

Radical System Solutions

Iomega Zip: The Hitchhiker's Guide



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Hitchhiker's Guide To The Iomega ZIP

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Attention Intel Users

This edition of Solutions deals with using Iomega ZIP drives from NeXT black hardware running NeXTSTEP 3.0 through 3.3. For all of us with **Intel** hardware and NeXTSTEP, we were out of luck until **Anke Ehlers** sacrificed a ZIP disk or two to the Intel gods. Now you can read about it in [Booting from a Zip-Drive on Intel-NEXTSTEP Systems](#). It has the Intel answers you're looking for!

Booting OpenStep from a ZIP?

This seems to be a feat which was not meant to be! An OpenStep bootable disk requires more than a ZIP's 100MB, largely due to all of the NS3.x legacy libraries, so it won't fit on a ZIP for booting! But maybe, just maybe, with a bit of OpenStep alchemy, it just might be possible to hand-pack a ZIP with nothing but the essentials of OpenStep...

Booting Rhapsody from a ZIP?

Stay tuned!

Hitchhiker's Guide To The Iomega ZIP

The Setup

So you finally plunked down a couple hundred bucks for one of those new, true & blue bundles of joy, an Iomega ZIP drive! Ah, the pride of ownership! It doesn't get any better than this! Your friends will be green with envy when you show 'em all the neat stuff your ZIP can do with your NeXT!

Hmmm, the manual's not exactly oozing with cool hints on how it's supposed to harmonize and become one with your NeXT system. In fact, these guys've probably never even heard of NeXT. And what's the software for? Do you need, like, drivers or disktabs, or something?

Things suddenly aren't looking so good. You've already swallowed your pride by buying a product with a "For Macintosh" sticker on it, and now, to add insult to injury, the instructions don't tell you squat about using it with the coolest operating system this side of the Alpha Quadrant.

You believed in the "vision" thing, you went out on a limb and tried to do The Right Thing, and got burned. "It Just Doesn't Work." Life can get no worse... or can it?

But hold on! Don't Panic! After all, **you know** you've heard rumors of such things being done, somewhere, by somebody. Rumors about canine head reattachments, UFO alien abductions, ZIP drives & NeXTs coexisting...

ZIP Drives and the NeXT

The ZIP drive can do everything a normal drive can do: You can use the drive as a normal external removable disk drive. And for the adventurous, you can even build a bootable version of NEXTSTEP on a single ZIP disk and boot from it!

Yep, this ZIP drive'll even work with YOUR NeXT. They can be connected to just about any hardware running NEXTSTEP. This includes NeXT hardware, Intel-based hardware, Suns, Hewlett Packard machines, even the NeXT You Own. And forget about disktab and fstab entries - you won't need to add one!

ZIP Drive Specifications

Capacity:	90MB, formatted with NEXTSTEP
Speed:	29 millisecond seek time 39 millisecond access time
Data Transfer:	Up to 1.4MB/sec transfer rate
Power:	External 5VDC @ 1A Regulated
Dimensions:	7.10" x 5.35" x 1.47"
Warranty:	1 year drive; unlimited disk
Drive Price:	\$189.99 street price Includes 1 read-only disk
Disk Price:	\$20 each, \$50 3-pack; \$150 10-pack Macintosh-formatted disks recommended
Availability:	Drive: Retail & Mail-order Disks: Retail & Mail-order

SCSI Interfacing

Hooks right into your current SCSI bus, just like real hardware. ZIP drives have a pair of SCSI-1 interface ports. The ports on the rear of the unit are DB25F Macintosh-style SCSI connectors. To connect to your SCSI chain, you'll need either a DB-25 to Mini SCSI-II external cable (p/n DCA 2200, \$25 from Mac Warehouse), or a standard Mac to Centronics external cable.

You may set the ZIP drive to SCSI target id 5 or 6 only. Yes, you read that right - only 5 or 6. The selector switch on the back of the unit has only 2 positions; it's not a rotary or thumbwheel switch, so you have only these choices.

Yet, it does have a nice feature - external switchable termination! (given that you might otherwise need a Macintosh SCSI terminator). Would that all drive cases offered this.

Connecting Your ZIP Drive to Your NeXT

This step is fool-proof. But there's still a way you can screw it up.

Turn off your NeXT and all devices on the SCSI chain. This'll ensure that no devices in the chain are damaged by the electrical disconnection of the SCSI bus, or by the unanticipated insertion of a new, raw device. :)

Insert the ZIP drive into the SCSI chain. Select SCSI target id 5 or 6 (5 is recommended, but see below), and enable internal termination if this is the last device in the SCSI chain.

Turn on all SCSI devices; boot up your NeXT. Power back on everything that you had powered off; then power on your NeXT. During boot, you should see the ZIP disk recognized via SCSI poll (if in verbose mode).

Once you've booted, insert a disk into the ZIP drive. The ZIP disk you insert will be mounted as soon as it's spun up, about 3 seconds. Piece o' cake!

Reformatting a ZIP Disk

Reformatting a ZIP disk is as easy as reformatting a floppy. If you can't do that, you can't do this.

Select the drive and click on the Workspace -> Disk -> Initialize menu entry of the workspace. You'll have the option of reformatting to Macintosh or NEXTSTEP only; Currently, DOS-formatted ZIP disks work fine under NEXTSTEP 3.3 or later, but for some reason you're not allowed to reformat a NeXT-formatted ZIP disk for the DOS filesystem. [Quite frankly, that's a FEATURE, not a bug. :)]

So, what's a person to do? The following, of course! (Kindly contributed by Frederic Stark):

- Bring up a panel to insert the disk:

```
% disk /dev/rsd?a (? = scsi controller #)
```

- Re-format the disk, brute-force style:

```
% sdformat -i? -v -f (? = scsi controller #)
```

- Eject the disk:

```
% disk -e /dev/rsd?a (? = scsi controller #)
```

- Re-insert the disk into the ZIP drive.
- Depending on your karma, you should now be able to reformat the disk as a NeXT disk.

What's that? You can't reformat the ZIP disk that came with your Drive? It's write protected? Sure is! Why _do_ they do that? No one seems to know, but it'd sure make for a real good "Unsolved Mysteries"... :) Anyway, one way to use this disk is to hook your ZIP up to a Macintosh, run the "special" MAC ZIP software and change it. Don't have a Mac? Of course you don't! Timothy J. Luoma writes in to remind us that if you're running on Intel, you can always invoke Alexander Wilkie's ziptool utility to remove the write protection from that stubborn Zip with finesse. For you NeXT folks, you might try some 3rd-party formatters like sdformat, but keep in mind you might end up just having to chuck the disk in frustration! Before you do, though, try the sdformat procedure described above. We'd love to hear from you if you succeed!

Building NEXTSTEP on a ZIP Disk

The easiest way to build a bootable version of NEXTSTEP on a ZIP disk is to use BuildDisk.app in /NextAdmin. You can, of course, "roll your own." But check your state and local laws first.

Load a ZIP boot-disk-to-be. Shove a sacrificial disk into your ZIP drive. NOT the disk that came free with your ZIP drive. You gotta buy a real one.

Launch BuildDisk.app. Using /NextAdmin/BuildDisk.app is merely the simplest way to build your ZIP disk; other ways exist.

Look for the "Hard Disk" moniker. The ZIP drive will show up as "Hard Disk." (You'll know you've selected the correct drive when BuildDisk shows "Removable disk, 96 MB".) **Be careful.** Screw this up and you'll be kissing some other unsuspecting drive good-bye.

Install other software, but wisely! Be VERY careful when choosing extension packages to install! By default, you'll have only about 30MB free on the ZIP disk (so don't even _think_ about installing NEXTSTEP Developer! Or Webster). Seriously think about adding sdformat, SCSIInquirer, and maybe even ppp to the disk's contents. Chances are, you'll be booting standalone for some ungodly reason, and these are good friends to have with you in your time of need.

Build the disk. Click the "Build" button. The build takes about 1/2 hour. Longer if it's your first time.

Booting NEXTSTEP from a ZIP Drive

Disconnect your ethernet. Go ahead and disconnect your machine from the network until such time as you have configured your new boot environment to use it.

```
Arbitrary Rule #42: No other removable media drives may have a
                    SCSI target id number lower than your ZIP
                    drive's target id number if you want to boot
                    from your ZIP drive.
```

Note: The SCSI "target id number" is the id number which is selectable

on the back of the ZIP unit.

Select SCSI target id 5. In light of the above, it would behoove you to set the ZIP drive to SCSI target id 5, and any CD-ROM drive you may have to SCSI target id 6. If this cannot be done, you must remove the offending CD-ROM drive from the SCSI chain (either disconnect it or power it off).

If Arbitrary Rule #42 is violated, the NeXT's SCSI sensing firmware seems to have trouble locating the correct device, and the boot will fail immediately. On NeXT hardware, you will receive a "no SCSI device" message.

Determine the ZIP drive's SCSI controller number. This is the drive's logical order number. For example, If your normal boot drive is SCSI target id 1, and you have an external drive at SCSI target id 4, and the ZIP drive is SCSI target id 5, then the ZIP drive's SCSI controller number would be 2 (it's the 3rd drive in SCSI logical order; count starting at 0).

If, as in the example above, your ZIP drive's SCSI controller number is 2, enter the following command at the boot prompt:

```
NeXT> bsd(2,0,0)sdmach rootdev=sd2a rootrw=1
```

In case you're looking for a slightly more canonical form of the command:

```
bsd(<>,0,0)sdmach rootdev=sd<> rootrw=1
```

This has not been tried on Intel hardware (or the other platforms). You might try entering this command at the "boot:" prompt, and letting us know the results. Who knows - you may even get your name mentioned, in real print, right here on Radical's web page!

Once the system has booted for the first time (this will take longer than you're used to), you'll be presented with a language selection panel. Choose the languages you'll be using, but don't choose too many - these can take up quite a lot of disk space when uncompressed and installed.

The system will automatically log you in under the "me" account, as there is no password set on that account. This will become a pain in the keister when you begin to perform system tasks. So - set passwords for both root and me accounts! Double-click on /NextAdmin/UserManager.app. When the panel requesting the root password comes up, just click "Login", as there is no password yet. Click on UserManager -> User -> Open in the menu, and select the account to change. Change the passwords to something you'll remember. Write 'em down **on the disk**, or I can guarantee you you'll forget what they are! Log out, log back in as root, and you're ready to rock `n' roll!

Taking a dump... on a ZIP Drive

You're not supposed to mention it in polite company. But I'm sure we've got you wondering. "If the NeXT is such hot stuff, can't I use it to write dumps to my Zip Drive? After all, my friend's Timex Sinclair can."

Well, it turns out that you can **try** to use the Unix `dump' command, as in:

```
# /etc/dump 0oOf 89 /My_Zip_Disk/MyBigDump.dump
```

...to dump a disk to the Zip mounted at /My_Zip_Disk, logged in as root. So, why didn't we mention it before? Are we trying to hide something? Not really. Just that it doesn't work.

When the first volume is full and it comes time to put the second Zip disk in, `dump' and the NeXT file

system automounter both go after the worm. The NeXT file system automounter wins out; `dump' craps out.

```
DUMP: The ENTIRE dump is aborted.
```

But it's common knowledge that a dump can't be held back forever! So what's a bloke to do?

Worry not! Don't panic! This is the Hitchhiker's Guide to the Iomega Zip after all! If we don't know it... we beg.

To save the day, Aaron Rosenzweig writes in to remind us of Eirik Fuller's patch in the current `gnutar' that lets the automounter have its worm, and eat it too. To do a multi-volume backup of the disk mounted at /My_Big_Disk onto the Zip mounted at /My_Zip_Disk, just log in as root and let 'er rip:

```
# gnutar -cvf /My_Zip_Disk/ZipBackup.tar -lL 89000 -mM /My_Big_Disk
```

When the first Zip disk is full, gnutar waits for you to press RETURN when you're ready with the next disk. Simply eject the current Zip disk, shove the next one into the drive (labeled the same as the first one), and press RETURN.

And to restore the backup, just log in as root and **cd to where you want the backup to be restored:**

```
# gnutar -xvf /My_Zip_Disk/ZipBackup.tar -lL 89000 -mM --same-owner
```

Check out `gnutar --help' for more detailed info.

"Hey! It just works!!!" We knew it all along.

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