Operating Procedures & Practice

This series of "OP" lessons explains how Radio Amateurs should operate to:-

-follow the basic rules in BR68
-use procedures that Radio Amateurs, world-wide, have developed over the years.

Standard operating techniques are also beneficial when attempting a foreign language!

Abbreviations and "Q"codes greatly assist communication where there is no common language. This is particularly true in CW (Morse) communication.

SHORT-WAVE LISTENERS

Students, who have spent time exploring the Short-wave Bands and listened to Radio Amateurs, will be familiar with most of the procedures and abbreviations.

Being a Short-Wave Listener (SWL) is a very good "apprenticeship" to becoming a Radio Amateur. The procedures make much more sense when they are heard in use.

To SWLs these "OP" lessons will mainly be revision!

One thing is certain, once you become an actual Radio Amateur, operating practices will be second nature.....

There are three main types of radio communication.

1) Speech - via microphone
2) Morse - via Morse key or keyer (automatic or semi-automatic)
3) Digital- via keyboard on teleprinter or computer

Procedures for each of these types will be explained.

When using a microphone..

In order to start a conversation (QSO), it is necessary to make a general call (CQ) or a call to a specific station.
Before transmitting, listen carefully and select a frequency that is not already in use. Here is an example of G4EGQ calling CQ on 3.745 MHz and being answered by GW0ABC:

G4EGQ CQ, CQ, CQ, this is Golf Four Echo Golf Quebec
calling CQ 80 Metres. This is Golf Four Echo Golf Quebec,
standing-by for any call.

GW0ABC Golf Four Echo Golf Quebec, this is GW0ABC Golf
Whisky Zero Alpha Bravo Charlie, go ahead.

G4EGQ Golf Whisky Zero Alpha Bravo Charlie, this is
Golf Four Echo Golf Quebec. Thanks for your reply.
Your signal report is Five and Eight.My name is
Pete, Papa Echo Tango Echo and I am in Sandgate, 15k South West of Dover.....

And so on...the conversation would continue....
Most Amateurs give callsigns at the start and end of each transmission - but this is more than is legally necessary. It is permissible to have a "normal" conversation once both call signs have been confirmed. Callsigns need then only be given each 15 Minutes. If a third Amateur joins the QSO (conversation) then callsigns should once again be exchanged.

Nets.

If more than two Amateurs are in conversation, over the radio, it is called a net. Each Amateur should give his callsign when joining and when leaving the net. [BR68 7.1A]
Each member of a net should also identify themselves (by call sign) at least every 15 minutes. If an individual in the net does not speak for 15 minutes, he should state his callsign as soon as he speaks (transmits). As usual, this sounds complicated, but in practise Amateurs are proud of their call signs and announce themselves more often than the "legal minimum".

MOX/PTT and VOX

Most Amateurs, these days, use a radio transeiver. This is a combination of a radio transmitter and a radio receiver.
To change from listen to speak (receive to transmit) the amateur operator usually presses a button on the mocrophone. This is called "PTT" (Push To Talk) or "MOX" (Manually Operated Transmit)
Most Amateurs and other radio operators use this method.

However, some amateurs with specially designed equipment, use a mode called "VOX" (Voice Operated Transmission) in which no button is pushed. Speaking into the microphone activates the transmitter.
This is suitable to Net Operation as the transceiver restores to the receive mode between words or (more likely) sentances or other pauses in speech.
Remember, radio operation is not like normal coversation. You cannot hear and speak at the same time!
Procedures when using Morse

It is very similar to the "layout" when using a microphone.
Note the important difference between "K" and "KN" at the end of each transmission.

Here is a **typical general call - CQ**

G4EGQ CQ CQ CQ DE G4EGQ CQ CQ CQ DE G4EGQ K (or PSE K)
[DE means "from" and K means "anybody, go ahead"]

GW0ABC G4EGQ DE GW0ABC GW0ABC KN
[KN means the person called only should go ahead]

G4EGQ GW0ABC DE G4EGQ TKS FER THE CALL
RPT IS RST 479 479
NAME IS PETE PETE ES QTH IS 15K SW DOVER DOVER
HW COPY? GW0ABC DE G4EGQ KN
[TKS = Thanks; FER = for; ES = and; HW = how]
This Morse conversation would then continue.....
When it is finishing, VA would be put in place of KN to confirm completion of the QSO (chat). This indicates to other Amateurs that G4EGQ and GW0ABC are likely be free for further contacts.

Partial and Full "Break-in"
This is the Morse equivalent to VOX.
In partial break-in the transceiver would return to receive during pauses in sending. IE between sentences or even between words.
In full break-in the transceiver is in the receive mode when ever a dit or dah is not being sent. IE You can even listen in between the Morse elements!

Remember: Listen before you Speak
Obviously, you should listen on a frequency before transmitting.
But a quiet frequency is not necessarily a unused frequency!
Imagine, tuning across the 14 MHz Amateur Band, a quiet frequency is found. However, an London Amateur (100 Km away) is talking to a station in USA. Being in the skip zone the London Amateur would not be heard in Folkestone... Unless you have been monitoring that frequency for several minutes, and would have heard the USA side of the conversation, you should make a brief transmission, asking "is this frequency in use, G4EGQ?"
The USA station, while listening to the transmission from the London Amateur, would also hear this question, and would reply "Roger, frequency is in use, thank you".
This simple, polite exchange, avoids the problems of mutual interference.
The use of this technique is not restricted HF and skip zones. The highly directional aerials used in VHF and above, means that a listener may only hear one side of a conversation.
For example, imagine an Amateur near Bath talking to one in Reading on 145.55 MHz. Another Amateur in London points his VHF aerial to the West in order to call for an Amateur in Wales,
If the Amateur near Bath was talking, the London station would be aware that 145.55 MHz was in use. But if the Reading station was talking the Londoner would not be aware the frequency was in use.

When using a keyboard

An introduction to digital communications.

Keyboard communication can be divided into two types of transmission:
Telegraphy IE RTTY, AMTOR etc. This mode users either mechanical teleprinters or a computer simulation.
This uses a low speed of data over radio of 50 Bauds (bits per second.) This is about the speed of an average (non professional) typist!

Packet Radio. This is a computer to computer (over radio) form of high speed data communication. Messages are automatically broken into bursts (packets) of data at rates of hundreds or thousands of bits per second. Once an instruction (command) and a message has been typed, the computer, in conjunction with a packet modem (called TNC Terminal Node Controller!) automatically controls the radio transmitter/receivers.

General call in Teleprinter Mode

Put the radio in the transmit mode and type:
RYRYRYRYRYRYRYRYRYRYRYRYRYRYRY (This RYRY is ideal for a receiving
CQ CQ CQ CQ CQ DE G4EGQ G4EGQ K station to "tune in" to)

General Call in Packet Radio

A general call is not often used in Packet Radio, but it is possible. You would type the immediate command K then type a suitable CQ call:
cmd: K CQ CQ CQ de G4EGQ pse K
It is more common, in packet mode, to connect to a known station, rather than Calling CQ. For example to connect to a local station, G0XYZ you would simply type "C" for connect and the required callsign:

cmd: C G0XYZ [Then press the "Enter" or "Return" key]

Once a connection was achieved, the following would appear on the screen:

Connected to G0XYZ

The conversation is then commenced, using the keyboard in the normal way. The screen usually has way of displaying what you have typed in a different way to that typed from the other station.

Hello Fred, hope all is well with you>
Yes all fine Pete>
Did you read the message that I left in your mailbox, Fred?>
Yes, I saw the light was flashing on the TNC this morning so I knew a message was waiting>
....and so on
(You type ">" to invite the other person to type)
Extra bits, that could be used in any mode...

A "CQ" call can be restricted. For example CQ JA CQ JA from G4EGQ would be used when looking for a contact in Japan.
This technique can also be used when looking for a particular group of Radio Amateurs:

CQ CQ White Cliffs Net from G4EGQ

Distance extrordinaire "DX"

"DX" means long distance. When looking for any long distant contact the DX can be incorporated into the call:

CQ CQ DX CQ CQ DX from G4EGQ

The actual distance meant by long distance depends upon the Amateur Band that is being used... On 432 MHz, one hundred kilometres could be "DX", where as 500 km on 14 MHz would not be!

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[QUESTION 1]
Which of the these letter groups would be used in a general call?
a) QQ QQ QQ b) CQQ CQQ CQQ c) QCQ QCQ QCQ d) CQ CQ CQ

[QUESTION 2]
Before actually transmitting, you should -
a) ensure that the mains voltage is 240v
b) listen on the frequency
c) adjust audio volume to minimum
d) wear rubber gloves

[QUESTION 3]
When using Radio Teleprinters (RTTY) it is useful to type the following to aid receiver tuning
a) 101010101
b) YRYRYRYRYRY
c) TESTESTESTE
d) RSTRSTRSTRST

[QUESTION 4]
G3XXX is attempting to contact G4YYY using packet radio.
G3XXX should type the following, in command mode
a) K G3XXX b) C G3XXX c) Calling G4YYY d) C G4YYY

[QUESTION 5]
A Morse transmission ending in "KN" is an invitation:

a) for the holder of the call sign specified, to transmit.
b) for anyone to continue the conversation.
c) for someone know to the caller to transmit.
d) for holders of call-sign containing the letters "KN" to reply.

[QUESTION 6]
What, in the world of Amateur Radio, is a "Net".
a) A close meshed filter to catch interference.
b) A network of fine wires to form a good "earth".
c) A complicated aerial array.
d) More than two Amateurs in radio communication conversation.

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