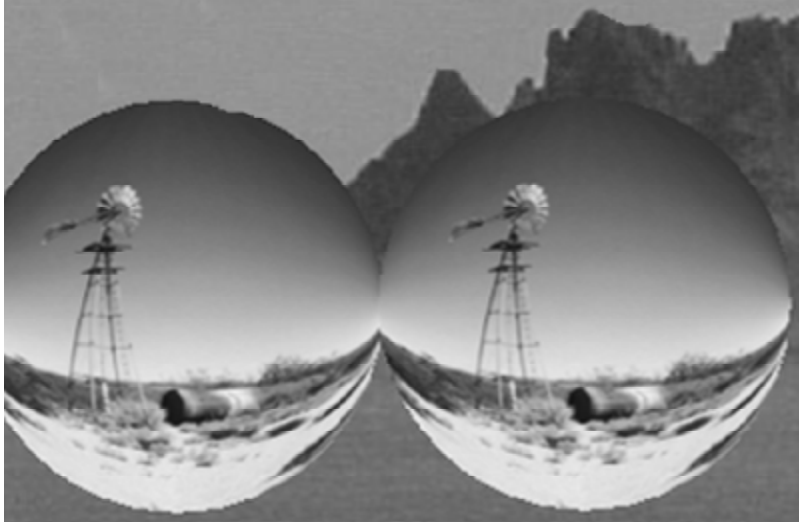
DESERT EMERGENCY SURVIVAL BASICS



By Jack Purcell

DESERT EMERGENCY SURVIVAL BASICS

Heartache and Heartburn

By Jack Purcell

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DESERT EMERGENCY SURVIVAL BASICS

Heartache and Heartburn

This book is dedicated to **Gale Kloesel**,
a man who knows the meaning of the word, 'friend',

And

To **Larry Austin**,
Division Director, Emergency Management and Preparedness Division,
New Mexico Department of Public Safety.
A man who knows the meaning of the word, 'survival'.

Jack Purcell 2003

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DESERT EMERGENCY SURVIVAL BASICS:

HEARTACHE AND HEARTBURN

The potential range of human experience includes finding ourselves in unanticipated dangerous situations. Most of those situations have been examined minutely and described in print in the form of survival manuals. Desert survival is not an exception. Excellent books are available to explain primitive survival in the desert southwest duplicating lifestyles of Native Americans a thousand years ago. That is not the intent of this book.

A few decades ago I had an acquaintance with a man named Walter Yates. Walter had the distinction of surviving a helicopter crash in the far north woods by jumping into a snowdrift before the impact. He managed to survive winter months with almost nothing except the clothes on his back when he jumped.

Walter's experience was a worthy test of human potential for emergency survival in extreme conditions. The margin for error was microscopic. The reason he survived rested on his ability to quickly detach his mind from how things had been in the past, how he wished they were, and accept completely the situation he was in. He wouldn't have made it out of those woods if he couldn't rapidly assess his new needs and examine every possibility of fulfilling them. "It's all in the mind," he once told me.

The margin for error in the desert is also narrow. That margin is dehydration. Extremes of temperature are also a factor, but they are more easily managed than the needs of the human body for water. Anyone who survives an unanticipated week in desert country did so by either having water, by carrying it in, or finding it.

Over the years I've followed a number of search and rescue accounts and discussed the issue with searchers. The general thinking among those workers is that a person missing in the desert southwest should be found or walk out within three to five days. After three days the chances for live return spiral downward. Returns after five days are lottery winners. When a missing person isn't found within a week, it's usually because he's been dead for five days.

This book is to assist in avoiding situations that lead to the need to survive those crucial three days, and to provide the basics of how to walk out and how to find water in the desert southwest. If you need the emergency information here it will be because you became lost, stranded by mechanical failure, or physically incapacitated. I won't address the bugs and plants you might find to eat. If you have water you'll survive without eating until rescue.

This was originally written as an addendum to the Lost Adams Diggings book. At the time I wrote it I had a close association with New Mexico State Search and Rescue (SAR). The State Search and Rescue Coordinator (SARC) knew what I was doing. I had a special arrangement with him because I was spending a lot of time in remote canyons. If something delayed me there I didn't want them to send out the SAR guys to look for me.

One day in the coffee room SARC asked me about the book I was writing. I explained The Lost Adams Diggings to him and how the information available in the past was sketchy.

"So you're writing a book that's likely to cause flatlanders to go out into the desert searching for this thing?"

I thought about it a moment before I answered. "It might. A lot of people would have tried anyway, but this book might bring in some who wouldn't have come otherwise."

SARC glared at me. His whole world revolved around flatlanders getting lost in the mountains or desert. Several times every month they'd scramble the forces to try to locate someone misplaced. Sometimes it's a brain surgeon from Houston who got himself mislocated mountain climbing on the east face of Sandia Mountain within sight of Albuquerque. Other times a physicist from California gets off the pavement in the desert and loses his bearings. Sometimes SAR arrived in time to save their lives. New Mexico back country can be unforgiving.

"If you're going to write a book like that you'd damned well better put in a chapter on desert survival! I don't want to spend the next five years dragging the bodies of your readers out of the arroyos in body bags."

Here's the result of that conversation:

I advise you not to search for the Lost Adams Diggings. If you do, however, you need to read this chapter.

The New Mexico Search and Rescue (SAR) Coordinator (SARD) sneers because people in trouble in the wilds nowadays think they can call SAR with their cell phones, but only after they discharge the batteries on the GPS (Global Positioning System) so they can't give coordinates of their location.

What he says is only partly true. People who can't program a VCR probably won't learn to use a GPS, either. And cell phones have a nasty habit of flashing "NO SERVICE" in little red letters when you try to use them in remote areas.

I'm including a few basic elements of back country survival for New Mexico and Arizona which might or might not be influenced by technology. Those who

haven't experienced the painful bite of desert beauty might find these suggestions helpful.

CLOTHING

HEADGEAR:

Wear one. The reason for the sombrero is the desert sun. Necessity was the real mother of the invention, despite the spiffy looks. A gimme cap will do if you turn the bill forward to shade your nose from sunburn and your eyes from glare. Wear a handkerchief under the back to protect your neck and give you a spicy Beau Geste look. Save the backward and sideway bills for back in town when you are planning your next drive-by.

LONG TROUSERS:

A must. Protect your legs from the sun, and from whatever else bites, scratches, stings, sticks, or festers. This includes almost everything in the desert.

LONG SLEEVES:

They help too. You can roll them up if you like, but rolled down they protect your arms the way long pants protect your legs.

FOOTWEAR:

1) Sandals are great, cool, and otherwise nice in the right environment. Walking in the desert isn't one of them. They sunburn the tops of your feet and allow stickers and thorns easy access to the sides. Your feet will cook top side, blister bottom side, and bleed in between.

2) Cowboy boots and Wellingtons ride too generously on your feet. You'll blister, slip around on rocks, and your feet will have lots of room to explore without going anywhere. No ankle support and general poor footing. A hot, bad choice.

3) Sneakers, at least, with socks, are going to be your blessing if you get into trouble and have to walk a long way. When your shoes give out, you'll be

finished walking. Good hiking boots with waffled soles and ankle support are better.

WATER

H20 you bring with you:

Carry 10-15 gallons of extra water in the vehicle, only for use in emergencies. Carry more water than you think you could possibly need in the daypack every time you plan to get out of sight of the vehicle or camp. A lady I once knew, an experienced backpacker, left her toddler son and hubby to step behind a bush to pee. Didn't carry anything with her. They never found her body, and she hasn't been seen since. Disorientation comes easy in rough country, even to seasoned woodsmen and desert rats.

Water you find in cow-tanks, streambeds, pools, tinajas, cienagas, etc:

It's worthwhile to carry a First Need or other similar water filter with filtration down to a couple of microns for protozoa. Halizone or iodine tablets are also useful for virus removal. Boiling works as a last resort, though it won't remove the bug larvae carcasses. Water you find in the desert is usually considered the property of a variety of other creatures, most of whom have already filed a claim.

Water Filters:

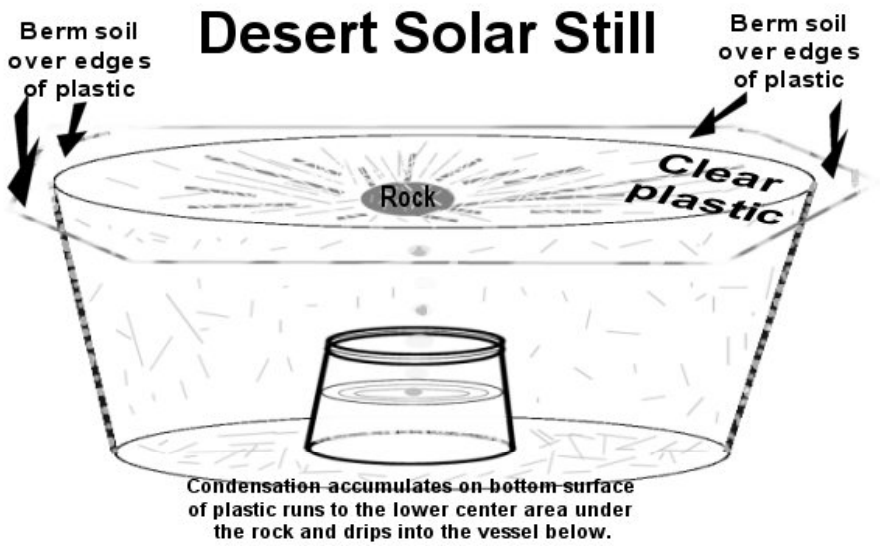
Desert water tends to have a lot of nitrogen from critter urine, and heavy microorganism counts. It also usually carries a massive organic loading from the swarms of visible animalcules taking swimming lessons. Filters will help remove a lot of this. If your inclinations don't include providing them with a house and 40 acres in your lower gut, a filter is a good alternative. Introducing new flora and fauna to your viscera works about as well as bringing a new feline into a house full of tomcats.

If you haven't experienced Giardia, ask someone who has. They'll have vivid memories they want to share.

Solar Still

If you are stationary in the desert one thing can extend your survival long enough to have you eating grasshoppers and lizards. Water. In the southwestern US desert the number of options available for getting water is limited. Most of the cactus listed as sources in survival manuals of the past the past are rare and protected by Federal Environmental Statutes. If you can't find a windmill you are

limited to using methods of drawing water molecules trapped between the soil particles and capturing it for your own use. The desert solar still is the best method I've ever seen for accomplishing this end. The still will produce approximately a quart of pure water per day in baked hardpan soil. In a moist, sandy arroyo bottom it will produce much more. Four such stills will yield enough water to keep a human alive long enough to die of starvation.



1) Excavate a hole in a channel bottom if you can find one. The top opening diameter of the hole needs to be small enough to allow complete coverage by your plastic sheet. The inside surface area of the hole has a direct bearing on how much water is produced. Larger surface areas produce more water. Damp soil gives more water.
2) Place a 1 quart or larger container in the bottom-center of the hole.
3) Secure the plastic sheet over the top of the hole with a few inches overlap on the sides. Leave enough slack in the sheet to allow it to droop 2-3 inches. Pile a berm of soil or sand over the overlap areas to seal the air inside the hole.
4) Place a small rock on the plastic sheet directly over the opening of the jar. This will create an incline on the bottom surface of the plastic with the lowest point being over the jar you'll be catching water in.
5) Empty the jar once each day in the evening. Opening the hole more often will allow moist air to escape into the desert air.

Water from the soil will evaporate from the freshly excavated walls. The moisture content of the air inside the hole and the temperature difference between the outside atmosphere and the air inside the hole will cause moisture to condense on the bottom side of the plastic sheet. The weight of the rock on the sheet will cause condensation to flow to the lowest area, just over the opening to the jar and drip downward to be captured.

If you aren't squeamish you'd be well advised to dig your latrines in the vicinity of the still. The body waste moisture you throw off will increase the moisture in the soil around the still, thereby providing more evaporation, more water.

If you don't have a bottle or jar to catch the water a freezer bag or square of plastic will do the job. You just have to erect a frame to hold the top up and keep it open so the water can drip inside. A small circle of rocks at the bottom of the hole with a square of plastic laid over it overlapping the rocks will do. You'll think of a way to get it out of the hole without spilling a single drop.

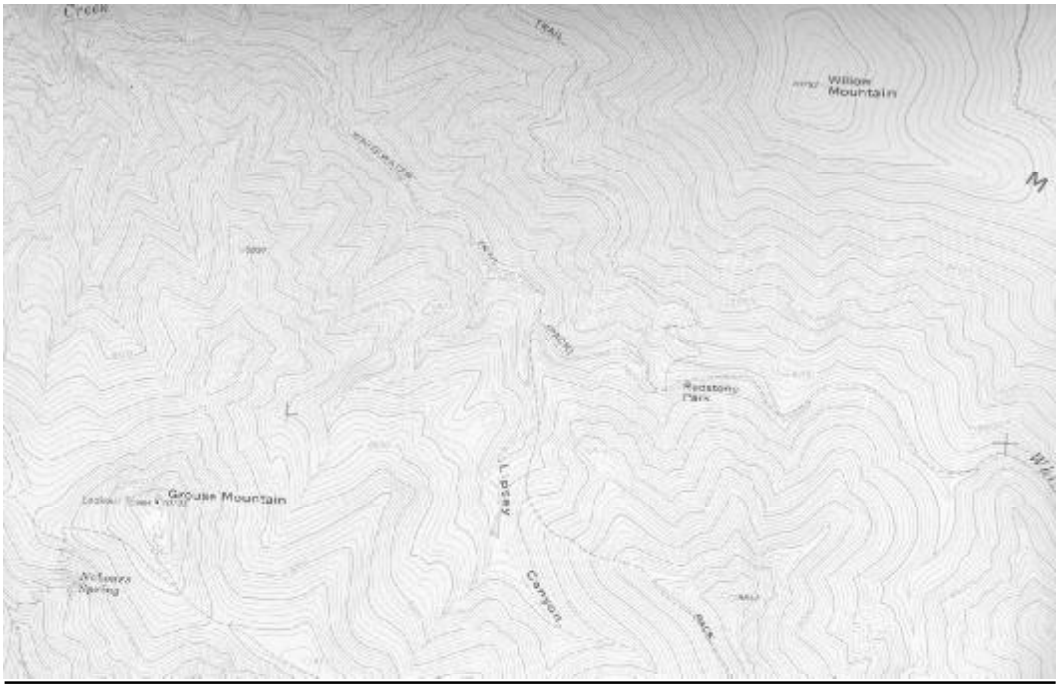
The Body Politic

Heatstroke: Electrolyte depletion of the human body. Sunshine, heat, and liquid deprivation. Salt tablets probably don't make much sense in normal life, but in the desert, they restore needed electrolytes to your body. These won't be provided by most water you'd care to drink, no matter how loaded with microorganisms. Perspiration evaporates quickly in arid climates. Your body is throwing off a lot of salt, waste and other juice when it perspires so heavily. Salt tablets help restore some of it.

Hypothermia: Know what it is, prepare for it, watch for it, and avoid it. The desert gets cold at night. But a sweaty rest in a cool breeze can do it on a hot day**.**

Navigation Tools

Avoid becoming a lost soul.



Maps:

Terms: *You need to be familiar with three terms before discussing back country maps. Scale and Minutes refer to the way the map relates horizontally to the country you are in. Contour refers to the method the map uses to communicate vertical information about the terrain.*

Scale:

1:24,000 is the scale for USGS Topographic Quad Maps. One inch on the map is equal to 24,000 inches, 2000 feet of terrain distance. Possessing 7.5 minute topo maps, and the ability to understand those helps a lot. They are published by the US Government and are a bargain, even at the prices charged for them today.

1:100,000 scale is used by BLM and several other US Government agencies One inch on the map equals 100,000 inches actual distance. 8333 feet per inch, or slightly over 1.5 miles to the inch.

1:250,000 is used for Delorme Atlas and Gazetteers and Roads of (Where You Are). Those show maps on a scale of one inch equals 4 miles. Both are good, showing a level of detail approaching the 30x60 Quads. These have the advantage of covering the entire state where you are.

Minutes

I've never understood the reasoning for doing so, but US Government agencies and other map gurus use the term 'minutes' to define the size of the area a map covers. The earth spins at a speed of 1000 miles per hour. It is 24,000 miles in circumference. Therefore, at the Equator, one mile passes directly under the sun every minute. A 7.5 Minute 1:24,000 scale USGS Quad covers an area 7.5 miles square. A 1:100,000 scale 30 x 60 Minute BLM Quad covers an area 30 miles wide by 60 miles long.

Contour Intervals

The illustration at the beginning of this section shows a portion of a USGS 7.5 Minute Quad. A part of the emphasis of the map includes specific terrain features shown in contour lines. The wavy lines are parallel contour lines, each following a single elevation. On this example the contour interval is 200 feet because the ground surface is more vertical than horizontal. In flatter areas the maps use 40 foot contour intervals, or in near-level terrain, 10 foot intervals. Intervals also increase and decrease to correspond with the minute/scale of the map. A 30x60 Minute BLM Map for rough terrain has contour intervals of 20 meters. A Delorme Gazetteer has contour intervals of 60 meters.

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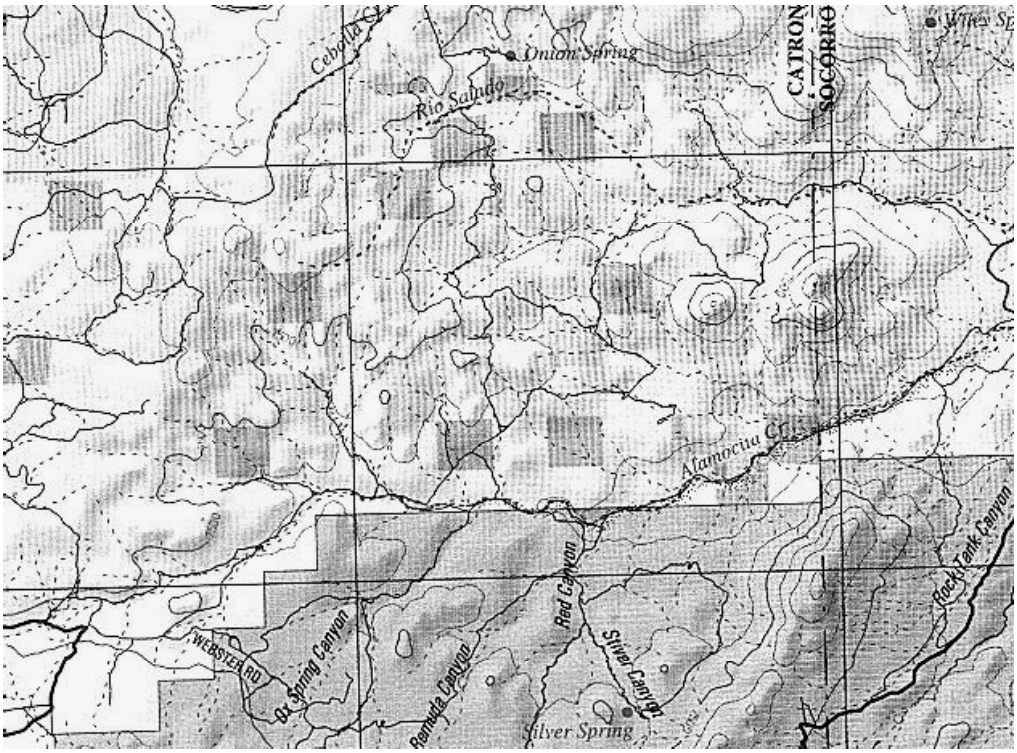


Map from DeLorme's New Mexico Atlas & Gazetteer ™
Copyright © DeLorme, Yarmouth, Maine reprinted by permission from Delorme, August 14, 2003.

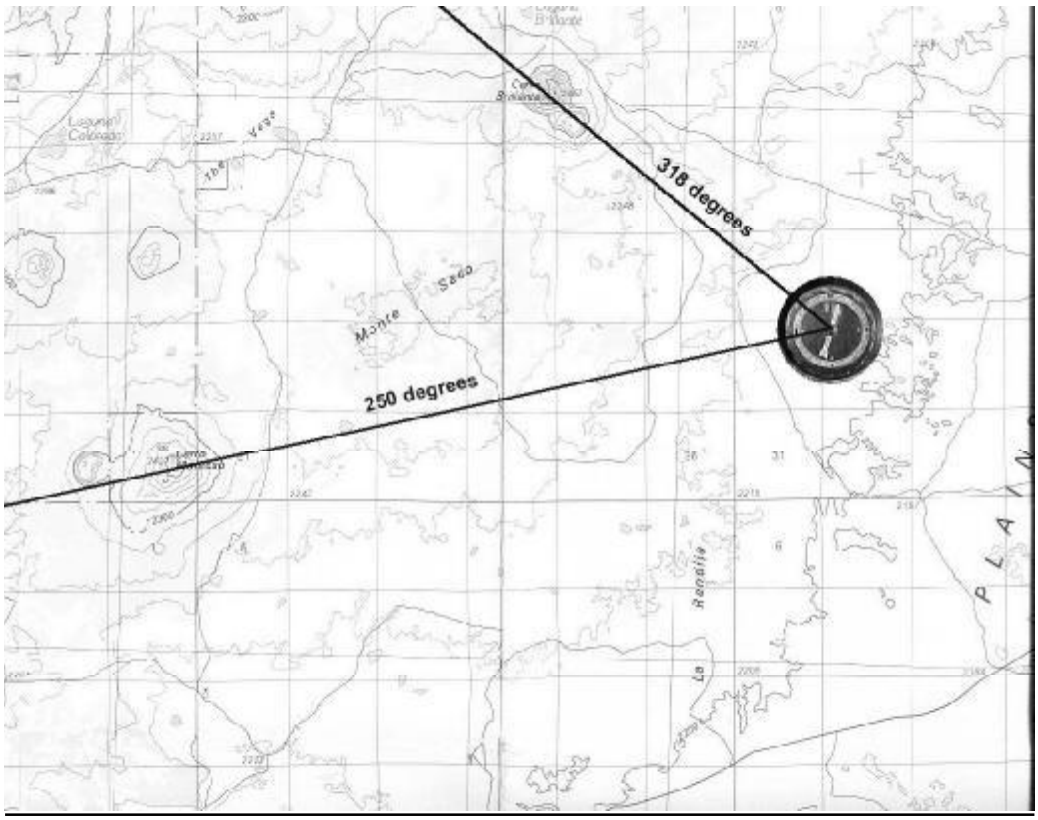
This illustrates the surprising detail on the Delorme maps for a remote area of New Mexico north of the Datil Mountains. The dotted lines are two-track dirt roads. The combination of shading, detail and contour lines render the map usable for motorized travel and trekking in spite of the fact the shaded squares are one mile square.

The best map for your needs.

7.5 Minute Quads: Driving the back country in a 4x4 covers a lot of ground. If you are just exploring and don't have a specific destination in mind you'll have a lot of money and space invested in maps if you try to use USGS 7.5 minute Quadrangles for general navigating. They come flat and if you use them a lot you'll want to avoid folding them, which wears them out. On the other hand, if you want specific, detailed information about the terrain you are trekking afoot or canyons you are exploring, the 7.5 Quad is the best you can get. I'd suggest buying 7.5 Quads for the area immediately surrounding your specific destination. There's no excuse for ever getting lost if you have a 7.5 Quad folded up in your pocket. Almost no one who gets lost has one. If there are any dwellings, stock tanks, windmills, or major roads within 3 1/4 miles of the center of the quad you are on you'll know where they are.

Folding BLM and USFS maps on a 1:100,000 scale are good for showing remote roads, but lack the detail of the 7.5 quads. They're also more difficult to make sense of from the Long/Lat and UTM coordinates in the margins. However, some have the added advantage of identifying whether you are on private land, or public land. One set of the BLM maps even identifies whether the mineral rights are owned by the public, or are privately owned.

For general traveling off the pavement, a Delorme Gazetteer of the state you are in, or a THE ROADS OF (STATE YOU ARE IN) is a minimum. You need a printed document showing unpaved, minor roads. Folding state roadmaps of the interstate won't help if things go sour. Knowing you are in Graham County, Arizona tells you something about the kind of sunset and amount of rain you can anticipate. Not much more than that. On the other hand, knowing the faint two-track heading off to the northeast will get you to a windmill five miles away might be a lifesaver**.**



Locating yourself by azimuths and triangulation

Compasses:

Carry two compasses, so you won't be tempted to believe one of them is wrong. Know the compass declination for the area you are in**.** The compass on the hilt of your survival knife isn't something you want to depend on. Buy a high quality compass and back it up with a cheaper one from the discount house. As a minimum it should have a rose on it showing 360 degrees on the face. The instrument will serve you better if the rose turns on the face so you can calculate magnetic declination.

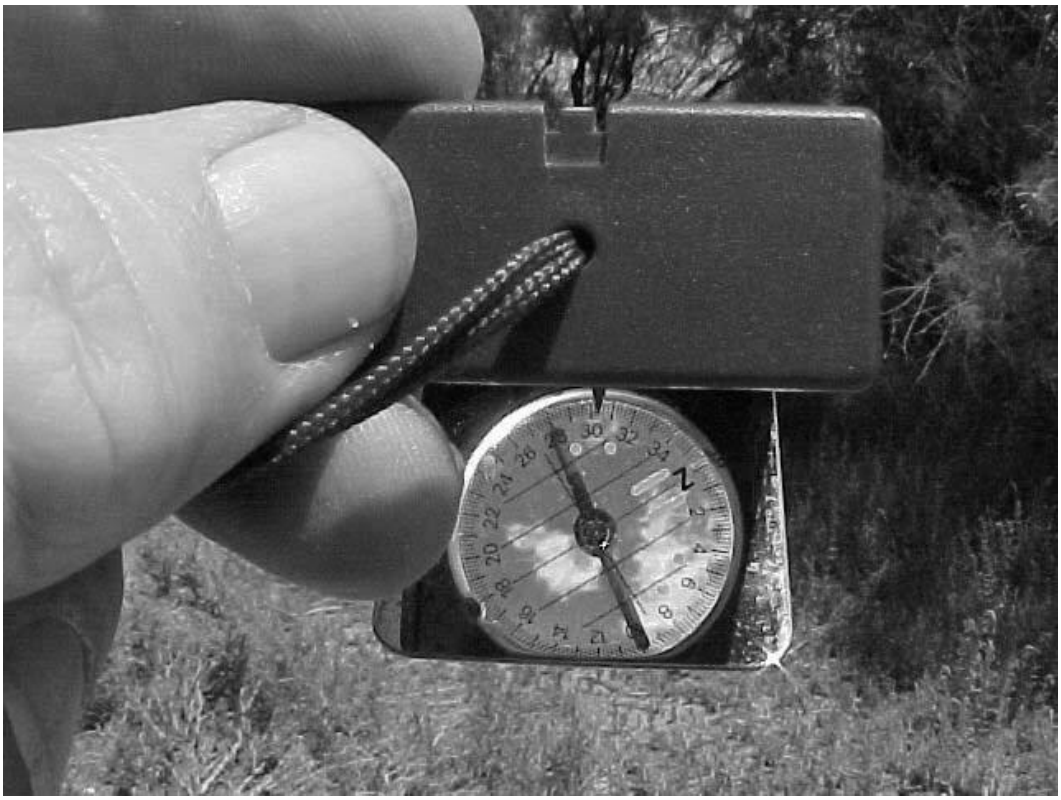
This is my personal favorite among the compasses I've used. It's called the Swiss Army Compass and I imagine it bears as much relationship to the Swiss Army as the Swiss Army knife has to that worthy body of men. But the Victorinox Swiss Army compass combines economic pricing and quality in ways the Swiss Army knives no longer do. The instrument is 'lensatic', meaning it's designed to allow viewing the rose while sighting on a terrain feature in the distance. This allows for more precise readings than can easily be obtained from a flat compass. The term for this process is called 'shooting an azimuth', or 'taking an azimuth.' The illustration over the heading, **Compasses**, shows two azimuths intersecting to triangulate on the position of the person shooting the azimuths. Before the advent of the GPS this was the most reliable method for getting a 'fix' on your exact location. It's still a good technique if you don't have a GPS or you've allowed the batteries to die.

The compass in the photo on the right slides into the plastic case in the upper half of the picture when not in use. It comes with a lanyard for easy accessibility and transport. The groove running vertically through the picture is a sighting groove. The three white lines in the groove are luminous to allow for use in low lighting conditions. The rose rotates on the surface to allow precise

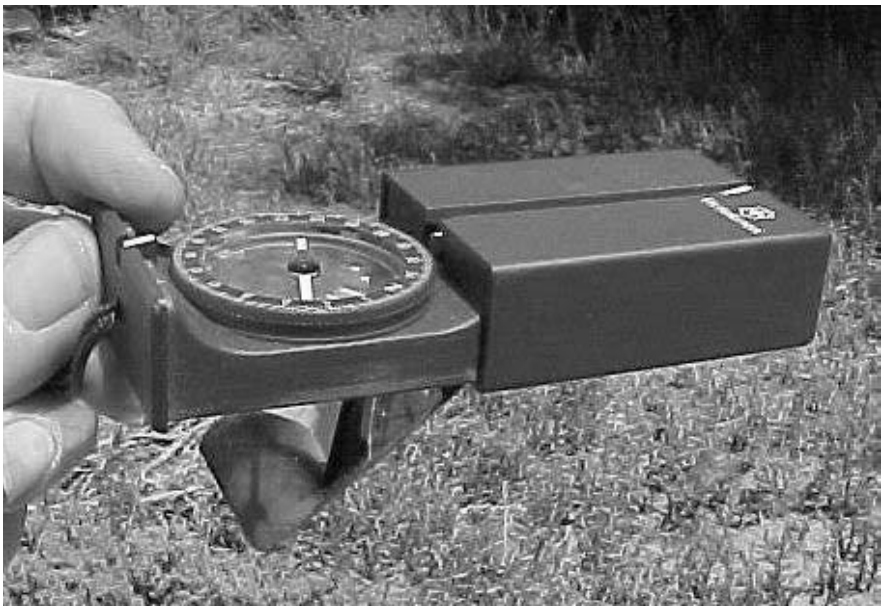
azimuths while holding the compass at eye-level while sighting. When closed the box is approximately two inches long by 1.5 inches wide and 3/8 inch thick. It's durable and dependable. I've carried the one in the illustration for twenty years. Even though it's seen hard use that compass is as good in 2003 as it was in 1983.

The discount houses are full of lensatic compasses built on the US Military model. They are cheap, and usually they don't work well. If you are determined to make do with a cheap compass you'll be far better off buying one designed for flat use.

If you want a lensatic compass you can choose one similar to the one in the photograph, or you can visit a surveyor supply store and get a good, durable lensatic instrument. My general opinion is that you are best off staying away from military models other than the Victorinox.



When you open the case on the Victorinox a mirrored-steel plate drops down to allow you to view the rose and take a reading while sighting through the groove along the top of the compass.



I mentioned earlier that I believe you should carry two compasses into the wilds. I consider the one on the right to be a good choice. It's a Silva, tough, cheap, and dependable. I've carried that one more than a decade. As you can see it's battered and scarred, but it still works. I usually keep it in my pocket emergency kit along with other items I don't want to be caught without.

This particular design for a compass is intended to be used flat on the surface of a map. The straight edges and the scales along the sides are useful for alignment by placing the edge along a section line or lat/long line to get a heading direction. In this sense the flat model instrument is actually better than the lensatic.

Using a wristwatch for a compass:

The watch in the picture is a Timex Expedition made especially for use as a compass. The bezel is a moveable ring compass rose. In the morning sunlight point the arrow on the lower right side of the bezel at the sun and the arrow on the top of the bezel will point rotational north. In the afternoon sunlight the arrow tab on the lower left performs the task.

Any watch or clock will serve the same purpose. Point the space between 3 and 4 at the sun in the morning and 12 is north. Point the space between 8 and 9 at the sun in the afternoon and 12 is north.

GPS dependence:

If you are depending on the GPS to get you back to the car, to camp, or to safety, don't keep it turned on all the time. Depleting the batteries will ruin your day if you haven't taken the time to learn ground reference navigation with a compass and map. Let the magic instrument give you a magnetic compass heading to your destination, then give the batteries a break. Turn it off and put it away. Use the compass to shoot an azimuth on a distant landmark in the approximate direction you are going, and put that away, too. Pay attention to the country around you and not to the ground immediately in front of your feet, the compass rose or the whispers and complaints from the display on the GPS.

Know how to translate the coordinates displayed on the GPS to a position on the map. The numbers displayed on the GPS screen represent one of two types of coordinates: These are Long/Lat, and UTM (Universal Transverse Mercator). The UTM coordinates are easiest to use. If you prefer one coordinate system over the other, you can go into the setup menu on the GPS, under COORDINATE SYSTEM, and instruct it to give you coordinates of that type.

When you find yourself in trouble take a fix of where you are. Write down the coordinates. If your vehicle is stranded it might save you a lot of trouble and money relocating it. Keep a mental record of what direction you are moving away from your vehicle and try to form a rough idea of how far you've gone. If

you eventually get cell phone contact and you can give them your coordinates the rest will flow smoothly.

Detailed maps for remote areas usually carry both sets of coordinates in the margins to allow you determine your position or destination on the map in terms of those coordinates, and then feed the coordinates to the GPS. That's useful information. You can double-check where you think you are against the exact position determined by the GPS. You can also feed in the coordinates for your destination to allow the GPS to tell you how far you have to travel. And when you leave your vehicle on a nondescript mountain road you can rob yourself a lot of healthy walking by taking a fix with the GPS and saving it under the heading, 'TRUCK'.

However, carry a set of spare batteries and rotate them frequently.

The first symptoms of trouble

When you get into trouble in any remote area but maybe aren't 'lost' yet, the first inclination is to go into a fit of cursing or remorse. The rock that has your differential high-centered, the rubber pom-pom that used to be a fan belt, steam escaping from a radiator hose and the pool of oil accumulating under the bash plate are all Fate's way of telling you to slow down. The pressures of modern life have conditioned us to see such blessings in a negative context. After the cursing or self-pity, a lot of people move on to frantic, counter-productive activity.

When one of these events happens in a remote desert area quiet reflection, moderation, and a carefully considered plan of action stands the best chance of making your day go better. Anger might be okay when there's a margin for error. During those first moments after you discover you are stranded or lost you don't know yet whether you have the luxury for anger. Respect the potentials.

Stop and think. Breathe slowly and reflect on your situation. Think smart. Don't move before you pause, consider everything and have a plan of action.

This might involve taking a long look at the maps you wisely carried along with you. Try to establish your exact geographic location. Inventory the water and equipment available to you. Consider how you will protect yourself from the sun, and cold. Look at all the possibilities.

Do your inventory with imagination and look for anything you might find useful. That plastic grocery bag was trash a little while ago. Now it might be treasure. The mirror on the back side of your windshield visor might belong in your pocket. If you are going to have to walk, consider your clothing, your shoes, how much water to carry, and where, exactly, you think you are headed.

LOST?

When you begin to wonder if you might be lost, you are. That's the rule of thumb. Believe in it from the first nagging wiggle at the corner of your mind.

Eyes and brain:

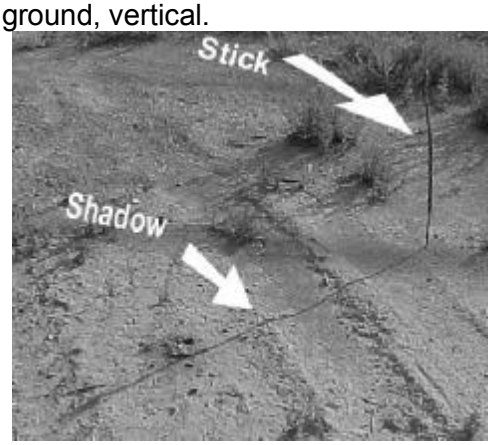
If you get into trouble in the desert, notice **game trails**, **cow trails**, and **fresh droppings**. Water might be somewhere at one end or the other of every trail. There's a 50% chance your guess will be right. Where the game trails converge and increase in number, the chances for water increase.

It might sound strange, but even contrails can help. Notice over several hours or days what directions high altitude air traffic in your area marks itself. In a lot of remote areas a predominance of **contrails** are headed to the same airport a few hundred miles from where you are. If you notice a pattern of that sort and take a compass bearing on the apex of their destinations you can always know when you see a contrail that 082 degrees from you is probably right over that ridge to your right.

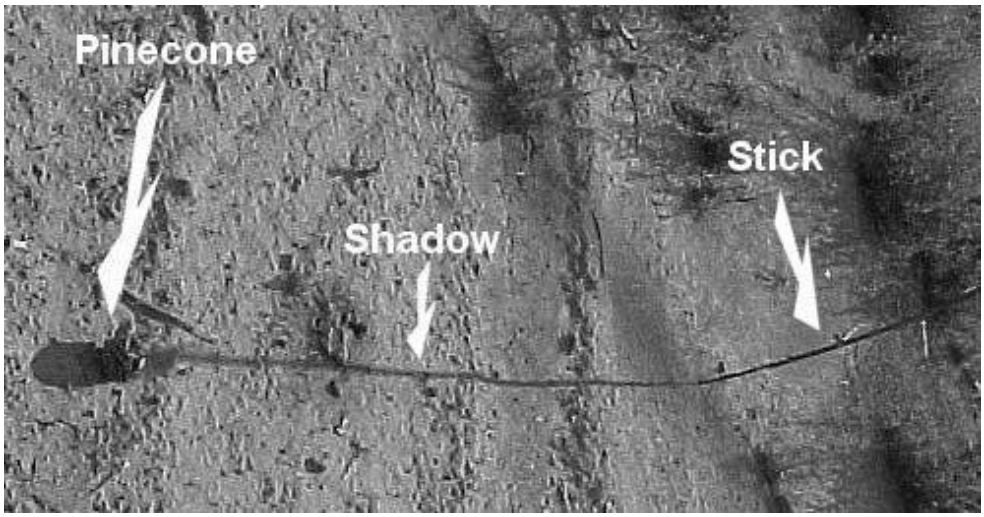
Lights. If you are on a high place in the desert you can see a long distance. Make sure you aren't in a canyon at sunset. After nightfall look carefully in every direction for lights. Those lights are probably a dwelling. Shoot an azimuth.

If you find you've done the stupid (and we all have) and gone just a little way out of sight of all your gear, compass, GPS, everything, back at the car, or under a tree hmmmmmm I think back over there somewhere, you might be in trouble.

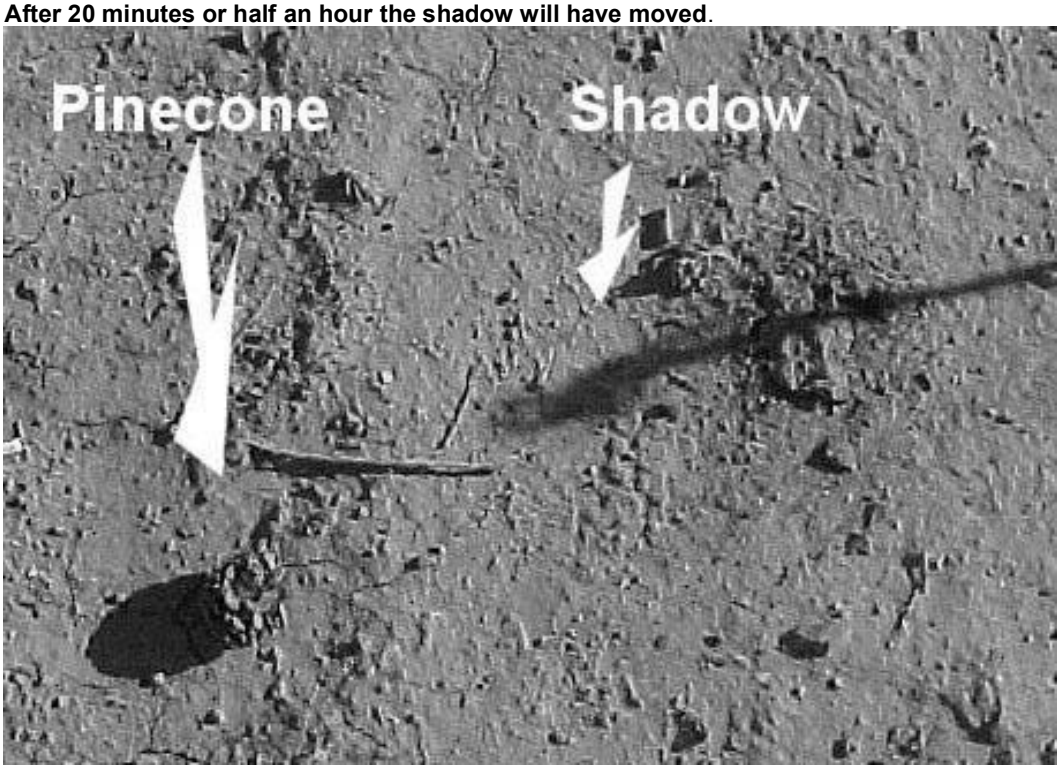
There's a trick called a **'shadow stick'** that might help if you've paid any attention to directions or can recall what was on the map you left with your gear. Put a 4' stick into the ground, vertical.



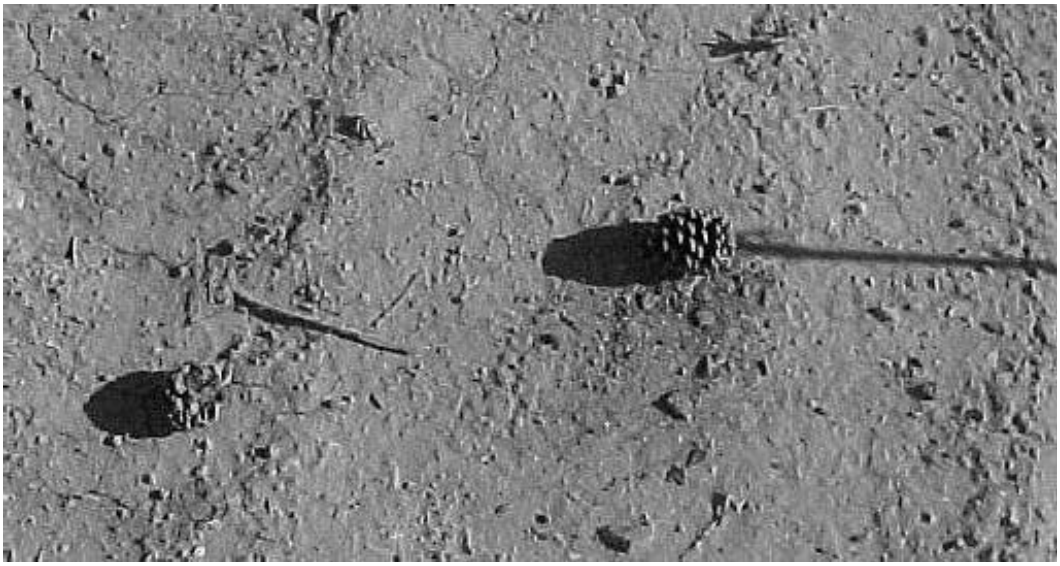
Place a rock at the end of the shadow as shown in the next photograph. Then sit for a while and let your life flash before your eyes.

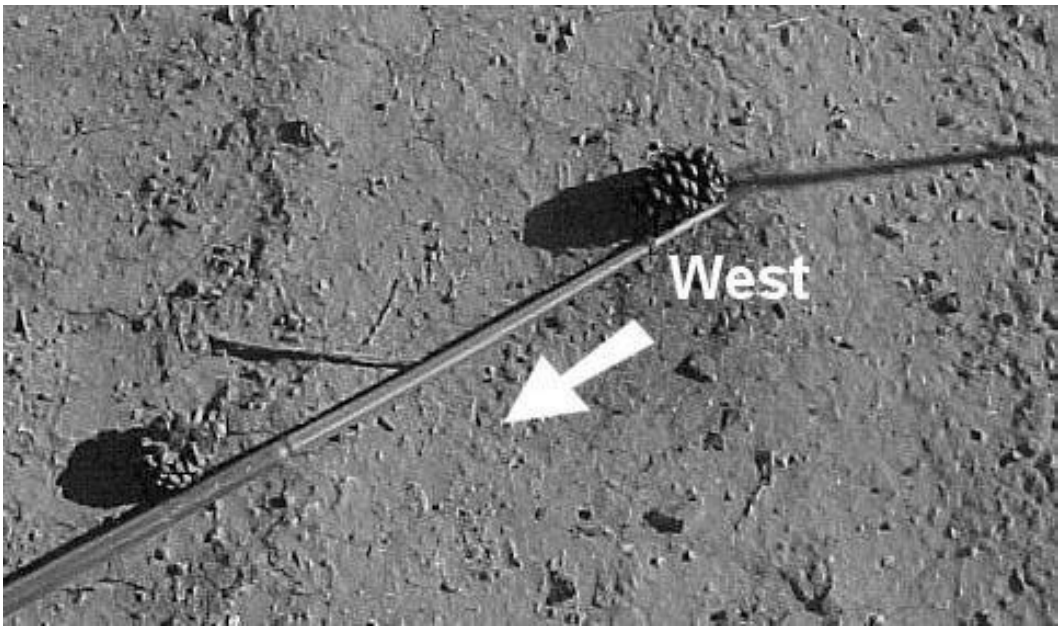


After 20 minutes or half an hour the shadow will have moved.

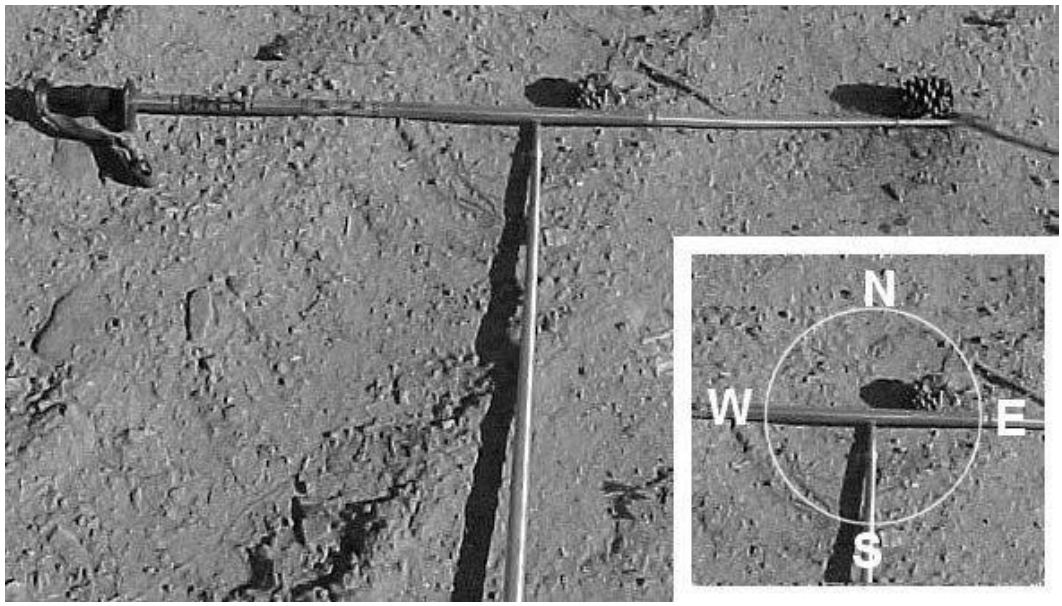


Place another rock, pinecone or other marker at the end of the new shadow location as shown below. You now have the basic instrument to give yourself a cool drink of water and a warm place to sleep tonight.

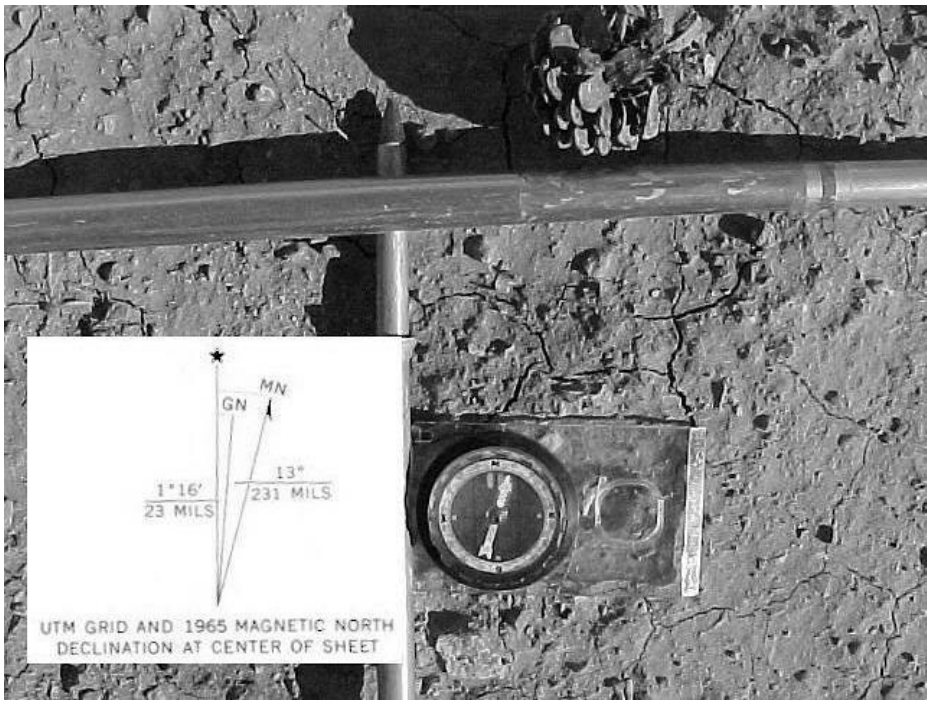




Draw a line between the two rocks. The line points east-west. The first rock you put down is always on the west end. You've established precise rotational east/west once you've placed those two rocks or pinecones and drawn the line between the two.



Cross-hatch the line between the rocks, and you have a north-south-east-west rose before you. This is particularly helpful when the sun is high and the shadows so short you can't really get a direction just by looking at them.



The end result

Without using a compass you've just established rotational East / West / North / South within a degree or three of being exact. At this point you should be feeling

a lot better. If you came in on a road from the south and walked away from it on the left side of the road you don't qualify as being 'lost' anymore. Even if your situation is more complicated you won't be stumbling around in circles.

If you know the general direction you need to travel pick out a prominent landmark in that direction and use it for a goal so you don't have to do this frequently. It's also a good idea to look behind you and try to pick out another landmark there. That way when you wander off your course or can't see the first landmark you'll still have a reference point you know you should be walking away from. Similarly, if you note large landmarks to the left or right and keep them there as you trek your route will be more direct than it would be otherwise.

When you sit down to rest go through the same process again just to reassure yourself.

MECHANICAL (VEHICLE) DIFFICULTIES:

Fan belts and hoses: Two of the peskiest problems in the backcountry. For some reason these two weak points in the mechanical system are responsible for the lion's share of summer vehicle problems, along with stuck thermostats. Any one of the three can set you afoot by causing you to lose all your engine coolant.

An extra set of fan belts in the trunk, along with whatever tools are necessary to change one, is a smart idea. With the chicken noodle soup under the hoods of a lot of cars, this can be a problem, but it's better than leaving a carload of equipment sitting out there while you go off to try to find your destiny in the desert.

Water hoses can be temporarily repaired by tightly wrapping the hose with electricians tape and refilling the radiator with the extra water you wisely brought along and wondered why. If the hose leak is too close to the clamp, an inch or two of hose can be usually be cut off, and the intact portion reattached under the clamp.

Tires: Make certain you have a good spare or two. Full sized. Street tires don't hold up well on 2-track roads. The wheelbarrow tire provided as a spare by the auto dealership probably isn't the best alternative for a 50 mile drive back to the pavement.

Jack: The thing provided in your trunk and represented as a jack is ok for changing a tire in the grader ditch of a paved road. For lifting your vehicle off a high center, a hydraulic jack is a minimum. A high lift handyman jack is better yet, if your bumper can take the strain.

4 Wheelers:

These vehicles are great for getting you one heluva long way off the beaten path. It's easy to cruise along and not pay attention to exactly where you are. It's also easy to assume you will be back in camp by suppertime. Keep in mind that 4 wheelers can have mechanical failures. Any vehicle capable of dumping you afoot more than a days walk from a drink of water needs some thought beforehand.

Fuel:

Bear in mind it's a long way between gas stations, and that low-speed, low-gear driving burns a lot of gas. It's a good idea to top off the tank every chance you get and go off the pavement in a car with a full belly.

If you are leaving people with the vehicle, make certain everyone understands the plan, and that the minimal needs of everyone are met. Everyone should know what is expected of them in the current circumstance, and in the event new developments arise sometime after you are out of sight of the vehicle. (Such as the arrival of a friendly rancher or someone noticing the wolf in the bushes is paying a lot of attention to Fido.)

If you leave your vehicle unattended, leave a note on it explaining what has happened, the direction you are headed, and what you intend. If there's a phone number would-be rescuers can call to notify someone of your situation, leave that, too. This will help a lot in the unlikely event you don't show up in a few days.

Communications

Cellular phones. If you are broken down, injured, or lost in the desert a cellular phone might save you if you are careful. If the phone shows 'No Service' where you are, turn it off to save the batteries. Try using it again at night or from a hilltop where line-of-sight might assist you. Sometimes 50 feet of elevation will get you enough service to bring in the US Cavalry.

CB Radio. If you're broken down in the back country and your vehicle has a functional battery you probably only need a CB radio unit to get help. People who live a long way from anywhere often use the CB to gossip with their neighbors in the evenings. No matter how far you get from civilization, if you turn on the CB at night you'll hear people talking about cow-prices, rain prospects and Charlie's pit-bull killing calves. The atmospheric density causes the signals to bounce at night. Evening conversations with people 50 miles away aren't uncommon. If you are going into an area where a breakdown is possible I'd suggest buying a garage-sale CB/antenna combination for $5 to carry in your trunk, just for emergencies. Pick a hilltop and use the radio to tell your location and problem. While you're waiting for rescue you can hear the funny stories about how Jim's kid told the new teacher in town, "I don't need to learn anything. I'm going to be a rancher."

Fire: If you think they are searching for you, keep a fire going all night. Even if they aren't searching, it might attract attention, especially if you are in an area where fires are forbidden.

Smoke. Gather some cow or elk manure, or green wood and keep it near a

small fire daytimes if you are stationary. The smoke or the smell of smoke might bring someone to investigate.

Mirror or shiny tin can lid. Almost anything to reflect sunlight. The methods for making or using a signal mirror are detailed below.

Laser Pointer. If you have one, sweep anything that looks promising. If you sweep that ranch house you can see 10 miles away it will get you some attention eventually.

Survival and Emergency Supplies:

Fire starter: A butane lighter, even if you don't smoke is a must. A film canister filled with cotton-balls soaked in candle wax will finish off your fire starting ensemble.

Water: Under some circumstances, there's no such thing as enough.

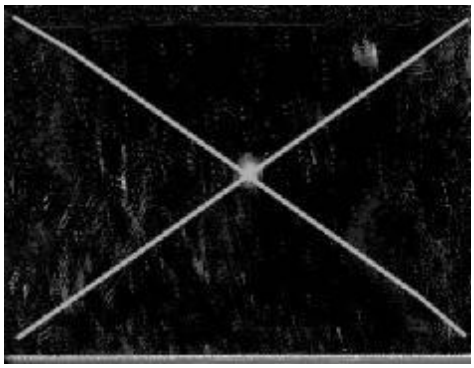
Clothing: A light jacket for cool desert nights, even if you don't plan to stay the night. A pair of extra socks.

Bedding: Blanket or bag, just for emergencies, can help you enjoy an unintended night under the stars.

Cutting tool: Never mind the big Buck skinner. A Victorinox Swiss Army knife with a cutting blade, a saw tooth blade, and can opener is a good choice.

Cyumel light sticks**:** 12 hours. A few in the trunk can serve as night road flares, but they can also give you something to wave around after dark when you are trying to get the attention of an SAR aircraft. If you are lost and carrying one don't light it to check whether the water has bugs in it. Wait until the second night you are lost to give the air search time to get rolling.

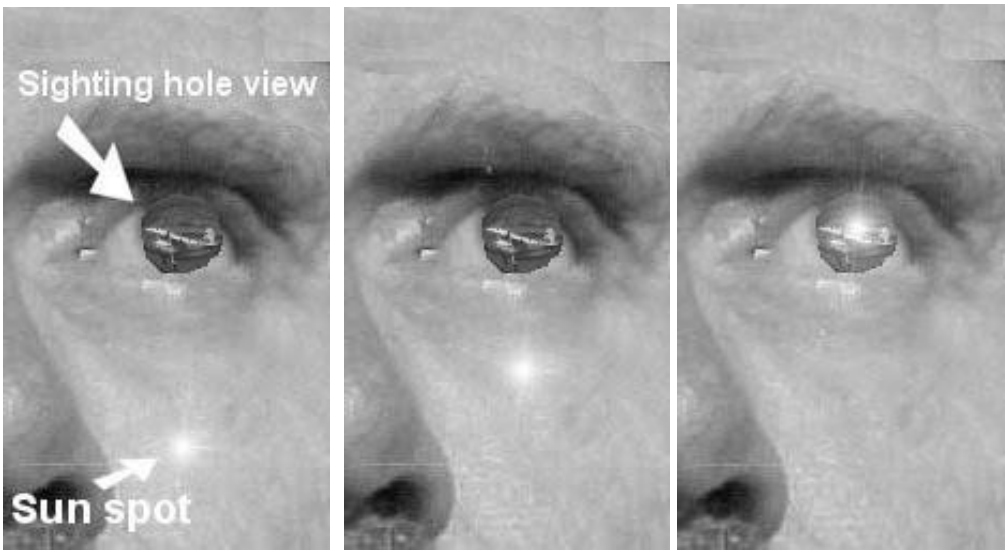
Mirror: If you place a makeup mirror in front of your eye so you are looking over the top of it, reflecting the dot of the sun on the ground in front of you, and extend your arm to full length in front of you, put your finger into the reflected light. Sight along the top of your finger, and move the arm, lighted finger, and reflection from the mirror all together toward the house on the ridge 10 miles away, the airplane above you, the fire tower you can barely see several miles away, and keep at it. It might eventually get you some help.



Some things are so small, easy, cheap and potentially valuable it makes no sense to be without them. A signal mirror is one of those. There's an easy way to make a foolproof signal mirror out of two small mirrors back to back. Buy two 1-inch square mirrors from the discount store, and a little glue. Draw an X from corner to corner on the backs of each of the mirrors. Scrape off the paint in a 1/4 inch circle at the center of each X, enough so you can see through. Apply some glue to the still-painted area on the mirrors, and stick them together neatly back-to-back.

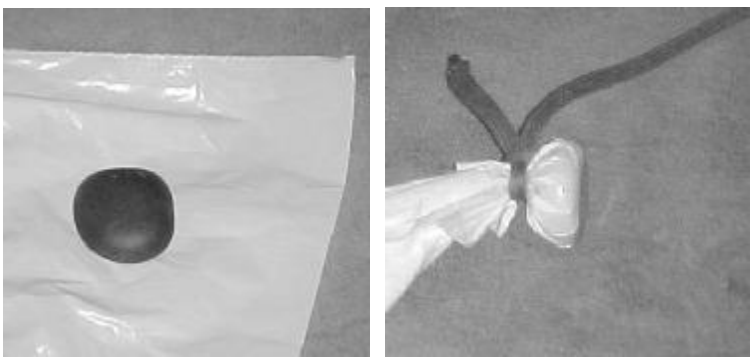
Hold the mirror up to your eye an inch or so from your face and look at the reflection. You'll see the spot of light on your face where the sun is coming through the hole in the paint of the two mirrors. Tilt the mirror until the spot moves over the hole in the mirror. Now the mirror will be shining on whatever you are looking at through the hole. The target can be a car on the road, an airplane, a house, the eyes of your pet llama, or the circling buzzards. This can be a nice way to amuse yourself while you're taking a breather from imitating those cartoon characters crawling through the desert.

Reflection in the signal mirror and view through the hole



This series of photographs illustrates how you focus the reflection on the target. You are looking at the reflection of your face in the mirror. Through the hole in the center you see an airplane. You also see the spot of sunlight that comes through the hole in the mirror. Keep the target in view through the hole and tilt the mirror. You'll see the spot moving upward toward the hole. When the reflection of the spot of sunlight reaches the hole you'll see a new glare. The mirror is reflecting precisely on target.

Shelter: A couple of black plastic leaf-bags will serve in a pinch. They pack down small and are tough. The bags can be cut open to make a lean-to, or worn as clothing, one top side, and one bottom side. Something to keep off the dew and night winds can be a blessing. 30 feet of trotline cord will be a plus, if you decide to go for the lean-to. A marble sized rock folded into each corner and tied as shown below will give the cord something to anchor to without tearing the plastic. Leaf bags are surprisingly strong. This type lean-to shelter will hold up under brisk gusts if you've been careful securing the corners.



Vessel to heat liquid: A double fold of heavy tinfoil will do the job if you have nothing else.

Water will heat a lot more rapidly if your vessel is shallow with a large surface area on the bottom. Use your belt for a frame to shape the foil into a shallow pan and reinforce the sides by folding the extra foil back over itself. This will keep the sides from collapsing and spilling your liquid when the foil heats. If you aren't in a hurry the best method for heating water this way is to place a flat-topped rock close to the flames and let it heat. After the rock is hot, place your foil pan on the surface and let the rock heat the water instead of using open flame. The pan will last longer using that method. Once the water is hot use your handkerchief or shirt tail for a pot holder to pick it up by both sides so you don't spill the hot liquid. The vessel sides don't have the strength to support the weigh of the water if you try to lift it by one side.

<u>Pocket survival kit</u>: the fire starter combo, the tinfoil, the lawn bags, cord, and cutting instrument will all fit inside a one-quart freezer bag for your jacket pocket. There's room left for a small compass, lip ice, 1 inch square mirror, and a bouillon cube or two if you want to include them. It's small, light, and can spare you a nasty case of exposure, or worse.

Pocket Emergency Kit

1) 2 ea. folded plastic leaf-bags
2) Light stick
3) Aluminum foil 18 In. Sq.
4) Bouillon packet
5) Compass
6) Lighter wrapped with 50' cord
2) All purpose cutting tool
3) Signal mirror
4) Film can with cotton/wax
5) Lip ice
6) Coffee

Ends of cord around lighter are secured
with a spot of super-glue to keep them in place.

I also include a tube of Super Glue for emergency closure of cuts and gashes and a small vial of chlorine bleach for water purification.

Ranchers, rainbow people, desert rats, and outfitters

Although it won't be obvious to you, most land in the continental United States, both public and private, has someone watching it, trying to scratch out a living on it, and feeling ownership for it. When you turn off the pavement, you are an intruder into a socio-economic system you are probably unfamiliar with. Respect it.

The people you meet who live in remote areas don't see a lot of strangers. They tend to have strong opinions about most things, and don't get many opportunities to express them. Listen politely, nod, and smile a lot. These monologues aren't an invitation for you to share your own opposing views.

You won't convert a remote desert dweller to your pet opinions, and he won't sway you to his. Your entire body of experience is unlike that of the person you are talking to. The observations about reality you base your opinions on are different. Keep your eye on the ball. Your investment in this person involves finding your way somewhere, or finding your way back. You aren't looking for a new best friend. You don't care what he thinks about Japanese-made automobiles. Keep it tight.

Talking about religion, sex, and politics used to be a breach of manners. There were solid reasons for this. The potential for someone being offended was too great, and the returns, too small. In remote areas today, those prohibitions should probably extend to other issues such as environmentalism, abortion, welfare, wolves, and almost everything besides the heat, the dry, and whether that dirt road goes all the way out to the pavement.

If he talks ugly about the government and welfare programs, you won't win his heart by telling him you think grazing leases on public lands are just another kind of welfare. If he tells you the land you are on is "his", and you know it's actually public, he probably means he has the grazing lease.

You can use that as an opportunity to apologize and tell him you thought it was public, and drag out the map to show him where you thought you were. Turn on the GPS and plop it on one corner of the map to keep the wind from blowing it away. And let him show you where you actually are. If the map shows it's public, you'll both know without anything more needing to be said. Sometimes technology has advantages.

If a gate is closed when you get to it, close it behind you. Stay on the two-track and don't drive on grass. Grass you drive over in June is still bent over and brown in August. Respect "No Trespassing" signs.

If you find you've driven into someone's yard and you want to stop and chat, honk the horn and wait a few minutes before you get out of the vehicle. Give the dogs a chance to come out of hiding and stand on their hind legs snarling at you through the window, if they're going to. Give the resident a chance to slip on a pair of bib overalls and clamp a kitchen match between his teeth before he comes out to greet you.

If you have a portable microphone and an oblique sense of humor you can point the megaphone at the front of the house and announce, "WE KNOW YOU ARE IN THERE! NOW COME OUT WITH YOUR HANDS UP!" But I don't recommend that, or carrying your guitar to the front porch and trying to practice *Dueling Banjoes* with the rancher's kid.

One of the unanticipated by-products of the War on Drugs is that people who used to depend on beef prices and drive 20 year old trucks are now driving new $30K 4x4s with extended cabs and are a lot less tolerant of strangers. If you hear the drone of a $5000 4-wheeler in the distance it will probably be a rancher out tending his cows. There are also a lot of bush-vets scattered around, and a few unreconstructed hippies.

For you, this calls for some specific attitude adjustments translated into your behavior. If you see something unusual, something that shouldn't be where it is, something that indicates there's been a lot of activity or gardening going on a long way from anywhere, don't investigate or linger. If you try to do a little harvesting on your own, someone is likely to be offended. While you pat yourself on the back for your good luck, an emergency situation will probably develop. Last, if you whiff the faint odor of acetone or iodine you are in the wrong place. Go somewhere else. Whatever trouble you are in can't compete with the trouble you are in.

Similarly, there are a few hard-core prospectors out there working established mining claims. They usually have a lot of pride of ownership. If you come across one of these, the law allows you to walk across it, because it's public, multi-use land. However, the person who filed the claim owns the mineral rights. You don't want to pick anything up or crank up your dry-washer to see how much color he's getting. Bad form. The boundaries of the claim are marked at the corners. Go outside those boundaries if you want to do any rock collecting.

If you get out much, someday you'll encounter a guy with an in-your-face, glaring stand-offishness and an air of knowing every possible thing about everything. He'll usually be in a cowboy uniform, but sometimes he'll opt for BDUs. If he spits on the ground and glares when you greet him, there's a fair-to-middling chance he's an outfitter.

I don't know whether the profession just draws men of that sort, or if they sit down and ponder the desired image and deliberately cultivate it. An outfitter

depends on affluent flatlanders spending a few grand to be led to a giant bull elk or some other prey, usually. I assume they believe to be successful they have to be the kind of character the flatlanders can go home and shake their heads about to their wealthy friends so they're dying to spend a few grand to meet this guy, too, and tell *their* friends.

These fellows don't suffer fools joyfully, and they project the wisdom that every man, save one, is a fool. They save their purplest scorn for other outfitters, but you can figure on deep maroon for yourself at the very least. In any case, Hollywood discovered the type a few years ago and enshrined it in a movie, but they added an authenticity and charm that's usually absent in the real item.

I'm telling you this so you are forewarned. Don't bother asking the guy any questions or conversing with him unless you happen to be on the upswing end of your manic-depressive cycle and need a little something to get you back down a little. If you get any answers from him, they probably won't be true, and the cost will be that you've had to communicate with him. The circumstance will have you replaying the conversation in your mind a week or so later, thinking what you *wish* you'd said.

Bumper-stickers:

Leave your politics at home. A banner on your car announcing that "Whitey Will Pay", or your opinion of cows, whales, ranchers, guns, abortion, or the president, invites hostile attention on an unattended vehicle. If you need help you won't improve the odds by rubbing the nose of your rescuer in your biases. You might find yourself at the mercy of a person who is violently opposed to your viewpoints a long way from the nearest lawyer or cop.

This could go on and on, and it begins to resemble a camp meeting sermon.

Crash Kits

Not many years ago all pilots carried 'crash kits' with a few essentials inside to make life easier if they were weathered down or experienced engine failure. The concept was a good one. People who think in those terms tend to be mentally prepared for jolts of reality. But a crash kit just makes good sense for travelers. The items stored inside can be handy even if you are broken down on the interstate and waiting for a wrecker. If your 4 wheeler breaks down on a mountain top it will be even handier.

Crash Kit contents inside a small day-pack:

1) Everything in the pocket survival kit shown above, including the cutting tool. (Don't bother with the cheapie multi-purpose knives you see today. Buy one of the two brands of original Swiss Army knives large enough to include a saw tooth blade. If you have to use it you'll be glad you did.)
2) A small garden trowel or other digging tool.
3) 1/4 roll of toilet paper.
4) A bar of motel soap.
5) A nylon windbreaker with hood. The kind that fits into its own pocket and zips shut is compact, light, and one of the items you'll use most.
6) Toothbrush and small tube of toothpaste
7) One pair of thick socks
8) One pair of underwear.
9) 30' of duct tape wound tightly around a pencil.
10) One small aluminum cook kit for backpackers.
11) A fork and spoon.
12) One sealed package of beef jerky and a ½ pound package of raisins.
13) A vial of garlic oil (internal) or other insect repellent (external).
14) 100' of nylon cord.
15) 4 ea. 1 quart freezer bags.
16) 2 ea. large leaf bags.
17) 2 ea. plastic sandwich bags.
18) A cloth hat with a brim if you don't always wear one.
19) A pair of walking shoes if you don't always wear them.
20) A bandana or large handkerchief.
21) 2 ea. Light sticks, one red, one yellow.
22) One road flare.
23) A bottle of salt tablets, tweezers and 2 alcohol pad packets.
24) Any medications you take regularly.
25) One pair of the longest shoestrings you can find.
26) One small, cheap fleece summer sleeping bag.
27) Good sunglasses and a tiny eyeglass repair kit.
28) One thin, clear plastic 10'x10' painting drop-cloth.

You'll soon discover you frequently have to replenish or return a number of these items to the crash kit.

I'd suggest you also include a Delorme Atlas & Gazetteer for whatever state you are visiting. If you get stranded tear out a page or two for the area you are in and fold it into a sandwich bag to carry with you. Then you'll have a good map of the back roads where you are and even some rough topographic features. You can use the rest of the atlas for fire starters if need be. Otherwise leave it behind when you start walking.

Conclusion

The most important facet of getting through any emergency situation is attitude and clear-headedness. Fear and anger are your worst enemies. Feel confidence in your own ability and consider what's happening just one of those inconveniences you have to get through in life. When you're home safe you'll be proven right.

Remember the words of Walter Yates, "It's all in your mind!" There's no challenge you are likely to have to equal the one he found himself in and survived.

About the author:
As a youth in the 1950s Jack Purcell worked on farms and ranches in eastern New Mexico. He spent many years searching for the Lost Adams Diggings and researching the history. Purcell's life-long passion for history and the outdoors have produced several books now in print.

Hell Bent for Santa Fe
The Texan Santa Fe Expedition of 1841

The Lost Adams Diggings
Myth, Mystery and Madness

Poems of the New Old West
Cowboys, Casinos, Truckers and Trotskyite Dogs

Desert Emergency Survival Basics

Purcell's books can be found at jackpurcellbooks.us

NineLives Press