



An Extended Guide · No. 1475

Sun Angle and Positioning for Portable Panels

Aim it right and
gather far more power

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! Read this first — solar is safe, with a few easy habits

Here's the good news first: a portable solar panel is one of the safest ways to make your own power. There's no fuel, no flame, no engine, and no carbon monoxide, so it's welcome right on a patio, a balcony, or the grass — no fumes to worry about. A panel sitting in the sun is still quietly making real electricity, though, so a few gentle habits keep it trouble-free: keep the plugs and connectors dry, never let the two bare metal ends touch each other, and don't use a panel or cable that's cracked, frayed, or chewed. Always plug a portable panel into a power station or battery — never straight into your home's wall outlets or breaker panel. Set it where no one will trip over the cord, and if anything ever looks scorched or feels too hot to touch, unplug it and let it cool. Aiming a panel is about gathering more power, not about danger — the only thing to watch is that a tilted panel can catch the wind, and I'll show you how to keep it steady.

Aim it right and gather far more

Where you point a solar panel makes a bigger difference than almost anything else — more than the brand, more than the weather on a decent day. This guide shows you how to aim it, for free, and gather noticeably more from the same sun.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. In 30-plus years of helping folks with their gear, I've found that aiming is the tip that surprises people most — a small nudge, a big payoff. I'll keep it plain and practical.

This is all about the fold-up panels that refill a power station. No roof, no ladders, no wiring — just a panel you can carry outside and point at the sky.

★ A two-minute lesson at your place

Aiming is one of the easiest things to learn once someone shows you once. Call or text me at (330) 200-8042 and I'll walk your yard or balcony with you and find your best sunny spots — no sales pitch, ever.

The whole idea, on one page

If you remember only these, you'll already gather more than most folks do from the very same panel.

- ❑ A panel makes the most power facing the sun straight-on, with light hitting it square.
- ❑ Tilt it up and aim it toward the sun — generally toward the south here in Ohio.
- ❑ Flat on the ground is the weakest position of all.
- ❑ The sun moves, so re-aim two or three times a day for a real boost.
- ❑ Use the panel's built-in kickstand angles to prop it at the sun.
- ❑ Keep the whole face clear of shade — even a small shadow costs a lot more than you'd expect.

✓ The free upgrade

Aiming costs nothing but a minute of your time, and it's the closest thing to a free upgrade your panel will ever get. No new gear required.

Why aiming matters so much

Before the how, let's cover the why — because once you see it, you'll never leave a panel lying flat again.

A solar panel drinks in sunlight best when the light strikes it head-on. When the sun hits at a slant, the same rays are spread thin across the face, and the panel gathers less. Point the face right at the sun and those rays land concentrated and strong.

This is why two people with identical panels on the same bright day can get very different results. One left it flat on the picnic table; the other propped it up and aimed it. Same sun, same panel — the aim did the rest.

✓ Think of catching rain

Picture holding a bucket in the rain. Tip it sideways and you catch a little; hold the opening straight up into the falling rain and you catch far more. Aiming a panel at the sun is the very same idea.

Facing the sun straight-on

The goal is simple to picture: you want the flat face of the panel looking right at the sun.

Imagine a line running straight out from the middle of the panel's face. When that line points right at the sun, the light is hitting square and the panel is working its hardest. The farther that line drifts off the sun, the more the panel loses.

You don't need instruments to get this right. A quick, reliable trick: glance at the shadow the panel's own edge casts. When the panel is aimed well, its shadow shrinks to a thin sliver. A long, fat shadow means it's pointed off to one side.

✓ Chase the thin shadow

Nudge the panel until the shadow it throws is as thin as you can make it. That's your sign the face is looking right at the sun — no gadget needed.

Tilt it up and point it south

Aiming has two parts: which way it faces, and how far it leans back. Here's how to set both.

For direction, aim the face toward the south here in Ohio. That's where the sun spends the middle of the day, riding across the southern part of the sky. Pointing south catches the strongest, longest stretch of it.

For tilt, lean the panel back so the face looks up at where the sun sits, not straight out at the horizon and not flat at the sky. The right lean changes with the seasons — steeper in winter, less steep in summer — and we'll come back to that.

✓ South plus a good lean

Point it south, lean it back toward the midday sun, and you've captured the biggest, easiest win. Everything after this is fine-tuning.

Why flat on the ground is the weakest spot

It's tempting to just lay the panel out on the grass or a table and walk away. It works — but it's leaving a lot of sun on the table.

Laid flat, a panel faces straight up at the whole sky rather than at the sun itself. Except for a brief moment near midday, the sun is off to one side of straight-up, so the light hits at a slant and the panel gathers less than it could all day long.

Flat is also where shadows and puddles love to gather, and where dust and pollen settle on the face. Propping the panel up and aiming it fixes the angle and sheds a bit of the grime at the same time.

! Flat is the biggest quiet mistake

If your panel is charging slower than you expected on a sunny day, the very first thing to check is whether it's lying flat. Standing it up and aiming it is often the whole fix.

The sun moves — so re-aim through the day

A panel you aimed perfectly at breakfast is pointing at empty sky by mid-afternoon. This is the habit that pays you back the most.

The sun rises in the east, climbs across the southern sky, and sets in the west. Since your panel can't follow it on its own, a panel set once in the morning slowly falls out of aim as the hours pass. By late day it may be gathering far less than it did at nine o'clock.

The fix is easy: turn it to face the sun again two or three times a day. Morning, around lunch, and late afternoon is plenty. Each pass takes a few seconds and noticeably lifts your day's total.

✓ Aim as part of charging

Re-aiming fits naturally into the charging routine — our step-by-step charging guide folds it right in, so following the sun becomes just another part of the day.

Use the built-in kickstand angles

Most foldable panels come with a clever kickstand or set of loops that do the tilting for you. Let them.

Many foldables have a built-in stand that props the panel at one or more set angles — a gentler lean and a steeper one. Others use grommets and a cord, or a pouch that folds into a stand. Whatever yours has, it's there to hold the face up toward the sun without you propping it on a chair.

- **Pick the steeper setting** when the sun is low — early, late, and through the winter months.
- **Pick the gentler setting** when the sun is high overhead, mainly around midday in summer.
- **Set it on firm, level ground** so a breeze or a bump can't fold the stand and drop the panel.

✓ No stand? A chair works

If your panel has no stand, lean it against a chair, a cooler, or a railing, angled toward the sun. The aim matters far more than what's holding it up.

Shadows: the silent power thief

This is the one that catches almost everyone. A shadow you'd barely notice can quietly cut your charge in half or worse.

You'd expect that shading a corner of a panel costs you just that corner. It doesn't. Because of how the cells are wired together, shading even a small part of the face can drag down the whole panel far more than seems fair. A little shade is a big deal.

The usual suspects are a railing, a branch, a chimney, a deck post, a hanging plant — and, most sneakily, the panel's own cable lying across the face. Tuck that cable off to the side every time, then look the whole face over for any patch of shade.

! One small shadow, a big loss

Keep the entire face in full sun. If a tree or a building creeps a shadow over part of the panel as the day moves, move the panel to stay in the clear. This single habit is worth more than any upgrade.

Two kinds of homes, two sets of needs

Aiming is the same everywhere, but a tight city balcony and a wide-open farmyard give you very different room to work with.

If you live in town or the suburbs

In town or the suburbs, your sky is often boxed in by buildings, fences, and trees. Aiming still helps enormously — you just have to hunt a bit for a clear, sunny patch and watch how the shade shifts.

- Find the spot with the most open southern sky — often a balcony rail, a driveway, or the sunny side of the yard.
- Watch how a wall or neighbor's roof throws shade at different hours, and move the panel to stay in the sun.
- A lightweight foldable is easy to pick up and re-aim several times a day.
- Keep the cord clear of walkways and check any balcony or railing rules before you set up.

If you are out in the country on a well

Out in the country, you have the gift of open sky in every direction — the easiest place there is to aim a panel well. Just keep the panel's real job in mind.

- Point a panel due south and follow the sun across the day with nothing in the way.
- You have room for a bigger panel or a couple of them, set out on the grass and aimed together.
- Aiming refills a station for phones, lights, and devices — it cannot run a 240-volt well pump, so store drinking water for an outage.
- Watch for shade from a barn, a silo, or a tall tree line as the sun swings west late in the day.

★ Let's find your sunny spots

Every home has its own pattern of sun and shade. Tell me about your place and I'll help you map where to aim and when. Call (330) 200-8042.

The winter sun sits differently

The sun isn't in the same place year-round, and the tilt that's perfect in July is wrong in January. Here's the short version.

In summer, the sun rides high overhead, so a gentler lean points the face up at it. In winter, the sun stays low across the southern sky even at midday, so a steeper lean — more upright — aims the face right at that low sun. Steeper in winter, gentler in summer is the rule of thumb.

A steeper winter tilt has a happy bonus: snow slides off more easily instead of piling up and blocking the face. Cold air itself is fine for a panel — it's the short days, the low sun, and the snow that make winter harder.

✓ Winter has its own guide

The cold months come with a few extra tricks — brushing snow off gently, leaning steeper, and leaning on stored battery through the gray. Our winter-and-snow guide covers all of it.

Finding south without fussing

You don't need a compass or a map. There are a few easy ways to find south right where you're standing.

- **Follow the midday sun.** Around the middle of the day, the sun sits in the south — aim toward it and you're aimed south.
- **Read a shadow.** At midday, shadows point roughly north, so south is the opposite way — toward the sun.
- **Use your phone.** The compass app, or the map showing which way you're facing, points you to south in a moment.
- **Remember the arc.** The sun comes up in the east and sets in the west, swinging through the south in between.

✓ Close enough is good enough

You don't have to hit south on the nose. Get the face generally pointed at the sun and leaning toward it, and you've captured nearly all the benefit. Aiming is forgiving.

A quick shadow check

Make this a ten-second habit each time you set the panel and each time you pass by. It catches the biggest, quietest losses.

- ☐ Step back and look at the whole face in the light — is any part in shadow?
- ☐ Is the panel's own cable lying across the face? Lift it off to the side.
- ☐ Is anything nearby — a rail, a branch, a post — about to throw shade as the sun moves?
- ☐ Has a shadow crept in since you set it up an hour or two ago?
- ☐ Is the face clean, or is dust, pollen, or a stray leaf shading the cells?

✓ The habit that pays for itself

A clear, clean face in full sun beats every gadget and gimmick. If you do just one thing from this guide, make it the shadow check.

Morning, noon, and afternoon

Here's the simple rhythm of following the sun, so re-aiming becomes second nature instead of a chore.

In the morning, the sun is low in the east, so turn the panel that way and lean it fairly steep to face the low light. Toward midday, swing it to the south and let it lean back a touch as the sun climbs higher overhead.

In the afternoon, follow the sun as it slides toward the west, turning the panel to keep facing it and tilting steeper again as it drops. Three small adjustments across the day — morning, midday, late — gather far more than setting it once and forgetting it.

✓ Tie it to your routine

Re-aim when you would naturally be up anyway — morning coffee, after lunch, before supper. Pinned to habits you already have, it never feels like extra work.

Honest truth: angle helps, but the sun rules

Aiming gets you more from whatever sun there is — but it can't conjure sun that isn't there. Let's be honest about that together.

On a bright day, good aiming is the difference between a fine charge and a great one. On a heavily overcast day, even a perfectly aimed panel makes much less, because there simply isn't strong, direct sun to catch. Aiming multiplies the sun you have; it can't add sun you don't.

So aim well, but plan realistically. Keep a battery charged ahead of time to ride through the gray stretches, and let good aiming top it back up when the sun returns.

✓ Two guides for the honest picture

Our how-much-sun guide explains what a day's sun can really refill, and our cloudy-day guide covers what to expect when the sky turns gray. Aiming is the partner to both.

Staying safe while you aim

Aiming a panel is about as low-risk as backup power gets. The one thing to mind is that a tilted panel can catch the wind.

A panel leaned back and pointed at the sky acts a little like a sail. A gust can flip it, slide it, or send it tumbling off a table or balcony. Weigh a light panel down with a sandbag, a brick, or a full water jug, or tie it to something solid — especially up high on a balcony.

Keep the setup gentle in the ordinary ways too: run the cable where no one will trip on it, keep the plugs and the station dry and off wet ground, and don't use a cracked or frayed panel or cable.

! Weigh it down before you walk away

A minute spent securing a tilted panel saves a cracked one later. If it's breezy, or the panel is anywhere it could fall, anchor it before you leave it. Our weatherproofing guide covers wind and weather in full.

Little aiming habits that add up

None of these are required, but each one squeezes a bit more from the same sunny day.

- **Chase the thin shadow.** Nudge the panel until its own shadow is as thin as it'll go — that's a good aim.
- **Steeper when the sun is low** — mornings, evenings, and winter. Gentler when it's high overhead at midday.
- **Re-aim on a schedule you'll keep** — pin it to coffee, lunch, and supper so you don't forget.
- **Wipe the face when you re-aim** — a quick brush of dust, pollen, or leaves keeps the whole face working.
- **Set it on firm, level ground** so the stand can't fold and drop the panel out of aim.

✓ Small nudges, real gains

A well-aimed, clean panel in full sun will out-gather a flat, dusty one every single time — with no new gear and no extra cost.

Common aiming mistakes to sidestep

Almost all the disappointment with aiming comes down to a few easy slips. Now you'll know them ahead of time.

- **Leaving it flat** on the grass or a table, so it faces the whole sky instead of the sun.
- **Setting it once and forgetting it**, letting it fall out of aim as the sun crosses the sky.
- **Ignoring a small shadow** from a rail, a branch, or the cable lying across the face.
- **Aiming the wrong way** — pointing it north, or out at the horizon, instead of south and up at the sun.
- **Using too gentle a tilt in winter**, when the low sun wants the panel leaned steeper and more upright.

✓ All of them are free to fix

Not one of these needs a new part or a dollar spent — just a nudge, a turn, or a second look. Aiming is the cheapest upgrade there is.

A simple aiming routine

Tuck this in with your panel. Run down it whenever you set up and you'll be aimed well every time.

- ❑ Prop the panel up on its kickstand — never leave it flat.
- ❑ Point the face toward the sun, generally to the south.
- ❑ Lean it steeper when the sun is low, gentler when it's high.
- ❑ Chase a thin edge-shadow to confirm it's aimed square at the sun.
- ❑ Clear the whole face of shade, including the cable, and give it a wipe.
- ❑ Re-aim two or three times through the day, and weigh it down if it's breezy.

★ Want to practice together?

I'm happy to come out and run this routine with you once, in your own yard or on your balcony, so it sticks. First visit is a flat \$99, and there's nothing to buy. Call (330) 200-8042.

Position and power, at a glance

Here's the whole idea in one quick look — how much a panel gathers depends mostly on where and how you set it.

How you set it	What it faces	Roughly what you get
Flat on the ground	The whole sky	The weakest
Propped, off-angle	Near the sun	Better
Aimed at the sun	Light hits square	The most
Any shade on the face	Sun, but blocked	Drops sharply

No numbers needed to see the pattern: stand it up, point it at the sun, and keep the whole face clear. Do those three things and you've gathered nearly all there is to gather on any given day.

Common Questions

The questions I hear most about aiming a portable panel, answered plainly.

Q: Which way should I point it?

Toward the sun — which here in Ohio generally means facing south and leaning the panel back toward the midday sun. Around the middle of the day, just aim it straight at the sun itself.

Q: How often do I really need to re-aim it?

Two or three times a day makes a real difference — morning, around lunch, and late afternoon. You don't have to hover over it; a quick turn each time is plenty.

Q: Does a little shade really matter that much?

Yes, more than you'd think. Shading even a small part of the face can drag down the whole panel far out of proportion. Keep the entire face in full sun, cable included.

Q: Is flat on the ground really that bad?

It's the weakest way to set a panel. Flat, it faces the whole sky instead of the sun, so it gathers less most of the day. Standing it up and aiming it is often the biggest single improvement.

Q: How steep should the tilt be?

Steeper when the sun is low — mornings, evenings, and winter — and gentler when it's high overhead at midday. Use your panel's kickstand settings and aim the face up at wherever the sun is.

Q: Will good aiming fix a cloudy day?

It helps, but it can't make sun that isn't there. Aiming multiplies whatever sun you have; on a gray day there's simply less to catch. Keep a charged battery to ride through the gray.

★ Still wondering about your spot?

Every yard and balcony has its own sun and shade. Call or text me at (330) 200-8042 and I'll help you find where and how to aim at your place.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made aiming a portable solar panel feel a little less daunting and a lot more doable. Keep it in a drawer with your other home papers, come back to a page whenever you need it, and don't worry about memorizing anything.

When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day, come-back-free guarantee. Most portable solar setups are simple, plug-and-play, and need no wiring at all — but if yours ever calls for a licensed electrician, I'll help you line up a trustworthy local pro.

★ Bill's Home Tech — real help, close to home

Call or text me at (330) 200-8042, or visit BillsHomeTech.com. Serving Atwater and all of Portage County. 30+ years of patient, plain-English tech help — and if you're ever not 100% happy with a visit, I'll make it right or refund it. That's a promise. — Bill

Where You Set It Changes Everything

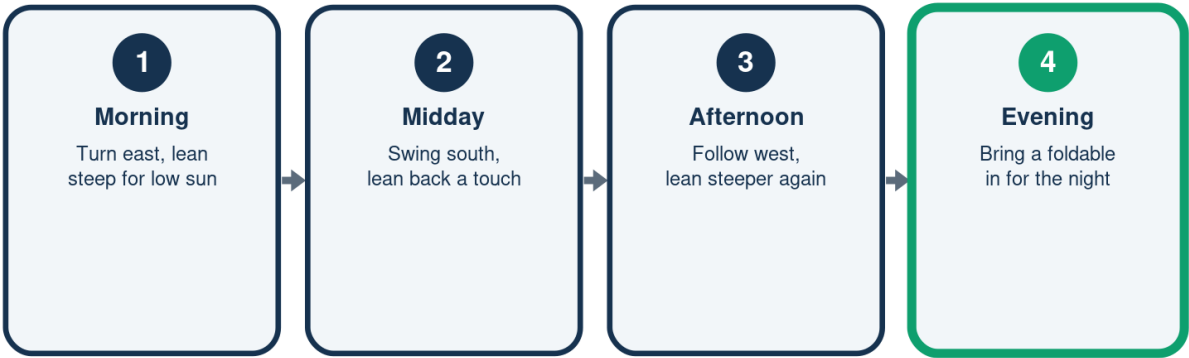
The same panel, the same sun, very different results

	What it faces	What you get
Flat on ground	The whole sky	The weakest
Propped, off-angle	Near the sun	Better
Aimed at the sun	Light hits square	The most
Shade on the face	Sun, but blocked	Drops sharply

Stand it up, point it at the sun, and keep the whole face clear.

Follow the Sun Across the Day

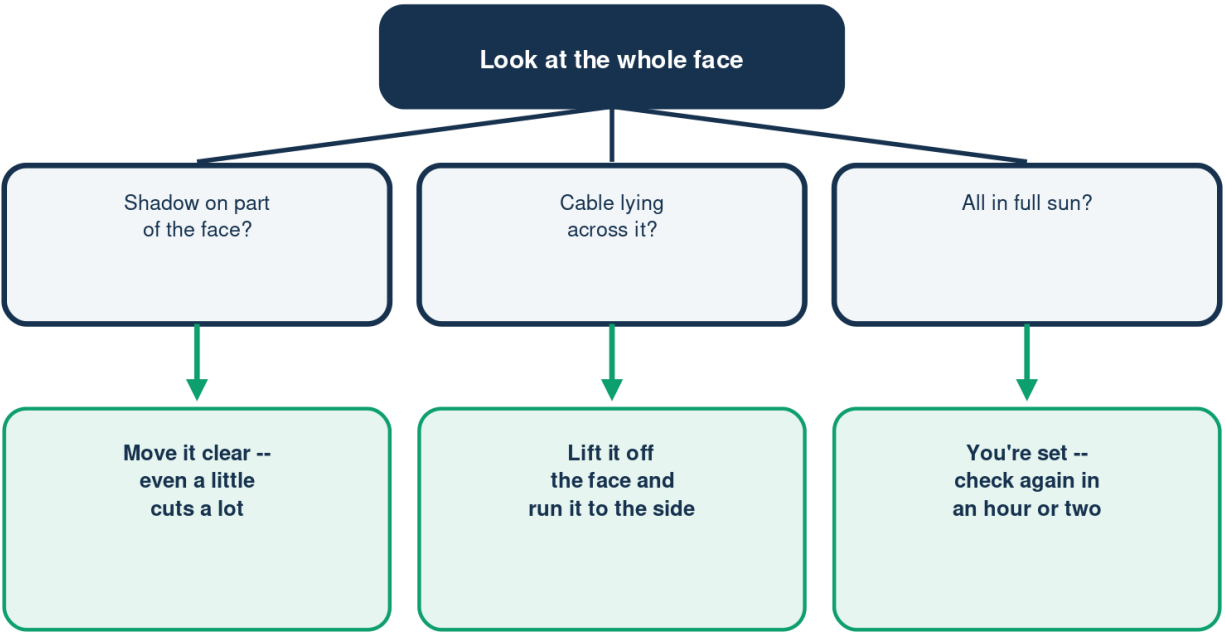
A quick nudge two or three times noticeably lifts your total



The sun won't wait for you -- a few turns a day is the free upgrade.

Is a Shadow Costing You Power?

A ten-second look that catches the quietest losses



Shading part of a panel can drag down the whole thing -- keep it clear.

Illustration - a schematic, not to scale. Your setup may differ.

The Winter Sun Sits Differently

Steeper in winter, gentler in summer

	Summer sun	Winter sun
Where it rides	High overhead	Low in the south
Best tilt	Gentler lean	Steeper, upright
Daylight hours	Long	Short
Snow to brush?	No	Yes, gently

Our winter-and-snow guide covers the cold months in full.



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A Note From Bill

A quick note from Bill.

I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that comes from using these guides. Thanks for reading, and stay safe out there.

— *Bill*



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