# Emergency Communications for Disaster Management

## Challenges and Solution

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### Introduction

The recent spate of floods, hurricanes, typhoons and wildfires showed that the disaster response for rescue and recovery is heavily dependent on timely communications in most demanding conditions from the front line to the command centers. If the first responders can rely on a robust voice, video and data communication system from the moment the event unfolds, countless lives could be saved and properties protected saving billions of dollars. The newer reality of our world today is a man-made event such as a terrorist attack on a densely occupied area where the first responders may find the conventional communication networks overloaded and unusable.

### Challenge

The primary challenge is that when the first responders arrive with the best of the rescue equipment, the basic communications channels are completely non-operational due to devastation and the resulting loss of electric power. The first responders require reliable voice, video and data communication for the mobile devices, sensors and computing equipment they bring with them. The ability to send situational reports in the form of video and pictures is immensely helpful in configuring the shape, size and the intensity of the response in real-time.

The second challenge is that as different agencies start arriving at the scene with their own radio sets, there is a lack of compatibility and interoperability among disparate communication gear now operating at the site.

A large body of research data pertaining to the survival rate shows the tremendous impact of effective medical care during the first hour, the Golder Hour, after the injury. Telemedicine from the incident location connecting the field medics with the hospital staff is one major tool that has to be addressed using large bandwidth communications channels.

### Requirements

There is a requirement for a self-contained communication architecture/framework that can be rapidly deployed to the incident location, set up in minutes and would provide high bandwidth connections for voice, location video, telemedicine video, position location information (PLI) and data communications using commercial user devices. This architecture must also allow the interoperability of these use devices with various field radio systems for seamless voice collaboration. The system must be compatible with a variety of backhaul options such as VSAT, MANET and broadband mobile routers for connectivity back to the command center(s).

It is also required that the solution integrates the communications node as well as the computer with storage in a small compact package reducing the number of separate pieces of equipment at the incident location.

The system must be easy to use and must not require an engineer to deploy to operate. The equipment must operate on DC battery and AC power.

### Solution

Cornet Technology's STINN LTEmp Manpack (STINN Manpack) leverages commercial 4G LTE technology and ubiquitous smart phones to form a standalone field mobile network to meet the communications challenges faced by first responders and disaster response forces. Cornet's STINN Manpack "crash-out package"

includes a man portable STINN that contains the 4G LTE cell tower (eNodeB), the mobile core network (Evolved Packet Core- EPC) and a powerful i7 processor inside a single unit weighing less than 9 Kg. When paired with Cornet's Radio Gateway TVCS InterConnect 10R, the package offers a standalone private 4G LTE-based IP network in the field along with interoperability with various HF/UHF/VHF field radio nets.

STINN Manpack, once turned on in the field, is ready to operate within minutes supporting 32 LTE devices in a 1 Km radius / 2 Km diameter "bubble". The STINN Manpack i7 processor hosts the VoIP server and the system management software. The i7 processor can also host customer's applications such as GIS-based position tracking and a video engine for two way video sharing. The STINN Manpack supports all major Android phones and operates in one of the four LTE bands: 4, 5, 7 and 14.

The STINN Manpack can be connected to a local IP WAN connection, or reach a distant IP WAN connection using a MANET radio, a VSAT or a mobile broadband router. Once connected to the IP WAN, the field users are connected with the command centers.

If the incident area is large or is made up of several zones, multiple STINN Manpacks can be deployed and connected by MANET radios to create one federated LTE operating network.

The STINN Manpack is designed to operate at-the-halt or can be mounted in the field command vehicle operating with AC and DC power.

The STINN Manpack is an appliance that when turned on sets itself up. The STINN Manpack comes with a rugged tablet with a Graphical User Interface (GUI) that allows the field operator to check the status of the phones as well as the status of the network. If an LTE device is lost, it can be easily disabled from the tablet GUI.

Only a phone with the authorized SIM can join the LTE network. The STINN Manpack supports AES encryption on the LTE network.

The TVCS InterConnect 10R radio gateway can support five radio nets. The gateway connects with a donor radio and patches that radio net into the system.

With Cornet's solution operating at the response site, the operators are able to perform the following tasks:

a) Carry out voice communication using Voice-over-IP (VoIP) technology
b) Use position location Apps to be able to send his/her exact location so that desired help can be planned where needed, and obviate the need of a staging station for critical supplies.
c) Take field video using the smart phone and send it to the STINN Manpack. The video engine on the Manpack distributes the video to other field users as well as to the upstream users in the command center.
d) Employ telemedicine applications
e) Carry out voice communication with the field radio users
f) Access public resources If connected with a WAN
g) Deploy customer-specific Android Apps

**About Cornet Technology**

Headquartered outside of Washington DC, Cornet Technology (www.cornet.com) designs and manufactures communications equipment and packages for emergency and military communications. Cornet supports its global customer base from Washington DC, Chennai, Delhi, Frankfurt and Tokyo.

Please contact us (sales@cornet.com) to configure an emergency response communications package specifically customized to your requirements. ∎