UK FOUNDATION AMATEUR RADIO LICENCE

Complete Study Checklist

Based on the RSGB Combined Syllabus Specification v1.6b, March 2026

Purpose of this document

This assumes no previous knowledge. It is not intended to teach every subject in full. It tells you what you need to know well enough to identify any gaps, ask questions about them, and look up the right material before taking the Foundation examination.

Exam at a glance

Questions	Pass mark	Time	Prior learning
26	**19 correct**	**60 minutes**	**None required**

The exam draws questions from eight subject areas. Measurements and construction is not examined at Foundation level.

Question weighting

Subject	Questions
Licensing conditions and station identification	6
Technical aspects	3
Transmitters and receivers	3
Feeders and antennas	3
Propagation	2
Electromagnetic compatibility	3
Operating practices and procedures	3
Safety	3

1. Licensing conditions and station identification

Learn what the amateur licence allows, what it forbids, and how a licensed station must be identified and operated.

- **Purpose of amateur radio.** Know that it is for personal self-training, experimentation and communication, not business advertising or commercial messaging.
- **Where a UK amateur licence is valid.** Learn the basic geographical limits and the rules affecting operation from ships, aircraft and outside the UK.
- **The UK licence levels and call signs.** Know what Foundation, Intermediate and Full licences are, how UK call signs are structured, and the individual Regional Secondary Locators D, E, I, J, M, U and W. Know that an RSL is mandatory for 2x-series call signs and must be used correctly when included.
- **Optional call-sign suffixes.** Know the common operating suffixes and when they may be used, including portable, mobile, alternative address and maritime mobile operation.
- **Keeping licence details current.** Know that Ofcom must be told about relevant changes and that licence details must be revalidated at the required interval.
- **Station identification.** Know when you must transmit your call sign, including after relevant changes such as frequency, mode, digital protocol, supervising operator or regional locator.
- **Supervised operation.** Understand who may use your station under direct supervision, whose call sign is used, what the supervising licensee remains responsible for, and that there are limited licence provisions for a User Service to use Radio Equipment.
- **Permitted communications.** Know that amateur transmissions are for communication with other amateur stations and understand what a net or network is. Know the special provision for passing international disaster messages on behalf of non-licensed people.
- **Receiving and transmitting restrictions.** Know the basic rules on general reception, acceptable message content, encrypted or secret messages, Morse code, and the limited situations in which encryption is permitted.
- **Interference obligations.** Understand the requirement to avoid undue interference and that Ofcom can require inspection, modification, restricted operation or closedown.
- **Station logs.** Know that Ofcom can require a log and understand the sort of operating information a log records.
- **Remote and unattended operation.** Learn the requirements for a secure control link, being able to stop transmissions promptly, and displaying the licence number where required.
- **Electromagnetic-field compliance.** Know why EMF exposure limits exist, which transmissions they apply to, the relevant power threshold, who must be protected, and when an assessment and record are required.
- **Schedule 1 of the licence.** Be able to use the supplied frequency table to find permitted amateur bands, power limits, restrictions and whether an allocation is Primary or Secondary.

2. Technical aspects

You only need basic electrical and radio theory at Foundation level, but you should be comfortable with the terms and simple calculations below.

- **Electric current.** Understand that current is the movement of electric charge, is measured in amperes (A), and requires a complete circuit.

- **Voltage or potential difference.** Understand that voltage provides the electrical push and is measured in volts (V).
- **Conductors and insulators.** Know typical examples and understand that materials which normally insulate can become conductive when wet or contaminated.
- **Series and parallel circuits.** Know that current is the same throughout a simple series circuit, while the voltage across parallel branches is the same.
- **Electrical power.** Know that power is measured in watts (W) and be able to use P = V x I to find power, voltage or current.
- **Resistance.** Know that resistance opposes current, is measured in ohms, and be able to use Ohm's law, V = I x R.
- **Simple resistor circuits.** Understand that voltages across series resistors add to the supply voltage and that branch currents in a parallel circuit add to the total current.
- **Polarity.** Understand why some equipment, components and batteries must be connected with the correct positive and negative polarity.
- **Direct current and alternating current.** Know the difference between DC and AC and recognise a basic sine-wave representation of AC.
- **Frequency.** Know that frequency is measured in hertz and understand the prefixes Hz, kHz, MHz and GHz.
- **Useful frequency ranges.** Know UK mains frequency is 50 Hz, normal hearing is roughly 20 Hz to 15 kHz, communications audio is roughly 300 Hz to 3 kHz, HF is 3 to 30 MHz, VHF is 30 to 300 MHz and UHF is 300 to 3000 MHz. Know the meanings of AF and RF.
- **Frequency and wavelength.** Understand that wavelength becomes shorter as frequency increases, and vice versa.
- **Analogue and digital signals.** Understand the basic difference between a continuously varying analogue signal and a digitally represented signal.
- **Cells and batteries.** Know the difference between a cell and a battery, that cells convert chemical energy into electrical energy, and that rechargeable cells reverse part of that chemical process during charging.
- **Battery disposal.** Know that unwanted batteries must be disposed of using appropriate recycling or disposal routes.

3. Transmitters and receivers

Learn the basic signal path through a radio and what the common amateur modes do to the radio-frequency carrier.

- **What a transmitter does.** Understand that it produces radio-frequency energy and adds information to it by modulation.
- **Carrier and modulation.** Know the idea of a carrier and how voice, audio tones or data can be placed onto it.
- **AM, FM and SSB.** Know that amplitude modulation varies amplitude, frequency modulation varies frequency, and single sideband transmits only one sideband of an amplitude-modulated signal.
- **CW and data.** Recognise CW as keyed carrier operation and understand that digital data may be sent using audio tones or software-generated signals.
- **Sidebands.** Know that modulation creates sidebands and recognise the basic relationship between an AM carrier, its two sidebands and SSB.
- **Waveforms.** Be able to recognise simple diagrams of an audio waveform, an RF carrier, AM, FM and CW.

- **Basic transmitter blocks.** Know the order and purpose of microphone, audio amplifier, frequency generation, modulator, RF power amplifier, feeder and antenna.
- **Frequency setting.** Understand that the oscillator or frequency-generation stage determines the transmit frequency and that an incorrect setting can put a signal outside the amateur band.
- **Microphone gain.** Know why microphone gain must be set correctly and what excessive input can do to transmitted audio.
- **RF power amplifier and load.** Know that the final amplifier raises the RF power and must see a suitable load through the feeder and antenna system.
- **Over-modulation and excessive deviation.** Understand that these cause distortion and can interfere with adjacent frequencies.
- **What a receiver does.** Understand that it selects a wanted radio signal and demodulates it to recover the original information.
- **Basic receiver blocks.** Know the order and purpose of antenna, feeder, signal selection/RF amplification, detector or demodulator, audio amplifier and speaker or headphones.
- **Software-defined radio.** Understand the basic idea that an SDR converts signals into digital form and uses software for selection, filtering, modulation or demodulation.

4. Feeders and antennas

Know how RF gets from the radio to the antenna, how common antennas behave, and what happens when the system is badly matched.

- **Feeders.** Recognise coaxial cable and twin feeder, and know that coax is commonly used because its screening helps contain RF.
- **Balanced and unbalanced systems.** Know that twin feeder is balanced, coax is unbalanced, and a balun may be needed between a balanced antenna such as a dipole and coax.
- **Feeder loss.** Understand that some RF is lost as heat, that longer cable means more loss, and that loss generally becomes more important as frequency rises.
- **What an antenna does.** Understand that an antenna converts electrical RF energy into electromagnetic waves when transmitting and does the reverse when receiving.
- **Polarisation.** Know the difference between horizontal and vertical polarisation and why matching polarisation matters particularly at VHF and UHF.
- **Radiation patterns.** Understand that antennas do not always radiate equally in every direction. Recognise the basic patterns of a half-wave dipole and a directional Yagi.
- **Omnidirectional antennas.** Know that common vertical antennas such as a vertical dipole, quarter-wave ground plane and 5/8-wave vertical radiate broadly around the antenna.
- **Antenna gain.** Understand that gain concentrates energy in particular directions and is commonly expressed in decibels (dB).
- **ERP and EIRP.** Know what Effective Radiated Power and Equivalent Isotropically Radiated Power mean at a basic level, that 10 W EIRP is approximately 6.1 W ERP, and be able to use simple supplied gain information in straightforward calculations.
- **Common antenna types.** Be able to recognise a half-wave dipole, quarter-wave ground-plane antenna, Yagi, end-fed wire and 5/8-wave vertical.
- **Antenna size.** Understand that the physical size of a resonant antenna is related to wavelength, and that a half-wave dipole is approximately half a wavelength long.

- **Feed-point impedance and matching.** Understand that a good match allows power to transfer efficiently and that a mismatch causes some power to be reflected.
- **SWR.** Know what Standing Wave Ratio indicates, how an SWR meter is used, and why a high SWR can indicate an antenna or feeder problem and can stress a transmitter.
- **ATU or AMU.** Know that an antenna tuning or matching unit can transform the impedance presented to the transmitter so that it sees a suitable match.
- **RF connectors.** Be able to recognise common connector families such as BNC, N, SMA and PL-259, and understand the need for correct termination of coaxial cable.

5. Radio propagation

Propagation is simply how radio waves travel from one place to another. Learn the main mechanisms that matter at HF, VHF and UHF.

- **Basic wave travel.** Know that radio waves normally travel in straight lines but can be reflected, refracted and diffracted, and become weaker as they spread.
- **The ionosphere.** Know that it is a region of ionised gas roughly 70 to 400 km above the Earth and that ultraviolet radiation from the Sun is a major cause of ionisation.
- **HF skywave propagation.** Understand that the ionosphere can refract HF signals back towards Earth and allow communication far beyond line of sight.
- **Changing HF conditions.** Know that usable propagation varies with frequency, time of day, season and solar activity, and understand what operators mean when they say a band is open.
- **VHF and UHF propagation.** Understand that these frequencies usually pass through the ionosphere and are mainly used over line-of-sight or tropospheric paths.
- **Terrain and buildings.** Know that hills can create radio shadows and buildings can weaken or obstruct signals.
- **Extended VHF/UHF range.** Be aware that Sporadic E and atmospheric ducting can occasionally carry signals much farther than normal.
- **Weather attenuation.** Know that heavy rain, snow or hail can increasingly attenuate signals at UHF and higher frequencies.
- **Improving VHF/UHF range.** Understand the importance of antenna height, gain and a clear path. Raising an antenna can often help more than simply increasing transmitter power.

6. Electromagnetic compatibility (EMC)

EMC is about making radio equipment and other electronic equipment coexist without causing or suffering unacceptable interference.

- **Meaning of EMC.** Understand the difference between causing interference and a device having poor immunity to strong RF fields.
- **Common interference problems.** Know that amateur transmissions can affect nearby radios, televisions, audio equipment, telephones and other electronics.
- **Power and mode.** Understand that increasing transmitter power generally increases the chance of interference and that AM and SSB are generally more likely to cause or reveal EMC problems than FM and some narrow digital modes.

- **How RF gets into equipment.** Know that unwanted RF can enter through mains wiring, antenna leads, telephone wiring and other connected cables, or be picked up directly by internal circuitry.
- **Chokes and filters.** Understand that suitable ferrite chokes and filters can reduce unwanted RF currents and are normally most effective close to the affected equipment.
- **Dummy loads.** Know that a dummy load is a screened load of the correct impedance and power rating that lets a transmitter operate without intentionally radiating a radio signal.
- **Using a dummy load for diagnosis.** Understand how it can help determine whether interference is being radiated from the antenna system or conducted through cables and wiring.
- **Station layout and antenna choice.** Know that keeping antennas well away from houses where possible, mounting them high, and using balanced antenna systems can reduce EMC problems. At HF, understand why a balanced horizontal dipole can be less troublesome than some end-fed wire arrangements.
- **RF earth.** Understand the basic purpose of an RF earth as a path for unwanted RF currents, while remembering that it is not a substitute for electrical safety earthing.
- **Vehicle installations.** Know that radio equipment must be installed so it does not interfere with vehicle electronics or safety systems and that professional advice may be needed.
- **Vehicle-generated interference.** Be aware that ignition, charging systems and other electronics can create noise in a mobile receiver.
- **Testing a vehicle installation.** Know that initial checks should be carried out while stationary with relevant vehicle systems operating before using the equipment on the road.
- **Interference disputes.** Understand the value of keeping accurate logs, cooperating with neighbours during tests, using RSGB guidance, and knowing that Ofcom has a regulatory role.

7. Operating practices and procedures

Learn how amateur operators share spectrum efficiently and how to make, maintain and record a contact.

- **Listen before transmitting.** Always establish that a frequency is free and know how to ask whether it is in use.
- **Calling CQ.** Know the normal structure of a CQ call on SSB and FM and how to identify yourself correctly.
- **Calling channels.** Understand that VHF and UHF calling channels are for making initial contact and that an established contact should normally move to another suitable frequency.
- **Centres of Activity.** Know what these are and how band plans use them to encourage similar modes or activities to gather in suitable parts of a band.
- **Operating suffixes.** Know the meanings and appropriate use of suffixes such as /A, /P, /M and /MM.
- **Phonetic alphabet.** Know the standard international phonetic alphabet well enough to spell call signs and other important information clearly.
- **Logging.** Know the useful information to record, including date, time in UTC, frequency or band, mode and the other station's call sign.
- **Acceptable content.** Know that music, broadcasting-type content, offensive language and threatening transmissions are not acceptable amateur operating practice.
- **Test transmissions.** Know how to make tests while minimising interference and why the station should be checked for unwanted emissions or other problems.
- **Band plans.** Be able to use the supplied band-plan information to locate calling frequencies, recommended modes and areas reserved for particular activities.

- **Mode conventions.** Know the usual convention of lower sideband on lower HF bands and upper sideband at higher HF frequencies, and recognise that CW and data are narrow modes.
- **Amateur spectrum.** Know the broad HF, VHF and UHF regions and understand that some amateur allocations are shared with, or adjacent to, other radio services.
- **Repeaters.** Understand why repeaters are used, transmit/receive frequency offsets, CTCSS access tones, time-out or reset behaviour, and why simplex operation should avoid repeater channels.
- **Digital voice.** Know that apparently quiet frequencies may still be in use by modes your radio is not decoding, so reasonable checks should be made before transmitting.
- **Microphones and accessories.** Understand that non-original microphones or interfaces must have compatible PTT wiring and suitable audio levels.
- **Signal reports.** Know the RST system and the order Readability, Strength and Tone.
- **Digital voice and digital data compatibility.** Understand that stations need compatible standards, equipment and settings, and that a borrowed digital radio may contain another operator's stored call sign.
- **Amateur satellites.** Know that amateur satellites use specific amateur allocations and that terrestrial stations should avoid transmitting on frequencies intended for satellite operation.
- **Operating abroad.** Know that a UK Foundation licence is not routinely recognised for reciprocal operation in other countries and that separate permission may be required.

8. Safety

Foundation safety questions cover electricity, batteries, tools, antennas, RF exposure, lightning and temporary or portable stations.

- **High voltage and high current.** Know that high voltage can cause electric shock and high current can cause overheating and fire.
- **Safety earth.** Know that an equipment safety earth must not be removed and that changes to mains earthing arrangements require competent professional advice.
- **Wiring a UK 3-pin plug.** Know the live, neutral and earth conductors, their colours and the correct terminals, including the fuse in the live side.
- **Fuses.** Understand that a fuse protects against excessive current, must have an appropriate rating, and that the cause of a blown fuse should be investigated rather than simply replacing it repeatedly.
- **RCBO protection.** Understand that an RCBO provides protection against earth-leakage faults as well as overcurrent and offers protection a conventional fuse alone does not provide.
- **Working on equipment.** Know that power sources should be disconnected before opening or servicing equipment and that manufacturer instructions should be followed.
- **Emergency isolation.** Know where the master switch is and that power should be isolated before touching a casualty involved in an electrical accident.
- **Battery hazards.** Understand short-circuit current, correct charging, the need to use the right charger for the battery chemistry, and the fire or explosion risk of mistreated lithium batteries.
- **Tool safety.** Know that tools and power tools can cause injury and that eye protection should be used where particles, solder or flux may be thrown towards the eyes.
- **Soldering safety.** Know the need for an iron stand, eye protection and good ventilation.
- **Antenna erection.** Understand that erecting antennas can be hazardous, that suitable help should be present, and that masts, wires and antennas must be securely located.

- **Ladder safety.** Know the 4:1 height-to-base rule, secure the ladder, avoid overreaching, use appropriate methods to carry tools and protect people below from falling objects.
- **RF exposure.** Know that strong RF fields can heat body tissue, with the eyes being particularly susceptible, and understand why exposure limits and compliance distances exist.
- **RF safety guidance.** Know that official guidance is available from bodies including the UK Health Security Agency and ICNIRP.
- **Microwave and high-gain antennas.** Know what a waveguide is and why you should not look into an active microwave waveguide or stand in front of a transmitting high-gain antenna.
- **Touching antennas while transmitting.** Know that antenna elements and RF-carrying conductors should not be touched while transmitting and should be positioned to prevent accidental contact.
- **Lightning.** Know that tall antennas may need specialist lightning protection and that professional or local-authority advice may be appropriate.
- **Overhead power lines.** Know that antennas, masts, ladders and feeders must be kept well clear of overhead electricity cables because contact or arcing can be fatal.
- **Trailing cables.** Understand trip hazards and the risk of damaged or frayed insulation.
- **Headphones.** Know that excessive listening volume can damage hearing.
- **Temporary and outdoor operation.** Know the added risks from damp ground, temporary mains supplies, trailing cables and outdoor equipment. Understand the need for risk assessment, suitable cable protection, correct fusing and RCBO protection.
- **General responsibility.** Understand that everyone at a station has a responsibility to notice, warn about and report unsafe conditions, including when visitors are present.

9. Maths, symbols and reference material

These skills support questions across the syllabus rather than forming a separate Foundation exam section.

- **Be comfortable with addition, subtraction, multiplication and division.**
- **Work with simple fractions and decimal numbers.**
- Know the common metric prefixes from micro through milli, kilo, mega and giga, and convert simple values between them.
- Recognise powers of ten used for common radio quantities, particularly 10^-3 through 10^9.
- **Use and rearrange very simple equations such as P = V x I and V = I x R.**
- Recognise the basic circuit symbols and block-diagram conventions that appear in the Foundation reference material.
- Use the Foundation exam reference booklet, Schedule 1 extracts, band plans, graphs and simple tables supplied with questions rather than trying to memorise every frequency or allocation.

When you are ready for the exam

- You can explain every term in this document in plain English without relying on guesswork.
- **You can use P = V x I and V = I x R for simple calculations.**
- You can identify the main transmitter, receiver, feeder and antenna concepts from simple diagrams.
- You can use a band plan and the Foundation licence frequency schedule to find information rather than memorising the whole document.

- You can complete the current RSGB Foundation mock papers and understand why your incorrect answers were wrong.

Official material to use alongside this checklist

- RSGB current exam specifications and syllabus
- RSGB Foundation mock exams and EX307 reference booklet
- RSGB Foundation licence information

Checked against the RSGB Combined Syllabus Specification v1.6b [March 2026].

Study note: use this checklist alongside the current official RSGB Foundation material and mock examinations.