

# The Loader Module

The Loader Module for Backup Exec for Windows NT Server is an optional add-on module for Backup Exec for Windows NT Server. The Loader Module provides random access loader support for backing up larger Windows NT Server networks. Administrators can divide the tapes within a loader into groups and direct tasks to specific groups, or they can use all tapes sequentially for large, unattended backups. Using either method, Backup Exec can locate any file in the loader in seconds for fast restores.

## What You Should Know About Loaders

When using loaders, you should be aware of specific information about:

- Starting Backup Exec with loaders
- Ejecting tapes
- Erasing tapes
- Editing a magazine definition
- Using a cleaning cassette

## Starting Backup Exec With Loaders

When you start Backup Exec, it expects the tape drive to be empty. If the tape drive is not empty, an error message asking you to remove the tape will be displayed and Backup Exec will not start. This is because Backup Exec expects all tapes to be in the magazine at startup; it puts all tapes back into the magazine at exit. The only time you should manually eject a tape would be in the event of an error condition that causes Backup Exec to exit without ejecting the tape (e.g., a power failure).

## Ejecting a Tape

To eject a tape from the loader, use Eject Tape under Operations in the Menu or use the Eject button on the Selection Bar.

**Note:** When a loader is accessed by Backup Exec, the loader's controls are locked until Backup Exec is terminated or another tape drive is selected through the Backup Exec software.

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## Erasing Tapes

The Erase Tape operation is applied to the currently selected group of tapes. Selecting Erase Tape will erase all of the tapes in the group definition.

## Editing a Magazine Definition

You cannot edit a magazine definition. You must delete the magazine definition and create a new magazine definition.

## Using a Cleaning Cassette

To use a cleaning cassette, define a single tape group for the cleaning tape. If the cleaning cassette group is selected as the active magazine group, or a job is run that has the cleaning cassette selected, the cleaning tape will be loaded into the loader. Since this is a cleaning cassette, the tape drive will eject the cassette when it is finished cleaning the tape head. When Backup Exec continues running after inserting the tape and finding that no tape is in the drive, the application will time-out and terminate the operation.

## The Installation Program

The installation program for Backup Exec for Windows NT Server creates a Backup Exec Setup icon in the Backup Exec program group. This setup program is used to install the loader software.

***To install the loader software, follow these steps:***

1. Double-click on the Backup Exec Setup icon.
2. Click Loader.  
A Load Install Disk dialog box appears.
3. Insert the Backup Exec CD-ROM into your CD drive.
4. Click OK.

The loader files will be copied to your hard disk. When completed, the Install Complete message appears.

5. Click OK to exit the installation program.

## Adding Tape Drives

1. Double-click on the Windows NT Setup icon.

The Windows NT Setup window appears.

2. Under Options, select Add/Remove Tape Devices.

3. In the Tape Device Setup window, click Add.

4. In the Select Tape Device Option window, use the arrow button to display the list of options.

5. Select Other.

This opens the Insert Diskette window.

6. Insert the Backup Exec CD-ROM into your CD drive and enter the following information:

If you are running Windows NT on an x86-based computer, type:

e:\i386

If you are running Windows NT on a MIPS computer, type:

e:\mips

If you are running Windows NT on an Alpha computer, type:

e:\alpha

7. Click OK.

8. Select Arcada supported SCSI-2 Medium Changer.

9. Click OK.

10. In the Select Tape Device Option window, select Arcada supported SCSI-2 Medium Changer.

11. Click Install.

This will open the Windows NT Setup window. It will show the full path to the files you are installing.

12. Click Continue.

The driver for loader support will be installed.

13: Click Close.

14: Close the Windows NT Setup window.

The following message appears:

The changes you have made will not take effect until the computer is restarted.

15: Click OK.

16: Reboot your computer.

## Using a Loader

Using a loader enables you to back up or restore large amounts of information without having to handle tapes during the operation. To accomplish this, you simply load the tapes into the loader's magazine before starting your backup or restore. Once the tapes are loaded into the loader and you have selected a magazine definition, the backup or restore operation will execute using the correct tapes.

## Tape Drive Loaders Supported

Backup Exec for Windows NT Server supports single and multi-drive loaders with random mode of operation. The random mode of operation allows Backup Exec to move from one magazine slot location to another magazine slot randomly. This random mode of operation, when coupled with the advanced capabilities of Backup Exec, provide you with sophisticated storage management options. In addition, you can also have multiple instances of Backup Exec running multi-drive loaders.

## Creating a Loader Definition

Before you can create a job to be used with a loader, you must first create a magazine definition that describes the layout of the loader's magazine. The definition describes the physical size of the magazine and must describe at least one group that defines the starting slot number and the number of slots in the group. This is called configuring the magazine. The definition tells Backup Exec the exact location of the tapes in the magazine that will be used.

## Loader Settings

Select Loader under Settings in the Menu Bar and you will see the Settings - Loader window. This window is used to select a magazine definition. The magazine definition describes the location for the group of slots that Backup Exec will use for its operations. In this window, you can also create magazine definitions.

The first time you configure Backup Exec for loader support, the Settings - Loader window will be displayed. If the loader has a magazine loaded, the default definition for this magazine will be displayed. This definition is dynamic and changes with different magazine sizes.

The default Magazine Name and Size fields will be displayed (the magazine name of All; the size will be set to the size of the magazine currently in the loader). The Group Name field will display the name All with all of the slots selected for this group. At this time, click OK to select the default group and load the first tape within the group.

If the loader has no magazine loaded, the Magazine Name and Group Name fields will be disabled. The Size and Slots will be set to one.

Once you select a magazine definition, all Backup Exec tape operations will be applied to the currently selected group of tapes.

## Loader Setup

To set up a loader, click on Setup in the Settings - Loader window. The Loader Setup window will open. In the Loader Setup window, you can create or delete a magazine definition.

### ***To create a new magazine:***

- 1: Click Create.

This opens the Magazine window.

- 2: Enter a name for the new magazine definition.

The Magazine Name can be uppercase, lowercase, or both. The Magazine Name will be checked against the Magazine Names currently in the loader magazine database file. A message will be displayed if the name already exists.

- 3: Enter the number of slots in the magazine in the Size field.

The magazine size will be checked for validity. If the information entered is not numeric, an error message will be displayed.

- 4: Click OK.

If the Magazine Name and the Magazine Size are valid, the Magazine Groups window will be displayed. If you click Cancel, the Magazine window will close and no information will be saved.

In the Magazine Groups window, you can divide the magazine definition into groups. The Magazine Groups window contains the following information:

Magazine Name	The name of the magazine just created in the Magazine window.
Magazine Size	The size of the magazine just created in the Magazine window.
Group Name	Enter a Group Name or select a Group Name from the drop-down list.
Starting Slot	This defines the first slot number for this defined group.
Number of Slots	This defines the number of slots allocated to this definition.
Slot Status	This is a display of all of the slots defined for this magazine definition. The slot numbers are shown on the left side and the group to which they belong is shown on the right side.

5: Enter a Group Name or click on the down arrow button to select one from the drop-down list.

6: Enter the starting slot number for this group definition in the Starting Slot field.

7: Enter the number of slots allocated to this group definition in the Number of Slots field.

8: Click Add to add the group definition to the Slot Status list.

**Note:** The Starting Slot number will automatically advance to the next number beyond the just defined group definition.

Repeat the above steps to define all of the groups for this magazine definition.

9: Click OK to save the definition or Cancel to exit this window without saving the definition.

To delete the currently defined group in the Group Name field, click Delete. This will remove the entry and free the assigned slots.

10: Click Close to close the Loader Setup window.



## Magazine Definition Examples

The following are examples of how a magazine can be configured:

Example 1		Example 2	
1	Company Name	1	Payroll
2	Company Name	2	Payroll
3	Company Name	3	Payroll
4	Company Name	4	Payroll
5	Company Name	5	Accounting
6	Company Name	6	Accounting
7	Company Name	7	Accounting
8	Company Name	8	Accounting
9	Company Name	9	Ordering
10	Company Name	10	Ordering

11	Company Name	11	Ordering
12	Company Name	12	Ordering

Example 1 shows a twelve cartridge magazine configured as one group with twelve slots. This example allows you to run the same job every day; you will not have to handle tapes for a long time.

Example 2 shows a twelve cartridge magazine configured with three groups and each group has four slots. By dividing the magazine into groups, you can dedicate backup operations to perform specific tasks. For example, Group 1 can be defined for your Payroll Department; Group 2 can be defined for your Accounting Department; Group 3 can be defined for your Ordering Department. Jobs can be created to back up each department and each department will have their own set of tapes.

Another example is to create a magazine definition according to your backup strategy. One group can be used for Normal backups that are run weekly while another group can be used for Incremental backups that are run daily.

Another example is to create a one-slot definition that contains a cleaning cassette. You could create and schedule a job that would run once each month to clean the tape heads in the tape drive.

***To delete a magazine definition:***

- 1: Select the desired name from the Magazine Name field drop-down list in the Loader Setup window.
- 2: Click Delete.
- 3: Click Close to close the Loader Setup window.

## Magazine Groups with Multiple Drive Loaders

When selecting magazine groups using a multiple drive loader, magazine tape group assignments cannot overlap one another.

## Multiple Drive Loader Support

Configuring Backup Exec to work with multiple tape drive loaders is all about associations. Associations must be made between tape drives, medium transport elements, and Backup Exec. However, before beginning the configuration process, a review of loader components and a discussion of related terms is required.

The following components make up a typical loader system:

- **Medium Transport Element** – this element refers to the mechanism that moves the tapes from the storage location (sometimes referred to as the magazine) to the tape drive, or from the tape drive back to the storage location. In some loaders this is referred to as the robotic arm; in others it is called the carousel; others may have a different design for their transport element.
- **Storage Element** – this element refers to physical container that holds the tape in the loader (sometimes referred to as the magazine).
- **Data Transfer Element** – this refers to the physical tape drive in the loader.

Loaders are designed and manufactured as SCSI devices. All SCSI devices are assigned an identifier known as the SCSI ID, which is actually the SCSI bus address assigned to the device. All SCSI devices must be assigned a unique ID and no devices can have the same ID. Because a loader contains both a SCSI tape drive and a SCSI medium transport element, the loader has two different SCSI IDs associated with it—one for the internal tape drive and one for the transport element. If a loader has more than one tape drive, each tape drive will have its own unique SCSI ID. You must know the SCSI IDs of each tape drive in the loader, along with the SCSI ID of the loader's medium changer before you can configure Backup Exec to work with your loader (refer to your loader documentation for SCSI ID information). You should also know how to change the SCSI IDs of the tape drives and the Medium Transport Element in order to resolve potential SCSI address conflicts.

In addition to SCSI IDs, each tape drive installed in a loader is assigned a unique Drive Element Address. You must know the Drive Element Address that is assigned to each drive in your loader (refer to your loader documentation to determine the Drive Element Address for each tape drive in the loader, or call the loader manufacture for this information).

Most loader documentation contains a chart used to explain the location of all tape drives inside the loader case and the Drive Element Address assigned to them. The key is to determine, from this documentation, which tape drive the manufacturer considers to be the first drive in the loader, otherwise known as Tape Drive 0. Once you've determined which tape drive is considered Tape Drive 0, use the chart to determine the Tape Drive 0's element address. Many manufacturers use hexadecimal numbers to represent Drive Element Addresses.

Once you have determined the above information, write it down using the following chart. This information will be used in during the configuration.

**Important:** If your loader documentation does not contain this information, you must call the manufacturer to get it. You cannot configure Backup Exec to work with the loader system without this information.

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Use the following chart as an example; fill in the remaining blanks with your information.

<b>Data Transfer Element (Tape Drives)</b>	<b>Data Transfer SCSI ID (Tape Drive SCSI ID)</b>	<b>Drive Element Address</b>	<b>Medium Transport SCSI ID</b>
Tape Drive 0	1	00000002	5
Tape Drive 1	4	00000003	5
Use the section below for your tape drives			
<b>Data Transfer Element (Tape Drives)</b>	<b>Data Transfer SCSI ID (Tape Drive SCSI ID)</b>	<b>Drive Element Address</b>	<b>Medium Transport SCSI ID</b>
Tape Drive 0			
Tape Drive 1			
Tape Drive 2			
Tape Drive 3			

## Configuration

The following configuration is a sample based on a two drive loader system. Using the values from the chart on the preceding page, continue with the following steps:

1. From the Backup Exec menu bar, click Settings|Hardware.

The Settings – Hardware Selection dialog box appears. This dialog box contains device names aliases that were generated and assigned to the first tape drive the first time Backup Exec was started.

2. Click Setup.

The Settings–Hardware Setup dialog box appears.

3. Click Add.

4. Enter a name in the Device Name field.

This name should closely reflect the name of the loader for easy recognition at a later time.

5. Refer to the chart of SCSI ID and Drive Element Address you filled out earlier in this section. From the chart, determine which drive is Drive 0 and note its SCSI ID and Drive Element Address.

6. In the Tape Drive section, click the drive that matches the SCSI ID of Drive 0 in your chart.

In the example screen above, the first WangDAT drive listed has a SCSI ID of 1. Determine the SCSI ID of your drive.

**Note:** Select the compression method desired for this device. If the drive supports hardware compression, Hardware is selected as the default; if it does not support hardware compression, only the choices, Software and None are available.

7. Click Enable Loader Support.

An X appears indicating is it now active.

8. In the Loader section of the dialog box, highlight the Medium Transport Mechanism with your mouse (note the SCSI ID).

This associates the first tape drive to the loader. From the Drive Element List box, select the drive element address that was assigned to the above drive's SCSI ID number.

9. Click OK.

10. The Settings–Hardware Setup dialog box appears again.

11. Click Add and repeat the above procedure, choosing the second tape drive listed in the Tape Drive section of the screen.

# Loader-Related Troubleshooting

## Troubleshooting Tips

The following Troubleshooting Tips describe a problem and possible solutions. Try each solution to eliminate the problem.

Problem	Possible Solution(s)
Backup Exec will not start. An error message is asking me to remove the tape from the tape drive.	When you start Backup Exec, it expects the tape drive to be empty. If the tape drive is not empty, an error message asking you to remove the tape will be displayed and Backup Exec will not start. This is because Backup Exec expects all tapes to be in the magazine at startup and will put all tapes back into the magazine at exit.
There was a power failure and there is still a tape in the tape drive. What should I do?	You should manually eject a tape in the event of an error condition that causes Backup Exec to exit without ejecting the tape (e.g., a power failure).
The Job Hardware dialog will not enable the loader list boxes.	Make sure you have installed the loader software and drivers and you have re-booted your system to load the loader driver. Make sure you have created a magazine definition.
The Settings - Loader dialog will not enable the Magazine name and Group name list boxes.	Click on Setup in the Settings - Loader window and create a magazine definition.
The loader will not let you unload a tape or magazine from the loader front panel.	Backup Exec locks the loader front panel to disable the removing of tapes while Backup Exec is running. If the loader front panel is locked, you can unlock it by starting and exiting the Backup Exec.
The loader inserted a tape in the tape drive, but Backup Exec still reports that there is no tape in the tape drive.	Make sure you have made the correct loader and tape drive association in the Settings - Hardware window.





# Loader-Related Error Messages

Error Message	Problem	Solution
No magazine was found in the loader.	The loader reported an error stating that no magazine was found.	Put a magazine in the loader and press Retry.
The source location is empty.	The loader was asked to move a tape from an empty location.	Make sure the active magazine group contains tapes.
Please remove the tape from the drive and re-start the application.	Backup Exec expects all tapes to be in the magazine when it starts.	Exit Backup Exec. Remove the tape from the drive and re-start Backup Exec.
SCSI bus was reset.	The SCSI bus encountered a reset condition. Some loaders will continue to report this error until you initialize the loader.	Please refer to the documentation you received with your loader for information on how to initialize the loader.
The changer is not in SCSI random mode.	The loader must support and be configured for SCSI random access mode.	Please refer to the documentation you received with your loader for information on random mode operation.
A group size specified was larger than the magazine size.	The selected magazine group size was larger than the size of the magazine currently in the loader.	Select a group that can be used with the current magazine or change the magazine in the loader.

## Glossary of Loader Terms

The following table contains a brief definition of terms used in this manual.

Term	Definition
Magazine Name	This is the name of the magazine created in the Magazine window.
Magazine Size	This is the size of the magazine created in the Magazine window.
Group Name	This is the name of the group created or selected from the drop-down list in the Magazine Groups window.
Starting Slot	This defines the first slot number for the group defined in the Magazine Groups window.
Number of Slots	This defines the number of slots allocated to the group defined in the Magazine Groups window.
Slot Status	This is a display of all of the slots defined for the magazine definition in the Magazine Groups window.

## Glossary of Loader Files

The following table contains a brief description of the Backup Exec files used with loaders:

File	Description
LDRDATA.DAT	This is the magazine definition file.
LDRDLL.DLL	This is the loader module file.

SCSICHNG.SYS

This is the loader driver file.