HOW TO COMMUNICATE AFTER SHTF

(INCLUDING SURVIVALIST RADIO FREQUENCIES)

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Table of Contents

Introduction

Surviving a major crisis is always going to be a challenge, but like everything else in life it's easier if you can talk to people. Staying in touch lets you share information, give advice and ask for help when you need it.

Just look at how much modern technology is geared towards letting us communicate. Cell phones let us stay in touch with people wherever we are. Smart phones go a big step further by adding internet connectivity, email and social media apps. The internet itself uses a whole array of technologies, from different ways to connect to encryption to keep our data safe, payment systems for online stores and services, and new apps that make it easier to talk to people.

So, right now, it's easier to communicate than it ever has been. Once you have a data package for your phone you can instantly talk so someone almost anywhere in the world using text, voice or video. You can look up information on any subject. Communications have become so simple, and so pervasive, that for most people it's already hard to remember it being any other way. Imagine that you want to check a fact and, instead of just firing up Google, you need to go to the library and find a reference book. It's an alarming thought – and it shows just how quickly we've got used to modern communications networks.

The problem is that all these networks are incredibly vulnerable to damage or disruption. The original idea for the internet was a robust network that could maintain communications through a nuclear war, but now it's linked into every telephone exchange in the country. It isn't robust anymore. Most of the data that's out there is stored on servers in universities and server farms that are totally unprotected against EMP. One high-level burst and the internet is basically gone; even if your connection survived, which it won't, most of the data will be erased. That includes all the apps you use to communicate with.

Cell phones would be hit just as hard. They're really only short-range devices; they can talk globally because they're hooked into a network

of transmission towers. An EMP would fry those towers and kill the whole system. That's assuming the phone itself survived – and it probably wouldn't.

Obviously an EMP is particularly destructive to modern comms equipment, but other types of crisis will do nearly as much damage in the end. Natural disasters like storms, earthquakes or volcanic eruptions can destroy communications infrastructure, or shut it down temporarily by taking out power. Civil unrest will have the same effect. If people can't get to work then the server farms and cell towers will start falling victim to technical problems and power outages. The more of the system fails the more overloaded the rest of it will become, so whatever communications you can manage will be slower and less reliable.

There's also an issue of security. In any serious emergency expect the government to take over whatever communications are still working. Even if they have the best of motives, their aims might not coincide with yours. What if you're discussing your supplies with someone and an eavesdropper decides your food should be redistributed to your hungry neighbors? It's important that as well as being able to communicate reliably, you can also do it securely.

However you plan to communicate after the SHTF, it's going to have to be a self-contained system. In a bad enough crisis *everything* we currently use to talk to each other is going to break down. It's not just the internet and cellphones; if society gets disrupted badly enough the landline phone network, and even the mail, will collapse too. If you want to stay in touch with friends, family and other preppers you're going to have to set up the systems yourself.

Chapter 1:

Radios – the Communication Solution

If you want reliable real-time communications over long distances once a crisis hits, there's only one option – radio. A radio doesn't rely on fixed infrastructure that can be destroyed by an EMP or shut down by lack of power or operators. It works whether you're mobile or at a fixed location. As long as you supply it with power it will work. Unlike a cell phone, it lets you keep a channel permanently open – just press the button and talk.

Radio can be used between two people or as part of a large network. The same device can take part in several networks simply by changing frequency. There's a whole range of radios with different capabilities, from high-powered base stations to compact handhelds that will fit in a pocket but still transmit over several miles. Finally, they're fairly simple to operate and don't cost much compared to more sophisticated gadgets. That's not to say modern radios aren't sophisticated, but they're a lot simpler – so a lot more reliable – than a smart phone.

Choosing radios

There are thousands of radios on the market, but they can be split into three basic types. All have their own advantages, and you'll probably want to add at least two – maybe all three – to your survival communication plans. Almost all radios fit into one of these boxes:

Base stations are externally powered sets designed to be used at a static location. They are the most powerful radios, and usually have more features than mobile sets. Base stations are generally designed to run on mains electricity, but they can also be powered by a generator or a bank of batteries. They are connected to a fixed antenna, which is normally on the roof or on top of a mast. Modern base stations are usually quite compact and can be moved around easily, but they have to be set up before you can use them. Some base stations are capable of transmitting and receiving over intercontinental distances.

Vehicle sets are smaller versions of base stations designed to be mounted in a vehicle. They're powered by the vehicle battery and

usually have an antenna mounted on the roof or fender. Modern vehicle sets can have most of the features of a base station, although power output is usually lower. That, and the fact the antenna isn't mounted as high, means they have a shorter range. However, many vehicle sets can also be used as base stations, and connecting them to a higher antenna will boost their performance.

Handheld sets are compact, battery-powered units. They range in size from tiny models that can fit in a pocket up to larger ones that clip to a belt or load-bearing equipment – and you could stretch a point and include military backpack radios in this category. The main thing is that, while they have lower power output and a shorter range, they can be taken anywhere.

To decide what kinds of radio you need, look at what you plan to be doing after the SHTF. Your home or refuge should have a base station; that's probably going to be the hub of your radio network. If you have a survival vehicle it's probably a good idea to put a set in that too. You could take a handheld with you, but they don't usually work very well inside a vehicle; the bodywork acts as a partial Faraday cage, weakening the signal. On top of that, most of them are too short-range to cope with the sort of distances you can cover in a vehicle.

As for handhelds, having a few of these is very useful. If you're out hunting, looking after livestock or just walking the perimeter of your land, a handheld will let you contact home if you need any help. Planning to work with your neighbors to secure the area against looters? You'll need a way for sentries to talk to each other and call for backup if intruders appear.

So, if you want to be able to communicate by radio in a crisis, you're certainly going to need a base station and probably some smaller radios too. It's all down to your personal situation, but having more options available increases your chances of being able to communicate if anything unexpected happens. For example, if all you have is a base station but you're forced to leave home for some reason, you're cut off. In that situation, a vehicle or handheld set will give you a chance to stay on the network.

Frequency options

Before you start choosing exactly what radios to buy, you also need to decide what frequencies you plan to use. There are several frequency classes with survival and preparedness uses, but some of them are regulated. There's a legitimate discussion to be had about whether the government has the right to regulate what frequencies private citizens are allowed to broadcast on, but the reality is that anyone who starts running an unlicensed transmitter in a licensed band is going to get unwanted visitors pretty soon. That's not so likely to happen in a crisis, but do you really want to keep your radio in its box until society breaks down? It's better to use it regularly, so you get to know who else is using the same frequencies around you.

Other frequency classes are free for anyone to use, but there's usually a price to be paid for that. For example, some popular unlicensed systems have so many users that it's difficult to find a clear frequency to talk on. Others have limited range or are line of sight only. Here are some of your options.

Citizen's Band

CB radio is unlicensed, and hardware is widely available. Most sets are designed for use as either a base station or vehicle mount. There are 40 channels available all at the top end of the HF waveband – they run from 26.965 MHz to 27.405 MHz. Radios are available in both AM and single sideband modes, with SSB generally giving better range.

Although it was introduced in 1945, CB reached the peak of its popularity in the 1970s and early 1980s. Since then it's declined, mostly thanks to cell phones, but it's still a usable option. In fact the lower number of users is a bonus – there aren't as many people trying to use each channel.

You don't need a license to use CB, but there are some restrictions on it. AM sets are limited to a 4W power output; SSB ones can go up to 12W. The antenna can't be mounted more than 20 feet above the highest point of the structure it's mounted on, and the highest point of the antenna itself can't be more than 60 feet above the ground. You're also not allowed to modify a CB transmitter – the wavelengths might be unregulated, but equipment must be FCC-certified. The government will get particularly annoyed if you increase transmission power or modify the set to transmit on anything except the authorized frequencies.

As for the frequencies themselves, there are some conventions on what they're used for. Channel 9 is reserved for emergency messages or traveler assistance, and using it for anything else will quickly generate a lot of complaints. Most police departments used to monitor Channel 9 to help them respond to incidents, and in some areas they still do. REACT, a volunteer organization, still monitors it across the USA and Canada, and they're likely to have a word with the local cops if anyone's abusing the channel. It was the FCC who designated Channel 9 as an emergency network, so using it for other purposes can get your radios taken away.

Channel 19 is usually used as a traffic information channel, mainly by truckers. Truckers also use it as a chat net, but if two users start chatting the polite thing to do is move to another channel to reduce traffic on 19. Many CB vehicle sets have a quick-select button for Channel 19; some also have one for Channel 9. Many radios also have built-in NOAA channels so you can monitor the weather.

To get the best range from a CB set use a long antenna and mount it as high as possible. Center-load antennas will give better range than a base-loaded one. A base station should give a range of at least 15 miles with a properly set up antenna, and depending on terrain it can be as much as 50 miles. The range for a vehicle set can be anywhere between about two miles with a single two-foot fiberglass whip up to around twelve miles with dual center-load antennas.

Handheld CB radios are also available. They're usually larger than pocket size, but compensate for that by having the same power output as standard CBs. They do have a shorter range because of the smaller built-in antenna, but in good conditions and reasonably flat ground most of them can reach out two miles or more.

Many handheld CB sets can also be connected to an external antenna and microphone. That means you can have one in your vehicle, plugged into the lighter socket and a standard antenna on the roof, and get the range of a vehicle set; then, if required, you can disconnect it and take it with you on foot.

CB radios are affordable. You can get a basic but effective set for under $60; for example the Cobra 18WXSTII. It doesn't have all the features of a high-end set, but it works fine and can monitor two channels at once. For $100 and up you'll get more functions. Handheld sets start at under $40, and for $80 you can get something like the Midland 75-822, which doubles as a vehicle set.

Multi-Use Radio Service

MURS was authorized by the FCC in 2000, and like CB it doesn't need a license to operate. It only has five channels, in the middle of the VHF band from 151.820 MHz to 154.600 MHz. Transmitters are FM, limited to 2W output, and have the same antenna height restrictions as CB.

There's a wide variety of MURS devices on the market, including base station, vehicle and handheld radios. With a good external antenna they can manage a range of up to ten miles. The shortage of channels is a drawback, though, and for SHTF use MURS is probably not as practical as CB.

Family Radio Service

Authorized in 1996, this is a set of 22 UHF channels between 462.5625 MHz and 462.7250 MHz. No license is needed to broadcast on these channels as long as the radio is limited to 2W (0.5W on Channels 8-14) and has a permanently attached antenna. Because if these restrictions most FRS radios are handheld sets, although there are some "base station" table top radios with a whip antenna.

FRS is a short-range service that's limited to line of sight. Depending on the terrain a range of half a mile to two miles is normal, although base stations can often transmit further. Obviously, if you want to share fallout warnings with preppers across the USA an FRS radio isn't going to do you a lot of good.

On the other hand, FRS handhelds are as cheap as chips. Almost all the budget handhelds on the market – and many of the mid-range ones – are FRS. You can get a pack of six on Amazon for under $60. If you're looking for radios to hand out to all your neighbors, or for guards on your community, these are ideal.

Amateur radio

Amateur, or "ham", radio is one of the oldest private systems. The USA has been issuing radio licenses since 1912; to get one you have to pass a test, and there are three levels of certification that give increasing levels of access to wavebands. Licensed radio hams are issued a callsign by the FCC, to identify their transmissions.

Thanks to licensing, amateur radio is a lot less popular than CB. It's also more strictly regulated by the government. On the upside there's a much wider range of frequencies available. Amateur frequencies are mostly set by international agreements and they range from Low Frequency to UHF. From the middle of the HF band down to LF, wavelengths are very long. This means you need to use larger

antennas, but it also means you can transmit over very long distances. Using skywave transmissions – bouncing the signal off the upper layers of the atmosphere – it's possible to communicate between continents. Many amateur bands are also allowed to use much higher power output than CB radio, so 200W transmitters aren't uncommon. CB is fine for talking to people across your local area, but amateur radio will let you communicate with anywhere in the USA.

There's also a huge range of equipment available for amateur radio. Basically, you can use any set that can be tuned into a frequency in any of the designated amateur bands. CB sets have the 40 channels programmed into them; ham radios can be tuned to any frequency inside the set's operating range. Sets range from small handhelds up to high-power sets capable of working with huge dipole wire antennas.

An easy way to get started with amateur radio, once you have your license, is to get a UHF/VHF starter kit. These are usually built around a radio capable of putting out around 40 or 50 watts, and have everything you need to mount it in a vehicle or use it at home. Generally you can expect up to a 20-mile range straight out of the box, and that can be significantly increased by connecting it to a larger antenna. This sort of kit sells for around $300, which isn't much more than a CB set with similar performance, and it's a lot more flexible.

The advantage of getting a UHF/VHF radio is that you can get handhelds that will operate on the same frequencies. Modern radios also let you dial in channels then store them in memory; often you can store up to 999. That means you can set up all your radios with the same list of channels, making it easy to quickly switch between nets.

Another thing it's easy to do is find a free channel to talk on. In a major crisis, expect everyone who has a CB radio to be using it. A lot of them won't be very organized, and they'll be desperately trying to use their radio to find out what's going on, ask for help and probably a million other things. With only 40 channels available it's going to get crowded, and you might really struggle to hold a conversation. There are a lot fewer radio hams than CB users, and a lot more amateur frequencies than CB channels.

At the end of the day, what matters is that the radios you have let you stay in touch with the people you need to stay in touch with. Overall, amateur radio is the most flexible option because there's such a wide range of equipment available and you can talk over much longer distances. It's not for everyone, though, and that means there's always a place for unlicensed options. Even a couple of cheap handhelds are worth having if it lets you talk to home while you're working outside. Radios are a bit like guns – the only bad one is the one you don't have.

Military surplus

If you look on ebay you'll find plenty of US Army surplus radios, many of them in working condition. They're usually older models, and the most interesting of them are the Vietnam-era AN/PRC-25 – known to generations of unlucky GIs who had to carry it as the Prick-25 - and the similar, but more capable, AN/PRC-77.

For post-SHTF use, the PRC-25 is probably your best bet. Unlike the PRC-77 it can't be fitted with a voice encryption unit, but that doesn't matter – you don't have a voice encryption unit anyway, because the US government destroys them with a blowtorch. The other main difference between the two is that the older PRC-25 has a final power amplifier that uses vacuum tubes, while the PRC-77 has integrated circuits – and vacuum tubes are a lot more resistant to EMP.

Both these radios operate in the low VHF waveband, and you'll probably need an amateur radio license to use them, but they have some advantages. They're as rugged as it gets – many of them spent years in Vietnam, being dragged and bumped around nasty terrain in foul weather conditions with things exploding around them. Unless they actually got shot, they kept working. They're designed to be EMP-resistant to a degree; part of the reason for their considerable weight is their thick, immensely strong and fairly well shielded metal cases.

The PRC-25 and 77 were designed for use as manpack radios, but they can also be used as base stations. They have a range of about five miles with the issued whip antennas, but you can boost that significantly by connecting them to an external antenna. Just make sure you get good batteries to go with them; they're military issue rechargeable packs, and there aren't any commercial equivalents.

FM receivers

As well as radios for communicating, don't overlook simple FM receivers. They're invaluable for getting weather data as long as NOAA is still operating. Many modern CBs have NOAA channels programmed in, but a couple of hand-cranked FM radios make a good addition to your equipment.

Chapter 2:
Setting up your radios

With most modern radios you can pretty much just take them out of the box, plug them in or charge them up, and start sending and receiving. That's fine for a hobbyist, but to get the most out of them in a SHTF scenario you should do a little more work.

Preparing a base station

If you plan to have a base station in your home or survival refuge – and it's a very good idea – you need to make sure it's going to do its job. That job is acting as the hub of your comms network; anyone who's away from home can talk to the base station. If multiple people are out doing different things their handheld sets might not be able to talk to each other, but the base station can relay messages.

Obviously that's only going to work if the base station can always be contacted. In the military, radio sets are always manned; you probably don't have enough people to do that. However, you can set things up so that, if someone calls home, they'll get a response as long as somebody is there.

It's tempting to set up a radio shack in a spare bedroom or even in an actual shed, but if you do that who's going to hear an incoming call? You're much better putting the radio in a room that's usually occupied, generally the living room or kitchen. Many radios can also be connected to external speakers; if yours can, consider putting two or three speakers throughout the house so someone will notice a call coming in.

Base stations run on mains electricity, but in a crisis you're likely to lose power pretty quickly. Use the mains while it works, but have a backup. If you have an emergency generator, that will power it. If not, look into setting up some car batteries to keep the radio running.

Because an EMP attack is on the list of potential crises, it's not just the mains you need to have a backup for. An electromagnetic pulse can also fry antennas, speakers, electronic microphones and power bricks, so keep spare ones in a Faraday cage.

Any radios that aren't being used should be kept in a cage too. Stored radios need to be completely disconnected; it's no use building one around the radio when the pulse can hit the antenna and generate a heavy current in it. If you can afford a backup radio, store it in a foil-wrapped box inside your cage.

Other preparations

Most vehicle radios will work with a simple whip antenna stuck to the roof with a magnetic mount, but you'll get much better performance if you set up, and wire in, a proper antenna system. Dual antennas can make a huge difference to range, and they also make your signal more consistent, especially if the antennas are mounted on the front fenders.

If you won't be using the vehicle for more than a few hours, take the radio out and put it in a cage. Disconnecting it will give some protection from EMP, but not enough that you'd want to rely on it. If your radio came with a magnetic whip antenna stick that in the cage as well; it will do for a backup if the ones you've installed get fried.

Handheld radios, again, should be stored in a cage when they're not being used or charged. It's best to keep a few spares as well. Basic handhelds are so cheap you can afford to buy another set as backups.

Finally, plan how to use the channels you have available. Designate one as a general chat net that everyone on the net monitors. If anyone wants to have a conversation they can switch to a different channel, then back to the chat net when they're finished.

Chapter 3:
Radio security

There's only one serious problem with radios, and that's security. Unless you have military-grade encryption, anything you send over a radio can potentially be overheard. All it takes is for someone to tune into the same frequency as you, and they can sit there quietly and listen to every word. If society has collapsed, that's not something you want happening.

You can't stop people listening to what you say on the radio, but you can make it difficult or impossible to know what you mean. It isn't hard to conceal important information, so even if someone hears you discussing your plans they won't know enough to interfere. Here are some things you should never say in clear:

- Names of places
- Names of people
- Map references
- Times and dates
- Details of stores and equipment

The problem is these are exactly the sort of important pieces of information that you often want to send over the radio. The trick is to find a way of doing that without letting the whole world know what you're saying. There are ways to do just about all of that.

Callsigns

A voice on the radio is just that – a voice. Unless someone knows you well enough to recognize your voice over the airwaves they don't know who you are, so why tell them? Instead of saying names over the net, give everyone a callsign. There's no need for it to be complicated. A simple way to do it is to just use people's first initial in the NATO alphabet, so if your name is Bob you become Bravo on the radio. If you're married to Belinda it doesn't matter; just be Bravo 1 and Bravo 2.

Number offsets

This simple trick works for any numbers. It doesn't matter if it's a map reference, a time or somebody's inside leg measurement – an offset will conceal the actual number from any listener. All you have to do is decide on a number to use as the offset, then add that to the number you want to send. If the result is ten or above, knock off the initial one – so ten would be sent as zero, and eleven as one. So for example if you use an offset of 4 you get:

Original number	Offset	Encoded Number
0	4	4
1		5
2		6
3		7
4		8
5		9
6		0
7		1
8		2
9		3

Offsets need to be changed at least every day, or patterns start to appear. It's a simple code, though, and it makes it a lot harder for a listener to guess exactly what you're talking about.

Spot codes

Maps marked with spot codes are a simple way to disguise locations. They were developed by British Army covert operators in Northern Ireland to let mobile teams securely report their location, and they're now used by many militaries and police forces.

Setting up spot codes is simple. Just get as many copies of your local area map as you need, and a few packs of colored sticky dot labels. Look for small ones, about 6mm or a quarter inch in diameter. Use different colors for different types of roads. In the British Army blue is used for motorways (freeways), because they're shown in blue on maps. Red shows main roads, and so on. Adapt the colors to however roads are marked on your local maps.

Now stick the dots to prominent points on the map. Road junctions are good, and so are noticeable buildings beside the road. If you plan to be moving around on foot you can also mark points you expect to be going through. You should aim to have enough points that, if you told somebody the nearest one to you, they should be able to go there and find you pretty quickly.

Once you've marked enough spots, number them. On roads, go in sequence – if one junction is numbered 41, the next should be 42. Use a different sequence for each color of dot, too. Then, when you give a location over the radio, combine the nearest dot's color and number; for example, Red 41. If anyone who's mobile calls each spot as they pass through it, you can easily keep track of where everyone is.

If there isn't a spot on your exact location but you want to call it in, just pick a nearby spot and give an offset from there – "I'm 400 yards northeast of Red 41."

Code names

If you mention the names of places – whether it's towns, streets or buildings – on the radio, anyone with a map can quickly work out exactly what you're talking about. The simple solution is to give code names to any location you think you're likely to mention. Pick code names that are easy to remember and don't give any clues to what you're talking about. If there's a stockyard near you, don't call it Cowtown. Give it a completely unrelated name that nobody's going to guess.

Be careful when using code names that you don't give away what they mean by how you use them. If everyone knows you were going to the stockyard don't call in when you get there and say "I'm at Bookshelf now." Just tell them you got where you were going. Obviously you need to balance keeping people informed against over-using code names, but in general the less often you use them the better.

Cyphers

When you start talking about cyphers people get visions of Enigma machines and decide it's too complicated. In general they're right – most cyphers are more trouble than they're worth. If anyone's trying to intercept your messages it's likely to be a gang of looters with a police scanner, or at most low-level federal officials looking for food supplies. You're not going to be up against Alan Turing and his crack Bletchley Park codebreakers.

If you just want to keep what you're doing secret from low-level listeners, you don't need elaborate machines or complicated code books. These aren't thinks you want to be messing with anyway. They're slow to use and, unless you're a highly trained signals operator, it's easy to make mistakes. As one small error can garble your whole message, you want to avoid that.

However, there's a place for simple ciphers that can be used quickly. Say you've found something interesting but don't want the whole county to know, or you've decided to head for a place that you don't have a code name for and that isn't near any of your spot codes. It's handy to have a way to encode the name, and one easy way to do that is with a bigram table. This is just a 10x10 square with a letter in each of its cells and numbers down each side. It looks like this:

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**0**
1	L	T	H	L	K	N	P	T	J	H
2	B	D	X	F	B	C	C	W	A	R
3	G	S	A	J	H	L	W	M	V	E
4	R	O	N	E	K	F	O	G	L	T
5	J	I	M	P	D	V	B	Y	J	T
6	F	C	V	C	U	S	R	I	Y	U
7	U	O	R	E	M	H	Y	E	G	D
8	E	Q	S	K	E	Y	A	P	G	O
9	N	A	F	W	U	D	Z	E	T	W
0	I	V	T	M	I	S	P	N	K	B

The letters in the cells are, roughly, the full alphabet repeated four times, but some of the less common letters – Q, X and Z – only appear once, and there are a few extra Es and Ts. If you want to spell out a word all you have to do is find each letter somewhere in the table then check the numbers on the top, then the side of the table and use those as coordinates for the letter. So if you want to send A, there's one in the third column. It's also in the third row, so you would send that as 33. To avoid anyone doing letter frequency analysis, if a letter is repeated in the same word find it somewhere else in the table next time. So if you wanted to tell someone you'd found an aardvark send 33 for the first A, then 92, 78 or 29 for the second one.

Spelling out words with a bigram table can get tedious, so don't bother trying to encypher whole sentences. Just hide the words that could tell a listener the details. You'll also want to change the tables every few weeks, or any time one gets lost. Drawing new ones is something you can get the kids to do, as long as they understand the simple rules – the most important one being that every copy of a table has to be identical.

Chapter 4: Survivalist Radio Frequencies

In a crisis you don't want to be sitting in front of your radio, scanning thousands of frequencies in the hope of stumbling across someone you want to talk to. Luckily, there are some frequencies that are regularly used by preppers and survivalists; if you can tune in to them, you'll soon be in touch with like-minded people. Here are some of the main channels you'll be interested in; keep a copy of this list beside your base station, and if you have radios with programmable channel memories you probably want to store at least some of these frequencies in them:

System	Channel	Frequency	Band	Description
FRS	3	462.6215 MHz	UHF	Prepper
GMRS	17	462.6000 MHz	UHF	Survivalist
PMR	3	446.03125 MHz	UHF	Survivalist/Prepper
MURS	3	151.9400 MHz	VHF	Survivalist/Prepper
CB AM	3	26.9850 MHz	HF	Prepper
CB AM	9	27.0650 MHz	HF	Emergency
CB SSB	37U	27.3750 MHz	HF	Survivalist/Prepper
CB	425 Freeband	27.4250 MHz	HF	Survivalist/Prepper
Amateur	HAMU3	446.0300 MHz	UHF	Prepper
Amateur	HAM42	146.4200 MHz	VHF	Prepper
Amateur	HAM52	146.5200 MHz	VHF	Ham calling
Amateur	HAM55	146.5500 MHz	VHF	Survivalist
Amateur	HAM10M	28.3050 MHz	HF	Survivalist/Prepper
Amateur	HAM20M	14.2420 MHz	HF	Prepper
Amateur	HAM40M	7.2420 MHz	HF	Prepper
Amateur	HAM60M	5.3570 MHz	HF	Survivalist
Amateur	HAM80M	3.8180 MHz	HF	Prepper
SAR	SAREMT	155.1600 MHz	VHF	Search and rescue
Marine	MAR 16	156.800 MHz	VHF	Marine safety
Marine	MAR 72	156.6250 MHz	VHF	Boat preppers

Channels marked Survivalist or Prepper (or both) are exactly what you'd expect – frequencies that preppers and survivalists use. Some of the others are worth pointing out:

CB Channel 9

We already discussed this in the CB section; it's the emergency channel. If you're in trouble this is always a good one to call for help on

– the message should get to someone who can assist you, probably fairly quickly.

HAM52

This is a general chat channel used by radio hams – so it's usually the most reliable place to find someone. It isn't a specialist emergency channel and it isn't favored by preppers, but if you're in trouble and struggling to make contact with anyone, try this one.

SAREMT

This is the official search and rescue channel. If you've called for rescue and want to talk the helicopter in, or you're trying to attract attention, use this channel. Don't use it if you're not in an emergency situation – that's an offence.

MAR 16

This marine VHF channel has the same function as CB Channel 9. It's an emergency channel, regularly monitored by the Coast Guard and other boaters. If you're in trouble on of beside the water, call for help on Channel 16.

MAR 72

Not all preppers live on land. Some like to stay afloat, and marine VHF channel 72 is how they keep in touch with each other.

Conclusion

Without good communications, preppers across the USA will be reduced to small, isolated groups with no real knowledge of what's going on outside their local area. Add a network of radios that can share and pass on information, however, and everyone is in a much stronger position. You'll be able to warn each other of approaching hazards, whether it's fallout, looter gangs or outbreaks of disease. You can give advice or share specialist knowledge. You can even just keep each other updated on the situation and give a bit of moral support. Unless you really want to be thrown completely on your own resources, radio is invaluable.

Not that long ago, radio sets were expensive and complicated. Now, prices have come down and most of the equipment is much simpler to use to at least a basic level. Obviously the more you know the better; with radios, a little knowledge about antennas can easily double the range of your set, for example. Knowing how radio waves act can help you choose the right frequency for the weather conditions or time of day; these are things that can make a big difference to performance. However, just about anyone can get a modern radio up and running straight out of the box.

The biggest problem with radios is the lack of security. Once you press the transmit button and start talking, it becomes possible for anyone within range to pick up your signal on their own equipment. Well-motivated criminals or rogue government agencies are likely to try to intercept radio messages to collect information before they take on a group of preppers, so make their lives harder by using the basic security procedures described in this book. The important thing about security is that you have to be consistent; if someone's doing a pattern of life study on you, and you get lazy and call something by its real name instead of the code name, it creates a chink in your security that can be levered open by an enemy. You also need to keep control of

things like spot maps and bigram tables; if one gets lost you need to change the system.

Most of all, keep your communications equipment safe. That means protecting it against the weather, accidental damage, theft and EMP. Keep replacements for everything you can, and store all equipment in a Faraday cage when it's not being used. If you look after your radio equipment properly, it will work when you need it – and it can be a lifesaver.

Alternatives to radios

Nothing beats radio for communicating over long distances without relying on infrastructure you don't control. Sometimes you might want not want to use it, though. If you're trying to keep a low profile, and not let potential hostiles know where you are, pumping out radio frequency energy isn't a great idea. It doesn't need much in the way of advanced SIGINT gear to find out where a transmitter is sending from. A simple directional antenna will give a bearing to your location; take two bearings from different points and plot them on a map, look at where they meet, and that's where the transmitter is. You might be using good security to disguise what you're saying, but if an enemy can find out your location that might be all they need.

There's also electronic warfare to consider. If the government decides to shut down radio transmissions for some reason, they're going to get shut down. No equipment you can buy on the open market is going to stand a chance against military jammers. That's bad news if you don't have any other way to communicate. It's always best to have some other options available.

Field telephones

Armies all over the world still use field telephones. They're old-fashioned and need to be linked together with wire, but they can't be jammed and they don't give away your position. If you want to be able to talk to neighbors they're ideal. In fact, if you have enough two-core wire, they work over amazingly long distances – the US Army's TA-312/PT will send a signal up to 14 miles in wet conditions, and 22 miles if it's dry. This phone can be found in working order on ebay for about $100, and runs on two D-cell batteries. If you run out of batteries, don't worry – it also has a sound-powered mode that's good up to four miles. Field telephones like this can be linked in pairs or in a ring. More modern ones cost more, but let you call specific phones on the network.

Field telephones are very secure; the only way to intercept the signal is to physically attach an intercept device to the wire. They also can't be jammed. The one vulnerability they really have is the wire itself; if it's cut, the connection is broken. That means, when you're laying out wires, you need to consider the best way to protect them from damage.

In war movies you'll often see field telephone links being knocked out by artillery fire cutting the wires. This can happen, but in reality the biggest threat to the wire is vehicles. Tracked combat vehicles are the worst – the wire often gets tangled in the track links, and the end result is usually hundreds of feet of wire being uprooted before it finally snags on something and breaks. Wheeled vehicles can also do a lot of damage, though. Just running a wheel over a wire on a rough, hard surface can shred the insulation and weaken or kill the signal. It's best to put wires where there's no chance of anyone driving into or over them.

An obvious place to string the wire is between existing telephone poles. There's no need to bother with the insulators used for regular phone wires – just use a staple or cable tie to fix them in place. If you want to conceal the wire, fix it to the cables that are already up there. They'll be dead, so there won't be any interference, and a thin, black field phone line will be almost invisible up there.

You can also run the wire between trees, high enough that anyone walking or driving between the trees won't snag it. The foliage will also help hire it. Just remember to string the wire loose enough that it won't break if the trees sway in a high wind. If it doesn't have to cross any roads it can also be fastened to walls, fences and other barriers; that will both protect and conceal it.

The main reason to conceal the wire is to stop anyone damaging it. Anyone who's might be planning to attack you have a reason to knock out your phones, but there's also a risk from people who weren't prepared for the crisis, and resent those who were. If they're bitter enough, they might just tear your wires down to make your life worse.

For ultimate concealment you can bury the wire, but that does take a bit of time. Lay it out on the ground, then cut a slit beside it with a

shovel. Feed the wire into the slit and stamp it down lightly – not hard enough to leave marks. As long as the wire's insulation is in good shape it will work fine, even if the ground is wet.

Field telephones are more secure than radios, but they're not totally impossible to intercept. If someone can splice their own wire into yours, they can attach a phone to the end of it and listen in. If your wires aren't all inside the area that you can effectively observe and secure, and you have something important to say, you can use any of the methods that work for secure radio messages.

Secret writing

There might be times when you need to put something in writing, but you don't want it to be read. Say you need to get a message to someone who doesn't have a radio; you might need to write them a letter and give it to someone to pass on to them. The question is, how much do you trust the person you're giving the letter to? Unless you're completely sure, it might be a good idea to make sure they can read it without knowing what it really says.

One simple way to do this is to write in invisible ink. It's an ancient method, but still a very effective one. What you do is write a convincing, but harmless, letter that doesn't reveal anything important. Then you use the remaining space on the page to write another, secret, message that won't show up unless someone knows how to reveal it.

Modern invisible ink usually glows under an ultraviolet light, but most people don't have an ultraviolet light handy. You probably don't keep too many invisible ink pens around the house, either (although you should – they're a good way to mark anything that might be attractive to thieves). Luckily there are older ways to make invisible ink, and they still work very well.

Centuries ago a solution of ferrous sulfate was used as an invisible ink. A message could be written with it, and would disappear completely

when dry. However, when the paper was heated the message would reappear. If you don't have any ferrous sulfate handy you can get exactly the same effect with lemon juice. The only problem with that is that the letter will smell of lemons for a while after the message is written, and someone might guess what you've done. If you can, leave it for a while to let the smell fade before you put it in an envelope and send it.

Messages written with these inks don't need a lot of heat to reveal them. There's no danger of the hidden writing appearing from someone's body heat, but you don't need to risk setting fire to them either. Holding it close to a light bulb will usually be enough.

There's another way to hide a message in a letter without using invisible ink, but it needs a bit more preparation and you have to use some artistry to pull it off, but if it works it's very effective. It's called a mask letter.

To write a mask letter you need a mask – a sheet of paper the same size as your notepaper, with blocks cut out of it in a random pattern. To write a message, you put the mask on top of a sheet of paper and write the message in the blocks. Then you take the mask off and compose a normal, innocent letter around the secret one. When the letter gets to the other end, all the receiver has to do is put their own mask over it and the hidden message will appear.

Obviously there's a potential weakness here – sender and receiver both need to have a copy of the mask. This isn't a method you can use without preparing in advance. If you have prepared however, it's very effective. Cops and anyone who knows something about secret writing will routinely heat up any letters they're suspicious of, just to see if invisible ink has been used. They might also use UV and chemicals. A well-written mask letter, however, is immune to all of these tricks.