

Video reporting on missions using mobile phones and *entry-level* cameras

Communications and networks

Bluetooth, Wi-Fi, Cellular, IP and RF

Although mission members use means of communication available to them, basic understanding is not always achieved. This paper provides a few basic clarifications on those technologies.

Bluetooth



Bluetooth is a short-range wireless technology allowing 2 devices to communicate with each other.

As an example, to establish a connection, the “host” (as a portable speaker) will send a *pairing signal*, and if another device (as a mobile phone) accepts, the two devices will be linked.

The most common range is ± 30 feet. Throughput is (usually) from a little less than 1 Mbps up to 2 Mbps.

Wi-Fi



Wi-Fi is a wireless networking technology used by devices (as computers and mobile phones) to connect to a physical network. If there are several devices, on the same Wi-Fi network, they can communicate with each other.

The SSID is the “name” of the Wi-Fi service. You normally need a password to

access the Wi-Fi service.

A Wi-Fi service is provided by a router (sometimes named access point - AP).

The most common range is ± 150 feet. “Real world,” throughput is said to be between 300 to 400 Mbps. (We also need to take network speed into account.)

Nice to know: Photos and videos can usually be transferred from your camera or phone to a computer using Wi-Fi. Personally, I use a USB cable with the (free) EOS Utility app.

Cellular



A cellular service is a wireless communication system servicing a geographical region by dividing it into subdivisions named “cells” in which each of them has a base station.

A handoff occurs when moving from one cell to another. Our connected device switches from one base station to the other, keeping a call or Internet access (data) interrupted.

Most countries offer 4G or 5G cellular services. (G stands for generation).

5G offers higher download speeds, less latency, more devices per square kilometre, but its coverage is still uneven (and even missing) in many areas.

Configure your device (phone) to avoid *roaming*, being your phone connecting to a different carrier's cell base station

Video reporting on missions using mobile phones and entry-level cameras

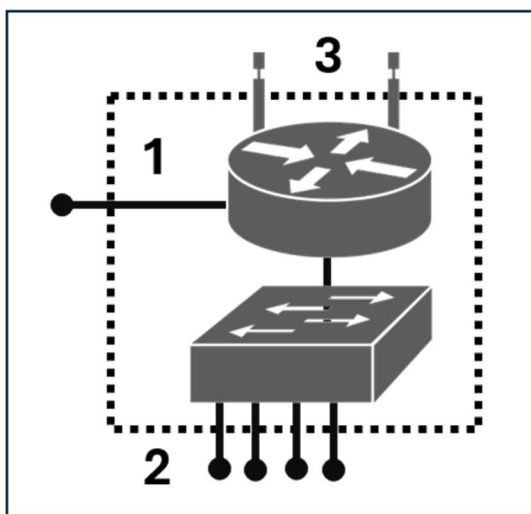
because your provider's coverage is weaker than this other carrier. This could result in significant additional costs.

IP (Internet Protocol)



This networking protocol allows communications between all devices connected to that network.

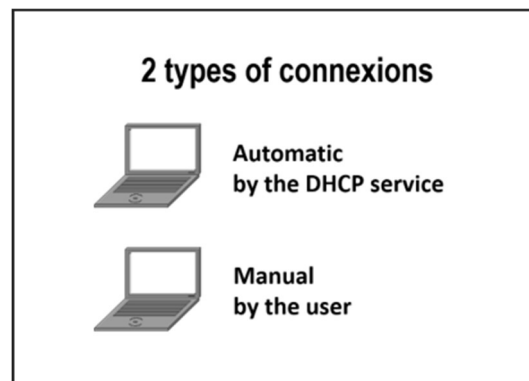
The router (gateway)



Your service provider would install a router to give you access to the Internet. The ports/access are:

1. The port (link) with your service provider
2. The Ethernet ports (to connect wired devices)
3. The Wi-Fi access point (to connect wireless devices)

Connexions and addresses



2

The default configuration of your device (phone, tablet or computer) is in automatic mode (to receive addresses). So, you don't have to worry about it. If not, you would have to enter IP, Subnet mask and Default gateway addresses, which would be suggested by your provider or your technical support.

IP address: the address of your device

Subnet mask: defines your network
(given by your provider)

Gateway address: your router address
(given by your provider)

DHCP and addresses range

My DHCP service addresses range setting

DHCP ☒ ON ☐ OFF Imposed by the provider

Router IP address	192	168	2	1
Subnet mask	255	255	255	0

IP address range (as example)

Start	192	168	2	101
End	192	168	2	254

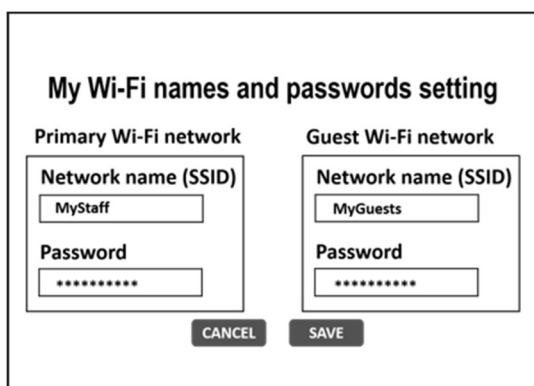
The DHCP (Dynamic Host Configuration Protocol) – a service from your router - assigns IP addresses to devices in

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automatic mode on your network. The router (Gateway) IP address and Subnet mask are the same for all devices.

In our example (see figure) a unique address from 192.168.2.101 to 192.168.2.254 would be assigned to devices.

Wi-Fi settings (within the router)



A router can offer 2 wireless networks being the main (or primary) and a guest network.

If the guest network is active, be careful not to overload the network, which would result in a shortage of available addresses.

RF



Radio communications can be very useful when telephone service (landline or cell phone) is unreliable or unavailable.

These RF (Radio Frequency) communications are done using a transceiver being a transmitter and

receiver unit, as the CB mobile radio presented in the **Your emergency package** paper.



President AM/SSB CB Radio

The typical range for CB mobile units (depending on factors such as the type of antenna used) is:

- AM (amplitude modulation) mode up to 5 miles
- SSB (single sideband) mode up to 15 miles
- A “base station” (SSB mode) with a good (high gain) sufficiently elevated antenna can reach up to 40 miles.

Notes: CBs are considered as local RF communication devices.
Understand that communications on CB radio are not private.

Be sure to have a properly installed antenna, which needs a metal surface (as a car chassis) to bounce radio waves of the CB transmitter. If it's not your case,

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you will need a *no-ground plane* (NGP) antenna.

Some elements of radio communication *etiquette*:

- IMPORTANT: What is said (using the CB radio) must comply with the laws of the country where the transmissions are taking place
- Identify yourself clearly
- Speak slowly and clearly
- Keep each of your transmissions short
- Communication should not last more than 5 minutes
- Not to be used to promote any activity
- Give details on what is happening, about the needed help and about the injured people.
- Learn the “CB 10 Codes”, available free on the ‘Net, as:
 - 10-4 Message received
 - 10-34 In trouble, help needed
 - 10-38 Injuries, ambulance needed
 - 10-70 Fire at [name of location]
 - 10-200 Police needed
- and much more...
(Not mandatory but quite useful)

And as for the channels (1 – 40):

- Channels 1 to 8, 10, 12 to 18 and 20 to 40 are open to everyone
- Channels 11 and 19 are generally used to initiate calls
- Channel 9 is for emergency communications
- Channels, 16, 36 to 40 are also open to SSB
- More info available on the ‘Net

4

In conclusion

There is much more that could be said about these technologies. This paper is merely intended to raise awareness.

In the service of our Lord,

Pierre

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“... how can they believe in the one
of whom they have not heard...”

Romans 10:14