

Thank you, Justin!

In this lesson, we will talk about different communication devices and how you can use them.

Good studying!



Advancements in technology have improved communications greatly, so as an EMT, you must not only leverage these developments but also learn to use them effectively to improve patient outcomes.

Radio and telephone systems link you and your team with other members of the EMS, fire, and law enforcement communities, so the entire team can work together more effectively. Besides, it also provides an important layer of safety and protection.



The most fundamental equipment of radio systems is base stations.

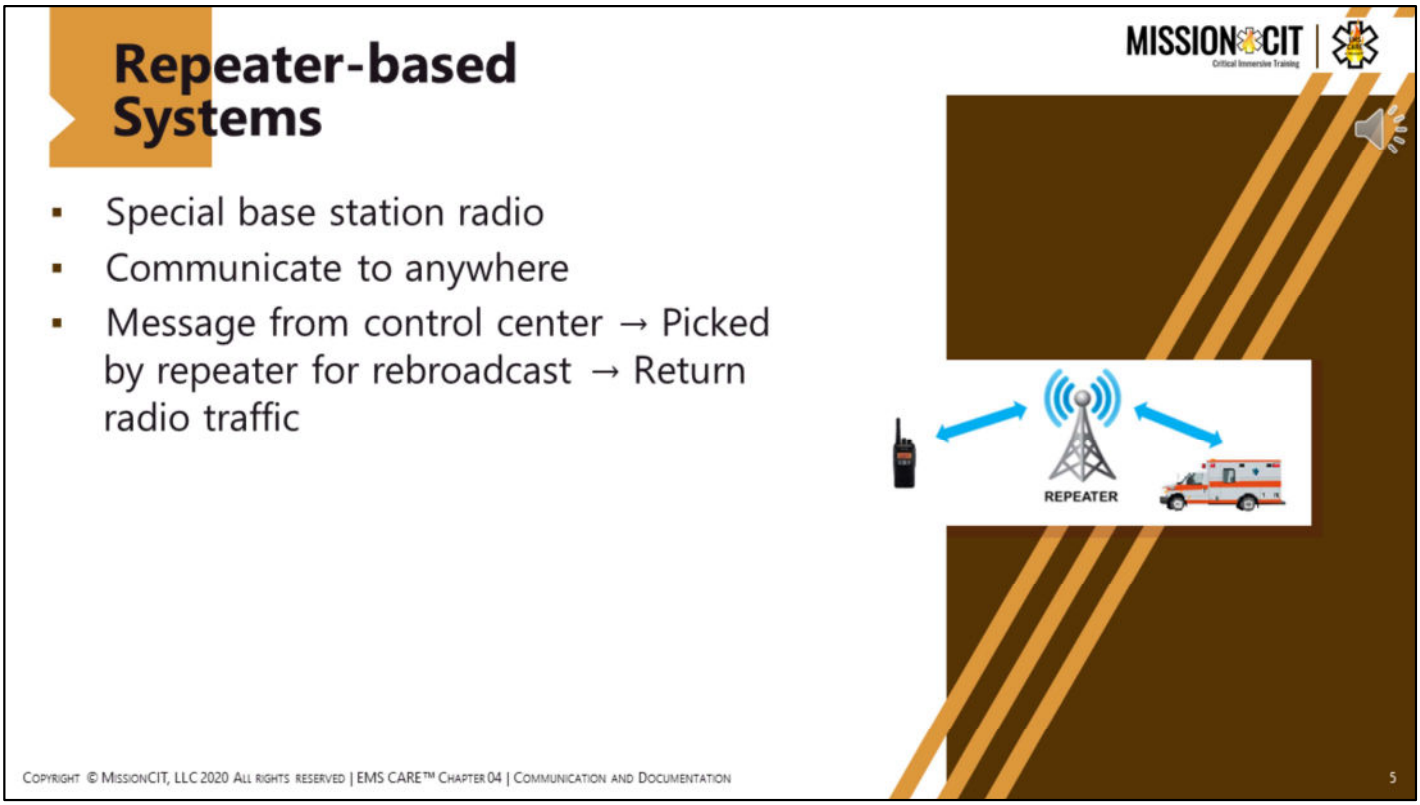
A base station contains a transmitter and a receiver in a fixed place while a two-way radio consists of a transmitter and a receiver.



Since base stations and the associated two-way radios are limited, more EMS providers are moving towards mobile and portable radios.

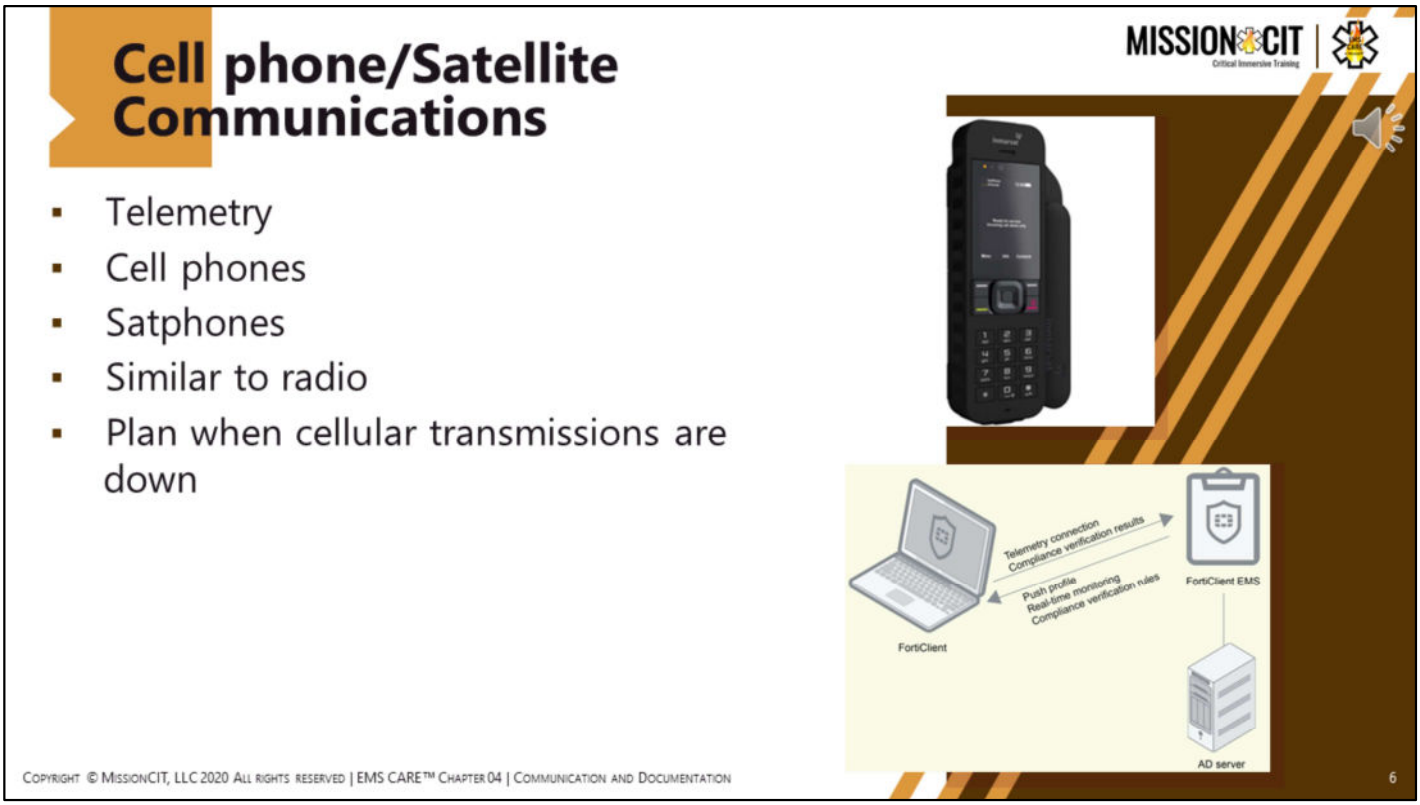
A mobile radio is installed in a vehicle and is mostly used in the ambulance to communicate with the dispatcher and the medical control. Most times, an ambulance has more than one mobile radio. Mobile transmitters usually transmit at lower power than base stations (typically 20-50 watts) and the typical transmission range is 10-15 miles over average terrain.
s

Portable radios, on the other hand, are hand-held devices. These are essential at the scene of an MCI and when away from the ambulance, a portable radio is helpful to communicate with the dispatch, another EMS unit, and the medical control. Typically, they have a power output of 1-5 watts, limiting their range.



A repeater is a special base station radio that receives messages and signals on one frequency and automatically retransmits them on a second frequency. The advantage of these systems is that they allow two mobile or portable units that cannot reach each other directly to communicate using their greater power and antenna.

A message is sent from the control center to the transmitter by a landline. The radio carrier wave is picked up by the repeater for rebroadcast to outlying units. Return radio traffic is picked up by the repeater and rebroadcast to the control center.



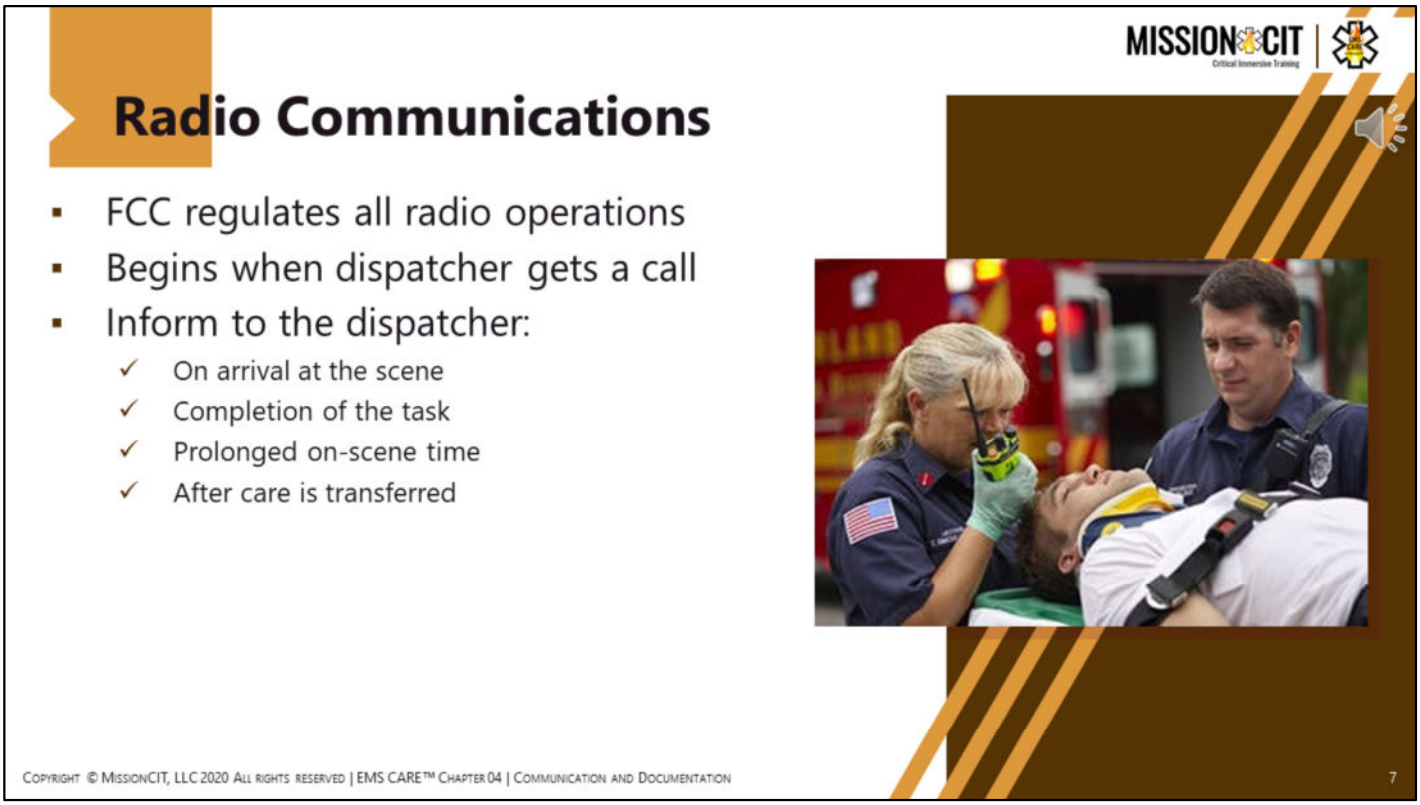
Digital signals are a part of EMS communications. Telemetry allows electronic signals to be converted into coded, audible signals that can be transmitted by radio or telephone to a receiver with a decoder at the hospital.

These digital signals are mostly transmitted through cell phones or satellite communications.

EMTs often communicate with receiving facilities by cellular telephone. These devices are simply low-power portable radios while satellite phones or satphones are another option. Both these devices can be easily overheard on scanners.

These communications should be treated similarly to radio communications when it comes to content and strategies for the delivery of pertinent information. The EMT should be familiar with important and commonly utilized telephone numbers, such as medical control, local hospital Emergency Departments, and dispatch centers.

You should also have a familiarity with cellular technologies and knowledge of the location of cellular dead spots in the area. Also, there should be another plan for when a cellular transmission fails during a report or communication with another agency.



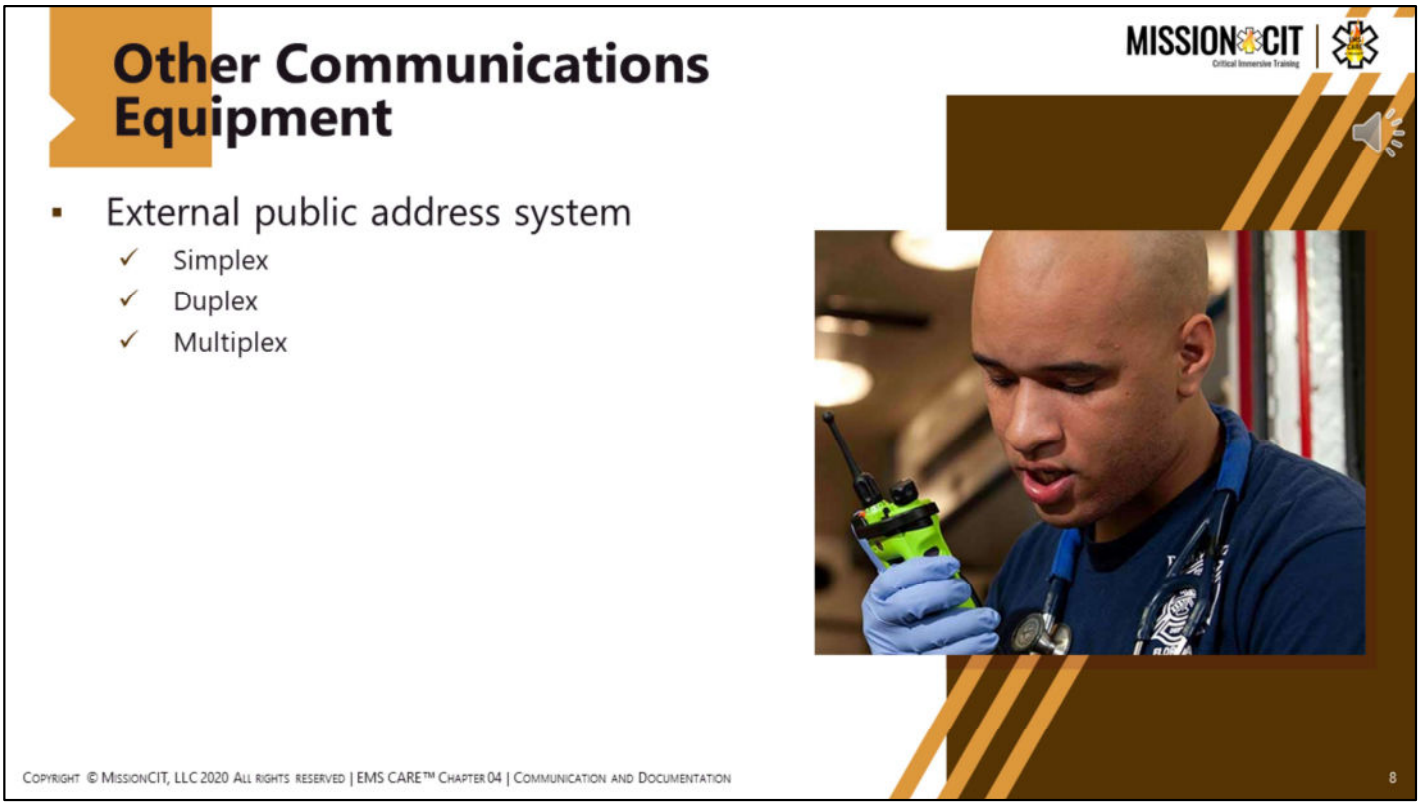
The Federal Communications Commission (FCC) regulates all radio operations in the United States. The FCC has five principal EMS-related responsibilities and they are:

- Allocate specific radio frequencies for use by EMS providers
- License base stations and assign appropriate radio call signs for those stations
- Establish licensing standards and operating specifications for radio equipment used by EMS providers
- Establish limitations for transmitter power output
- Monitor radio operations

The FCC's rules and regulations section (part 90, subpart C) deals with EMS communications issues.

The communication process begins when the dispatcher is notified that the call was received. The dispatch needs to know that the unit is en route and on arrival at the scene, the dispatcher must be notified. After the EMT completes the task and is ready to depart the scene, the dispatcher must be notified.

Prolonged on-scene times with the absence of communications often signifies an emergency, so the EMT must keep the dispatcher abreast of the developments. Finally, after arriving at the receiving facility or rendezvous point, the dispatcher must be notified. Also, the EMT has to notify the dispatcher after the patient care is transferred to an appropriate healthcare professional.



Besides the previously-mentioned equipment, ambulances usually have an external public address system. The EMS systems may use a variety of two-way radio hardware that is simplex where you have to push to talk and release to listen. The other is a duplex, where you can simultaneously talk and listen.

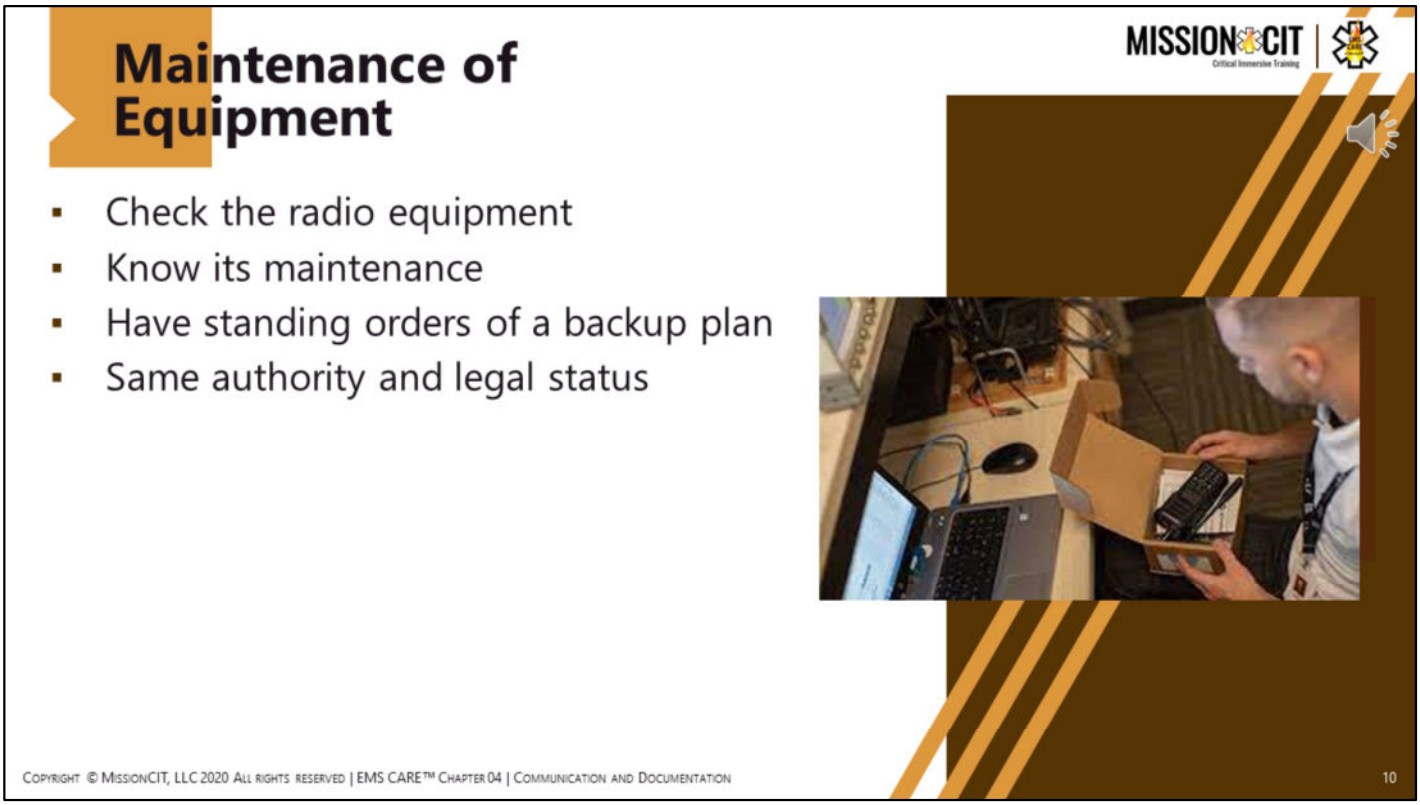
Multiplex utilizes two or more frequencies, which enables more than one transmission to occur simultaneously while MED channels are reserved for EMS use.

EMS Radio Communication System Orientation



9

This video provides guidance for the use of the Santa Clara County Emergency Medical Services EMS Communication System.



If using communication equipment is one side of the coin, its maintenance knowledge is equally important.

The radio equipment must be serviced by properly trained and equipped personnel. Remember, the radio is your lifeline and gives you a medium to communicate to other public safety agencies who could protect you and to medical control.

At the beginning of a shift, check the radio equipment.

Also, radio equipment may fail during a run. In such cases, a backup plan must then be followed.

Standing orders of a backup plan involve written documents signed by the EMS systems medical director outlining specific directions, permissions, and sometimes prohibitions regarding patient care. When properly followed, they have the same authority and legal status as orders given over the radio.

With these words, we end this lesson and in the next one, Justin will talk about key communication and reporting strategies that you must be aware of.