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# LOW-COST CAMERA FOR PRESENTATIONS

My EMC seminars always include several equipment and measurement demonstrations, While some test instruments offer a VGA video output that may be connected to an LCD projector, most do not. There's also the issue when demonstrating probing techniques that the small PC boards and probes are small and not easily seen by the audience.

I've used a small Web-cam in the past, but the mounting and positioning of these small devices leaves a lot to be desired. When I saw the ads for the recently-announced IPEVO "Point 2 View" camera with its handy stand, I plunked down the cash right away.

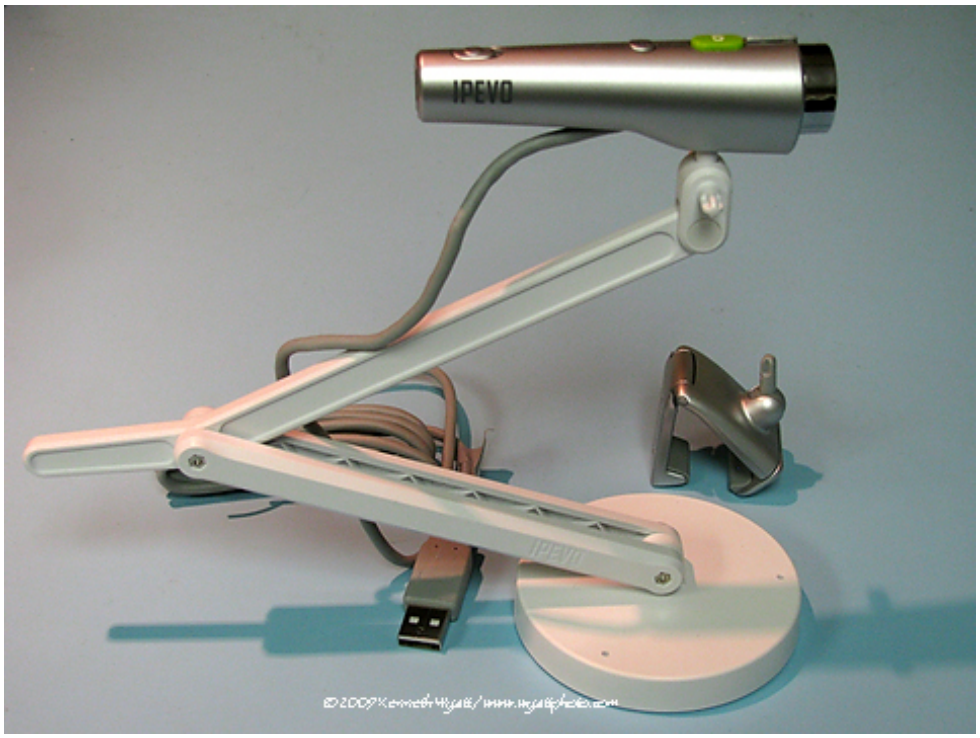


Fig. 1 - The IPEVO "Point 2 View" video and still camera. The spare clip is designed to attach to an laptop display. The green button is the shutter release for still images.

This slim pencil-shaped USB-powered camera may either be hand-held or fixed to an adjustable stand as shown in Fig. 1. The weighted stand makes it ideal for pointing to PC boards or the screens of test instruments. Included software allows you to display a video image and by pressing on the green button on top of the camera, or by clicking the "shutter" button on the screen, you can take any number of still photos. Unit includes auto white balance and can not be adjusted manually.

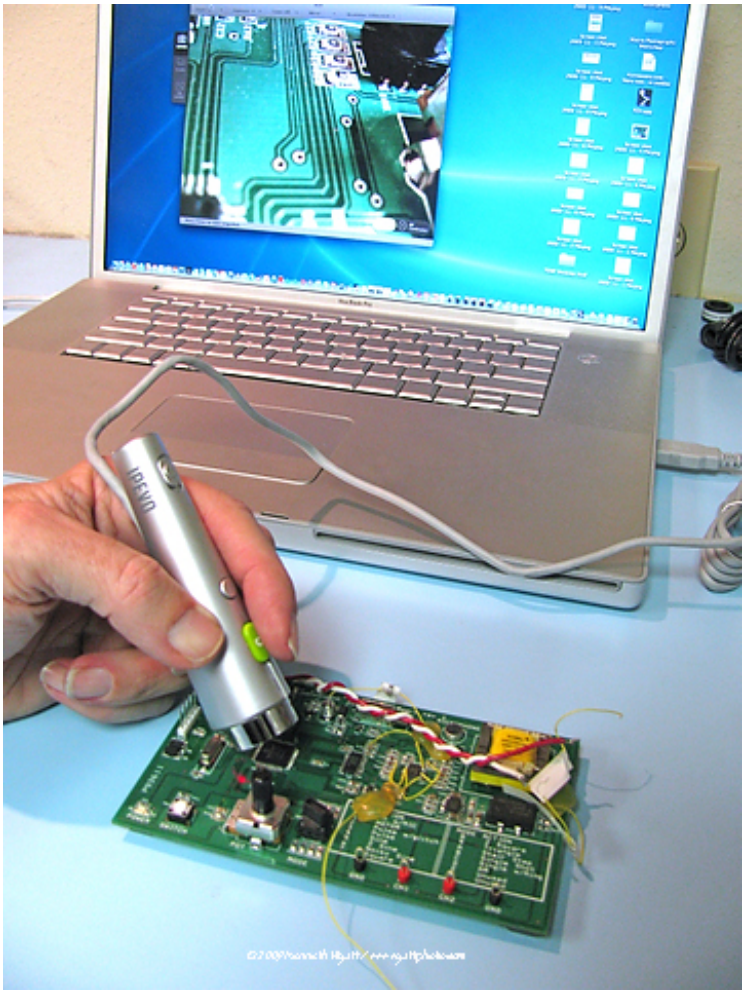


Fig. 2 - Using the camera hand-held while pointing to various features on a PC board.

The basic camera resolution is 1200 x 1600 (~2 MP), which by todays standards, is a bit small. However, visually - at least for LCD display or LCD projector use - it seems adequate. When used for real-time video, the display update rate is quite slow, but if you readjust to VGA-quality, is much faster. For purposes of equipment or measurement demonstrations, this isn't that much a an issue, as mostly things happen slowly anyway. The camera includes autofocus, autoexposure and auto white balance. Unfortunately, white balance is not manually settable, so there may be times under mixed lighting that the subject will take on a color cast.

Still capture is quick and easy using either the on-camera shutter button or the on-screen shutter. The weighted stand seems stable for all angles, allowing the camera to point up, down or sideways. Extra male fittings are also located on the side, so if you need to read and display a page of text, it will appear right-side up on the display with the stand off to the side.

I tried the camera out on some typical circuit boards and so long as the resolution was dialed up to a reasonable value - usually the 1 or 2 MP setting, the image was pretty clear (still or video). Here are a few samples:

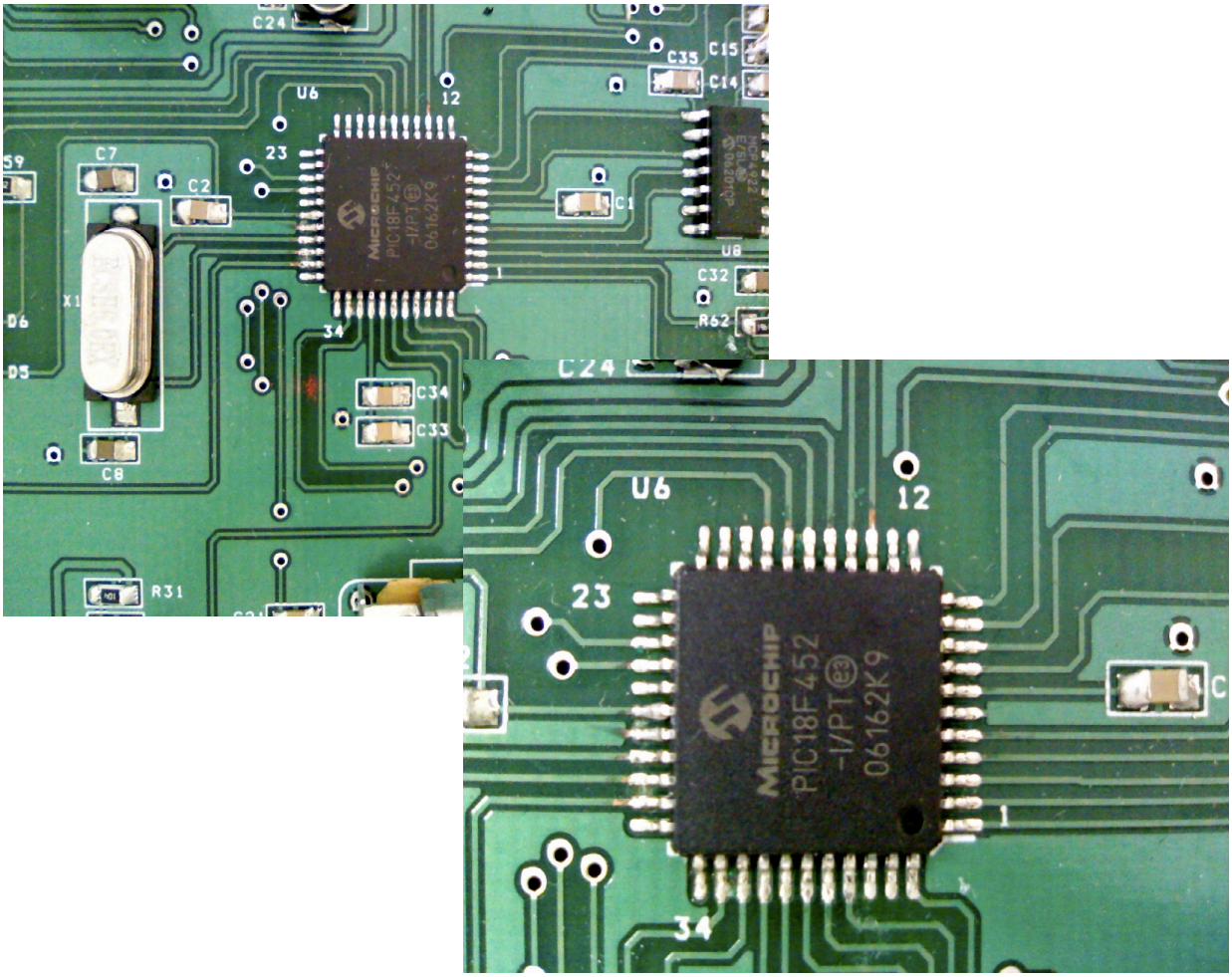


Fig. 3a,b - *Unprocessed still captures of circuit boards at different magnification*s (1X and 2X). Autofocus was a bit slow compared to modern cameras, but after a second, or so, it would get there OK. I found that lighting was key to achieving a clear picture. Direct light was bad, but when I held a piece of copy paper between the light source and subject, the resulting diffused light illuminated the subject evenly.

Bringing up the preferences pane reveals several controls for the camera; including "instant Preview (off, 2, 4 secs), Sound Effects (for focus and shutter), custom folder for pictures and the format for the photo name.

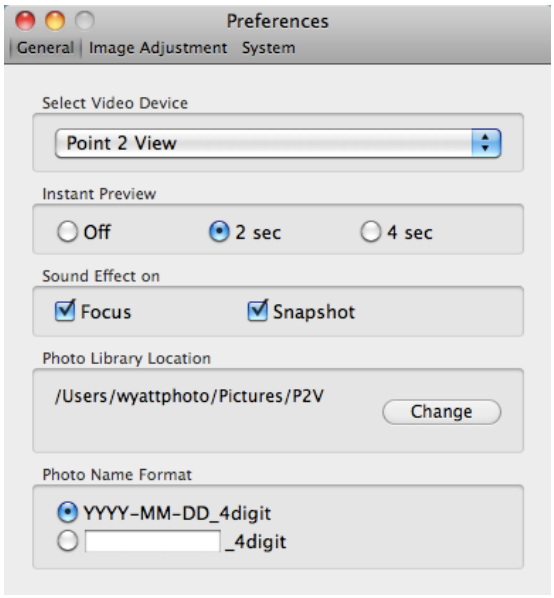


Fig. 4 - The General Preferences pane.

The camera has a myriad of possible adjustments as shown in Fig. 4. It also includes a control for exposure compensation (Fig. 5), which was a surprise. This allows you to override the autoexposure feature for subjects that are lighter or darker than normal. There is also a timer feature (off, 3, 10 sec) for delaying the shutter. Resolution may be adjusted from 240 x 320 (77kP) all the way to 1200 x 1600 (~2 MP). Software will also allow you to "flip" or mirror the image vertically or horizontally. There's a digital zoom feature (1X, through 3X) that digitally "crops" the image. In doing so, however, you'll lose resolution and sharpness.

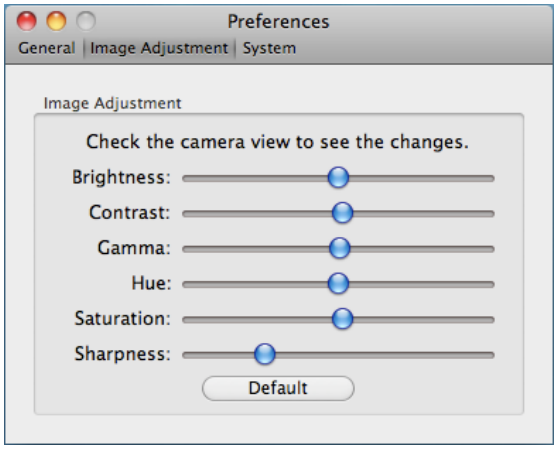


Fig. 6 - The Image Adjustment pane.

I did run into a quality issue on the stand. The central male fitting on the stand pulled out as I removed the camera. This fitting is only held in by a small Tinnerman-style washer that is simply pressed onto a steel post with a circular recess. A similar attachment method is used for the up-down swivel on the head-end of the stand.

After removing the up-down swivel by punching out the center pin, I was able to access the twisting swivel joint and press the washer back on with a security-style Torx bit (has a hollow recess in the end).

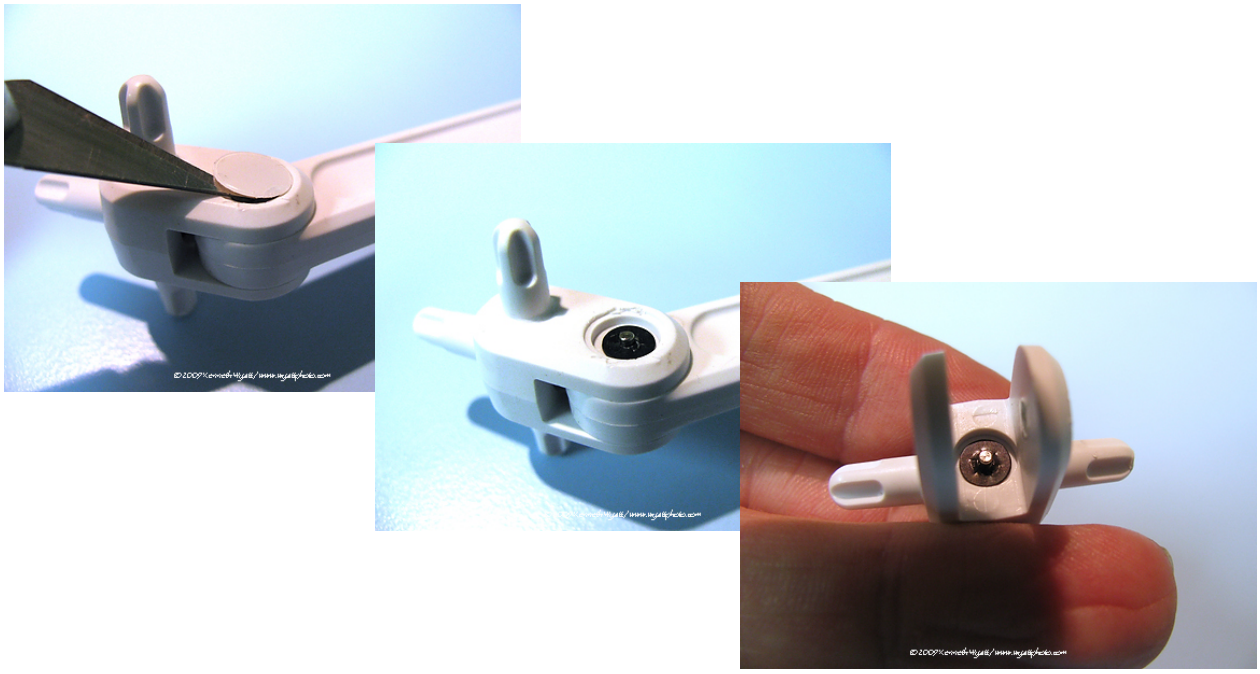

Fig. 3a,b,c - *Repair of the swivel head* - Because the press-on washer fell out of the central swivel pin, I had to remove the up-down joint in order to gain access. Once the stick-on cover was removed with an Exacto® knife, I used a punch to knock out the steel pin holding the joint together. This allowed the whole thing to be removed and I reinstalled the washer to the central swivel pin; pressing it back on with a hollowed out "security" Torx bit. After that, I reinstalled the steel pin for the up-down joint and pressed on the corresponding washer with the same Torx bit. I'm not at all sure how permanent this is, although a small blob of epoxy might do the trick.

Hopefully, IPEVO will address the current design of the stand, however, they failed to respond in time for publication. Overall, I'm pleased with the performance and the versatility of the camera and am looking forward to using it in my next seminar. Recommended on the condition the stand is redesigned and their customer service is more responsive. Source: www.ipevo.com. Price class $70. Software/hardware works with PC or Mac.

**UPDATE:** IPEVO eventually responded with apologies and sent me a replacement stand no charge. So far, it has worked well during several seminars. I like the fact it can be adjusted in so many directions - for example, pointing to instrument LCD screens and experimental circuits.