BERKELEY BOXER RESOURCES: (Startup 1)
Documentation, tutorials & other resources

This document contains:

1. Overview of Resources

This document is an overview of resources for learning about Berkeley Boxer. It is the first of four Boxer Startup documents, and it supplements the information in the "quick start" listing in **Getting Started** (Boxer Startup, document **3**)**.**

There are many documents you can use in learning Boxer. We have provided some of these with the Berkeley Boxer Release Packet or Internet Download, including hard copy (or PDF file) of the Boxer Startup series. Some other useful information for how to use Boxer comes in the Boxer **on-line manuals** and **demonstration files**. Still more resources can be found through the Internet in the **Boxer Hub**.

The Startup documents we have provided on paper with the release packet, or in PDF form with the Internet download, are meant to walk you through the steps necessary to get the Berkeley Boxer application up and running on your Macintosh. You should begin with the **Installation Guide** (Boxer Startup **2**) to install Boxer on your machine. If you already have Boxer installed on your machine then you should begin with **Getting Started** (Boxer Startup **3**). Boxer's user interface is very different from most applications you have encountered, so we strongly recommend you consult **Getting Started**, and work through the Interface Survival Guide in the **!Start Exploring Boxer Here!** Boxer file, even if you're an expert computer user. As you begin using Boxer you might also want to refer to the **Berkeley Boxer Survival Guide** (Boxer Startup **4**), which is a handy reference sheet and brief hard copy (PDF) replacement for basic aspects of the on-line tutorials.

There are also two reference documents available on paper for you to refer to as you continue to develop your Boxer expertise. You may request these from the Boxer Project (see address at the end of this document) for the cost of copying and postage. The documents are **Boxer Structures** and the **Command Manual**. **Boxer Structures** provides a good overview of Boxer capabilities—a good "quiet introductory read," and something to refer back to when you want to orient yourself for learning more capabilities in Boxer. You will most likely get to know the **Command Manual** as you need quick information on particular commands, although the on-line command manual will in general be more complete and up to date.

The book *Changing Minds: Computers, Learning and Literacy* (MIT Press, http://www-mitpress.mit.edu/, available early 2000) provides an extended exposition of Boxer's educational philosophy and our experience with it.

Once you have installed Boxer and learned basics like opening and closing boxes, you will be ready to do some real Boxer work. We suggest you open some of the Boxer tutorials that we've provided on-line. The best starting point, again, is the **!Start Exploring Boxer Here!** disk file.

(See further explanation of this file on the Startup **3** hardcopy document.) From **!Start Exploring…** you can move to other tutorials and demos by clicking.

Beyond **!Start Exploring Boxer Here!**, the **Interface** tutorial file explains more features and details of the Boxer interface. Other on-line tutorials, referred to in **!Start Exploring Boxer Here!**, will help you learn how to do turtle graphics in Boxer and, more generally, how to begin programming Boxer. The on-line **Command Manual** has many working examples, as well as a nearly exhaustive list of Boxer commands.

Finally, there are a huge number of Boxer demos and applications created by graduate students, developers, teachers, and students. In addition to what is supplied with the Release Documentation and Demos, more can be found on the Internet at the Berkeley Boxer site. This site may be accessed from the top level box of **!Start Exploring Boxer Here!** See also the Internet Resources section, below.

2. Listing of Hard Copy Boxer Documents

The following are text documents supplied with Berkeley Boxer Release Packet, or in PDF form with the Internet download.

- **Installation Guide** (Boxer Startup **2**). Describes how to install Boxer on your machine. It also describes how to deal with (and avoid) some simple problems, and explains the basics of reading and saving Boxer documents.
- **Getting Started** (Boxer Startup **3**). A short document that points you in the right direction when you're just getting started learning and using Boxer.
- **Berkeley Boxer Survival Guide** (Boxer Startup **4**). The (very basic) basics of the Macintosh Boxer user interface.

The following may be obtained at cost by writing to the Boxer Project; address at the end of this document.

- **Structures Manual.** An introduction in prose to the basic concepts of Boxer.
- **Command Manual.** A reference manual that briefly describes each Boxer primitive. This is essentially a condensed hard copy of the information available in the on-line **Command Manual**.

Look for the following book on Boxer's theory and practice.

- **Changing Minds: Computers, Learning and Literacy** by A. diSessa, MIT Press, available early 2000, http://www-mitpress.mit.edu/.

3. On-line Documents (readable in Boxer format)

These resources are all Boxer documents. That means you need Boxer to look at them.

- **!Start Exploring Boxer Here!.** An introduction to the basics of the Boxer interface. Also includes pointers to demos and other tutorials. This file is automatically loaded into Boxer on startup if you obtained Boxer together with online documents and demonstration files.

- **Interface.** An introduction to the basics of the interface. It is similar to !**Start Exploring Boxer Here!**, but restricted to interface information. It includes more details about the interface and no pointers to other tutorials and resources.

- **Turtle Programming Tutorial.** An introduction to Turtle Graphics programming in Boxer. This is a good thing to try once you've got the basics of the interface and possibly explored some of the demos.

- **ProgrammingQuickStart.** A tutorial designed for those who know Logo or similar programming languages.

- **Command Manual.** This collection of Boxer documents is a nearly complete on-line reference manual. It is broken into pieces so that you don't need to load the whole manual at one time. You may start from the main "Command Manual" file, or read any individual file. This is likely to be the most up to date information available. The working examples may be a good way to learn about Boxer.

- **Demos.** This folder contains many demonstration learning microworlds and Boxer tools. The **!!!Read Me!!!** file provides a brief overview of what is included with the Berkeley Boxer Release. **Tools** is a subset of **Demos** that may be quite generally useful.

4. Boxer Internet resources

- **The Boxer Home Page – http://soe.berkeley.edu/boxer.html.** An introduction to the Boxer project plus a few useful links, including a link to The Boxer Hub.

- **The Boxer Hub – ftp://soe.berkeley.edu/pub/boxer.** A public FTP site with various Boxer goodies. This site is best explored from Boxer. With Boxer, you can start browsing by clicking on the hub box at the top level in **!Start Exploring Boxer Here!**. This connects you directly to the "hub.box" at the above URL, i.e., **ftp://soe.berkeley.edu/pub/boxer/hub.box**.

- For inquiries, mail to **boxer-inquiry@soe.berkeley.edu**.

Credits:

Boxer was developed with major support by the National Science Foundation. The NSF did not support development of Mac Boxer, documentation or demos. Some Boxer development was done with support from the Spencer Foundation. Development has also benefited from two gifts of equipment from Sun Microsystems. The Graduate School of Education, U.C. at Berkeley provided additional support. The main systems development was done with Lucid Common Lisp. The Macintosh version uses Macintosh Common Lisp, by Digitool, Inc., Cambridge, MA. Apple supplied a gift to support graduate students. Early work on Boxer was funded by DARPA under a grant to the MIT Laboratory for Computer Science, M. Dertouzos, director. Andrea diSessa has been the PI and Boxer Project Director. Ed Lay has been chief systems designer/implementor. Mike Travers did the initial port to the Macintosh, and supplied other help for that version. Leigh Klotz designed and built the core of the original interpreter. Gregor Kiczalis implemented the first editor/redisplay. Jeremy Roschelle implemented the first version of the current graphics system. Hal Abelson co-founded the Boxer Project at MIT and contributed to the early design.

For further information or an extensive listing of publications about Boxer, write to:

Boxer Project
4533 Tolman Hall
Graduate School of Education
University of California
Berkeley, CA 94720

Berkeley Macintosh Boxer Legal Notification

BERKELEY MAC BOXER: Installation Guide

(Startup 2)

This document contains:

1. Minimal Hardware Configuration

68K Macintoshes: A minimal hardware configuration for running Berkeley Boxer is System 7.5 or newer, 8 Mb memory (12 Mb recommended) running on a 68030 or newer processor. All Quadras (68040 machines) with sufficient memory work well. (Notes for older machines: Boxer may also work on older machines with System 7.0 or newer, provided provision is made for 32 bit memory addressing. 68030 machines without FPU, e.g., unupgraded Mac si, will not provide sufficient graphics performance.)

Power Macintoshes: Boxer will work on any Power Macintosh. Minimal recommended configuration, using the native PowerPC Boxer, is 16 Mb memory.

2. Installation

These are the instructions for installing the Boxer application on your Macintosh computer. Make sure you have at least 8-12 Mb for 68030 or 68040 machine, 16 Mb for a Power Mac, and System 7.5 or newer. Boxer will run better with larger memory assignment, and 16 Mb for 68K and 24 for Power Mac is not at all extravagant. See Memory Adjustments, below, for suggestions on settings. Be sure to check the Safety Tips, at the end of this document, to make your Boxer experience more pleasurable. Revisit this document after becoming familiar with Boxer; it will help you use Boxer more effectively.

Make sure you have the 68K or PowerPC version of Berkeley Boxer, as appropriate. If you downloaded from the Internet and the download expanded into the Boxer folder with Boxer application inside, skip to step 3, below. Otherwise, you must have the Boxer.sea (sea = “Self Extracting Archive”) download file. (Distribution by floppies, CD or other media should come with its own instructions.)

1. Double click on the Boxer.sea icon.

2. You will be asked to select a folder in which to install the Boxer folder, which will include Boxer, documentation and demonstrations. Follow the instructions that appear on your screen.

3. (Optional step) Boxer looks neatest when it can use the font Geneva 7. This font is not found in most machines so we have provided a copy of it in the Boxer folder. Drag this font to your System Folder.

4. (Optional, for older machines and systems) For Boxer to run the System must be running with 32 bit memory addressing turned on. [Newer machines and systems (e.g., 7.5 and newer) do not have the option to

turn 32 bit addressing off. It will not appear as an option in the Memory control panel.] To make sure this is on:
a. Select “Control Panels” under the Apple menu (the Control Panels window should appear).
b. Double-click on the “Memory” panel.
c. If 32 bit addressing is on then no action is necessary. If not, turn it on and restart your machine for this change to take effect.

Supplementary Notes: Extensions to Boxer that add special functionality, as well as upgrades to Boxer between releases, must be put in a folder called “Extensions.” The Extensions folder itself must reside in the same folder as Boxer.

3. Memory Adjustments

If you have a reasonable amount of memory (32-64 Mb, or more) you should have no problem with Boxer. However, for marginal cases, we offer some suggestions.

- It is advisable to set the “preferred memory” setting in Boxer’s “Get Info” window to an amount that is right for your machine and usage. If preferred size is set too high relative to the memory you have, Boxer may not start, or you may unnecessarily restrict simultaneous use of other applications. If it is set too low, Boxer may also not start, or you may begin to have frequent pauses (garbage collection) while Boxer manages memory. Crashes may result.
- On Power Macs with virtual memory turned off, your system will increase slightly in size, in addition to whatever memory Boxer itself uses.
- Virtual memory is a boon to memory usage in multiple ways. It avoids the above “extra system” penalty, and Boxer itself will run with 5 or 6 Mb less memory. Virtual memory, however, entails some performance loss.
- It’s generally best to shut down other applications before starting Boxer.
- With small amounts of memory (less than 16 Mb), you may want to start with some or all extensions turned off.

For those with less than 16 Mb memory (24 for Power Macs):
In these cases, you will probably have to use virtual memory. If you have only 8 Mb on a 68K machine, try setting virtual memory to allow allocating about 8-10 Mb for Boxer as a start. That is, set virtual memory at about “system memory” + 8-10 Mb. (System memory can be found using “About This Macintosh” or “About This Computer” selection, Apple pulldown menu.) On a Power Mac, try to allow at least 12 Mb for Boxer (although as little as 10 may do), above what your system requires. In general, keep virtual memory as small as still allows you to work comfortably; using more entails more performance penalty.

Ram Doubler:
Ram Doubler might be an excellent alternative to virtual memory. It may let you assign all or most of your memory to Boxer, and it may also let you avoid “memory saving” tactics, such as shutting down other applications while using Boxer. Ram Doubler, like virtual memory, slows Boxer somewhat. Speed Doubler is not particularly useful for Boxer because, if you have a Power Macintosh, you should be using the Power PC native version of Boxer.

4. Safety Tips and Crash Recovery

There are things you can do which will help in avoiding problems and crashes.

- **Save your work and restart Boxer every once in a while**. Boxer has a limited amount of memory and when you work in it, you use it up little by little. Even if you initially have sufficient memory, after use, Boxer may start pausing (garbage collecting) frequently. The

only thing you can do to clean up the memory is to save the box you're working on, quit Boxer, and start it again.

- **Don't leave big boxes lying around**. Delete big when done with them. This will help you get some memory back. You can get the same effect by Closing (File menu) file boxes or net boxes. Closing has the advantage that you can reload the file with a click, if necessary.

- **Almost all crashes are recoverable simply by clicking on the Boxer window**. Redisplay crashes (usually marked by a continuous blinking of the status line) may be fixed sometimes by exiting the current box (use "}" key) or by going to the toplevel box (Place menu, Toplevel selection).

- With slower, non-Power PC machines, you may need to **be patient**, particularly when Boxer seems to be "thinking."

    a. When you are expanding a box with a lot of stuff in it: Boxer may be slow in displaying it for you. Wait for Boxer to catch up! Extra clicks may cause actions you don't want (like opening or executing boxes inside the one you are opening).
    b. When a large file is first read in: Boxer takes a moment to get everything in order. Even though the box shows up, it may be unresponsive for a few seconds.
    c. When reading in a netbox over a modem or other slow Internet connection.
    d. When you delete a large box: Boxer takes some time to delete large boxes. Please give it some time to do house cleaning.

5. Loading Files and Saving Work

Opening Files:

• Files correspond to boxes in Boxer, not to windows. Opening a file in Boxer places that new box at the position of the typing cursor. You will soon appreciate the power this affords; but you may need to think twice about where you open new files in the short term. You will generally want to open a file at the top level (world) of Boxer.

Saving:

• File boxes (boxes that you have read in from a file) appear with a thick border. You can save a file box simply by selecting "Save" or "Save As" from the File Menu while you are anywhere inside of that box. Boxer will save the most immediate superior file box to the typing cursor.

• Boxer highlights the box that is being saved. Use this feature to make sure you are saving what you want. You can also check the listing in the Boxer window title bar to see what file box (and corresponding file) you are in.

• To save a box to a file when it is not already a file box, make sure your cursor is in that box but not in some contained box. Then go to the File Menu and select "Save Box As".

• (Tip) For extra security, you might want to check that you saved what you wanted by reloading the file you just saved.

BERKELEY BOXER: Getting Started

(Startup 3)

This document contains:

1. Getting Started

Once you are done installing Boxer you can start enjoying it. Many useful tutorials are on-line.

- The full Boxer + Documentation & Demos set comes configured to start up automatically with the **"!Start Exploring Boxer Here!"** file. Just double-click on the Boxer application. **!Start Exploring…** explains the Boxer interface and allows easy access to supplementary tutorials and demos. If you downloaded Boxer and Documentation separately, you can always double-click on **!Start Exploring…**.

- As an alternative to **!Start Exploring Boxer Here!**, consult the **Berkeley Boxer Survival Guide**, which is a paper or PDF (downloaded) document (Boxer Startup **4**). You can always refer to the **Survival Guide** for information on where to click and how to move around in Boxer as you continue exploring.

2. Guide to On-line Materials

- The file called **Interface** in the **Tutorials** folder contains additional information about the Boxer interface, beyond what is in **!Start Exploring…** or the **Survival Guide**.

- **Turtle Programming Tutorial** (**Tutorials** folder) offers an easy introduction to Boxer programming in a graphics context. **ProgrammingQuickStart** (**Tutorials** folder) is a short and faster-paced tutorial of Boxer programming meant for people who know Logo or similar programming languages. Both are accessible through **!Start Exploring Boxer Here!**.

- There are many Boxer demonstration boxes included in the **Demos** folder. (**!Start Exploring…** is another point of access to the demos.) See the **!!!Read Me!!!** file in that folder for information on available demos. Among the many demos, **Infinity** (in the Mathematics subfolder) is a fine place to start. It shows both teacher and student work that was carried out in a high school class. Don't miss the **!Tool Box!** (in the **Tools** subfolder of **Demos**), which refers to many helpful tools and Boxer extensions that are included. **Grapher** and the **Visible Calculator** are good examples of Boxer tools.

- The files in the **Command Manual** folder constitute a nearly complete on-line manual. You may start from the main **!Command Manual!** file, which contains an automated index, or you can just read any individual file. The on-line manual contains many working examples, which can be useful for you to cut and paste into your projects, or to inspect to learn about Boxer. Once again, **!Start Exploring…** provides an alternate access route to the **Command Manual**.

BERKELEY BOXER: Survival Guide

(Startup 4)

This information is duplicated on line in the Interface Survival Guide (in the file !Start Exploring Boxer Here!*, and in the Tutorials Folder,* Interface).

This is a minimal set of Boxer that will allow you to navigate and use things other people have constructed in Boxer.

1. Files

When you read a Boxer file (File menu, Open selection), the box that is read in appears at the position of the typing cursor. Usually you will want to read a new box in at the top level of your Boxer world, not inside another box. You may simultaneously start Boxer and open a file by double clicking on the file.

2. Moving

The typing cursor (vertical black bar) shows where you are at in Boxer.

- To move to a new place, move the mouse cursor (arrow) to the new place, then click the mouse button.

3. Expand and Shrink

Boxer usually shows boxes in three sizes: shrunken (small gray); regular (showing the contents of the box); and full screen (showing ONLY the contents of the box). In addition, the usual shrunken presentation may be replaced by an icon, and shrunken boxes may be shrunk one more stage to "supershrunk," about the size of a character.

- When you can't see what is in a box, a click expands it and a double click expands to full screen. Most file boxes are intended to be used at full screen size.
- The upper corners of a box are "hotspot" controls for easy size control. Click on the upper left corner to shrink and the upper right corner to expand. The mouse cursor changes shape to show you when you are over the hotspot. Double clicks on expand/shrink hotspots will get another level of shrinking or expanding.

Option-mouse-click in the interior of a box is an alternate way to shrink it. Similarly command-mouse-click expands. These clicks are handy in case regular mouse-clicks have been redefined (say, in box-buttons). They also may be doubled for an extra stage of shrinking/expanding. Mnemonic: Option and command—to shrink and expand—are in the same spatial order as the less (<) and greater (>) keys.

4. "Doing" a Line; Stopping Execution

- Double clicking the mouse button will "do" (execute) the line the mouse cursor is pointing to.

Be careful not to point inside a box on the line you want to execute, or you will execute a line inside that box! (You may also execute a line by placing the typing cursor on the line and choosing "Do Line" from the Do menu, or pressing the doit key—Enter, or command-Return. People usually create menus in Boxer simply by typing some text for you to "do.")

- Use command-. or Stop (in the Do menu) to halt an execution that is going on longer than you wish.

For more information, consult the on-line tutorial, "interface." See also "keystrokes and editing" in the on-line manual, and hard-copy "Boxer Structures" for information on box structure and sizing.