

Communications and Accountability



Communications

- Radio – limited resource, shared locally and globally
- International convention on shared use of radio spectrum
- National laws implementing the international agreements
 - US: FCC – Federal Communications Commission
 - Specific rules for specific Radio Services

UNITED STATES FREQUENCY ALLOCATIONS

THE RADIO SPECTRUM

RADIO SERVICES COLOR LEGEND

AERONAUTICAL MOBILE	INTER SATELLITE	RADIO ASTRONOMY
AERONAUTICAL MOBILE SATELLITE	LAND MOBILE	RADIO DETERMINATION SATELLITE
AERONAUTICAL RADIOLOCATION	LAND MOBILE SATELLITE	RADIO LOCATION
AMATEUR	MARITIME MOBILE	RADIO LOCATION SATELLITE
AMATEUR SATELLITE	MARITIME MOBILE SATELLITE	RADIO NAVIGATION
BROADCASTING	MARITIME RADIOLOCATION	RADIO NAVIGATION SATELLITE
BROADCASTING SATELLITE	METEOROLOGICAL	SPACE OPERATION
EARTH EXPLORATION SATELLITE	METEOROLOGICAL SATELLITE	SPACE RESEARCH
FIXED	MOBILE	STANDARD FREQUENCY AND TIME SIGNAL
FIXED SATELLITE	MOBILE SATELLITE	STANDARD FREQUENCY AND TIME SIGNAL SATELLITE

ACTIVITY CODE

FEDERAL GOVERNMENT	NON-FEDERAL GOVERNMENT
NON-FEDERAL EXCLUSIVE	

ALLOCATION USAGE DESIGNATION

SERVICE	EXAMPLE	DESCRIPTION
Primary	FIXED	Capital Letter
Secondary	MOBILE	3rd Capital with three case letters

The chart depicts the allocation of the radio spectrum across various frequency bands, from 0 kHz to 300 GHz. It is color-coded according to the legend, showing the primary and secondary uses for each band. The chart is divided into several sections, each representing a different frequency range. The top section shows the 0 kHz to 300 kHz range, followed by 300 kHz to 3 MHz, 3 MHz to 30 MHz, 30 MHz to 300 MHz, 300 MHz to 3 GHz, 3 GHz to 30 GHz, and finally 30 GHz to 300 GHz. The chart is a complex mosaic of colored blocks, each representing a specific frequency allocation. The colors correspond to the radio services defined in the legend. The chart is a detailed and comprehensive representation of the United States radio spectrum.



PLEASE NOTE: THIS CHART IS ONLY FOR INFORMATIONAL PURPOSES. IT IS NOT A SUBSTITUTE FOR THE OFFICIAL FEDERAL REGISTER NOTICES OF FREQUENCY ALLOCATIONS.

Chart: United States Department of Commerce, Public Domain

Radio Services

- No License required
 - FRS
 - MURS
 - CB
- License required
 - Amateur Radio Service (individuals)
 - Public Safety (public safety agencies)
 - Land Mobile (commercial)
 - GMRS (families)
- [Marine]

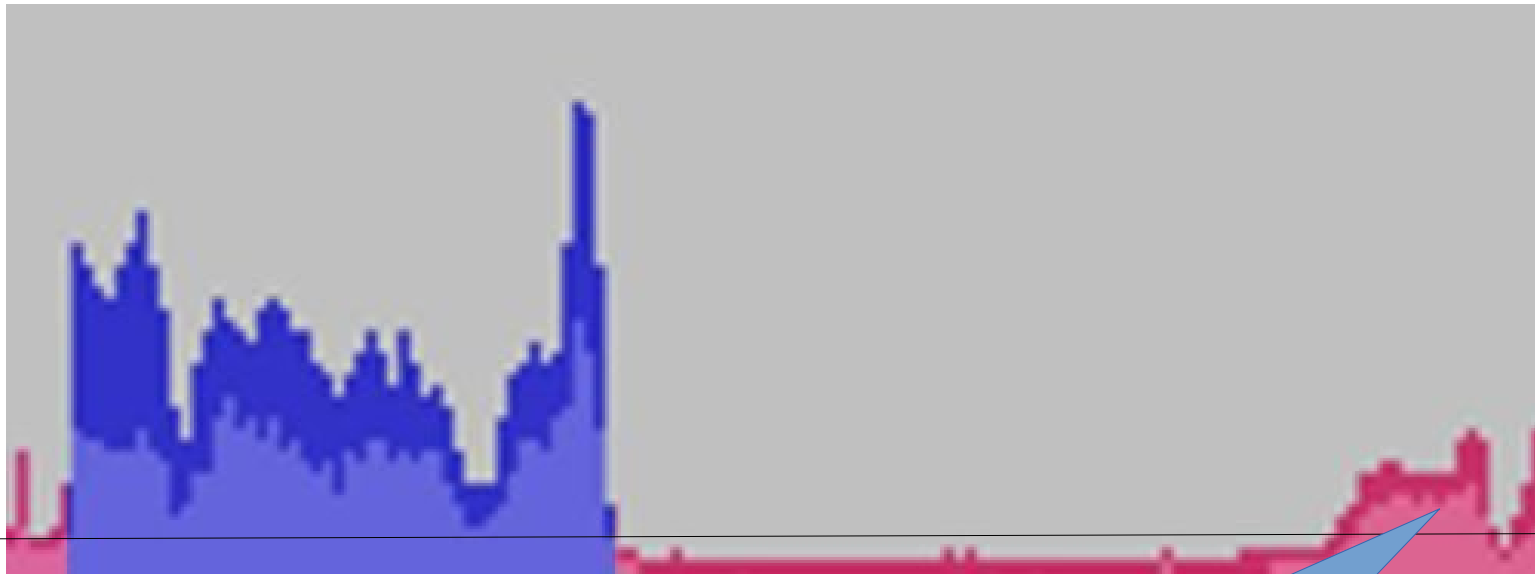
- FRS, No License, Small set of shared frequencies, 0.5 watt, FM, UHF.
- GMRS, License per family, Small set of shared frequencies, 7 shared with FRS, 8 repeater pairs, Typically 1-5 watt, up to 50 watt, FM, VHF.
- Citizens Band. No License. Small set of shared frequencies, AM, HF.
- MURS, No License, Small set of shared frequencies, 2 watt, FM, UHF
- Public Safety. License per agency, frequency coordination through coordination body (APCO), one or a few frequencies. May be encrypted, VHF or UHF, 11KHz FM, can be Trunked digital, often repeater pairs.
- Amateur Radio. Individual license, written tests. Multiple bands, many frequencies, repeaters, digital networks, location beacons, video, many different capabilities.

Parts of a Radio

- Antenna
- PTT button
- Battery
- Volume control
- Squelch control
- Speaker
- Microphone



Squelch



Squelch too low
Undesirable weak signals
get through as interference

Squelch

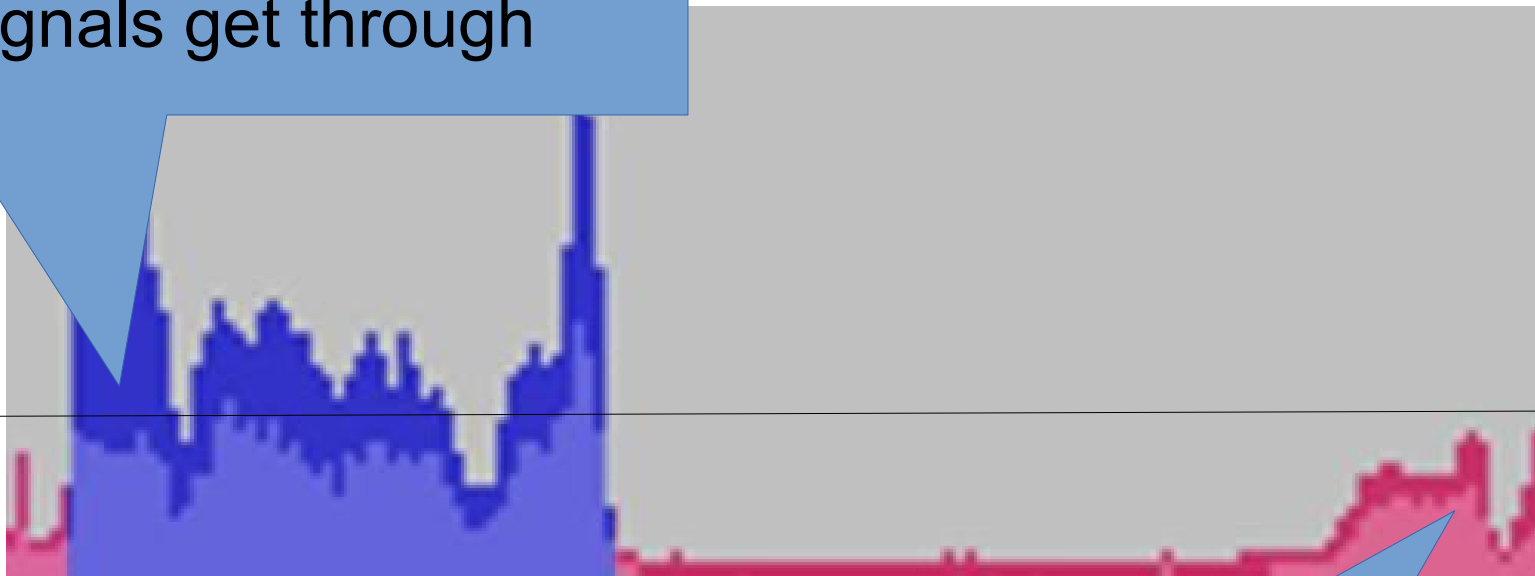
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Squelch too high
Strong local signal
doesn't get through

Squelch: Just Right

Desired strong local signals get through



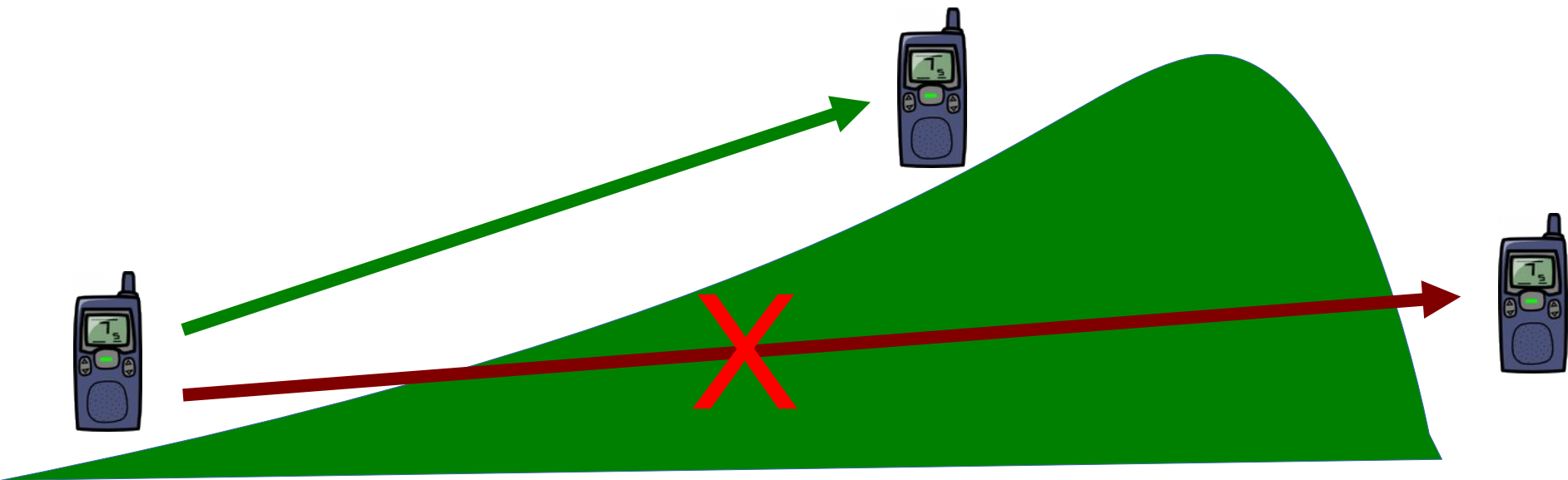
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Undesirable weak signals don't break squelch

PL (CTCSS) Tones

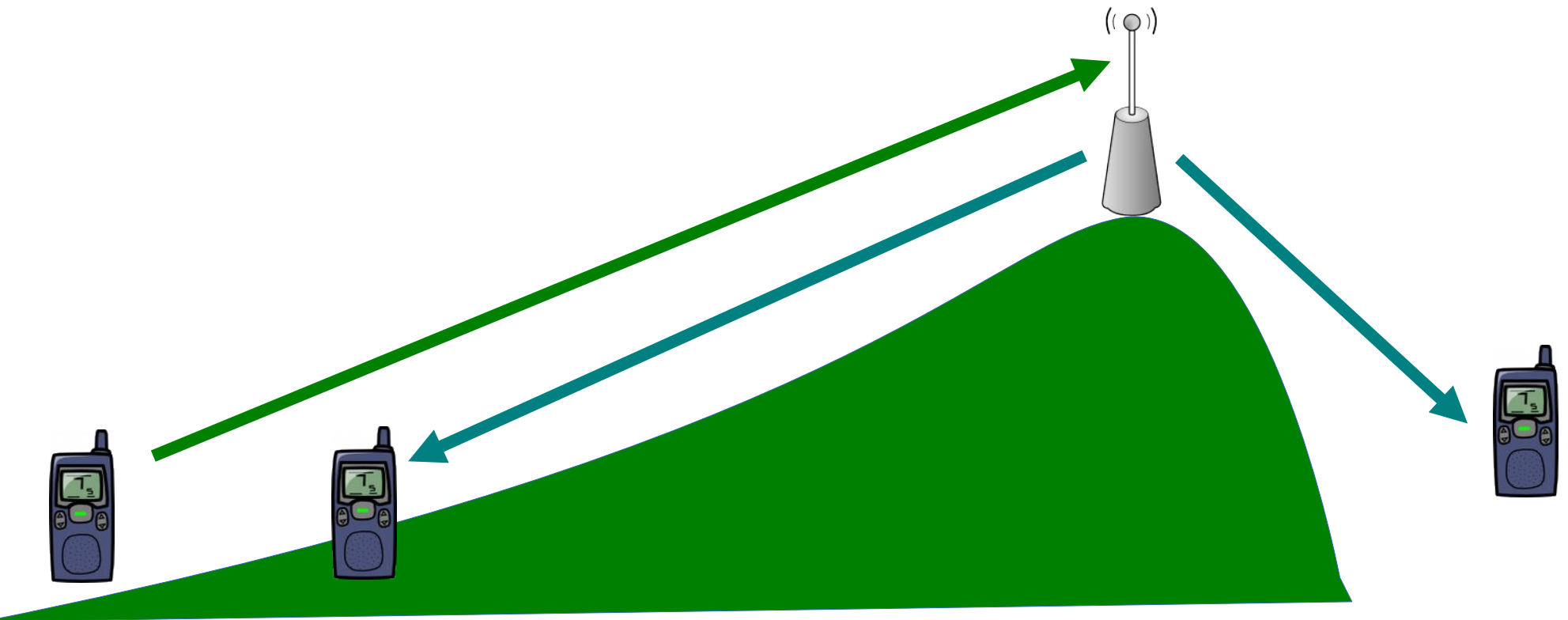
- Continuous Tone-Coded Squelch System
 - Squelch won't open (even for a strong signal) unless it hears a particular tone on the signal.
 - Assist frequency sharing, reduce noise in poorly designed receivers.
 - Doesn't prevent your transmissions from being heard.
 - Someone with CTCSS turned off can hear all transmissions.
 - You can only hear the transmissions with the CTCSS tone that you are using on them.

Simplex: Single Frequency Line of Sight



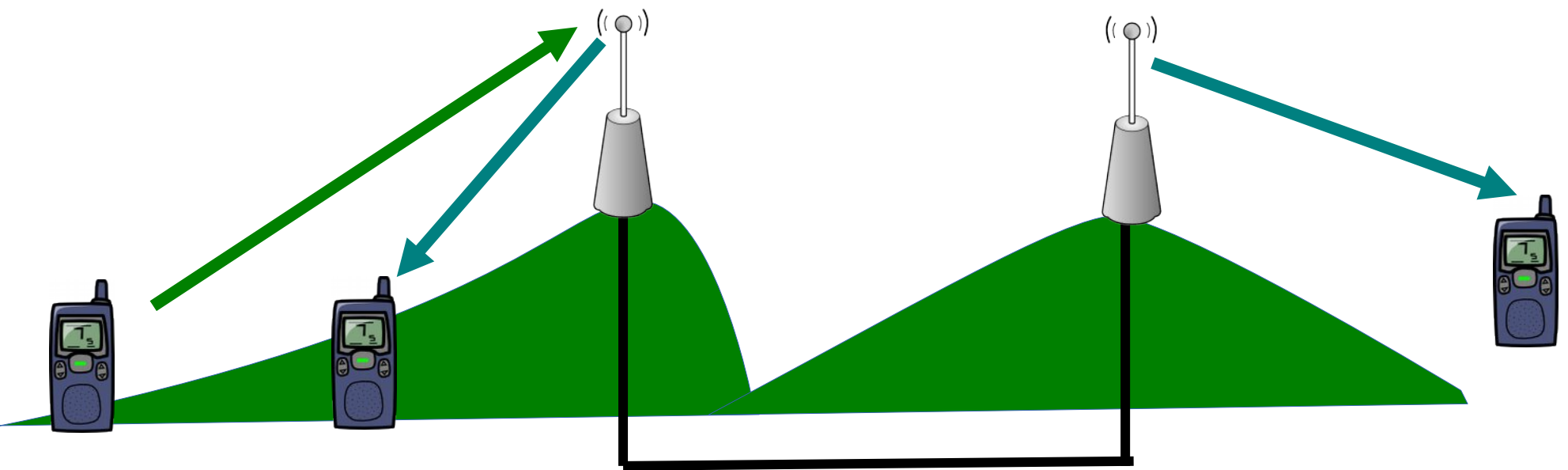
Repeater

Transmit on Repeater Input
Listen on Repeater Output



Linked Repeaters

Transmit on Repeater Input
Listen on Repeater Output



Troubleshooting Radio Communications

- Some common sorts of issues
 - Low Battery: Radio transmits briefly then drops out. Radio can hear transmissions but won't transmit.
 - Loose speaker/microphone connector: Radio appears to be on but isn't transmitting and/or you can't hear anything.
 - Weak, broken signals: Hold the radio up in the air, antenna vertical. Turn down the squelch. Hold the radio vertical over the top of a car. Move to higher ground

Using a Radio

- **Plan** what you are going to say.
- Listen to make sure channel is clear.
- Press PPT button.
- Pause.
- State your message.
- Release the PPT button.
- Establish contact then transmit message.
- Use plain English, no codes.

Establishing Contact

- One Convention:
- Your call **to** the station you are calling:
 - Ground Team 3 **to** Operations
- Another Convention:
- The station you are calling **from** your call:
 - Operations **from** Ground Team 3

Failure Modes:

If you start talking before transmitting

- Your call **to** the station you are calling:
 - [REDACTED] m 3 **to** Operations
 - This is Operations, station calling, go ahead.

- The station you are calling **from** your call:
 - [REDACTED] **from** Ground Team 3
 - ?????

Call Signs: Who are you calling

- ICS Positions
 - Command: The incident commander
 - Operations: The operations section chief
- ICS Locations
 - Base: A logistic support base
 - Staging: A staging area
- Functional call signs
 - Ground Task Force 5:
 - Ground Strike Team 3:
 - Team Pippa (Single Resource)
 - Control (or Fire Control, or Dispatch: a PSAP center)

Acknowledge **and** Echo Back

- *task*: Task 4 to Operations
- *ops*: Go ahead Task 4
- *task*: Completed assignment, returning to pickup point.
- *ops*: **Acknowledged, task 4 completed assignment, returning to pickup.**

Take out your notebook and a pen
Turn around
Prepare to copy a location



19T 0297385 4710843

Take out your notebook and a pen.
Turn around.
Prepare to copy a location.



19T BH 87446 09591

What To Say

- Radio check when departing staging.
- Call in when starting assignment.
- Welfare check, often every 30 minutes.
- Call in upon completion of assignment.
- Clues, with location (unless directed to call in by cell phone).
- USNG Coordinates in **full**, unless some other practice has been established in the search (e.g. first 4 digits each of easting and northing).

Choose Words For Clarity

- Affirmative instead of (Yes, OK, 10-4)
- Negative instead of No
- Obtain instead of Get
- Standby instead of Wait
- Received, Acknowledged instead of (OK, 10-4)
- Niner for 9
- Numbers individually: 12 as “one two” not twelve.

How To Say It: Be Professional

- To the point, brief, transmissions
- Speak in a clear normal voice
- Control your emotions
- Remain impersonal: no irritation, sarcasm, disgust, laughter.
- Be courteous (but not “Please”, “Thank you”)
- No Humor on the Air

What Not To Say

- Assume all communications are being monitored (by the general public and the news media)
- Use other communication channels (cell phone) to report a find of a deceased person
- No codes, unless you have been briefed on a code to use to communicate sensitive information (such as a find of a deceased subject when cell coverage aren't available).
- You do not want someone to overhear something they shouldn't (the perpetrator may be monitoring search communications).
- Absolutely no swearing the radio

It Is Unlawful To

- Transmit false distress signals
 - For transmissions in training that could be mistaken for reports of distress, regularly state “This is a Drill”
- Transmit obscene, indecent, or profane language.
- Cause malicious interference.

Not responsible for communications on your assignment? **Turn your radio off.**

- Unnecessary noise.
- You are wasting your battery. 12 hours from now it may be needed!
- Rumor Control: Someone in hearing distance may hear something they shouldn't (e.g. a friend or family member).

Radio Nets

- Formal Nets Have:
 - A Net Control Station
 - Check In procedure
- Some Types of Net
 - Status (PAR) check
 - Net control calls each station on a list
 - Each station replies briefly with their status.
- Traffic net on more than one frequency
 - Check in and net management on one frequency.
 - Passing of long messages from one station to another is moved to another frequency.

Personnel Accountability Report (PAR) [Status Check]

- Roll Call
- Is everyone in an incident physically accounted for?
- Initiated by Command (or a net control station) at regular intervals (20 or 30 minutes).

- Fire Service: Call sign, PAR, personnel count, location
 - IC: *Command to all stations stand by for a PAR.*
 - IC: *Ground Task 1, PAR*
 - Ground Task 1: *Ground Task 1, PAR 8, segment 3.*
 - IC: *Ground Task 2, PAR*
 - Ground Task 2: *Ground Task 2, PAR 6, segment 5*
- More usual in SAR: call sign, status
 - IC: *Command to all stations stand by for status check.*
 - IC: *Ground Task 1, status check*
 - Ground Task 1: *Ground Task 1, on task*
 - IC: *Ground Task 2, status check*
 - Ground Task 2: *Ground Task 2, on task*

Accountability Systems

- Location of all personnel at all times.
- Identity and location of all responders to the incident.
- Use at every incident (including every training).
- Location and assignment (or other status) of all responders at all times.

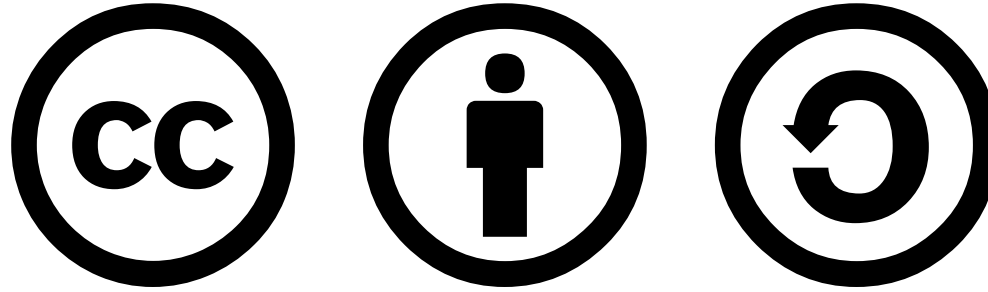
T-Cards

ST/Unit:	LDW:	# Pers:	Order #:
Agency	Cat/Kind/Type		Name/ID #
Front			
Date/Time Checked In:			
Leader Name:			
Primary Contact Information:			
Resource ID #(s) or Name(s):			
Home Base:			
Departure Point:			
ETD:		ETA:	
Date/Time Ordered:			
Remarks:			
Prepared by:			
Date/Time:			
ICS 219-8 MISCELLANEOUS EQUIPMENT/TASK FORCE (TAM)			

ST/Unit:	LDW:	# Pers:	Order #:
Agency	Cat/Kind/Type		Name/ID #
Front			
Date/Time Checked In:			
Leader Name:			
Primary Contact Information:			
Crew/Team ID #(s) or Name(s):			
Manifest:		Total Weight:	
<input type="checkbox"/> Yes <input type="checkbox"/> No			
Method of Travel to Incident:			
<input type="checkbox"/> AOV <input type="checkbox"/> POV <input type="checkbox"/> Bus <input type="checkbox"/> Air <input type="checkbox"/> Other			
Home Base:			
Departure Point:			
ETD:		ETA:	
Transportation Needs at Incident:			
<input type="checkbox"/> Vehicle <input type="checkbox"/> Bus <input type="checkbox"/> Air <input type="checkbox"/> Other			
Date/Time Ordered:			
Remarks:			
Prepared by:			
Date/Time:			
ICS 219-2 CREW/TEAM (GREEN)			

Managing Accountability

- Who has been mobilized for the incident. (sign in)
- Who is out on which task. (SAR task assignment form)
- What is the status of each resource. (T cards)
- Communications to support accountability: (test, on task, regular check-ins, off task).
- Regular status checks – may include location.
- Demobilization: Did everyone get home safe. (demobilization plan and implementation)



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