

PURPOSE

The recent disasters such as Katrina and Rita have been horrific. The challenges that FEMA, First responders and local governments face daily in the wake of these events are daunting to say the least. However, while each organization strives tenaciously to overcome and rebuild, cohesive inter and intra communication will be key in assisting these organizations. To support these existing needs and also in preparation for future response such as disasters man made or natural (hurricanes Katrina & Rita), Invisi-Wire (A Louisiana Based corporation) offers the Mobile Communications System (MCS) platform. MCS is ideally suited for local, state & federal agencies, to provide for a rapid deployment of scalable communications capability, independent from the legacy infrastructure. The MCS system, which provides internet connectivity, telephony and streaming video, coupled with its own power system, also provides for the critical back haul bandwidth to internet and national telephone systems via satellite at 2 Mbps downlink and 1.2 Mbps uplink and is scaleable to various requirements. Further, unlike other solutions offered, the MCS solution is mobile and transportable into virtually any area where essential communications infrastructure is needed and capable of operations within a few hours of arrival on site. Recent experiences have reinforced that common forms of communications tend to fail under adverse conditions and there is an uncertain timeline as to reestablishment of power and communications to a specific area. Additionally, the proven Mobile Communications System (MCS) delivers performance and reliability, allowing critical relief agencies such as FEMA, State and Local first responders, and other relief organizations to focus on recovery efforts has been maximized by the MCS advanced communications capability.

MCS “AT A GLANCE”

The “ONLY” advanced disaster communication solution proven to provide for a rapid deployment of communications capability, independent from the legacy infrastructure:

- Broadband Internet connectivity, telephony, cellular, LMR and streaming video
- Independent Power Capabilities
- Backhaul bandwidth to the internet via satellite at speeds up OC3 uplink (155 mbps)
- National telephone system and interconnection for ground communications integration
- Emergency Mesh Capabilities (Unique ability to interconnect multiple MCS units to function as one seamless network)
- FIPS 140-2 Security across the wireless network
- Minimal set up time “minutes, not days”

BATTLE TESTED, PERFORMANCE PROVEN

Louisiana State Government

The Invisi-Wire MCS delivered & deployed was comprised of a 1.2 Meter Satellite Dish with Internet data stream download and upload capabilities, consisting various networking equipment simultaneously including WiFi capabilities, VoIP, and streaming video. All of this equipment was mounted on a flatbed platform that was easily positioned where we needed. Setup and operation of the system was completed in a matter of an hour as opposed to days.

The Invisi-Wire solution provided the State of Louisiana with the ability to deploy WiFi enabled laptops to remote areas of the state to perform response & recovery functions, saving critical time in getting the assistance to the victims as quickly as possible. In most cases these efforts were set up in impromptu areas that were lacking any traditional communications infrastructure.



In one instance, the LA state organization need was to access programs on the state mainframe, which were accessible through IBM's Host on Demand application (Java-based 3270 program). Capitalizing on the MCS's high bandwidth capability, the customer connected scores of WiFi enabled laptops & phones & video through the MCS system. By doing so, state officials were able to gain critical situational awareness and communication, thus providing for the acceleration of their processes allowing over 7500 clients in a day from a single site, eliminating the need for local office or to have the clients wait for days to have relief. State officials were elated.

Using VoIP to PSTN capabilities Invisi-Wire was able to allow hundreds of evacuees the ability to call friends and family while waiting for DSS assistance, for many this was the first time they were able to contact their loved ones.

MCS TECHNICAL OVERVIEW

The MCS is specifically designed to address inoperable and unreliable communications infrastructure based on specific requirements. It shall address communication infrastructure failure and deal with uncertain timelines that exist to reestablish power and communications that are damaged or destroyed by any natural disaster or catastrophic events.

Multiple agencies struggle to maximize relief and recovery efforts because of the lack of sufficient communications. The MCS for disaster recovery efforts has proven to provide a significant improvement to limited communication capabilities by providing private VPN access to the responder's secured network. The MCS systems & operational design maintain Government approved encryption standards shown below:

- WiFi Protected Access (WPA) including TKIP encryption, 802.1X authentication, and WPA-PSK pre-shared key
- Static WEP, as specified in the IEEE 802.11 standard
- Authentication via 802.1X, including all the EAP types
 - EAP-MD-5
 - EAP-TLS
 - EAP-PEAP
 - EAP-TTLS
 - Cisco LEAP
- Captive Portal with Web Authentication
- 802.1x RADIUS Security
- FIPS 140-2 Capable
- VLAN Assignment
- MAC Filtering

MCS units are capable of supporting responders' requirements for simultaneously 28 wirelesses Voice over Internet Protocol (VoIP) handsets that connect to an offsite Public Switch Telephone Network (PSTN) for voice communications, 125 separate user wireless PCs using 802.11 a, b, g protocol, and 15 high resolution video surveillance cameras separate from current first response frequencies used in a specific area. MCS also has the capabilities to operate using Qualcomm proprietary emergency responder frequencies and 1900 MHz and 800 MHz equipment.

ENVIRONMENTAL CONDITIONS

Each MCS unit is adaptive and flexible to fit each environment specific to the customer. A MCS has three main base application models.

1. MCS – Mobile / Light Duty

This unit is primarily used for friendly environments where it can be easily operated, primary users are located in adjacent facilities and core utilities are functional.



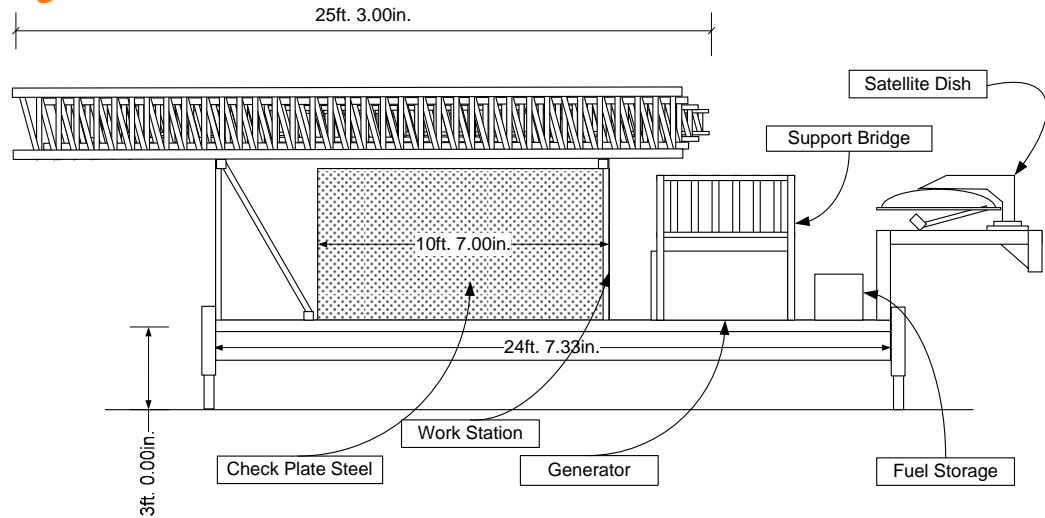
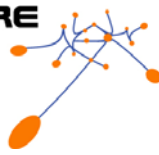
1.1 Stowed MCS – Mobile / Light Duty



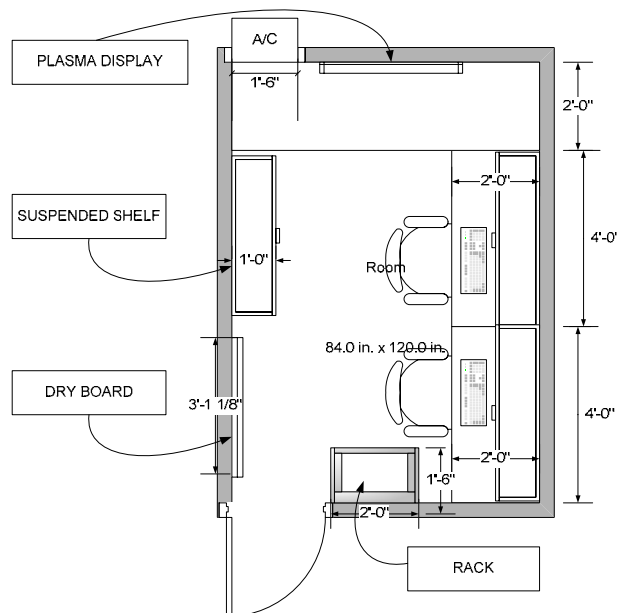
1.2 Deploying MCS – Mobile / Light Duty

2. MCS – Mobile / Heavy Duty

This unit is primarily used in semi-hostile environments where primary users will operate command and control functions. Command and Control would operate from a work station that supports hard-lined users to access data (including secure networks), voice (including interconnect for ground communications for field operations as well as public switched telephone network (PSTN) which allow for voice calls to additional offsite operation and emergency operation locations. Emergency cellular and LMR frequencies, 800 MHz 2-way radios and 1900 MHz, are integrated as a redundancy to traditional Public Safety RF that could be effected or may not function due to down power, tower, or telco lines.



2.1 Stowed MCS – Mobile / Heavy Duty



2.2 Work Station MCS – Mobile / Heavy Duty

3. MCS – Drop / Hostile Duty

This MCS is primarily used as a drop unit that provides communications in an extreme hostile environment. The MCS Drop unit is a fully enclosed unit that can be deployed and stowed from a remote location and communicates independently or as a part of a wide area network (WAN) which creates a communications system for areas that have failed infrastructure of a large scale. This unit also contains a 500 gallon double skinned fuel reserve which allows for continuous operation in excess of 30 days.

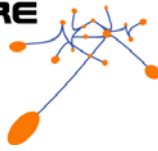
DIFFERENTIATORS

The MCS unit is different from any other mobile command unit currently available. This is demonstrated not by the construction of the shell that the MCS is enclosed in but the communications architecture which supports the data, voice, and video systems and its high capacity of users. This proprietary architecture system prioritizes the difference between data, voice, and video packets to ensure a high quality of service (QoS) that ensures a low



latency voice system that for the best PSTN calls and high resolution video. The MCS dynamic IP hierarchy allocation distinguishes the difference in data, voice, and video users and how much bandwidth each user is assigned. This system allows for priority users to jump ahead of lower priority users to ensure proper connection and ensures maximum usage of available bandwidth. Below is a matrix which compares the MCS Mobile / Light Duty to a typical satellite provider of similar size.

	MCS Mobile / Light Duty	Most Satellite Solutions
Communications		
1.2-meter auto-commissioning dish w/4 watt BUC	YES	YES
Downlink speeds to 9 Megabits/uplink to 2.5 Megabits	YES	YES
Dedicated bandwidth using EF Data modem	YES	YES
Ku band 1 to 10 mbps	YES	YES
Modem with 10/100 Ethernet	YES	YES
29' Communications Mast with mounts	YES	YES
Multi-Casting 802.11 a/b/g	YES	NO
Layer 3 Security Protocols (FIPS 140-2)	YES	NO
3 rd Party Network Management System (SNMP)	YES	NO
Rouge User and AP Detection	YES	NO
VLAN Assignment	YES	NO
Bandwidth Control Module (QoS at site)	YES	NO
Wireless VoIP to PSTN	YES	NO
Wireless VoIP Interconnect	YES	NO
800 MHz LMR backhauled to Command and Control	YES	NO
Emergency 1900 MHz backhauled to PSTN	YES	NO



High Resolution IP Surveillance	YES	NO
Simultaneous IP Surveillance Cameras	15 @5-30 frames per second	1 @ 5-15 frames per second
Simultaneous Wired Data Users	200	4
Simultaneous Wireless Data Users	225	4
Simultaneous VoIP Users	50	4
Simultaneous Wireless VoIP Users	36	2
Simultaneous Combined Users	250	4
Physical Equipment		
Power Supply	Honda 3 kV gasoline generator	Honda 3 kV gasoline generator
Equipment Listing	Toolbox, stabilizing legs, dish lift assist cranks, NEMA 4 equipment enclosure, external fuel reservoir	Toolbox, stabilizing legs, dish lift assist cranks