

The following pages include 8 tasks you can assign to a non-pilot companion to help you get ready before a flight. Excerpted from:

Flying Companion A Pilot-Friendly® Manual



From passenger to helpful crew member— 50 tasks a non-pilot can complete

Details on the full manual are available at PilotWorkshops.com

Research Your Destination

One quick way to spoil a trip is arriving at your destination only to find everything is closed, there's nowhere to park for the night, or that the only food involves a five-mile walk to a Quik-mart. Imagine a fuel stop where it turns out there's no self-serve gas—or the person with the key has left for the day.

Pilots are trained to research a destination airport, but their planning can be thin on what happens *after* landing. You can be a huge help here.

Get the names of each airport where your pilot plans to land. There may be more than one option, and your research might help in deciding which one to use. Larger airports may have multiple FBOs (see below) to choose between on the same airport. It pays to research these options ahead of time.

FBOs vary from bare-bones, family-owned businesses to huge national chains. Customer service is not every FBO's forte. Read reviews to get the scoop.

Some FBOs charge "ramp fees" for use of the facilities and line services. Some charge parking fees. Sometimes fees are waived if you only stay an hour or two, or buy a certain amount of fuel. Higher fuel prices often cover additional services and amenities that you may not even use. These prices can vary at the same airport.

Fuel isn't always available 24 hours a day. If the fuel stop is critical (as in, you won't be able to depart if anything prevents refueling), verify there is fuel and

Fixed-base operators (FBOs) are businesses on an airport that provide fuel, parking, maintenance, aircraft rentals, flight instruction, and so forth. The term "fixed-base operations" came into use after the

TIP

Some airport diagrams show the location of transient parking or FBOs. If you know the runway your pilot is landing on, you can offer help getting to the FBO. Sometimes it helps just knowing if the FBO is a left or right turn off the runway.



that the pump is working. Fuel prices vary widely, so some research can save quite a bit of money.

If you're planning on staying overnight—or longer—call to check on the availability (and cost) of tie-downs or hangar space. Also check on ground transportation options: Do taxis or rideshare companies service the airport? Is there a rental car facility nearby? Some FBOs have loaner cars you can borrow for a quick drive into town.

passage of the Air Commerce Act in 1926—which forced transient barnstormers, mechanics, and instructors to stop flying from town to town and set up shop in one place.



RESEARCH TOOLS FOR DESTINATION PLANNING

You can do much of the research for a flight right from your web browser. Dedicated flight planning websites and aviation apps are usually your best starting point for information about an airport. You can also use the airport's name or identifier to find the airport's website, but it's usually best to start by checking a planning resource like the ones below.

SkyVector.com (right) features an easy-to-use map. Right-click and select the airport to see airport operational statistics, and a listing of FBOs, fuel providers, and other businesses.

AirNav.com (below) is

similar to SkyVector but without the map inter-



FBO, Fuel Providers, and Aircraft Ground Support

SkyVector 🔌 🗓

World Hi Enroute H-11 Enroute H-12

8

11 - 21

World Lo

face. AirNav.com is one of the most popular **Business Name** Contact Services / I Santa Barbara sits between the more Its Beautiful scenery is matched by a vigoro websites for pilots quickly looking for informa-ASRI 131,475 manufacturing, tourism, education and many 805-967-5608 include business or pleasure, Signature-San tion about airports, fuel, and hotels. Vianature. [web site] services. [email] 7 More info and photos of Signatu FBO, Fuel Providers, and Aircraft Ground Support f 🔰 50¢ off Saturday US Governa Business Name Contact ASRI 131.475 turing, tourism, education and many profe Aviation Fuel, Aircraft Parking (ramp, tiedov 05-967-5605 web site] services. More info and photos of Signature Flight Supp nature FS \$5.35 \$6.83 9 read write SOC Off Seturday \$4.55 E S GUARANTEED Aviation Fuel, Aircraft Parking (ramp, tiedown, hangar), Lounge, Catering, Rental Care UNICOM 122.95 100LL Jet A S5.30 S6.78 6 read write ATLANTIC eb site] Mertz FS FS=Full service SS=Self ser

ForeFlight (right) is a subscription-based aviation app featuring destination information on an iPad or iPhone. Along with general airport information, you'll find contact info, amenities, services, fuel prices, and comments/reviews for each FBO. You'll also see lists of nearby restaurants, car rental companies, lodging, taxis, and other businesses. ForeFlight doesn't require an internet connection to access airport listings, so you can do research while you're flying, if you didn't get to it on the ground.





FltPlan.com and Fltplan Go (left) are a website and app, respectively. Both are free and include airport information. Fltplan Go works on both iOS and Android tablets and phones. You must download the information before flight, but it's a great research tool for the cockpit in case plans change in the air.

Run the Numbers

Pilots must know the distances required for each takeoff, climb, descent, and landing. They must also know how much fuel they need for the trip, plus extra for unforeseen events.

Many times pilots rely on experience, knowing the available runway or terrain around the airport far exceeds what's required. Other times, pilots make detailed calculations. With practice, you can determine these numbers too—because they mean a lot as far as where and when you can use the airplane. You'll need at least the following information:

- Aircraft weight. The heavier the aircraft, the longer it takes to get airborne, the slower it climbs, and the more runway it needs to land.
- Wind direction and speed. Headwinds reduce the required distances, while tailwinds greatly increase them. Tailwinds increase the aircraft's speed over the ground, so you arrive sooner.
- Airport elevation (altitude). Higher altitudes increase takeoff and landing distances, and for many aircraft reduce engine power.

Charts like this take practice to read, and it helps to have a straight-edge. Most contain an example problem illustrating how it works.

- **Cruise altitude.** Airplanes fly faster at higher altitude, but more importantly they experience different winds depending on altitude.
- **Temperature**. Higher temperatures degrade takeoff and climb performance. If your pilot likes early morning departures on summer days, this is probably why.

The first few times you do these calculations, have your pilot walk you through the app they like to use or the technique for your specific airplane's charts.

Takeoff

Using the airport's elevation, wind direction, weight of the airplane, and temperature, you should end up with two numbers: The **ground roll** for the takeoff, which is how much runway the airplane will use, and the **total distance over a 50-foot obstacle**, which is a combination of both the runway used and the distance the airplane will travel to get 50 feet into the air. Check that you're using the chart for normal takeoffs, as opposed to "short field" takeoffs, which may use a different procedure.

You can compare the predicted runway required to the lengths of the runways available. Generally, pilots like 50 percent more runway available than the



Tabular charts are simpler, but may require extrapolation between numbers—or simply rounding up to the next highest number on the chart.

chart says is required. If the wind is relatively light, your pilot may choose a runway not aligned with the winds to take advantage of more pavement to work with on takeoff.

Cruise

Cruise charts or apps typically offer a

choice of power settings between 55- and 75-percent power. High power saves time; lower power saves fuel. Ask your pilot what setting he or she will use that day. You should then be able to see how much fuel will be burned at a certain altitude and power setting. Knowing this information helps make sense of how much fuel the pilot plans to put in the tanks before departure—and reveals whether or not you need to make a fuel stop enroute. The regulations require a minimum amount of fuel on landing, but many pilots like extra. An hour of fuel remaining is common.

Landing

The charts for landing generally work the same way as takeoff, with both a total distance to clear some 50foot tall trees plus runway to land and stop, as well as just the runway used. Again, a buffer of 50 percent over what's required is nice to have for safety.

PERFORMANCE APPS MAKE IT MUCH EASIER

There may be an app or PC-based calculator you can use for your aircraft, such as CirrusProFlight (right). This makes it much easier. However, you should verify the predictions of these apps against both the book values and your pilot's experience with the airplane.





Other apps, such as ForeFlight (left), can do fuel calculations for the entire flight. Most pilots will want to review these calculations themselves, but you can offer them as a member of the cockpit team. Even better, if the pilot must change destination in flight, you can run these numbers to check the required fuel to get to the new airport, as well as the landing and subsequent takeoff distances required.

Landing Distance							
WEIGHT = 3400 LB				Headwind: Subtract 10% per each			
Speed over 50 Ft Obstacle = 77 KIAS				13 knots headwind.			
Flaps - 100% · Idle · Dry, Level Paved Surface				Tailwind: Add 10% for each 2 knots			
				tailwind up to 10 knots.			
				Runway Slope: Ref. Factors.			
				Dry Grass: Add 20% to Ground Roll			
				Wet Grass: Add 60% to Ground Roll			
PRESS	PRESS DISTANCE TEMPERATURE ~ °C						
FT	FT	0	10	20	30	40	ISA
SL	Grnd Roll	1082	1121	1161	1200	1240	1141
	50 ft	2244	2298	2352	2408	2464	2325
1000	Grnd Roll	1122	1163	1204	1245	1286	1175
	50 ft	2298	2355	2412	2470	2529	2372
2000	Grnd Roll	1163	1206	1248	1291	1334	1210

Check the Fuel

O ne of the first things most pilots check when they walk up to a GA airplane—or should check—is how much fuel is onboard. Fuel for the engine or engines means time in the air to reach your destination, or an alternate landing spot, without undue stress or hazard.

Checking the fuel can be a bit more complex than just looking at a fuel gauge, as happens in a car. Many airplanes have two or more fuel tanks, usually in the wings. Both the total fuel on board and where the fuel is located matters. Many planes have limitations for a maximum imbalance between the weight of fuel in each wing or auxiliary tank. So your goal for telling the pilot how much fuel is onboard isn't: "We have 12.5 gallons." It's: "We have 10 gallons in the left tank and about 2.5 gallons in the right tank."

Pilots often complain that aircraft fuel gauges are inaccurate. That's not exactly fair. Fuel gauges must be accurate for every calibration mark on the gauge. However, the flat, wide nature of most aircraft fuel tanks mean a large change in fuel quantity results in a small change in the height of the fuel in the tank, which is what the gauge really measures. The height is commonly measured by a float in the tank, which can get stuck or saturated with fuel over time. Add a bit of turbulence sloshing the fuel around and you see why pilots treat fuel gauges with a certain amount of suspicion.

Luckily for you, there's no sloshing while the aircraft is still on the ground, so the reading from the fuel gauges should be fairly accurate. However, for most light aircraft it's still best to open each tank and confirm visually that the amount inside appears to match what's shown on the gauge. Some aircraft have a calibrated stick you can dip into the tank for a precise measure, or when the fuel is too low to see.

A calibrated stick is a great way to check the fuel in each tank. This could simply be a piece of wood with

marks on it. To use a dip tube like the one shown here, put the tube straight down into the tank with your thumb off the end. Then put your thumb tightly over the end and lift it out. Read the fuel level quickly off the scale, and then lift your thumb to drop the fuel back into the tank.



on to read the levels shown on the gauges. Check with your pilot before turning on or off the master.

Some gauges read in pounds or kilos, as well as gallons or liters. Be sure you report the correct number and unit. An Air Canada flight once ordered fuel in kilos, but got fueled by pounds. Later the captain got to practice his skill at flying a 200-seat glider to an abandoned airfield (successfully).



Drain the Fuel Sumps

The fuel used in the airplane must be clean and free from water, so some fuel is drained from each tank and checked prior to flying. You'll use a fuel testing tool. Pilots normally carry one on board at all times (it's that important) or keep it handy in the hangar.

Take fuel samples before your first flight of the day (especially if the airplane sat outside in the rain, or you're in a humid environment) and after fueling. You'll always check to see if there's water in the fuel and that the fuel is the correct type.

Locate the sumps on the airplane, using the preflight section of the POH as a guide, and check with the pilot to ensure you've found them all. Some highwing Cessnas have 13 sumps. There's often a fuel drain at the lowest point in the system, on the belly. Sometimes a drain is actuated by pulling a knob in the engine compartment, or even inside the cabin.

Drain enough fuel so that you have a good visual—a few ounces or so, like a full shot glass. Look at the sample in the cup. If your aircraft uses 100LL avgas, it should look light blue.





Clear liquid mixed in with the blue is a bad sign: water in the fuel. Water may also show up as a large bubble at the bottom of the cup (water is heavier than fuel) or in smaller bubbles suspended in the fuel. You'll

TIP

Wait 15 minutes after fuel is added (page 16) before sumping the fuel tanks. It can take that long for water to settle.

need to empty the water-contaminated fuel, dry out the cup to remove any droplets, and sump again—repeating until you no longer see water in the samples

If your airplane was parked outside during a rain storm, quite a bit of water may find its way into the tanks. You might sump a lot of fuel to clear it all out.

Dirt and other foreign objects can clog the fuel screens in the system. So look for debris in the cup as well. Again, drain fuel until the sample runs clear of particles—there should be none.

The common 100LL avgas is a leaded fuel. While it's still legal to burn, dumping it on the ramp is dumping a toxic substance, as well as wasting a valuable resource. The airport may have a receptacle for hazardous liquids, but many don't.

Some sump tools, such as the one shown here, let you pour the fuel back into the tanks. They even strain out any water from the sampled fuel as you pour. Check with your pilot about pouring sumped fuel back into the tanks.

Fuel drains are spring-loaded. Pushing up releases the fuel into a collection jar. Drains with a hole in the center require pushing up with a metal pin (top left). Drains with a T-shape are pushed with a notched cylinder (bottom left). Water will settle in the bottom of the collection jar (below).



Check Tire Pressures

You don't need to check tire pressure before every flight. However, if you suspect the pressure is low, checking tire pressure for airplane tires is roughly the same as with cars. Look up the tire pressure required in the POH or service manual. There may be a different pressure required on the nose or tailwheel tire compared to the tires on the main landing gear. The number is given in *pounds per square inch*, or psi, and you'll look for the same number on the tire pressure gauge.

Go to the tire, and unscrew the cap on the tire valve stem. If the airplane has wheel covers (commonly called "wheel pants"), you may need to roll the airplane forward or backward to uncover the valve stem. If the cap is missing, let the pilot know.

Slide the tire pressure gauge over the stem and press down to release air from the tire into the gauge. An instant readout appears on a dial, display, or along the side of a scale that extends.

The reading you get at first is the highest pressure that you'll see from that tire. Remove the gauge in a quick motion so as little air escapes as practical.

If you need to add air to the tires, the FBO can bring out their portable tank or compressor on a fuel or maintenance truck. Alternately, you may have a portable tank or compressor in your hangar that you can use. Have the pilot show you how to fill a tire, bringing it slowly up to the right pressure.

If you overfill the tire, you can release the extra air pressure by pushing in the pin in the tire valve stem. It hisses as air is released.

Changes in the weather can affect your tires. If there has been a significant change in barometric air pressure, that can cause some change in tire pressure. So you should consider checking the tire pressure before flight in this case.



TIP

Periodically look for worn spots. To do this with wheel pants, have someone roll the airplane forward and back to see each tire's full circumference.

EYEBALL TIRES BY THE SIDEWALLS

Even when inflated to their full pressure, aircraft tires can look low compared to car tires, especially on a cold day.



This tire is at its full pressure of 30 psi. One clue that it's fine is gleaned from the side of the tire coming up from the ground to the metal wheel, called the sidewall. If the angle between the lowest part of the sidewall and the ground is at least 45 degrees, the tire is probably fine.



As the air leaks out, the belly of the tire gets bigger and the sidewall droops lower. This tire is down to about 25 psi. It wouldn't be unsafe, but it's not good for the tire. Tell your pilot.



When the sidewall of the tire is close to—or touching—the ground, the tire almost certainly needs air. Tell your pilot right away.

Clean the Windshield

Before and after each flight, ensure a clear view by cleaning the windshield and other windows inside (where dust gathers) and out.

You'll use different products than you would on your car to make sure you don't scratch the delicate Plexiglass. Find a new microfiber cloth (one you only use on the airplane's windows) and a specialized cleaner such as Plexus or Prist.



You can also use plain water—just not Windex or other scouring cleansers. To clean dried-on bugs, let the water or cleaner soak them for a while—and prevent them from drying on in the future by cleaning the windows after the flight.

When the windshield dries, use a soft, dry cloth or T-shirt to rub off any streaks.

At every fuel stop, it pays to make another pass at the windshield, especially in the summer months. Bugs bake on after several hours in the air, but they're even tougher to get off days later.

You can also clean other surfaces. Many aircraft owners use Pledge, or a similar gentle polish, on aluminum-covered wings, cowlings, and control surfaces. The polish not only removes caked-on bugs well, but also leaves a slick finish that tends to shed future grime with greater ease.

Wipe up and down, right and left. Avoid wiping in a circular motion as it's more likely to leave smears that catch sunlight.

KNOW YOUR LIMITATIONS: FIND THEM IN THE POH

Section 8 Handling, Servicing, Maintenance

Cirrus Design SR20

Tire Inflation

For maximum service from the tires, keep them inflated to the proper pressure. When checking tire pressure, examine the tires for wear, cuts, nicks, bruises and excessive wear.

To inflate tires:

- Remove inspection buttons on wheel pants to gain access to valve stems. It may be necessary to move airplane to get valve stem aligned with the access hole.
- 2. Remove valve stem cap and verify tire pressure with a dial-type tire pressure gage.
- Inflate nose tire to 40 +2/-0 psi (276 +15/-0 kPa) and main wheel tires to 53 +2/-0 psi (365 +15/-0 kPa).
- Replace valve stem cap and inspection buttons.

All wheels and tires are balanced before original installation and the relationship of tire, tube, and wheel should be maintained upon reinstallation. In the installation of new components, it may be necessary to rebalance the wheels with the tires mounted. Unbalanced wheels can cause extreme vibration in the landing gear.

Propeller Servicing

The spinner and backing plate should be cleaned and inspected for cracks frequently. Before each flight the propeller should be inspected for nicks, scratches, and corrosion. If found, they should be repaired as soon as possible by a rated mechanic, since a nick or scratch causes an area of increased stress which can lead to serious cracks or the loss of a propeller tip. The back face of the blades should be painted when necessary with flat black paint to retard glare. To prevent corrosion, the surface should be cleaned and waxed periodically.

The Pilot's Operating Handbook, or POH, is the final word on the operation and care of the airplane. That's where you'll find how much oil it holds or the correct tire pressure, usually in Section 8. Ask your pilot to show you where it's kept in the airplane.

CESSNA MODEL 172P

SECTION 8 HANDLING, SERVICING & MAINTENANCE

CLEANING AND CARE

WINDSHIELD-WINDOWS

The plastic windshield and windows should be cleaned with an aircraft windshield cleaner. Apply the cleaner sparingly with soft cloths, and rub with moderate pressure until all dirt, oil scum and bug stains are removed. Allow the cleaner to dry, then wipe it off with soft flannel cloths.

If a windshield cleaner is not available, the plastic can be cleaned with soft cloths moistened with Stoddard solvent to remove oil and grease.

NOTE

Never use gasoline, benzine, alcohol, acetone, fire extinguisher or anti-ice fluid, lacquer thinner or glass cleaner to clean the plastic. These materials will attack the plastic and may cause it to craze.

Follow by **carefully** washing with a mild detergent and plenty of water. Rinse thoroughly, then dry with a clean moist chamois. **Do not rub** the plastic with a dry cloth since this builds up an electrostatic charge which attracts dust. Waxing with a good commercial wax will finish the cleaning job. A thin, even coat of wax, polished out by hand with clean soft flannel cloths, will fill in minor scratches and help prevent further scratching.

Do not use a canvas cover on the windshield unless freezing rain or sleet is anticipated since the cover may scratch the plastic surface.

8-18

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Load the Baggage

Referring back to the weight and balance chart (page 8), you should know the exact weights and locations (stations) where you'll load baggage into the airplane. It's important the bags go where you planned because there are maximum weights for each cargo or seating area. Placards or signs in the airplane's interior state these limits. If it turns out something you planned for a specific station in the airplane doesn't fit and must be stowed elsewhere, you must recheck how shifting that baggage effects the weight and balance.

Make sure heavier items are near the bottom of the baggage area, otherwise they may topple onto passengers, or fall out of the baggage door when you open it after the flight. It's also good practice to put the biggest, heaviest items in first and toward the forward part of the baggage area. Pack the smaller stuff around them.

Smaller, soft-sided bags, such as duffels or backpacks, are easier to load and arrange than larger hard-sided luggage. A soft-sided duffel made of a comfortable fabric and filled with clothing can also double as a pillow in the back seat. However, anything fragile should be in a lightweight, hard-sided case. If you pack a bunch of smaller bags, you can arrange them so that you can access the items you need along the way, or for earlier parts of the trip. You'll also be able to adjust loading to fit cargo in tighter spots in the baggage area.



Aircraft baggage doors are smaller than your average car trunk. This is another reason to pack in multiple, soft-sided bags

Bags can really jump in turbulence or maneuvering flight such as takeoff and landing. Not to criticize your pilot's skills in this regard—unless you're keeping score (page 54). Bungee cords or webbed cargo straps that hook onto tie-down points in the baggage areas are a good idea.

This is particularly important for anything up high, such as on a shelf, that could fly forward with sudden deceleration. If you don't have a cargo net on these areas, get something from a sporting goods or outdoor store.

KNOW YOUR LIMITATIONS: WEIGHT & BALANCE

The weight and balance section in the POH (normally Section 6) carries much of the info you need to safely load the airplane, but you also need to pay attention to the placards and any markings in the cargo areas and other sections of the airplane.

MAXIMUM BAGGAGE THIS COMPARTMENT 100 LBS.

SEE THE LIMITATIONS SECTION OF THE AIRPLANE FLIGHT MANUAL 120 POUNDS MAXIMUM BAGGAGE INCLUDING 12 LBS. MAXIMUM IN BAGGAGE WALL HATSHELF

FOR ADDITIONAL LOADING INSTRUCTIONS SEE WEIGHT AND BALANCE DATA.

ALL WEIGHT IN EXCESS OF 3112 POUNDS MUST BE FUEL WEIGHT ONLY FILL TIP TANKS FIRST USE MAIN TANKS FIRST RESTRICT PASSENGER WEIGHTS OR CARGO WEIGHT AS REQUIRED FOR COMPLIANCE

Find the Runway

Runway ends are identified by the heading in which they point, rounded to the nearest multiple of 10 with the last zero dropped. For example, "Runway 18" refers to a runway pointed to a compass heading of 180 degrees when an airplane sits in position ready to take off. The opposite end of the same strip of pavement is the reciprocal direction, 360 degrees, and is called "Runway 36."

When spoken aloud, you read the individual digits, so you would say "Runway Three Six," not "Runway Thirty-six." Sometimes the entire strip of pavement is referred to by both ends: "Runway 18-36." The point is that a "runway" is really two runways from a pilot's point of view with a different name depending on which way the airplane is facing.

Taxiways are designated "A," "B," and so on, in alphabetical order, with the primary taxiway along the main runway normally designated "Taxiway A" (pronounced "Taxiway Alpha").

Pilots want to take off into the wind as much as possible, so if the wind is blowing from 180 at 12 knots, the pilot will use Runway 18 unless there's a compelling reason not to. The runway pilots are using is called the "active runway."

That's where you can help. There are two critical

TIP

Short taxiways connecting to a runway are often numbered in sequence. So, when you see a taxiway called "N2," look on the chart to see where "N1" and "N3" are, and so forth.

tasks that must happen to reach the active runway: One is finding the route to the runway, and the other is ensuring the airplane doesn't enter any forbidden areas, or conflict with other aircraft, on the way.

At a towered airport, the pilot is assigned a path to the active runway. It might sound like, "Runway Two Nine, taxi via Charlie, Alpha. Cross Runway One Eight." That means to follow Taxiway C, until it reaches Taxiway A, then turn whichever way on Taxiway A takes you towards Runway 29. In the process, you may cross over Runway 18-36.

Find that route on an airport diagram that has the taxiways and runways marked, and trace that route so you understand which way to go. You'll need to know where your starting point is, so ask your pilot where you're starting from if you're not sure. As your pilot taxis along, watch the direction of each turn to ensure the airplane is going the right way. Compare





Paint on the pavement has its code, but these two are probably the most important at towered airports. The pilot may not cross from a solid-line side to a dashed-line side without permission. The single lines mean you're entering a taxiway or similar

the taxiway and runway signs you see out the window to the ones on the chart.

A critical element is if the airplane was told to "hold short" of a specific runway or taxiway. The pilot must stop at this point even if it appears no one is there to create a conflict. Tower should never issue instructions to cross more than one runway at a time, so if your route will cross two runways, expect a hold short. If your pilot appears to be going too far, you can remind them about the hold short. Often the



movement area. The double lines mean you're entering a runway. Pilots may cross from the dashed side to the solid side without permission. At a non-towered airport, pilots must use their own judgment to ensure it's safe to cross these lines.

tower will remove the "hold short" before the airplane actually stops, so listen for that on the radio as well.

TIP

At night, blue lights mark taxiway edges and (at some airports) green lights mark the center of taxiways. Runway side lights are white or orange. Some airports have alternating red and white lights where a taxiway crosses a runway.



FOLLOW THE TAXI ON THE APP

Cockpit displays with moving maps and apps such as Fore-Flight and Garmin Pilot make a huge difference when taxiing around unfamiliar airports. Not only does the pilot—and you—have airport charts for almost any airport, the location of the taxiing airplane is shown progressing across the map. Sometimes the most helpful aspect is just seeing exactly where you are on the chart to start the taxi.

If you and your pilot coordinate, you can give progressive directions, "The next left is Alpha and we're still expected

to hold short of Runway Three Six," while the pilot focuses out the window during the taxi.

Another advantage to these apps is you can usually draw marks on the chart itself. When tower gives your pilot instructions, you can annotate the map with that route or holding point, and then erase the marks later.



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