

Protecting your Photos

Mike Richards



Tonight's plan

- Introduction
- Typical computer setups
- What could possibly go wrong?
- Organising your photos
- Protecting your Photos
- Questions...



Why Me?

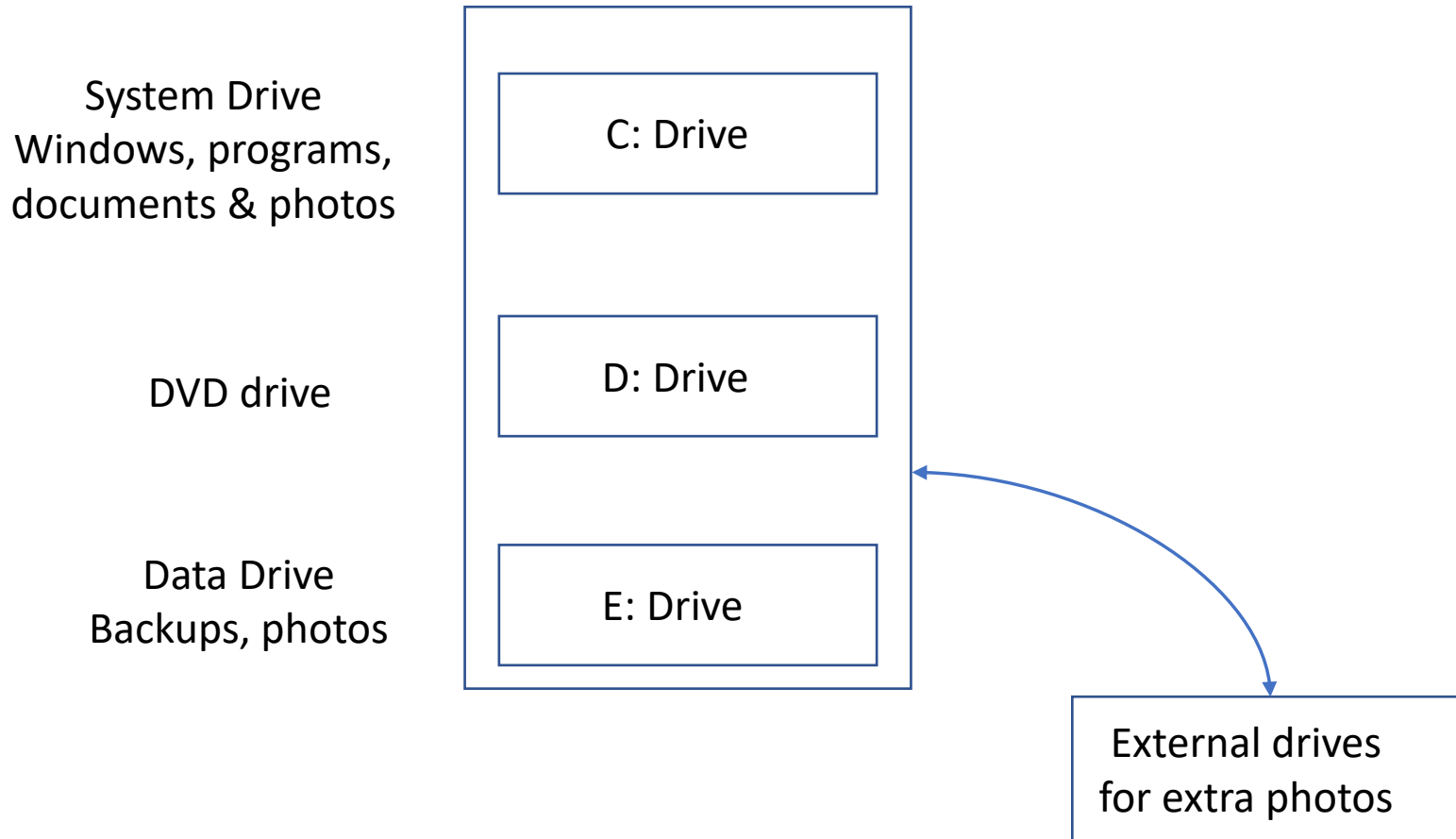
- Built my first radio when I was 10 and have been playing with radio, electronics and computing ever since
- I had my first computer in 1979 – a Compukit UK101 – home built.
 - 1MHz processor with 8kB RAM
 - Display was 16 lines of 48 characters
 - Programs stored on audio cassette tapes and took about 5 mins to load!

Why Me?

- I've owned most of the popular computers of the time:
 - Atari, Commodore 64, BBC B, Sinclair ZX80, Amstrad PCW8256, then various PCs and Single Board Computers such as the Raspberry Pi.
- I've been maintaining friends and family computers for years – about 30 on the books at present.
- Survived a number of panics as my children's laptops failed at critical times at university!
- Rescued friends from data loss

Typical Installation

Laptop and basic desktop

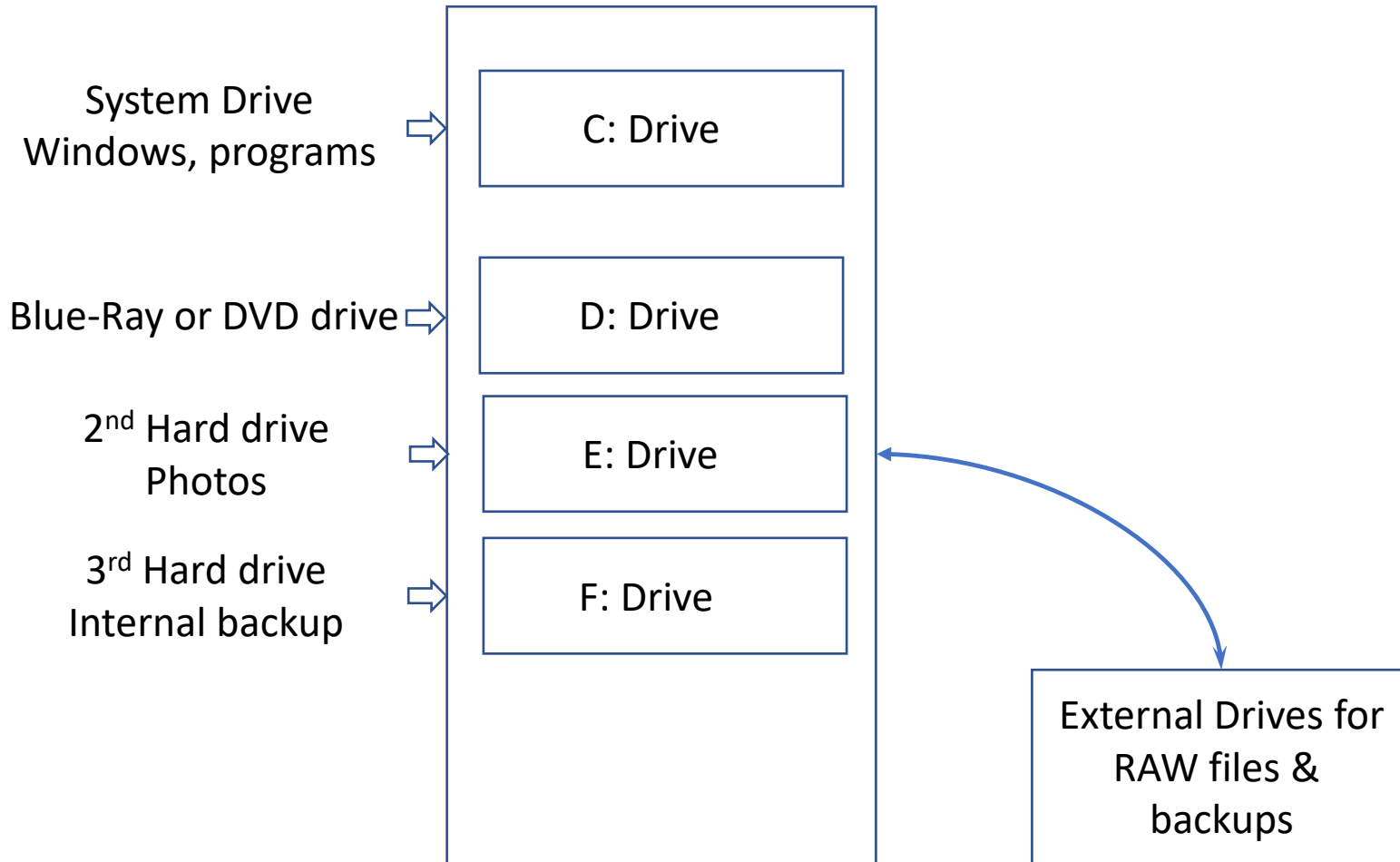


Basic setup problems

- Windows default saves all photos, documents and videos to the C: or system drive
 - This is the busiest drive so is the first to fail!
- Virus and malware target the C: drive so this will affect your photos and documents
- The use of 2 drive letters (C: and E:) implies 2 hard drives but is often just 2 partitions on the same drive!
- Many people spread photos across several drives as their portfolio grows. This makes recovery challenging!
- ..

Typical Installation

Advanced desktop



Advanced setup problems

- Photos may be more secure but documents and spreadsheets are often left in the default Windows Documents folder on the C: drive
- Raw file backup keeps the digital negatives safe but is not suitable for a full recovery
 - You'd have to rework all your photos from the RAW files!
- Backing-up multiple drives/directories gets complex and is difficult to restore.
- ...

What could possibly go wrong?

- Hard Disk failure



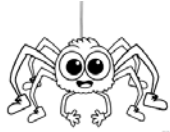
- Human error



"HIT ANY KEY TO CONTINUE"

- Virus, malware or ransomware

- Software failure



- Theft



- Power surge storm, lightning



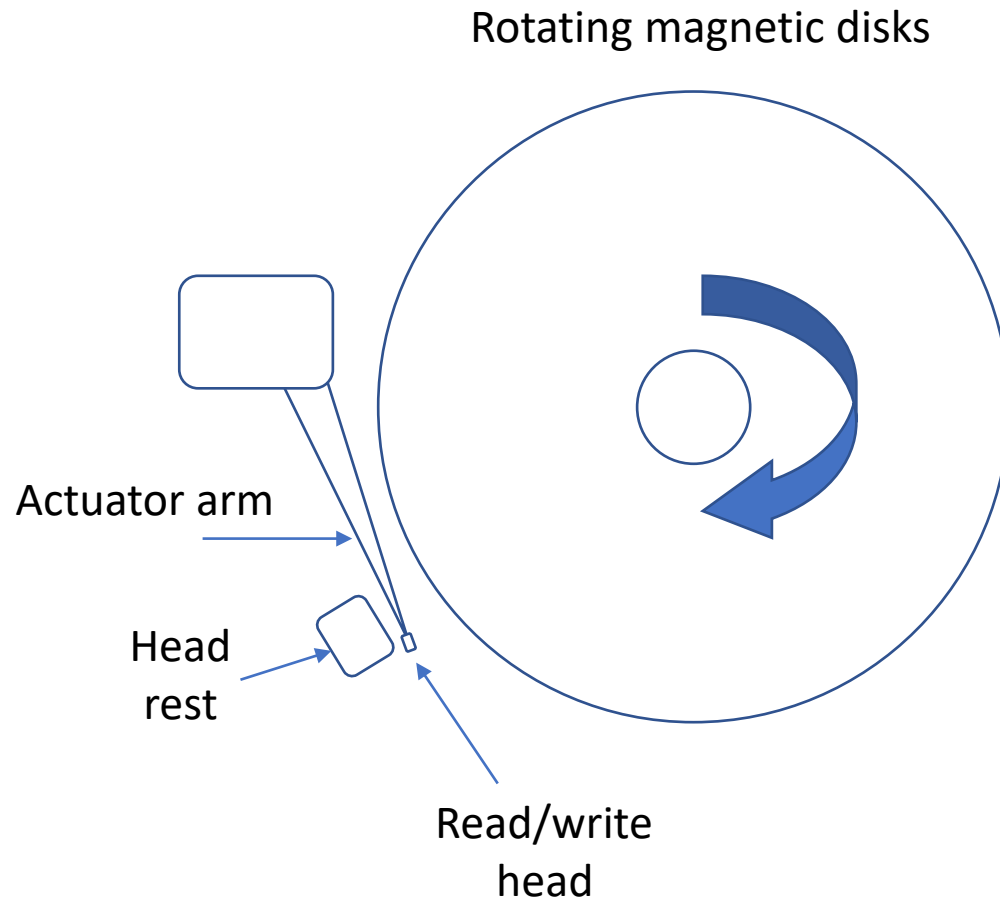
- ...



Hard Drives - worst offenders

- Let's understand why ...

About Hard Disk Drives



Hard Drive Facts - 1

- Disk stack spins at 5400rpm or 7200rpm
- Typically has 300,000 concentric tracks on each disk
- Large drives have stacked disks and heads
- Wind speed at the head is around 80 mph
- Head is aerodynamically shaped to fly just above the surface
- ...

Hard Drive Facts - 2

- Modern hard drives can read & write data at up to 150 Million Bytes per second
- To do that, the individual data bits have to be read from the disk at 1.2Gb/s – that's 1,200,000,000 bits every second!
- Here's one in action...

YouTube Video of Hard drive in Action

<https://www.youtube.com/watch?v=3owqvmMf6No>

Solid State Drives

- 6 -10 times faster than spinning hard drives
- Ideal replacement for C: drive to speed up software
- No moving parts
- Small, robust and reliable
- Uses less power
- They still fail!
 - Data is stored as an electrical charge
 - Storage cells fade over time
 - Disk controller manages the storage
- ...

Hard Drives - Care

- All hard drives fail – just a matter of when!
 - Even Solid State Drives
- Hard drives are robust when powered-down and the head is parked
- Vulnerable to knocks when powered-up
- Failure warning signs:
 - Computer slows down
 - The disk automatically marks and avoids bad surface areas
 - This fragments the data so it takes longer to read
 - As the error rate increases the computer will fail to start or become unreliable
 - `wmic diskdrive get model,status`

External Hard Drives - Care

- Be careful with external drives – don't move if powered up
- Allow a few seconds for the drive to stop spinning
- Use SSD or 3.5" drives for best reliability
- Locate external drives carefully so you don't accidentally knock them.
- ...

Human Error

- Moving and deleting are a common cause
 - Overwriting the RAW or JPEG file
 - Downsizing and saving the jpeg
- Take extra care when deleting or moving images
- Take special care with Drag & Drop
 - It's very easy to miss the target folder!
- Simple protection: Copy to a spare drive before deleting/moving – gives you a safety net
- ...

Virus, Malware, Ransomware

- Normally targets the operating system on the C: drive
- Best protection – buy good quality antivirus software
- Which Best Buys (2017):
 - Bitdefender
 - Norton Security Deluxe
 - Trend Micro
- My Favourite: Sophos Home Premium
- ...

Software Bugs

- Avoid using beta versions
- Don't be too quick to upgrade.
 - Give new products time to iron-out bugs
- Keep your computer updated
 - Use Windows or Mac Update
 - ...

Theft

- Other than the hardware, what would you lose if your computer and peripherals were stolen?
- You need a copy of your valuable data stored away from your computer – more on this later...
- Also make sure your computer and photo kit is insured – ask your insurer.

Power Surge, Lightning

- Can wipe out your computer system
- Lightning doesn't have to be a direct strike
- Overhead power and phone lines will bring the lightning to you!
- Precautions:
 - Use an extension block with power surge protection
 - When lightning's expected, unplug your computer from the wall socket and disconnect the ethernet cable
 - Use an off-site data backup – more later
 - ...

How are you feeling so far?

Help is coming!

The Way Forward

- Make sure you have plenty of storage space
 - Required for safety net to keep things safe
 - Need room to expand
 - Avoids disasters when trying to free-up space for new photos!
- Organise
 - Create a single archive with all your important data
 - Simplifies backup and restore
- Decide what you need to back-up
- Implement the Backup!

Taking Control – How much space?

- Here's an image size guide:
- Raw files are typically 20MB
- JPEGs are around 5MB
- 1GB = 1,000MB = 50 Raw or 200 JPEGs
- 1TB = 1,000GB = 50,000 Raw or 200,000 JPEGs
- If you use Lightroom or Capture One you will need an extra 1GB for previews and a catalogue.

Taking Control – Storage Capacity

- Acquiring disk space
 - External (USB) 2.5” drives are cheap. 1TB (£40), 2TB (£60)
 - Suppliers: Amazon, Novatech, PC World, etc
 - Pro quality, fast, external 3.5” drives 6TB (G-Technology £170)
 - Suppliers: Jigsaw
- If you need portable storage, use the right drives and stick to USB-3 or Thunderbolt (Mac) for speed;
 - SSD - Samsung T-5 - 500GB (£95 Amazon)
 - SSD - Adata SD700 - 500GB (£92 Amazon)
 - Hard disk - G-Tech G-Drive 1TB (£120 Jigsaw)
 - ...

Taking Control – Organisation - 1

- Aim to have a single archive to contain all your important data
 - Main Archive
 - Documents
 - Accounts
 - Tax
 - General letters
 - Writing
 - Music
 - Videos
 - Janes wedding 2015
 - etc
 - Photos
 - ...

Taking Control – Organisation - 2

- Simplify your photo archive
- Create a single folder structure that contains all your images
 - Use sub-folders to separate by date/event/job etc
- Photos
 - Family
 - Joe birthday party
 - Brenda birthday party
 - Christmas
 - House warming
 - Alice Christening
 - Camera Club
 - Raptors photo shoot
 - Mundeford Quay
 - Holidays
 - Bulgaria
 - Italy
 - France
 - Costa Rica
- ...

Taking Control – Organisation - 3

- Lightroom users: Use Lightroom to relocate your files and folders
 - Saves lots of time searching later
 - Maintains the catalogue integrity
- When moving large folders with Windows Explorer or Finder (Mac), make a copy to a spare disk drive first.
 - This is your safety net against human error!
- Pro's - Make a 2nd copy of memory cards as you import
 - ...

Taking Control – Organisation 4

- Create a master catalogue of all your images
 - Easy with Lightroom or Capture One
 - Use keywords to organise images
 - Use Lightroom face recognition
 - Automatically keywords all the faces it finds
- Relocate your Windows default folders to your Archive disk
 - Documents, Videos, Photos and Music
 - It's easy: Right-click – Properties – Location – Move!
- Create a folder in your archive for software licenses

Backup – Basic Rules

- Simplified storage structure makes backups easy
- Use 3 – 2 – 1 principle
 - 3 copies of your data
 - Original + local backup + off-site backup
- Backup your system drive
 - Enables a quick recovery in the event of a system (C: drive) failure or corruption.
- Off-site backup....

Off-Site Backup

- Important if you want to cover theft or lightning damage
- Could be as simple as a 2nd drive that's hidden somewhere in the home or shed
 - Do the backup regularly, then hide the drive away
- Store the drive at a friend or relatives house.
- Pro setups would have 2 off-site back-up drives that are swapped regularly
- If your main archive is less than 1TB or you have very fast broadband – try online storage

Backup –Software

- Windows backup and restore (Windows 7, 8 & 10)
 - Provides an automated system and file backup
- EaseUS ToDo Backup (free)
 - Provides a customisable solution.
- Acronis True Image
 - Popular paid option
- Retrospect
 - Multi-computer & operating system backup

Precious Memories

- We used to put them in family photo albums
- Now they sit on the PC!
 - High risk
- Use online photo sites
 - Flickr, Facebook, Smugmug, etc
- Create Photobooks
- How do we preserve for future generations?

Long term storage

- Hard drives – too fragile
- Online – dependant on a 3rd party
 - What if they go bust?
- CDs and DVDs – Limited capacity
 - Rewritable disks use a dye that fades with age and is degraded by exposure to light.
 - Many will be unreadable after 10 years
- Best current solution is MDISCs
- ...

M-DISCs

- A new Write Once Read Many (WORM) storage disk
- Uses a mineral based recording layer that is punctured by the recording laser.
- 1,000 year life!
- Comes in CD, DVD and Blue-Ray formats
- Needs a special burner to record (£60)
- Can be played on any device
- Capacities up to 100GB per disk
- ...

That's Enough!

- Any questions?



**STOP
TALKING!**