

## Chapter 28 - - Memory Cards and Readers for Digital Cameras

The most popular types of flash memory cards for use in digital cameras are: Secure Digital (SD), CompactFlash (CF), SmartMedia (SM), Memory Stick (MS), MultiMediaCard (MMC) and xD-Picture Card (xD).



The type of memory card you use is dictated by which digital camera you buy. These physically different cards are **-not-** interchangeable.

As of 2004 the most popular flash memory format is undoubtedly the diminutive Secure Digital (SD) card. SD and MMC (MultiMediaCard) cards are physically identical on the outside but technically different on the inside. Not all devices that are specified to use SD will also use the MMC cards. Currently the SD cards are much faster than comparable MMC cards.

SD cards were originally designed to hold copyrighted musical content and prevent its unauthorized duplication. Although this use was not widely adopted, SD cards have become the flash memory card of choice for digital cameras because of their small size and low power consumption. Small cameras need small memory cards and the larger CF cards are no longer viable due to their physical size.

SD memory cards range in size from 4MB up to 2GB. As with other flash media, SD cards come in different transfer speed ratings. Most SD cards that are not marked "High Speed" or "Ultra High Speed" are probably ~2Mb/s capable. The newer, fast cards are capable of transferring data at 8-10Mb/s such as the SanDisk Ultra III or Extreme cards. Transfer speed is an important factor if you use the card for recording high framerate motion video or high quality audio tracks. Many digital camera makers only certify their 30fps VGA motion video capability when using high speed SD cards.



**MiniSD card** for cellphones, MP3 players, digicams. The miniSD card is both electrically and software compatible with the existing SD standard. It uses the same SD interface, including security features for content protection (CPRM—Content Protection Rights Management) as the standard SD card. The miniSD card is 21.5 millimeters (mm) long, 20 mm wide and 1.4 mm thick, and occupies a footprint of 430 square mm and volume of 602 cubic mm.

## CompactFlash

CompactFlash cards contain both memory chips and a controller. Most digi-cams that use CompactFlash (CF) cards can use ANY capacity card up to 1GB (possibly 4GB) with no problems. CF cards above 2GB are using the FAT-32 file system and the camera must be able to read this or it



won't work.

There are two styles of CompactFlash cards:

**Type I** (3.3mm thick) and **Type II** (5mm thick)

Cameras with Type I slots cannot use Type II cards. Cameras with Type II slots can use either.

CompactFlash Type I cards currently range from 8MB (MegaByte) all the way up to 8GB (GigaByte) - Sandisk just announced their new Ultra II cards and pushed the upper



limit to 8GB!

## CompactFlash Type II

Some digicams are equipped with a CompactFlash Type II card slot which can hold either a Type I CF card or the thicker Type II flash cards or memory devices like the IBM/Hitachi Microdrive (170MB, 340MB, 512MB, 1GB, 2GB, 4GB). Click to read my Microdrive review, Hitachi recently bought the hard drive business from IBM and is now offering up to a 4GB



Microdrive.

## CF Type I ... Type II ... what's the difference?

Physically a CF Type II card looks like a CF Type I card in every dimension except thickness, CF Type II cards are 5mm thick whereas Type I cards are 3.3mm.

CompactFlash Type II devices can NOT be used in cameras that have the thinner Type I card slots. Pictured above you can see the height difference between Type I and II cards.



## SmartMedia

Physically smaller than a book of matches and not even as thick as a credit card. SmartMedia (SM) cards have no controller, they are simply memory that has been laminated on a plastic card. The controller has to be built into the camera and this causes incompatibilities with cameras made before 2001 and the higher capacity 64MB and 128MB size cards.

Before you buy a 64MB or 128MB card for your pre-2001 camera, check to see if your camera can accommodate it.

SmartMedia cards max out at 128MB. Nobody has come right out and said it but - SmartMedia cards are very much dead - we do -not- expect to see any further capacity increase. Fuji and Olympus were two of the biggest users of SmartMedia cards and they are both now using their new xD-Picture Card media. All other camera makers have gone with Secure Digital (SD) except Sony which uses their own Memory Stick (MS) media.

### xD-Picture Card (xD)



Olympus Optical Co., Ltd. and Fuji Photo Film Co., Ltd. (Fujifilm) of Japan announced they have jointly developed the xD-Picture Card

The xD-Picture Card is in response to the needs of consumers using today's high resolution digital still cameras that require greater memory capacity. With initial sizes from 16 to 128 megabytes at introduction, and followed by larger sizes up to 8 gigabytes in the future.

There's an xD-Picture Card PCMCIA adapter, CF card adapter and a dual xD and SmartMedia USB card reader available now. Fujifilm and Olympus are now shipping the higher capacity 512MB xD-Picture Card and just announced 1GB xD cards.

### Sony Memory Stick (MS)



In 1999 Sony brought out their own flash memory product called the Memory Stick, which is being used in most of their Cyber-shot digital still cameras and many of their Handycam video camcorders.

Pictured above is the 128MB MemoryStick, they come in 4, 8, 16, 32, 64 and 128MB sizes.

The Memory Stick Select card allows older (pre-2003) Sony cameras to use a 256MB Memory Stick card, it has a switch on the back to select one of two 128MB "banks." Lexar Media and SanDisk will also be making Memory Stick Select cards.



## The new Sony Memory Stick Pro



Memory cards have capacities up to 2GB ( Sandisk just announced new 4GB MSPro cards. The MS Pro cards are NOT compatible with pre-2003 Sony digi-cams except the Cyber-shot F717 which can use both types. You will also need a newer card reader to handle the MS Pro cards, older card reader will not work.

MS Pro cards have much faster transfer speed of up to 160 megabits per second (Mbps), the minimum write speed of 15Mbps (Sandisk Ultra II MS Pro cards are rated at 18Mbps) can be realized with optimized Memory Stick PRO format-compatible devices such as the new Cybershot V3 camera.

Lexar Media and SanDisk are also shipping Memory Stick Pro products.

The Memory Stick DUO card is 1/2 the size of regular Memory Stick cards. To transfer data in a card reader or Memory Stick card slot you need the adapter. Sony is using this small card in the new Cyber-shot DSC-T1 digicam



And there's also the Memory Stick DUO Pro card with higher capacities and faster transfer rates.

## External Card Readers

The fastest way to get your digicam's images from a flash memory card is to use one of the readily available card readers. These come in many varieties depending on the desired computer interface. The most common type are made for PCs and connect to the USB port.

One of the most popular readers is SanDisk's 8-in-1 ImageMate USB 2.0 pictured here. It reads/writes to just about every flash memory card made except for MS Duo and MiniSD which require the full-size adapters. SanDisk also has single and dual slot USB 1.1 and 2.0 models for CF I/II, SmartMedia, SD/MMC, Memory Stick/MS Pro and xD-Picture Cards. Note that SanDisk does NOT officially approve of the use of Microdrives with this reader due to bus power restrictions in some computers.



