Metal Detector Ergonomics

Whether you've been detecting for years or are considering the purchase of your first detector, you want to be as comfortable as possible, for as long as possible, when you're out in the field swinging. No matter the brand or model you are using, detector ergonomics comes down to three things: how your hand grips the detector, the weight and balance of the detector, and the ability to adjust the handle length. A machine with excellent ergonomic design means less strain on your wrist, arm, shoulder, and back.

• There are two types of handle designs used by detector manufactures: the "L" shaped handle and "S" shape. Most detectorists find that the "L" shaped handle helps to reduce the load on the wrist when you swing the search coil. In contrast, gripping the "S" shaped handle tips your hand slightly downward. This slight downward tilt of the hand could put an unnatural strain on your wrist and forearm, and over time could extend to your shoulder. It's really a matter of personal preference and comfort, so just be aware of the two handle designs and which might work the best for you.

• The second ergonomic issue is the weight of the detector and how the weight is distributed on the detector's handle when batteries are in place. A well balanced detector will have equal weight before and after the grip, which is the best possible situation for swinging the search coil for a long period of time. For the "L" shaped handle, the electronics are placed directly above the hand grip, and usually the batteries are placed under the forearm for added balance to the overall assembly. This brings the balance point very close to the hand grip, but still slightly forward of the grip point, which is ideal.

• The ability to adjust the lower handle to the correct length for good upright posture while swinging the search coil cannot be over-emphasized. This adjustment will reduce strain on your shoulder and back. Improper adjustment can cause you to bend over while swinging the coil and may result in lower back pain. Ouch!

Other ergonomic issues to consider for maximum comfort and enjoyment while detecting is the audio controls. The audio output should be stereo and the volume control should cover a wide range so when you hear a signal, you can discern what the target is made of. Also, if your detector has an LCD display, the display information should be large and readable, even in bright sunlight.

Several top companies such as Garrett, Fisher and Tesoro have perfected the modern art of metal detecting. With each new machine that comes to market, the features and success rate just keeps getting better. Learn more about metal detectors here.

Beachcombing with Your Metal Detector

From dry sand to deep salt water, match your detector to the conditions.

Water and sunscreen have a sneaky way of slipping rings from fingers of swimmers and sunbathers, making beaches a lucrative location for metal detecting. Recovering an object from sand is pretty easy, too, especially compared to digging in hard ground. Necklaces, watches, and bracelets are also great finds on beaches, along with coins— lots of coins. Although some beaches can yield historic artifacts, most finds will likely be of the modern variety.

WHEN TO GO. Purist beach detectorists will argue that the best time to find goodies on a beach is after winter storms. While that's certainly true, summer crowds can mean a fresh crop of coinage and jewelry just waiting to be found by the average beachcomber everyday.

WHAT TO TAKE. Beach hunting can be done on the dry sand or out in the water where many more rings are lost. Salt water beaches present special problems (mineralization) and you must determine if you will hunt only in dry sand, dip the coil under water in the shallows, or desire a totally submersible machine suitable for deep water wading or diving. All quality metal detectors have submersible search coils but not all control boxes are waterproof or suitable for the pressures of deep water diving, so match your detector to the type of detecting you'll do.

In all types of beach hunting, the discrimination must be kept very low, eliminating only small iron (bobby pins and nails). Aluminum pull tabs and tin foil should not be discriminated or you will lose some gold and/or platinum rings as well. Some beach hunters operate with zero discrimination and dig everything. Use of a sand scoop makes target recovery fast and easy.

If you plan to hunt only in dry sand and in very shallow water, a good coin shooting detector will work well if you keep the discrimination set low. If you wish to go out into deeper water you will need a totally submersible machine. Some machines have a single tone for all targets and some have variable tones for different targets. It's important to realize that most gold rings will read in the "middle" tones (above iron but below coins).

All metal detectors work well in the dry ocean sand but most single frequency detectors become erratic in the wet salt sand or in the surf. Wet salt makes the ground conductive and the detector sees the sand as a large sheet of metal. In order to operate in those areas with most single frequency instruments, you must decrease the sensitivity of the detector and it may still operate erratically. If you only occasionally visit the ocean and own an instrument that becomes erratic in wet salt sand, you can still operate perfectly in the dry sand area. If you live near the ocean, or get to the ocean frequently, consider investing in a detector that will operate well in all conditions including wet salt sand. Those detectors are generally higher priced than multi-purpose detectors, but they are definitely worth the investment if you frequent the ocean.

SUMMARY. For best results on beaches, keep your discrimination levels low, tonal ID gives you an advantage, and purchase a fully submersible machine if you wish to hunt deeper water. If you plan on hunting salt water areas often invest in a machine designed for those conditions. *Note: Fisher Metal Detectors provided some information for this article.*

Treasure Hunting

When treasure hunting with your detector for coins, relics, or jewelry, use your imagination — anywhere people are likely to have lost something or left something behind is a likely place to dig up good finds! Right under your feet might be a good place to start! You never know what you'll find in your own backyard. Today it is easier and more productive than ever before to go treasure hunting. The metal detecting hobby has gone to a whole new level using state of the art technology that makes metal detecting equipment more high tech than ever! Gone are the days of just listening for "beeps" and digging up who knows what. Now, metal detectors can actually speak to you and tell you what it is you've found before you even have to dig!

There really is still plenty of treasure to be found around the world. To help you get started, here is a short list of locations that are generally more productive for finding coins, relics, or jewelry. Just be sure local laws permit the use of a metal detector. Many state and national parks or historic sites do not. Be sure to first ask permission to treasure hunt on private property.

- picnic areas
- playgrounds at schools and parks
- campgrounds
- ploughed fields and pastures
- new construction sites

- woodlands
- ghost towns
- old homesteads
- sports fields, showgrounds, and racecourses
- swimming holes, beaches, jetties, and piers

Do you suffer from GOLD FEVER?! Want to get out there and get your share of the gold but the idea of panning, sluicing, highbanking, or using another piece of gold mining equipment just isn't your idea of fun? That's OK because gold prospecting with a metal detector is becoming more and more popular. The lure of uncovering a gold nugget of any size is addictive, so you'll see people everywhere swinging a detector, listening intently through their headphones for that magic tone that says DIG! Gold detectors are not necessarily higher in cost, but they are built with a higher sensitivity to detecting gold nuggets, have better ground balancing and discrimination abilities. So whether you're looking for gold in Arizona or Australia, searching volcanic rockslides in the Pacific Northwest, or hunting the black sand areas along a waterway, just be sure to choose a gold detector made for the task!

In addition to the desert, woods, and open fields, remember that gold can be found on beaches, too— in the form of lost gold jewelry such as rings, necklaces, watches, and more. Suntan oils have a way of slipping those precious items off unwary swimmers and sunbathers! Of course gold coins from long-ago shipwrecks also wash up on beaches, so very valuable old coins can be uncovered as well.

Tips for Treasure Hunting for GOLD: Generally speaking, the best way to hunt for gold nuggets with a metal detector is to hunt in the All Metal mode. Nuggets, depending on their size, shape, purity, and orientation in the ground, will all create different signals. If you hunt in the Discriminate mode, some nuggets may be lost. The best way to get rid of iron is to search in the All Metal mode and then check the targets in the Discriminate mode. This allows you to search and find all of the possible gold nuggets. Checking the targets with the Discriminate mode turned up just high enough to knock out the small iron will give you much more information before you decide to dig. Practice this by doing air tests to see the best setting for your particular metal detector.

What is a Hot Rock?
A hot rock causes a metal detector to sound off because it contains iron minerals. Hot rocks can be a real nuisance, especially when detecting for gold nuggets. There are two basic types of hot rocks:

Negative hot rocks (also called cold rocks) are usually magnetite or contain magnetite, and give a negative response because their ground balance value is a higher number than the soil they are found in. They tend to be dark in color, usually black, and usually heavy. In some cases they will have rust stains. They are usually attracted to a magnet.

Positive hot rocks are iron-bearing rocks which have been oxidized by natural weathering so that their Ground Balance number is a number lower than the soil they are found in. They are often small, right on the surface, sound just like a gold nugget, and are common in many gold prospecting areas. They are usually, but not always, drawn to a magnet. They are most often reddish in color but are often black, brown, or yellow. On relic hunting sites, red clay bricks and rocks which have lined a fireplace or a campfire will often be hot rocks.

Whether you're a beginner or pro, there's a metal detector for every purpose and budget. Whether you're thinking of buying your first metal detector, or it's time to upgrade, consider these brands: Tesoro (Spanish for "treasure"), Garrett, Fisher (the oldest brand of detectors), Bounty Hunter (offers lower priced models). Mine Lab and Teknetics.

Metal Detecting

Metal detecting is a hobby that can actually pay you back! It is one of the most fun ways to find gold and other metallic treasures such as coins, jewelry, and relics. It has practical applications, too, beyond hunting for buried treasure. You can locate pipes underground or hidden metal boundary markers. If you lose an earring or a key in tall grass, sand, or in a pond, a detector will find it quickly. It's so easy to have your metal detector ready to go in its carry bag with detecting accessories such as extra coils, a digger or scoop, headphones, and spare batteries. Just grab and go!

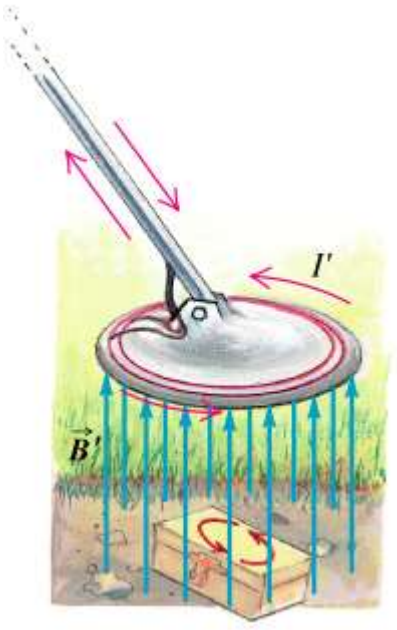
No doubt if you've bought a metal detector, where it's a Bounty Hunter, or Tesoro (Spanish for "treasure"), a Garrett, or Fisher (the oldest brand of detectors), or Teknetics, or another brand, you probably can't wait to use it. But what if you haven't quite made the decision yet as to which one to buy? Below are a few common Questions and Answers about metal detecting that might help you decide:

What is the best metal detector? This is probably the number one question that everyone asks. Unfortunately, there is no one single answer. Each metal detectorist usually has specific needs that cannot be met by one single detector. The easiest way to find the "best" detector is to evaluate YOUR detecting style, your experience level, what items you hope to find, and the time that you will spend metal detecting. After taking all of these things into consideration, then you will be able to find a metal detector that fits your needs and your budget.

Can one metal detector really do it all? Most metal detectors are designed to excel at one type of hunting or another but can be used for other types of hunting as well. For example, most gold detectors use some form of higher gain in the circuitry to get better sensitivity to small gold nuggets in the ground. While this is a good thing for prospectors, coin hunters may find it annoying that their detectors are picking up every piece of a pulltab that has been run over with a lawnmower. If you live by the water or travel there often, and will be mainly metal detecting on a beach, you might want a waterproof model, or want to use water resistant coil. The art of metal detector design is the art of compromise. By accenting certain characteristics of any detector, you take away from other features. Any metal detector that does it all may not work as well for very specific treasure hunting. Finding a detector with the features that will best suit YOUR hunting style is the most important choice you can make when deciding to puchase a metal detector.

Are detectors with a lot of knobs better than those with just a few? How much better is a $900 metal detector than a $200 metal detector? Generally speaking, the higher the price of a metal detector, the more features that it will have. More features translate into more knobs. The more features and/or knobs that a detector has, the more you are able to tune the metal detector to the type of hunting conditions that you are likely to encounter. With that being said, the downside to a large number of features is that even though you are able to fine tune the detector to match the local conditions, there are also more ways of setting up the detector incorrectly. Setting up a machine "wrong" may result in a decrease in depth and sensitivity and your $900 metal detector may be outdone by a $200 model! Reading and re-reading your Owner's Manual cannot be emphasized enough!

How Deep Do Metal Detectors Go? That depends on two things: the detector circuitry/coil design and environmental factors.



Coil and circuitry design determine the overall ability of any metal detector to find targets. During the design phase of any detector, the engineers decide which features to include. The things that they consider are the type of hunting and who will be using it. A beginner's model may not have the bells and whistles of the more professional models, but it will be easier to use. The more specific a metal detector's design, the narrower set of features it will have. Some detectors designed for ultimate depth will be hard for a beginner to use or may be too sensitive to use in trashy areas. Coil size will affect the depth of the metal detector but may not be suited for a particular type of hunting.

Environmental factors include just about everything except the detector and coil. Just a few of the things to take into consideration are the size and shape of the target, soil conditions, orientation of the target in the ground, content of the target, and any outside interference, such as electrical wires and radio or cell phone traffic. Weather conditions, such as rain-soaked ground, may also play a part in the depth and sensitivity of any detector.

With all that being said, an average metal detector using a stock coil in moderate ground should see the following targets with these ranges:

Dime to nickel: 4 to 8 inches
Quarter to half dollar: 6 to 12 inches
Dollar to fruit jar lid: 8 to 16 inches

Knowing your metal detector and using it properly are the two most important things that you can do to get the best depth and sensitivity out of any machine. Again, don't under estimate the importance of reading and understanding your detectors' Owners Manual!

All About Metal Detector Searchcoils

Searchcoil shape. Most searchcoils are round, but some are elliptical. This refers to the overall shape, not to the type of coil construction. In general, elliptical coils provide a broader sweep pattern over the ground, and narrower target response for better pinpointing. Round coils are easier to design and less expensive to manufacture, which is why they're the most common.

Searchcoil type of construction. The words "concentric" and "DD" (or "double-D") refer to the type of internal coil construction. Most searchcoils (whether round or elliptical) are of concentric construction. A concentric searchcoil has a large transmitter coil, and a smaller receiver coil in the center, usually in the same plane. This coil arrangement is relatively easy to manufacture and its symmetry helps to minimize electrical drift due to time and temperature. It also provides good discrimination on shallow targets. Some searchcoils (whether round or elliptical) are of DD construction. Double-D's comprise two overlapping D-shaped coils of approximately the same size, one being the transmitter and the other the receiver. The advantages of the DD are greater depth in mineralized soil, a broad sweep pattern, and narrower target response. Its primary disadvantages from a user's point of view are multiple responses on shallow targets and poor discrimination of flat iron objects. Designing and manufacturing them is more difficult because their lack of radial symmetry makes them prone to drift which the design and the manufacturing process must minimize. Manufacturing cost is higher because the coils cannot be wound on high-speed winding equipment.

Searchcoil size. Most standard searchcoils are approximately 8 inches (20 cm) in diameter if round, or approximately 10 inches in length if elliptical. Larger searchcoils allow covering more area with each sweep, and offer a slight increase in depth on medium and large size targets. Unfortunately they are heavier, more difficult to pinpoint with, tend to lose small targets, and provide poor target separation. Small searchcoils provide superior target separation (important in trashy areas) and the ability to detect smaller targets (important in gold prospecting). Of course they don’t cover as much ground as a standard size coil. However (and this may surprise you) small searchcoils usually have nearly as much depth capability as standard size searchcoils.

What’s on the market. The least expensive metal detectors usually come equipped with a round concentric searchcoil. The more expensive recent models often come equipped with an elliptical and/or DD searchcoil. Older models, even expensive ones, frequently don't have a DD searchcoil available because DD's fell out of favor during the 1980s and 1990s as the knowledge of how to make DD's did not advance fast enough to keep up with the demands of higher performance circuit designs. Nowadays there seems to be a trend toward DD's as manufacturers have gained more confidence in their ability to design and make them.

What users prefer. Double-D's are usually preferred for relic hunting and gold prospecting. Concentrics are usually preferred when searching for modern coins in an area where there is also iron and aluminum trash

Understanding Key Metal Detecting Concepts

Metal detecting is a fun, family-friendly hobby that not only gets you out into the great outdoors, but it can actually pay you back (try saying that about golf!). But if you're just getting started, some of the terminology and concepts can be a little confusing. The good thing is, no matter if you're prospecting for gold with your detector, hunting for relics on a beach, or coin shooting in a park, a few basic concepts pertain to all forms of detecting, and understanding them will improve your success. Consult your detector's operating manual for specific how-to

information.

Ground Balance is a variable setting that increases detection depth in mineralized ground (i.e., beach sand containing salts or soil with iron particles). These minerals respond to a detector's transmit field in a similar way that a target does, and because the land mass is so much greater compared to the buried target, the effect of mineralization can easily mask small targets. To correct the possibility of missing a great find, ground balancing your detector either manually or automatically removes the overall ground signals you don't need to hear, so you clearly hear the important target signals you want to dig.

Discrimination is a metal detector's ability to identify buried targets based on its conductive and/or ferrous properties. By accurately identifying a buried target you can decide to dig it up, or consider it trash and continue hunting.

The **Depth** that a metal detector can detect a target depends on a number of factors such as: level of ground mineralization where you are hunting, the size of the target, the shape of the target (round items can be detected deeper than long thin ones), the orientation of the target (coins lying flat can be detected deeper than a vertical coin), and what the target is made of.

Concentric coils refer to the type of internal construction of a searchcoil. A concentric searchcoil has a large transmitter coil, and a smaller receiver coil in the center, usually in the same plane. This coil arrangement generally provides good discrimination on shallow targets. Some searchcoils are of DD construction. **Double-D search coils** comprise two overlapping D-shaped coils of approximately the same size, one being the transmitter and the other the receiver. The advantages of the DD are greater depth in mineralized soil, a broad sweep pattern, and narrower target response.

Knowing your metal detector and using it properly are the two most important things that you can do to get the best depth and sensitivity out of any machine. Please always thoroughly read and follow your detector's operating manual (many which can be downloaded from this website). Here is where to shop for or get details about Garrett metal detectors, Fisher metal detectors, Tesoro metal detectors and other brands.

How Do Metal Detectors Work?

Metal detectors work by transmitting an electromagnetic field from the search coil into the ground. Any metal objects (targets) within the electromagnetic field will become energized and retransmit an electromagnetic field of their own. The detector's searchcoil receives the retransmitted field and alerts the user by producing a target response (various audio tones). This is how you know when to dig!

Battery: The battery provides the power to the detector.

Control Box: The control box contains the detector's electronics. This is where the transmit signal is generated and the receive signal is processed and converted into a target response.

Search Coil: The detector's coil transmits the electromagnetic field into the ground and receives the return electromagnetic field from a metal target.

Transmit Electromagnetic Field: The transmit electromagnetic field energizes targets to enable them to be detected.

Target: A target is any metal object (valuable or junk) that can be detected. Valuable targets are coins, gold, and relics. Junk targets are aluminum foil, pull tabs, modern nails and other trash. Unwanted junk targets are generally ferrous (attracted to a magnet). If your detector is set to reject unwanted targets than a target response (audio tone) will not be produced for those targets so you don't waste your time digging up junk.

Receive Electromagnetic Field: The receive electromagnetic field is generated from energized targets and is received by the search coil.

Target Response: When a good target is detected, the metal detector will product an audible tone such a beep. Most detectors also provide a visual display of target information.

How to Detect Old Homesteads

Is there an old homestead or barn that you'd love to swing your detector at but you're not sure how best to go about it since there's bound to be lots of trash mixed in with the treasure? First, be sure you have permission from the property owner. Even old abandoned buildings that are half falling down are owned by someone.

After you have the OK to hunt, follow these tips from expert Charles Garrett. Of course Mr. Garrett suggests using one of his own detectors such as the AT Gold or AT Pro for best results, but even if you own another brand of detector, his advice still applies: use a smaller size searchcoil, use minimum discrimination, and scan slowly.

• The use of a smaller size DD searchcoil configuration will provide you with the best ability to separate good targets from adjacent trash. Use a detector that has a visual target display and be sure to learn how your detector identifies targets both audibly and visually. Try to correlate the audible and visual signals before making a decision on digging a specific target.

• You will probably hear a steady reporting of sounds on old sites littered with iron junk. You can reduce the number of these signals by increasing your iron discrimination settings. Be aware, however, that the use of too much iron discrimination can cause you to miss good targets that are being masked by iron trash. Use as little discrimination as possible. You might be surprised at what others have missed on an old home site where they searched using maximum levels of discrimination.

• For the greatest depth and sensitivity, use headphones and set your controls for the faintest threshold you can hear. Cover old sites methodically and thoroughly. What does this mean? SLOW DOWN! Move along old home sites slowly and cross over the same area from different directions. Because of iron trash items, good targets may sometimes only present just a hint of a good signal— and sometimes only from one approach direction.

Whenever you're out detecting, remember to leave all structures and the ground around them in better condition than you found them. Good luck!

Tips for Finding Gold with a Metal Detector

At first glance, metal detecting seems like the least demanding form of prospecting for gold. But it has its share of challenges, too, just like sluicing, drywashing, or panning by hand. Whether you've been swinging a metal detector for years, or just purchased your first machine, there might be a few things you could do to increase your chances of uncovering a piece of buried gold.

• Properly tune your detector. Whether it's a $200 or a $10,000 model, the settings are important to get right -- especially Ground Balancing and Gain/Sensitivity. Goldfields are usually heavily mineralized, which can make it

really frustrating to know a false target from a real one, so follow the manufacturer's directions for ground balancing and do it often. Ideally, the Gain/Sensitivity is run as high as possible while maintaining a stable threshold as you swing. Try pumping your coil up and down during ground balancing.

• Control the Coil. The coil should be kept level and close to the ground from one end of your swing to the other. If your swing arcs and the coil is coming off the ground several inches on the ends, you may get false signals and lose a lot of depth. Also, don't swing too slowly. A Pulse Induction (PI) detector performs better with a slower swing, but a Very Low Frequency (VLF) machine needs to be swung faster to detect targets.

• Target Recovery. If you have ever "lost" a target after you first heard it, try this: after pinpointing, start digging until you have moved a small pile of dirt. Pass the material from your pile, one scoop or handful at a time, over the TOP of the coil. You will have better target recovery if you move the target first.

Gold detectors are not necessarily higher in cost, but they are built with a higher sensitivity to detecting gold nuggets, have better ground balancing and discrimination abilities. Reading your owners' manual cannot be stressed enough. Once you know how to use your detector, then practice makes perfect. Sometimes success comes after just making a few small adjustments and getting out in the field as often as you can. If you're shopping for a gold detector, click here for ideas. Good luck and have fun!

What is an Artifact?

Whether you're new to metal detecting or have been digging targets for years, you probably have imagined uncovering something really BIG... meaning really important (not necessarily big in size). What if while out hunting you dug up a relic — something of real historical and cultural importance? Would you know what to do? Do you know what you SHOULD do?

Laws and regulations and ordinances vary from state to state, county to county, and city to city. And if that's not enough to keep track of, there are also federal laws that regulate the collecting of relics, too. For a list of links to each state's Archaeological Services Department and/or Historical Commission visit http://www.uiowa.edu/~osa/nasa/osalist.html.
Each state has a wealth of regulatory laws that govern metal detecting and artifact recovery. Keep in mind that even if you are not on state-owned land, there are state laws that govern private property archaeological finds.

The really big federal law to pay attention to is the Archaeological Resources Protection Act of 1979 (ARPA). This law will be enforced no matter what federal or Indian lands you happen to be treasure hunting on. ARPA covers archaeological resources and not mineralogical resources like gold and silver and other precious and semi-precious minerals. What is an "archaeological resource" exactly? It's a fancy term for an artifact. Which leads to the question, "What is an artifact?"

The Federal Bureau of Land Management defines an artifact as *"...objects made or used by humans... examples are pottery, baskets, bottles, weapons, arrowheads, rock paintings and carvings. Artifacts also include graves and skeletal materials that are at least 100 years old."*

In very simple words, the ARPA defines an artifact as any man-made object or object used by man that is more than 100 years old. So this could include coins, rusty tin cans, or other "trash" commonly found in old ghost towns. Download the entire 13-page Archaeological Resources Protection Act .pdf here.

Many metal detectorists keep what they find a secret. Not only because they might want to go back to the spot several times to make sure they have uncovered everything there is to find, but also so that governmental agencies don't close yet another area to the public. Whether or not you decide to "do the right thing" or even what the "right thing" means to you is a personal matter. But it's good to know what the rules and laws are just in case you uncover that really significant treasure we all dream about.

In the meantime, if you follow the metal detecting and treasure hunting code of ethics below, you can avoid getting into trouble even before your next big find!

Federation of Metal Detector and Archaeological Clubs, Inc. Code of Ethics

- I will always check federal, state, county and local laws before searching. It is my responsibility to "know the law."
- I will respect private property and will not enter private property without the owner's permission. Where possible, such permission will be in writing.
- I will take care to refill all holes and try not to leave any damage.
- I will remove and dispose of any and all trash and litter that I find.
- I will appreciate and protect our inheritance of natural resources, wildlife and private property.
- I will as an ambassador for the hobby, use thoughtfulness, consideration and courtesy at all times.
- I will work to help bring unity to our hobby by working with any organization of any geographic area that may have problems that will limit their ability to peacefully pursue the hobby.
- I will leave gates as found.
- I will build fires in designated or safe places only.
- I will report to the proper authorities any individuals who enter and or remove artifacts from federal parks or state preserves.

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