



Become a U.S. Commercial Drone Pilot

John D. Deans

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Acknowledgments

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I’m a lucky man to have such smart, beautiful, and supportive ladies in my life; I love you all.



Introduction

After experiencing the computer boom in the early 1980s, I'm seeing the same initial eruption of a new, advanced industry; one that combines aviation, technology, and photography creating the unmanned aerial vehicle (UAV) market. Also known as drones, these airborne technological wonders have exploded onto both consumer and commercial environments creating opportunities for all. As legal entities such as the Federal Aviation Administration (FAA) and state legislatures catch up with the fast-developing industry, marketplace rules will soon be established for a high-flying entrepreneurial race to begin.

The goal of this book is to provide a comprehensive roadmap on how to become a commercial drone pilot and earn a good income creating beautiful aerial videos, 2D photographic mapping, and other UAV-based aerial services. We will focus on the most popular drone platform, the DJI Phantom line, take you through the current FAA UAV licensing processes, and describe in detail how to start and run a UAV-based aerial photography business. The market share for DJI is estimated to hit \$1 billion in 2015, so they are the safe bet for the best and smartest UAV available, and they have the capital for good support and future product development in the years to come.

1. Original, Old-school RC

The old name for drones and UAVs is Remote Controlled (RC) model airplanes and helicopters. As a kid in the 1970s, I remember many kids with cool dads who had impressive RC planes, which they built and flew as father and son/daughter bonding projects. Back then it took both true piloting skills and a nearly required background in small gas-engine maintenance to get those little motors started and keep them running properly. There were no technical aides like First Person View (FPV), GPS-guided flight, or a “return home” feature.

RC pilots back then had no choice but to maintain line of sight with the aircraft and be responsible for all aspects of takeoff, flight pattern, and landing it in one piece without knowing the exact amount of fuel left in the tiny tank. Most of these early RC configurations were put together by hand with off-the-shelf components from a local hobby shop, or ordered from a model plane catalog. Painstaking efforts were made and numerous hours spent carefully assembling the airframe, mounting the wings, and connecting all the airfoil control surfaces. This was followed by testing sessions to verify the RC controller was compatible and reliable with the model plane’s receiver unit.

After all the workshop labor was completed, it was time to head to the park and try the first test flight. If you were able to finger-start the prop without losing a digit, the time finally came to test your flying skills for real, but while standing on the ground. Remember, this was before computer or Internet-based flight simulators were in the home, so usually only true private pilots or seasoned commercial passenger jet captains were able to smoothly operate their airborne creations.

Lord help you if the funds were available and you built an RC model helicopter. Those who thought flying a fixed-wing RC plane in a pattern and landing smoothly in a field was difficult never attempted flying an RC helicopter; those who did were likely to crash it the very first day. Even after basic flight maneuvers were learned, any small mistakes at low altitude or strong gusts of wind during landing could make a dangerous accident occur quickly. Life and limb were in jeopardy when a two-foot (or larger) radius RC helicopter rotor broke up during a rough landing.

A couple of generations ago, flying those RC crafts took patience, skill, and actual aeronautical knowledge. One was always aware of landing zone options, fuel levels, altitudes, wind direction, airspeed, and visibility.

2. UAVs Are Here

Fast forward a few decades, and we now have an explosion of high-tech quadcopters that can be removed from the box, flown autonomously to GPS waypoints, and viewed on an iPad within minutes of delivery from Amazon.com. By the way, how long will it be until Amazon delivers your new drone with an Amazon delivery UAV to your home an hour after your online purchase, given they're considering drone deliveries?

We now have the low-cost and limited-feature quadcopter drones from Parrot starting at \$100 all the way up to the long-range and heavy payload oct-rotor UAVs for \$10,000 or more. For ultra-range UAVs, both the consumer and the commercial pilot can opt for fuel-efficient, fixed-wing planes that can fly waypoint courses for tens to hundreds of miles if you are willing to make that investment.

Again, the drone platform we are going to focus on in this book is the most popular UAV on the market, the DJI Phantom 2 Vision Plus and Phantom 3 quadcopters. Tens of thousands of DJI Phantoms have been purchased, flown, crashed, and enjoyed in the US over the past couple of years, and this is just the start. It is one thing to take out your new Phantom, get it a couple of hundred feet in the air above your subdivision and start taking pictures. It is another to plot out a strategy on how to utilize this amazing flying camera in a profit-making venture, during the birth of the UAV commercial market in a barely legal environment.

This book is a comprehensive guide on how to make money with your DJI Phantom in a robust but legal manner. We will cover all aspects of what it takes to develop your aeronautical skill sets, commercial photography capabilities, small-business marketing techniques, safety procedures, video editing processes, end product deliverables, computer software for aerial mapping, and UAV maintenance practices.

3. Why Am I the Right Person to Teach You How to Make Money with Drones?

I was a National Honor Society "A" student at Bellaire High School in Houston, Texas, but I despised college at the University of Houston. So, before the first week of my freshman semester was over, I was out. Since I was only 18 years old, I had to wait a year before I could apply to the Houston Police Academy to start a career in law enforcement. During that year, my dad found me a job at Control Data Corporation (CDC) as a process control clerk working with computers. This began

my 35+ year career in Information Technology (IT), as a fluke; I never joined HPD. The simple reason was I was making more than the cops were when I became a programmer in less than a year.

During that same year in 1982, I began flight school to get my private pilot's license flying out of Houston Hobby airport. I was trained on a low-wing Grumman Cheetah, and before the year was over I passed my check ride and became an FAA-licensed private pilot.



The Author and His Plane

Those were the simpler days. I worked hard in the computer rooms to earn plane rental money for the weekend. Since there were no digital cameras back in the 1980s and I could not afford a big-dollar SLR camera, I'd fly down the Galveston beach with the plane's canopy pulled all the way back, while holding my Kodak Instamatic film camera with a dozen exposures trying to get a good aerial shot from only a few hundred feet above the surf. Try to fly that low nowadays and you'd probably have at least the FAA on you when you landed, if not the National Guard out of Ellington military base on the trip back.

After three years, I left CDC as a systems analyst to migrate oil field reservoir simulation software to every type of super computer available

from 1984 to 1987, while working with J. S. Nolen and Associates. During that time I married my first wife and had a son. Aerial anything went to the very back burner. I guess that is what happens when the responsibility of a family hits you when you are young.

Things got interesting again when I became manager of computer operations at CogniSeis Development and started making some good money in 1988. The downside of those days is my marriage broke up, but the upside was I got to start flying again and spend some good one-on-one time with my growing boy.

When the first digital cameras came out in the early 1990s, I had to try them out by flying over downtown Houston. Remember, this was pre-9/11, so it was no big deal to fly near buildings at less than 1,000 feet Above Ground Level (AGL). By that time, I was a networking consultant being billed out by Paranet to Fortune 100 companies in Houston like Amoco, British Petroleum, and Compaq Computer. I borrowed the company's first digital camera, which cost more than \$1,000 and only took black and white images.

My boss wanted to take some aerial pictures of his home in Memorial, so we used the new corporate camera. The neat thing about the digital camera was that I could see my aerial photos as soon as I got home and downloaded them to my Windows 3.1 desktop, for which I paid more than \$3,000 back in 1995.

My first semiprofessional aerial photography shoot was a bust since his house was completely surrounded by trees, and I refused to fly the rented Cheetah at his requested low altitude of 200 feet above the rooftops. That was more than 20 years ago, but I remember thinking how cool it would be if I could mount this bulky digital camera on a model airplane to have a "flying camera." I could fly it from the ground to take pictures at very low altitudes with little risk to myself and other people.

I married my wonderful wife Beth in 1995 and we now have two beautiful teenage daughters. Since their births I have taken thousands of pictures with my Nikon D5000 SLR. Each vacation destination has inspired me to build up my lens variety, try different scene techniques, and constantly learn more about photography. My images got even clearer after I took photography classes and sought photographic tutoring from local professionals.

After 17 years in the high-stress world of IT while fighting the hellish traffic in Houston on a daily basis, I cashed out my Paranet stock

and left the corporate world in 1998. We purchased a 115-acre ranch just west of Brenham, Texas, and I started Deans Consulting in 2000. During my attempted escape from the computer industry, I looked at every agri-business from raising chickens for eggs and meat, goats for meat, sheep for wool, horses for boarding, grapes for wine, and numerous other ventures. None of these panned out and I quickly discovered that I could not make near the same money on my small ranch as I could rejoining the IT world in the business community of a small town.

Deans Consultant, a.k.a., The Country Computer Consultant, has been highly profitable for more than 16 years, and odds are I'll have a hand in it for years to come, since I love my clients and it's relatively easy IT work. My self-employment has only caused a fraction of the stress I felt in the 1990s, since there is no plane travel, minimal traffic, no contracts, and really nice country people to work for here in Washington County.

However, being in my mid-50s, crawling under desks to find data cabling problems, climbing ladders to mount wireless access points, and having the heavy responsibility of data integrity and security for numerous small companies has been weighing on me over the past few years.

In 2014, I starting a part-time career as a firearms instructor teaching Concealed Handgun Licensing (CHL) classes at the gun range on our ranch. The next year I developed numerous gun fighting simulation services for law enforcement and CHL clients. I was making money outside of IT, but I was still looking for something else to make a second attempt of finding a new career outside of my 35-year IT identity.

That same year, a new era of aerial photography started with the availability of the DJI Phantom 2 Vision Plus. That changed everything for me. After seeing incredible aerial videos and still photos on YouTube and the Internet, I had to purchase one for at least testing purposes. This was the "flying camera" I dreamed about 20 years earlier, and the possibilities for new business opportunities went off like fireworks in my head.

From mid-2014 and through 2015 I flew more than 100 test flights at buddies' ranches and IT clients' construction sites without charging for the flights or the videos I produced. My goal was to explore these test markets in a "hobby" mode to see if a real business could be derived from flying drones.

As it turned out, this was it! This was my ticket out of IT and into a new, booming industry that is exciting, challenging, beautiful, and potentially very profitable. I'm in! I'm all in!



The Author, John D. Deans



1

Is Commercial “Droning” Right for You?

Flying UAVs in a hobby mode at the park or filming your buddy’s farm for fun is one thing, but to start a small business based on uncharted market waters, with highly technical apparatus in a confusing legal matrix of restrictions, and make money on the whole endeavor is quite another world.

First and foremost, you will need the passion for it. As with any other career path, to be successful you need to have that fire in the belly; the yearning to get up every day early to check the weather. Wanting to fly and earn must be there naturally. Even if you have the best UAV configuration, hold all the legal commercial pilot credentials, and have customers who want your aerial photography services, you also need to have a small-business mentality.

1. Starting a Business and Wearing Many Hats

It is difficult for most people to resign from stable, full-time jobs with consistent paychecks and medical insurance benefits, to start up new jobs based on a brand new marketplace and be able to successfully plan, execute, and survive past the first few years. Small-business owners must

have not only the desire to be independent and prosperous, but also possess the skill sets to wear the numerous hats required to start a new company.

Those roles include business plan developer, service/product designer, salesperson, bookkeeper, customer service representative, bill collector, tax preparer, photographer, software and hardware technician, moviemaker, and finally, drone/UAV pilot. Those are a lot of hats to wear, and it may take many years to acquire critical business skills and technical capabilities.

I am not trying to scare you away from this fascinating field, but you do need to know what you are contemplating getting into, since most new, small companies fail within the first five years of operation, mostly due to lack of funding and poor preparation. The goal of this book is to help you succeed as a commercial drone pilot, but at the same time you need to understand and face the realities of the free enterprise market. You must be armed with a strong capitalistic attitude and have success in your soul.

2. Your Time

One of the most critical resources for you to manage as a commercial drone pilot is time. Odds are you will not be able to immediately quit your job or leave school to devote 100 percent of your time to droning. Most aerial data acquisition projects, including mapping, real estate photography, and construction status aerial surveys are time sensitive. As we will discuss in later chapters in detail, time windows can be critical; you will need to have your bird (what we often call our drones) in the air capturing exactly what your client wants, when he or she wants it captured.

Throw in the massive variable of weather and your time opportunities become much more complex. For example, you may have an agreement with a real estate agent to perform aerial photography on a 50-acre ranch that is for sale, but the agent requested it be filmed in the late afternoon with the golden setting sunlight, and you need to get it done this week, before the farmer moves the hay bales from the meadow. If the sun sets at 6:00 p.m. and you cannot get off work until 5:30 p.m., that can be difficult. There may be high winds or rain several days in a row that hamper your scheduled flights, and time is ticking.

Another example: Your construction client wants you to aerial-film a concrete pour at sunrise. What is the dew and moisture situation?

Can you make it to that location at that time? Do you have work or school commitments and conflicts?

How about filming outdoor weddings and other events? Since they are mostly on the weekend, are you ready to work during the week and on the weekends? What about public holidays? Then there are possible law enforcement opportunities, for which you may be required to be on call 24/7 and be immediately available to perform aerial surveillance over a quickly evolving event. Can you move fast and have your bird ready to fly at a moment's notice?

All these time-related issues need to be contemplated and evaluated. Some aerial markets are more time-sensitive and -consuming than others. When you are just starting up you will be tempted to take any and all aerial opportunities to fly and earn, but be aware of the golden resource of your time, that you must efficiently manage.

3. Location of Markets

What if you have significant free time on your hands; are you in the right place near the right aerial markets? There are market limitations for numerous reasons in the middle of large metropolitan areas such as New York, Chicago, Dallas, and others mainly due to FAA airport area UAV restrictions and local ordinance bans on drones, not to mention line of sight and signal interference problems in downtown areas. There may be tons of people with carloads of money in big cities, but legal and realistic aerial photography opportunities are limited.

The same thing goes for the opposite end of that spectrum in sparsely populated areas like West Texas, where you have ample sky in which to hover and open land to fly over, but few people are around to pay you for it. If there is limited growth in a region then there will be fewer construction projects to film. If land is not selling such as smaller acreage ranches, then fewer real estate agents will be in need of your UAV photography services.

Optimally, you need to be based in a 100-mile radius of economic growth including construction projects, rural developments, industrial activity, and agricultural businesses. The closer you are to multiple aerial market prospects, the more opportunities you will have to sell your aerial photography services.

Also critical to the location you choose will be the state laws and local ordinances restricting UAV activities, which can put a chokehold

on your business with the stroke of a bureaucrat's pen, or worse yet, a politician's ill-thought vote.

After you consider all these factors, take a breath and do the math. Can you manage your time well enough in a small-business person's world in the right area of the country to make real money with your flying camera? If your answer is yes, then keep reading. I'll show you how!