Emergency Communications (EmComm)
A Ham Radio Perspective

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ARRL District Emergency Coordinator – Maricopa County
All Hazards Communications Unit Leader (COML)

Questions?

The Federal Communications Commission

Within the US, the allocation and use of the limited radio spectrum is regulated by the FCC

- *"The Federal Communications Commission regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories. It was established by the Communications Act of 1934 and operates as an independent U.S. government agency overseen by Congress...."*

The FCC authorizes several Personal Radio Services

*"Personal radio services provide **<u>short-range, low power radio</u>** for personal communications, radio signaling, and business communications not provided for in other wireless services. The range of applications is wide, spanning from varied one- and two way voice communications systems to non-voice data transmission devices used for monitoring patients or operating equipment by radio control. Licensing and eligibility rules vary. Some personal radio services require a license grant from the FCC, while others require only that you use equipment that is properly authorized under the FCC's rules. See specific service pages for the licensing and eligibility details about each individual service."*

Some of the personal radio services are:

- *Citizens Band (CB) Radio Service*
  - *1-5 mile range two-way voice communication for use in personal and business activities.*
- *Family Radio Service (FRS)*
  - *1 mile range Citizen Band service for family use in their neighborhood or during group outings*
- *General Mobile Radio Service (GMRS)*
  - *5-25 mile range Citizen Band service for family use in their neighborhood or during group outings*
- *Multi-Use Radio Service (MURS)*
  - *private, two-way, short-distance voice or data communications service for personal or business activities of the general public.*
- *Personal Locator Beacons (PLB)*
  - *used by hikers, and people in remote locations to alert search and rescue personnel of a distress situation.*

Amateur or "HAM" Radio

The FCC provides for the deployment of an "amateur" radio service

" § 97.1 Basis and purpose.

The rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles:

- (a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications....."

- (b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.

- (c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.

- (d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.

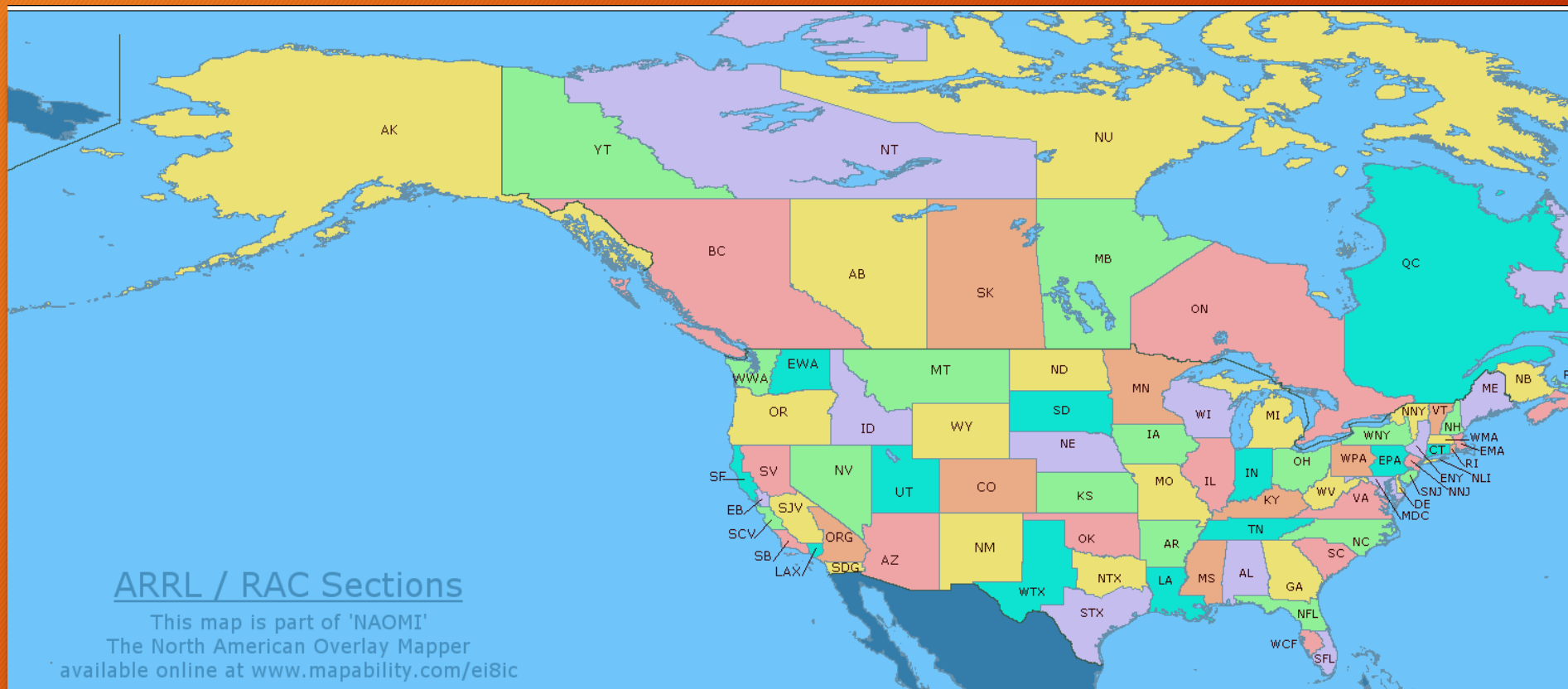- (e) Continuation and extension of the amateur's unique ability to enhance international goodwill.

The American Radio Relay League (ARRL) is an organization of HAM radio operators

- Amateur radio's ARRL has its headquarters in Newington, Connecticut, USA.

- The organization was founded in 1914 by Hiram P. Maxim.

- The ARRL offers publications intended to inform the general public about amateur radio,
- help people obtain amateur radio licenses, and assist newly licensed operators
- concerning various aspects of the hobby.

- The ARRL maintains a Morse code practice and bulletin station that uses Hiram P. Maxim's original call letters, W1AW.

- See http://www.arrl.org for more information

ARRL / RAC Sections

This map is part of 'NAOMI'
The North American Overlay Mapper
available online at www.mapability.com/ei8ic

The ARRL organization is divided into "Sections"

Arizona has an ARRL organization

Arizona Section Manager

Richard A Paquette, W7RAP

W7RAP@arrl.org

Assistant Section Managers

Youth and Scouting
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Affiliated Club Coordinator
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Section Emergency Coordinator
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ke7ejf@arrl.net

State Government Liaison
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QRZ-DX@ne7x.com

Section Traffic Manager
Thomas R Ivan Sr, KF7GC
KF7GC@arrl.net

Technical Coordinator
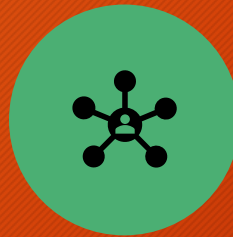KB7AZ@arrl.net

AZ Section Emergency Communications

Mission Statement

Mission Statement:

IT IS THE ARIZONA ARES (AZ-ARES) MISSION TO PROVIDE COMMUNICATIONS SUPPORT IN TIME OF EMERGENCY TO LOCAL AND STATE GOVERNMENT ENTITIES, NON-GOVERNMENT ORGANIZATIONS (NGOS), LOCAL VOLUNTEER ORGANIZATIONS ASSISTING IN DISASTERS (AZVOAD) AND THOSE ORGANIZATIONS THAT MAINTAIN A MEMORANDUM OF UNDERSTANDING (MOU) WITH AZ-ARES OR THE AMATEUR RADIO RELAY LEAGUE (ARRL).

AZ-ARES WILL ESTABLISH A NETWORK OF HAM RADIO OPERATORS WITH THE NECESSARY EQUIPMENT, SKILLS AND TRAINING TO MEET THE NEEDS OF OUR SERVED AGENCIES AND BEYOND IN SUPPORT OF EVENTS, DRILLS AND EMERGENCIES.

AZ-ARES WILL PROMOTE HAM RADIO TO THE PUBLIC BY DEMONSTRATING IT'S CAPABILITIES THROUGH SUPPORTING PUBLIC SERVICE EVENTS, GOVERNMENT SPONSORED DRILLS AND EXERCISES AND DEMONSTRATIONS.

Emergency Management Agencies can use Hams to assist via the Radio Amateur Civil Emergency Service - RACES

• Protocol created by the Department of the Army's Office of Civil Defense and provided for by the Federal Communications Commission (FCC Part 97, Section 407).

• Many government agencies across the country train their Auxiliary Communications Service (ACS) volunteers using the RACES protocol.

• The volunteers serve their respective jurisdictions pursuant to guidelines and mandates established by local emergency management officials.

Every HAM radio operator can volunteer their skills and equipment by participating in the Amateur Radio Emergency Service® (ARES)

Amateur Radio Emergency Service® (ARES)

The Amateur Radio Emergency Service® (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment, with their local ARES leadership, for communications duty in the public service when disaster strikes.

ARES membership requirements

Every licensed amateur, regardless of membership in ARRL or any other local or national organization is eligible to apply for membership in ARES. Training may be required or desired to participate fully in ARES. Please inquire at the local level for specific information. Because ARES is an Amateur Radio program, only licensed radio amateurs are eligible for membership. The possession of emergency-powered equipment is desirable but is not a requirement for membership.

The FCC's Technician Class Question Pool states it clearly…

T2C04

33. What do RACES and ARES have in common?

• A. They represent the two largest ham clubs in the United States

• B. Both organizations broadcast road and weather traffic information

• **C. Both organizations may provide communications during emergencies**

• D. Neither may handle emergency traffic supporting public service agencies

The ARRL has agreements in place to serve a variety of agencies and partners
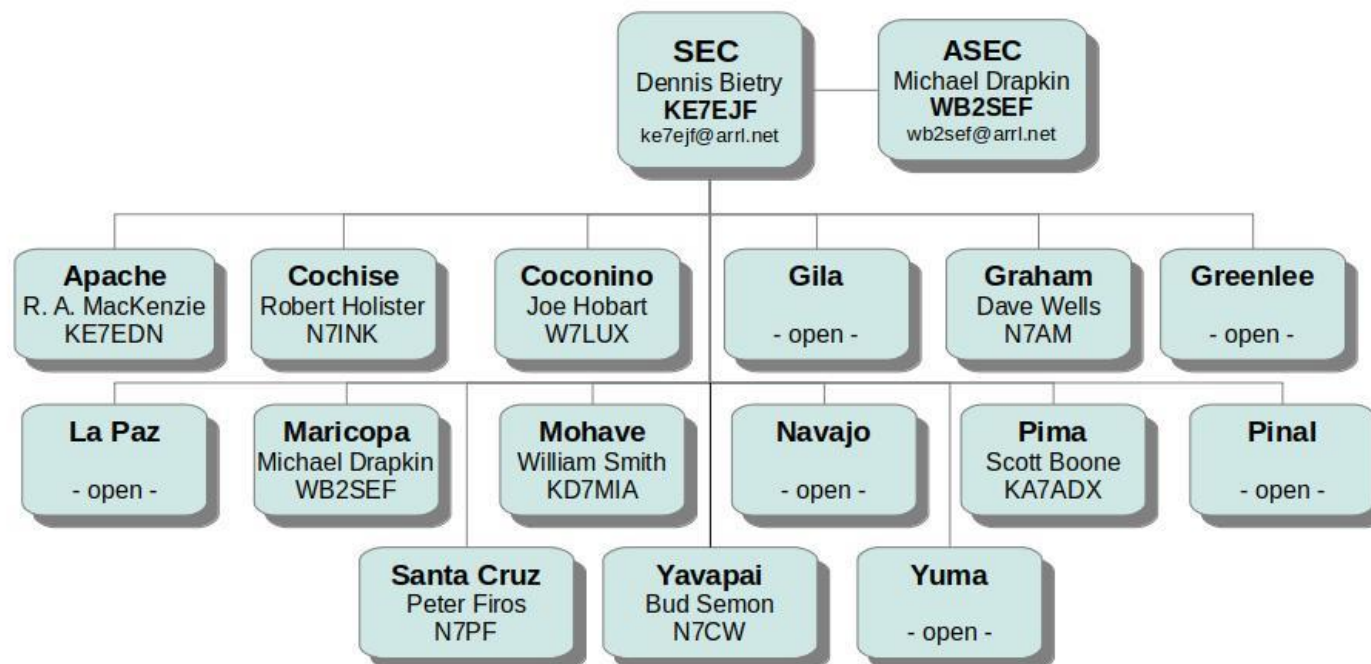
Memoranda of Understanding

- American Red Cross
- Association of Public-Safety Communications Officials-International (APCO-International)
- Boy Scouts of America
- Citizen Corps (Department of Homeland Security)
- Civil Air Patrol (CAP)
- Federal Emergency Management Agency (FEMA)
- National Frequency Coordinators Council
- National Volunteer Organizations Active in Disaster (NVOAD)
- REACT International Inc.
- Salvation Army & SATERN
- SKYWARN (National Weather Service)
- Society of Broadcast Engineers (SBE)
- United States Power Squadrons

Arizona ARES Organization

SEC
Dennis Bietry
KE7EJF
ke7ejf@arrl.net

ASEC
Michael Drapkin
WB2SEF
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Apache
R. A. MacKenzie
KE7EDN

Cochise
Robert Holister
N7INK

Coconino
Joe Hobart
W7LUX

Gila
- open -

Graham
Dave Wells
N7AM

Greenlee
- open -

La Paz
- open -

Maricopa
Michael Drapkin
WB2SEF

Mohave
William Smith
KD7MIA

Navajo
- open -

Pima
Scott Boone
KA7ADX

Pinal
- open -

Santa Cruz
Peter Firos
N7PF

Yavapai
Bud Semon
N7CW

Yuma
- open -

10/14/19

ARES Organization in Maricopa County

Dennis Bietry – KE7EJF
AZ Section Emergency Coordinator (SEC)

Michael Drapkin – WB2SEF
District Emergency Coordinator (DEC)
Maricopa County

Andrew Cornwall – KF7CCC
Emergency Coordinator (EC)
Maricopa County

Club / Agency Liaisons
Assistant Emergency Coordinator (AEC)
Maricopa County

Ham Radio and NIMS/ICS

Understanding NIMS and ICS

The National Incident Management System (NIMS), a program of the Federal Emergency Management Agency (FEMA), is a comprehensive approach to incident management that can apply to emergencies of all types and sizes. The NIMS approach is intended to be both:

- Flexible, to work in all incidents
- Standardized, to provide a coordinated, efficient response to each incident

ICS Command Structure
The ICS command structure provides an orderly chain of command that is consistent across responding organizations. This chain of command may have either a single person, the Incident Commander (IC), at its head, or a multi-agency team, which is referred to as Unified Command. All other elements of the command structure are the same, regardless of how it is commanded.

Incident Commander

Operations Section Chief
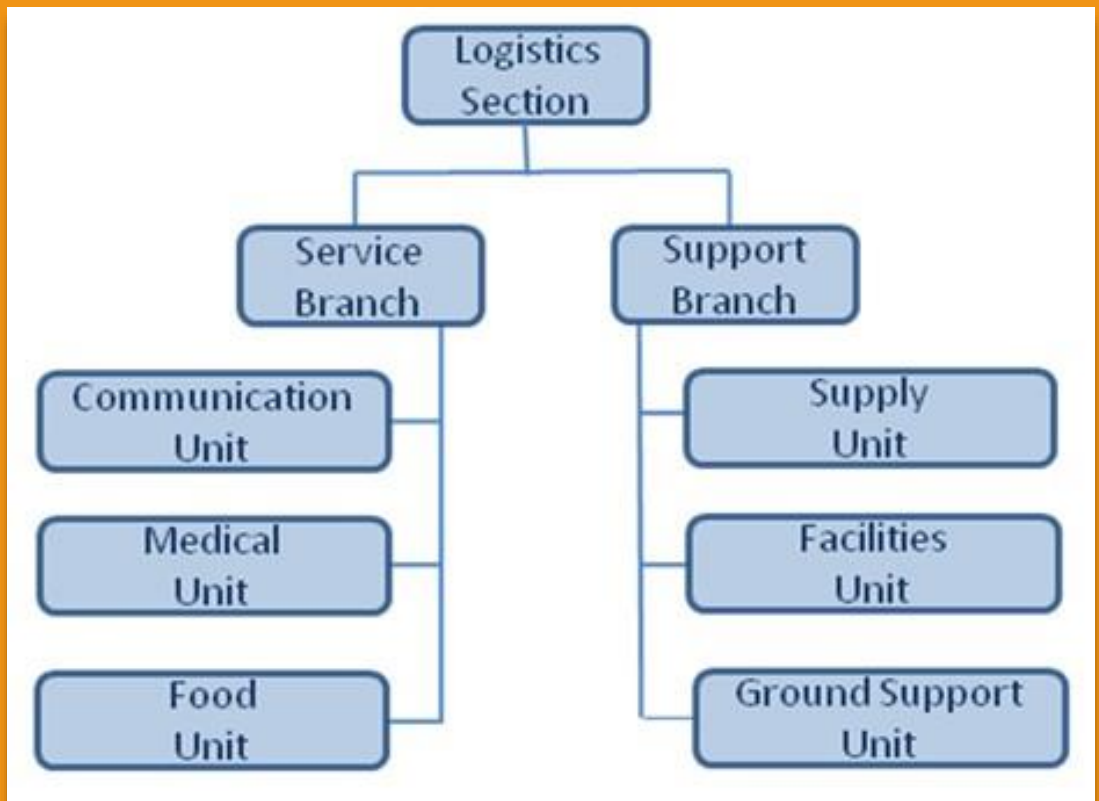
Planning Section Chief

Logistics Section Chief

Finance/Admin Section Chief

CERT

Communications

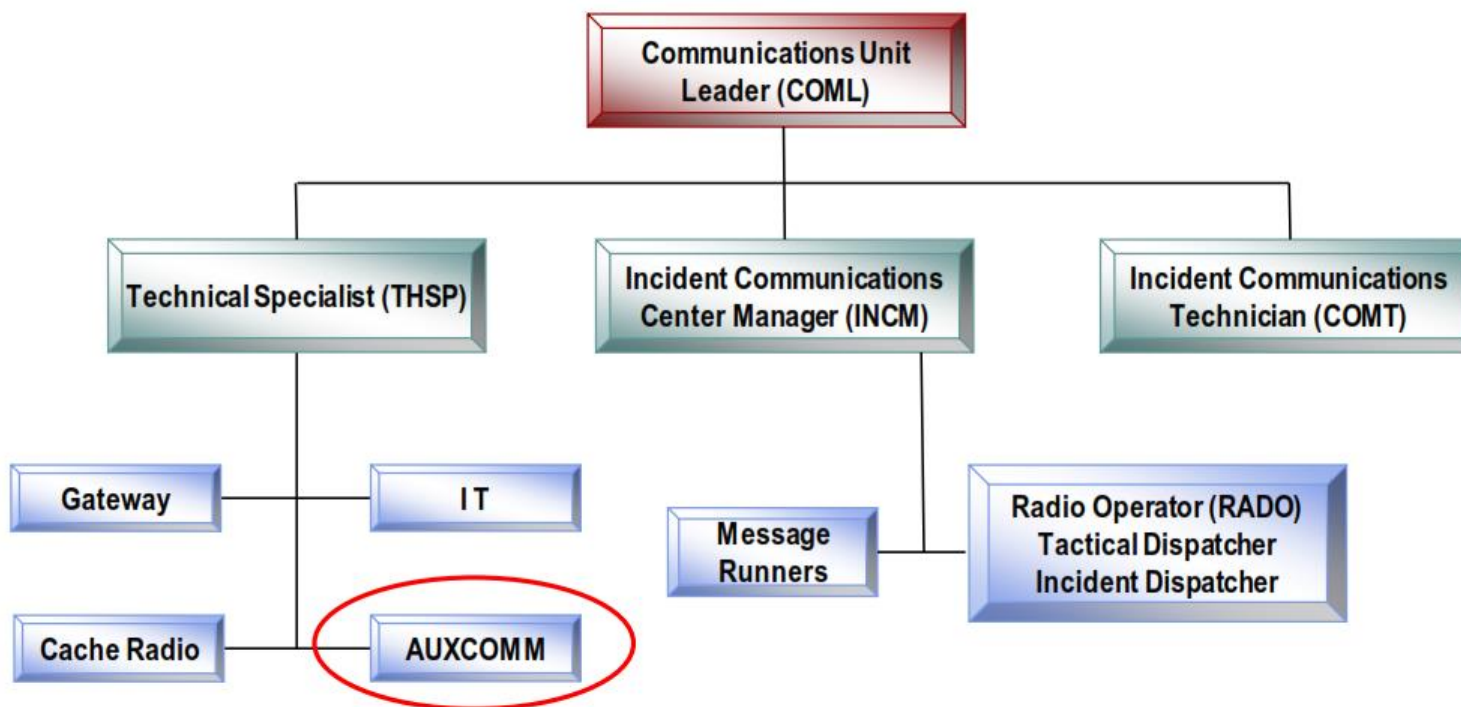# Incident Command System (ICS)

Incident Command System (ICS)

The ICS Comm Unit and Auxcomm

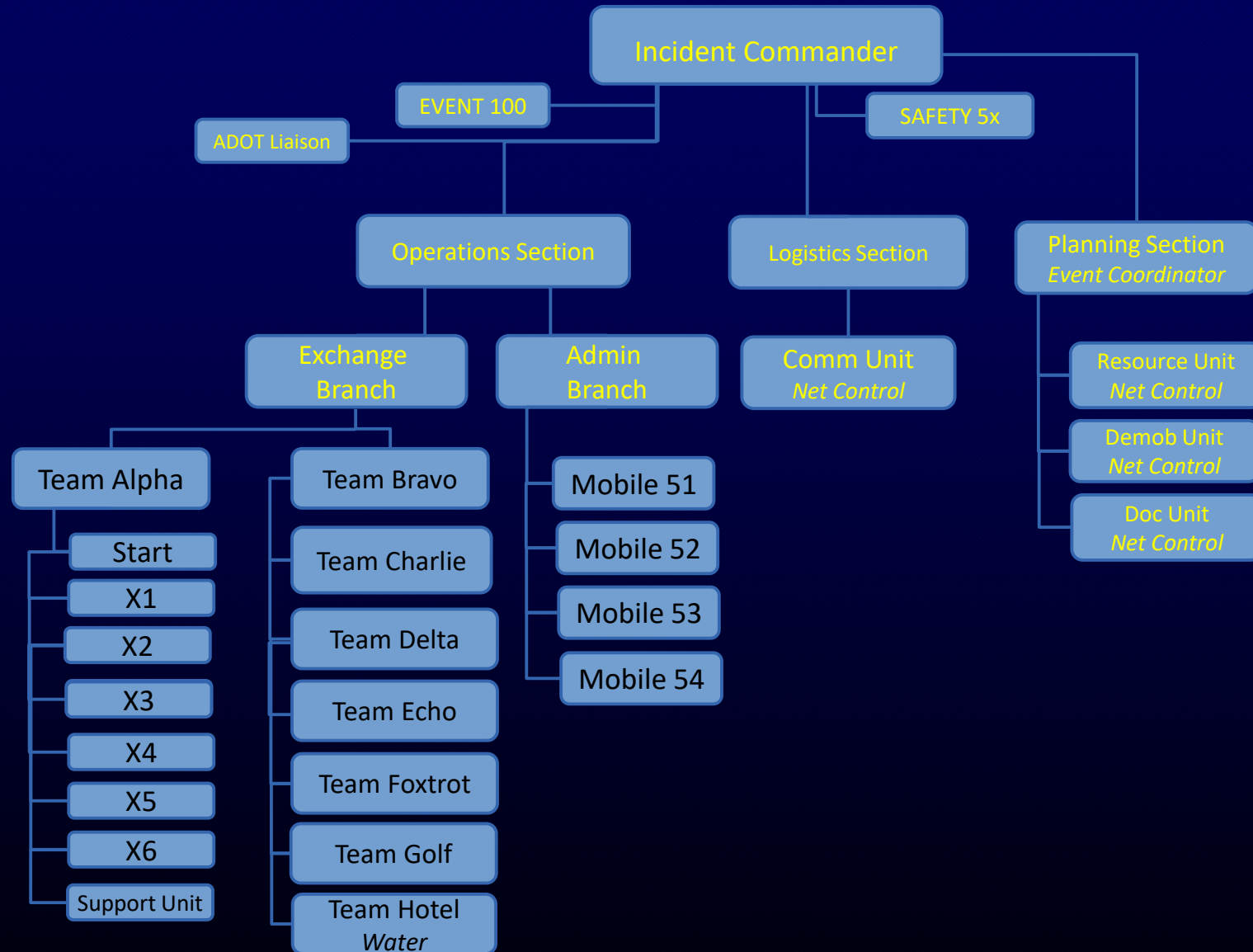# Auxiliary Communicators (Cont'd)

- Performs AUXCOMM duties:
    - Radio Operator
    - Technician
    - Other Technical Specialist (THSP) duties as required and/or assigned depending on their training, experience and qualifications
- Operate on voice, digital, satellite, VoIP, RoIP and numerous other modes if equipment is available

CISA
CYBER+INFRASTRUCTURE

Incident Command System (ICS)

Ragnar (SET) Command Structure

EOC (Cont'd)

ECD/ICTAP
Emergency Communications Division / Interoperable Communications Technical Assistance Program

AUXCOMM UNIT 1 – THE COMMUNICATIONS UNIT

Ham Radio in Arizona

Hams in AZ have a variety of clubs, groups and associations that are geared to further the art of specific aspects of radio communications

Technology focused
- Repeaters
  - ARA – The Arizona Repeater Association
  - EARS – Eastern Arizona Repeater Society
  - A lot more …
- Amateur TV
- Digital Communications

Activity Centric
- AEN-MAR (Arizona Emergency Net - Maricopa)
- MCECG (Maricopa Emergency Communications Group)
- "Fox Hunting" (search and rescue)
- Etc…a

City or regional centric clubs

- TBARC
- Scottsdale
- …

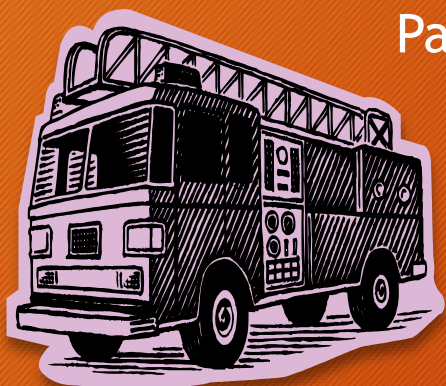A variety of **company based** clubs

- IBM
- Motorola
- Intel

Organizational relationships
- Boy Scouts
- Religious groups
- Educational Institutions

Hams in AZ participate in a variety of activities that range from real life situations to drills to practice deployments

Participation in Drills & Exercises
- Top Off
- NDMS
- Palo Verde siren tests
- Pandemic exercise
- Others

Scheduled "Disasters"
- A variety of Races, Walks and Events around the state
- Ragnar Relay (200+ mile relay over 36 hour period)
- Bike MS
- March for Babies
- Barnburner
- JAVALINA JUNDERD
- More than 35 Others this year

The Arizona Emergency Net - Maricopa (AEN-MAR) uses an ARA repeater system:

The *"MetroLink"*

Frequency	Offset	Location
147.240	+ 600khz	Shaw Butte (Phoenix)
146.920	- 600khz	Mt Ord (Between Mesa and Payson)
146.760	- 600khz	Scottsdale Airpark
146.860	- 600khz	Usery Mountain (Far East Valley)
448.375	- 5Mhz	Daisy Mountain (North Phoenix)
146.820	- 600khz	Mingus Mountain (Yavapai County)

VHF uses CTCSS tone of 162.2hz / UHF uses CTCSS tone of 100hz

Additional EMCOMM Opportunities

Ham Radio assists the National Weather Service through it's SKYWARN® program

- SKYWARN® is a volunteer program with nearly 290,000 trained severe weather spotters. These volunteers help keep their local communities safe by providing timely and accurate reports of severe weather to the National Weather Service.

- The Greater Phoenix Area (Sector 2) has over 200 hams on the regular roster with a weekly radio "net" that is used to verify equipment functionality, educate and exchange weather service insight.

Arizona Traffic Emergency Net (ATEN): www.atenaz.net

Brief History:

• ATEN was founded in 1969, and has been operating daily since then. There have been times when the net was very busy handling traffic. The net meets each day practicing the passing of formal written NTS Radiogram Traffic messages into and out of our coverage area. We have a great bunch of people that make up the Net. We practice every day for that emergency which we hope never comes.

• Many stations have contacted us with their full support as to the ATEN format and Protocol. These include ARRL, NTS Area Chairs, Transcontinental Corps (TCC) Director, and many experienced traffic handlers in the NTS System.

Net Meets on 3986kHz at 5:30 PM MST or 0030Z…

• All Amateur Stations are welcome. If you have a Technician license, please check into the net at a General class or higher license station and **signify which station you are checking in from.** The net meets for drill and practice handling NTS Radiograms, and ARES ICS-213 messages.

• ATEN training sessions are most Fridays after the formal net ends.

Saguaro National Traffic System (NTS) Net:

http://www.saguaronts.net/

SAGUARO NTS NIGHTLY NET:

The Saguaro NTS Net meets nightly on ham radio at 6:30 P.M. (1830 hrs MST) on the EAARS Repeater Network (Eastern Arizona Amateur Radio Society).

EAARS repeaters cover Eastern Arizona clear into new Mexico! Our purpose is to relay radiogram message traffic within the United States (and outside the U.S. wherever Third-Party Traffic is permitted).

The Saguaro NTS Net is on VHF two-meters, voice mode, to enable hams with any level of amateur radio license to participate repeater atop Mt. Lemmon, -145.25 (156.7 PL) and utilize K7OEM, -146.880 (110.9 PL), as our alternate repeater. We are always on the lookout for additional net control stations. Hop in and join us!
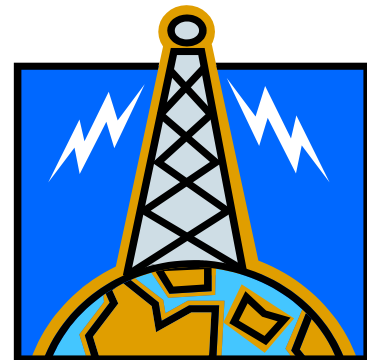
A variety of Organizations have volunteer positions involving radio communications skill and Ham Radio technologies.

How Can you get involved?

- Contact your club AEC / EC / DEC for guidance
- Sign up for public service exercises
- Participate in scheduled ARES / NTS nets
- Register with ARES on the AZ ARES Database
    - http://az-arrl.org/ARES
    - Click on "user login"
    - Create new account if you don't have one
- In Maricopa County register with M.C.E.C.G.
    - http://www.mcecg.net

What you need to do…

- Get Trained!
  - IS100,200,700,800… http://training.fema.gov/IS/
  - ARRL Emcomm Training available
  - Attend an Auxcomm class
  - Local participation training
  - Find a mentor (Elmer)

- Be prepared
  - Establish a "go" kit with communications supplies
  - Know where to tune for local information and "resource net" activity

- Practice
  - Participate in "scheduled disasters"
  - Hone your skills and procedures on regular nets
  - Verify operational status of equipment

When disaster strikes, never self deploy!

All incident responses start locally with minimal resources.

As the scope of the incident expands, the Logistics Section will request additional resources as needed.

The responding Incident Commander will request resources through proper channels.

If asked, ARES Incident Command will formally recruit and deploy resources (HAMs) to assist

EMComm Examples

Missouri Hams Help Out When 911 Service Goes Down

09/14/2011

It doesn't take a major disaster for Amateur Radio to step in and save the day. Around 9 PM on September 5, a cable cut completely isolated the Johnson County 911 Center in Warrensburg, Missouri, impacting landline, Internet and cellular service. Johnson County -- home to Whiteman Air Force Base -- is located just east of the Kansas City metro area.

Johnson County's emergency plan called for the telephone company to transfer all 911 calls to the Henry County 911 facility in Clinton, Missouri; Henry County is the next county south of Johnson County. But an equipment problem at Henry County's center prevented the transfer from completing successfully. Calls were then routed to the Benton County 911 Center in Warsaw, Missouri; Benton County is the next county west of Henry County. This transfer was successful and calls started coming in to Warsaw. Unfortunately, Warsaw is more than 40 miles from Warrensburg, and the two centers were unable to establish communication using the county VHF radio facilities.

It was then that radio amateurs were brought in to provide communications support. Johnson County Emergency Management Director Gloria Michalski, KC0TPB, activated the Johnson County ARES® group, while Benton County Emergency Management Director Gary England, KC0ZYL, activated the Benton County ARES® group. Amateur Radio operators from both groups reported to their respective Emergency Operations Centers, and using the VHF repeater facility operated by the Warrensburg Area Amateur Radio Club, **quickly established reliable communications. Hams relayed the 911 calls between the two centers, with the hams in Benton County handing the calls off to Warrensburg officials for dispatch.**

Hams from North Carolina to Maine Provide Communication Support Before, During and After Hurricane Irene

Hurricane Irene -- the first major hurricane of the 2011 hurricane season -- left extensive flood and wind damage along its path through the Caribbean, the East Coast of the United States and as far north as Atlantic Canada. Beginning on August 20 as then-Tropical Storm Irene headed toward Puerto Rico, radio amateurs were already on alert.

New York

In Greene County, New York -- located about 25 miles south of Albany, the state capital -- hams are currently active, providing communication support to the County Emergency Operations Center. According to Greene County Emergency Coordinator Len Signoretti, N2LEN, Irene "took out" portions of the towns of Prattsville and Windham. "We've seen a tremendous amount of property damage throughout the county," Signoretti told the ARRL. "With the help of hams from Greene, Ulster, Rensselaer, Dutchess and Columbia Counties, we are supporting the Greene County Emergency Services."

So, How do I get started in HAM Radio?

	Do some homework	http://www.arrl.org/getting-licensed
	Contact a local club to attend their training	http://www.arrl.org/licensing-education-training
	Get a study guide	
	Get an *"Elmer"*	
	Take on-line classes	
	Validate your readiness with on-line practice tests	
	Take the exam	
	Get cool toys!	

Are there any Questions?