


VIRTUAL Branches[™] for OpenVMS User Guide


storage in a nutshell
Acorn Software, Inc.
Hudson, MA

Document Version:	version 1.0
Revision Information:	This manual supersedes all previous versions of documentation.
Software Version:	version 3.0
Operating System and Version:	OpenVMS VAX version 5.5-2 or later OpenVMS AXP version 6.1 or later

Copyright © 1994-1999, Acorn Software, Inc.

All rights reserved

Information in this document is subject to change without notice and does not constitute a commitment on the part of Acorn Software, Inc. The software described herein is provided subject to a license agreement and the descriptions may include proprietary information belonging to Acorn Software, Inc. No part of this manual may be reproduced in whole or in part by any means, including electronic means, without specific written permission from Acorn Software, Inc. or as part of a specified permission contained within a specific software license agreement. The associated software may not be redistributed, copied, or reproduced in any form except for specified user backup as described in the software license agreement.

Branches, *VIRTUALBranches*, *VIRTUALBranches/VMS*, *VIRTUALBranches for OpenVMS*, *VIRTUALBranches/NT*, *VIRTUALBranches for Windows/NT*, *HSM*anager, *MODISK* and *Squash* are trademarks of Acorn Software, Inc.

All other trademarks or registered trademarks are the properties of their respective manufacturers.

Printed on recyclable paper.

Contents

DOCUMENTATION CONTENTS AND AUDIENCE	5
FOR AN EVALUATION COPY OF OUR SOFTWARE AND DOCUMENTATION	6
FOR THE MOST CURRENT TECHNICAL INFORMATION ON OUR SOFTWARE AND DEVICE SUPPORT.....	6
FOR TECHNICAL SUPPORT AND INFORMATION ABOUT INSTALLING OR USING ANY OF OUR PRODUCTS.....	6
FOR A LICENSE KEY FOR ANY OF OUR PRODUCTS.....	7
FOR SALES AND MARKETING INFORMATION: SOFTWARE SOLUTIONS FOR STORAGE PROBLEMS.....	7
FEATURES.....	9
SYSTEM PREREQUISITES;.....	10
EXCLUSIONS AND EXCEPTIONS.....	10
VIRTUALBRANCHES SUPPORTED DEVICES;.....	11
<i>Table of VIRTUALBranches Supported Devices.....</i>	<i>11</i>
VIRTUAL DISKS.....	11
WHERE AND HOW TO GET VIRTUALBRANCHES;.....	13
<i>VAXStation 3100 Hardware Configuration.....</i>	<i>14</i>
<i>Digital 3000-300L AXP Hardware Configuration.....</i>	<i>15</i>
INSTALLING VIRTUALBRANCHES (VMSINSTAL).....	15
<i>Example of Typical Installation.....</i>	<i>17</i>
CONFIGURING VIRTUALBRANCHES.....	20
<i>Example of Configuring VIRTUALBranches to support a Pioneer 604x.....</i>	<i>20</i>
STARTING VIRTUALBRANCHES.....	20
LICENSING VIRTUALBRANCHES.....	21
USING VIRTUALBRANCHES.....	21
PROBLEMS GETTING STARTED.....	37
PROBLEMS AFTER GETTING STARTED.....	39
ADVANCED TROUBLE SHOOTING.....	41
<i>Running VIRTUALBranches AXP 2000 systems.....</i>	<i>41</i>
<i>Inventory table corruption.....</i>	<i>41</i>
<i>Hardware Problems.....</i>	<i>42</i>
<i>Drive Problems.....</i>	<i>42</i>
AXP 150 PROCESSORS WITH ADAPTEC AHA1742 SCSI CONTROLLERS	45
DIGITAL OPTICAL DISK LIBRARIES	45
HEWLETT PACKARD OPTICAL DISK LIBRARIES.....	45
CYGNET AND ELMS.....	46
<i>Cygnel ID-100 and Elms DVL.....</i>	<i>46</i>
IDE MODEL LIBRARY SYSTEMS	46
<i>IDE Model 7100 Personal Library System;.....</i>	<i>46</i>
<i>IDE Model 9000 Corporate Library System.....</i>	<i>48</i>
NKK MODEL 556 LIBRARY SYSTEMS.....	48
PIONEER 6XX SERIES CDROM CHANGERS.....	48
PIONEER 1804X CDROM CHANGER	48
PIONEER 5004X CDROM CHANGER	49
OTHER HARDWARE CONFIGURATIONS.....	50
<i>CMD SCSI Controllers;.....</i>	<i>50</i>
ERROR MESSAGES IN ALPHABETIC ORDER.....	51
EXAMPLE OF A BLANK KEY REQUEST FORM FOR THE NODE, QUICK.....	55
EXAMPLE OF A COMPLETED KEY REQUEST FORM.....	57
SEND THE COMPLETED FORM TO US AT ACORN SOFTWARE:.....	58
HELPFUL INFORMATION	61
CONTACT US BY INTERNET.....	62

CONTACT US BY THE CARRIER OF YOUR CHOICE62

VIRTUAL DISKS.....69

Preface

March 1999 -- Welcome to Acorn Software's *VIRTUALBranches* for OpenVMS documentation. We at Acorn are happy to add you to our group of users world wide who enjoy the advantages of optical data library management and robotic control software.

In this preface, you will find:

- what information our documentation contains
- who this manual is written for
- what conventions we used
- Help! from Acorn

Documentation Contents and Audience

Our documentation consists of this user guide. We have written it with the experienced OpenVMS VAX or AXP system manager and application developer in mind. We have relied upon your knowledge and experience as well as your access to the complete operating system documentation set.

Our documentation follows these conventions:

<i>italics</i>	indicates optional items that you substitute the specific names or numbers in commands
----------------	--

courier, roman	indicates commands, <i>VIRTUALBranches</i> licensing and program documentation
----------------	--

shaded note	indicates that we ask you to pay very strict attention to the information contained in the gray area.
--------------------	--

<u>double underline</u>	indicates that the text is a hot spot in the <u>HTML</u> version of the manual.
-------------------------	---

shaded text	indicates that the material discussed will be implemented in a later version of <i>VIRTUALBranches</i> .
-------------	--

Acorn Help!

When you need help with storage, look to us first! On the Internet, by fax or by phone.

For an evaluation copy of our software and documentation

VIRTUALBranches is available on the Internet via anonymous FTP from acornsw.com in UUCP_PUBLIC:[ACORN.VIRTUAL-BRANCHES]. To obtain the files from the Internet via FTP, please follow these steps:

```
ftp ftp.acornsw.com
user anonymous
password: your email address
cd uucp_public:[acorn.virtual-branches]
binary
get *.zip                ! for all savesets in a ZIP file.
get unzip.exe            ! OpenVMS/VAX UNZIP
get unzip.exe-axp        ! OpenVMS/AXP UNZIP
mget vb*.*               ! For all savesets.
exit
```

You may also get *VIRTUALBranches* via Gopher:

<gopher://gopher.acornsw.com/>

or the World Wid Web:

<http://www.acornsw.com/>

You will receive your software and documentation as quickly as the Internet transports it.

Or, call us at

(888) 226-7679 (voice)
(978) 562-1133 (fax)

For the most current technical information on our software and device support

Contact us at info@acornsw.com. We will respond quickly (during the usual business hours).

For technical support and information about installing or using any of our products

Please send a mail message to:

support@acornsw.com

We will respond quickly (during the usual business hours). If you prefer, call us at:

1-(888) 226-7679 x5 (voice)
1-(978) 562-1133 (fax)

We will answer your questions or return your call no later than the close of the next business day.

For a license key for any of our products

Please fill out a key request form and send or fax it to:

267 Cox St.
Hudson, MA 01749
(978) 562-1133 (fax)
license-request@acornsw.com (email)

We will send your license key within 24 hours.

For sales and marketing information: software solutions for storage problems

Please send a mail message to:

info@acornsw.com

We will respond quickly (during the usual business hours). If you prefer, call us:

(888) 226-7679 (voice)
(978) 562-1133 (fax)

We will return your call or fax no later than the close of the next business day.

This chapter describes *VIRTUALBranches*, the Acorn Software data library management software for optical data jukeboxes in an OpenVMS VAX or AXP environment. Also, in this chapter you will find system requirements as well as the devices that *VIRTUALBranches* supports.

VIRTUALBranches is fully integrated CDROM and optical disk library software for OpenVMS systems. *VIRTUALBranches* provides totally transparent access to applications and users with complete support for all operating system file and disk management services. Optical disk libraries, or jukeboxes, are one or more optical disk drives with robotics for retrieving and mounting a platter; *VIRTUALBranches* provides the data library management capability for each side of each platter to be used as a disk volume. A juke-box containing 16 platters appears to OpenVMS applications or users as 32 virtual disk devices. A CDROM juke box containing 18 CDROMs appears to OpenVMS applications or users as 18 virtual disk devices.

VIRTUALBranches has a built-in fragmentation avoider. Typically, OpenVMS disks can become fragmented (once they have become defragmented) and can, as a result, have very high numbers of disk head motions. Consequently access time to data is increased dramatically. Magneto-optical disk drive seek times are already very long compared to normal hard drives, so fragmented data is especially bad. The *VIRTUALBranches* fragmentation avoider slows disk fragmentation by altering OpenVMS file extend operations. Typically, this provides a greater than 15% increase in I/O performance.

With *VIRTUALBranches*, OpenVMS views jukebox platters as virtual disk devices where each side of the media can have a volume name. The software, which is implemented at the device driver level, supports all OpenVMS storage management utilities.

VIRTUALBranches lets you integrate CDROM and optical jukeboxes into your existing OpenVMS system seamlessly. There is no need to make any modifications to your applications.

Features

VIRTUALBranches software automates the management of data libraries: the contents of optical data libraries can be searched, accessed, shared, stored and managed with robotic control that is transparent to your applications.

VIRTUALBranches provides these features:

- integrates optical disks with OpenVMS file systems transparently
- installs automatically and easily (VMSINSTAL in less than 15 minutes; it depends on your machine)
- has assured upward compatibility with software for larger devices
- supports multiple data libraries connected to single processor
- eliminates operator intervention and error in locating and mounting volumes
- improves data processing efficiency and lowers cost of data storage.
- supports failover when multiple processors connect to a single data library.

With VIRTUALBranches you can add an optical data library to your system with your existing applications and, as your storage requirements change, upgrade to another device or add additional devices with no additional software adaptation. All with a simple upgrade to your original license from Acorn.

Use your knowledge of DCL commands and OpenVMS system services to access data libraries either locally or on a cluster. All you need to know is the JB device name and the volume name to mount and dismount that volume; the software and the robotics take care of making the appropriate sides of the optical disk available when I/O occurs.

System Prerequisites;

VIRTUALBranches has certain system prerequisites that appear below. If your system does not conform to these requirements, you may experience unpredictable results. We urge you to conform to these requirements for best performance and results. If your business requirements define other systems, we will be happy to work with you on those specific models and their use of VIRTUALBranches. Here are the requirements:

- | | |
|--------------------|--|
| • Operating system | OpenVMS VAX version 5.4 or later
OpenVMS AXP version 1.5 or later |
| • FTDriver | must be started, if DECwindows is not running |
| • SCSI interface | CMD Technologies controller with SCSI pass through enabled or VAX with embedded SCSI bus |
| • Disk space | 100000 blocks to install. |

Exclusions and Exceptions

Prior to version 6.2 of OpenVMS, some CDROM and optical disk drives may require Acorn Software's MODISK to provide compatibility with OpenVMS. Starting with version 6.2 of OpenVMS for AXP, Digital has provided Acorn Software with an upgraded version of DKDRIVER that provides support for these devices.

Beginning with version 7.1 of OpenVMS, Digital will provide the upgraded DKDRIVER in its standard release.

VIRTUALBranches Supported Devices;

VIRTUALBranches supports many different off-the-shelf SCSI-based data libraries from companies such as Pioneer, IDE, and Hewlett-Packard. Optical libraries support includes Rewritable, WORM, Multifunction, and CDROM.

Table of VIRTUALBranches Supported Devices

Use the following chart to note all Branches-supported devices and their model numbers. If you do not see a device that you are interested in knowing about its support, contact Acorn Software at info@acornsw.com, or by FAX, or telephone.

VIRTUALBranches Supported Devices				
Optical Jukeboxes		Capacities		
	Model	Num.	Drives Size	Max Cartridges
• Digital	10	2	1.2 GB	16
• Digital	20	2	1.2 GB	32
• Digital	60	4	1.2 GB	88
• Digital	100	4	1.2 GB	144
• Hewlett-Packard	10	2	650 MB	16
• Hewlett-Packard	10LC	1	650 MB	16
• Hewlett-Packard.	20	2	1.2 GB	32
• Hewlett-Packard	20LT	1	1.2 GB	16
• Hewlett-Packard	20T	2	1.2 GB	16
• Hewlett-Packard	40T	2	1.2 GB	32
• Hewlett-Packard.	60	4	650 MB	88
• Hewlett-Packard.	100	4	650 MB	144
• Hewlett-Packard.	120T	4	1.2 GB	88
• Hewlett-Packard.	200T	4	1.2 GB	144
• IDE	LG5TSD	1	1.2 GB	5
• IDE	7100 PLS	1	1.2 GB	10
• IDE	9000	2	1.2 GB	20
• Kodak	560E	5	1.2 GB	61
• NKK	556	2	650MB	56
CDROM		Capacities		Max. CDs
	Model	Drive Nu.	Capacity	
• Cygnet	ID-100	4	650 MB	100
• Cygnet	Infinidisc	8	650 MB	500
• Cygnet	Infiniwriter	8	650 MB	500
• Elms	DVL	4	650 MB	100
• Pioneer	602x	1	650 MB	6
• Pioneer	604X	1	650 MB	6
• Pioneer	624X	1	650 MB	6
• Pioneer	1004x	4	650 MB	100
• Pioneer	1804x	1	650 MB	18
• Pioneer	5004X	1	650 MB	500

VIRTUAL DISKS

To allow customers to test VIRTUALBranches without requiring data library hardware, VIRTUALBranches supports a data library emulation consisting of 2 virtual disk drives and 6 virtual platters. Virtual platters are simulated using container files. Container files are created and deleted automatically with VIRTUALBranches commands (IMPORT and EXPORT). For more information on how to use virtual disks, please see the following chapter, Installing

*VIRTUAL*Branches.

This chapter contains information on installing *VIRTUALBranches* with an example of an installation on a VAXstation 3100-based system of a Pioneer 1804x, a 1 drive, 18 CD CDRom juke box subsystem and the appropriate way to install the same subsystem on an Digital 3000-300L AXP. The subsections appear in the order that you will follow in installing *VIRTUALBranches*. We have formatted this chapter with additional white space for your convenience in writing notes and any information that may assist you in a speedy and successful installation.

Installing the data library hardware and the *VIRTUALBranches* software is a three-stage process:

- Connect the data library hardware to your system
- run the installation procedure
- configure *VIRTUALBranches*.

Where and how to get *VIRTUALBranches*;

VIRTUALBranches is shipped to you on a TK50 tape or the medium of your choice. You should have this file: VBUUVVV.A. *VIRTUALBranches* is also available on the Internet via anonymous FTP from acornsw.com in UUCP_PUBLIC:[ACORN.VIRTUAL-BRANCHES]. To obtain the files from the Internet via FTP, please follow these steps:

```
ftp ftp.acornsw.com
user anonymous
cd uucp_public:[acorn.virtual-branches]
binary
get *.zip                ! for all savesets in a ZIP file.
get unzip.exe            ! OpenVMS/VAX UNZIP
get unzip.exe-axp       ! OpenVMS/AXP UNZIP
mget vb*.*              ! For all savesets.
exit
```

You may also get *VIRTUALBranches* via Gopher:

<gopher://gopher.acornsw.com/>

or the World Wid Web:

<http://www.acornsw.com/>

Included on the TK50 tape or in the directory noted above is *VIRTUALBranches* documentation in Microsoft Word 5.0 format:

- BRNCH-VIRTUAL.DOC is the Macbinary copy of the file. This may be moved to any Macintosh and converted into a Microsoft Word 5.0 document.

- BRNCH-VIRTUAL.RTF is the rich text format version of BRNCH.DOC. This may be read by any version of Microsoft Word that supports importing RTF files.

You can print as many copies of this documentation as you want provided that no changes of any kind are made in the documentation.

VAXStation 3100 Hardware Configuration

This requires you to do several things:

Step 1 Determine the SCSI addresses to be used by your data library. You will have to determine which SCSI addresses are available on your system. For this example, we selected:

SCSI ID 0, LUN 0: Drive for the Pioneer 1804x.

SCSI ID 0, LUN 1: Robot for the Pioneer 1804x.

Step 2 Connect the data library to your system.

Unless your system specifically allows “hot swapping” of SCSI devices, it is a good idea to shut your system down before connecting the SCSI devices to your SCSI bus. If you **do** shut down your system, take a few minutes after physically connecting your data library use the SHOW DEVICE command at the console prompt to make sure that all the SCSI devices are, in fact, visible to the system. This example assumes that you are connecting to the B bus of your VAXStation 3100.

Step 3 Configure the devices.

OpenVMS/VAX Autoconfigure automatically configures the CDROM drive in the Pioneer 1804x as DKB0 and will **not** configure devices on SCSI LUNs other than LUN 0, so nothing special need be done other than configure the robot itself. The robot is configured by entering SYSGEN and connecting GKDRIVER to the robot:

```
$ MCR SYSGEN
SYSGEN> AUTOCONFIGURE ALL
SYSGEN> AUTOCONFIGURE ALL
SYSGEN> AUTOCONFIGURE ALL
SYSGEN> CONNECT GKB1:/NOADAPT/DRIVER=GKDRIVER
SYSGEN> EXIT
```

It is necessary to enter the autoconfigure 3 time in order to guarantee that Autoconfigure correctly configures DKB0. If you shut your system down to install the hardware, the 3 autoconfigure commands may be omitted.

Step 4 Edit SYCONFIG.COM

To guarantee that the robot is configured appropriately when the VAXStation 3100 is rebooted, add the following lines to SYS\$MANAGER:SYCONFIG.COM:

```
$ MCR SYSGEN
$ DECK
CONNECT GKB1:/NOADAPT/DRIVER=GKDRIVER
EXIT
$ EOD
```

If you are running in a cluster environment, you are **strongly** advised to create a system specific copy of SYCONFIG.COM before editing. To create a system specific copy of SYCONFIG.COM, simply

```
$ COPY SYS$MANAGER:SYCONFIG.COM SYS$MANAGER:
```

Digital 3000-300L AXP Hardware Configuration

Hardware configuration for an AXP differs in detail from configuring a VAXStation 3100. The overall steps remain the same.

Step 1 Determine the SCSI addresses to be used by your data library. You will have to determine which SCSI addresses are available on your system. For this example, we selected:

SCSI ID 0, LUN 0: Drive for the Pioneer 1804x.

SCSI ID 0, LUN 1: Robot for the Pioneer 1804x.

Step 2 Edit SYCONFIG.COM

To guarantee that the robot is configured appropriately when the 3000-300L is rebooted, add the following lines to SYS\$MANAGER:SYCONFIG.COM:

```
$ MCR SYSMAN
$ DECK
IO CONNECT GKA1:/NOADAPT/DRIVER=SYS$GKDRIVER
IO AUTOCONFIGURE /DISABLE=(MKA1:,DKA1:)
EXIT
$ EOD
```

If you are running in a cluster environment, you are **strongly** advised to create a system specific copy of SYCONFIG.COM before editing. To create a system specific copy of SYCONFIG.COM, simply

```
$ COPY SYS$MANAGER:SYCONFIG.COM SYS$MANAGER:
```

Step 3 Connect the data library to your system.

Shut your system down before connecting the SCSI devices to your SCSI bus.

Take a few minutes after physically connecting your data library to use the SHOW DEVICE command at the console prompt to make sure that all the SCSI devices are, in fact, visible to the system. This example assumes that you are connecting to the A bus of your 3000-300L.

Step 3 Reboot the 3000-300L

When SYCONFIG.COM is executed during system startup, the robot device (GKA1:) is configured manually and DKA0: is configured as part of the IO AUTOCONFIGURE processing.

Installing *VIRTUALBranches* (VMSINSTAL)

The installation program for *VIRTUALBranches* is a VMSINSTAL kit. If you are not familiar with VMSINSTAL, see the *VMS System Manager's Guide* for more information.

The files are contained in the BACKUP save set named VBUUVVVA where UUVV is the version number.

Do the installation from the system manager's login. If you aren't the system manager, get the system manager to perform this installation for you.

In this example we used a TK50 tape with *only* *VIRTUALBranches* on it.

Follow these steps:

Step 1 Log in as the system manager.

```
Username: SYSTEM
Password:
```

Step 2 Insert the tape in the drive. We used a TK50.

Step 3 Enter this VMSINSTAL command:

```
@SYS$UPDATE:VMSINSTAL product device
```

product: the exact file name (VBxxx)

device: the system name of the drive that you inserted the tape into.

We used this command to install *VIRTUALBranchesV1.2-2A* from the TK50 device, MUA0:

```
$ @SYS$UPDATE:VMSINSTAL VBU2A012 MUA0:
```

Step 4 As VMSINSTAL transfers files, respond to the questions on the screen. See the next chapter, *VIRTUALBranches System Information*, which describes file names and logical names if you need to make any changes while installing *VIRTUALBranches*.

Example of Typical Installation

The following example is a typical installation. If there is no response shown to a prompt, the default has been chosen:

```
$ @sys$update:vminstal vb030 toolshed$root:[virtual-branches.code]
```

OpenVMS AXP Software Product Installation Procedure V7.0

It is 11-MAR-1999 at 12:21.

Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]?

The following products will be processed:

VB V3.0

Beginning installation of VB V3.0 at 12:21

%VMSINSTAL-I-RESTORE, Restoring product save set A ...

* Do you want to purge files replaced by this installation [YES]?

Acorn Software, Inc. makes no representation or warranties of any kind, express or implied, with respect to this software, and specifically disclaims all implied warranties of merchantability and fitness for a particular purpose.

Acorn Software, Inc. does not warrant that operation of the software will be uninterrupted or error free or that the software will operate in the combination selected by the user.

Acorn Software, Inc. shall have no liability to any user from any claim, loss, or damage arising out of or resulting from the use of this software.

Acorn Software, Inc. makes no representation or warranties of any kind and specifically excludes incidental, consequential, special or indirect damages of any kind during the usage of its software.

By installing this or any software provided by Acorn Software, Inc. the user acknowledges and accepts the terms stated above.

* Do you accept these terms and conditions [Y]?

* Enter root directory for Virtual BRANCHES directories [SYS\$SYSDEVICE:[BRANCHES-VIRTUAL.]]: dka100:[branches-virtual.]

* Select allocation class used for Virtual BRANCHES [255]:

* Do you want to set up the VIRTUALBranches Virtual Disk demonstration [Y]?

* Enter directory to contain Virtual Disks [BRANCH_VIRTUAL_ROOT:[VDISK]]:

* Can this system send to and receive mail from the Internet [N]? y

The Internet address for Virtual BRANCHES Support is:

support@acornsw.com

Enter the VMSMail address necessary to reach support@acornsw.com.

* OpenVMSMail address is [support@acornsw.com]: mx%"support@acornsw.com"

No further questions will be asked.

```
%CREATE-I-EXISTS, BRNCH_VIRTUAL_ROOT:[SYSTEM.AXP] already exists
%CREATE-I-EXISTS, BRNCH_VIRTUAL_ROOT:[SCRATCH] already exists
%CREATE-I-EXISTS, BRNCH_VIRTUAL_ROOT:[SCRATCH.DISABLED] already exists
%CREATE-I-EXISTS, BRNCH_VIRTUAL_ROOT:[SCRATCH.DOCUMENTATION] already exists
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-INVENTORY-TABLE.FDL to
BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-VDISK.COM to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-SYSHUTDWN.COM to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-STARTUP.COM to SYS$COMMON:[SYS$STARTUP]
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-STARTUP.COM to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-SYSTARTUP.COM to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-RUN-SERVER.COM to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL.KRF to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering SCSI-2-RELEASE-10-VERSION-L.TXT to
BRNCH_VIRTUAL_DOCUMENTATION:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-CONFIGURATION-UTILITY.COM to
BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-CONFIGURATION-UTILITY.DEVICES to
BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-CONVERT.COM to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-VDISK-TEMPLATE.FDL to
BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering ZMENU.CLD to BRNCH_VIRTUAL_SYSTEM:
%VMSINSTAL-I-RESTORE, Restoring product save set C ...
%BRNCH-I-DELIVER, Delivering ZMENU.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering ZMENU_SCROLL.EXE to BRNCH_VIRTUAL_SYSTEM:
%VMSINSTAL-I-RESTORE, Restoring product save set E ...
%BRNCH-I-LINKING, Ignore multiply defined transfer address and compilation warnings
for BRNCH-VIRTUAL-ACP.EXE
%BRNCH-I-LINK, Linking BRNCH-VIRTUAL-ACP.EXE
%LINK-W-MULTFR, multiply defined transfer address
      in module ADVD file QUICK$DKA0:[SYS0.SYSUPD.VB030]SYS-LIBRARY-AXP.OLB;1
%BRNCH-I-LINK, Linking BRNCH-VIRTUAL-DISK.EXE
%BRNCH-I-LINK, Linking BRNCH-JB-MOVER.EXE
%BRNCH-I-LINK, Linking BRNCH-VIRTUAL.EXE
%BRNCH-I-LINKING, Linking JB Driver...
%BRNCH-I-LINKING, Linking Virtual Branches Virtual Disk Driver...
%BRNCH-I-LINK, Linking BRNCH-SYSTEM-DEPENDENT-AXP.EXE
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-ACP.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-JB-MOVER.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering SYS$JBDriver.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering SYS$DFDriver.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-VIRTUAL-DISK.EXE to BRNCH_VIRTUAL_SYSTEM:
%BRNCH-I-DELIVER, Delivering BRNCH-SYSTEM-DEPENDENT-AXP.EXE to
BRNCH_VIRTUAL_SYSTEM:
```

To complete the installation of Virtual Branches you must modify the file
SYS\$MANAGER:SYSTARTUP_VMS.COM to contain:

```
$ @SYS$STARTUP:BRNCH-VIRTUAL-STARTUP.COM
```

You must also modify SYS\$MANAGER:SYSHUTDWN.COM to contain:

```
$ @BRNCH_VIRTUAL_SYSTEM:BRNCH-VIRTUAL-SYSHUTDWN.COM
```

See BRNCH_VIRTUAL_DOCUMENTATION:RELEASE-NOTES.PDF (Adobe Portable
Document Format) for details on changes since the last release of

Virtual Branches.

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
BRNCH-I-UPDATE, Updating Pioneer Device Types...
BRNCH-I-UPDATE, Processing BRNCH_VIRTUAL_ROOT:[000000.SCRATCH]IDISK.CONFIGURATION;8
%SEARCH-I-NOMATCHES, no strings matched
BRNCH-I-UPDATE, Processing
BRNCH_VIRTUAL_ROOT:[000000.SCRATCH.DISABLED]P1804X.CONFIGURATION;1
BRNCH-I-UPDATE, Processing
BRNCH_VIRTUAL_ROOT:[000000.SCRATCH.DISABLED]P5004X.CONFIGURATION;1
```

Installation of VB V3.0 completed at 12:27

Adding history entry in VMI\$ROOT:[SYSUPD]VMSINSTAL.HISTORY

Creating installation data file: VMI\$ROOT:[SYSUPD]VB030.VMI_DATA

VMSINSTAL procedure done at 12:27

Configuring *Virtual*Branches

After you have completed the VMSINSTAL, the next step is to create the *Virtual*Branches configuration file using the *Virtual*Branches configuration utility.

@BRNCH_SYSTEM:BRNCH-VIRTUAL-CONFIGURATION-UTILITY.COM

The Configuration File Utility is discussed full in Appendix E.

Example of Configuring *VIRTUAL*Branches to support a Pioneer

604xThe Pioneer 604x is a special case. It appears as 6 independent CDROM drives occupying LUNs 0 to 5 of the specified SCSI ID and it has no robot. Since OpenVMS will not properly autoconfigure LUNs other than 0 in the general case, you must connect the remaining LUNs manually:

```
$ MCR SYSGEN
SYSGEN> CONNECT DKB501:/NOADAPT/DRIVER=DKDRIVER
SYSGEN> CONNECT DKB502:/NOADAPT/DRIVER=DKDRIVER
SYSGEN> CONNECT DKB503:/NOADAPT/DRIVER=DKDRIVER
SYSGEN> CONNECT DKB504:/NOADAPT/DRIVER=DKDRIVER
SYSGEN> CONNECT DKB505:/NOADAPT/DRIVER=DKDRIVER
SYSGEN> EXIT
```

These commands should be added to SYCONFIG.COM for your system.

Starting *VIRTUAL*Branches

You can start *VIRTUAL*Branches by entering this command:

\$ @SYS\$STARTUP:BRNCH-VIRTUAL-STARTUP.COM

To guarantee that *VIRTUAL*Branches starts when your system reboots, add the above command to your system startup command procedure.

You may use the *VIRTUAL*Branches startup command procedure to define the logical name environment of *VIRTUAL*Branches **without** starting any servers:

\$ @SYS\$STARTUP:BRNCH-VIRTUAL-STARTUP.COM LOGICALS

You may start servers **without** running the mount procedure:

```
$ @SYS$STARTUP:BRNCH-VIRTUAL-STARTUP.COM STARTONLY
```

This may help you if the server crashes, leaving the JB devices in an indeterminate state.

You may start a **single** server in the following way:

```
$ @SYS$STARTUP:BRNCH-VIRTUAL-STARTUP.COM "" serverName
```

Licensing *VIRTUAL*Branches

When *VIRTUAL*Branches is started, it automatically installs a 45 day temporary license. During this period you may freely operate *VIRTUAL*Branches. Once this time period expires *VIRTUAL*Branches will no longer respond to user requests. Once a week during the temporary license period and once a day for the last 7 days of the temporary license period, *VIRTUAL*Branches sends mail to the SYSTEM account warning that the *VIRTUAL*Branches temporary license is about to expire. The body of the mail message contains a key request form for the node running the *VIRTUAL*Branches server.

You must acquire a license key from Acorn Software to continue using *VIRTUAL*Branches beyond this time period.

To do this, follow these steps:

Step 1. Do a BRANCHES/*VIRTUAL* License/OUTPUT=license.txt

Step 2. Edit license.txt to fill in the requested information.

Step 3. Mail, email, or fax it back to Acorn Software, Inc.

The email address for processing your license request is:

license-request@acornsw.com

If you prefer, complete a key request form and send or fax it to:

267 Cox St.
Hudson, Ma. 01749
(888) 226-7679 x5 (voice)
(978) 562-1133 (fax)

Step 4. You will receive your license information within 24 hours

Step 5. Install the license with the BRANCHES/*VIRTUAL* License/INSTALL command.

*VIRTUAL*Branches must be licensed on each node on which a data library server is to be run. In practice this means that a license must be installed on each node to which a data library is connected.

Note:	It is the policy of Acorn Software to not grant extension keys. Specific exceptions to this rule are made on a case by case basis. To get an extension key, you must provide documentation of your time requirements to finish evaluation. Upon receipt and analysis of this document Acorn Software will grant a single extension key.
--------------	--

Using *VIRTUAL*Branches

For specifics on commands, please see the next chapter, *VIRTUAL*Branches commands. But, here in the broadest of strokes, are the first steps in using *VIRTUAL*Branches.

The *VIRTUALBranches* startup command procedure creates an inventory table and starts the server by default. If all has gone well with the startup command procedure, all you need to do is to:

Step 1. Populate the jukebox with media.

```
$ Branches/Virtual Import/Library=x
```

as many times as are necessary, *VIRTUALBranches* loads platters into slots.

Step 2. Initialize the media, if necessary, for each platter

```
$ Init JBA0 label
```

Step 3. Update the inventory table with the label of each platter, the logical name and mount qualifiers.

```
$ Branches/Virtual Set Volume 0 /label=labelname  
/logical=logicalname /mount="qualifier"
```

Step 4. Mount the media

```
$ Mount/qualifier JBA0 label
```

Step 5. Use the media as if it were a disk:

```
$ Create/Dir JBA0:[test]  
$ Copy file.ext JBA0:[test]
```


Chapter 3

VIRTUALBranches Commands

With the *VIRTUALBranches* commands noted in this chapter, you can access contents of your and control the server data library. *VIRTUALBranches* commands provide an interface for controlling your data library devices. This is a quick summary of *VIRTUALBranches* commands:

Function	<i>VIRTUALBranches</i> Command
Display the current version number	BRANCHES/VIRTUAL VERSION
Export the disk	BRANCHES/VIRTUAL EXPORT
Import the disk	BRANCHES/VIRTUAL IMPORT
Initialize the database	BRANCHES/VIRTUAL INITIALIZE
Manage the license key information	BRANCHES/VIRTUAL LICENSE
Start <i>VIRTUALBranches</i>	BRANCHES/VIRTUAL START
Set parameters	BRANCHES/VIRTUAL SET
Show the contents of a data library	BRANCHES/VIRTUAL SHOW
Shutdown the data library server	BRANCHES/VIRTUAL SHUTDOWN

The following pages list each command in alphabetical order. Each command appears on a separate page.

Branches/Virtual Export

Exports media from a library. For libraries with mailboxes, the specified media will be placed in the mailbox and the mailbox opened. The media may then be removed.

For libraries with magazines, all media in the magazine must be dismounted prior to exporting. Export procedures vary from library to library but in all cases, an OPCOM message will inform you when it is appropriate to access the magazine and which magazine to access.

Media may only be exported if the JB devices associated with the media have been dismounted and deallocated on all cluster members. After the media is exported, the associated JB devices are turned offline.

This command requires:

- OPER and TMPMBX privileges.

In all cases, the media is removed from the inventory table.

Format

Branches/Virtual EXPORT [argument]

Qualifiers

/LIBRARY[=DEFAULT]
/SLOT

Notes

The data library from which the media is to be exported.
The argument is a slot number.

Branches/Virtual Import

Imports media into a library. For data libraries with mailboxes, the specified media must be placed in the mailbox and then *VIRTUALBranches* will place the media in the right spot.

For libraries with magazines, import procedures vary from library to library but in all cases, an OPCOM message will inform you when it is appropriate to access the magazine and which magazine to access.

This command requires:

- OPER and TMPMBX privileges.

Format

Branches/Virtual IMPORT [argument]

Qualifiers

/LIBRARY[=DEFAULT]
/MAGAZINE

/SYMBOL

Notes

The data library to which the media is to be imported. A collection of media contained in a magazine is to be imported. The corresponding JB devices are brought online. Argument is required if this is present.

When specified, IMPORT defines local DCL symbols of the form: BRNCH_VIRTUAL_JB_DEVICE_n (n starts at 0) for each JB device brought online as a consequence of the import. If global symbols are required, you must promote the provided symbols to global context.

Branches/Virtual Initialize

Performs initialization of components of the *VIRTUAL*Branches library subsystem and the library hardware.

This command requires:

- OPER and TMPMBX privileges.

To repopulate the inventory table, use the Branches/Virtual Set command.

Format	Branches/Virtual INITIALIZE libraryname	
Parameters	The name of the library for which the initialize operation is to be performed. If omitted, the default library is used.	
	Qualifiers /DATABASE	Notes The inventory data base for the specified library is constructed. The /DATABASE, /LIBRARY, and /VERIFY qualifiers are mutually exclusive.

NOTE:	The database must be initialized before the data library can be used.
--------------	--

Branches/Virtual License

Produces a license and key request form for *VIRTUAL*Branches. Please see the section, *VIRTUAL*Branches Key Request and License Form, for an example of the output of this command.

The command, Branches/Virtual License requires:

- SYSPRV privilege.

Format	Branches/Virtual LICENSE	
	Branches/Virtual LICENSE/INSTALL key	
	Qualifiers	Notes
	/OUTPUT[=SYS\$OUTPUT:]	The file to contain the key request form. The key request form is written to SYS\$OUTPUT by default.
	/INSTALL key	Installs a license. <i>VIRTUAL</i> Branches must be licensed on each node on which it will run and for each data library on each node.

Branches/Virtual Set

Sets operational and volume parameters for *VIRTUAL*Branches.

Format **Branches/Virtual SET**

Format **Branches/Virtual SET DWELL n**

Sets the server or volume Dwell Time to n seconds. The Dwell Time is the length of time a volume remains in a drive if there are I/O requests for other volumes that require that drive.

Qualifiers

/VOLUME

Notes

The volume number whose dwell is to be changed. When this qualifier is used, only internal server state is affected. To permanently change the dwell of a volume, use SET VOLUME.

/LIBRARY[=DEFAULT]

Specifies the name of the library whose parameters are to be changed.

Format **Branches/Virtual SET PRIORITY n**

Sets the volume Priority. The Priority defines the importance of I/O to this volume. Volumes with larger priority values will be serviced before volumes with smaller priority values. This command affects internal server state **only**. To permanently change the priority of a unit, use SET VOLUME.

Qualifiers

/VOLUME

Notes

The volume number whose priority is to be changed.

/LIBRARY[=DEFAULT]

Specifies the name of the library whose parameters are to be changed.

Format **Branches/Virtual SET STATE DRIVES**

Set all drives in the jukebox enabled.

Qualifiers

/ENABLE

Notes

Specifies the state of the drives in the library.

/LIBRARY[=library]

Specifies the data library whose state are to be set. The default is /LIBRARY=DEFAULT.

Format **Branches/Virtual SET TRACE [ON|OFF]**

Enables or disables the tracing of commands and other internal information within a library server. Use this command as a service and debugging aid. ON is equivalent to /ENABLE=(OPCOM,SCSI). OFF is equivalent to /DISABLE=(OPCOM,SCSI). Beware of enabling ARBITRATION tracing unless you have an unlimited amount of disk storage for the *Virtual*Branches log file.

Qualifiers

/DISABLE

Notes

Disable one or more classes of tracing information. The classes are: ALL, ARBITRATION, OPCOM, QIO, and SCSI.

/ENABLE

Enable one or more classes of tracing information. The classes are: ALL, ARBITRATION, OPCOM, QIO, and SCSI.

/LIBRARY[=DEFAULT]

Specifies the name of the library whose parameters are to be changed.

Branches/Virtual SET VOLUME n

Sets volume parameters for the unit JBAn. These parameters are written to the database record for this unit. This command does not affect **any** internal server state. After you modify the volume parameters, we suggest that you used the **SHOW VOLUME /POPULATE** command to create a command procedure to rebuild the volume parameters in case the parameters become corrupted due to a system crash.

Qualifiers	Notes
/[NO]AVOID_FRAGMENTATION	Enable/disable fragmentation avoidance. When fragmentaton avoidance is on file space is allocated contiguously, if possible, and when files are extended, the extension size is 1/4 of the file size or 1/8 of the total free space on the disk, which ever is less. Be default, fragmentation avoidance is off .
/[NO]DWELL	The number of seconds this volume is to be kept in a physical drive. Any value greater than or equal to 0 may be used. To revert to using the library default dwell time, use NODWELL. By default, the library's default dwell time is used.
/LABEL=label	Sets the volume label string in the inventory table record for the specified unit. The label is limited to 12 characters, and must follow the OpenVMS conventions for volume labels. This qualifier is valid only for SET VOLUME.
/LIBRARY[=DEFAULT]	Specifies the name of the library whose parameters are to be changed. This qualifier is valid for all SET options.
/LOGICAL=logical-name	Sets the logical name string in the inventory table record for the specified unit. The logical name is limited to 64 characters, and must follow the OpenVMS conventions for logical names. This qualifier is valid only for SET VOLUME.
/MOUNT_QUALIFIERS=string	Sets the mount qualifier string in the inventory table record for the specified unit. The string is limited to 256 bytes. The mount qualifiers must be valid qualifiers to the DCL Mount command. These qualifiers are not checked by the SET command. This qualifier is valid only for SET VOLUME.
/ONLINE	Sets the enable flag in the inventory table record for the specified unit. This will ensure that the JB unit is enabled (set online) the next time the server is started, and there is a platter in the jukebox slot corresponding to the unit. This does not affect the current state of the unit. This qualifier is valid only for SET VOLUME.
/OFFLINE	Clears the enable flag in the inventory table record for the specified unit. This will ensure that the JB unit is disabled (set offline) the next time the server is started, and there is a platter in the jukebox slot corresponding to the unit. This does not affect the current state of the unit. This qualifier is valid only for SET VOLUME.
/PRIORITY	A number in the range 0 to 255. Volumes with higher priority numbers get service before or preempt current service to volumes of lower priority numbers.

Branches/Virtual Show

Displays information on the contents of the objects managed by *VIRTUALBranches*.

Format

Branches/Virtual SHOW CONTENTS

Qualifiers

/[NO]BITMAPS

/[NO]COMMAND=[file]

/[NO]DEVICES

/[NO]FLAGS

/[NO]HEADER

/[NO]LABEL

/LIBRARY[=library]

/[NO]LOGICAL

/MEDIA[=wildcard-name]

/[NO]MOUNT_QUALIFIERS

/[NO]POPULATE

/OUTPUT[=file]

/UNIT=n

Notes

Displays the internal bitmaps used to keep track of the jukebox contents. The bitmaps are displayed in hexadecimal. Each bit corresponds to either a JB unit or a jukebox slot. The leftmost bit corresponds to slot or unit zero, and the rightmost bit corresponds to the highest numbered unit. The default is /NOBITMAPS

Produces a command file that will mount all the units in the jukebox, using the label, logical and mount qualifier fields from the inventory table. The default file name is BRNCH_VIRTUAL_MOUNT.COM, and it is created in the current working directory. The default is /NOCOMMAND.

Displays information about all the JB units managed by the server. The default is /DEVICES

Displays the inventory table flags field for each device. The default is /NOFLAGS

Identifies the data library, the inventory table file, and the current time. The default is /HEADER

Displays the label field in the inventory table record for each device. The default is /LABEL.

Specifies the data library whose contents are to be displayed. The default is /LIBRARY=DEFAULT.

Displays the logical field in the inventory table record for each device. The default is /LOGICAL.

Specifies a wild-card pattern to be matched with all volume labels in the inventory table. Only those that match are displayed. The default is /MEDIA=*

Displays the mount qualifiers field in the inventory table record for each device. The default is /MOUNT_QUALIFIERS.

Produces a command file that will repopulate the jukebox in the event of the database becoming corrupted or destroyed. The default file name is BRNCH_VIRTUAL_POPULATE.COM and it is created in the current working directions. The default is /NOPOPULATE.

Specifies the file to which the information will be written. The default is /OUTPUT=SYSS\$OUTPUT:.

Specifies that information about the specified JB unit is to be displayed. All other units are ignored. The default is to display information about all units.

Format

Branches/Virtual SHOW STATE DRIVES

Show the enabled/disabled state of the physical drives in the specified jukebox.

Qualifiers

/LIBRARY[=library]

Notes

Specifies the data library whose contents are to be displayed. The default is /LIBRARY=DEFAULT.

Branches/Virtual Shutdown

Stops the *VIRTUALBranches* server for a given library. When *VIRTUALBranches* is shutdown, all JB devices must be dismounted. If the JB devices are **not** dismounted, *VIRTUALBranches* will abort the shutdown request and provide a list of the first 5 mounted devices for that server.

Note: If is crucial to shutdown the server and you cannot afford to wait to dismount all the JB devices, you may use the */ABORT* qualifier. This guarantees an orderly shutdown of the server, but may result in corrupt data or, possibly, unusable media. Acorn Software recommends using the */ABORT* qualifier only when told to do so by Acorn Software technical support or when an emergency shutdown of your entire system is imperative.

Format **Branches/Virtual SHUTDOWN libraryName**

Qualifiers

- | | |
|---------------|--|
| <i>/ABORT</i> | Specifies that the server for the specfied library is to be aborted. |
| <i>/ALL</i> | Specifies that all libraries are to be shutdown. |

Branches/Virtual Start

Starts *VIRTUAL*Branches manually.

Format **Branches/Virtual START librarnName**

Branches/Virtual Version

Displays the current version number of *VIRTUAL*Branches. When you call us for Technical Support, this is one of the first questions that will need an answer “What version are you using?”.

Format

Branches/Virtual VERSION

Problems Getting Started

So, you did everything we told you to do, you saw the hardware when you were at the console prompt, you used the configuration utility to specify your configuration file entry, all your devices were seen by OpenVMS, you ran the startup command procedure and your reward for all this great effort:

the server doesn't come up.

You will recognize this because one or both of the following happen when you run the system startup command procedure:

- A BRNCH-E-NOSERVER error occurs
- Processes of the form VBRx-librarayName do not appear when you do a SHOW SYSTEM at the DCL prompt.

The first thing to do is **don't panic!**

The second thing to do is to verify that your configuration table entry for you library is accurate. Common mistakes, especially if you created your configuration table entry manually instead of using the Configuration File Utility (BRNCH_VIRTUAL_SYSTEM:BRNCH-VIRTUAL-CONFIGURATION-UTILITY.COM) are :

- Embedded spaces in configuration entry lines other than the white space between the keywords and the parameters.
- The configuration entry lines must have **no** leading whitespace.
- The drives specified in the DRIVE configuration entry do not exist, are not online, or OpenVMS will not return a full device name for them.
- The control device specified in the CONTROL configuration entry does not exist, is not online, or OpenVMS will not return a full device name for it.

If you find one of these errors, correct it and run the *VirtualBranches* startup command procedure. If you are using a CMD Technologies controller, you may not have properly configured the controller. The Cobra and CDI 4xxx series do not require any specific configuration to enable SCSI pass through. To the best of our knowledge, all other controllers **do** require some form of controller specific configuration to enable SCSI pass through. CMD Technologies calls SCSI pass through SCSI Format Online. Check your controller documentation for the specific mechanism used to enable SCSI Format Online. Then verify that the controller is, indeed, properly configured. Also, call CMD Technologies technical support and verify that the firmware in the controller is the latest and greatest (not necessary for controllers purchased from Acorn Software or

their authorized resellers). This step is especially important if you are using an older CMD Technologies controller, e.g., CQD series, purchased prior to 1994. If the firmware requires upgrading, you should do this as a matter of course. CMD Technologies will be glad to do it for you (for a fee) or to send you the necessary ROMs to install (for a smaller fee).

OK, the controller is properly configured and up to date, the configuration entry is correct, all the necessary devices are present, and OpenVMS returns full device names for all of them. You **may** have not configured your data library properly. Check the Applications Notes chapter, below, for details on how to configure your specific hardware. If we haven't included details for your data library it is because, to the best of our knowledge, it does not **require** any specific configuration for compatibility with *VirtualBranches*. Make sure to check the release notes that may have come with your *VirtualBranches* kit. Any details on new hardware support are included there and not here, pending the next major documentation revision cycle.

The third thing to do is to look in the *VirtualBranches* log file (BRNCH_VIRTUAL_SCRATCH:libraryName-OUTPUT.LOG) for more information. The *VirtualBranches* log file contains the various tracing requested by the user and process termination information. You **did** remember to turn tracing on, didn't you?

In any event, either print or edit the file and see what happened down towards the end of the file. One of the most common problems is a corrupt inventory table (BRNCH-E-CORRUPTIT) error. This means that, for some reason, *VirtualBranches* either created a corrupt inventory table or the inventory table became corrupt on its own, possibly due to a system crash or a bug in RMS both of which we have seen. The simplest solution for this is to delete the inventory table (BRNCH_VIRTUAL_SCRATCH:libraryName.INVENTORY_TABLE) and restart the server using the system startup command procedure (SYSSSTARTUP:BRNCH-VIRTUAL-STARTUP.COM). See the section on Starting *VirtualBranches*, above.

If you are trying to use an old CMD Technologies controller (purchased prior to 1993) you may see an access violation in the log file just after a SCSI Mode Sense Request. Are you **sure** you checked the firmware revision to make sure you have the latest and greatest in that board? We have only seen this specific problem with relatively early version of the SCSI Format Online feature. The latest releases of all CMD firmware (as of this writing) are known to work properly.

If you see specific SCSI errors in your log file there is frequently a lot of information available in the data library manufacturer's documentation that you received with your data library. If it is **not** there, contact the manufacturer's technical support to see what the SCSI error is, you may have a problem with your data library. We wish that we could provide you with a detailed explanation of the errors for each data library we support, but this manual would be several hundred pages long if we did and always out of date since we don't write the data library documentation as well. However, we **did** provide you with a machine readable copy of the SCSI 2 specification (in BRNCH_VIRTUAL_DOCUMENTATION:). In this document you will find a table that gives you the definitions of the Additional Sense Code (ASC) and Additional Sense Code Qualifiers (ASCQ). Any text editor may be used to search the manual or you may print it and study it at your convenience. The SCSI 2 specification will help you understand what your library hardware is complaining about and will, in many circumstances, avoid any necessity of a support call.

Once you have determined that none of the above are the case, you probably have stumbled across one of our undocumented “features”. Further, that feature probably shouldn’t be there. You will need to contact Acorn Software.

Since you’re having problems getting started, we will need to see the following information (physically):

- the configuration file with the entry for the specific data library marked. This file is pointed to by the logical name BRNCH_VIRTUAL_CONFIGURATION:
- the **entire** contents of the output log file (BRNCH_VIRTUAL_SCRATCH:libraryName-OUTPUT.LOG).
- the type of controller you are using (if this is a CMD Technologies controller, please make sure you know the firmware revision number)
- the version of OpenVMS upon which you are running.
- the output of a SHOW DEVICE/FULL for each relevant device in the configuration file entry for the data library, i.e., **all** drives in the DRIVE line and the device in the CONTROL line.
- the scsi id’s for all the drives **and** the robot in your data library.
- the type of data library you are trying to use.

Collect all of this information and send it to Acorn Software:

by electronic mail: support@acornsw.com

by fax: (508) 568-1133

by physical mail: 267 Cox Street, Hudson, Ma. 01749, USA

along with a cover letter detailing your problem and how to contact you in return.

Then, and only then, call our support line and let us know that the information we need to help you is on the way. Technical support at Acorn Software may be reached at:

(888) 226-7679 x5

Someone from Acorn will be in touch within 1 working day.

We know this is a lot of information to gather, but you will be doing it one way or another, so you might as well do it up front. We’ll be able to help you faster that way.

Problems **After** Getting Started

These generally fall into three distinct categories, licensing, *VirtualBranches* dieing because of hardware errors, and *VirtualBranches* dieing because of software errors and configuration problems.

Configuration problems tend to show up as *VirtualBranches* working, but when you attempt to mount the JB devices, you see errors of the form:

Volume not software enabled

This is generally due to an incorrect setting of the LOAD-TIMEOUT in the configuration file for your library. Acorn Software selects **reasonable** values for the amount of time drives take to load, but drive specifications change without

notification. Some manufacturers, notably Pinnacle Micro, have drives which have unpredictable or, worse, undeterminable, LOAD-TIMEOUT values. Contact Acorn Software for the correct value for your LOAD-TIMEOUT parameter.

In all other cases, you will **need** to look in the output log (BRNCH_VIRTUAL_SCRATCH:libraryName-OUTPUT.LOG) to sort out what's happening. If there is a licensing problem, you should see a license error message (BRNCH-E-NOLICENSE), perhaps with some explanatory text. If you have not applied for, received, and installed your permanent license key, you had better do so in a hurry. See the details on licensing *VirtualBranches* elsewhere in this document.

Acorn Software does not use Digital's LMF for licensing our products. As a consequence, our licenses are sensitive to things like the ethernet address, processor type, SCS node name, SCS node number, clustering state, and several others. If you have changed any major piece of hardware in your system or made the transition from non-clustered to clustered or clustered to non-clustered you will have to get a new license for your copy of *VirtualBranches*. See the details on licensing *VirtualBranches* elsewhere in this document.

Occasionally, and we are still trying to track down why, the license system simply stops working for a product. Frequently you can fix this by simply reinstalling the key for the product. You **did** keep the key form we sent to you, didn't you? If this fails to work, we will need to know a great deal about your system so that we can examine the licensing algorithms in the context of your specific installation.

If none of the above work, you will have to contact Acorn Software. We will need the following details:

- the **entire** contents of the output log file (BRNCH_VIRTUAL_SCRATCH:libraryName-OUTPUT.LOG).

Collect this information and send it to Acorn Software:

by electronic mail: support@acornsw.com

by fax: (508) 568-1133

by physical mail: 267 Cox Street, Hudson, Ma. 01749, USA

along with a cover letter detailing your problem and how to contact you in return.

Then, and only then, call our support line and let us know that the information we need to help you is on the way. Technical support at Acorn Software may be reached at:

(888) 226-7679 x5

Someone from Acorn will be in touch within 1 working day.

Hardware errors are somewhat more difficult to deal with. We have not dealt with the generic problem of robotics failure particularly well in *VirtualBranches*. We continue to refine our techniques, but there comes a time when the hardware is so broken (by our lights) that we cannot continue to operate. Unfortunately when this happens *VirtualBranches* dies and you see your JB devices in states like offline and mounted when you do a SHOW DEVICE.

If you have SCSI tracing on, your output log will be of use to Acorn Software in further studying the failure modes of the various data libraries supported by *VirtualBranches*. It will also be of use to your data library hardware support personnel. Please send it to us as detailed above.

You **may** be able to bring up *VirtualBranches* enough to cleanly shut down your data library by using the *VirtualBranches* startup command procedure specifying the STARTONLY mode. Due to the tight coupling between the JB device driver and the rest of *VirtualBranches* this has only a moderate chance of success and can result in a system crash. We recommend instead that you reboot your system and restart *VirtualBranches*. If your data library persists in giving you problems call your data library hardware support personnel.

Software errors occasionally get past our testing regimen. When unexplainable crashes of *VirtualBranches* occur, they leave process dumps (BRNCH-VIRTUAL-ACP.DMP) in directory from which *VirtualBranches* was started. This and other information needs to be sent to Acorn Software as per the instructions below in the chapter dealing with Software Problem Reports.

Advanced Trouble ShootingRunning *VIRTUALBranches* AXP 2000 systems

There appear to be a number of AXP 2000 system options which don't interoperate with the Digital supplied GKDRIVER. Without a properly working GKDRIVER, *VIRTUALBranches* cannot function. The symptoms of this are as follows:

- The startup command procedure runs to completion but the JB devices never come on-line and there **may** be the appropriate *VIRTUALBranches* processes running.
- The log for the library held in BRNCH_VIRTUAL_SCRATCH: have, near the bottom, the log for a single SCSI command, usually a test unit ready, and nothing else.
- No error information of any kind is recorded in the log files.
- No progress appears to be made towards turning the JB devices online (the *VIRTUALBranches* processes are not paging or issuing I/O).

As near as we can tell, the SCSI command to the robot we use goes into the GKDRIVER but never comes out.

You should report this problem to Digital and request that they contact us to work toward a solution to this problem.

If you have this particular problem, you must purchase a new SCSI controller, part number PKZAA, cost as of this writing of about \$300 (US).

Inventory table corruption

Occasionally, and the causes are unknown, the inventory table may become corrupt. You can recognize this by looking in the log files when you try to start *VIRTUALBranches* and it fails to work and there is text near the bottom of the log file indicating that *VIRTUALBranches* found some form of inconsistency in the inventory table.

If this happens, the only way to repair the problem is to shutdown *VIRTUALBranches* (if it hasn't already crashed), delete the inventory table for the library, restart *VIRTUALBranches*, and repopulate the inventory table (you **did** remember to generate a command procedure to do this using BRANCHES/VIRTUAL SHOW CONTENTS/POPULATE=POPULATE.COM, didn't you?).

In a cluster environment, this may be difficult since the server that dies is usually the master server and, because of the inventory table corruption, the master server cannot be restarted.

Future versions of *VIRTUALBranches* will have a formal mechanism for getting out of this particular problem, but today what you have to do under these circumstances is reboot your cluster (not an acceptable alternative to the majority of people) or bring up a different server for the same physical devices.

Fortunately this is relatively easy. All you need do is:

- Edit the configuration table (BRNCH_VIRTUAL_CONFIGURATION:) and change the following entries:
 1. Add a or change the name specified in the DEFINE entry.
 2. Change the JB device specified in the JBDEVICE entry.
- Start the new server on all member of your cluster.
- Repopulate the inventory table.
- Remount your JB devices.

Hardware Problems

Should hardware errors occur, information necessary to your hardware vendor is captured in the *VirtualBranches* log files (BRNCH_VIRTUAL_SCRATCH:libraryName-OUTPUT.LOG). This information appears in the log files following a "Request Sense" SCSI command.

```
Wed Nov 15 17:56:54 1995:
SCSI Command = Request Sense (03 (00, 03))
SCSI Command body = 00, 00, 00, 0e, 00

SCSI Sense Data
  Valid = 0, Error Code = 70
  Segment Number = 00
  FileMk = 0, EOM = 0, ILI = 0, Sense Key = 06
  Information = 0000, 0000
  Additional Sense Length = 8
  Command Specific Information = 0000, 0000
  Additional Sense Code = 29
  Additional Sense Code Qualifier = 00
  Sense Key Specific Valid = 0
```

The information reported is defined in the ANSI SCSI specification. If you do not have a copy of this specification you may contact your library hardware vendor for the details associated with your specific error. A version of a draft of the SCSI-2 Specification (Draft X3T9.2 Rev 10L) is provided in BRNCH_VIRTUAL_DOCUMENTATION:. The key pieces of information that will need to be communicated with your library hardware vendor are the Sense Key, Additional Sense Code and Additional Sense Code Qualifiers. Do **not** contact Acorn Software directly. If your library hardware vendor has any specific questions concerning the operation of *VirtualBranches*, have them contact us.

Drive Problems

At times, one or more of your drives may fail. Under these circumstances you will have to remove the drive from the library and send it out for repair.

VIRTUALBranches provides a way for you to continue to operate your data library even with missing drives.

All you have to do is replace the device name in the *DRIVES* line of the configuration table entry with the keyword "DISABLED". Then shutdown (or abort) your server and restart it. *VIRTUALBranches* will now operate your library without attempting to utilize the missing drive.

This chapter details for the application developer and system manager some unusual aspects of *VIRTUALBranches* software when used with some data libraries. Those libraries are:

- All Digital data libraries
- All Hewlett-Packard data libraries
- All Cygnet Libraries
- All Digital Versatile Libraries (DVL)
- IDE Models 7100 and 9000
- All NKK Model 556 data libraries
- Pioneer 1804X and 5004X CDROM Changers

Additionally, we have noted here hardware configuration and specific information that we found helpful to know in testing with *VIRTUALBranches*.

AXP 150 processors with Adaptec AHA1742 SCSI Controllers It appears that the Adaptec AHA1742 and the Digital GKDRIVER do not support SCSI LUNs other than 0. This makes use of all libraries using these LUNs unusable.

Digital optical disk libraries

CONF 32

Must be set to ON in order for *VIRTUALBranches* to function with Digital data libraries. See the your user manual for instructions on changing the configuration.

Hewlett Packard optical disk libraries

CONF 32

Must be set to ON in order for *VIRTUALBranches* to function with Hewlett-Packard data libraries. See the your user manual for instructions on changing the configuration.

Cygnet and Elms

Cygnet ID-100 and Elms DVL

The Elms DVL will operate properly even if no magazines are present in the library.

Export requires that all media in the magazine be dismounted prior to export. Once the EXPORT/MAGAZINE command has been issued, the door of the appropriate DVL must be opened, the magazine removed (optional), and the door closed before any further access to CDs in the library will be allowed.

An OPCOM message identifying which library and which magazine is to be removed is issued to the DISK operator when it is safe to remove the magazine.

Note: Do not open the library prior to receipt of the OPCOM message. Doing so may result in the *VIRTUALBranches* not properly placing all media in the magazine to be exported.

At the end of the EXPORT/MAGAZINE processing all JB devices associated with the exported magazine will be offline.

Import simply requires that the magazine be physically present in the library. If it is, no operator interaction is required. If it is **not** then the door to the Elms DVL must be opened, the required magazine inserted (optional) and the door closed before any further access to CDs in the library will be allowed.

An OPCOM message identifying which library and which magazine is to be inserted is issued to the DISK operator when it is safe to insert the magazine.

Note: Do not open the library prior to receipt of the OPCOM message. Doing so may result in the *VIRTUALBranches* not properly preparing for magazine import.

IDE Model Library Systems

IDE Model 7100 Personal Library System;

When the operator aborts an import cartridge request in this library, the server detects the abort but cannot clear the pending import in the library hardware. To clear the hardware condition, turn the power to the library off and then on.

When a cartridge is exported from the library, the hardware move operation does not complete until the media is removed from the mailbox. Only after media has been removed will the server respond to *VIRTUALBranches* commands.

This library uses the mailbox slot to store the 10th cartridge in inventory. *VIRTUALBranches* attempts to distribute wear evenly across the contents of the inventory and will place a cartridge in the 10th slot. This may result in a situation in which you cannot import or export your media from the library. The work around is

Step 1. export the cartridge in the 10th slot (positions 18 and 19)

Step 2. import or export the desired cartridge, and

Step 3. import the cartridge formerly in the 10th slot.

In this library, there are two configuration items that must be set. They are:

- CHANGER EJECT and

- ANSI ST SCSI2

CHANGER EJECT must be set to Y. See the IDE Model 7100 Personal Library System *Technical Reference Manual* for instructions on changing the configuration.

ANSI ST SCSI2 must be set to Y. See the IDE Model 7100 Personal Library System *Technical Reference Manual* for instructions on changing the configuration.

IDE Model 9000 Corporate Library System

Due to the way in which IDE designed the IDE Model 9000 Corporate Library System, it is not possible to support it on any system which ejects cartridges automatically on DISMOUNT. This restricts *VIRTUALBranches* support of this model to those systems using a CMD Technologies SCSI controller or Acorn Software's MODISK product.

This restriction is in addition to the configuration requirements and restrictions noted above for the Model 7100.

CMD Controller

To prevent the premature unloading of the cartridge from the drive, the "Eject on Unload" for the host controller must be set to "N" using the CM Technologies on board configuration utility. See the documentation provided with your controller for more details.

NKK Model 556 Library Systems

There is a **significant** restriction in the Branches IMPORT and EXPORT commands due to the design of the NKK 556 firmware. Specifically, there is no way to abort either operation once they have been begun. The only way to recover from an unintentional IMPORT or EXPORT command is to do the following:

1. Abort the EXPORT or IMPORT command with ^Y.
2. From a fully privileged account, use SHOW SYSTEM to identify the server for the N-556. Its' process name will be of the form BRNCH-libraryName where libraryName is taken from the BRNCH_CONFIGURATION: file.
3. Use STOP/ID=processID to stop the server process.
4. Cycle power on the N-556 box.
5. Restart the Branches server using the system startup command procedure.

Pioneer 6xx Series CDROM Changers

These CDROM changers were electrically designed to appear on the SCSI bus as 6 individual SCSI devices and **no** robot. Because of this, a separate configuration example has been provided in the manual.

Pioneer 1804X CDROM Changer

The Pioneer 1804X requires that all magazines be present at all times in order for the library to operate properly.

Export requires that all media in the magazine be dismounted prior to export. Once the EXPORT/MAGAZINE command has been issued, the magazine is ejected from the library and must be reinserted before any further access to CDs in the library will be allowed.

An OPCOM message identifying which library and which magazine is to be removed is issued to the DISK operator when it is safe to remove the magazine.

Note:	Do not open the library prior to receipt of the OPCOM message. Doing so may result in the <i>VIRTUALBranches</i> not properly placing all media in the magazine to be exported.
--------------	--

At the end of the EXPORT/MAGAZINE processing all JB devices associated with the exported magazine will be offline.

Since magazine must be present for the library to function, you must first EXPORT the magazine into which new media is to be placed, insert the new media in the magazine, insert the magazine in the library and issue the IMPORT command.

Pioneer 5004X CDROM Changer

This CDROM changer was mechanically designed without a “mailbox”. As a consequence, IMPORT and EXPORT operate somewhat differently for the 5004X than for devices with a “mailbox”.

Note: During IMPORT and EXPORT operations all servicing of I/O requests for the entire changer ceases until the IMPORT or EXPORT operation either succeeds, fails or is aborted.

The IMPORT process is as follows:

- Issue BRANCHES/IMPORT
- Open the door of the 5004X.
- Place the CDROM to be imported in the transport in the proper orientation.
- Close the door.

This completes the IMPORT operation. *VIRTUALBranches* should put the CDROM in the appropriate place within the changer and I/O to other CDROMs in the changer will resume.

To abort the IMPORT operation:

- Open the door of the 5004X.
- Leave it open for 5 seconds.
- Close the door of the 5004X.

See also the SE-RANGE configuration file entry.

The EXPORT process is as follows:

- Issue BRANCHES/EXPORT
- Open the door of the 5004X.
- Remove the exported CDROM from the transport.
- Close the door.

This completes the EXPORT operation.

Once begun, it is not possible to abort the EXPORT operation.

Other Hardware Configurations

CMD SCSI Controllers;

VirtualBranches relies on the SCSI pass through features of the CMD SCSI controllers. The documentation provided by CMD Technologies for their controllers refers to this feature as “SCSI Format OnLine”. If your installation is using a CMD SCSI controller check your documentation to determine if anything, and what, must be done to enable SCSI Format OnLine.

CQD Q-Bus to SCSI Controllers

A jumper must be inserted to enable SCSI Format OnLine for the CQD controllers. Check your documentation to determine which jumper is appropriate for your specific controller.

CBI BI to SCSI Controllers

The on board configuration utility must be used to enable SCSI Format OnLine for the CBI controllers. Check your documentation to determine how to enable SCSI Format OnLine for your specific controller.

CDI, Cobra, Hawk and Trident DSSI/CI Controllers

These CMD Technology controllers have pass through built in at the factory. However, versions of the firmware for these controllers prior to revision X50 may not work fully. Check your controller firmware to make sure that your version is at least this level or higher.

Appendix A *VIRTUALBranches* Error Messages and Recovery Techniques

This chapter contains *VIRTUALBranches* error messages and some recovery techniques. If you have further difficulty, do not hesitate to contact us for support at atsupport@acornsw.com or (888) 226-7679.

Error messages in alphabetic order

CLOSEMAILBOX Empty and close mailbox for library "*libraryName*"

This OPCOM message is presented to the CENTRAL operator in response to a *VIRTUALBranches* EXPORT request. *VIRTUALBranches* will process no more requests for the data library until the mailbox door is closed. The export operation may be aborted using the REPLY/ABORT DCL command.

CORRUPTIT Inventory table *filename* is corrupted

The specified inventory table has become corrupted. This should not happen. If it does, report the problem, along with a copy of the inventory table, to Acorn Software. The DCL DUMP/RECORD command should be used to produce the copy of the inventory table.

To recover from this state, shutdown the server if possible and delete the inventory table using the DCL DELETE command. The file to be deleted is BRNCH_VIRTUAL_SCRATCH:*libraryName*.INVENTORY_TABLE.

ERROR Error: *string*

This is a result of an internal error in *VIRTUALBranches*. Report the problem as described earlier to Acorn Software.

INSERTCARTRIDGE Insert cartridge into mailbox for library "*libraryName*"

This OPCOM message is presented to the CENTRAL operator in response to a *VIRTUALBranches* IMPORT request. *VIRTUALBranches* will process no more requests for the data library until the mailbox door is closed. The import operation may be aborted using the REPLY/ABORT DCL command.

INTLOGERR Internal Logic Error

Report this problem as discussed above to Acorn Software.

INVCONTROL Invalid control device: *deviceName*

The configuration file entry contains a CONTROL statement with an invalid device name. Correct the configuration file and restart *VIRTUALBranches*.

INVDRIVENAME Invalid drive name: *deviceName*

VIRTUALBranches was unable to get the full device name of the specified drive. Make sure that FSGETDVI("*deviceName*", "FULLDEVNAM") returns

the full device name. If it does not, you must reconfigure your OpenVMS system or the *VIRTUALBranches* configuration file to contain the proper device specification.

INVDRIVES Invalid DRIVE statement.

The configuration file entry contains a badly formatted DRIVE statement. Correct the configuration file and restart *VIRTUALBranches*.

INVLIBNAME Invalid library name specified.

The configuration file entry contains a DEFINE statement with an invalid data library name. Correct the configuration file, restart *VIRTUALBranches*.

INVLIBTYPE Library type is invalid.

The configuration file entry for the data library contains a TYPE statement with an invalid data library type. Correct the configuration file, restart *VIRTUALBranches*.

INVLOADTIMEOUT <Invalid Load Timeout: !AS>/FAO_COUNT=1

The load timeout must be a decimal number. The specified value in the configuration file is bad.

INVPOSITION Invalid position number: *position*

The value specified in the last *VIRTUALBranches* command containing a /POSITION qualifier was invalid. Make sure you specify a valid position number and reissue the command that failed.

INVSCSITIMEOUT <Invalid SCSI Timeout: !AS>/FAO_COUNT=1

This SCSI timeout must be a decimal number. The specified value in the configuration file is not valid.

INVSLOT Invalid slot number: *slot*

The value specified in the last *VIRTUALBranches* command containing a /SLOT qualifier was invalid. Make sure you specify a valid slot number and reissue the command that failed.

LIBDEFAULT Too many default library definitions

The configuration file entry for the data library contains more than one DEFINE statement without a name field. There may be only one such statement in the configuration file. Correct the configuration file and restart *VIRTUALBranches*.

MISSINGARG <One or more arguments missing>

MOUNTEDDRIVES One or more drives mounted in library "*libraryName*"

MOVEMENTFAILURE Moving *volumeName* to drive *deviceName* has failed.

The last mount or *VIRTUALBranches* MOUNT command failed to move the volume to the drive. Generally this is a result of physically rearranging the contents of the data library without restructuring the inventory data base for the library. Reconstruct the data library inventory data base with *VIRTUALBranches* INITIALIZE/VERIFY and reissue the failed command.

NOCONFIGURATION <No configuration is available in library "!AS">

NOCONTROL CONTROL statement is missing.

The configuration file entry for the data library is missing a CONTROL statement. Correct the configuration file and restart VIRTUALBranches.

NODISMOUNT <Dismount of !AS failed.>/FAO_COUNT=1

NODRIVE No drive is available in library "*libraryName*"

A VIRTUALBranches command could not be satisfied because there were no available drives. Dismount one or more drives and reissue the failed VIRTUALBranches command.

NOLICENSE This product is not licensed.

The license for VIRTUALBranches has expired. Only VIRTUALBranches SHUTDOWN will be executed. Fill out a key request form and send it or fax it to Acorn Software for a license. Contact us at:

**267 Cox St.
Hudson, Ma. 01749
(888) 226-7679 x5 (voice)
(978) 562-1133 (fax)**

You may send the completed license request form to us via email to:

license-request@acornsw.com

NOMAILBOX <No mailbox available for library "!AS".>/FAO_COUNT=1

NOOUTPUTFILE <Output file open failed.>

NORECOVERY No recovery is possible.

VIRTUALBranches has failed to recover from a detected error condition. More information on the error is present in BRNCH_SCRATCH:BRNCH-ERROR.LOG. Report this problem to Acorn Software.

NOSCRATCHAV No scratch volume is available.

No scratch volume is available for mounting in response to a MOUNT/FOREIGN or MOUNT/OVERRIDE=IDENTIFICATION with no volume name. Add a scratch volume to the data library and reissue the failed command.

NOSERVER <Server for data library is not running.>

The server is not started or has stopped before executing the operation requested by the user. Restart the server and reissue the command.

NOTCLOSED <Mailbox is not closed in library "!AS">/FAO_COUNT=1

NOTDEFINE <Not a define statement>

NOTEJECTED Volume not ejected from one or more drives in library "*libraryName*".

A VIRTUALBranches INITIALIZE operation was attempted while media was present in the drives. Dismount or unload the media in the drives and reissue the failed command.

NOTHOMED Library *libraryName* not homed.

The library failed to home during initialization. This may indicate a hardware problem. Check and reissue the operation. Details on the specific error can be found in BRNCH_SCRATCH:BRNCH-ERROR.LOG.

NOTIMPLEMENTED *operation* is not implemented.

The requested operation is not implemented for the data library.

NOTINLIB Volume *volumeName* is not in library "*libraryName*"

The volume requested in the last *VIRTUALBranches* operation doesn't exist in the library. Add the required volume to the data library and reissue the failed command.

NOTINROTOR Volume *volumeName* is not in any rotor in library "*libraryName*"

In attempting error recovery for a Kodak 560, volume was not in the rotor where *VIRTUALBranches* expected it to be. Report the problem to Acorn Software.

NOTINVENTORIED Library *inventoryName* not inventoried.

The library failed to inventory during initialization. This may indicate some sort of hardware problem. Check your hardware and reissue the operation. More details on the specific error can be found in BRNCH_SCRATCH:BRNCH-ERROR.LOG.

NOTOCCUPIED <The drive isn't occupied.>

NOTYPE Library type missing.

The configuration file entry for the data library is missing a TYPE statement. Correct the configuration file and restart *VIRTUALBranches*.

SCSI SCSI Error: Sense Key = !ZL, ASC = !ZL, ASCQ = !ZL

A SCSI error occurred. More details can be found in BRNCH_SCRATCH:BRNCH-ERROR.LOG

SLOTMISSING Required slot number was not specified.

Data libraries with magazines require /SLOT qualifiers for all IMPORT operations. Reissue the *VIRTUALBranches* command with the appropriate /SLOT qualifier.

UNKKEYWORD Unknown keyword.

The configuration file entry for the data library contains a statement that contained an unknown keyword. Correct the configuration file and restart *VIRTUALBranches*.

Appendix B Licensing *VIRTUALBranches* These are examples of how to acquire

Example of a blank key request form for the node, QUICK.

Log into any account on the system to which the data library is connected. Create a license request form for the node.

```
$ BRANCH/VIRTUAL LICENSE/OUTPUT=LICENSE.TXT
$ TYPE LICENSE.TXT
```

Key Request Form: VIRTUAL BRANCHES V1.2-1
Date: 28-MAR-1995 07:39:29.13

To obtain your Software Key, send this form containing your System Identification Code (below) to Acorn Software, Inc., or contact your Acorn Software service or sales representative. If you are outside of North America, contact your local Virtual Branches distributor or send your System Identification Code directly to Acorn Software to obtain a Software Key which will enable full use of VIRTUAL BRANCHES V1.2-1.

Acorn Software, Inc.
267 Cox St.
Hudson, Ma. 01749

Phone: (888) 226-7679 Fax: (978) 562-1133
E-Mail: LICENSE-REQUEST@ACORNSW.COM

Please complete this software key request form by providing the following information before sending this form to Acorn Software, Inc. or your local Virtual Branches distributor. Only key request forms that have been filled out completely can be processed.

Company: _____
Address: _____

Country: _____
Phone: _____
Fax: _____
E-Mail: _____
Contact Person: _____
Title: _____
Data Library Manufacturer: _____
Data Library Model: _____

The following is a list of System Identification Codes for some or all of the VAXes in your VAXcluster. To include the System Identification Codes (SICs) for additional VAXes in your VAXcluster, log in to those VAXes and issue the

BRANCHES/VIRTUAL LICENSE/OUTPUT=filename

command for Virtual Branches.

SIC: VBR1-K7XF2W-CRK8TT-TDJT2L---6KDP7P-7EPV5L-9D5C09 (QUICK)

```
$ EDIT LICENSE.TXT
```

Using your favorite editor, complete the key request form. Please see the next section for an example of a complete key request form.

Example of a completed key request form

Log into any account to which the data library is connected and fill in the form.

\$ BRANCH/VIRTUAL LICENSE/OUTPUT=LICENSE.TXT

\$ TYPE LICENSE.TXT

Key Request Form: VIRTUAL BRANCHES V1.2-1

Date: 28-MAR-1995 07:39:29.13

To obtain your Software Key, send this form containing your System Identification Code (below) to Acorn Software, Inc., or contact your Acorn Software service or sales representative. If you are outside of North America, contact your local Virtual Branches distributor or send your System Identification Code directly to Acorn Software to obtain a Software Key which will enable full use of VIRTUAL BRANCHES V1.2-1.

Acorn Software, Inc.
267 Cox St.
Hudson, Ma. 01749

Phone: (888) 226-7679 Fax: (978) 562-1133

E-Mail: LICENSE-REQUEST@ACORNSW.COM

Please complete this software key request form by providing the following information before sending this form to Acorn Software, Inc. or your local Virtual Branches distributor. Only key request forms that have been filled out completely can be processed.

Company: Data Library Specialists_____
Address: 946 Massachusetts Avenue_____
Cambridge, MA. 02139_____

Country: USA_____
Phone: (617) 491-7474_____
Fax: (617) 491-7475_____
Contact Person: D.Dewey_____
Title: V.P., Marketing_____

Data Library Manufacturer: HP-----
Data Library Model: 20T-----

The following is a list of System Identification Codes for some or all of the VAXes in your VAXcluster. To include the System Identification Codes (SICs) for additional VAXes in your VAXcluster, log in to those VAXes and issue the

BRANCHES/VIRTUAL LICENSE/OUTPUT=filename

command for Virtual Branches.

SIC: VBR1-K7XF2W-CRK8TT-TDJT2L---6KDP7P-7EPV5L-9D5C09 (QUICK)

Send the completed form to us at Acorn Software:

Via the internet to:

license-request@acornsw.com

Via fax, our fax number is:

1 (508) 562-1133

Via mail, our address is:

Acorn Software, Inc.
267 Cox St.
Hudson, MA 01749 USA

To report a problem with *VIRTUALBranches*, you must first put together the information that will allow us to diagnose the problem, then contact us with this information, either by the Internet, by telephone or Fax.

Helpful Information

First, assemble the information we need to help you:

Step 1 Use BRNCH_SYSTEM:BRNCH-PROBLEM-REPORT.TEMPLATE as your basis for the software problem report and create a file named BRNCH-PROBLEM-REPORT.TXT. Describe the problem in as much detail as you can. In addition, please note

- If you were able to duplicate the circumstances that caused the problem.
- The location of the file, SYSUAF.DAT
- The definition of the SYSUAF logical name, if it is defined
- The privileges (specifics) of the account from which you started *VIRTUALBranches*. We need the details since not all accounts such as a system manager's account have the same privileges.
- The version number of *VIRTUALBranches*, of OpenVMS VAX or AXP.

Step 2 If the software problem involves a crash, locate the process dump. When *VIRTUALBranches* crashes, it leaves a process dump on your system device. The location can vary according to where the default directory is when the BRNCH-VIRTUAL-STARTUP command procedure starts. Check the date of the process dump with the DIRECTORY command to identify the one that might have been part of the problem.

Step 3 Make a backup save set of these files: (TBD)

Step 4 If you are connected to the Internet, send us the backup set via mail or anonymous FTP. Here are the commands that will send us the files we need:

```
FTP FTP.ACORN.SW.COM
USER INCOMING
BINARY
PUT filename
EXIT
```

Or, copy the backup save set to one of these media and mail it to us: TK50 Cartridge, TF85 Cartridge, 4 mm DAT, 5 1/4" Sony optical disk cartridge (ISO format).

Contact us by Internet

This the fastest way to get to us. During the installation for *VIRTUALBranches* the *BRNCH_SUPPORT* logical name gets set as the default support address. Please use the *VIRTUALBranches* utility command just for that purpose:

```
$ @BRNCH_SYSTEM:BRNCH-PROBLEM-REPORT.COM backupSaveSet [support]
```

backupSaveSet is the fully qualified file name of the backup save set containing the problem report and diagnostic information.

support is the email address that will reach support@acornsw.com. The installation parameter *BRNCH_VIRTUAL_SUPPORT* is the default.

Contact us by the carrier of your choice

If you are not on the Internet, send us the backup save set with a brief letter:

Acorn Software, Inc.
267 Cox St.
Hudson, Ma. 01749
USA
attn: Customer Services, Software Problem Report

If you need operational support and you have a maintenance contract, please call or FAX a Software Problem Report to:

VOICE: 1 (888) 226-7679 x5
FAX 1 (508) 562-1133

Our business hours are 8:00 am to 5:00 PM EST (GMT -5:00). We will call you/email you within 24-hours.

Acorn Software Customer Service Policy

October 1995 -- We are pleased to have you join our community of *VIRTUALBranches* users. We are committed to the best possible software product and the best possible support for you and your data library software requirements. Occasionally difficulties in installation or operation of our software occurs. We stand ready to assist you in the diagnosis and recovery from errors. Our technical support is available by telephone, Internet and fax. We are open for business during the usual hours EST (USA).

As with all our customers, we will make every effort to resolve your technical difficulties or help you diagnose them to the level that you can seek information from the source of the difficulty.

We value you as our customer, especially your ideas and comments. We welcome your calls and letters with suggestions on how we can improve our product, our documentation or our technical support. Working together we make a better product. And, we thank you for purchasing *VIRTUALBranches*.

Under rare circumstances, you will have to manually edit the configuration file. If you are not running *VirtualBranches*, you must first define the logical names used by *VirtualBranches*:

But, first, define the logical names; use this command

```
@SYS$STARTUP:BRNCH-VIRTUAL-STARTUP.COM LOGICALS
```

You are now prepared to edit the configuration file (BRNCH_VIRTUAL_CONFIGURATION:). The text editor of your choice may be used.

Lines begin with a keyword that cannot be abbreviated, with parameters and a carriage return, CR. Lines may **not** have leading blanks. Entries begin with a DEFINE keyword and end with a null line (a line with no characters except the ending CR) or the end of the configuration file. Each entry defines a library to be served, its physical characteristics, the physical characteristics of the linkage to the robot, the location of the library inventory database, etc. Branches allows more than one data library per OpenVMS or OpenVMSCluster system.

Each entry defines a library to be served, its physical characteristics, the physical characteristics of the linkage to the robot, the location of the library inventory database, etc. *VIRTUALBranches* allows more than one data library per OpenVMS or OpenVMSCluster system.

The following sections, which appear in alphabetic order according to the first letter of the first word, describe each line of the configuration file. If you prefer example configuration files, please skip to the next section, Examples.

Control robot_dev [,devpara[,...]]

This **required** line identifies and defines the device which performs the robotic motions to the data library device.

robot_dev must be a

- a SCSI pass-through device from a CMD Technologies SCSI controller (DUc254:) or
- a device from a Digital-supplied SCSI driver (GKbu0l) without the option of devpar.

If the device is a SCSI pass-through device from a CMD Technologies SCSI controller, the optional *devpara* is: the OpenVMS unit number of the disk device representing the robot. For example, if the robot is seen as DUA3:, the *devpara* is 3.

Define data_library

This **required** line defines the name of the data library. Be specific and characterize the data library according to its use or origin or another easily recognizable names. To use the default, type Define. The default name is DEFAULT and requires a blank parameter for *data_library*. Do not enter "DEFAULT" as a parameter. There can be only one default data library per OpenVMS or OpenVMSCluster system.

Drive *n*, (*datname* [, *datname* ...])

This **required** line defines the number of the data transfer devices and the OpenVMS device name of each data transfer device in the data library. The parentheses surrounding the device names are required.

NOTE:	The device names <i>must</i> be specified in the physical address order of the library.
--------------	---

Depending on your OpenVMS device names, the actual device order may not be related to the device names.

Should a drive need to be removed from your library for any reason, simply replace it's name with the word "DISABLED" and restart your VIRTUALBranches server.

Inventory *filename*

This **optional** line specifies the name of the inventory database. The default is: BRNCH_VIRTUAL_SCRATCH:*data_library*.INVENTORY_TABLE.

data_library is the parameter on the DEFINE line for the current entry. A unique inventory data base must be defined for each library. The directory with the inventory database(s) must allow *world access* for read operations.

JBDEVICE *JBc*

This **optional** line specifies the JB device code and controller used by the VIRTUALBranches server. At this time, the device code portion **must** be "JB". The controller may be any alphabetic between A and Z. A **different** controller must be assigned to each ODL. The default value is "JBA".

LOAD-TIMEOUT n

This **optional** entry notes the number of seconds it takes for media to become available for I/O after it is in the drive. *VIRTUALBranches* sets reasonable values for the LOAD-TIMEOUT.

NOTE:	Do NOT use this entry unless told to do so by an Acorn Software support representative.
--------------	--

Mount mountAtStartup

If mountAtStartup is 1, all disks in the *VIRTUALBranches* database are mounted. If the *VIRTUALBranches* startup command procedure was submitted to a batch queue, a command procedure to mount the disks is submitted to that same queue.

Node node_name

This **optional** line names the node connected to the data library and from which it receives commands. *node_name* must be the name used by other systems on the network. When the node line is omitted, *VIRTUALBranches* starts a library server and driver on each node where the *VIRTUALBranches* startup procedure runs. Typically, include a Node line for future expansion (to a cluster, for example).

Priority serverPriority

Sets the process priority of the *VIRTUAL Branches* server to the specified value. *serverPriority* must be in the range 1 to 15. If omitted it defaults to 4.

SCSI-TIMEOUT n

This **optional** entry notes the number of seconds it takes for the longest SCSI command to complete. This is useful for systems with embedded SCSI busses using the GKDRIVER to control the data library robotics.

NOTE:	Do NOT use this entry unless told to do so by an Acorn Software support representative.
--------------	--

SE-RANGE n-m

This **optional** entry notes the range of storage element to be used by the data library hardware. At this time, this entry is only used by the Pioneer 5004X support.

Type device

This **required** line defines the type of data library. These are the *device* codes that are valid:

604X Pioneer 602x or 604x CDROM changer
1804X Pioneer 1804x CDROM changer
5004X Pioneer 5004x CDROM changer
HP10C Hewlett-Packard 10C ODL
HP10LC Hewlett-Packard 10LC ODL
HP20T Hewlett-Packard 20T ODL
HP20LT Hewlett-Packard 20LT ODL
HP20C Hewlett-Packard 20 ODL
HP40T Hewlett-Packard 40T ODL
HP60C Hewlett-Packard 20 ODL
HP100C Hewlett-Packard 100 ODL
HP120T Hewlett-Packard 120T ODL
HP200T Hewlett-Packard 200T ODL
IDE IDE HyperShuttle

IDE7100	IDE Model 7100 Personal Library System
IDE9000	IDE Model 9000 Corporate Library System
NKK556	NKK 556 2 drive data libraries
RW504	Digital 16 Cartridge

RW510 Digital 32 Cartridge
RW514 Digital 44 Cartridge
RW516 Digital 88 Cartridge

Trace state

This **optional** line specifies the initial state of the tracing as if a *VIRTUAL*Branches TRACE command had been executed and is optional. The value of the TRACE command is a bit map that requests specific sets of information be placed in the output log file (BRNCH_VIRTUAL_SCRATCH:libraryName-OUTPUT.LOG). The values and what gets traced are:

- 1 OPCOM Messages
- 2 SCSI Commands
- 16 Arbitration State

state is at 0 if tracing is to be off or the value of your choice if tracing is to be on initially. The default value is 0, tracing off. We highly recommend that tracing be set to 3 during the first few weeks of operation just to make sure that sufficient information is captured to make diagnosis and trouble shooting by Acorn Software easy.

UNLOAD-TIMEOUT n

This **optional** entry notes the number of seconds it takes for media to become available to the robot after a SYSSDISMOU system service has been executed. *VIRTUALBranches* sets reasonable values for the UNLOAD-TIMEOUT.

NOTE: **Do NOT use this entry unless told to do so by Acorn Software personnel.**

Virtual Disks

For virtual disk support you must create a directory for the container files; this can be on any disk accessible from the system. All container files will be located in this directory. A container file is 10240 blocks and has a name like VTESTn.DSK, where "n" is a digit from 0 to 6.

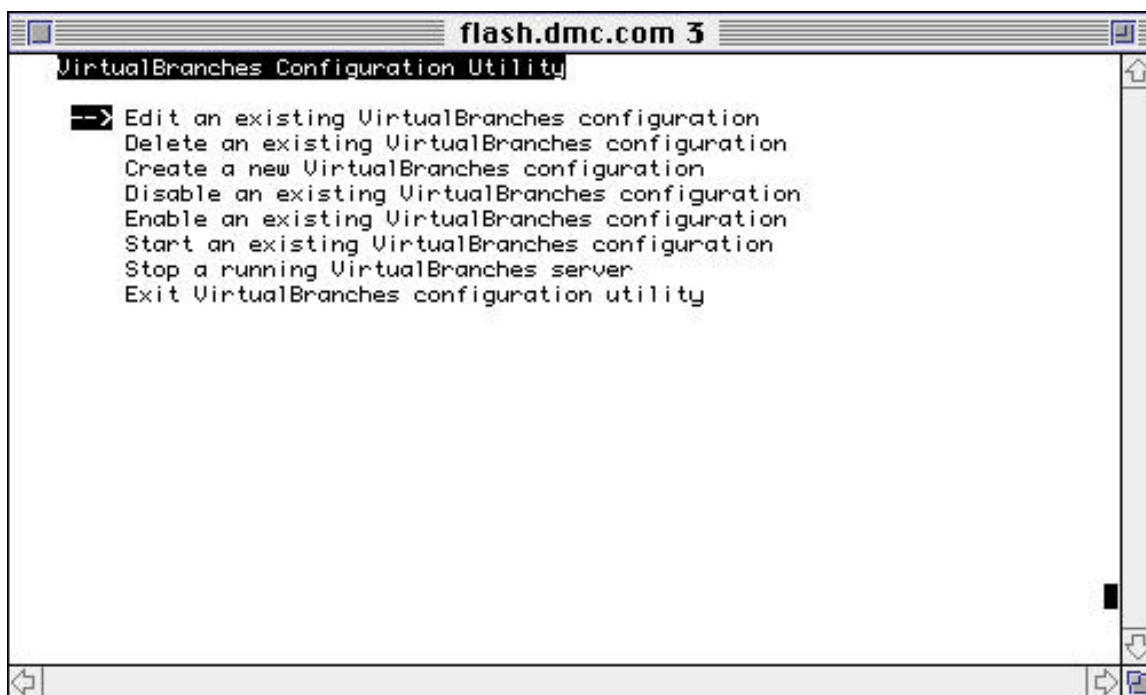
Then, create the system-wide logical name BRNCH_VIRTUAL_VDISK to point to the container file directory, like this:

```
DEFINE/SYSTEM/EXEC BRNCH_VIRTUAL_VDISK disk:[dir]
```

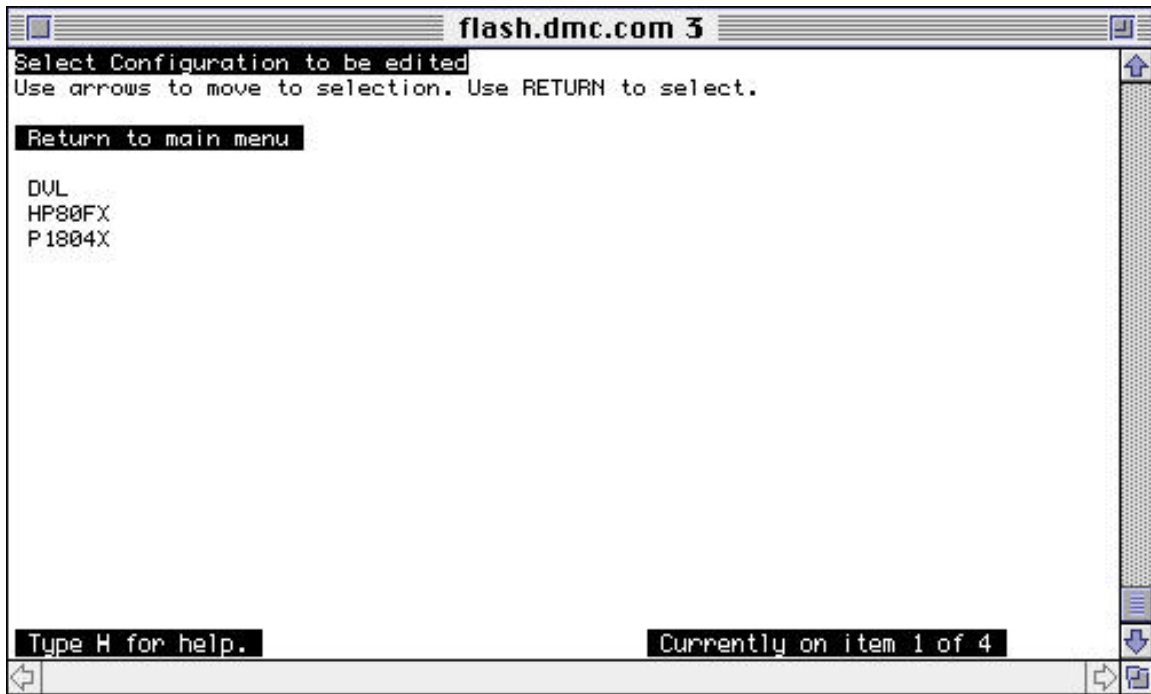
VIRTUALBranches supports up to 6 virtual disks. The disk container files are created automatically when you IMPORT a virtual disk, and are deleted automatically when you EXPORT a virtual disk. If a container file exists when *VIRTUALBranches* starts up, its internal database is updated automatically.

Use the Configuration File Utility to create the initial entry for your virtual disk "data library".

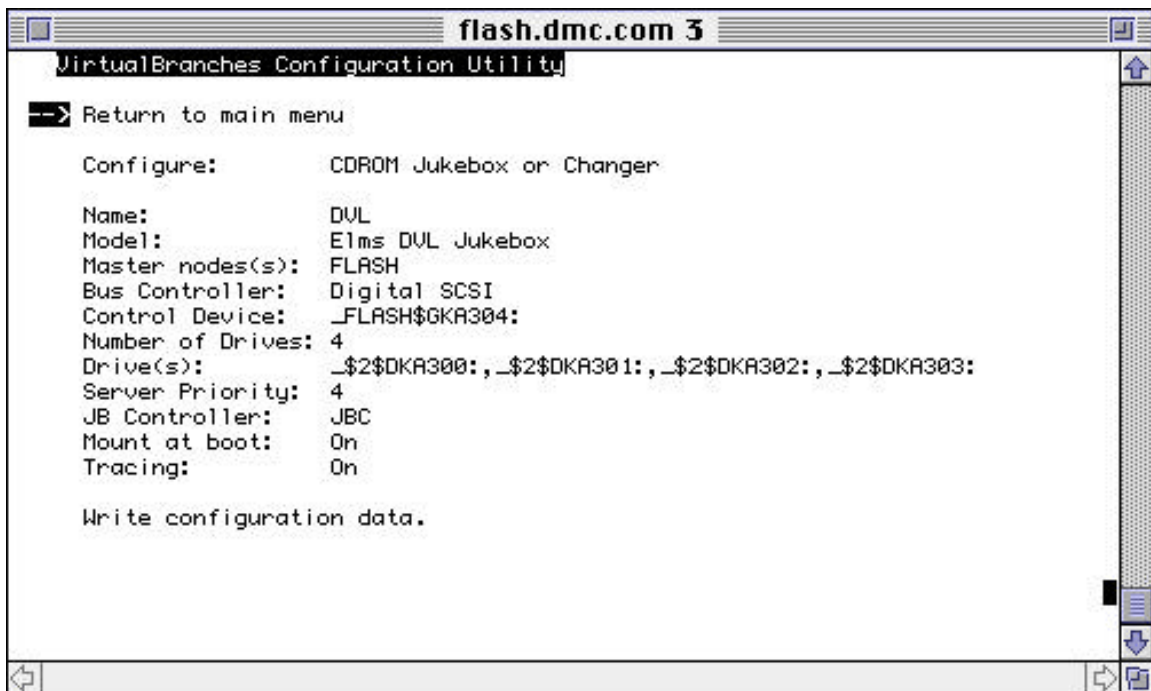
The *VIRTUALBranches* configuration utility has been completely redesigned. The following is the set of screens that are available along with the explanations of the use of them.



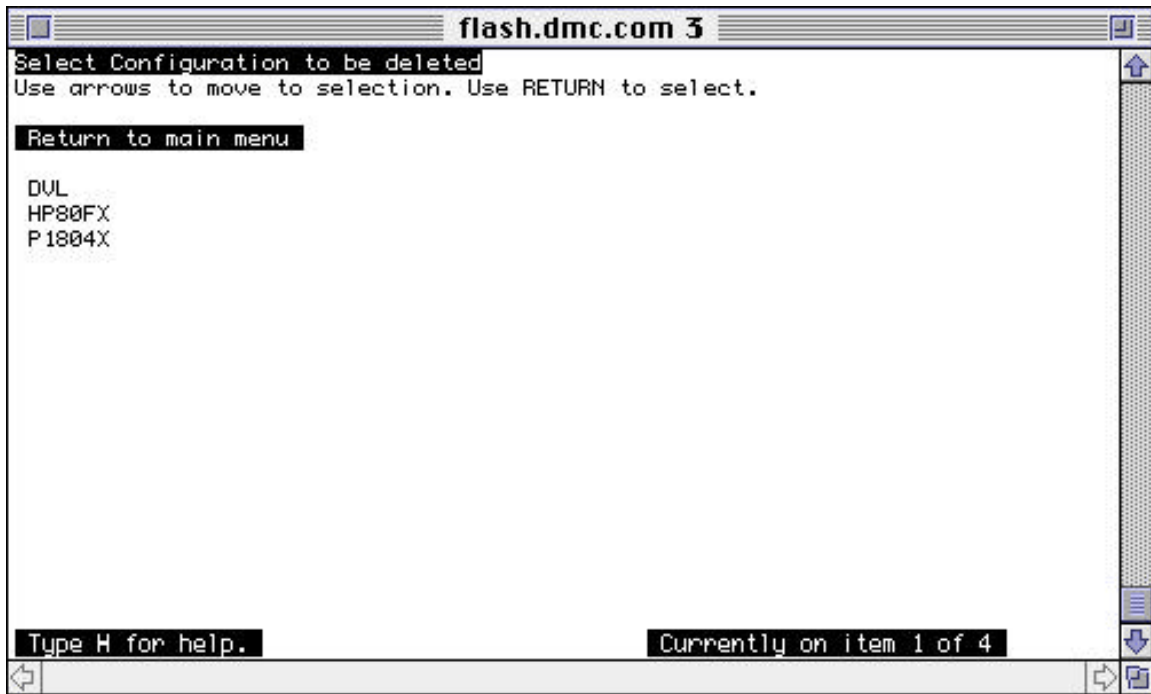
The configuration utility allows you to manage all aspects of the creation, editing, deletion, enabling, disabling, and starting *VIRTUALBranches*. Provisions for multiple configurations per system have been made. To select an operation, simply use the arrow keys to move to the entry of choice and enter return to select it.



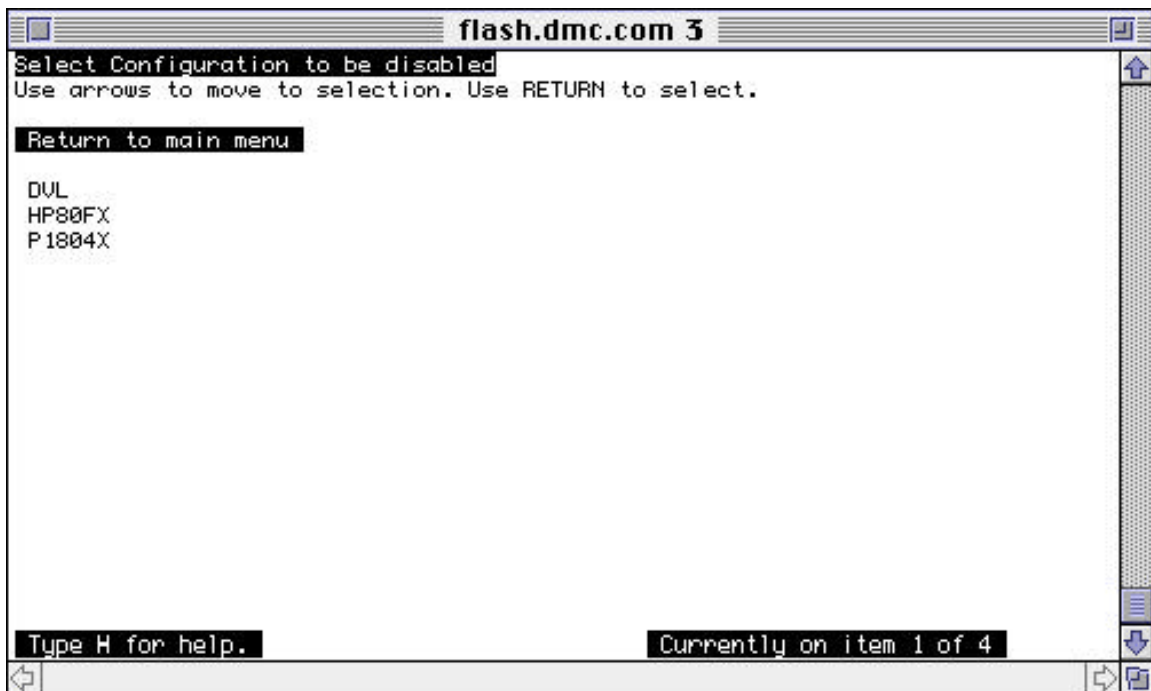
The interface is menu driven with only those options that are possible shown to you. For example, when asking to edit existing configurations only those configuration present and enabled are show. This particular system has three data libraries attached, each named for the type of data library.



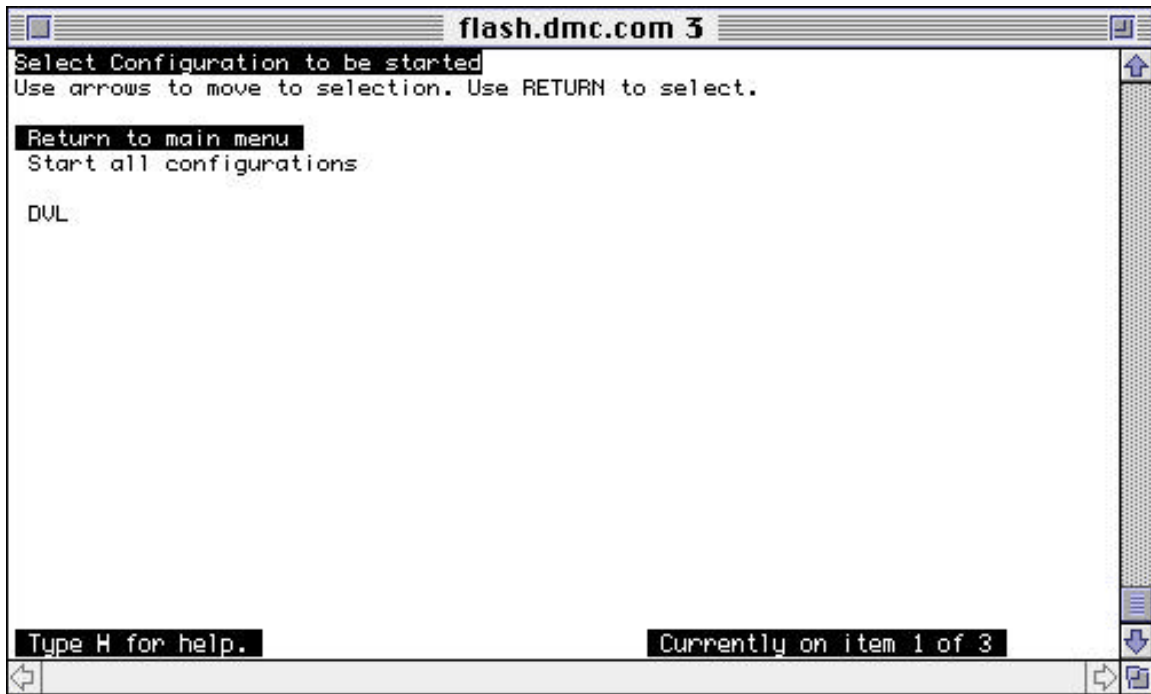
By selecting the one named DVL the current configuration is displayed and may be changed at will.



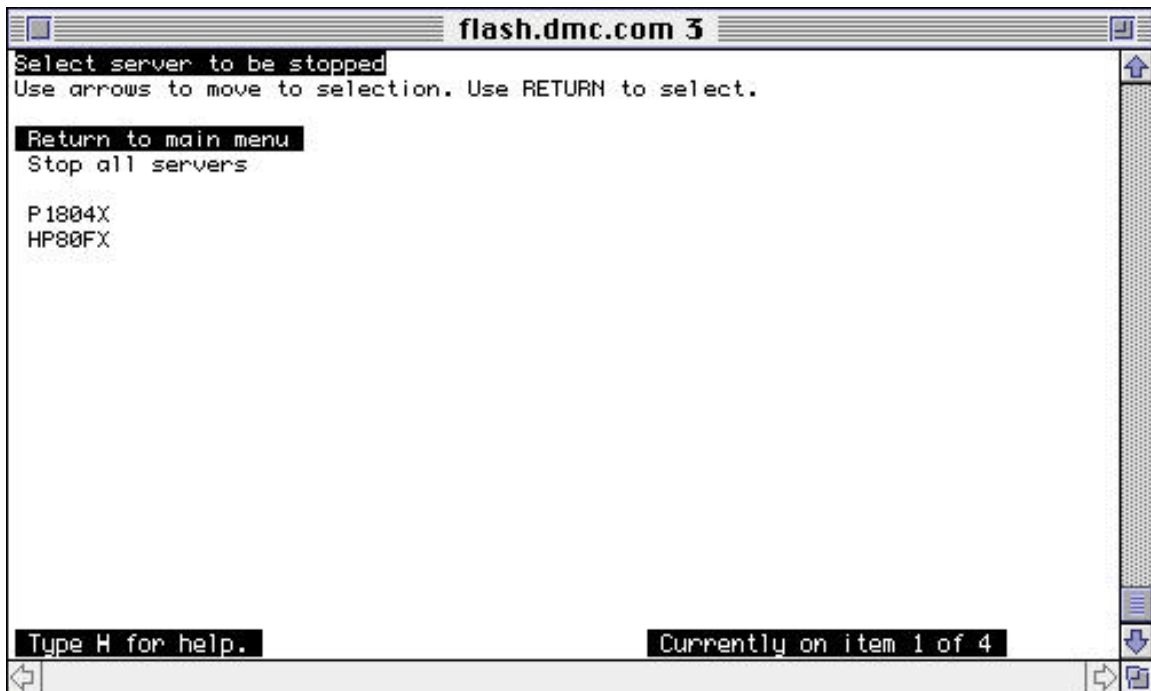
All server configurations may be deleted at will. The server may be running when the configuration information is deleted. If you delete the configuration information for a running server, the server continues to run but will not be started the next time the system is booted.



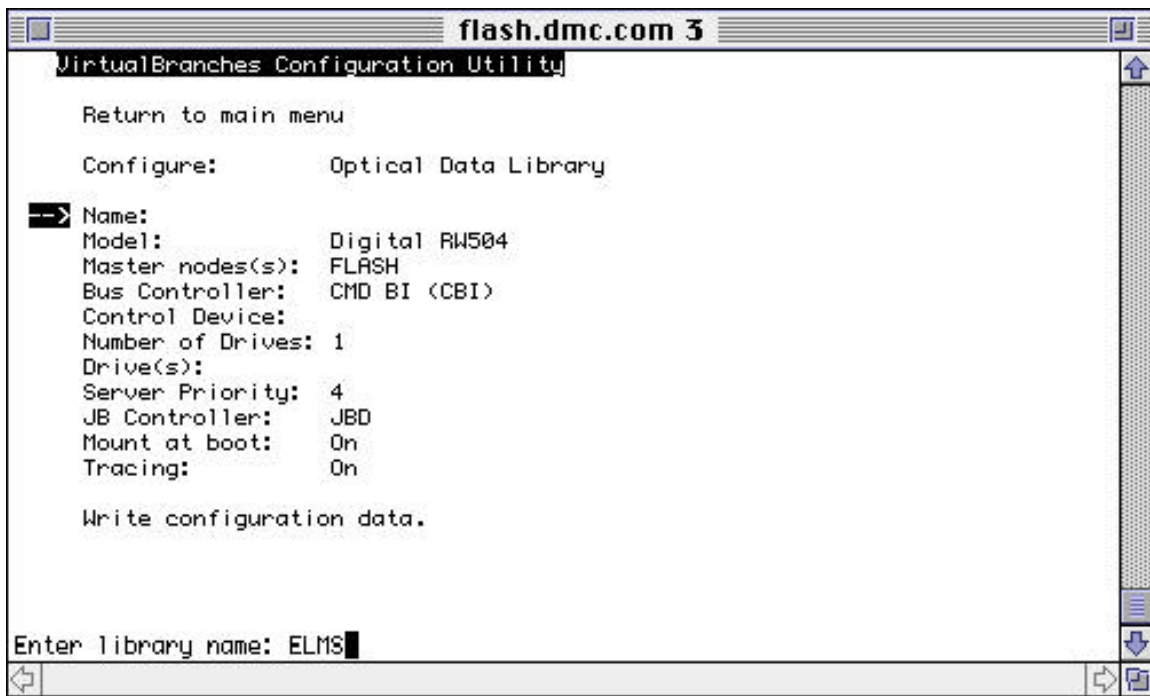
All server configurations may be disabled at will. Disabling a server means that the configuration information is saved but removed from the area in which the startup command procedures search for configuration information. The server may be running when the configuration is disabled. This is convenient when testing new data libraries or in the event of a hardware or controller failure for one or more existing libraries.



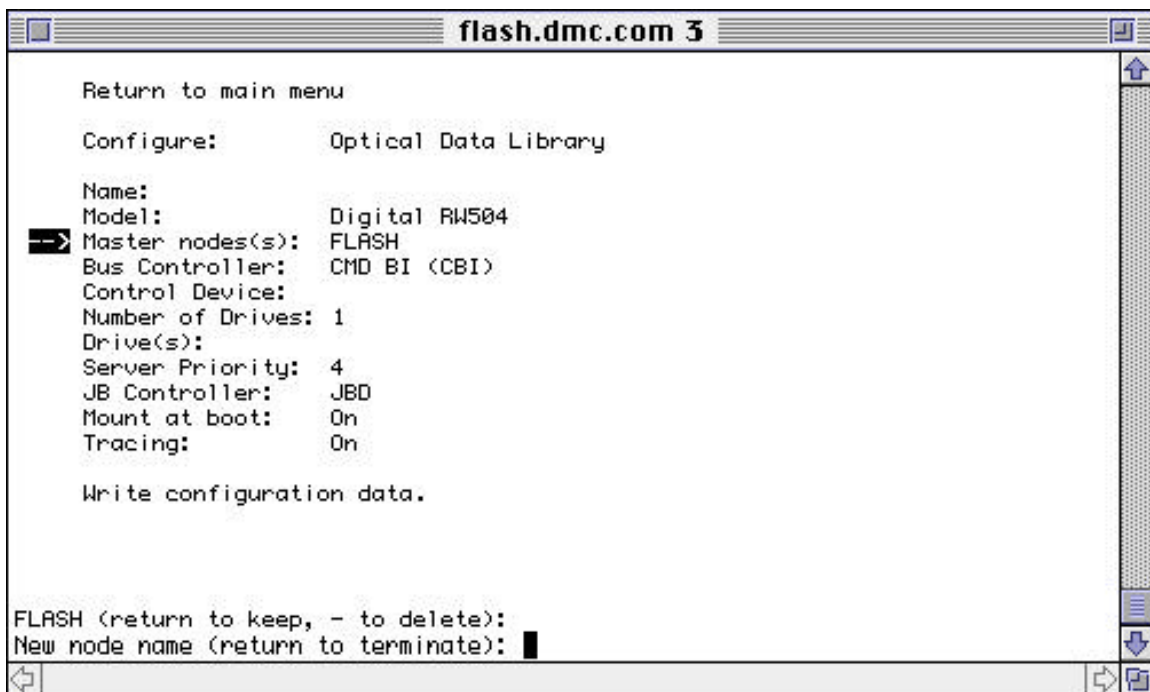
Assuming that you have sufficient privileges all stopped servers may be started. Only those servers not running on the current machine are displayed.



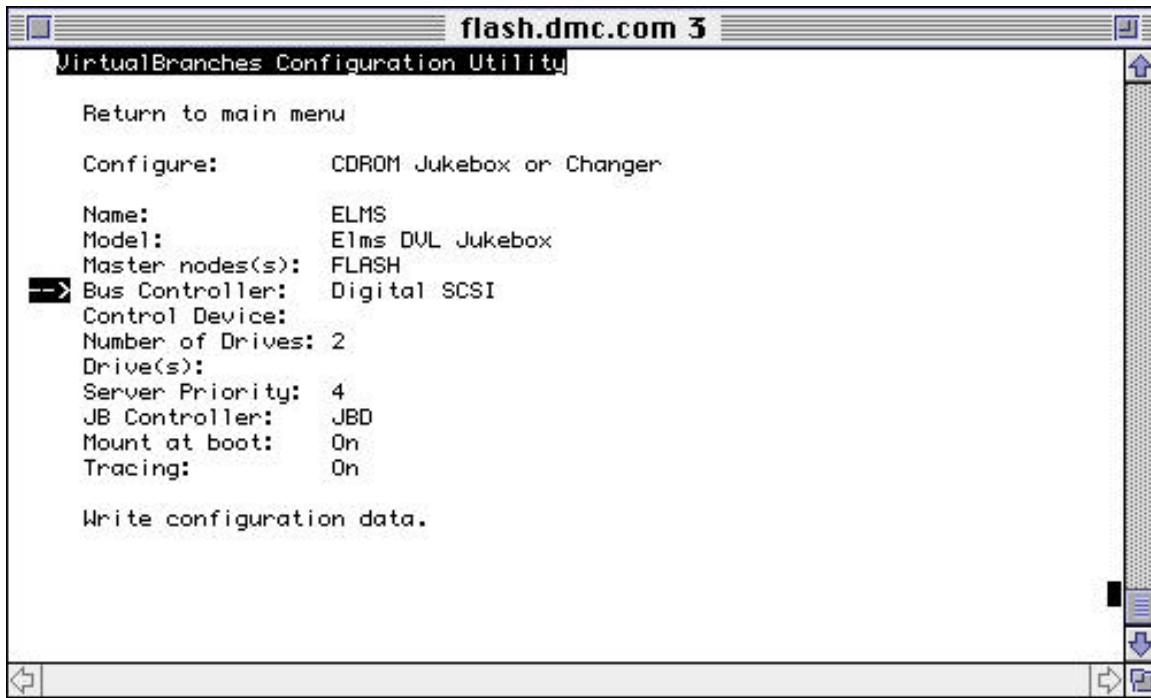
And, of course, started servers may be stopped. Only those servers running on the current machine are displayed.



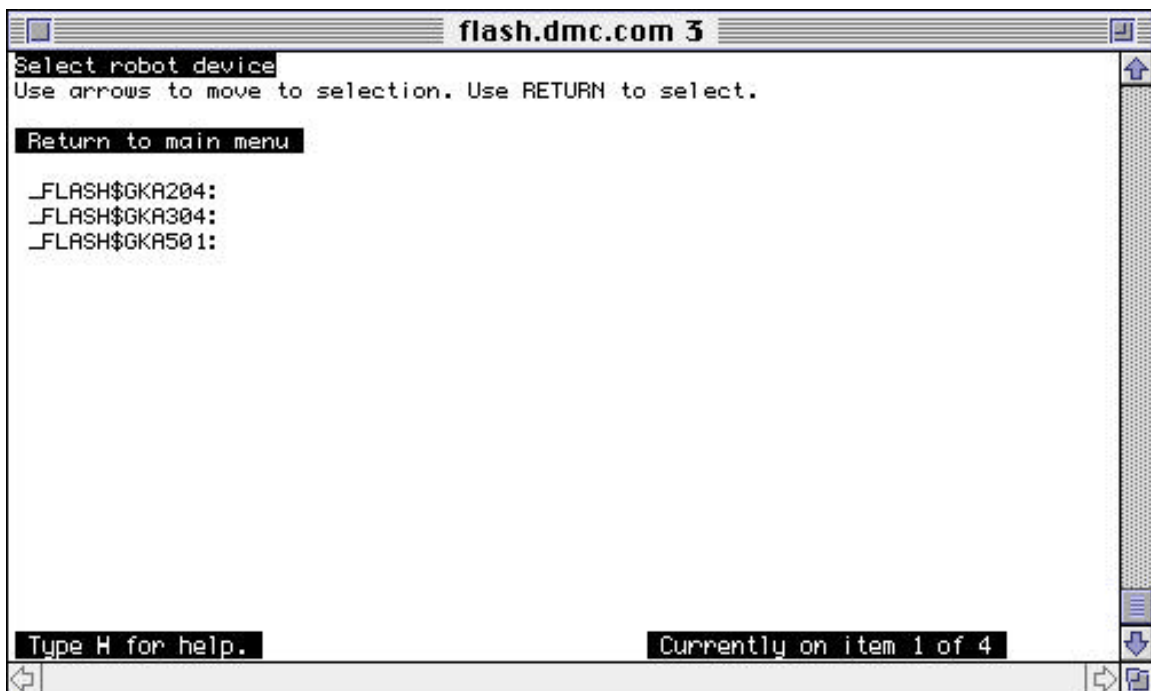
New configurations may be added at will. Fields in the configuration file may be modified in any order. Not all possible fields in the configuration file may be entered using the configuration utilities. These fields are typically used by Acorn Software to correct specific problems with your hardware and should not be present under normal operating situations.



If your data library may be controlled from more than one node at a time, for example if it is connected to any cluster wide controller such as a CMD Trident, you may add nodes to the list of master nodes. If you have a node on the list that you want deleted, enter "-" when given the opportunity and it will be removed.

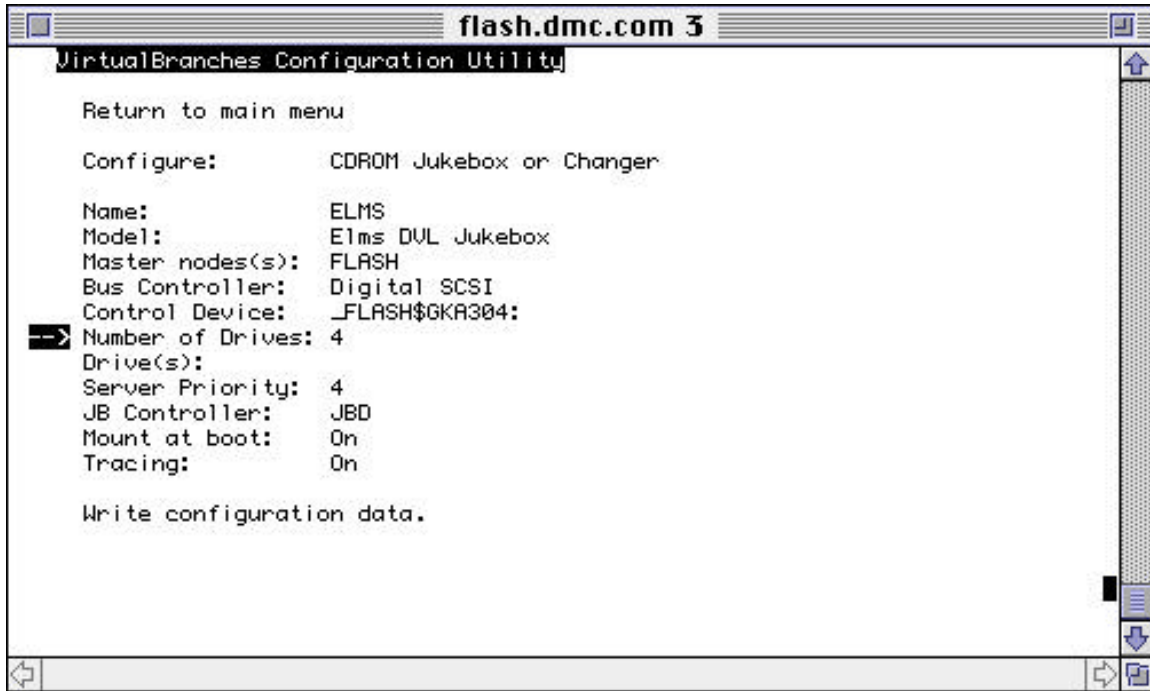


Select the particular controller by repeatedly using the return key until the correct correct bus is displayed. In this case, the jukebox is connected to a workstation using the embedded SCSI controller. Note that the generic type of jukebox/changer being edited is now a CDRom jukebox. As it happens the first entry in the list of supported types is an Elms 100 CDRom jukebox which is the type of box being configured. Had it not been, you could select the model configuration line and get a list of supported hardware types for that class of data library. There are three classes of data library supported by VIRTUALBranches: Optical, CDRom, and a software only demonstration called Virtual Disk.

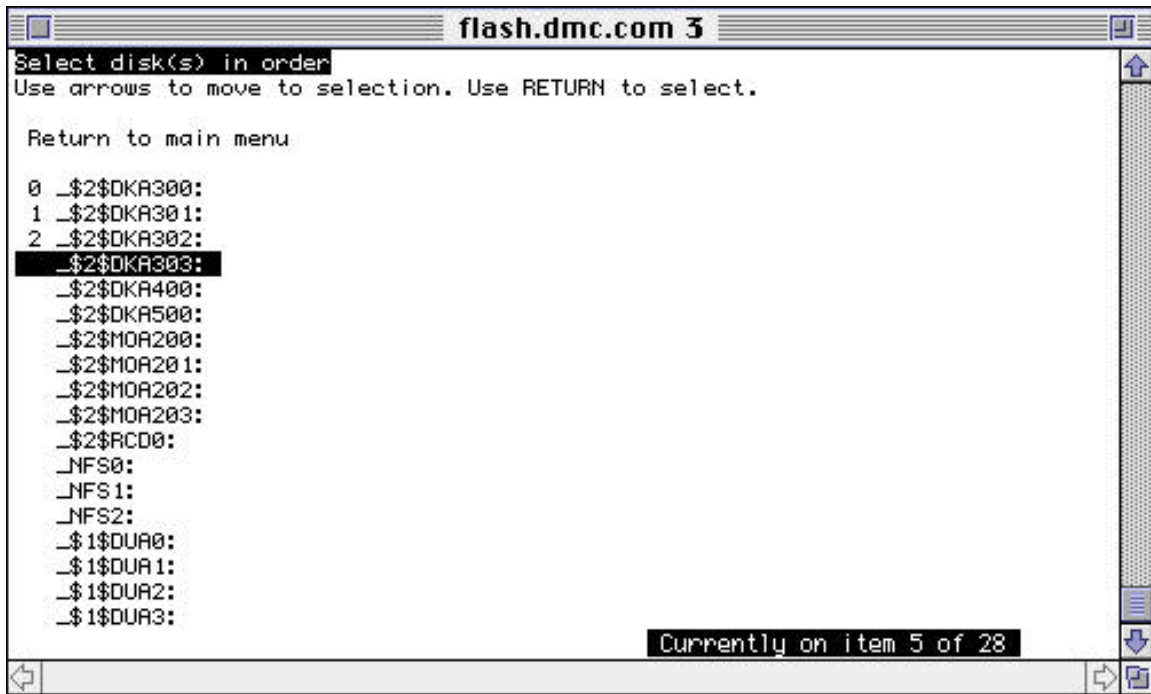


When the Control Device entry is selected, a list of the valid control devices for the specified bus controller is displayed. If no control devices are available for the specified bus controller the configuration utility will not display this menu.

Note that slightly different displays are presented depending upon the type of bus controller. However, in all cases the basic mechanism for selecting the devices are the same.



Some data libraries have specific configurations allowed by the manufacturer. Elms ships two configurations a two drive and a four drive configuration. The configuration utility allows you to select either of these. For libraries with more flexible configurations the number 0 is presented as an initial choice in which case you must specify the number of drives present in the library.



Last but not least in this example is selecting the drives in the library. A list of all drives on the system are displayed and you may select the appropriate ones. Pick them in the addressing order for the library so that drive 0 for the library has 0 next to it. Once you have selected all the drives the menu is dispatched and, effectively, the configuration is complete. You may then write the configuration data and start the newly configured server.

