

Flying in the Wireless World

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Abstract - This paper describes the rules and regulations for using USHGA radio frequencies to make flying more enjoyable and safe. It also discusses the process for obtaining the USHGA special skills signoff. Amateur radio is proposed as a supplement to USHGA frequencies. The process for obtaining an amateur radio license is discussed as well as the advantages that such a license provides. A description of an amateur radio based weather station that gives pilots weather conditions at remote sites is included.

INTRODUCTION

"You're doing fine. ... That's good. ... A little more brake. ... Weight shift to the right. ... That's it. ... Get out of your harness. ... Get ready to flare. ... Flare! ... Well done!"

If you paraglide, that is probably what your instructor said as he coached you during your first flight. If you are a hang glider, the instructions were slightly different, but the reassuring words were the same. We have radio to thank for providing us with a terrestrial copilot during our solo flights.

Having a radio comes in handy on many other occasions. When you find yourself far from the LZ after an unexpected change in conditions, having a radio to call for aid is reassuring. Without radios, flying competitions, cross country flights, instruction, and other activities would be more difficult and less safe.

Despite the ubiquitous use of radios in flight, most of us take radio communication for granted. So much so, that many do not follow USHGA or Federal Communications Commission (FCC) rules. In this article, I'll address the rules, regulations and procedures to follow when operating a radio. I'll also cover the special skills signoff needed to legally transmit on USHGA authorized frequencies. I will also suggest getting an amateur radio license, which provides additional flexibility and is not difficult to obtain.

WPRY 420

One of the questions on the P4 written exam I recently took asked if FCC or USHGA authorization is required to legally transmit on USHGA frequencies. I am not sure it is ethical to give away the answer, but I'll give you a hint (Yes Virginia, authorization is required).

Authorization, more accurately called a "special skills signoff", is granted after a pilot passes a 24-question exam. The *USHGA Radio Authorization Study Guide*, which is accessible on the web at <http://www.ushga.org/forms/radio.pdf>, includes everything you need to prepare. The guide provides the rules, regulations, and procedures to follow when operating. Embedded within the study guide are the answers to the questions, so after reading the four-page guide you should be ready. After passing the exam, the recommendation of an observer/instruction, along with a one-time \$15 payment is submitted to the USHGA. A new member card is awarded showing special skills for portable and/or vehicular authorization.

The introduction to the study guide states:

The Federal Communications Commission on March 16, 2001 granted to the United States Hang Gliding Association, a radio station license in the IB business radio service for an unlimited number of vehicular and portable units in specified quantities. These radios are licensed for use on 151.505, 151.625, 151.925, 151.955, and 158.40 MHz transmitting with a power limit of up to 50 watts. The call sign issued to the USHGA was WPRY 420.

The USHGA frequencies are within the business band, which is shared by other services. For this reason, there is often congestion. However, with a little persistence, you can find one of the frequencies that is less used.

Procedures require the use of the USHGA call sign, WPRY 420, when using USHGA frequencies. The pilot transmitting must identify themselves during each transmission or at least once every fifteen minutes during continuous transmissions. I have been a pilot for several years and have yet to hear this procedure used correctly. It is pretty simple when you get used to it.

It is important to emphasize that no special authorization is required to listen on these frequencies. The USHGA special skills signoff is required only for transmitting. For example, if your instructor gives you guidance using a radio, he/she requires authorization, not you.

BUYING A RADIO

Many pilots use a portable amateur radio called a Handy Talkie (HT) for communication on USHGA frequencies. Using these radios for receiving is perfectly acceptable. However, they cannot be used legally for transmitting, even if you have a special skills signoff. The 2 meter amateur band extends from 144 to 148 MHz and comes close to USHGA frequencies, but attempts to transmit on USHGA channels will fail. To get around this, some pilots modify the equipment. The modification may be easy, but that does not make it legal.

Virtually anything that can cause radio interference must go through a process called FCC "type acceptance". This process is both lengthy and costly to the manufacturer. During type acceptance, sophisticated measurements are made to assure the radio will not cause interference. Modifying equipment can result in the equipment not meeting technical specifications, negating FCC type acceptance and resulting in an illegal unit. On a practical note, modification will also void any manufacturer warranty. While a modification is tempting, it should not be considered an option.

To transmit on USHGA frequencies legally, a commercial radio should be used. Remember, USHGA frequencies are business class frequencies, hence the need to use commercial, rather than amateur radios. ICOM (<http://www.icomamerica.com>) and Vertex Standard (<http://www.vertexstandard.com/>) are two of many manufacturers that make commercial radios. Each manufacturer offers handheld mobile radios, sometimes called "channelized radios", that can be programmed to operate on USHGA frequencies. The programming is a one-time process that is performed without modifying the radio's hardware. These commercial radios have been specifically manufactured for this purpose, as such; they are the preferred radio for USHGA pilots.

I would be remiss if I didn't mention the Family Radio Service (FRS). In fact, if you don't obtain the USHGA signoff or an amateur radio license, the FRS is a good alternative. These radios have become very popular in the past few years. They can be seen on ski slopes and other places family members need to keep in contact. The radios are inexpensive, small, and easy to use. The limitation is poor coverage. Fortunately, this is typically not a problem at flying sites where pilots are in close proximity to each other. However, for cross country flying or competitions, a FRS radio would be grossly inadequate.

The bottom line is, use equipment for its intended purpose. Use commercial radios for commercial purposes, and amateur radios for amateur applications, which brings us to our next topic.

AMATEUR RADIO

The *USHGA Radio Authorization Study Guide* states:

The amateur radio service was inadequate, in spite of two-meter use of frequency modulated emissions (FM) and many useable frequencies, because of their stringent licensing requirements for both pilot and retrieval driver, and expense.

I do not believe the exam is difficult and the cost is minimal. On April 15, 2000 the rules governing amateur radio licenses changed drastically. The number of licenses changed from five to three and the Morse code requirement was dropped for the entry level license. For these and other reasons, obtaining an amateur radio license today isn't much more difficult than obtaining an USHGA special skills signoff. As an example, the amateur radio Technician class license requires passing a thirty five question exam, not much more than the USHGA exam. If you are concerned about cost, the USHGA exam is \$15 while the fee charged for taking an amateur exam is typically \$6.

The salient factor for pursuing an amateur radio license is the greater flexibility that it offers. For example, more frequency spectrum is provided increasing the likelihood of finding a clear channel. The ability to use repeaters to extend the range hundreds of miles is also important, particularly on XC flights. And as we shall see later in this article, amateur radio can be used to monitor weather conditions at remote sites.

GETTING YOUR LICENSE

There was a time when getting an amateur radio license was difficult, at least more difficult than it is today. The Morse code requirement was a barrier to many. The questions were also more difficult, due in part to the fact that amateur radio operators had to show they had the skills to build and/or repair their own equipment. This required a solid understanding of electronic theory and construction skills. Those days are long gone.

There are three classes of licenses: Technician, General, and Amateur Extra. All exam questions are taken from a published pool of questions available at <http://www.arrl.org/arrlvec/pools.html>. To prepare for an exam, download and study the questions. For the Technician license, the question pool consists of 511 questions. Books with the question pool are available and have the advantage of providing explanations to the answers. The exam you take will consist of 35 questions taken from the question pool. This means you know in advance what questions will be on the exam, just not which ones.

Many questions are not technical; they address proper operating procedures and are more or less common sense. For example, it should be obvious that one should not maliciously interfere with other radio transmissions or use foul language. If you are good at taking tests, you may even find you won't have to study for the exam at all.

The General class license is the only license that requires Morse code skills. Both the General and Amateur Extra class licenses require more technical expertise. These licenses authorize additional frequency spectrum and modes of operation. However, the Technician license provides more than enough flexibility and frequency spectrum for pilots.

If you need help preparing for the exam, try to locate a licensed operator. He/she can explain questions and inform you of exam locations, amateur radio clubs, and books to use to study. The American Radio Relay League (ARRL) is another excellent source of information and help. They can be reached on the Internet at <http://www.arrl.org>. The ARRL is the largest organization in the US devoted entirely to amateur radio. It supports all aspects of the hobby and provides most everything you need to prepare for the exam.

MORE THAN JUST TALKING

Due to the remoteness of most flying sites, many pilots have to rely on information from weather stations miles from the site. Using amateur radio's Automatic Position Reporting System (APRS), it is possible to monitor weather conditions at a remote site. Weather data, rather than voice, is transmitted which includes: wind speed, wind direction, temperature, barometer pressure, humidity, and rain fall.

Both my wife and I fly frequently at the Torrey Pines Gliderport in San Diego, CA. Although most days are good for flying due to the winds that blow like clockwork each day, there are days when a trip to the Gliderport results in more parawaiting than paragliding. To monitor weather conditions, I installed an APRS weather station. The beauty of the system is that it is totally wireless. No telephone lines or Internet access is required. By adding solar cells for power, such a system can be used to monitor remote mountain weather conditions.

Photo 1 shows an anemometer, which measures wind speed and direction at the Torrey Pines Gliderport. A 2 meter antenna is also shown which transmits the weather data to the local APRS network which then passes the data to the Internet for distribution. Anyone in the world can access the web page at: <http://w9if.net/cgi-bin/torreywx/wx.pl>. The page has been a huge success with several hundred hits each day. If you are interested in some of the details, see the paper at: <http://w9if.net/iweb/papers/aprswx.pdf>.

CONCLUSION

Getting a special skills signoff and using the USHGA frequencies is not difficult. Getting an amateur radio license is almost as easy and provides many options, too many to mention in this short article. I hope you pursue both, since they each have advantages.

I am a P4 pilot and hold an FCC Amateur Extra class license, call sign W9IF. My wife, Sharon, is a P3 pilot and amateur radio operator, call sign KC5PVL. I introduced her to amateur radio and she introduced me to paragliding. She will always be the wind beneath my wing.



Photo 1. Weather station anemometer and antenna. See <http://w9if.net/cgi-bin/torreywx/wx.pl>.



Photo 1 Weather station control equipment. See <http://w9if.net/iweb/torreywx/index.shtml>.