



An Extended Guide · No. 1452

Setting Up and Aiming Your Solar Panels

A few minutes of good aiming
beats another whole panel

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✓ The best news first — this one is safe indoors

Here is the best news about a solar generator, and the reason it earns a place in your home: despite the word 'generator,' it has no engine. At its heart is a big rechargeable battery in a case — a power station — and the panels simply refill it from the sun. It burns no fuel, so it gives off no exhaust and no carbon monoxide — the invisible, deadly gas that makes a gas generator a strictly outdoors-only machine. That means the power station part is safe to use right inside your home, in any room, with the windows closed — beside your chair, on the nightstand, next to a medical device. (The panels sit outside in the sun; the station stays indoors where it is dry.) A few simple habits keep it that way: charge it with the gear it came with, give it a little air while it works (don't bury it under a blanket or shut it in a tight cabinet), keep it away from water and from baking heat, and never use one that is cracked, soaked, or swollen. This guide is all about that outdoor half — setting the panels out in the sun and aiming them well — while the station stays safe and dry indoors, with just one cable running between them.

A few minutes of good aiming, and free power

Setting up solar panels is easier than it looks — you unfold them, point them at the sun, and plug in one cable. This guide walks through the whole thing in plain English, so you get the most out of every sunny hour.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. In 30-plus years of helping folks with the gear in their homes, I've learned that solar panels reward a little care. The difference between a lazy setup and a good one isn't money — it's a few thoughtful minutes of aiming.

So that's what we'll cover: where to set the panels, how to tilt and aim them, how to keep shade and dust from stealing your power, and how to do it all safely. Nothing to memorize, and nothing you can't manage on a pleasant afternoon.

★ Nothing to sell you

I don't sell panels or power stations and I earn no commission, so this is just honest advice. If you'd like a hand getting your panels set up right the first time, call or text me at (330) 200-8042 — the conversation's free.

The whole guide, on one page

If you remember only these things, you already know how to set up and aim your solar panels.

- ❑ Unfold the panels and set them where the sun falls — on the ground, a table, a stand, or leaned somewhere steady.
- ❑ Tilt them toward the sun with the built-in legs; don't lay them flat. The more directly the sun strikes the face, the more power.
- ❑ Point them squarely at the sun, and re-aim a couple of times as it crosses the sky through the day.
- ❑ Keep the whole panel out of shade — even a small shadow takes a surprising bite out of the power.
- ❑ Keep the station dry and indoors, run the one cable out to the panels, and keep that cable clear of walkways and puddles.
- ❑ Do a relaxed dry run on a nice afternoon, so it's all familiar before the day you really need it.

✓ One line to hold onto

Point the panel squarely at the sun, keep every corner of it out of shade, and keep the station dry — get those three right and the rest is easy.

Unfolding and placing the panels

Portable panels are made to be simple. Most open up about as easily as a lawn chair or a padded folder, and you set them wherever the sun is falling.

Carry the panels to a spot that's getting good, direct sun, and unfold them. They open into one or more shiny faces joined together, usually with little legs or a kickstand on the back. There's nothing to assemble and no tools involved — if you can unfold a map or open a folding chair, you can set these out.

You can rest them right on the ground, on a picnic table, on a small stand, or leaned securely against something steady — whatever puts them in the sun and holds them at a good angle. The only rules are that they face the sun and sit somewhere they won't slide, tip, or blow over.

- **On the ground:** simple and steady, as long as the spot stays sunny and dry.
- **On a table or bench:** lifts them up out of the wet grass and makes them easy to re-aim.
- **On a stand or leaned up:** lets you tilt them nicely toward the sun — just be sure they're secure.

✓ Chase the sunniest spot

Before you settle in, take a slow look around for the brightest, most open patch of sun with no shadows falling across it. A better spot is worth more than any amount of fiddling later.

Tilt them toward the sun — don't lay them flat

This is the single biggest thing you control, and it costs you nothing: standing the panels up at an angle so they face the sun, instead of lying flat on the ground.

Most portable panels have built-in legs or a kickstand for exactly this. Prop them open so the face of the panel tilts up toward the sun. The more directly the sunlight strikes the face — straight on, rather than skimming across it — the more power the panel makes.

Laid flat on the ground, a panel only catches the sun head-on for a short while in the middle of the day, and skims it the rest. Tilted to face the sun, it drinks in far more. You don't need to fuss over the exact angle; just tip it toward the sun so it's looking right at it.

✓ Stand it up to face the sun

Think of the panel like your own face on a sunny day: you feel the warmth best when you turn toward the sun, not when you look at your feet. Tilt the panel the very same way.

Point it squarely at the sun, then follow it

Tilting is half the job. The other half is aiming the panel right at the sun — and nudging it now and then as the sun travels across the sky.

Aim it straight at the sun

Set the panel so it looks right at the sun, not off to one side. An easy way to check is to glance at the shadow the panel casts: when the aim is good, the panel's own shadow is short and squared-up right behind it. When that shadow stretches off to the side, the aim has drifted, and you're leaving power on the table.

Then follow the sun across the day

Here's the part folks forget: the sun doesn't hold still. It climbs through the morning, rides high at midday, and sinks in the afternoon. The aim that was perfect after breakfast is pointing at empty sky by supper. So step out and re-aim a couple of times through the day — morning, midday, and afternoon is plenty.

✓ A few nudges beat a whole extra panel

Re-aiming takes only a few seconds, and it adds real power to your day — often more than buying another panel would. It's the cheapest upgrade there is: your own two hands and a minute of attention.

Shade is the quiet thief

If there's one thing that steals more power than poor aiming, it's shade — and it likes to sneak up on you as the day goes on.

Keep the whole panel in the sun — not most of it, all of it. A solar panel doesn't shrug off a little shade the way you might expect. Even a small shadow takes a surprising bite out of what the entire panel makes, and a thin bar of shadow across the face does far more harm than its size suggests.

- **Railings and posts:** a porch post or deck rail casts a thin, moving bar of shade.
- **Branches overhead:** even light, dappled shade from leaves cuts into the power.
- **The house and chimney:** as the sun sinks, the roofline reaches out across the yard.

And shadows move. The corner that's in bright sun in the morning may be behind the porch post by mid-afternoon. So when you step out to re-aim, glance for shade creeping in from a new direction, and shift the panel back into the clear if it has.

! Even a little shade hurts a lot

Don't talk yourself into 'that little shadow won't matter.' It matters more than almost anything else. When you check the aim, check for shade in the same glance, and keep every corner of the panel in open sun.

A clean panel is a hungry panel

Sunlight has to reach the face of the panel to become power. Anything sitting on the glass gets in the way — so a quick wipe now and then earns its keep.

Out in the weather, panels pick up a film of dust, a dusting of pollen in spring, a bird dropping here and there, or a layer of snow in winter. None of it is a crisis, but all of it dims the light before it reaches the panel. A soft cloth or a little water, and a gentle wipe when the panel is cool, clears it right up.

You don't need to baby them or clean them every day — just knock off the obvious stuff before you set them out, and brush away snow so the face is clear. For folding them away and keeping them in good shape over the long haul, see our storage-and-maintenance guide.

✓ A gentle wipe, when it's cool

Wipe a panel when it's cool and shaded, not baking hot, and go easy — a soft cloth and plain water are all it takes. No harsh scrubbing, and no gritty rags that could scratch the face.

Let them breathe so they don't bake

Here's a small surprise about solar: a panel that gets too hot actually makes a little less power. A bit of airflow keeps it happy.

It seems backwards — more sun, but a hot panel makes less? — yet that's how they work. The sunlight is what makes the power; the heat that builds up is just a side effect, and too much of it takes the edge off. It's nothing to worry about, just something to allow for.

The fix is easy and mostly takes care of itself outdoors. Set the panels where a little breeze can reach them, rather than pressed flat against hot pavement or trapped in a stuffy corner. Leaning them up on their legs already lets air move behind them, which is one more reason not to lay them flat.

✓ A little breeze is a friend

You don't need to do anything special — just don't smother the panel against a hot surface. Standing it up on its legs in open air keeps it cool enough to do its best work.

Making sure it's actually charging

Once the panel is aimed and plugged in, you'll want to know the power is really flowing. Happily, the station tells you — you just have to glance at it.

After you connect the cable, look at the station's little screen or its lights. Nearly every one shows when power is coming in from the solar input — often a sun symbol, a little arrow pointing in, or a reading that climbs when the sun hits the panel. That's your proof it's working.

Here's a handy trick for aiming: watch that incoming reading while you tilt and turn the panel. Nudge it one way and the number rises; nudge it back and it falls. When you've found the aim that makes it read highest, you've pointed it about as squarely at the sun as it'll get. It turns aiming into a simple little game.

✓ Let the display be your guide

You don't have to guess whether the aim is good — the station's own display will tell you. Aim for the highest incoming reading you can find, and you've done it right.

Two kinds of homes, two sets of needs

Where you live shapes how much your aiming pays off. In town it's a tidy convenience; out in the country, on a long outage, good aiming can matter quite a lot more.

If you live in town or the suburbs

In town, in the suburbs, or in an apartment, you may be working with a smaller sunny patch — a balcony, a patio, or a corner of the yard that only catches sun for part of the day. Outages tend to be short here, so you're usually just topping up.

- Scout the sunniest spot you have — a bright balcony, a patio, or the most open corner of the yard.
- Watch for shade from the building next door, a fence, or a big tree as the sun moves through the day.
- Even a short, well-aimed session in the bright midday hours can put a good bit back into the station.
- Set the station just inside a door or window, dry and safe, with the one cable running out to the panel.

If you are out in the country on a well

Out in the country, you likely have more open sky and fewer buildings throwing shade — but outages also run longer, so squeezing every bit of sun out of each day matters much more. Good aiming stops being a nicety and becomes part of keeping the lights on.

- With more open sun, a well-aimed panel can refill the station day after day through a long outage.
- Re-aiming through the day pays off most here, where you're leaning on solar to keep up over many days.
- Give yourself room to set the panels in full, open sun, well clear of the house's own long shadow.
- Be honest about the well pump: aiming panels won't change it — a 240-volt well pump stays a gas generator's job.

★ Not sure where the sun falls at your place?

Tell me about your yard or balcony — which way it faces, what throws shade — and I'll help you find the best spot and the best times to set your panels out. Call (330) 200-8042.

Setting up safely

Solar is wonderfully safe, but you are running a cable from outdoors to your station, so a little common sense keeps everything — and everyone — out of trouble.

Start with the station itself. The panels are built to sit out in the sun and light weather, but the station is not a weatherproof device. Keep it indoors, or just inside a door or window, somewhere dry and sheltered, and run the one cable out to the panels. Panels outside, station inside — that's the whole safe habit.

Then mind the panels and the cable. Set the panels so they sit steady and won't tip, slide, or catch a gust and go tumbling. Run the cable along the edge of things, not straight across a path where someone could catch a toe, and keep it up out of any standing water or puddle.

! Water, wind, and the cable

Water and electricity don't mix — keep the station dry and sheltered, and never run the cable through standing water. Set the panels down securely so a gust of wind can't send them tumbling, and route the cable clear of walkways so no one trips. Bring everything in before a storm.

✓ Panels out, station in

The simplest safe setup: panels out in the sun, station just inside where it's dry, one cable between them. Do that and you get free solar without ever putting the unit — or anyone — at risk.

Your simple setup routine

Once you've done it once, setting up takes only a few minutes. Here's the whole routine, start to finish, in the order I'd do it.

You don't have to think hard about any of this after the first time — it turns into a pleasant little ritual on a sunny morning. Run down the list and you'll get the most the day has to offer.

- ❑ Confirm the panels match your station before the day you need them — our series-vs-parallel guide walks through matching.
- ❑ Set the panels in full, open sun, tilted to face it, with the whole face out of any shade.
- ❑ Run the cable to the station — which stays dry and sheltered indoors — and plug it into the solar input.
- ❑ Glance at the display to confirm power is flowing in.
- ❑ Step out and re-aim a couple of times as the sun crosses the sky, checking for shade each time.
- ❑ Bring everything in before a storm, and top up early in the day rather than waiting until late.

✓ **Slow the first time, quick ever after**

Do a relaxed dry run on a nice afternoon before you ever need it. Once you've set it up once, you'll do it in minutes and know just what to expect.

What a day with the panels looks like

Using solar has a gentle rhythm to it, and once you feel it, the whole thing becomes second nature. Here's how a sunny outage day tends to go.

First thing in the morning, you carry the panels out, set them in the sun, tilt them to face it, and run the cable in to the station. Through the bright hours they pour power into the battery while you draw from it for your essentials. Getting them out early, rather than waiting, gives you the longest, richest stretch of sun.

A few times during the day, you wander out and give the panels a nudge to keep them facing the moving sun, and check that no shade has crept across them. As evening comes, you bring them in and lean on the stored battery through the night. The next morning, you start again.

✓ Harvest by day, spend by night

Treat the daylight as your chance to gather power. Set up early, re-aim a few times, keep the shade off, and go into each evening as full as the day allowed. For what the sun can and can't give, see the sun-and-weather guide.

Don't let a good panel walk off

A solar panel is a genuinely valuable thing, and it's sitting out in the open where anyone can see it. A little care keeps it yours.

This mostly comes up when you're away from home — camping, at a campsite, or set up in a spot that isn't fenced or watched. A panel left unattended in a public or open place can be an easy target, so it's worth keeping it where you can see it, or bringing it in when you step away for a good while.

At home in your own yard, this is far less of a worry, but the same sense applies: don't leave the panels and cable out overnight where they don't need to be, and bring them in when the day's charging is done. That protects them from weather and wandering hands alike.

✓ In sight, or brought in

The rule of thumb is simple: if you can't keep an eye on the panels, or you're done for the day, bring them in. They're too useful — and too valuable — to lose to carelessness.

Making it easy on yourself

None of this should be a strain. A little forethought when you choose and set up your panels keeps the whole business comfortable.

When you're picking panels, weight is worth thinking about. Portable panels come in lighter and heavier versions, and a set that's light enough for you to carry out to the yard and set up on your own is a set you'll actually use. If lifting is hard, a smaller panel you can manage beats a big one that stays in the closet.

And do yourself a kindness: try it all out on a calm, pleasant afternoon, long before any outage. Unfold the panels, aim them, plug them in, and watch the station take the charge. Doing it once in no hurry means that when the power really does go out, your hands already know the way.

★ Let's make it manageable

If you're not sure a set of panels is light enough for you, or you'd like a hand with a first practice run, that's just what I'm here for. I'll set it up with you, at your pace. Call (330) 200-8042.

Common setup mistakes

Almost every solar letdown comes from a handful of avoidable slips. Now you'll spot them coming.

- **Laying the panels flat.** Flat on the ground, they only catch the sun well for a short spell. Tilt them up to face it.
- **Setting it and forgetting it.** The sun moves all day; a panel left at the morning's aim is pointing at empty sky by afternoon.
- **Shrugging off a little shade.** Even a thin shadow cuts the power sharply — keep every corner of the panel in open sun.
- **Leaving the station out in the weather.** Panels can take a sprinkle; the station needs to stay dry and sheltered.
- **A dusty or snowy face.** Grime and snow block the light before it ever becomes power. A quick wipe brings it back.

! The two that cost you most

Laying panels flat and letting shade fall across them are the two that quietly rob you of the most power. Fix just those and you're most of the way to a good setup.

A few myths, cleared up

A handful of hopeful ideas about panel setup come up again and again. It's kinder to know the truth now than to be let down later.

Q: 'As long as it's outside, it's fine.'

Not quite. A panel dumped flat in a shady spot makes a fraction of what the same panel makes tilted up in full sun. Where and how you set it out is most of the whole game.

Q: 'I can set it up in the morning and leave it.'

You'll lose a lot of the day's power that way. The sun keeps moving, so a panel aimed at breakfast is poorly aimed by supper. A couple of nudges through the day makes a real difference.

Q: 'A little shade in one corner is no big deal.'

It's a bigger deal than it looks. Even a small shadow across part of the panel can cut its output sharply. Keep the whole face in clear, open sun.

Q: 'More aiming can make up for a cloudy day.'

Sadly, no. Aiming helps a great deal in sun, but it can't conjure light that isn't there. On a heavy-gray day, do your best and lean on a wall charge — see the sun-and-weather guide for what to expect.

✓ Sun, tilt, and no shade

Remember those three and the myths take care of themselves: give the panel real sun, tilt it to face the sun, and keep every corner out of shade.

A few questions to ask yourself

Before an outage arrives, these plain questions help you set up for success — and spot anything worth sorting out ahead of time.

- Where's the sunniest, most open spot at my place, and when does the sun reach it?
- What throws shade across that spot as the day goes on — a tree, a fence, the house itself?
- Are my panels light enough for me to carry out and set up on my own?
- Do I know how to tell, on the station's display, that power is really flowing in?
- Have I done a relaxed practice run, so the steps are familiar before I need them?

★ We can walk through it together

Not sure about the best spot, or whether your setup will work when it counts? That's exactly what I'm here for. We'll walk through it together, no guessing. Call or text (330) 200-8042.

Getting the most from your panels

Pull it all together and it comes down to a short list of good habits. Keep this handy, and you'll wring every bit of power out of the sun you've got.

- ❑ I set the panels in the brightest, most open spot I have.
- ❑ I tilt them up to face the sun, instead of laying them flat.
- ❑ I point them squarely at the sun and re-aim a few times as it moves.
- ❑ I keep the whole face out of shade, and watch for shadows creeping in.
- ❑ I keep the face clean and let a little air move behind the panels.
- ❑ I keep the station dry indoors, mind the cable, and bring everything in before a storm.

✓ Good habits, free power

Every one of these costs nothing but a little attention, and together they add up to a real difference in what you get from a sunny day. That's the whole secret.

Where to go from here

Aiming and setup is one piece of the solar picture. The rest of the series fills in the others, one calm topic at a time.

To make sure your panels and station actually fit together — how many panels, and how they wire up — see our series-vs-parallel guide. To set honest expectations for how much the sun will give you in different weather and seasons, see the sun-and-weather guide. And when the day's charging is done, the storage-and-maintenance guide covers folding them away and keeping them in good shape.

There's no need to read them all at once, or in order. Pick the question that's on your mind today, and come back to the others when you need them. Every one is written the same plain way, with nothing to memorize.

✓ One question at a time

You don't have to become an expert. Learn just enough for today's setup, and lean on the guides — or on me — for the rest whenever you're ready.

Common Questions

The setup and aiming questions I hear most, answered plainly.

Q: Which way should I point the panels?

Straight at the sun, tilted up to face it rather than laid flat. Aim so the panel's own shadow is short and squared-up behind it, and re-aim a couple of times as the sun crosses the sky.

Q: How often do I need to move them?

A couple of times through the day is plenty — roughly morning, midday, and afternoon. Each time, nudge the aim toward the sun and check that no shade has crept across the face.

Q: Does a little shade really matter that much?

Yes, more than you'd guess. Even a small shadow across part of a panel cuts its output sharply, so keep every corner in open sun and watch for shadows moving in as the day goes on.

Q: How do I know it's actually charging?

Look at the station's screen or lights. It'll show power coming in from the solar input — often a sun symbol or a reading that climbs. Aim the panel for the highest incoming reading you can find.

Q: Can I leave everything set up overnight?

Better to bring it in. The panels make nothing after dark, the station needs to stay dry, and an unattended panel can be a target. Bring it in, and set up fresh in the morning.

★ Still have a question?

That's what I'm here for, and there's never a silly one. Call or text me at (330) 200-8042 and I'll give you a straight, friendly answer.

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 setting up and aiming solar panels 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. I don't do licensed electrical work myself — for anything that needs to be wired into your home, 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

Good Aim vs. Poor Aim

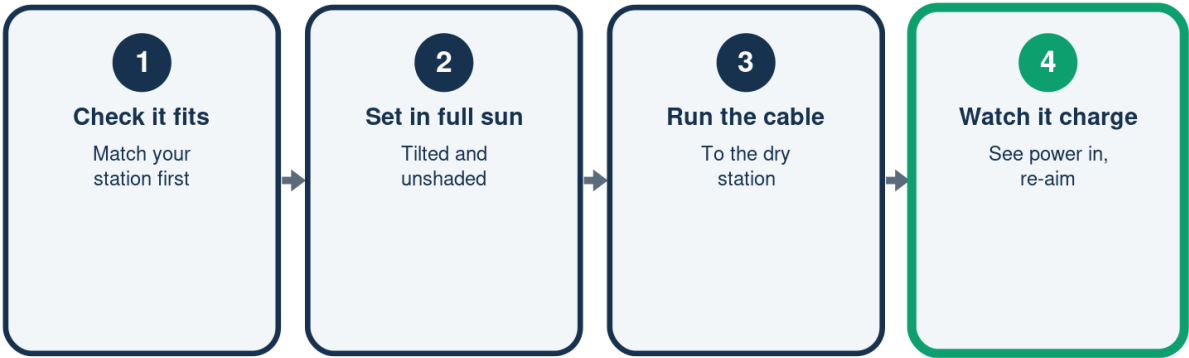
The same panel, two different setups

	Good aim	Poor aim
Tilt	Toward the sun	Laid flat
Facing	Straight on	Off to the side
Shade	Full sun	Partly shaded
Result	Strong charge	Weak charge

A few minutes of aiming beats another whole panel.

Set Up in Four Steps

From folded panel to power in



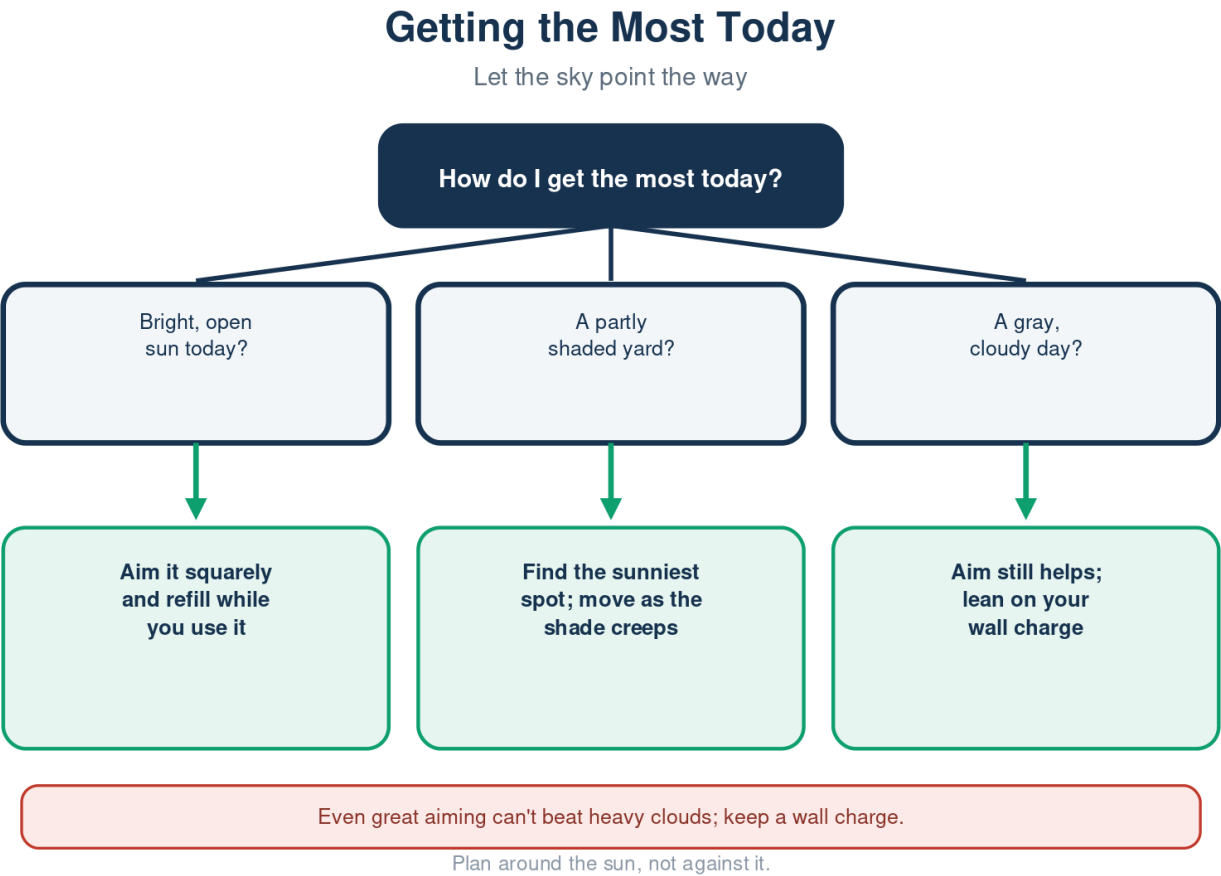
The last step is the good one: power flowing in.

The Do's and Don'ts

Simple habits for a good, safe setup

	Do	Don't
Placement	Stable, tilted	Flat or wobbly
Shade	Full sun	In a shadow
The station	Keep it dry	Out in the rain
The cable	Clear of paths	Across a walkway

Panels out in the sun, station in where it's dry.





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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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