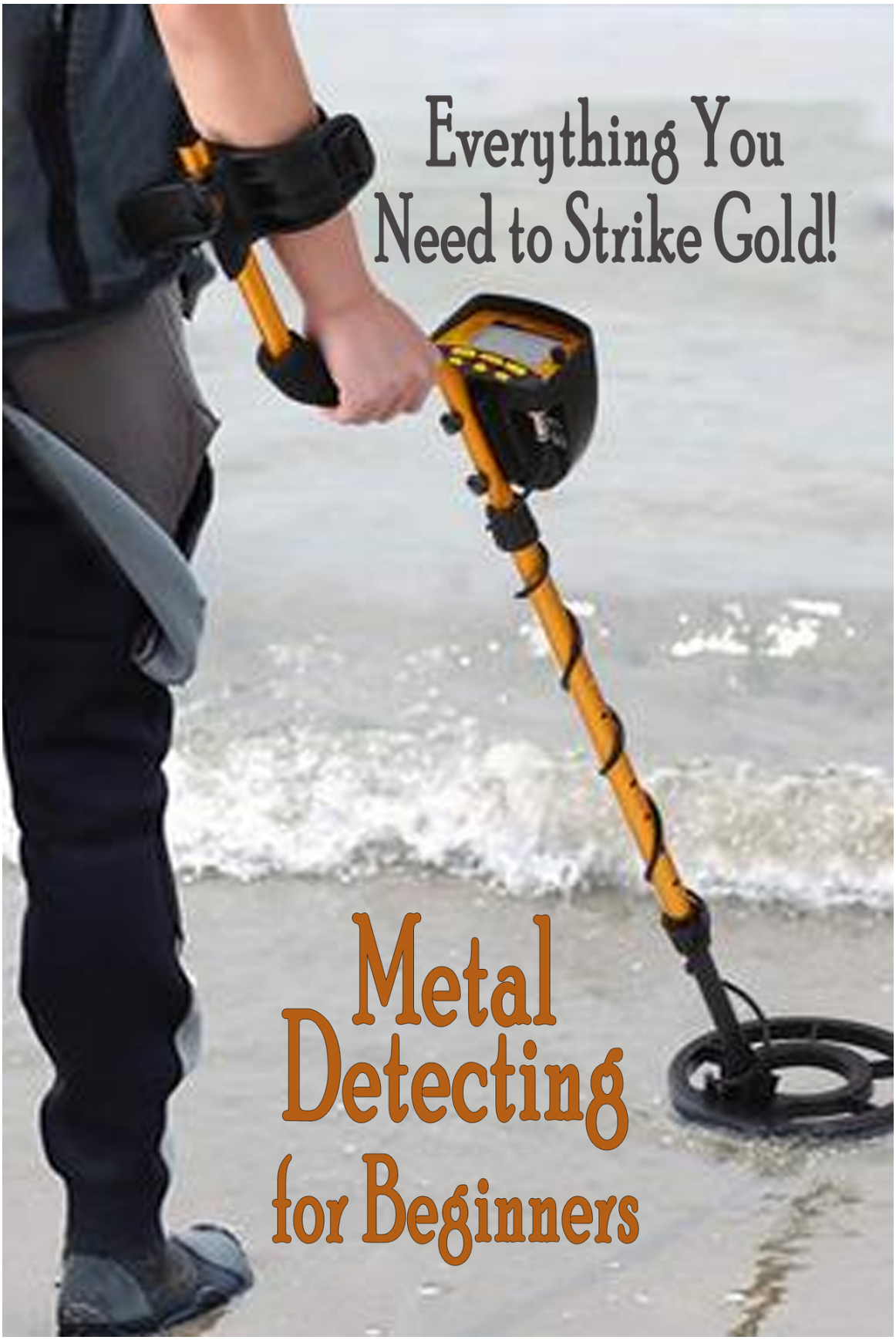

Everything You
Need to Strike Gold!
Metal
Detecting
for Beginners


Everything You
Need to Strike Gold!
Metal
Detecting
for Beginners

Metal Detecting for Beginners

Everything You Need to Strike Gold!

DEDICATION

Contents

Feeling Inspired to Give Metal Detecting A Try

What is Metal Detecting:

Metal detecting is a fun and educational hobby that has recently become quite popular, especially in the United States and England. A Metal detectorist typically use a piece of equipment known as a metal detector to help locate objects buried in the ground. Metal detectors use electromagnetic principles to pinpoint buried metal objects. They send a magnetic current through the earth and when the current hits a metal object, an electric current is generated, thus setting off the equipment's sensors. While hobbyists make up the largest sector of metal detectorists, others also use it for other purposes such as criminal investigations, archeology, or military research. Coins are most commonly found through hobbyist sweeps of an area. Other items can include buttons, commercial tokens, military pins and badges, bullets, toys, and tools. In the United States, metal detectorists often report findings that date back to the 1700s and 1800s, and some even earlier. In various parts of Europe, skilled detectorists have also found objects that go back to Ancient Roman and Celtic times.

Well, before you get ahead of yourself, keep in mind that your odds of turning up medieval treasure (especially if you're detecting in the United States) aren't great.

But with the right equipment, some skill, and a little luck, you can find some fascinating historical artifacts: coins, jewelry, buttons, tools, toys, keys, military items, the list goes on.

We can't all stumble upon a massive hunk of gold like the Mojave Nugget, a 4.9kg gold nugget found in California in 1977. But there are countless reasons to give metal detecting a try:

- Metal detecting gets you outside, walking around in the fresh air. If you already enjoy going for walks, you may well enjoy adding the thrill of metal detecting. It's sort of like Pokémon Go, but you're hunting for actual, tangible goods.
- Interested in history? Imagine holding historical artifacts in your own two hands. Many people nurture their love of history (or find that an interest arises) through metal detecting.
- You'll learn about your region as you explore it with your metal detector. This hobby will take you to nearby beaches and parks, historic homes and schools. It's the perfect excuse to go on a few local adventures!

- And finally, the treasure. If you do your research and keep at it, you’re quite likely to turn up some shiny items—like coins and jewelry—that would satisfy anyone’s magpie impulses.

Overall, metal detecting is a great way to learn a new hobby and even collect a lot of neat historical artifacts.

You can really learn a lot about history and your local area while out looking for treasure. If you’re a naturally curious person, metal detecting may be the perfect new hobby for you.

Some people do sell their finds for profit (at pawn shops, for example), but you’ll find that many people simply do it for the thrill of hunting and the satisfaction of connecting with history on a deeper, tangible level.

Naturally, you may have some questions about just how to get into this new activity. It may even seem like a daunting task to learn what you may need to know, but really it’s quite simple.

Here, we’ll go over some of the basics to help you get started without making things too complex or expensive. This will be a beginner’s guide to metal detecting.

What Equipment Do You Need?

There are tons of them on the market, ranging from pretty cheap to so expensive you'd have to sell your car to buy one.

Here's a good rule, really not just for metal detecting but for a lot of things in life: you don't need to spend a ton of money, especially as a beginner, on all the fancy gadgets and toys. Just buy a good, solid piece of gear and learn how to use it proficiently.

That said, here are a few good options and tips for finding the best metal detector.

You have several solid brands to choose from, such as Garrett, Fisher, Minelab, and plenty of others.

Whichever metal detector you decide to buy, make sure to do your research beforehand. Read reviews, and if possible, ask friends who metal detect for their personal experiences and recommendations.

A solid intro metal detector should cost you more than around $150—any less and you're probably settling for a lower-quality machine that will ultimately let you down.

Depending on the brand and model you buy, expect to spend up to about $400. Within the $150-400 price range, you can get a good-quality metal detector that will serve you well for years.

Some high-end metal detectors retail in the thousands (up to around $10K!), but that is completely unnecessary unless you are a serious prospector.

Now, you may be asking what makes the $300 machines different from a $10,000 machine?

Simply put, the more finely made and expensive a machine is, the more information it can give you about what it's detecting beneath the ground.

All machines can identify the presence of metal.

A cheaper machine will reliably tell you that it has found something, but a high-end machine will be able to provide more details without you actually

digging anything up—have you found a rare golden nugget or a piece of trash? This will save you some time, but at considerable financial cost.

Our detailed comparison guides of some popular detectors – from the budget machines to the mid-range and to the high-end ones – could help you get a clearer idea of what's the best metal detector for you.

What else? Do I need additional equipment?

Besides the metal detector, what else do you need to make your time out there searching is fun, fulfilling, and worthwhile? A couple suggestions:

- A hand digger
- A pinpointer
- A bag or other container for holding your finds

First off, you'll probably want a hand digger for digging plugs. A plug is the term for the small hole you dig to get your hands on the object you've found.

The industry standard is the Lesche Digging Tool. There are other, cheaper tools out there, but the Lesche is the best bang for your buck. Don't bother with plastic, unless you want it to break when you need it most.

The Lesche has a serrated edge to allow you to cut through roots. It's basically a narrow trowel that will let you dig neat, easily filled holes and make sure that you leave as minimal of an impact on the land as possible.

Another useful tool for a metal detectorist is a pinpointer, which has a pretty self-explanatory name.

Pinpointers give you the location of your target with far more precision than your metal detector itself will. This allows you to dig far fewer plugs, saving time and energy and making less of a mark on your area.

The gold standard for pinpointers is the Garrett Pro Pointer AT. If you really need to save money, the Garret Pro Pointer II is also solid.

Third, you need a bag of some sort to carry your finds, whether junk you'll sell as scrap or a precious artifact.

A fanny pack is a simple yet effective solution, though if you think you may find anything really nice, keeping something with individual containers for storage may be useful. A pouch with multiple pockets or a fishing tackle box works well for this.

If you use a hard container, stuff it with rags to keep your finds protected.

There are also specialized carry bags for metal detectorists, but to be totally honest, unless you are very serious about metal detecting, you are probably better off saving your money and using something you have on hand to carry your finds in the field.

Additional accessories to consider include:

- Extra coils: search coils come in different sizes and are tailored to different conditions and terrains. If you hunt in multiple kinds of locations, you might want to invest in an additional coil.
- Coil covers: these inexpensive covers protect the search coil of your metal detector from scratches and other damage.
- A purpose-built carry bag: this will let you transport your metal detector easily and conveniently. The alternative is using a standard backpack, but this means dismantling your detector every time you transport it.

Finally, remember that metal detecting involves spending substantial time outside.

Dress for the elements, wear good shoes, don’t forget your sunscreen and bug repellant if necessary, and bring along some snacks, water, and extra batteries.

The History of The Metal Detector

The first metal detector was made by Gustave Trouvé, a French electrical engineer, in 1874. He made it to find and remove bullets or other metal objects from people. Alexander Graham Bell tried to make a metal detector like Trouvé's device in 1881, after United States President James Garfield was shot. Bell tried to find the bullet inside President Garfield using his device. Bell's metal detector worked, but the metal coils of James Garfield's bed confused the detector, and the attempt to find the bullet was not successful.

Metal detectors were very useful as land mine detectors in World War II. A Polish Army engineer, Lieutenant Józef Kosacki, made the first portable metal detector in 1941. Poland was occupied by Nazi forces, and Lieutenant Kosacki was stationed in Scotland at the time. His design had a long wand and dish, like modern portable detectors, but it needed a large and heavy

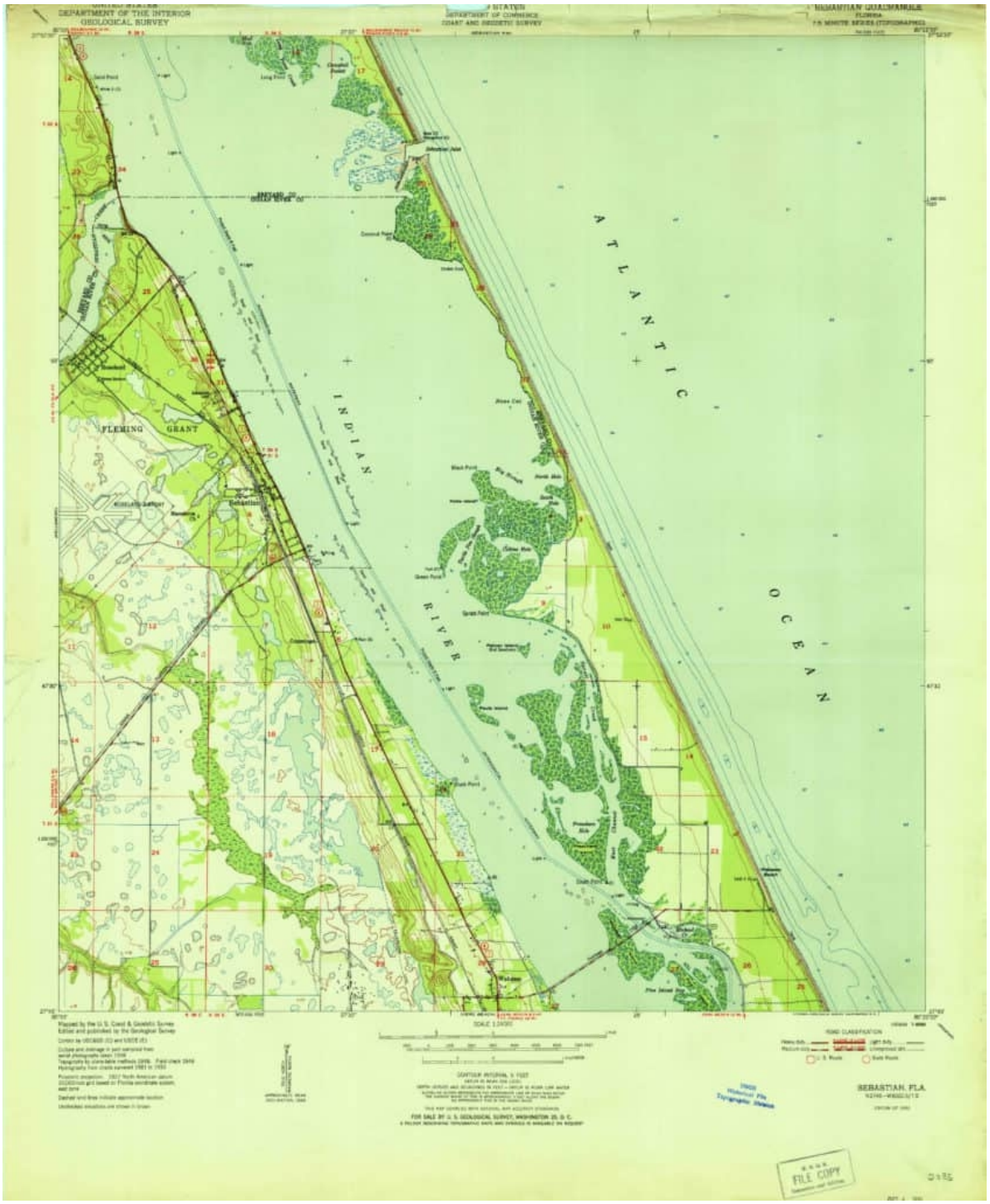
backpack for the electronics. Hundreds of thousands of land mine detectors based on his design were used by the Allies during World War II.

- Gerhard Fisher applied for the first metal detector patent in 1925. He was working on a system for navigation using radio waves, but found that the results were thrown off when his device was near rocks that contained a lot of metal. He realized he could use this to make a metal detector, and applied for the patent.
- Metal detectors are used in archaeology to find metal artifacts. The first recorded use was by a military historian in 1958. Don

Rickey used a metal detector to map the site of the Battle of the Little Bighorn.

- The first use of metal detectors at airports was in the United States, in 1972. A company in Finland, Outokumpu, made the first walk-though security detectors.

Where Should I Go Metal Detecting?



All this equipment won’t do you any good if you don’t go looking in the right place.

First, you need to decide what you’re looking for. Then, do some research on places that may turn up those items.

A good first step is the local library, which often will have old records and maps of the area.

You can compare these old maps to new satellite images and see where old structures once stood and now are abandoned in the forest.

This kind of research can give you great insight into how an area used to be a couple decades or even centuries back.

Consider perusing old newspapers, as they may also reference places in the area which are worth your time and interest.

In a similar vein, if your city or town has a local historical society, there may be people and resources there who can help you.

Local historical societies often keep archival records, and knowledgeable staff members can likely point you in the right direction.

You can also find old maps online, for example, through the Library of Congress, Old Maps Online, or Historic Map Works.

If you’re planning to look in coastal areas, check old navigational charts to see how the coastline has shifted.

You’d be surprised how much the ocean can move in some areas and this can open up opportunities for metal detecting.

If you’re detecting in the United States, you can take advantage of the app Clio, which is searchable by location and maps out nearby sites of historical interest, from old battlefields and schools to historic homes and parks.

Another good way of getting information is reading metal detecting guide books, but you should be aware that basically anything in them is well-known enough to be fairly picked over.

That is one of the advantages of metal detecting on private property, as you may well be the first person to ever search the area around an abandoned farmhouse since its owners left in in the Great Depression.

Of course, exercise caution around old buildings, but they can often have really neat things hidden inside or in the vicinity which your metal detector can find.

Some areas even have historical aerial photos, which allow you to see change over time in a way that even an old map isn’t able to.

Check out Historic Aerials if you’re interested in trying out this tactic. The site allows you to compare new aerial maps to historic ones, showing you at a glance how things have changed in your area over the past few decades.

You can even talk with people who know the area well.

While of course no one alive today lived through the Civil War, someone who has lived since the 1940s may have a memory of a building or other place related to the war which once stood in a certain area and is now collapsed into ruin. So don’t be hesitant to ask around a local bar or café; you never know what you’ll find out or how many new friends you’ll make.

All in all, you really do have a lot of options when it comes to researching the areas you want to search.

Before you actually head out into the field, conduct some thorough research, make sure you have a firm grasp of what you're looking for, and know the area well enough to be confident of your metal detecting plan.

The Best Places to Use a Metal Detector?

You can find buried treasure almost anywhere. Whether you're looking for ancient relics, coins, jewellery or gold nuggets, there's plenty to be uncovered.

Choosing the right search site increases the chance of a big find though. Places with heavy footfall to replenish items, sites of historical activity, or

those that haven’t been searched by other detectorists, are often the most fruitful.

There’s a problem though: the best search locations are nearly always private property (aside from some beaches.)

After all, trespassing with a metal detector is still trespassing. So you need to check the rules and ask if there’s any doubt. There can be serious consequences for getting caught – including fines and your metal detector being confiscated – so it’s not worth the risk.

Don’t be put off though!

Getting permission isn’t always easy, but you’ll be surprised at how often it’s possible – even when dealing with private landowners. The key is to choose the right hunting grounds, so when you get permission the chances of a big find are higher.

To help you on your quest for hidden treasure, here are ten of the best places to hunt.

1. Your Yard

Your back yard might not be the most exciting place to search for treasure, but it’s a great place to test a new detector and drill that smooth, long

sweep.

There’s always the chance of finding an unexpected item too. You never know what coins, jewellery or other items you or previous owners could have dropped.

Your back yard is also one of the few places you don’t need to worry about getting permission!

2. Land Owned by Friends and Family

Once you’ve exhausted your back yard, the obvious next step is to ask friends and family if you can search their property. Yards are often small and unlikely to contain ancient relics, but there’s always a chance of an exciting find.

You can even take this a step further and ask people with large gardens in your neighbourhood. As long as you’re polite and open about your plans, many people will be intrigued by what’s hiding in their garden.

3. Sports Stadiums

Loads of coins and other valuable items are lost at sporting events. People are distracted, jumping around, and generally not concentrating on what could be falling out of their pockets.

The downside is that many detectorists know this. So, for best results, aim to get to a stadium or bleachers soon after a game ends.

Sports stadiums are private property, so make sure you get written permission.

4. Parks

The general rule of metal detecting sites is that more footfall leads to more lost items.

As this is the case, parks are one of the best places to search for coins or jewellery. Items are constantly replenished by people having picnics, playing games or just walking their dog. Searching after events or public gatherings can yield even better results.

You’ll usually need permission to dig plugs in public parks though. Be prepared for odd looks from other park users too.

5. Beaches

The combination of water, slippery sun lotion, and playing vigorous games makes it easy to lose items at the beach.

This means jewellery, coins and other valuables are replenished each day. Tidal forces also uncover older items, making beaches one of the best places to hunt.

Most public beaches allow metal detecting, although you may still need to apply for a permit. Private beaches are a different matter, as you’ll need written permission.

The only downside to beach metal detecting is that it can be a competitive spot. Try to go late on busy days or after storms for the best chance of finding a valuable item.

Tip: Tides often wash several items into pockets. Make sure you keep scanning after finding an item, as there may be multiple in the same location.

6. Prospect for Gold in Known Hunting Grounds

Relics, jewellery and coins can be found almost anywhere. But gold nuggets tend to be found in more specific locations.

For this reason, gold prospecting requires in-depth research and an understanding of where nuggets are most likely to be uncovered. As a beginner, stick to places where large gold nuggets have been found in the past, as this increases the chance of a similar find.

You'll also need a different type of detector when searching for gold. High-frequency VLF or pulse induction detectors are best for cutting through mineralisation and detecting small nuggets.

7. Churches

Buildings come and go, but churches have often occupied the same location for hundreds of years. This makes them prime spots for finding both modern jewellery and older artefacts.

Of course, you should always get permission and never search burial grounds. Doing so is disrespectful and is likely to get you quickly thrown out.

Instead, concentrate on where people might sit or walk. The ground around big trees and pathways are good places to start.

8. Battlefields

There are hundreds of civil war battlefields across the United States. And in Europe, there are battlefields from both ancient times and both world wars. If you're interested in finding historical items, these sites are an excellent choice.

The downside is that major battle sites have been searched many times by other detectorists. That doesn't mean you won't get lucky though.

If you find a historical item, track the location and tell the local archaeology department. They'll be grateful to hear about what you've found.

9. Woodland

Dog walkers, trail runners, mountain bikers and hikers regularly use woodland paths. This makes them a great place to find dropped items.

There’s also the chance of finding older relics in woodland. Trails and footpaths might change over the years, but you can bet people walked the same woodlands in the past – especially if it’s close to a town.

As with all locations, check whether you need permission. Just because woodland has a public path doesn’t mean you’re allowed to detect there.

10. Fields

It’s not a coincidence that many of the biggest metal detecting finds have been in fields. Farming land has often been used for centuries and may not have been searched before.

Ploughed fields can be particularly fertile hunting grounds. Older soil is recycled to the surface, bringing hidden objects with it.

While any field can yield buried treasure, spending time researching can pay off. Are there fields in your local area that hosted a historical event? Was there once an old farmhouse? Or did the town use a certain field for local meetings?

Your library is a good place to start researching, as you can find local plans, newspapers and other historical documentation. It can also be helpful to talk to people who’ve lived in the area for a long time.

Of course, you’ll need written permission to hunt in private fields. If you can get access, there might be some big hauls waiting though.

The Relevant Laws and Regulations Concerning Metal Detecting

Now that you've got your equipment sorted out and gotten some ideas for metal detecting locations, it's important to talk rules and regulations. After all, you can't just walk anywhere you want and start searching.

There are rules to abide by, some written in law, others more like guidelines. All must be respected.

So here are some ideas for making sure you don't break laws or cause harm to anyone or anything while metal detecting.

First off, in the United States it is not legal for you to roll into a National Park and begin looking for artifacts with your metal detector.

It would be awkward if the police caught you digging up buttons in the middle of Gettysburg National Battlefield, so don't. In fact, it would be a lot worse than awkward.

Metal detecting in National parks is a crime, as is relic hunting and removing artifacts. Doing so could land you in serious trouble: you may be arrested, prosecuted for a felony, fined up to $10,000, and/or imprisoned. Plus, your awesome new equipment will likely be confiscated.

Where are you potentially permitted to dig?

You'll have better luck with city parks, public schools, beaches, and private property—but you'll still need to acquire the proper permissions.

Before starting your hunt, make sure you check with the authorities who run the given area.

Want to go metal detecting in a local park? Contact the town government or local law enforcement.

Interested in looking for artifacts on school properties? Give the school district superintendent a call to acquire permission to metal detect on school grounds all over the district.

In general, and especially if you're on public land, it's a good idea to get written permission from the owner or administrator of the area. Bring this written permission with you when you search in case anyone questions your right to be there.

A great place to look for buried treasures is on private land, especially since there you are not bound by public land regulations. Simply ask the owner for permission to metal detect and dig on the property.

It often helps if you explain your basic procedure to property owners, letting them know that you dig only small plugs and leave the land just as you found it. If you feel uncomfortable with knocking on someone's door to ask permission, try sending a letter instead.

As long as you follow these common-sense rules, you should be safe from trouble while out metal detecting.

Metal Detecting Etiquette

Etiquette for metal detecting can be defined as a form of ethical behavior regarding metal detectorist responsibility, the actions of detectorist in their dealings with each other, the use of land, abiding by the law, practicing correct and acceptable social behavior in the field and by adhering to the Metal Detecting Code of Ethics.

These guidelines will ensure that you don’t do any damage or give metal detectorists a bad name.

As a good first rule, do no harm.

This applies to life as a whole, but you need to be careful of it here, since when you metal detect you can end up digging quite a few holes. Fill them in. No exceptions.

Be conscientious about where you dig and make sure you leave everything looking about the same way you found it.

If you get permission to dig on private land and in the process you dig two hundred holes, none of which you fill in, that is a surefire way of never being allowed back on that land. And the landowner will probably never let any metal detectorist on their property again because of those damages.

You’re bound to find more junk than treasure. So what to do with all the rusty nails or bolts or soda cans?

It’s bad form to leave them just lying there in the dirt, so pick up and pack out any trash you may find. If nothing else, you will make the area you’re

searching a cleaner, safer place for everybody.

Also, cleaning an area up will absolutely help the reputation of metal detectorists like you in that area, so be considerate and do what you can to pick up trash and improve the area.

Time to Metal Detecting

1) Learn how to use your metal detector

This should happen before you take off on a major treasure hunt.

Your detector almost certainly arrives with a manual or instructional DVD, and there are also plenty of model-specific tutorials you can search for online. Do your homework, then get outside and give it a try!

2) Once you're in your location, you'll start your search

It's a common misconception that you need to stare at your metal detector's screen to know when you've hit the jackpot—actually, it's most important to listen.

Your machine will make a number of bleeps in different tones, which you'll learn to interpret as you gain experience. If you have trouble hearing your detector over background noise, try using headphones.

3) Walk slowly.

If you powerwalk around, you're bound to miss things. Keep the coil low and close to the ground—but not too close. It shouldn't touch or bump into the ground, just hover over it.

4) Got a good signal? It's time to dig a plug

To learn how to do this, it's easiest to watch a tutorial on YouTube. With a little hands-on practice, you'll get the hang of it in no time.

Let's say you're hunting on a lawn: In essence, the plug is a small hole cut in a U-shape that remains connected on one side to the grass. This allows you to flip it back over and replace it in the ground once you're retrieved your target. A good plug is at least 3" or so deep to avoid severing the grass roots.

5) Can you see your target immediately? If not, get out your pinpointer and put it in the hole

The pinpointer will let you know (by beeping or vibrating) when you're super close to your find and will direct where you should look. This way, you avoid digging up a massive hole and can get straight to your target.

6) Place your finds in a pouch or pack

If you want to clean your finds (***not always advisable: more on this below), you can do so with a soft toothbrush or similar implement before you stow them away.

If you've just found junk, you should pack that away too, ideally in a different section of your container.

7) Replace any loose dirt into the hole

And flip your plug back down into the ground.

8) Keep hunting!

Where to go next time? It's sensible to switch up your locations.

Once you've thoroughly searched a particular area, you're unlikely to turn up anything good the very next week.

Whether you rotate through a few favorite spots or always try somewhere new is up to you.

Should We Clean Our Finds?

Let’s say you’ve had a successful day and you’re now holding some 18th century French coins once lost in the Ohio River Valley! What do you do with these? Well you have a couple of solid options.

Many metal detectorists keep their finds for their own personal collections.

As I said earlier, a natural curiosity about local history is a strong motivator to go metal detecting in the first place, so those French coins would make a fine addition to a collection and give a good reference point for, say, an interest in the Seven Years’ War.

If you plan to keep your finds, then you may want to consider cleaning them so that you can maximize your appreciation of them.

There are several ways to clean old metal items, but the simplest is to use warm water and gentle soap. Rub gently with a cloth or soft brush to

remove stubborn dirt or debris.

However, if you think you may want to sell your finds, or if you are a historical collector who values authenticity highly, do not clean your finds. This is especially true for coins, but goes for other objects too.

Remember that Winchester Model 1873 rifle found leaning against a tree in the Nevada wilderness back in 2014?

Well in case you don’t, a National Park employee found a Winchester Model 1873 rifle made in 1882 just leaning against a tree in Great Basin National Park. This rifle went to a museum, naturally, since it was found in a National Park (remember what I said earlier about that?).

Museum conservationists took great pains to conserve this antique gun in its present condition and prevent further damage—but otherwise altering or restoring it was out of the question.

Now what if you found a gun like this on private land out there in Nevada? Well, whatever it was worth to a vintage arms collector would be greatly reduced if you went and cleaned it up, or even worse, refinished it.

The same goes for cleaning a coin. To a rare coin collector, the coin is worth most in its found condition, uncleaned.

Cleaning a coin will almost certainly damage it, either by leave abrasions on its surface from scrubbing it, no matter how gentle you are, or by depositing chemical residues from any cleaning agents you use.

So if you may have any plans of selling your finds, keep them in their original condition!

25 Metal Detecting Tips for Beginners

Tip #1. Expect to find more trash than treasure. Along the way, you will probably encounter a lot of junk. You'll find a lot of pennies, bottle caps, and trash, but don't give up. Just keep searching.

Tip #2. The more you search, the more you find. Persistence is key when you are using your first metal detector. The more time you spend searching, the more likely you are to find something really amazing!

Tip #3. Buy the best metal detector you can afford. Even if you are working on a small budget, get the best detector you can afford. Don’t scrimp when it comes to quality. It only means you’ll have to spend even more money to upgrade in the future.

Tip #4. For relic hunting, look for the local hot spot. Visit the library, local historians, and your city hall to find out about historic places in your city and then start searching there to find relics.

Tip #5. Avoid high traffic times. If you are searching in public places, avoid times when foot traffic is highest or you could end up drawing a crowd and spending more time answering questions than digging for treasure.

Tip #6. Dig everything. When you’re just getting started, it’s nearly impossible to know if a signal is trash or treasure so dig everything. You don’t want to miss something good!

Tip #7. Start in your own backyard. While you’re learning the ropes, try searching in your own backyard or in a deserted area near your home. It will give you time to play with the settings and determine what works best.

Tip #8. Hunt after rain. Wet ground is much better suited for conductivity and it will make it much easier to find treasure hidden deep below the surface if the ground is wet.

Tip #9. Rotate your hunting spots. If you didn’t find something at the park yesterday, you aren’t likely to find something today. However, if you go back in a few months or a year, you might discover something amazing. Rotate between spots to give yourself a better shot at finding new treasures.

Tip #10. Be respectful. Cover up your holes after you are done digging. Don’t leave trash behind. Be careful to respect the people and the land or you might find that you are no longer welcome to hunt in your favorite areas.

Tip #11. Carry a sack. Always take along a metal detecting bag to collect your finds. Even if you dig up trash, take it with you and don’t leave it behind. It will be one less false signal to worry with later.

Tip #12. Be nice to nosy strangers. You’ll probably get some funny looks if you are MDing in busy areas, but just smile and keep moving. If you can

avoid the crowd, that’s always better, but sometimes you just have to do your best to keep your head down and keep moving.

Tip #13. Search early in the day or late in the evening. This will reduce your chances of encountering big groups of people or having someone try to run you off. With that said, there are some that do indeed opt for night detecting.

Tip #14. Slightly overlap your sweep. When you’re moving the metal detector in a sweeping motion, be careful to overlap your sweeps so you don’t miss any potential targets.

Tip #15. Slow down! If you are moving too fast, you might miss something important!

Tip #16. Keep the coils parallel to the ground. Sometimes you might have the tendency to accidentally lift your coil at the end of a sweep, but be careful to avoid this, as you are losing potential targets.

Tip #17. Don’t discard faint signals. A common rookie mistake is to only dig on strong signals, but don’t skip those faint sounds because they could be great finds hidden at greater depths.

Tip #18. Sweep the surface before you dig. If you hear a signal, take a second to clear away the top layer of dirt before you start digging. Once the top layer is moved, use your metal detector to do another sweep. If the signal is gone, it was probably a small piece of trash or mineralization in the dirt and you need to move on.

Tip #19. One treasure often means two. If you dig up something extraordinary, then spend some time searching in the same area because oftentimes, you will find several great finds in the same spot.

Tip #20. Choose comfortable headphones. You’re going to be wearing them for a while so you don’t want your ears to feel itchy and irritated.

Tip #21. Hit the beach. The beach is one of the most lucrative places to hunt because there are constantly new people coming through and losing earrings, rings, bracelets, and other items.

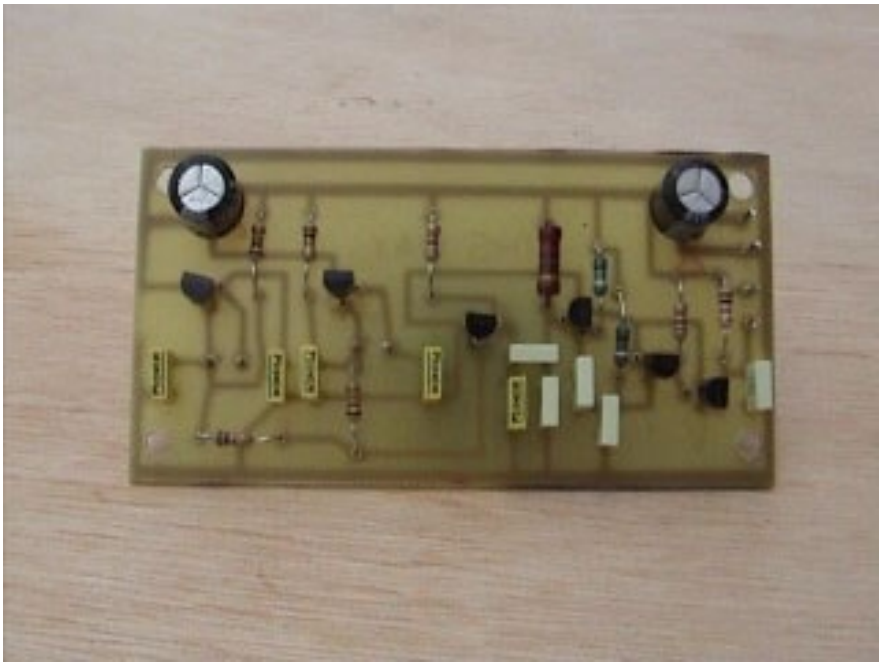
Tip #22. Talk to other metal detector enthusiasts. They might have tips on places to search in your area. Some cities even have metal detecting meetups you can join!

Tip #23. Keep a record of your finds. Every time you hunt, keep a record of where you went and what you found. This will help you keep track of your sites and rotate them accordingly.

Tip #24. Hunt in the springtime. This is a prime time of year for detecting because the winter weather has thawed away and anything that was left behind will be lingering near the surface.

Tip #25. Use smaller coils in trashy areas. If you are searching in an area that is covered in trash, use a smaller coil for better target discrimination. Opt for a coil that is no more than six inches for best results.

How to Make A Metal Detector



Simple BFO metal detector

BFO (beat frequency oscillator) metal detectors use two oscillators, each of which produces a radio frequency. One of these oscillators uses a coil of wire that we call the search loop. The second oscillator uses a much smaller coil of wire, and is usually inside the control box and is called the reference

oscillator. By adjusting the oscillators so their frequencies are very nearly the same, the difference between them is made audible as a beat note, this beat note changes slightly when the search loop is moved over or near to a piece of metal. It has been found in practice best to make the search oscillator fixed say at 100khz and to arrange for the reference oscillator to be adjustable 100khz plus or minus 250hz. This gives a beat note of 250hz to 0 to 250hz. The beat note disappears or nulls when the two oscillators are about equal. This type of detector is most sensitive when the beat note is close to zero, about 5hz (motor boating) any slight change being noticeable.

Parts list

Power source:

Any 9v battery PP3 is ideal.

Capacitors:

- 2 off 220uF 16v electrolytic.
- 5 off .01uF polyester.
- 5 off .1uF polyester.

Resistors:

- All resistors 1/4 watt 5%
- 6 off 10k
- 1 off 1K
- 1 off 2.2m ===== 2.2 Mega ohm
- 2 off 39k

Transistors:

All BC 184B, or 2N3904, or 2N2222A. Just about any small signal npn with a gain of 250+ will do. There are hundreds to choose from.

Audio output:

A 2.5 inch 8 ohm speaker will work but headphones or earpiece are preferable the higher the impedance the better.

Many of the above parts could be salvaged from a broken transistor radio, or purchased from companies like RS Components, Maplin Electronics, Farnell, or Digikey who's adds often appear at the top of this page..

Once the components have been obtained the circuit can be built in a few hours using copper clad stripboard, or if you have the facilities make a printed circuit board using the layout below. The original layout as below should print out at about 50mm x 100mm.

Coils

This is the only tricky part. The search loop is best wound on to a plywood former. Method 1: Cut three circles from some 3mm plywood, one 15cm diameter and two 16cm diameter. Using wood glue make a sandwich with the 15cm circle in the center. When the glue has set you can wind 10 turns of . 25 mm enameled copper wire around the groove in the edge of the former. Connect this coil when finished to the points marked coil 1 on the schematic. Method 2: Cut a 16mm diameter circle from some 10mm plywood. Then with this circle clamped in a vice run a saw around the edge of the circle so as to make a slot about 5mm deep and 2mm wide around the edge to accommodate the windings. If you have access to an oscilloscope or frequency counter make a note of the frequency. Ideally This coil will be oscillating at about 104khz, with an amplitude of about .5v p to p. The second or reference oscillator needs to be made much smaller and if possible attached to the control box so it can be adjusted as the detector is used. To make a really good adjustable reference oscillator you will have to visit a DIY store, what you need are some plastic water fittings, two examples are shown below. The smaller one is the inlet pipe to a plastic ball valve assembly fitted with a brass nut. The larger one is a plastic tank connector fitted with a brass nut from an old tap. Both of these work well and are glued to the control box in a position where they can be adjusted. The reference coil itself is wound on a piece of wood or plastic about 10/12mm diameter and about 50mm long The actual number of turns of this coil depends on the diameter of the former and can only be found by experiment. Start with about 125 turns . 25 enameled copper wire (this coil when finished has to fit inside the plastic tube) and remove turns until the two frequencies are close. This coil is attached to the circuit board at points marked coil 2. If all is well the detector should be howling at this point.

When the two oscillators are well matched it should be possible by adjusting the brass nut in or out to bring the beat note to a halt or null.

Note. On the working detector shown in these pictures we wound 10 turns on to the searchcoil which then oscillated at 104 khz. Then we wound on to a piece of 12mm dia x 50mm long wooden dowel (taken from a bird cage) 120 turns of wire. This was pushed inside inside a threaded plastic tube from a ball valve assembly. This oscillated at 96 khz without the brass nut and increased gradually as the brass nut was screwed on up to 106 khz. This was perfect for tuning the detector.

Searchcoil made from 10mm thick plywood

The reference coil (tuning coil) is wound on to a piece of wooden dowel about 12mm diameter x 50mm long. This has to fit inside the plastic pipe fitting above, and is tuned by moving the brass nut. Drill a very small hole 1mm dia through each end of the dowel so you can pass the ends of the wire through these holes to keep the windings in place.

This large coil is 30cm wide by 60cm long (12 inches by 24 inches) and is made from 10mm plywood. It has 5 turns of wire in a 3mm deep groove cut around the edge with a saw. it oscillates at 104 khz . If you want to make different size coils start with the big one, as with only 5 turns you can only alter it in big jumps eg. 4 turns = 115 khz and 6 turns = 85khz . next make the reference coil to match. next make the next smallest coil and so on. The smaller coils are easier to match up as adding or removing a turn at a time only alters the frequency in small amounts.

This 600x600 coil made from plastic overflow pipe and bends from B&Q has 4 turns of 7/0.2 plastic coated wire and gives a really good signal on something like a manhole cover. It needs a very small amount of thin paint run around the inside to stop the wire from vibrating

Building a practical detector for outdoor use will depend on the skills a materials at your disposal. The golden rule with metal detectors is keep it lightweight. Avoid using heavy materials such as hardwood or perspex. The round search loop needs to be glued of fixed to a wooden/plastic handle, With the circuit board inside a small plastic box at the other end for balance. You will need to adjust the reference oscillator quite often when using.

The simplest way to make this is to use copper clad stripboard (.1 inch) track spacing , but can be prone to errors. Examine the stripboard with a magnifying glass to begin with. Make sure there are no cuts in the tracks, Or short circuits (careless soldering) between the tracks. If you cut the stripboard tiny wiskers of copper can somtimes get accross the tracks. To drive you mad. If you make breaks in the tracks use a small sharp 3mm drill bit with your fingers. (not a hammer drill).

Coil A = search coil: Coil B = reference coil: B + = The red battery lead from 9v PP3 or similar

B - = the black battery lead. You can put the on/off switch in the red or black battery lead .

Notes for the electronics beginner.

2 off 220uf / 16v Electrolytic : These are 220 microfarad / 16v working voltage. You can use a higher working voltage but not less. Higher working voltage capacitors work just the same but they get physically bigger. They have a negative lead that must be connected to the battery - track. These components must go in the correct way round.

5 off .1 and .01 polyester : These also have a working voltage. 63 volt in quite common and will be ideal. If you want to use the pcb layout above you will need capacitors with 5mm lead spacing. .1 can be marked as .1 or 100n or sometimes 104 : .01 can be marked as .01 or 10n or sometimes 103. These components can go in any way round.

All resistors 1/4 watt 5%: These are general purpose carbon film resistors with a 5% tolerance and rated at 1/4 watt. You could use resistors of a higher wattage as this does not affect the working they just get bigger. 1 watt or bigger will not fit on the board. These components can go in any way round.

Transistors: The bc 184b transistor is described has Audio, low current, general purpose NPN . These are quite easy to get in the UK but may be difficult to get in other countries. There are hundreds of types of small plastic NPN transistors available around the world and just about all will work in this circuit. You will have to be sure of the pinouts though. You can get the pinouts for most transistors from manufacturers websites. This will

be the most likely problem area when building this project. These components must be connected correctly. PNP types won't work.

Other Transistors: 2N 3904 --2N2222A --BC183--most small npn transistors will work.