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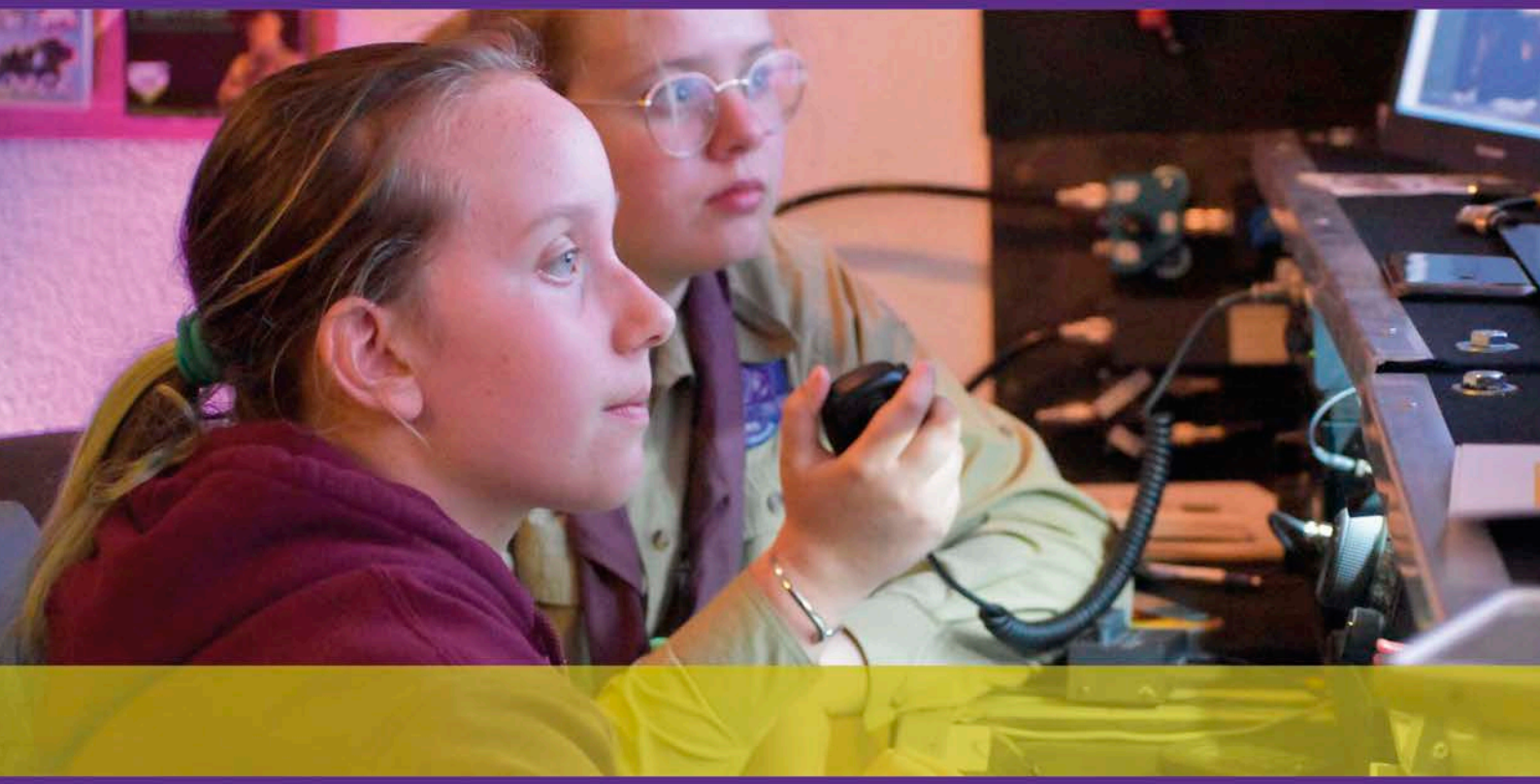

JOTA-JOTI HAM RADIO HANDBOOK

jota joti

jotajoti Jamboree

ON THE AIR - ON THE INTERNET

15-17 OCTOBER / OCTOBRE 2021

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Creating a Better World

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JOTA-JOTI

Jamboree On The Air -

Jamboree On the Internet

15 - 17 OCTOBER 2021

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What is "Ham Radio"?

Ham Radio, sometimes also called Amateur Radio, is a technology that allows two people - called ham radio operators - to communicate directly through the air.

Most of the time, when people talk about "radio," they mean broadcast radio: A station sends out a programme like music or news, and countless people listen to that same station using a receiver, it is often also just called "radio."

In ham radio, everybody can be the sender and the receiver - just like a phone call, the two sides take turns talking. While many other technologies allow this, for example, the internet or the public phone network, ham radio is unique. It does not require any network or central function to operate - the two stations exchange signals directly through the air.

There is a wide range of ham radio devices. For example, from toy radios for kids, which in most countries can be used by anyone, all the way to large stations with special licences that can send their signals halfway around the world and even up to the International Space Station.

"Ham Radio" and the people that use it is an extraordinary world, full of technology and special words that need to be learned. But all newcomers are very welcome, and all experienced ham radio operators love nothing more than introducing someone new to this exciting world. JOTA-JOTI is the perfect event to explore Ham Radio!

What is JOTA-JOTI?

A Jamboree is a large gathering of Scouts, either global or national, and traces its roots back to the early days of Scouting in the last century. The first World Scout Jamboree was held in 1920, and it still takes place every four years.

As ham radio became popular among Scouts, the idea of holding a Jamboree remotely, using ham radio: the "Jamboree on the Air" was born and first held in 1957. Later, when the internet became increasingly popular, the "Jamboree on the Internet" was created in 1995. Today, the two events have merged into a single experience called JOTA-JOTI.

JOTA-JOTI always takes place on the third weekend of October, with over 2 million Scouts participating.

In this manual, we teach and guide you as a Scout or Scout leader about participating in JOTA-JOTI using amateur radio technology: How it works, Radio operator practice, technical background, activities and ideas, rules and regulations, specific radio language, handy tools, and links.

Important: Radio regulations differ from country to country. This manual is not a replacement for local rules. We recommend that all Scouts work with a local radio amateur who has all the required licences.

The activity of radio amateurs is like driving a car; it must obey a code whose objective is to allow people to travel on the airwaves without hindrance because everyone knows the rules and follows them.

After passing an exam, one is granted the right to use an amateur radio station and talk over the air, possibly over long distances.

However, you will be able to speak on the microphone yourself under the conditions described below:

• *the station is under the effective control and in the presence of a licensed amateur radio operator;*
• *you can say your first name and a few words using the international alphabet*
• *you know how to use the CQ calling procedures and the Q (amateur radio) and J (Jamboree) code*
• *you have prepared one or two sentences or a question to ask your listener. You can use this example: https://nswjotajoti.org/pdf's/JOTA-Qesuestons-1.pdf*

JOTA-JOTI is not a competition. There are no points or time limits for contacts.
JOTA-JOTI is a fantastic event during the 3rd weekend of October. We are making and exploring old and new friendships on a weekend of experiences, connections, and communications with Scouts worldwide.

Amateur Radio Code of Conduct

The basic principles that should govern our code of conduct on the ham bands are:

- FRIENDLY, BROTHERLY SPIRIT
- TOLERANCE
- POLITENESS
- UNDERSTANDING

The Radio Amateur is:

- CONSIDERATE
- LOYAL
- PROGRESSIVE
- FRIENDLY
- BALANCED
- PATRIOTIC

For more please read: https://www.jotajoti.info/amateur-radio-code-conduct and/or Ethics and operation procedures for the Radio Amateurs (Edition 3, 2010)

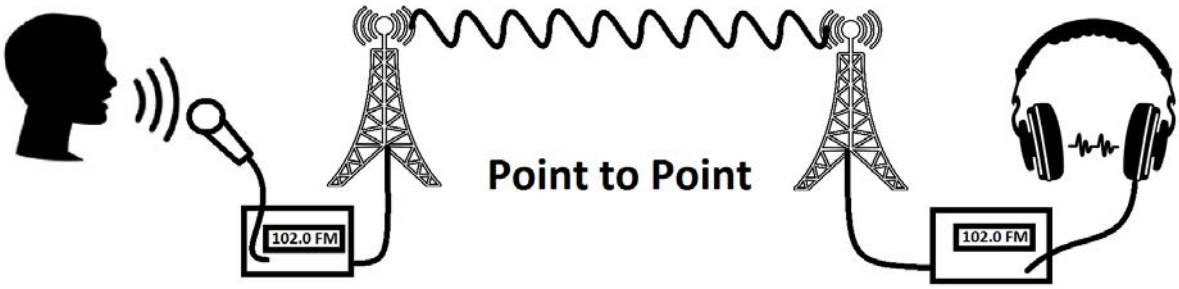
Be safe

With all of its opportunities and enriching content, using the Internet and Amateur Radio also comes with many risks, including threats to personal data, wellbeing or safety.

We strongly encourage all participants to take our Be Safe Online e-learning course to learn more about online safety and to be fully prepared for JOTA-JOTI and other online activities.
https://www.scout.org/elearning_beingsafeonline
More information can be found at
https://www.jotajoti.info/be-safe

What is Radio, and how does it work?

Radio is the technology of signalling and communicating using radio waves. A radio wave is made by a transmitter and will be received by a receiver. A radio transmitter is an electronic device that converts communication like spoken words via an antenna into electromagnetic signals. In between the Transmitter and the Receiver, there could be distortion that could affect understanding in communication. All kinds of different types of transmission on various frequencies are possible. You will be familiar with broadcast radio, eg, to listen to your favourite music in the car. The critical point is that the transmitter and the receiver have to be on the same frequency. For decoding the message, they should be in the same mode to understand the communication (for example, two different countries using one language to understand each other). They could make an appointment about how and when they planned to have a conversation by following the International regulations for Amateur Radio.



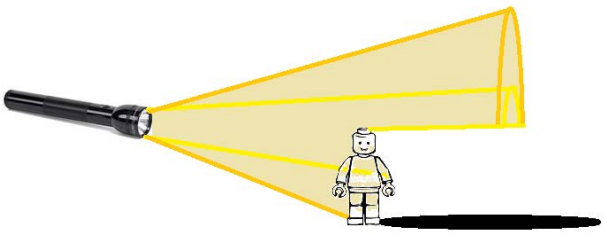
In general, the higher the transmission frequency (>50MHz), the shorter the possible receiving distance. The lower the frequency (<50MHz,) the more efficiently the transmission could travel worldwide. It is just like audio signals. If there is a music festival with a rock band in a park, the low frequency (bass) sound could be heard at a much greater distance than the higher tones.

Most common frequencies as used in radio waves by Ham Radio.
There are 2 groups: High Frequency (HF <50Mhz) or Very High Frequency, Ultra High Frequency (VHF-UHF >50Mhz). Radio waves could be compared to (visual) light. Light is also a ' frequency' but it is much higher in frequency and visible to the human eye. An antenna can be directed, like a light source (light bulb or torch). So depending on the type of antenna, radio signals can be directed in all directions or sent as a beam in one direction, just like light.

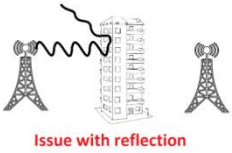
UHF VHF Radio Signals

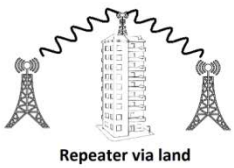
Radio transmitter

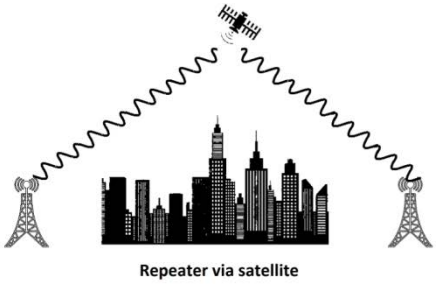
For higher frequencies from 30MHz to 300MHz (Very High-Frequency VHF), 300MHz-3GHz(UHF, Ultra High Frequency), an object could hinder clear reception of a signal. The object could "reflect" the radio signal, just like a light source. If you are using a lamp and something is standing in the middle of the beam, this will result in a "Shadow." There will be less or no light behind the object.

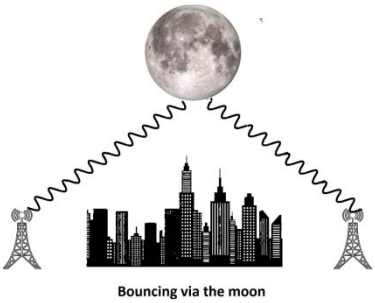


High-rise buildings, cities, or even the curvature of mother earth could be 'an issue' for UHF and VHF. Satellites, repeaters or high antenna towers can solve this issue by receiving and repeating the signal.









HF Radio signals

For lower frequencies in the HF spectrum (<30MHz), the magnetic protection shield around the earth can help reflect signals and make it possible to use these layers for really long distances. The way this protection shield helps or disrupts a radio signal is a combination of the earth's magnetic field and the magnetic transmission of the sun, just like the weather forecast. Every day or hour, conditions can differ.
To understand what is happening, if the sun produces a 'solar flare' (magnetic), the earth reacts in these layers to protect itself. We can see this solar activity, it is known as the Northern Lights (or aurora borealis). So the earth has a layer around the planet to protect us from incoming magnetic fields.

You can see the solar forecast on youtube here:
https://www.youtube.com/channel/UCkXjdDQ-db0xz8f4PKgKsag

When HF radio signals are transmitted, the transmission goes from earth to these F-Layers. The system works in reverse. The protection (F) layer around the planet reflects the signals from inside and tries to keep the signal inside these layers. So the earth is helping the HF signal travel around the world. If there is an "opening" in the F-layer reflecting the signal back to land somewhere around the world, it would be possible to receive this signal many kilometres away.

https://www.nsta.org/science-teacher/science-teacher-novemberdecember-2020/aurora-borealis

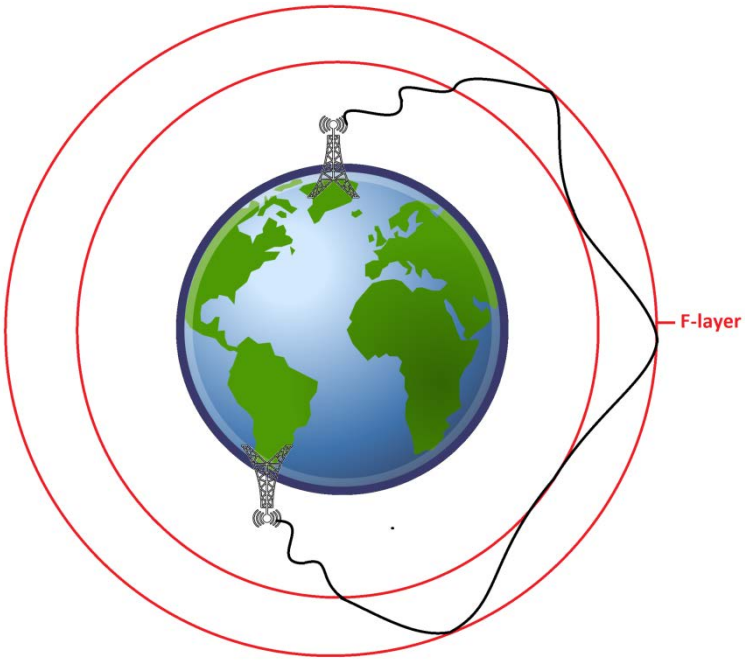


Diagram of how HF signals can travel around the world.

In JOTA-JOTI, a radio can be used to connect. In this guide, we are trying to provide some basic skills and conventions that are helpful for radio communication (during JOTA-JOTI). If you are speaking a different language, understanding could be an issue. So with amateur radio communication, we have a global tool to talk to each other.

Operator practice & code of ethics

During JOTA-JOTI, we are talking to other stations. As mentioned earlier, to use a radio transmitter, you need to have a licence or licensed amateur next to you to make the radio transmission. You cannot play music with an amateur radio licence (that requires a different licence). During the conversation, you can talk about the weather, techniques, school, your Scouting games, or talk about the JOTA-JOTI event. You cannot talk about religion or make

political statements. It is an excellent way to make friends every day around the world, sharing knowledge and the love of technology to connect with one another other!

Basic principles of transmitters and receivers

(On / Off, Volume, Frequency, Mode, Squelch, PTT)

There are radios for mobile or stationary use. There are all kinds of transceivers, and just like a car, there are many different models ranging from minivans to sports cars. They are all 'cars,' and all require the same driver's licence, but they all work a bit differently or have different buttons at different places and have specific functions for applications. But overall, they all have a steering wheel, wheels, tyres, engines, and headlights to bring you to the finish line.

The same is the case with amateur radios. There are many different types and brands. In this part, we want to show some basics of transceivers that can be used. The main difference between a transceiver and a receiver is that the transceiver can transmit (send out your message via the antenna) and receive signals. A receiver can only receive radio signals (as the name says).

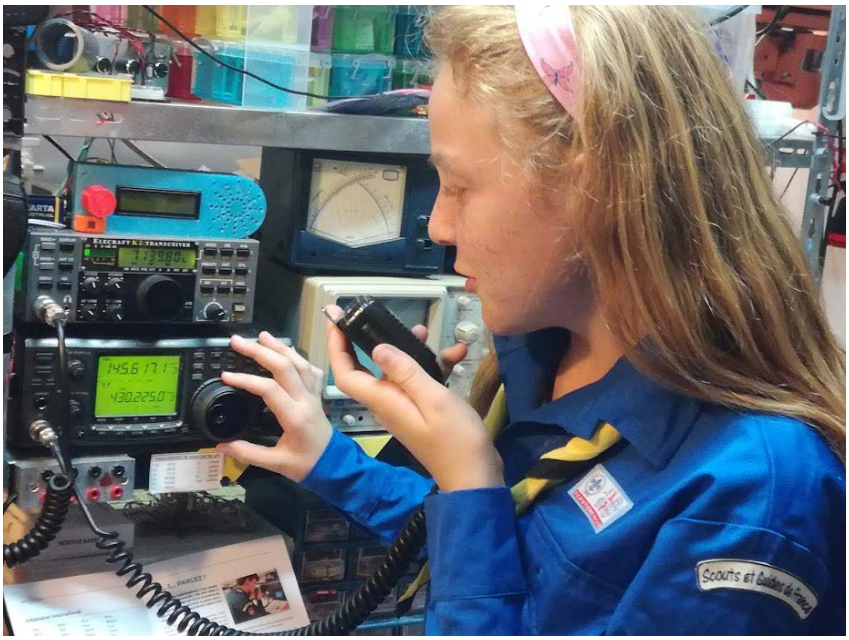
Overview of a Radio

To turn the radio on (or off), find the 'on-off' button. Be sure before powering 'on', the power supply should be connected, and the correct antenna for a specific band connected to the radio. This power ON/OFF could be a power button or a knob (volume).

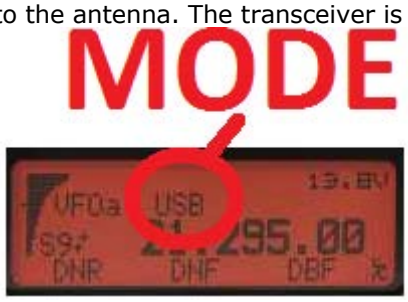
With the radio ON, before we make a connection or listen to radio signals, we need to talk about some of the functions of these devices.

On the radio's display, there could be a lot of information. Some of the essential elements are:

To 'Tune in' a frequency, you must select the same frequency as the receiving station or choose an empty frequency to start a conversation. This is usually done with the large main dial (large rotary knob).



Now you need to choose your operating mode. {MODE SELECT} This is like language. If you are talking in English and the other station is talking Russian, you can hear but not understand each other. Mode is a sort of language to transmit how the signal is being modified by the transceiver to the antenna. The transceiver is just like a big translation machine.



- FM Mode (Frequency Modulation)
- AM Mode (Amplitude Modulation)

- SSB (USB - LSB) (Upper or Lower Sideband of an AM signal)
- CW (Morse code)
- Data modes (Packet or digital modes with a computer)

There are certain main (most used) Modes for specific frequencies. They are listed for each region and frequency. Worldwide this can be found in the Ham Radio 'band plan' of (together with the maximum power allowed for transmission).

You can select a band (eg 20m - 14.190 MHz) and the { USB MODE } turn on the volume and listen to the signals. (If nothing else, you will hear noise, maybe. There is no one there, tune in to another frequency).

If you have selected a frequency and mode (matching with your antenna), you will be able to contact the other station by pushing the {PTT} button on your microphone (Push To Talk).

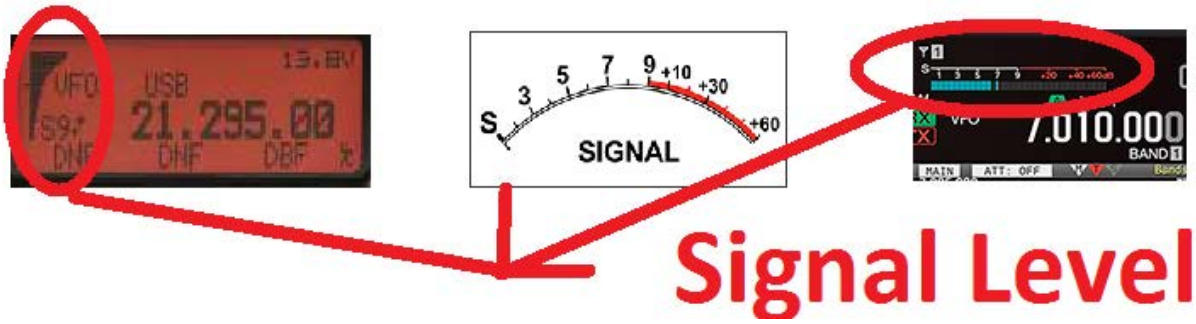
Do not be afraid of the microphone. It is ok to speak directly into it.

You have to talk close to the microphone (10cm away, but you can still see the micro in your hand); first *PUSH* the button; then TALK; otherwise the other station will not be able to hear you because the transmitter in the radio {TX} will not have been activated yet). After you are finished talking, you must release the button to listen to the other station.

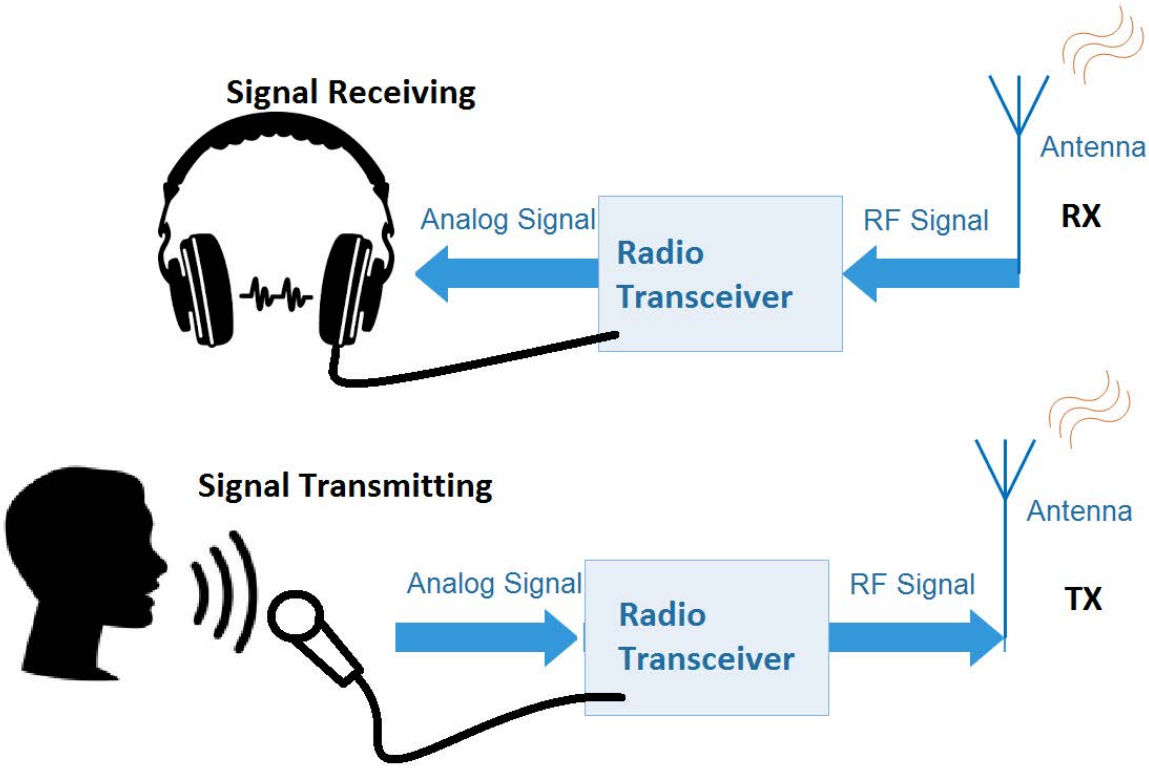
In some modes {FM} the noise can be turned off with the SQUELCH.
If a station is talking into the microphone, and our reception signal is sufficient, the squelch will automatically open the audio on the level.

An example of the USA region Band Plan for Ham Radio frequencies

Finally - To provide the other radio station a receiving report, on the radio you will find a 'VU meter' or 'level meter' in the display to give the received signal strength in 'RST'. (*More about these reporting numbers is shown on the next page of this manual)*



Because every station has a different radio and antenna and a unique distance, every signal is different. Radio operators are interested in how strongly the signals are being received.



Transmitting and receiving a signal separately from each other is called a Simplex connection. A connection like a telephone (listening and talking at the same time) is called Duplex.

With many radios nowadays you can use a wide variety of 'Filters' to make the reception or transmitting signal much easier to understand. Common filters are {CWfilter} -Bandwidth filter, {DNR} -digital noise filter and {Notch filter} -to clear unwanted audio signals like interfering tones or heavy background noise signals.

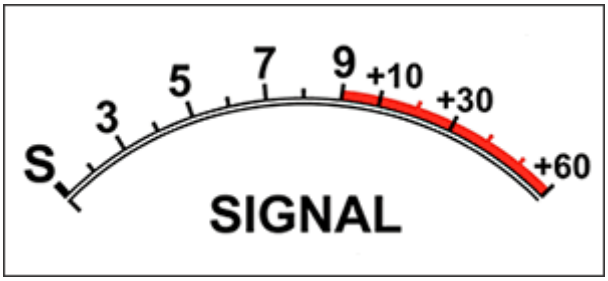
Signal Report RST

This information is used to indicate to correspondents the quality of the signals received. In their jargon, radio amateurs call it a 'Report'.

(RS for phone/ spoken words, RST for {Mode} cw)
For example, FIVE and NINE+ indicates : (R) Perfectly readable, (S) Extremely strong signals

Readability

R1 Unreadable.
R2 Barely readable, occasional words distinguishable.
R3 Readable with considerable difficulty.
R4 Readable with practically no difficulty.
R5 Perfectly readable.



Signal strength

S1 Faint, signals barely readable
S2 Very weak signals
S3 Weak signals
S4 Fair signals
S5 Fairly good signals
S6 Good signals
S7 Moderately strong signals
S8 Strong signals
S9 Extremely strong signals

Tone
T: for dial tone, is only used for Morse code and digital communications. Values go from 1 (very irregular) to 9 (crystal clear) and provide information on the quality of the sound heard.

Tl Extremely rough hissing note
T2 Very rough ac note, not musical
T3 Rough, low-pitched ac note, mod. music
T4 Rather rough ac note, mod. musical
T5 Musically modulated note
T6 Modulated note, slight trace of whistle
T7 Near dc note, smooth ripple
T8 Good dc note, just a trace of ripple
T9 Purest dc note

Now you have some basic knowledge of the techniques behind radio equipment for operating during JOTA-JOTI! Next, we will look at what we could tell the other station and how we talk to each other over our radio connection.

Of course, during JOTA-JOTI, a Scout leader or the Ham radio operator could help you make the connection to another radio station happen. Making connections with the magic of amateur radio is pretty cool!

Operator Practice

How to 'set up' a radio connection?
For a radio connection, we need the following

- An amateur radio transmitter
- an antenna
- a licence and or licensed ham radio operator to help you out.

Every radio station has its own 'call sign'. This is just like the number plate of a car. The first letters (called the prefix) show the country or the region, followed by a number. The following letters are random or could be chosen by the radio amateur station.

For example, let's look at call sign LX9S: LX stands for Luxembourg, 9 is locally regulated as a club station, and S has been chosen for Scout. So in this example, LX9S is the European station during JOTA-JOTI. , The radio operator needs to announce the station's name (call sign) at least every 5 minutes if it is active (ON AIR).

To spell your call sign name or town (QTH), the NATO phonetic alphabet is used internationally;

NATO Phonetic Alphabet

A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliett	W	Whiskey
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

***Setting up a connection by radio*: What to say.**

One of the rules is always to state your caller's code and then the code of the station you are using (you from me) at the start and end of your programme.

This is a general call for JOTA-JOTI for the Scout example station LX9S in Luxembourg, EU.

CQ Jamboree CQ Jamboree this is "LIMA X-RAY NINE SIERRA" calling and listening for any call. LX9S is calling CQ and standing by

Once an amateur station reacts-> What to say during a conversation (QSO)? -> you can have a normal conversation ;)

LX9S this is Pi4RS how do you copy?

Pi4RS this is LX9S returning (afternoon, night.....) to you.
My Name is Toni, like *TANGO OSCAR NOVEMBER INDIA*
My QTH (location) is *LUXEMBOURG, Like LIMA UNIFORM X-RAY ECHO MIKE BRAVO OSCAR UNIFORM ROMEO GOLF*
Your Signal Report (RST) is 5 and 9, Microphone back to you, Pi4RS from LX9S

The station is returning the microphone ->

LX9S this is PI4RS
Thank you for……bla bla…… Mic back to you LX9S from Pi4RS

After his reaction; this station has returned the microphone to you:

Very fine copy dear **JOHN**. We are a scout station and enjoy the **JOTA-JOTI** Weekend. The weather here is….and my age is … years. Thank you for this conversation micro back to you for the final. **PI4RS from LX9S**

The microphone is going back from you again to the other station.

LX9S this is PI4RS
Thank you for the information, hope you are enjoying the JOTA weekend. For now 73's (*Greetings*) back to you LX9S from Pi4RS

OK Fine John, Thank you for the conversation. Our QSL Card is 100% via the Bureau. Thank you for the Nice Contact and 73's to you and your family, Pi4RS from LX9S… 73's

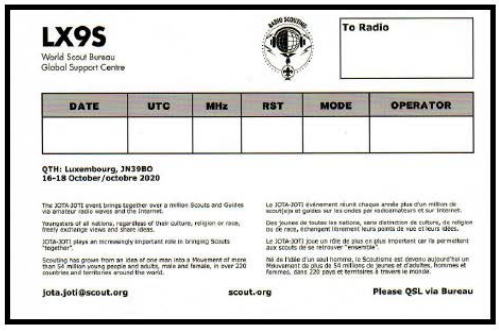
=Now, you can register the conversation in the logbook and write a "QSL" card to the station to confirm the connection you just made. And you can start all over to request any call.

CQ Jamboree CQ Jamboree this is ……

*You will find a blank sheet and logbook, in **Appendix** A at the back of this guide.*

Sending QSL cards for confirmation

After a connection with an amateur station has been made, you can send a confirmation card directly (by mail) to the QSL Bureau. All cards sent to the bureau are sorted by country and district handed over to the central organization. These cards will be handed over from person to person to save the bureau postage!



Example: QSL cards sent for Scouting-related activities and a sample QSL Card

The QSL card is to confirm that you have 'worked' the other station. A lot of radio amateurs collect these paper QSL Cards. Some of these cards are unique and designed only for an event or a special call sign. It is just like a postcard from summer camp to confirm you are there, having fun. The QSL cards are also available digitally with E-QSL or LOTW. This is a much quicker way to send your card + Confirmation.

The (paper or electronic) QSL Card should contain the information collected and shared. Such as:

-> Receiver info	*Call sign you are sending to*
-> Date	*Date of the QSO*
-> Time	*Time of the QSO*
-> Frequency	*for example 14.190Mhz or 20M*
-> Signal Report (RST)	*599*
-> Mode	*Mode of transmission (such as FM, AM, SSB)*
-> Your (operator)name	*Personal name(s)*

-> Note; If there is some space left on the card you can write a short comment or personal message such as "Thank you it was my first QSO ever!".

Amateur Radio Games on JOTA-JOTI

FoxHunt or RDF

Fox hunts are an excellent JOTA-JOTI activity though not part of the main radio activity; they are a good way of keeping younger members occupied while not on the radio. Common Foxes used are FM bugs from jaycar, or the like, but bigger and better foxes have been used in the past. Scouts could even build receivers or the fox as part of another activity.

Fox hunting is a game where a transmission signal has been hidden. The game is to search and spot the transmitter. This could be done as a 'walking' foxhunt in, for example, a park or forest during JOTA -JOTI or could be done with a larger transmission signal (a static hidden transceiver or a moving (high altitude) weather balloon) over a wider area where you need a car to reach the foxhunt hiding or landing spot.

If you do not have a foxhunting radio, you can program some MicroBit electronic devices. The range is lower (~30m), but it's cheap.

In English:
https://www.sgdf.fr/vos-ressources/doc-en-stock/category/136-radioScoutisme?download=3255:microbit-beacon-radioScouting

In French:
https://www.sgdf.fr/vos-ressources/doc-en-stock/category/136-radioScoutisme?download=3125:microbit-recherche-ta-balise

Radio activity ideas:

The JOTA-JOTI platform offers a variety of ideas that can be used for complementary activities to make the JOTA-JOTI local event more varied and exciting and help Scout/Guide leaders teach radio techniques and good communications practice.

All the activities can be performed respecting common COVID safety rules. These ideas are for both experienced radio operators and Scouts, Guides, and leaders who would like to learn more about radio communications. Most activities do not require a ham radio licence. The list of available activities is shown below; you will find their description at the JOTA-JOTI amateur radio hub.

Links to all these activities can be found at https://www.jotajoti.info/jota

Basic activities

- How to build a Morse key
- How to use a radio (CB - PMR)
- How to manage a radio communication
- How to use Zello
- Game: prisoners
- Game: battleship
- Game: maps and paths
- Game: red moose

Intermediate activities

- How to build a dipole antenna for Citizens Band (CB)
- Game: radio listening - stations from all over the world
- Game: spy story!
- Game: monument hunt
- Game: triangulation
- Game: number stations
- Game: subtone telephone game

Advanced activities

- How to build a crystal radio
- How to build a Morse transceiver
- SSTV images from space
- Call (QSO) the International Space Station via Amateur Radio
- Game: radio listening - digital modes
- Game: radio listening - naval messages
- Game: fox hunting

No young people at the station?:
If you do not have young people at your station, you can still answer JOTA-JOTI stations but advise the operator that you currently do not have any youth members, but you are happy to talk to their youth members.

Commonly used HF frequencies for Scouting events:

Bands	SSB (phone)	CW (morse)
80 m	3.690 & 3.940	3.570 MHz
40 m	7.090 & 7.190 MHz	7.030 MHz
20 m	14.290 MHz	14.060 MHz
17 m	18.140 MHz	18.080 MHz
15 m	21.360 MHz	21.140 MHz
12 m	24.960 MHz	24.910 MHz
10 m	28.390 MHz	28.180 MHz
6 m	50.160 MHz	50.160 MHz

Language in Ham Radio

Here is a short list to help you understand what Ham radio amateurs are saying:
Abbreviations
CQ: general call (addressed to all stations)
CW: Carrier wave used for Morse code
DX: distant contact (different continents)
R or Rgr: Roger - Ok
RST: Readable Signal Tone - To identify in numbers the quality of the signal as received
RX: Receive
SDR: Software Defined Radio - A receiver for (radio) signals in a Personal Computer
TNX or TKS: Thanks - this ham radio abbreviation is widely used for Morse / CW transmissions
TX: Transmit
UTC: Universal Time Coordinated is the primary time standard

Words

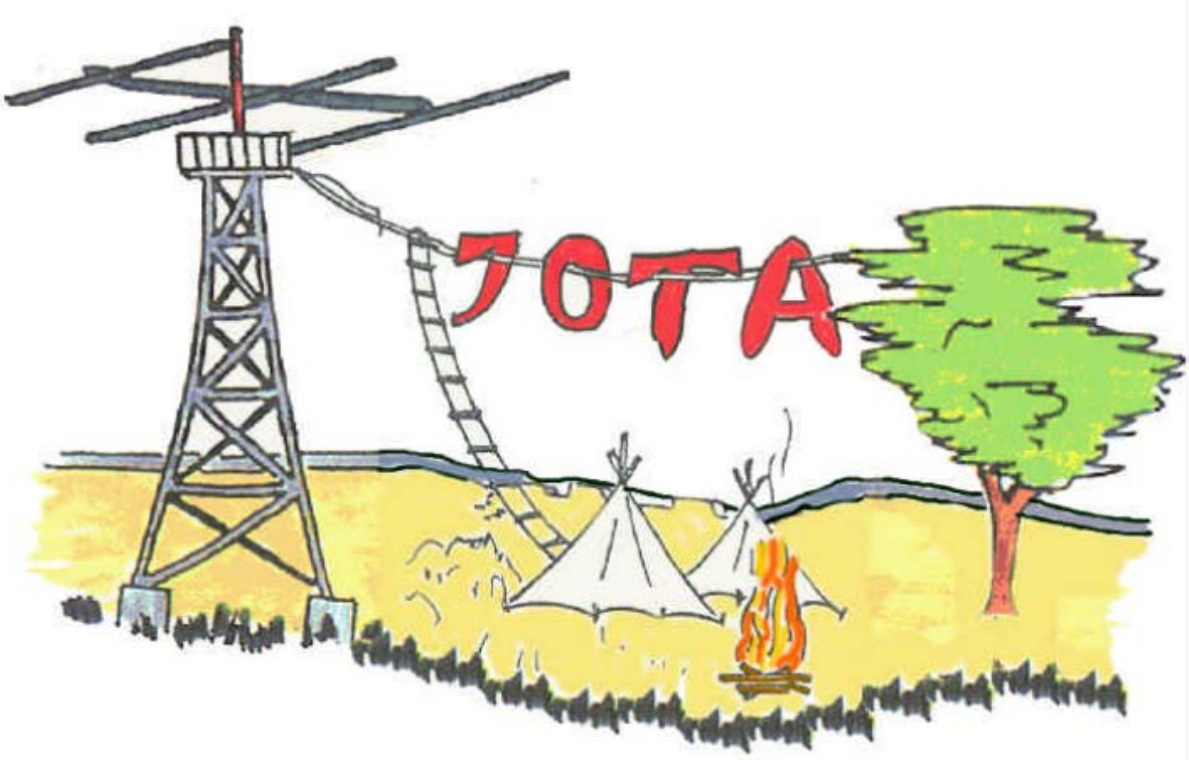
Buro: QSL by Buro - a well-established system for sending amateur radio QSL cards in bulk from amateur to amateur. It does take more time than mail, but the QSL bureau provides a much more cost-effective way of sending cards.
Call (or call sign): Registration number of a ham radio amateur or amateur organization
Contest: an event in which people compete for supremacy in ham radio.
JOTA-JOTI: Jamboree on the Air -, Jamboree on the Internet - World largest Scouting event every 3rd weekend of October.
Pile-up: accumulation of calls to a single station
QSL card: A postcard-sized card used to confirm contact or a report of a station that has been heard. These cards are often exchanged between radio hams or CB enthusiasts. They are also frequently sent out by short-wave broadcast stations to confirm a reception report.
S Meter: A Signal meter on a receiver or transceiver indicates the signal strength of incoming signals. It is normally marked in "S" units from 1 to 9.
Shack: A radio room originally a ship's radio room, but now often used to describe a radio ham's station
Squelch: A control on a receiver or transceiver used to mute or turn off the audio when no signal is present. This prevents large noise levels from being present on the output when there is nothing to be heard.
Vertical: A vertical antenna
VSWR (or SWR): Voltage standing wave ratio. A measure of the power returned from the antenna when the antenna and feeder are not correctly matched.
Yagi: A type of beam antenna. (Most television antennas are Yagis).
YOTA: Youngsters on the Air - an organization (non-Scouting) of ham radio amateurs encouraging young people to enjoy making radio contacts.

Numbers

59: Given a lot as a standard answer for signal reporting "RST" (and still asking what is your call sign))
73: "I send you my best regards."
88: "I kiss you" OR KISSES

LINK: https://www.electronics-notes.com/articles/ham_radio/abbreviations_codes/abbreviations.php

Other Links / Technical information



JOTA Originals Website

A lot of historical information about the history of JOTA dating back to 1957 can be found on https://www.jota-originals.ml/

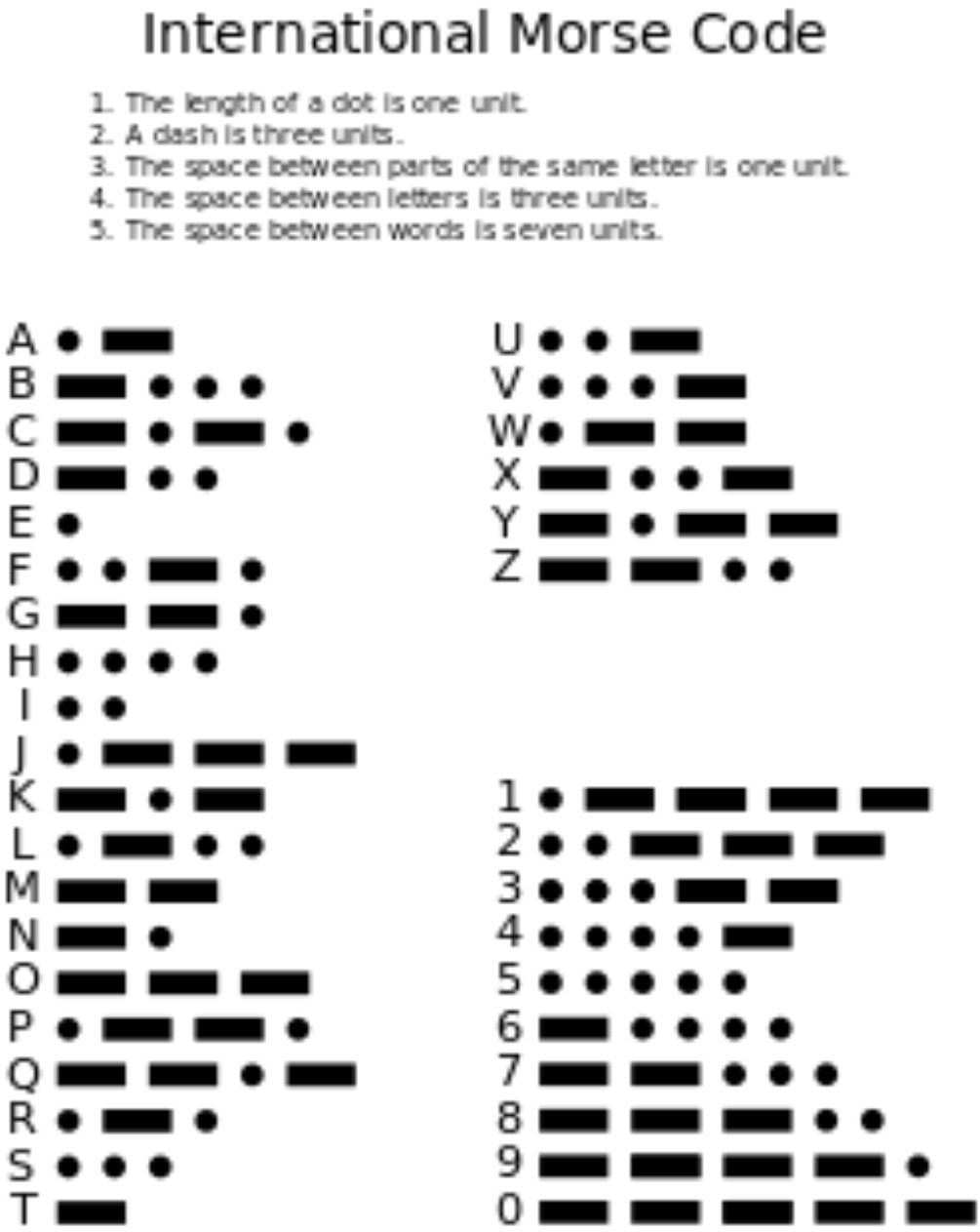
"Feel free to download them and mention this web page in your JOTA-JOTI communications to others."

NATO Alphabet

https://en.wikipedia.org/wiki/NATO_phonetic_alphabet#/media/File:FAA_Phonetic_and_Morse_Chart2.svg

CHARACTER	MORSE CODE	TELEPHONY	PHONIC (PRONUNCIATION)
A	• —	Alfa	(AL-FAH)
B	— • • •	Bravo	(BRAH-VOH)
C	— • — •	Charlie	(CHAR-LEE) or (SHAR-LEE)
D	— • •	Delta	(DELL-TAH)
E	•	Echo	(ECK-OH)
F	• • — •	Foxtrot	(FOKS-TROT)
G	— — •	Golf	(GOLF)
H	• • • •	Hotel	(HOH-TEL)
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) or (OO-NEE-FORM)
V	• • • —	Victor	(VIK-TAH)
W	• — —	Whiskey	(WISS-KEY)
X	— • • —	Xray	(ECKS-RAY)
Y	— • — —	Yankee	(YANG-KEY)
Z	— — • •	Zulu	(ZOO-LOO)
1	• — — — —	One	(WUN)
2	• • — — —	Two	(TOO)
3	• • • — —	Three	(TREE)
4	• • • • —	Four	(FOW-ER)
5	• • • • •	Five	(FIFE)
6	— • • • •	Six	(SIX)
7	— — • • •	Seven	(SEV-EN)
8	— — — • •	Eight	(AIT)
9	— — — — •	Nine	(NIN-ER)
0	— — — — —	Zero	(ZEE-RO)

Morse Code



https://en.wikipedia.org/wiki/Morse_code

Morse Specials Codes

Abbreviation	Mnemonic	code		comment
	SOS	...---...		International Emergency
K (k)		-.-		Contact, request to send
	HH	.....		issue in decoding on the receiver side(8 points)
=	BT	-...-		Separation (stop), new paragraph
+	AR	.-.-.		In message/ transmission ("over to you.") I'm waiting for a response from you
?	IMI	..--..		Not understood, Please repeat!
	VA, SK	...-.-		End of contact, I am not expecting an answer from you

J Code

Scouting has its own "short code" language. We are a worldwide organization with a considerable variety of languages. To talk to each other or give some basic information about yourself, you can use the J code.

The J-Code.

Developed by a group of National JOTA Organizers, following the idea of Dave Gemmell, NJO of South-Africa, the J-code aims to make a very basic communication possible between Scouts that have no language in common.
It is a fun way to try to link up with someone who you otherwise could not communicate with. The J-code is analogous to the Q-code often used by radio amateurs. The code can be used in radio contacts during the JOTA weekend. It is very well suited for IRC during the JOTI too.

Personal
JWN = My name is .....
JFC = I come from .... (Country)
JHO = I am ..... years old.
JWA = My address is .....
JEM = Our e-mail address is .....
JWL = The language I speak is ...
1 = English
2 = French
3 = Spanish
4 = Portugese
5 = Russian
6 = German
7.= Dutch
8 = Italian

Scouting
JCS = I am a Cub Scout
JSC = I am a Scout.
JGI = I am a Guide.
JRS = I am a Rover Scout.
JRG = I am a Ranger Guide.
JLS = I am a Scout Leader.
JWG = I belong to the Group ....
JHJ = Happy JOTA / JOTI
JSW = Best Scouting wishes to you

General
JAC = We are camping.
JWB = The weather here is ...
1 = overcast
2 = rainy
3 = very heavy rain
4 = snowy
5 = fine

In order to ask a question just add the letter "X" to the end of the particular code, e.g.:
JWN = My name is ..... JWNX = What is your name?
JHO = I am ..... years old. JHOX = How old are you?

Imagine the following exchange between a Russian Scout in Wladiwostok and his friend-to-be in Caracas, Venezuela. All words can be spelled in the international spelling alphabet:

Doswe danja, JWN Dimitri
Hola Dimitri, JWN Paco
JHJ Paco, JFC Russia, QTH Wladiwostok. JWL 5
OK Dimitri, QTH Caracas y JHO 12. JHOX
JHO 14 Paco. JSC, JAC, JWB 4
Muy bien, JSC y JWB 1. JSW Dimitri.
JSW Paco.

Looks like code to you? Well, thats exactly what it is, the J-Code. Dimitri and his friend Paco would otherwise not be able to have this basic contact. Can you? Give it a try.

From the JOTA library on www.scout.org/jota.

https://www.Scout.org/node/10137

Q code

Q-Code	Used as a Question	Used as a Statement
QRA	What is the name of your station?	My name is ...
QRB	How far approximately are you from my station?	The distance between our stations is about ... your nautical miles (or kilometers).
QRG	What is my exact frequency?	Your exact frequency is ... kHz (Or MHz).
QRK	What is the intelligibility of my signals?	The intelligibility of your signals is ... (scale of 1 to 5).
QRL	Are you busy?	I'm busy Please do not interfere.
QRM	Are you bothered by noise?	I am disturbed by interference.
QRN	Are you bothered by noise of natural origin (storms, lightning)?	I am disturbed by natural origin noise
QRO	Shall I increase transmitter power?	Increase (or increase) the transmission power.
QRP	Shall I decrease transmitter power?	Decrease the transmission power.
QRQ	Shall I send faster?	Increase the transmission speed [... Words per minute].
QRS	Shall I send more slowly?	Send more slowly [... Words per minute].
QRT	Shall I stop transmissions?	Close (or I close) transmissions.
QRV	Are you ready?	I'm ready.
QRX	When you call me again?	I'll get back at ... on ... kHz (or MHz).
QRZ	Who is calling me?	You are called by ... on ... kHz (or MHz).
QSA	What is the strength of my signals?	The strength of your signals is ... (Scale from 1 to 5).
QSB	Does my signal strength fade?	The strength of your signals varies.
QSK	Can you hear me? If so, can I interrupt you?	I hear you, speak up.
QSL	Can you receive?	Confirmed, received.
QSO	Can you communicate with ... directly or through support?	I can communicate with ... directly NOTE: It is also synonymous of direct communication or direct connection.

HAM RADIO PREP

Most commonly used Q Codes in Ham Radio

Link to the complete list of Q codes: https://hamradioprep.com/ham-radio-q-codes/

Addressing your location - The QTH locator
To address the location of the radio installation, we use a 'locator grid'. This is a series of letters and numbers around the globe like the grid on a map to provide your location or area.

Maidenhead Locator System (formerly QRA Map)

European Locator Map - Version 1

https://en.wikipedia.org/wiki/Maidenhead_Locator_System
the MAP Locator:
https://www.voacap.com/qth.html
or:
https://k7fry.com/grid/

JOTA-JOTI Dx Cluster

How do I find a JOTA-JOTI station on the amateur radio bands quickly?
Well, help is available through the JOTA-JOTI Dx Cluster (a database for radio amateurs) used during JOTA-JOTI to see exactly on which frequency a Scout station somewhere in the world is transmitting.

How does this work?
If one amateur radio station hears a Scout station on the air, it can enter the date, time, frequency, and call sign in the database. The information is immediately visible worldwide. You can also enter your transmitting frequency. Other Scout stations can use the info to tune to the published frequency and make contact.

What do you need for this?
* A computer, a packet radio terminal program, Ham net or Internet connection
* Electricity or battery pack
*An enthusiastic Scout or Guide to survey the cluster (the JOTA-JOTI contact manager)

Webpage to use:
To see:
https://www.dxwatch.com/
To add some info (Share a spot):
http://www.dxsummit.fi/#/

The map:
https://www.dxmaps.com/spots/mapg.php?Lan=E

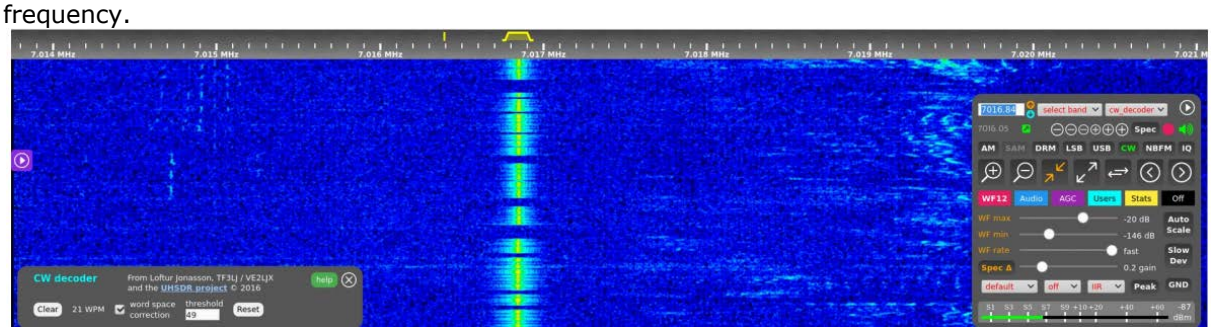
SDR and WEBSDR

Software-defined radio (SDR) is a radio made from software instead of hardware.

SDR receivers are mostly low-cost and readily available. It could be a USB Dongle (RTLSDR). There are two main (components) chips as used. For HF RT820 (band with 0 - 50mHz) and E4000 or RTL2832U for UHF-VHF (30 - 2 gHz)

Besides some hardware such as a USB dongle as a receiver, a PC with software will be needed to "decode" the received signals. Available software : HDSDR, Airspy, or KIWI SDR

KiwiSDR web SDR: this is what you see—the signal in a "waterfall display," mode, and the frequency.



With SDR, you can make the receiver online available to others (only with a PC). In the links below, you will find WebSDR receivers and receiving websites. You can listen to JOTA stations via the internet.

Try these links:
http://kiwisdr.com/public/

http://rx.linkfanel.net/

http://www.Websdr.org

Direct link to a receiver in the Netherlands: http://websdr.ewi.utwente.nl:8901/

QO-100

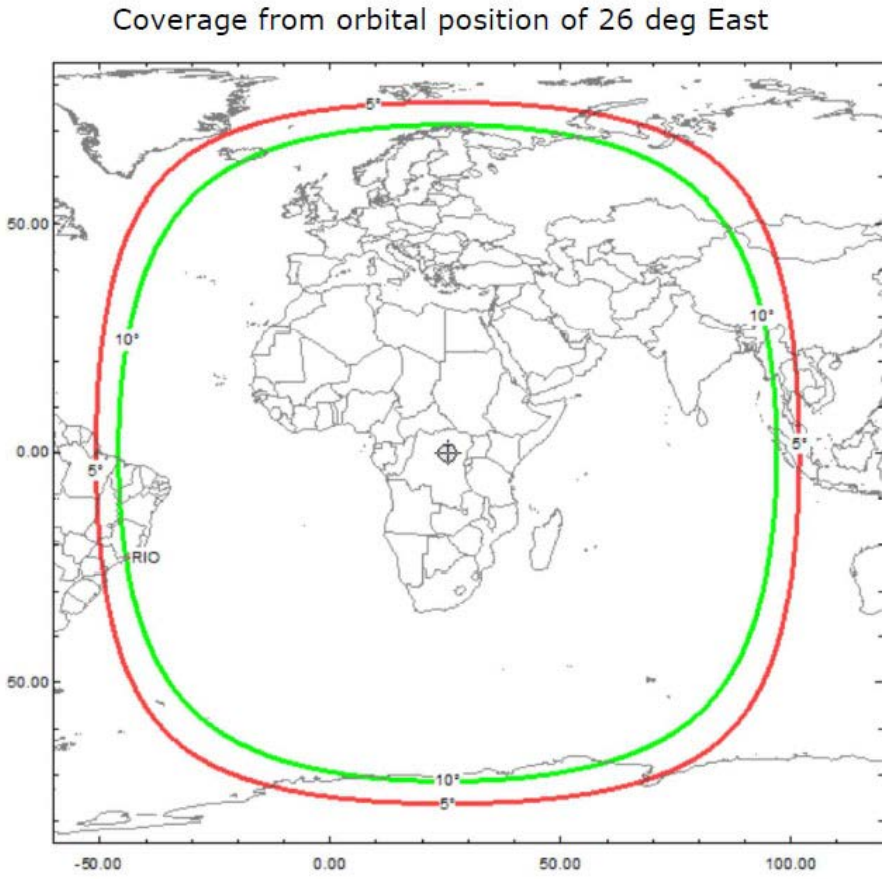
Qatar OSCAR-100 is a first geostation amateur radio transponder, a joint project between the Qatar Satellite Company (Es'hailSat), the Qatar Amateur Radio Society (QARS), and AMSAT Deutschland (AMSAT-DL), which provided the technical lead.

OSCAR-100 is hosted on Es'hail-2, a Broadcast Transponder Satellite owned by the Es'hailSat Qatar Satellite Company; the satellite is now in geostationary orbit at 25.9° E.

You can also listen to Oscar 100 satellite via web SDR.

INFO Link: https://eshail.batc.org.uk/nb/

SSB Frequency **10.489.890 RX, TX 2400.390**



DMR

Digital mobile radio (DMR) is a limited open digital mobile radio standard defined in the European Telecommunications Standards Institute (ETSI) Standard TS 102 361 parts 1–4[1] and used in commercial products around the world. DMR, along with P25 phase II and NXDN, are the main competitor technologies in achieving 6.25 kHz equivalent bandwidth using the proprietary AMBE+2 vocoder. DMR and P25 II use two-slot TDMA in a 12.5 kHz channel, while NXDN uses discrete 6.25 kHz channels using frequency division, and TETRA uses a four-slot TDMA in a 25 kHz channel.

DMR was designed with three tiers. DMR tiers I and II (conventional) were first published in 2005, and DMR III (trunked version) was published in 2012, with manufacturers producing products within a few years of each publication.

The primary goal of the standard is to specify a digital system with low complexity, low cost, and interoperability across brands, so radio communications purchasers are not locked into a proprietary solution. In practice, given the current limited scope of the DMR standard, many vendors have introduced proprietary features that make their product offerings non-interoperable with other brands.

Brandmeister

The 907 Talk Group ->will be used to let Scouts make contacts worldwide, under appropriate supervision, following individual country's guidelines.

Open 24 hours a day, 7 days a week, 365 days a year)

List of the different lounges reserved for JOTA on the Brandmeister network

TG 907 - JOTA Call, when contact is established, you will have to go to one of the chat rooms below:

TG 9071 - JOTA Room 1	TG 9072 - JOTA Room 2
TG 9073 - JOTA Room 3	TG 9074 - JOTA Room 4
TG 9075 - JOTA Room 5	TG 9076 - JOTA Room 6
TG 9077 - JOTA Room 7	TG 9078 - JOTA Room 8

TG 90737 - JOTA French	Francophone (sked tous les 3ème jeudi du mois, 20H30 Paris)
TG 90710 - JOTA German	Deutsch (jeden 4. Donnerstag im Monat, 20:30 Uhr Berlin)

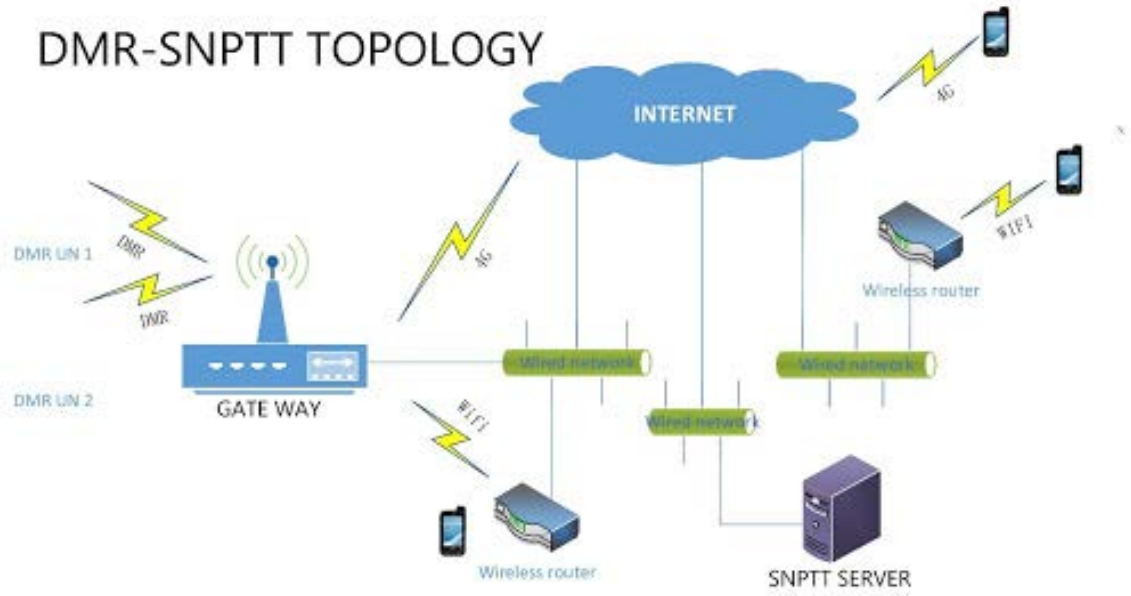
TG 235907 - JOTA United Kingdom,	in English
TG 272907 - JOTA Ireland,	In English
TG 250907 - JOTA Russia,	на русском
TG 268907 - JOTA Portugal,	em português
TG 222907 - JOTA Italy,	in Italiano
TG 204907 - JOTA The Netherlands,	In het Nederlands
TG 50297 - JOTA Malaysia,	di Malaysia
TG 50298 - JOTA Malaysia,	di Malaysia
TG 748907 - JOTA Uruguay,	en español
TG 748918 - JOTA Uruguay,	en español
TG 33457 - JOTA Mexico,	en español
TG 724907 - JOTA Brazil	em português

TG 918 - YOTA Call (Only for young radio amateurs) when contact is established, you will have to move to another TG chat room to release TG 918

FreeDMR Network Hotspot or Local Repeater TG907 & TG9071-9078

D-STAR

D-STAR (Digital Smart Technologies for Amateur Radio)



http://www.dstarinfo.com

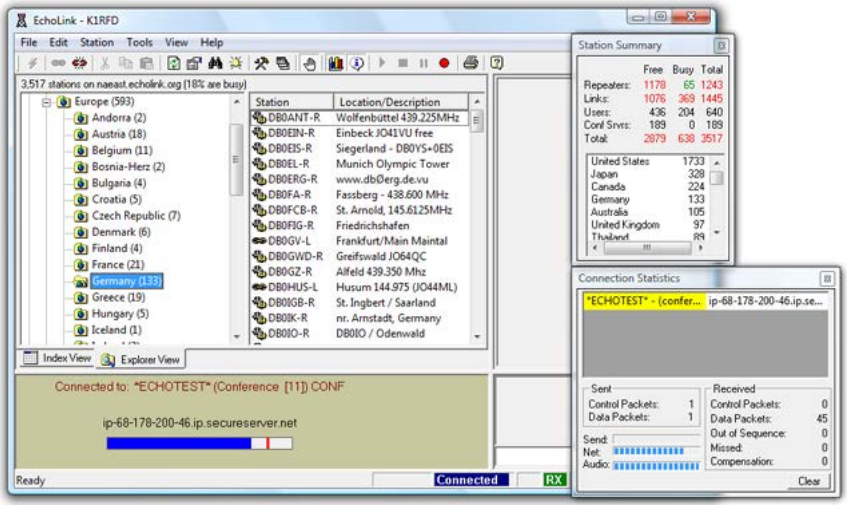
D-STAR is a digital mode that allows users to be connected through repeaters and personal hotspots.
There are two D-star reflectors for which REF33A and XLX005J can be used.
REF033A has been assigned as a full-time D-STAR JOTA / Radio Scouting reflector. Once contact is made, stations should disconnect from REF033A and connect to either repeater or migrate to an unused reflector.
https://freestar.network
XLX005J is linked to the FreeDMR TG907, which is the dedicated Radio Scouting Talkgroup.
Connect to XLX005J through your D-STAR radio or your hotspot.
On your Hotspot, set the mode to D-STAR and select DCS005 or XLX005, and then select Node J.
To monitor XLX005J Visit http://xlx005.freedmr.uk/

C4FM / fusion

Is a digital modulation technique used to transmit digital voice and data information over a radio channel. C4FM is the acronym for Continuous 4-level Frequency Modulation. Accordingly, four frequencies are used for frequency-shift keying. These are in frequency ranges such as the ultra-short wave and the decimetre wave below 1 GHz. The modulation method is used, among other things, in APCO P25 (Radio Land Mobile Communications, Project 25), a higher-level transmission network for digital authority radio for police and rescue services in North America and worldwide in amateur radio. C4FM is specified for this application by the Telecommunications Industry Association (TIA), an association of government agencies in the United States, in the ANSI / TIA-102.CAAB-C standard
ID: IT-RADIOScoutING DTFM ID: 87202 Catania Sicily Italy
ID: N2TPA-ND 271432 N2TPA Digital HudsonFloridaUSA N:28 20' 36"W:082 42' 10"Supporting International Scouting and disaster response
UK:

- Fusion Hotspot or Local Repeater FCS004, Room 27 Available 24/7
- Fusion Wires-X Hotspot or Local Repeater JOTA-365-Scouts Available 24/7

EchoLink
EchoLink is a computer-based Amateur Radio system distributed free of charge.



If you have an internet connection available at your radio station, we recommend using the EchoLink system. Its main advantage allows you to make radio contacts over considerable distances, regardless of the radio propagation conditions, using even small handheld radios. Echolink works via computers that are connected both to the internet and to an amateur radio station. By contacting one of these, your signals can go from the airwaves onto the internet and vice-versa. Suppose you are at a location that does not allow you to put up antennas or have easy access to the computer classroom in a school building. You will now have the chance to participate in JOTA from the school's PCs simply by connecting to EchoLink. There is a primary conference node on Echolink where Scout stations meet: JOTA-365.

Your radio amateur has to register with EchoLink beforehand. This takes a few days, so don't wait until the last moment to prepare your EchoLink station.

Register with www.Echolink.org before 1 October if you intend to use it for JOTA-JOTI.

Scheduled Radio Meetings: (ECHOLINK)

UK Scout Net Saturday 09:00 UK Local HF SSB LSB 3.690/7.190 +/- .QRM Band Agreed via EchoLink Net First
UK Scout Net Saturday 09:00 UK Local EchoLink EchoLink App/Software Jota-365
World Scout Net 1st Saturday of Month 22:00GMT EchoLink EchoLink App/Software Jota-365
USA Radio Scouting Net Monthly 2nd Thursday of month 9 pm Central EchoLink EchoLink App/Software Jota-365
USA Radio Scouting NEt Monthly 2nd Sunday of month 7 pm Mountain EchoLink EchoLink App/Software Jota 365

SSTV

Slow-scan television is a picture transmission method to transmit and receive static pictures via radio.

A (SDR)receiver/ transceiver is needed + software such as MMSSTV or (mobile)Droidsstv to decode the SSTV signals. Most used Mode = Scottie 2 or Martin 2

SSTV Frequencies:

80 m: 3,730 (LSB)
40 m: 7,033-7,040 (LSB)
20 m: 14,230 (USB) **(commonly used)**
17 m: 18,160 (USB)
15 m: 21,340 (USB)
10 m: 28,680 (USB)
6 m: 50,300 (USB)
2 m: 144,500 - 144,525 (FM)
70 cm: 433,700 - 433,925

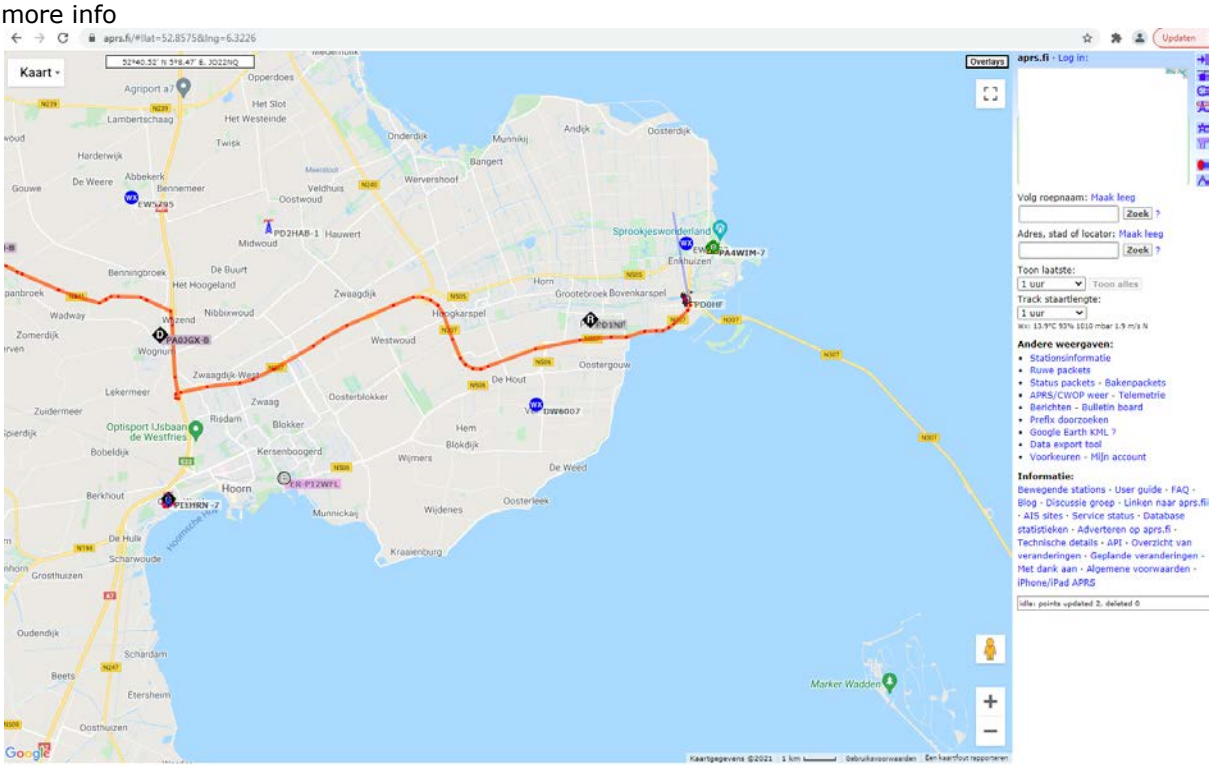
SSTV simplex repeater network 2m (EU) 144.88750

Spotting SSTV images on the internet (link) www.cqsstv.com

ARISS regularly sends SSTV images from space from the ISS.

Automated Packet Reporting System (APRS)

APRS is a method of tracking a radio station. It could be done using a mobile device with GPS. A fixed receiving/antenna system collects the location data and puts it on the internet. This is an amateur radio application like AIS for boats or ACARS for aeroplanes (used for the professional market).
APRS can be used over JOTA but has limited applications with direct JOTA activities; you may use it to show your site location, as a TXT service, and so on. It would most likely be best used as part of another activity, not in the radio shack. You can also use the APRS.fi page to show APRS information
NSW JOTA-JOTI is currently looking for an APRS Digipeater, and Igate. See the APRS page for more info



A link to a website where you can spot APRS stations. www.aprs.fi

APRS VHF frequencies
144.390 MHz — North America, Colombia, Chile, Indonesia, Malaysia, Thailand
144.575 MHz — New Zealand
144.640 MHz — Taiwan
144.660 MHz — Japan
144.800 MHz — South Africa, Europe, Russia
144.930 MHz — Argentina, Uruguay
145.175 MHz — Australia
145.570 MHz — Brazil
145.825 MHz — International Space Station
432.500 MHz — Europe (UHF)

Other related links

Smartphone software (only for ham radio): google play.
Please request an ID here in advance (it takes a little time to get a valid number)
https://www.radioid.net/
Phone communication apps:
- EchoLink https://play.google.com/store/apps/details?id=org.echolink.android
- DROID-Star https://play.google.com/store/apps/details?id=org.dudetronics.droidstar
- peanut https://play.google.com/store/apps/details?id=peanut.peanut
SSTV apps
https://play.google.com/store/apps/details?id=xdsopl.robot36
https://play.google.com/store/apps/details?id=om.sstvencoder
Ham radio call sign Search
QRZ.com app https://play.google.com/store/apps/details?id=com.qrz.database.callsign
or direct link to web address: https://www.qrz.com
Ham radio aprsdroid
https://play.google.com/store/apps/details?id=org.aprsdroid.app

Locator:
Hamgps https://play.google.com/store/apps/details?id=ea4eoz.HamGPS

Propagation :
https://play.google.com/store/apps/details?id=appinventor.ai_MzMd1494.HamSolar

Satellite:
https://play.google.com/store/apps/details?id=com.heavens_above.viewer
https://play.google.com/store/apps/details?id=com.noctuasoftware.stellarium_free
https://play.google.com/store/apps/details?id=com.runar.issdetector

Scoutlink app (JOTI chat)
https://play.google.com/store/apps/details?id=uk.org.mattford.scoutlink
https://radioscout.it/jota-joti/strumenti-jota/jota-it-echolink.html
https://radioscout.it/jota-joti/strumenti-jota/logbook.html

Internet Radio Linking Project, IRLP
https://nswjotajoti.org/IRLPinfo.html , https://nswjotajoti.org/kml/setup-irlp.kml

APPENDIX A

One of the rules is always to state your caller's code and then the code of the station you are using ("you" from "me") at the start and end of your program.

CQ Jamboree CQ Jamboree this is (*Your callsign*) …….

Calling and listening for any call. (*Your callsign*)…… Is calling CQ and standing by for any call.

Wait for a reaction from an amateur station to your call->

(Other Callsign) …….

What to say during a conversation (QSO)?

(*Other Callsign*) This is (*Your Callsign*) returning. Thank you for picking up my station call and a very good Morning/afternoon/night to you. My Name is ……, Spelling like

(NATO)……

My QTH (location) is …… ,Spelling like

(NATO)……

Your signal is (RST 5 and 9)…….. Microphone back to you, (*Other Callsign*) from (*Your Callsign*)

The station is returning the microphone ->
-> Thank you for……blah blah…….. Mic back to you.
After his reaction; the station has returned the microphone to you:

Very fine copy (*Other callsign*) …… this is (Your callsign) …… . We are a scout station and enjoy the JOTA-JOTI Weekend. The weather here is……and my age is …… years old. Thank you for this conversation microphone back to you for the final (Other callsign) …… . this is (Your callsign) …… .

Microphone is going back again to the other station.
-> For now 73's (Greetings) back to you

OK, Thank you for the conversation. Our QSL Card is 100% via the Bureau. Thank you for the Nice Contact and 73's to you and your family, (Other callsign) …… .
this is (Your callsign) …… .73's

-> 73's => END OF CONNECTION

=Now, you can register the conversation in the logbook and write a "QSL" card to the station to confirm the connection you just made. And you can start all over to request for any call.

Radio Logbook

RADIO LOGBOOK

MY STATION NAME CALLSIGN:

OPERATOR NAME(S)

QSO	DATE	TIME	FREQ	CALL	COMMENTS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
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