

CARING FOR PHOTOGRAPHIC MEMORY CARDS

As we see a lot of customers who have lost images from their memory cards we like to answer their questions as to why the images “disappeared” and how to prevent this happening again. There’s a lot of information on the web on this topic, some very technical and some conflicting. A recent discussion with a data recovery expert clarified some of this and so I decided to share it with those interested. I hope it’s accurate but apologise in advance for any errors. (*Jill, Snapshot Cameras*)

What’s inside a Memory Card?

Memory cards are tougher than hard drives as they have no moving parts but inside they have a lot of small vulnerable parts involved in capturing your memories.

1. Memory Chip (large rectangle in photo),

- Data is stored as zeros and ones in memory cells on the memory chip (larger cards have more than one memory chip)
- There are no photos as such on the card – just a set of instructions for creating an image on your screen or printer
- Individual memory cells have a limited lifespan measured in the many, many thousands of erase/write cycles
- The speediest memory cards offer the highest number of erase/write cycles (longer life).
- The slower and less expensive cards have a lower erase/write cycle specification (shorter life).



2. The controller (small rectangle in photo).

- The controller determines how data is to be written to and read from the memory chip on the card
- It keeps track of the location of the data (“photos”)
- It balances the wear across the entire card’s cells using an algorithm

3. Drive electronics

- If something goes wrong with the drive electronics, you can no longer read what is on the memory chip.
- Our recovery tech has the ability to take apart a memory card and place the chip in a special reader.

How do images “disappear” from a memory card?

- **Logical damage** which prevents access to the data/pictures
 - the card is recognized by the PC but no photos can be seen, possibly due to
 - Deleting photos by mistake.
 - Formatting the card by mistake
 - Corruption of the card by a virus
 - Storage device's file system gets damaged in some way or the other.
 - Pulling out the card while the camera is on.
 - Switching of the camera just after capturing a photo.
 - Errors while transferring the photos, videos and other files from the card to the computer
 - specialized types of recovery software usually find the data without destroying the card.
- **Physical damage**, most frequently caused by electrical problems
 - the card is not recognized by the PC
 - impossible to access the contents of the memory chip.
 - if the controller is damaged but the memory chip undamaged then our recovery expert will take the memory card apart, unsolder the memory chip and directly access the raw data with a chip reading device
 - Card is sacrificed (it was physically damaged anyway)
 - Expensive (how valuable are the lost images?)



card buckled but memory chip undamaged



If your images disappear, or you get card error messages...

- Stop using the card immediately.
- If any pictures on it are accessible, take a back-up of them right away.
- Refrain from saving any new information on this card. Any further data written to the memory card may overwrite and destroy data and reduce the chance of recovery
- Keep the card in a place where it will not get damaged.

Practice these 7 F-steps of Card Care

1. Buy only the **FINEST** cards. You are capturing memories so stick to brands you can trust.
2. **FORMAT** new cards **in the camera** before you use them the first time, and then every time you've wiped the images from the card.
3. **FILL** cards up **without deleting** images in the camera. Continually deleting images in the camera significantly increases the chance of problems.
4. **FINALISE** the writing -to-card process **before**: switching to "review", turning the camera off, or removing the card. **Interrupting this process is a common cause of corruption.**
5. Check the **FUEL**—be aware of remaining battery power so that data is not lost if the battery goes flat during the writing-to-card process or during transfer to a PC
6. **FILE (back-up)** the created images in several places and then wipe the card using **FORMAT** (do not use "delete all images")

Optional extra

7. **FILL** the card WITH ZEROS **before reformatting to erase every piece of data from the card***.
 - If your card suffers logical damage, it saves paying for the recovery of photos you've already backed up elsewhere.
 - If your card suffers physical damage, the data recovery expert knows every piece of data belongs to your last shooting session

If you follow this approach, your pictures will always be stored in sequential, contiguous blocks - which makes it easy for recovery software to retrieve them. The more images that are deleted in the camera, the harder it will be to recover the ones you didn't want to delete - if there is a problem.

Erasing data

DELETE IMAGES FROM CARD

- When you delete an image, the data is still on the memory card. You are just giving the camera permission to overwrite that image.
- The camera removes the reference to the image from the file allocation table. This is like removing a chapter reference from the table of contents in a book. The actual chapter is still in the book. The only thing removed was the page number reference in the table of contents. With the file location reference removed the camera now sees that card space as being available for use.
- Data tends to get fragmented ...if you must delete, delete only the last image (or images, deleting the last recorded one first and working backward)
- Avoid DELETE ALL – use FORMAT instead

FORMAT CARD

- When you format a card, in most cases the data is still there – however don't reformat the card until all your files are downloaded and you've made two copies of all the files on either hard drives or optical media
- Format resets the file system to a given known state. It is like removing the entire table of contents from the book so the camera sees the whole card being available and starts adding images from page 1 onwards.
- Data stays sequential so is a better way of erasing files than deleting.

WIPE CARD (FILL WITH ZEROS) – RECOMMENDED FOR PROFESSIONALS

- If you want to permanently remove all data from a memory card you need to "wipe" the card. This is like erasing every piece of text from the book so effectively that no one can see what was written there previously
- Card wiping doesn't really wipe, or delete the data - it actually replaces or overwrites the existing data with new data. The new data written could be all zero's or garbage data. Zeros is best if you are going to reuse the card yourself – in

the unlikely event your card is damaged, the data recovery expert knows every piece of data belongs to your most recent shooting session

- Nothing can ever be recovered after this is done – make sure you've made two copies of all the files on either hard drive or optical media before you start
- Triple check you've selected the correct drive before you start
- Recommended prior to an important photographic job – such as wedding. In the event your card fails the data recovery person will find it much easier to piece together your files

*Try something like DISKWIPE, available from <http://www.diskwipe.org>. It's a slow process - I tried it and it took 4 hrs for a 4GB card. One web site mentioned "Low Level Format" in some cameras does the same thing – but it's super fast in comparison so need to do more research on that.