How To Turn Your Q-Hut Into An EMP-shielded Home

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Can a Quonset Hut be turned into an EMP-shielded home? With this reader question, the devil is in the details. If you are ready to face them, grab a napkin, sharpen a pencil and then go rent a crane: you have work to do!

First let's see what it takes to shield something from EMP and how a Quonset Hut is constructed to determine if this building could provide a cost effective solution to EMP under the right circumstances.

I imagine that the reason that leads to this question is something along the lines of: "Quonset Huts have a steel skin, and steel is a conductor, so they must provide some shielding against EMP. Almost 200,000 of the buildings were manufactured for WWII, some are still in use by the military to this day and many others are still knocking around as surplus, so maybe this could be an inexpensive way to build a shielded home or retreat or some sort.

But the subject of EMP is complex, and a building is a major investment. For most people, it would be a considerable waste of resources to erect a building that did not serve its intended purpose."

The (Very) Basics of How to Shield Against EMP

As you may recall from an elementary physics class (or a diligent 2-seconds of research on your "Inter-web Thingy,") Faraday cages can be used to shield vulnerable microelectronics from EMP.

For some, but certainly not all, of our readers, that fact and perhaps how to improvise a Faraday cage from a metal trash can (or similar conductive vessel with a tight fitting lid) is about the deep end of the pool when it comes to the depth of their knowledge this particular subject.

Now, that is not a bad thing. Where that not the case, us folks toward the nerdier end of the scale might be doing something other than writing about EMP survival, so I'm good with that.

But society's ever-decreasing attention span being what it is, that is to whom I orient this type of article, so those of you who are "Walter White-level intelligence", and beyond, you will have to bear that in mind (or break down and buy the book.)

A Faraday cage provides EMP shielding by creating a conductive skin around what you are trying to protect. Imagine that this conductive skin helps conduct some of the flow of energy around a protected envelope, like a river flowing around a sand bar. This is a bit of an oversimplification, but I think it is an effective analogy for most people.

The idea is that most of river goes around the sand bar. You end up with a lot less intensity of water flow inside the sand bar than outside because the amount of flow that penetrates the sand bar is reduced by the (shielding effect of the) sand bar. The bulk of the flow of water is "conducted" around the sand bar like the conductive skin of a Faraday cage conducts electricity around the occupant of the cage.

Click here to find out more about building your own Faraday cage.

Another way to say this is that the Faraday cage attenuates (or reduces) the intensity of the field strength of the EMP that is able to penetrate the shielding provided by the cage.

Back to the sand bar analogy, the shielding provided by the conductive skin of the Faraday cage is the difference in EM flow outside and inside the cage. So the cage does not completely stop or shut out the EMP, it just "turns down the volume" to point that it doesn't "blow the speakers" (so to speak) of electronics protected by the cage. The volume of sound, EMP wave flow or sound wave flow is lower or quieter inside the cage than outside it.

This protective skin needs to have the following properties:

1. It must completely encapsulate whatever you are trying to protect. Depending of the frequency range of energy you are protecting against, the skin can be a cage or a mesh. But for our application, openings as small as a quarter inch could allow EMP inside, compromising the protected space. So mesh would have to be roughly 20 openings per inch or finer. If you are trying to shield a multisided space such as a cube, all six side would have to be shielded. I often see people forget about the floor! EMP is not like rain, you cannot just drape a space blanket over the object and call it good.

2. The flow of electrons through the skin must be unimpeded. If you join two or more sheets of conductive material to form the conductive skin, the seams where they mate must be free of non-conductive paint or any other insulation. I see people make this mistake a lot with metal ammo cans. They fail to remove the paint where the lid fits onto the box and remove the rubber gasket. Gaskets are still helpful, but they need to be conductive gaskets as opposed to the non-conductive rubber gaskets that come in the cans.

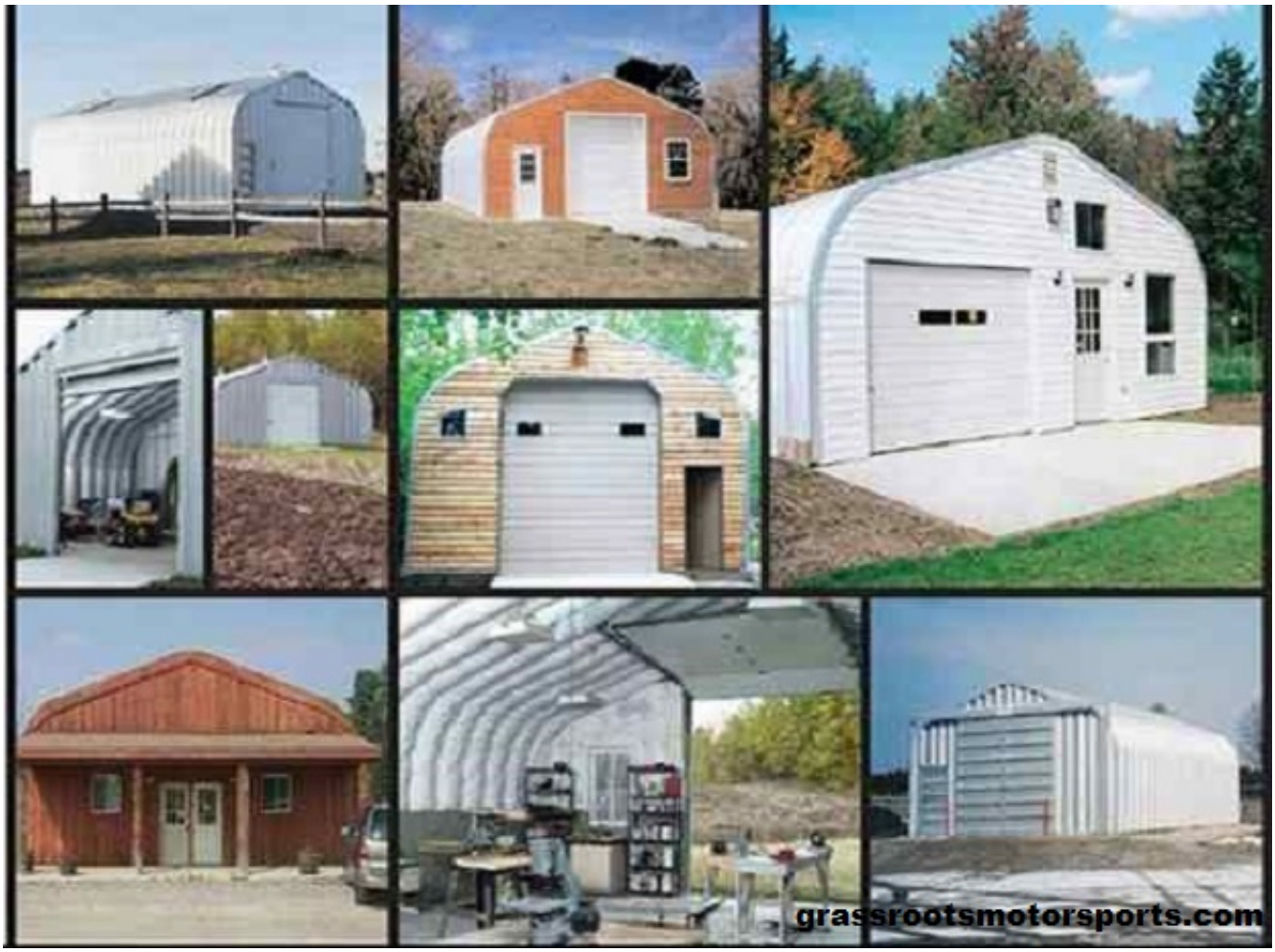
3. Any insufficiently shielded wires or other conductors penetrating the skin compromise its integrity.

4. The conductive skin must have a non-conductive layer gap of air between the skin and whatever you are protecting. If the object touches the skin or is too close to it, the electromagnetic energy can be conducted from the skin into what you are trying to protect.

5. The conductive material must provide sufficient electromagnetic shielding (measured in decibels) to protect against EMP. The thicker the conductive material, the more shielding it will provide. To shield against the field strength of an EMP generated by a nuclear weapon detonated high in the earth's atmosphere, directly above your location, would require approximately 73dB of shielding. If the weapon was detonated hundreds of miles away, this number will be lower.

Just keep in mind that the relationship of shielding thickness to the number of dB of shielding it provides is logarithmic, so doubling the shielding layer thickness does not double the dB of shielding.This means that if you buy a Faraday bag that provides 40dB of shielding, and you put your bag inside another 40dB you don't end up with 80dB of shielding. You would end up with less than 50dB of shielding at that level.

And to protect against a super-EMP weapon (a nuclear weapon optimized to yield the maximum amount of energy released in the form of EMP as opposed to light or heat) this number would have to be much higher. You would not be talking Mylar bags, aluminized bags or tinfoil anymore, you would need a shielding material more along the lines of an aluminum pressure cooker for that.



How Does the Quonset Hut Stack Up As a Faraday Cage?

Once assembled, a Quonset Hut is essentially a semicircular cross-section of corrugated, of galvanized steel that can be moved by crane and set on a concrete slab or wooden floor. Steel is a conductor, so won't that offer some electromagnetic protection?

If you have been paying attention, you may already know the answer. IF the steel sections have been properly joined THEN you have a start.

Notice that the answer is conditional and that even then, a Quonset Hut can only be viewed as possible place to start or source of raw material in the form of steel. Even if the integrity of the building's steel skin is maintained, you would still have some major issues to deal with in order to turn it into an EMP-shielded structure.

Here is what it would take to turn a "Q-Hut" into an EMP-shielded stronghold:

- Any sealant, lacquer, paint or other non-conductive material between the seams of steel sections, any holes or gaps a quarter of an inch or larger will compromise the free flow of electrons through the shielded "skin" of the structure so they would have to be stripped and replaced with conductive product.
- Any holes or gaps a quarter of an inch or larger will compromise the shielded envelope, including any windows, doors and the entire floor would not be shielded by "upside down

steel half pipe" formed by the steel portion of the Quonset Hut. All these areas would need to be covered with material that meets our shielding requirement of greater than 73dB (for a normal nuclear weapon used to initiate Compton Scattering, generating a nuclear high-altitude EMP, not a super-EMP weapon.) As mentioned, 20OPI or smaller mesh could be used for the windows and to encapsulate any solar panels you add. To add solar panels to the project, please refer to my past articles on the subject starting here: How to Protect Your Solar Gear from EMP (Part 1)

- No unshielded long conductors such as electrical wiring should be attached to the building without first being shielded, shunted through EM-shielded gaskets, fitted with fast switching (less than a millisecond) surge protection with power handling in the same range as lighting protection circuits. They should also be properly grounded.
- The conductive skin should be separated from the building interior by a gap or suitable non-conductor. A non-conductive spray-on bed lining material or any other non-conductive material could be used for this purpose, just do not forget the floor!

There you go! If this does sound like a fun project, let me know, I just might squeeze you into my consulting schedule so I can see how it turns out, so shoot me an email.

Better yet, leave your comments below. Either way, I enjoy reading them, and have even been known to respond to reader questions and comments from time to time.

This article has been written by Cache Valley Prepper for Survivopedia.