Personal Tech
The New York Times

An image taken from a high-altitude balloon flight was photographed with a Canon PowerShot A570is camera about 100,000 feet above northeast Iowa in November 2009.

PETE LILJA

Tweaking a Camera to Suit a Hobby

By PETER WAYNER

When he is not fighting fires in Waterloo, Iowa, Pete Lilja likes to rig his camera to a weather balloon and send it up to record the world.

"I got a picture when the balloon was at about 87,000 feet above northeast Iowa," he said. "We could see Lake Michigan. That was pretty impressive."

To take these photos, Mr. Lilja, of Cedar Falls, packed his Canon A570is with a GPS transmitter in a cushioned box (and attached his phone number in case the GPS failed). He chose that particular point-and-shoot camera because a group of programmers from around the world had created software that gave photo hobbyists like him the ability to change the way Canon intended the camera to operate.

It is called the Canon Hack Development Kit (or C.H.D.K. for short). Mr. Lilja used it to reprogram his camera to snap one shot every 15 seconds on its journey into the stratosphere. The software has allowed photographers using more than 50 models of Canon Power-Shot cameras to reprogram the time lapse instructions to record construction projects or to use motion-sensing programs to capture animals in the deep woods. It can also be used to alter the camera's exposure control to produce imaginative images in difficult lighting. (The hacks do not work with the more expensive D.S.L.R. cameras.) Development of the hack kit began as a volunteer project about three years ago. It can be customized by adding programs written in "ubasic" or "lua," two common languages that are fairly easy for programmers. Many C.H.D.K. users also swap scripts with each other and modify the work of others.

But the hacking kit works only with Canon cameras, one of the most popular brands. Apparently, no such extensive project exists for hacking the software that runs Nikon, Sony, Panasonic or other popular cameras.

The Canon hack kit is good at setting up a camera to perform simple, repetitive tasks.

Julien Quénard, an amateur photographer and bird watcher in Arrest, France, programmed his Canon Power-Shot A540 to constantly watch for birds, modifying a motion-detection script originally written by a developer who referred to himself among fellow camera hackers only as Fudgey. When the birds move into the frame, the camera quickly focuses and then takes a sequence of four pictures. He keeps the camera pointed at the bird feeder, but he has also found that the redstarts and flycatchers like one particular section of his garden. Mr. Quénard's version uses the fastest shutter speed possible because the birds move quickly, and uses macro mode for close focus.

The camera's new software leaves some tasks for him, however. "Each time, there are a few good pictures and hundreds for the trash," he said. "I also need to crop most pictures for better framing."

The C.H.D.K. developers pool their resources at chdk.wikia.com, a Web site that collects software contributions and shares the packages with other users. Any photographer can download software files free under an open-source license and copy it onto a flash memory card that normally holds photographs. The site offers a "C.H.D.K. for Dummies" page with step-by-step instructions for loading the software into the camera. The C.H.D.K. software loads itself into the camera by taking advantage of the updating mechanism normally used by the manufacturer to install new software with bug fixes or new features. When a Canon camera is first turned on, the camera scans the flash memory card for updates to the camera's software, often called firmware. The C.H.D.K. software is made to be temporary, though, and it can be removed by turning off the camera and deleting these files from the flash card. The C.H.D.K. Web site warns that something may go wrong in the process, potentially voiding the warranty, but several developers say there are no documented cases that it has ever happened.

Canon did not want to comment directly upon the C.H.D.K. project or whether it could harm the camera, saying only that untested software might "damage Canon equipment."

Several contributors to the C.H.D.K. project suggest that many employees at Canon quietly support the project, either because they think it is cool or they guess that it will sell more cameras. Other programmers say they think Canon may lose some sales of more expensive models to users who can use the C.H.D.K. to add these features to the lower-priced cameras. But while C.H.D.K. can add some advanced features, it can not change the lens or increase the size of the sensor, the two factors that most influence a photograph's quality.

"A good lens and a good sensor can't be emulated by software," says Francesco Bonomi, a programmer who works near Florence, Italy.

Mr. Bonomi, who experiments with taking photographs when there is very little light, has been rethinking the traditional solution of leaving the shutter open longer. Estimating how long to leave the shutter open is hard, so many photographers take a wide range of pictures, exposing the sensor for different amounts of time, a process often called "bracketing."

"I don't do actual bracketing." Mr. Bonomi said. "That means five to seven exposures. What I have done is a few hundreds of exposures that are kind of short and then do a virtual bracketing. If I have 512 photos, each one that is two seconds, then I can add them up and get a virtual exposure of 1,024 seconds."

Splitting the long exposure into hundreds of smaller ones avoids the problems that might occur when a car drives by and lights up a dark scene. Mr. Bonomi just discards the atypical images when adding together the results of all the short images.

But splitting the image can conflict with the way many point-and-shoot cameras store images in a compressed format known as JPEG. The compression algorithm saves space by omitting detail, which introduced errors into an application like Mr. Bonomi's.

The C.H.D.K. solves this problem by reprogramming the camera to store all information without any compression in the raw format.

Mr. Bonomi also puts his Canon SD1100 on balloons to take high-altitude pictures of Italy. He is rewriting the software that measures the light available to improve the exposure of his pictures. His version will average the 100 or so measurements taken as the camera swings around under the balloon.

Rewriting this software requires careful attention to detail, he said.

"It's a program that must run for two or three hours, making some critical decisions on its own. It can't crash," he said.

Crash? He was using programmers' slang, he said to describe when the camera locks up because of a software error.

"If it crashes into the ground, that's also bad," he said.

But that is easier to handle with a bit of padding.

Pete Lilja of Cedar Falls, Iowa, likes to rig his camera to a weather balloon and send it up to record the world. Software lets him alter camera settings.

MATTHEW HOLST FOR THE NEW YORK TIMES

For the Latest on Lindsay or Brad, Magazines Bow to the Phone

In Marx's view, religion was the opiate of the masses. Now the drug is celebrity news, and cellphones are well on their way to becoming the world's biggest pushers.

PHONE SMART
BOB TEDESCHI

After all, why wait for a weekly magazine to appear, a nightly news show to broadcast or your weekly planning meeting to end, when you can just hit a button on a smartphone and be the first of your friends to read about Jesse's mea culpa or Lindsay's latest party?

Mobile apps like People's Celebrity News Tracker ($2 for iPhone), Gossip Junkie ($1 for iPhone) and E! Online (free for iPhone) are among the more refined apps of any mobile category. Free Android apps like Gossip Buzz Widget and Celebrity Gossip are nearly as good.

They should give great pause to anyone still paying $50 a year for a subscription to a celebrity magazine.

Especially when that magazine is People. The company's iPhone app, the People Celebrity News Tracker, costs $2, and is in many ways better than the magazine — at least if you are an avid celebrity watcher.

The "Latest News" section is continuously updated, with posts written by People staff. The "Photos" section is a reproduction of sorts of the magazine's "Star Tracks" section, showing roughly 15 photos daily of celebrities — far more than the magazine prints in that section weekly. And because the photos are high resolution, iPad users can view them full-screen with no degradation.
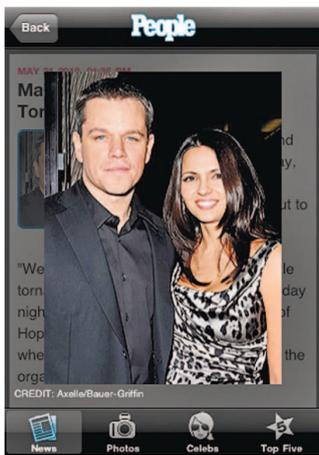
True, you can get the same articles and photos on the magazine's mobile site free, but on a mobile browser you lose precious screen space, and your reading experience suffers as a result.

The E! Online app has the same news — they all have the same news — but if you are truly over the top with your celebrity fixations, the app allows you to create a personalized news page for various stars, and a "Talk Box" where you can submit video comments about the news of the day.

Another option is to search for celebrity-specific apps. Kim Kardashian has a (poorly rated) app for $2, in which she dishes out beauty and relationship tips. Or you could try quiz-game apps for Lady Gaga, Taylor Swift, Justin Bieber and other boldface names.

E!, People, AOL's PopEater ($1 for iPhone), PopSugar Mobile, Star and Yahoo Entertainment share other advantages over many apps, in that they have deeper wells of photos, and they are closely edited, with none of the vulgarity and messy grammar you'll find on blogs like Perez Hilton DListed.

For many readers, of course, the rougher takes are more than half the fun of reaching beyond mainstream outlets for this type of news. While on People's app last week you could read about Lindsay Lohan "partying" at Cannes and TMZ's app (free on iPhone) posted a photo of Ms. Lohan "partying with a strange white powder in the foreground," blogs accessible only through the phone's Internet browser went much further in their descriptions.

Blogs like Dlisted, Perez Hilton, Radar Online and Superficial lack dedicated mobile apps, but you can still get them on your mobile phone, in a format that some may say is better than single-source apps. Gossip Junkie, for instance, is something of a portal app, offering quick access to these bloggers, and an additional 15 celebrity sites.

People, Star Magazine, E! Online and

CREDIT: Axelia/Bauer-Griffin

People's Celebrity News Tracker for the iPhone is updated regularly.

US Mobile can be found there. What you get, however, is the mobile version of these Web sites, rather than pages suited to your particular device, as with People's app, for instance. So although you can quickly scan through the content of many sites, the text is a bit small,

Why wait for a celebrity weekly when you crave urgent gossip?

and you can't pinch and pull photos to enlarge them.

Users of Android phones and Black-Berrys face a similar problem. You can get a decent fill of celebrity news from free Android apps like Gossip Buzz Widget and Celebrity Gossip, but the apps run much less smoothly than comparable iPhone apps.

BlackBerry users have fewer choices, and must rely on apps like Elle Canada and Daily News Mobile to find their gossip. At least both are free.

iPad users who tire of the limitations of iPhone apps have some options. Entertainment Weekly's Must List (free) is light on celebrity news, but it is great for absorbing the state of pop culture atmosphere, with weekly recommendations of TV shows, movies and apps.

The Yahoo Entertainment iPad app, meanwhile, is about as slick as they get. The graphics and photos are beautifully

sharp, and the pages move briskly forward and backward with a quick tap of your thumb on the screen.

The app includes odd news, book reviews, Dear Abby columns, 15 popular comic strips and local TV listings, but it is anchored by the Entertainment News, with headlines from Hollywood and sometimes well beyond.

Readers last week were apparently supposed to recognize the photo of a man holding an "Assassins" sign. It turns out the story was about demonstrators at Cannes, protesting a film about Algeria's fight for independence.

For most people who indulge in the opiate of celebrity news, this sort of surprise digital disappointment is completely unacceptable. For them, the TMZ app is just a tap away.

Quick Calls

iPhone chargers abound, but portable iPad chargers — when a wall outlet is unavailable — are only now coming to market. The Zagg Sparq 2.0 ($99, at Zagg.com) is about the size of a coaster, weighs 8 ounces and is about an inch thick, and charged my iPad to roughly 50 percent power. It can also charge two smaller devices simultaneously, through twin U.S.B. ports. . . . The popular Vector Runner iPhone game is now on iPad (Vector Runner HD $3), and even more rewarding on a big screen. . . . Android-toting duffers can refine their golf swings with the help of Golf Like a Tour Pro, for $5. The app has been available for iPhone since February, drawing generally good reviews.