Branches™
User Guide



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

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Preface

April 1998 -- Welcome to Acorn Software's Branches documentation. We at Acorn are happy to add you to our group of users world wide who enjoy the advantages of data library management software.

In this preface, you will find the following information:

- what information our documentation contains
- who this manual is written for
- what conventions we used

Documentation set contents

Our documentation set consists of one book with two distinct sections: the user guide and the release notes. The user guide contains information on installation, use and trouble shooting; the release notes contains information specific to each release of Branches.

Although we will keep you informed on new product features by reoccurring mailings, you are welcome to take a copy of our documentation *at any time* from the Internet. These documents and all other Acorn Software products are accessible via the World Wide Web:

- http://www.acornsw.com/

Audience

We have written our documents with the experienced OpenVMS system manager and application developer in mind; if you are that reader, skip Chapters 1 and 2, and go on to Chapter 3, Installing and Using Branches. We have relied upon your knowledge and experience as well as your access to the complete OpenVMS documentation set.

If you are new to a data library management system, we have written Chapter ????, Introduction to Data Libraries with you in mind. Your comments on this chapter, and in fact, the entire book are always welcome. In Chapter ????, Installing and Using Branches. we have included several sections of examples in the installation chapter as an introduction that may prove useful.

If you are an application developer, be sure to see Chapter ????, Branches and Backup, and Chapter ????, Application and Hardware Notes.

\\\\ If possible put URLs to chapters in with Acrobat \\\\

Should you experience problems, chapter ???? contains helpful trouble shooting instrutions for the resolution of problems or difficulties. If you have further questions, we will be happy to address them. Feel free to contact us on the Internet at support@acornsw.com.

Conventions

Our documentation follows these conventions:

Character	Convention
italics	indicates optional items that you substitute the specific names or numbers in Branches or DCL commands
courier, roman	indicates Branches or DCL commands or program documentation
Oloron Program	indicates OpenVMS examples, other literal text seen by the user or program documentation in response to Branches commands.
shaded note	**indicates that we ask you to pay very strict attention to the information contained in the gray area.**
double underline	indicates a hot spot in the HTML versions of the documentation.

Chapter 1, Introduction

This chapter describes Branches, the Acorn Software data library management and robotic control software for optical disk jukeboxes, CDROM autochangers and tape stackers in an OpenVMS environment. Also, in this chapter you will find the particulars of our system requirements.

Branches provides OpenVMS systems transparent access to data libraries locally or within a cluster. There are no modifications to OpenVMS software needed thereby eliminating the installation of new device drivers or patches on your system.

Branches, which was written for storage-intensive applications like imaging, multimedia and large data base systems, also provides support for the more typical and reoccurring operations like file migration, archiving and backup. For instance, with Branches and your own backup procedure, you can achieve lights-out backup. Or, you can use Branches to access and manipulate data in diverse database management systems like Rdb/VMS, Rdb/ELN, DBMS, DSM and Oracle.

Branches supports an extensive array of data libraries supporting rewriteable magneto-optical, CDROM and all tape technologies supported by OpenVMS, including DLT, 4 mm, 8 mm, 3480 and others.

Features

Branches software automates the management of data libraries: the contents of magneto-optical disk, magnetic tape and CDROM libraries can be searched, accessed, shared and managed with robotic control that is transparent to you. Branches provides these features:

- integrates tapes, magneto-optical disks and CDROM with OpenVMS file systems transparently
- installs automatically and easily (VMSINSTAL in less than 30 minutes)
- assured upward compatibility with software for larger devices
- supports multiple data libraries connected to single system or VMSCluster
- automatic failover for non-stop usage of Branches in VMSClusters.
- eliminates operator intervention and error in locating and mounting volumes

- improves data processing efficiency and lowers cost of data storage.
- full integration with **all** OpenVMS applications.
- performs drive substitution as necessary to fully utilize library hardware.
- supports bar code readers for all libraries having them.

With Branches, you can add an entry-level library device to your OpenVMS system, use your existing software to support these libraries, and upgrade later to a larger device or 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 volume name in order to mount and dismount that volume; the software and the robotics take the place of the operator.

System Prerequisites

Branches 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 Branches. Here are the requirements:

• Operating system	VMS version 5.5-2 or later, excluding versions of OpenVMS/AXP prior to V6.0.
• Operator's terminal	for OPCOM messages
• SYSGEN parameters, DISMOUNTMSG, GBLPAGES and GBLSECTIONS	set prior to starting Branches
• FTDriver	must be loaded if DECwindows is running; if DECwindows is not running, then must be started manually
• SCSI interface	Digital Hsx controllers supporting the Command Disk Interface, all Digital systems with embedded SCSI busses supporting the IO$_DIAGNOSE QIO or all CMD Technologies controller with SCSI pass through enabled
• Disk space	100000 blocks to install.

Exclusions and exceptions

Some magneto-optical disk drives may Acorn Software's MODISK to provide compatibility with the Digital-supplied SCSI disk driver. MODISK is supplied as a separate installation kit free of charge to any licensed Branches installation.

Chapter 2, Introduction to Data Libraries

Introduction

This chapter discusses the basics of data library concepts and definitions and how they are used with Branches. Immediately following the concepts and definitions section is a step-by-step illustration and two examples: one with an optical library and mailbox and one with a tape stacker and magazine. Both examples presume that Branches has already been installed on your system. We included these examples as a way to add to your knowledge of data libraries with Branches.

If you are already familiar with data libraries, please skip to the next chapter, Installing Branches.

Concepts and definitions

Data libraries are made of hardware and software; they are similar to the library that you may have in your company or town. There are volumes (of media containing data), which are stored on shelves (slots within the data library). The volumes are placed in slots by a either a robot (through a media input/output port generally known as a mailbox) or by a human being who manually places media into a portable collection of slots called a magazine. Shelves (slots) are identified by a specific address (here, we have slot numbers). The software, in this case, Branches is the librarian that guides you to the right book or volume.

Here is a short tour of a data library as if it were the public library in your town:

- the door or the entrance to the library is, in a data library, a mailbox or a magazine. Both mailbox and magazine provide the ability to import and export the media that contains your data. The difference between them is -- a mailbox can pass only one piece of media at a time; a magazine can pass more than one piece of media at a time.
- the library staff is made up of *robots* , which move the media and *drives* , which read and write data on the media, as part of the staff, since without the drives, books and volumes would not be shelved.
- the books are the *media* , either tape, CDROM or magneto-optical cartridge. They contain the data and can be read from or written to. Media is made up of at least one volume.

Magneto-optical media, like the Tor double paperbacks, have two volumes.

- the card catalog of a public library corresponds to a *data library inventory*. All the media combined is the *data library inventory*.

  In the public library card catalog, you can find a information on a book whether or not it is not on the shelf. In a data library, the inventory references *only* the media currently inside the data library. Any media outside of the library cannot be accessed or used without operator intervention. The inventory table maintains information about a volume: its position within the library and its label, if any. For easy identification, each volume has a *position* and each piece of media a *slot* . A slot and a position are identical only when the media has one volume. Each volume can have a *label* , which may or may not be unique. For example, scratch tapes can all be labeled SCRTCH (tape labels can contain 6 characters; disk labels can contain up to 12 characters).

Using Branches and Data Libraries

There are six basic steps for using Branches with data libraries. They are presented in the following section in the order you should perform them.

Creating and initializing your inventory table

First step: create and initialize your inventory table, then populate it.

The Branches startup procedure creates an inventory table with no entries the very first time that you run Branches. If, at any time, you need another inventory table, use the command, Branches Initialize/Database.

After you have created the inventory table and your data library already has tapes or disks inserted, use the command, Branches Initialize/Verify, to populate the inventory table with volume labels.

Importing media into your inventory table

Second step: import all media.

All media must be imported into your data library to list it in the inventory table. Branches can then track the media within your data library.

Although it is handy to label all media, it is not required. Branches can label your media for you when the media is imported. To import your media and make it ready for use by Branches, use the

• Branches Import command to import media into the inventory table.

If you use the Branches Import/Initialize command, you destroy all data on the media. All systems routinely use scratch media; including data libraries. Whether the media is labeled or not, it can be used as scratch media. To import media as scratch, use the

• Branches Import/Scratch command.

Note: **If you plan to use scratch media with OpenVMS Backup, the media *must* be labelled prior to use or Backup will fail to initialize and mount it.**

Before reading and writing your data to a volume, mount the volume

Third step: read and write data to the volume.

Before you can read or write to a volume, it must be in the drive and the operating system must know about it. To make the volume ready for use, use

• either the SYS$MOUNT system service, the Branches Mount command or the DCL Mount command.

Branches picks the requested media from its slot, then positions it so that the volume is available, and places it in the drive.

Loading and unloading a volume

Fourth step: if your data processing requires that a volume be placed in a drive without mounting it, you can do so with

• Branches Load command.

You can remove any unmounted media from a drive with the Branches Unload command.

After reading and writing your data to a volume

Fifth step: after you are finished with the volume, the media *must* be dismounted. To finish the operation, use

• either the SYS$DISMOU system service, Branches Dismount command or the DCL Dismount command

Branches removes the media from the drive, orients it properly, and returns it to the slot from which it was removed[1].

Removing the disk or tape from the library

Sixth step (optional): remove your tapes or disks from the inventory table and place them in external storage, if your data processing requires. To do this, use the

[1] In versions of VMS after 5.5-2 and prior to OpenVMS 7.0, the dismount notification provided by OpenVMS is broken and Branches leaves media in drives until the drive is required again or the Branches server is shutdown.

- Branches Export command.

Examples

These examples presume that you have completed a successful installation of Branches, that you have media in the data library and that you are somewhat versed, but have no in-depth knowledge of VMS.

If, after a quick scan of the bulleted items below, you are not familiar with one or more of them, you may require more knowledge to be successful with Branches; please consult with your system manager and/or your hardware vendor documentation for tips on how to proceed.

Example with optical disk data library and one mailbox

This example shows BRANCHES working with an *optical disk* data library which has *one mailbox*. Please see the chapter, Branches Commands, for the details on each command shown below.

```
$ BRANCHES INITIALIZE/DATABASE                          1
$ BRANCHES INITIALIZE/LIBRARY                           2
$ BRANCHES IMPORT/INITIALIZE SIDE1,SIDE2                3
$ MOUNT/SYSTEM $1$DUA21 SIDE2                           4
$ DISMOUNT $1$DUA21                                     5
$ BRANCHES EXPORT SIDE2                                 6
```

1. Initializes inventory table for default data library. This is done automatically by the the Branches startup command procedure. Under normal circumstances you will never issue this command unless your inventory table has become corrupted in some fashion.

2. Initializes data library hardware for use. This is also done automatically by the Branches startup command procedure. Under normal circumstances you will never issue this command unless you are trouble shooting some sort of library hardware problem.

3. Requests that an optical disk be placed in the mailbox, imports that disk from the mailbox into the data library and then, initializes both sides with the labels , SIDE1 and SIDE2, and records these labels in the inventory table.

4. Places the volume, SIDE2, into the drive, 1DUA21, mounts it for system wide access.

5. Dismounts the volume in drive 1DUA21 and returns the disk to its original slot in its original orientation.

6. Removes the volume labels, SIDE1 and SIDE2, from the inventory table and places the disk in the mailbox for removal by the operator.

Example with a tape data library and one magazine

This example shows BRANCHES working with a *tape* data library with *one magazine*. The slots are numbered starting at 0 for ease of use. A tape data library with a magazine containing 10 tapes has slots numbered from 0 to 9. Some Branches commands require a slot number.

```
$ BRANCHES INITIALIZE/DATABASE                          1
$ BRANCHES INITIALIZE/LIBRARY                           2
$ BRANCHES LOAD/MAGAZINE                                3
$ BRANCHES IMPORT/INITIALIZE/SLOT=3 MONDAY              4
$ MOUNT MKA0 MONDAY                                     5
$ DISMOUNT MKA0                                         6
$ BRANCHES EXPORT/POSITION=3                            7
```

1. Initializes inventory table for default data library. This is done automatically by the the Branches startup command procedure. Under normal circumstances you will never issue this command unless your inventory table has become corrupted in some fashion.

2. Initializes data library hardware for use. This is also done automatically by the Branches startup command procedure. Under normal circumstances you will never issue this command unless you are trouble shooting some sort of library hardware problem.

3. Requests that the magazine, already loaded with tapes and placed within the data library, be made available for use. Branches will not import the media in magazine.

4. Initializes tape in the 4th slot of the magazine. And assigns label, MONDAY, to volume, recording label in inventory table.

5. Places volume labeled, MONDAY, into the drive, MKA0, and mounts it.

6. Dismounts volume in drive, MKA0, and returns tape to original slot.

7. Removes label, MONDAY, in 4th position of data library from inventory table. Media remains in the magazine, but Branches has no knowledge of it. Branches does not restrict use of /POSITION or /SLOT qualifiers. For data libraries with no mailbox, it may require that those qualifiers be present.

Chapter 3, Installing and Using Branches

This chapter contains information on installing Branches with an example of an installation on a VAXstation 3100-based system of an Exabyte 210, a 2 drive, 10 cartridge 8mm tape 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 Branches. 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 BRANCHES software is a four-stage process:

- Connect the data library hardware to your system
- prepare your system
- run the installation procedure
- configure Branches.

Where and how to get Branches;

Branches is shipped to you on a CDROM as part of the Acorn Software Consolidated Distribution. Should you require another type of distribution media, special arrangements can be made with your local distributor or you may contact Acorn Software directly. Additional charges may be applied for media other than CDROM.

On your distribution media you should have this file: BRNCH*UUVVV*.A. Branches is also available on the Internet via the World Wide Web. To download a copy of Branches, go to:

http://www.acornsw.com/

and follow the instructions you find on the Download page.

If you are updating your Branches software, please see the following section, Updating your Branches software, for the differences between an initial installation and an update.

Included on the distribution media is Branches documentation in Adobe Portable Document Format (BRNCH.PDF).

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

Connect the data library hardware to the system

VAXStation 3100 Configuration;

This requires you to do several things:

Step 1 Determine the SCSI address(es) used by the library.

You will have to determine which SCSI addresses are available on your system. The easiest way to do this is to shutdown your system and issue a Show Device command at the console prompt. Using this information set the SCSI ID(s) on your library.

For this example, we selected:

SCSI ID 0: Robot for the Exabyte 210.
SCSI ID 1: Drive 0 for the Exabyte 210.
SCSI ID 2: Drive 1 for the Exabyte 210.

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 to make sure that all the SCSI devices are, in fact, visible to the system. Do this using the Show Device command at the console prompt. Record the output of this command for future reference. Remember that the device address reported by the console Show Device command may not match with the devices seen with the OpenVMS Show Device command.

This example assumes that you are connecting to the B bus of your VAXStation 3100.

Step 3 Configure the devices.

OpenVMS Autoconfigure automatically configures the tape drives in the Exabyte 210 as MUB100 and MUB200 and will **not** mistake robot devices for other types of devices, so nothing special need be done. The robot device will be connected automatically by the Branches startup command procedure so nothing further in the way of system configuration need be done.

Digital 3000-300L AXP 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 address(es) used by the library.

You will have to determine which SCSI addresses are available on your system. The easiest way to do this is to shutdown your system and issue a Show Device command at the console prompt. Using this information set the SCSI ID(s) on your library.

SCSI ID 0: Robot for the Exabyte 210.
SCSI ID 1: Drive 0 for the Exabyte 210.
SCSI ID 2: Drive 1 for the Exabyte 210.

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 to make sure that all the SCSI devices are, in fact, visible to the system. Do this using the Show Device command at the console prompt. Record the output of this command for future reference. Remember that the device address reported by the console Show Device command may not match with the devices seen with the OpenVMS Show Device command.

Step 3 Reboot the 3000-300L

Installing Branches (VMSINSTAL)

The installation program for Branches 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 *BRNCH[UUU]VVV*, where *UUU* is the update level and may be omitted, e.g., U2 or U3A, and *VVV* is the version number, e.g., 023 or 030.

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

Follow these steps:

Step 1 Log in as the system manager.

```
Username: SYSTEM
Password:
```

Step 2 Insert distribution CDROM in the drive and mount it.

```
$ MOUNT/OVERRIDE=IDENTIFICATION DKA400:
```

Step 3 Enter this VMSINSTAL command:

```
$ @SYS$UPDATE:VMSINSTAL product device:[directory]
```

product: the exact file name (BRNCHUUUVVV)
device:[directory]: the location of the installation kit on the distribution media.

We used this command to install Branches V3.0 from the disk to which we copied the installation savesets.

```
$ @SYS$UPDATE:VMSINSTAL BRNCH030 DKB400:[BRANCHES]
```

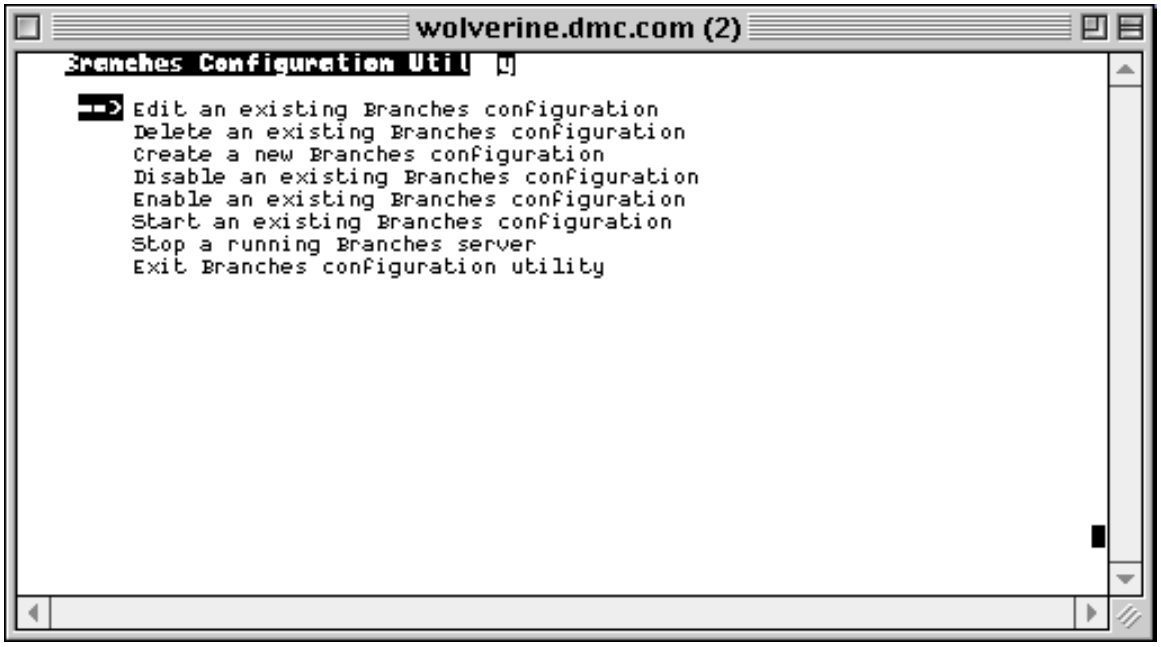
Step 4 As VMSINSTAL transfers files, respond to the questions on the screen and follow all additional instructions provided by the installation kit.

Example of Typical Installation

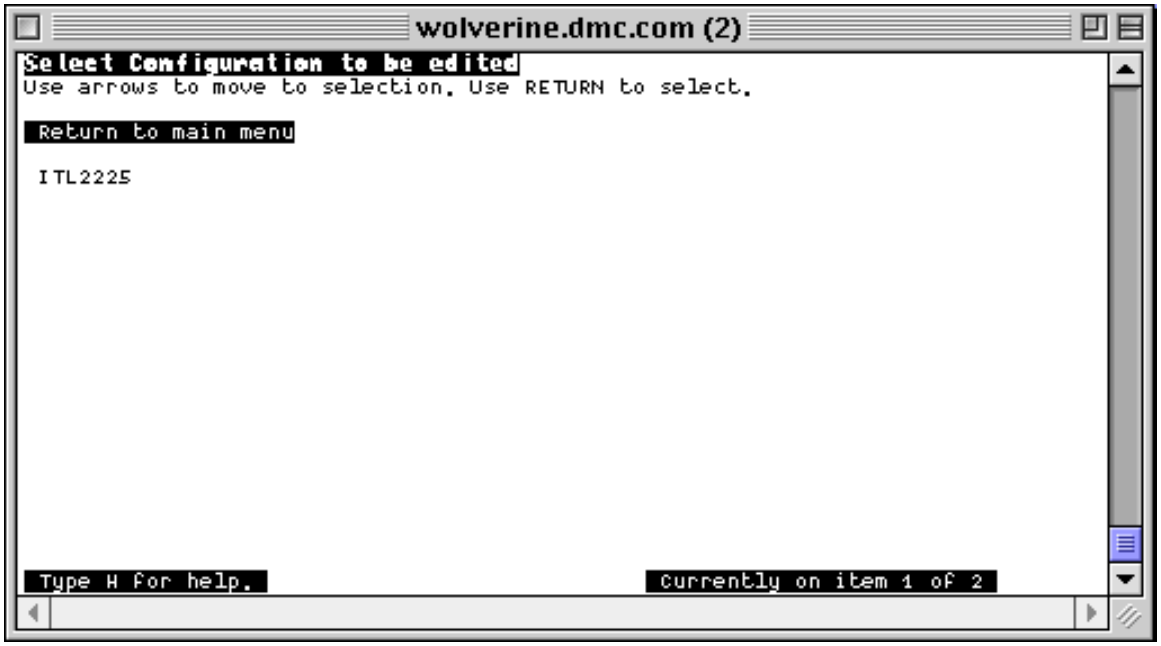
**** Need a new installation example ****

Configuring Branches

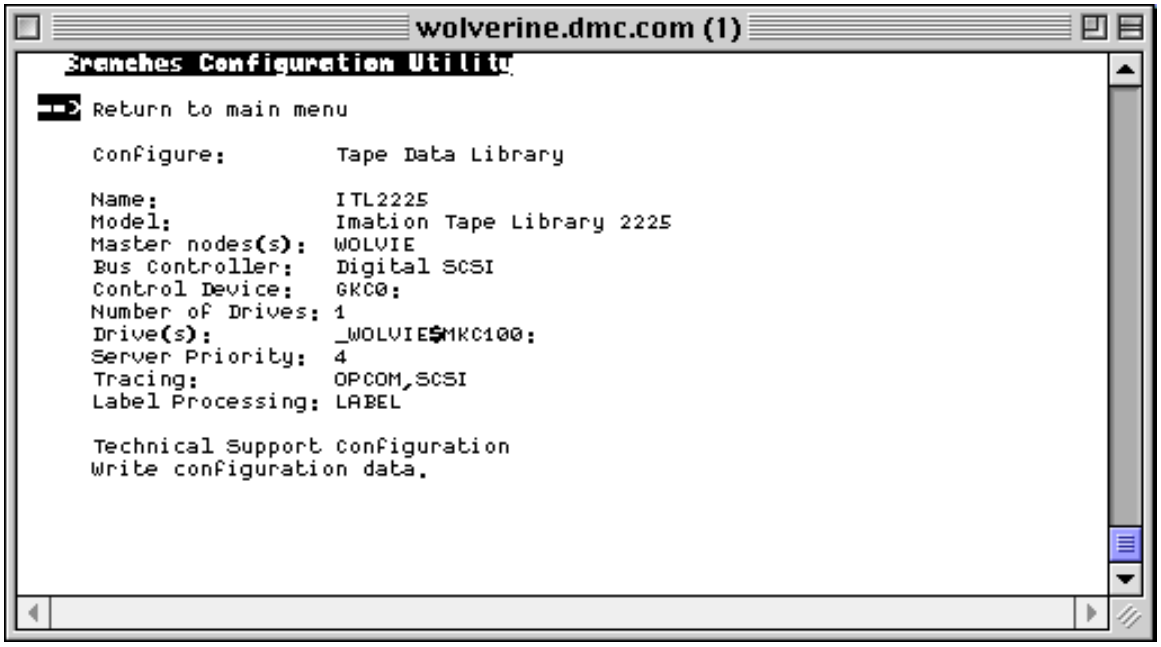
After you have completed the VMSINSTAL, the next step is to create a configuration file for you library using the Branches Configuration Utility.



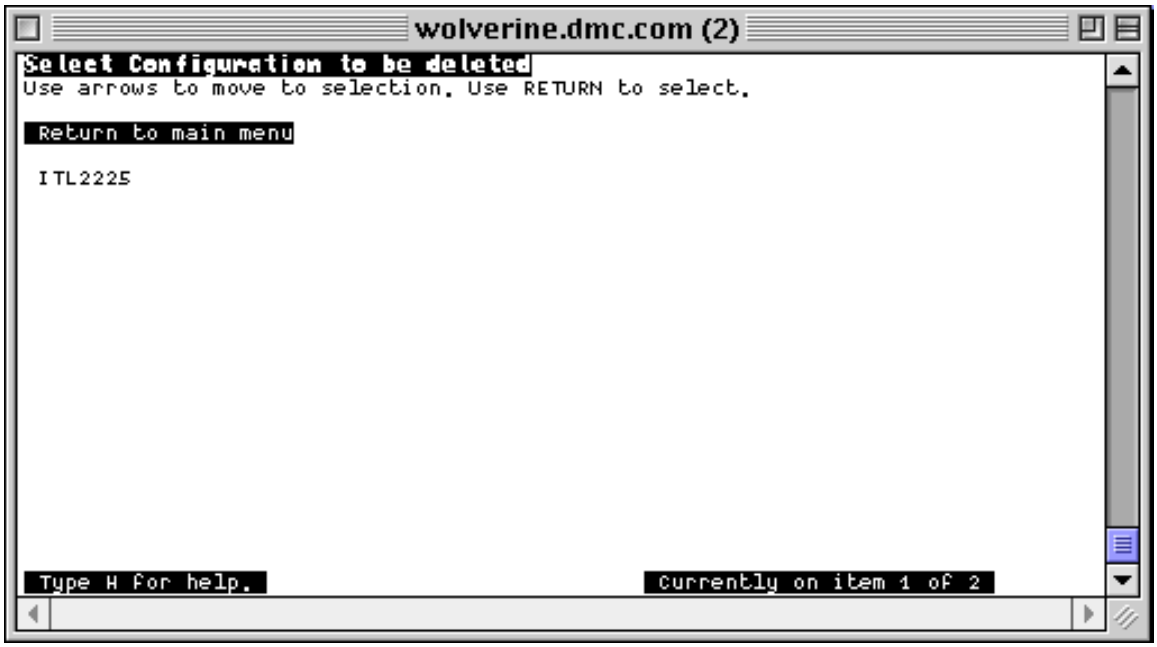
The configuration utility allows you to manage all aspects of the creation, editing, deletion, enabling, disabling, and starting Branches. Each system may support more than one configuration. To select an operation, simply use the arrow keys to move to the entry of choice and enter return to select it.



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



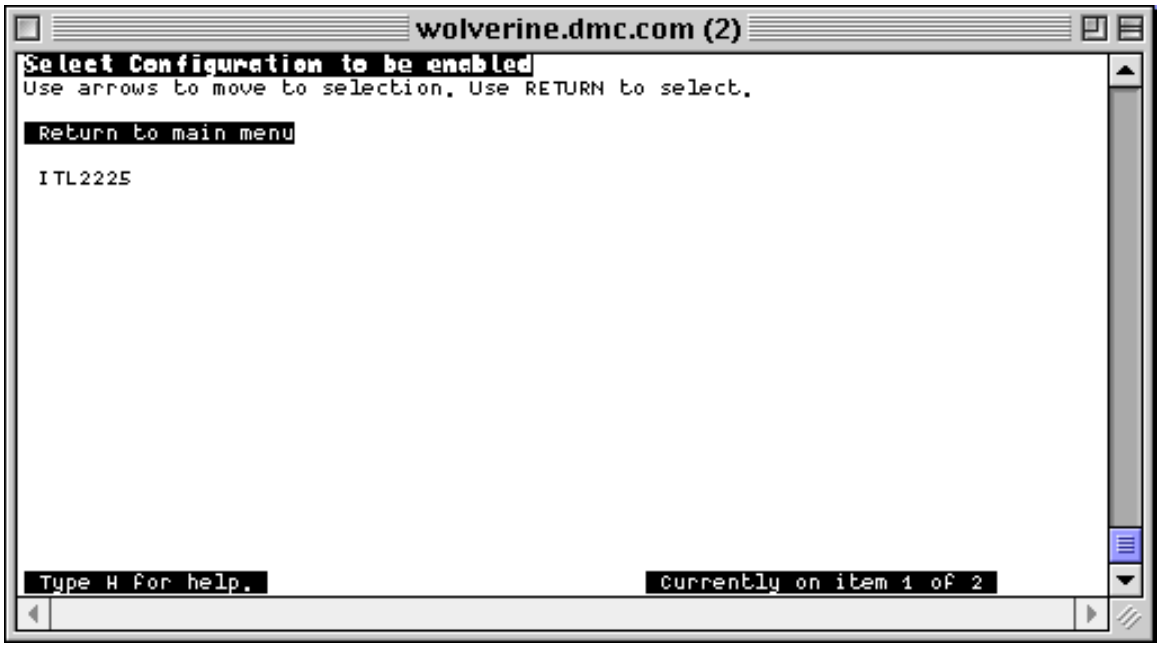
By selecting the one named ITL2225 the current configuration is displayed and may be changed at will.



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.



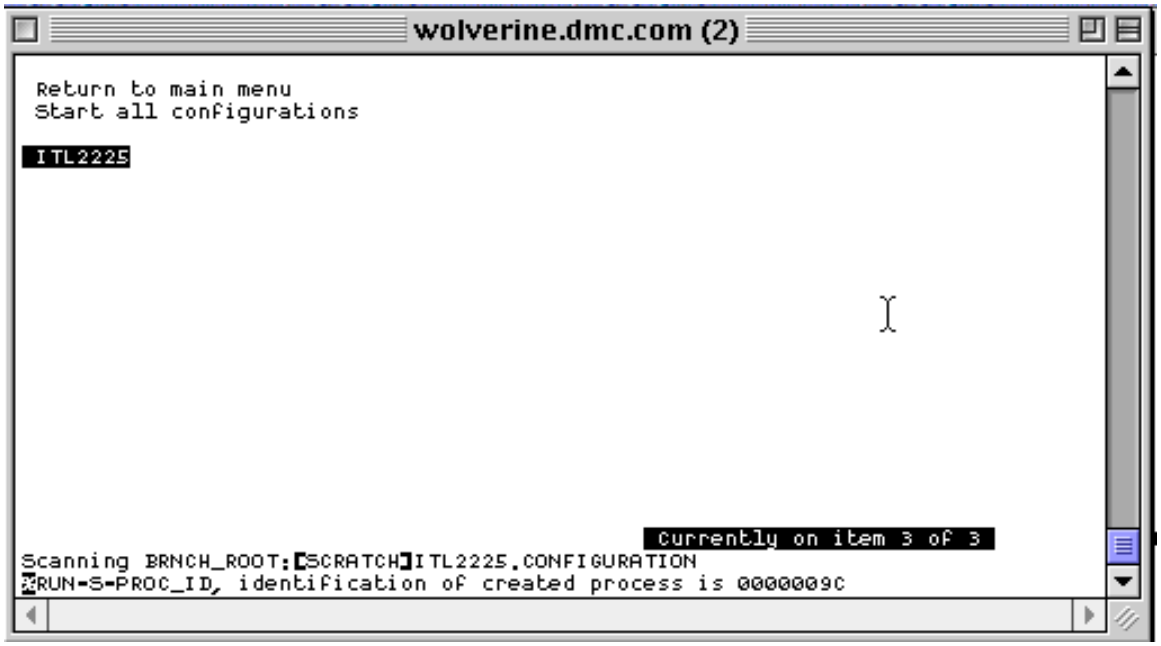
All server configurations may be disabled at will. Disabling a server means that the configuration information is saved but removed from the area in which the startup command procedures search for configuration information. The server may be running when the configuration is disabled. This is convenient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



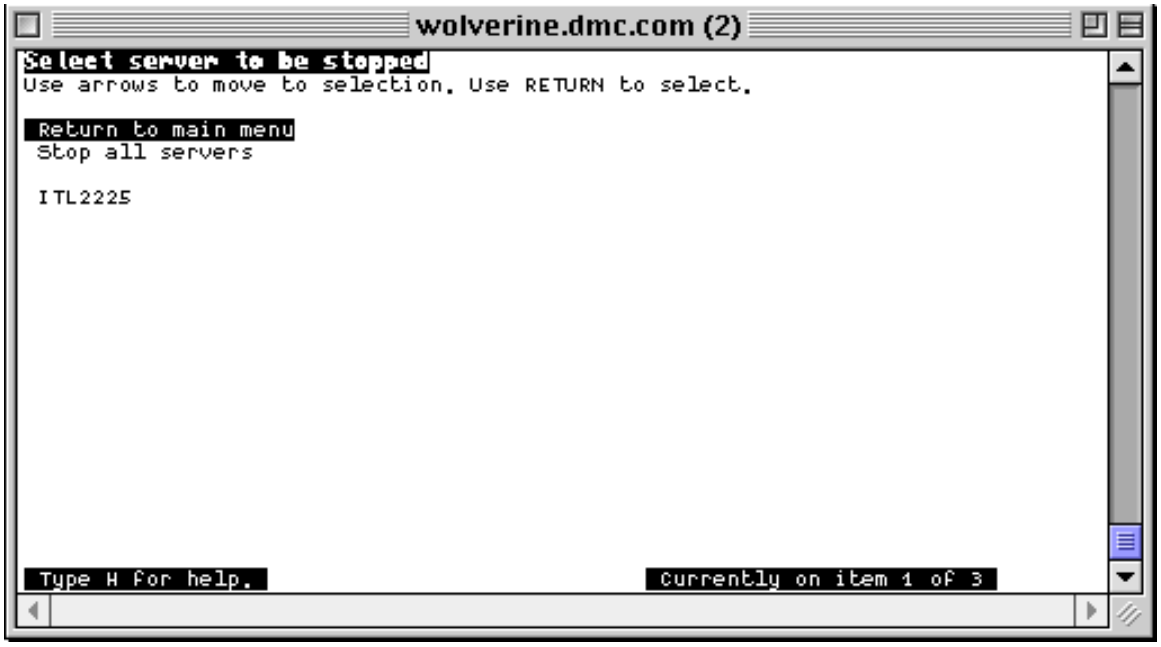
Once the conditions for getting the server to start correctly are in place, the disabled server configurations can be enabled.



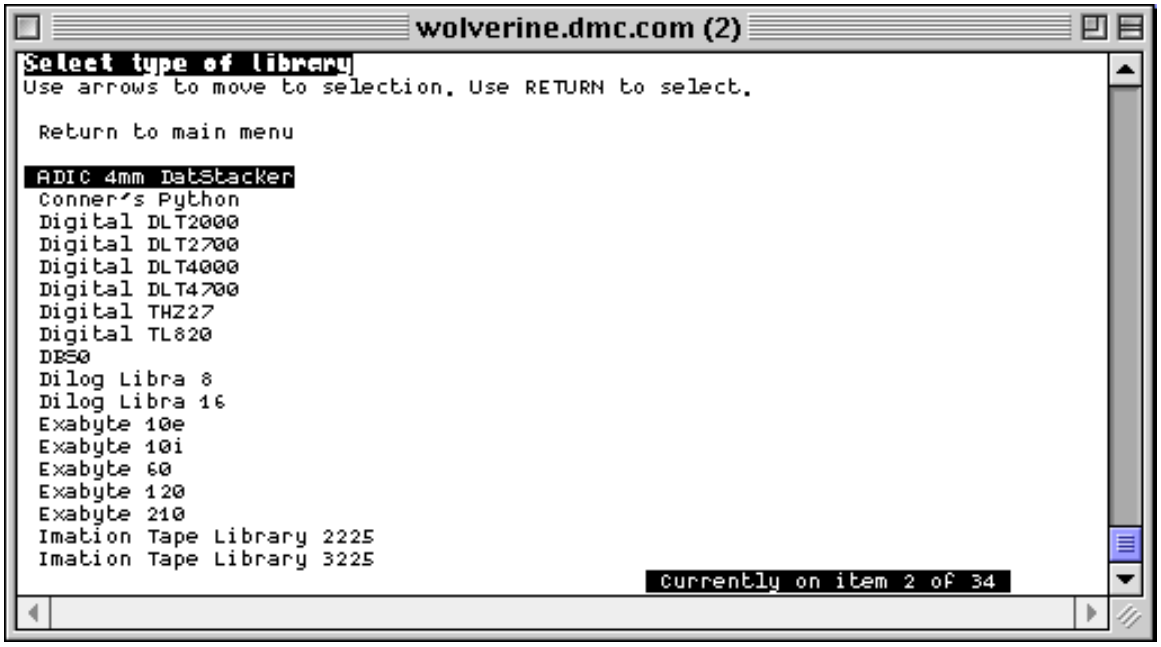
Assuming that you have sufficient privileges all stopped servers may be started. Only those servers not running on the current machine are displayed.



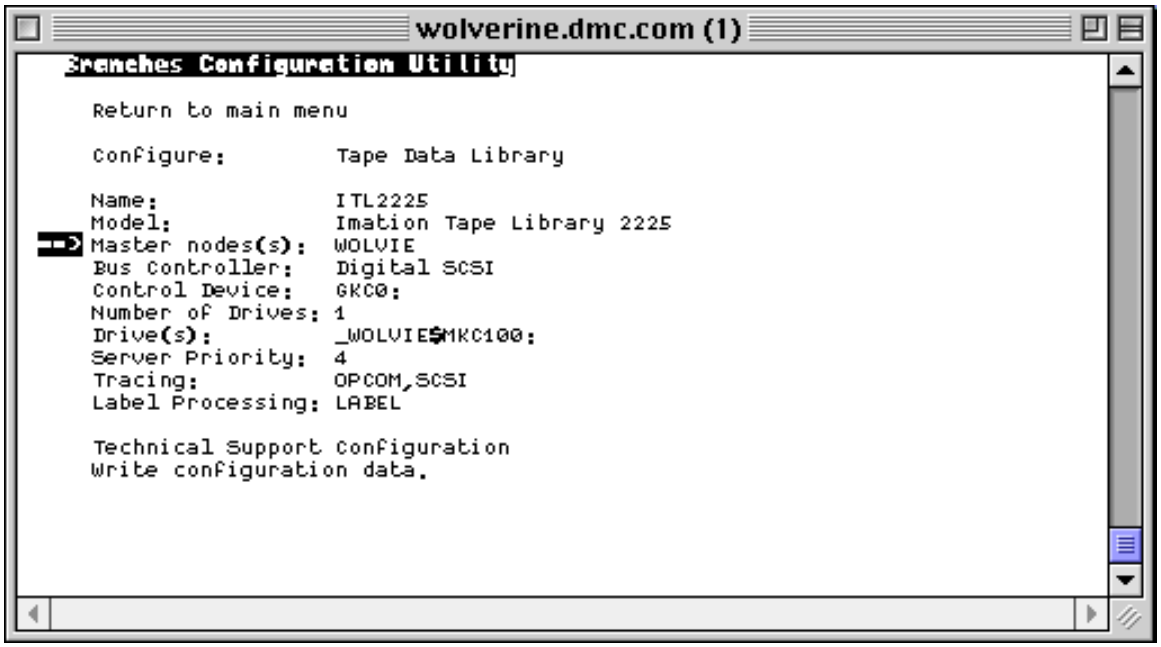
Once you have selected a server to be started, you will see notification of the starting. Once the startup command procedure is complete, the menu is redisplayed and contains a list of all stopped servers. If the server you just started in the new display, your server has failed to start. See the output and error logs in BRNCH_SCRATCH: for details on the failure.



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

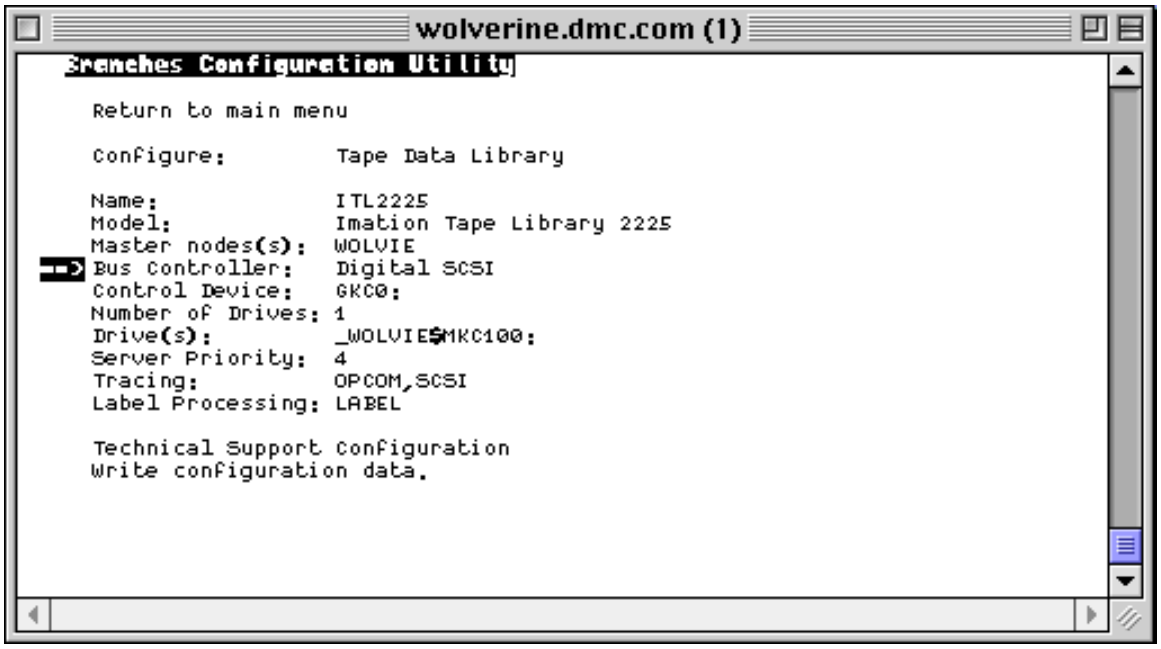


Generally, you first select the type of the library you wish to configure. This is the complete and up to date list of all supported libraries. If your library doesn't appear here, contact Acorn Software to see if your library is supported but not currently included on this list. This happens from time to time as vendors introduce new libraries that emulate existing libraries that are already supported.



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

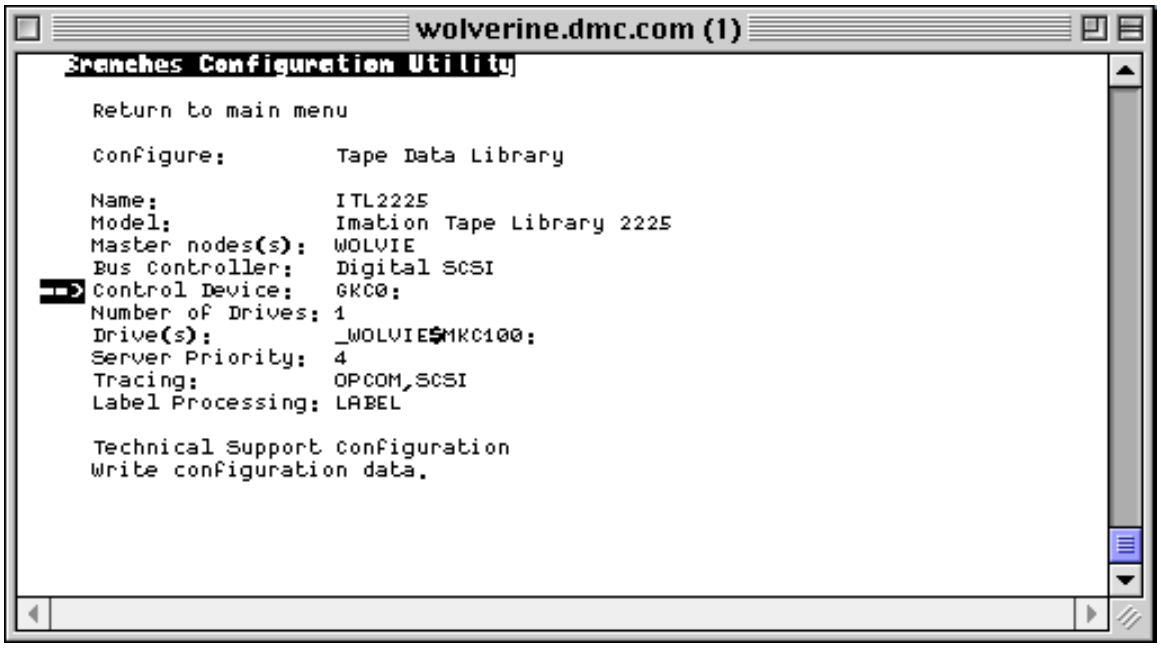
deleted, enter "-" when given the opportunity and it will be removed.



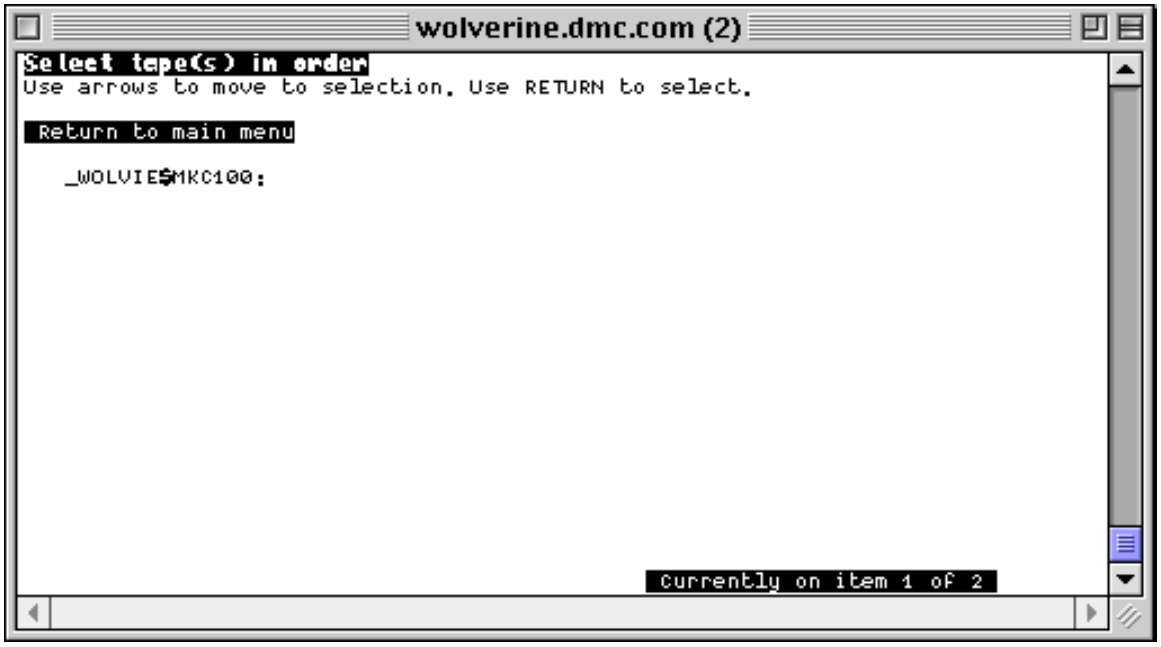
Select the particular controller by repeatedly using the return key until the correct correct bus is displayed. In this case, the jukebox is connected to a workstation using the embedded SCSI controller. Note that the generic type of data library being edited is now a tape data library. There are three classes of data library supported by Branches: Optical, CDROM, and Tape.

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

In this particular case, the Digital provided SCSI controller is being used. You specify the bus (A..Z) and the SCSI ID and LUN of the robot device and the configuration utility will, if necessary, create it.



Some data libraries have specific configurations allowed by the manufacturer. Imation ships two configurations a one drive and a two 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.



Having set the number of drives, you can then selectthe 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.

done at the specific instructions of Acorn Software's support group.

Starting Branches

Start all Branches servers on the current system by entering this command:

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

If the Branches system startup command procedure is invoked by your system startup command procedure, then Branches will restart when you reboot your system.

The Branches system startup command procedure may be used to define the Branches system wide logical names **without** starting any servers:

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

Servers may be started **without** either database or library initialization:

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

Specific servers may be also be started on the current node:

```
$ @SYS$STARTUP:BRNCH-STARTUP.COM "" libraryName
```

Licensing Branches

When Branches is started, it automatically installs a 45 day temporary license. During this period you may freely operate Branches. Once this time period expires Branches will no longer respond to user requests.

Once a week and daily during the last week of a temporary license, Branches sends mail to the SYSTEM account warning that the Branches temporary license is about to expire. The body of the mail message contains a key request form for the system running the Branches server.

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

Branches must be licensed on each node on which a data library server is to be run. A separate license must be obtained for each different type of library, e.g., one for your Exabyte 120 and one for your StorageTek 7430. In practice this means that at least one license must be installed on each node to which a data library is connected. Branches licenses are capacity based. The charges vary depending upon the number of libraries and the number of drives within the libraries. Contact Acorn Software for details on license charges.

There are two different kinds of licenses available for Branches, temporary and permanent. In general Acorn Software will **not** extend the automatically installed temporary license. Contact

Acorn Software directly if you need to extend your temporary license.

Use the Branches License command to generate the permanent or temporary license request form. The output of that command appears below complete and ready to send back to Acorn Software.

Example of Branches License/Output

```
\\\\ Need License output example \\\\
```

Set Startup Sequence

For automatic startup, modify the system startup procedures to include this command:

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

Note: Due to the amount of time libraries can take to go through hardware initialization (some require and hour or more) you are *strongly* encouraged to submit the Branches startup command procedure to a batch queue at system startup time.

The next step is to modify the system login command procedure, SYS$MANAGER:SYLOGIN.COM so that Branches can respond to DCL Mount requests. In the Digital supplied version of this file, the line, $ MOU*NT :== MOUNT/NOASSIST, edit it to read:

```
$ MOU*NT :== MOUNT/ASSIST
```

Branches can now respond to DCL MOUNT requests.

Using Branches

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

```
$ Branches Initialize/Verify                    1
$ Branches Import                               2
$ Mount MKB100: FRED                            3
$ Branches Mount MKB200: BARNEY
```

1. Populate the inventory table with volume labels, if media are present (the inventory table is created automatically for you when you start Branches the first time). Depending upon the type of media in the library, this operation can take up to 3 minutes per volume.

2. Import media to place it in inventory.

3. Mount a volume to make it available for input or output.

Updating Branches

If you are updating your installation of Branches with a new version, stop all Branches library servers with this command:

```
$ Branches SHUTDOWN/ALL
```

After you have entered this command, install the upgrade as described before, and run Branches system startup procedure again. If you are upgrading Branches, the default values of the answers to the questions asked during installation will be those of your current installation.

Chapter 5, Branches Commands

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

Function	Branches Command
Dismount the tape or disk	BRANCHES DISMOUNT
Display the current version number	BRANCHES VERSION
Export the tape, disk or magazine	BRANCHES EXPORT
Import the tape, disk or magazine	BRANCHES IMPORT
Initialize the data library hardware	BRANCHES INITIALIZE
Load the magazine, tape or disk	BRANCHES LOAD
Manage the license key information	BRANCHES LICENSE
Mount the tape, disk, or CDROM	BRANCHES MOUNT
Mount the tape, disk, or CDROM	DCL Mount/SYS$MOUNT
Set state within Branches	BRANCHES SET
Show the contents of a data library	BRANCHES SHOW
Shutdown the data library server	BRANCHES SHUTDOWN
Tune an account for use by BACKUP	BRANCHES TUNE
Unload a drive	BRANCHES UNLOAD

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

Branches Dismount

Closes a device mounted in a library and cancels the logical name associated with it. For full details of the interpretation of the command qualifiers, see the *VMS DCL Dictionary* discussion of DISMOUNT.

This command requires:

- the GRPNAM (group logical name) and
- SYSNAM (system logical name) privileges to dismount group and system volumes as well as TMPMBX.

The Branches Dismount command should be used when it is important to **guarantee** that the volume being dismounted is immediately removed from the drive. Versions of OpenVMS between 5.5-2 to 7.1 do not correctly notify Branches when a volume is dismounted. This does not interfere with the correct operation of Branches but it does result in media remaining in drives until the drive is required for another volume, the drive is explicitly unloaded using Branches Unload or the Branches server for the library is shut down.

Format **BRANCHES DISMOUNT device-name**

Qualifiers	**Notes**
/ABORT	Specifies that the volume is to be dismounted regardless of who mounted it.
/CLUSTER	Dismounts a volume cluster-wide.
/OVERRIDE=CHECKS	To be supplied
/UNIT	Dismounts only the volume of a volume set on the specified drive.
/[NO]UNLOAD	Unloads the device on which the volume is mounted.

Branches Export

Exports a volume from a library. For libraries with mailboxes, the media associated with the volume will be placed in the mailbox and the mailbox opened. The media may then be removed. For libraries with magazines, the media associated with the volume is placed in the magazine. The magazine may then be removed later.

This command requires:

- OPER and TMPMBX privileges.

In all cases, the volume and all other volumes associated with the media is removed from the inventory table.

Format **BRANCHES EXPORT [volume-name]**

Qualifiers	**Notes**
/MAGAZINE	For libraries that have magazines, the /MAGAZINE qualifier is used to allow the user to remove the magazine from the library. If /MAGAZINE is omitted, volume-name is required. /MAGAZINE only has effect for libraries having magazines. /MAGAZINE and /POSITION are mutually exclusive.
/LIBRARY[=DEFAULT]	The data library from which the volume is to be exported.
/POSITION=number	The position of the volume to be exported. /POSITION and /MAGAZINE are mutually exclusive. If the position being exported is on media with more than one side, e.g., magneto-optical, all positions associated with the exported position will **also** be exported.

Branches Import

Imports media into a library. For data libraries with mailboxes, the specified media will be placed in the mailbox and then imported. For data libraries with magazines, the media is placed in the magazine.

This command requires:

- OPER and TMPMBX privileges.

Media imported using the /SCRATCH qualifier remains as SCRATCH media until it has been placed in a device in response to a Branches LOAD, Branches MOUNT, DCL MOUNT or SYS$MOUNT request.

Format **BRANCHES IMPORT [volumelabel[, volumelabel ...]]**

Qualifiers	**Notes**
/INITIALIZE	Import media into a library and initialize all volumes with the associated media with their specific labels. If not enough labels are provided, media with multiple sides are initialized with the name volumelabelA, volumelabelB, etc. The /INITIALIZE and /MAGAZINE qualifiers are mutually exclusive.
/MAGAZINE	Accept a magazine of media into a library and, for each piece of media present, read the label on each side of the media and place the media into the library inventory database. The /INITIALIZE and /MAGAZINE qualifiers are mutually exclusive.
/LIBRARY[=DEFAULT]	The data library to which the media is to be imported.
/SCRATCH	The imported media is to be considered scratch media.
/SLOT=number	All media must, at some time, be initialized. In the case of libraries with magazines, the /SLOT qualifier allows a specific media in the magazine to be initialized and placed into the library inventory database. Slots are always numbered from 0. 0 is the first slot in the magazine. The /SLOT and /MAGAZINE qualifier are mutually exclusive. The /SLOT qualifier may be used at any time to reimport or reinitialize media that are already within a data library. If the specified slot does not have media in it **and** the data library has a mailbox, then Branches will request that media be placed into the mailbox for processing into inventory.

Branches Initialize

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

This command requires:

- OPER and TMPMBX privileges.

When a new inventory data base is created and the data library has media in it, the new inventory data base will have those slots marked as full with a volume name of "++++++++++++". Thus, Branches cannot attempt to use either drives or slots which already contain media. To fully recover the inventory table database, you must issue a Branches INITIALIZE/VERIFY command.

Format **BRANCHES 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	**Notes**
/DATABASE	The inventory data base for the specified library is constructed. The /DATABASE, /LIBRARY, and /VERIFY qualifiers are mutually exclusive. The database created correctly records the state of slots and drives. If drives have media in them, the drive will be marked as full and will **not** be available for use by Branches.
/LIBRARY	The library hardware is initialized for use. No media may be mounted in the library and the library inventory database must exist. The /DATABASE, /LIBRARY, and /VERIFY qualifiers are mutually exclusive.
/USAGE=BACKUP	Verify the labels of all media flagged as processed by the OpenVMS BACKUP utility. This qualifier must be used in conjunction with /VERIFY.
/VERIFY	The inventory database is constructed by reading the volume labels of the media in the library. No media may be mounted on drives in the library and the library inventory database must exist. The /DATABASE, /LIBRARY, and /VERIFY qualifiers are mutually exclusive.

Note: For tapes, this command may take up to 3 minutes per tape.

Note:	**The database must be created before the library can be initialized.**

Branches License

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

The command, Branches License/Install, requires:

- SYSPRV privilege.

Each type of library connected to a system that runs a Branches server must be licensed seperately. This means that a given system may have several licenses installed.

Format **BRANCHES LICENSE [libraryName]**

Note: **If the library name is omitted a license request form is generated for the default library.**

BRANCHES LICENSE/INSTALL licenseKey

Qualifiers	**Notes**
/OUTPUT[=SYS$OUTPUT:]	The file to contain the license request form. The license request form is written to SYS$OUTPUT by default.
/INSTALL	Cannot be used with /OUTPUT or /TEMPORARY. Installs a license. Branches must be licensed on each node on which it will run and for each data library on each node. Key parameter, provided by Acorn, must be entered.
/TEMPORARY	Cannot be used with /INSTALL. Indicates that a license request form for a temporary license is to be generated.

Branches Load

Loads a device with the volume. Load/Position loads the volume from a position in the data library into a drive. Load/Scratch loads a SCRATCH volume into a drive. Any available SCRATCH volume will be loaded.

This command requires:

- OPER and TMPMBX privileges.

Format **BRANCHES LOAD device-name [volumename]**

Qualifiers	Notes
/MAGAZINE	Loads a magazine of media into a library without importing any of the media.
/LIBRARY[=DEFAULT]	The data library into which the magazine is to be loaded.
/POSITION=position	The position from which the volume is to be taken.
/SCRATCH	Loads any SCRATCH volume into the device specified.

Branches Mount

Mounts the media in a library onto a drive in a library. Only those qualifiers relevant to disks are supported. For a full discussion of the meaning of the various qualifiers see the *VMS Mount Utility Manual*.

This command requires:

- GRPNAM (group logical name) and SYSNAM (system logical name) privileges to mount group and system volumes and
- TMPMBX privileges.

Branches MOUNT provides a subset of the functionality of the VMS DCL MOUNT command. For maximum flexibility use Branches MOUNT.

Format **BRANCHES MOUNT device-name volume-label [logical-name]**

Qualifiers	**Notes**
/BIND	Creates a volume set of one or more volumes or adds one or more volumes to an existing volume set.
/CLUSTER	Specifies that after the volume is successfully mounted on the local node, or if it is already mounted /SYSTEM on the local node, it is to be mounted on every other node in the existing VMScluster.
/EXTENSION	Specifies the number of blocks by which disk files are to be extended on the volume unless otherwise specified by an individual command or program request.
/FOREIGN	Indicates that the volume is not in the standard format used by the VMS operating system
/GROUP	Makes the volume available to other users with the same group number in their UICs as the user entering the Mount command.
/[NO]SHARE	Makes the volume shareable.
/SYSTEM	Makes the volume public, that is available to all users of the system, as long as the UIC-based volume protection allows them access.
/[NO]UNLOAD	Controls whether or not the disk or tape volume or volumes specified in the Mount command are unloaded when they are dismounted.

DCL Mount/SYS$MOUNT

This section is **not** a full discussion of the OpenVMS Mount DCL command. Rather it discusses the integration between Branches and the OpenVMS Mount services.

Under normal usage when an OpenVMS user issues a DCL Mount command, Branches examines the mount request and, if the request is for a device in a data library managed by Branches, Branches will move the requested volume into the specified device. If the requested volume isn't in the data library, Branches will abort the mount request.

OpenVMS allows a user to issue a MOUNT/FOREIGN request that doesn't have a volume label. If Branches receives such a request Branches will load the device with scratch media.

Format **MOUNT device-name [volume-label]**

Qualifiers	**Notes**
/FOREIGN	Indicates that the volume is not in the standard format used by the VMS operating system

Branches Set Drive

Modifies information about the drives managed by Branches.

Format **BRANCHES SET DRIVE device-name**

Qualifiers	Notes
/[NO]LABEL[=label]	Specifes the label, if any, of the media in the drive.
/LIBRARY[=DEFAULT]	Specifies the library whose contents are to be displayed.
/[NO]LINKAGE=[position]	Specifies the position which should contain the volume when unloaded, if any.
/STATE=state	Specifies one of the following: DISABLED The drive cannont be used. FULL The drive contains a volume. EMPTY The drive is empty

Branches Set Position

Modifies information about the volumes managed by Branches.

Format **BRANCHES SET POSITION position-number**

Qualifiers	Notes
/[NO]LABEL[=label]	Specifes the label, if any, of the volume.
/LIBRARY[=DEFAULT]	Specifies the library whose contents are to be displayed.
/[NO]LINKAGE=[device-name]	Specifies the drive containing the volume, if any.
/STATE=state	Specifies one of the following: FULL The position contains a volume. MOUNTED The volume is mounted
/[NO]USAGE[=usage]	Specifies the usage, if any, of this volume: BACKUP Mounted by BACKUP SCRATCH Scratch volume.

Branches Set Slot

Modifies information about the media managed by Branches.

Format **BRANCHES SET SLOT slot-number**

Qualifiers	Notes
/LIBRARY[=DEFAULT]	Specifies the library whose contents are to be displayed.
/STATE=state	Specifies one of the following: DISABLED The slot cannont be used. FULL The slot contains media. EMPTY The slot is empty
/[NO]VID[=string]	Specifies the volume id, if any, of this media.

Branches Set Trace

Enables or disables the tracing of commands and other internal information for a library server. Use this command as a service and debugging aid.

Log files are written to BRNCH_SCRATCH. Error logs have a file extension of ERR and trace logs have a file extension of LOG.

Format **BRANCHES SET TRACE**

Parameters on|off Specifies that tracing is either ON or OFF.

Qualifiers	**Notes**
/DISABLE=(ALL, QIO, OPCOM, SCSI)	Disable ALL tracing, or any combination of QIO, OPCOM, or SCSI tracing.
/ENABLE=(ALL, QIO, OPCOM, SCSI)	Enable ALL tracing, or any combination of QIO, OPCOM, or SCSI tracing.
/LIBRARY[=DEFAULT]	Specifies the name of the library whose server is to have the trace state manipulated.

Branches Show Contents

Displays information on the contents of the objects managed by Branches.

Format **Branches SHOW CONTENTS**

Qualifiers	Notes
/ALL	All entries in the inventory table are displayed.
/COLUMNS=n	Specifies the number of columns for listing contents; either 1, 2, or 3. The default value is 3.
/DRIVE	The state of drives in the inventory table is displayed.
/FULL	All information in the inventory table is displayed..
/[NO]HEADER	Identifies the data library (with SHOW CONTENTS). Suppressed by /NOHEADER. The default is /HEADER.
/MEDIA[=wildcard-name]	Specifies a wild card pattern to be matched with all media names in library inventory. If wildcard name is omitted, the default is '*'.
/LIBRARY[=DEFAULT]	Specifies the library whose contents are to be displayed.
/OUTPUT[=filename]	Specifies the file to which the information will be written. If the output file name is omitted, the default is SYS$OUTPUT.
/POSITION	Specifies that the volume's physical position is to be displayed.
/SLOT	Specifies that the volume's physical slot location is to be displayed. For some media there are more than one volume per slot, i.e., optical disk cartridges.
/VIDS	The bar code information is displayed.

The Show Contents command displays these codes:

B The disk volume was used by BACKUP during a multi-volume sequential disk save operation. The label displayed may be invalid; to determine the proper label, use the Branches Import command on the slot containing the media.

M The volume is mounted.

U The volume is unavailable; one of the other surfaces has already been mounted.

S The volume is a SCRATCH volume.

If no additional information is shown, the volume may be mounted.

Branches Show Version

Displays the current version number of 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 SHOW VERSION**

Branches Shutdown

Stops the Branches library server for a given library. If the library name is omitted, the DEFAULT library server is terminated.

Format **BRANCHES SHUTDOWN [libraryName]**

Qualifiers	Notes
/ALL	All Branches servers running on the system are shut down.

Branches Tune

Sets the account quotas for the current account for best use by OpenVMS BACKUP. Use this command whenever AUTOGEN is run and the values of the SYSGEN parameters WSMAX or CHANNELCNT are changed; the account(s) running BACKUP should be TUNEd.

Format **BRANCHES TUNE**

Branches Unload

Unloads a volume from a drive.

Format **BRANCHES UNLOAD [device-name]**

Qualifiers

/LIBRARY[=DEFAULT] Specifies the name of the library whose drives are to be unloaded.

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 enty, 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 BRNCH-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 the configuration table file for your library is accurate. Common mistakes, especially if you created your configuration file manually instead of using the Configuration File Utility (BRNCH_SYSTEM:BRNCH -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 Branches 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 specfic 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 (800.426.2832) and verify that the firmware in the controller is the latest and greatest. 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 file 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. One common problem if the above conditions are met is that the order of the drives in the DRIVES line of the configuration file doesn't match the order of the drives as addressed by the library itself. Check your library documentation to confirm which drive is the first, second, etc. drive and that you have used the OpenVMS devices names in the drive line in the **same** order. If you haven't, then the Branches server will run but mount may not work at all or may not work reliably depending on the number of drives in the library.

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 Branches. Make sure to check the release notes that may have come with your Branches kit. Any details on new hardware support are included there, pending the next major documentation revision cycle.

The third thing to do is to look in the Branches log file (BRNCH_SCRATCH:libraryName-OUTPUT.LOG and BRNCH_SCRATCH:libraryName-ERROR.LOG) for more information. The Branches 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, Branches 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_SCRATCH:libraryName.INVENTORY_TABLE) and restart the server using the system startup command procedure (SYS$STARTUP:BRNCH-STARTUP.COM). See the section on Starting Branches, above.

If you are trying to use an old CMD Technologies controller (purchased prior to 1994) 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.

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 explaination 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.

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 for the data library (BRNCH_SCRATCH:libraryName.CONFIGURATION).
- the **entire** contents of the output log file (BRNCH_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 relavent device in the configuration file 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: (978) 562-1133
- 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 Sofware may be reached at:

(888) 226-7679

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 catagories, licensing, hardware errors, and software errors/configuration problems.

Configuration problems tend to show up as Branches working, but when you attempt to mount the 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. Contact Acorn Software for the correct value for your LOAD-TIMEOUT parameter.

This problem may also be caused by incorrectly ordering of device names in the DRIVE line of the configuration file. Carefully check the library documentation to may sure that the addressing order in the library matches the SCSI IDs on the drives and the order of the corresponding OpenVMS device names in the DRIVE line.

In all other cases, you will **need** to look in the output log (BRNCH_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 Branches 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 Branches. See the details on licensing Branches 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_SCRATCH:libraryName-OUTPUT.LOG and BRNCH_SCRATCH:libraryName-ERROR.LOG).

Collect this information and send it to Acorn Software:

- by electronic mail: support@acornsw.com
- by fax: (978) 562-1133
- 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 Sofware may be reached at:

(888) 226-7679

International customers can reach us at:

(978) 568-1618

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 Branches. 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.

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 Branches. It will also be of use to your data library hardware support personnel. Please send it to us as detailed above.

Software errors occasionally get past our testing regimen. When unexplainable crashes of Branches occur, they leave process dumps (BRNCH.DMP) in directory from which Branches was started. This and other information needs to be available to Acorn Software. Resolving the problem may require our support staff to log into the system having the problem.

Advanced Trouble Shooting**Running Branches 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, Branches cannot function. The symptoms of this are as follows:

- The startup command procedure runs to completion but the Branches server never gets to the point of really being started.
- The log for the library held in BRNCH_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.

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.

We do not know if there **is** as solution from Digital, but we cannot provide one for this particular problem.

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 Branches and it fails to work and there is text near the bottom of the log file indicating that Branches found some form of inconsistency in the inventory table.

If this happens, the only way to repair the problem is to shutdown Branches (if it hasn't already crashed), delete the inventory table for the library, restart Branches, and repopulate the inventory table.

Hardware Problems

Should hardware errors occur, information necessary to your hardware vendor is captured in the Branches log files (BRNCH_SCRATCH:libraryName-OUTPUT.LOG and BRNCH_SCRATCH:libraryName-ERROR.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 available over the world wide web and has been provided in your installation kit in BRNCH_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 Branches, have them contact us:

- by electronic mail: support@acornsw.com
- by fax: (978) 562-1133
- by physical mail: 267 Cox Street, Hudson, Ma. 01749, USA

Chapter 7, Third Party Product Integration;

Using Branches and Backup

All Backup operations that request media for writing record the correct label of the media.

Sequential Disk Saves;

Before starting your BACKUP procedures, initialize all disks to be used with a cluster factor of 1. You may experience unpredictable results if you do not do so.

Issue your backup command. We strongly recommend that when you backup to disk, e.g., /IMAGE or backups to sequential disks, use the /NOINITIALIZE qualifier (since Branches does not know you are performing a backup).

When the disk is full, BACKUP notifies Branches that a new volume is needed. Branches selects a scratch volume from the inventory table, removes the disk, replaces it in the storage bay, places the scratch volume in the drive and tells BACKUP to continue. If a scratch volume is not available, Branches stops the backup. Unload the volume in the drive (Branches Unload) because Branches is not notified when BACKUP terminates. Although this is not required, it is strongly recommended.

Example of sequential disk saves

```
$ MOUNT/FOREIGN drive label                                    1
$ BACKUP/NOINITIALIZE filelist drive:[000000]saveset-
$_name/SAVESET/qualifiers                                      2
$ DISMOUNT drive                                               3
$ Branches UNLOAD drive                                        4
```

1. Mount the first volume in the sequential disk save set.

2. Issue the backup command.

3. Dismount the drive to free it for further use by VMS.

4. Replace the volume in the library. This is unnecessary if only one volume is used in the backup operation.

Sequential Disk Restores

Branches provides a way to interact with BACKUP during restores. -- use the Branches UNLOAD and LOAD commands. Because BACKUP does not specify the required volume label Branches cannot automate the removal and loading of volumes during restores.

When BACKUP requires another volume, issue an UNLOAD command to empty the drive, a LOAD command to place the next volume in the drive, and a DCL REPLY command to tell BACKUP that the next volume in the save set has been made available. You must unload the final volume in the save set with the Branches UNLOAD command.

Example of sequential disk restores

```
MOUNT/FOREIGN drive label                                              1
BACKUP drive:[000000]saveset-name/SAVESET output /qualifiers           2
Branches UNLOAD drive                                                  3
Branches LOAD drive volume                                             4
DISMOUNT drive                                                         5
Branches UNLOAD drive                                                  6
```

1. Mount the first volume in the sequential disk save set.

2. Issue the backup command.

3. Replace the volume in the library. This is unnecessary if only one volume is used in the backup operation.

4. Load the next volume in the save set in the drive. Any of the various Branches LOAD commands may be used.

5. Dismount the drive to free it for further use by VMS.

6. Empty the drive.

Multi-volume Tape Saves

Branches tape save operations are simpler than the disk saves. In the simplest case, you issue a BACKUP command with the /LABEL qualifier specifying the volume upon which to start saving data. The starting volume does not need to be mounted. Branches mounts the volume in response to BACKUP's mount request.

During output processing of a multi-volume save set, if BACKUP requests a volume that is not available in inventory Branches aborts the mount request. BACKUP ignores the abort and requests the mount again. A loop results. To get around this potential problem, make sure that all members of a multi-volume save set are present in inventory before beginning any multi-volume save operations.

If you have specified the BACKUP command with the /NOREWIND qualifier, you must populate the data library with appropriately named volumes for any overflow. BACKUP **does not** initialize tape volumes when the /NOREWIND qualifier is used. Branches attempts to mount a labelled scratch volume in response to a request from BACKUP for a new volume. This causes a BACKUP error because the tape labels do not match. Branches aborts the BACKUP operation.

If you have specified the BACKUP operation with the /REWIND qualifier, you can specify the set of volumes to use via the /LABEL qualifier or omit them. Branches attempts to mount

either the named volume **or** a labelled scratch volume if the named volume doesn't exist in inventory. BACKUP initializes the tape and continues with the BACKUP operation.

Example of multi-volume tape saves

```
$ MOUNT/FOREIGN drive label                                          1
$ BACKUP/LABEL=label filelist drive:saveset-name/SAVESET -
$_ /qualifiers                                                       2
$ DISMOUNT drive                                                     3
```

1. Mount the first volume in the sequential disk save set. This may be omitted if the /LABEL BACKUP qualifier is used.

2. Issue the backup command. These are not the only qualifiers that may be used. The effect of the BACKUP command on Branches varies depending upon the particular combination.

3. Dismount the drive to return the last volume of the multi-volume save set to inventory and free the drive for further use by VMS.

Multi-volume Tape Restores

Branches restores work in much the same way as tape saves. Use the /LABEL qualifier if the label of the volume being processed is **not** the default (derived from the save set name).

During input processing of a multi-volume save set, if BACKUP requests a volume that is not available in inventory Branches aborts the mount request. BACKUP ignores the abort and requests the mount again. A loop results. To get around this potential problem, make sure that all members of a multi-volume save set are present in inventory before beginning any multi-volume restore operations.

Using Branches and SYSWAREBranches is fully compatible with SYSWARE version 3.2 and up. Branches is **not** compatible with earlier versions of SYSWARE (aka BAC/Plus). You must upgrade to SYSWARE version 3.2 or later to obtain Branches compatibility.

To use Branches and SYSWARE, simply install both products, acquire the necessary keys to run SYSWARE from Professional Software, Inc., and define your backup policies and strategies. Branches will keep SYSWARE supplied with tapes for handling your lights out backup and hands off file restores.

Recovery of lost files, directories, or entire disks is a matter of a few keystrokes and due to the integration between Branches and SYSWARE require **no** operator involvement unless the necessary tape is not in the library.

In this event, you must use the Branches IMPORT command to put the necessary tape in the library and make it known to Branches **prior** to making the SYSWARE restore request.

There is one known incompatibility between SYSWARE and Branches. You cannot utilize Branches to initialize tapes using the PREINIT.COM command procedure produced by SYSWARE. You **must** initialize tapes manually using the Branches IMPORT/INITIALIZE command. This is problem is being addressed and will be fixed in a later version of Branches and SYSWARE.

Using Branches and TapeSys

Branches has been made compatible with TapeSys. This allows data libraries to be supported without intervention of the JB product provided with TapeSys and to be generally useful for a wide variety of other OpenVMS applications above and beyond those inherent with TapeSys.

Using Branches and Hierarchy

Conformance testing has demonstrated that Branches can be used to control data libraries used as inswap and outswap devices by Hierarchy.

Using Branches and SLS

Branches now directly supports integration with Digital's SLS. AUTOSELECT is fully support. If Branches is to be used to select scratch volumes for SLS, the SLS database and Branches inventory table must be kept synchronized, i.e., volumes that can be selected by SLS must be imported into an appropriate library with the appropriate volume labels. A sample TAPESTART.COM that allows integration of SLS with Branches is provided in:

SYS$COMMON:[SYSHLP.EXAMPLES.BRANCHES.SLS]TAPESTART.COM

The settings of SLS variables that are required by Branches are fully documented there.

Using Branches and HyperTape

HyperTape has been made compatible with Branches. This allows archive management for Unix, IBM MVS, Macintosh, and a variety of other systems.

Chapter 8, Application and Hardware Notes

This chapter details for the application developer and system manager some unusual aspects of Branches software. Those libraries are:

- Digital THZ27
- Exabyte 10e
- All Hewlett-Packard Optical Disk Libraries
- IDE Models 7100 and 9000
- Kodak 560E
- NKK 556
- Olympus Deltis OLS-10
- QualStar Q7 DLT Tape Library
- Spectralogic 4000 and 6000 Tape Librarys

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

AXP 150 processors with Adaptec AHA1742 SCSI ControllersIt 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.

OpenVMS/AXPThe volume name is omitted from Dismount notification messages. As a consequence, Branches leaves media in drives until a request for media other than that in the drive is received. This behavior is caused by a bug in OpenVMS and will disappear when the bug in OpenVMS is fixed.

OpenVMS/AXP 6.1Digital introduced a “feature” into OpenVMS/AXP 6.1. It can take up to 5 minutes for Mount to notice that a drive does not contain media. This directly affects the speed with which Branches can respond to mount requests. This is a bug in OpenVMS and cannot be addressed by Branches.

Writing programs to integrate with BranchesBranches utilizes a little known feature of OpenVMS which allows an operator to place a requested volume in a drive other than the requested drive and then “substitute” the drive selected by the operator for the one requested by the program. All programs should therefore be prepared for the drive specified in their mount request to be different from the one upon which the requested volume is actually mounted.

This is accommodated by **always** specifying that a logical name be defined upon completion of the mount request which will translate to the drive actually containing the media. The program (DCL or otherwise) must use that logical name for all operations refering to the physical drive containing the media.

In the event that this is not possible, drive substitution may be disabled through use of the DRIVE-SUBSTITUTION configuration entry.

Many programs frequently assume that they are the **only** programs utilizing a specific drive. Further, they assume that once a volume is placed in a drive that that volume will remain there for all time.

This is **never** the case with Branches. Volumes remain in drives only as long as the drives are mounted or allocated. Once a volume has been dismounted it is placed back into inventory and is no longer in the drive. Programs must be written to accommodate this behavior, that of a smart and aggressive operator whose job it is to keep hardware maximally utilized.

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 Branches commands.

This library uses the mailbox slot to store the 10th cartridge in inventory. Branches 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

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

2. import or export the desired cartridge, and

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.

If you are connecting your IDE 7100 data library to an OpenVMS system using an embedded SCSI bus, you must be aware that the Branches Import and Export commands are considered by the data library to be part of a single SCSI command. This means that you **must** adjust the SCSI-TIMEOUT configuration line to the maximum time the data library will wait for cartridges to be inserted (Branches Import) or removed (Branches Export). Remember too that until a cartridge is either placed in the mailbox (Branches Import) or removed from the mailbox (Branches Export) no other Branches commands will be honored.

An implication of this hardware design is that there is **no** way to abort either a Branches Import or Export operation. If you must abort either, then the following is done:

1. Abort the Branches EXPORT or IMPORT command with ^Y.
2. From a fully privileged account, use SHOW SYSTEM to identify the server for the IDE 7100. 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 IDE 7100 box.
5. Restart the Branches server using the system startup command procedure.

Kodak Model 560E Library SystemsIs supported **only** in NKK emulation mode. You must place your 560E in this mode prior to attempting to start Branches. See your library documentation for details.

NKK Model 556 Library Systems

There is a **signigicant** 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 fuly priviledge 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.

Olympus Deltis OLS-10

This library is functionally equivalent to the IDE 7100, see above for details for configuring the IDE 7100 for Branches compatibility.

QualStar Q7 DLT Tape Library

This library is supported **only** in Quad7 mode. See your documentation for details on configuring the Q7 for Quad7 mode.

Spectralogic 4000 and 6000 Data Libraries

Make sure that the import/export door is **open** prior to issuing the first import command. After that, the door will remain in the correct state.

In order for the bar code information to be correctly maintained by Branches, the bar code reader must be **enabled** and automatic bar code reading must also be **enabled**.

Exabyte 10eThe Exabyte 10e as shipped from the factory is in **sequential** mode. Branches will not operate until the library has been configured to be in **random** mode. Make this change following the instructions in the documentation provided by Exabyte.

Other Hardware Configurations

CMD Technology SCSI Controllers;

Branches 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.

There appears to be a bug in the CMD Technology CQD controllers that occasionally prevents a Mount request from successfully completing. If you have problems with Mount completing and Acorn Software support can come up with no other reason, you may have to disable the ability of the CQD to support SCSI Disconnect for the tape devices during SCSI command processing. Acorn Software has only seen this problem with tape data libraries, but CMD has noted that this problem may occur with optical data libraries as well.

Note: **Turning off SCSI Disconnect will prevent any other SCSI device on that bus from using the bus until operations are complete. This may have a serious performance impact. If you must turn SCSI Disconnect off, you may want to make the library and its' I/O devices the only devices on that bus.**

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 revison X50 may not work fully. Check your controller firmware to make sure that your version is at least this level or higher.

Tape Data Libraries;

When connecting a tape data library to an OpenVMS system using a CMD TM (tape and disk) controller, e.g., CQD223-TM, configure the data library so that the autochanger SCSI address is in the range 0..3 and the tape drive(s) have SCSI addresses in the range 4..7. If this is not possible, consult your CMD manual for instructions on controller configuration.

Connors Python

The Python is implemented as two LUNs, 0 is the drive, 1 is the autochanger. This requires special initialization of the CMD controller. Specifically, two of the devices provided by the CMD controller must be dedicated to the same SCSI ID, but to different LUNs.

For example, if the SCSI ID of the LD4 is 4, one MU device must support SCSI ID 4, LUN 0 and one DU device must support SCSI ID 4, LUN 1. The DU device thus created will be used by Branches to control the robotics.

See the documentation that came with your controller for further details on configuring SCSI IDs and LUNs.

Digital THZ27

The Digital THZ27 is implemented as two LUNs, 0 is the drive, 1 is the autochanger. This requires special initialization of the CMD controller. Specifically, two of the devices provided by the CMD controller must be dedicated to the same SCSI ID, but to different LUNs.

For example, if the SCSI ID of the THZ27 is 4, one MU device must support SCSI ID 4, LUN 0 and one DU device must support SCSI ID 4, LUN 1. The DU device thus created will be used by Branches to control the robotics. In addition, there appears to be a bug in the CMD controllers that occasionally prevents a Mount request from successfully completing. To avoid this problem, disable the ability for the devices supporting the Digital THZ27 to disconnect from the SCSI bus during command processing. Acorn Software has only seen this problem with tape data libraries, but CMD has noted that this problem may occur with optical data libraries as well

See the documentation that came with your controller for more details.

DILOG LIBRA DATstacker

For CMD controllers, the SCSI IDs for the drive and the autochanger must have DISCONNECT turned off.

See the CMD manual provided with your controller for more details.

Optical Data Libraries;

Hewlett Packard Optical Disk Libraries

CONF 32

Must be set to ON in order for Branches to function with HP ODLs See the HP user manual for instructions on changing the ODL configuration.

IDE Model 7100 Personal Library System

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 Branches support of this model to those systems using a CMD Technologies SCSI controller or SCEA board.

Changer Eject

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

CMD Controller or SCEA board Configuration

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 CMD Technologies on board configuration utility. See the documentation provided with your controller for more details.

Chapter 9, Branches Error Messages and Recovery Techniques

This chapter contains Branches error messages and some recovery techniques. If you have further difficulty, do not hesitate to contact us for support at support@acornsw.com or (508) 568-1618 x5 or by fax at (508) 562-1133.

Error messages in alphabetic order

CANTINITDB Cannot initialize database for library "*libraryName*".

The inventory database cannot be initialized for the specified library.

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

This OPCOM message is presented to the CENTRAL operator in response to a Branches EXPORT request. Branches 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.

ERROR Error: *string*

This is a result of an internal error in Branches. 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 Branches IMPORT request. Branches 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 Line *lineNumber*: Invalid control device: *deviceName*

The configuration file entry for the data library contains a CONTROL statement with an invalid device name. Correct the configuration file and restart Branches.

INVDRIVENAME Line *lineNumber*: Invalid drive name: *drive*

The specified drive does not exist on the system. Correct the configuration file and restart Branches.

INVDRIVES Line *lineNumber*: Invalid DRIVE statement.

The configuration file entry for the data library contains a badly formatted DRIVE statement. Correct the configuration file and restart Branches.

INVLIBNAME Line *lineNumber*: Invalid library name specified.

The configuration file entry for the data library contains a DEFINE statement with an invalid data library name. Correct the configuration file and restart Branches.

INVLIBTYPE Line *lineNumber*: 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 and restart Branches.

INVLOADTIMEOUT Line *lineNumber*: Invalid Load Timeout: *string*

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

INVPOSITION Line *lineNumber*: Invalid position number: *position*

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

INVSCSITIMEOUT Line *lineNumber*: Invalid SCSI Timeout: *string*

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

INVSLOT Invalid slot number: *slot*

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

INVUNLOADTIMEOU Line *lineNumber*: Invalid Unload Timeout: *string*

The unload timeout must be a decimal number. The specified value in the configuration file is bad. Correct the configuration file and restart Branches.

INVXPORT Line *lineNumber*: Invalid transport: *string*

The specified transport type is invalid. Correct the configuration file and restart Branches.

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 Branches.

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 Branches 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 Branches INITIALIZE/VERIFY and reissue the failed command.

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

NOCONTROL Line *lineNumber*: CONTROL statement is missing.

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

NODISMOUNT Dismount of !AS failed.

During an import operation, a SYS$DISMOU system service failed.

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

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

NOHWSUPPORT <No hardware support for this function.>

NOLICENSE This product is not licensed.

The license for Branches has expired. Only Branches SHUTDOWN will be executed. Fill out a key request form at the back of this book and send it or fax it to Acorn Software for a license.

NOMAILBOX No mailbox available for library "*libraryName*".

An operation requiring a mailbox was request for the specified data library which has no mailbox.

NOMAGAZINE <No magazine in library.>

NOOUTPUTFILE <Output file open failed.>

NORECOVERY No recovery is possible.

Branches has failed to recover from a detected error condition. More information on the error is present in the file, BRNCH_SCRATCHlibraryname-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. If the problem persists, report the problem to Acorn Software product support.

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

NOTDEFINE Line *lineNumber*: Not a define statement

The first line of the configuration file is not a DEFINE statement.

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

A Branches 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 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.

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 Branches 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 recover for a Kodak 560 Optical Data Library, the volume was not in the rotor where Branches 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 Line *lineNumber*: Library type missing.

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

REMOVECARTRIDGE <Remove cartridge from mailbox for library "!AS">/FAO_COUNT=1

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 Branches 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 Branches.

Branches License and Key Request Form

This chapter contains examples on how to acquire a license for Branches. We have made every effort to make it easy for you so there is a blank license form that you can fax back to us. or contact us on the Internet

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

\\\\ Need a new example of license request forms. \\\\

Send the completed form to us at Acorn Software via the Internet.

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

@SYS$STARTUP:BRNCH-STARTUP.COM LOGICALS

Once this is completed, the logicals are defined exactly as they appear in the following examples.

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

The format of the configuration file is simple. Lines begin with a keyword that cannot be contracted, 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.

NOTE: This file must be *world readable*.

The following sections 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 DIcnnn:) 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 CQD or CBI SCSI controller, the optional *devpara* is the OpenVMS **unit number** of the disk device representing the robot, e.g., if the robot is seen as DUA3:, the *devpara* would be 3.

`DEFINE [libraryName]`

This **required** line defines the name of the data library. The name can contain up to 8 alphanumeric characters. Be specific and characterize the data library according to its use or origin or another easily recognizable name.

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 VMS or VAX Cluster system.

DRIVE *n*,(*driveName*[,*driveName...*])

This **required** line defines how many drives (the number of the data transfer devices) and their names (the VMS device name of each data transfer device) in the data library. The parentheses are **required**.

Note: The device names *must* be specified in the physical address order of the library.

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

DRIVE-SUBSTITUTION n

This **optional** line allows you to disable or enable the drive substitution behavior of Branches. Some 3rd party archiving packages, notably TapeSys from Software Partners 32, do not fully support all OpenVMS capabilities. Specifically they are not well behavied when faced with drive substitution in response to a mount request. Should you be in the unfortunate position of possesing one of these packages, it is possible to disable the drive substitution feature of Branches.

A value of 0 for this configuration entry will disable drive substitution. By default drive substitution is enabled.

INVENTORY *filename*

This **optional** line specifies the name of the inventory database. The default is: BRNCH_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.

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. Branches sets reasonable values for the LOAD-TIMEOUT.

Note: Do NOT use this entry unless told to do so by a Branches support representative.

NODE node_name[,node_name]

This **optional** line names the node connected to the data library and from which it receives commands. *node_name* must be the SCS name; there are no exceptions to this rule.

When the node line is omitted, Branches starts a library server on each node where the Branches startup procedure runs. When running multiple Branches library servers for the **same** library, you must provide a list of nodes upon which the servers are to start. When the servers start, they bid to become a **master** server. Only the master server operates the robot in response to mount and dismount requests and Branches commands. When the node running the master server crashes or is shut down, the remaining servers go through the bidding process again to determine a new master server. Once this process is complete,

the new master takes over responding to mount and dismount requests and Branches commands.

To successfully operate cluster failover for Branches, you must:

- have the device names of the drives identical throughout the cluster.
- have the device name of the robot identical on each system running a server which could potentially become a master server.
- have installed a Branches license on each node which could potentially become a master server.

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 a Branches support representative.

TRACE state

This **optional** line specifies the initial state of the tracing as if a Branches SET TRACE command had been executed. Set *state* to 0 if tracing is to be off or to a comma seperated list containing one or more of the following if tracing is to be on:

- ALL
  Trace everything.
- OPCOM
  Trace all OPCOM messages.
- QIO
  Trace all QIO activity to the robot.
- SCSI
  Trace all SCSI commands and responses.

The default value is 0, tracing off.

TRANSPORT transportType

This optional entry specifies the command transport to be used by Branches. transportType may be one of CDI, CMD, GKA, or DSA.

TYPE device

This **required** line defines the type of data library. A complete list of the valid devices type can be found in BRNCH_SYSTEM:*.DEVICES

UNLOAD-TIMEOUT n

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

Note:	**Do NOT use this entry unless told to do so by a Branches support representative.**

Acorn Software
Customer Service Policy

July 1998 -- We are pleased to have you join our community of Branches users. We are committed to the best possible software solution for storage system requirements and the best possible support for you. Occasionally difficulties in installation or operation of our software occurs. We are ready to assist you in the diagnosis and recovery from errors. Our technical support is available by telephone and Internet. 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 then can seek information from the source of the difficulty.

On a regular basis, we issue new versions of our documentation, both printed and on-line help as well as our software. The newest versions are available on the Internet or at your request.

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 Branches.