

CALLBACK

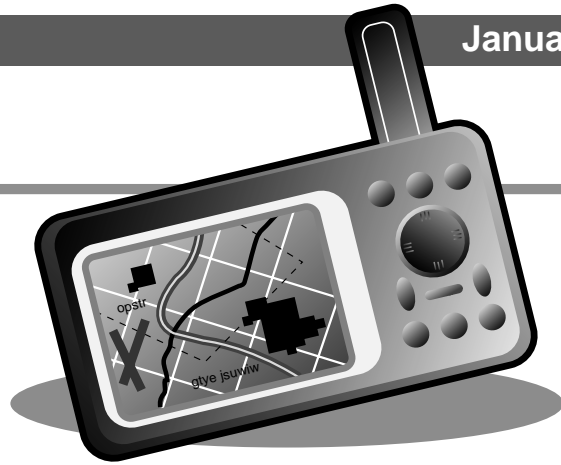


From NASA's Aviation Safety Reporting System

Number 257

January 2001

Experiences with GPS



The Global Positioning System (GPS) is a worldwide, satellite-based radio navigation system that is based on several components — ground stations that control the system; a “constellation” of 24 or more satellites orbiting 11,000 miles above the surface of the earth; and receivers carried by users.

GPS signals are derived from the atomic frequency standards on board each satellite. When receiving the signals from at least 4 satellites, a ground-based receiver can determine latitude, longitude, altitude, and time — highly accurate information used by both air carrier and general aviation pilots. But GPS use also requires judicious cross-checking with cockpit charts and instruments, as well as knowledge of the technology's limitations. Several ASRS reports explain:

■ *I was enroute and intended to utilize the GPS approach. After loading the approach into my IFR-certified GPS [unit], I decided to head direct to the XYZ GPS fix. I thought that the XYZ fix was the same as the XYZ airport. Unfortunately, the fix was slightly northwest of the airport. My path took me directly over a Restricted Area. Since I was descending for the GPS approach I possibly broke the 2999 foot MSL ceiling of the Restricted Area.*

ASRS frequently hears from pilots who “go direct” with GPS and neglect other flight planning. A quick look at a VFR chart, low altitude IFR chart, or the airport GPS approach plate would have helped this pilot differentiate between the location of the GPS fix and the airport location. The use of flight following, even with no flight plan filed, might also have prevented the airspace violation.

Confused by the Map

Our next reporter relied on a visual feature of GPS for navigation when other features would have better served the purpose:

■ *Took off from field, relied on GPS moving map for Class G guidance. Too many lines on screen and I interpreted [them] to mean I was under Class B segment with base at 3,000 feet. At 2,200 feet Tower informed me I should be at 1,700 feet. Flew east at 1,700 feet until clear, then back up to 3,000 feet under Class B airspace. Should not have relied on moving map. Should have calculated Class B transition points with GPS or VOR/DME.*

An additional factor past ASRS research has demonstrated leads to Class B airspace violations is flying too close to the floor (or ceiling) of Class B airspace. ATC often uses the floor/ceiling altitudes to route IFR air

carrier flights transitioning to or from the airport terminal area. Safer practice is to maintain an appropriate VFR altitude buffer between the aircraft and Class B floor/ceiling altitudes.

Code/A Alert

Another pilot reported that he used GPS successfully to navigate to a distant point on an IFR flight plan — but ran afoul of the FARs in the process:

■ *IFR flight plan filed on airways [with] equipment Code /A. Aircraft equipped with 2 VFR GPS units, with current database. Requested and received vectors (radar) for a short-cut on the route. Controller asked if I had GPS. I replied “VFR” GPS. Used GPS to aid navigation to vector fix. When handed over to next Center controller, he rerouted my flight plan and current radar vector to a quite distant VOR fix. All was going well until we were handed over to Approach, who complained that we were filed equipment /A but were flying to a distant fix on GPS navigation. He said I should have refused the unsolicited rerouting by Center. I remain confused, as it's my understanding that using any GPS as an adjunct to flying an assigned radar vector to a fix is legal. Nothing dangerous occurred. Conditions CAVU, VMC, continuous radar contact.*

IFR equipment rules apply to all conditions under which instrument flights may be made, including CAVU. According to Section 5-1-7(a)3 of the current *Aeronautical Information Manual*, the /A notation on an IFR flight plan indicates that the aircraft has transponder with Mode C capability only. The /G notation indicates that the aircraft is GPS/GNSS equipped with enroute, terminal, and approach GPS capability.

The reporter erred twice — in requesting a route short-cut using VFR-certified GPS on an IFR flight plan; and in accepting the Center controller's reroute to the distant fix. The Center controller in this case should not have approved the direct reroute, since the pilot legally should have had IFR-certified GPS on board in case radar coverage was lost. ▲

ASRS Recently Issued Alerts On...

B757-200 power port converter electrical short
Multiple reports of ATC incidents at a major NY airport
A319 pitch-up on approach with engines in auto throttle
Laptop computer interference with B767 cabin speakers
Bulb replacement anomaly involving a SF340A gear light

A Monthly Safety Bulletin
from

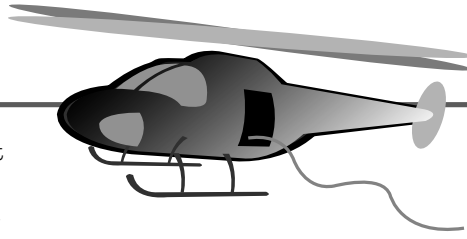
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November 2000 Report Intake

Air Carrier / Air Taxi Pilots	2388
General Aviation Pilots	662
Controllers	74
Cabin/Mechanics/Military/Other	168
TOTAL	3292

Helicopter Connections



CALLBACK has published stories in past issues about aircraft that took off with a tow bar or tail stand attached. Here's a similar report filed by the pilot of a helicopter air ambulance flight:

■ *I was going to move the aircraft to airport so it could be hangared from the approaching severe thunderstorm. The aircraft has several orange electrical cords used to power the medical equipment and cellular telephone. I walked around the aircraft, untied the rotor blade and observed the orange cords lying on the ground. I started the aircraft and took off for the airport and returned to the hospital due to the thunderstorm. I missed one of the cords plugged into the aircraft and it became tangled in power lines on approach (over) to the hospital. No damage to the aircraft occurred.*

The incident was caused by the urgency to move the aircraft due to severe weather.... I also started the aircraft without the assistance of the other crew members, as they were busy. All of these factors caused me to miss the cord going in the right rear door of the aircraft.

Telephone Line Flexes Muscle

Professional helicopter pilots spend many hours honing the skills needed to perform confined area landings and takeoffs. These skills are crucial to the completion of many helicopter missions. Pilots in a multi-crew helicopter operation often used ground observers to help judge clearance from wires and other hazards to spinning rotor blades. But at times even this precaution is not enough to prevent an incident, as the pilot of this aerial photography mission discovered.

■ *The mission was to take up a photographer to take aerial pictures of the scene of a shooting. A landing was to be made near the incident to pick up the photographer. The area was an urban environment with numerous wires. After an aerial reconnaissance was completed, a landing was made to a suitable spot.*

After landing, the pilot got out of the helicopter to better inspect the wires he would need to negotiate on departure. There was a single strand wire crossing North to South between two telephone poles. The departure was to the West. Below the wire was a chain link fence approximately 12 feet high. With the way the helicopter was configured, the pilot was not sure he would be able to clear the wire on departure. He decided the best option would be to fly slowly over the fence and under the wire. Beyond the wire the departure area was clear. The estimated distance between the top of the fence and the wire was 20+ feet. The wind was out of the West at 10 knots.

The observer was left on the ground so the load would be lighter. The pilot brought the helicopter to a high hover

and slowly moved over the fence. The pilot looked up to check the clearance of the wire

again and it looked good, so he proceeded forward. A loud snapping sound was heard and the aircraft began to shudder. The pilot continued forward and brought the helicopter to a landing beyond the fence.

The observer that was left on the ground said that as the helicopter moved over the fence it appeared to have plenty of clearance. Then as the rotor system was just about centered under the wire, the wire began to oscillate up and down eventually coming down far enough to strike the top of the rotor system... The pilot simply did not imagine at the time that the wire could be affected to that extent by the rotor wash.

After the incident, the pilot talked to other pilots in the unit about the incident. Most said they would have done the same thing and had never considered that something of this nature could happen. The exception was a military trained pilot who said that when the military trains for under-wire flights, the minimum clearance is 200 feet. ▲

Frequency Update

The November 2000 CALLBACK (#255) included an article on wake vortex hazard at cruise altitudes. This article cited 131.8 MHz as the aircraft-to-aircraft communications frequency used on North Atlantic routes in conjunction with Reduced Vertical Separation Minimum (RVSM) air traffic procedures. We heard back from several alert readers that the 131.8 MHz frequency is no longer in use.

☛ *I sometimes fly in [North Atlantic] airspace with my Air Force Reserve unit and the last time, two crossings in October 2000, the several airline pilots also on the mission told me that 131.8 MHz is no longer used and that in general, airline pilots over the Atlantic are using 123.45 MHz. In fact, I monitored both and heard no chatter on 131.8 and a lot on 123.45. I do not fly the Atlantic much anymore but was surprised at that information, since I used to fly the Atlantic a lot and 131.8 had always been used.*

ASRS has verified with ATC sources that **123.45 MHz** is the aircraft-to-aircraft communications frequency now in use on most North Atlantic routes under RVSM procedures — *except* the West Atlantic Route System (WATRS), which is still using 131.8 MHz. Thanks to our readers for bringing this change to our attention. ▲