

SurviveInPlace

Lesson 10

Alternative Means Of Communication Powering Electronics If The Grid Goes Down

By

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Alternative communications:

Recent events in the US have shown the telecommunications grid be both amazingly robust and amazingly fragile at the exact same time. I told you about a recent "geek" conference that I was at where the sheer number of people using their iPhones caused 6 AT&T cell towers in downtown San Francisco to overheat and shut down.

I also told you how the major cell carriers brought in portable cell tower/generator trailers and had phones working within a day or two of the levees breaking after Katrina.

Even when cell service was down in New Orleans, and there were jon boats cruising by in the streets, there were hotels in the French Quarter that had landline phone service, even though you'd think the connections would have been shorted out.

The point is that we just don't know what communication will work after disasters. Cell phones and landlines can be a great primary means of communication, but if they aren't working, it's smart to have one or more backup means of communication. An old saying that has been widely attributed to the US Navy Seals is "One is None. Two Is One." It's not only going to be smart to have backup communication for when your primary communication stops working, it's also going to be necessary to have a simple, efficient way to power your gear.

Email??? One of the simplest "alternative" methods of communication MAY actually be email. Phone lines being jammed doesn't necessarily mean that DSL is down. Even if phone lines and DSL are down, cable, fiber, T1, or satellite internet connections could still be working and allow you to get a message out or communicate with others in your area.

One of the benefits of email, like texting, is that the sending and receiving parties don't have to be engaged simultaneously in order to communicate. So, if you have access now, but someone else doesn't have access to their email for another 2-3 hours, you can still have a conversation.

In addition to actively emailing people, another option is to have an email account with a free email service like Gmail or Yahoo that everyone in your family/group has login information for. When you need to get a message to the other people, simply write the message and save it as a draft. Since it never gets "sent," the chances of getting lost in cyberspace drop considerably.

If you decide to use this strategy, you may also want multiple accounts with Yahoo, Hotmail, and Gmail using the same username and password in case one of the

servers is unavailable. You will want to agree in advance about how often everyone will attempt to check these accounts in a disaster situation.

If you can afford to have other people read your conversation, you can also use **Twitter, Facebook, blogs, or even the SurviveInPlace.com/members forum** to communicate with friends, relatives, your group, or the world. One example of this happened in 2008 when James Buck, a UC Berkley journalism student, took photographs of a demonstration in Egypt and was arrested.

He “tweeted” the word “arrested” on the way to the police station and his friends back in the US immediately contacted UCB, the US Embassy, press organizations, and eventually an Egyptian lawyer who got him out of jail the next day.

Be aware of OpSec when you post to blogs, forums, and other social networking sites. You have to simultaneously assume that your message will get deleted immediately and that it will never go away.

When I say that you need to assume that your message will be deleted immediately, I’m saying that you shouldn’t depend on the intended party ever receiving it. This could be because of posting issues or possibly censorship.

When I say that the message will never go away, I mean just that...Other people will be able to read what you say for days, weeks, or months after you post it, so be careful with your username and be careful with what you post.

VOIP stands for “Voice Over Internet Protocol” and is a technology that lets you talk to people over your internet connection rather than on a regular phone. Some commercial names are Vonage, Skype, and Magic Jack and they cost as little as \$30 per year for service. If you have good enough internet access in a disaster situation, you will probably have VOIP access and be able to talk with other VOIP users and/or call telephone numbers outside of the affected area.

The major benefit is that your VOIP phone will be able to send and receive calls anywhere that you have a high speed internet connection...not just at a fixed location.

That’s great...how do I connect to the internet after a disaster?

Strange things happen in disaster situations. Guests in the hotel I mentioned that had simultaneous flooding and working landlines ASSUMED that the lines were down and didn’t even try making calls for one to two days.

Even if the internet connection at your house is down, it’s very likely that with all of the different methods of connecting to the internet that you will be able to find one that works after most disasters. Here’s how.

War Driving is the practice of finding unsecured wireless (WIFI) networks that you can “steal” bandwidth from to surf the net, talk via VOIP, download email, post pictures, comments, tweets, etc.

There are handheld devices made specifically for “sniffing out” unsecured WIFI connections, but you can do the same thing by driving around with a laptop in your car.

If you’ve got a laptop and have never done it, take a drive with your laptop turned on and your “View Available Wireless Networks” tab opened. In most residential areas, you’ll have the option to log onto a dozen or more networks per mile and in high rise areas, it may even be more. In fact, there’s a good chance that one of your neighbors has an unsecured connection that you could access right now, although I don’t suggest that you do that since it is technically illegal.

Depending on the disaster that you’re facing, you could find that your cell phone doesn’t work, but that you can connect to someone’s DSL, Cable, or Satellite WIFI network with your laptop or WIFI enabled phone, allowing you to access email, tweet, or post to a blog.

In many cities around the world, war drivers have been marking unsecured WIFI locations for several years. I’ll link to some guides on the resource page for this lesson at <http://urbansurvivalplan.com/441/lesson10>. The idea behind these markings is that if you find an unsecured network, you mark the sidewalk, a wall, or lamp post near where you get the signal so that other “war drivers” can access the network in the future.

The ability to be able to quickly send/post pictures that you take on your phone in a disaster situation could be very valuable and I encourage you to practice this if you have a WIFI enabled phone with a camera. Many coffee houses have free, unsecured WIFI and they will allow you to try out this skill without stealing anyone’s bandwidth.

To Do: If you have a WIFI enabled phone with a camera, practice taking a picture, logging onto an unsecured public WIFI network, and sending the picture by email. Ask someone you know who has advanced computer/phone skills to show you how if you have any trouble.

If it is challenging for you to do, write down the instructions and put them in your SurviveInPlace plan.

Another reason to practice this is so that you can see how vulnerable unsecured networks are. If you have an unsecured network at your home or office, someone could easily do illegal acts (view kiddy porn, use a stolen credit card, harass a public figure, post hate speech, etc.) using your network. If the police investigated the incident, they would see that the incident originated at your IP address and you would be the primary suspect. You would most likely be found innocent eventually, but would have to prove your innocence in the meantime.

As I talk about in my book, **"47 Proven Identity Management and Identity Theft Prevention Techniques,"** the default admin login information is easily available online and anyone who wanted to could also lock you out of your own network in a matter of a couple of minutes if your network is unsecured.

To Do: If you have a wireless network, make sure that it is secured and that it does not use the default admin login. I write the updated admin login on a post-it note on the routers that I have so I won't forget it in the future.

Two Way Radio Communications

FRS (Family Radio Service) & GMRS (General Mobile Radio Service) Radios are a cheap, easy backup for cell phones and they're what I have used on road trips, guiding backpacking trips, and on close protection details. Some models claim that they have a 10 or 20 mile range, and while this is technically possible, I have not found it to be practical. In order to get this range, you would need to basically be in a flat dessert with no physical obstructions between radios, not have any radio interference and be at different elevations (or both be on hilltops with valleys inbetween) so that the curvature of the Earth doesn't block the signal.

Yes...curvature of the earth limits FRS and GMRS (and eXRS) radios to a maximum effective range of 6 miles, despite what advertising in the stores claim.

These radios do work well over short distances in urban areas...even through some buildings. In short, you need to test your radios before you use them so that you know how they will perform in urban and wilderness areas.

When you're buying walkie talkies, I suggest buying ones that take both rechargeable and ordinary AA batteries, like the Motorola Talkabouts so that you have multiple options for power.

If you're concerned about range with a GMRS radio, I have links to external antennas for your home and car that will get the antenna higher and extend your range considerably.

CB (Citizens Band) Radios are an option, but I would encourage you to use FRS or GMRS radios instead due to how much larger CB radios are and how simple FRS & GMRS radios are to power.

Short Wave, MURS, VHF, Wired Radios and Repeater Radios are a HUGE topic that are far beyond the scope of this course. Suffice it to say that they can be powered from car batteries, made portable, and short wave can even communicate half way around the world. All of these are GREAT survival communication tools, but they all take much more time and research to make a decision on than FRS and GMRS.

This is similar to the saying that "The 9mm that you're carrying is better than the .45 at home in your safe." In many cases, one of these other radios would be "better" than FRS/GMRS radios in terms of range, fewer people on the frequencies, etc., but they aren't systems that you can go to your local store, buy, buy AA batteries for, and start using them immediately for under \$100 TOMORROW.

At a minimum, I'd suggest getting a set of FRS/GMRS radios for backup two way communication and a crank/solar powered FM/AM/short wave receiver like the Kaito Voyager. It will allow you to listen to shortwave radio broadcasts and news that could be much better than your local news in a disaster situation.

OpSec. Anyone with the same type of radio can hear your transmissions on these radios, so watch what you say and decide in advance what names you want to use and any code words, if applicable. One strategy for names that I came up with and have used successfully is to assign everybody on your team/in your family a letter. It could be A,B,C, or it could be "D" for David, "P" for Peter. In either case, the first letter is all that matters.

Let's say that I am assigned the letter "A." It means that I will answer to ANY name that starts with the letter "A." It could be Adam, Aaron, Andy, Andrew, Amy, Angie, etc. I can also identify myself using any name that starts with the letter "A." One advantage of this is that it doesn't sound like code. I'm not saying, "This is Alpha," or "This is Maverick." I just say, "This is Adam."

With non-secure communication, you want your conversations to sound as uninteresting as possible so that other people will simply change to another channel rather than listen in.

Some codes that you may want to decide on ahead of time:

Danger. Come and help.

Danger. Flee. (“Look at that balloon going up outside of the bank”)

Change channels to the next pre-determined channel.

Come to my location discretely.

Something suspicious is at my 3:00 (straight right), 15 meters out. (I’ve used a system like this: “Would you rather meet in 15 minutes or at 3:00?”)

Try it out at a mall, a market, a theme park, or a fair. Again, in many cases it is preferable not to sound serious or tactical and to simply sound like friends talking.

Graffiti?? As I mentioned with war driving, there is a graffiti communication system in use to communicate information about wireless networks. It is actually based on a decades old system called “hobo chalk codes.” It could be very useful in a survival situation.

From denoting which dumpsters have good food and who’s an easy mark to where hobos get beat up, where homeless stings are happening, to which stores/homes have armed men, the hobo chalk codes can help urban survivalists recognize opportunities and avoid danger.

I’ve got both war driving and hobo chalk code guides on the resource page for this lesson. Make sure to take a look at them and even consider printing them out and putting them in your SurviveInPlace Plan.

To Do: As you’re driving about, see if you can spot any war driving codes or hobo codes. They are much more common in the northeast and on the west coast than other places in the country, but you may see some. As you see them, snap a picture and send it to me.

Satellite Telephones is one final two way emergency communication method that I’ll discuss. They have such strong good points and such strong bad points, that I can neither completely recommend or completely discourage you from using one.

On the plus side, they won’t be subject to local infrastructure breakdown or jammed phone lines due to a local disaster and you can use them in wilderness areas and out at sea where you can’t use cell phones.

On the downside, they’re expensive, they don’t work in some urban areas where cell phones do (underground parking garages,) and if you’re concerned about

conspiracies, satellites can be shut down as easy as a cell network and conversations easily monitored.

To Do: Decide what forms of backup disaster communication your family will use. If you use radios, decide on channels, names, and codes, as well as times that you will turn on your devices if you are low on battery power.

If you are going to post to a website or use a common email account, make sure everyone knows how to post to it.

Write this information down and record it in your SurviveInPlace Plan.

How Do I Power This Stuff???

Your basic options are batteries, cranks, solar, or generators. I'm going to cover generators in the Katrina lesson, so today we're going to discuss cranks, solar, and batteries. The big advantage of cranks and solar is that, unless they break, they will continue to work for years. They won't die like batteries or run out of gas like generators, so I consider them a vital component in most people's survival planning. Unfortunately, they're not real simple.

You may be saying to yourself, "The Native American Indians didn't have batteries." Or "Les Stroud doesn't use batteries on Survivorman." You're right. People who are highly skilled in survival do not NEED batteries. They don't need headlamps, flashlights, radios, or communication.

If you're like me and want as many advantages as possible in a survival situation. You're going to want to be able to communicate with others, have flashlights at night, and do other activities that require batteries.

I've got to get a little bit technical on you for a minute for all of this to make sense. You see, when you go shopping for solar and crank powered survival tools, you'll see a LOT of grandiose claims.

****begin major geek speak****

To help you understand what all the terms mean, I need to explain what watts, amps, and volts are. To use a common analogy, think of a garden hose spraying water. The amp rating is the volume of water flowing through the hose. The voltage is the pressure, and the wattage is the total amount of water that comes

out of the hose per unit of time. They relate to each other through the equation Watts=amps X volts.

AA batteries are rated at either 1.2 or 1.5 volts and most alkaline AA batteries have around 2000 mA and NiMH rechargeable AAs have between 2000-2500 mA (milli amps) when fully charged. (AAA batteries have roughly ½ as much)

Milli amps are simply 1/1000ths of an amp. 1000mA=1Amp

Using the above information, a 1.2 volt fully charged 2500 mA AA battery will hold 1.2 Volts X 2.5 Amps = 3 Watts of power and would power something that requires 3 watts for about an hour.

****end major geek speak. Begin minor geek speak****

One popular compact solar battery charger, for example, advertises that it puts out 80-160 mA of power. It claims that it can charge 4 AA batteries in 3-6 hours. When you dig deeper, their claim falls apart.

The batteries that the company used for their test were 500 mA batteries, rather than the 2000-2500 mA batteries that you're used to using.

Put another way, it would REALLY take 31 HOURS of direct sunlight to charge "normal" rechargeable AA batteries using this charger, rather than the 3-6 hours that they advertise. (2500 mA / 80 mA/hr = 31 hours)

Crank chargers are somewhat better when it comes to compact chargers. The Kaito Voyager, as an example, has both a solar panel (4.5V 40 mA/hr max) AND a hand crank (5-6V and 500-600 mA/hr at a 2 crank per second pace.) This is better, but it still means that you would have to crank for just over 4 hours to fully charge 4 2500 mA rechargeable batteries.

(This is a great little radio...I have one and I fully recommend it as an emergency radio, but do not recommend it for charging batteries/appliances except for limited use.)

There are four big takeaways here:

1. Test out your survival equipment before your life depends on it. Don't just assume that since it says it can "charge anything with a plug" that it can do it in a timely manner. If you aren't WILLING to crank the equivalent of a pencil sharpener for hours at a time right now when things are good, don't plan on being ABLE to do it in a disaster situation. Find a more realistic solution.

Also, if you don't have DAYS for the sun to charge your batteries, make sure you have a big enough solar array to charge your batteries as quickly as you use them.

2. You've got to know a little math when you're buying solar and crank chargers. Here are the biggies: Good AA NiMH batteries hold 2000-2500 mA. Divide that number by the number of mA of the charger you're looking at and you'll know how long it will take to charge the batteries. If you only drain the batteries part way before recharging, adjust your numbers accordingly. In any case, you need to make sure that you're USING fewer mA per day than you're GENERATING to have sustained power.

Watts=volts x amps. If you're charging 4 1.5 volt batteries, then you need 6 volts of input. If the charger that you are looking at is rated in watts instead of mA and is rated at 2 watts, it means that you're putting 2 watts/6 volts=.33 amps or 330 mA per hour into your batteries. If they're completely drained, it means that it will take $2500 \text{ mA} / 330 \text{ mA} / \text{hour} = 7.5$ hours to charge them.

Most output ratings on solar chargers are "ideal" and you will only get that output by continually pointing the panel towards the sun throughout the day. If you don't continually reposition your solar panel, you should only expect a maximum of 3-4 hours of fully effective sunlight per day.

3. For short term emergencies, you could consider just going out and buying a LOT of regular batteries. As an aid in figuring out how many batteries you could need, Motorola talkabouts go through 3 AA batteries every 30 hours. LED lamps vary widely from a couple of hours to 1200 hours (50 days.) I would suggest buying a couple of 30 packs of each size of battery that you regularly use, if not more, and cycle through them, just like you do with food.
4. In interviewing solar/generator experts, one consistent bit of feedback I received was that 90% of people who start out looking at solar off-grid solutions or solar backup systems end up going to Costco and buying a generator.

****end of geek speak****

Hopefully I haven't scared you out of using solar or crank power. They are great options in a survival situation, but you do need to know the limitations and size them correctly for the application. With that in mind, I want to show you some options that will give you enough usable power to help you in a short to long term survival situation.

This technology changes very rapidly, so I won't be mentioning models, or places to buy the following items here, but I will have them on the resource page for this lesson so that you'll always have access to the newest information. I'll be updating the link as I continue to do research and get feedback from students, so if you find a better vendor, better pricing, or a better package, make sure to let me know!



has a car charger.

If you need to recharge high capacity rechargeable batteries quickly, you're going to want a bigger system than what you can get at camping stores.

This type of system runs around \$200, puts out 12 watts, and can charge 4 high capacity AA batteries in 4-5 hours.

Put another way, it will charge batteries at 600 mA per hour.

Since it has a female cigarette lighter plug, you can charge anything that



The next option is a big step up in both price and features. For \$600, you can get a 40 watt solar array, a 55 amp-hour battery, 300 watt inverter, a charge controller, voltage meter, and a 12 volt DC outlet. Again, to figure out exactly what that means in terms of AA batteries, we take $\text{watts} = \text{volts} \times \text{amps}$.

If we're recharging 4 AA batteries (6V), then 40 watts will charge them at a rate of 6.6 Amps per hour and your batteries will be fully charged in about an hour. There is enough power to charge them faster than that, but most batteries can't take being charged any faster than that.

The big advantage of this system is that the lead acid battery holds the equivalent of 220 AA batteries of energy when it's fully charged. You can use it to power anything that plugs into a cigarette adapter. With the included 120 V inverter, you can even plug in small household appliances. (More on lead acid batteries in a minute.)

If you're interested in a small, foldable version of this setup, Brunton has several large solar arrays to choose from, but they cost 2-3 TIMES as much as the ones I'm showing you for the same amount of power and storage.

As you know, the sun doesn't always shine. Whether it's because of storms, smoke, clouds, or your location in relation to the equator, solar power doesn't work in all situations.

Fortunately, there is a simple solution to this problem that will work for people who are in good enough physical shape to pedal. (If you're not, I suggest making that a goal. If medical conditions make that impossible, try to find a "young buck" or two to add to your team.)

One energy generation solution that has been around for several decades is simply attaching pedals to a generator. As discussed in the book, "Patriots," you can build your own if you are mechanically inclined and I have links to plans on the resource page for this lesson.

You can also buy pre-assembled systems that will work with a bicycle. As a bonus, they can be used on their own or in combination with the solar/battery system above. A pre-built pedal system that a moderately fit person can use will put out 150 watts for around \$300. This is almost four times more than what the solar array will put out. Again, I have links to a couple of options on the resource page.

Batteries are not created equally. One of the solar experts I talked with for this lesson has been helping people with off-grid homes and power backup systems for 40 years. I originally approached him about buying a couple of car batteries and a 2'x4' solar panel. I had the brilliant idea that I could have an "even" battery and an "odd" battery. On even days I'd charge the even battery and use the odd one. On odd days, I'd charge the odd battery and use the even one.

After I explained what I wanted to do for the 2nd time, he laughed (nicely) and proceeded to tell me that I was a complete idiot. (again, very nicely.)

It turns out that car batteries are a very poor choice for off-grid power, but it's a common mistake to try to use them for that purpose. Car batteries are designed to work for a very short period of time (cranking the motor) at high output and then

immediately charged back to a full charge. For this reason, they are called “shallow cycle” batteries.

If shallow cycle batteries are drained more than 20-30% their life spans will be shortened considerably and if they are left in a drained state for more than a day or two, they can be completely destroyed.

Deep cycle batteries, on the other hand, are made to be discharged as much as 80%. Rolls batteries, for example, can be discharged 80% and have a lifespan of 7-15 years. A few non-survival example of deep cell batteries are golf cart batteries, RV “house” batteries, and marine batteries, although not all of them are truly “deep”.

What’s the difference? Here’s a simplified explanation...a lead acid battery is made up of lead plates dipped in acid. The more surface area of the lead that touches the acid, the more amps the battery has.

The lead plates in shallow cycle batteries are like sponges and have a lot of surface area, but corrode quickly if they aren’t kept charged. Lead plates in deep cycle batteries, on the other hand, are big, solid blocks of lead. They don’t have as much surface area, but they can handle being drained much deeper.

The other big difference is price. High end (Rolls) 12 volt deep cell batteries run up to \$1000 apiece, but you can buy MK deep cell batteries for as little as \$100.

If you decide to go this route, your battery and/or charger will come with maintenance instructions. Make sure to follow them so that your battery lasts as long as possible, doesn’t explode, and doesn’t leak acid on you or your valuables.

As a basic cautionary note with any car, marine, or deep cycle battery; storing batteries on concrete floors will cause them to die very fast.

To Do: Decide what power solutions you are going to use in a disaster situation. Add the items to your SurviveInPlace prioritized supply list. At a minimum, start buying extra batteries in the sizes that you use when you find them on sale in bulk.

That’s it for this week. It’s a fair guess to say that if you can go over this information a couple of times this week and retain 20-30% of the information, you will know more about emergency communication and batteries than 95% of the population.

I know it was a little more technical than usual, but I found the information necessary for my own preparations and I hope you agree that it was valuable. Before I knew the numbers on solar and crank chargers, I thought that I had the ability to easily recharge all of my electronics with my pocket solar charger and a hand crank radio. As you now know, the facts are a little different.

Hang tight...we've still got some important topics to cover, including:

Lessons from Katrina...from security contractors and people who teamed up and rode out the storm.

Poop, sleep, and psychology...everyone has to face these three things every day. We'll walk through how to do it in a disaster situation.

Venturing out...safe travel and commerce.

Time to leave...when your current location is no longer survivable.

Make sure to head over to the resource page for this lesson at <http://urbansurvivalplan.com/441/lesson10> , take a look at the resources for this lesson, and comment on what you thought about it.

See you in 7 days!

God Bless,

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