



Saul Griffith

# HOW TO HOW-TO

USE A HEAD-MOUNTED VIDEO CAMERA TO  
PRODUCE INSTRUCTIONS FOR MAKING THINGS.

One can now picture a future investigator in his laboratory. His hands are free, and he is not anchored. As he moves about and observes, he photographs and comments. Time is automatically recorded to tie the two records together. If he goes into the field, he may be connected by radio to his recorder. As he ponders over his notes in the evening, he again talks his comments into the record. His typed record, as well as his photographs, may both be in miniature, so that he projects them for examination.

—From *“As We May Think”* by Vannevar Bush, *Atlantic Monthly*, 1945

**M**Y CURRENT OBSESSION IS meta-making, or the documentation side of how-tos. A source of inspiration for my thinking is Vannevar Bush’s seminal essay “As We May Think,” which has been an influential piece in computer science since it was written in 1945. Most people read it for its incredible foresight as to what the internet would become.

The part I love to latch on to is the “memex,” a device Bush describes that links researchers everywhere and the contents of their notebooks so that documentation is seamless, and negative results are registered as often as positive results. It sounds like my fondest dream: it’s all wireless, hands-free, and auto-documenting. But that’s still the future.

Elegant instructions are quite rare. There are a lot of how-tos out there, in books, on websites, in the instructions for toys and washing machines, even in the seat backs of airplanes, but few are truly great. Lego’s original building instructions are good, but

those aren’t the ones that really count. They’re high production value (and high cost) and have been labored over by teams of designers. In a long-tail world, the instructions you’d like to be obvious are your auntie’s Roomba hacks, or the Tron guy’s instructions on el-wire Halloween costumes. The problem is that documentation is generally so laborious that it is rarely complete or well done.

I listened keenly to the observation by Neil Gershenfeld (of MIT’s Media Lab) that the best moment to capture documentation is immediately after someone has just successfully done something for the first time. It’s at that moment that people are high on success and wanting to dance around and show the world how they did it. If you can capture that energy toward writing instructions, you’ll get the best how-to. The other element that makes instructions top-quality is images, and plenty of them. When inserting a  $\frac{1}{4}$  left-hand threaded hex bolt into the diaphragm pump housing of your washing machine, no number of images is too many.

I’ve been thinking a lot about what can be done now to make how-tos a no-brainer. Here’s the problem: you want to capture the details as you do it, and probably the first time you do it. Second time around, your hands move fast, and you’ve figured out the hard bits, so they don’t seem so important. The other big problem for me is that I generally use both hands for building things. I often use my mouth too, as two hands aren’t enough, and the mouth is such a versatile tool for holding screws and gripping things. Cheek pouches full of pop-rivets — that’s my type of squirrel. So with mouth and hands occupied, stopping to take the photograph is damnedly hard.



Will Bosworth models the all-recording eye: A video camera in the backpack is connected by a cable to a bullet camera on the maker's head.

And, I don't know about you, but cameras and greasy welding workshops don't mix well.

My latest solution is a head-mounted video camera. It's been the domain of extreme sportists for a while, but its true home is in the workshop. The solution is still expensive, but I suspect the toy industry will soon solve that problem for us. What I'm experimenting with right now for documentation is pretty simple, but you still have to put it together yourself.

My current solution (as seen above) may not be the most stylish thing you've ever worn on your head, but it doesn't get in your way. And because it's video, you can record the entire project. It's great to have all the footage to choose from.

It's quite simple. I put the camcorder in a Pelican watertight case. The LANC controller and bullet camera emerge from that case, which resides in a slim, comfortable backpack. I've mounted the bullet camera on an old Petzl head-mounted flashlight holder with the controller on the backpack strap.

Unfortunately, editing still takes a long while. iMovie has improved things, but an hour of videotape is still an hour of video to go through, no matter how easy the interface is. I don't yet have any answers to the ultimate in documentation, but I've been learning a lot with the head-mounted camera. I happily recommend it, but what I'd really recommend is for people to explore the solution space until someone

figures out the cheapest and simplest way.

There will be a moment in my life when I want to know how to reboot a Prius car computer to run on a higher mix of ethanol using nothing but a Treo, and I hope that I'll be able to get that tutorial when the moment arises. That level of MAKE-ability doesn't exist yet, but I know it has a lot to do with how we document things as a collective. Bring on the memex.

**+** Find complete instructions for the Helmet Cam at [instructables.com](http://instructables.com).

#### YOU WILL NEED:

**Sony DCR-HC32 camcorder** Good because it has a LANC controller and video input.

**Hoyttech bullet camera** They make a sweet one with 580 lines of resolution.

**Hoyttech LANC controller** This is a remote control for the camera.

**Pelican case with waterproof feed-throughs** ([ahphotovideo.com](http://ahphotovideo.com)) To keep it all safe from water, oil, dust, and welding sparks.

Saul Griffith thinks about open source hardware while working with the power-nerds at Squid Labs ([squid-labs.com](http://squid-labs.com)).

Photograph by Erich Brandeau