

# 2013 JOTA Teaching Station Guidelines

CW and Signaling, Q codes, - 30 minutes- 2 Stations

Goal: To give an introduction to Phonetic Alphabet, Morse Code, both auditory and visually (flashlights), and Q codes.

Guideline

1. Introduce the terms.
2. Introduce the hardware to use with brief discussion.
3. The Scouts should be able to recognize the terms and use them with handouts.
4. They should practice using the methods and terms using a key, flashlight and verbally as appropriate.

Background: **Morse Code** ( -- --- ••• ••• ••• ••• ••• )

## ***Phonetic Alphabet***

A number of phonetic alphabets exist. The NATO version is most common and can be considered to be the "international" phonetic alphabet.

Letter	Code word	Pronunciation
A	<b>Alfa</b>	AL FAH
B	<b>Bravo</b>	BRAH VOH
C	<b>Charlie</b>	CHAR LEE
D	<b>Delta</b>	<a href="#">DELL</a> TAH
E	<b>Echo</b>	ECK OH
F	<b>Foxtrot</b>	FOKS TROT
G	<b>Golf</b>	GOLF
H	<b>Hotel</b>	HO TELL
I	<b>India</b>	IN DEE AH

J	<b>Juliett</b>	<b>JEW LEE ETT</b>
K	<b>Kilo</b>	<b>KEY LOH</b>
L	<b>Lima</b>	<b>LEE MAH</b>
M	<b>Mike</b>	MIKE
N	<b>November</b>	NO VEM BER
O	<b>Oscar</b>	<b>OSS CAH</b>
P	<b>Papa</b>	PAH PAH
Q	<b>Quebec</b>	KEH BECK
R	<b>Romeo</b>	<b>ROW ME OH</b>
S	<b>Sierra</b>	SEE AIR RAH
T	<b>Tango</b>	<b>TANG GO</b>
U	<b>Uniform</b>	<b>YOU NEE FORM</b>
V	<b>Victor</b>	<b>VIK TAH</b>
W	<b>Whiskey</b>	<b>WISS KEY</b>
X	<b>X-ray or Xray</b>	<b>ECKS RAY</b>
Y	<b>Yankee</b>	<b>YANG KEY</b>

Z	<b>Zulu</b>	<b>ZOO LOO</b>
<b>Number</b>	<b>Code word</b>	<b>Pronunciation</b>
0	Zero	ZE RO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	<b>FOW ER</b>
5	Five	FIFE
6	Six	SIX
7	Seven	<b>SEV EN</b>
8	Eight	AIT
9	Nine	<b>NIN ER</b>

## **Morse Code**

Morse Code is named after Samuel F. B. Morse (1791-1872), a painter and founder of the National Academy of Design, who, along with Alfred Vail (1807-1859) a machinist and inventor, and the physicist Joseph Henry (1797-1878) developed [the electromagnetic](#) telegraph and the code that assigns a set of dots and dashes or [short](#) and long pulses to each letter of the English alphabet. The first working telegraph was produced in 1836. This made transmission possible over any distance. The first Morse Code message, "What hath God wrought?", was sent from Washington to Baltimore in 1844.

Today experienced operators copy received text without the need to write as they receive, and when transmitting, can easily converse at 20 to 30 words per minute. Morse Code will always remain a viable means of providing highly reliable communications during difficult communications conditions.

Morse Code can be transmitted using sound or light, as sometimes happens between ships at sea. It is used in emergencies to transmit distress signals when no other form of communication is available. The standard international distress signal is **•••---•••** (SOS)

Since December 2003, Morse Code has included the @ symbol: it is a combination of a and c: **•---••** and is the first change to the system since before World War II.

Morse code is a way to encode text through the generation of a carrier wave ([CW](#)). It is used to communicate over long distances or with low power ([QRP](#)).

You do not need to learn morse code to obtain a radio license or operate an amateur [radio station](#) anymore.

The code is composed of 5 elements:

1. short mark, dot or 'dit' (•) — one unit long
2. longer mark, dash or 'dah' (—) — three units long
3. intra-character gap (between the dots and dashes within a character) — one unit long
4. short gap (between letters) — three units long
5. medium gap (between words) — seven units long

Character	Code	Character	Code	Character	Code	Character	Code	Character	Code	Character	Code
<b>A</b>	•—	<b>J</b>	•— —	<b>S</b>	•••	<b>1</b>	•— — —	<b>.</b>	•—• —• —	<b>:</b>	— —•• •
<b>B</b>	—•• •	<b>K</b>	—• —	<b>T</b>	—	<b>2</b>	••— —	<b>,</b>	— ••— —	<b>;</b>	—• —• —•
<b>C</b>	—• —•	<b>L</b>	•—• •	<b>U</b>	••—	<b>3</b>	••• —	<b>?</b>	••— —••	<b>=</b>	—•• •—
<b>D</b>	—••	<b>M</b>	—	<b>V</b>	••• —	<b>4</b>	•••• —	<b>"</b>	•— — —•	<b>+</b>	•—• —•
<b>E</b>	•	<b>N</b>	—•	<b>W</b>	•— —	<b>5</b>	•••• •	<b>!</b>	—• —• —	<b>-</b>	—•• ••—
<b>F</b>	••— •	<b>O</b>	— —	<b>X</b>	—•• —	<b>6</b>	—•• ••	<b>/</b>	—•• —•	<b>_</b>	••— —• —

<b>G</b>	— — — ·	<b>P</b>	· — — — ·	<b>Y</b>	— · — — —	<b>7</b>	— — — · · · ·	<b>(</b>	— · — — — ·	<b>"</b>	· — · · — ·
<b>H</b>	· · · ·	<b>Q</b>	— — — · — —	<b>Z</b>	— — — · ·	<b>8</b>	— — — — · ·	<b>)</b>	— · — — — · — —	<b>\$</b>	· · · — · · —
<b>I</b>	· ·	<b>R</b>	· — ·	<b>0</b>	— — — — — — —	<b>9</b>	— — — — — — ·	<b>&amp;</b>	· — · · ·	<b>@</b>	· — — · — ·

## Q-Code

These codes were originally developed to shorten transmission times when using CW, but are frequently used in voice [transmissions](#). (eg. *I am going to go QRT, thanks for the QSO.*)

The *QRA...QUZ* code range includes phrases applicable to all services and is allocated to the International Telecommunications Union. NATO's [ACP 131\(E\)](#), COMMUNICATIONS INSTRUCTIONS - OPERATING SIGNALS, March 1997, chapter 2 contains a full list of 'Q' codes. Other 'Q' code ranges are allocated specifically to aviation or maritime services; many of those codes have fallen into disuse as voice displaces CW in commercial operation.

The Q-code was originally instituted at the Radiotelegraph Convention held in London, 1912 and was intended for marine radiotelegraph use. The codes were based on an earlier list published by the British postmaster general's office in 1908.<sup>[1]</sup> More information about the history and usage of Q-codes can be found [here](#).

### Q Codes Commonly Used by Radio Amateurs

Code	Meaning	Sample use
QRG	Exact frequency	HE TX ON QRG 14205 kHz
QRI	Tone (T in the RST code)	UR QRI IS 9
QRK	Intelligibility (R in the RST code)	UR QRK IS 5
QRL	This frequency is busy.	Used almost exclusively with morse code, usually as a question (QRL? - is this frequency busy?) before transmitting on a new frequency

<a href="#">QRM</a>	Man-made interference	ANOTHER QSO UP 2 kHz CAUSING LOT OF QRM
<a href="#">QRN</a>	Natural interference, e.g. static crashes	BAND NOISY TODAY LOT OF QRN
QRO	Increase power	NEED QRO WHEN PROP POOR
<a href="#">QRP</a>	Decrease power	QRP TO 5 W (As a mode of operation, a QRP station is five watts or less, a QRPP station one watt or less)
QRQ	Send more quickly	TIME SHORT PSE QRQ
QRR	Temporarily unavailable/away, please wait	WILL BE QRR 30 MIN = THAT STN IS QRR NW
QRRR	Land distress	A non-standard call proposed by ARRL for land-based or railroad emergency traffic in situations where response from ships at sea (which listened for SOS) was neither needed nor desired. <a href="#">[2][3]</a> Now deprecated.
<a href="#">QRS</a>	Send more slowly	PSE QRS NEW TO CW (QRS operation - a slower dot rate - is useful during weak-signal conditions; a QRSS mode uses an extremely low code rate on a channel less than 1Hz wide to allow reception under extreme QRP conditions)
QRT	Stop sending	ENJOYED TALKING 2 U = MUST QRT FER DINNER NW
QRU	Have you anything for me?	QRU? ABOUT TO QRT
QRV	I am ready	WL U BE QRV IN UPCOMING CONTEST?
QRX	Will call you again	QRX @ 1500H
QRZ	You are being called by _____.	QRZ? UR VY WEAK (Only someone who has previously called should reply)
QSA	Signal strength	UR QSA IS 5

QSB	Fading of signal	THERE IS QSB ON UR SIG
QSD	Your keying is defective	QSD CK YR TX
QSK	Break-in	I CAN HR U DURING MY SIGS PSE QSK
<a href="#">QSL</a>	I Acknowledge receipt	QSL UR LAST TX = PSE QSL VIA BURO (i.e. please send me a card confirming this contact).
QSM	Repeat last message	QRM DROWNED UR LAST MSG OUT = PSE QSM
QSN	I heard you	QSN YESTERDAY ON 7005 kHz
QSO	A conversation	TNX QSO 73
QSP	Relay	PSE QSP THIS MSG TO MY FRIEND
QST	General call to all stations	QST: QRG ALLOCS HV CHGD
QSX	I am listening on ... frequency	QSX 14200 TO 14210 kHz
<a href="#">QSY</a>	Shift to transmit on ...	LETS QSY UP 5 kHz
QTA	Disregard last message	QTA, DID NOT MEAN THAT
QTC	Traffic	STN WID EMRG QTC PSE GA
<a href="#">QTH</a>	Location	QTH IS SOUTH PARK CO
QTR	Exact time	QTR IS 2000 Z

Optional

## **RST code**

The RST code, in its original form, is intended for CW operation. On SSB, the final digit (tone) is normally omitted.

### **RST Code Commonly Used by Radio Amateurs**

<b>Number</b>	<b>R - Readability</b>	<b>S - Strength</b>	<b>T - Tone</b>
1	Unreadable	Faint signal, barely perceptible	Sixty cycle a.c or less, very rough and broad
2	Barely readable, occasional words distinguishable	Very Weak	Very rough a.c., very harsh and broad
3	Readable with considerable difficulty	Weak	Rough a.c. tone, rectified but not filtered
4	Readable with practically no difficulty	Fair	Rough note, some trace of filtering frequency
5	Perfectly readable	Fairly Good	Filtered rectified a.c. but strongly ripple-modulated
6	not used	Good	Filtered tone, definite trace of ripple modulation
7	not used	Moderately Strong	Near pure tone, trace of ripple modulation
8	not used	Strong	Near perfect tone, slight trace of modulation
9	not used	Very strong signals	Perfect tone, no trace of ripple or modulation of any kind

#### **Radio Merit Badge- 30 minute-3 Group Sessions Morning and afternoon**

Goal: To complete the RMD components.

Guideline;

1. Use PPT presentation and group discussion.
2. Provide opportunity to make contacts on any band or mode.



## **Antenna Building and Soldering**-30 minutes-2 Stations, morning and afternoon

Goal: To present the basics of antennas, their use, construction, and soldering

Guideline:

1. Why we use antennas.
2. What makes an antenna system Definition: An antenna system consists of the antenna, the feed-line, and any matching unit.
3. Where they are found
4. Why are they different sizes.
5. Help the Scouts build a ladder line antenna.
  - a. Measuring the wire
  - b. Cutting and stripping the wire
  - c. Soldering
  - d. Testing the antenna

## **Radio Direction Finding (RDF)** – 30 minutes- 2 Stations, morning and afternoon

Goal: To demonstrate and operate RDF in the context of finding a transmitter.

Overview:

Amateur radio direction finding (ARDF, also known as radio orienteering and radiosport) is an amateur racing sport that combines radio direction finding with the map and [compass](#) skills of orienteering. It is a timed race in which individual competitors use a topographic map, a magnetic compass and radio direction finding apparatus to navigate through diverse wooded terrain while searching for radio transmitters.

Guideline:

1. Talk about beacons/ transmitters used, Hikers, Airplanes, Boats EPRIBS. **Distress radio beacons**, also known as **emergency beacons**, **PLB** (Personal Locator Beacon), **ELT** (Emergency Locator Transmitter) or **EPIRB** (Emergency Position-Indicating Radio Beacon), are [tracking transmitters](#) which aid in the detection and location of [boats](#), [aircraft](#), and people in [distress](#)
2. Talk about directional antenna and how it focuses the reception.
3. Demonstrate how the antenna is swept to find the direction of the signal.
4. Scouts hands-on finding the beacon.

## **Tower Building and Emergency Antennas**- 30 minutes- 2 Stations in afternoon

Goal: To demonstrate/display Emergency antennas, tape measure, foil, wire and use of trees and towers. Balloon optional.

To construct a simple radio tower with lashing and bamboo. They may continue work on a tower.

Overview:

1. Show and discuss different types of antennas, supports and general safety.
2. Discuss types of antennas, size and height.
3. Discuss methods of getting lines into trees, launcher, weighted line.
4. Build simple tower with bamboo, twine with haul line on top with proper lashings.
  - a. The tower should have a triangular base 3 feet a side with three legs 6 feet long, to a center point with a mast 6- 10 feet above the center point.
  - b. The top of the mast should have a loop and a haul line attached.
5. If time, they can use there constructed antenna with coax for making contacts OR putting up a dipole.

## **Simulated SAR**- 1.5 hours

- 3 teams- to combine for retrieval to LZ
  - 1 (3 Scouts) for RDF
  - 1 (3 Scouts) for First Aid
  - 1 (3 Scouts) for stretcher
  - 2 Scout as team leader
- Must locate patient with RDF
- Signal CW/light signal to send First aid crew- **Patrol letter plus FA, return Patrol letter**
- Lead first aid to patient
- Perform first aid
- Signal CW/light signal to send stretcher- **Patrol letter plus LT, return Patrol letter**
- Build stretcher and all move patient (Rescue Randi) to LZ by RDF