

Familiarization Training for Radio Communication

I. Radio Nets

Radio nets are organized to address specific purposes but generally fall into a few common categories.

- **Traffic nets**, which relay formal written communications (“radiograms”).
- **Resource nets** which control and direct deployed assets.
- **Tactical nets** which provide direct communication between deployed assets and their command.

There are many other net types depending on the needs of the sponsoring organization. Skywarn nets collect and report weather data for the National Weather Service. Weather and information nets serve travelers on land and sea and are convenient “watering holes” to make contacts and obtain assistance when in disress. Weekly nets are useful to confirm functional communication circuits exist, exercising station equipment and operators alike.

Nets may be formal or informal, directed or open.

- **Formal** nets generally hold to a specific schedule with recognized member stations who meet to accomplish a specific mission.
- **Informal** nets are often convened to pass the time in simple conversation, often called “rag chewing”. They may be held in-between scheduled sessions of a formal net and serve to “watch” the frequency to ensure it is clear for regular net operations.
- **Directed** nets are commanded by a net control station (NCS) that uses established protocols and procedures. Directed nets are capable of managing high volumes of traffic, numerous participants, and generally keep formal written records. They are also useful when conditions are poor or chaotic, to maintain a calming influence and ensure smooth and efficient operations.
- **Open** nets operate without a net control but still follow established procedures and protocols. These are often used during lulls in activity or when station-to-station communication would facilitate operations better than mediated communication. These are also useful for watch purposes.

Nets may operate under any combination of the above. Depending on needs, they may switch from format to format as required.

II. Net Operations

Net operations are comprised of individual participating stations. Stations must be capable of communicating with the net control station and with at least some of the other net members. Equipment and operating modes must be compatible, which implies prior publication of the schedule, frequency, mode and mission/membership list.

There are several common functions within an operating radio net.

- **Net managers** are assigned to all formal nets and work to ensure its operations are coordinated and effective. To this end, they determine the specifics of time, place, participation and roles of member stations. Of primary importance is the recruitment and training of suitable net control and liaison stations.

- **Net control stations** are the day-to-day management officers of the net. They open and close the net, admit stations, direct traffic, and maintain formal records. Alternate net controls monitor for stations that cannot be heard directly and provide relay services for them. They also are the official substitutes should a scheduled station be unable to keep to schedule.
- **Liaison stations** carry traffic between nets. These may entail formal messages between higher and lower levels of a hierarchical traffic net or perhaps to collect and relay information between nets of any kind.
- **Member stations** typically expect to pass traffic either inbound or outbound, whether it is formal radiogram traffic or tactical, operational traffic based on the situation.

All stations should be able to operate in any role needed and should be prepared for such eventuality by training and practice.

III. Net Participation

Participating stations have a responsibility to operate with good efficiency and skills to ensure the success of the net itself. Station equipment must be in good order and condition. Operating skills must be maintained in a state of proficiency.

There are a number of time-tested rules for net operation that member stations must learn and internalize:

- **Listen first and transmit only when invited or directed** by the NCS or when you have something specific to contribute to an open net. While it may seem counter-intuitive, good radio discipline is simple listening—the primary role for a net member. Radio spectrum is a scarce resource. Unnecessary or irrelevant transmissions reduce the available spectrum and make it harder for a net to function. It also wastes power which may be in short supply.
- **Speak at conversational rate in a well-supported speaking voice.** Shouting into the microphone will overmodulate your signal. It produces “splatter” that wastes precious RF energy as noise that detracts from intelligibility and may interfere with adjacent signals.
- **Messages should be paced.** Read in complete phrases to improve contextual understanding. Do not repeat or interject your own comments without a specific warrant.
- **Speak across the microphone** to avoid aspirant pops and sibilance. There should be a gap of an inch or two between mouth and microphone to facilitate this condition.
- **Use standard English** and avoid “10 codes” and jargon/slang.
- **Use the standard NATO phonetic alphabet** to spell difficult or ambiguous words. Do not ad lib which will confuse the recipient and reduce intelligibility.
- **Use formal prowords** to maintain net efficiency.
- **Take notes and maintain a formal written log.** This will avoid confusion and alteration of important messages and traffic and will also provide an “audit trail” to confirm delivery or answer subsequent questions and follow on messages.
- **Station equipment should be suitable for conditions.** Use a combination of antenna and power necessary to achieve reliable communications. If mobile or portable, seek higher or clear and unobstructed ground. Generally speaking, antenna improvements produce “the most bang for the buck” as they are effective both in receiving and transmitting.
- **Have a source of backup power** appropriate to your mission parameters. This could be as simple as a supply of alkaline batteries to fit your walkie-talkie.

IV. Operating Aids

Prowords

Voice	Morse Code	Situation
Go ahead	K	Used after calling CQ, or at the end of a transmission, to indicate any station is invited to transmit.
Over	AR	Used after a call to a specific station, before the contact has been established
	KN	Used at the end of any transmission when only the specific station contacted is invited to answer.
Stand by or Wait	AS	A temporary interruption of the contact.
Roger	R	Indicates a transmission has been received correctly and in full.
Clear	SK	End of contact. SK is sent before the final identification.
Out		Leaving the air or closing the station
	CL	Indicates that a station is going off the air, and will not listen or answer any further calls. CL is sent after the final identification.

NATO/ITU Phonetic Alphabet

Character	Code word	Pronunciation
A	Alfa	AL FAH
B	Bravo	BRAH VOH
C	Charlie	CHAR LEE
D	Delta	DELL TAH
E	Echo	ECK OH
F	Foxtrot	FOKS TROT
G	Golf	GOLF
H	Hotel	HOH TELL
I	India	IN DEE AH
J	Juliett	JEW LEE ETT
K	Kilo	KEY LOH
L	Lima	LEE MAH
M	Mike	MIKE
N	November	NO VEM BER
O	Oscar	OSS CAH
P	Papa	PAH PAH
Q	Quebec	KEH BECK
R	Romeo	ROW ME OH
S	Sierra	SEE AIR RAH
T	Tango	TANG GO
U	Uniform	YOU NEE FORM
V	Victor	VIK TAH
W	Whiskey	WISS KEY
X	X-ray	ECKS RAY
Y	Yankee	YANG KEY
Z	Zulu	ZOO LOO

Digit	Code word	Pronunciation
0	Zero	ZEE-RO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOW-ER
5	Five	FIFE
6	Six	SIX
7	Seven	SEV-EN
8	Ait Eight	AIT
9	Nine	NIN-ER
100	Hundred	HUN-DRED
1000	Thousand	TOU-SAND