Practical Assessments

Formal practical assessments have been removed from the Foundation Syllabus, there is no reference to them in the current syllabus.

The practical assessments were originally intended to help reinforce the theoretical training that you've received as well as to prepare you for hands-on operation by allowing you to get on the air in a controlled manner.

It used to be necessary to complete these practical assessments acceptably and have them signed off by a Registered Assessor prior to taking the exam.

With the advent of the COVID pandemic, lockdowns and on-line remote invigilated examinations the requirement to complete the practical assessments has been temporarily suspended. It is unclear if or when these assessments will be reinstated or in what form. There is some suggestion that new remote compatible assessments may be introduced in the future, possibly in Syllabus 2.0. As stated, the Practical Assessments are intended to demonstrate and reinforce the theory in a "hands-on" manner. In the absence of formal practical assessments, or indeed demonstrations, the RSGB has created a set of videos showing these elements of the course which are recommended viewing.

https://youtu.be/WrX7ZmbUuXo

This document is intended to summarise the elements covered by the practical assessment and provide points of reference to help complete them. It is not a verbatim instruction sheet.

Operating

10A1 Demonstrate the ability to make a contact using a mode other than telephony. This may be either: • A data contact on-air or • Receiving and sending Morse code which need not be on-air	Data Contact. This contact must be made on-air and include as a minimum: • tuning the radio and/or the computer system to the correct frequency • selecting the correct mode • setting the radio microphone gain and/or computer audio interface to correct levels and • the two-way exchange of call sign, signal report, location. The candidate must type and send all information in real-time.

	Morse Code. Demonstrate ability to send correctly by hand, and to receive correctly by ear, text in Morse Code. The receiving and sending test shall be conducted using text from the RSGB provided booklet. The candidate may choose the character speed and spacing. The candidate will be provided with a copy of the Morse Code both in code and alphabetical sequence during the assessment. Receiving test: • The candidate may, if desired, write down the dots and dashes for subsequent transcription and proceed one letter at a time. • The tutor may resend characters if required. • Sufficient correct code must be received for the content of the message to be understood. Sending test: • The candidate is permitted to make any necessary preparations prior to sending, including writing the Morse code for each character to be sent. • The assessor will indicate which characters if any, were incorrectly sent and these shall be re-sent. This may be on a letter-by-letter basis or at the end of the exercise. • Sufficient correct code must be sent for the content of the message to be understood.

A "crib sheet" will be made available, there is no need to learn Morse Code for this assessment.

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

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

A Digital Modes QSO will require a suitable station to be set up with the assistance of the assessor and will rely on the availability of a suitably equipped QSO partner; it is potentially more logistically involved than the off-air Morse assessment.

The following exercises involve using transmitting equipment on air. Foundation students are allowed to operate under the supervision of a full licensee using the callsign of the full licensee.

All equipment is different but there are a number of controls that are common to modern transceivers that you might need to operate during either or both of the QSO exercises.

- **Power On/Off** - This may be either a separate switch or a click position on the volume control. Some modern rigs require a long press as the switch is actually a software input to the radios processor.
- **Tuning** - Usually the most dominant knob on the front panel this adjusts the transmit and receive frequency. On transceivers intended for use on channelised FM frequencies, there may be a secondary channel knob.
- **Volume (or AF gain)** - Adjusts the volume of the audio from the loudspeaker or headphones.
- **Squelch (or Muting)** - Normally only used on FM this silences the "white noise" that is audible when no signals are present. It should be adjusted to just shut off the hiss in the absence of a signal
- **Mode** - Only present on Multi-Mode transceivers this control changes the mode between AM, FM, CW, SSB and possibly digital modes
- **RIT** - Receiver Incremental Tuning, usually available in AM or SSB modes RIT allows the receiver to be tuned above or below the selected transmit frequency to bring the other station in more clearly. This should not be used when working in a net containing multiple stations who should leave RIT at 0 (no offset) and all tune to the net controller irrespective of the frequency displayed on the transceiver.
- **RF Gain** - Adjust the amount of gain in the receivers RF amplifier
- **Microphone Gain** - Adjusts the audio level of the transmitted signal but if set too high can cause distortion and interference.
- **Output Power** - This varies depending on the type of rig and the complexity of the transceiver. Most handhelds and the majority of mobiles usually implement 2 or 3 predefined power levels (low, mid, high). Other transceivers will implement this in a menu and some will have a knob on the front panel.

10A2 Demonstrate the ability to make a contact using SSB.	The contact must be made on-air and include as a minimum: • Tuning the radio to the correct frequency, or section of the band; • Selecting the correct mode; • Setting the radio microphone gain to the correct level; • Checking if the frequency is in use and make a CQ call; • Vacating the calling frequency if appropriate after establishing the initial contact; • The two-way exchange must include call sign, signal report and location; • Ending the contact • Recording all details of the contact in the log.

Note that there is no requirement for this QSO to be undertaken on HF, the only stipulation is that SSB is employed as a mode and it could, therefore, be undertaken on 6m or 2m SSB if this is easier.

Check the band plans for SSB Centres of Activity or limits of where SSB or All Modes activity occurs on the band used in the assessment.

Remember the form of the Readability/Signal Strength reports.

Remember to log using UTC.

10A3 Demonstrate the ability to make a contact using FM Simplex.	The contact must be made on-air and include as a minimum: • Setting the radio to the correct calling frequency; • Selecting the correct mode; • Correct setting of the squelch control; • Making a CQ call; • Vacating the calling frequency after establishing the initial contact; • Checking if the new (working) frequency is in use; • Establishing contact on the working frequency; • The two-way exchange must include call sign, signal report and location; • Ending the contact; • Recording all details of the contact on the log.

This is a VHF or UHF exercise since FM is rarely used below 30MHz.

Check the band plans to determine the calling frequency on the band being used in the assessment.

Remember to check that the new frequency is not in use before changing frequency and to identify your station on the new frequency.

Remember the form of the Readability/Signal Strength reports.

Remember to log using UTC.

10A4 Adjust the physical length of an antenna for lowest SWR.	Assessment to be performed using an adjustable antenna with a transmitter or transceiver and an SWR meter[1]. Alternatively, an antenna analyser displaying SWR may be used[2]. Candidate must: • Be familiar with the operation of the SWR meter available for the test. • Adjust the length of the antenna to achieve an SWR of 1 or close to it. **Note**: The antenna elements are not to be adjusted whilst transmitting. The correct procedure for a radiating test shall be demonstrated. The two halves of the antenna must be set to the same length on each test. It must be evident that the lowest SWR is achieved, for example by recording or plotting the SWR against length showing the minimum point and an increase in SWR each side of the minimum. 1. The SWR meter may be internal or external with single, twin or, crossed needle provided the SWR is clear. 2. The analyser must display SWR and may also display R and X depending on the type.

Can be undertaken at VHF using QRP power levels. Often forms a follow-on exercise after the station set-up has been completed.

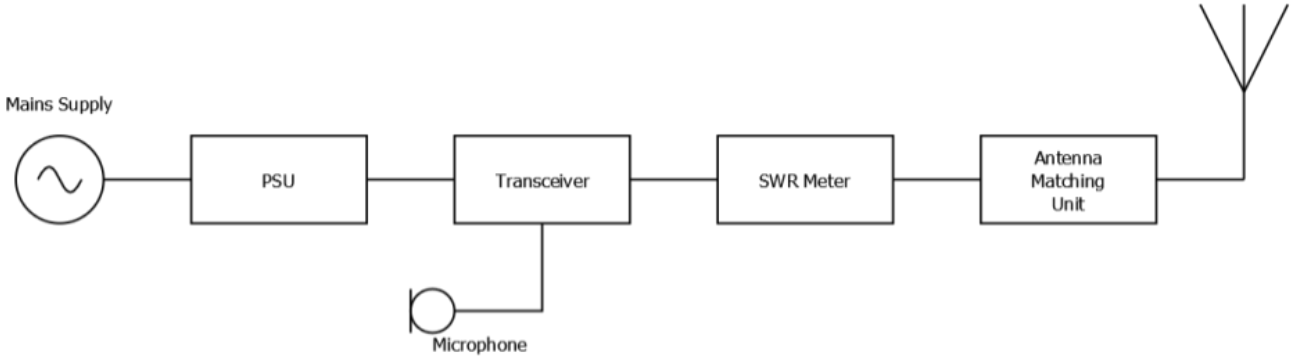
10A5 Using a manual Antenna Matching Unit (AMU or ATU)	Match an antenna system for lowest SWR on at least two bands using a transmitter or transceiver and a (manual) antenna matching unit. Note that the lowest SWR may require three components to be adjusted so that the lowest obtainable value is achieved whereas adjusting just two components will produce false minimums.

This is a typical Manual ATU, adjust the main "**inductor selector**" to maximise the received noise level, then use the "**transmitter matching**" and "**antenna matching**" knobs alternately to reduce the SWR.

Remember to tune for lowest SWR using low power settings and then once a good SWR has been achieved check at high power.

Construction

10B1 Correctly connect up a station	Connect up a station such that it is ready for on-air operation. Items to be connected will include, as a minimum: • Mains PSU • Amateur radio transmitter/receiver or transceiver • Microphone or PC interface • External item (e.g. VSWR/Power meter, AMU, filter) • Feeder and antenna. • Other accessories can be included as appropriate to local circumstances (e.g. external speaker). Correct setting up shall be demonstrated by means of a brief contact. Note: A dummy load may be used for this part of the assessment in place of an antenna if it is convenient or appropriate to do so with the 'contact' being locally arranged



Remember to check polarity on the Transceiver power connections.

Ensure that the correct plugs are mated to the correct sockets (use adapters if necessary) and if the SWR meter has multiple ranges or inputs that the correct sensor for the frequency range in use is selected before transmitting.