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(and the Sky)
with Better
Flying Videos*

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By Mike Jones

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My grandfather, Elden Leach, was a gadget guy. He was the first person in Parkersburg, West Virginia to own a car. He bought the first color TV in town, the first automatic dishwasher, the first car with an automatic transmission. Right after World War II, he invested \$175 (about \$2,000 today) in a top-quality 8mm motion picture camera. With 50 feet of 8mm film, it captured about three minutes of Christmas joy.

I still have that camera today. It is small but surprisingly heavy, like a Norden bombsight with a wind-up spring. Three lenses sprout proudly from its stubby nose. The brass case carries an elegant repoussage finish which resembles the armor of a Bronze Age warrior. It will never see another reel of Kodak but I will never part with it.

Seventy years on, our fascination with moving images remains but the world changed in 2006 with the first “action camera.” Barely bigger than a matchbox and with only ten seconds of memory, the company sold \$800,000 of them in the first year. The indestructible, go anywhere, record anything GoPro had arrived, and now the company’s founder is a billionaire. My granddad would have been first in line, strapping them on to his snowboard or Harley.

Good Gear Makes Good Video

Most flying videos are instantly forgettable. Quality video needs three ingredients: exciting visuals, a challenge to accomplish, and good “production values.” Production values are the quality of the videography: the focus, the lighting, the framing, and the pace. Ever notice that you quickly ignore inexpensively-produced TV commercials of local car dealers and HVAC repair companies? Your eyes know good production values.

A few videos — very few — are delightful, thrilling, and awe-inspiring. Check out Paul Bertorelli on AvWeb, who golf-carts around Oshkosh. Other creators include Mike Patey, who flies some crazy machines; Trent Palmer, who features heart-stopping bush-flying; and lanky Stevie Triesenberg who ushers her 1952 Bonanza V-tail around the West Coast.

Most memorably for me is the cellphone video of an unnamed pilot landing a Cessna 210 on an 800-foot muddy patch in the South American jungle, stall horn screaming, his wingtips in the trees. I wouldn't drive an SUV down that runway, much less land my Cessna there. How did he find it? How does he squeeze in there? Even more crucially, how does he get out? That's great video.



My favorite amateur flying video, showing a super-skilled pilot navigating his Cessna 210 in a muddy strip in the South American jungle. Absolutely astounding flying. If you can't scan the QR code, the YouTube address is: youtube.com/watch?v=zSxxy0JwYds



Egos being what they are, I wanted to join the video club. But my first efforts were weak. Using my iPhone, I shot confusing stories through dirty windscreens with bouncing cameras. I was overwhelmed by the accessories offered on Sporty's and Amazon: which ones did I need? Which ones actually worked? It was hard to decide.

Putting my iPhone aside I bought a cheap Chinese action camera, quickly relearning "you get what you pay for." The soft plastic mounting clips could not withstand the 200-mph winds on a cruising Cessna 210. Now I have a shiny and sturdy GoPro 10, but it came with incomprehensible menus, icons, swipes and double-taps. It was worse than programming my Tivo. I was digging in deeper and deeper, with less and less to show for my efforts.



Chris Ewart, budding aviator and action camera enthusiast. Chris flits between his mom's Cessna 182 and his dad's Mooney; he wanted to sample my Bushcat light-sport taildragger but late school schedules and early winter sunsets simply didn't permit even a quick trip around the patch. Next time, I promise.

I did what every red-blooded American man does, when confronted with new technology or a big snowstorm. I called a teenager.

My home lacks a resident teenager but the neighborhood is full of them, as bountiful as cocker spaniels and oversized pick-ups. Chris

Ewart, aged 18, was proud to show me the ropes. I could not have picked a better guide because not only is Chris an action camera enthusiast he's a newly-minted pilot eager to swap his skills for a few hours of right-seat time. Ewart has been flying all his life: his mother is a CFI and was instructing while she was pregnant; his first "outside" ride was at the ripe old age of two weeks.

In the few minutes when high school and pilot training are not getting in the way, Ewart has developed a brief but visually impressive video portfolio, including briefly work with Patty Wagstaff.

“My buddy Hunter and I were hanging out at Oshkosh and there she was. We asked if we could get a picture of her and her plane, and she said ‘Sure, but my plane is dirty.’ Like, we can take a hint. We washed her plane a few times, including the famous one before the photo shoot with Honda Jet,” he explained with a huge grin. “We used a sticky-mount to put the camera on the wing of the plane, it was rock-solid and didn’t blow off as she flew her show.”

Camera Basics

Based on that pedigree, I asked Ewart for his advice in selecting a camera. His first admonition was to dump anything that wasn’t GoPro-brand. The leverage provided by the GoPro support team and the deep accessory ecosystem makes those cameras enormously more useful than other choices. But it doesn’t have to be the latest-and-greatest to be useful.



My favorite GoPro mounting system for airplanes with struts. Made of heavy aluminum, this clamp firmly grips the strut without damage to the structure or the paint. The lengthy strap allows it to fit struts of any size. A rock-solid design from NFlightCam. In his left hand, Chris is using the hex-head screwdriver to tighten the fittings on the clamp. That is one very clever innovation.

“I have an older GoPro 6, and it works fine. They keep spitting out new models with new features,” he told me. Compared to Ewart’s GoPro 6, my GoPro 10 is slightly larger and has a different form-factor, so some accessories are not transferable. The brand-new GoPro Max is still a different size. It uses two

lenses and highly sophisticated software to take 360° videos, which are dizzying to watch.

“I also have a GoPro Session which is amazingly small and fits into tighter spaces.” The Session is an interesting design because GoPro sacrificed the viewfinder display; you can’t see what you have recorded until the files are downloaded.

“Usually I use two cameras; one outside the plane and one inside the cockpit, showing the panel,” Ewart cautioned me. “Any more than that it becomes a bit of a challenge to control them while in flight.” But a lot depends on your particular steed: “On my Cessna 150 there just isn’t a lot of room to move things around.”

I asked Ewart about batteries, memory cards and mounting systems. He uses SD cards which store 64 gigabytes of video, because they were affordable when he bought his unit. “Now they go up to 256 gig and larger,” he said. “That’s handy for long trips. Get the biggest you can afford.” I found mine at BestBuy, 128 gig of storage for about \$70.

Both action camera and electric cars suffer from the same problem: range anxiety. To keep the camera small, action camera batteries are much smaller than cell phone batteries. “At the most they last an hour and a half, which makes it hard to video an entire long flight,” he explained. Ewart strongly recommends buying an external battery charger and spare batteries; the GoPro recharger handles two batteries simultaneously (see: GoPro, Dual Battery Charger + Spare Battery for Hero9 and Hero10, \$49.99, and GoPro, Enduro Rechargeable Battery, \$24.99).

He urged me to start with short videos to learn what works for me and my plane. Play around with positions on the airplane; perhaps one spot on the plane may get more vibration than another location. Try different lighting at different times of the day, and be ready with soft tissues and lens cleaner. Just

like windscreens and leading edges of wings, cameras will get bugs on their lenses. But mostly, he urged me to experiment with different mounts and angles.

Accessorize with Style

When mounting cameras inside the cockpit, Ewart uses two suction mounts, one from GoPro and one from NFlightCam. The long-armed GoPro suction mount is a good choice “even though it vibrates a bit,” he said. “It’s very adjustable and has a very firm grip.” The NFlightCam suction mount is better for windows but he believes they’re both rock-solid set-ups. I bought two different units from Sporty’s: the three-legged “Spider” Swivel Cockpit Mount (\$29.99) which uses suction cups to lock on to glass or metal, and for out in the slipstream I selected the heavy-duty GoPro Airplane Mount for grabbing a tie-down loop, \$59.99.

Another must-have accessory, according to Ewart, are prop filters. These are dark glass disks which fit snugly across the camera lens. While the spinning prop is invisible to human eyes, it generates a strobing, black scimitar across a digital image. This is a function of the timing of the blades interacting with the timing of the camera shutter; the scimitars shift as you add or subtract RPM. Ewart is a big fan of prop filters and he has several (Nflightcam Propeller Filter for GoPro Hero9 and Hero10, \$59.99).

“Most filters work pretty good. They cut out a great deal of the prop motion,” he said. Be careful about the size and placement of the prop filters. He has one that’s very handy because it can be adjusted for different angles, but it is very large. If it were mounted outside the cabin of the plane, the jumbo-sized filter would catch the wind and be lost forever.

Nobody wants to waste money buying tools you don’t need, and Ewart thinks some companies are selling stuff which doesn’t work very well. Some accessory kits come with ten or fifteen attachments of all different sorts. “Most

are extraneous,” he advised me, and only occasionally “are they useful, such as to give you a little more reach.” For example — and although every accessory kit includes them — Ewart recommends against tripods. They come in an astounding array of sizes, quality and prices. He has one from Garmin that is more like a selfie-stick. “But they’re just another gimmick you’ll lug around and rarely use,” he said.



This is my second favorite clamp, designed for strutless airplanes. The bolt goes through a tie-down hook or a tail ring, the blue lever squeezes the ring tight and the camera (not shown) produces clear, vibration-free videos. Note this device does not need a cable tie for back-up security: the center bolt is drilled out for a cotter pin, so if the clamp becomes loose the camera may flap in the breeze but will not fall off the plane.

Cool Upgrades

Ewart’s Number One recommendation didn’t even involve the camera. He strongly suggests repurposing some sort of case or bag to house your soon-to-be growing collection of action camera gear. He noted that most of these devices are small, black, and really easy to lose. Getting an organized

carry-all will make life much more convenient. Ewart recommends a foam-filled, hard-sided case about the size of a three-ring binder. “Bags are easier,” he admits, “but the hard-sided case keeps things safer.”

He also strongly suggested adding long cable ties to your tool kit. Nothing is more discouraging than watching your \$500 camera snap a plastic clamp and swan-dive into the swamp a thousand feet below. Ten cents of plastic insurance may give your camera the chance to fly another day.

I liked the fact my GoPro featured a rugged housing which was water-proof to 35 feet of depth, but Ewart scoffed at it. Ewart recommends swapping out

the battery cover with an improved version which sacrifices waterproofing to allow access to the camera's USB port. NFlightCam makes a rugged snap-on cover which handles this nicely. This inexpensive, fool-proof upgrade allows users to connect a USB cable to either power the camera or to record audio from the intercom system (NFlightCam Battery Door for Use with Audio Cable, fits GoPro Hero8, 9, or 10, \$19.99).



Straight from GoPro, this out-of-camera recharging station allows users to have multiple fresh batteries on hand for those busy afternoons. Flawless performance and GoPro quality; recommended highly.

A cable enables the camera to be powered by the airplane. Ewart uses a long USB cable snaked through a window to power his externally-mounted GoPro. Using the time-lapse feature on his GoPro and USB electrical power, he flew for almost six hours from Fayetteville, NC to Oshkosh and recorded it all into a 90-second video. Who needs batteries when your alternator has tons of electrons?

“I’d rate the audio cables as essential. It’s great to include in your video the stuff from air traffic control, the voices of other planes, and your own transmissions,” Ewart told me. “It also allows you to narrate the video as your flying. They’re really fun.” (CrazedPilot.com, GoPro Airplane Cockpit Recording Adapter Cable, \$95).

Speaking of cables: they are not trouble-free in a crowded cockpit. The savvy videographer will experiment on the ground to ensure all these extra wires don’t get in the way of safety. “Bring some cable ties or duct tape,” Ewart cautioned me, “to make sure they’re out of the way and not going to tangle up anything.”

In addition to the interior mounting devices mentioned earlier, there are two or three essential exterior mounts that Ewart uses on his mom's C-182 and his dad's Mooney. One choice are the glue-on fixtures from GoPro and others. These grip tightly and don't damage the paint; if they worked on Patty Wagstaff's plane they'll hang on to your Bugsmasher 2000. Another highly recommended choice is the heavy aluminum clamp from NFlightCam which uses Allen screws and a leather strap to firmly holds the camera in the slipstream without scratching the paint; I found this device worked very well on my light-sport taildragger (NFlightCam Strut Clamp Camera Mount, \$149.99).

Sporty's and NFlightCam have mounts for tie-down rings and tail hooks which clamp through the metal loops tightly; these turned out to be an excellent choice for my strutless Cessna T210. NFlightCam also sells a ball-head mount which is affixed to the plane with high-quality machine screws. Just use one the inspection ports holes for a convenient and rugged mounting location (NFlightCam Exterior Ball-Head Mount, \$79.99). No FAA approvals are needed for these temporary, non-structural tweaks.

Rummaging through his kit, Ewart surprised me with a ball-end hex driver. This is simply a screwdriver with an Allen wrench hex-nut tip. It's brilliant! Its big enough to be easily located, it can be used from almost any angle, it's comfortable, and it will reach into tight spaces where an Allen wrench won't fit (NFlightCam, Ball-End Hex Screwdriver, \$9.99).

Beam Me Up

From time to time, I noticed Ewart tapping a Star Trek-like device strapped to his arm. It was a wrist-mounted GoPro wireless remote.

"It allows you to control your cameras on the outside of the airplane; it will reach a camera on the wing or behind you on the tail tie-down loop," he explained. "It was \$50 or so. It works well but takes a little getting used to."

He explained that remote's operation was pain-free: sitting at home, simply boot up all the GoPro cameras, tell the remote to connect, and it finds all the devices. Once you're in the air, simply press the "record" button and the remote turns all the cameras on and off. "It keeps the connections alive a little more consistently than the WIFI on a smartphone," Ewart confided. "The best part is how well it works with multiple cameras."

No video is complete without editing the snippets into a handsome, engaging presentation. 90% of the video you shoot will eventually find its way into the digital waste basket. It's painful, but essential. Nothing kills engagement faster than tedium.

Ewart prefers short, snappy videos which can easily be edited in the GoPro iPad app, Quik. This software seamlessly links to the GoPro cameras and downloads the files both to your device and into the Cloud for trouble-free back-ups. From there, Ewart simply posts them to social media or YouTube.

"I like Quik because it eliminates the need to pull the memory chip out," he explained. Once Quik has grabbed the files off the camera, "You just press 'Export' then 'Save to Photos' and Quik saves everything to your camera roll; full video, full quality."



Two clever upgrades on one GoPro 10 camera. First, the rectangular prop filter covers the normal GoPro lens and eliminates from your videos the distracting, swirling prop "scimitar" which is an artifact of the shutter speed and the prop RPM. This is very handy on single-engine aircraft where forward-looking camera shots are always through the prop. On the left side of the camera notice the NFlightCam replacement battery cover. This hatch voids the waterproofing of the GoPro 10, but allows access to the micro-USB port. With access to that port you can power the camera or record intercom audio, depending upon the cables you employ.

Experimenting with Quik, I learned it offers simple video editing features for quick-and-dirty tweaks. For example, you can trim videos pretty easily. It can add a music background using the “Studio” feature. But overall, I would rate the software as “really basic.” For high-quality content, creators should plan on using full-featured software like iMovie or Adobe Premier Pro.

Now Showing

Based on Ewart’s expert guidance, I have spent the past month collecting accessories and experimenting with their locations on both airplanes. This has been a challenge because it’s been a cold, wet winter here in North Carolina. Even inside the hangar, fussing with tiny buttons with frozen fingers is problematic.

One learning worth sharing is the joy of a reliable autopilot. Cameras on my T210 are a cinch to adjust because the autopilot is on-the-job. But on my twitchy light sport flivver you really cannot take your hands and eyes off the business of flying.

“Cameras in the cockpit are a distraction. You’re flying, but you want to press a button or pivot the camera,” Ewart explained with that eye-rolling tone teenagers use with their elders. “Autopilots help a lot. Even better is to get the system set up on the ground and leave it alone in the air.”

Happily, I think I am approaching nirvana. All the pieces seem to be working reliably, nothing has broken or been lost, and as long as I keep the batteries charged I soon should be ready to publish my first content. At that point, it will be up to you to decide if the juice was worth the squeeze.

About the Author

Jonesy is a 3,000-hour commercial-rated pilot who flies a Cessna T210 with most of the seats removed. This allows him to carry tents, sleeping bags, a desk, a cot, two computers, golf clubs and even a generator without noticing the load. Now his poor Cessna is going to be burdened with even more junk, both inside and out, as he videos his arrival at Sun-n-Fun in just two months. He's always accessible at

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