

Using Satellite Communications for Disaster Recovery, Part 3



By [Leo Wrobel](#)

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Satellite phones? Mobile voice and data terminals? They can be life-savers in time of disaster. In part three of his series on satellite communications in disaster recovery, Leo Wrobel encourages you to jump right in and use some really cool applications of these winning satellite-based recovery solutions:

The last article in this series ended with a promise to look at some hypothetical examples of winning satellite-based recovery solutions. Now that the basics of the technology have been laid down in previous articles, you can jump right in and use some really cool applications

Satellite Phones for Command and Control

In any recovery effort, you need to be concerned with two types of communications. One consists of the links that connect your customers to you, which can be incoming phone lines, access to the web or a variety of other modes of operation. Although they might seem to be of primary importance because they represent your organization's cash register, in reality they are number 2. Your main priority is to reestablish essential command and control. Stated another way, although your organization might have the finest disaster recovery plan in the world, it is essentially useless if you cannot get in contact now with the people you will need to recover.

How can you call people back to work if your telephone serving central office is down? Don't think that does not happen. Recently, a Verizon central office in Raymond, New Hampshire went under war. A Nor'easter was anything but an Easter present for Verizon. As the storm surged up the east coast, torrential rains overflowed creeks and flooded the Verizon one-story central office. Verizon distributed free mobile phones to police, fire, EMS, other essential services, as well as to any area residents in need.

Under some circumstances you might not be able to count on your wireless phone, either. A mobile telephone serving office (MTSO) usually has to terminate back into the wire line network at some point. Sometimes this is through an "end office," and occasionally it occurs in a more important central office called a "tandem." Either of these types of central offices can have problems that affect both the wire line and the wireless networks. Tandems not only switch traffic for the immediate area but they also switch traffic for other end offices. Among other things, the disaster becomes more widespread as well as making tandems very tempting targets for terrorists.

In these situations, a handheld satellite phone can be a godsend. Units available today typically are pretty rugged insofar as being waterproof and shock- or dust-resistant for use in harsh environments. They offer many of the same features as regular or wireless phones such as the capability to store many numbers as well as to speed dial them after a disaster. (Where is *your* callout list at this moment in the building that just burned down?) Many are also headset or Blue Tooth compatible allowing both hands to remain free. Remember: you could be writing, installing equipment, tending the wounded, driving in wicked weather, or doing many other things that will require use of both hands in a disaster. Many handheld satellite phones also include features such as voicemail or call forwarding, which can be very useful.

A typical satellite handset provides three or four hours of "talk" time and about a day of standby, so don't forget extra batteries. It might be some time before the lights come back on again.

You need a clear line of sight to use a satellite phone, which can be a problem if the storm is still going on when you need to make a call. Some of these phones require that you dial an international access code; others require 00, then the number, and so on. This is because the calling area of a satellite is the plane, for all practical purposes, with the possible exception of the north and south poles. In any event, you should know how to dial and which access codes to use in advance to avoid wasting valuable time in a disaster.

Satellite phones are still expensive, with phones costing a few hundred dollars and rate plans from \$1.00 per minute and up. However, they are worth it. Let me tell you why.

Long ago, the U.S. military invented the term **CCC**: **C**ommand, **C**ontrol, and **C**ommunications. They were the three most essential elements for the military to accomplish a given mission, such as getting our missiles out of the ground before the Russians did. To do that, the military quickly maneuvered a large number of people. That's the **C**ommand part. Targets had to be acquired and the situation accurately assessed; ergo, the **C**ontrol part of the three Cs. Finally, orders had to be dispatched about exactly what to do, how to respond, and who was responsible to do it. That's the **C**ommunications part. Hence the term **CCC**, or **3C**.

More recently, **C**omputers were added, making the acronym **Command, Control, Communications, Computer** or **4C**. In recognition of the fact that decisions are now made in minutes or split-seconds, computers have become indispensable to the command and control process in view of their rapid response time.

As far as I can tell, the current term of art with the military, is **4i**. This term is the same as **4C** but with the *i* added, which stands for intelligence. In so many words, it means using the four Cs, combined with an accurate assessment of the disaster situation, hence the addition of *intelligence*.

So where do satellite phones play into this process and why are they so valuable in the recovery process? It's because they preserve and aid in the restoration of everything contained in **4i**.

It is not a coincidence that the Defense Information Systems Agency (DISA) is the largest supplier of satellite services in the world. Satellites assure that **C**ommand, **C**ontrol and **C**ommunications are preserved. Satellite technology can also recover data and hence **C**omputers through myriad technologies, including mobile broadband area networks (discussed later in this article). Finally, and perhaps most importantly, a handheld satellite device can provide on-the-spot situational analysis under virtually any conditions and in spite of any damage to the existing telecommunications infrastructure. Hence, the *i* part of **4Ci**.

In the critical first hours after a disaster, preservation of **4i** is worth far more than a dollar a minute. In fact, I submit to you that today's business is ready for this level of precision. I have even coined a new phrase (**b4Ci**) in my latest book and named one of my companies after that term. The *b* is for *business*.

In summary, don't think about satellite phones as backup for customer communications, at least initially. Think of them in terms of **b4Ci**.

Mobile Voice and Data Terminals

A long time ago, a good friend of mine in disaster recovery made the following observation about restoring voice as opposed to restoring data communications. He said it didn't make any difference because voice is really data, and data is really data, too. Any questions?

All kidding aside, this is a true statement. A 64Kbps-per-second path can be just as easily used to transmit a 64Kbps data circuit as a human voice. And yes, because your voice is digitized in the process, it is really data. In fact, satellite providers are very clever about this fact. A typical telephone circuit is 64Kbps, but a very understandable human voice can be transmitted in as few as 408Kbps. That's an 8016x advantage. On terrestrial communications with bountiful capacity who cares? On satellite, however, such compression technologies mean that more capacity can be provisioned to more users for lower cost.

Some users want to use a portion of their satellite capacity for data. Today, mobile broadband *Global Area Networks* can be leased that are capable of moving e-mail, providing Internet access, conducting transaction processing, and performing a host of other applications that go beyond voice. Data speeds of up to 492Kbps or more can be provisioned from mobile equipment with a pizza pan sized dish. Streaming data rates are also possible at up to 256Kbps. This does not sound like a lot when compared with terrestrial SONET carrier, T1, T3, and the like, but think about what you will be doing with it. You will not be instantly replacing your infrastructure, you will primarily be using this for **b4Ci**, remember? A 492Kbps circuit will move one hell of a lot of e-mails. A 256Kbps streaming data rate will nail up a fairly respectable video conference, or even transmit a critical x-ray image from a disaster area if you are willing to wait a little while. Think about it. First responders would be in a position to speak to their leadership in real time while sending them video feeds of the disaster area. That's **b4Ci** on steroids if you ask me! These terminals come in suitcases, backpacks, or in automobile mounted versions. I kind of like the idea of the auto mounted version. If

addition to mobility there are no worries about batteries as long as you can get gasoline and keep the motor running

What's Around the Corner

I suppose this would not be a Leo Wrobel article without some glimpse of upcoming "Euck Rogers" technology. Accordingly, I will share an exciting morsel that I have encountered "by the watercooler." I would not be surprised to see people using it very soon.

"PRI on the Fly"

This is obviously not a term of art. The idea here is to connect a PRI (Primary Rate Interface, sometimes called a "smart T1") to a satellite link. "Hey, wait a minute, Wrobel," someone interjects. "You said that streaming rates over satellite were generally limited to 256Kbps and PRI is 1.536Mbps." This, of course is true if you use 64Kbps channels. But remember when I talked about voice compression earlier in the article? You don't need all that bandwidth to carry voice. Besides, 256Kbps divides into 1.536Mbps very nicely, and equals 6. That means you need only 1/6 of the bandwidth to carry this hypothetical PRI. 64Kbps divided by 6 = about 10Kbps, more than enough for good voice quality with today's technology and no additional delay (other than propagation to the satellite and back about one-quarter second) because it is not based on IP packet or cell technology. In other words it works on paper, so how does one marry it to a PBX? That part as it turns out is pretty easy. A number of companies manufacture black boxes that convert raw bandwidth to the four-wire circuit and PRI signaling that your PBX expects to see. If you can restore a single PRI and its associated DID (Direct Inward Dial) numbers to a medium-sized hospital isolated by a telecommunications disaster, you have, for all practical purposes, restored communications to that hospital (the same for government offices, businesses, and essential services). That's why I think this particular "PRI on the Fly" idea is really cool.

So, How Do You Restore Numbers, Leo?

Note the caveat on the previous statement: if you can restore the DID numbers, you have restored the hospital. How does one do such a thing? I have found at least one proprietary system that does this and a whole lot more. Go to [this web page](#) and click on the three-minute demo at the top of the page. It will give you a little bit of an idea, but the real meat of this thing is what you will find after you sign an NDA with the firm (its technology is closely guarded). Part of this process is protecting secrets, but you will often run into it because of the threat of terrorism as well. If things are splattered across web sites, the bad guys can get to them, too.

What I can tell you is that this particular technology is one of the best I have seen in my 21 years in this business. It also really augments all the satellite technologies discussed here, and a lot more. Personally, I think this is another example of *b4Ci* on steroids.

Summary

I find it amazing that after three articles there is still so much more to talk about regarding satellite for disaster recovery.

Unfortunately, I need to end this series and move on to an exciting new aspect of recovery planning for next month. For now, let me express my thanks again to the Global VSAT Forum and Satellite Industry Association for their contributions to this article. If you are looking for a great reference and easy read on this topic, download or order the First Responder's Guide to Satellite Communications, published by the Satellite Industry Association (SIA) [here](#). Check out the Global VSAT Forum web site [here](#).

I also want to thank the folks at [Telecom Recovery Inc.](#) for their contribution and to commend them on a well-thought-out product for maintaining *b4Ci*. Until next time, good luck in your planning efforts.
