

Chapter 1

THE AUTHOR'S LIFE

I got interested in the radio world early in life. While I was in the 9th grade I built my amateur radio station. Built using the Knight Kit R-55 Receiver and T-60 Transmitter. But without a ham license station was a glorified SWL station (for any of you who remember what SWL means!). The problem : I lived 330 mile to the nearest FCC office, I was in High School with no drivers license, and I was born and raised on a farm (which is a 365 day per year life style. The VE program was not in operation.)

So it was not until 1979 that I finally obtained the novice license. That was after college (electronics degree) and a 4 year employment with Hewlett Packard. But that was good / great time to be on the air. As 15 meter band was open until 2200 hours (10 PM) and was open at 0800 hours (8 AM) every day! Making contacts on low power was not a challenge.

I progressed up the licenses over a short time (couple years) and stopped at the Advanced License. No incentive to get the Extra.

I became a member of the Tillamook Amateur Radio Club and shortly started working as a Net Control Station (NCS) for the club's net. That being on the VHF bands. But I lived on the HF bands, and getting involved with some emergency based communications nets. And, to help out in NCS for the Oregon RACES Net.

Those actions set my life as an emergency communications volunteer. I have been working the emergency communications and traffic nets for over 40 years. I do not remember when I got involved with ARRL Amateur Radio Emergency Services (ARES) Operations, but do know that I have worked that side of the industry for many years.

I have held many of the ARES leadership positions. As with many volunteers, I started as a Assistant Emergency Coordinator (to help out in a shortage situation), and moved to EC, DEC, ASEC, ADEC, Net Manager, Official Bulletin Station, and ?

I have worked some of the Major Incidents in Washoe County and Northern Nevada. Incidents like the Truckee River Floods covering downtown Reno, Reno Tahoe International Airport, several forest fires, snow storms / ice storms, and Red Cross Shelter activation.

Countless exercises in and for the local county, district, and state, both ARES and multi-government exercises. Some government exercises enlisted as many as 60 distinct agencies and groups.

Sporting events ... oh boy! A bunch of them. Bicycle, marathon and endurance runs, off-road car racing, fund raising walks. From short three to four hour events to two day non-stop events. The Reno Air Races is a nine day event.

One of the greatest need in the ARES Organization is training. Thus I became the training officer for the Nevada Section Washoe County ARES group. Over the period of time I trained other county ARES members. Eventually I became an ARRL ARES Field Instructor, to which I held for over 15 years.

I enjoy doing teaching and training. Even did such tasks at some of my employment years. I have been a leader a good portion of my life covering many different topics. This is the fun part of my life! Working with other like minded volunteers endeavoring in emergency communications. And I have met some great, interesting individuals through the training efforts.

The ARRL ARES EmComm Level I Certification is a course, not a class. There are 29 chapters in the book. I held weekly in person sessions, covering three topics per the three hour session. In doing such training I had a 98% success rate for the final exams.

Over the years of doing this 10 week course I developed other material to help the students grasp the course topics. The topics and material covered in the book is the material I developed for those students.

This book is not meant to replace the ARES EmComm Level I Certification, but to support that training. The content of this book is to further detail the EmComm Training and to provide better understanding for the certification.

Enjoy.

Doug

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Chapter 2

NET CONTROL STATION

2.1 Net Control Station

1. Why is NCS so important?
2. This is one of two major pillars in ARES operations
3. You may be assigned the task during a deployment
4. First station on frequency is the NCS

2.2 What Is A Net?

1. The word "net" is an abbreviation for network
2. A net is an on-the-air meeting of amateurs to handle messages and / or pass information relating to a scheduled or unscheduled event
3. Each net has a purpose!

2.3 Why Do We Have Nets?

1. A net provides a structured arrangement for directing messages and traffic
2. The purpose of a net is to move as much information in a minimal amount of time with accuracy and efficiency
3. Without a network structure, in an emergency situation, messages and traffic will not be picked-up and delivered

2.4 Types Of Nets

1. Informal (Open) Net
2. Controlled (Directed) Nets

2.5 Informal (Non-Controlled) Net

1. During informal nets, there is minimal central control by a Net Control Station
2. Casual conversation is accepted
3. Unnecessary chatter is kept to a minimum
4. Traffic is handled on a first-come-first-served basis
5. Stations can pass traffic directly by calling the destination station

2.6 Controlled Net

1. A net run by a Net Control Station (NCS) where all traffic is authorized by the NCS
2. Casual discussions is highly discouraged
3. The net has a purpose / task
4. Structure is applied defining the Do's and Dont's

2.7 Resource Net

1. A Controlled Net
2. Resource management
3. Recruiting workers for the task
4. Dispatching workers

2.8 Tactical Net

1. Controlled net
2. Tactical callsigns are used
3. Net is designed to meet the served agency's needs
4. Informal traffic is typically used

2.9 Traffic Net

1. Controlled net
2. Designed for formal traffic handling
3. Small, tight-knit, experienced operators
4. Focused on originating, routing, delivery of traffic
5. Allows interface between ARES, RACES, NTS, and MARS

2.10 Net Modes

1. Phone
2. CW
3. Digital (AX25, Forward Error Correcting, Security Modes, should be used)
4. Packet
5. QPSK31
6. MT63

2.11 Bands

1. VHF Local area (most common band)
2. UHF Local area
3. HF Large geographical coverage
4. Nevada Section
5. 3965 KHz
6. 7280 Khz

2.12 Anatomy Of A Net

1. Net Participants
2. Net Control Station
3. Net Manager
4. Net Liaison

2.13 Net Participant

1. All the stations that check into that particular net
2. Radio operator at that particular location / station
3. Works directly with that served agency
4. Expected to be in the net for the duration of the net --- unless formal check-out

2.14 Net Control Station

1. The station that controls that net's session, tone, structure, traffic and messages
2. The NCS keeps a list of stations that are in the net and activity logs
3. A NCS can assign assistants to help keep track of the nets activities
4. Keeps a "list of traffic" to be handled

2.15 A NCS is NOT

1. Bossy
2. Judgmental
3. Degrading
4. A Know-It-All
5. Refer any questions and inquires to the Subject Matter Expert (SME)

2.16 Net Manager

1. Creates and maintains the net's preamble
2. Coordinates the NCS operators scheduling, including backup NCS
3. Assign the various human and equipment resources to meet the nets needs
4. Keeps summary of net activity logs and other records for ARES Staff, ARRL Headquarters, and eventually to DHS

2.17 Net Liaison

1. Is a single operator, preferably at a non-agency location
2. This station rotates between multiple nets
3. Transfers traffic from one net to another net

2.18 PRO-WORDS

1. Clear End of contact
2. Over Lets other station know to respond
3. Go Ahead Lets any station know to respond
4. Stand By Temporary interruption of contact

5. Roger Transmission received correctly
6. Out No further transmissions from this station, or terminating all operations

2.19 ITU Phonetics

1. A : AL-fa L : LEE-mah
2. B : BRAH-voh O : OSS-cah
3. C : CHAR-lee P : PAH-PAH
4. D : DELL-tah Q : kay-BEK
5. E : ECK-oh R : ROW-me-oh
6. F : FOKS-trot S : SEE-air-ah
7. G : GOLF T : TANG-go
8. H : HOH-tell U : YOU-ni-form
9. I : IN-dee-ah V : VIK-tor
10. J : JU-lee-ett W : WISS-key
11. K : KEY-loh X : ECKS-ray
12. M : MIKE Y : YANG-key
13. N : no-VEM-ber Z : ZOO-loo
14. ITU Phonetics
15. One : Wun Five : FY-ive
16. Two : TOOO Six : Sicks
17. Three : THUH-ree Seven : SEV-vin
18. Four : FOH-wer Eight : Ate
19. Nine : NINE-er Zero : ZEE-row

2.20 NCS Requirements

1. A clear voice, not a strong voice
2. Proper use of microphone: talk across the microphone, not into the microphone
3. Fluency in language, ability to speak precisely, distinctly
4. The ability to listen and comprehend in a noisy and chaotic environment
5. The ability to write legibly what is heard as you receive the information
6. While calling for check-ins, list several check-in calls before acknowledging the station that have checked into the net.
7. Acknowledge each station by their call-signs or their names
8. State the name of the net often on a regular basis. This identifies the net to stations who are looking for the net and/or "passing-by" stations
9. Take time to explain the nets purpose and protocols

2.21 NCS Requirements

1. The ability to handle mental and physical stress. In an emergency situation, be prepared for lots of net activity over a long period of time
2. Decisive and mature judgment call, possessing a strong and self-assured management style
3. The ability to defuse tension and stress
4. Need to have a constant concern for the safety of the net participants
10. Remember to identify the net by name on a regular basis
11. Remember that you (as NCS) are on a 10 minute clock
12. Remember, you are working with volunteers
13. During a long net session, take breaks often. Turn the net over to the back-up station
14. Refer queries to the knowledge points (Subject Matter Expert)
15. Pair up stations to handle traffic

2.22 Techniques For NCS

1. ALWAYS have pencil and paper ready
2. Log participants callsigns and other information
3. Control the tone of your voice
4. Be as concise as possible. Use the fewest words possible of convey the meaning
5. Listen carefully - Might seem obvious, but do not miss the critical information while operating under stress. THIS is a learned skill !!!!!

2.23 Net Precedents And Operation

2.23.1 EMERGENCY

1. Any message having life and death urgency to any person, or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages from welfare agencies during emergencies requesting supplies, material, or instructions vital to relief stricken populace in emergency areas.
2. Net Precedents And Operation

2.23.2 Priority

1. Important messages having a specified time limit
2. Official message not covered in the "EMERGENCY" category
3. Traffic that is not of the utmost urgency but is very important
4. Notices about death or injury in a disaster (NO PERSONAL INFORMATION!)
5. Net Precedents And Operation
4. Ask specific questions and give specific instructions
5. Read your radio operators manual, know your radio before an emergency occurs
6. If a net is scheduled for a specific time --- Start On Time!
7. Use the proper preamble / script
8. Ask specific question and give specific instructions
9. When there is a "double", listen carefully. You can still identify one if not both stations

2.23.3 Welfare

1. Refers to an inquiry as to the health and welfare of an individual in the disaster area
2. Refers to an individual advisory from within the disaster area regarding status
3. Such traffic is handled only after EMERGENCY and Priority traffic
4. Is primarily Red Cross's responsibility
5. Net Precedents And Operations
10. Do not be afraid to ask for assistance (relays) if in need
11. Do not think "on air". Silence is better than muttering
12. Keep transmissions as short as possible
13. You will make mistakes!
14. Avoid becoming the source for general information.
15. Refer to the station having the announcement

2.23.4 Routine

1. Most traffic in daily life is handled with this precedent
2. In an EMERGENCY / Disaster situation Routine traffic should not be handled!
16. Refer to the Public Information Officer
17. Use the ITU phonetics
18. Use the established net protocol

2.24 Hints And Kinks

1. If the net is a scheduled net, start on time!
2. Use a script / preamble
3. Be friendly, yet in control