South Bristol Amateur Radio Club
Practical Sessions

The practical sessions have to be completed and signed off by the Instructor before the exam can be sat. It is therefore imperative that all students attend at the correct times and with the correct equipment.

The practical sessions normally take around 2 evenings to complete, but this is dependent on the number of students and the availability of equipment. You will undertake the assessments with an instructor or tutor, who will sign off the achievement record required by the RSGB.

Tuning an FM and Data Signal
(Syllabus 8e.1)

This exercise is usually completed using the clubs FT736 multi-mode 2m/70cm transceiver.

You should consult the band plan for the 2m band which formed part of lesson 7. From this you should be able to identify the sections of the 2m band that is most likely to provide an FM voice signal and a data signal. As a hint packet radio is a typical data signal.

Using the channel tuning knob (rather than the larger and more obvious continuous tuning knob) adjust the frequency until an appropriate signal is received. Once a signal is located examine the signal strength meter and report the signal strength to your tutor/instructor for confirmation.

VHF QSO
(Syllabus 8e.2, 8e.5)

This exercise is also undertaken using the clubs FT-736 multi-mode transceiver, as students you are allowed to operate equipment under the supervision of other licence holders. In this case the student will operate the clubs callsign (G4WAW). The exercise can be undertaken live with a random QSO partner or through the use of a dummy load with a volunteer from the wider club membership.

In this exercise the student will initiate a CQ call on a calling channel and await a response. As explained in Lesson 7 once contact is established the conversation will move off to another clear frequency so as to leave the calling channel free for other users.

During the QSO the student should make use of the following controls: frequency, squelch and audio gain (volume).

Set out below is a typical QSO. It is not intended that this should be treated as a prescriptive script, particularly if the session is undertaken live on air, however by familiarising themselves with the contents of this script students should be able to cope with subtle variations

The student, operating the club station G4WAW, will include the sections in RED.
The responding stations sections are in BLUE.
Elements in GREEN are dependant on the people involved and the conditions prevailing and will potentially change from QSO to QSO.

G4WAW: Is this frequency in use, from G4WAW?

Wait, and if no response proceed with CQ call.

G4WAW: CQ, CQ, CQ. This is G4WAW calling CQ two metres and standing by.

Be ready to note the **callsign** of the replying station.

Stn: G4WAW, this is *[callsign]*

G4WAW: *[callsign]*, this is G4WAW returning. Can we change frequency to 145.450MHz?

Stn: G4WAW from *[callsign]*, roger QSY to 145.450MHz.

Tune to 145.450

G4WAW: *[callsign]*, this is G4WAW are you receiving? Over.

Stn: G4WAW from *[callsign]*, yes receiving. Over.

G4WAW: *[callsign]* from G4WAW. Hello, thanks for replying, I'll give you a signal report on the next over. The name here is *[students name and spell phonetically]*. Over.

Be ready to note the **operators name** of the replying station.

Stn: G4WAW from *[callsign]*. Nice to work you *[students name]*. My name is *[operators name and spell phonetically]*

G4WAW: *[callsign]* from G4WAW. OK *[operators name]* I have you readability *[1 to 5 depending]* and strength *[1 to 9 from s-meter]*. Over.

Stn: G4WAW from *[callsign]*. Thank you for the report you are readability *[1 to 5 depending]*, strength *[1 to 9 depending]*, over.

G4WAW: *[callsign]* from G4WAW. We are using an FT736 here, what's your set up? Over.

Stn: G4WAW from *[callsign]*. Set up here is *[details of rig and antenna]*, over.

G4WAW: *[callsign]* from G4WAW. Thank you *[operators name]* for the information and QSO, hope to work you again sometime, 73s until then. G4WAW clear.

Stn: This is *[callsign]* with G4WAW off and clear.

Connecting a transceiver to a power supply, antenna & feeder
(Syllabus section 8f.1)

This exercise is normally undertaken as a prelude to the dipole adjustment (Syllabus section 8f.2) set out below.

In this case the equipment usually comprises:

- The clubs small 6 Amp power supply
- A Yaesu FT-817
- An SWR meter
- An adjustable dipole which can be adjusted to be resonant on 2m

The order of connection is straight forward:

Mains → PSU → FT-817 → SWR Meter → Feeder → Dipole

However there are some niceties and safety issues that should be observed.

1. Do not plug in or turn on the mains supply until all other connections have been made and checked to be correct
2. Do not key the microphone or put the transceiver into transmit mode until the transmit power has been reduced to its minimum setting

The tutor or instructor will check all of the interconnections before the equipment is plugged in and turned on. This is for safety reasons and to ensure that there is no risk of the equipment being damaged.

Adjusting a Dipole for minimum SWR
(Syllabus section 8f.2)

Having sucessfully connected the parts of the system together you must now proceed to demonstrate, using the /2 dipole antenna with adjustable elements that the SWR varies as the length of the elements are varied.

Having demonstrated the variation you should then set up the dipole for minimum SWR, which represents the best match to the transceiver and a resonant length for the frequency in use.

NOTE: The elements of the antenna are not to be adjusted whilst transmitting even at low power. Correct procedure for a radiating test shall be demonstrated.

Tuning a SSB and Morse signal
(Syllabus section 8e.3)

This exercise is usually completed using the clubs FT840 multi-mode HF transceiver.

You should consult the band plan for the 20m band which formed part of lesson 7. From this you should be able to identify the sections of the 20m band that is most likely to provide a SSB and a Morse (telegraphy) signal.

Using the tuning knob adjust the frequency until an appropriate signal is received. Once a signal is located examine the signal strength meter and report the signal strength to your tutor/instructor for confirmation.

HF QSO
(Syllabus section 8e.4)

This exercise is also undertaken using the clubs FT-840 multi-mode transceiver, as students you are allowed to operate equipment under the supervision of other licence holders. In this case the student will operate the clubs callsign (G4WAW). The exercise can be undertaken live with a random QSO partner or through the use of a dummy load with a volunteer from the wider club membership.

During the QSO the student should make use of the following controls: frequency, RIT (clarifier), audio gain (volume), RF gain, microphone gain and antenna tuner (ATU).

Set out below is a typical QSO. It is not intended that this should be treated as a prescriptive script, particularly if the session is undertaken live on air, however by familiarising themselves with the contents of this script students should be able to cope with subtle variations

The student, operating the club station G4WAW, will include the sections in RED.
The responding stations sections are in BLUE.
Elements in GREEN are dependant on the people involved and the conditions prevailing and will potentially change from QSO to QSO.

G4WAW: Is this frequency in use, from G4WAW?

Wait and if no response proceed with CQ call

G4WAW: CQ, CQ, CQ, CQ, CQ, CQ. This is Golf Four Whisky Alpha Whisky, G4WAW, calling CQ, CQ, CQ G4WAW calling CQ and standing by.

Be ready to note the **callsign** of the replying station

Stn: G4WAW, this is *[callsign]*

G4WAW: *[callsign]* from G4WAW. Hello, thanks for replying, I'll give you a signal report on the next over. The name here is *[students name and spell phonetically]*. Over.

Be ready to note the **operators name** of the replying station

Stn: G4WAW from *[callsign]*. Nice to work you *[students name]*. My name is *[operators name and spell phonetically]*

G4WAW: *[callsign]* from G4WAW. OK *[operators name]* I have you readability *[1 to 5 depending]* and strength *[1 to 9 from s-meter]*. Over.

Stn: G4WAW from *[callsign]*. Thank you for the report you are readability *[1 to 5 depending]*, strength *[1 to 9 depending]*, over.

G4WAW: *[callsign]* from G4WAW. We are using an FT840 here, what's your set up? Over.

Stn: G4WAW from *[callsign]*. Set up here is *[details of rig and antenna]*, over.

G4WAW: *[callsign]* from G4WAW. Thank you *[operators name]* for the information and QSO, hope to work you again sometime, 73s until then. G4WAW clear.

Stn: This is *[callsign]* with G4WAW off and clear.

Morse
(Syllabus section 10a.1)

The earliest radio transmissions were Morse code, and Morse continues to have many advantages over speech and digital modes it is simple to set up a station and works well under difficult transmissions.

Originally created for Samuel F. B. Morse's electric telegraph in the early 1840s, Morse code was also extensively used for early radio communication beginning in the 1890s. For the first half of the twentieth century, the majority of high-speed international communication was conducted in Morse code, using telegraph lines, undersea cables, and radio circuits.

The most popular current use of Morse code is by amateur radio operators, although it is no longer a requirement for amateur licensing in many countries. In the professional field, pilots and air traffic controllers are usually familiar with Morse code and require a basic understanding. Navigational aids in the field of aviation, such as VORs and NDBs, constantly transmit their identity in Morse code. Morse code is designed to be read by humans without a decoding device, making it useful for sending automated digital data in voice channels. For emergency signalling, Morse code can be sent by way of improvised sources that can be easily "keyed" on and off, making Morse code one of the most versatile methods of telecommunication in existence.

Morse code has been in use for more than 160 years - longer than any other electronic encoding system. What is called Morse code today is actually somewhat different from what was originally developed by Vail and Morse. The Modern International Morse code, or continental code, was created by Friedrich Clemens Gerke in 1848 and initially used for telegraphy between Hamburg and Cuxhaven in Germany. After some minor changes, in 1865 it was standardised at the International Telegraphy congress in Paris (1865), and later made the norm by the International Telecommunication Union (ITU) as International Morse code. Morse's original code specification, largely limited to use in the United States, became known as American Morse code or "railroad code." American Morse is now very rarely used except in historical re-enactments.

International Morse code today is most popular among amateur radio operators, where it is used as the pattern to key a transmitter on and off in the radio communications mode commonly referred to as "continuous wave" or "CW". The original amateur radio operators used Morse code exclusively, as voice-capable radio transmitters did not become commonly available until around 1920. Until 2003 the International Telecommunication Union (ITU) mandated Morse code proficiency as part of the amateur radio licensing procedure worldwide. However, the World Radio-communication Conference of 2003 (WRC-03) made the Morse code requirement for amateur radio licensing optional. Many countries subsequently removed the Morse requirement from their licence requirements.

The simplicity and technical advantages of Morse remain and many amateurs continue to use and learn Morse for their own enjoyment. For this reason the Foundation Course includes an introduction to Morse, although there is no speed requirement.

For both the receiving and sending tests you will be provided with a copy of the Morse code alphabet, as shown below.

Morse Code - Character to Code

Character	Code	Character	Code	Character	Code	Character	Code
A	∘ –	J	∘ – – –	S	∘ ∘ ∘	2	∘ ∘ – – –
B	– ∘ ∘ ∘	K	– ∘ –	T	–	3	∘ ∘ ∘ – –
C	– ∘ – ∘	L	∘ – ∘ ∘	U	∘ ∘ –	4	∘ ∘ ∘ ∘ –
D	– ∘ ∘	M	– –	V	∘ ∘ ∘ –	5	∘ ∘ ∘ ∘ ∘
E	∘	N	– ∘	W	∘ – –	6	– ∘ ∘ ∘ ∘
F	∘ ∘ – ∘	O	– – –	X	– ∘ ∘ –	7	– – ∘ ∘ ∘
G	– – ∘	P	∘ – – ∘	Y	– ∘ – –	8	– – – ∘ ∘
H	∘ ∘ ∘ ∘	Q	– – ∘ –	Z	– – ∘ ∘	9	– – – – ∘
I	∘ ∘	R	∘ – ∘	1	∘ – – – –	0	– – – – –

Morse Code - Code to Character

Code	Character	Code	Character	Code	Character	Code	Character
∘	E	∘ – ∘	R	– – ∘ ∘	Z	∘ ∘ – – –	2
∘ ∘	I	∘ – ∘ ∘	L	– – ∘ –	Q	∘ ∘ ∘ – –	3
∘ ∘ ∘	S	∘ ∘ – ∘	F	– ∘ ∘	D	∘ ∘ ∘ ∘ –	4
∘ ∘ ∘ ∘	H	∘ – – ∘	P	– ∘ ∘ ∘	B	∘ ∘ ∘ ∘ ∘	5
∘ –	A	–	T	– ∘ –	K	– ∘ ∘ ∘ ∘	6
∘ ∘ –	U	– –	M	– ∘ – ∘	C	– – ∘ ∘ ∘	7
∘ ∘ ∘ –	V	– – –	O	– – –	Y	– – – ∘ ∘	8
∘ – –	W	– ∘	N	– ∘	X	– – – – ∘	9
∘ – – –	J	– – ∘	G	∘ – – – –	1	– – – – –	0

In both the receiving and sending tests only letters and numbers shall be used. Their will be no procedural or punctuation characters.

Receiving

You will be sent 20 – 30 characters by your tutor or instructor, the character speed and spacing will be chosen by the candidate in discussion with the tutor.

The candidate may write down the dots and dashes heard for subsequent transcription and may proceed one letter at a time.

The tutor may resend characters that have been wrongly recorded or invite the candidate to re-check characters that have been correctly recorded but wrongly transcribed. No residual errors are permitted.

A typical text might be:

M3ABC de M0XYZ TX Here is a kit

Sending
You will send a similar pre-prepared text to the one you received.

You are permitted to make such preparations as you wish prior to sending, including writing the message and transcribing the letters into Morse characters.

The tutor will indicate any wrongly sent characters either on a letter by letter basis or at the end of the passage. Wrongly sent characters must be correctly resent. No residual errors are permitted.