



**Stan/Eval Newsletter
CIVIL AIR PATROL
UNITED STATES AIR FORCE AUXILIARY
105 S. Hansell Street
Maxwell AFB, AL 36112**

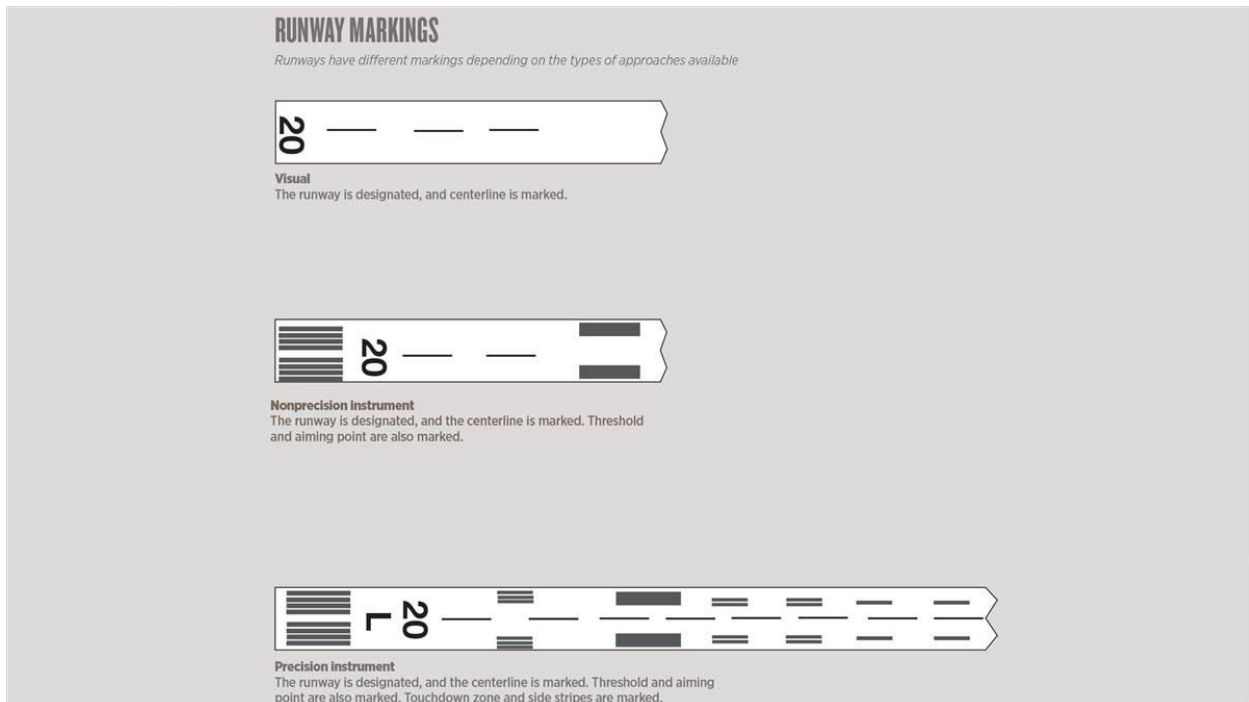
September 2021

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The Runway is a Precision Instrument

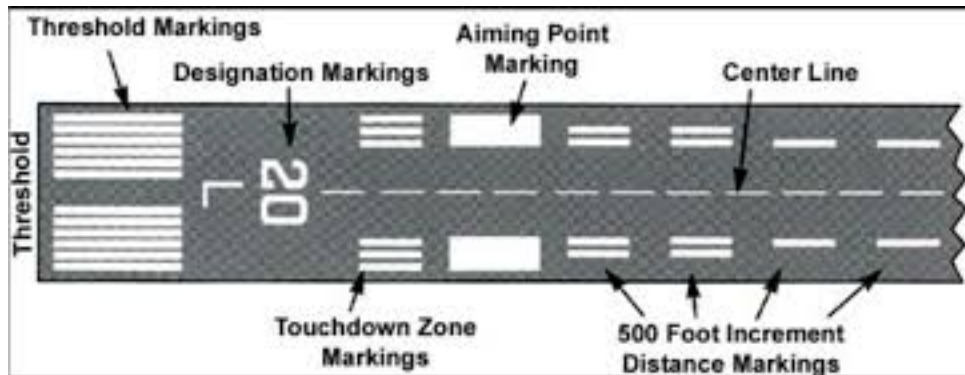
When we first start flying, a runway is a long black road of limited length with a dotted line down the middle (indicating it's safe to pass). US students tend to land to the right of the line whereas Brits land to the left. It's only later after much coaching by the instructor we realize we should land on the centerline and that passing traffic on the runway whether taking off or landing is not really a good idea. After many landings and takeoffs at many different airports it begins to dawn on us that there is a lot of information that a runway can provide to us that we didn't really notice before. At a small GA airport, the runway may only have the runway identifier and a center line but if a runway supports a precision approach there will be a lot more.

One of the things to notice is the paint on the runway. These are not artistic decorations but provide information to us that can be useful. For example, the runway numbers are not random but are two-digit numbers that are roughly the magnetic orientation of the runway. And there are no runways labelled 00 but rather 36. Runways marked 37 and higher are to be avoided. Especially troubling is seeing 36 at one end and 27 at the other end. Use caution. These numbers must be pronounced correctly as well. Runway 17 is not pronounced "seventeen" but "one seven." Otherwise, the listening audience will know you are not a local. If there are multiple parallel runways, the two digits may be supplemented by a "L", "R", or "C" indicating for example 20L (left), 20R (right), or 20C (center). If there are four or more parallel runways, they would be designated in pairs of different numbers such as 20L, 20R, 21L, and 21R even though they are all aligned to the same direction. VFR runways usually only have the runway identifier and centerline markings whereas IFR runways are a bit more complex.



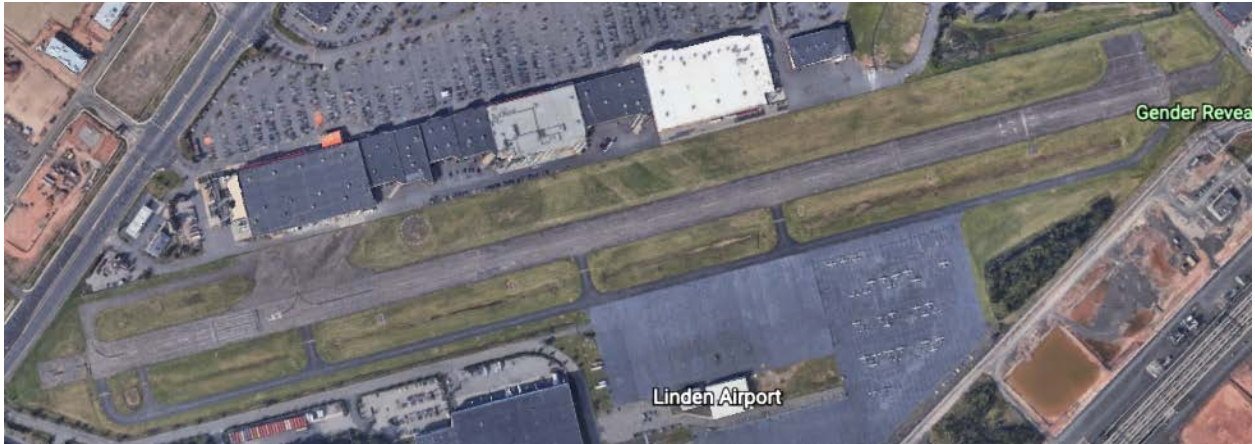
The edges of a runway are defined by a white line on either side of the runway. If the runway has a shoulder, it will have yellow markings indicating it is not part of the runway. As a rule, white paint indicates a runway whereas other colors are something else (taxi way for example).

As we approach a runway either for takeoff or landing there are often stripes at both ends of the runway (threshold markings). The number of stripes indicates the width of the runway (see AIM Table 2-3-2). The threshold markings are 150' long. Again, use caution if the number of stripes at one end does not match the number of stripes at the other end. As we go down the runway the centerline stripes give us information as well. Each stripe is spaced 200' apart (center to center) while each stripe is 120' long with 80' in between. Counting stripes as you takeoff or land gives you a rough idea of how much runway you've used. One caveat is that the stripe length and spacing may be adjusted in the mid portion of the runway to make things "fit" properly, but you can mostly ignore this.

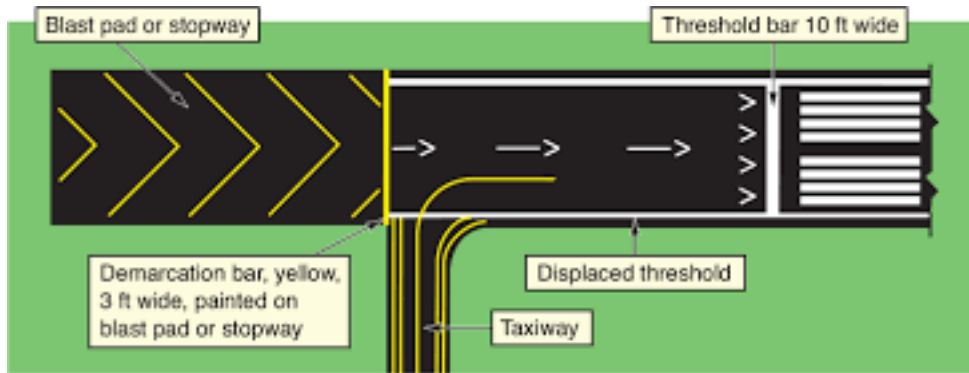


On runways supporting instrument approaches, there are two white bars called the aiming point 1,000 feet down the runway. If you follow the glide slope or PAPI/VASI all the way to a landing you will impact these two white bars (try flaring first) affectionately known as the refrigerators. Aside from their utility for approaches, they also indicate to a VFR pilot that they have used 1,000 feet of runway. Normally these refrigerators are 150' long but can be 100' long on shorter runways. There are also touchdown zone markings spaced at 500' intervals along the runway that define the touchdown zone. In Part 121 operations, you are expected to touch down on the aiming point but its allowable to touch down anywhere in the touch down zone. If you can't touch down in this segment you are required to go around. We in GA don't need to worry about that but touching down in the "zone" is good practice. Note that if only one end of the runway supports approaches, the refrigerators and touch down zone will only be on the approach end.

On some runways, the paved area begins before the runway does. This is called a displaced threshold and can be there for a variety of reasons. For example, KLDJ (Linden) has displaced thresholds to prevent you from hitting obstacles on approach. You may not land on a displaced threshold, but you may use it for takeoff if it is marked with white arrows. You may not use it for any reason if it is marked with yellow chevrons.



Also helpful are runway remaining signs. These black signs with white lettering on one side of the runway gives us a precise distance remaining in 1,000-foot increments. It is helpful to determine if you have enough runway remaining for takeoff or landing.



We've focused on runways to make the point that a black stretch of asphalt is transformed by very precise markings that can be used by pilots to improve landings and takeoff operations. Taxiways exhibit similar characteristics, but we'll stick to the runway for this article. Now let's look at this same asphalt at night.

Most runways have centerline lights that are spaced 50' apart. They are white until the last 3,000' (instrument runways). Between 3,000' and 1,000' they alternate red and white to indicate you are running out of runway and the last 1,000' are all red. The edges of the runway are also lit by white lights but turn yellow for the last 2,000'. Red lights identify the end of the runway whereas green lights indicate the runway threshold. Don't touchdown before the row of green lights! After landing at night, it can sometimes be difficult to exit the runway as you can't see the taxiway. Many airports will have taxiway centerline lead off lights (green) turning to the left or right to guide you onto the taxiway.



The touchdown zone often has lights as well so you can clearly identify it. There is approach lighting as well - the lights prior to the runway to help guide you to the runway but that's another subject.

All pilots should be familiar with the basics of runway markings and runway lighting if you fly at night. There is a lot of information provided by these markings and we should use it to improve our airport operations.

Teaching Students how to handle Emergencies

One of the most important subjects we can teach a student is how to handle an emergency. This is when a flight simulator can be a valuable tool as very few instructors or students are killed in a simulator no matter how badly we botch things (there's always a first time so be careful). When teaching a simulated emergency in a real airplane you must plan and execute the plan carefully lest a simulated emergency become a real one. The following is from Kathryn's Report on how a simulated emergency turned into a fatal emergency. Read and heed.

Location: Hartford, WI
Accident Number: CEN21FA345
Date & Time: July 31, 2021, 11:30 Local
Registration: N42522
Aircraft: Piper J3C-65
Injuries: 1 Fatal, 1 Serious
Flight Conducted Under: Part 91: General aviation - Instructional

On July 31, 2021, about 1130 central daylight time, a Piper J3C-65 airplane, N42522, was substantially damaged when it was involved in an accident near Hartford, Wisconsin. The flight instructor was fatally injured and the pilot receiving instruction was seriously injured. The airplane was operated as a Title 14 Code of Federal Regulations (CFR) Part 91 instructional flight.

The pilot receiving instruction reported that they had been practicing touch-and-go takeoffs and landings from runway 27 at the Hartford Municipal Airport (HXF) and had performed about 10 before the accident occurred. On the accident takeoff, when the airplane reached about 400-500 ft. agl, the instructor said, "engine failure, turn around for 09". Both pilots were on the controls at this time and started a turn for runway 09 when the airplane entered a "graveyard spin". He reported that he remembered about one to two seconds of the spin and had no further recollection of the accident.

The airplane impacted a bean field about 1,100 ft. west of the departure end of runway 27 at HXF. Based on impact signatures, the airplane impacted in a left-wing low, nose low attitude, with the airplane coming to rest about 35 ft west of the initial impact point. A post-accident examination of the airplane confirmed control system continuity from the cockpit controls to all control surfaces. There were no separations in any of the flight control cables.

The left-wing spars were broken at the wing root, but the remainder of the wing remained predominately intact. Both left lift struts were bent and remained attached at the fuselage and wing. The right wing remained attached to the fuselage with little damage. Both right lift struts were bent and remained attached to the fuselage and wing. The forward lower fuselage at the firewall was pushed rearward. The engine remained attached to the fuselage. One propeller blade was bent aft and under the engine, and the crankshaft was partially separated just aft of the propeller flange.

Examination of the engine confirmed rotation, thumb compression, valve train continuity, and ignition on all sparkplug leads. All spark plugs were examined, and no anomalies were noted.

The Dark Side of Foreflight



Many pilots, myself included, regularly fly with an iPad and Foreflight. This is especially true in CAP where Foreflight is provided for free. Foreflight and other EFB's can be invaluable in planning, executing, and analyzing a flight. However, Foreflight can also be a huge distraction, so we need to exercise some judgement.

Many pilots will mount their iPad in some custom mount in the cockpit. I think I've seen them all. Some mount to the yoke, some to the windscreen, and some elsewhere. But in most cases the mounted iPad blocks something. It either blocks the instrument panel or obscures the outside view in some way. The only way to avoid this is to just leave the iPad in the side pocket, on your knee, or on the seat if you don't have someone in the right-hand seat. But in most cases, pilots are ok with this obstruction.

I've even seen pilots carefully mount the iPad and initiate Foreflight for pattern work. Gee whiz.

Do we really need Foreflight for the pattern?



Another problem I've observed is that pilots often "fly by Foreflight" vice relying on the G1000 or other glass cockpit. As good as Foreflight is, it is not certified for flight. The G1000 is. Although I prefer many things about Foreflight over the G1000, the G1000 should be primary, not secondary. In fact, I often counsel pilots to put Foreflight away and focus on the G1000. Only pull out Foreflight as an exception (for example, to brief an approach plate which are hard to see on the G1000). As hard as it is to believe, I've seen flights successfully completed without reference to the iPad and Foreflight (rare but occasionally happens). If you are flying a steam gauge aircraft vice a TAA, Foreflight is a big help.

The worst problem I see is flying by both. Pilots will often put a flight plan in the G1000 and then repeat it on Foreflight. Just doubles heads down time and the workload with no benefit. When you get a modification from ATC it's not necessary to duplicate it twice. Use the G1000. Don't try to make Foreflight and the G1000 perfectly synchronized. You have more important things to do.

If you are in your Piper Cub with no GPS or other electronic aids, using Foreflight makes a lot of sense. In a G1000 cockpit, it still makes sense to do your flight planning and flight analysis on Foreflight. But once in the air, fly by the G1000 and only use Foreflight for those things that can't be done with the G1000. Otherwise, it's a distraction, not a feature.

In person has advantages

When COVID hit, CAP, like other organizations learned to do most of its business virtually using TEAMS, Zoom, and other distance tools. Although it was hard to do actual missions virtually, we were surprised at how effective we could still be without in person meetings and assemblies. But now that COVID has subsided, we need to rethink the distance approach. Although we did learn to live without it, there is no substitute for in person meetings and assemblies. If you have the option of doing flight clinics, seminars, or other activities in person or at a distance, opt for in person if possible. It really does make a difference.

A message from Safety - NTSB Part 830 Notifications

*CAP/SE is receiving reports of pilots directly corresponding with the NTSB and/or FAA to provide notification of a possible accident or reportable incident. Please note that NTSB regulation 49 CFR Part 830.5 requires “The [operator](#) of any [civil aircraft](#), or any [public aircraft](#) not operated by the Armed Forces or an intelligence agency of the United States, or any foreign aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board (NTSB) office...” 49 CFR Part 830.2 defines “operator” as: “any person who causes or authorizes the operation of an aircraft, such as the owner, lessee, or bailee of an aircraft.” This means Civil Air Patrol is legally the operator of the aircraft, NOT the PIC. To support CAP’s legal responsibility, and to assure consistency, *CAPR 160-2 requires CAP/SE to be “the CAP Corporation’s designated point of contact for communication with NTSB or FAA investigators. Members should fully cooperate with NTSB and FAA representatives if they are contacted but should refer the NTSB/FAA representatives to CAP/SE as the official CAP point of contact. Record the name and contact information of the FAA or NTSB representative and pass the information via phone call to the NOC, who will pass it to CAP/SE.”* Following this regulation will ensure the NTSB and/or FAA receive all relevant information about the event in a consistent and timely manner and allows CAP an opportunity to involve the General Counsel’s office for legal advice when necessary. Please contact your Wing or Region Director of Safety with any questions*

Articles for the National Stan Eval Newsletter:

These articles have been written to present ideas, techniques, and concepts of interest to CAP aircrews rather than provide any direction. The articles in this newsletter in no way should be considered CAP policy. We are always looking for brief articles of interest to CAP aircrews to include in this newsletter. CAP has many very experienced pilots and aircrew who have useful techniques, experiences, and tips to share. Please send your contribution to stephen.hertz@vawg.cap.gov. You can view past issues [here](#).