Wesley, 1992, ISBN 0-201-56543-9.
Tutorial for the Oberon programming language and concise language reference.

M. Reiser: The Oberon System. User Guide and Programmer's Manual.
Addison Wesley, 1991, ISBN 0-201-54422-9.
User manual for the programming environment and reference for the standard module library.

N. Wirth and J. Gutknecht: Project Oberon. The Design of an Operating System and Compiler.
Addison Wesley, 1992, ISBN 0-201-54428-8.
Program listings with explanations for the whole Oberon system, including the compiler for NS32000.

H. Mössenböck: Object-Oriented Programming in Oberon-2
Springer-Verlag, 1993, ISBN 0-387-56411-X.
Principles and applications of object-oriented programming with examples in Oberon-2.

The technical report 160 by H. Mössenböck, *Differences between Oberon and Oberon-2*, *The Programming Language Oberon-2*, is recommended too. It is present as on-line documentation:

Edit.Open Oberon2.Differences.Text
Edit.Open Oberon2.Report.Text

If you want deeper information about the implementation of HP-Oberon, the technical report 212 by J. Supcik, *HP–Oberon™, The Oberon Implementation for Hewlett–Packard Series 700*, is recommended.

The following short tutorial describes the differences to the original implementation from a user's point of view.

HP-Oberon runs as a single HP-UX process on a color or monochrom Apollo Serie 700. It has the form of an X Windows application using only one X window covering the whole screen. This window can be controlled by the Window Manager, i.e. it can be pushed, moved, resized or iconized, but the WM has no control on the internal layout of the window (tracks and viewers are not X windows). The dimensions of the user track and ther system track are automatically defined when starting HP-Oberon and cannot be changed until the Oberon process terminates, even if the window is resized. Since HP-Oberon is a normal X application, it can be used remotely over a network.

Required architecture

- HP-oberon should work on any HP 9000 Series 700 workstation with HP-UX 9.01 or higher, X11R5 and a 3-buttons mouse. It has been successfully tested on 715/33, 712/60 * and 745/99.
- Printing requires a Postscript printer.

** On early 712 workstations you may encounter problem with the DIN mouse driver. If two buttons released at the same time, the driver may think one button is still down. If this is the case, ask your HP-Support Center for the patch PHSS-3707.*

Installation

HP-Oberon is distributed as a compressed tar file (see the accompanying readme file for a description of the contents). It can be either installed by the /etc/update program or by manually extracting the differents filesets.

Even if you can install HP-Oberon in any directory you want, we recomende you (if you have the right to) to install it in */usr/local/Oberon*. This directory should me made readonly, in order to avoid accidental removal of files.

The installation process is explained in the **README** files, **PLEASE DO READ IT BEFORE TRYING TO INSTALL HP–OBERON**.

The environment variable *OBERON* is used, when defined, as search path for files. Its default setting is *'. /usr/local/Oberon'*. Each user can define *OBERON* in his *.login* file (e.g. *setenv OBERON '. MyLib /usr/local/Oberon'*). The environment variable *APATH* is used as path for audio files (used by the ALib module). The environment variable SHLPATH is used, when defined, as search path for HP-UX shared libraries (.sl files). the default is *'/lib /usr/lib /usr/lib/X11R5 /usr/lib/X11R4'*

To improve the character drawing speed on the screen, the Oberon fonts should be installed as X fonts. This installation has to be done only once. You can either extract the OBERON–X–FONTS subset from the Package or convert the Oberon fonts. See the text file *InstallXFonts.Tool* and follow the instructions in that tool.

Once the X–Fonts are installed you need to extend the X fontpath by the new directory (I suppose that your X–Fonts are in /usr/local/Oberon/XFonts):

```
% xset +fp /usr/local/Oberon/XFonts
```

This command can also be entered in the .login file of Oberon users:

```
% xset –fp /usr/local/Oberon/XFonts
% xset +fp /usr/local/Oberon/XFonts
```

The first line avoids a repetition of the fontpath, if already present.

Note that the font path must be absolute. On some machines it must also be terminated by "/".

Starting HP-Oberon

HP-Oberon is started from a terminal window using the executable *oberon*. The syntax is:
oberon [–h heapsizeinMB] [–x module command] [–b bootfile]
[–f fontmapfile] [–d displayname] [–g geometry] [–c]

where
- *heapsizeinMB* is the size of the allocated Oberon heap in MB (default: –h 4)
- the command *module.command* is executed (default: –x Oberon Loop)
- *bootfilename* is the name of the boot file (default: –b HPoberon.Boot)
- *fontmapfile* is the name of the Font Mapping File (default: –f "Fonts.Map")
- *displayname* is the name of the X server display used, e.g. –d name:0.0 (default: –d "")
- *geometry* gives the position and dimensions of the Oberon window, e.g. –g 800x600+100+100 (the default depends on the dimensions of the screen)
- the option *–c* allocates a private colormap of 256 colors (default: not set, 16 colors from 0 to 15)

As in all X applications, the window needs to get the focus before being able to receive input from the keyboard. Just click the left mouse button with the pointer in the HP-Oberon window.

If HP-Oberon gets out of control (e.g. because of a looping command), press Ctrl-C in the terminal window (do not forget to set the focus first). Xlib is not reentrant, and hence should not be interrupted. To avoid this problem, the Ctrl-C is ineffective if pressed while the Oberon process is executing outside an Oberon procedure, else a trap viewer should appear and execution will resume in the central Oberon loop. If the system does not react on that interrupt after several tries, one can kill HP-Oberon by pressing Ctrl-\ in the terminal window.

System.Quit terminates the oberon process. It is the normal way to leave HP-Oberon.

Differences to the Original Oberon

The differences are due to the underlying hardware and software. Here follows a list of modules containing differences:

System

New commands:
- *Quit* to leave HP–Oberon
- *Execute command* to execute a (non-interactive) shell command
- *ChangeDirectory newdir* to change the working directory

Compiler

Supports the Oberon-2 language.
Implements fine-grained consistency checking of separately compiled modules, which allows module interfaces to be extended without requiring a recompilation of client modules (*Object Model*).
See *Compiler.Tool* for options.

X11

New module acting as interface to Xlib.

Display

Imports *X11*.

Procedures *DefCC*, *DefCP*, *DrawCX*, *FadeCX*, *InitCC*, *InitCP*, *SetCursor* are not implemented.

Procedure *SetMode* has no effect.

The display bitmap is not directly accessible (*Map* returns 0).

The cursor is controlled by the window manager and is still active when a command is executing.

Pattern format is different, use *Display.NewPattern* to define a pattern.

image[1] defines the bottom line of the pattern. image[0] is not used.

Display1

Module exporting additional drawing procedures.

Unix

New module acting as interface to Unix (system calls).

Unix.Result() may be called immediately after a non function system call.

If not zero, it gives the error number.

Unix.Done() may be called immediately after a system call, first call *Unix.Result()* if the error number is needed.

Do not use function system calls as parameters of calls.

Pointer to array in Oberon-2 is not compatible with pointer to array in C;

if compatibility is required, use pointer to record a: array end

Input

Input events are puffered.

Special keys:

F1	mark viewer
F2 or Esc	escape
F3	break
F4	init colors
F5	Diacritics combine key
F6..F12	Programmable function keys
Select	line feed
Ctrl-L	redraw screen
Prev (also ë)	redraw for Draw
Ctrl-Prev (also ç)	home for Draw

Input.Time() returns the real time in milliseconds since HP-Oberon has been started.

Files

Exports *ChangeDirectory*.

Types

New interface module to the type system. Necessary to implement persistent objects.

Oberon

Time() returns *Input.Time()*

Printer

generates a postscript file named *Oberon.Printfile.ps* and sends it to the printer if the printer name is not *none*.

Kernel

GC may be called at any time, since local pointers (on the stack or in registers) are used as roots during the mark phase of the garbage collection.
Garbage collection is done on (open) array elements too.

Font Mapping File

Since Oberon fonts may be too small for high resolution displays, several font mapping files are provided : *Normal.Map*, *Medium.Map* and *Big.Map*. (See option –f above). *Normal.Map* should be preferred for better printing results.

International Characters

On an ITF Keyboard, international characters can be typed using <Extendchar> + <Ctrl> + <diacriticKey> and then the base letter of the diacritical character. The supported diacriticKeys are r (acute), t (grave), y (circumflex), u (diaeresis) and i (tilde).
For example : to obtain a 'Ä', press <Extendchar> + <Ctrl> + <u> and then type "A".

Another way to obtain diacritical character is to first type the base character, then the diacritic and then pres <F5> in order to combine the two symbols into a single diacritical character. Valid diacritics are : { ' ` " ↑ , ~ }
For example : to obtain a 'é', type "e'" and then press <F5>.

The option character is "\" instead of "/". This allows to use "/" in file names (Unix path names).

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