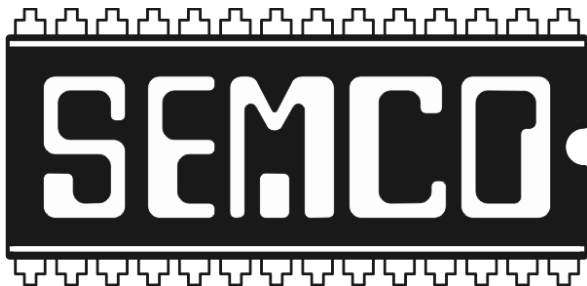


1-RECOVERING DATA FROM A DRIVE

by Francis Chao
fchao2@yahoo.com



TuCS COMPUTER
SON SOCIETY



Web location for this
presentation:

<http://aztcs.apcug.org>

Then click on "Meeting Notes"

SUMMARY

To recover data from a failed hard drive, you should start with low-risk, less invasive procedures first, followed by increasingly aggressive, higher risk and cost procedures.

TOPICS

- Initial Advice for Recovering Data from Drives
- Big Steps for Recovering Data
- Details of the Big Steps

INITIAL ADVICE FOR A FAILED HARD DRIVE IN A "WINDOWS.." COMPUTER:

- ..it is best to click on "Scan and fix (recommended) if "Windows.." asks you to do so
- Click on "Cancel" if Windows.. asks you to "Initialize disk.."

IF YOU AN UNEXPECTED POP-UP BOX ASKS
YOU IF YOU WANT TO SCAN AND FIX A
DRIVE..

- Click on "..scan and fix.." if Windows..
asks you to

Microsoft Windows



Do you want to scan and fix USB Drive (F:)?

There might be a problem with some files on this device or disc.
This can happen if you remove the device or disc before all files
have been written to it.

→ Scan and fix (recommended)

This will prevent future problems when copying files to this
device or disc.

→ Continue without scanning

Microsoft Windows



Do you want to scan and fix USB Drive (F:)?

There might be a problem with some files on this device or disc.
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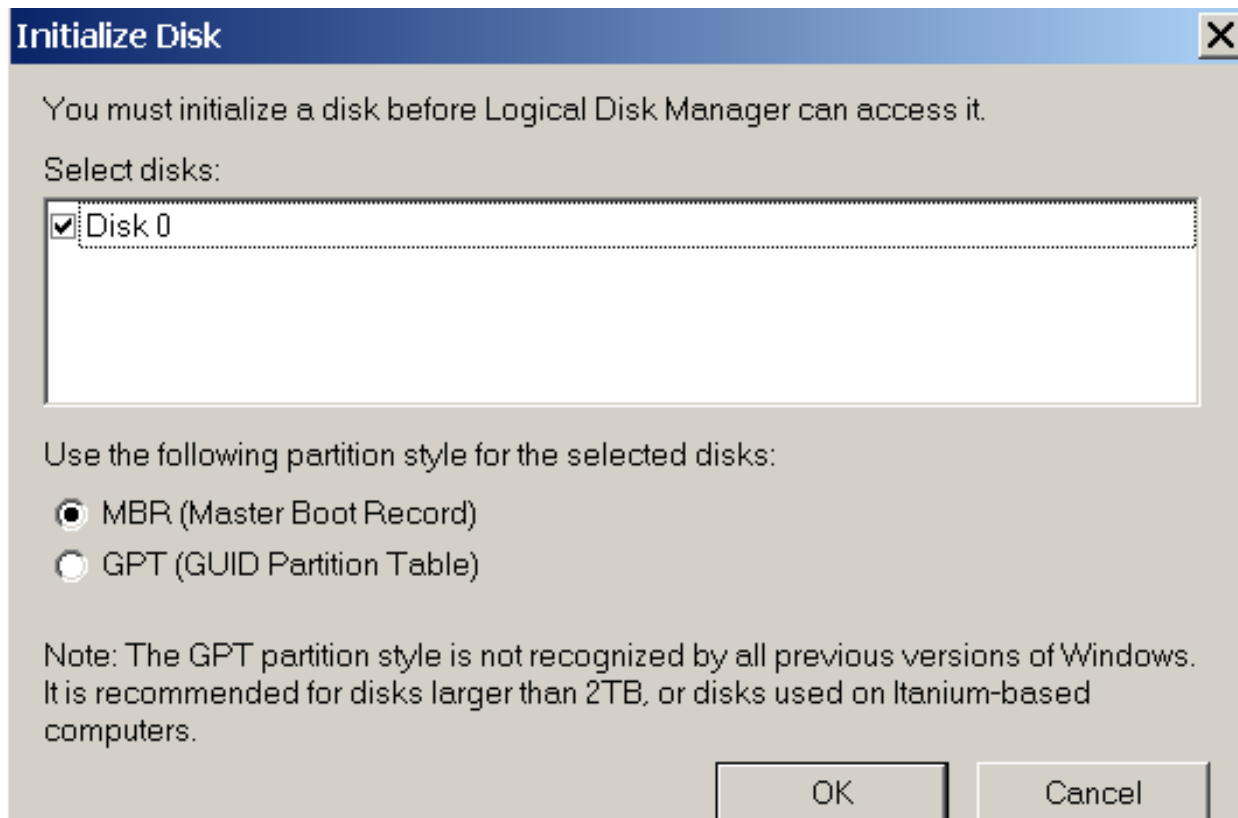
→ Continue without scanning

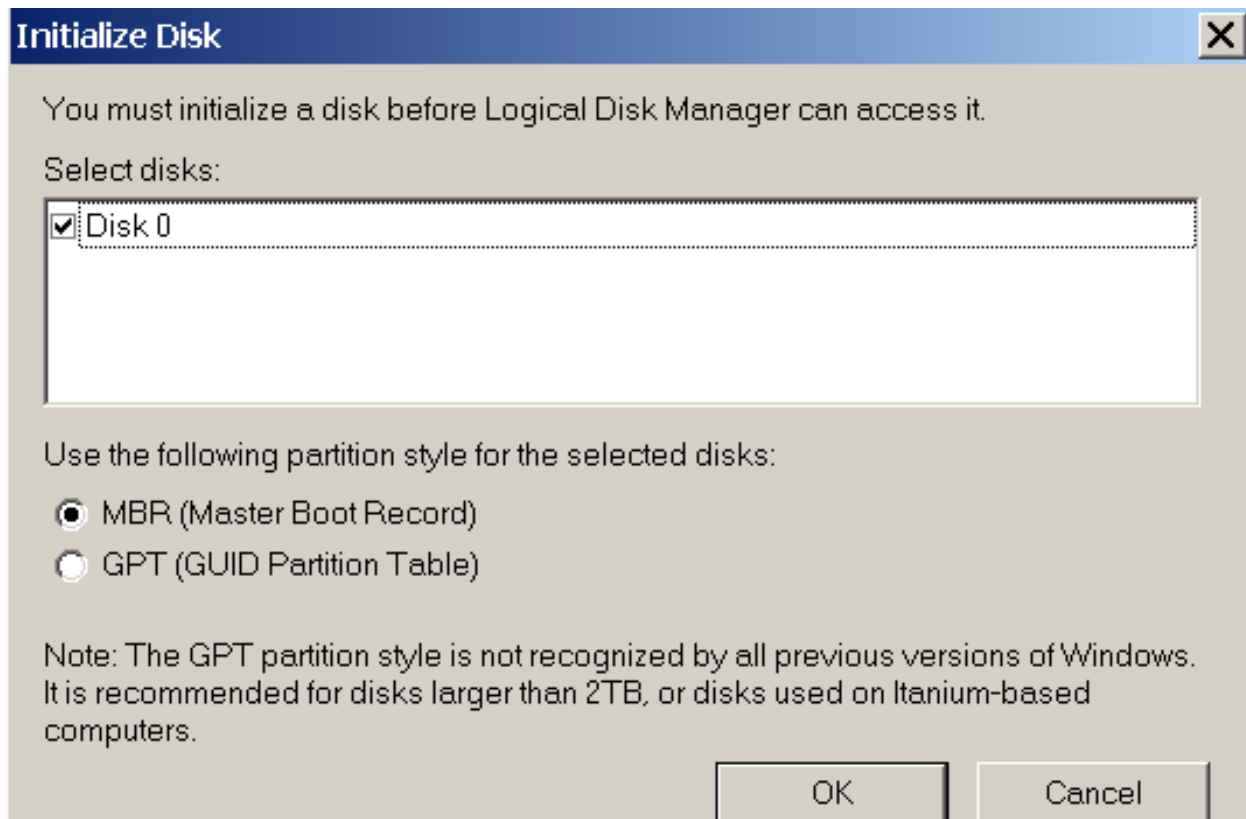
IF YOU AN UNEXPECTED POP-UP BOX ASKS
YOU IF YOU WANT TO SCAN AND FIX A
DRIVE..

- Reference for the previous slide
<https://7datarecovery.com/blog/there-is-a-problem-with-this-drive/>

IF YOU AN UNEXPECTED POP-UP BOX ASKS YOU IF YOU WANT TO "INITIALIZE" A DRIVE..

- ..always click on "Cancel" unless you have just inserted an unformatted drive into a USB port





BIG STEPS TO RECOVER DATA FROM A DRIVE

- STEP 100: PRESS AND HOLD DOWN ON THE POWER BUTTON OF THE COMPUTER UNTIL THE COMPUTER POWERS DOWN
- STEP 200: PHYSICALLY REMOVE THE PROBLEMATIC DRIVE FROM THE COMPUTER

BIG STEPS TO RECOVER DATA FROM A DRIVE (continued)

- STEP 300: ATTACH THE PROBLEMATIC DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: Then run "Disk Error Checking" and "chkdsk"
- STEP 400: ATTACH THE PROBLEMATIC DRIVE TO A "KNOWN-GOOD" "Linux" COMPUTER USING A USB ADAPTER: Then run "GParted".

BIG STEPS TO RECOVER DATA FROM A DRIVE (continued)

- STEP 500: RE-ATTACH THE PROBLEMATIC DRIVE TO A KNOW-GOOD "WINDOWS.." COMPUTER: RUN "RECUVA" AND "DISK DRILL"
- STEP 600: CONTACT A "CLEAN-ROOM RECOVERY SERVICE" FOR NOT-FREE REMOTE AND CLEAN ROOM ASSISTANCE

STEP 100: PRESS AND HOLD DOWN ON THE POWER BUTTON OF THE COMPUTER UNTIL THE COMPUTER POWERS DOWN

- ..for a problematic hard drive inside a "Windows 7" or "Windows 8" or "Windows 10" or "Windows 11" computer
- If the problematic hard drive resides inside a "Windows XP" or "Windows Vista" computer, do not press the power button!!--->instead disconnect the AC power cord to turn off the computer

STEP 200: PHYSICALLY REMOVE THE FAILED DRIVE FROM THE COMPUTER

- To open a specific model of computer, you can usually search the Internet to locate the manufacturer's instructions or a "how-to" video at [youtube.com](https://www.youtube.com)
- Spinning hard drives usually require a short #1 Phillips screwdriver
- M.2 SSDs usually require a jewellers' Phillips screwdriver and a wad of Scotch tape

STEP 200: REMOVE FAILED DRIVE FROM THE COMPUTER (continued)

- For every minute that you leave a failed hard drive running with it's original operating system (Windows.., macOS, or ..Linux..), the operating system will overwrite more and more supposedly "free space" on the drive and less and less of the "clusters" that were part of the problematic data files will be recoverable

STEP 200: REMOVE FAILED DRIVE FROM THE COMPUTER (continued)

- For "Windows 7" and earlier versions of "Windows..", you could leave the "Windows.." operating system on a problematic hard drive still running and still recover lots of data files from the drive. However, for "Windows 11" and "Windows 10", this is no longer true and these two operating systems rapidly overwrite the "available" clusters on the drive, making them unrecoverable, if you leave them running.

STEP 300: ATTACH THE FAILED DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: Then run "Disk Error Checking" and "chkdsk"

- If the problematic drive has a copy of a "Windows 10" or "Windows 11" on it, using a USB adapter instead of a SATA data cable insures that you will not accidentally boot up the operating system that resides on the problematic drive since "Windows 10" or "Windows 11" will not boot from a USB-attached drive

STEP 300: ATTACH THE FAILED DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: then run "Disk Error Checking" and "chkdsk" (continued)

- If you attach the problematic drive to a known-good computer that is not the same as the one that the problematic computer originally resided in, you eliminate the possibility that some hardware issue in the original computer caused the data loss in the problematic drive

STEP 300: ATTACH THE FAILED DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: then run "Disk Error Checking" and "chkdsk" (continued)

- Some corrupted drives that are consistently "missing" data files when attached to a SATA data cable when attached to the original computer, will then display their data files intermittently when attached by means of a USB adapter.

--->Connecting a problematic hard drive to a USB adapter seems to increase the chances of recovering data files.

STEP 300: ATTACH THE FAILED DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: then run "Disk Error Checking" and "chkdsk" (continued)

- Information on hardware devices for attaching a drive to a "known-good" computer via USB, please see
- https://aztcs.apcug.org/meeting_notes/winhardsig/harddrives/recover-data/2-USB-adapters-to-connect-drive.pdf

STEP 300: ATTACH THE FAILED DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: then run "Error Checking" and "chkdsk" (continued)

- To run Windows' "Error Checking", see https://www.majorgeeks.com/content/page/how_to_use_disk_error_checking.html

STEP 300: ATTACH THE FAILED DRIVE TO A "KNOWN-GOOD" "WINDOWS.." COMPUTER USING A USB ADAPTER: then run "Error Checking" and "chkdsk" (continued)

- To run Windows' "chkdsk", see <https://www.geeksinphoenix.com/blog/post/2021/12/02/how-to-check-your-drive-for-errors-in-windows-11> and <https://www.minitool.com/data-recovery/chkdsk-f-or-r.html>

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO A "KNOWN-GOOD" "Linux" COMPUTER USING A USB ADAPTER: Then run "GParted"

- Alternatively, you can boot up your existing computer (the one with the problematic hard drive) by booting it up with a "GParted Live" CD or DVD or USB flash drive which has a bootable copy of ..Linux.. in it as explained at <https://gparted.org/livecd.php> and <https://gparted.org/download.php>

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- After connecting the problematic drive to starting up your "Linux" computer via a USB adapter, start up the "GParted" app.



Exit



Screenshot



Terminal



GParted



Screen resolution



Web Browser



Network config





Exit



Screenshot



Terminal



GParted



Screen resolution



Web Browsers



Network config





GParted



Exit



Screenshot



Terminal



GParted



Screen resolution



Web Browser



Network config

/dev/sda - GParted

GParted Edit View Device Partition Help

/dev/sda (596.17 GiB)

/dev/sda1
585.00 GiB

Partition	File System	Label	Size	Used	Unused	Flags
/dev/sda1	ntfs	Beckys-HP	585.00 GiB	78.60 GiB	506.40 GiB	boot
/dev/sda3	ntfs	FACTORY_IMAGE	11.17 GiB	9.67 GiB	1.50 GiB	
unallocated	unallocated		2.49 MiB	---	---	

0 operations pending

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- Click on the drop-down list arrow of the drive selector:



Exit



Screenshot



Terminal



GParted



Screen resolution



Web Browser



Network config

/dev/sda - GParted

GParted Edit View Device Partition Help

/dev/sda (596.17 GiB)

/dev/sda1
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unallocated	unallocated		2.49 MiB	---	---	

0 operations pending

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted", (continued)

- Click on the problematic drive in the drop-down list:

/dev/sda - GParted

GParted
Edit
View
Device
Partition
Help

+

×

✂

📄

📁

🔍

📁 /dev/sda (596.17 GiB)

📁 /dev/sdb (58.62 GiB)

📁 /dev/sda1 585.00 GiB

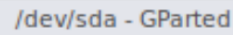
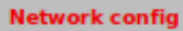
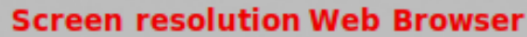
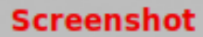
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unallocated	unallocated		2.49 MiB	---	---	

0 operations pending

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STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- The partitions of the problematic drive will now be displayed in the "partitions list":






GPARTED Edit View Device Partition Help



 /dev/sda (596.17 GiB) ▼



Partition	File System	Label	Size	Used	Unused	Flags
/dev/sda1	 ntfs	Beckys-HP	585.00 GiB	78.60 GiB	506.40 GiB	boot
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unallocated	 unallocated		2.49 MiB	---	---	

0 operations pending

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- Click on the partition that contains the problematic data files:



Exit



Screenshot



Terminal



GParted



Screen resolution



Web Browser



Network config

/dev/sda - GParted

GParted Edit View Device Partition Help

Icons: Add, Remove, Resize, Move, Copy, Paste, Undo, Redo

/dev/sda (596.17 GiB) ▼

/dev/sda1
585.00 GiB

Partition	File System	Label	Size	Used	Unused	Flags
/dev/sda1	ntfs	Beckys-HP	585.00 GiB	78.60 GiB	506.40 GiB	boot
/dev/sda2	ntfs	FACTORY_IMAGE	11.17 GiB	9.67 GiB	1.50 GiB	
unallocated	unallocated		2.49 MiB	---	---	

0 operations pending

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- The partition that contains the problematic data files will now be highlighted:



Exit



Network config



Screenshot



Terminal




GParted










Screen resolution



Web Browser




 /dev/sda - GParted

GParted Edit View Device Partition Help



/dev/sda (596.17 GiB) ▼

/dev/sda1
585.00 GiB

Partition	File System	Label	Size	Used	Unused	Flags
/dev/sda1		ntfs Beckys-HP	585.00 GiB	78.60 GiB	506.40 GiB	boot
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unallocated		unallocated	2.49 MiB	---	---	

0 operations pending

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- Click on "Device" in the top pull-down menu:



Exit



Screenshot



Terminal



GParted



Screen resolution



Web Browser



Network config

/dev/sda - GParted

GParted Edit View Device Partition Help

File icons: New, Close, Copy, Paste, Undo, Redo, Commit

/dev/sda (596.17 GiB) ▼

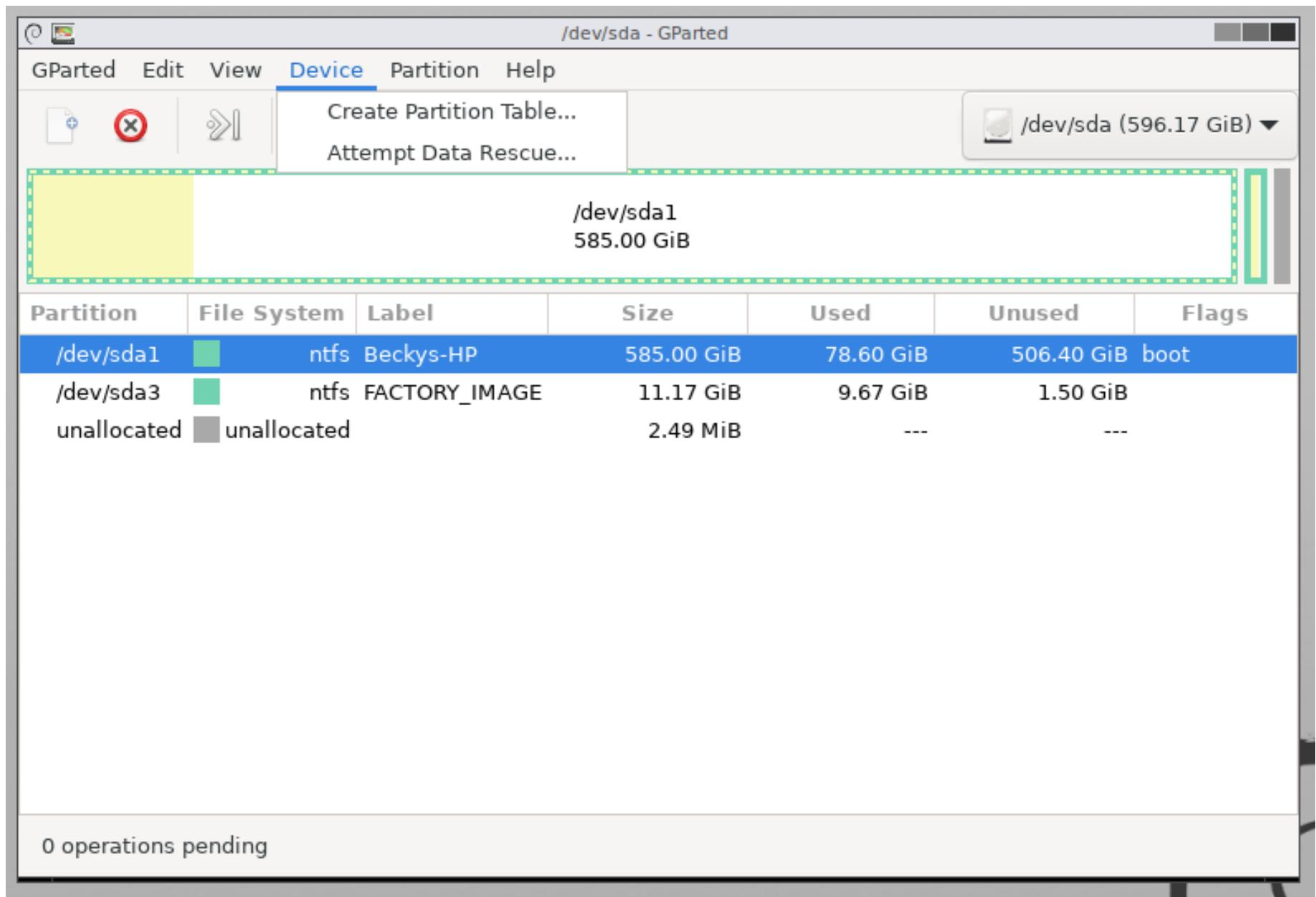
/dev/sda1
585.00 GiB

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unallocated	unallocated		2.49 MiB	---	---	

0 operations pending

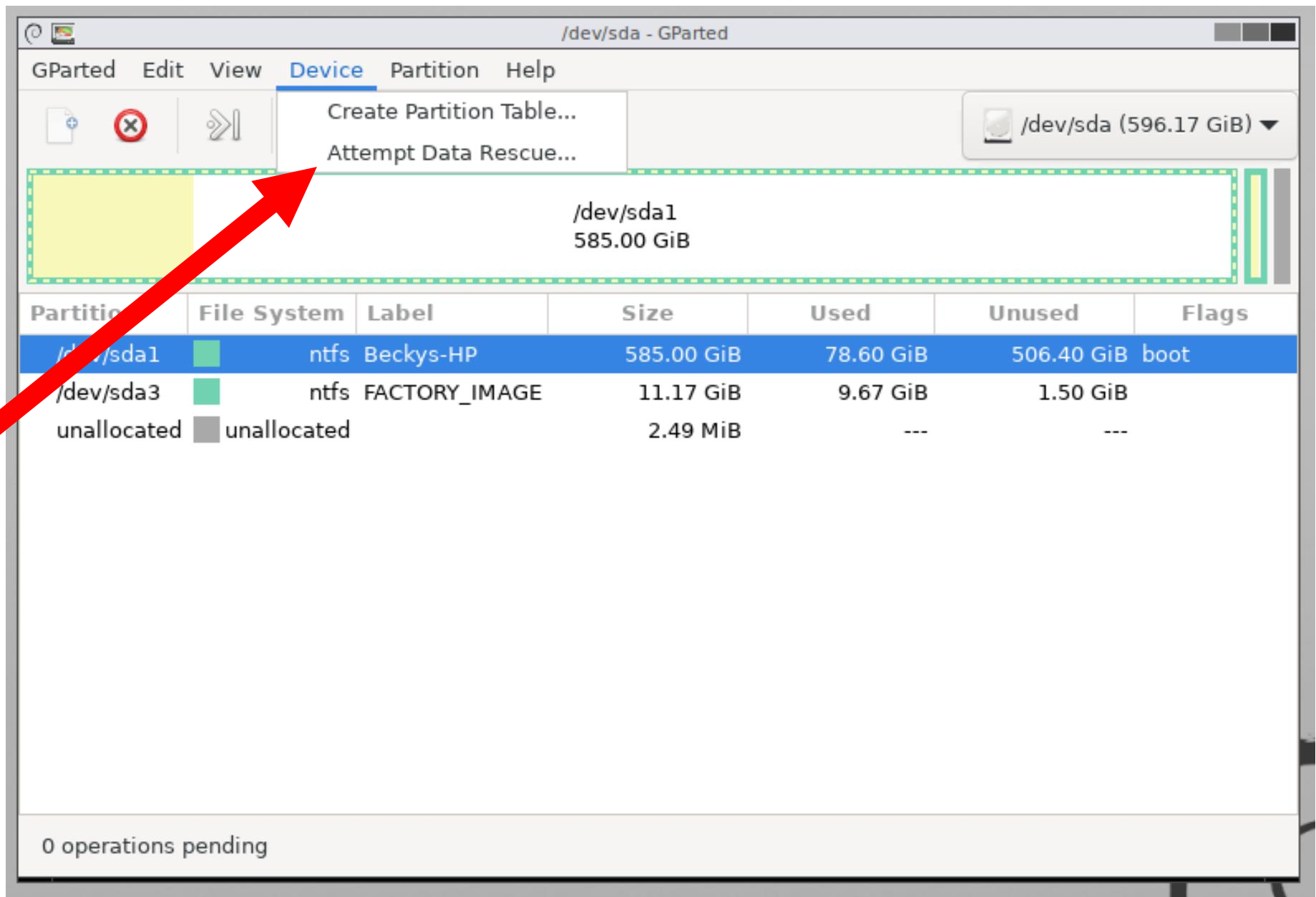
STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- A sub-menu will be displayed:



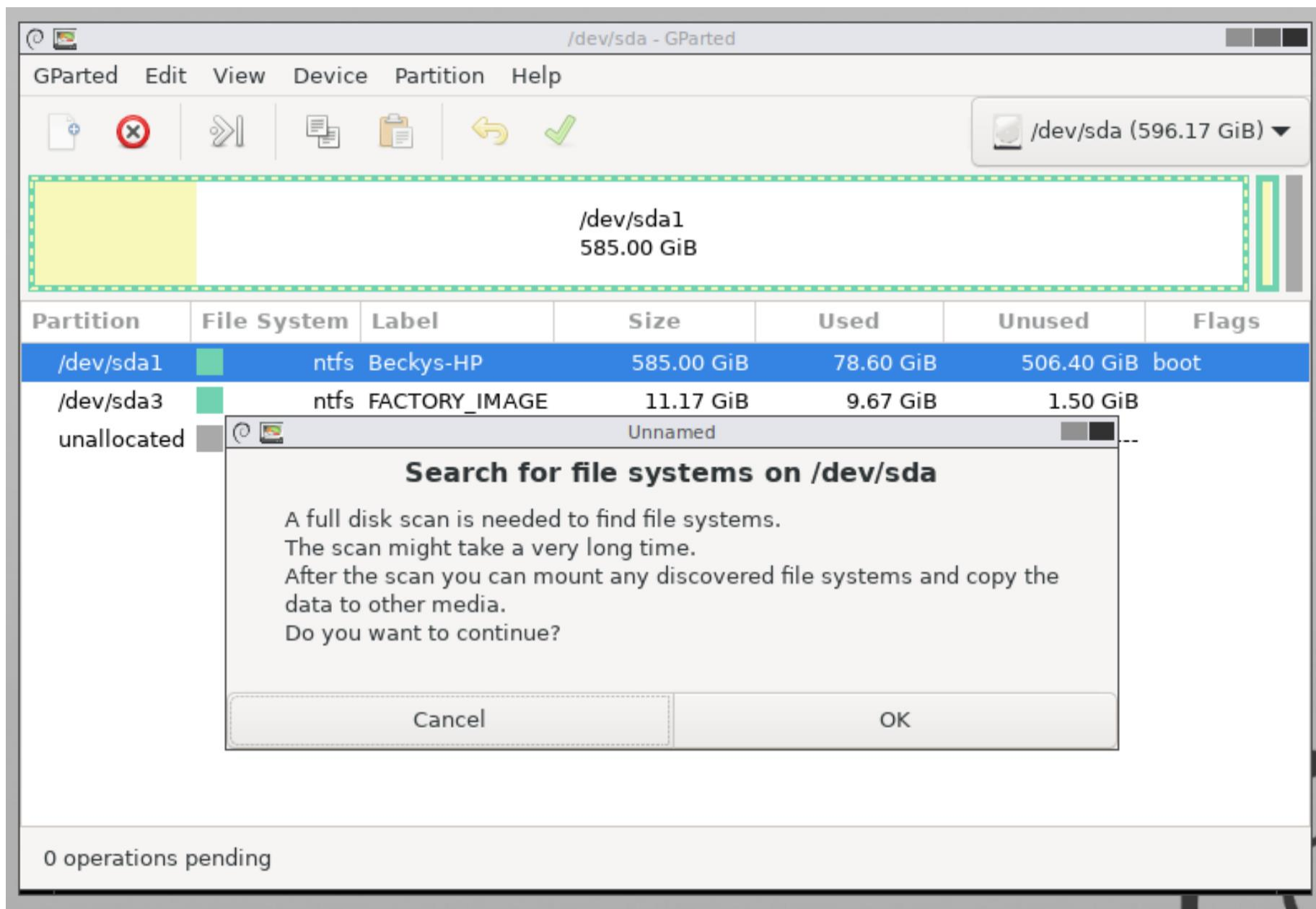
STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- Click on "Attempt Data Rescue" in the sub-menu:



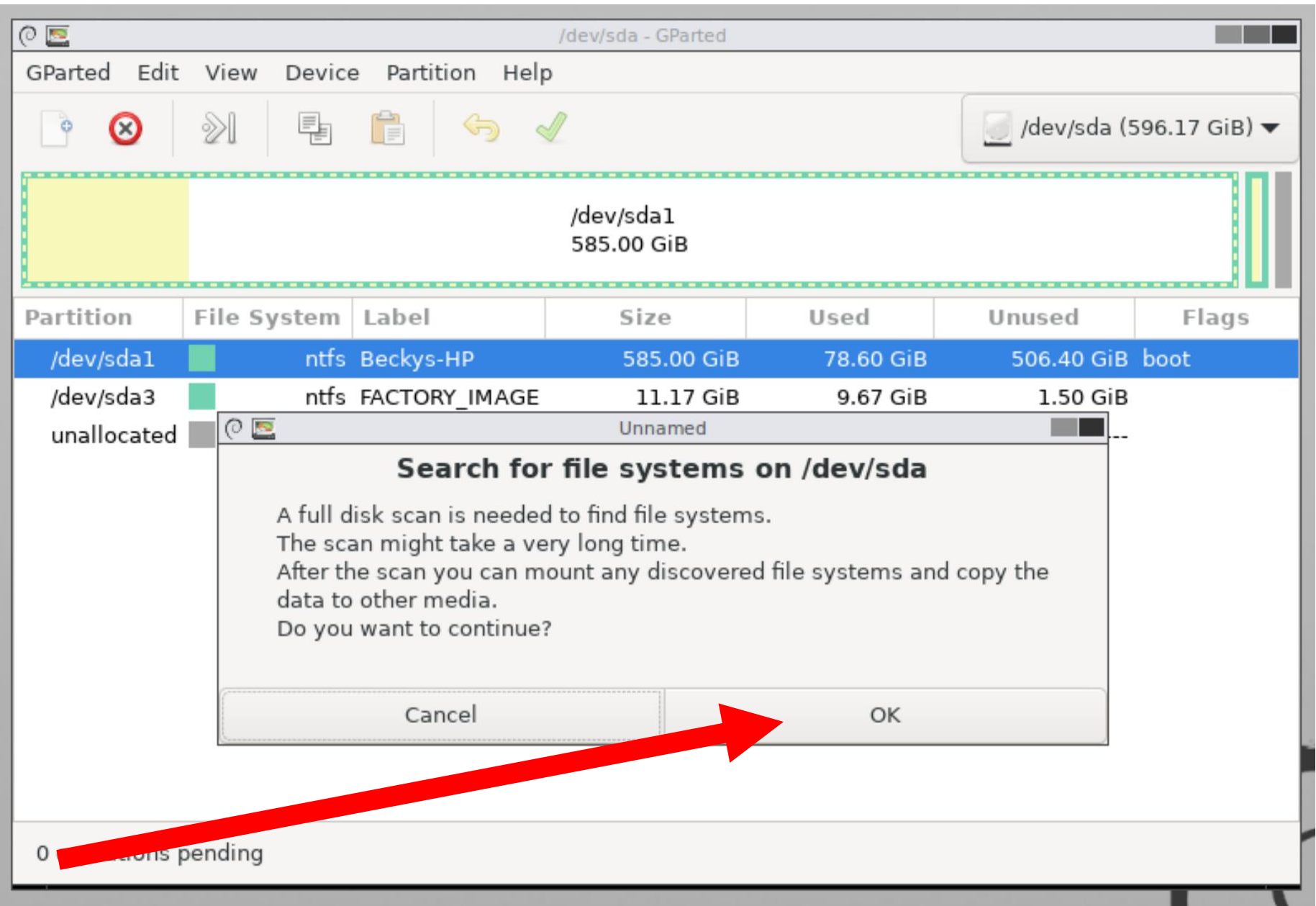
STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- A "Search for file systems on.." pop-up box will be displayed:



STEP 400: ATTACH THE PROBLEMATIC DRIVE TO
A "KNOWN-GOOD" "Linux" COMPUTER
USING A USB ADAPTER: Then run
"GParted" (continued)

- Click on "OK" in the "Search for file systems on.." pop-up box:



STEP 400: ATTACH THE PROBLEMATIC DRIVE TO A "KNOWN-GOOD" "Linux" COMPUTER USING A USB ADAPTER: Then run "GParted" (continued)

- After it scans the problematic drive for a while, "GParted" will either restore it fully, restore it partially, or fail to restore it.

If "GParted" restores the problematic drive, copy to the restored data files to a known-good hard drive using either Linux or Windows..

STEP 400: ATTACH THE PROBLEMATIC DRIVE TO A "KNOWN-GOOD" "Linux" COMPUTER USING A USB ADAPTER: Then run "GParted" (continued)

- If "GParted" restores the problematic drive partially, follow the instructions at [https://subscription.packtpub.com/book/hardware-&-creative/9781849519823/1/ch01lvl1sec24/rescuing+data+from+a+lost+partition+\(become+an+expert\)](https://subscription.packtpub.com/book/hardware-&-creative/9781849519823/1/ch01lvl1sec24/rescuing+data+from+a+lost+partition+(become+an+expert))

STEP 500: RE-ATTACH THE PROBLEMATIC
DRIVE TO A KNOW-GOOD
"WINDOWS.." COMPUTER USING A
USB ADAPTER: RUN "RECUVA", ETC.

- "Recuva" is a portable program at <https://www.ccleaner.com/recuva>

STEP 500: RE-ATTACH THE PROBLEMATIC
DRIVE TO A KNOW-GOOD
"WINDOWS.." COMPUTER USING A
USB ADAPTER: RUN "RECUVA", ETC.
(continued)

- "Disk Drill" is a not-portable program
at
<https://www.cleverfiles.com/disk-drill-windows-pro.html>

STEP 500: RE-ATTACH THE PROBLEMATIC
DRIVE TO A KNOW-GOOD
"WINDOWS.." COMPUTER USING A
USB ADAPTER: RUN "RECUVA", ETC.
(continued)

- Additional free apps for recovering data files are available at
<https://www.handyrecovery.com/best-open-source-data-recovery-software/>

