GhostNet Overview

GhostNet is the overarching term for a collection of communications networks set up to allow users around the world to exchange information without relying on pre-established infrastructure. Far from being just an emergency plan, GhostNet is intended to ease the transition of radio technology into everyday life. Though radio networks cannot truly replace the internet, we hope that we can replace a substantial portion of a person's daily information requirements, and promote a culture of off-grid information sharing.

Weekly JS8Call Nets on 40m

Once per week (or more often, based on world events), users can gather on JS8Call for a brief chat in a casual atmosphere. JS8 is simple to use, easy to work with, and extremely common among radio hams. Users that are perhaps not as experienced in other HF data modes might find JS8Call to be an easy way to maintain contact. JS8 also serves as a great meeting point in the event of catastrophic communication loss; if a major societal event is occurring, simply hop on JS8 to find out what's going on and to coordinate other communications plans.

Data Bridges (On Multiple Bands)

In the world of HF radio, everything is a trade-off. The configurations, frequencies, and antennas needed to communicate over long distances are not best suited for local comms, and vice versa. Therefore, to allow users to have the best chance of success with extreme-long range comms, networks have been established to allow links between continents and regions, at the time and frequency that is most effective for each link. Understandably, one weekly net, on only one or two bands is not robust enough to handle substantial message traffic. When we start to consider global partners, and the 24 hours in a day, we realize that a more substantial plan is needed to allow users around the world to communicate. Users in North America can usually only link up with Europeans during certain times of day. Similar situations appear with other long-range links, such as USA/Australia, Mediterranean/South America, Far East/ Europe, etc. As such, various comm plans have been established to allow communications to occur between major regions, at the times of day when there is the highest chance of success. In due time, we hope to incorporate major relay stations which can facilitate the movement of traffic 24/7. In this way, a person wishing to communicate with another continent can wait for the data bridge to open at a certain time of day, then use antenna configurations, power levels, frequencies, and data modes that are more suited to long-range communications instead of more local contacts.

What About My Baofeng?

Unencrypted analog communications are not generally recommended for use in non-permissive environments. Even using brevity codes and other EMCOM procedures, voice recognition, direction finding, and meta-data analysis make analog voice comms a risk on the modern battlefield. However, due to their low cost and extreme popularity, handheld VHF/ UHF radios will always have a place in emergency preparedness or for local Line of Sight comms. the GhostNet is not meant to replace local VHF/UHF traffic, which warrants it's own comm plan. Rather, GhostNet plans are intended to serve as a more strategic, region-wide communications network using HF transceivers.

Receive-Only Options (For Decoding RTTY, JS8)

To incorporate those who do not have the ability to transmit radio messages, various networks have been established to allow users to receive crucial information. Radio Teletype, despite being an ancient communication method, is a great tool for transmitting one-way communications, news updates, or other critical information to a wide audience. Those wishing to monitor various JS8Call networks or Data Bridges can also do so with a simple Software Defined Radio (SDR) receiver, a computer/phone, and an appropriate antenna. Understanding that radio communications are difficult, complex, and boring, special emphasis has been placed on creating networks for users who don't want/need to dedicate so much time to radios. In short, we have simple and easy-to-understand networks that users can monitor cheaply and without any technical knowledge at all. And since receiving messages does not require a license (in the US, at least), anyone can listen in. Various tutorials have been created (and are continuing to be made) guiding users step by step through the whole process. The goal for Receive-Only comm networks is to make the process as easy as possible, and incentivize many people to start treating radio as a viable information source, rather than a novelty.

Ion2G ALE Networks ("Right Now" Comms)

A bit more advanced than JS8, several ALE networks are set up for persistent communication. Automatic Link Establishment protocols are the future of HF radio, and a gold standard for determining the best band/ frequency to maintain a comm link. ALE removes the guesswork of which band to choose based on time of day, or other propagation factors. Simply fire up the program, and the software will determine the best frequency for you automatically. This makes comm plans obsolete, and allows for "right now" communications to be possible at any time of day.

GhostNet Concept

Establishing a truly global communications plan is difficult, simply due to the physics of ionospheric propagation. There is no one plan that will allow the globe to communicate at the exact same time; various factors such as time of day, frequency, and scheduling conflicts make this a challenge. Even if a solution can be agreed upon, scheduling conflicts would add in another layer of complexity. Therefore, multiple networks are required. We can get by with two main concepts for communication: Local comms nets, and long-range links with other continents or major population centers. This way, a person can get their gear set up for local information exchange during one comm window, and if so desired can switch their gear and data modes to make contact with extremely long range regions, when band conditions allow for the highest chance of success.

GhostNet Provides Two Main Paths of Info Exchange

40m Networks

For more local communications throughout a region, set up on a schedule that is most convenient for people within that region

Scheduled weekly every Thursday night at times convenient for those working standard business hours.

Data Bridges

A variety of networks using bands, times, antenna configs, and data modes best for making long range contacts.

Scheduled weekly, every Saturday with time windows to allow for multiple DX contacts.

Most users will likely find great utility in local communications throughout a region. For instance, if an incident were to occur within North America, most people in that region would likely tune in to JS8Call on 40m to obtain more information. This is easy to do with a wide variety of equipment, and can be done even in a comparatively small location. Using a local 40m network, comms can be reliably established even in the worst of times, using minimal gear, and very little power.

However, the gear, space, power, and experience needed to make that same network functional around the world is quite a challenge. Different antenna arrangements, and an extensive knowledge of band conditions is usually required to make reliable links with contacts at extremely long ranges. The average radio operator can easily make contact throughout Europe, but making a contact at any time of day from Sweden to Australia is another story entirely. Band conditions alone require very specific parameters to be met to ensure the highest chance of success. Therefore, we need to establish specific times of day, freqs, and antenna configs to make these long range comms reliable.

Though seemingly complex, the plan is quite simple. Need to check in to a local net, or see what's going on throughout your region? Pick up this guide and flip to the card for your local area. Fire up whatever HF transceiver you have (or even just a receiver) and tune in.

Need to send an email around the world? Flip the card over, find the link you want to make, wait until the appropriate Data Bridge comm window opens up, and give it your best shot. This also allows for more complicated relay stations to be set up in the future. For instance, a person in the US might be able to briefly make limited contact with Australia on 80m, but contact might be sketchy or difficult to maintain. To send a full email, they might have to relay longer messages through stations in Africa of the Mediterranean. This comm plan allows for the network to grow and eventually make that a reliable option.

Leaving Room for Automatic Link Establishment

Ideally, ALE technology would make the concept of Data Bridges irrelevant. Even with enough power, reliable contact can be made at will without waiting for a comm window. These Data Brides are made with the portable operator in mind who might have to rearrange his/her antenna to make long range contacts. With ALE, there is no guesswork to determine which band or time of day is most appropriate for a data link, as the software computes this automatically. This is why ALE is the gold standard for military communications links around the world. However, among radio amateurs, ALE is still in its infancy. Ion2G is the front-runner software package intended to encourage more ALE-based comms in the ham radio world, but the antenna and transceiver requirements make ALE cost prohibitive for most radio operators.

However, since ALE is the future, we can still allow for an ALE comm window. ALE is not magic, it simply chooses the best frequency to make a link between two points. At the moment, Ion2G in particular can only really be used for simple text messages, or voice calls. Sending emails must still be done using traditional Winlink P2P methods. This means that ALE can remove the guesswork when it comes to frequency choice, but the time of day must still be chosen by the operator*, and using different data modes (like RTTY) still requires manual decision making by the radio operator. One must remember that cutting-edge technology (in the ham world anyway), is perhaps not the most reliable in a serious emergency. Therefore, we can allow for the use of Ion2G by creating a specific time window for its use, but we also want to allow for other more manually selected networks to function using the equipment that most people already have.

*Ion2G is best used by leaving the software to run 24/7. However, this is not the best option for most radio operators as 1- it ties up resources, and 2- the clicking of relays in the radio 24/7 is not appealing to most people. Various work-arounds exist to make Ion2G a viable persistent system, but as this software is still in development trusting it with one's life is not advised unless a highly reliable backup solution is also in place...like a Data Bridge.